

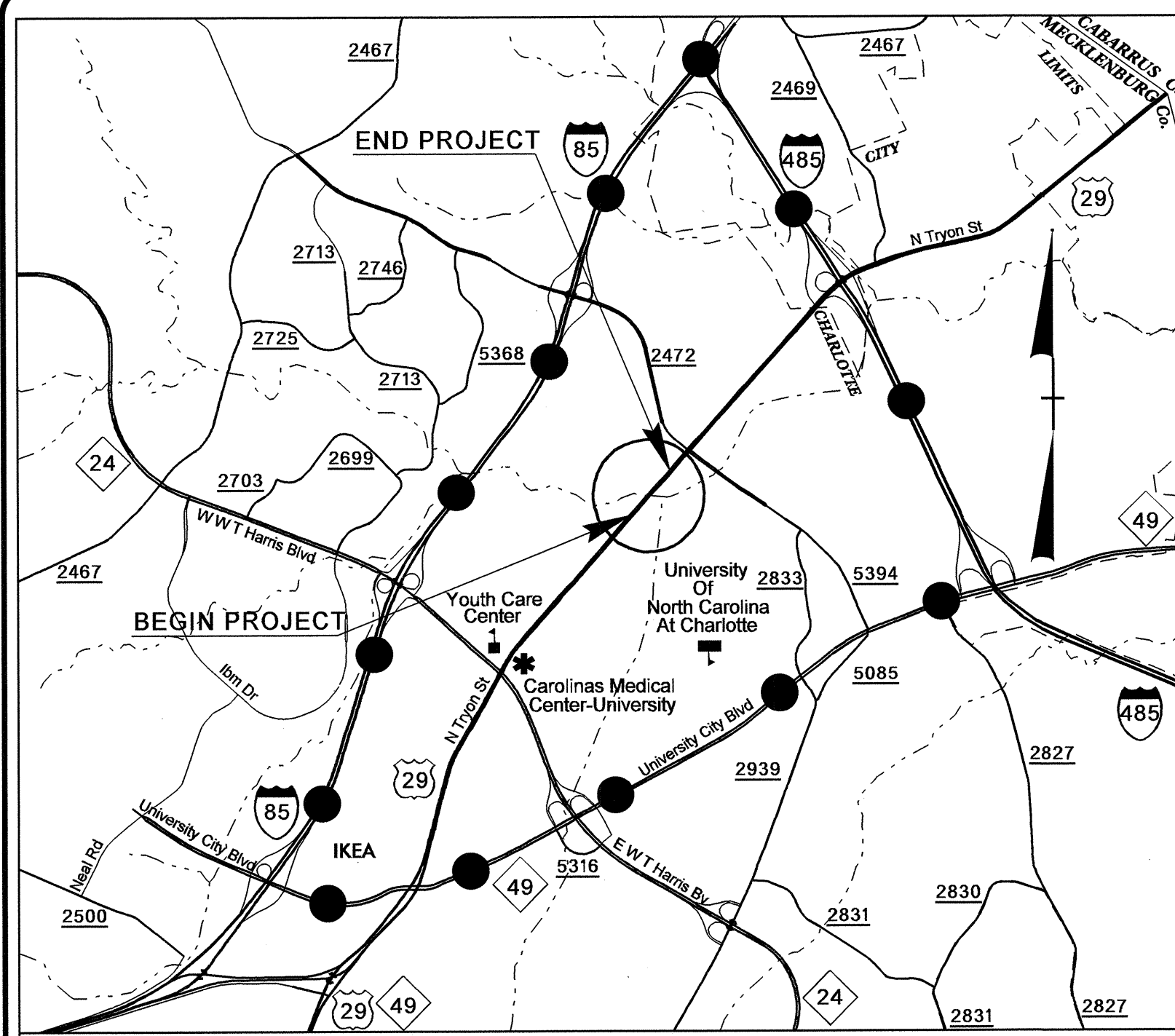
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4779		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
38550.1.1	BRSTP-0029(39)	PE	
38550.2.1	BRSTP-0029(39)	RW & UTIL	
38550.3.FR1	BRSTP-0029(39)	CONSTR.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG COUNTY

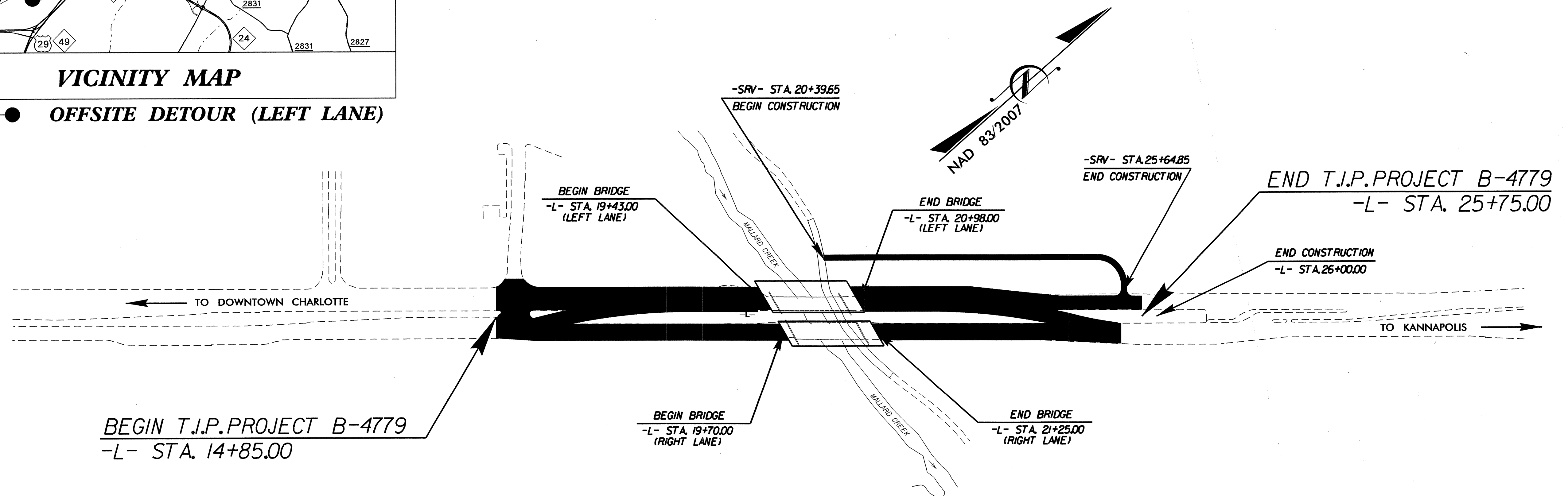
LOCATION: BRIDGE No. 147 (LEFT LANE) AND BRIDGE No. 140 (RIGHT LANE)
OVER MALLARD CREEK ON US 29 (N. TRYON ST.)

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



VICINITY MAP

● ● ● OFFSITE DETOUR (LEFT LANE)

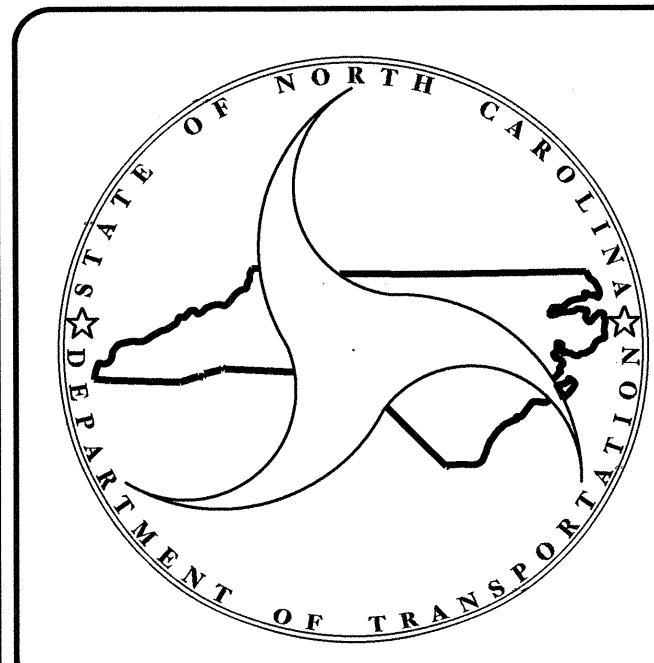


STRUCTURES

TIP PROJECT: B-4779

CONTRACT: C203284

17-SEP-2013 11:50
\$\$\$\$\$DGN\$\$\$\$\$
Thorill



DESIGN DATA	
ADT 2008 =	37,800
ADT 2035 =	49,200
DHV =	10 %
D =	65 %
T =	4 % *
V =	50 MPH
* TTST 1%	DUAL 3%
FUNC. CLASS = MAJ. ARTERIAL STATEWIDE TIER	

PROJECT LENGTH	
LENGTH ROADWAY T.I.P. PROJECT B-4779 =	0.177 MI
LENGTH STRUCTURE T.I.P. PROJECT B-4779 =	0.029 MI
TOTAL LENGTH OF T.I.P. PROJECT B-4779 =	0.206 MI

Prepared In the Office of:	
DIVISION OF HIGHWAYS	
2012 STANDARD SPECIFICATIONS	
LETTING DATE :	
MARCH 18, 2014	
B. C. HUNT, P.E.	PROJECT ENGINEER
V. A. PATEL, P.E.	PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

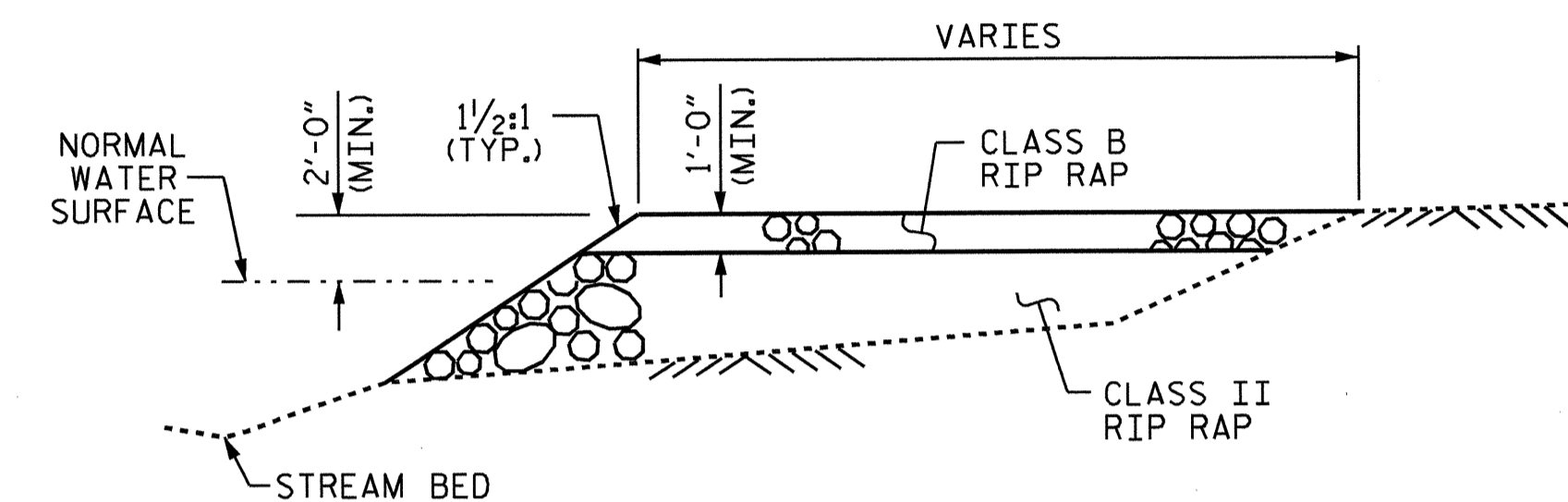
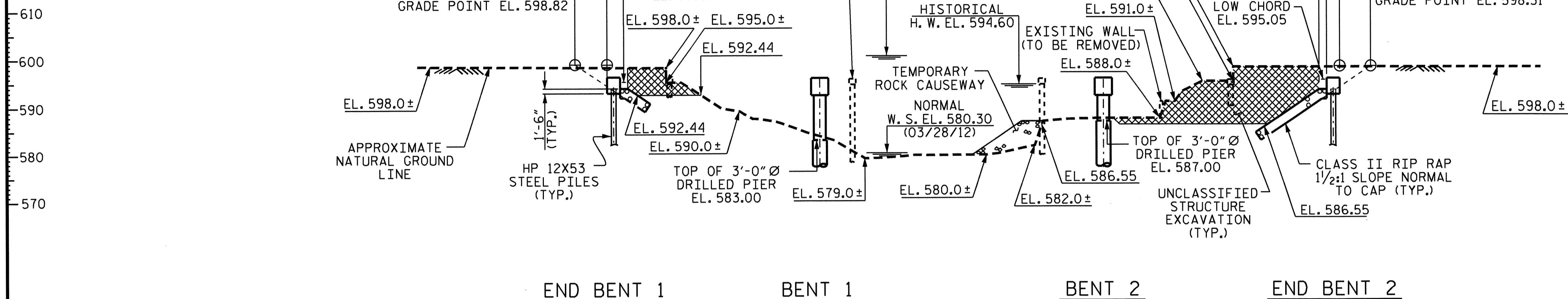
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

19+00 19+50 20+00 20+50 21+00 21+50

SPAN A SPAN B SPAN C

GRADE DATA

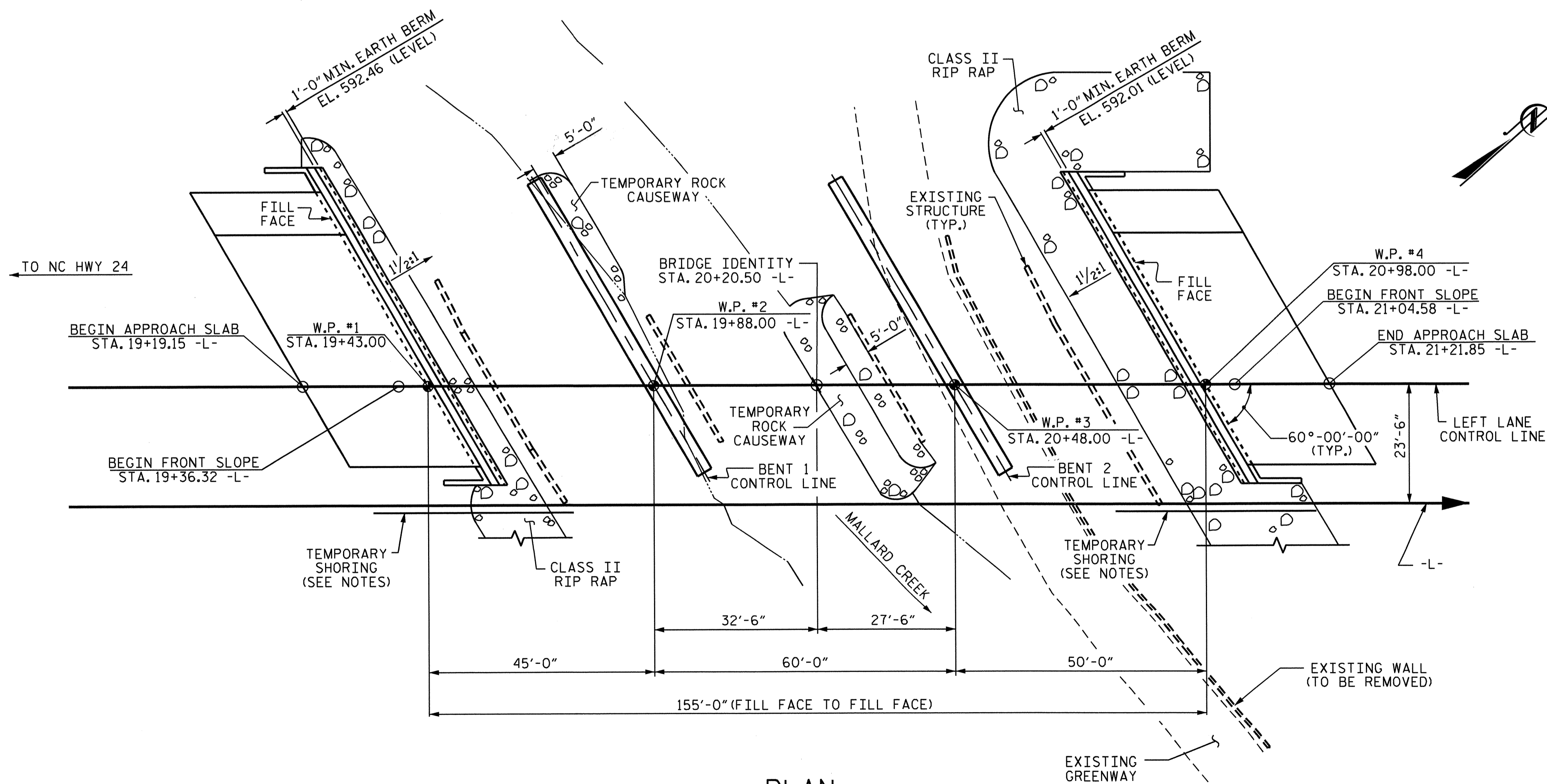
-0.3000% +1.1375%
 PI = 22+15.00 -L-
 EL. 597.98
 VC=140'



SECTION ALONG LEFT LANE CONTROL LINE

(SECTION TAKEN AT RIGHT ANGLE TO END BENTS AND BENTS)
 FOR CLASS II RIP RAP AT THE INTERIOR BENTS
 SEE "RIP RAP DETAILS" SHEET.

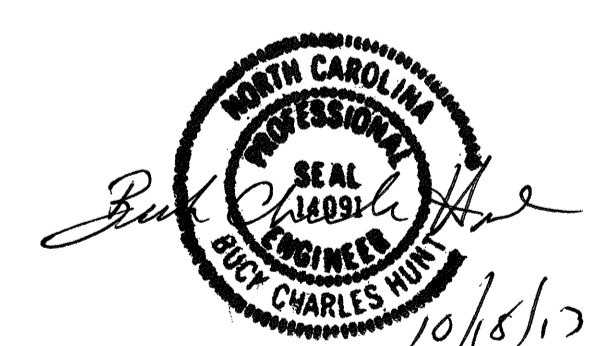
DETAIL OF TEMPORARY ROCK CAUSEWAY



PLAN

(PILES, COLUMNS, & DRILLED PIERS NOT SHOWN FOR CLARITY)
 FOR CLASS II RIP RAP AT THE INTERIOR BENTS
 SEE "RIP RAP DETAILS" SHEET.

I HEREBY CERTIFY THESE PLANS
 ARE THE AS-BUILT PLANS



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

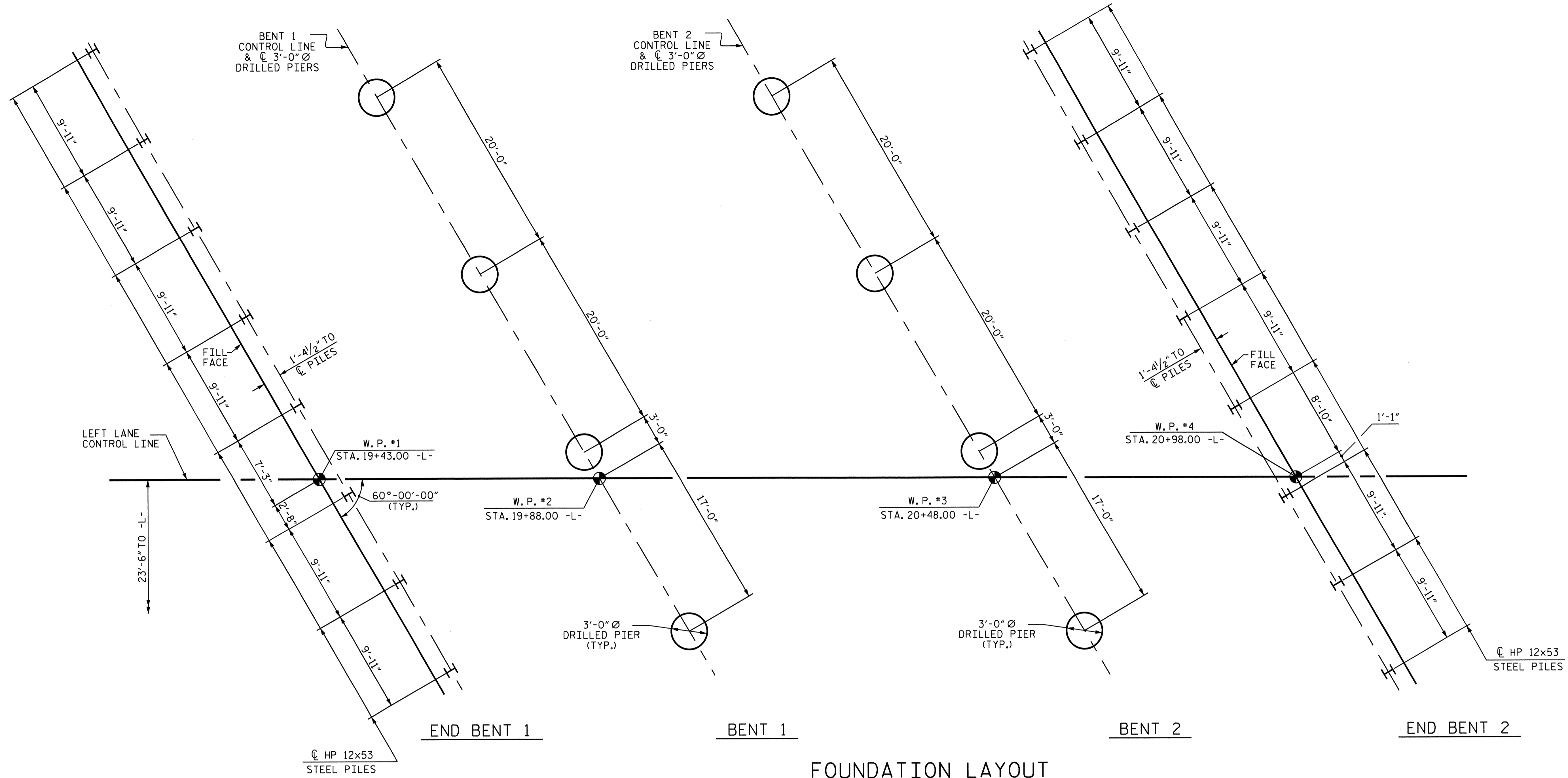
SHEET 1 OF 3 REPLACES BRIDGE #147

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER MALLARD
 CREEK ON US HWY 29 BETWEEN
 NC HWY 24 AND SR 2472
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			58

DRAWN BY: J. G. KHARVA DATE: 02/11/13
 CHECKED BY: T. H. CARROLL DATE: 05/09/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
 DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO CENTERLINE OF DRILLED PIERS.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 158 TONS PER PILE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 551.0 (LT), 552.0 (LT/CTR), 553.0 (CTR/RT), 554.0 (RT), AND WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 432.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 40.0 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 579.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 561.5 (LT), 562.0 (LT/CTR), 562.5 (CTR/RT), AND 563.0 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 428.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 546.0 (LT), 544.0 (LT/CTR), 542.0 (CTR/RT), 540.0 (RT), AND WITH THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 582.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 559.5 (LT), 560.0 (LT/CTR), 560.5 (CTR/RT), AND 561.0 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENTS NO. 1 AND 2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT IS REQUIRED FOR DRILLED PIERS AT BENTS NO. 1 AND 2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 2 OF 3

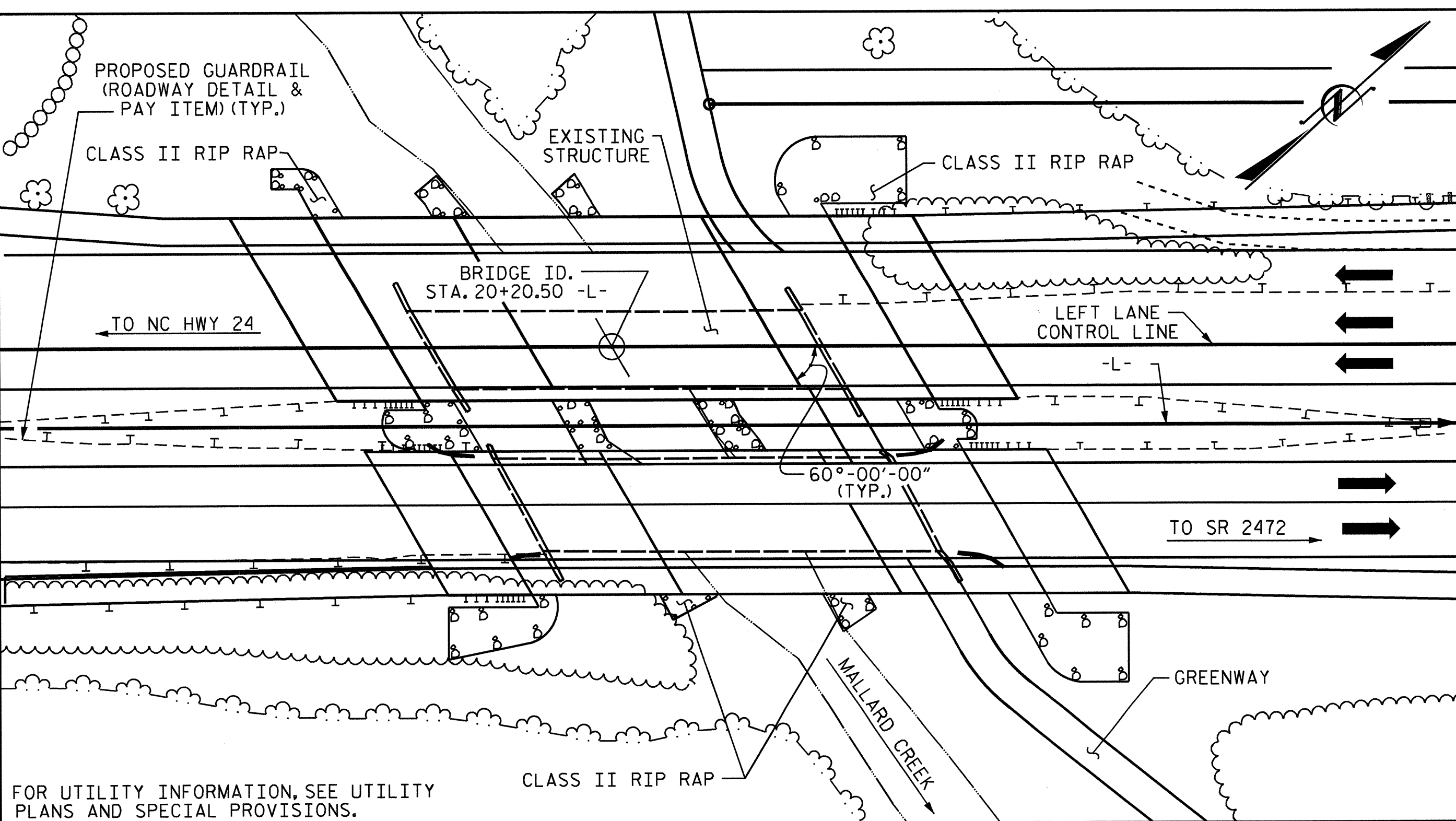
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER MALLARD
 CREEK ON US HWY 29 BETWEEN
 NC HWY 24 AND SR 2472
 (LEFT LANE)

DRAWN BY : J. G. KHARVA DATE : 02/11/13
 CHECKED BY : T. H. CARROLL DATE : 05/09/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			58
2			4			58

BENCH MARK #2: R/R SPIKE IN 24" POPLAR TREE, 139' LEFT OF STA. 25+52.25 -L-, ELEV. 592.71.



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE = 8857 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YRS.
 DESIGN HIGH WATER ELEVATION = 599.70
 DRAINAGE AREA = 21.1 SQ. MI.
 BASE DISCHARGE (0100) = 9871 CFS
 BASE HIGH WATER ELEVATION = 600.68

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 7100 CFS
 FREQUENCY OF OVERTOPPING FLOOD = 50 YRS. (-)
 OVERTOPPING FLOOD ELEVATION = 598.50

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS (3 @ 40'-0") WITH A CLEAR ROADWAY WIDTH OF 26'-0" AND REINFORCED CONCRETE DECK GIRDERS ON REINFORCED CONCRETE CAPS ON TIMBER PILES AT END BENTS AND REINFORCED CONCRETE POST AND WEB ON SPREAD FOOTINGS AT BENTS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT 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.

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 50 FT. LEFT AND 25 FT. RIGHT 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. 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.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+20.50 -L-.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE										8248	10196	37.6		LUMP SUM
END BENT 1													26.9	
BENT 1			67.0	55.0	20.0	2	1						34.7	
BENT 2			116.0	60.0	24.0	2	1						31.7	
END BENT 2													27.2	
TOTAL	LUMP SUM	LUMP SUM	183.0	115.0	44.0	4	2	1	LUMP SUM	8248	10196	37.6	120.5	LUMP SUM

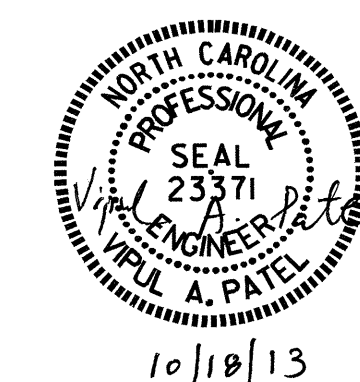
TOTAL BILL OF MATERIAL

	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12x53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 3'-7 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS		
	LBS.	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE		2380				288.46	304.80			LUMP SUM	LUMP SUM	57	2890.17
END BENT 1	3941			8	220			60	70				
BENT 1	16950		2758					80	120				
BENT 2	18728		3364					85	125				
END BENT 2	3937			8	320			220	245				
TOTAL	43556	2380	6122	16	540	288.46	304.80	445	560	LUMP SUM	LUMP SUM	57	2890.17

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER MALLARD CREEK ON US HWY 29 BETWEEN NC HWY 24 AND SR 2472 (LEFT LANE)



DRAWN BY: J. G. KHARVA DATE: 02/11/13
 CHECKED BY: T. H. CARROLL DATE: 05/09/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13

17-SEP-2013 11:50
 R:\Structures\Plans\Str#1\B-4779.SD.GD.01.dgn
 rncorroll

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			58

STR. #1

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						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	1.27	--	1.75	0.257	1.75	B	EL	29.35	0.644	1.3	B	EL	5.87	0.80	0.257	1.27	B	EL	29.350		
	HL-93(0pr)	N/A	--	1.68	--	1.35	0.257	2.27	B	EL	29.35	0.644	1.68	B	EL	5.87	N/A	--	--	--	--	--		
	HS-20(Inv)	36,000	2	1.56	56,260	1.75	0.258	2.21	C	EL	23.737	0.644	1.56	B	EL	5.87	0.80	0.257	1.61	B	EL	29.350		
	HS-20(0pr)	36,000	--	2.03	72,929	1.35	0.258	2.86	C	EL	23.737	0.644	2.03	B	EL	5.87	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	3.47	46,780	1.4	0.258	5.56	C	EL	23.737	0.644	4.51	B	EL	5.87	0.80	0.257	3.47	B	EL	29.350	
		SNGARBS2	20,000	--	2.66	53,094	1.4	0.258	4.42	C	EL	23.737	0.644	3.25	B	EL	5.87	0.80	0.257	2.65	B	EL	29.350	
		SNAGRIS2	22,000	--	2.55	56,004	1.4	0.258	4.28	C	EL	18.99	0.644	3.03	B	EL	5.87	0.80	0.257	2.55	B	EL	29.350	
		SNCOTTS3	27,250	--	1.73	47,044	1.4	0.258	2.77	C	EL	23.737	0.644	2.26	B	EL	5.87	0.80	0.257	1.73	B	EL	29.350	
		SNAGGRS4	34,925	--	1.47	51,349	1.4	0.258	2.42	C	EL	23.737	0.644	1.9	B	EL	5.87	0.80	0.257	1.47	B	EL	29.350	
		SNS5A	35,550	--	1.44	51,045	1.4	0.258	2.36	C	EL	23.737	0.644	1.94	B	EL	5.87	0.80	0.257	1.44	B	EL	29.350	
		SNS6A	39,950	--	1.33	53,102	1.4	0.258	2.21	C	EL	23.737	0.644	1.79	B	EL	5.87	0.80	0.257	1.33	B	EL	29.350	
	SNS7B	42,000	--	1.27	53,183	1.4	0.258	2.11	C	EL	23.737	0.644	1.77	B	EL	5.87	0.80	0.257	1.27	B	EL	29.350		
	T1ST	TNAGRIT3	33,000	--	1.62	53,606	1.4	0.258	2.71	C	EL	23.737	0.644	2.11	B	EL	5.87	0.80	0.257	1.62	B	EL	29.350	
		TNT4A	33,075	--	1.64	54,073	1.4	0.258	2.74	C	EL	23.737	0.644	2.05	B	EL	5.87	0.80	0.257	1.63	B	EL	29.350	
		TNT6A	41,600	--	1.35	56,089	1.4	0.258	2.28	C	EL	23.737	0.644	1.92	B	EL	5.87	0.80	0.257	1.35	B	EL	29.350	
		TNT7A	42,000	--	1.36	57,174	1.4	0.258	2.32	C	EL	23.737	0.644	1.83	B	EL	5.87	0.80	0.257	1.36	B	EL	29.350	
		TNT7B	42,000	--	1.42	59,717	1.4	0.258	2.42	C	EL	23.737	0.644	1.72	B	EL	5.87	0.80	0.257	1.42	B	EL	29.350	
		TNAGRIT4	43,000	--	1.34	57,747	1.4	0.258	2.3	C	EL	23.737	0.644	1.66	B	EL	5.87	0.80	0.257	1.34	B	EL	29.350	
TNAGT5A		45,000	--	1.26	56,738	1.4	0.258	2.14	C	EL	23.737	0.644	1.67	B	EL	5.87	0.80	0.257	1.26	B	EL	29.350		
TNAGT5B	45,000	3	1.24	55,838	1.4	0.258	2.1	C	EL	23.737	0.644	1.57	B	EL	5.87	0.80	0.257	1.24	B	EL	29.350			

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

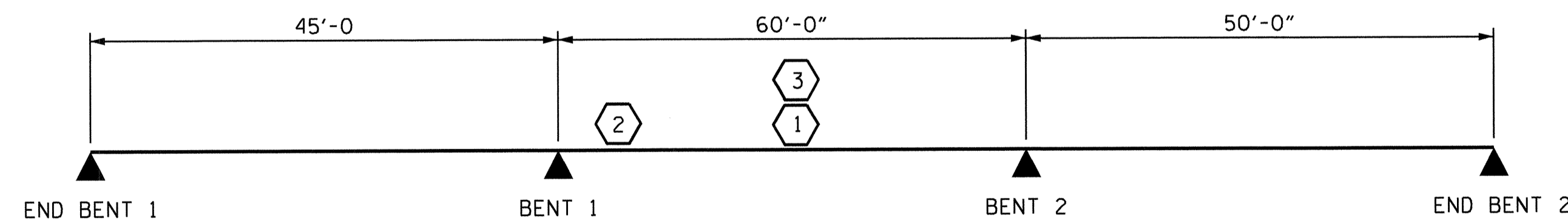
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

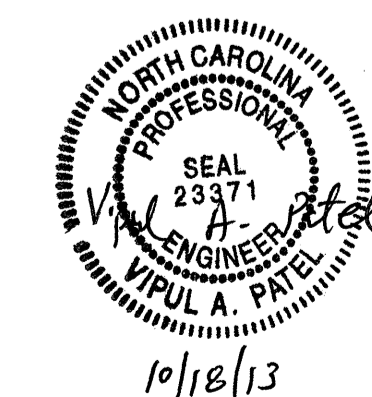
GIRDER LOCATION

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



LRFR SUMMARY

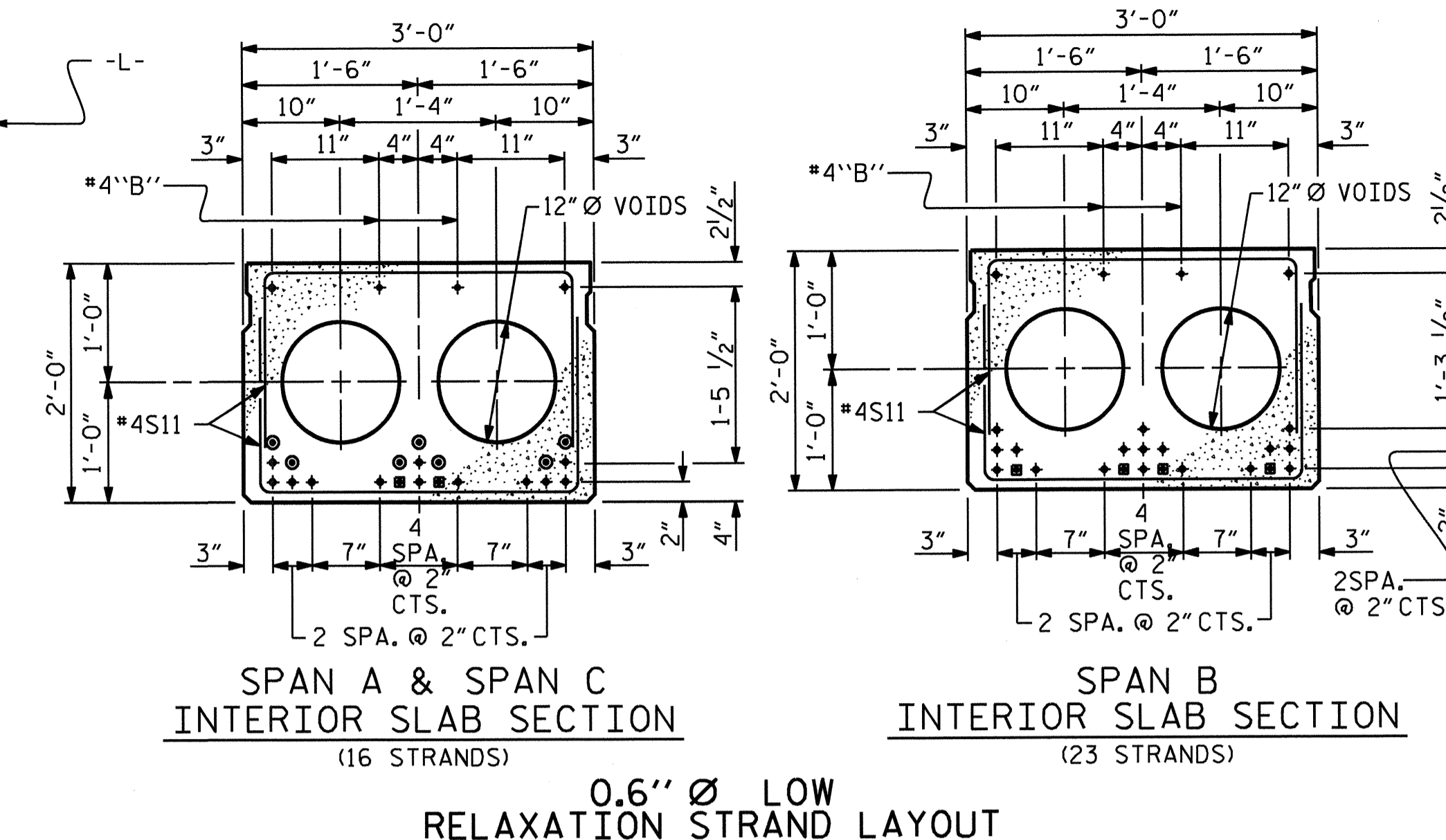
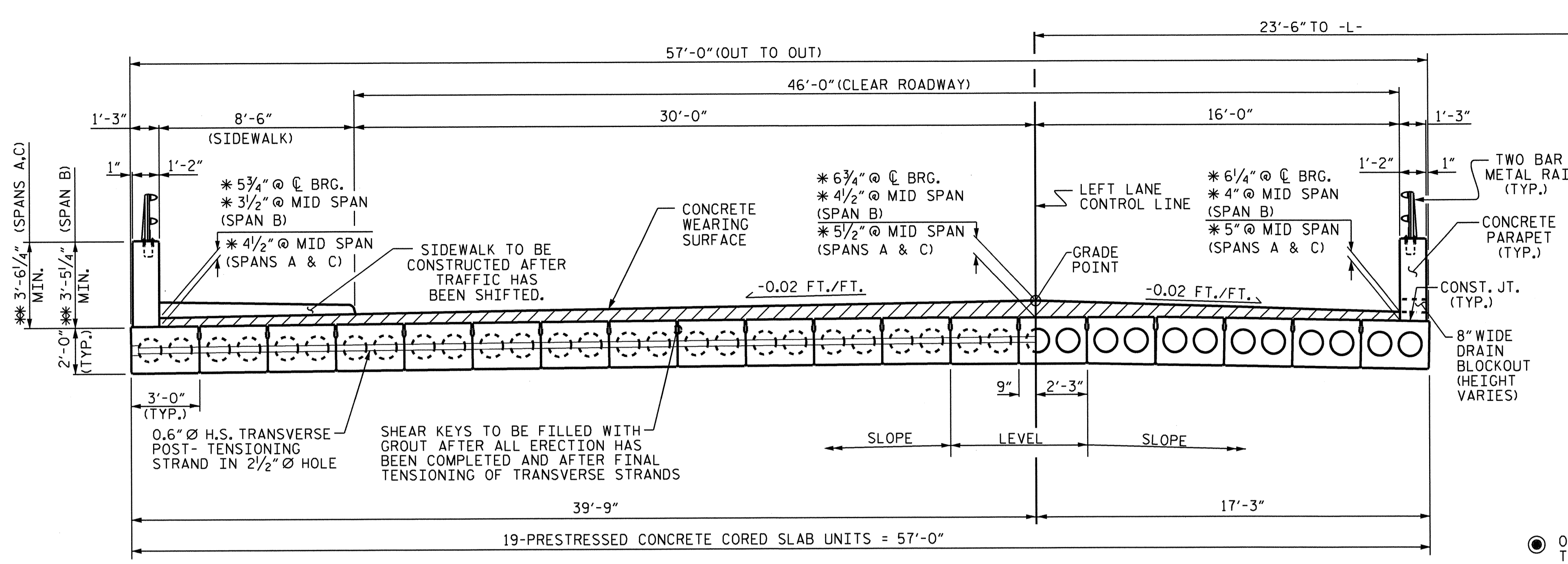
PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+20.50 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : D. R. SMITH	DATE : 6/12
CHECKED BY : R. L. CHESSON	DATE : 7/12
DRAWN BY : MAA 1/08	REV. 11/12/OBR MAA/GM
CHECKED BY : GM/DI 2/08	

REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			



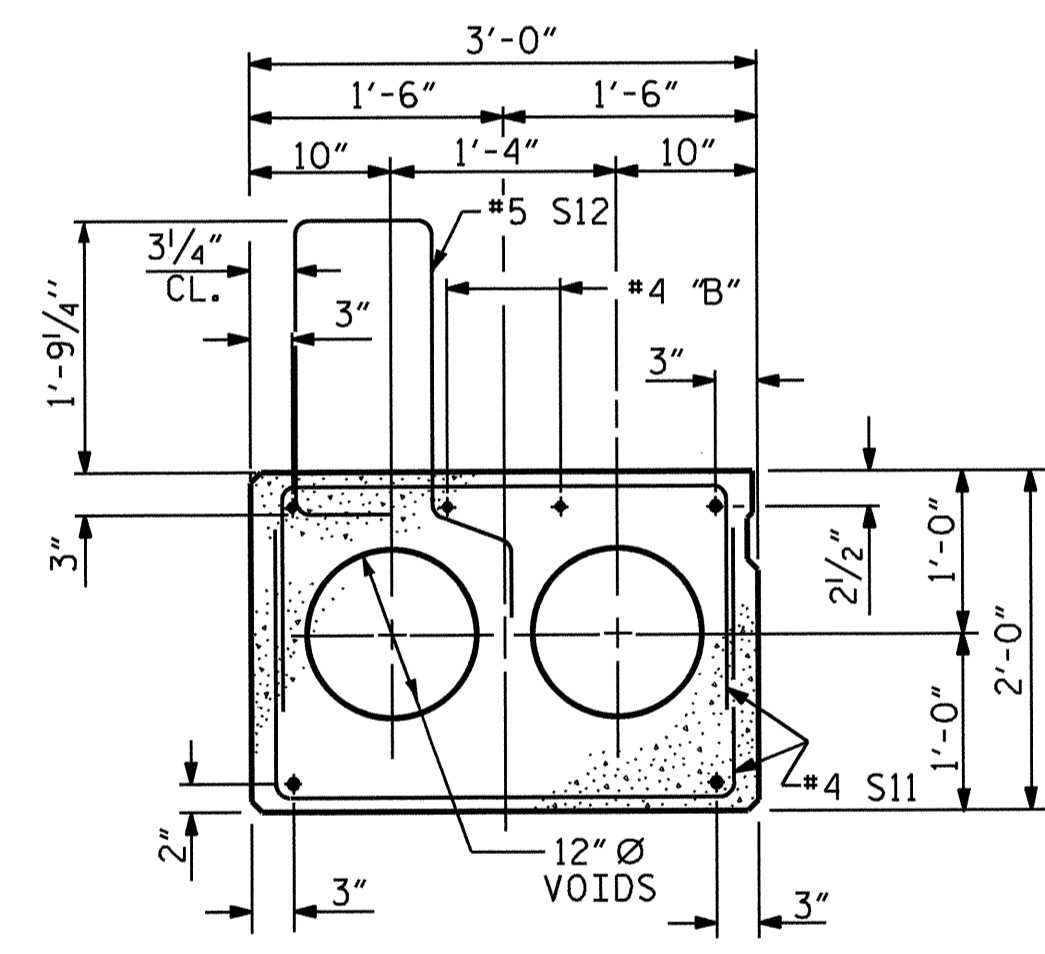
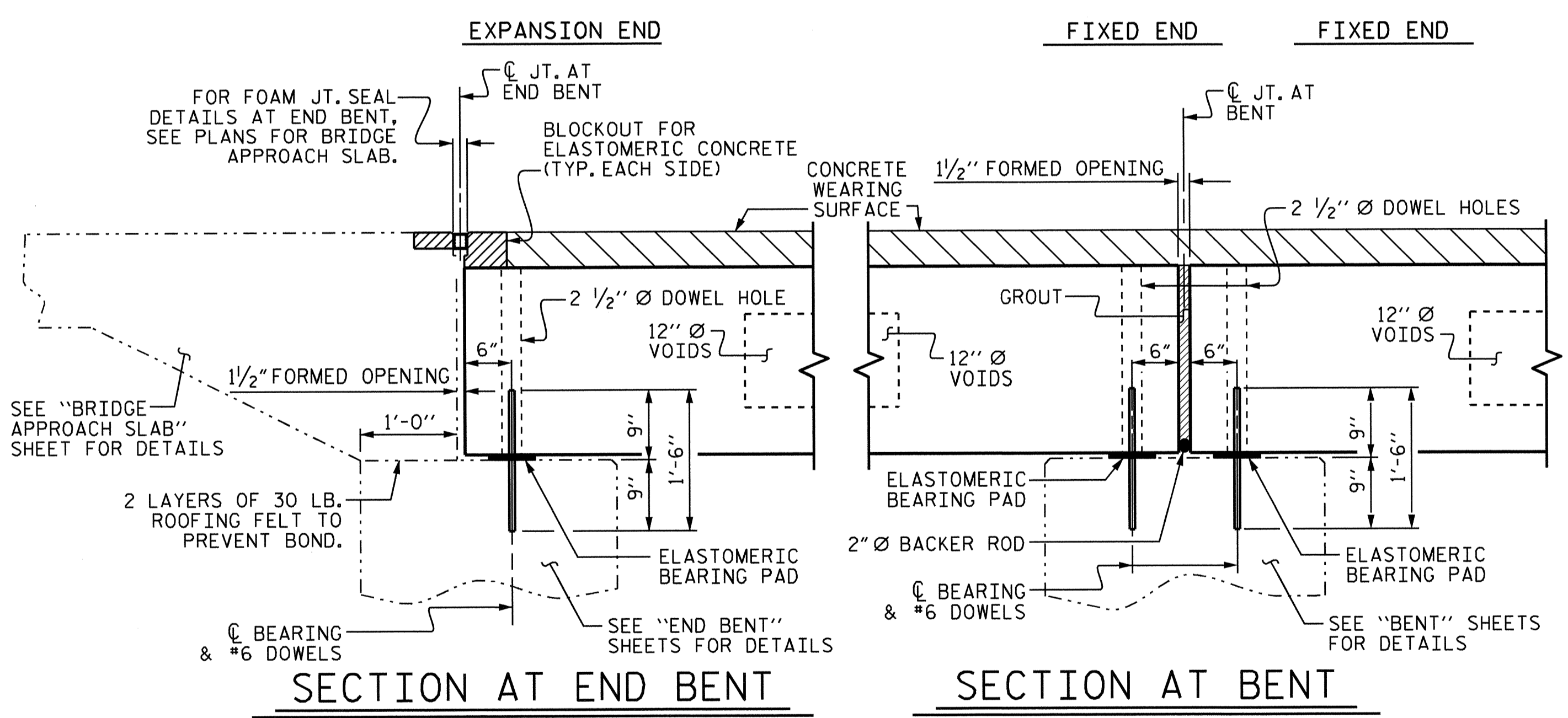
OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

HALF SECTION AT INTERMEDIATE DIAPHRAGM
 TYPICAL SECTION
 HALF SECTION THROUGH VOIDS

*BASED ON PREDICTED CAMBER & THEORITICAL GRADE LINE ELEVATIONS
 **THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

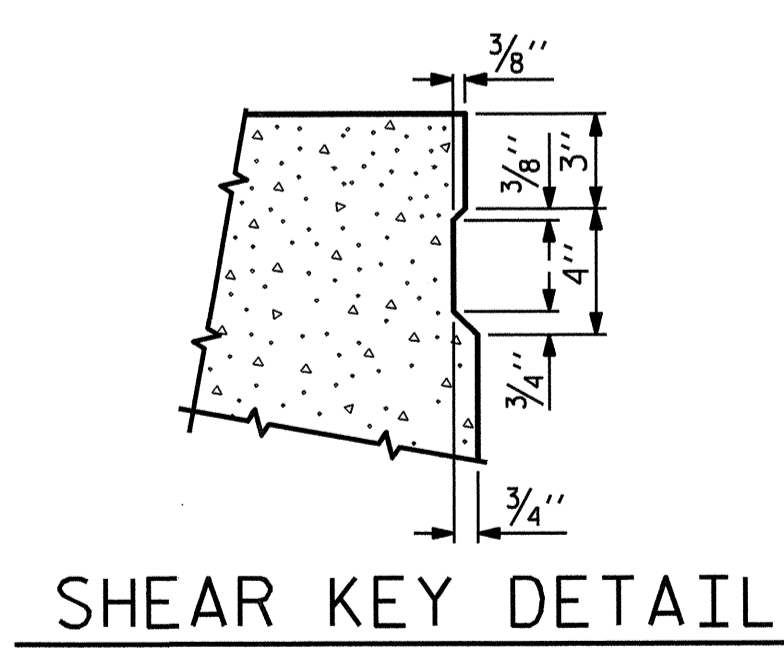
DEBONDING LEGEND



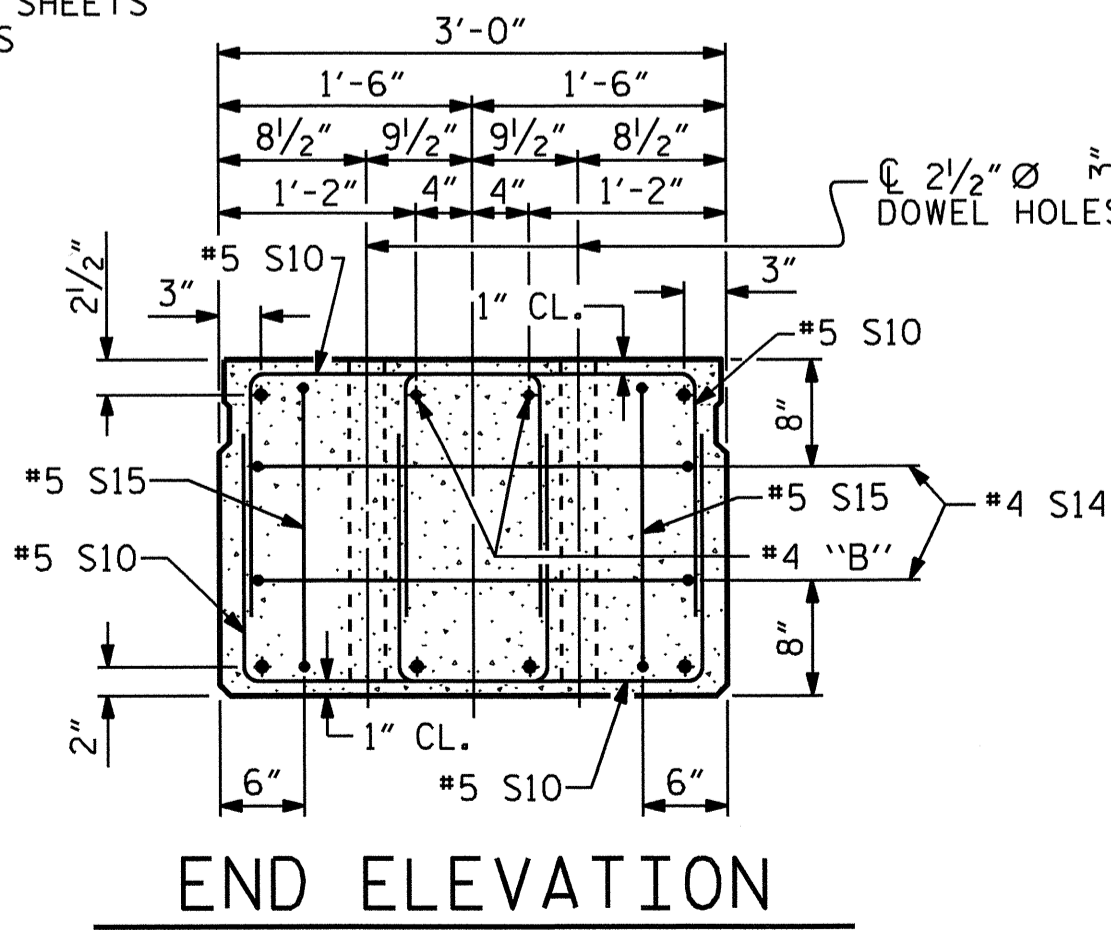
EXTERIOR SLAB SECTION
 (FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

SECTION AT END BENT

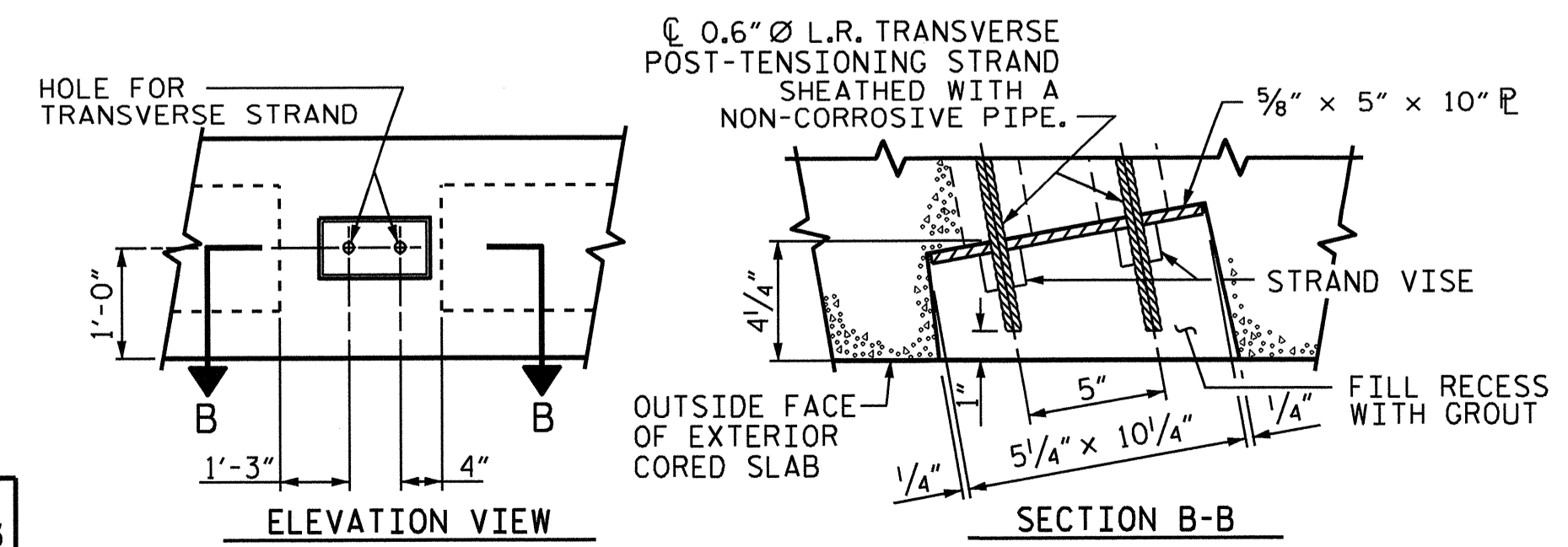
SECTION AT BENT



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



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



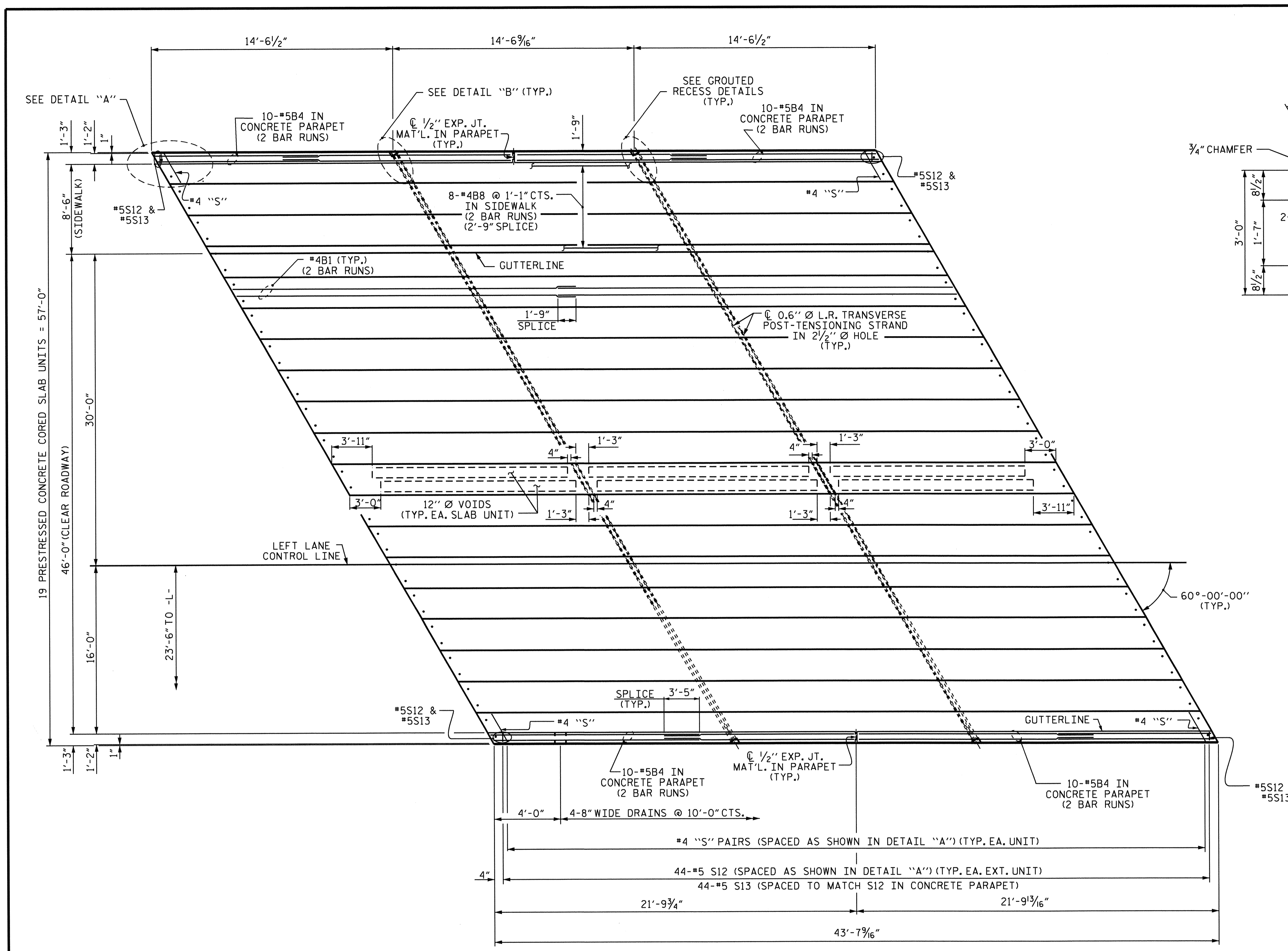
GROUTED RECESS AT END OF POST-TENSIONED STRAND-CORED SLABS

DESIGN ENGINEER OF RECORD: D. R. SMITH	DATE: 09/10/13
ASSEMBLED BY: J. G. KHARVA	DATE: 7/12
CHECKED BY: R. L. CHESSON	DATE: 8/12
DRAWN BY: MAA	5/10
ADDED: MAA/GM	5/6/10
CHECKED BY: GM	5/10
REV. 10/1/11	MAA/GM

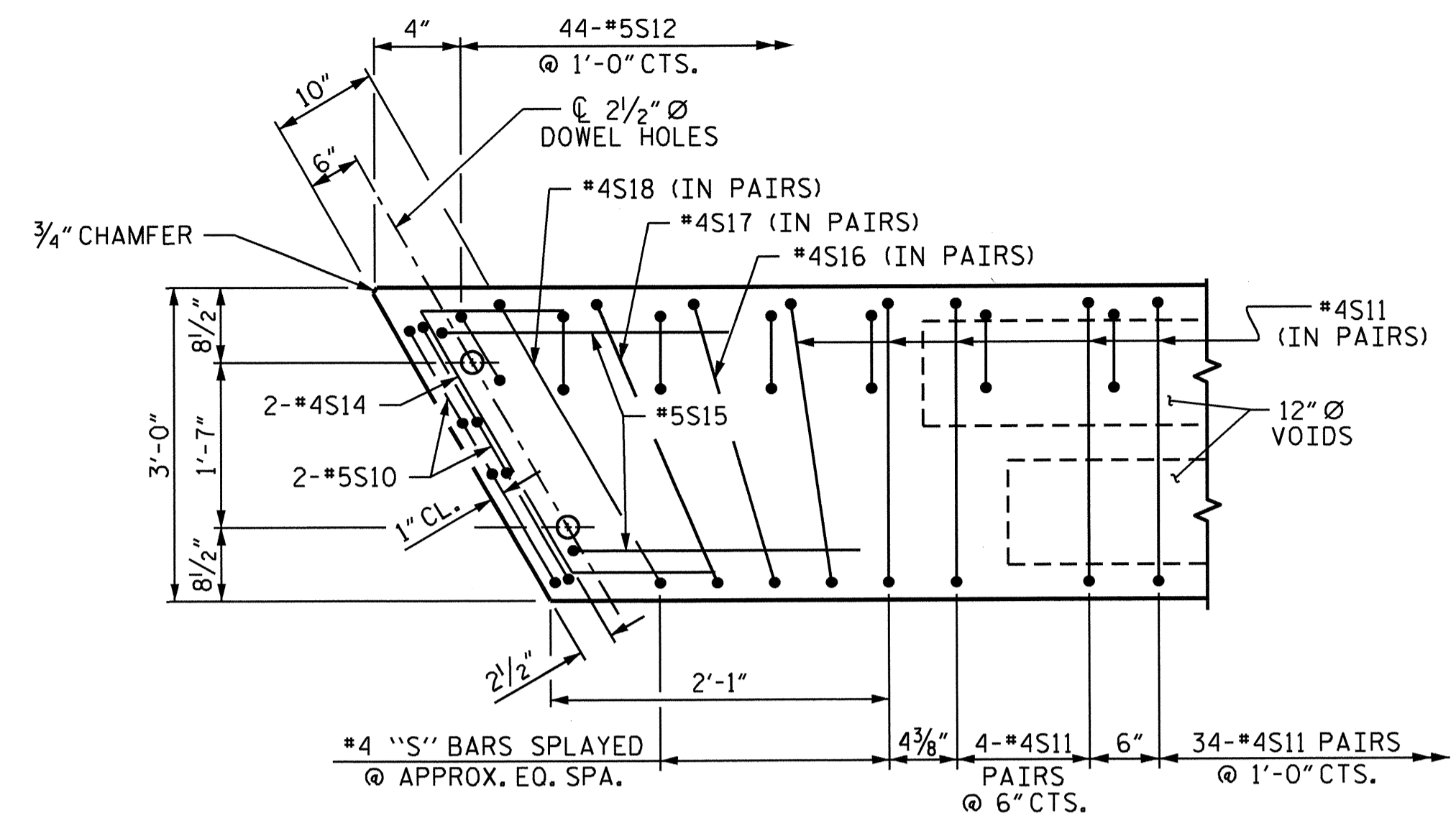
PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50-L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-5
					TOTAL SHEETS 58

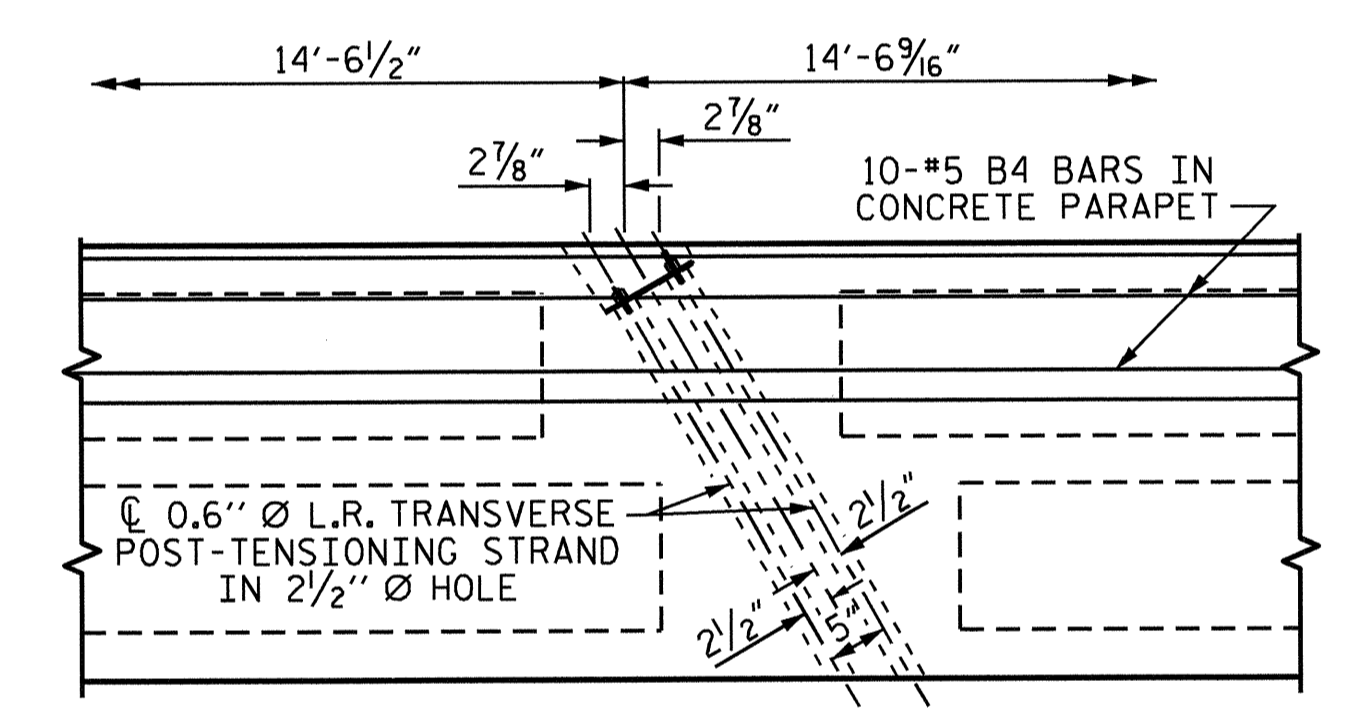


PLAN OF SPAN A



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50-L-

SHEET 2 OF 5

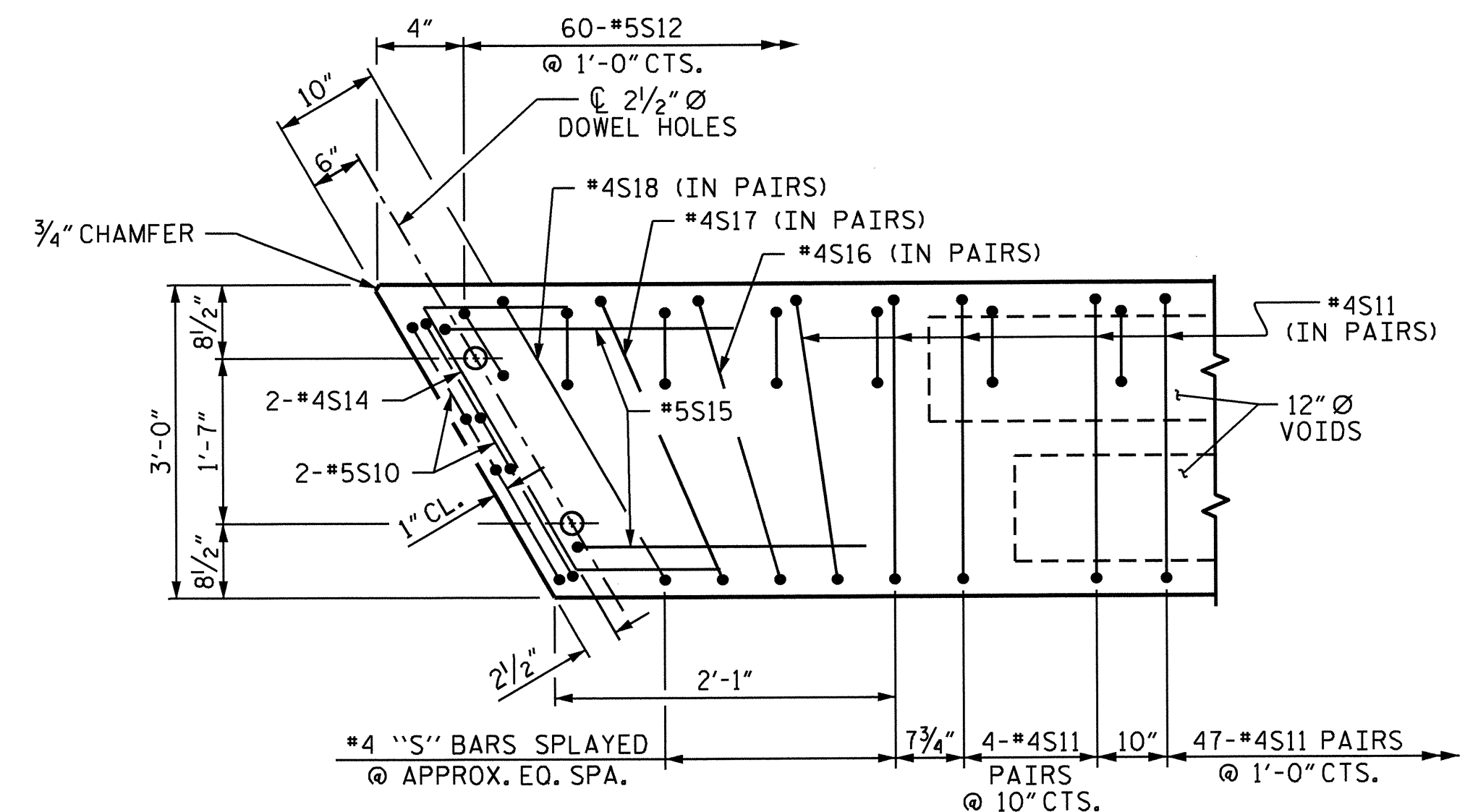
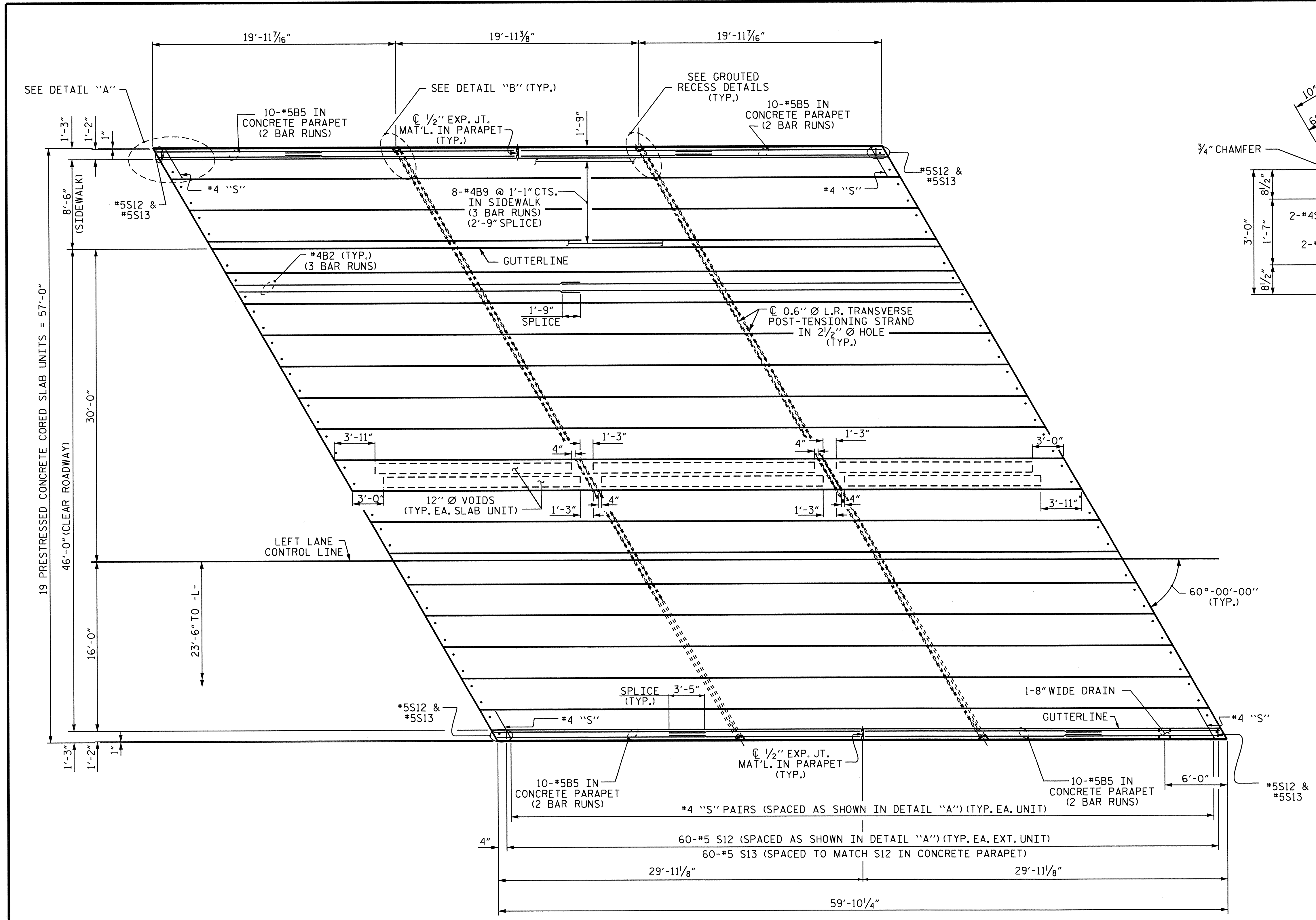
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPAN A
 60° SKEW
 (LEFT LANE)

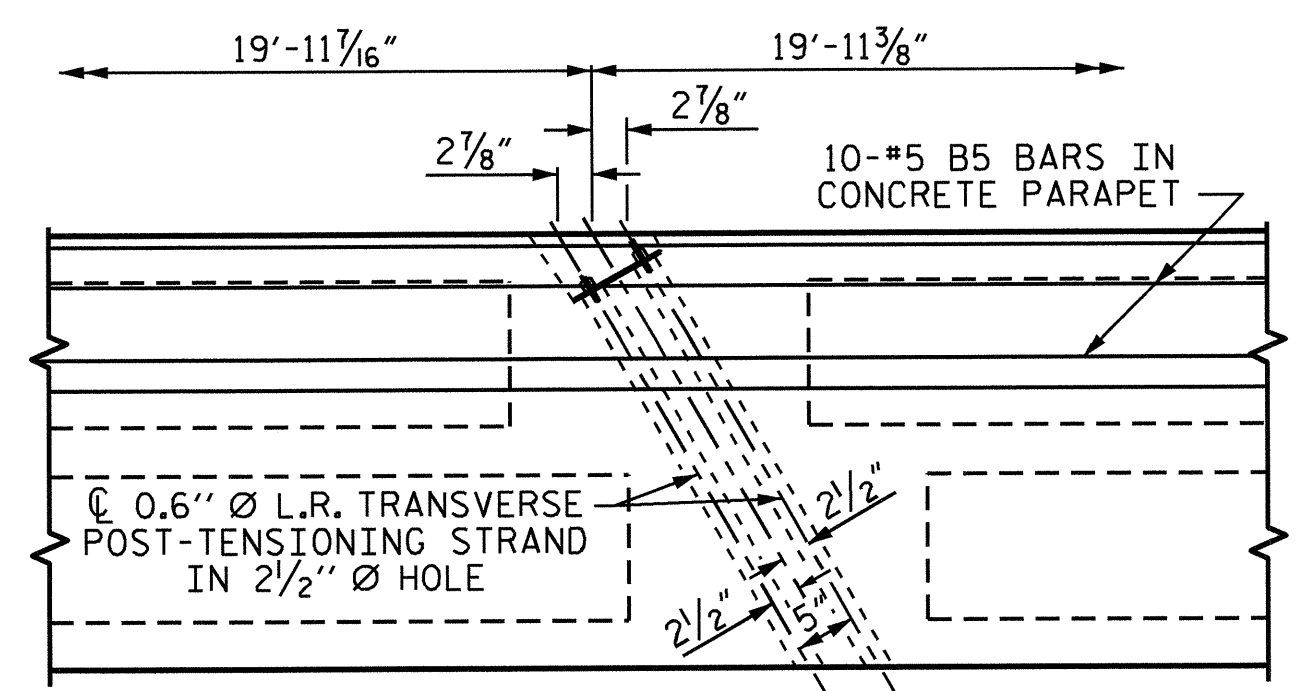
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			58



DRAWN BY : J. G. KHARVA DATE : 7/12
 CHECKED BY : R. L. CHESSON DATE : 8/12
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 09/10/13



DETAIL "A"
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5S12 BARS.

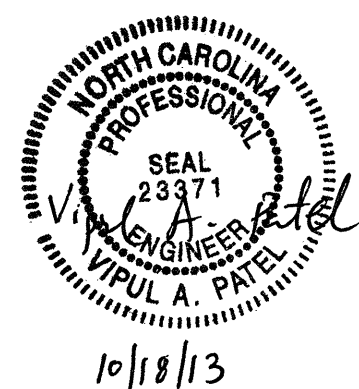


DETAIL "B"
 #4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" TRANSVERSE POST-TENSIONING STRAND HOLES

PLAN OF SPAN B

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50-L-

SHEET 3 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

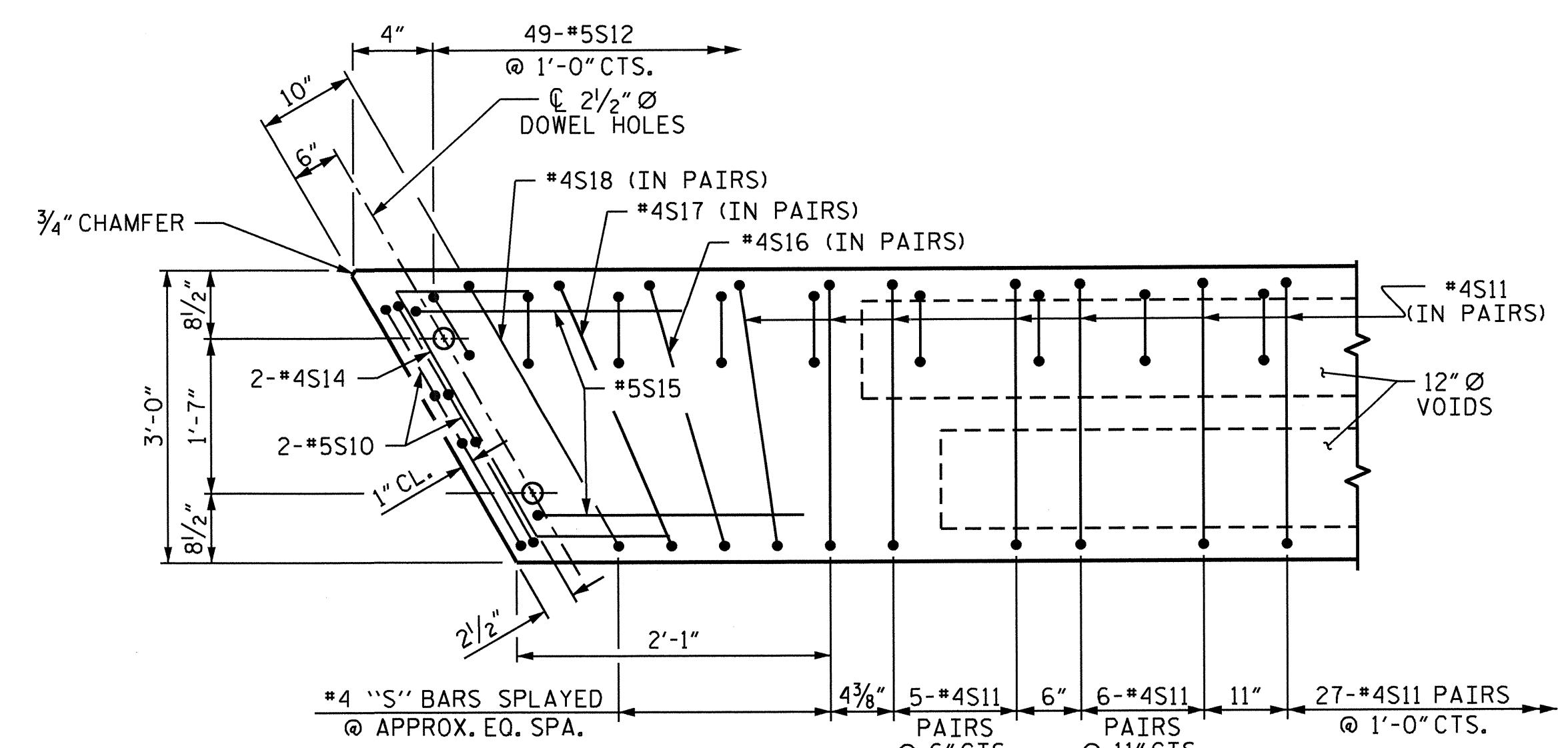
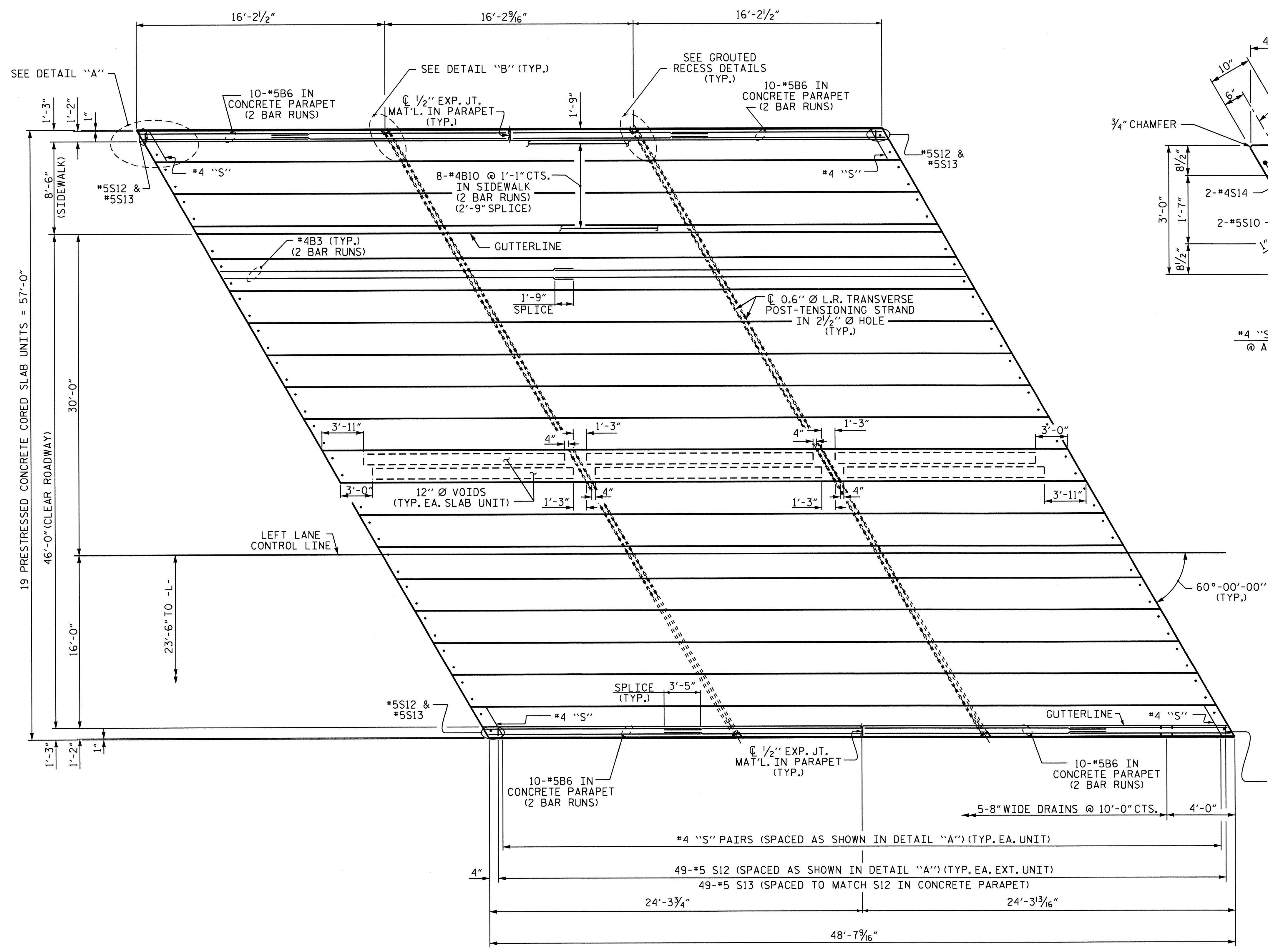
**PLAN OF SPAN B
 60° SKEW
 (LEFT LANE)**

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

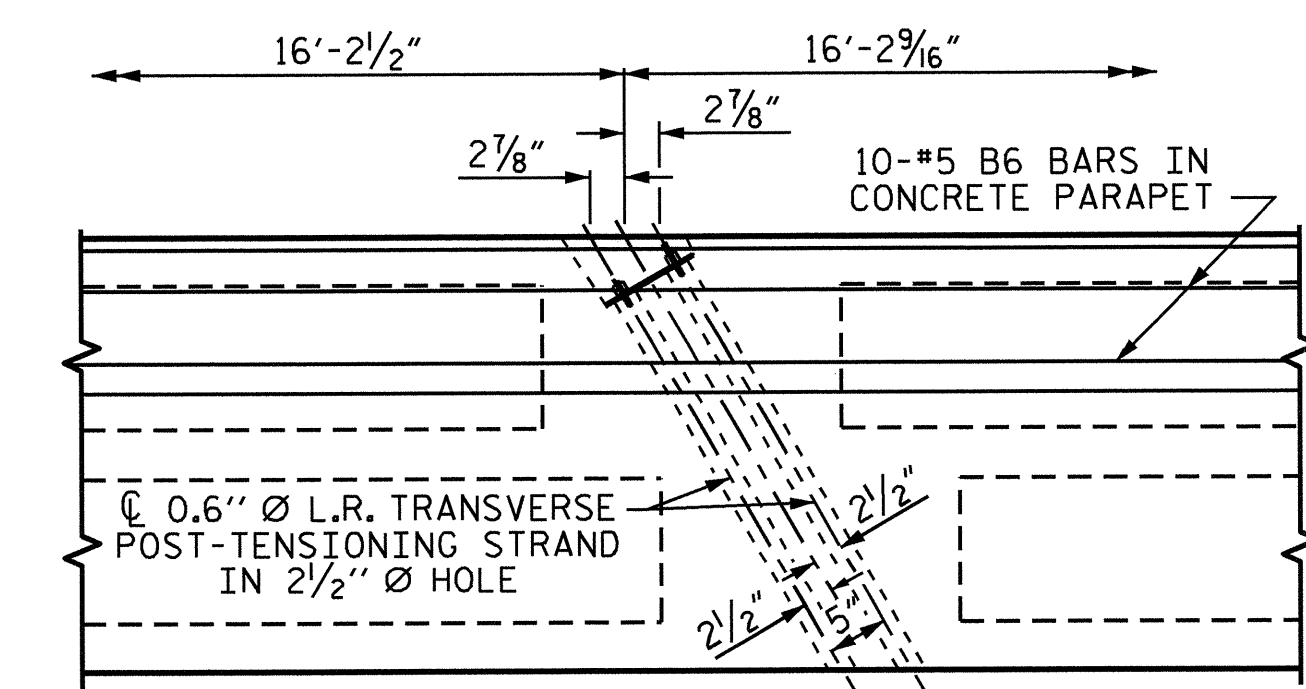
DRAWN BY : J. G. KHARVA DATE : 7/12
 CHECKED BY : R. L. CHESSON DATE : 8/12
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 09/10/13

17-SEP-2013 11:49
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STR. #1



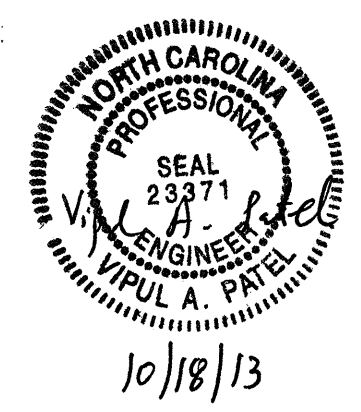
DETAIL "A"
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5S12 BARS.



DETAIL "B"
#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PLAN OF SPAN C

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50-L-
 SHEET 4 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF SPAN C
 60° SKEW
 (LEFT LANE)

DRAWN BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: R. L. CHESSON DATE: 8/12
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 09/10/13

REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

17-SEP-2013 11:49
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STR. #1

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN A)							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	#4	STR	22'-8"	61	22'-8"	61
S10	8	#5	2	5'-0"	42	5'-0"	42
S11	92	#4	2	5'-10"	358	5'-10"	358
*S12	44	#5	1	6'-6"	298	-	-
S14	4	#4	3	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				556		556
*EPOXY COATED REINFORCING STEEL	LBS.				298		-
5000 P.S.I. CONCRETE	CU. YDS.				7.7		7.7
0.6" Ø L.R. STRANDS	No.				16		16

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN B)							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B2	6	#4	STR	21'-2"	85	21'-2"	85
S10	8	#5	2	5'-0"	42	5'-0"	42
S11	118	#4	2	5'-10"	460	5'-10"	460
*S12	60	#5	1	6'-6"	407	-	-
S14	4	#4	3	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				682		682
*EPOXY COATED REINFORCING STEEL	LBS.				407		-
7000 P.S.I. CONCRETE	CU. YDS.				10.3		10.3
0.6" Ø L.R. STRANDS	No.				23		23

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN C)							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	25'-2"	67	25'-2"	67
S10	8	#5	2	5'-0"	42	5'-0"	42
S11	106	#4	2	5'-10"	413	5'-10"	413
*S12	49	#5	1	6'-6"	332	-	-
S14	4	#4	3	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				617		617
*EPOXY COATED REINFORCING STEEL	LBS.				332		-
5000 P.S.I. CONCRETE	CU. YDS.				8.5		8.5
0.6" Ø L.R. STRANDS	No.				16		16

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

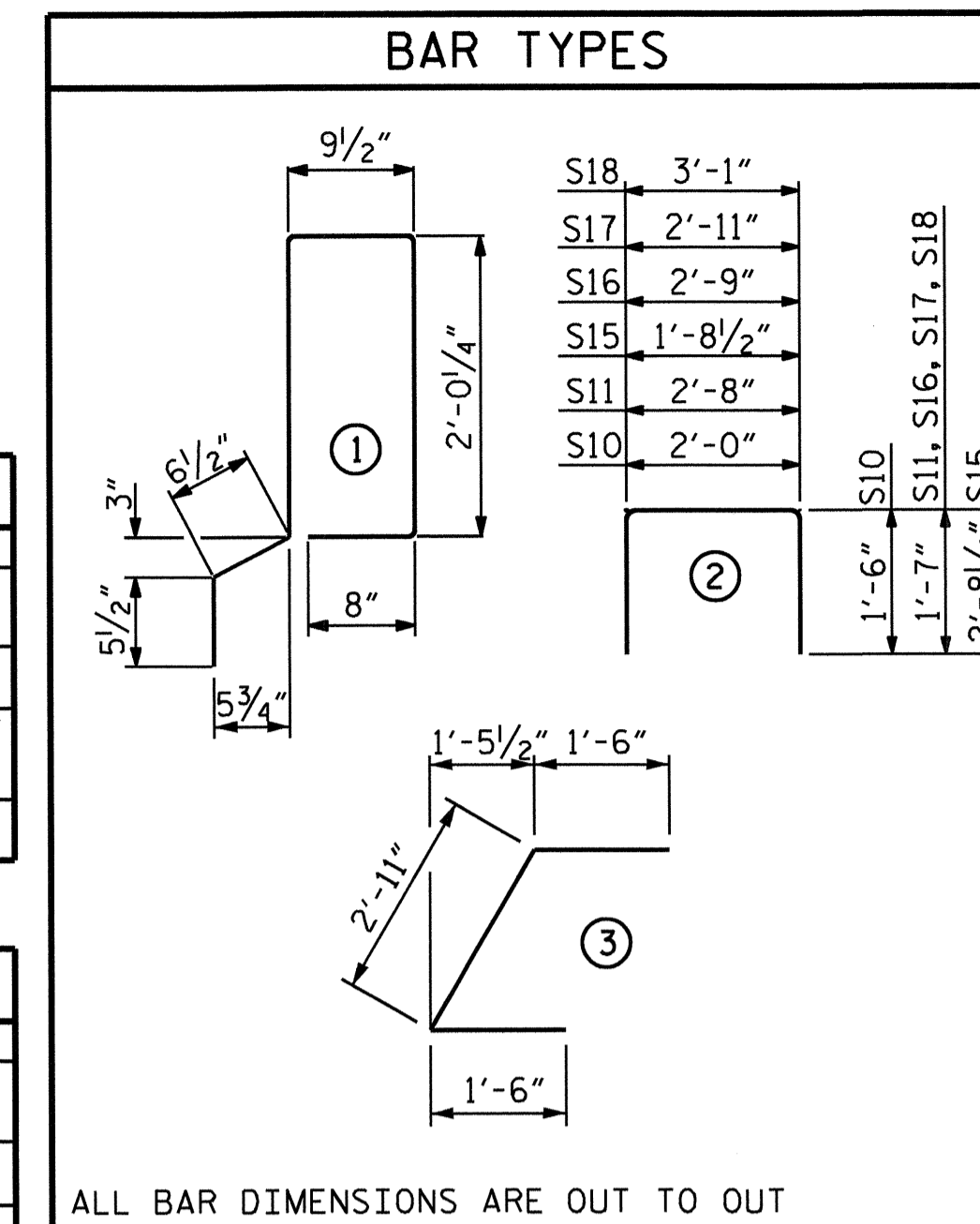
DEAD LOAD DEFLECTION AND CAMBER	
SPAN A	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO CONC. WEARING SURFACE	1 1/16" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	1/8" ↓
FINAL CAMBER **	1 5/16" ↑

DEAD LOAD DEFLECTION AND CAMBER	
SPAN B	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO CONC. WEARING SURFACE	2 3/4" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	5/16" ↓
FINAL CAMBER **	2 7/16" ↑

DEAD LOAD DEFLECTION AND CAMBER	
SPAN C	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO CONC. WEARING SURFACE	1 1/16" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	1/8" ↓
FINAL CAMBER **	1 7/16" ↑

** DOES NOT INCLUDE DEFLECTION DUE TO FUTURE WEARING SURFACE, CONCRETE PARAPET, & SIDEWALK

GROOVING BRIDGE FLOORS	
APPROACH SLABS	2422 SQ. FT.
BRIDGE DECK	7774 SQ. FT.
TOTAL	10196 SQ. FT.



CORED SLABS REQUIRED			
SPAN	NUMBER	LENGTH	TOTAL LENGTH
SPAN A			
EXTERIOR C.S.	2	43'-7 7/16"	87'-3 3/8"
INTERIOR C.S.	17	43'-7 7/16"	741'-8 9/16"
TOTAL	19		828.97

CORED SLABS REQUIRED			
SPAN	NUMBER	LENGTH	TOTAL LENGTH
SPAN B			
EXTERIOR C.S.	2	59'-10 1/4"	119'-8 1/2"
INTERIOR C.S.	17	59'-10 1/4"	1017'-6 1/4"
TOTAL	19		1137.23

CORED SLABS REQUIRED			
SPAN	NUMBER	LENGTH	TOTAL LENGTH
SPAN C			
EXTERIOR C.S.	2	48'-7 7/16"	97'-3 3/8"
INTERIOR C.S.	17	48'-7 7/16"	826'-8 9/16"
TOTAL	19		923.97

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 GROUDED 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.

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.

ALL REINFORCING STEEL IN CONCRETE PARAPET 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 CONCRETE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUDED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

THE BOTTOM TWO #5 "B" BARS IN THE PARAPET MAY BE FIELD CUT TO AVOID DRAINS.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
SPAN A, C	4000
SPAN B	5600

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50-L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-0"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (LEFT LANE)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			58

ASSEMBLED BY : J. G. KHARVA DATE : 1/12
 CHECKED BY : R. L. CHESSON DATE : 8/12
 DRAWN BY : MAA 6/10 REV. 12/11 MAA/AAC
 CHECKED BY : MKT 8/10

FIXED END
 (TYPE I - 76 REQ'D)
 EXPANSION END
 (TYPE II - 38 REQ'D)
ELASTOMERIC BEARING DETAILS
 ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

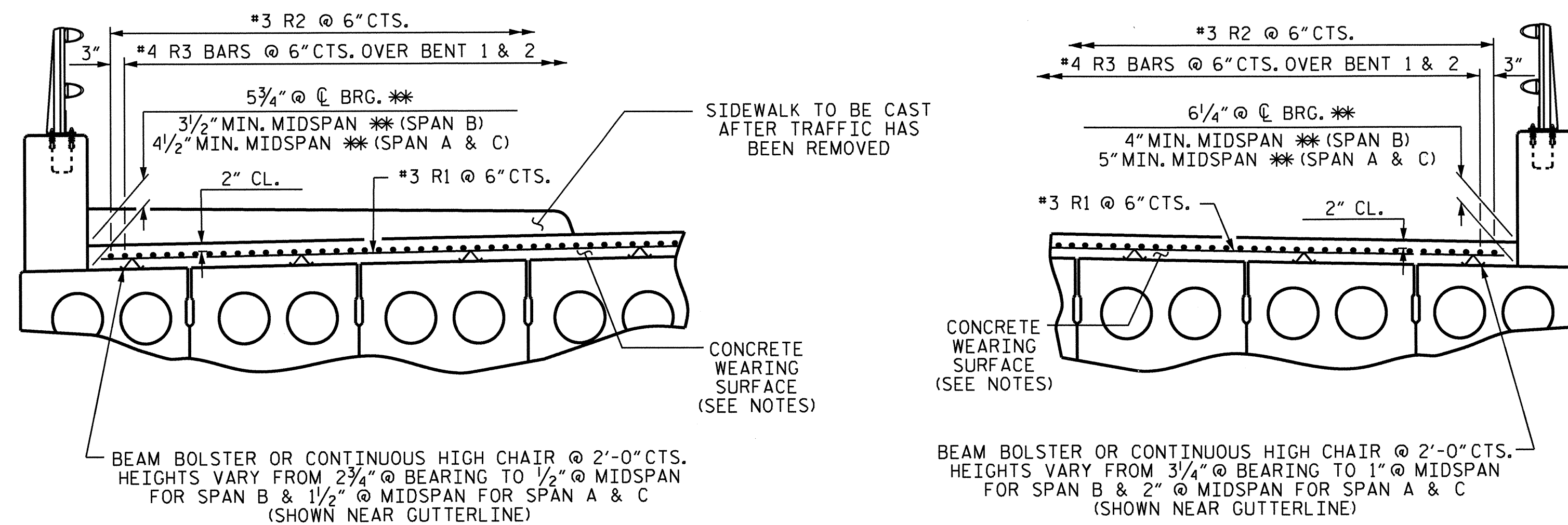
BILL OF MATERIAL FOR
CONCRETE WEARING SURFACE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	912	#3	STR	21'-9"	7458
*R2	654	#3	STR	26'-5"	6496
*R3	216	#4	STR	20'-0"	2886
* EPOXY COATED REINFORCING STEEL				LBS.	16,840
CONCRETE WEARING SURFACE				SO. FT.	8248

SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#3	1'-3"
#4	1'-8"

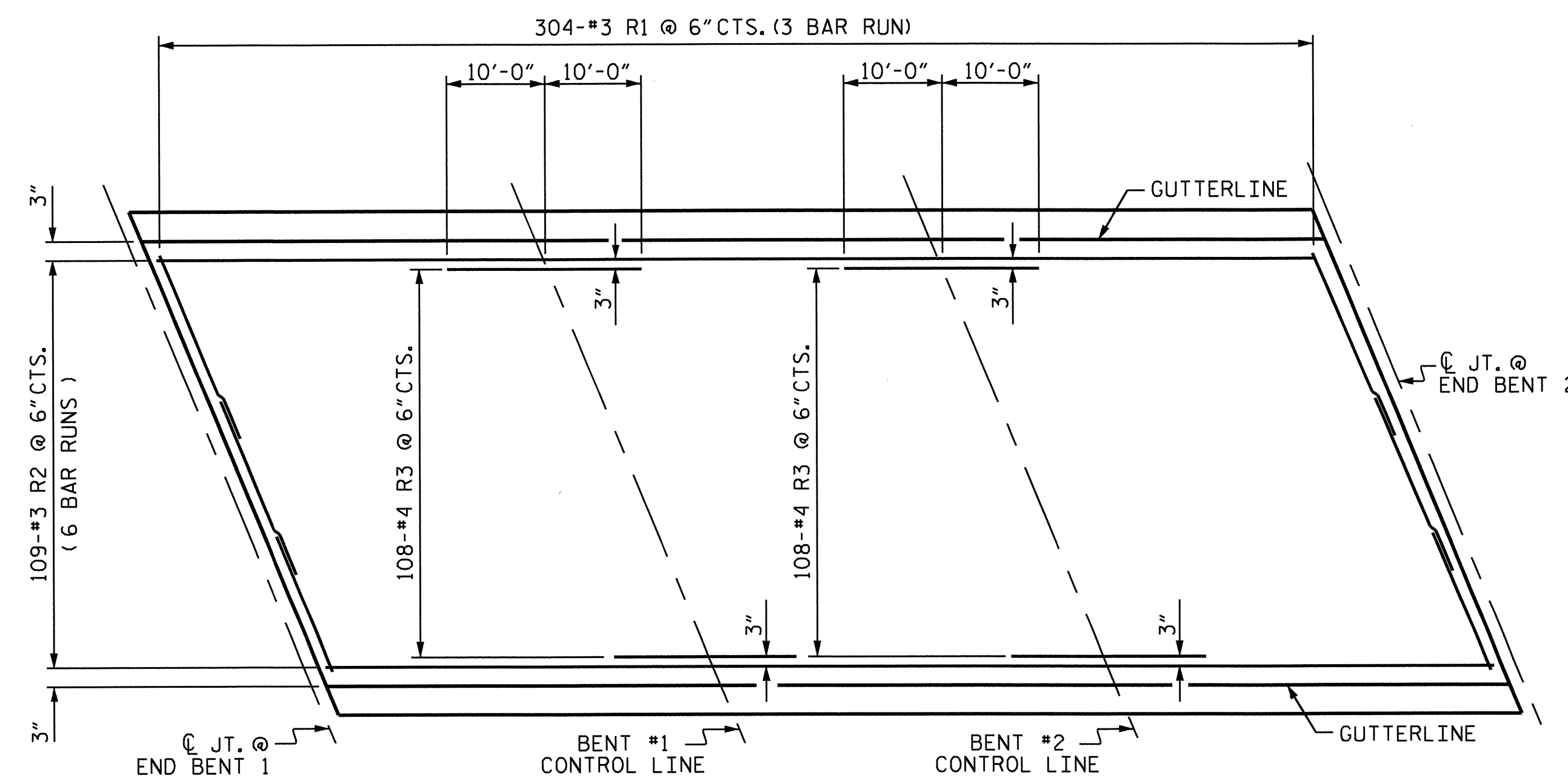
NOTES

SIDEWALK SHALL BE CONSTRUCTED ON TOP OF CONCRETE OVERLAY AFTER TRAFFIC HAS BEEN SHIFTED.
FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.



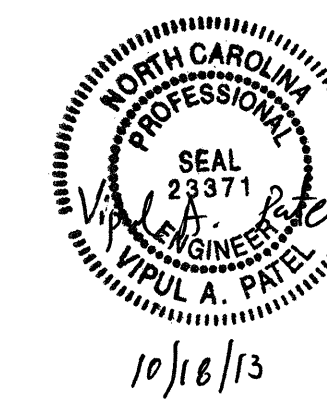
REINFORCING FOR CONCRETE WEARING SURFACE

** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+20.50 -L-

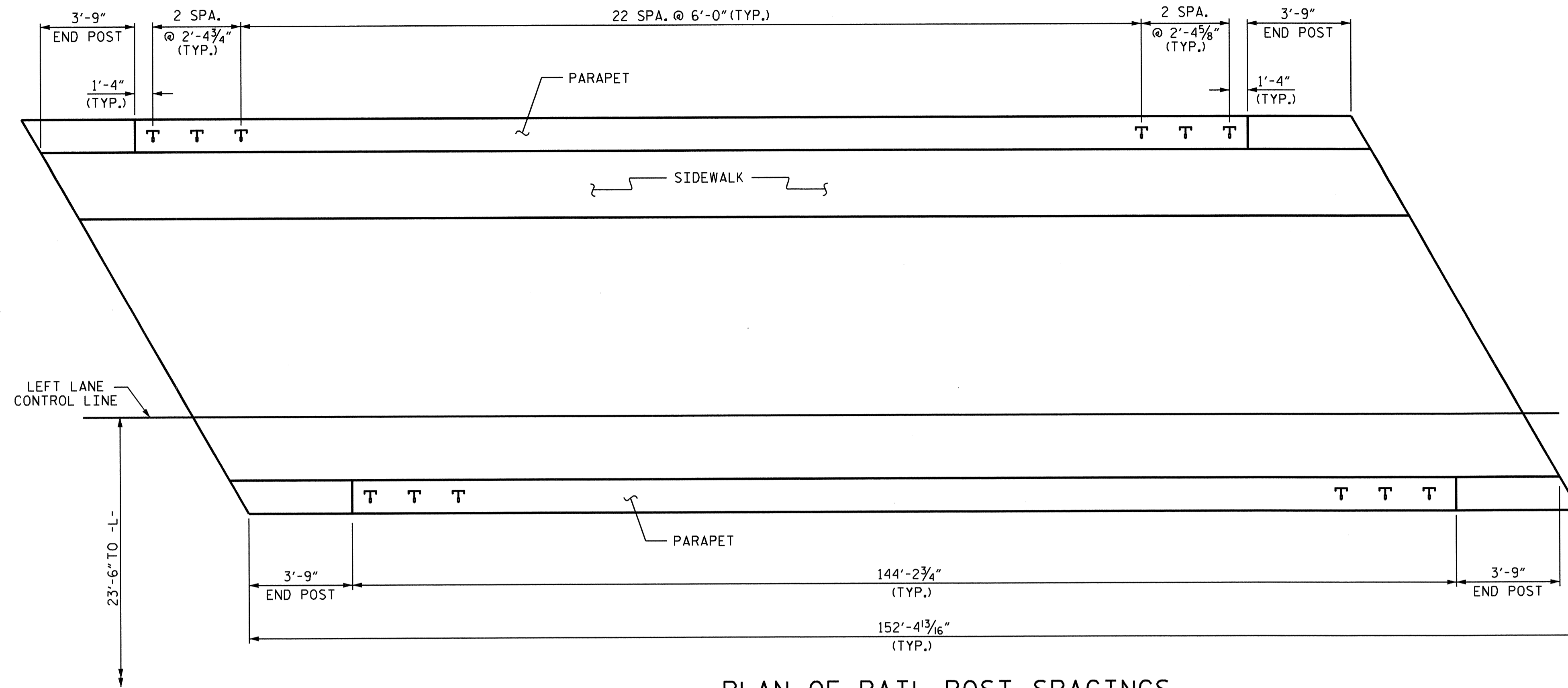


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

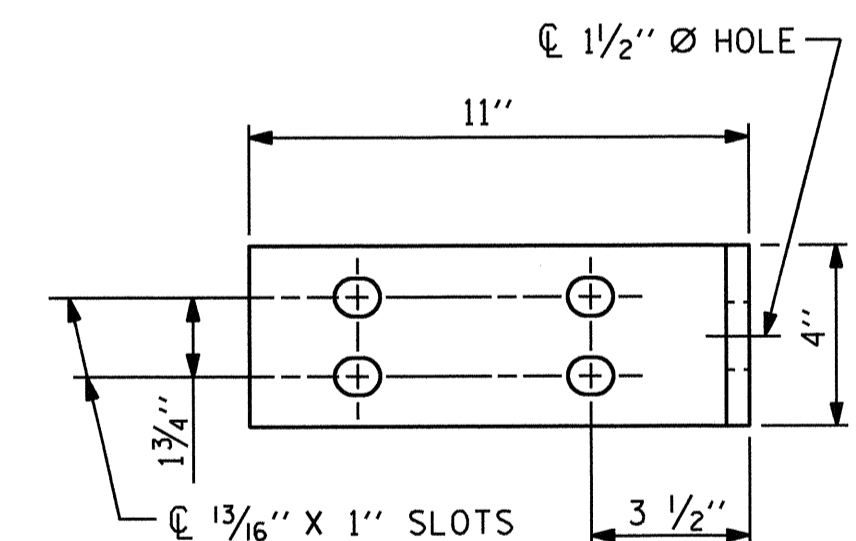
CONCRETE WEARING SURFACE
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			58

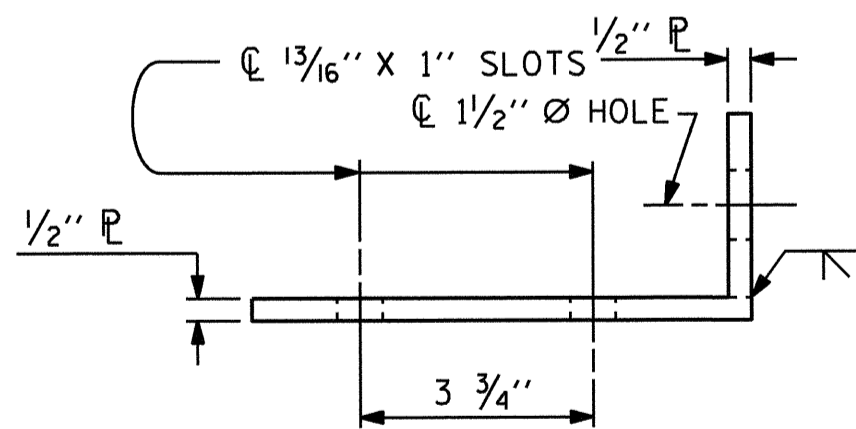
DESIGN ENGINEER OF RECORD :	
D. R. SMITH	DATE : 09/10/13
ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : R. L. CHESSON	DATE : 9/12
DRAWN BY : TLA 5/05	ADDED 7/11/05R
CHECKED BY : GM 6/05	REV. 5/1/06RR TLA/GM
	REV. 10/1/11 MAA/GM



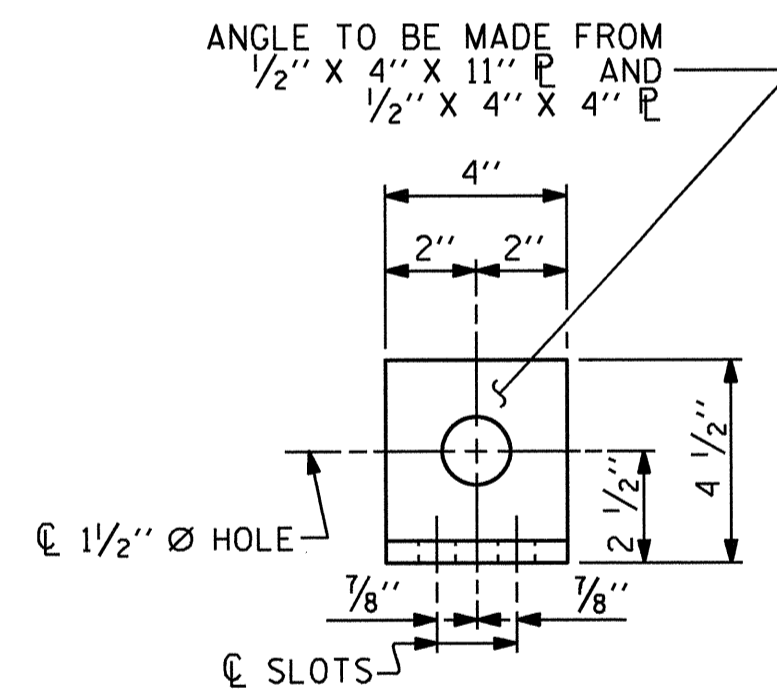
PLAN OF RAIL POST SPACINGS



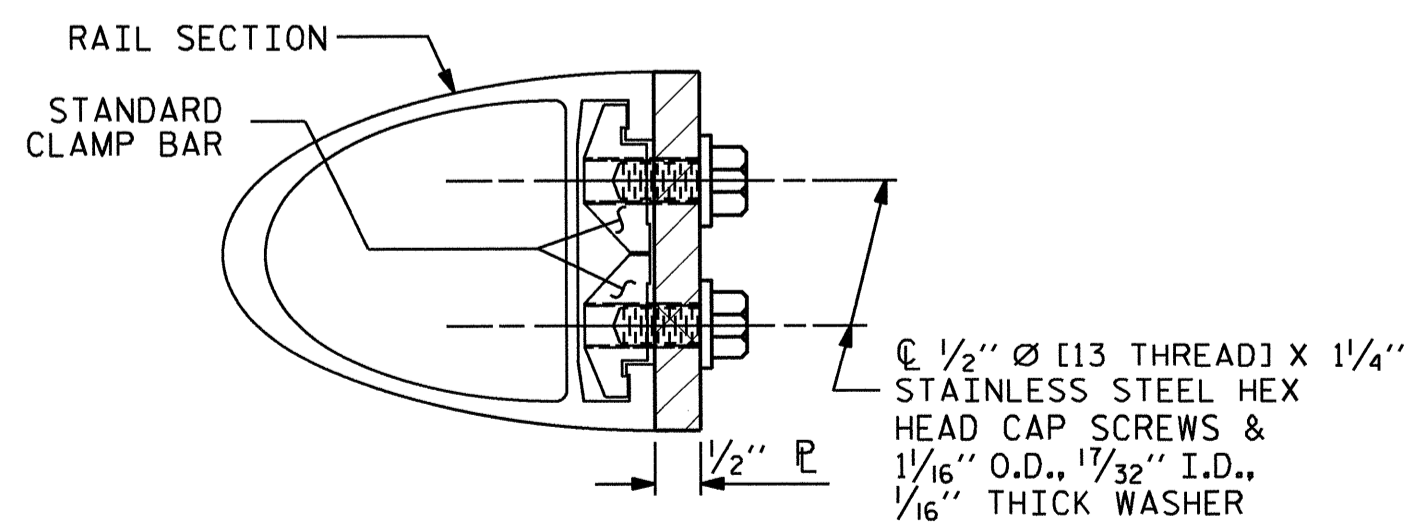
ELEVATION



TOP VIEW



END VIEW (FIX)



SECTION H-H (FIX)

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

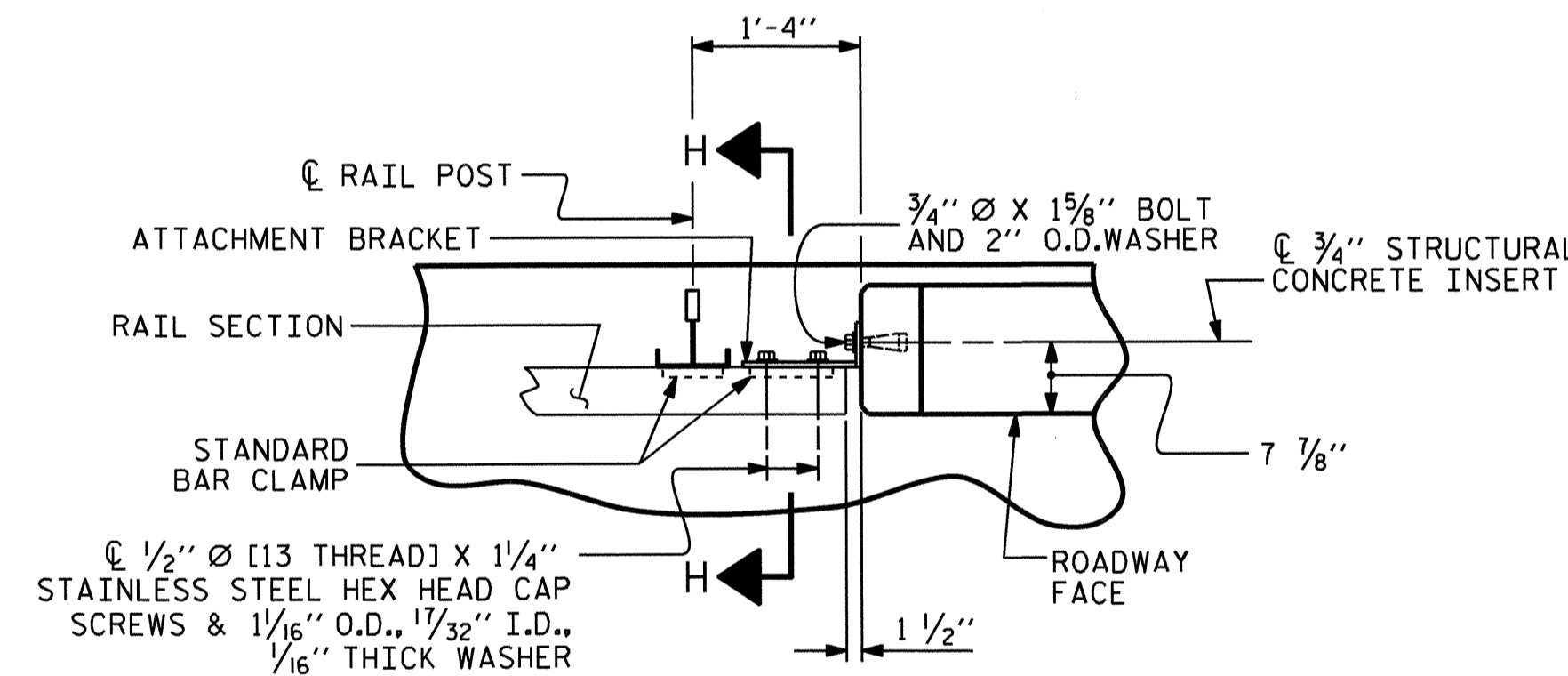
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALL0Y 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

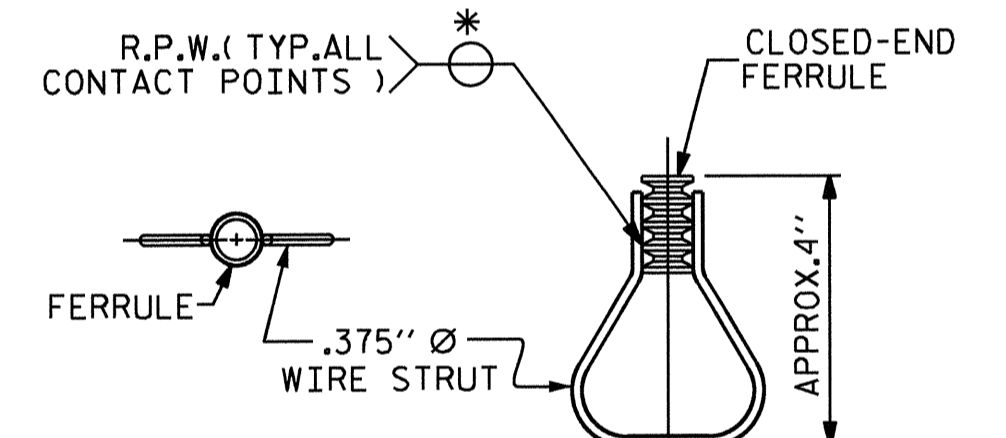
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

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



PLAN - RAIL AND END POST



PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

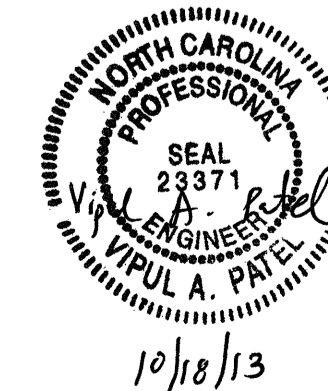
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 TWO BAR METAL RAILS
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			58



ASSEMBLED BY : J. G. KHARVA DATE : 08/02/12
 CHECKED BY : R. L. CHESSON DATE : 08/30/12
 DRAWN BY : FCJ 1/88 REV. 5/7/03 RWW/JTE
 CHECKED BY : CRK 3/89 REV. 5/1/06 TLA/GM
 REV. 10/1/11 MAA/GM

NOTES

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

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

ALUMINUM RAILS

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

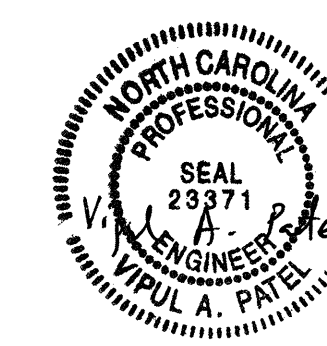
PAY LENGTH = 288.46 LIN. FT.

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 2 BAR METAL RAIL
 (LEFT LANE)

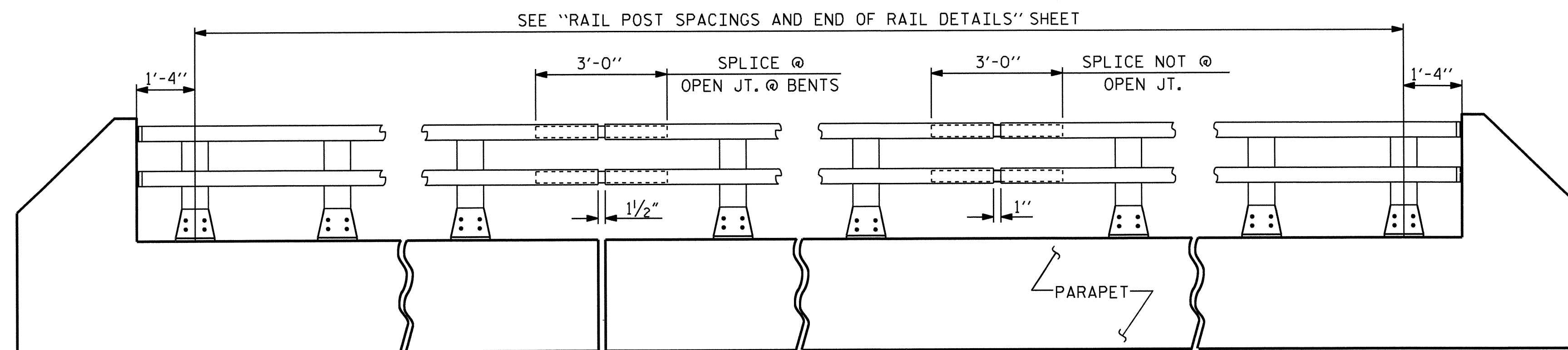


10/18/13

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	
2			4			58	

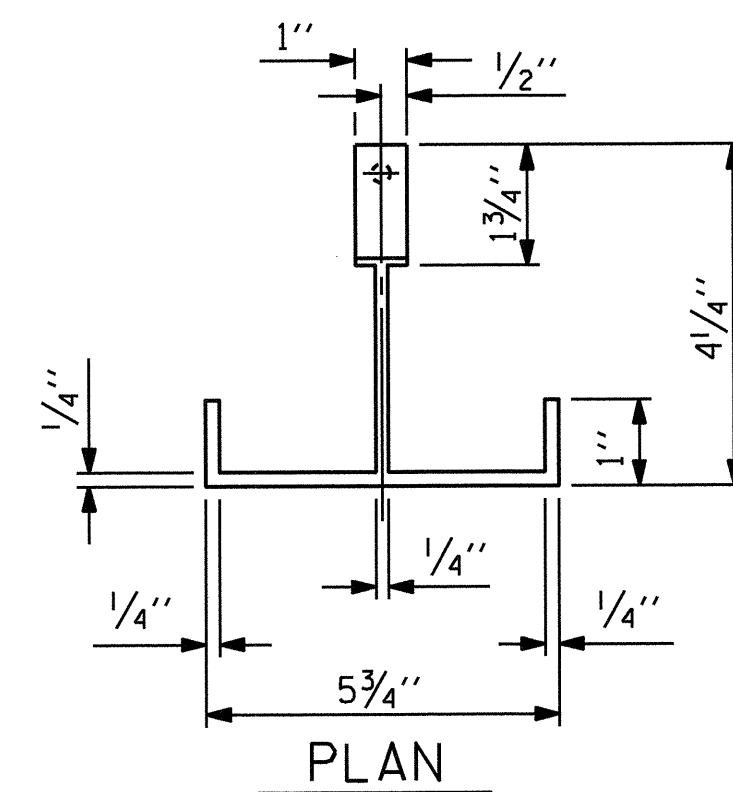
STR. #1

STD. NO. BMR3

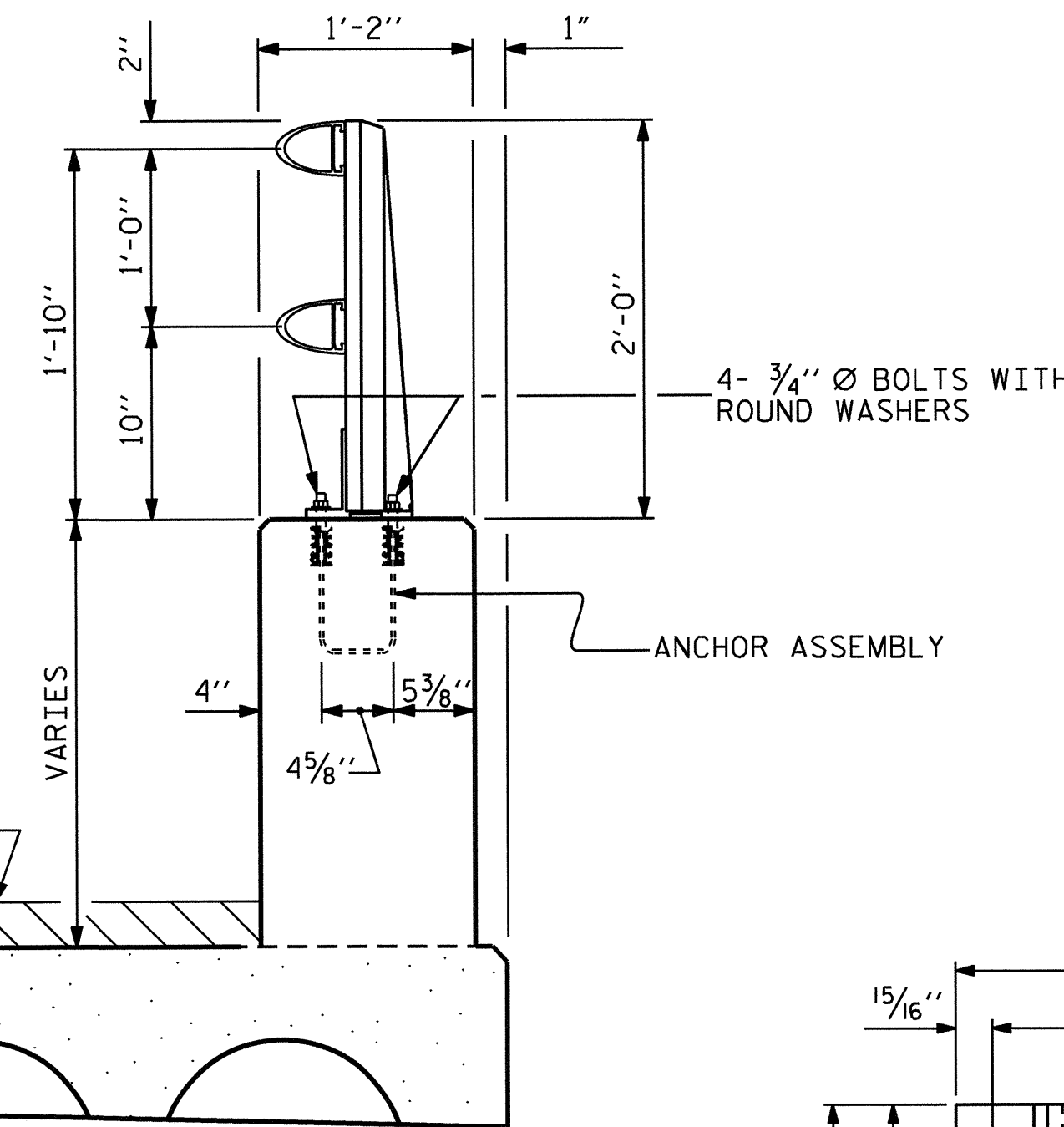


ELEVATION

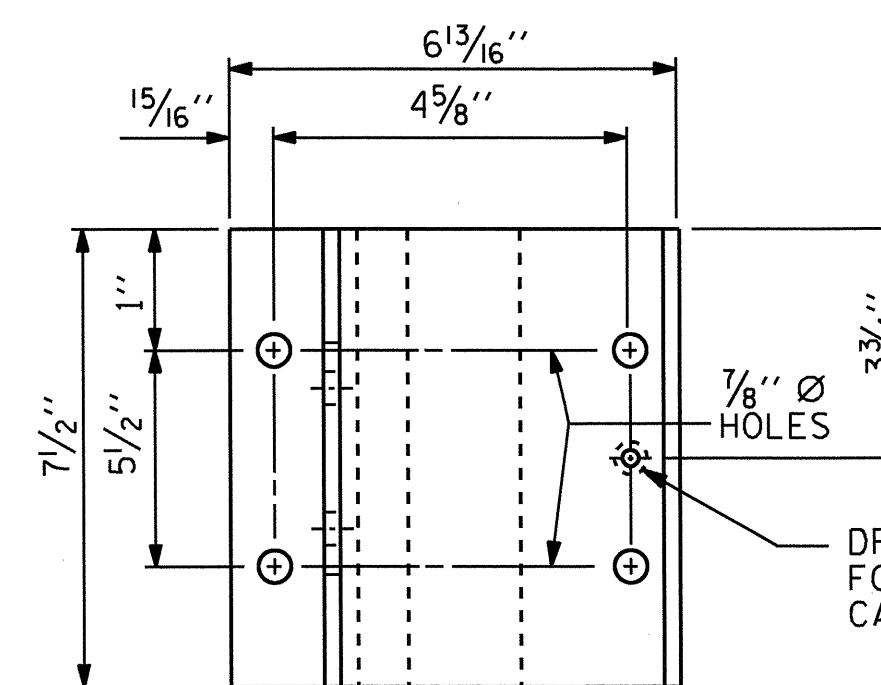
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



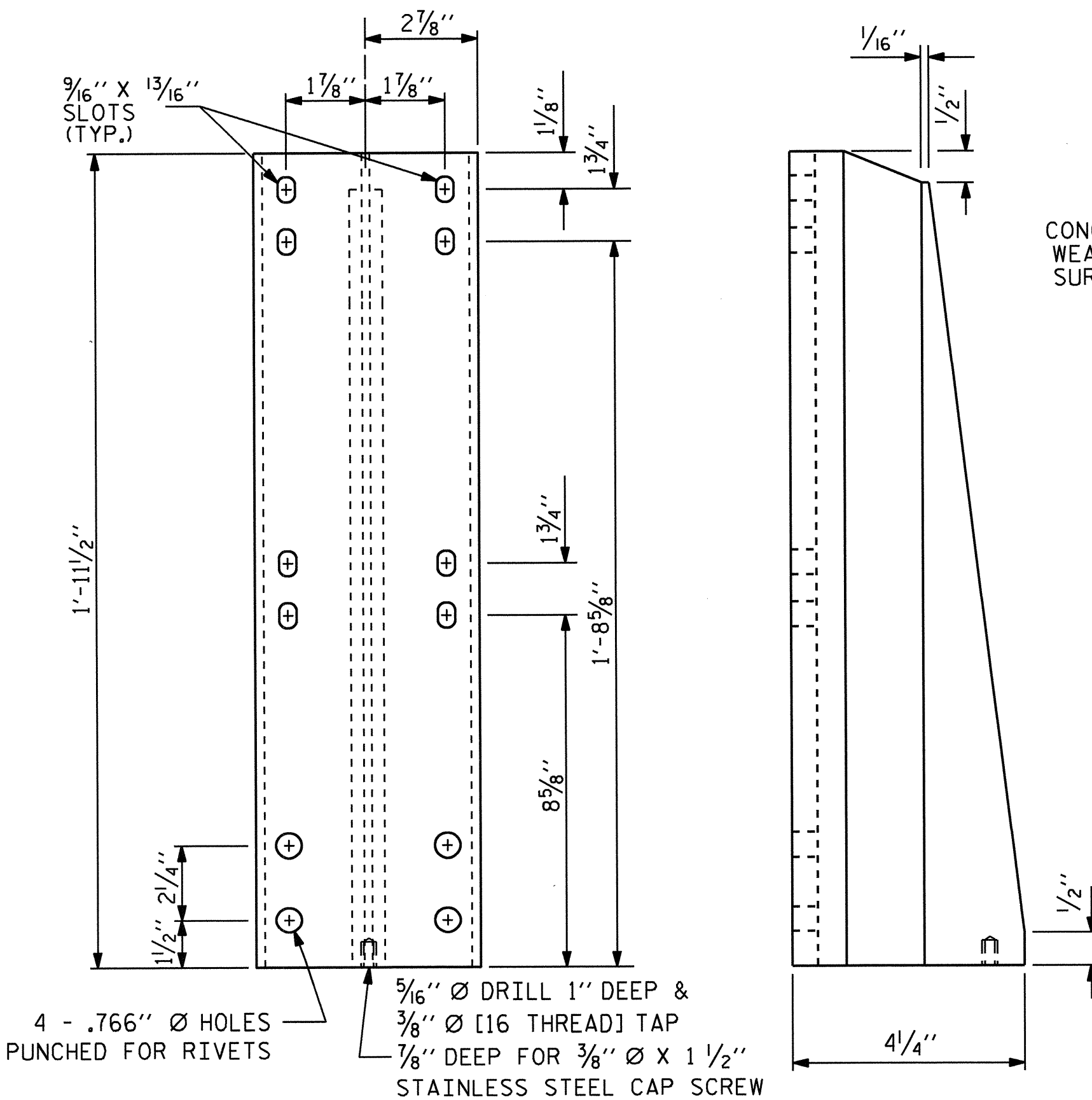
PLAN



SECTION THRU PARAPET AND RAIL



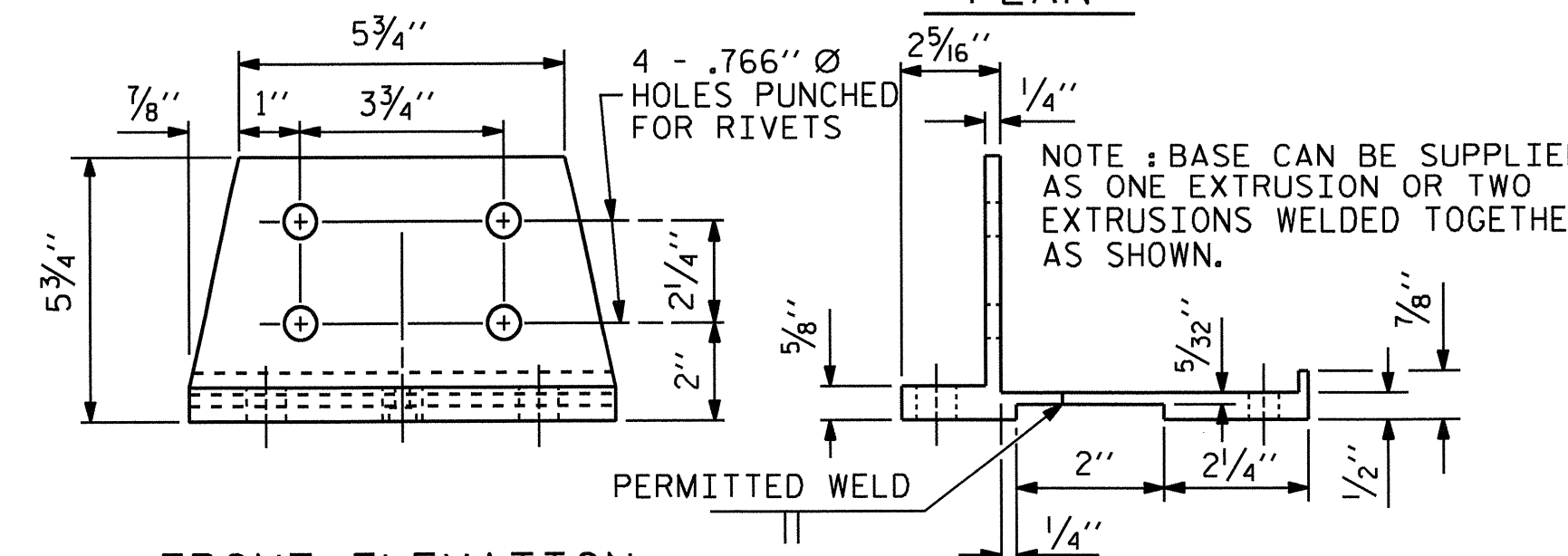
PLAN



FRONT ELEVATION

SIDE ELEVATION

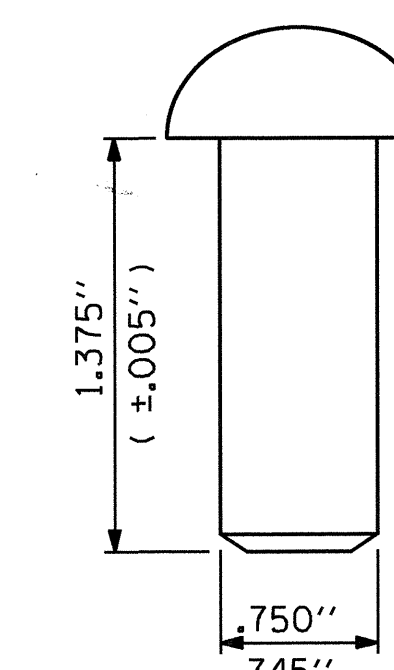
DETAILS OF POST



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

ASSEMBLED BY : J. G. KHARVA	DATE : 07/24/12
CHECKED BY : R. L. CHESSON	DATE : 08/12
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

04-SEP-2013 12:37
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 thcarroll

NOTES

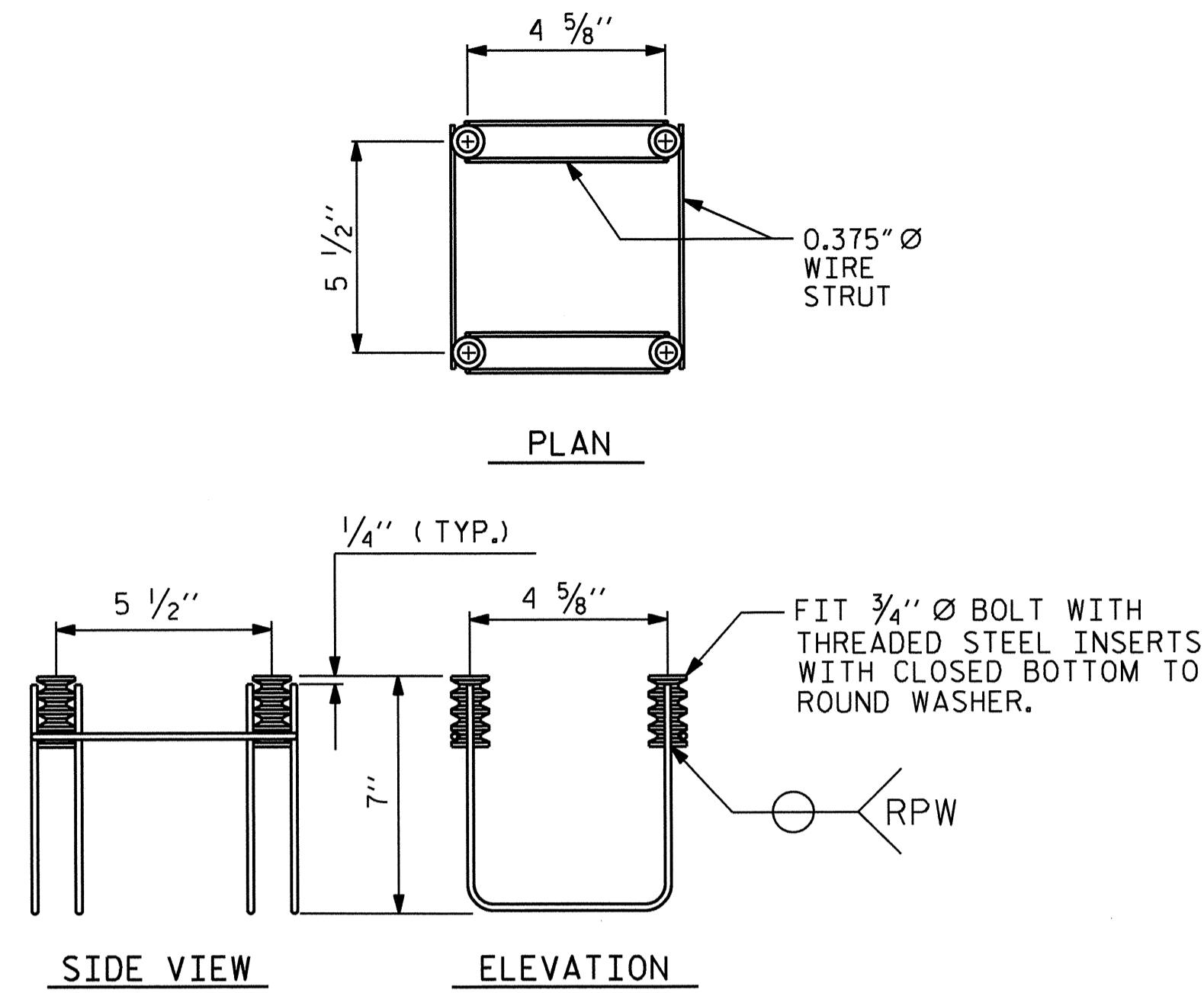
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/6" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

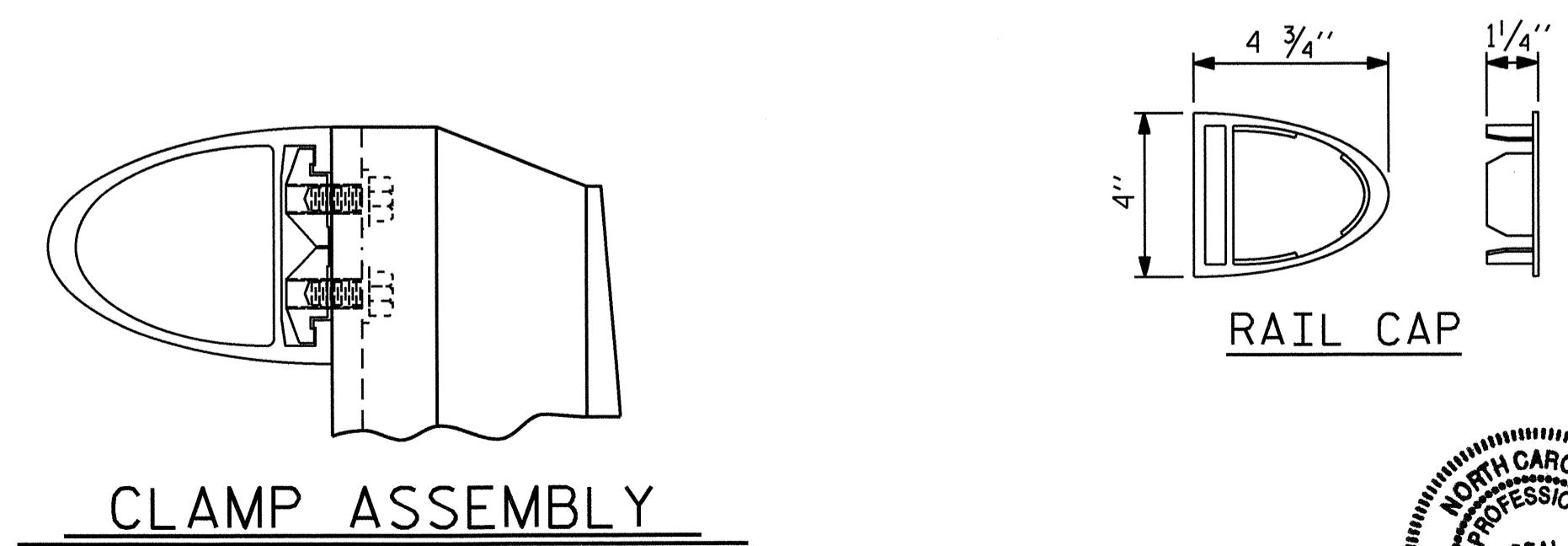
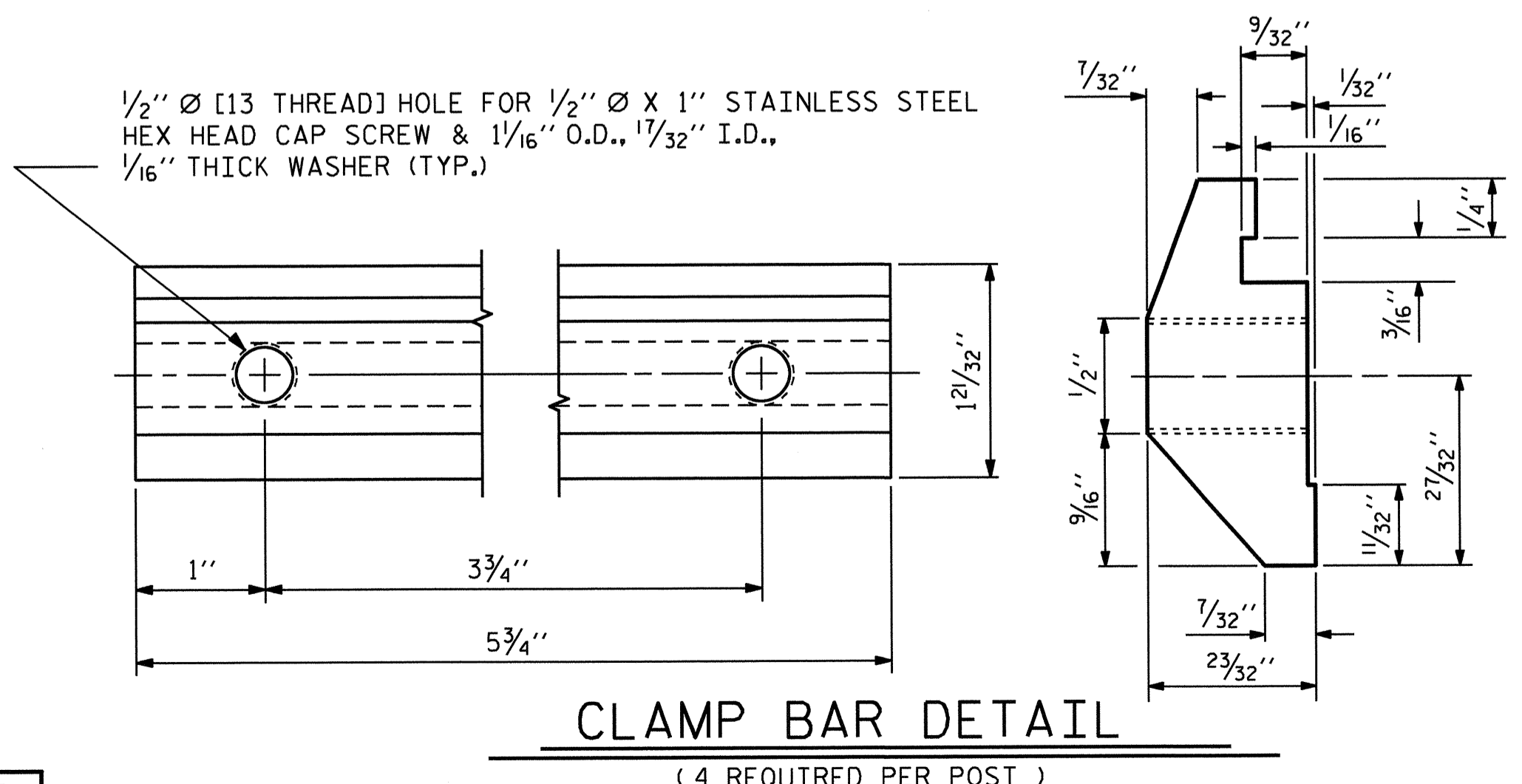
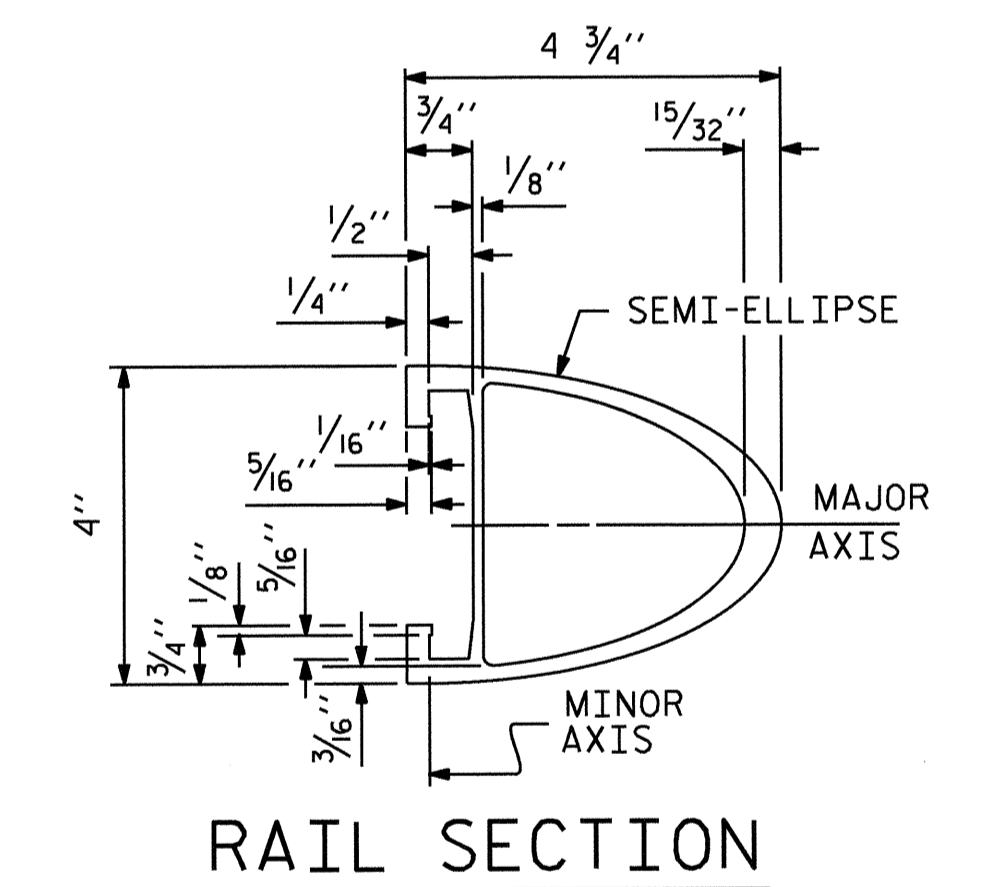
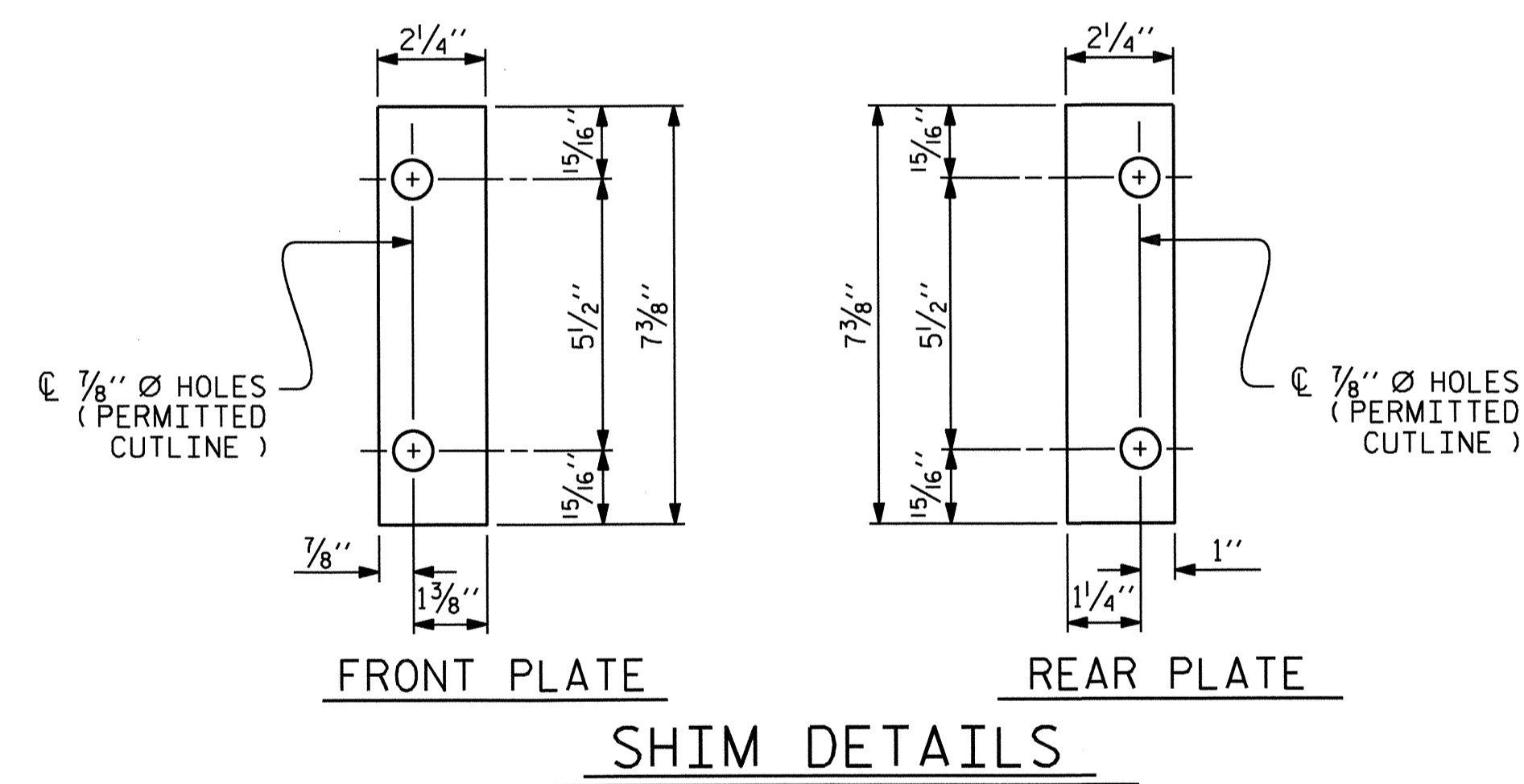
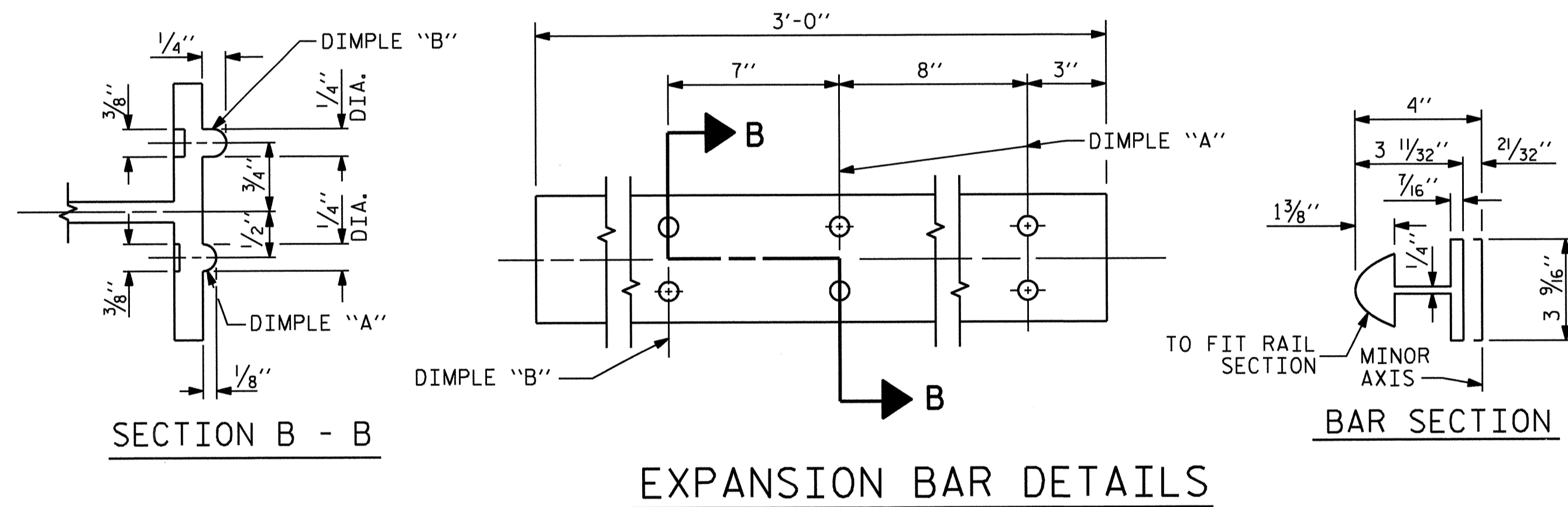
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(54 ASSEMBLIES REQUIRED)



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

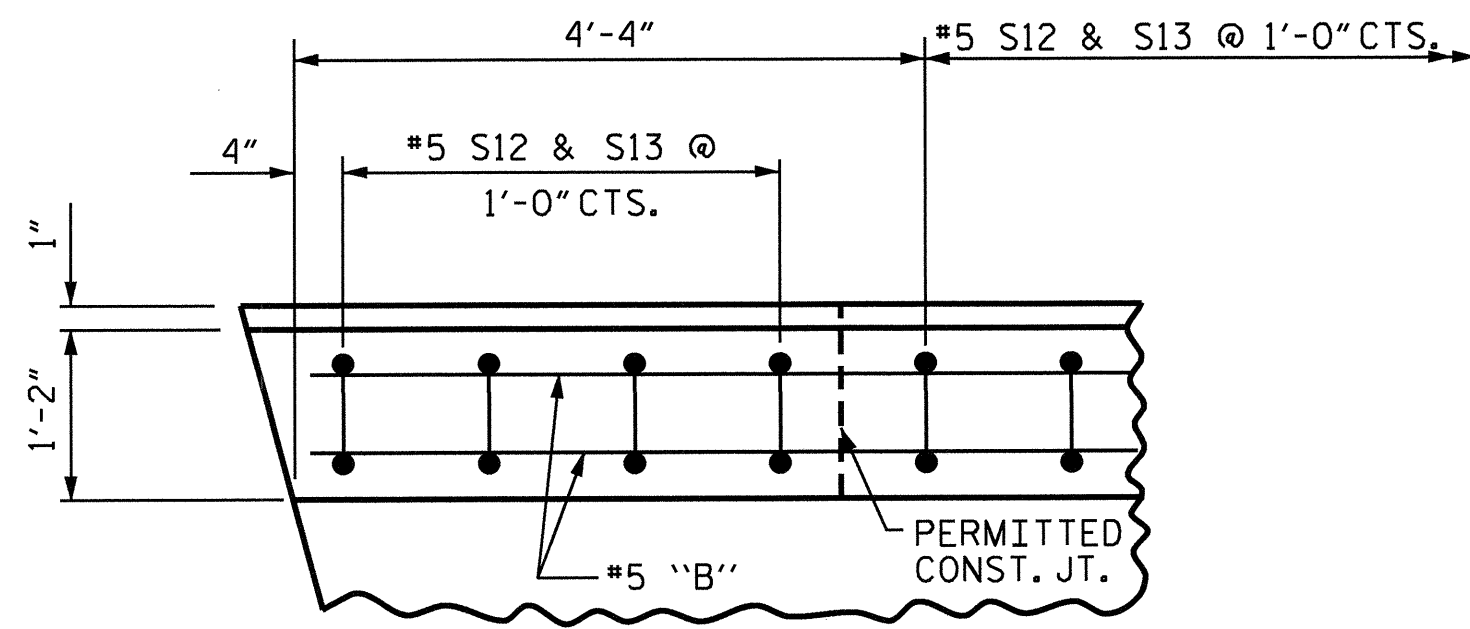
SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL
 (LEFT LANE)

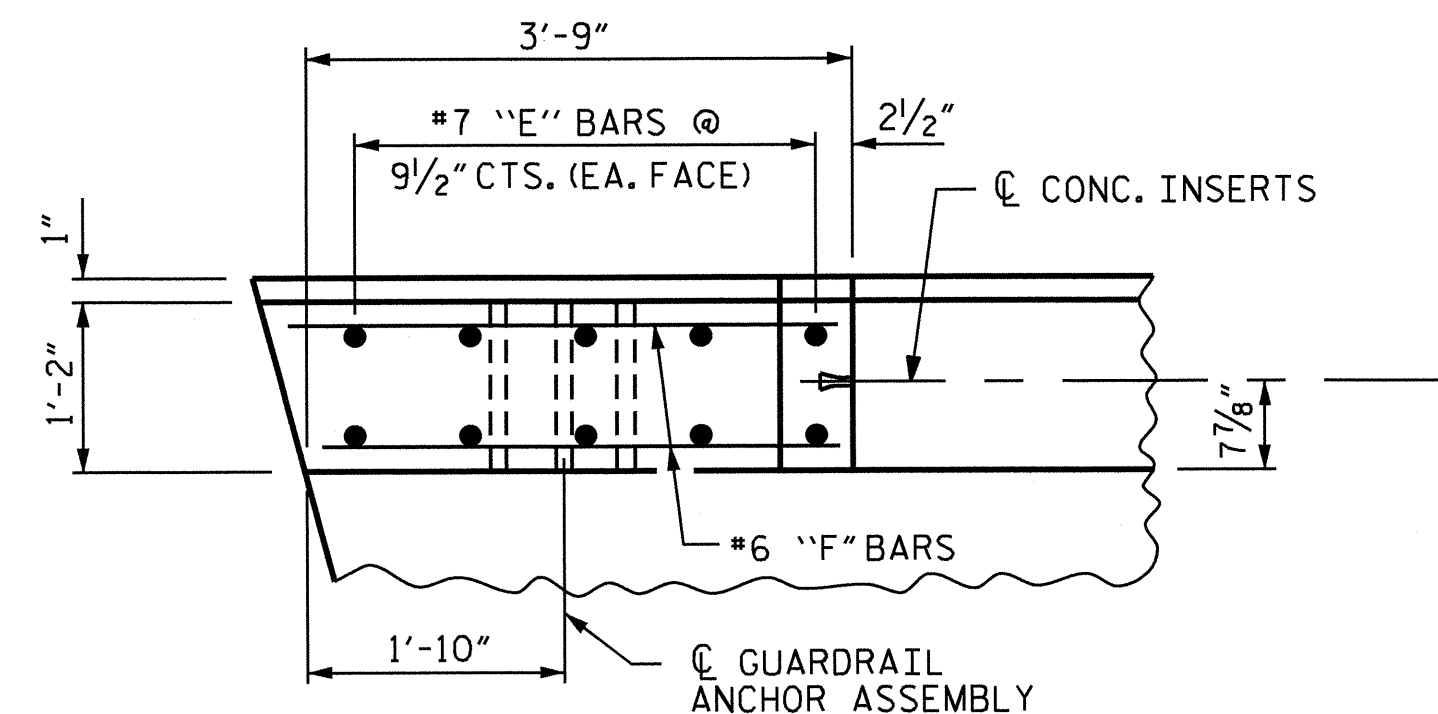


ASSEMBLED BY : J. G. KHARVA	DATE : 07/24/12
CHECKED BY : R. L. CHESSON	DATE : 08/12
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

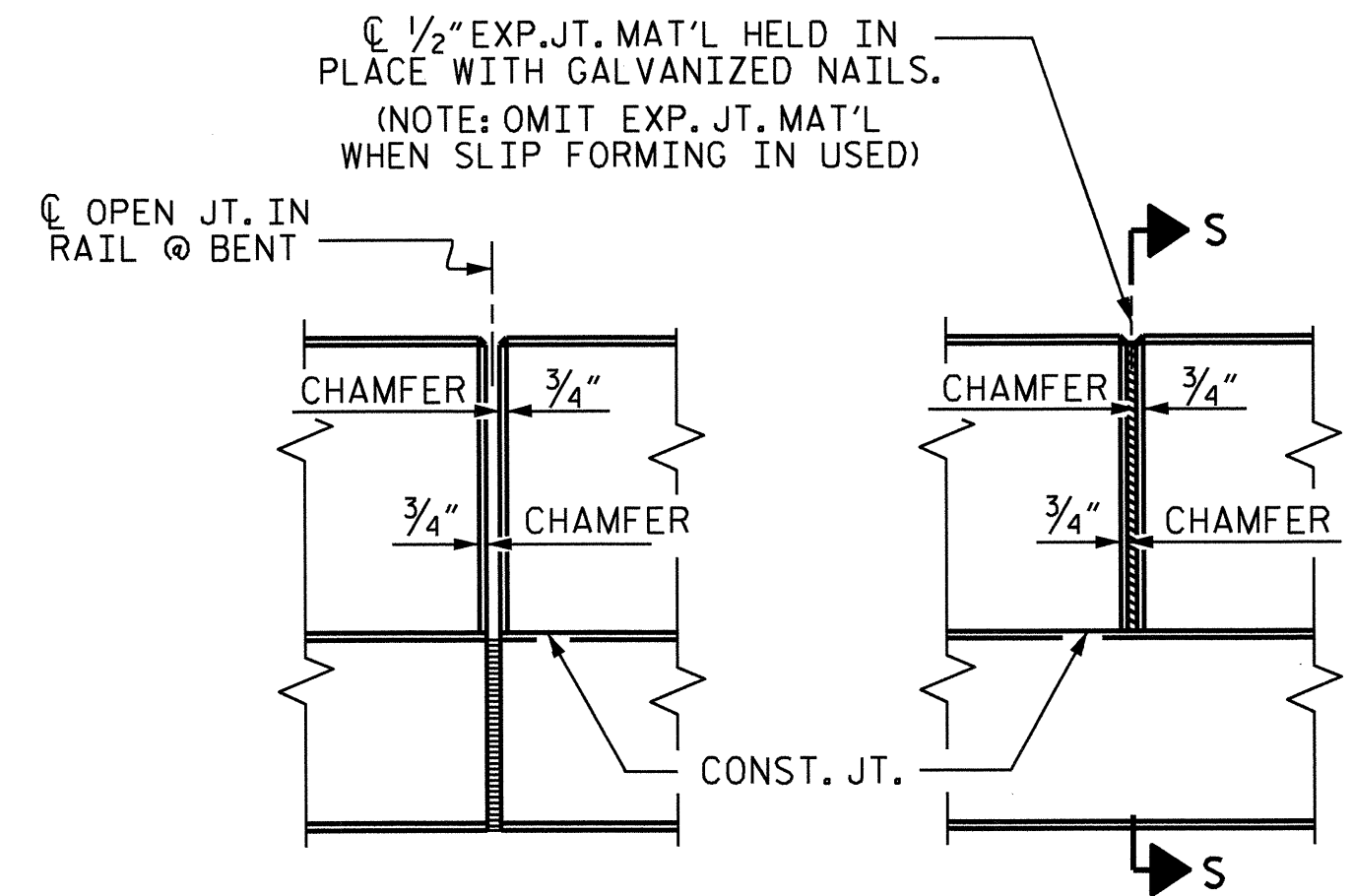
REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			



PLAN OF PARAPET

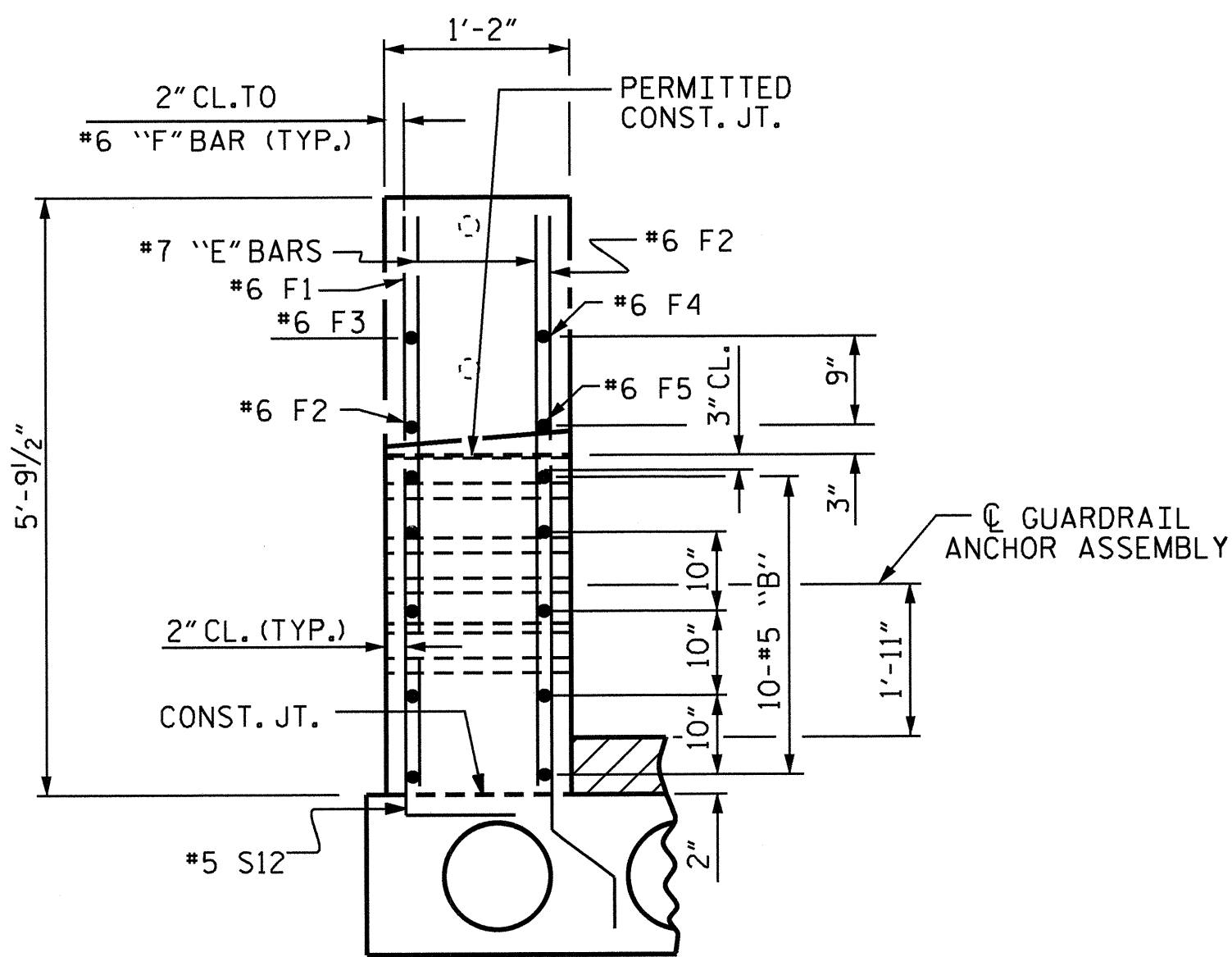


PLAN OF END POST

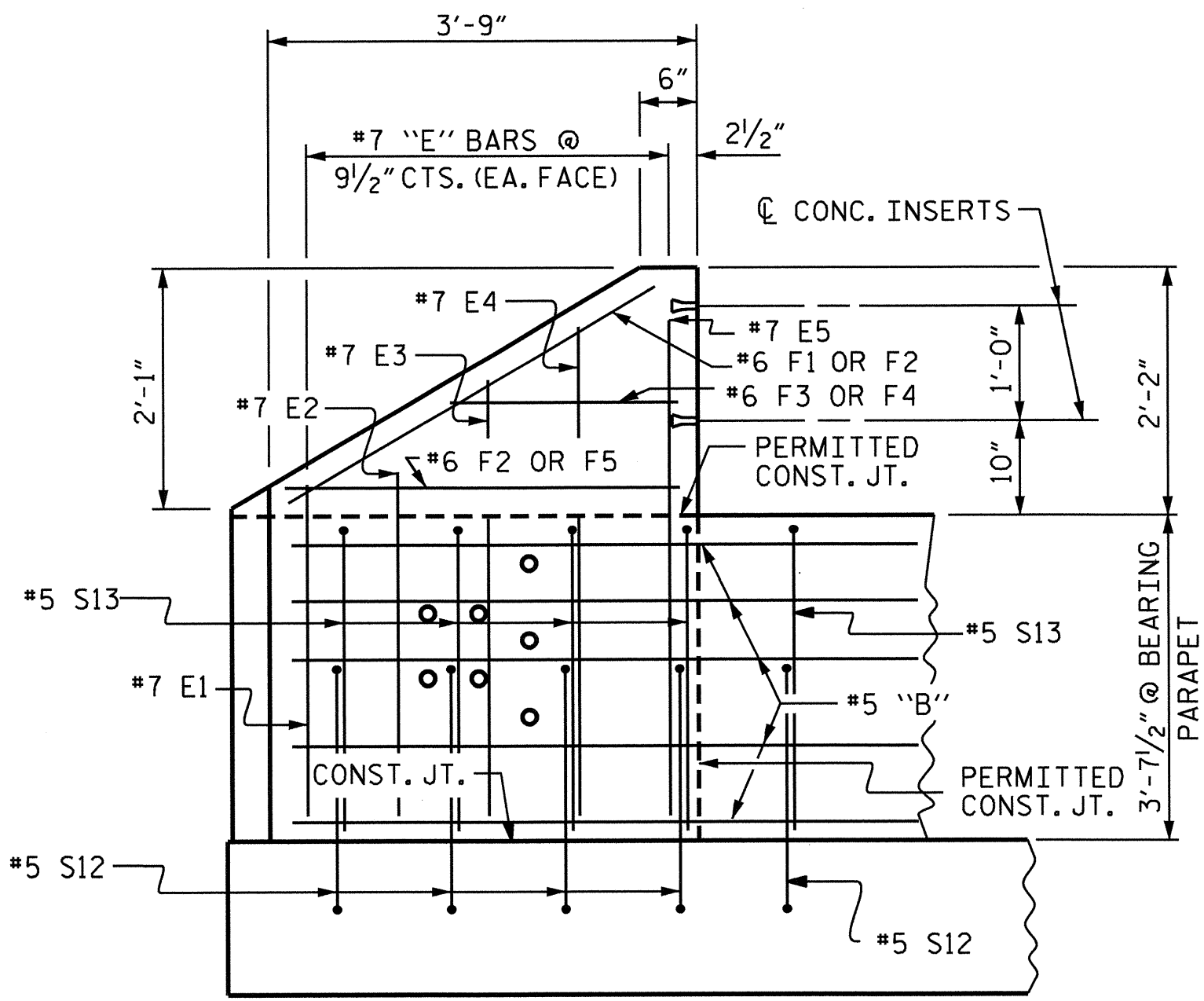


ELEVATION AT EXPANSION JOINTS

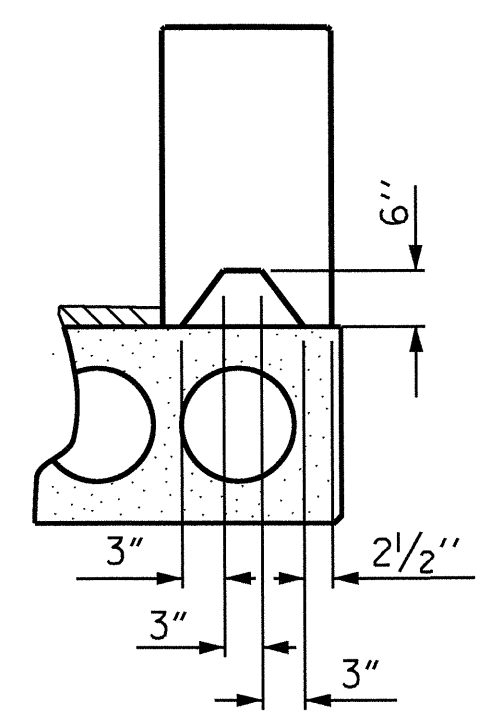
BAR TYPE		BILL OF MATERIAL PARAPET AND END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*B4	80	#5	STR	12'-8"	1057		
*B5	80	#5	STR	16'-9"	1398		
*B6	80	#5	STR	14'-0"	1168		
*E1	8	#7	STR	3'-10"	63		
*E2	8	#7	STR	4'-4"	71		
*E3	8	#7	STR	4'-10"	79		
*E4	8	#7	STR	5'-4"	87		
*E5	8	#7	STR	5'-8"	93		
*F1	4	#6	STR	4'-2"	25		
*F2	8	#6	STR	3'-8"	44		
*F3	4	#6	STR	2'-6"	15		
*F4	4	#6	STR	2'-0"	12		
*F5	4	#6	STR	3'-2"	19		
*S13	306	#5	1	5'-9"	1835		
* EPOXY COATED REINFORCING STEEL					LBS.	5966	
CLASS AA CONCRETE							
PARAPET & END POSTS					CU. YDS.	52.0	
1'-2" X 3'-7 1/2" CONCRETE PARAPET					LIN. FT.	304.80	



END VIEW

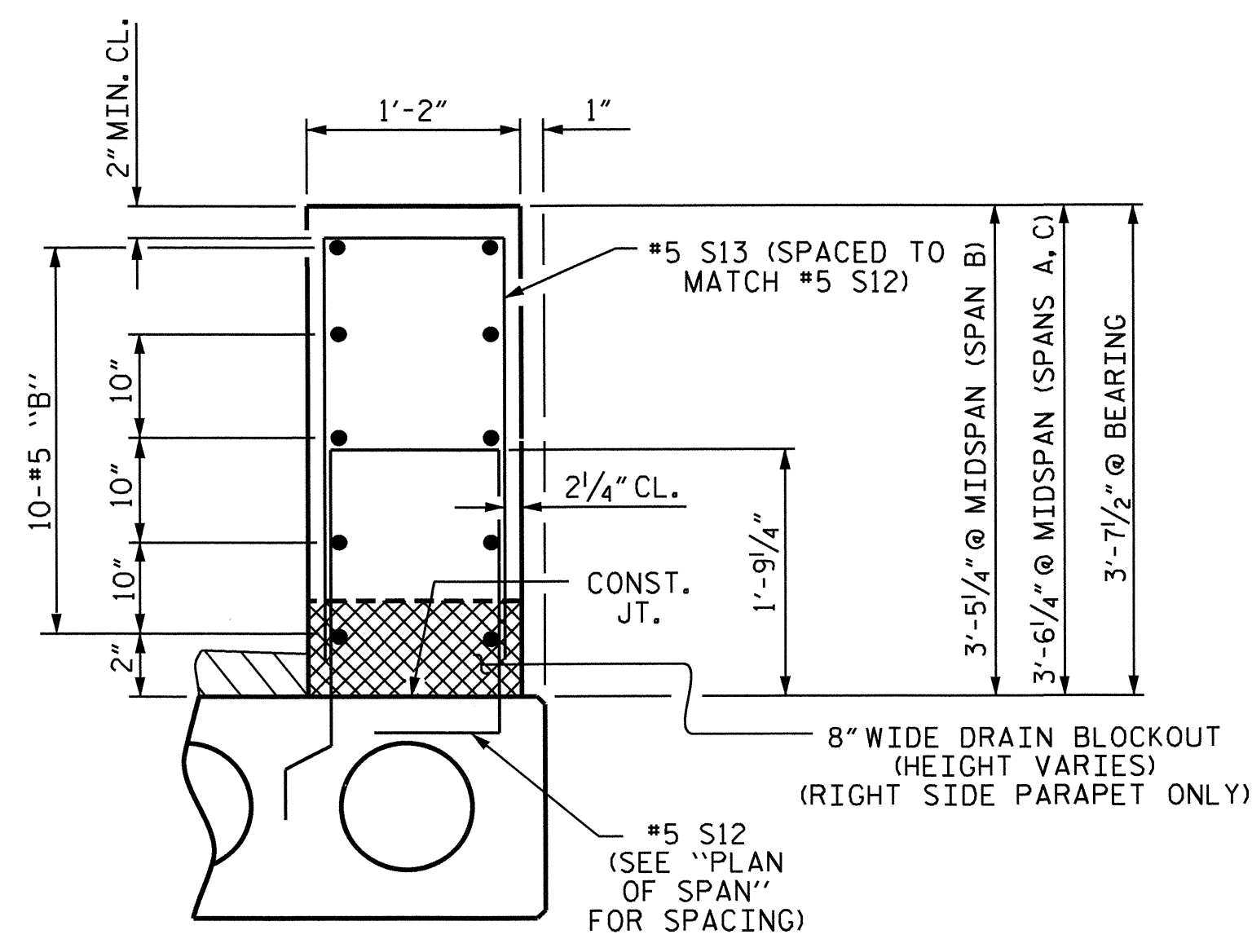


ELEVATION



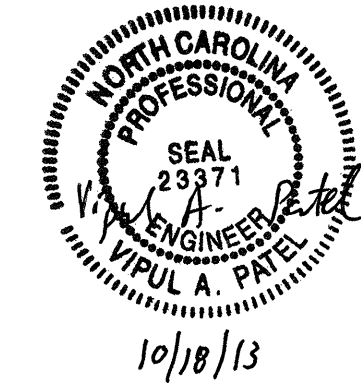
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

PARAPET AND END POST FOR TWO BAR RAIL



SECTION THRU PARAPET
PARAPET DETAILS

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 END POSTS
 &
 PARAPET DETAILS
 (LEFT LANE)

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTALS 58
2			4			

DRAWN BY : J. G. KHARVA DATE : 08/02/12
 CHECKED BY : R. L. CHESSON DATE : 08/12
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 09/10/13

17-SEP-2013 11:49
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 thcarroll

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

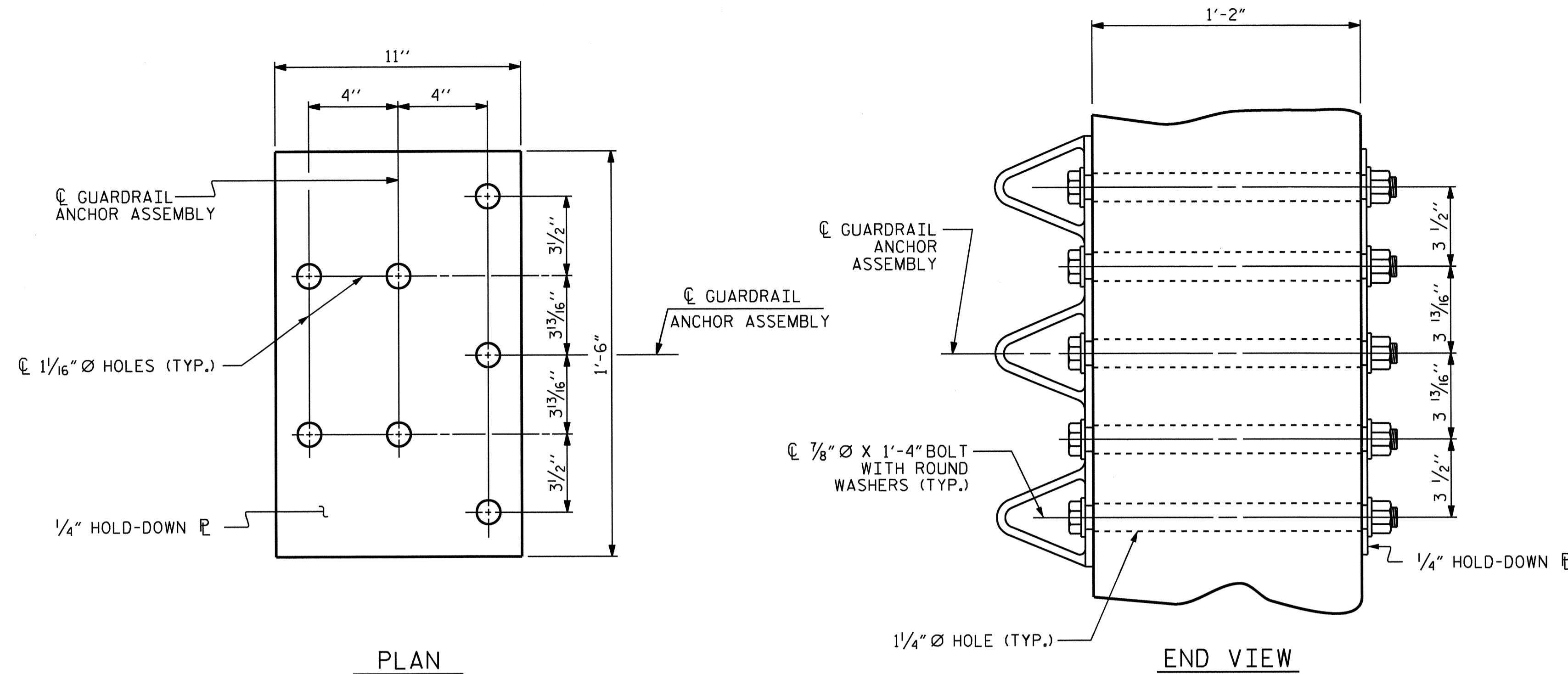
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

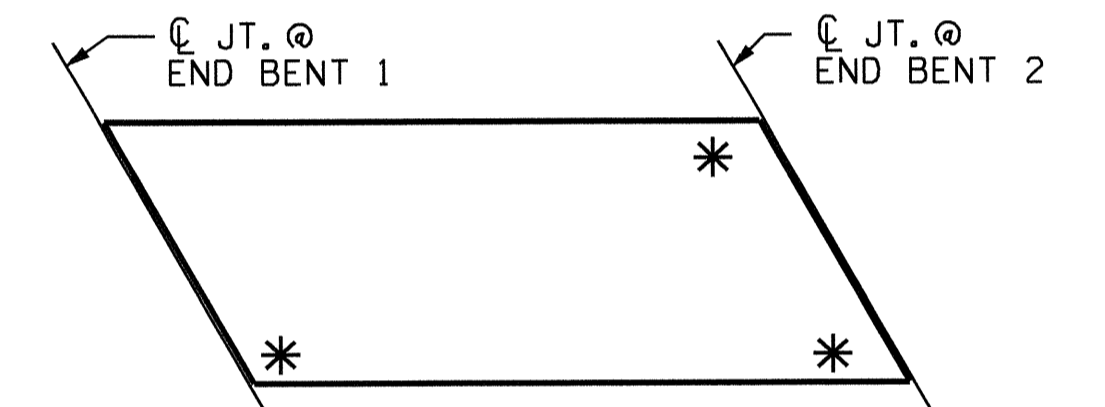
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

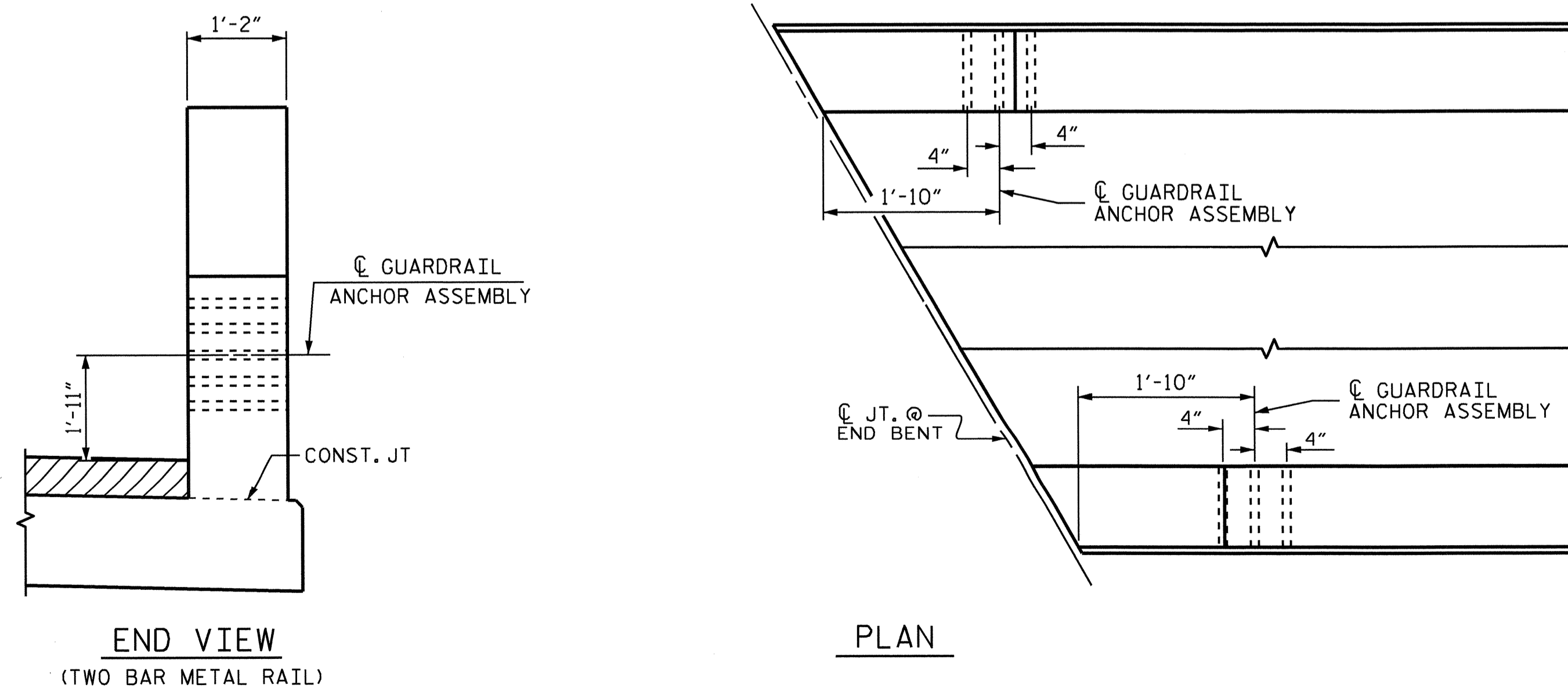


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

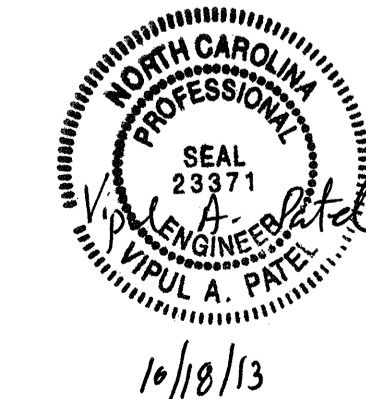
* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : J. G. KHARVA	DATE : 07/24/12
CHECKED BY : R. L. CHESSON	DATE : 08/12
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

17-SEP-2013 11:49
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thcarroll



PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+20.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS
FOR METAL RAILS
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			58

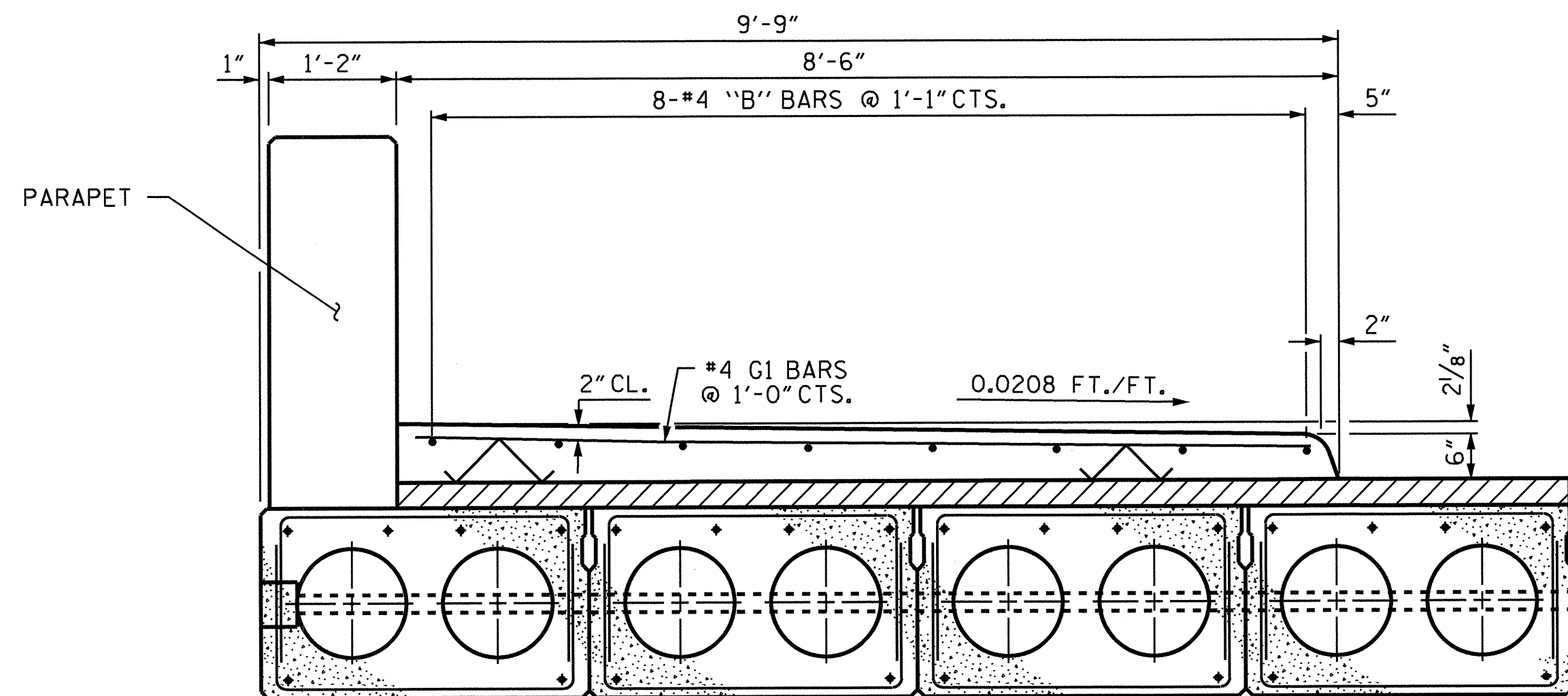
STR. #1 STD. NO. GRA3

BILL OF MATERIAL
SIDEWALK

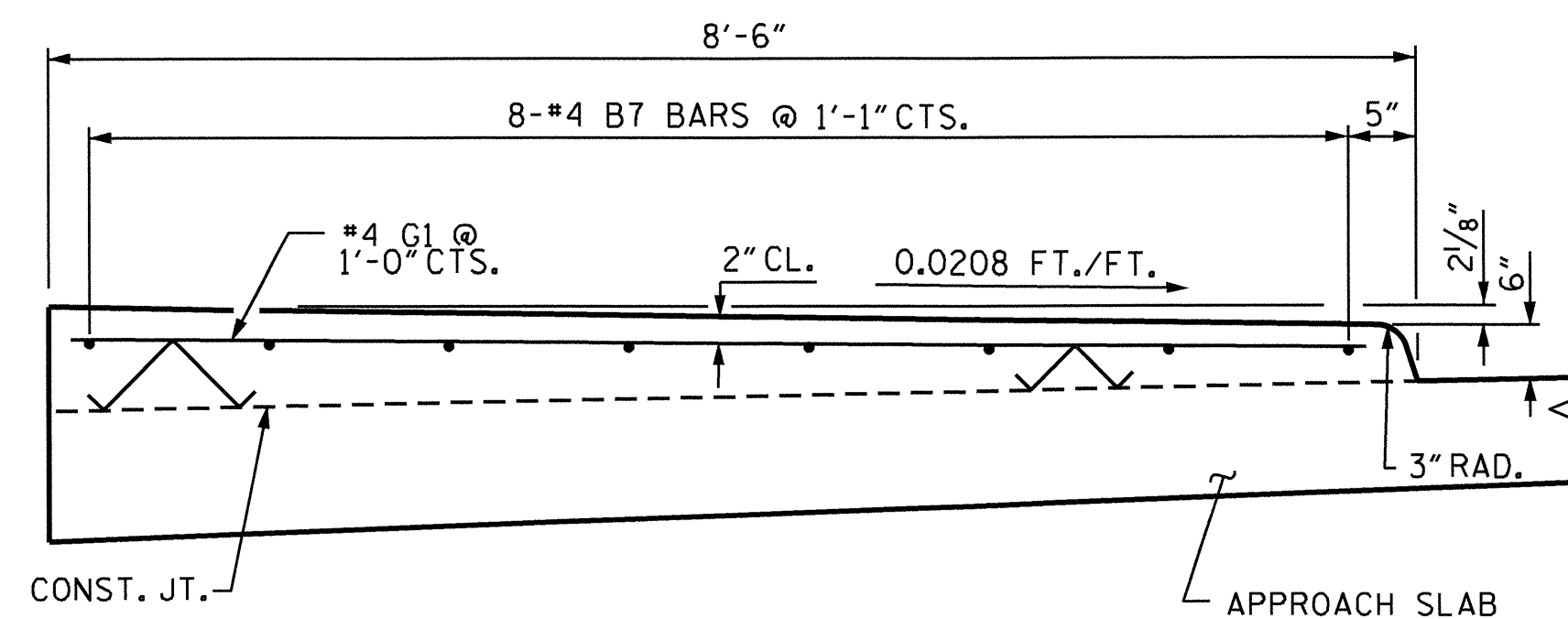
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B7	16	#4	STR	24'-7"	263
* B8	16	#4	STR	22'-9"	243
* B9	24	#4	STR	21'-3"	341
* B10	16	#4	STR	25'-2"	269
* G1	201	#4	STR	9'-5"	1264

* EPOXY COATED REINFORCING STEEL LBS. 2380

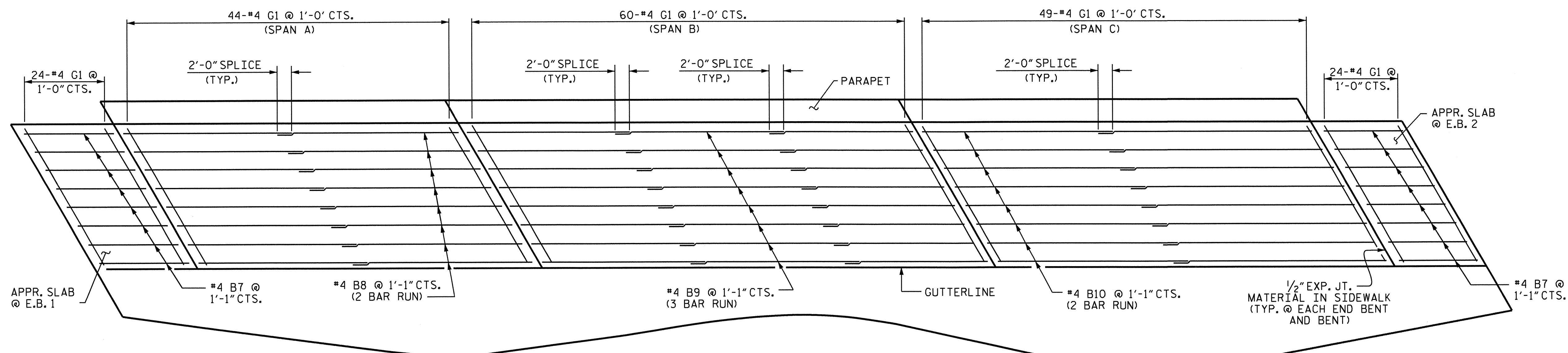
CLASS AA CONCRETE SIDEWALK CU.YDS. 37.6



SECTION THROUGH SIDEWALK
ON CORED SLABS



SECTION THRU SIDEWALK
ON APPROACH SLABS



PLAN OF SIDEWALK

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT IS REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

B-4779

MECKLENBURG COUNTY

STATION: 20+20.50 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
SIDEWALK
DETAILS
(LEFT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	
2			4			58	

DRAWN BY: J. G. KHARVA DATE: 8/12
CHECKED BY: R. L. CHESSON DATE: 8/12
DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 09/10/13

17-SEP-2013 11:49
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theadroll

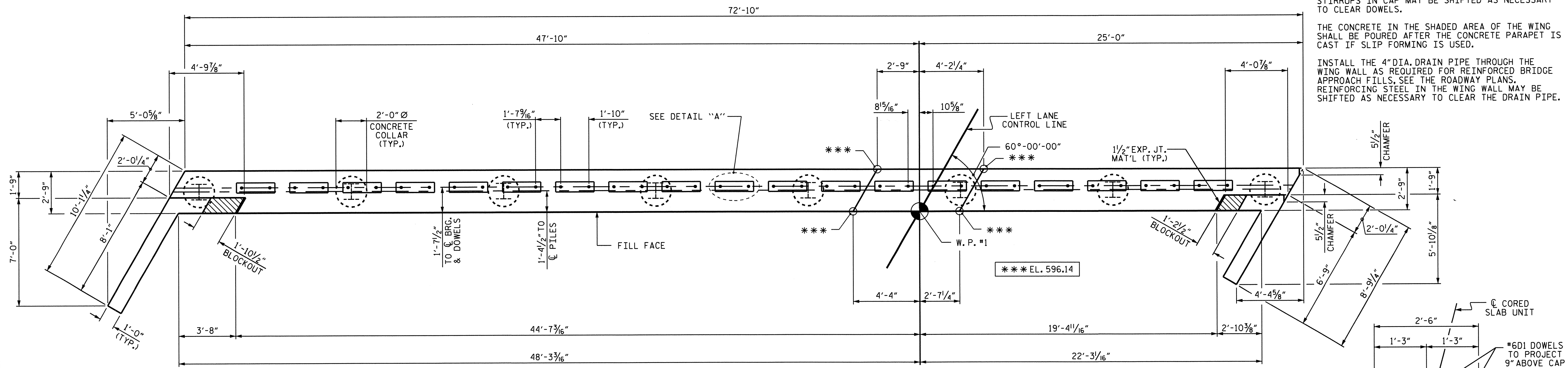
STR. #1

NOTES

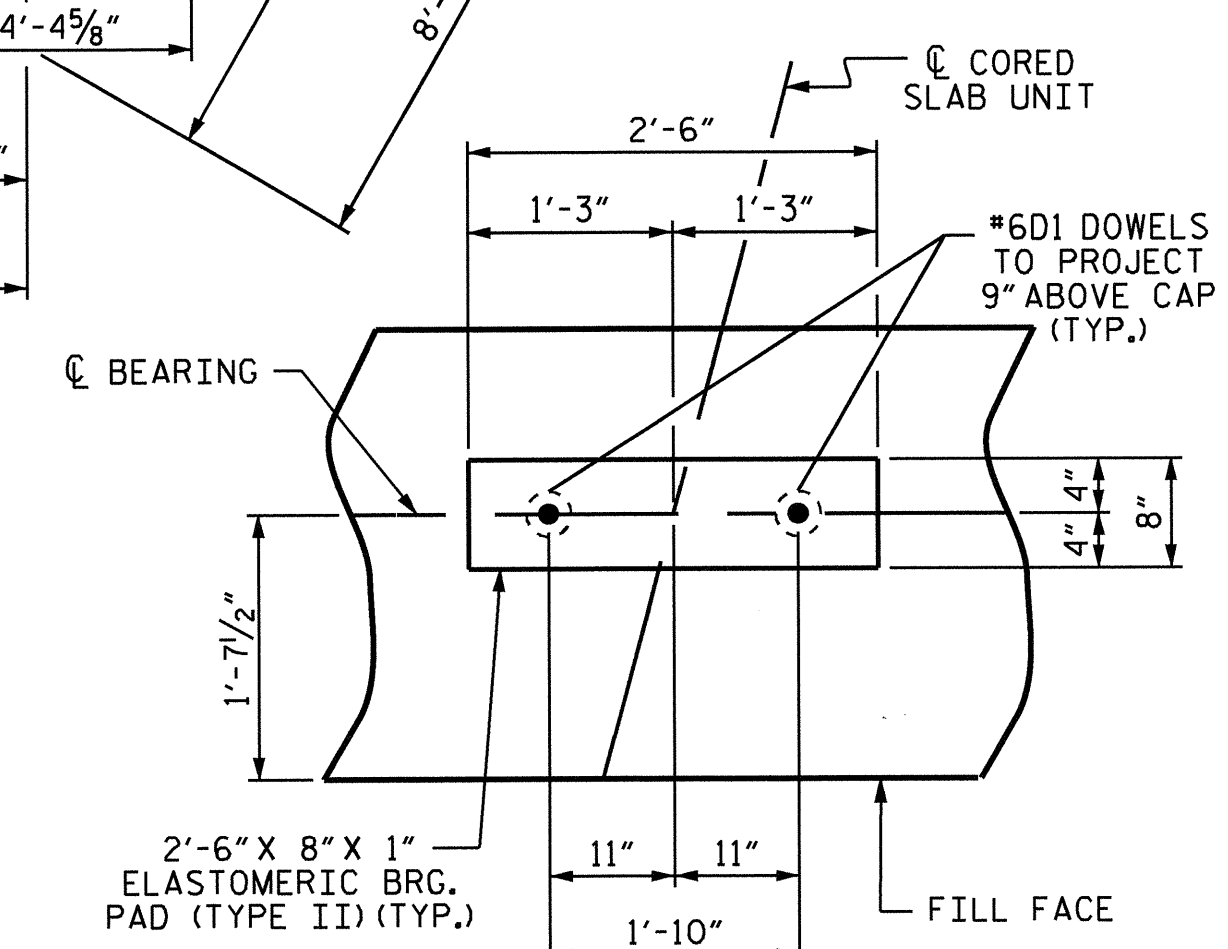
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

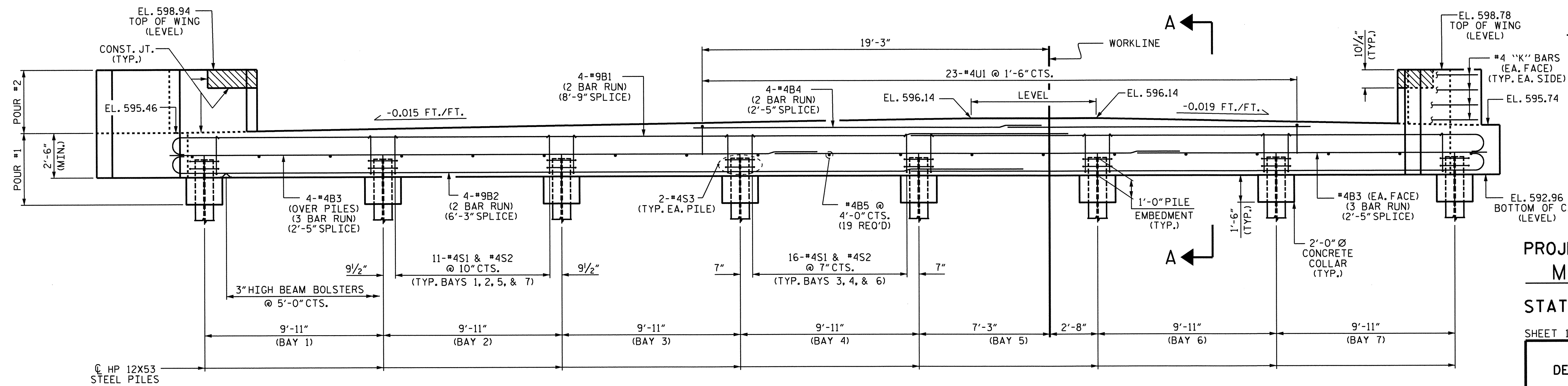
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"

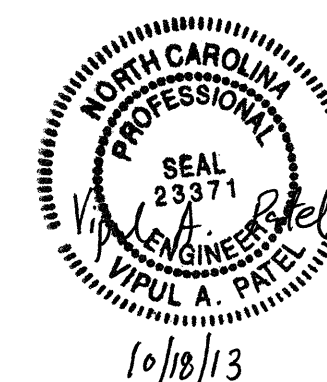


ELEVATION

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 (LEFT LANE)



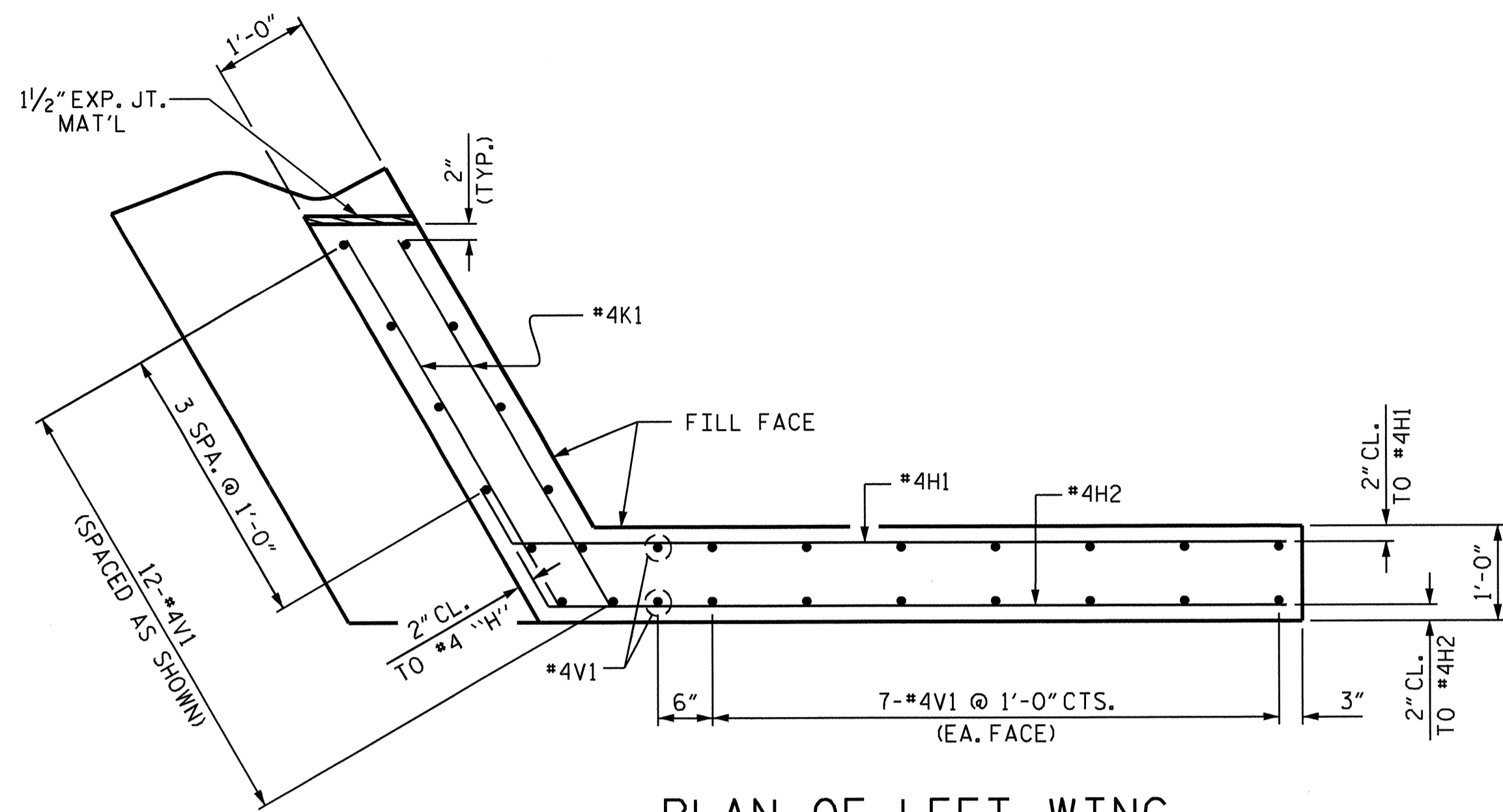
10/18/13

DRAWN BY : T. H. CARROLL DATE : 04/04/13
 CHECKED BY : R. L. CHESSON DATE : 05/30/13
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 09/10/13

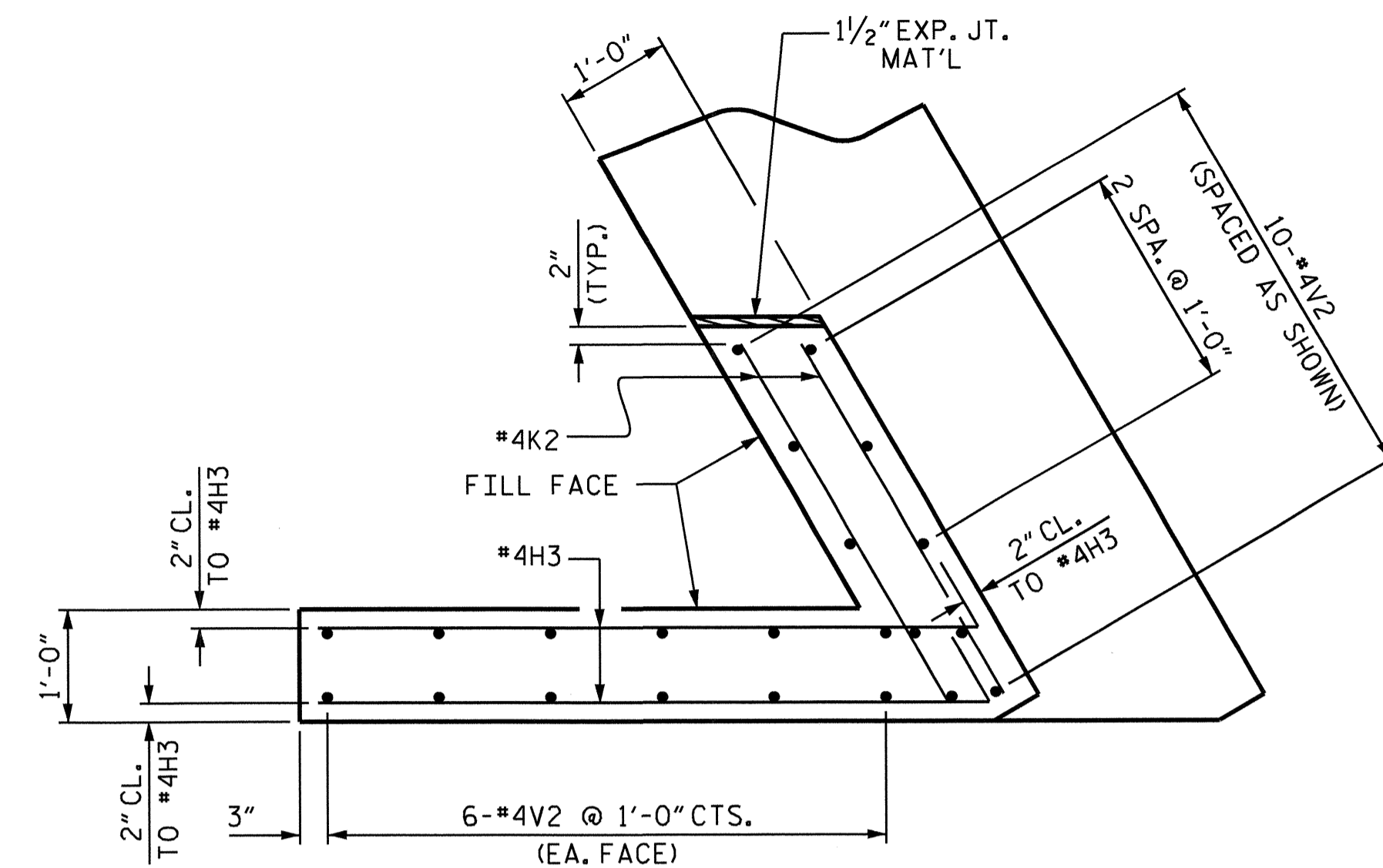
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			58

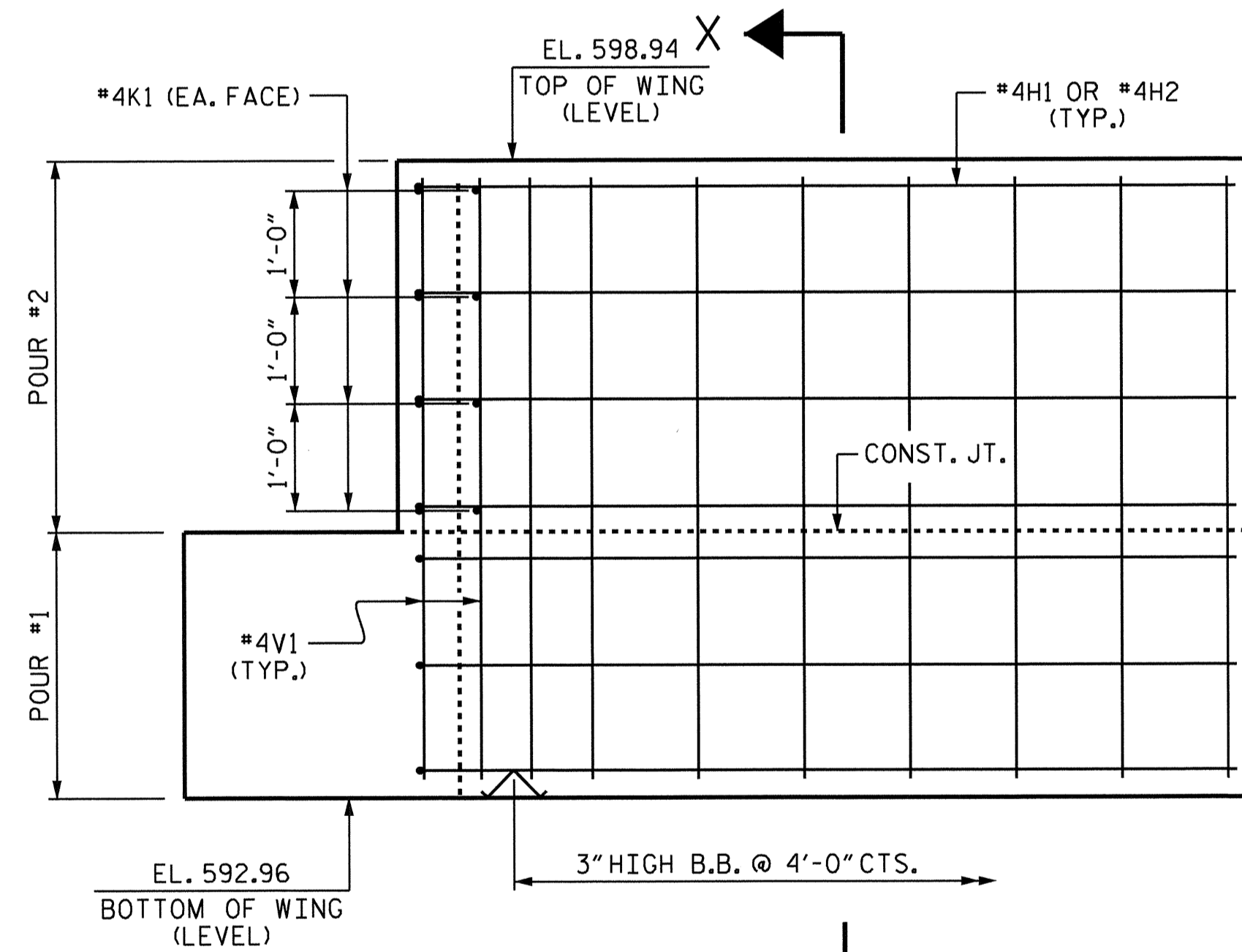
STR. #1



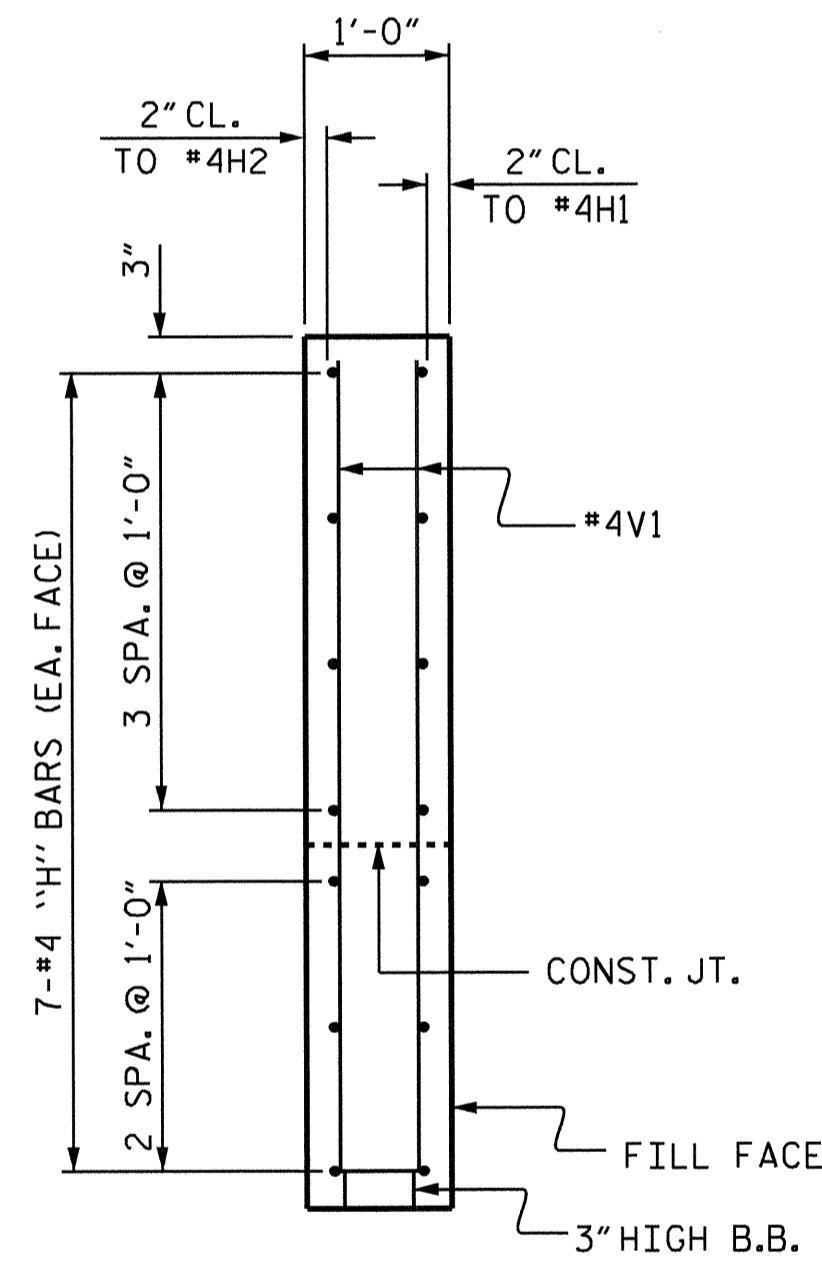
PLAN OF LEFT WING



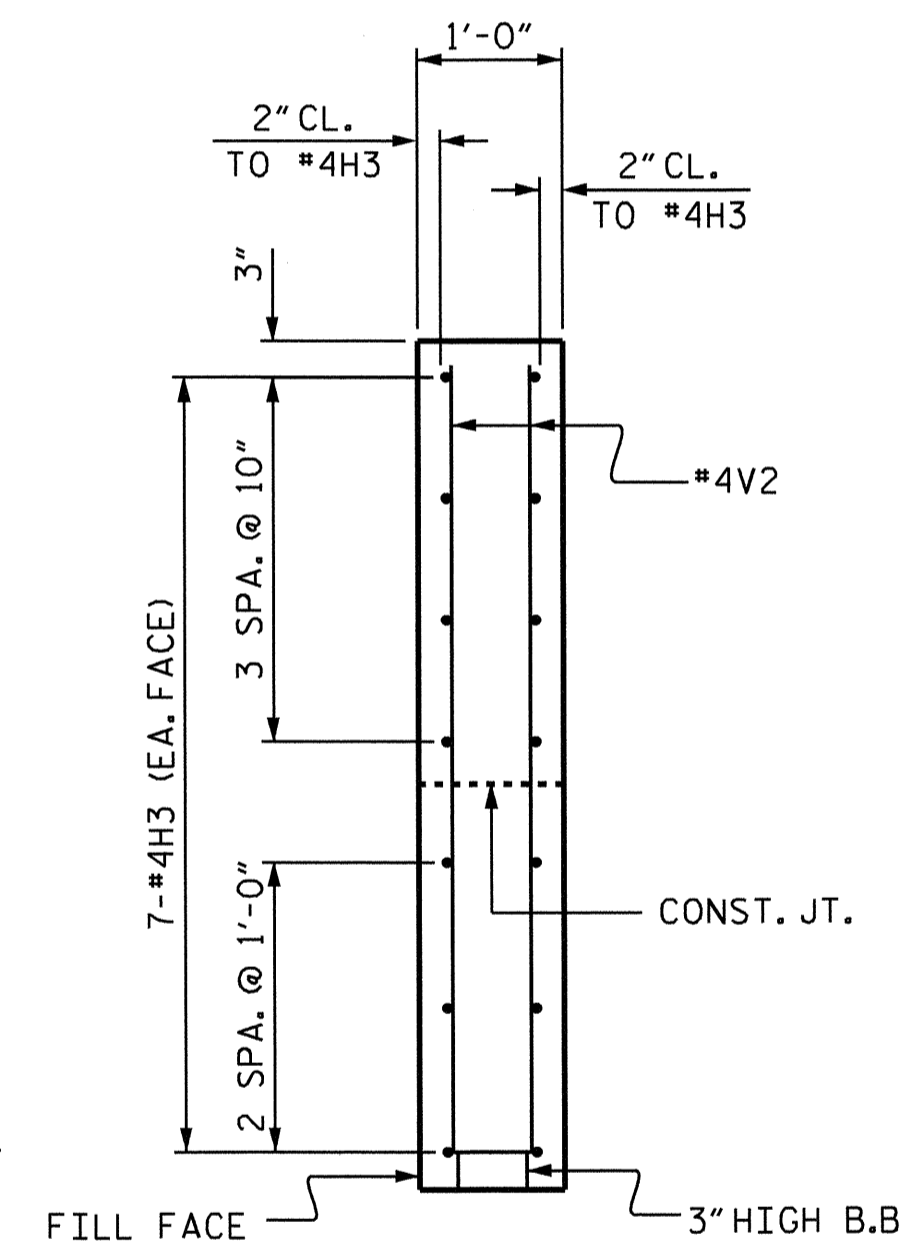
PLAN OF RIGHT WING



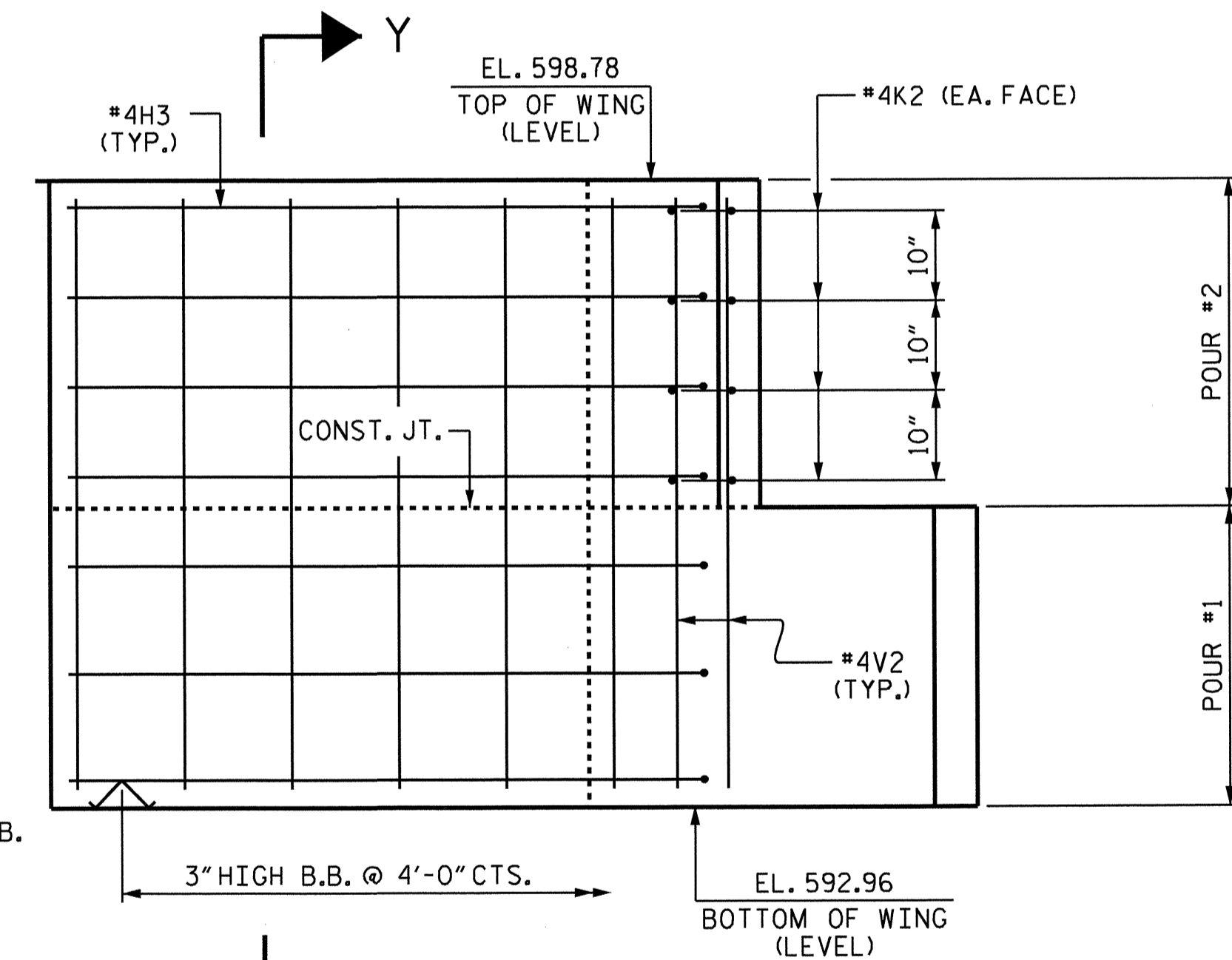
ELEVATION OF LEFT WING



SECTION X-X



SECTION Y-Y



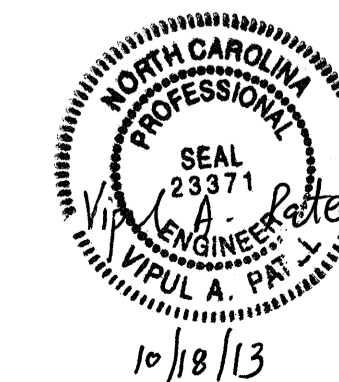
ELEVATION OF RIGHT WING

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1
 (LEFT LANE)

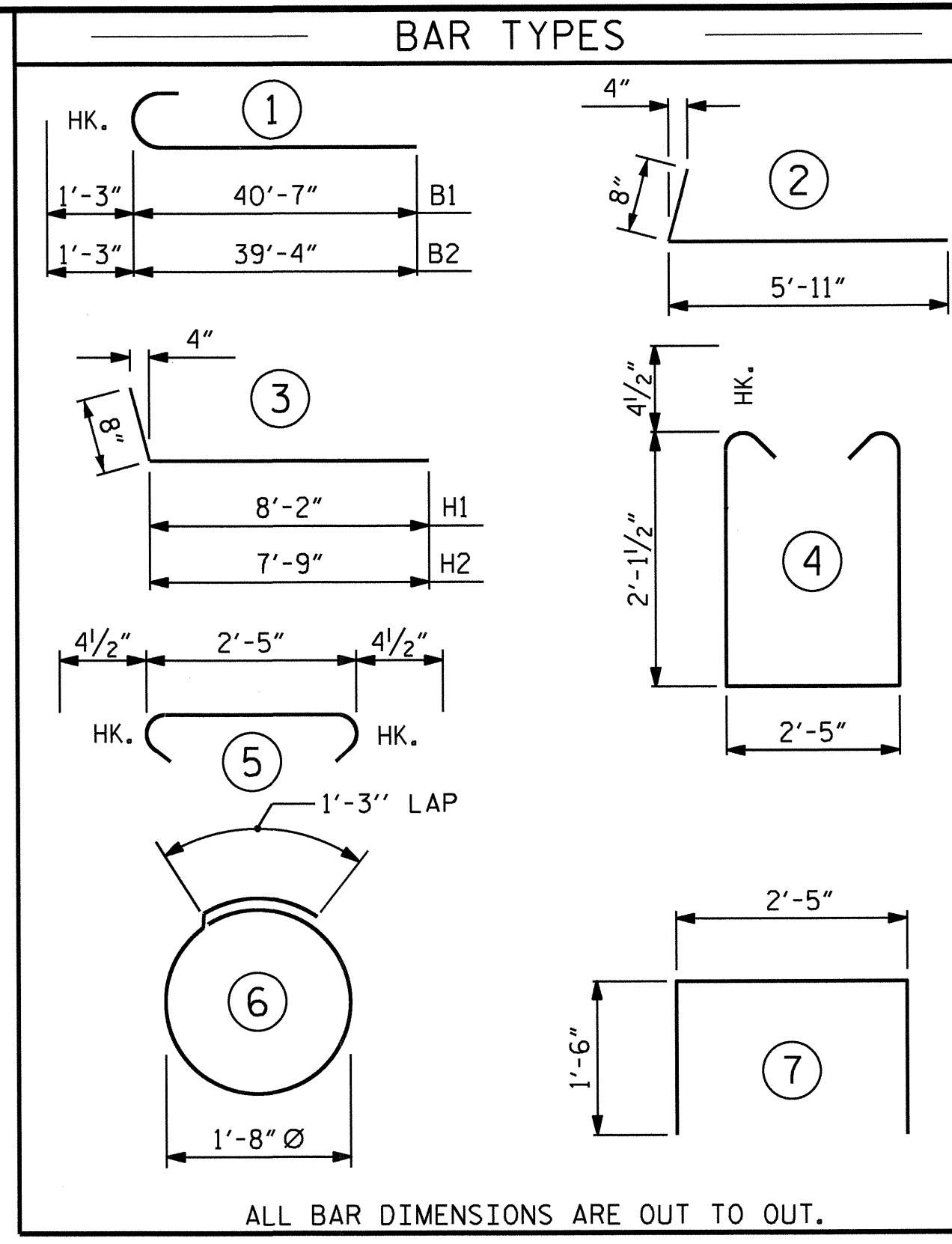
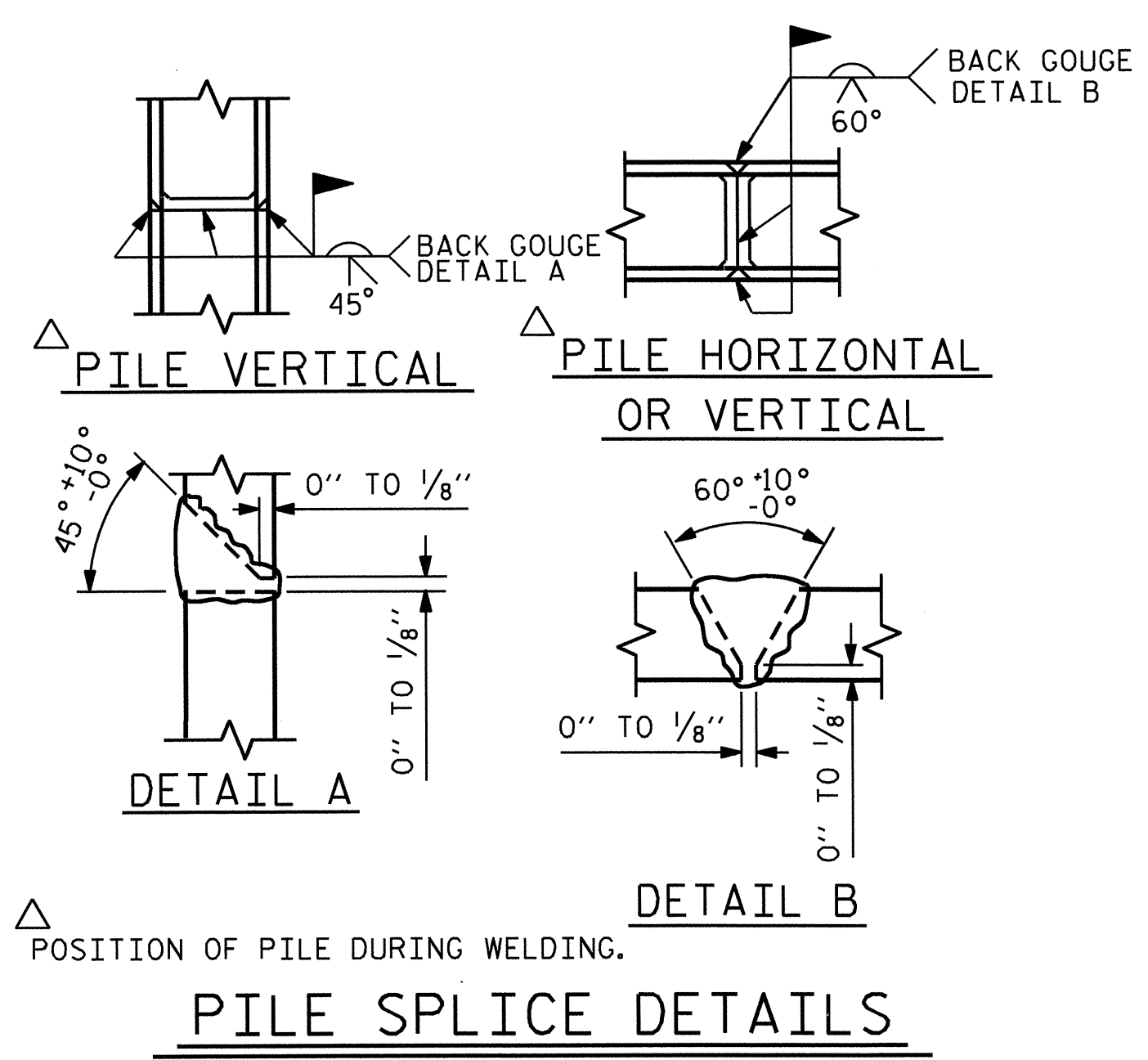


DRAWN BY : T. H. CARROLL DATE : 04/04/13
 CHECKED BY : R. L. CHESSON DATE : 05/30/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

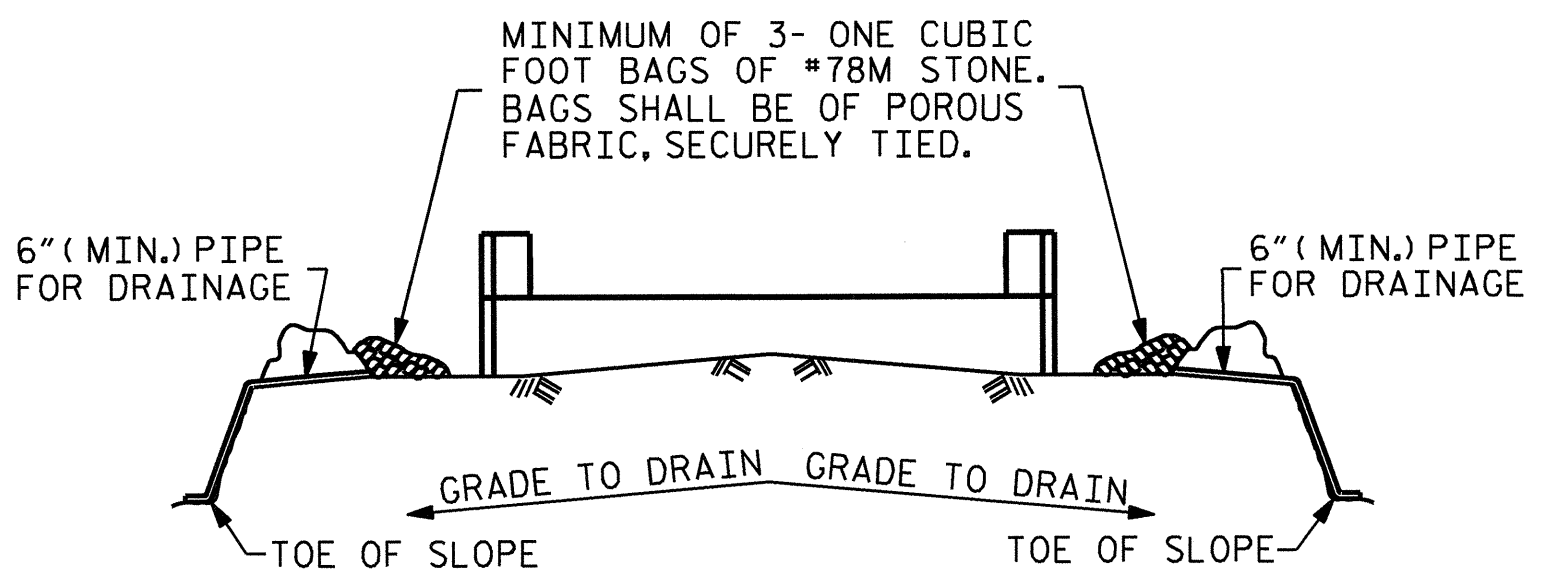
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 thcarroll

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			58

STR. #1



BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-10"	1138
B2	8	#9	1	40'-7"	1104
B3	18	#4	STR	25'-10"	311
B4	8	#4	STR	18'-3"	98
B5	19	#4	STR	2'-5"	31
D1	38	#6	STR	1'-6"	86
H1	7	#4	3	8'-10"	41
H2	7	#4	3	8'-5"	39
H3	14	#4	2	6'-7"	62
K1	8	#4	STR	4'-5"	24
K2	8	#4	STR	3'-8"	20
S1	92	#4	4	7'-5"	456
S2	92	#4	5	3'-2"	195
S3	16	#4	6	6'-6"	69
U1	23	#4	7	5'-5"	83
V1	28	#4	STR	5'-7"	104
V2	22	#4	STR	5'-5"	80
REINFORCING STEEL					3941 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				24.3 C.Y.	
POUR #2 UPPER PART OF WINGS				2.6 C.Y.	
TOTAL CLASS A CONCRETE				26.9 C.Y.	
HP 12X53 STEEL PILES					
NO: 8					LIN. FT. 220



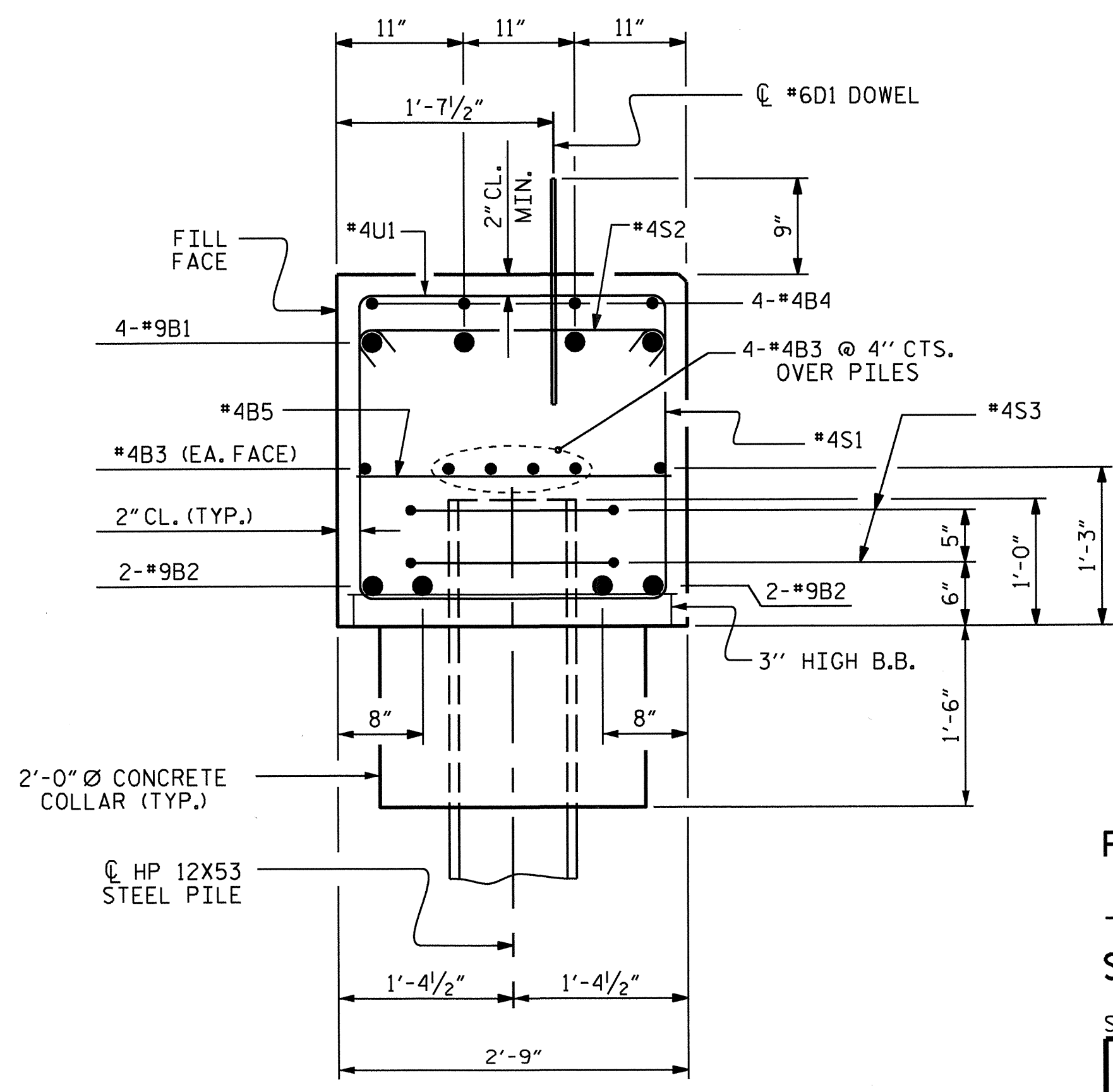
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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



SECTION A-A



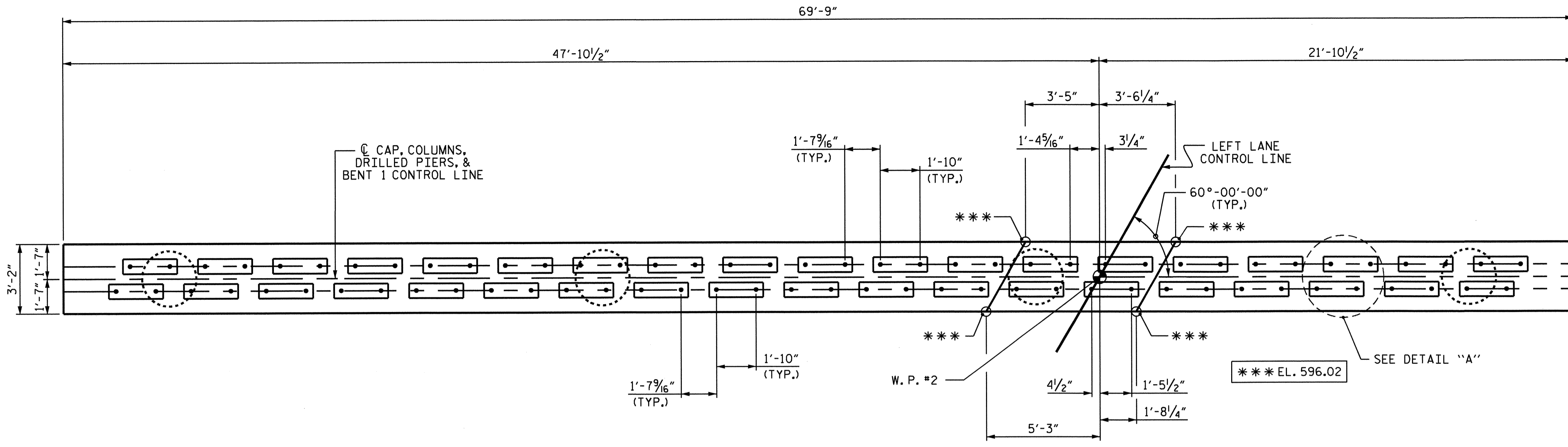
PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 (LEFT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 58

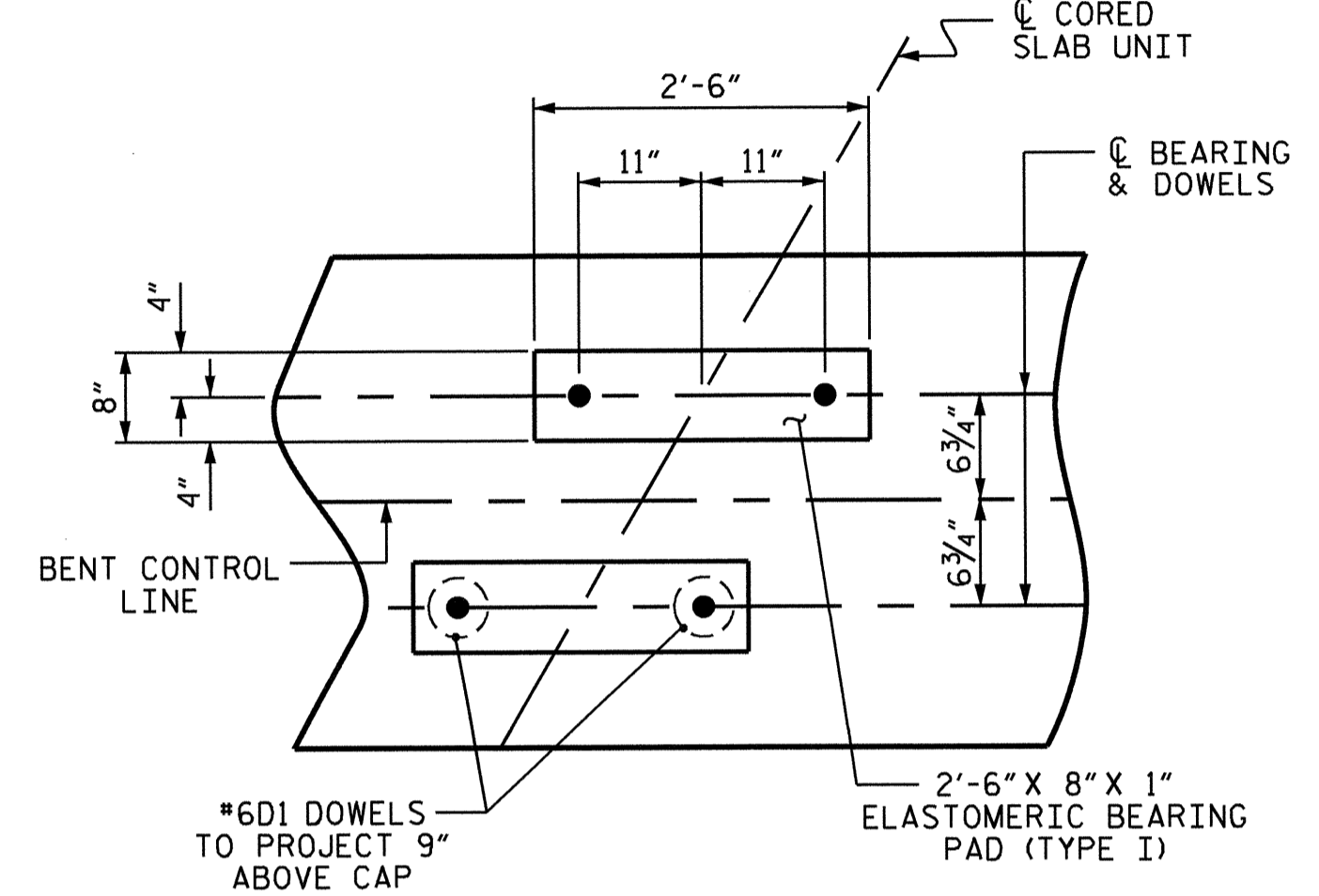
DRAWN BY : T. H. CARROLL DATE : 04/04/13
 CHECKED BY : R. L. CHESSON DATE : 05/30/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
 FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

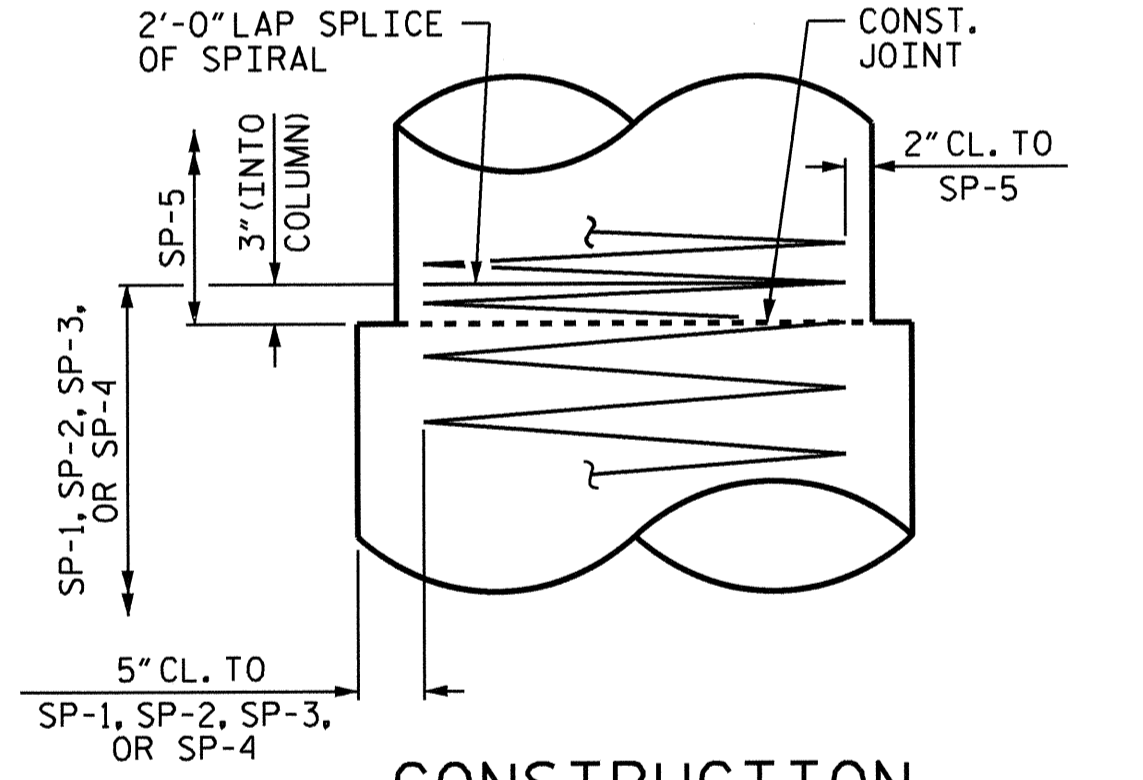


PLAN



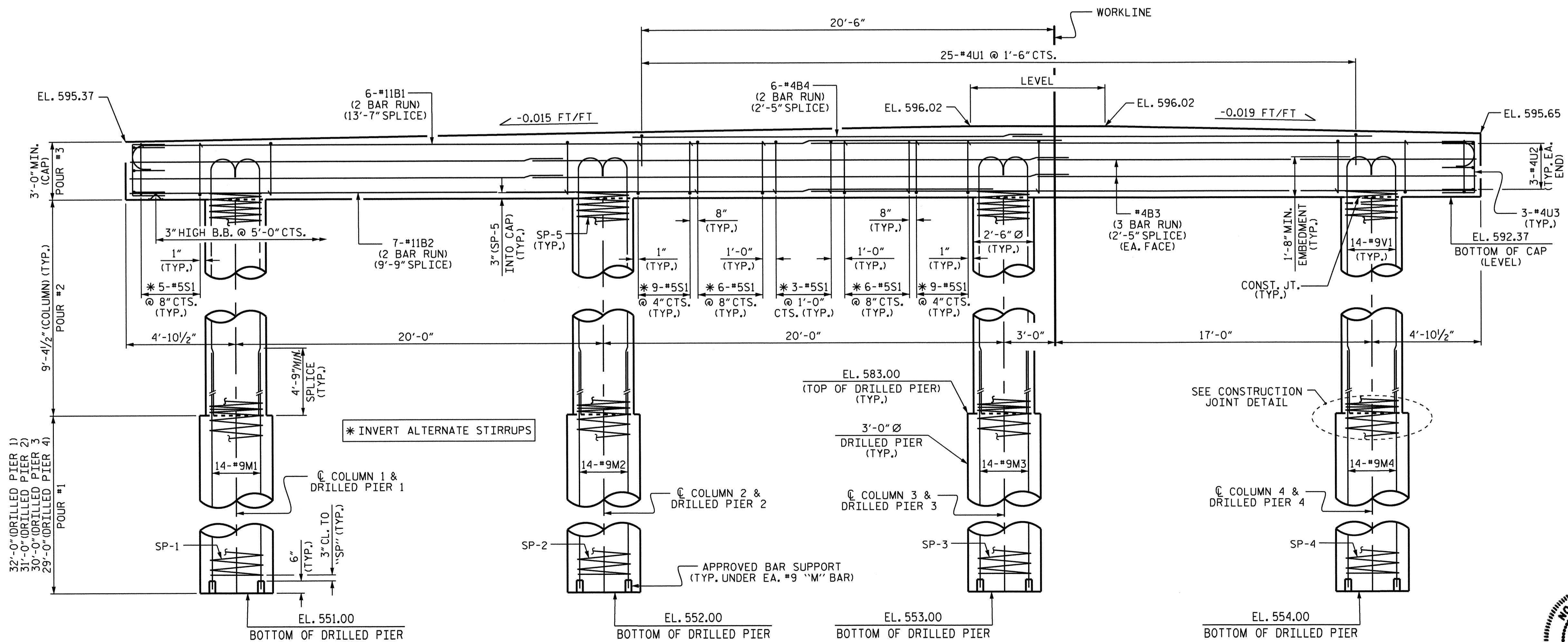
DETAIL "A"

(TYP. EA. BEARING)



CONSTRUCTION JOINT DETAIL

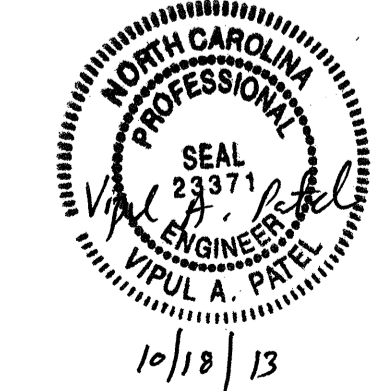
(TYP. EA. DRILLED PIER)



ELEVATION

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

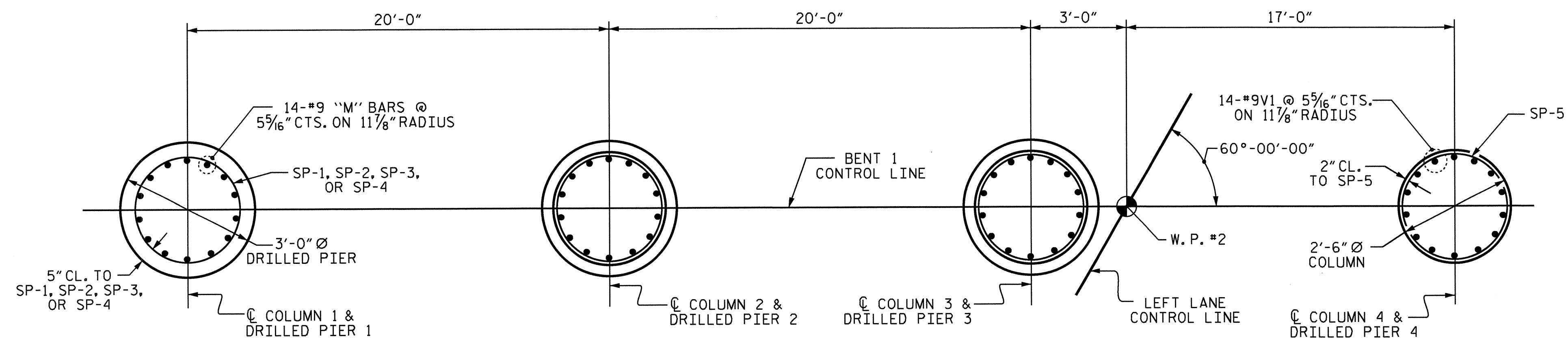
SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Raleigh
 SUBSTRUCTURE
BENT 1
 (LEFT LANE)

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

DRAWN BY: T. H. CARROLL DATE: 05/06/13
 CHECKED BY: R. L. CHESSON DATE: 05/22/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13



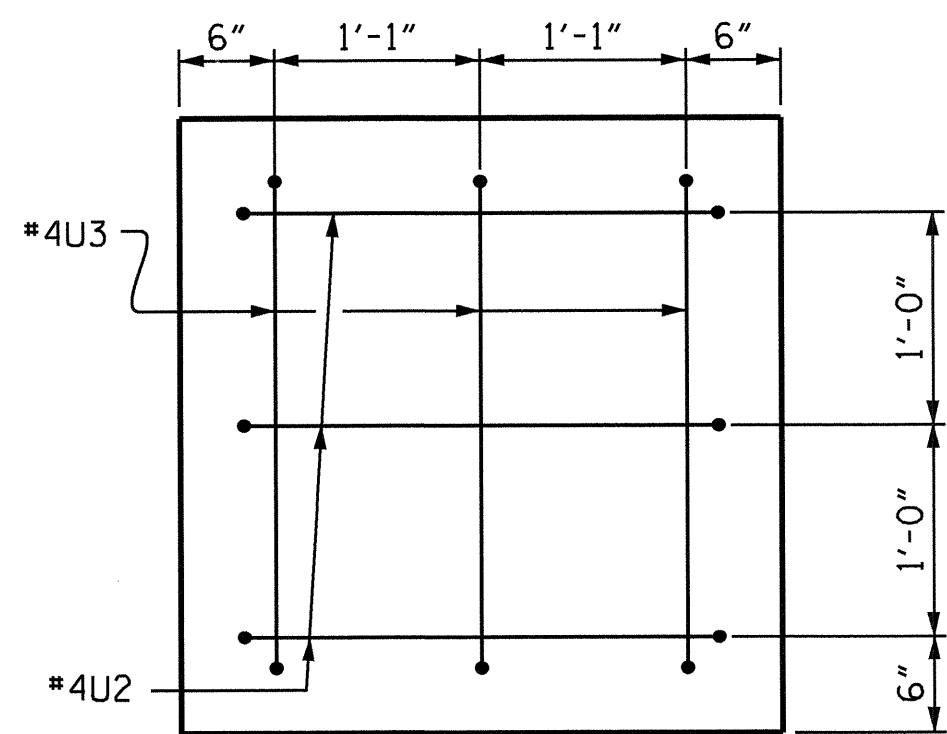
PLAN OF DRILLED PIERS

(TYP.)

PLAN OF COLUMNS

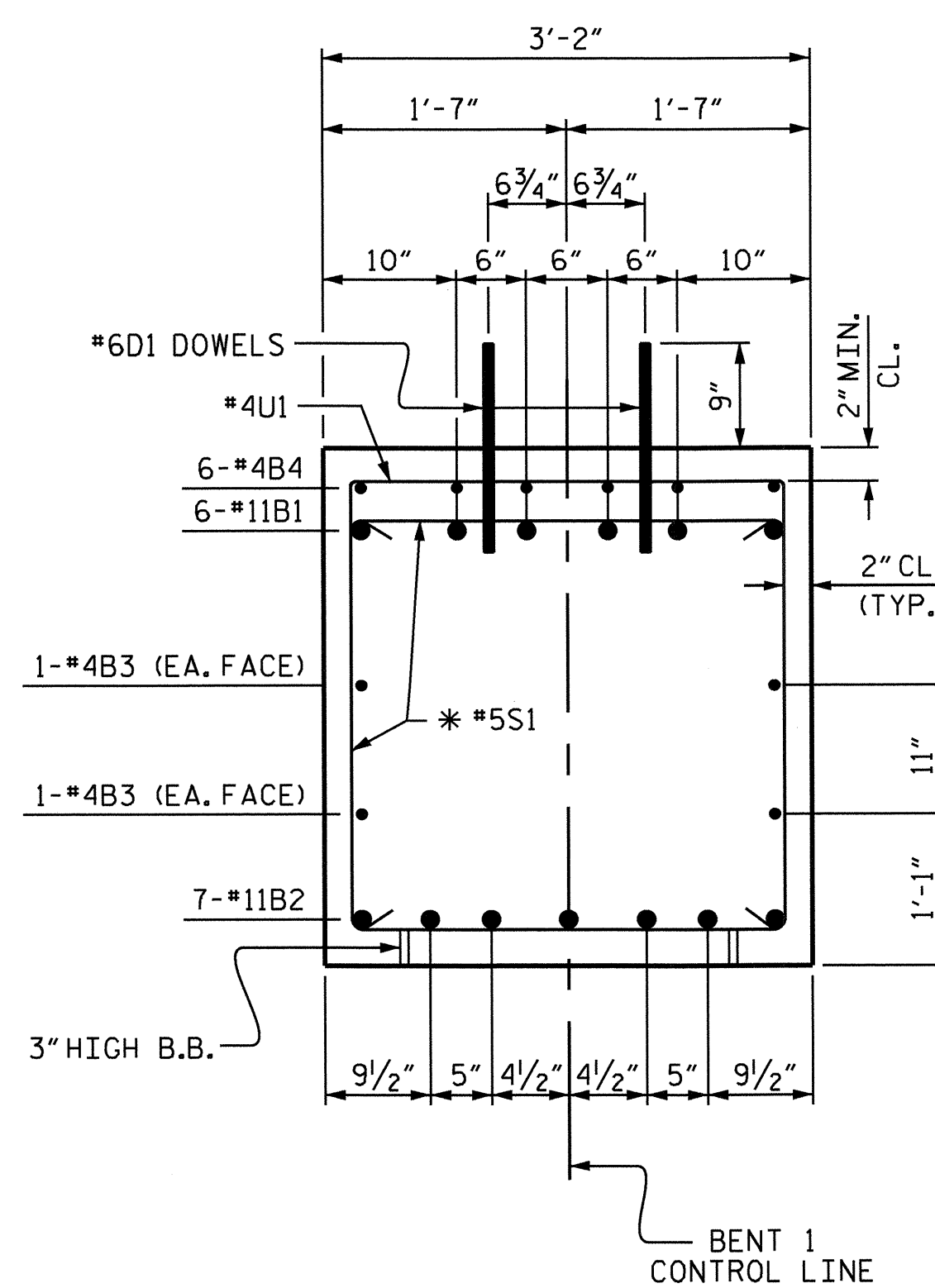
(TYP.)

PLAN OF COLUMNS AND DRILLED PIERS



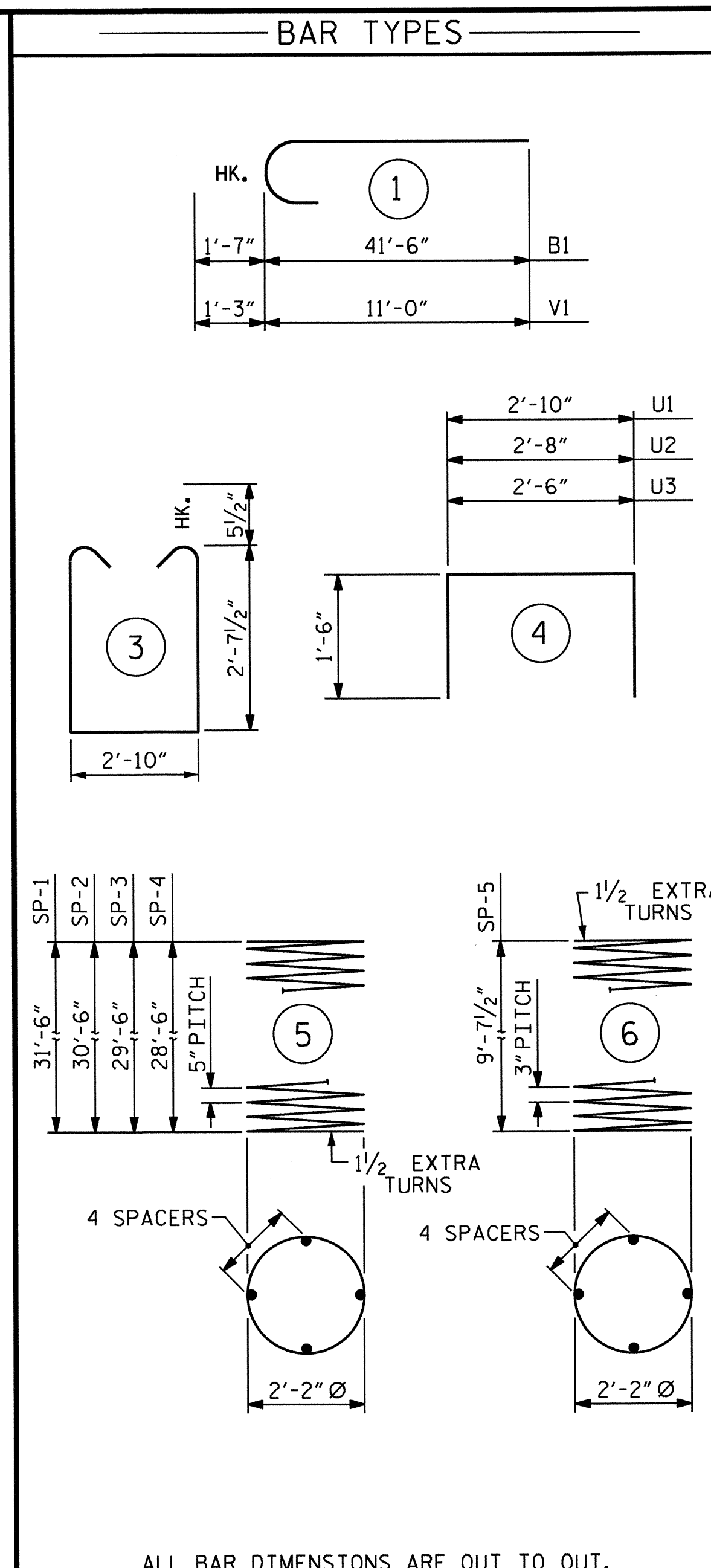
END OF CAP DETAIL

(TYP. EA. END)



SECTION THRU CAP

* INVERT ALTERNATE STIRRUPS



ALL BAR DIMENSIONS ARE OUT TO OUT.
 ** THE SP-1, SP-2, SP-3, & SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
 *** THE SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	43'-1"	2747
B2	14	#11	STR	39'-7"	2944
B3	12	#4	STR	24'-9"	198
B4	12	#4	STR	19'-9"	158
D1	76	#6	STR	1'-6"	171
M1	14	#9	STR	39'-6"	1880
M2	14	#9	STR	38'-6"	1833
M3	14	#9	STR	37'-6"	1785
M4	14	#9	STR	36'-6"	1737
S1	109	#5	3	9'-0"	1023
U1	25	#4	4	5'-10"	97
U2	6	#4	4	5'-8"	23
U3	6	#4	4	5'-6"	22
V1	56	#9	1	12'-3"	2332
TOTAL REINFORCING STEEL					LBS 16950
SP-1	1	**	5	514'-3"	536
SP-2	1	**	5	497'-7"	519
SP-3	1	**	5	482'-7"	503
SP-4	1	**	5	466'-0"	486
SP-5	4	***	6	267'-3"	714
TOTAL SPIRAL COLUMN REINFORCING STEEL					LBS. 2758
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					6.8 C.Y.
POUR #3 (BENT CAP)					27.9 C.Y.
TOTAL CLASS A CONCRETE					34.7 C.Y.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) IN SOIL					32.0 C.Y.
3'-0" DIA. DRILLED PIERS IN SOIL					67.0 LIN. FT.
3'-0" DIA. DRILLED PIERS NOT IN SOIL					55.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS					20.0 LIN. FT.
SID INSPECTIONS					2 EA.
SPT TESTING					1 EA.
CSL TUBES					512.0 LIN. FT.

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1
 (LEFT LANE)

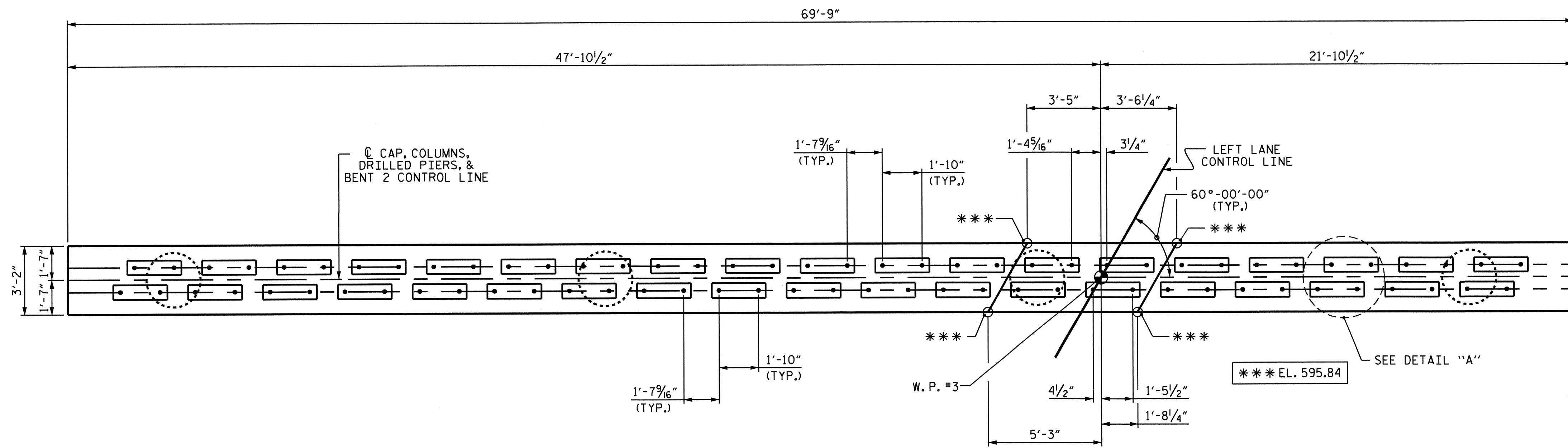


DRAWN BY: T. H. CARROLL DATE: 05/06/13
 CHECKED BY: R. L. CHESSON DATE: 05/22/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13

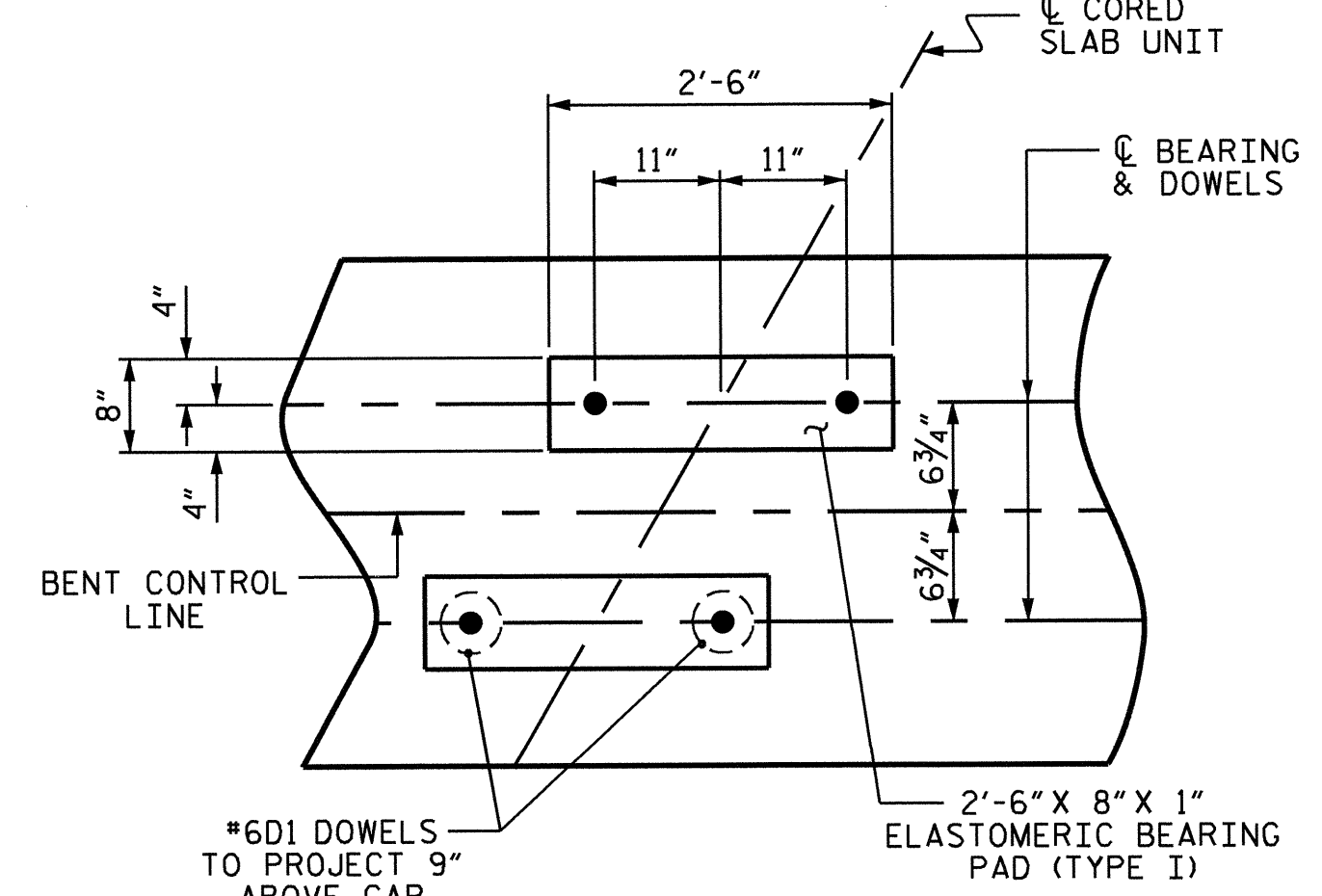
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			58

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 HOOKS ON "W" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
 FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

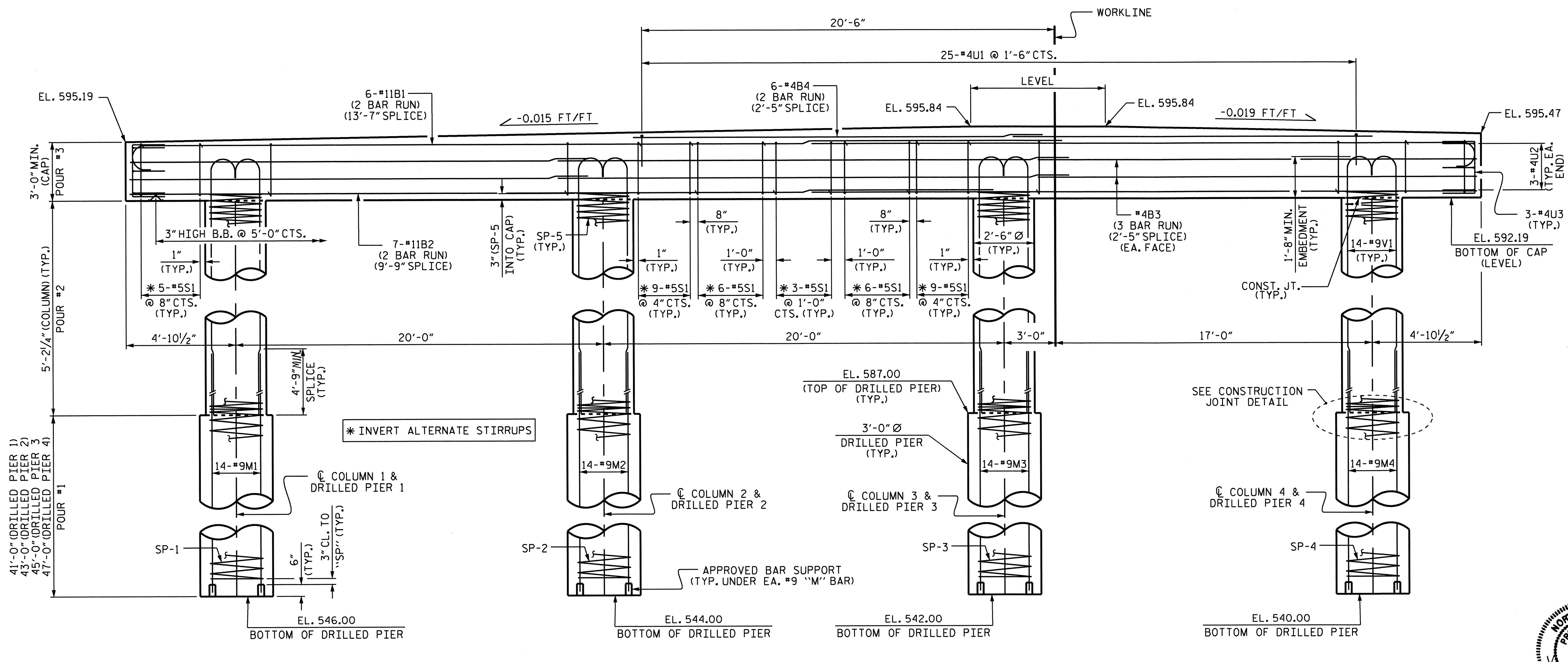


PLAN

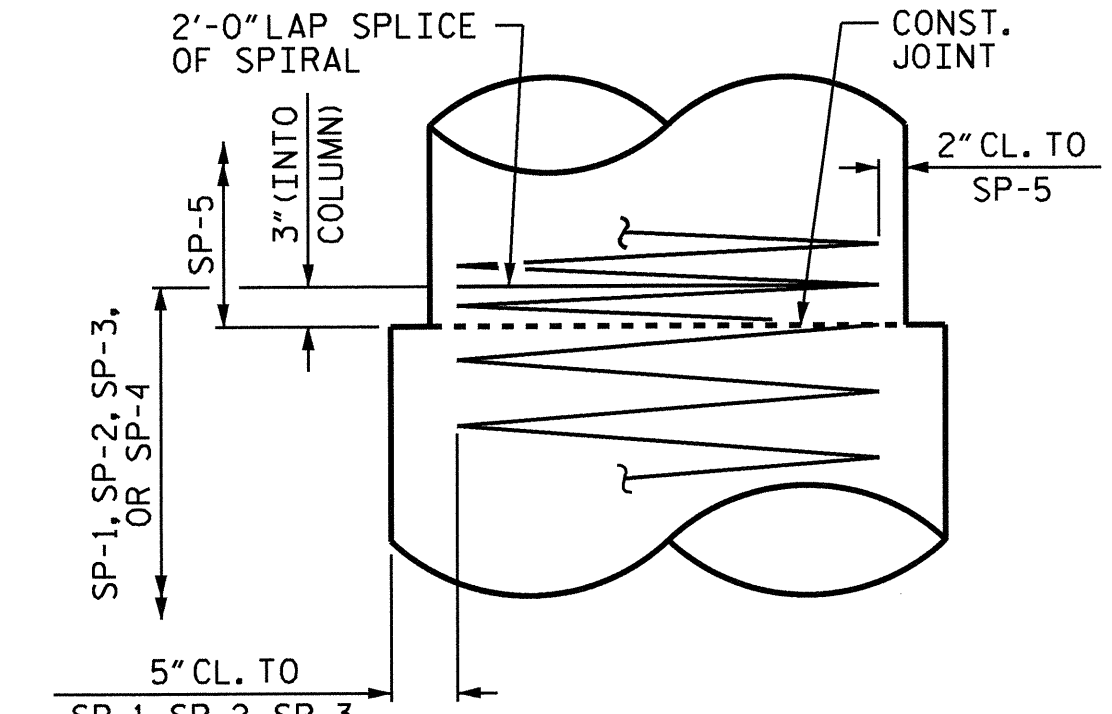


DETAIL "A"

(TYP. EA. BEARING)



ELEVATION

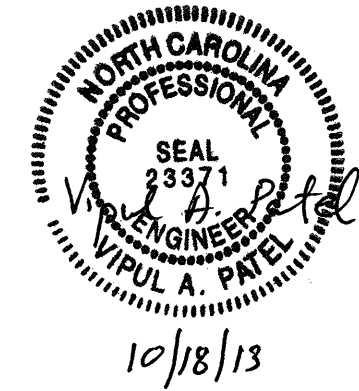


CONSTRUCTION JOINT DETAIL

(TYP. EA. DRILLED PIER)

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

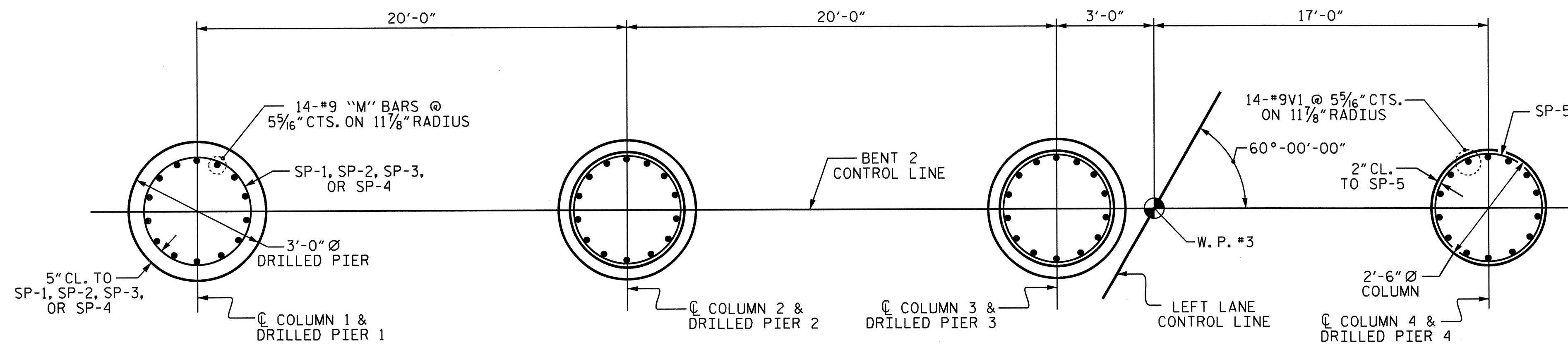
SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-22
 TOTAL SHEETS 58

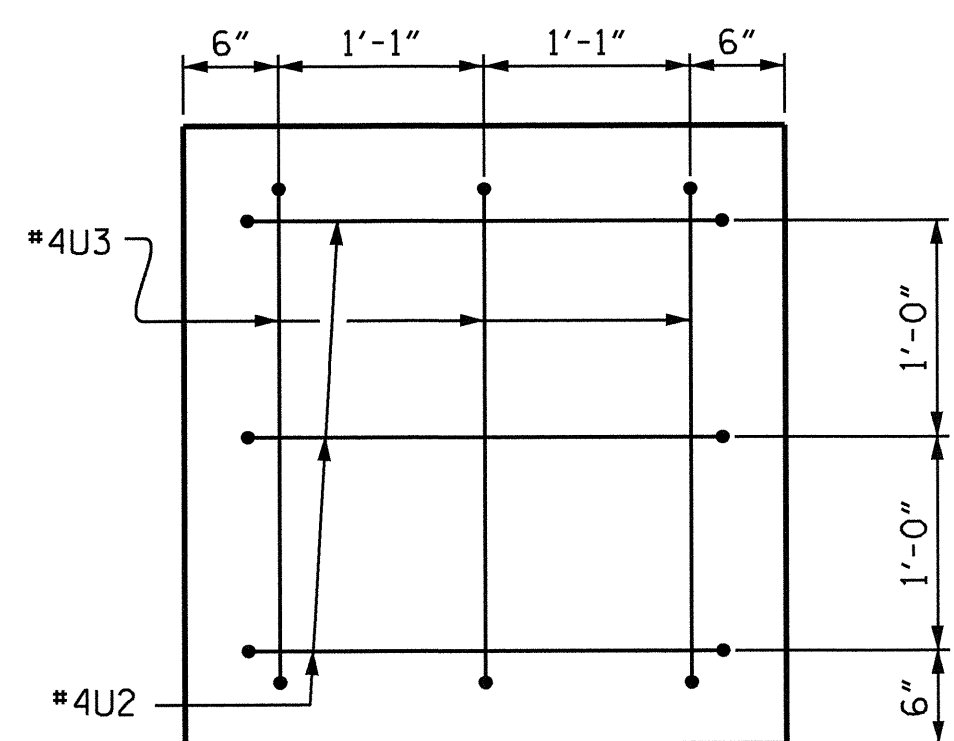
DRAWN BY: T. H. CARROLL DATE: 05/06/13
 CHECKED BY: R. L. CHESSON DATE: 05/28/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13



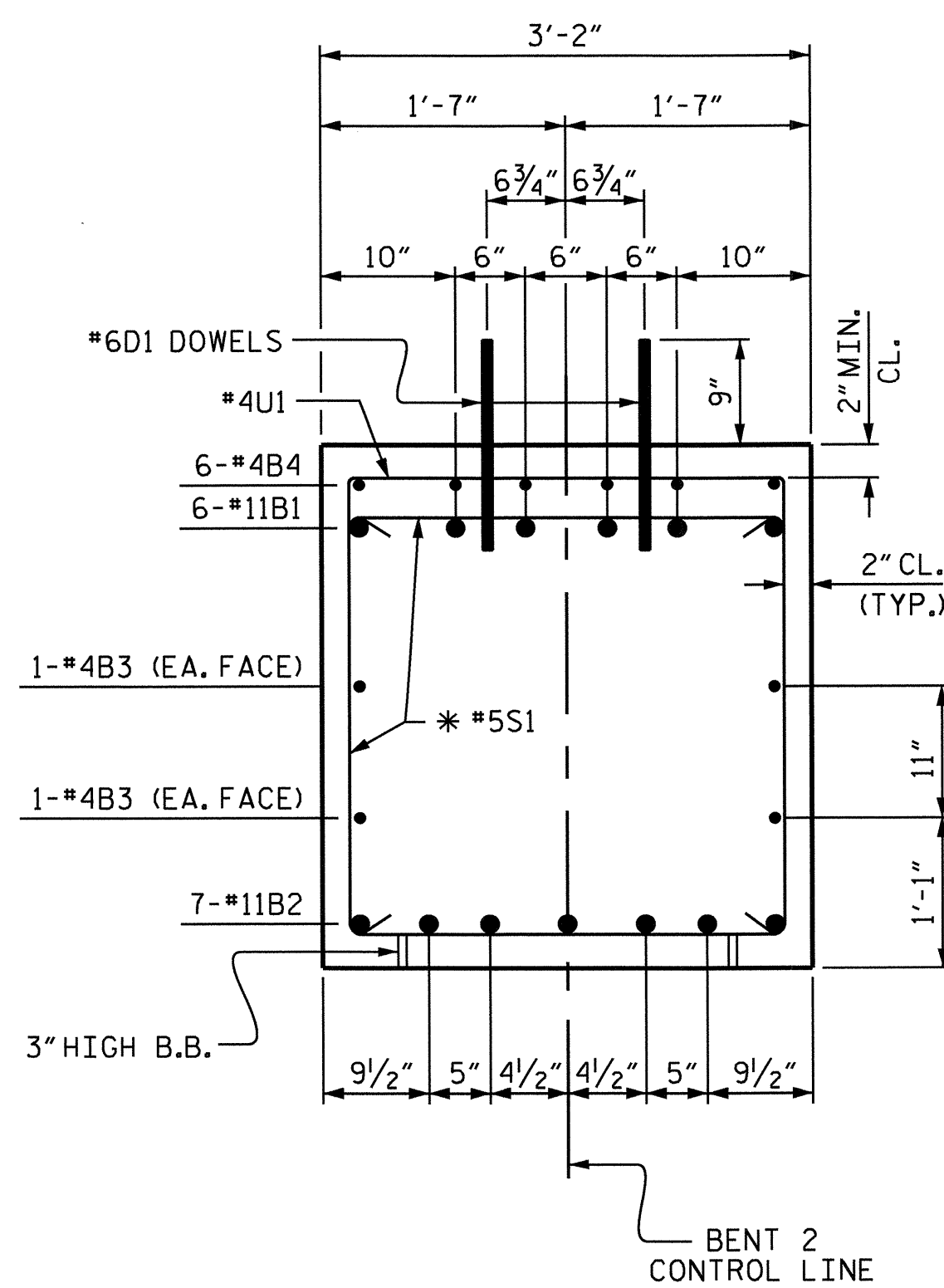
PLAN OF DRILLED PIERS
(TYP.)

PLAN OF COLUMNS
(TYP.)

PLAN OF COLUMNS AND DRILLED PIERS



END OF CAP DETAIL
(TYP. EA. END)

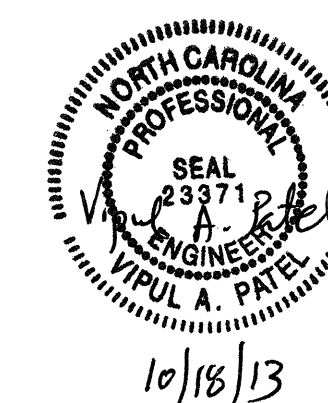


SECTION THRU CAP
* INVERT ALTERNATE STIRRUPS

BAR TYPES						BILL OF MATERIAL																																																																																
						<p align="center">BENT 2</p> <table border="1"> <thead> <tr> <th>BAR NO.</th> <th>SIZE</th> <th>TYPE</th> <th>LENGTH</th> <th>WEIGHT</th> </tr> </thead> <tbody> <tr><td>B1</td><td>#11</td><td>1</td><td>43'-1"</td><td>2747</td></tr> <tr><td>B2</td><td>#11</td><td>STR</td><td>39'-7"</td><td>2944</td></tr> <tr><td>B3</td><td>#4</td><td>STR</td><td>24'-9"</td><td>198</td></tr> <tr><td>B4</td><td>#4</td><td>STR</td><td>19'-9"</td><td>158</td></tr> <tr><td>D1</td><td>#6</td><td>STR</td><td>1'-6"</td><td>171</td></tr> <tr><td>M1</td><td>#9</td><td>STR</td><td>48'-6"</td><td>2309</td></tr> <tr><td>M2</td><td>#9</td><td>STR</td><td>50'-6"</td><td>2404</td></tr> <tr><td>M3</td><td>#9</td><td>STR</td><td>52'-6"</td><td>2499</td></tr> <tr><td>M4</td><td>#9</td><td>STR</td><td>54'-6"</td><td>2594</td></tr> <tr><td>S1</td><td>#5</td><td>3</td><td>9'-0"</td><td>1023</td></tr> <tr><td>U1</td><td>#4</td><td>4</td><td>5'-10"</td><td>97</td></tr> <tr><td>U2</td><td>#4</td><td>4</td><td>5'-8"</td><td>23</td></tr> <tr><td>U3</td><td>#4</td><td>4</td><td>5'-6"</td><td>22</td></tr> <tr><td>V1</td><td>#9</td><td>1</td><td>8'-1"</td><td>1539</td></tr> </tbody> </table>						BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	B1	#11	1	43'-1"	2747	B2	#11	STR	39'-7"	2944	B3	#4	STR	24'-9"	198	B4	#4	STR	19'-9"	158	D1	#6	STR	1'-6"	171	M1	#9	STR	48'-6"	2309	M2	#9	STR	50'-6"	2404	M3	#9	STR	52'-6"	2499	M4	#9	STR	54'-6"	2594	S1	#5	3	9'-0"	1023	U1	#4	4	5'-10"	97	U2	#4	4	5'-8"	23	U3	#4	4	5'-6"	22	V1	#9	1	8'-1"	1539
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT																																																																																		
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						<p>TOTAL REINFORCING STEEL LBS 18728</p> <table border="1"> <thead> <tr> <th>SP-1</th> <th>SP-2</th> <th>SP-3</th> <th>SP-4</th> <th>SP-5</th> <th>REINFORCING STEEL</th> <th>LBS</th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>657'-4"</td><td>686</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>5</td><td>689'-0"</td><td>719</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>5</td><td>722'-3"</td><td>753</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>5</td><td>753'-10"</td><td>786</td></tr> <tr><td>4</td><td>1</td><td>1</td><td>1</td><td>6</td><td>157'-0"</td><td>420</td></tr> </tbody> </table> <p>TOTAL SPIRAL COLUM REINFORCING STEEL LBS. 3364</p> <p>CLASS A CONCRETE BREAKDOWN</p> <p>POUR #2 (COLUMNS) 3.8 C.Y.</p> <p>POUR #3 (BENT CAP) 27.9 C.Y.</p> <p>TOTAL CLASS A CONCRETE 31.7 C.Y.</p>						SP-1	SP-2	SP-3	SP-4	SP-5	REINFORCING STEEL	LBS	1	1	1	1	4	657'-4"	686	1	1	1	1	5	689'-0"	719	1	1	1	1	5	722'-3"	753	1	1	1	1	5	753'-10"	786	4	1	1	1	6	157'-0"	420																																	
SP-1	SP-2	SP-3	SP-4	SP-5	REINFORCING STEEL	LBS																																																																																
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4	1	1	1	6	157'-0"	420																																																																																
<p>DRILLED PIER QUANTITIES</p> <p>DRILLED PIER CONCRETE</p> <p>POUR #1 (DRILLED PIERS) 46.1 C.Y.</p> <p>3'-0" DIA. DRILLED PIERS IN SOIL 116.0 LIN. FT.</p> <p>3'-0" DIA. DRILLED PIERS NOT IN SOIL 60.0 LIN. FT.</p> <p>PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS 24.0 LIN. FT.</p> <p>SID INSPECTIONS 2 EA.</p> <p>SPT TESTING 1 EA.</p> <p>CSL TUBES 728.0 LIN. FT.</p>						<p>ALL BAR DIMENSIONS ARE OUT TO OUT.</p> <p>** THE SP-1, SP-2, SP-3, & SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.</p> <p>*** THE SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.</p>																																																																																

DRAWN BY : T. H. CARROLL DATE : 05/06/13
 CHECKED BY : R. L. CHESSON DATE : 05/28/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

17-SEP-2013 11:49
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 thcarroll



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

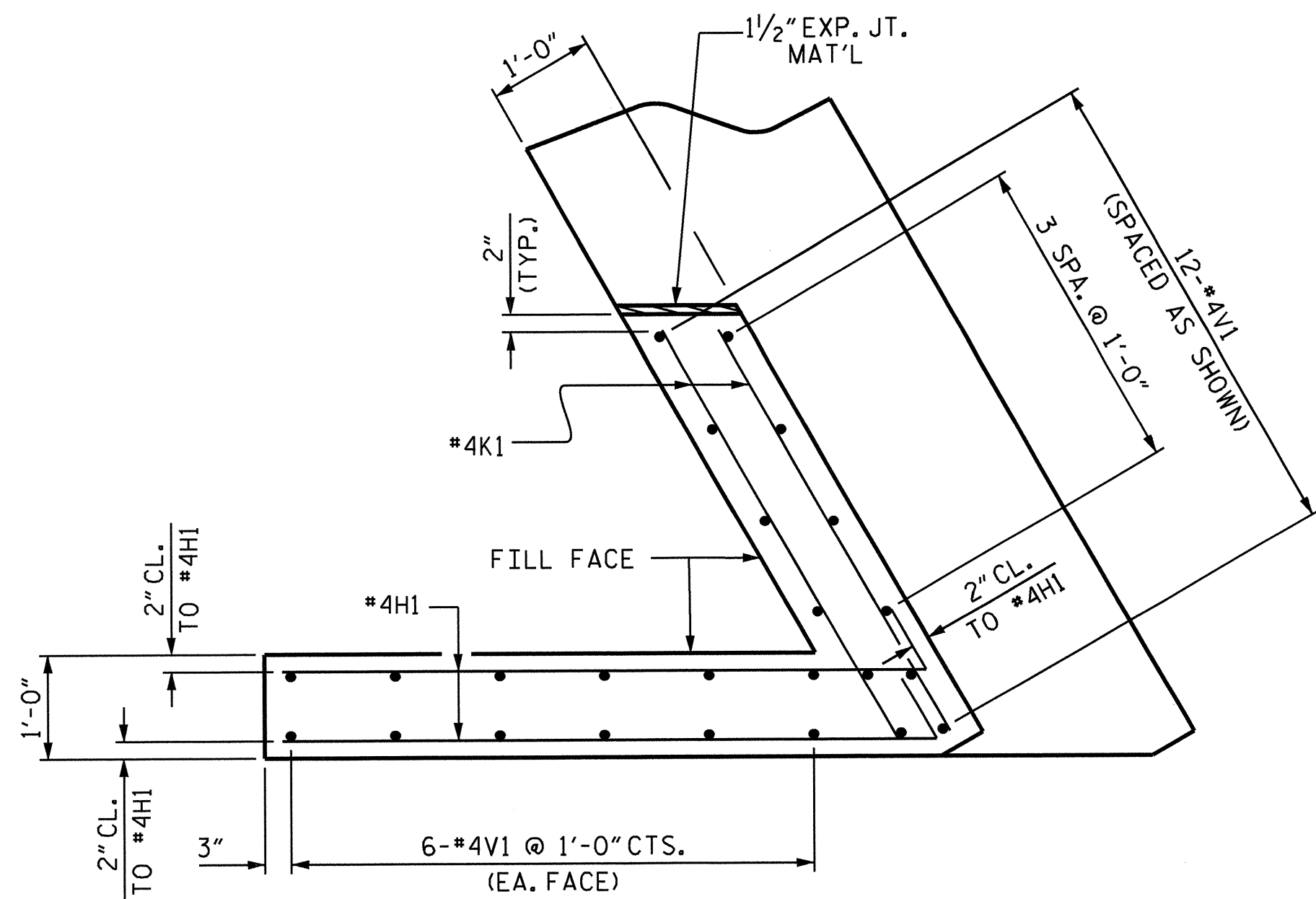
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

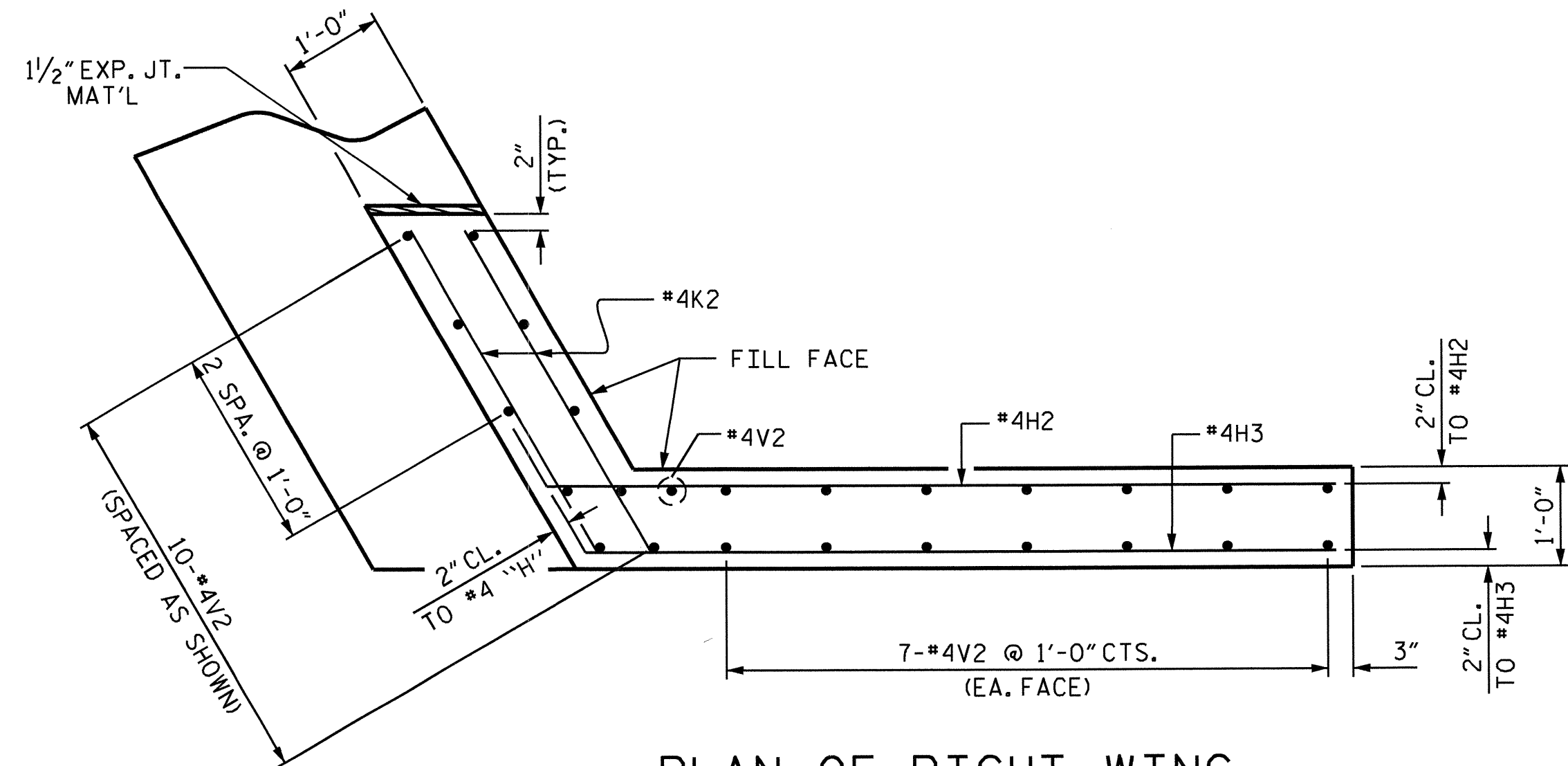
SUBSTRUCTURE
 BENT 2
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 58
2			4			

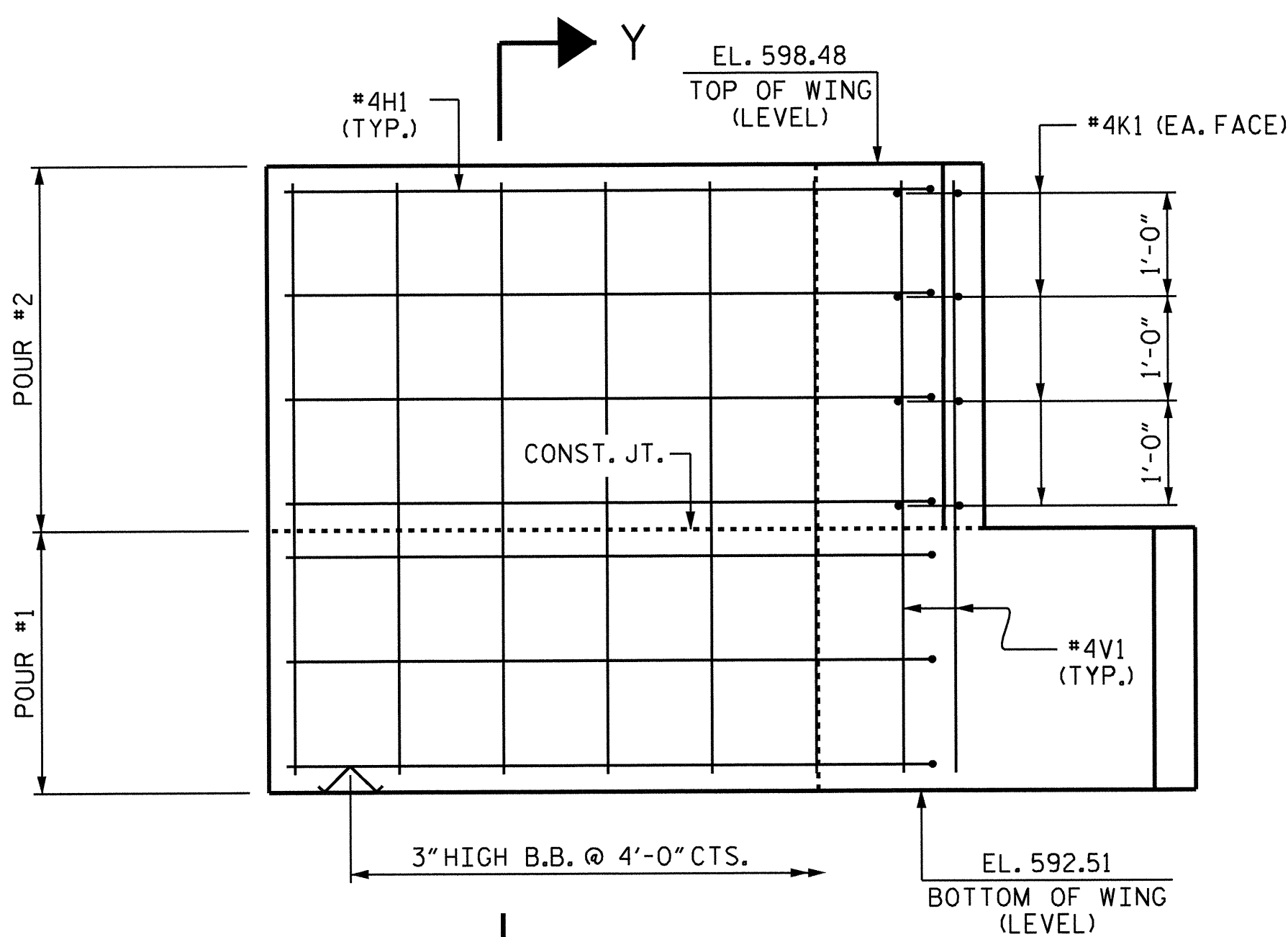
STR. #1



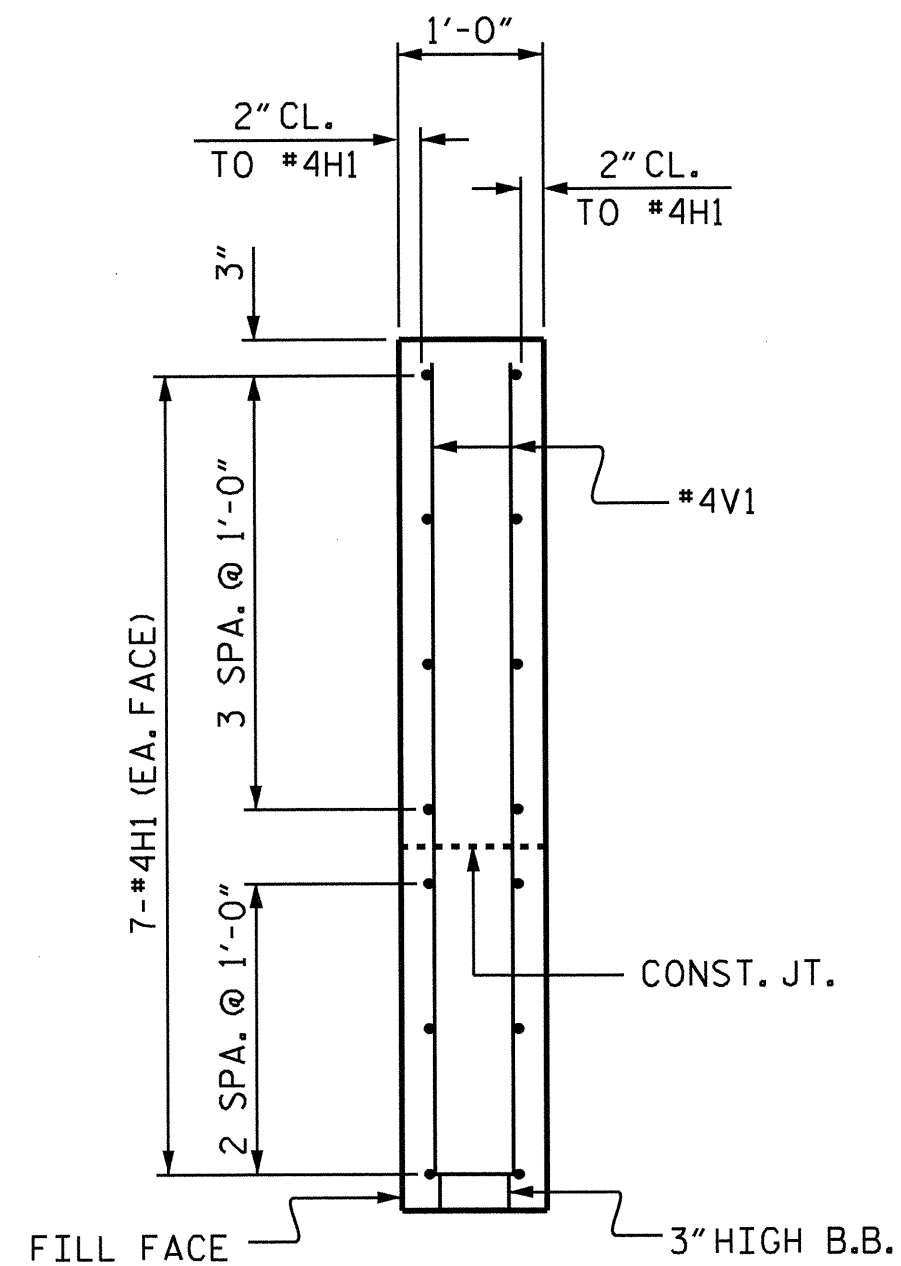
PLAN OF LEFT WING



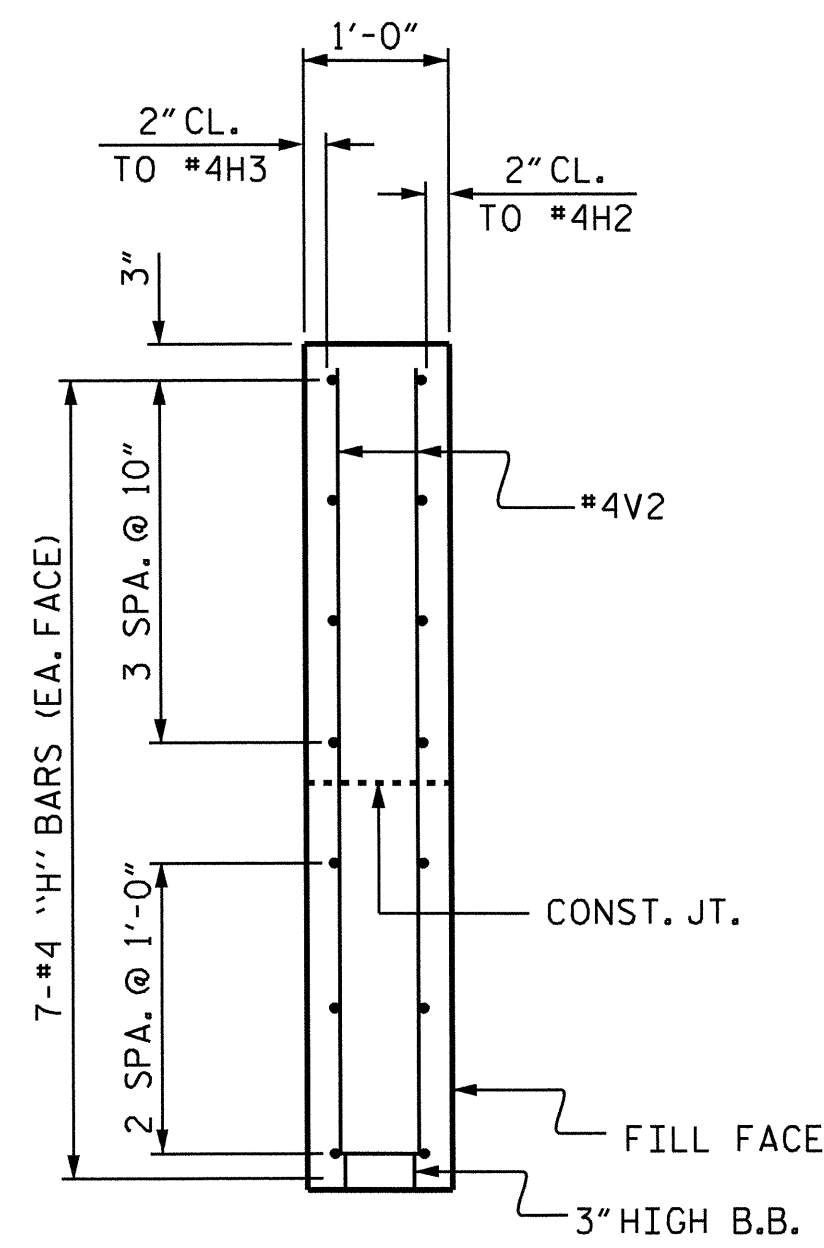
PLAN OF RIGHT WING



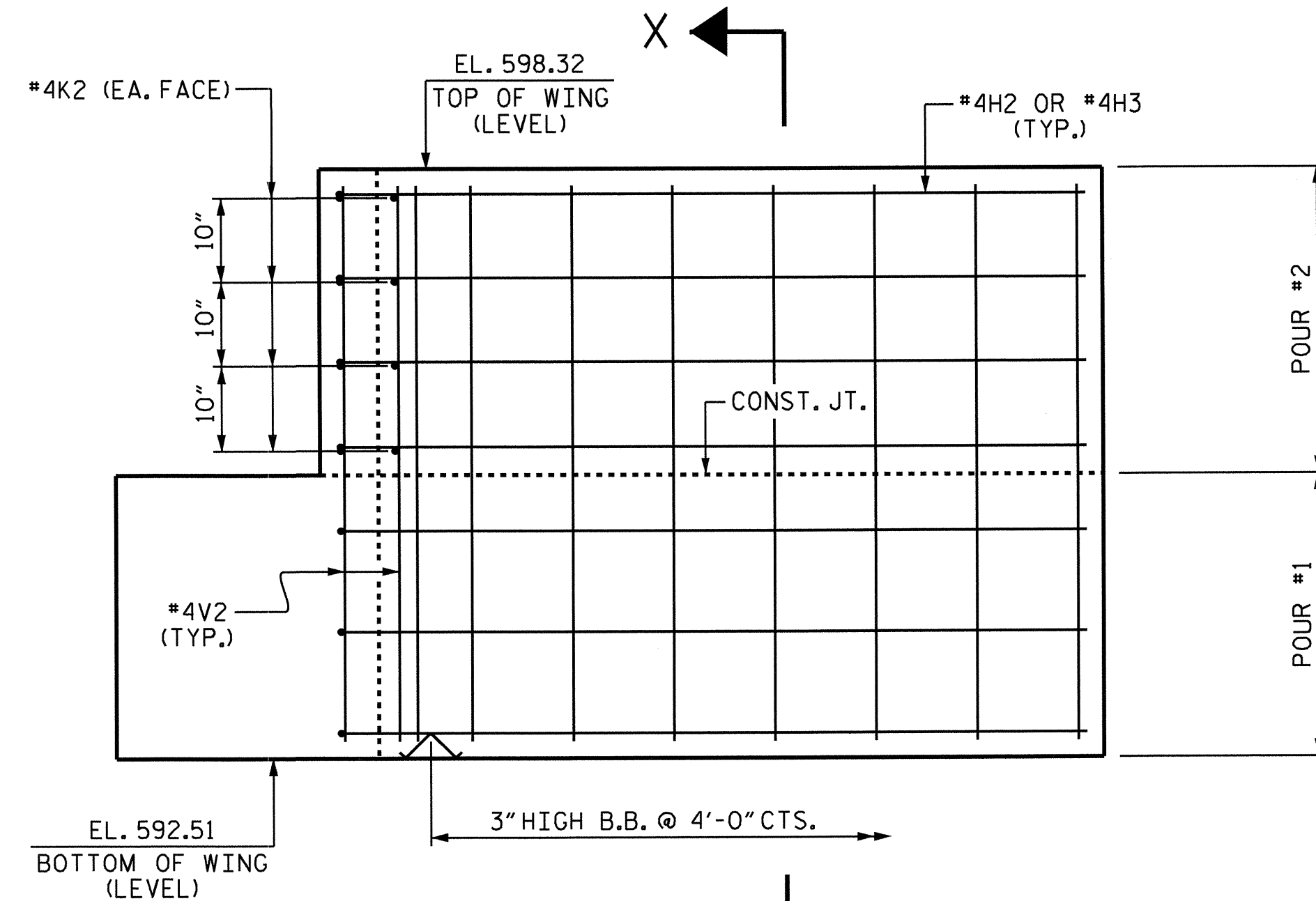
ELEVATION OF LEFT WING



SECTION Y-Y



SECTION X-X



ELEVATION OF RIGHT WING

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2
 (LEFT LANE)



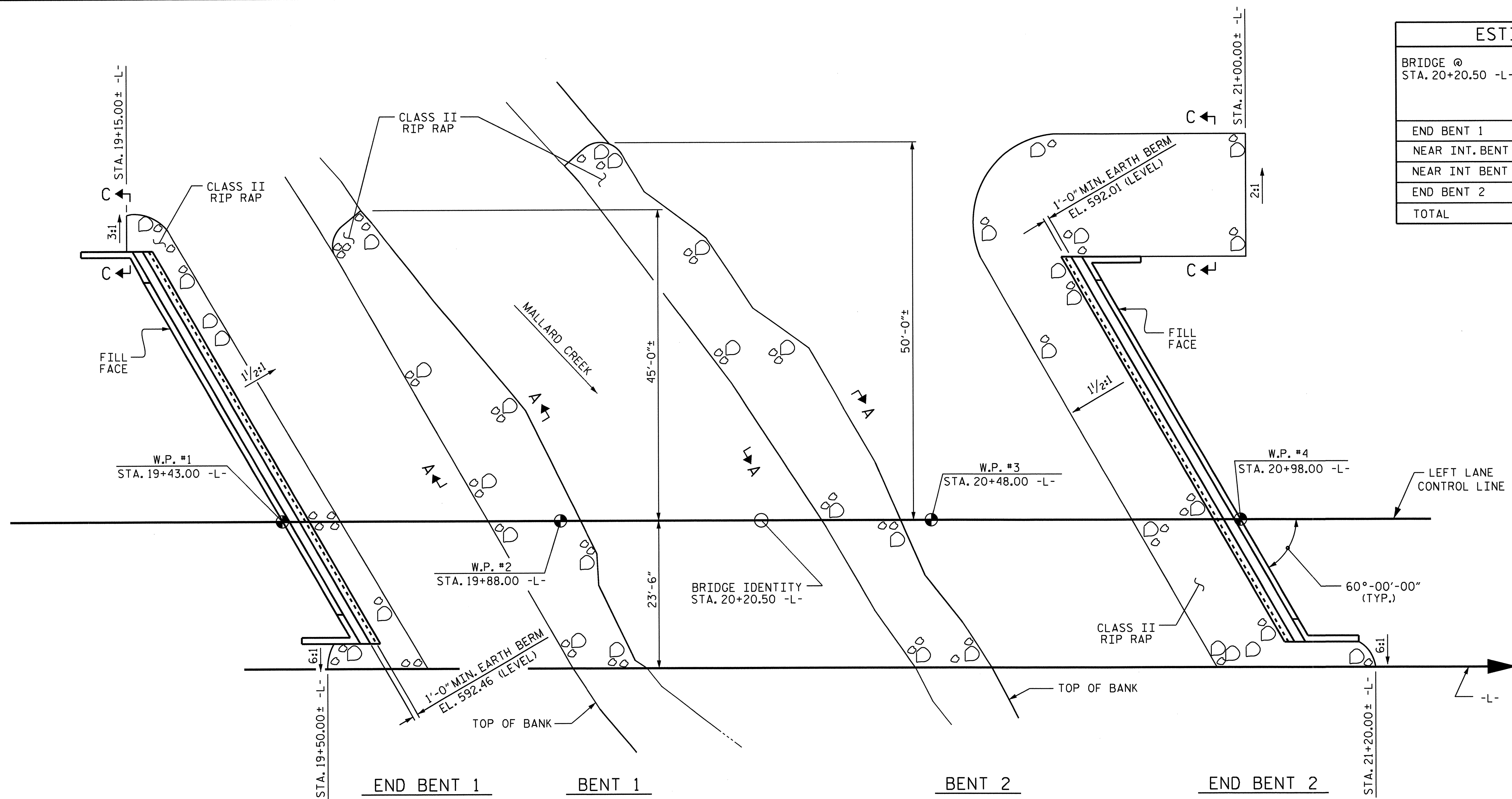
10/18/13

DRAWN BY : T. H. CARROLL DATE : 04/04/13
 CHECKED BY : R. L. CHESSON DATE : 05/30/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

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 thcarroll

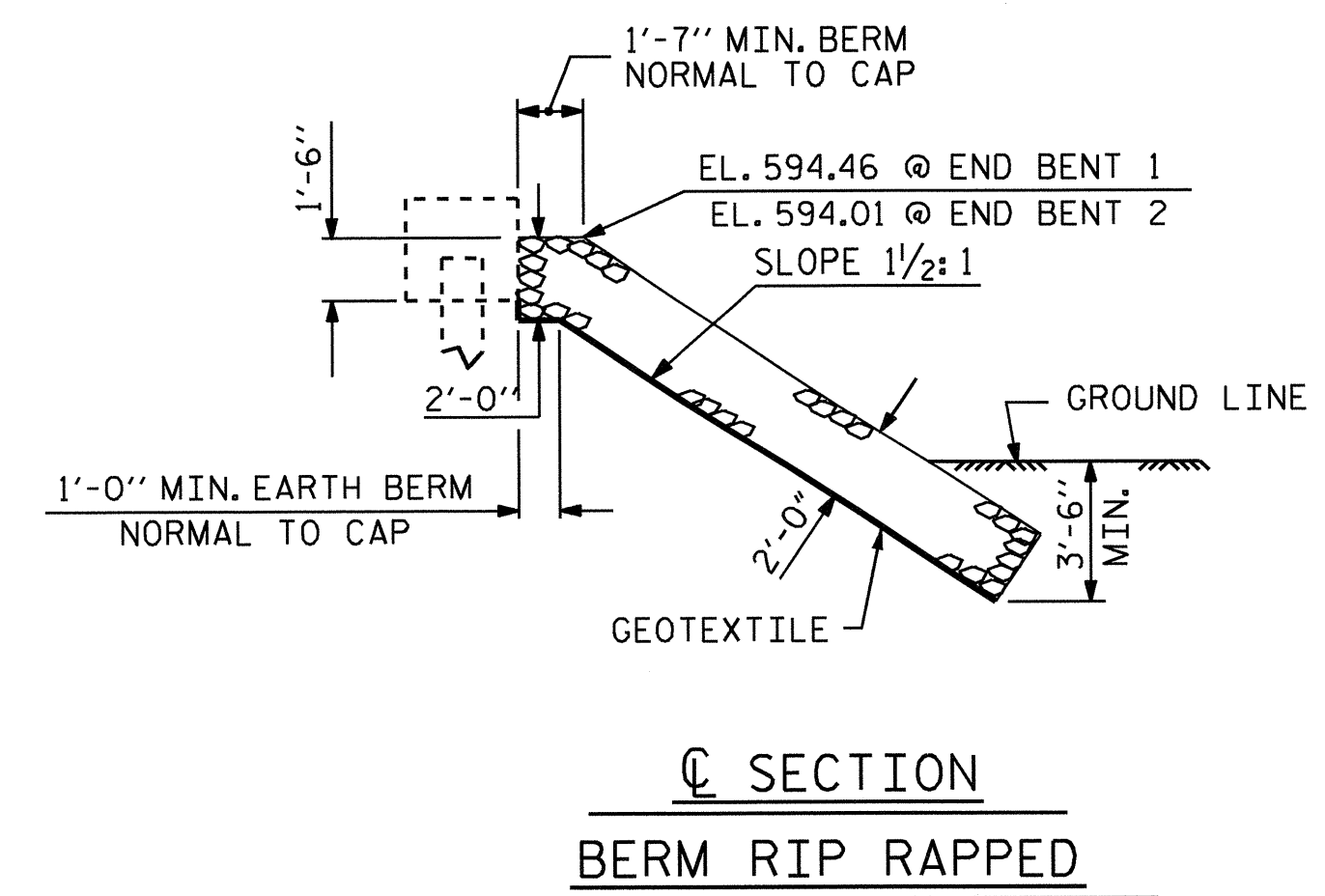
REVISIONS						SHEET NO. S-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

STR. #1

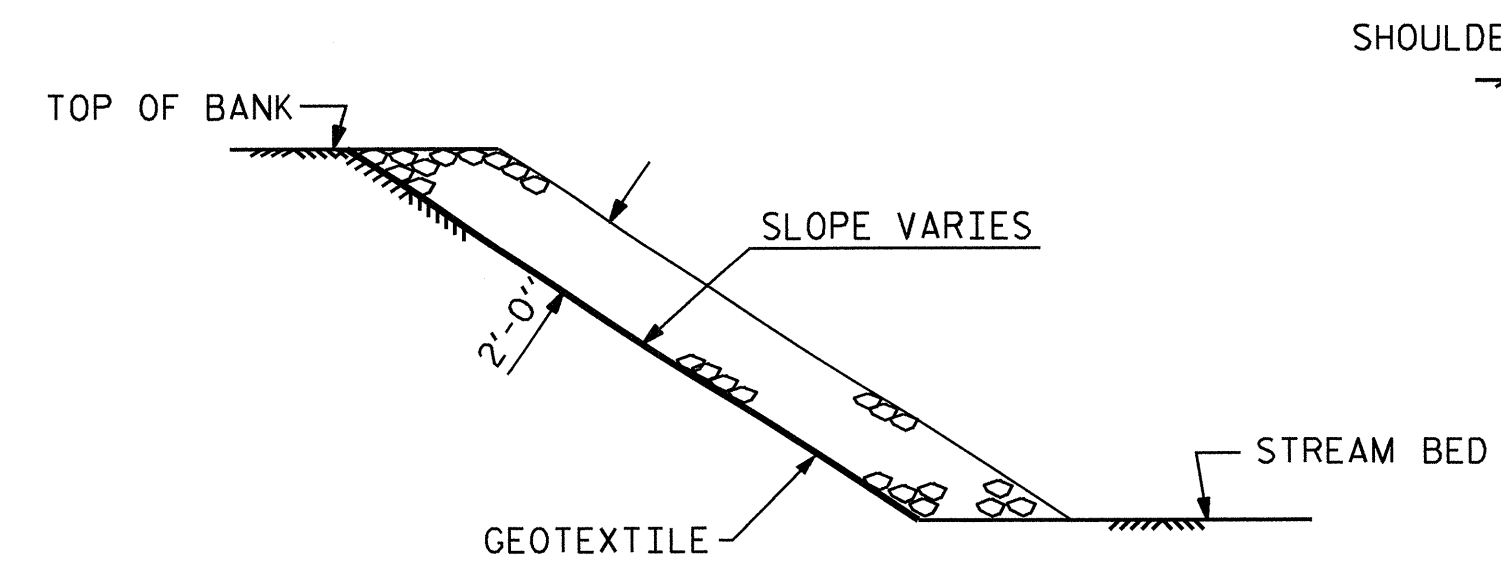


ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+20.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	60	70
NEAR INT. BENT 1	80	120
NEAR INT BENT 2	85	125
END BENT 2	220	245
TOTAL	445	560

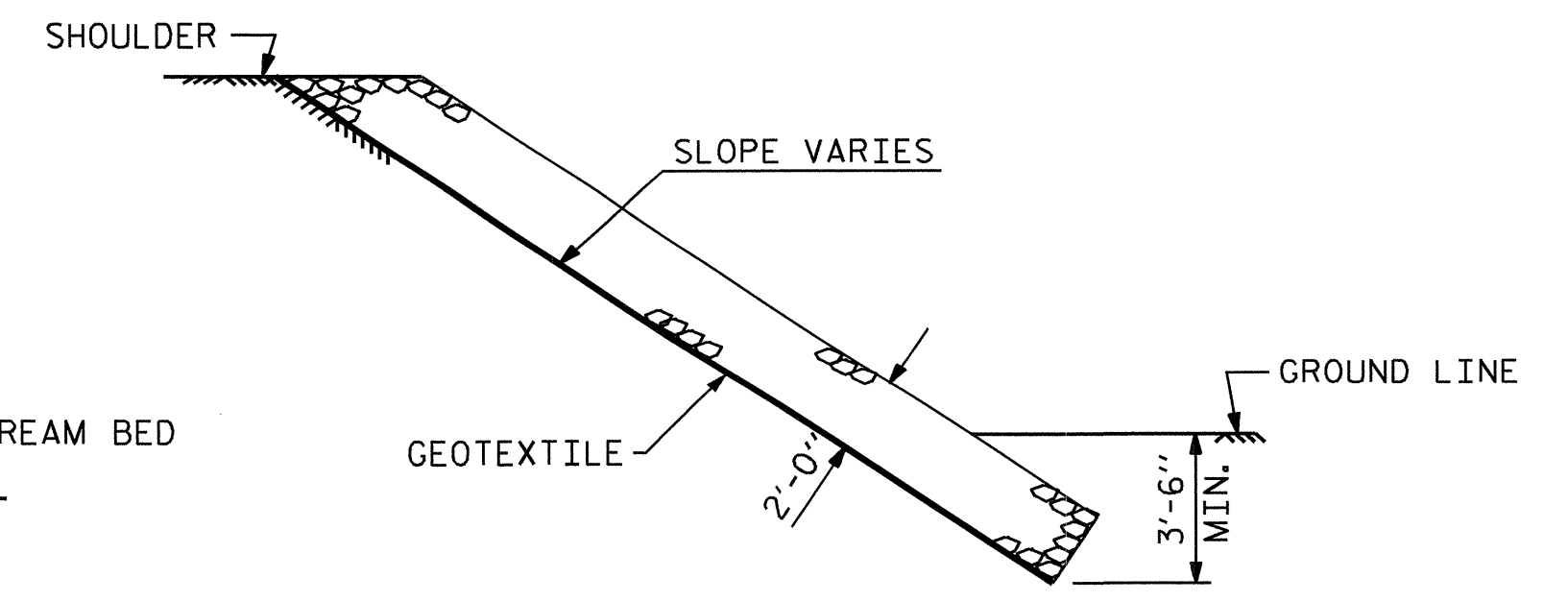
PLAN OF RIP RAP



**SECTION C-C
BERM RIP RAPPED**



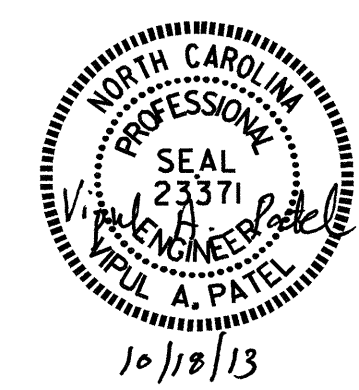
SECTION A-A



SECTION B-B

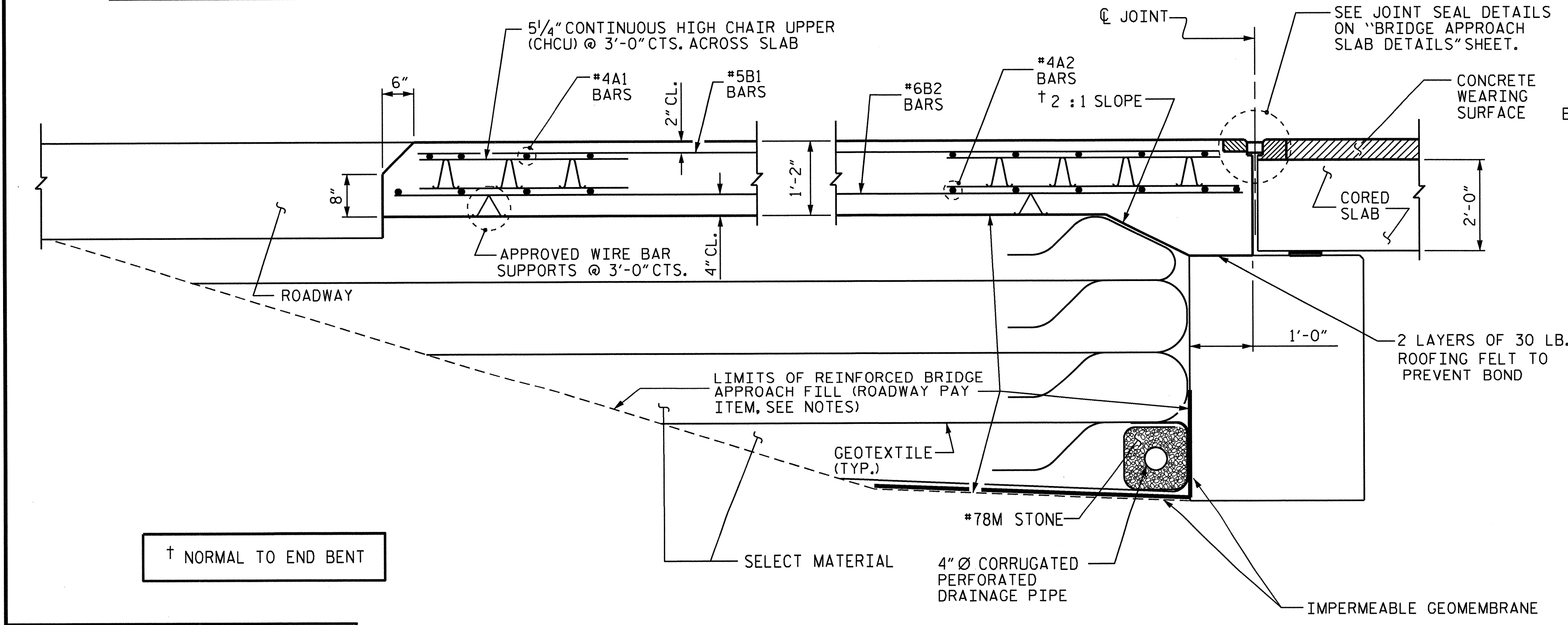
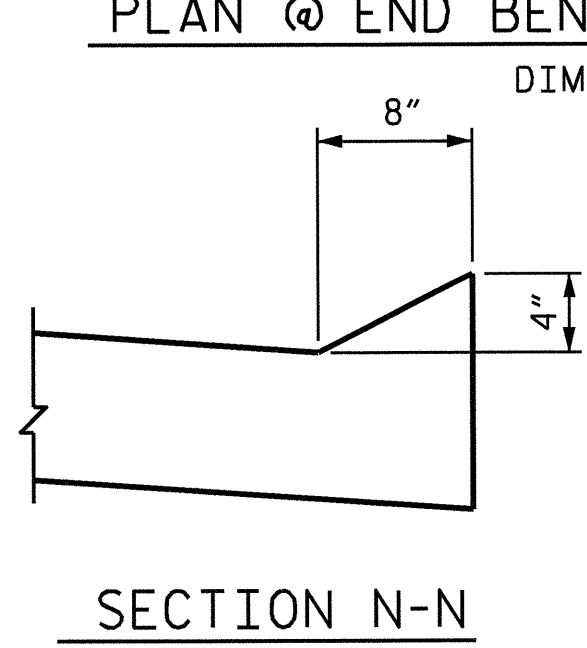
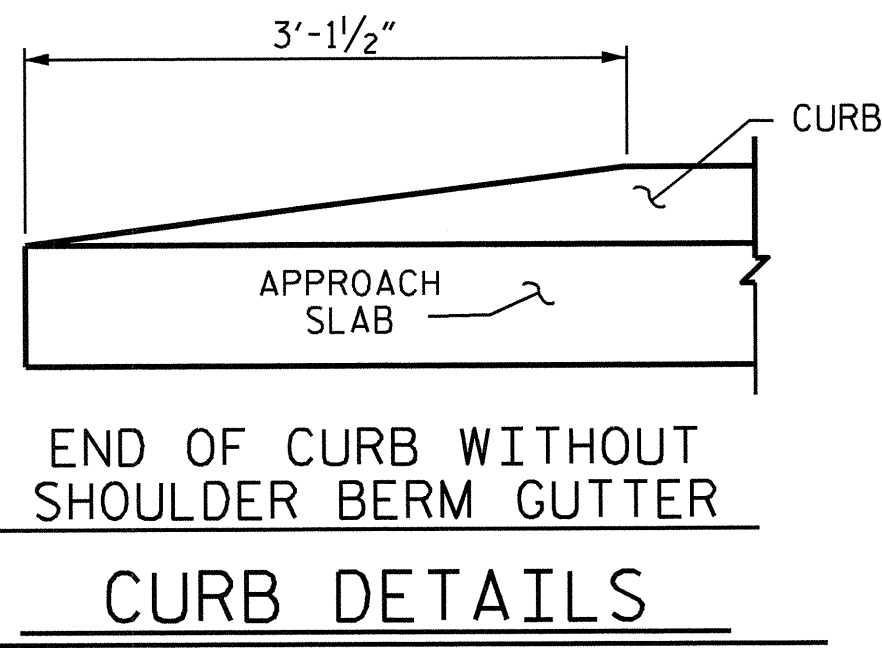
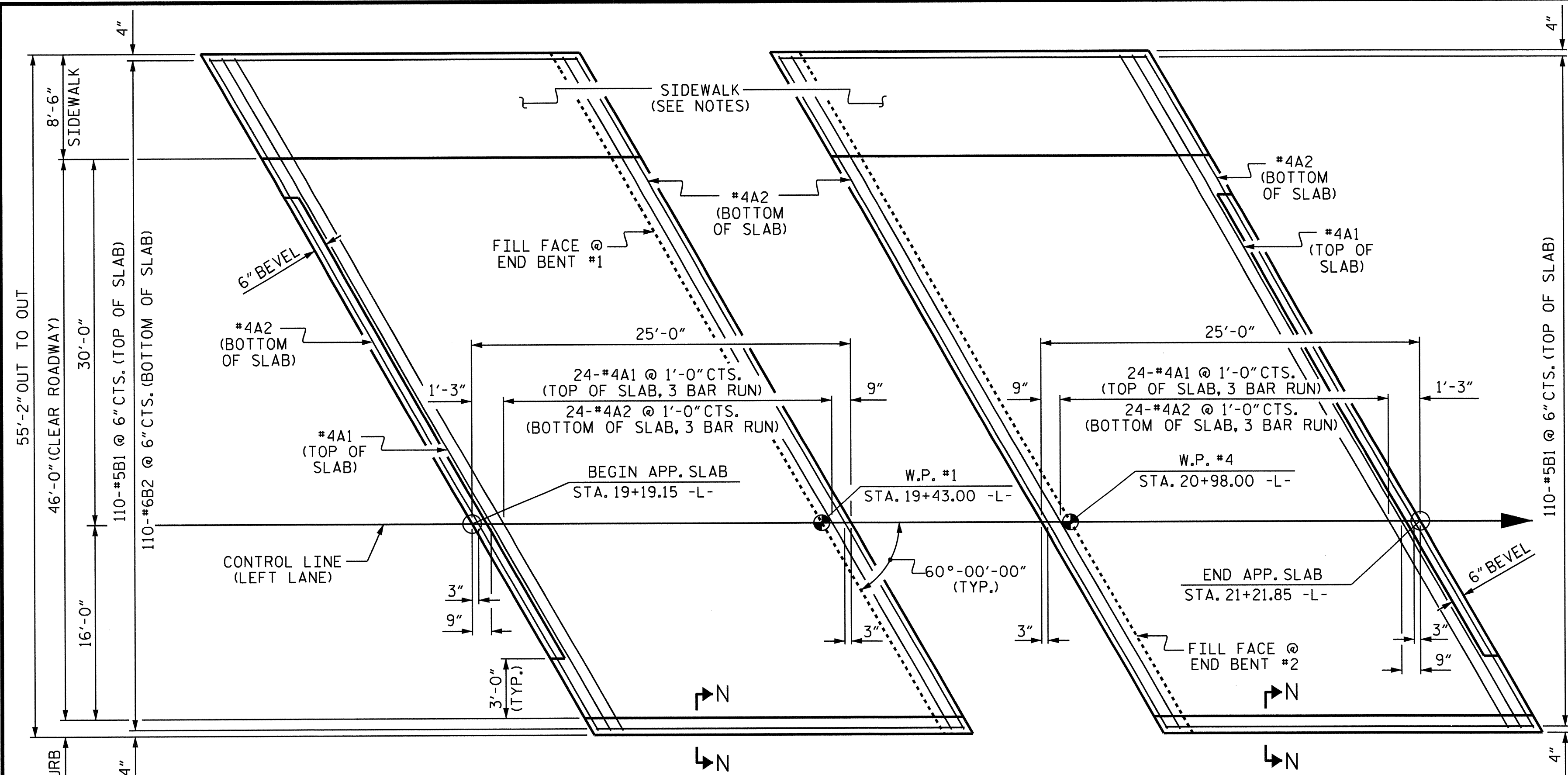
PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 = RIP RAP DETAILS =
 (LEFT LANE)



DRAWN BY : J. G. KHARYA DATE : 10/25/12
 CHECKED BY : T. H. CARROLL DATE : 05/28/13
 DESIGN ENGINEER OF RECORD: V. A. PATE DATE : 09/10/13

REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			



NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMETRIC CONCRETE, SEE SPECIAL PROVISIONS

APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED

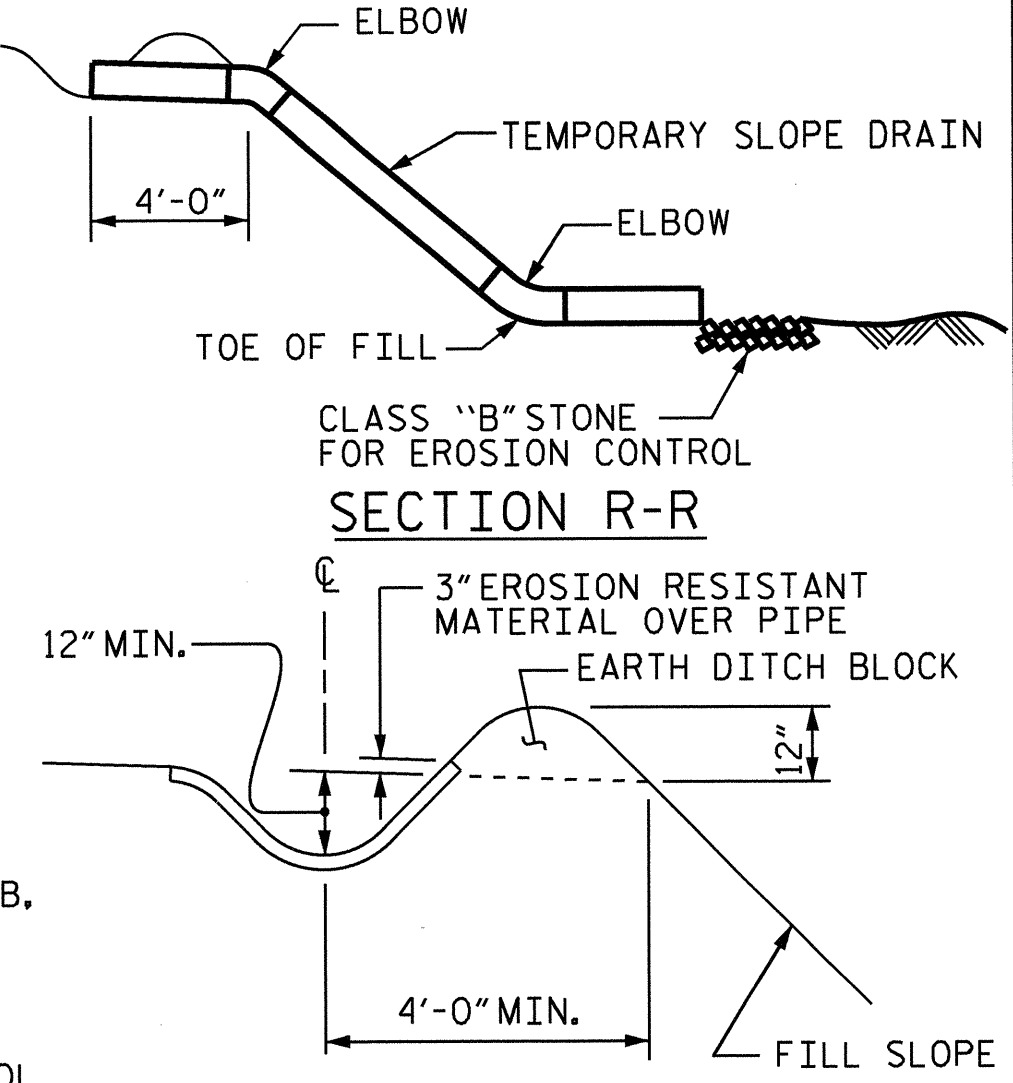
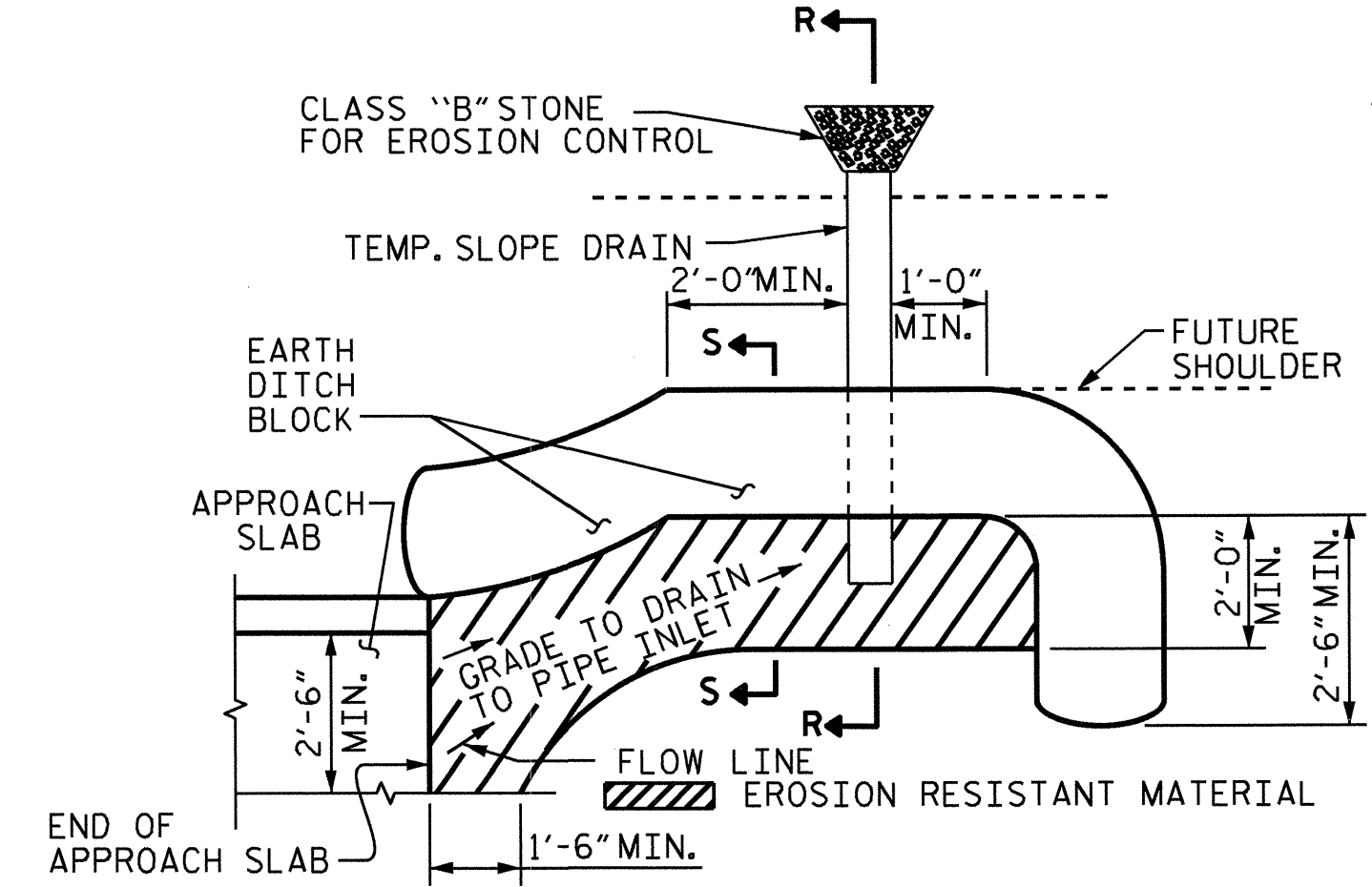
FOR SIDEWALK STEEL REINFORCING DETAILS, SEE "SIDEWALK DETAILS" SHEET

BILL OF MATERIAL FOR ONE APPROACH SLAB (2 REQUIRED)

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	75	#4	STR	22'-6"	1127
A2	78	#4	STR	22'-4"	1164
*B1	110	#5	STR	23'-6"	2696
B2	110	#6	STR	24'-7"	4062
REINFORCING STEEL				LBS.	5226
*EPOXY COATED REINFORCING STEEL				LBS.	3823
CLASS AA CONCRETE				C. Y.	67.9

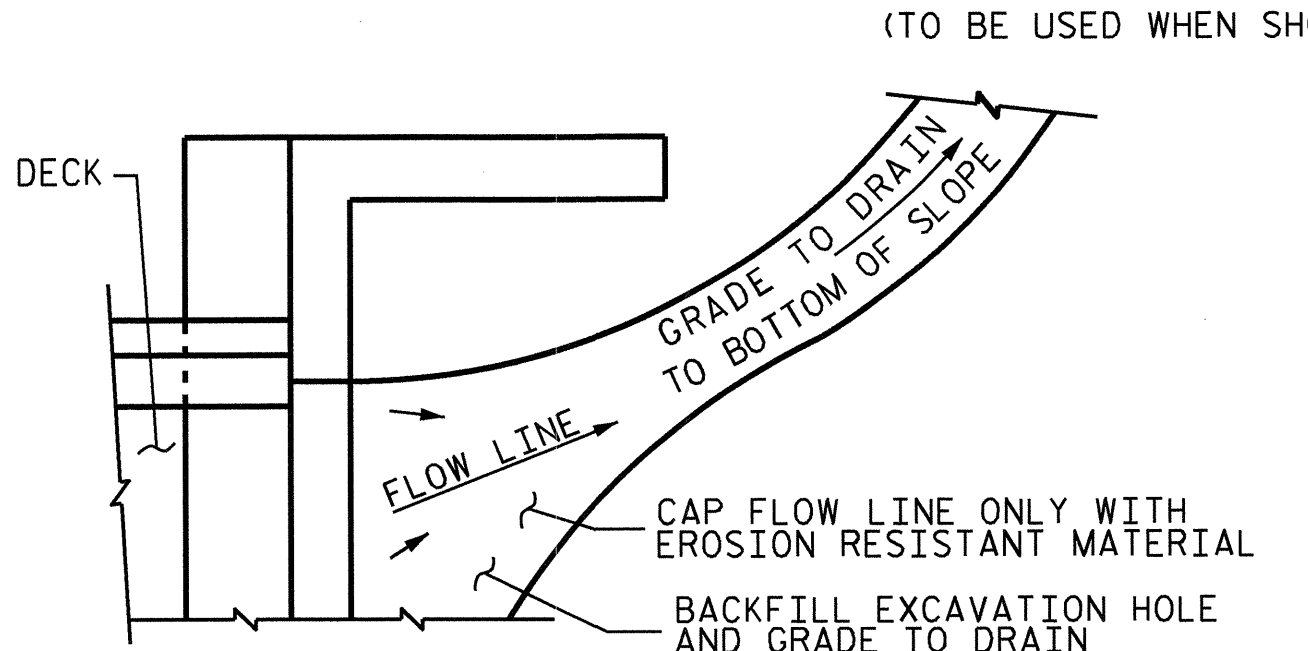
SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"



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

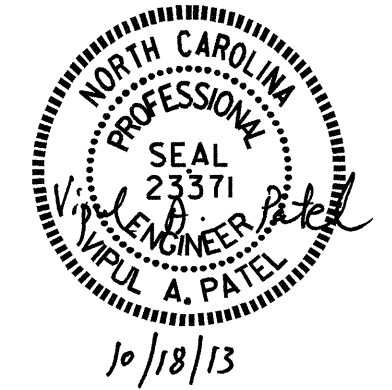
TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.

ASSEMBLED BY : T.H. CARROLL DATE : 10/10/12
 CHECKED BY : J.G. KHARVA DATE : 10/12

DRAWN BY : FCJ 6/87 REV. 5/1/06RR KMM/GM
 CHECKED BY : EGA 6/87 REV. 10/1/11 MAA/GM
 REV. 12/21/11 MAA/GM

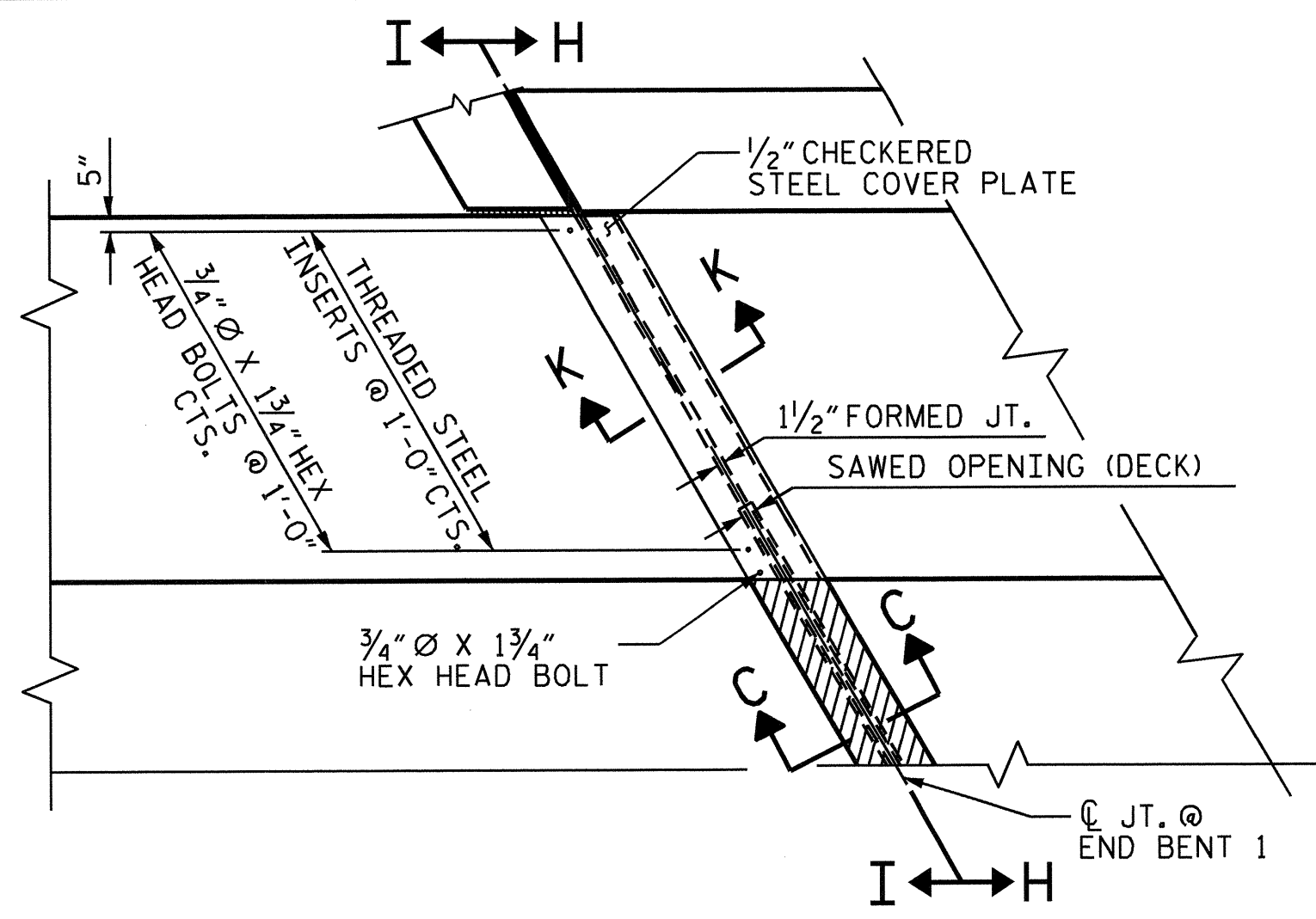


PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+20.50 -L-

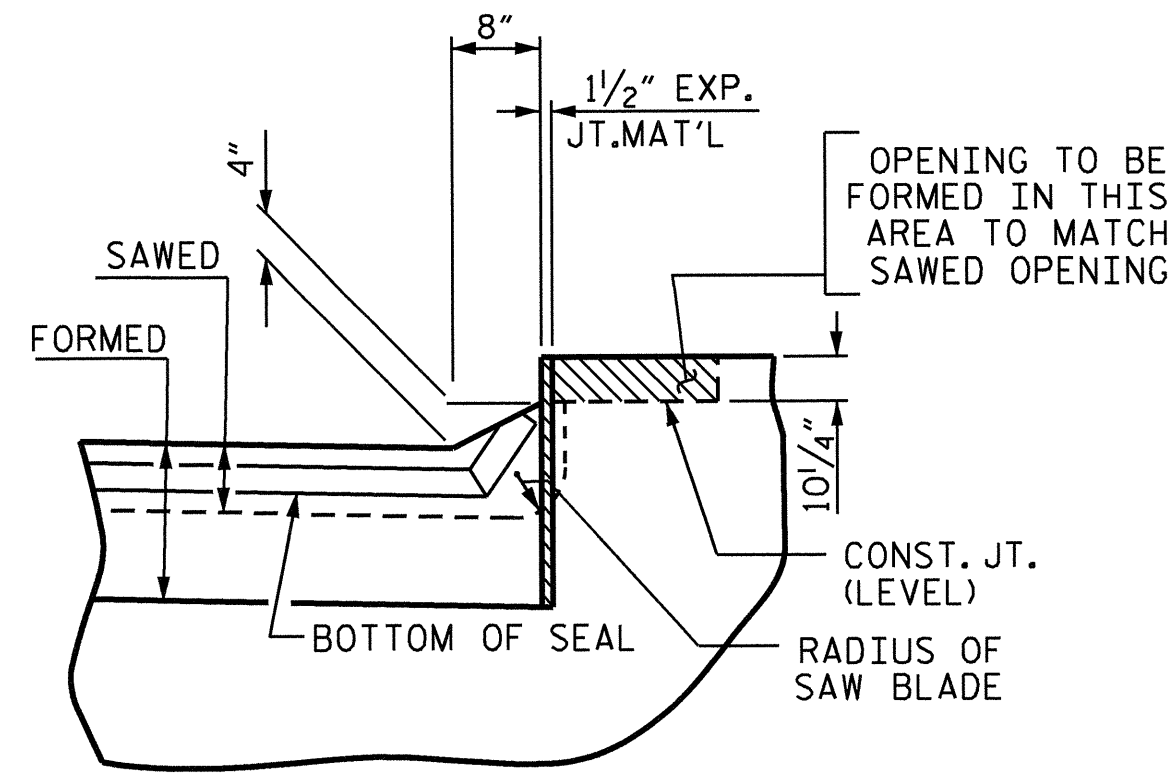
SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB
 (LEFT LANE)

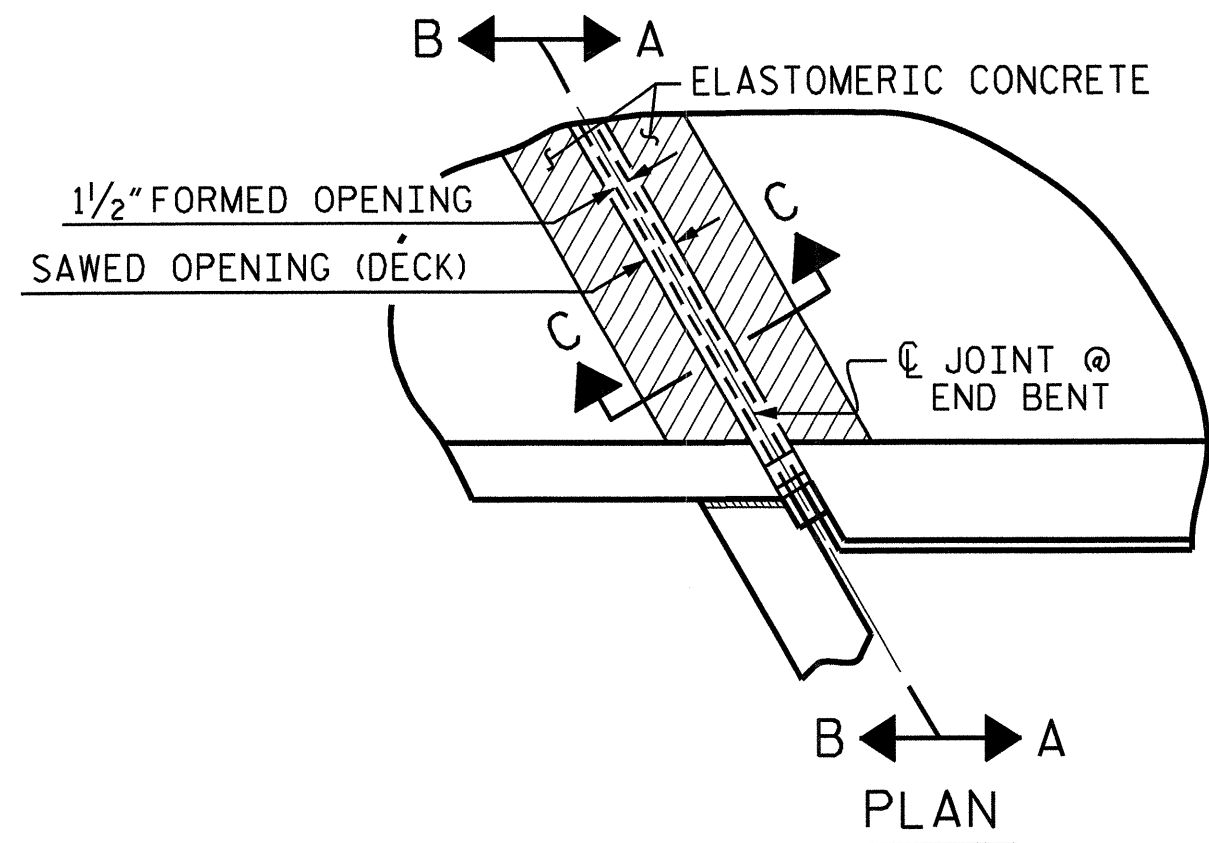
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 58
2			4			



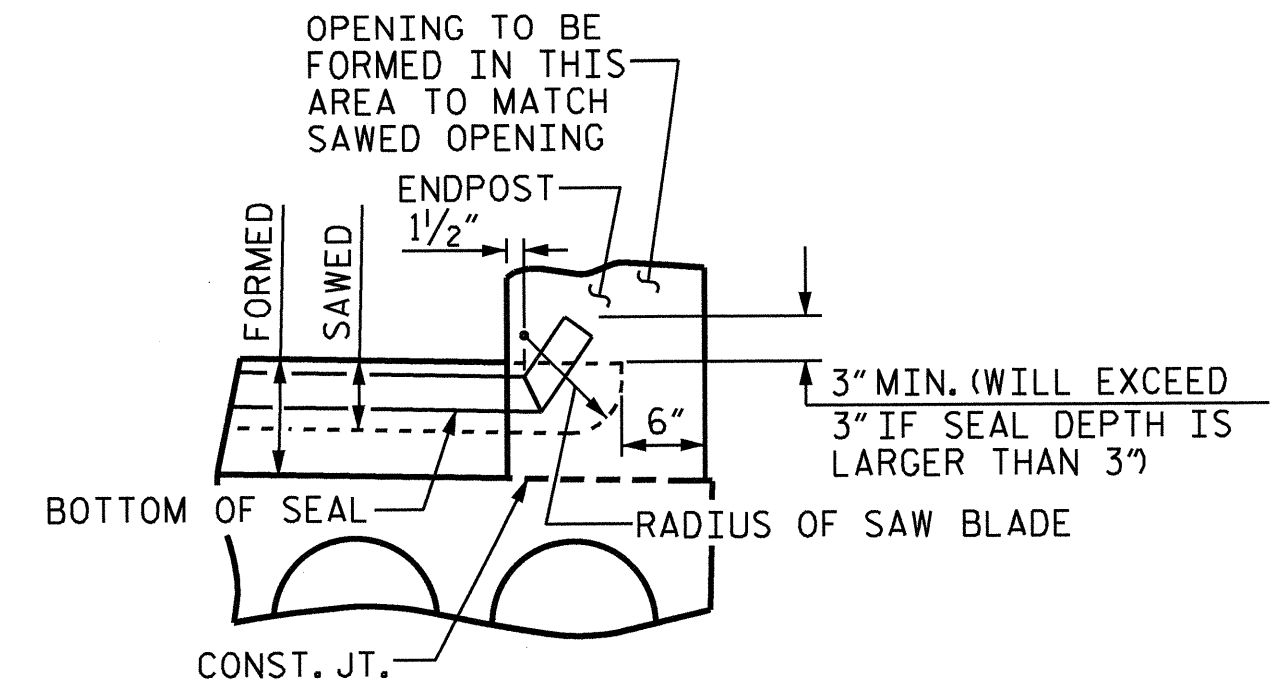
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK



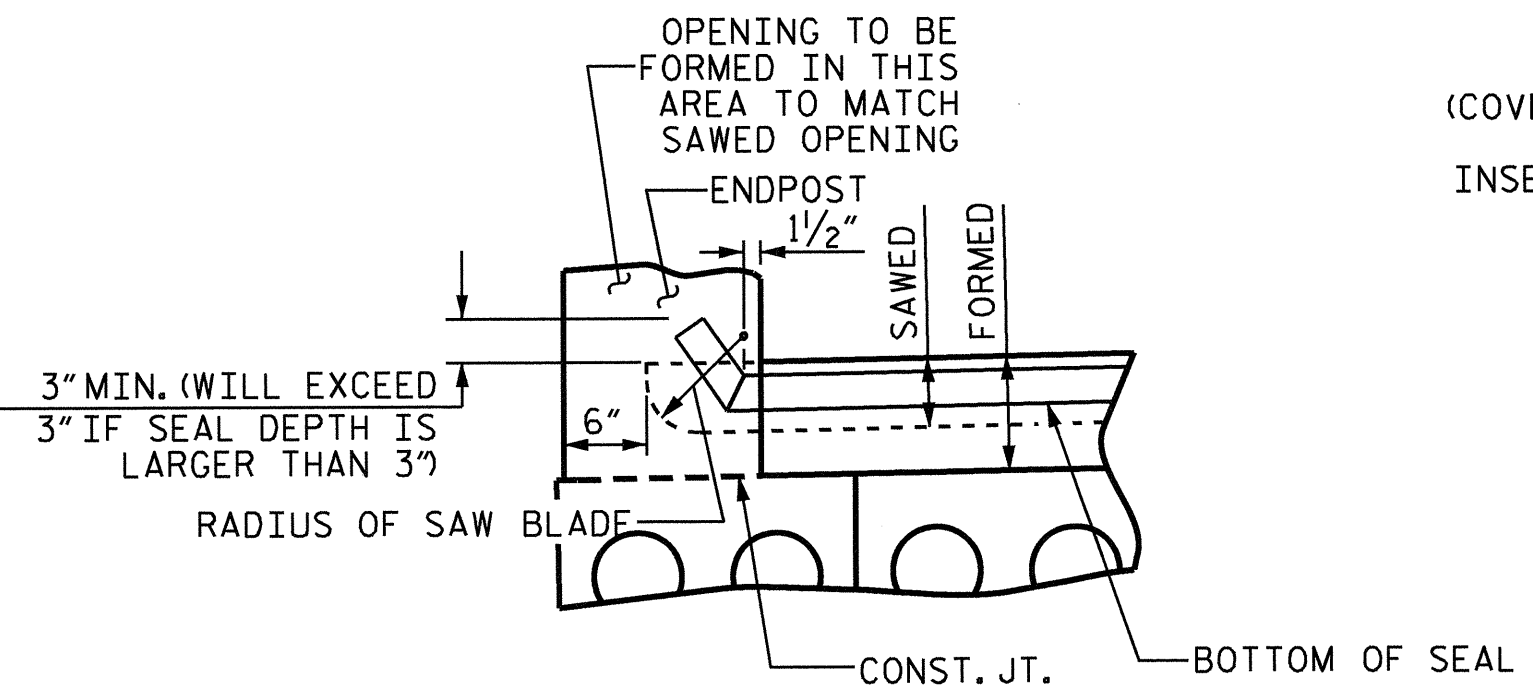
SECTION I-I (WITHOUT SIDEWALK)



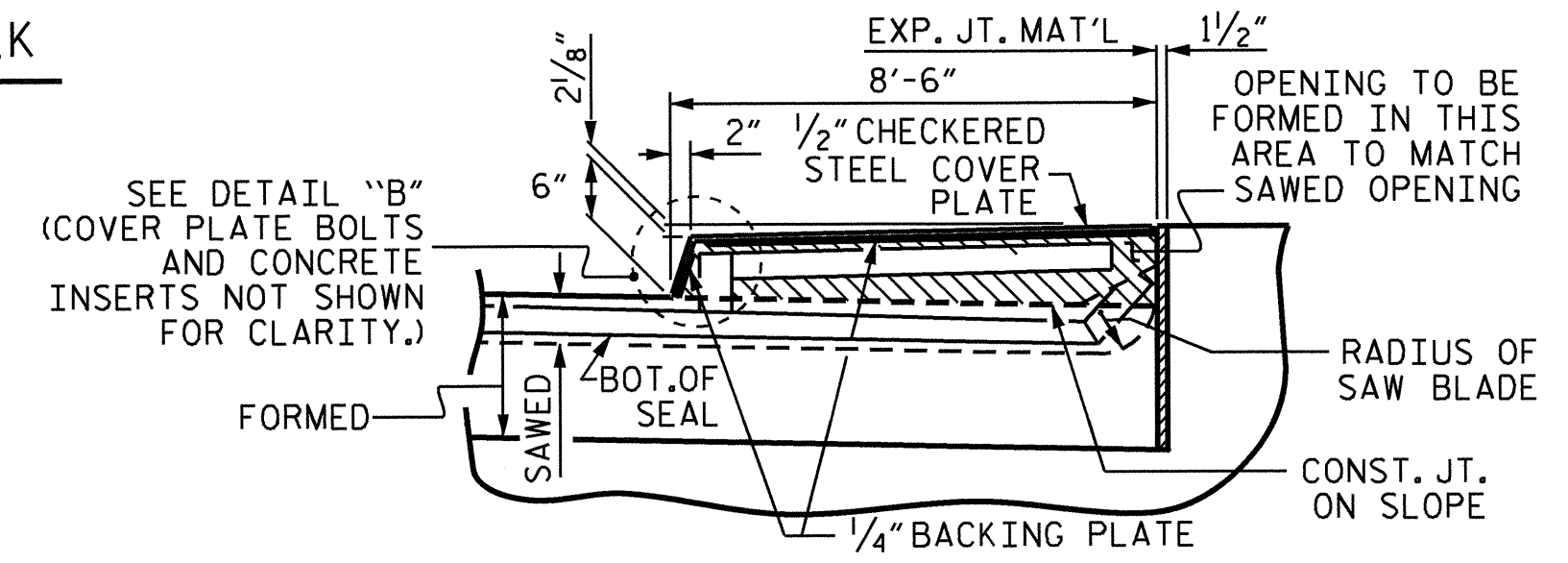
PLAN



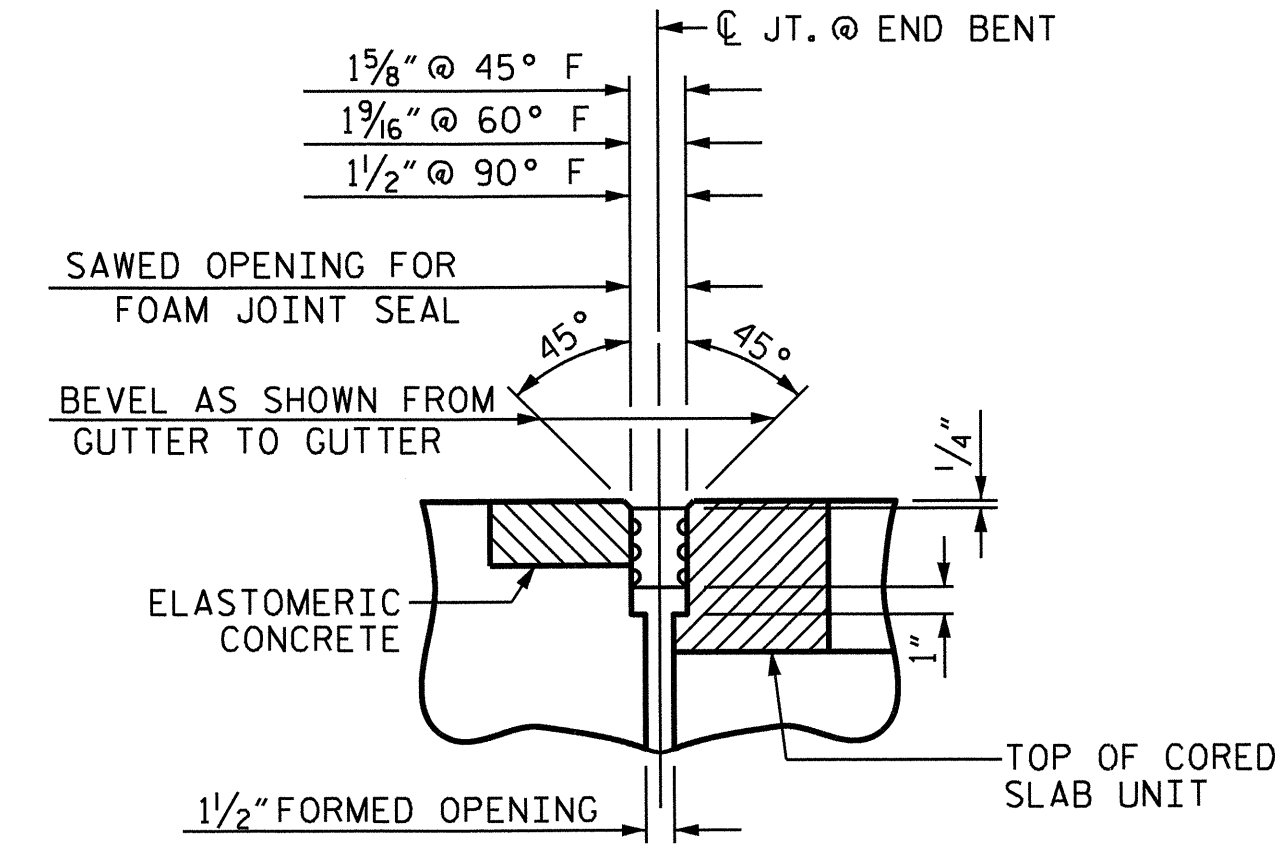
SECTION A-A



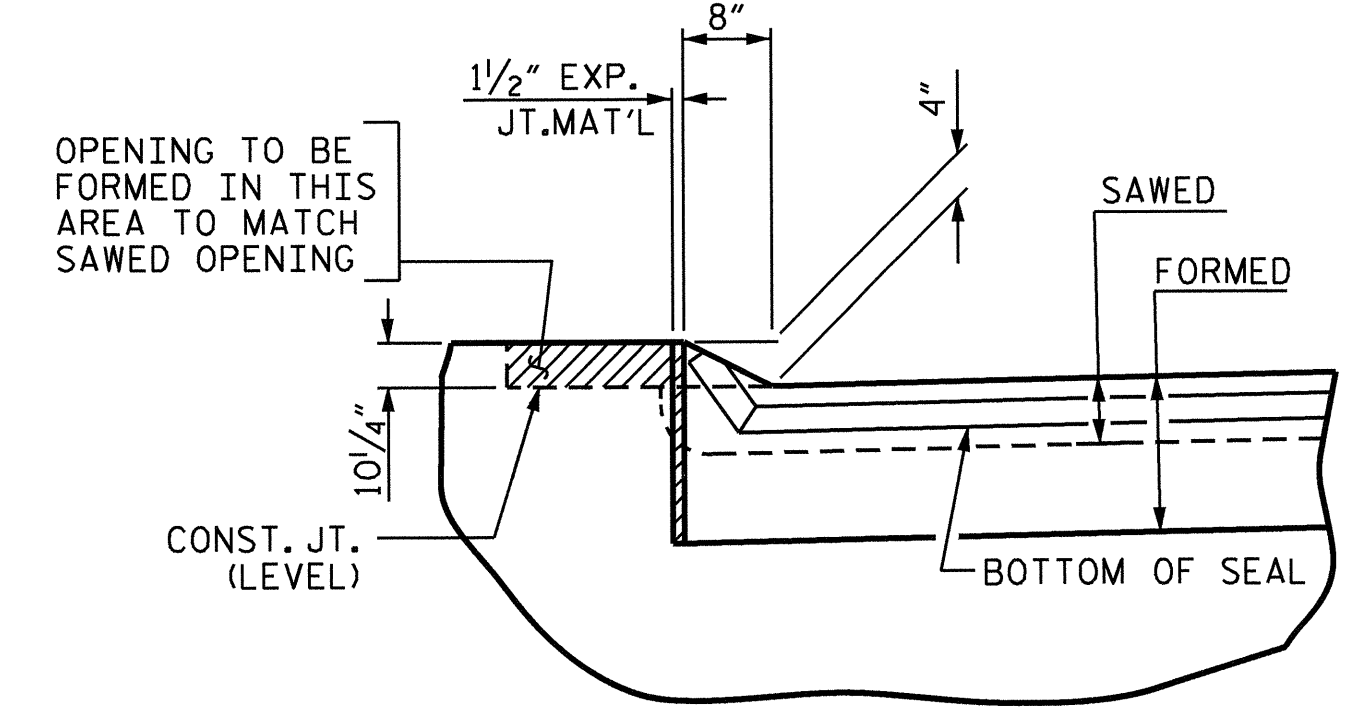
SECTION H-H (WITHOUT SIDEWALK)



SECTION I-I (WITH SIDEWALK)



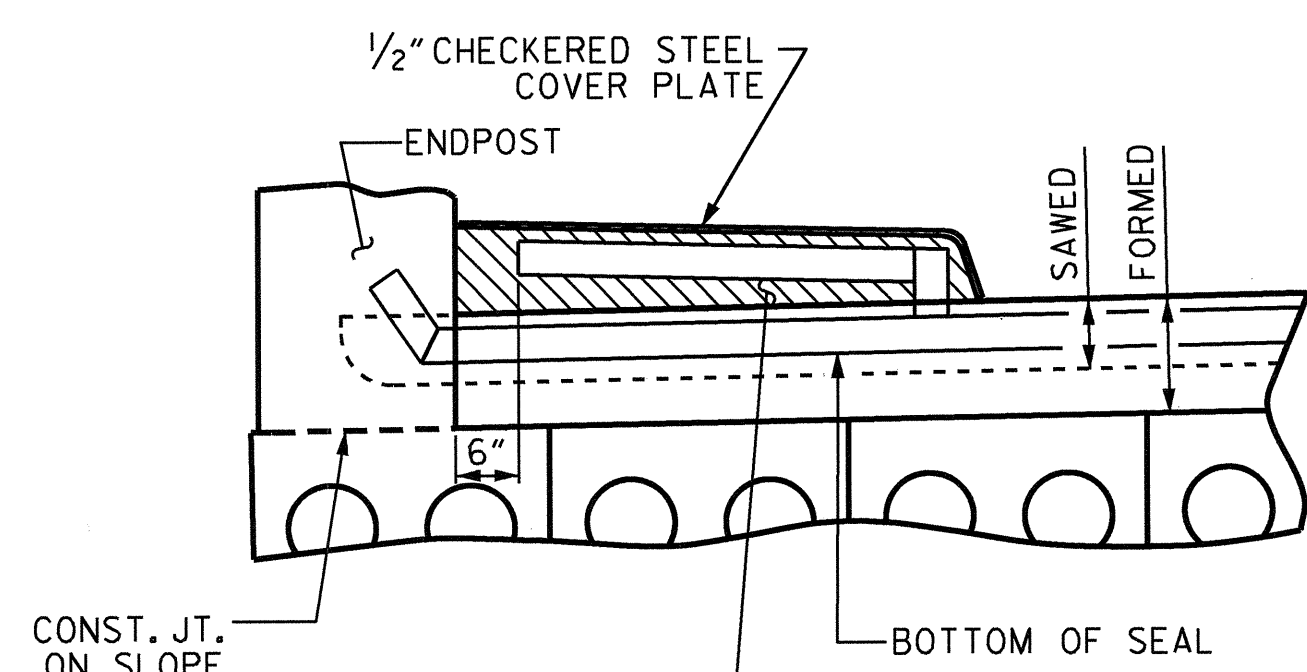
SECTION C-C FOAM JOINT SEAL (EXPANSION)



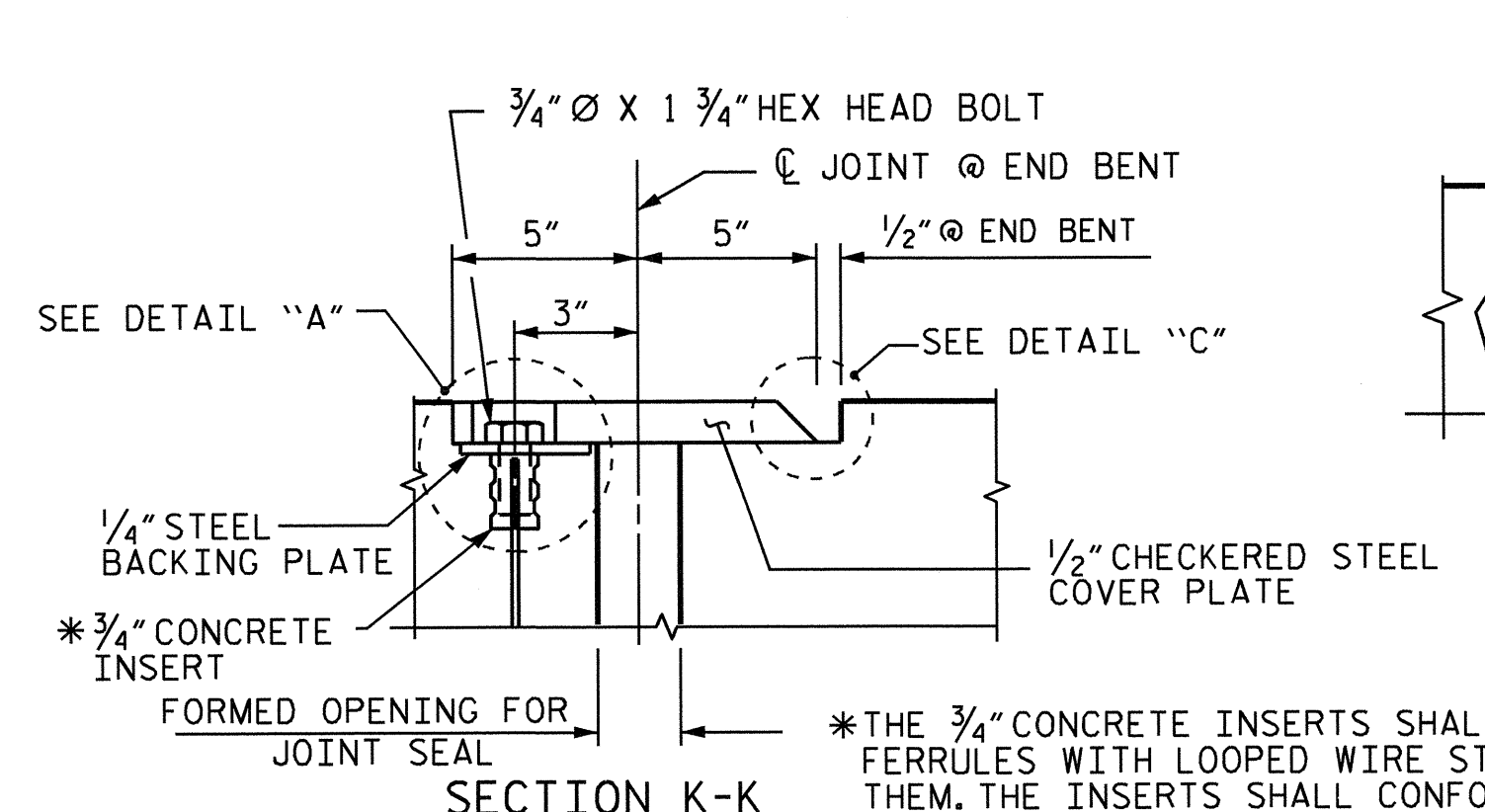
SECTION B-B

JOINT SEAL DETAILS @ END BENT

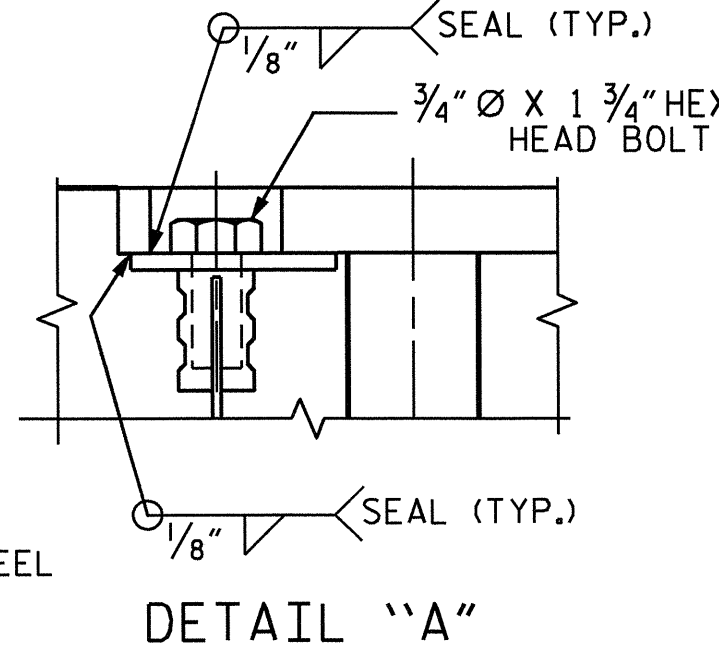
FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE PARAPET.



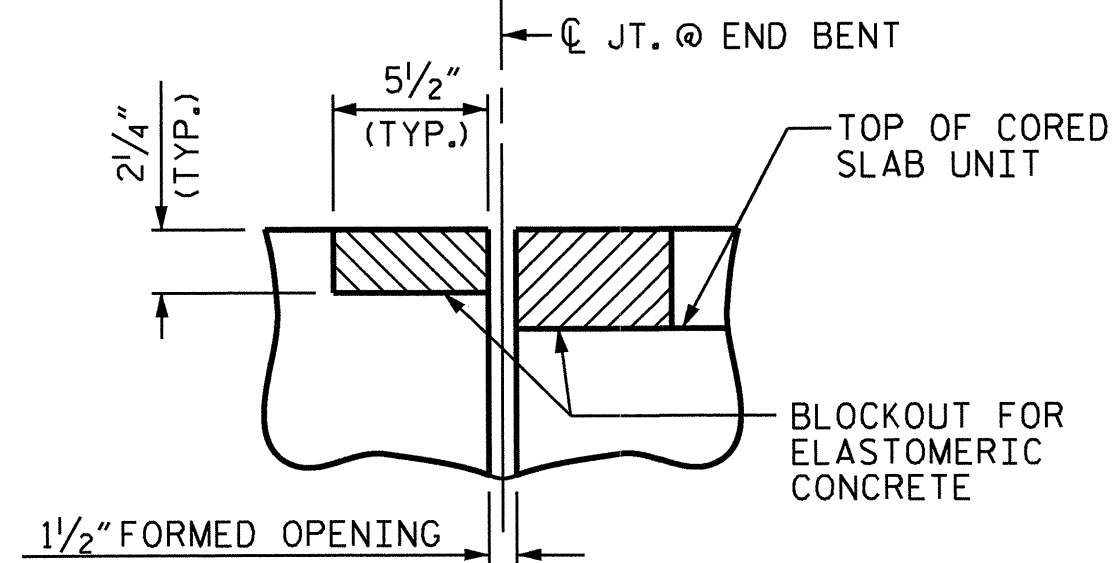
SECTION H-H (WITH SIDEWALK)



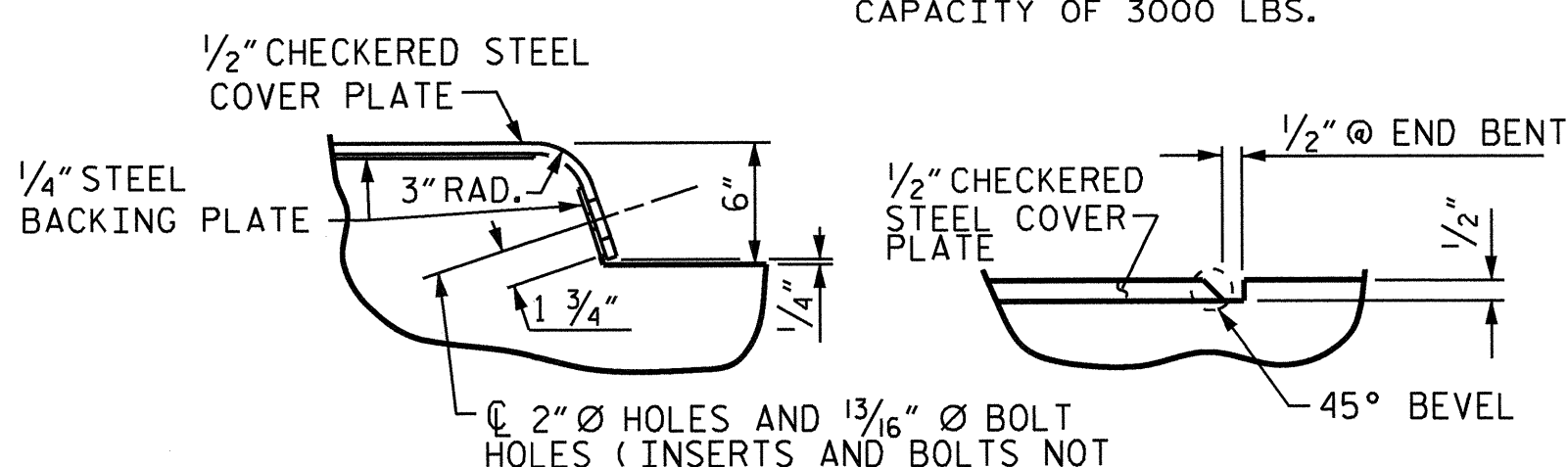
SECTION K-K



DETAIL "A"



SECTION C-C FOAM JOINT SEAL (PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



DETAIL "B" DETAIL "C" JOINT SEAL DETAILS @ END BENT

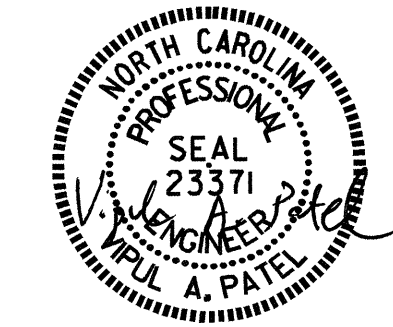
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	20.7
2	20.7
TOTAL	41.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+20.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
(LEFT LANE)



10/12/13

ASSEMBLED BY : T.H. CARROLL	DATE : 10/11/12
CHECKED BY : J.G. KHARVA	DATE : 10/12
DRAWN BY : FCJ 11/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 11/88	REV. 5/1/06RRR MAA/KMM
	REV. 10/1/11 MAA/GM

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thcarroll

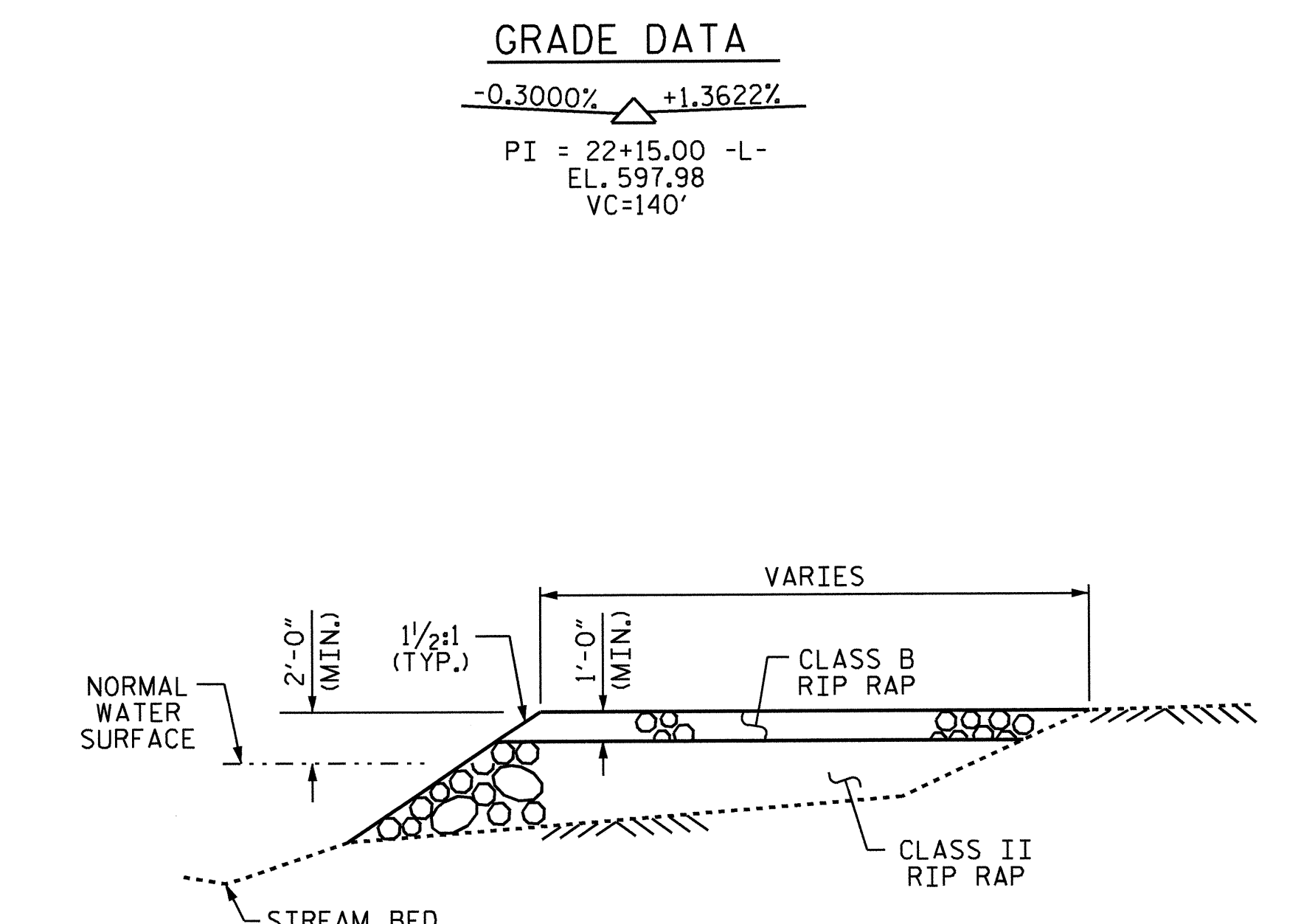
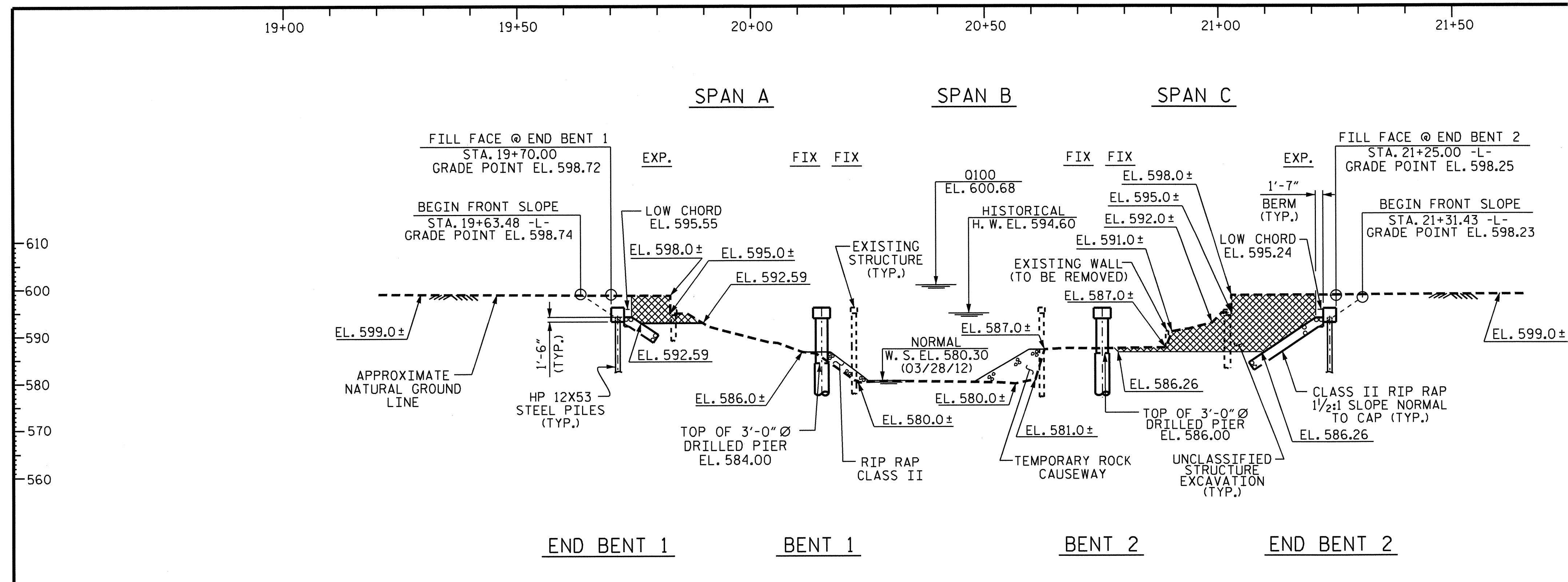
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

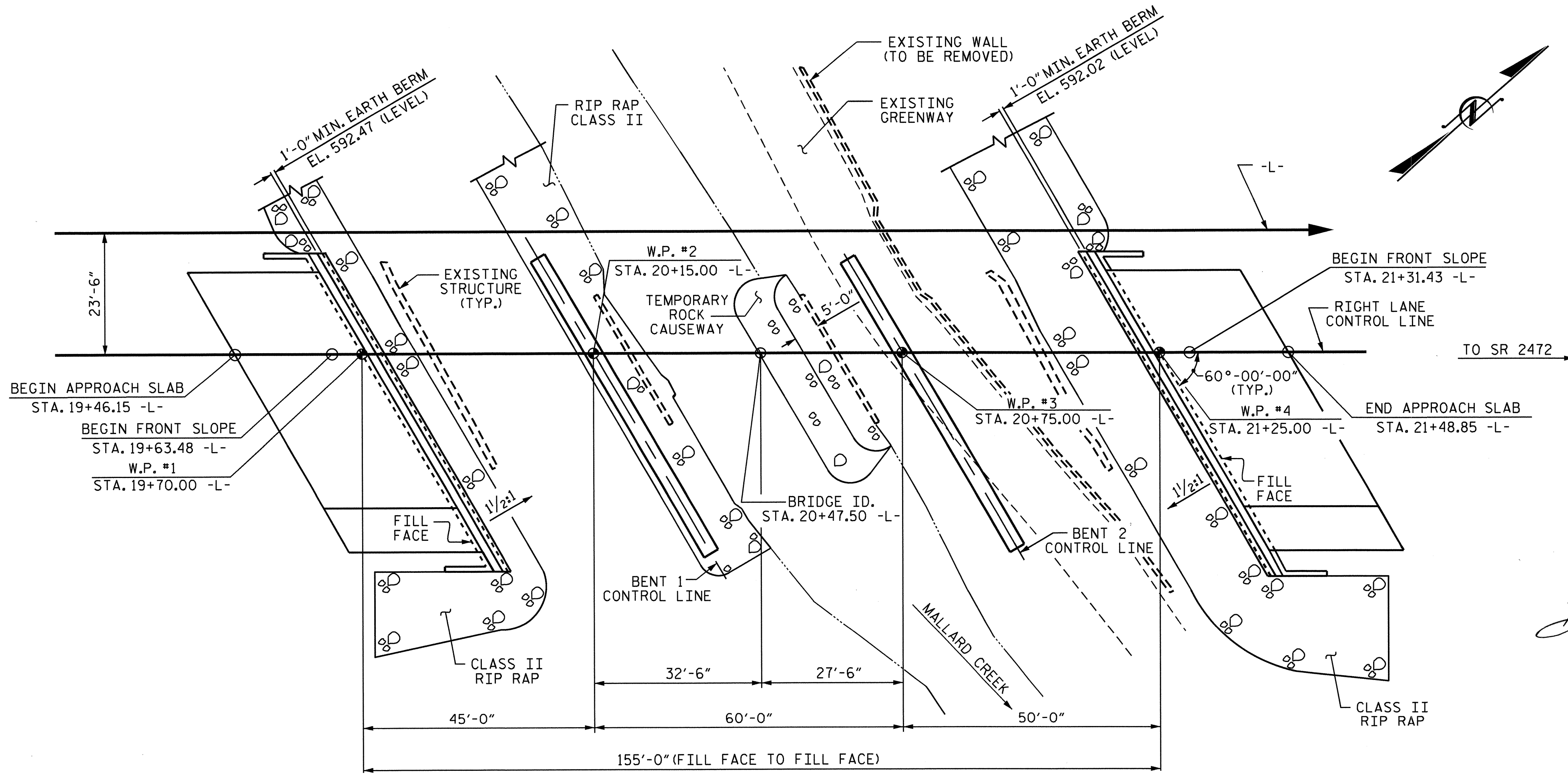
REVISIONS						SHEET NO. 5-29
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

STR. #1 STD. NO. BAS4 (SHT 2a)



SECTION ALONG RIGHT LANE CONTROL LINE

(SECTION TAKEN AT RIGHT ANGLE TO END BENTS AND BENTS)
FOR RIP RAP CLASS II AT INTERIOR BENT 2
SEE "RIP RAP DETAILS" SHEET.



PLAN

(PILES, COLUMNS, & DRILLED PIERS NOT SHOWN FOR CLARITY)
FOR RIP RAP CLASS II AT INTERIOR BENT 2
SEE "RIP RAP DETAILS" SHEET.

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+47.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE #140

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER MALLARD
CREEK ON US HWY 29 BETWEEN
NC HWY 24 AND SR 2472
(RIGHT LANE)

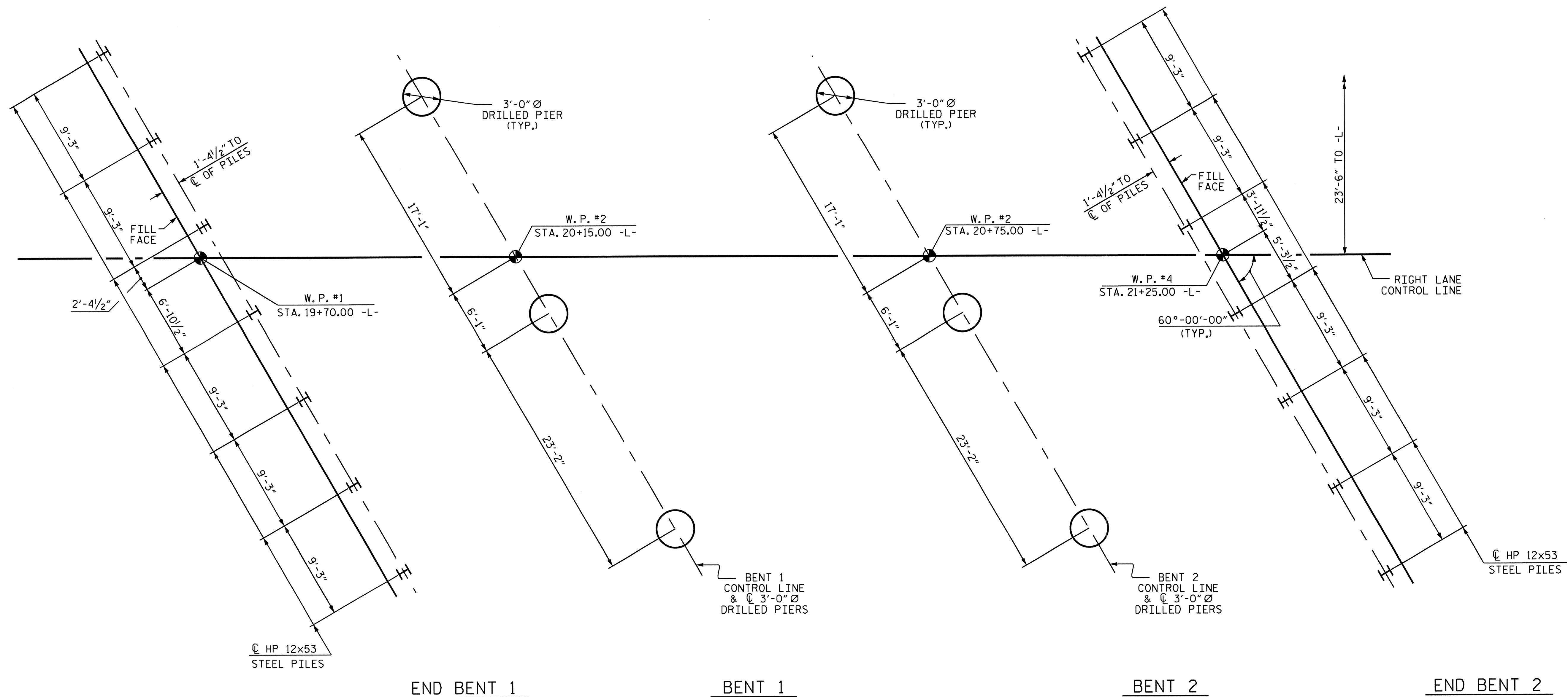
Professional Engineer Seal
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 23371
10/18/13

Professional Engineer Seal
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 23371
10/18/13

DRAWN BY: J. G. KHARVA DATE: 02/12/13
CHECKED BY: T. H. CARROLL DATE: 05/10/13
DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			58

STR. #2



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
 DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO CENTERLINE OF DRILLED PIERS.

NOTES

FOR PILES, SEE 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.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 562.0 (LT), 548.5 (CTR), 535.0 (RT), AND WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 515 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 55 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 580.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 568.0 (LT), 562.5 (CTR), AND 557.0 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 530 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 537.0 (LT), 533.0 (CTR), AND 529.0 (RT), AND WITH THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 581.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 560.5 (LT), 558.0 (CTR), AND 555.5 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENTS NO.1 AND 2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT IS REQUIRED FOR DRILLED PIERS AT BENTS NO.1 AND 2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

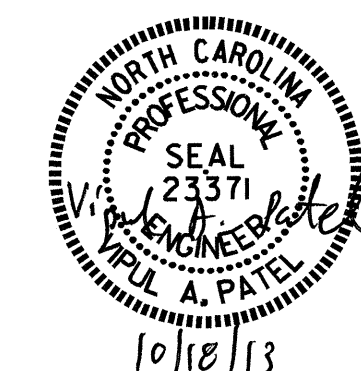
PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER MALLARD
 CREEK ON US HWY 29 BETWEEN
 NC HWY 24 AND SR 2472
 (RIGHT LANE)



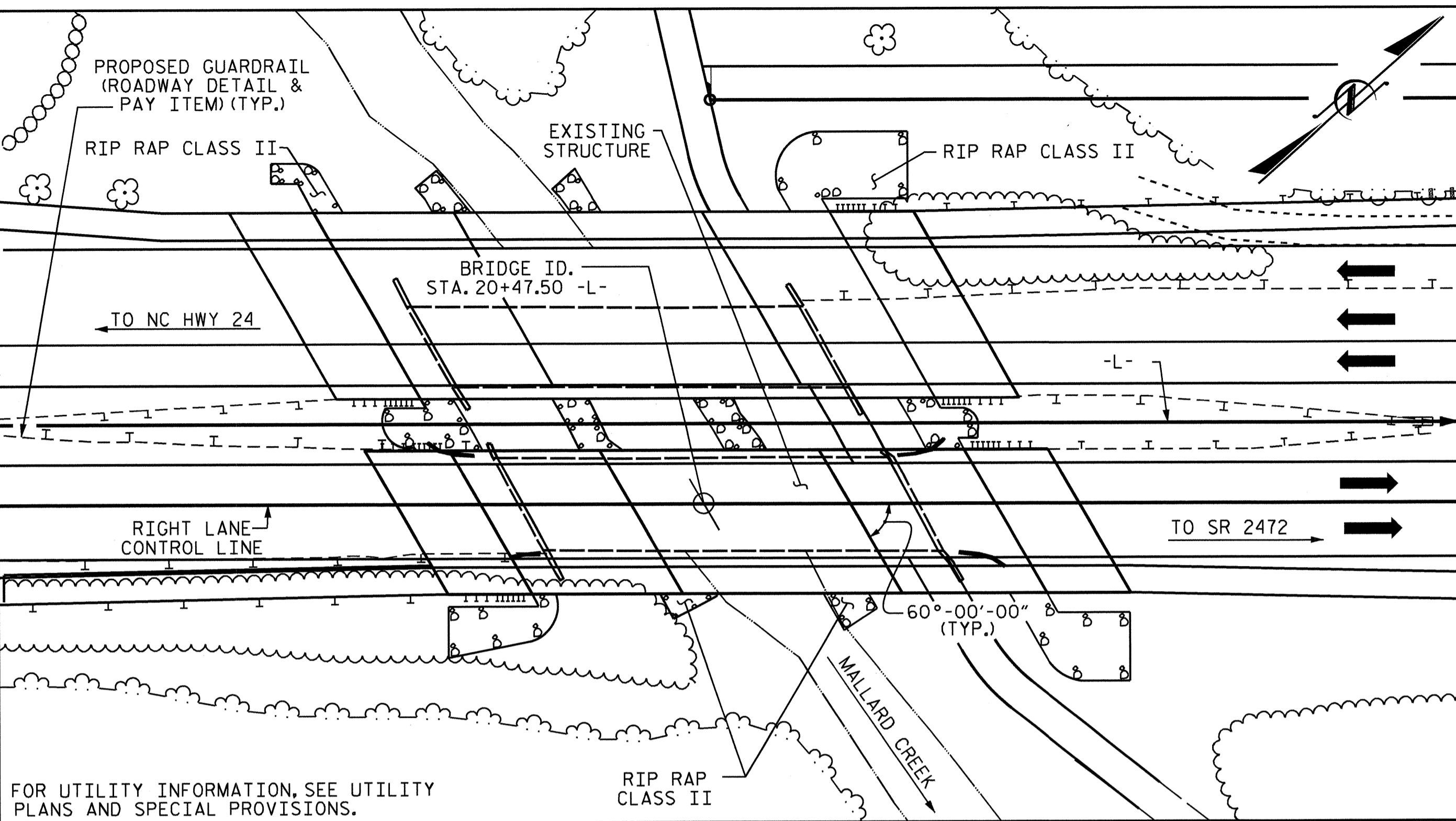
DRAWN BY : J. G. KHARVA DATE : 02/12/13
 CHECKED BY : T. H. CARROLL DATE : 05/10/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			58

STR. #2

BENCH MARK #2: R/R SPIKE IN 24" POPLAR TREE, 139' LEFT OF STA. 25+52.25 -L-, ELEV. 592.71.



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 8857 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 599.70
DRAINAGE AREA	= 21.1 SQ. MI.
BASE DISCHARGE (Q100)	= 9871 CFS
BASE HIGH WATER ELEVATION	= 600.68

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 7100 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 50 YRS. (-)
OVERTOPPING FLOOD ELEVATION	= 598.50

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS (3 @ 40'-0") WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND REINFORCED CONCRETE DECK GIRDERS ON REINFORCED CONCRETE CAPS ON TIMBER PILES AT END BENTS AND REINFORCED CONCRETE POST AND WEB ON SPREAD FOOTINGS AT BENTS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT 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.

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 25 FT. LEFT AND 40 FT. RIGHT 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. 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.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+47.50 -L-.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE										5146	6139	64.2		LUMP SUM
END BENT 1													22.2	
BENT 1			66.5	40.0	15.0	2	1						32.5	
BENT 2			96.0	63.0	18.0	2	1						31.3	
END BENT 2													22.3	
TOTAL	LUMP SUM	LUMP SUM	162.5	103.0	33.0	4	2	1	LUMP SUM	5146	6139	64.2	108.3	LUMP SUM

TOTAL BILL OF MATERIAL

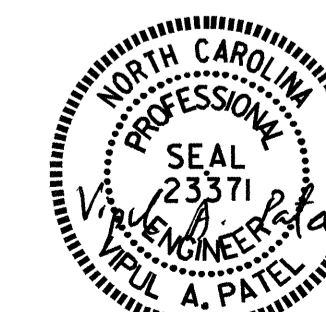
	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12x53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 3'-7 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS		
	LBS.	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE		2458				288.46	304.80			LUMP SUM	LUMP SUM	45	2281.71
END BENT 1	3254			7	175			95	110				
BENT 1	13095		2212					70	80				
BENT 2	15490		2972					65	95				
END BENT 2	3256			7	280			185	210				
TOTAL	35095	2458	5184	14	455	288.46	304.80	415	495	LUMP SUM	LUMP SUM	45	2281.71

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER MALLARD CREEK ON US HWY 29 BETWEEN NC HWY 24 AND SR 2472 (RIGHT LANE)



DRAWN BY : J. G. KHARVA DATE : 02/12/13
 CHECKED BY : T. H. CARROLL DATE : 05/10/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

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 thcarroll

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			58

STR. #2

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE								COMMENT NUMBER
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.27	--	1.75	0.25	1.78	B	EL	29.35	0.644	1.28	B	EL	5.87	0.80	0.25	1.27	B	EL	29.350		
	HL-93(0pr)	N/A	--	1.67	--	1.35	0.25	2.31	B	EL	29.35	0.644	1.66	B	EL	5.87	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.55	55.702	1.75	0.256	2.2	C	EL	23.737	0.644	1.55	B	EL	5.87	0.80	0.25	1.60	B	EL	29.350		
	HS-20(0pr)	36.000	--	2.01	72.206	1.35	0.256	2.85	C	EL	23.737	0.644	2.01	B	EL	5.87	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.45	46.570	1.4	0.256	5.54	C	EL	23.737	0.644	4.47	B	EL	5.87	0.80	0.25	3.45	B	EL	29.350	
		SNGARBS2	20.000	--	2.64	52.856	1.4	0.256	4.4	C	EL	23.737	0.644	3.22	B	EL	5.87	0.80	0.25	2.64	B	EL	29.350	
		SNAGRIS2	22.000	--	2.53	55.753	1.4	0.256	4.27	C	EL	18.99	0.644	3	B	EL	5.87	0.80	0.25	2.53	B	EL	29.350	
		SNCOTTS3	27.250	--	1.72	46.834	1.4	0.256	2.76	C	EL	23.737	0.644	2.23	B	EL	5.87	0.80	0.25	1.72	B	EL	29.350	
		SNAGGRS4	34.925	--	1.46	51.119	1.4	0.256	2.41	C	EL	23.737	0.644	1.88	B	EL	5.87	0.80	0.25	1.46	B	EL	29.350	
		SNS5A	35.550	--	1.43	50.816	1.4	0.256	2.35	C	EL	23.737	0.644	1.92	B	EL	5.87	0.80	0.25	1.43	B	EL	29.350	
		SNS6A	39.950	--	1.32	52.864	1.4	0.256	2.2	C	EL	23.737	0.644	1.77	B	EL	5.87	0.80	0.25	1.32	B	EL	29.350	
	SNS7B	42.000	--	1.26	52.945	1.4	0.256	2.1	C	EL	23.737	0.644	1.75	B	EL	5.87	0.80	0.25	1.26	B	EL	29.350		
	TTST	TNAGRIT3	33.000	--	1.62	53.366	1.4	0.256	2.7	C	EL	23.737	0.644	2.09	B	EL	5.87	0.80	0.25	1.62	B	EL	29.350	
		TNT4A	33.075	--	1.63	53.831	1.4	0.256	2.72	C	EL	23.737	0.644	2.03	B	EL	5.87	0.80	0.25	1.63	B	EL	29.350	
		TNT6A	41.600	--	1.34	55.838	1.4	0.256	2.27	C	EL	23.737	0.644	1.9	B	EL	5.87	0.80	0.25	1.34	B	EL	29.350	
		TNT7A	42.000	--	1.36	56.918	1.4	0.256	2.31	C	EL	23.737	0.644	1.81	B	EL	5.87	0.80	0.25	1.36	B	EL	29.350	
		TNT7B	42.000	--	1.42	59.450	1.4	0.256	2.41	C	EL	23.737	0.644	1.7	B	EL	5.87	0.80	0.25	1.42	B	EL	29.350	
		TNAGRIT4	43.000	--	1.34	57.488	1.4	0.256	2.29	C	EL	23.737	0.644	1.64	B	EL	5.87	0.80	0.25	1.34	B	EL	29.350	
TNAGT5A		45.000	--	1.26	56.484	1.4	0.256	2.13	C	EL	23.737	0.644	1.65	B	EL	5.87	0.80	0.25	1.26	B	EL	29.350		
TNAGT5B	45.000	3	1.24	55.588	1.4	0.256	2.09	C	EL	23.737	0.644	1.56	B	EL	5.87	0.80	0.25	1.24	B	EL	29.350			

NOTES:

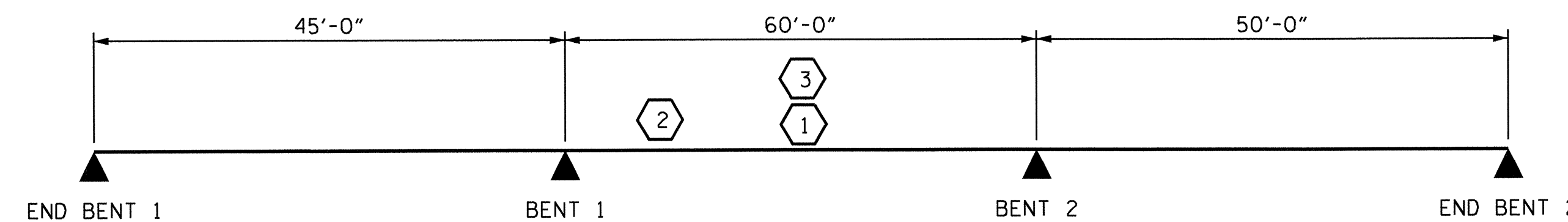
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ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

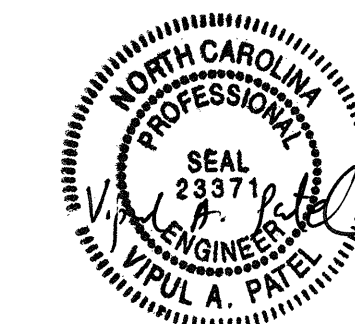
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#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-



10/18/13

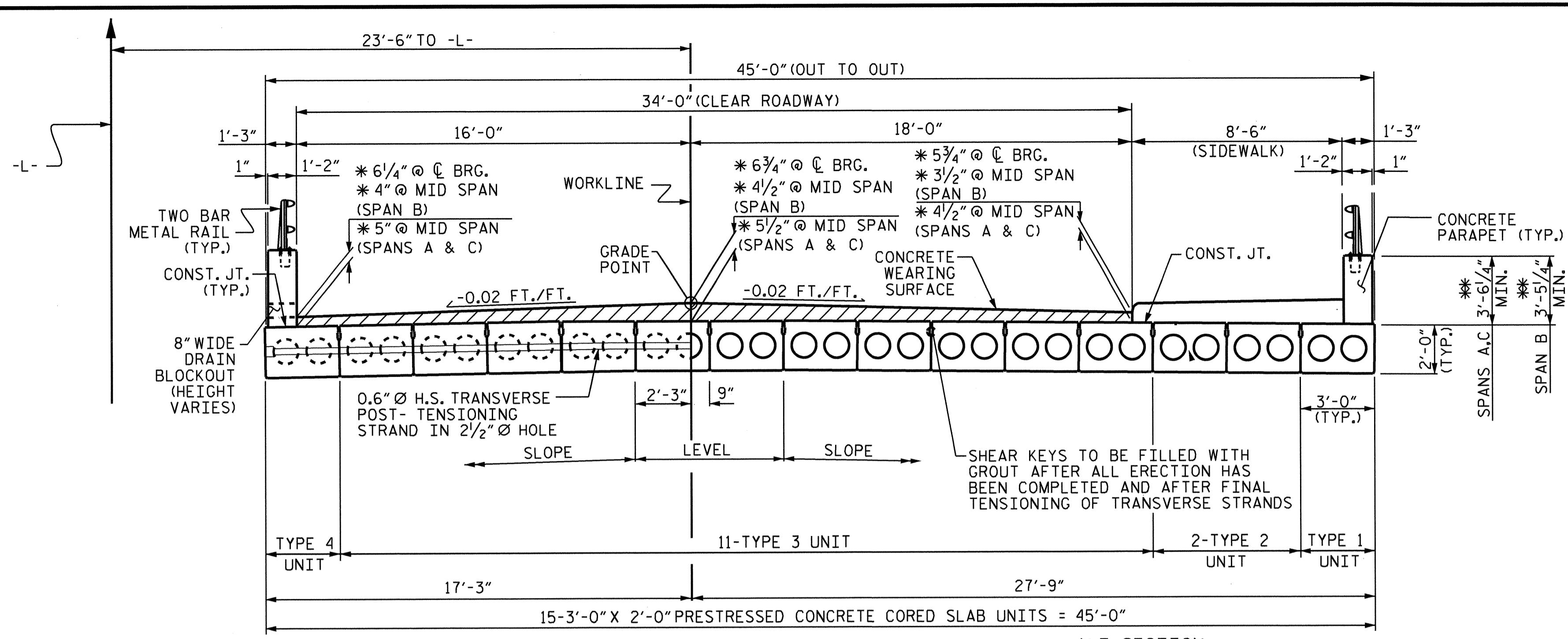
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS 58
2			4			

STR. #2

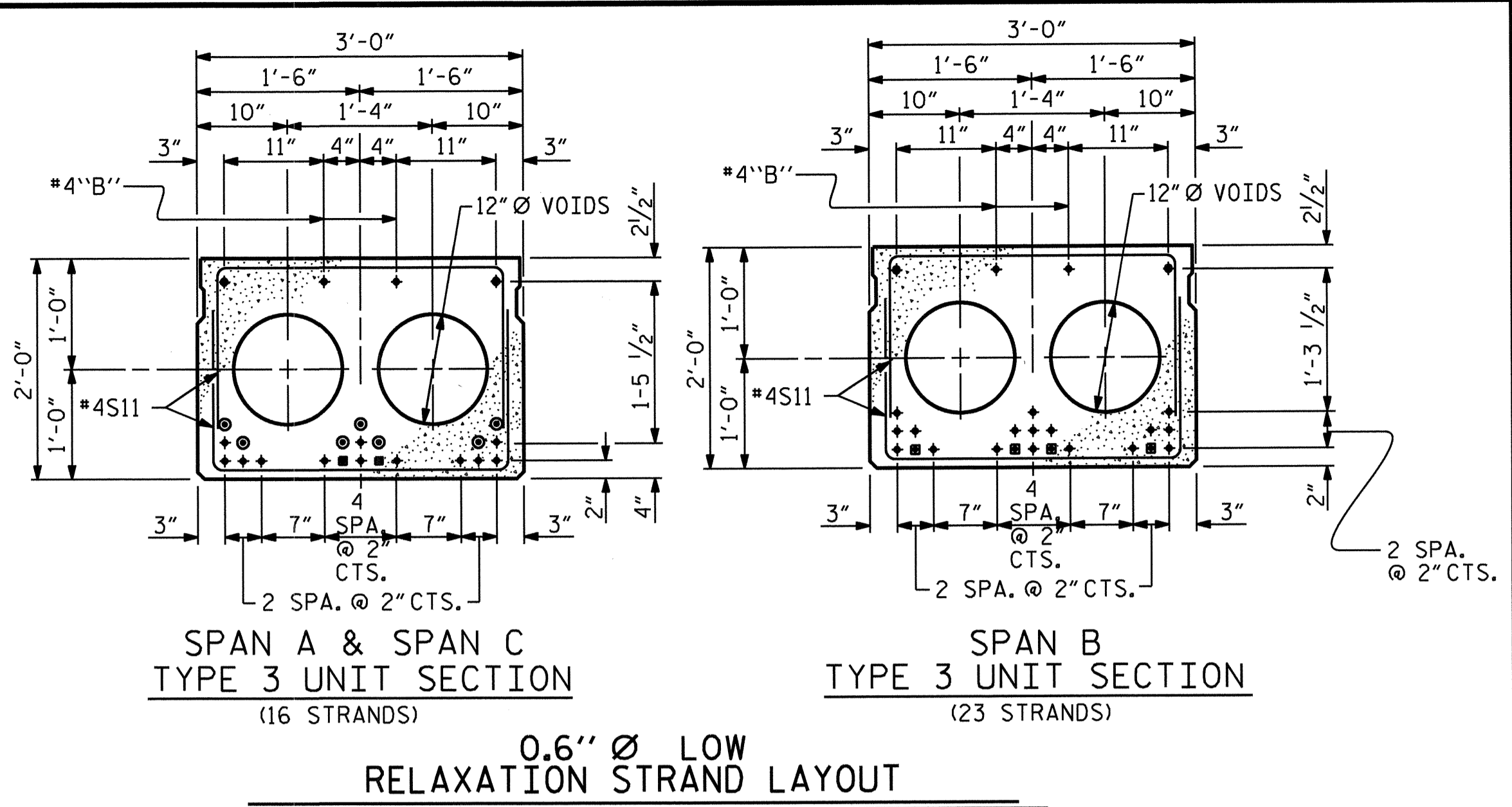
STD. NO. LRFR1

ASSEMBLED BY : D. R. SMITH	DATE : 7/12
CHECKED BY : R. L. CHESSON	DATE : 7/12
DRAWN BY : MAA 1/08	REV. 11/12/08R MAA/GM
CHECKED BY : GM/DI 2/08	



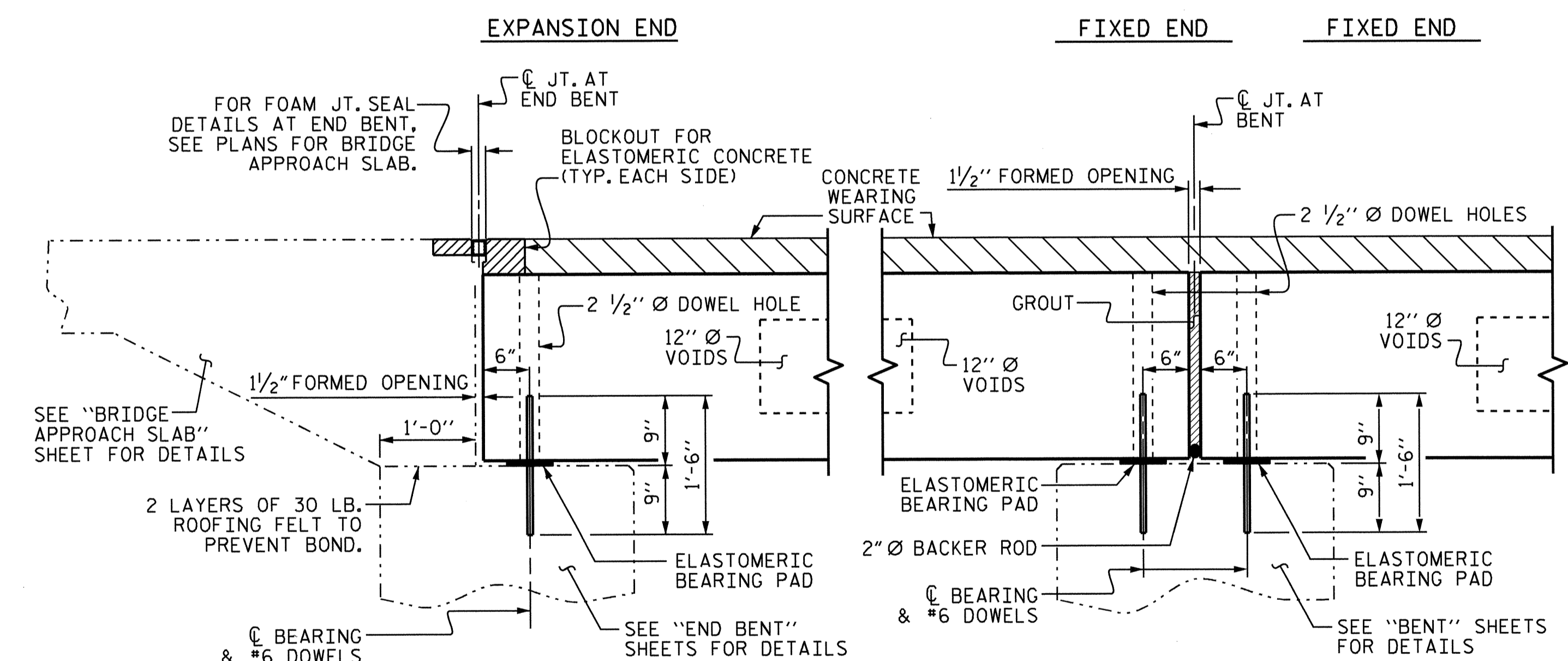
HALF SECTION AT INTERMEDIATE DIAPHRAGMS
TYPICAL SECTION
 HALF SECTION THROUGH VOIDS

* BASED ON PREDICTED CAMBER & THEORETICAL GRADE LINE ELEVATIONS
 ** THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN, THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

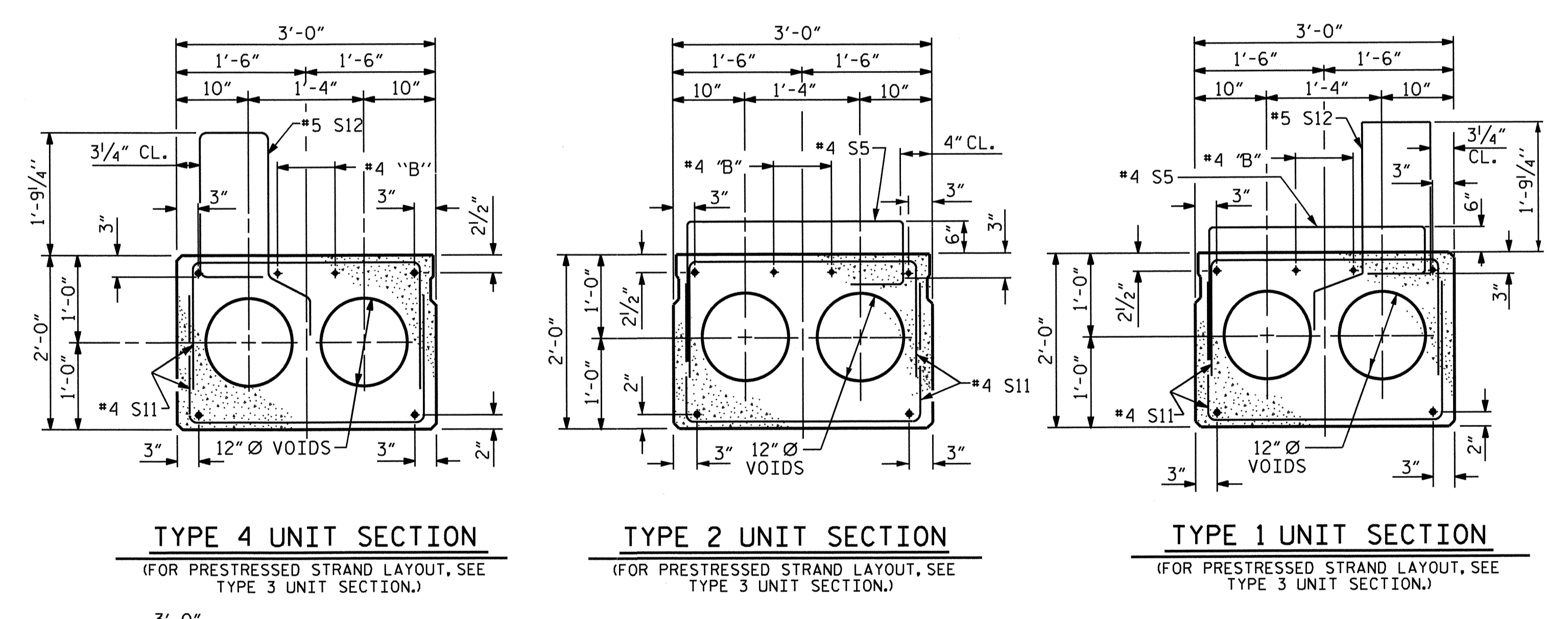


SPAN A & SPAN C
 TYPE 3 UNIT SECTION
 (16 STRANDS)
 SPAN B
 TYPE 3 UNIT SECTION
 (23 STRANDS)
 0.6" Ø LOW RELAXATION STRAND LAYOUT

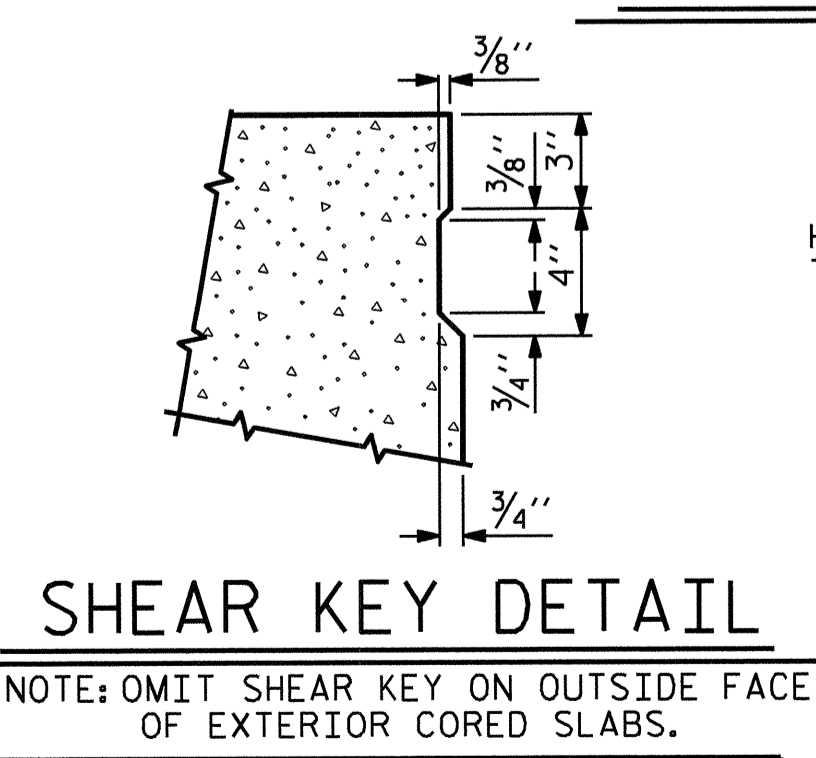
OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.



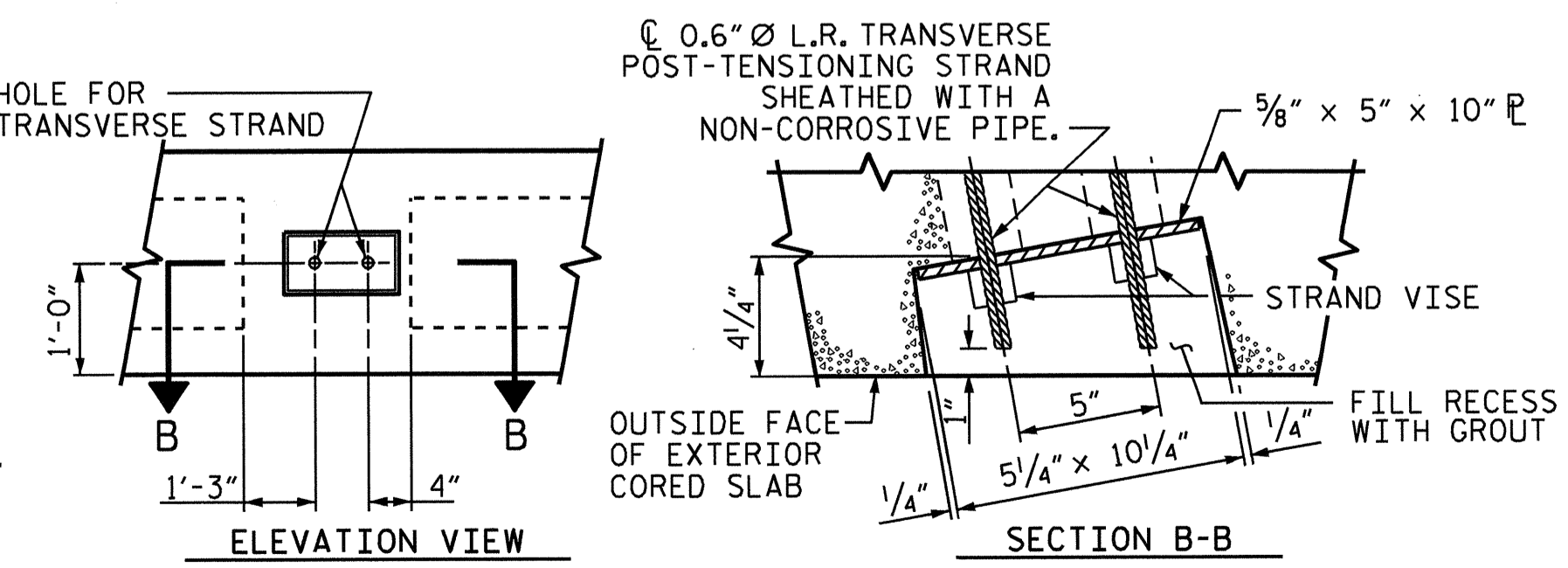
SECTION AT END BENT
 SECTION AT BENT



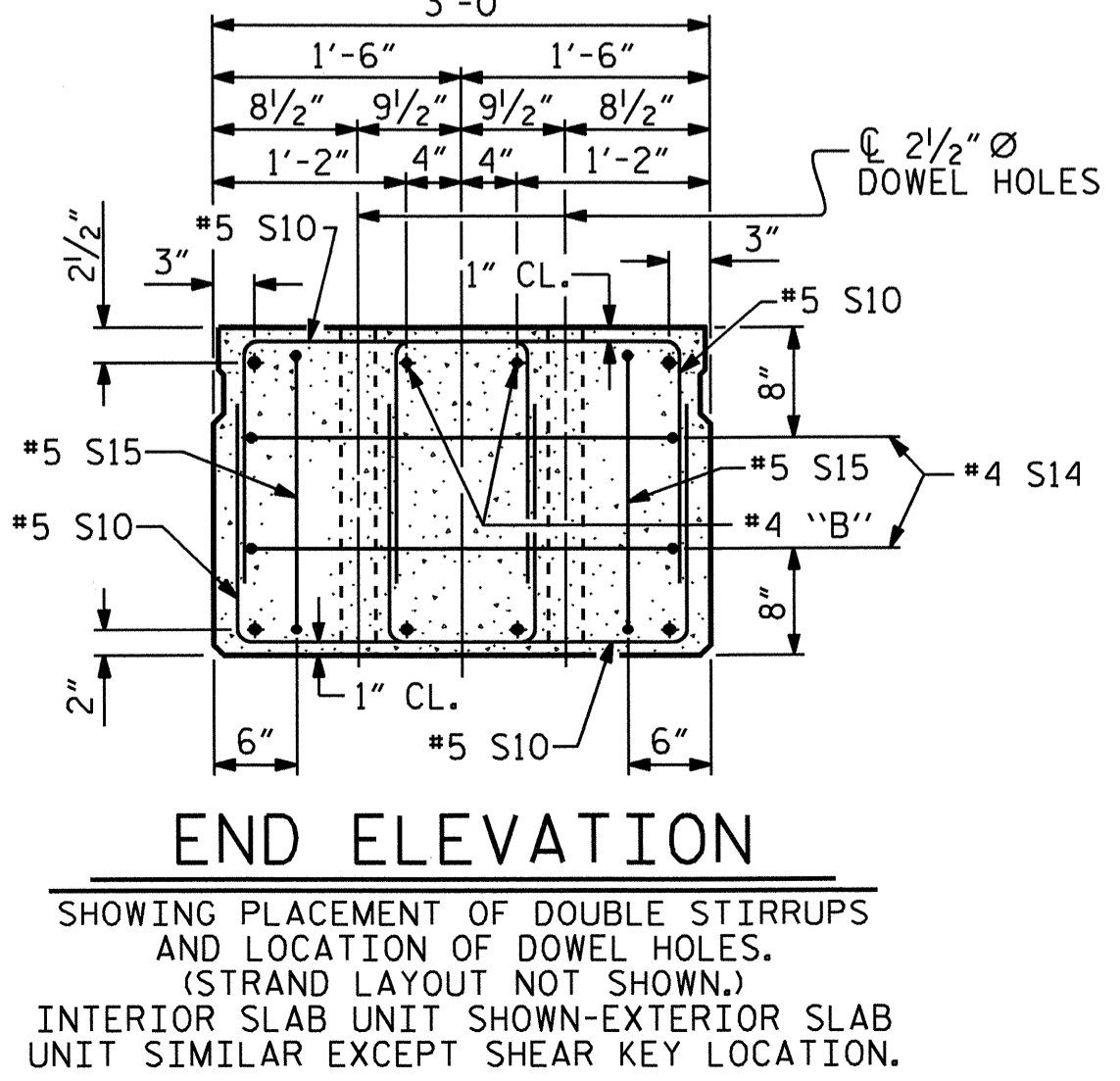
TYPE 4 UNIT SECTION (FOR PRESTRESSED STRAND LAYOUT, SEE TYPE 3 UNIT SECTION.)
 TYPE 2 UNIT SECTION (FOR PRESTRESSED STRAND LAYOUT, SEE TYPE 3 UNIT SECTION.)
 TYPE 1 UNIT SECTION (FOR PRESTRESSED STRAND LAYOUT, SEE TYPE 3 UNIT SECTION.)



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



ELEVATION VIEW
 SECTION B-B
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

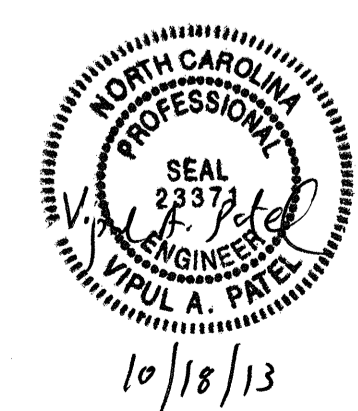


END ELEVATION
 SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)
 INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

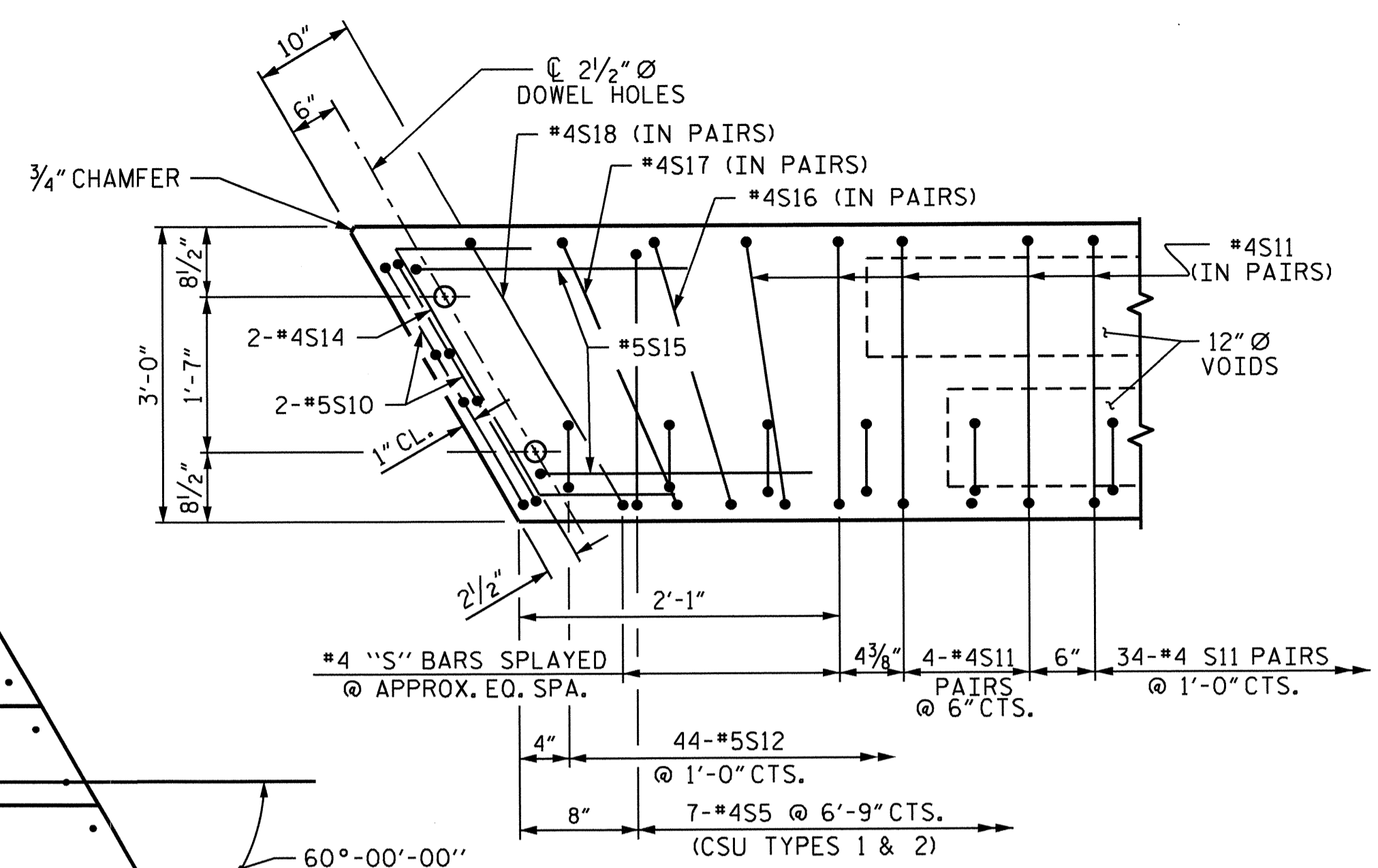
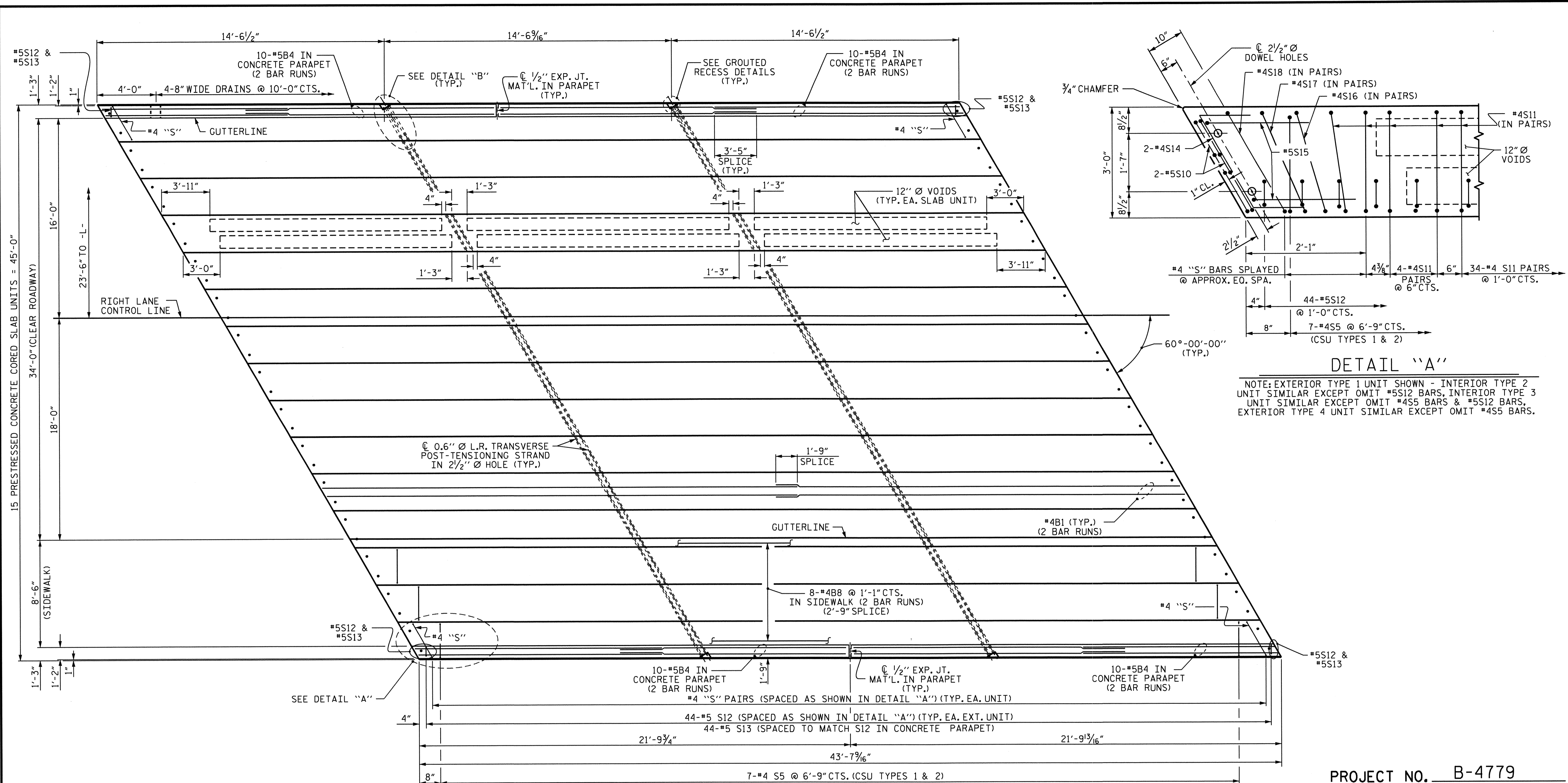
PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+47.50-L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-34
STANDARD 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT (RIGHT LANE)						TOTAL SHEETS 58
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



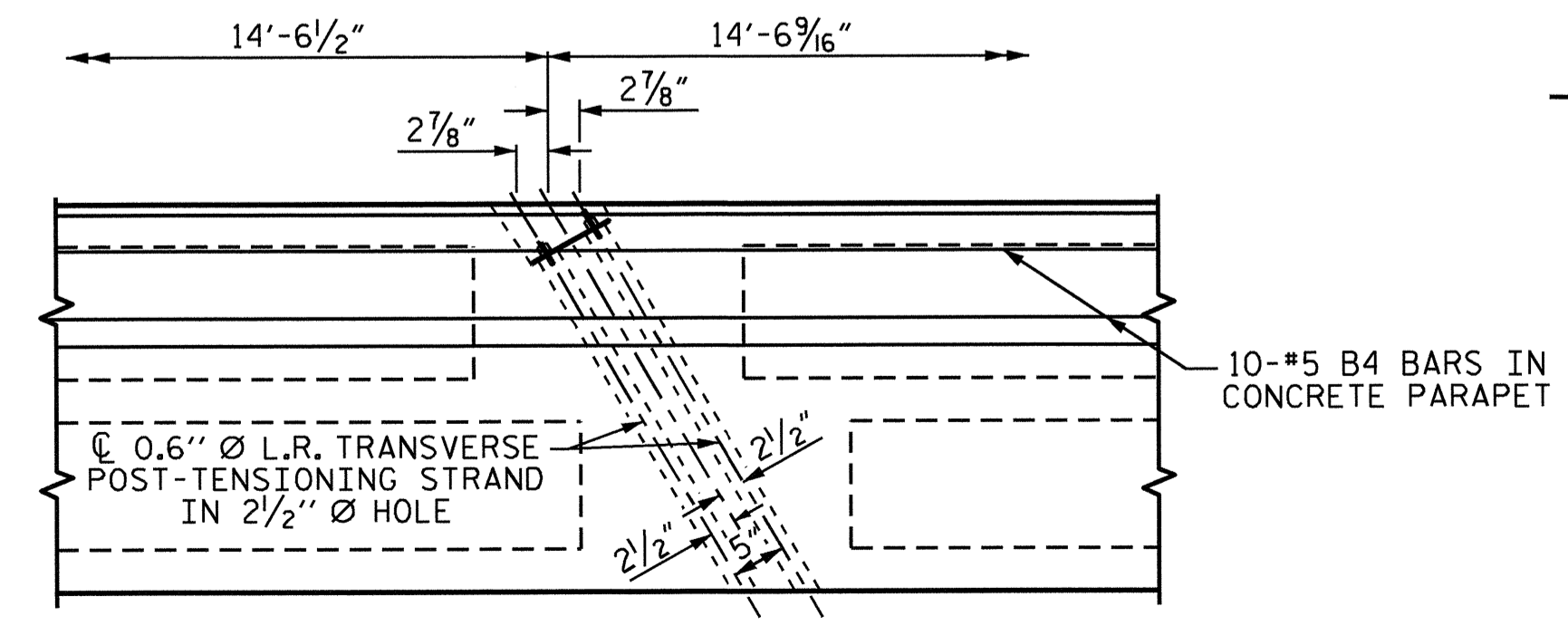
DESIGN ENGINEER OF RECORD: D. R. SMITH	DATE: 09/10/13
ASSEMBLED BY: J. G. KHARVA	DATE: 7/12
CHECKED BY: R. L. CHESSON	DATE: 9/12
DRAWN BY: MAA	5/10
CHECKED BY: GM	5/10
ADDED REV. 10/1/11	5/6/10
	MAA/GM



DETAIL "A"

NOTE: EXTERIOR TYPE 1 UNIT SHOWN - INTERIOR TYPE 2 UNIT SIMILAR EXCEPT OMIT #5S12 BARS, INTERIOR TYPE 3 UNIT SIMILAR EXCEPT OMIT #4S5 BARS & #5S12 BARS, EXTERIOR TYPE 4 UNIT SIMILAR EXCEPT OMIT #4S5 BARS.

PLAN OF SPAN A



DETAIL "B"

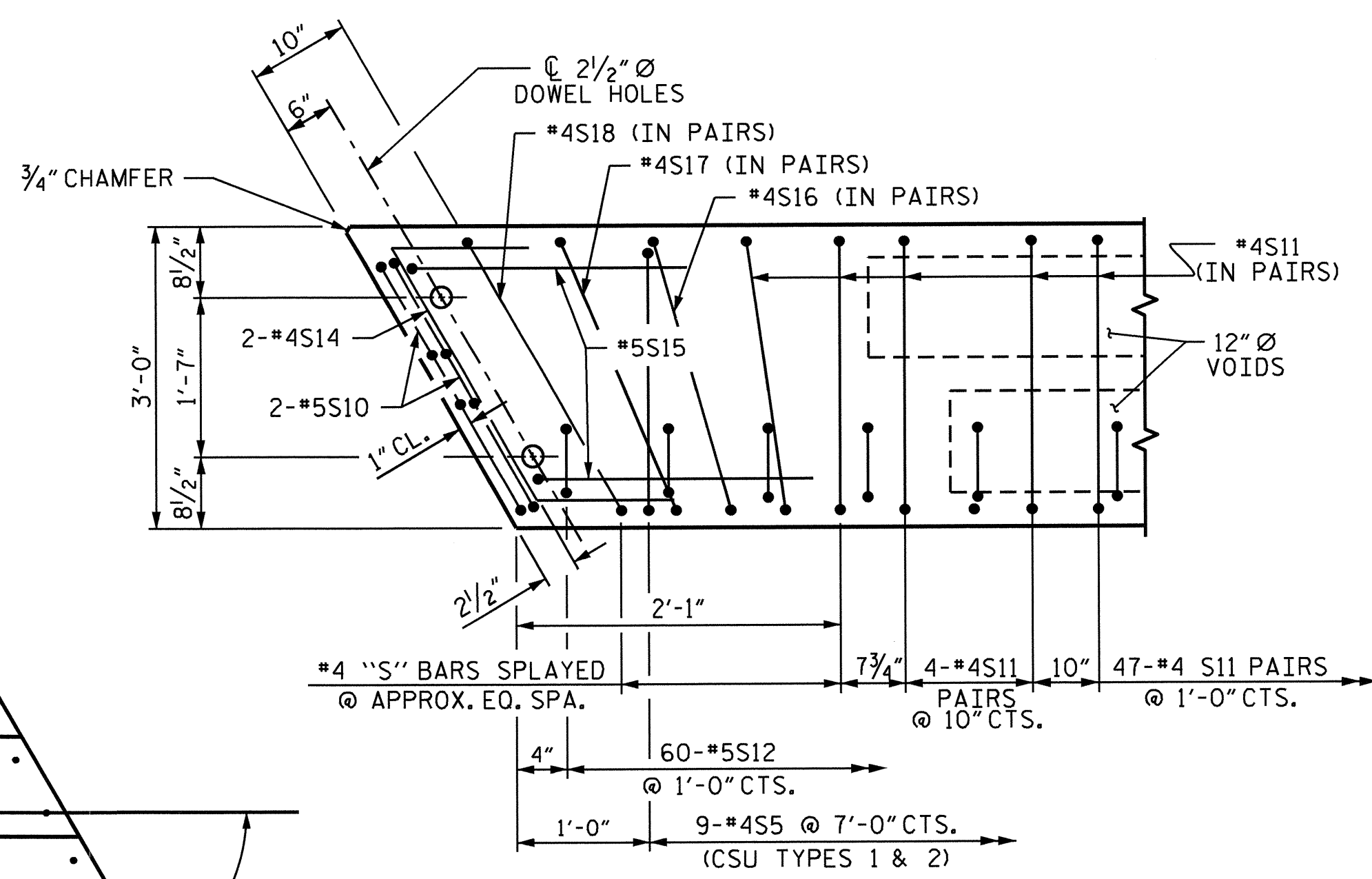
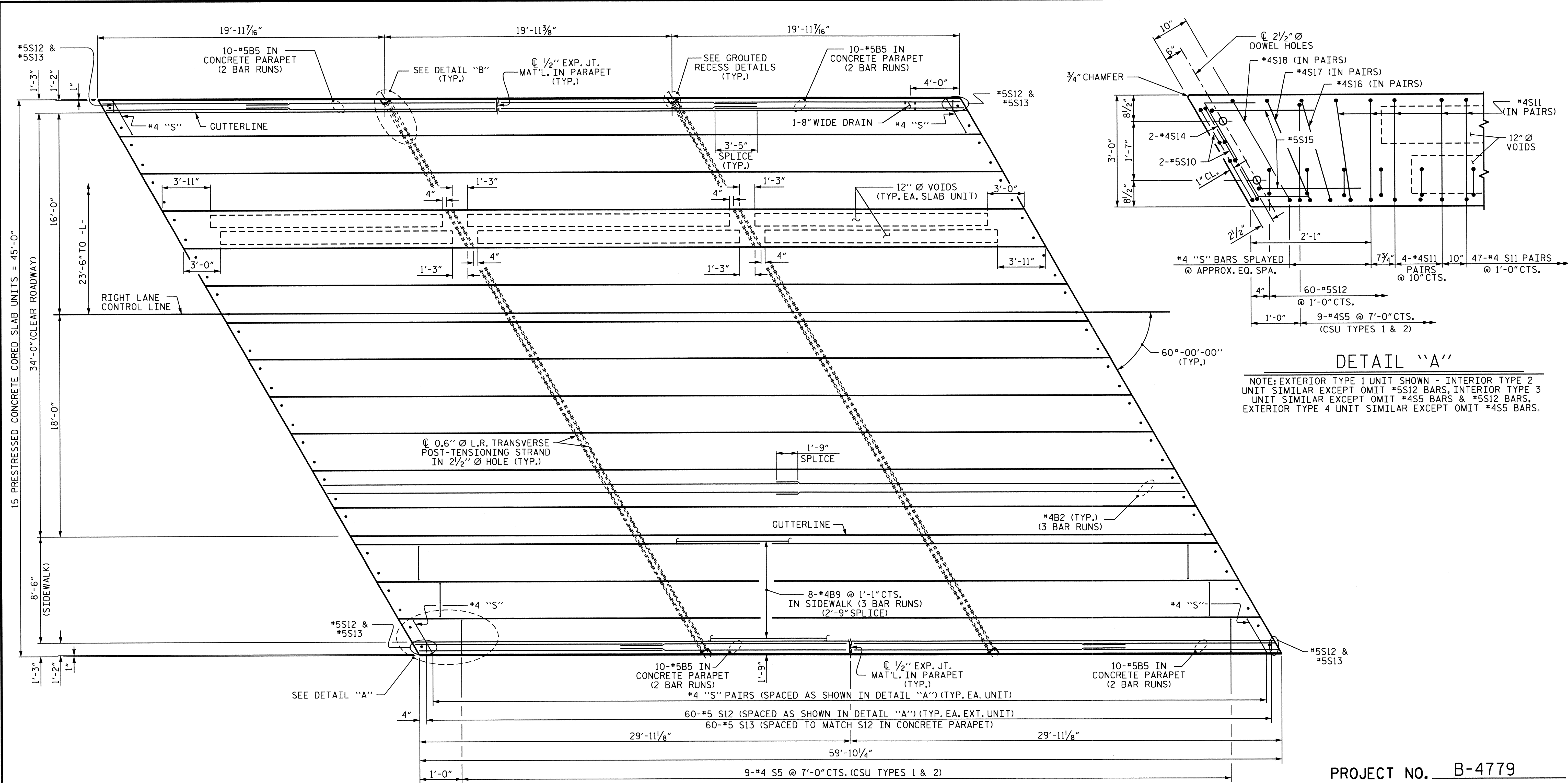
#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50-L-
 SHEET 2 OF 5



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-35	
PLAN OF SPAN A 60° SKEW (RIGHT LANE)						TOTAL SHEETS 58	
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35	
1			3			TOTAL SHEETS	
2			4			58	

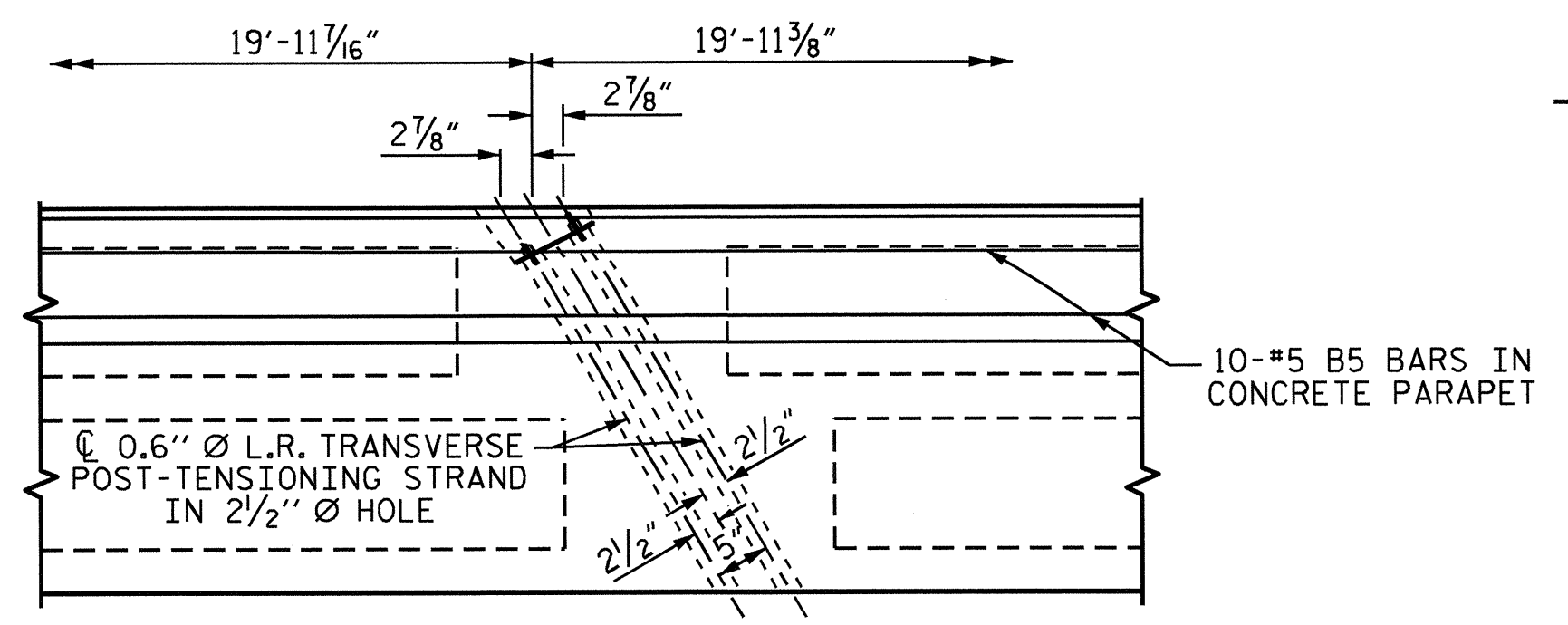
DRAWN BY: J. G. KHARYA DATE: 7/12
 CHECKED BY: R. L. CHESSON DATE: 9/12
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 09/10/13



DETAIL "A"

NOTE: EXTERIOR TYPE 1 UNIT SHOWN - INTERIOR TYPE 2 UNIT SIMILAR EXCEPT OMIT #5S12 BARS, INTERIOR TYPE 3 UNIT SIMILAR EXCEPT OMIT #4S5 BARS & #5S12 BARS, EXTERIOR TYPE 4 UNIT SIMILAR EXCEPT OMIT #4S5 BARS.

PLAN OF SPAN B

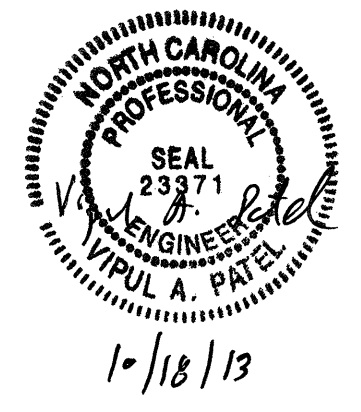


DETAIL "B"

*4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

DRAWN BY : J. G. KHARVA DATE : 7/12
 CHECKED BY : R. L. CHESSON DATE : 9/12
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE : 09/10/13

04-SEP-2013 11:53
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 thcarroll



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50-L
 SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF SPAN B 60° SKEW (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 58

STR. #2

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN A)											
				TYPE 1 UNIT		TYPE 2 UNIT		TYPE 3 UNIT		TYPE 4 UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	#4	STR	22'-8"	61	22'-8"	61	22'-8"	61	22'-8"	61
*S5	7	#4	3	5'-9"	27	5'-9"	27	-	-	-	-
S10	8	#5	2	5'-0"	42	5'-0"	42	5'-0"	42	5'-0"	42
S11	92	#4	2	5'-10"	358	5'-10"	358	5'-10"	358	5'-10"	358
*S12	44	#5	1	6'-6"	298	-	-	-	-	6'-6"	298
S14	4	#4	4	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				556		556		556		556
*EPOXY COATED REINFORCING STEEL	LBS.				325		27		-		298
5000 P.S.I. CONCRETE	CU. YDS.				7.7		7.7		7.7		7.7
0.6" Ø L.R. STRANDS	No.				16		16		16		16

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN B)											
				TYPE 1 UNIT		TYPE 2 UNIT		TYPE 3 UNIT		TYPE 4 UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B2	6	#4	STR	21'-2"	85	21'-2"	85	21'-2"	85	21'-2"	85
*S5	9	#4	3	5'-9"	35	5'-9"	35	-	-	-	-
S10	8	#5	2	5'-0"	42	5'-0"	42	5'-0"	42	5'-0"	42
S11	118	#4	2	5'-10"	460	5'-10"	460	5'-10"	460	5'-10"	460
*S12	60	#5	1	6'-6"	407	-	-	-	-	6'-6"	407
S14	4	#4	4	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				682		682		682		682
*EPOXY COATED REINFORCING STEEL	LBS.				442		35		-		407
7000 P.S.I. CONCRETE	CU. YDS.				10.3		10.3		10.3		10.3
0.6" Ø L.R. STRANDS	No.				23		23		23		23

BILL OF MATERIAL FOR ONE CORED SLAB UNIT (SPAN C)											
				TYPE 1 UNIT		TYPE 2 UNIT		TYPE 3 UNIT		TYPE 4 UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	25'-2"	67	25'-2"	67	25'-2"	67	25'-2"	67
*S5	7	#4	3	5'-9"	27	5'-9"	27	-	-	-	-
S10	8	#5	2	5'-0"	42	5'-0"	42	5'-0"	42	5'-0"	42
S11	106	#4	2	5'-10"	413	5'-10"	413	5'-10"	413	5'-10"	413
*S12	49	#5	1	6'-6"	332	-	-	-	-	6'-6"	332
S14	4	#4	4	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17	6'-3"	17	6'-3"	17
REINFORCING STEEL	LBS.				617		617		617		617
*EPOXY COATED REINFORCING STEEL	LBS.				359		27		-		332
5000 P.S.I. CONCRETE	CU. YDS.				8.5		8.5		8.5		8.5
0.6" Ø L.R. STRANDS	No.				16		16		16		16

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

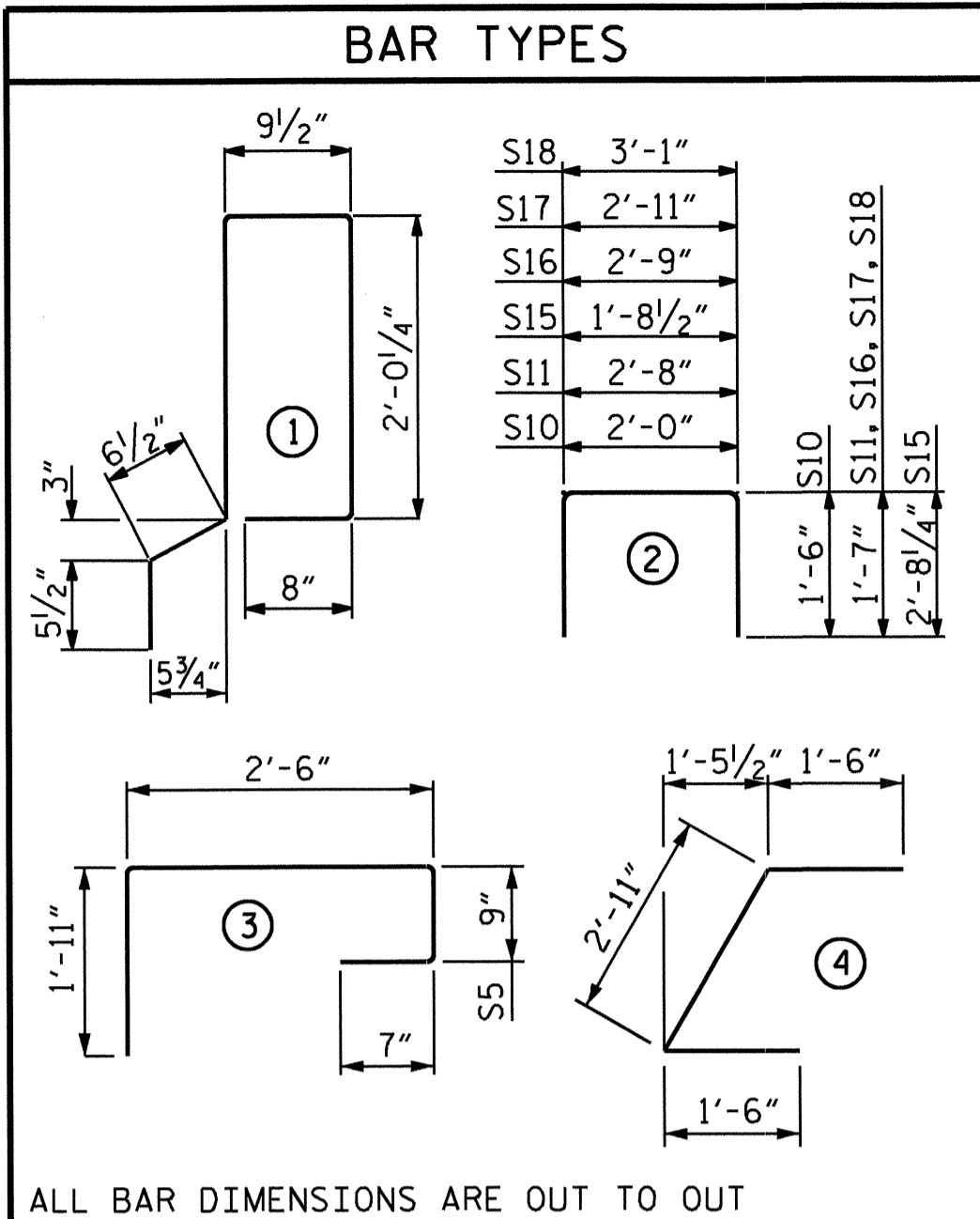
DEAD LOAD DEFLECTION AND CAMBER	
SPAN A	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	1 7/16" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	1/8" ↓
FINAL CAMBER **	1 5/16" ↑

DEAD LOAD DEFLECTION AND CAMBER	
SPAN B	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	2 3/4" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	5/16" ↓
FINAL CAMBER **	2 7/16" ↑

DEAD LOAD DEFLECTION AND CAMBER	
SPAN C	3'-0" x 2'-0"
CAMBER (SLAB ALONE IN PLACE)	1 9/16" ↑
DEFLECTION DUE TO CONC. WEARING SURFACE	1/8" ↓
FINAL CAMBER **	1 7/16" ↑

** DOES NOT INCLUDE DEFLECTION DUE TO FUTURE WEARING SURFACE, CONCRETE PARAPET, & SIDEWALK

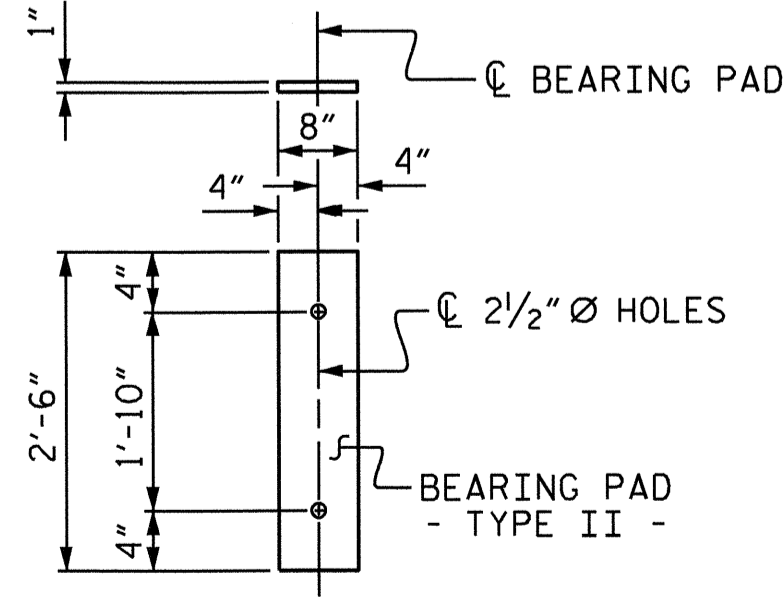
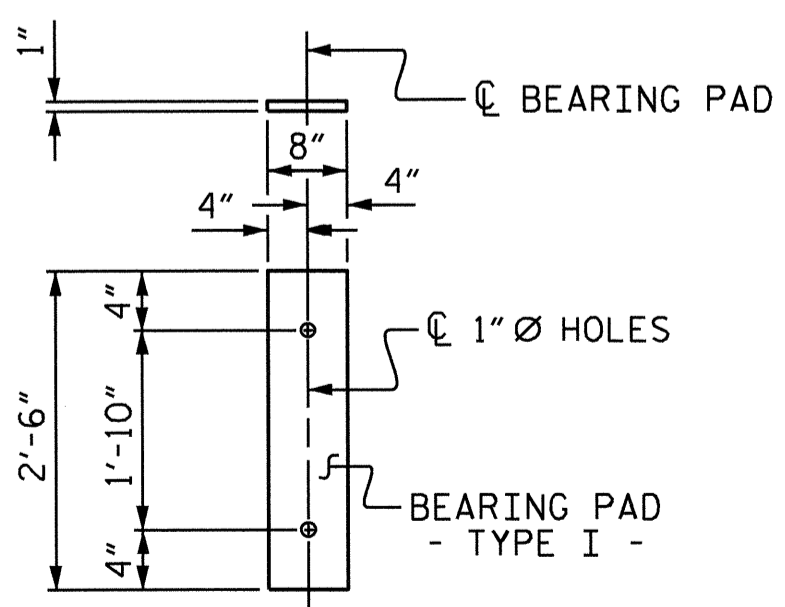
GROOVING BRIDGE FLOORS	
APPROACH SLABS	1458 SQ. FT.
BRIDGE DECK	4680 SQ. FT.
TOTAL	6139 SQ. FT.



CORED SLABS REQUIRED			
SPAN A	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 UNIT	1	43'-7 9/16"	43'-7 9/16"
TYPE 2 UNIT	2	43'-7 9/16"	87'-3 3/8"
TYPE 3 UNIT	11	43'-7 9/16"	479'-11 3/16"
TYPE 4 UNIT	1	43'-7 9/16"	43'-7 9/16"
TOTAL	15		654.45

CORED SLABS REQUIRED			
SPAN B	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 UNIT	1	59'-10 1/4"	59'-10 1/4"
TYPE 2 UNIT	2	59'-10 1/4"	119'-8 1/2"
TYPE 3 UNIT	11	59'-10 1/4"	658'-4 3/4"
TYPE 4 UNIT	1	59'-10 1/4"	59'-10 1/4"
TOTAL	15		897.81

CORED SLABS REQUIRED			
SPAN C	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 UNIT	1	48'-7 9/16"	48'-7 9/16"
TYPE 2 UNIT	2	48'-7 9/16"	97'-3 3/8"
TYPE 3 UNIT	11	48'-7 9/16"	534'-11 3/16"
TYPE 4 UNIT	1	48'-7 9/16"	48'-7 9/16"
TOTAL	15		729.45



FIXED END (TYPE I - 60 REO'D)
 EXPANSION END (TYPE II - 30 REO'D)
ELASTOMERIC BEARING DETAILS
 ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

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 GROUDED 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 SIDWAYS, AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

ALL REINFORCING STEEL IN CONCRETE PARAPET 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 CONCRETE PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF CONCRETE PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUDED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE DRAIN OPENING AT THE CUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE PARAPET SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

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

THE BOTTOM TWO #5 "B" BARS IN THE PARAPET MAY BE FIELD CUT TO AVOID DRAINS.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
SPAN A,C	4000
SPAN B	5600

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+47.50-L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-0"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (RIGHT LANE)



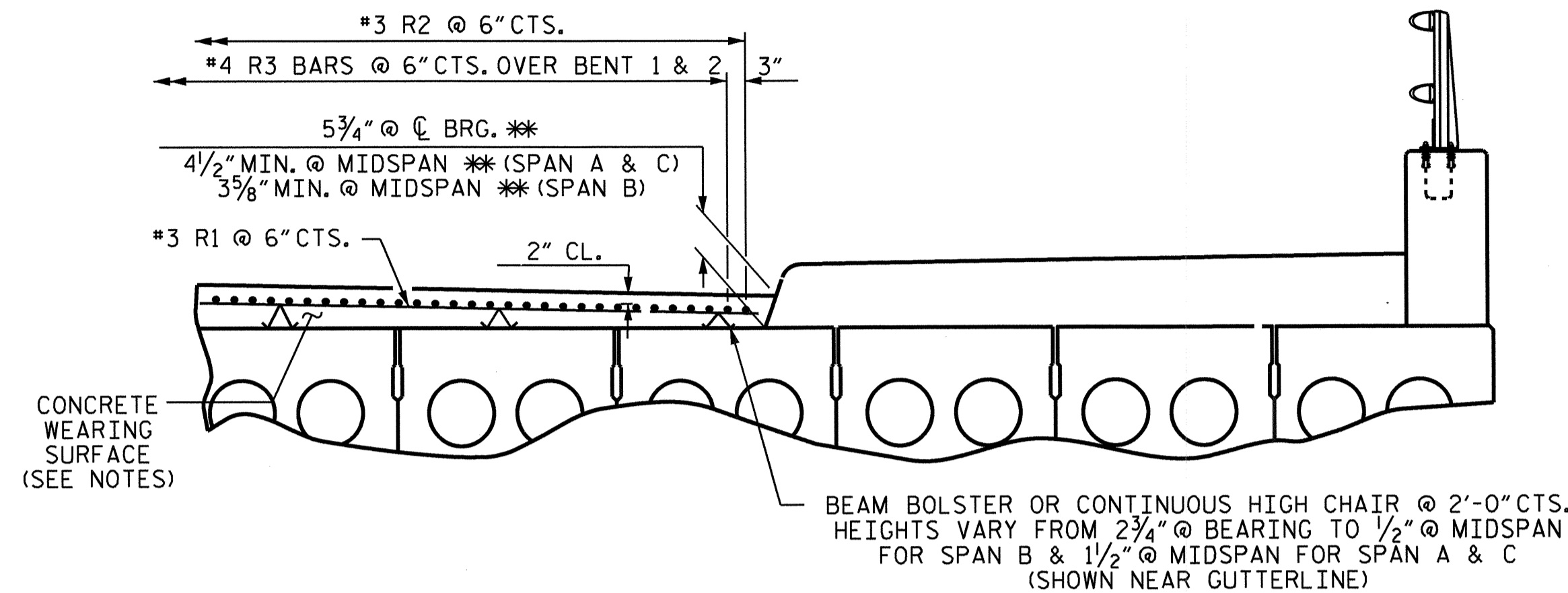
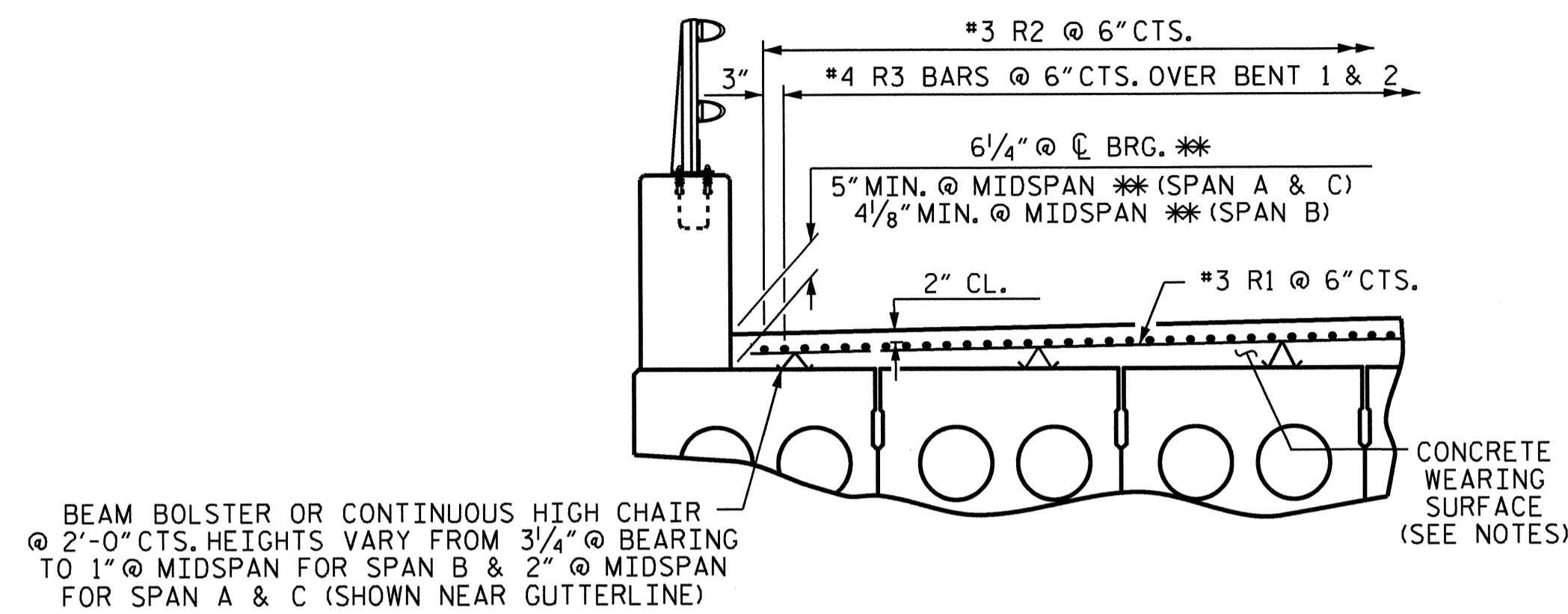
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38	
1			3			TOTAL SHEETS	58
2			4				

DESIGN ENGINEER OF RECORD :
 D. R. SMITH DATE : 09/10/13
 ASSEMBLED BY : J. G. KHARVA DATE : 7/12
 CHECKED BY : R. L. CHESSON DATE : 9/12
 DRAWN BY : MAA 6/10 REV. 12/11 MAA/AAC
 CHECKED BY : MKT 8/10

BILL OF MATERIAL FOR
CONCRETE WEARING SURFACE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	608	#3	STR	20'-0"	4572
*R2	408	#3	STR	26'-5"	4053
*R3	134	#4	STR	20'-0"	1790
* EPOXY COATED REINFORCING STEEL				LBS.	10,415
CONCRETE WEARING SURFACE				SO. FT.	5146

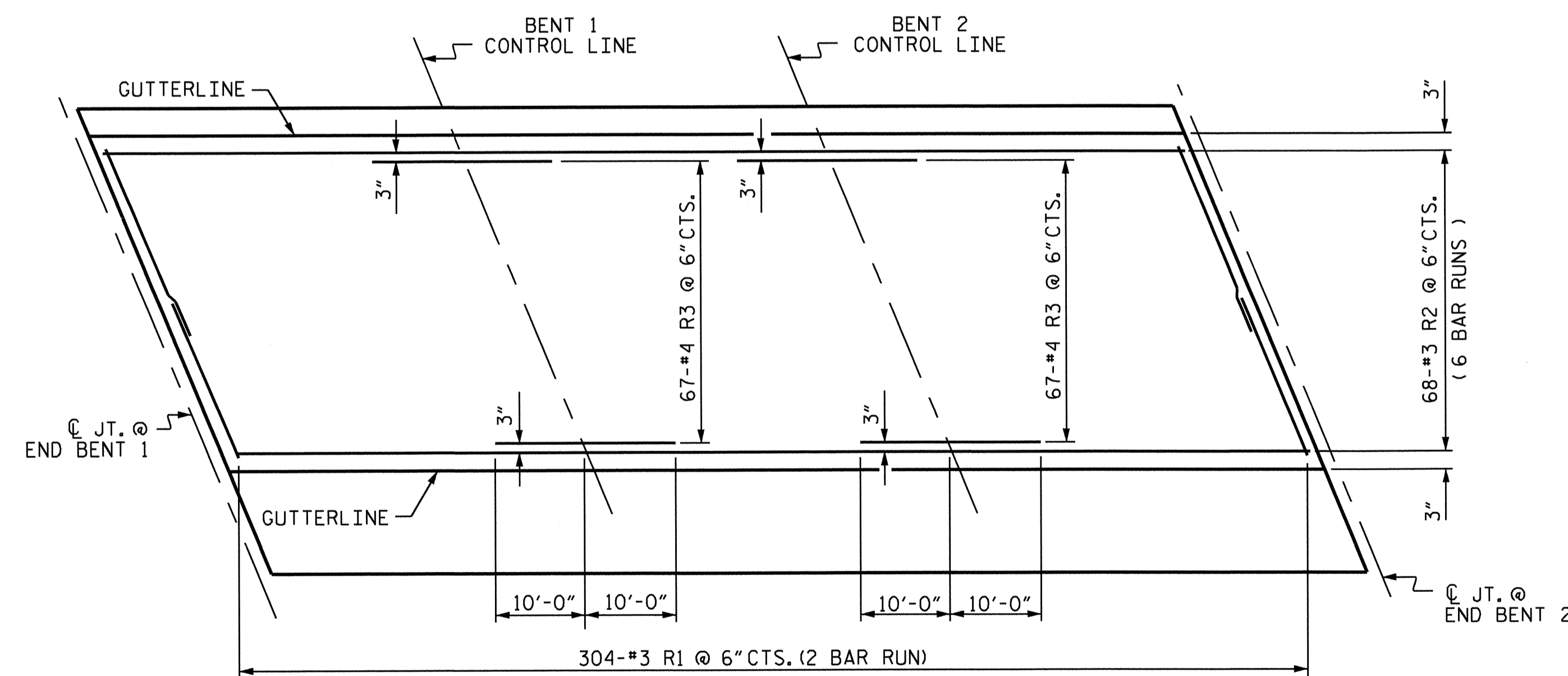
SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#3	1'-3"
#4	1'-8"



REINFORCING FOR CONCRETE WEARING SURFACE

** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

NOTE
FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

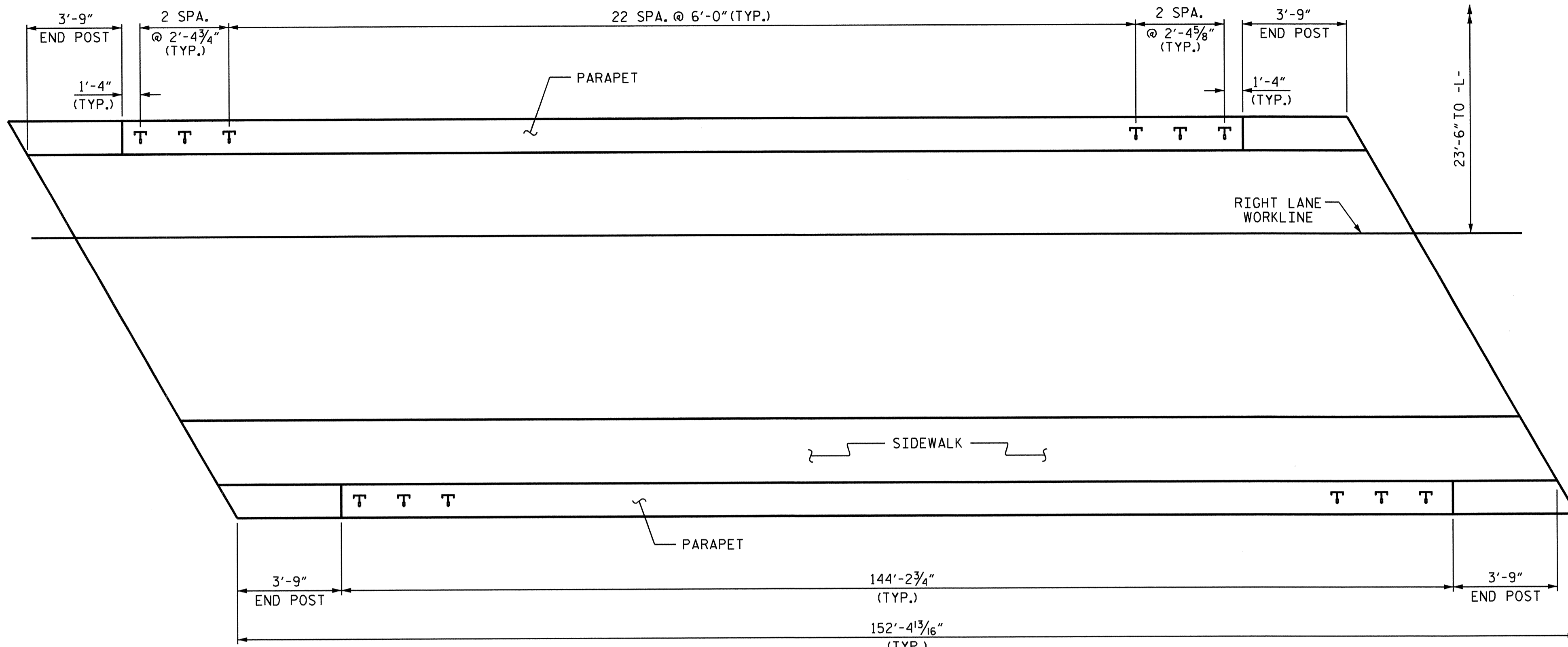
PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+47.50 -L-



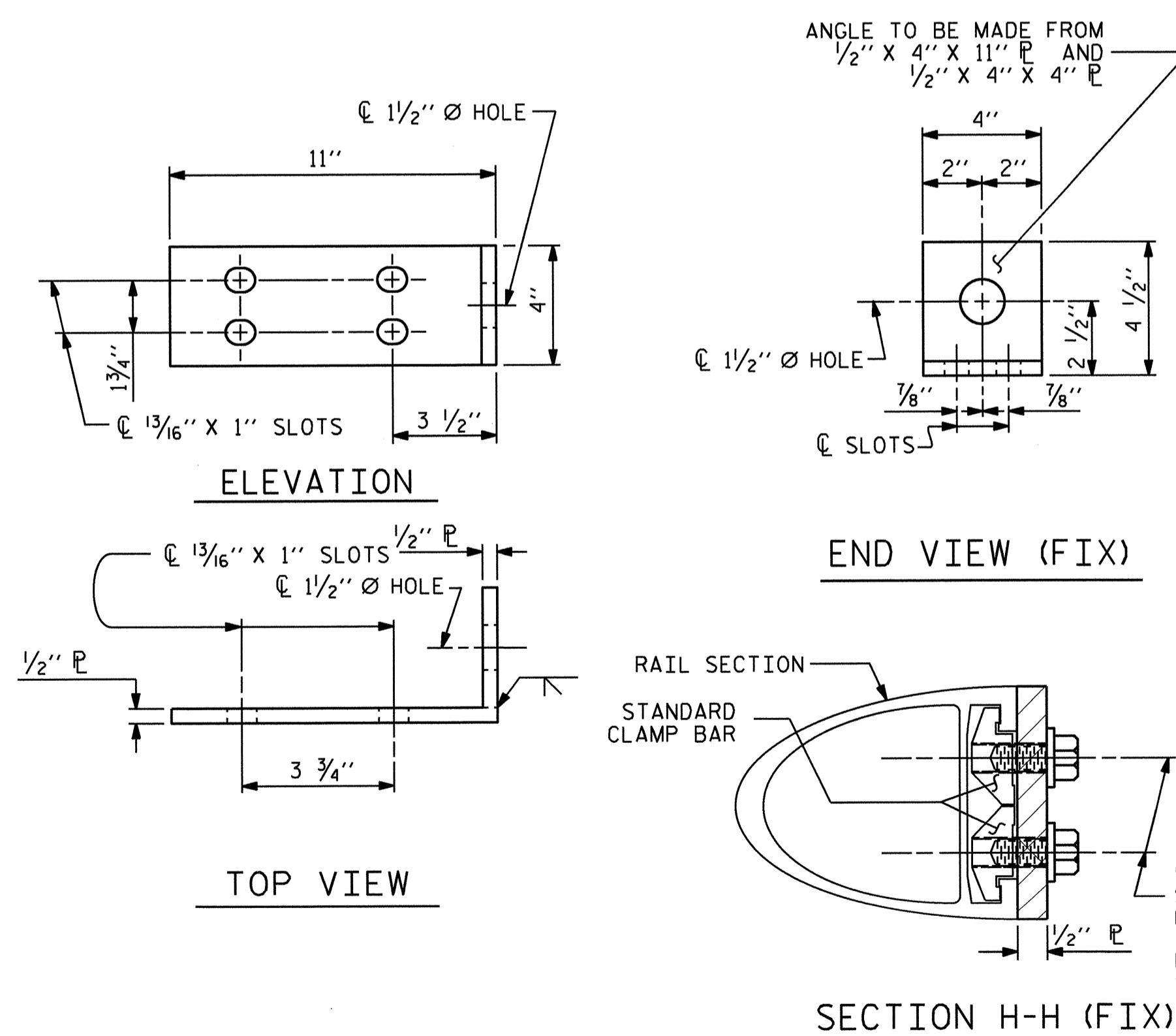
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CONCRETE WEARING SURFACE
(RIGHT LANE)

DESIGN ENGINEER OF RECORD :	D. R. SMITH	DATE :	9/12
ASSEMBLED BY :	J. G. KHARVA	DATE :	8/12
CHECKED BY :	R. L. CHESSON	DATE :	9/12
DRAWN BY :	TLA 5/05	ADDED :	7/11/05R
CHECKED BY :	GM 6/05	REV. :	5/1/06RR
		REV. :	10/1/11
		TLA/GM	MAA/GM

REVISIONS						SHEET NO. S-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			



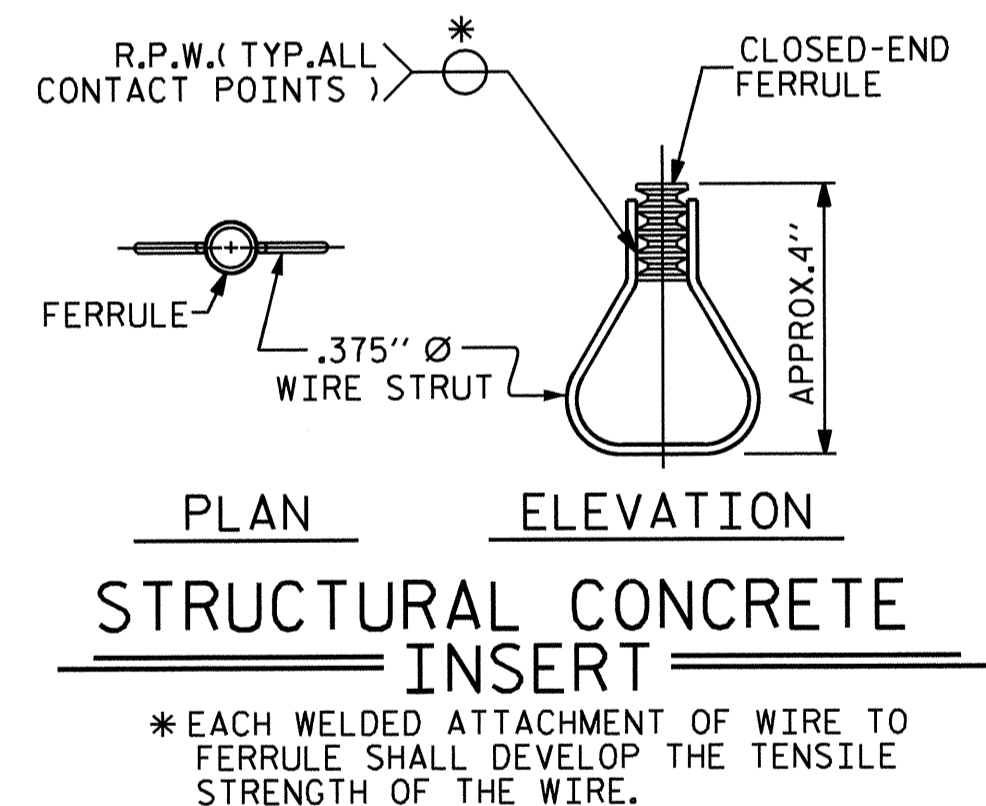
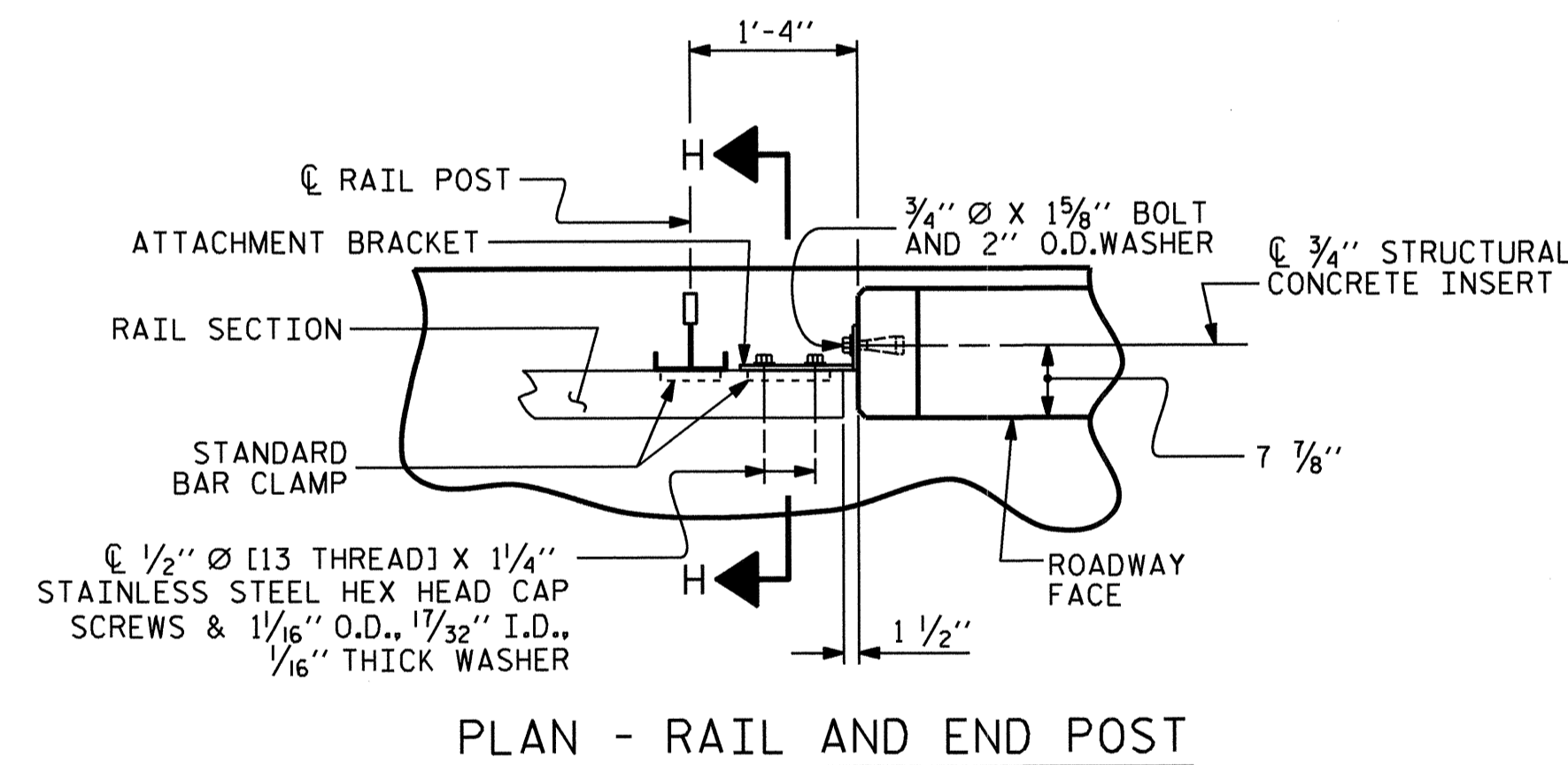
PLAN OF RAIL POST SPACINGS



DETAILS FOR ATTACHING METAL RAIL TO END POST

- NOTES**
STRUCTURAL CONCRETE INSERT
- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
 - 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

- NOTES**
METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
 - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.
 - STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

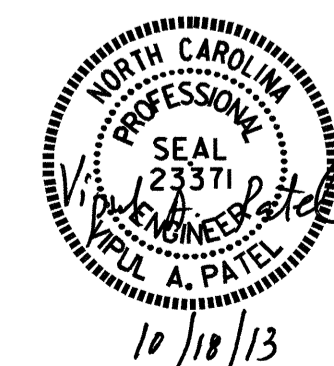


PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 TWO BAR METAL RAILS
 (RIGHT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40	
1			3			TOTAL SHEETS	58
2			4				



ASSEMBLED BY : J. G. KHARVA DATE : 07/30/12
 CHECKED BY : R. L. CHESSON DATE : 09/12
 DRAWN BY : FCJ 1/88 REV. 5/7/03 RWW/JTE
 CHECKED BY : CRK 3/89 REV. 5/1/06 TLA/GM
 REV. 10/1/11 MAA/GM

NOTES

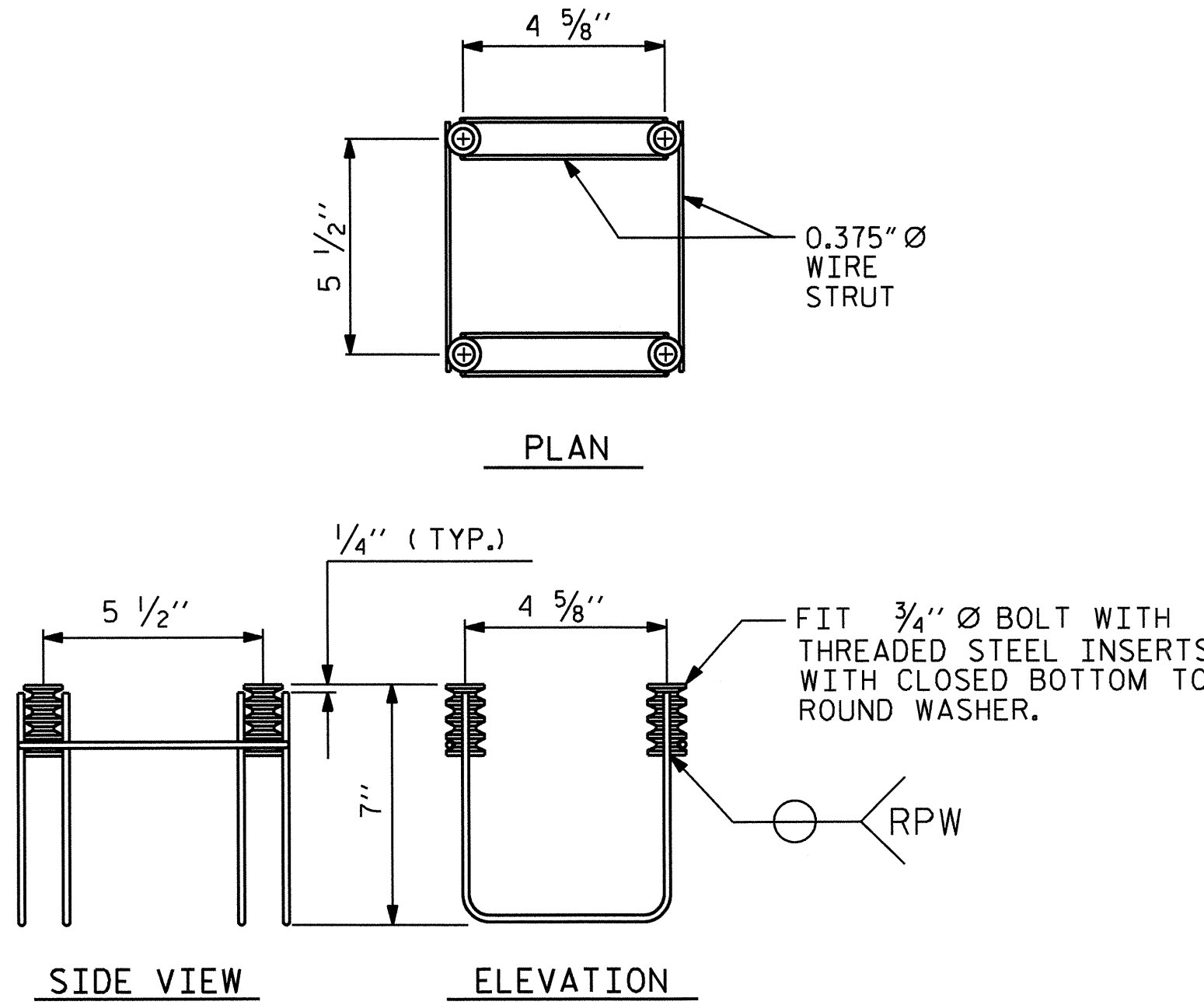
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

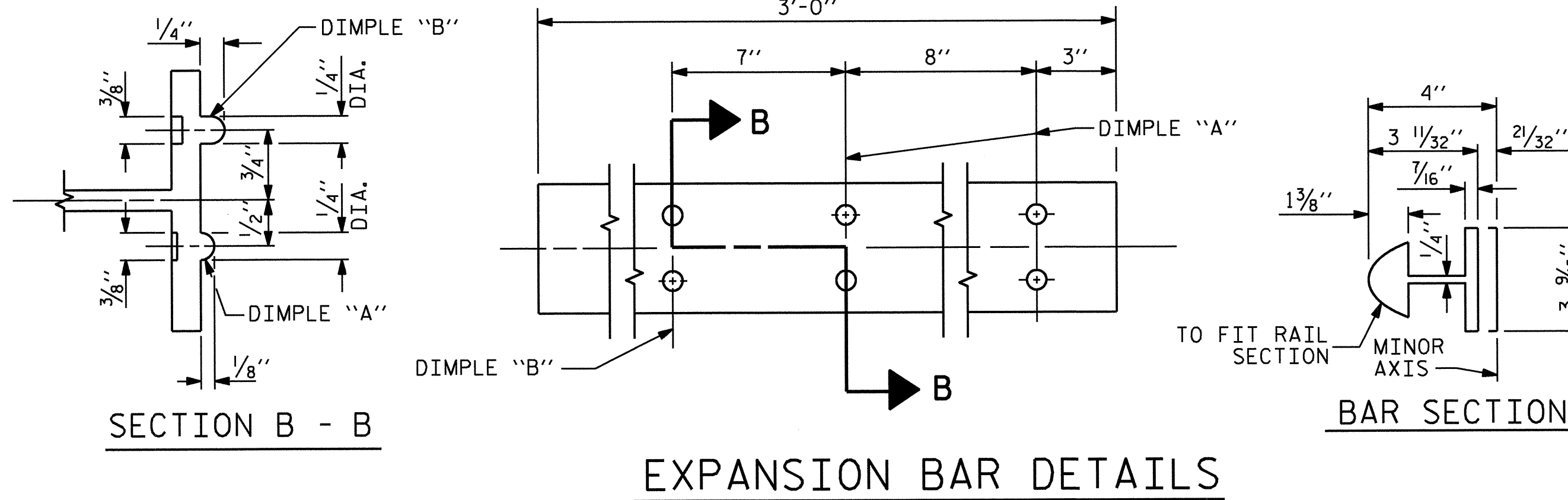
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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

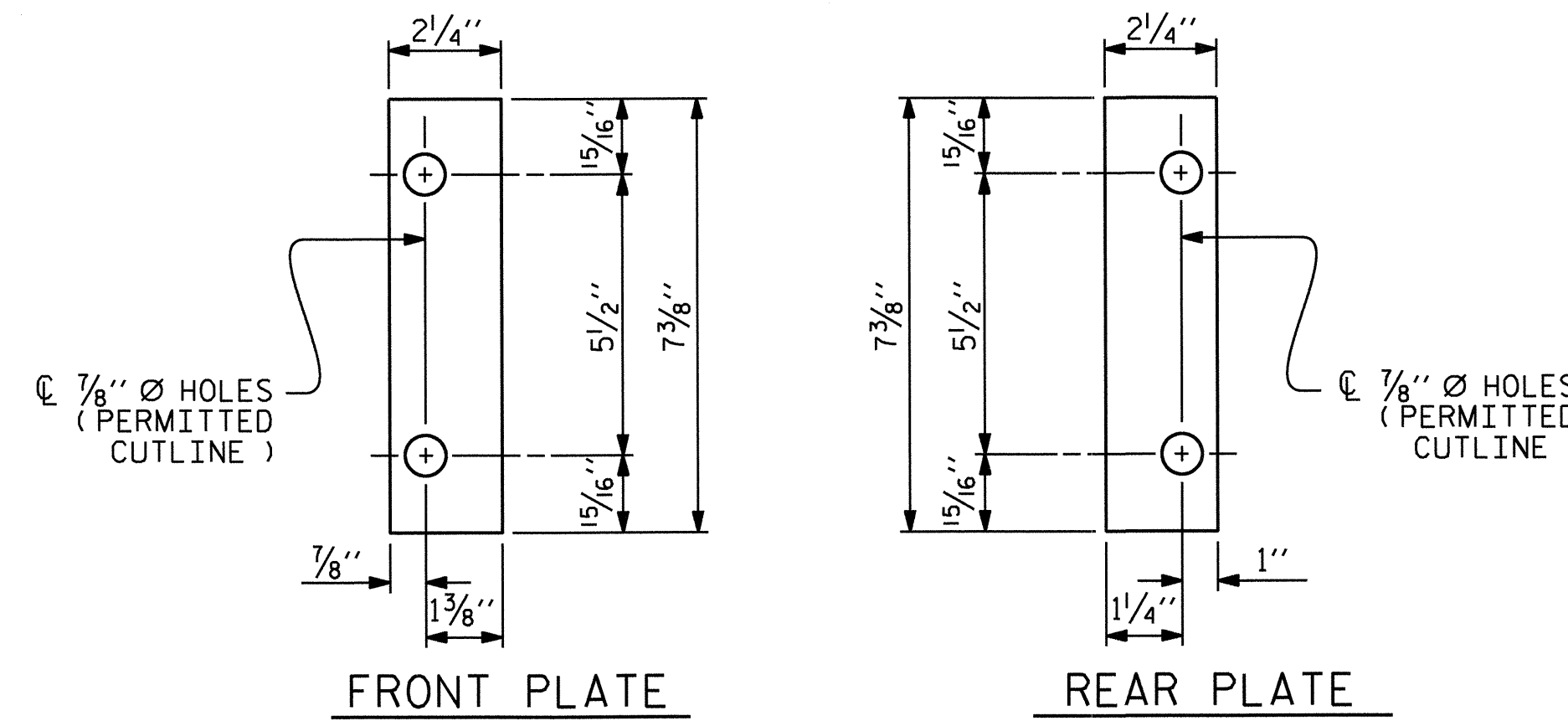


4-BOLT METAL RAIL ANCHOR ASSEMBLY

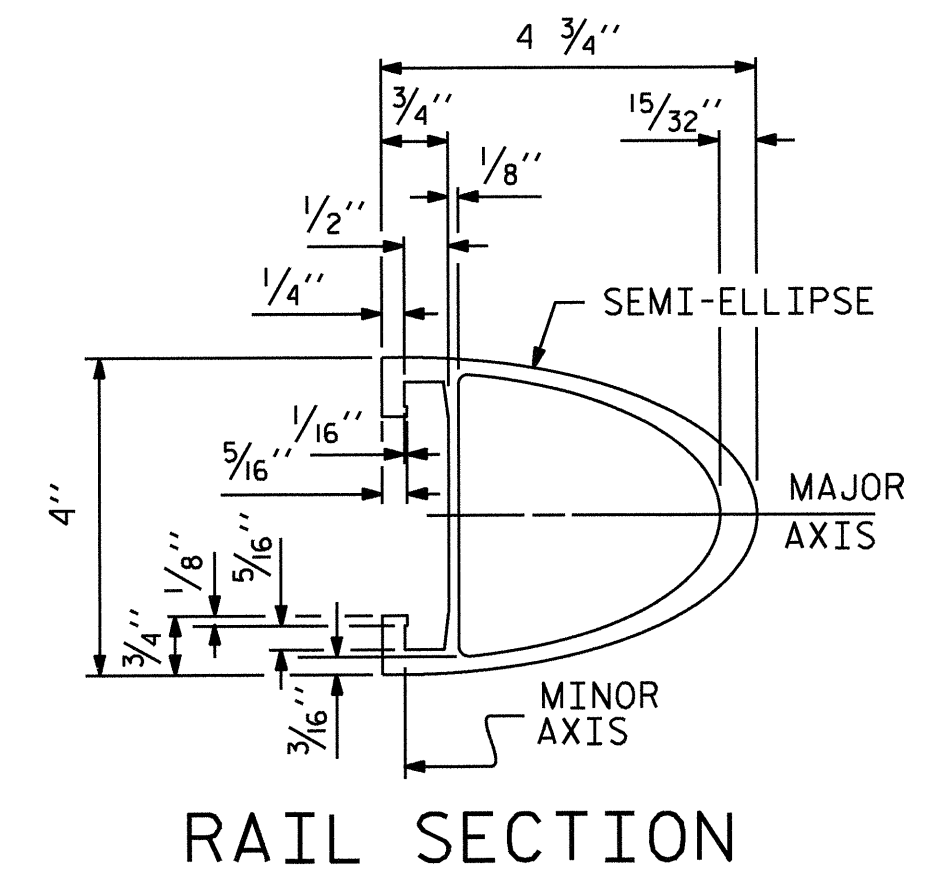
(54 ASSEMBLIES REQUIRED)



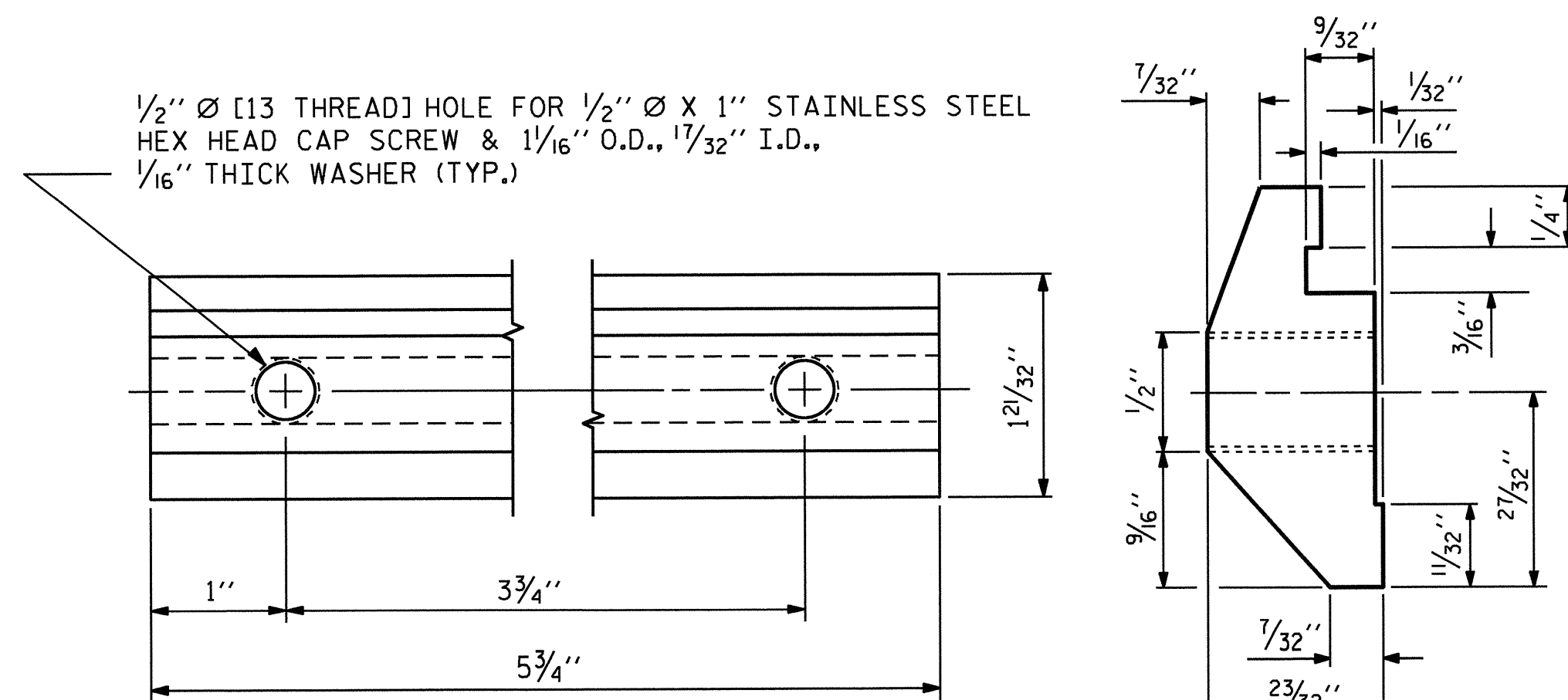
EXPANSION BAR DETAILS



SHIM DETAILS

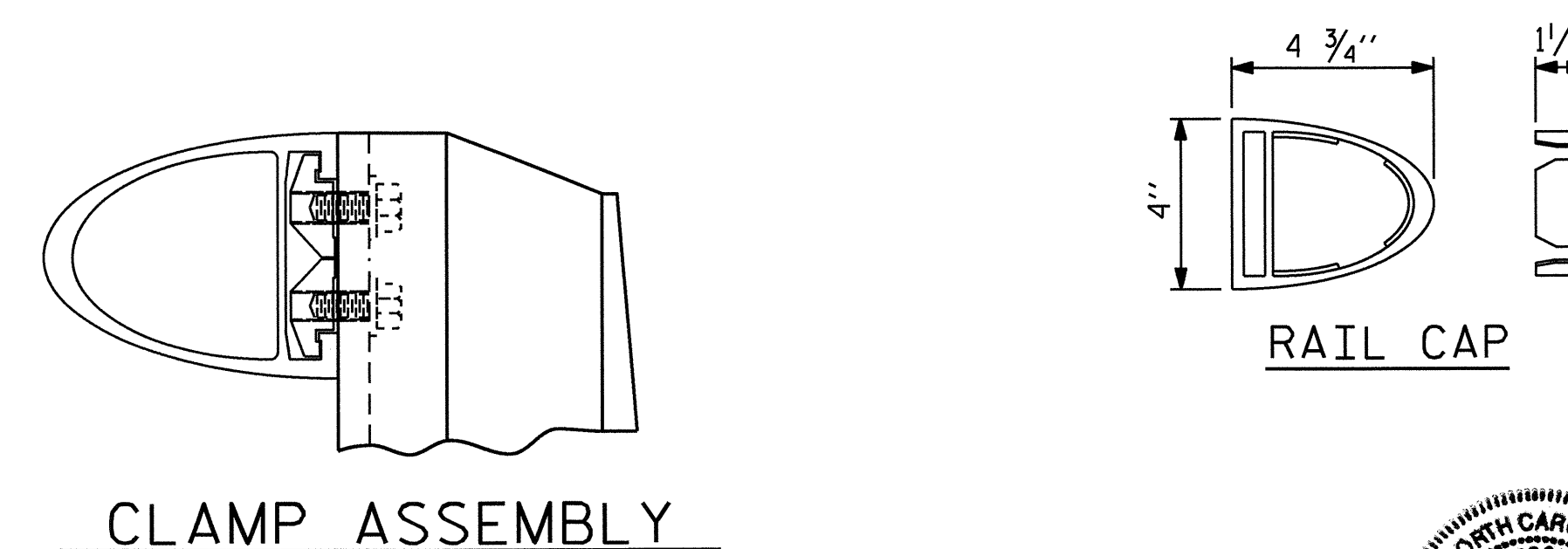


RAIL SECTION

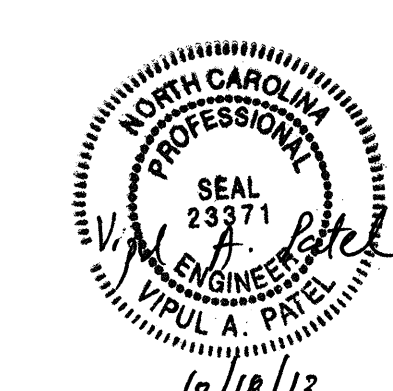


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



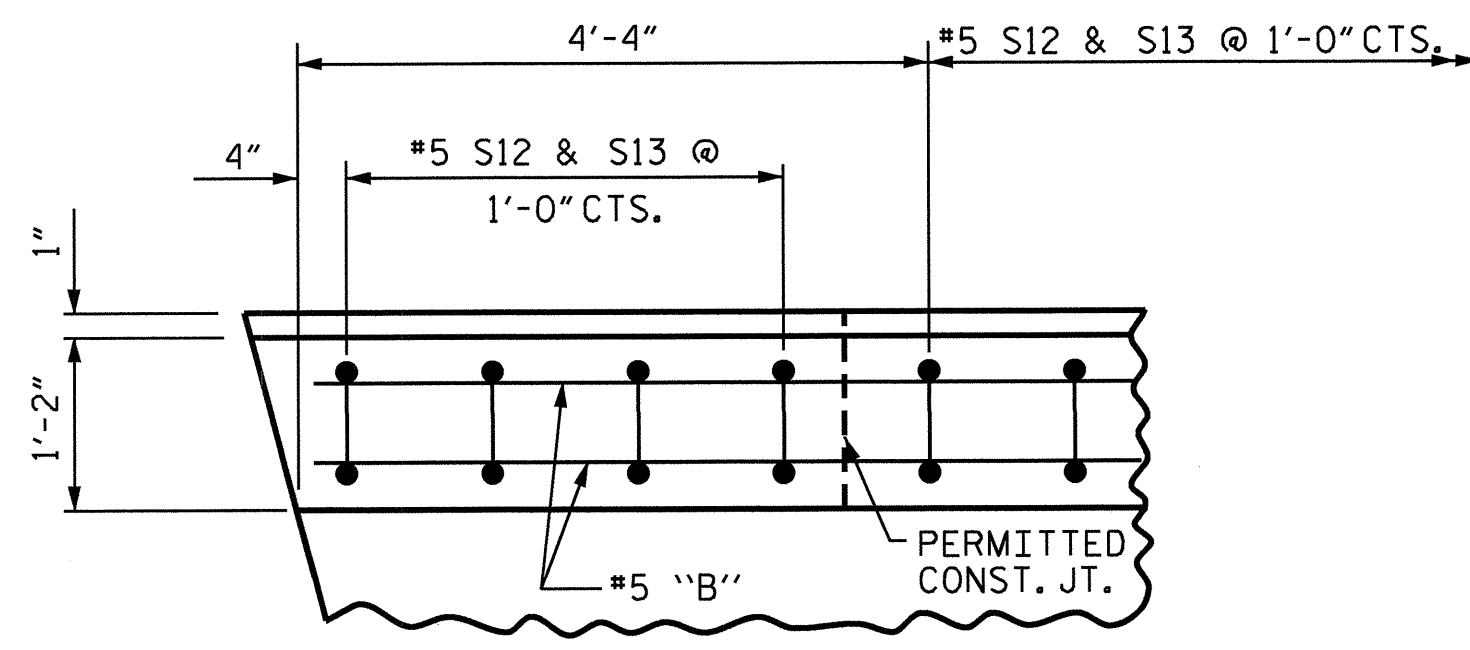
PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 3 OF 4

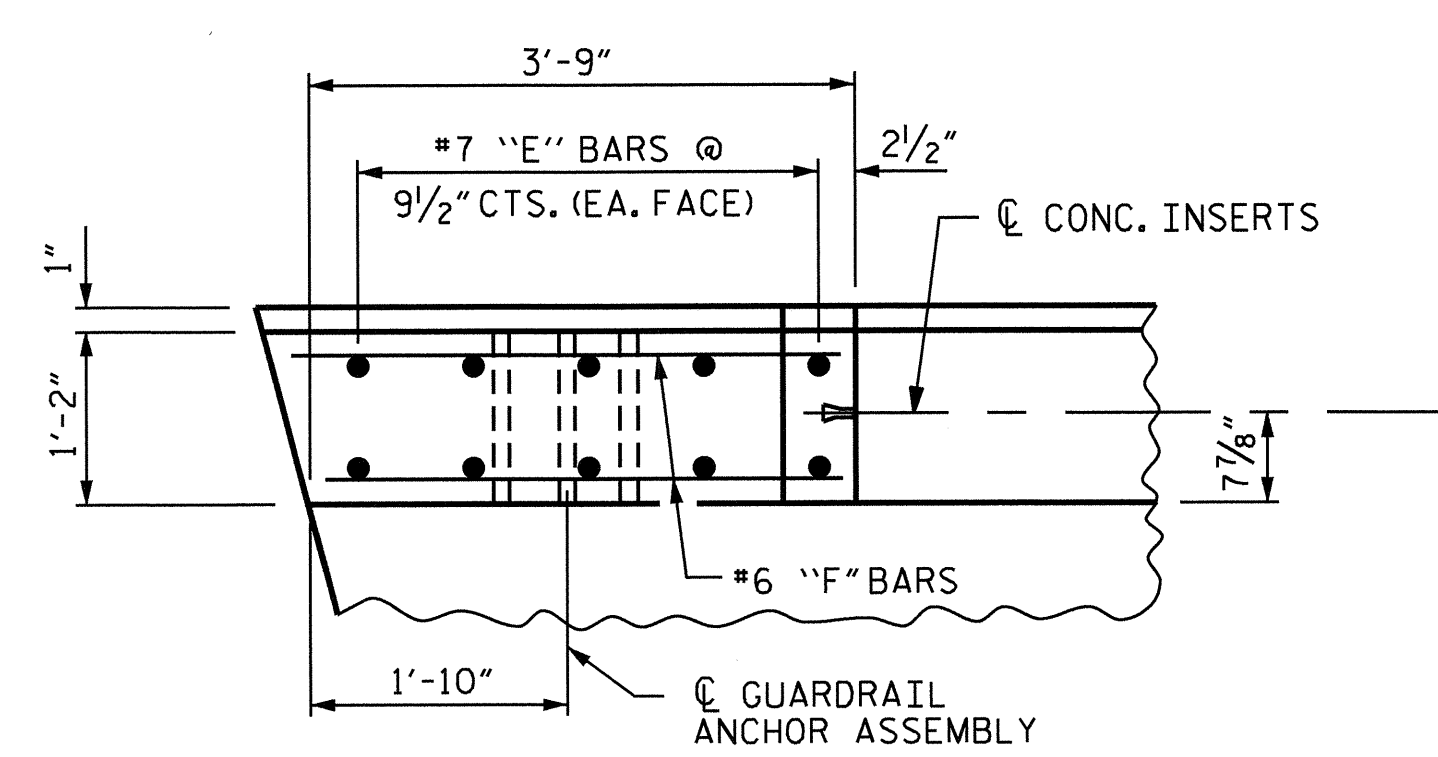
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL
 (RIGHT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42	
1			3			TOTAL SHEETS	
2			4			58	

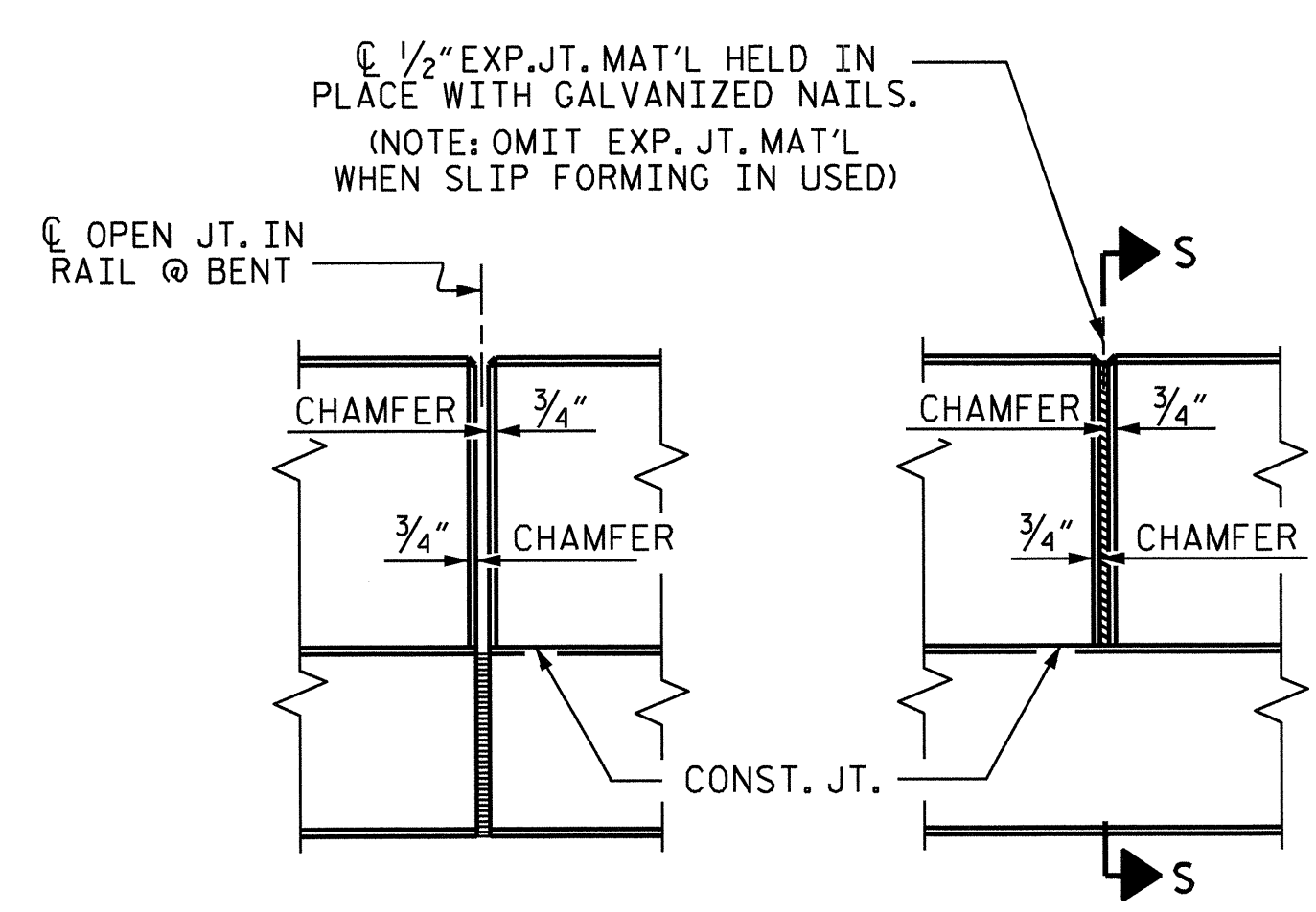
ASSEMBLED BY : J. G. KHARVA DATE : 07/24/12
 CHECKED BY : R. L. CHESSON DATE : 09/12
 DRAWN BY : EEM 6/94 REV. 8/16/99 MAB/LES
 CHECKED BY : RGW 6/94 REV. 5/1/06R KMM/GM
 REV. 10/1/11 MAA/GM



PLAN OF PARAPET

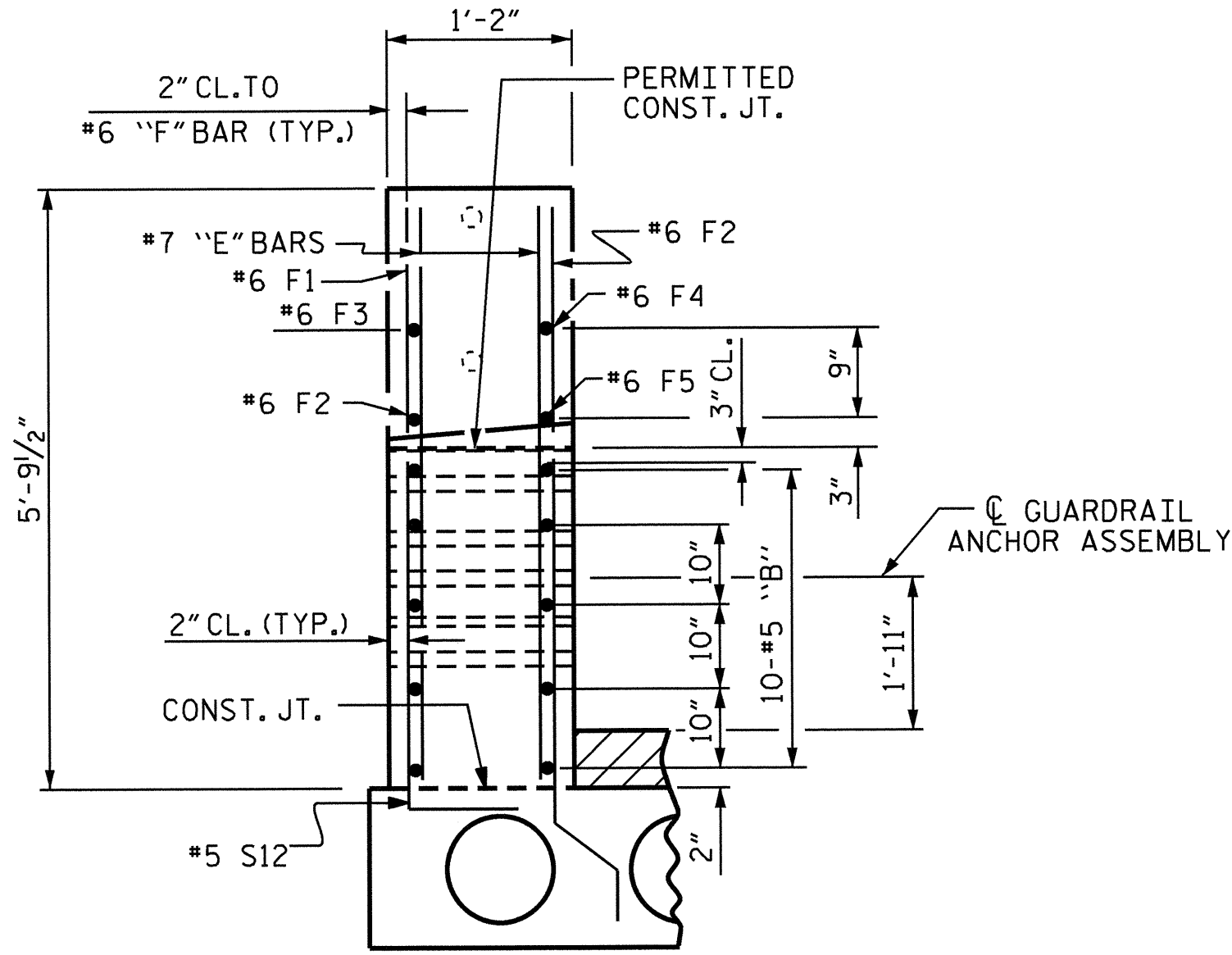


PLAN OF END POST

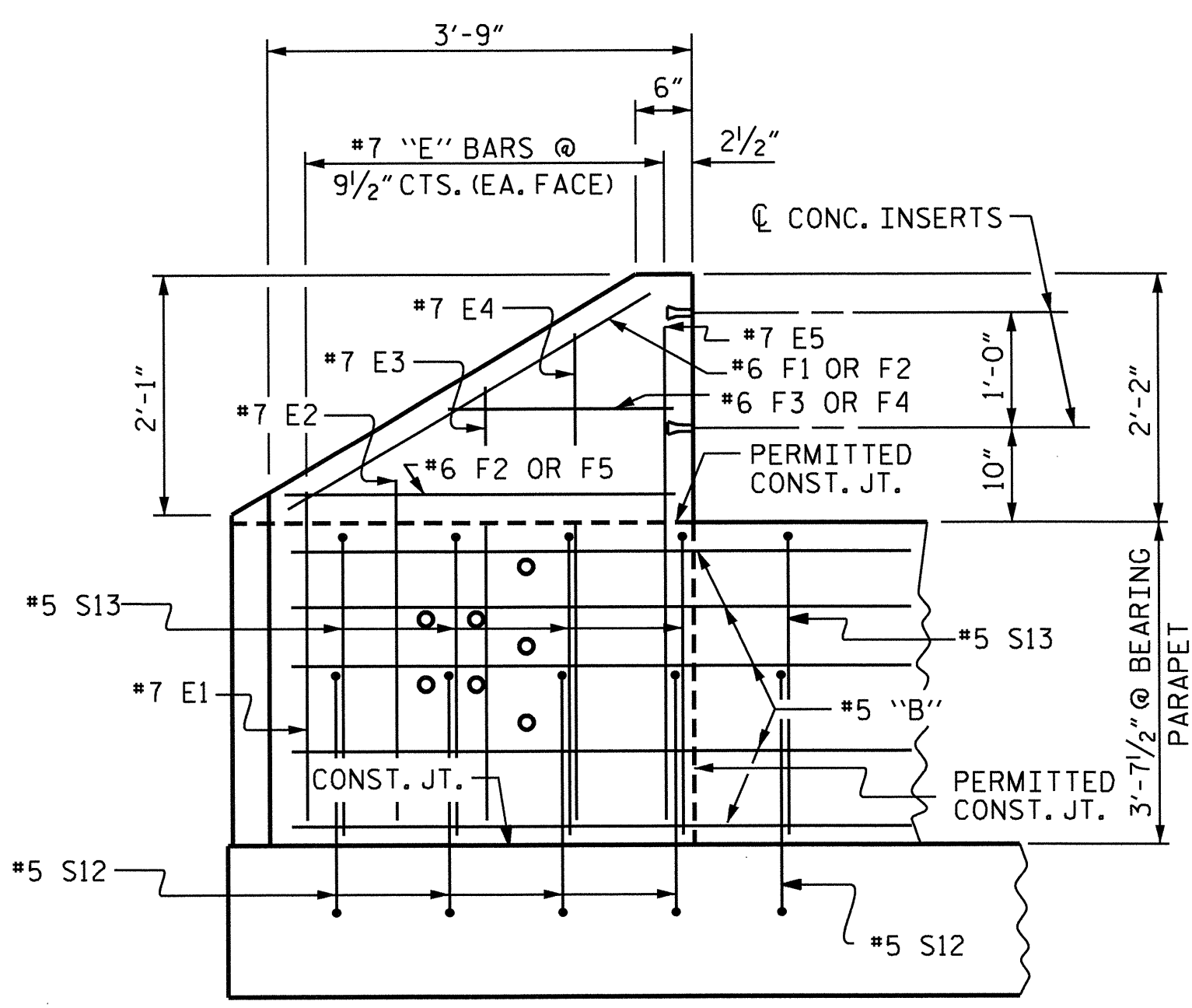


ELEVATION AT EXPANSION JOINTS

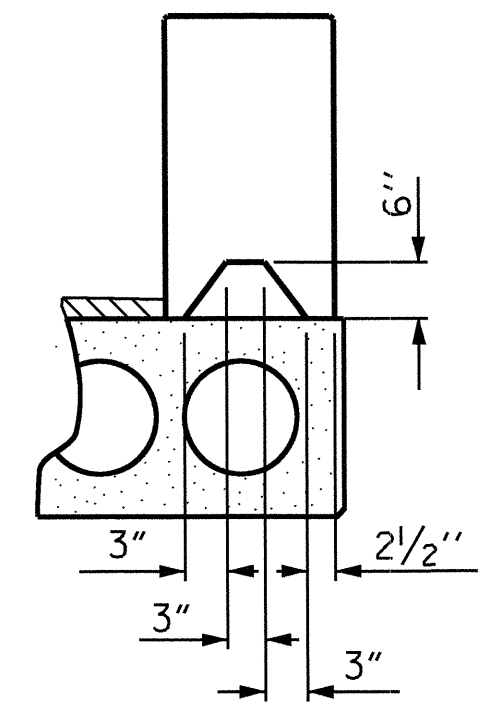
BAR TYPE		BILL OF MATERIAL PARAPET AND END POSTS				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B4	80	#5	STR	12'-8"	1057	
*B5	80	#5	STR	16'-9"	1398	
*B6	80	#5	STR	14'-0"	1168	
*E1	8	#7	STR	3'-10"	63	
*E2	8	#7	STR	4'-4"	71	
*E3	8	#7	STR	4'-10"	79	
*E4	8	#7	STR	5'-4"	87	
*E5	8	#7	STR	5'-8"	93	
*F1	4	#6	STR	4'-2"	25	
*F2	8	#6	STR	3'-8"	44	
*F3	4	#6	STR	2'-6"	15	
*F4	4	#6	STR	2'-0"	12	
*F5	4	#6	STR	3'-2"	19	
*S13	306	#5	1	5'-9"	1835	
*EPOXY COATED REINFORCING STEEL					LBS. 5966	
CLASS AA CONCRETE						
PARAPET & END POSTS					CU. YDS. 52.0	
1'-2" X 3'-10 1/4" CONCRETE PARAPET					LIN. FT. 304.80	



END VIEW

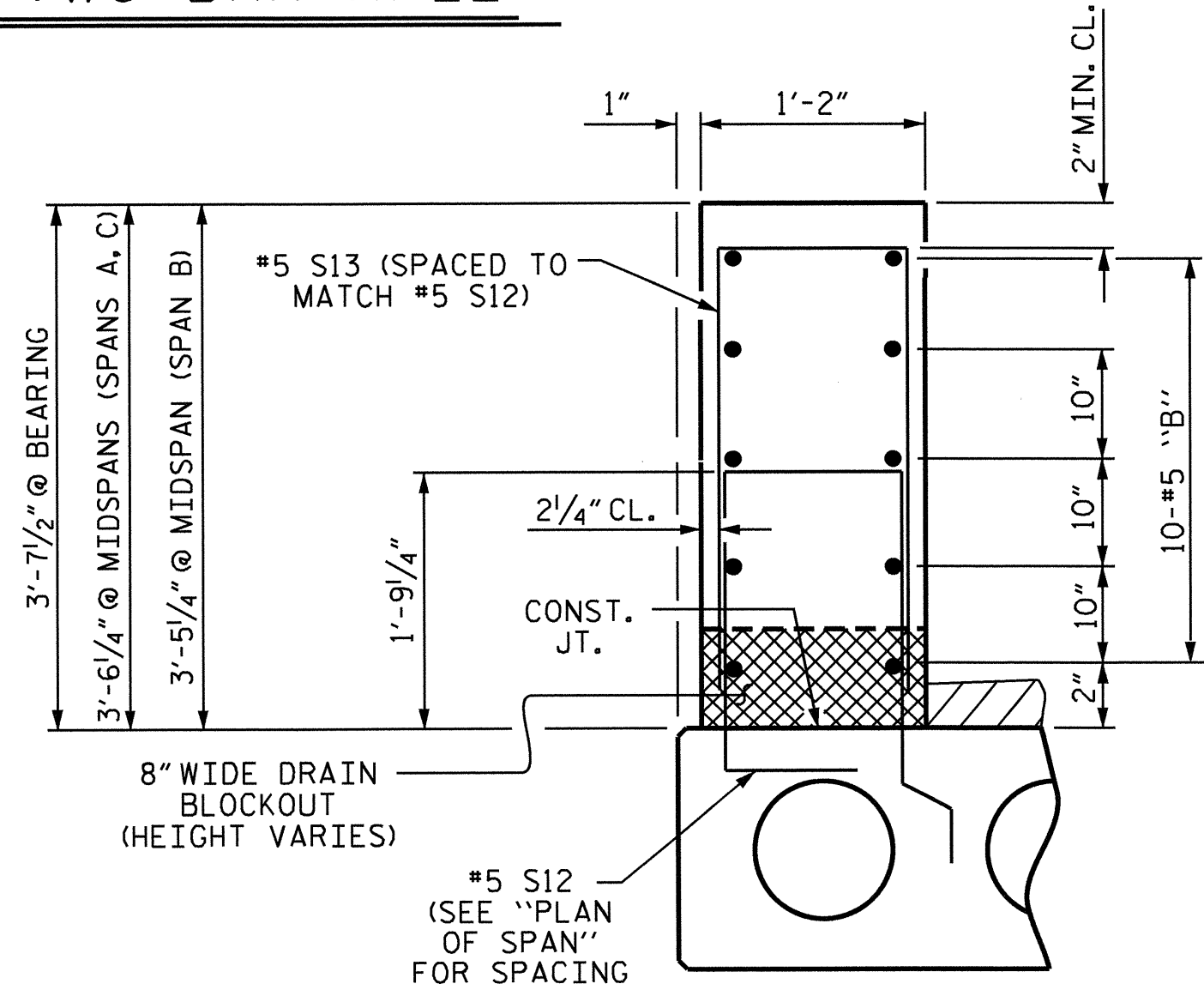


ELEVATION

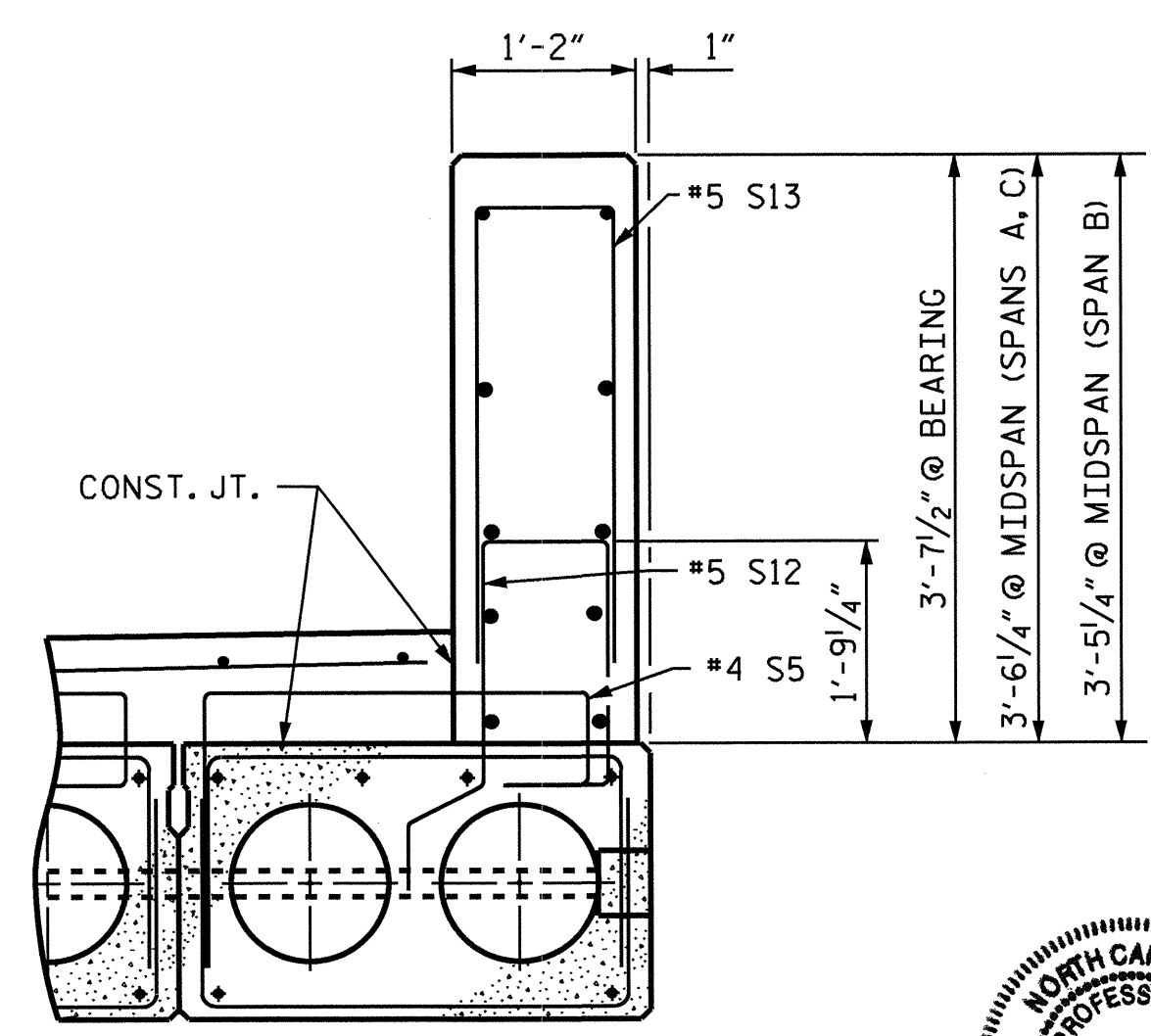


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

PARAPET AND END POST FOR TWO BAR RAIL



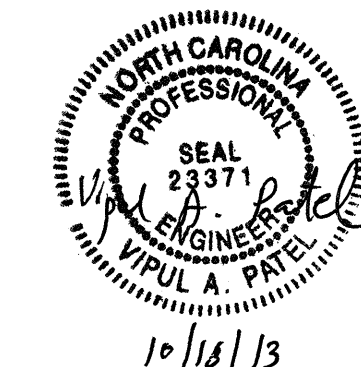
SECTION THRU PARAPET
PARAPET DETAILS



DRAWN BY : J. G. KHARVA DATE : 07/24/12
 CHECKED BY : R. L. CHESSON DATE : 09/12
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 09/10/13

18-OCT-2013 08:15
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 thcarroll

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+47.50 -L-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 END POSTS
 &
 PARAPET DETAILS
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			58

STR. #2

NOTES

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

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

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

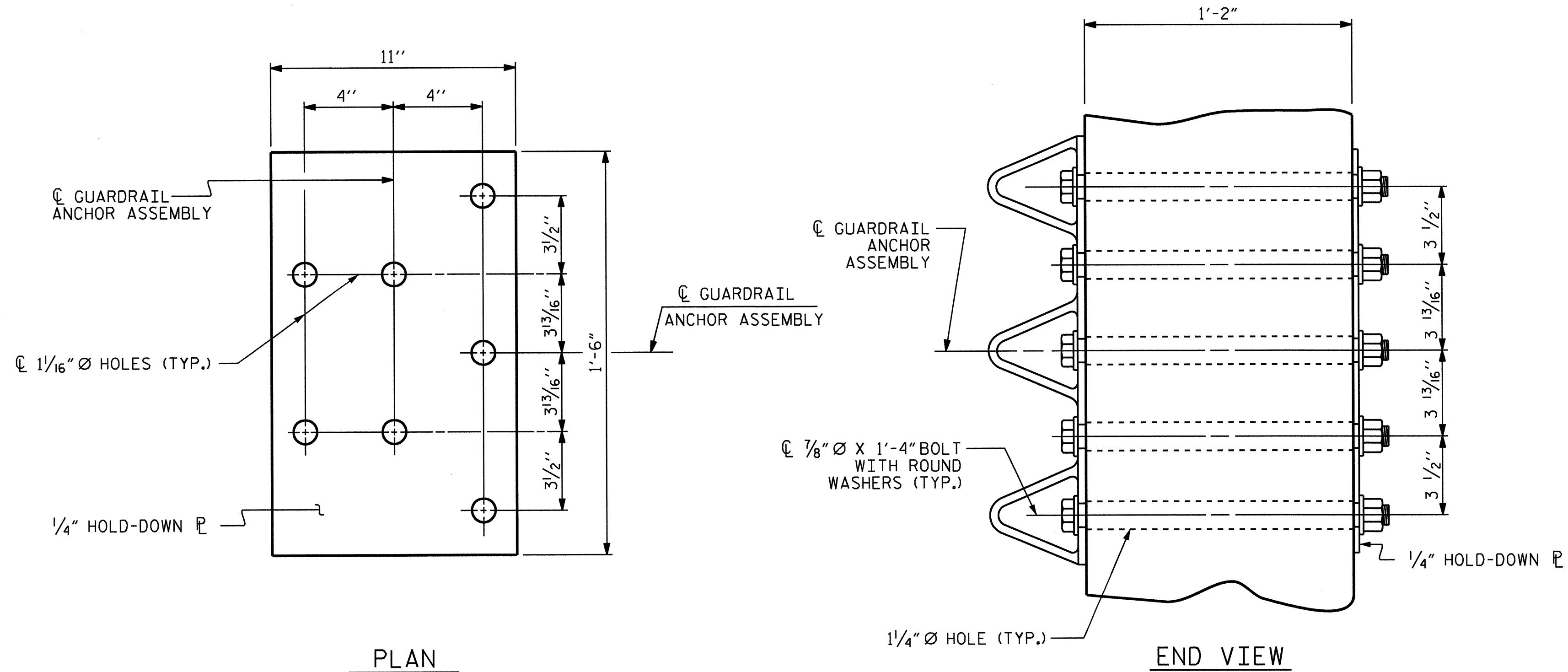
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

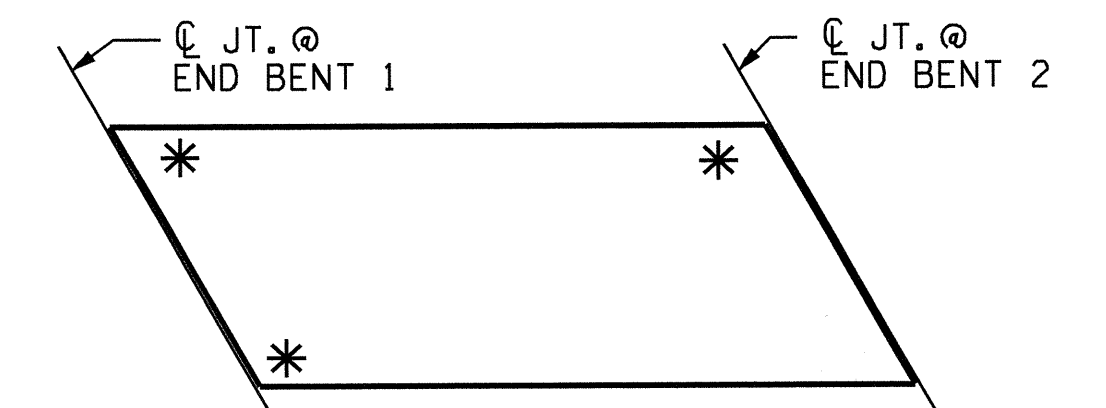
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

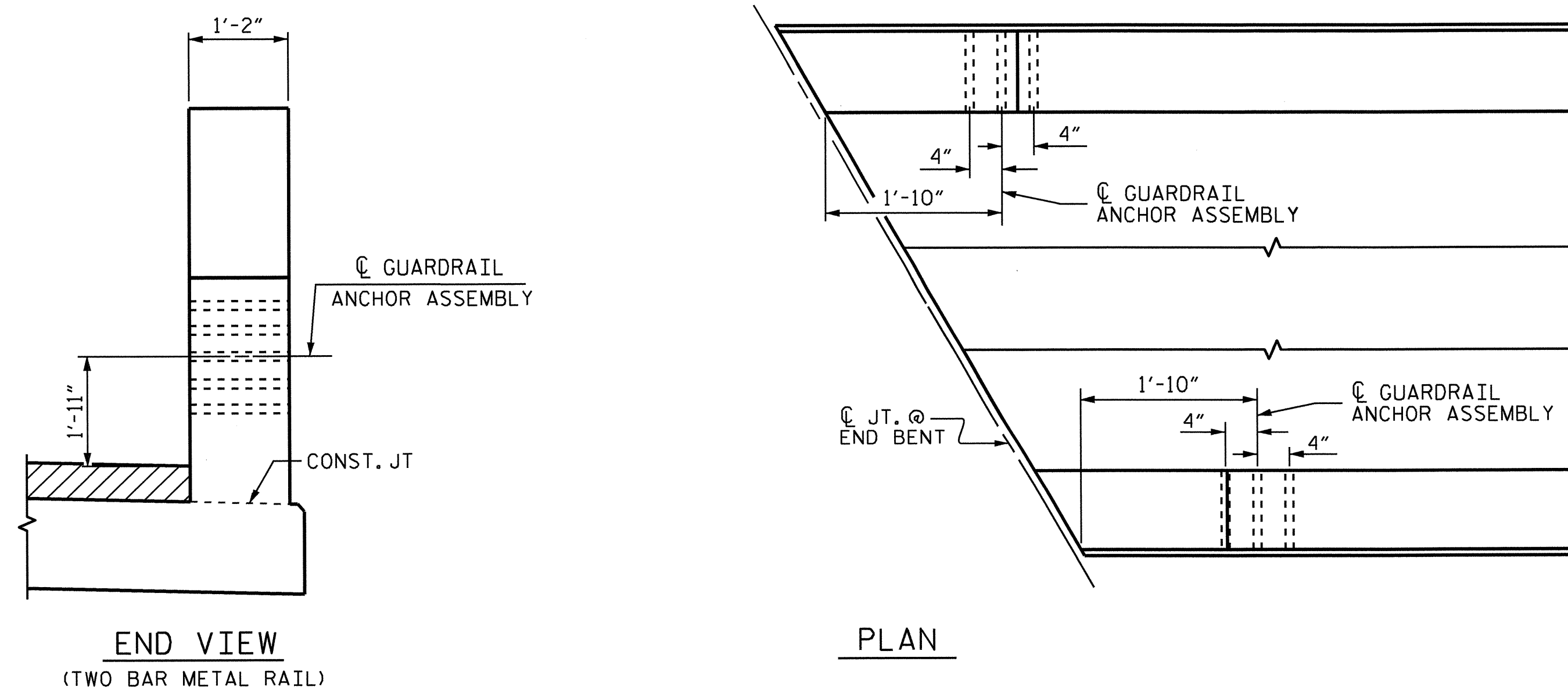
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



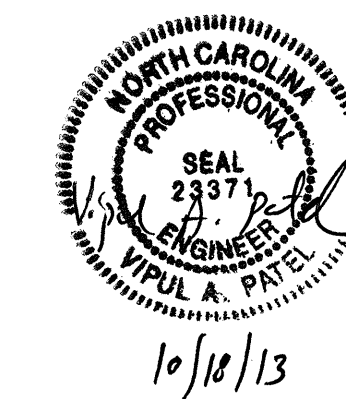
END VIEW
(TWO BAR METAL RAIL)

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : J. C. KHARVA	DATE : 07/24/12
CHECKED BY : R. L. CHESSON	DATE : 09/12
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

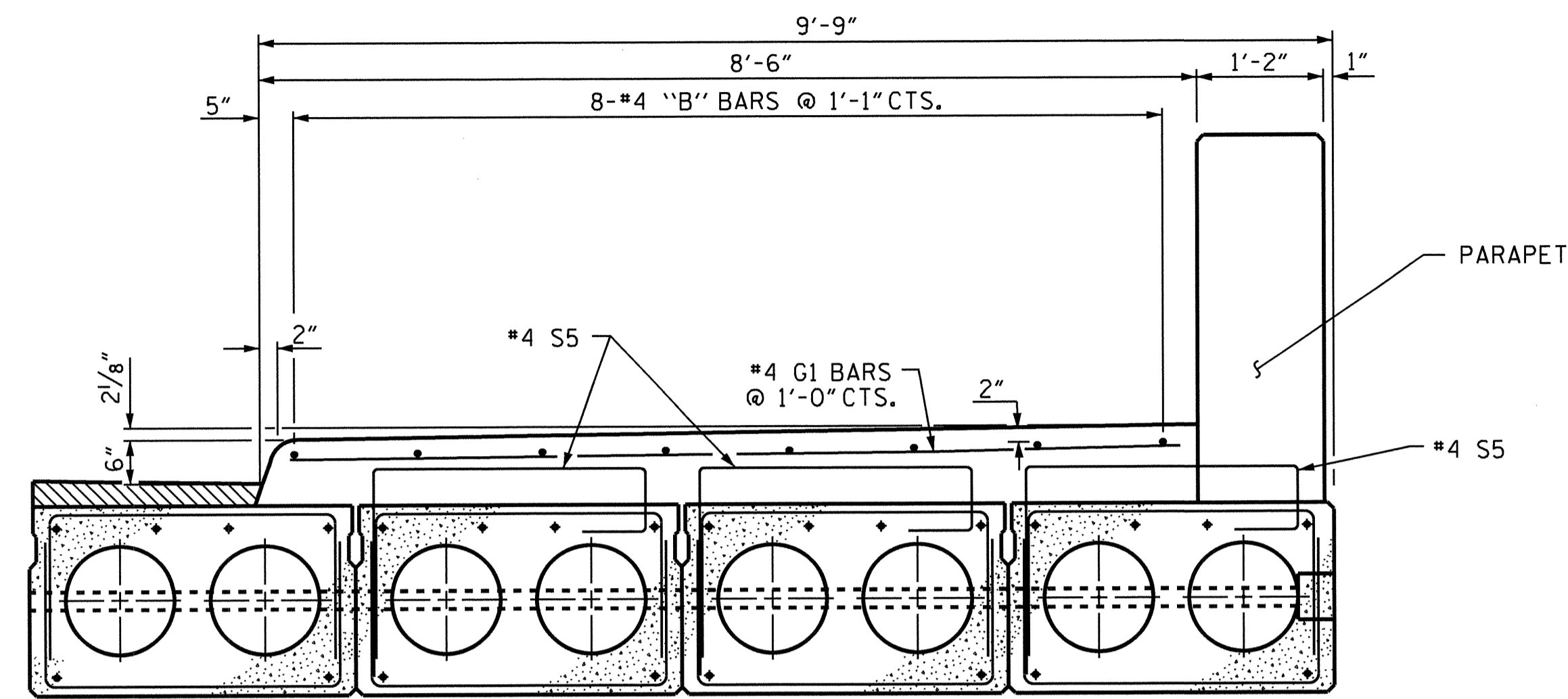
04-SEP-2013 11:53
R:\Structures\Plans\Str*2\B-4779.SD.cs.02.dgn
thcarroll



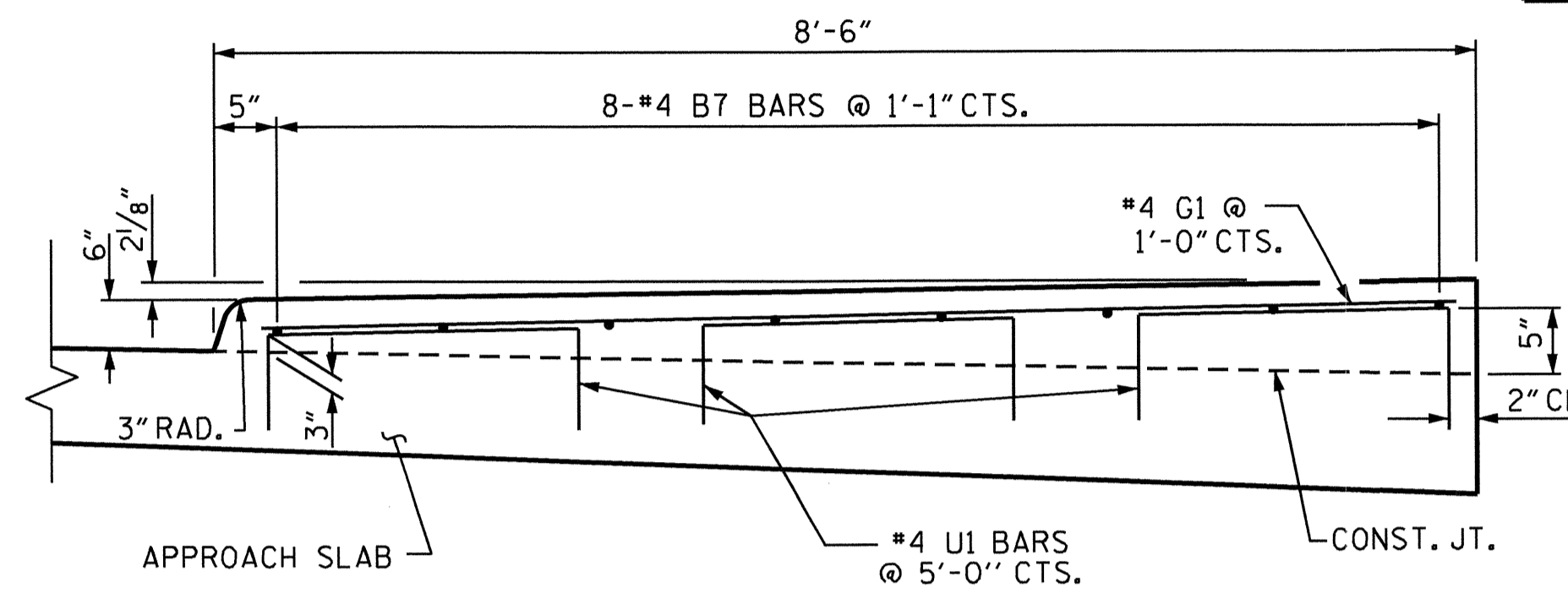
PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS
 (RIGHT LANE)

REVISIONS						SHEET NO. S-44
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			

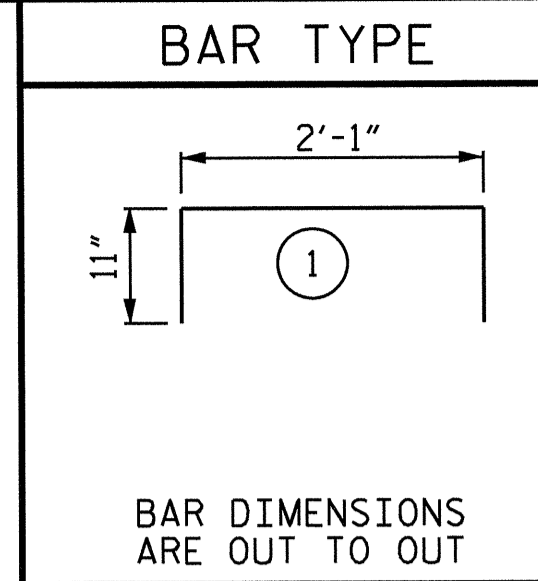


SECTION THROUGH SIDEWALK ON CORED SLABS

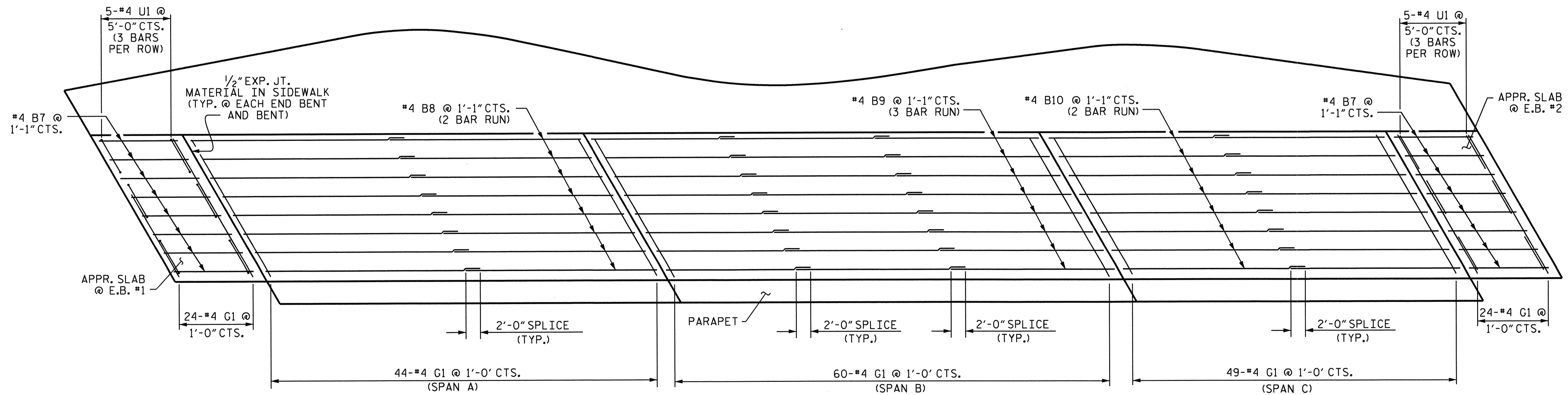


SECTION THRU SIDEWALK ON APPROACH SLAB

#4 U1 BARS MAY BE PUSHED INTO GREEN CONCRETE EXCEPT NOTED OTHERWISE



BILL OF MATERIAL SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B7	16	#4	STR	24'-7"	263
*B8	16	#4	STR	22'-9"	243
*B9	24	#4	STR	21'-3"	341
*B10	16	#4	STR	25'-2"	269
*G1	201	#4	STR	9'-5"	1264
*U1	30	#4	1	3'-11"	78
* EPOXY COATED REINFORCING STEEL				LBS.	2458
CLASS AA CONCRETE SIDEWALK				CU.YDS.	64.2



PLAN OF SIDEWALK

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT IS REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE SIDEWALK DETAILS (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-45
					TOTAL SHEETS 58

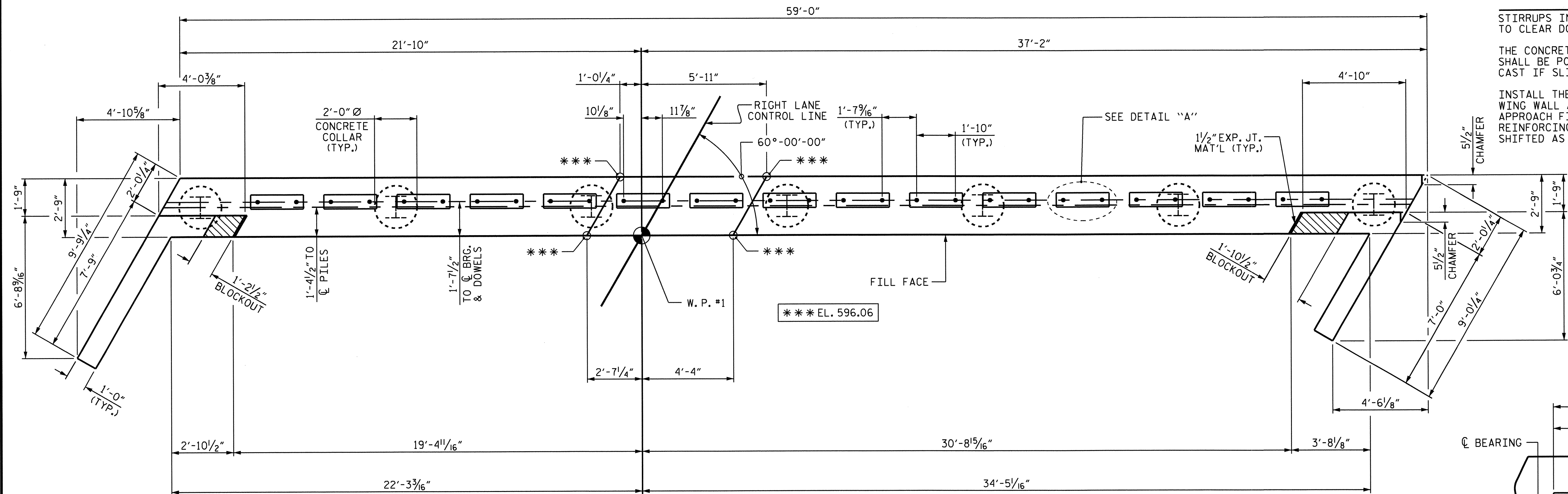
DRAWN BY : J. G. KHARVA DATE : 8/12
 CHECKED BY : R. L. CHESSON DATE : 9/12
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 09/10/13

NOTES

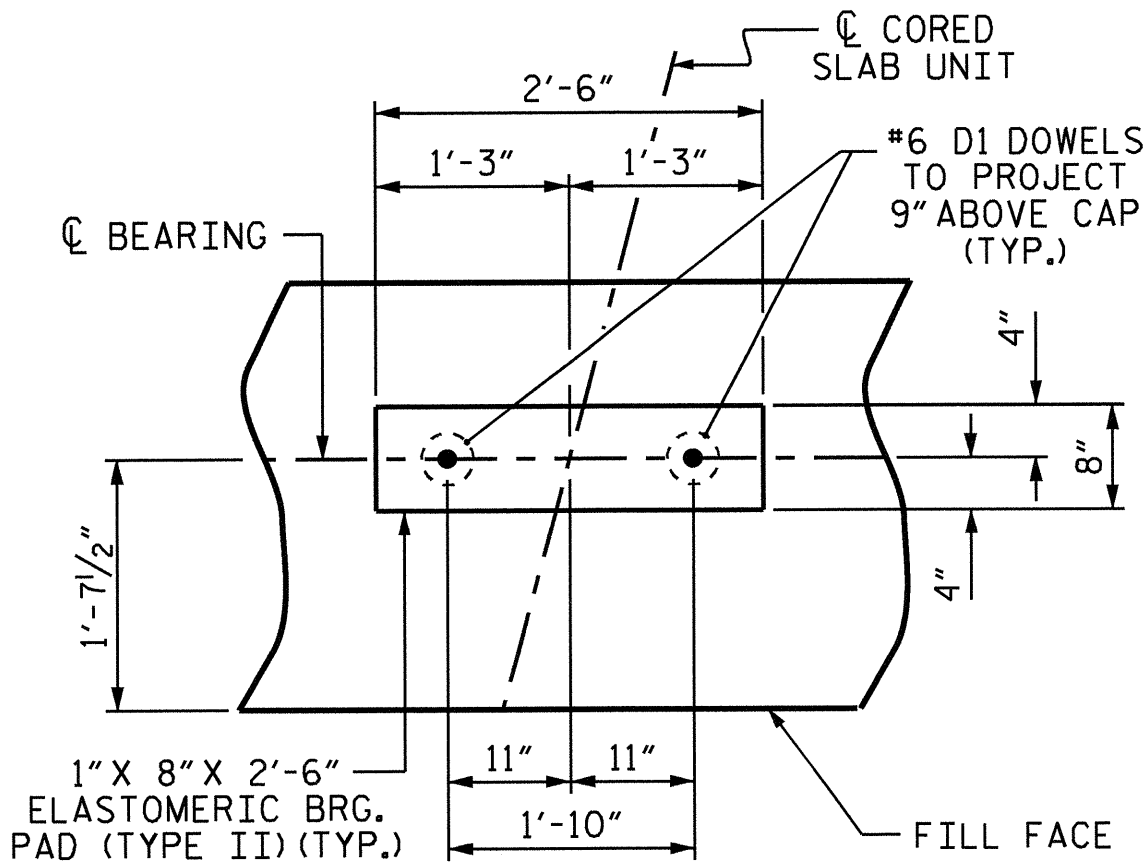
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

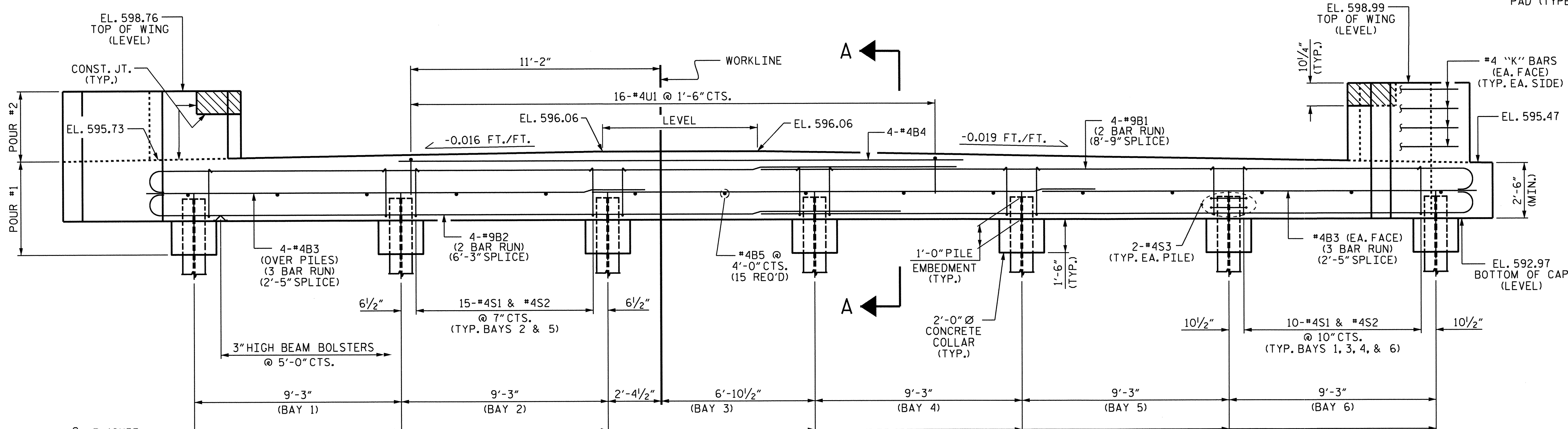
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"

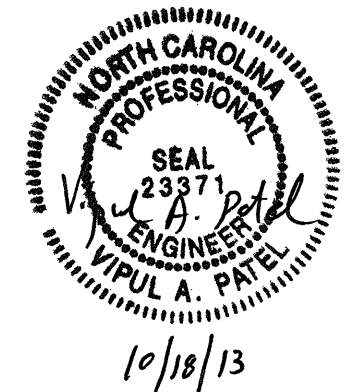


ELEVATION

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-
 SHEET 1 OF 3

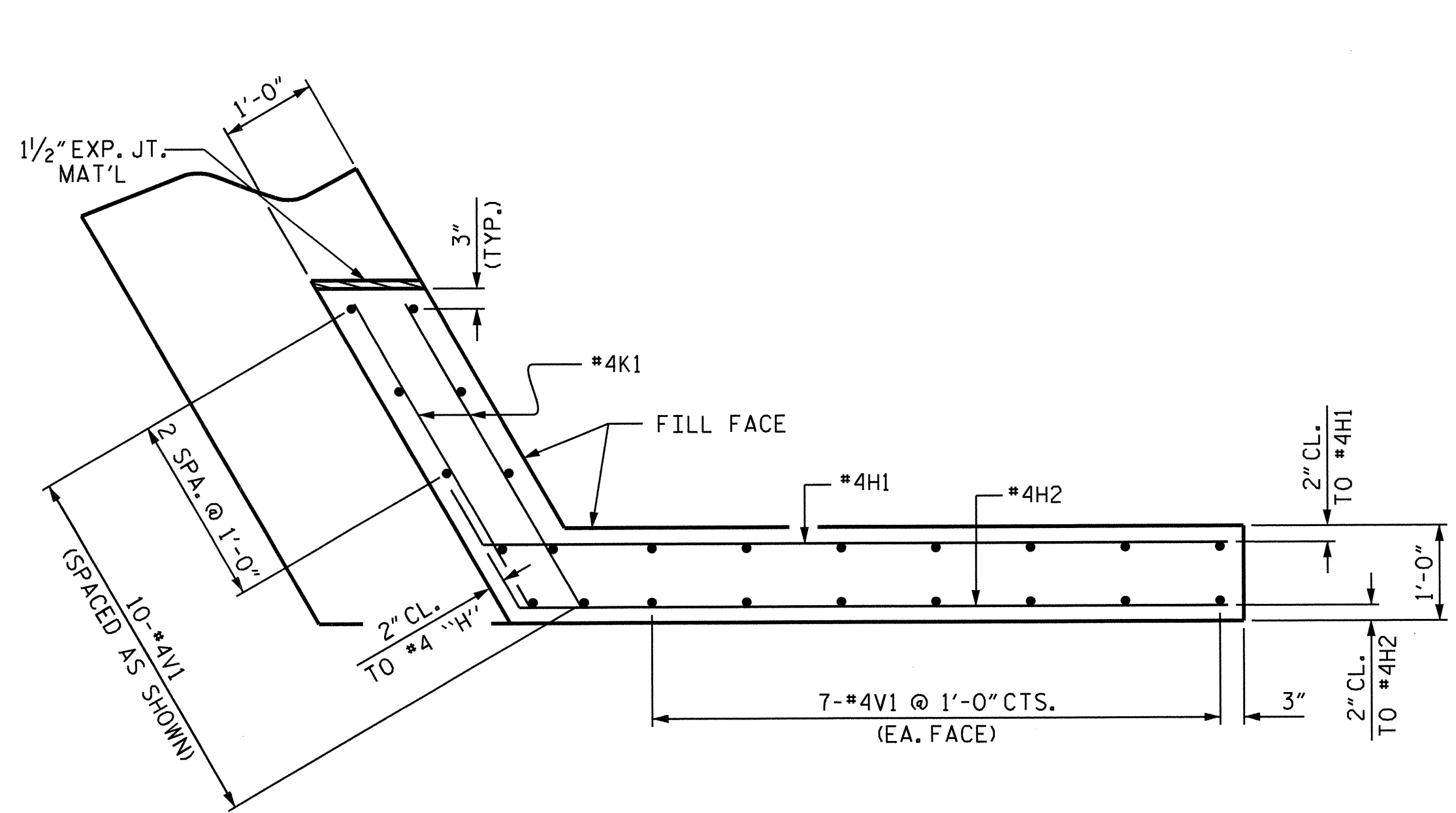
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1
 (RIGHT LANE)**

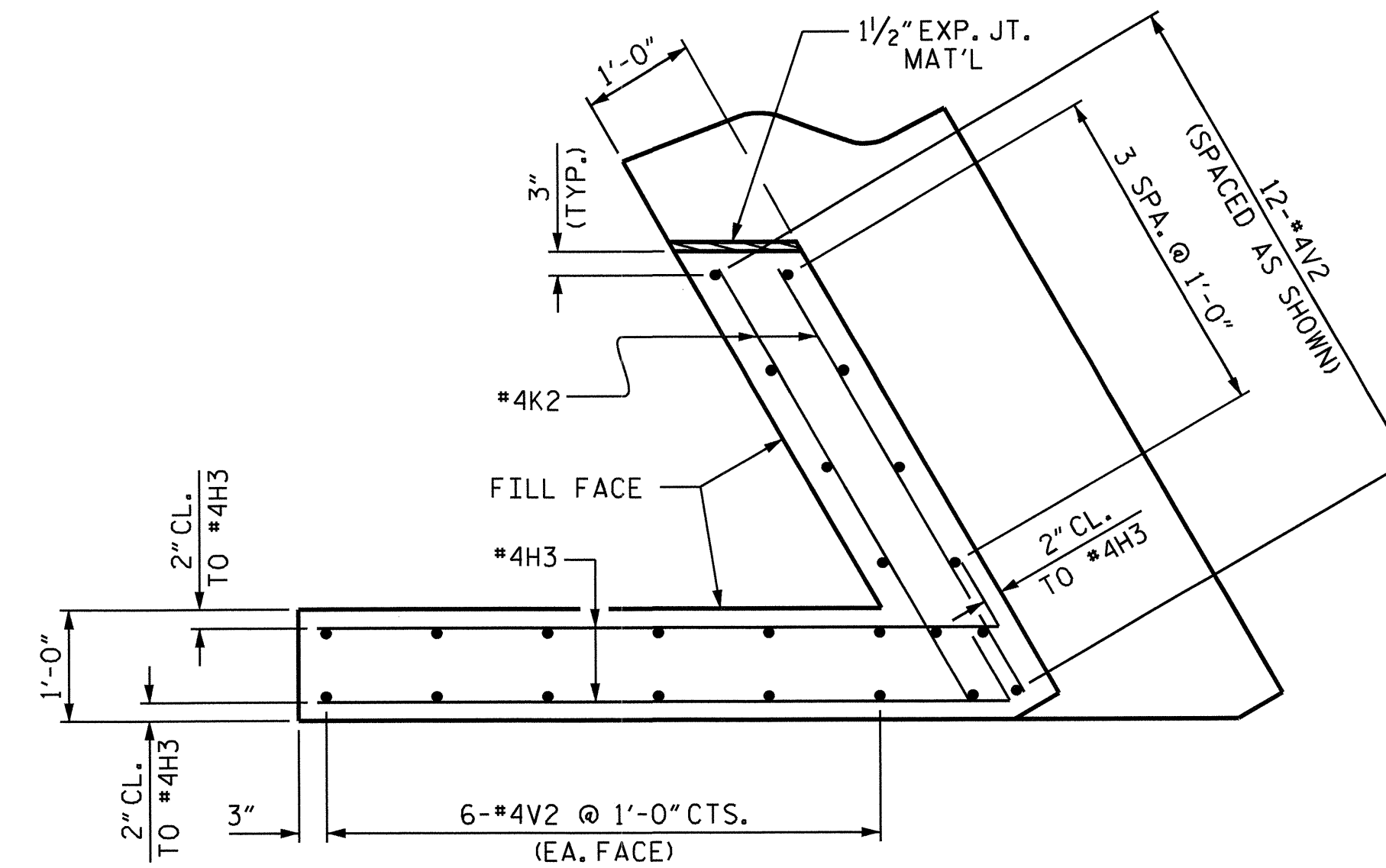


DRAWN BY : T. H. CARROLL DATE : 03/26/13
 CHECKED BY : R. L. CHESSON DATE : 05/31/13
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 09/10/13

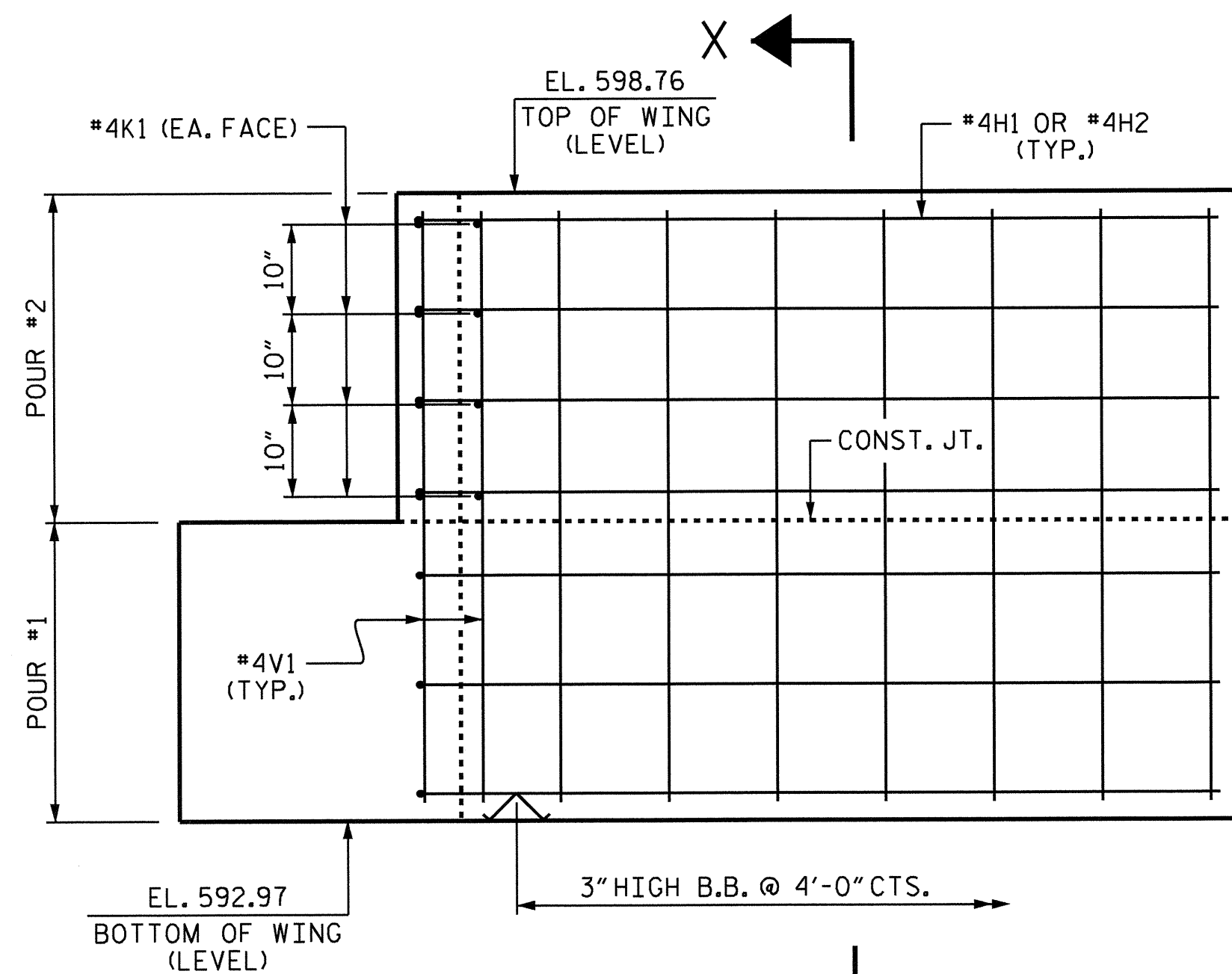
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46	
1			3			TOTAL SHEETS	
2			4			58	



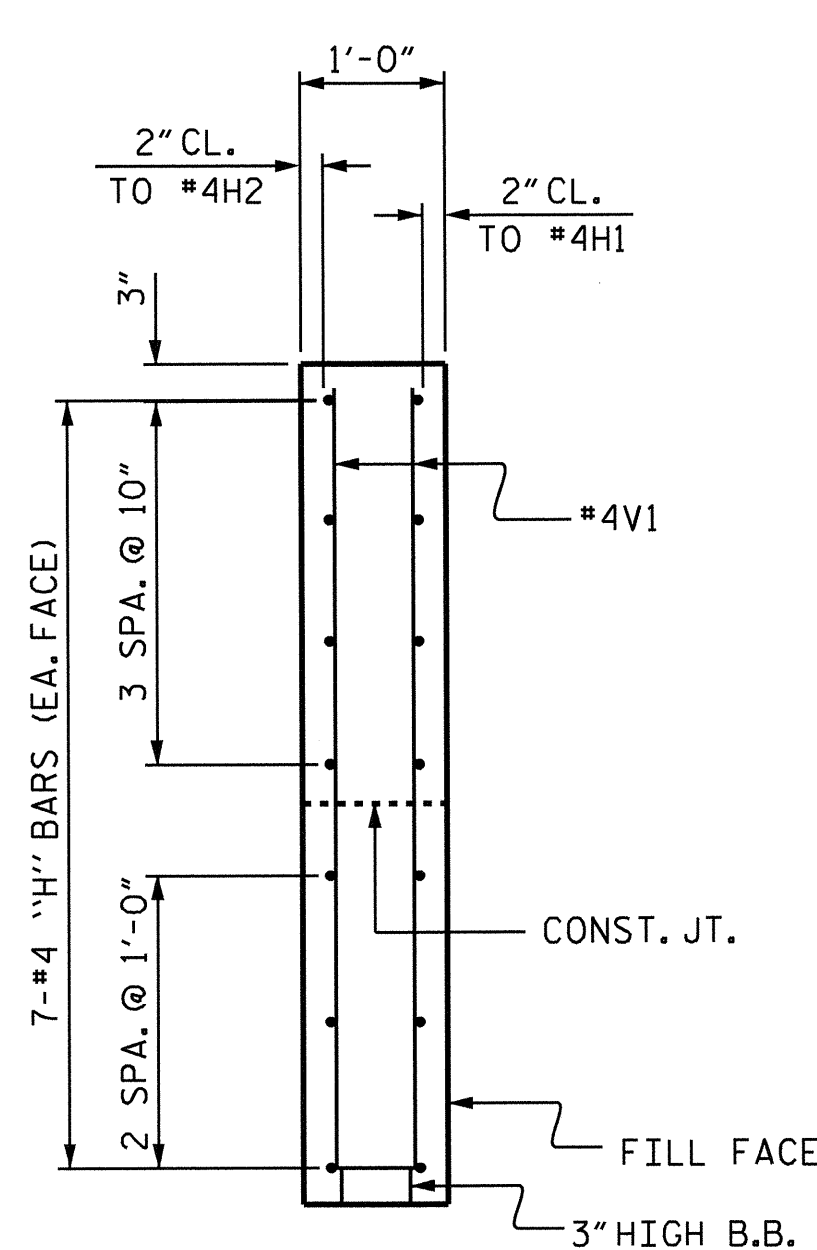
PLAN OF LEFT WING



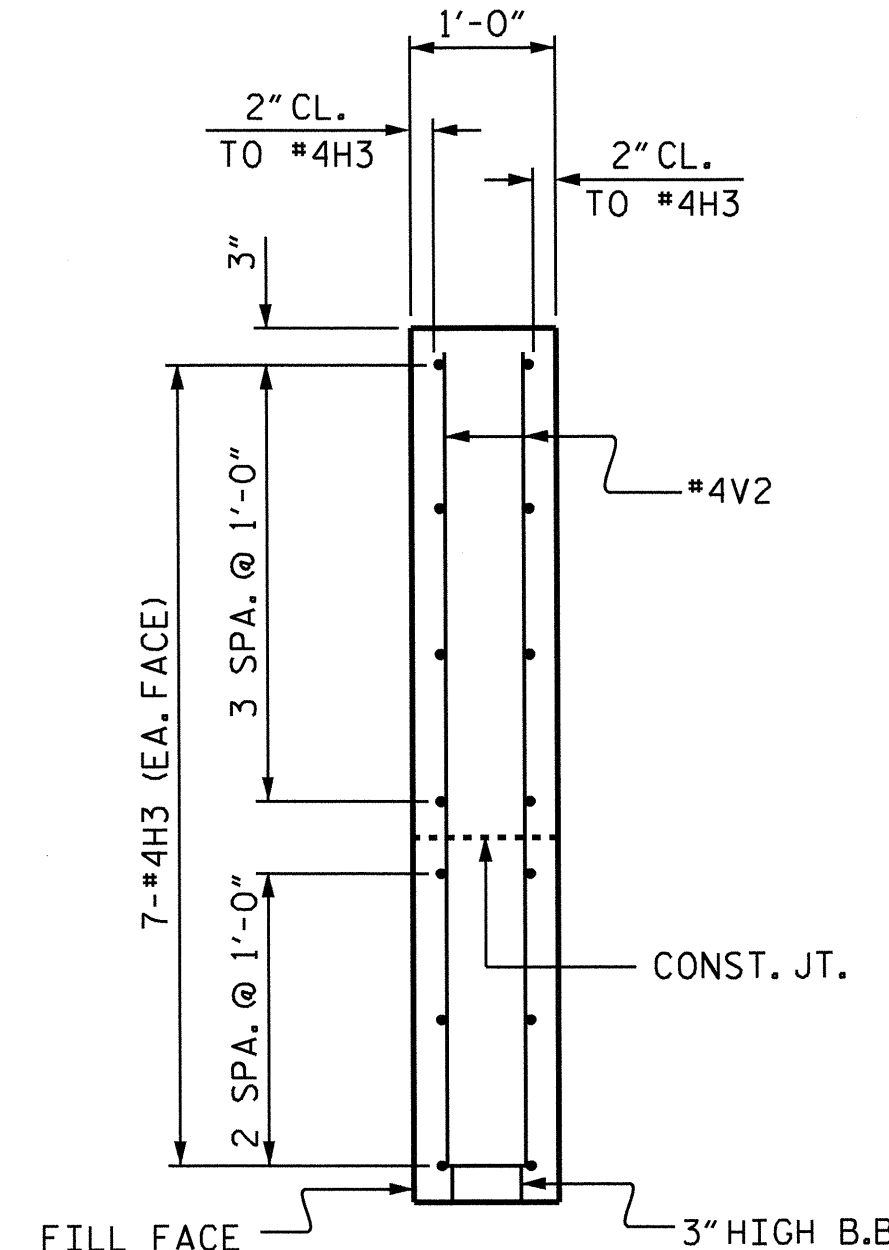
PLAN OF RIGHT WING



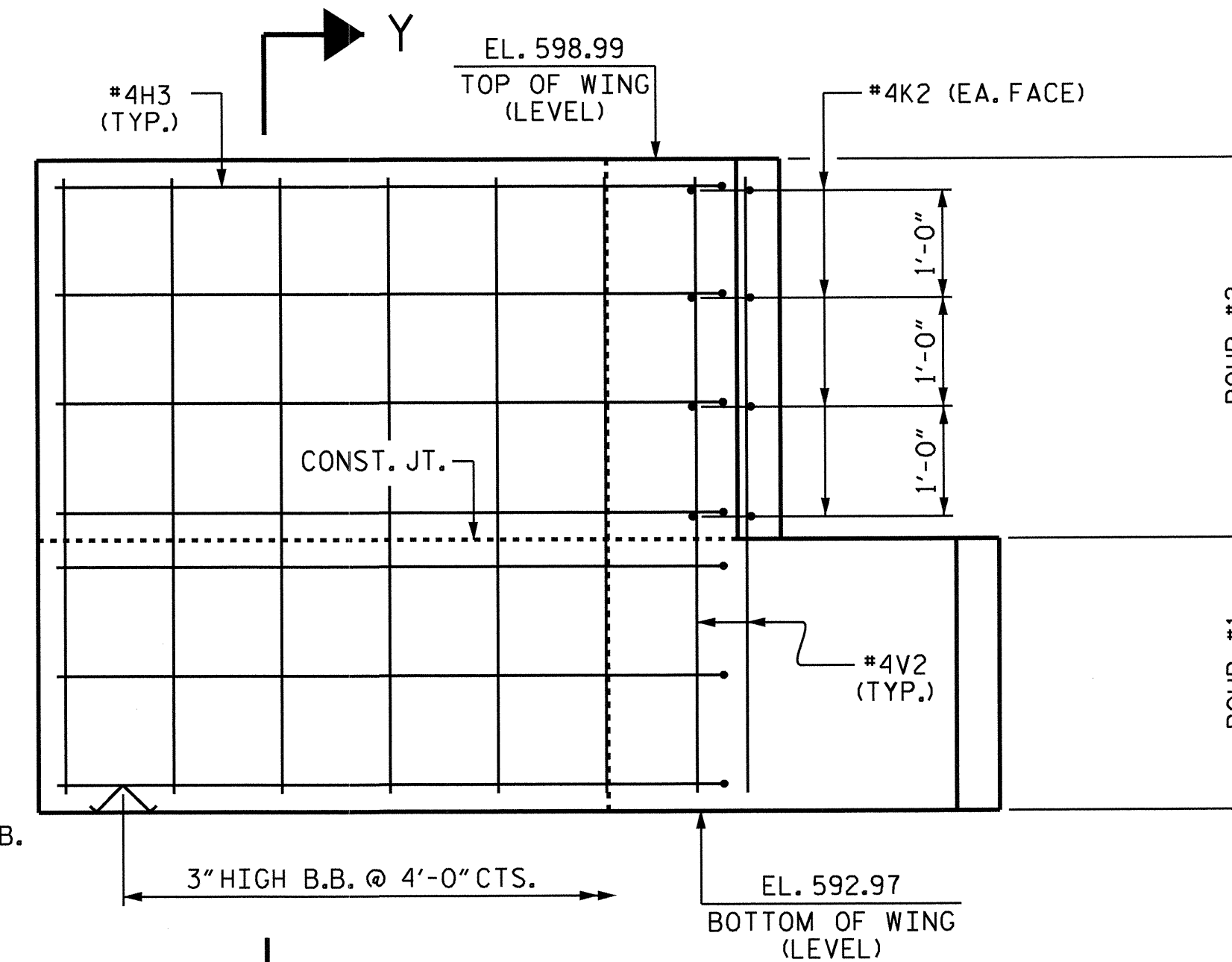
ELEVATION OF LEFT WING



SECTION X-X



SECTION Y-Y



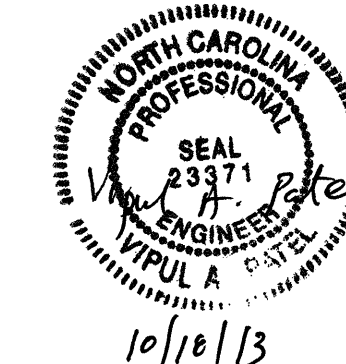
ELEVATION OF RIGHT WING

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1
 (RIGHT LANE)

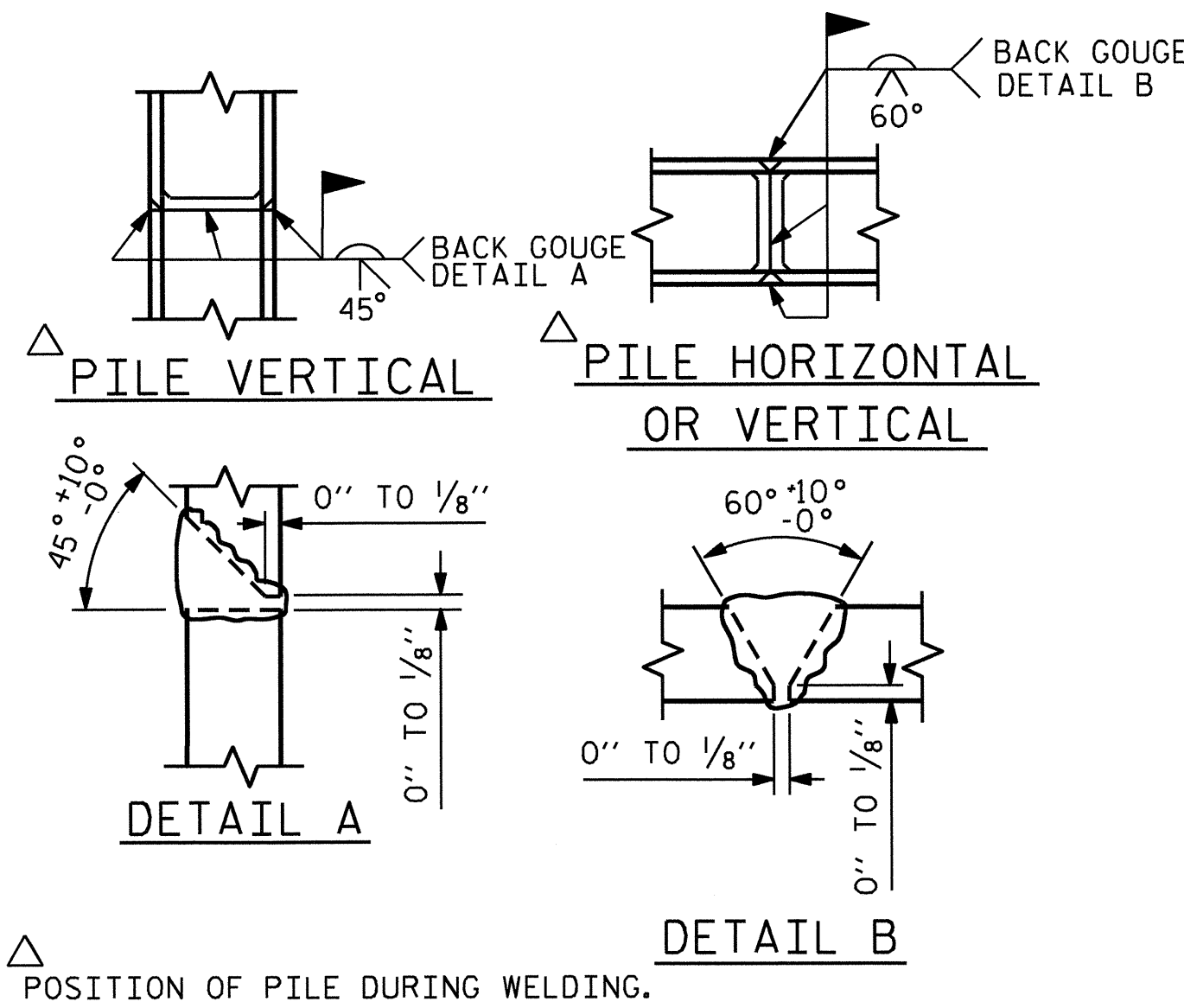


DRAWN BY: T. H. CARROLL DATE: 03/26/13
 CHECKED BY: R. L. CHESSON DATE: 05/31/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13

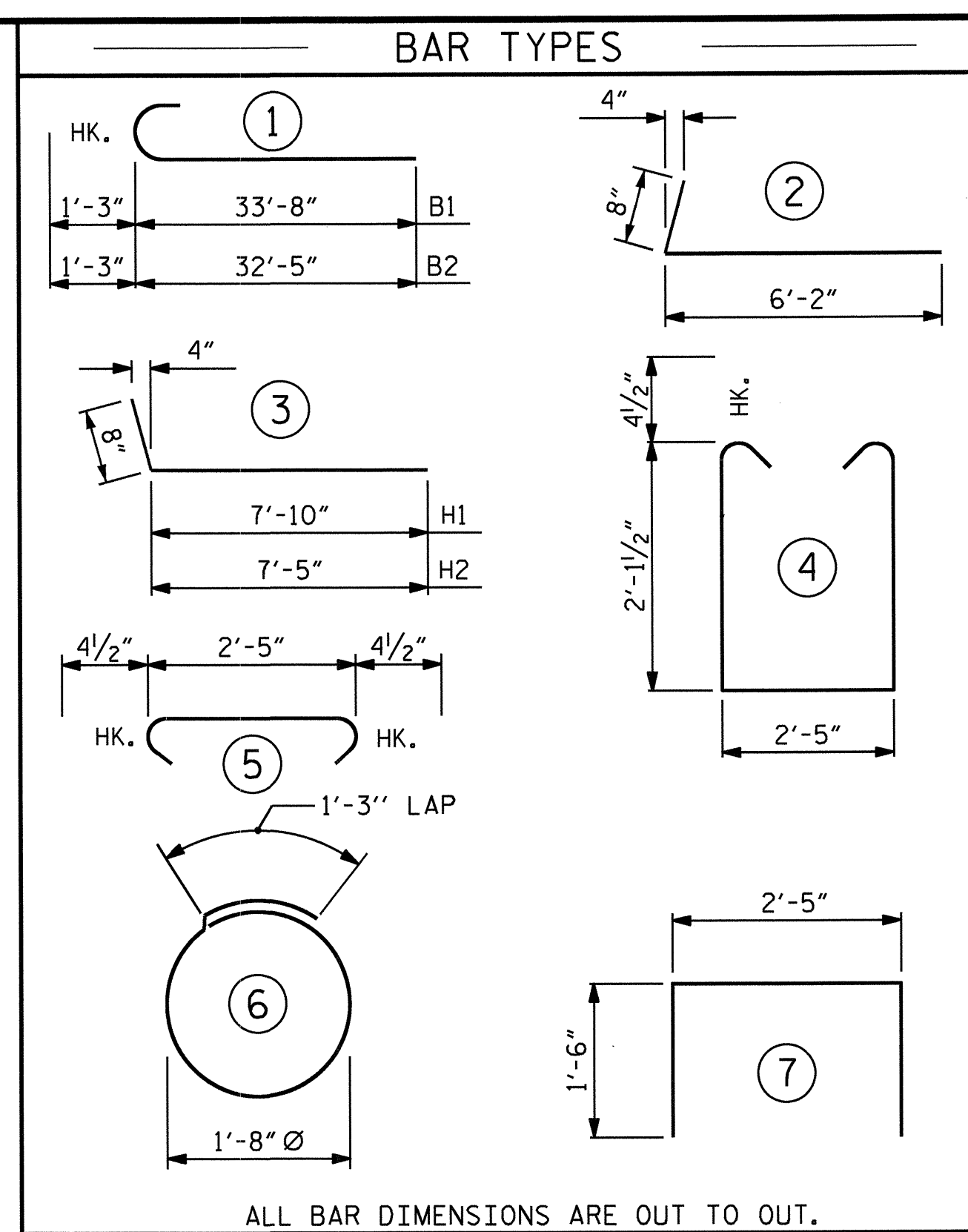
04-SEP-2013 11:53
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 thcarroll

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			58

STR. #2

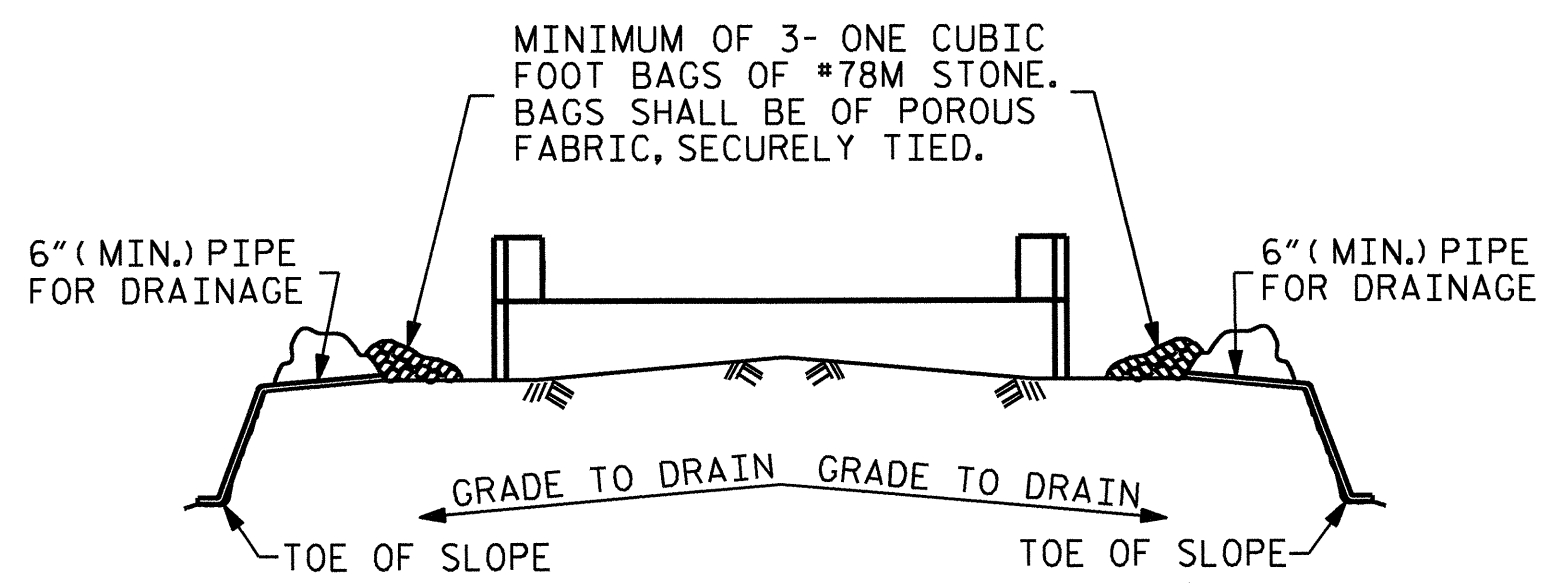


POSITION OF PILE DURING WELDING.
PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	34'-11"	950
B2	8	#9	1	33'-8"	916
B3	18	#4	STR	21'-2"	255
B4	4	#4	STR	23'-6"	63
B5	15	#4	STR	2'-5"	24
D1	30	#6	STR	1'-6"	68
H1	7	#4	3	8'-6"	40
H2	7	#4	3	8'-1"	38
H3	14	#4	2	6'-10"	64
K1	8	#4	STR	3'-8"	20
K2	8	#4	STR	4'-5"	24
S1	70	#4	4	7'-5"	347
S2	70	#4	5	3'-2"	148
S3	14	#4	6	6'-6"	61
U1	16	#4	7	5'-5"	58
V1	24	#4	STR	5'-5"	87
V2	24	#4	STR	5'-8"	91
REINFORCING STEEL					3254 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					19.6 C.Y.
POUR #2 UPPER PART OF WINGS					2.6 C.Y.
TOTAL CLASS A CONCRETE					22.2 C.Y.
HP 12X53 STEEL PILES					LIN. FT. 175



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN

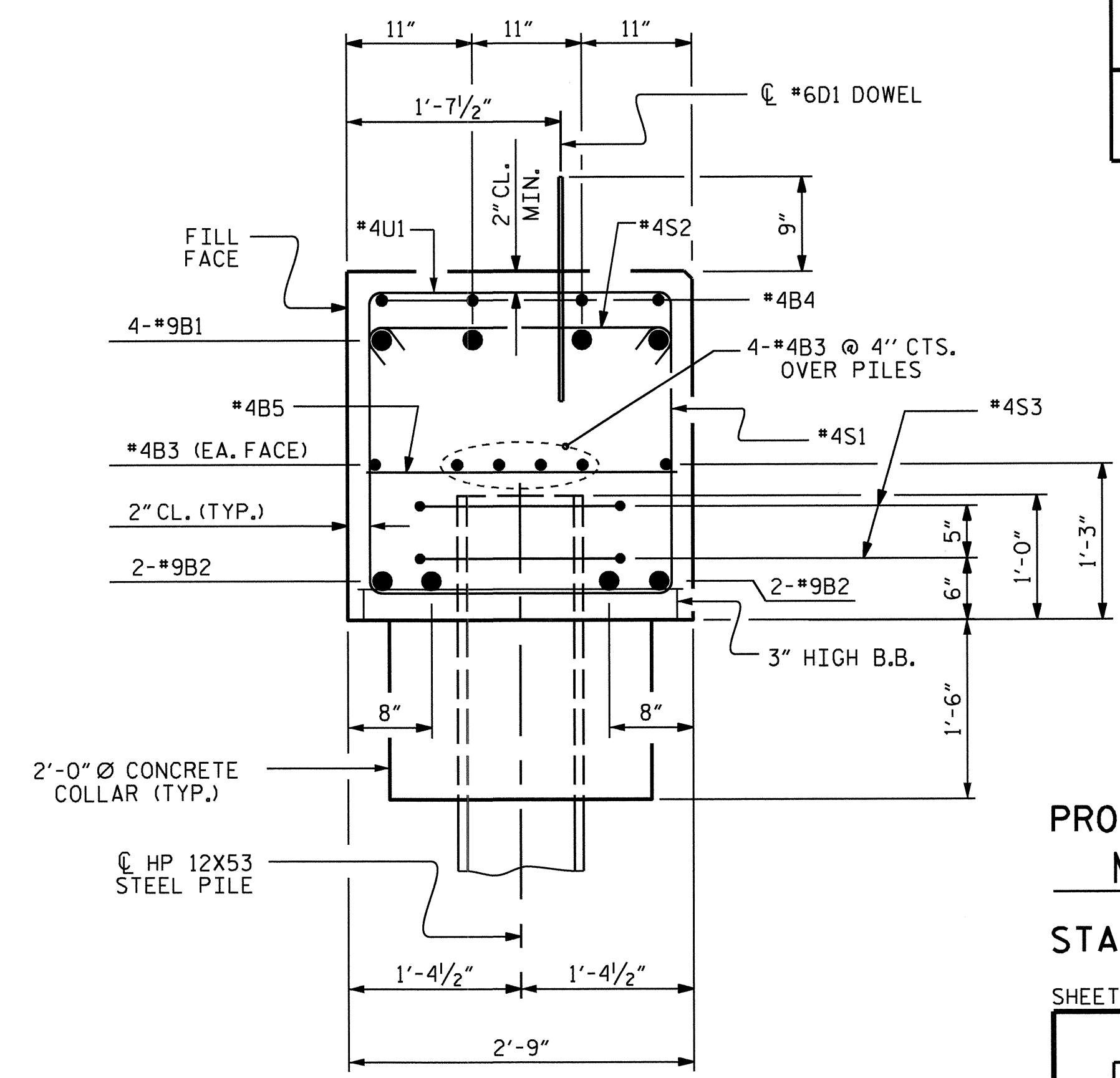
TOE OF SLOPE

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



SECTION A-A



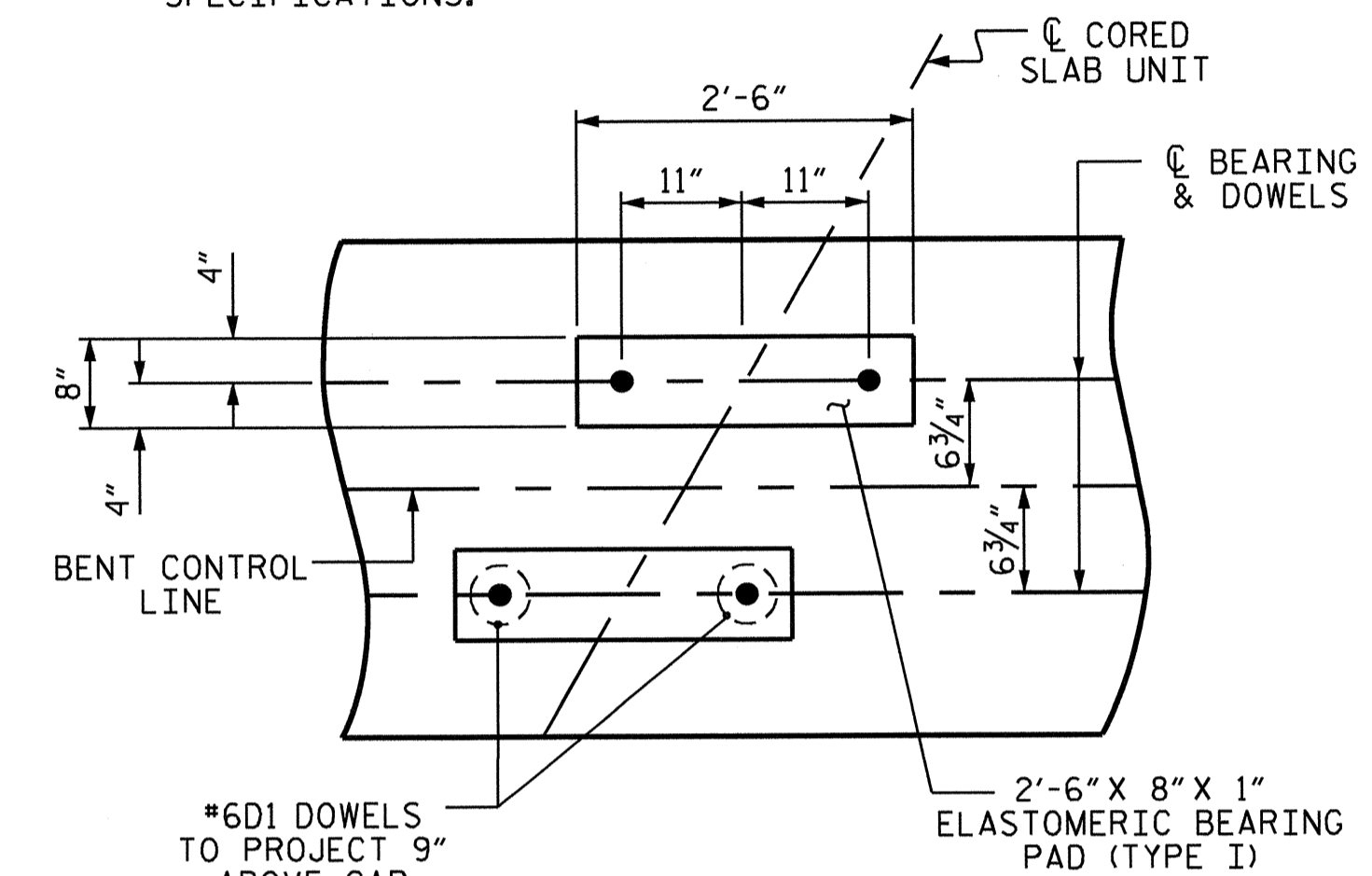
PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 58

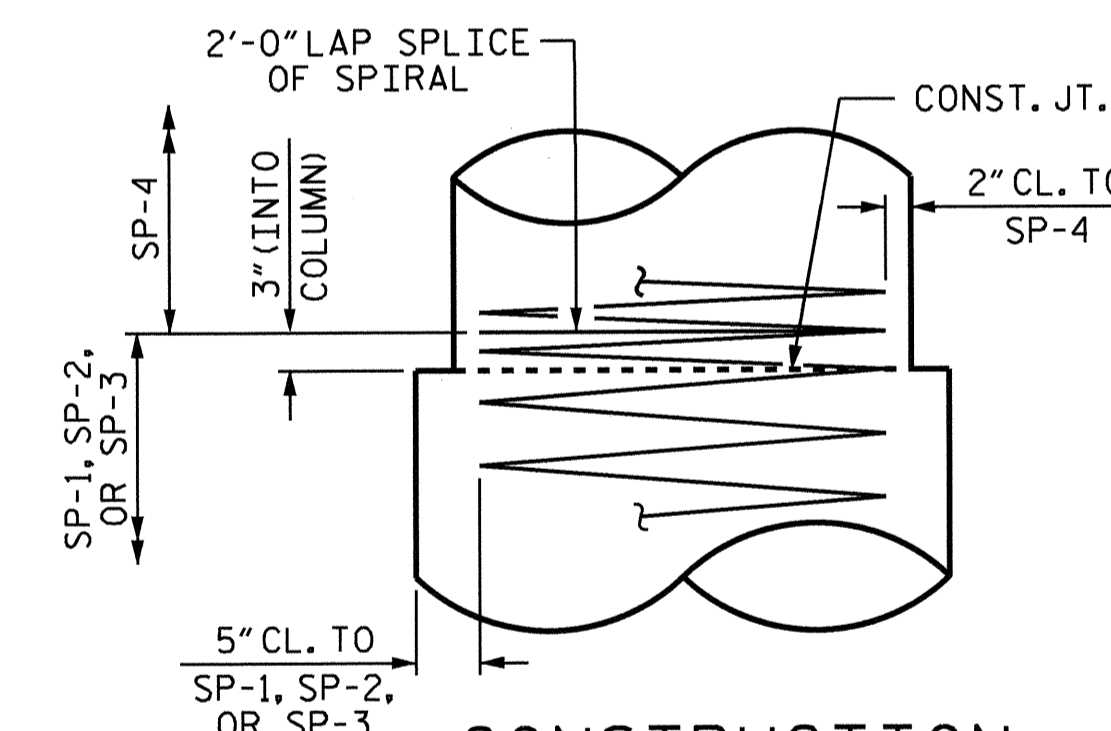
DRAWN BY : T. H. CARROLL DATE : 03/26/13
 CHECKED BY : R. L. CHESSON DATE : 05/31/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
 FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.



DETAIL "A"
(TYP. EA. BEARING)



CONSTRUCTION JOINT DETAIL
(TYP. EA. DRILLED PIER)

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

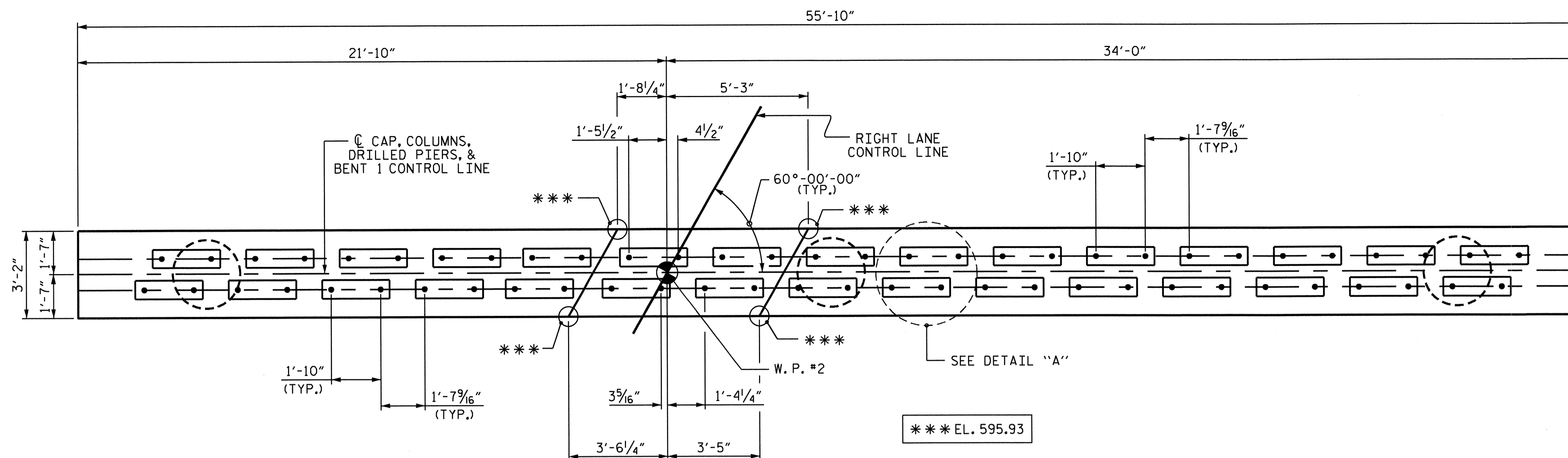
SUBSTRUCTURE
 BENT 1
 (RIGHT LANE)



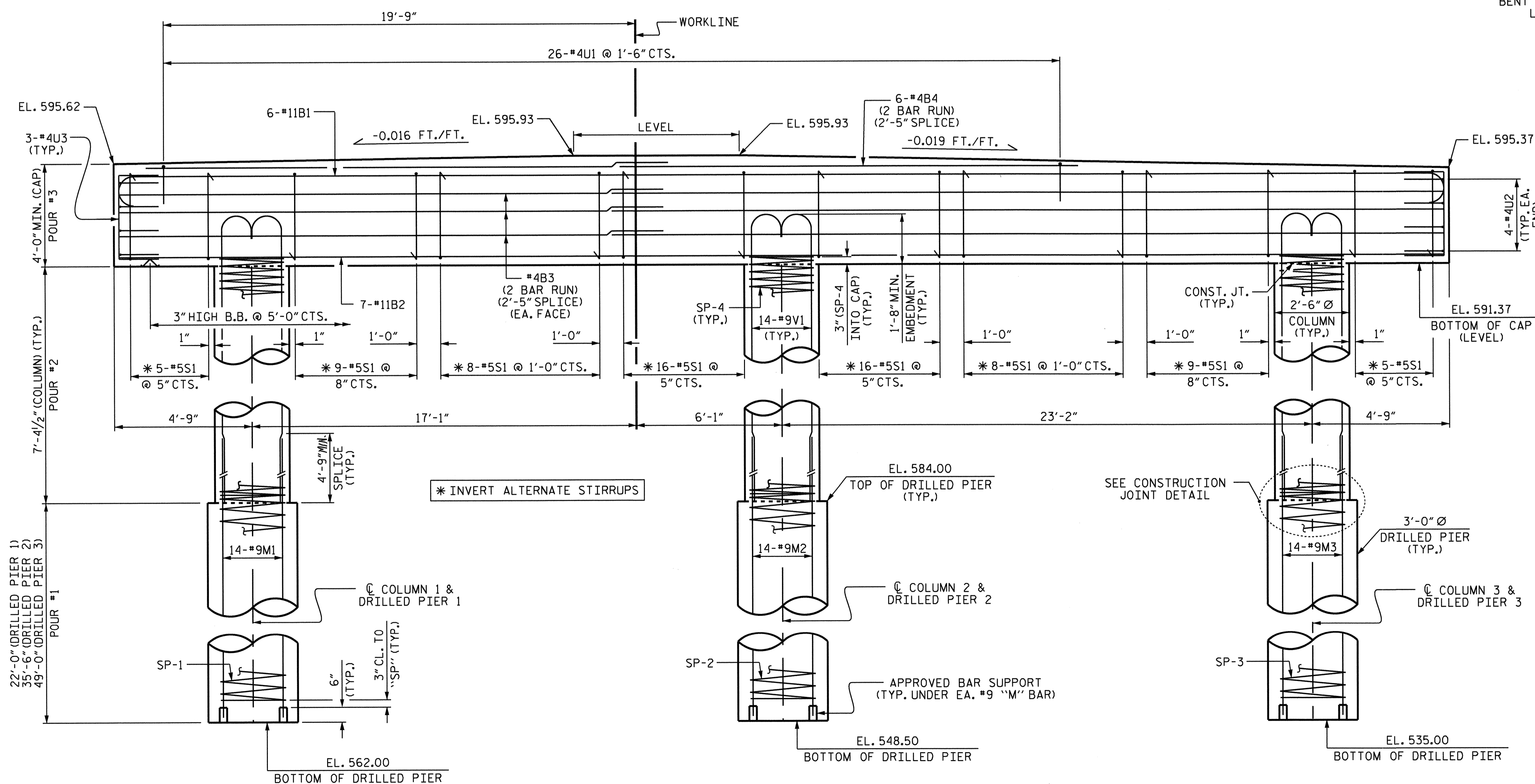
10/10/13

REVISIONS						SHEET NO.
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2			4			58

STR. #2



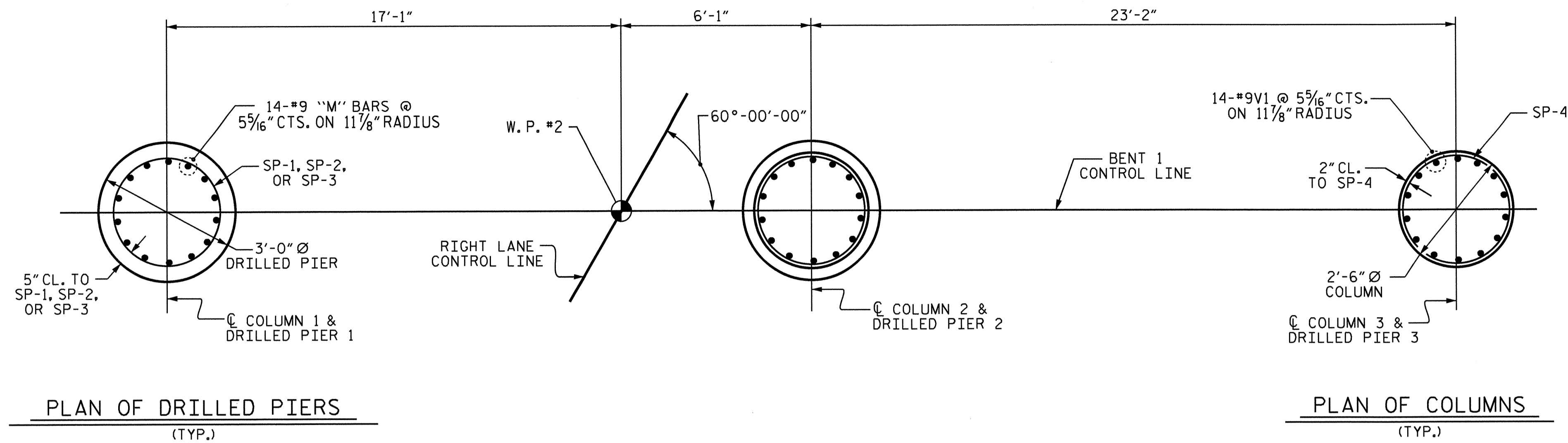
PLAN



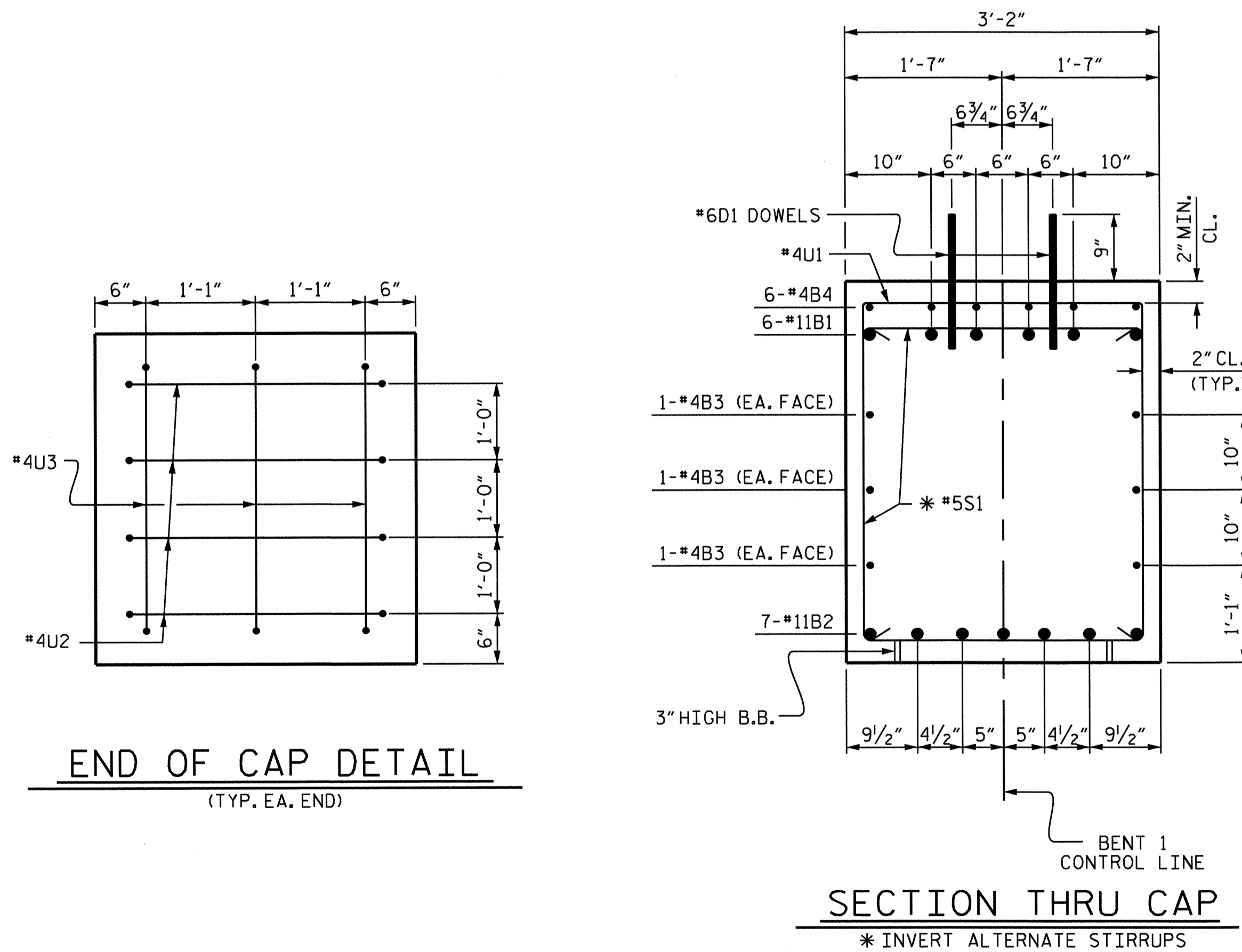
ELEVATION

DRAWN BY: T. H. CARROLL DATE: 05/03/13
 CHECKED BY: R. L. CHESSON DATE: 05/24/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13

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PLAN OF COLUMNS AND DRILLED PIERS



SECTION THRU CAP
* INVERT ALTERNATE STIRRUPS

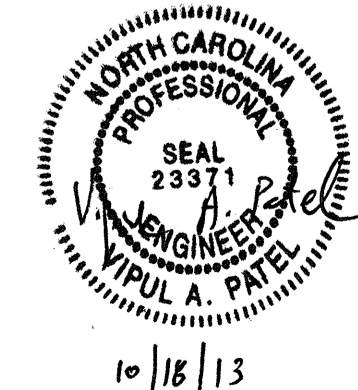
BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	58'-6"	1865
B2	7	#11	STR	55'-6"	2064
B3	12	#4	STR	29'-0"	232
B4	12	#4	STR	20'-9"	166
D1	60	#6	STR	1'-6"	135
M1	14	#9	STR	29'-6"	1404
M2	14	#9	STR	43'-0"	2047
M3	14	#9	STR	56'-6"	2689
S1	76	#5	3	11'-0"	872
U1	26	#4	4	5'-10"	101
U2	8	#4	4	5'-8"	30
U3	6	#4	4	6'-6"	26
V1	42	#9	2	10'-3"	1464
TOTAL REINFORCING STEEL				LBS	13095
SP-1	1	**	5	354'-6"	370
SP-2	1	**	5	569'-2"	594
SP-3	1	**	5	785'-6"	819
SP-4	3	***	6	213'-10"	429
TOTAL SPIRAL COLUMN REINFORCING STEEL				LBS	2212
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				4.0	C.Y.
POUR #3 (BENT CAP)				28.5	C.Y.
TOTAL CLASS A CONCRETE				32.5	C.Y.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				27.9	C.Y.
3'-0" DIA. DRILLED PIERS IN SOIL				66.5	LIN. FT.
3'-0" DIA. DRILLED PIERS NOT IN SOIL				40.0	LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS				15.0	LIN. FT.
SID INSPECTIONS				2	EA.
SPT TESTING				1	EA.
CSL TUBES				444.0	LIN. FT.

ALL BAR DIMENSIONS ARE OUT TO OUT.
 ** THE SP-1, SP-2, & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
 *** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

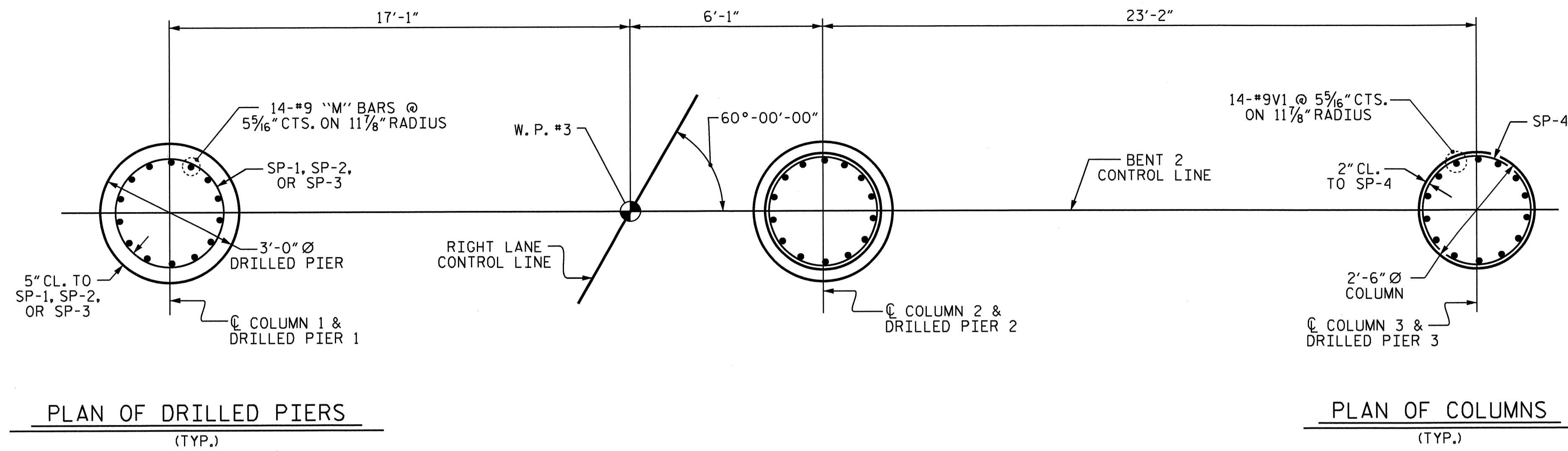
PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 2 OF 2

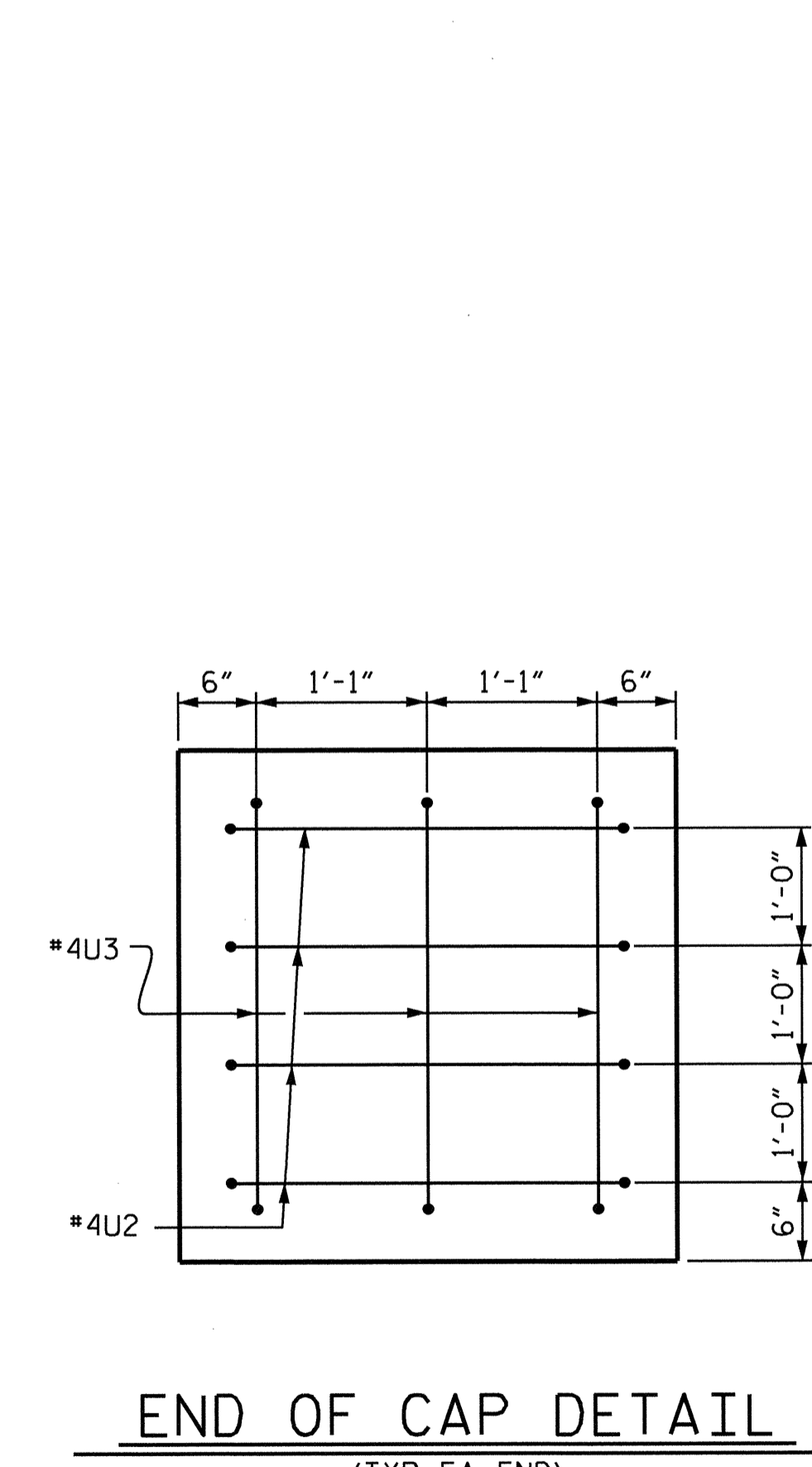
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-50
					TOTAL SHEETS 58



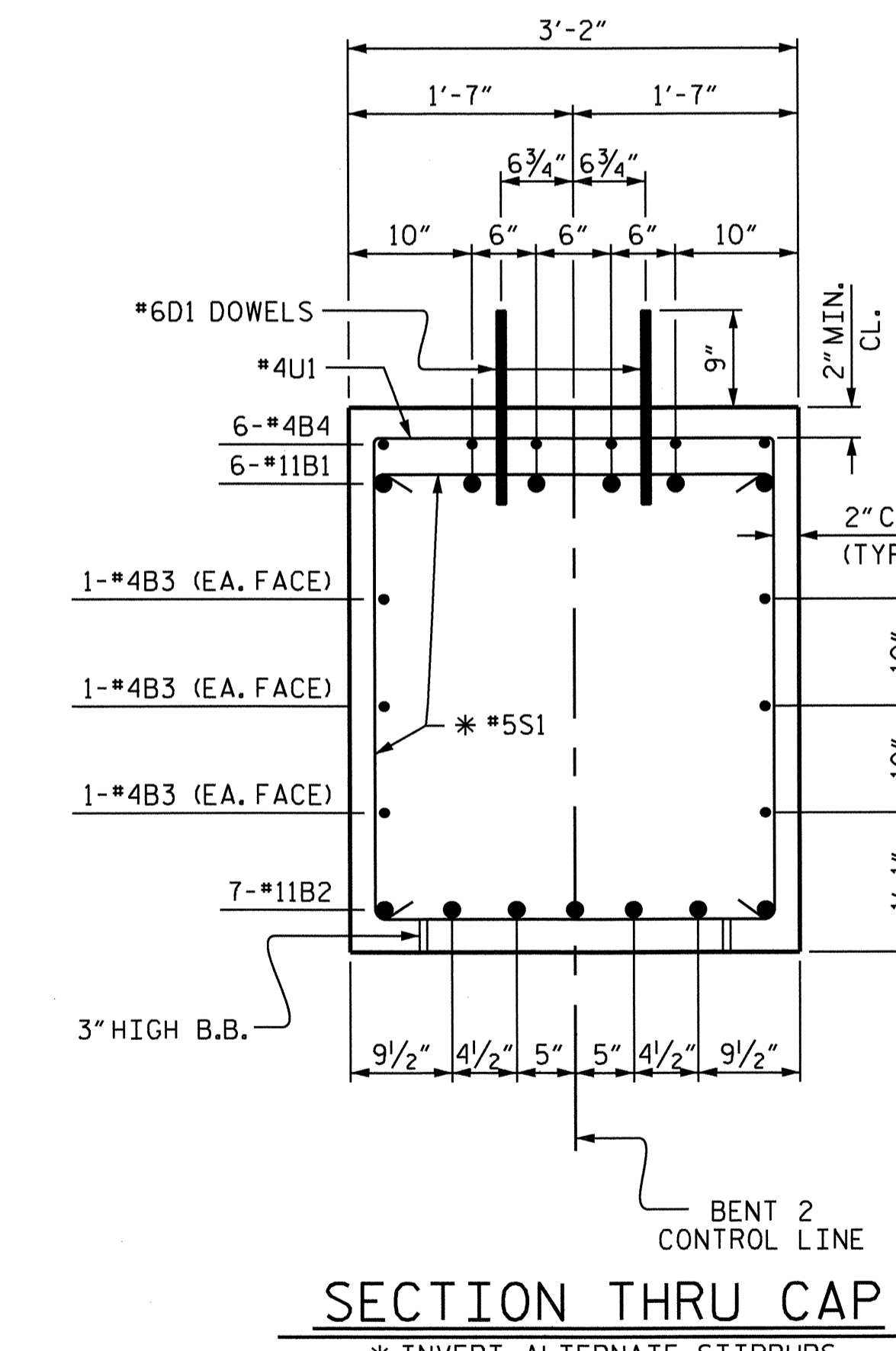
DRAWN BY: T. H. CARROLL DATE: 05/03/13
 CHECKED BY: R. L. CHESSON DATE: 05/24/13
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 09/10/13



PLAN OF COLUMNS AND DRILLED PIERS



END OF CAP DETAIL
(TYP. EA. END)



SECTION THRU CAP
* INVERT ALTERNATE STIRRUPS

BAR TYPES

BILL OF MATERIAL

BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	58'-6"	1865
B2	7	#11	STR	55'-6"	2064
B3	12	#4	STR	29'-0"	232
B4	12	#4	STR	20'-9"	166
D1	60	#6	STR	1'-6"	135
M1	14	#9	STR	56'-6"	2689
M2	14	#9	STR	60'-0"	2856
M3	28	#9	STR	34'-8"	3300
S1	76	#5	3	11'-0"	872
U1	26	#4	4	5'-10"	101
U2	8	#4	4	5'-8"	30
U3	6	#4	4	6'-6"	26
V1	42	#9	2	8'-1"	1154
TOTAL REINFORCING STEEL					LBS 15490
SP-1	1	**	5	785'-6"	819
SP-2	1	**	5	848'-9"	885
SP-3	1	**	5	913'-7"	953
SP-4	3	**	6	157'-0"	315
TOTAL SPIRAL COLUMN REINFORCING STEEL					LBS. 2972
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					2.8 C.Y.
POUR #3 (BENT CAP)					28.5 C.Y.
TOTAL CLASS A CONCRETE					31.3 C.Y.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					41.6 C.Y.
3'-0" DIA. DRILLED PIERS IN SOIL					96.0 LIN. FT.
3'-0" DIA. DRILLED PIERS NOT IN SOIL					63.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIERS					18.0 LIN. FT.
SID INSPECTIONS					2 EA.
SPT TESTING					1 EA.
CSL TUBES					654.0 LIN. FT.

ALL BAR DIMENSIONS ARE OUT TO OUT.

** THE SP-1, SP-2, & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-52
					TOTAL SHEETS
					58

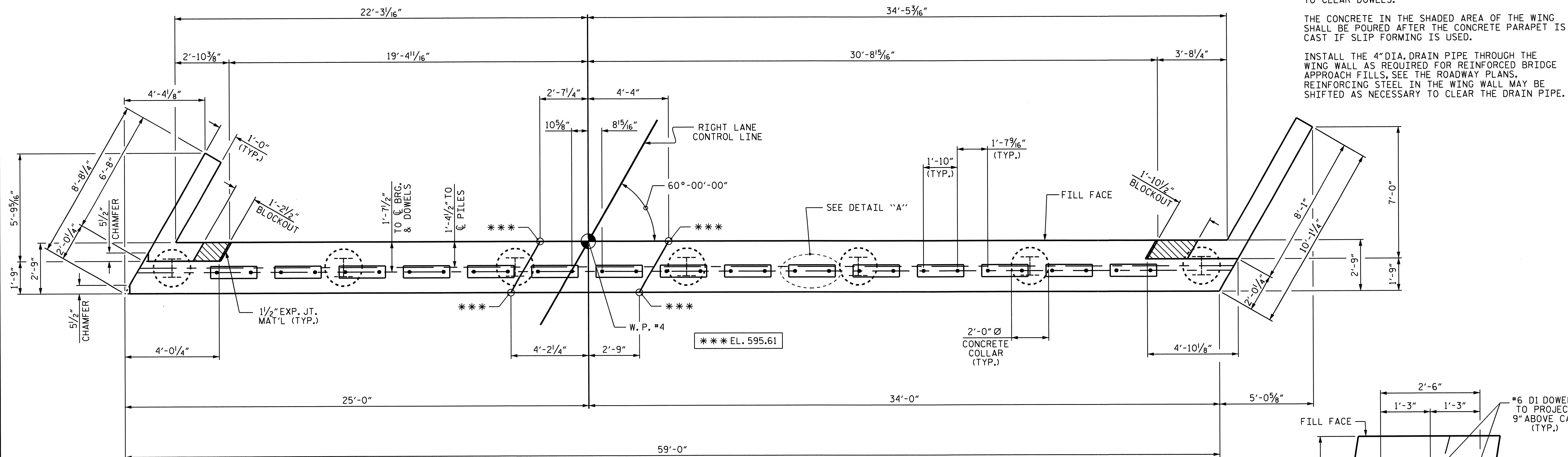
DRAWN BY: T.H. CARROLL DATE: 05/03/13
 CHECKED BY: R.L. CHESSON DATE: 05/24/13
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE: 09/10/13

NOTES

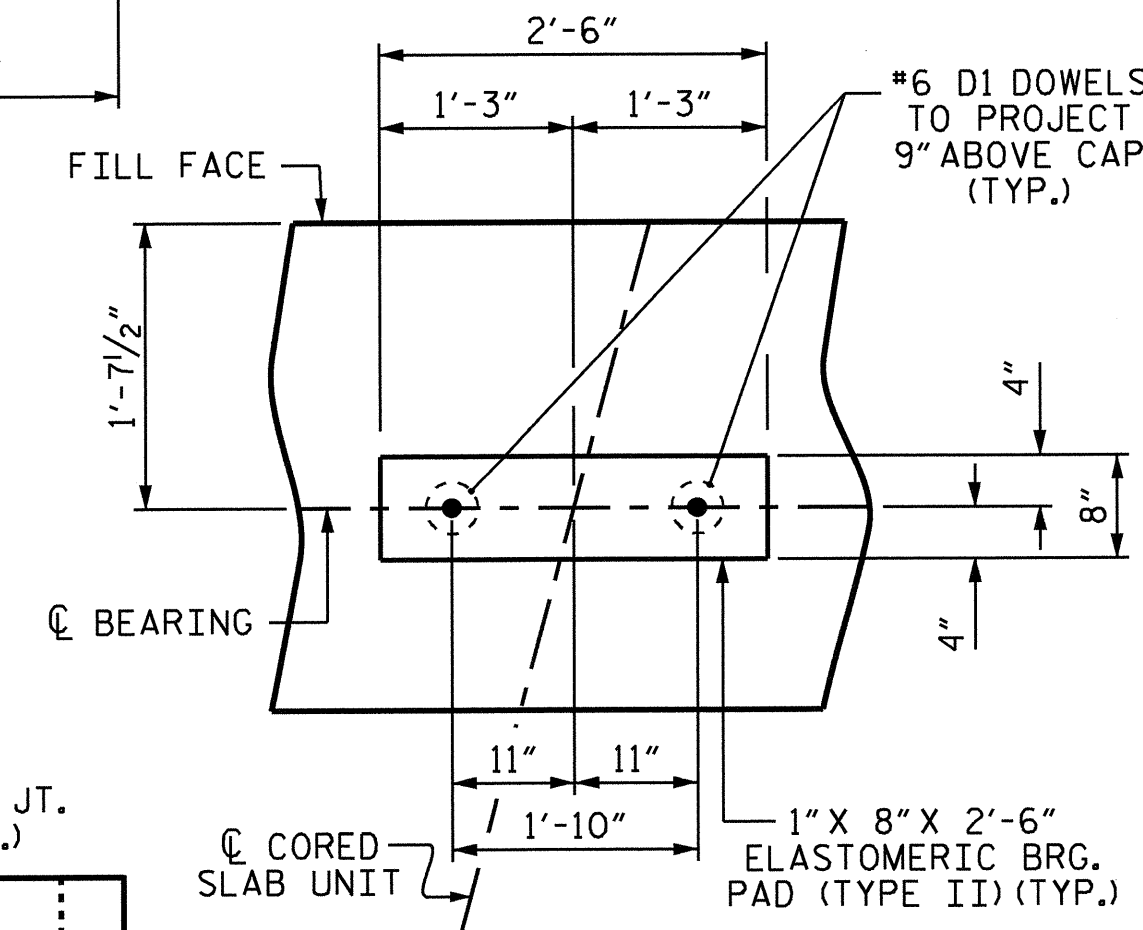
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

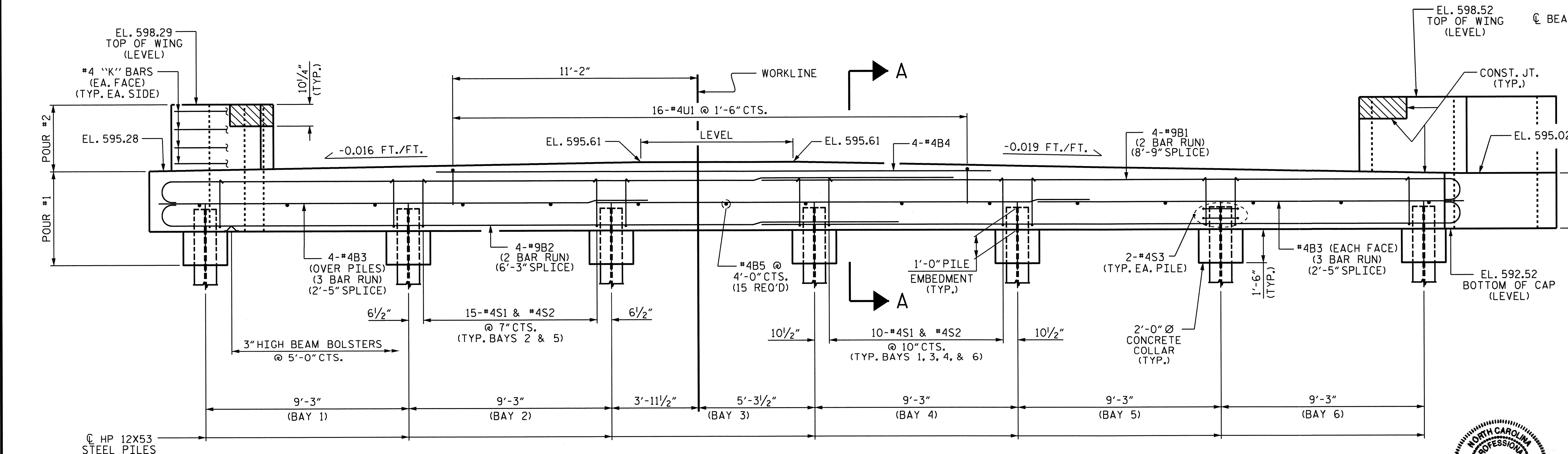
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"



ELEVATION

PROJECT NO. B-4779
 MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

SHEET 1 OF 3

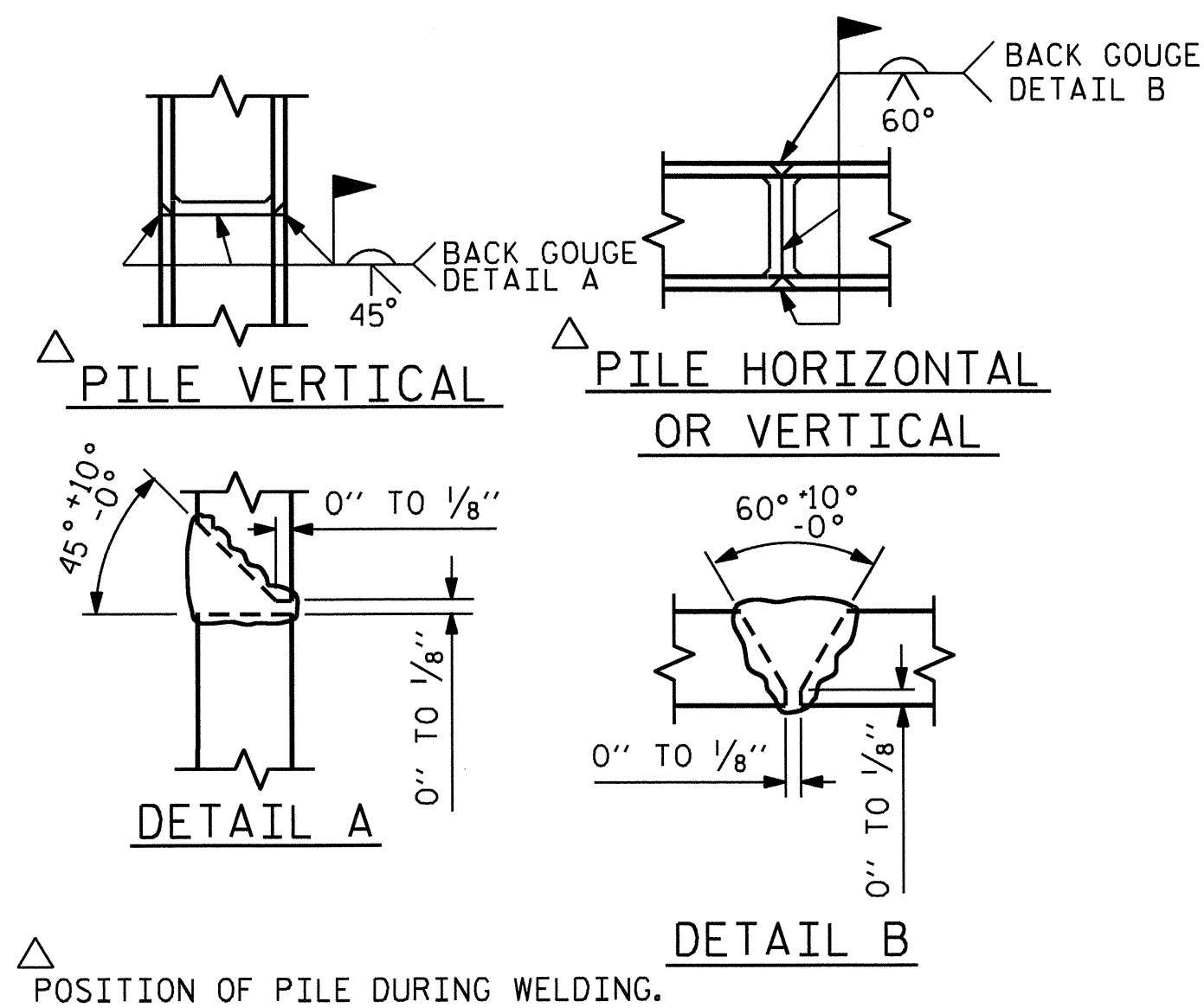
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2
 (RIGHT LANE)**

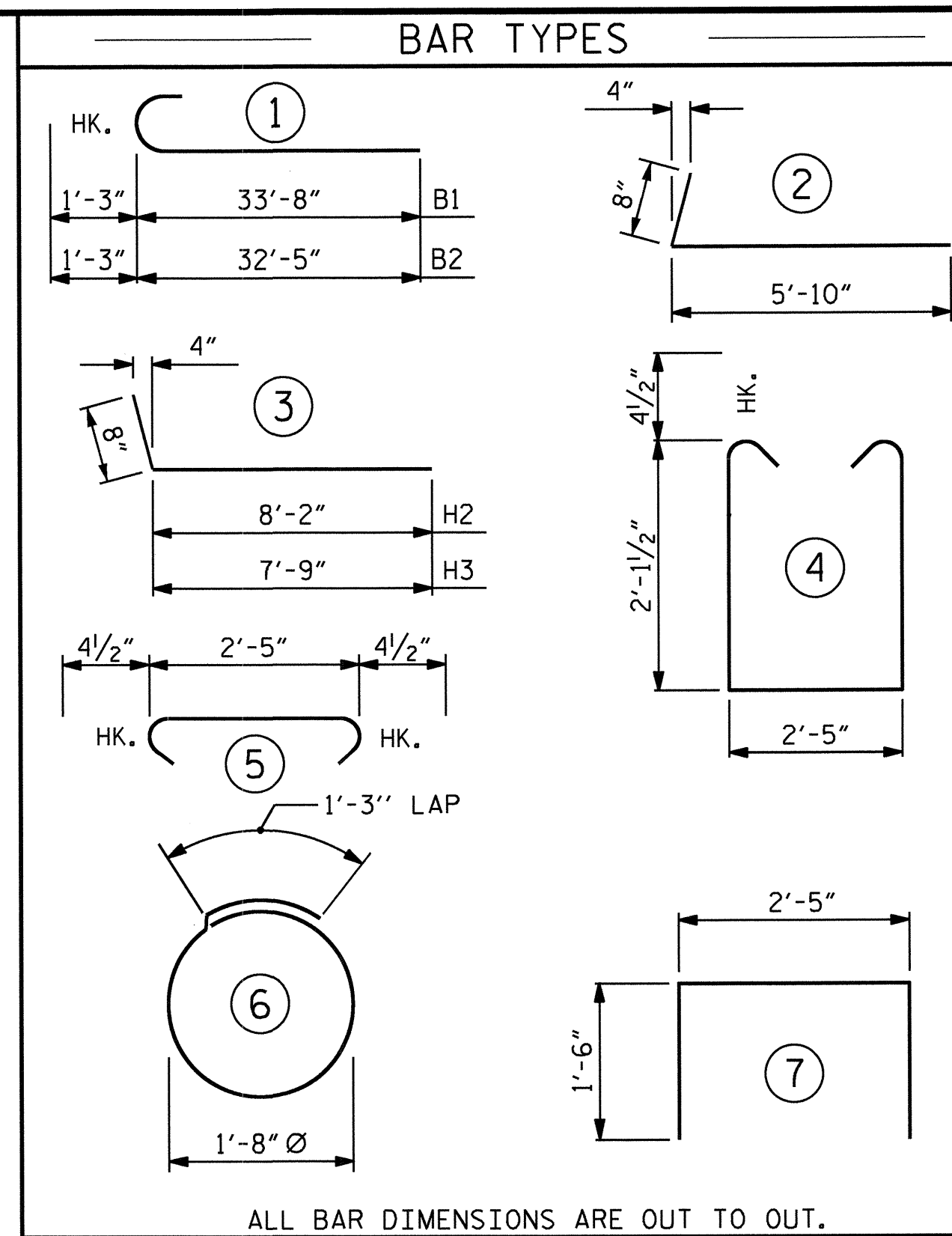


DRAWN BY : T. H. CARROLL DATE : 03/26/13
 CHECKED BY : R. L. CHESSON DATE : 05/31/13
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 09/10/13

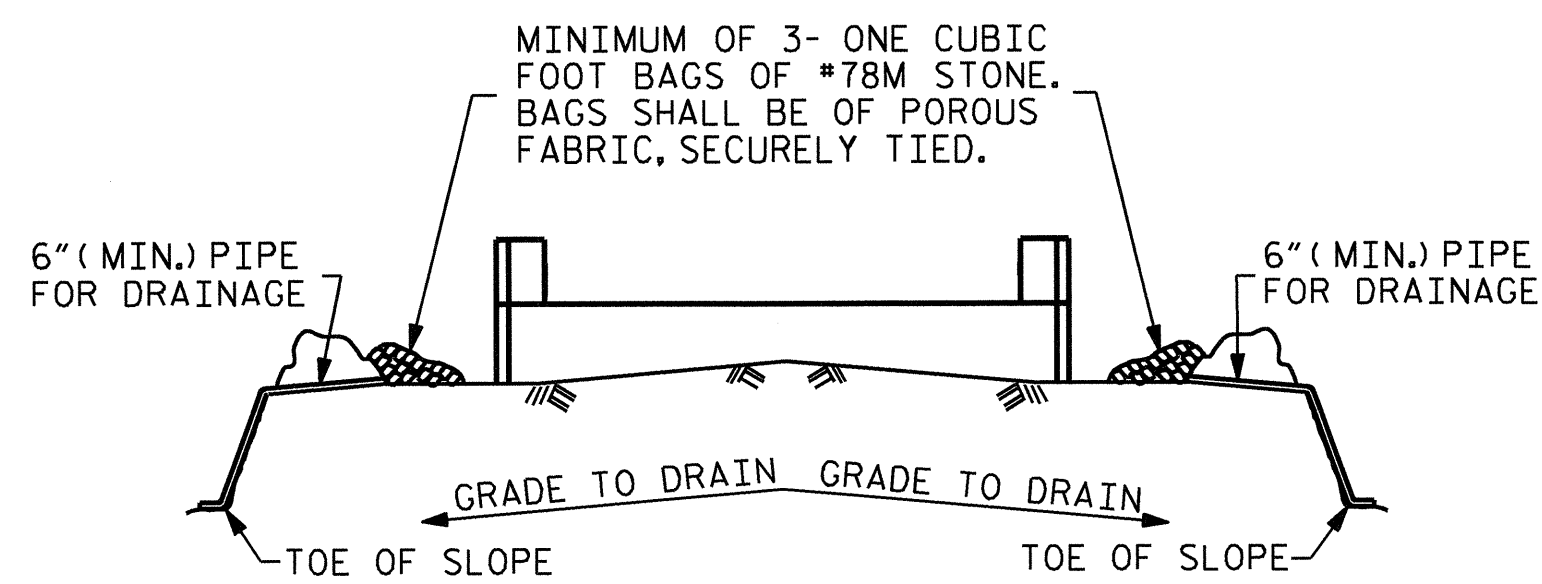
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53	
1			3			TOTAL SHEETS	
2			4			58	



PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	34'-11"	950
B2	8	#9	1	33'-8"	916
B3	18	#4	STR	21'-2"	255
B4	4	#4	STR	23'-6"	63
B5	15	#4	STR	2'-5"	24
D1	30	#6	STR	1'-6"	68
H1	14	#4	2	6'-6"	61
H2	7	#4	3	8'-10"	41
H3	7	#4	3	8'-5"	39
K1	8	#4	STR	3'-7"	19
K2	8	#4	STR	4'-6"	24
S1	70	#4	4	7'-5"	347
S2	70	#4	5	3'-2"	148
S3	14	#4	6	6'-6"	61
UI	16	#4	7	5'-5"	58
V1	22	#4	STR	5'-5"	80
V2	27	#4	STR	5'-8"	102
REINFORCING STEEL				3256 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				19.7 C.Y.	
POUR #2 UPPER PART OF WINGS				2.6 C.Y.	
TOTAL CLASS A CONCRETE				22.3 C.Y.	
HP 12X53 STEEL PILES				NO: 7 LIN. FT. 280	

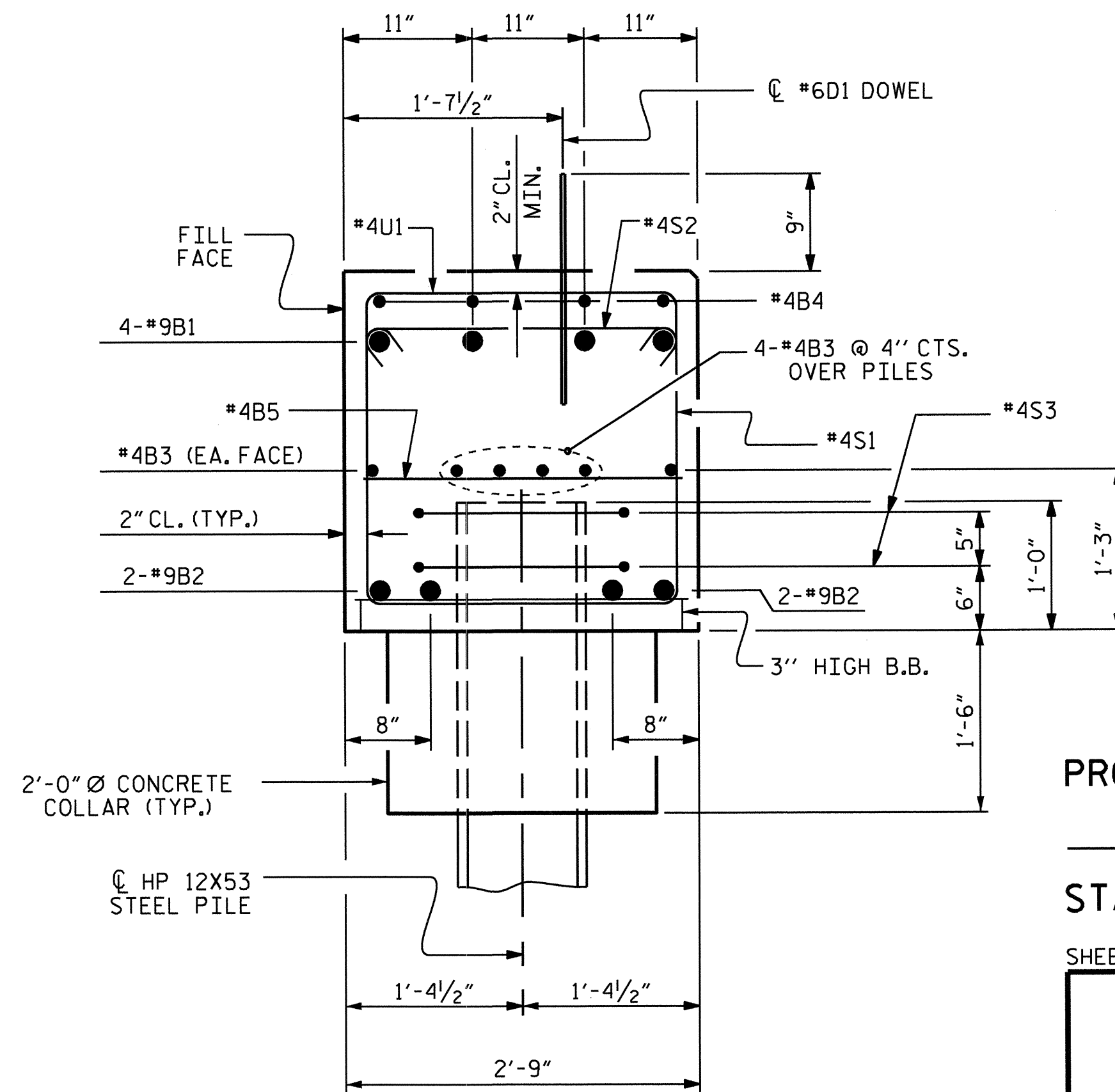


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



PROJECT NO. B-4779

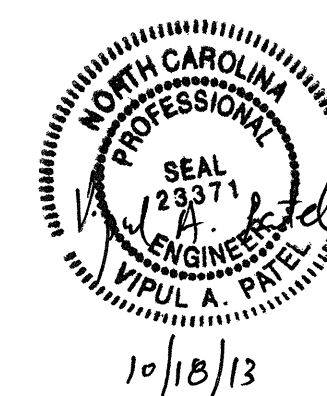
MECKLENBURG COUNTY

STATION: 20+47.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
(RIGHT LANE)

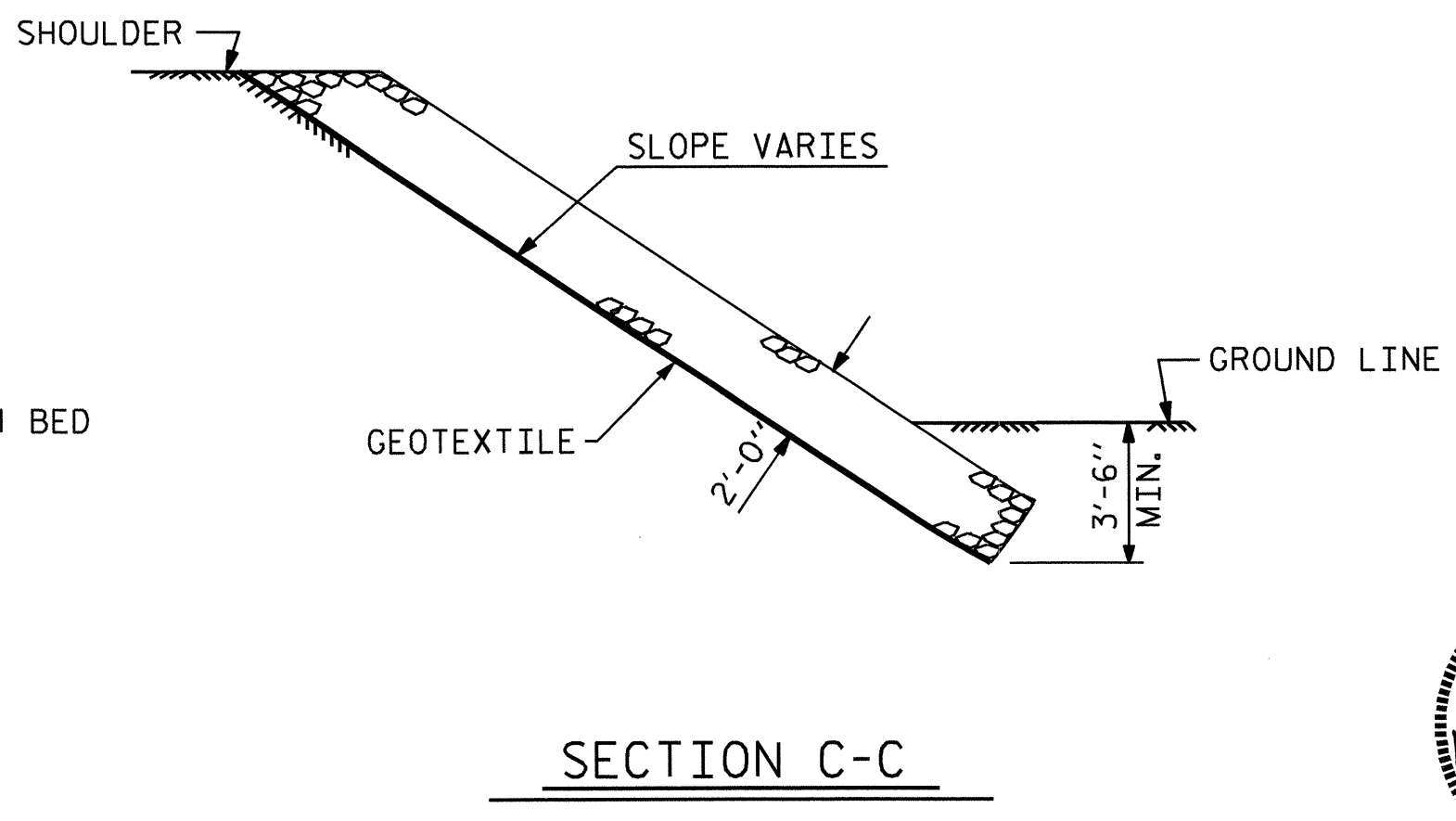
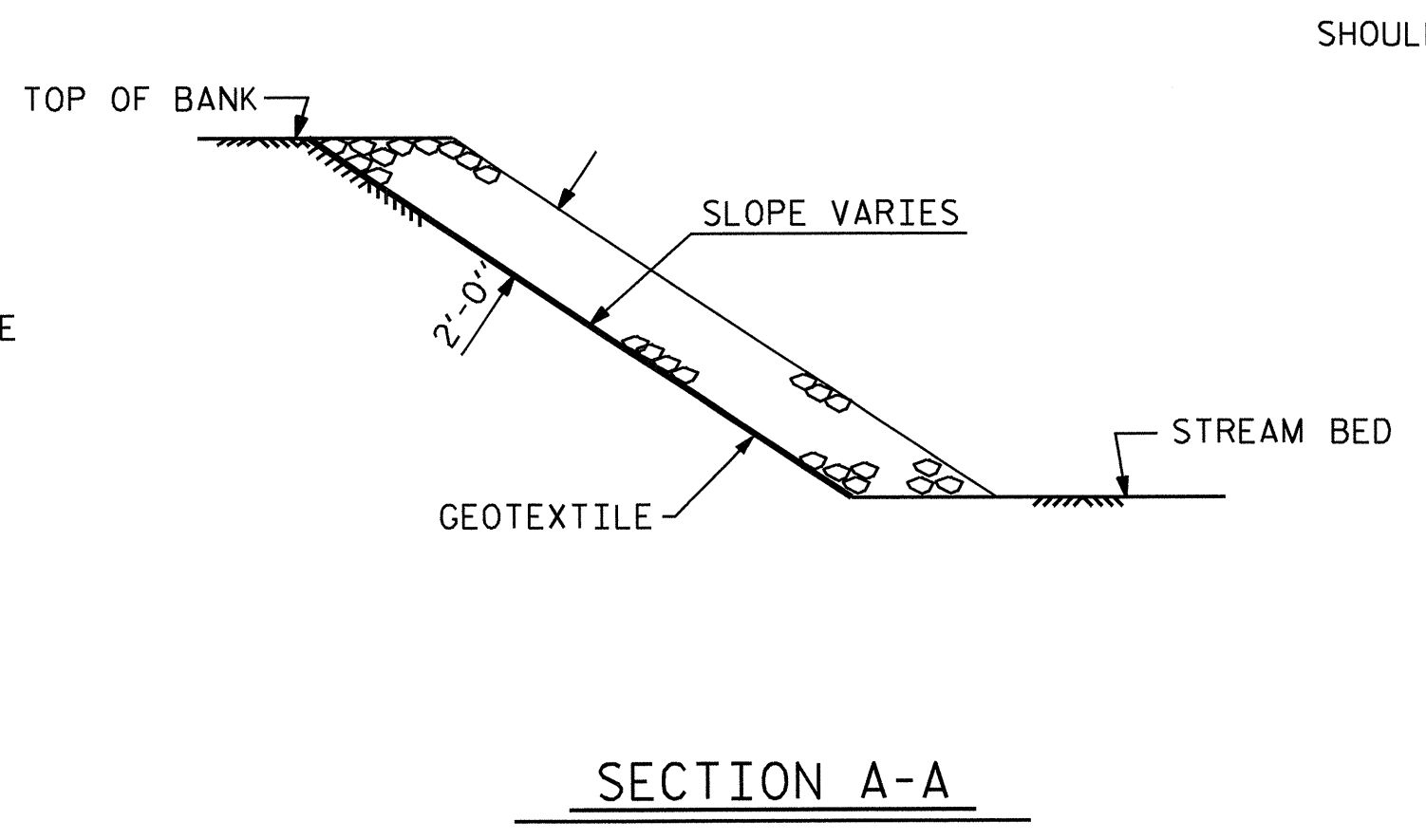
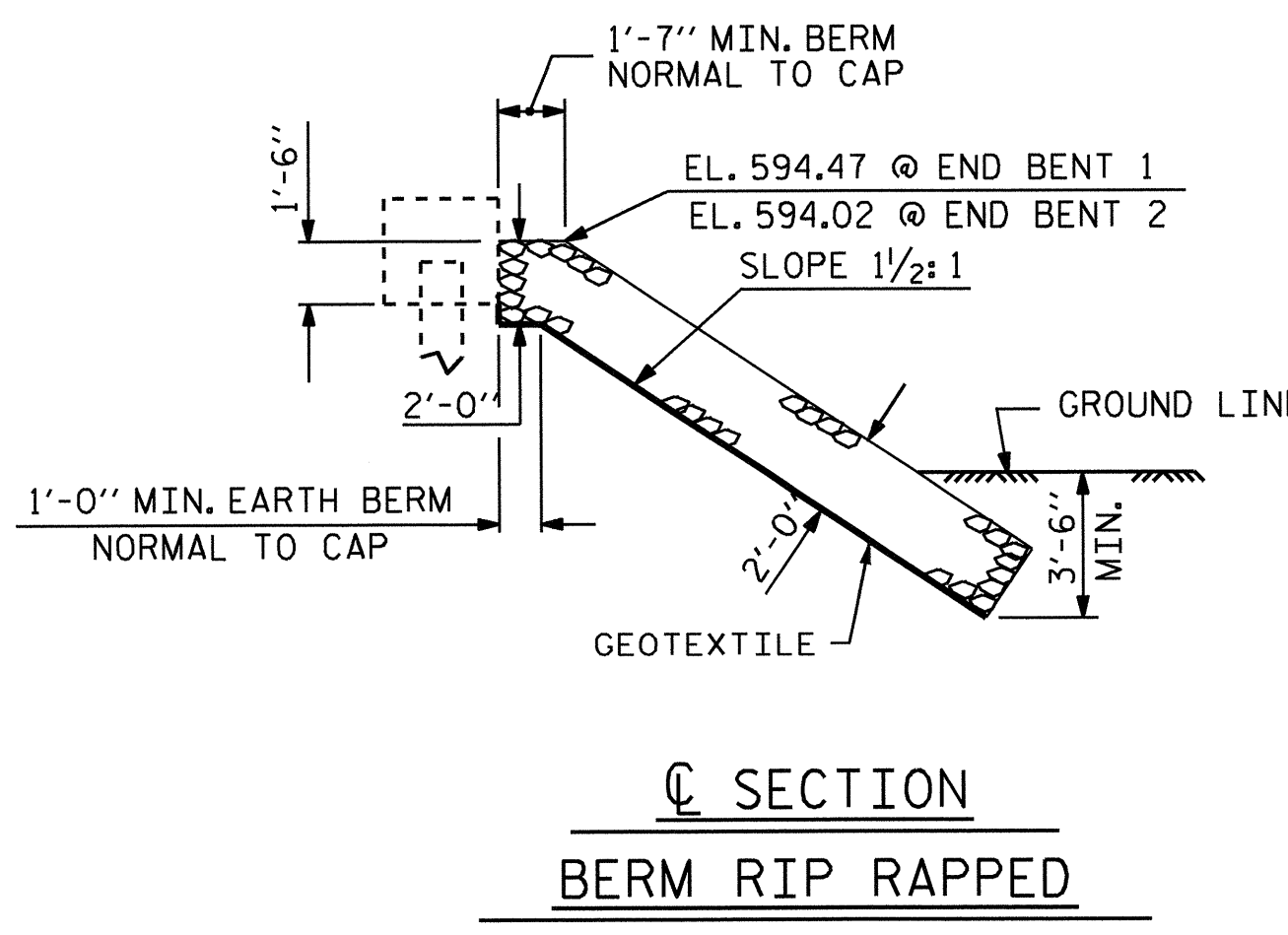
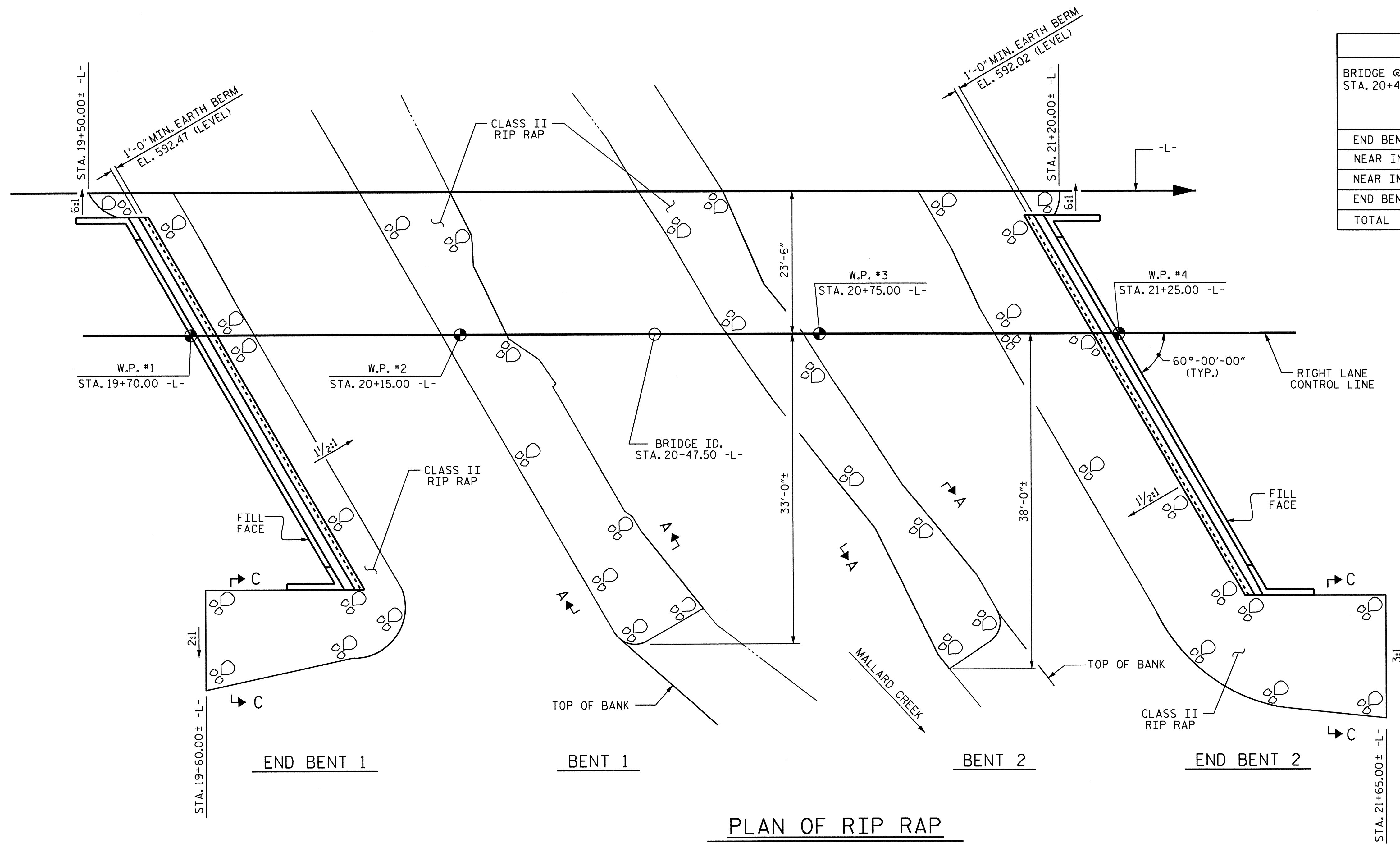


DRAWN BY : T. H. CARROLL DATE : 03/26/13
CHECKED BY : R. L. CHESSON DATE : 05/31/13
DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 09/10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			58

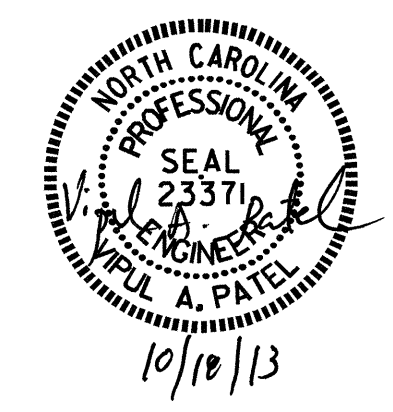
STR. #2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+47.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	95	110
NEAR INT. BENT 1	70	80
NEAR INT. BENT 2	65	95
END BENT 2	185	210
TOTAL	415	495



PROJECT NO. B-4779
MECKLENBURG COUNTY
 STATION: 20+47.50 -L-

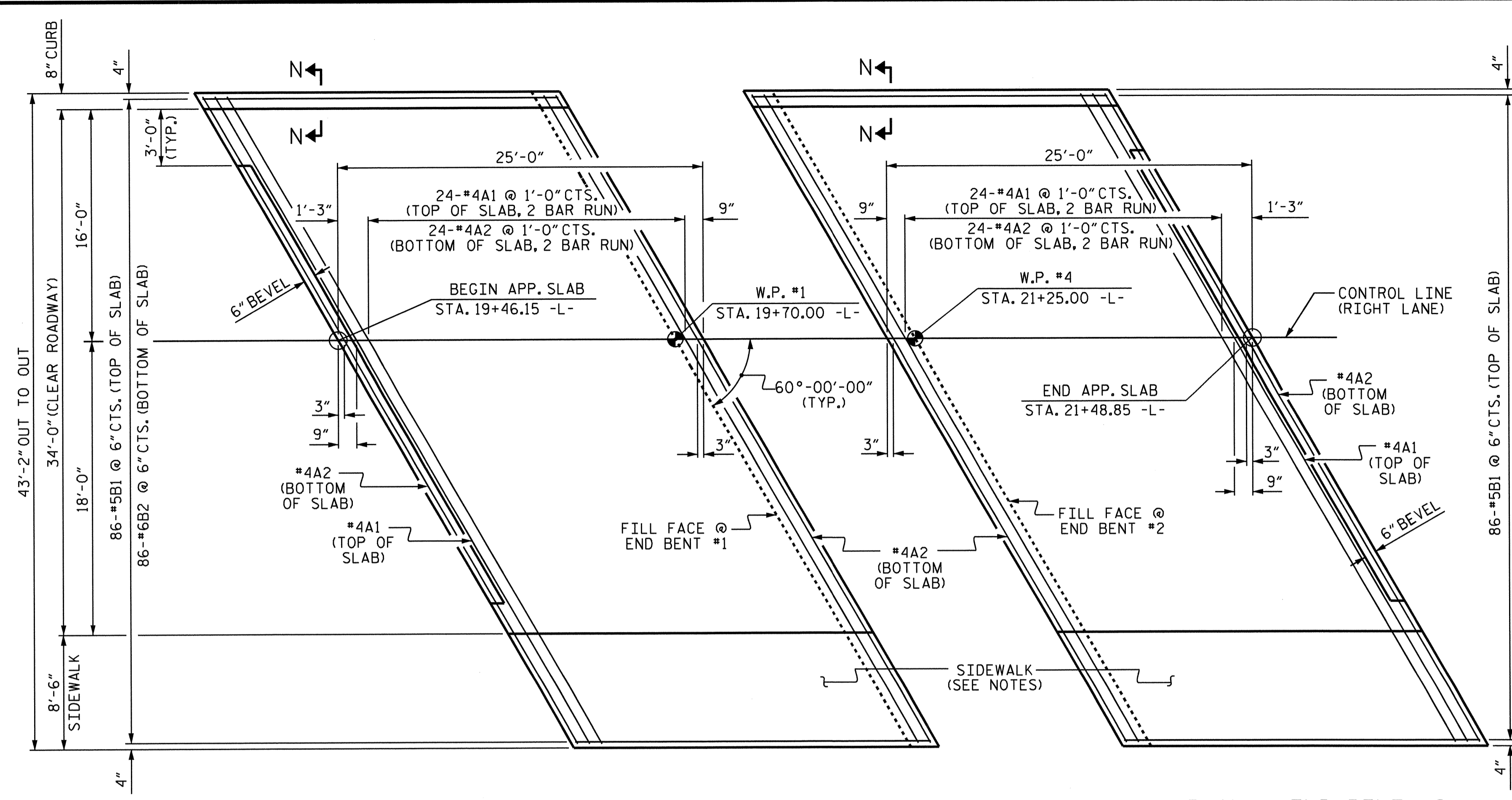
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS
 (RIGHT LANE)



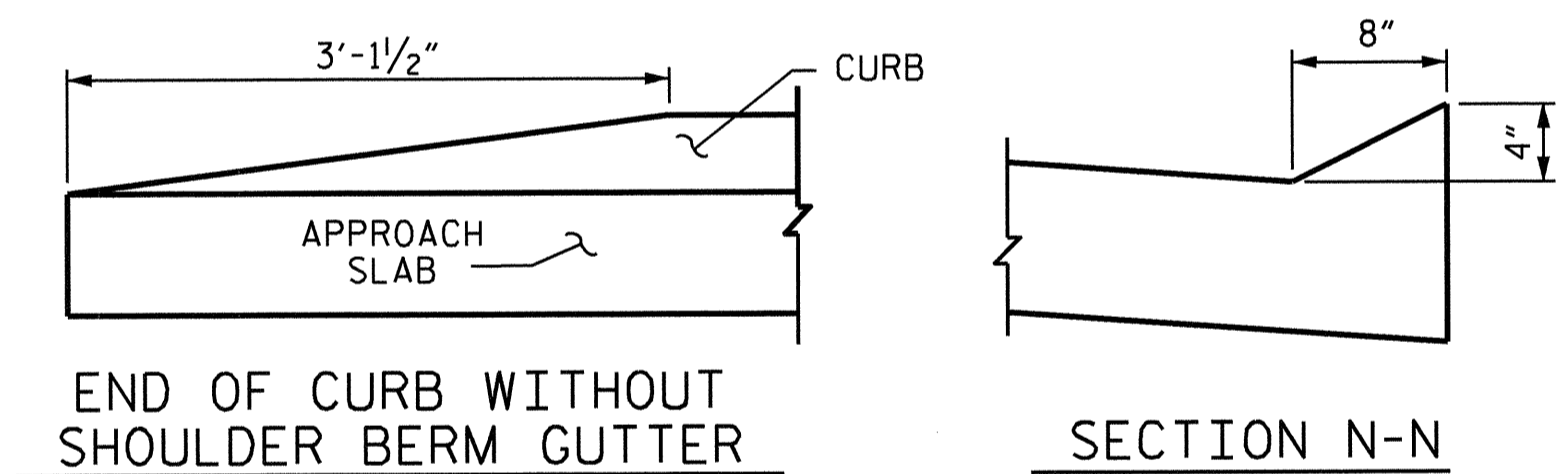
DRAWN BY : J. G. KHARVA DATE : 10/25/12
 CHECKED BY : T. H. CARROLL DATE : 05/28/13
 DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 09/10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			58

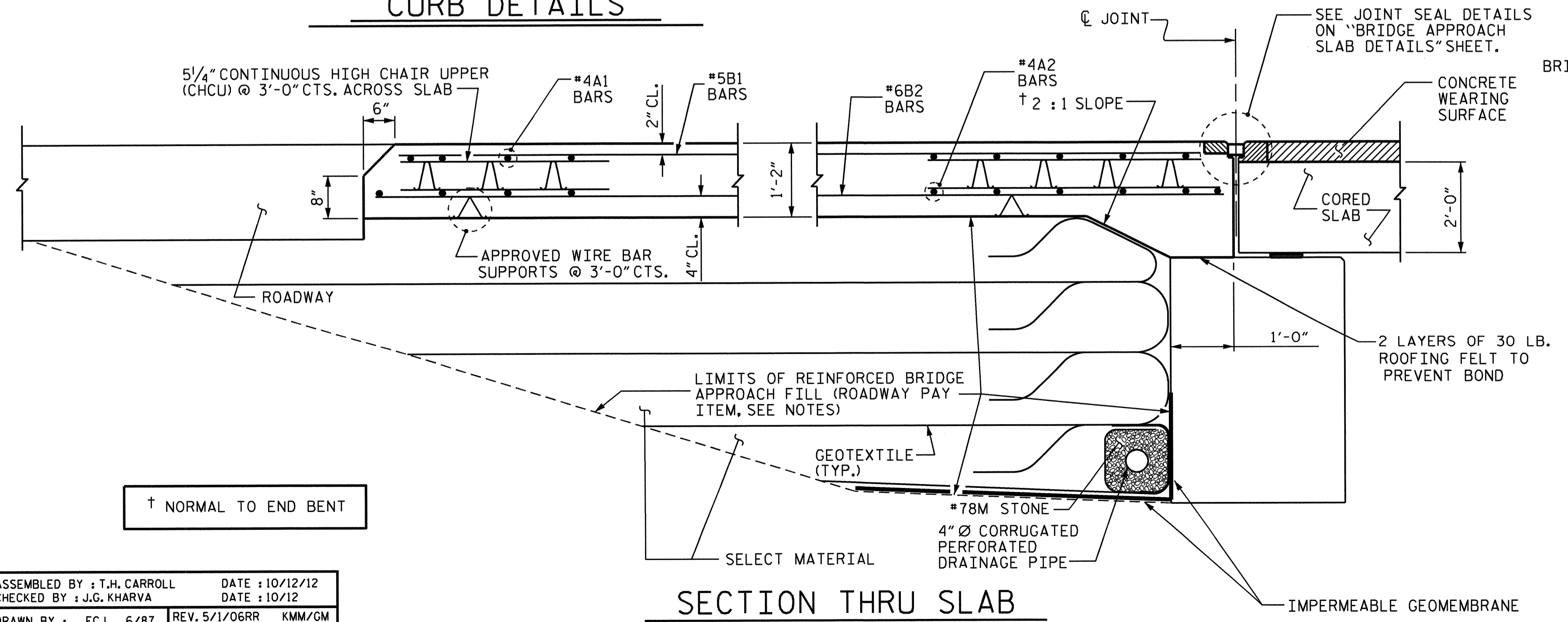
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 thcarroll



PLAN @ END BENT #1 PLAN @ END BENT #2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



CURB DETAILS



SECTION THRU SLAB

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMETRIC CONCRETE, SEE SPECIAL PROVISIONS.

APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

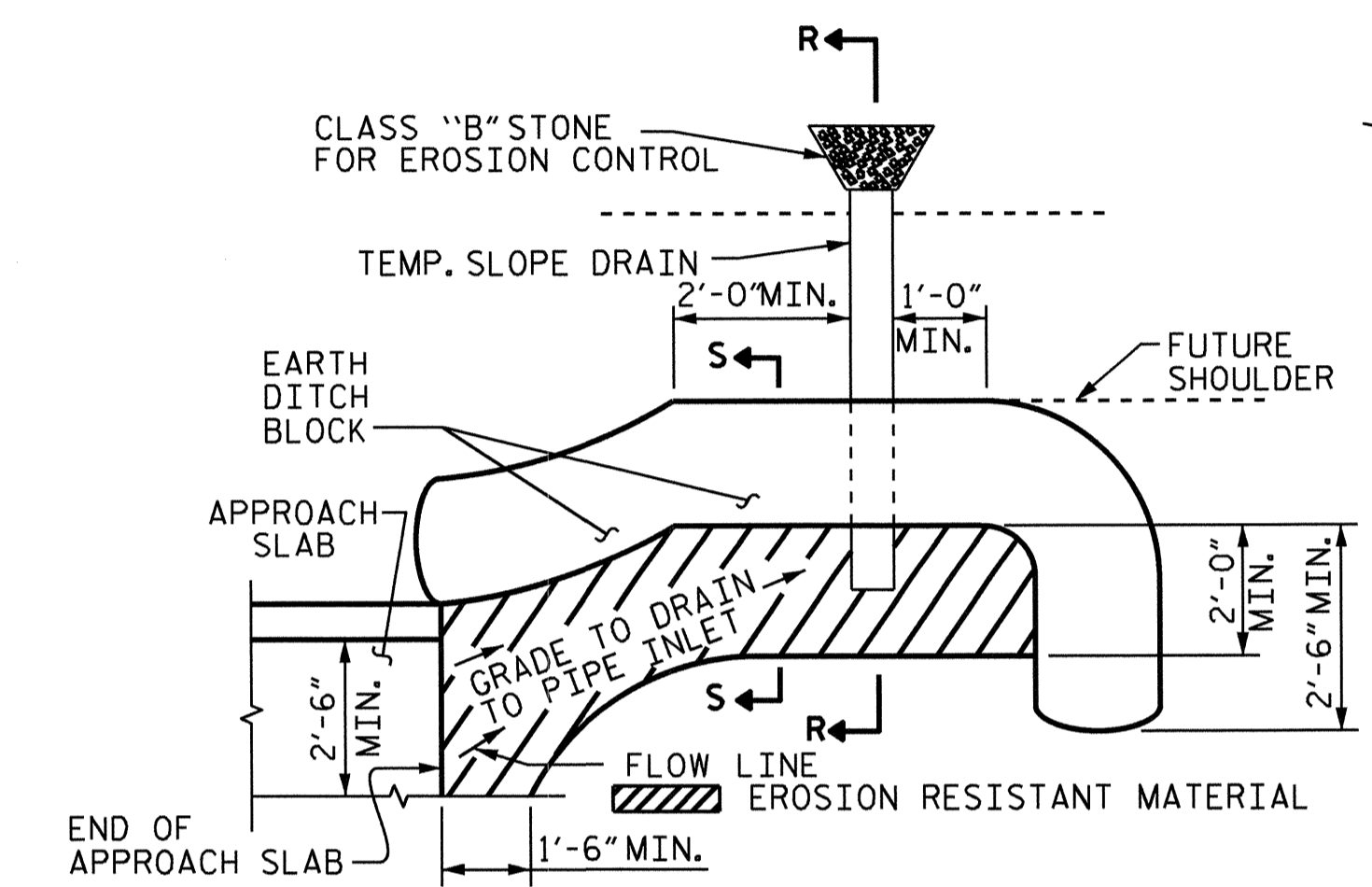
FOR SIDEWALK REINFORCING STEEL DETAILS, SEE "SIDEWALK DETAILS" SHEET.

BILL OF MATERIAL FOR ONE APPROACH SLAB (2 REQUIRED)

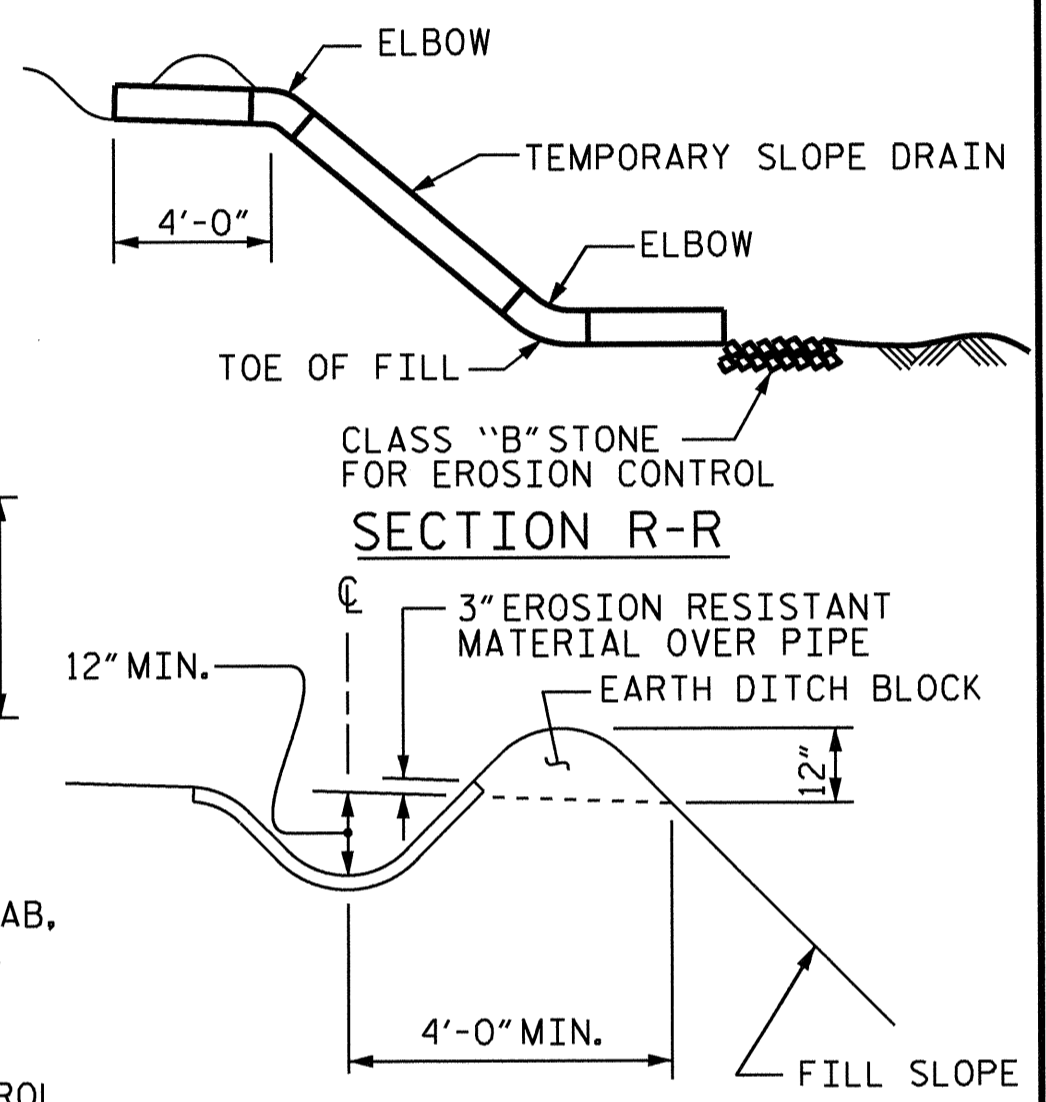
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR 25'-9"	860
A2	52	#4	STR 25'-8"	892
*B1	86	#5	STR 23'-6"	2108
B2	86	#6	STR 24'-7"	3175
REINFORCING STEEL				LBS. 4067
*EPOXY COATED REINFORCING STEEL				LBS. 2968
CLASS AA CONCRETE				C.Y. 52.2

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"



PLAN VIEW

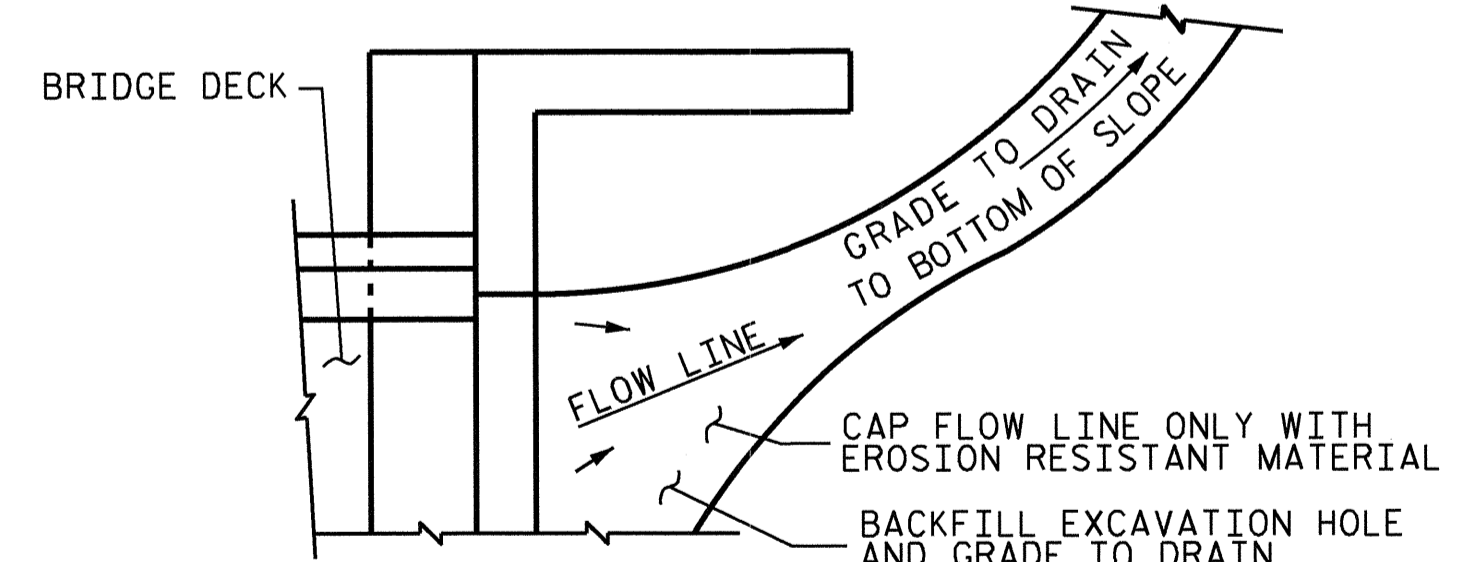


SECTION S-S

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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.

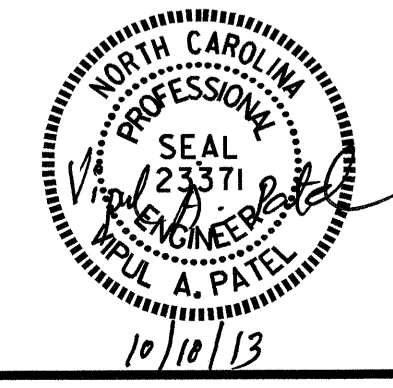
TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+47.50 -L-

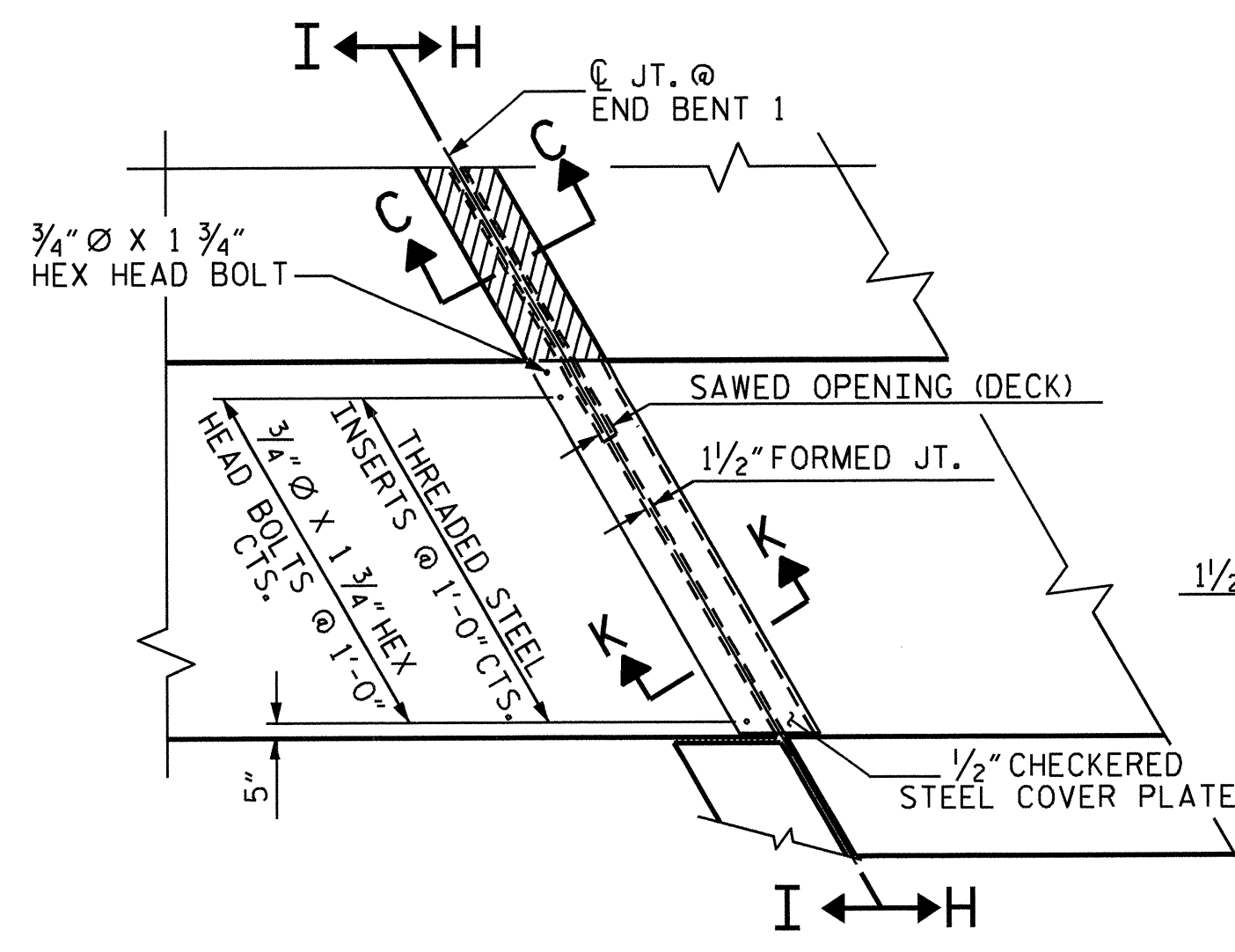
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB
(RIGHT LANE)

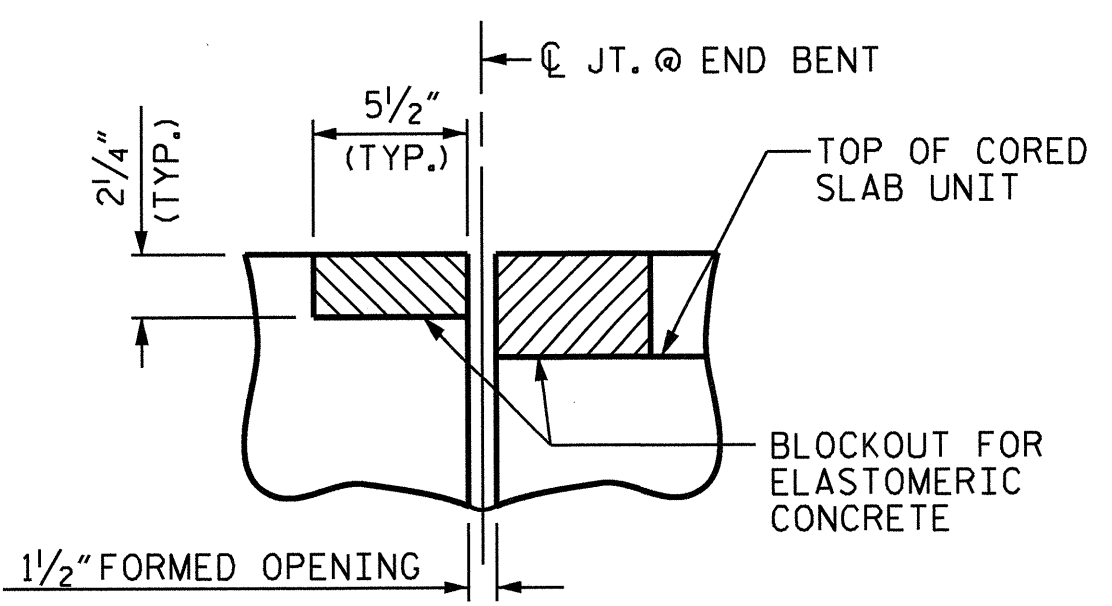
REVISIONS						SHEET NO. S-57
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 58
2			4			



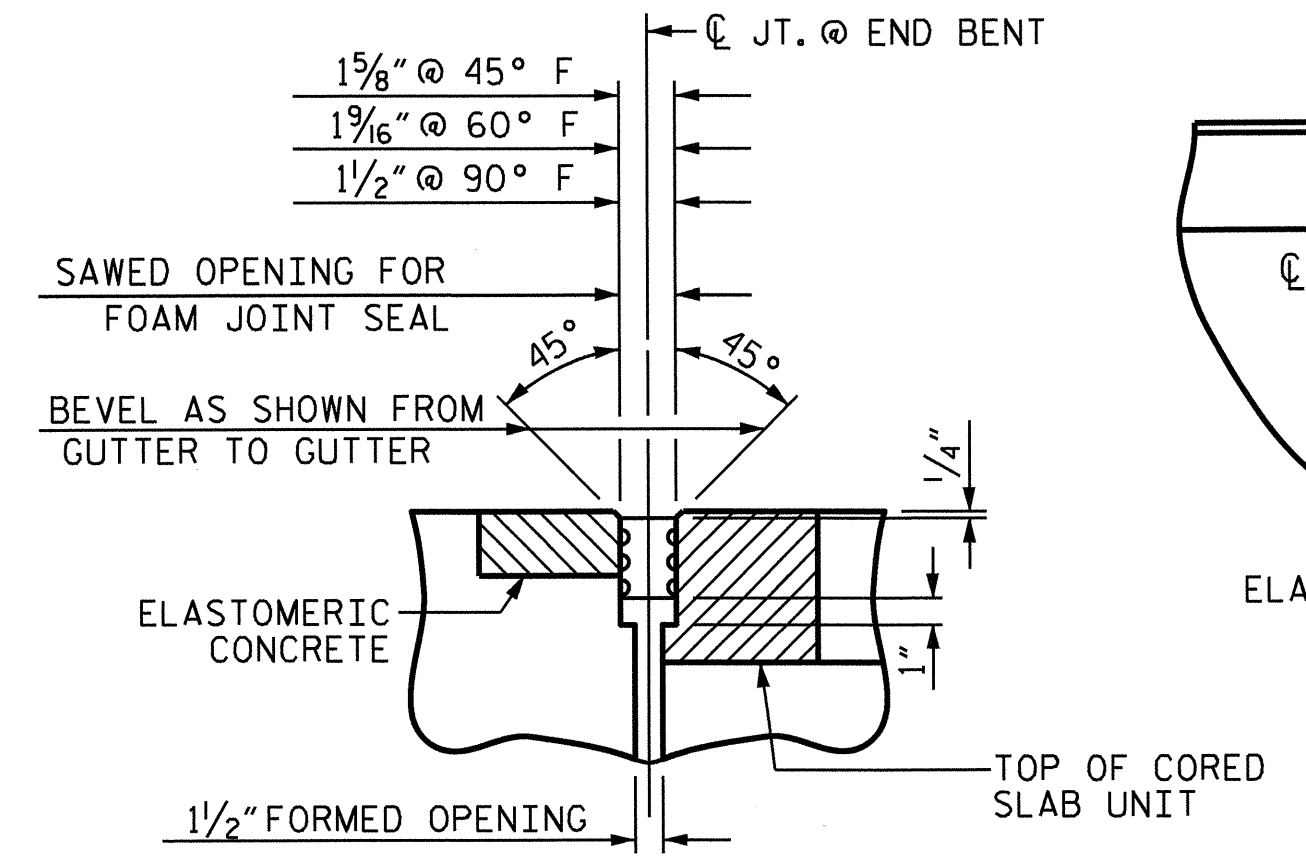
ASSEMBLED BY : T.H. CARROLL	DATE : 10/12/12
CHECKED BY : J.G. KHARVA	DATE : 10/12
DRAWN BY : FCJ 6/87	REV. 5/1/06RR KMM/GM
CHECKED BY : EGA 6/87	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM



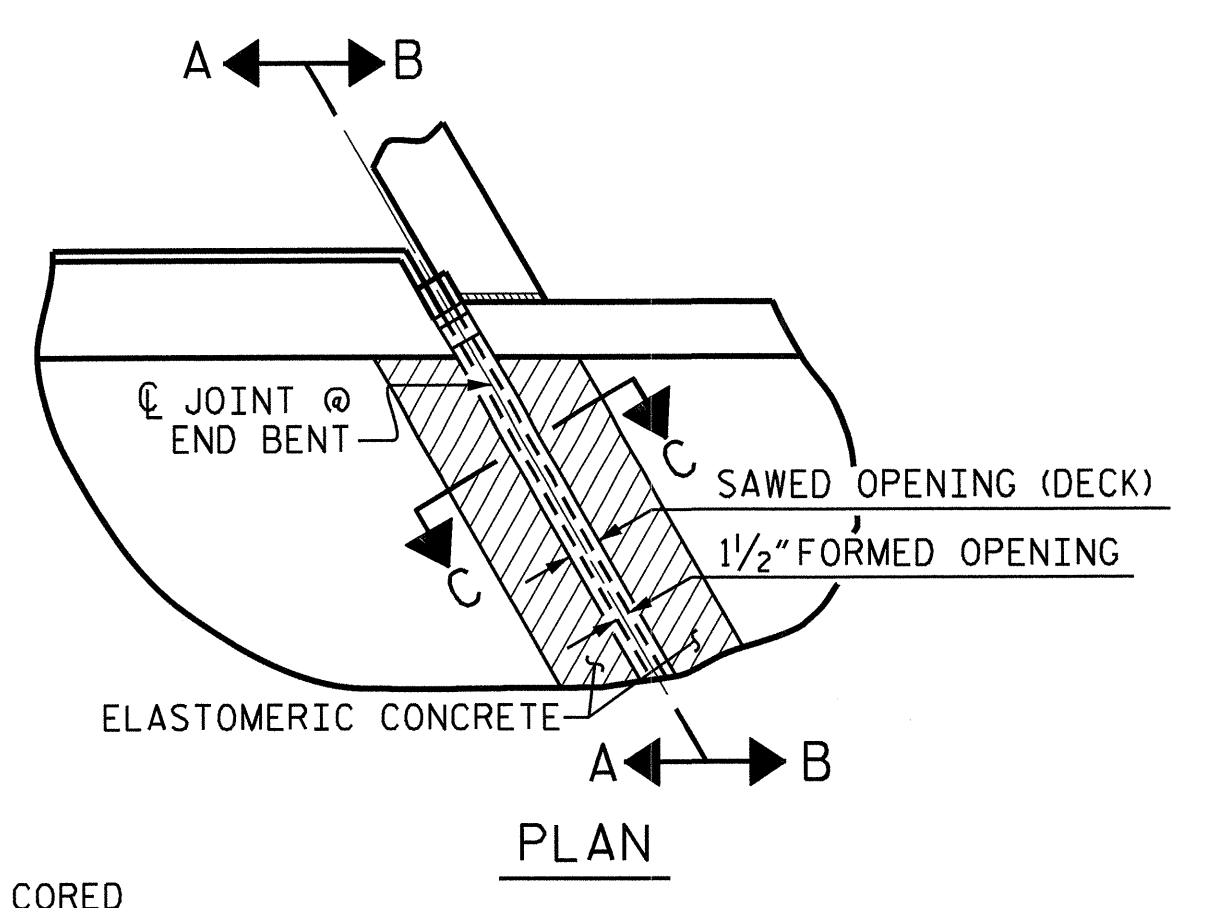
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK



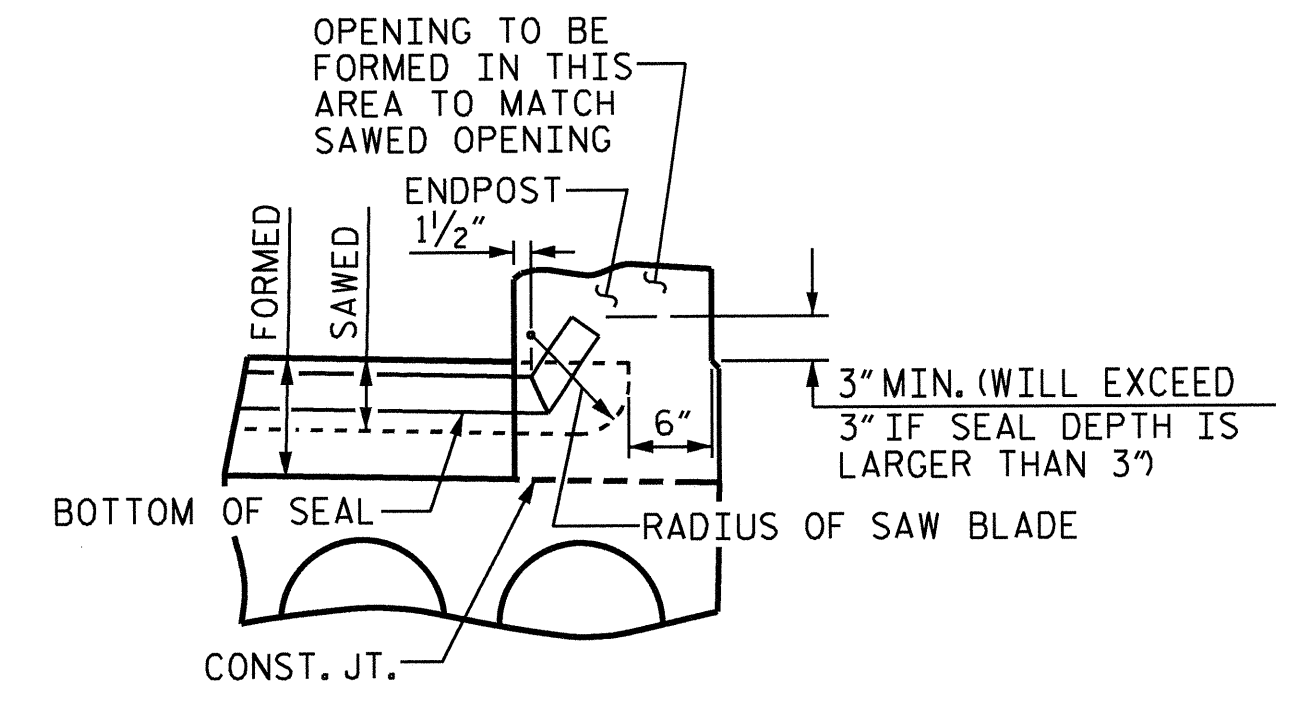
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



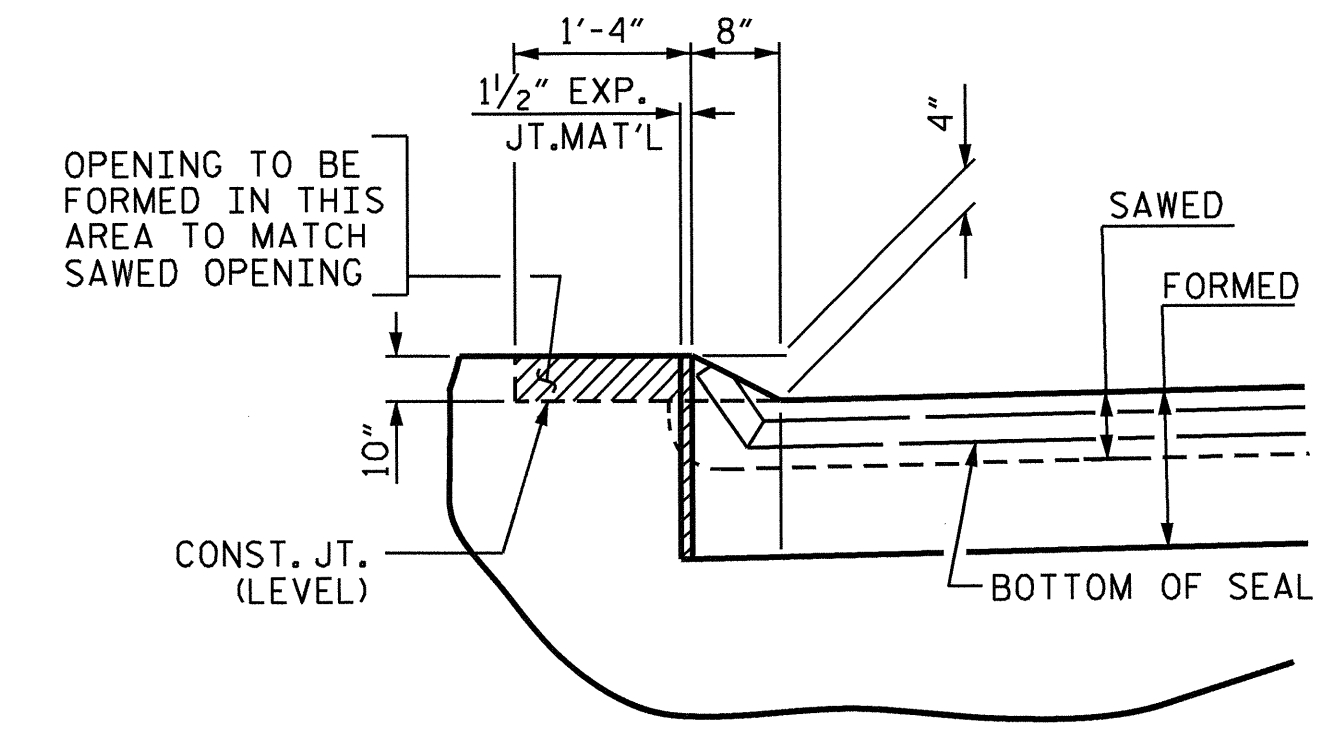
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



PLAN



SECTION A-A



SECTION B-B

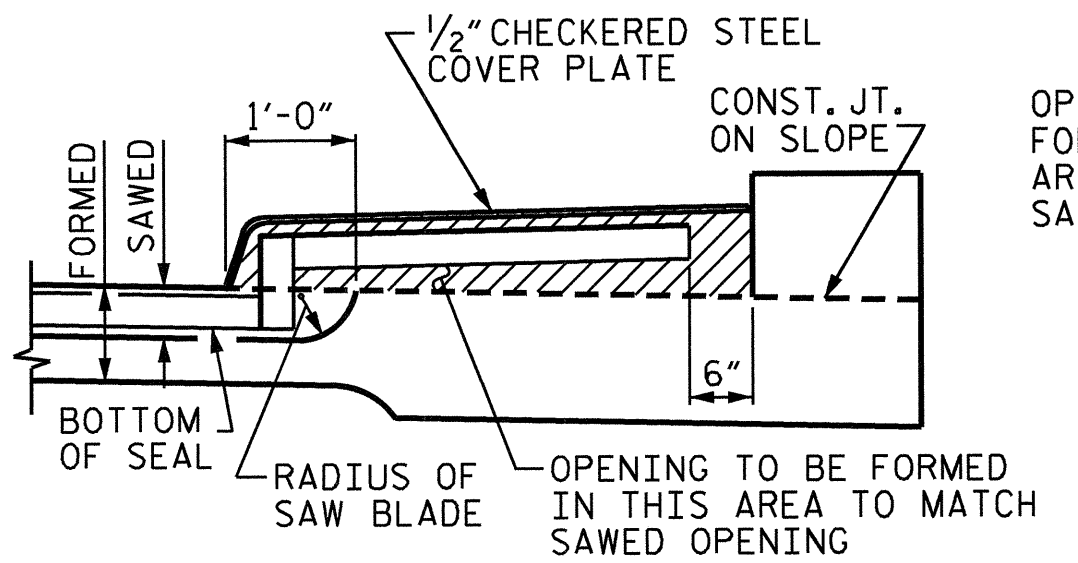
JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE PARAPET.

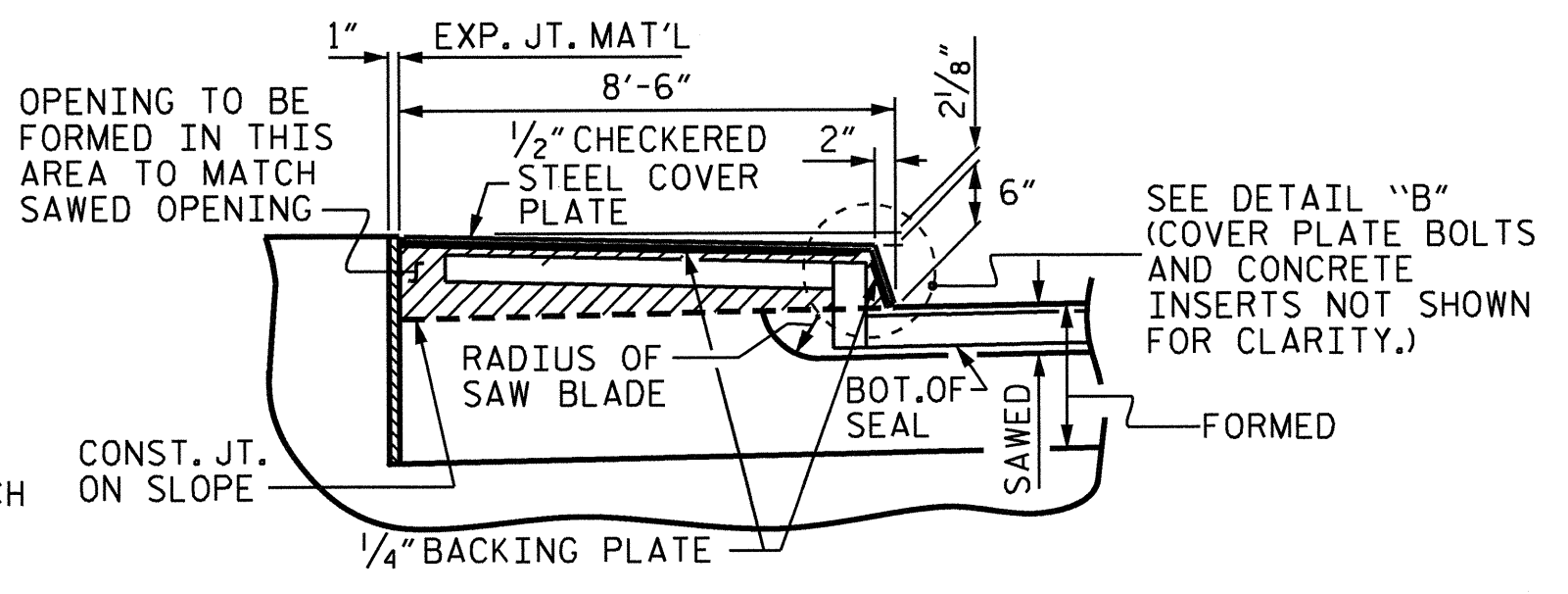
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

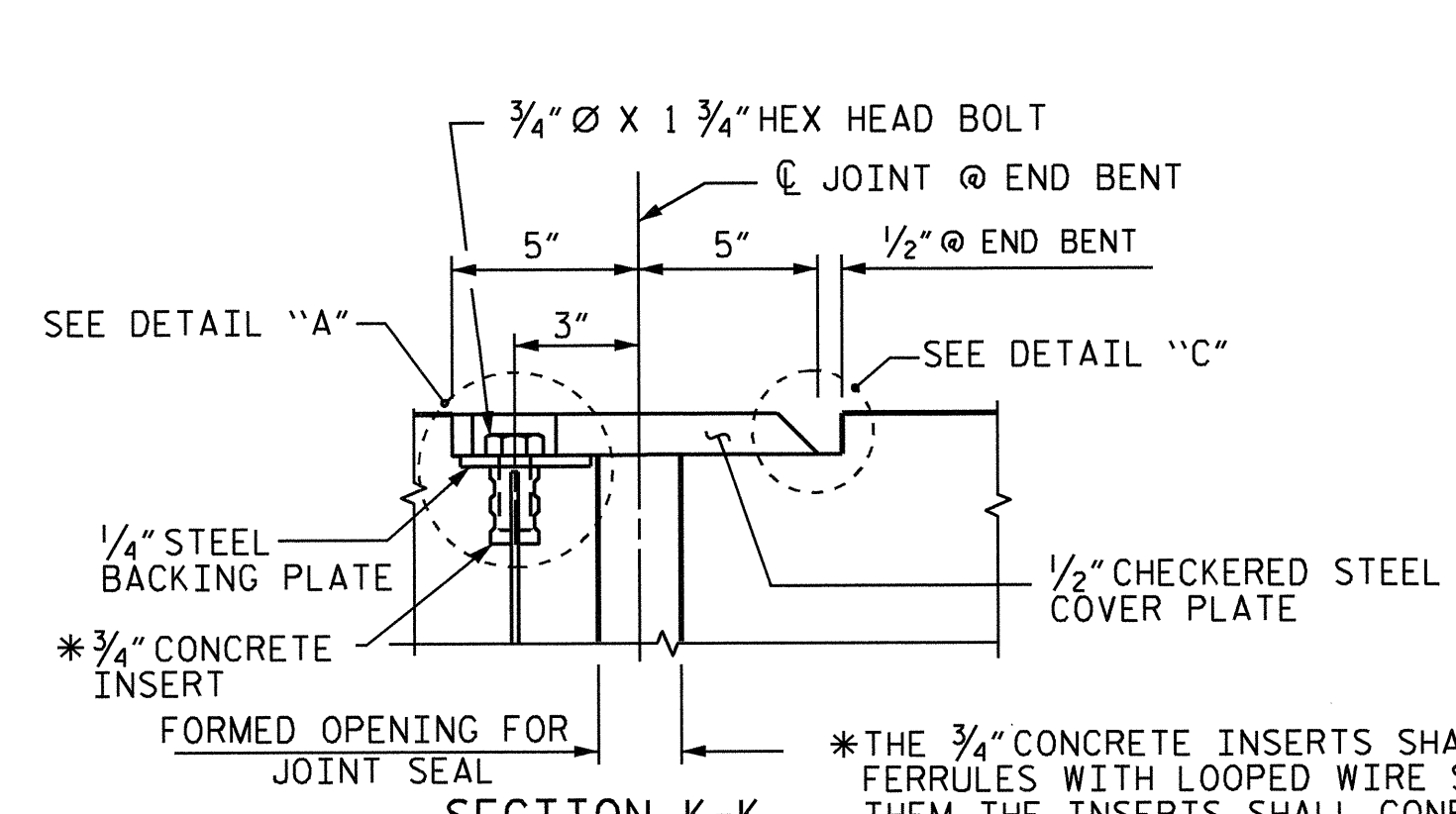
NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".



SECTION H-H



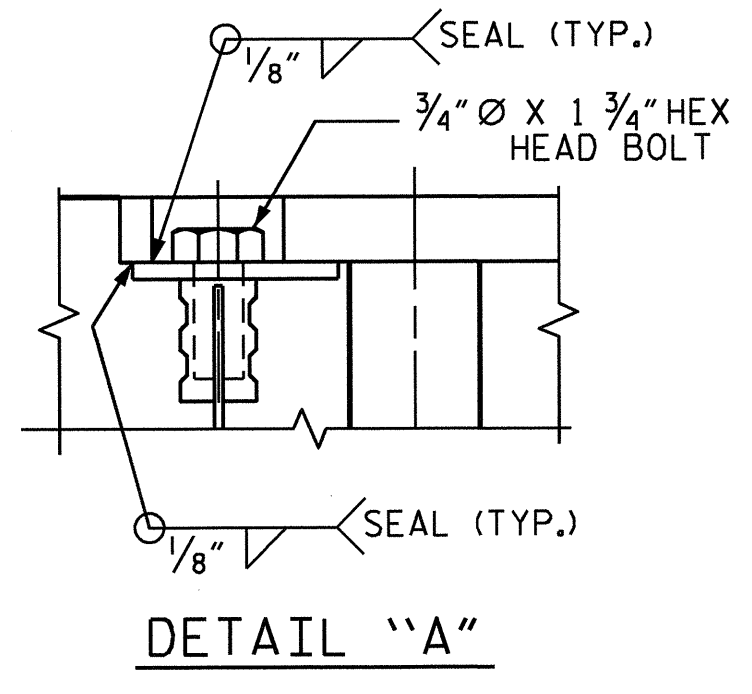
SECTION I-I



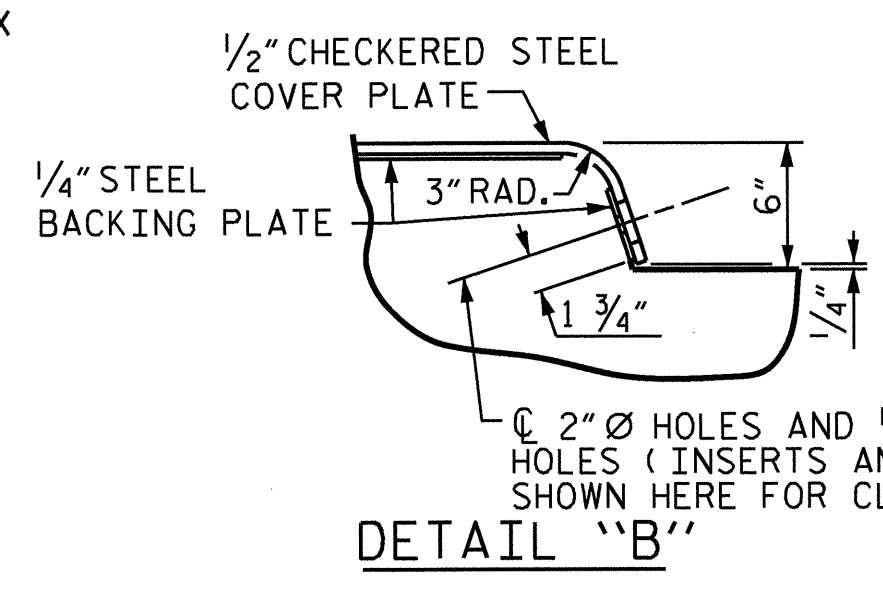
SECTION K-K

*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

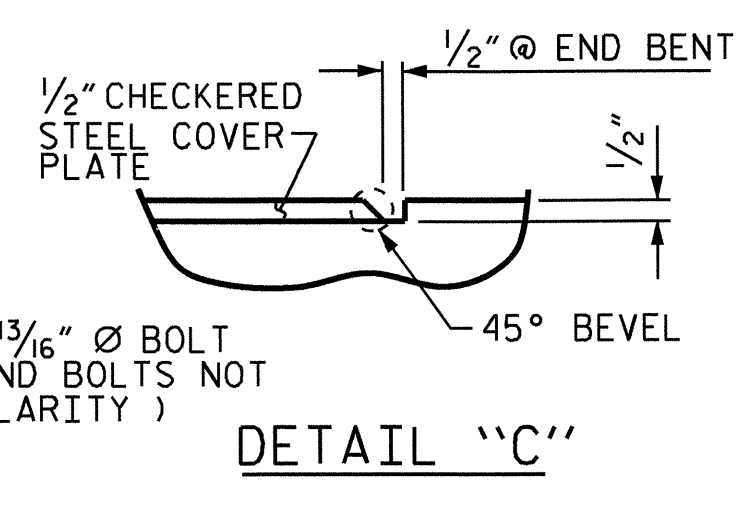
JOINT SEAL DETAILS @ END BENT



DETAIL "A"



DETAIL "B"



DETAIL "C"

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	12.7
2	12.7
TOTAL	25.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



PROJECT NO. B-4779
MECKLENBURG COUNTY
STATION: 20+47.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS 58
2			4			

ASSEMBLED BY : T.H. CARROLL	DATE : 10/11/12
CHECKED BY : J.G. KHARVA	DATE : 10/12
DRAWN BY : FCJ 11/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 11/88	REV. 5/1/06RRR MAA/KMM
	REV. 10/1/11 MAA/GM

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990