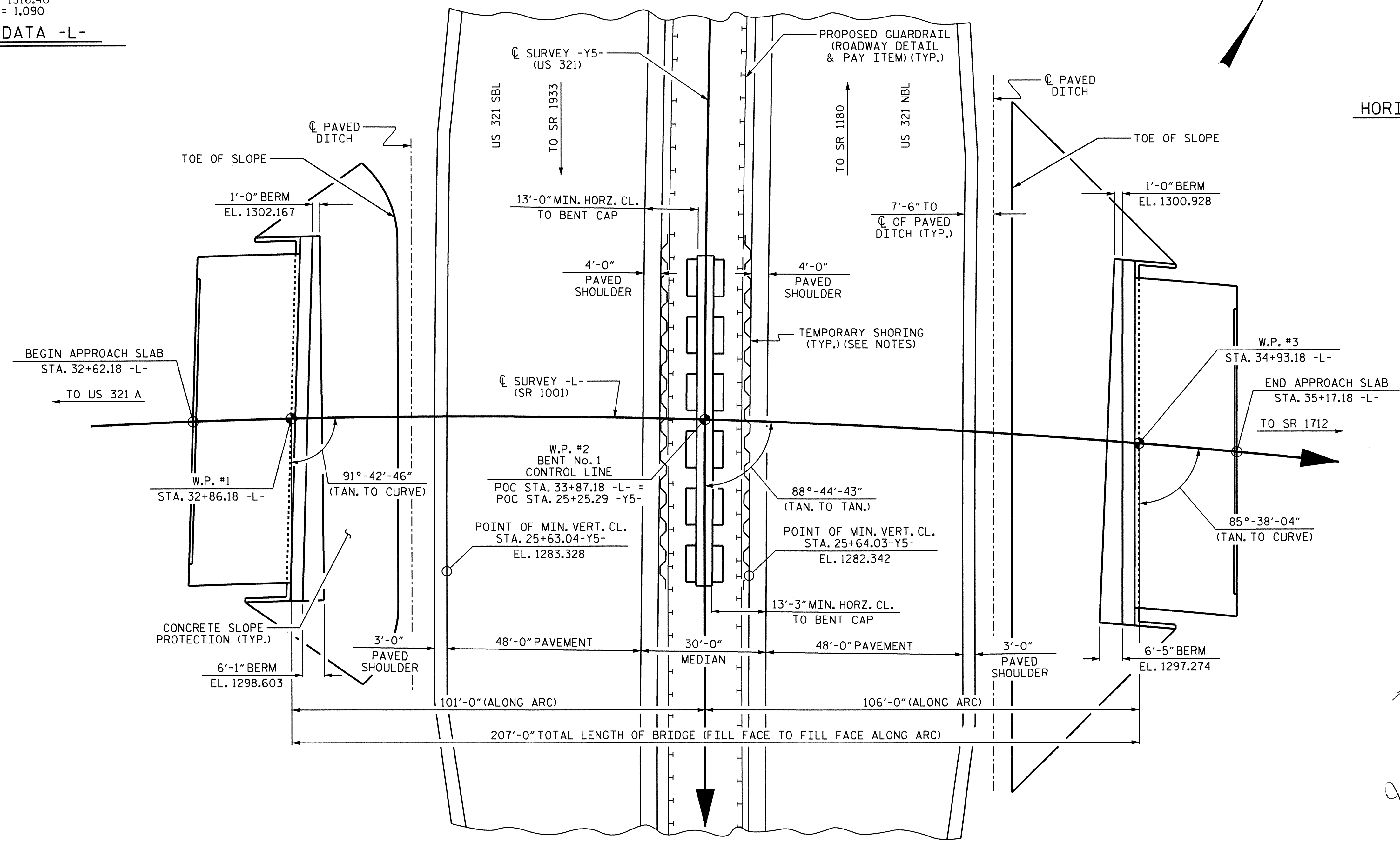


GRADE DATA -L-
 +3.5035 % Δ -2.2286 %
 PI = 31+50.00
 EL. = 1316.40
 VC = 1,090

SECTION ALONG C SURVEY -L-
 (SECTION AT BENT AND END BENTS ARE AT RIGHT ANGLES)

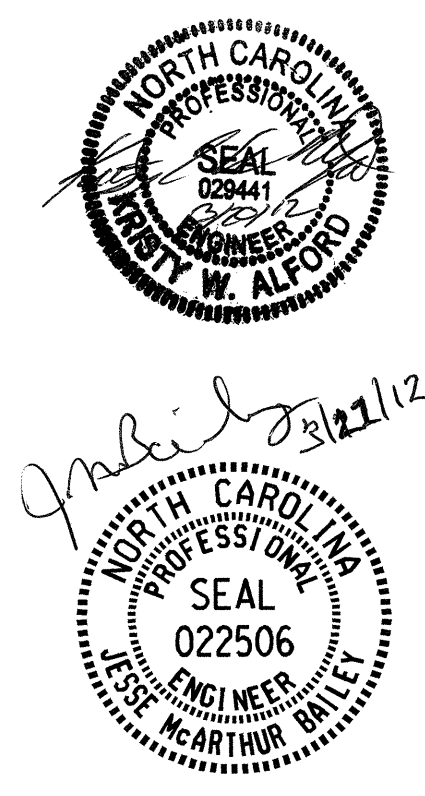
HORIZONTAL CURVE DATA -L-
 PI = 34+53.26
 Δ = 29°-31'-52.5" (RT)
 D = 2°-56'-17.7"
 L = 1,005.60'
 T = 513.96'
 R = 1,950.00'



PLAN

(PILES AND COLUMNS NOT SHOWN FOR CLARITY)

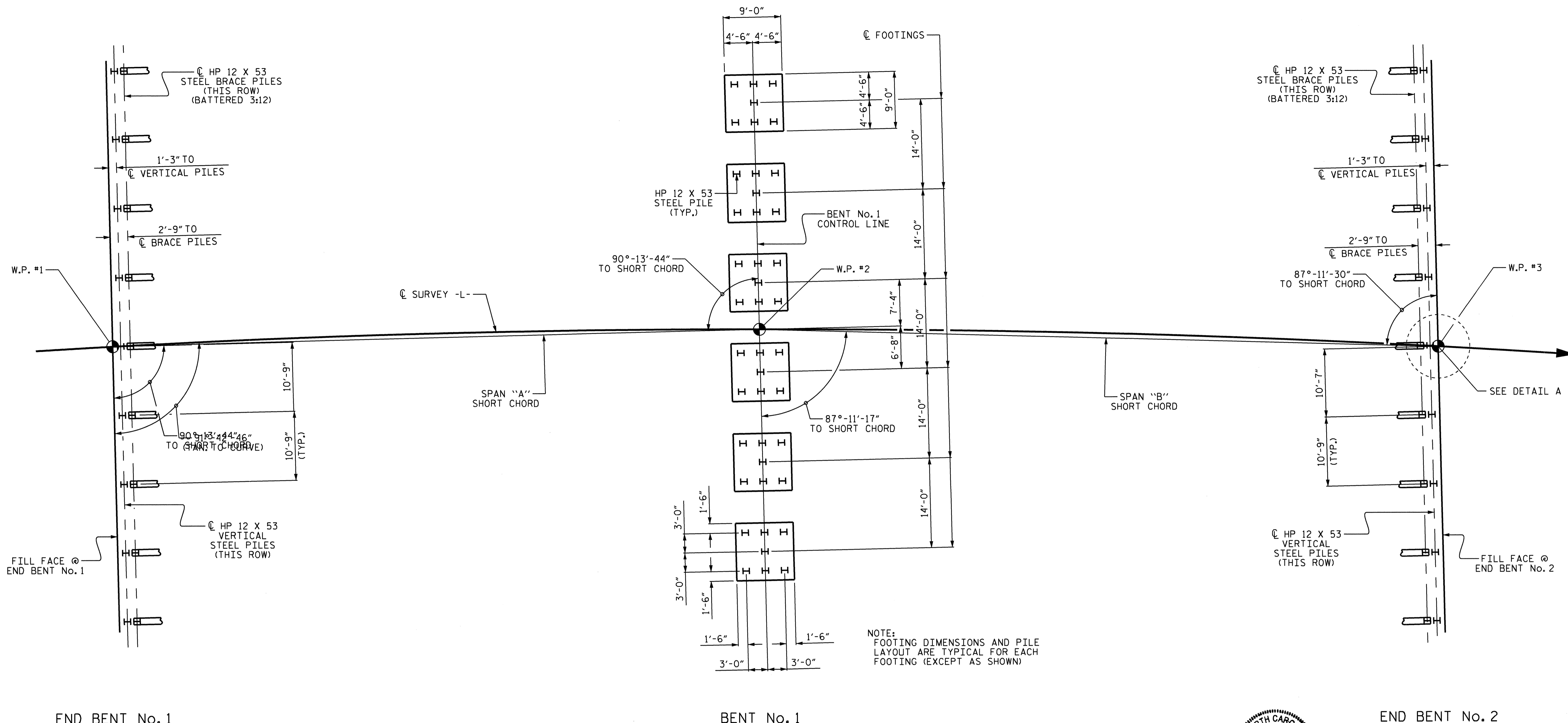
PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-
 25+25.29 -Y5-
 SHEET 1 OF 4 REPLACES BRIDGE No. 51



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 1001
 (CONNELLY SPRINGS ROAD)
 OVER US 321 BETWEEN
 US 321 A AND SR 1712

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

DRAWN BY: T. BANKOVICH DATE: 6-2010
 CHECKED BY: M.L. BROWN DATE: 6-2010

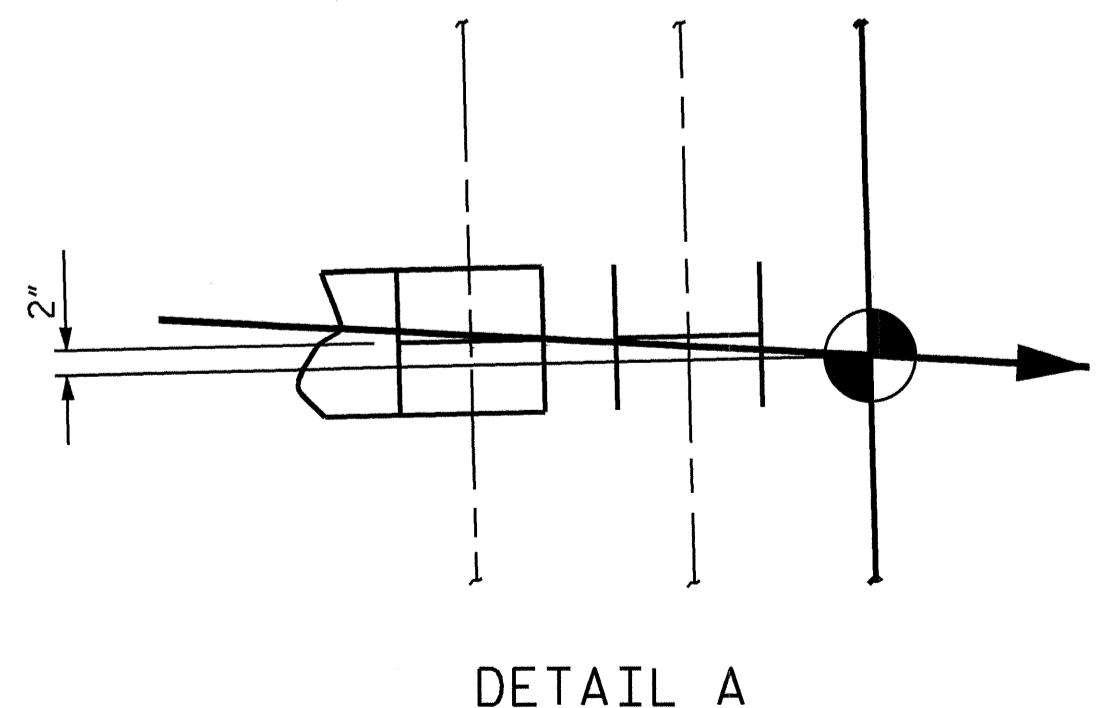


FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP AND FOOTING)

NOTES:

- FOR PILES, SEE SPECIAL PROVISIONS.
- DRIVE PILES AT END BENT No.1 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No.1 IS 60 TONS PER PILE.
- TESTING THE PRODUCTION PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT No.1. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.
- DRIVE PILES AT BENT No.1 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- THE ALLOWABLE BEARING CAPACITY FOR PILES AT BENT No.1 IS 60 TONS PER PILE.
- TESTING THE PRODUCTION PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT No.2. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.
- DRIVE PILES AT END BENT No.2 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No.2 IS 60 TONS PER PILE.
- TESTING THE PRODUCTION PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT No.2. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.
- FOR ADDITIONAL NOTES, SEE SHEET 4 OF 4.



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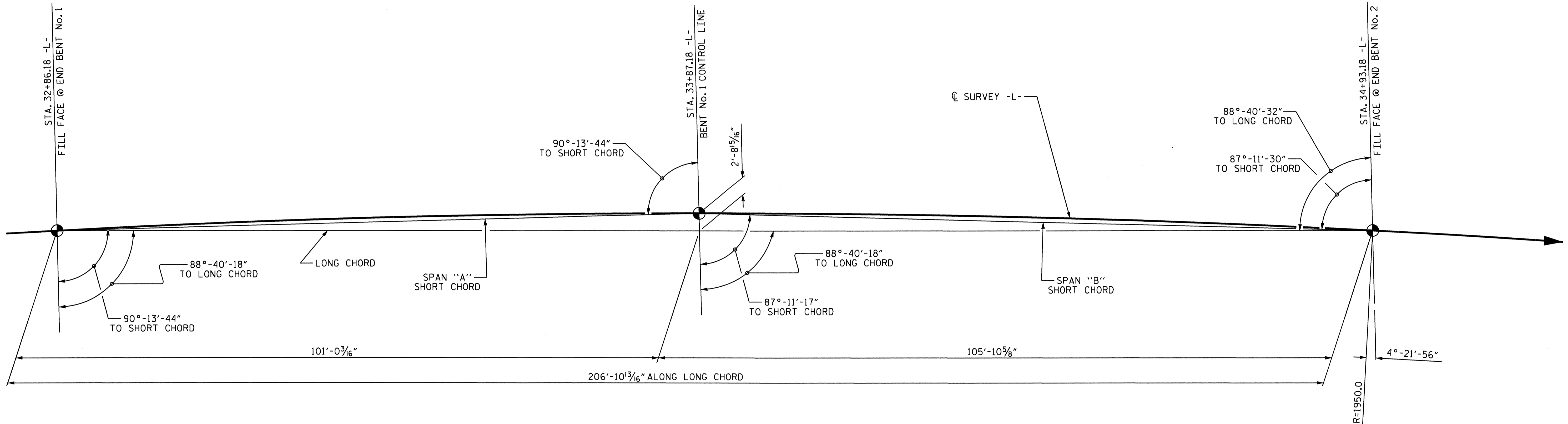
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PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 2 OF 4

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

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 1001
 (CONNELLY SPRINGS ROAD)
 OVER US 321 BETWEEN
 US 321 A AND SR 1712



LONG CHORD LAYOUT

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

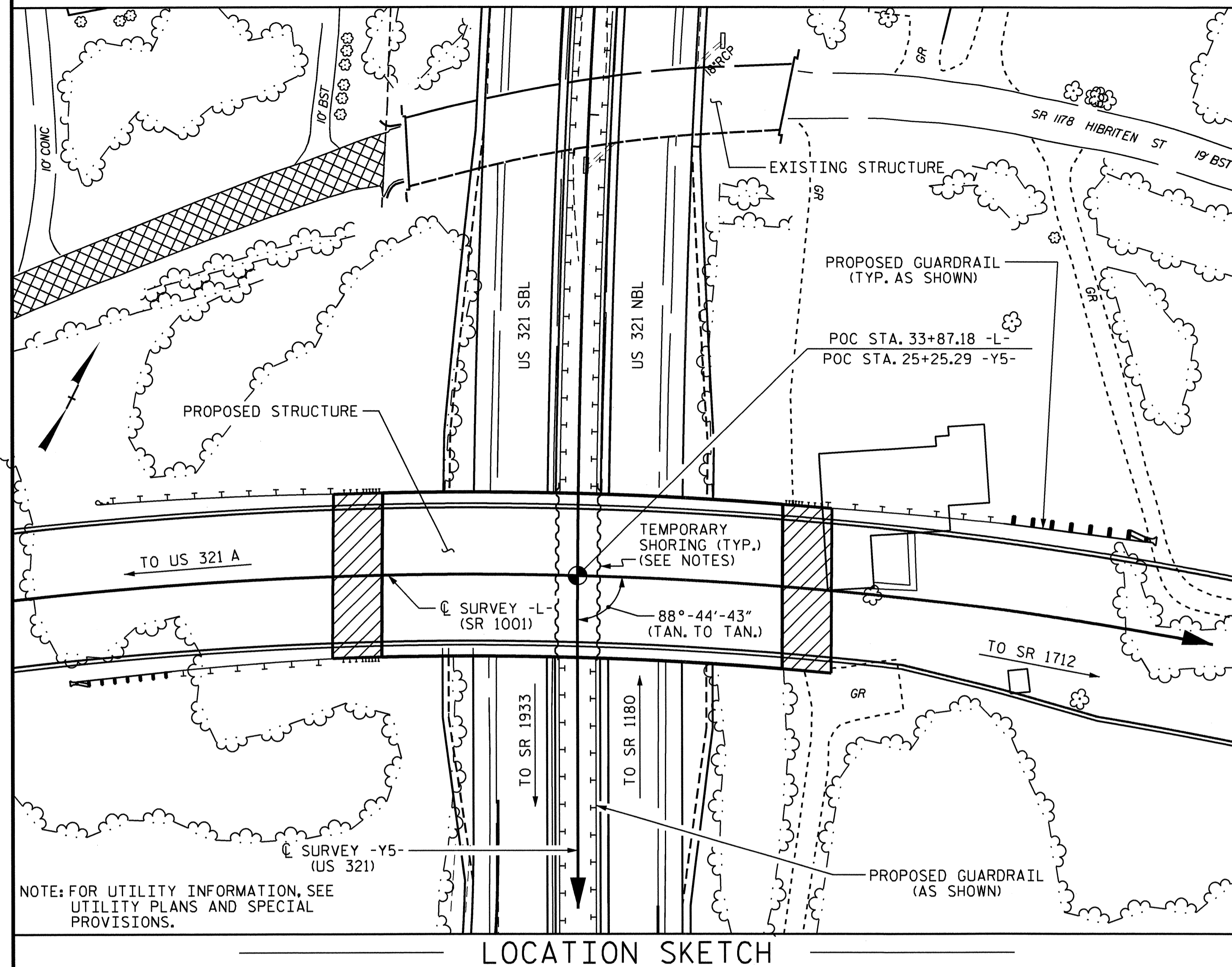
LONG CHORD LAYOUT



DRAWN BY : T. BANKOVICH DATE : 6-2010
 CHECKED BY : M.L. BROWN DATE : 6-2010

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



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

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THE PRESTRESSED GIRDERS HAVE BEEN DESIGNED FOR HS 25.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 60 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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 EXISTING STRUCTURE CONSISTING OF 5 SPANS @ 1 @ 40', 1 @ 54'-6", 1 @ 10', 1 @ 48'-6" & 1 @ 40' WITH REINFORCED CONCRETE DECK GIRDERS AND PRESTRESSED CONCRETE GIRDERS AND A CLEAR ROADWAY WIDTH OF 26'-0" ON REINFORCED CONCRETE CAP ON STEEL H PILE END BENTS AND REINFORCED CONCRETE POST AND BEAM ON PILE FOOTING BENTS AND LOCATED 190'± NORTH OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

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.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	PDA ASSISTANCE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	THREE BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS		
	LUMP SUM	LUMP SUM	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE					LUMP SUM	17,018	16,691		LUMP SUM			20	2,032.19				LUMP SUM	LUMP SUM	
END BENT No. 1			2					70.7		9,995			18	1,440	425				
BENT No. 1		LUMP SUM	2					150.8		20,959	3090		42	2,520					
END BENT No. 2			2					70.8		9,994			18	1,260	475				
TOTAL	LUMP SUM	LUMP SUM	6	6	LUMP SUM	17,018	16,691	292.3	LUMP SUM	40,948	3090	20	2,032.19	78	5,220	394.66	900	LUMP SUM	LUMP SUM

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 4 OF 4

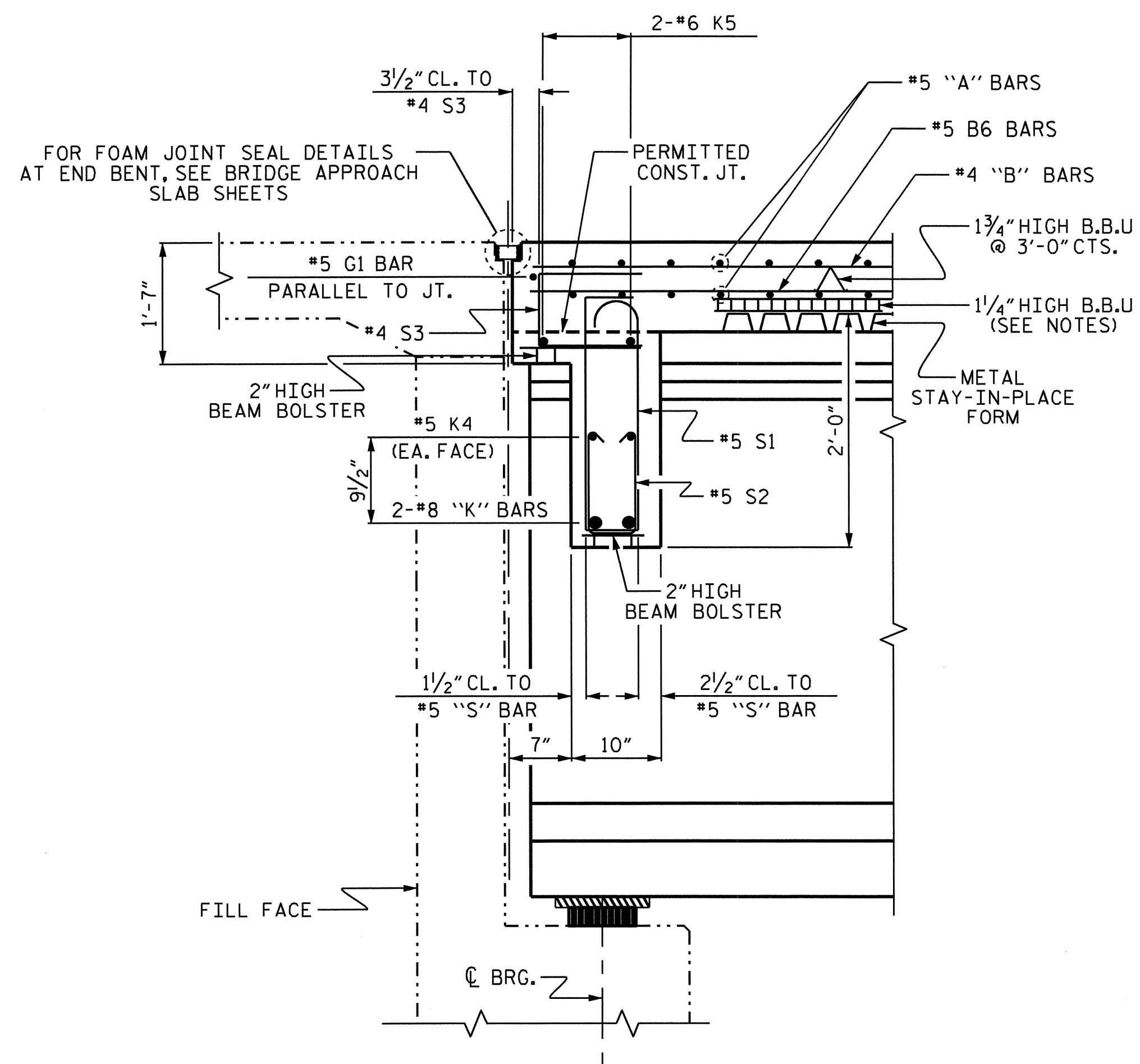


GENERAL DRAWING
 FOR BRIDGE ON SR 1001
 (CONNELLY SPRING ROAD)
 OVER US 321 BETWEEN
 US 321 A AND SR 1712

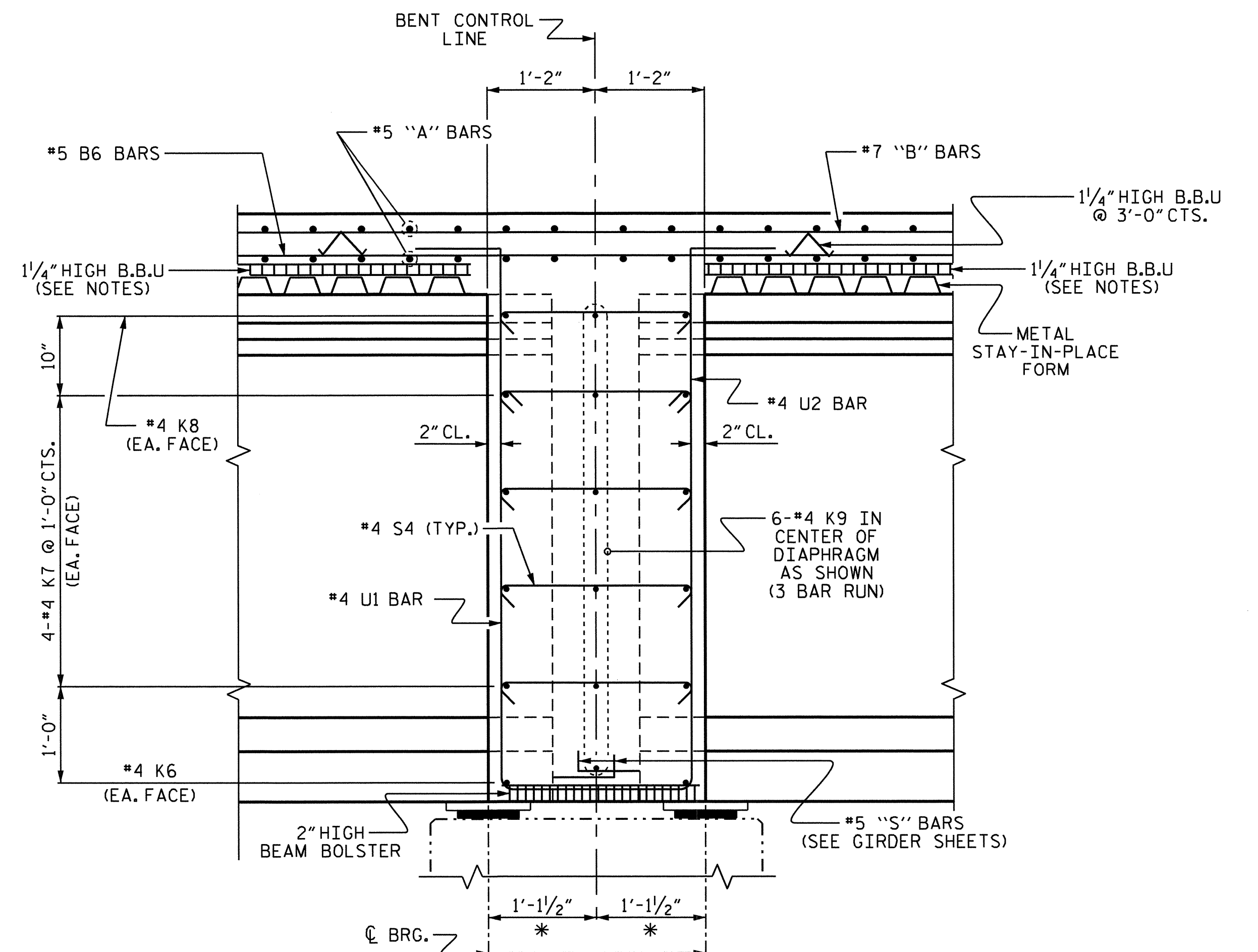
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 CHECKED BY: M.L. BROWN DATE: 6-2010

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

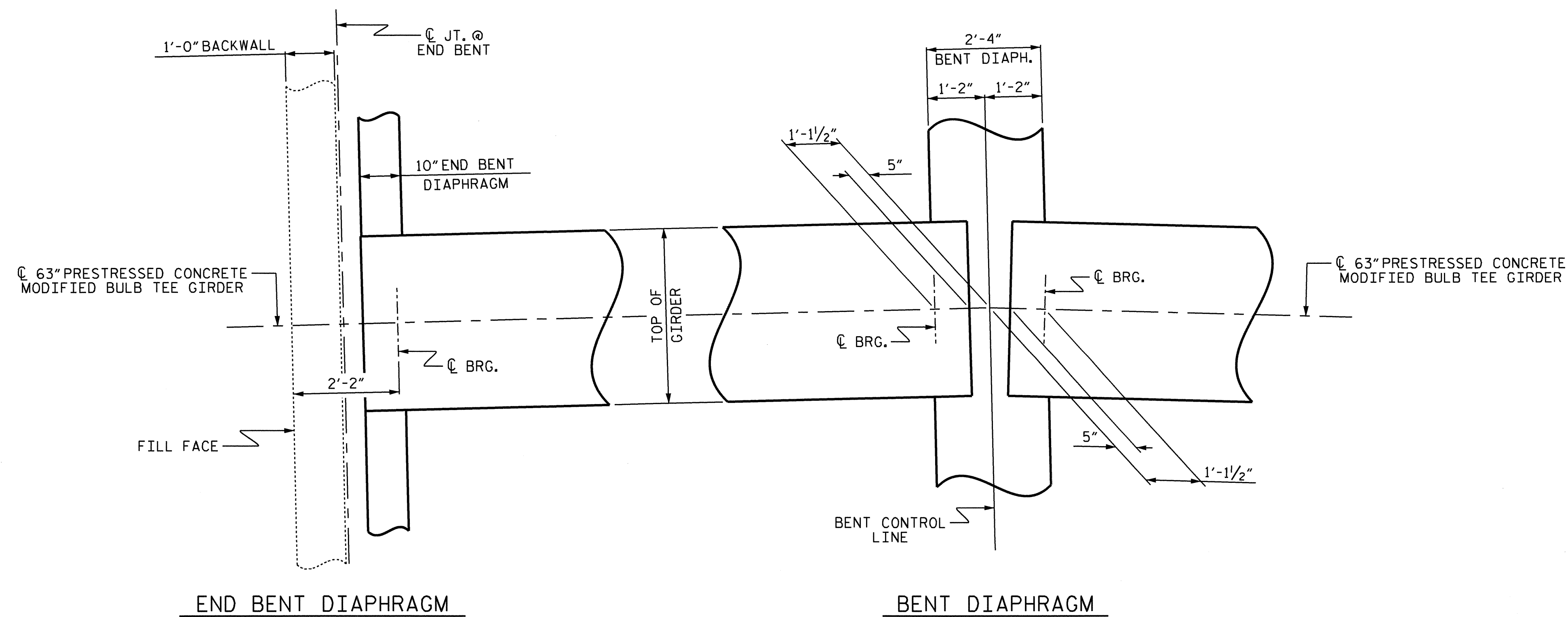


SECTION THRU END BENT DIAPHRAGM



SECTION THRU BENT DIAPHRAGM

* MEASURED ALONG C GIRDER



END BENT DIAPHRAGM

BENT DIAPHRAGM

PLAN OF DIAPHRAGMS

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION



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 CHECKED BY: D.G. ELY DATE: 6-2009

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			40

TOTAL ARC LENGTH = 204'-10¹⁵/₁₆" @ JT. @ END BENT No. 1 TO @ JT. @ END BENT No. 2 (MEASURED ALONG OUTSIDE EDGE OF SUPERSTRUCTURE)

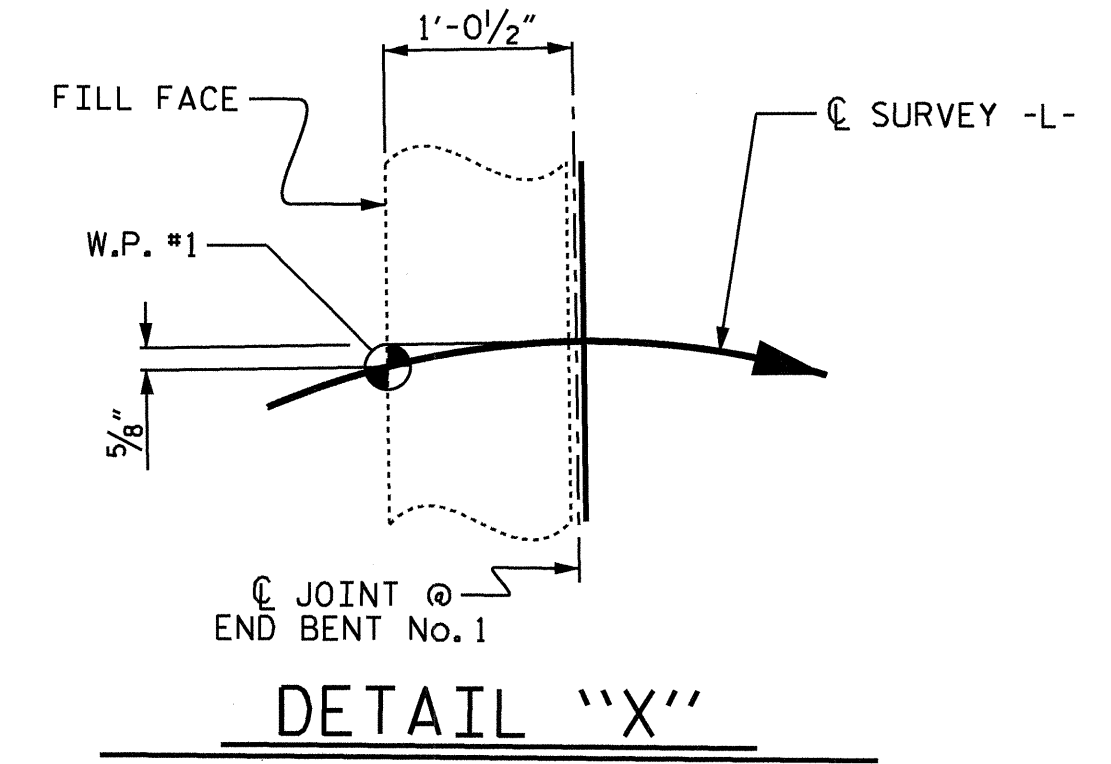
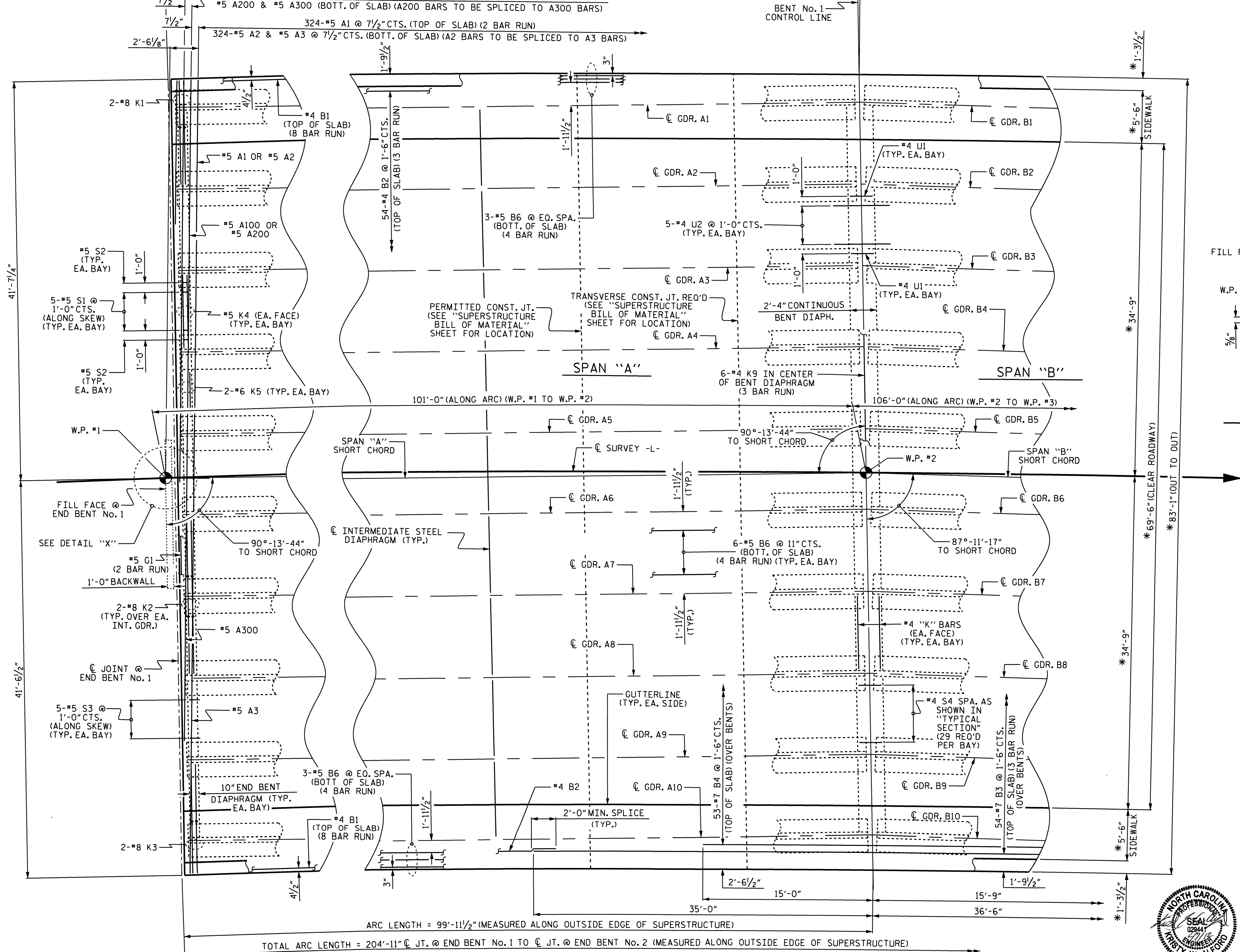
ARC LENGTH = 99'-11¹/₂" (MEASURED ALONG OUTSIDE EDGE OF SUPERSTRUCTURE)

NOTES:

FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEETS.
 FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEETS.
 FOR LOCATION OF CONCRETE ISLAND REINFORCEMENT AND LOCATION SEE "CONCRETE ISLAND" SHEET.
 CONCRETE ISLAND NOT SHOWN FOR CLARITY.
 #5 "A" BARS ARE TO BE PLACED NORMAL TO LONG CHORD.

* RADIAL DIMENSIONS

#5 A101 THRU #5 A102 @ 7¹/₂" CTS. (TOP OF SLAB)
 #5 A201 THRU #5 A202 @ 7¹/₂" CTS. (BOTT. OF SLAB)



DRAWN BY: T. BANKOVICH DATE: 5-2009
 CHECKED BY: D.G. ELY DATE: 6-2009

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PARTIAL PLAN OF SPAN

PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN A



REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

NOTES:

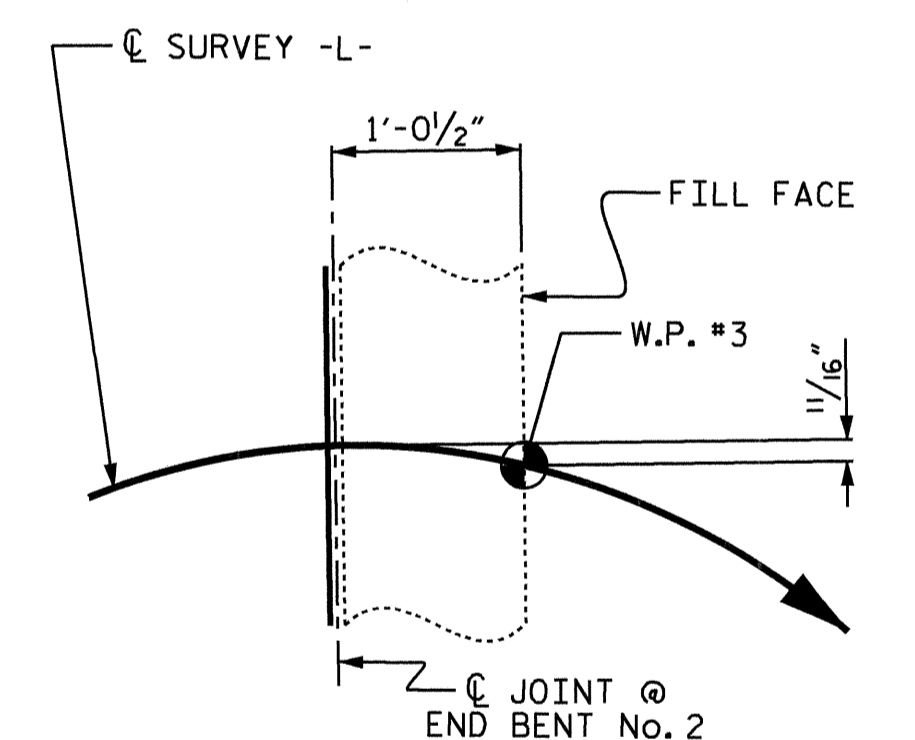
FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEETS.

FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "FRAMING PLAN" SHEETS.

FOR LOCATION OF CONCRETE ISLAND REINFORCEMENT AND LOCATION SEE "CONCRETE ISLAND" SHEET.

CONCRETE ISLAND NOT SHOWN FOR CLARITY.

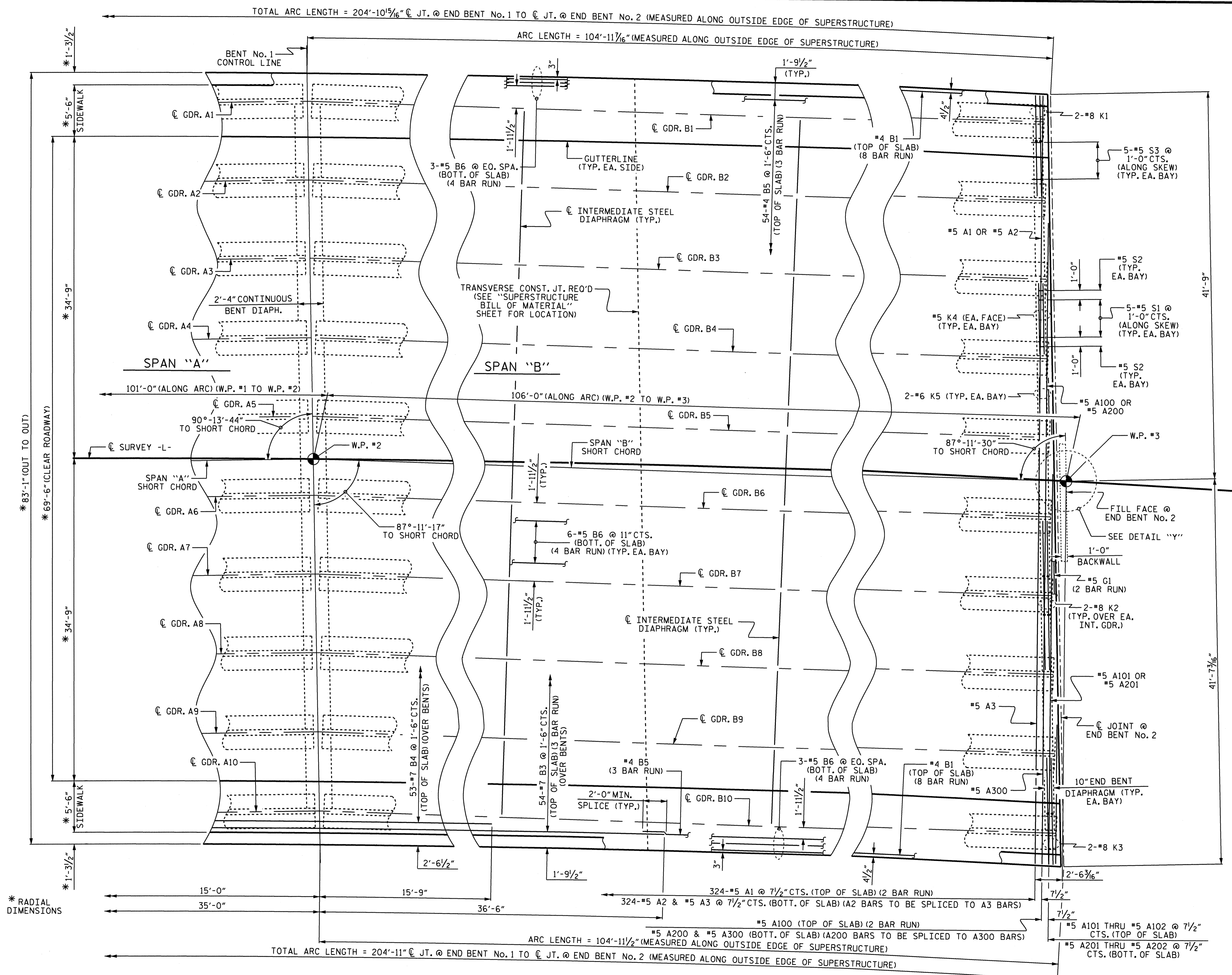
#5 "A" BARS ARE TO BE PLACED NORMAL TO LONG CHORD.



DETAIL "Y"

PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 2 OF 2

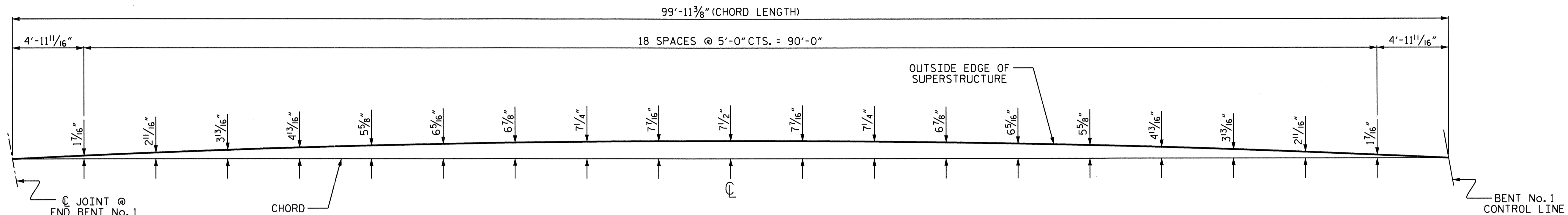
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-9
SUPERSTRUCTURE						
PLAN OF SPAN B						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			40
2			4			



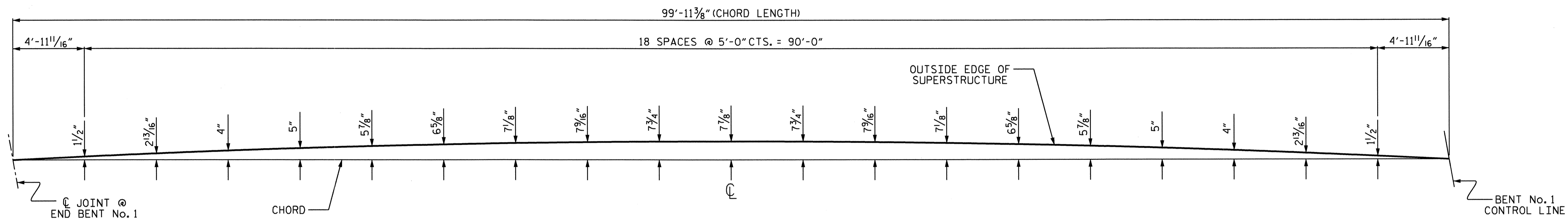
PARTIAL PLAN OF SPAN

DRAWN BY: T. BANKOVICH DATE: 5-2009
 CHECKED BY: D.G. ELY DATE: 6-2009

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SPAN "A" LEFT SIDE ARC OFFSETS



SPAN "A" RIGHT SIDE ARC OFFSETS

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

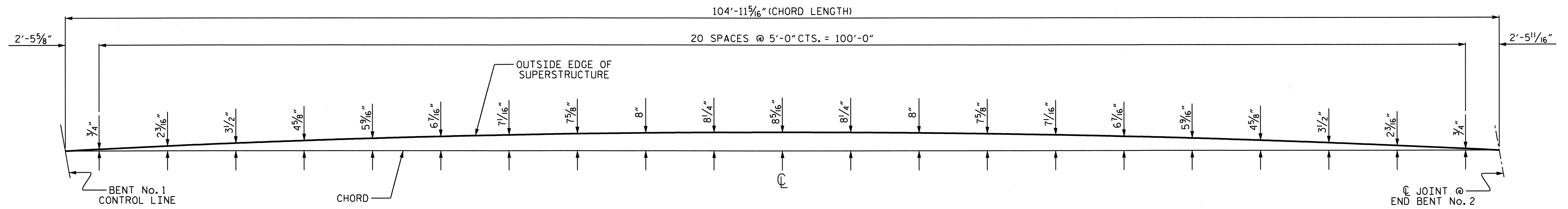
ARC OFFSETS
 SPAN A



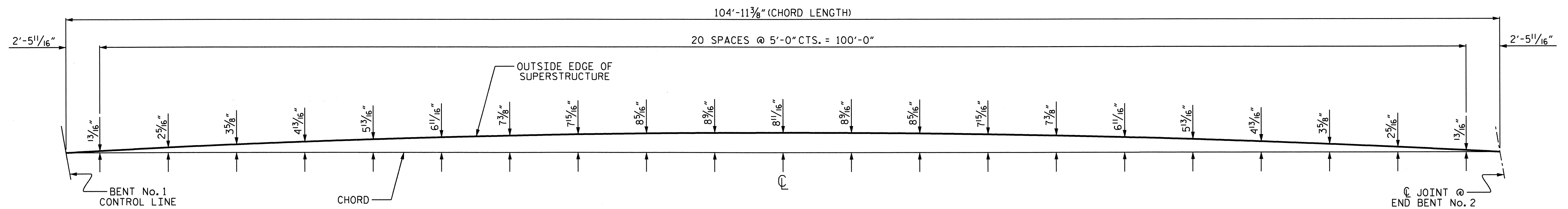
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 CHECKED BY : D.G. ELY DATE : 6-2009

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			40



SPAN "B" LEFT SIDE ARC OFFSETS



SPAN "B" RIGHT SIDE ARC OFFSETS

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 2 OF 2

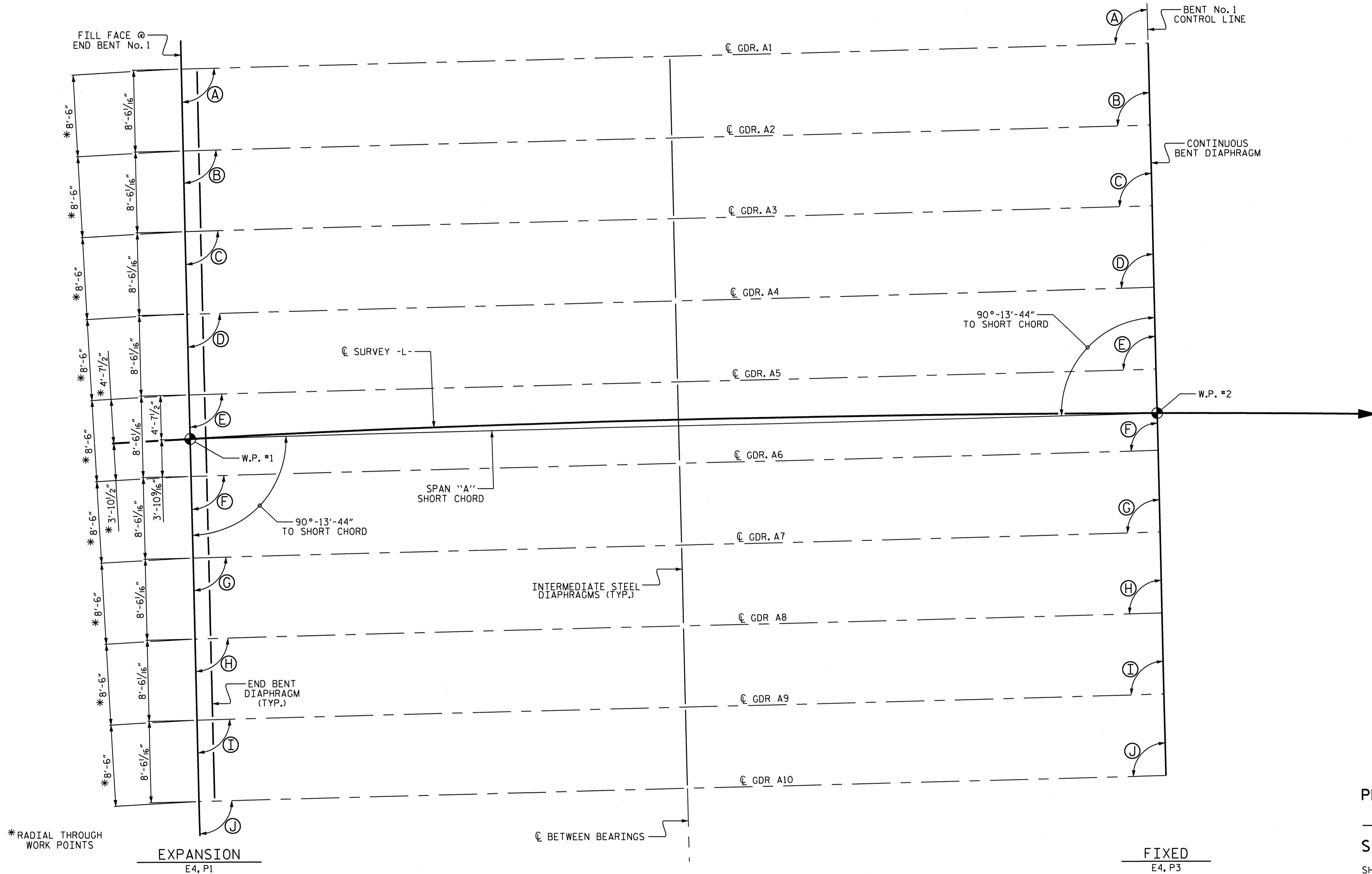


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ARC OFFSETS
 SPAN B

DRAWN BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 6-2009

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			40



*RADIAL THROUGH WORK POINTS

SPAN "A" ANGLES

(A)	90°-13'-28"	(F)	90°-13'-46"
(B)	90°-13'-32"	(G)	90°-13'-50"
(C)	90°-13'-35"	(H)	90°-13'-53"
(D)	90°-13'-39"	(I)	90°-13'-57"
(E)	90°-13'-43"	(J)	90°-14'-01"

SPAN "A" FRAMING PLAN

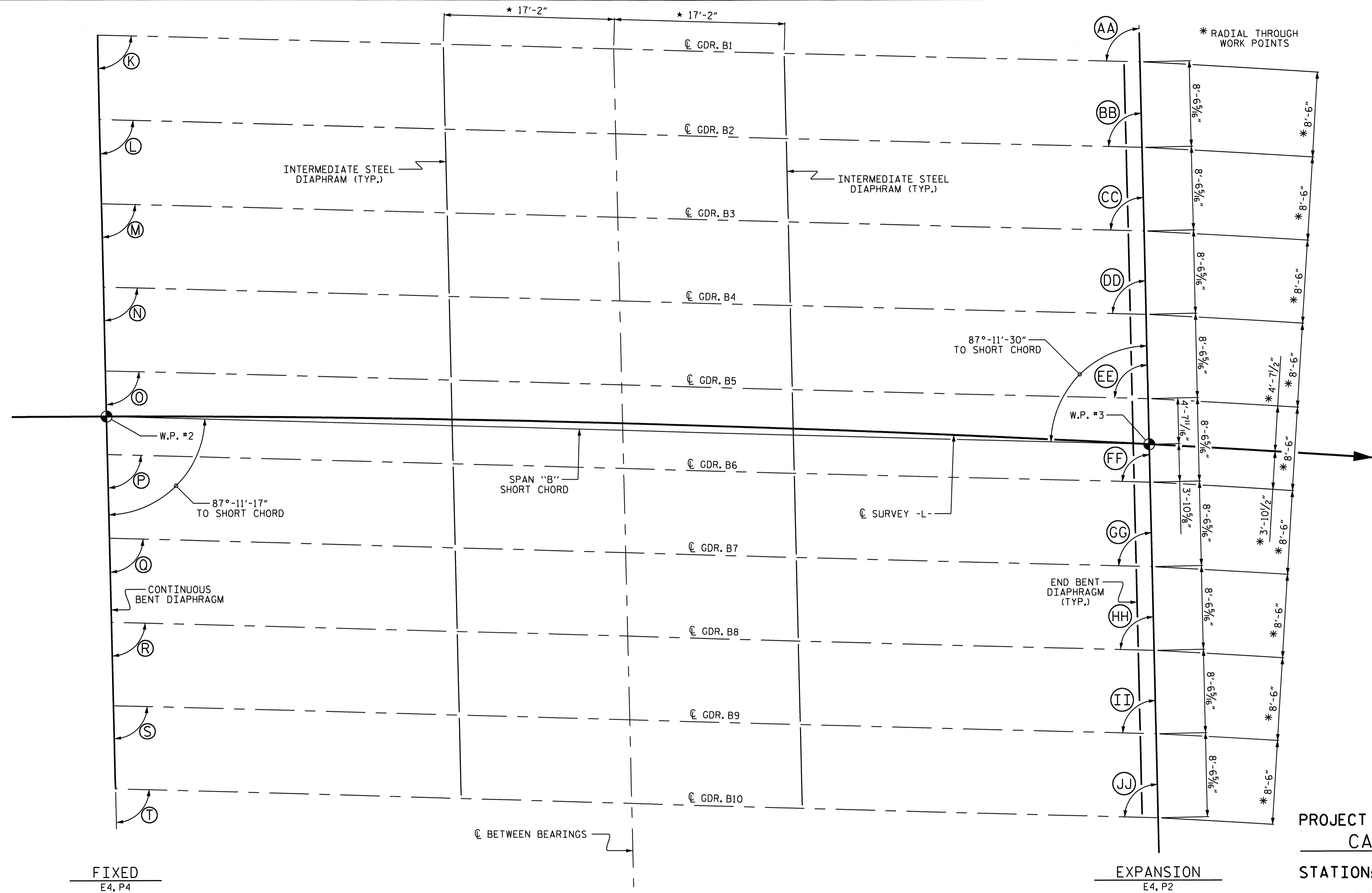
PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 SPAN A

DRAWN BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 6-2009

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			40



PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 2 OF 2

SPAN "B" ANGLES

SPAN "B" FRAMING PLAN

(K) 87°-14'-33"	(P) 87°-10'-56"	(AA) 87°14'-47"	(FF) 87°-11'-10"
(L) 87°-13'-51"	(Q) 87°-10'-12"	(BB) 87°14'-04"	(GG) 87°-10'-26"
(M) 87°-13'-08"	(R) 87°-09'-27"	(CC) 87°-13'-21"	(HH) 87°-09'-41"
(N) 87°-12'-24"	(S) 87°-08'-42"	(DD) 87°-12'-38"	(II) 87°-08'-55"
(O) 87°-11'-41"	(T) 87°-07'-56"	(EE) 87°-11'-54"	(JJ) 87°-08'-10"

NOTES:

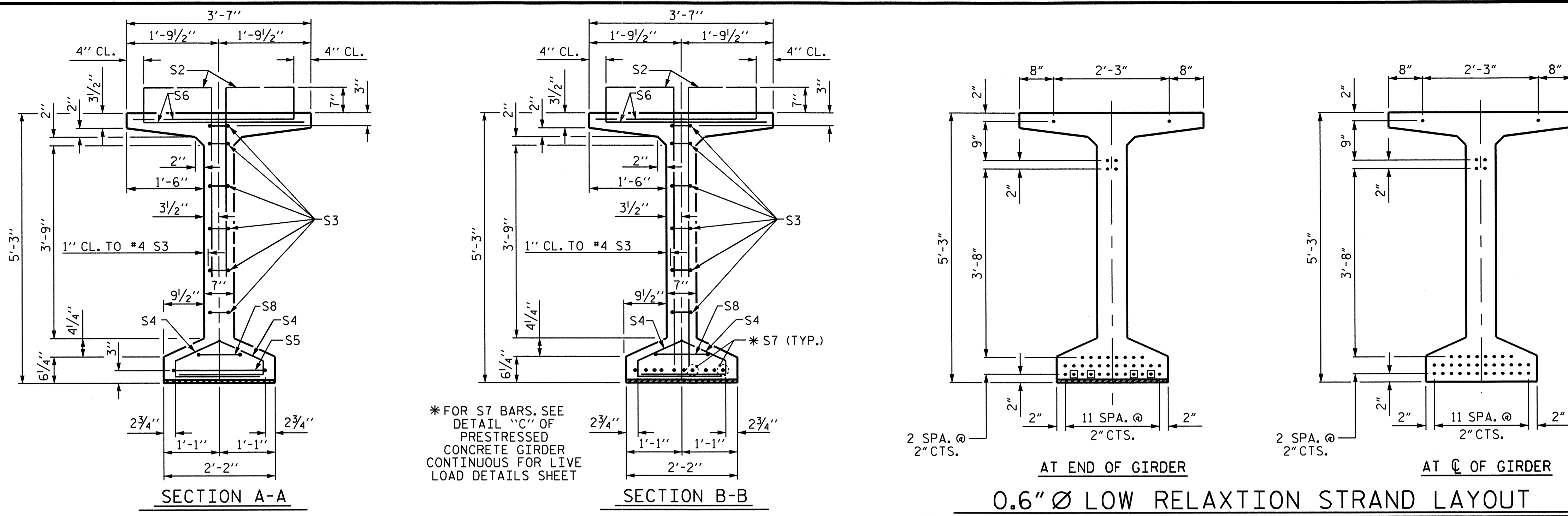
* MEASURED ALONG \bar{C} GIRDER B1



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-13
FRAMING PLAN SPAN B						TOTAL SHEETS
REVISIONS						40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

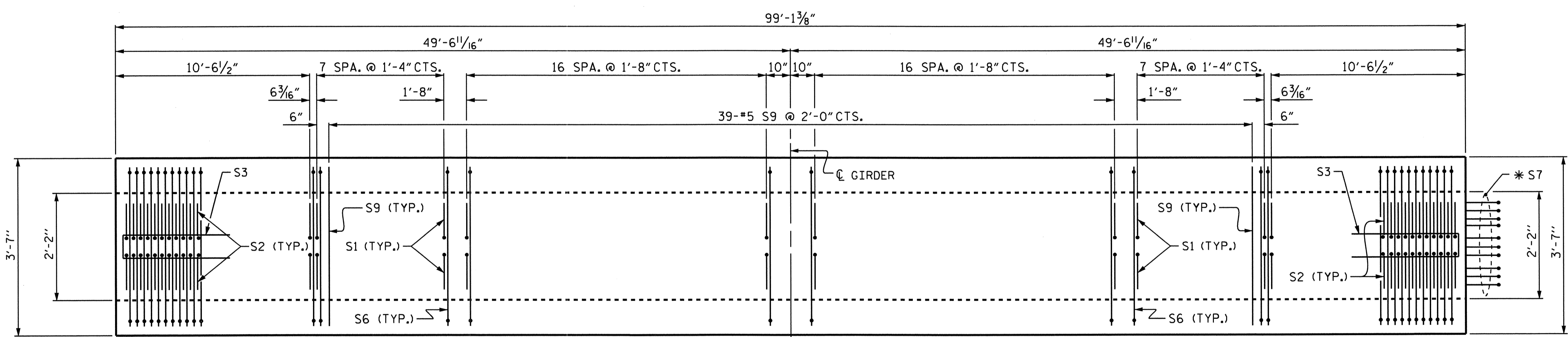
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 CHECKED BY : D.G. ELY DATE : 6-2009

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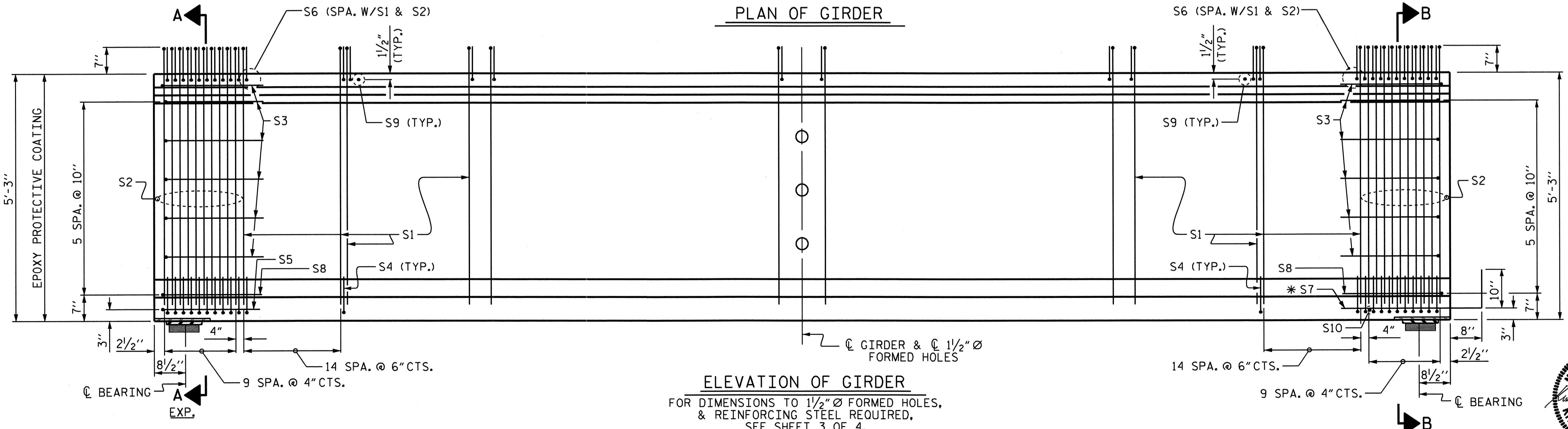


DEBONDING LEGEND
 ● FULLY BONDED STRANDS
 ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

AT END OF GIRDER
 AT C. OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



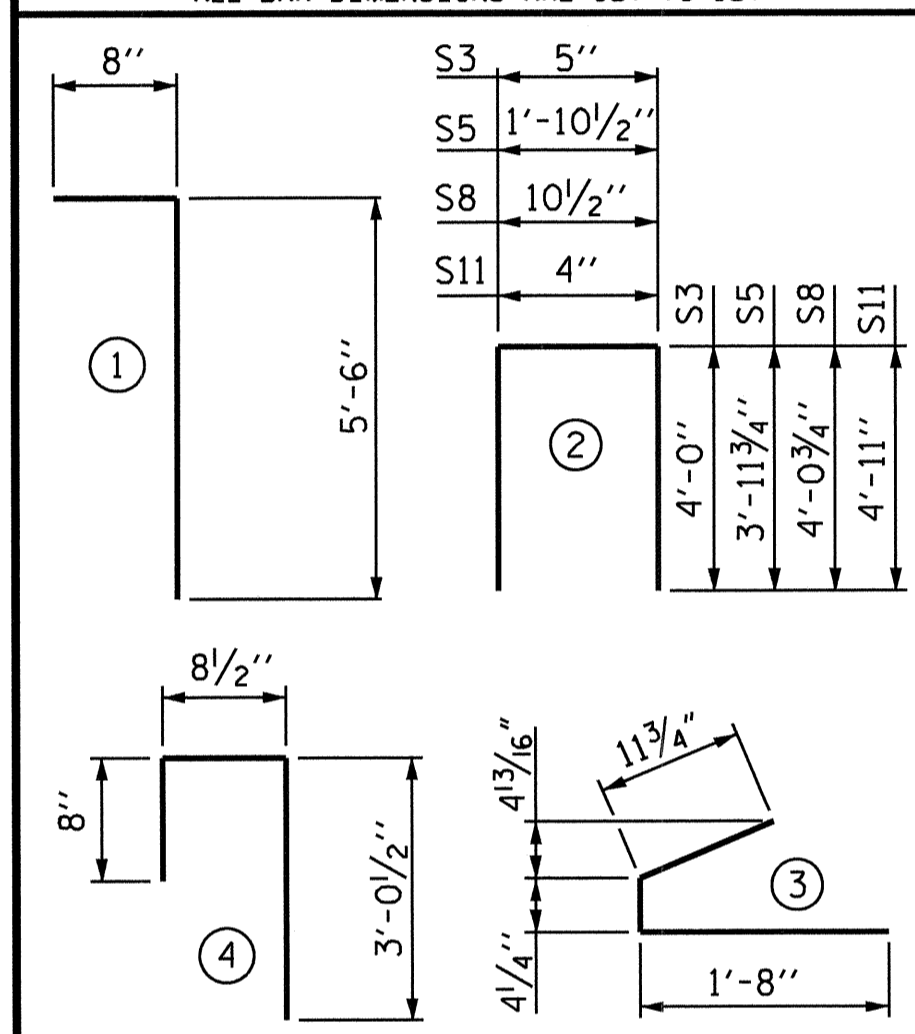
ELEVATION OF GIRDER
 FOR DIMENSIONS TO 1/2" Ø FORMED HOLES, & REINFORCING STEEL REQUIRED, SEE SHEET 3 OF 4.

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

REINFORCING STEEL FOR ONE GDR.					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	160	#4	1	6'-2"	659
S2	40	#5	1	6'-2"	257
S3	12	#4	2	8'-5"	67
S4	100	#4	3	3'-0"	200
S5	1	#5	2	9'-0"	10
S6	200	#5	4	4'-5"	920
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	39	#5	STR	3'-3"	132
S10	1	#3	STR	1'-10"	1
S11	4	#5	2	10'-2"	42
S12	8	#4	STR	8'-0"	43

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES
 ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS A1 THRU A10	2388	19.6	38

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	99'-1 3/8"	991.15'

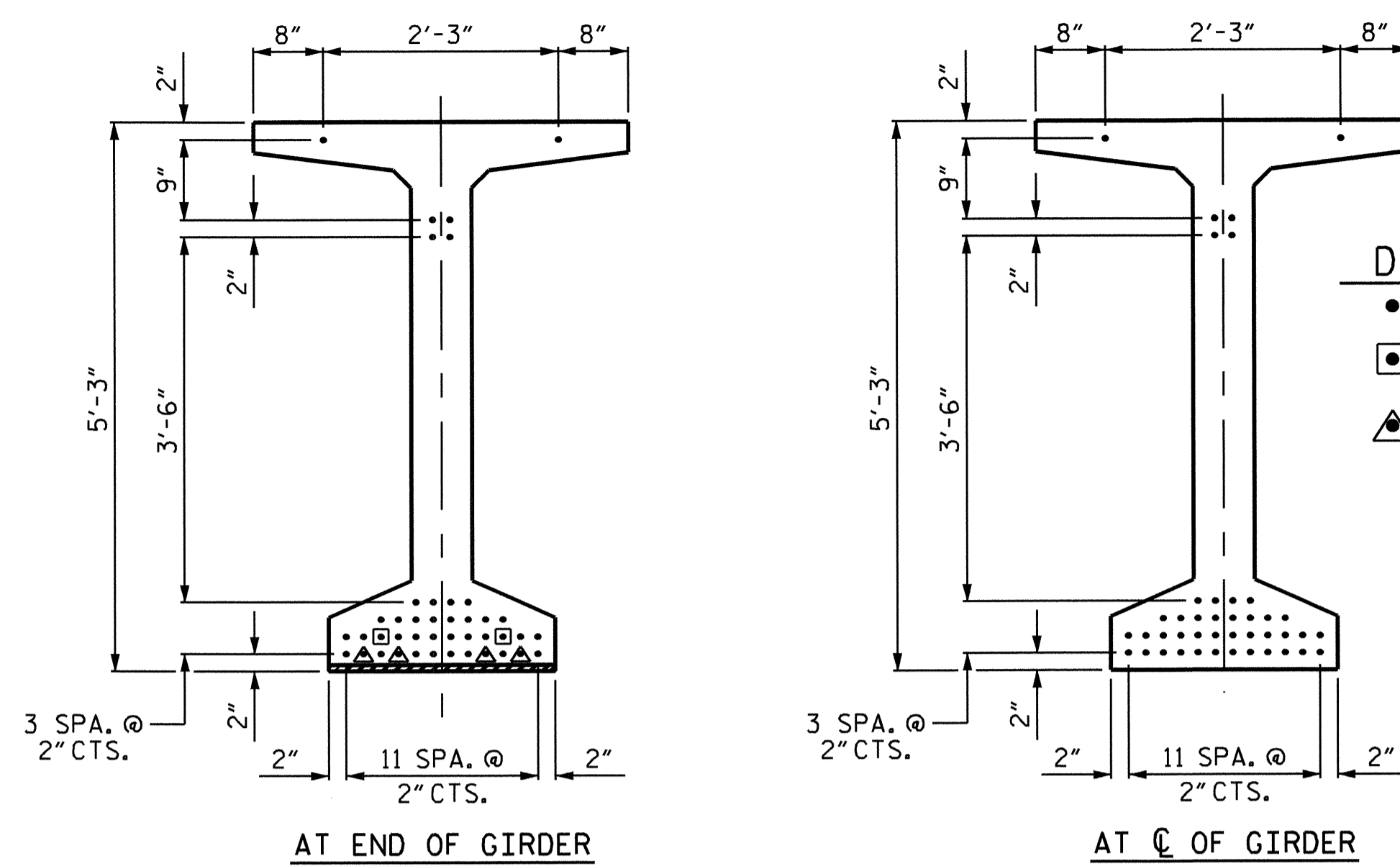
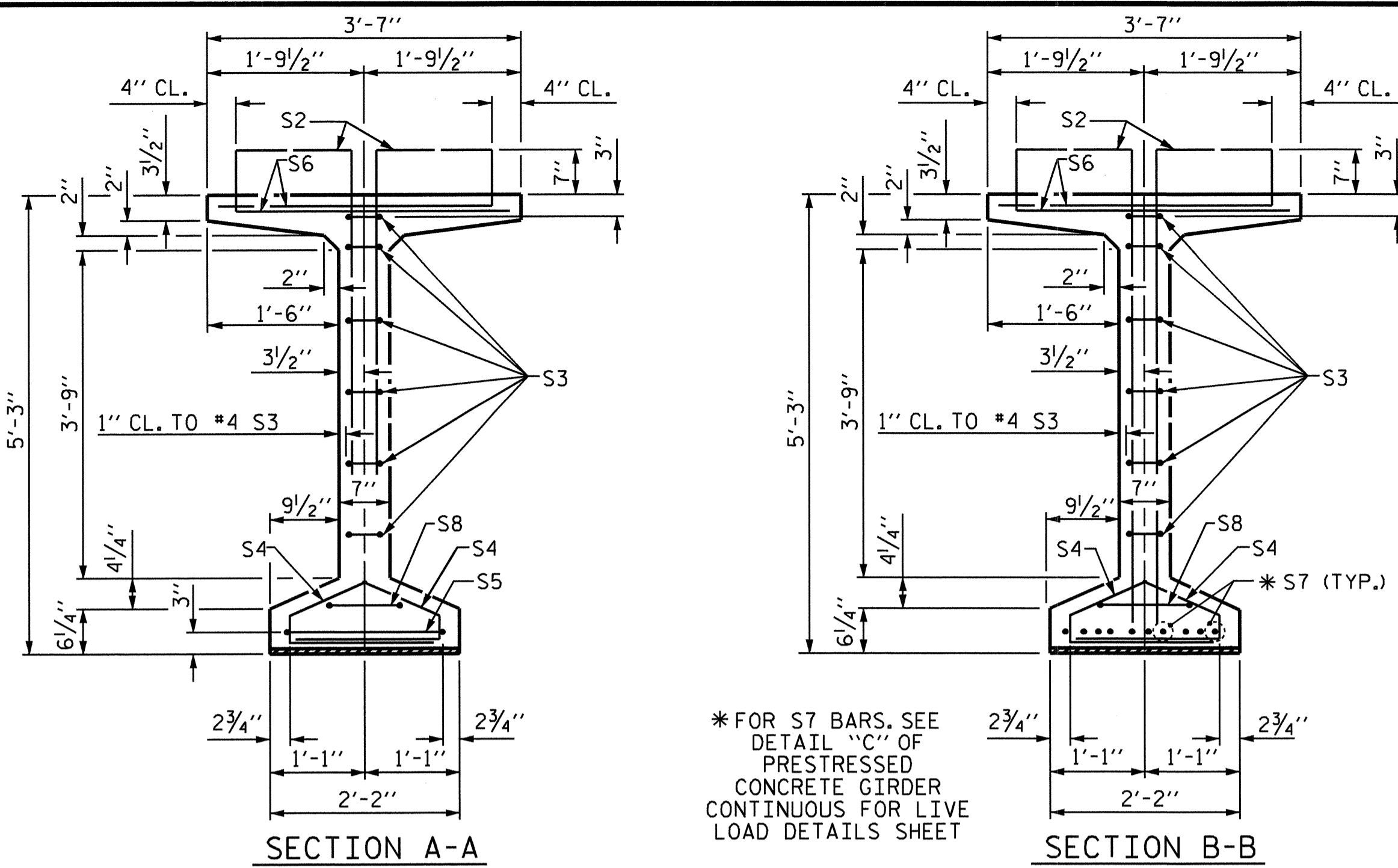
PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
 SPAN "A"



ASSEMBLED BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 7-2009
 DRAWN BY : EEM 2/6/97 REV. 10/17/00 RWW/LES
 CHECKED BY : VAP 2/6/97 REV. 5/1/06R TLA/GM
 REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			40



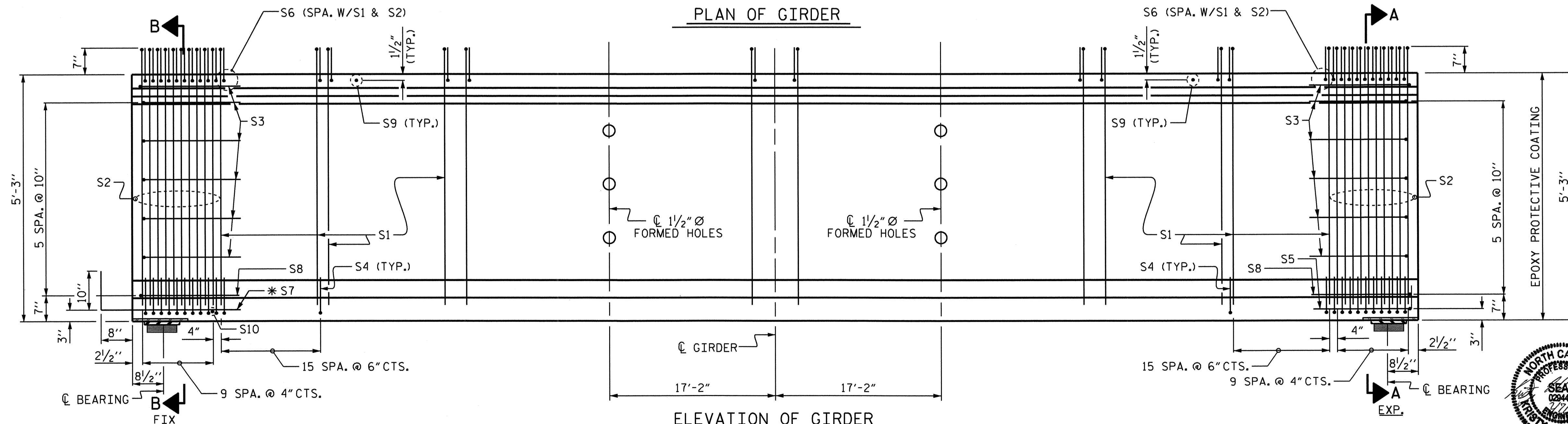
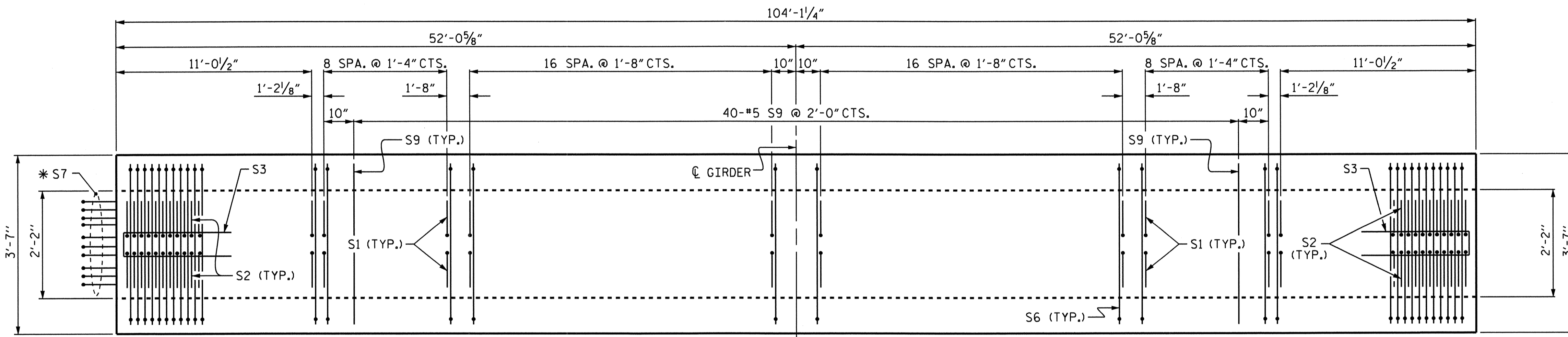
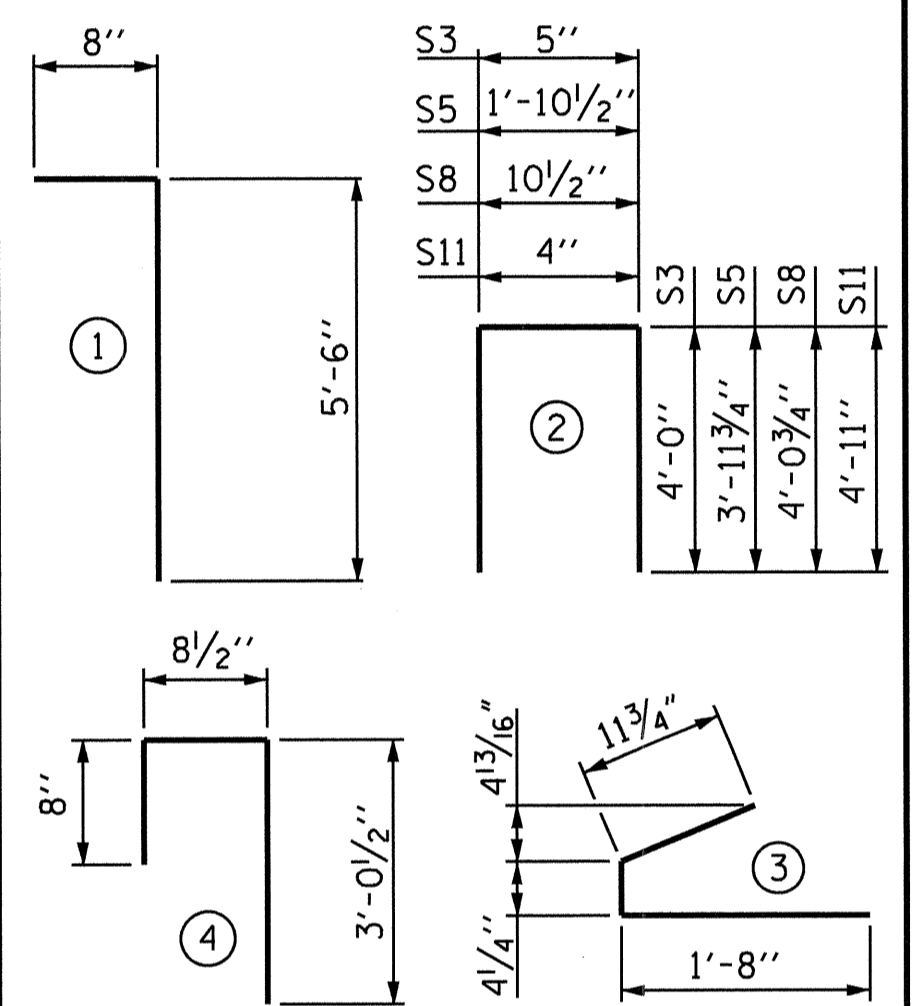
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ◼ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

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

REINFORCING STEEL FOR ONE GDR.					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	6'-2"	692
S2	40	#5	1	6'-2"	257
S3	12	#4	2	8'-5"	67
S4	104	#4	3	3'-0"	208
S5	1	#5	2	9'-10"	10
S6	208	#5	4	4'-5"	957
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	135
S10	1	#3	STR	1'-10"	1
S11	8	#5	2	10'-2"	85
S12	16	#4	STR	8'-0"	86

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS A1 THRU A10	2555	20.6	42

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	104'-1 1/4"	1041.04'

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD

SPAN "B"



ASSEMBLED BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 7-2009
 DRAWN BY : EEM 2/6/97 REV. 10/17/00 RWW/LES
 CHECKED BY : VAP 2/6/97 REV. 5/1/06R TLA/GM
 REV. 10/1/11 MAA/GM

ELEVATION OF GIRDER
 FOR DIMENSIONS TO 1/2" Ø FORMED HOLES, & REINFORCING STEEL REQUIRED, SEE SHEET 3 OF 4.

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			40

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

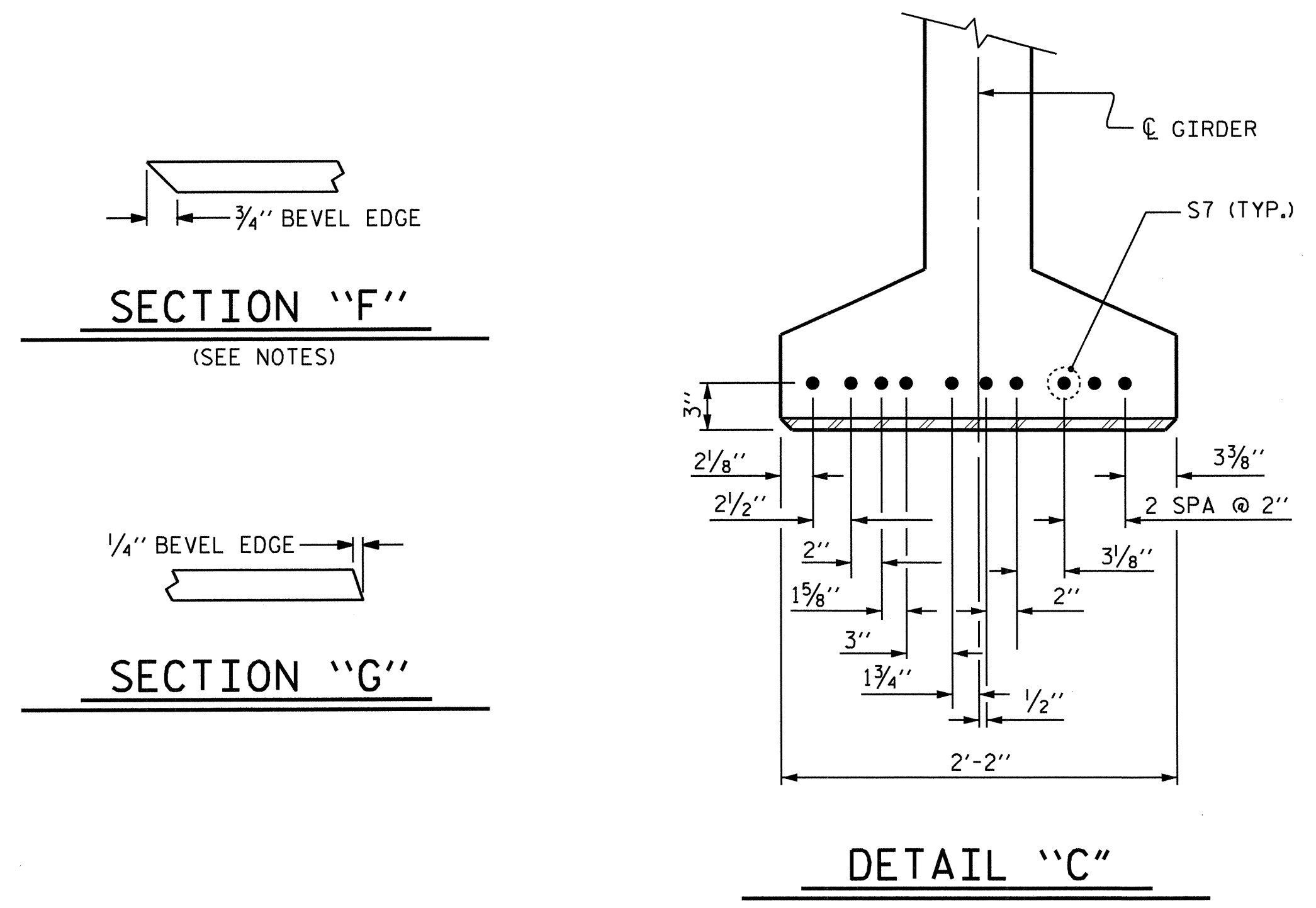
THE TRANSFER LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7800 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

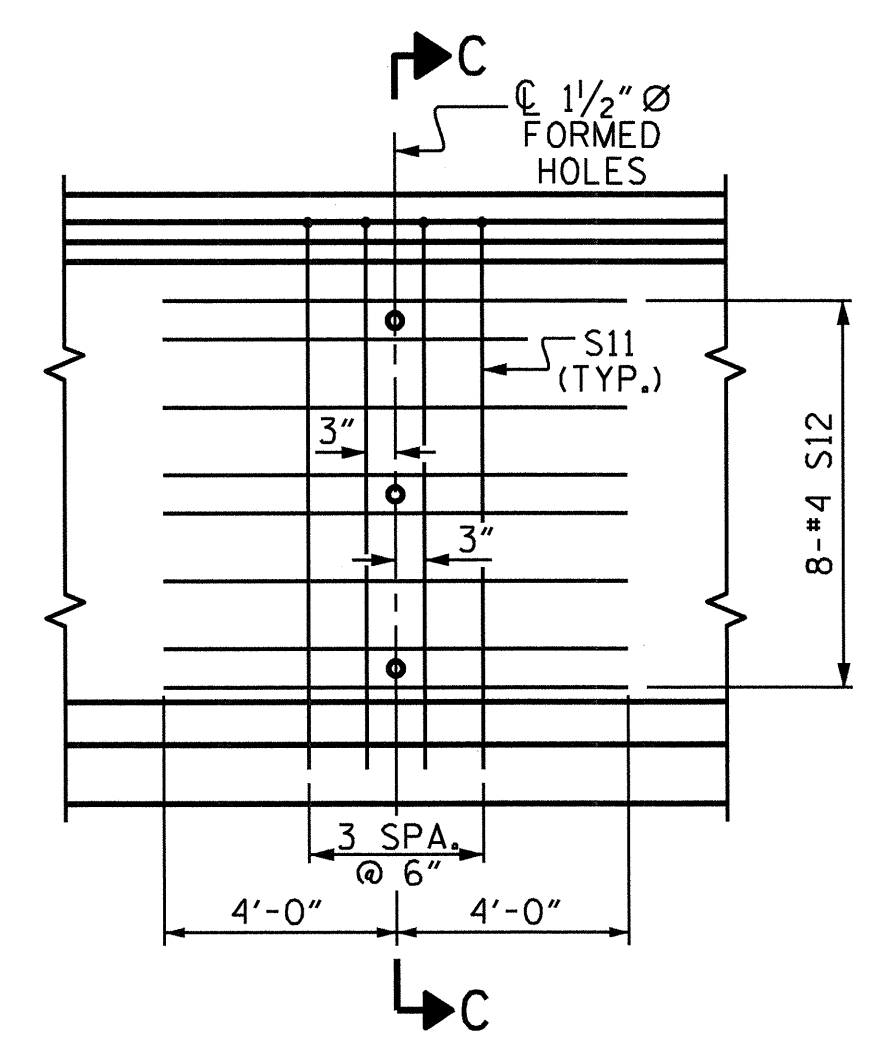
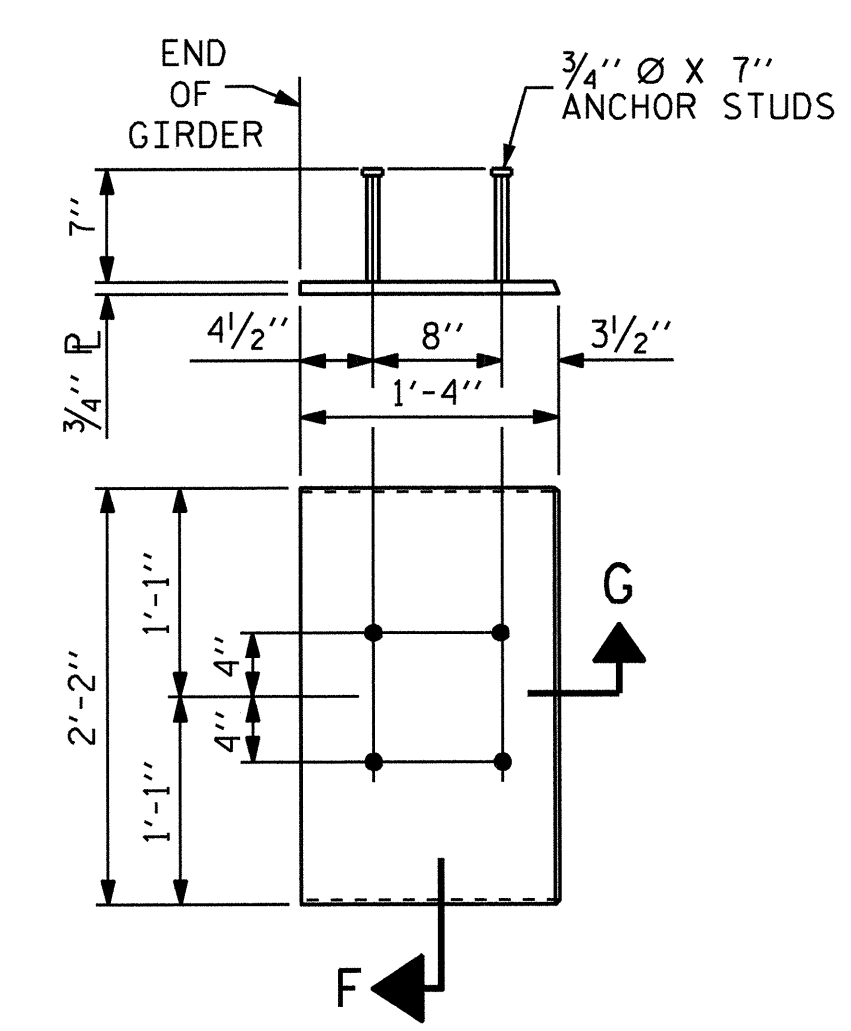
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES ONLY.

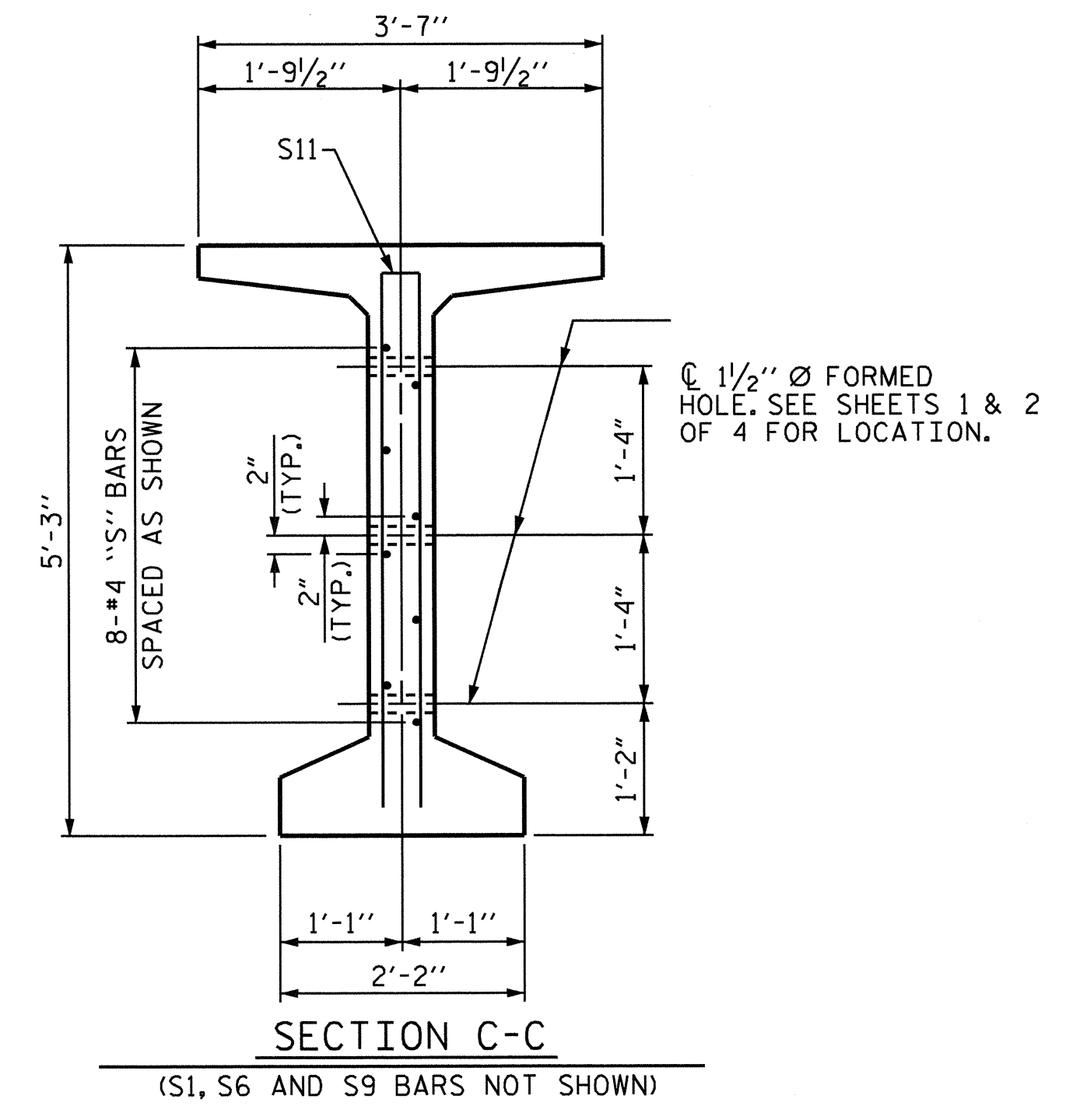
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES
(2 REQ'D PER GIRDER)



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL



SECTION C-C
(S1, S6 AND S9 BARS NOT SHOWN)

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS



ASSEMBLED BY : T. BANKOVICH	DATE : 6-2009
CHECKED BY : D.G. ELY	DATE : 7-2009
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			40

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

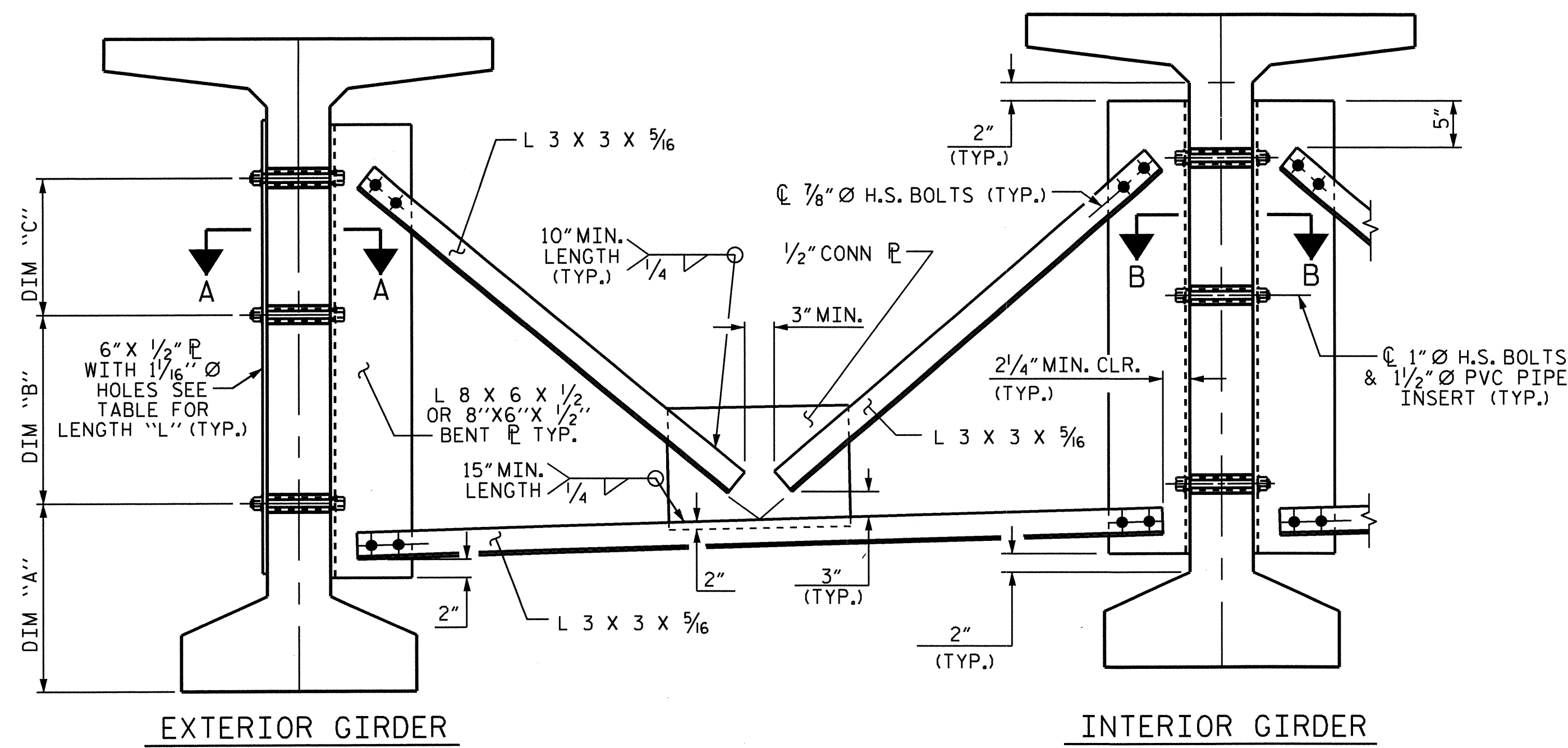
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

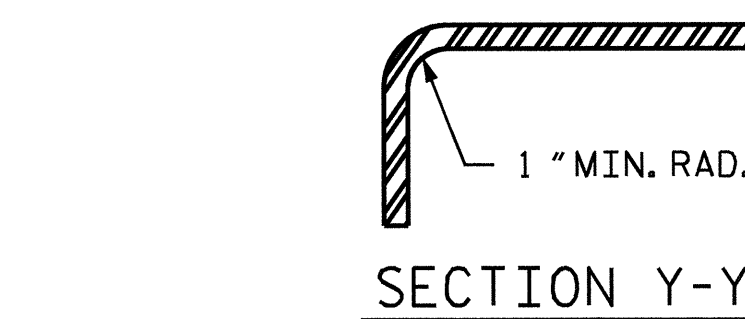
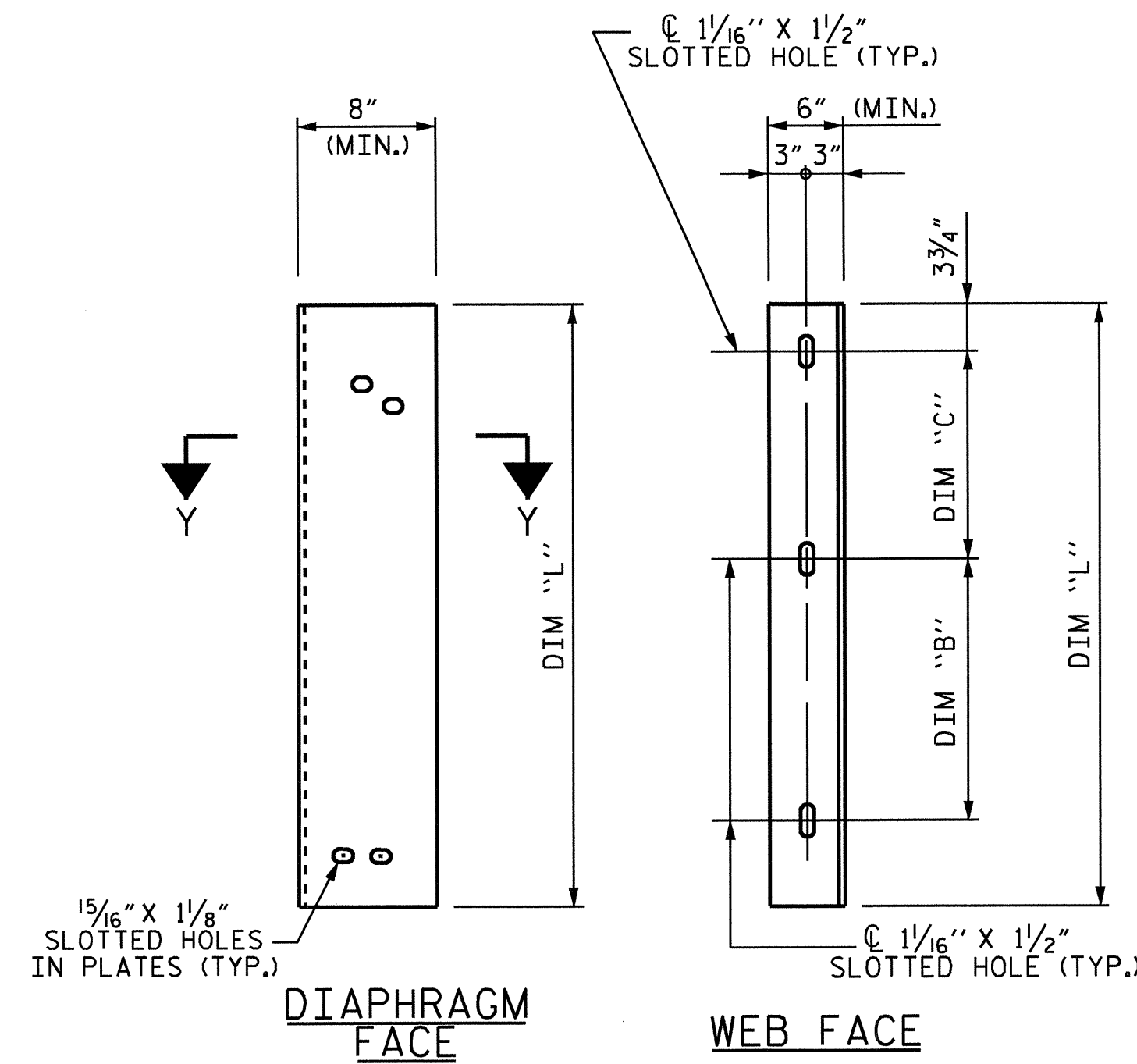
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

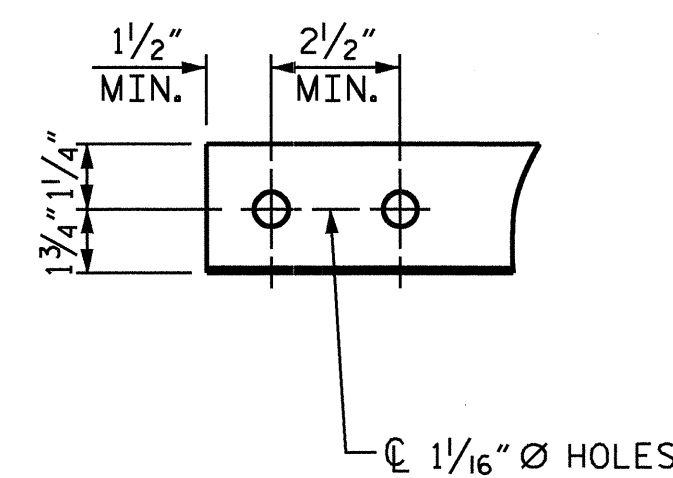
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



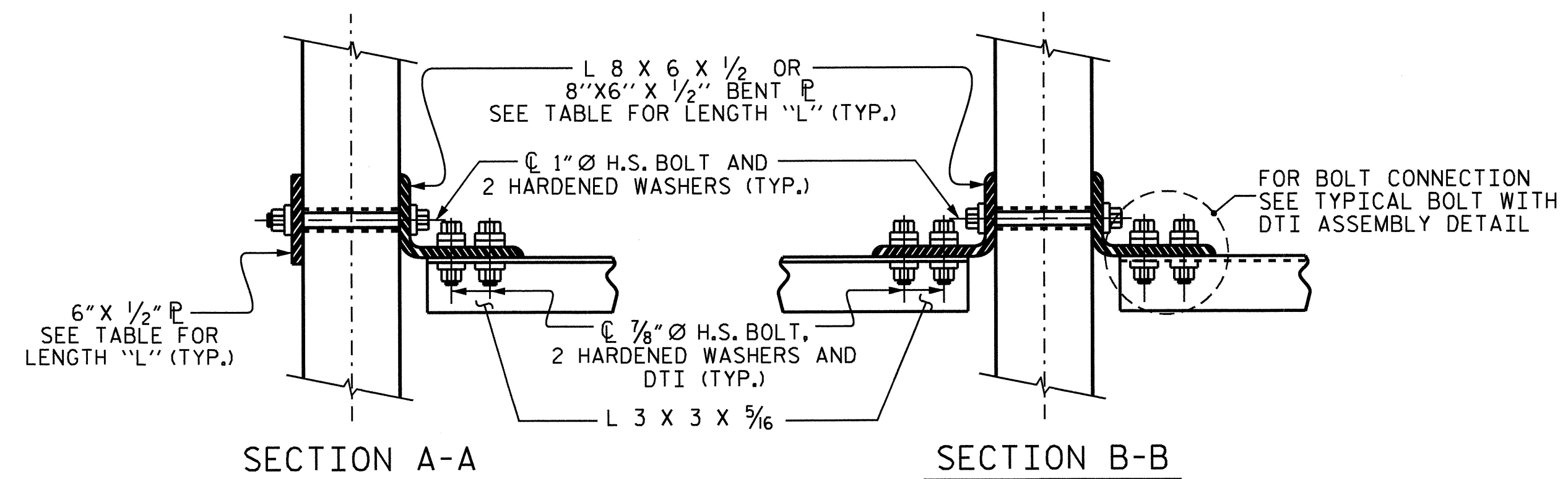
PART SECTION AT INTERMEDIATE DIAPHRAGM



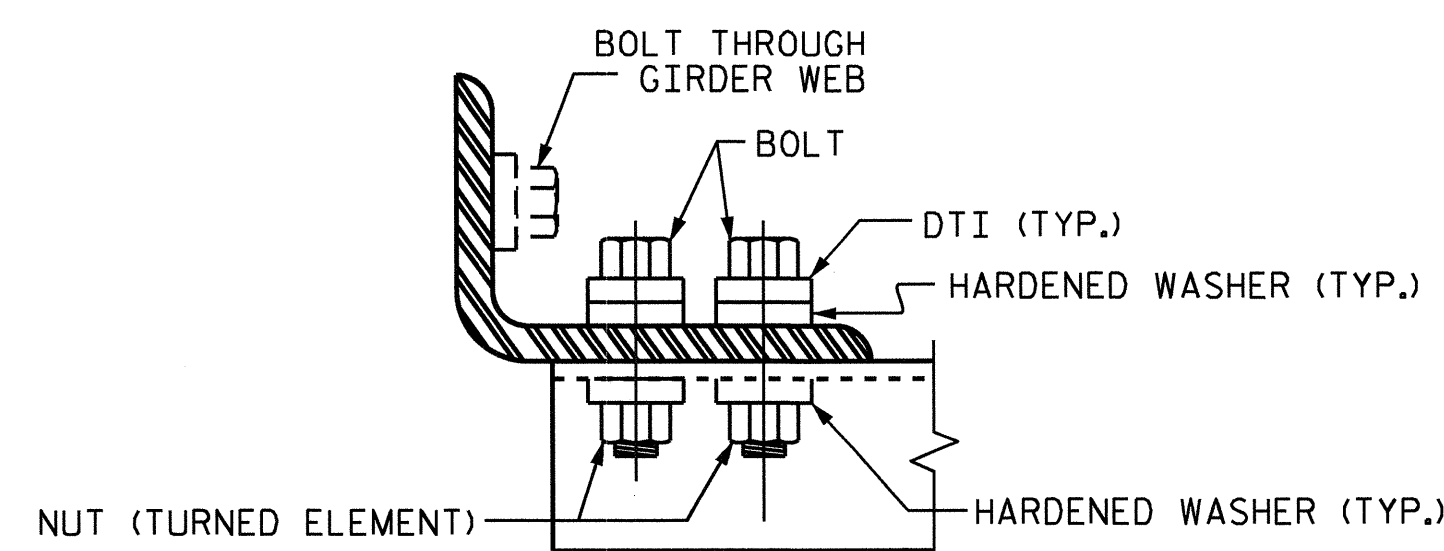
CONNECTOR PLATE DETAIL



ANGLE END (L 3 x 3 x 5/16)



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-2"	1'-4"	1'-4"	3'-5"

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY : D. G. ELY DATE : 01/12
CHECKED BY : K. W. ALFORD DATE : 02/12
DRAWN BY : RWW 11/09
CHECKED BY : CM 11/09

ADDED 11/23/09R
REV. 10/11/11 MAA/GM

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

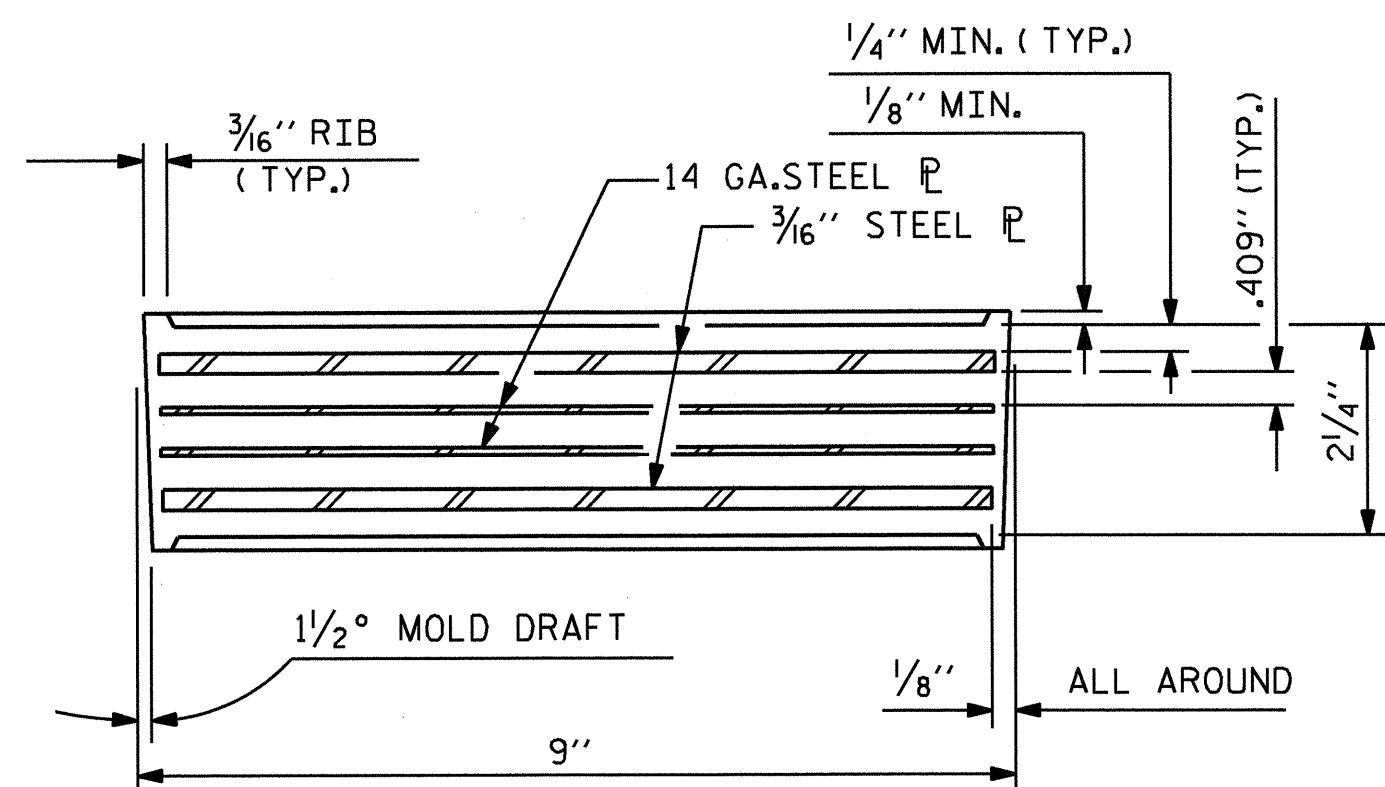
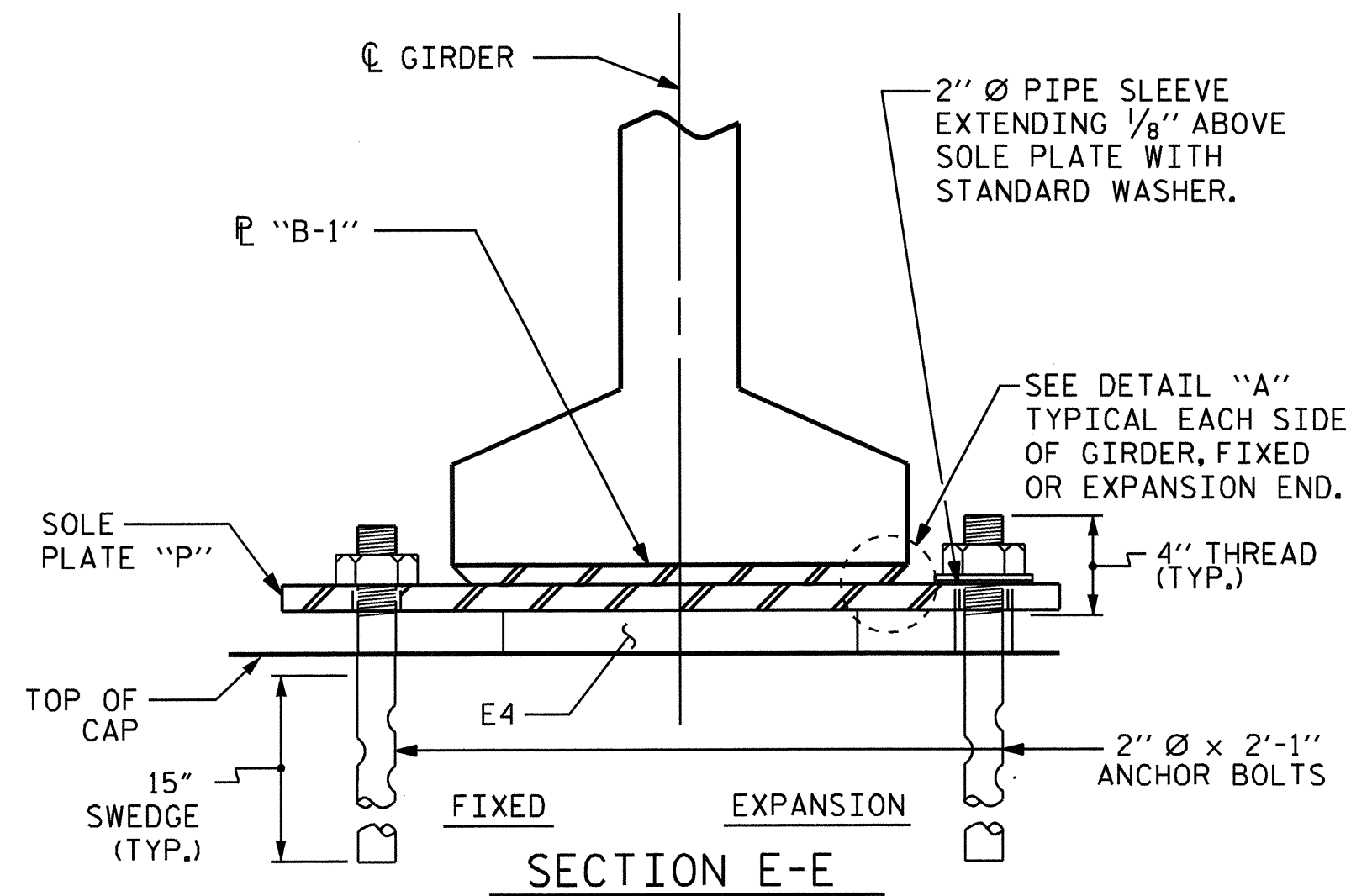
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

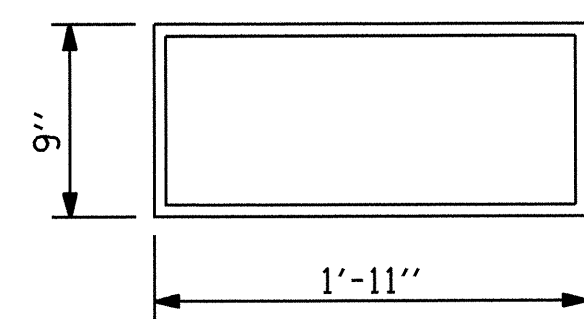
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

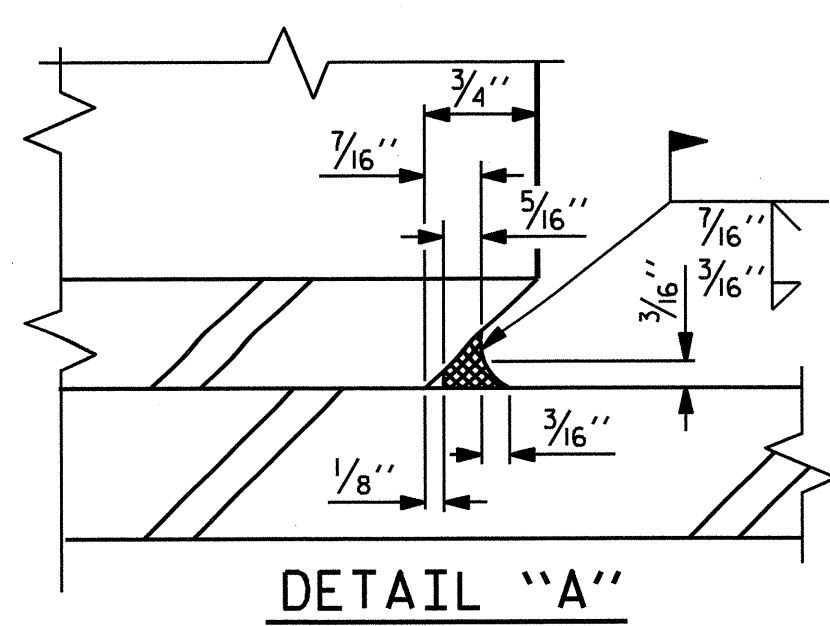
— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE V	207 K



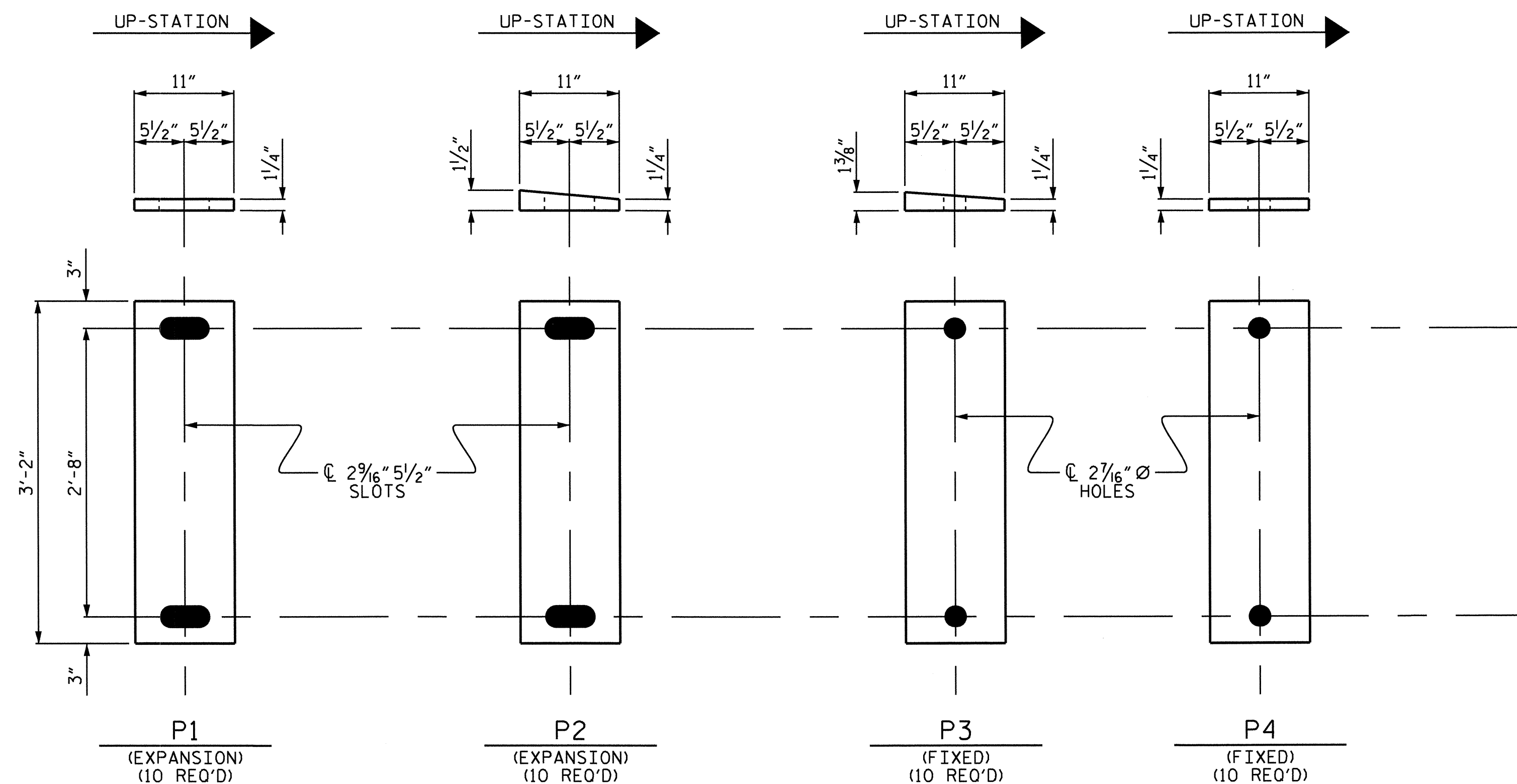
TYPICAL SECTION OF ELASTOMERIC BEARINGS



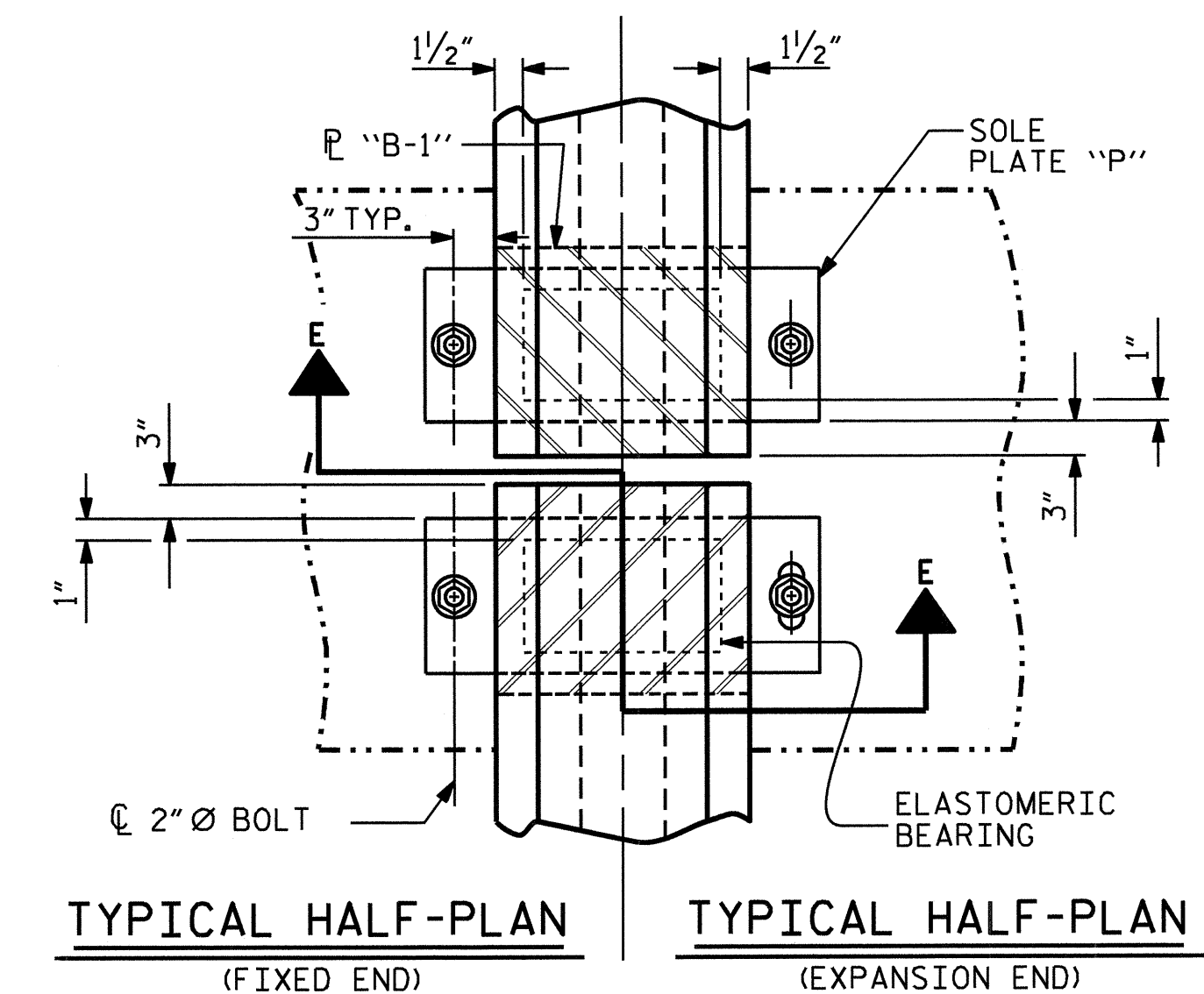
E4 (40 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



DETAIL "A"

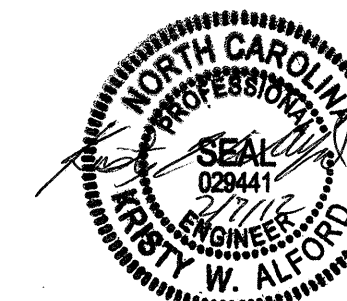


SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (FIXED END) TYPICAL HALF-PLAN (EXPANSION END)

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY : T. BANKOVICH	DATE : 6-2009
CHECKED BY : D.G. ELY	DATE : 7-2009
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN "A"																						
0.6" Ø LOW RELAXTION	GIRDER A1											GIRDERS A2 & A3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.109	0.206	0.282	0.330	0.347	0.330	0.282	0.206	0.109	0	0	0.109	0.206	0.282	0.330	0.347	0.330	0.282	0.206	0.109	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.035	0.066	0.091	0.106	0.112	0.106	0.091	0.066	0.035	0	0	0.034	0.064	0.087	0.102	0.107	0.102	0.087	0.064	0.034	0
FINAL CAMBER ↑	0	7/8"	1 1/16"	2 5/16"	2 11/16"	2 13/16"	2 11/16"	2 5/16"	1 11/16"	7/8"	0	0	7/8"	1 1/16"	2 5/16"	2 3/4"	2 7/8"	2 3/4"	2 5/16"	1 11/16"	7/8"	0
SPAN "B"																						
0.6" Ø LOW RELAXTION	GIRDER B1											GIRDERS B2 & B3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.043	0.081	0.111	0.130	0.136	0.130	0.111	0.081	0.043	0	0	0.041	0.077	0.106	0.124	0.130	0.124	0.106	0.077	0.041	0
FINAL CAMBER ↑	0	1/8"	2/16"	2 7/8"	3 3/8"	3 1/2"	3 3/8"	2 7/8"	2 1/16"	1/8"	0	0	1/8"	2/8"	2 5/16"	3 7/16"	3 9/16"	3 1/16"	2 5/16"	2 1/8"	1/8"	0
SPAN "B"																						
0.6" Ø LOW RELAXTION	GIRDER B4											GIRDERS B5, B6, & B7										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.038	0.072	0.099	0.116	0.121	0.116	0.099	0.072	0.038	0	0	0.039	0.074	0.102	0.119	0.125	0.119	0.102	0.074	0.039	0
FINAL CAMBER ↑	0	1/8"	2 3/16"	3"	3 1/2"	3 11/16"	3 1/2"	3"	2 3/16"	1/8"	0	0	1/8"	2 3/16"	2 5/16"	3 7/16"	3 5/8"	3 1/16"	2 5/16"	2 3/16"	1/8"	0
SPAN "B"																						
0.6" Ø LOW RELAXTION	GIRDERS B8 & B9											GIRDER B10										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0	0	0.135	0.255	0.349	0.408	0.429	0.408	0.349	0.255	0.135	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.042	0.080	0.110	0.128	0.135	0.128	0.110	0.080	0.042	0	0	0.042	0.079	0.109	0.127	0.133	0.127	0.109	0.079	0.042	0
FINAL CAMBER ↑	0	1/8"	2/8"	2 7/8"	3 3/8"	3 1/2"	3 3/8"	2 7/8"	2 1/8"	1/8"	0	0	1/8"	2/8"	2 7/8"	3 3/8"	3 9/16"	3 3/8"	2 7/8"	2 1/8"	1/8"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			40

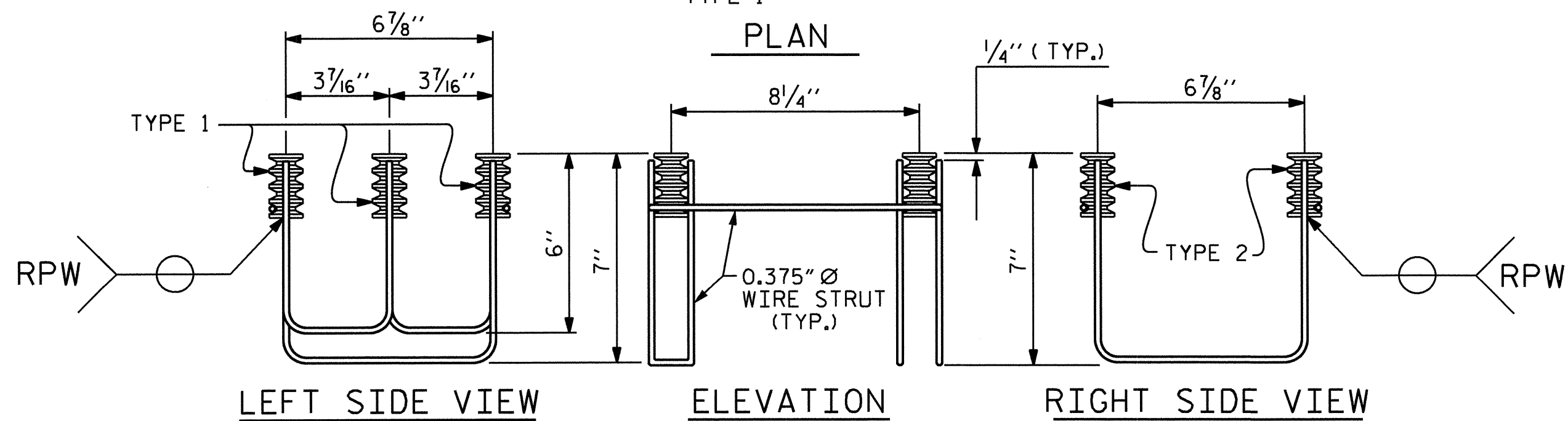
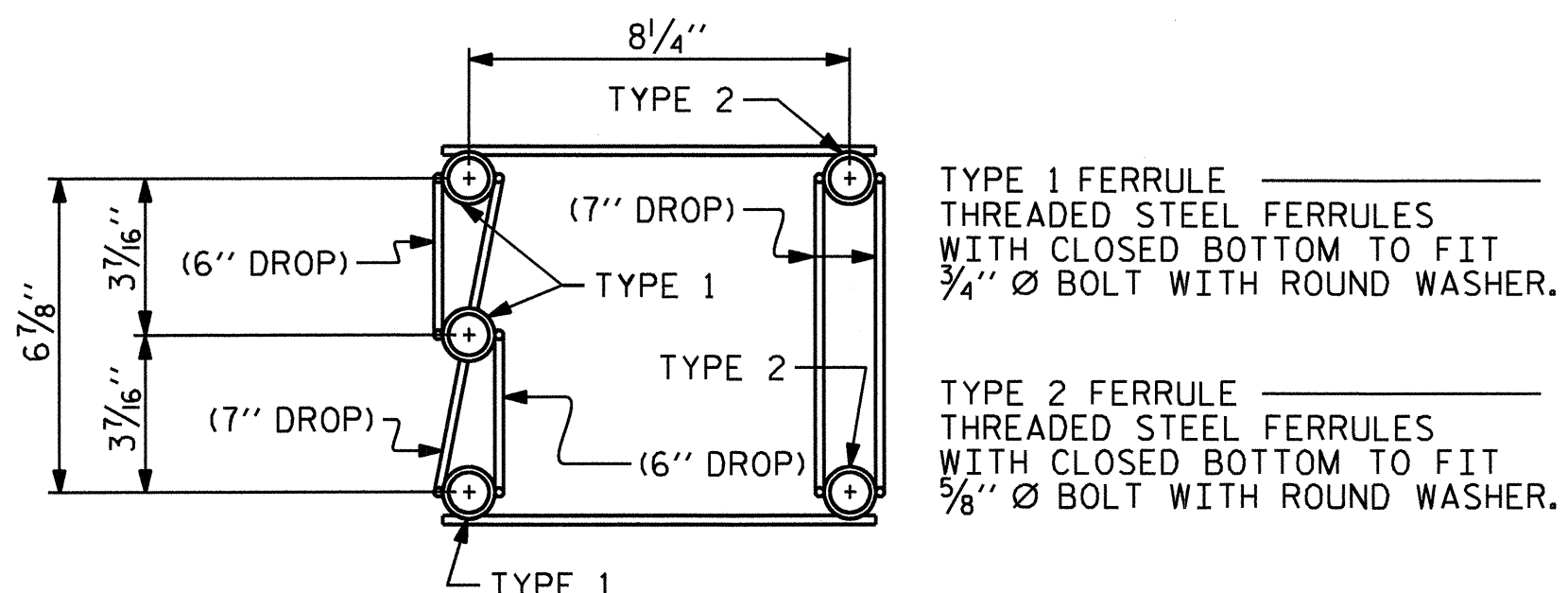
DRAWN BY : T. BANKOVICH DATE : 5-2009
CHECKED BY : D.G. ELY DATE : 7-2009

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

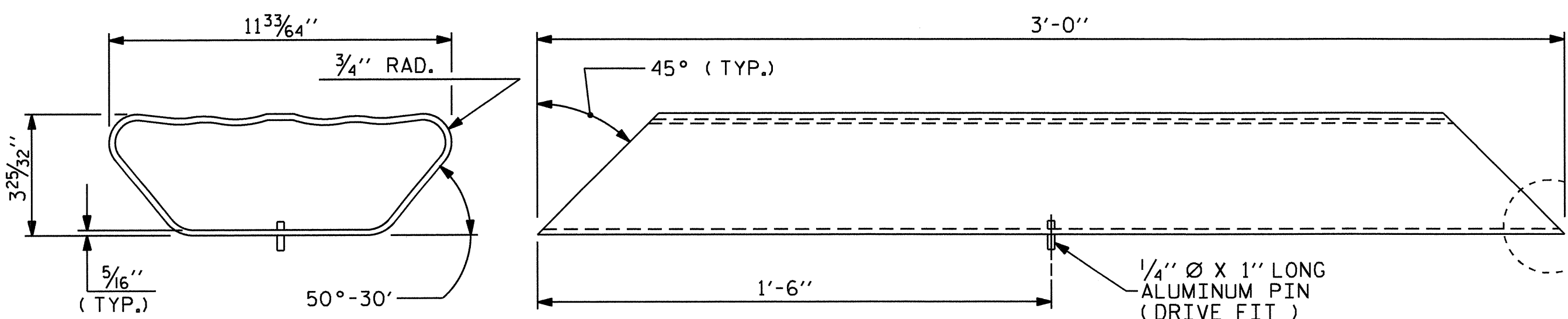
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 AND 1 1/4" FOR 5/8" FERRULES.
- B. 3 - 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. 2 - 5/8" Ø X 2 1/4" 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 5/8" Ø X 2 1/4" 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.
- D. 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 WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. 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.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



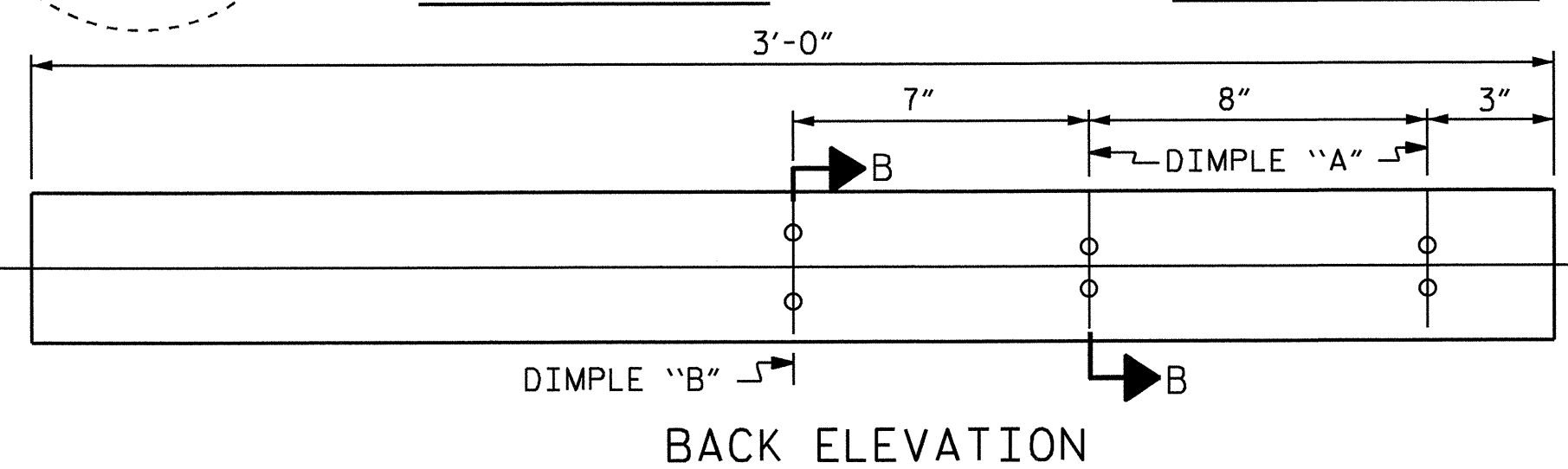
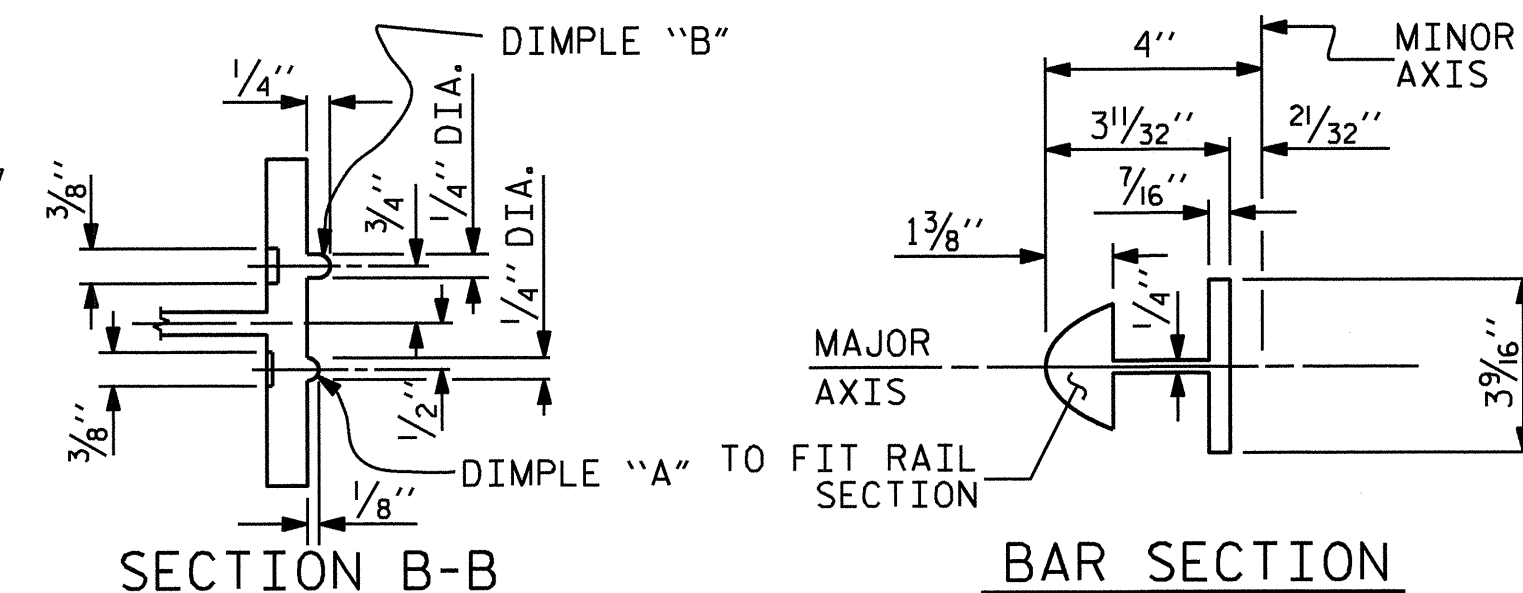
5-BOLT METAL RAIL ANCHOR ASSEMBLY

(66 ASSEMBLIES REQUIRED)

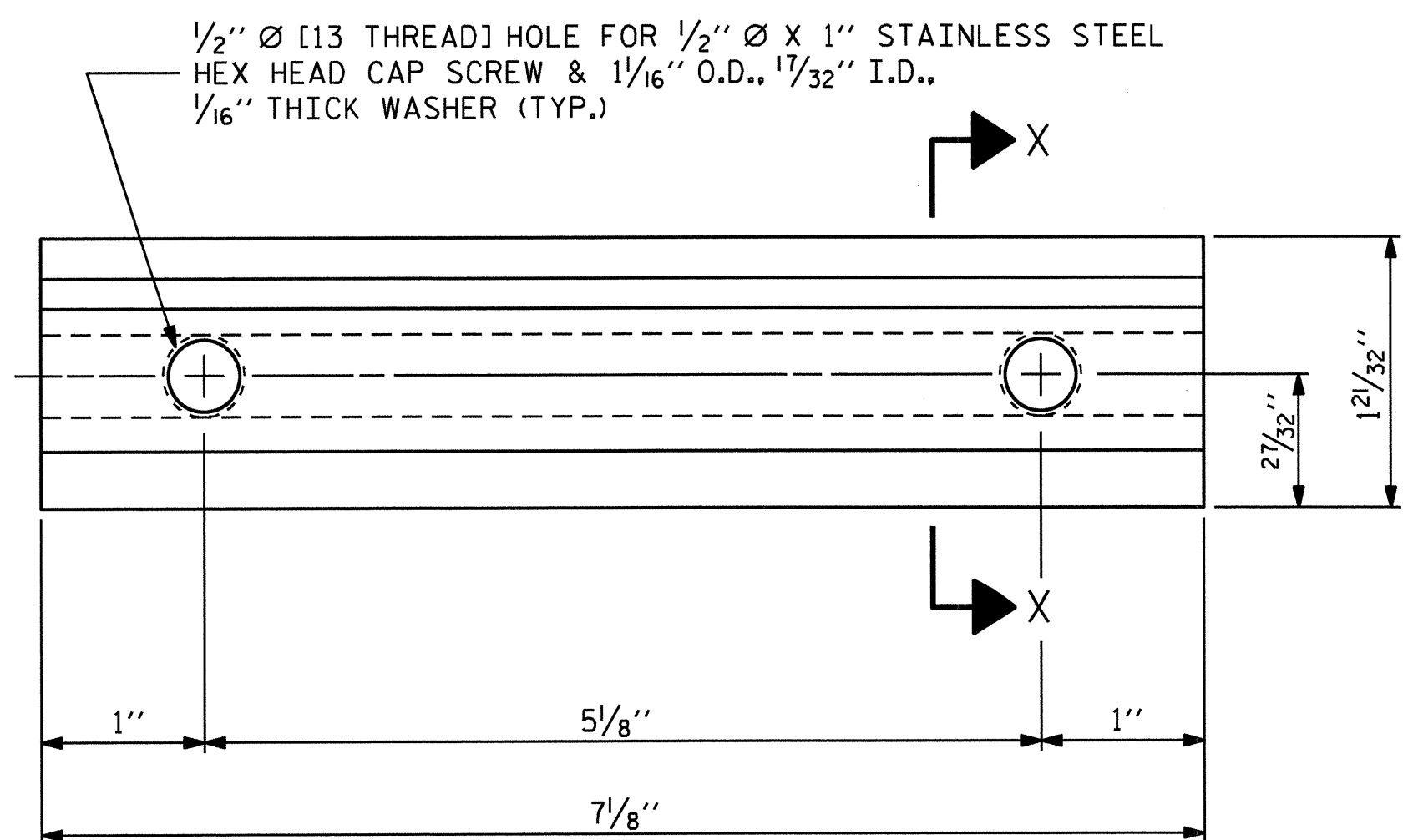
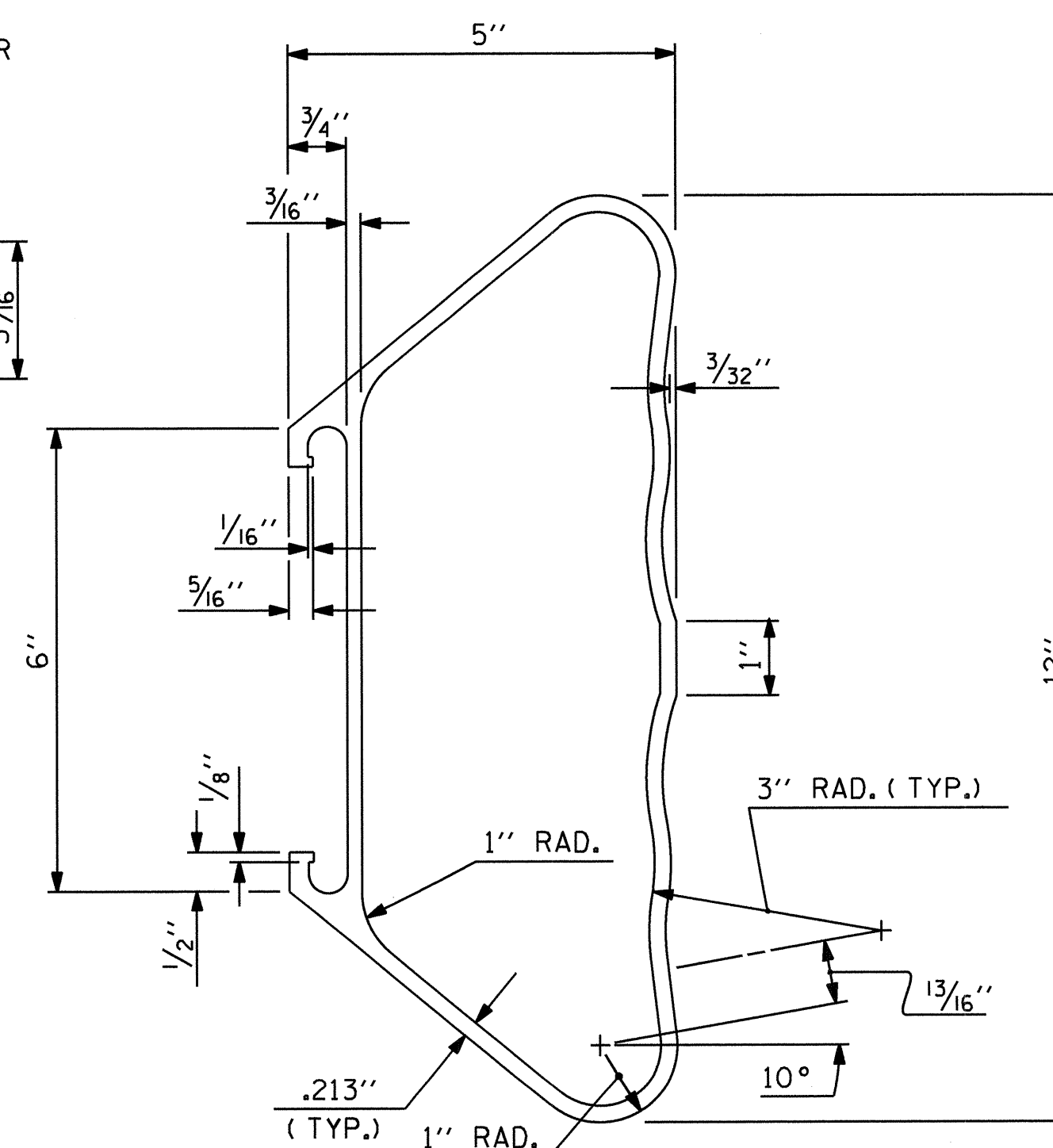
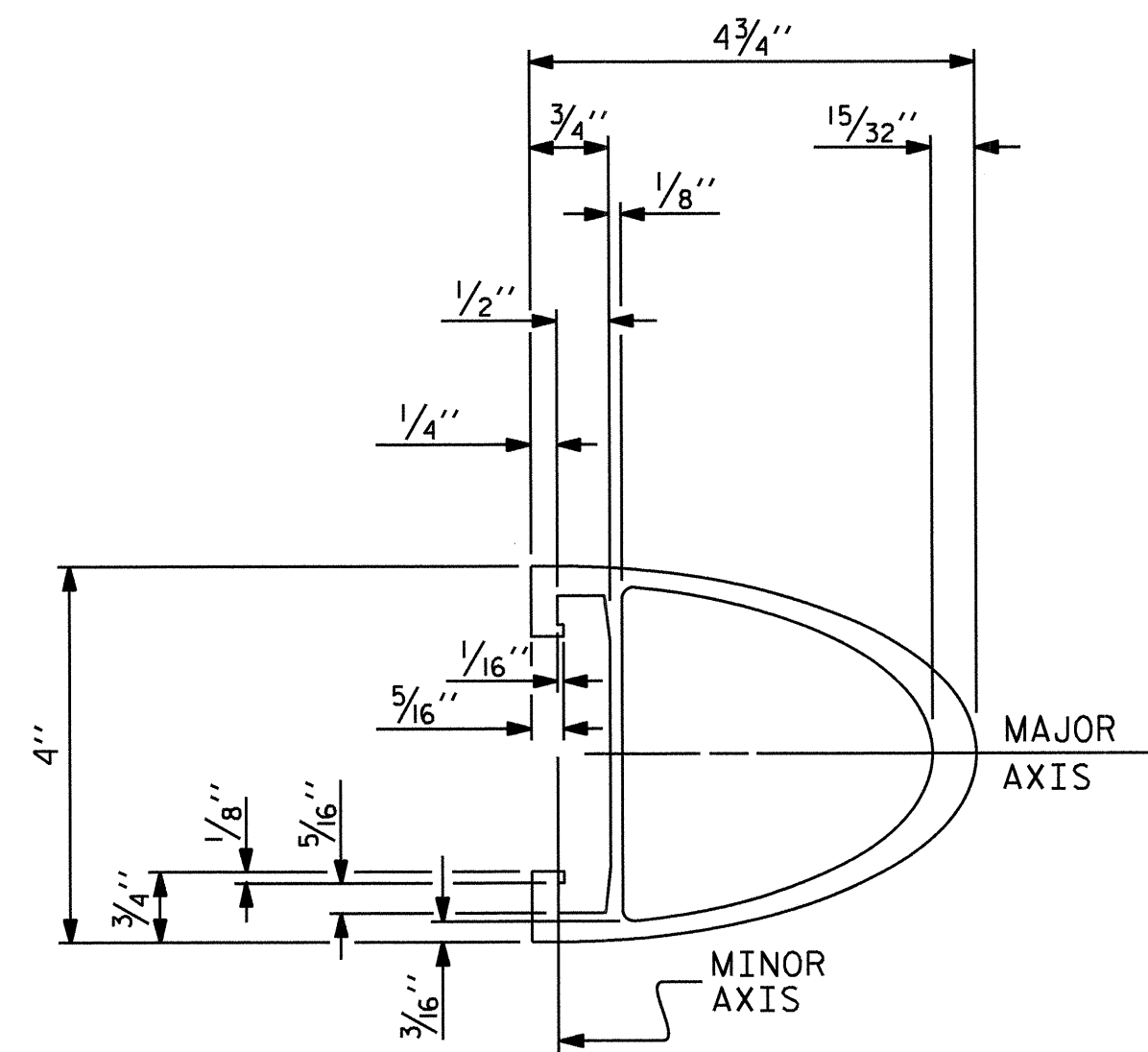


BOTTOM RAIL EXPANSION BAR

BREAK 1/8" RAD. WITH GRINDER - BOTH ENDS

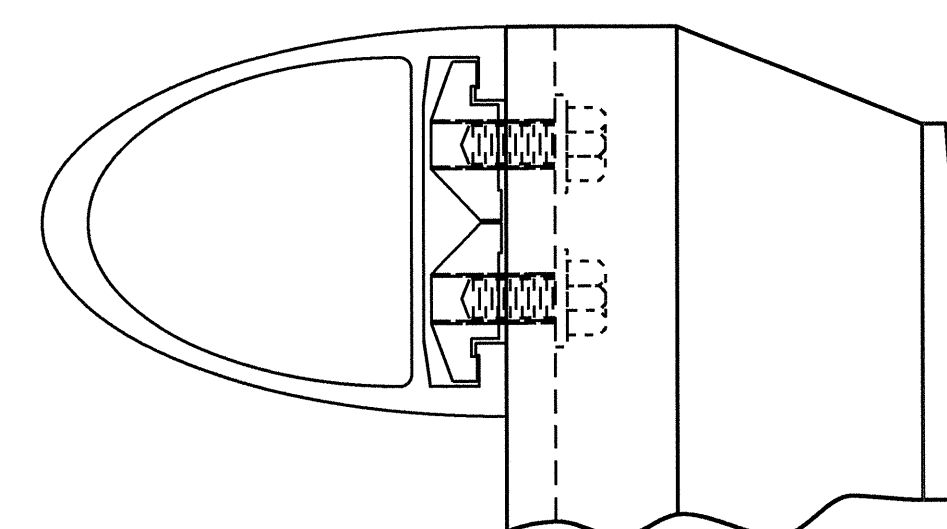
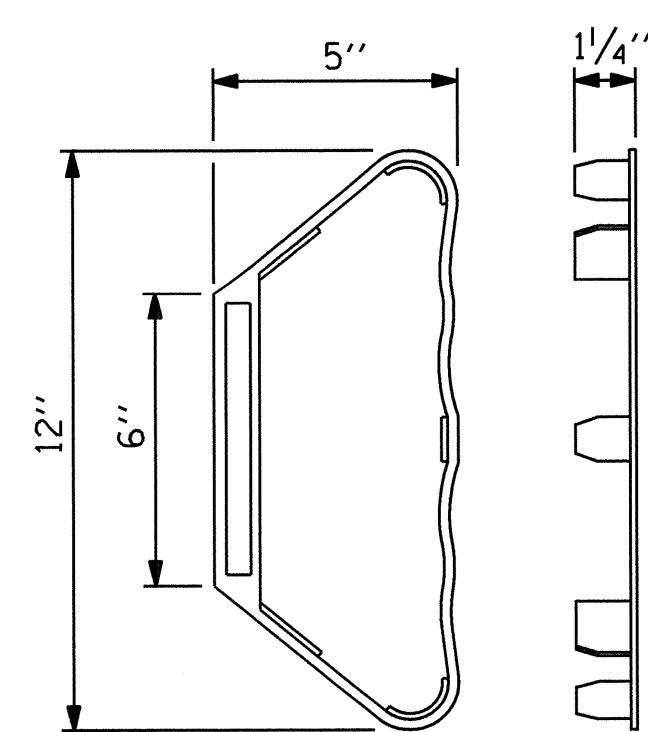
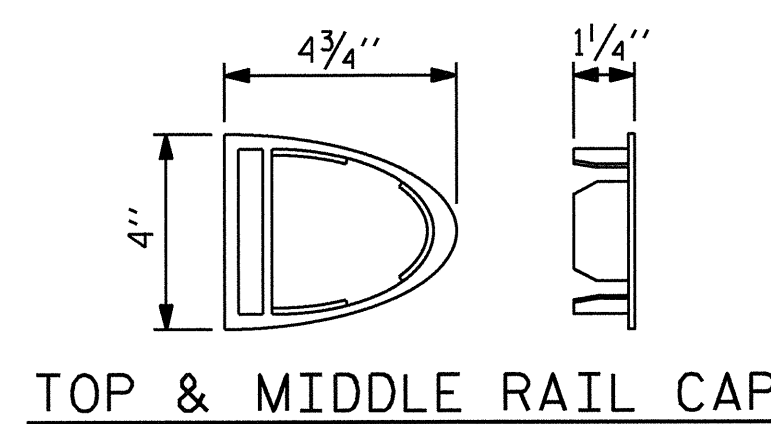
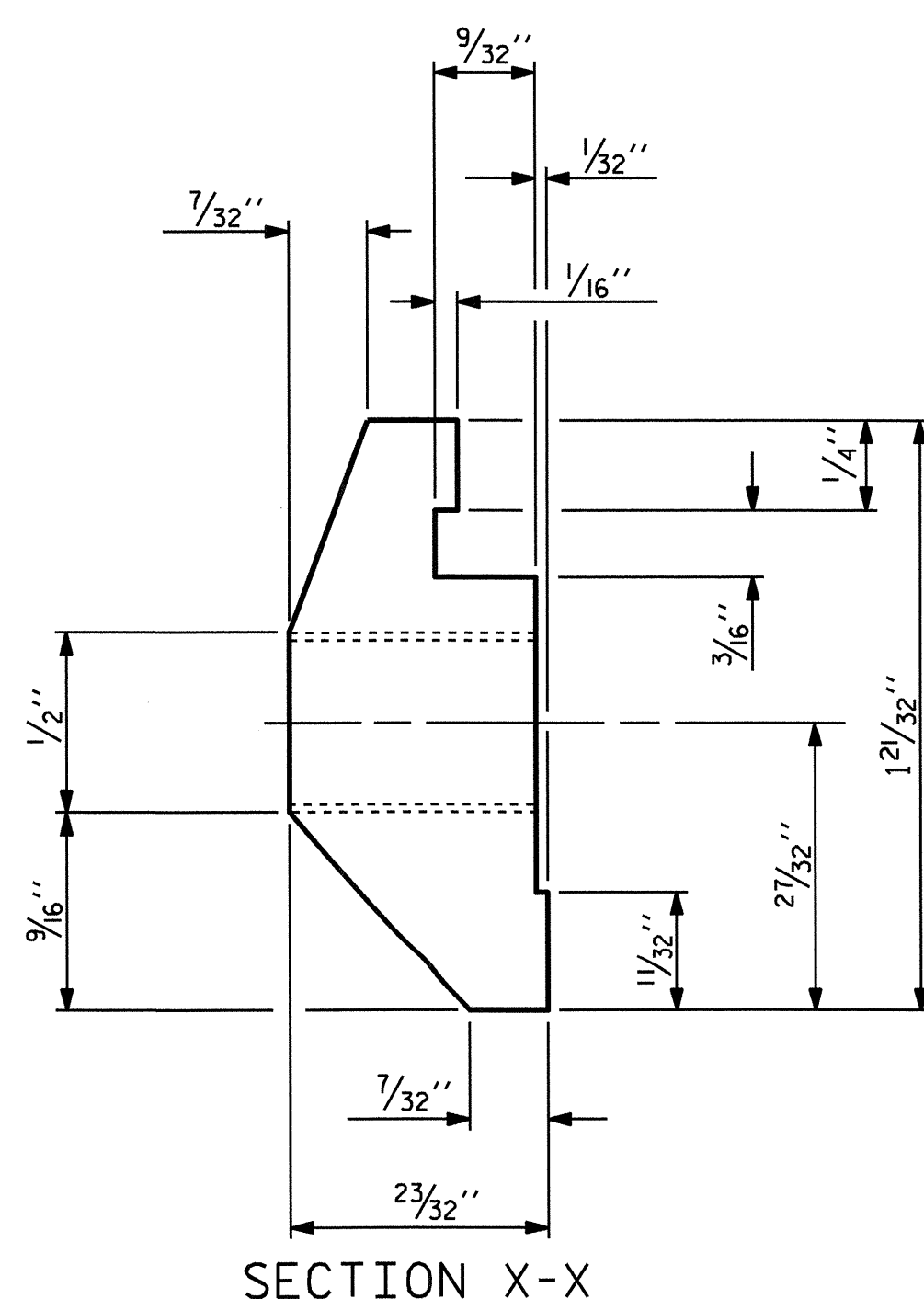


TOP & MIDDLE RAIL EXPANSION BAR



CLAMP BAR DETAIL

(6 REQUIRED PER POST)

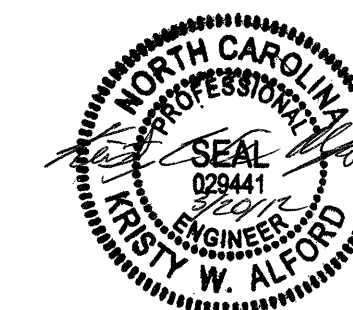


TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 2 OF 3

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



ASSEMBLED BY : T. BANKOVICH	DATE : 5-2009
CHECKED BY : D.G. ELY	DATE : 7-2009
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

20-MAR-2012 08:23
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS 40
2			4			

STD. NO. BMR6

NOTES

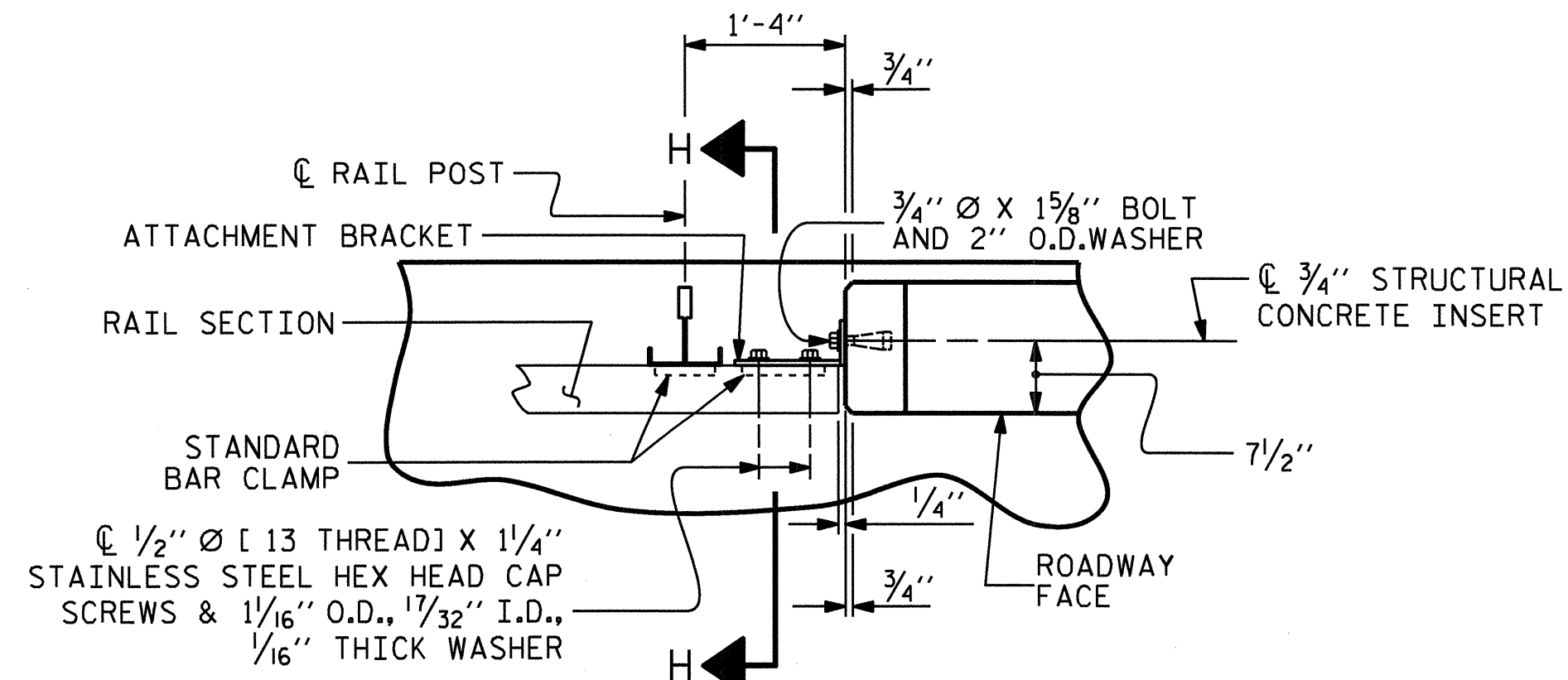
METAL RAIL TO END POST CONNECTION

- 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°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
 - STANDARD CLAMP BARS ("3 BAR METAL RAIL" SHEET 2 OF 3).
- 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 3 BAR METAL RAIL.
- 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.

NOTES

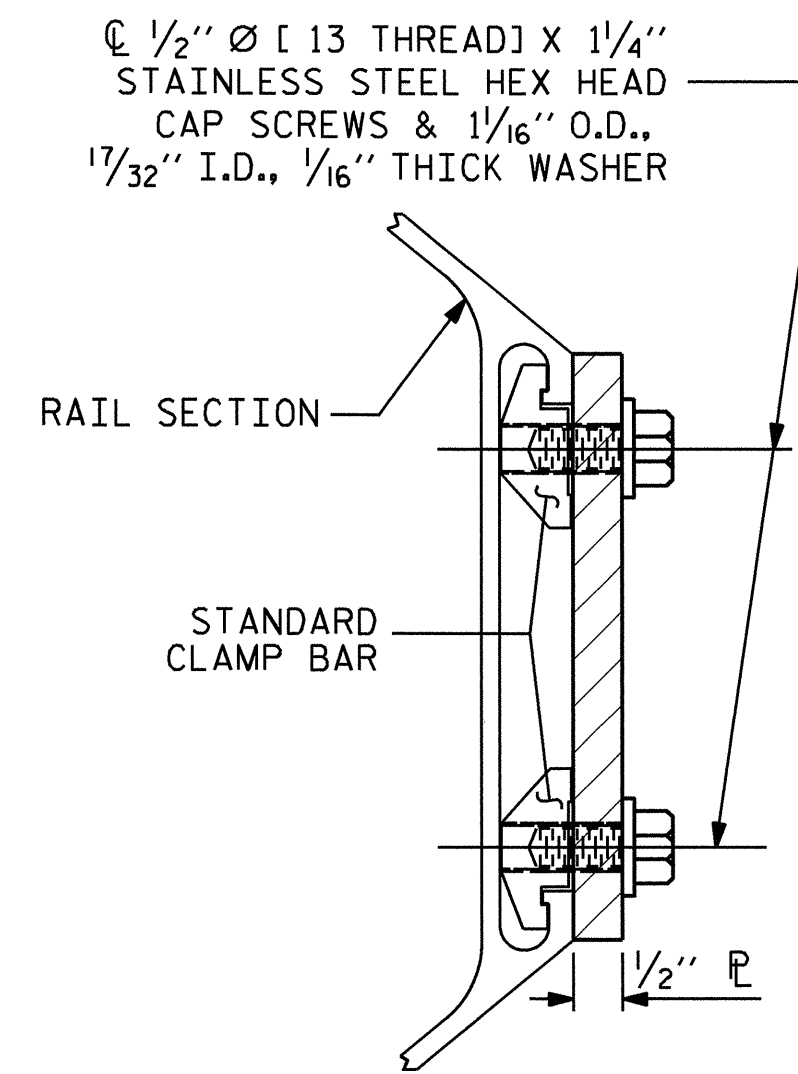
STRUCTURAL CONCRETE INSERT

- 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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



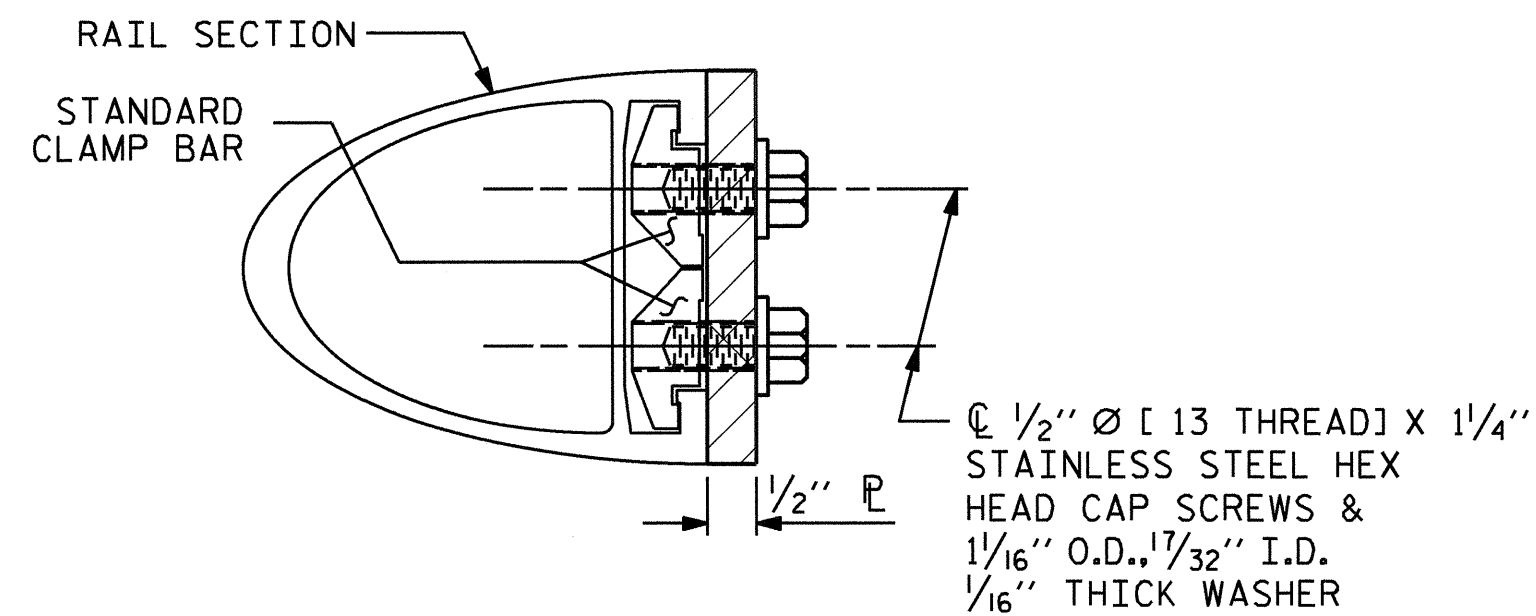
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



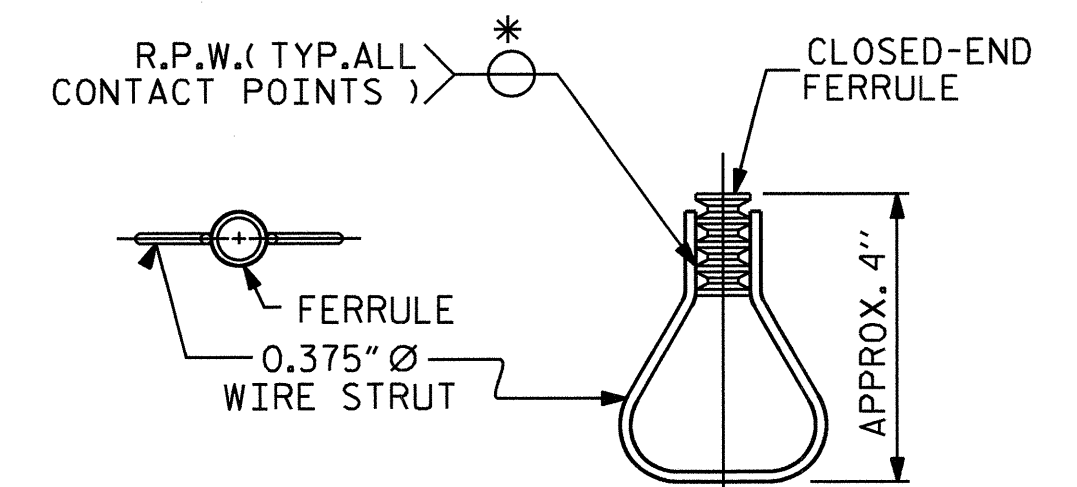
SECTION H-H

(FOR BOTTOM RAIL)



SECTION H-H

(FOR TOP & MIDDLE RAIL)



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-2211B

CALDWELL COUNTY

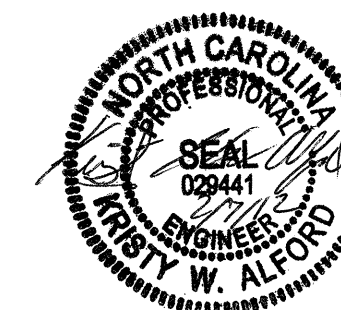
STATION: 33+87.18 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

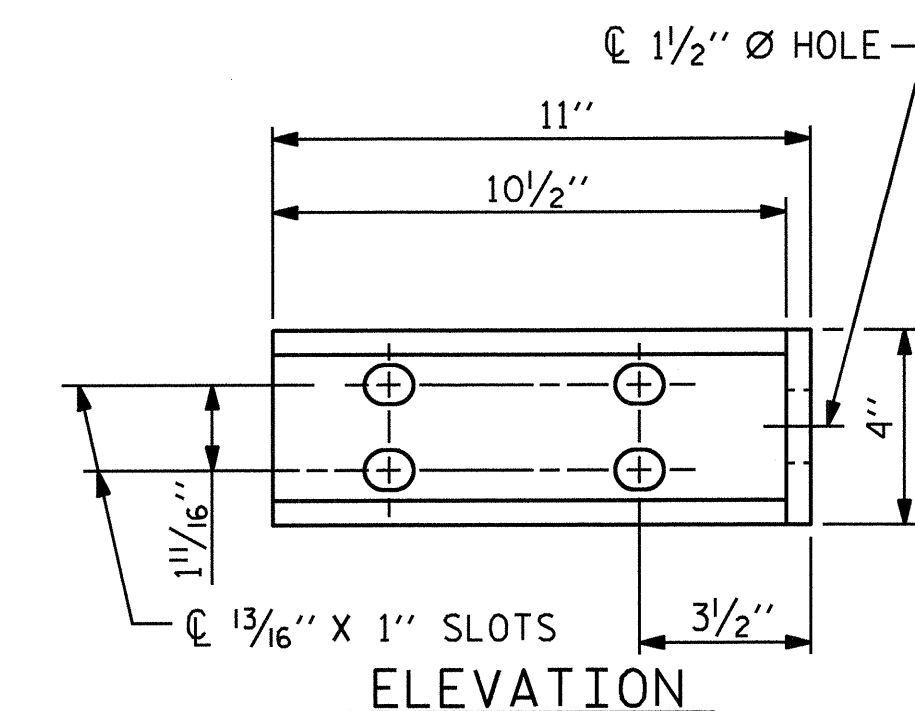
STANDARD

3 BAR METAL RAIL

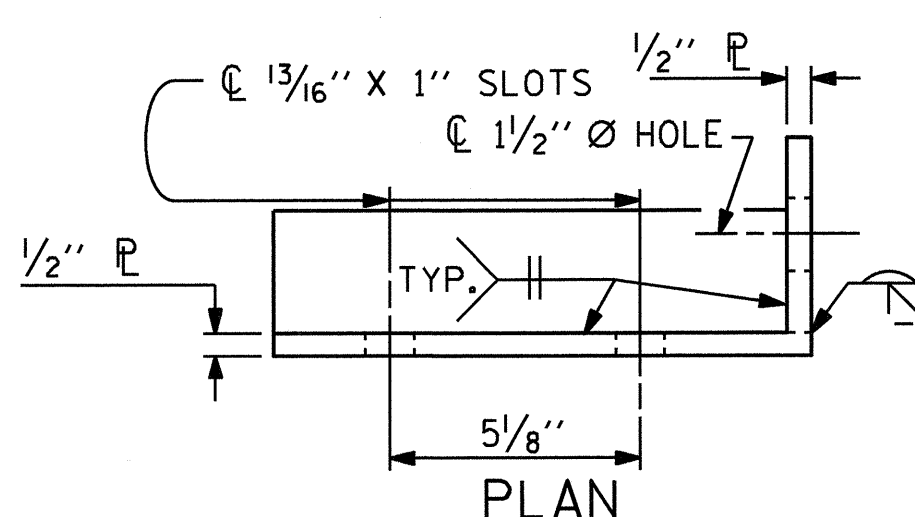


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			40

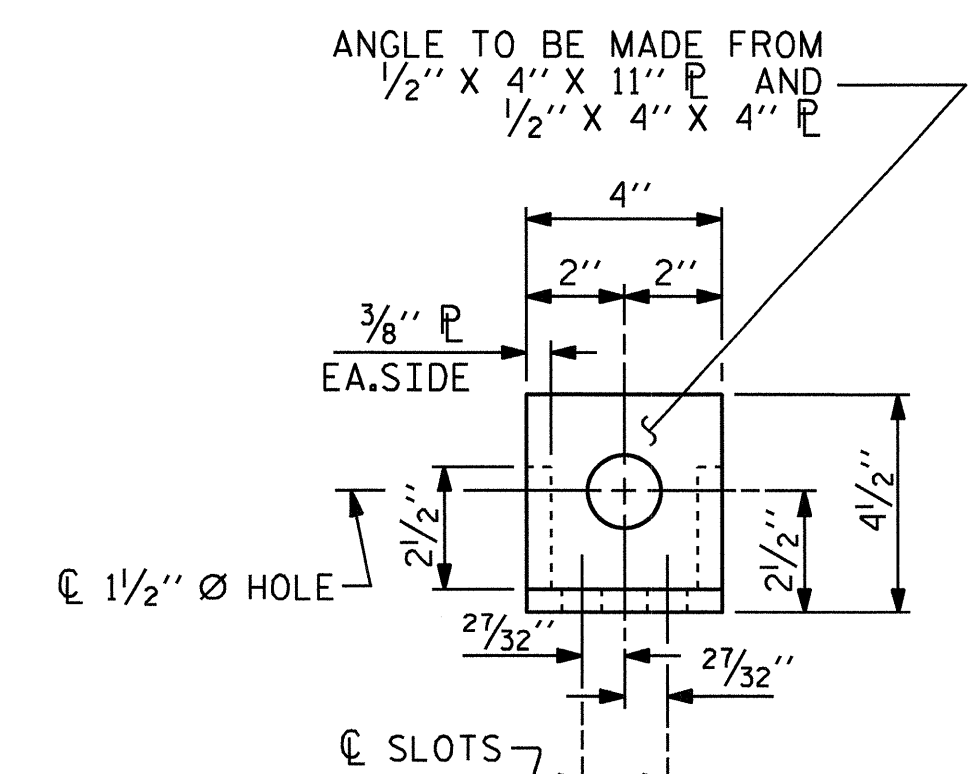
STD. NO. BMR7



ELEVATION



PLAN

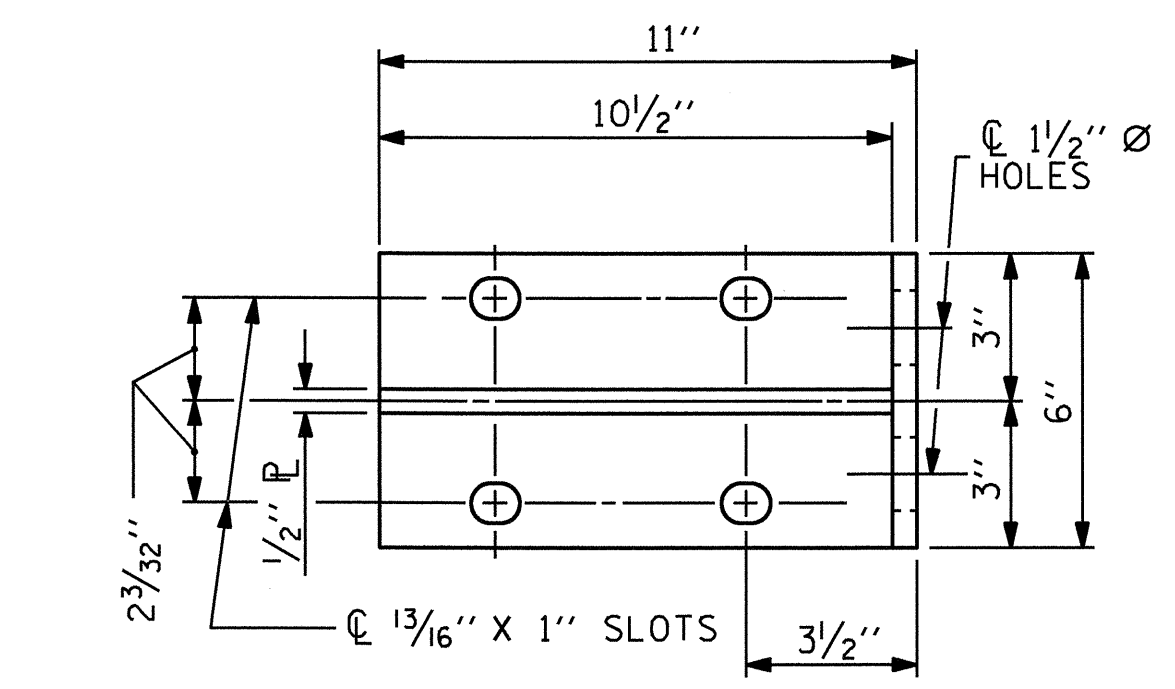


END VIEW

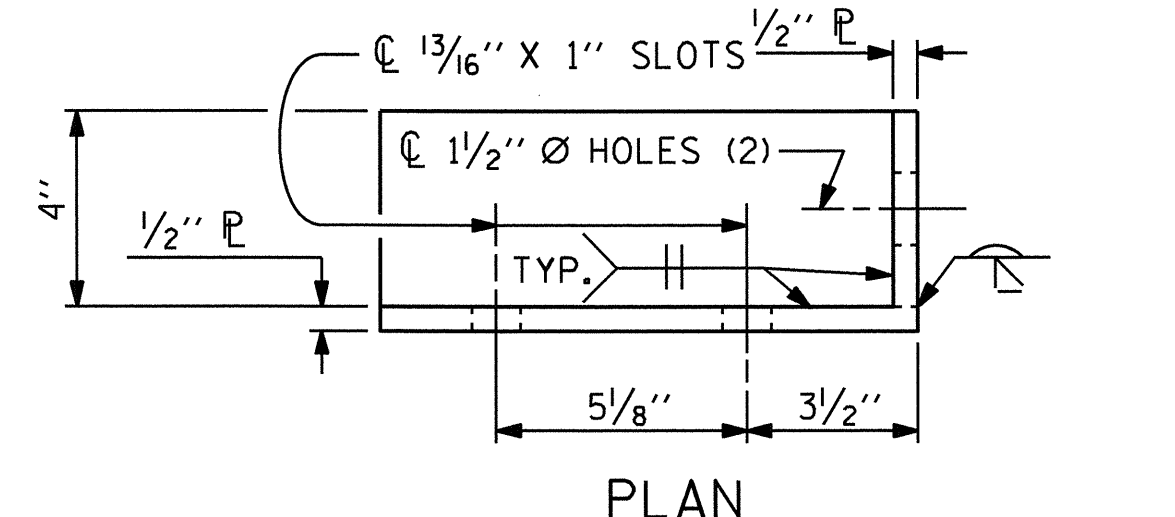
(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



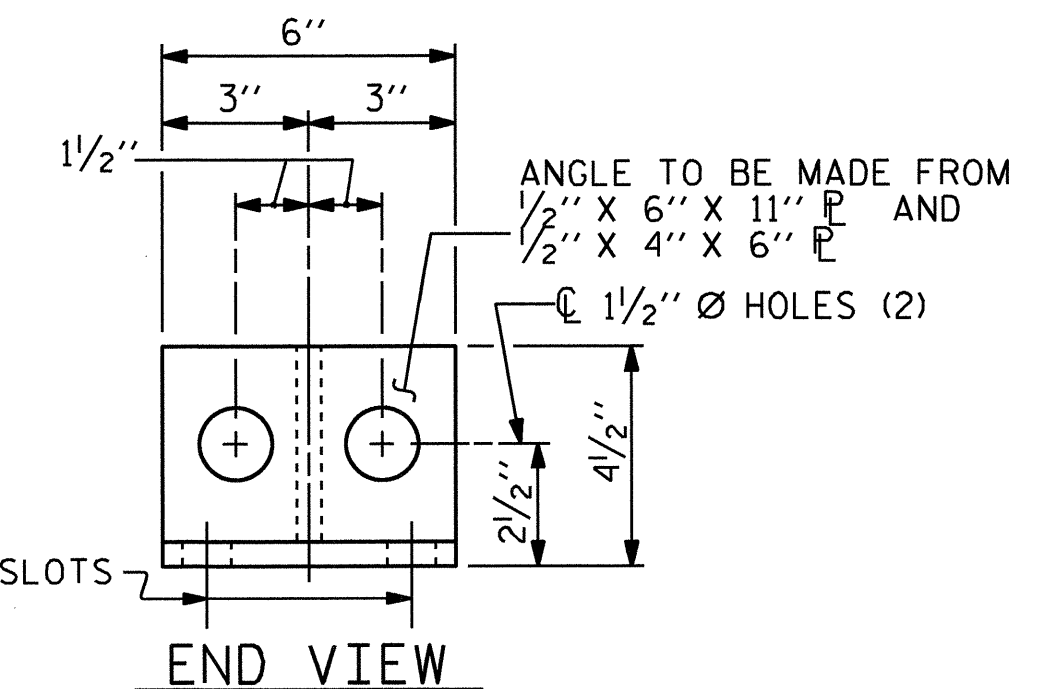
ELEVATION



PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW

ASSEMBLED BY : T. BANKOVICH	DATE : 5-2009
CHECKED BY : D.G. ELY	DATE : 7-2009
DRAWN BY : JMB 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : GGH 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NOTES

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

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

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

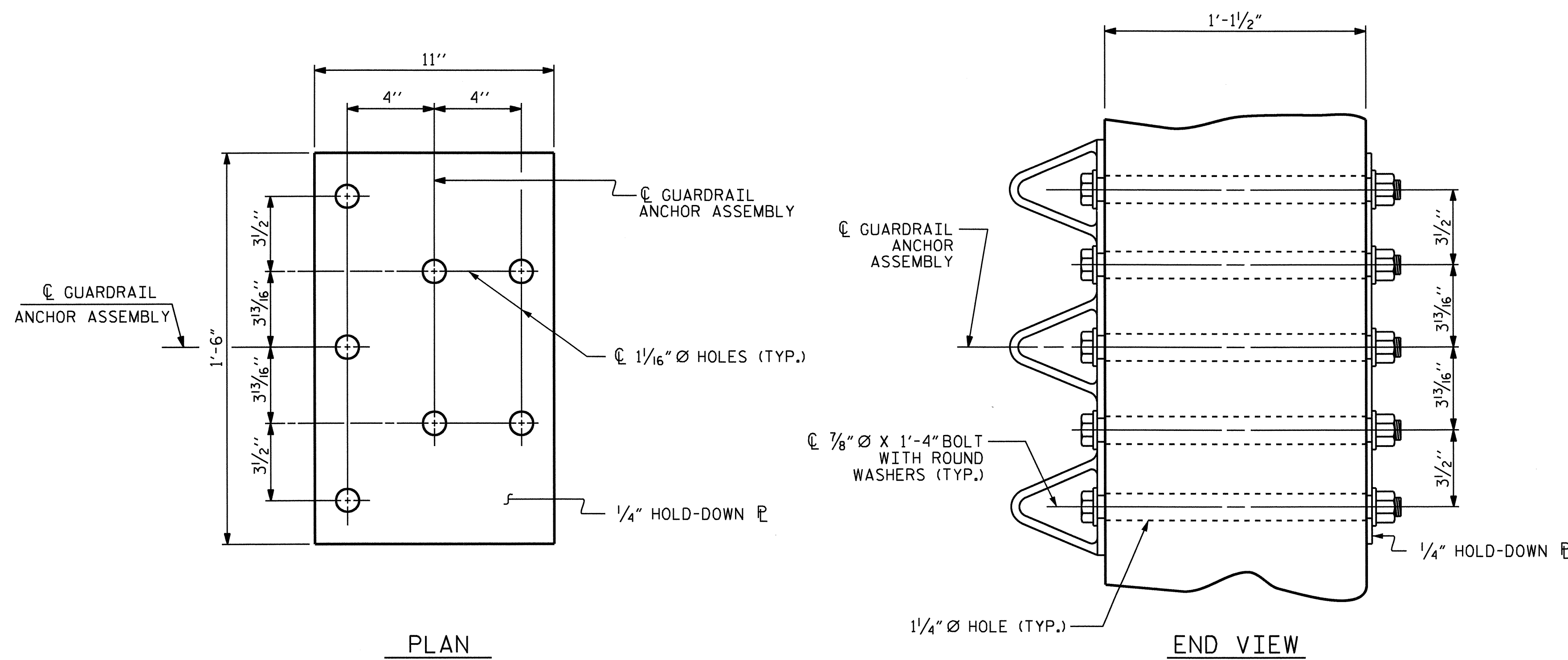
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE ENDS OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

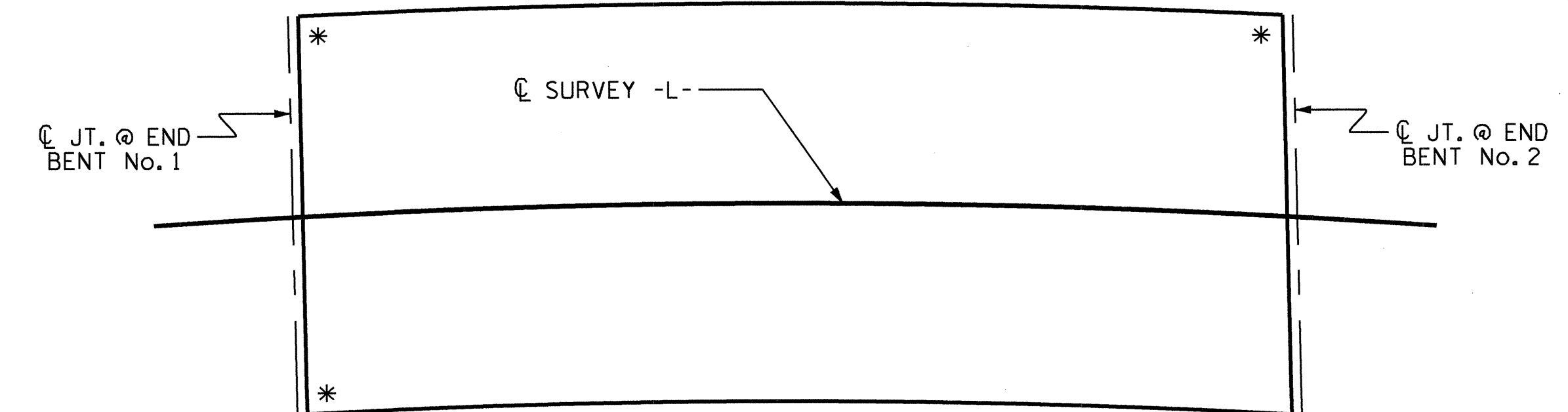
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

THE 1/4" 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.

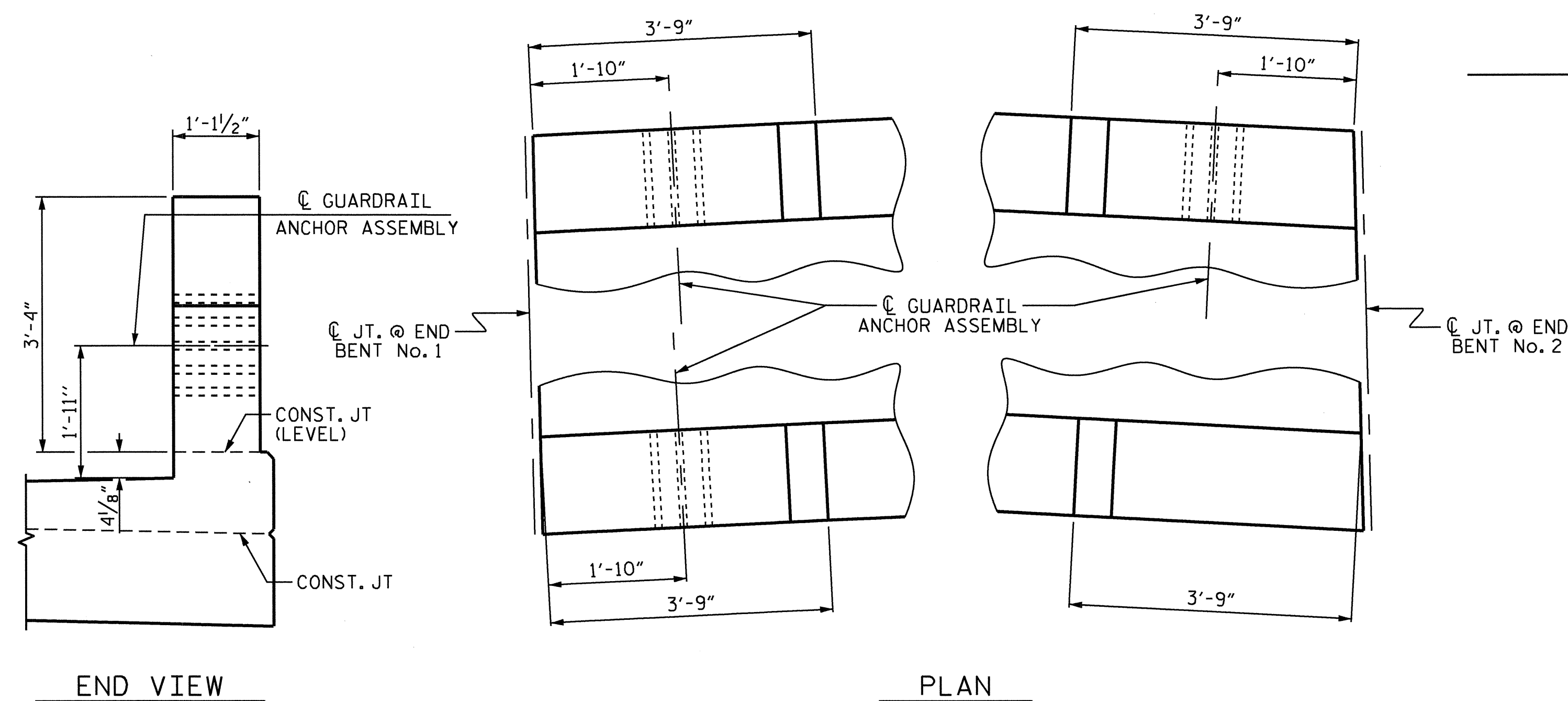


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

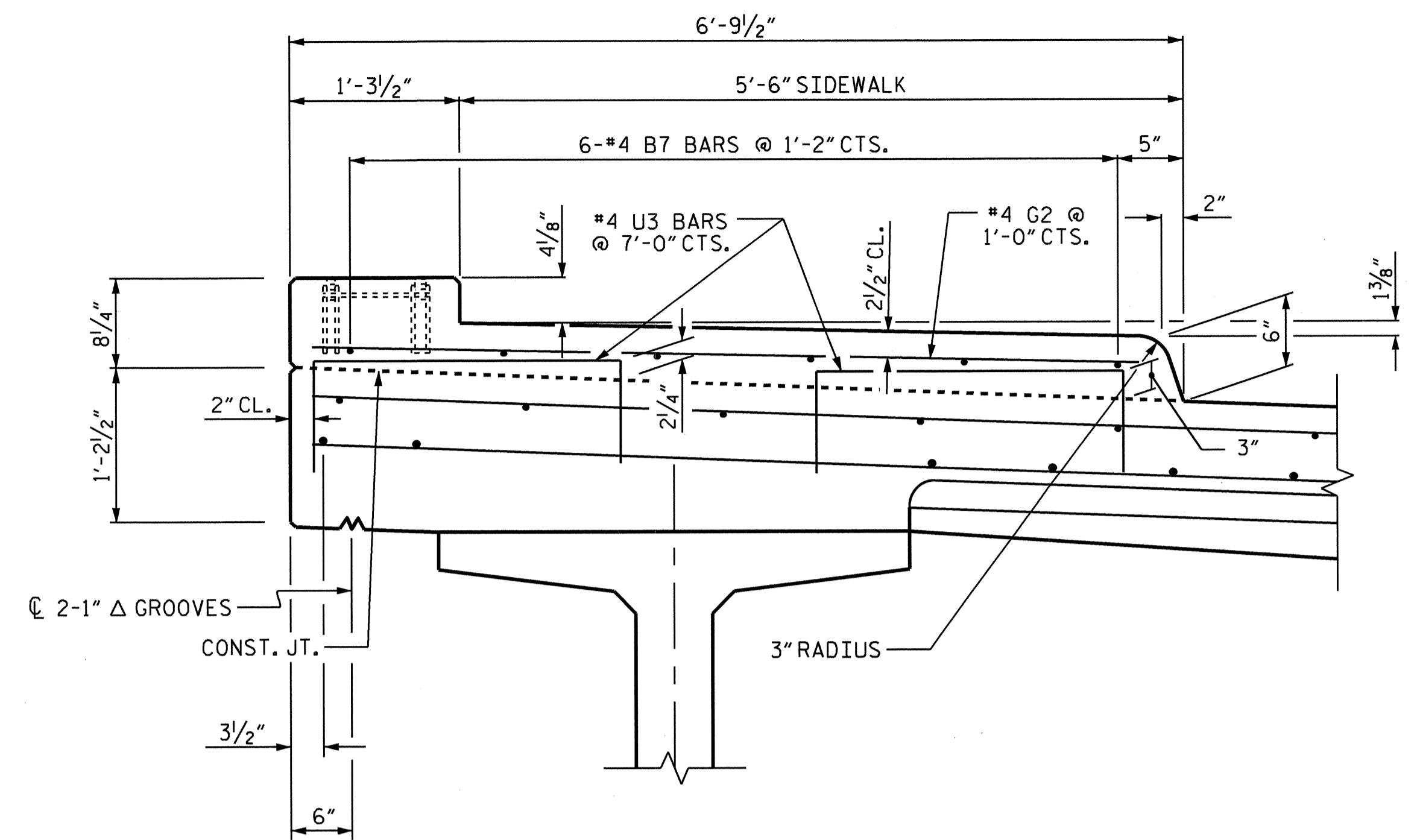
PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-



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

ASSEMBLED BY : T. BANKOVICH	DATE : 5-2009
CHECKED BY : D.G. ELY	DATE : 7-2009
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

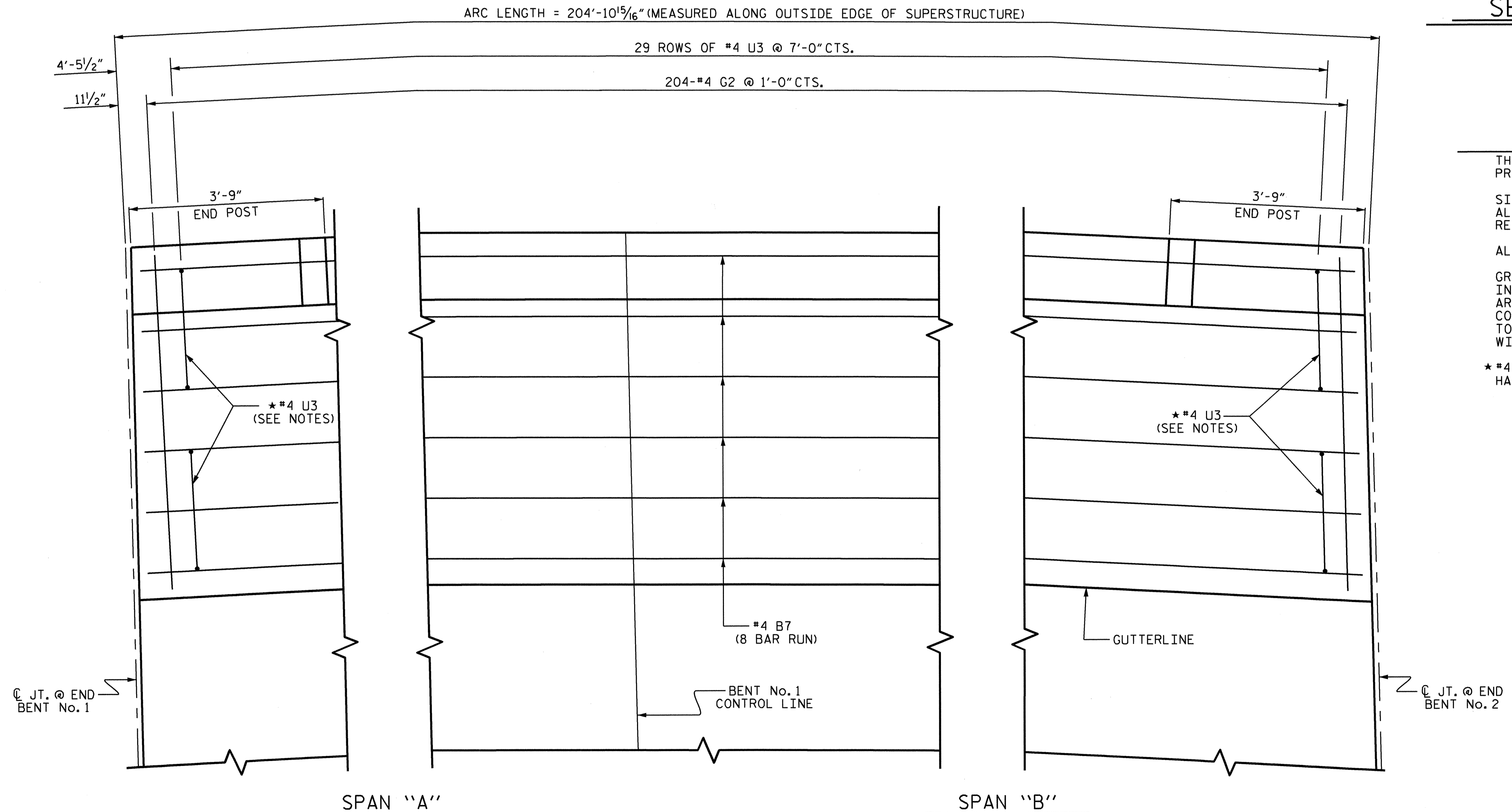
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			40



SECTION THRU LEFT SIDEWALK

NOTES:

- THE JOINT IN THE DECK AT THE END BENTS SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALKS.
- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.
- * #4 U3 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.



PLAN OF LEFT SIDEWALK

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

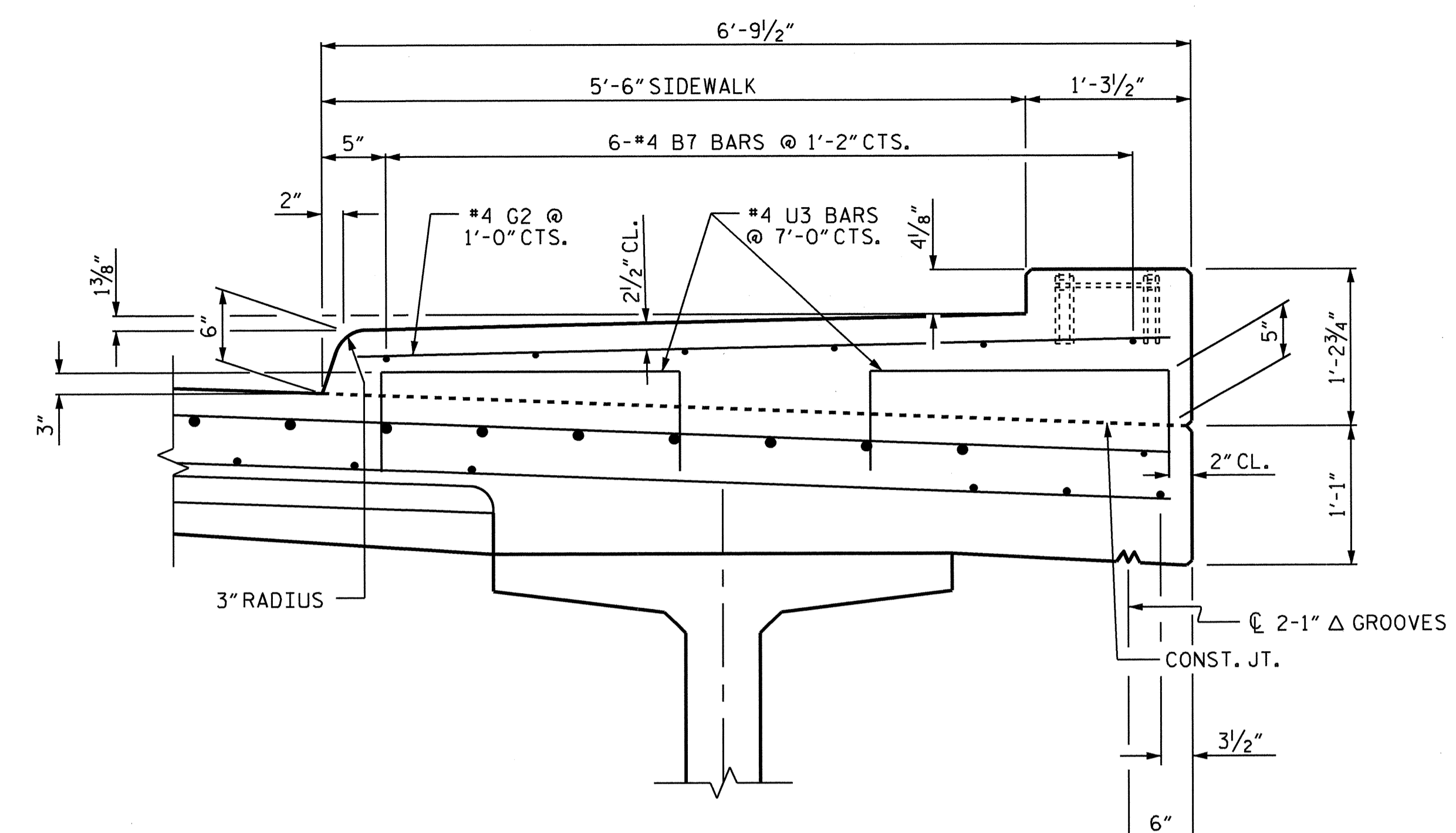
SIDEWALK DETAILS
 (LEFT SIDE)



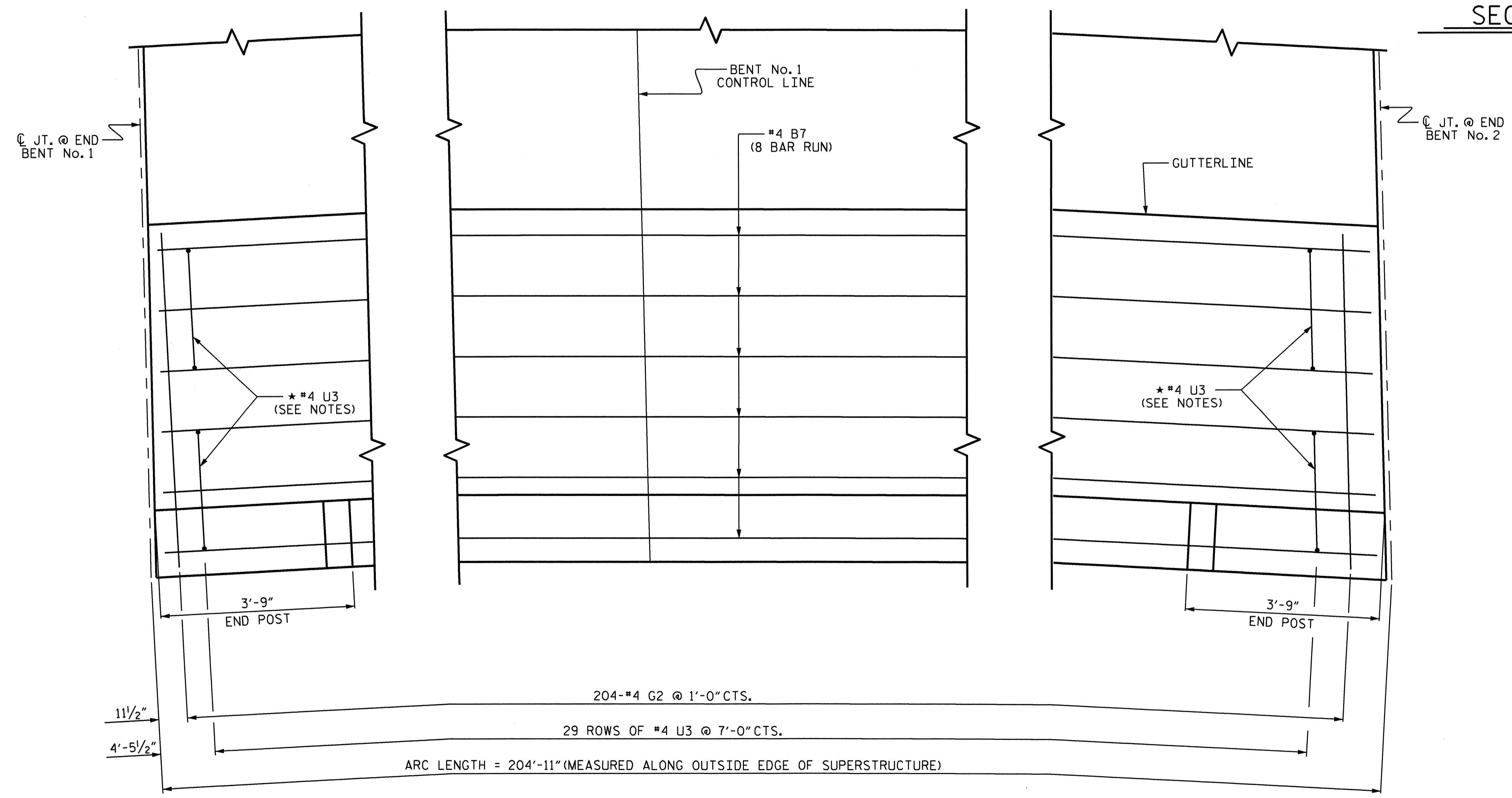
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-25	
1			3			TOTAL	40
2			4			SHEETS	

DRAWN BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 7-2009

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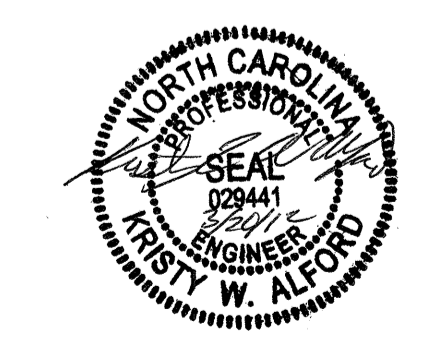
SECTION THRU RIGHT SIDEWALK



PLAN OF RIGHT SIDEWALK

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 2 OF 2

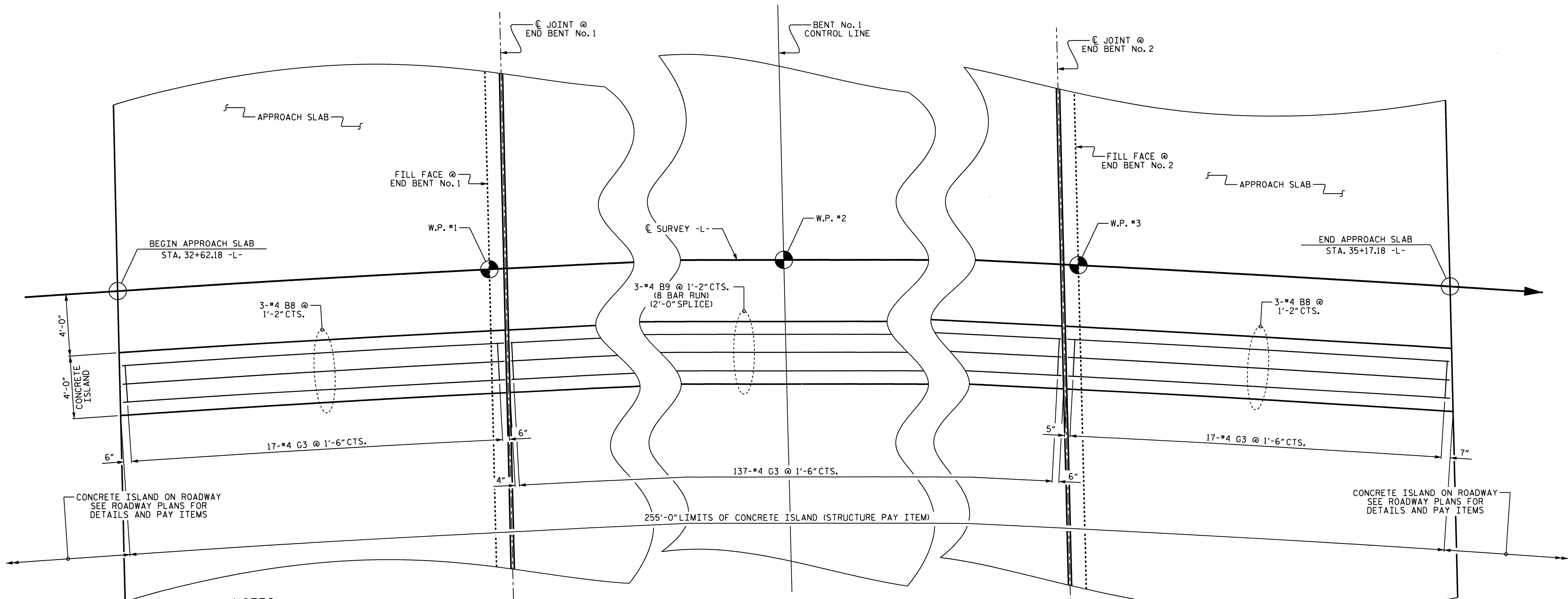
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 SIDEWALK DETAILS
 (RIGHT SIDE)



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS	
2			4			40	

DRAWN BY : T. BANKOVICH DATE : 5-2009
 CHECKED BY : D.G. ELY DATE : 7-2009

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PLAN OF CONCRETE ISLAND

NOTES:

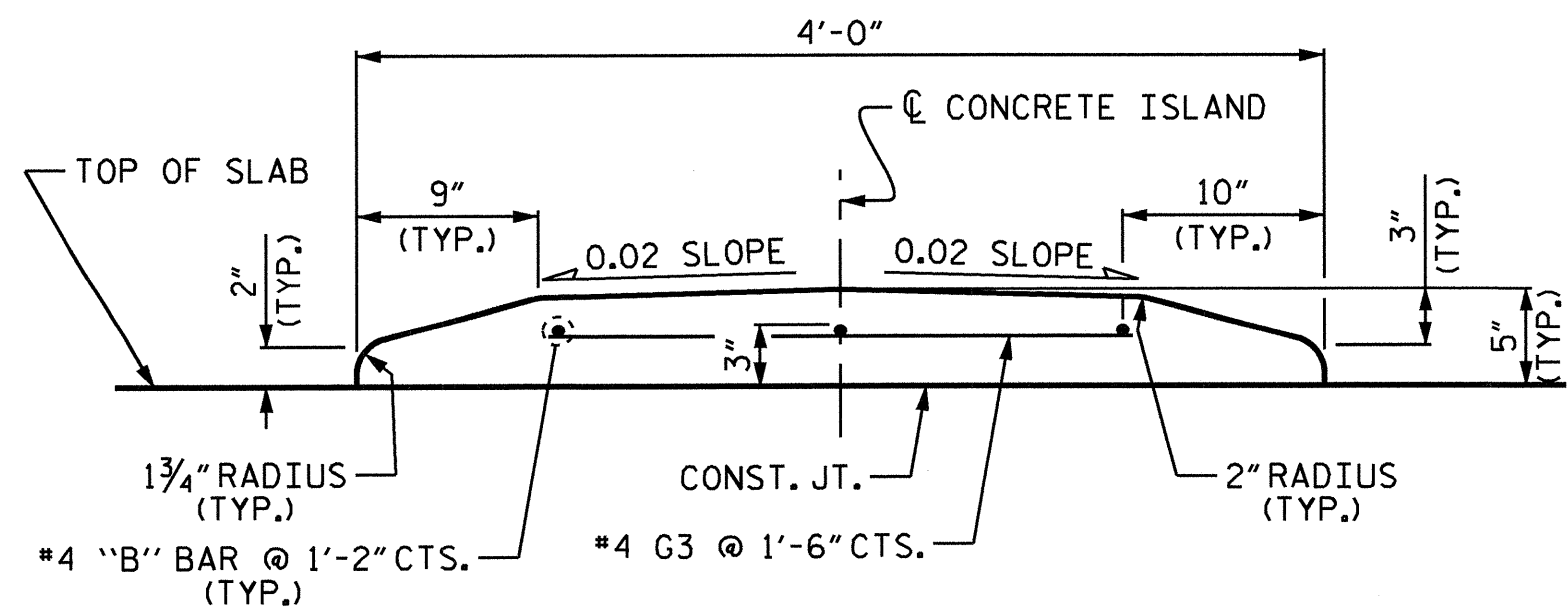
THE CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONCRETE ISLAND ON THE APPROACH SLABS AND BRIDGE DECK IS INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND INCLUDED IN THE SQUARE FOOT PRICE BID FOR "REINFORCED CONCRETE DECK SLAB".

ALL REINFORCING STEEL IN CONCRETE ISLAND SHALL BE EPOXY COATED.

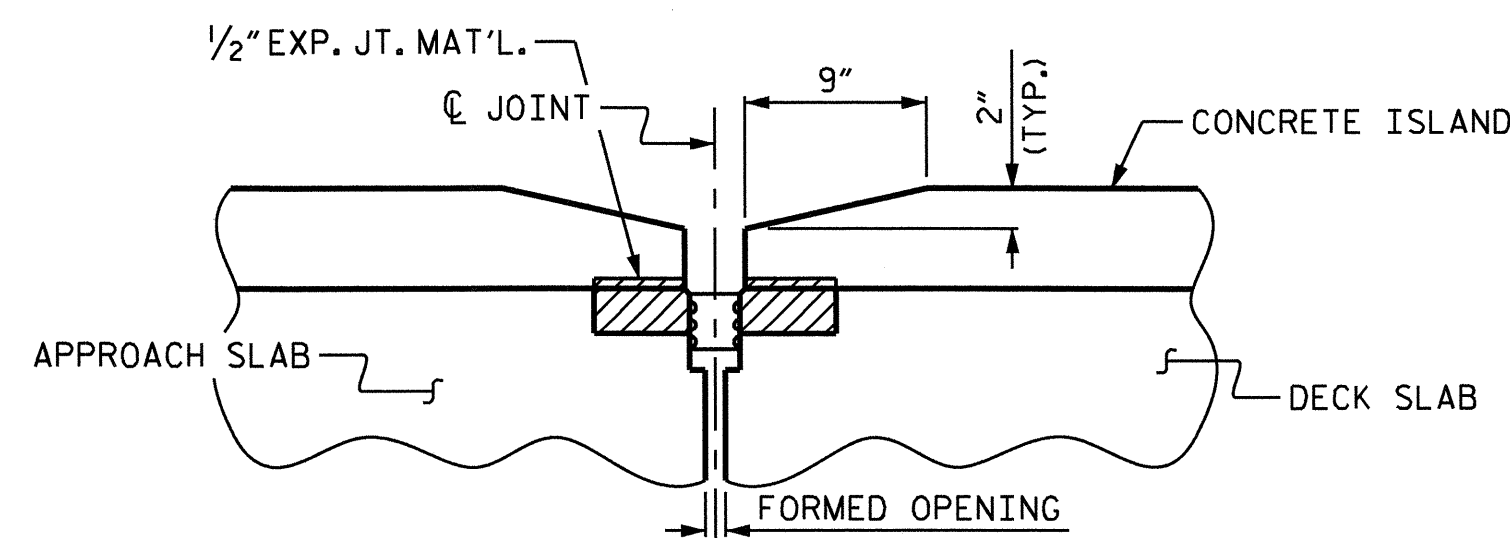
CONCRETE ISLAND SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

THE JOINT IN THE CONCRETE ISLAND AT THE END BENTS SHALL BE FORMED TO MATCH THE SAWED OPENING FOR THE FOAM JOINT SEAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE ISLAND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSIONS JOINTS. NO CONTRACTIONS JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THEN 10 FT. IN LENGTH.

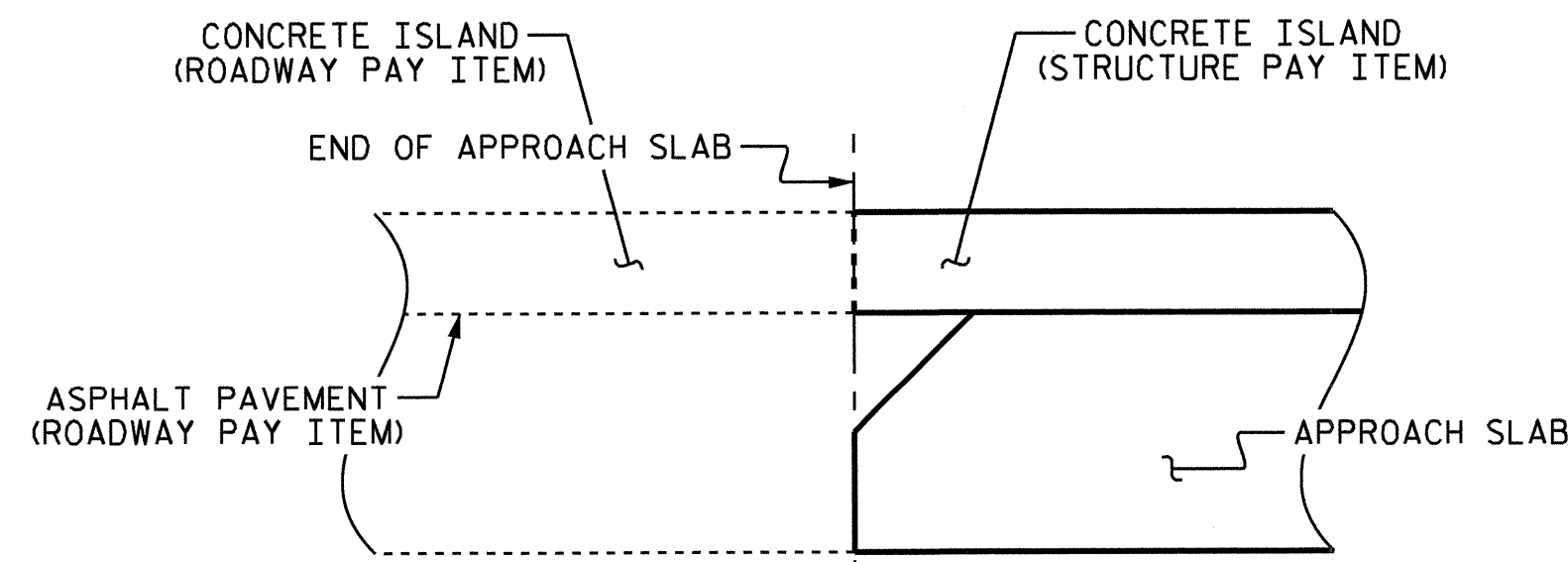


SECTION THRU CONCRETE ISLAND



SECTION THRU ISLAND AT END BENTS

END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR



SECTION THRU ISLAND AT END OF APPROACH SLABS

PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE ISLAND



DRAWN BY: T. BANKOVICH DATE: 5-2009
 CHECKED BY: D.G. ELY DATE: 7-2009

20-MAR-2012 08:24
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27	
1			3			TOTAL SHEETS	
2			4			40	

NOTES:

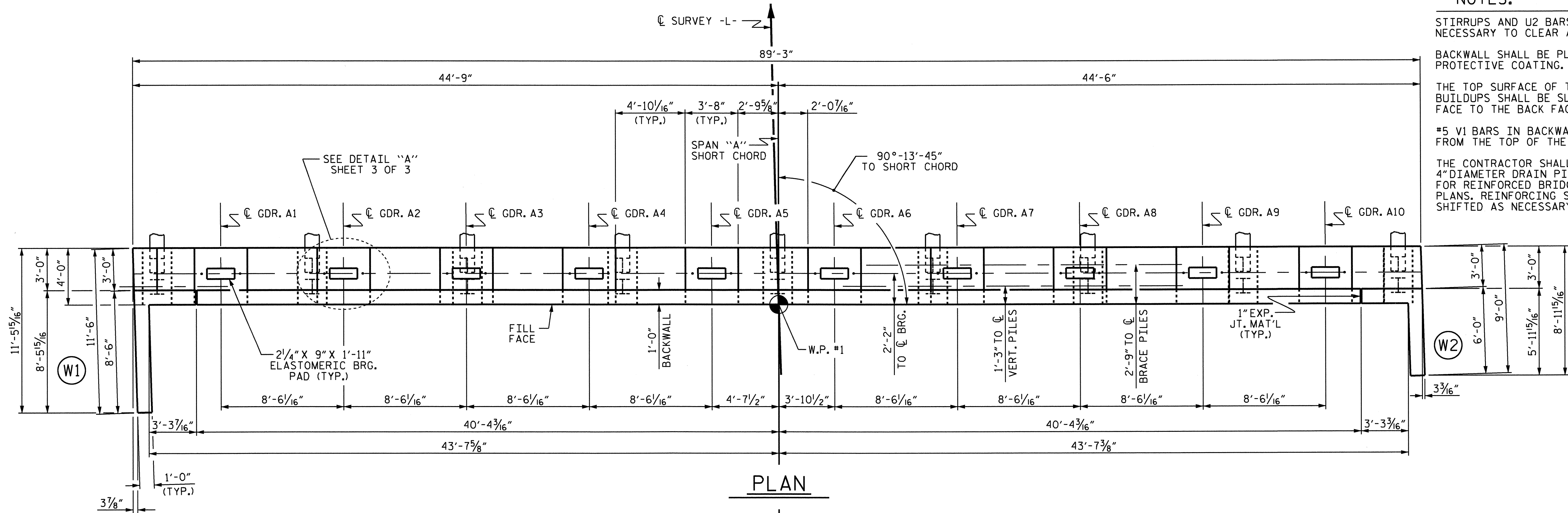
STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

#5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

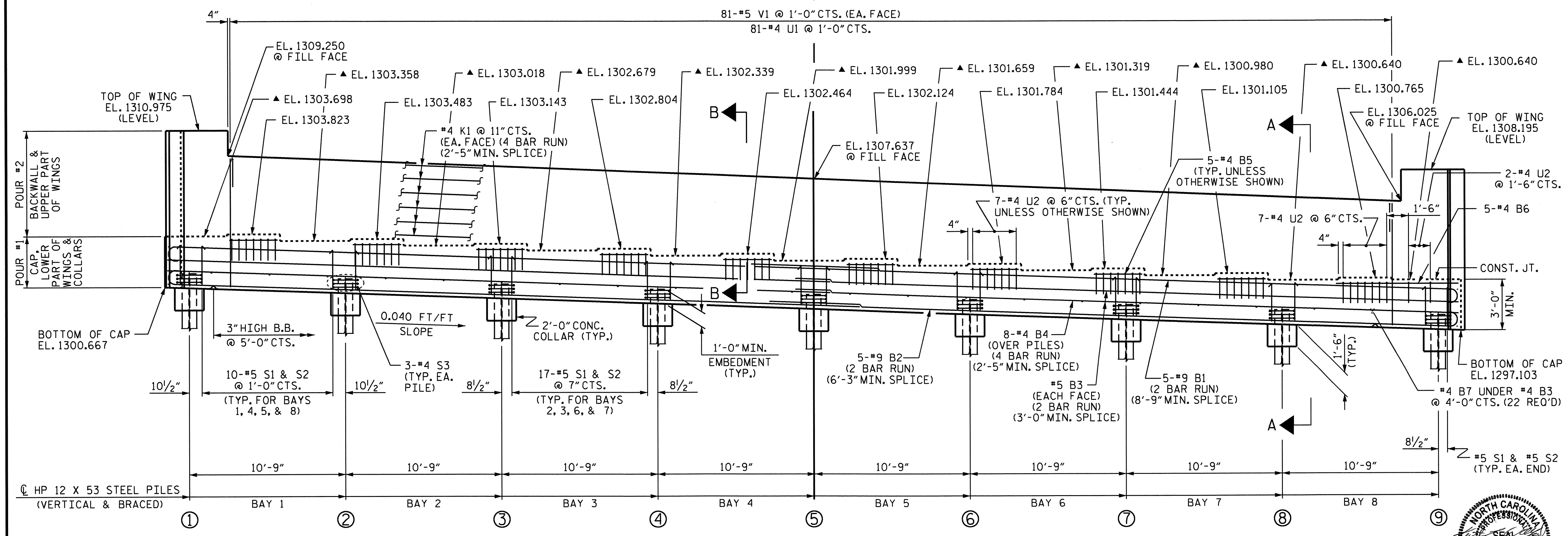
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN

TOP OF PILE ELEVATIONS			
①	1301.619	⑥	1299.473
②	1301.190	⑦	1299.043
③	1300.761	⑧	1298.614
④	1300.331	⑨	1298.185
⑤	1299.902		

▲ FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE "SECTION A-A," SHEET 3 OF 3.



ELEVATION

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 1 OF 3

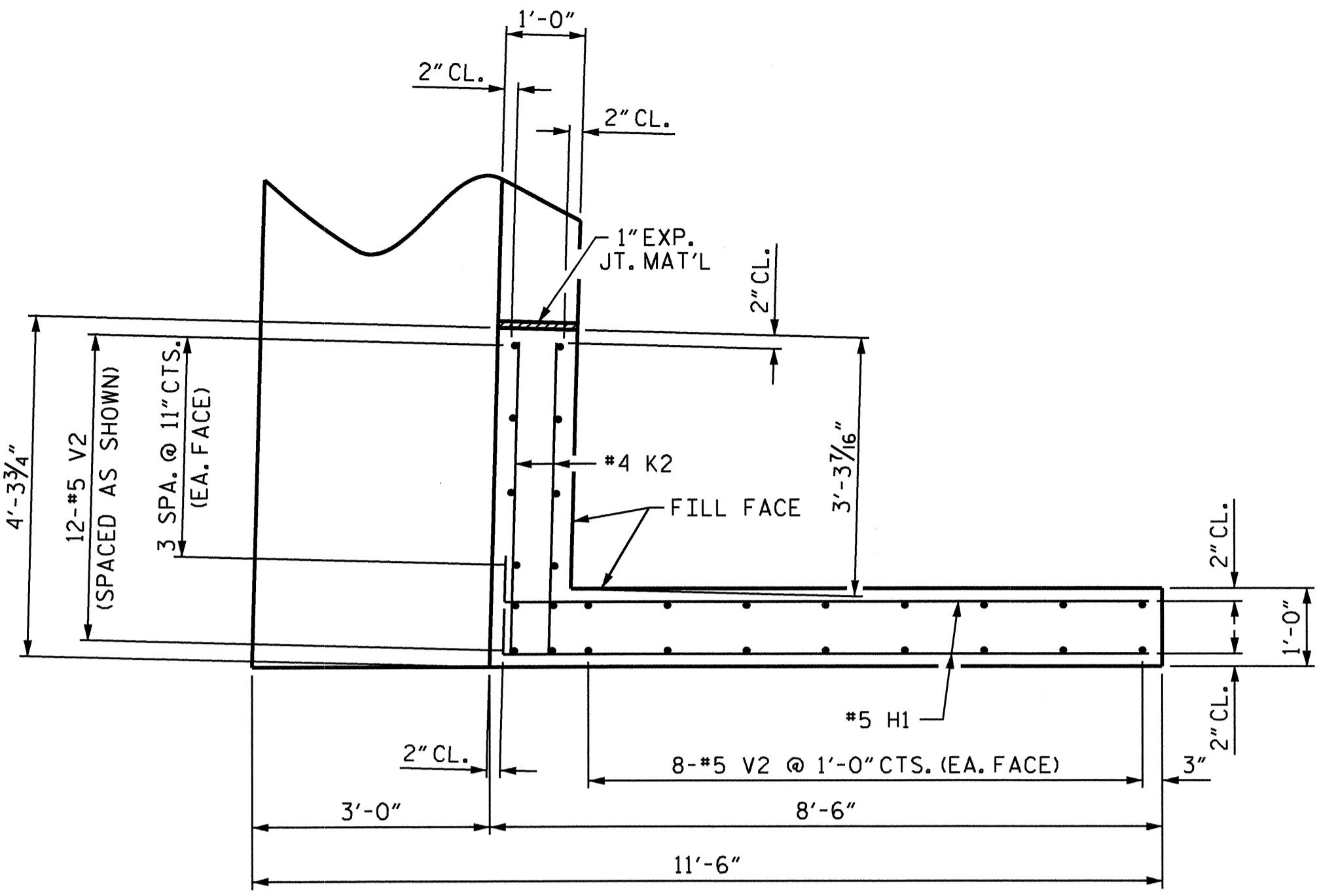
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT No. 1**

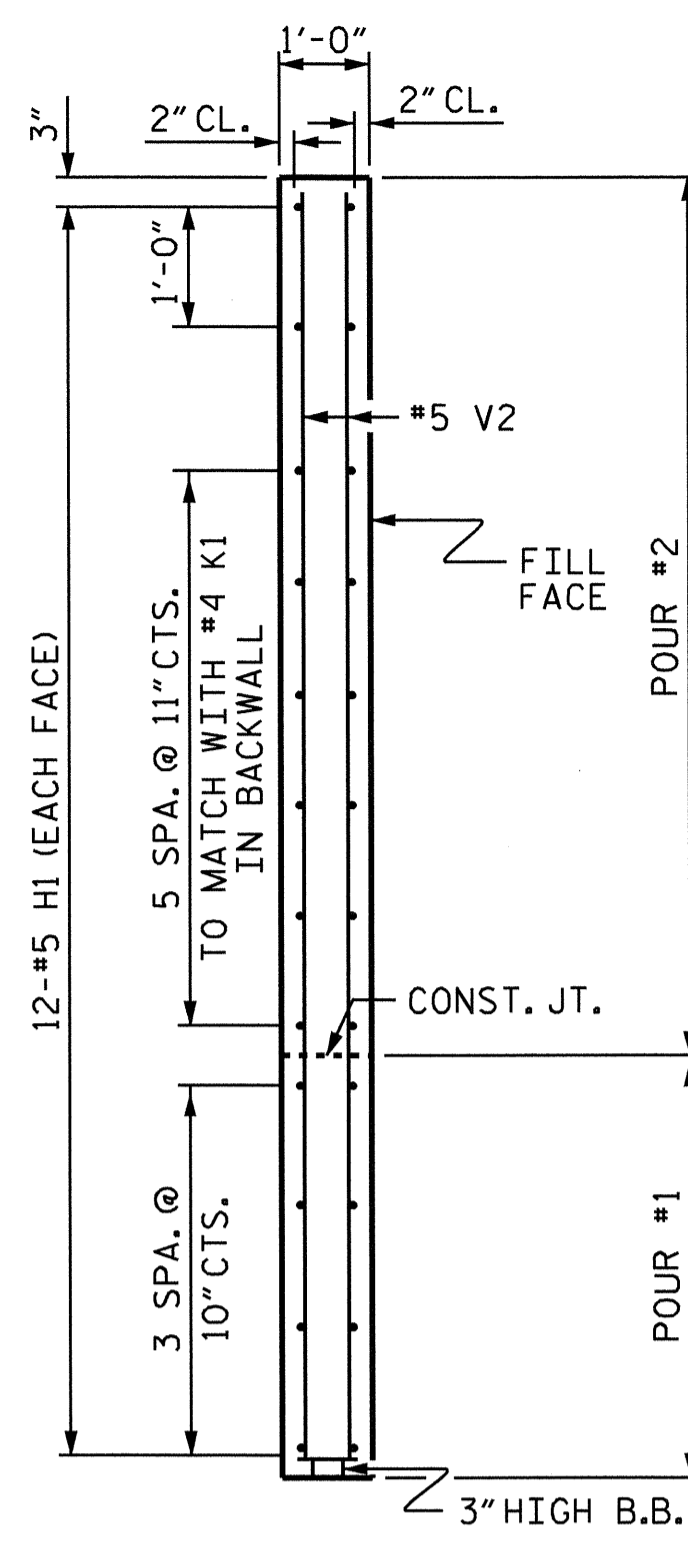


DRAWN BY: W.G. PRICE, II DATE: 6/2009
 CHECKED BY: D.G. ELY DATE: 8/2009

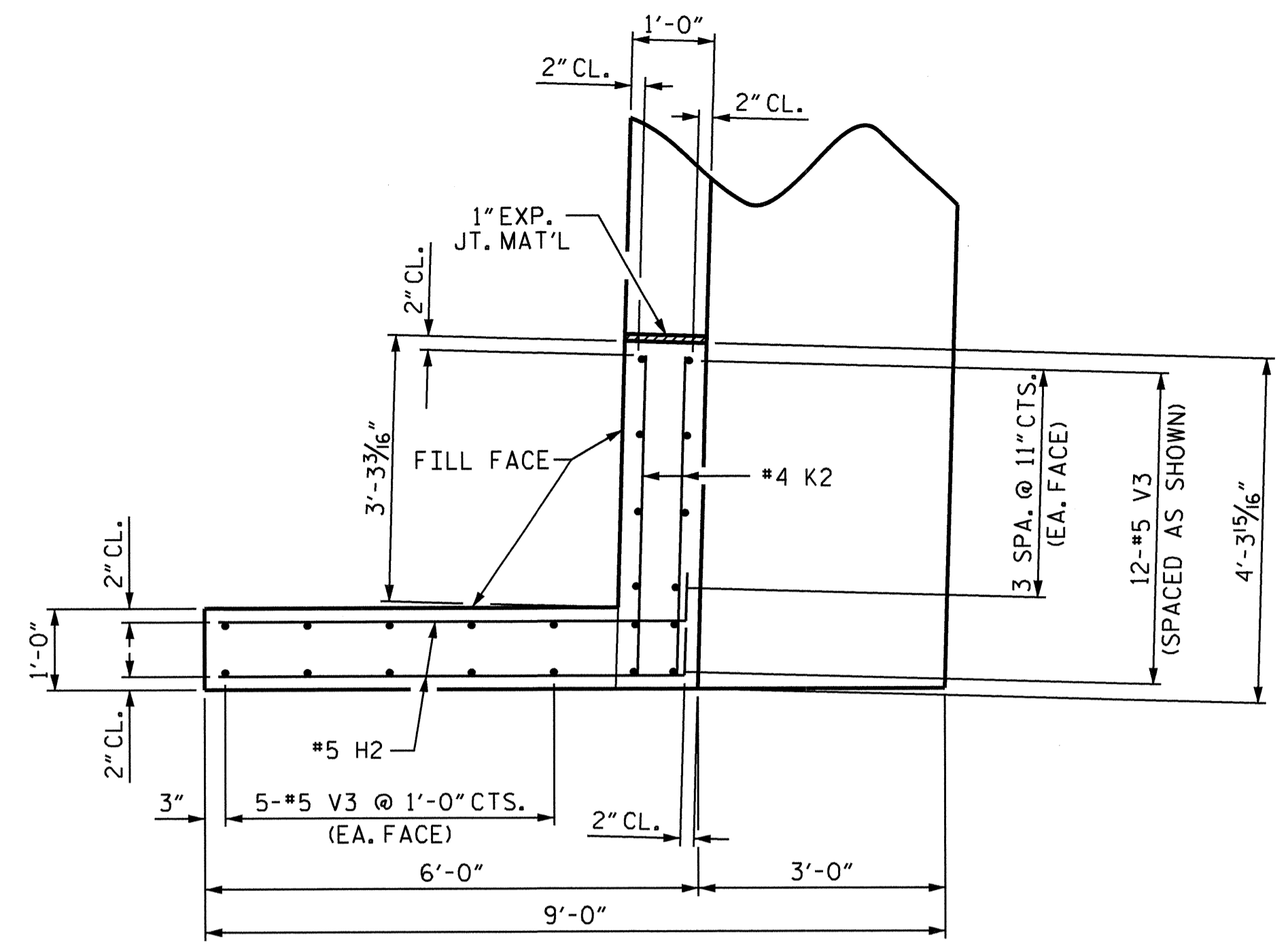
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29	
1			3			TOTAL SHEETS	
2			4			40	



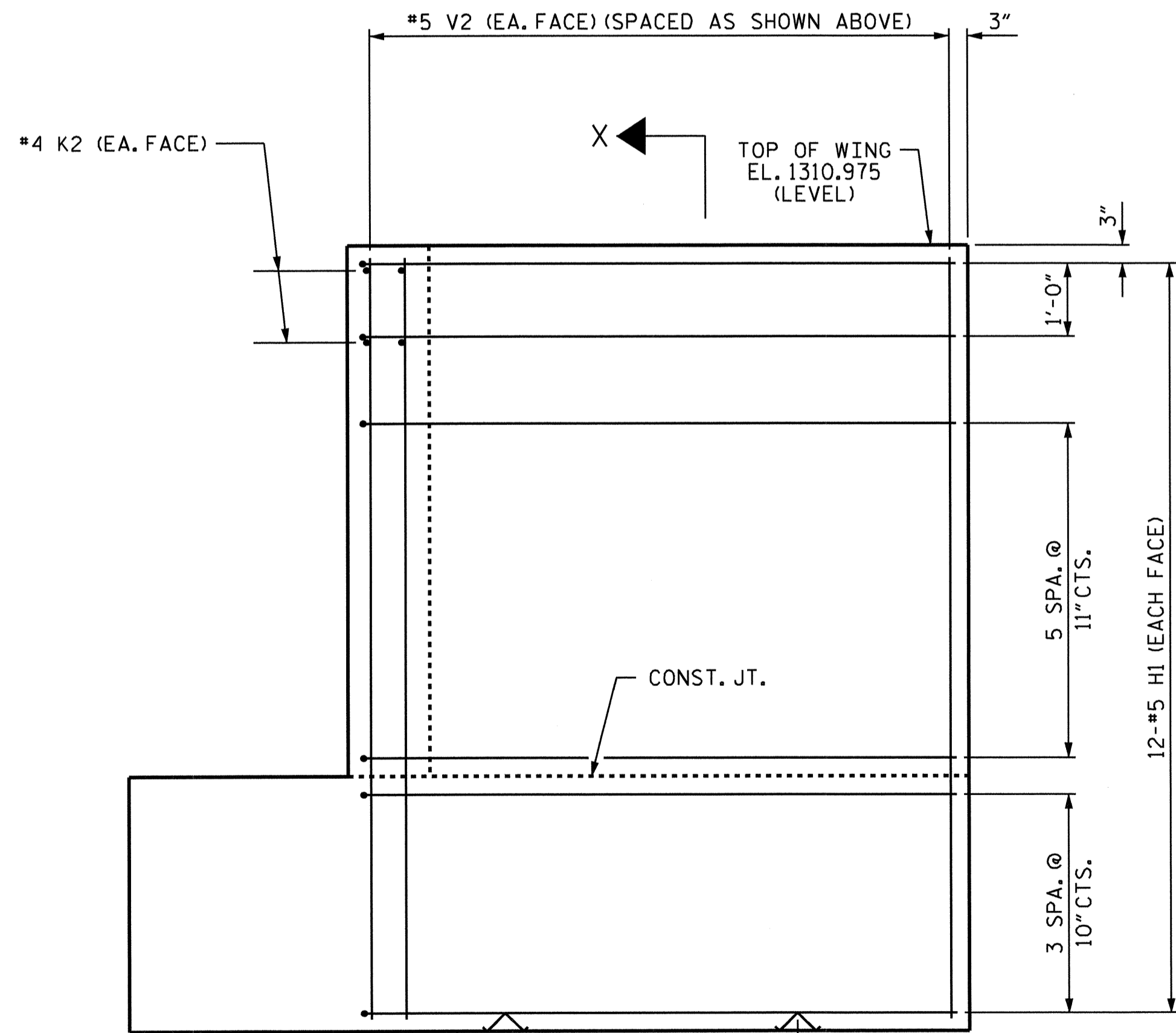
PLAN OF WING (W1)



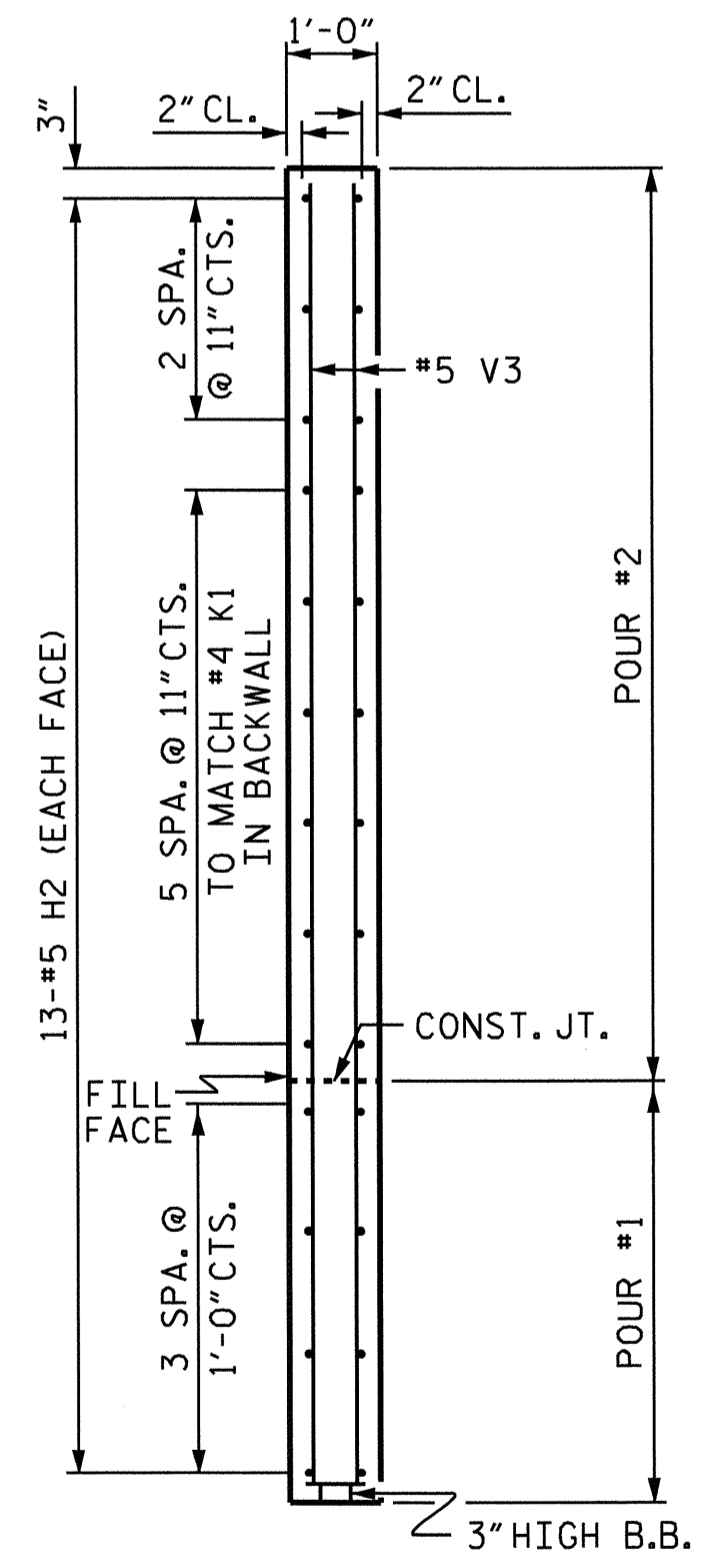
SECTION X-X



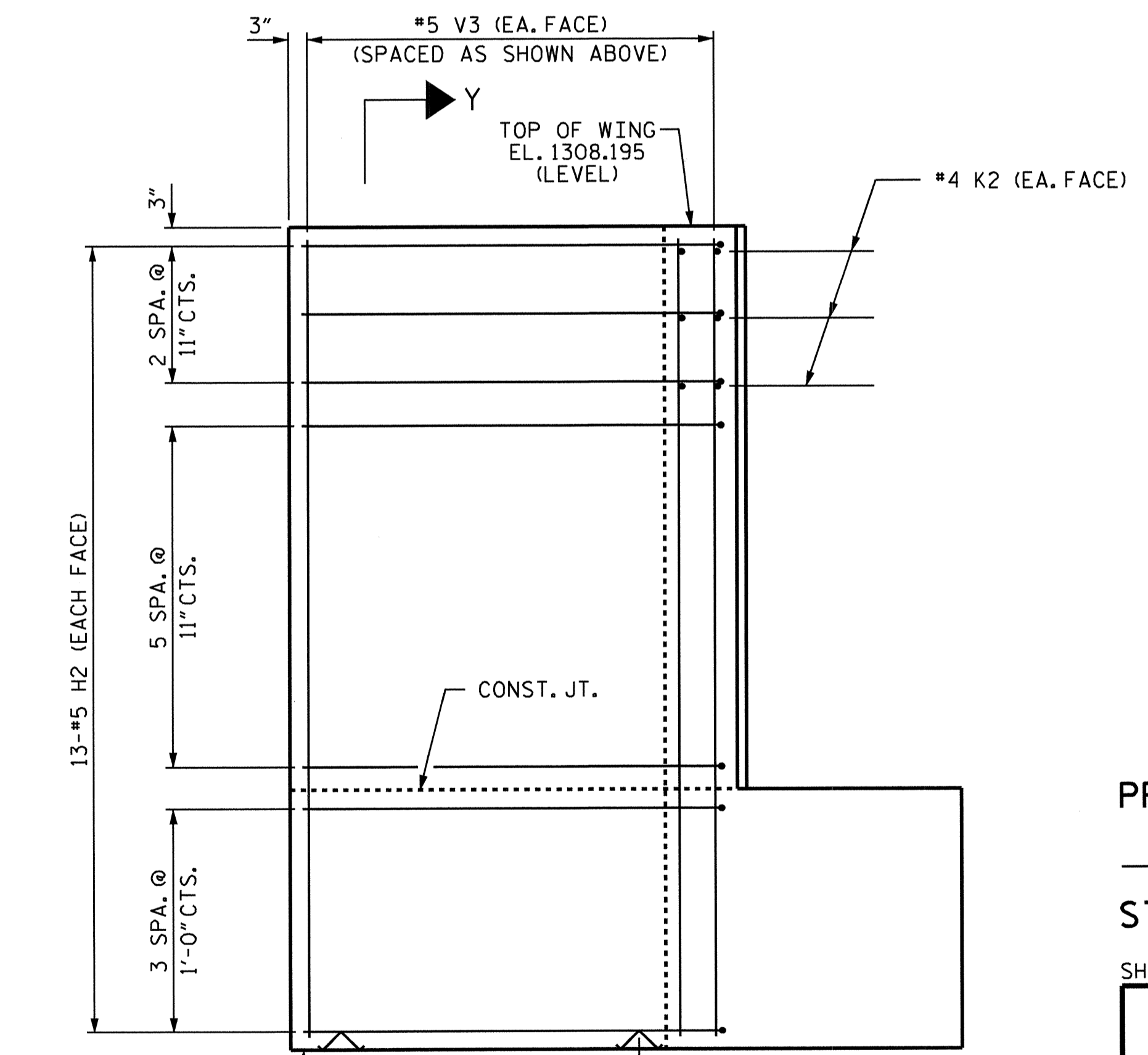
PLAN OF WING (W2)



ELEVATION OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W2)



PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 2 OF 3

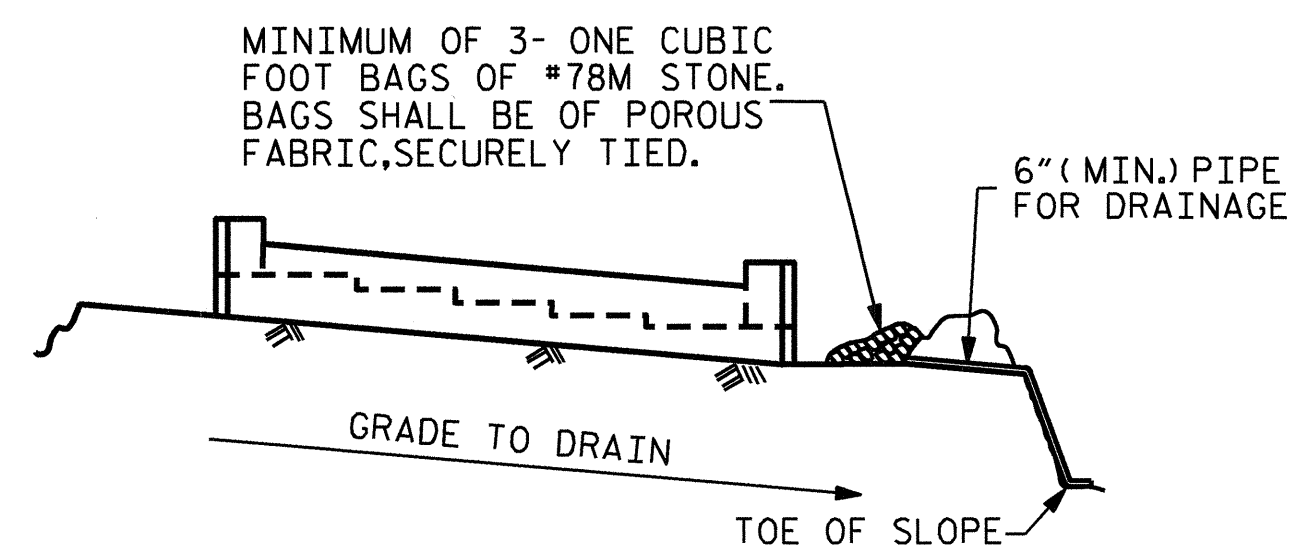
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1

DRAWN BY : W.G. PRICE, II DATE : 6/2009
 CHECKED BY : D.G. ELY DATE : 8/2009

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS	
2			4			40	

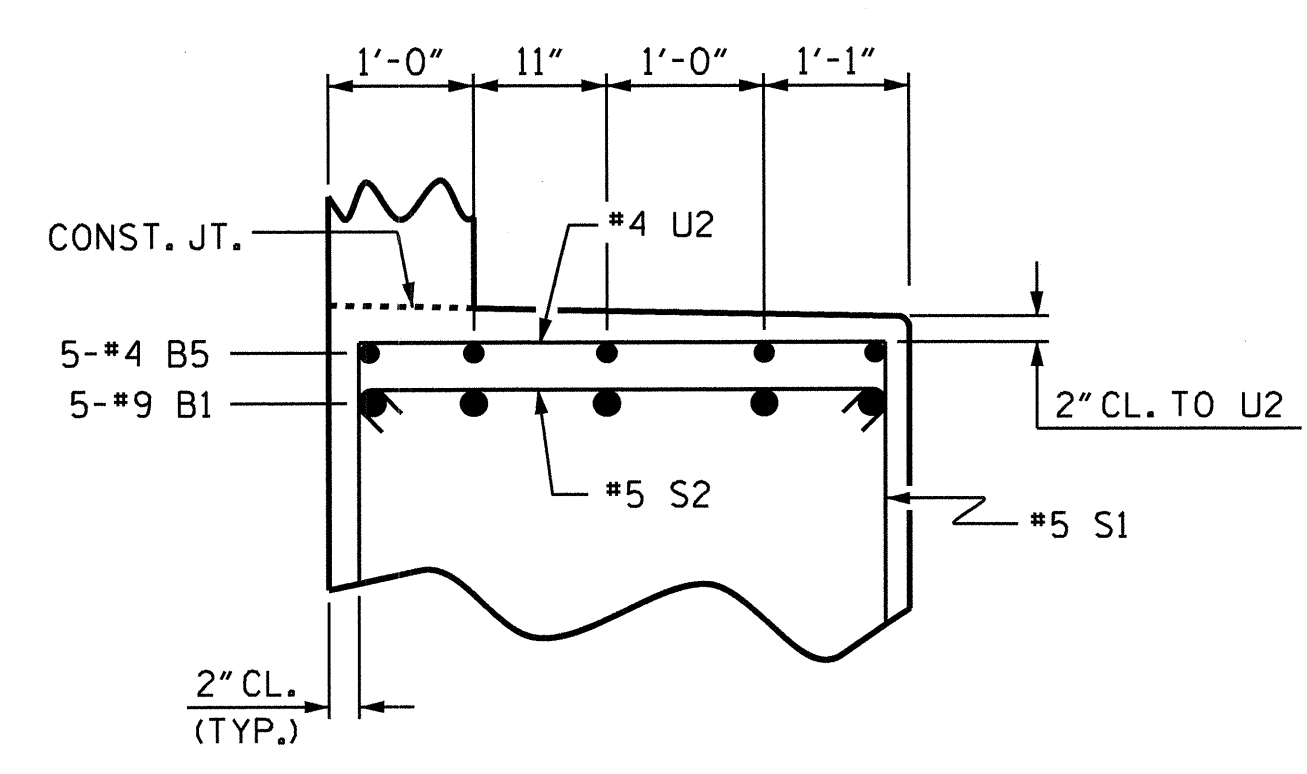


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

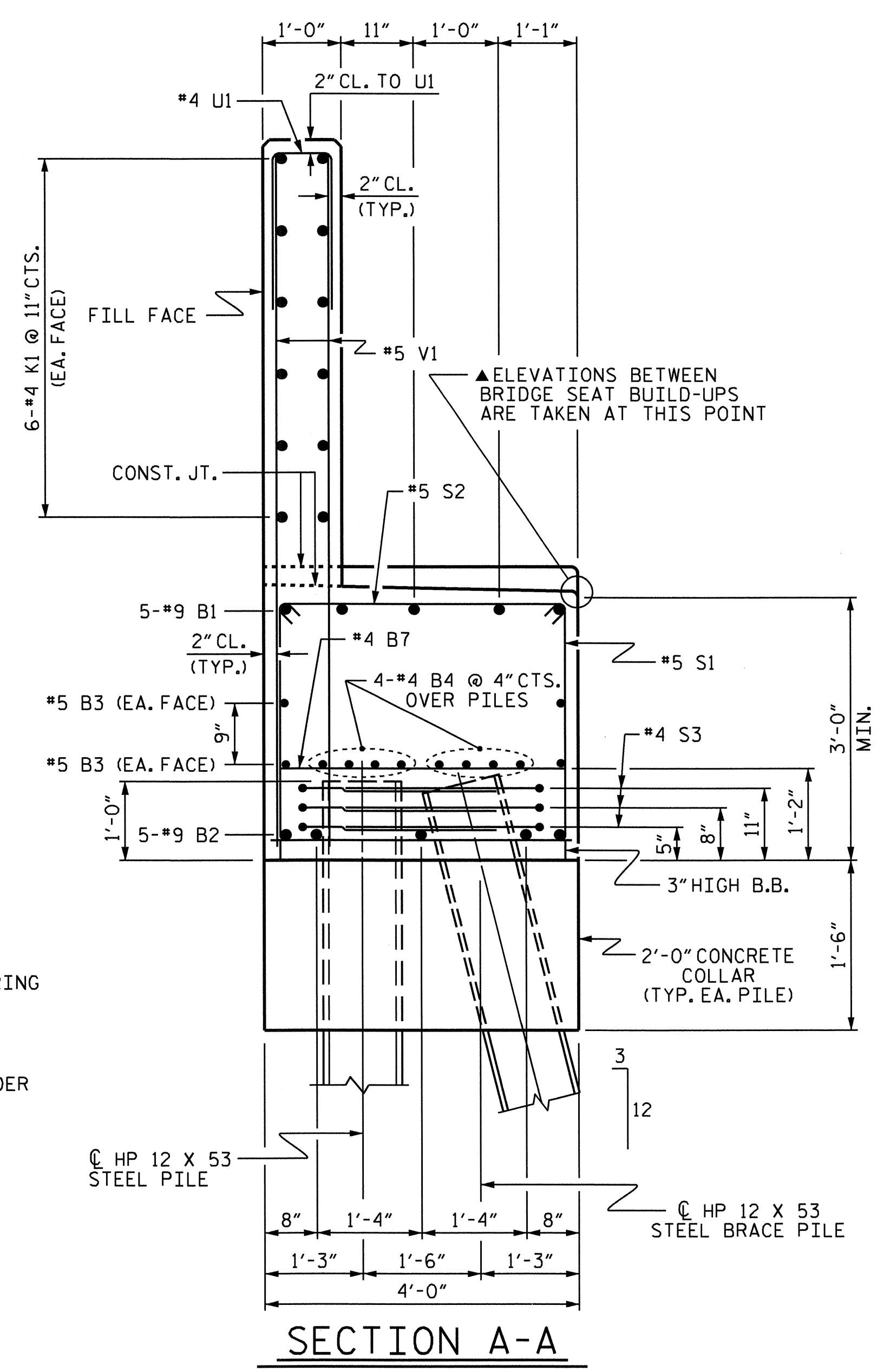
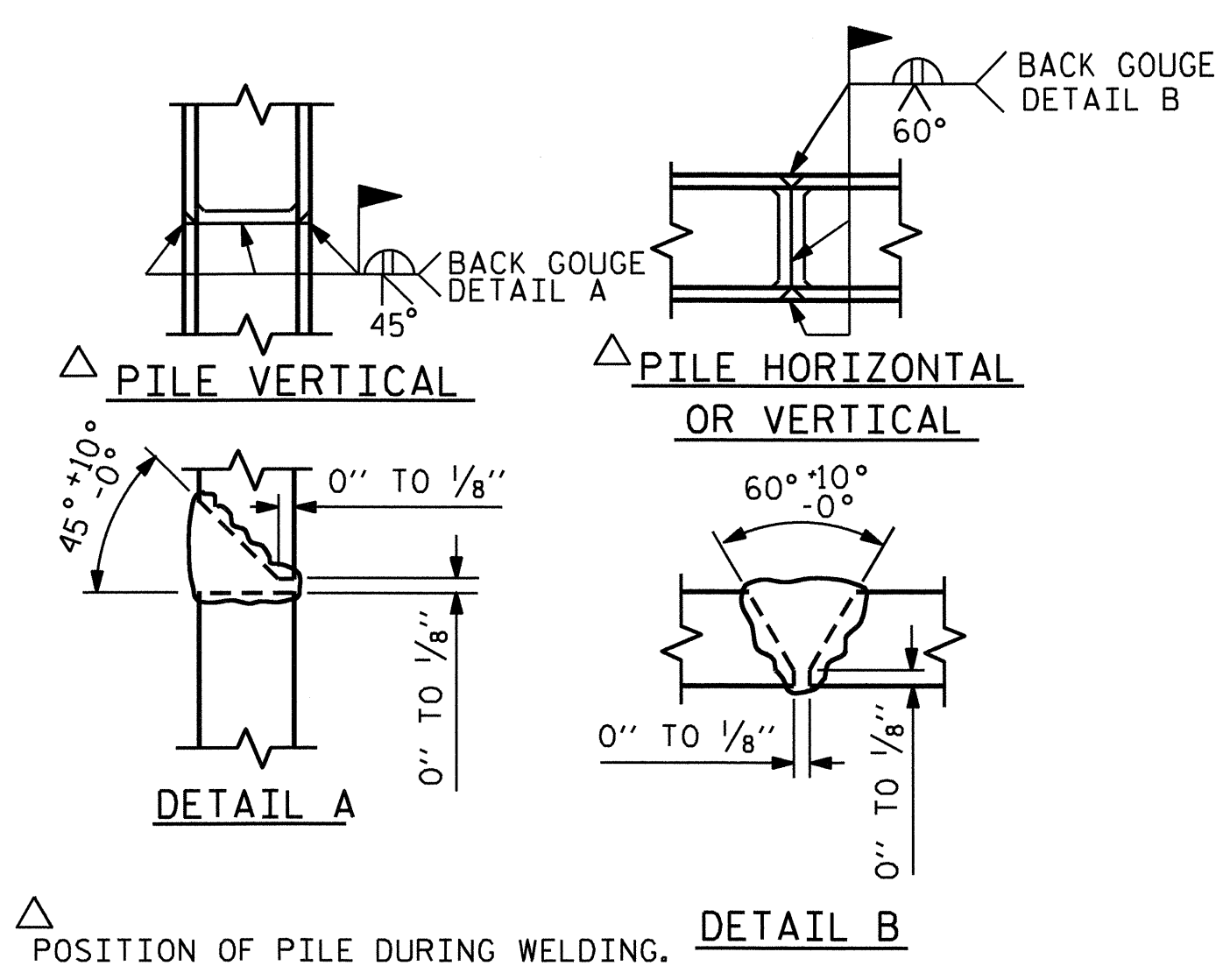
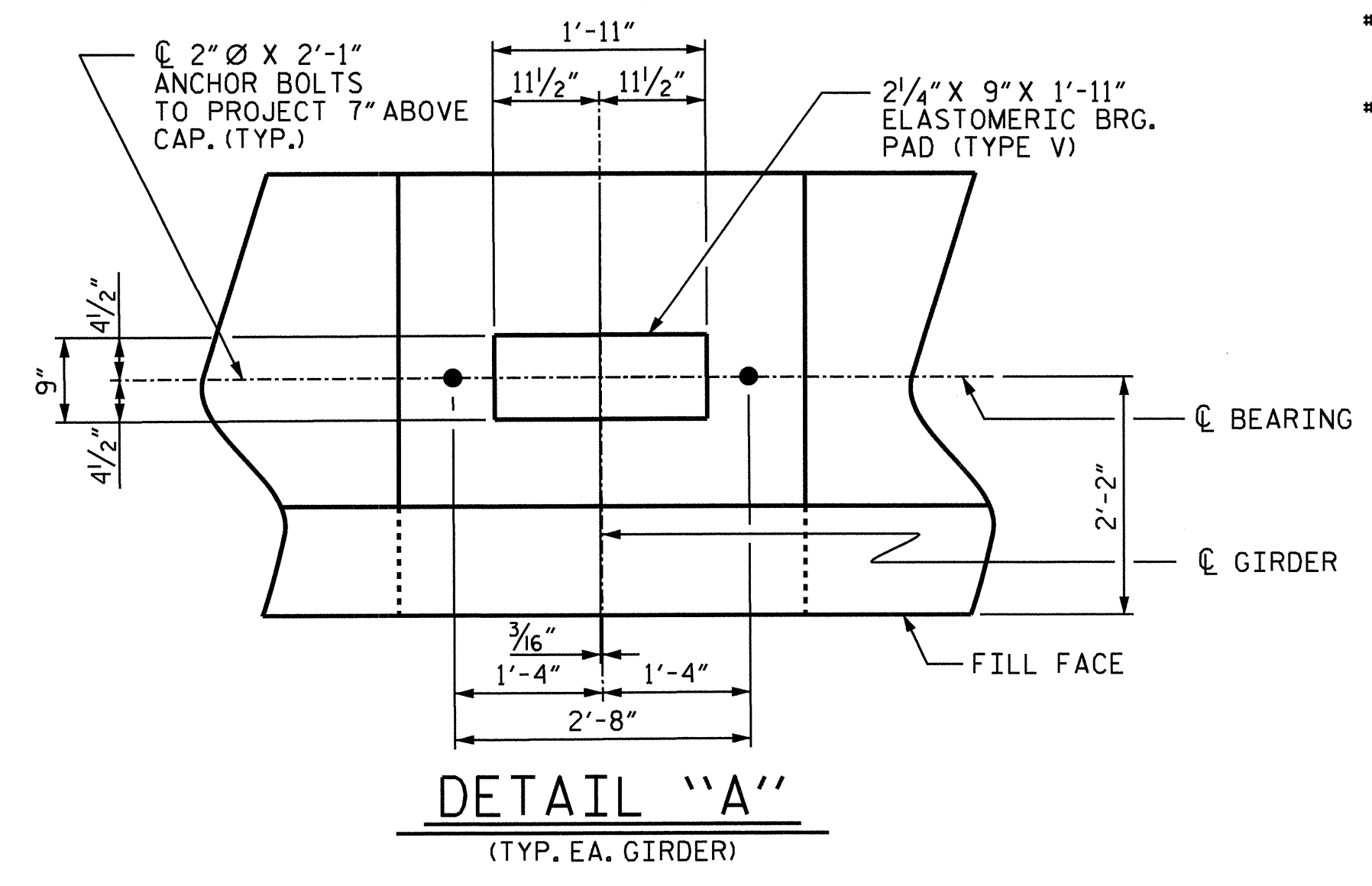
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETEIORATED AND LOST THEIR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

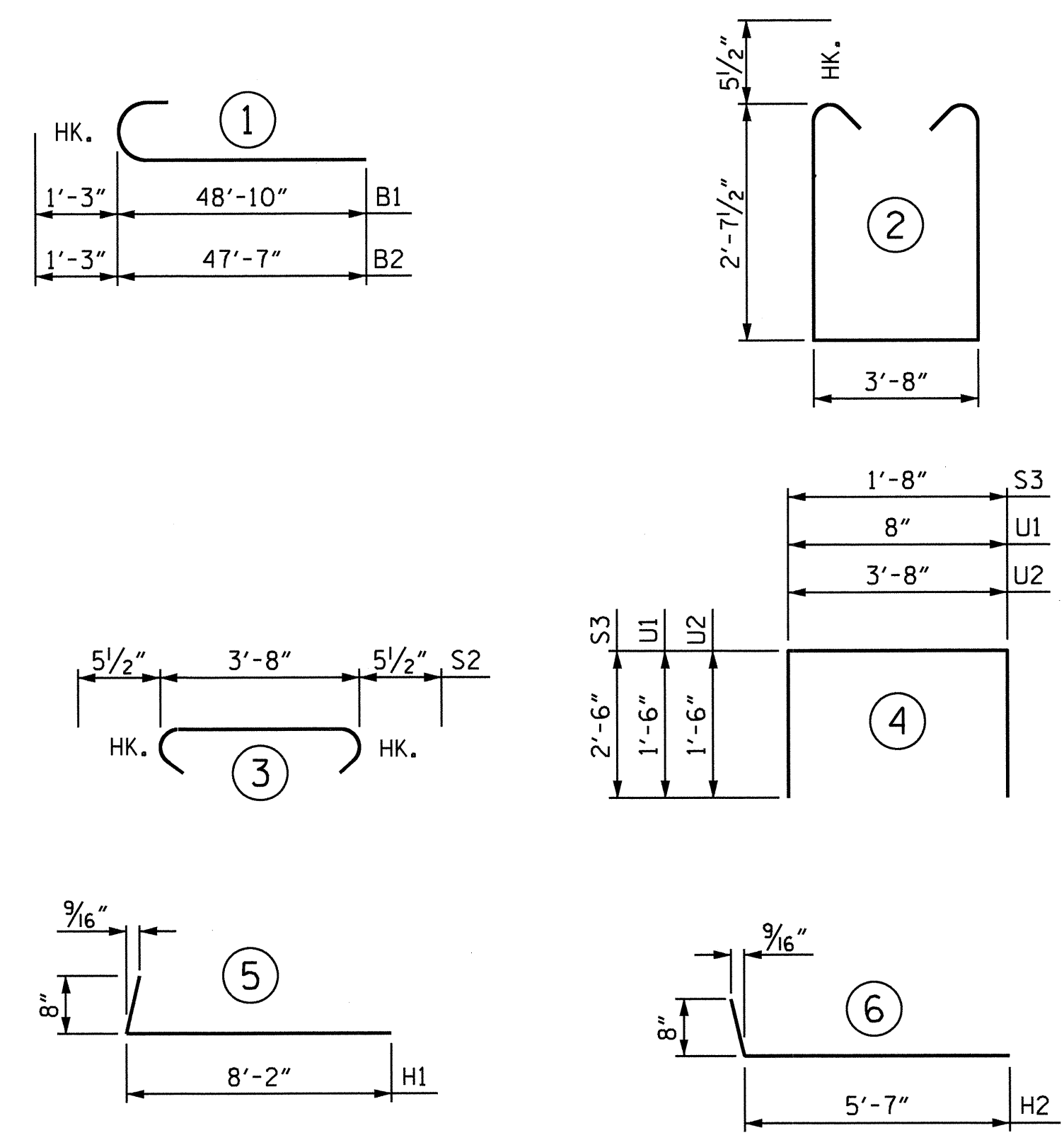
TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	50'-1"	1703
B2	10	#9	1	48'-10"	1660
B3	8	#5	STR	46'-0"	384
B4	32	#4	STR	24'-1"	515
B5	45	#4	STR	3'-3"	98
B6	5	#4	STR	8'-3"	28
B7	22	#4	STR	3'-8"	54
H1	24	#5	5	8'-10"	221
H2	26	#5	6	6'-3"	169
K1	48	#4	STR	24'-1"	772
K2	10	#4	STR	3'-11"	26
S1	110	#5	2	9'-10"	1128
S2	110	#5	3	4'-7"	526
S3	54	#4	4	6'-8"	240
U1	81	#4	4	3'-8"	198
U2	72	#4	4	6'-8"	320
V1	162	#5	STR	8'-4"	1408
V2	28	#5	STR	9'-11"	290
V3	22	#5	STR	10'-8"	245
REINFORCING STEEL					9,995 LBS.
CLASS A CONCRETE					
POUR #1 (CAP, LOWER WING & COLLARS)					48.4 C.Y.
POUR #2 (UPPER WING & BACKWALL)					22.3 C.Y.
TOTAL =					70.7 C.Y.
HP 12 X 53 STEEL PILES					
No. = 18					1440 LIN. FT.
PDA TESTING					2 EA.

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

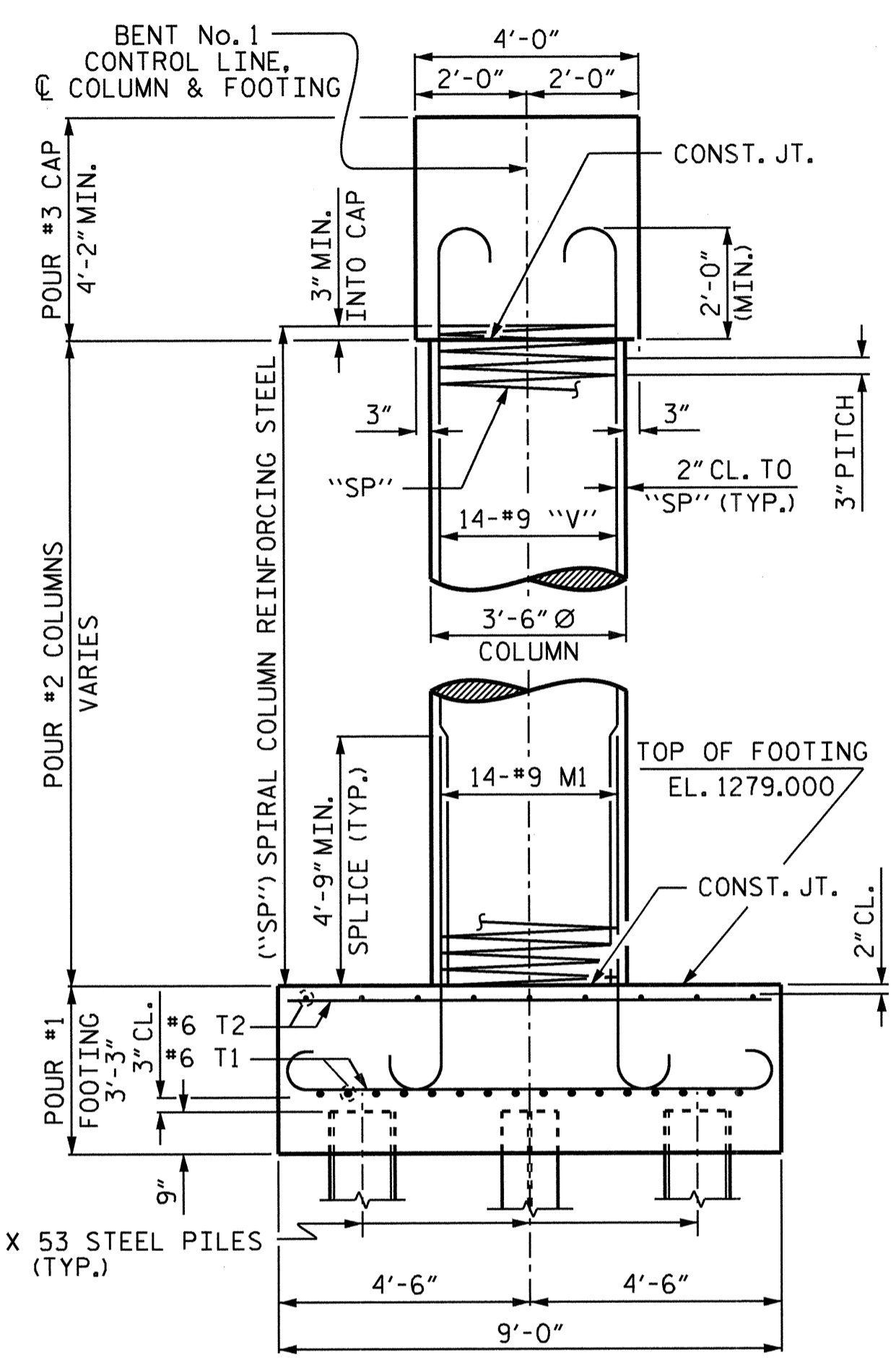
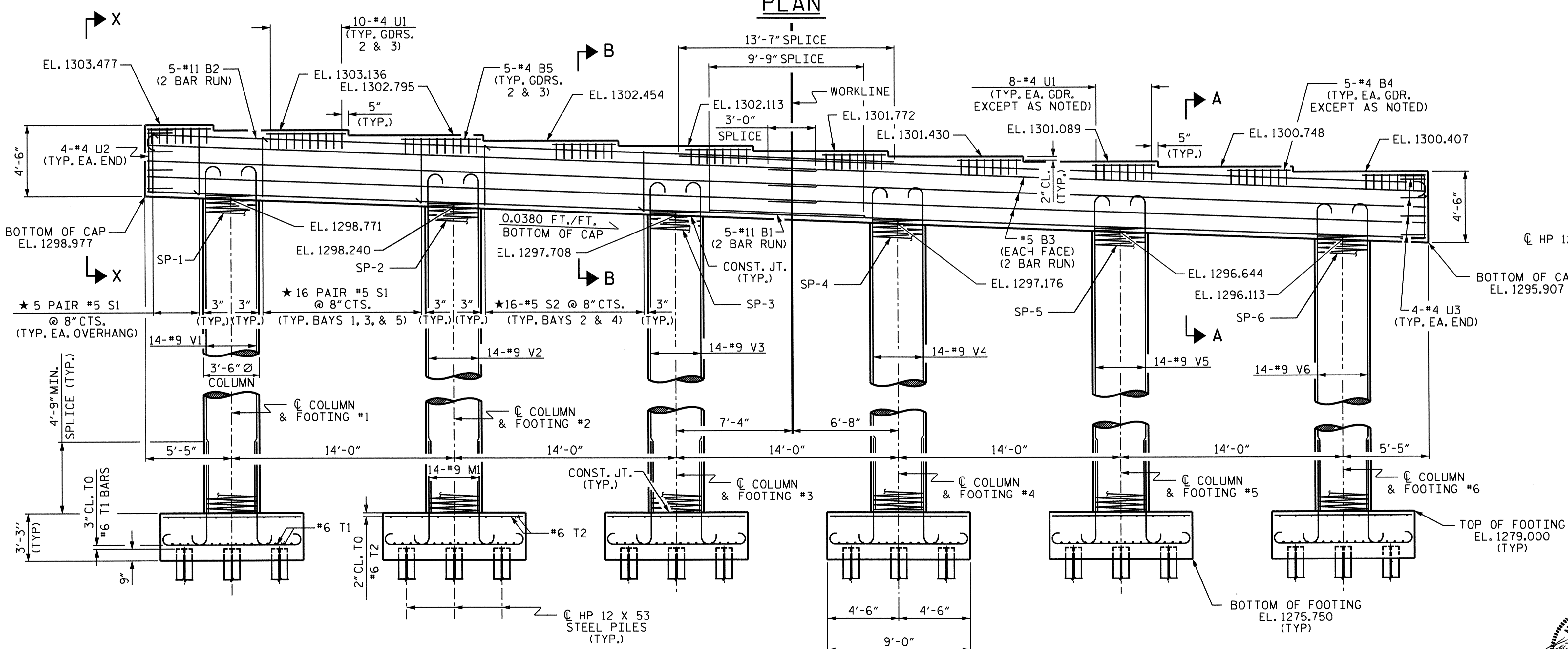
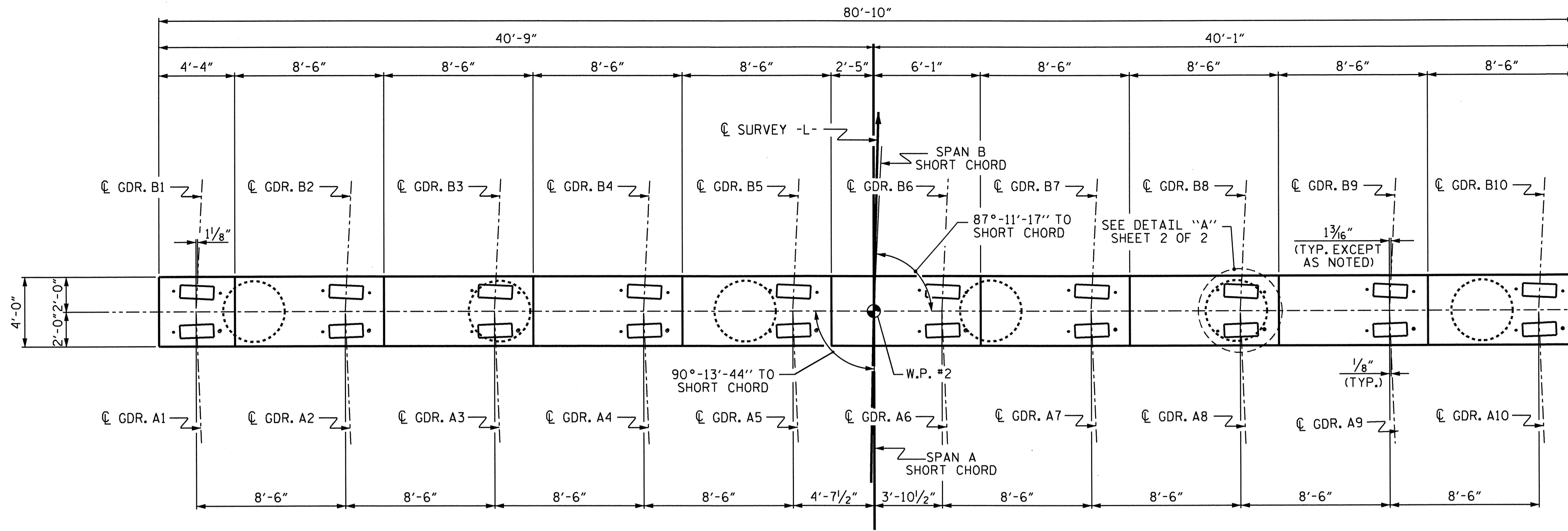
SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31	
1			3			TOTAL SHEETS 40	
2			4				

DRAWN BY: W.G. PRICE, II DATE: 6/2009
 CHECKED BY: D.G. ELY DATE: 8/2009

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR PILE SPLICE DETAILS, SEE END BENT No. 1, SHEET 3 OF 3.
- ★ INVERT ALTERNATE STIRRUPS AS SHOWN.



REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN & FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT No. 1**

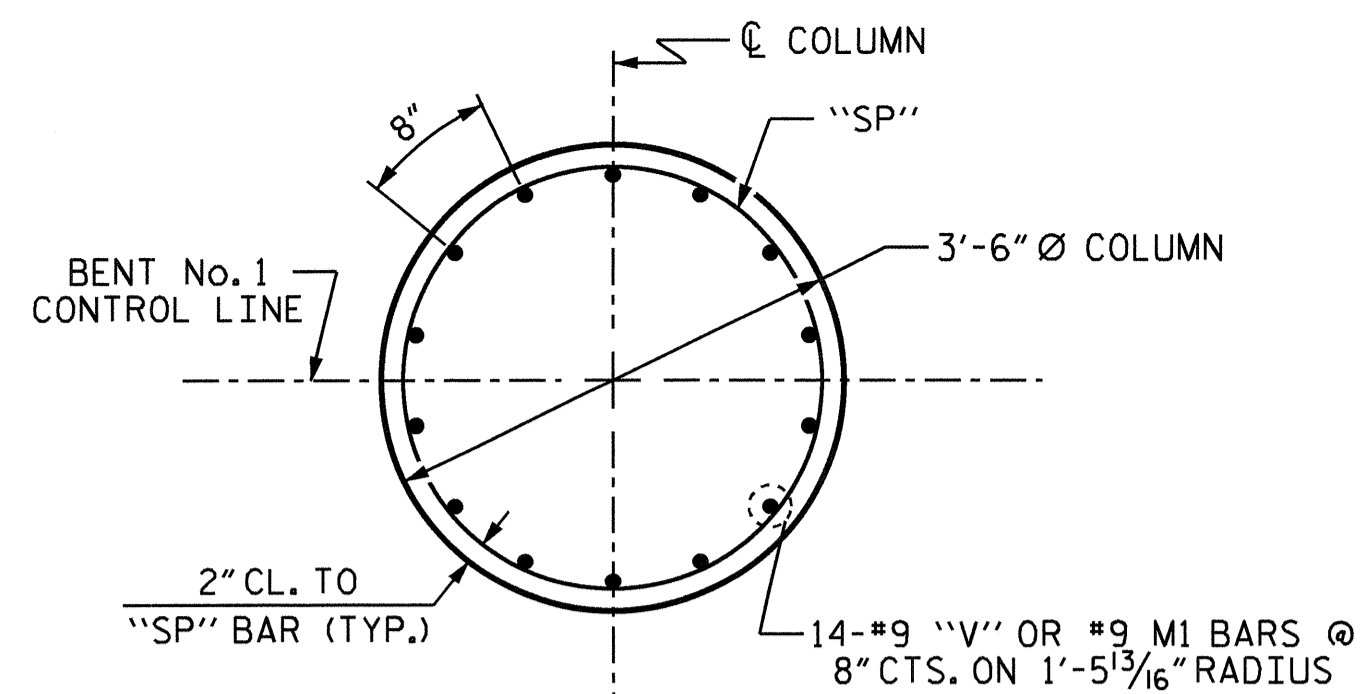
REVISIONS						SHEET NO. S-32
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

DRAWN BY : D. G. ELY DATE : 10/2009
 CHECKED BY : M. K. TOM DATE : 10/2009

20-MAR-2012 08:26
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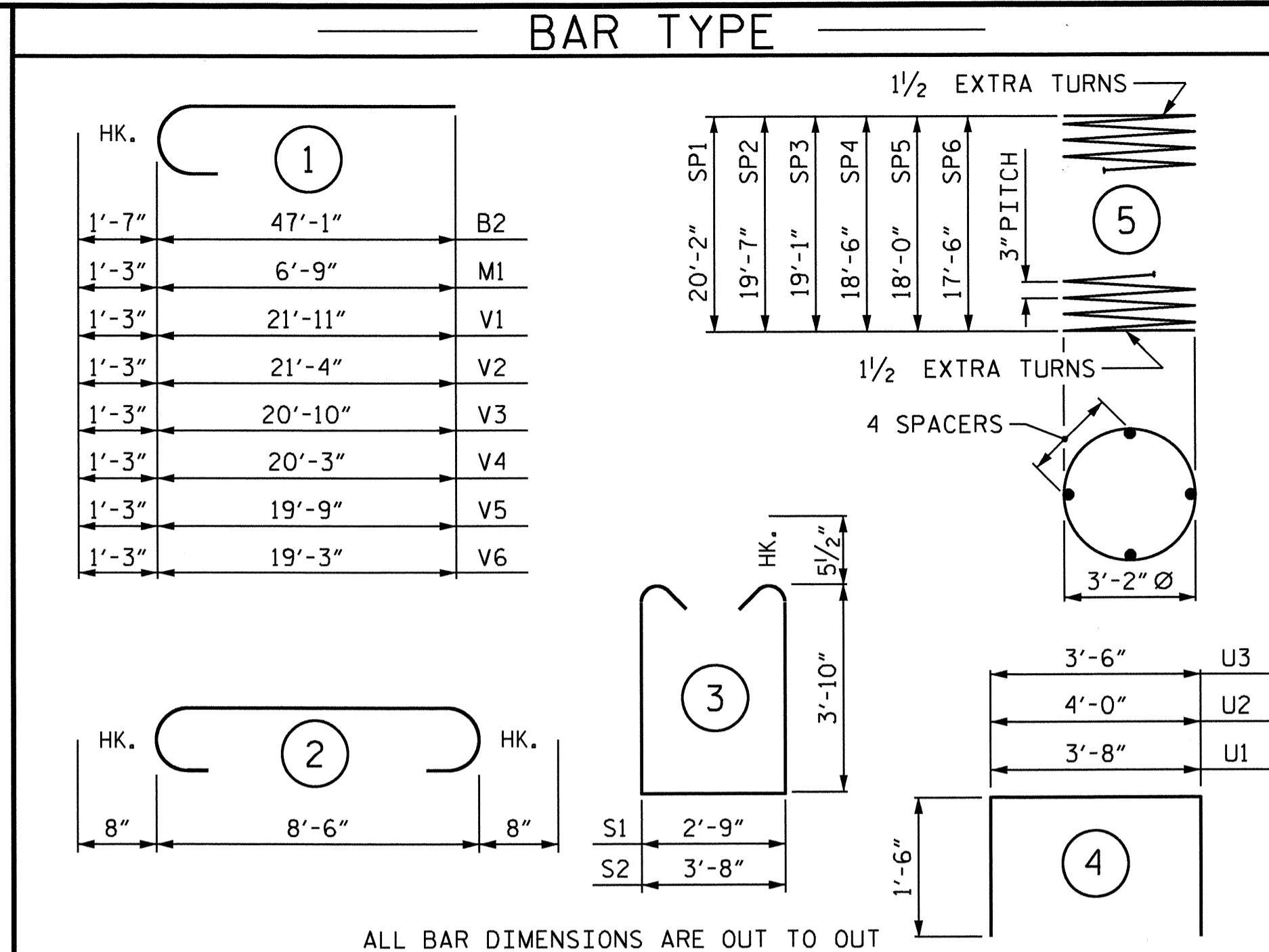
DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & FOOTING UNLESS OTHERWISE NOTED.

NC005



PLAN OF COLUMN

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN

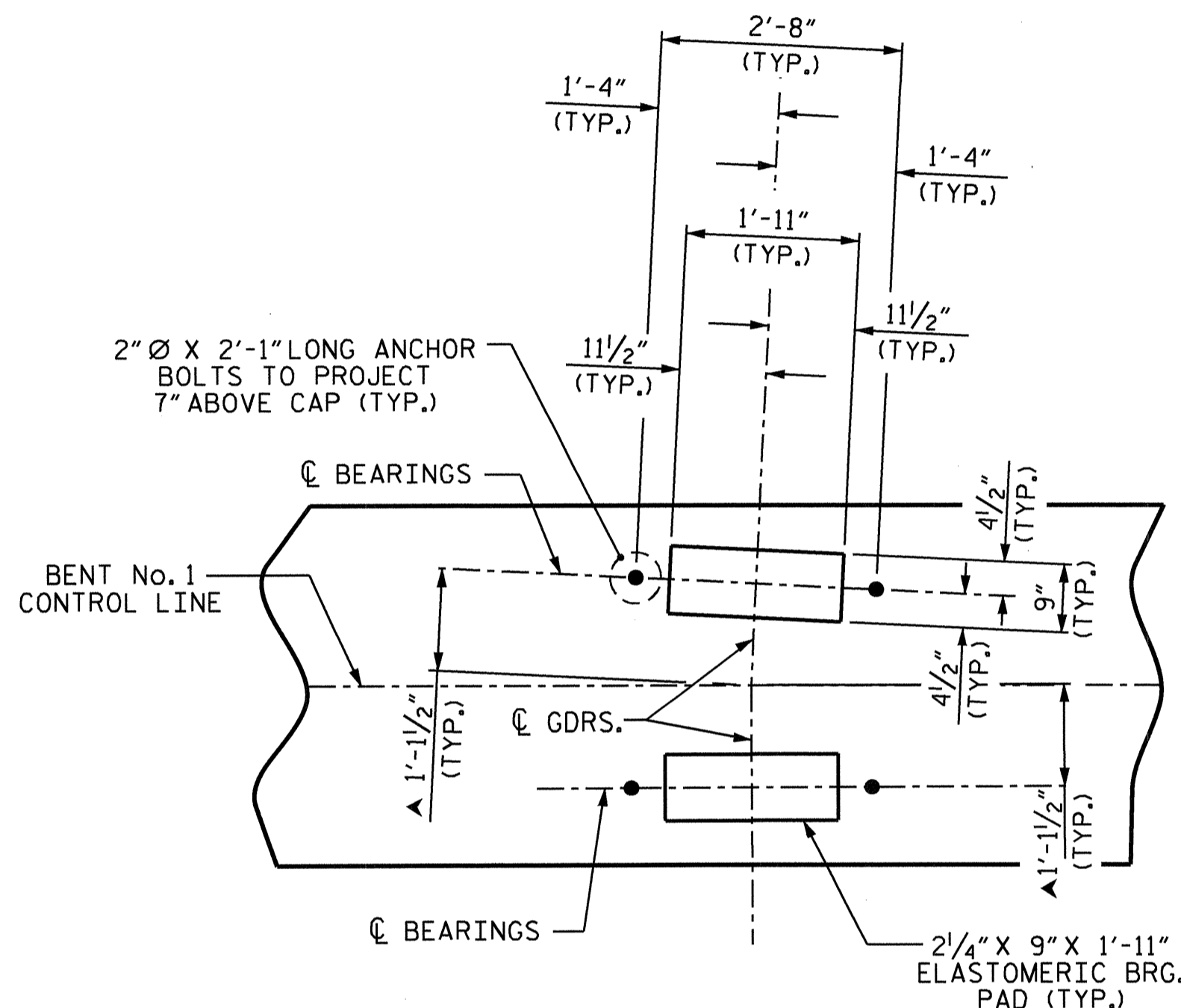


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

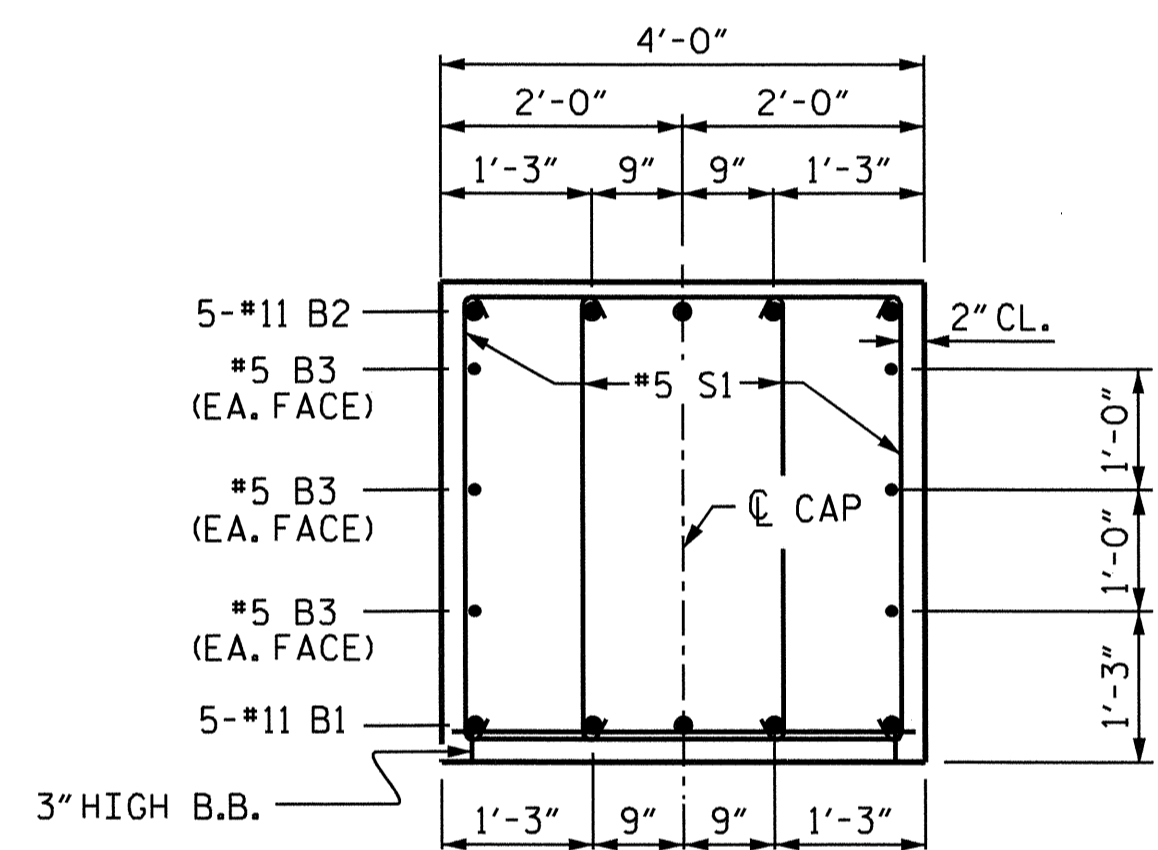
BENT No. 1

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	10	#11	STR	45'-2"	2400	SP-1	1	*	5	825'-0"	551
B2	10	#11	1	48'-8"	2586	SP-2	1	*	5	805'-4"	538
B3	12	#5	STR	41'-9"	523	SP-3	1	*	5	785'-9"	525
B4	40	#4	STR	4'-0"	107	SP-4	1	*	5	756'-3"	505
B5	10	#4	STR	5'-0"	33	SP-5	1	*	5	736'-7"	492
						SP-6	1	*	5	717'-0"	479
M1	84	#9	1	8'-0"	2285	SPIRAL COLUMN REINFORCING STEEL				3090 LBS.	
S1	116	#5	3	11'-4"	1371	* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OF D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
S2	32	#5	3	12'-3"	409	CLASS A CONCRETE BREAKDOWN					
T1	216	#6	2	9'-10"	3190	POUR #1 (FOOTINGS)				58.5 C.Y.	
T2	108	#6	STR	8'-6"	1379	POUR #2 (COLUMNS)				39.4 C.Y.	
U1	84	#4	4	6'-8"	374	POUR #3 (CAP)				52.9 C.Y.	
U2	8	#4	4	7'-0"	37	TOTAL CLASS A CONCRETE				150.8 C.Y.	
U3	8	#4	4	6'-6"	35	HP 12 X 53 STEEL PILES					
V1	14	#9	1	23'-2"	1103	No. = 42				2520 LIN. FT.	
V2	14	#9	1	22'-7"	1075	PDA TESTING				2 EA.	
V3	14	#9	1	22'-1"	1051						
V4	14	#9	1	21'-6"	1023						
V5	14	#9	1	21'-0"	1000						
V6	14	#9	1	20'-6"	976						
REINFORCING STEEL				20959							

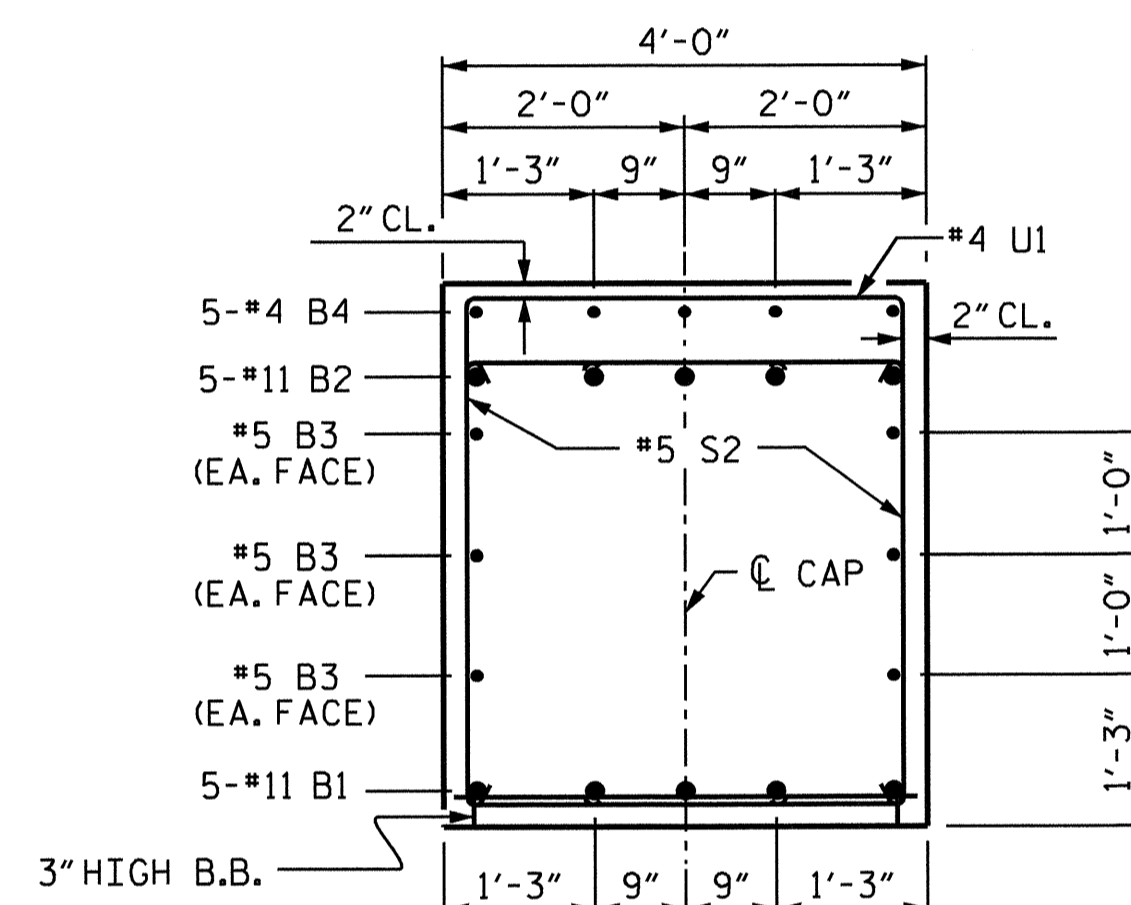


DETAIL "A"

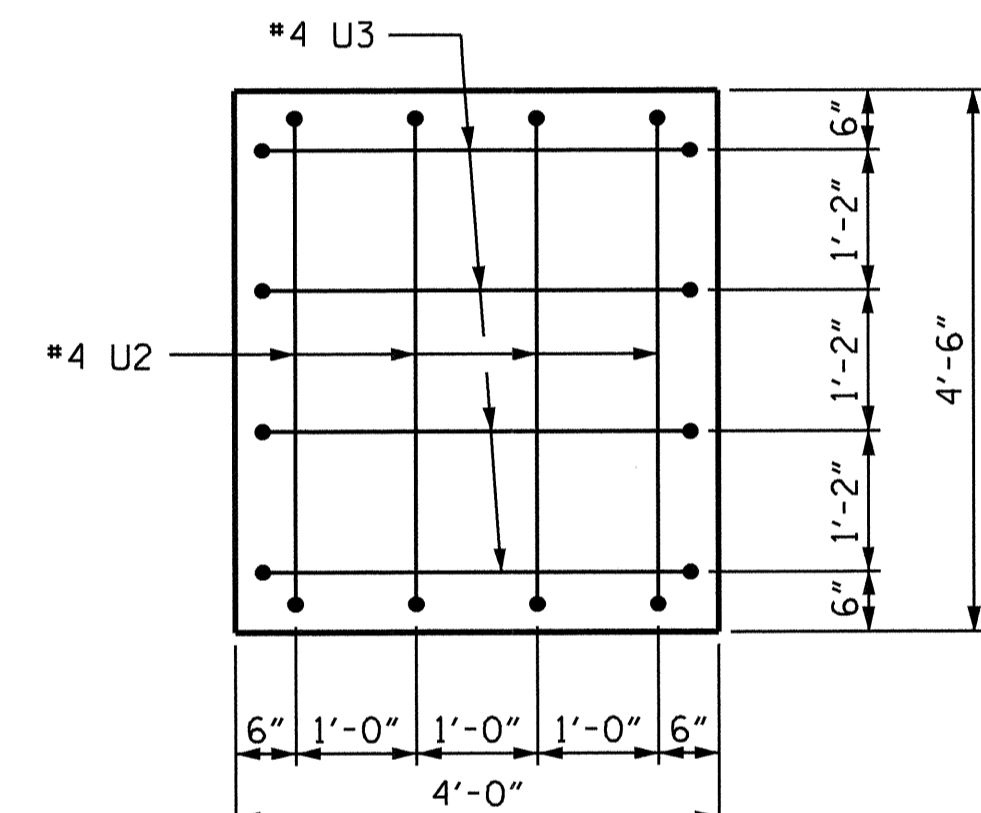
MEASURED ALONG GIRDERS (TYP. EA. GIRDER)



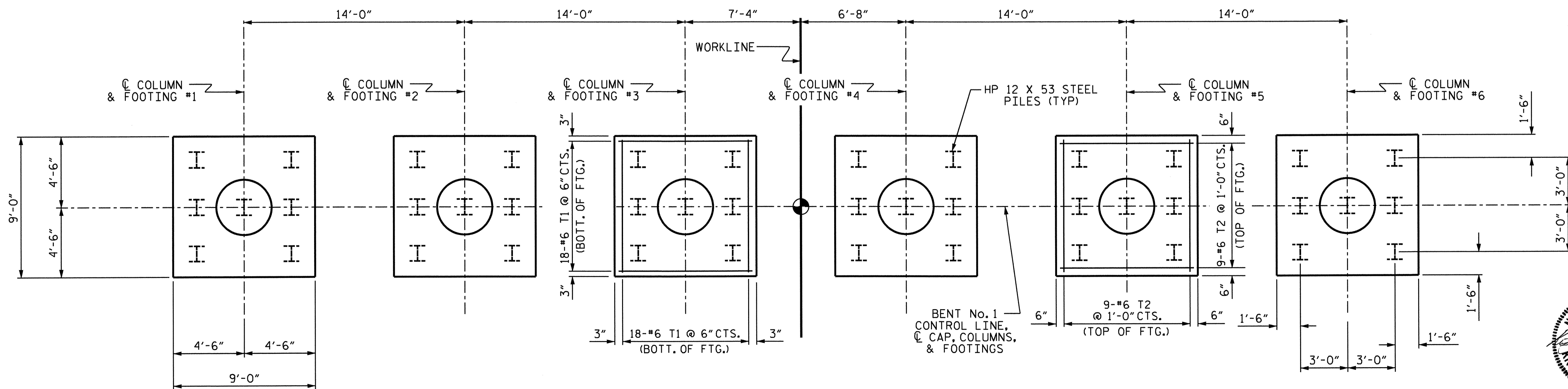
SECTION A-A



SECTION B-B



SECTION X-X



PLAN OF FOOTING

PILE PLACEMENT, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

SHEET 2 OF 2

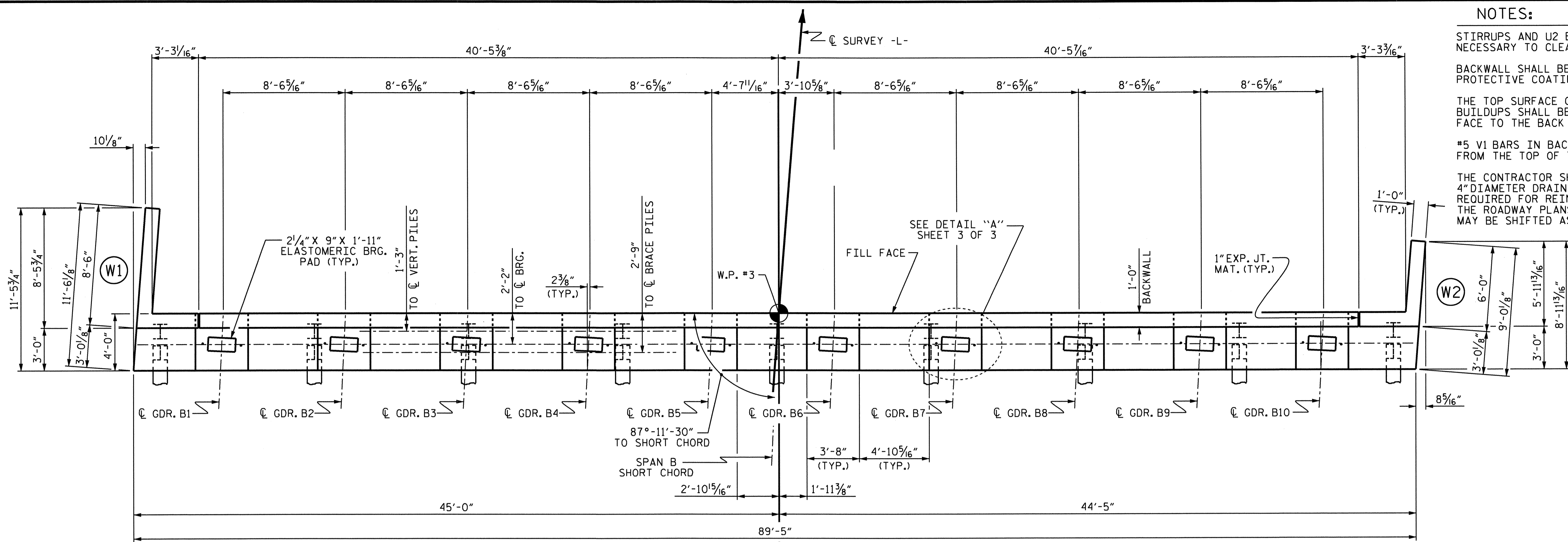
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 1



DRAWN BY: D. G. ELY DATE: 10/2009
 CHECKED BY: M. K. TOM DATE: 10/2009

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	40
2			4				



PLAN

NOTES:

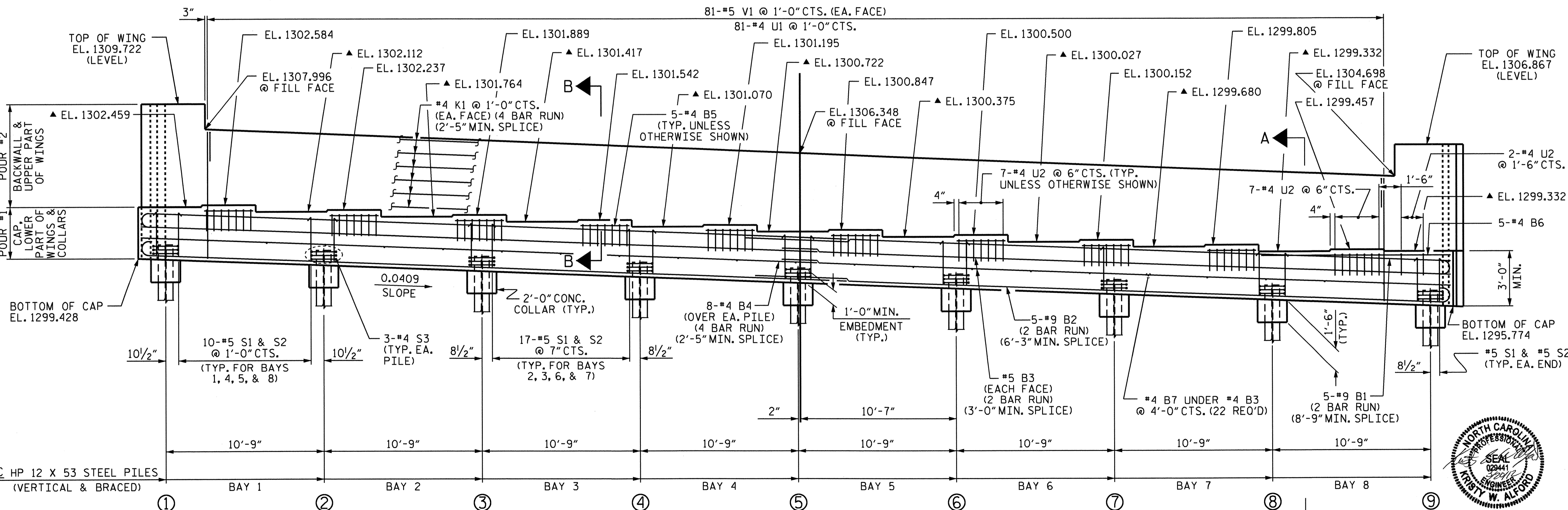
STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

#5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER 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.



ELEVATION

TOP OF PILE ELEVATIONS	
① 1300.379	⑥ 1298.183
② 1299.940	⑦ 1297.744
③ 1299.501	⑧ 1297.304
④ 1299.062	⑨ 1296.865
⑤ 1298.622	

▲ FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE "SECTION A-A," SHEET 3 OF 3.

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

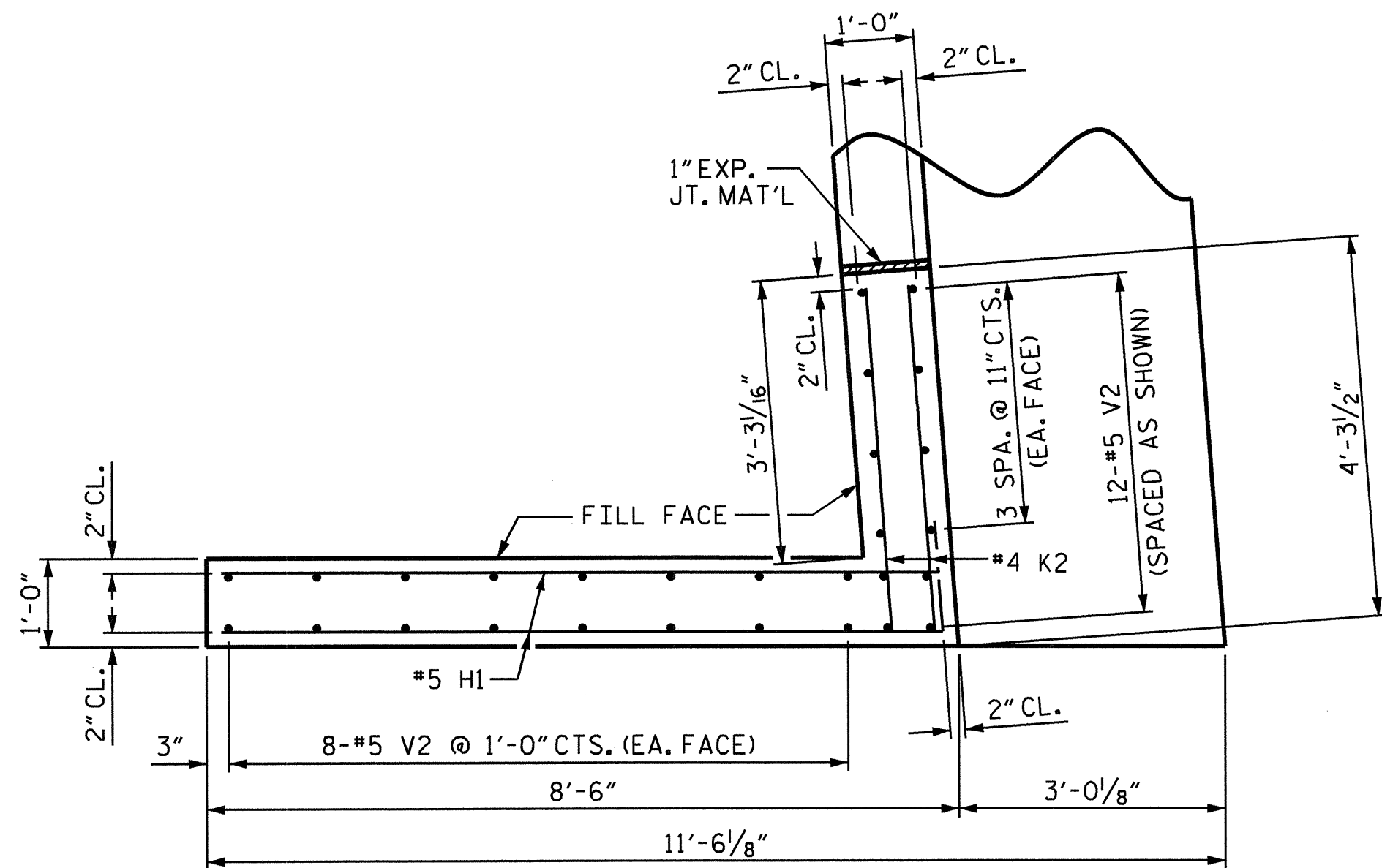
**SUBSTRUCTURE
 END BENT No. 2**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
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2			4				

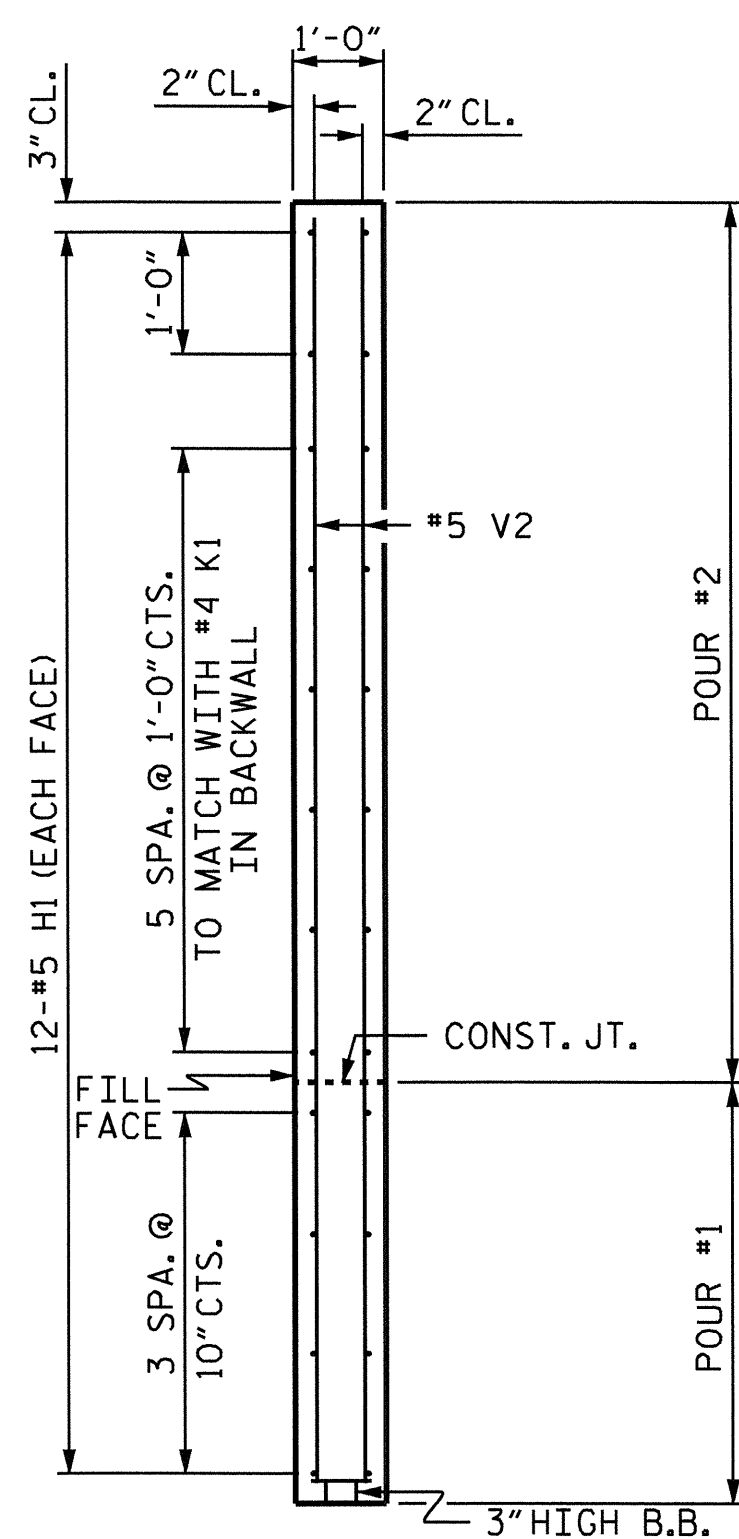
DRAWN BY: W.G. PRICE, II DATE: 7/2009
 CHECKED BY: D.G. ELY DATE: 8/2009

20-MAR-2012 08:27
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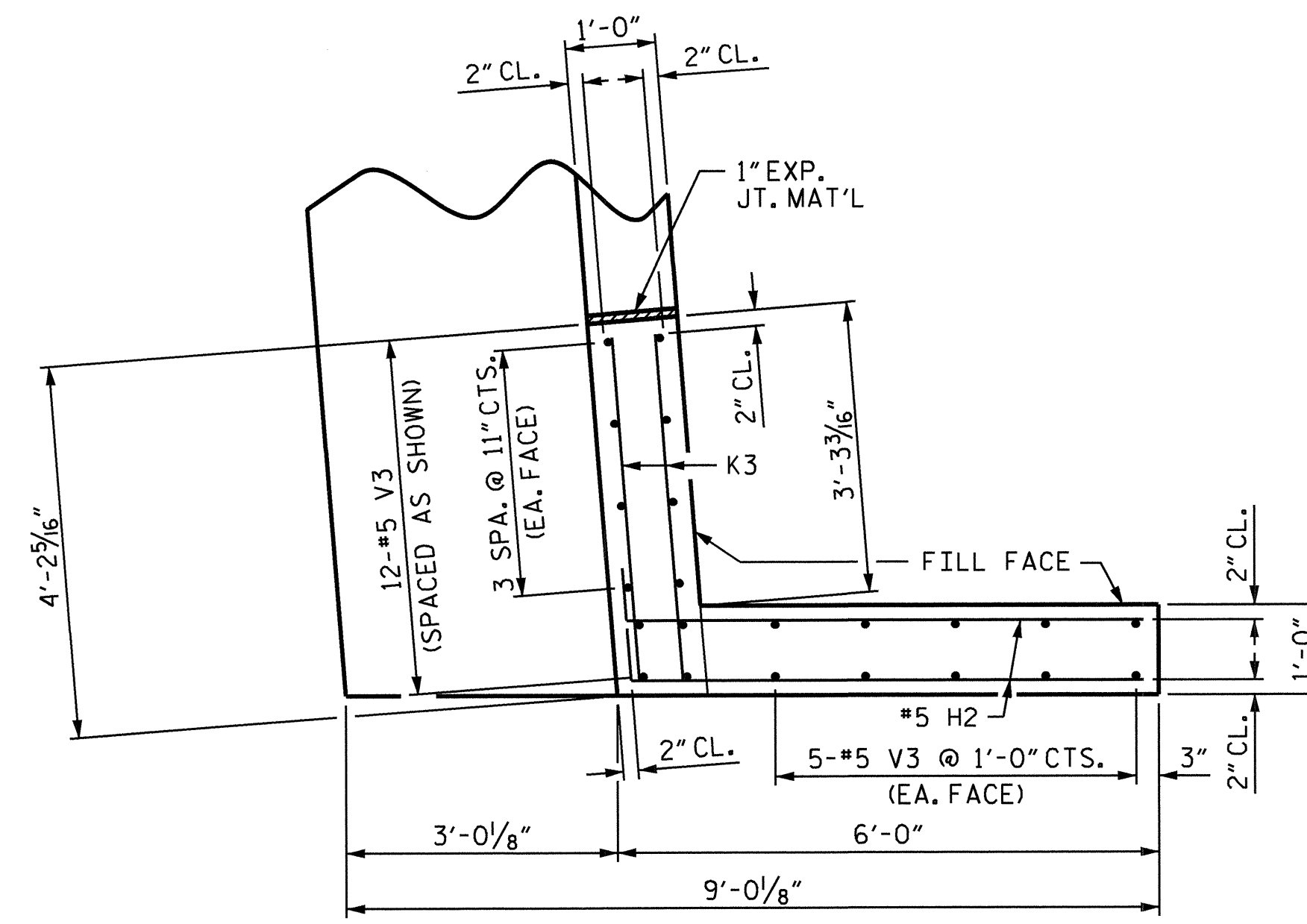




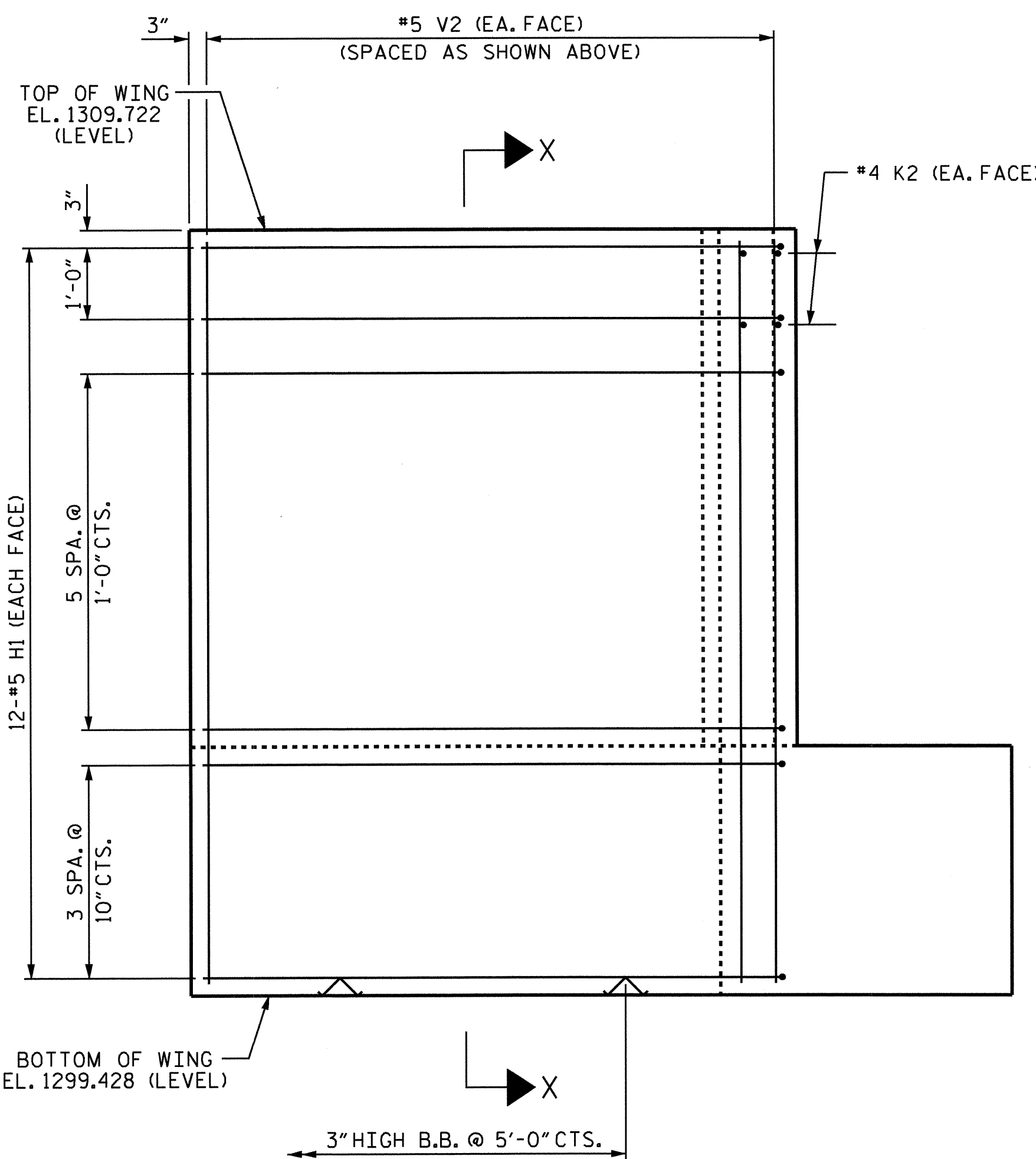
PLAN OF WING (W1)



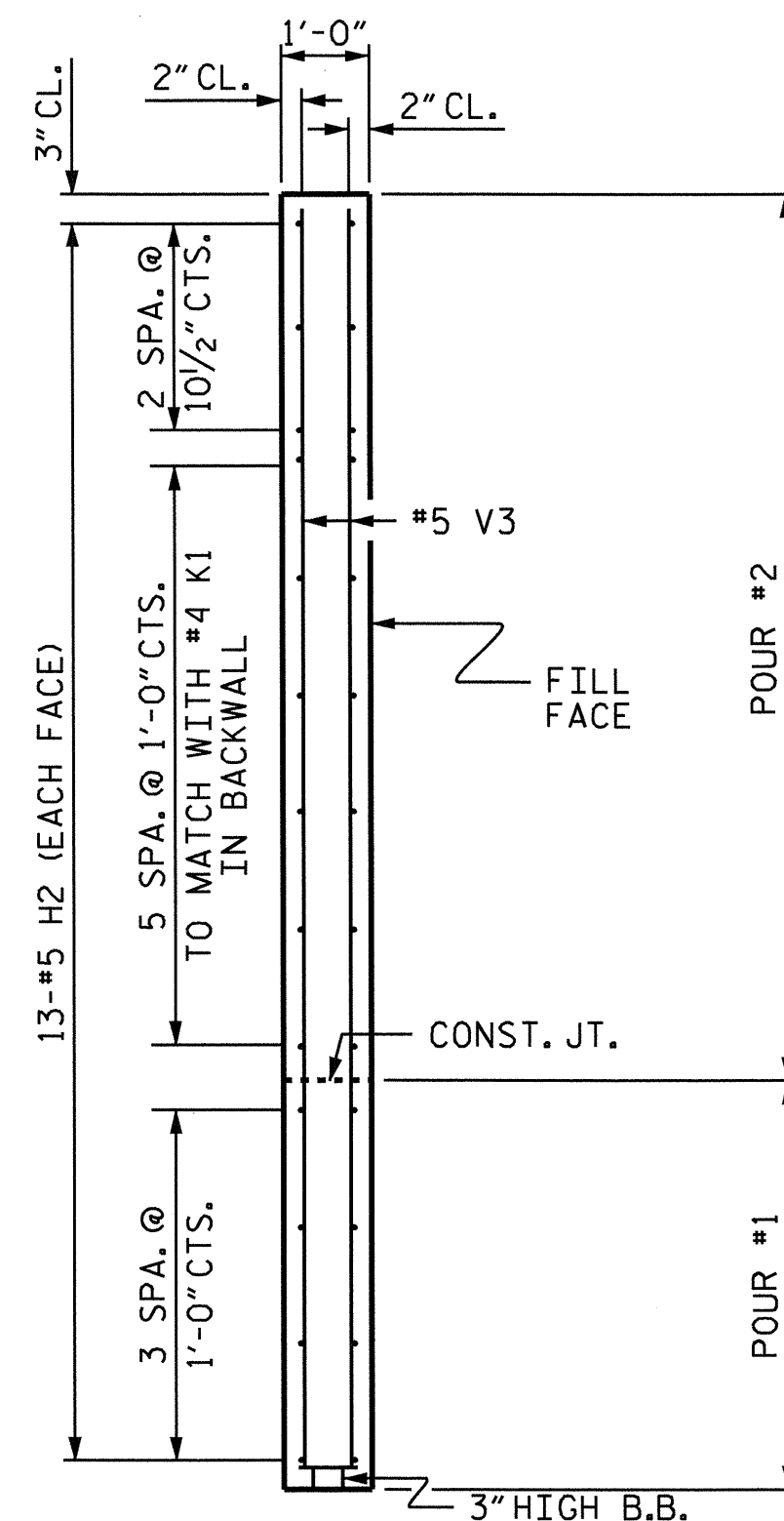
SECTION X-X



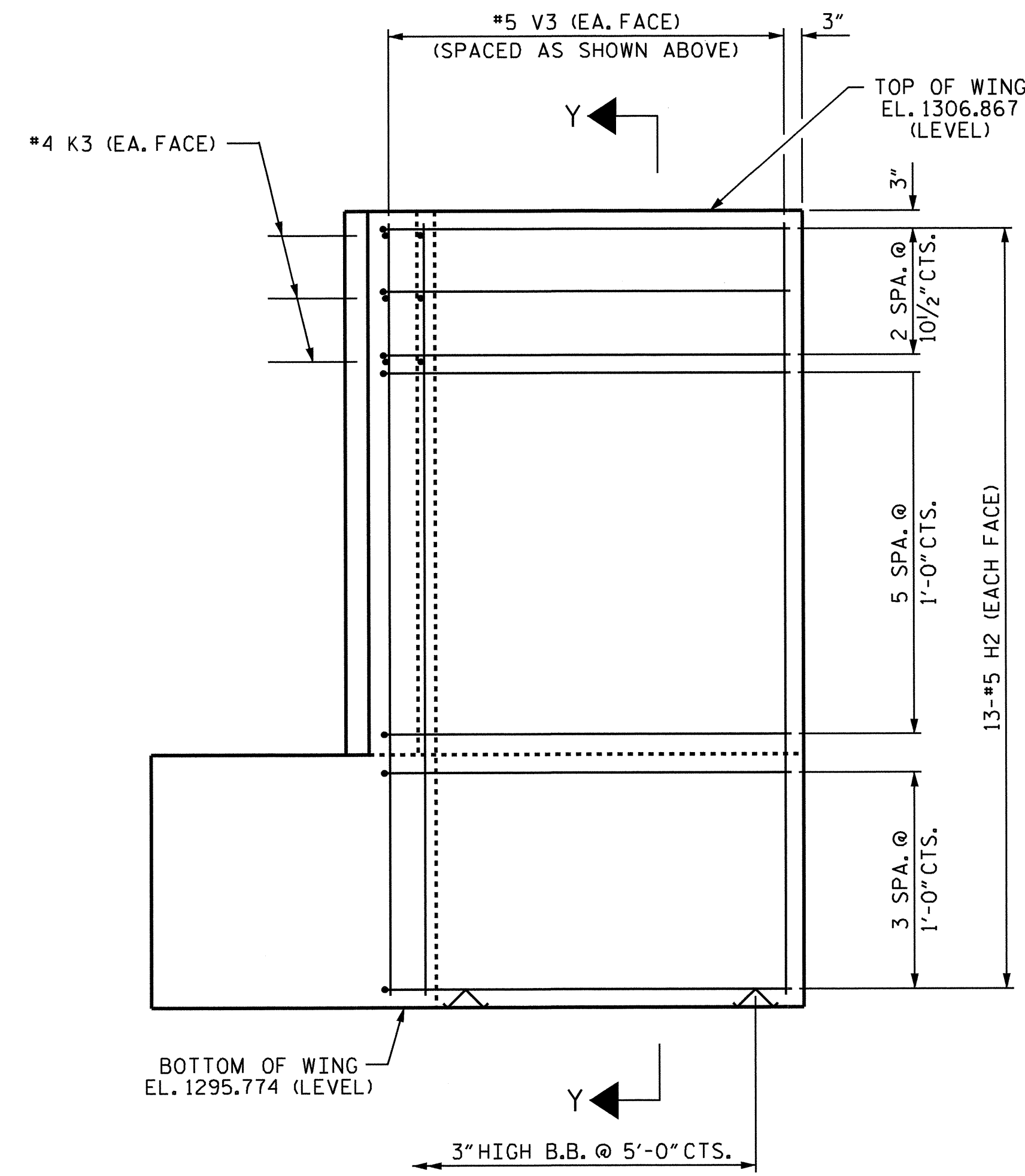
PLAN OF WING (W2)



ELEVATION OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W2)



PROJECT NO. U-2211B
 CALDWELL COUNTY
 STATION: 33+87.18 -L-

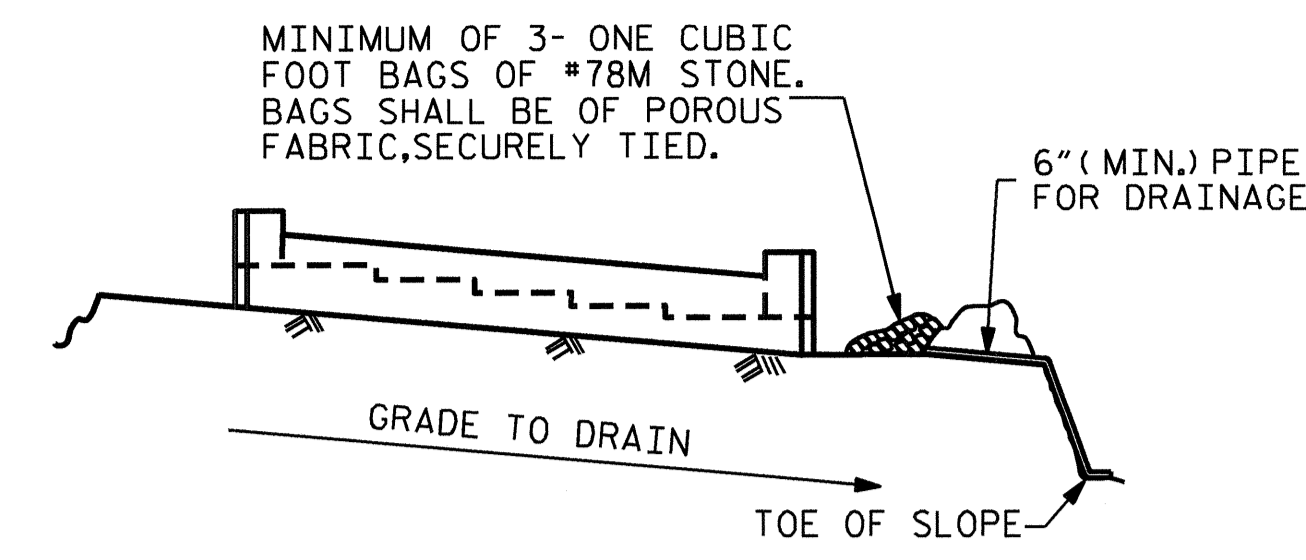
SHEET 2 OF 3

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

DRAWN BY: W.G. PRICE, II DATE: 7/2009
 CHECKED BY: D.G. ELY DATE: 8/2009

20-MAR-2012 08:27
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35	
1			3			TOTAL SHEETS	
2			4			40	

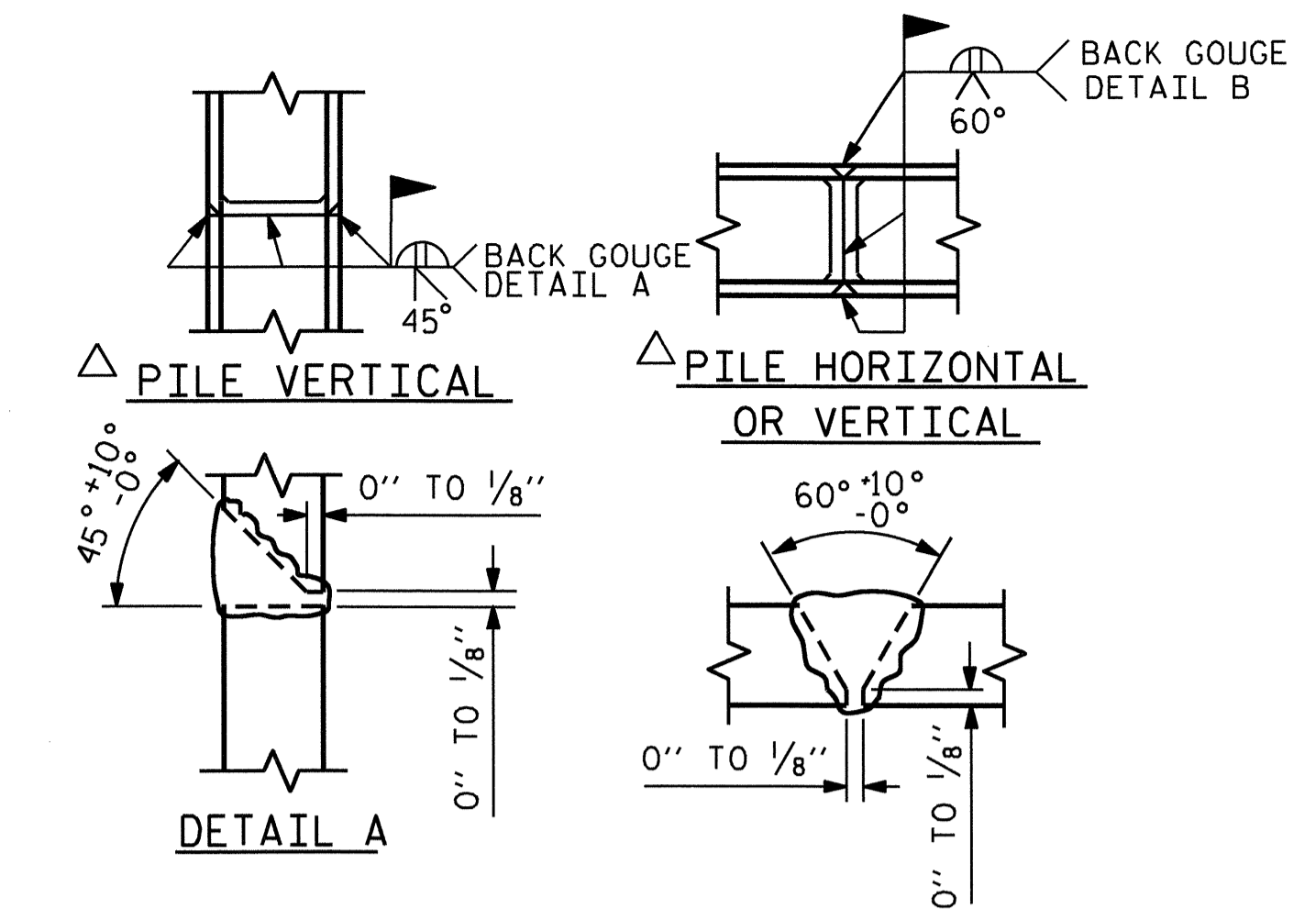


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

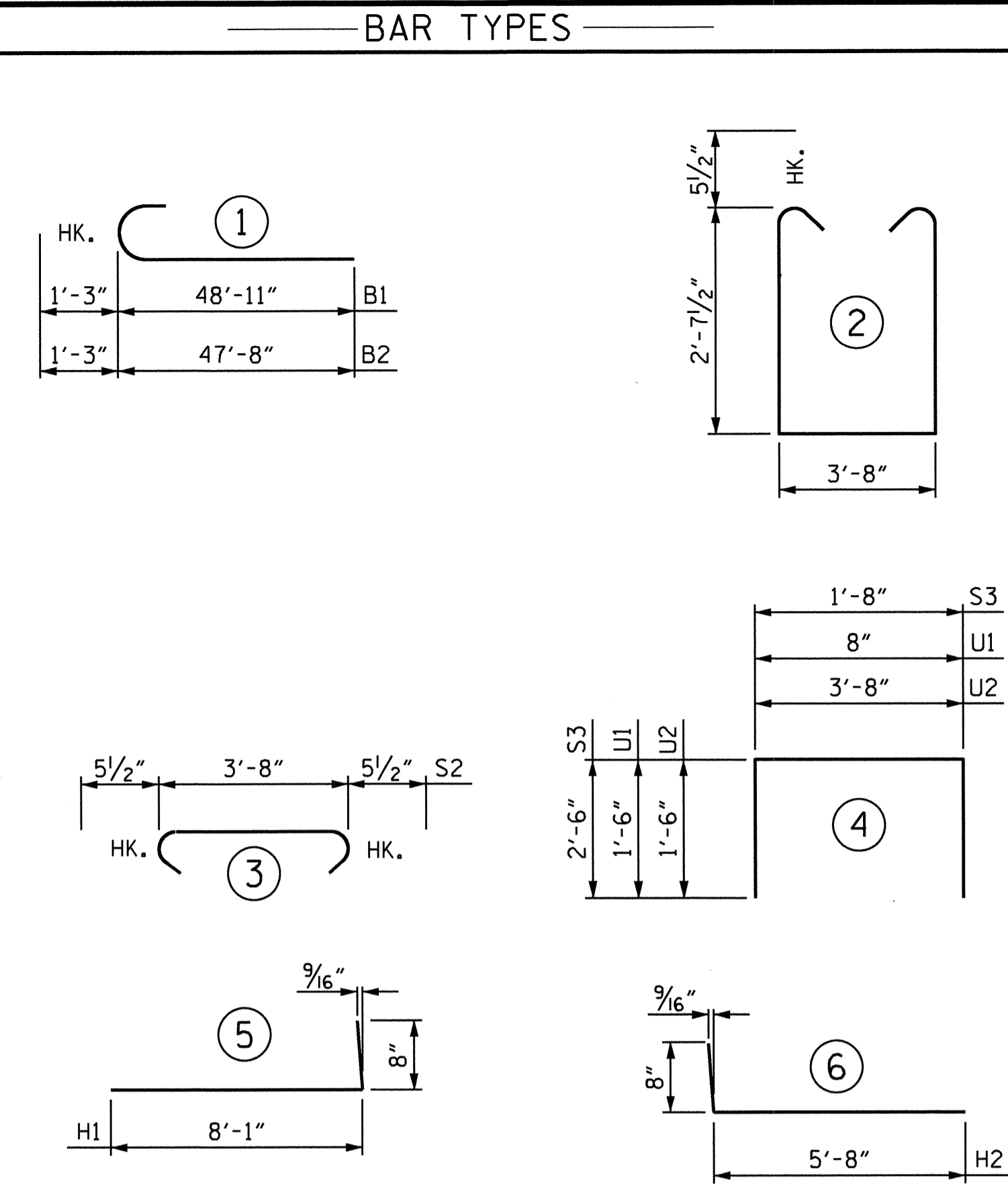
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

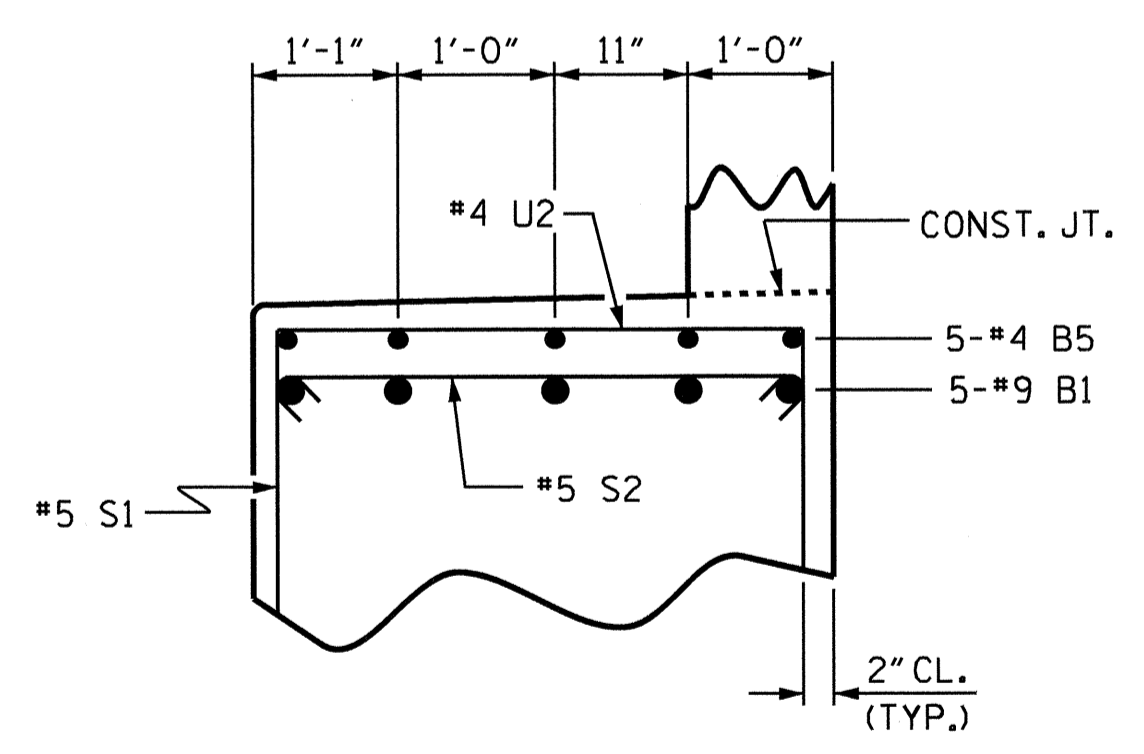
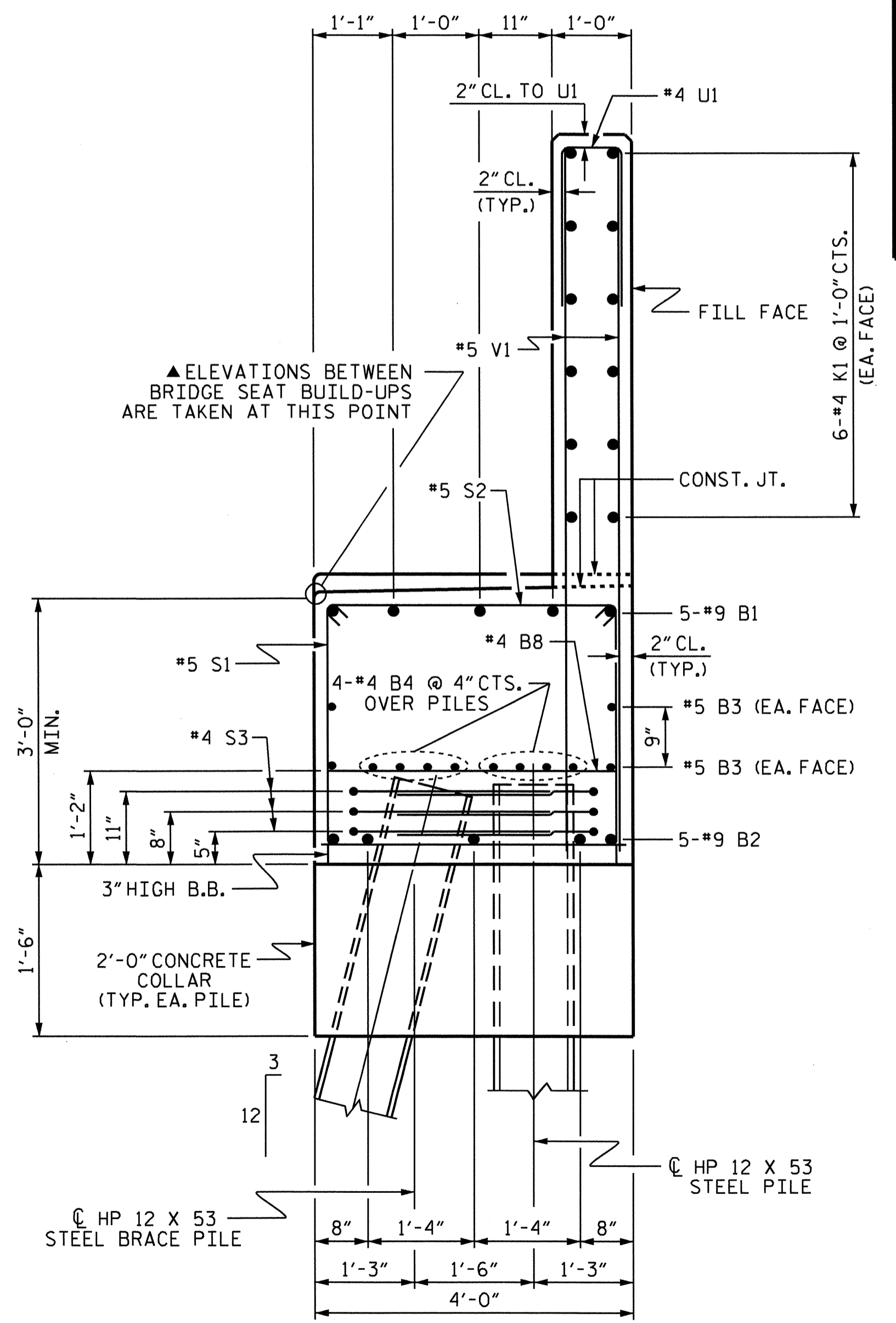
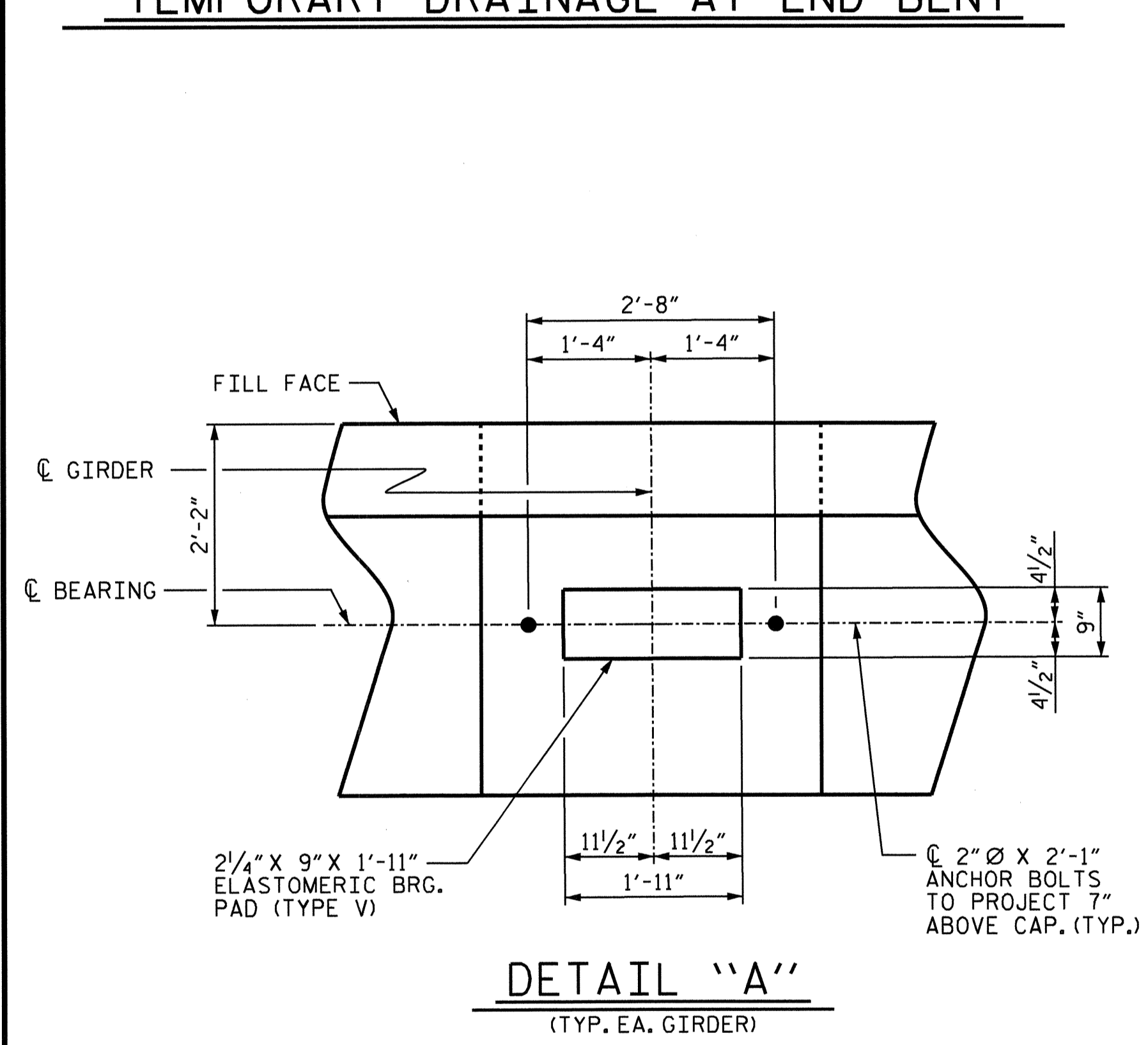


POSITION OF PILE DURING WELDING. **PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT No. 2					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	50'-2"	1706
B2	10	#9	1	48'-11"	1663
B3	8	#5	STR	46'-1"	385
B4	32	#4	STR	24'-1"	515
B5	45	#4	STR	3'-4"	100
B6	5	#4	STR	8'-11"	27
B7	22	#4	STR	3'-8"	54
H1	24	#5	5	8'-9"	219
H2	26	#5	6	6'-4"	172
K1	48	#4	STR	24'-1"	772
K2	4	#4	STR	3'-11"	10
K3	6	#4	STR	3'-10"	15
S1	110	#5	2	9'-10"	1128
S2	110	#5	3	4'-7"	526
S3	54	#4	4	6'-8"	240
U1	81	#4	4	3'-8"	198
U2	72	#4	4	6'-8"	321
V1	162	#5	STR	8'-4"	1408
V2	28	#5	STR	9'-11"	290
V3	22	#5	STR	10'-8"	245
REINFORCING STEEL				9,994 LBS.	
CLASS A CONCRETE					
POUR #1 (CAP, LOWER WING & COLLARS)				48.6 C.Y.	
POUR #2 (UPPER WING & BACKWALL)				22.2 C.Y.	
TOTAL =				70.8 C.Y.	
HP 12 X 53 STEEL PILES					
No. = 18				1260 LIN. FT.	
PDA TESTING (PER PILE)				2 EA.	



PROJECT NO. U-2211B

CALDWELL COUNTY

STATION: 33+87.18 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

DRAWN BY: W.G. PRICE, II DATE: 7/2009

CHECKED BY: D.G. ELY DATE: 8/2009

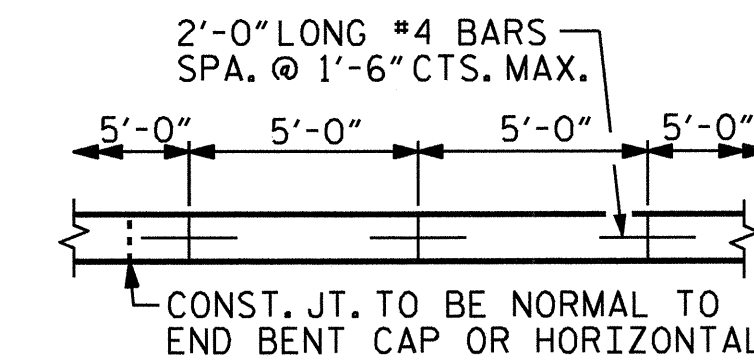
REVISIONS						SHEET NO. S-36
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

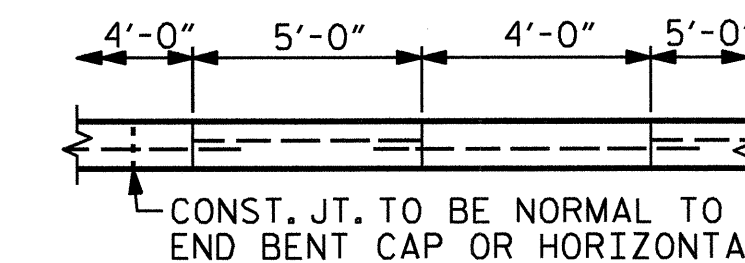
SLOPE PROTECTION

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

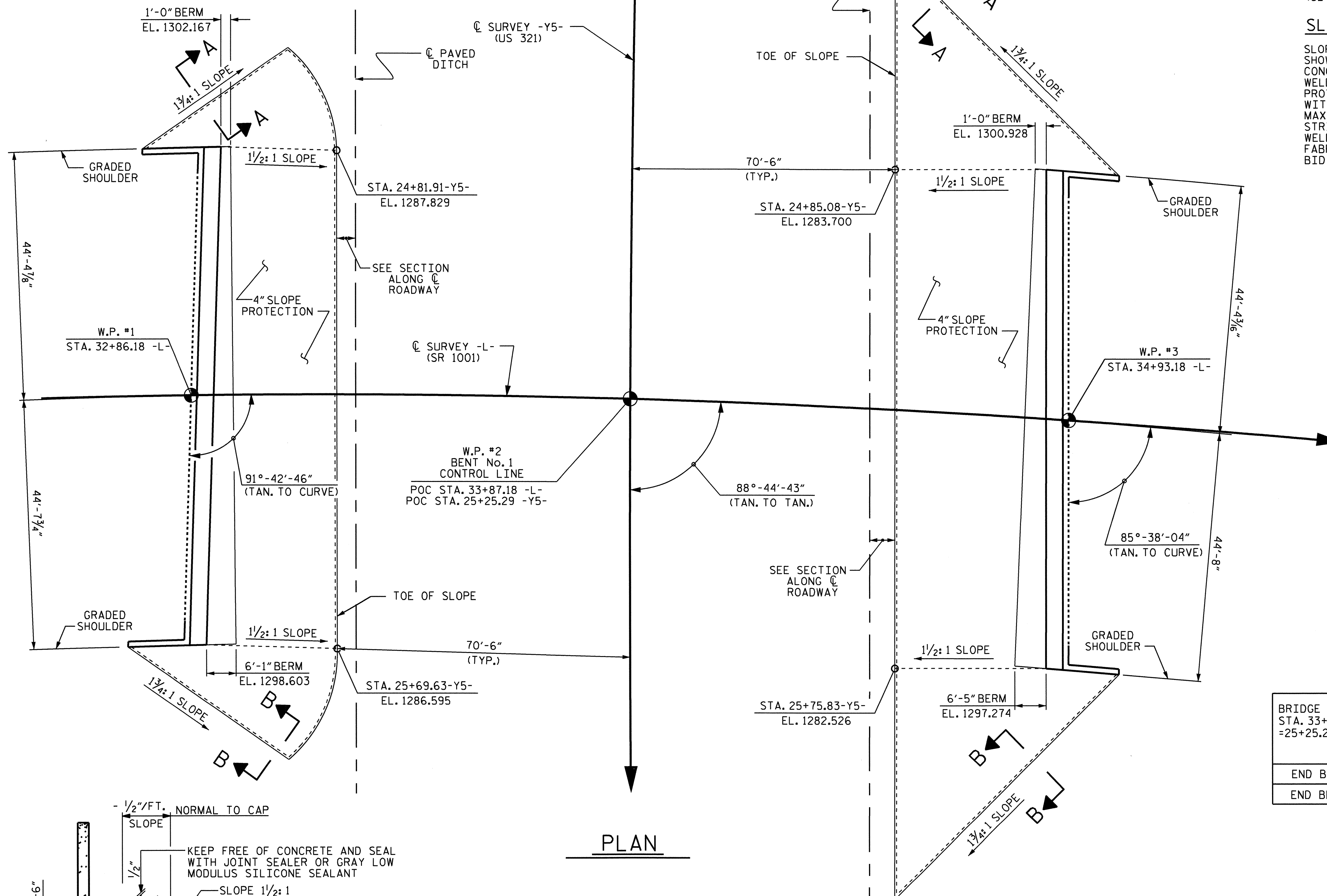


POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

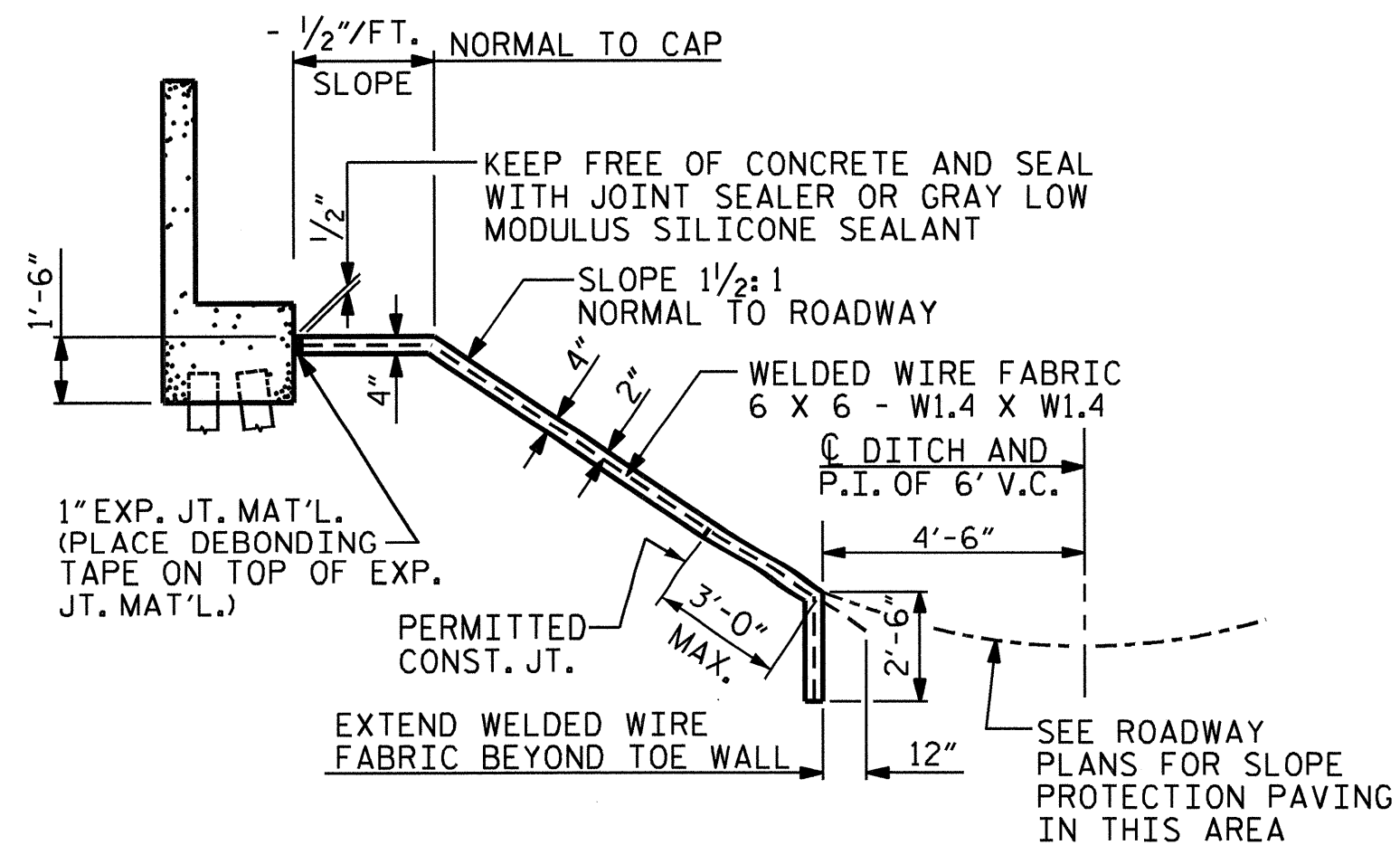
OPTIONAL POURING DETAIL

BRIDGE @ STA. 33+87.18 -L- =25+25.29 -Y5-	4 INCH SLOPE PROTECTION	WELDED * WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	425	765
END BENT 2	475	855

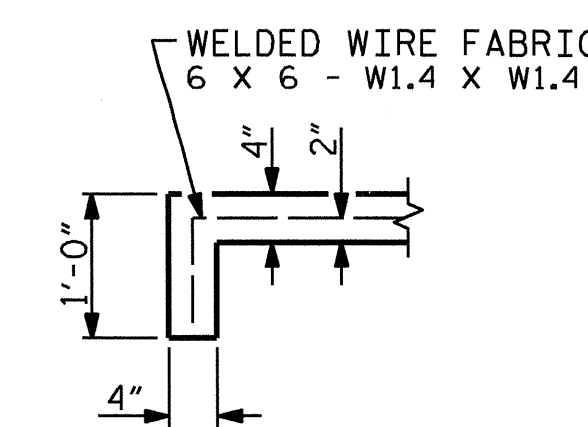
* QUANTITY SHOWN IS BASED ON 5' POURS.



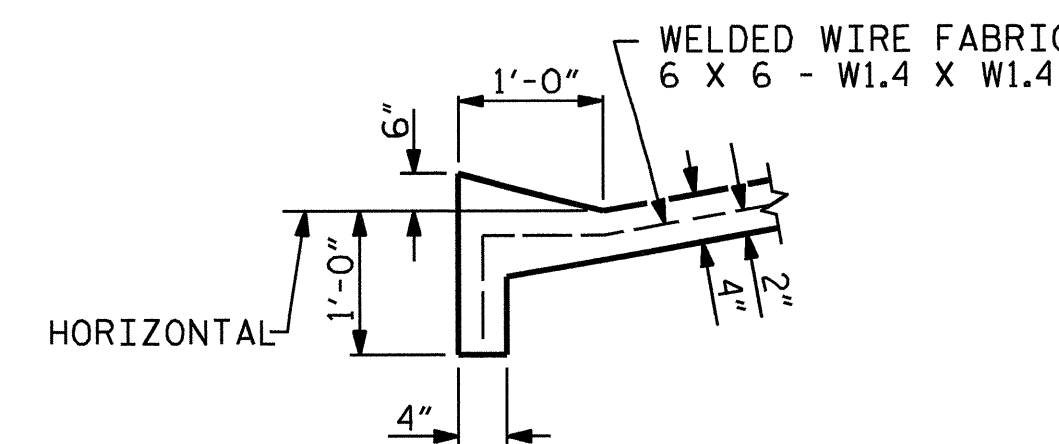
PLAN



SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH



SECTION A-A



SECTION B-B

DETAILS FOR SLOPE PROTECTION

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 33+87.18 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**STANDARD
 SLOPE PROTECTION
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			40

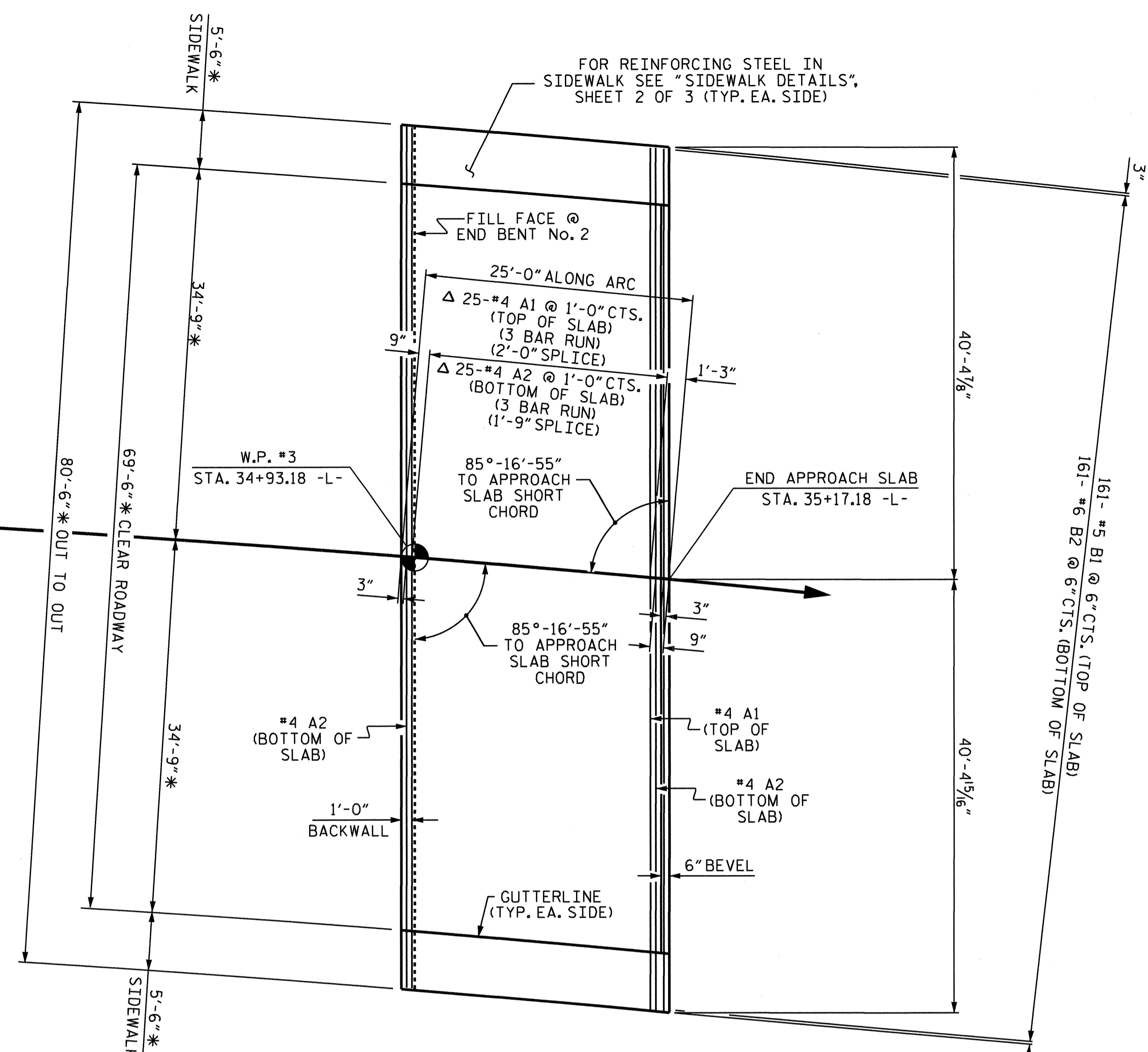
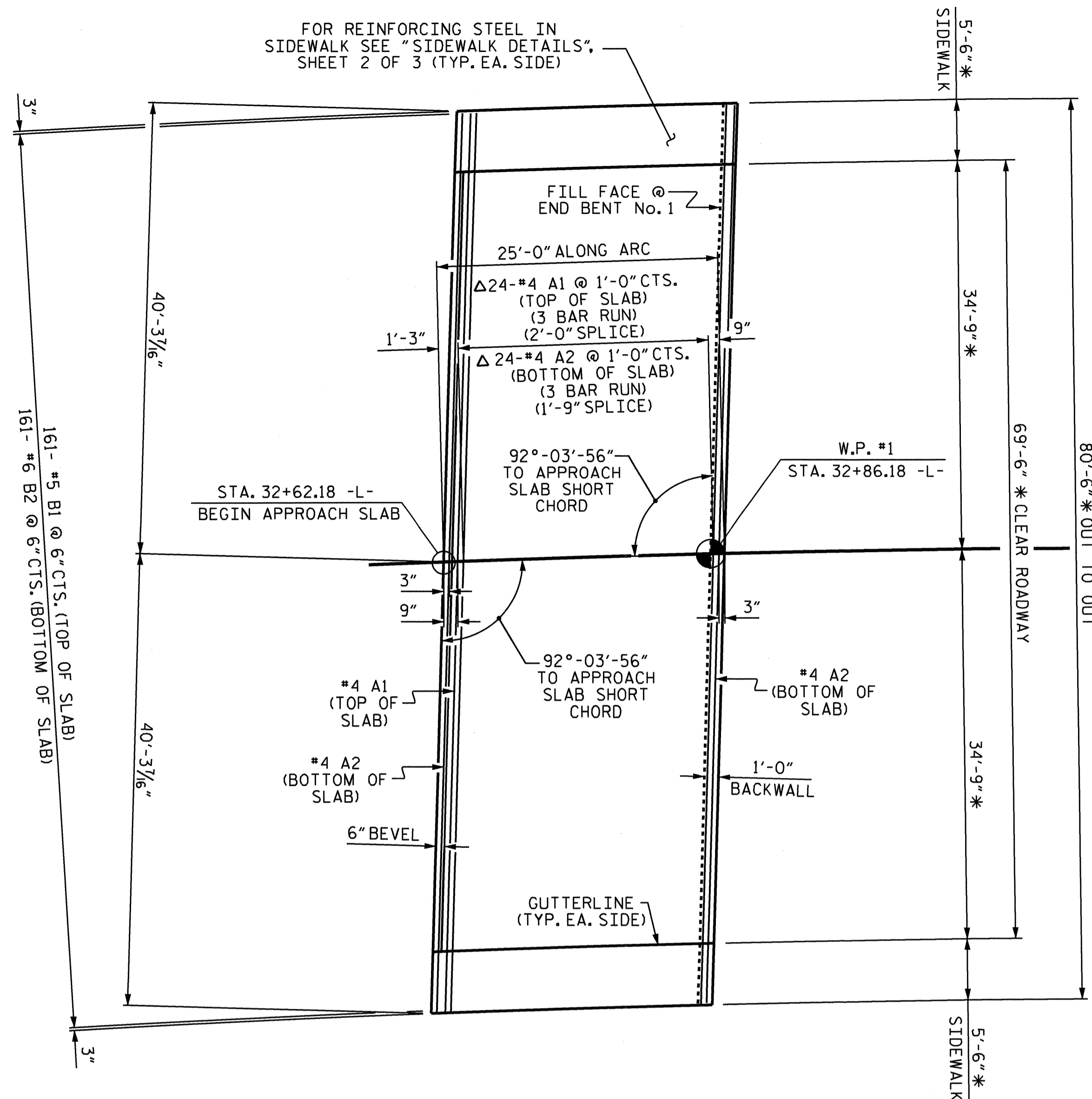


DRAWN BY: A. V. ROYAL DATE: 10-09
 CHECKED BY: M. K. TOM DATE: 10-09

20-MAR-2012 08:28
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 kalford

FOR REINFORCING STEEL IN SIDEWALK SEE "SIDEWALK DETAILS", SHEET 2 OF 3 (TYP. EA. SIDE)

FOR REINFORCING STEEL IN SIDEWALK SEE "SIDEWALK DETAILS", SHEET 2 OF 3 (TYP. EA. SIDE)



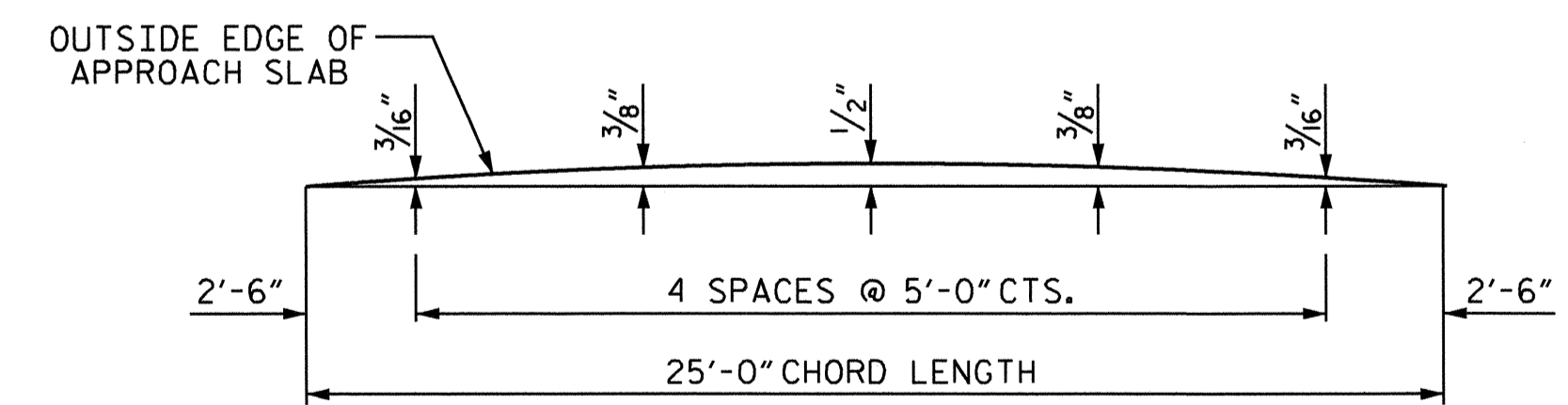
PLAN @ END BENT No. 1

PLAN @ END BENT No. 2

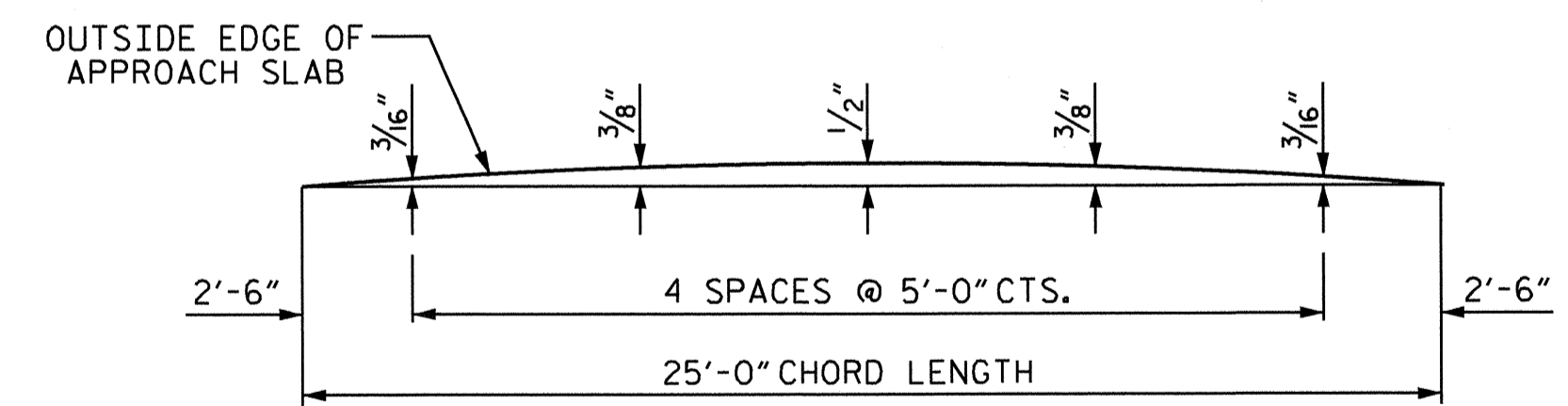
PLAN OF APPROACH SLABS

* RADIAL DIMENSIONS

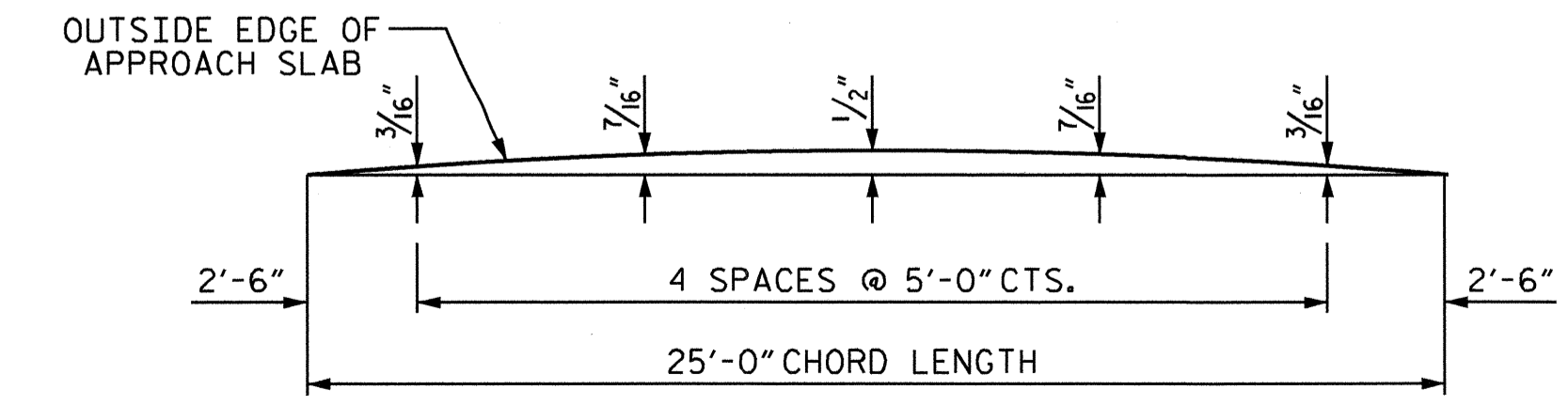
NOTES:
* MEASURED RADIALLY
Δ "A" BARS ARE SPACED ALONG APPROACH SLAB CHORD AND PLACED PARALLEL TO FILL FACE



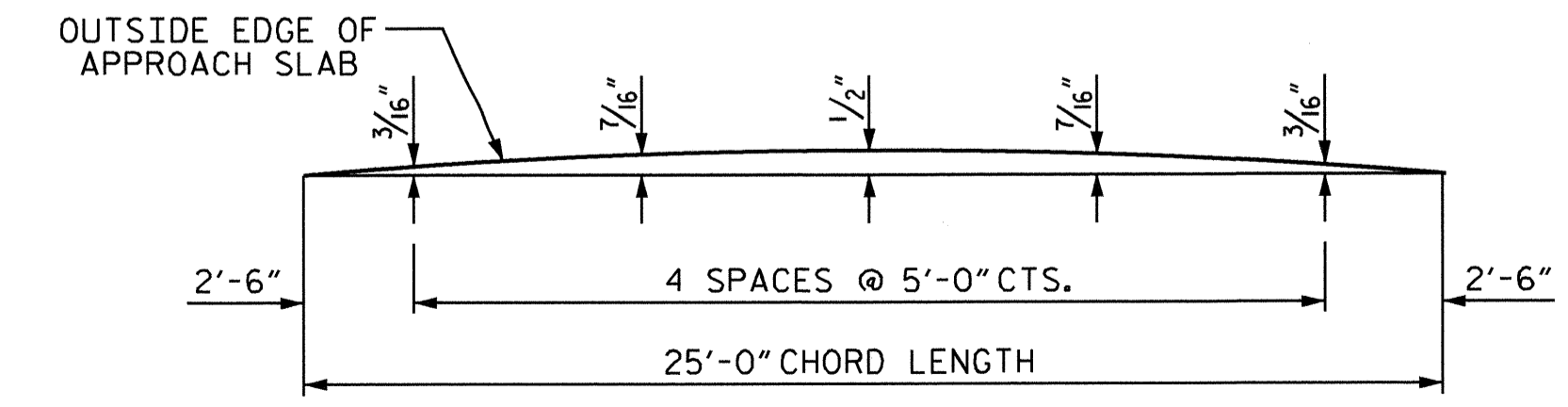
LEFT SIDE



LEFT SIDE



RIGHT SIDE



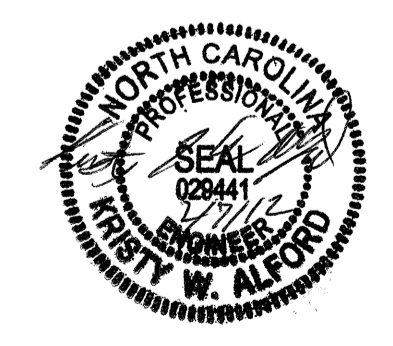
RIGHT SIDE

ARC OFFSETS @ END BENT No. 1

ARC OFFSETS @ END BENT No. 2

DRAWN BY : A. V. ROYAL DATE : 09/09
CHECKED BY : M. K. TOM DATE : 10/09

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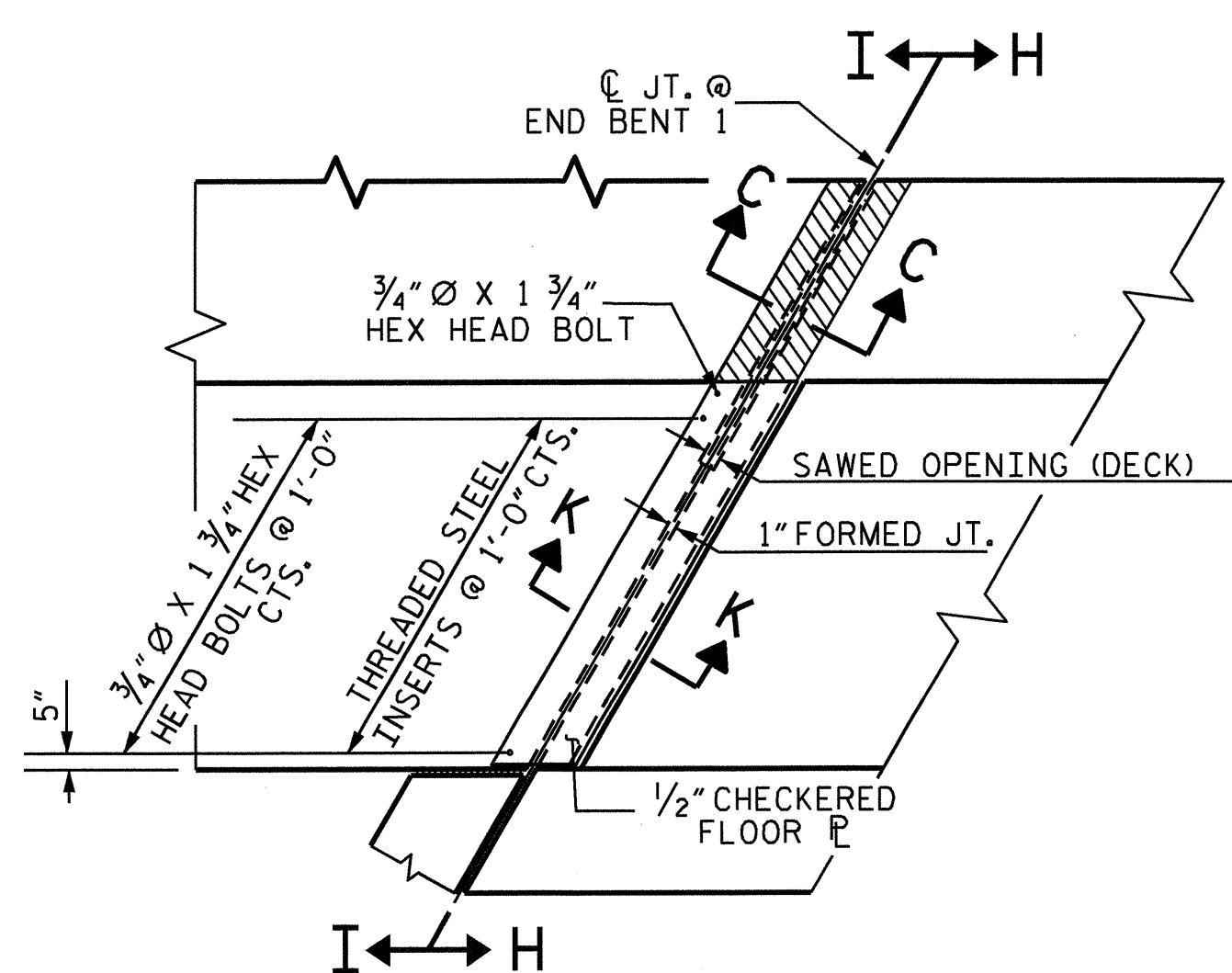
PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 1 OF 3

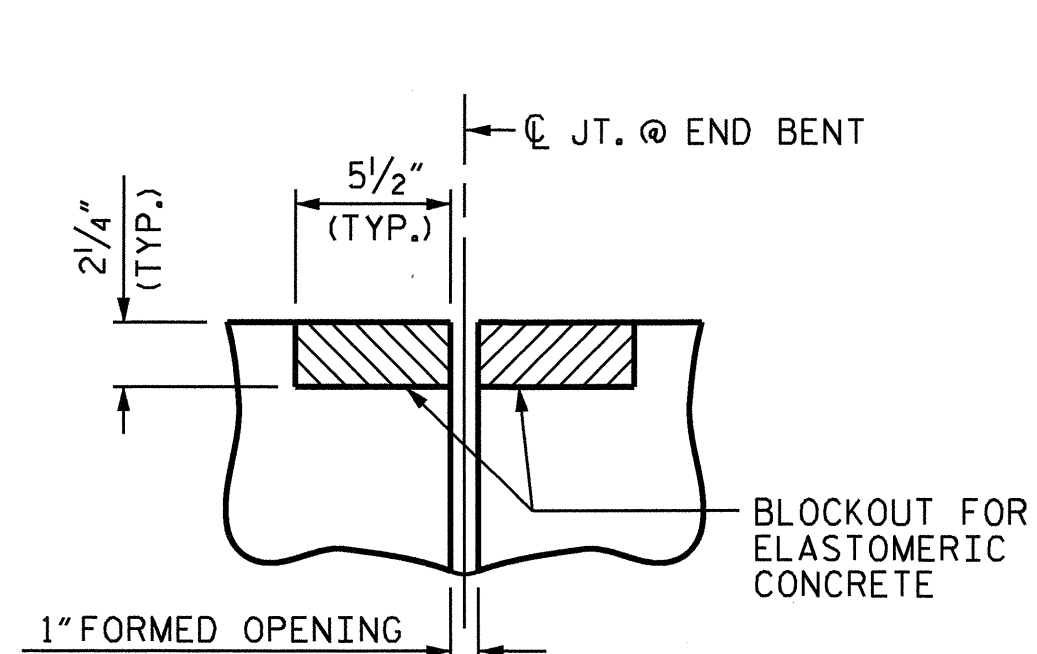
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB AND ARC OFFSETS

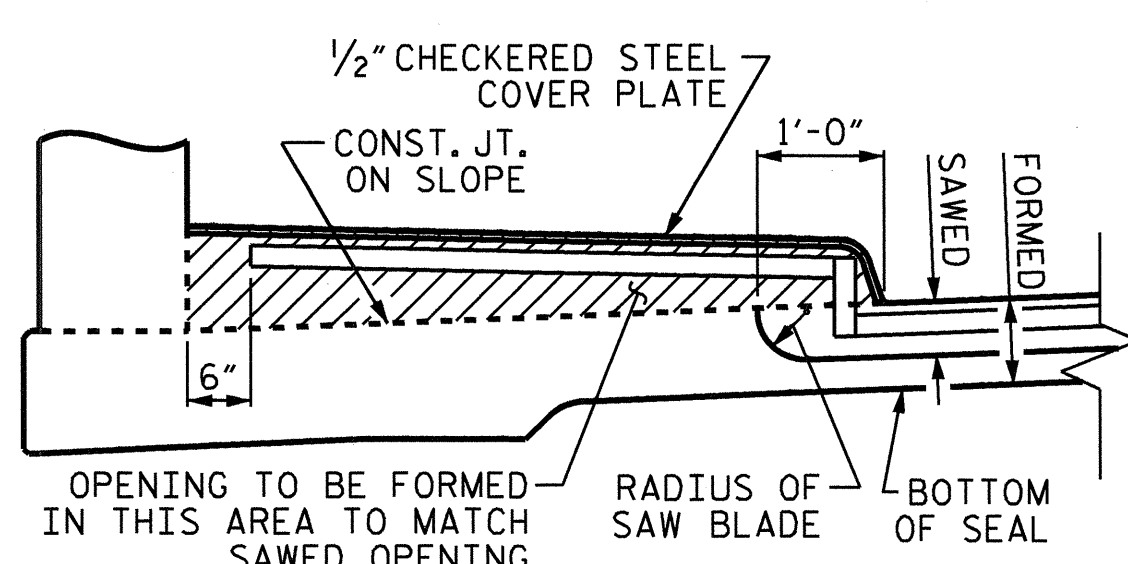
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38	
1			3			TOTAL SHEETS	
2			4			40	



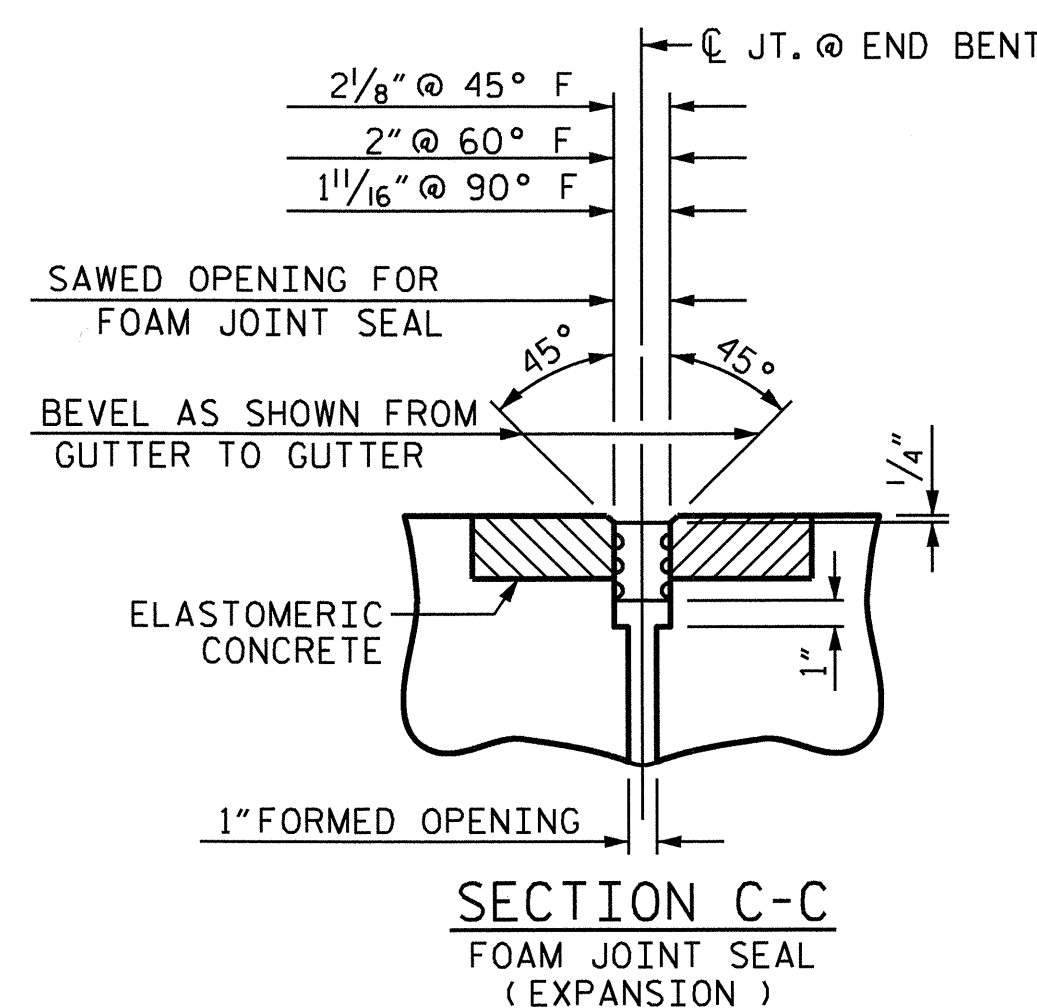
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK
PLAN VIEW @ END BENT No.1 SHOWN END BENT No.2 SIMILAR



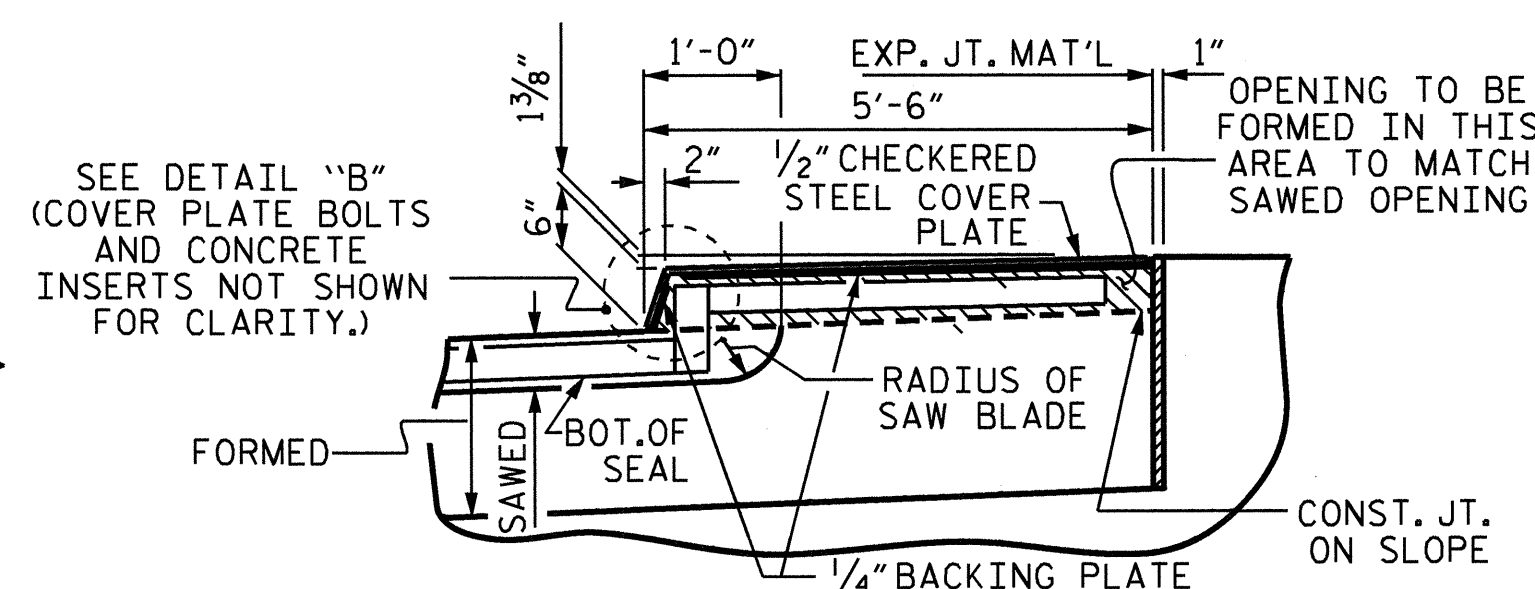
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



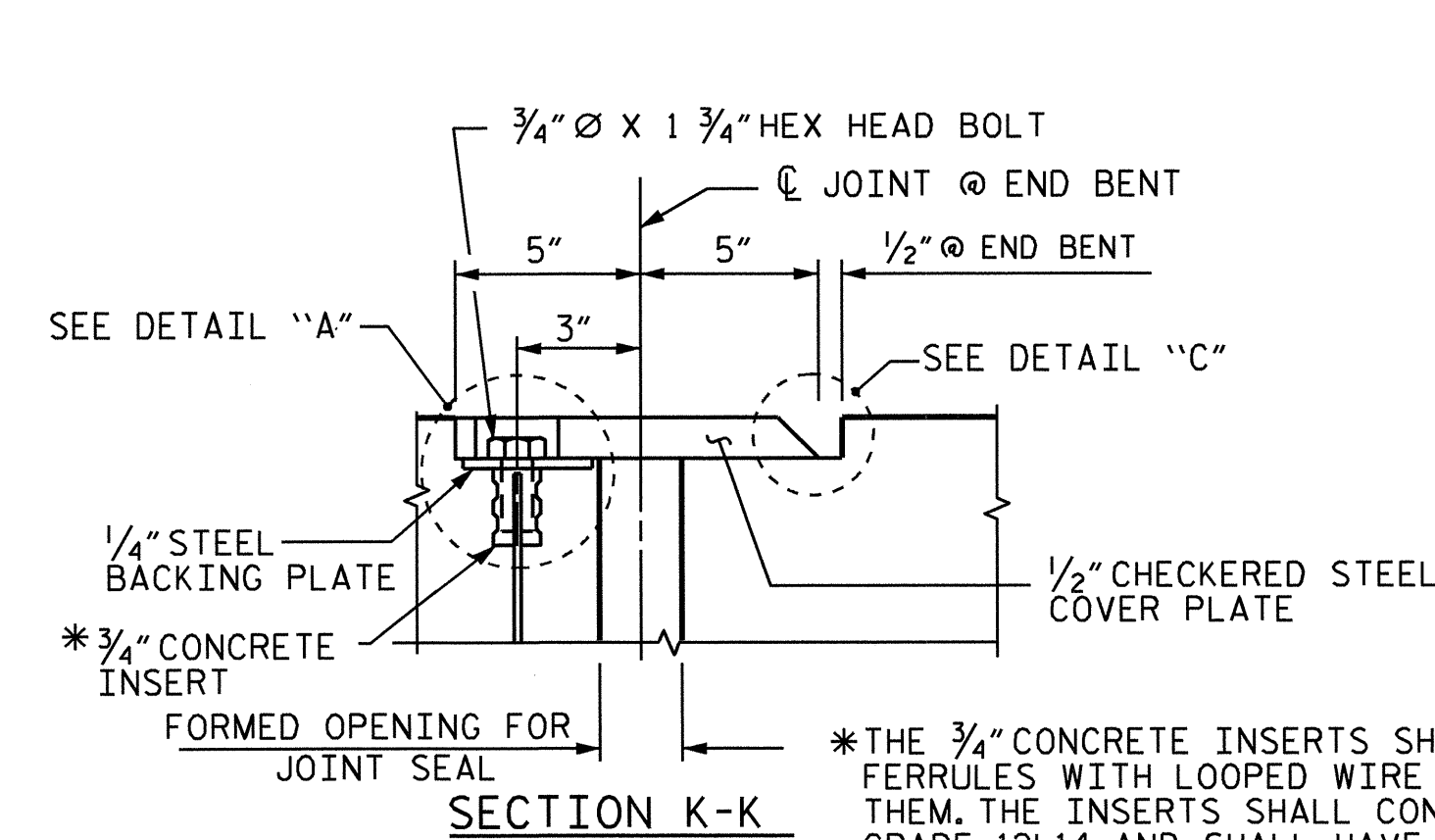
SECTION H-H



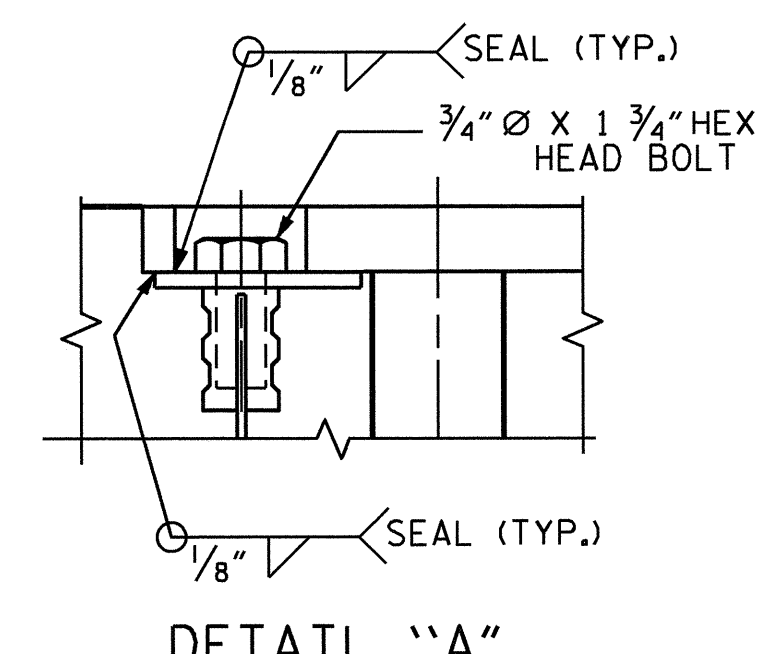
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION I-I

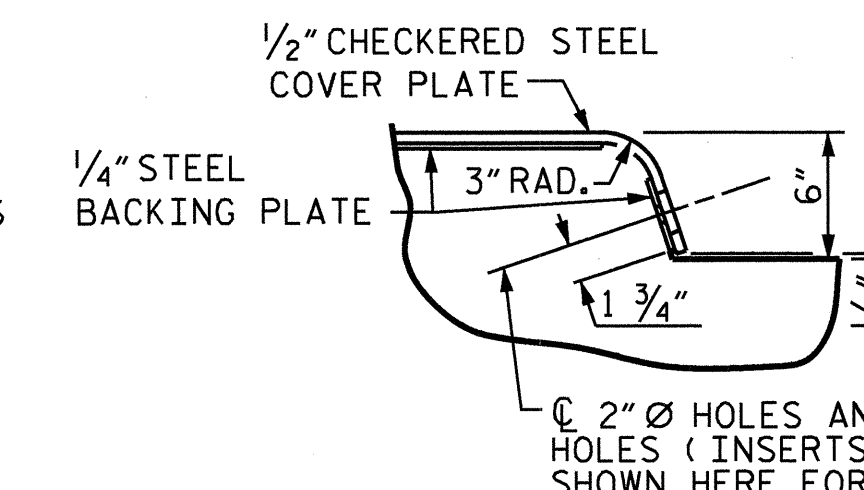


SECTION K-K

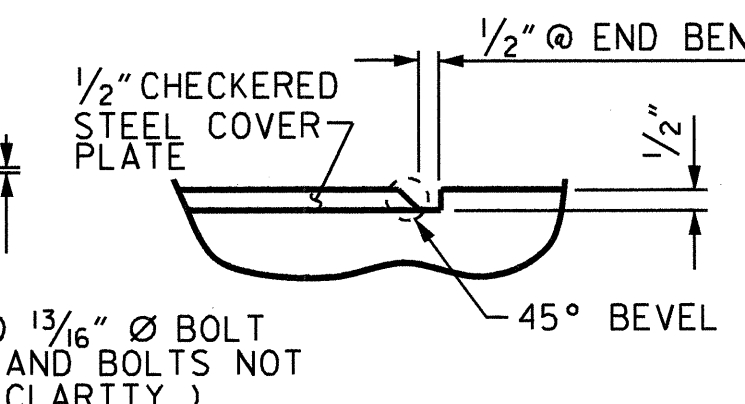


DETAIL "A"

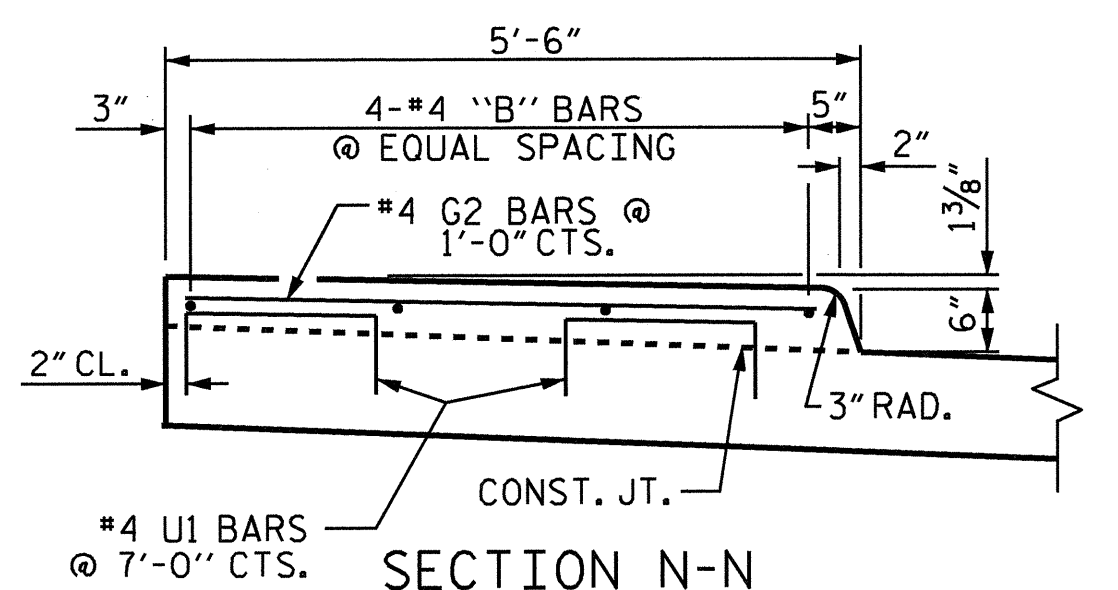
*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



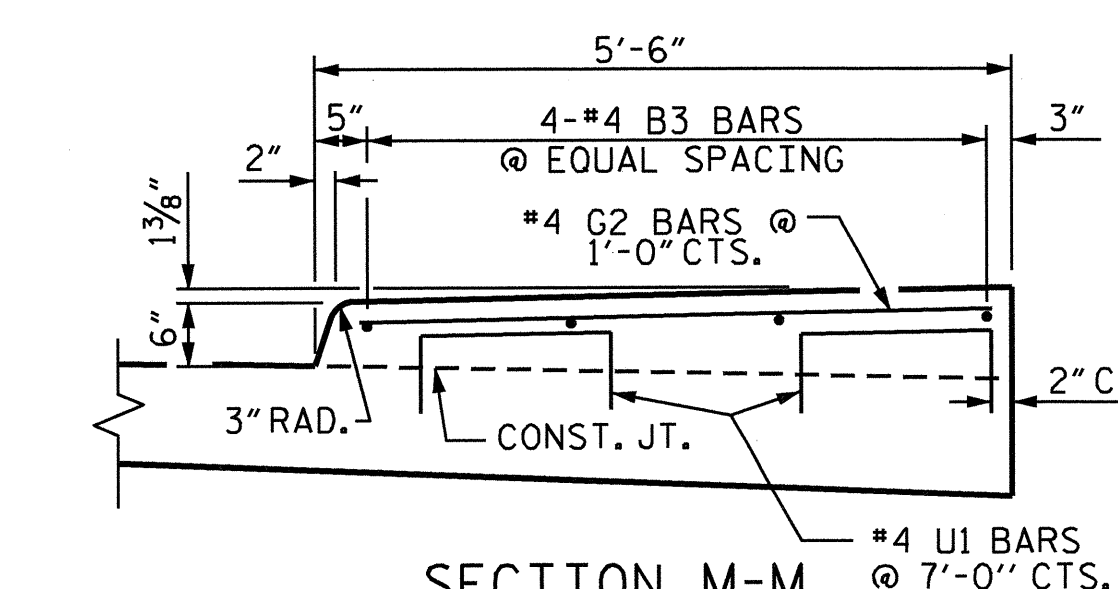
DETAIL "B"



DETAIL "C"



SECTION N-N



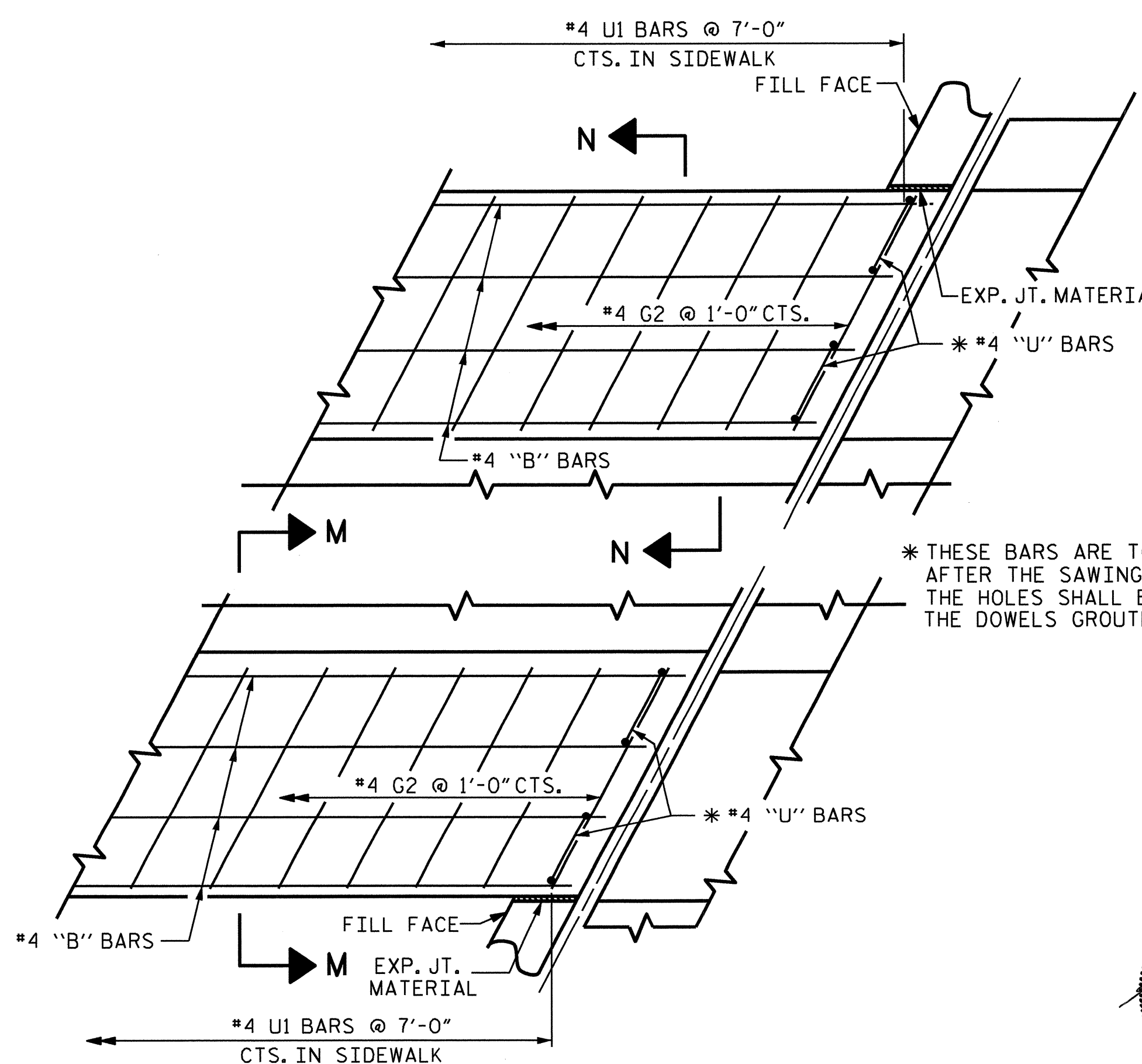
SECTION M-M

SECTION THRU SIDEWALK

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	11.9
2	11.9
TOTAL	23.8

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

JOINT SEAL DETAILS @ END BENT



PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB

END BENT No.1 SHOWN, END BENT No.2 SIMILAR

COVER PLATE NOTES:

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".

* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

SIDEWALK NOTES:

* THE JOINT IN THE DECK AT THE END BENTS SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK.

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

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

* 4U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

ASSEMBLED BY : A. V. ROYAL	DATE : 09/09
CHECKED BY : M. K. TOM	DATE : 10/09
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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PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					39
					TOTAL SHEETS 40



STD. NO. BAS4 (SHT 20)

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND SIDEWALK.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR CONCRETE ISLAND DETAILS, SEE "CONCRETE ISLAND" SHEET.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	28'-1"	1407
A2	78	#4	STR	27'-11"	1455
*B1	161	#5	STR	24'-2"	4058
B2	161	#6	STR	24'-8"	5965
*B3	8	#4	STR	24'-8"	132
*G2	50	#4	STR	5'-2"	173
*U1	8	#4	1	3'-0"	16

REINFORCING STEEL 7420 LBS.
* EPOXY COATED REINFORCING STEEL 5786 LB6

CLASS AA CONCRETE
POUR #1 (SLAB) 87.0 C. Y.
POUR #2 (SIDEWALKS) 5.6 C. Y.
TOTAL 92.6 C. Y.

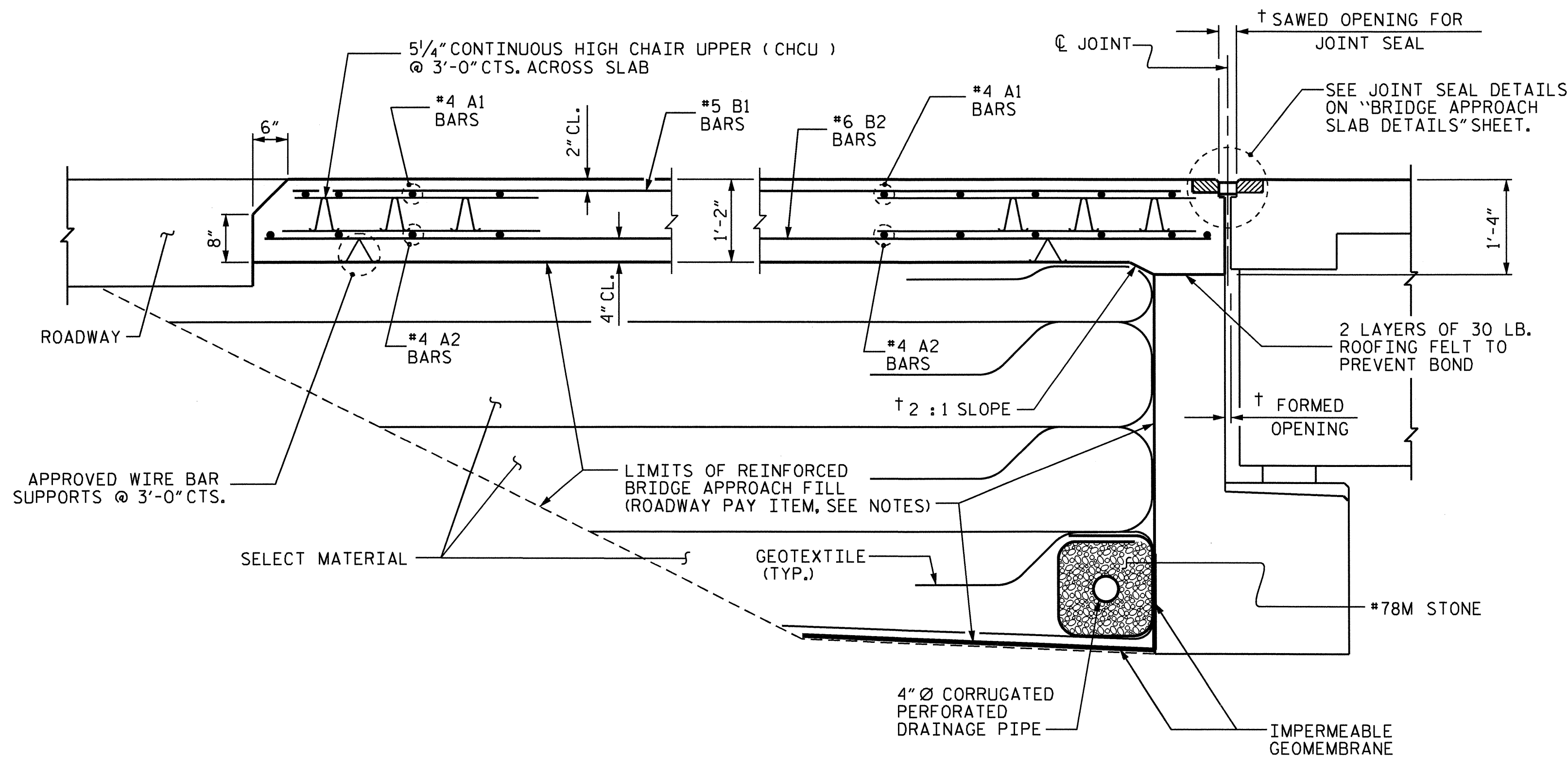
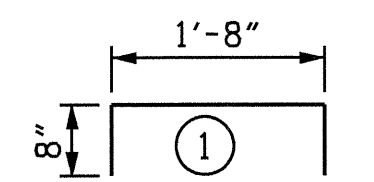
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	28'-1"	1407
A2	78	#4	STR	27'-11"	1455
*B1	161	#5	STR	24'-2"	4058
B2	161	#6	STR	24'-8"	5965
*B3	8	#4	STR	24'-8"	132
*G2	50	#4	STR	5'-2"	173
*U1	8	#4	1	3'-0"	16

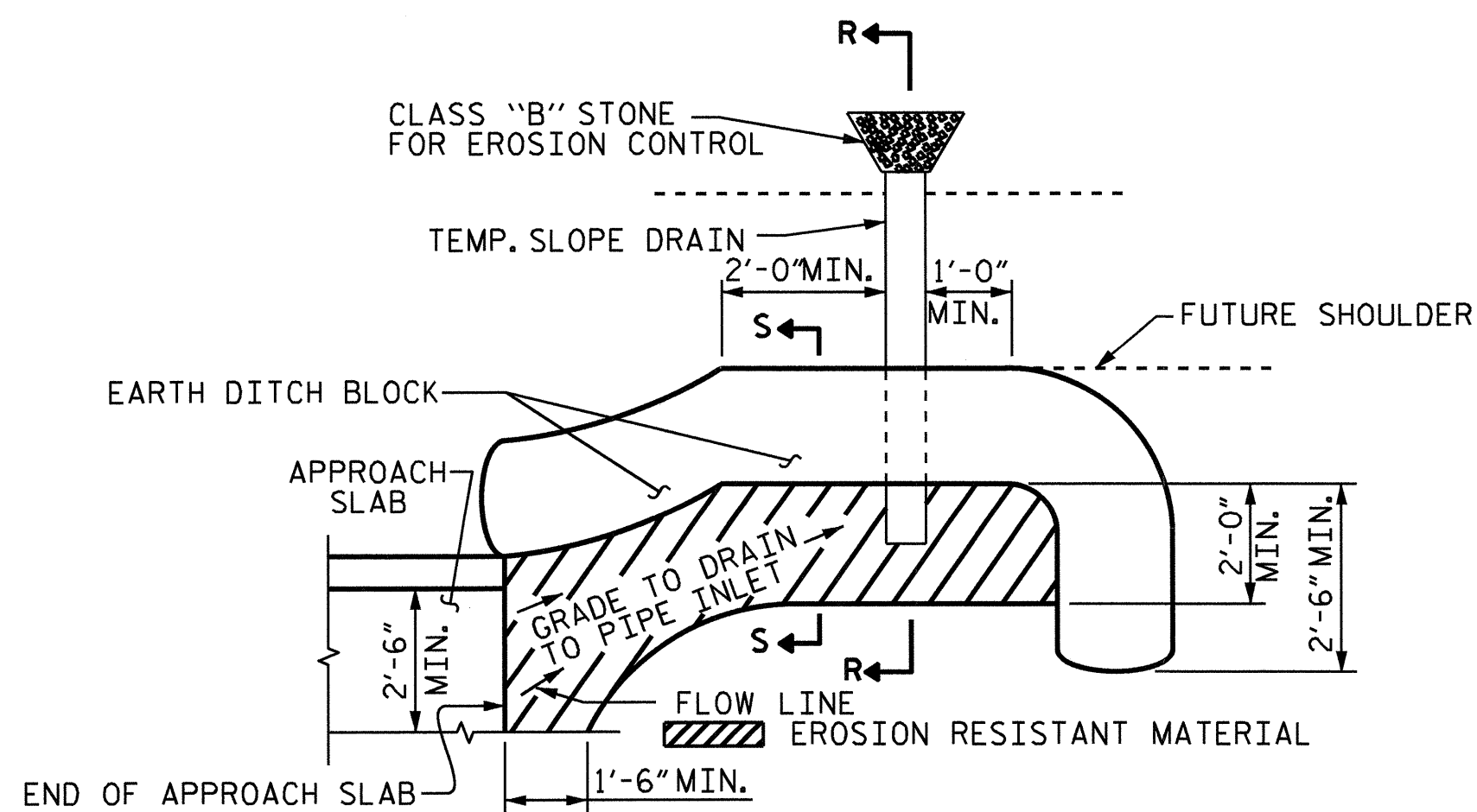
REINFORCING STEEL 7420 LBS.
* EPOXY COATED REINFORCING STEEL 5786 LBS.

CLASS AA CONCRETE
POUR #1 (SLAB) 87.0 C. Y.
POUR #2 (SIDEWALKS) 5.6 C. Y.
TOTAL 92.6 C. Y.

BAR TYPE



SECTION THRU SLAB

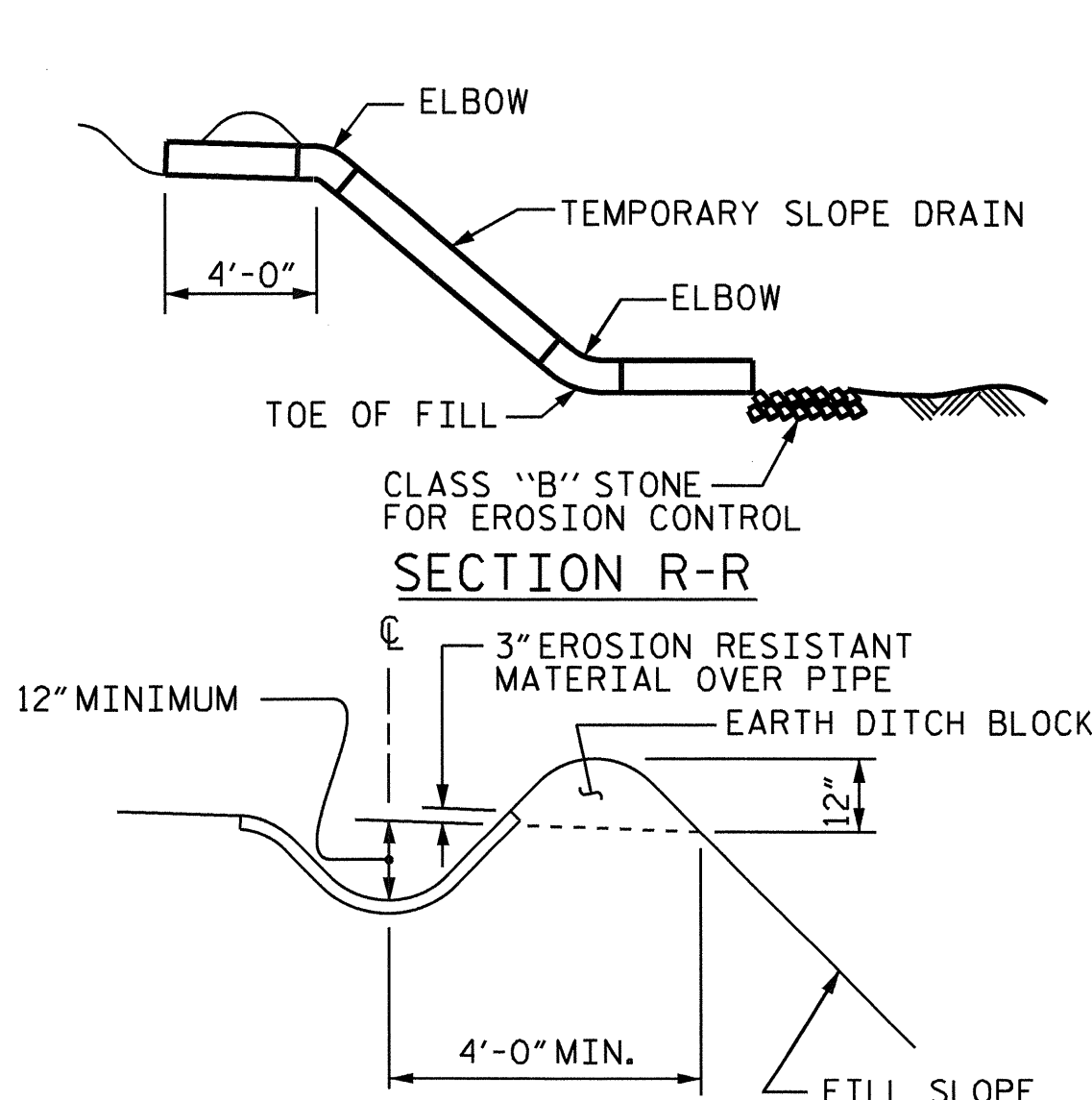


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

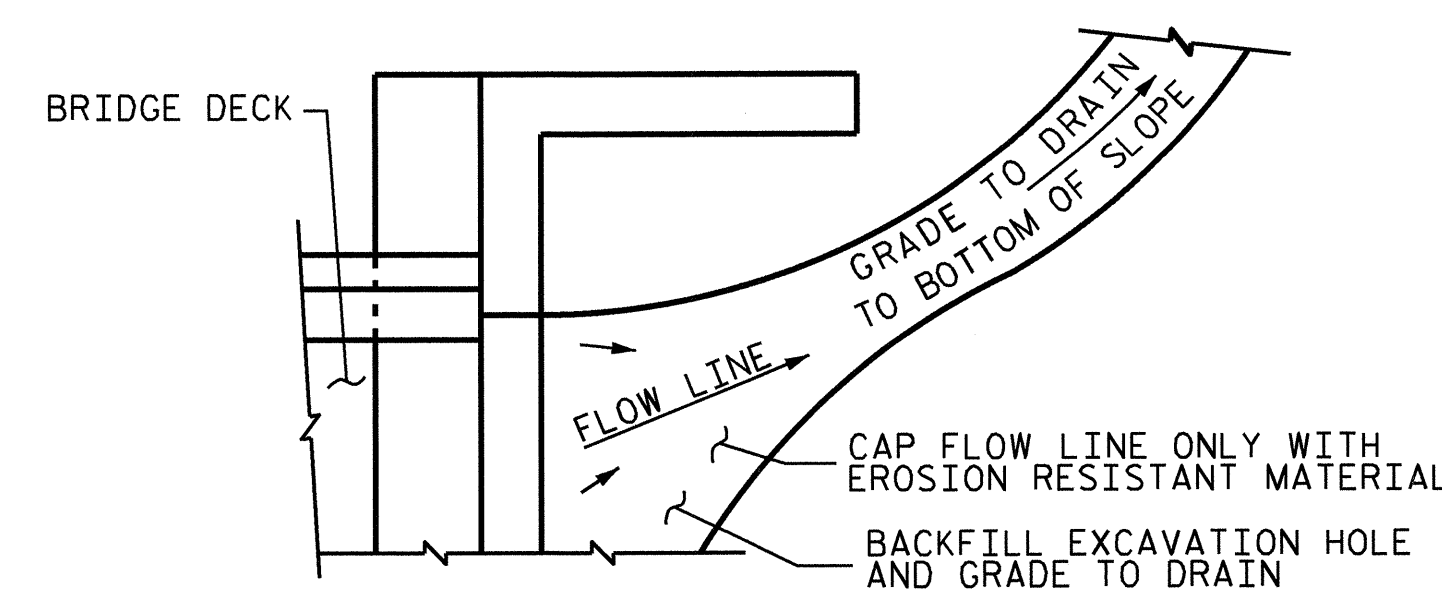
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION S-S



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. U-2211B
CALDWELL COUNTY
STATION: 33+87.18 -L-

SHEET 3 OF 3

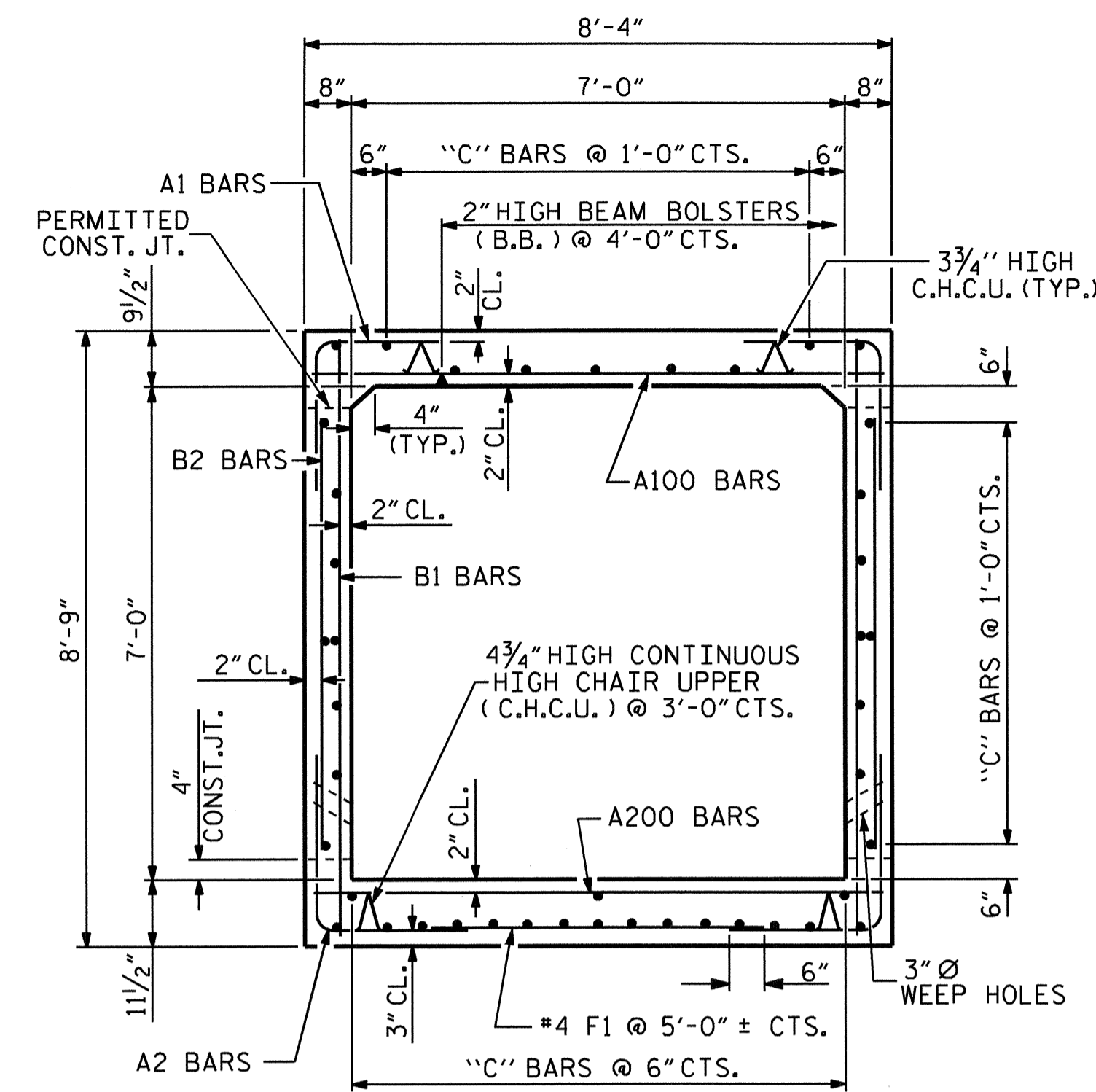
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

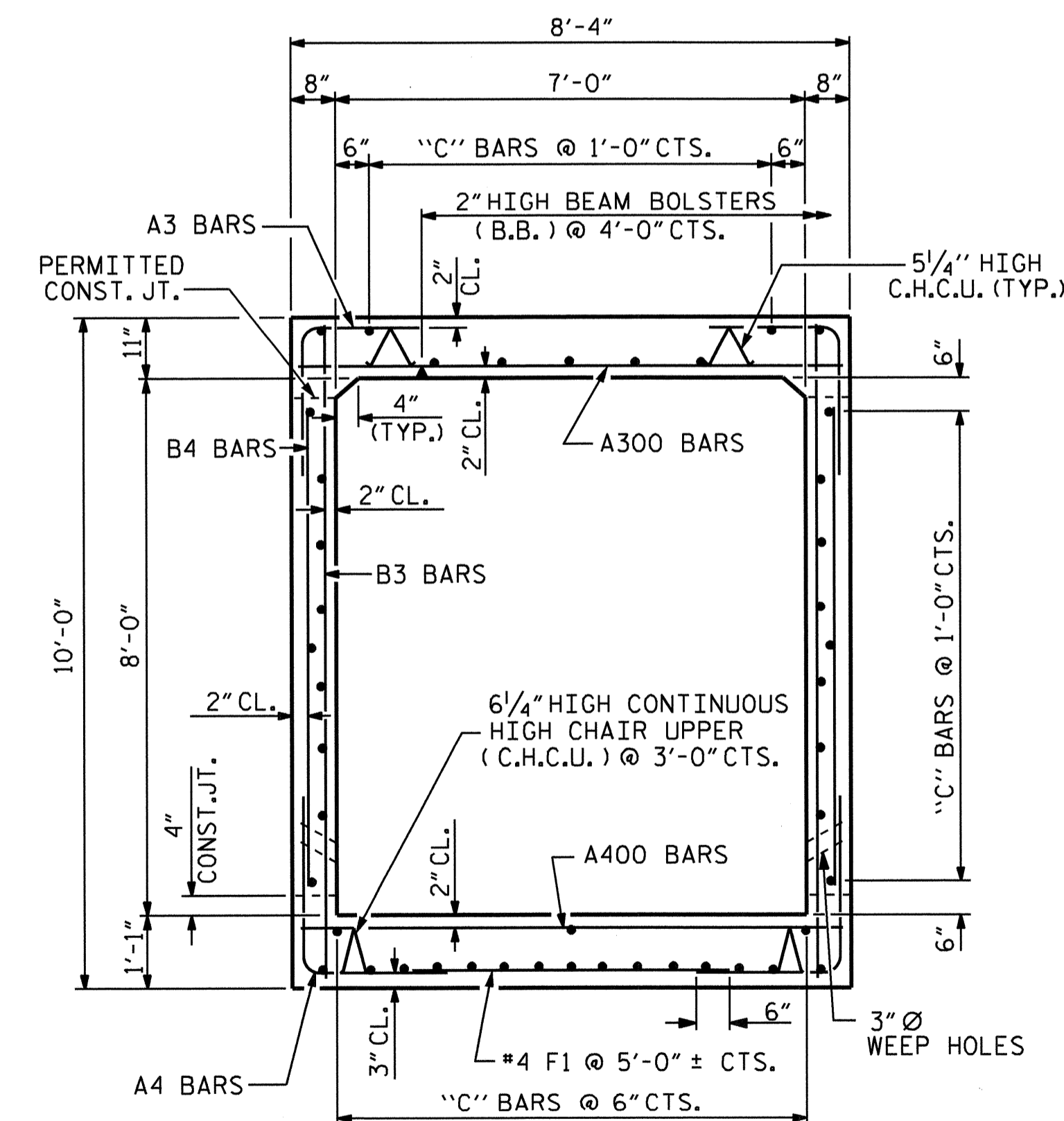
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS 40
2			4			

ASSEMBLED BY: A. V. ROYAL	DATE: 09/09
CHECKED BY: M. K. TOM	DATE: 10/09
DRAWN BY: EEM 3/95	REV. 7/10/01 LES/RDR
CHECKED BY: VAP 3/95	REV. 5/7/03R RWW/JTE
	REV. 5/1/06R KMM/GM



RIGHT ANGLE SECTION OF INLET BARREL

THERE ARE 43 "C" BARS IN SECTION OF BARREL



RIGHT ANGLE SECTION OF OUTLET BARREL

THERE ARE 45 "C" BARS IN SECTION OF BARREL

HYDROGRAPHIC DATA

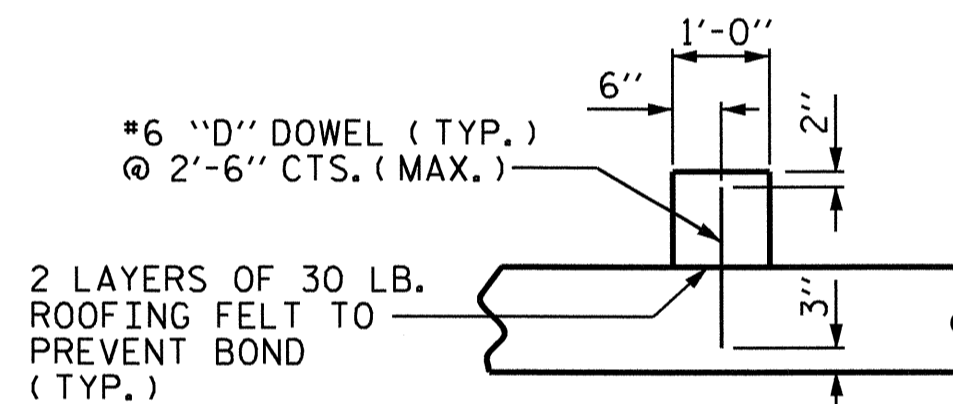
GRADE POINT ELEV. @ STA. 31+08.14-Y5-	= 1283.990
BED ELEV. @ STA. 31+08.14-Y5-	= 1251.750
ROADWAY SLOPES	= 2 : 1
DESIGN DISCHARGE	= 755 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS
DESIGN HIGH WATER ELEVATION	= 1269.3'
DRAINAGE AREA	= 1.61 SQ. MI.
BASE DISCHARGE (Q100)	= 874 CFS
BASE HIGH WATER ELEVATION	= 1270.1'

OVERTOPPING FLOOD DATA

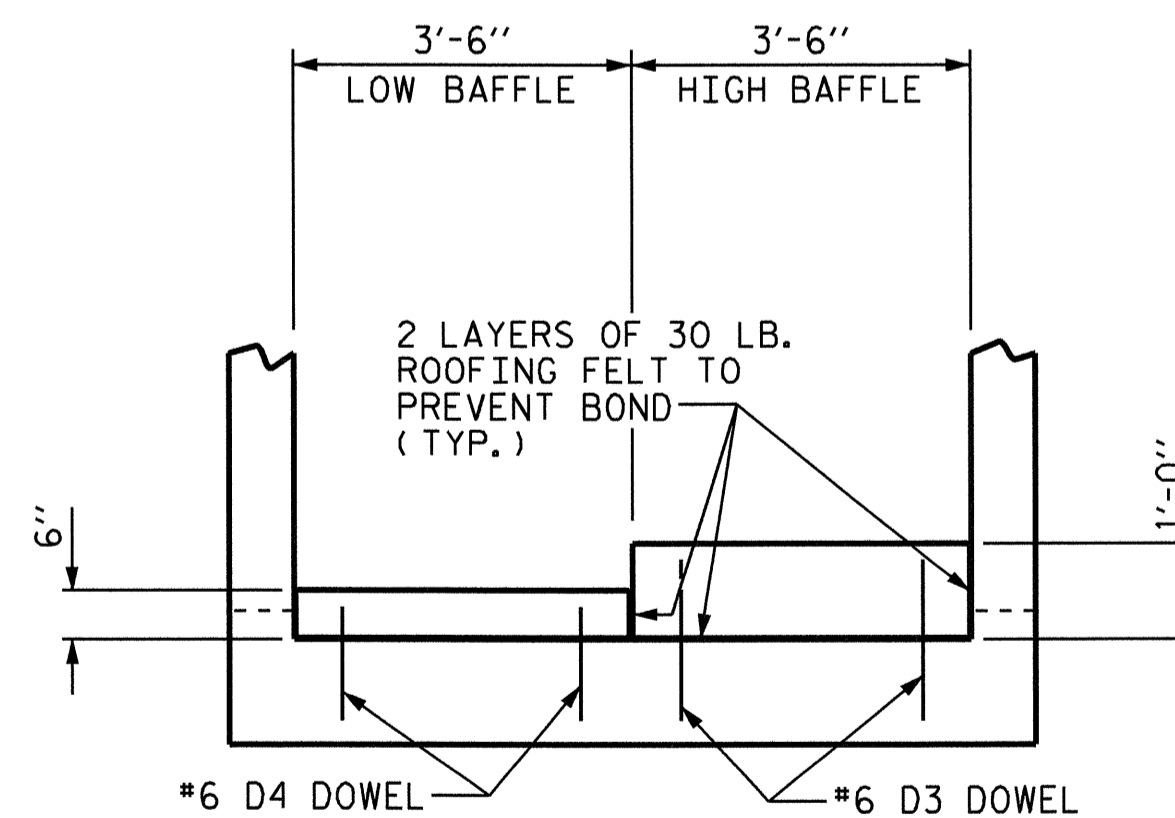
OVERTOPPING DISCHARGE	= 1380 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS
OVERTOPPING FLOOD ELEVATION	= 1283.5'
OVERTOPPING LOCATION	= STA. 20+80 -RPC-RT. SHOULDER

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
INLET STAGE I CONSTRUCTION	520.0 C.Y.
INLET STAGE II CONSTRUCTION	72.8 C.Y.
OUTLET STAGE I CONSTRUCTION	141.9 C.Y.
OUTLET STAGE II CONSTRUCTION	96.6 C.Y.
TOTAL	831.3 C.Y.
REINFORCING STEEL	
INLET STAGE I CONSTRUCTION	84,399 LBS.
INLET STAGE II CONSTRUCTION	12,124 LBS.
OUTLET STAGE I CONSTRUCTION	22,402 LBS.
OUTLET STAGE II CONSTRUCTION	13,729 LBS.
TOTAL	132,654 LBS.
FOUNDATION CONDITIONING MATERIAL	
INLET STAGE I CONSTRUCTION	491 TONS
INLET STAGE II CONSTRUCTION	70 TONS
OUTLET STAGE I CONSTRUCTION	119 TONS
OUTLET STAGE II CONSTRUCTION	67 TONS
TOTAL	747 TONS
CULVERT EXCAVATION	
INLET STAGE I CONSTRUCTION	LUMP SUM
INLET STAGE II CONSTRUCTION	LUMP SUM
OUTLET STAGE I CONSTRUCTION	LUMP SUM
OUTLET STAGE II CONSTRUCTION	LUMP SUM
TOTAL	LUMP SUM



TYPICAL SECTION THRU BAFFLE



DETAIL OF OUTLET BARREL BAFFLES

HIGH AND LOW BAFFLES SHALL ALTERNATE SIDES EVERY OTHER BAFFLE (FOR LOCATION OF BAFFLES, SEE SHEETS 7 & 8 OF 13)

NOTES

- ASSUMED LIVE LOAD -----HS20 OR ALTERNATE LOADING.
- INLET END DESIGN FILL-----25.05
- OUTLET END DESIGN FILL-----31.97
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
- INLET END STAGE I
 1. WING AND HEADWALL FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS PLUS AREA AS SHOWN UNDER PIPE.
 2. THE REMAINING PORTIONS OF THE HEADWALL AROUND THE 60" Ø PIPE, REMAINING VERTICAL WALLS, ROOF SLAB AND WINGS W1 & W2 FULL HEIGHT.
- INLET END STAGE II
 1. FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE VERTICAL WALLS AND ROOF SLAB.
- OUTLET END STAGE I
 1. FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE VERTICAL WALLS AND ROOF SLAB.
- OUTLET END STAGE II
 1. WING AND HEADWALL FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALLS PLUS AREA AS SHOWN UNDER PIPE.
 2. THE REMAINING PORTIONS OF THE HEADWALL AROUND THE 60" Ø PIPE, REMAINING VERTICAL WALLS, ROOF SLAB AND WINGS W3 & W4 FULL HEIGHT.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEETS.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.
- FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

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.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

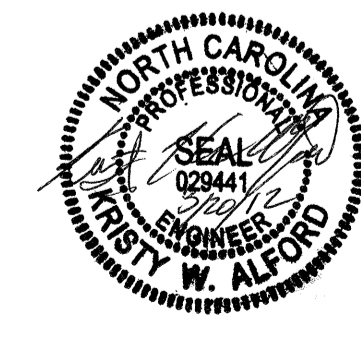
NO PRECAST REINFORCED CONCRETE BOX CULVERT OPTION WILL BE ALLOWED.

FOR GROUT FOR STRUCTURE, SEE SPECIAL PROVISIONS.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

PROJECT NO. U-2211 B
CALDWELL COUNTY
 STATION: 31+08.14 -Y5-

SHEET 1 OF 13 CULVERT No. 49

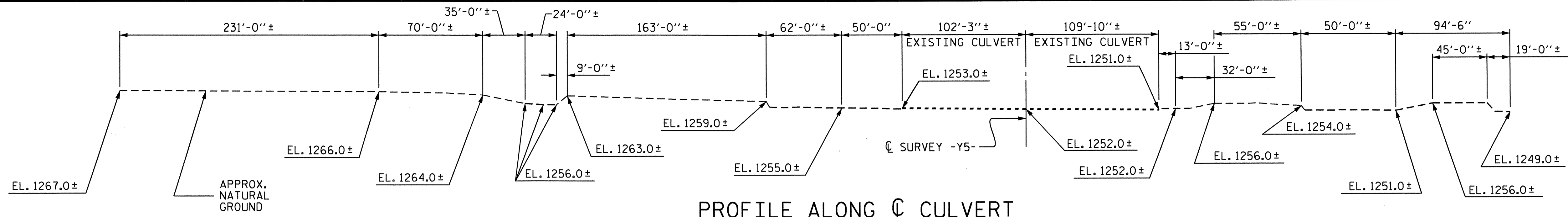


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SINGLE
 7 FT. x 7 FT. (INLET)
 & 7 FT. x 8 FT. (OUTLET)
 CONCRETE BOX CULVERT
 EXTENSIONS AND
 60" Ø PIPE HEADWALLS

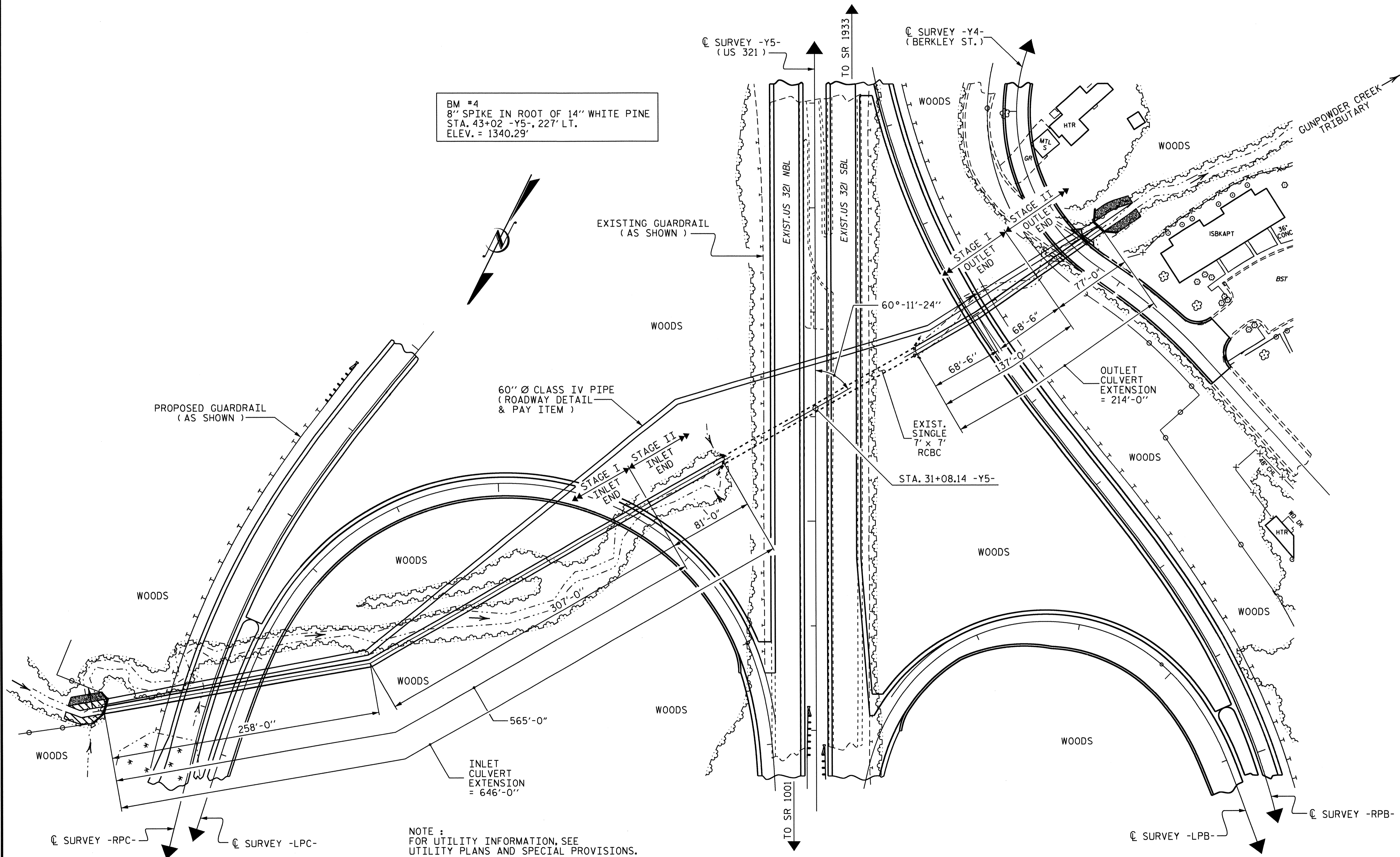
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



PROFILE ALONG C CULVERT



BM #4
8" SPIKE IN ROOT OF 14" WHITE PINE
STA. 43+02 -Y5-, 227' LT.
ELEV. = 1340.29'

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



PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 2 OF 13
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE
7 FT. x 7 FT. (INLET)
& 7 FT. x 8 FT. (OUTLET)
CONCRETE BOX CULVERT
EXTENSIONS AND
60"Ø PIPE HEADWALLS

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

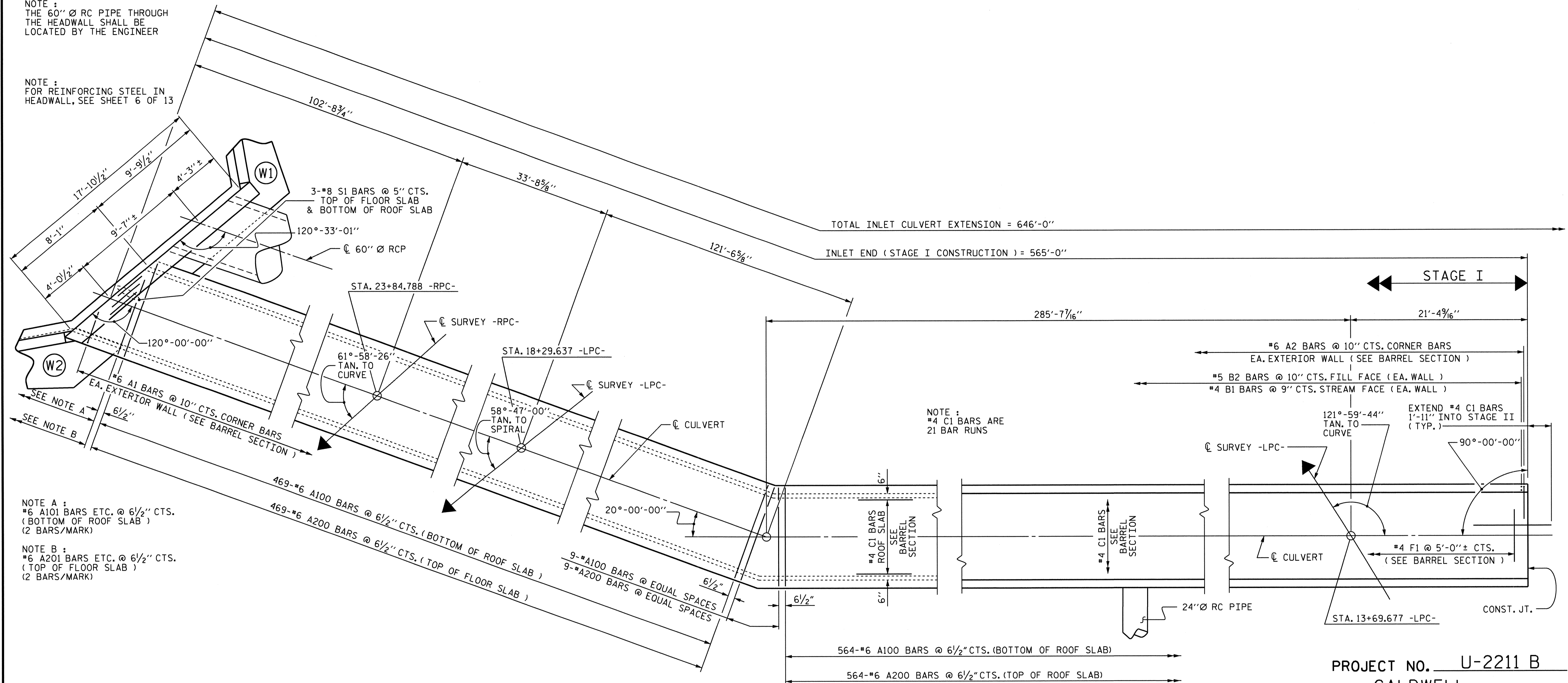
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CHECKED BY: D.G. ELY DATE: 11-09

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LOCATION SKETCH

NOTE :
THE 60" Ø RC PIPE THROUGH
THE HEADWALL SHALL BE
LOCATED BY THE ENGINEER

NOTE :
FOR REINFORCING STEEL IN
HEADWALL, SEE SHEET 6 OF 13



NOTE A :
#6 A101 BARS ETC. @ 6 1/2" CTS.
(BOTTOM OF ROOF SLAB)
(2 BARS/MARK)

NOTE B :
#6 A201 BARS ETC. @ 6 1/2" CTS.
(TOP OF FLOOR SLAB)
(2 BARS/MARK)

NOTE :
#4 C1 BARS ARE
21 BAR RUNS

PART PLAN - ROOF SLAB
(INLET EXTENSION - STAGE I)

PART PLAN - FLOOR SLAB
(INLET EXTENSION - STAGE I)

NOTE :
REINFORCING STEEL IN INLET EXTENSION
SHALL BE FIELD BENT AND/OR SPLAYED AS NECESSARY.

NOTE :
THE 24" Ø RC PIPE THROUGH THE
WALL OF THE CULVERT SHALL BE
LOCATED BY THE ENGINEER. THE
REINFORCING STEEL SHALL BE
FIELD BENT AND CUT AS
NECESSARY TO CLEAR THE PIPE.



PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 3 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

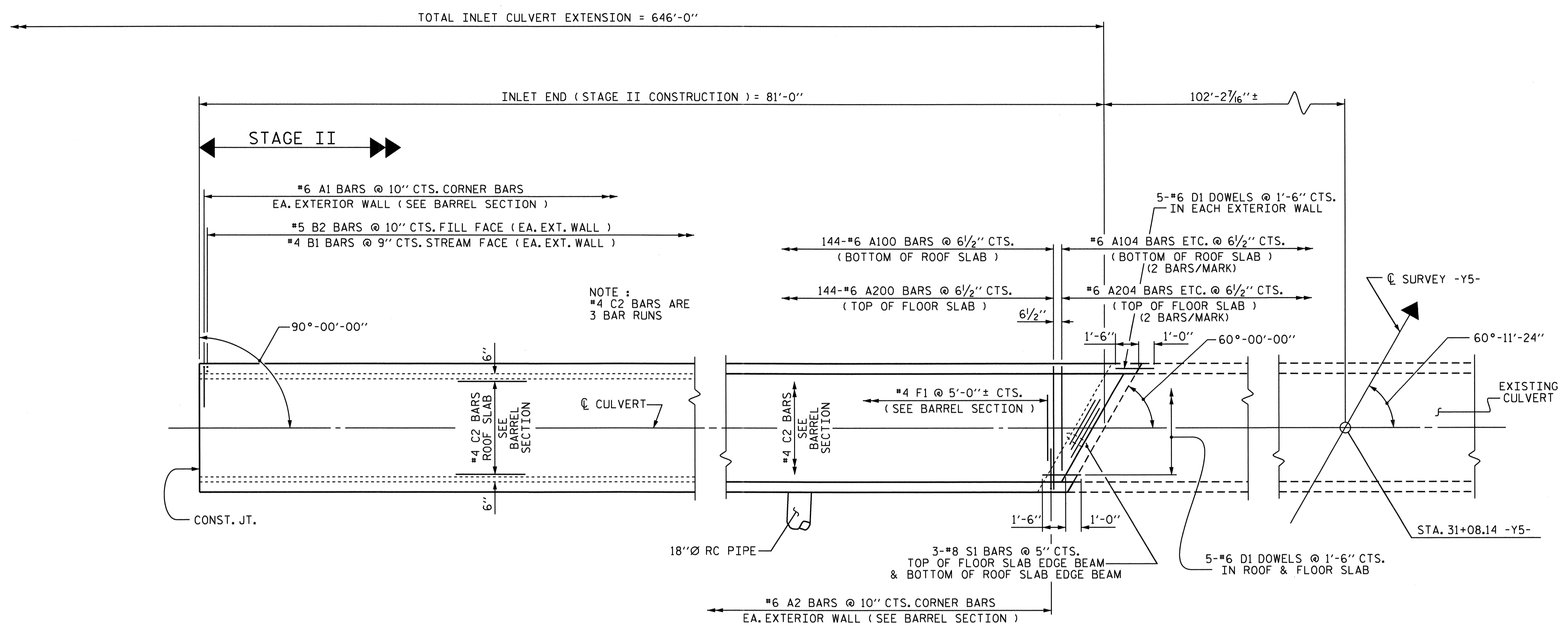
SINGLE
7 FT. x 7 FT. (INLET)
CONCRETE BOX CULVERT
EXTENSION
(STAGE I)

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

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STR. #1



PART PLAN - ROOF SLAB
(INLET EXTENSION - STAGE II)

PART PLAN - FLOOR SLAB
(INLET EXTENSION - STAGE II)

NOTE :
THE 18"Ø RC PIPE THROUGH THE WALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AND CUT AS NECESSARY TO CLEAR THE PIPE.

PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 4 OF 13

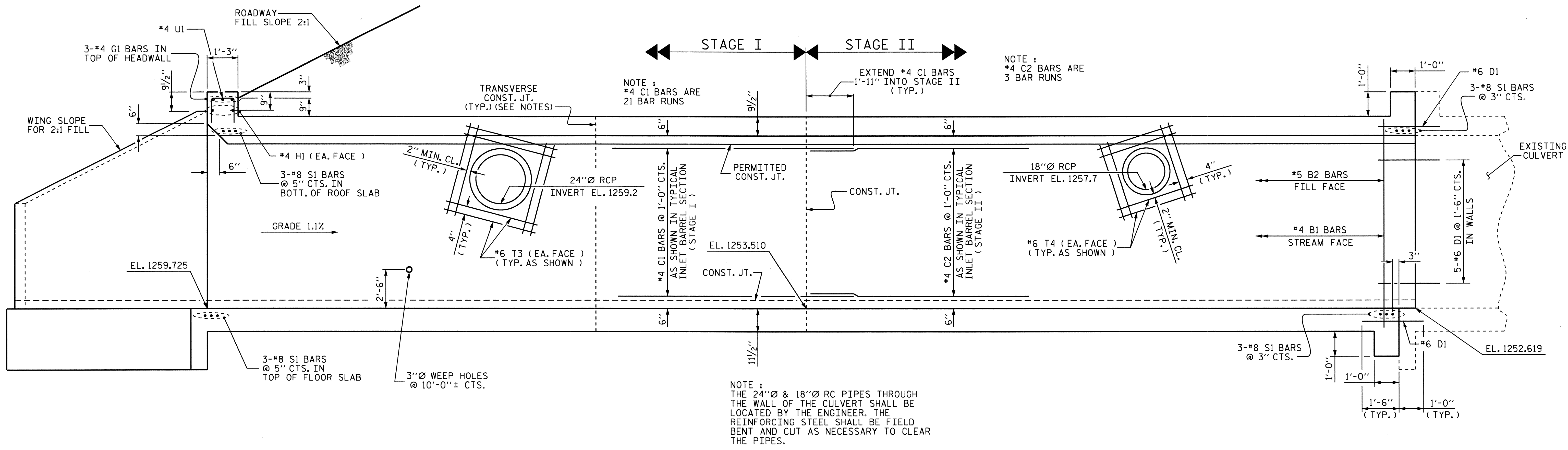


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE
7 FT. x 7 FT. (INLET)
CONCRETE BOX CULVERT
EXTENSION
(STAGE II)

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

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CULVERT SECTION - NORMAL TO HEADWALL
(INLET EXTENSION - STAGE I)

CULVERT SECTION - NORMAL TO HEADWALL
(INLET EXTENSION - STAGE II)

PROJECT NO. U-2211 B
CALDWELL COUNTY
 STATION: 31+08.14 -Y5-

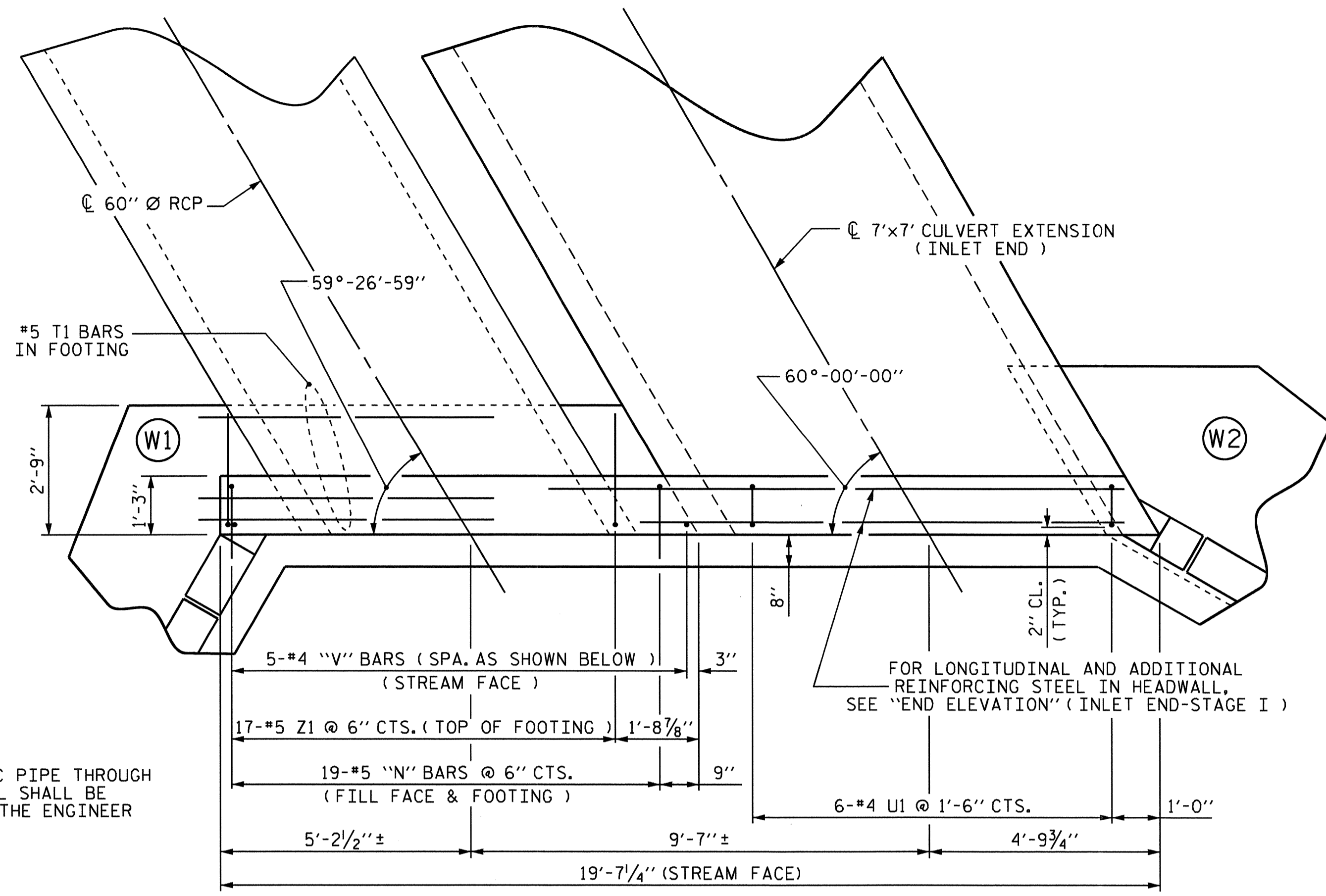
SHEET 5 OF 13



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE
 7 FT. x 7 FT. (INLET)
 CONCRETE BOX CULVERT
 EXTENSION

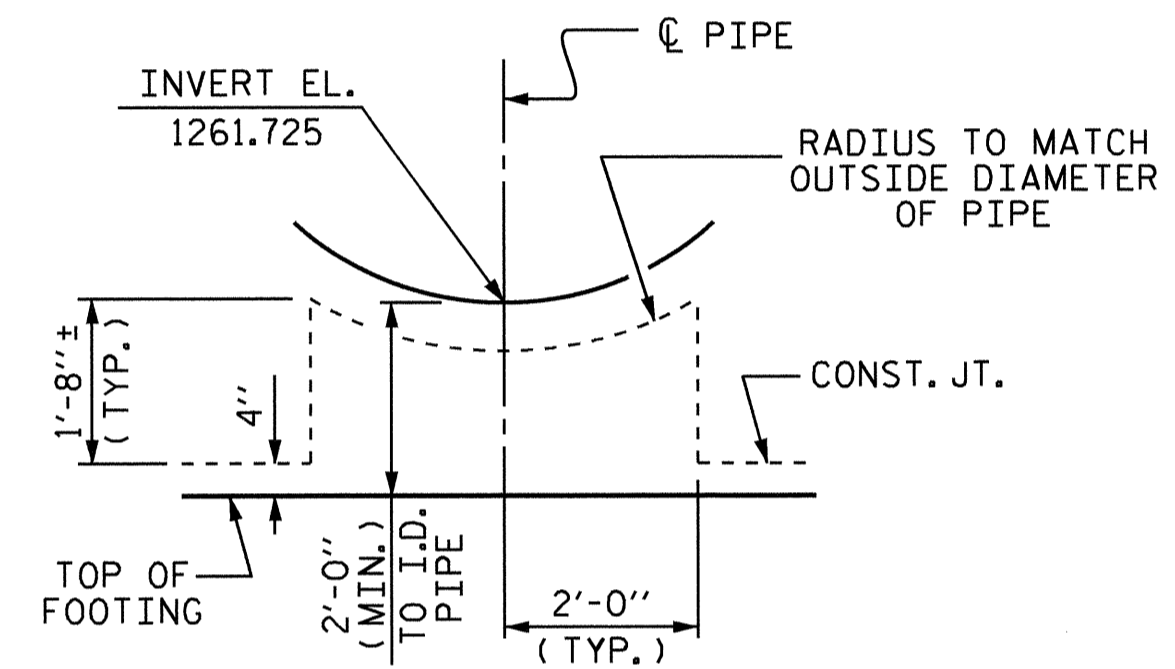
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			16

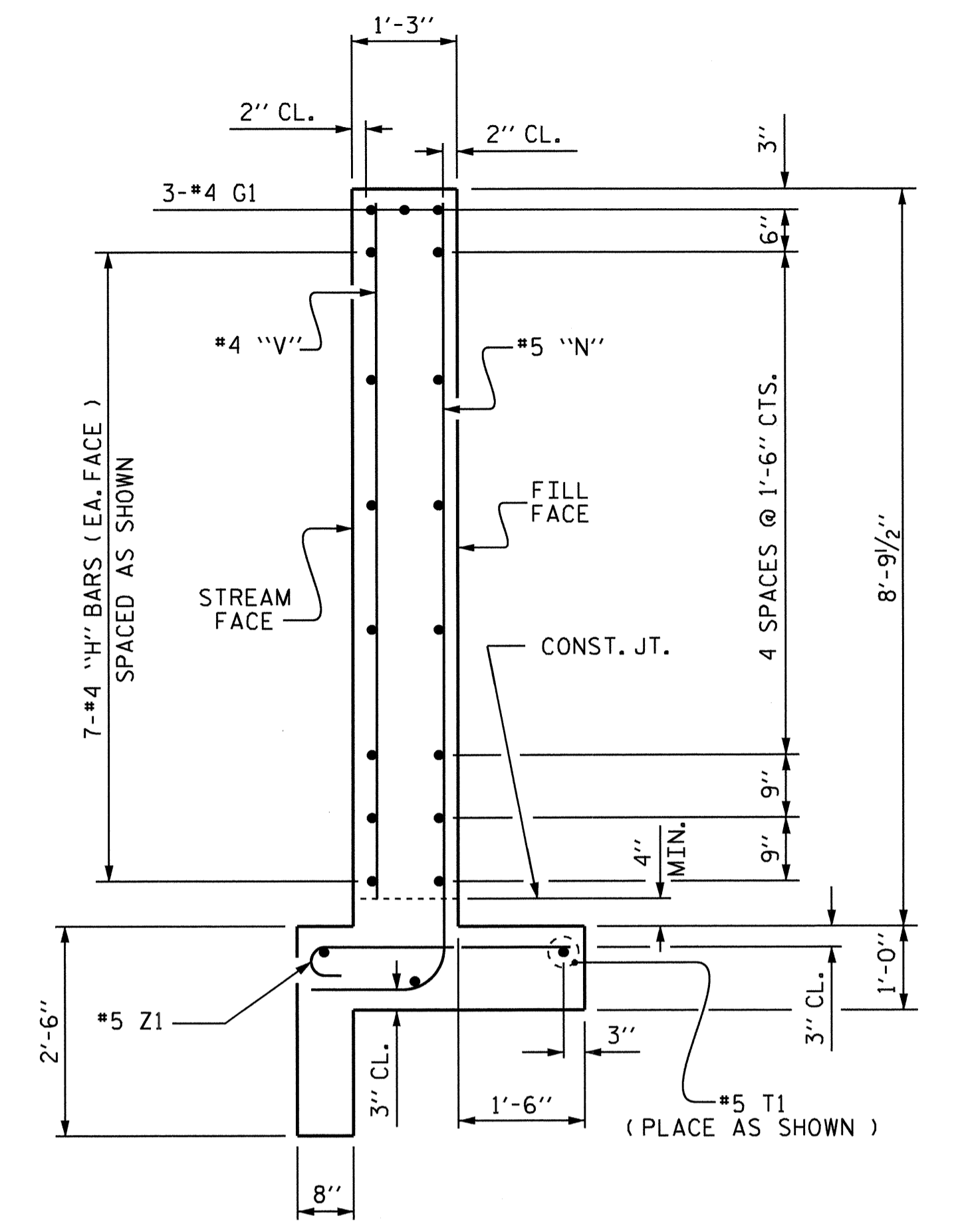


NOTE:
THE 60" Ø RC PIPE THROUGH
THE HEADWALL SHALL BE
LOCATED BY THE ENGINEER

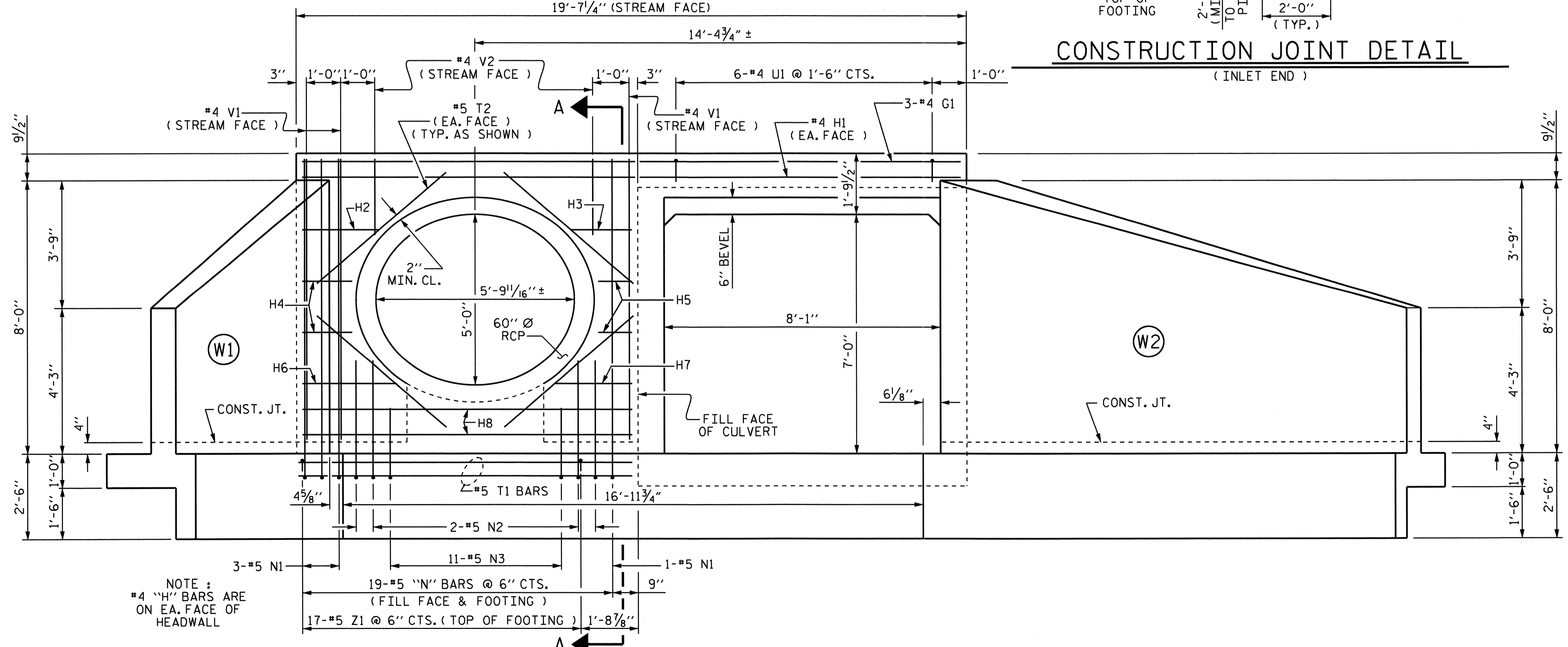
PLAN
(INLET END - STAGE I)



CONSTRUCTION JOINT DETAIL
(INLET END)



SECTION A-A



NOTE:
#4 "H" BARS ARE
ON EA. FACE OF
HEADWALL

END ELEVATION - NORMAL TO SKEW
(INLET END - STAGE I)

PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 6 OF 13

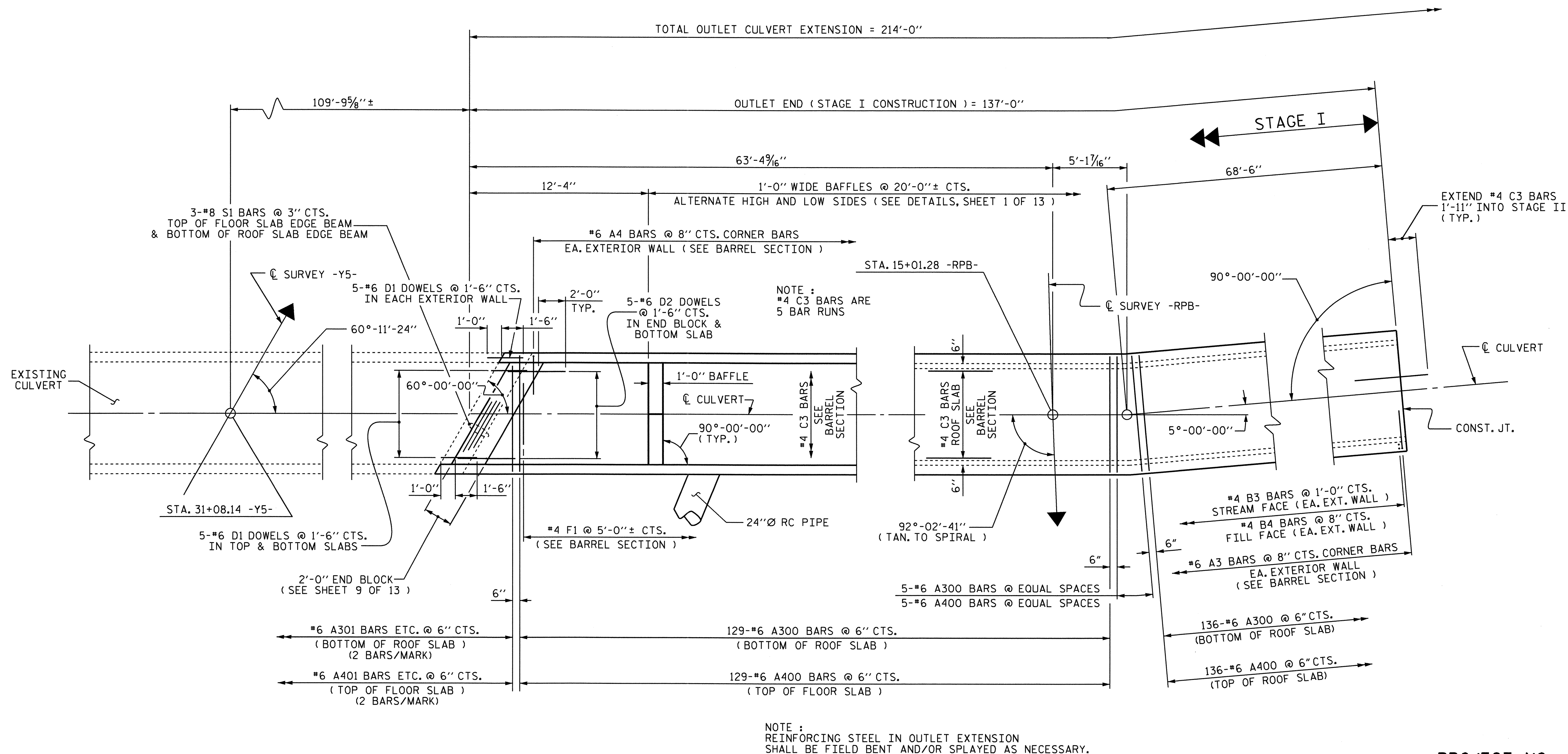


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE
7 FT. x 7 FT. (INLET)
CONCRETE BOX CULVERT
EXTENSION AND
60" Ø PIPE HEADWALL

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

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PART PLAN - FLOOR SLAB
(OUTLET EXTENSION - STAGE I)

PART PLAN - ROOF SLAB
(OUTLET EXTENSION - STAGE I)

NOTE :
THE 24" Ø RC PIPE THROUGH THE WALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AND CUT AS NECESSARY TO CLEAR THE PIPE.

PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

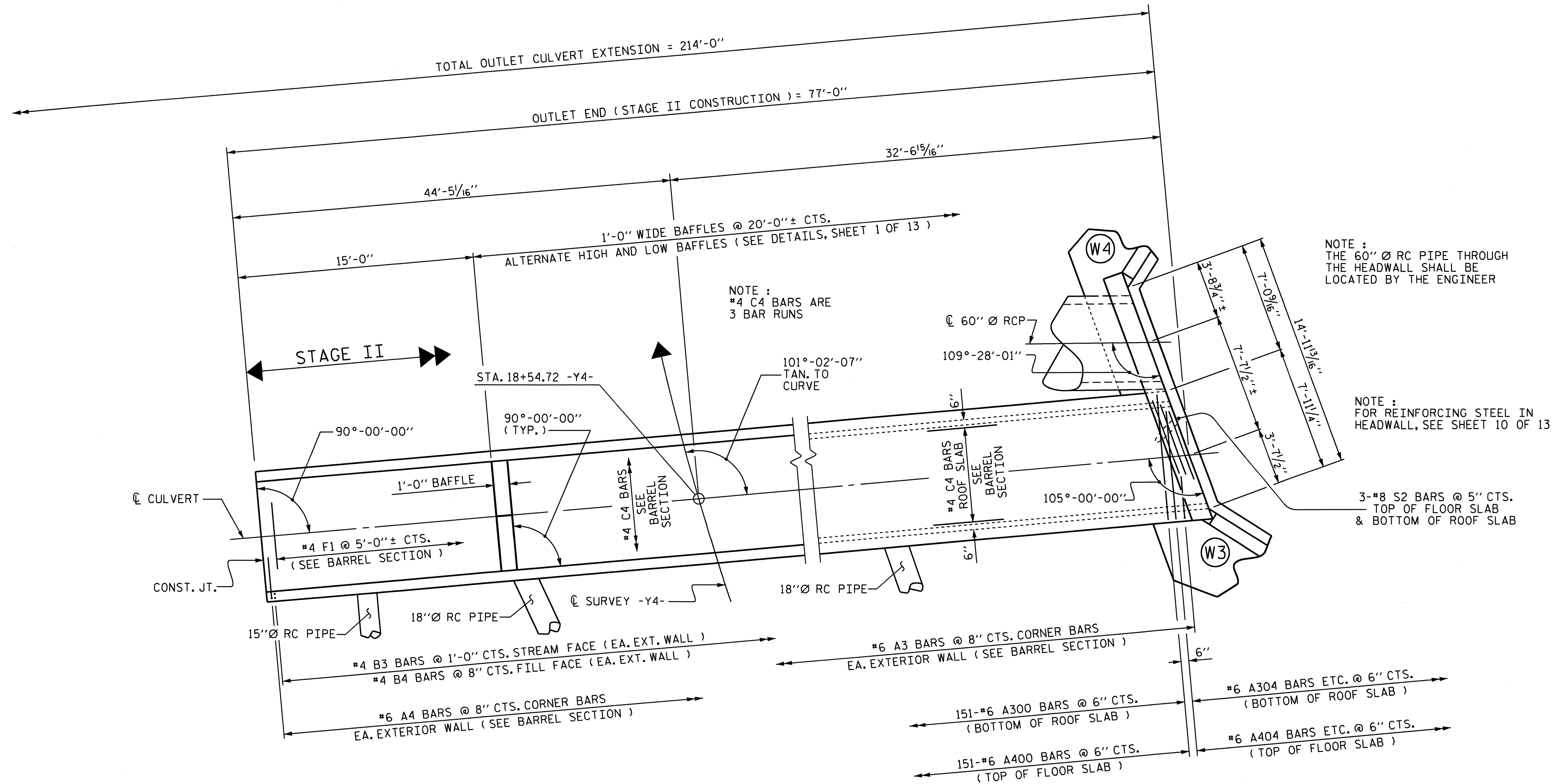
SHEET 7 OF 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE
7 FT. x 8 FT. (OUTLET)
CONCRETE BOX CULVERT
EXTENSION
(STAGE I)



DRAWN BY : MIKE BRITT DATE : 10-13-09
CHECKED BY : D.G. ELY DATE : 11-09

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



PART PLAN - FLOOR SLAB
(OUTLET EXTENSION - STAGE II)

PART PLAN - ROOF SLAB
(OUTLET EXTENSION - STAGE II)

NOTE :
THE 15" Ø & 18" Ø RC PIPES THROUGH THE WALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AND CUT AS NECESSARY TO CLEAR THE PIPES.

PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 8 OF 13



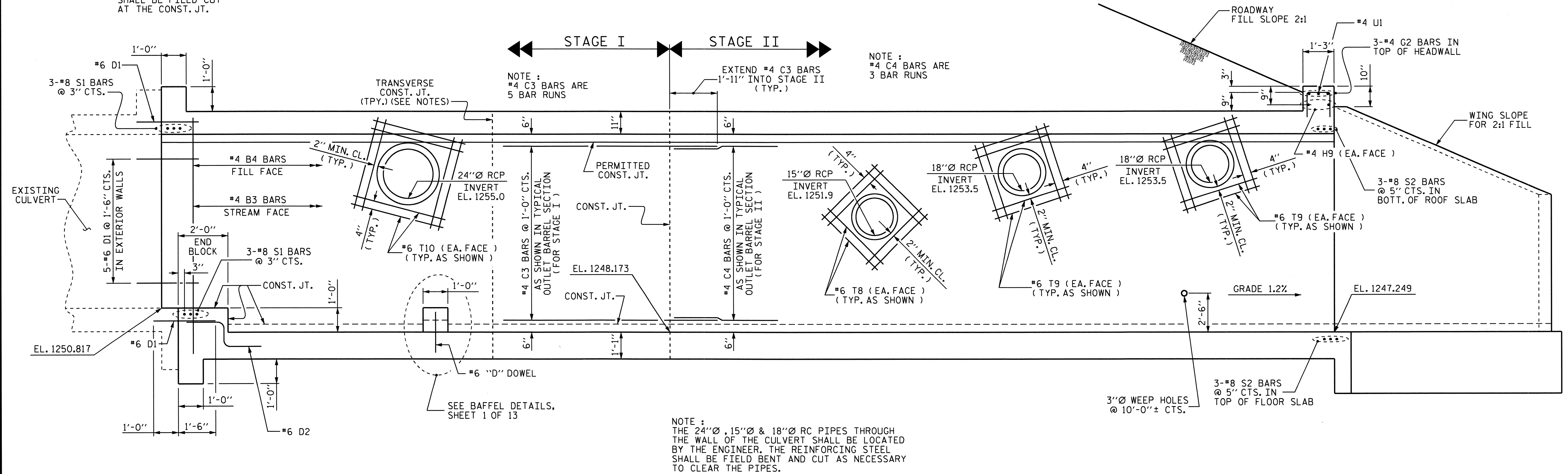
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SINGLE 7 FT. x 8 FT. (OUTLET) CONCRETE BOX CULVERT EXTENSION (STAGE II)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. C-8
					TOTAL SHEETS 16

DRAWN BY : MIKE BRITT DATE : 10-14-09
CHECKED BY : D.G. ELY DATE : 11-09

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STR. #1

NOTE :
 ANY #4 B4 BARS
 IN THE AREA OF
 THE 2'-0" END BLOCK
 SHALL BE FIELD CUT
 AT THE CONST. JT.



NOTE :
 #4 C4 BARS ARE
 3 BAR RUNS

NOTE :
 #4 C3 BARS ARE
 5 BAR RUNS

NOTE :
 THE 24"Ø, 15"Ø & 18"Ø RC PIPES THROUGH
 THE WALL OF THE CULVERT SHALL BE LOCATED
 BY THE ENGINEER. THE REINFORCING STEEL
 SHALL BE FIELD BENT AND CUT AS NECESSARY
 TO CLEAR THE PIPES.

CULVERT SECTION - NORMAL TO HEADWALL
 (OUTLET EXTENSION - STAGE I)

CULVERT SECTION - NORMAL TO HEADWALL
 (OUTLET EXTENSION - STAGE II)

PROJECT NO. U-2211 B
CALDWELL COUNTY
 STATION: 31+08.14 -Y5-

SHEET 9 OF 13

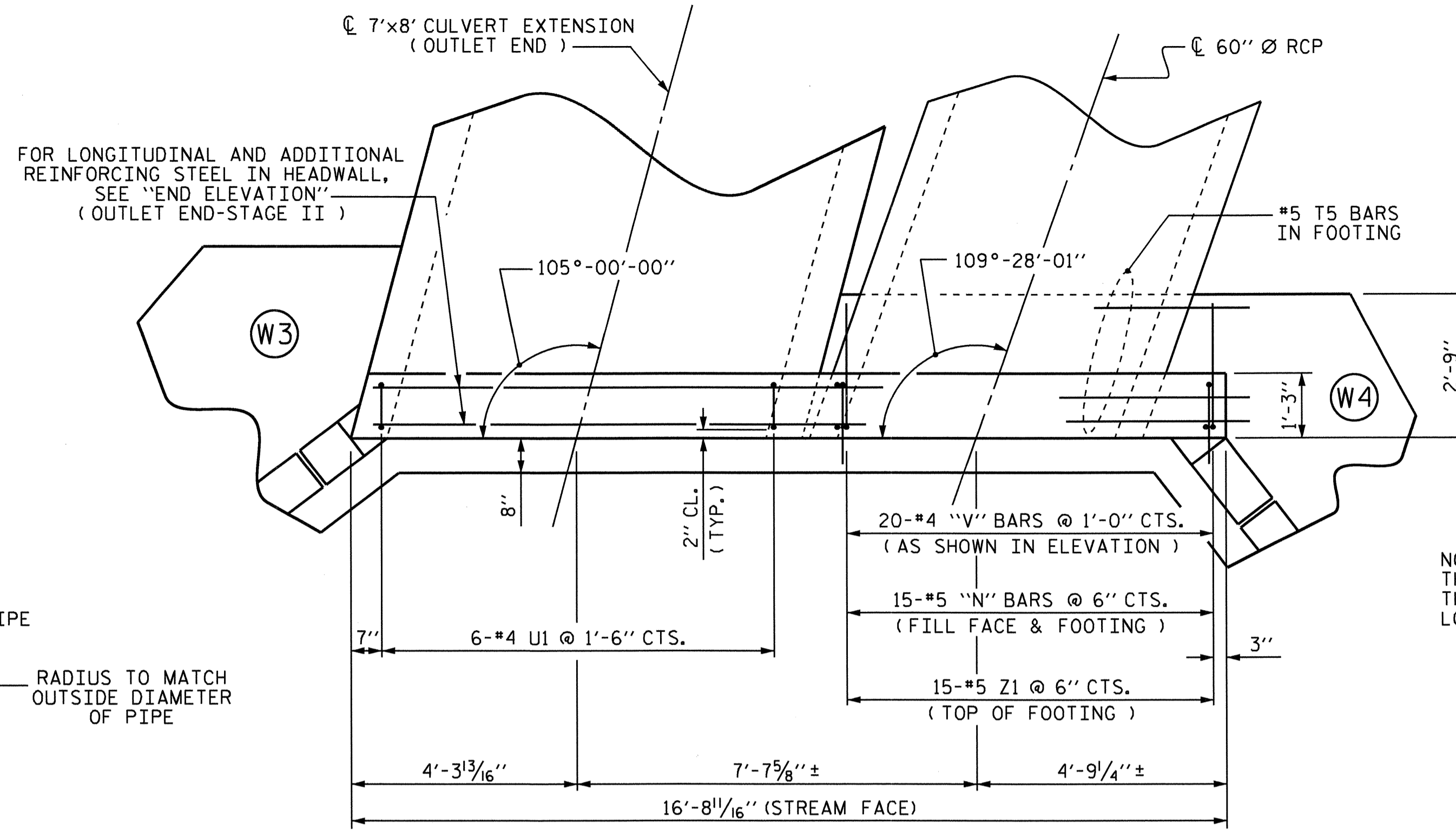


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

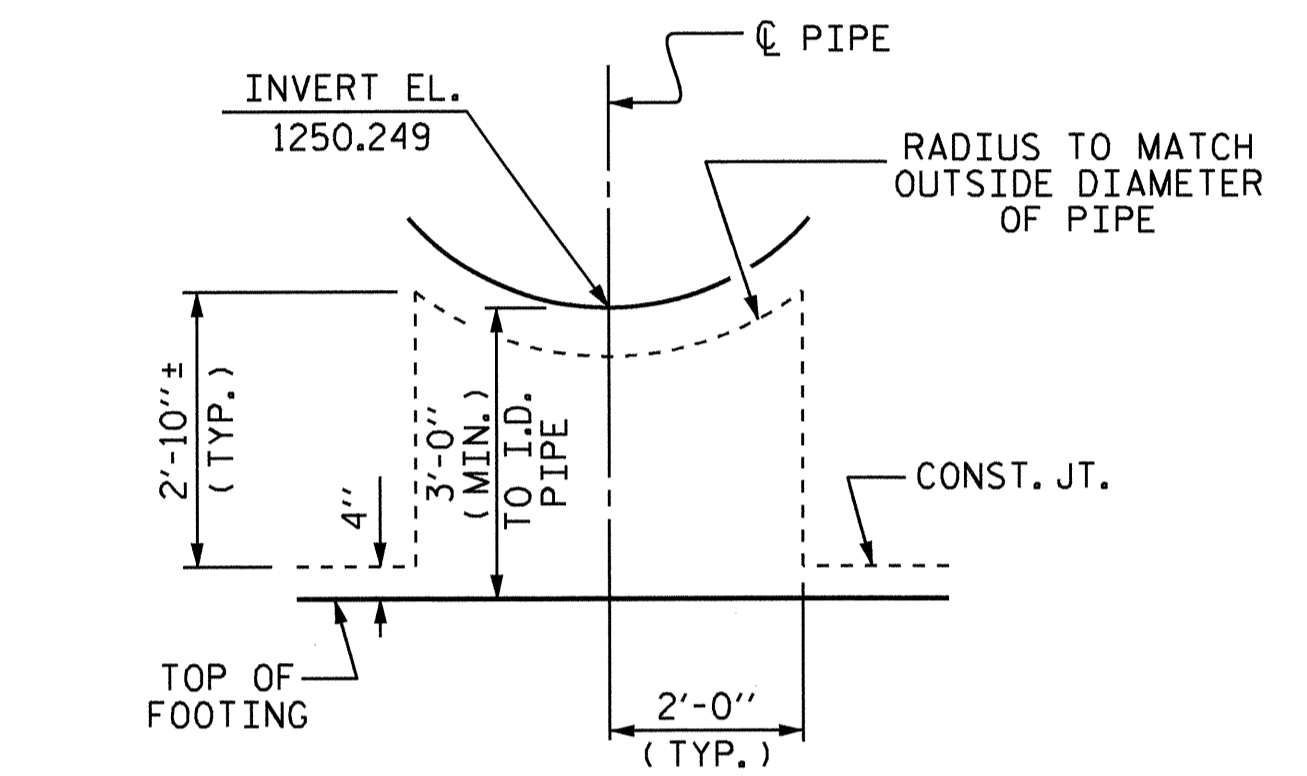
**SINGLE
 7 FT. x 8 FT. (OUTLET)
 CONCRETE BOX CULVERT
 EXTENSION**

DRAWN BY : MIKE BRITT DATE : 10-15-09
 CHECKED BY : D.G. ELY DATE : 11-09

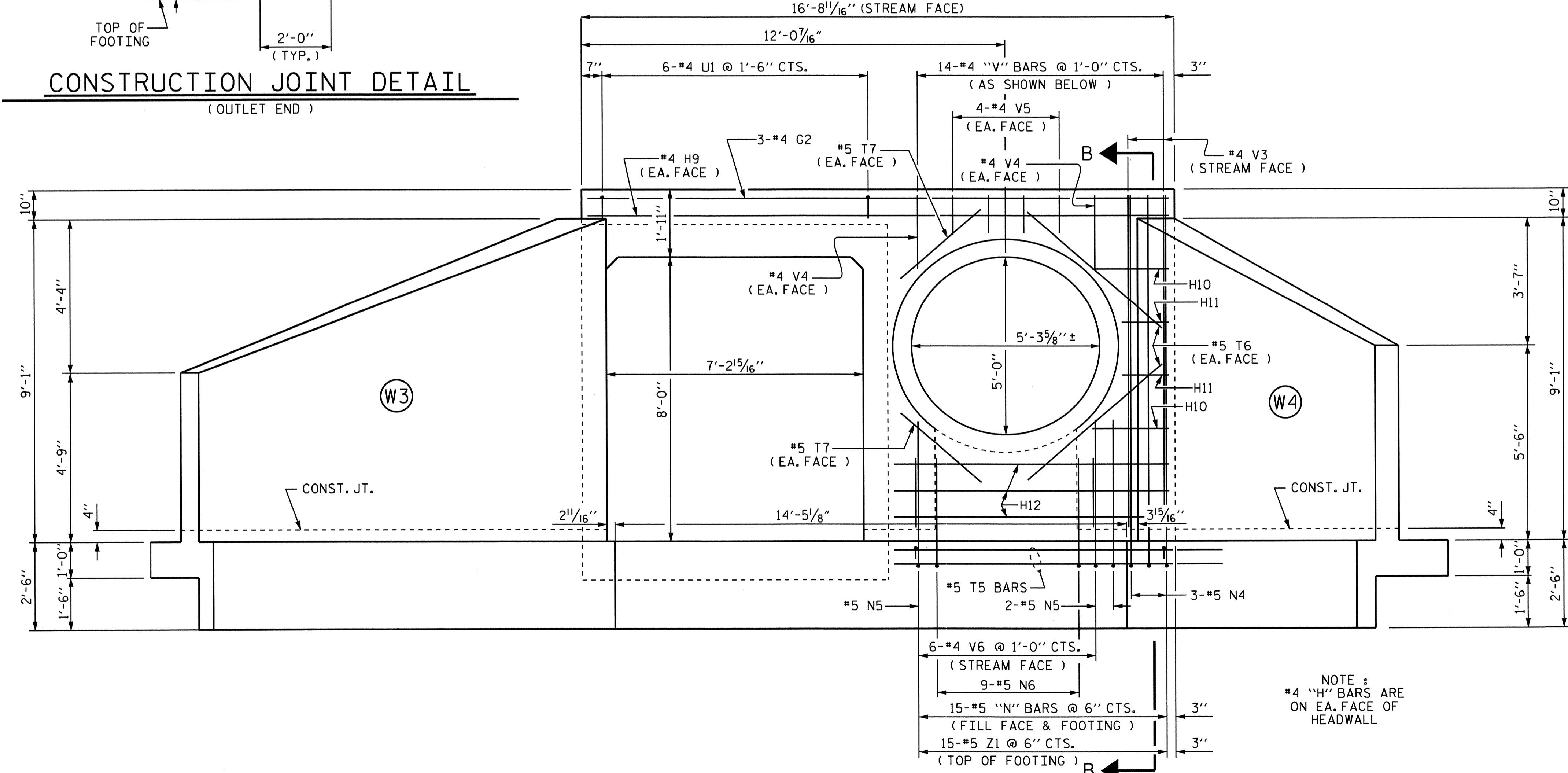
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-9
1			3			TOTAL SHEETS
2			4			16



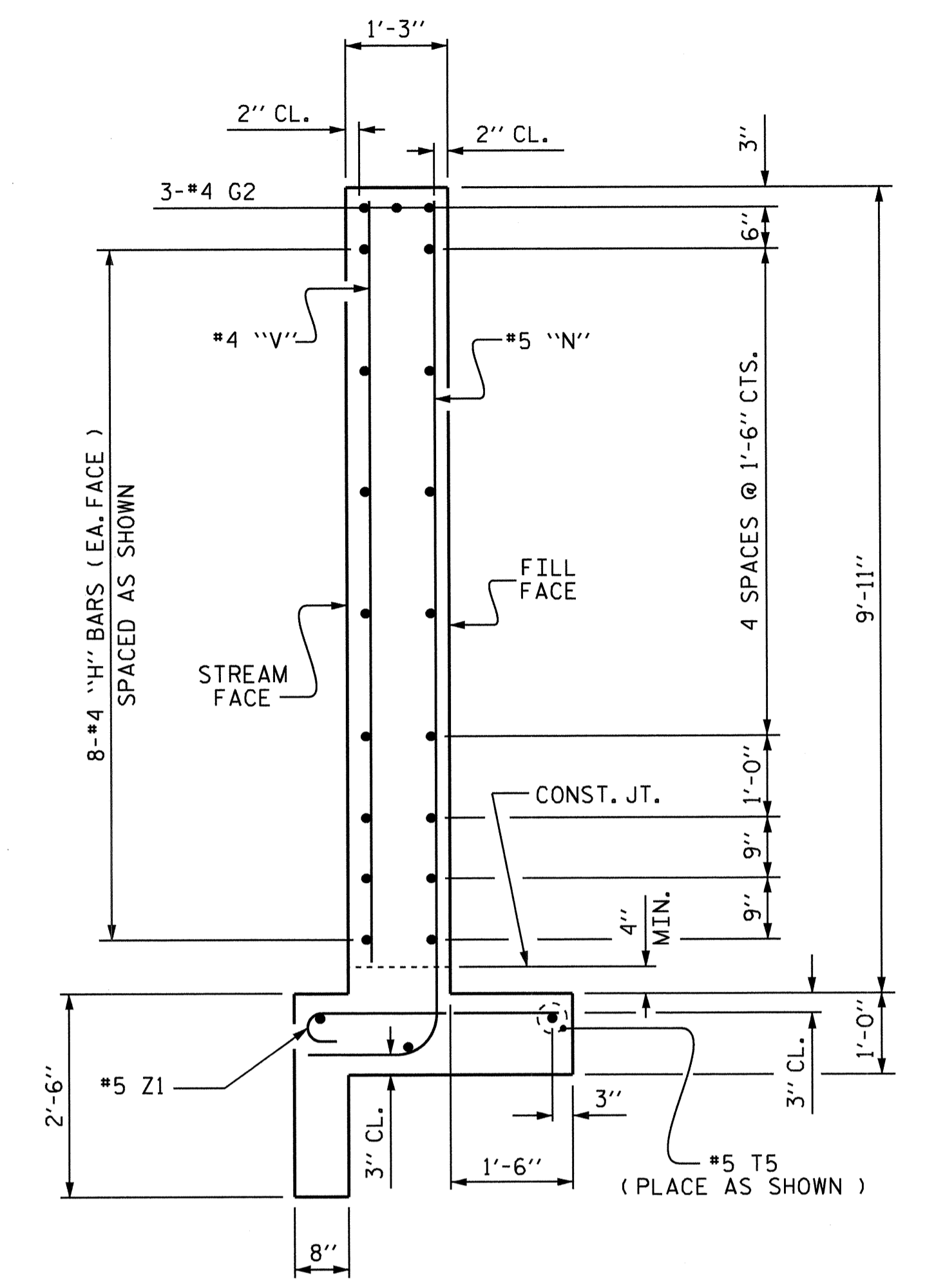
PLAN
(OUTLET END - STAGE II)



CONSTRUCTION JOINT DETAIL
(OUTLET END)



END ELEVATION - NORMAL TO SKEW
(OUTLET END - STAGE II)



SECTION B-B

PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-
SHEET 10 OF 13

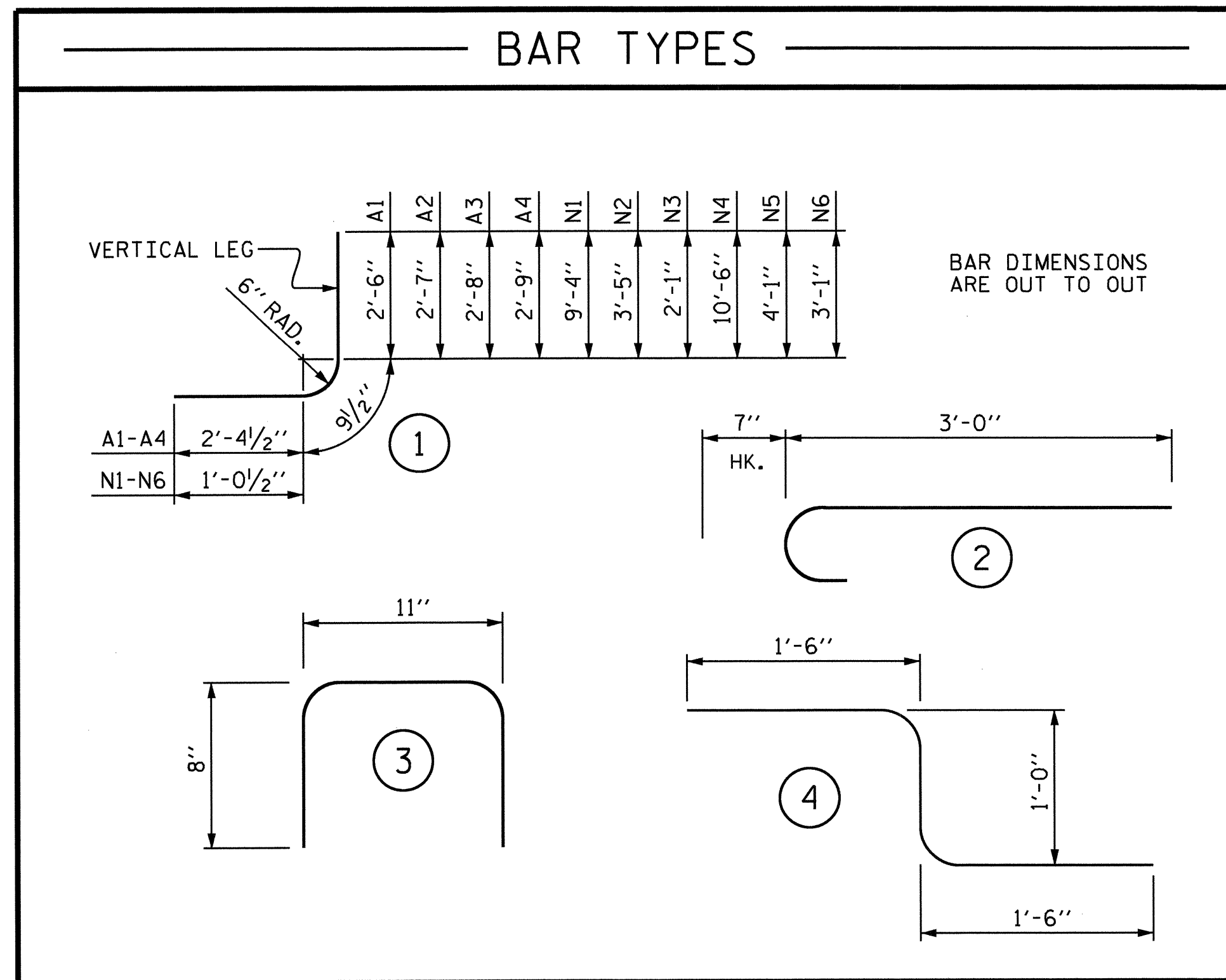


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE
7 FT. x 8 FT. (OUTLET)
CONCRETE BOX CULVERT
EXTENSION AND
60"Ø PIPE HEADWALL

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

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REINFORCING BAR SCHEDULE FOR INLET END - STAGE I

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A1	1355	#6	1	5'-8"	11533
A2	1355	#6	1	5'-9"	11702
A100	1042	#6	STR.	7'-11"	12390
A101	2	#6	STR.	5'-10"	18
A102	2	#6	STR.	4'-0"	12
A103	2	#6	STR.	2'-1"	6
A200	1042	#6	STR.	7'-11"	12390
A201	2	#6	STR.	5'-10"	18
A202	2	#6	STR.	4'-0"	12
A203	2	#6	STR.	2'-1"	6
B1	1506	#4	STR.	8'-3"	8300
B2	1356	#5	STR.	6'-4"	8957
C1	903	#4	STR.	29'-0"	17493
F1	115	#4	STR.	4'-3"	326
G1	3	#4	STR.	18'-6"	37
H1	2	#4	STR.	18'-6"	25
H2	2	#4	STR.	2'-3"	3
H3	2	#4	STR.	1'-9"	2
H4	4	#4	STR.	1'-5"	4
H5	4	#4	STR.	1'-0"	3
H6	2	#4	STR.	2'-9"	4
H7	2	#4	STR.	2'-3"	3
H8	4	#4	STR.	9'-7"	26
N1	4	#5	1	11'-2"	47
N2	4	#5	1	5'-3"	22
N3	11	#5	1	3'-11"	45
S1	6	#8	STR.	9'-2"	147
T1	3	#5	STR.	10'-0"	31
T2	8	#5	STR.	5'-0"	42
T3	16	#6	STR.	4'-0"	96
U1	6	#4	3	2'-3"	9
V1	3	#4	STR.	8'-3"	17
V2	2	#4	STR.	2'-2"	3
Z1	17	#5	2	3'-7"	64
TOTAL REINFORCING STEEL					83,793 LBS.

REINFORCING BAR SCHEDULE FOR INLET END - STAGE II

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A1	192	#6	1	5'-8"	1634
A2	192	#6	1	5'-9"	1658
A100	144	#6	STR.	7'-11"	1712
A104	2	#6	STR.	6'-3"	19
A105	2	#6	STR.	4'-5"	13
A106	2	#6	STR.	2'-6"	8
A200	144	#6	STR.	7'-11"	1712
A204	2	#6	STR.	6'-3"	19
A205	2	#6	STR.	4'-5"	13
A206	2	#6	STR.	2'-6"	8
B1	216	#4	STR.	8'-3"	1190
B2	194	#5	STR.	6'-4"	1281
C2	129	#4	STR.	29'-1"	2506
D1	20	#6	STR.	2'-6"	75
F1	16	#4	STR.	4'-3"	45
S1	6	#8	STR.	9'-2"	147
T4	16	#6	STR.	3'-6"	84
TOTAL REINFORCING STEEL					12,124 LBS.

REINFORCING BAR SCHEDULE FOR OUTLET END - STAGE I

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A3	406	#6	1	5'-10"	3557
A4	406	#6	1	5'-11"	3608
A300	270	#6	STR.	7'-11"	3211
A301	2	#6	STR.	6'-3"	19
A302	2	#6	STR.	4'-5"	13
A303	2	#6	STR.	2'-6"	8
A400	270	#6	STR.	7'-11"	3211
A401	2	#6	STR.	6'-3"	19
A402	2	#6	STR.	4'-5"	13
A403	2	#6	STR.	2'-6"	8
B3	274	#4	STR.	9'-6"	1739
B4	411	#4	STR.	7'-4"	2013
C3	225	#4	STR.	29'-11"	4496
D1	20	#6	STR.	2'-6"	75
D2	5	#6	4	4'-0"	30
D3	14	#6	STR.	1'-8"	35
D4	14	#6	STR.	1'-2"	25
F1	28	#4	STR.	4'-3"	79
S1	6	#8	STR.	9'-2"	147
T10	16	#6	STR.	4'-0"	96
TOTAL REINFORCING STEEL					22,402 LBS.

REINFORCING BAR SCHEDULE FOR OUTLET END - STAGE II

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A3	229	#6	1	5'-10"	2006
A4	229	#6	1	5'-11"	2035
A300	151	#6	STR.	7'-11"	1796
A304	1	#6	STR.	6'-0"	9
A305	1	#6	STR.	4'-3"	6
A306	1	#6	STR.	2'-7"	4
A400	151	#6	STR.	7'-11"	1796
A404	1	#6	STR.	6'-0"	9
A405	1	#6	STR.	4'-3"	6
A406	1	#6	STR.	2'-7"	4
B3	154	#4	STR.	9'-6"	977
B4	231	#4	STR.	7'-4"	1132
C4	135	#4	STR.	27'-4"	2465
D3	8	#6	STR.	1'-8"	20
D4	8	#6	STR.	1'-2"	14
F1	16	#4	STR.	4'-3"	45
G2	3	#4	STR.	16'-0"	32
H9	2	#4	STR.	16'-0"	21
H10	4	#4	STR.	2'-2"	6
H11	4	#4	STR.	1'-4"	4
H12	6	#4	STR.	7'-9"	31
N4	3	#5	1	12'-4"	39
N5	3	#5	1	5'-11"	19
N6	9	#5	1	4'-11"	46
S2	6	#8	STR.	8'-3"	132
T5	3	#5	STR.	9'-4"	29
T6	4	#5	STR.	5'-0"	21
T7	4	#5	STR.	3'-0"	13
T8	16	#6	STR.	3'-3"	78
T9	32	#6	STR.	3'-6"	168
U1	6	#4	3	2'-3"	9
V3	2	#4	STR.	9'-3"	12
V4	4	#4	STR.	2'-1"	6
V5	8	#4	STR.	1'-1"	6
V6	6	#4	STR.	2'-0"	8
Z1	15	#5	2	3'-7"	56
TOTAL REINFORCING STEEL					13,060 LBS.

INLET STAGE I QUANTITIES

CLASS A CONCRETE	
INLET STAGE I BARREL @ 0.890 CY/FT	= 502.9 CY
INLET STAGE I HEADWALL, ETC.	= 6.2 CY
INLET STAGE I WING W1, W2, ETC.	= 10.9 CY
TOTAL	520.0 CY
REINFORCING STEEL	
INLET STAGE I BARREL, ETC.	= 83,793 LBS.
INLET STAGE I WINGS W1 & W2	= 606 LBS.
TOTAL	84,399 LBS.
FOUNDATION CONDITIONING MATERIAL	
INLET STAGE I	491 TONS
CULVERT EXCAVATION	
INLET STAGE I	LUMP SUM

INLET STAGE II QUANTITIES

CLASS A CONCRETE	
INLET STAGE II BARREL @ 0.890 CY/FT	= 72.1 CY
INLET STAGE II EDGE BEAMS	= 0.7 CY
TOTAL	72.8 CY
REINFORCING STEEL	
INLET STAGE II BARREL	12,124 LBS.
FOUNDATION CONDITIONING MATERIAL	
INLET STAGE II	70 TONS
CULVERT EXCAVATION	
INLET STAGE II	LUMP SUM

OUTLET STAGE I QUANTITIES

CLASS A CONCRETE	
OUTLET STAGE I BARREL @ 1.016 CY/FT	= 139.2 CY
OUTLET STAGE I EDGE BEAMS & END BLOCK	= 1.3 CY
OUTLET STAGE I BAFFLES	= 1.4 CY
TOTAL	141.9 CY
REINFORCING STEEL	
OUTLET STAGE I BARREL	22,402 LBS.
FOUNDATION CONDITIONING MATERIAL	
OUTLET STAGE I	119 TONS
CULVERT EXCAVATION	
OUTLET STAGE I	LUMP SUM

OUTLET STAGE II QUANTITIES

CLASS A CONCRETE	
OUTLET STAGE II BARREL @ 1.016 CY/FT	= 78.2 CY
OUTLET STAGE II BAFFLES	= 0.8 CY
OUTLET STAGE II HEADWALL, ETC.	= 5.9 CY
OUTLET STAGE II WING W3, W4, ETC.	= 11.7 CY
TOTAL	96.6 CY
REINFORCING STEEL	
OUTLET STAGE II BARREL, ETC.	= 13,060 LBS.
OUTLET STAGE II WINGS W3 & W4	= 669 LBS.
TOTAL	13,729 LBS.
FOUNDATION CONDITIONING MATERIAL	
OUTLET STAGE II	67 TONS
CULVERT EXCAVATION	
OUTLET STAGE II	LUMP SUM

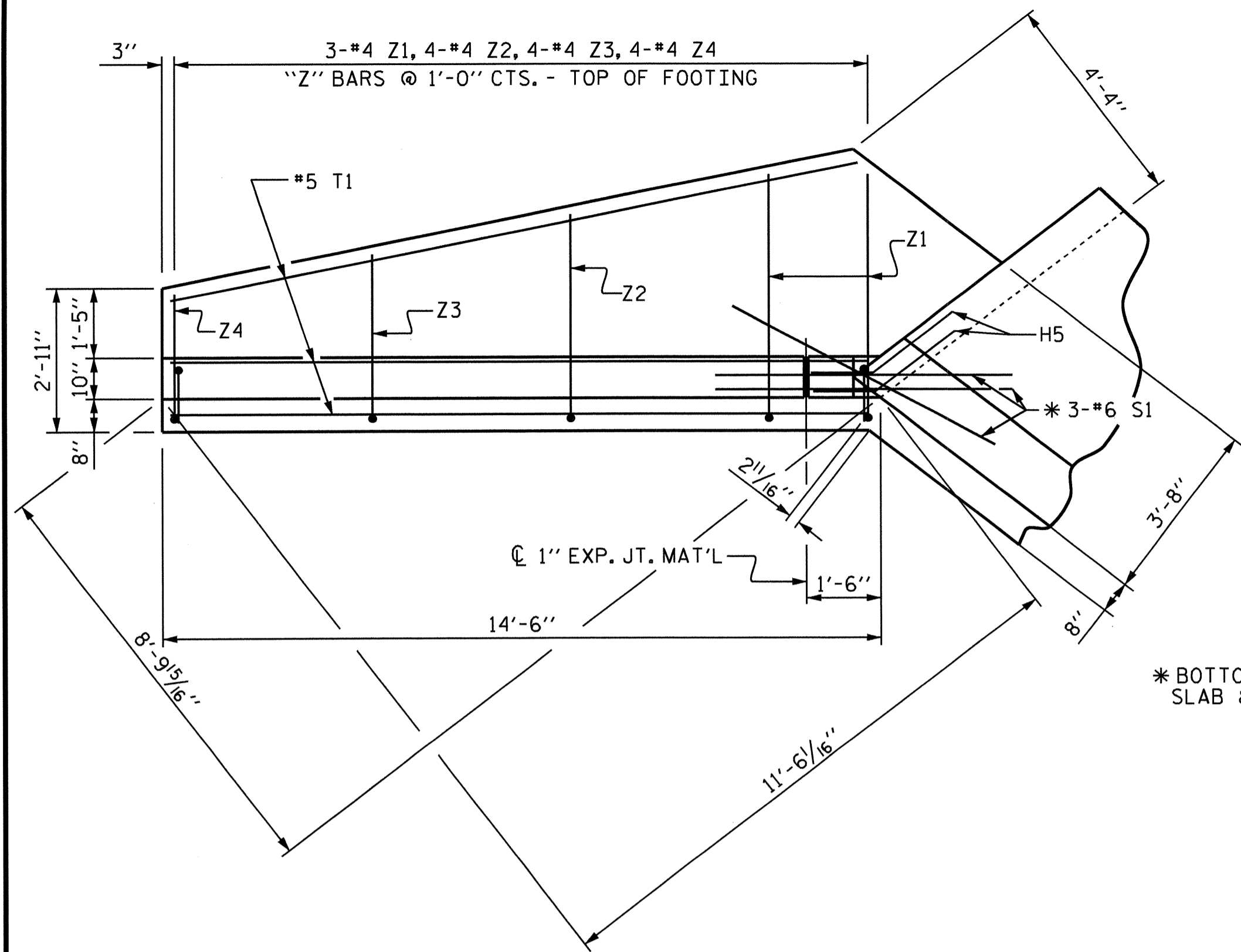
PROJECT NO. U-2211 B
CALDWELL COUNTY
 STATION: 31+08.14 -Y5-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SINGLE
 7 FT. x 7 FT. (INLET)
 & 7 FT. x 8 FT. (OUTLET)
 CONCRETE BOX CULVERT
 EXTENSIONS AND
 60"Ø PIPE HEADWALLS

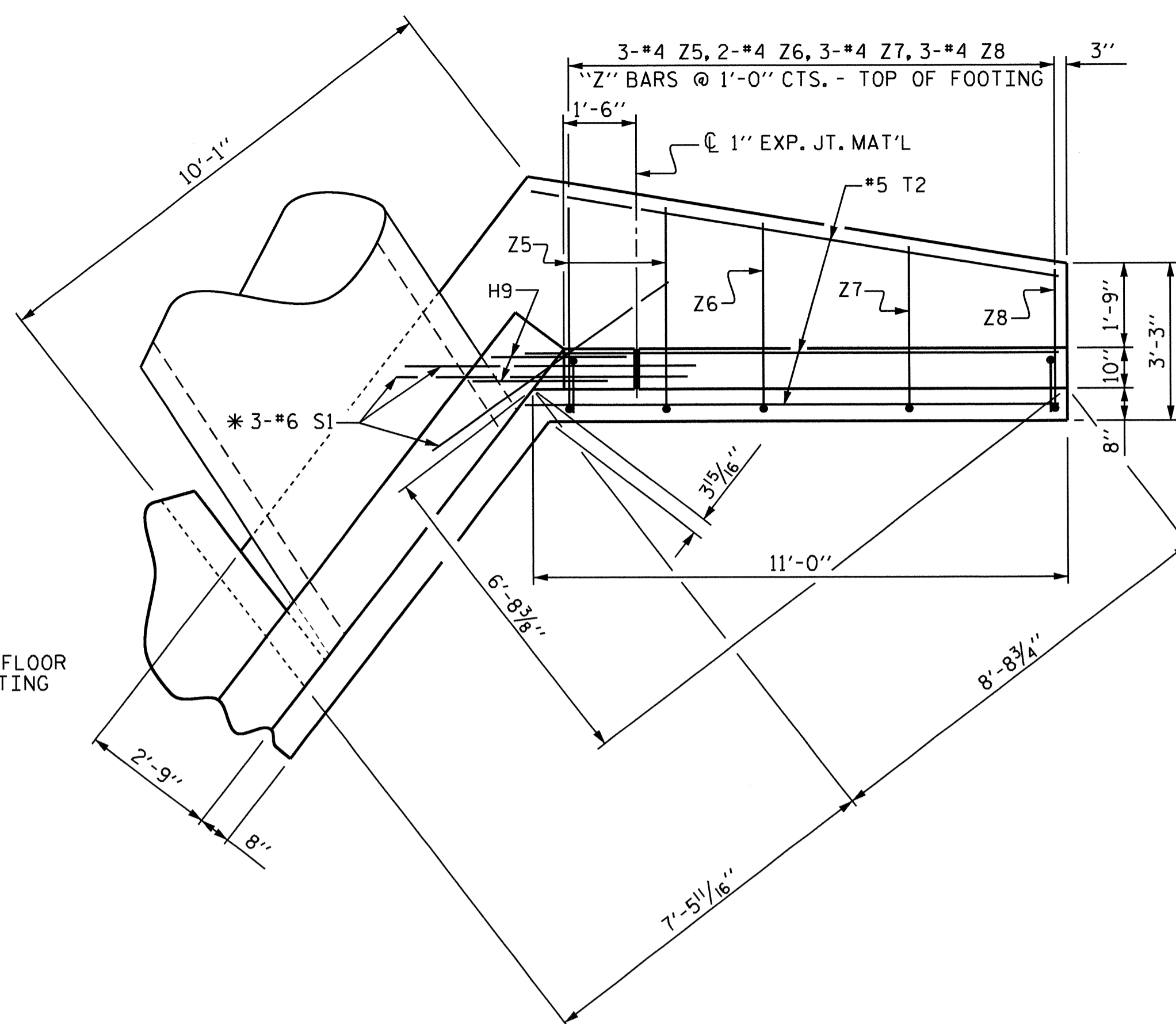


DRAWN BY: MIKE BRITT DATE: 11-4-09
 CHECKED BY: D.G. ELY DATE: 11-09

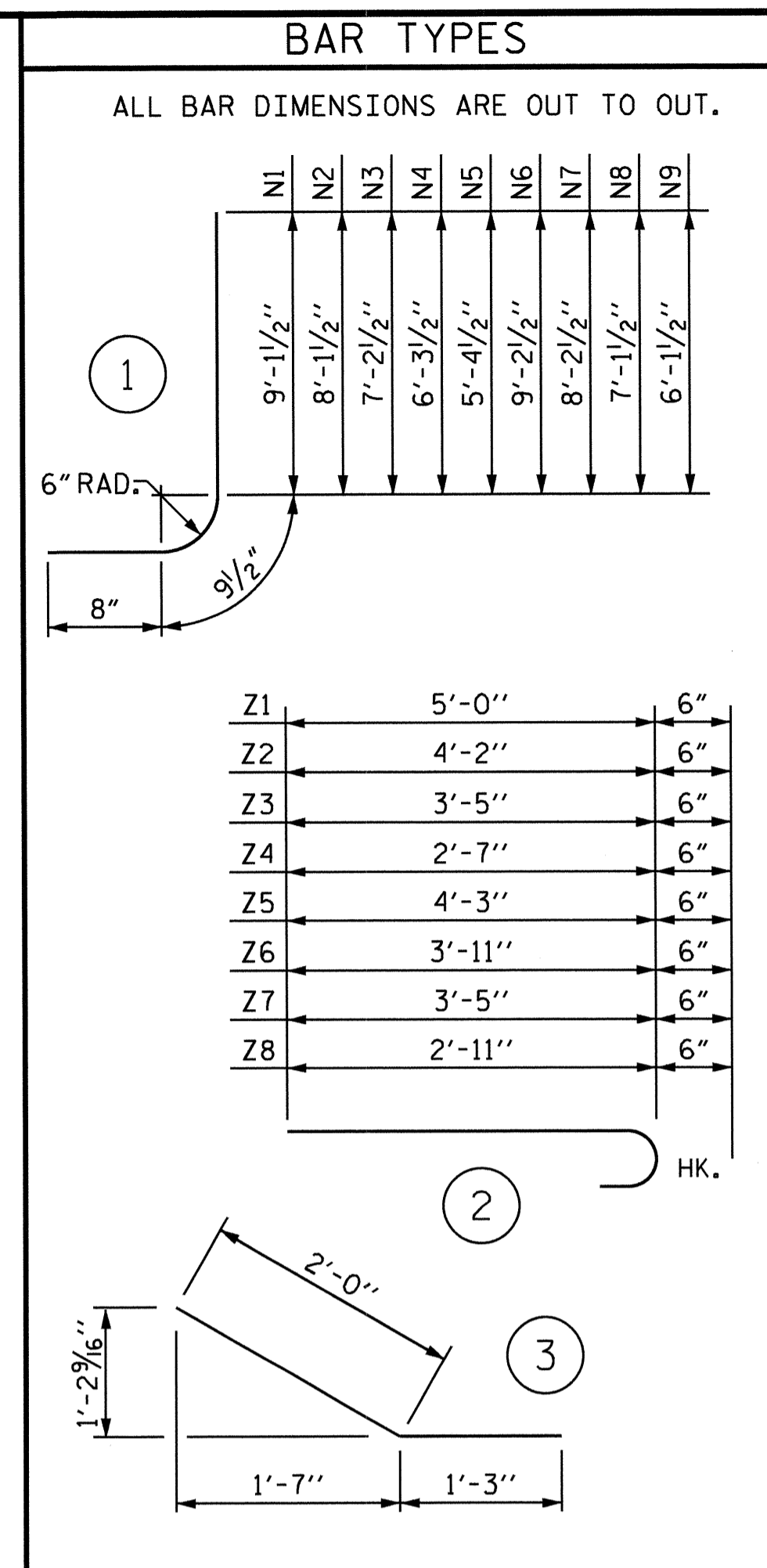
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			16



PLAN WING W3
OUTLET END (STAGE II)



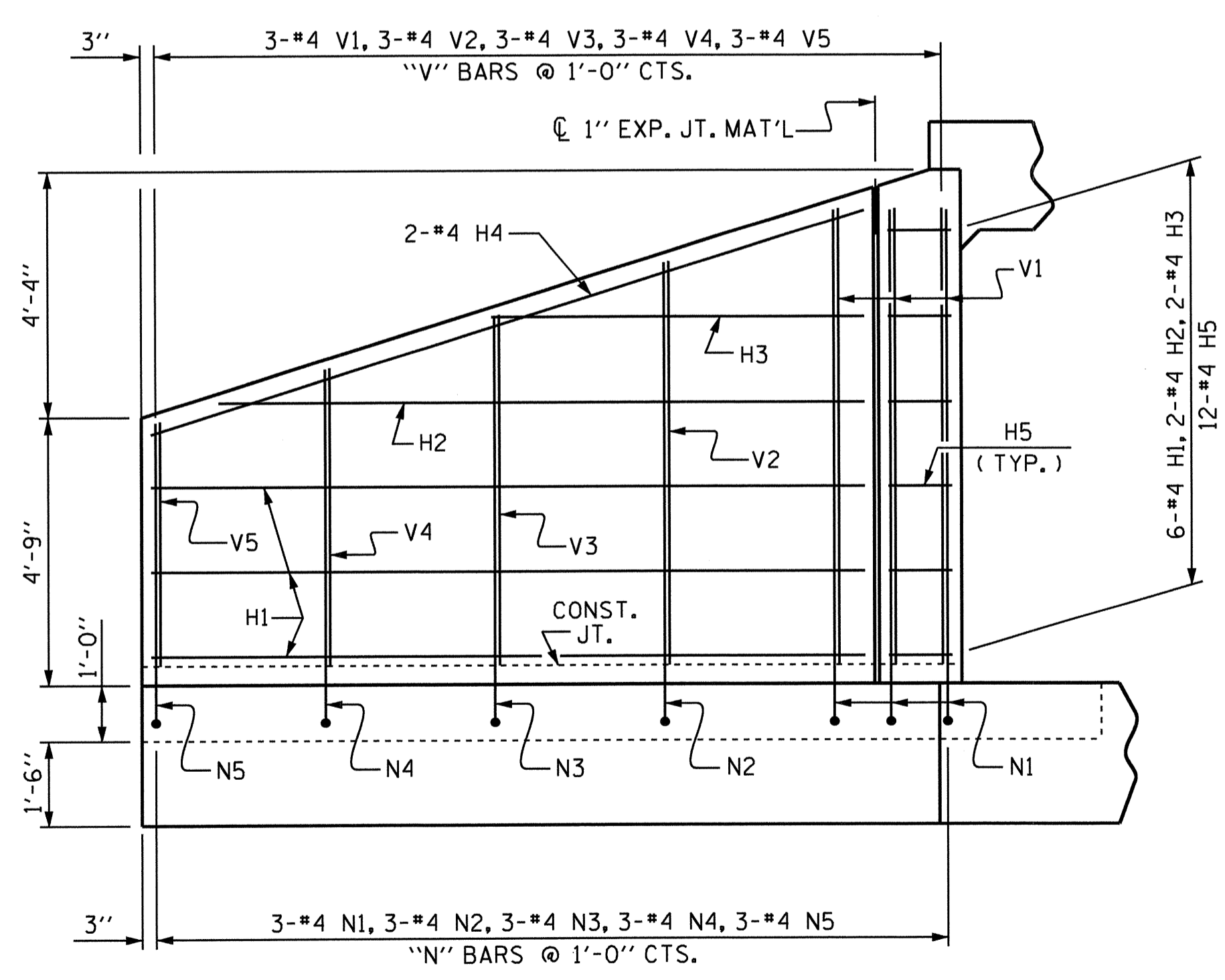
PLAN WING W4
OUTLET END (STAGE II)



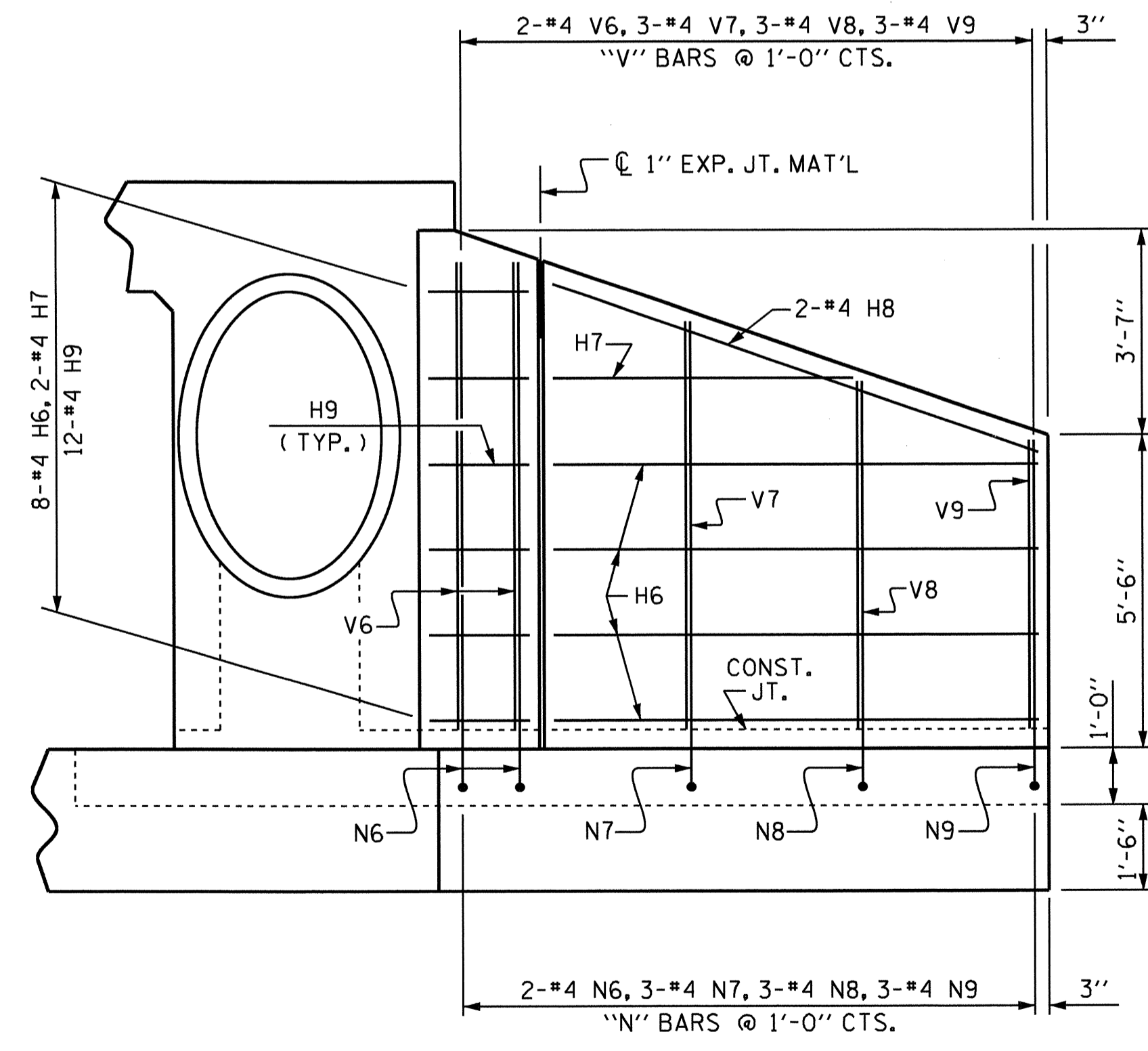
BILL OF MATERIAL					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	12'-7"	50
H2	2	#4	STR	11'-5"	15
H3	2	#4	STR	6'-7"	9
H4	2	#4	STR	13'-2"	18
H5	12	#4	STR	3'-3"	26
H6	8	#4	STR	8'-5"	45
H7	2	#4	STR	5'-3"	7
H8	2	#4	STR	8'-11"	12
H9	12	#4	STR	2'-7"	21
N1	3	#4	1	10'-7"	21
N2	3	#4	1	9'-7"	19
N3	3	#4	1	8'-8"	17
N4	3	#4	1	7'-9"	16
N5	3	#4	1	6'-10"	14
N6	2	#4	1	10'-8"	14
N7	3	#4	1	9'-8"	19
N8	3	#4	1	8'-7"	17
N9	3	#4	1	7'-7"	15
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	14'-1"	44
T2	3	#5	STR	11'-1"	35
V1	3	#4	STR	8'-1"	16
V2	3	#4	STR	7'-1"	14
V3	3	#4	STR	6'-2"	12
V4	3	#4	STR	5'-3"	11
V5	3	#4	STR	4'-4"	9
V6	2	#4	STR	8'-2"	11
V7	3	#4	STR	7'-1"	14
V8	3	#4	STR	6'-1"	12
V9	3	#4	STR	5'-1"	10
Z1	3	#4	2	5'-6"	11
Z2	4	#4	2	4'-8"	12
Z3	4	#4	2	3'-11"	10
Z4	4	#4	2	3'-1"	8
Z5	3	#4	2	4'-9"	10
Z6	2	#4	2	4'-5"	6
Z7	3	#4	2	3'-11"	8
Z8	3	#4	2	3'-5"	7

REINFORCING STEEL FOR WINGS W3 & W4	669 LBS
CLASS A CONCRETE	
OUTLET END WING W3	6.2 CY
OUTLET END WING W4	5.5 CY
TOTAL	11.7 CY

NOTE:
FOR TYPICAL SECTION OF WINGS W3 & W4,
SEE "WINGS W1 & W2", SHEET 12 OF 13



ELEVATION WING W3
OUTLET END (STAGE II)



ELEVATION WING W4
OUTLET END (STAGE II)

DRAWN BY: MIKE BRITT DATE: 11-4-09
CHECKED BY: D.G. ELY DATE: 11-09

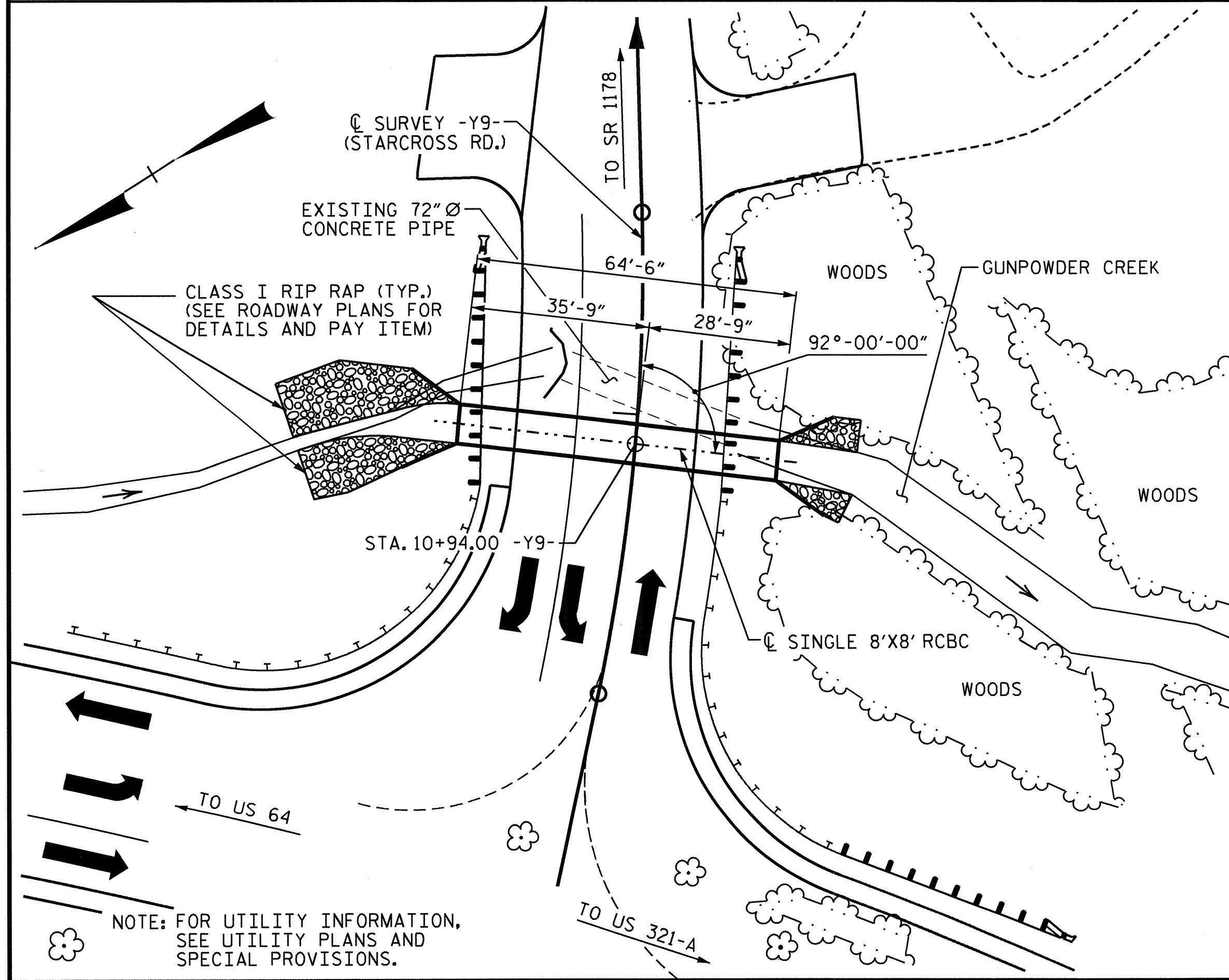
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PROJECT NO. U-2211 B
CALDWELL COUNTY
STATION: 31+08.14 -Y5-

SHEET 13 OF 13
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
WINGS W3 & W4
FOR
OUTLET END
(STAGE II)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-13	
1			3			TOTAL SHEETS	
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LOCATION SKETCH

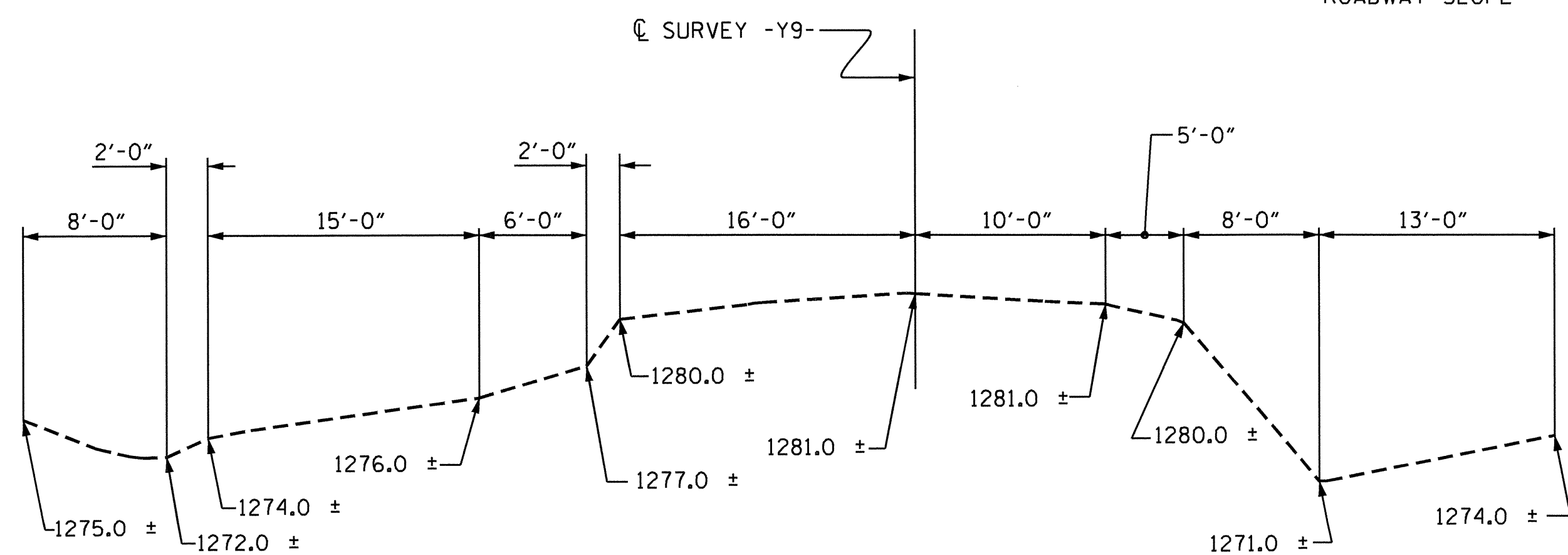
REINFORCING STEEL BAR SCHEDULE						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A100	111	6	STR	8'-11"	1487	
A200	111	6	STR	8'-11"	1487	
A1	164	5	1	4'-7"	784	
A2	164	5	1	4'-5"	755	
B1	130	4	STR	8'-11"	774	
B2	164	6	STR	7'-4"	1806	
C1	114	4	STR	22'-9"	1732	
G1	4	4	STR	9'-0"	24	
REINFORCING STEEL				LBS.	8849	

TOTAL STRUCTURE QUANTITIES		
CLASS A CONCRETE		
BARREL @ 0.889 CY/FT		57.3 C.Y.
WING ETC.		23.1 C.Y.
TOTAL		80.4 C.Y.
REINFORCING STEEL		
BARREL		8849 LBS.
WINGS ETC.		1453 LBS.
TOTAL		10302 LBS.
FOUNDATION CONDITIONING MAT'L.		61 TONS
CULVERT EXCAVATION		LUMP SUM

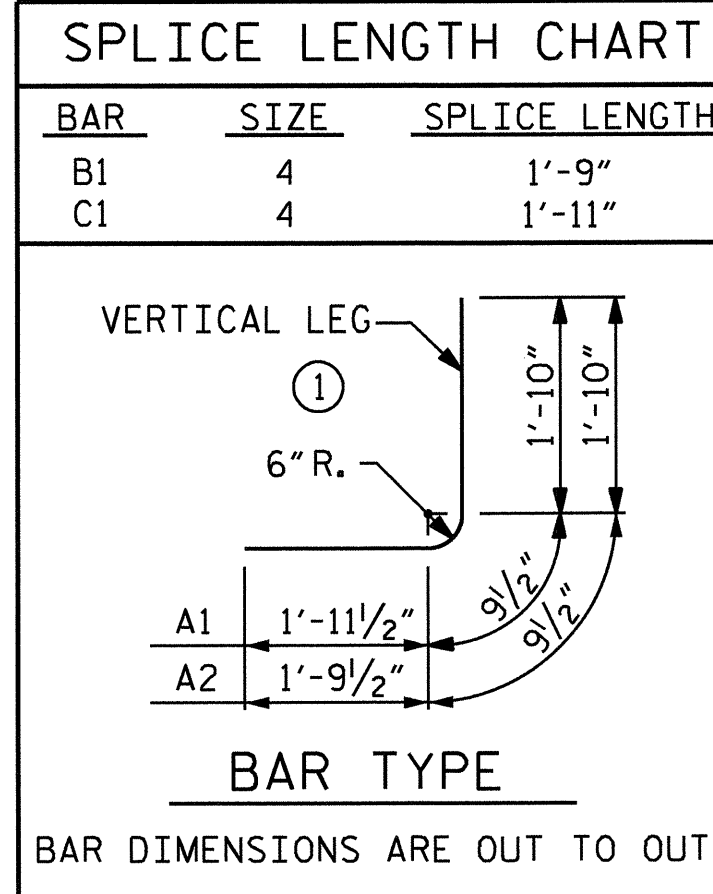
HYDRAULIC DATA	
DESIGN DISCHARGE	= 577 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 1278.6
DRAINAGE AREA	= 0.36 SQ. MILES
BASE DISCHARGE (Q100)	= 874 CFS
BASE HIGH WATER ELEVATION	= 1282.6

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 775 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 50 YRS. +
OVERTOPPING FLOOD ELEVATION	= 1282.4
OVERTOPPING LOCATION @ STA. 11+00 -Y9-	SAG

GRADE DATA	
GRADE POINT ELEV. @ STA. 10+94 -Y9-	= 1282.41
BED ELEV. @ STA. 10+94 -Y9-	= 1270.42
ROADWAY SLOPE	= 2:1

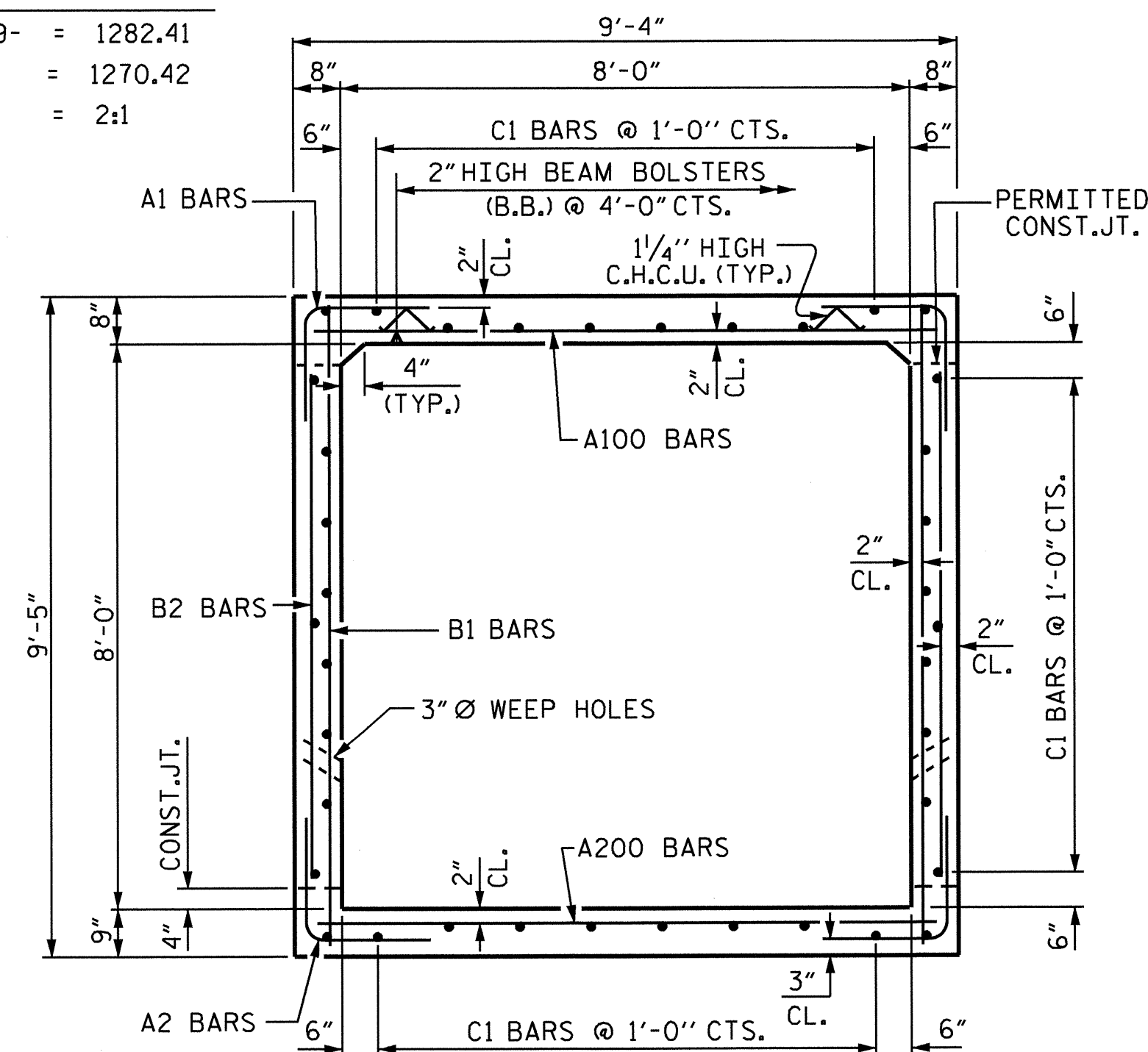


PROFILE ALONG CULVERT



NOTES:

- ASSUMED LIVE LOAD -----HS20-44 OR ALTERNATE LOADING.
- DESIGN FILL-----2.87' MIN. FILL-----4.57' MAX. FILL
- FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
 1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- AT THE CONTRACTOR'S OPTION, HE MAY SUBMIT TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.
- 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.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURE, SEE SPECIAL PROVISION
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.
- FOR CULVERT DIVERSION DETAILS, SEE EROSION CONTROL PLANS.
- NO SEPARATE PAYMENT SHALL BE MADE FOR REMOVAL OF EXISTING STRUCTURE. COSTS FOR REMOVAL OF THE EXISTING STRUCTURE SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR CULVERT EXCAVATION.

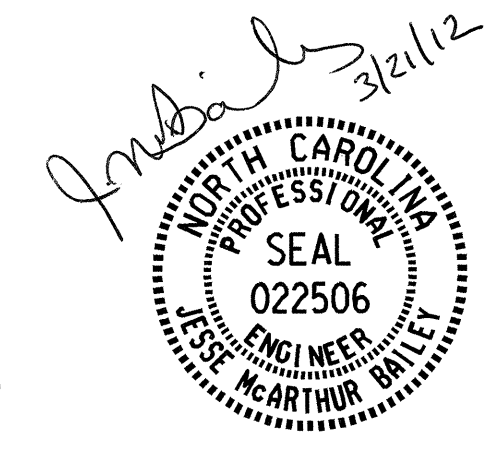
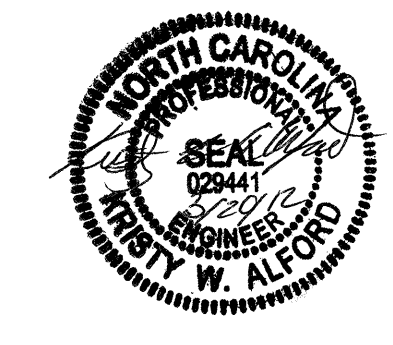


RIGHT ANGLE SECTION OF BARREL

THERE ARE 38 "C" BARS IN SECTION OF BARREL.
C1 BARS ARE 3 BAR RUNS

PROJECT NO. U-2211B
CALDWELL COUNTY
STATION: 10+94.00 -Y9-

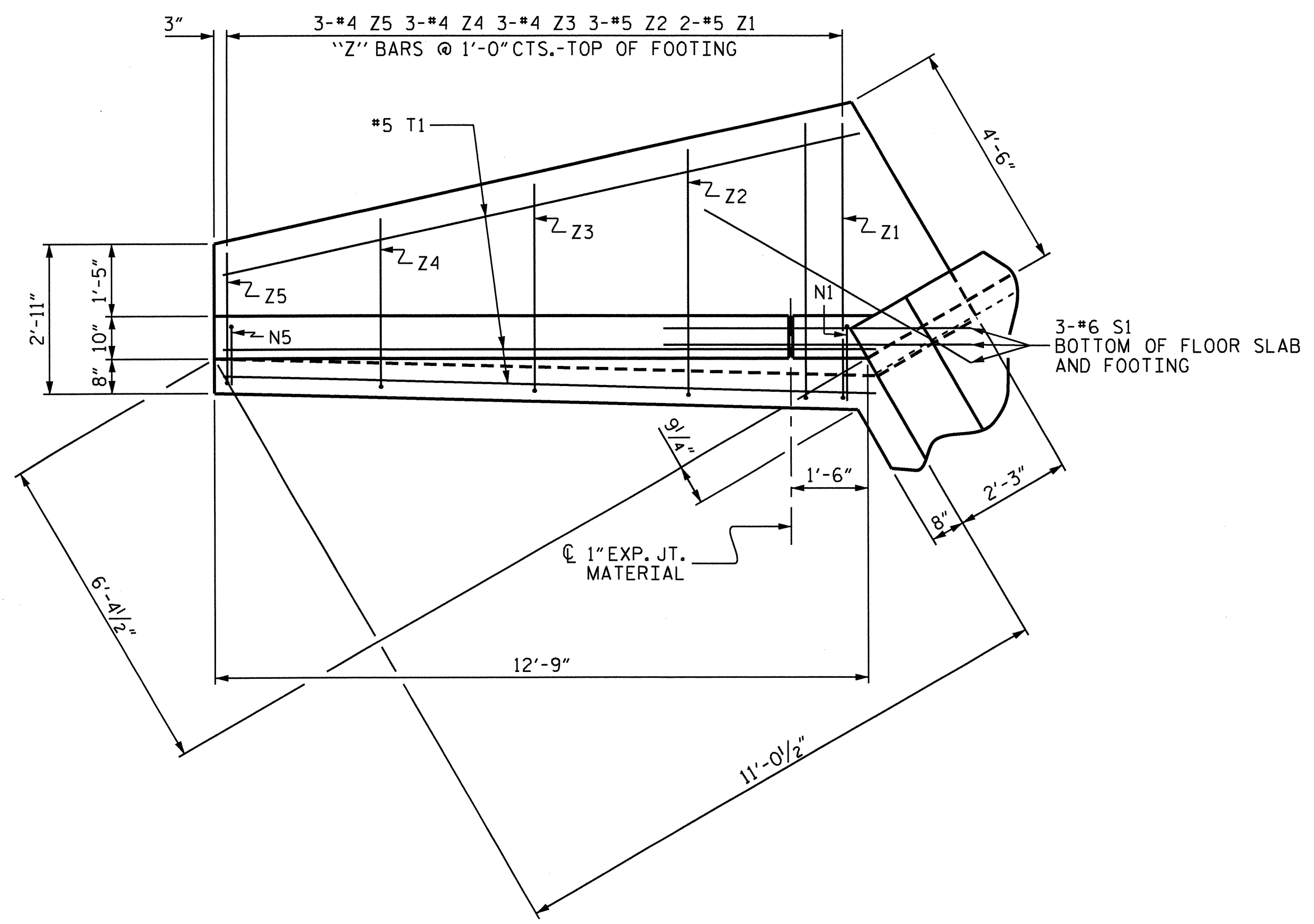
SHEET 1 OF 3



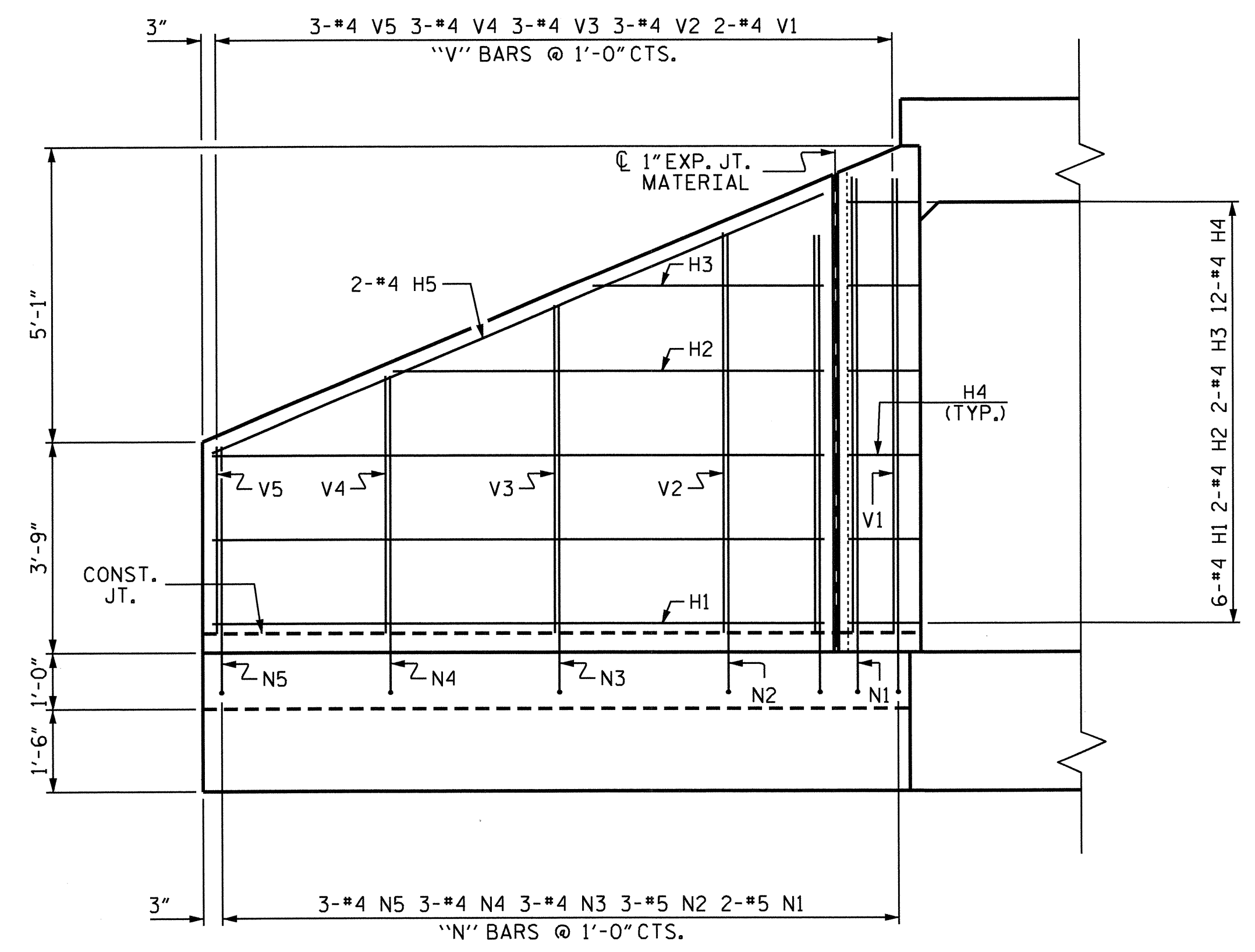
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SINGLE 8 FT. X 8 FT.
CONCRETE BOX CULVERT
92° SKEW

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

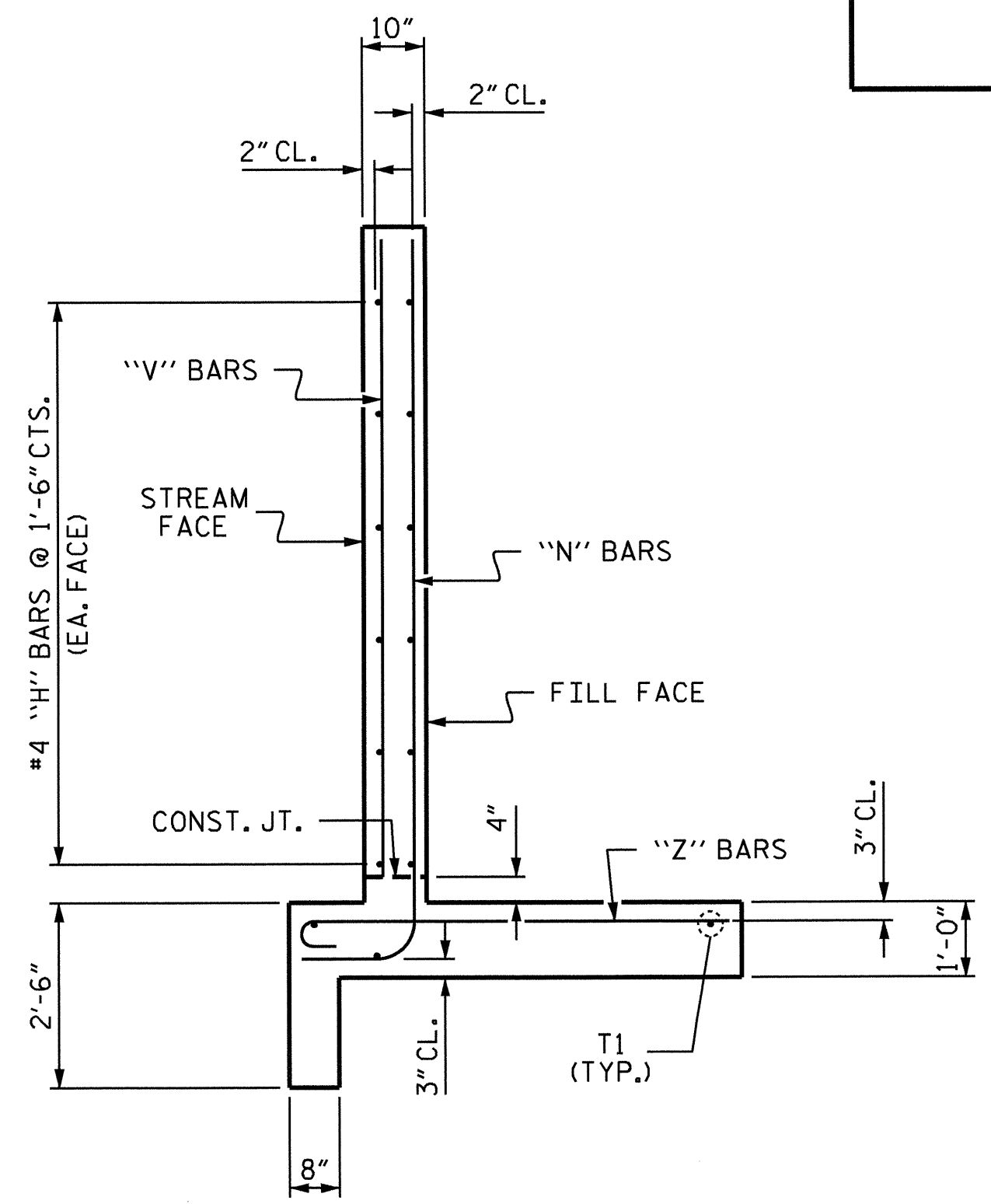
DRAWN BY : A. V. ROYAL DATE : 04/09
CHECKED BY : D. G. ELY DATE : 04/09



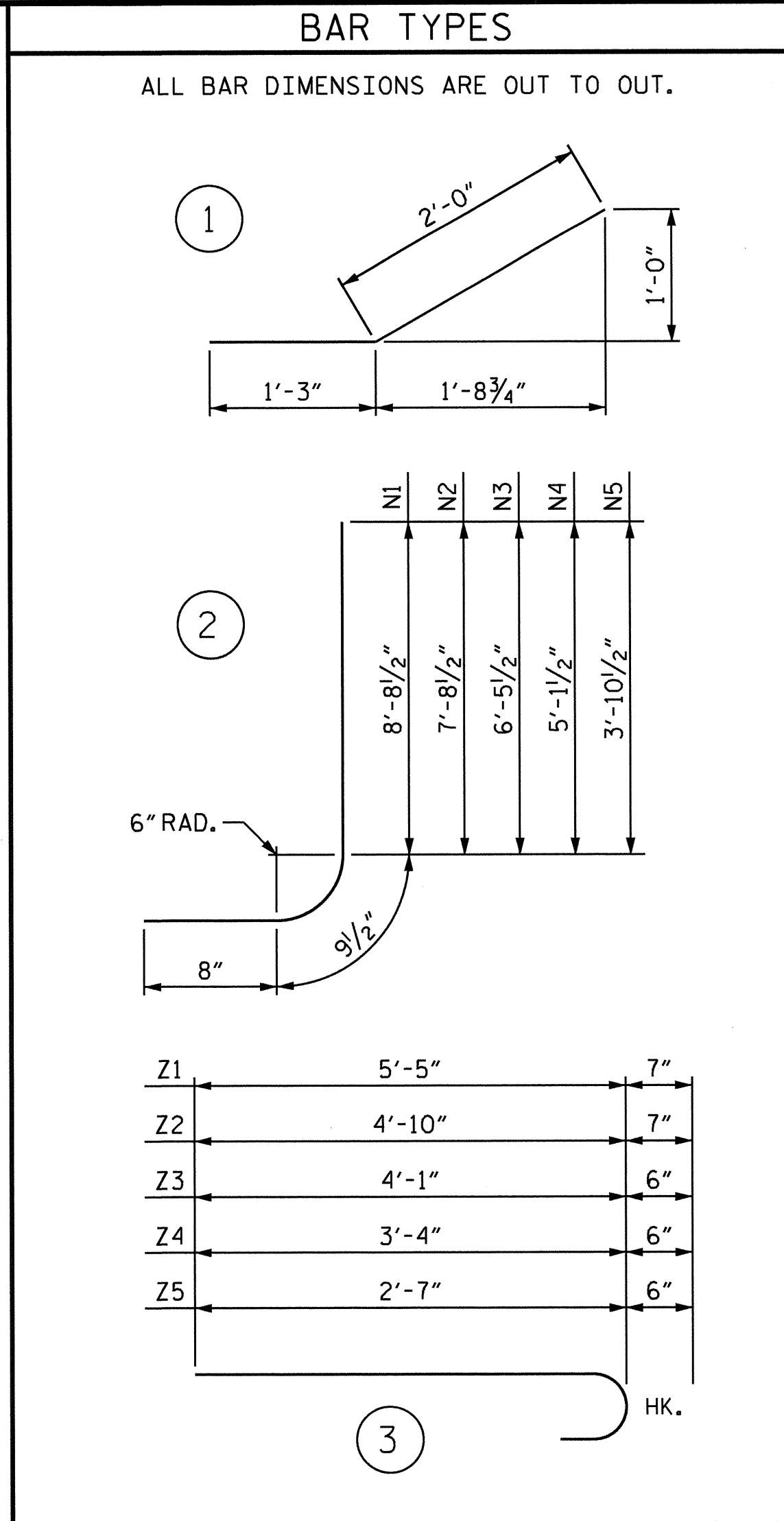
PLAN



ELEVATION



TYPICAL WING SECTION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	24	#4	STR	10'-10"	174
H2	8	#4	STR	7'-8"	41
H3	8	#4	STR	4'-1"	22
H4	48	#4	1	3'-3"	104
H5	8	#4	STR	11'-9"	63
N1	8	#5	2	10'-2"	85
N2	12	#5	2	9'-2"	115
N3	12	#4	2	7'-11"	63
N4	12	#4	2	6'-7"	53
N5	12	#4	2	5'-4"	43
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	12'-9"	160
V1	8	#4	STR	8'-1"	43
V2	12	#4	STR	7'-1"	57
V3	12	#4	STR	5'-10"	47
V4	12	#4	STR	4'-7"	37
V5	12	#4	STR	3'-4"	27
Z1	8	#5	3	6'-0"	50
Z2	12	#5	3	5'-5"	68
Z3	12	#4	3	4'-7"	37
Z4	12	#4	3	3'-10"	31
Z5	12	#4	3	3'-1"	25
REINFORCING STEEL FOR 4 WINGS					1453 LBS
CLASS A CONCRETE					
4 WINGS					21.4 CY
2 HEADWALLS					0.9 CY
2 END CURTAIN WALLS					0.8 CY
TOTAL					23.1 CY

ASSEMBLED BY : A. V. ROYAL DATE : 04/09
 CHECKED BY : D. G. ELY DATE : 04/09
 DRAWN BY : CCJ 10/99
 CHECKED BY : RWW 03/00

PROJECT NO. U-2211B
CALDWELL COUNTY
 STATION: 10+94.00 -Y9-
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD WINGS
 FOR
CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 2:1
 90° SKEW

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

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	---	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN