

TIP PROJECT: B-4176

CONTRACT: C202579

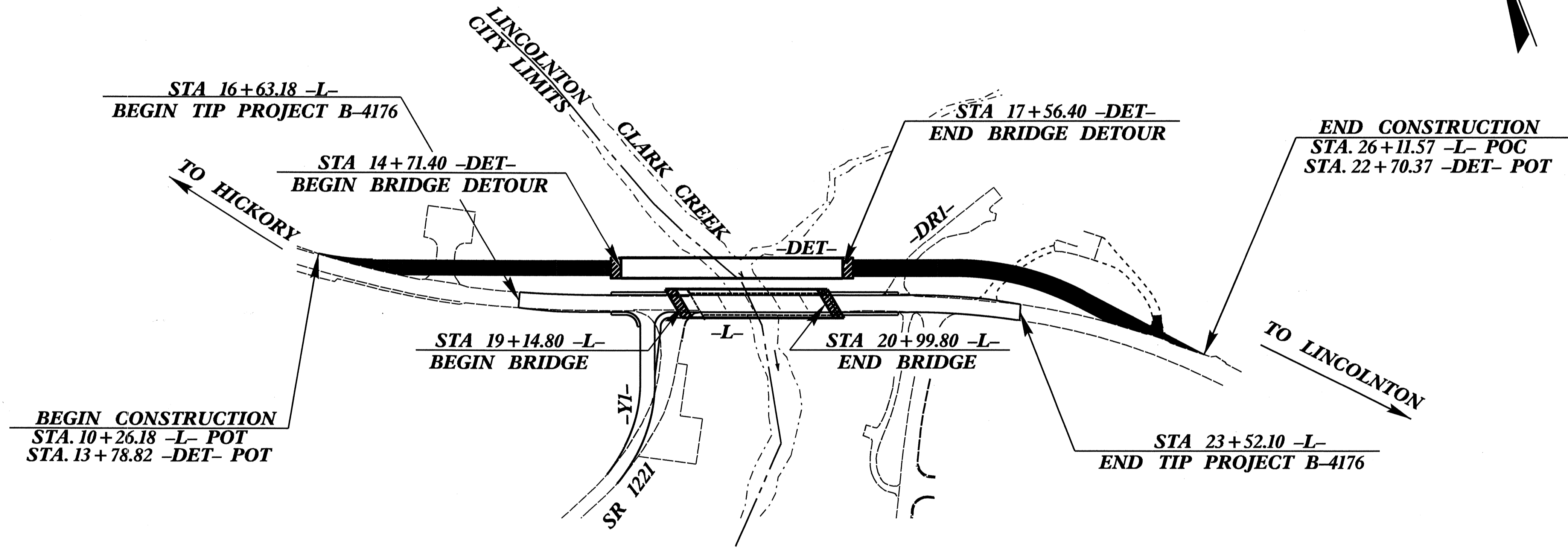
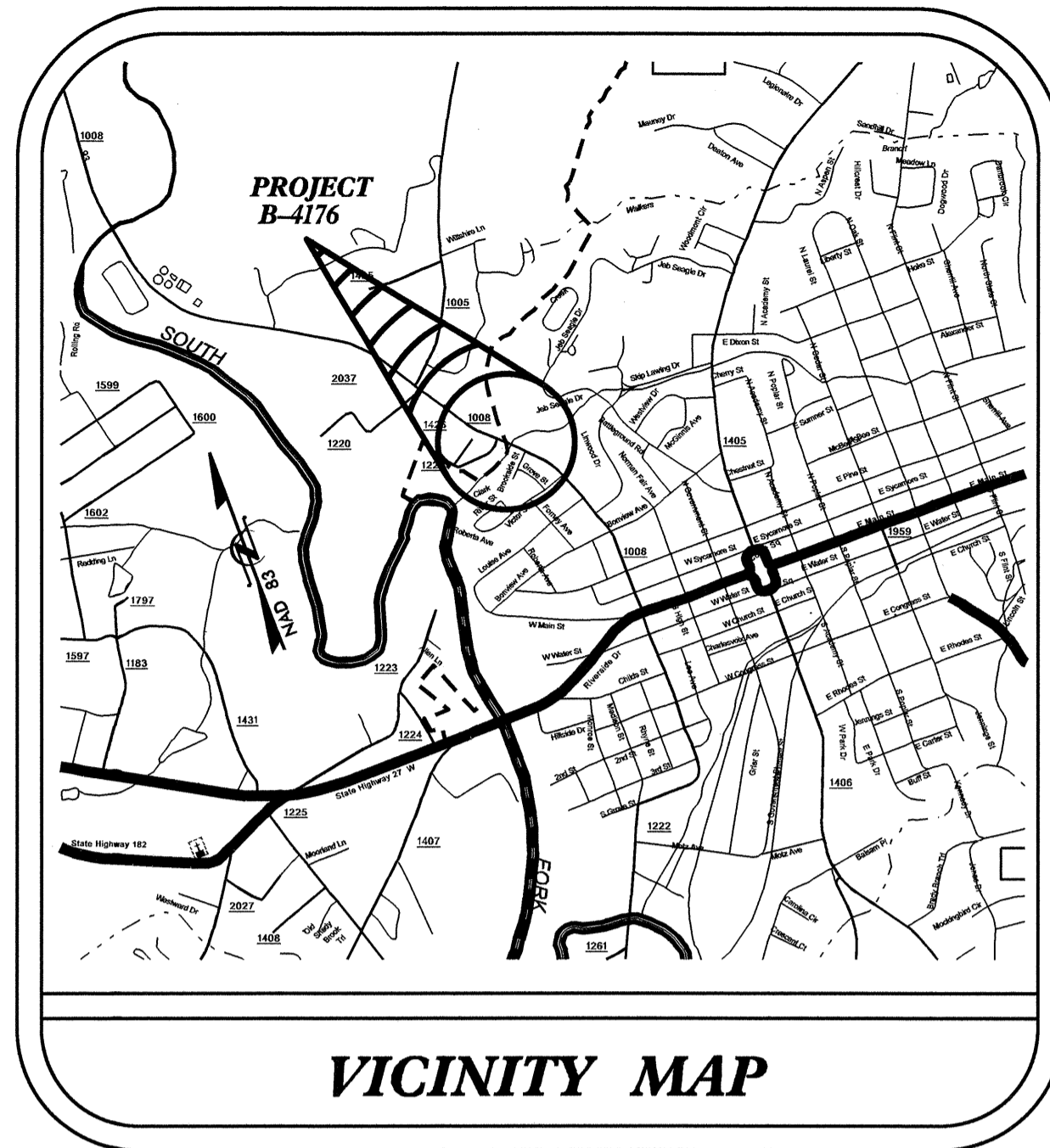
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LINCOLN COUNTY

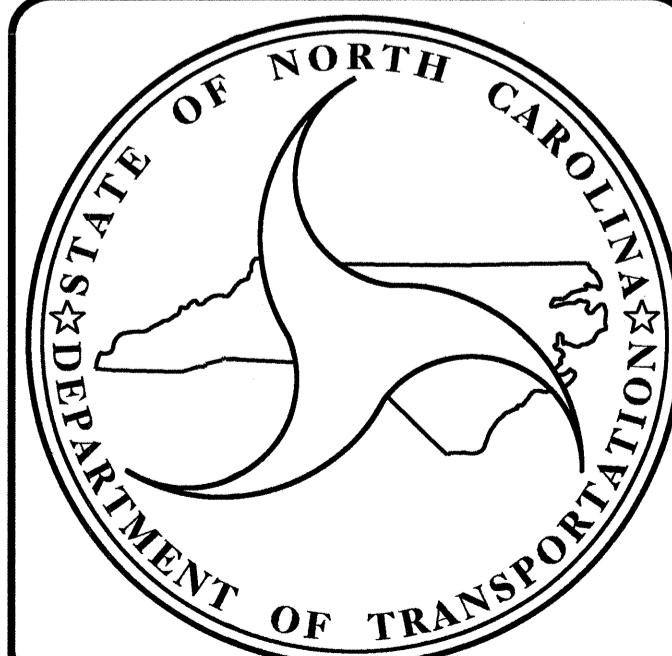
LOCATION: BRIDGE NO. 118 OVER CLARK CREEK ON
SR 1008 (NORTH GROVE STREET)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4176		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33523.1.1	BRSTP-1008(12)	PE	
33523.2.1	BRSTP-1008(12)	RW & UTIL.	
33523.3.1	BRSTP-1008(12)	CONST.	



STRUCTURE



DESIGN DATA

ADT 2008	=	9,300
ADT 2030	=	13,700
DHV	=	10 %
D	=	60 %
T	=	4 % *
V	=	40 MPH
FUNG. CLASS	=	COLLECTOR
* TTST	1% DUAL	3%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4176	=	0.095 Mi.
LENGTH STRUCTURE TIP PROJECT B-4176	=	0.035 Mi.
TOTAL LENGTH TIP PROJECT B-4176	=	0.131 Mi.

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:
FEBRUARY 15, 2011

J.M. BAILEY, P.E.
PROJECT ENGINEER

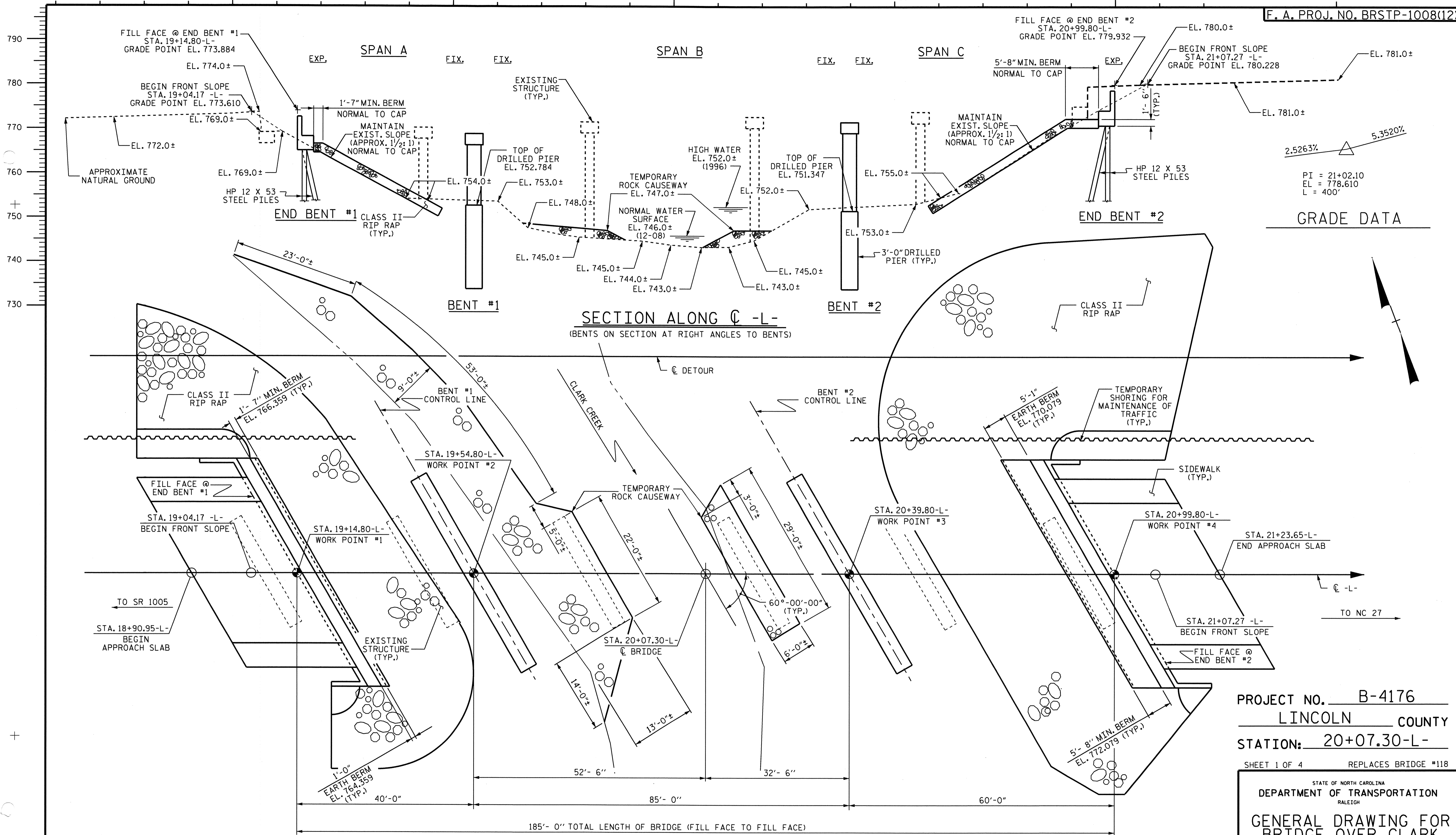
D.A. DAVENPORT, JR., P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
1000 Birch Ridge Dr.,
Raleigh NC, 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER _____ P.E.
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE _____
DIVISION ADMINISTRATOR



GRADE DATA

$PI = 21+02.10$
 $EL = 778.610$
 $L = 400'$

2.5263%
 5.3520%

SECTION ALONG C-L
(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)

PLAN
(PILES NOT SHOWN FOR CLARITY)

THE TWO CAUSEWAYS SHALL NOT BE IN THE STREAM AT THE SAME TIME.

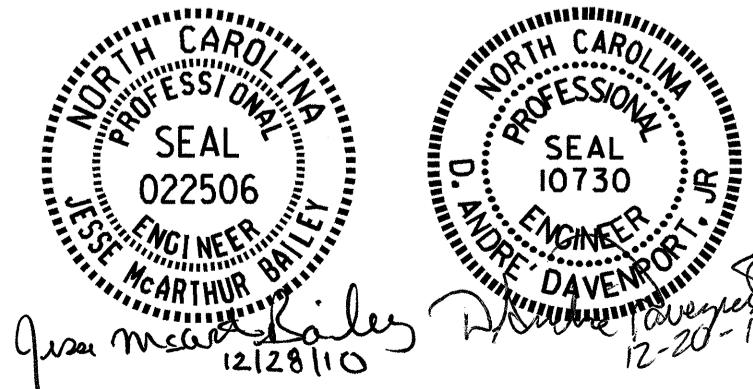
PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L-

SHEET 1 OF 4 REPLACES BRIDGE #118

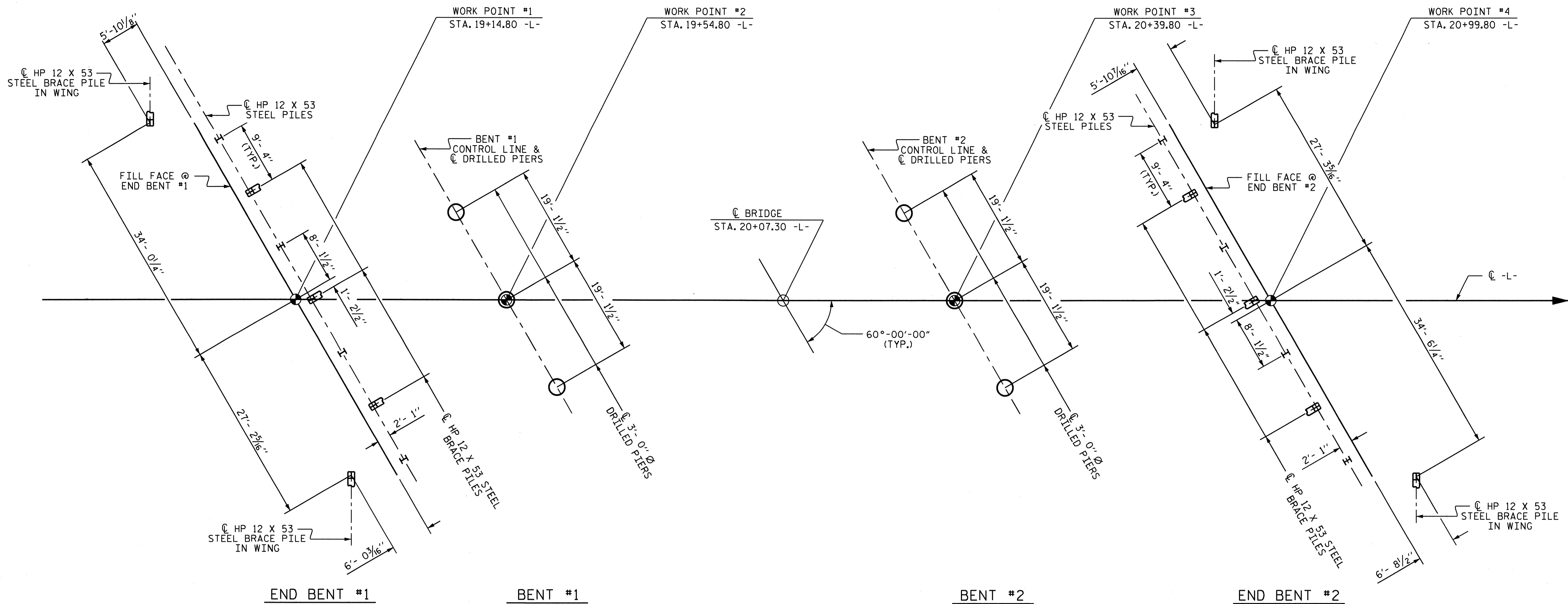
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING FOR
 BRIDGE OVER CLARK
 CREEK ON SR 1008
 BETWEEN SR 1005
 AND NC 27**

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



DRAWN BY: D.A. GLADDEN DATE: 5-25-10
 CHECKED BY: H. T. BARBOUR DATE: 6-22-10



FOUNDATION LAYOUT

ALL DIMENSIONS LOCATING PILES ARE TO PILE CENTERLINE AT BOTTOM OF THE CAP
 ALL BRACE PILES ARE BATTERED 3:12.

NOTES

FOR PILES SEE SPECIAL PROVISIONS.

PILES AT END BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 360.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 60.0 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT #1. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 740.000 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT BENT #1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN EL. 729.000 (LT.), EL. 731.000 (RT.) AND SATISFY THE REQUIRED END RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT #1 IS EL. 738.500 THE SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT #2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 400.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70.0 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT #2. IF REQUIRED, DO NOT EXTEND CASING BELOW EL. 740.000 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT BENT #2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN EL. 729.000 AND SATISFY THE REQUIRED END RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT #2 IS EL. 738.000. THE SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

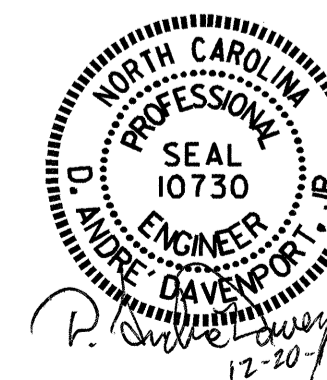
PILES AT END BENT #2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 158 TONS PER PILE.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

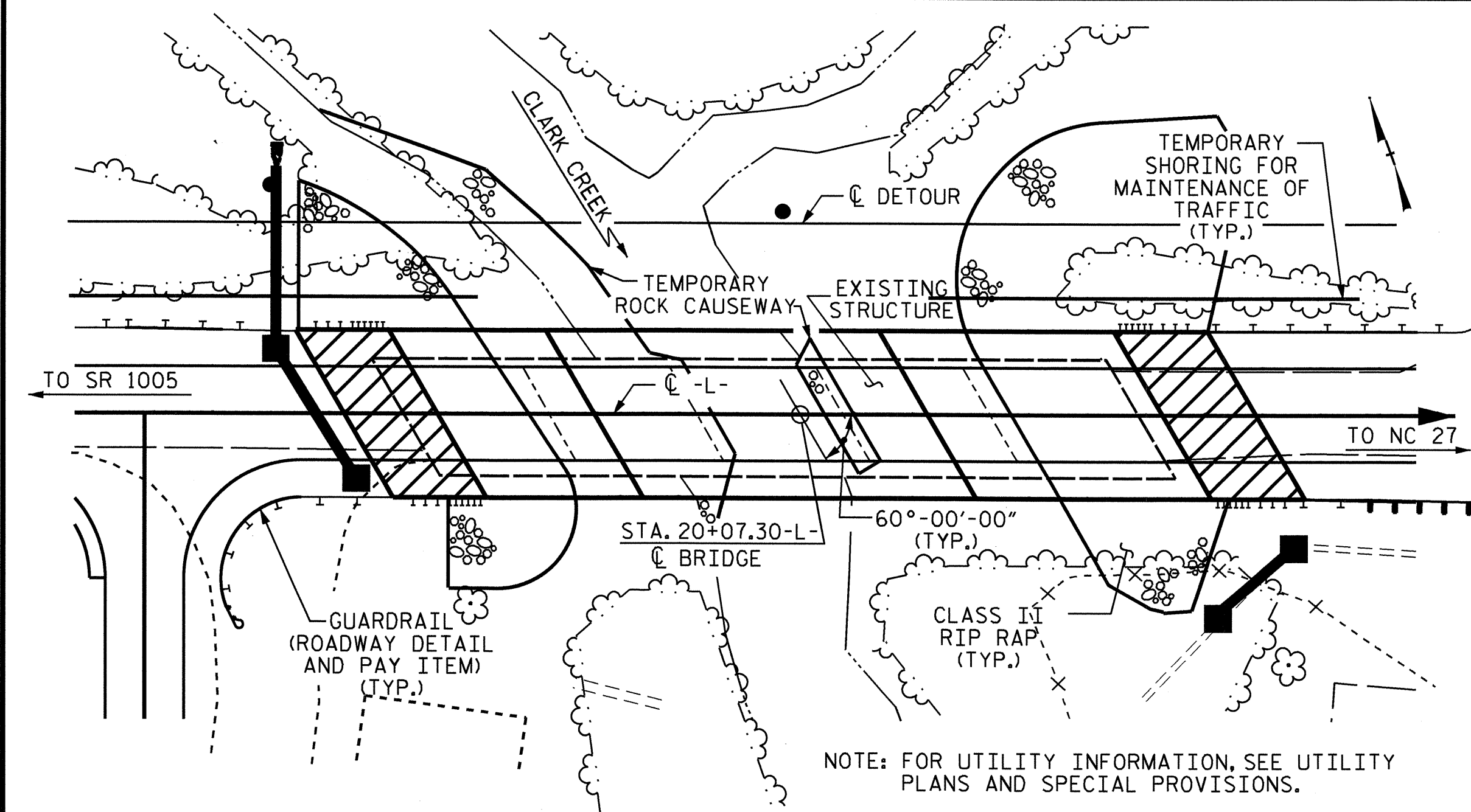
GENERAL DRAWING FOR
 BRIDGE OVER CLARK
 CREEK ON SR 1008
 BETWEEN SR 1005
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DRAWN BY : D. A. GLADDEN DATE : 5-25-10
 CHECKED BY : H. T. BARBOUR DATE : 6-22-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-2
1			3			TOTAL SHEETS
2			4			42

BENCH MARK: #2 RAILROAD SPIKE IN 18"Ø SYCAMORE TREE STA. 7+08.00 -BY2- EL. 770.010



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE = 8710 CFS.
 FREQUENCY OF DESIGN FLOOD = 25 YR.
 DESIGN HIGH WATER ELEVATION = 761.300
 DRAINAGE AREA = 91.0 SQ. MI.
 BASIC DISCHARGE (Q100) = 12380 CFS.
 BASIC HIGH WATER ELEVATION = 764.400

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 25600 CFS.
 FREQUENCY OF OVERTOPPING FLOOD = 500 YR. ++
 OVERTOPPING FLOOD ELEVATION = 774.200

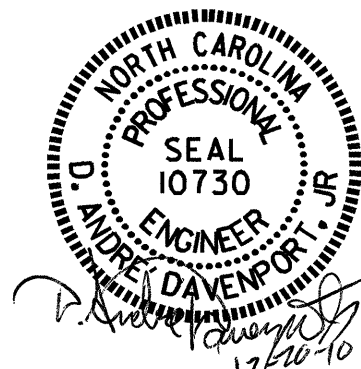
TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. STRUCTURE	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'- 0" Ø DRILLED PIERS IN SOIL	3'- 0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'- 0" Ø DRILLED PIER	SID INSPECTION	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	THREE BAR METAL RAIL	RIP RAP CLASS II (2'- 0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	SO. FT.	SO. FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE									8323	6626		LUMP SUM			894.90			348.614			LUMP SUM	LUMP SUM
END BENT NO.1											43.9		6400			9	225		575	640		
BENT NO.1				34.25	34.0	38.4					37.1		10055	1839								
BENT NO.2				30.25	37.0	34.0					39.9		10516	2040								
END BENT NO.2											46.1		7026			9	250		835	930		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	64.50	71.0	72.4	1	1	8323	6626	167.0	LUMP SUM	33997	3879	894.90	18	475	348.614	1410	1570	LUMP SUM	LUMP SUM

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING FOR
 BRIDGE OVER CLARK
 CREEK ON SR 1008
 BETWEEN SR 1005
 AND NC 27



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-3
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : D. A. GLADDEN DATE : 5-25-10
 CHECKED BY : H. T. BARBOUR DATE : 6-22-10

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NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

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

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

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

THE EXISTING STRUCTURE CONSISTING OF 5 SPAN REINFORCED CONCRETE DECK ON I-BEAMS (2 SPANS AT 37'- 9" AND 3 SPANS AT 37'- 6") SUPPORTED WITH REINFORCED CONCRETE END BENT CAPS WITH TIMBER PILES, REINFORCED CONCRETE CAP WITH STEEL PILES AT BENT #1, AND REINFORCED CONCRETE POST AND BEAM AT BENT #2, BENT #3 AND BENT #4, WITH A CLEAR ROADWAY OF 24'- 0" AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 20+07.30 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

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

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.

THE SKEWED END CONDITIONS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE. USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.

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.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 20+07.30 -L-."

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE TEMPORARY STRUCTURE AT STA. 20+07.30-L-, THE CLASS II RIP RAP USED TO PROTECT THE TEMPORARY EMBANKMENT MAY BE PLACED AS RIP RAP SLOPE PROTECTION.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+07.30 -L-.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

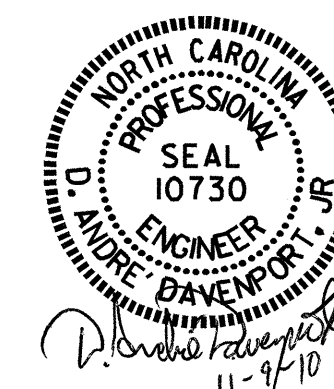
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING FOR
 BRIDGE OVER CLARK
 CREEK ON SR 1008
 BETWEEN SR 1005
 AND NC 27



DRAWN BY : D. A. GLADDEN DATE : 5-25-10
 CHECKED BY : H. T. BARBOUR DATE : 6-22-10

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.00	--	1.75	0.866	1.45	B	ER	41.375	0.924	1.00	B	I	4.138	0.80	0.866	1.04	B	ER	41.375		
	HL-93 (OPERATING)	N/A		1.30	--	1.35	0.866	1.88	B	ER	41.375	0.924	1.30	B	I	4.138	N/A	--	--	B	--	--		
	HS-20 (INVENTORY)	36.000	②	1.13	40.617	1.80	0.983	2.26	A	I	14.395	0.866	1.13	A	ER	1.799	1.00	0.983	2.88	A	I	14.395		
	HS-20 (OPERATING)	36.000		1.50	54.156	1.35	0.983	3.02	A	I	14.395	0.866	1.50	A	ER	1.799	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.91	39.297	1.46	0.983	4.97	A	I	17.994	0.866	2.91	A	ER	1.799	1.00	0.983	5.19	A	I	17.994	
		SNGARBS2	20.000		2.18	43.698	1.46	0.983	4.13	A	I	14.395	0.866	2.18	A	ER	1.799	1.00	0.983	4.32	A	I	14.395	
		SNAGRIS2	22.000		2.08	45.667	1.46	0.983	4.07	A	I	14.395	0.866	2.08	A	ER	1.799	1.00	0.983	4.28	A	I	14.395	
		SNCOTTS3	27.250		1.46	39.904	1.46	0.983	2.49	A	I	17.994	0.866	1.46	A	ER	1.799	1.00	0.983	2.59	A	I	17.994	
		SNAGGRS4	34.925		1.30	45.329	1.46	0.983	2.27	A	I	17.994	0.866	1.30	A	ER	1.799	1.00	0.983	2.37	A	I	17.994	
		SNS5A	35.550		1.36	48.433	1.46	0.983	2.21	A	I	17.994	0.866	1.36	A	ER	1.799	1.00	0.983	2.30	A	I	17.994	
		SNS6A	39.950		1.28	51.145	1.46	0.983	2.12	A	I	17.994	0.866	1.28	A	ER	1.799	1.00	0.983	2.21	A	I	17.994	
	SNS7B	42.000		1.31	54.923	1.46	0.983	2.02	A	I	17.994	0.866	1.31	A	ER	1.799	1.00	0.983	2.11	A	I	17.994		
	TRUCK TRACTOR SEMI-TRAILER (TTS)	TNAGRIT3	33.000		1.49	49.293	1.46	0.983	2.61	A	I	17.994	0.866	1.49	A	ER	1.799	1.00	0.983	2.72	A	I	17.994	
		TNT4A	33.075		1.42	46.807	1.46	0.983	2.65	A	I	17.994	0.866	1.42	A	ER	1.799	1.00	0.983	2.75	A	I	17.994	
		TNT6A	41.600		1.39	57.837	1.46	0.983	2.27	A	I	17.994	0.866	1.39	A	ER	1.799	1.00	0.983	2.36	A	I	17.994	
		TNT7A	42.000		1.28	53.911	1.46	0.983	2.33	A	I	17.994	0.866	1.28	A	ER	1.799	1.00	0.983	2.43	A	I	17.994	
		TNT7B	42.000		1.24	52.155	1.46	0.983	2.34	A	I	17.994	0.866	1.24	A	ER	1.799	1.00	0.983	2.43	A	I	17.994	
		TNAGRIT4	43.000		1.19	51.183	1.46	0.983	2.30	A	I	14.395	0.866	1.19	A	ER	1.799	1.00	0.983	2.40	A	I	14.395	
TNAGT5A		45.000		1.24	55.723	1.46	0.870	1.46	C	I	27.994	0.924	1.24	C	I	44.791	1.00	0.870	1.02	C	I	27.994		
TNAGT5B	45.000	③	1.13	50.633	1.46	0.983	2.08	A	I	17.994	0.866	1.13	A	ER	1.799	1.00	0.983	2.16	A	I	17.994			

LOAD FACTORS:

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

LEGAL LOAD RATING FACTORS	YEAR	ADTT	γ _L
	2008	223	N/A
	2030	328	1.46

NOTES:

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

MINIMUM RATING FACTORS FOR LEGAL LOAD RATING ARE BASED ON THE STRENGTH I LIMIT STATE.

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

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

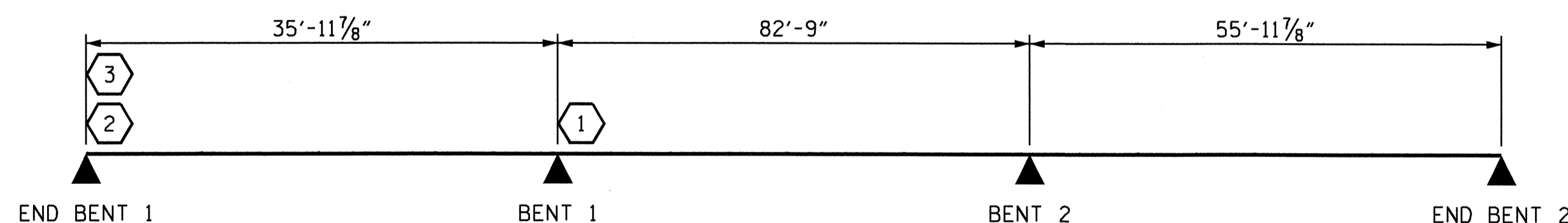
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

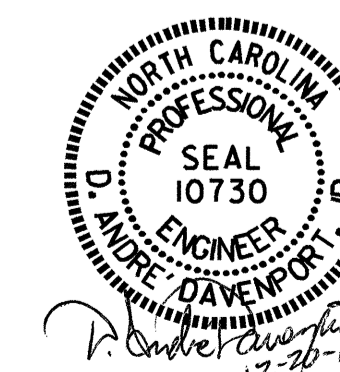
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-5
					TOTAL SHEETS 42

ASSEMBLED BY : D.A. DAVENPORT DATE 07/13/09
 CHECKED BY : G.W. DICKEY DATE 07/27/09
 DRAWN BY : MAA 1/08
 CHECKED BY : GM/DI 2/08

REV. 11/12/08R MAA/GM

NOTES

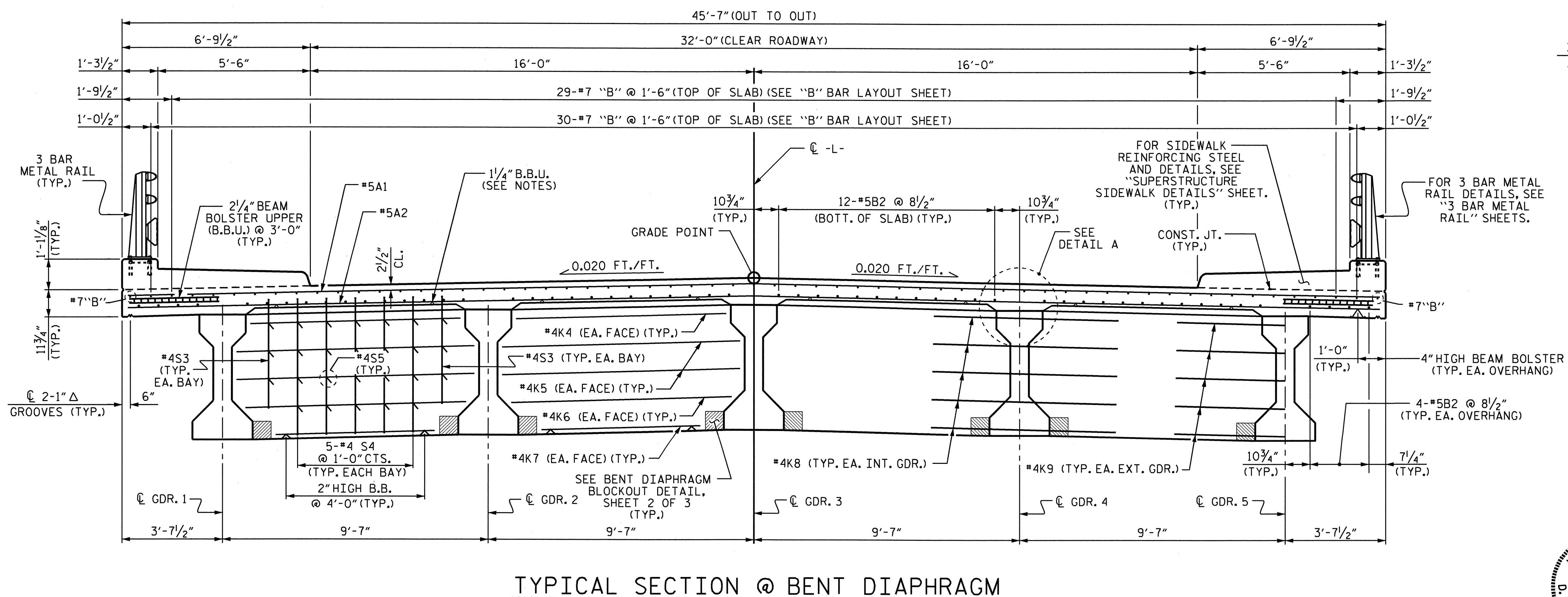
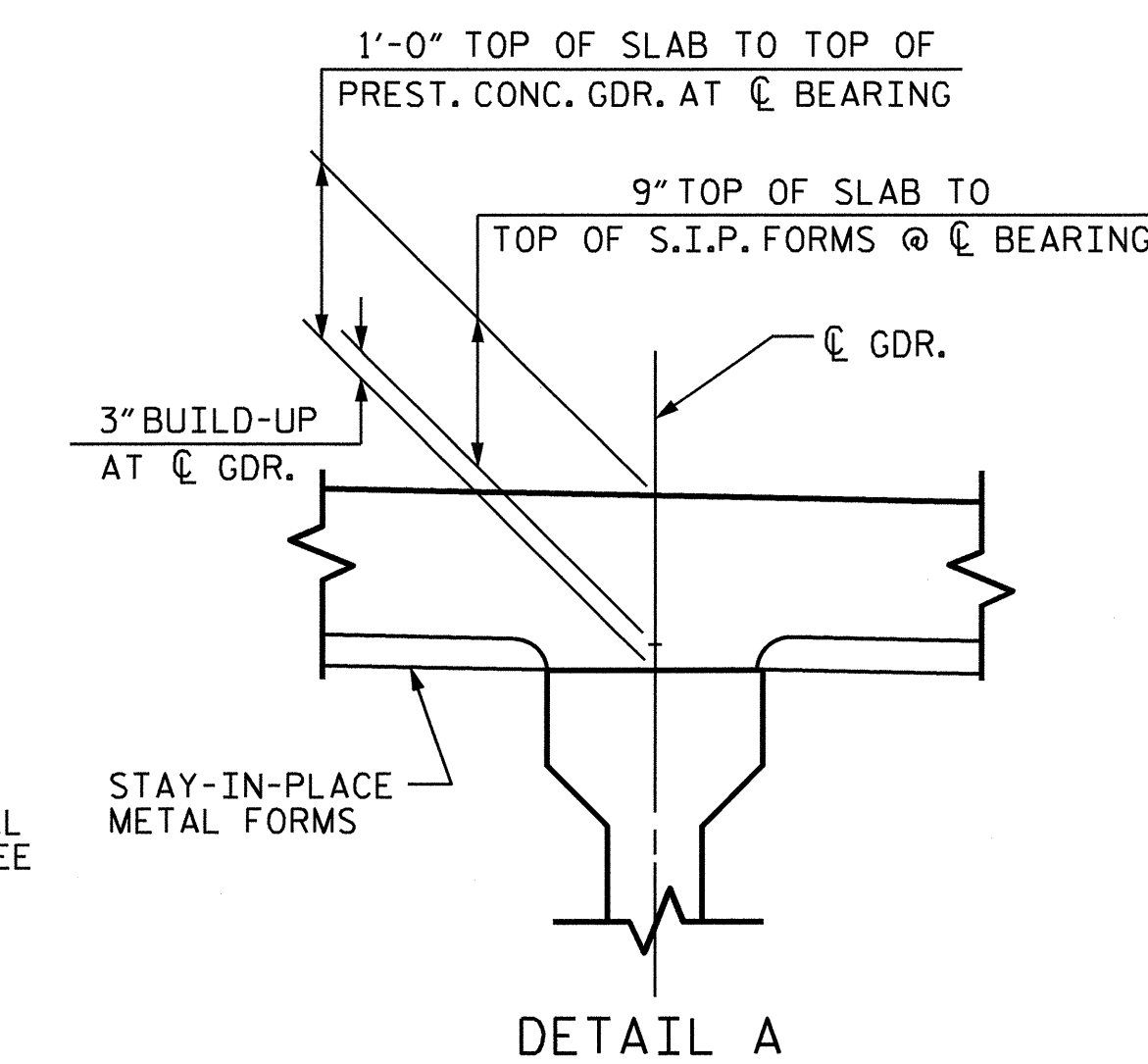
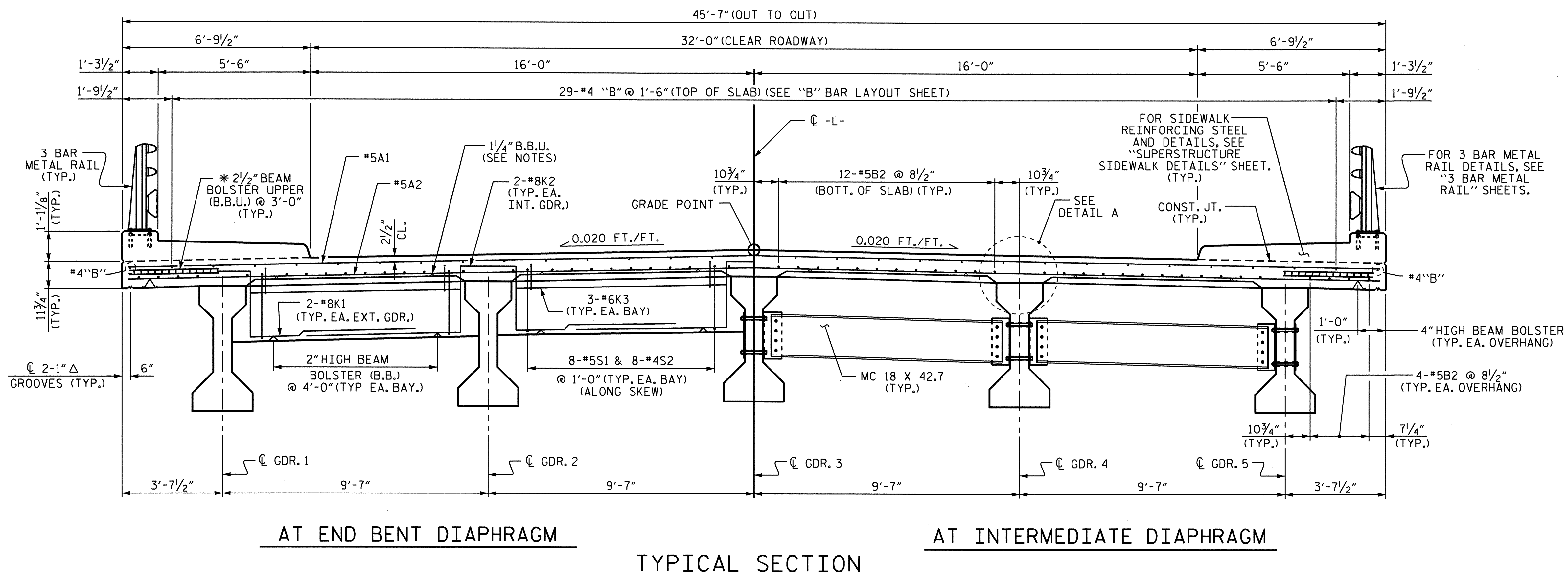
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

*USE THIS SIZE BAR SUPPORT IN THE AREAS WITH #4 "B" BARS. FOR OTHER AREAS WITH #7 "B" BARS, USE THE BAR SUPPORT AS SHOWN IN TYPICAL SECTION AT BENT.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK.

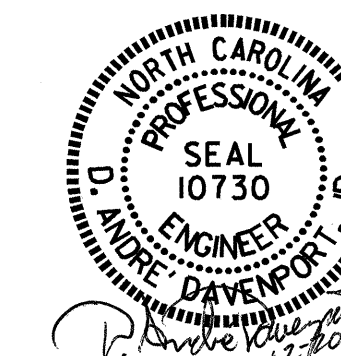


PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

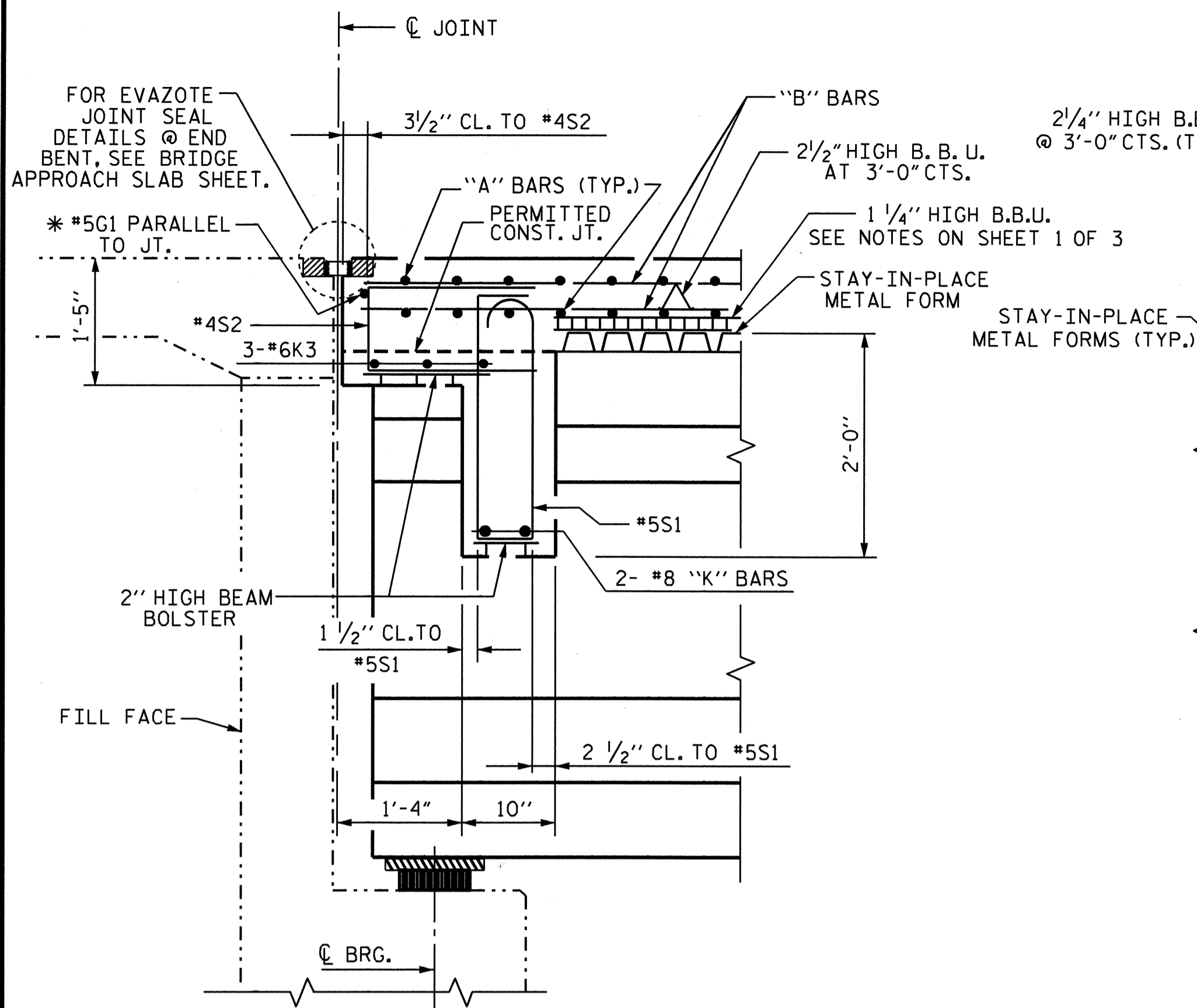
**SUPERSTRUCTURE
 TYPICAL SECTION**



DRAWN BY : M. G. SHAIKH DATE : 06-04-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-21-09

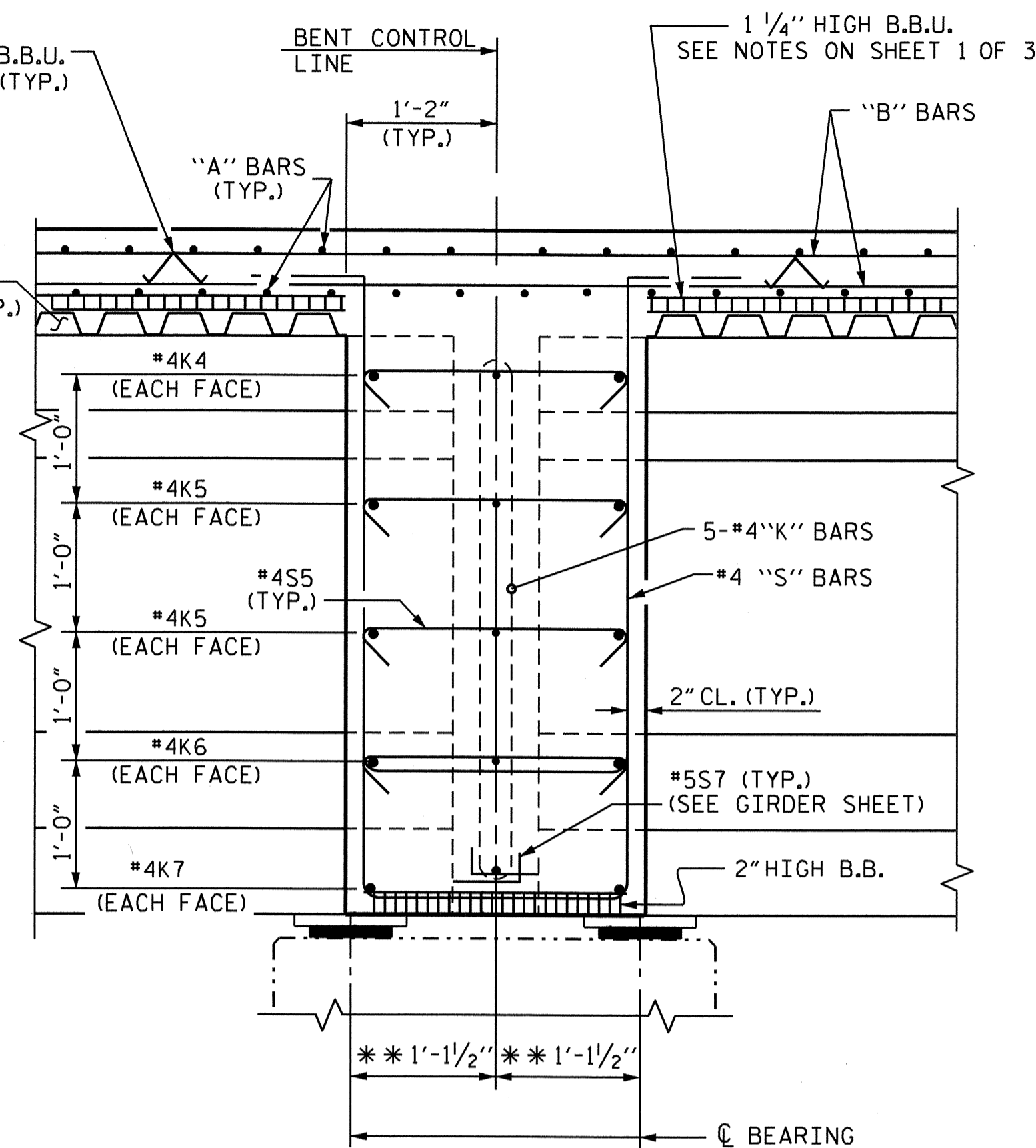
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 gdavenport

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			42



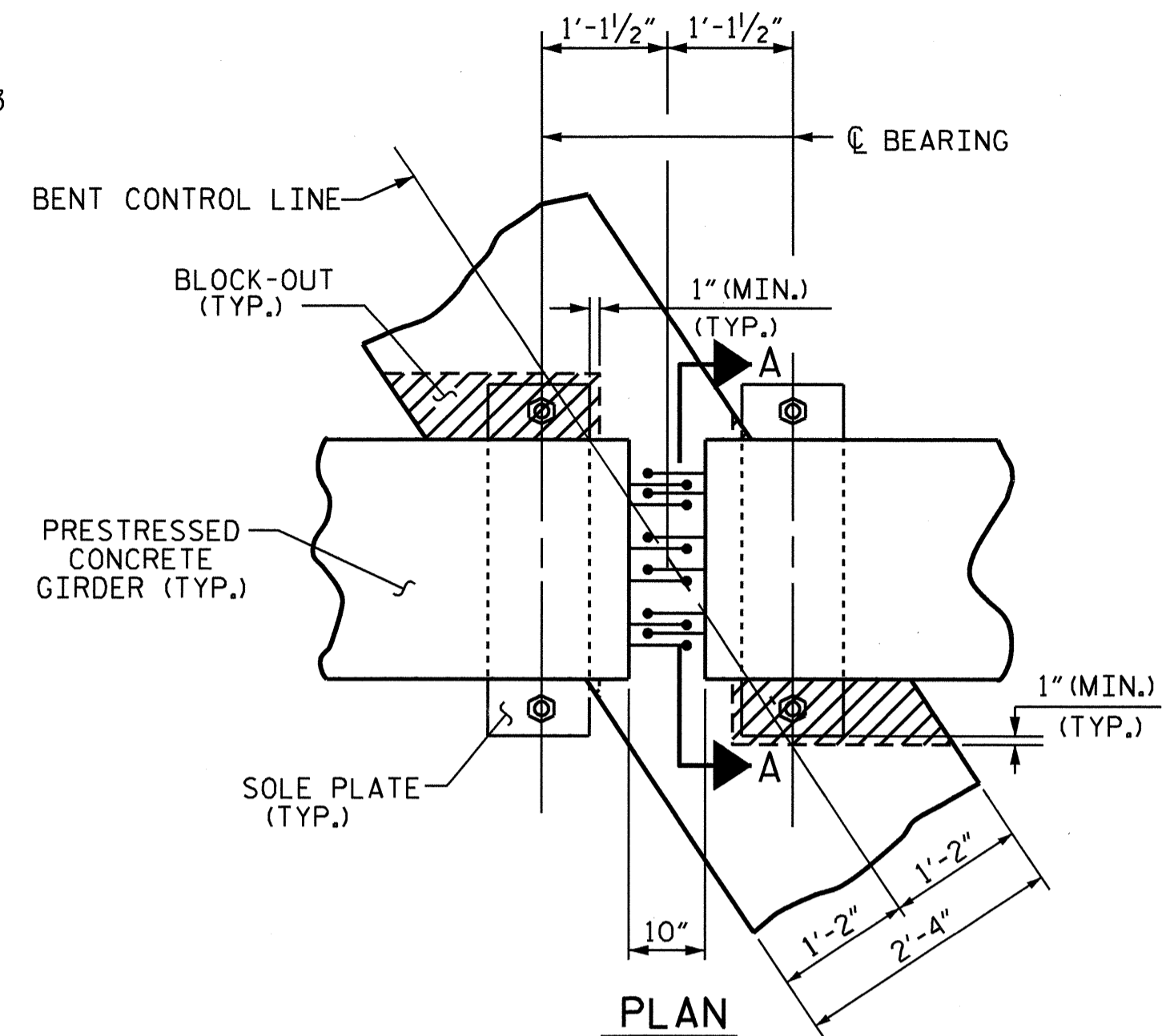
SECTION AT END BENT

*#5 G1 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

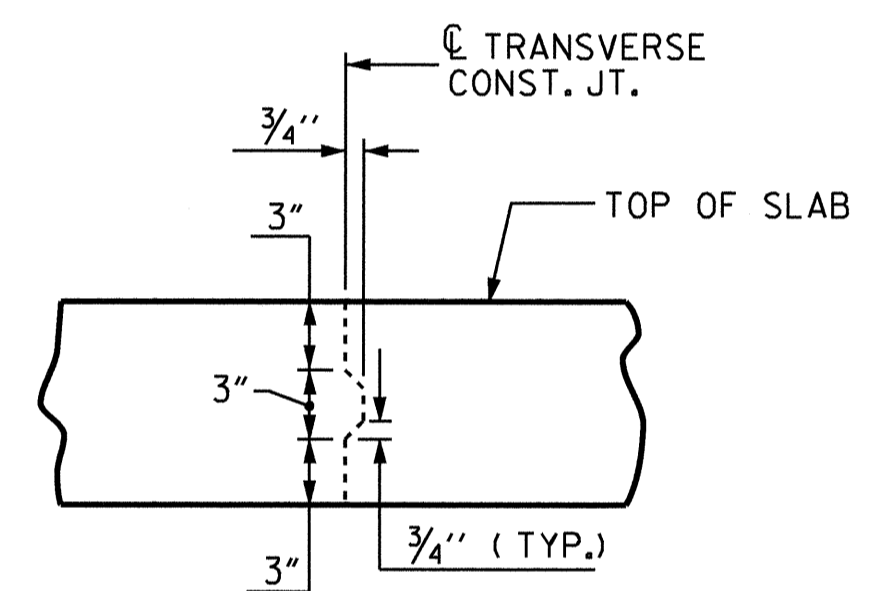


SECTION AT BENT DIAPHRAGM

** MEASURED ALONG C GIRDER

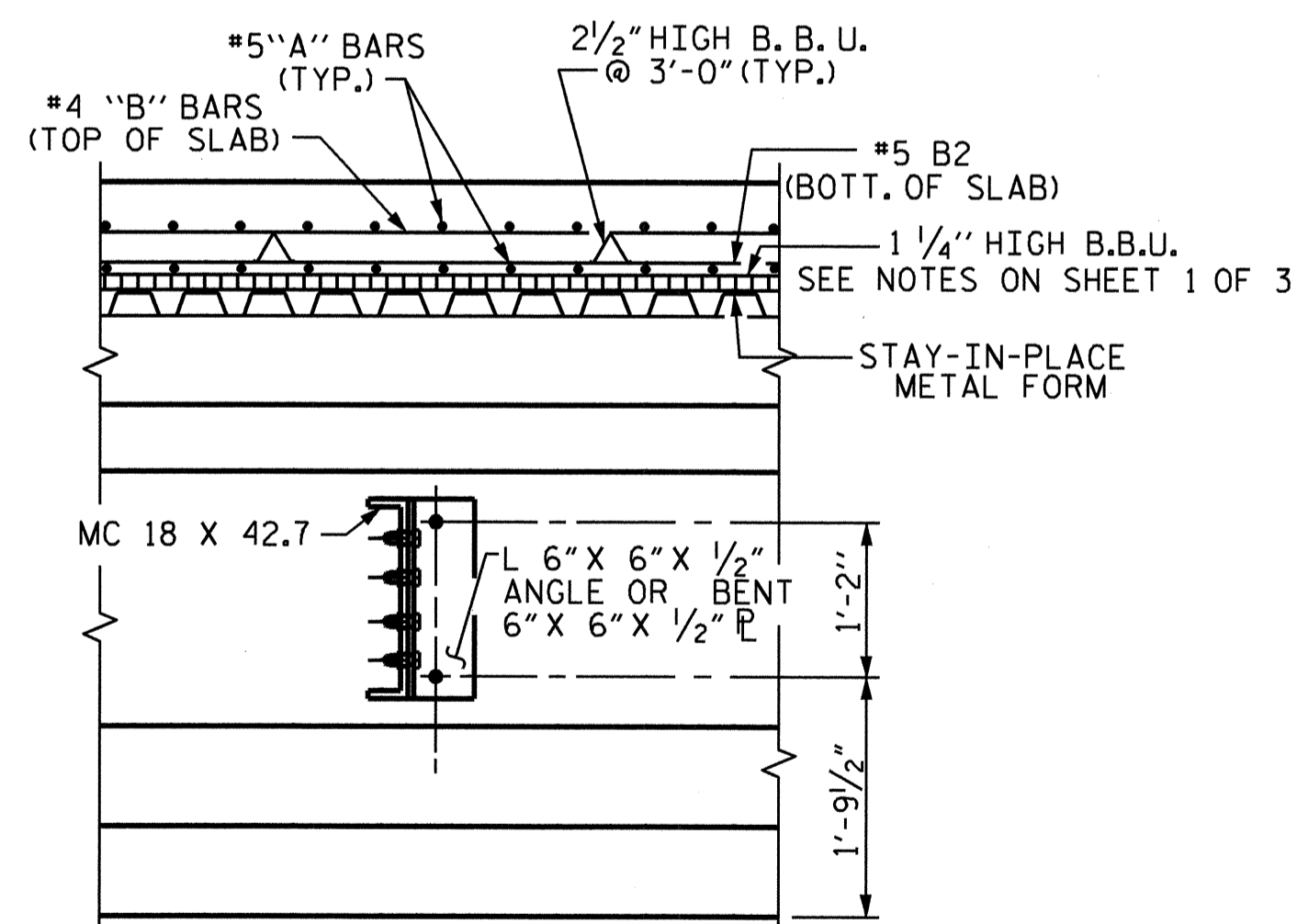


BENT DIAPHRAGM BLOCK-OUT DETAIL

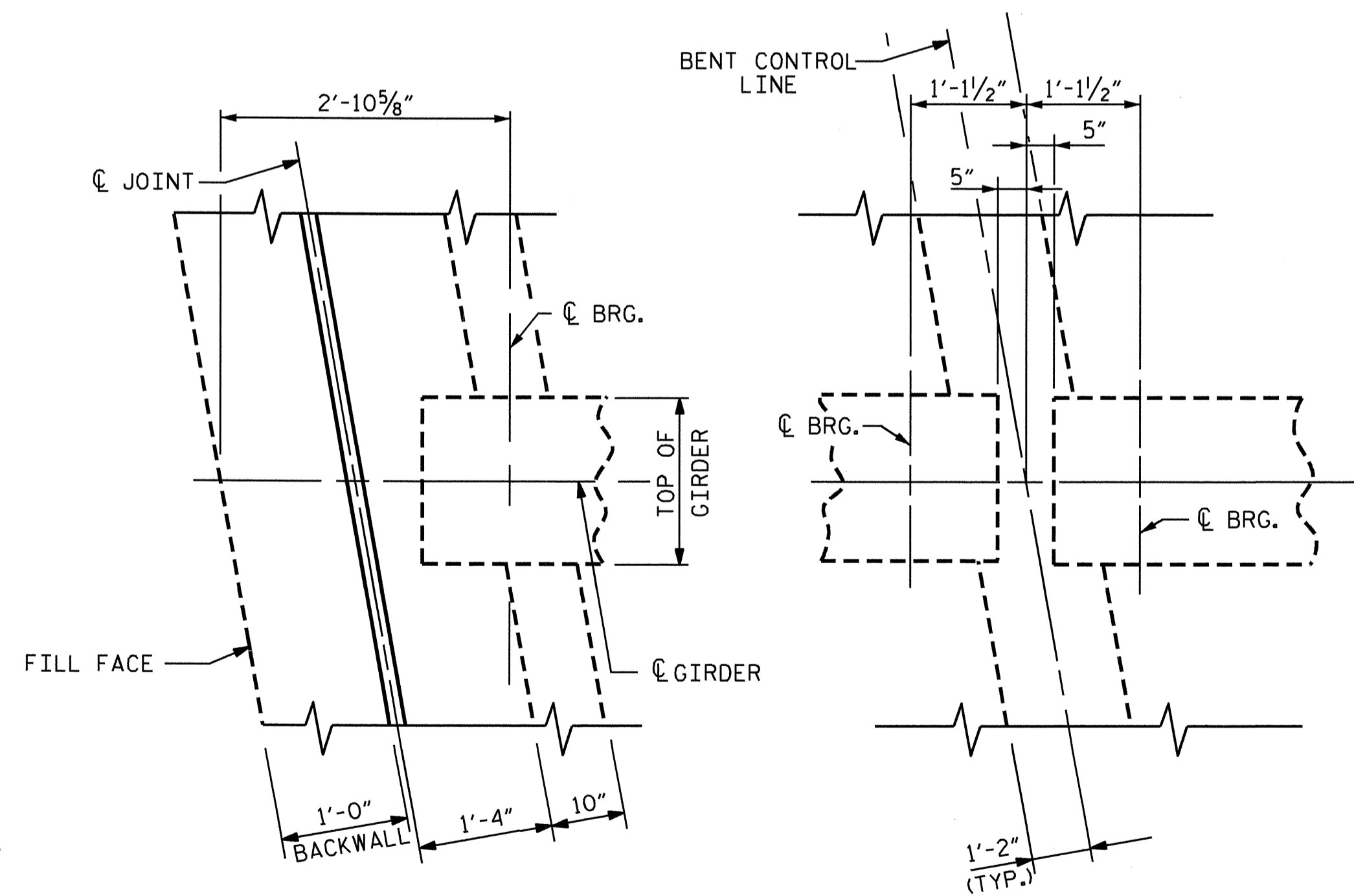


TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT



SECTION AT INTERMEDIATE STEEL DIAPHRAGM



END BENT DIAPHRAGM

BENT DIAPHRAGM

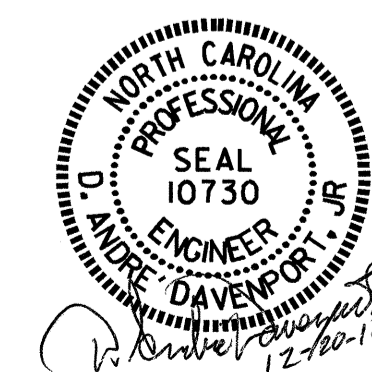
PLAN

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS**



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

DRAWN BY: M. G. SHAIKH DATE: 06-04-09
 CHECKED BY: D. A. DAVENPORT DATE: 07-23-09

TOTAL SHEETS: 42

NOTES

SIDEWALK IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

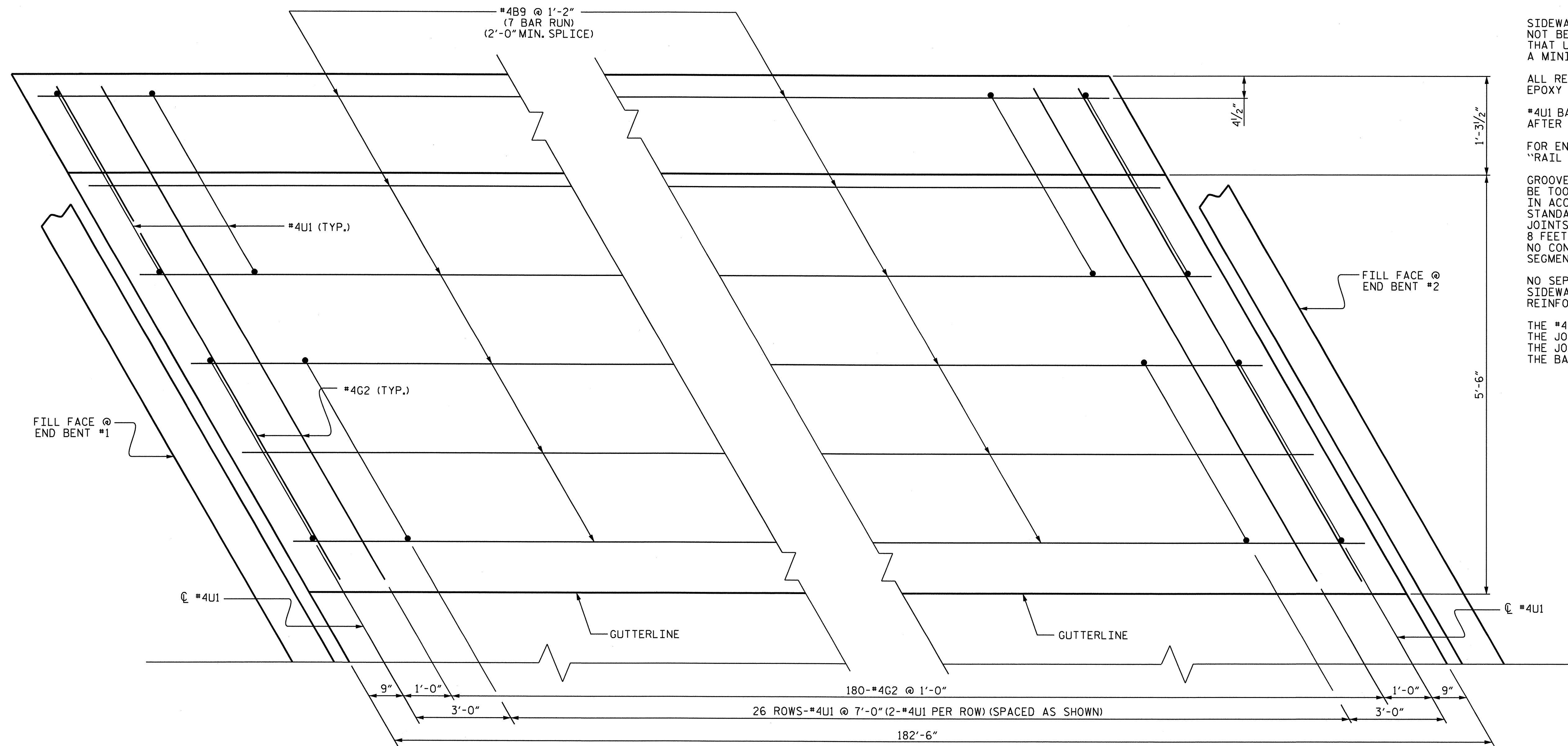
#4U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

FOR END POST DETAILS AND REINFORCING STEEL SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS".

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

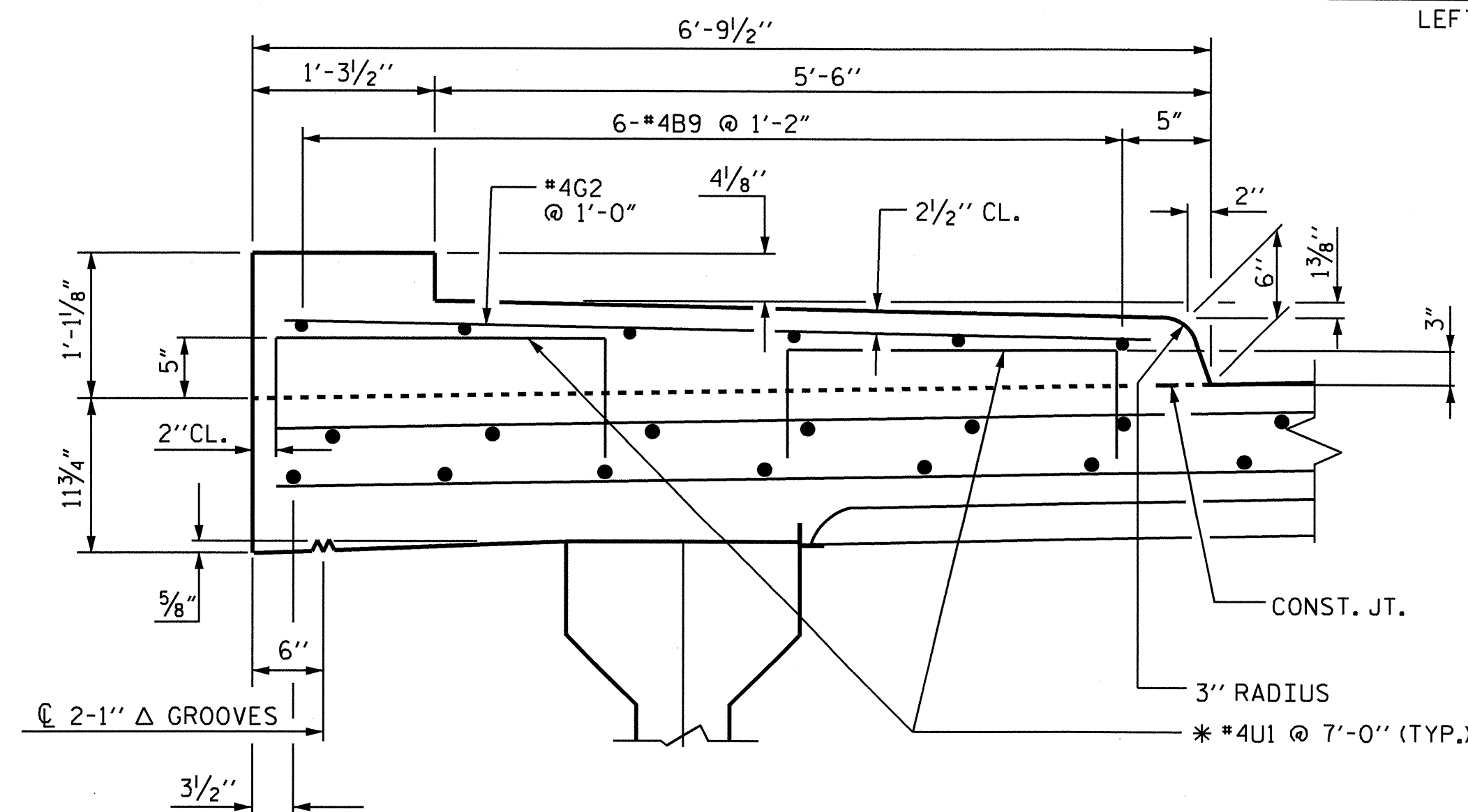
NO SEPARATE PAYMENT WILL BE MADE FOR THE SIDEWALK AS IT IS INCLUDED WITH THE REINFORCED CONCRETE DECK SLAB PAY ITEM.

THE #4U1 BARS WITHIN A DISTANCE OF 4'-0" OF THE JOINT ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.



PLAN OF SIDEWALK

LEFT SIDE SHOWN (TYP. EA SIDE)



SECTION AT SIDEWALK

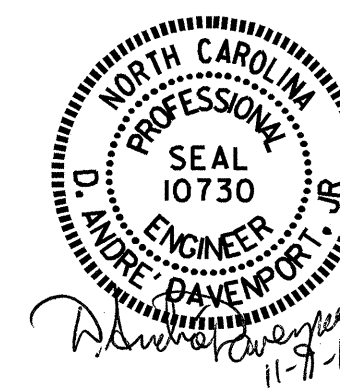
* U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 SIDEWALK DETAIL

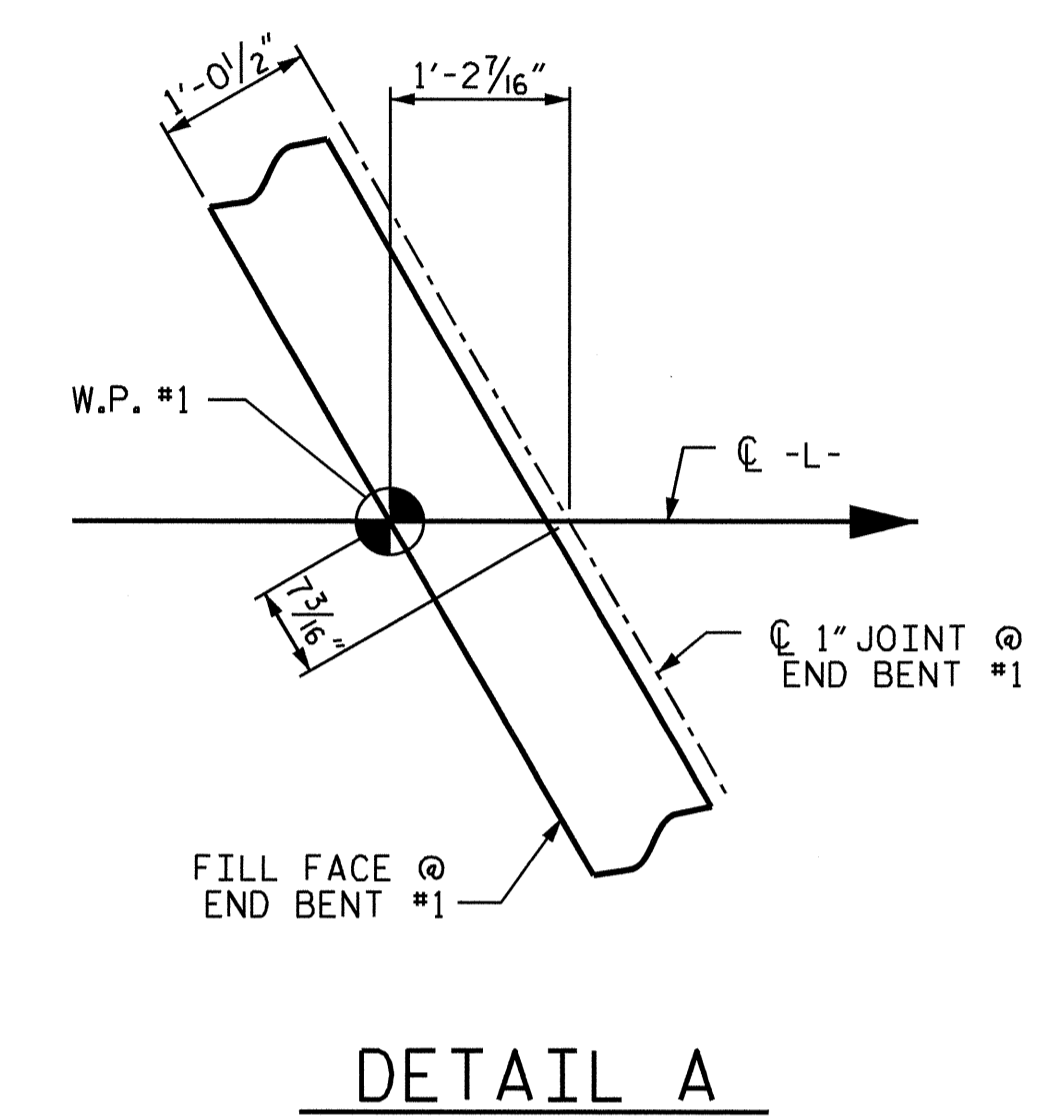
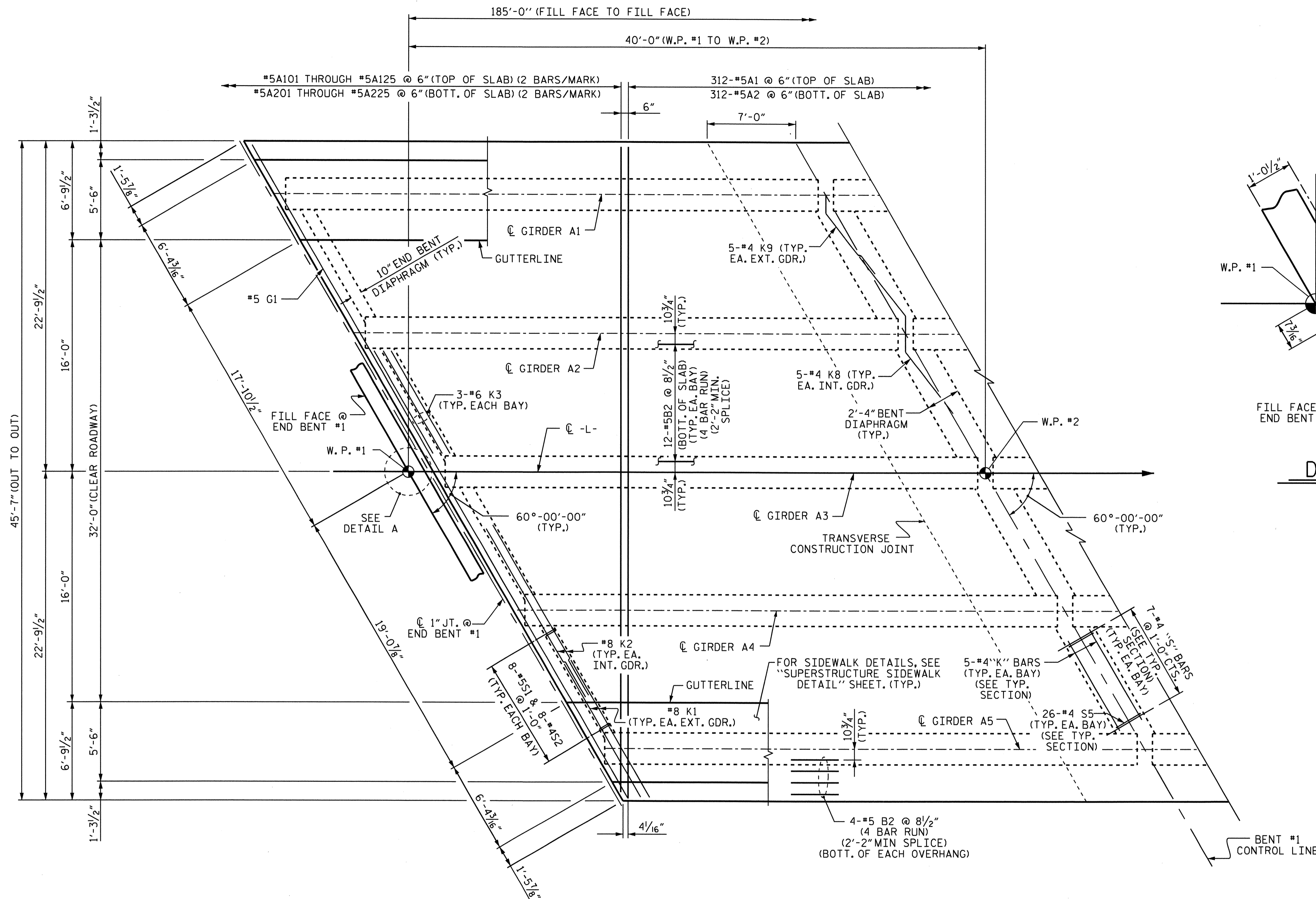


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : M. G. SHAIKH DATE : 06-17-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-23-09

09-NOV-2010 10:30
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 adavenport

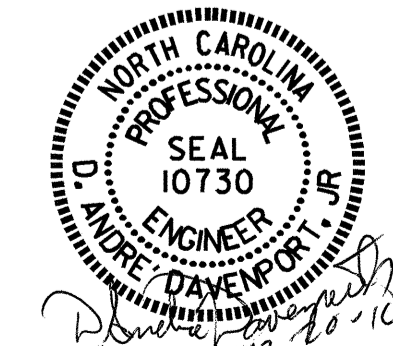
NCBDS



PLAN OF SPAN A
 FOR TOP "B" BARS SEE "B" BAR LAYOUT SHEET.

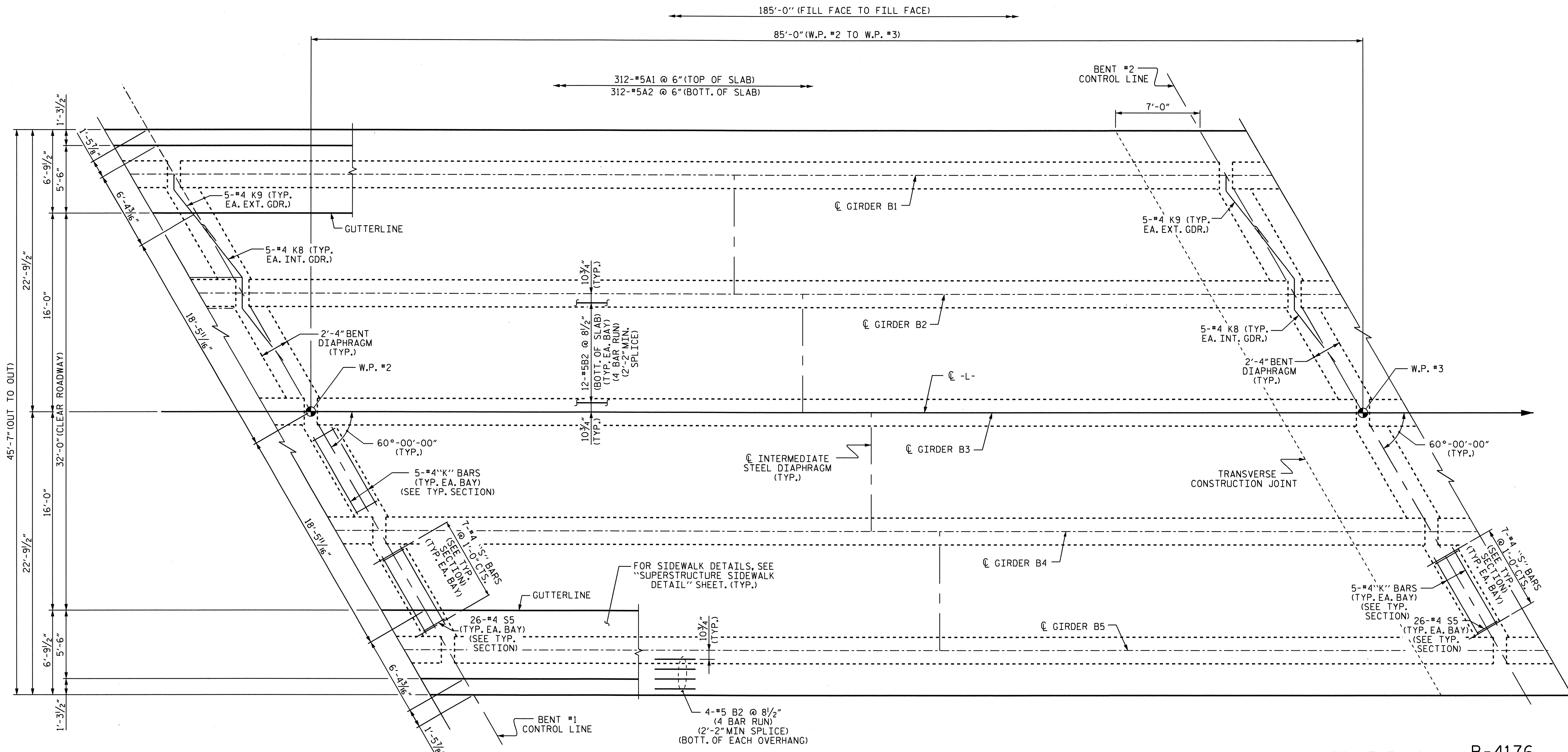
PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 42
					S-9



DRAWN BY : M. G. SHAIKH DATE : 06-11-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-23-09

20-DEC-2010 15:23
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PLAN OF SPAN B

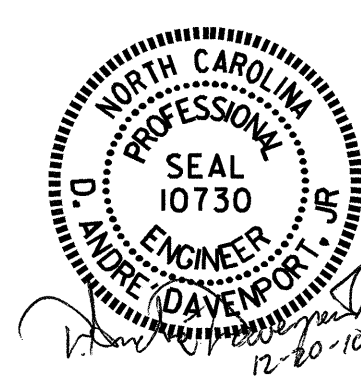
FOR TOP "B" BARS SEE "B" BAR LAYOUT SHEET.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

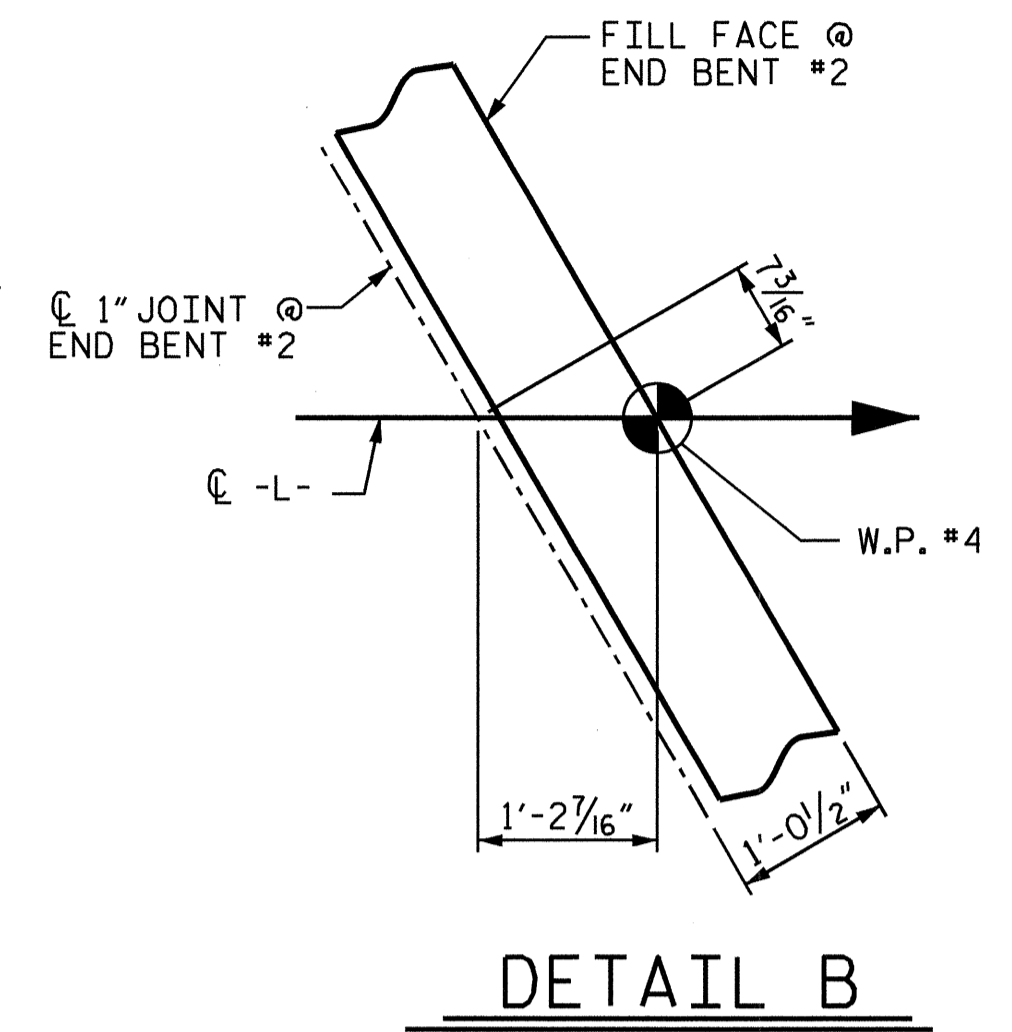
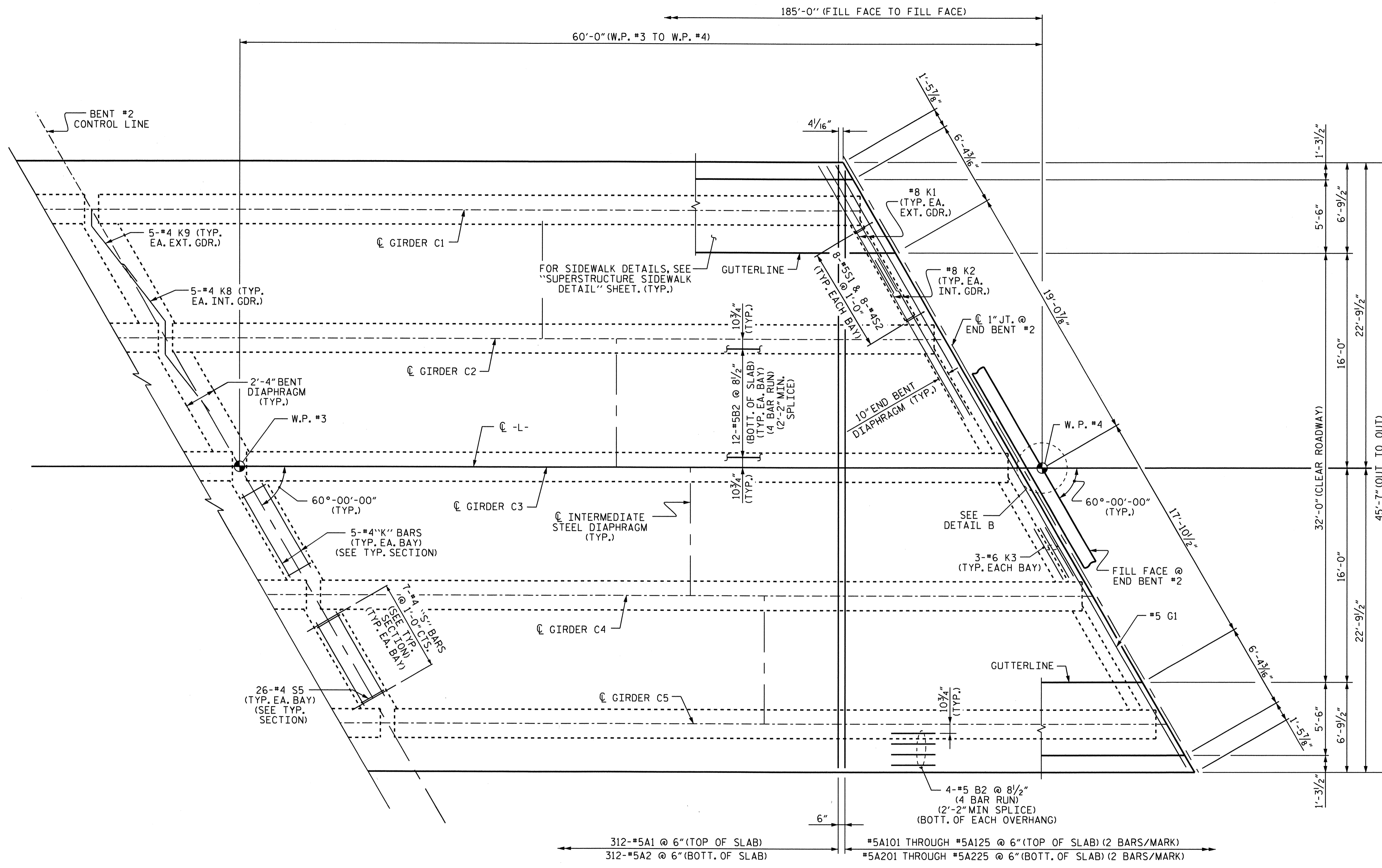
**SUPERSTRUCTURE
 PLAN OF SPAN B**



DRAWN BY : M. G. SHAIKH DATE : 06-11-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-23-09

20-DEC-2010 15:23
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			42



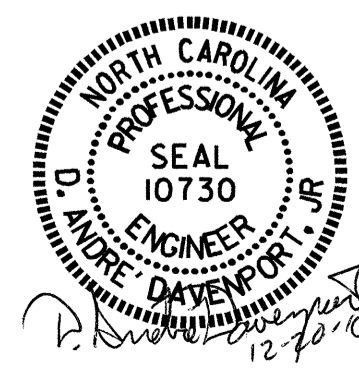
PLAN OF SPAN C
FOR TOP "B" BARS SEE "B" BAR LAYOUT SHEET.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

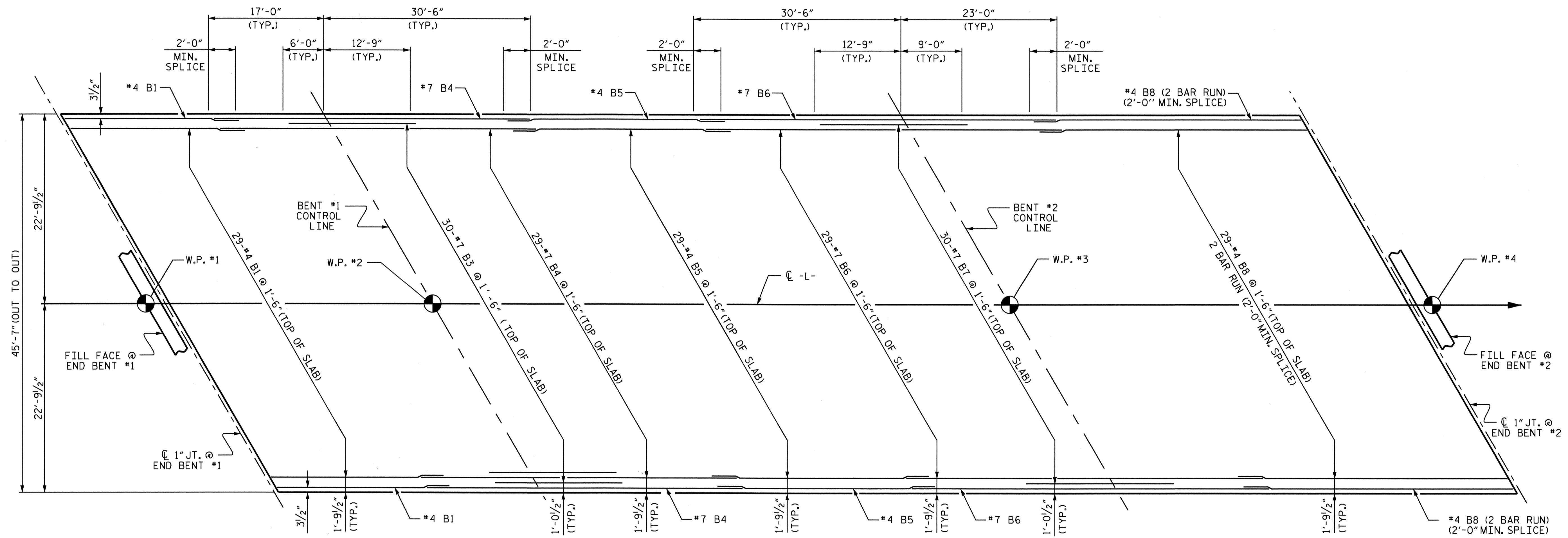
**SUPERSTRUCTURE
 PLAN OF SPAN C**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			42



DRAWN BY : M. G. SHAIKH DATE : 06-11-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-23-09

20-DEC-2010 15:24
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PLAN OF "B" BAR LAYOUT

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 "B" BAR LAYOUT

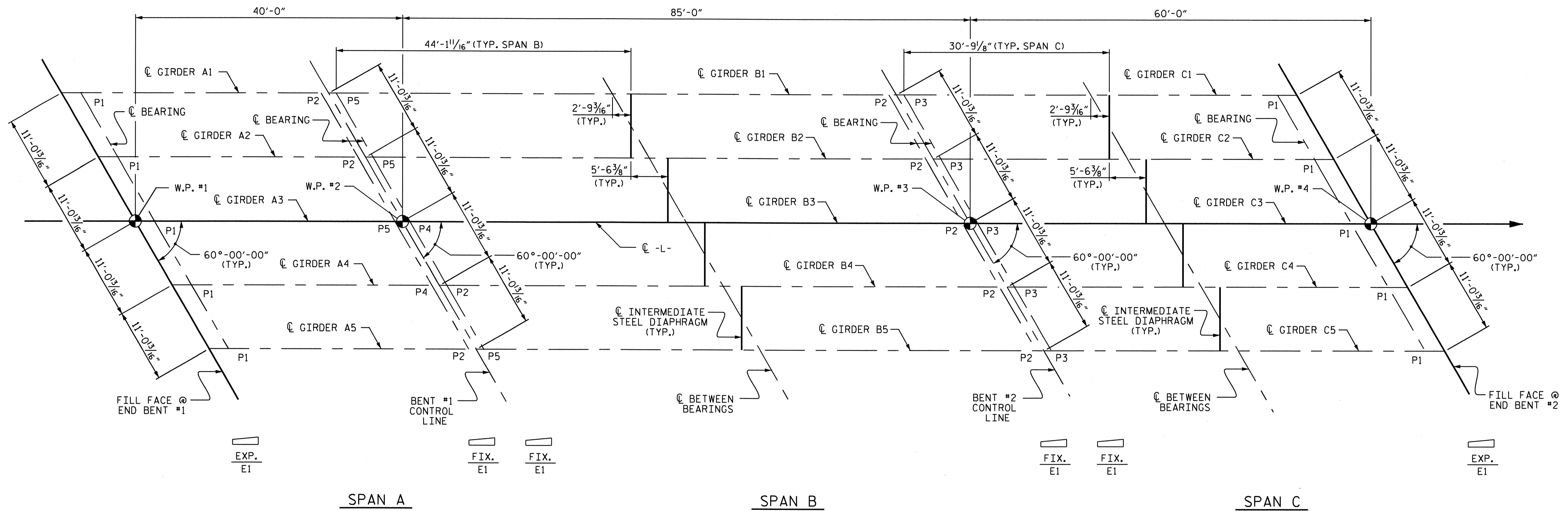


DRAWN BY : M. G. SHAIKH DATE : 06-12-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-22-09

09-NOV-2010 10:31
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REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			

NC006



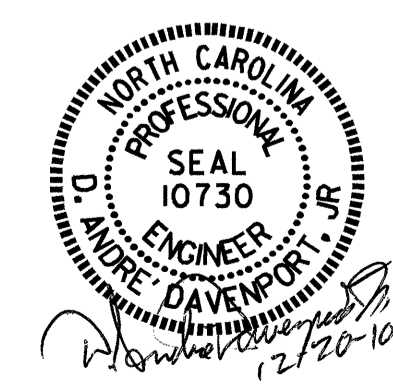
FRAMING PLAN

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 FRAMING PLAN**

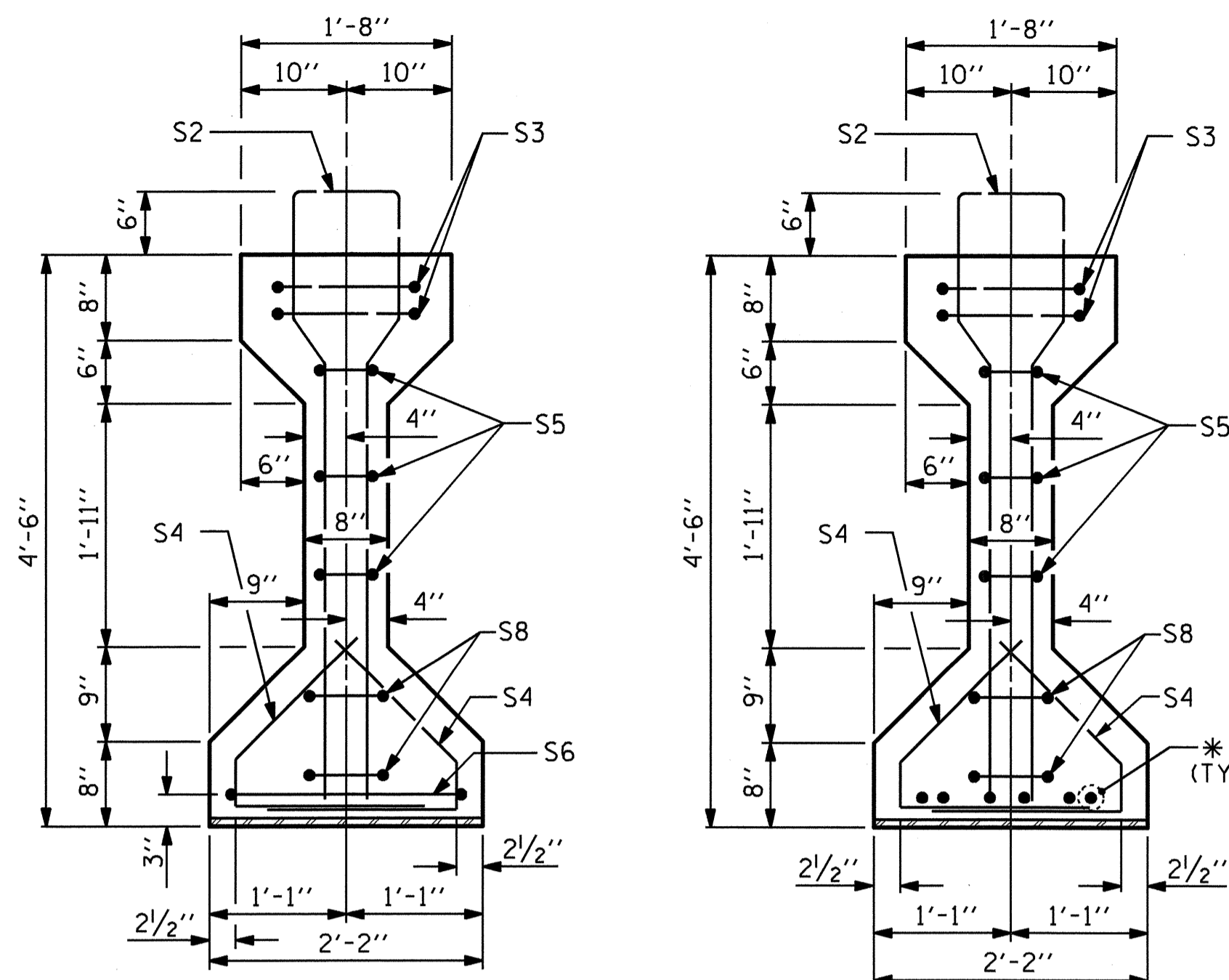
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	
1			3			TOTAL SHEETS 42	
2			4				



DRAWN BY : M. G. SHAIKH DATE : 06-12-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-22-09

20-DEC-2010 09:51
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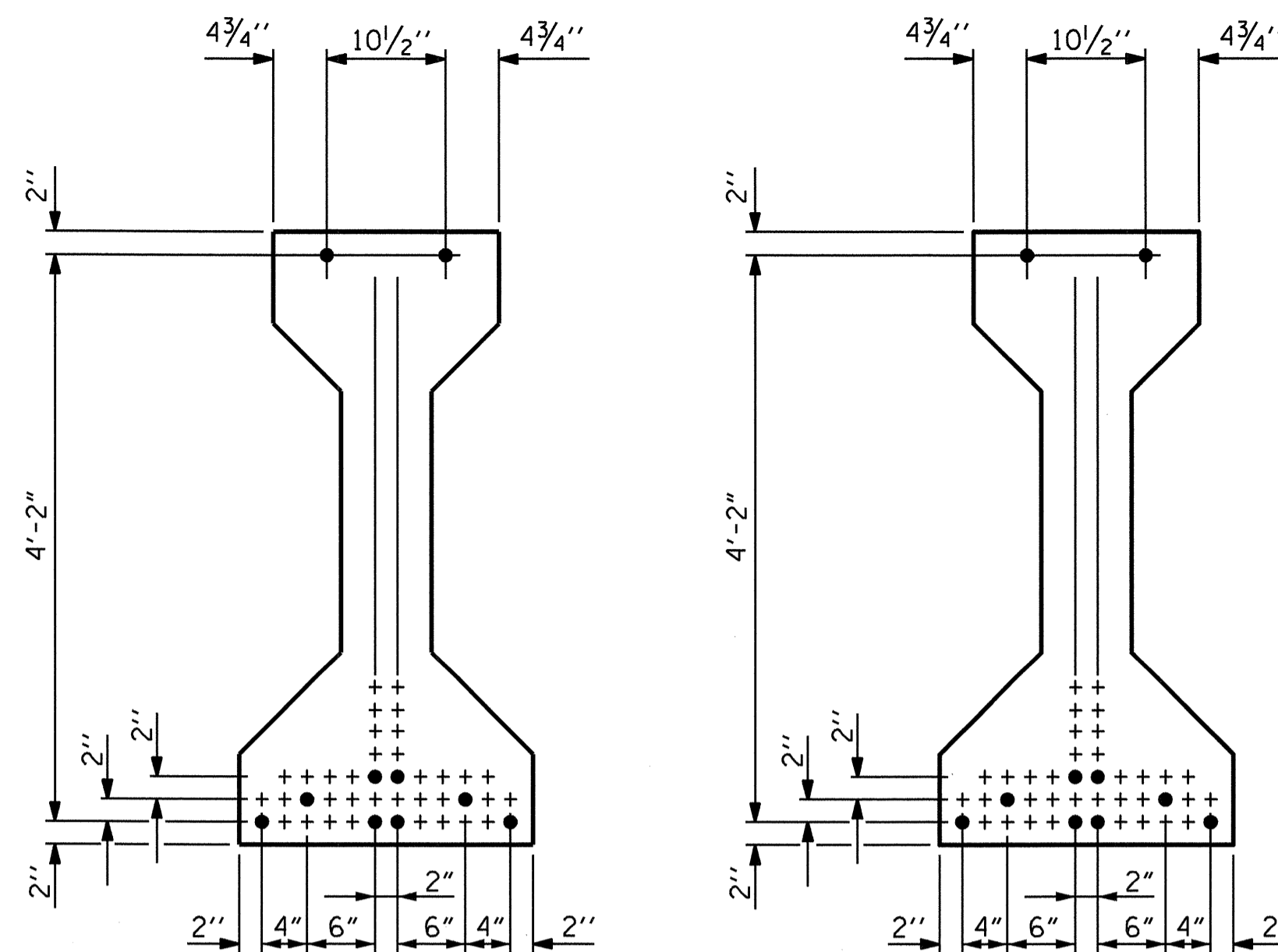
NCBDS



SECTION A-A

SECTION B-B

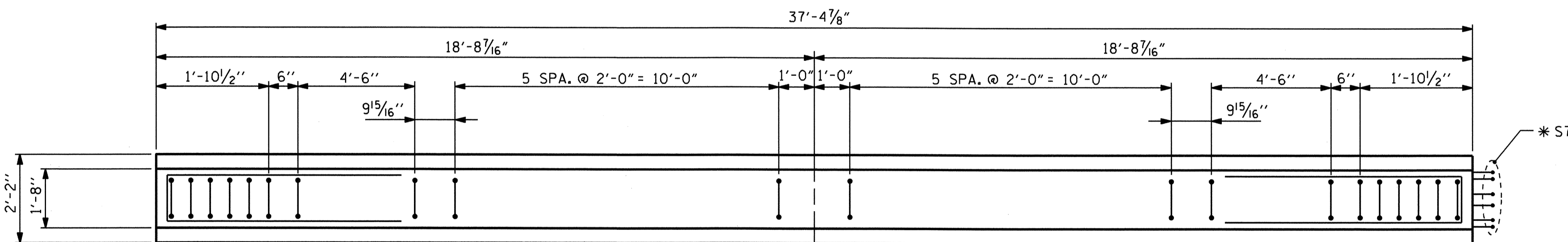
* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



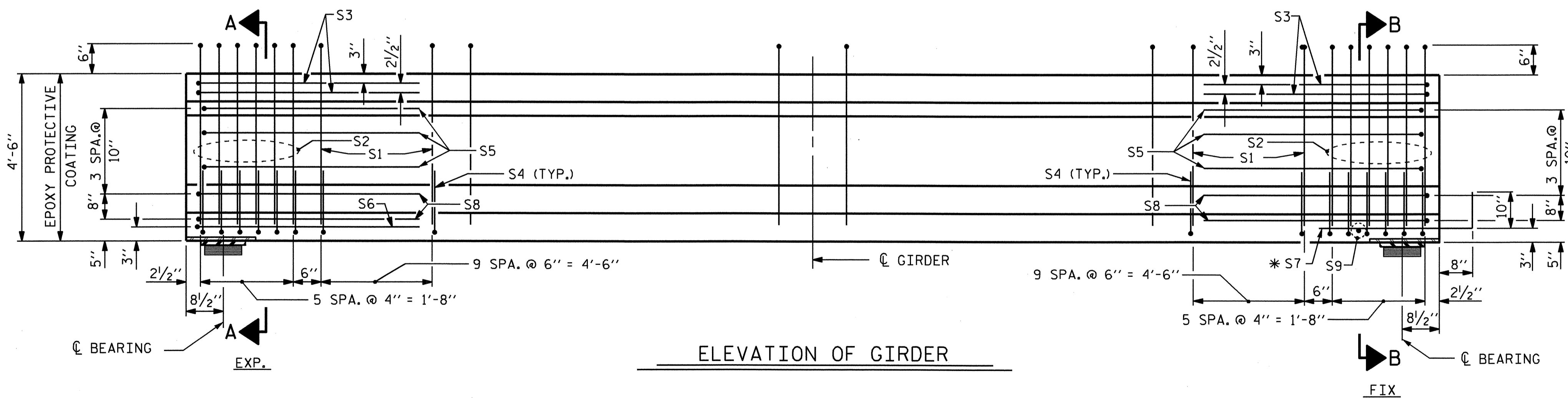
AT END OF GIRDER

AT \bar{C} OF GIRDER

0.6" \bar{O} LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" \bar{O} L. R. GRADE 270 STRANDS

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

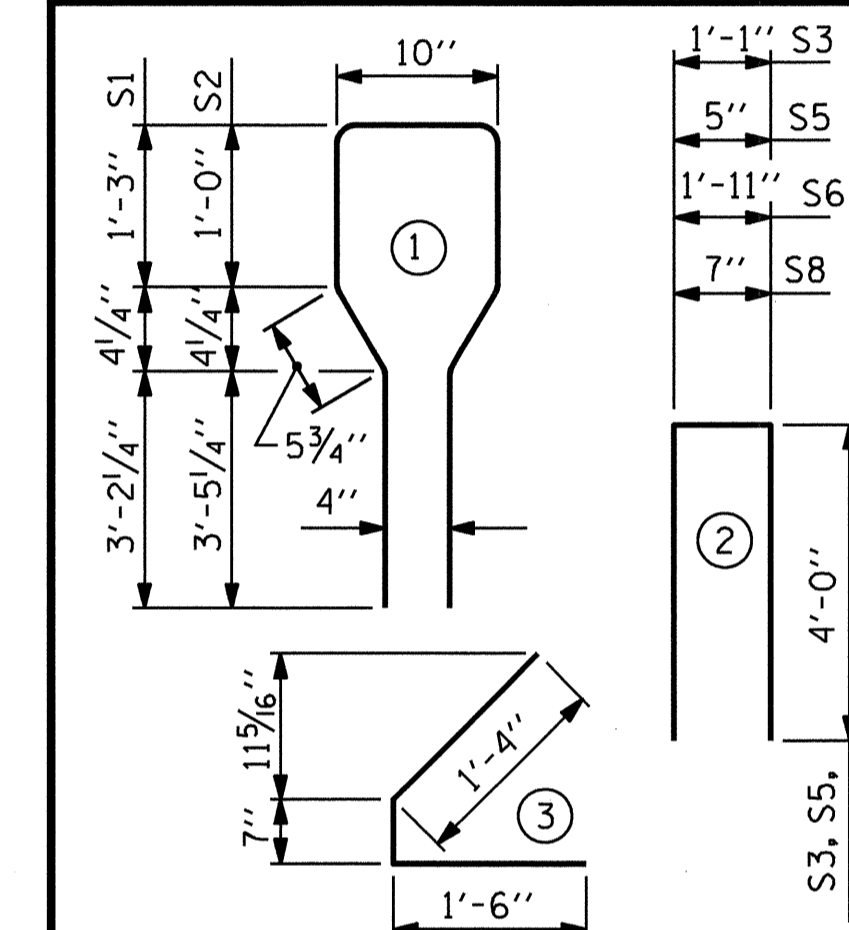
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	32	#4	1	10'-8"	228
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1

* 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	5000 PSI CONCRETE	0.6" \bar{O} L.R. STRANDS
	LB.	C.Y.	No.
SPAN A	678	7.6	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	37'-4 1/8"	187'-0 3/8"

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

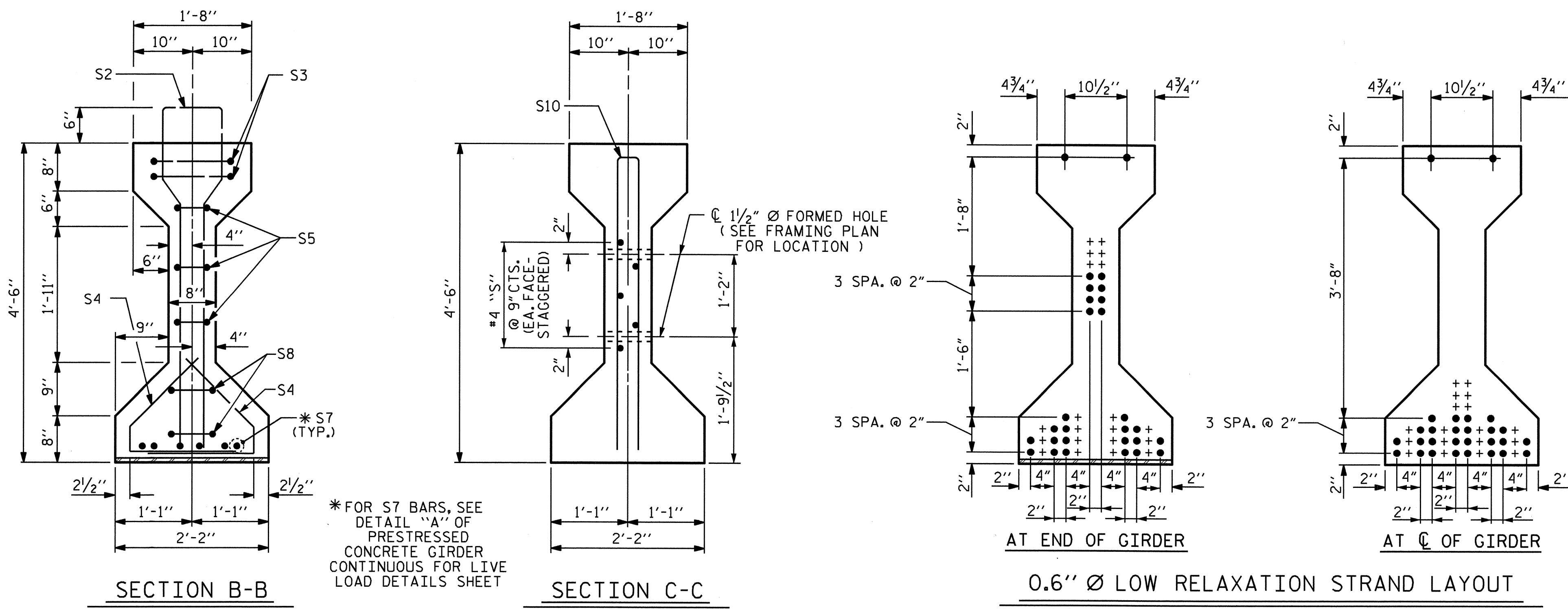


ASSEMBLED BY : M. G. SHAIKH DATE : 06-17-09
CHECKED BY : D. A. DAVENPORT DATE : 07-22-09
DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91 REV. 10/17/00R RWW/LES
REV. 5/1/06 TLA/GM

09-NOV-2010 10:32
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

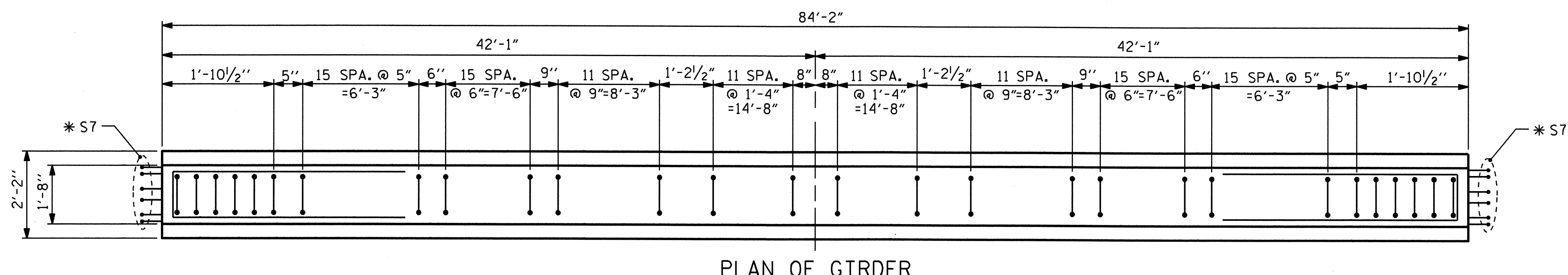
STD. NO. PCG6



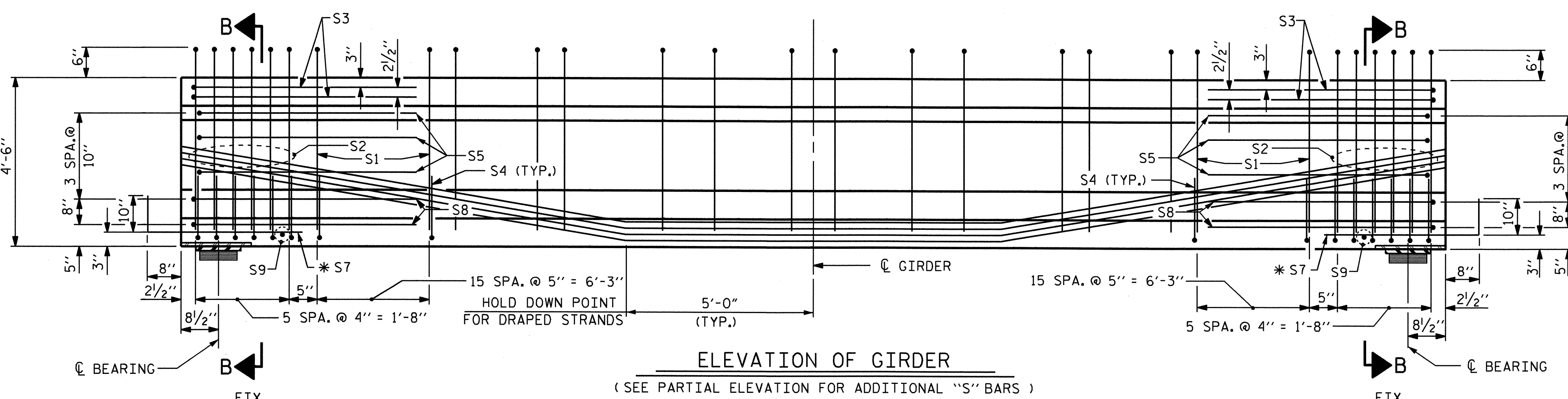
* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET

1/2" Ø FORMED HOLE
(SEE FRAMING PLAN
FOR LOCATION)

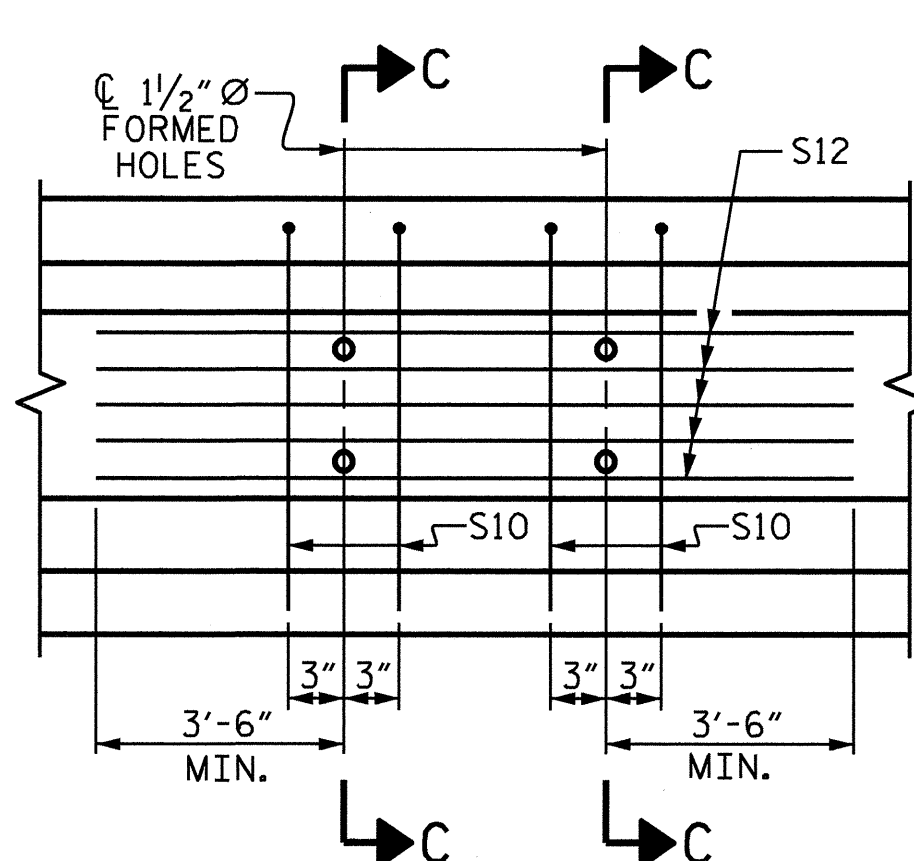
AT END OF GIRDER
AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT



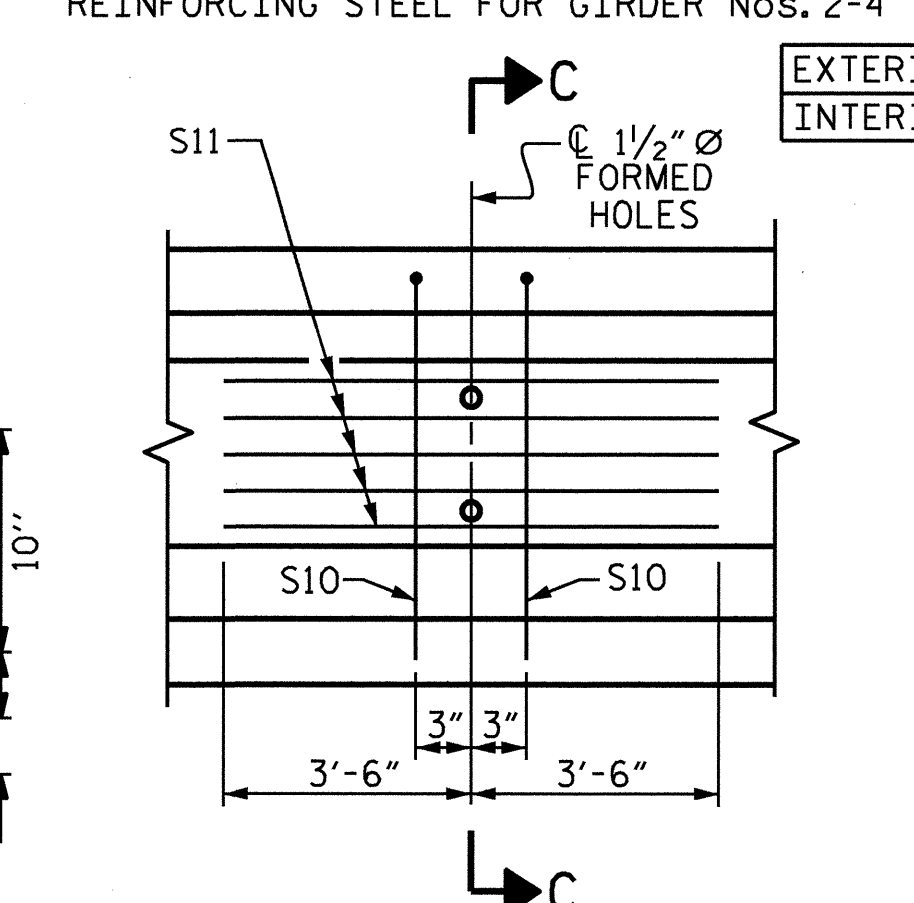
PLAN OF GIRDER



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 2-4



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 1 & 5

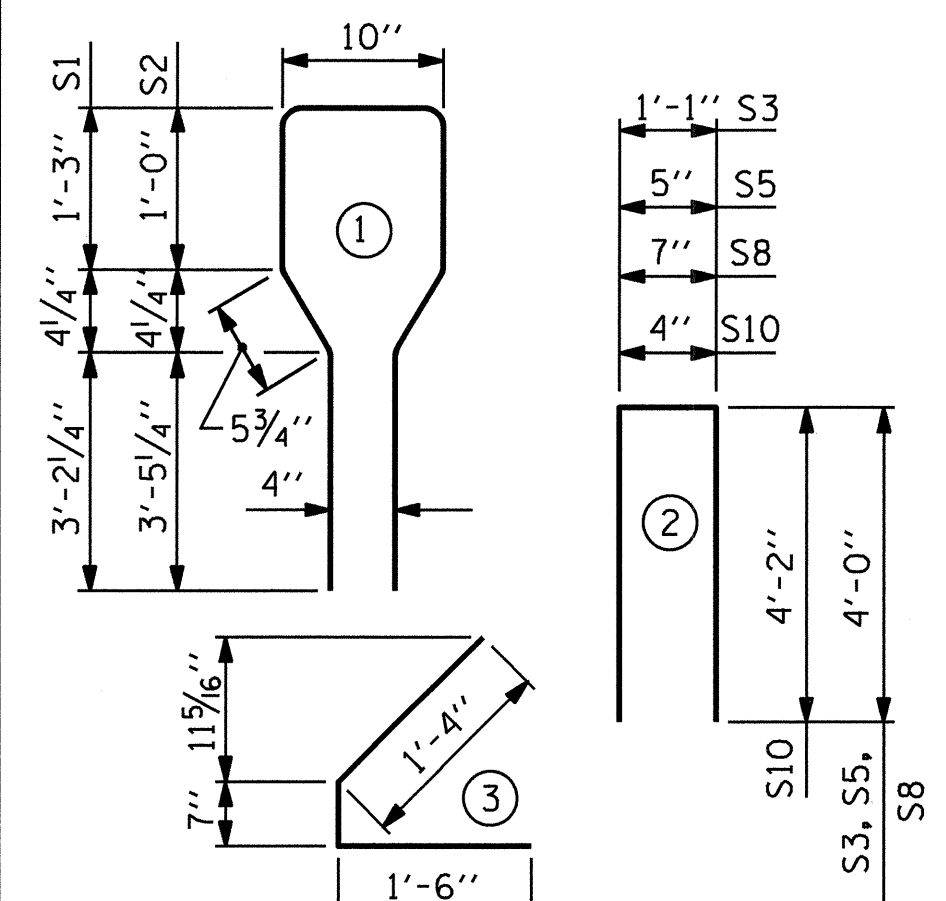
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	112	#4	1	10'-8"	798	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	88	#4	3	3'-5"	201	
S5	6	#4	2	8'-5"	34	
*S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	2	#3	STR	1'-10"	1	
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-7"	42

EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-7"	42

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



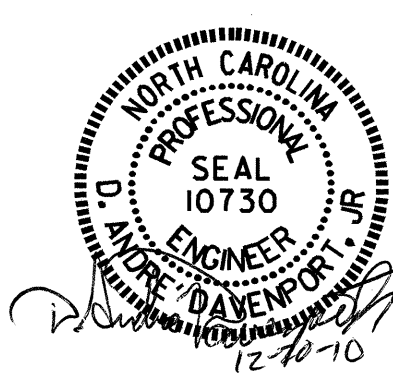
QUANTITIES FOR ONE GIRDER				
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.	
EXTERIOR GDR.	SPAN B	1360	17.1	28
INTERIOR GDR.	SPAN B	1397	17.1	28

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	84'-2"	420'-10"

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

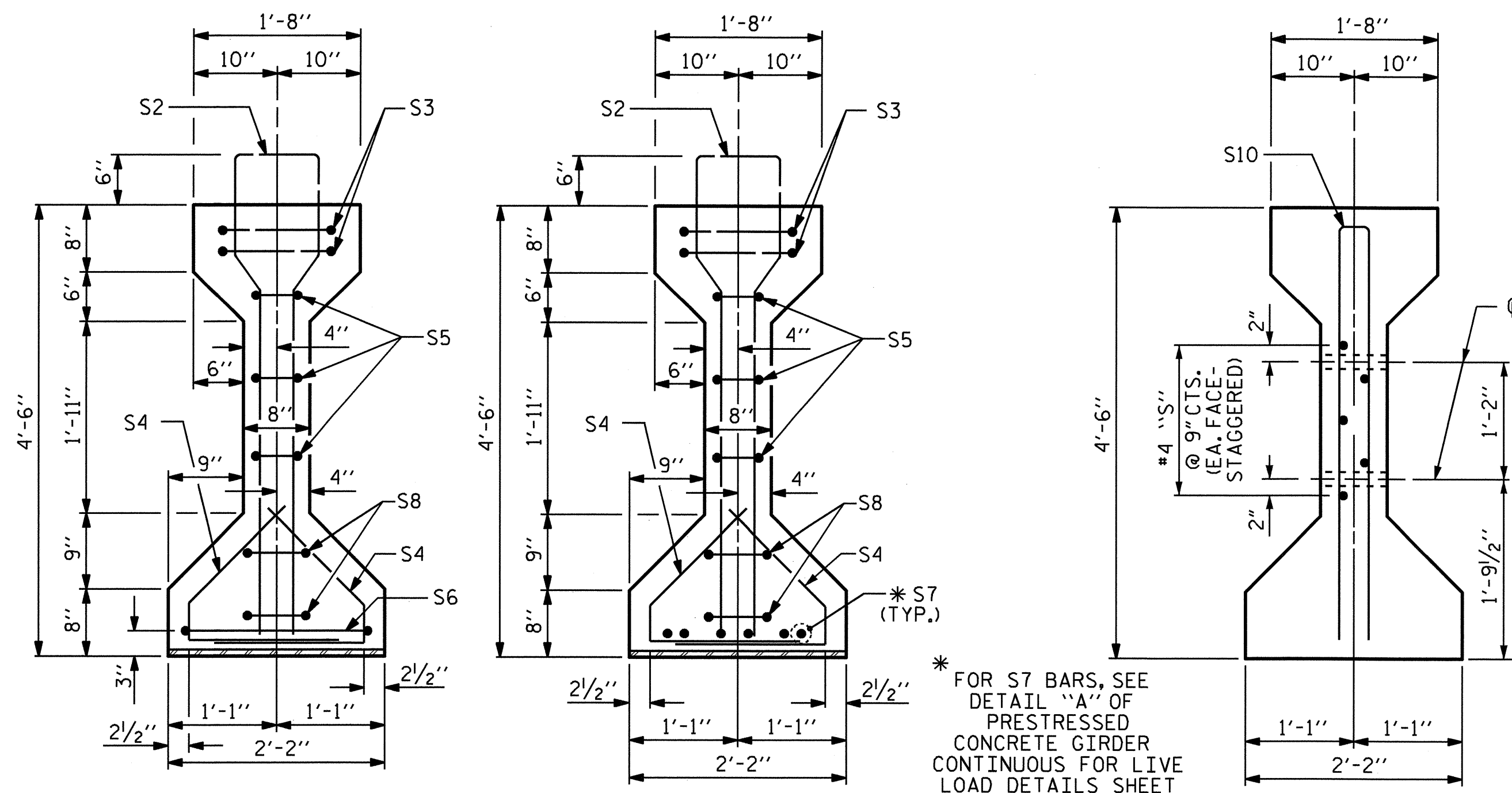
SHEET 2 OF 5
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B



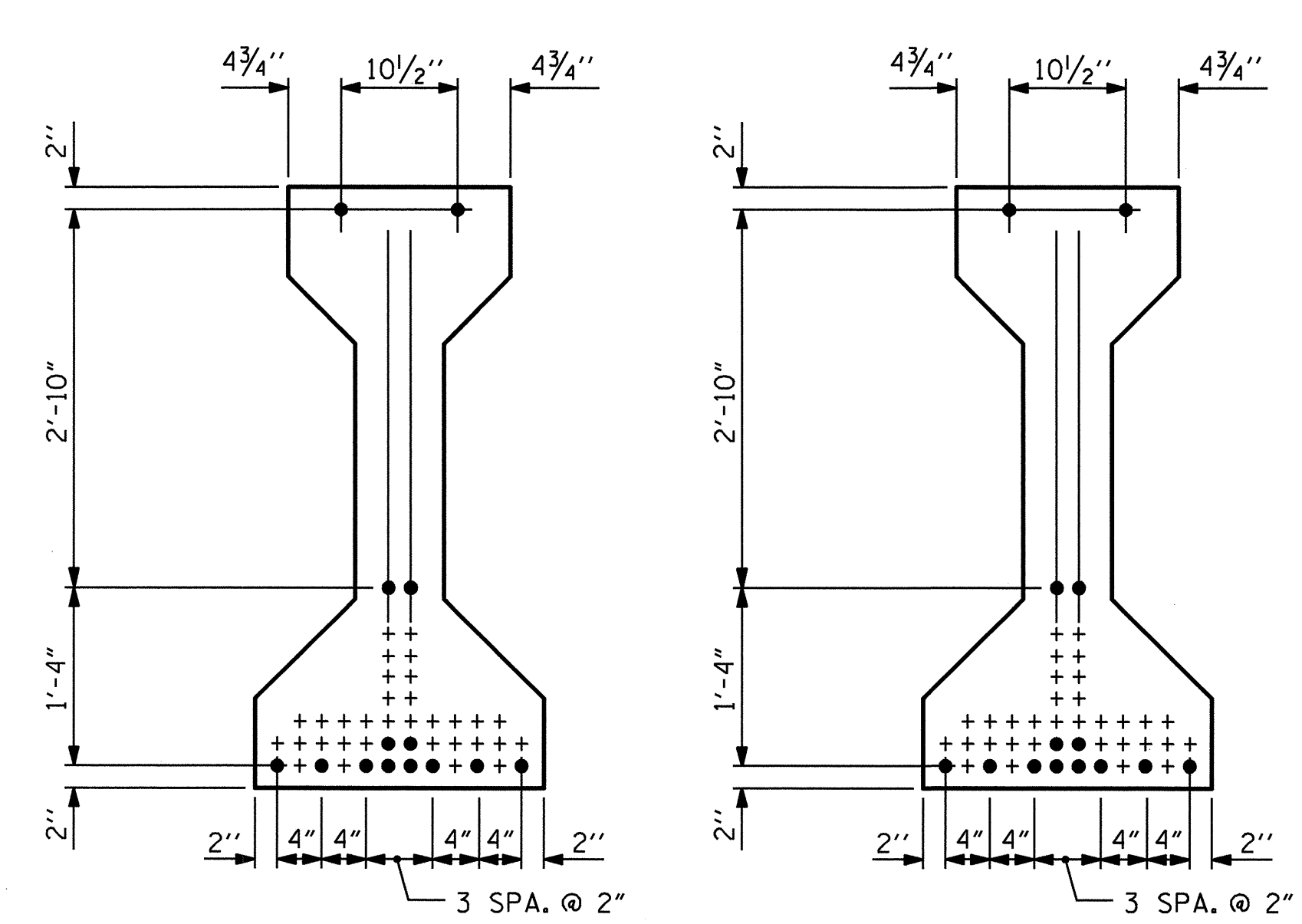
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			42
2			4			

ASSEMBLED BY : M. G. SHAIKH DATE : 06-17-09
CHECKED BY : D. A. DAVENPORT DATE : 07-22-09
DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91 REV. 10/17/00R RWW/LES
REV. 5/1/06 TLA/GM



1/2" Ø FORMED HOLE
(SEE FRAMING PLAN FOR LOCATION)

* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



AT END OF GIRDER AT C OF GIRDER

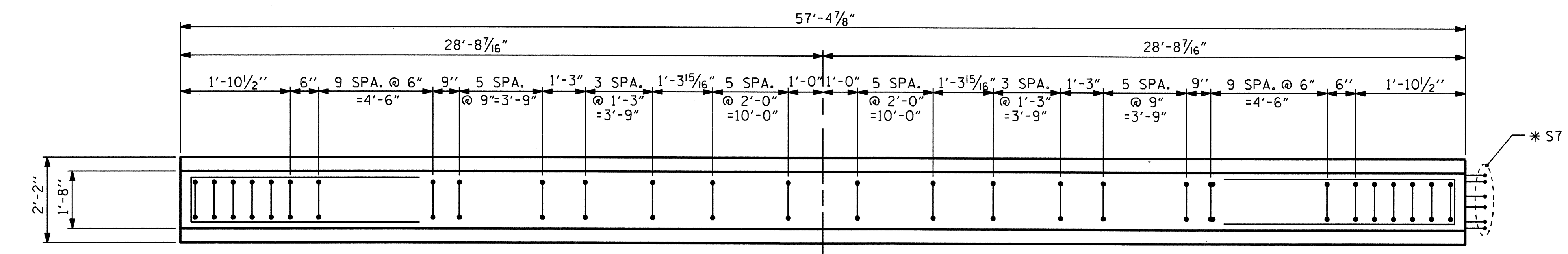
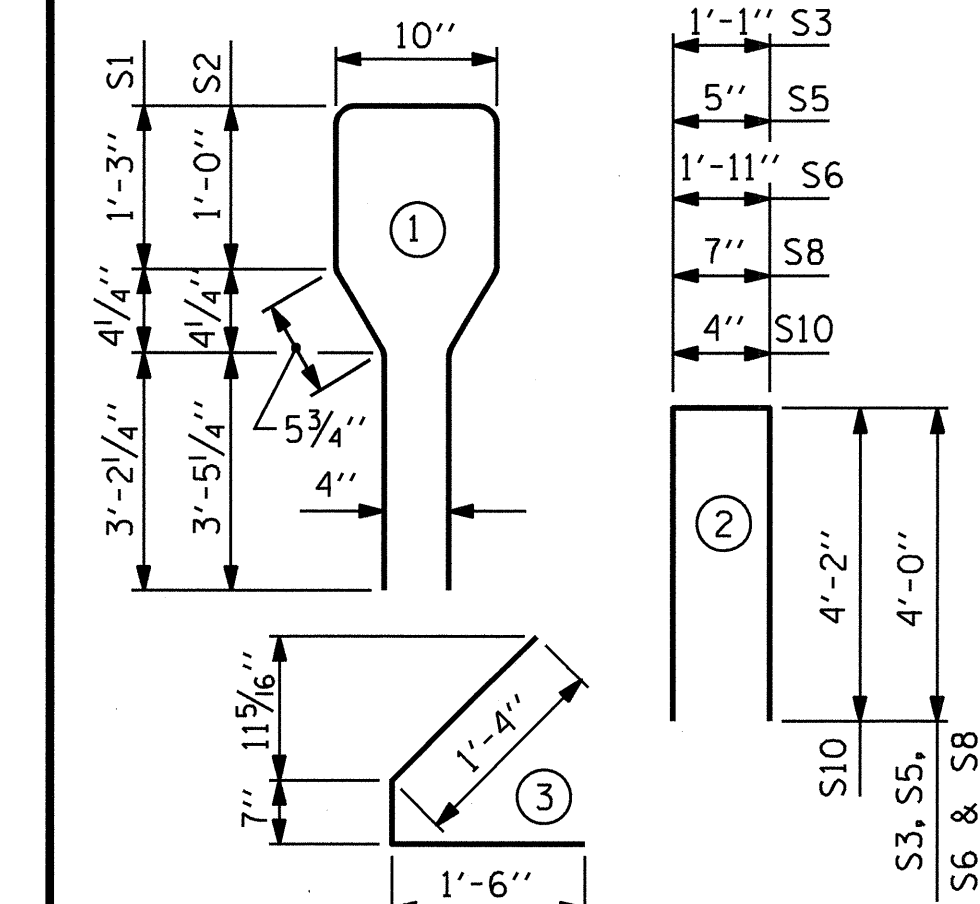
0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-7"	42

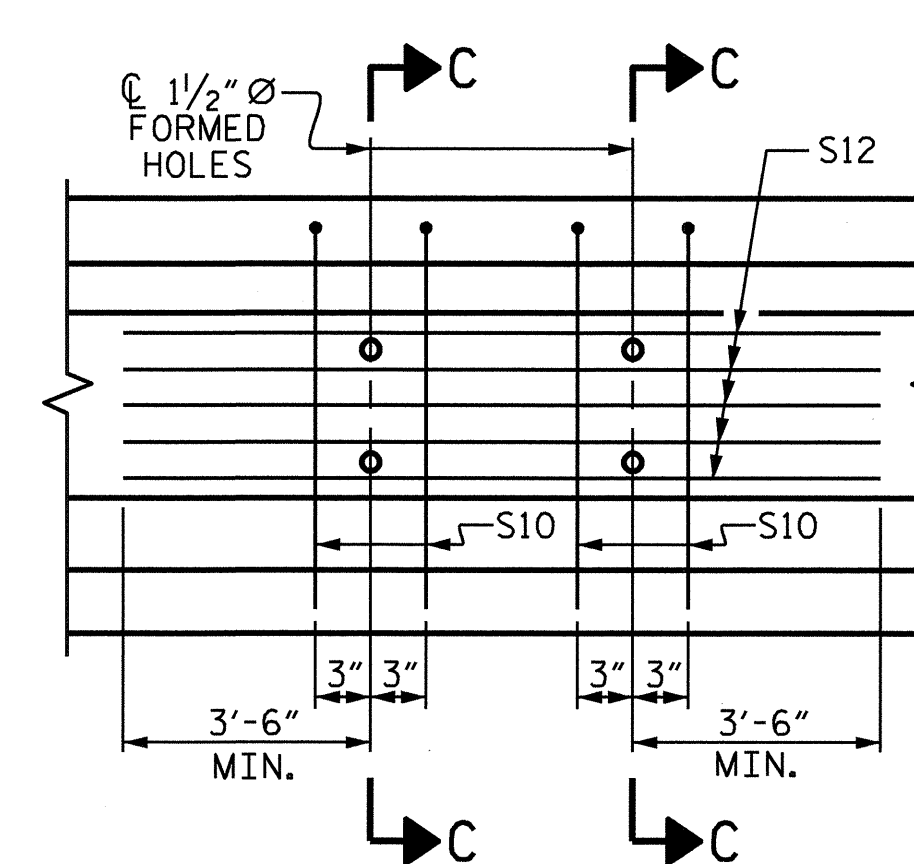
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

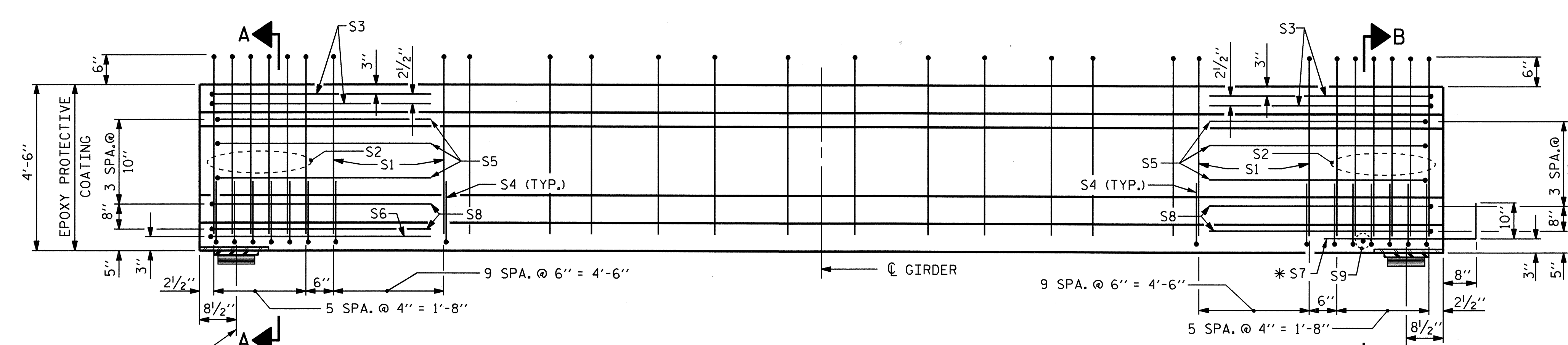
ALL BAR DIMENSIONS ARE OUT-TO-OUT



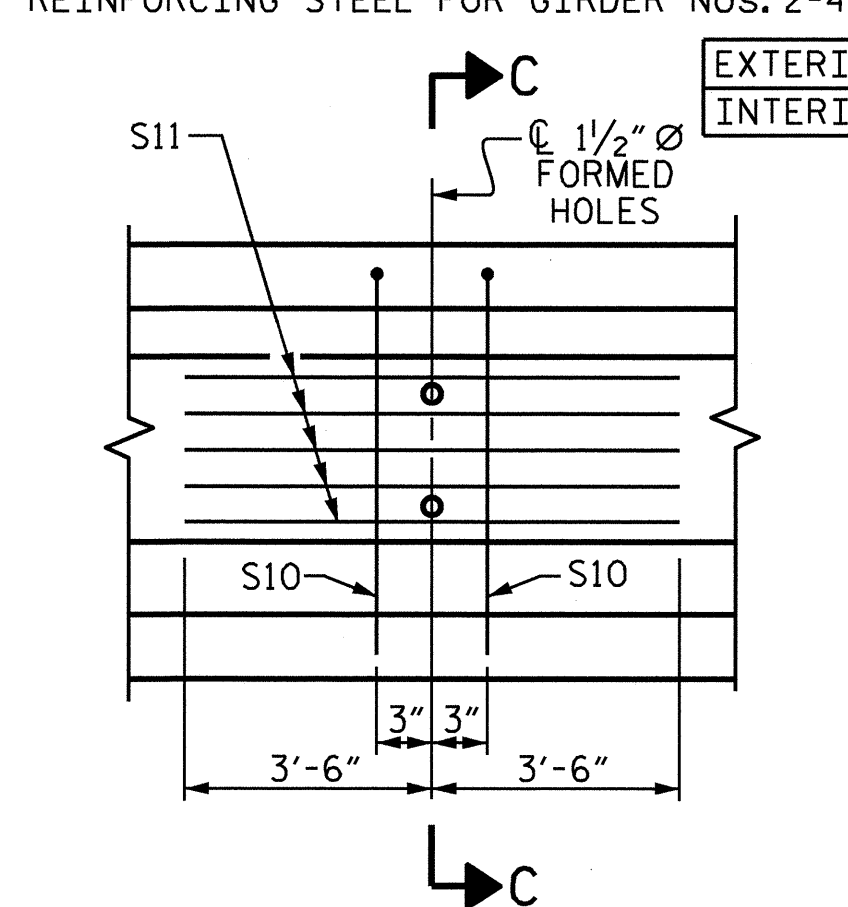
PLAN OF GIRDER



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2-4



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 5

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 GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	52	#4	1	10'-8"	371	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	64	#4	3	3'-5"	146	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
* S7	6	#5	STR	3'-8"	23	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
S10	2	#5	2	8'-8"	18	
S10	4	#5	2	8'-8"	36	
S11	5	#4	STR	7'-0"	23	
S12	5	#4	STR	12'-7"	42	

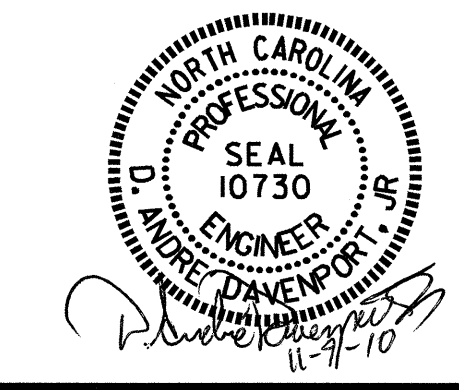
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
SPAN C	862	11.6	14
SPAN C	899	11.6	14

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	57'-4 7/8"	287'-0 3/8"

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

SHEET 3 OF 5
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN C

ASSEMBLED BY : M. G. SHAIKH	DATE : 06-17-09
CHECKED BY : D. A. DAVENPORT	DATE : 07-22-09
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM



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

STRUCTURAL STEEL NOTES

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, ANGLES, AND PLATE WASHERS 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 PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE CHANNEL MEMBER CONNECTION.

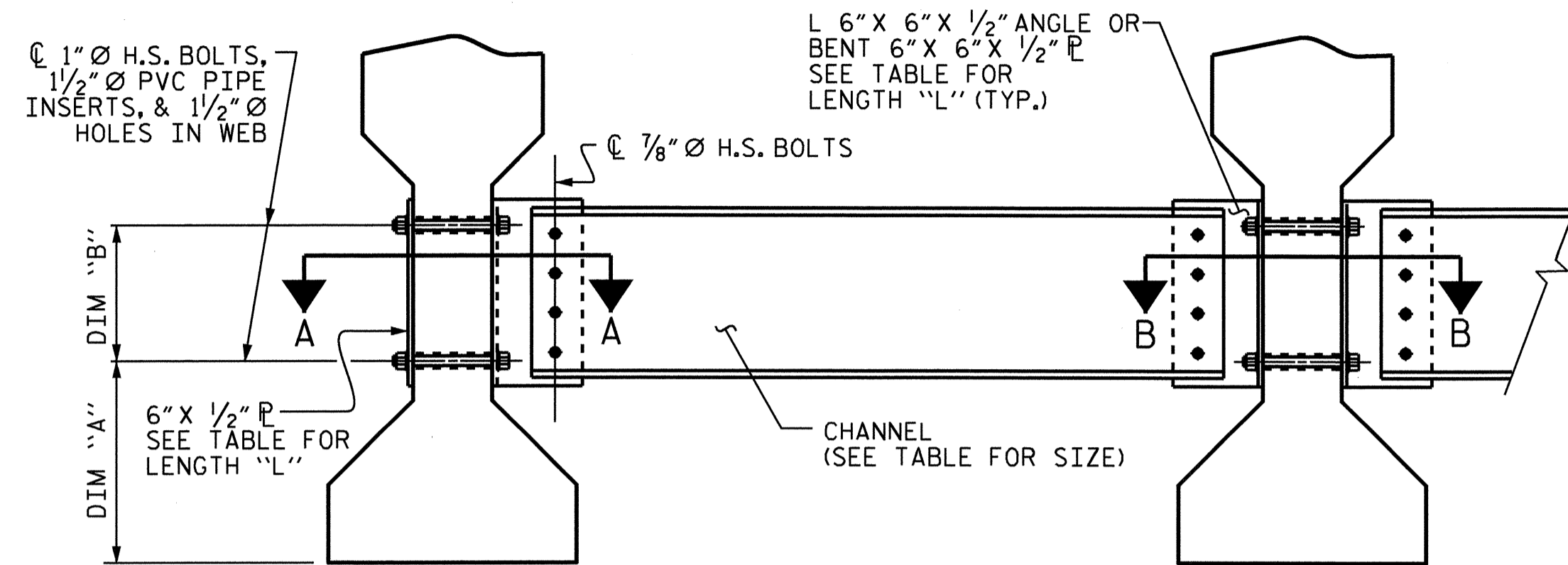
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

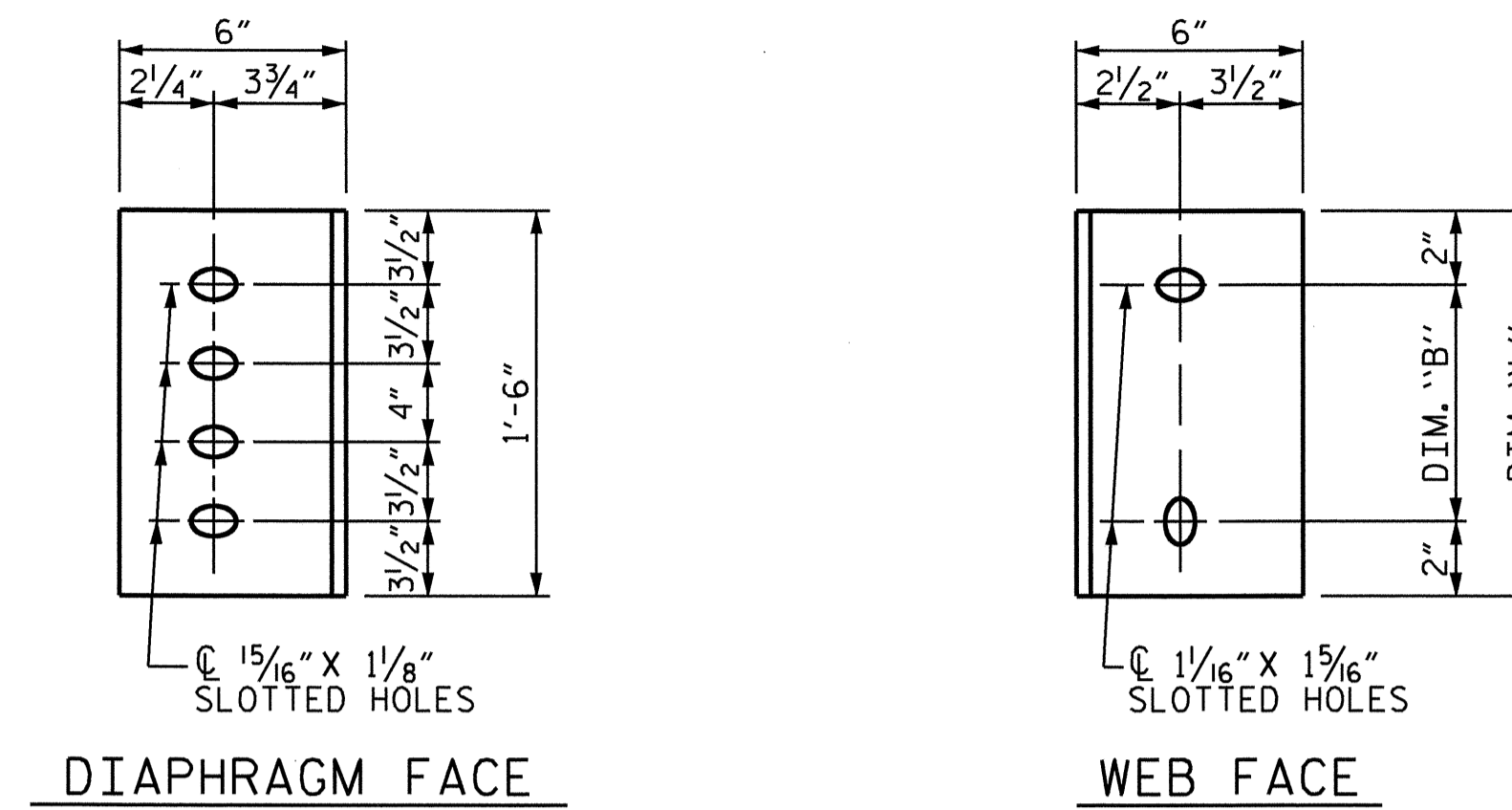
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

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



EXTERIOR GIRDER INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

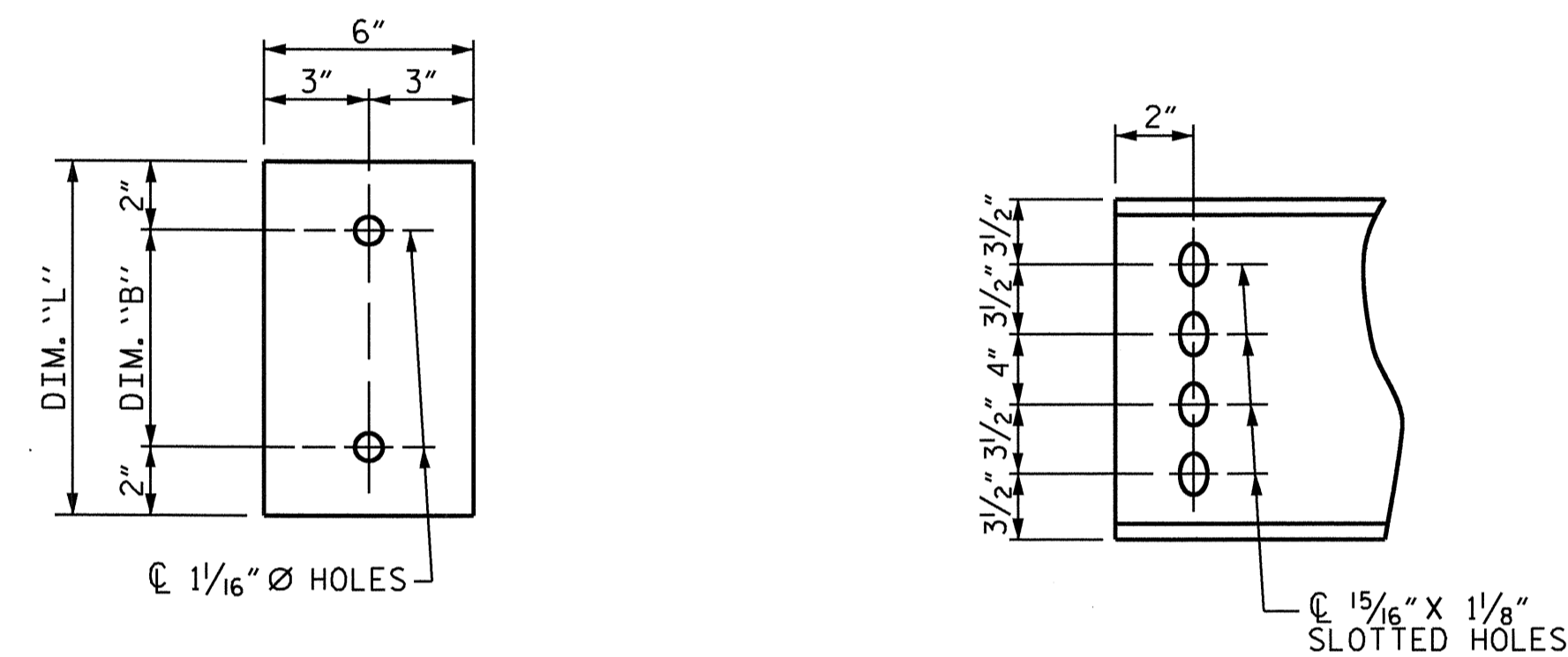
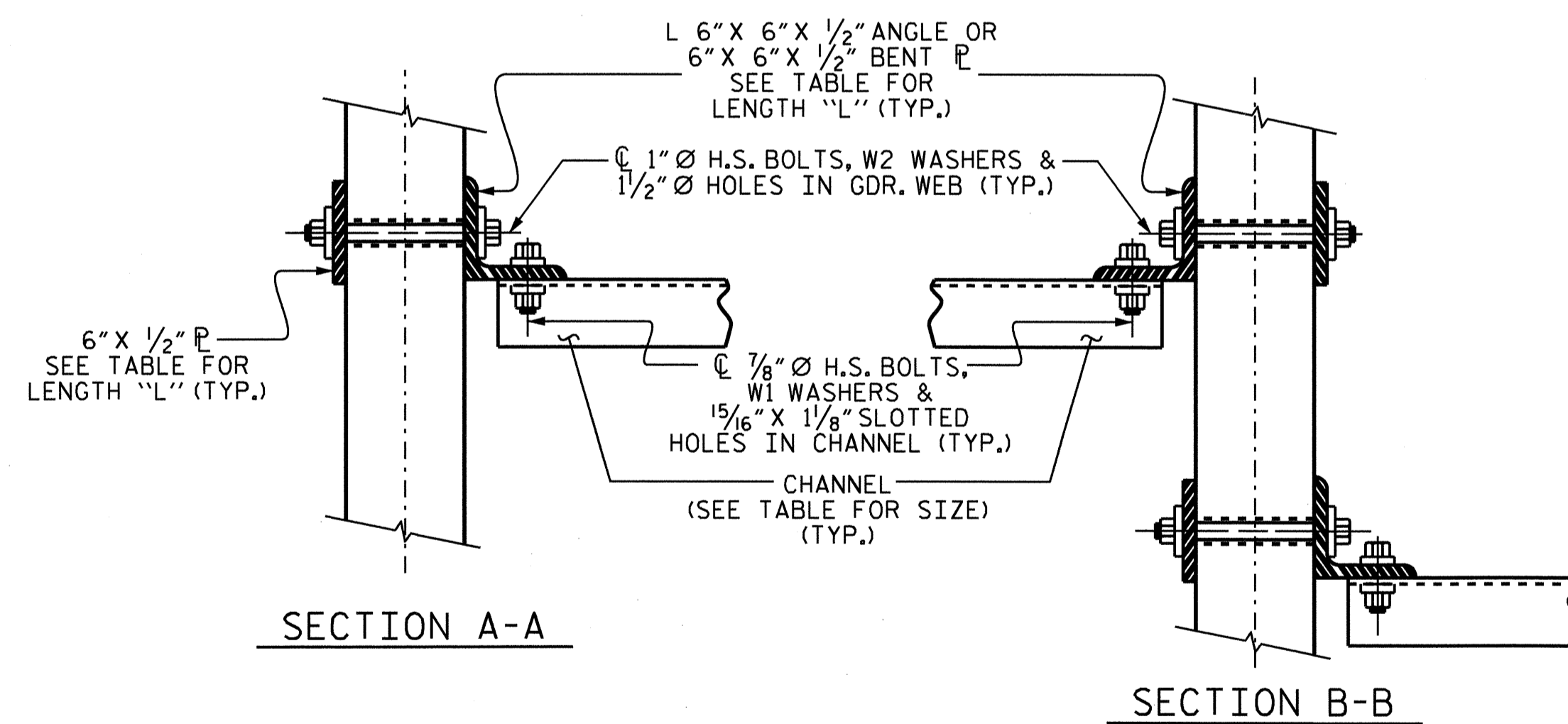
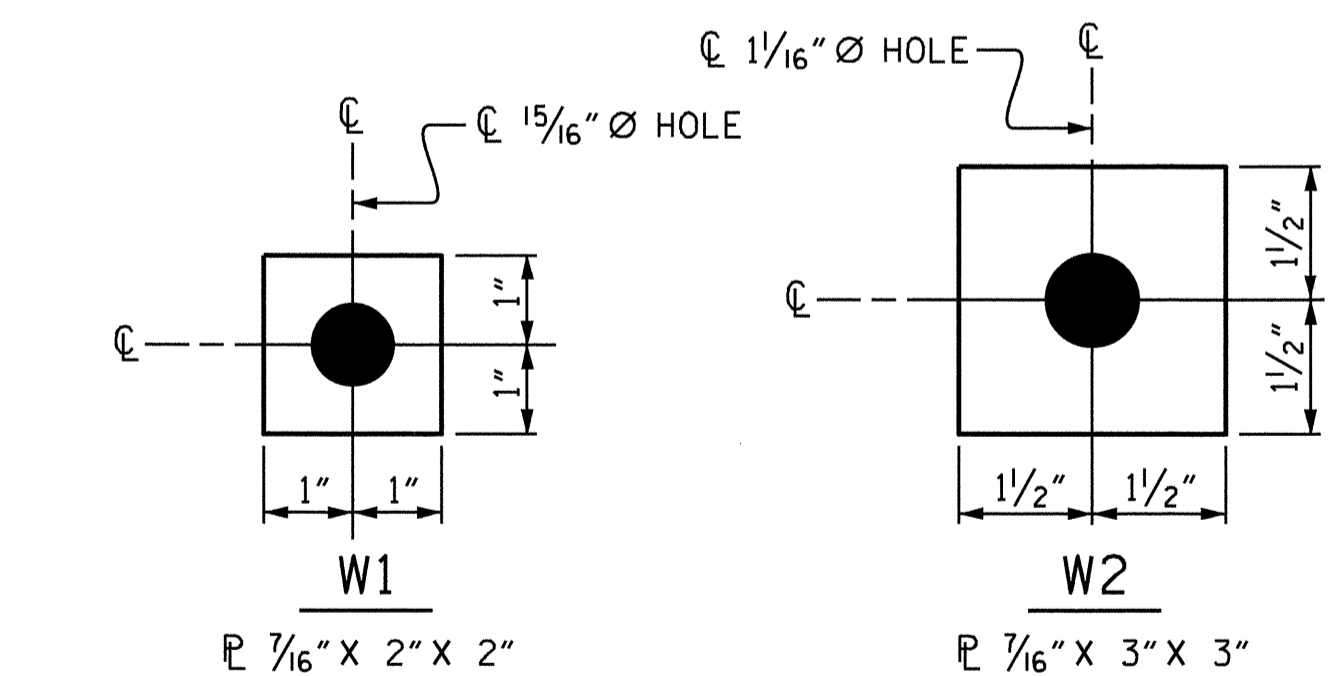


PLATE DETAILS

CHANNEL END



CONNECTION DETAILS



USE WITH 7/8" \varnothing HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" \varnothing HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS

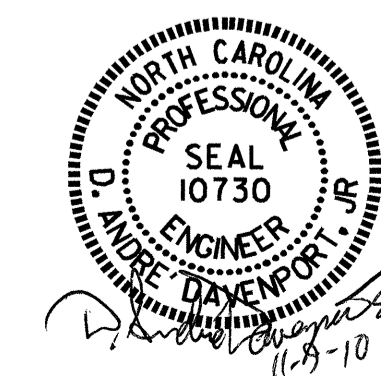
TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE IV
 PRESTRESSED CONCRETE
 GIRDERS



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

TOTAL SHEETS 42

ASSEMBLED BY : M. G. SHAIKH DATE : 06-22-09
 CHECKED BY : D. A. DAVENPORT DATE : 07-22-09
 DRAWN BY : TLA 6/05
 CHECKED BY : VC 6/05
 ADDED 10/21/05
 REV. 5/1/06R KMM/GM

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 OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

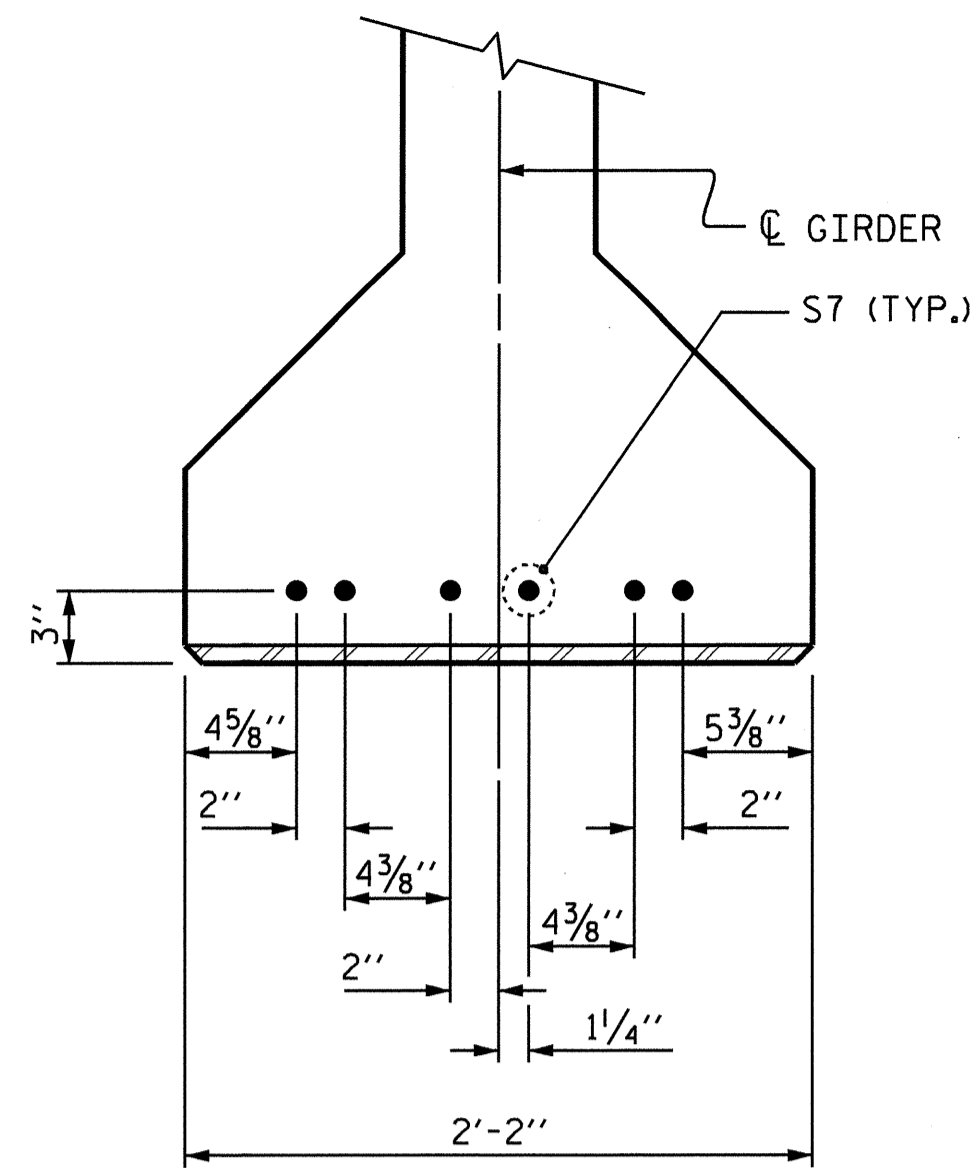
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

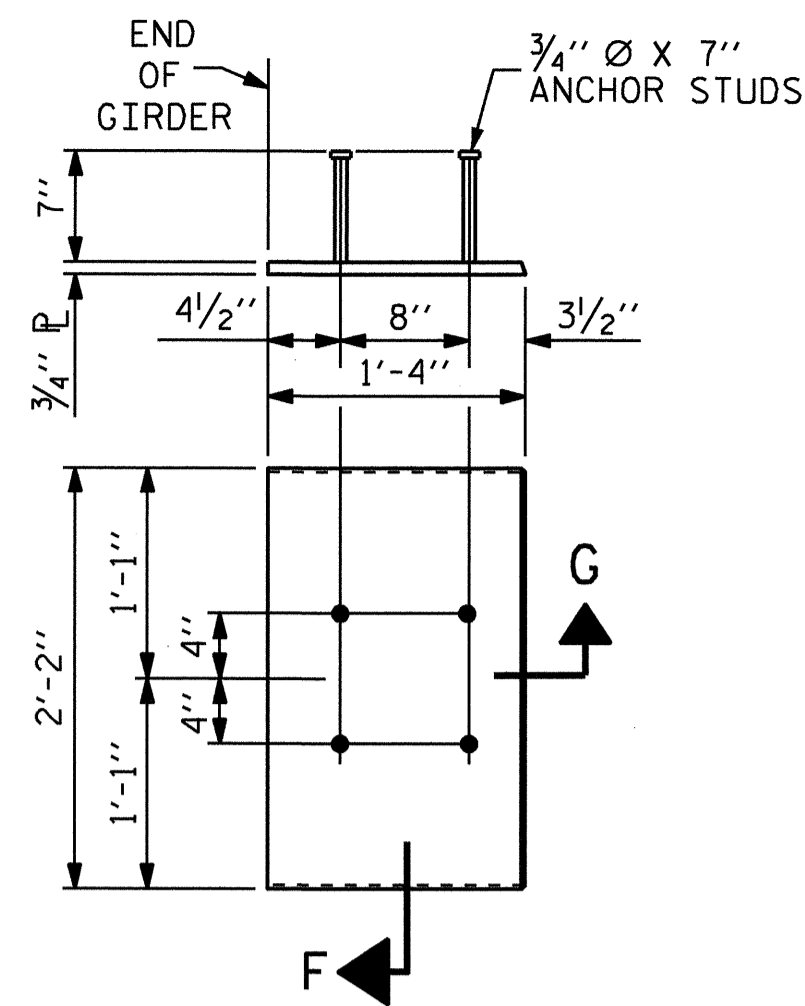
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



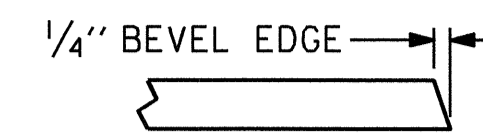
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

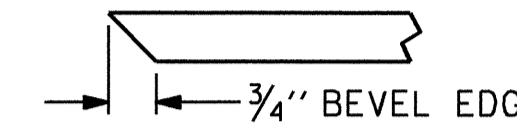


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "G"



SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A																						
	GIRDERS 1 & 5										GIRDERS 2, 3 & 4												
	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)	↑	0.000	0.054	0.102	0.140	0.164	0.172	0.164	0.140	0.102	0.054	0.000	0.000	0.054	0.102	0.140	0.164	0.172	0.164	0.140	0.102	0.054	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.014	0.027	0.036	0.043	0.045	0.043	0.036	0.027	0.014	0.000	0.000	0.015	0.029	0.039	0.046	0.049	0.046	0.039	0.029	0.015	0.000
FINAL CAMBER	↑	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/16	1/16	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/16	1/16	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN B																						
	GIRDERS 1 & 5										GIRDERS 2, 3 & 4												
	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)	↑	0.000	0.808	1.529	2.093	2.451	2.574	2.451	2.093	1.529	0.808	0.000	0.000	0.808	1.529	2.093	2.451	2.574	2.451	2.093	1.529	0.808	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.395	0.747	1.022	1.197	1.257	1.197	1.022	0.747	0.395	0.000	0.000	0.428	0.810	1.109	1.299	1.364	1.299	1.109	0.810	0.428	0.000
FINAL CAMBER	↑	0	7/16	13/16	1 1/16	1 1/4	1 5/16	1 1/4	1 1/16	13/16	7/16	0	0	3/8	3/4	1	1 1/8	1 3/16	1 1/8	1	3/4	3/8	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

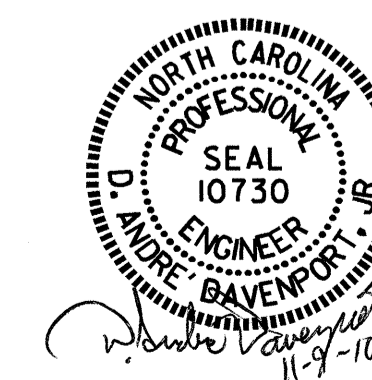
0.6" Ø LOW RELAXATION	SPAN C																						
	GIRDERS 1 & 5										GIRDERS 2, 3 & 4												
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.164	0.311	0.426	0.499	0.524	0.499	0.426	0.311	0.164	0.000	0.000	0.164	0.311	0.426	0.499	0.524	0.499	0.426	0.311	0.164	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.083	0.157	0.215	0.251	0.264	0.251	0.215	0.157	0.083	0.000	0.000	0.090	0.170	0.233	0.273	0.287	0.273	0.233	0.170	0.090	0.000
FINAL CAMBER	↑	0	1/16	1/8	3/16	1/4	1/4	1/4	3/16	1/8	1/16	0	0	1/16	1/8	3/16	1/4	1/4	1/4	3/16	1/8	1/16	0

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

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

SHEET 5 OF 5

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



ASSEMBLED BY : M. G. SHAIKH DATE : 06-18-09
CHECKED BY : D. A. DAVENPORT DATE : 07-23-09
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:	5-18
1			3			TOTAL SHEETS 42
2			4			

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.

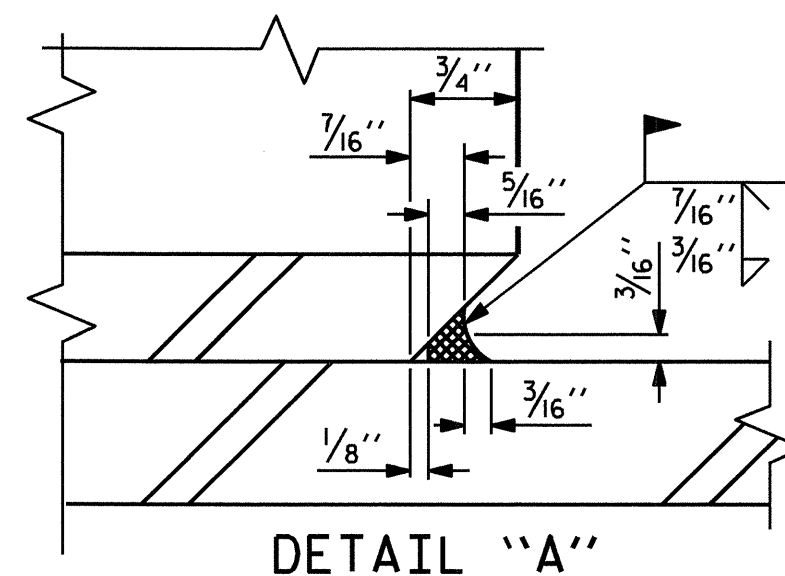
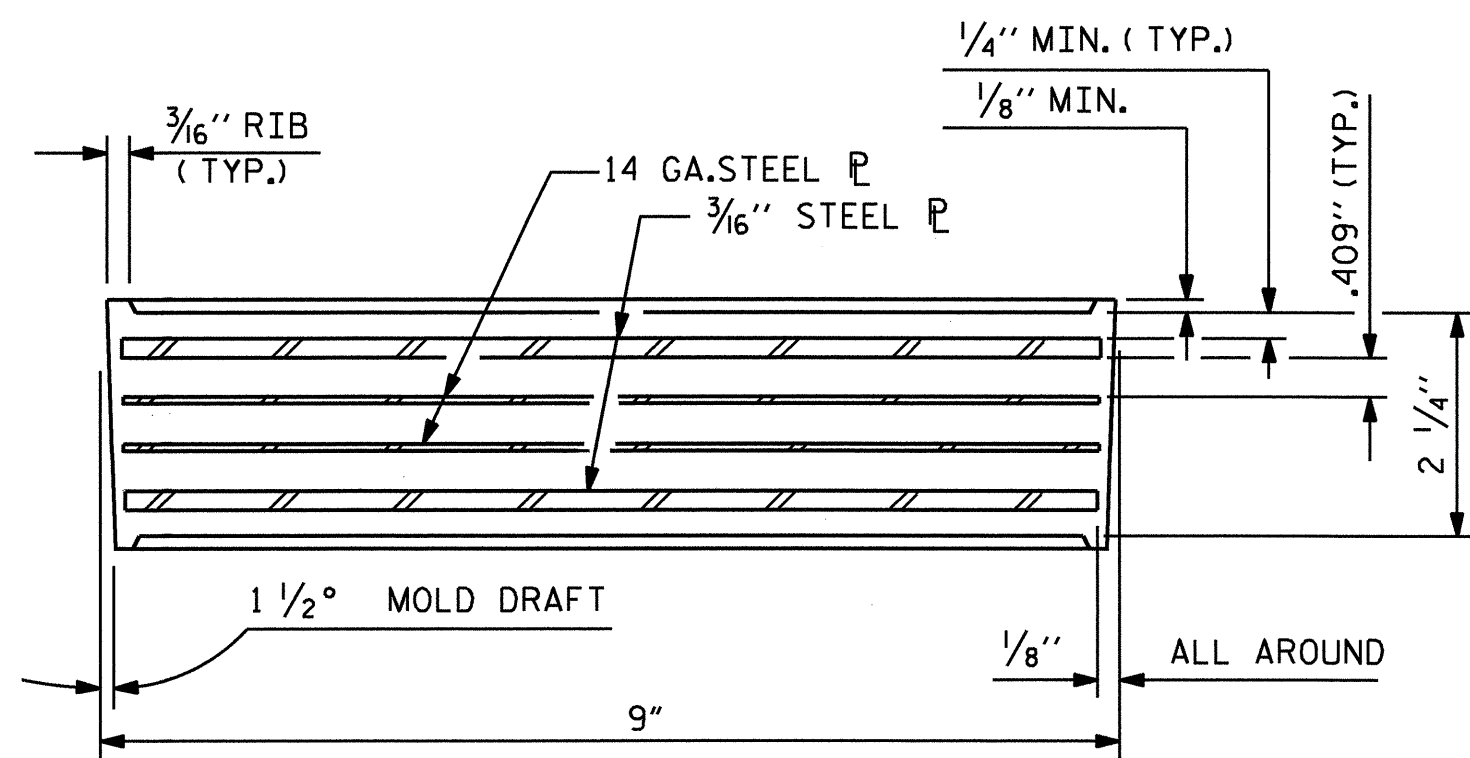
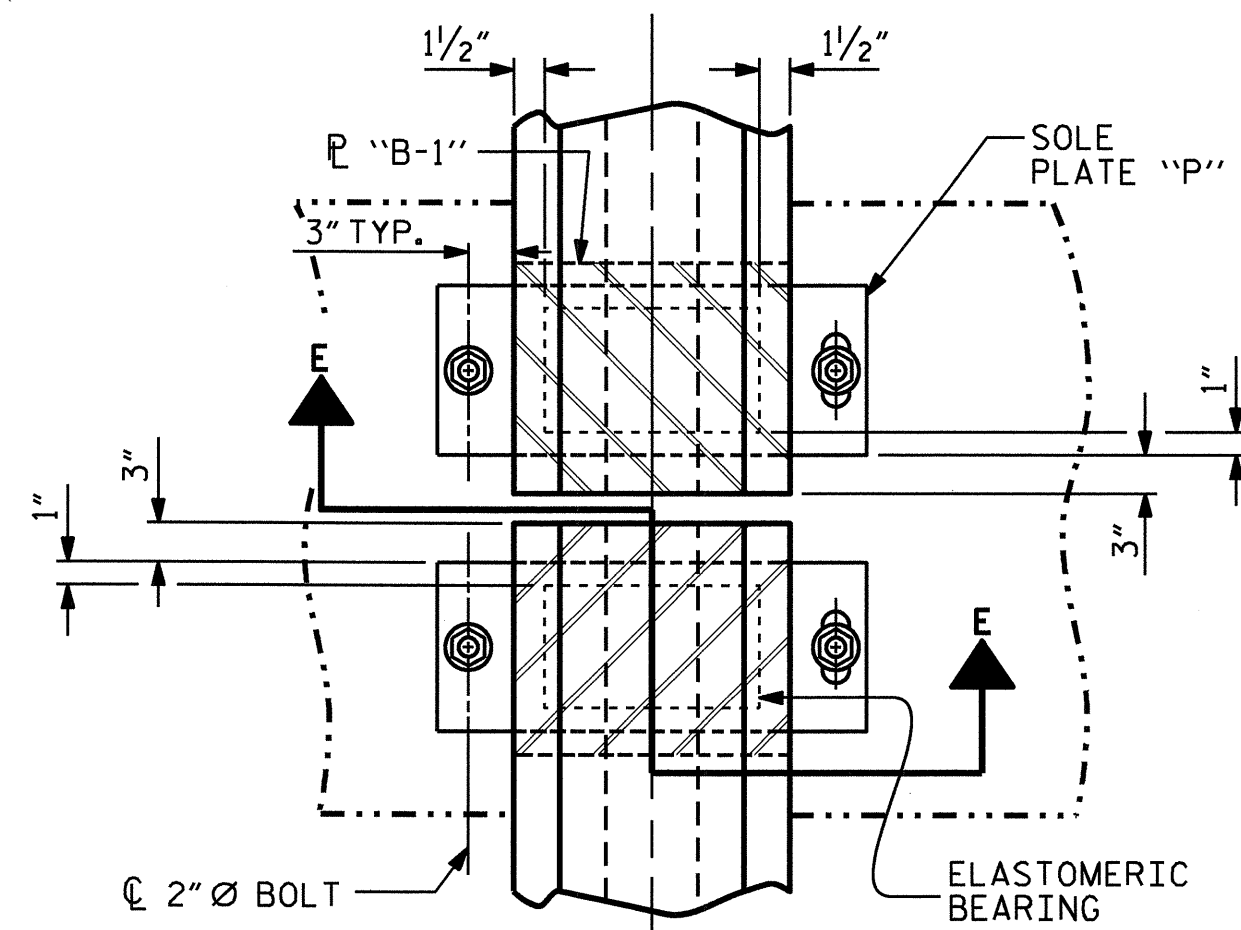
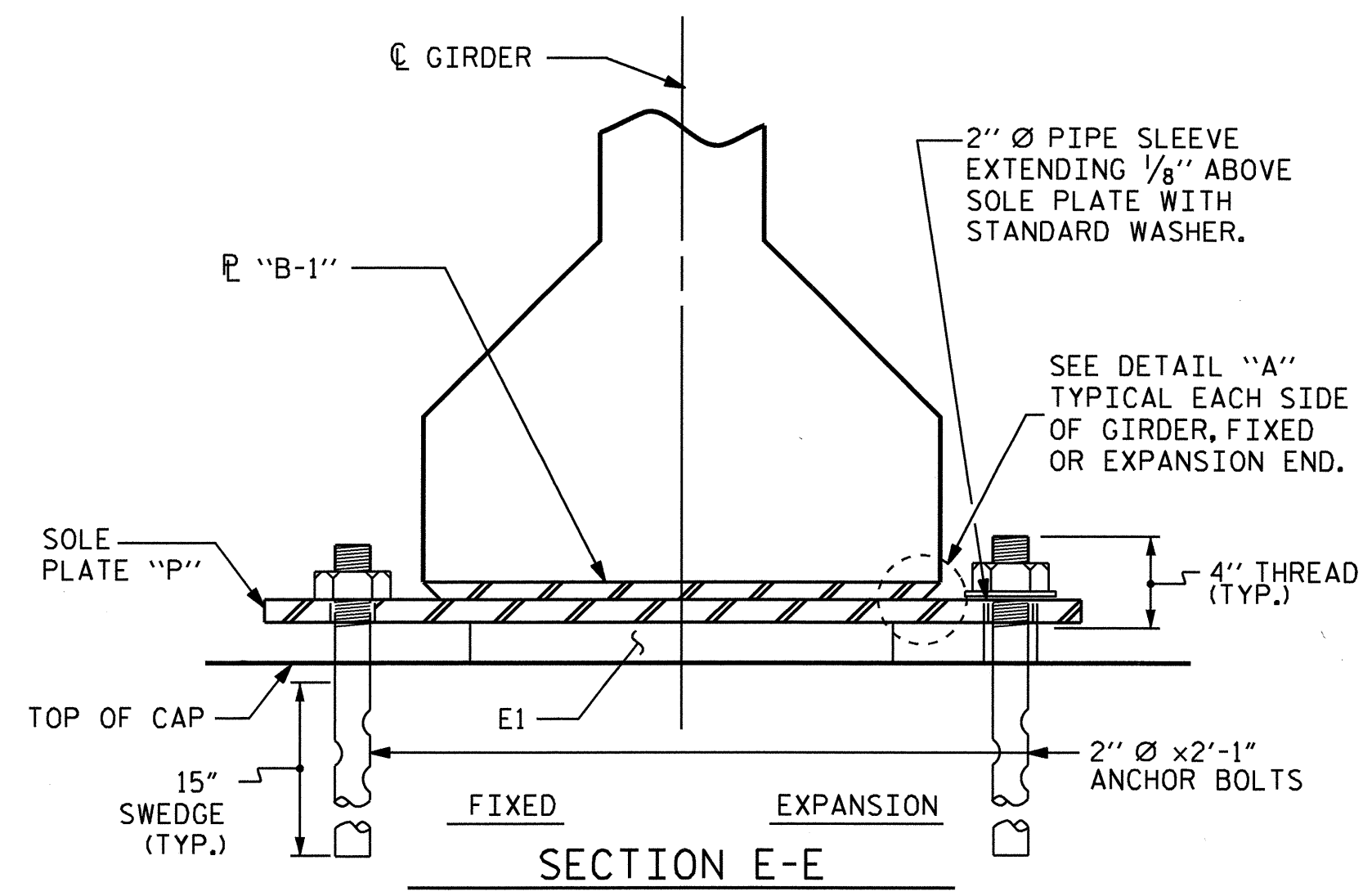
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

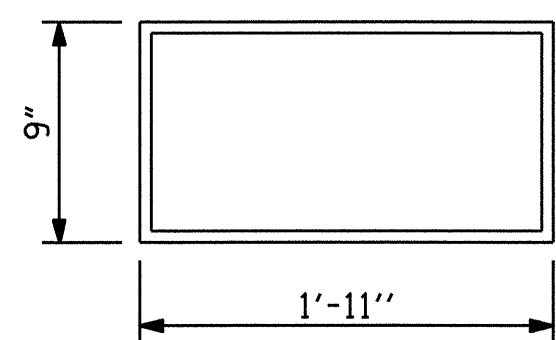
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

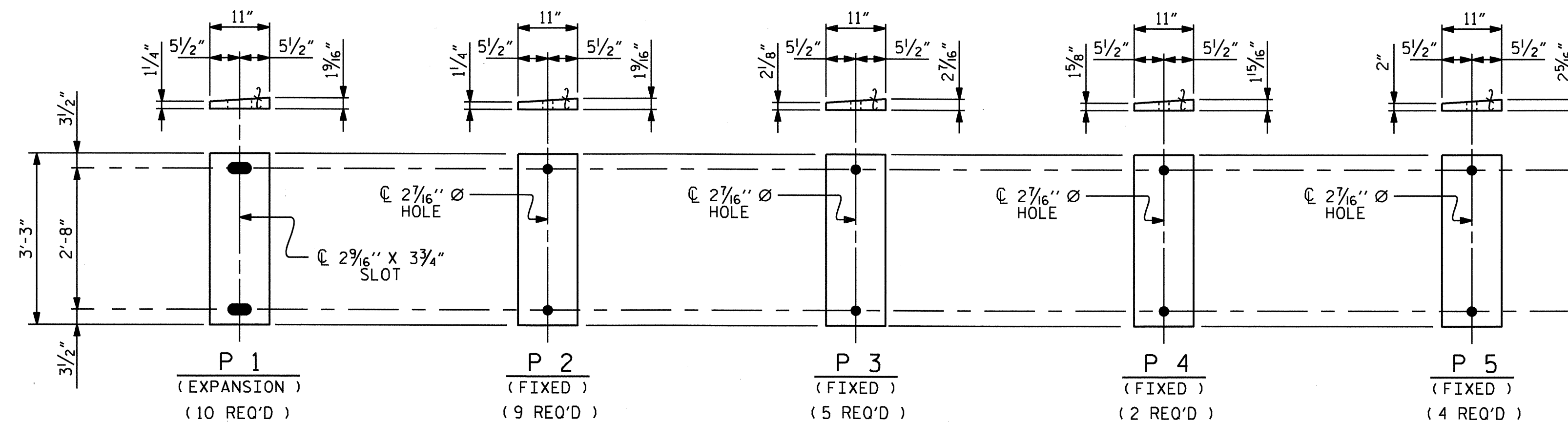
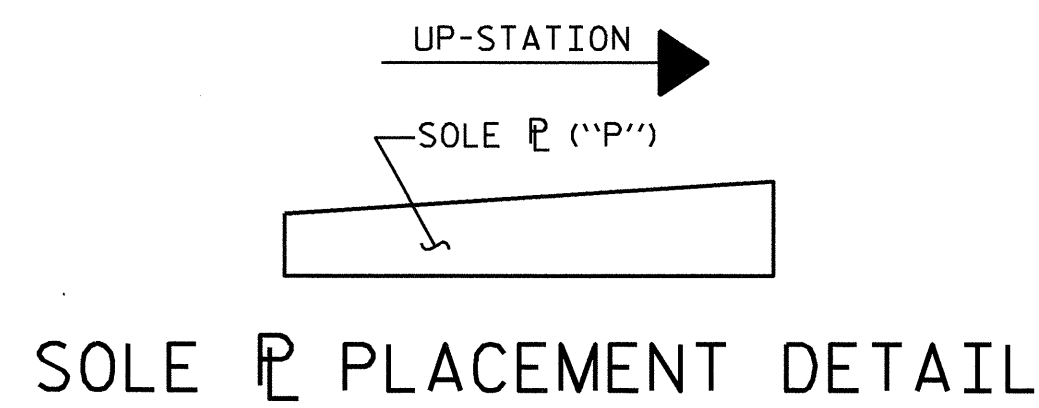
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



— LOAD RATINGS —	
	MAX.D.L.+L.L.
TYPE V	180 K



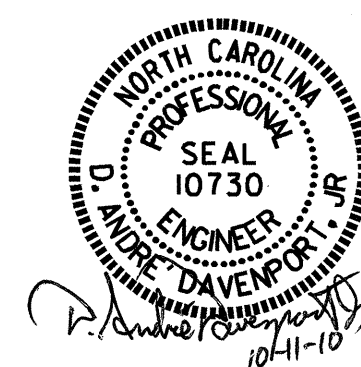
E1 (30 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



SOLE PLATE DETAILS ("P")

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

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



ASSEMBLED BY : M. G. SHAIKH DATE : 06-23-09
CHECKED BY : D. A. DAVENPORT DATE : 07-23-09
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

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

TOTAL SHEETS: 42

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "3 BAR METAL RAIL", SHEET 3 OF 3.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

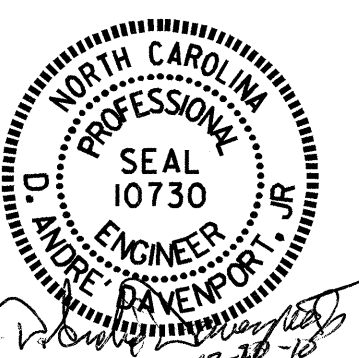
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PAY LENGTH = 348.614 LIN. FT.



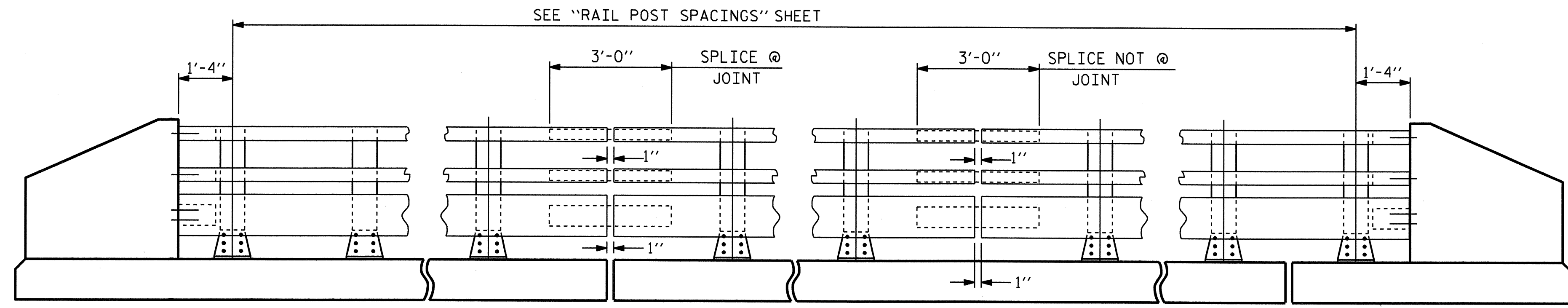
PROJECT NO. **B-4176**
LINCOLN COUNTY
 STATION: **20+07.30 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

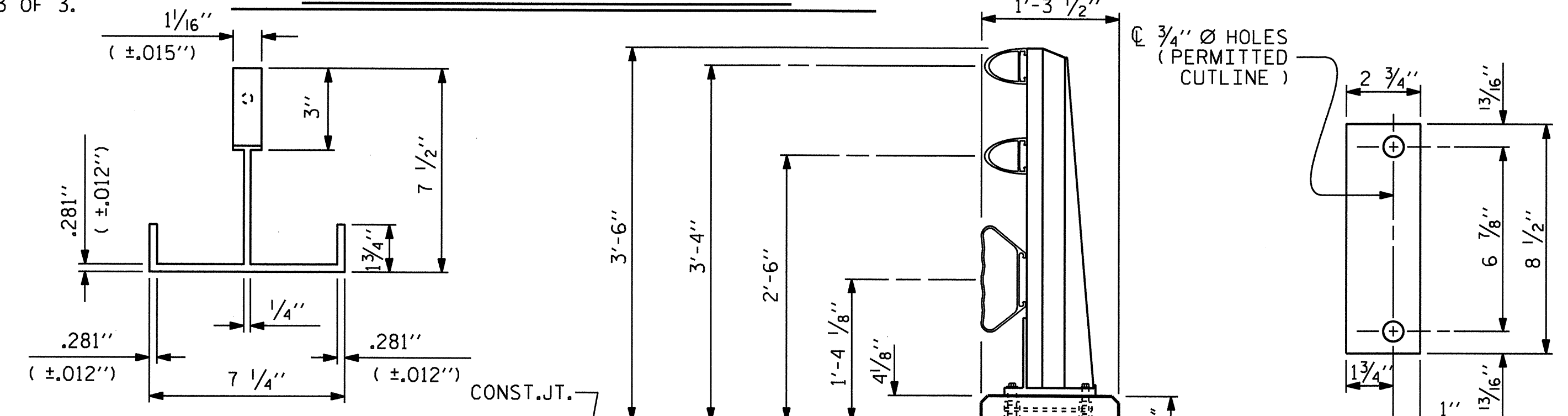
3 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			42



NOTE:
 FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAL RAIL", SHEET 3 OF 3.

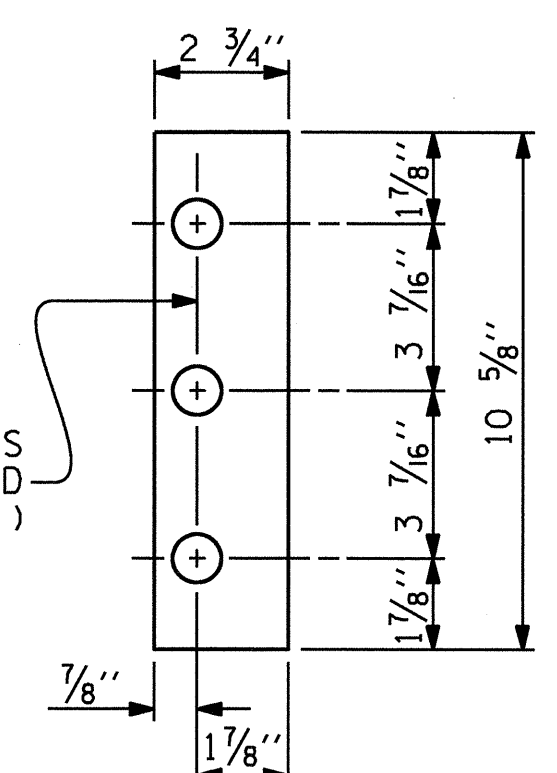
ELEVATION



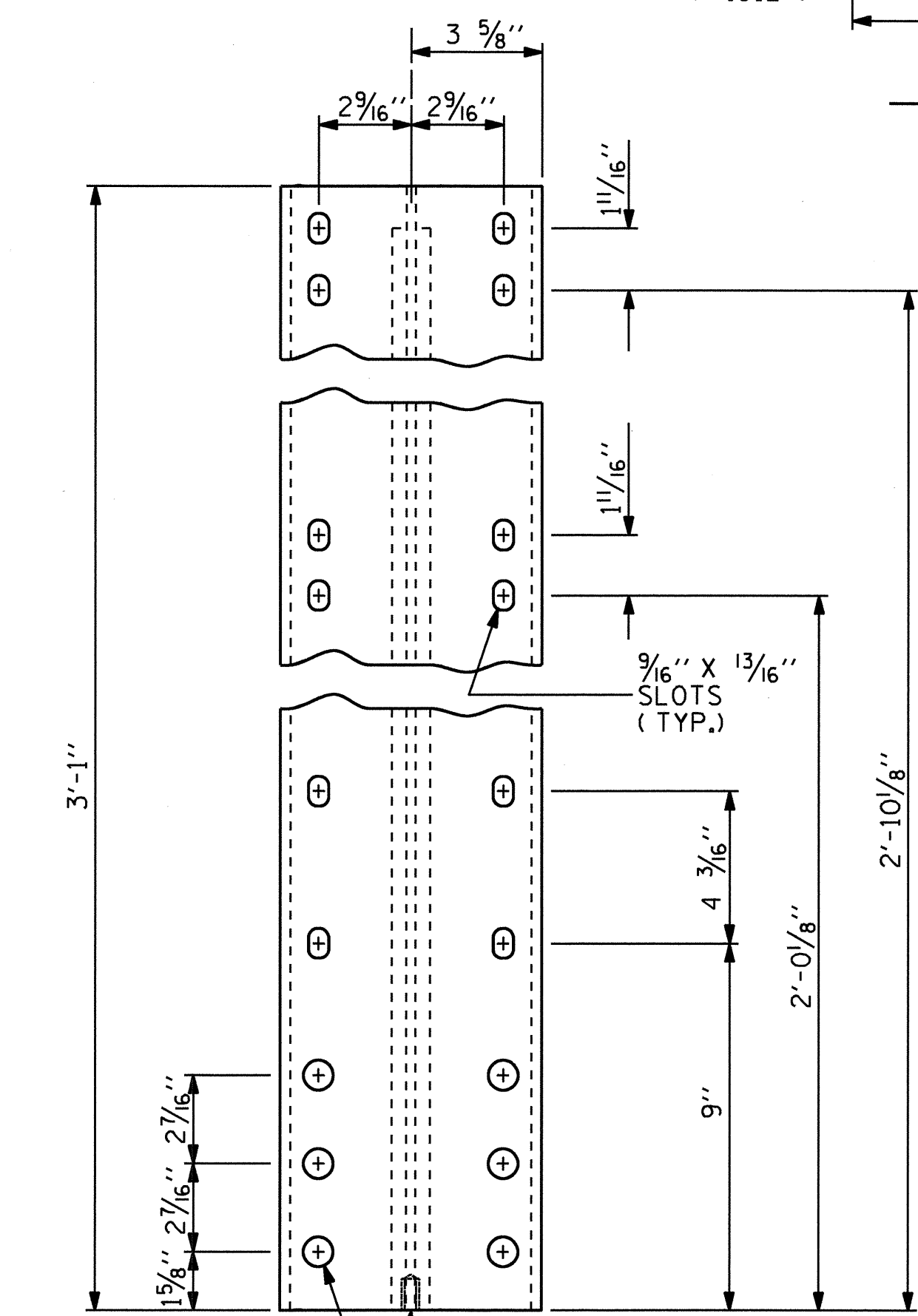
PLAN

SECTION THRU RAIL

REAR PLATE



FRONT PLATE SHIM DETAILS

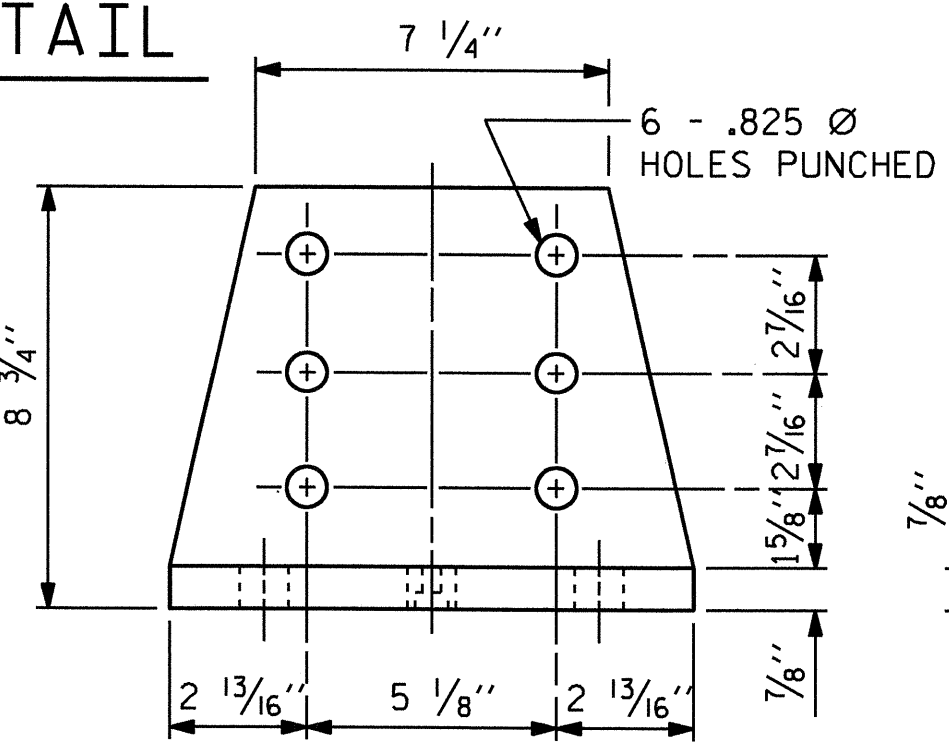
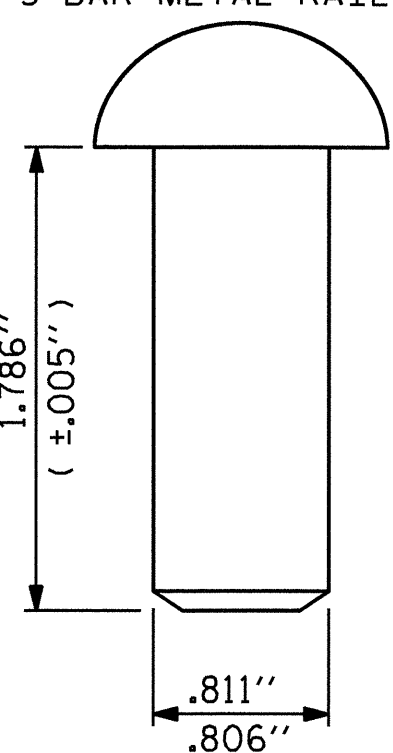


FRONT ELEVATION

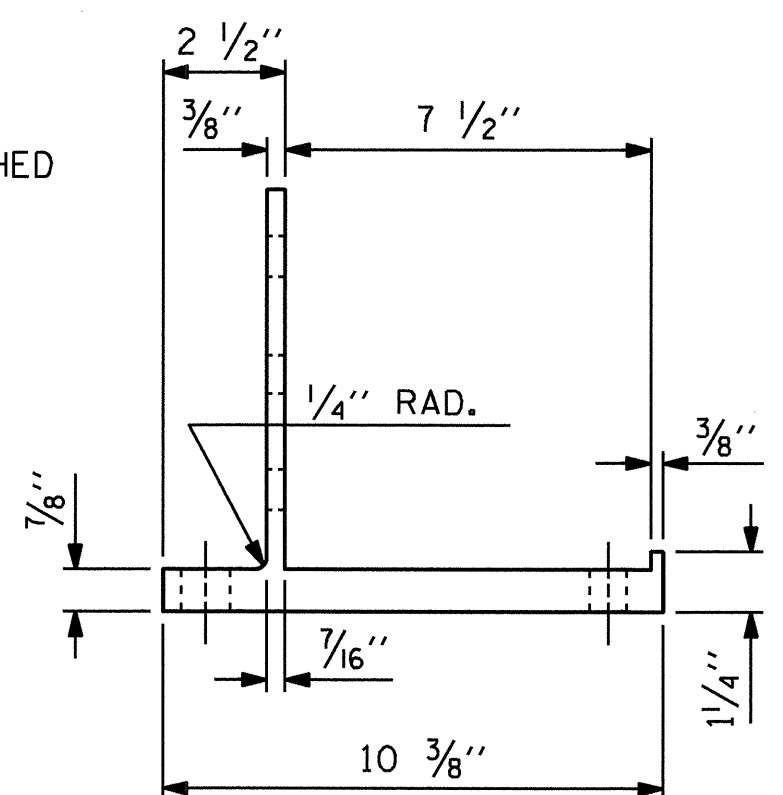
SIDE ELEVATION

DETAILS OF POST

RIVET DETAIL

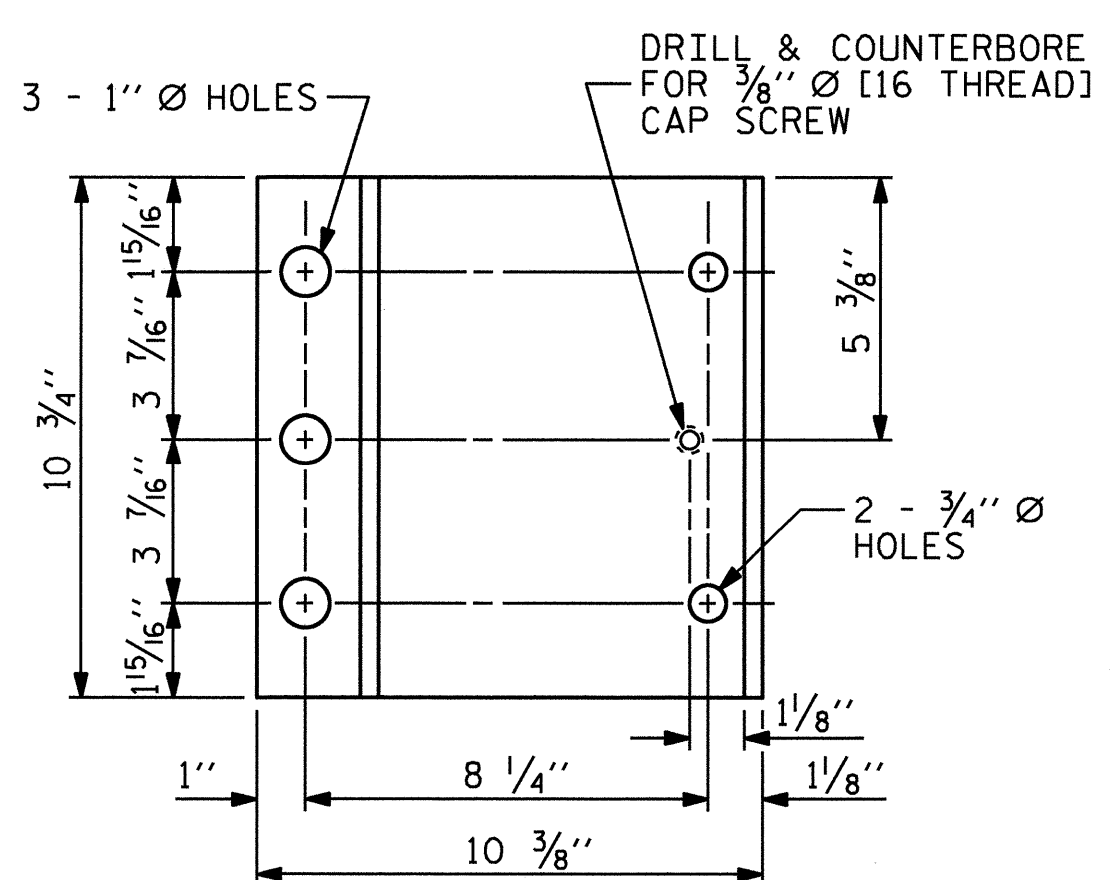


FRONT ELEVATION



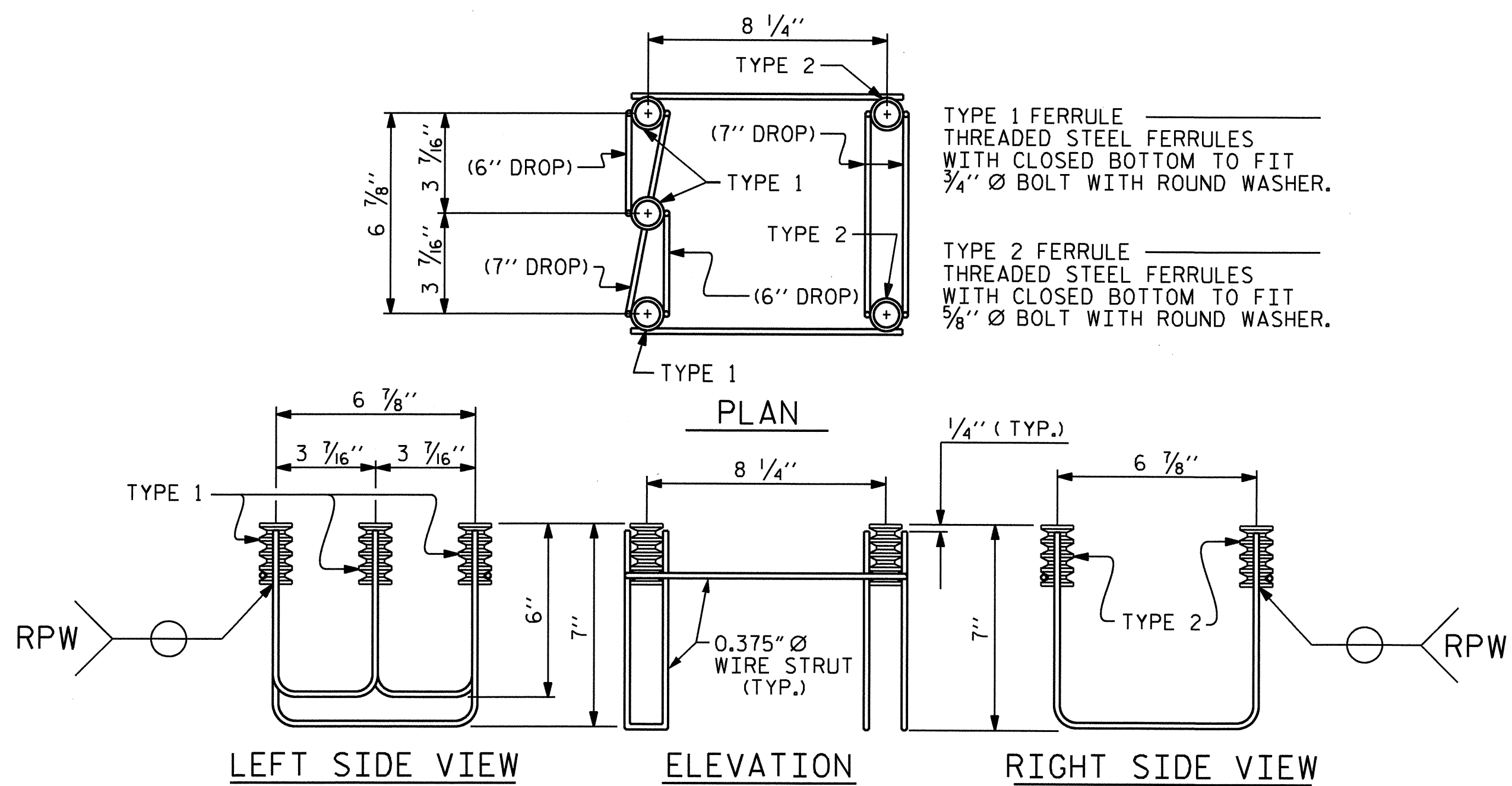
SIDE ELEVATION

POST BASE DETAILS

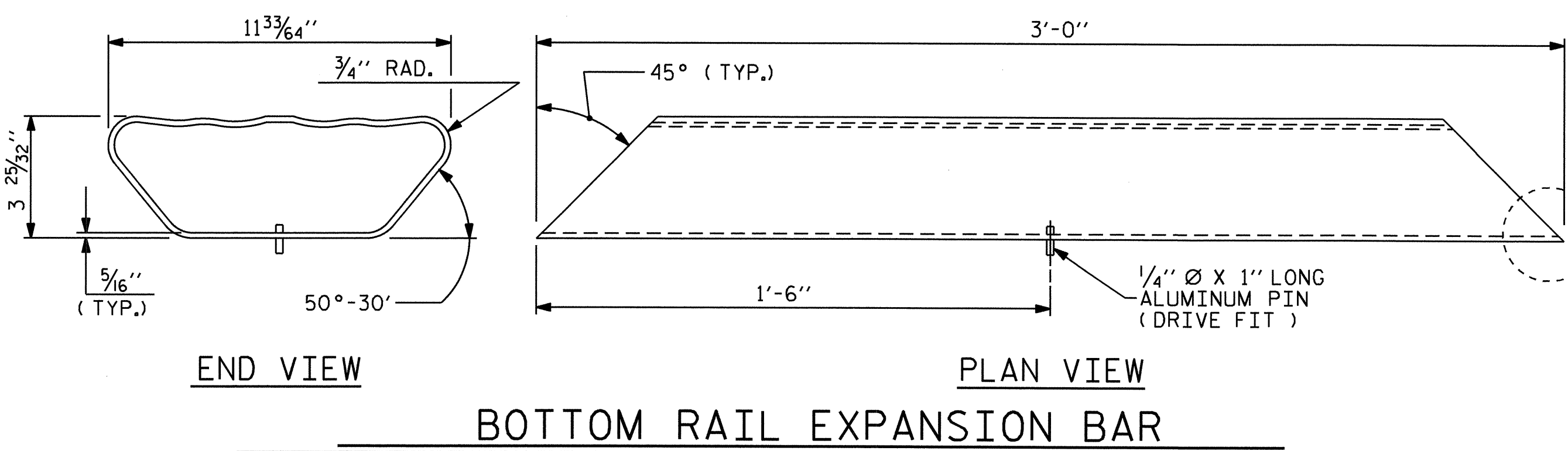


PLAN

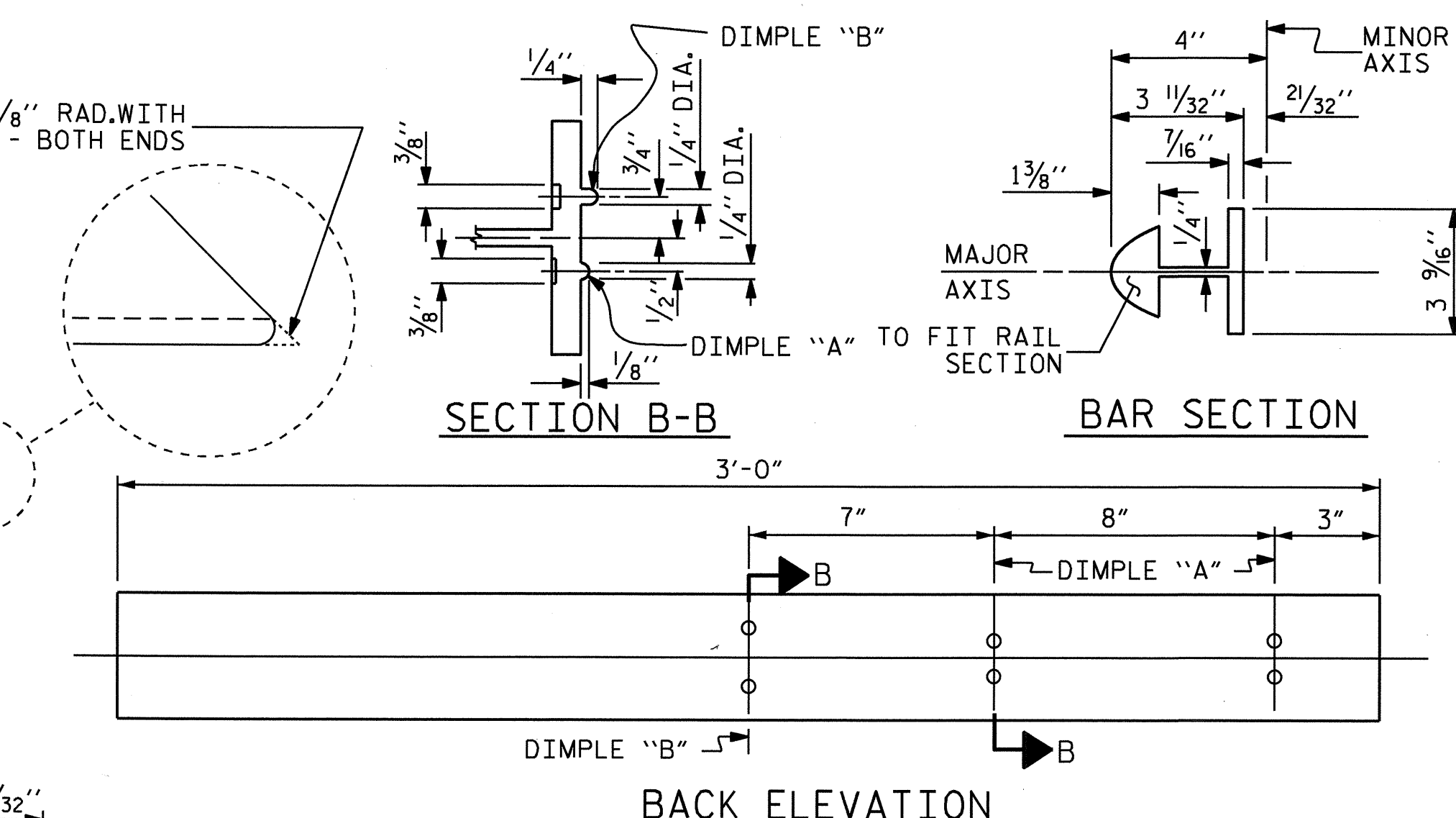
ASSEMBLED BY : M. G. SHAIKH DATE :06-23-06
 CHECKED BY : D. A. DAVENPORT DATE :07-23-09
 DRAWN BY : JMB 1/88 REV. 10/17/00 RWW/LES
 CHECKED BY : GGH 1/88 REV. 5/7/03 RWW/JTE
 REV. 5/1/06 TLA/GM



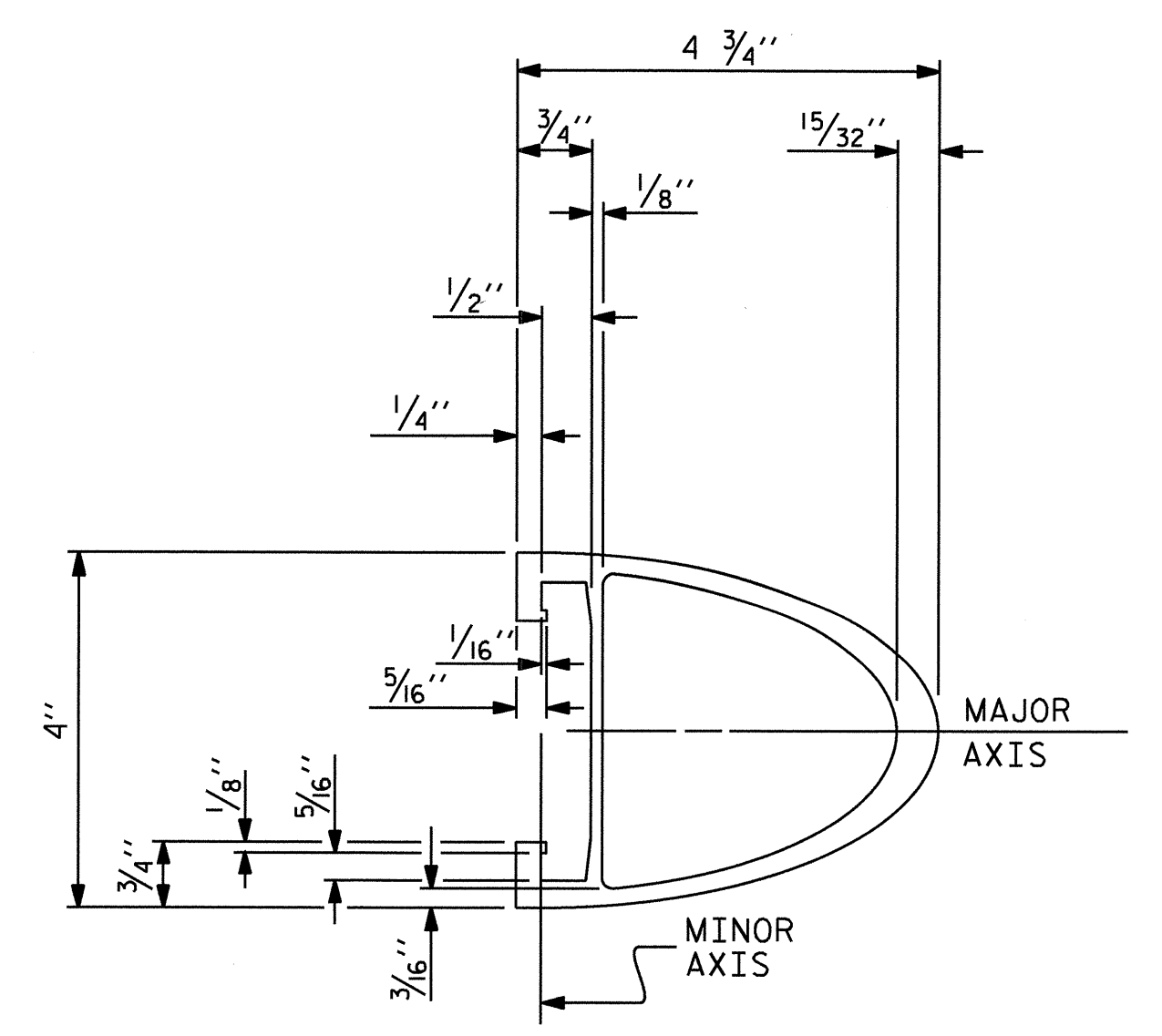
5-BOLT METAL RAIL ANCHOR ASSEMBLY
(60 ASSEMBLIES REQUIRED)



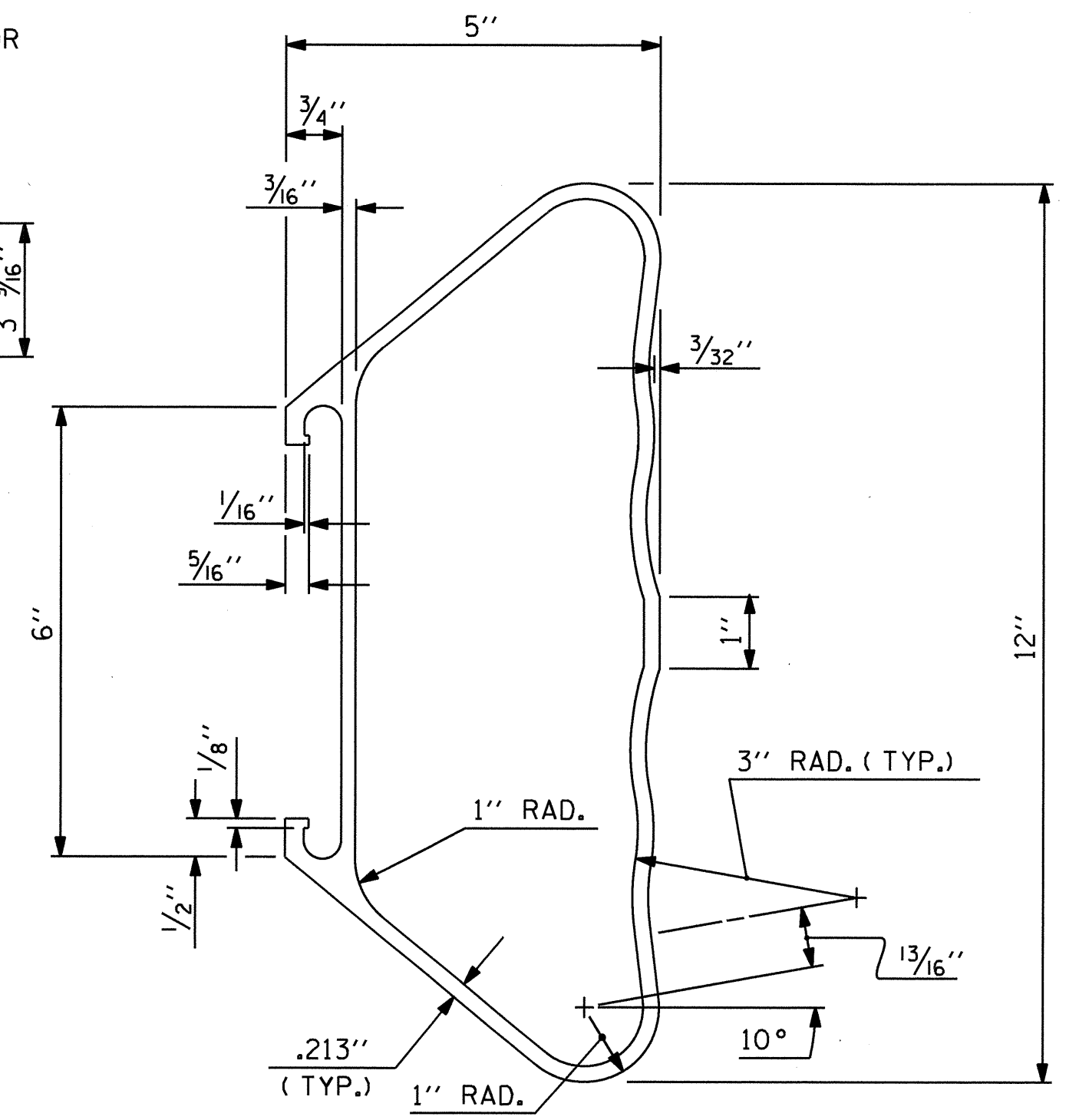
BOTTOM RAIL EXPANSION BAR



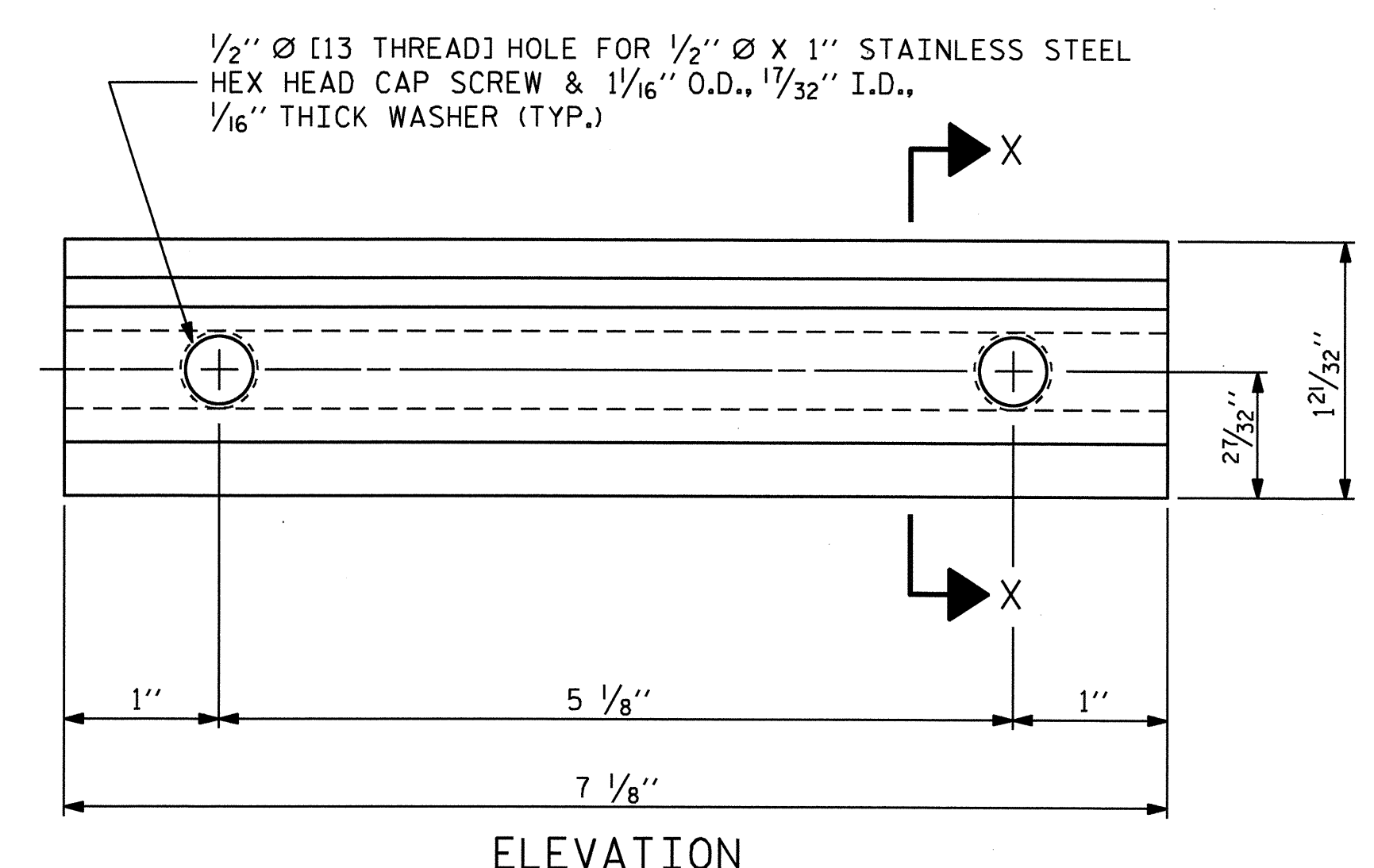
TOP & MIDDLE RAIL EXPANSION BAR



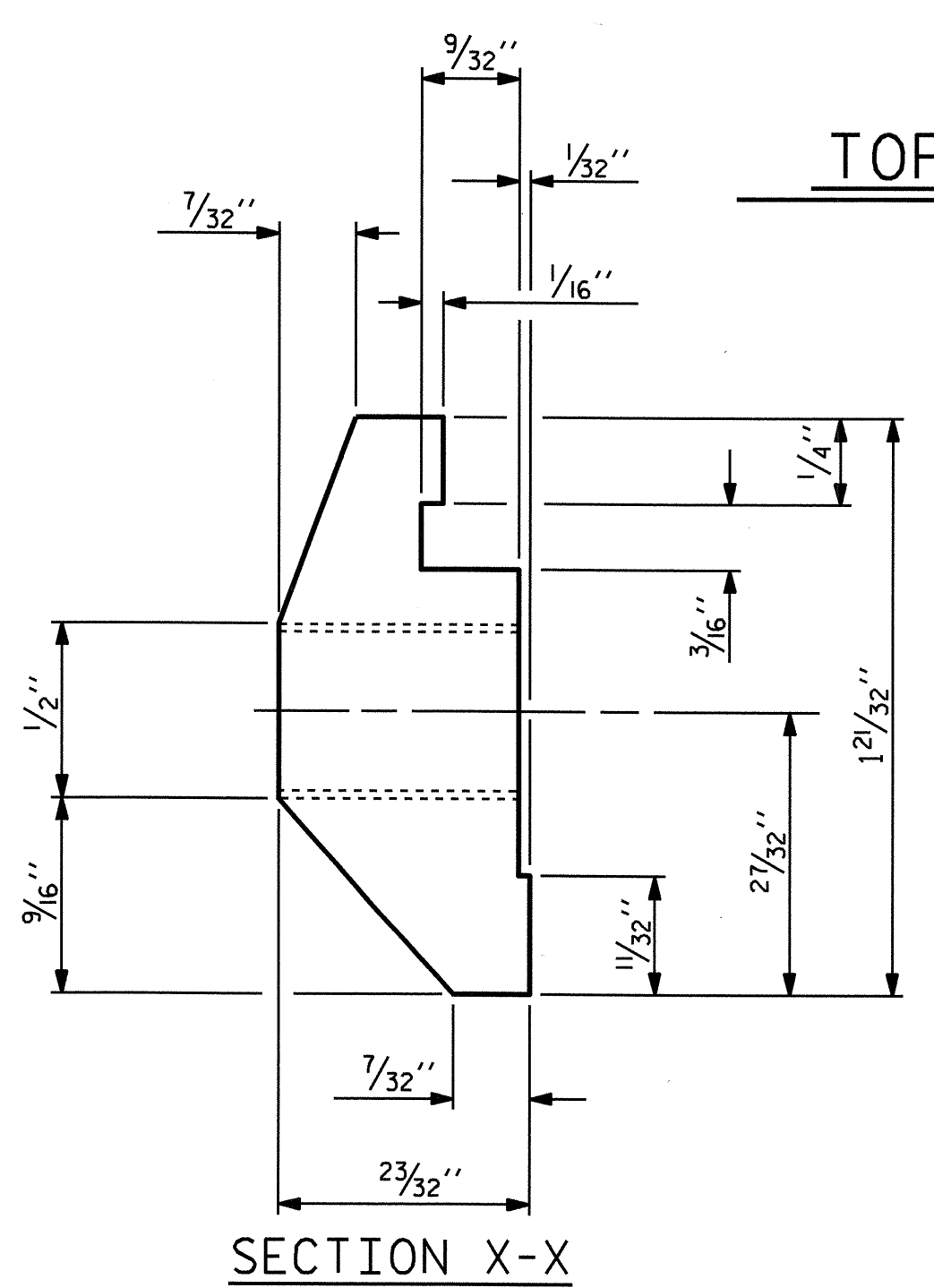
TOP & MIDDLE RAIL SECTION



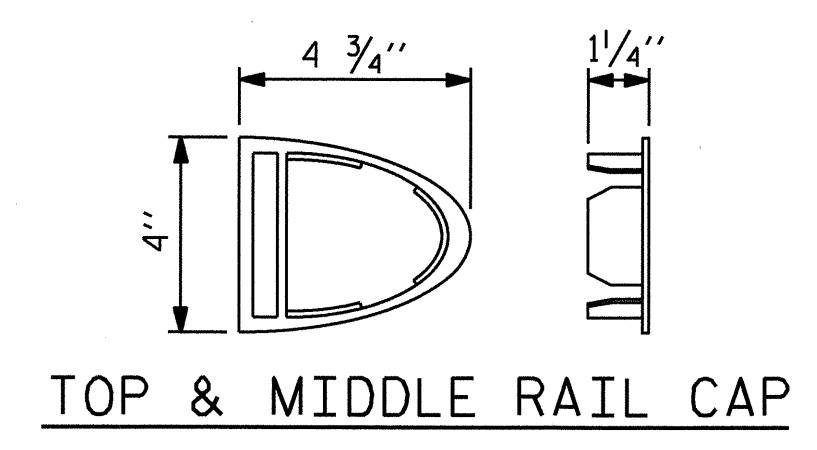
BOTTOM RAIL SECTION



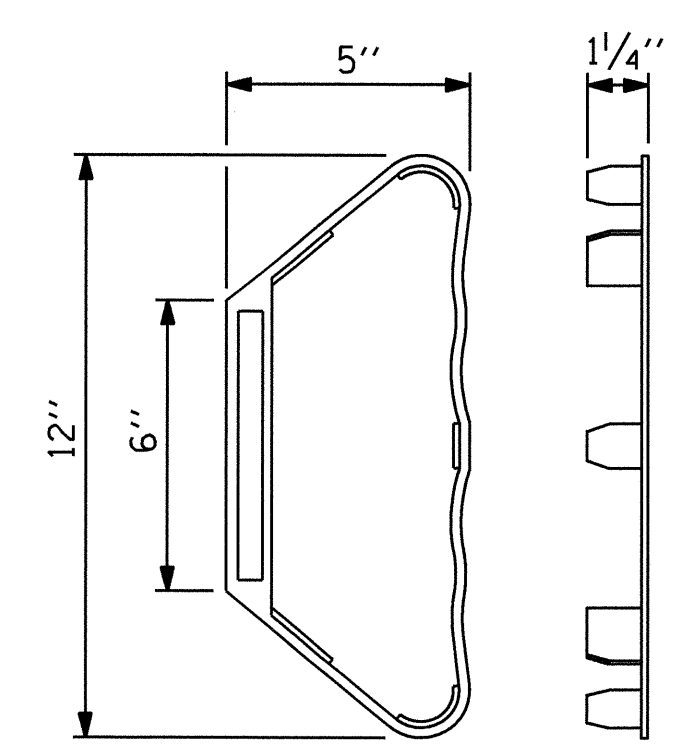
CLAMP BAR DETAIL
(6 REQUIRED PER POST)



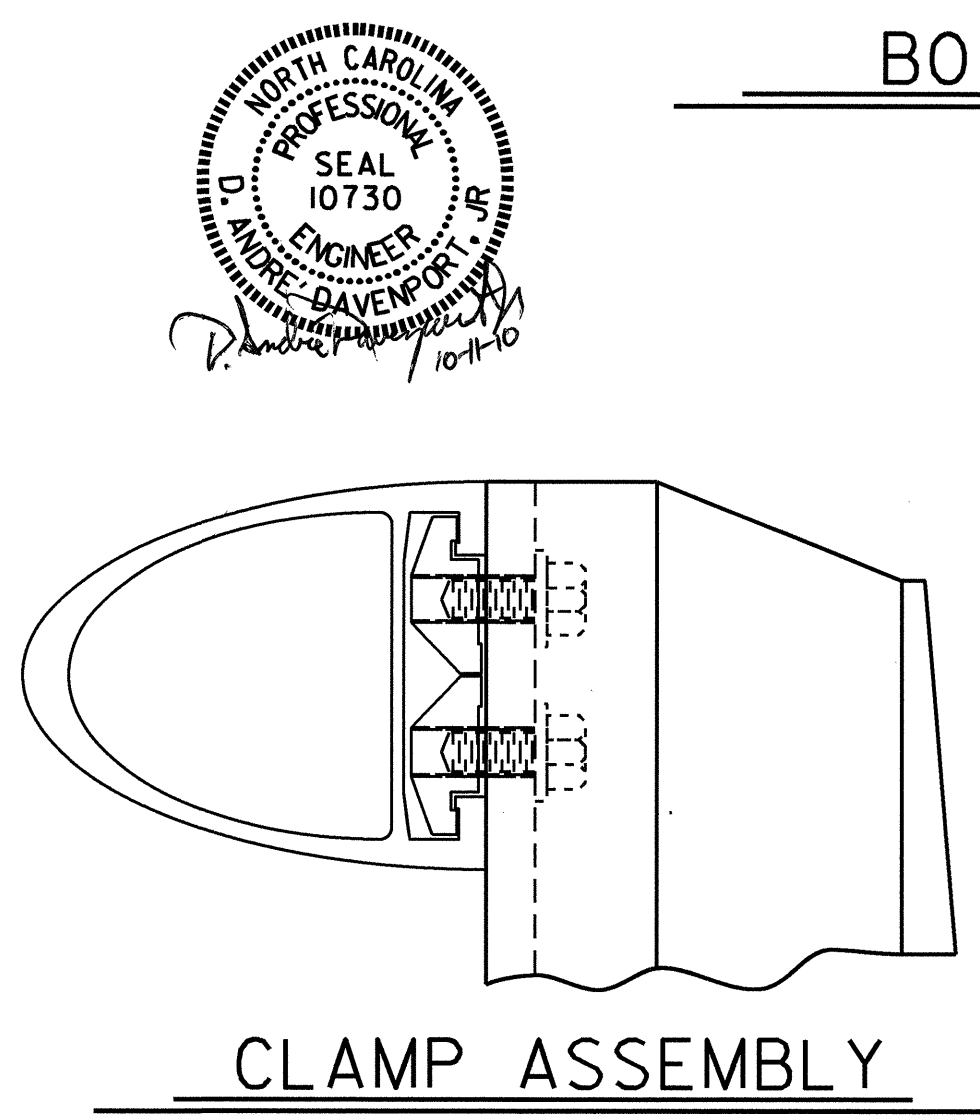
SECTION X-X



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP

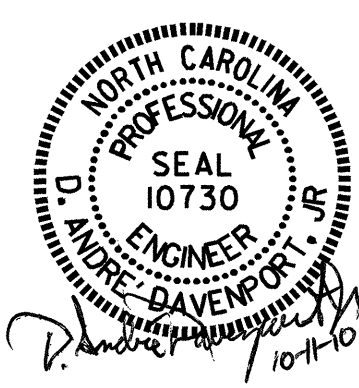


CLAMP ASSEMBLY

NOTES
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR 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 2" FOR 3/4" FERRULES AND 1 1/4" FOR 5/8" FERRULES.
- 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.
- 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.
- 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.
- THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- 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.
- BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-21
					TOTAL SHEETS 42

ASSEMBLED BY : M. G. SHAIKH DATE : 06-23-06
CHECKED BY : D. A. DAVENPORT DATE : 07-23-09
DRAWN BY : JMB 1/88 REV. 7/10/01 RWW/LES
CHECKED BY : GGH 1/88 REV. 5/17/03 RWW/JTE
REV. 5/1/06 TLA/GM

NOTES

METAL RAIL TO END POST CONNECTION

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

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS, SEE "3 BAR METAL RAIL", SHEET 3 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.

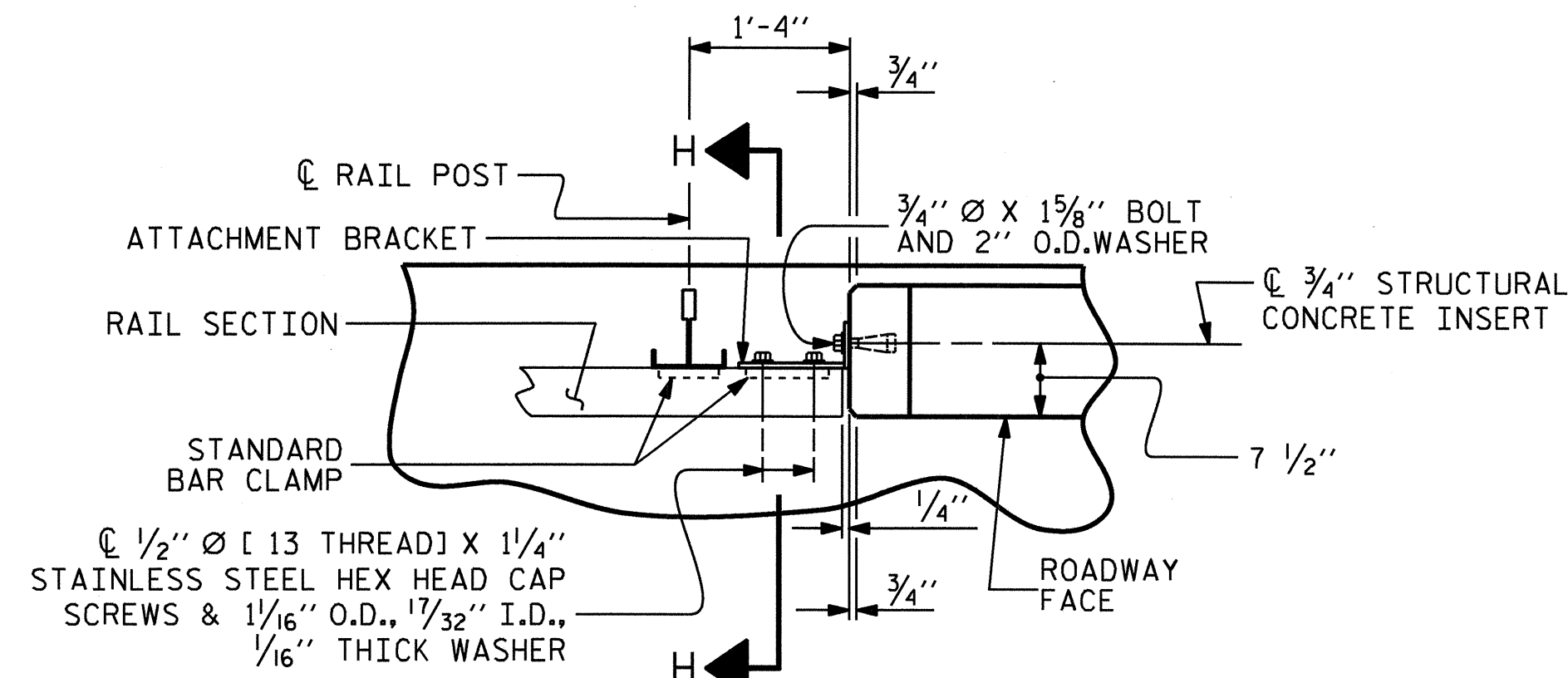
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 1/8" 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

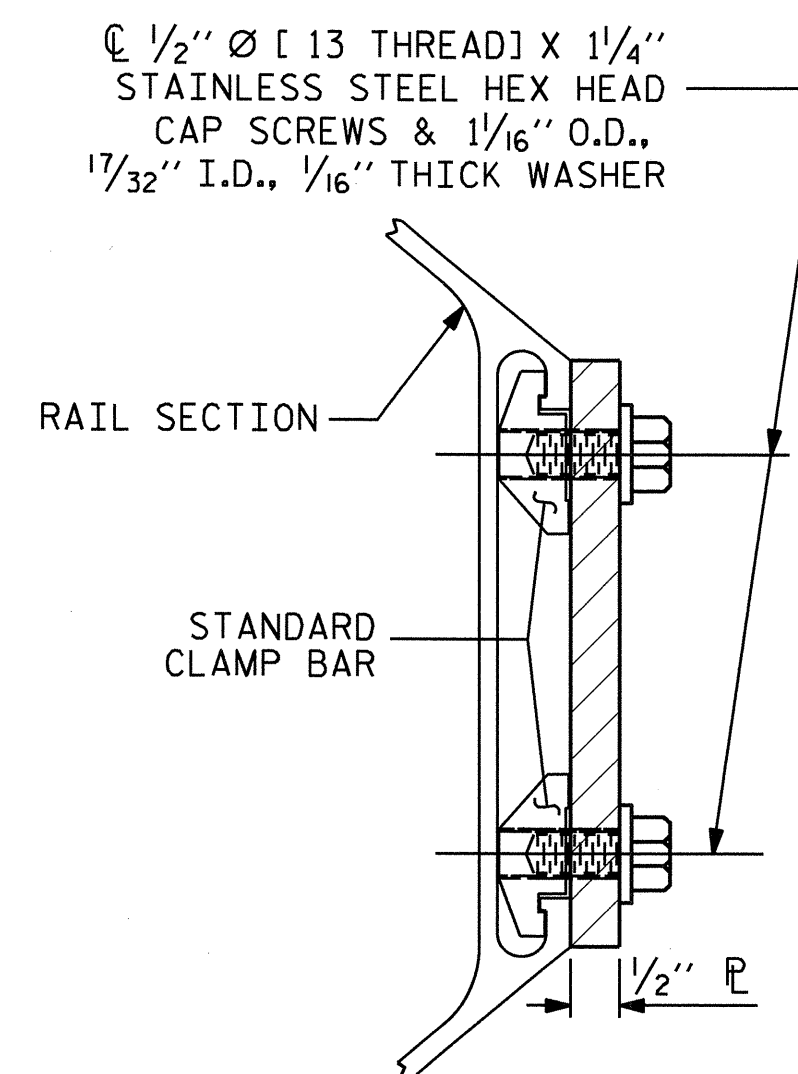
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

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



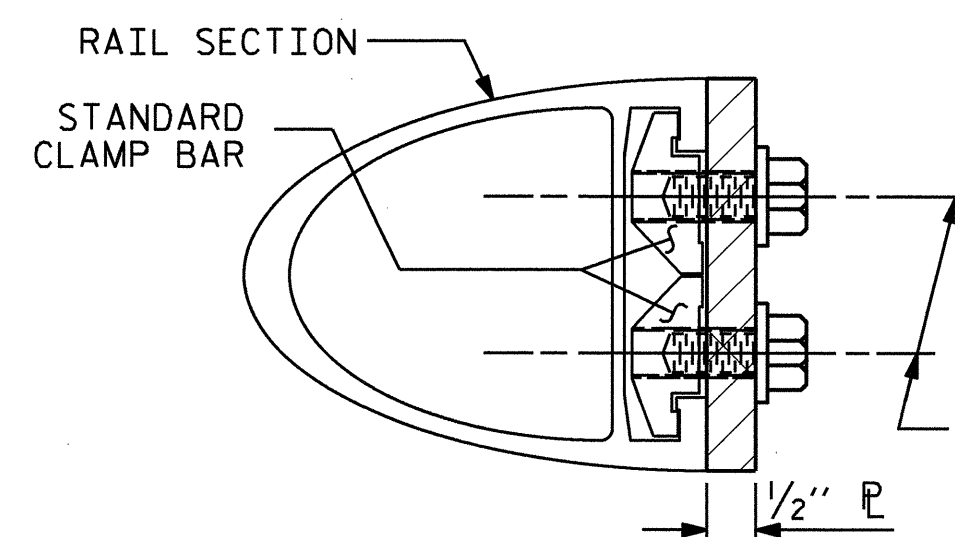
PLAN OF RAIL AND END POST

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



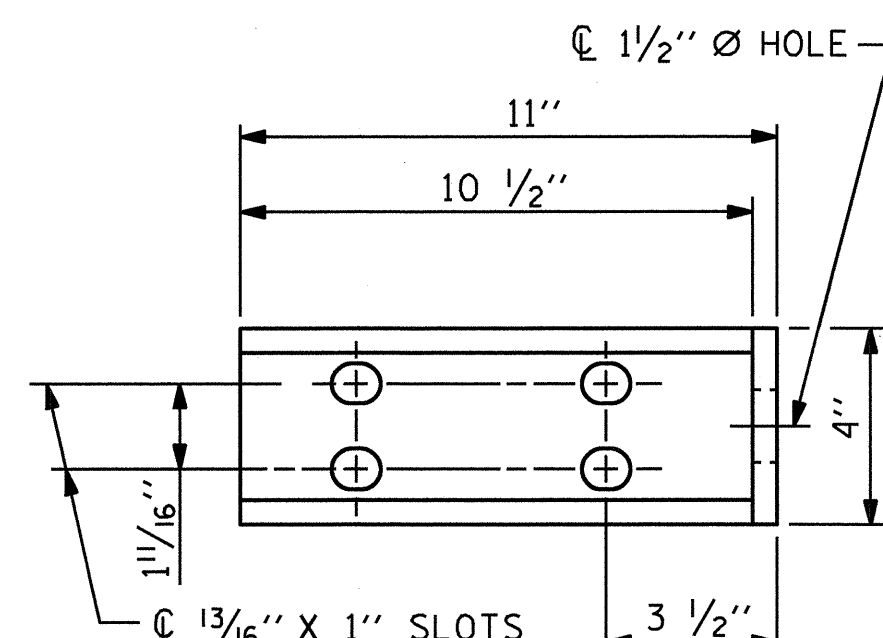
SECTION H-H

(FOR BOTTOM RAIL)

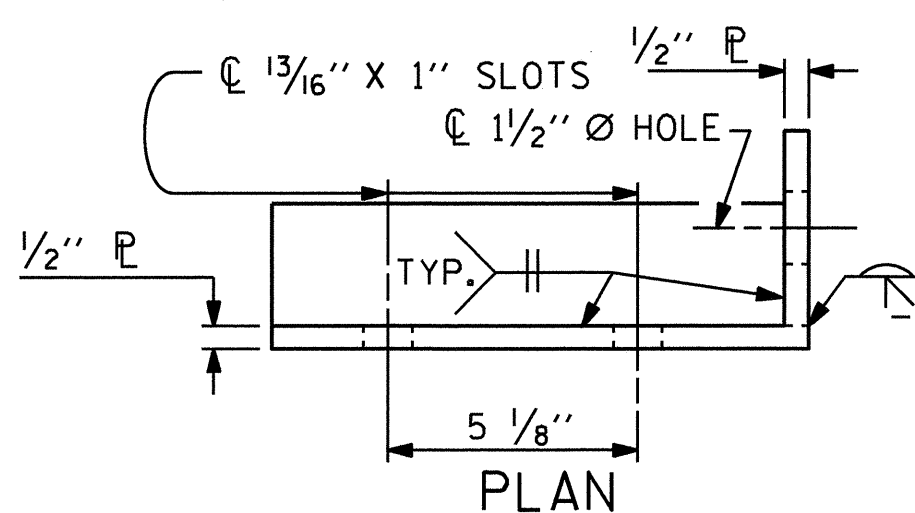


SECTION H-H

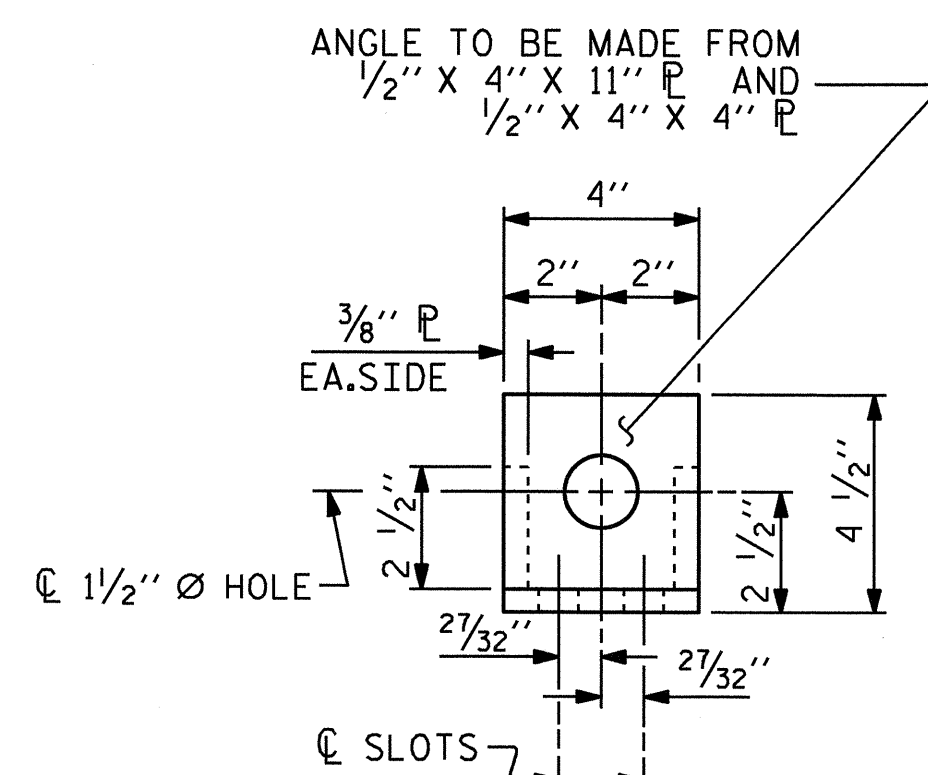
(FOR TOP & MIDDLE RAIL)



ELEVATION

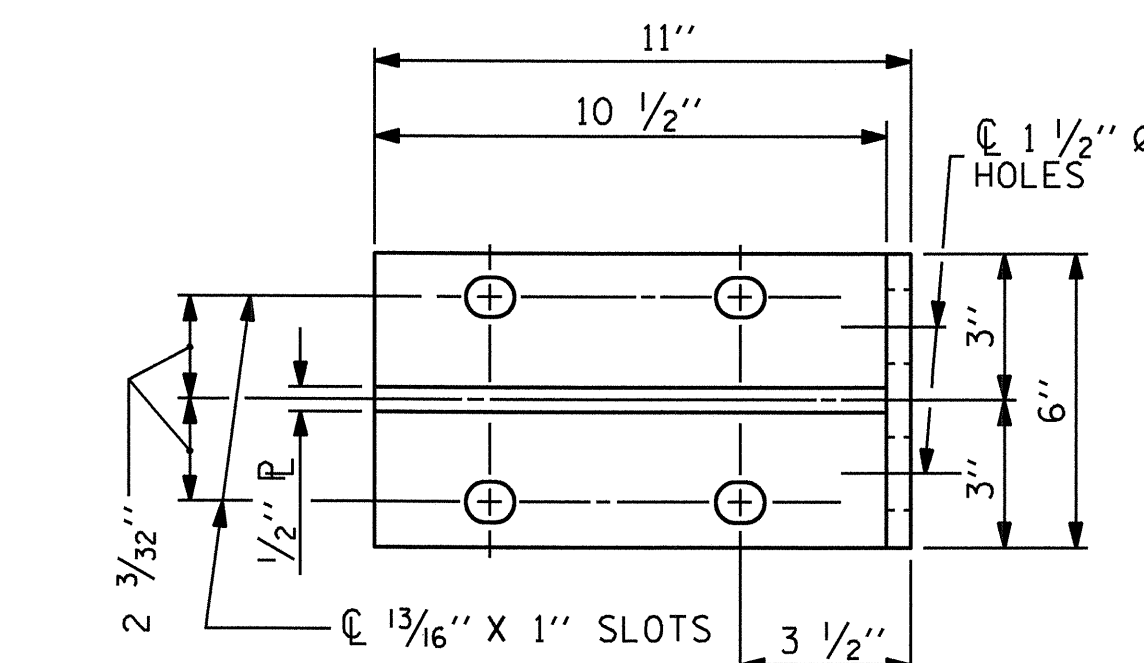


PLAN

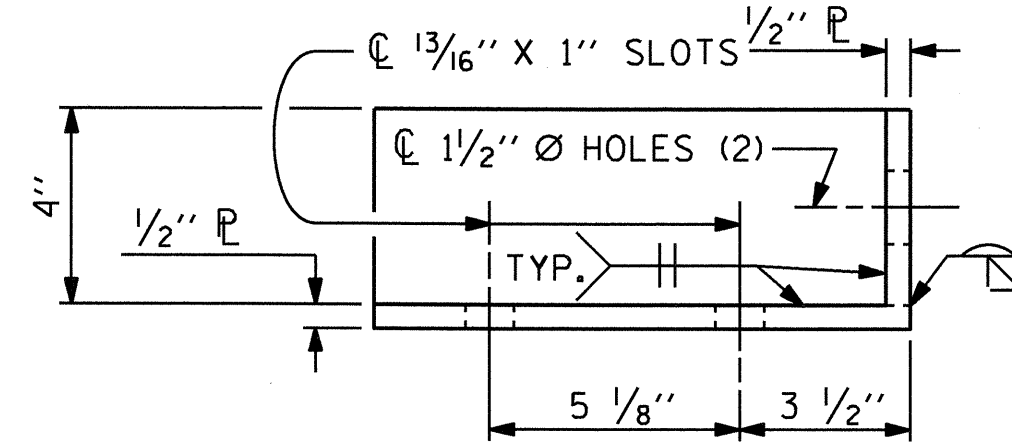


END VIEW

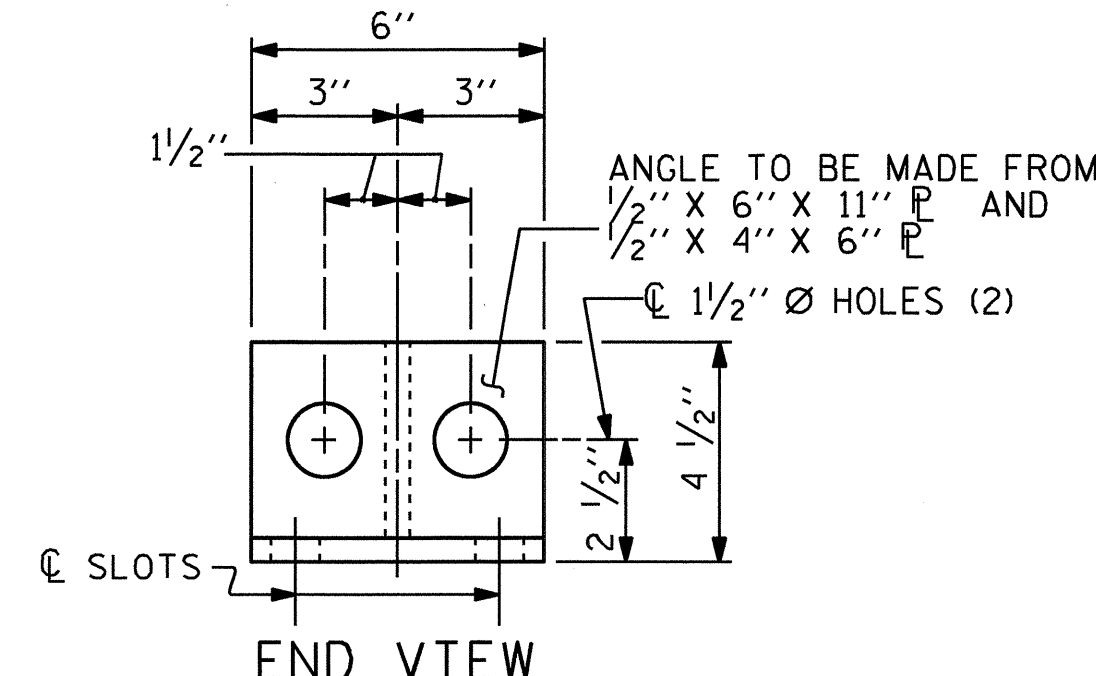
(FIX. AND EXP.)



ELEVATION



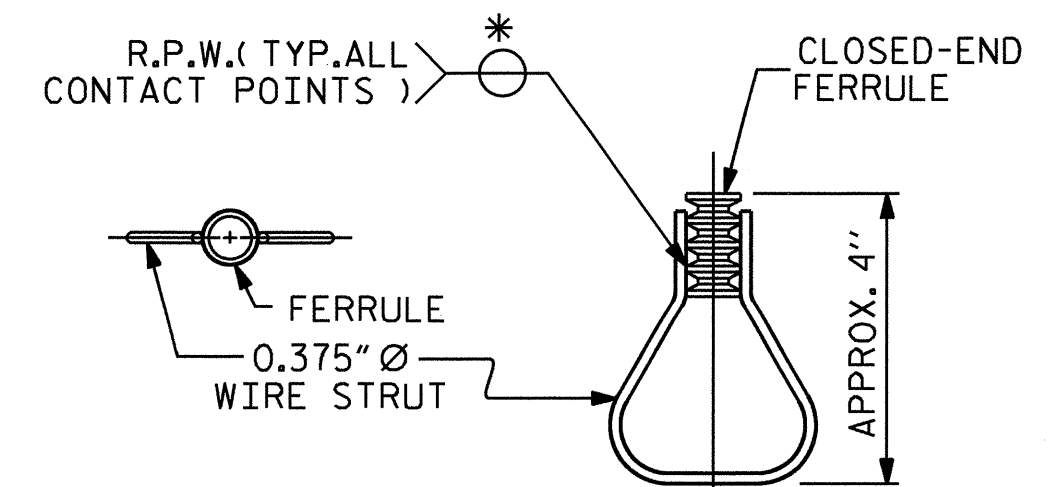
PLAN



END VIEW

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



PLAN ELEVATION

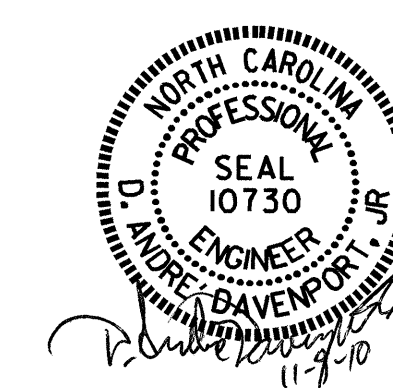
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 3 OF 3

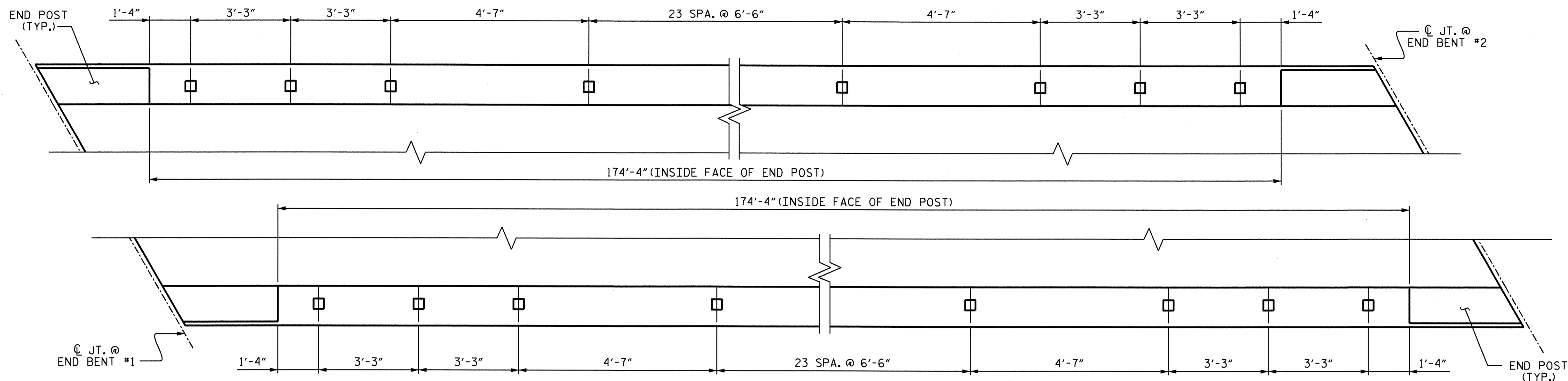
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3 BAR METAL RAIL



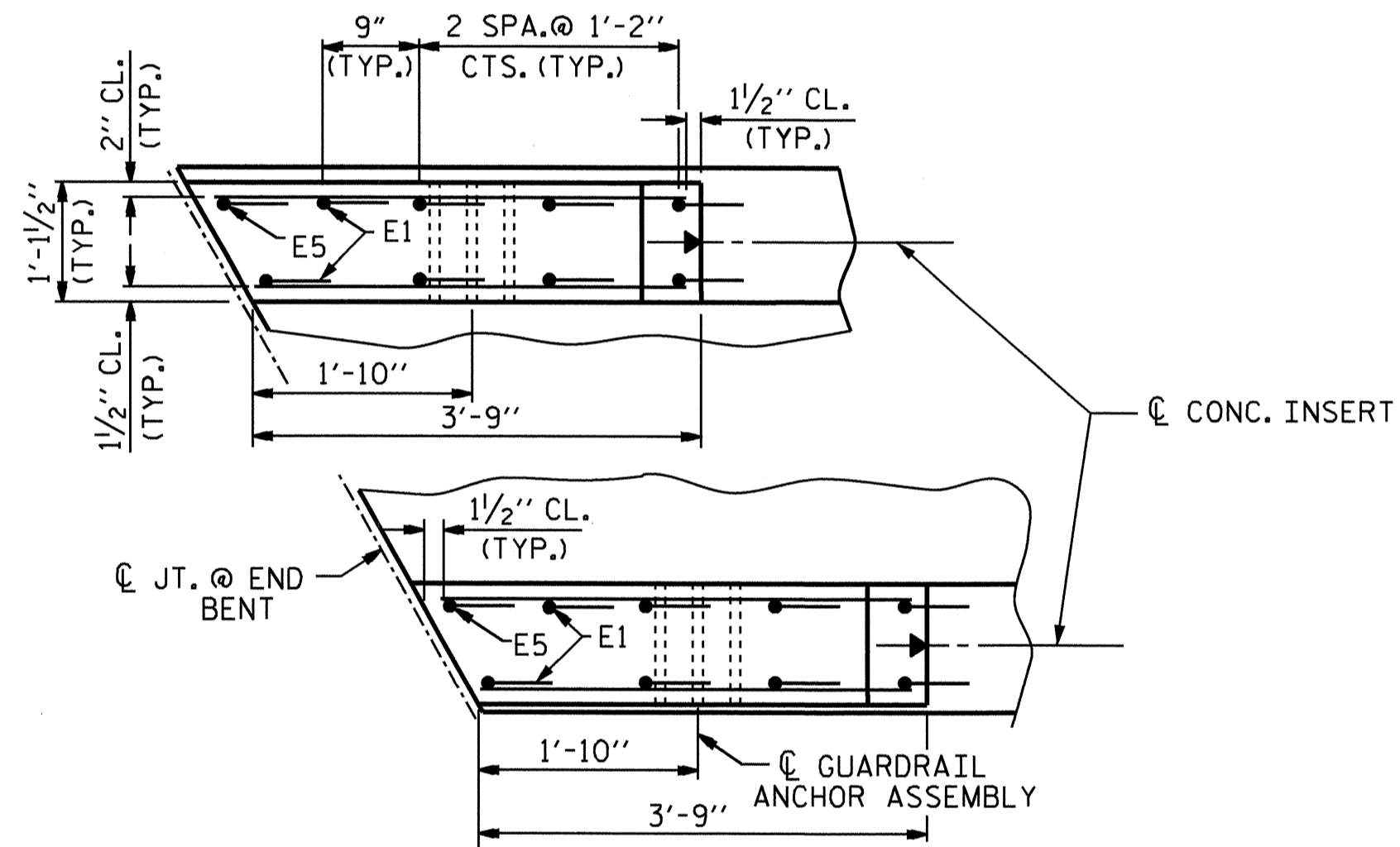
ASSEMBLED BY : M. G. SHAIKH	DATE :06-23-06
CHECKED BY : D. A. DAVENPORT	DATE :07-23-09
DRAWN BY : JMB	1/88
CHECKED BY : GGH	1/88
REV. 7/10/01	RWW/LES
REV. 5/7/03	RWW/JTE
REV. 5/1/06	TLA/GM

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

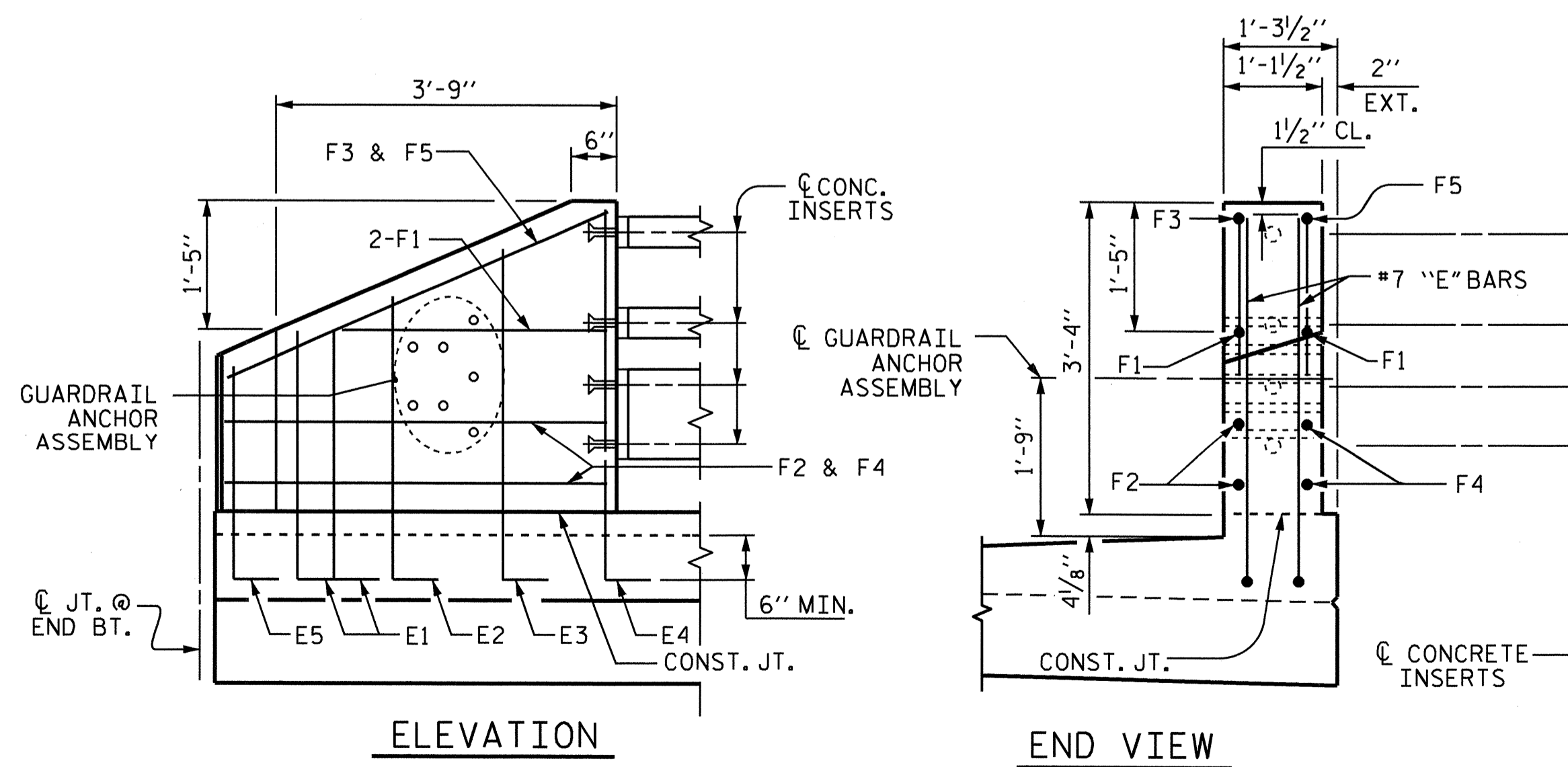
S-22
TOTAL SHEETS 42



PLAN OF RAIL POST SPACING



PLAN



ELEVATION

END VIEW

END POST DETAILS

NOTE
FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "3 BAR METAL RAIL" SHEETS.

BILL FOR ONE END POST

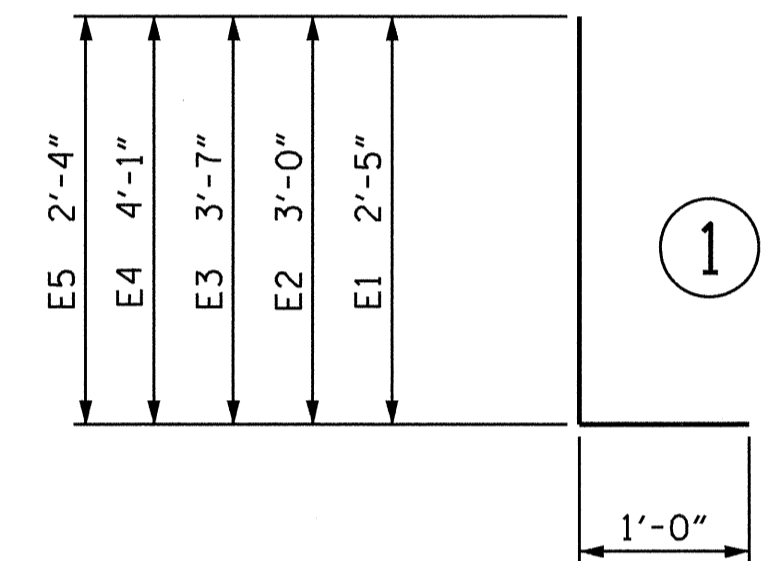
(4 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	2	#7	1	3'-5"	14
*E2	2	#7	1	4'-0"	16
*E3	2	#7	1	4'-7"	19
*E4	2	#7	1	5'-1"	21
*E5	1	#7	1	3'-4"	7
*F1	2	#6	STR	3'-2"	10
*F2	2	#6	STR	4'-0"	12
*F3	1	#6	STR	4'-5"	7
*F4	2	#6	STR	3'-5"	10
*F5	1	#6	STR	3'-8"	6

*EPOXY COATED REINFORCING STEEL 122

CLASS AA CONCRETE 0.5 CY

BAR TYPE

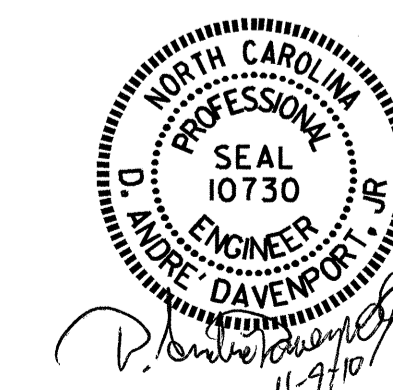


ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4176
LINCOLN COUNTY
STATION: 20+07.30 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACING
AND
END POST DETAILS



DRAWN BY : M. G. SHAIKH DATE : 06-23-09
CHECKED BY : D. A. DAVENPORT DATE : 07-23-09

09-NOV-2010 10:36
R:\Structures\mshaikh\Microstation\B-4176.SD.3MR.dgn
adavenport

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS 42	
2			4				

NOTES

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

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

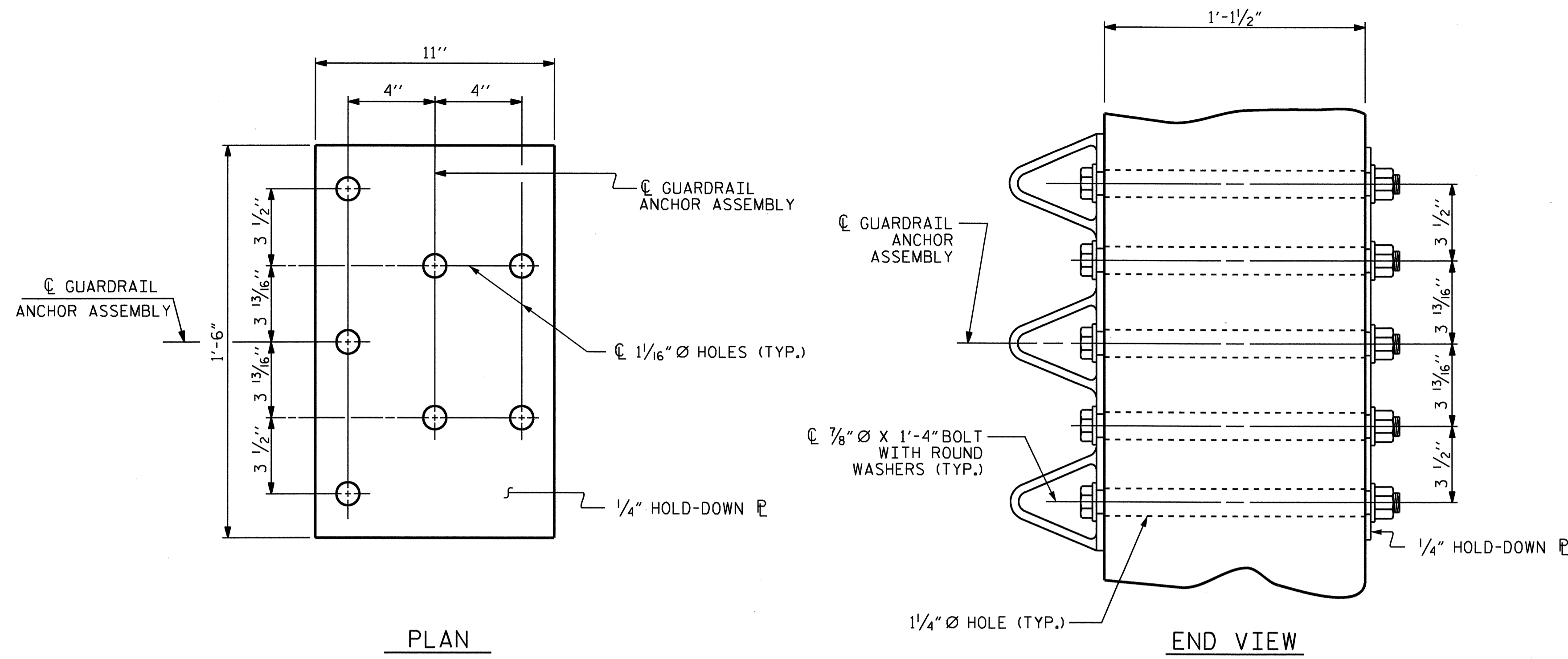
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

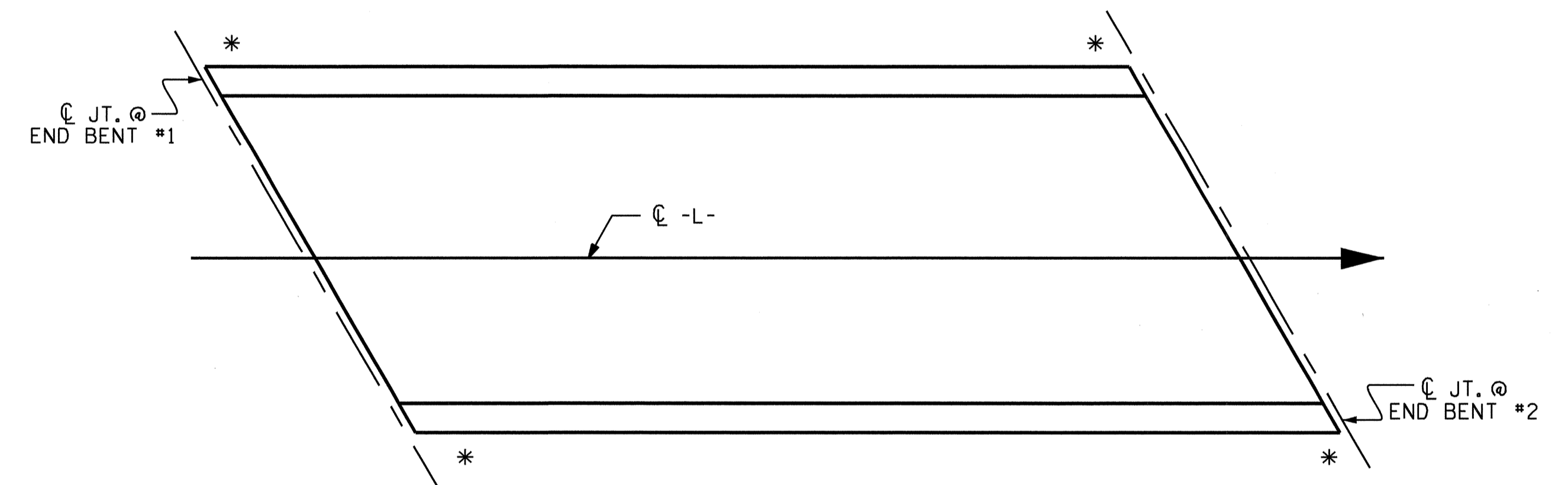
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

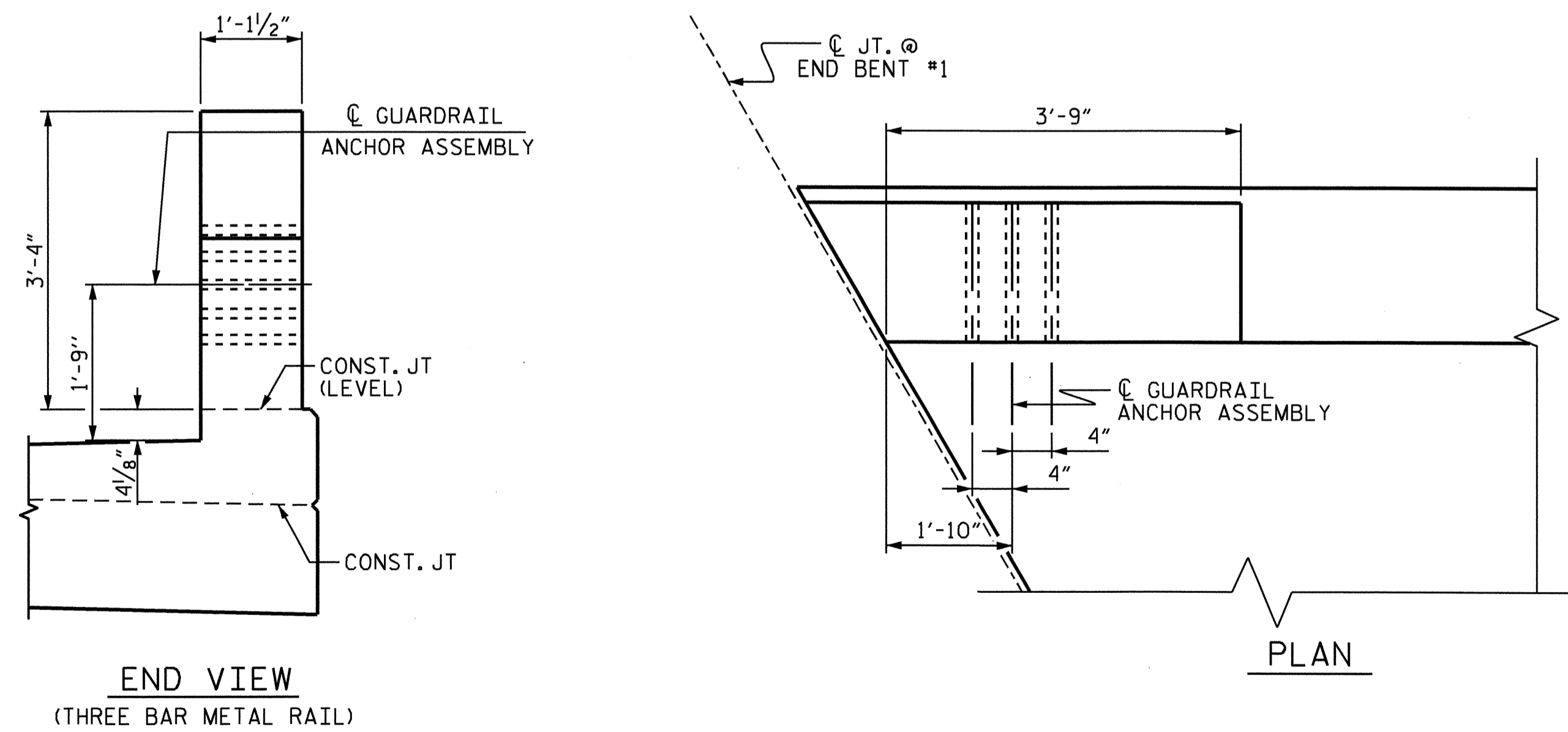


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

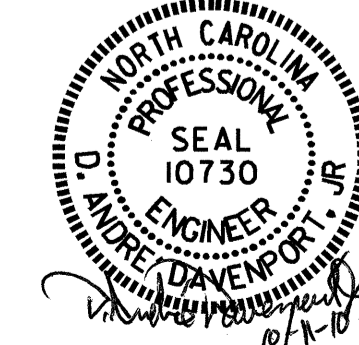
* LOCATION OF GUARDRAIL ATTACHMENT FOR 3 BAR METAL RAIL



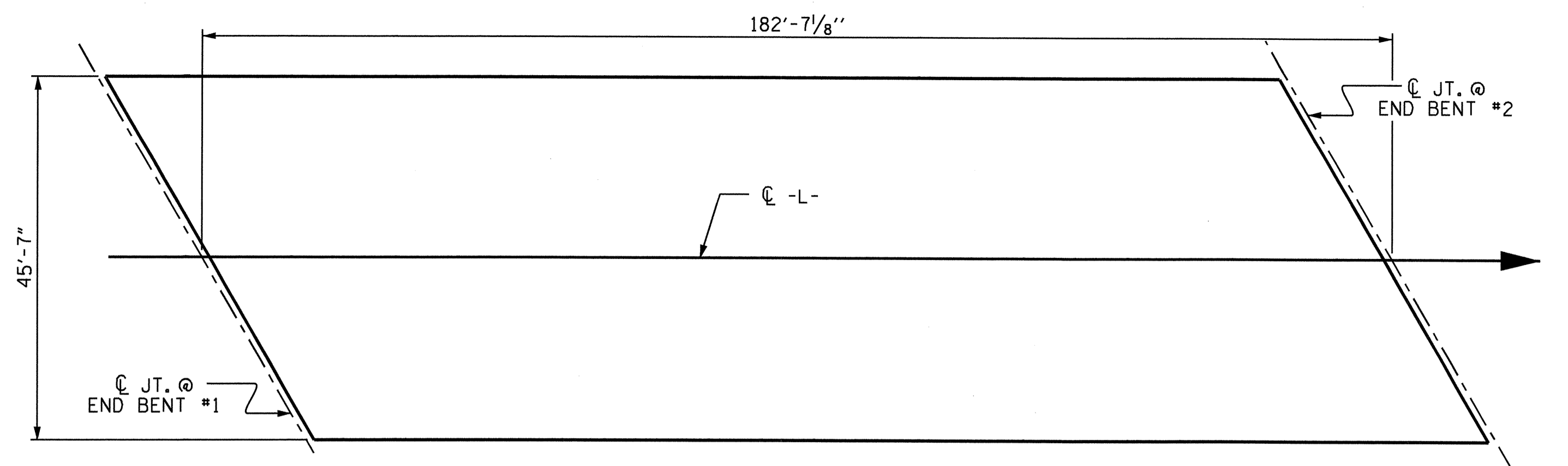
LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

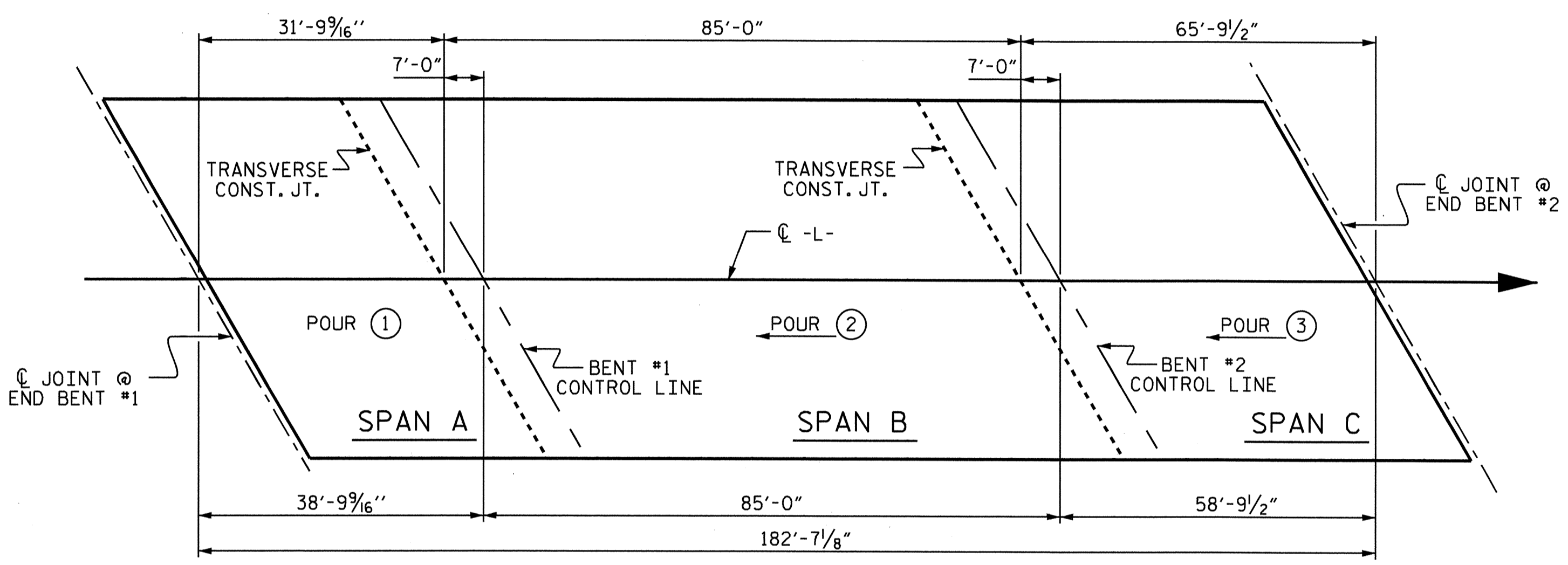
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 42
					S-24



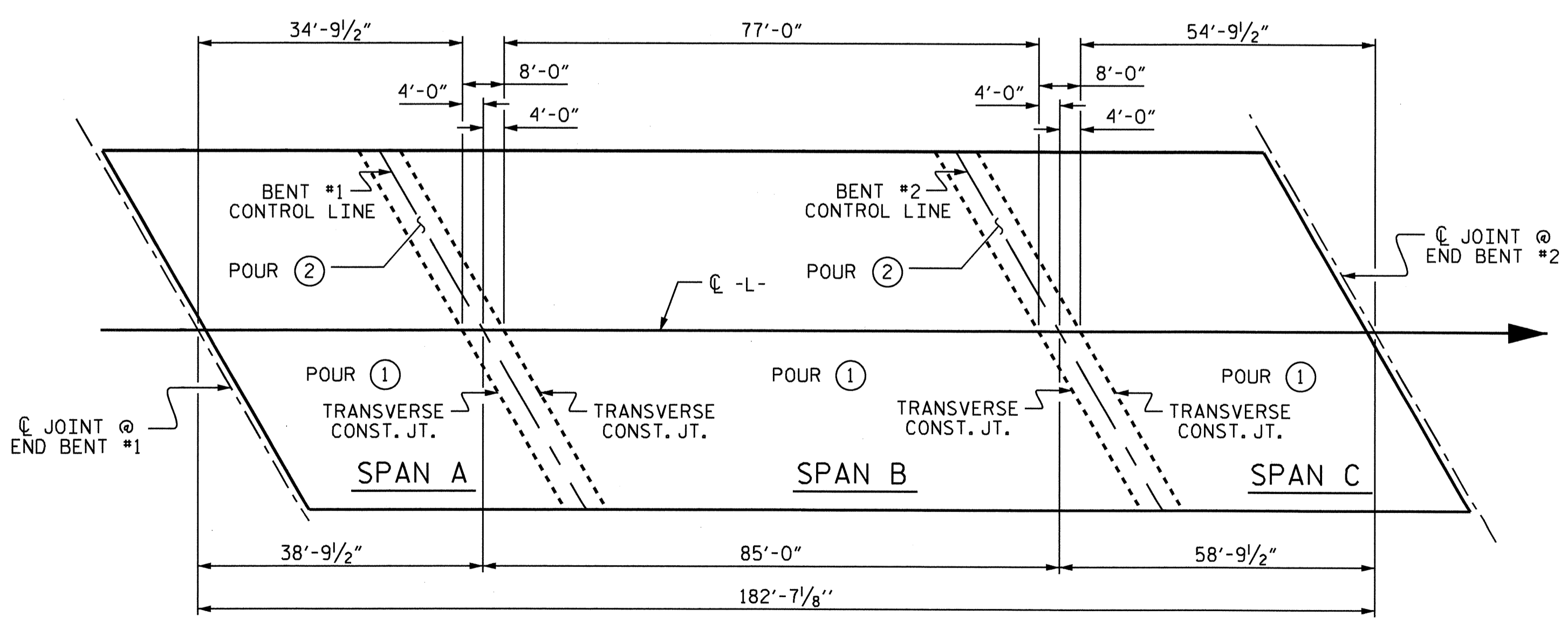
ASSEMBLED BY : M. G. SHAIKH DATE :06-22-09
 CHECKED BY : D. A. DAVENPORT DATE :07-23-09
 DRAWN BY : EEM 6/94 REV. 10/17/00 RWW/LES
 CHECKED BY : RGW 6/94 REV. 5/7/03 RWW/JTE
 REV. 5/1/06 TLA/GM



LAYOUT FOR COMPUTING AREA
 REINFORCED CONCRETE DECK SLAB
 (SQ. FT. = 8323)



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	312	#5	STR	45'-3"	14725	*B1	31	#4	STR	23'-7"	488
A2	312	#5	STR	45'-3"	14725	*B2	224	#5	STR	47'-2"	11020
						*B3	30	#7	STR	18'-9"	1150
*A101	4	#5	STR	43'-11"	183	*B4	31	#7	STR	47'-6"	3010
*A102	4	#5	STR	42'-2"	176	*B5	31	#4	STR	28'-0"	580
*A103	4	#5	STR	40'-5"	169	*B6	31	#7	STR	53'-6"	3390
*A104	4	#5	STR	38'-9"	162	*B7	30	#7	STR	21'-9"	1334
*A105	4	#5	STR	37'-0"	154	*B8	62	#4	STR	19'-10"	821
*A106	4	#5	STR	35'-3"	147	*B9	84	#4	STR	27'-9"	1557
*A107	4	#5	STR	33'-6"	140						
*A108	4	#5	STR	31'-9"	132	*G1	2	#5	STR	52'-3"	109
*A109	4	#5	STR	30'-1"	126	*G2	364	#4	STR	7'-3"	1763
*A110	4	#5	STR	28'-4"	118						
*A111	4	#5	STR	26'-7"	111						
*A112	4	#5	STR	24'-10"	104	*K1	8	#8	2	15'-0"	320
*A113	4	#5	STR	23'-1"	96	*K2	12	#8	1	22'-2"	710
*A114	4	#5	STR	21'-5"	89	*K3	24	#6	STR	8'-9"	315
*A115	4	#5	STR	19'-8"	82	K4	16	#4	STR	8'-9"	94
*A116	4	#5	STR	17'-11"	75	K5	32	#4	STR	9'-10"	210
*A117	4	#5	STR	16'-2"	67	K6	16	#4	STR	9'-1"	97
*A118	4	#5	STR	14'-6"	60	K7	16	#4	STR	6'-7"	70
*A119	4	#5	STR	12'-9"	53	K8	30	#4	5	13'-2"	264
*A120	4	#5	STR	11'-0"	46	K9	20	#4	6	6'-7"	88
*A121	4	#5	STR	9'-3"	39						
*A122	4	#5	STR	7'-6"	31	*S1	64	#5	4	5'-11"	395
*A123	4	#5	STR	5'-10"	24	*S2	64	#4	3	4'-3"	182
*A124	4	#5	STR	4'-1"	17	S3	16	#4	1	11'-8"	125
*A125	4	#5	STR	2'-4"	10	S4	40	#4	1	13'-8"	365
						S5	208	#4	7	2'-9"	382
A201	4	#5	STR	43'-11"	183						
A202	4	#5	STR	42'-2"	176	*U1	112	#4	3	3'-4"	249
A203	4	#5	STR	40'-5"	169						
A204	4	#5	STR	38'-9"	162						
A205	4	#5	STR	37'-0"	154						
A206	4	#5	STR	35'-3"	147						
A207	4	#5	STR	33'-6"	140						
A208	4	#5	STR	31'-9"	132						
A209	4	#5	STR	30'-1"	126						
A210	4	#5	STR	28'-4"	118						
A211	4	#5	STR	26'-7"	111						
A212	4	#5	STR	24'-10"	104						
A213	4	#5	STR	23'-1"	96						
A214	4	#5	STR	21'-5"	89						
A215	4	#5	STR	19'-8"	82						
A216	4	#5	STR	17'-11"	75						
A217	4	#5	STR	16'-2"	67						
A218	4	#5	STR	14'-6"	60						
A219	4	#5	STR	12'-9"	53						
A220	4	#5	STR	11'-0"	46						
A221	4	#5	STR	9'-3"	39						
A222	4	#5	STR	7'-6"	31						
A223	4	#5	STR	5'-10"	24						
A224	4	#5	STR	4'-1"	17						
A225	4	#5	STR	2'-4"	10						

REINFORCING STEEL = 29851
 *EPOXY COATED REINF. STEEL = 33509

GROOVING BRIDGE FLOORS

BRIDGE DECK	5251	SO.FT.
APPROACH SLABS	1375	SO.FT.
TOTAL	6626	SO.FT.

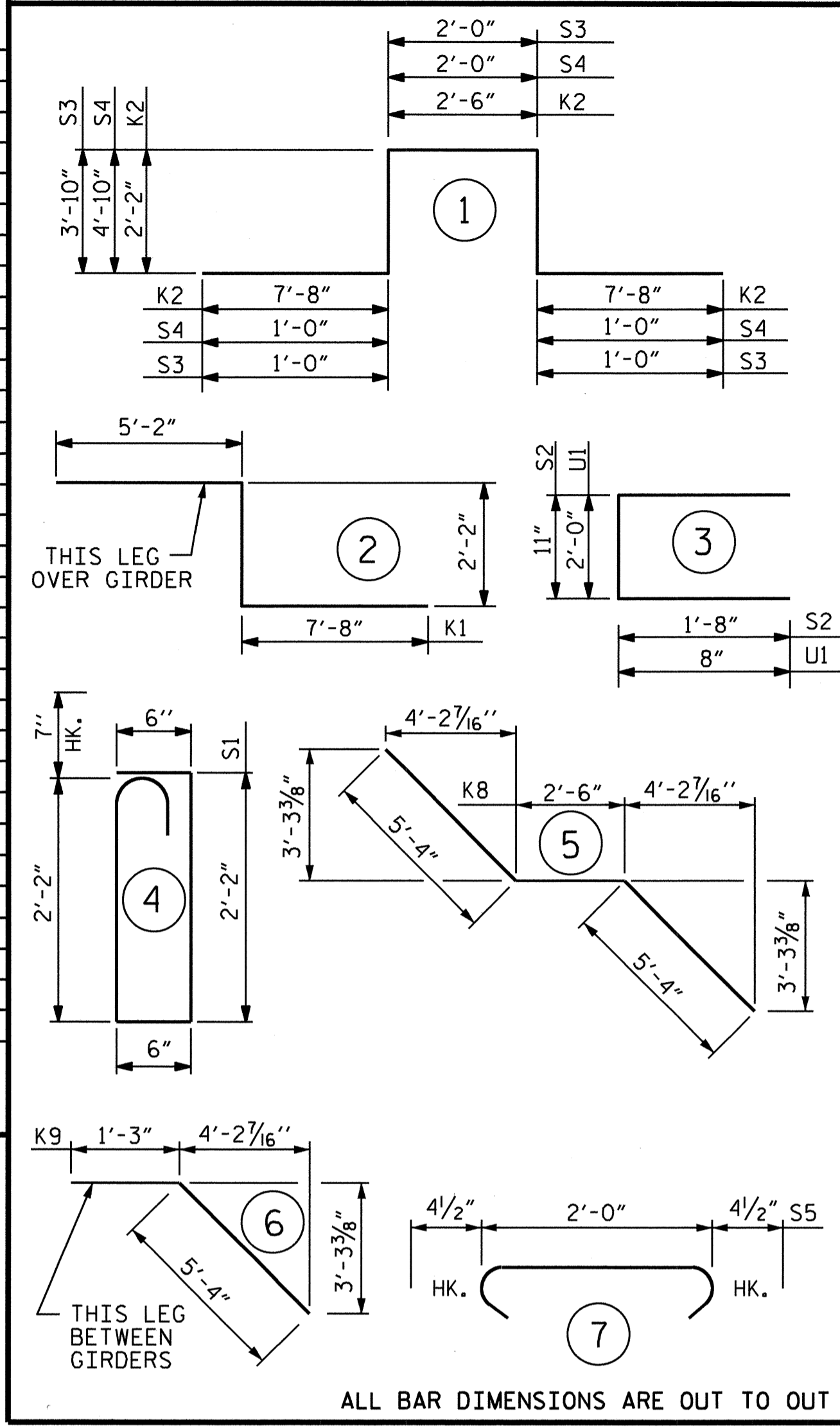
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	*EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	51.7		
POUR 2	145.0		
POUR 3	120.0		
SIDEWALK	59.6		
TOTALS	376.3	29851	33509

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

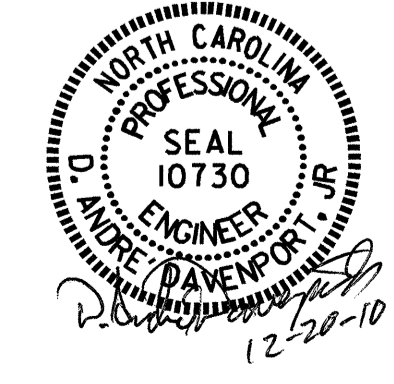
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

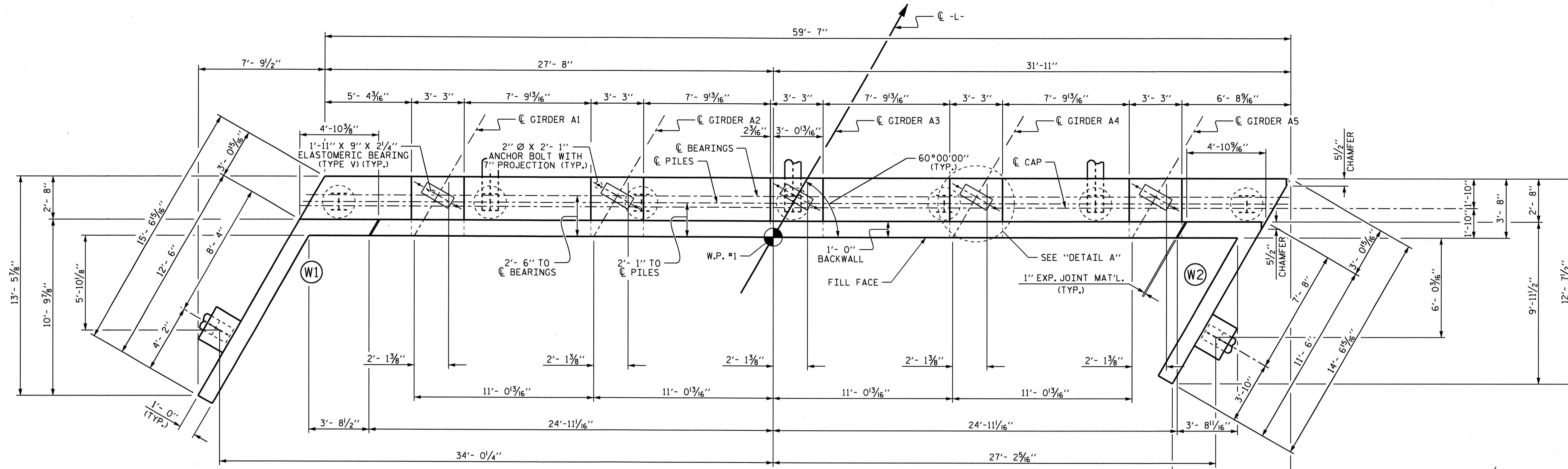
PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL

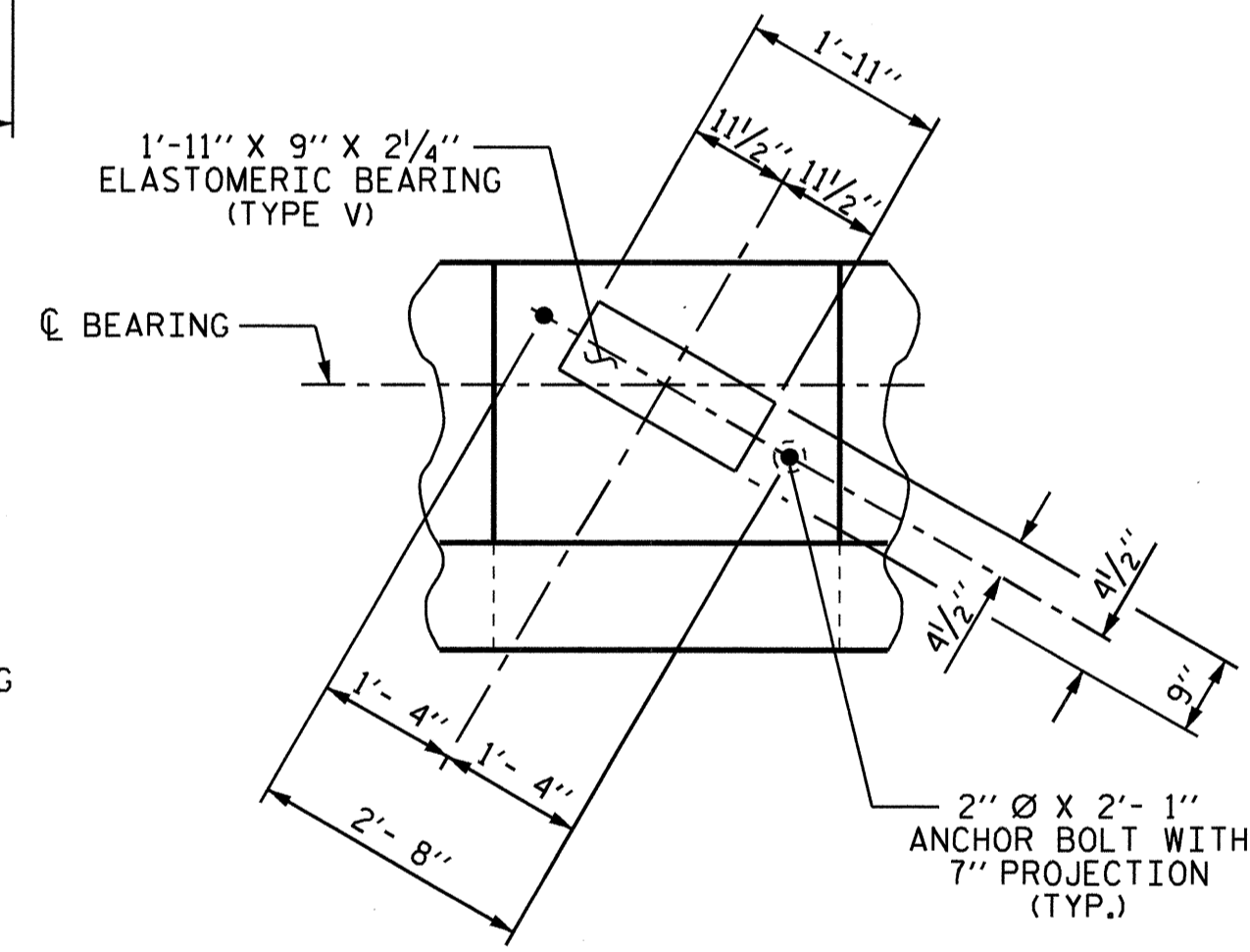


REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	DATE:	S-25
1			3		TOTAL SHEETS 42
2			4		

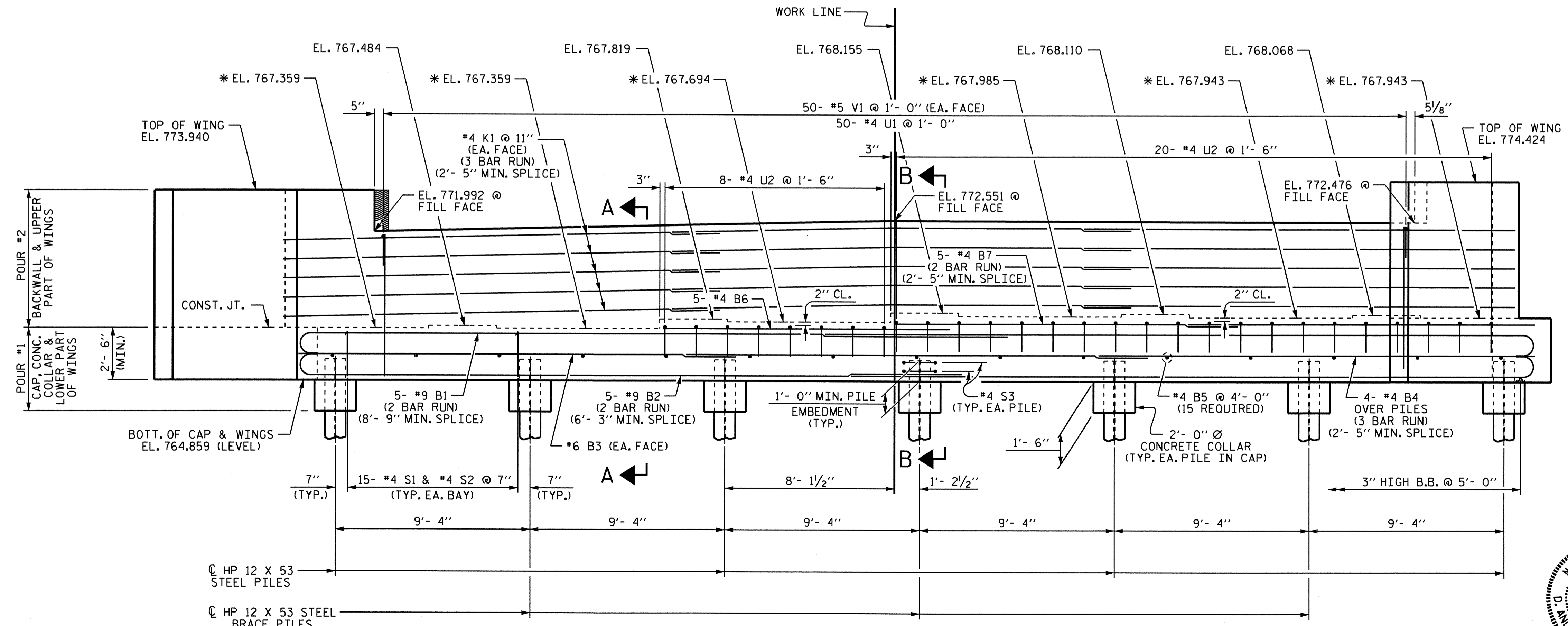
ASSEMBLED BY : M. G. SHAIKH DATE :06-29-09
 CHECKED BY : D. A. DAVENPORT DATE :07-23-09
 DRAWN BY : JMB 5/87 REV. 6/1/94 EEM/GRP
 CHECKED BY : SJD 9/87 REV. 8/16/99 RWW/LES



PLAN



DETAIL A
(TYP. EACH GIRDER)



ELEVATION

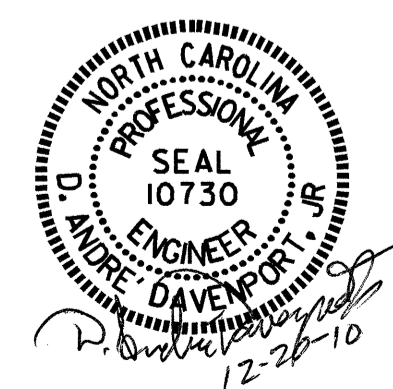
(WING PILES ARE NOT SHOWN FOR CLARITY)

PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30 -L-

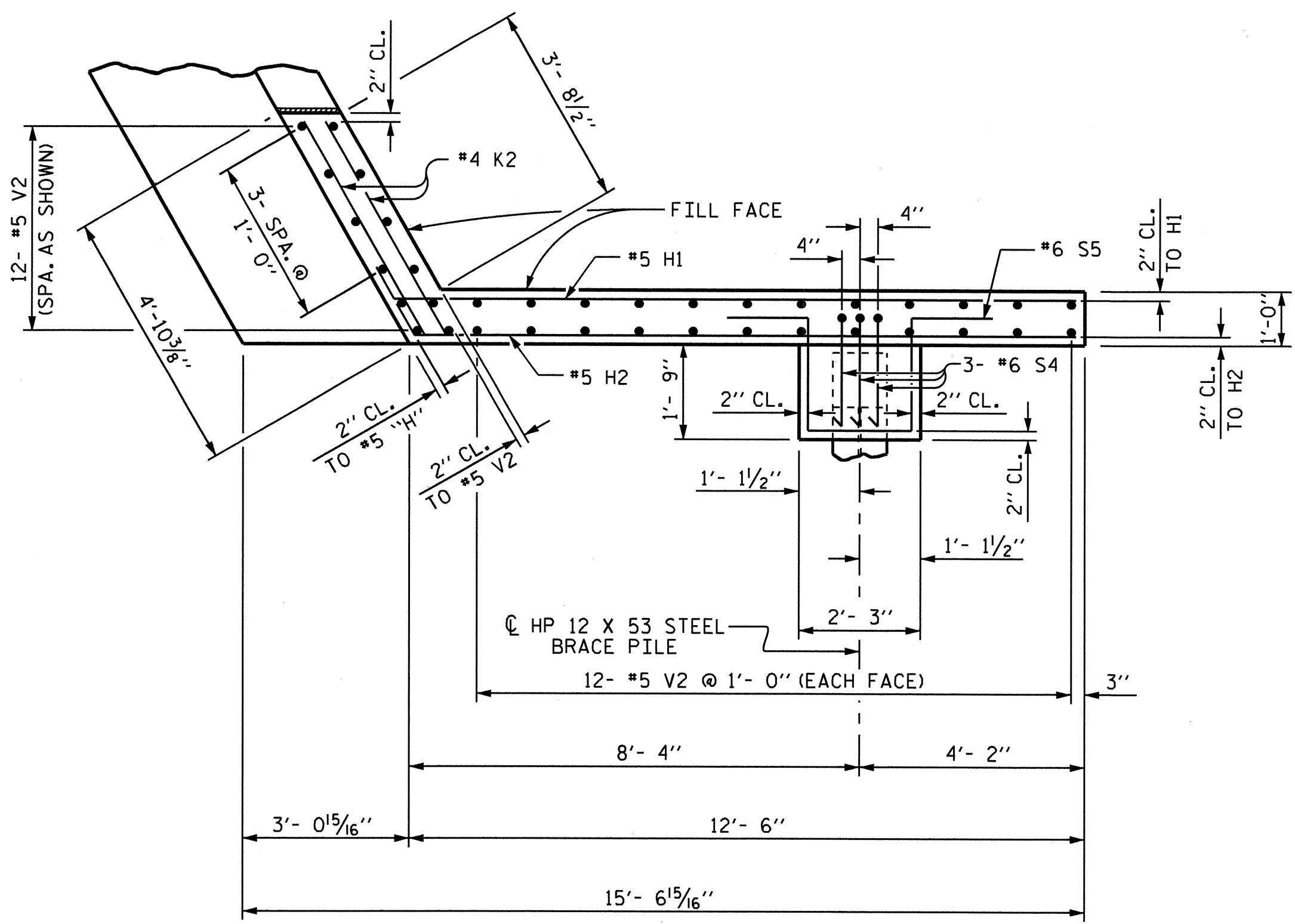
SHEET 1 OF 3

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

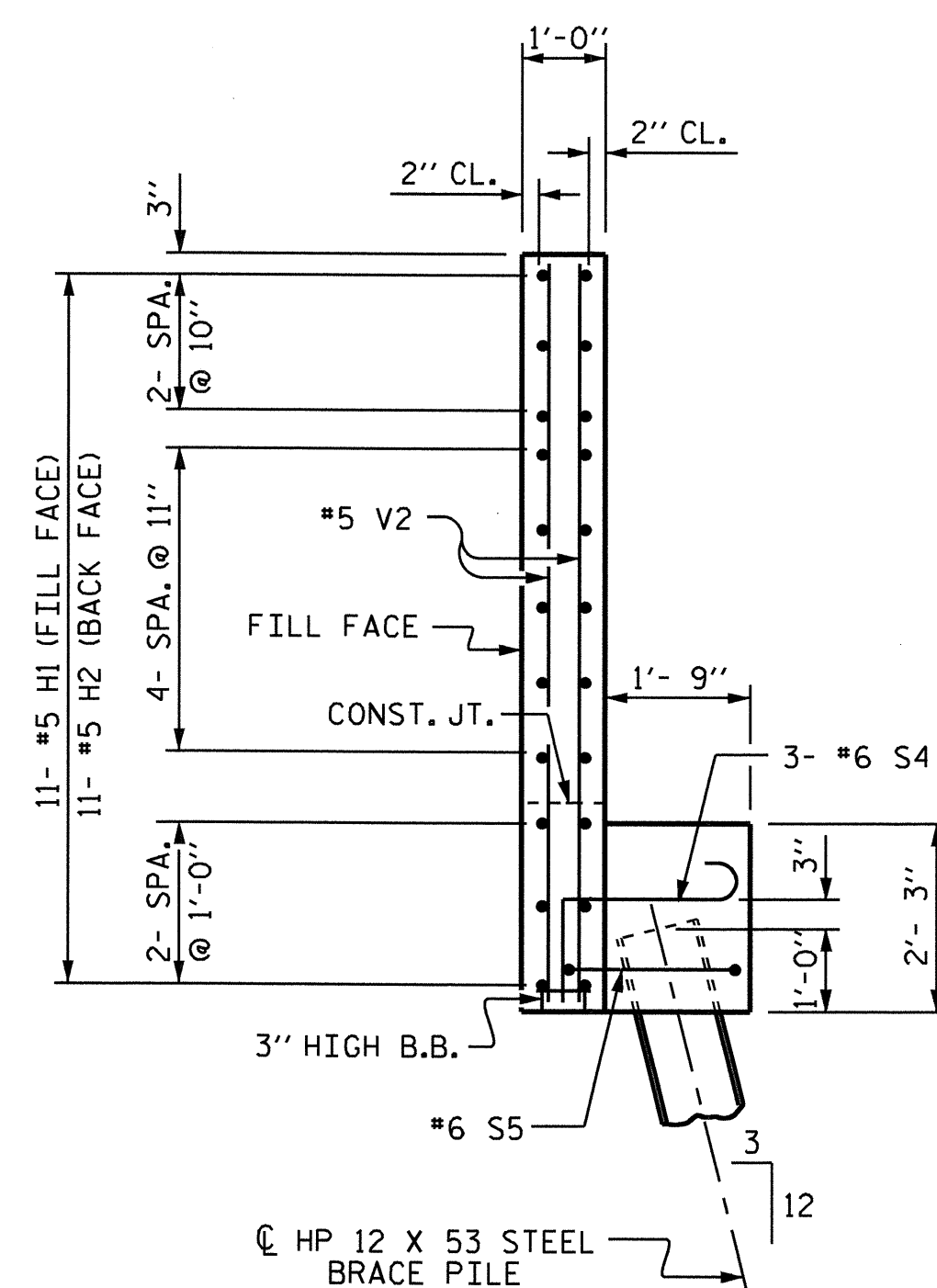
SHEET NO. S-26
 TOTAL SHEETS 42



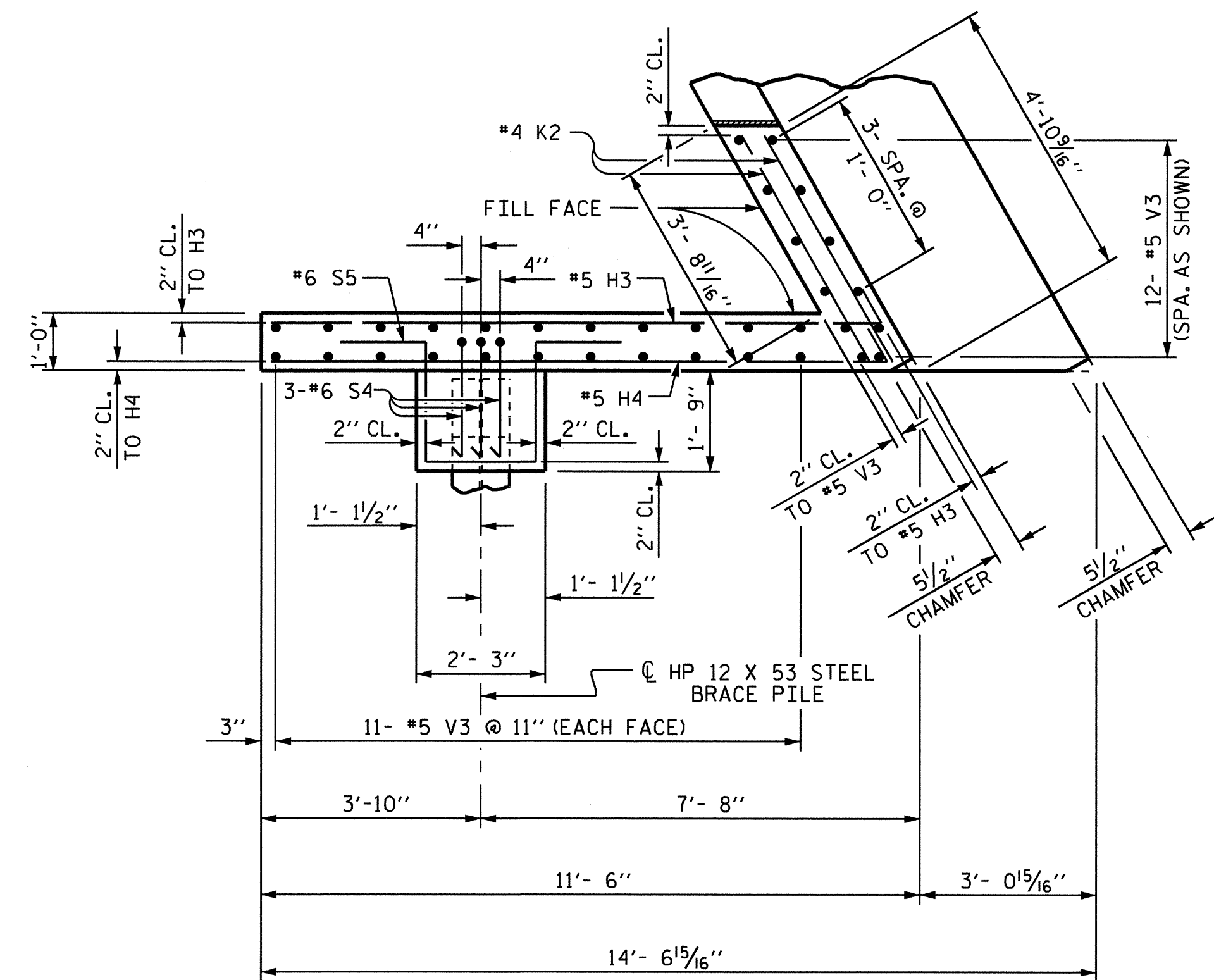
DRAWN BY: D. A. GLADDEN DATE: 4-14-10
 CHECKED BY: H. T. BARBOUR DATE: 6-22-10



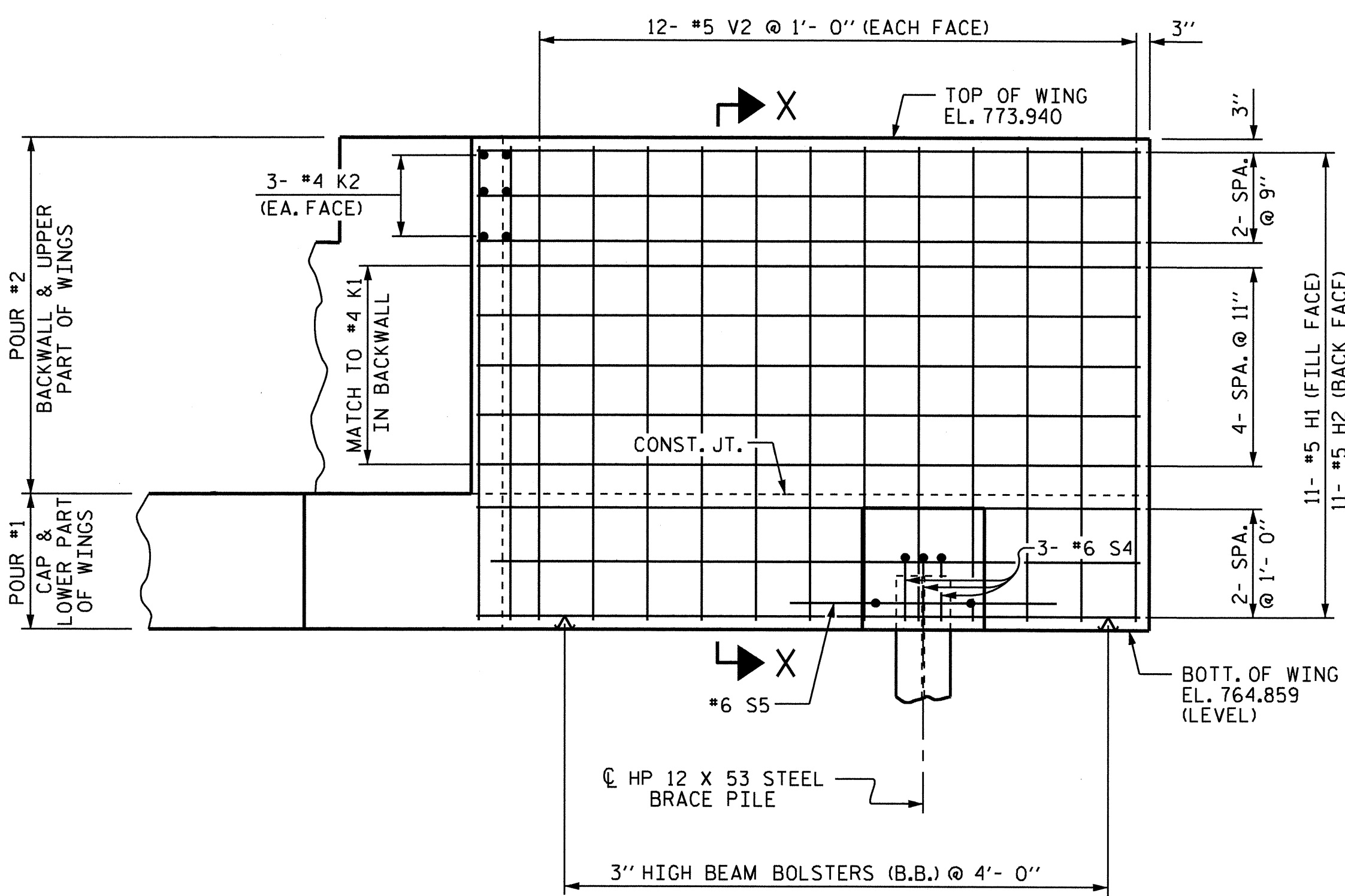
PLAN OF LEFT WING (W1)



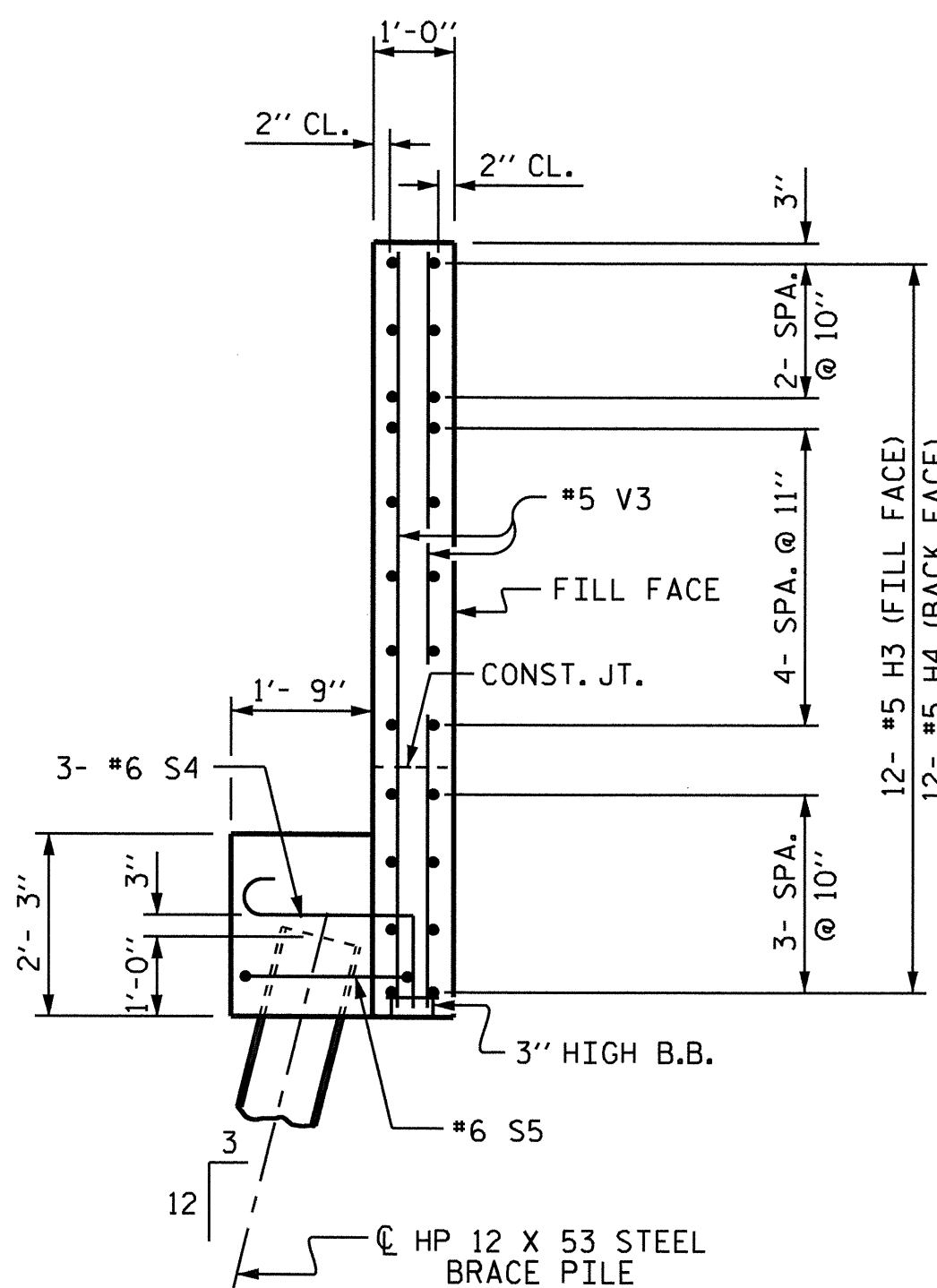
SECTION X-X



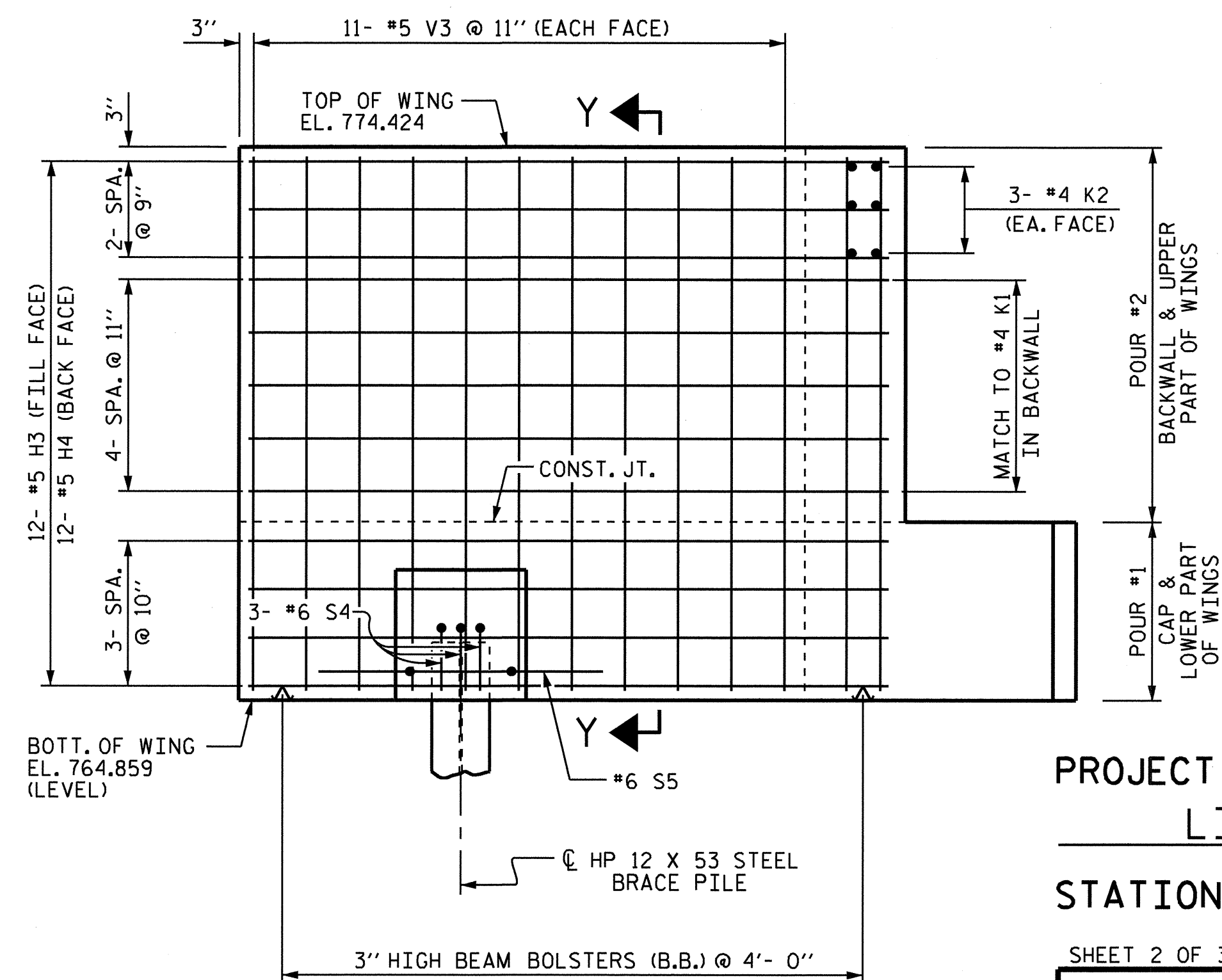
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30 -L-

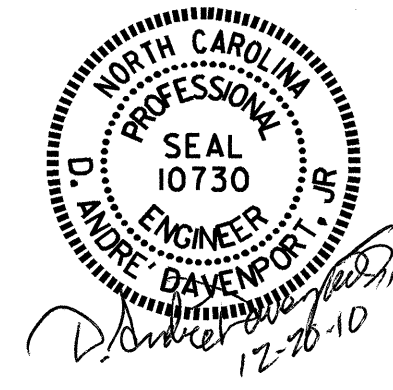
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

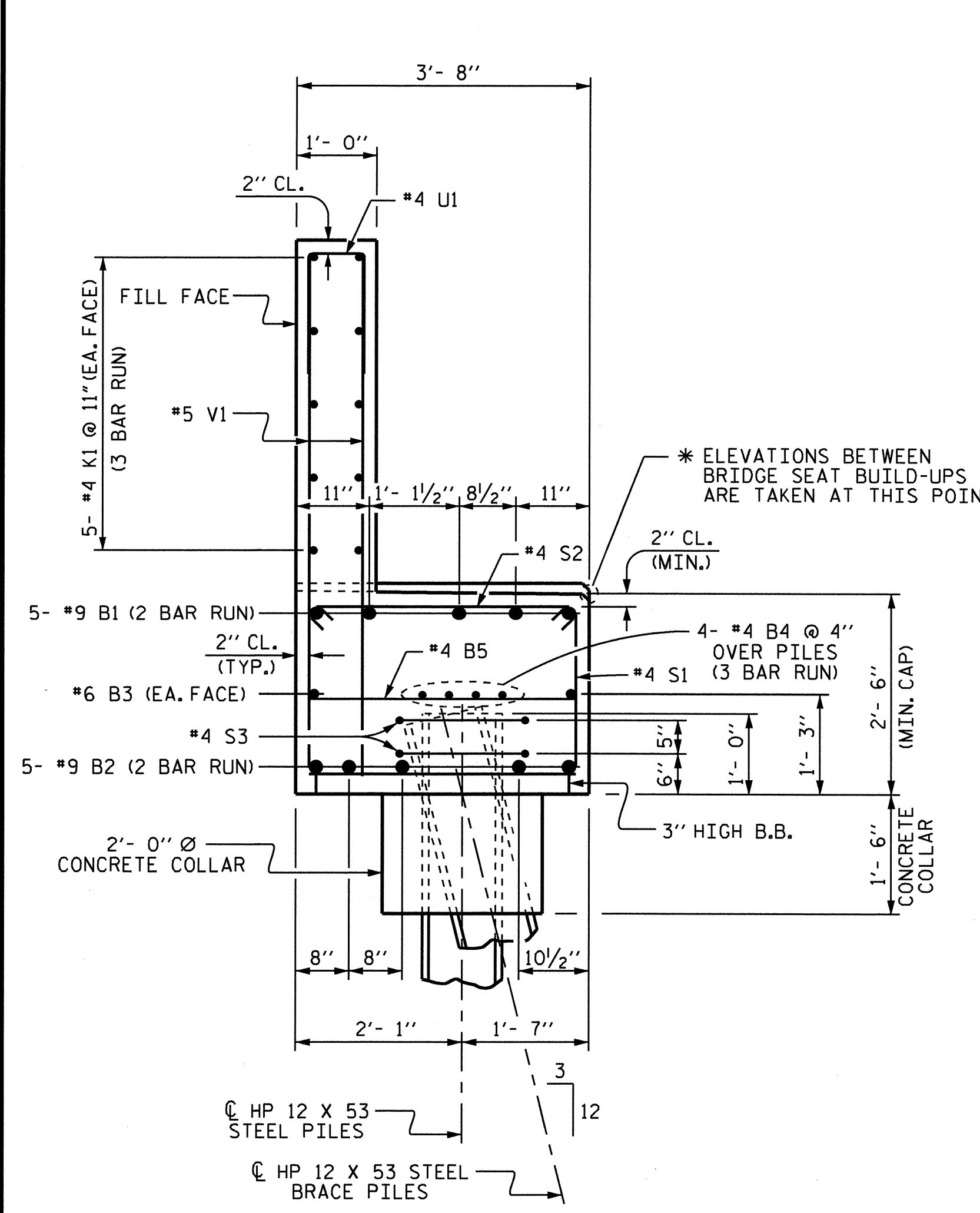
SUBSTRUCTURE
 END BENT #1

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	42
1			3			
2			4			

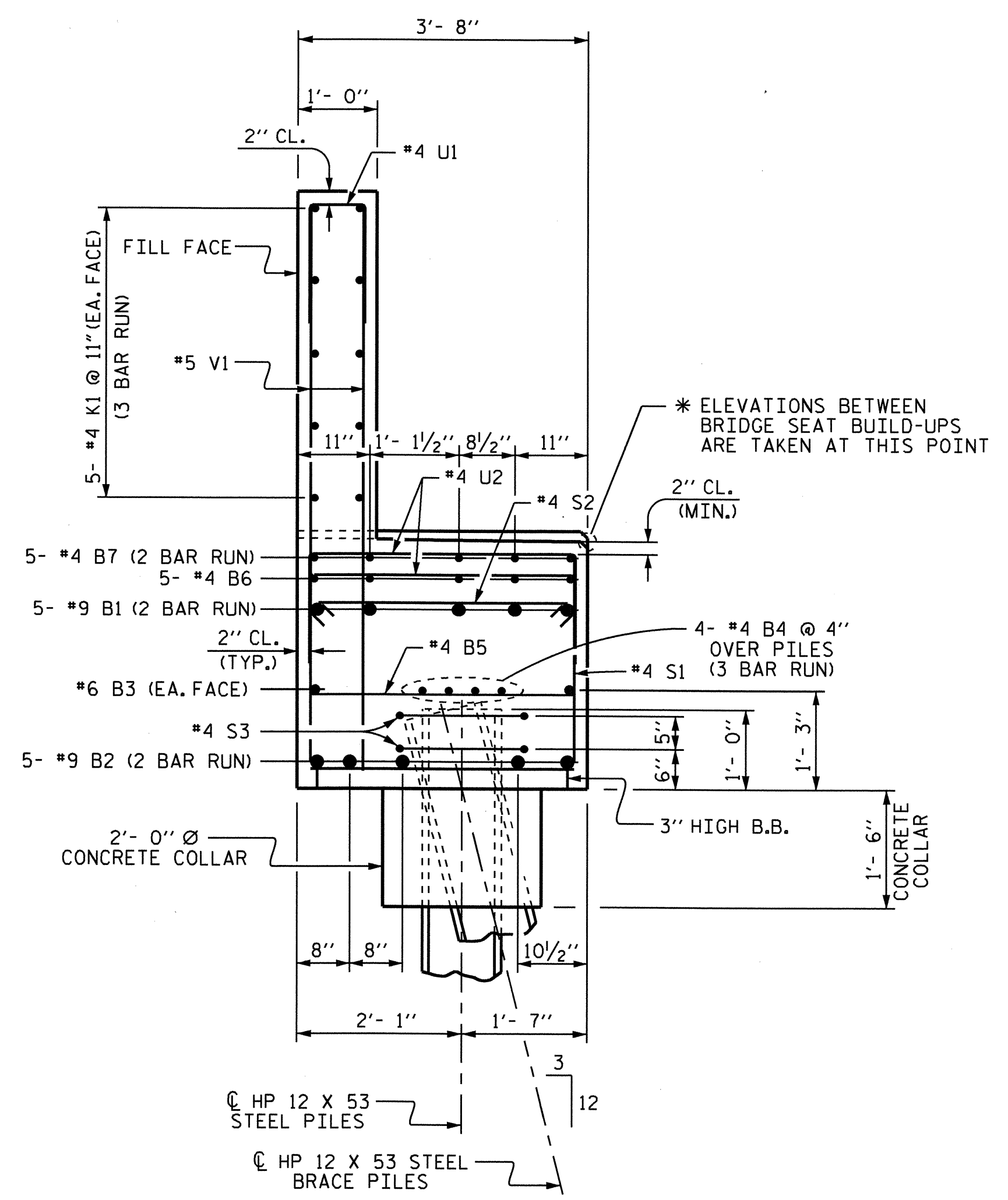
SHEET NO. S-27



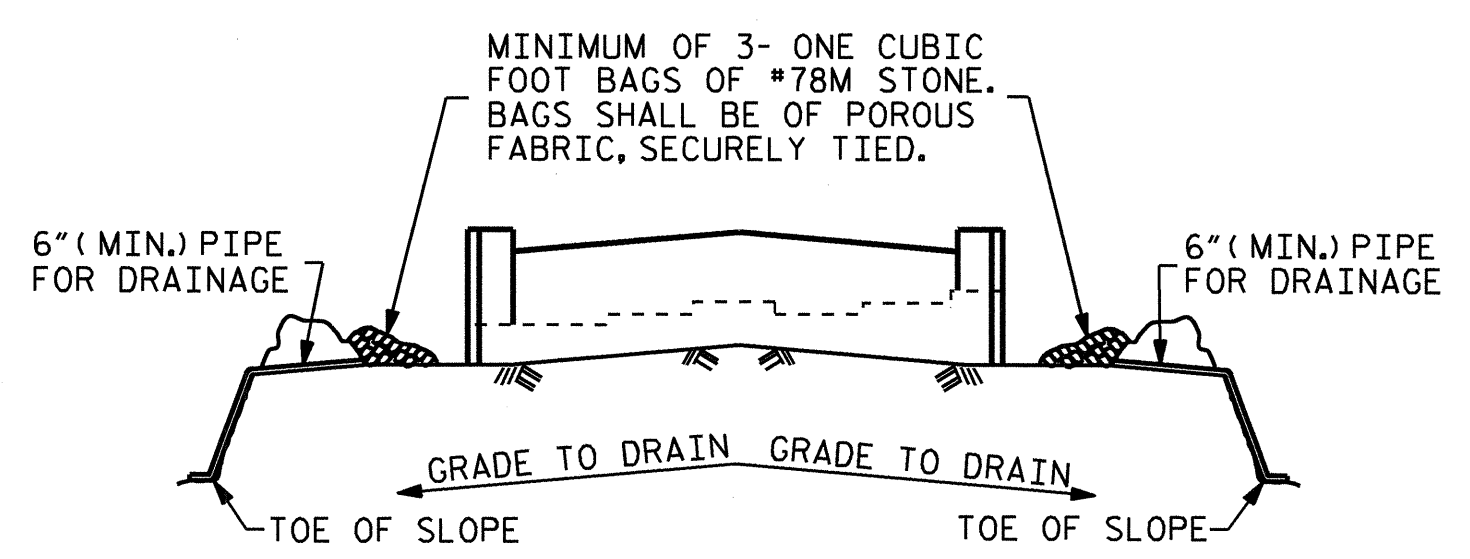
DRAWN BY : D. A. GLADDEN DATE : 4-14-10
 CHECKED BY : H. T. BARBOUR DATE : 6-22-10



SECTION A-A



SECTION B-B

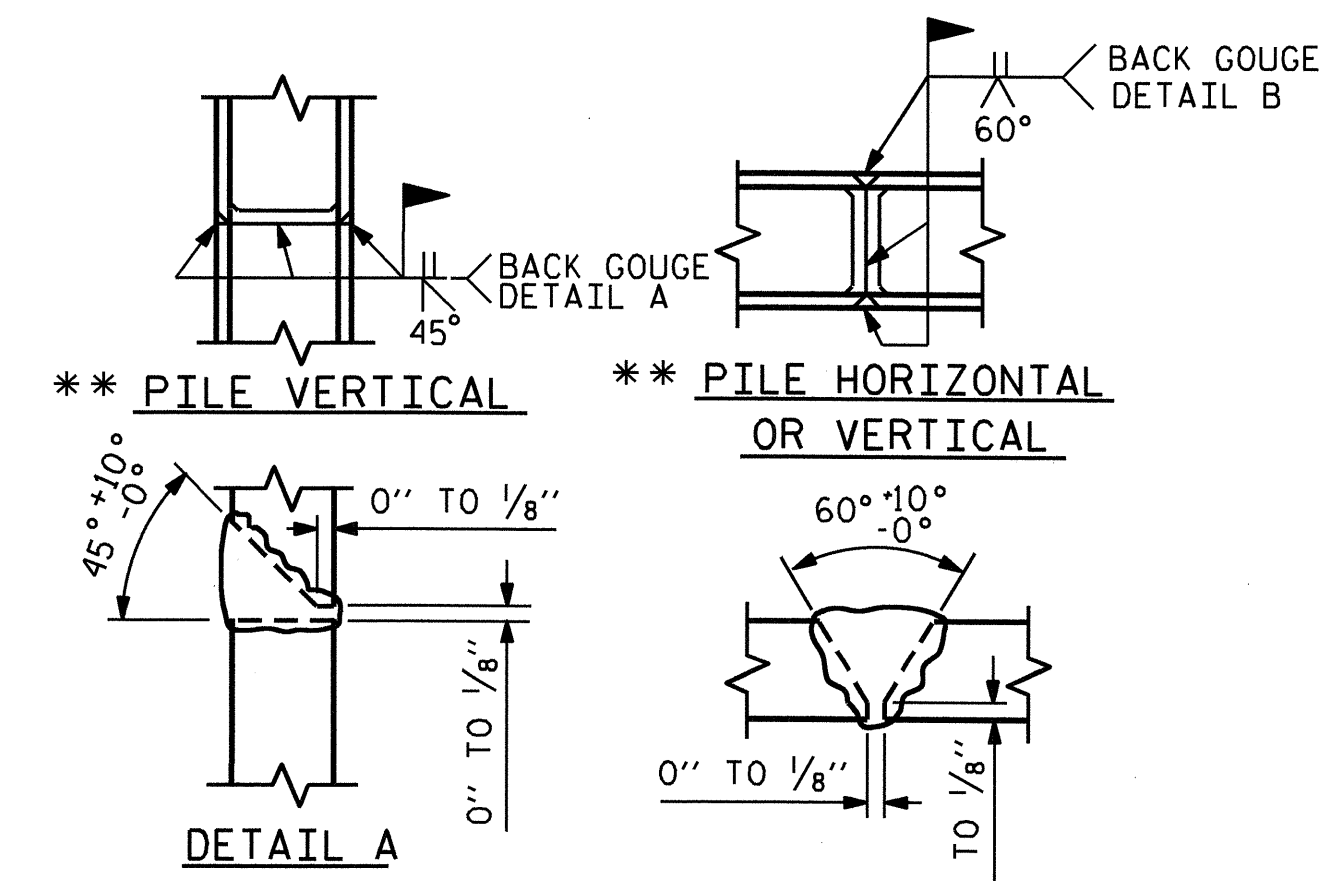


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

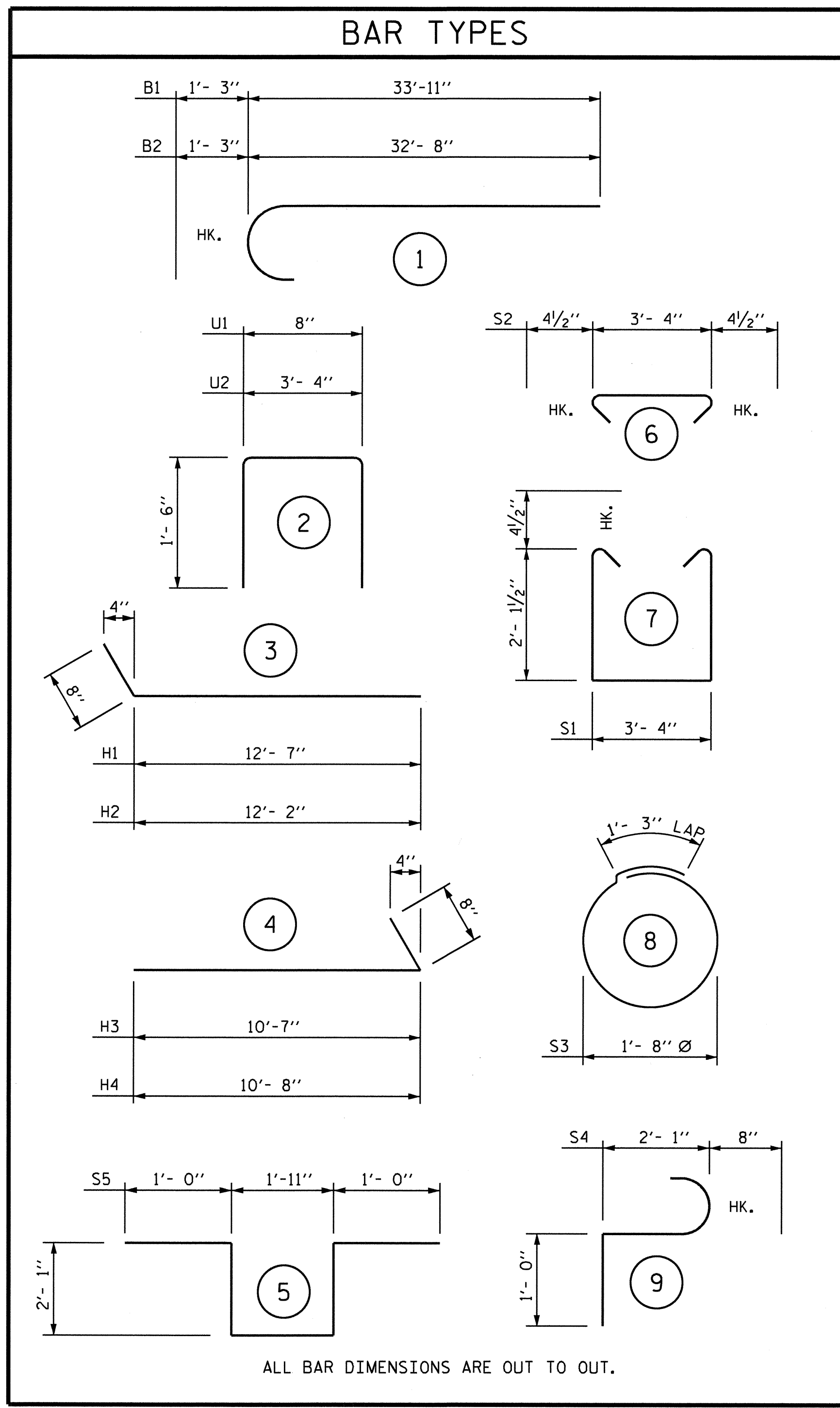
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



PILE SPLICE DETAILS



NOTES

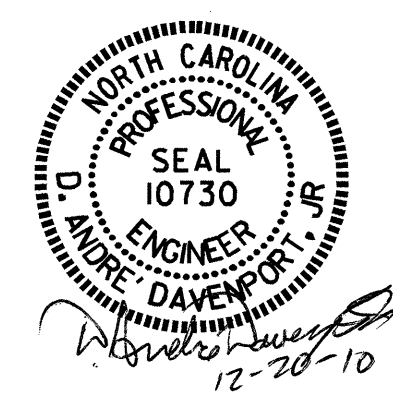
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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.



BILL OF MATERIAL

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	35'-2"	1196
B2	10	#9	1	33'-11"	1153
B3	2	#6	STR	59'-2"	178
B4	12	#4	STR	21'-5"	172
B5	15	#4	STR	3'-4"	33
B6	5	#4	STR	13'-4"	45
B7	10	#4	STR	17'-1"	114
H1	11	#5	3	13'-3"	152
H2	11	#5	3	12'-10"	147
H3	12	#5	4	11'-3"	141
H4	12	#5	4	11'-4"	142
K1	30	#4	STR	21'-5"	429
K2	12	#4	STR	4'-5"	35
S1	90	#4	7	8'-4"	501
S2	90	#4	6	4'-1"	245
S3	14	#4	8	6'-6"	61
S4	6	#6	9	3'-9"	34
S5	2	#6	5	8'-1"	24
U1	50	#4	2	3'-8"	122
U2	28	#4	2	6'-4"	118
V1	100	#5	STR	6'-9"	704
V2	36	#5	STR	8'-9"	329
V3	34	#5	STR	9'-2"	325
REINFORCING STEEL				6400	LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP, CONCRETE COLLAR & LOWER PART OF WINGS) = 27.8 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS = 16.1 C.Y.

TOTAL CLASS A CONCRETE = 43.9 C.Y.

HP 12 X 53 STEEL PILES

NO. 9 LIN. FT. 225

PROJECT NO. B-4176

LINCOLN COUNTY

STATION: 20+07.30 -L-

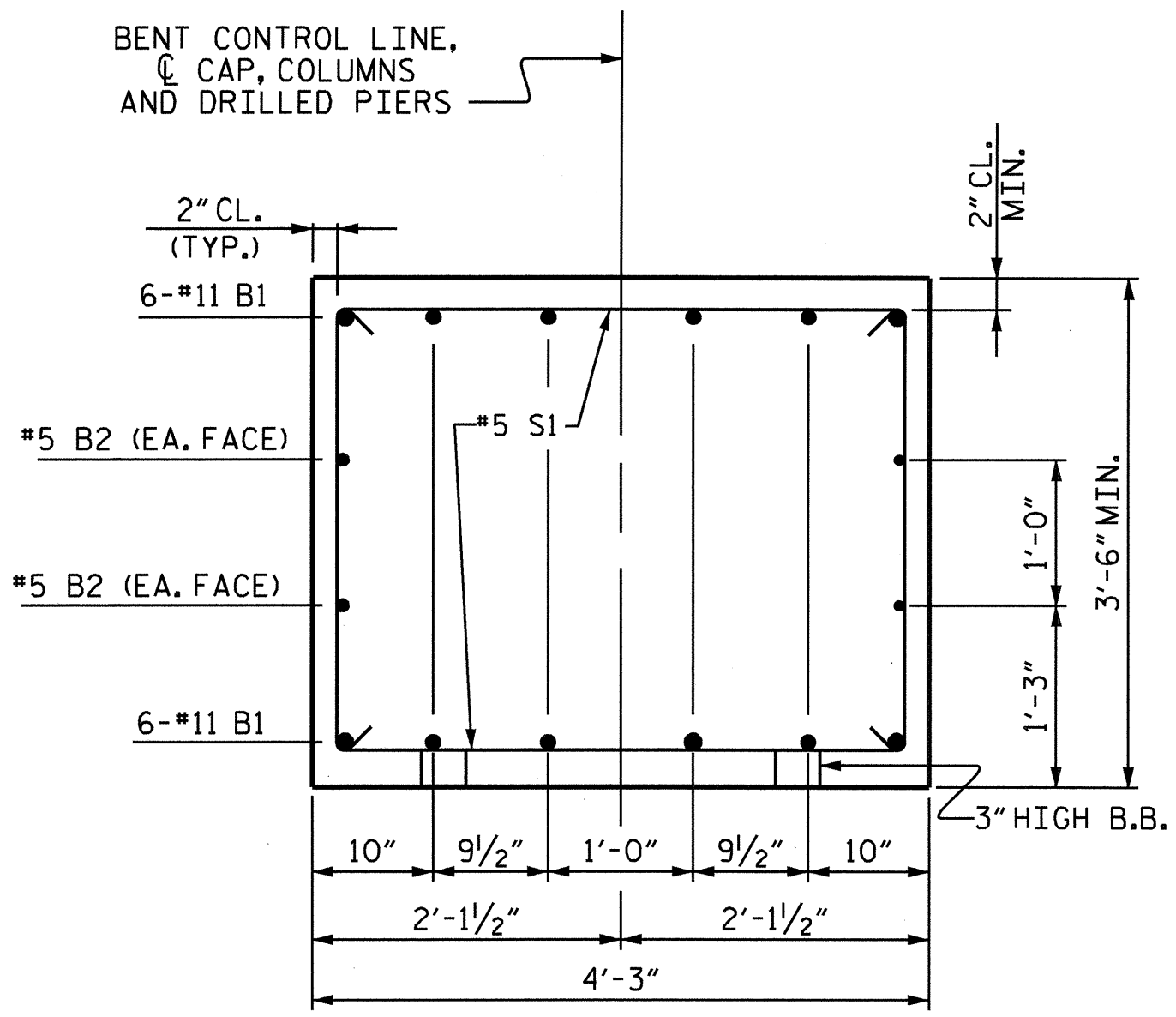
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

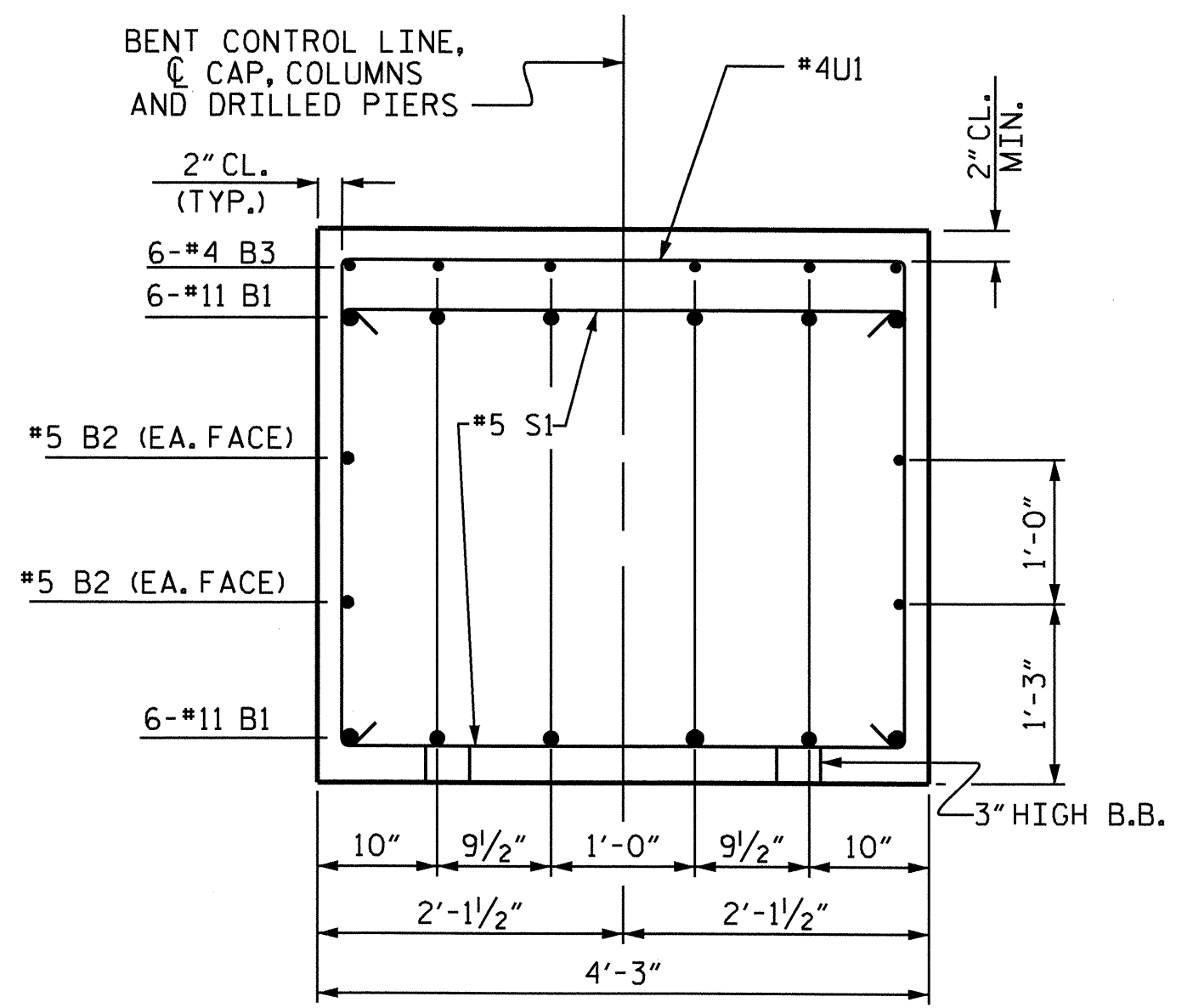
**SUBSTRUCTURE
END BENT #1**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 42
2			4			

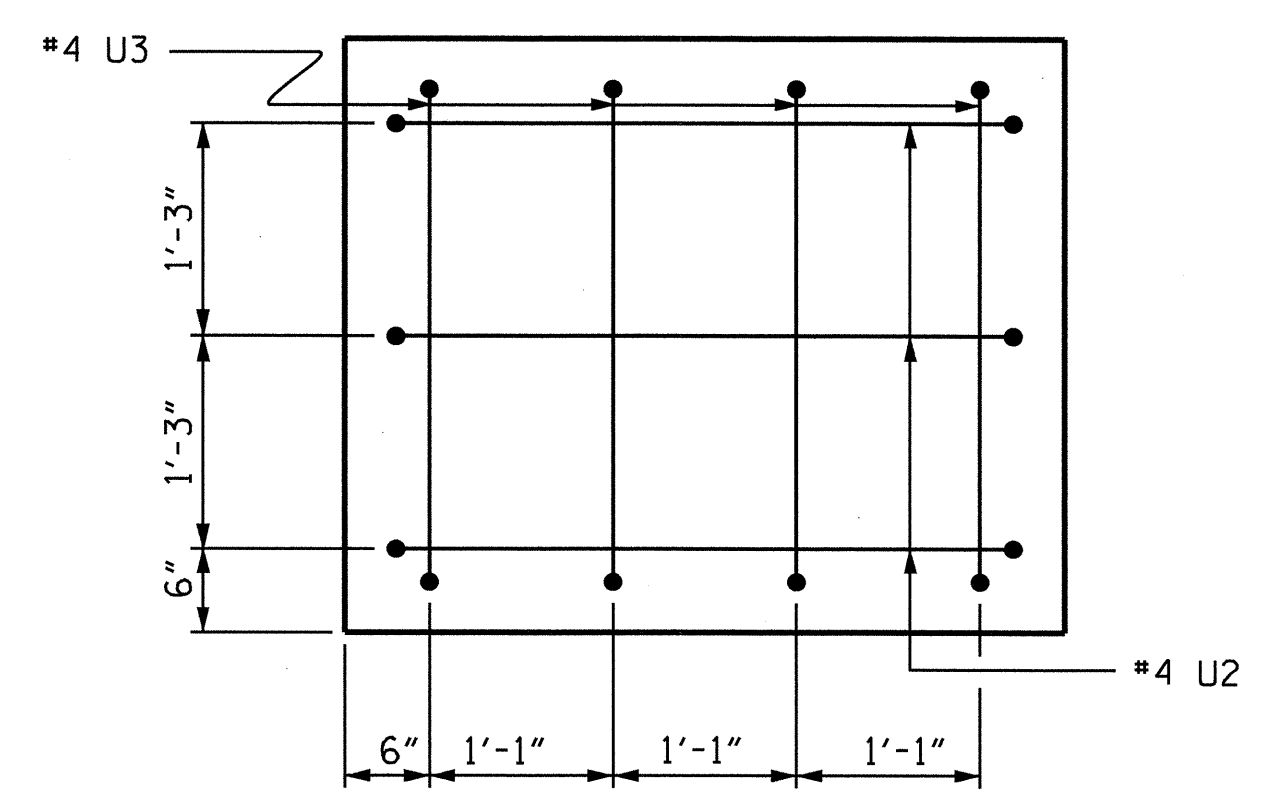
DRAWN BY: D. A. GLADDEN DATE: 4-14-10
CHECKED BY: H. T. BARBOUR DATE: 6-22-10



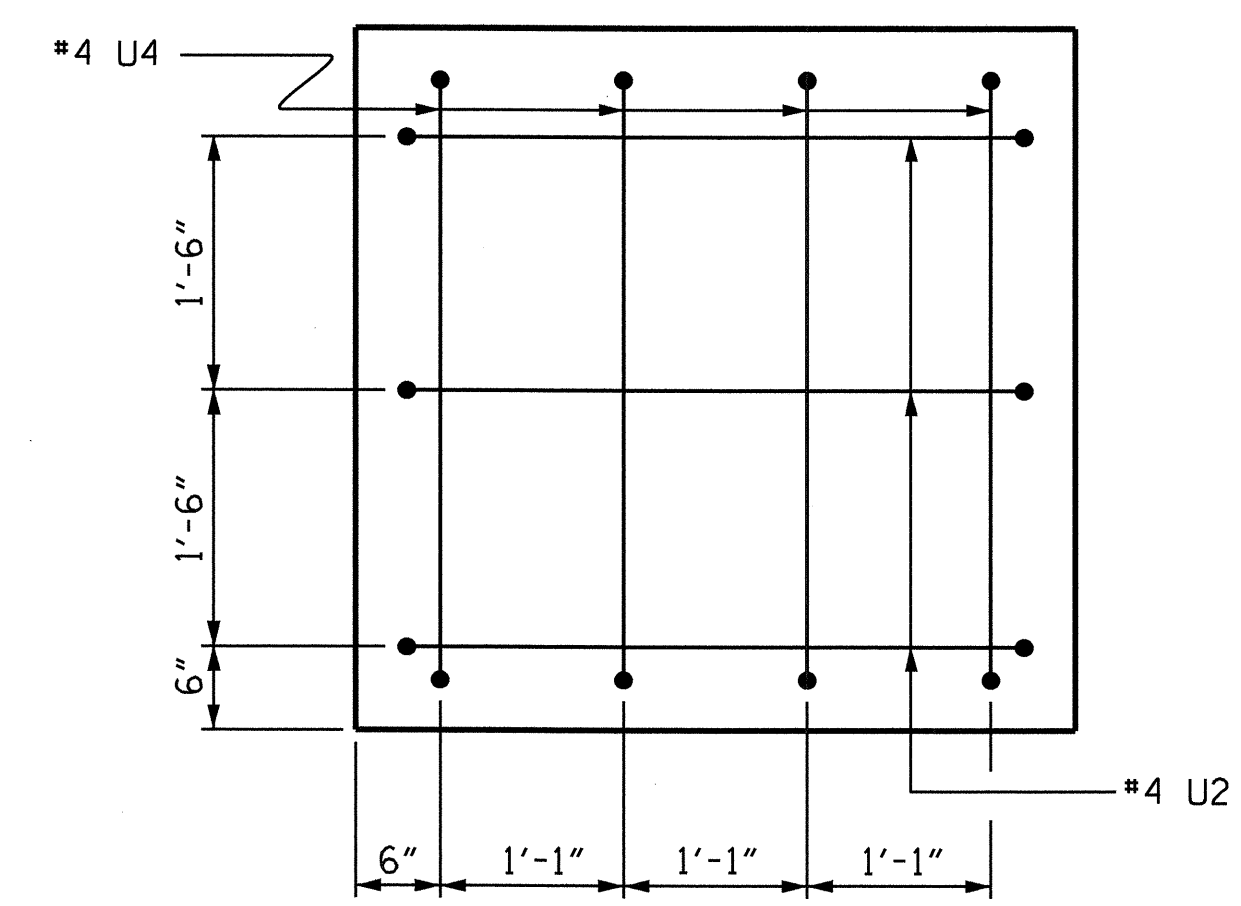
SECTION A-A



SECTION B-B

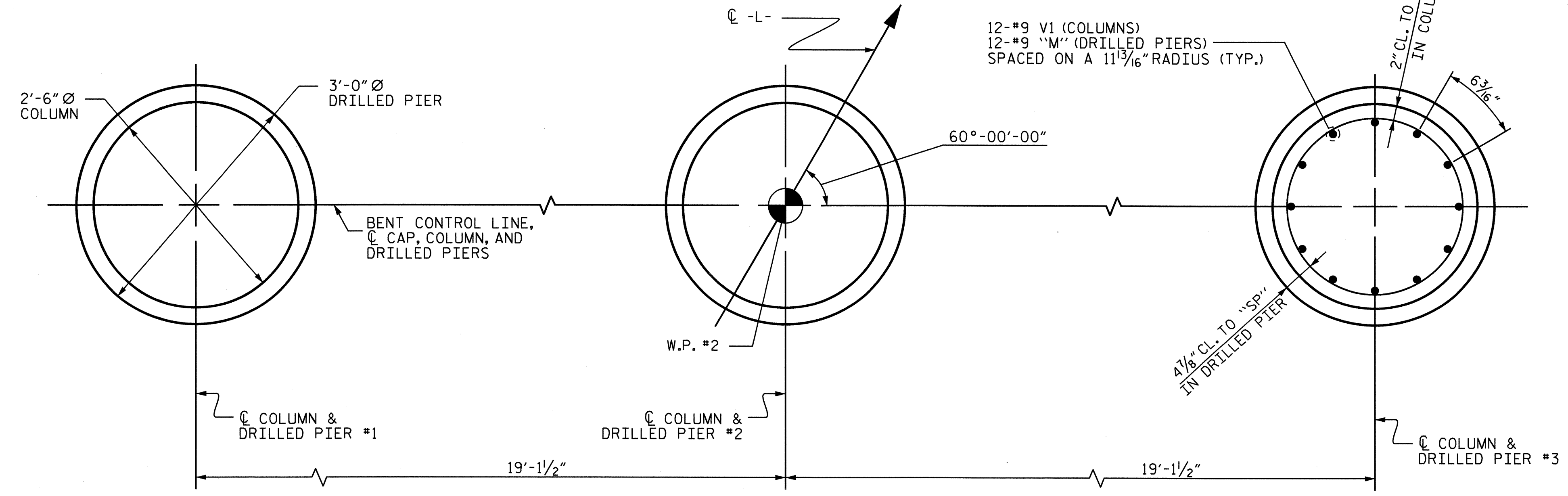


LEFT END VIEW



RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U3 AND #4U2 BARS.
 #4U3 AND #4U2 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

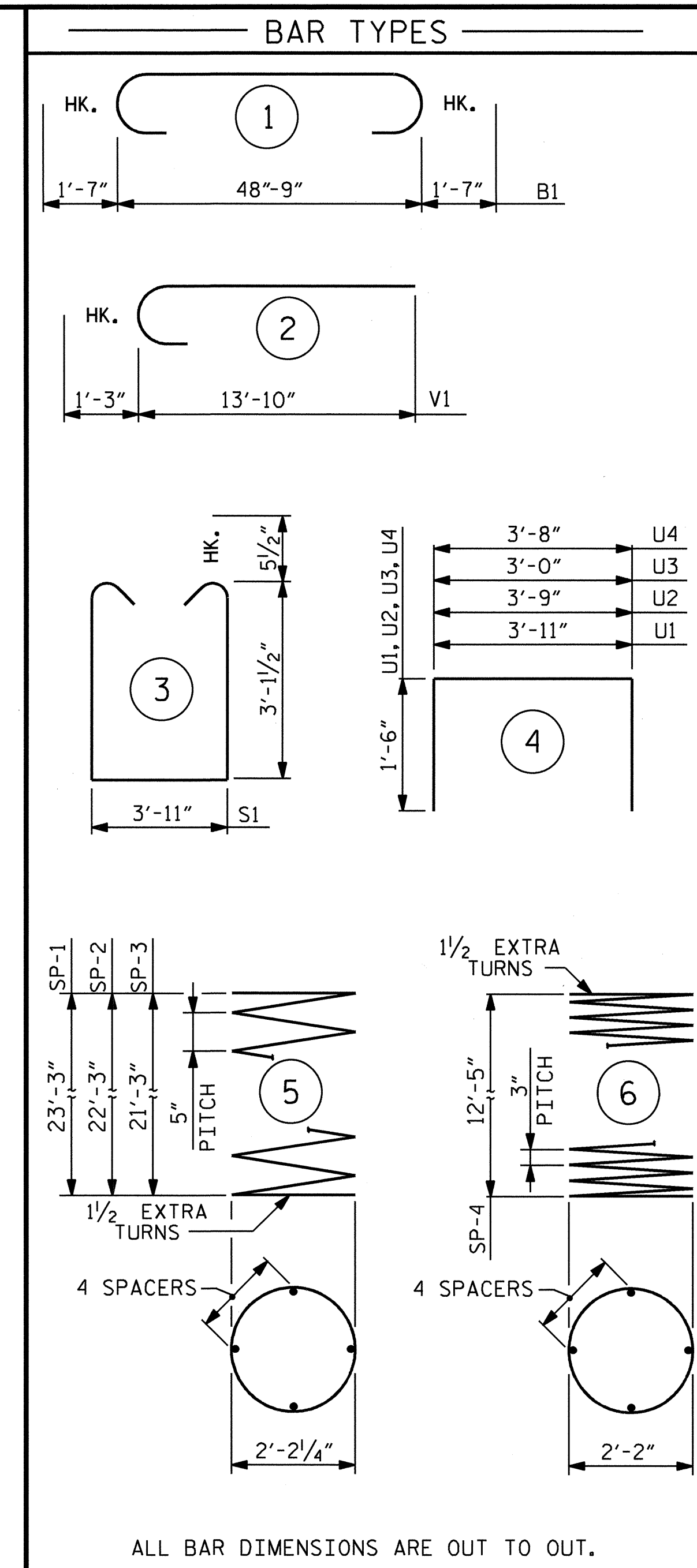


PLAN OF COLUMNS AND DRILLED PIERS

ALL COLUMNS AND DRILLED PIERS ARE SIMILAR

DRAWN BY : H. T. BARBOUR DATE : 4-23-10
 CHECKED BY : D. A. GLADDEN DATE : 6-10

09-NOV-2010 10:39
 R:\Structures\barbour\Microstation\B4176.SD.B*.dgn
 odavenport



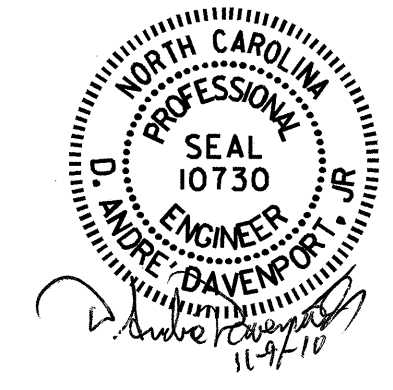
ALL BAR DIMENSIONS ARE OUT TO OUT.
 * THE SP-1, SP-2 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN STEEL WIRE OR #5 PLAIN OR DEFORMED BAR.
 ** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN STEEL WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT #1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	12	#11	1	51'-11"	3310
B2	4	#5	STR.	48'-11"	204
B3	12	#4	STR.	20'-0"	160
M1	12	#9	STR.	31'-3"	1275
M2	12	#9	STR.	30'-3"	1234
M3	12	#9	STR.	29'-3"	1193
S1	46	#5	3	11'-1"	532
U1	52	#4	4	6'-11"	240
U2	6	#4	4	6'-9"	27
U3	4	#4	4	6'-0"	16
U4	4	#4	4	6'-8"	18
V1	36	#9	2	15'-1"	1846
REINFORCING STEEL (LBS.)					10055
SP-1	1	*	5	385'-7"	402
SP-2	1	*	5	368'-10"	385
SP-3	1	*	5	352'-1"	367
SP-4	3	**	6	341'-7"	685
SPIRAL REINFORCING STEEL (LBS.)					1839
CLASS A CONCRETE					
POUR #2 (COLUMNS)					6.6 C.Y.
POUR #3 (CAP)					30.5 C.Y.
TOTAL					37.1 C.Y.

DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	
3'-0" Ø DRILLED PIERS IN SOIL	34.25 LIN. FT.
3'-0" Ø DRILLED PIERS NOT IN SOIL	34.0 LIN. FT.
3'-0" Ø PERMANENT STEEL CASING	38.4 LIN. FT.
CSL TUBES	303.0 LIN. FT.

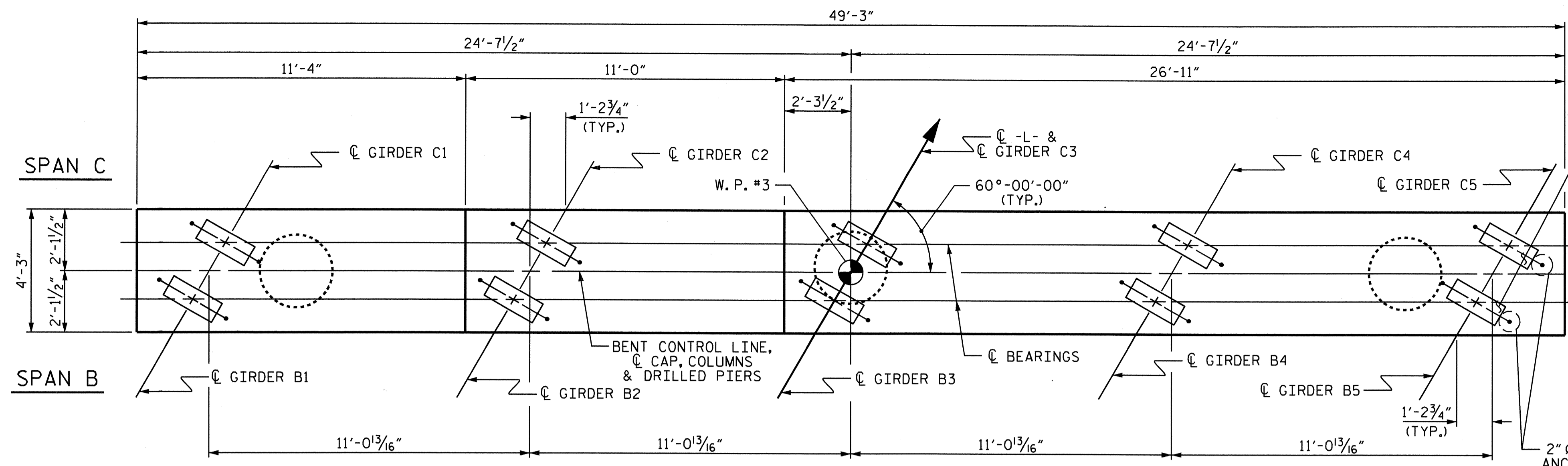
PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30-L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT #1

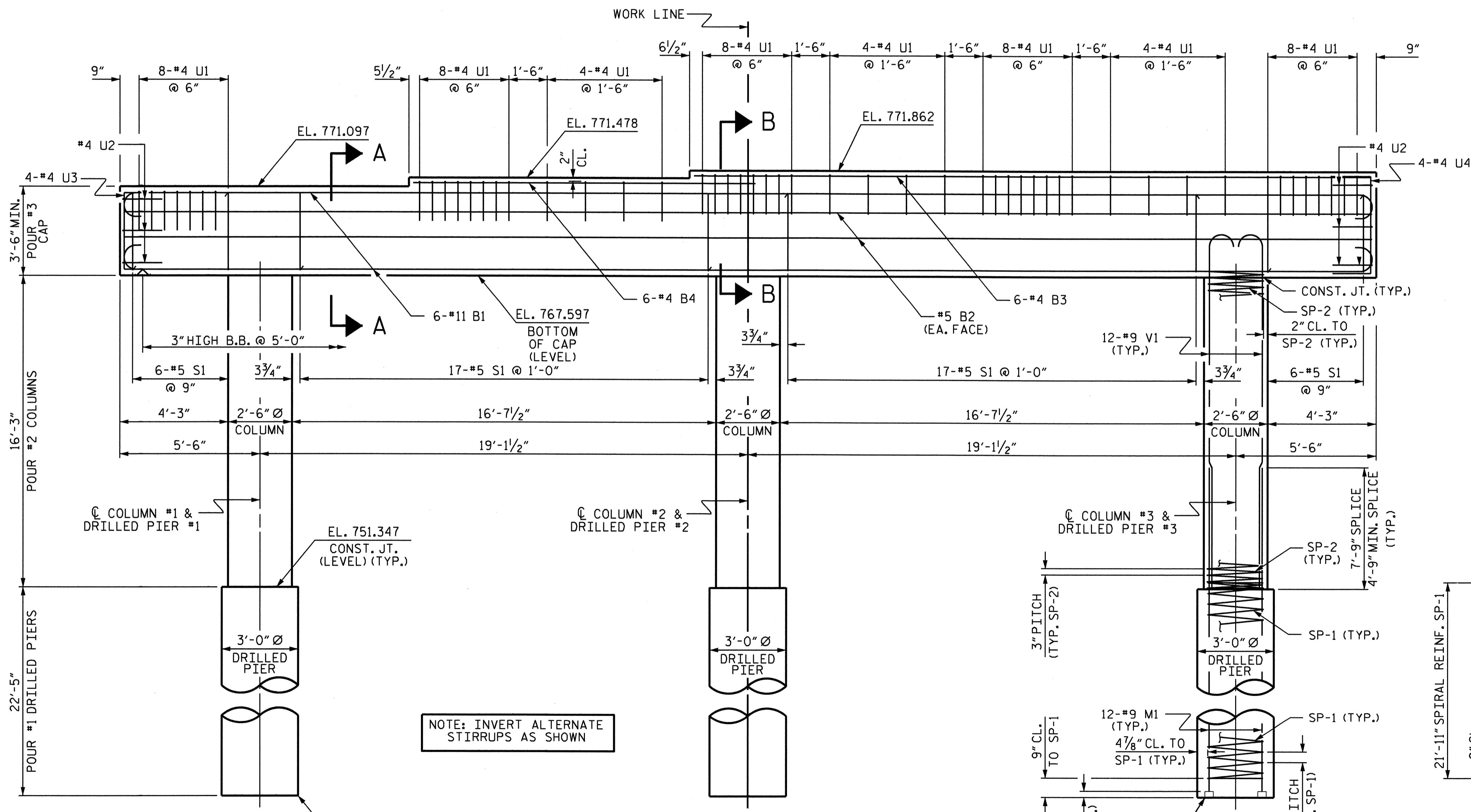


REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-30
 TOTAL SHEETS 42



PLAN OF CAP



ELEVATION

ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL

1'-11" x 9" x 2/4" ELASTOMERIC BEARING (TYPE V) (TYP. SPANS B & C) (SEE DETAIL A)

2" Ø x 2'-1" ANCHOR BOLT TO PROJECT 7" ABOVE CAP (TYP.)

NOTES

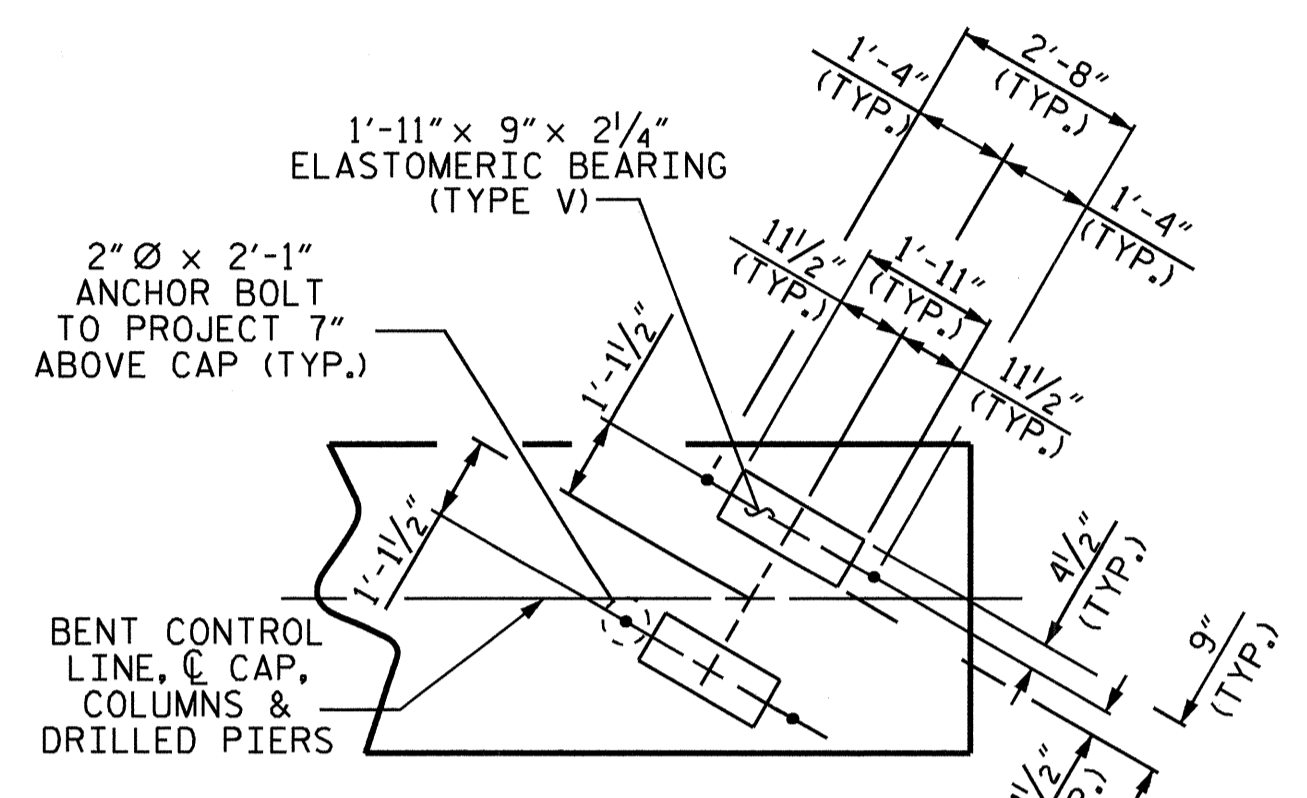
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

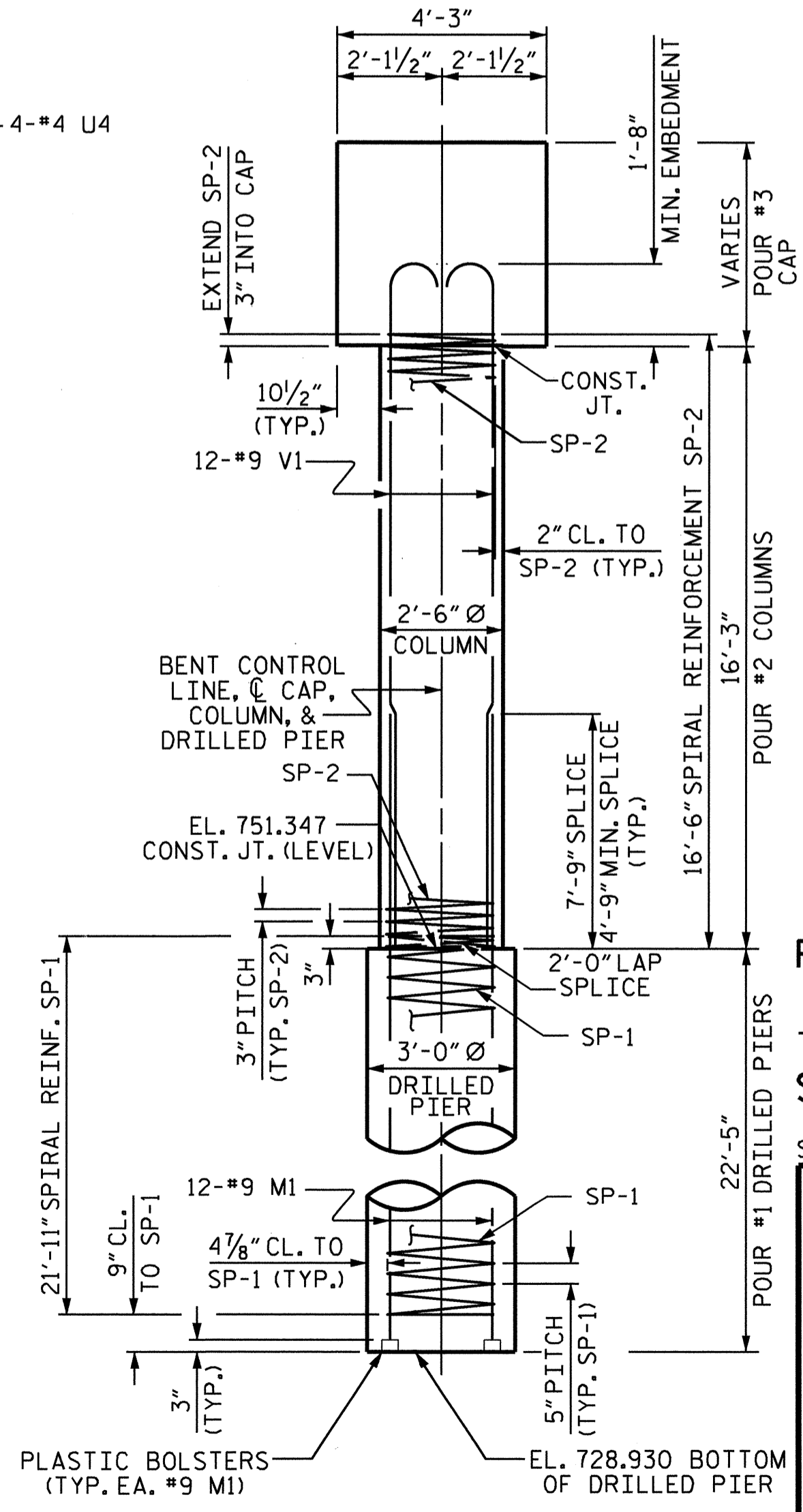
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

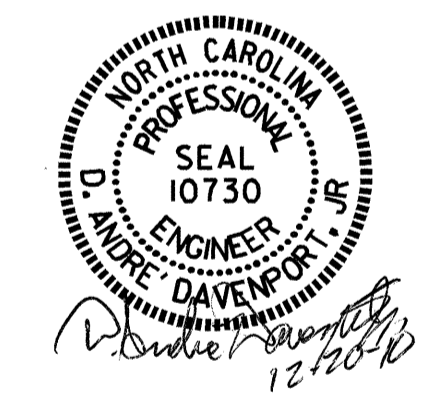
HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



DETAIL A
(TYP. ALL BEARINGS)



RIGHT END ELEVATION

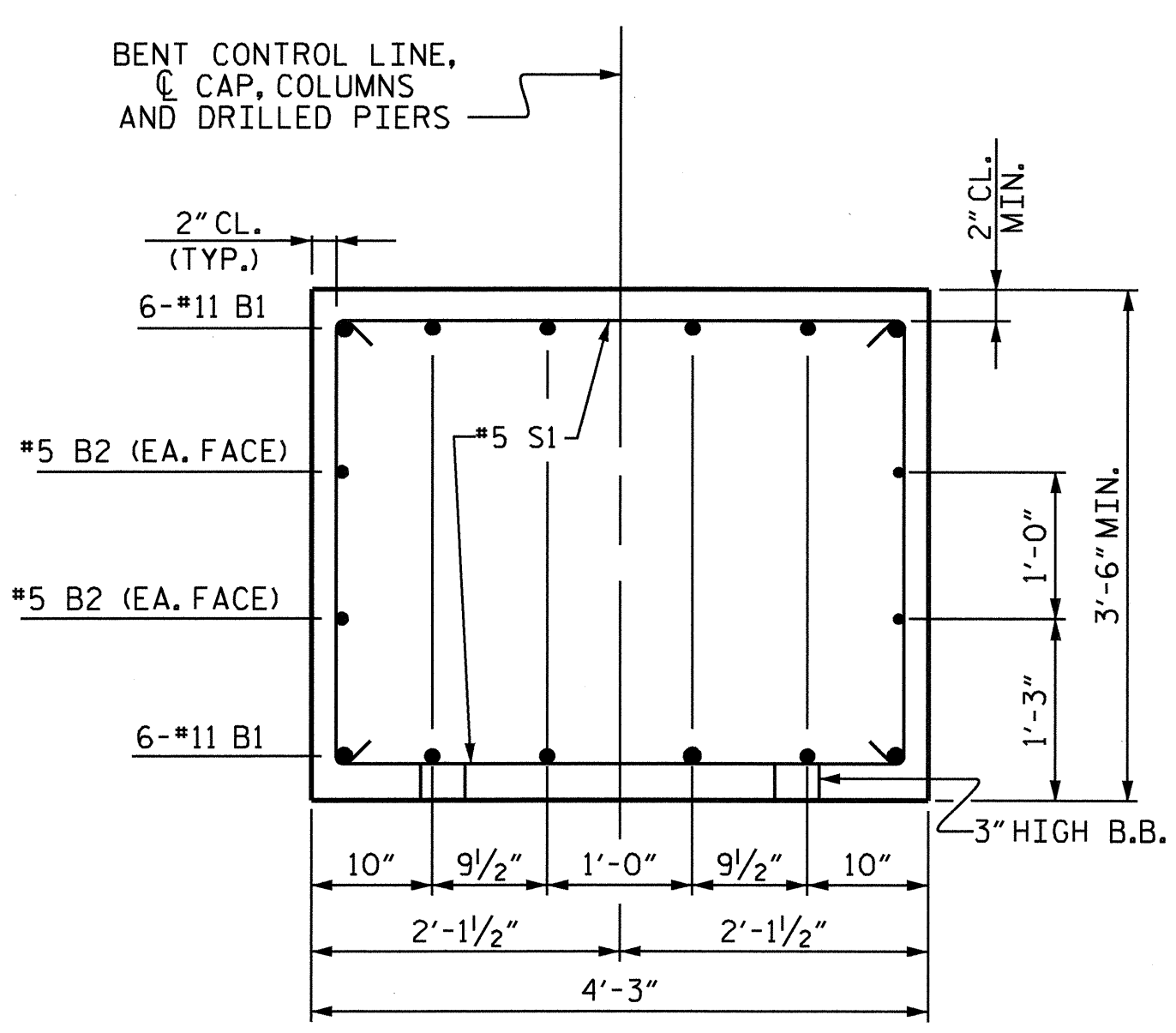


PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30-L-
 SHEET 1 OF 2

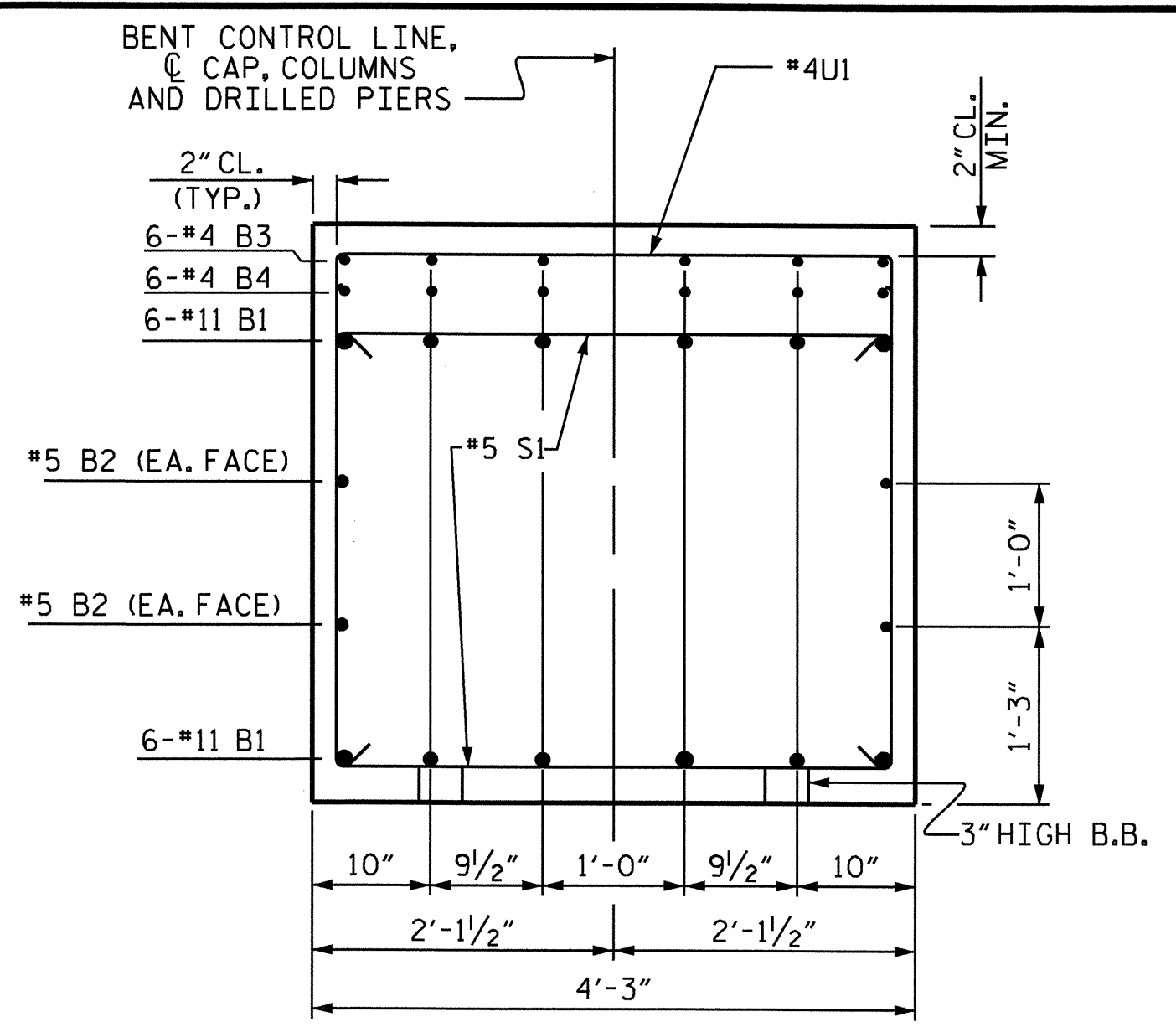
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT #2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-31
					TOTAL SHEETS 42

DRAWN BY: H. T. BARBOUR DATE: 4-23-10
 CHECKED BY: D. A. GLADDEN DATE: 6-10

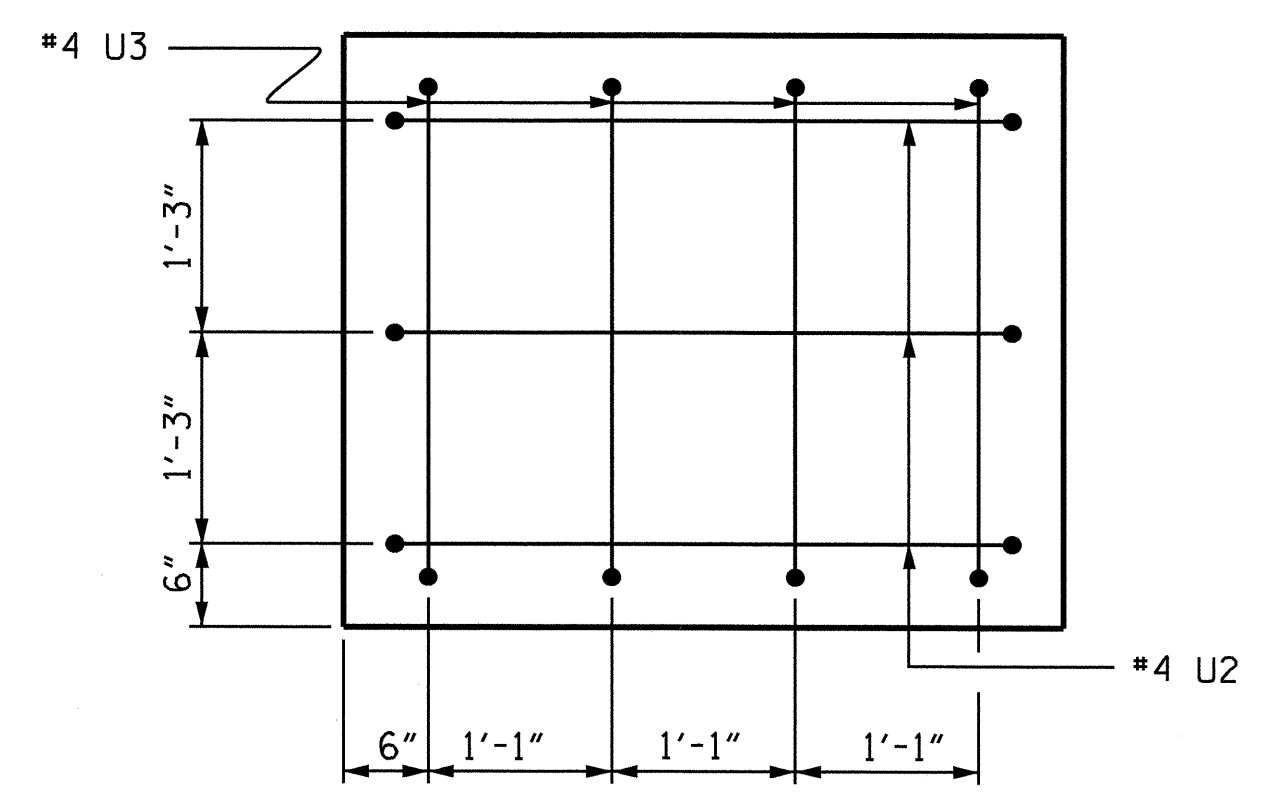
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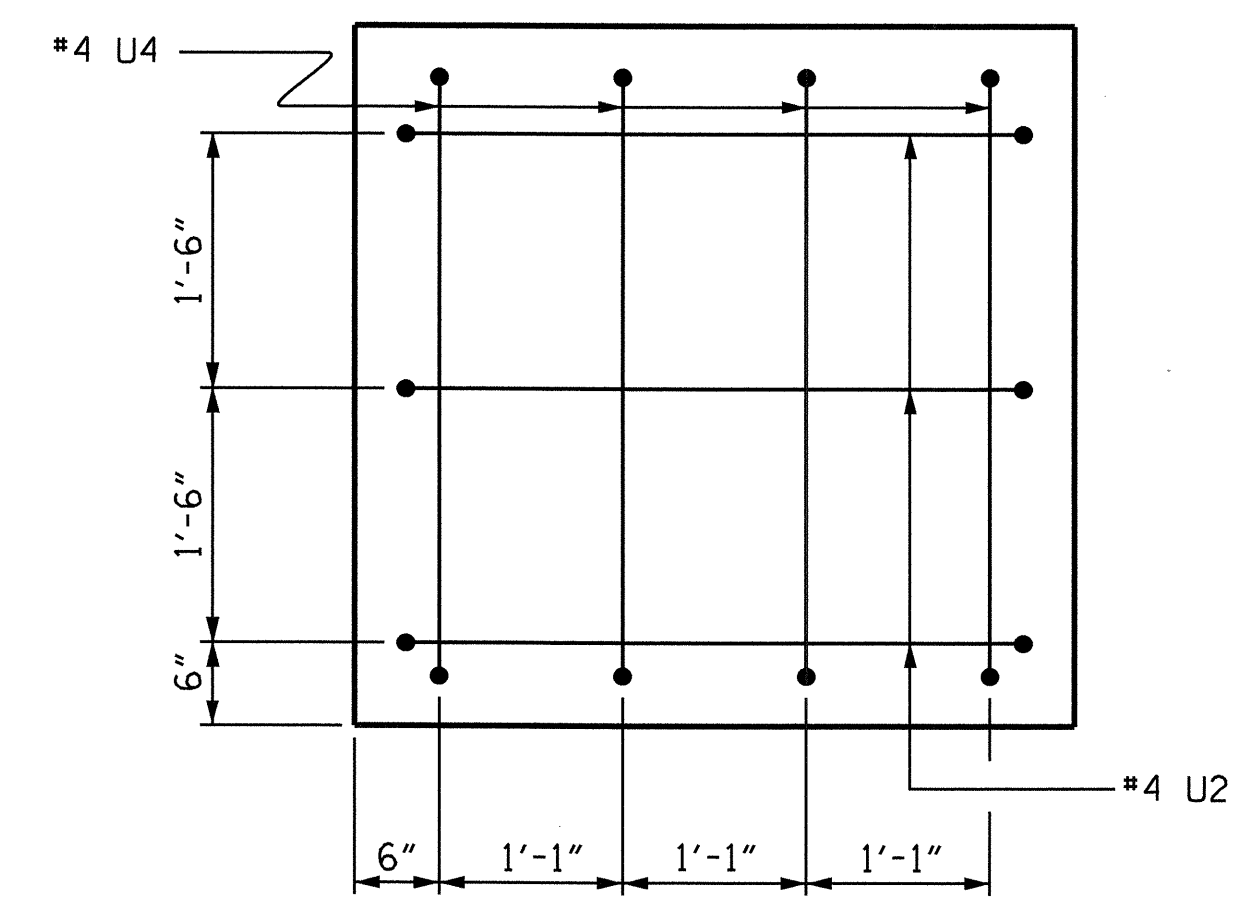
SECTION A-A



SECTION B-B

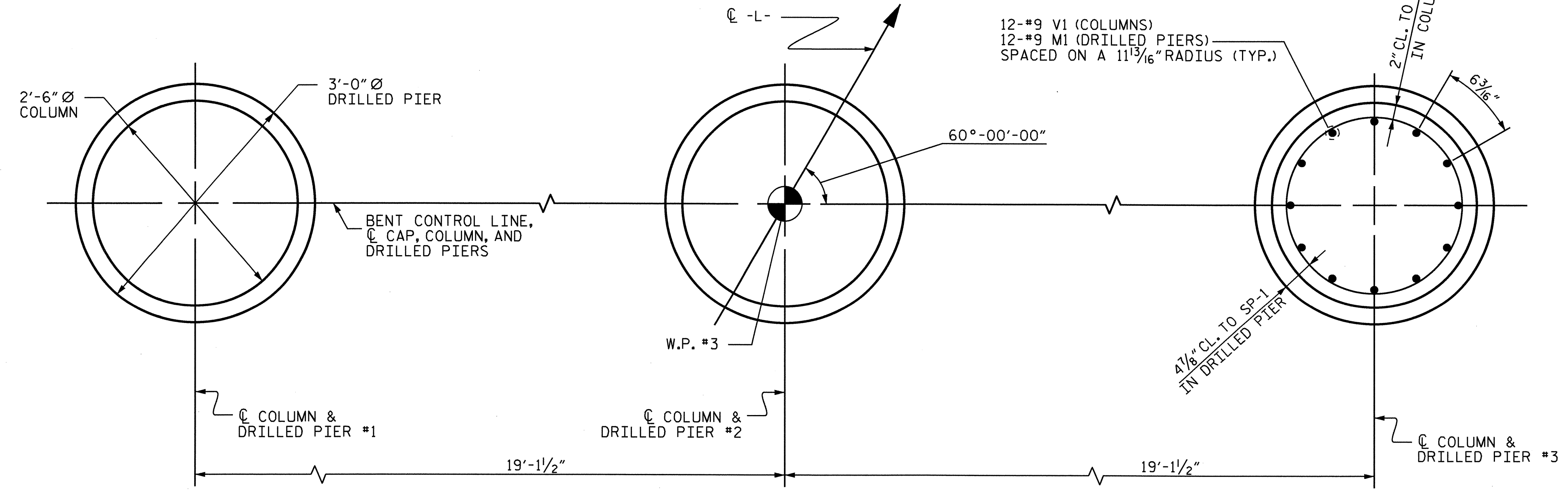


LEFT END VIEW



RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U3 AND #4U2 BARS.
 #4U3 AND #4U2 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

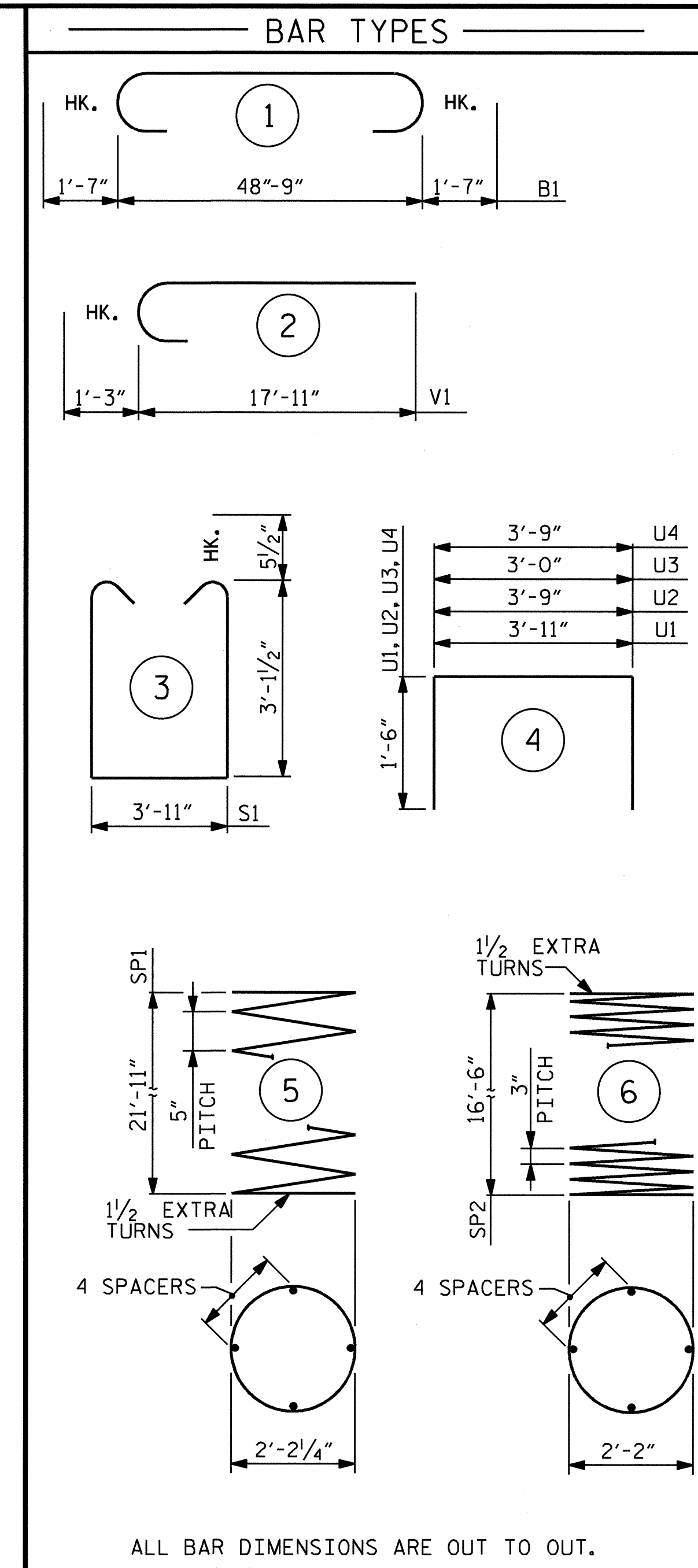


PLAN OF COLUMNS AND DRILLED PIERS

ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL

DRAWN BY : H. T. BARBOUR DATE : 4-23-10
 CHECKED BY : D. A. GLADDEN DATE : 6-10

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ALL BAR DIMENSIONS ARE OUT TO OUT.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
 ** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT #2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	51'-11"	3310
B2	4	#5	STR.	48'-11"	204
B3	6	#4	STR.	26'-7"	107
B4	6	#4	STR.	13'-5"	54
M1	36	#9	STR.	29'-11"	3662
S1	46	#5	3	11'-1"	532
U1	52	#4	4	6'-11"	240
U2	6	#4	4	6'-9"	27
U3	4	#4	4	6'-0"	16
U4	4	#4	4	6'-9"	18
V1	36	#9	2	19'-2"	2346

REINFORCING STEEL (LBS.)					10516
SP-1	3	*	5	363'-10"	1138
SP-2	3	**	6	449'-11"	902
SPIRAL REINFORCING STEEL (LBS.)					2040

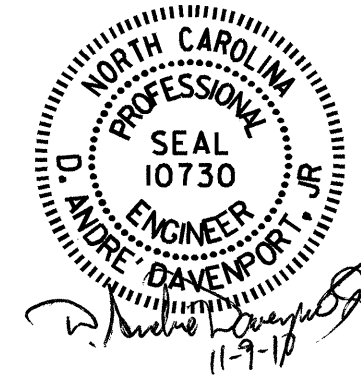
CLASS A CONCRETE		
POUR #2 (COLUMNS)		8.9 C.Y.
POUR #3 (CAP)		31.0 C.Y.
TOTAL		39.9 C.Y.

DRILLED PIERS		
DRILLED PIER CONCRETE		
POUR #1 (DRILLED PIERS)		17.6 C.Y.
3'-0" Ø DRILLED PIERS IN SOIL		30.25 LIN. FT.
3'-0" Ø DRILLED PIERS NOT IN SOIL		37.0 LIN. FT.
3'-0" Ø PERMANENT STEEL CASING		34.0 LIN. FT.
CSL TUBES		299.0 LIN. FT.

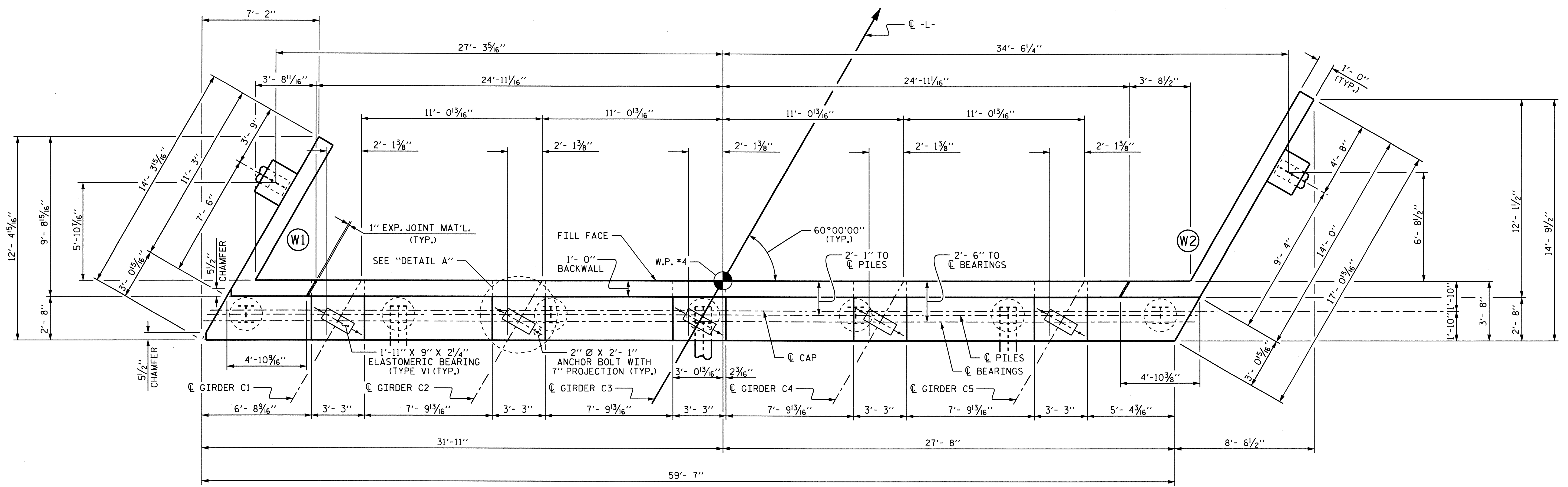
PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30-L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

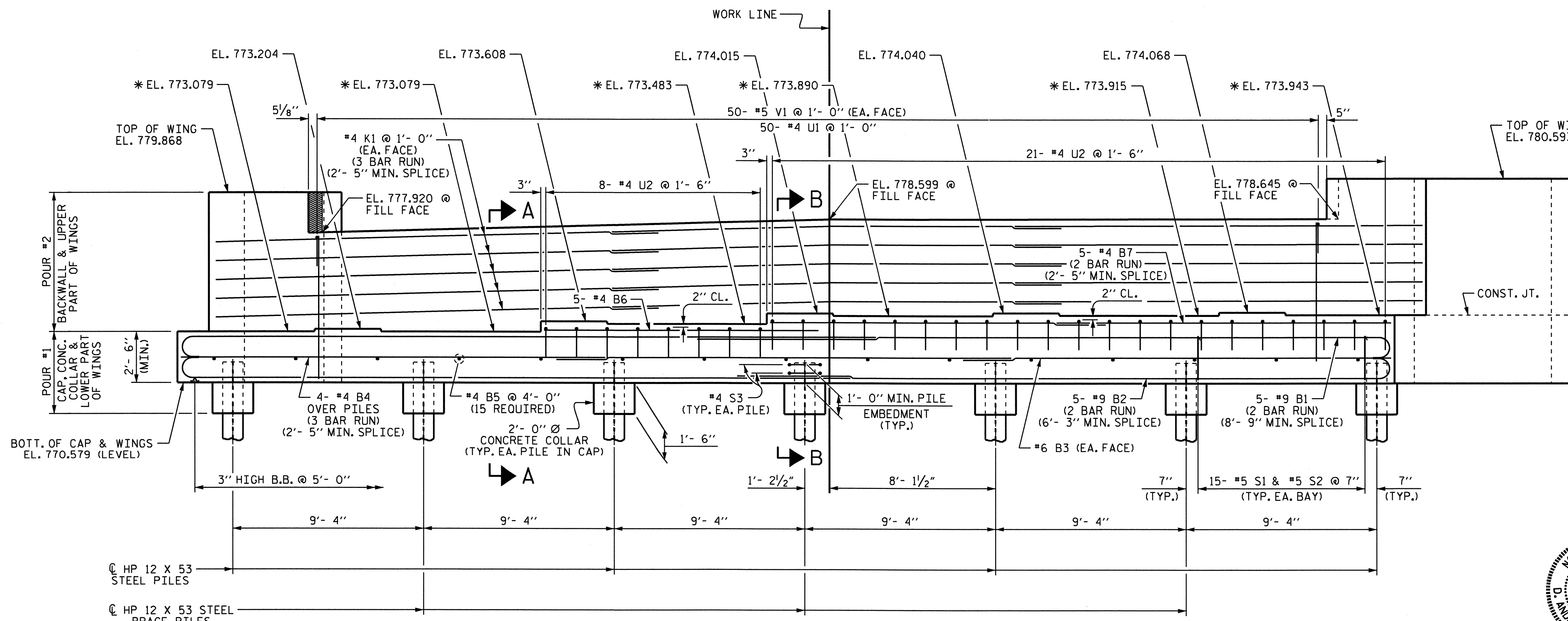
SUBSTRUCTURE BENT #2



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
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2			4			

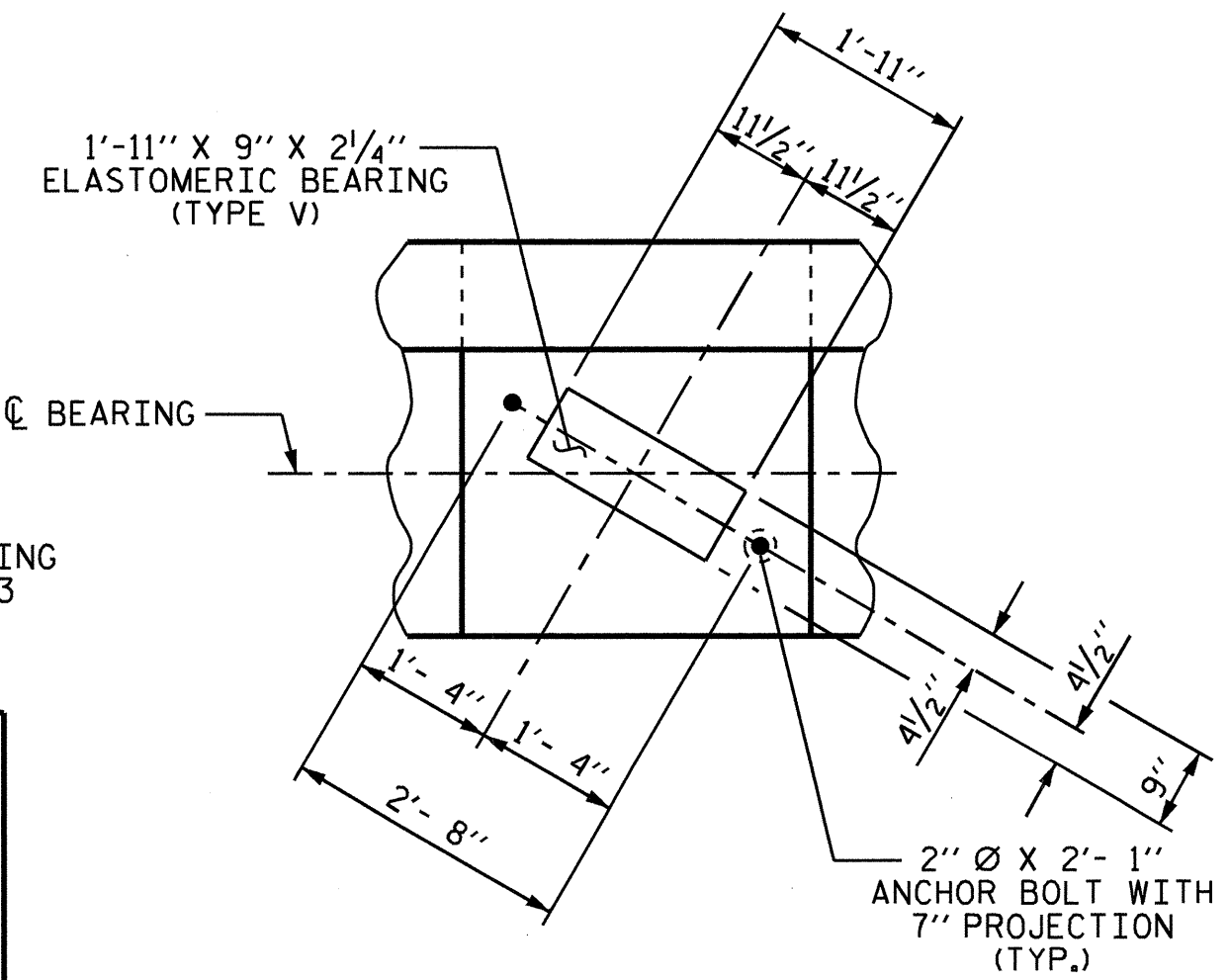


PLAN



ELEVATION

(WING PILES ARE NOT SHOWN FOR CLARITY)



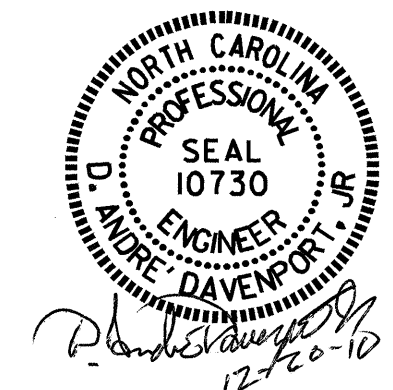
DETAIL A
(TYP. EACH GIRDER)

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 1 OF 3

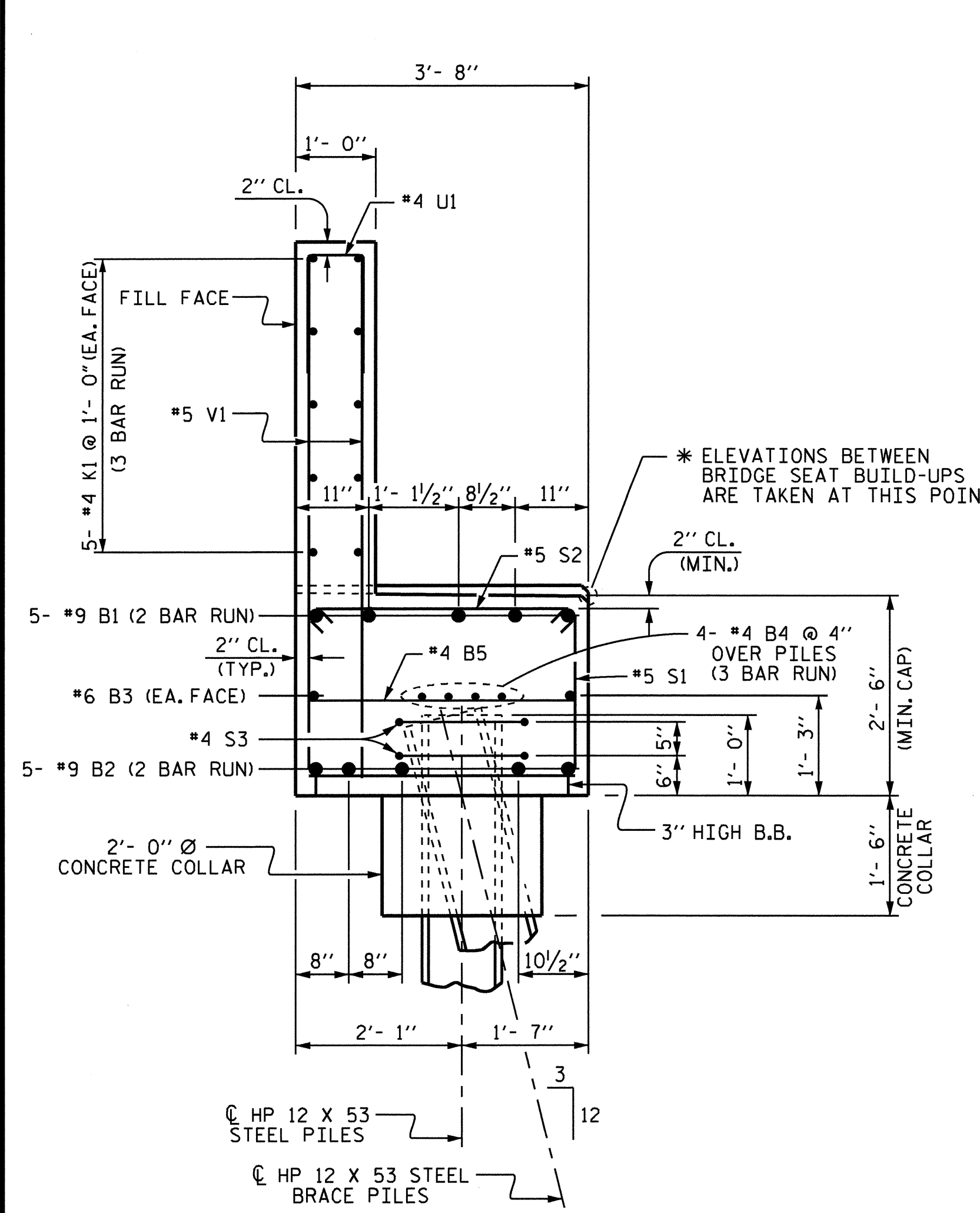
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT #2**

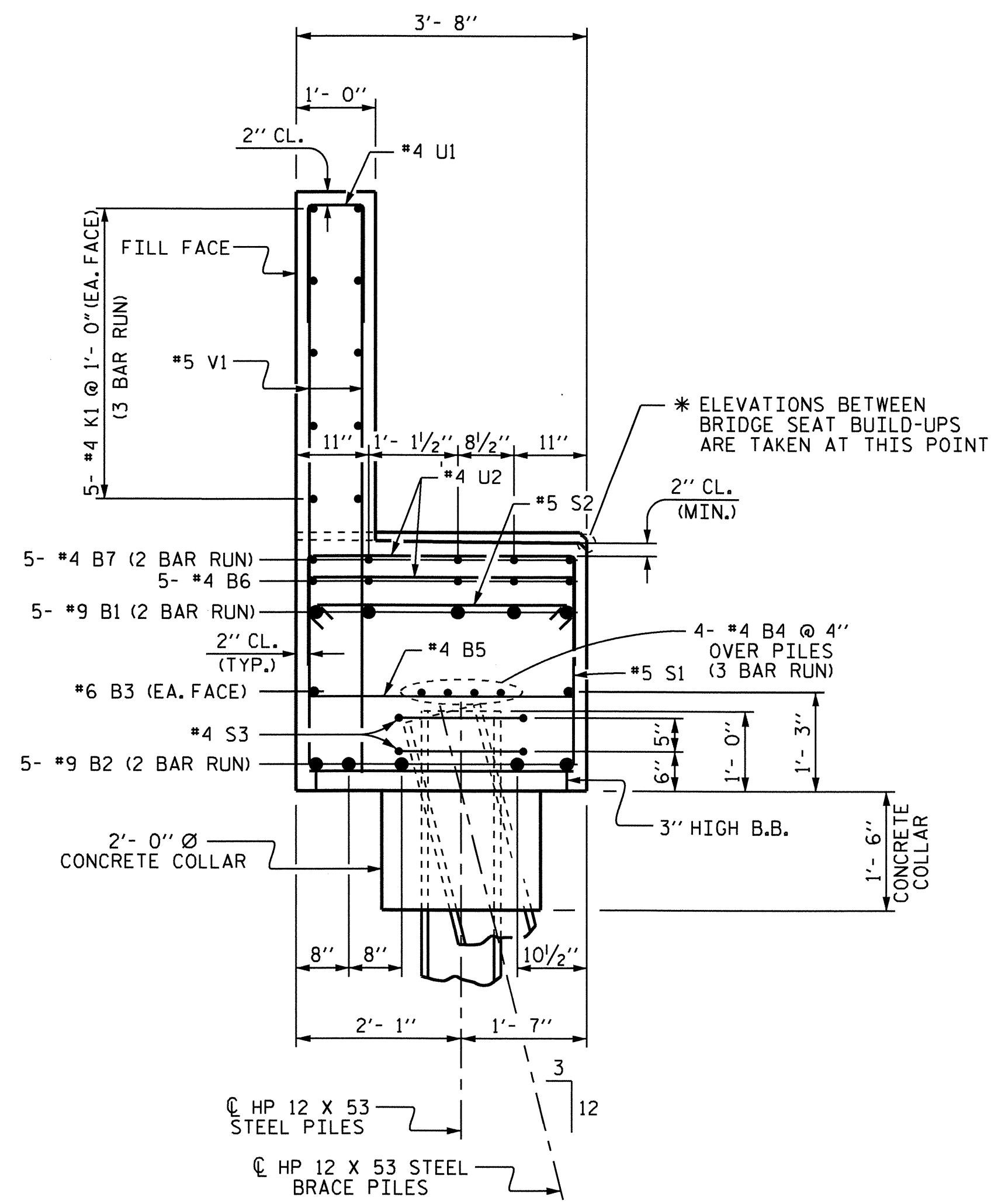


DRAWN BY : D. A. GLADDEN DATE : 4-14-10
 CHECKED BY : H. T. BARBOUR DATE : 6-22-10

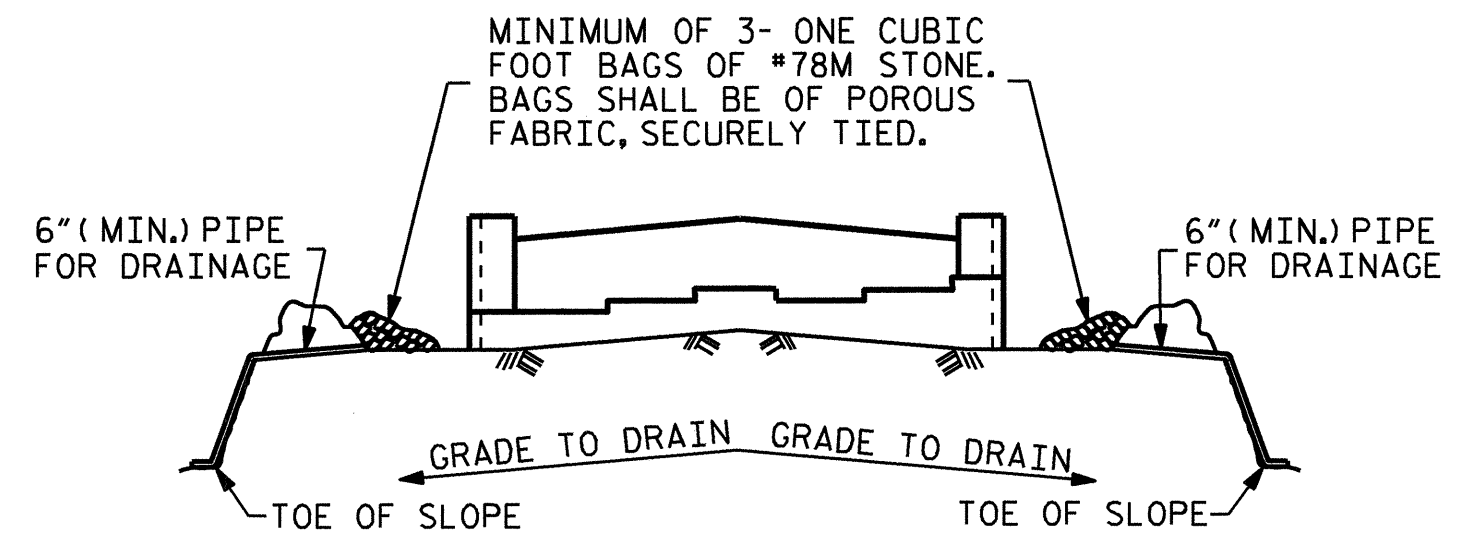
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	
2			4			42	



SECTION A-A



SECTION B-B



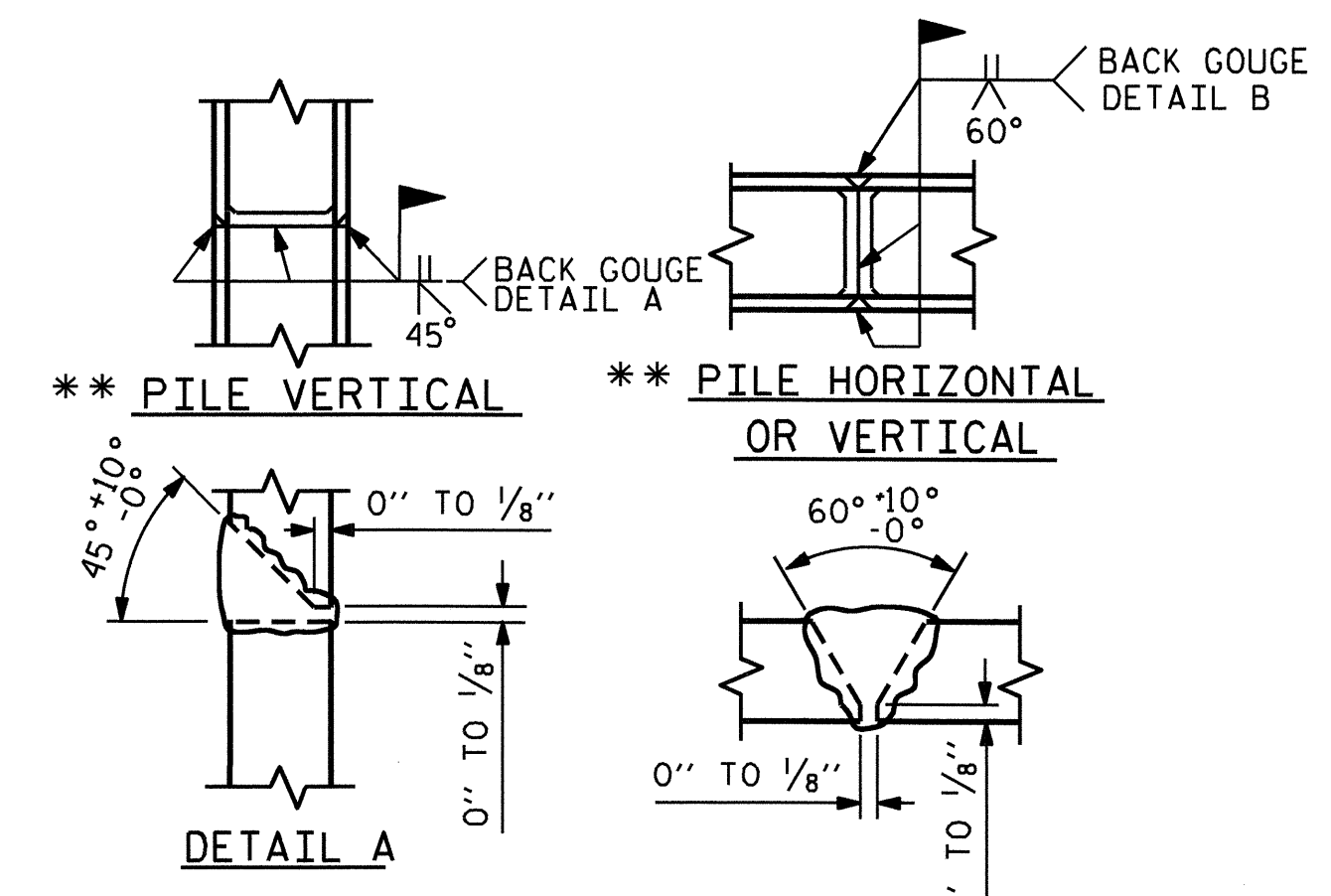
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

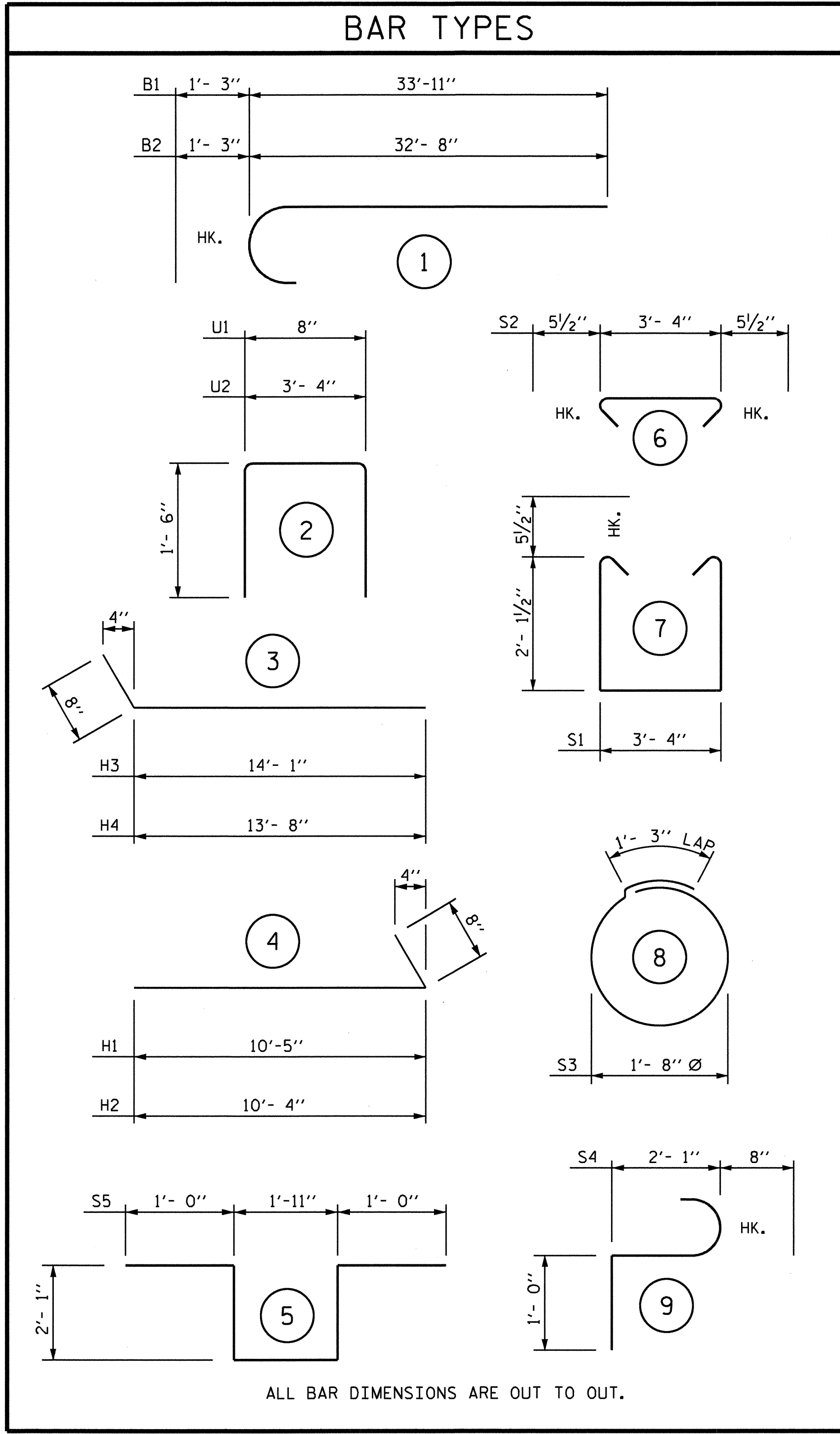
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



NOTES

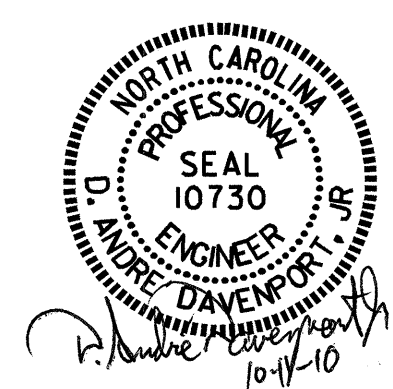
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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.



BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9	1	35'- 2"	1196
B2	10	#9	1	33'-11"	1153
B3	2	#6	STR	59'- 2"	178
B4	12	#4	STR	21'- 5"	172
B5	15	#4	STR	3'- 4"	33
B6	5	#4	STR	13'- 4"	45
B7	10	#4	STR	17'- 6"	117
H1	11	#5	4	11'- 1"	127
H2	11	#5	4	11'- 0"	126
H3	12	#5	3	14'- 9"	185
H4	12	#5	3	14'- 4"	179
K1	30	#4	STR	21'- 5"	429
K2	12	#4	STR	4'- 5"	35
S1	90	#5	7	8'- 6"	798
S2	90	#5	6	4'- 3"	399
S3	14	#4	8	6'- 6"	61
S4	6	#6	9	3'- 9"	34
S5	2	#6	5	8'- 1"	24
U1	50	#4	2	3'- 8"	122
U2	29	#4	2	6'- 4"	123
V1	100	#5	STR	7'- 0"	730
V2	34	#5	STR	8'-11"	316
V3	44	#5	STR	9'- 8"	444
REINFORCING STEEL				7026	LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP, CONCRETE COLLAR & LOWER PART OF WINGS) = 29.2 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS = 16.9 C.Y.

TOTAL CLASS A CONCRETE = 46.1 C.Y.

HP 12 X 53 STEEL PILES

NO. 9 LIN. FT. 250

PROJECT NO. B-4176

LINCOLN COUNTY

STATION: 20+07.30 -L-

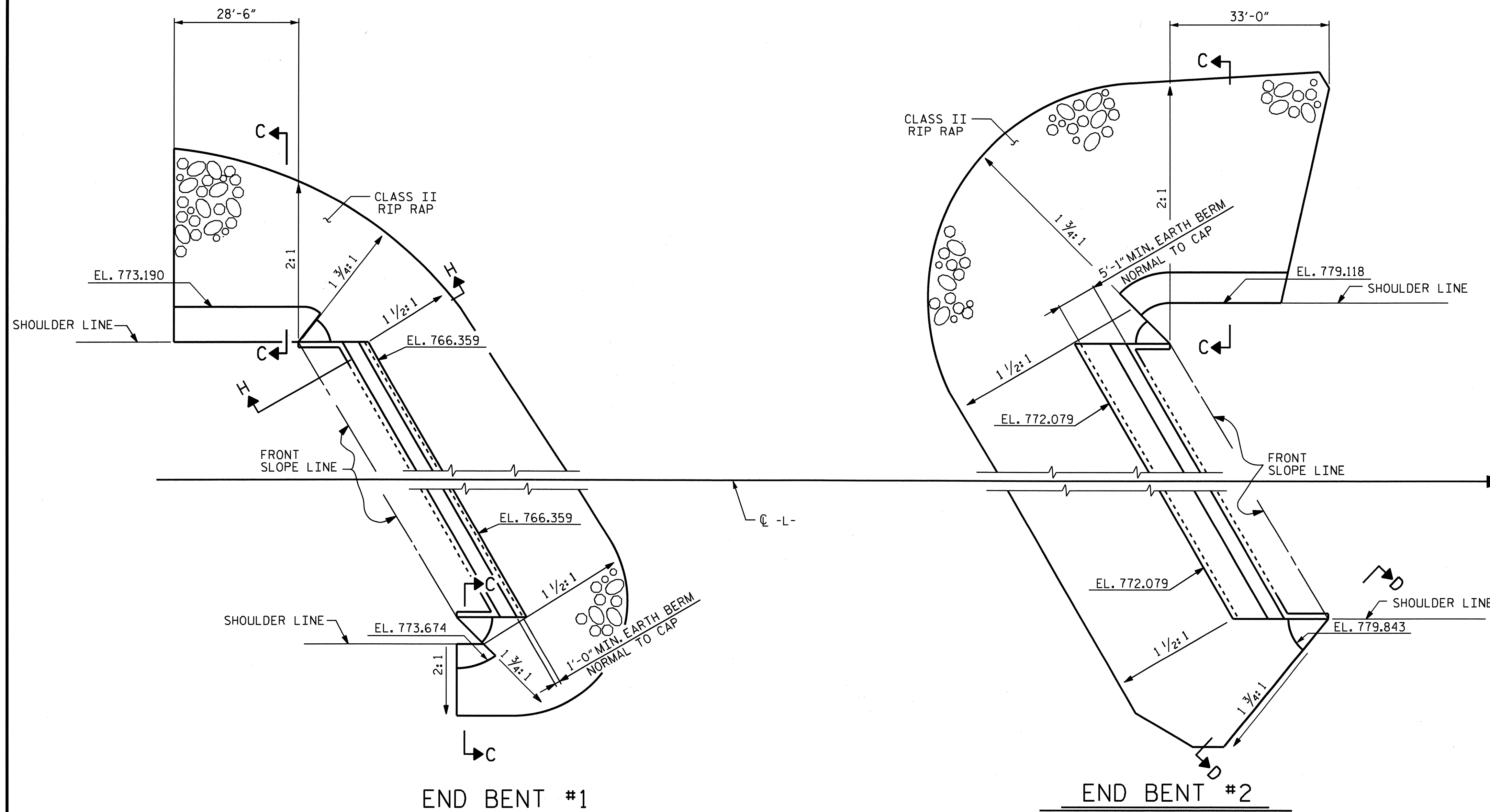
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

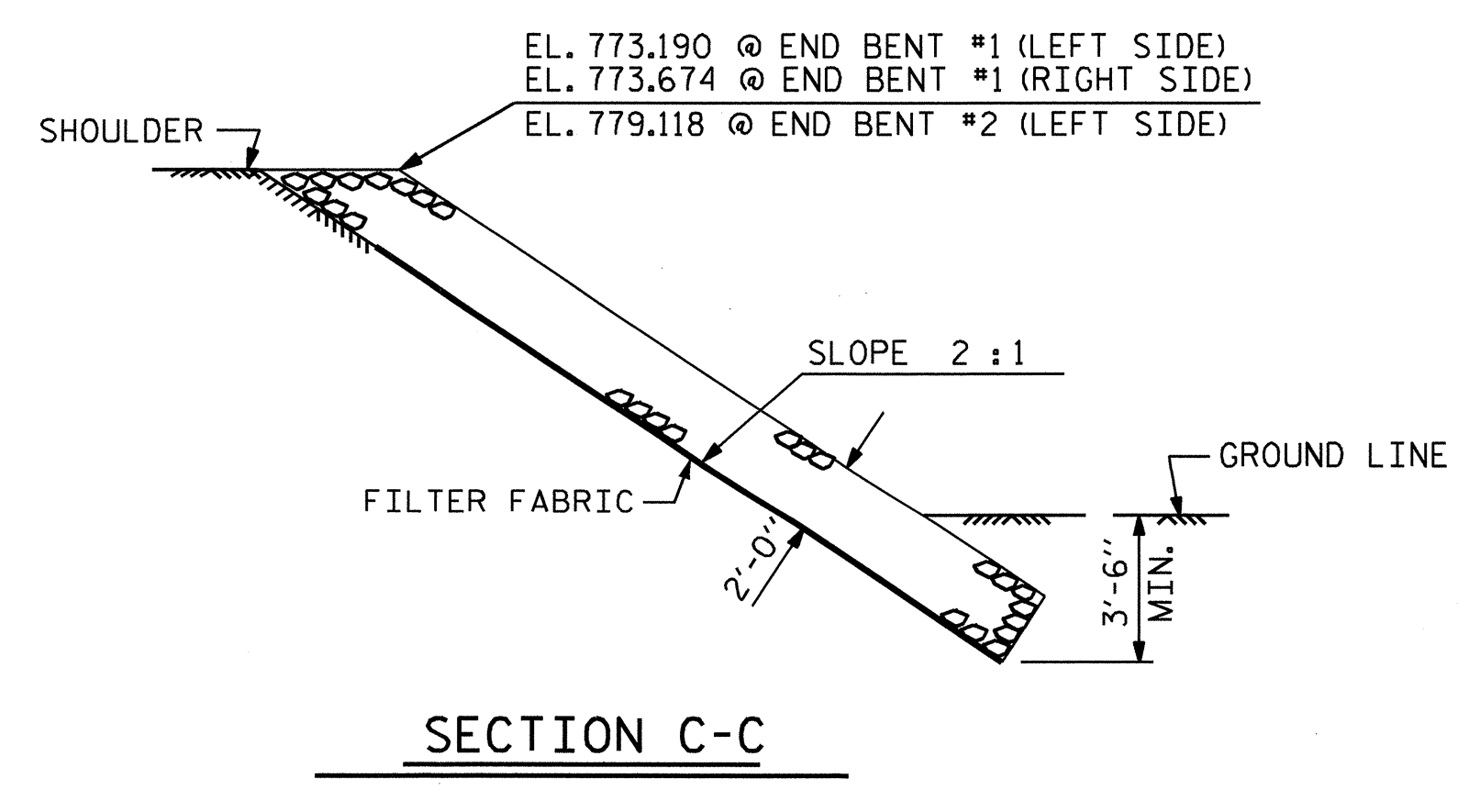
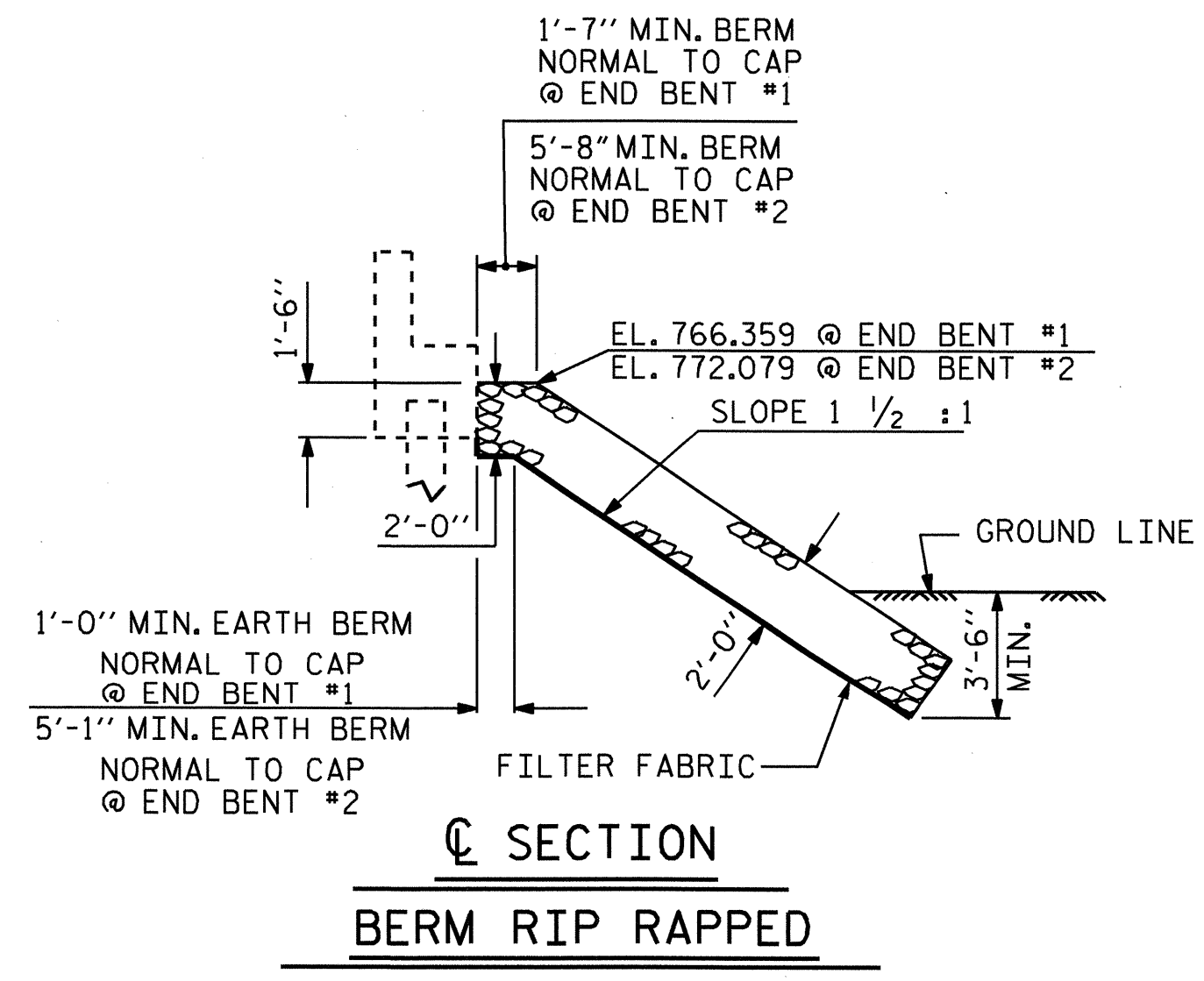
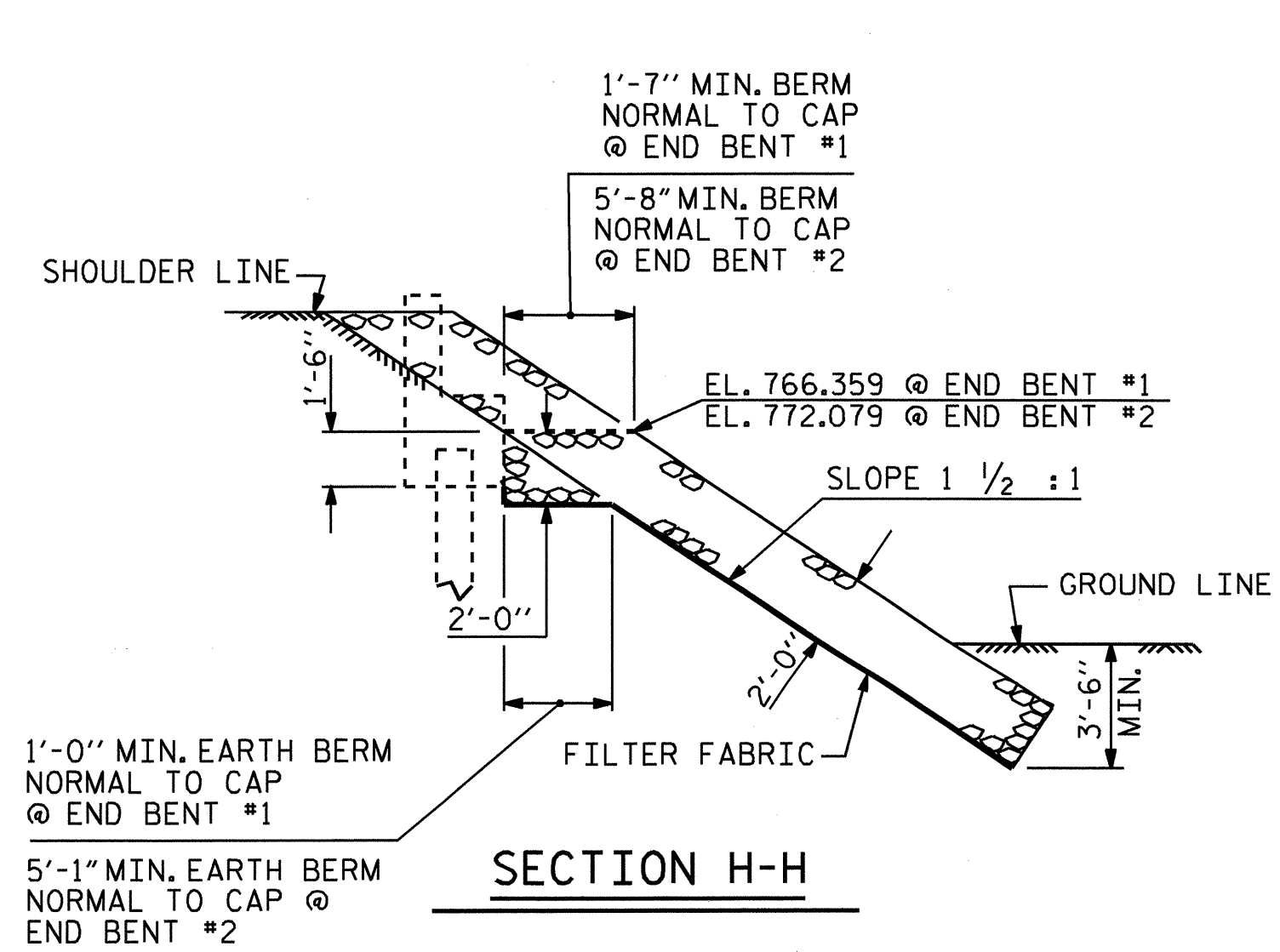
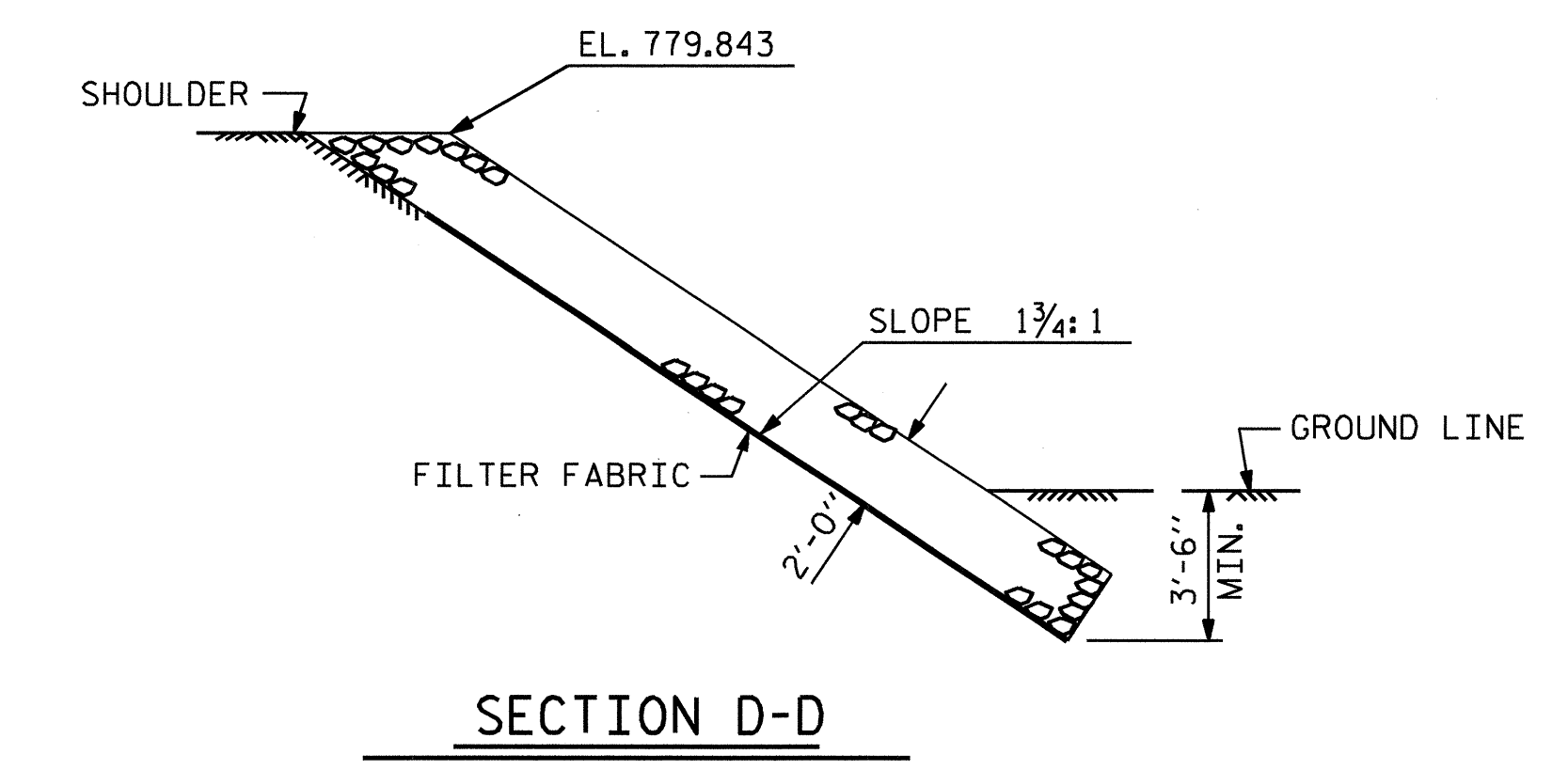
SUBSTRUCTURE
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: D. A. GLADDEN DATE: 4-14-10
CHECKED BY: H. T. BARBOUR DATE: 6-22-10



ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+07.30 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
-L-	TONS	SQUARE YARDS
END BENT 1	490	545
END BENT 2	770	855
SUB TOTAL	1260	1400
-DET-		
END BENT 1	85	95
END BENT 2	65	75
SUB TOTAL	150	170
TOTAL	1410	1570

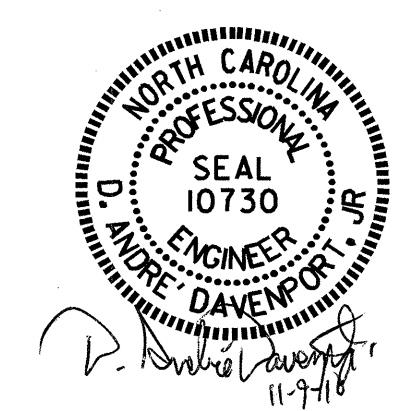


PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

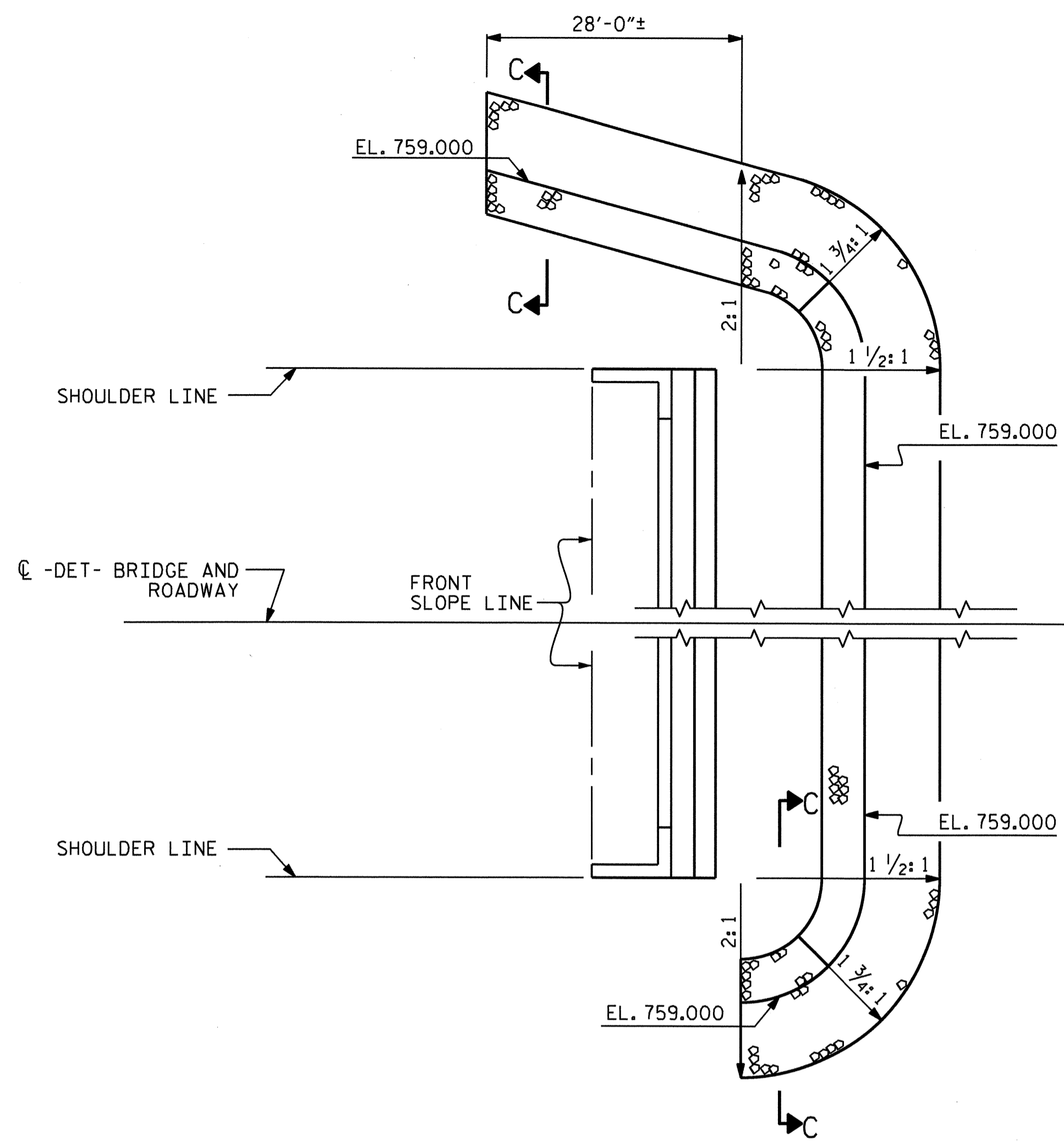
—RIP RAP DETAILS—

REVISIONS						SHEET NO.	
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2			4				

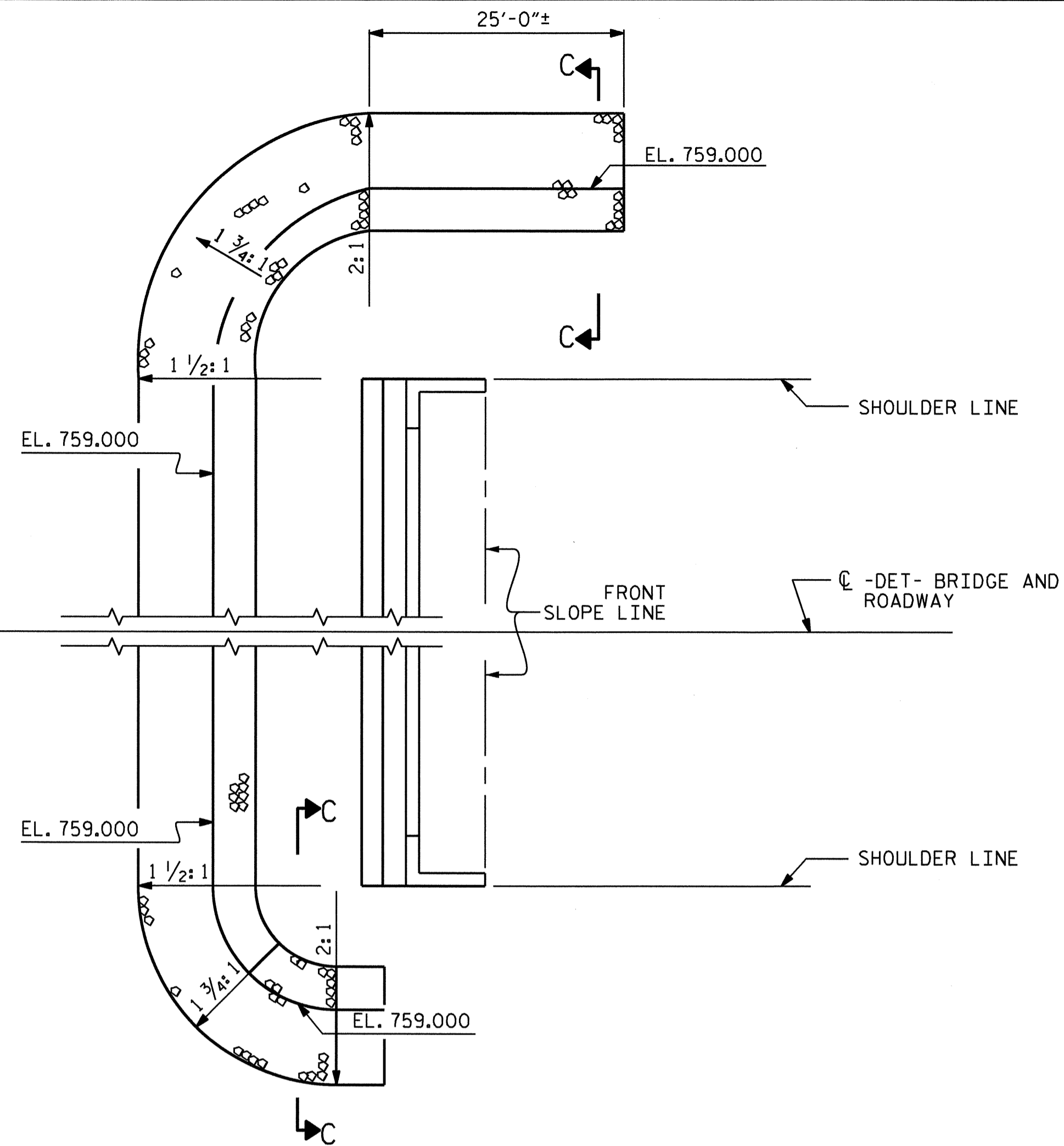


ASSEMBLED BY : W. B. HILL DATE : 10/09
 CHECKED BY : D. A. GLADDEN DATE : 02/10
 DRAWN BY : REK 1/84 REV. 8/16/99 RWW/LES
 CHECKED BY : RDU 1/84 REV. 10/17/00 RWW/LES
 REV. 5/1/06 TLA/GM

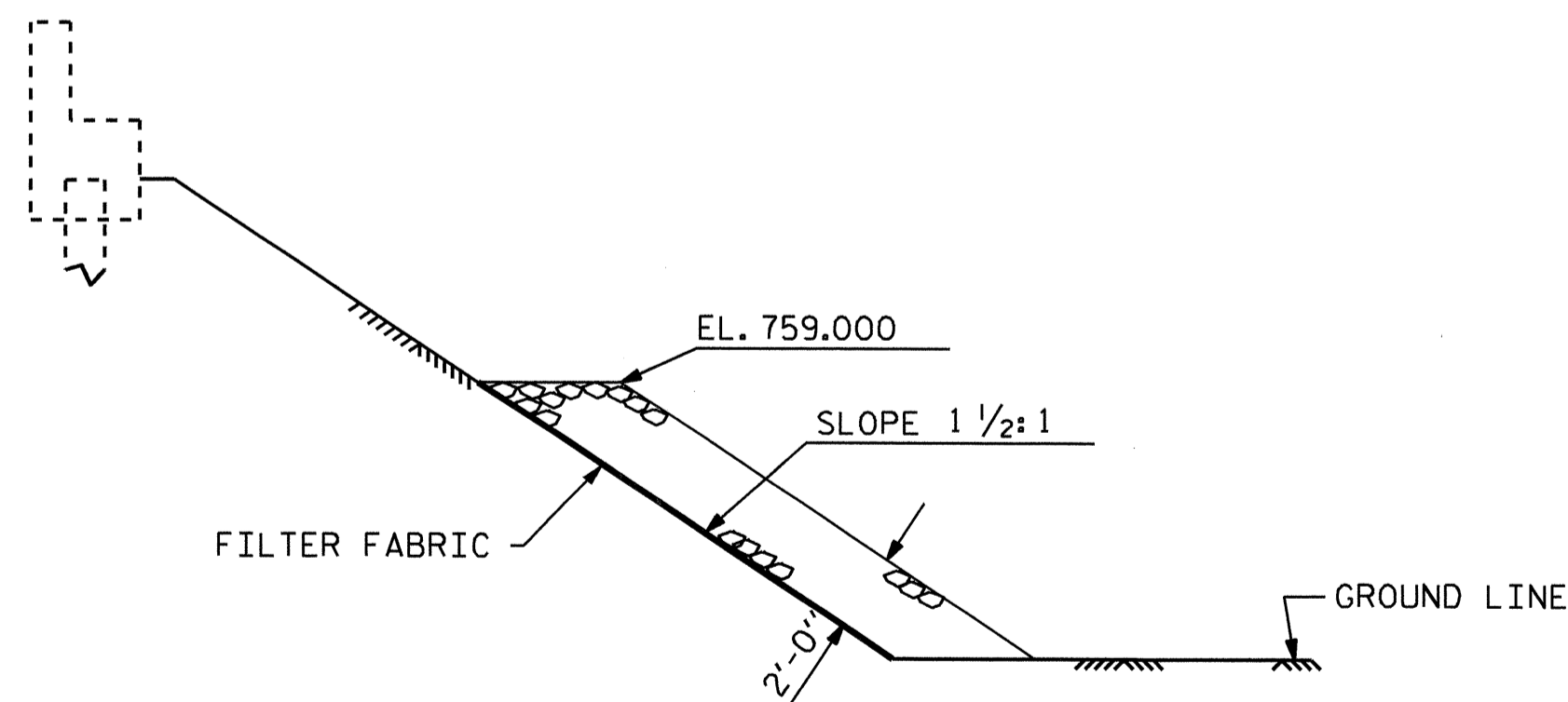
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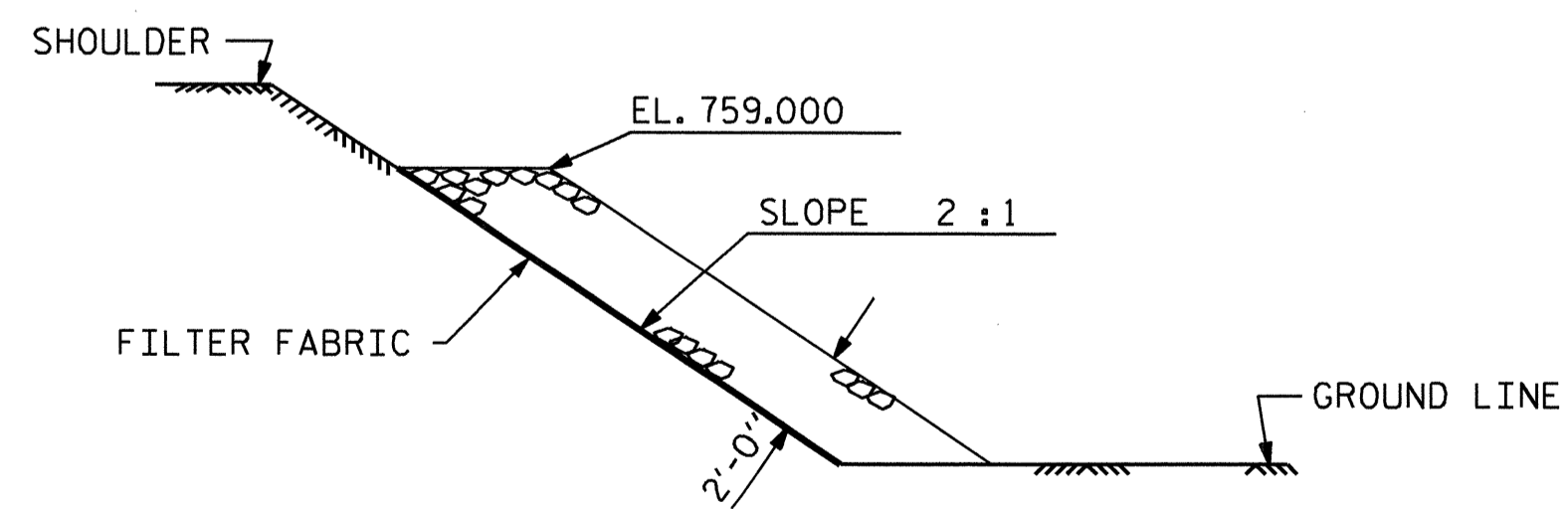
END BENT #1



END BENT #2



C SECTION



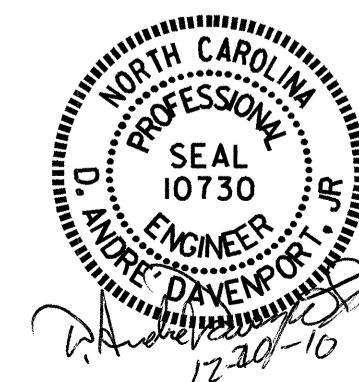
SECTION C-C

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RIP RAP DETAILS
 TEMPORARY DETOUR
 STRUCTURE



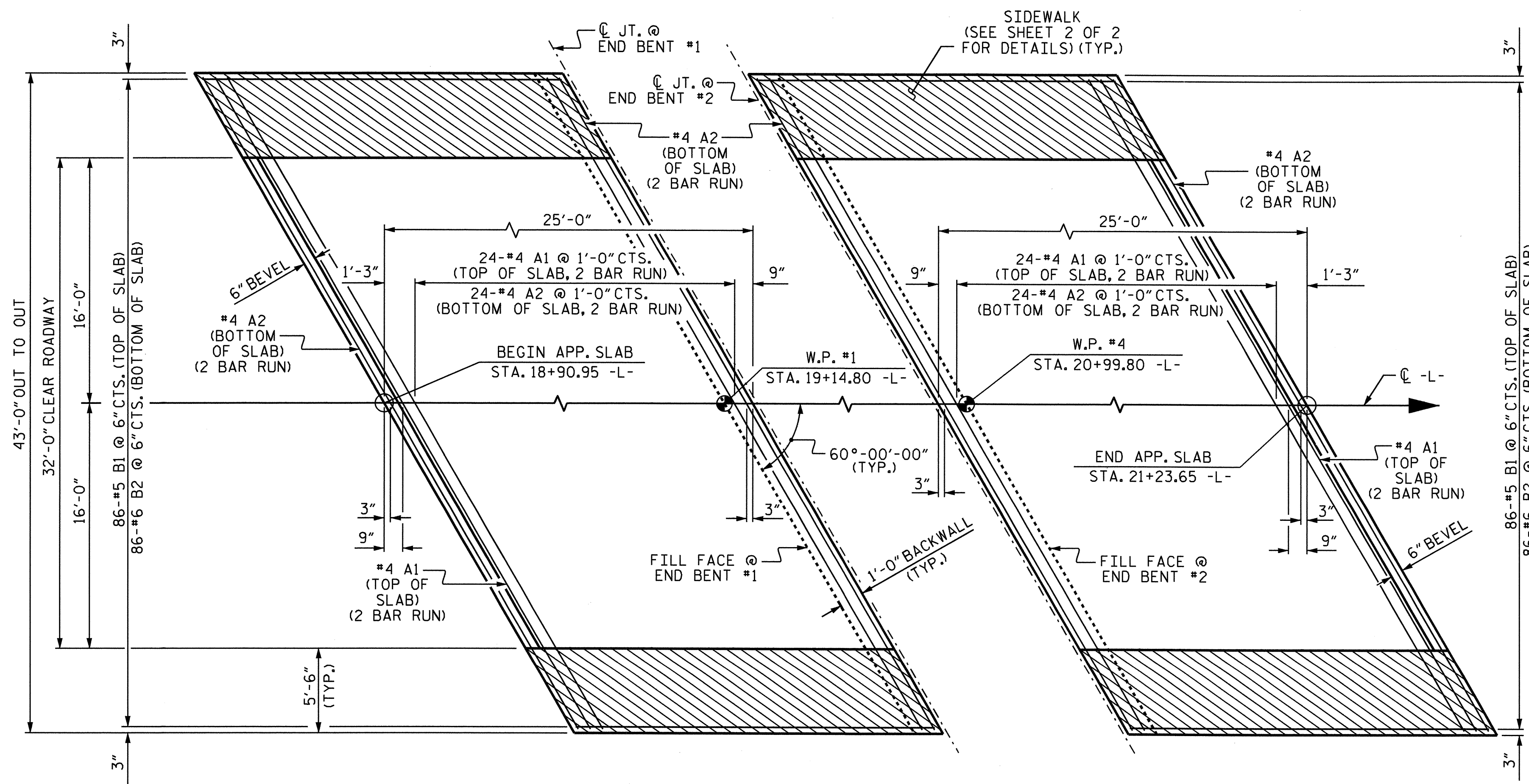
ASSEMBLED BY : D.A. DAVENPORT	DATE : 11/10
CHECKED BY : W.B. HILL	DATE : 11/10
DRAWN BY : FCJ 2/88	REV. 8/16/99 RWW/LES
CHECKED BY : ARB 8/88	REV. 10/17/00 RWW/LES
	REV. 5/1/06R TLA/GM

20-DEC-2010 15:32
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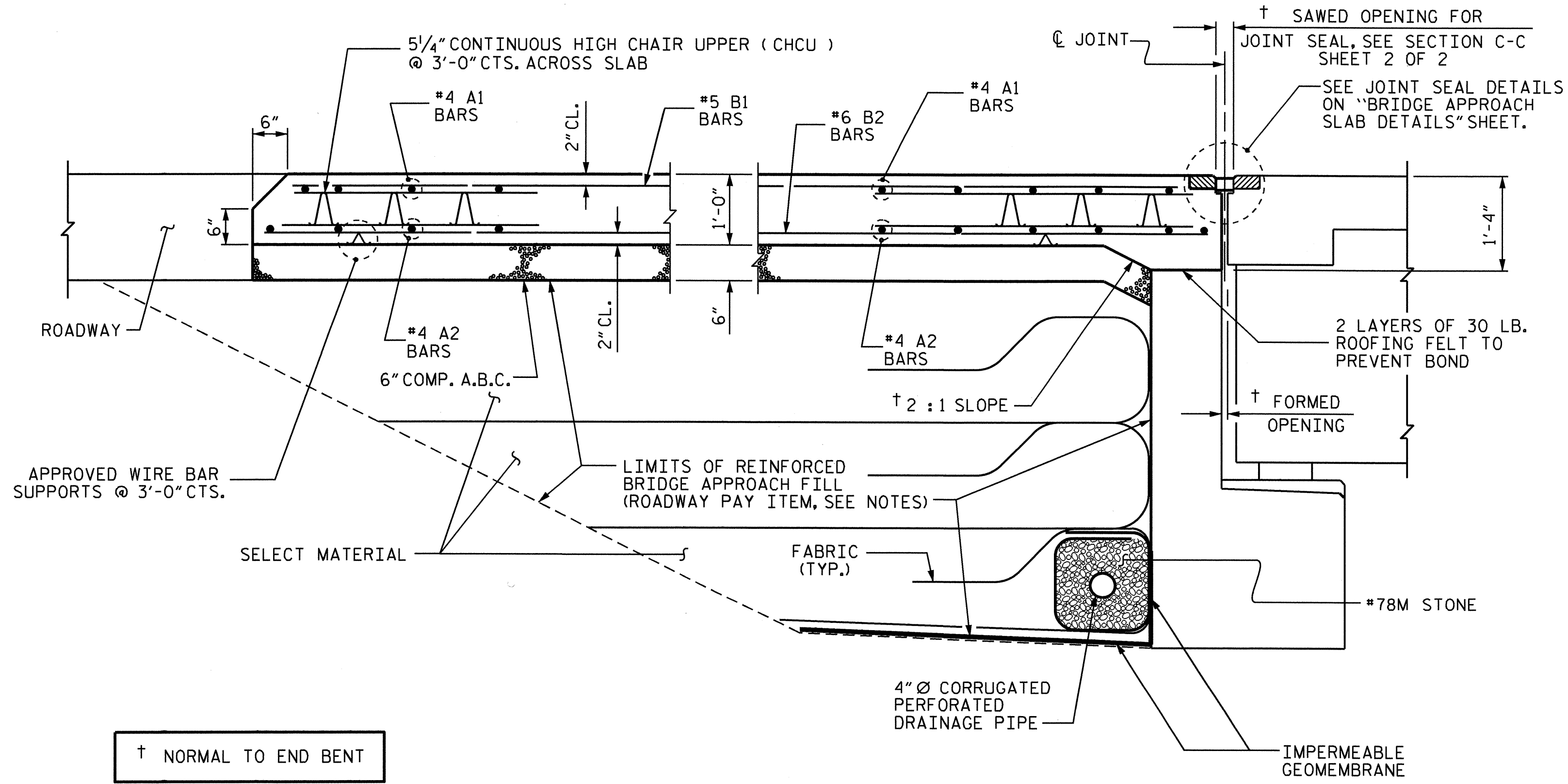
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37	
1			3			TOTAL SHEETS	
2			4			42	

SKREW 90°

STD. NO. RR2



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



SECTION THRU SLAB

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, 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 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWSD PRIOR TO THE CASTING OF THE END POST, AND SIDEWALK.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

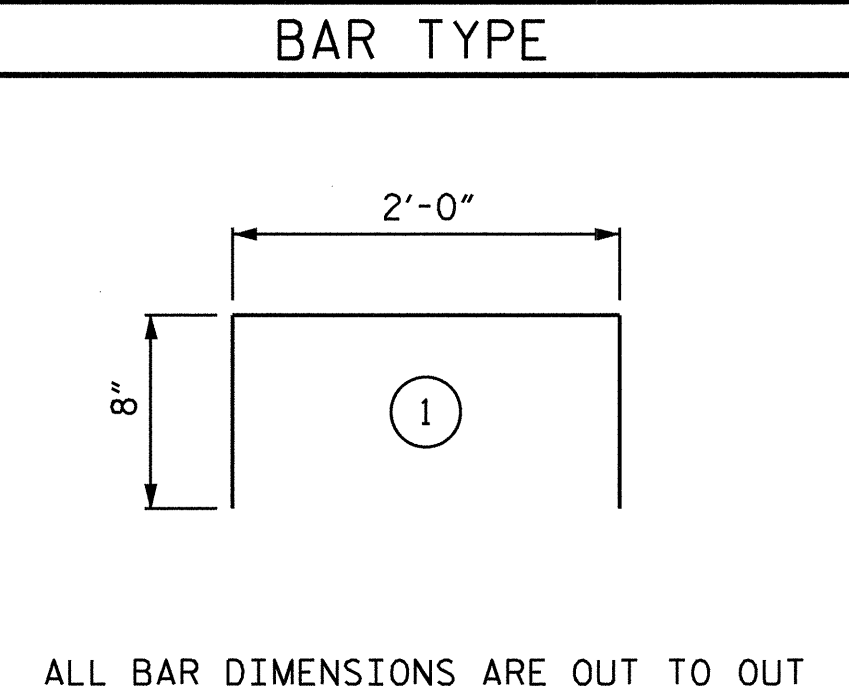
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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 "EVAZOTE JOINT SEALS".

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	25'-8"	857
A2	52	#4	STR	25'-7"	889
*B1	86	#5	STR	23'-7"	2115
B2	86	#6	STR	24'-7"	3175
*B3	8	#4	STR	24'-7"	131
*G1	50	#4	STR	5'-9"	192
*U1	16	#4	1	3'-4"	36
REINFORCING STEEL				4064	LBS.
*EPOXY COATED REINFORCING STEEL				3331	LBS.
CLASS AA CONCRETE				46.7	C. Y.

APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	25'-8"	857
A2	52	#4	STR	25'-7"	889
*B1	86	#5	STR	23'-7"	2115
B2	86	#6	STR	24'-7"	3175
*B3	8	#4	STR	24'-7"	131
*G1	50	#4	STR	5'-9"	192
*U1	16	#4	1	3'-4"	36
REINFORCING STEEL				4064	LBS.
*EPOXY COATED REINFORCING STEEL				3331	LBS.
CLASS AA CONCRETE				46.7	C. Y.

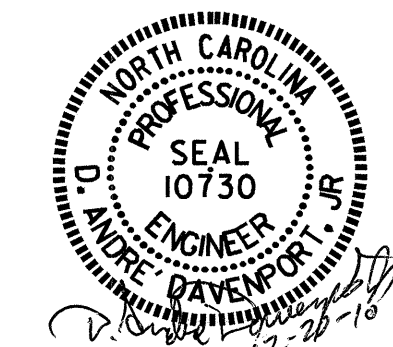


PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-
 SHEET 1 OF 2

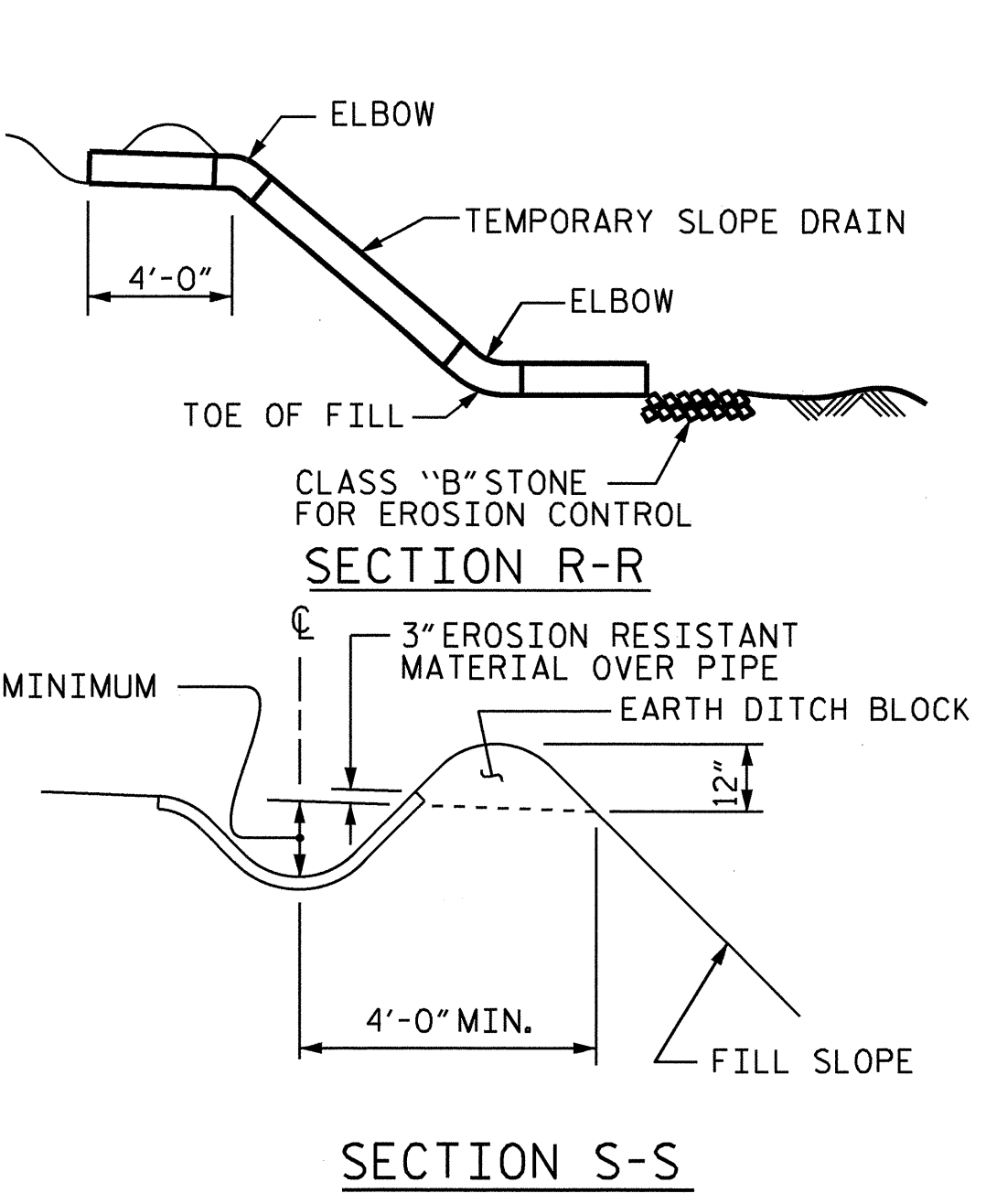
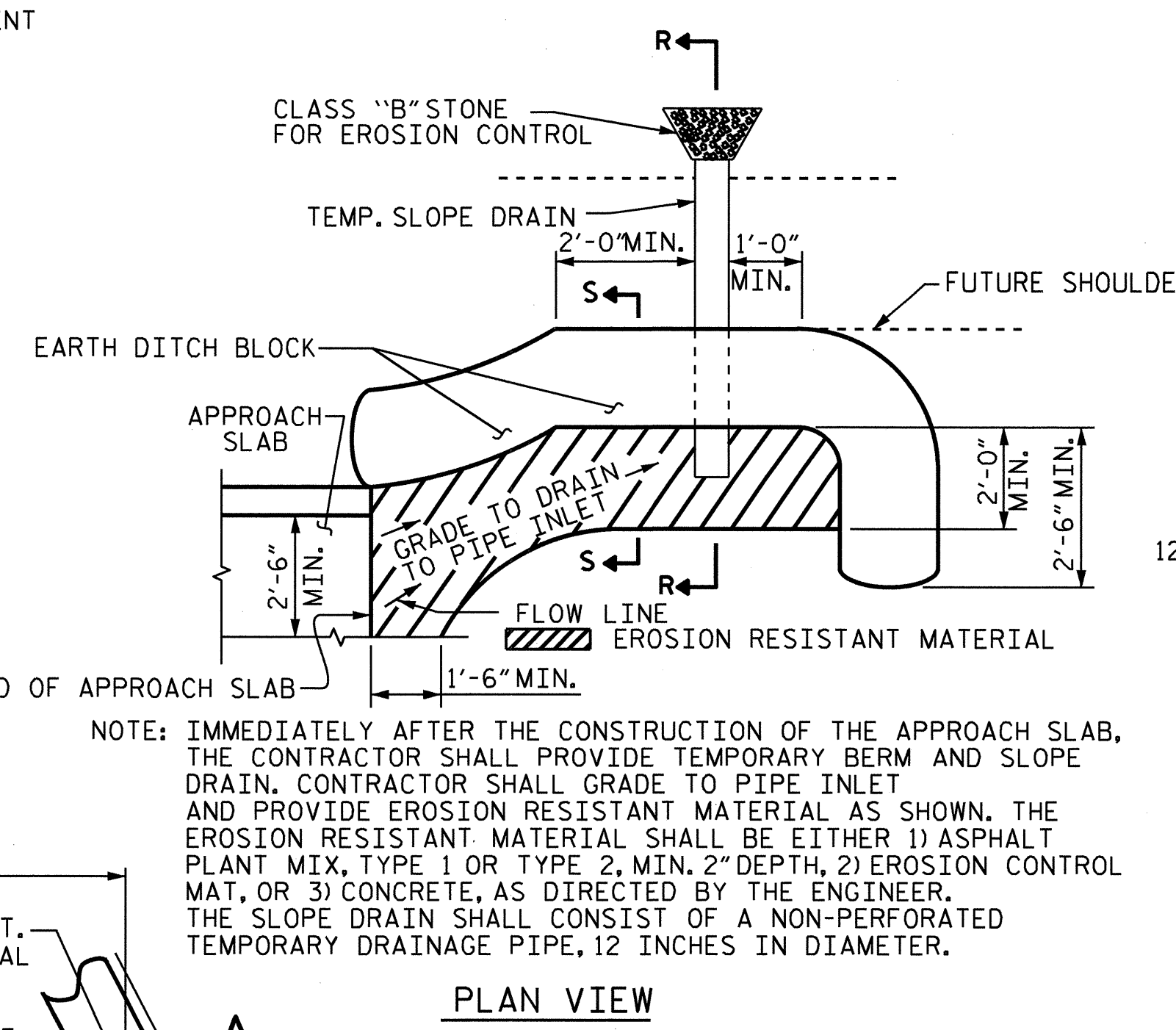
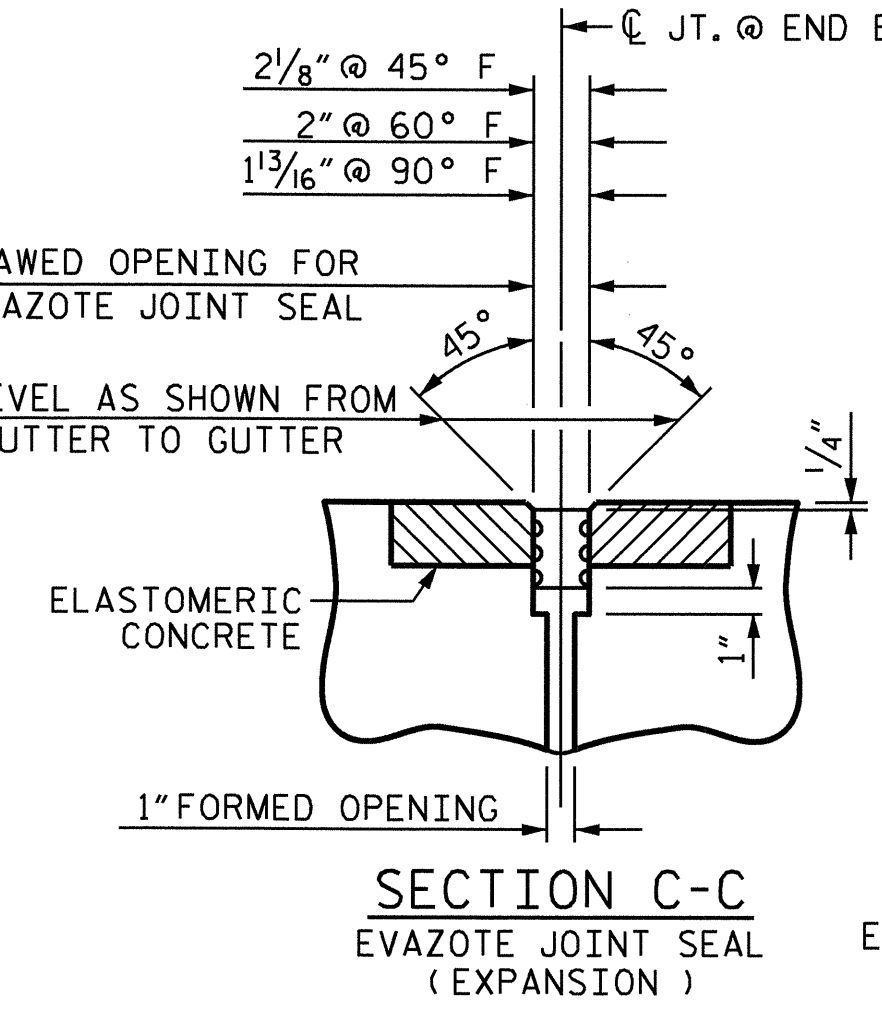
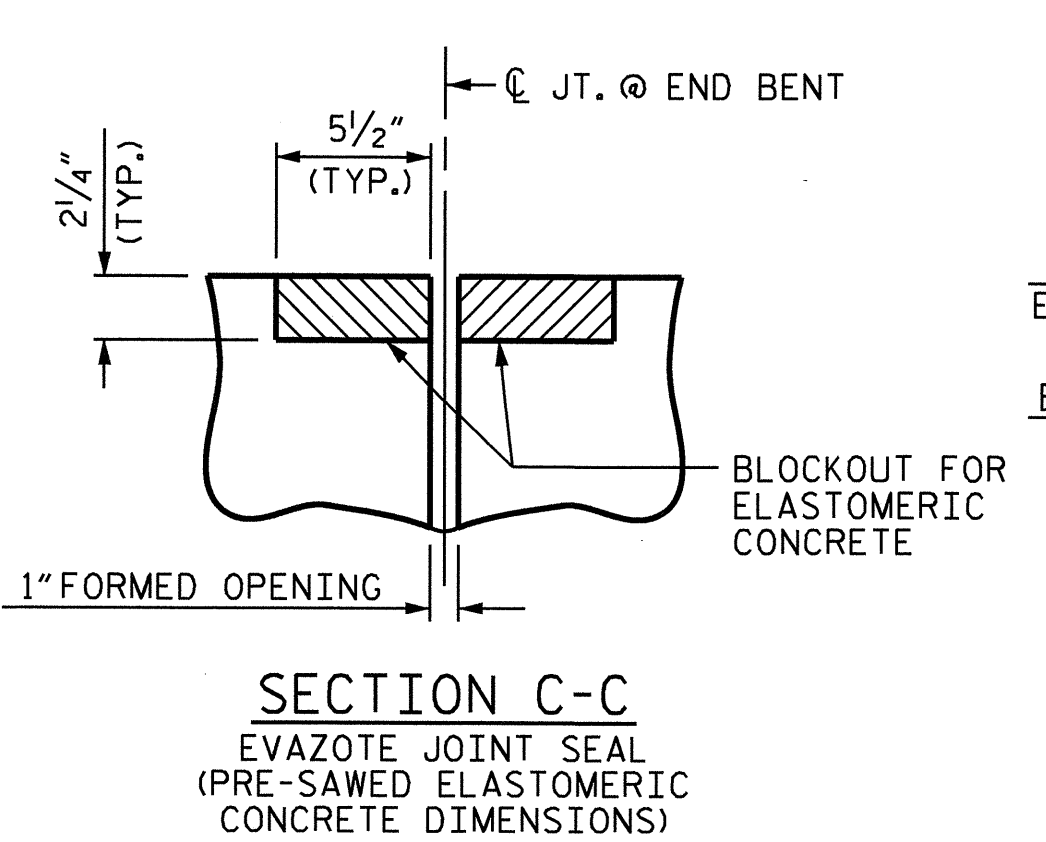
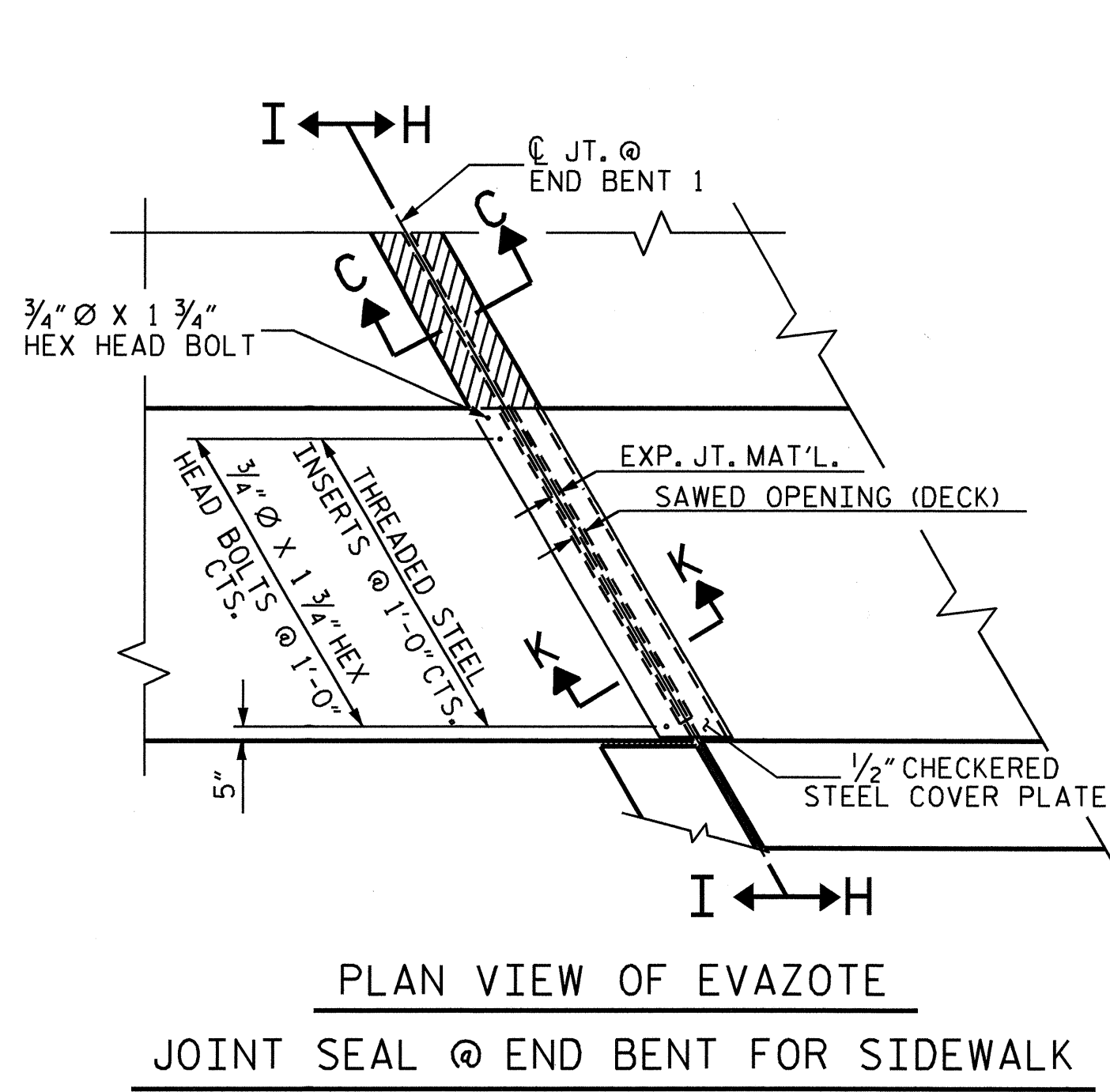
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS 42
2			4			

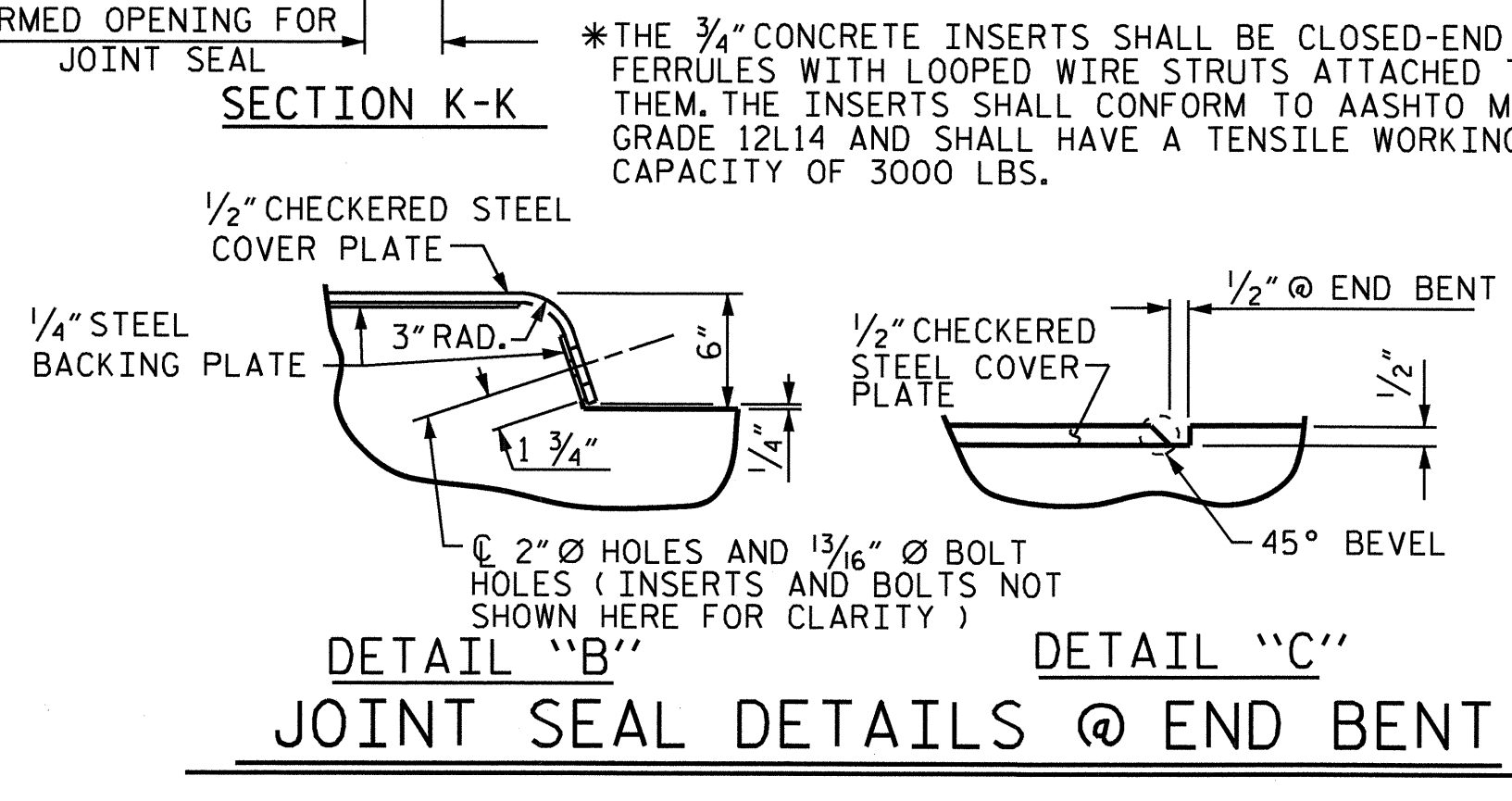
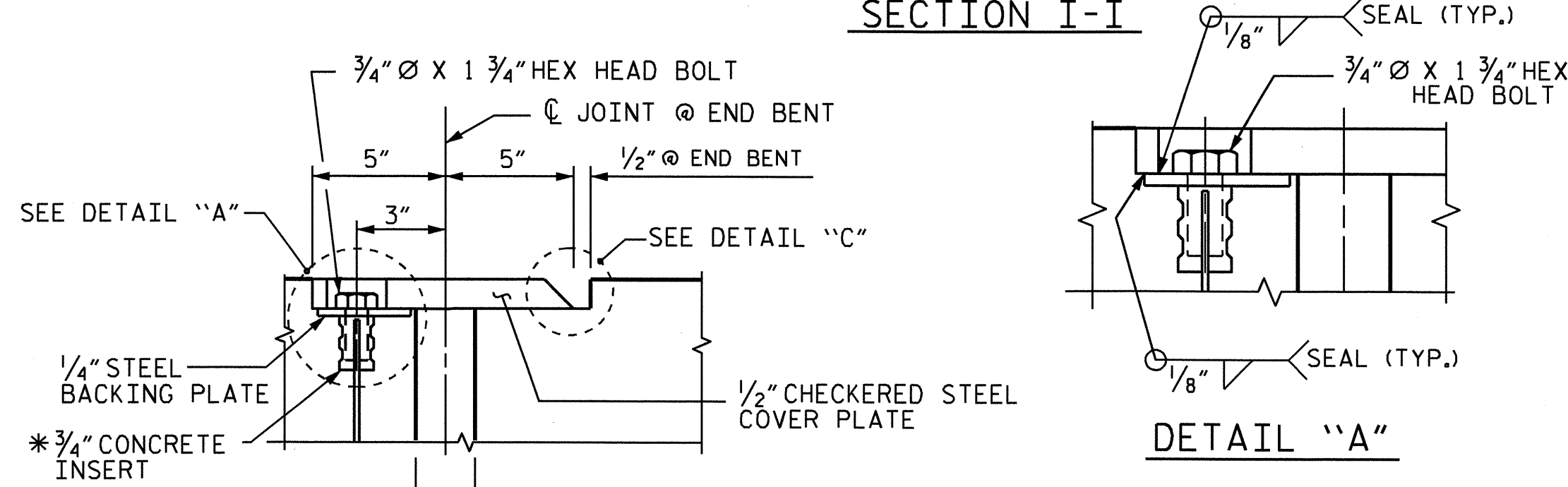
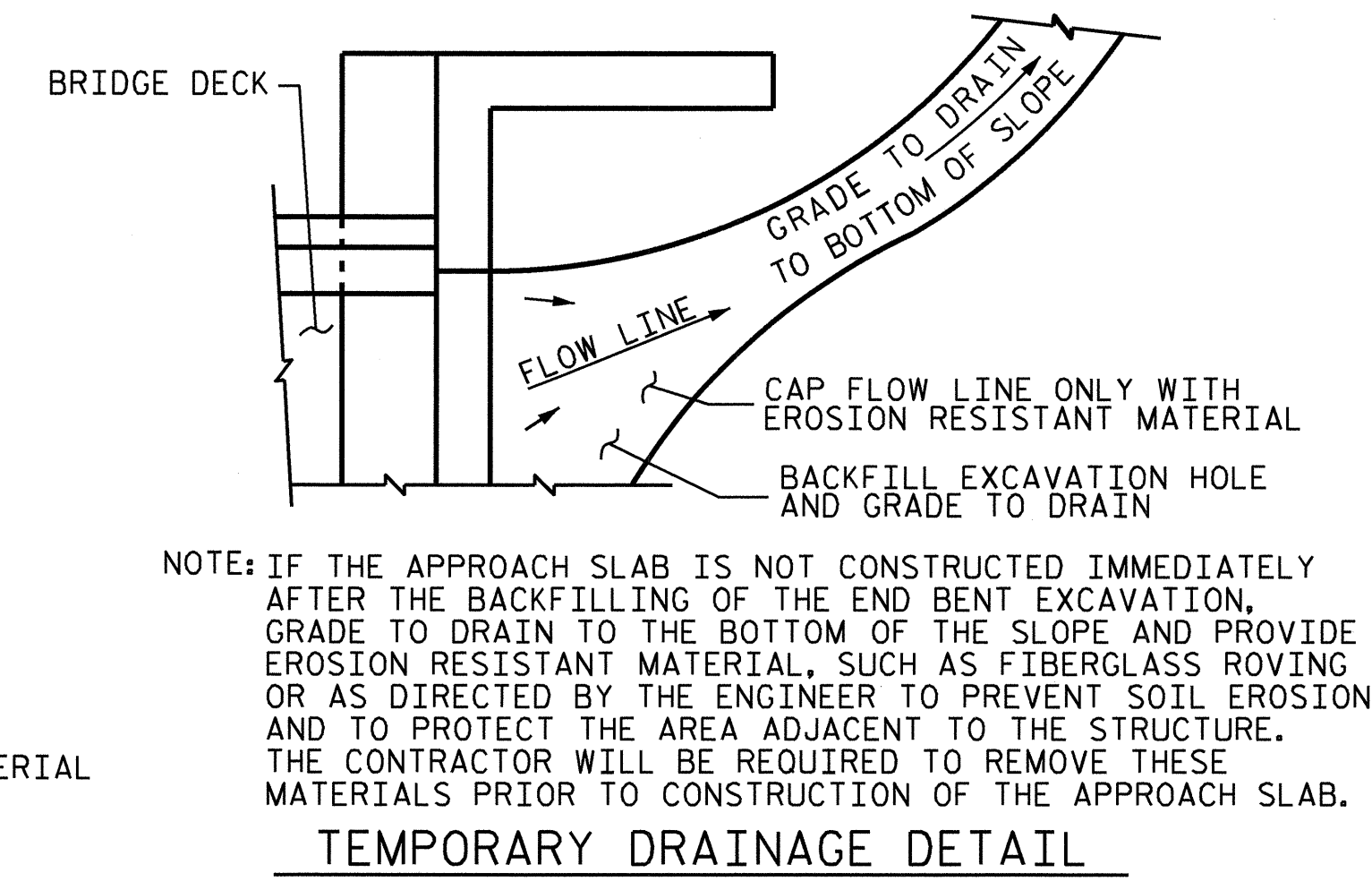
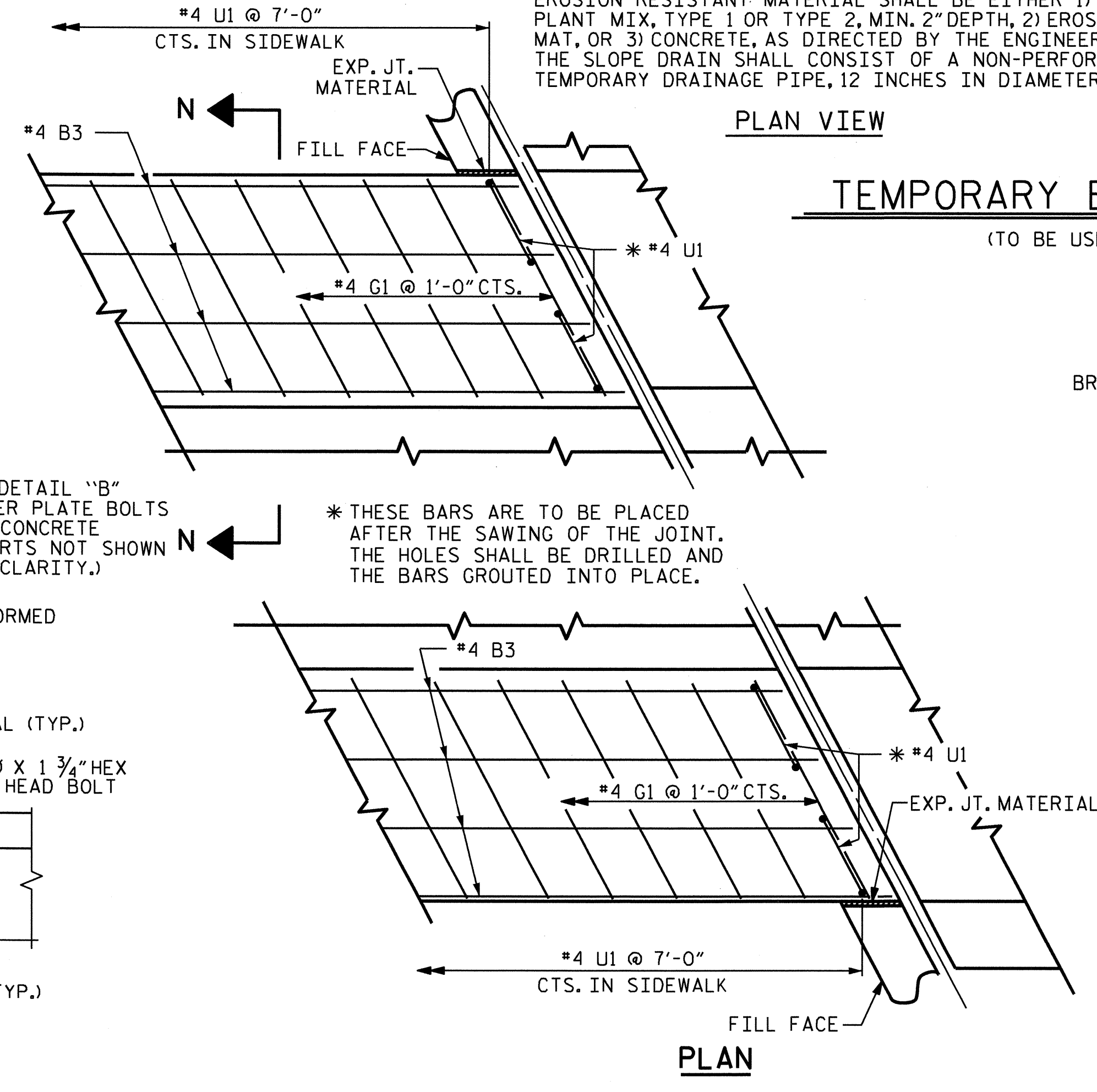
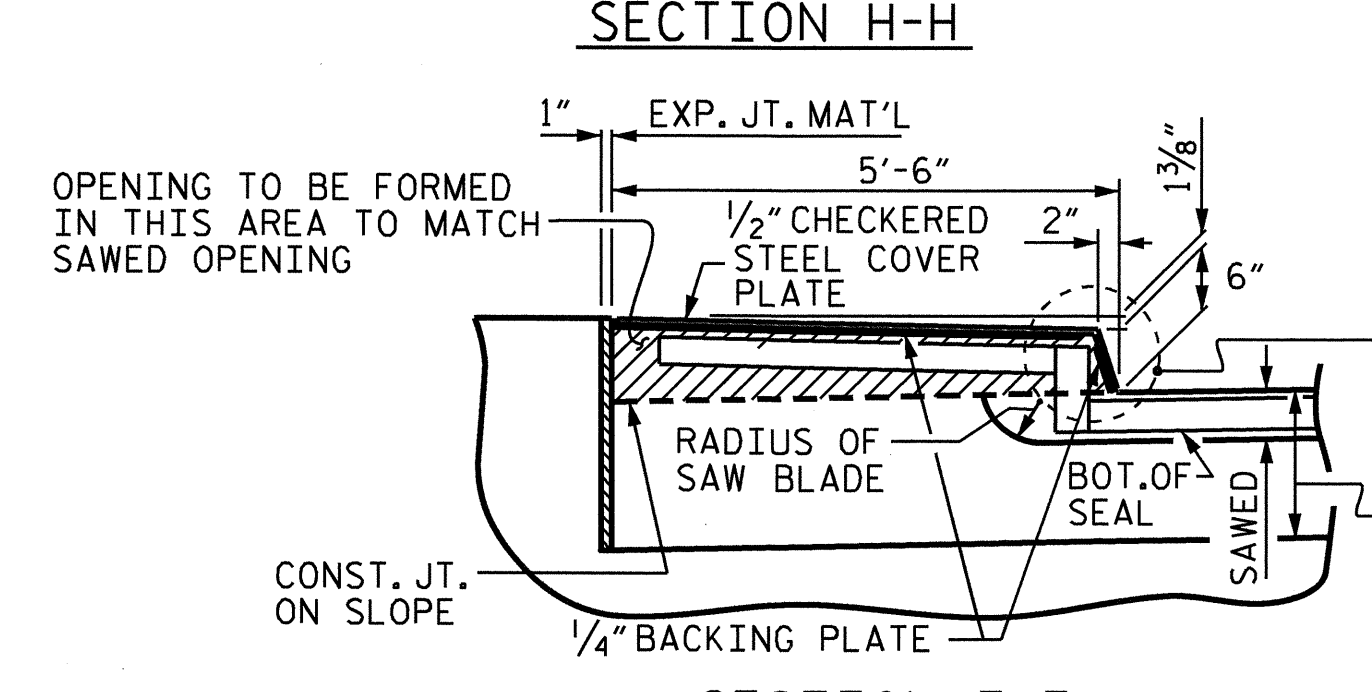
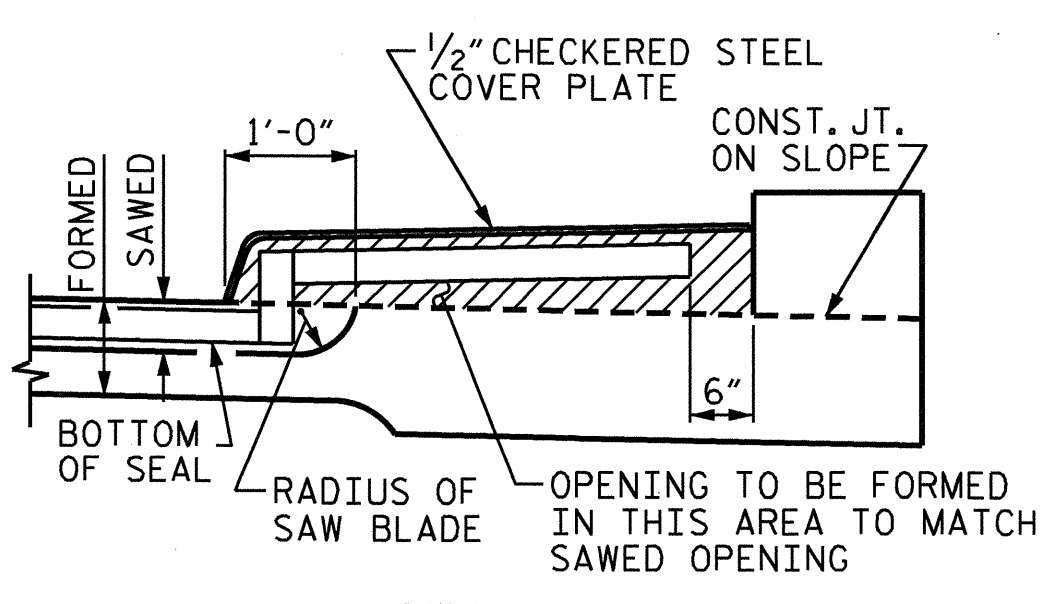


ASSEMBLED BY :	W.B. HILL	DATE :	04/09
CHECKED BY :	D.A. DAVENPORT	DATE :	04/09
DRAWN BY :	EEM 3/95	REV. 7/10/01	LES/RDR
CHECKED BY :	VAP 3/95	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06R	KMM/GM



ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	6.4
2	6.4
TOTAL	12.8

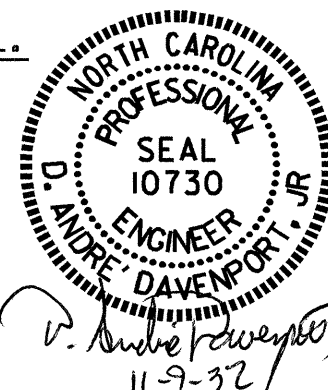
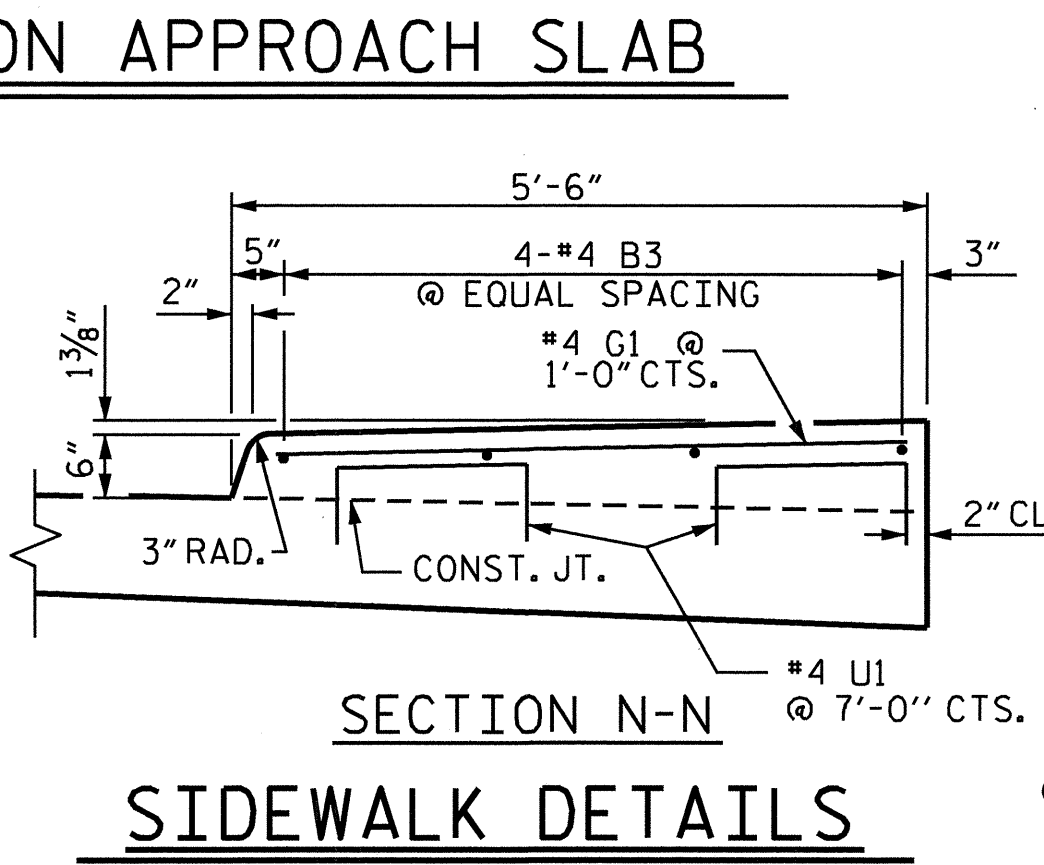
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



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 "EVAZOTE JOINT SEALS".



PROJECT NO. B-4176
 LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 2 OF 2

REVISIONS						SHEET NO. S-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			

ASSEMBLED BY: W.B. HILL DATE: 04/09
 CHECKED BY: D.A. DAVENPORT DATE: 04/09
 DRAWN BY: FCJ 11/88 RWN/LES
 CHECKED BY: ARB 11/88 REV. 5/7/03 RWN/JTE
 REV. 5/1/06RR MAA/KMM

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

- RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED R = 1.5. $SLPB = R \times W$. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
- CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
- CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
- CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
- CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
- CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
- RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
- SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON UP TO 2'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (t) (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
	40	3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
12	30	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	40	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	50	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
14	30	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	40	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	50	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
16	30	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	40	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	50	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (t) (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30	3'-1"	3'-6"	4'-0"	4'-5"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
	40	3'-1"	3'-6"	4'-0"	4'-5"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
	50	3'-1"	3'-6"	4'-0"	4'-5"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
12	30	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	50	2'-9"	3'-2"	3'-7"	4'-0"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
14	30	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	40	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	50	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
16	30	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-9"	6000
	40	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-9"	6000
	50	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-9"	6000

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (t) (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
12	30										4000
	40										4000
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
14	30										4000
	40										4000
	50	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6000
16	30										4000
	40										4000
	50	2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	6000

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (t) (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30										4000
	40										4000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
12	30										4000
	40										4000
	50	2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
14	30										4000
	40										4000
	50										4000
16	30										4000
	40										4000
	50										4000

DEFINITIONS

- SLPB = SCREED LOAD PER BRACKET (R x W)
- R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
- W = WHEEL LOAD
- S = BRACKET SPACING
- T = AVERAGE SLAB THICKNESS
- SWL = SAFE WORKING LOAD
- K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

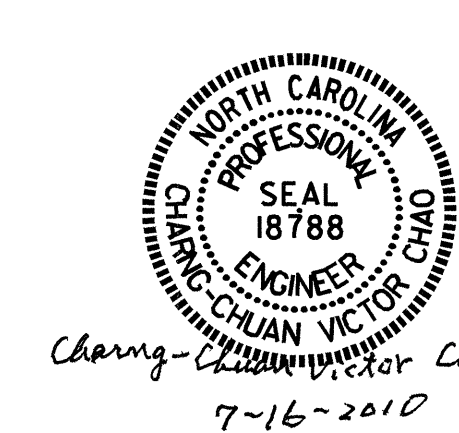
PROJECT NO. B-4176

LINCOLN COUNTY

STATION: 20+07.30 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD OVERHANG FALSEWORK					
AASHTO TYPES III, IV, V, AND VI					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. 40					
TOTAL SHEETS 42					



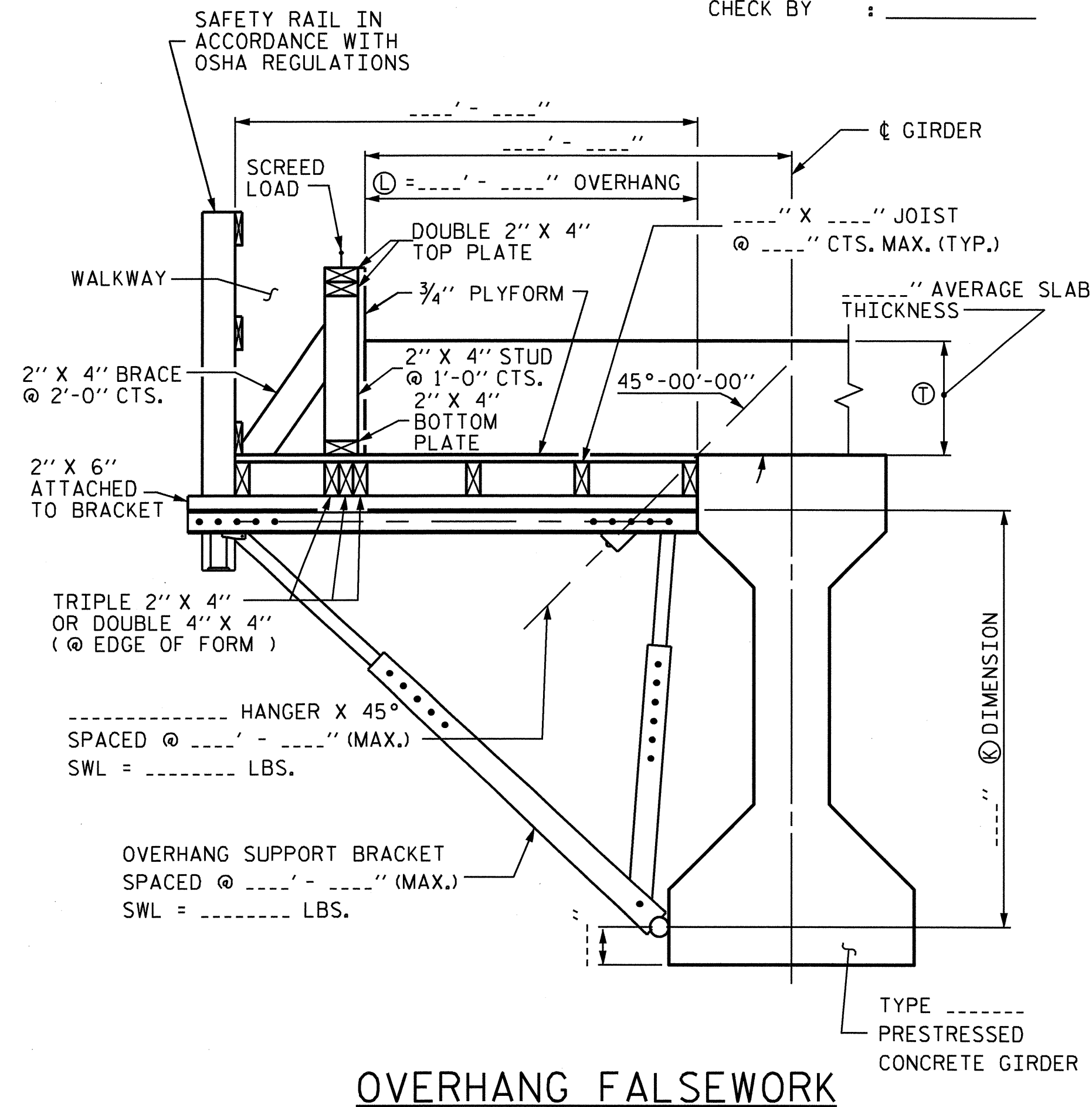
ASSEMBLED BY: R. WRIGHT	DATE: 06/04
CHECKED BY: C. V. CHAO	DATE: 06/04
REV.	

BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
 NUMBER OF SCREED WHEELS = _____
 SCREED WHEEL LOAD (W) = _____ LBS.
 SCREED LOAD PER BRACKET = _____ LBS.

PROJECT No. : _____
 COUNTY : _____
 STATION : _____
 DESCRIPTION : _____

DATE : _____
 DESIGN BY : _____
 CHECK BY : _____



OVERHANG FALSEWORK

NOTES

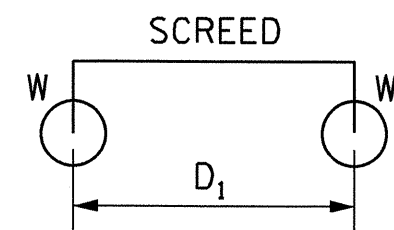
DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

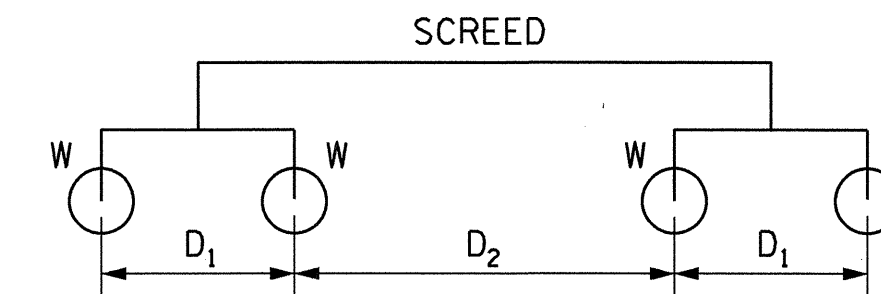
THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.



4-WHEEL MACHINE



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D ₂																	
		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
S/D ₁	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50	
2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59	
2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67	
2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73	
2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79	
3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83	
3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93	
4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00	

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
10	2 X 4	---	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	---	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	---	4' - 0"	4' - 6"	5' - 0"
	4 X 4	---	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	---	4' - 0"	4' - 3"	4' - 9"
	4 X 4	---	5' - 3"	5' - 9"	6' - 3"

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 2 OF 3

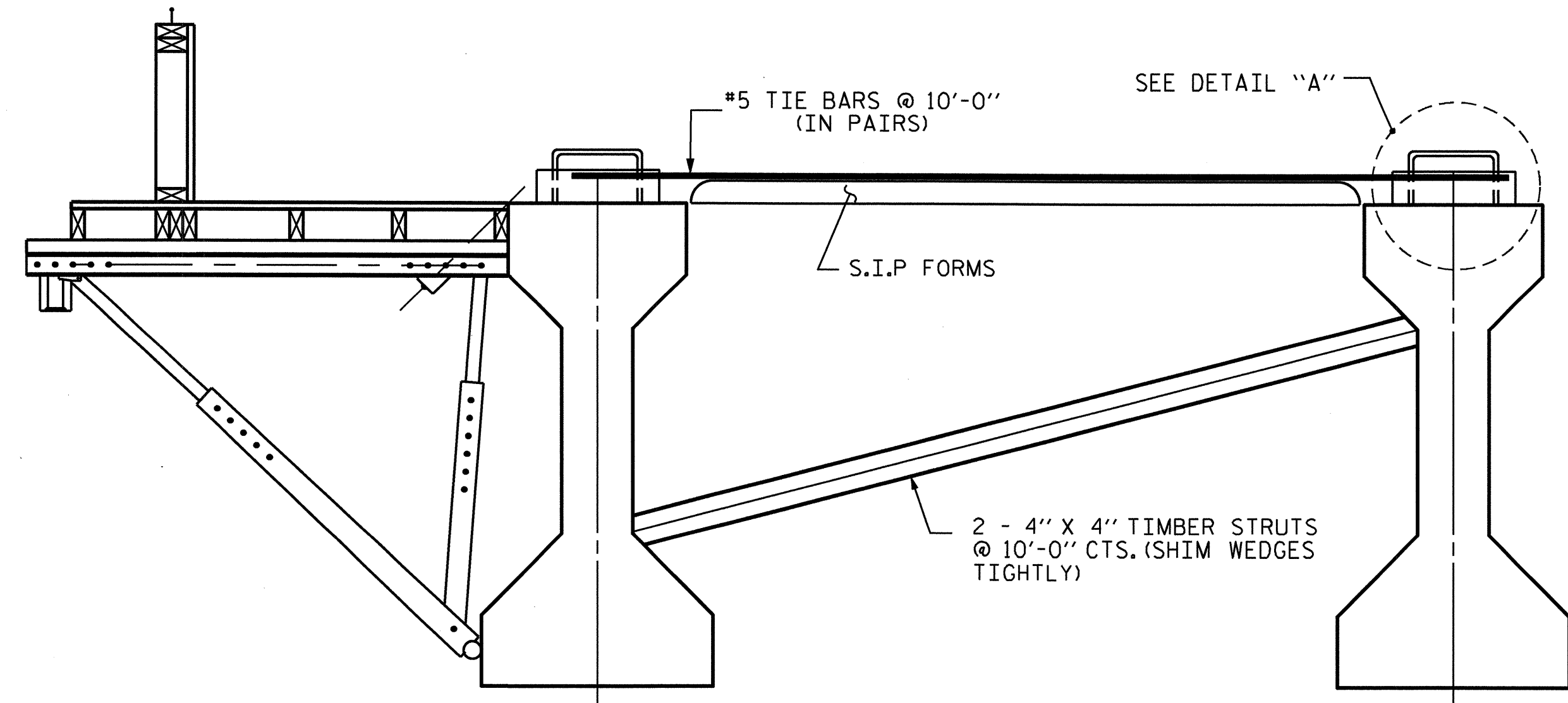
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			41
2			4			TOTAL SHEETS 42

Professional Engineer Seal for Victor Chao, No. 18788, State of North Carolina. Signature: Chang-Chuan Victor Chao, 7-16-2010.

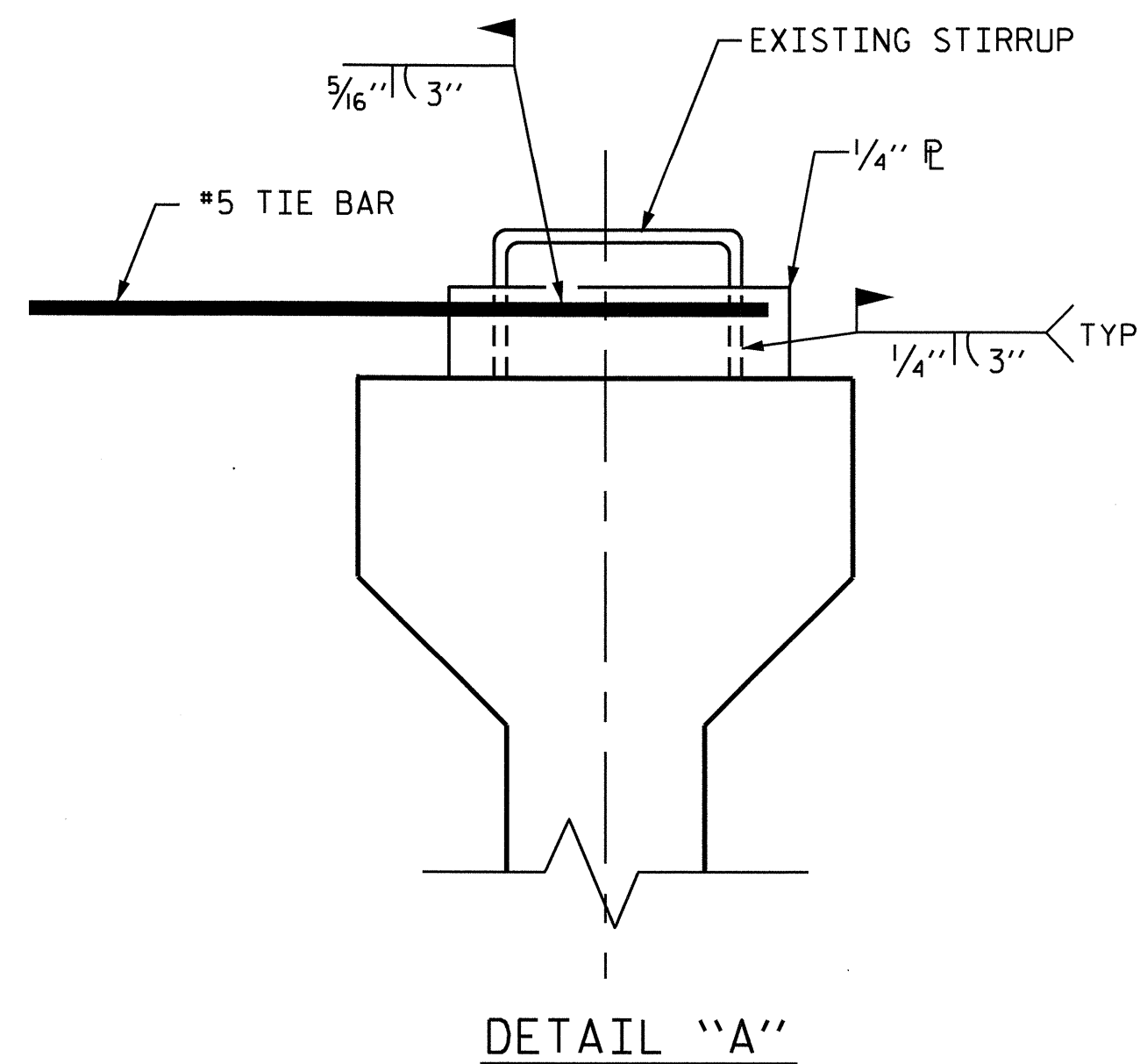
ASSEMBLED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 DRAWN BY: R. WRIGHT 06/04 REV.
 CHECKED BY: C. V. CHAO 06/04



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 10'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-4176
LINCOLN COUNTY
 STATION: 20+07.30 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD OVERHANG FALSEWORK
 AASHTO TYPES
 III, IV, V, AND VI



Cheng-Chuan Victor Chao
 7-16-2010

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

DRAWN BY: R. WRIGHT 06/04 DATE : _____
 CHECKED BY: C. V. CHAO 06/04 DATE : _____

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	-----	375 LBS. PER SQ. IN.
OF TIMBER	-----	
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