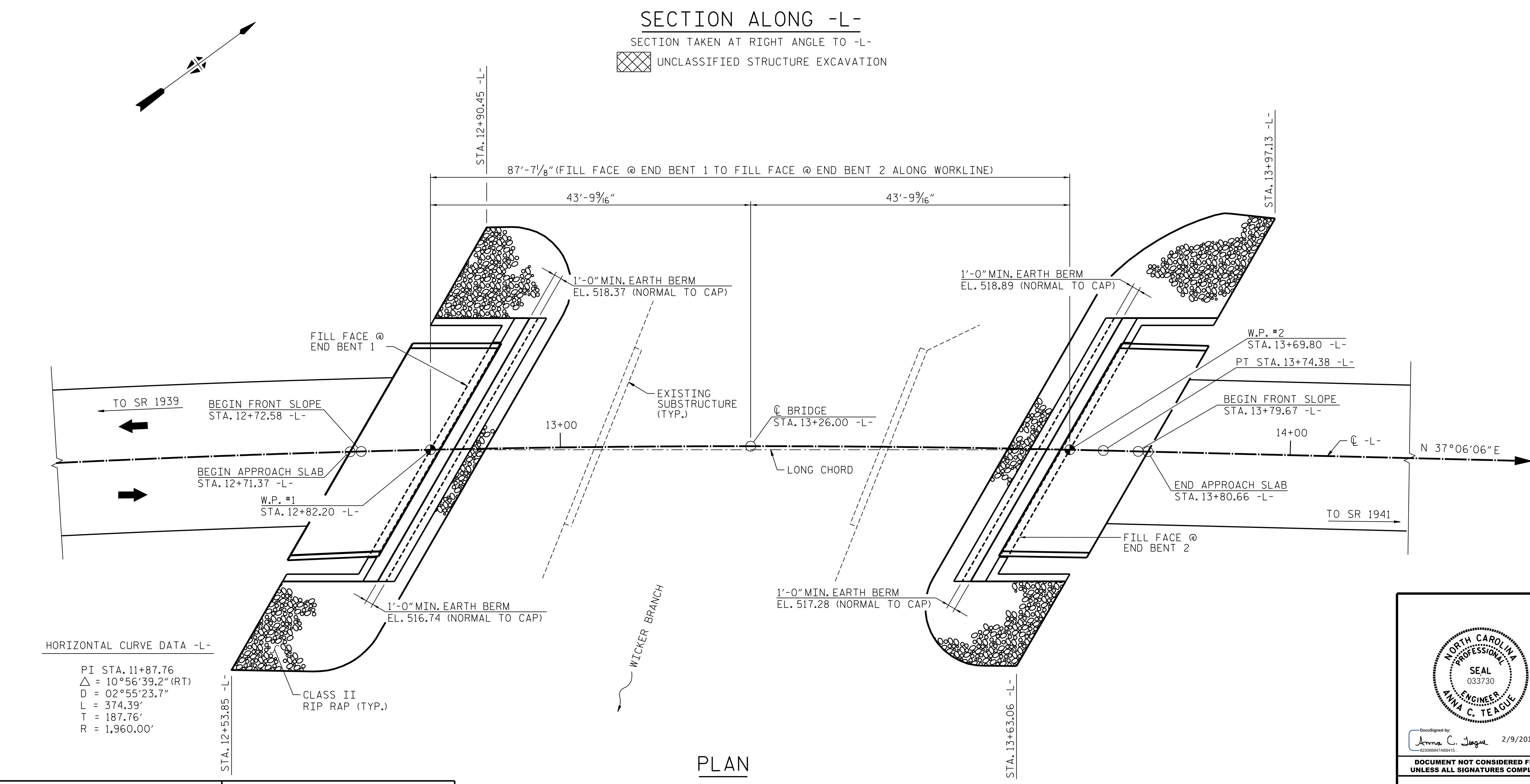
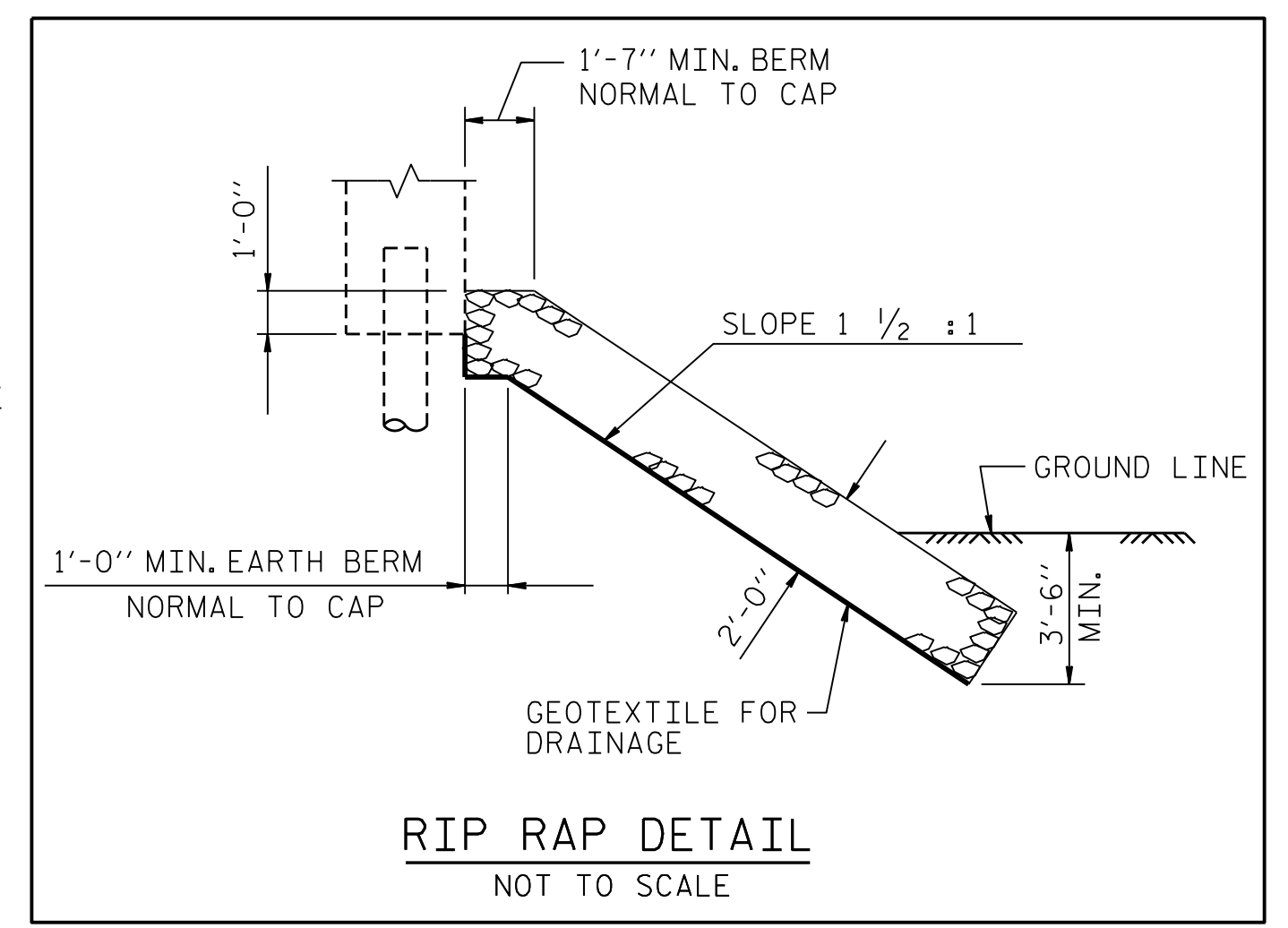
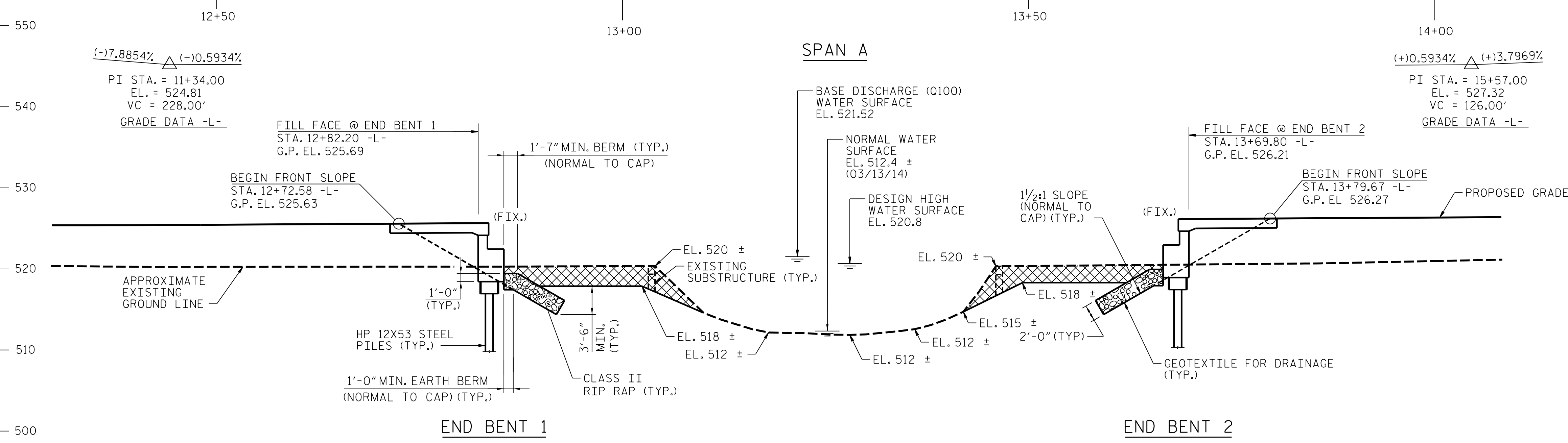


**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

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

PLOT DRIVER: NCDOT_pdf_mono_eng_50upit
 USER: MSELLS
 DATE: 2/9/2016
 FILE: Nor-th-Carolina-Dept-of-Transportation\NCDOT_2012_2014_OC_DIV_LSC_M\NCDOT_17BP_10_To_3c_06_00_TIP_Folder_S\Structure\17BP_10_R_71_Union_#122_Belk_MillRd\Structures\CAD\Union122_SD_00_01.dgn



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.10.R.71
 UNION _____ COUNTY _____
 STATION: 13+26.00 -L-
 SHEET 1 OF 2 REPLACES BRIDGE NO. 122

Designed by: *Anna C. Jagul* 2/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE ON SR 1940
 OVER WICKER BRANCH

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

SHEET NO. S-1
 TOTAL SHEETS 16

DES BY: <u>A. TEAGUE</u>	DATE: <u>10/14</u>	DWG BY: <u>M. SELLS</u>	DATE: <u>10/14</u>
DES CHK: <u>E. NOLTING</u>	DATE: <u>10/14</u>	CHK BY: <u>A. TEAGUE</u>	DATE: <u>10/14</u>

BENCHMARK: BL-4, 17.34' LT. OF STA. 16+58.67 -L-, EL. = 531.11'

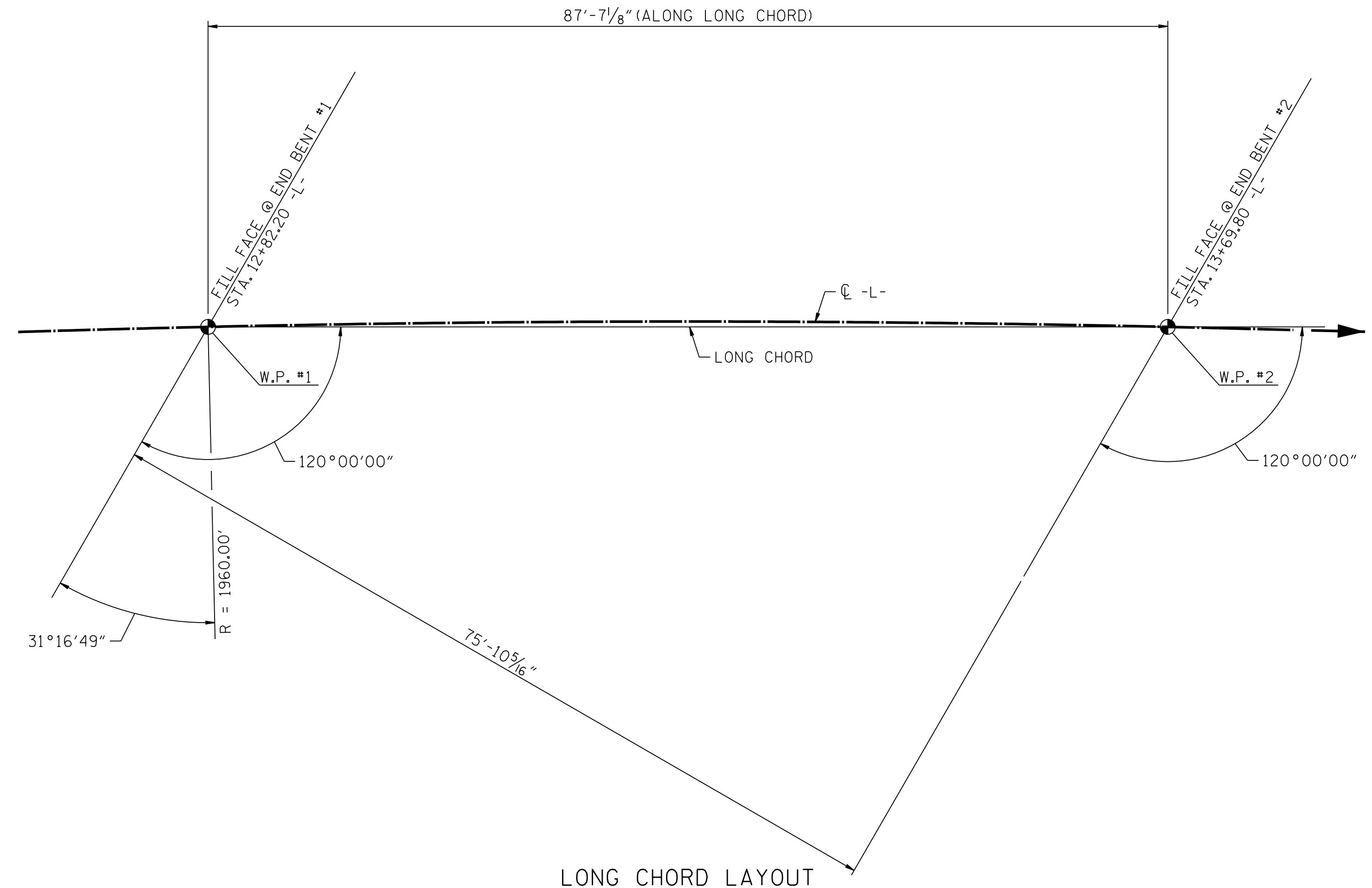
HYDRAULIC DATA	
DESIGN DISCHARGE	= 1600 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR
DESIGN HIGH WATER ELEVATION	= 520.8
DRAINAGE AREA	= 5.8 SQ. MI.
BASE DISCHARGE (Q100)	= 2259 CFS
BASE HIGH WATER ELEVATION	= 521.52

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 4950 CFS
FREQUENCY OF OVERTOPPING FLOOD	= > 500 YR
OVERTOPPING FLOOD ELEVATION	= 525.4

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 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 ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR 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.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 THE EXISTING STRUCTURE CONSISTING OF 1 SPAN (1 @ 40'-8") WITH A TIMBER DECK ON I-BEAMS AND A CLEAR ROADWAY OF 19'-2" ON TIMBER CAPS, POSTS, AND SILLS, WITH TIMBER CAP AND PILE CRUTCHES, AND LOCATED AT THE PROPOSED SITE 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 PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
 DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 208 TONS PER PILE.
 PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO.1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 509.0 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.1.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
 DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 208 TONS PER PILE.
 PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO.2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 509.5 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.2.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18, EVALUATING SCOUR AT BRIDGES".
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+26.00 -L-".
 FOR UTILITY INFORMATION, SEE ROADWAY PLANS.



LONG CHORD LAYOUT
 (END BENTS ARE PARALLEL)
 (SEE GENERAL DRAWING SHEET 1 FOR HORIZONTAL CURVE DATA)

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 13+26.00 -L-	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 13+26.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 13+26.00 -L-	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 2'-9" PRESTRESSED CONCRETE BOX BEAMS	ASBESTOS ASSESSMENT		
	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	NO.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE						LUMP SUM			170.00			LUMP SUM	10	850.0		
END BENT NO. 1		39	6		26.7		3,724	5	75		99	110				
END BENT NO. 2		31	14		26.4		3,692	5	75		104	115				
TOTAL	LUMP SUM	70	20	LUMP SUM	53.1	LUMP SUM	7,416	10	150	170.00	203	225	LUMP SUM	10	850.0	LUMP SUM

PROJECT NO. 17BP.10.R.71

UNION COUNTY

STATION: 13+26.00 -L-

SHEET 2 OF 2

Designed by: Anna C. Teague 2/9/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1940
 OVER WICKER BRANCH

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

SHEET NO. S-2
 TOTAL SHEETS 16

PLOT DRIVER: NCDOT...pdf...mono...eng...50...pt
 USER: MSELLS DATE: 2/9/2016
 FILE: Nor-th-Carolina-Dept-of-Transportation\NCDOT-2012-2014-0C-Div-LSC-M\NCDOT-17BP-10-R-71-Union-1722-Belk-MillRd\Structures\CAD\Union122-SD-00-02.dgn

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR BOX BEAMS

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			
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	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 (INVENTORY)	N/A	①	1.117	--	1.75	0.247	1.93	A	EL	41.634	0.625	1.12	A	EL	8.327	0.80	0.247	1.56	A	EL	41.634		
	HL-93 (OPERATING)	N/A		1.448	--	1.35	0.247	2.50	A	EL	41.634	0.625	1.45	A	EL	8.327	N/A	--	--	--	--	--	--	
	HS-20 (INVENTORY)	36.000	②	1.448	52.140	1.75	0.247	2.59	A	EL	41.634	0.625	1.45	A	EL	8.327	0.80	0.247	2.09	A	EL	41.634		
	HS-20 (OPERATING)	36.000		1.877	67.589	1.35	0.247	3.35	A	EL	41.634	0.625	1.88	A	EL	8.327	N/A	--	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.378	59.102	1.40	0.247	7.48	A	EL	41.634	0.625	4.38	A	EL	8.327	0.80	0.247	4.84	A	EL	41.634	
		SNGARBS2	20.000		3.091	61.822	1.40	0.247	5.50	A	EL	41.634	0.625	3.09	A	EL	8.327	0.80	0.247	3.56	A	EL	41.634	
		SNAGRIS2	22.000		2.861	62.937	1.40	0.247	5.17	A	EL	41.634	0.625	2.86	A	EL	8.327	0.80	0.247	3.35	A	EL	41.634	
		SNCOTTS3	27.250		2.183	59.498	1.40	0.247	3.72	A	EL	41.634	0.625	2.18	A	EL	8.327	0.80	0.247	2.41	A	EL	41.634	
		SNAGGRS4	34.925		1.797	62.749	1.40	0.247	3.08	A	EL	41.634	0.625	1.80	A	EL	8.327	0.80	0.247	1.99	A	EL	41.634	
		SNS5A	35.550		1.812	64.409	1.40	0.247	3.01	A	EL	41.634	0.625	1.81	A	EL	8.327	0.80	0.247	1.95	A	EL	41.634	
		SNS6A	39.950		1.647	65.797	1.40	0.247	2.75	A	EL	41.634	0.625	1.65	A	EL	8.327	0.80	0.247	1.78	A	EL	41.634	
		SNS7B	42.000		1.610	67.634	1.40	0.247	2.62	A	EL	41.634	0.625	1.61	A	EL	8.327	0.80	0.247	1.70	A	EL	41.634	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.965	64.845	1.40	0.247	3.35	A	EL	41.634	0.625	1.97	A	EL	8.327	0.80	0.247	2.17	A	EL	41.634	
		TNT4A	33.075		1.922	63.556	1.40	0.247	3.36	A	EL	41.634	0.625	1.92	A	EL	8.327	0.80	0.247	2.18	A	EL	41.634	
		TNT6A	41.600		1.701	70.755	1.40	0.247	2.74	A	EL	41.634	0.625	1.70	A	EL	8.327	0.80	0.247	1.77	A	EL	41.634	
		TNT7A	42.000		1.670	70.125	1.40	0.247	2.75	A	EL	41.634	0.625	1.67	A	EL	8.327	0.80	0.247	1.78	A	EL	41.634	
		TNT7B	42.000		1.578	66.274	1.40	0.247	2.83	A	EL	41.634	0.625	1.58	A	EL	8.327	0.80	0.247	1.83	A	EL	41.634	
		TNAGRIT4	43.000		1.530	65.773	1.40	0.247	2.70	A	EL	41.634	0.625	1.53	A	EL	8.327	0.80	0.247	1.75	A	EL	41.634	
TNAGT5A	45.000		1.511	68.008	1.40	0.247	2.55	A	EL	41.634	0.625	1.51	A	EL	8.327	0.80	0.247	1.65	A	EL	41.634			
TNAGT5B	45.000		③	1.456	65.508	1.40	0.247	2.52	A	EL	41.634	0.625	1.46	A	EL	8.327	0.80	0.247	1.63	A	EL	41.634		

LOAD FACTORS:

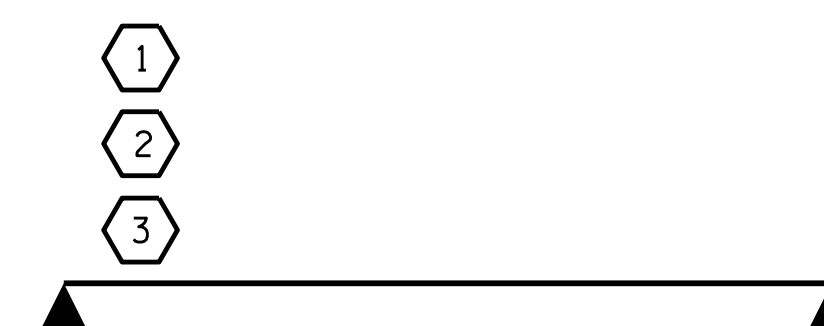
DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

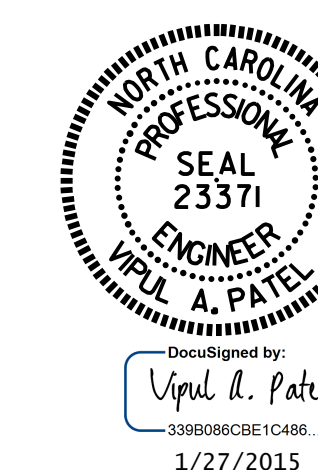
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

#	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	



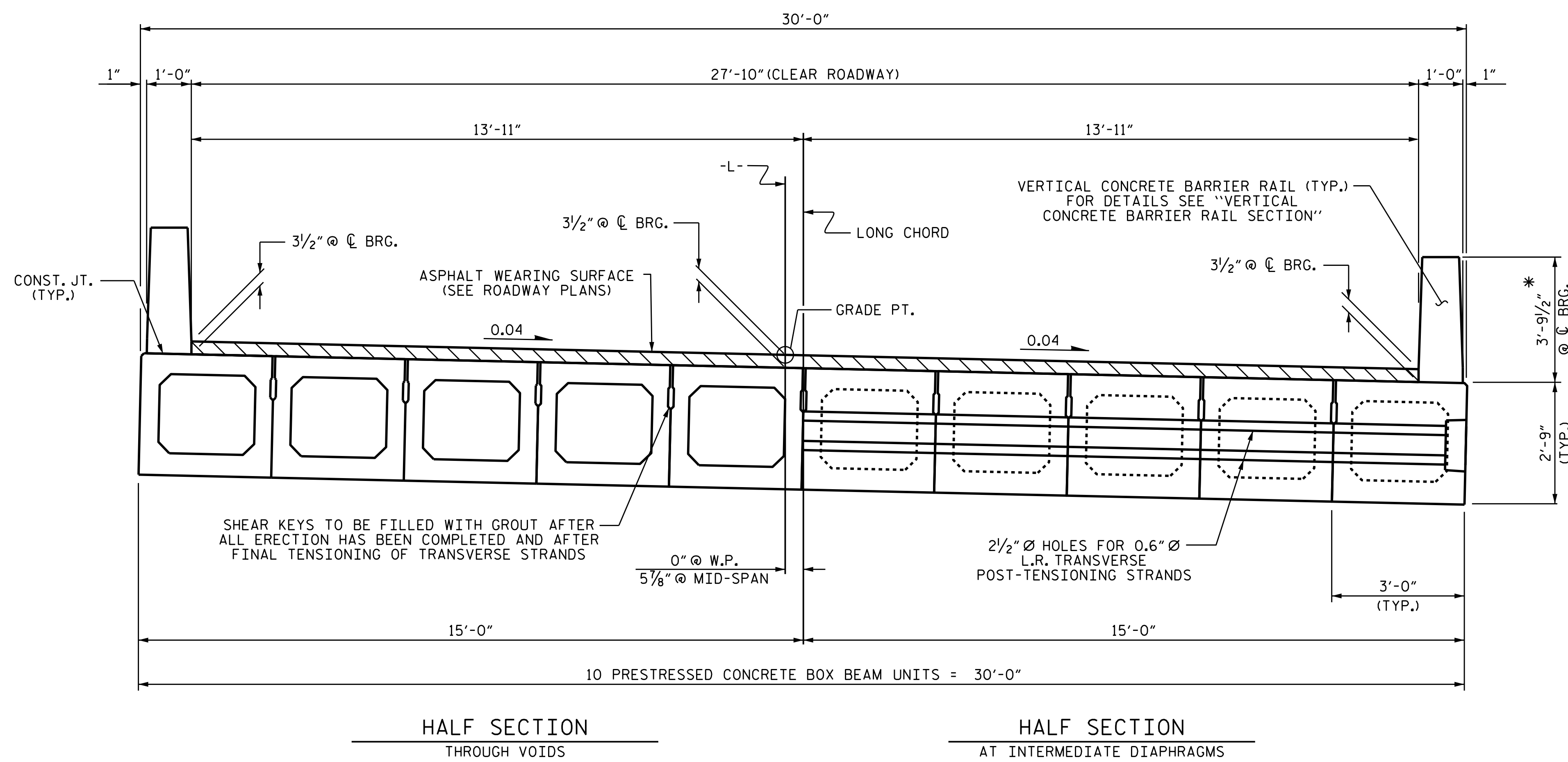
LRFR SUMMARY

PROJECT NO. 17BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR 85' BOX BEAM UNIT 60° SKEW & 120° SKEW (NON-INTERSTATE TRAFFIC)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 16

ASSEMBLED BY : N.D.AIUTO	DATE : 10/16/14
CHECKED BY : M.E.GILES	DATE : 12/5/14
DRAWN BY : TMG	DATE : 11/11
CHECKED BY : AAC	DATE : 11/11



HALF SECTION THROUGH VOIDS HALF SECTION AT INTERMEDIATE DIAPHRAGMS

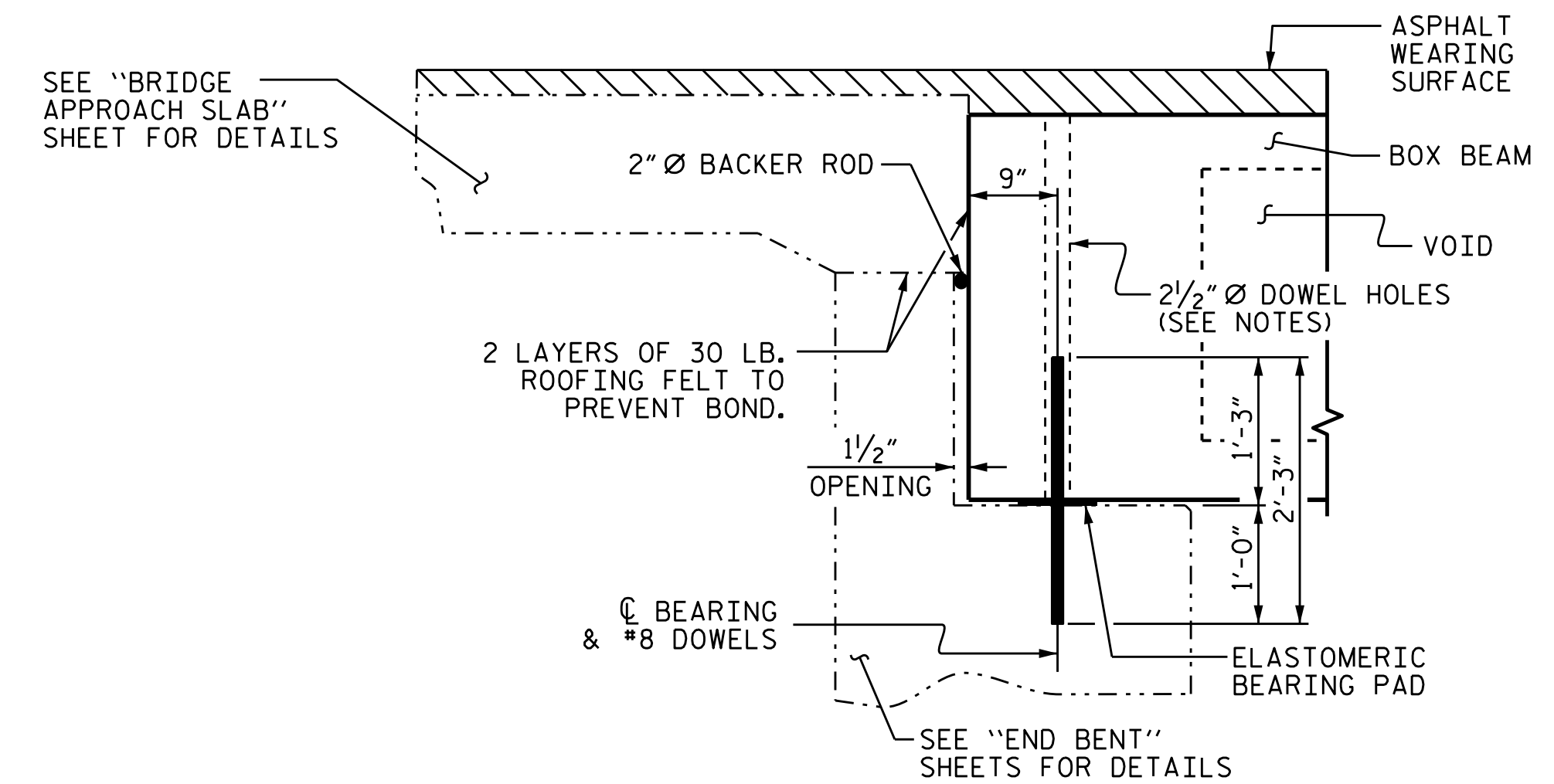
TYPICAL SECTION

* 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.

NOTES

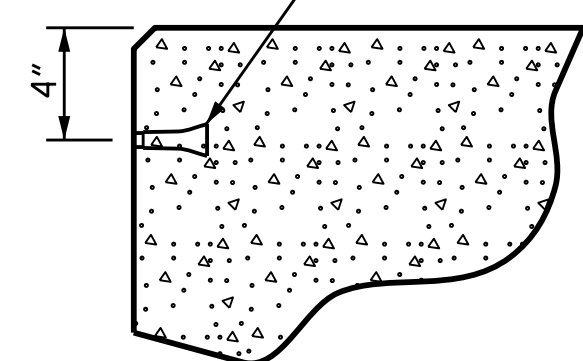
- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.
- FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.
- RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.
- THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.
- THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.
- ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.
- PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.
- APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.
- VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL 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.
- THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.
- THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.
- THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.
- THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

FIXED END



SECTION AT END BENT

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

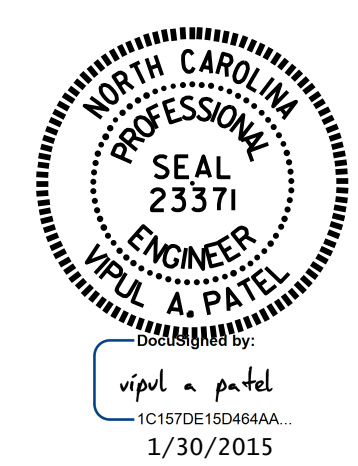


THREADED INSERT DETAIL

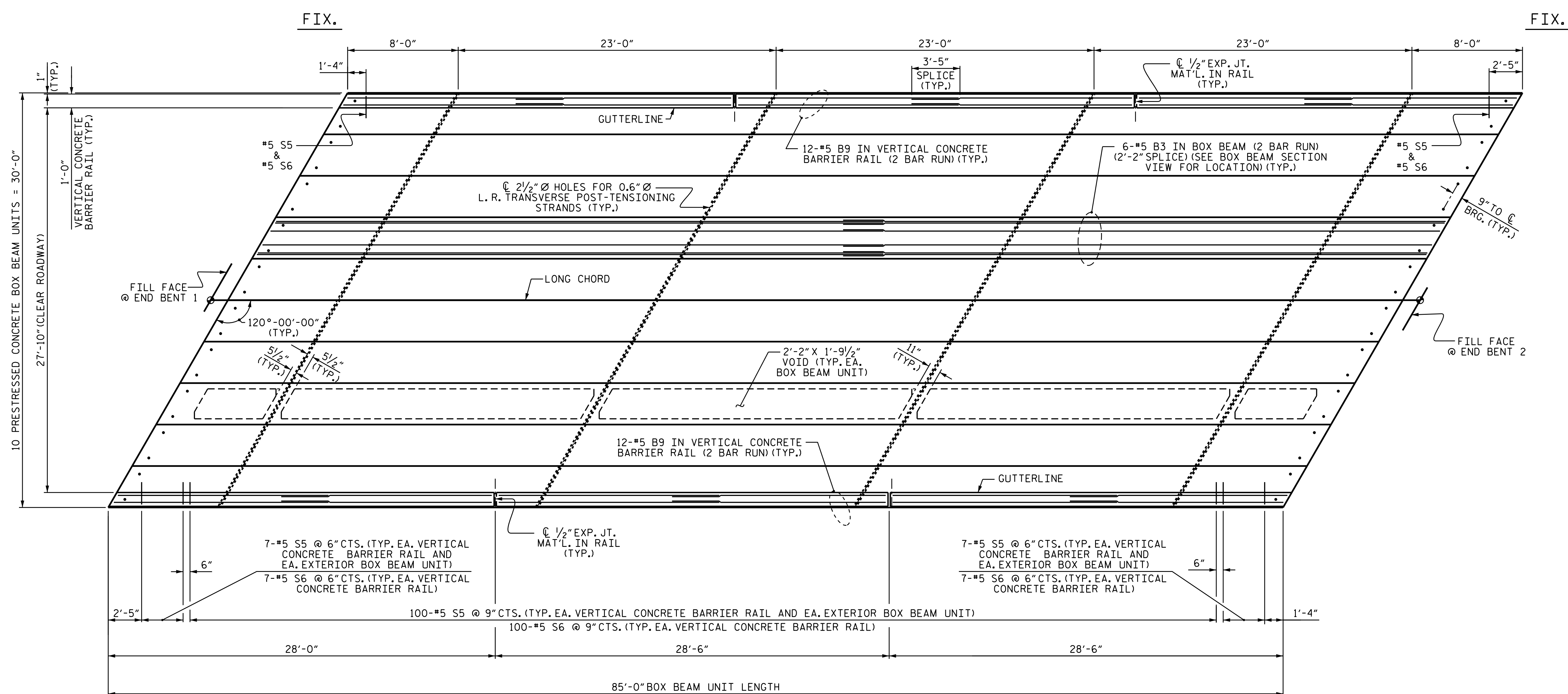
PROJECT NO. 17BP.10.R.71
UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 1 OF 5

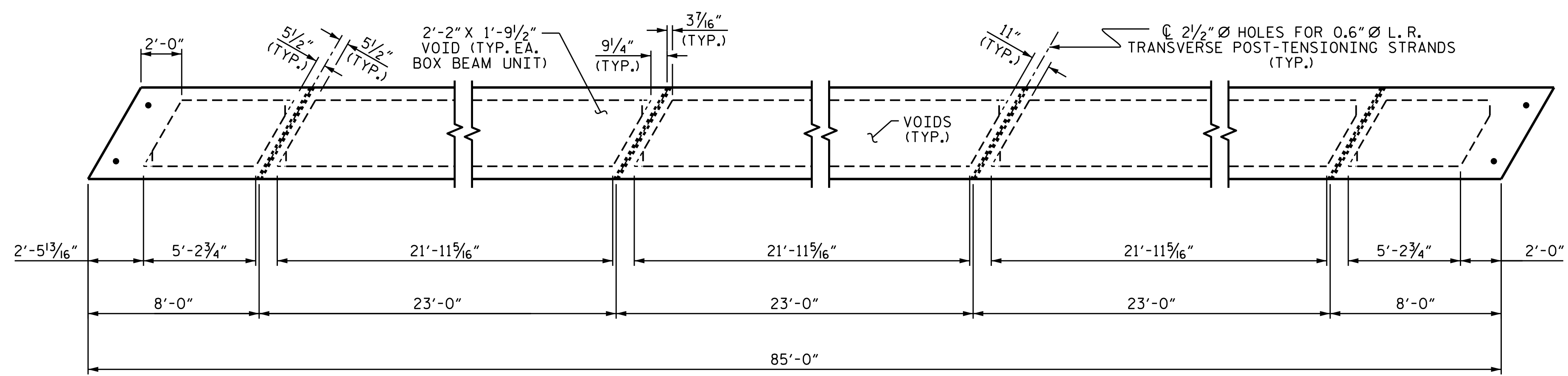
STATE OF NORTH CAROLINA			
DEPARTMENT OF TRANSPORTATION			
RALEIGH			
STANDARD			
3'-0" X 2'-9"			
PRESTRESSED CONCRETE			
BOX BEAM UNIT			
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S-4
2			TOTAL SHEETS
			16



ASSEMBLED BY : N.D. AIUTO	DATE : 10/16/14
CHECKED BY : M.E. GILES	DATE : 12/5/14
DRAWN BY : DGE 8/II	REV. 8/14
CHECKED BY : TMG II/II	MAA/TMG



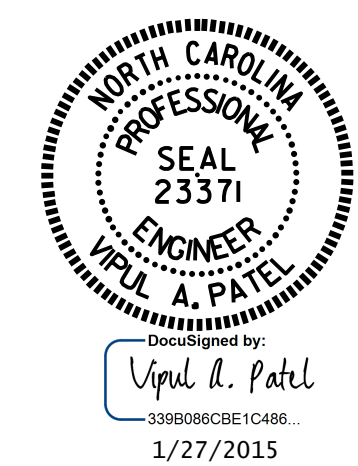
PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

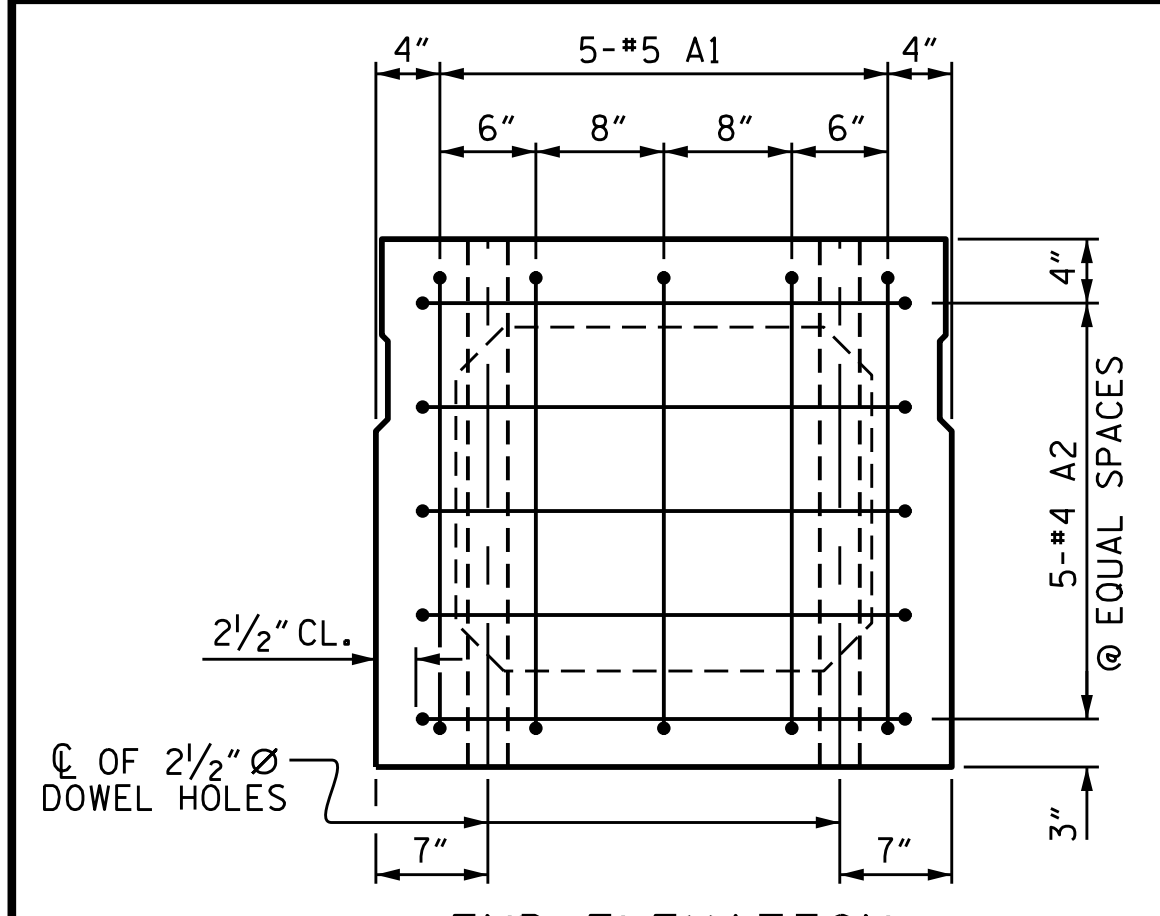
PROJECT NO. 17BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 85' UNIT
 27'-10" CLEAR ROADWAY
 120° SKEW

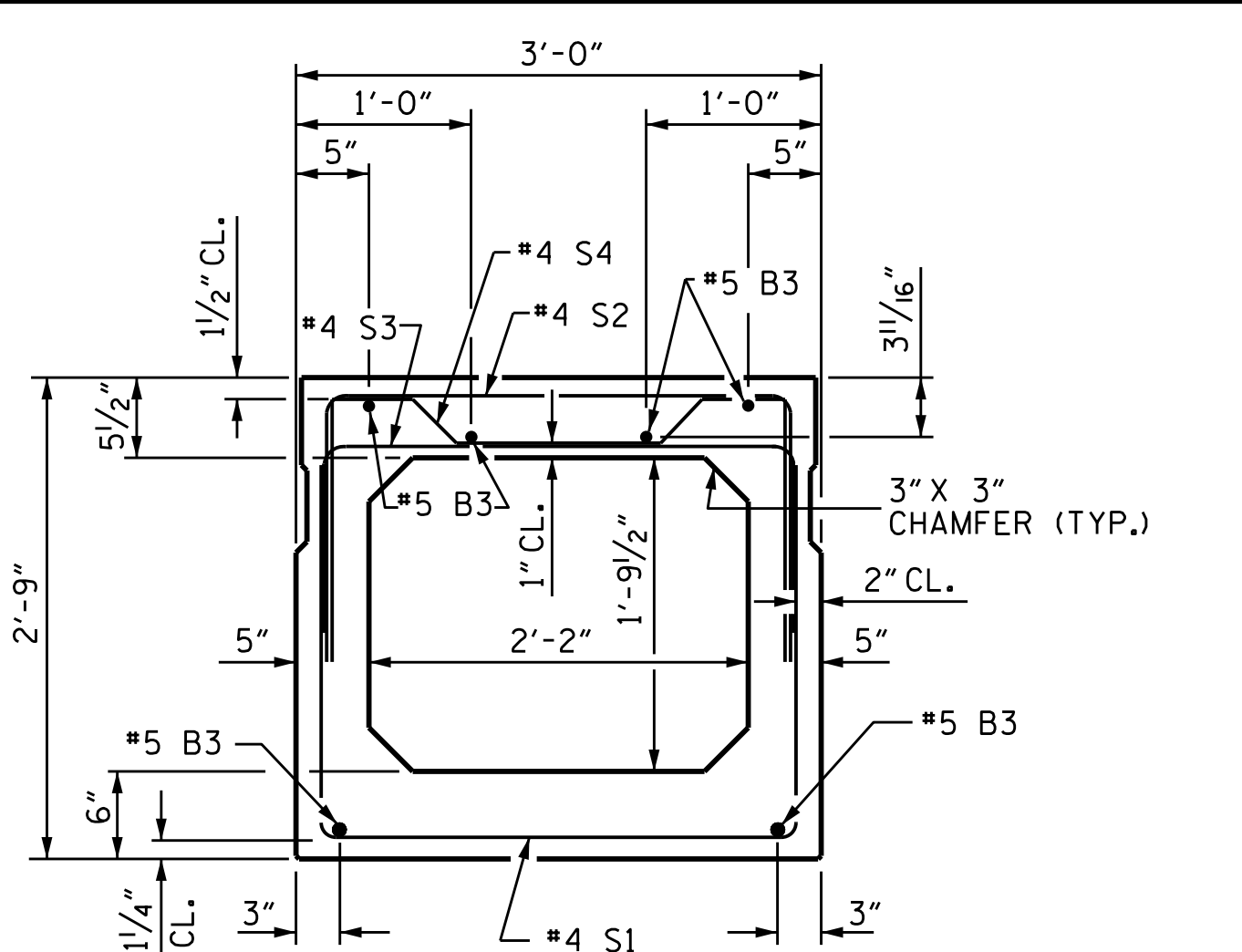


ASSEMBLED BY: N.D. AIUTO DATE: 10/16/14
 CHECKED BY: M.E. GILES DATE: 12/5/14
 DRAWN BY: DCE 8/11 REV. 8/14 MAA/TMG
 CHECKED BY: TMG 11/11

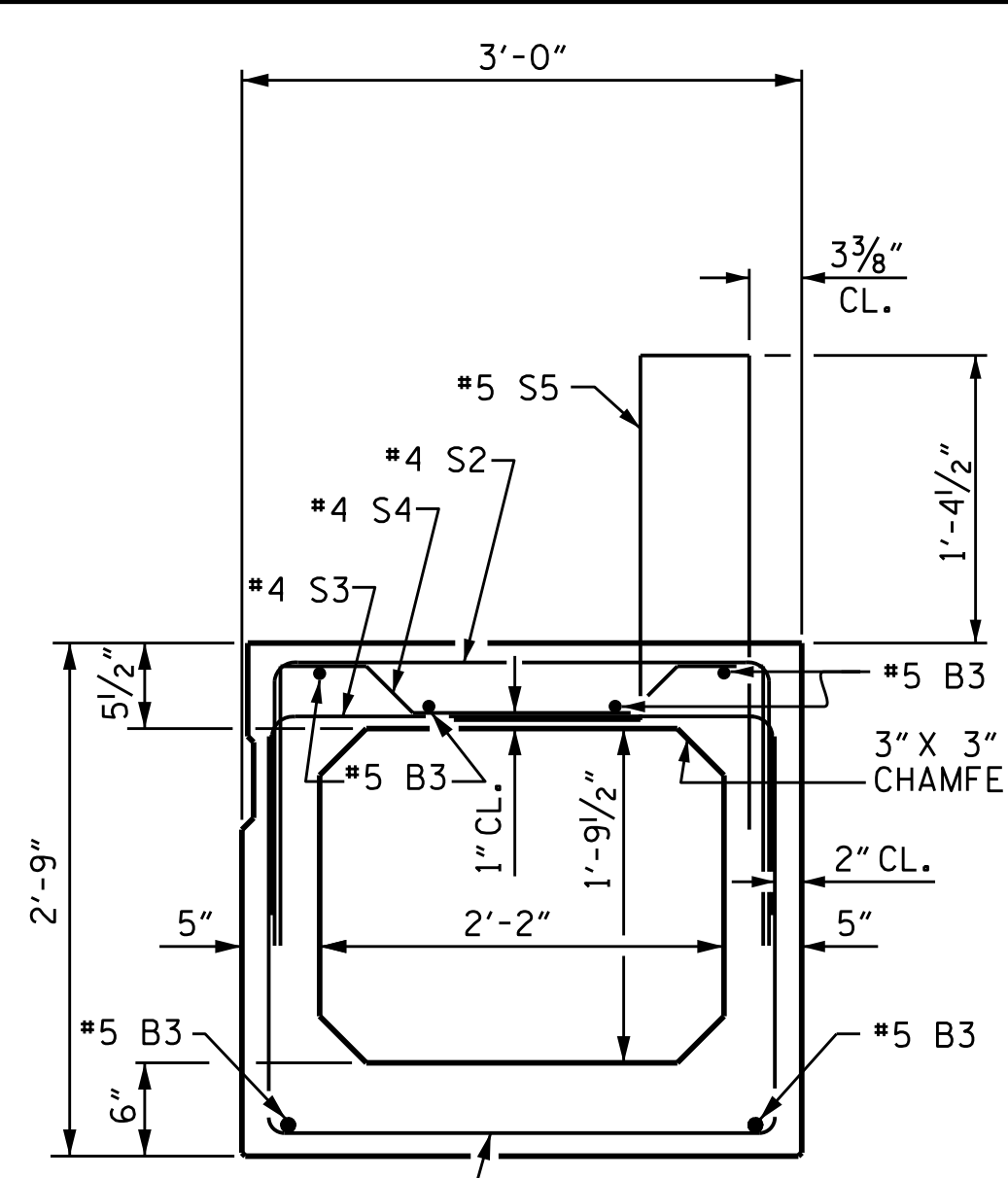
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16



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

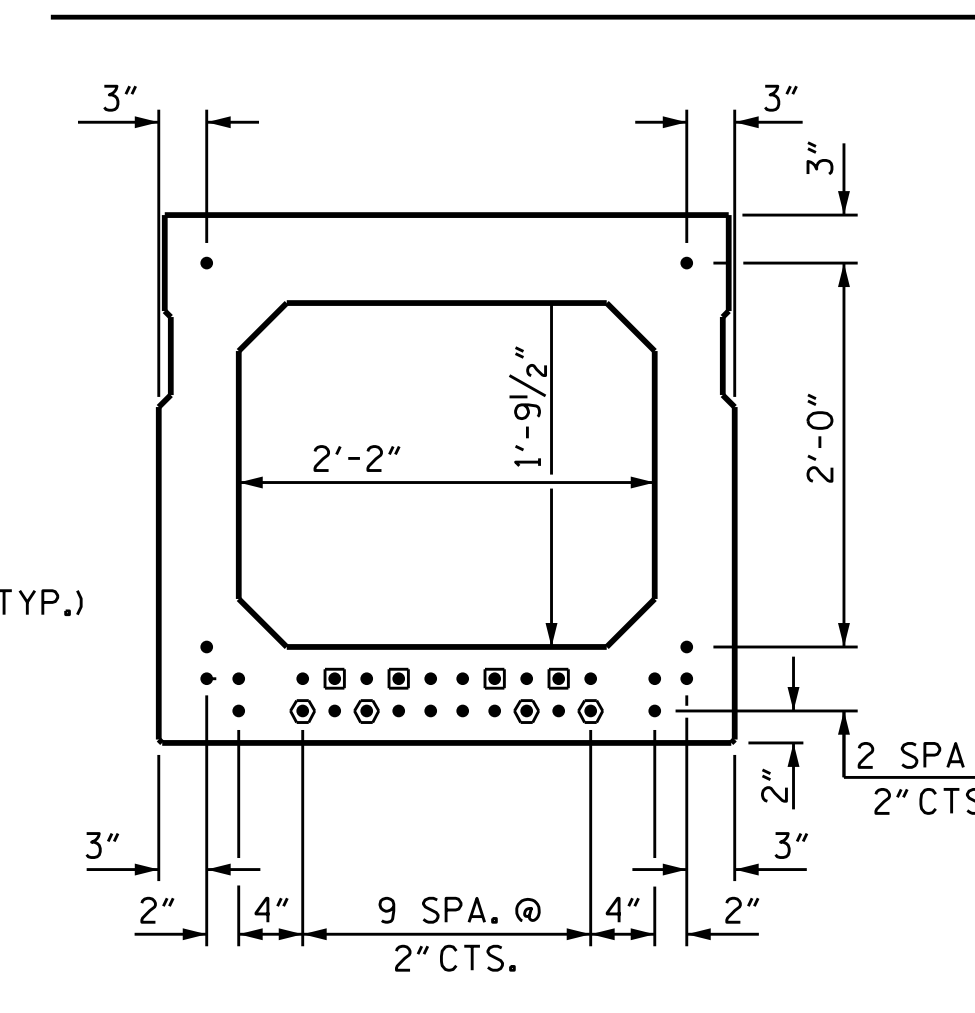


INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

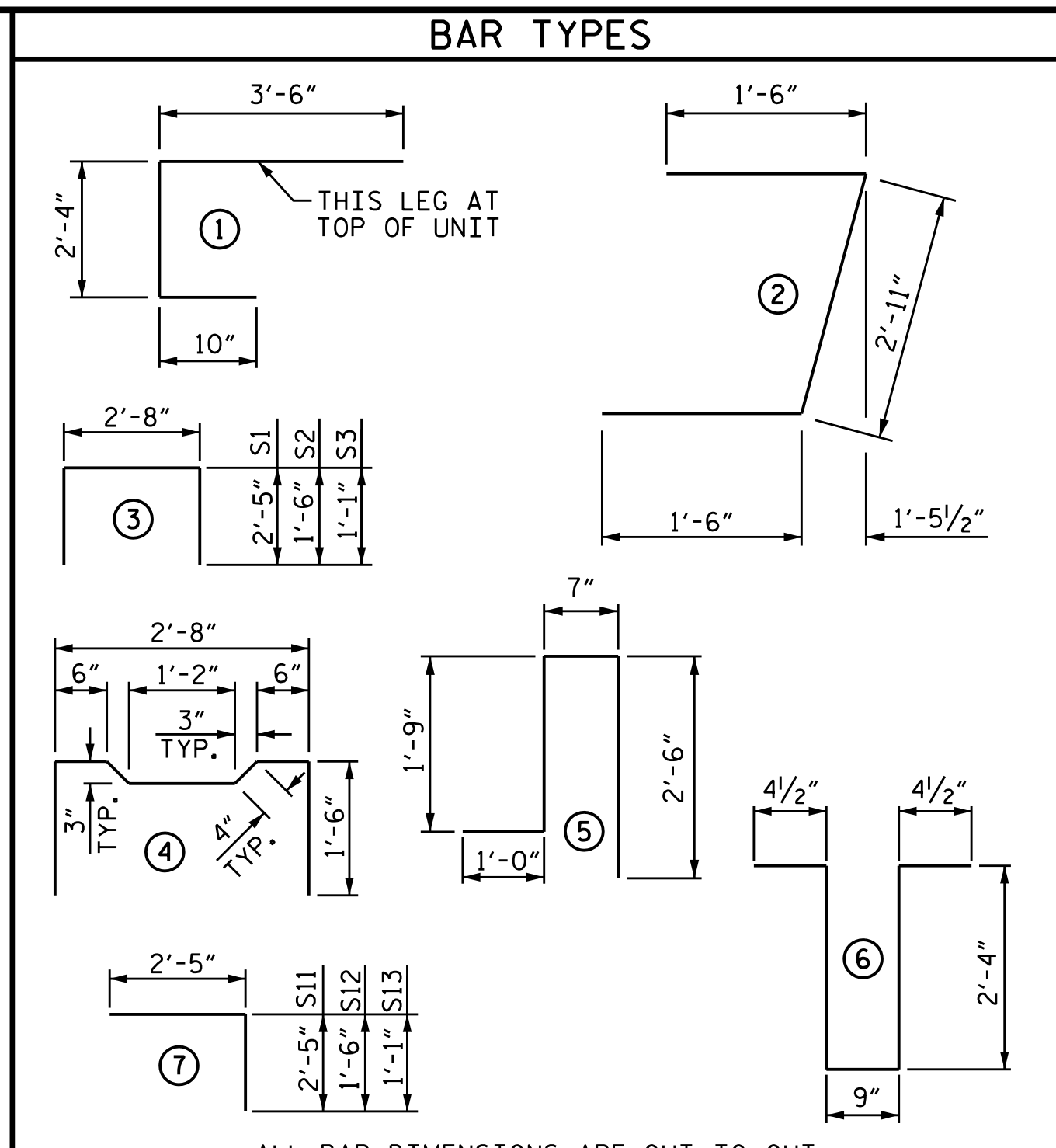
0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION
(30 STRANDS REQUIRED)
DEBONDING LEGEND

- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ⦶ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

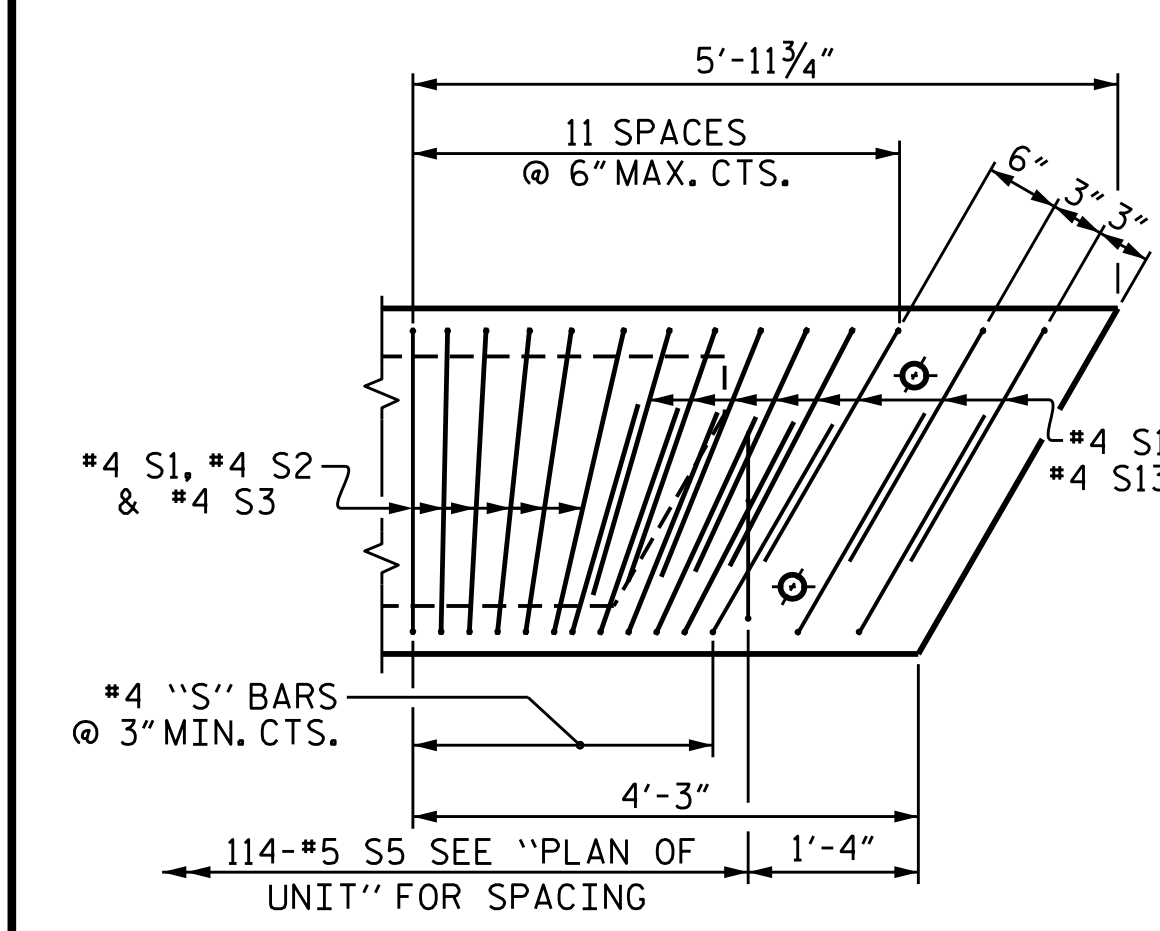
GRADE 270 STRANDS	
AREA (SQUARE INCHES)	0.6" Ø L.R.
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



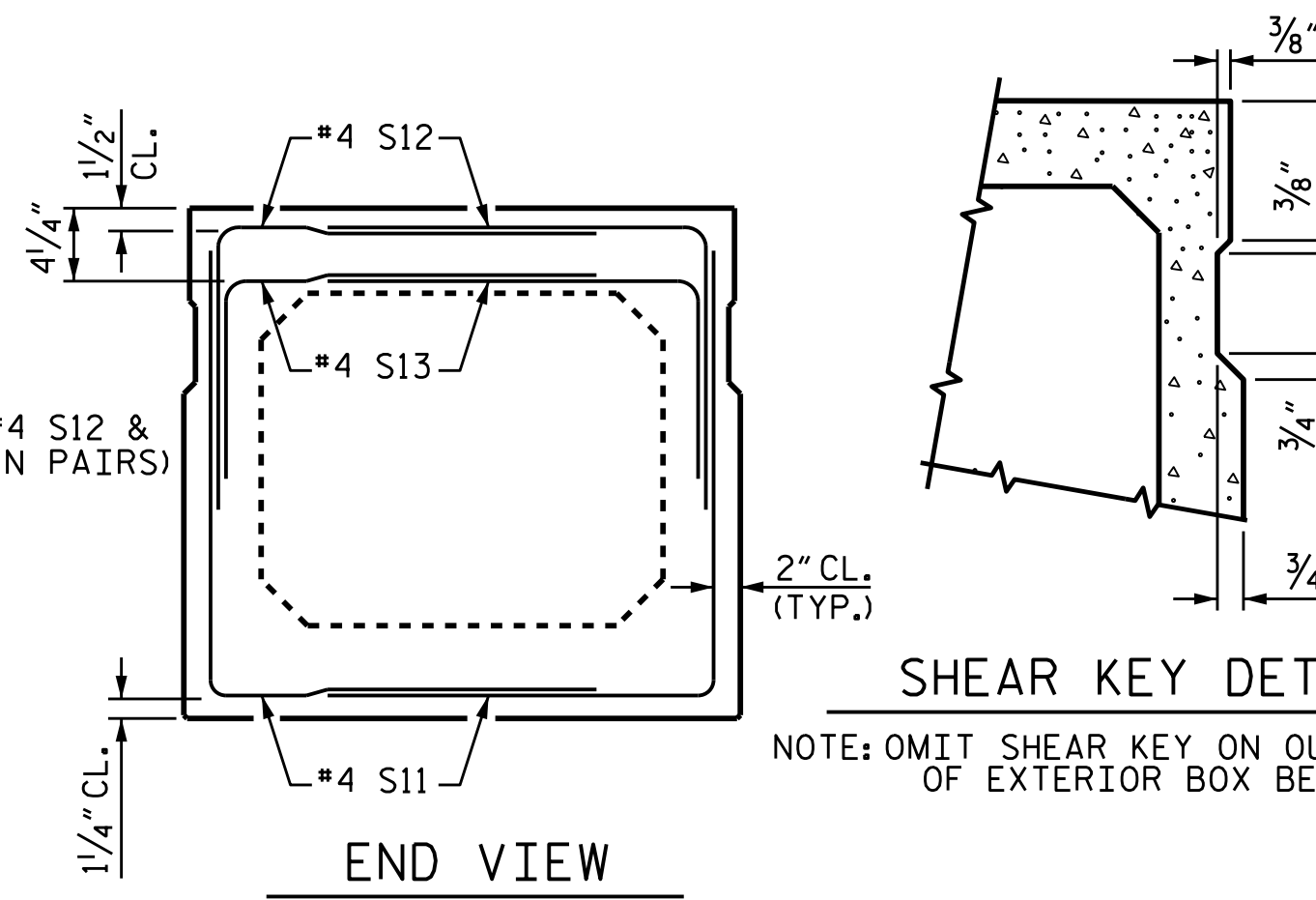
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

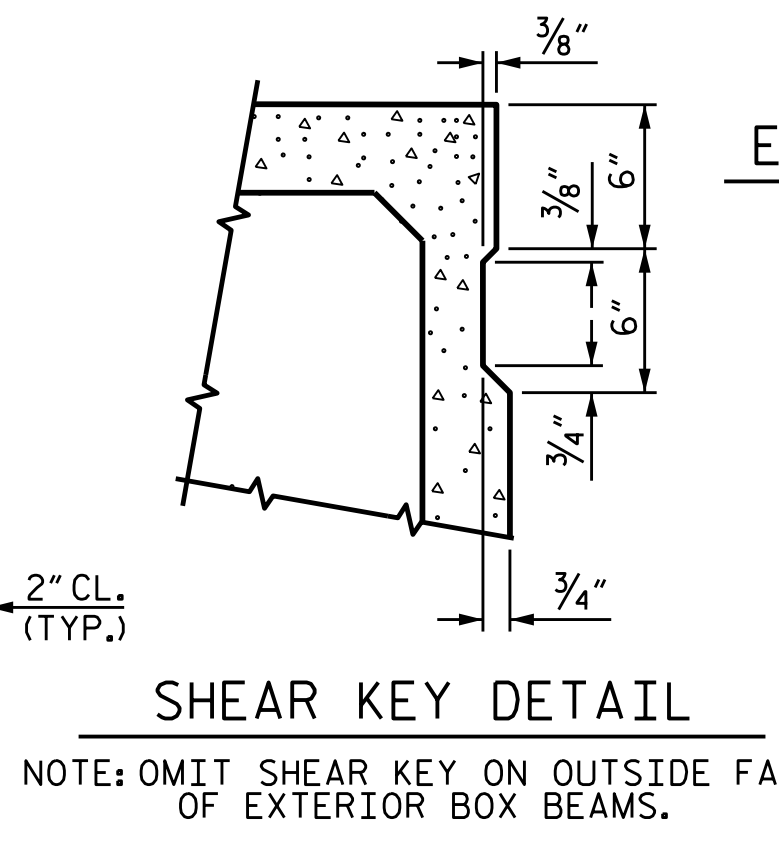
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-11"	134	5'-11"	134
B3	12	#5	STR	43'-5"	543	43'-5"	543
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-10"	15	2'-10"	15
S1	62	#4	3	7'-6"	311	7'-6"	311
S2	62	#4	3	5'-8"	235	5'-8"	235
S3	111	#4	3	4'-10"	358	4'-10"	358
S4	49	#4	4	5'-10"	191	5'-10"	191
S11	32	#4	7	4'-10"	103	4'-10"	103
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
* S5	114	#5	5	5'-10"	694	--	--
REINFORCING STEEL				LBS.	2,168	LBS.	2,168
* EPOXY COATED REINF. STEEL				LBS.	694	LBS.	694
8,000 P.S.I. CONCRETE				CU. YDS.	15.2	CU. YDS.	15.1
0.6" Ø L.R. STRANDS				No.	30	No.	30



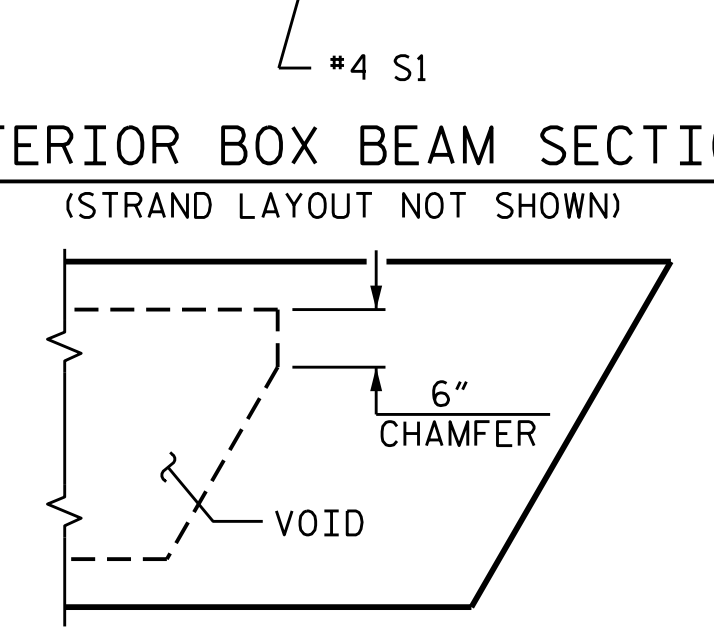
DETAIL "B"
EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS, "B" BARS AND "A" BARS NOT SHOWN.



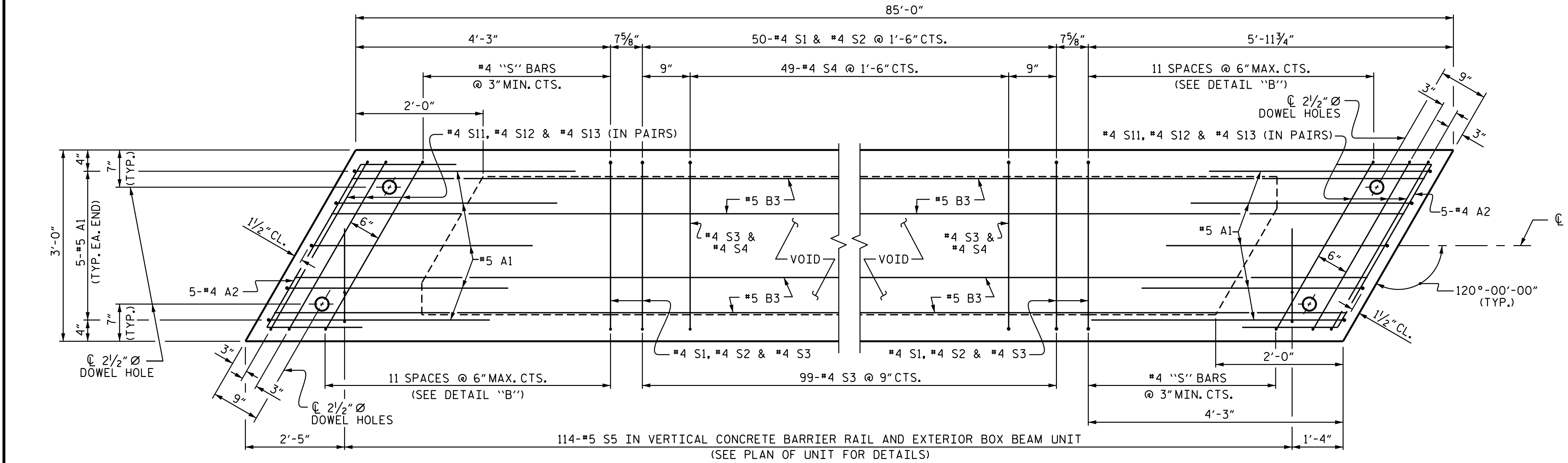
END VIEW
(SHOWING #4 "S" BARS IN END OF BEAM)



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



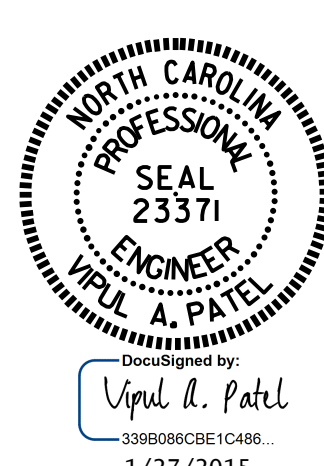
CHAMFER DETAIL
SHOWING 6" VOID CHAMFER



PLAN OF BOX BEAM

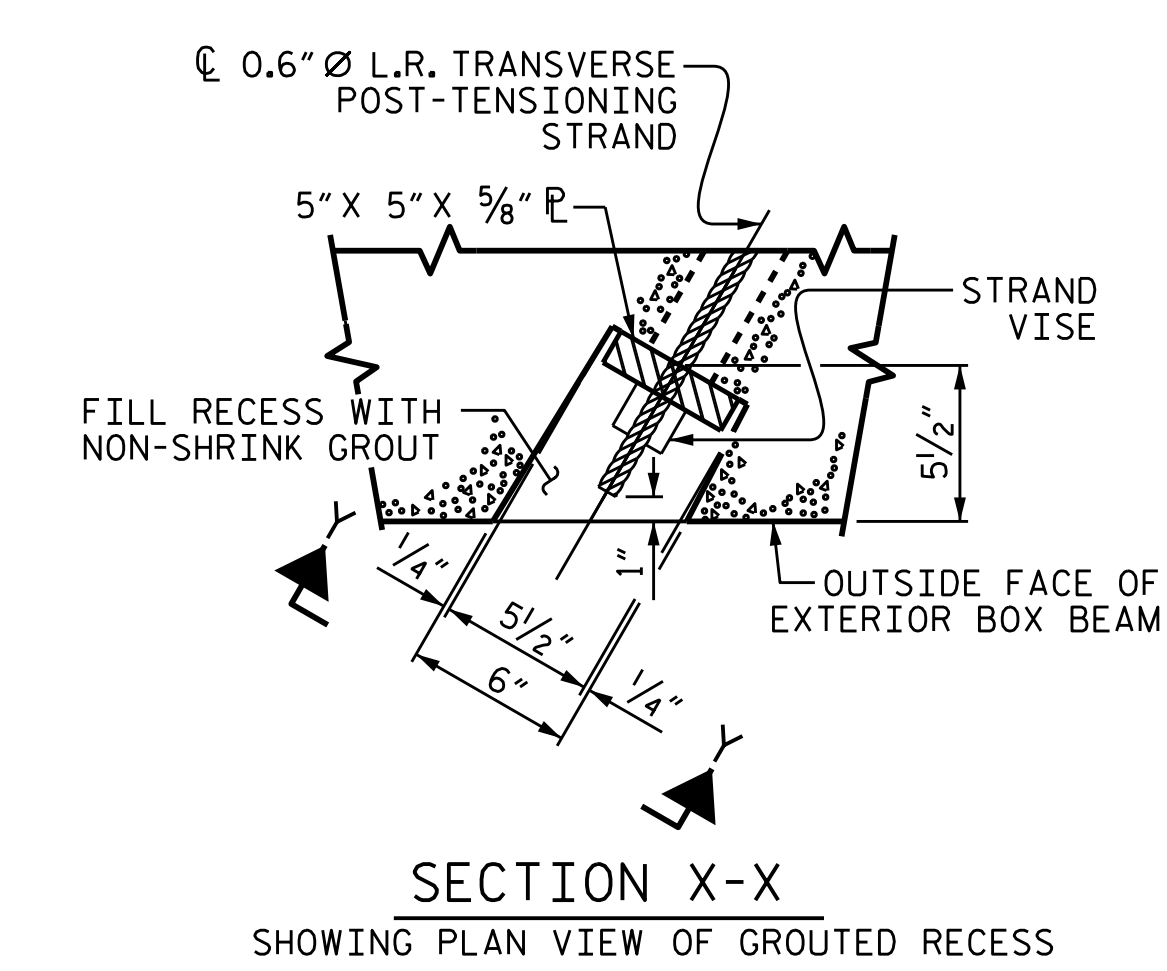
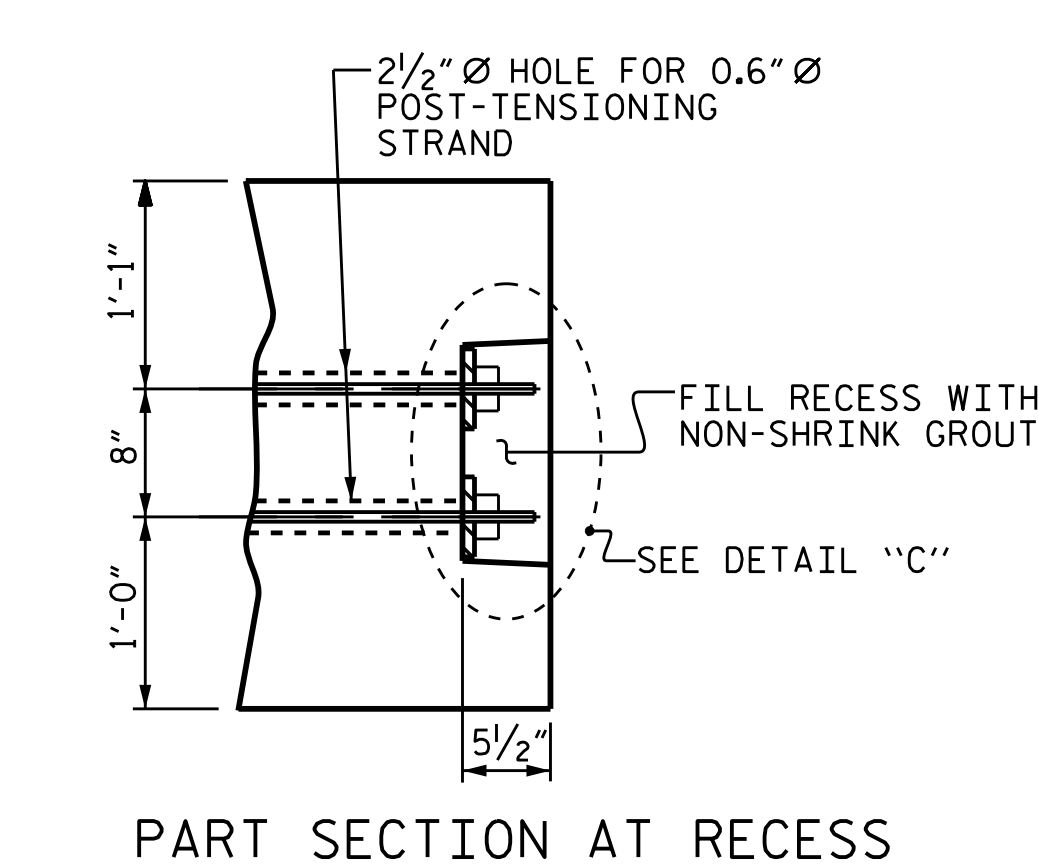
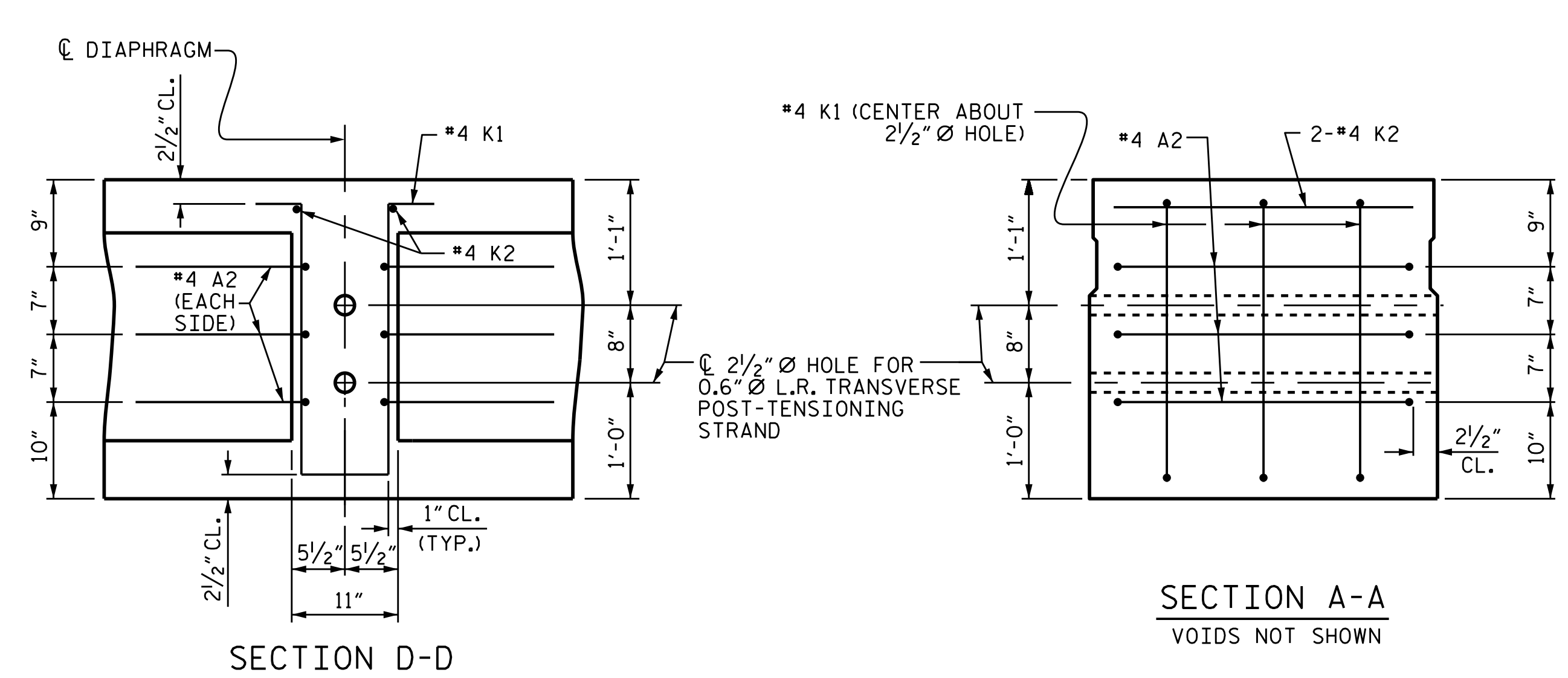
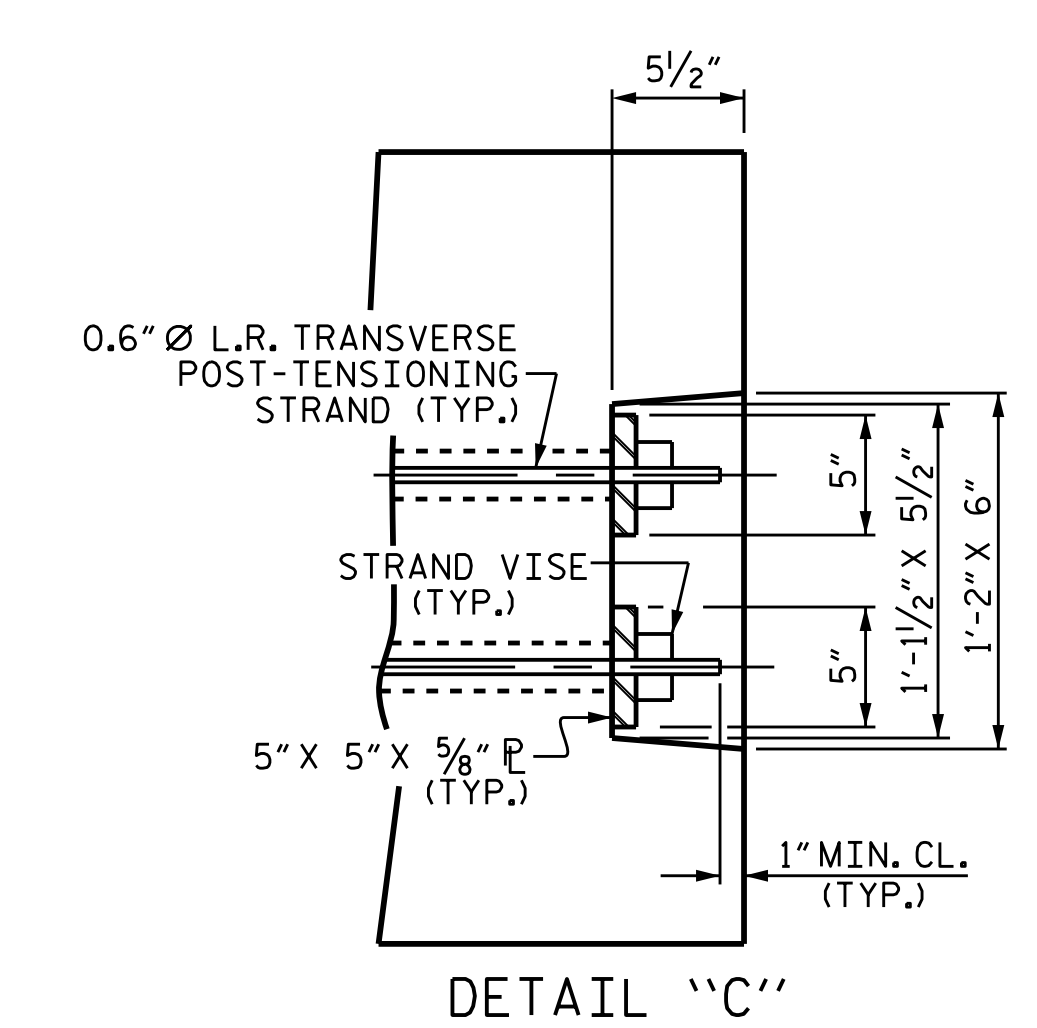
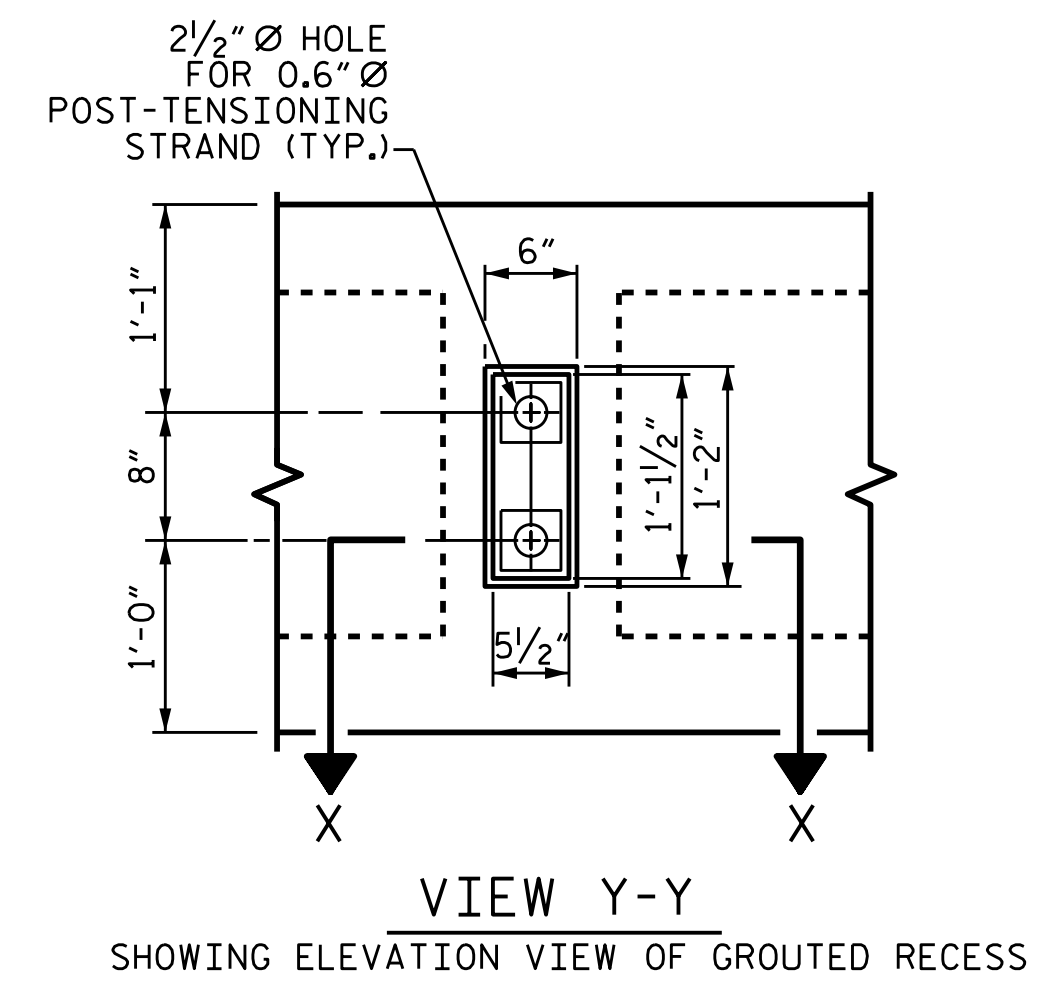
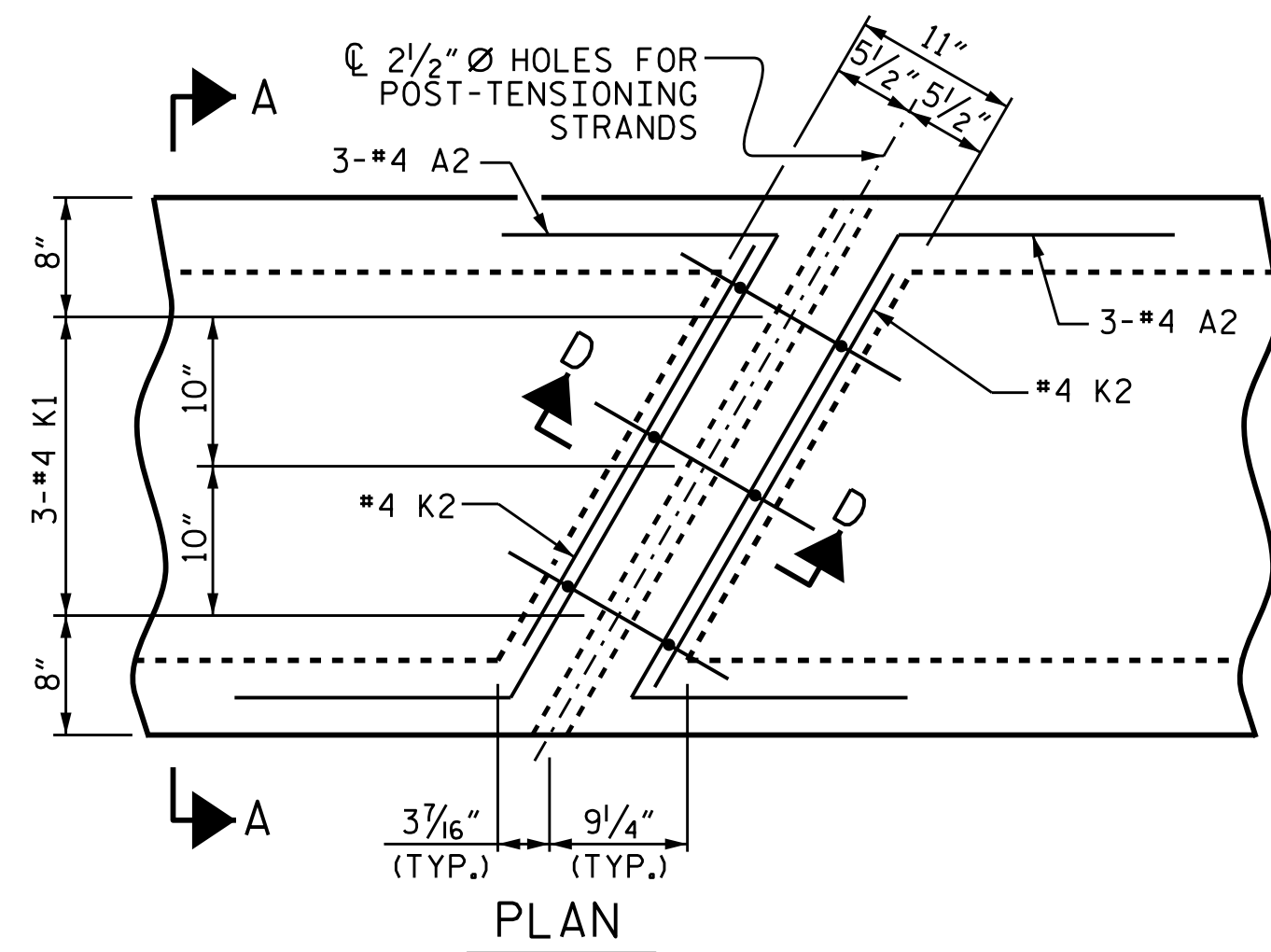
EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

ASSEMBLED BY : N.D. AIUTO DATE : 10/16/14
CHECKED BY : M.E. GILES DATE : 12/5/14
DRAWN BY : DGE II/II REV. 8/14 MAA/TMG
CHECKED BY : TMG II/II



PROJECT NO. 17BP.10.R.71
UNION COUNTY
STATION: 13+26.00 -L-
SHEET 3 OF 5

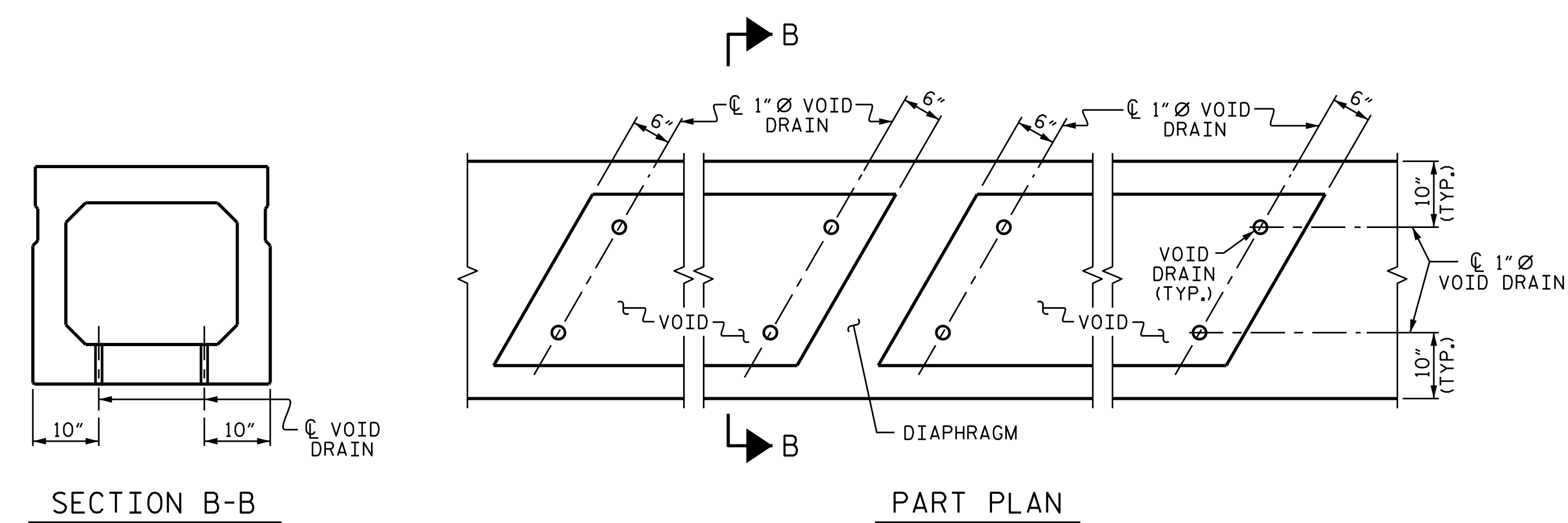
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD			
3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO. S-6			TOTAL SHEETS 16



**GROUTED RECESS DETAIL AT
END OF POST-TENSIONED STRANDS
OF EXTERIOR BOX BEAM**

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



VOID DRAIN DETAILS
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
85' BOX BEAM UNIT	3'-0" x 2'-9"
CAMBER (SLAB ALONE IN PLACE)	2 3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↓
FINAL CAMBER	2" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 17BP.10.R.71
UNION COUNTY
STATION: 13+26.00 -L-
SHEET 4 OF 5

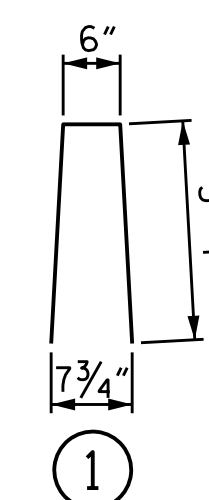


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

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

ASSEMBLED BY : N.D'AIUTO	DATE : 10/16/14
CHECKED BY : M.E.GILES	DATE : 12/5/14
DRAWN BY : DGE 11/11	REV. 8/14
CHECKED BY : TMC 11/11	MAA/TMG

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-0"	170'-0"
INTERIOR B.B.	8	85'-0"	680'-0"
TOTAL	10		850'-0"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	85' UNIT				
* B9	144	#5	STR	16'-0"	2,403
* S6	228	#5	1	7'-2"	1,704
* EPOXY COATED REINFORCING STEEL				LBS.	4,107
CLASS AA CONCRETE				CU.YDS.	22.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	170.00

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
85' UNITS	1 1/2"	3'-7 1/2"

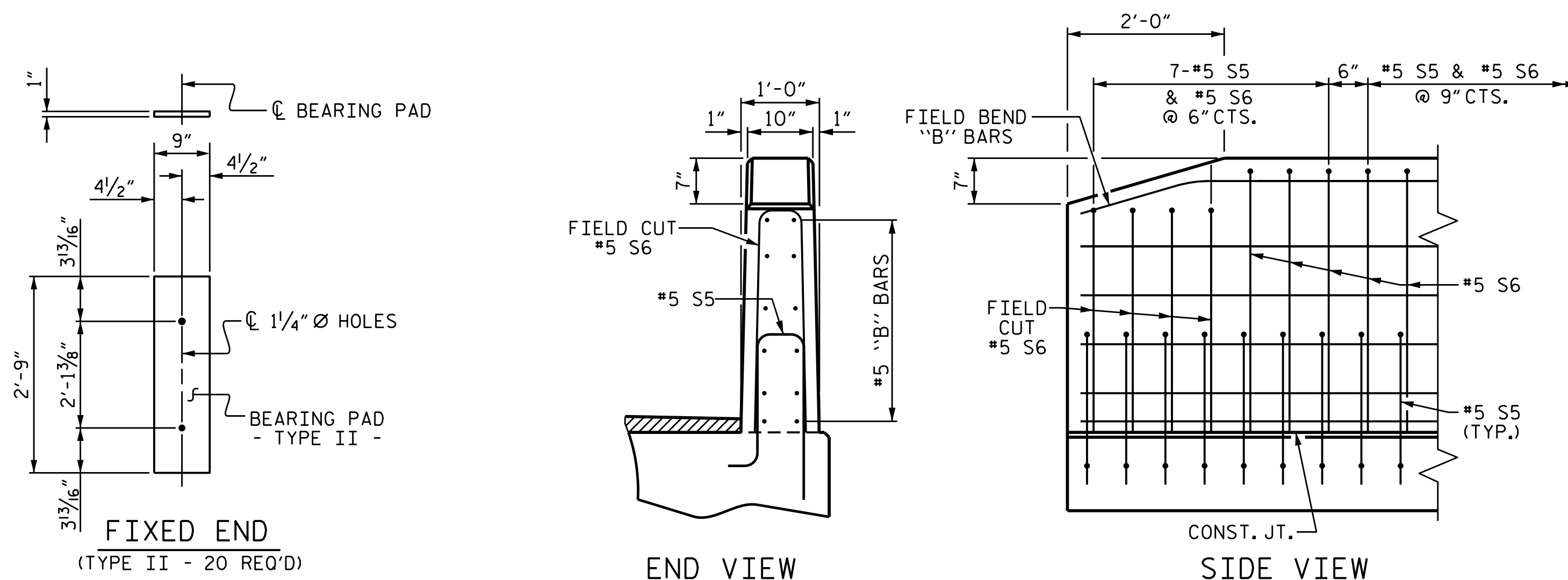
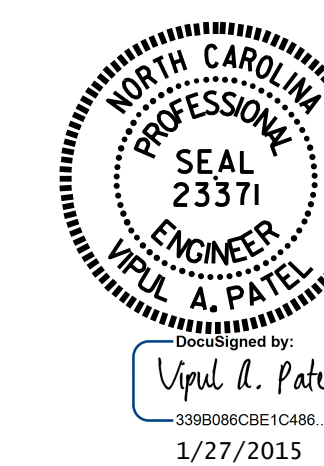
PROJECT NO. 17BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

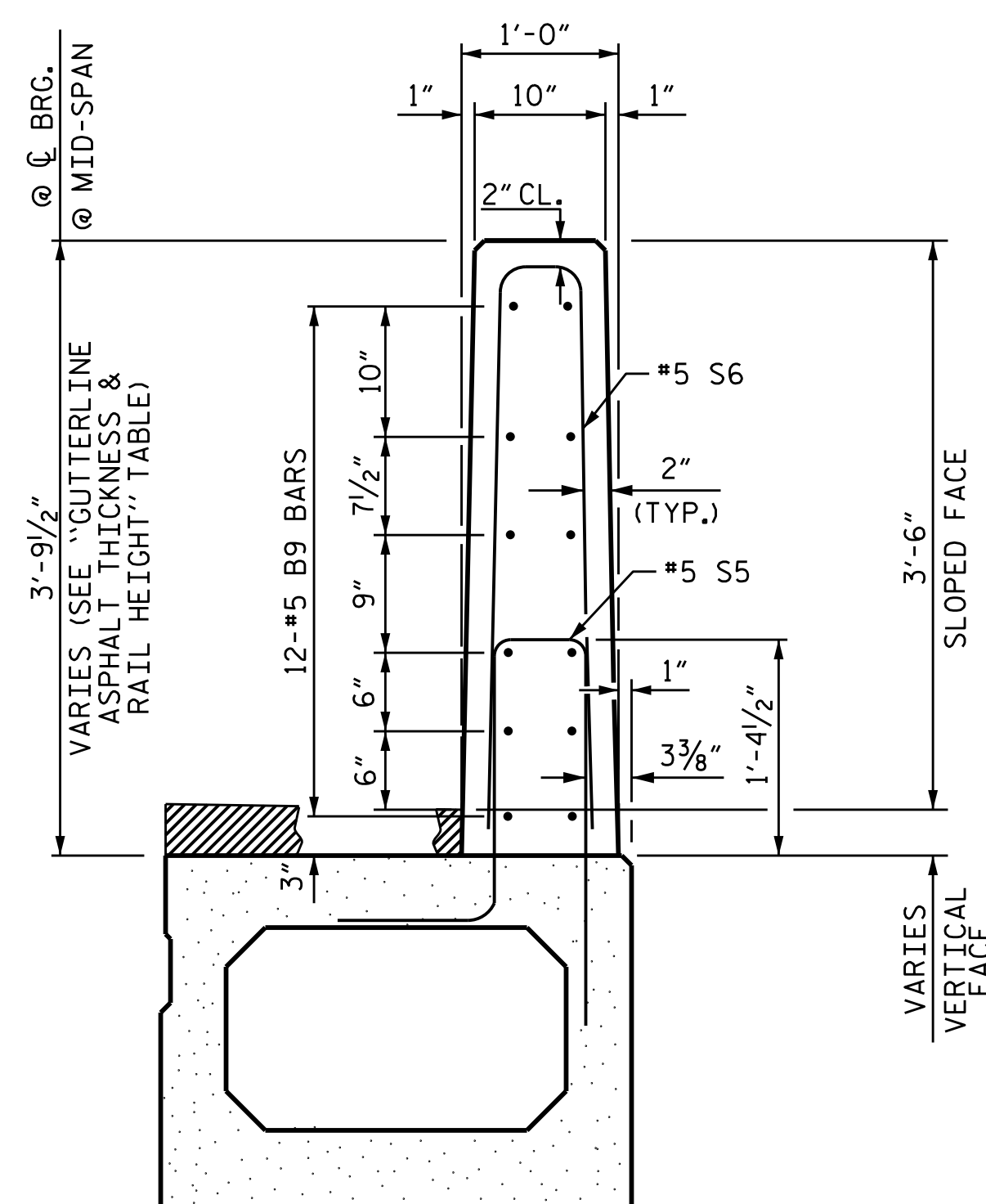
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS 16
2			4			



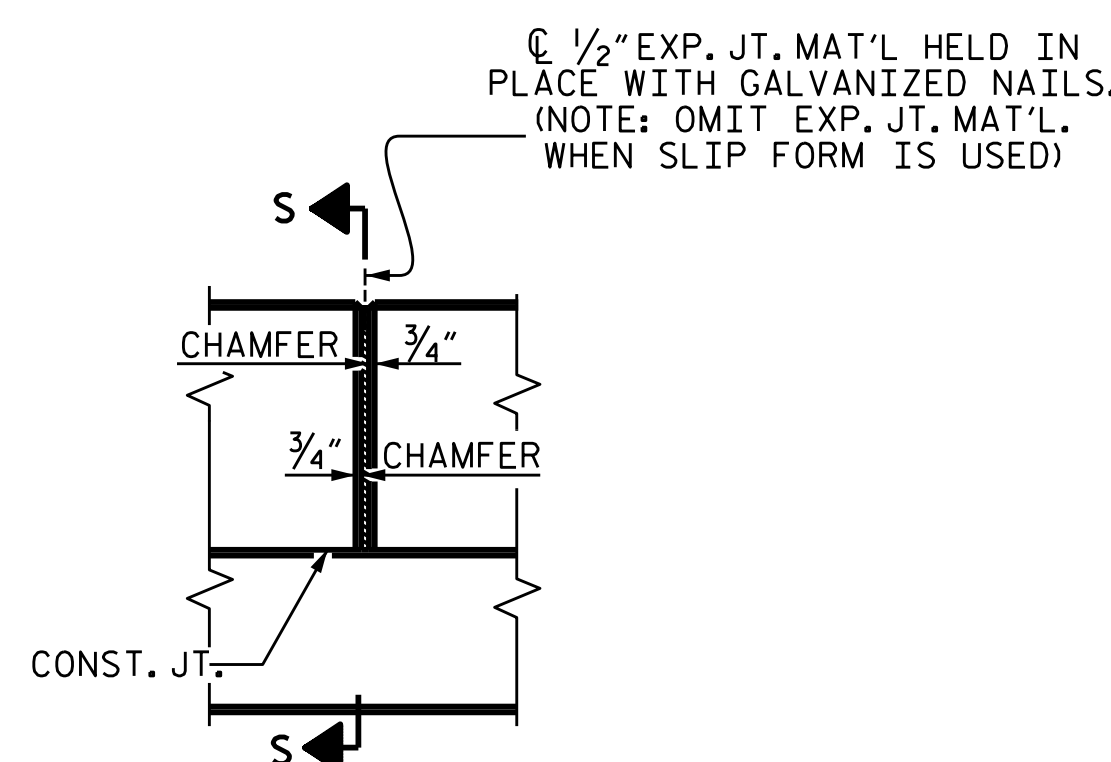
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

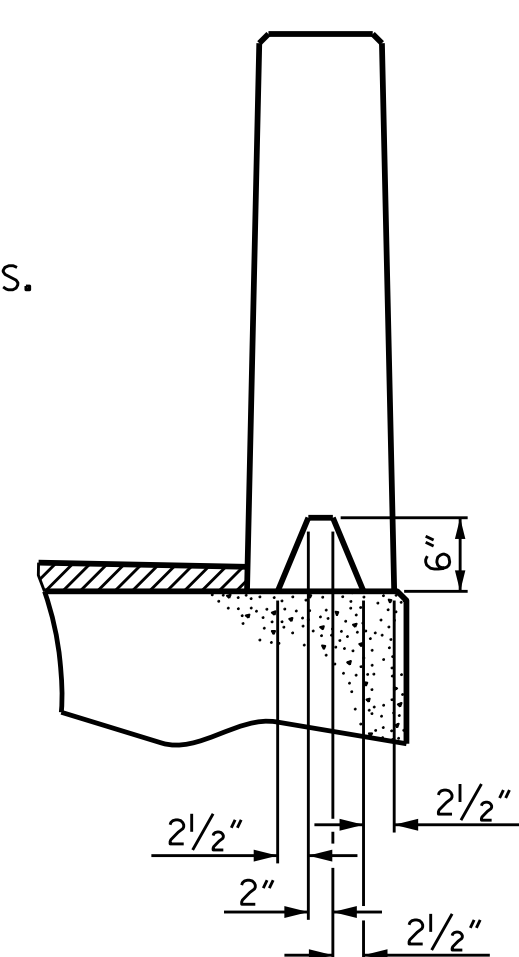
END OF RAIL DETAILS



SECTION THRU RAIL



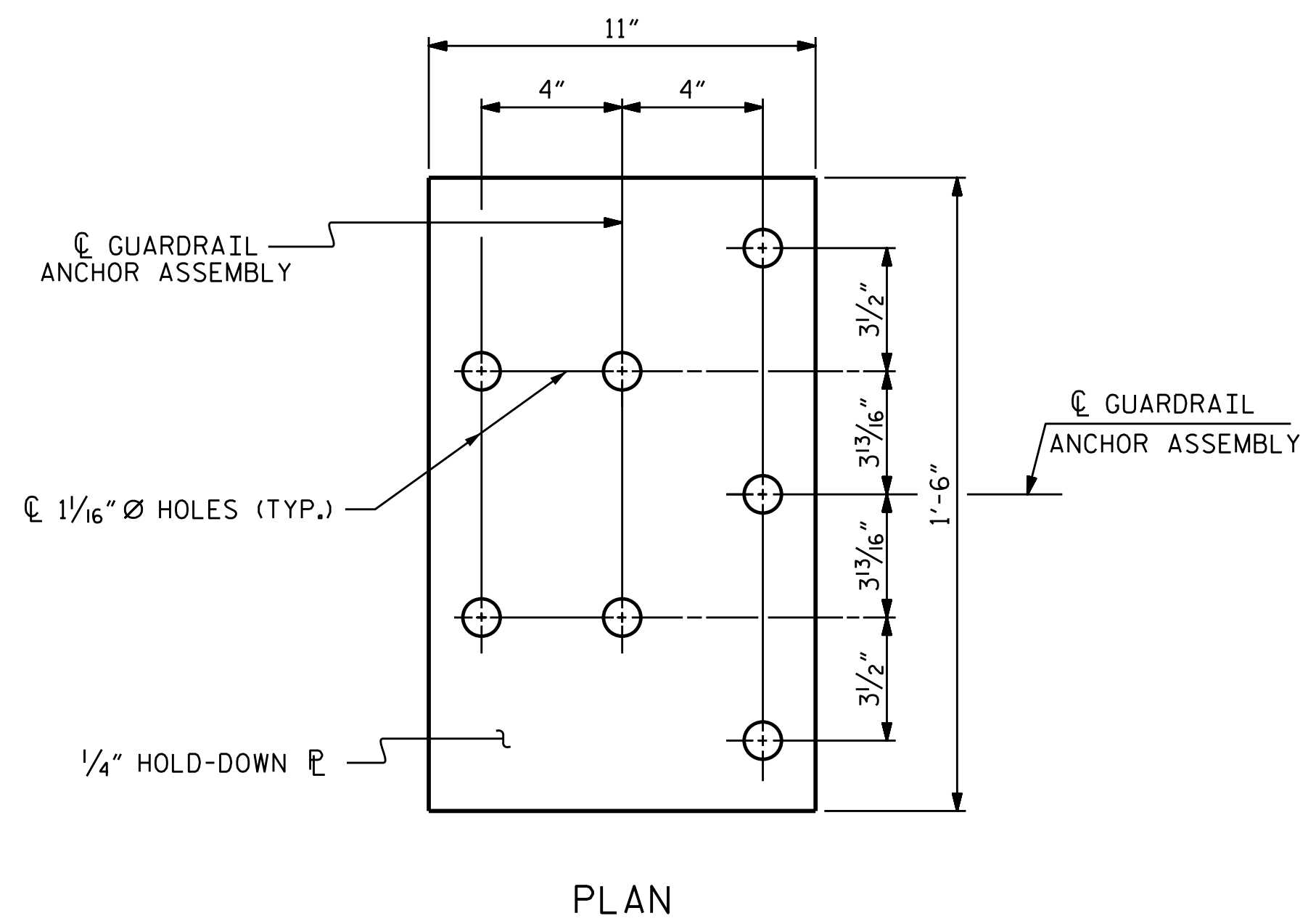
ELEVATION AT EXPANSION JOINTS



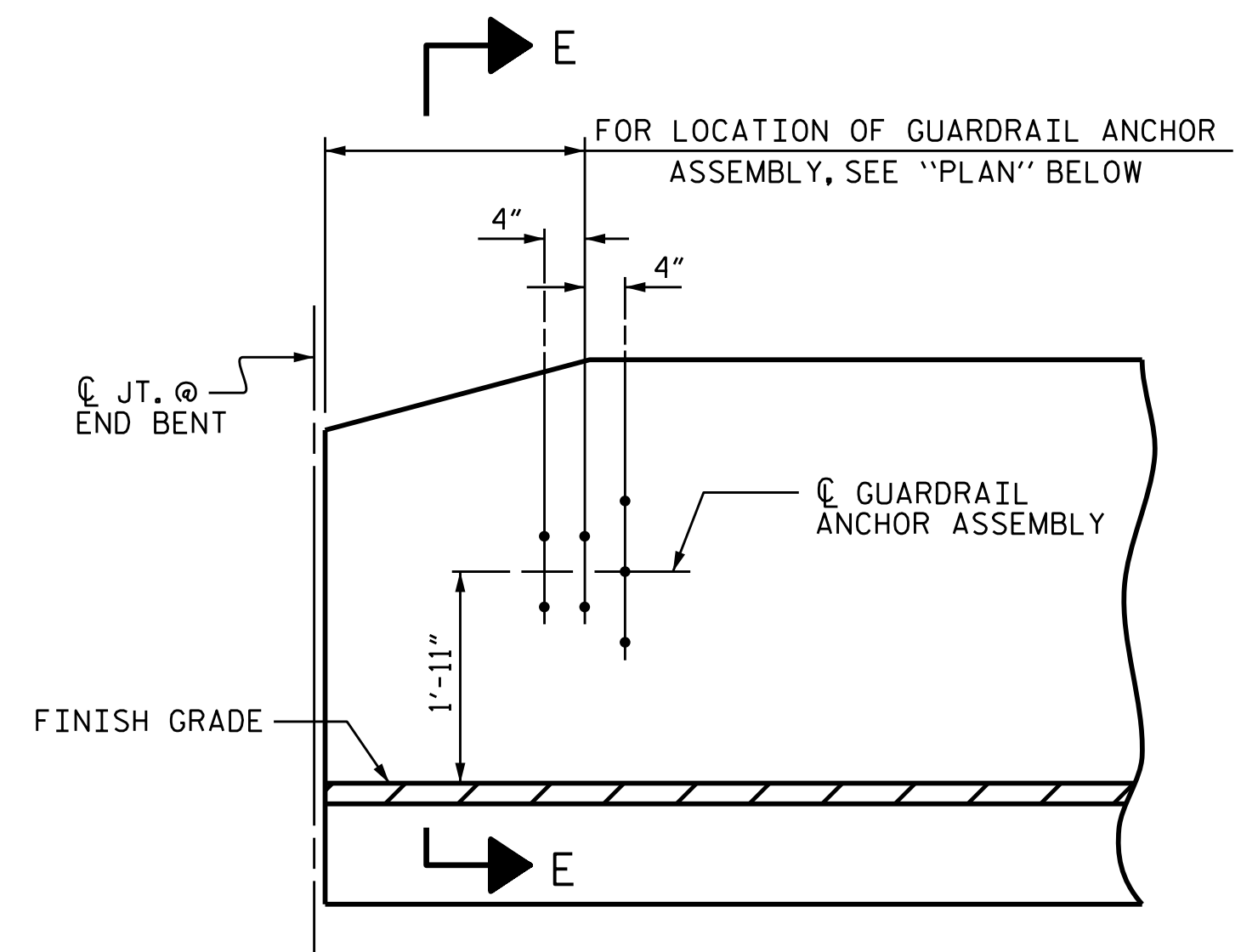
SECTION S-S
 AT DAM IN OPEN JOINT
 (THIS IS TO BE USED ONLY
 WHEN SLIP FORM IS USED)

VERTICAL CONCRETE BARRIER RAIL DETAILS

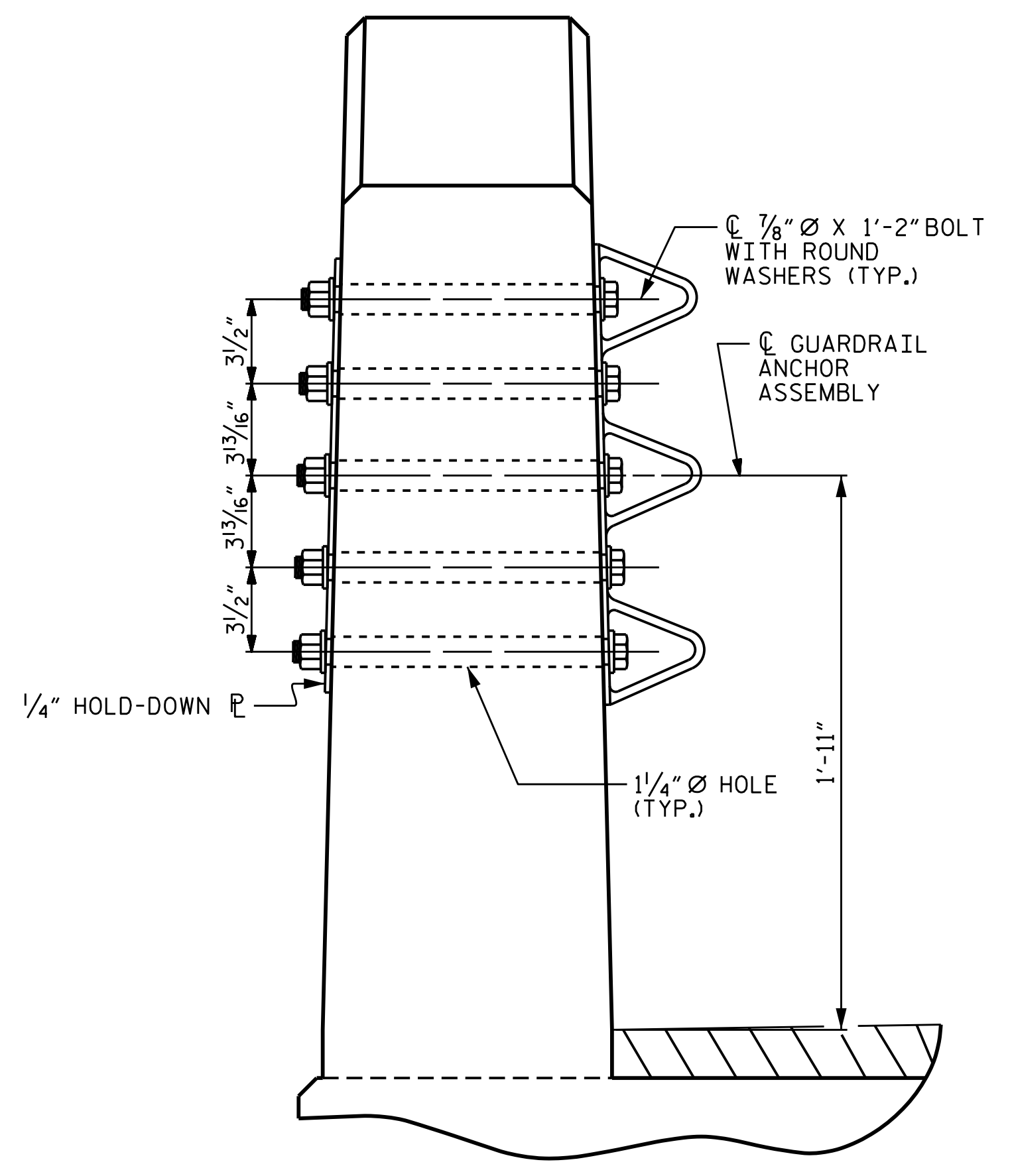
ASSEMBLED BY : N.D'AIUTO	DATE : 10/16/14
CHECKED BY : M.E.GILES	DATE : 12/5/14
DRAWN BY : DGE 10/11	REV. 8/14
CHECKED BY : TMC 11/11	MAA/TMG



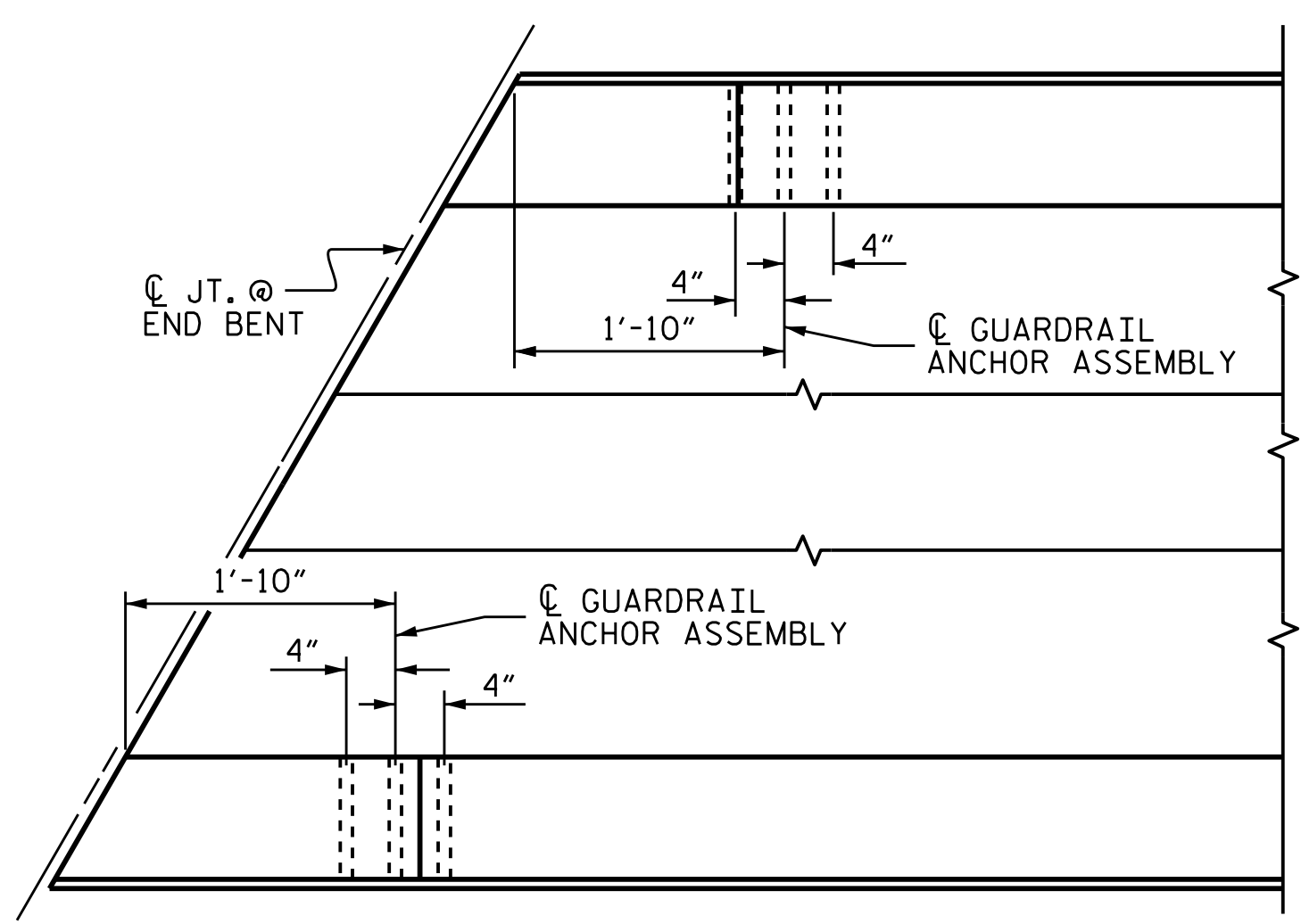
PLAN



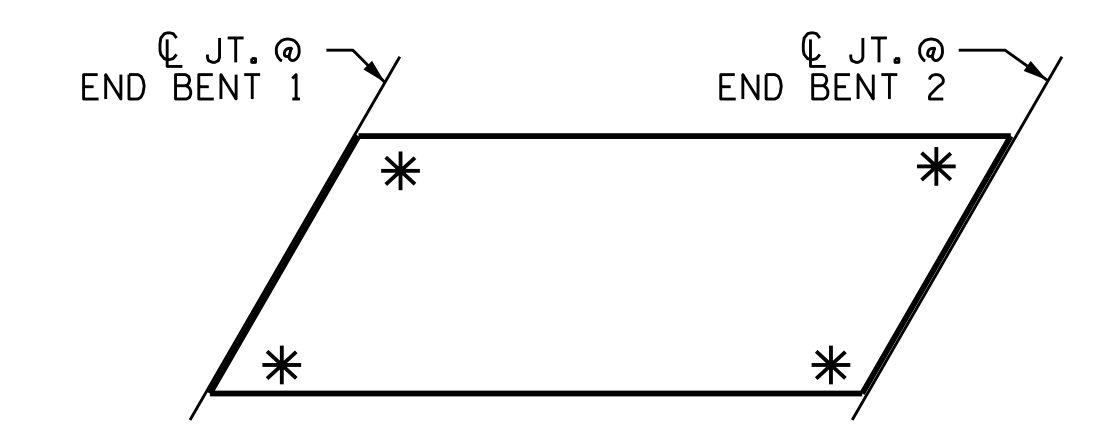
ELEVATION



SECTION E-E



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

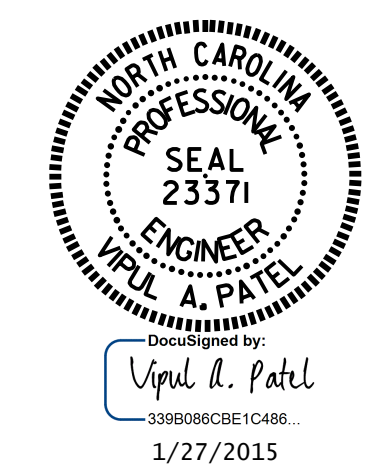


SKETCH SHOWING POINTS OF ATTACHMENT
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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 1/4" 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.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-9
STANDARD GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL						
REVISIONS						TOTAL SHEETS 16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : <u>N.D. AIUTO</u>	DATE : <u>10/16/14</u>
CHECKED BY : <u>M.E. GILES</u>	DATE : <u>12/5/14</u>
DRAWN BY : <u>MAA 5/10</u>	REV. <u>10/1/11</u> <u>MAA/GM</u>
CHECKED BY : <u>GM 5/10</u>	REV. <u>12/5/11</u> <u>MAA/GM</u>
	REV. <u>6/13</u> <u>MAA/GM</u>

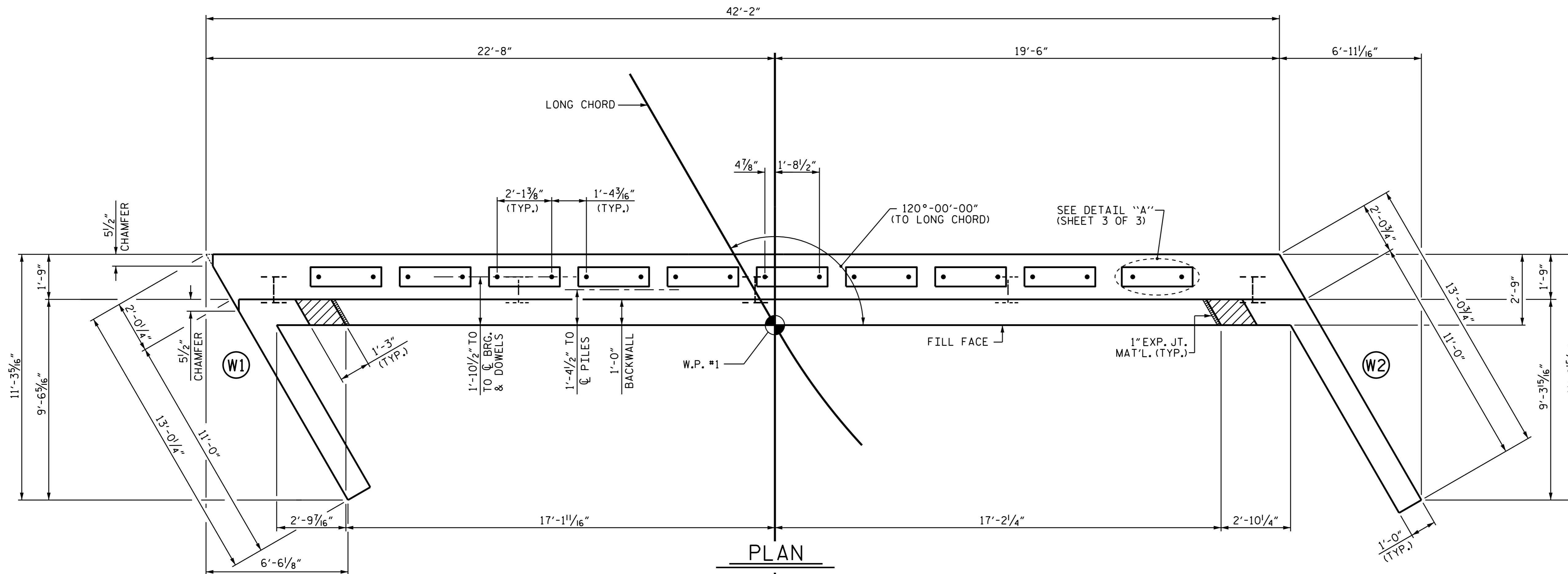
NOTES

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.

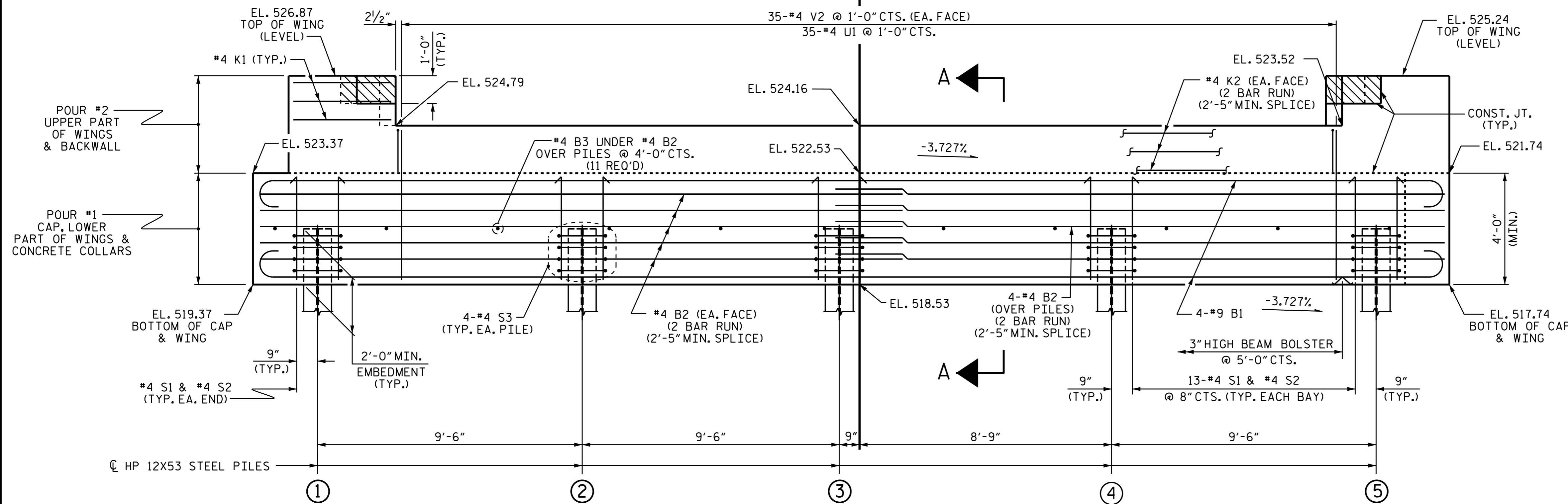
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN

TOP OF PILE ELEVATIONS	
①	521.29
②	520.94
③	520.58
④	520.23
⑤	519.87

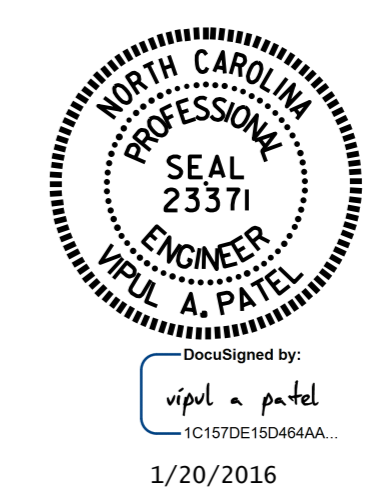


ELEVATION

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

PROJECT NO. 17.BP.10.R.71
UNION COUNTY
STATION: 13+26.00 -L-

SHEET 1 OF 3



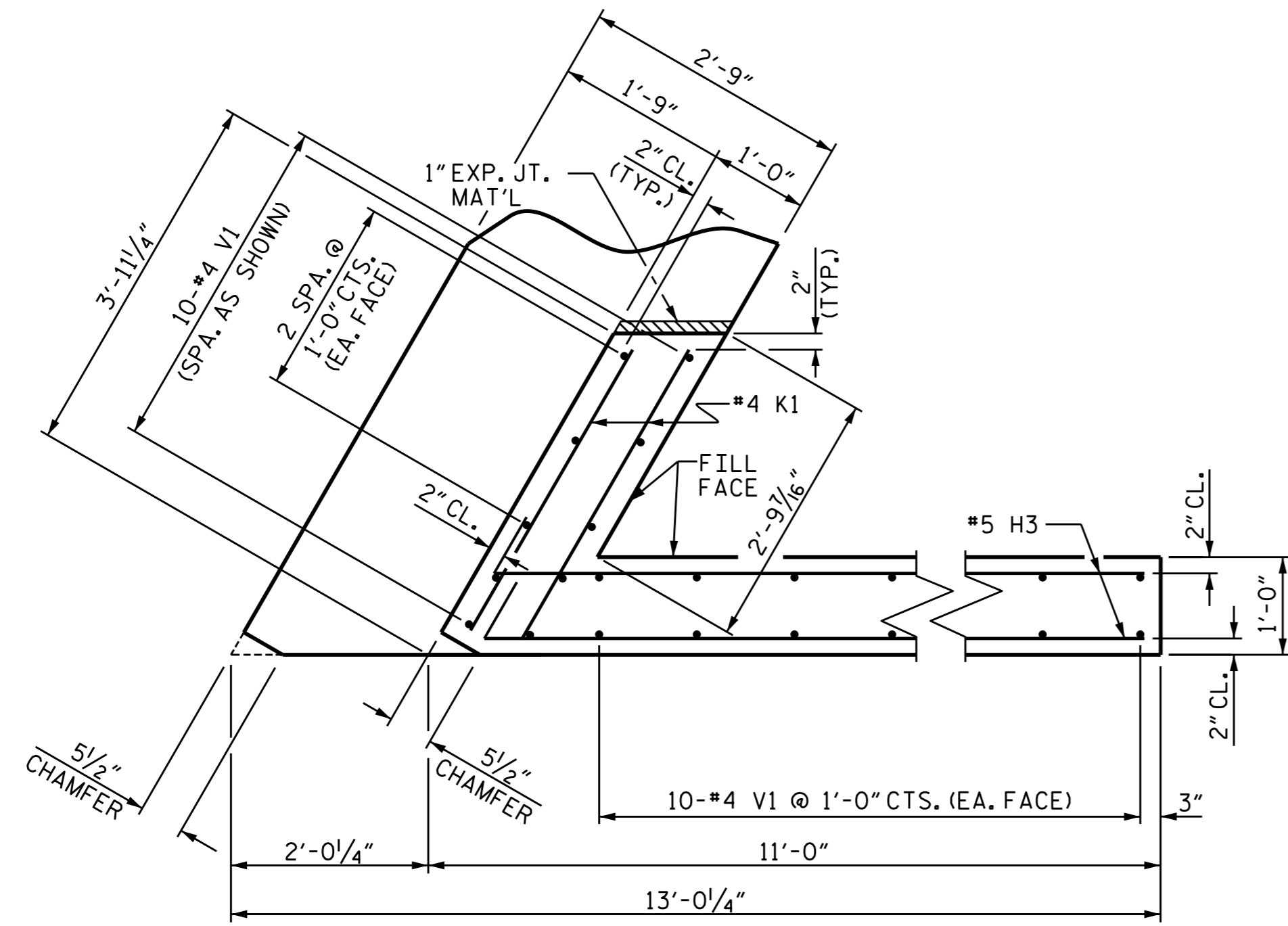
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
END BENT 1**

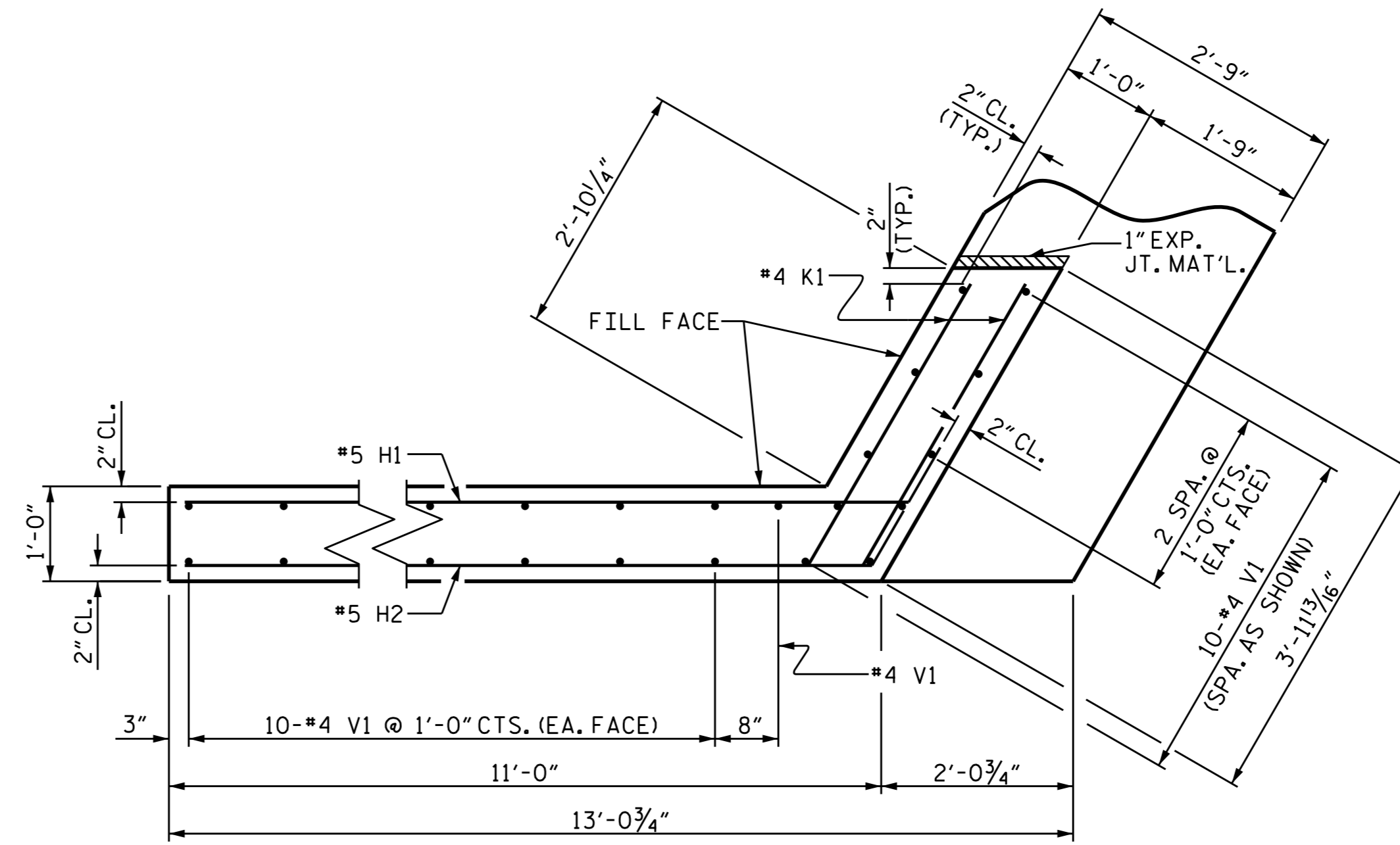
ASSEMBLED BY : N.D. AIUTO DATE : 10/21/14
CHECKED BY : M.E. GILES DATE : 12/8/14
DESIGN ENGINEER OF RECORD : N.D. AIUTO DATE : 1/21/15

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

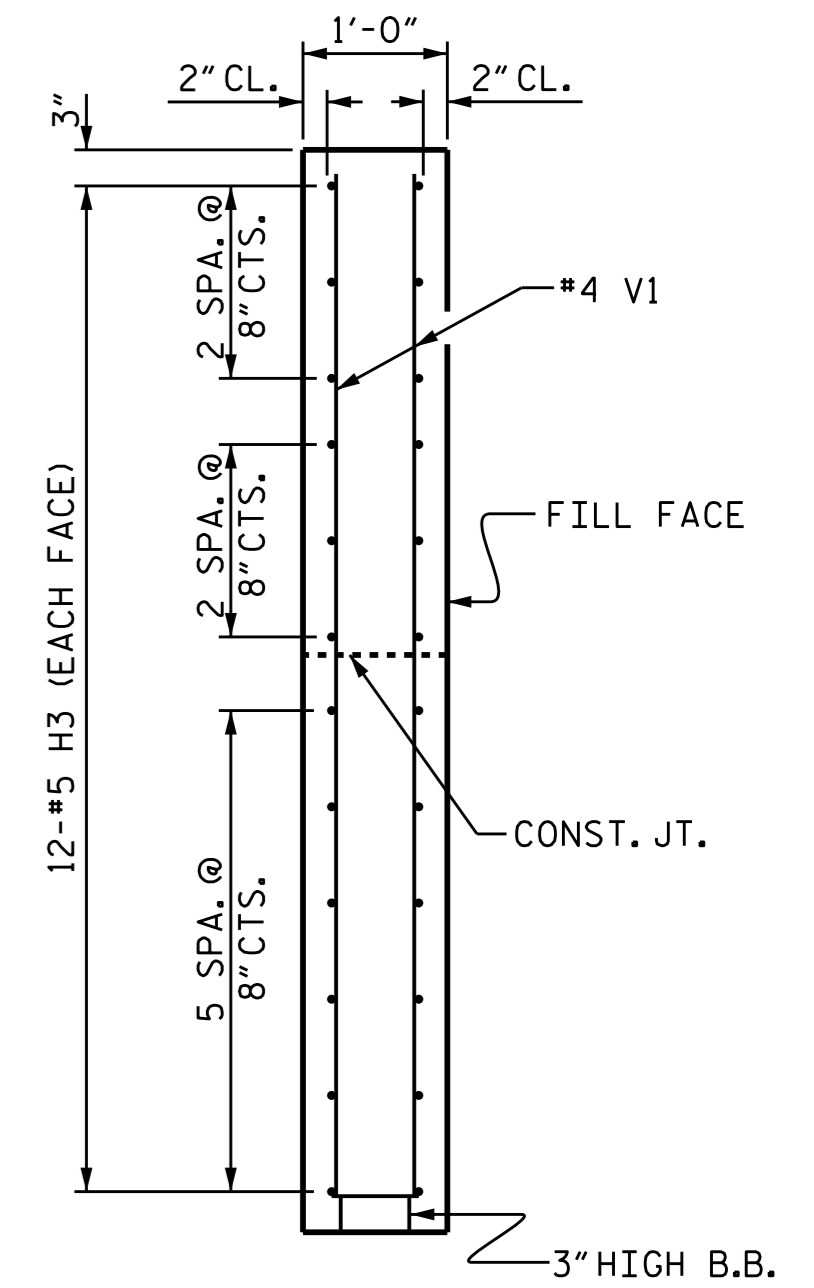
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



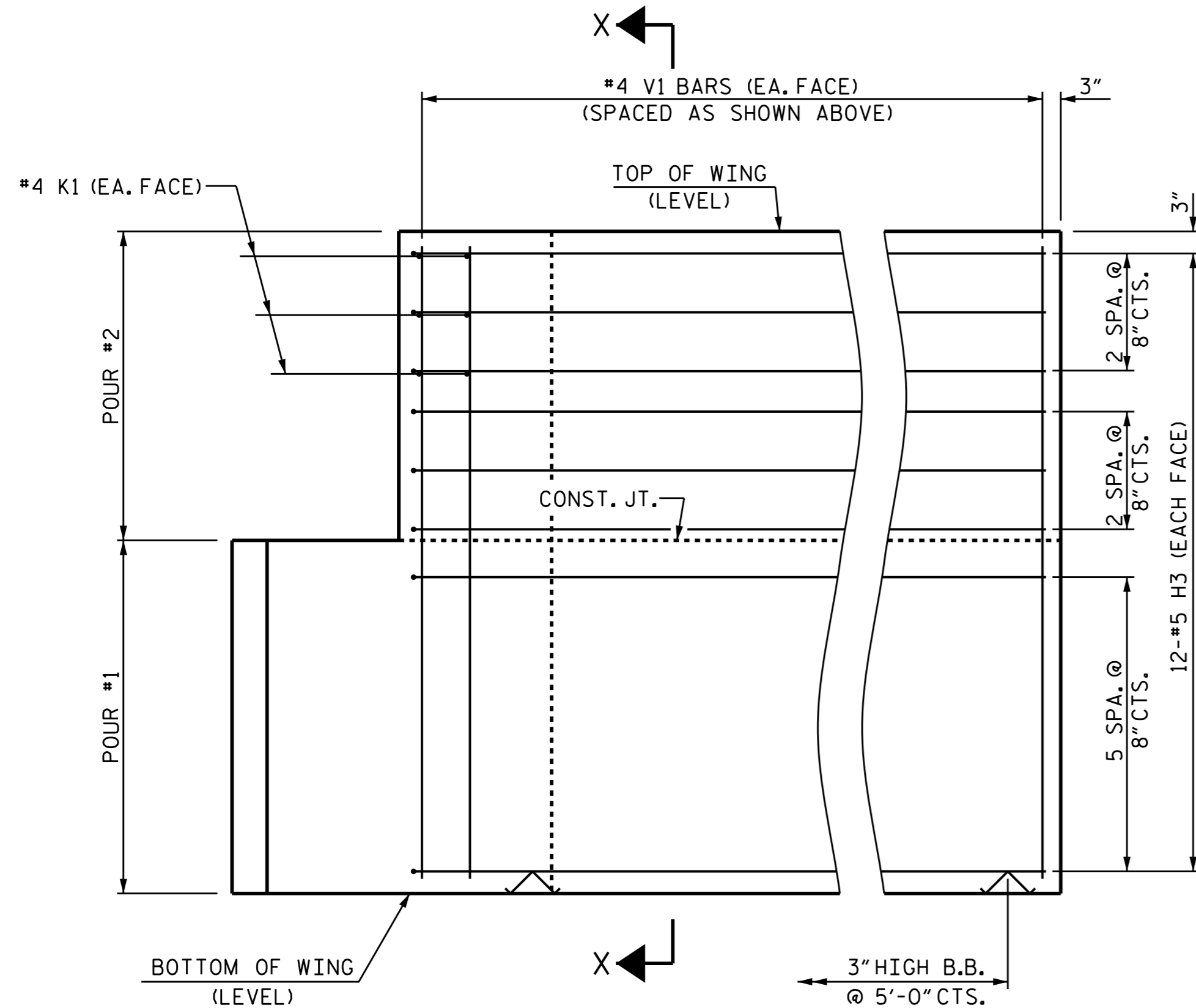
PLAN OF WING (W1)



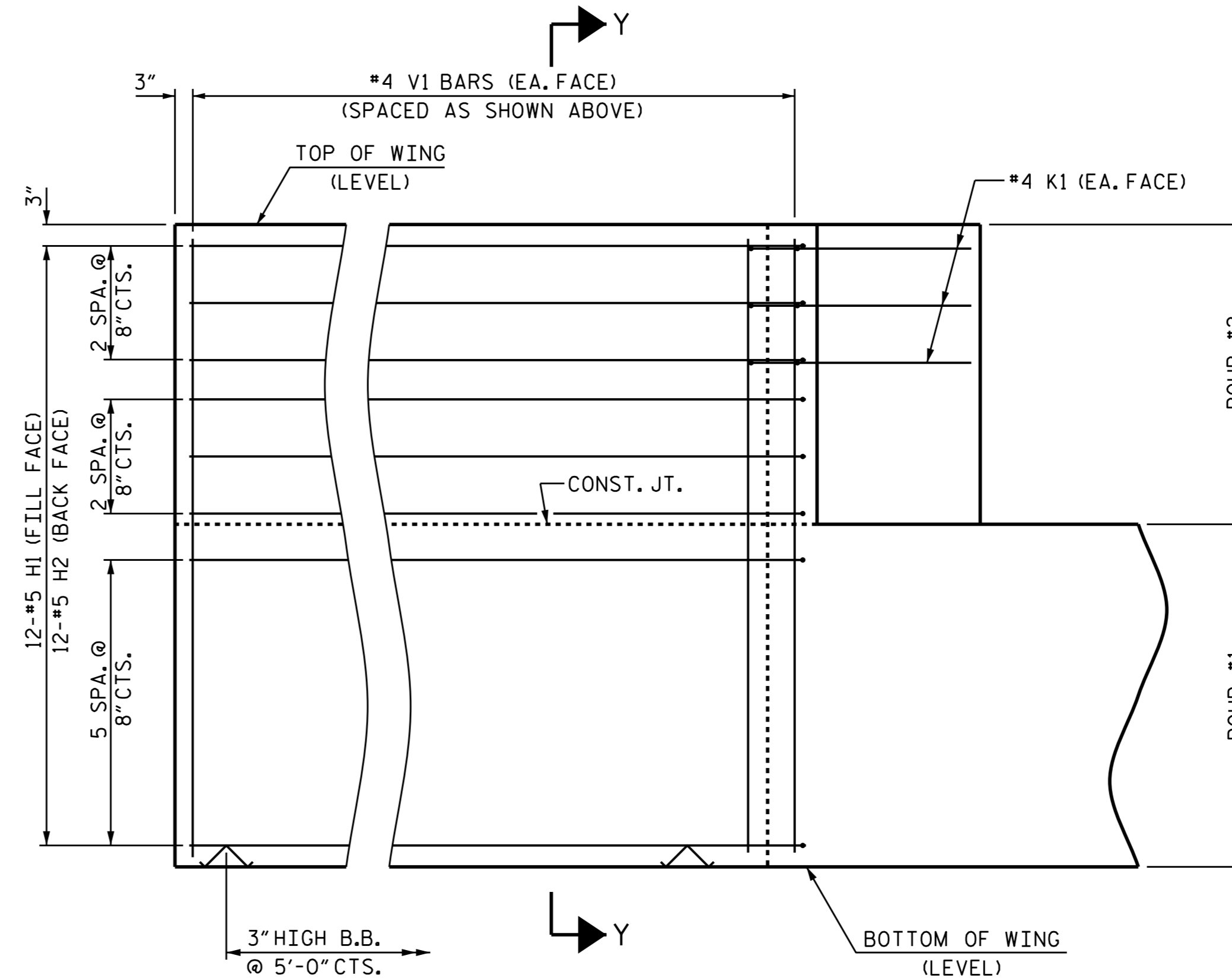
PLAN OF WING (W2)



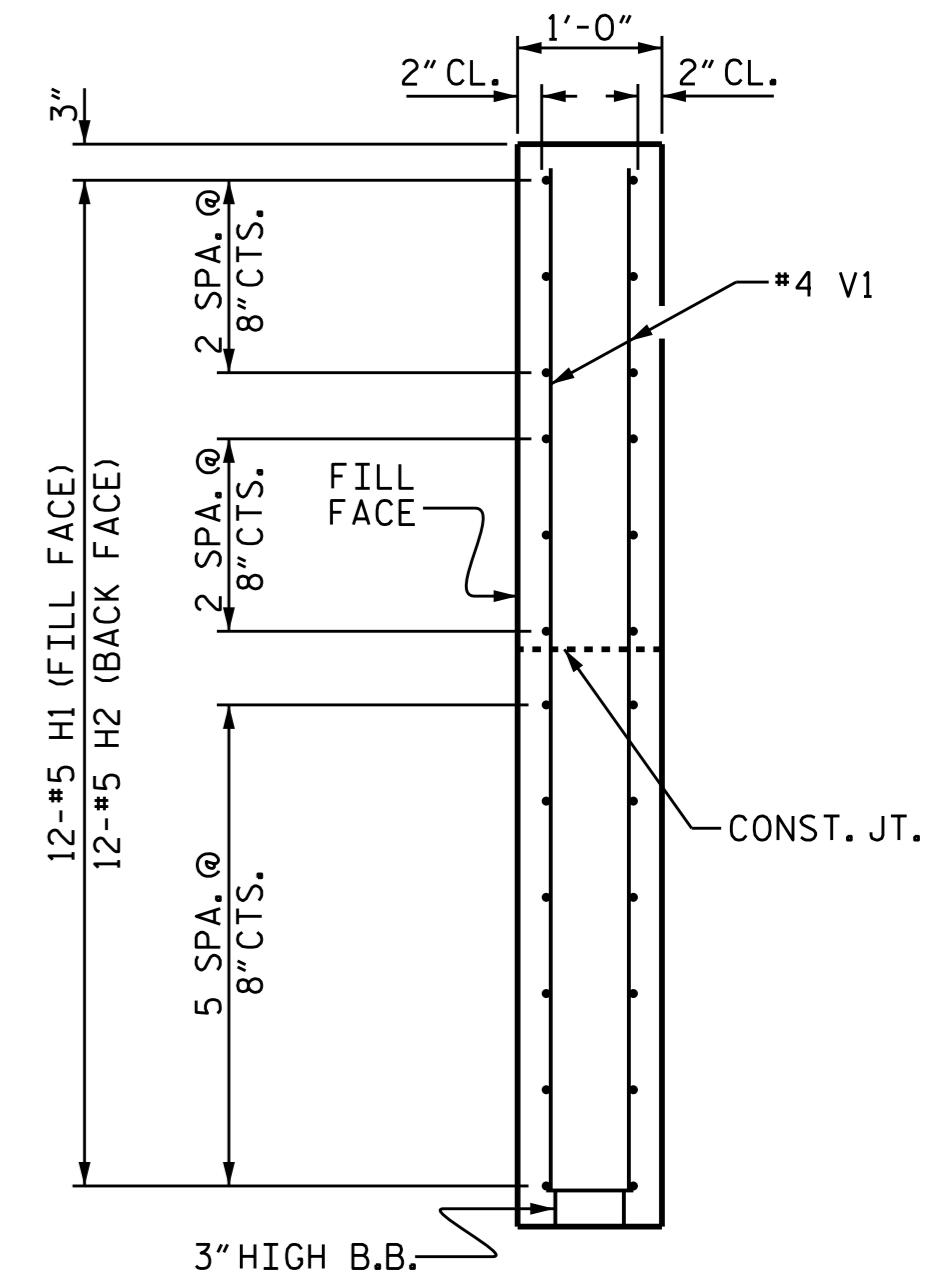
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

PROJECT NO. 17.BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 2 OF 3



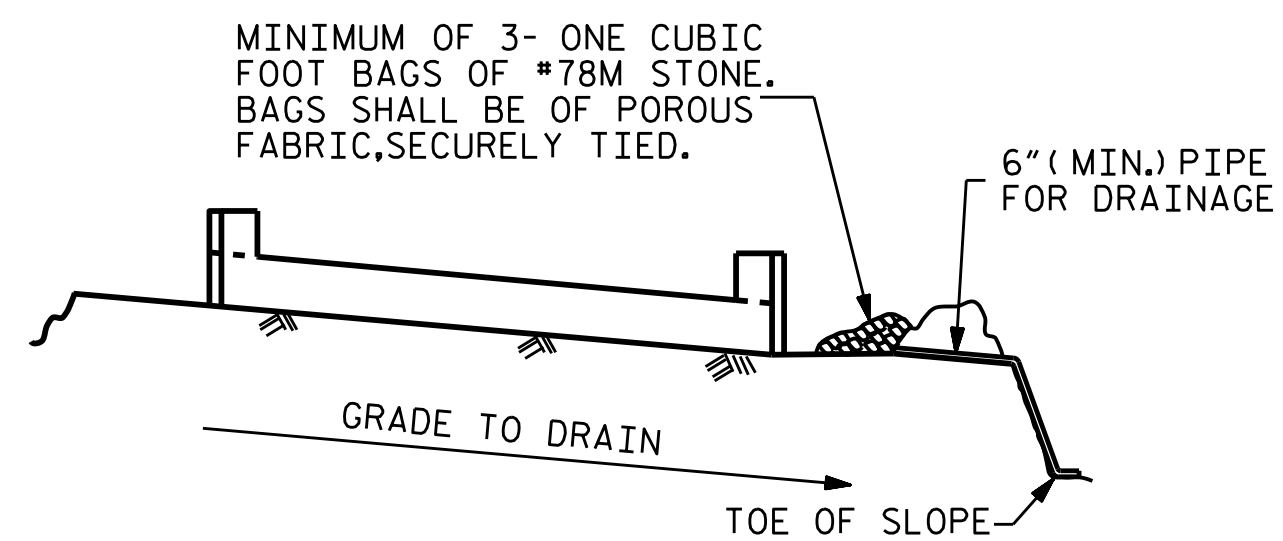
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1
 WING DETAILS

ASSEMBLED BY: N.D'AIUTO DATE: 10/21/14
 CHECKED BY: M.E.GILES DATE: 12/8/14
 DESIGN ENGINEER OF RECORD: N.D'AIUTO DATE: 1/21/15

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

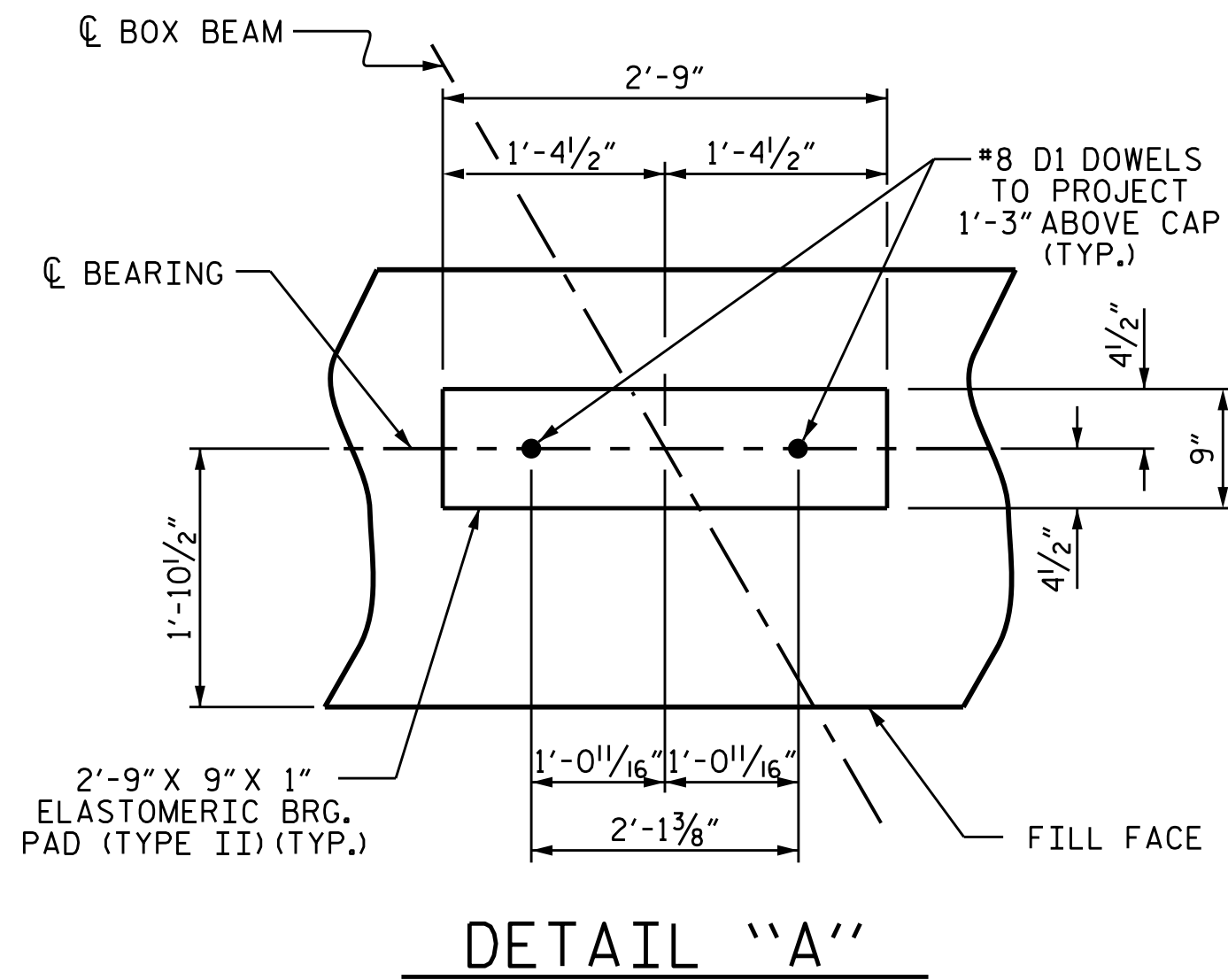


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

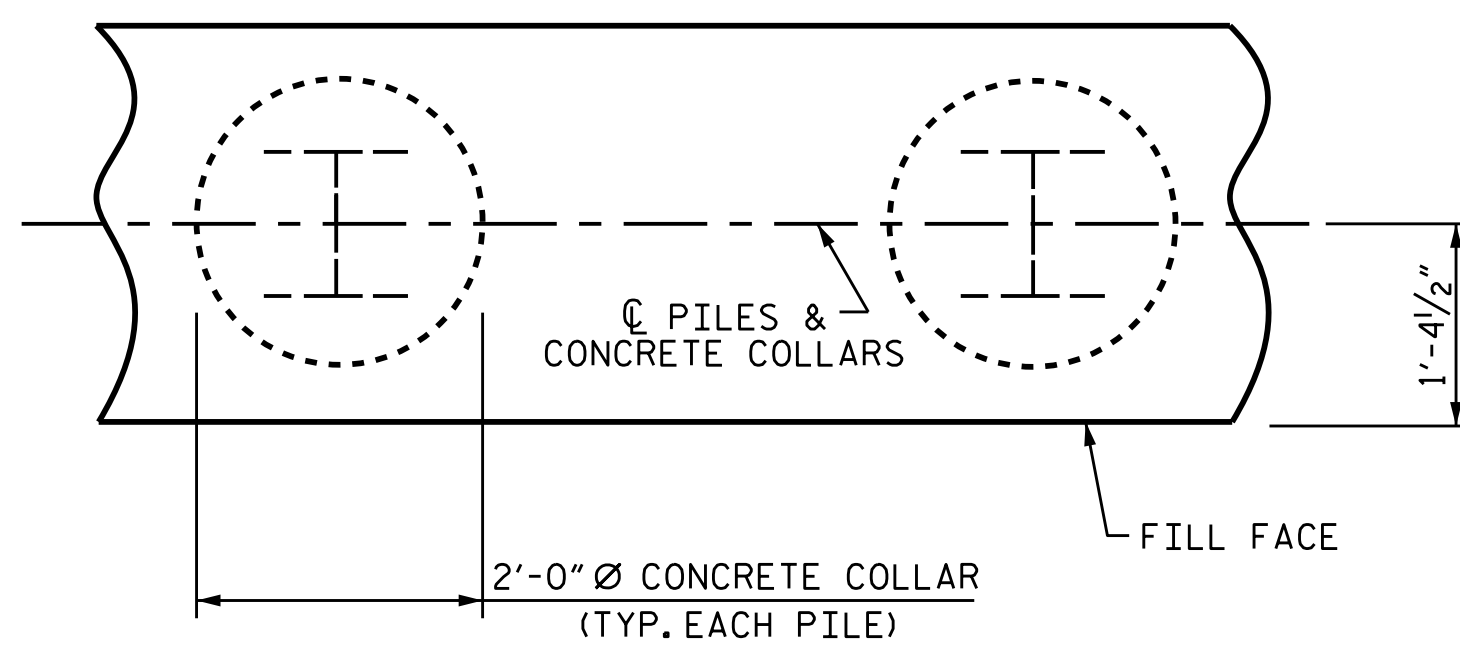
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

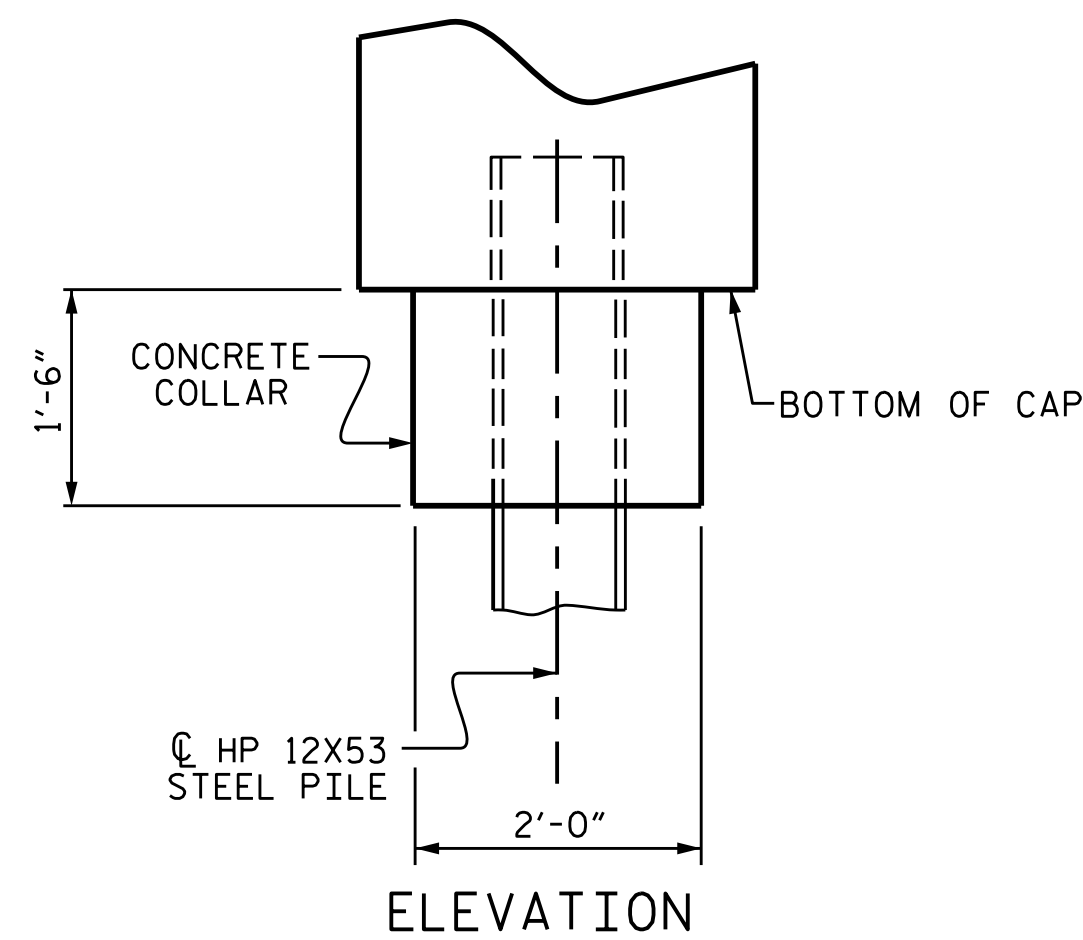


DETAIL "A"

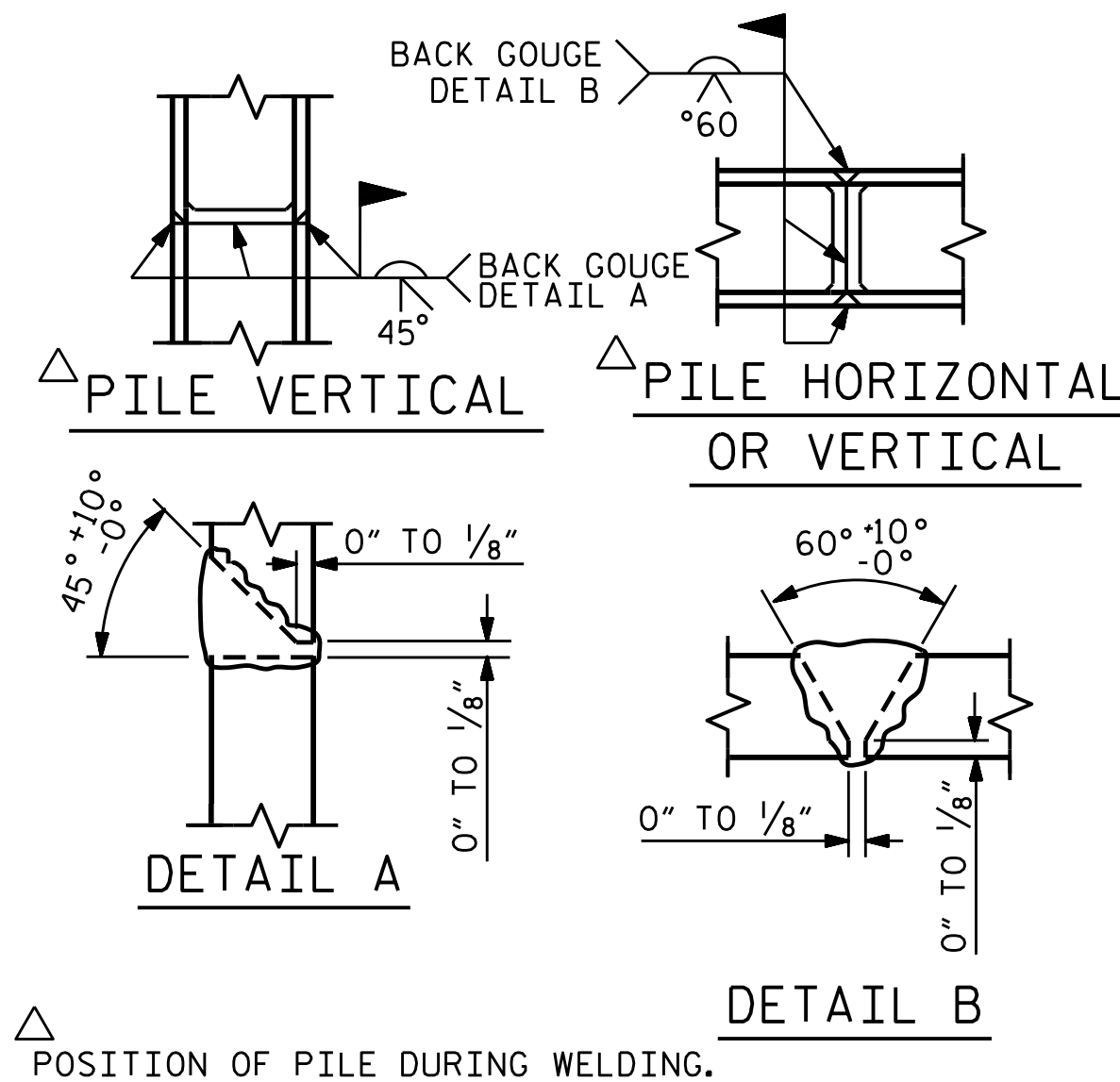


PLAN

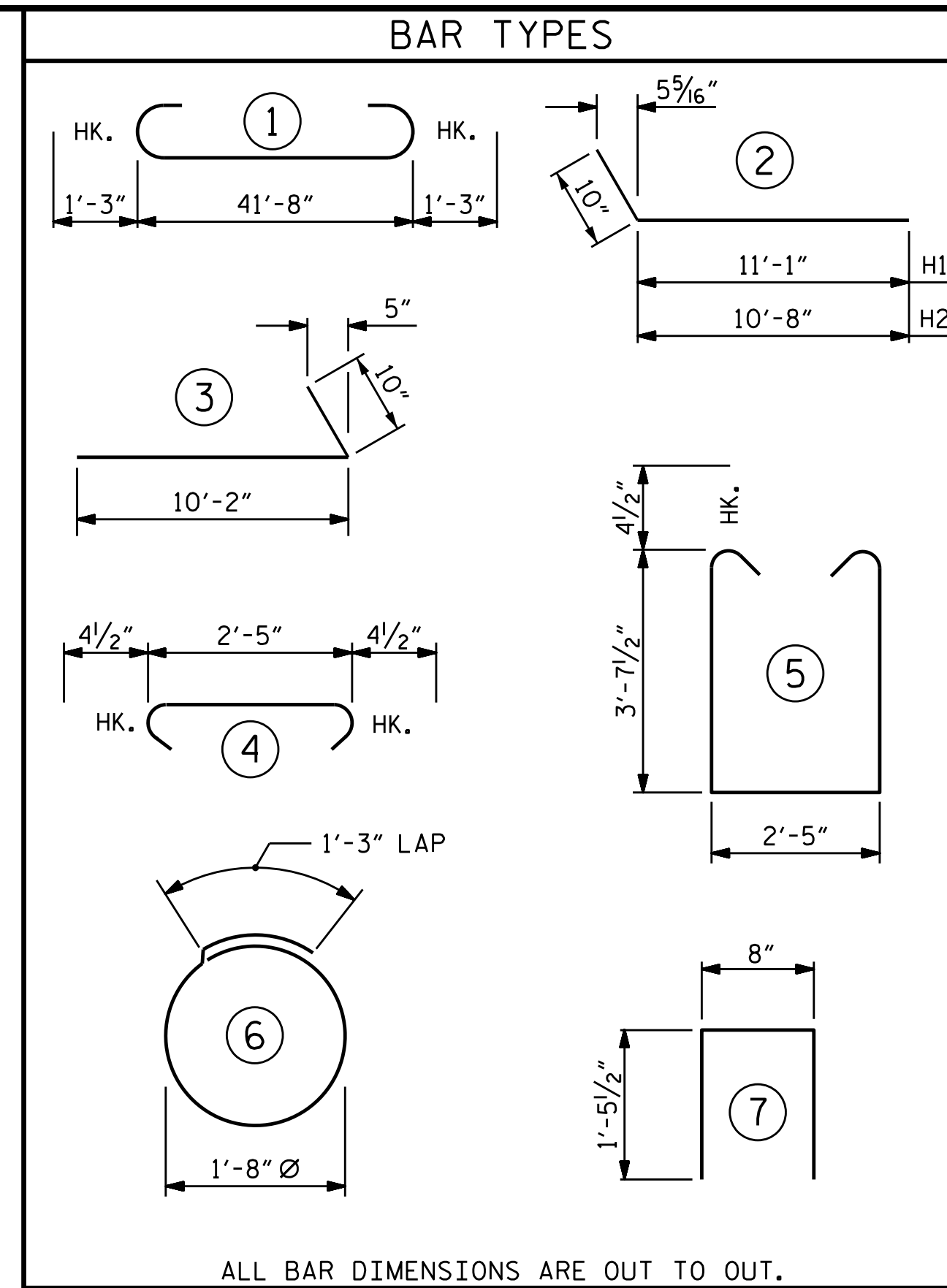
CORROSION PROTECTION FOR STEEL PILES DETAIL



ELEVATION



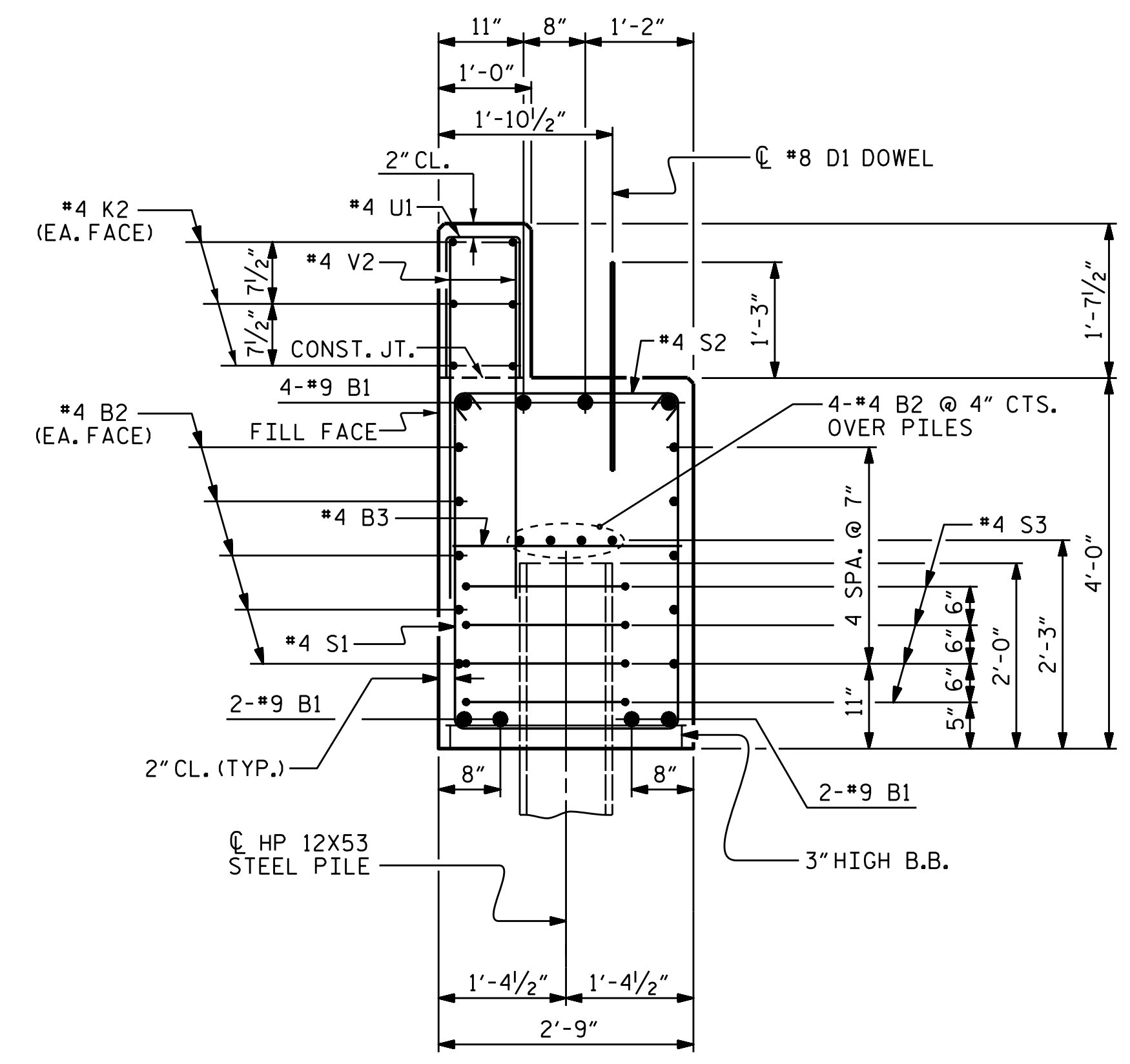
PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

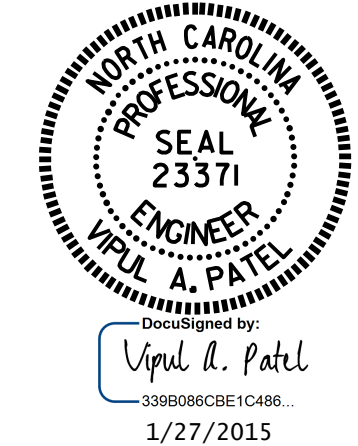
BILL OF MATERIAL

END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8	#9	1	44'-2"	1201
B2	28	#4	STR	22'-2"	415
B3	11	#4	STR	2'-5"	18
D1	20	#8	STR	2'-3"	120
H1	12	#5	2	11'-11"	149
H2	12	#5	2	11'-6"	144
H3	24	#5	3	11'-0"	275
K1	12	#4	STR	3'-3"	26
K2	12	#4	STR	22'-2"	178
S1	54	#4	5	3'-2"	114
S2	54	#4	4	10'-5"	376
S3	20	#4	6	6'-6"	87
U1	35	#4	7	3'-7"	84
V1	61	#4	STR	7'-2"	292
V2	70	#4	STR	5'-3"	245
REINFORCING STEEL				LBS.	3,724
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				C.Y.	21.0
POUR #2 BACKWALL & UPPER PART OF WINGS				C.Y.	5.7
TOTAL CLASS A CONCRETE				C.Y.	26.7
HP 12X53 STEEL PILES				LIN. FT.=	75
NO: 5					
PILE EXCAVATION IN SOIL				LIN. FT.=	39.00
PILE EXCAVATION NOT IN SOIL				LIN. FT.=	6.00



SECTION A-A

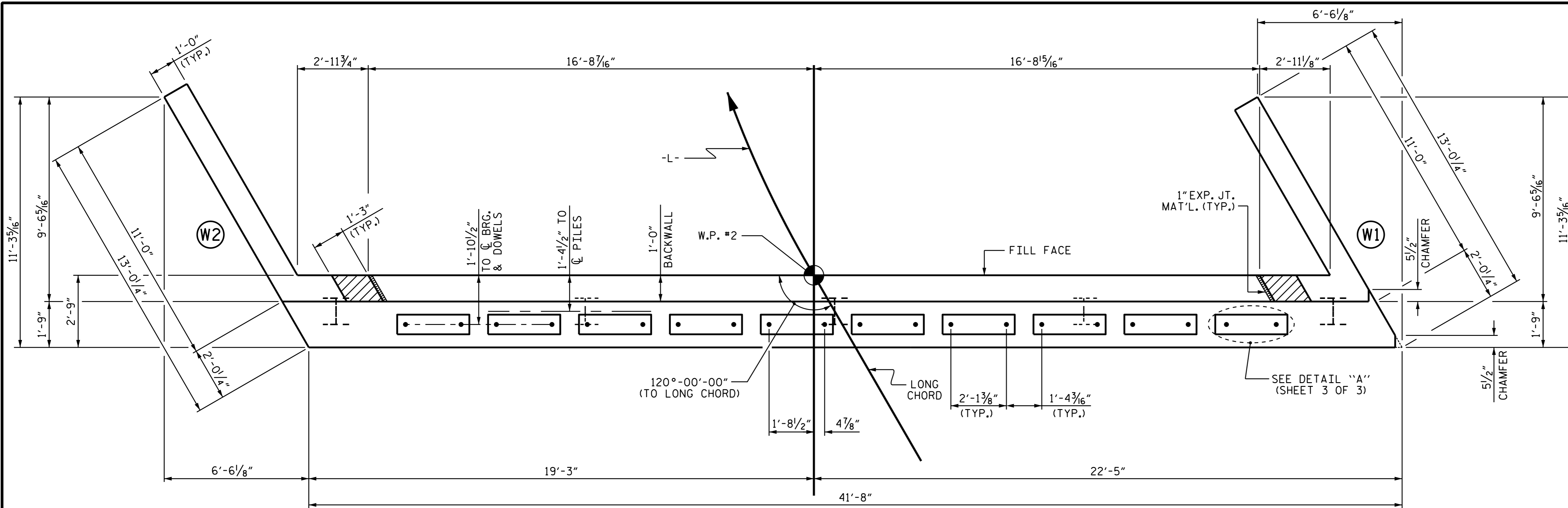
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PROJECT NO. 17.BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-
 SHEET 3 OF 3

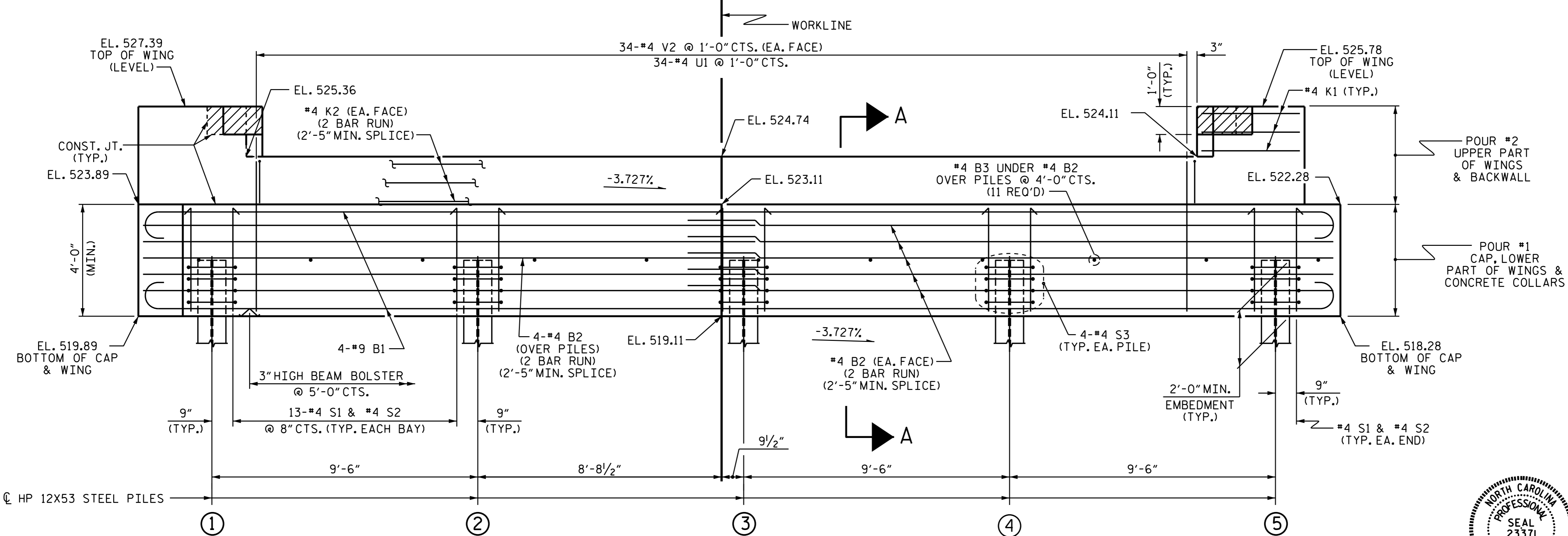
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					16

ASSEMBLED BY: N.D. AIUTO DATE: 10/21/14
 CHECKED BY: M.E. GILES DATE: 12/8/14
 DESIGN ENGINEER OF RECORD: N.D. AIUTO DATE: 1/21/15



PLAN

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 3 OF 3.
 FOR WING DETAILS, SEE SHEET 2 OF 3.



ELEVATION

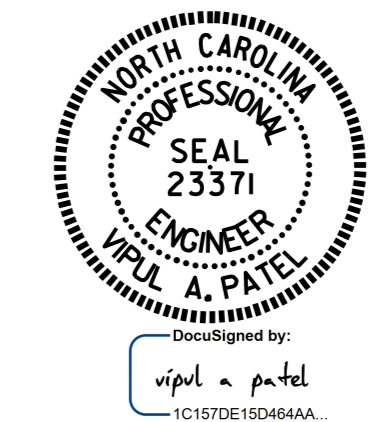
TOP OF PILE ELEVATIONS	
①	521.81
②	521.45
③	521.10
④	520.75
⑤	520.39

PROJECT NO. 17.BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**



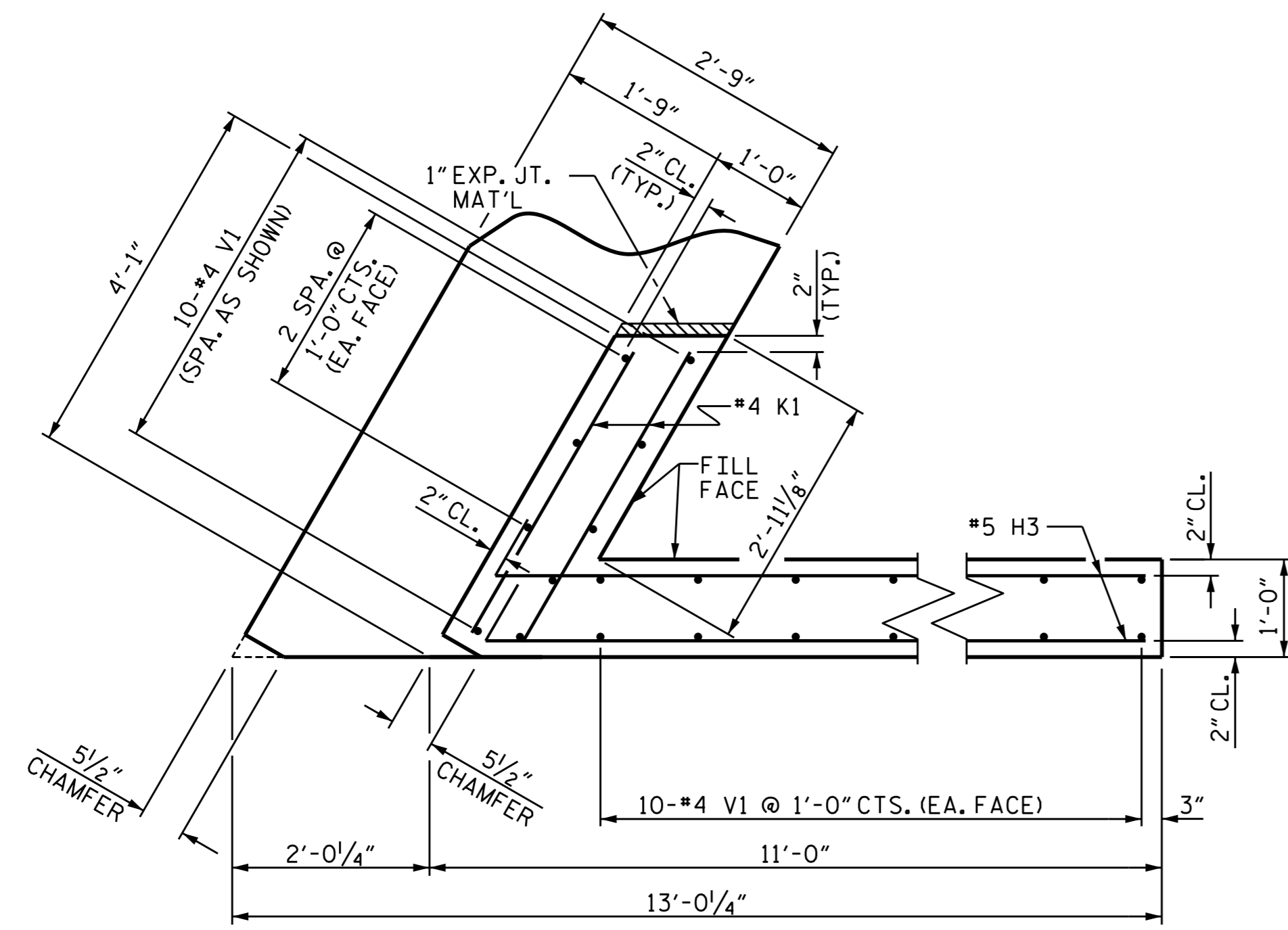
ASSEMBLED BY : N.D'ATUTO DATE : 10/21/14
 CHECKED BY : M.E.GILES DATE : 12/8/14
 DRAWN BY : WJH 12/11 REV. 4/15 MAA/TMG
 CHECKED BY : AAC 12/11

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

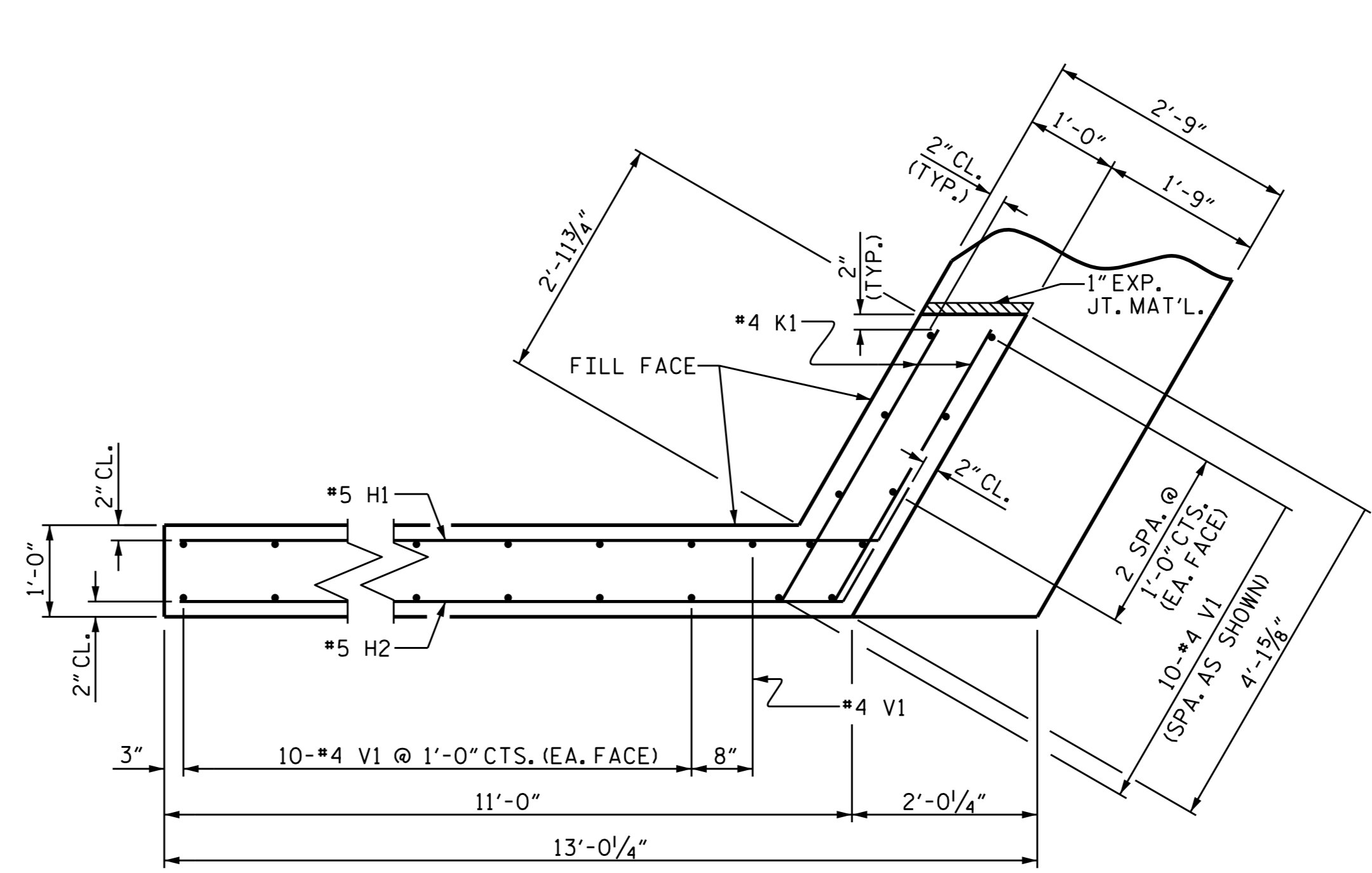
REVISIONS						SHEET NO. 5-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

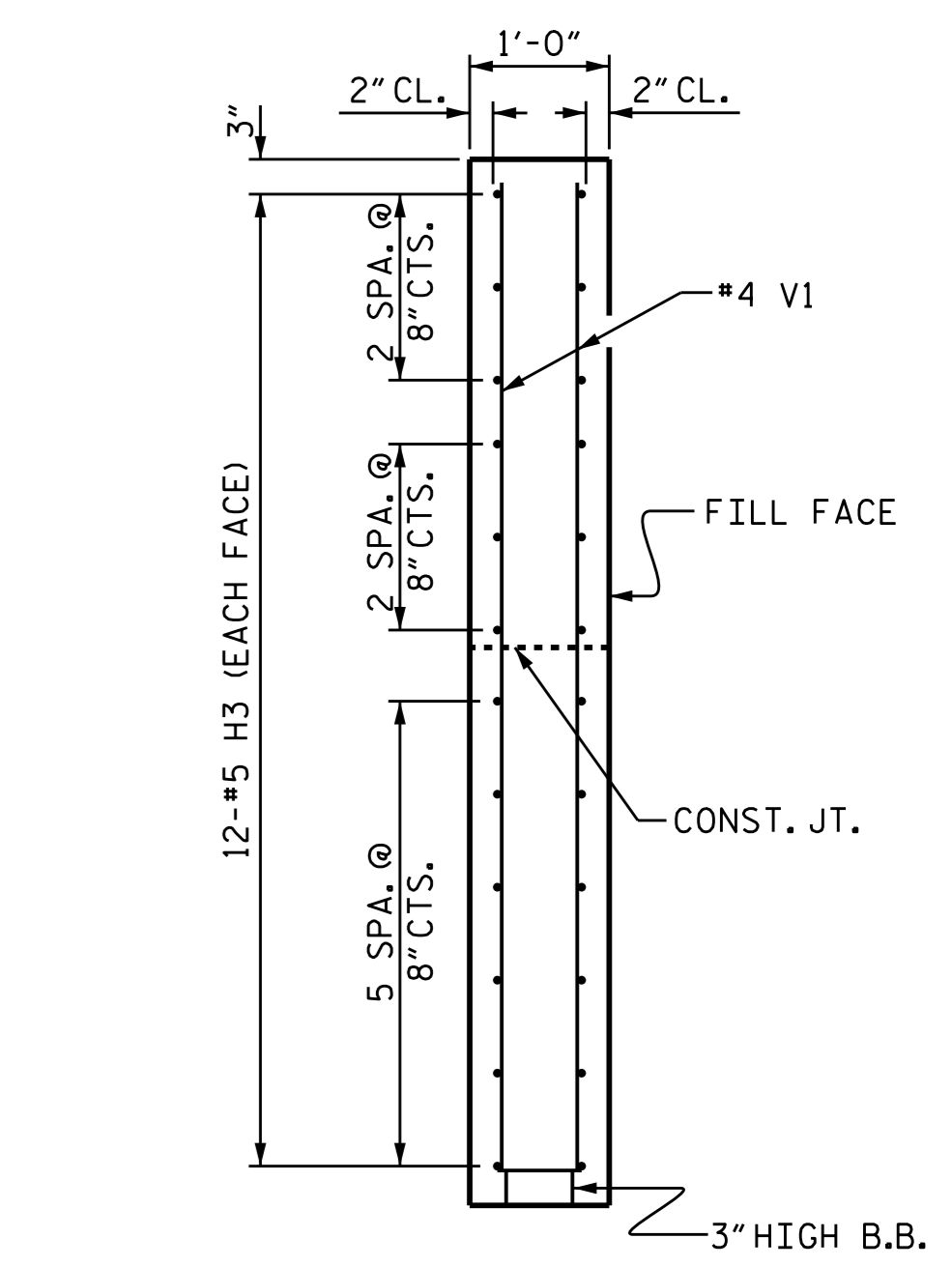
STD. NO. EB_30_120S4_33BB



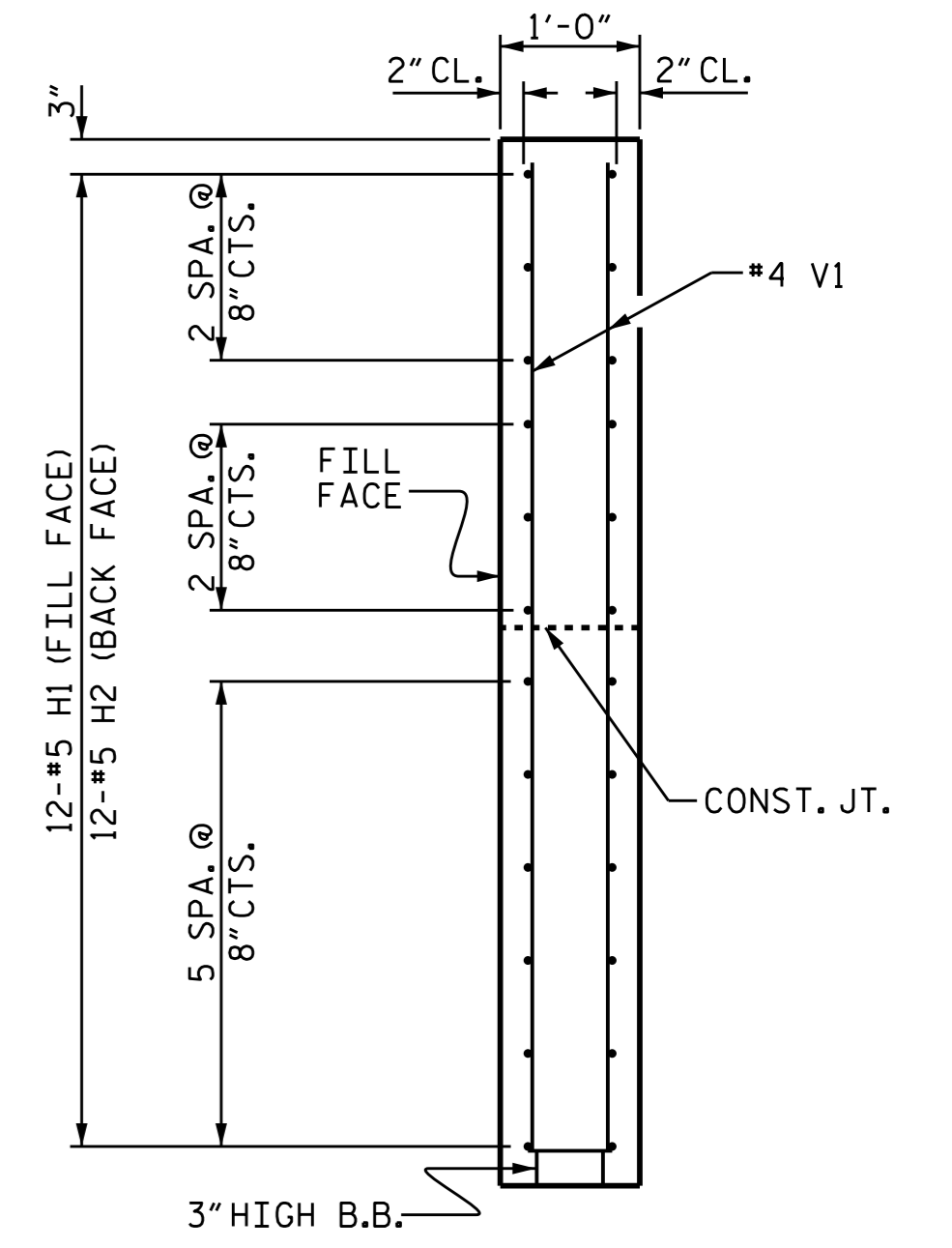
PLAN OF WING (W1)



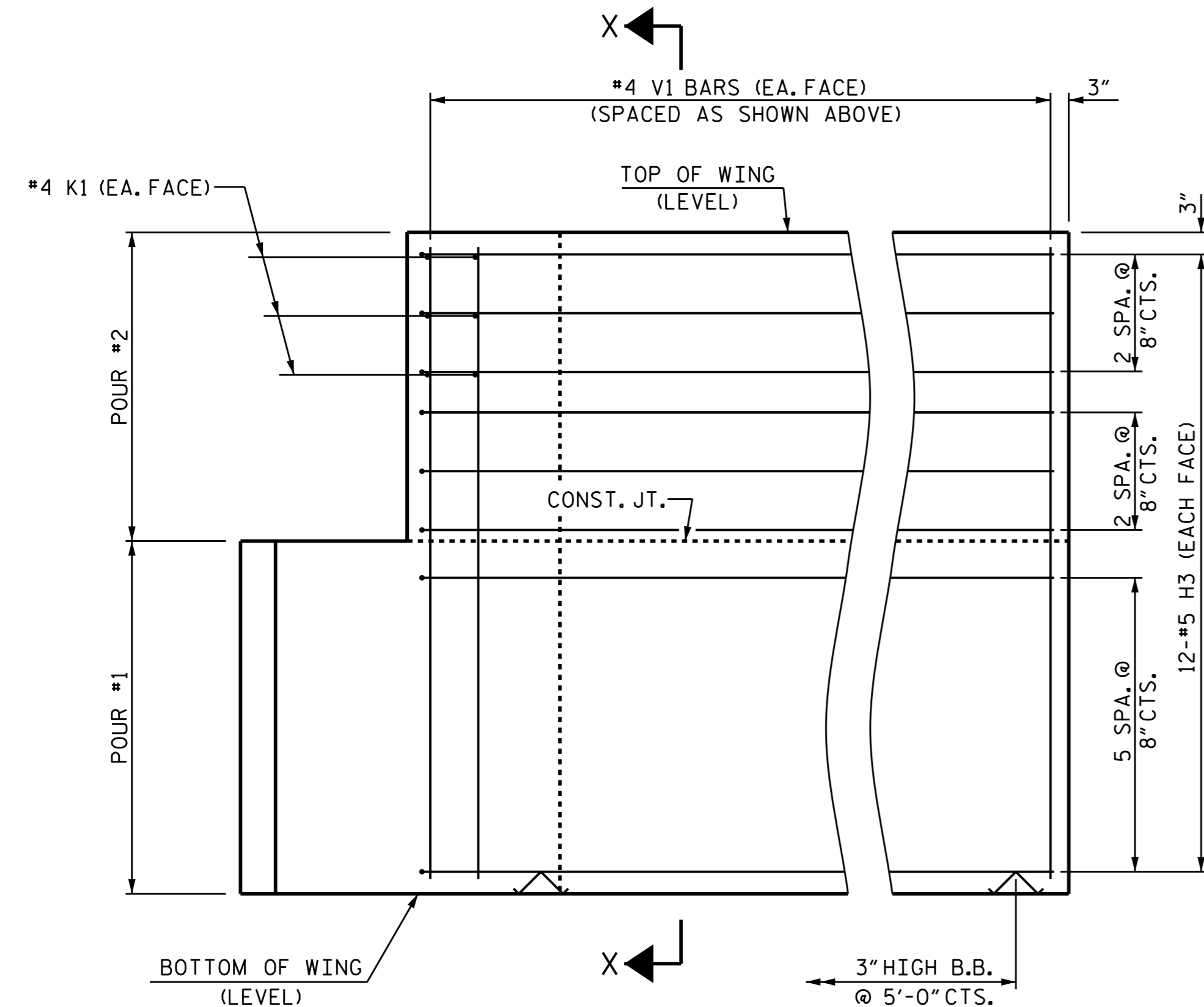
PLAN OF WING (W2)



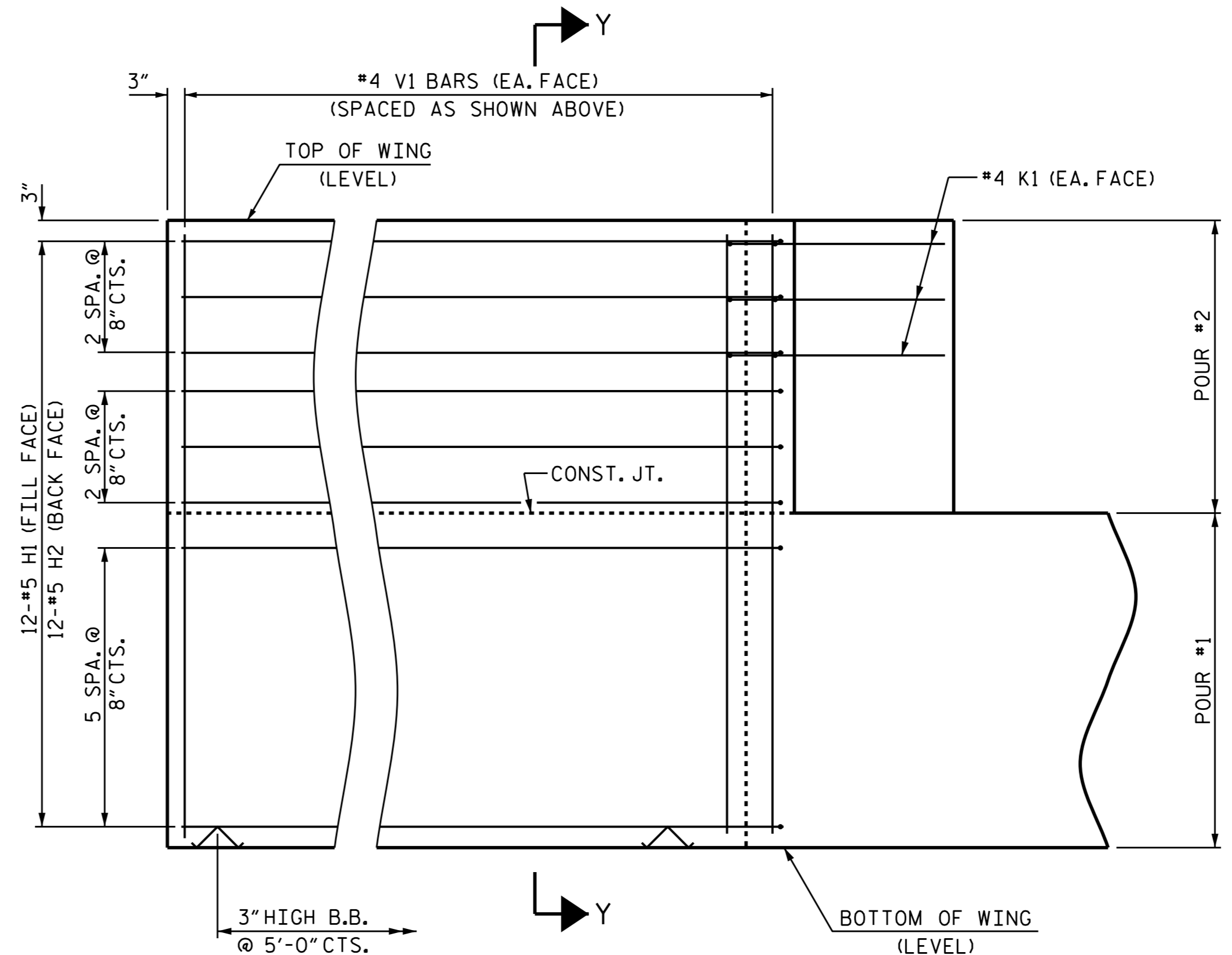
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

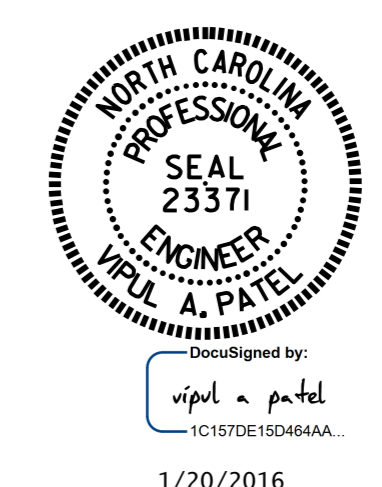


ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. 17.BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

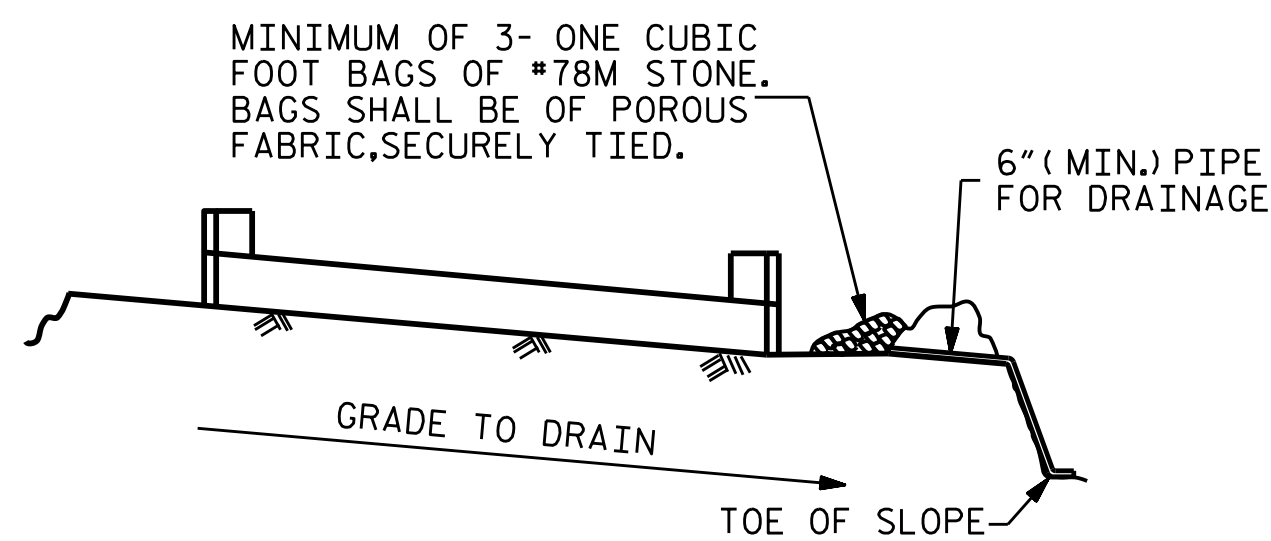
SUBSTRUCTURE
 END BENT 2
 WING DETAILS

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

ASSEMBLED BY : N.D'AIUTO DATE : 10/21/14
 CHECKED BY : M.E.GILES DATE : 12/8/14
 DRAWN BY : WJH 12/11 REV. 4/15 MAA/TMG
 CHECKED BY : AAC 12/11

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STD. NO. EB_30_120S4_33BB

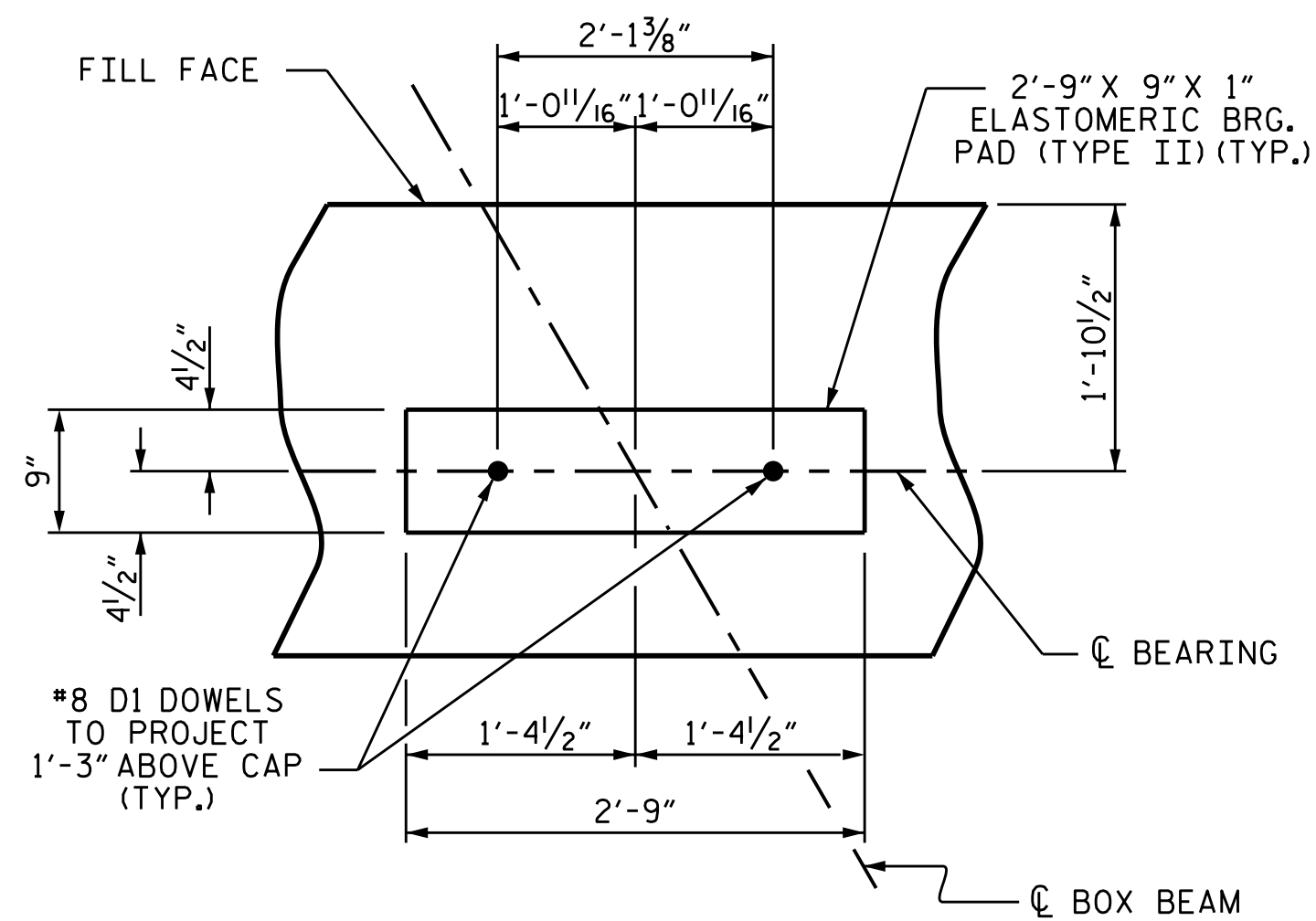


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

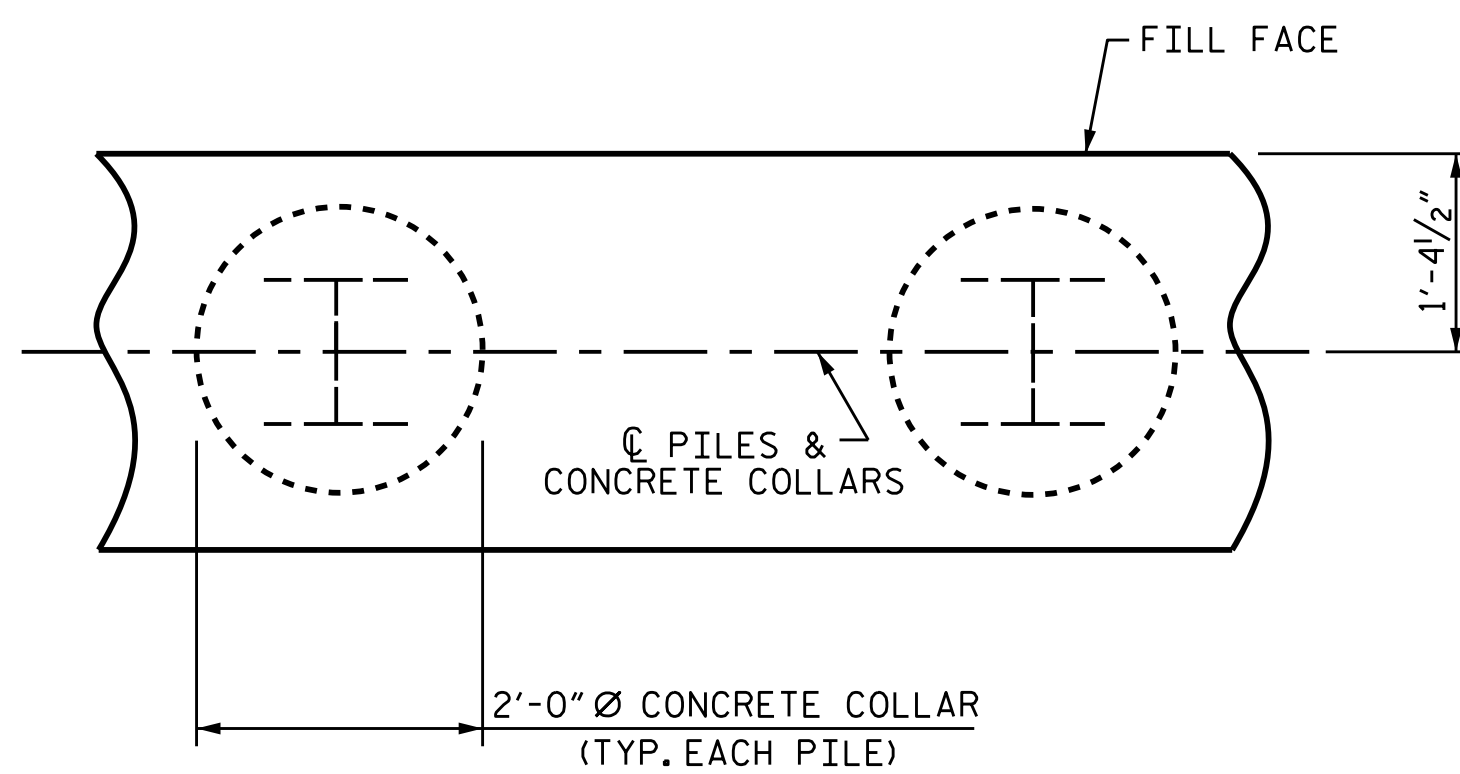
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

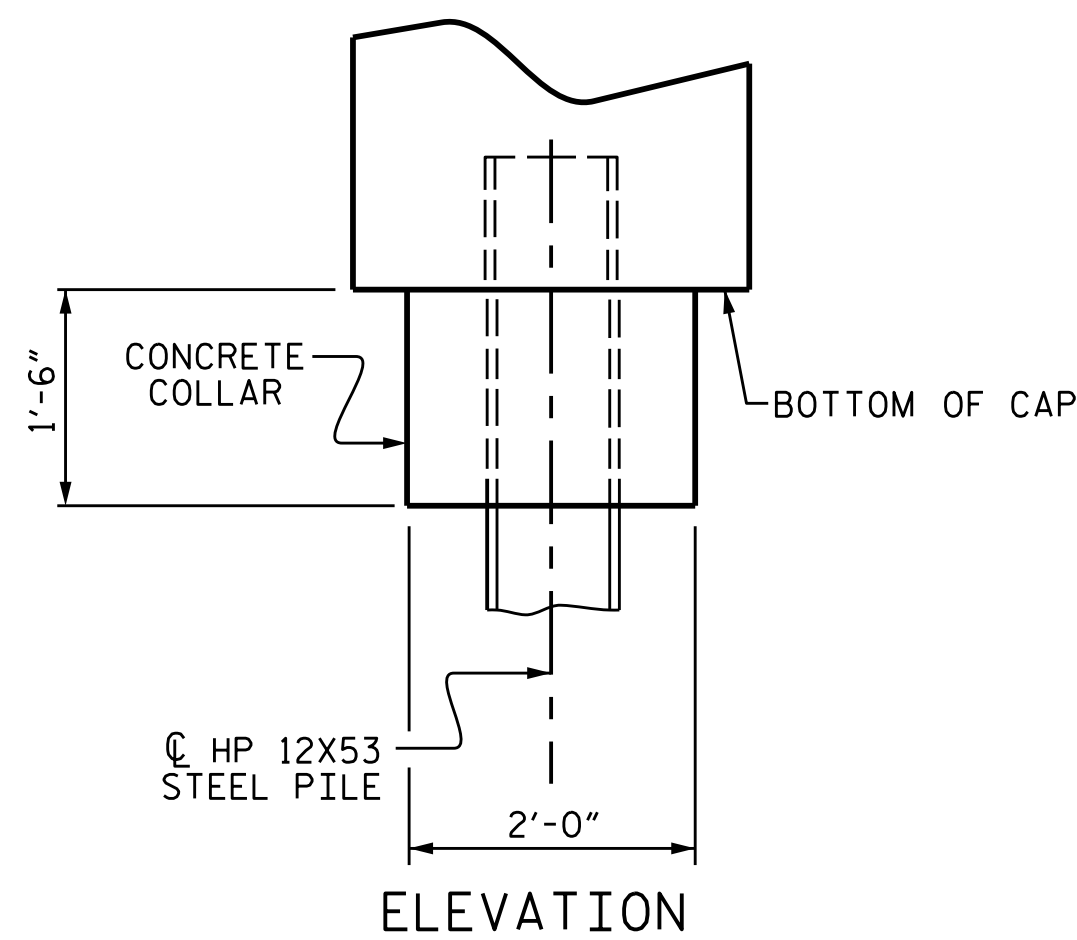


DETAIL "A"

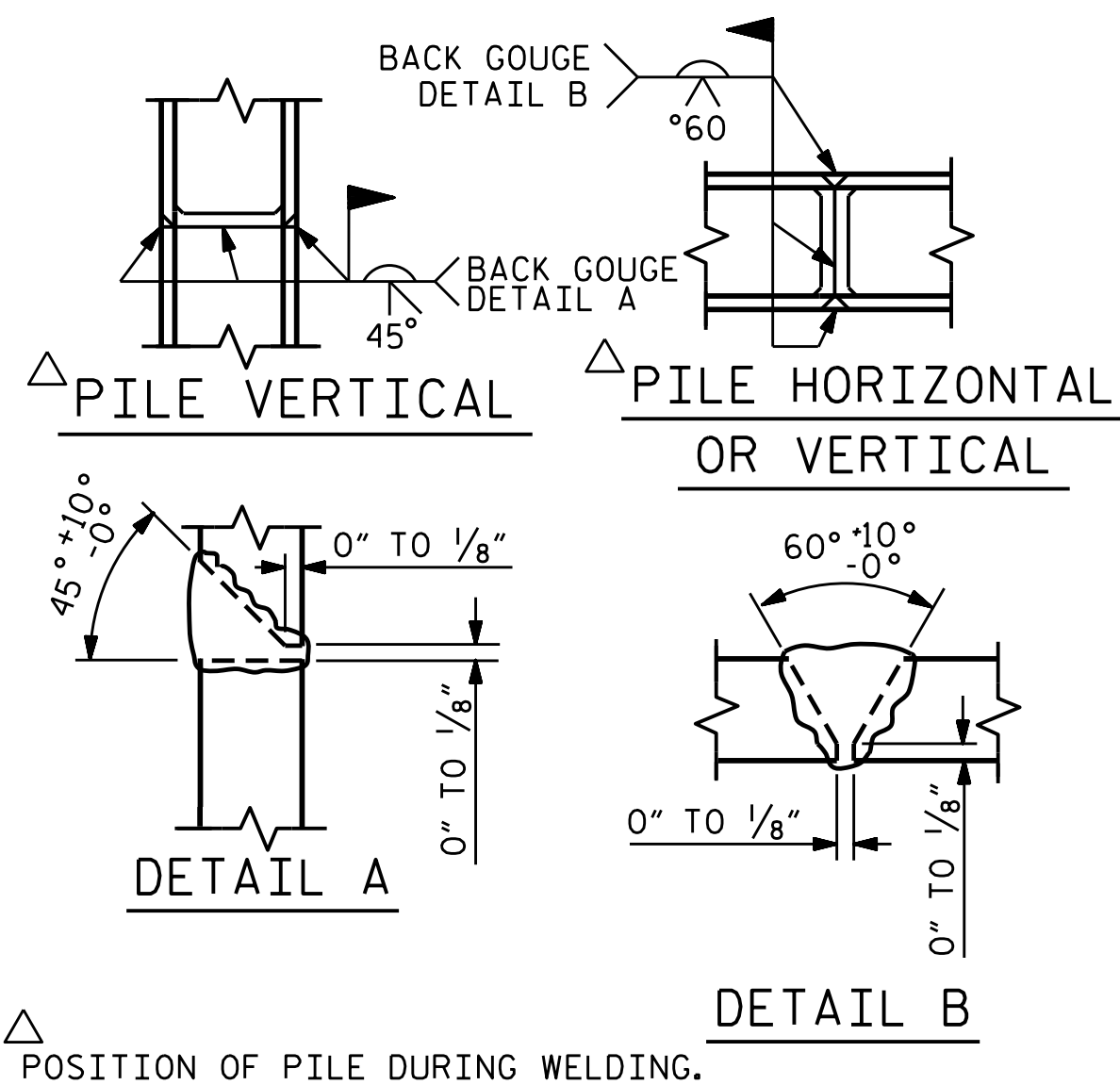


PLAN

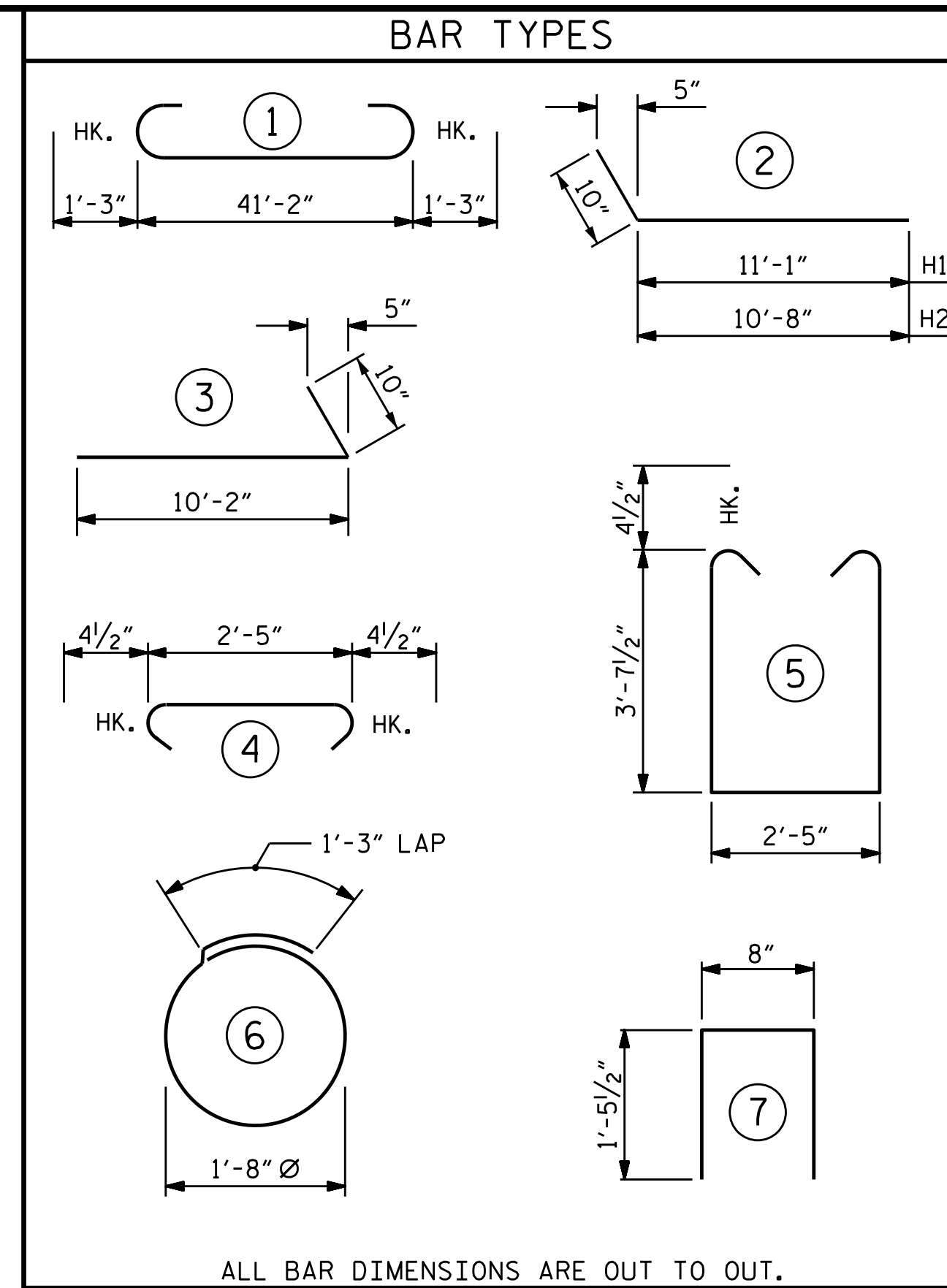
CORROSION PROTECTION FOR STEEL PILES DETAIL



ELEVATION



PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

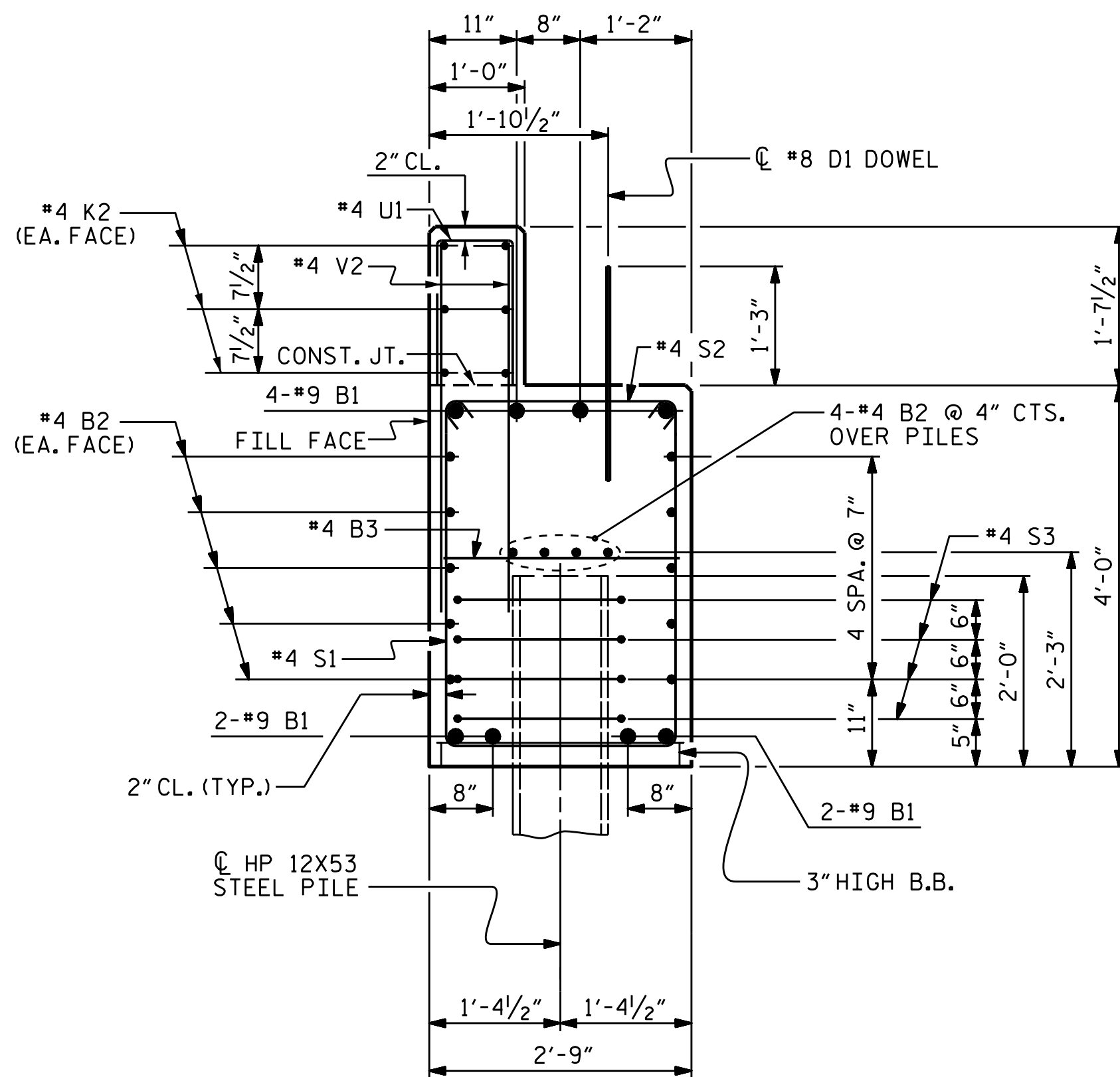
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9	1	43'-8"	1,188
B2	#4	STR	21'-11"	410
B3	#4	STR	2'-5"	18
D1	#8	STR	2'-3"	120
H1	#5	2	11'-11"	149
H2	#5	2	11'-6"	144
H3	#5	3	11'-0"	275
K1	#4	STR	3'-5"	24
K2	#4	STR	21'-11"	176
S1	#4	5	3'-2"	114
S2	#4	4	10'-5"	376
S3	#4	6	6'-6"	87
U1	#4	7	3'-7"	81
V1	#4	STR	7'-2"	292
V2	#4	STR	5'-3"	238

REINFORCING STEEL LBS. 3,692

CLASS A CONCRETE BREAKDOWN

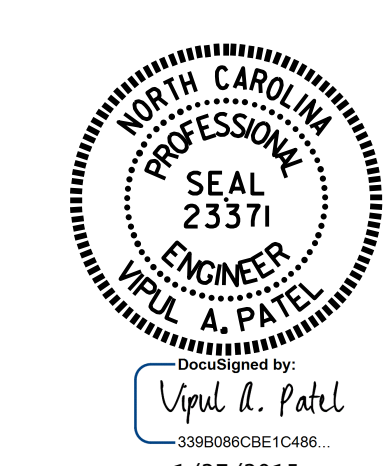
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	C.Y.	20.8
POUR #2	BACKWALL & UPPER PART OF WINGS	C.Y.	5.6
TOTAL CLASS A CONCRETE		C.Y.	26.4

HP 12X53 STEEL PILES	NO: 5	LIN. FT. =	75
PILE EXCAVATION IN SOIL		LIN. FT. =	31.00
PILE EXCAVATION NOT IN SOIL		LIN. FT. =	14.00



SECTION A-A

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

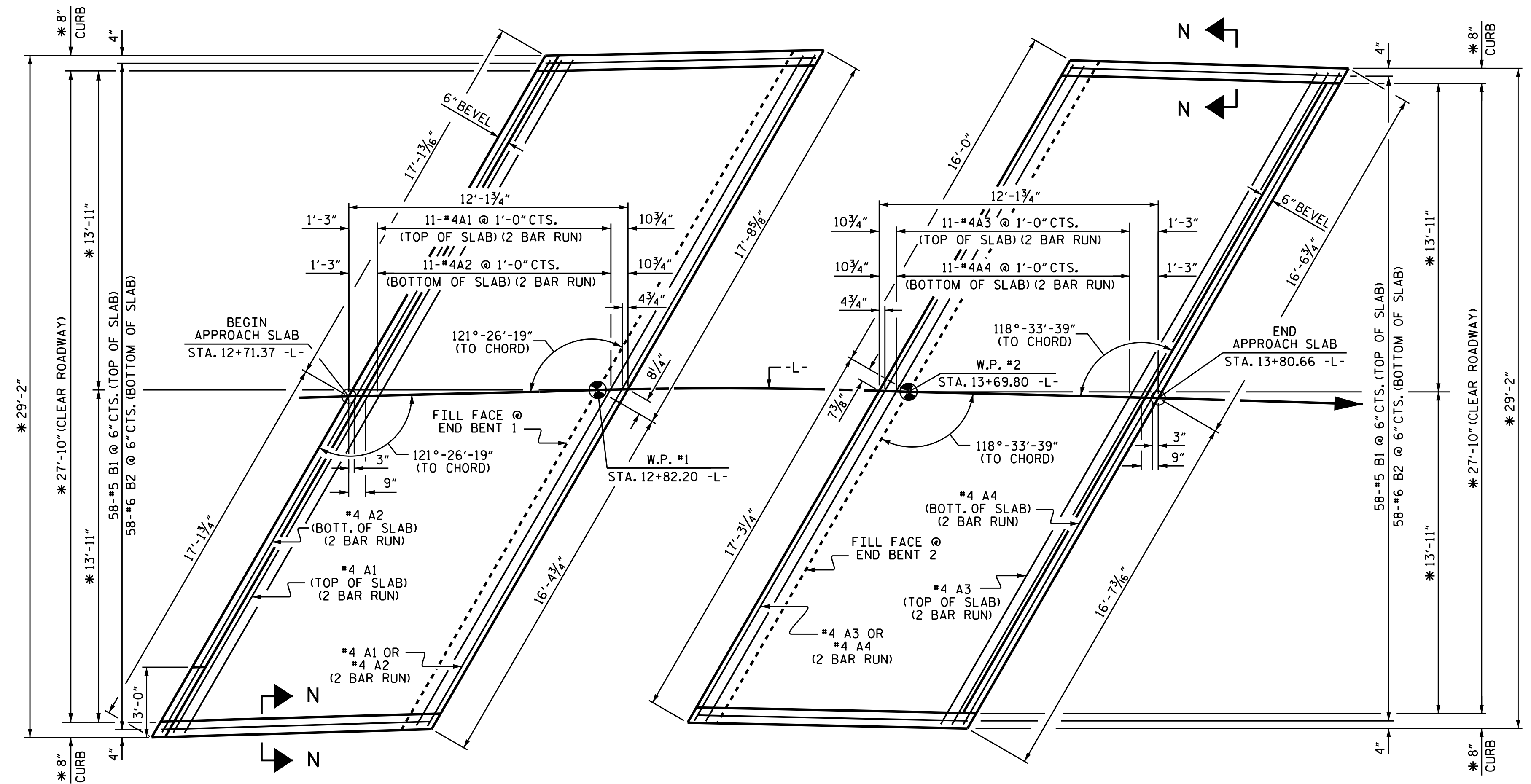


PROJECT NO. 17.BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					16

ASSEMBLED BY :	N.D. AIUTO	DATE :	10/21/14
CHECKED BY :	M.F. GILES	DATE :	12/8/14
DRAWN BY :	WJH	REV.	8/14
CHECKED BY :	AAC	DATE:	12/11



PLAN @ END BENT 1 PLAN @ END BENT 2

ARC OFFSETS ARE NEGLIGIBLE.

* RADIAL DIMENSIONS

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.

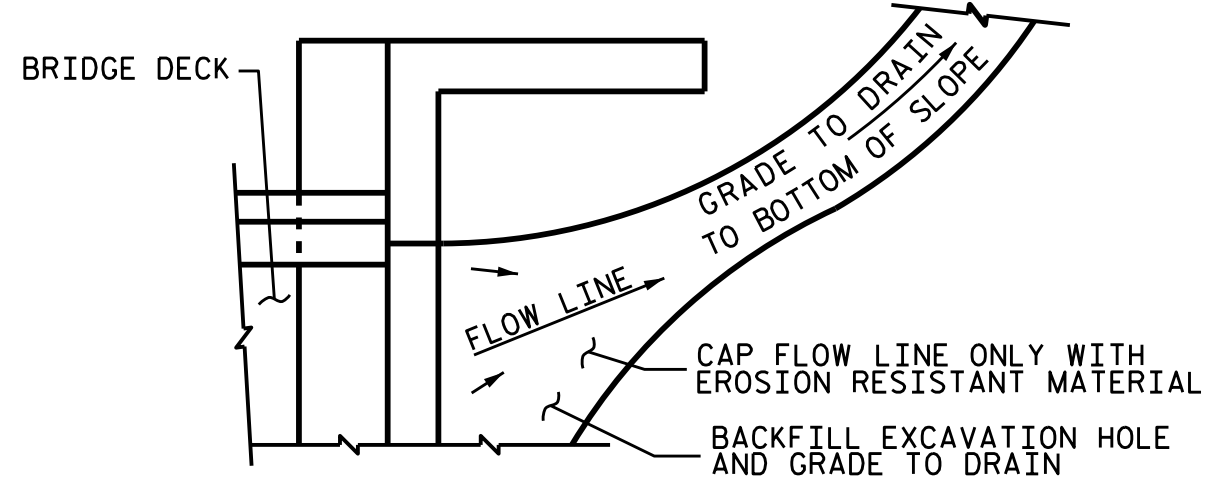
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#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.

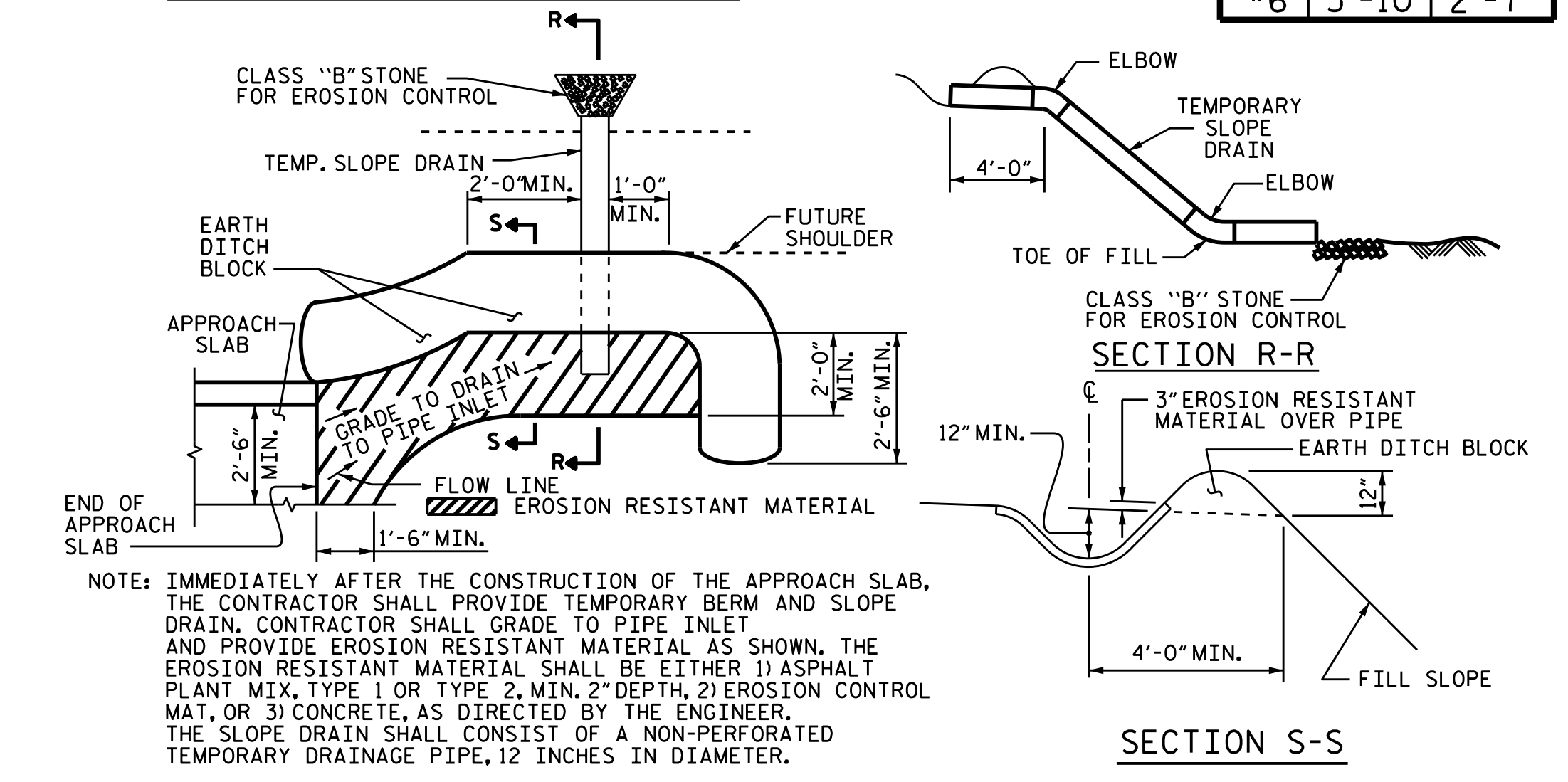
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED, SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



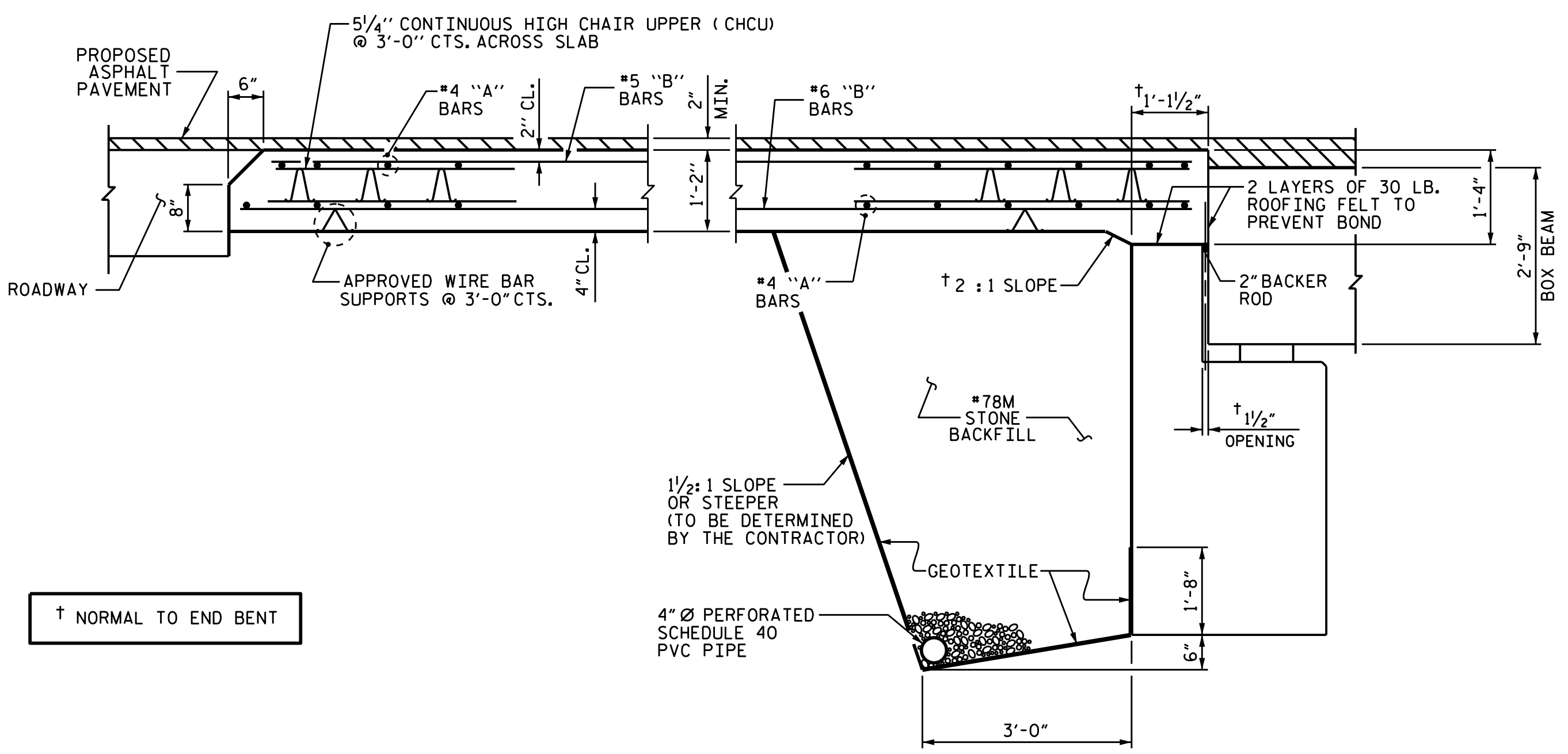
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



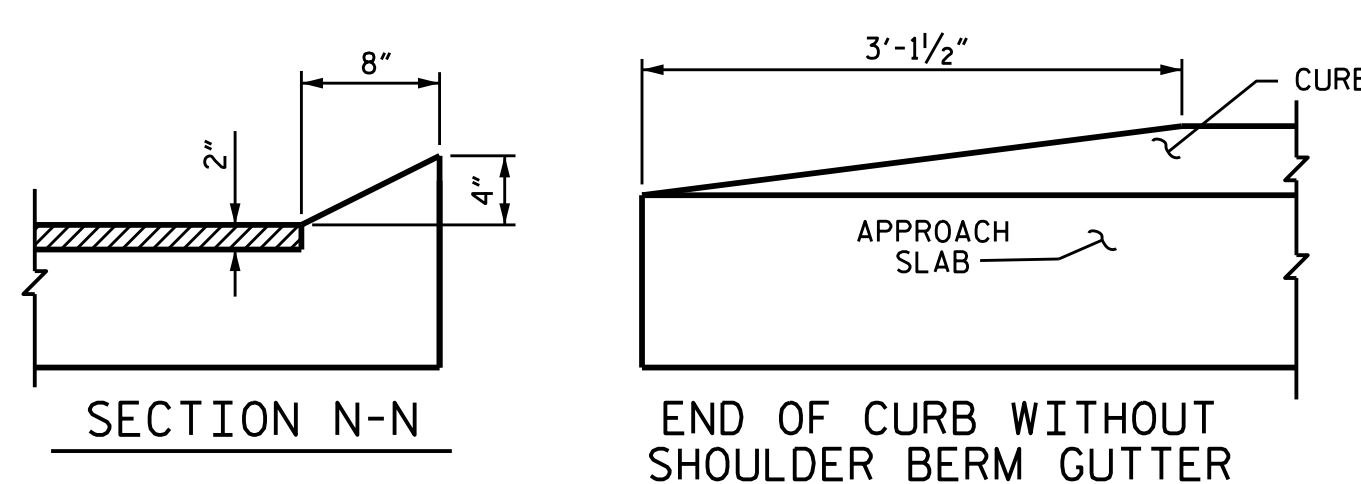
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN, CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

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



SECTION THRU SLAB

† NORMAL TO END BENT



CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	17'-10"	310
A2	26	#4	STR	17'-9"	308
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1,324
* EPOXY COATED REINFORCING STEEL				LBS.	980
CLASS AA CONCRETE				C. Y.	15.6
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	26	#4	STR	17'-5"	302
A4	26	#4	STR	17'-3"	300
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-8"	1016
REINFORCING STEEL				LBS.	1,316
* EPOXY COATED REINFORCING STEEL				LBS.	972
CLASS AA CONCRETE				C. Y.	15.6

SPLICE LENGTHS

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

ASSEMBLED BY: N.D.AIUTO DATE: 10/22/14
 CHECKED BY: M.E.GILES DATE: 12/8/14
 DESIGN ENGINEER OF RECORD: N.D.AIUTO DATE: 12/8/14

27-JAN-2015 10:58
 S:\DPG3\Division\lets\Div10\17BP10R71\Plans\17BP10R71_SD_AS_01.dgn
 vpatel



DocuSigned by:
 Vipul A. Patel
 33980808E1C486
 1/27/2015

PROJECT NO. 17BP.10.R.71
 UNION COUNTY
 STATION: 13+26.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)					
120° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 16

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 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE. ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER. DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS. WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0". EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED. WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES 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.

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