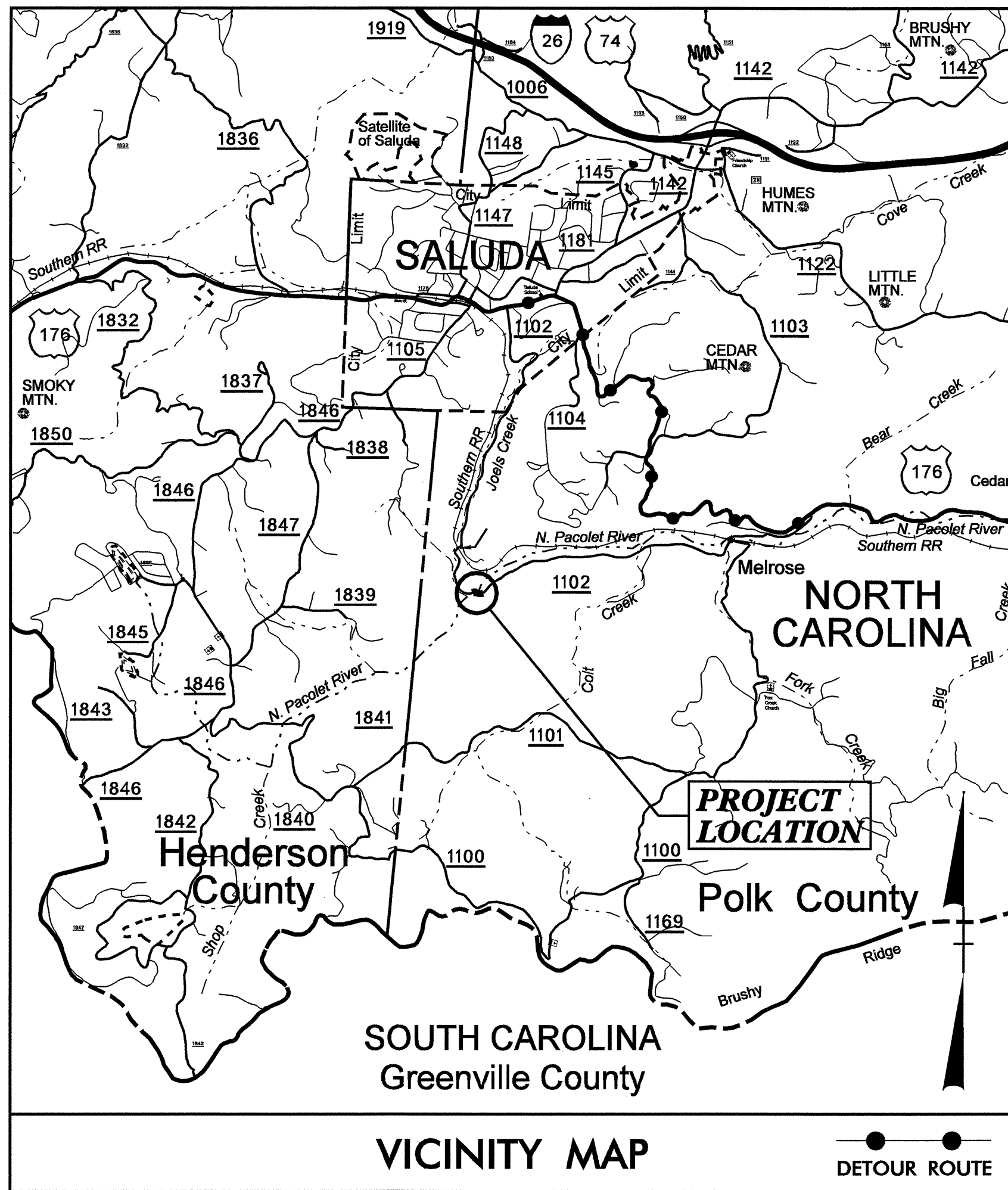


CONTRACT: 202070 TIP PROJECT: B-4239

STRUCTURES

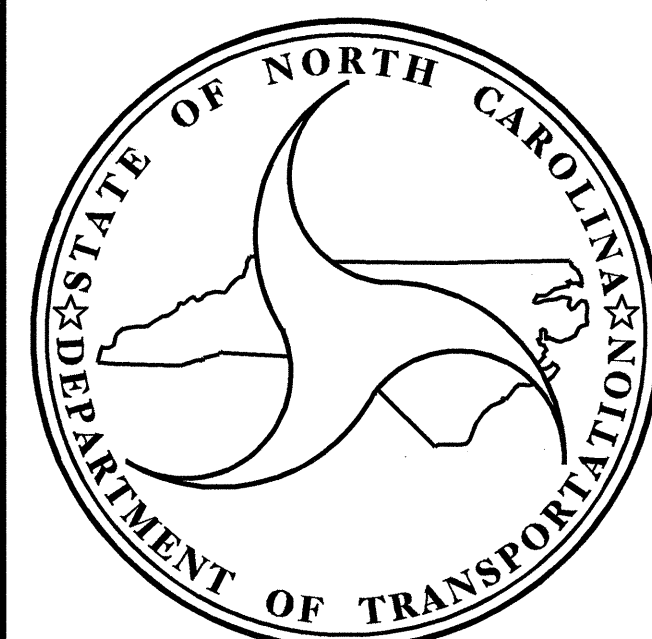
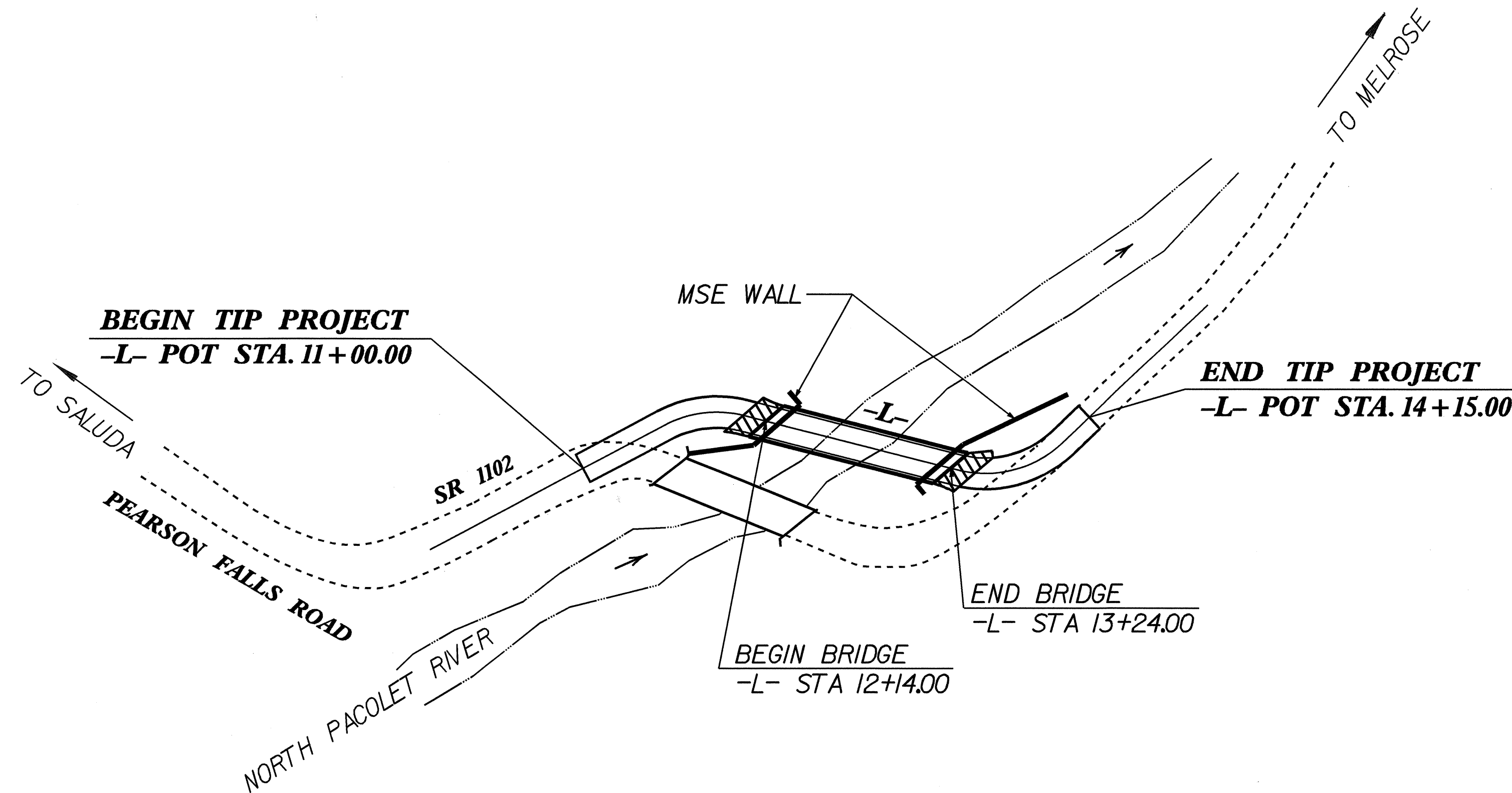


STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
POLK COUNTY

**LOCATION: BRIDGE NO. 2 OVER NORTH PACOLET RIVER
 ON SR 1102 (PEARSON FALLS RD.)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, BRIDGE & MSE WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4239		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33582.1.1	BRZ-1102(1)	P.E.	
33582.2.1	BRZ-1102(1)	UTIL. & RW	
33582.3.1	BRZ-1102(1)	CONST.	



DESIGN DATA

ADT 2009 = 260
 ADT 2029 = 435
 DHV = 10 %
 D = 60 %
 T = 3 % *
 V = 15 MPH
 * (TTST 1% + DUAL 2%)
 FUNC. CLASS: RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY OF F.A. PROJECT = 0.039 MI
 LENGTH STRUCTURE OF F.A. PROJECT = 0.021 MI
 TOTAL LENGTH OF STATE PROJECT = 0.060 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :
 FEBRUARY 17, 2009

J. C. FRYE, P.E.
 PROJECT ENGINEER

T. H. FANG, P.E.
 PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

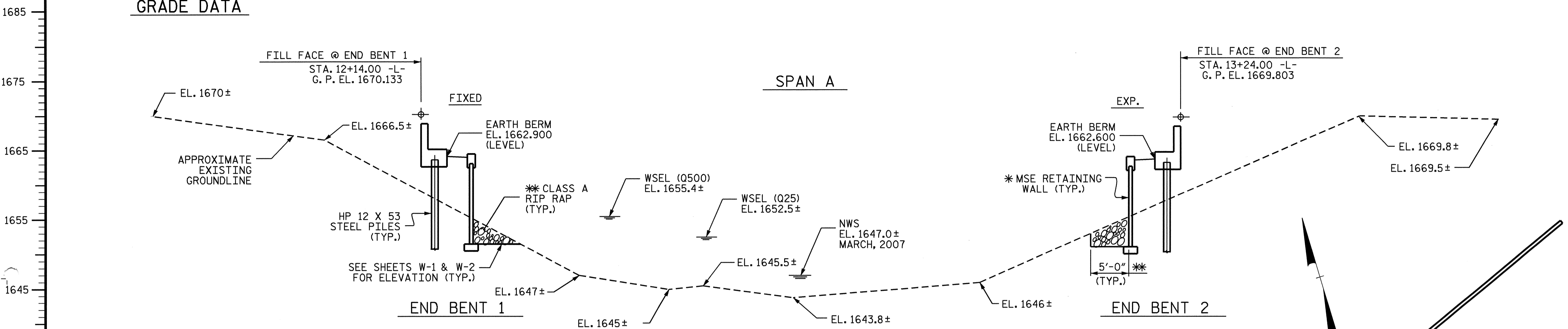
DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

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

APPROVED
 DIVISION ADMINISTRATOR DATE

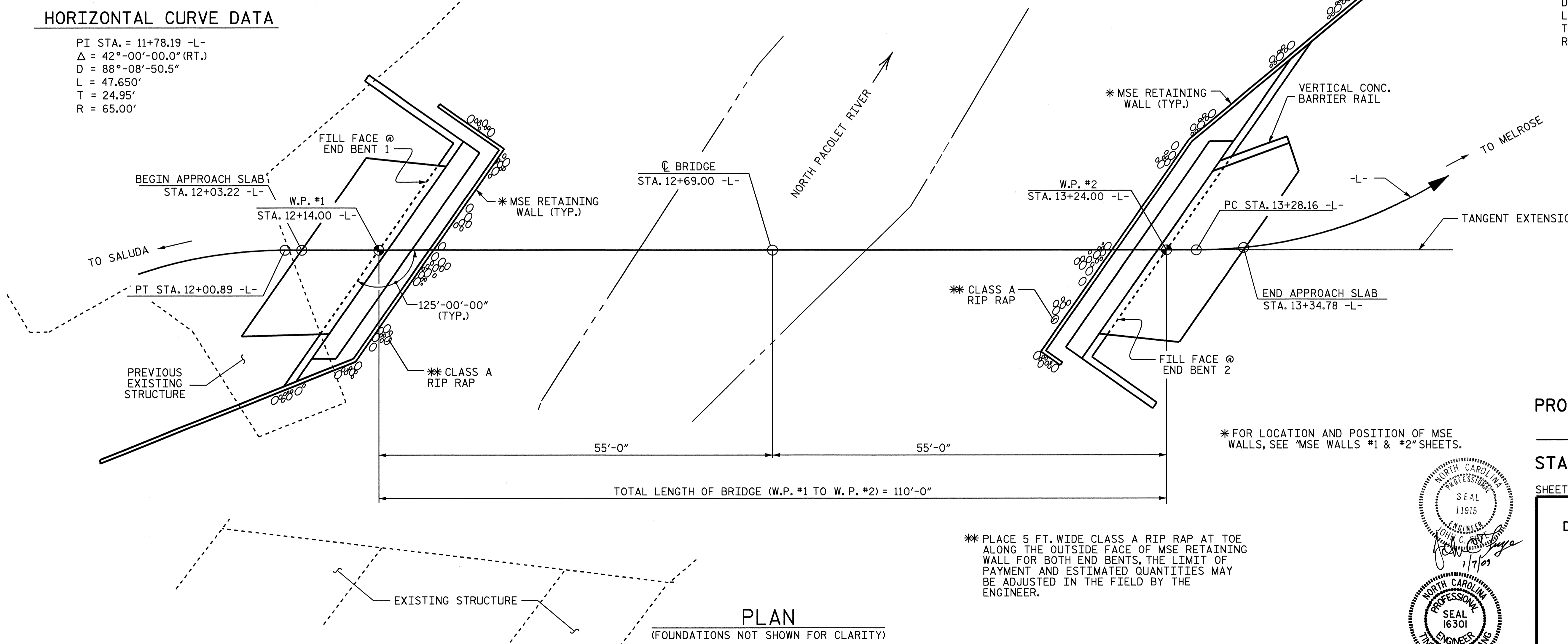
-7.2000% Δ -0.3000%
 PI STA. = 11+25.00
 EL. = 1670.40
 VC = 75'

-0.3000% Δ -5.9818%
 PI STA. = 13+95.00
 EL. = 1669.59
 VC = 100'



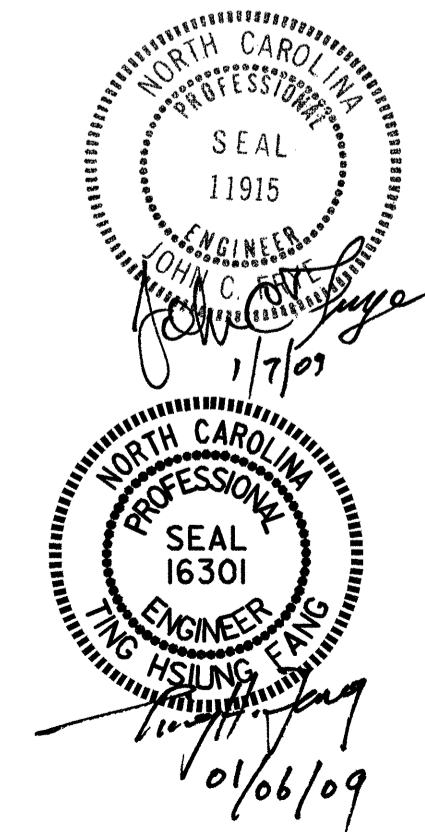
HORIZONTAL CURVE DATA
 PI STA. = 11+78.19 -L-
 $\Delta = 42^\circ-00'-00.0"$ (RT.)
 D = 88'-08"-50.5"
 L = 47.650'
 T = 24.95'
 R = 65.00'

HORIZONTAL CURVE DATA
 PI STA. = 13+63.97 -L-
 $\Delta = 57^\circ-42'-24.6"$ (LT.)
 D = 88'-08"-50.5"
 L = 65.47'
 T = 35.810'
 R = 65.00'



** PLACE 5 FT. WIDE CLASS A RIP RAP AT TOE ALONG THE OUTSIDE FACE OF MSE RETAINING WALL FOR BOTH END BENTS, THE LIMIT OF PAYMENT AND ESTIMATED QUANTITIES MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.

* FOR LOCATION AND POSITION OF MSE WALLS, SEE "MSE WALLS #1 & #2" SHEETS.



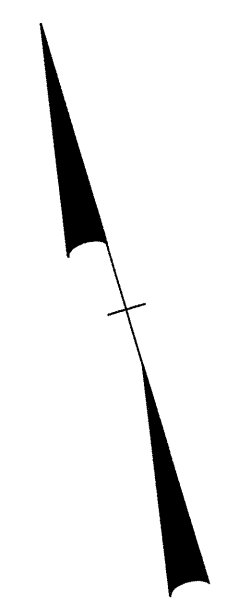
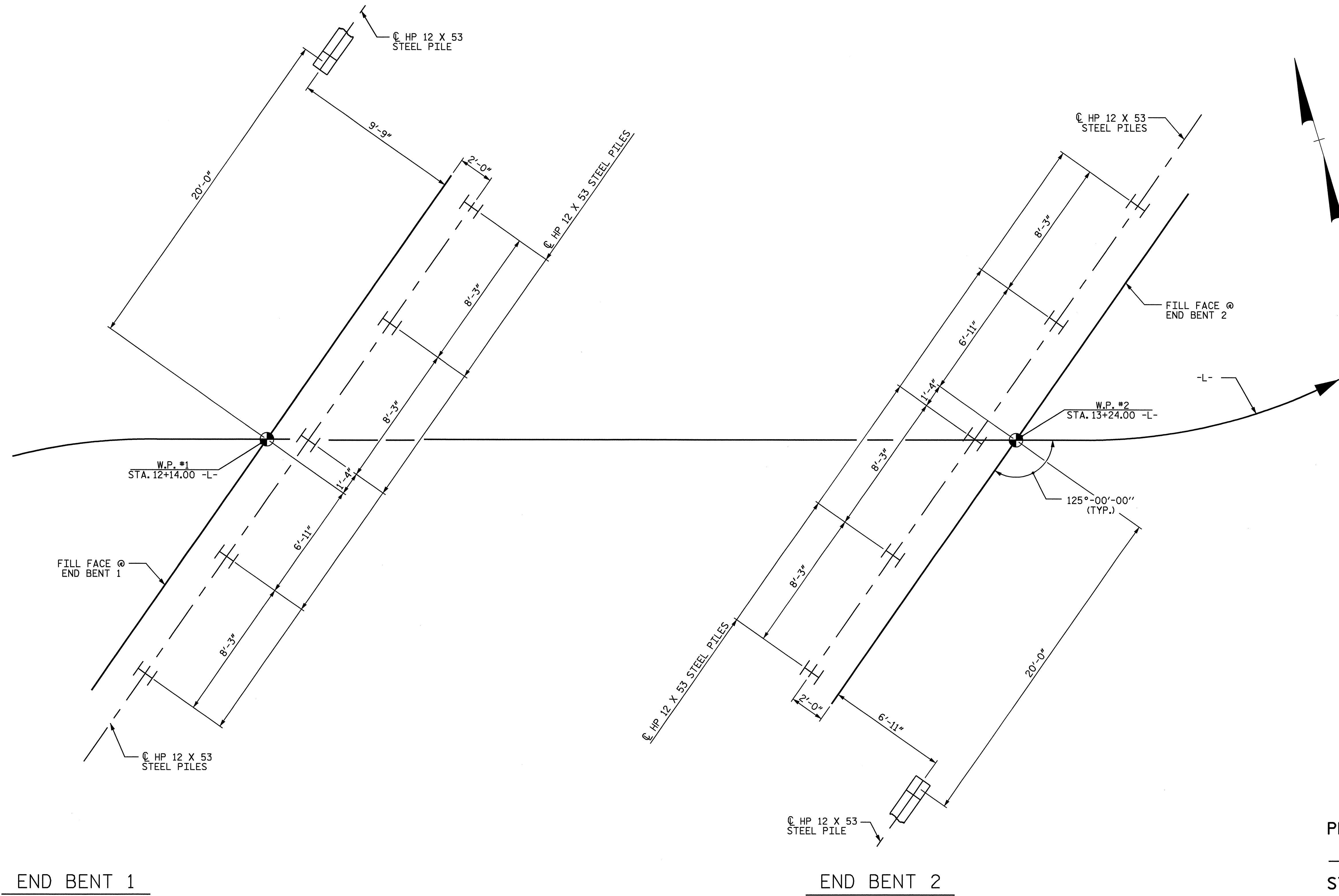
PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 NORTH PACOLET RIVER
 ON SR 1102 BETWEEN
 SR 1100 AND NC 176

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

DRAWN BY : H. B. SHAH DATE : 1/7/08
 CHECKED BY : I. H. FANG DATE : 11/14/08



END BENT 1

END BENT 2

FOUNDATION LAYOUT
 (DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP)

NOTES:

- FOR PILES, SEE SPECIAL PROVISIONS.
- PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- INSTALL PILES AT END BENT 1 TO A TIP ELEVATION NO HIGHER THAN 1649 FT.
- INSTALL PILES AT END BENT 2 TO A TIP ELEVATION NO HIGHER THAN 1645 FT.
- STEEL PILES POINTS WITH TEETH ARE REQUIRED FOR STEEL PILES AT END BENTS 1 AND 2.

- IF THE TIP ELEVATIONS CANNOT BE REACHED DUE TO BOULDERS, EXCAVATE BOULDERS AND BACKFILL WITH SELECT MATERIAL CLASS IV.
- IF PILES ARE INSTALLED AFTER MSE WALL CONSTRUCTION, USE A FORM TO BLOCKOUT PILE LOCATIONS DURING WALL CONSTRUCTION. DRIVE PILES INSIDE FORM AND FILL FORM WITH NON-EXCAVATABLE FLOWABLE FILL PER ARTICLE 340-2 OF THE STANDARD SPECIFICATIONS.
- THE PILE PENETRATION OF 10 FEET INTO NATURAL GROUND THAT IS REQUIRED PER THE PILES SPECIAL PROVISION WILL BE WAIVED FOR PILES AT END BENTS NO.1 AND 2.



PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
GENERAL DRAWING					
BRIDGE OVER NORTH PACOLET RIVER ON SR 1102 BETWEEN SR 1100 AND US 176					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO.
					S-2
					TOTAL SHEETS
					24

DRAWN BY : H. B. SHAH DATE : 10/08
 CHECKED BY : T. H. FANG DATE : 10/08

19-DEC-2008 10:44
 Q:\B4239\Structures\Final Plans\b4239.sd.gdn
 sdombrowski

TOTAL BILL OF MATERIAL															
	REMOVAL OF EXISTING STRUCTURE	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS A	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	APPROX. LB	NO.	LIN. FT.	EA.	LIN. FT.	TON	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		2604	2450				94,000				214.91				
END BENT 1				29.5		3,689		6	90	6		45	50		
END BENT 2				29.2		4,016		6	90	6		45	50		
	LUMP SUM	2604	2450	58.7	LUMP SUM	7,705	94,000	12	180	12	214.91	90	100	LUMP SUM	LUMP SUM

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN FOR SEISMIC PERFORMANCE ZONE 1.

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

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.

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.

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

DIRECTION OF CASTING DECK CONCRETE SHALL BE FROM THE FIXED BEARING END TOWARD THE EXPANSION BEARING END OF THE SPAN.

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".

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 41'-6", WITH A CLEAR ROADWAY OF 19'-2", AND 3" SUB & 2" TOP DIAGONAL WOOD FLOOR ON I BEAMS; ABUTMENTS: RC WIDENED WITH YOUNT MASONRY; BENT: TIMBER CAP AND TIMBER POST ON CONCRETE SILL SHALL BE REMOVED. THE EXISTING BRIDGE IS POSTED FOR 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 EXISTING ABUTMENTS SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. PORTIONS OF EXISTING ABUTMENTS MAY NEED TO REMAIN IN PLACE TO SUPPORT THE EXISTING ROADBEDS. THE CUTTING AND REMOVAL OF THE ABUTMENTS SHOULD CLOSELY MATCH THE FINAL GRADED SLOPES.

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 SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR VERTICAL CONCRETE BARRIER RAIL, SEE SPECIAL PROVISIONS.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

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

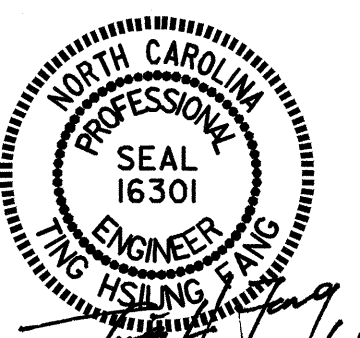
FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

ACCESS TO BRIDGE NO. 2 REQUIRES PASSING UNDER A NORFOLK SOUTHERN RAILROAD UNDERPASS (POLK CO. BRIDGE NO. 215) WITH LOW VERTICAL CLEARANCE. NCDOT BRIDGE MANAGEMENT UNIT LISTS THE MINIMUM VERTICAL CLEARANCE AS 11'-11". TO ASSIST WITH CLEARING GIRDERS UNDER THIS RAILROAD UNDERPASS, THE CONTRACTOR HAS THE OPTION OF WELDING SHEAR STUDS TO THE GIRDERS AFTER GIRDERS HAVE CLEARED THIS BRIDGE.



PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 3 OF 3

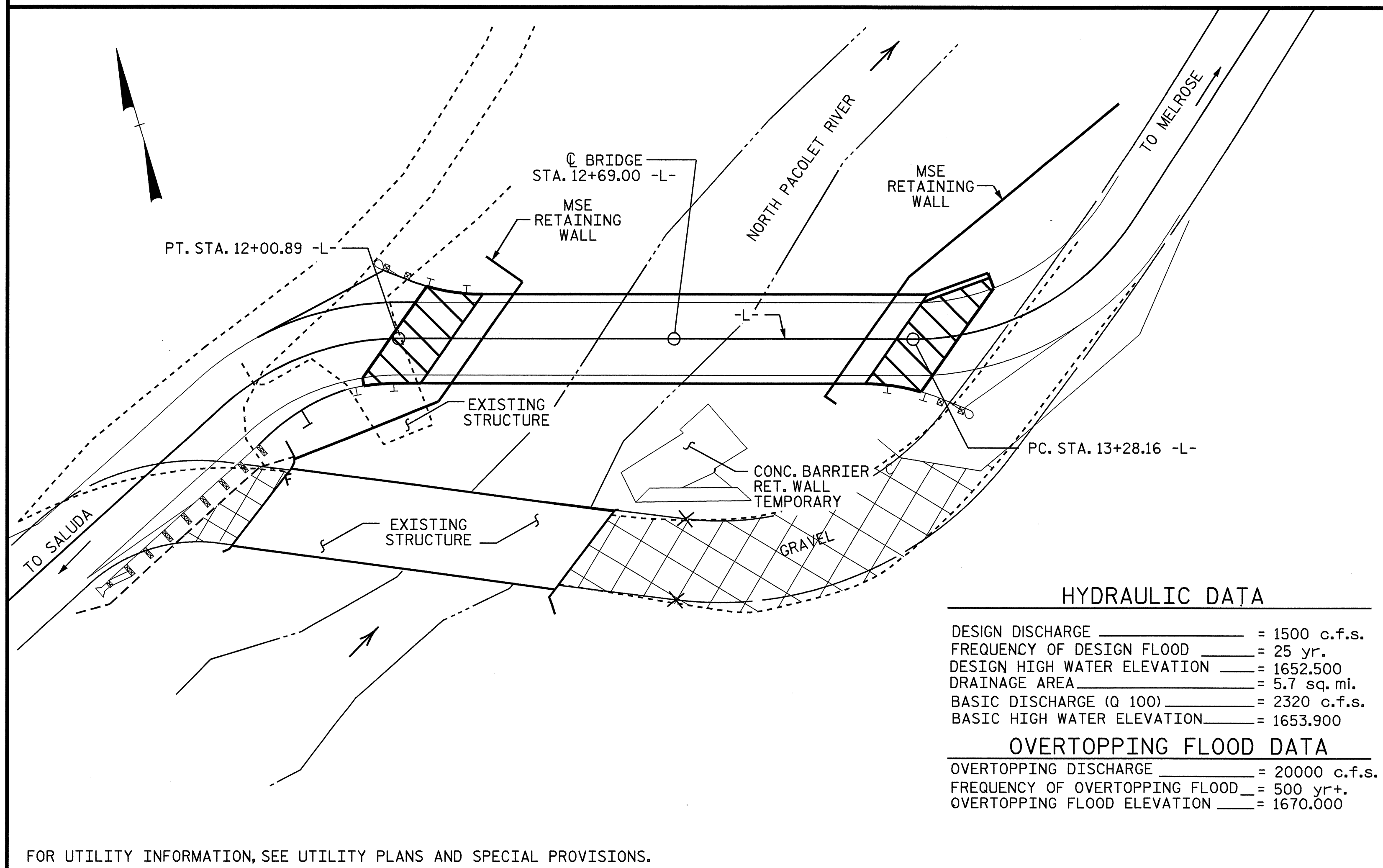
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
 NORTH PACOLET RIVER
 ON SR 1102 BETWEEN
 SR 1100 AND NC 176

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

BM #2: REBAR WITH CAP STAMPED "TBM2", -L- STA. 13+03.24, 69.03' RIGHT, EL. 1671.93'.



HYDRAULIC DATA

DESIGN DISCHARGE _____ = 1500 c.f.s.
 FREQUENCY OF DESIGN FLOOD _____ = 25 yr.
 DESIGN HIGH WATER ELEVATION _____ = 1652.500
 DRAINAGE AREA _____ = 5.7 sq. mi.
 BASIC DISCHARGE (Q 100) _____ = 2320 c.f.s.
 BASIC HIGH WATER ELEVATION _____ = 1653.900

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = 20000 c.f.s.
 FREQUENCY OF OVERTOPPING FLOOD _____ = 500 yr+.
 OVERTOPPING FLOOD ELEVATION _____ = 1670.000

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

DRAWN BY: HARISH SHAH DATE: 8/08
 CHECKED BY: T.H. FANG DATE: 10/08

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								SERVICE II LIMIT STATE					COMMENT NUMBER	
						MOMENT				SHEAR				MOMENT						
						LIVE-LOAD FACTORS (γ _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		DISTANCE FROM LEFT END OF SPAN (ft)
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.56	--	1.75	0.632	1.64	A	52.05	0.632	1.76	A	0.00	1.30	0.632	1.56	A	52.05	
	HL-93 (OPERATING)	N/A		1.93	--	1.35	0.632	2.13	A	52.05	0.632	2.28	A	0.00	1.00	0.632	1.93	A	52.05	
	HS-20 (INVENTORY)	36.00	2	2.71	97.56	1.80	0.632	2.89	A	52.05	0.632	3.04	A	0.00	1.30	0.632	2.71	A	52.05	
	HS-20 (OPERATING)	36.00		3.61	129.96	1.35	0.632	3.85	A	52.05	0.632	4.05	A	0.00	1.00	0.632	3.61	A	52.05	
LEGAL LOAD RATING	SN5H	13.50		6.48	87.48	1.80	0.632	6.90	A	52.05	0.632	7.56	A	0.00	1.30	0.632	6.48	A	52.05	
	NGARBS2	20.00		4.93	98.60	1.80	0.632	5.26	A	52.05	0.632	5.40	A	0.00	1.30	0.632	4.93	A	52.05	
	NAGRIS2	22.00		2.13	48.86	1.80	0.632	4.65	A	52.05	0.632	4.85	A	0.00	1.30	0.632	2.13	A	52.05	
	NCOTTS3	27.25		3.22	87.75	1.80	0.632	3.43	A	52.05	0.632	3.76	A	0.00	1.30	0.632	3.22	A	52.05	
	NAGGRS4	34.93		2.63	91.87	1.80	0.632	2.80	A	52.05	0.632	3.05	A	0.00	1.30	0.632	2.63	A	52.05	
	NS5A	35.55		2.58	91.72	1.80	0.632	2.75	A	52.05	0.632	3.05	A	0.00	1.30	0.632	2.58	A	52.05	
	NS6A	39.95		2.34	93.48	1.80	0.632	2.49	A	52.05	0.632	2.76	A	0.00	1.30	0.632	2.34	A	52.05	
	NS7B	42.00		2.23	93.66	1.80	0.632	2.37	A	52.05	0.632	2.67	A	0.00	1.30	0.632	2.23	A	52.05	
	NAGRIT3	33.00		2.85	94.05	1.80	0.632	3.03	A	52.05	0.632	3.30	A	0.00	1.30	0.632	2.85	A	52.05	
	NT4A	33.08		2.85	94.28	1.80	0.632	3.04	A	52.05	0.632	3.25	A	0.00	1.30	0.632	2.85	A	52.05	
	NT6A	41.60		2.31	96.10	1.80	0.632	2.46	A	52.05	0.632	2.78	A	0.00	1.30	0.632	2.31	A	52.05	
	NT7A	42.00		2.27	95.34	1.80	0.632	2.46	A	52.05	0.632	2.74	A	0.00	1.30	0.632	2.27	A	52.05	
	NT7B	42.00		2.15	90.30	1.80	0.632	2.51	A	52.05	0.632	2.63	A	0.00	1.30	0.632	2.15	A	52.05	
	NAGRIT4	43.00		2.27	97.61	1.80	0.632	2.42	A	52.05	0.632	2.56	A	0.00	1.30	0.632	2.27	A	52.05	
NAGT5A	45.00		2.15	96.75	1.80	0.632	2.29	A	52.05	0.632	2.50	A	0.00	1.30	0.632	2.15	A	52.05		
NAGRIT5B	45.00		3	2.13	95.85	1.80	0.632	2.27	A	52.05	0.632	2.44	A	0.00	1.30	0.632	2.13	A	52.05	

LOAD FACTORS:

LIMIT STATE	γ _{DC}	γ _{DW}
STRENGTH I	1.25	1.50
SERVICE II	1.00	1.00
FATIGUE	0.00	0.00

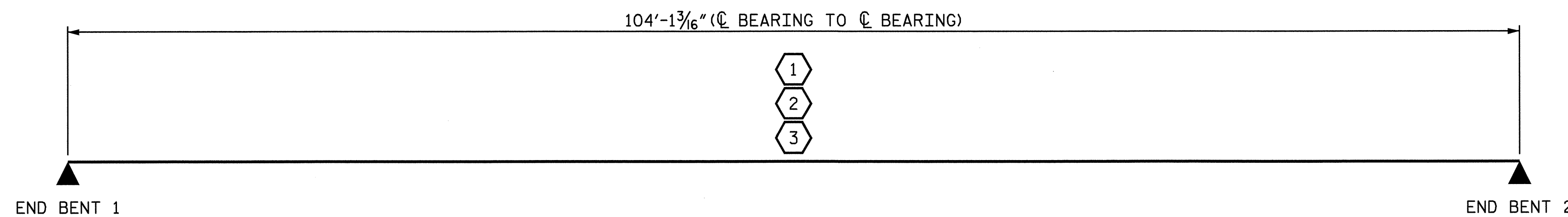
NOTES:

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

ALLOWABLE STRESS FOR SERVICE II 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) **

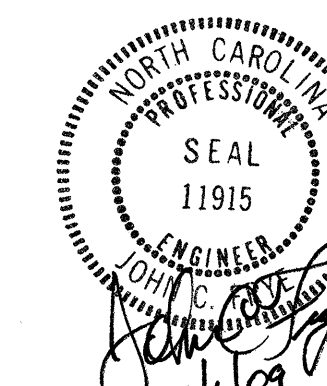
3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

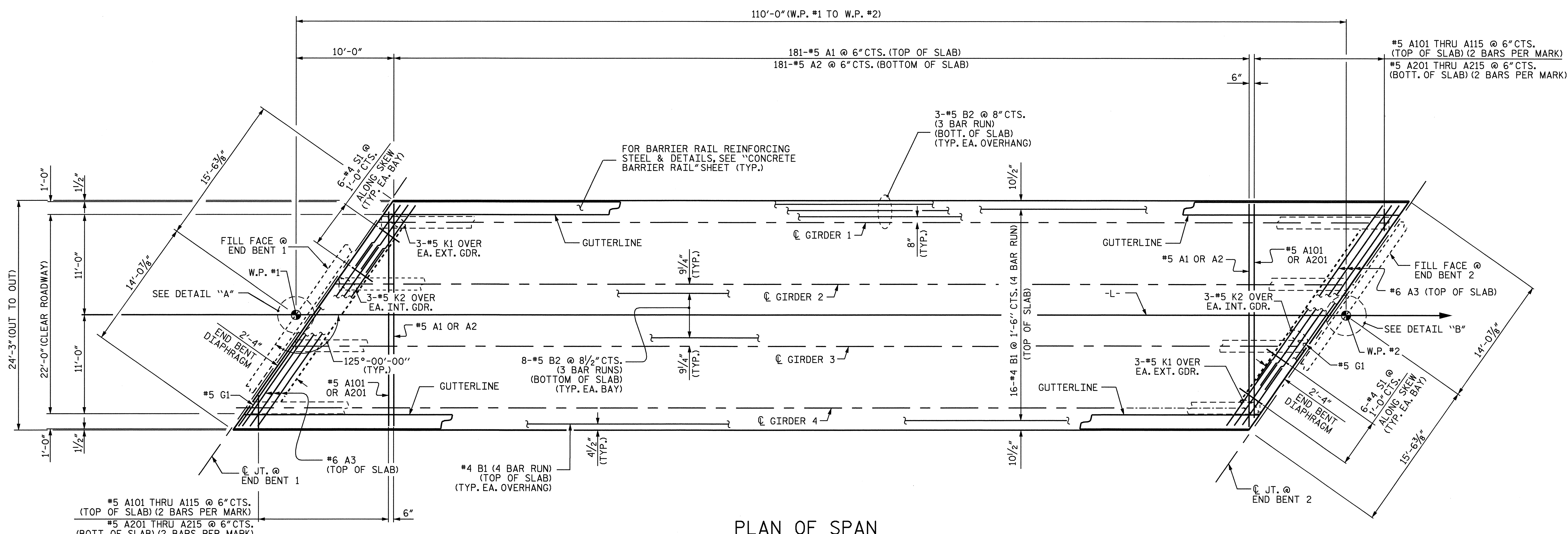
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD

LRFR SUMMARY FOR
 STEEL GIRDERS
 (NON-INTERSTATE TRAFFIC)

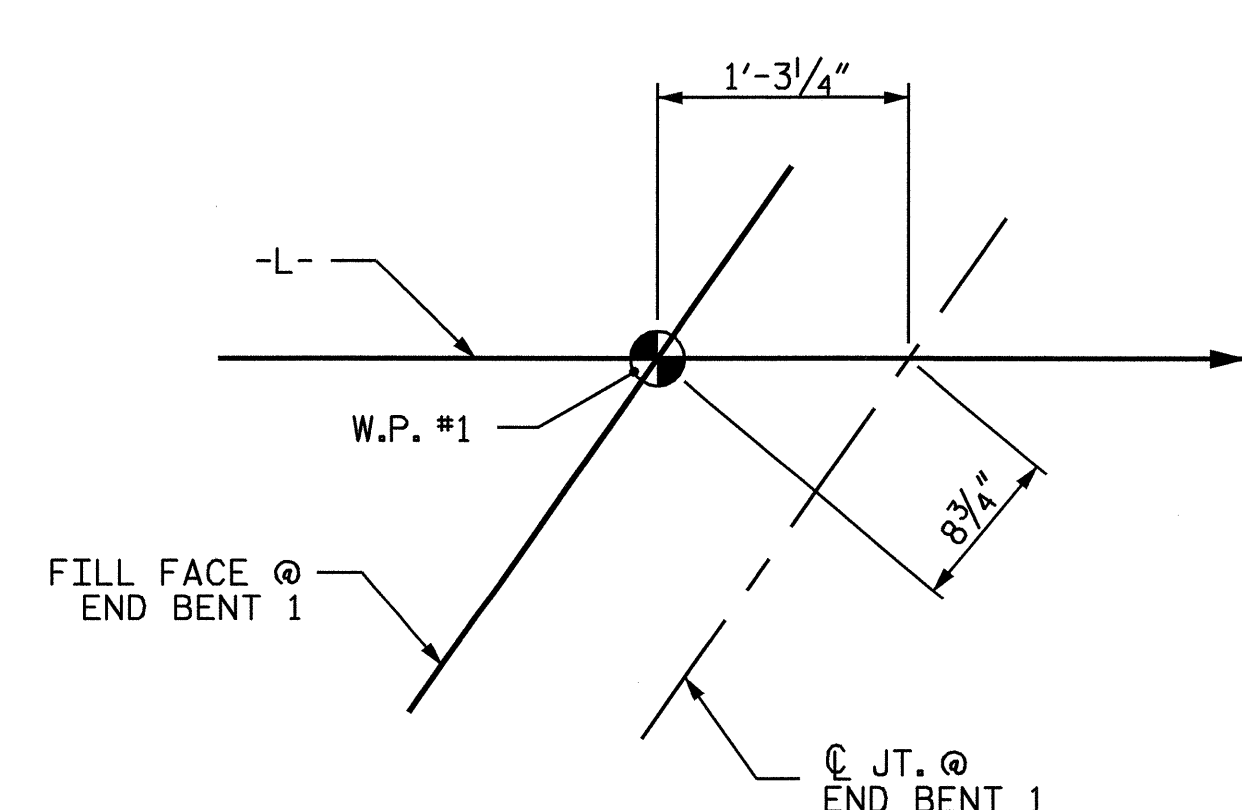


ASSEMBLED BY : S. DOMBROWSKI DATE : 1/6/09
 CHECKED BY : J. FRYE DATE : 1/6/09
 DRAWN BY : MAA 1/08
 CHECKED BY : GM/DI 2/08

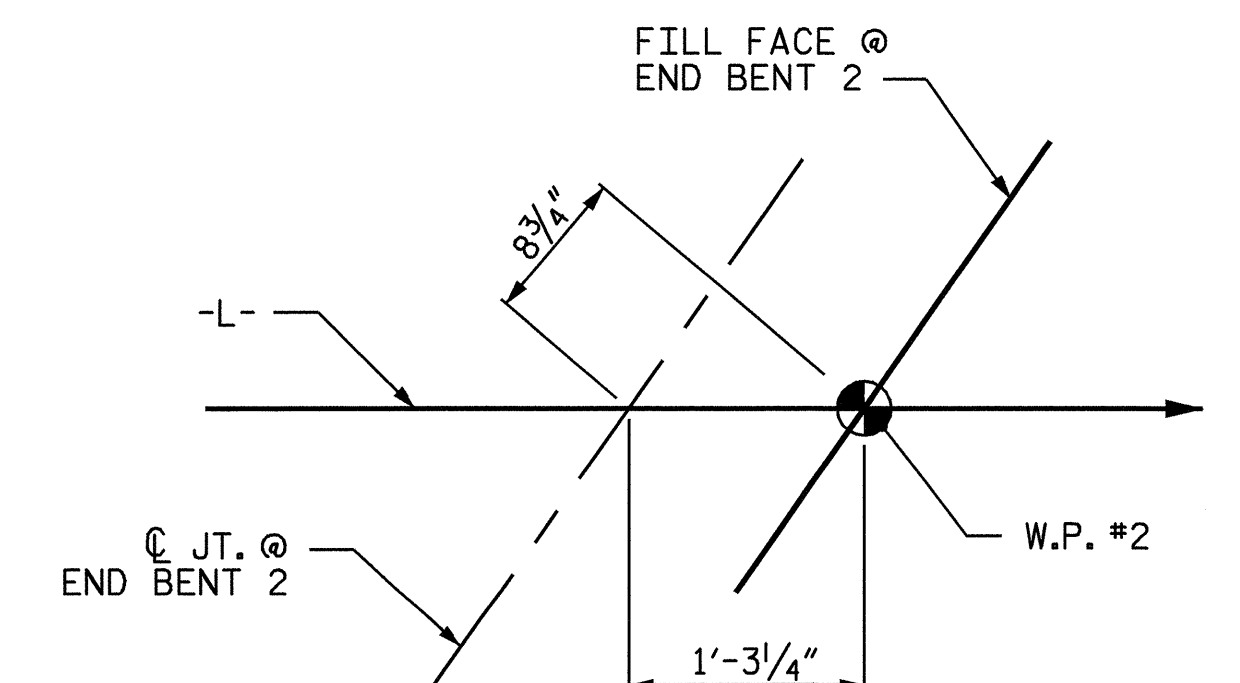
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			24



PLAN OF SPAN



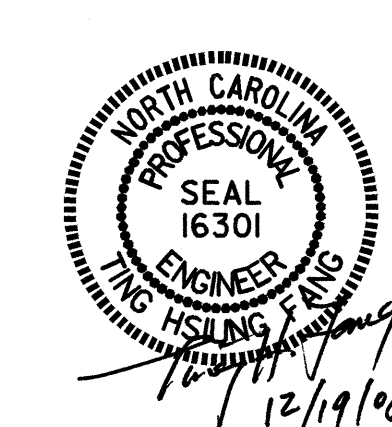
DETAIL "A"



DETAIL "B"

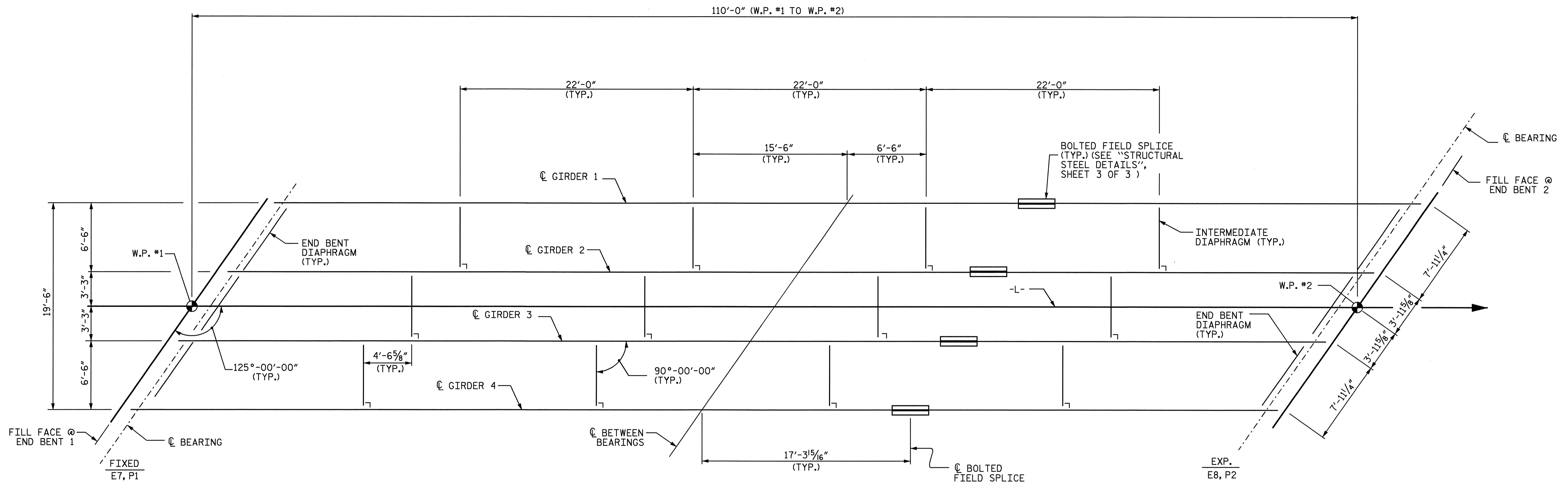
PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

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



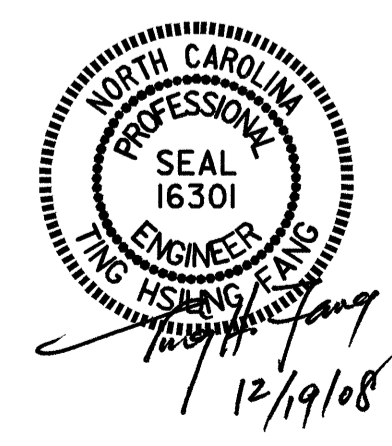
DRAWN BY : H.B. SHAH DATE : 07/31/08
 CHECKED BY : I.H. FANG DATE : 08-08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			24



FRAMING PLAN

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

DRAWN BY : H.B. SHAH DATE : 7/3/08
 CHECKED BY : TING FANG DATE : 11/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			24

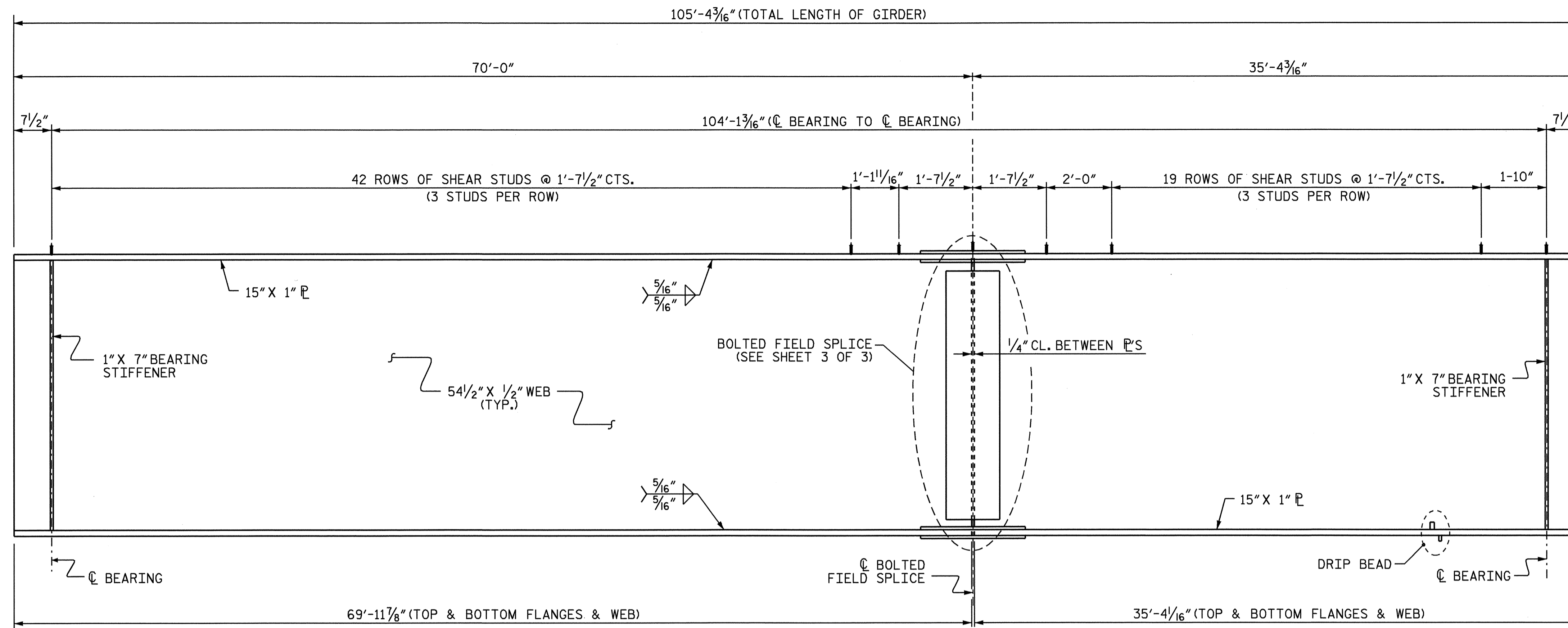
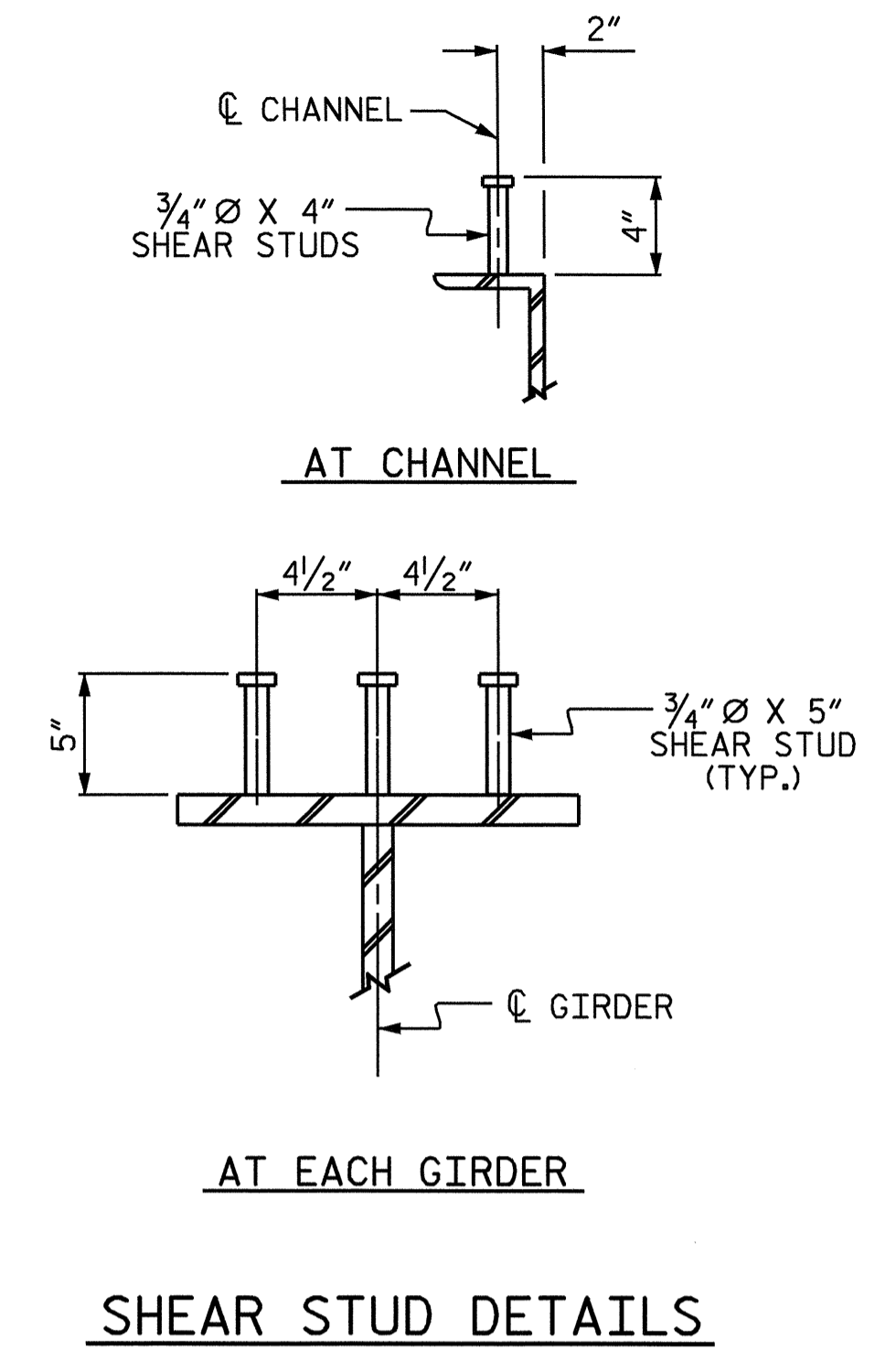
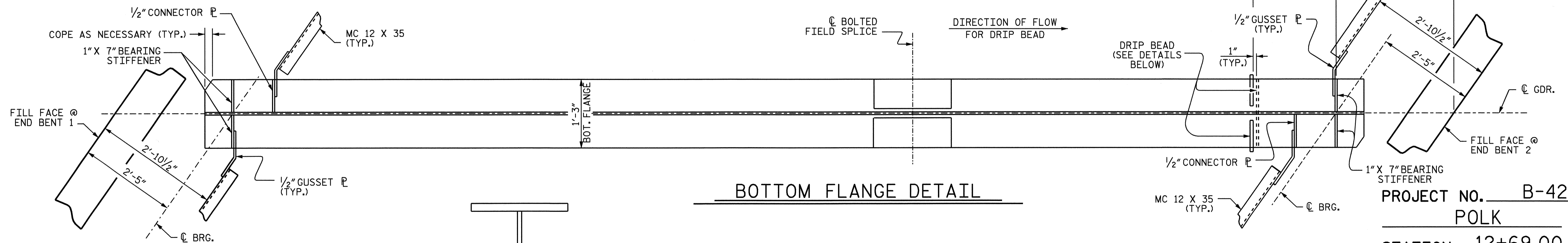


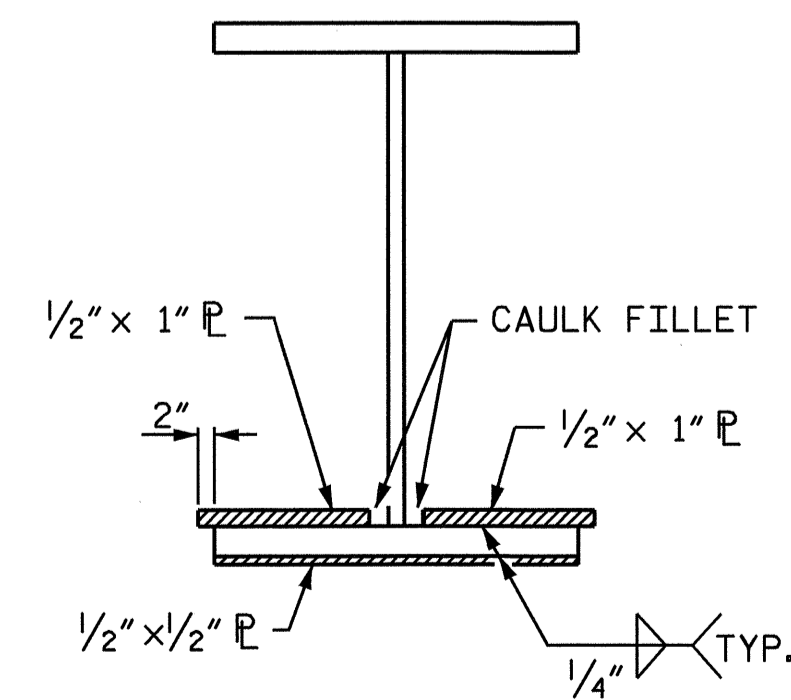
PLATE GIRDER ELEVATION



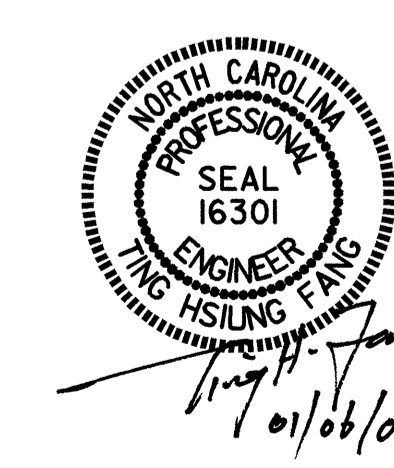
SHEAR STUD DETAILS



BOTTOM FLANGE DETAIL



DRIP BEAD DETAIL
FOR EXTERIOR GIRDERS ONLY



PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

DRAWN BY : HARISH SHAH DATE : 07-08
 CHECKED BY : TING FANG DATE : 11-08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			24

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

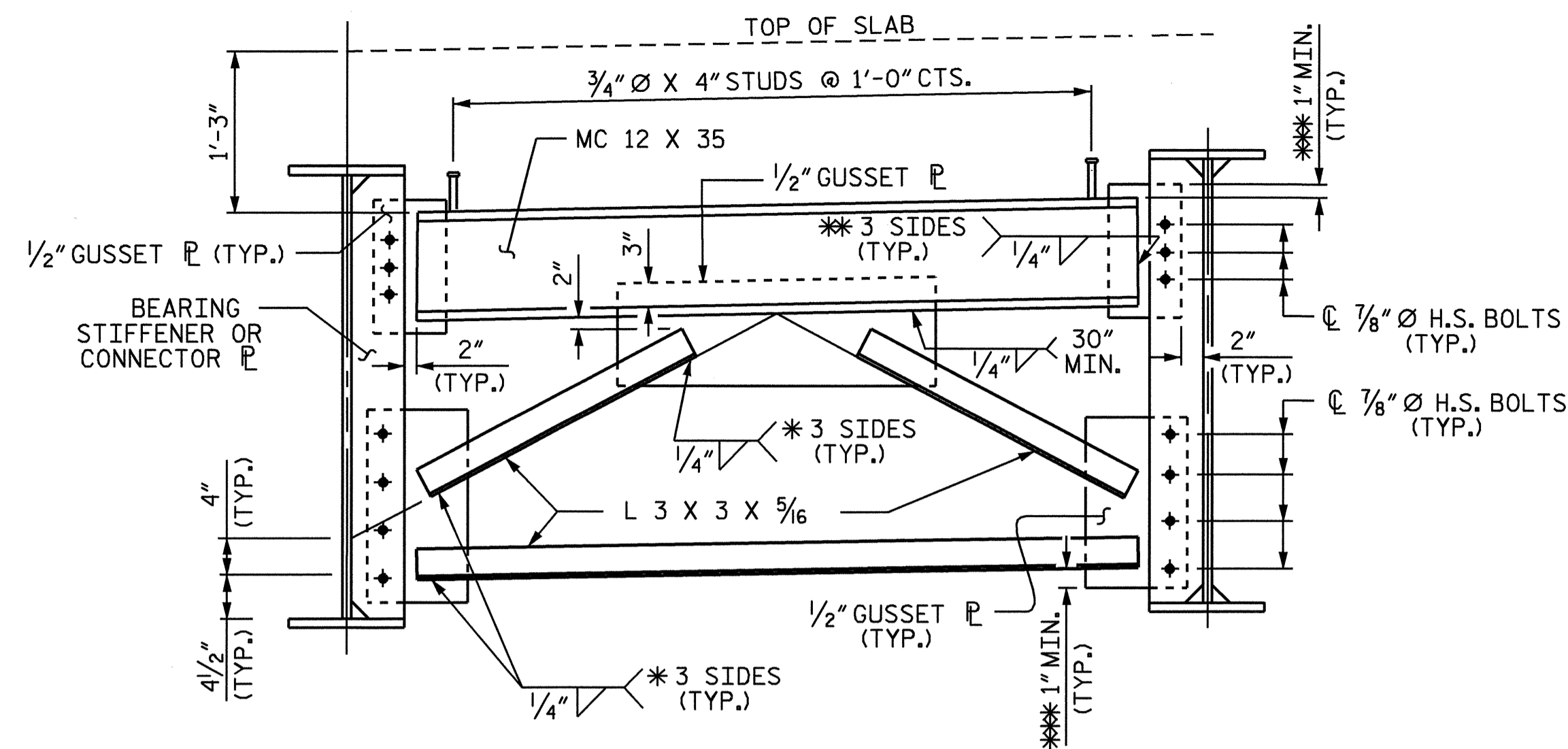
END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.

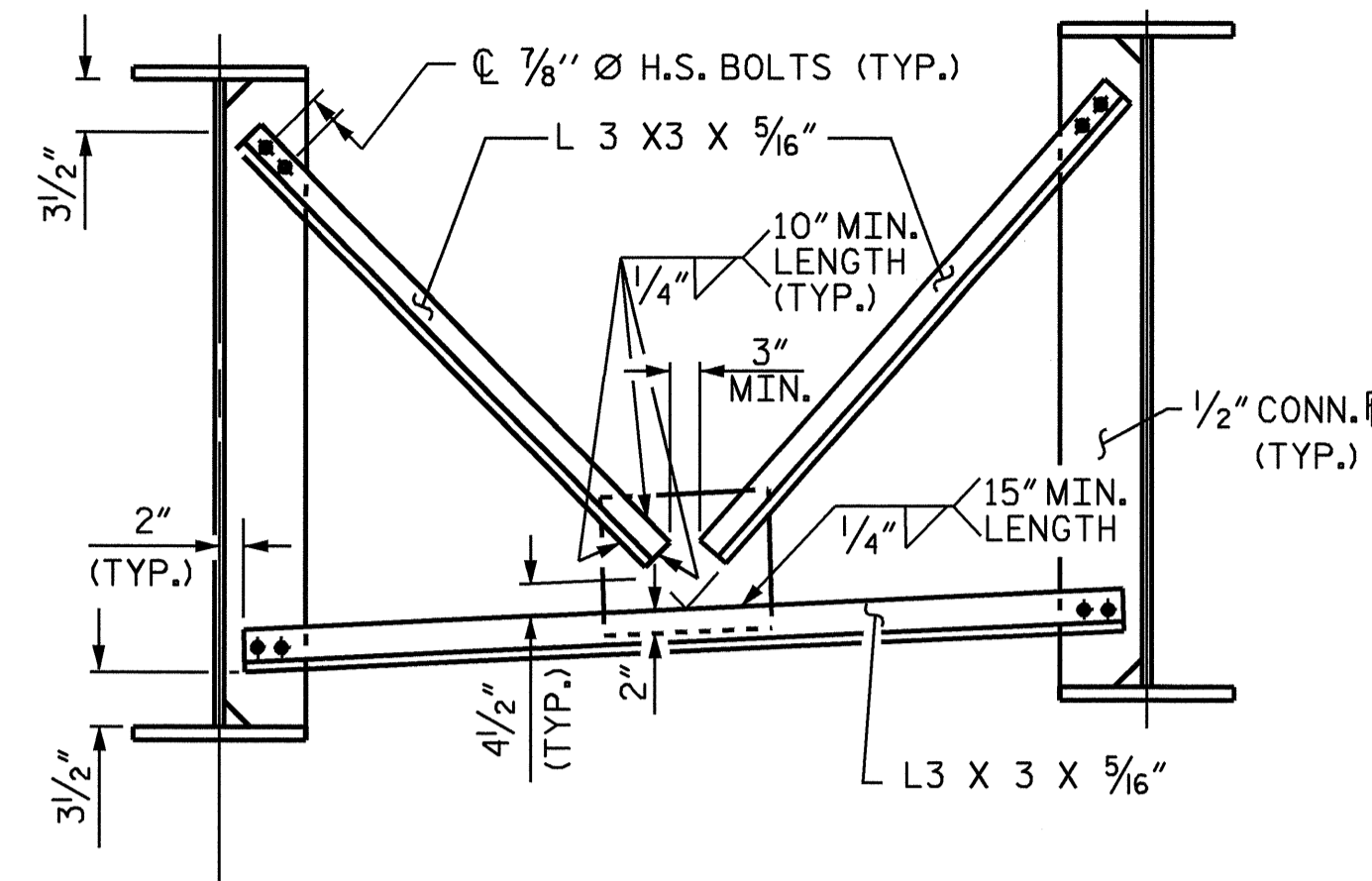
FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

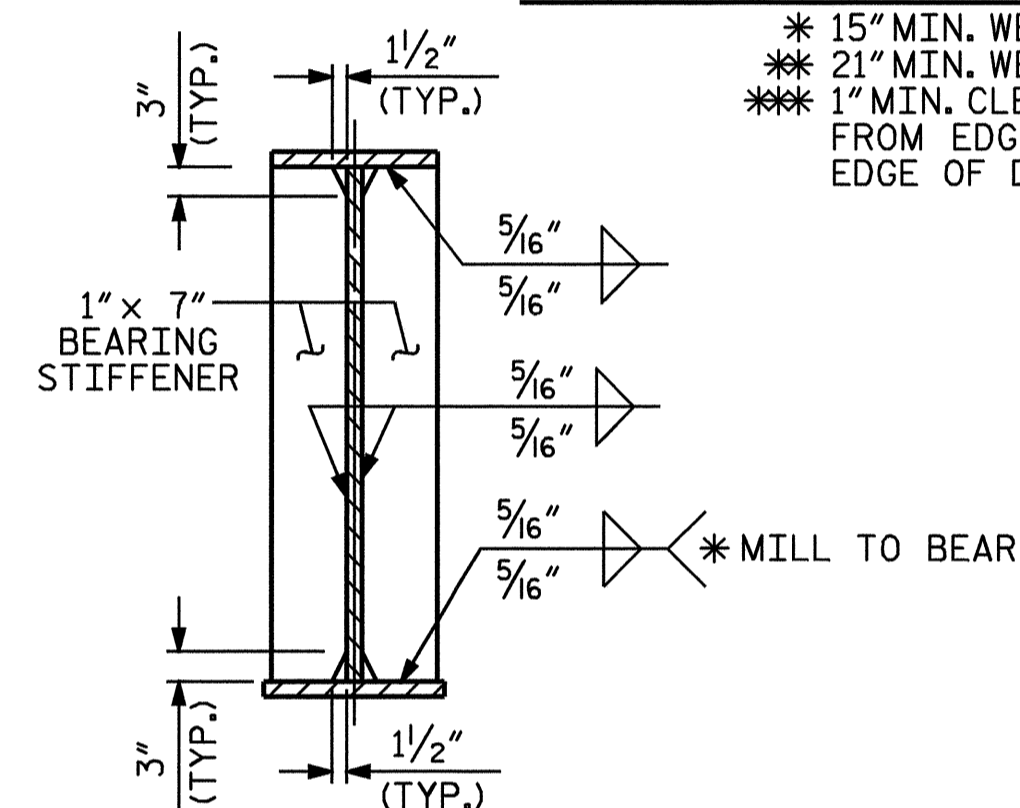
ACCESS TO BRIDGE NO. 2 REQUIRES PASSING UNDER A NORFOLK SOUTHERN RAILROAD UNDERPASS (POLK CO. BRIDGE NO. 215) WITH LOW VERTICAL CLEARANCE. NCDOT BRIDGE MANAGEMENT UNIT LISTS THE MINIMUM VERTICAL CLEARANCE AS 11'-11". TO ASSIST WITH CLEARING GIRDERS UNDER THIS RAILROAD UNDERPASS, THE CONTRACTOR HAS THE OPTION OF WELDING SHEAR STUDS TO THE GIRDERS AFTER GIRDERS HAVE CLEARED THIS BRIDGE.



END BENT DIAPHRAGM



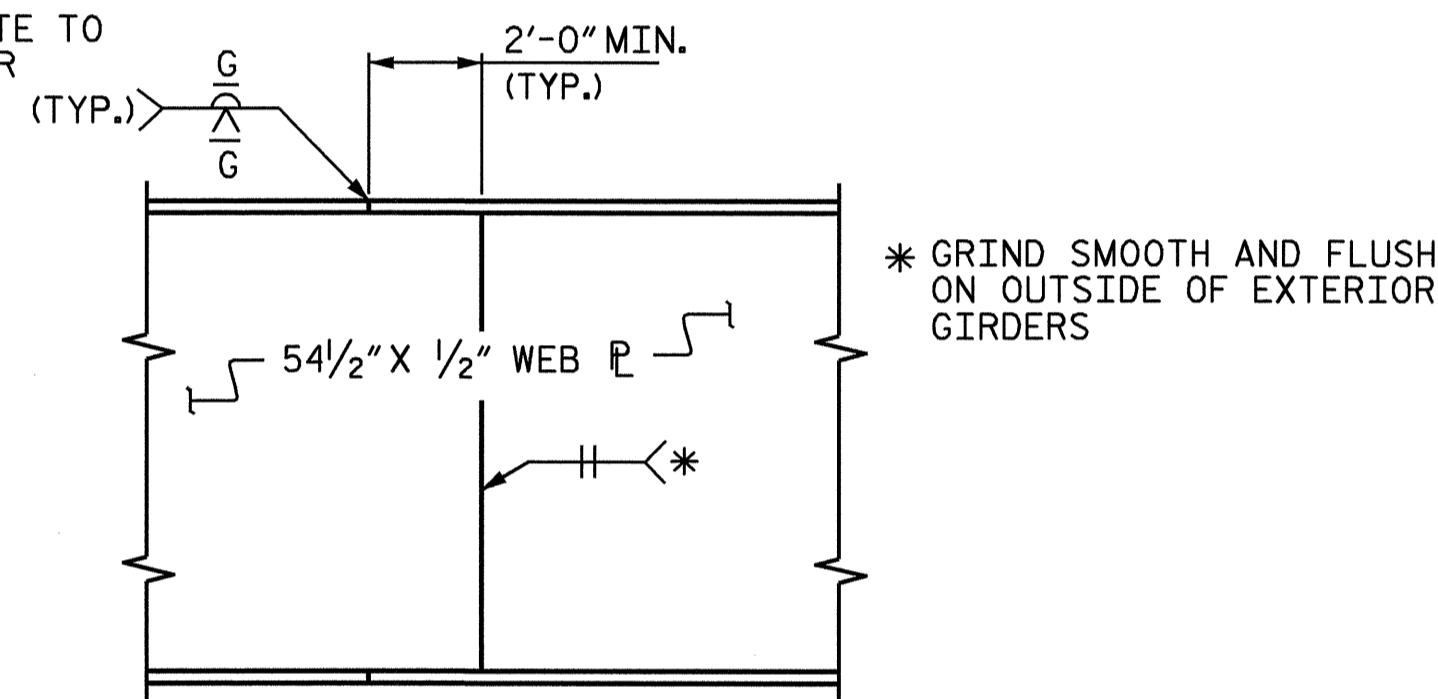
INTERMEDIATE DIAPHRAGM



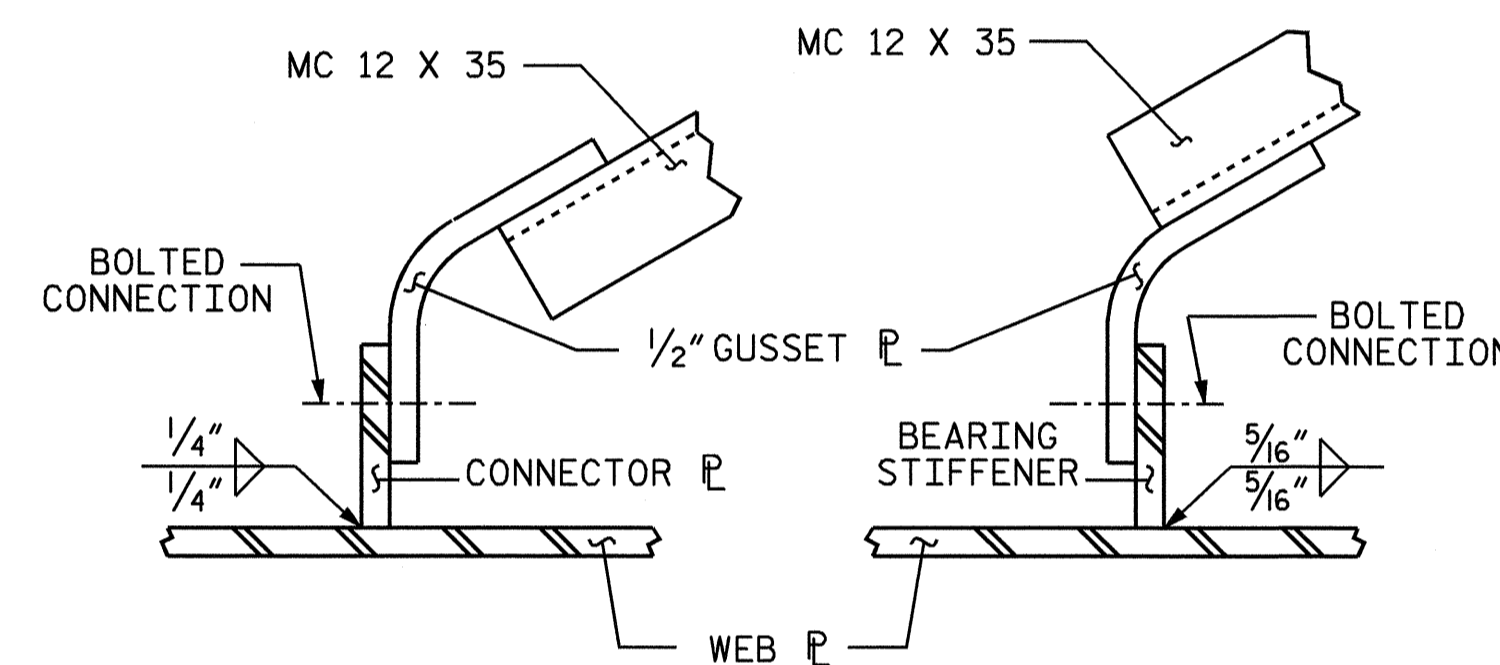
BEARING STIFFENER

* WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE

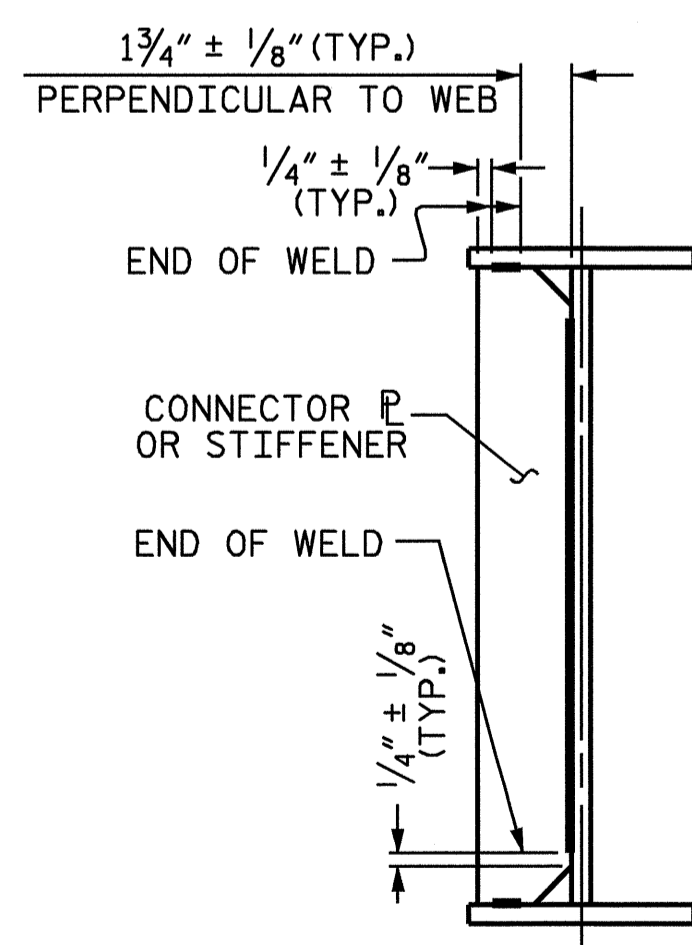
* 15" MIN. WELD LENGTH
 ** 21" MIN. WELD LENGTH
 *** 1" MIN. CLEARANCE TYPICAL FROM EDGE OF GUSSET PLATE TO EDGE OF DIAPHRAGM MEMBER



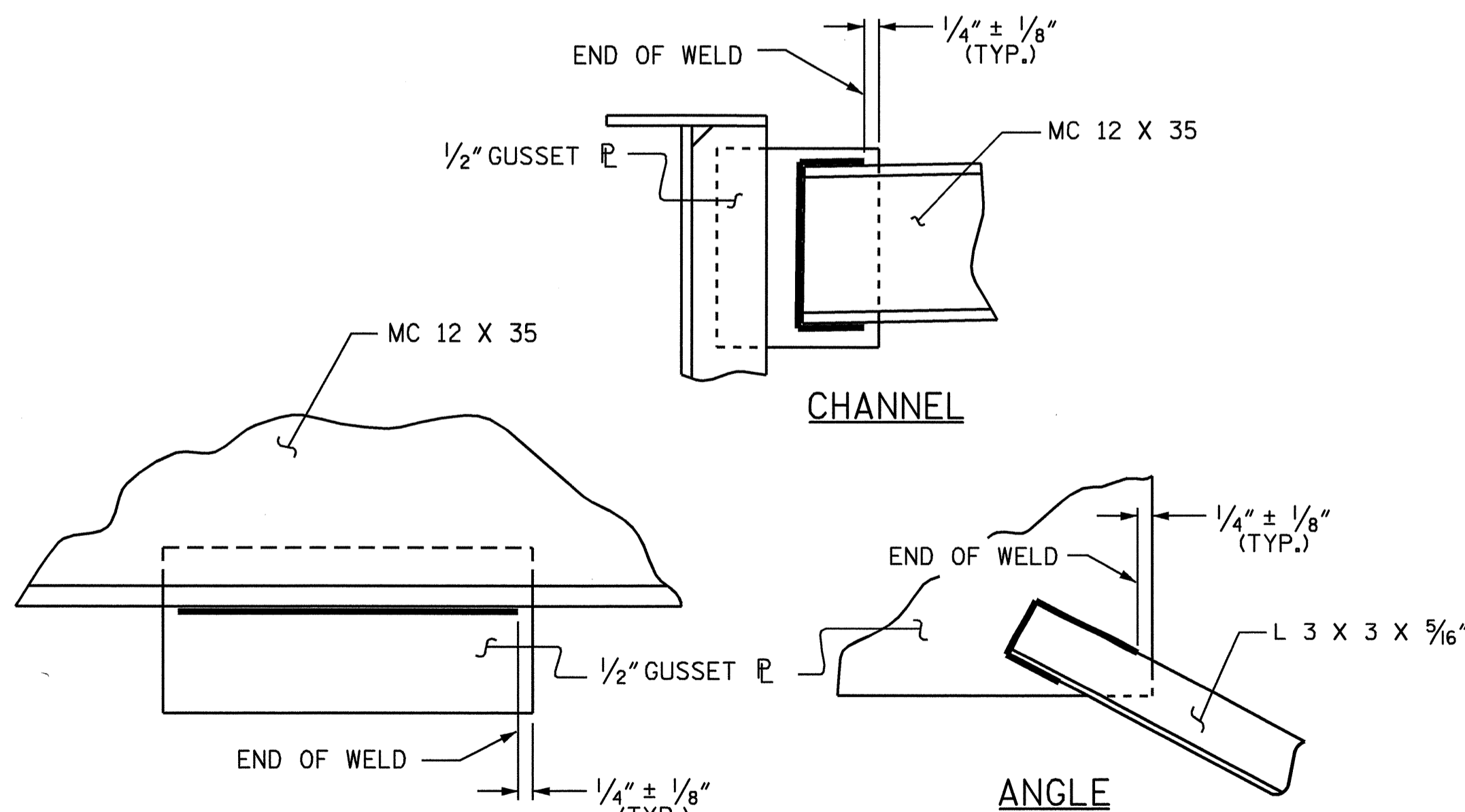
PERMISSIBLE SHOP FLANGE & WEB SPLICE



GUSSET PLATE DETAIL

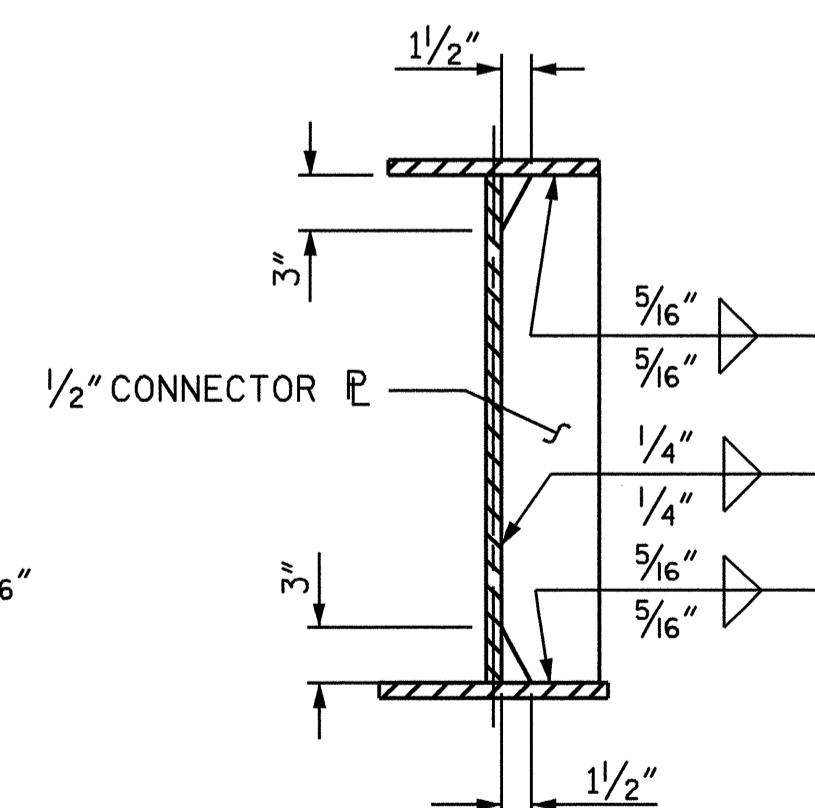


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



GUSSET PLATE CONNECTIONS

WELD TERMINATION DETAILS

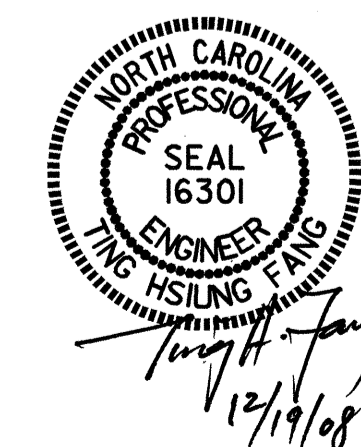


CONNECTOR PLATE DETAILS

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

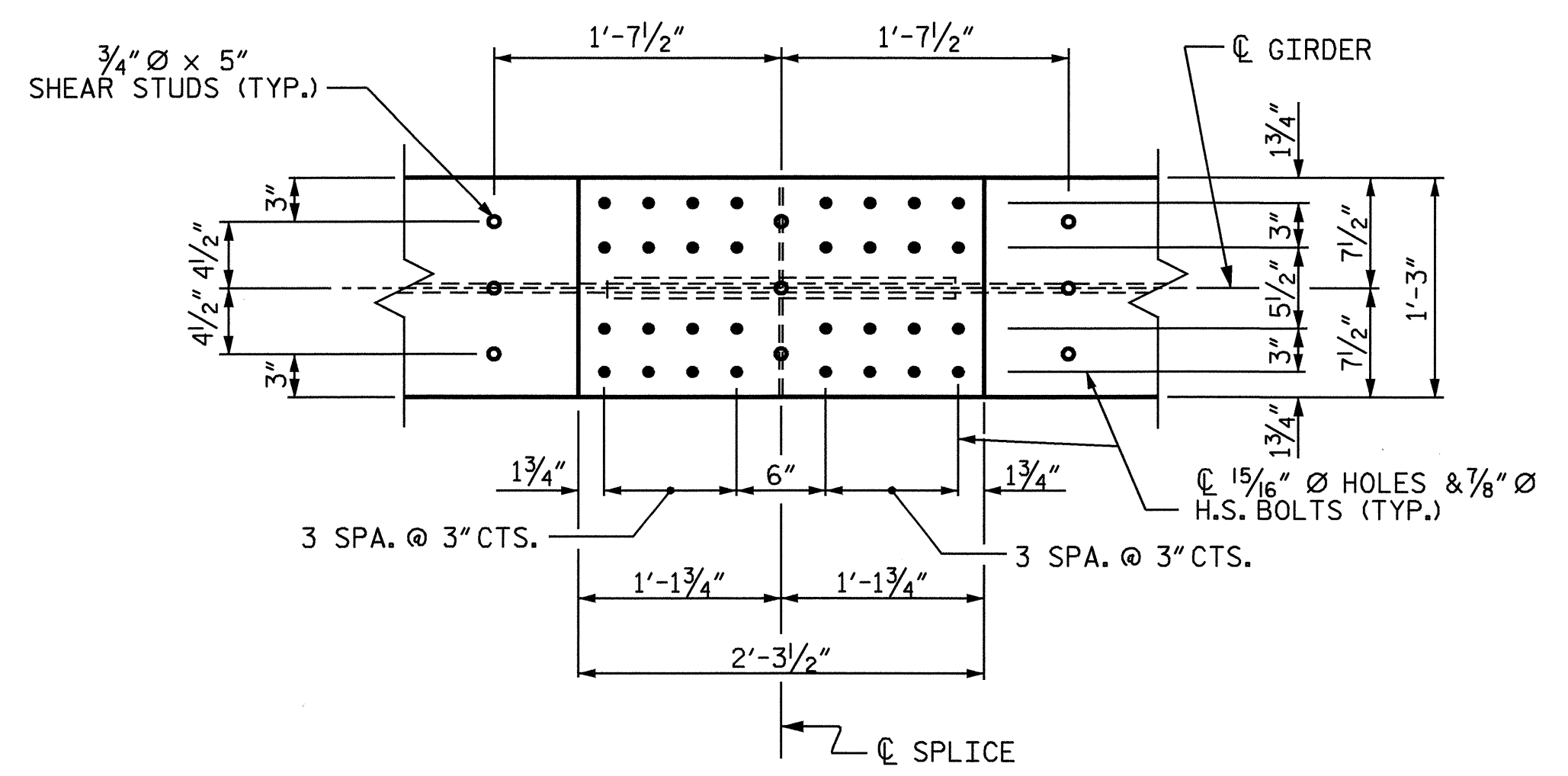
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
**STRUCTURAL STEEL
 DETAILS**

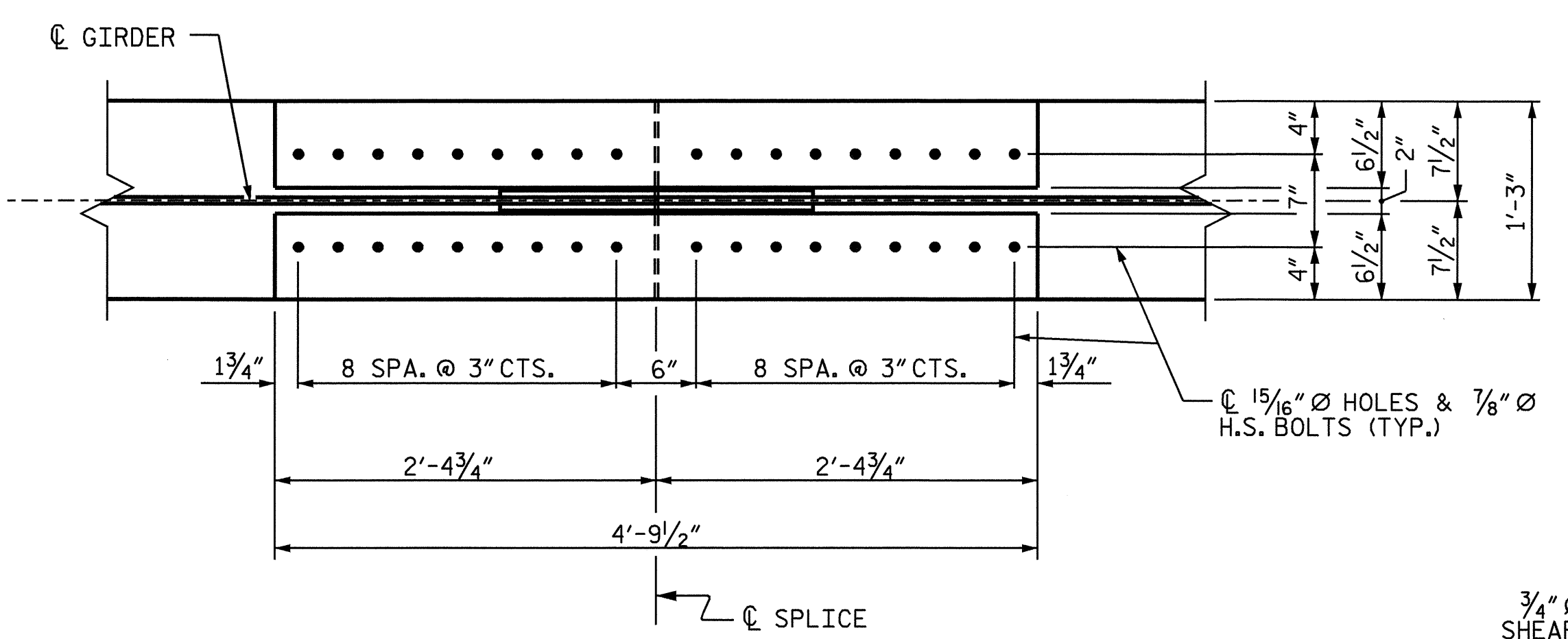


REVISIONS						SHEET NO. S-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

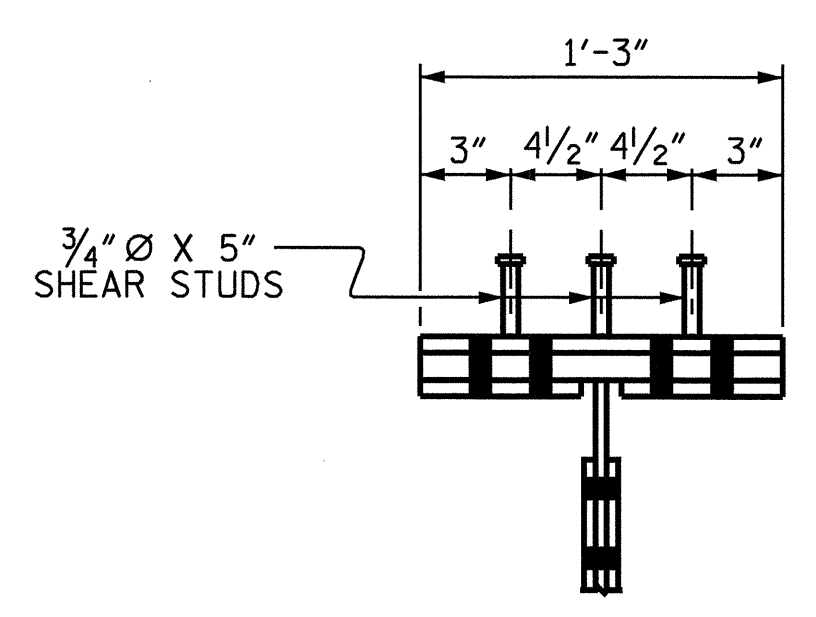
DRAWN BY: HARISH SHAH DATE: 07-08
 CHECKED BY: TING FANG DATE: 11-08



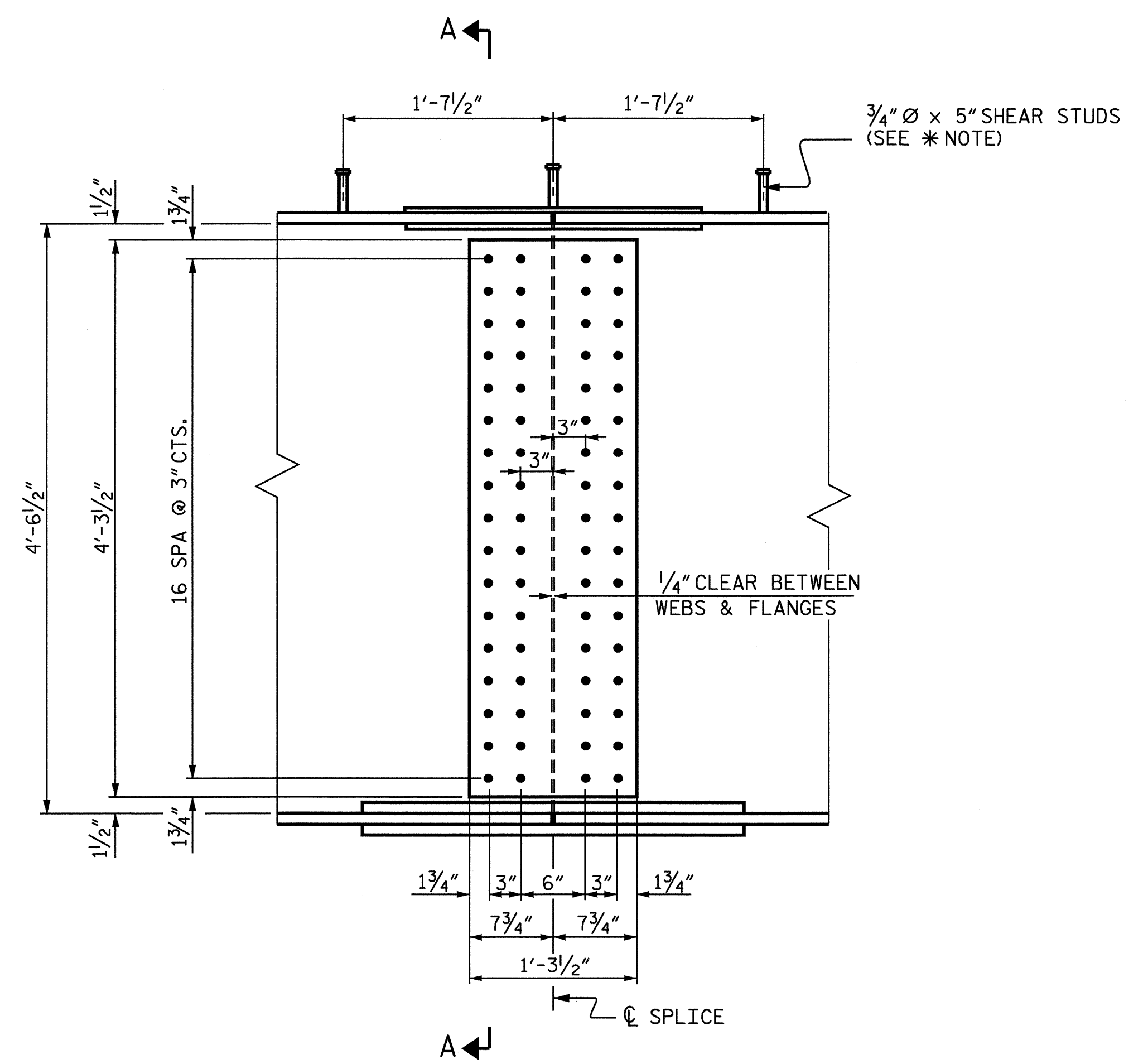
PLAN (TOP OF TOP FLANGE)



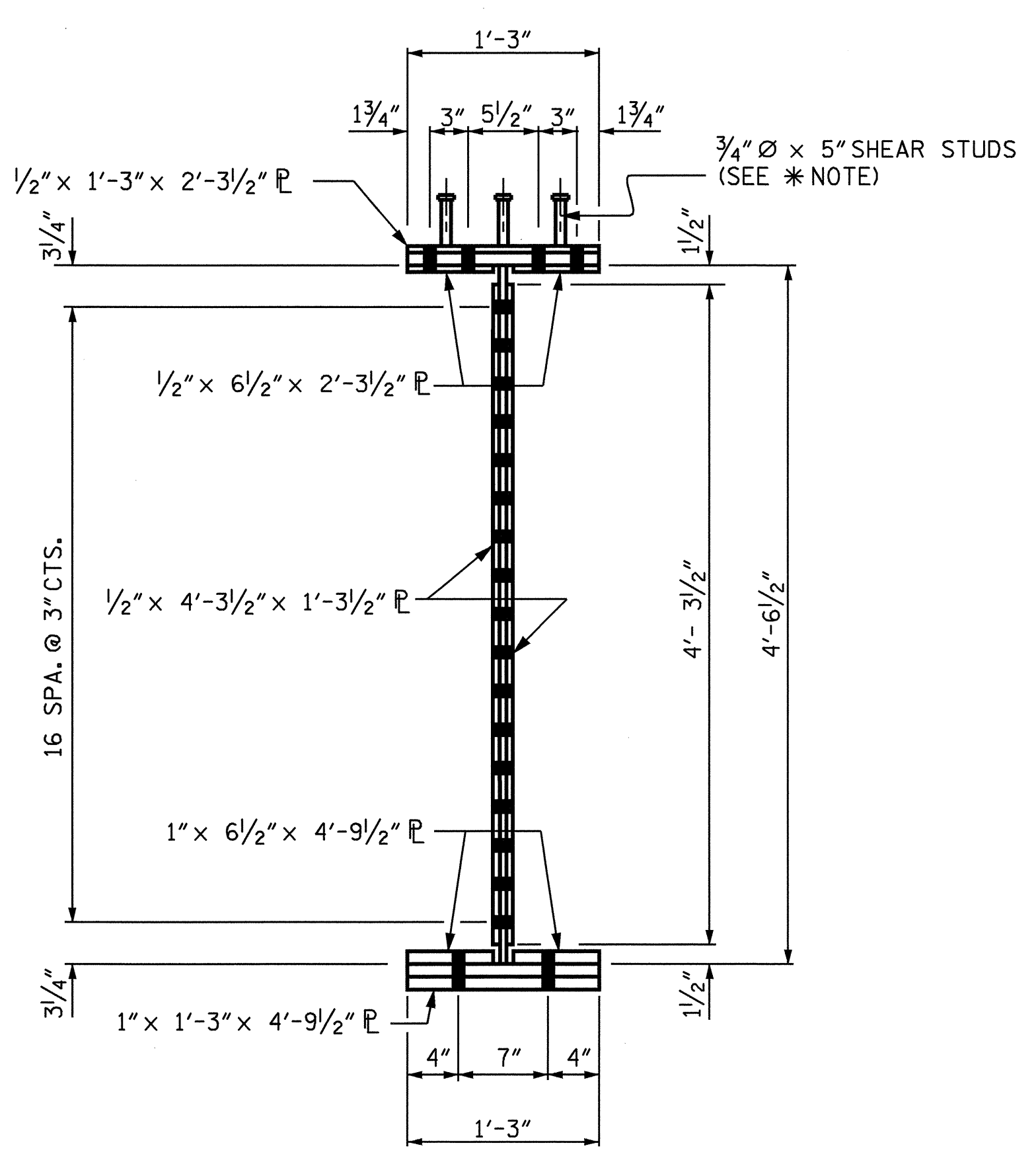
PLAN (TOP OF BOTTOM FLANGE)



SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE
* NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY, FOR CONTRACTOR'S OPTION, SEE NOTE ON SHEET 2 OF 3.



ELEVATION

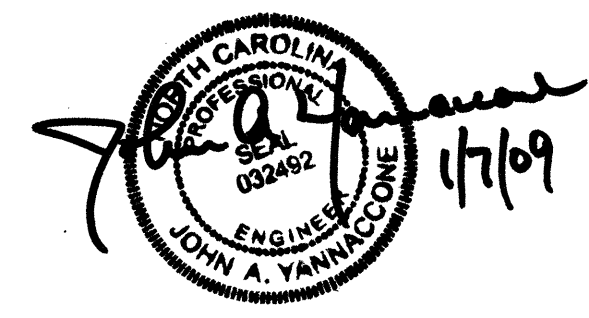


SECTION A-A

BOLTED FIELD SPLICE DETAILS
(TYPICAL EACH FIELD SPLICE)

PROJECT NO. B-4239
POLK COUNTY
STATION: 12+69.00 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS
BOLTED FIELD SPLICE



DRAWN BY: T. H. FANG DATE: 12-08
CHECKED BY: J. YANNAACONE DATE: 1-07-09

07-JAN-2009 14:00
k:\t\p\projects-b\4239\structures\final plans\b-4239.sd.ss.01.dgn
tfang

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
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.

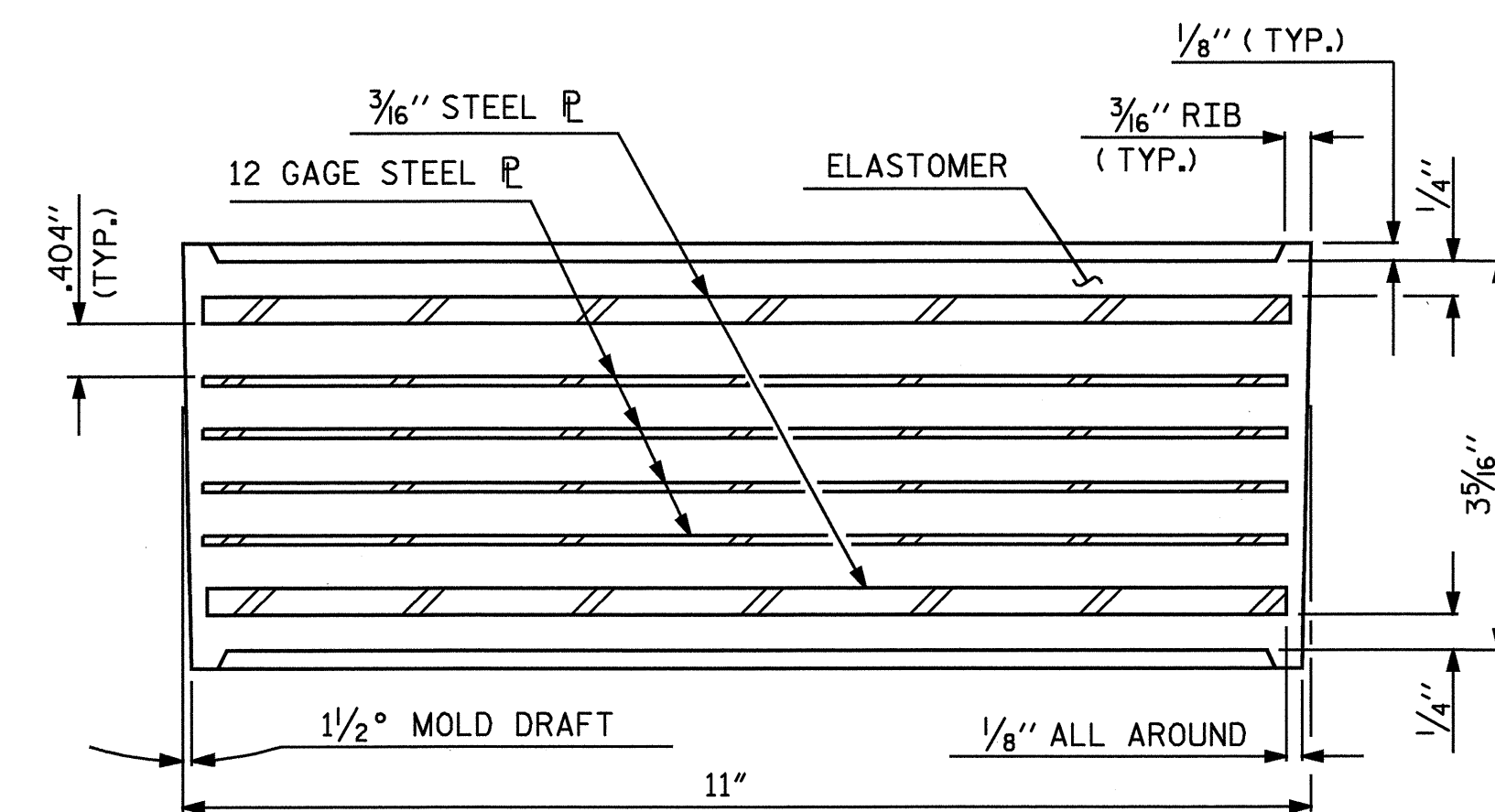
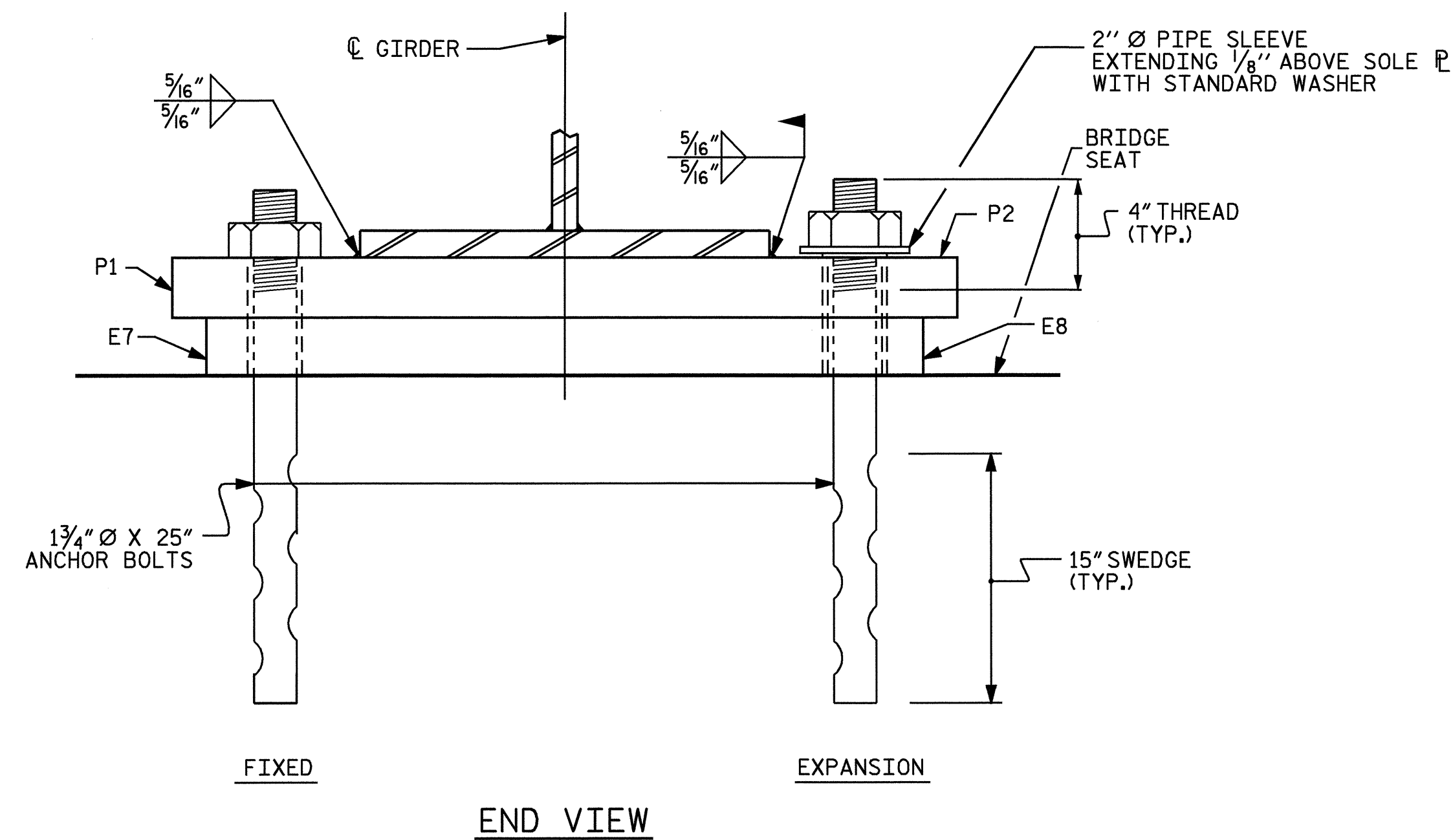
THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

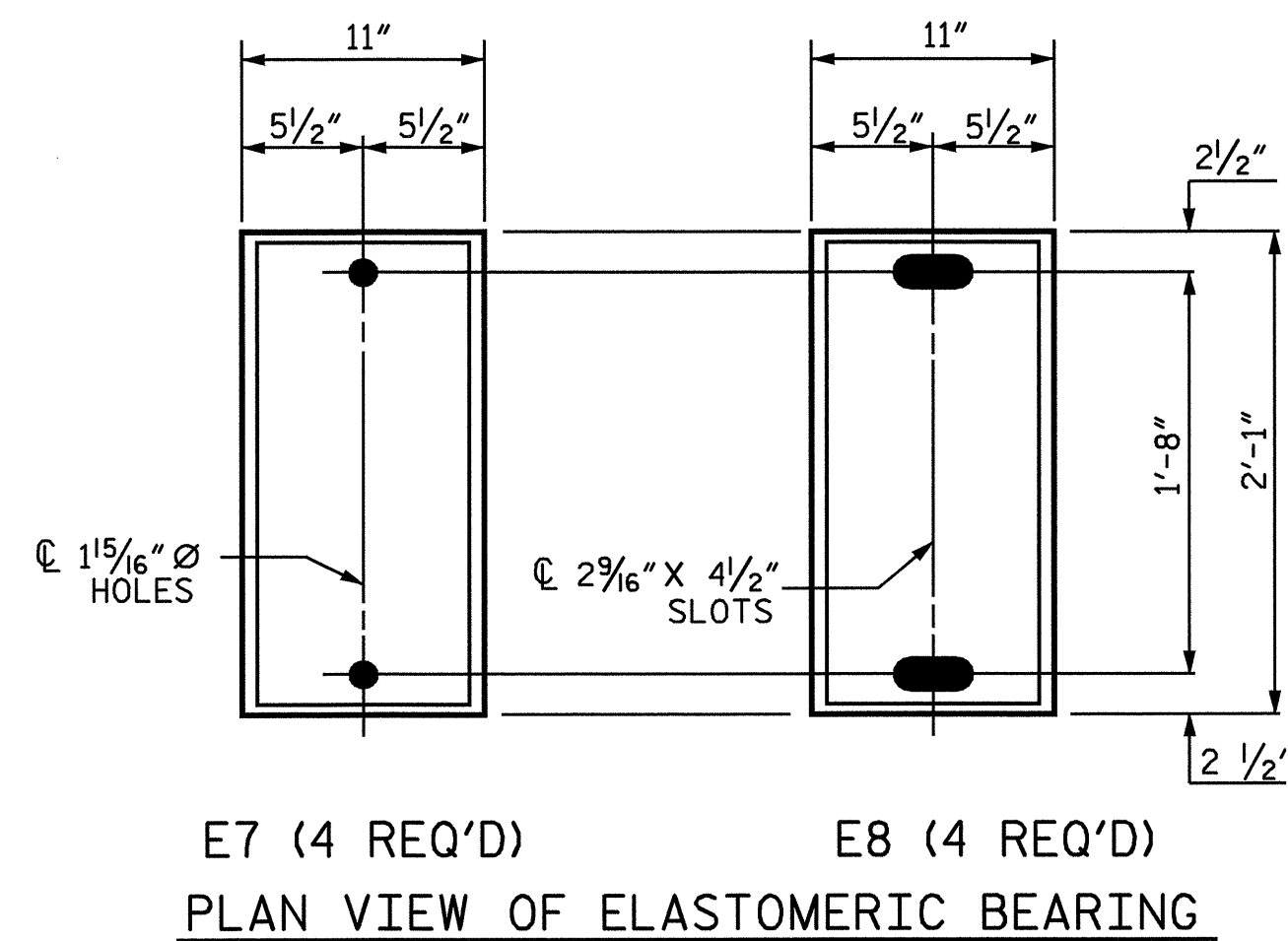
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

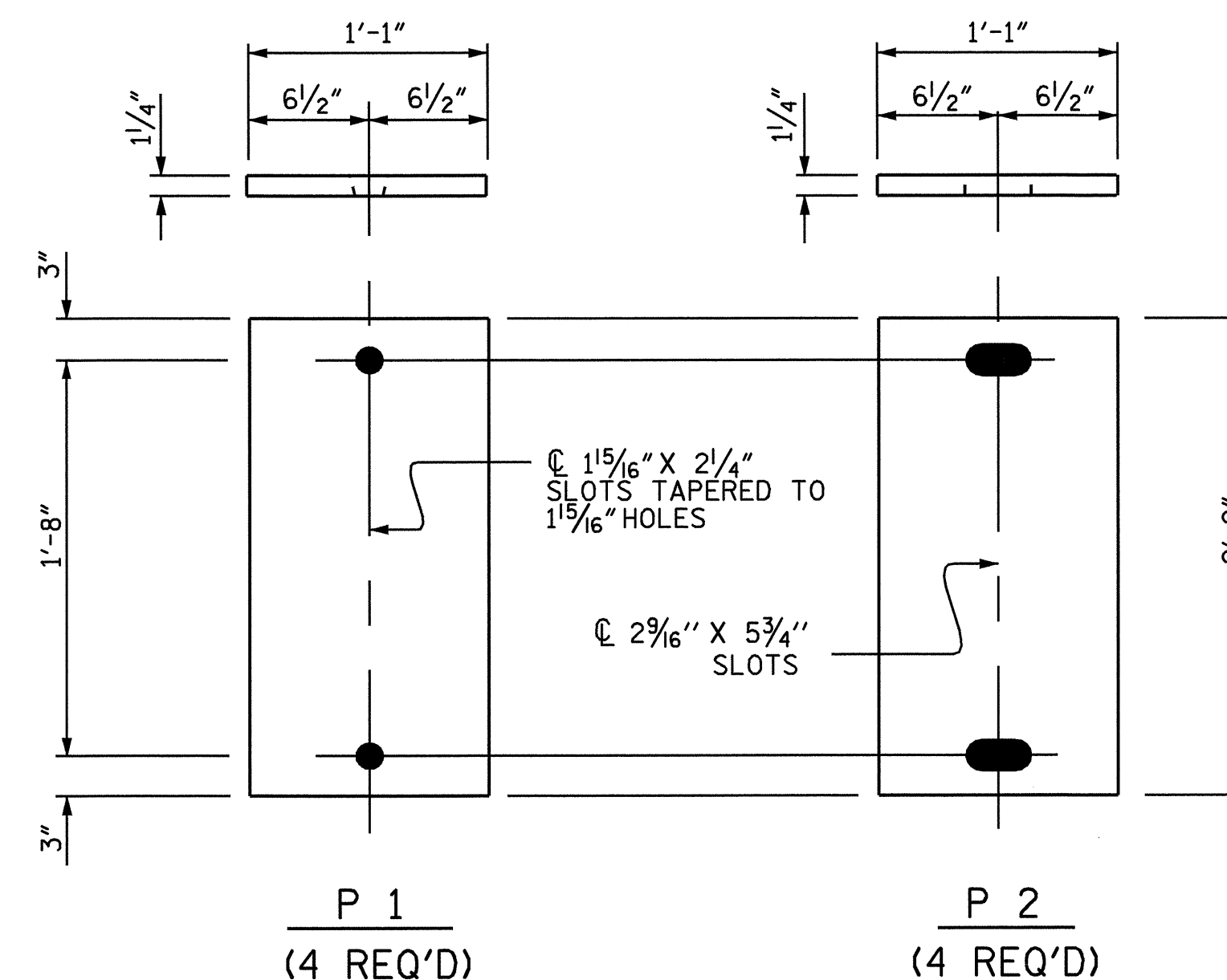


TYPICAL SECTION OF ELASTOMERIC BEARING



E7 (4 REQ'D) E8 (4 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

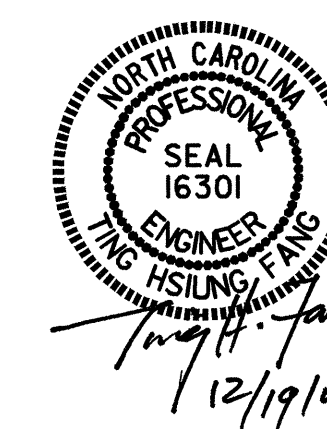
TYPE IV



SOLE PLATE DETAILS ("P")

-LOAD RATINGS-	
TYPE IV	MAX.D.L.+ L.L. 184 K

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-11
ELASTOMERIC BEARING DETAILS						TOTAL SHEETS 24
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

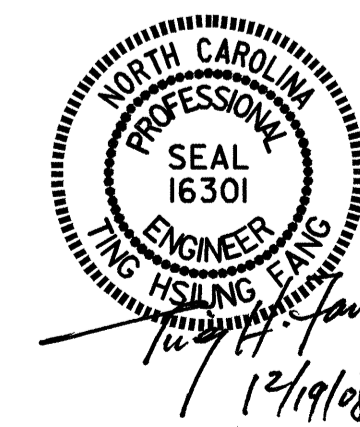
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

GIRDERS 1 & 4																					
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.009	0.017	0.025	0.032	0.039	0.044	0.049	0.052	0.054	0.055	0.054	0.052	0.049	0.044	0.039	0.032	0.025	0.017	0.009	0
* DEFLECTION DUE TO WEIGHT OF SLAB ↓	0	0.006	0.034	0.062	0.087	0.109	0.128	0.143	0.154	0.161	0.163	0.161	0.154	0.143	0.128	0.109	0.087	0.062	0.034	0.006	0
DEFLECTION DUE TO WEIGHT OF RAIL ↓	0	0.005	0.009	0.014	0.018	0.021	0.025	0.027	0.029	0.030	0.030	0.030	0.029	0.027	0.025	0.021	0.018	0.014	0.009	0.005	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.020	0.060	0.101	0.137	0.169	0.197	0.219	0.235	0.245	0.248	0.245	0.235	0.219	0.197	0.169	0.137	0.101	0.060	0.020	0
VERTICAL CURVE ORDINATE	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
REQUIRED CAMBER ↑	0	1/4"	3/4"	1 3/16"	1 5/8"	2 1/16"	2 3/8"	2 5/8"	2 13/16"	2 15/16"	3"	2 15/16"	2 13/16"	2 5/8"	2 3/8"	2 1/16"	1 5/8"	1 3/16"	3/4"	1/4"	0

GIRDERS 2 & 3																					
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.009	0.017	0.025	0.032	0.039	0.044	0.049	0.052	0.054	0.055	0.054	0.052	0.049	0.044	0.039	0.032	0.025	0.017	0.009	0
* DEFLECTION DUE TO WEIGHT OF SLAB ↓	0	0.005	0.034	0.061	0.085	0.107	0.126	0.141	0.151	0.158	0.160	0.158	0.151	0.141	0.126	0.107	0.085	0.061	0.034	0.005	0
DEFLECTION DUE TO WEIGHT OF RAIL ↓	0	0.005	0.009	0.013	0.017	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.013	0.009	0.005	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.019	0.060	0.099	0.134	0.167	0.194	0.216	0.231	0.241	0.244	0.241	0.231	0.216	0.194	0.167	0.134	0.099	0.060	0.019	0
VERTICAL CURVE ORDINATE	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
REQUIRED CAMBER ↑	0	1/4"	3/4"	1 3/16"	1 5/8"	2"	2 5/16"	2 9/16"	2 3/4"	2 7/8"	2 15/16"	2 7/8"	2 3/4"	2 9/16"	2 5/16"	2"	1 5/8"	1 3/16"	3/4"	1/4"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
 VALUE GIVEN IN TABLE ARE @ 20 TH POINTS BETWEEN C BEARINGS.

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

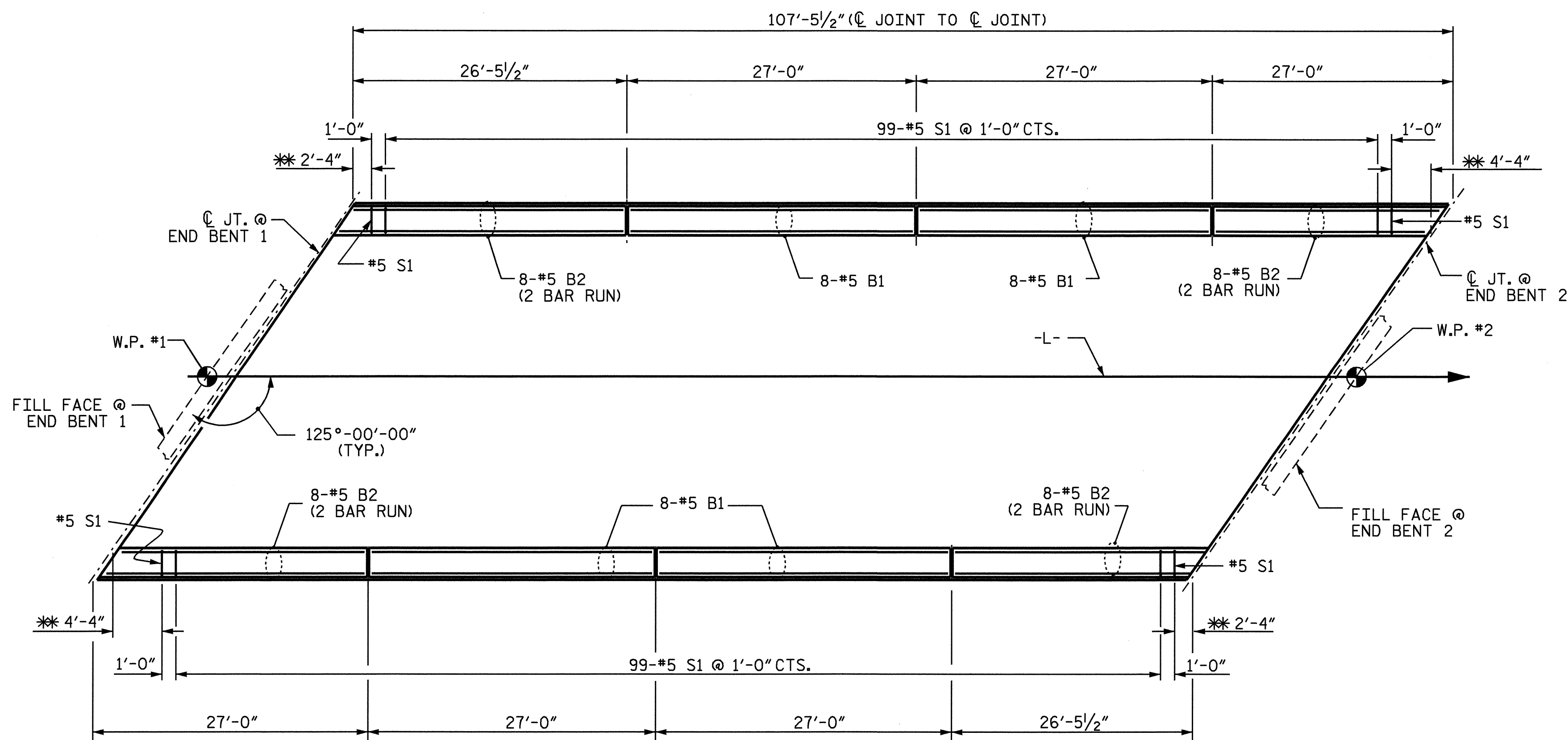


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 DEAD LOAD
 DEFLECTIONS

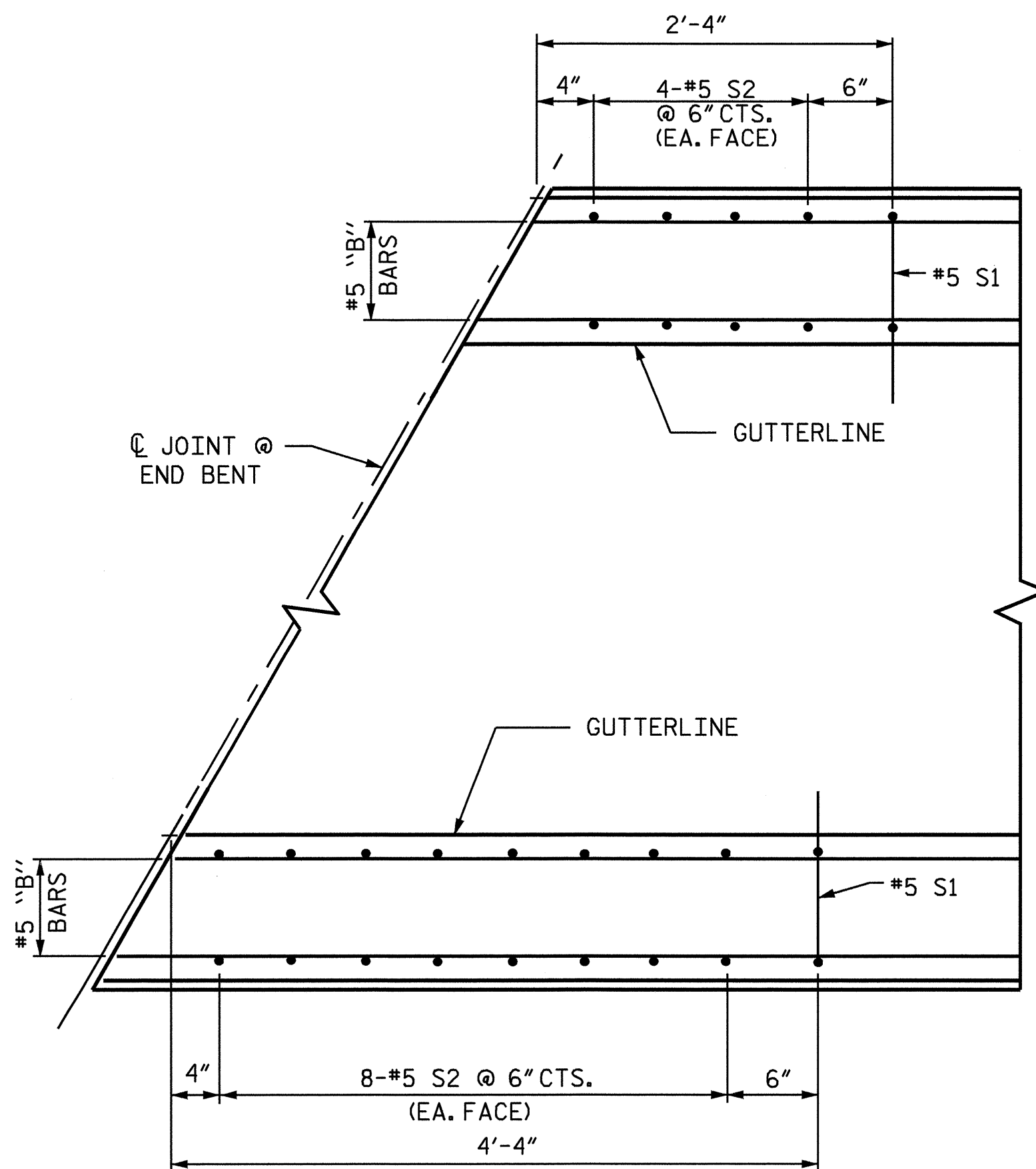
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			24

DRAWN BY : H.B. SHAH DATE : 07-08
 CHECKED BY : TING FANG DATE : 11-08



PLAN OF BARRIER RAIL

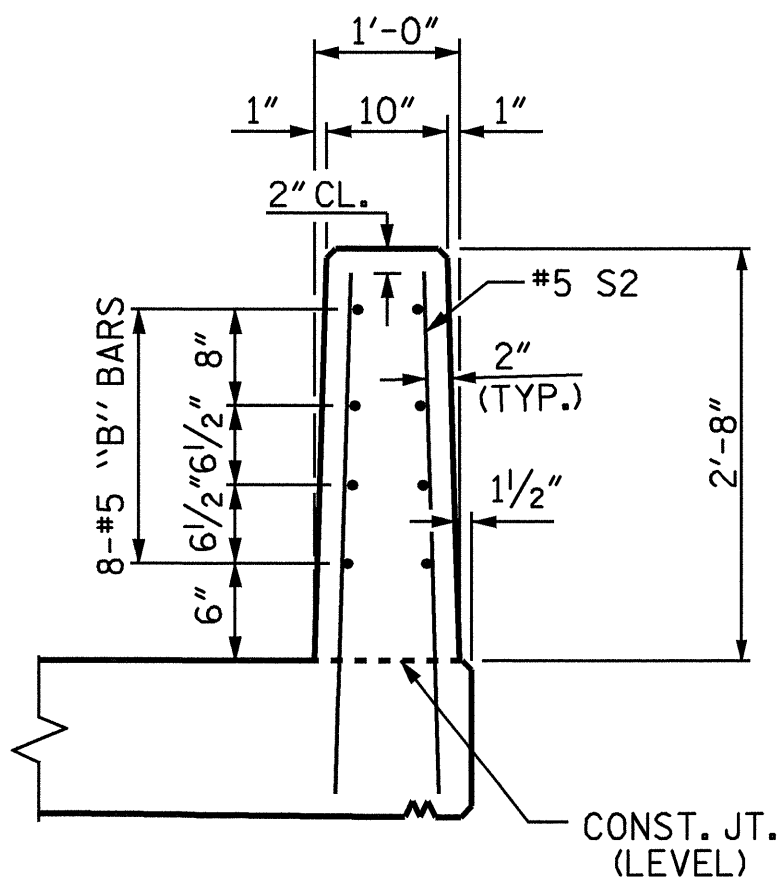
*SEE "END OF RAIL DETAILS - PLAN VIEW" FOR ADDITIONAL REINFORCING STEEL.



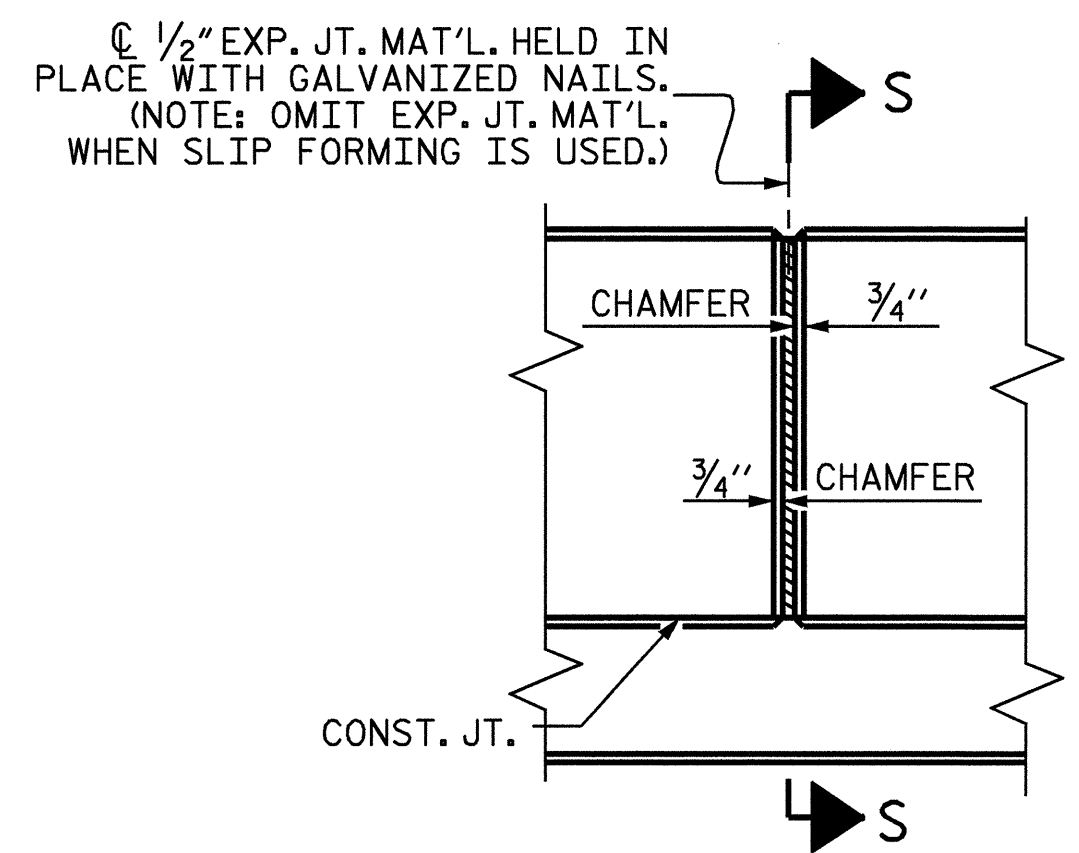
PLAN

END OF RAIL DETAILS

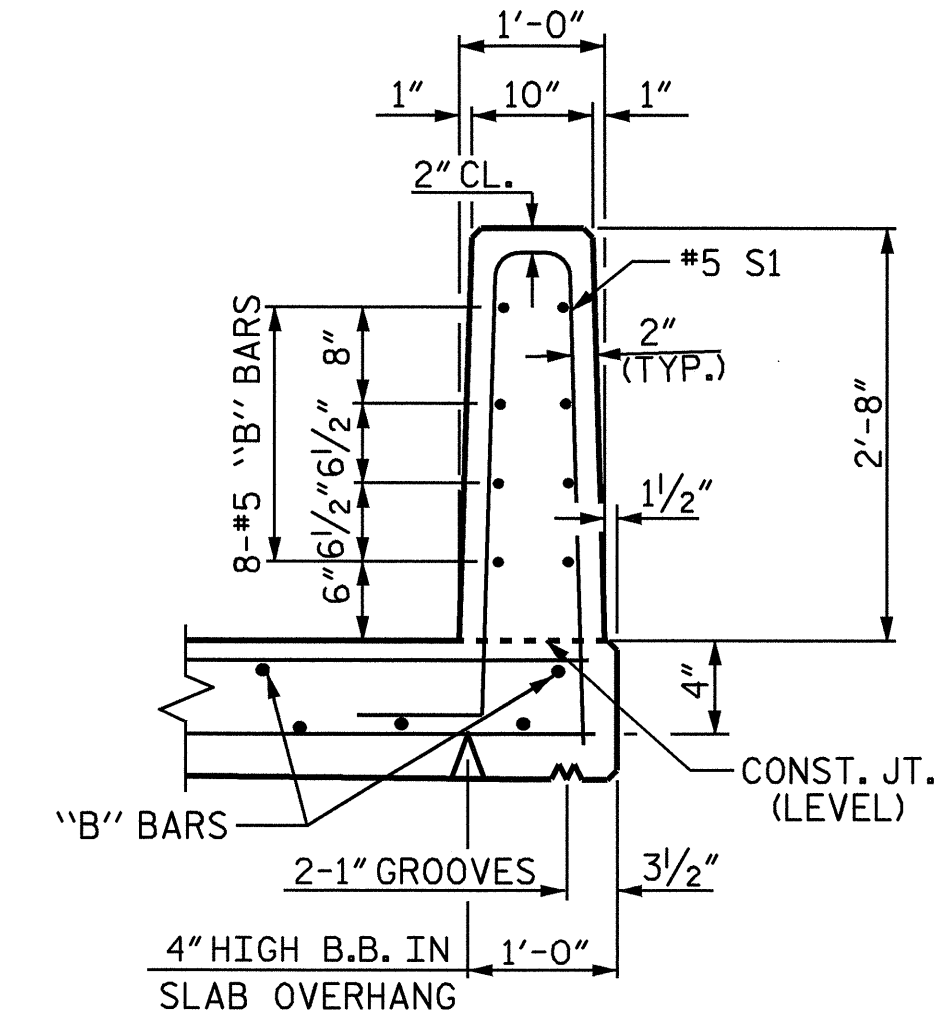
FOR ADHESIVE ANCHORING AT SAWED JOINTS



SECTION VIEW



ELEVATION AT EXPANSION JOINTS



SECTION S-S

BARRIER RAIL DETAILS

NOTES

BARRIER RAILS SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

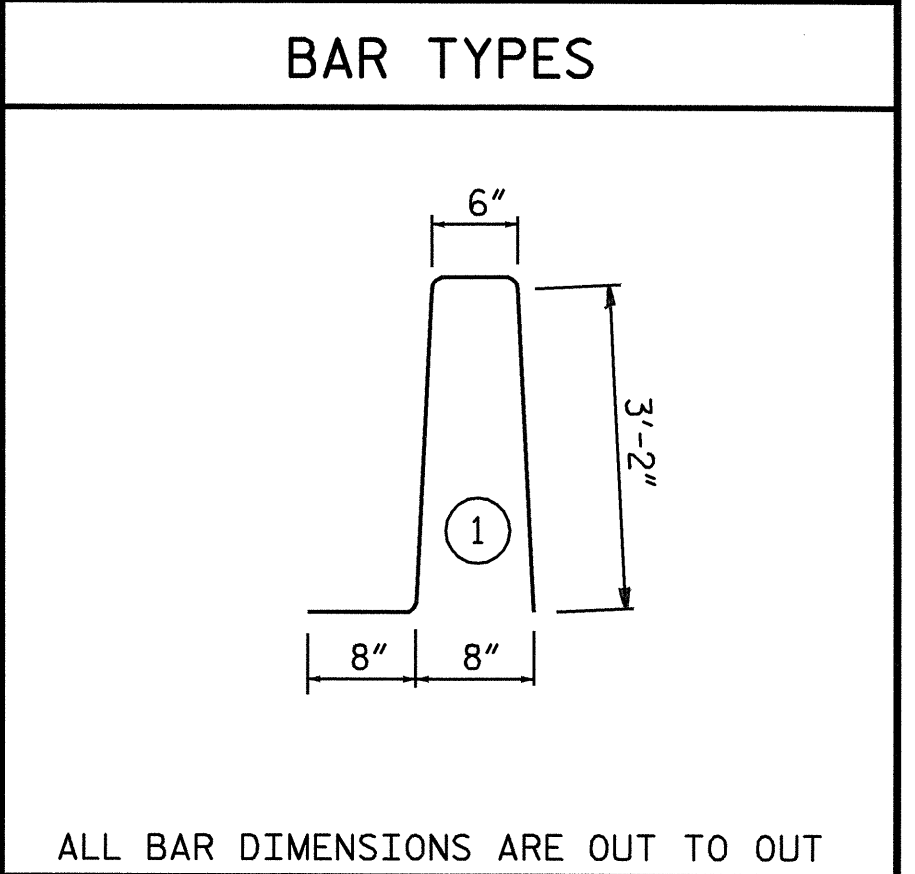
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S2 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S2 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

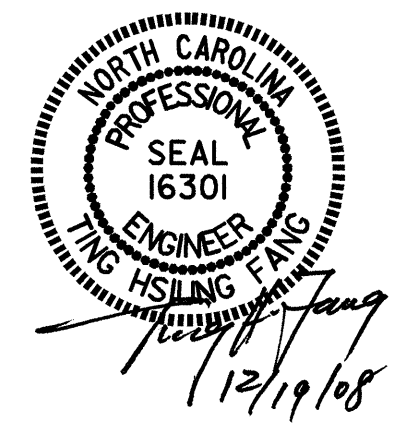
VERTICAL GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF VERTICAL CONCRETE BARRIER RAIL IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION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

FOR VERTICAL CONCRETE BARRIER RAIL, SEE SPECIAL PROVISION.

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	32	#5	STR	26'-8"	890
* B2	64	#5	STR	14'-7"	973
* S1	202	#5	1	7'-6"	1580
* S2	48	#5	STR	3'-2"	159
* EPOXY COATED REINFORCING STEEL					3,602 LBS.
CLASS AA CONCRETE					19.5 CU. YDS.
CONCRETE BARRIER RAIL					214.91 LIN. FT.



ALL BAR DIMENSIONS ARE OUT TO OUT



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 POLK COUNTY
 STATION: 12+69.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
VERTICAL CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-13
TOTAL SHEETS	24

ASSEMBLED BY :	H. B. SHAH	DATE :	07-08
CHECKED BY :	J. H. FANG	DATE :	11-08
DRAWN BY :	ARB 5/87	REV. 8/16/99	RWW/LES
CHECKED BY :	SJD 9/87	REV. 10/17/00	RWW/LES
		REV. 5/7/03R	RWW/JTE

NOTES

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

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

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

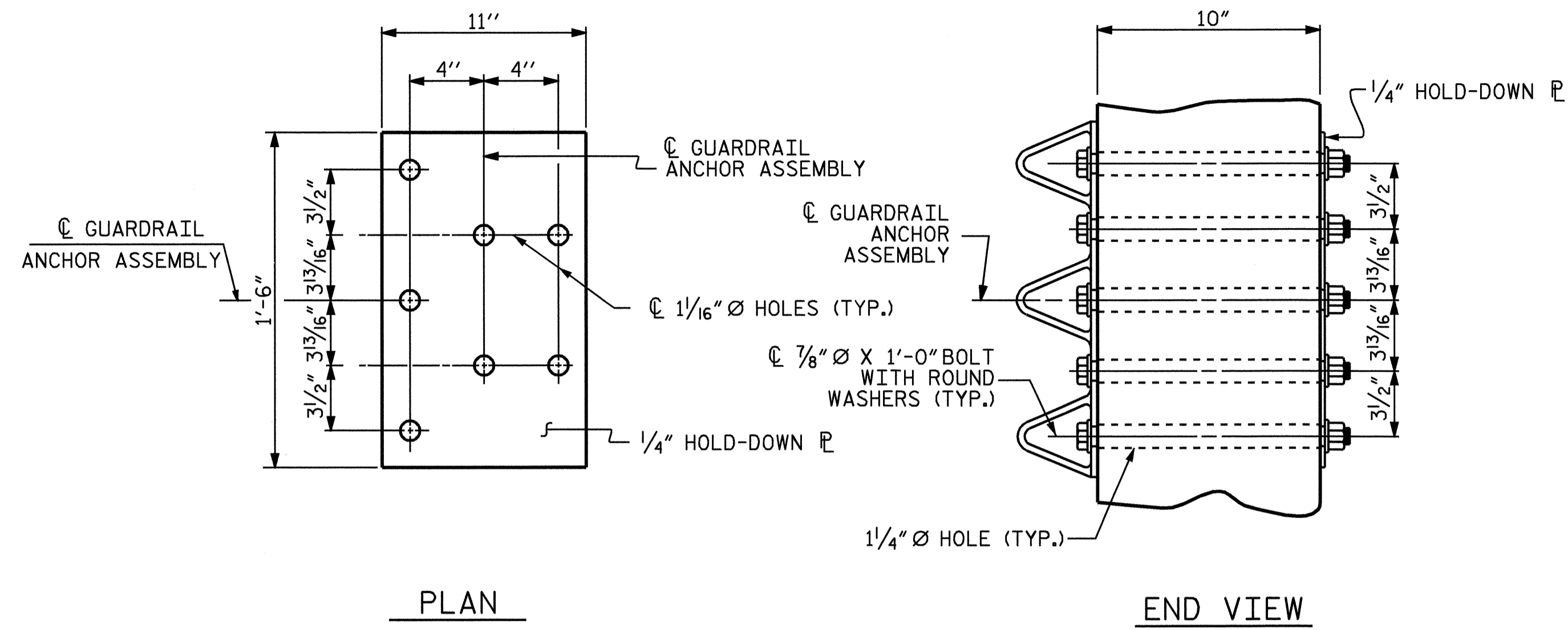
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

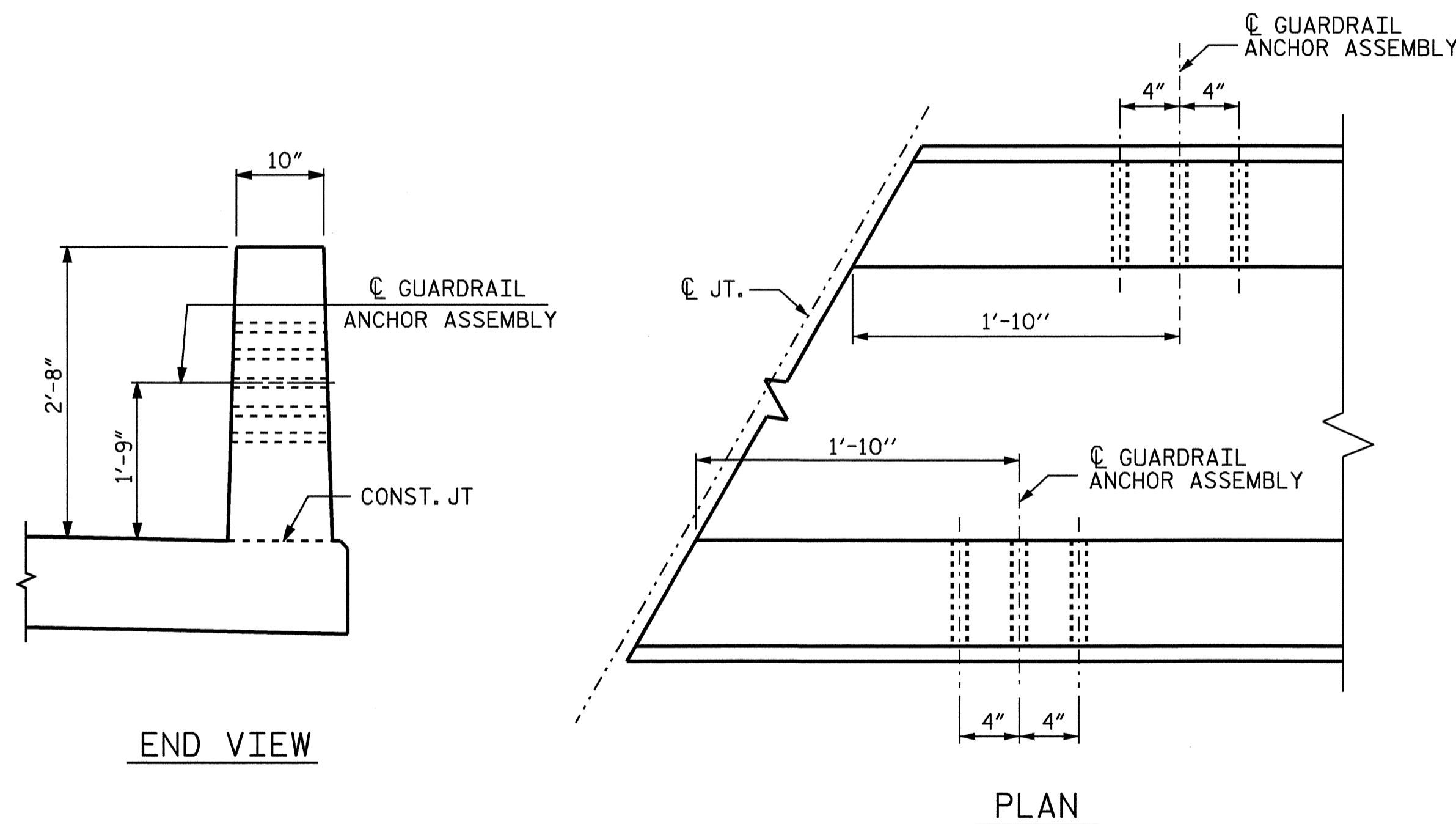
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

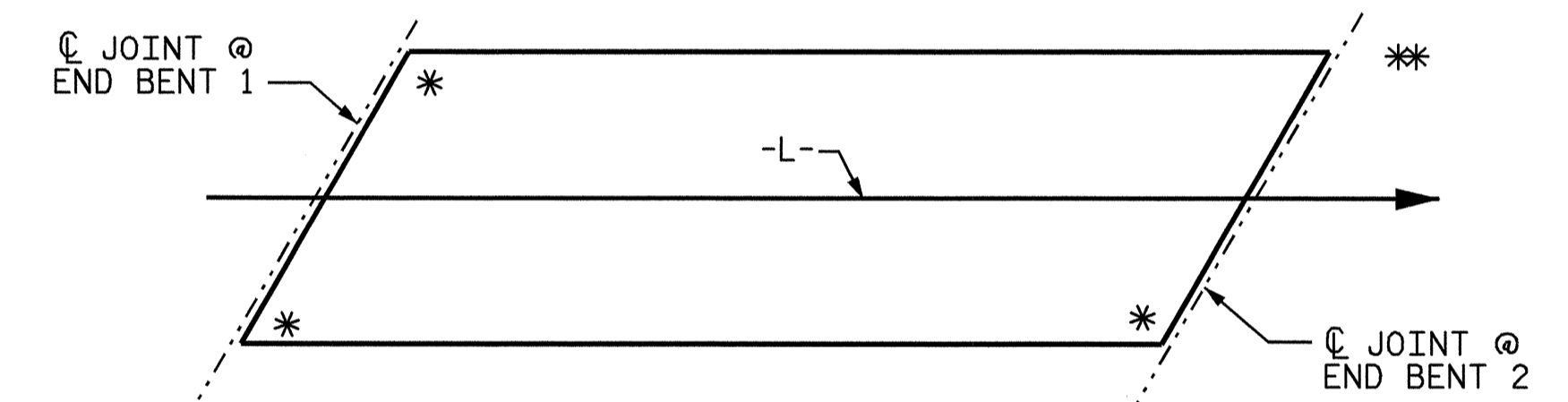
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT
 ** LOCATED AT LEFT END OF APPROACH SLAB.

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-



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

ASSEMBLED BY : H. B. SHAH	DATE: 8-08
CHECKED BY : T. H. FANG	DATE: 9-08
DRAWN BY : EEM 6/94	REV. 8/16/99 RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00 RWW/LES
	REV. 5/7/03 RWW/JTE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			24

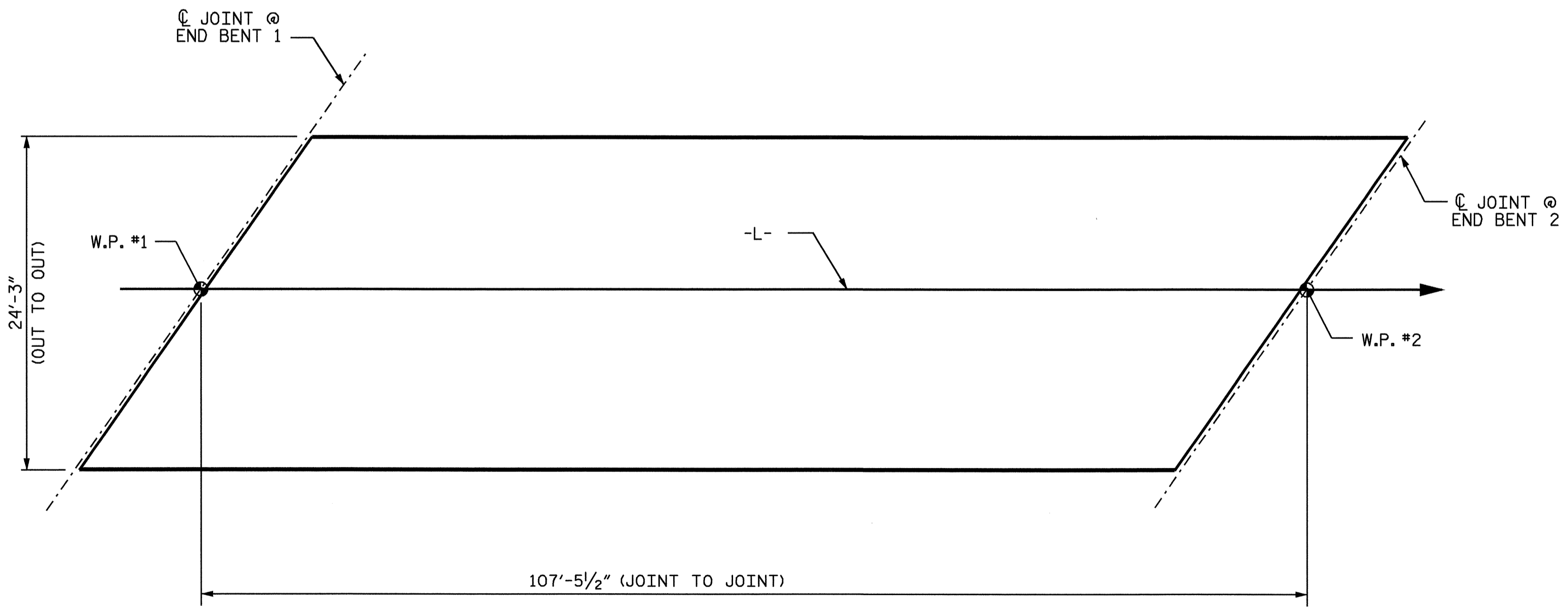
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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"			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPAN A	79.0	8,808	7,354
TOTALS**	79.0	8,808	7,354

**QUANTITIES FOR VERTICAL CONCRETE BARRIER RAIL ARE NOT INCLUDED

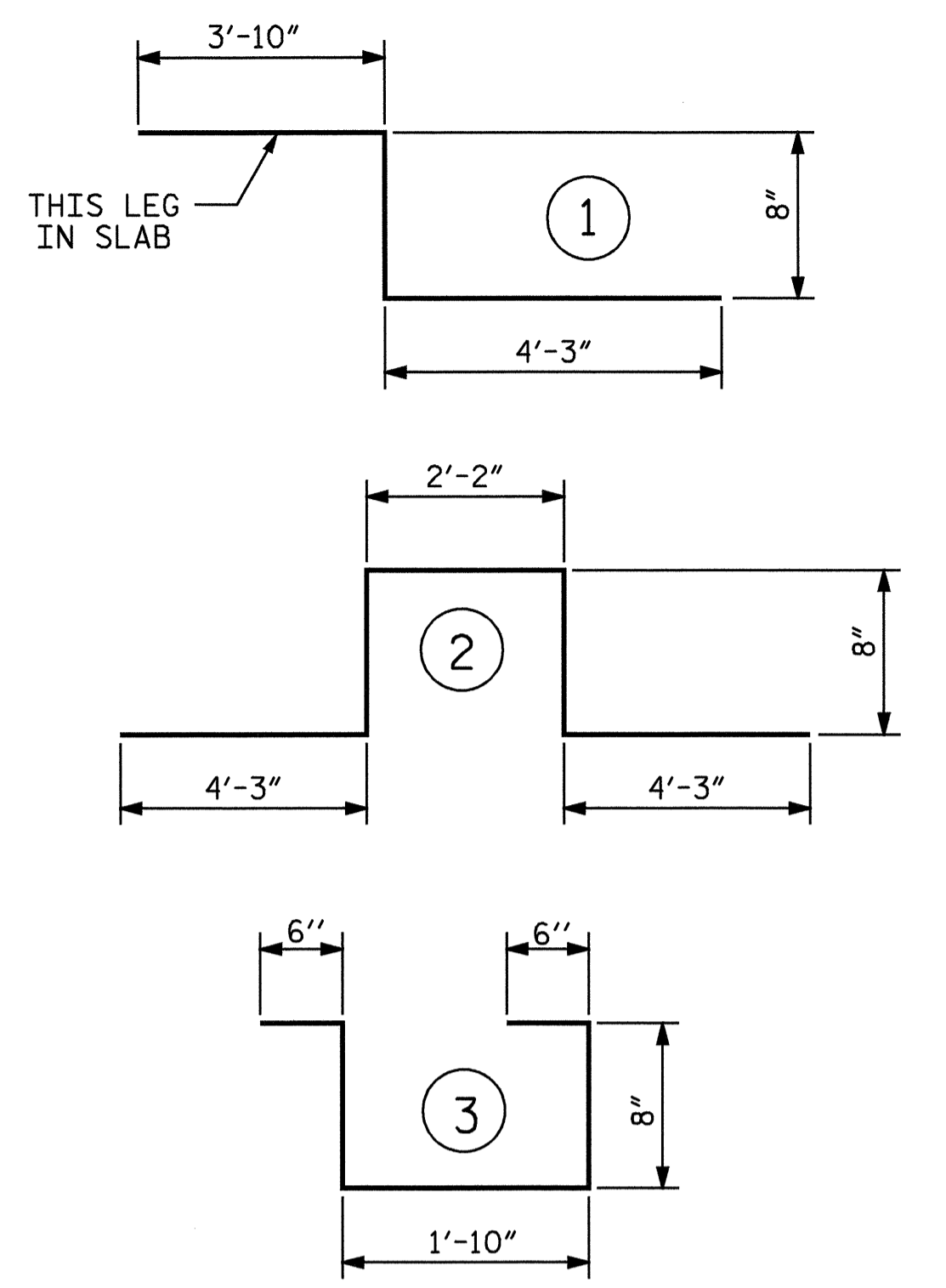


LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 2604.0)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	181	5	STR	23'-11"	4515
A2	181	5	STR	23'-11"	4515
* A3	6	6	STR	29'-2"	263
* A101	4	5	STR	22'-9"	95
* A102	4	5	STR	22'-4"	89
* A103	4	5	STR	19'-11"	83
* A104	4	5	STR	18'-6"	77
* A105	4	5	STR	17'-0"	71
* A106	4	5	STR	15'-8"	65
* A107	4	5	STR	14'-2"	59
* A108	4	5	STR	12'-9"	53
* A109	4	5	STR	11'-4"	47
* A110	4	5	STR	9'-11"	41
* A111	4	5	STR	8'-6"	35
* A112	4	5	STR	7'-0"	29
* A113	4	5	STR	5'-8"	24
* A114	4	5	STR	4'-2"	17
* A115	4	5	STR	2'-9"	11
A201	4	5	STR	22'-9"	95
A202	4	5	STR	22'-4"	89
A203	4	5	STR	19'-11"	83
A204	4	5	STR	18'-6"	77
A205	4	5	STR	17'-0"	71
A206	4	5	STR	15'-8"	65
A207	4	5	STR	14'-2"	59
A208	4	5	STR	12'-9"	53
A209	4	5	STR	11'-4"	47
A210	4	5	STR	9'-11"	41
A211	4	5	STR	8'-6"	35
A212	4	5	STR	7'-0"	29
A213	4	5	STR	5'-8"	24
A214	4	5	STR	4'-2"	17
A215	4	5	STR	2'-9"	11
* B1	72	4	STR	28'-4"	1363
B2	90	5	STR	37'-3"	3497
* G1	2	5	STR	29'-2"	61
* K1	12	5	1	8'-9"	110
* K2	12	5	2	12'-0"	150
* S1	36	4	3	3'-10"	92
REINFORCING STEEL					LBS. 8,808
* EPOXY COATED REINFORCING STEEL					LBS. 7,354

BAR TYPES

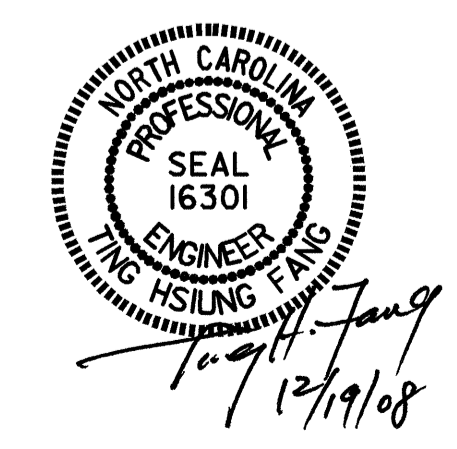


ALL BAR DIMENSIONS ARE OUT TO OUT

GROOVING BRIDGE FLOORS

APPROACH SLABS	437	SQ.FT.
BRIDGE DECK	2013	SQ.FT.
TOTAL	2450	SQ.FT.

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

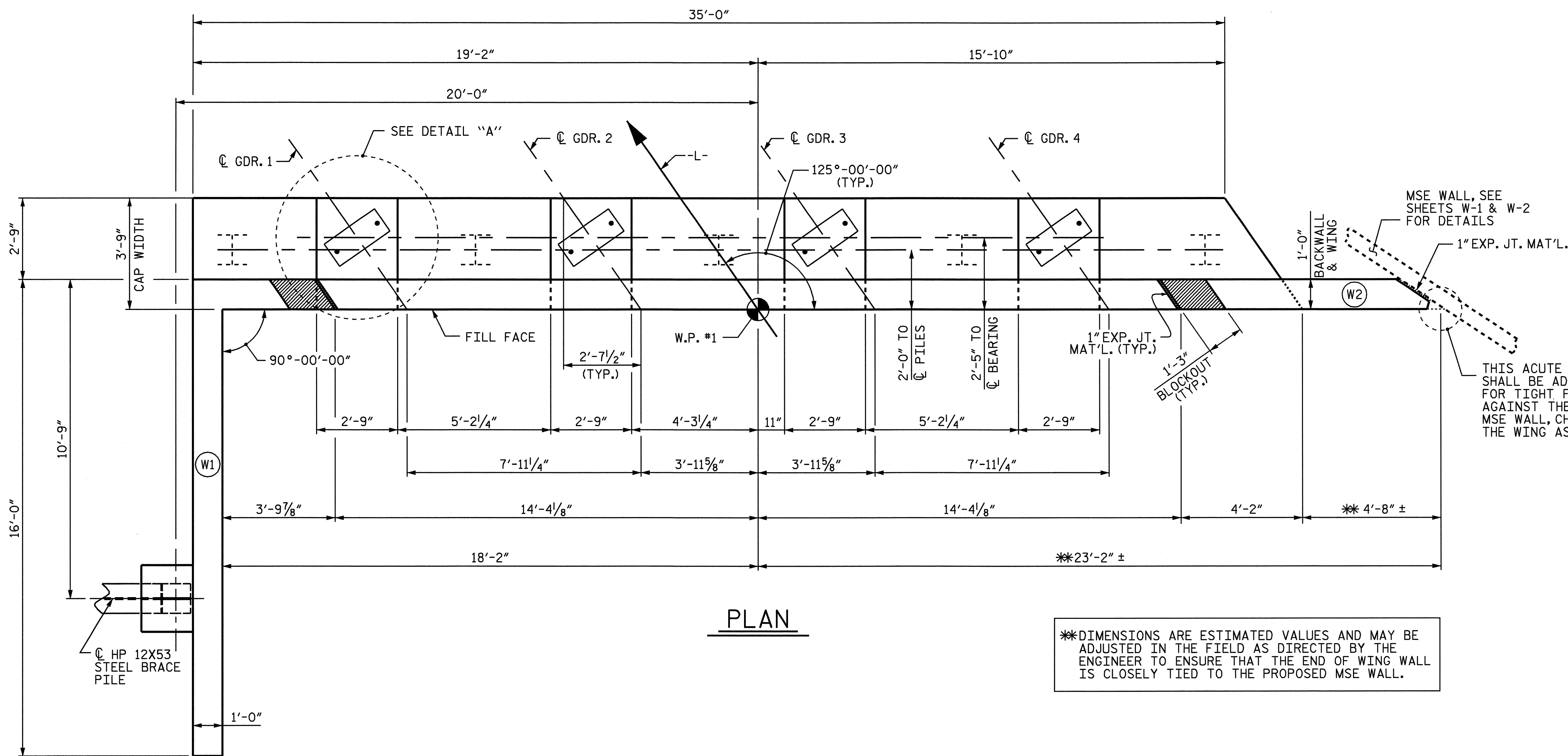
**SUPERSTRUCTURE
 BILL OF MATERIAL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : H.B. SHAH DATE : 08/05/08
 CHECKED BY : TING FANG DATE : 11/08

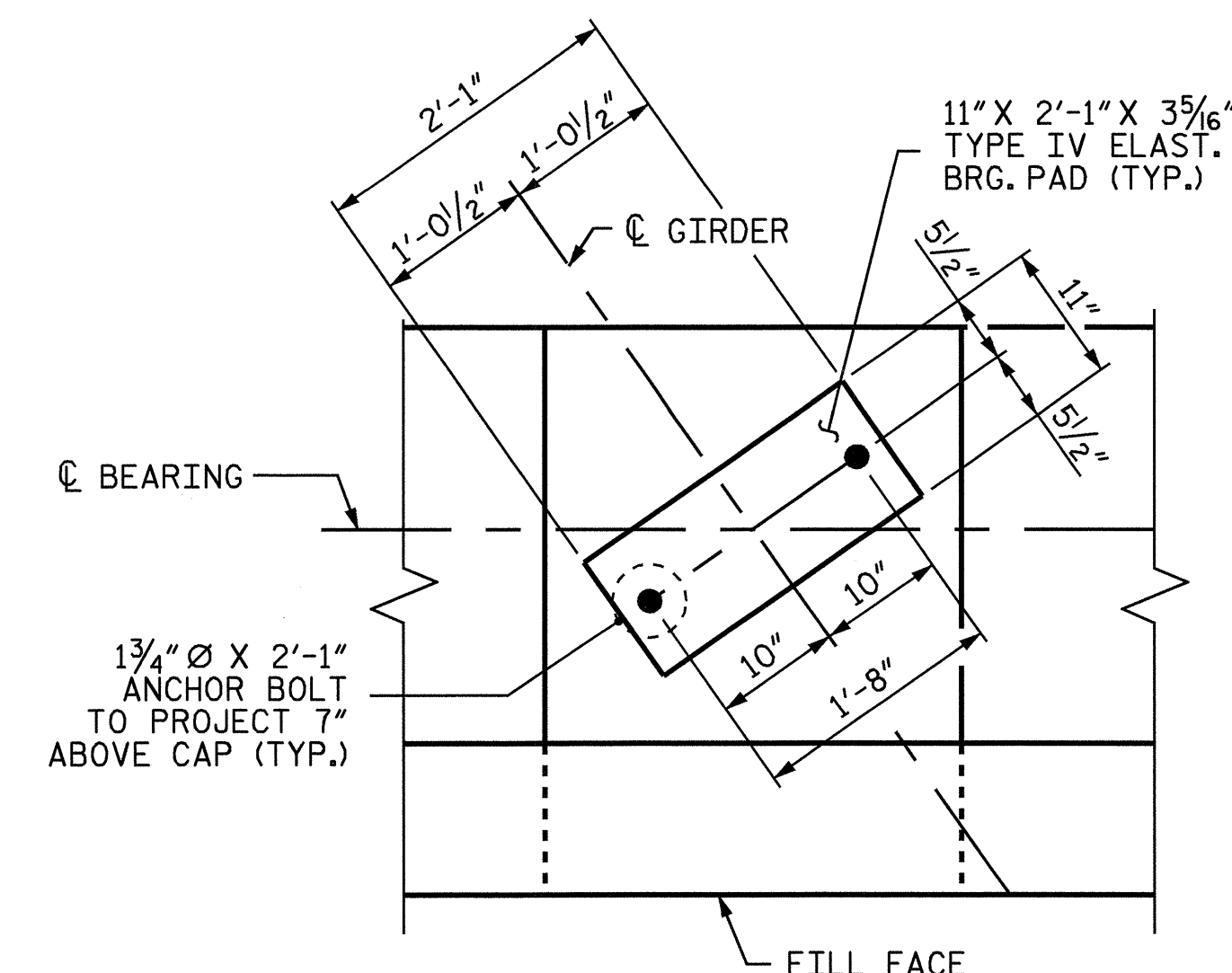
NOTES

- 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 AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- * THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS 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.
- STRAPS FOR LATERAL SUPPORT SHALL BE CONNECTED TO END BENT AND WINGS. SEE MSE WALL PLANS.

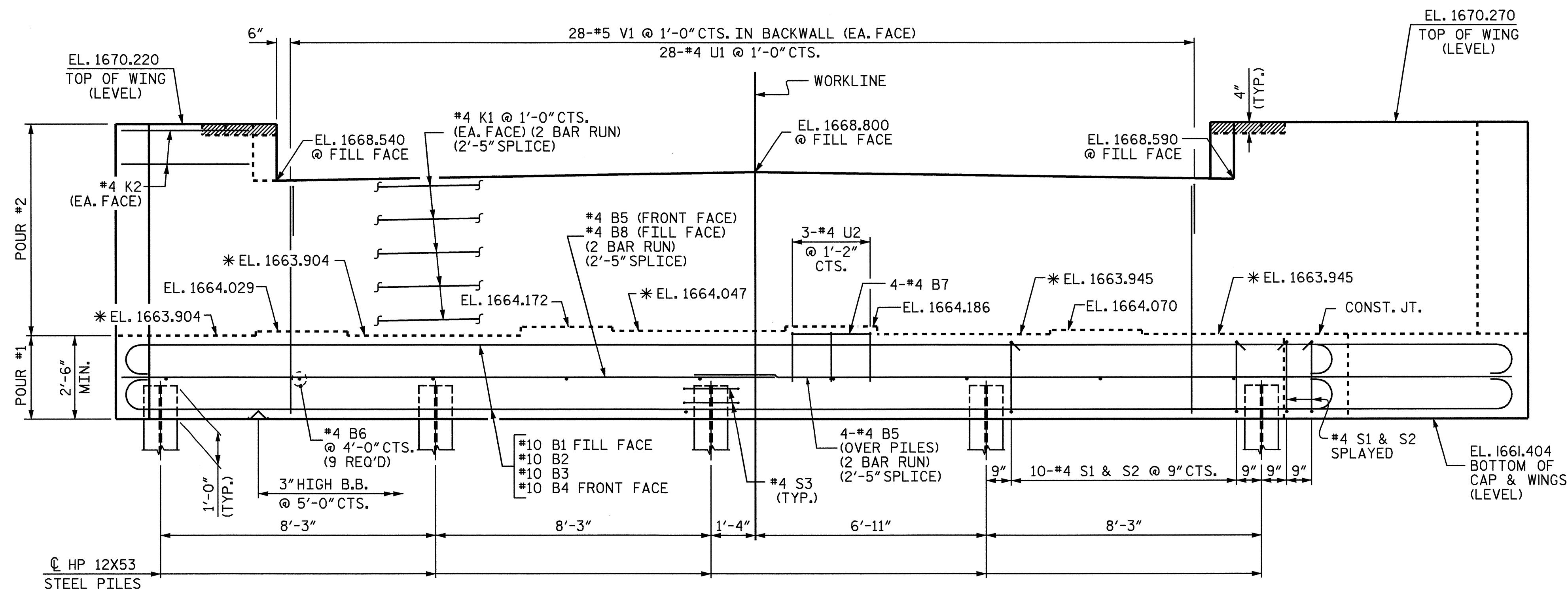


PLAN

*DIMENSIONS ARE ESTIMATED VALUES AND MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER TO ENSURE THAT THE END OF WING WALL IS CLOSELY TIED TO THE PROPOSED MSE WALL.



DETAIL "A"



ELEVATION

WING BRACE PILE NOT SHOWN FOR CLARITY

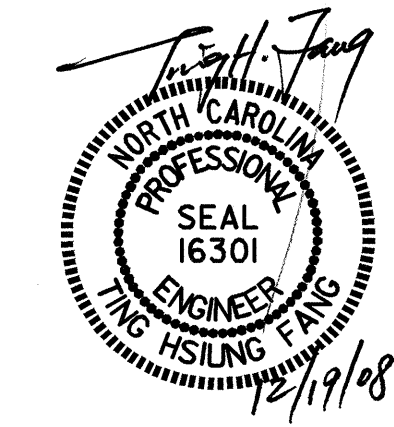
*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SHEET 3 OF 3

PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

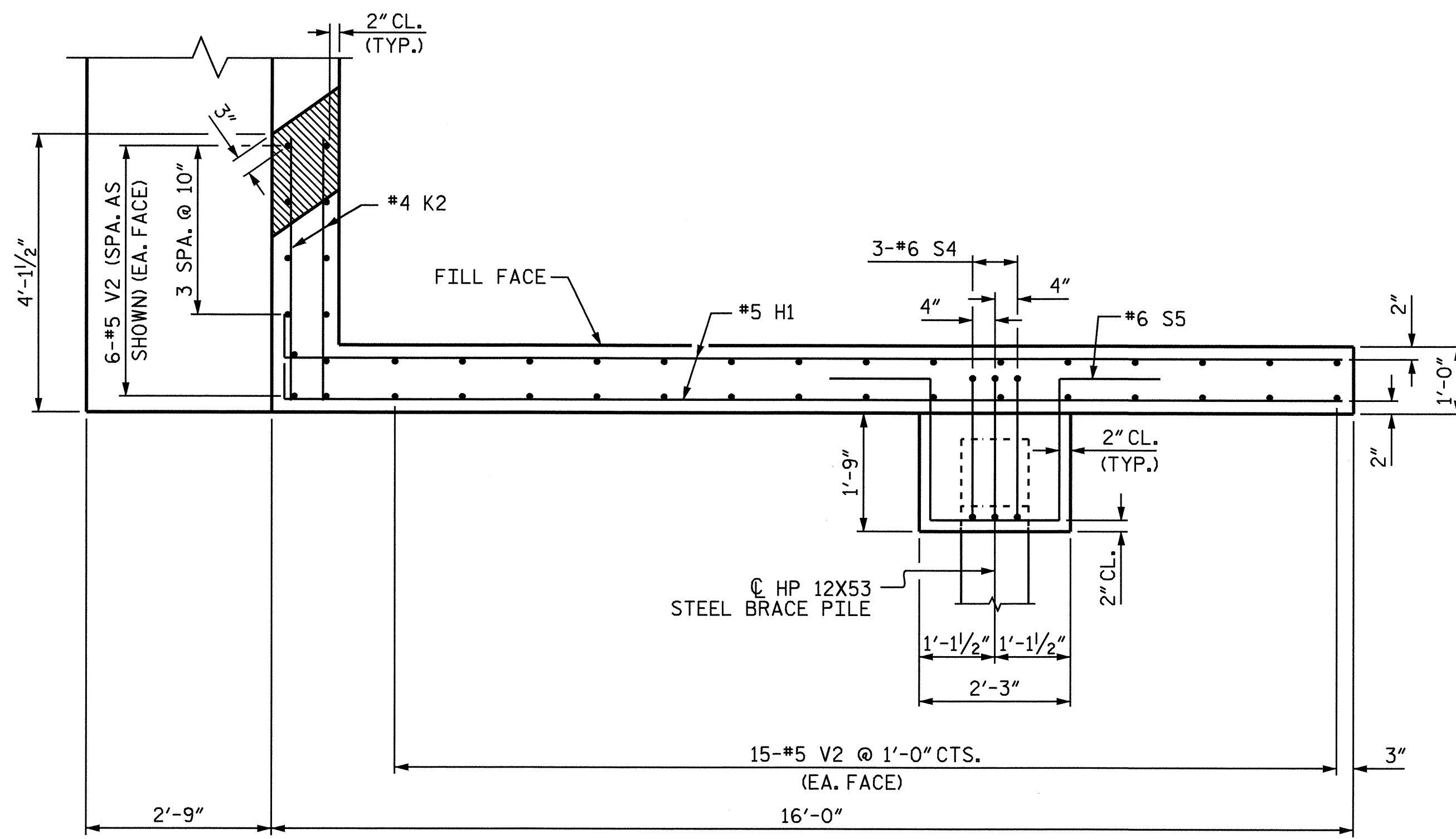
SHEET 1 OF 3

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

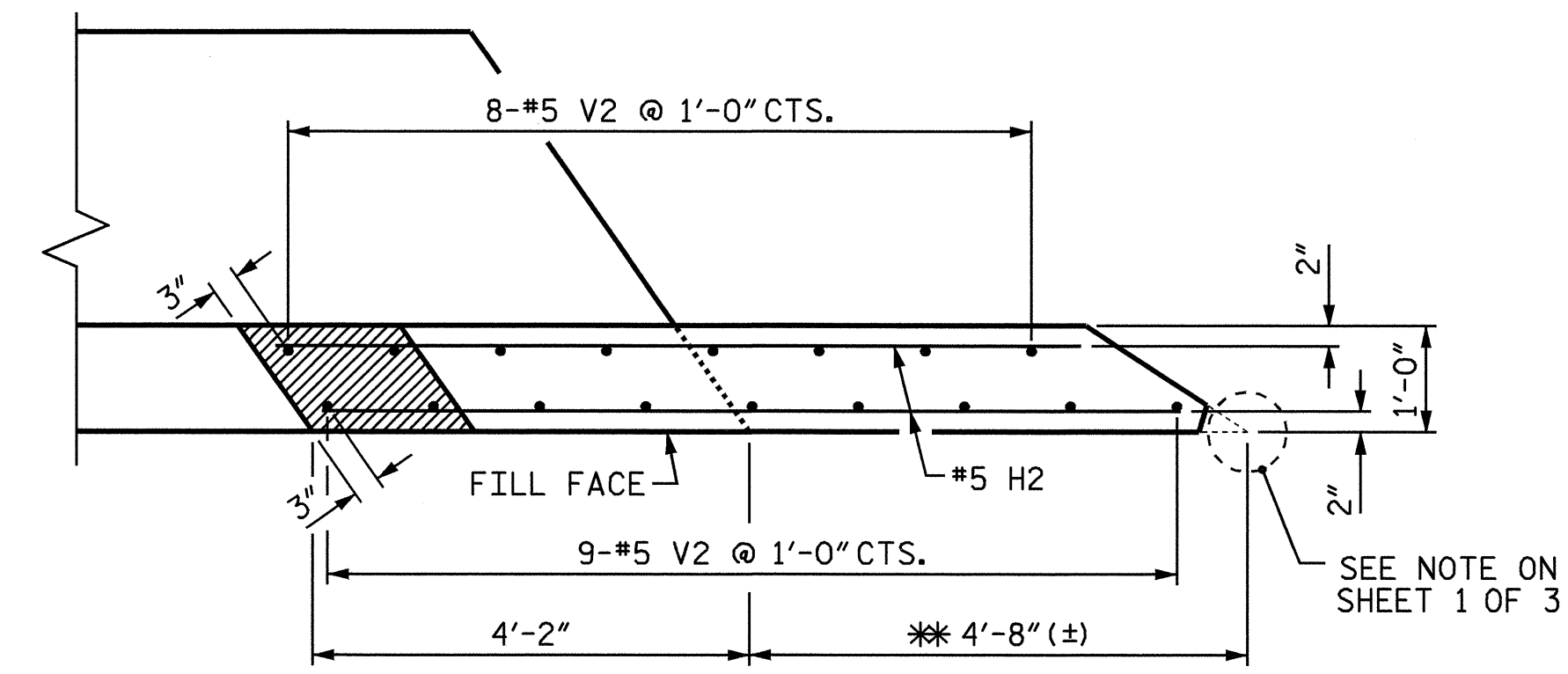
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS 24	
2			4				



DRAWN BY: S. DOMBROWSKI DATE: 10/21/08
 CHECKED BY: T. H. FANG DATE: 12/02/08

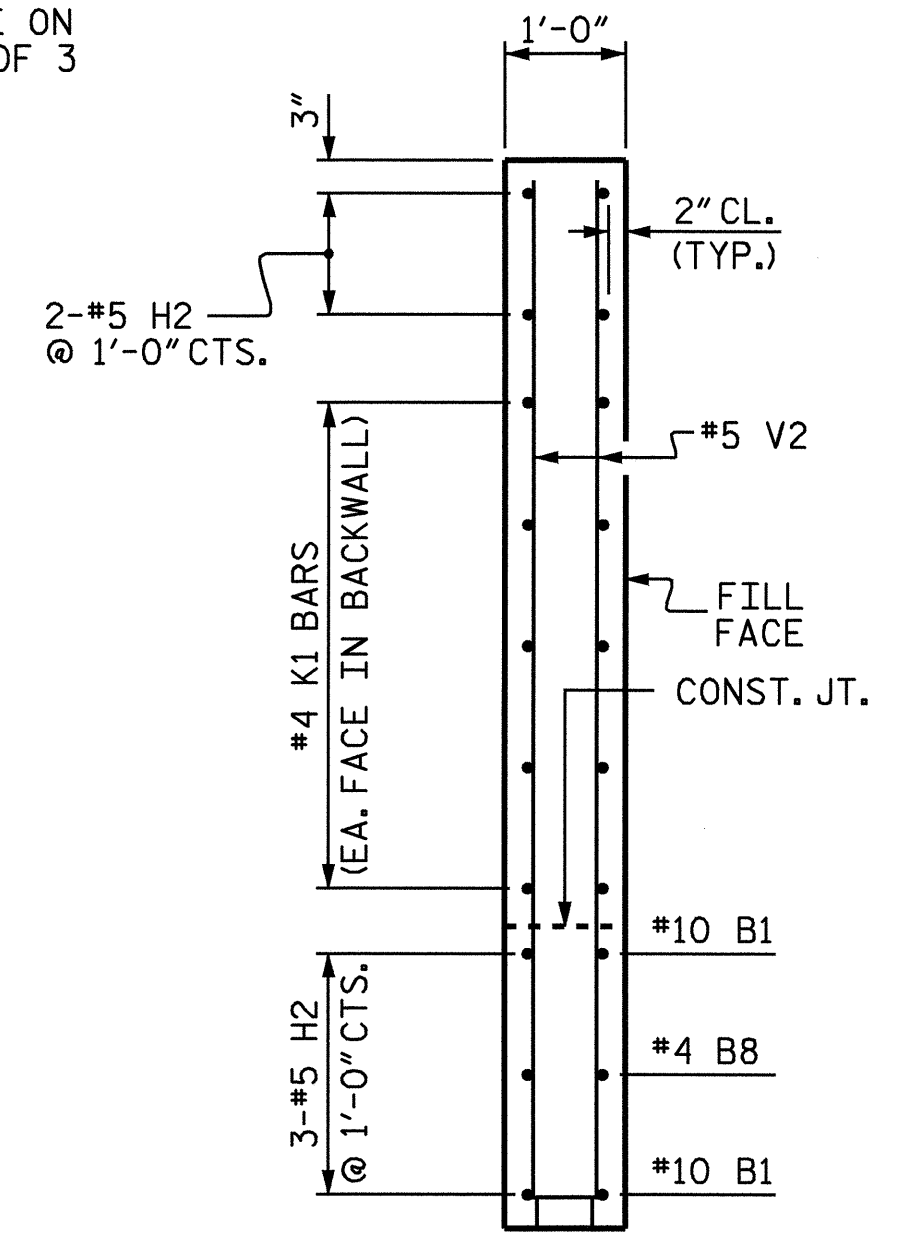


PLAN OF WING - W1

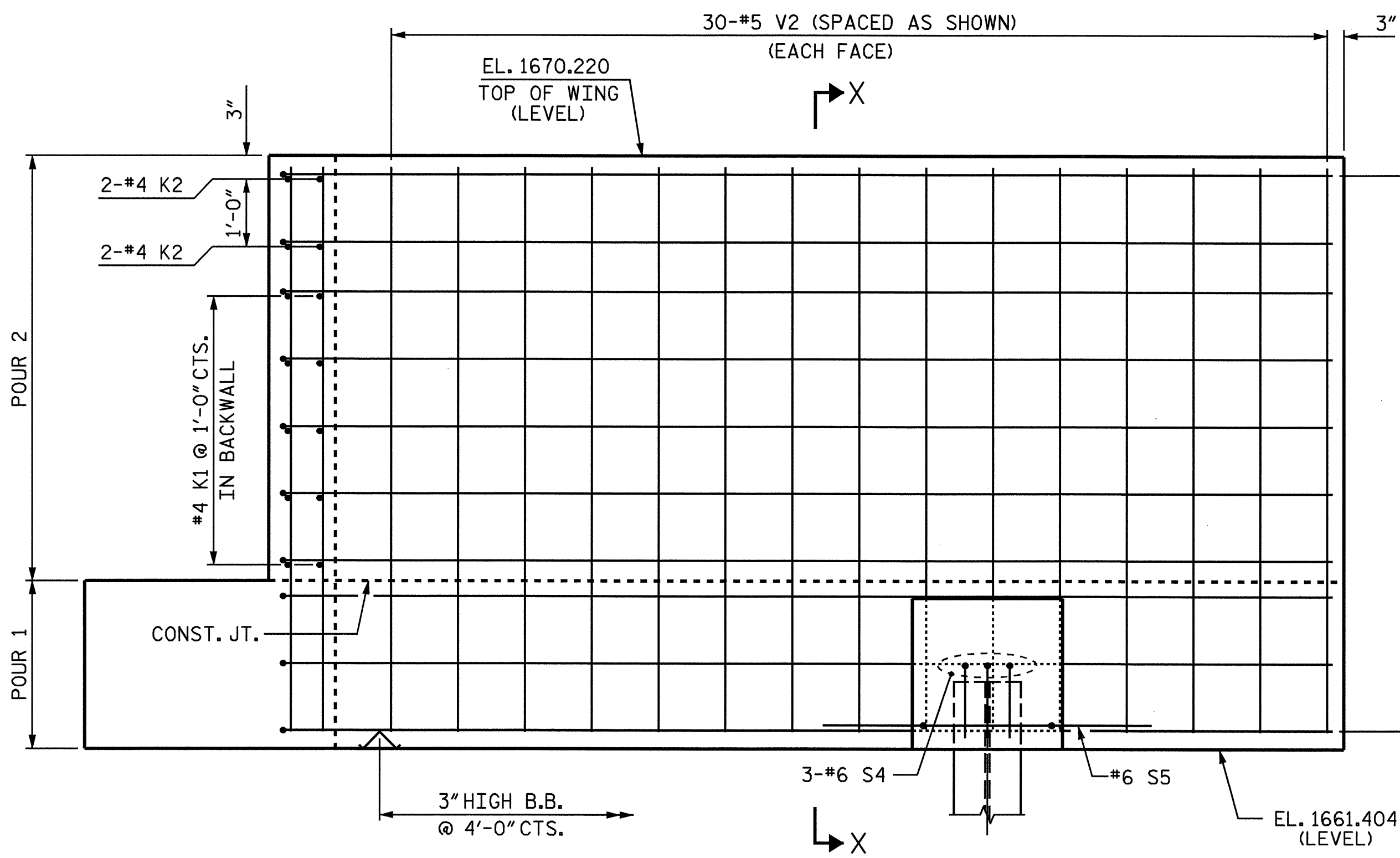


PLAN OF WING - W2

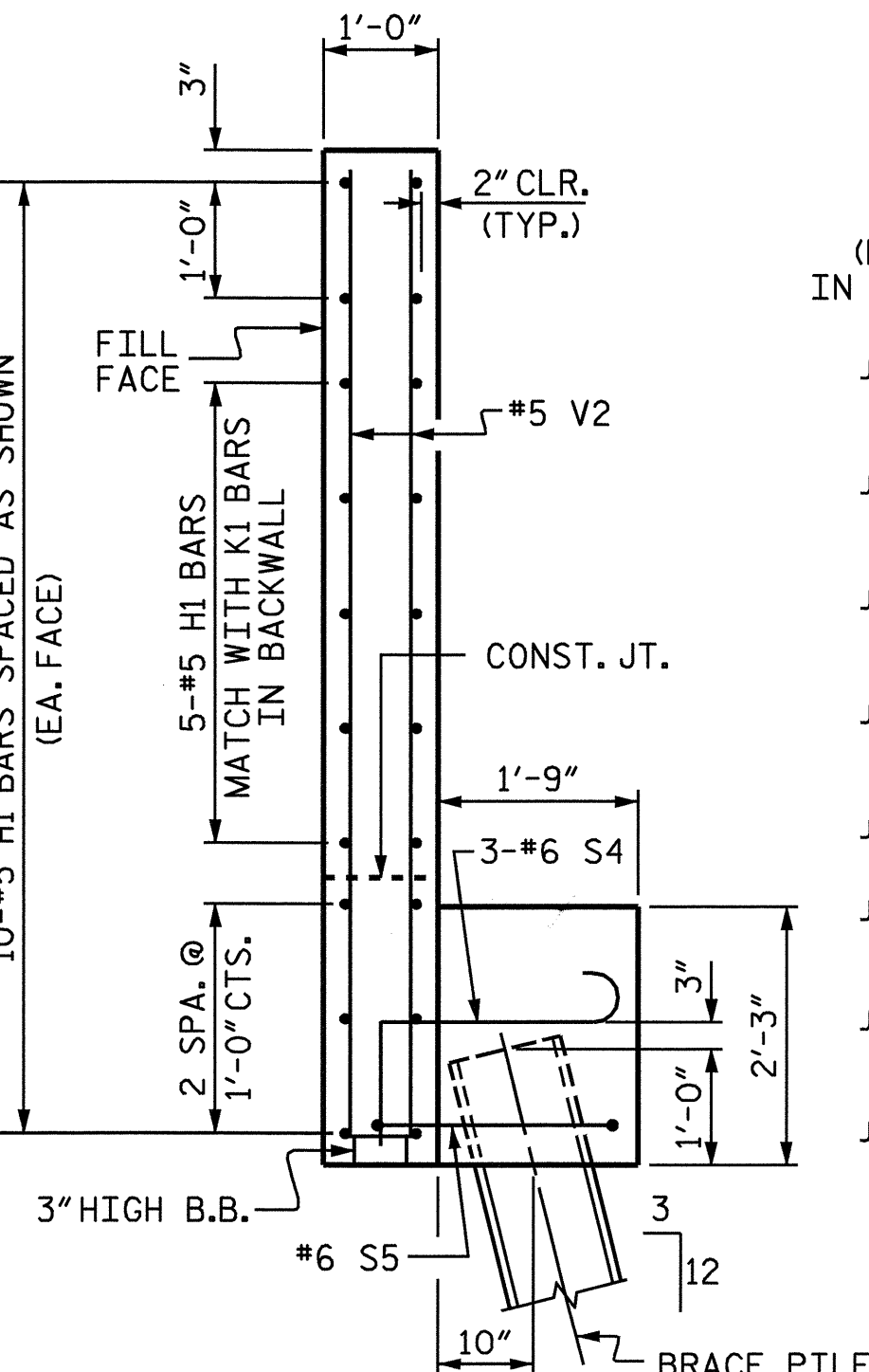
** SEE NOTE ON SHEET 1 OF 3



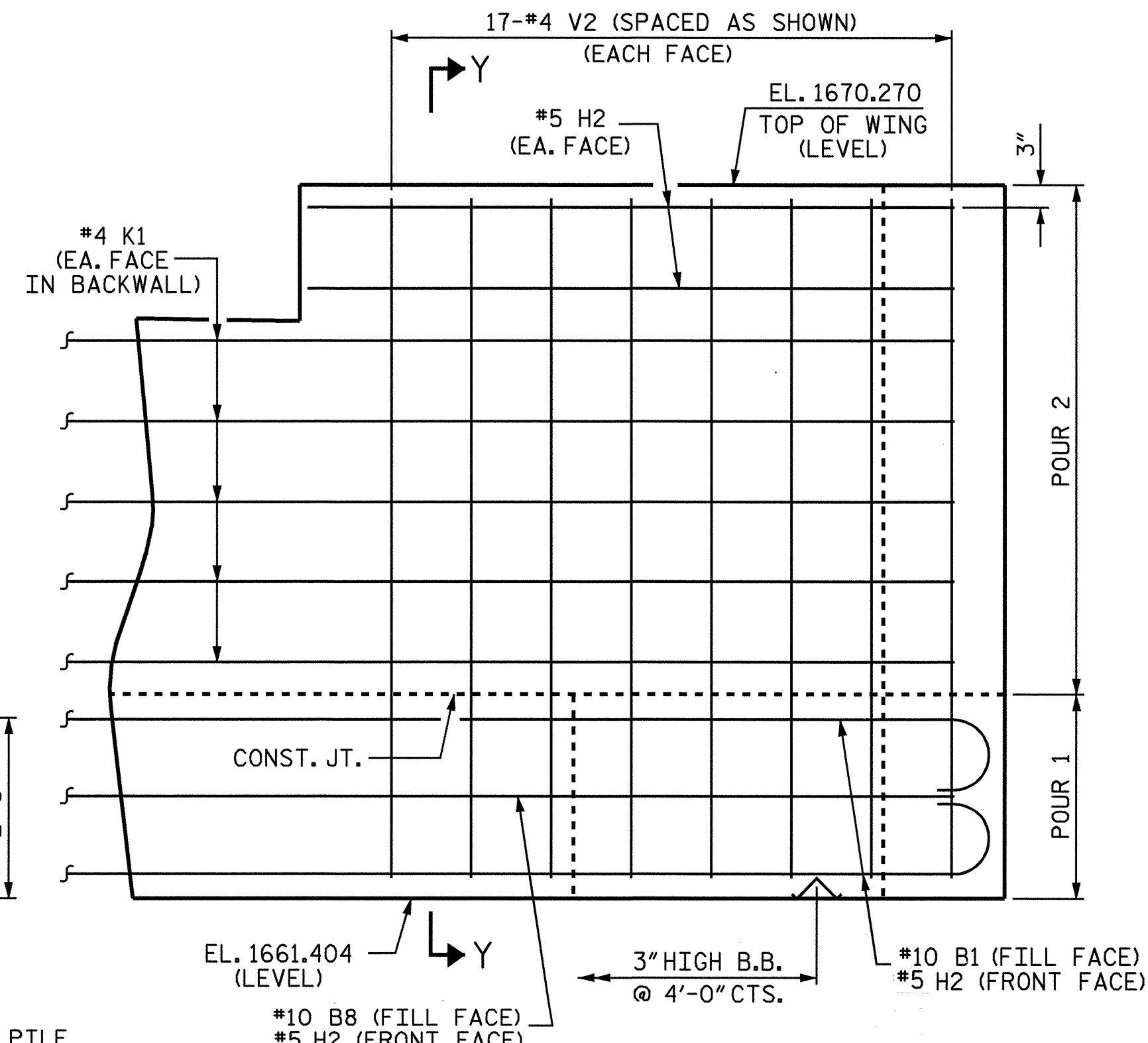
SECTION Y-Y



ELEVATION OF WING - W1

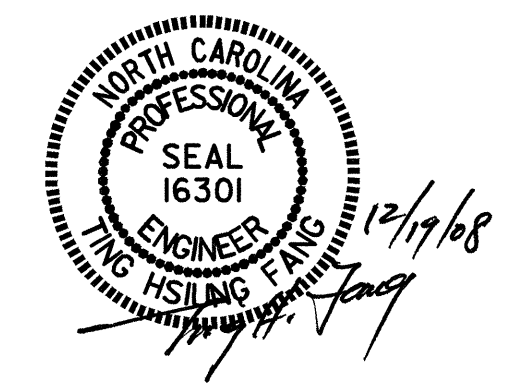


SECTION X-X



ELEVATION OF WING - W2

V2 BARS ALONG FILL FACE SHOWN

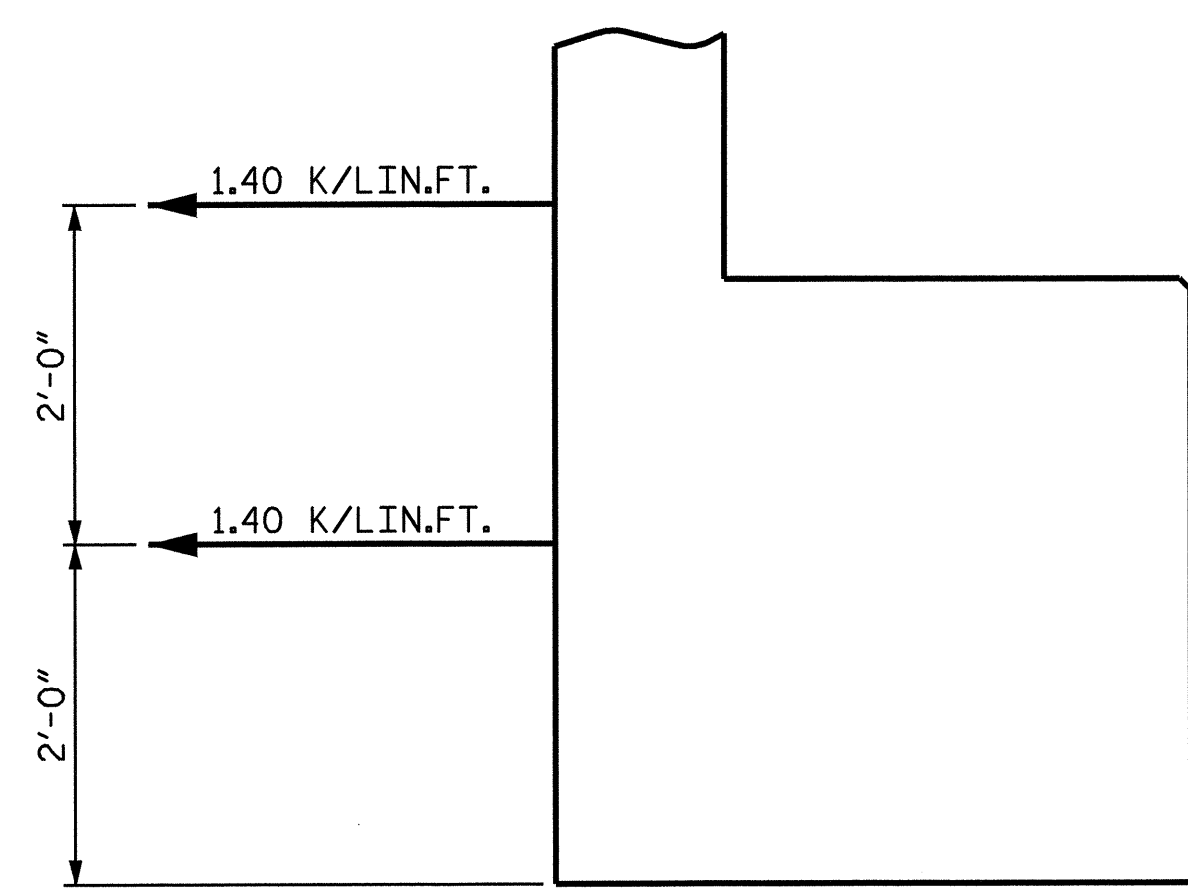


PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

DRAWN BY: S. DOMBROWSKI DATE: 10/21/08
 CHECKED BY: T. H. FANG DATE: 12/05/08

REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



GALVANIZED REINFORCING STRAP LOAD DETAIL

GALVANIZED REINFORCING STRAP NOTES

GALVANIZED REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE "MECHANICALLY STABILIZED EARTH RETAINING WALL" SPECIAL PROVISIONS.

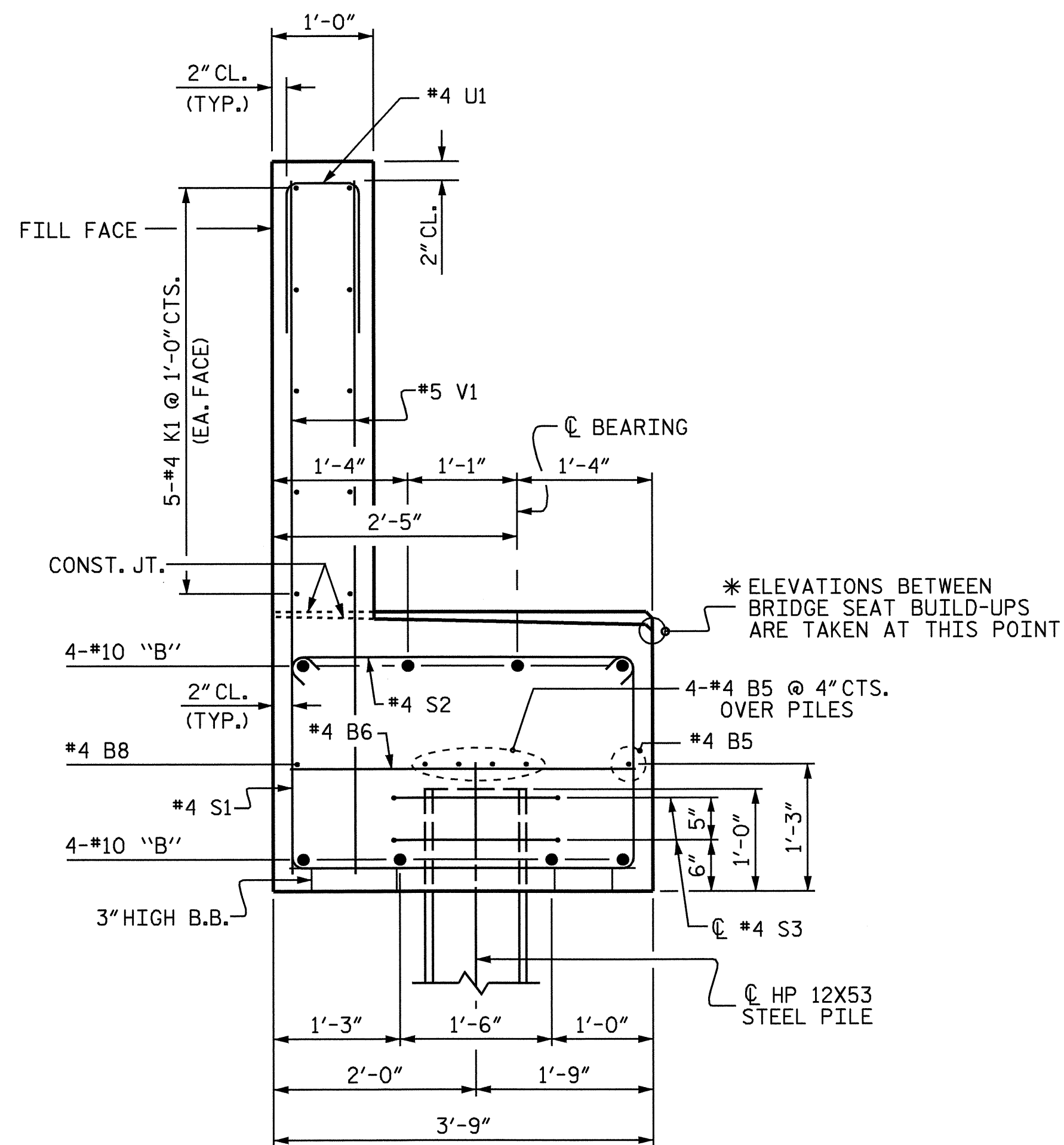
PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

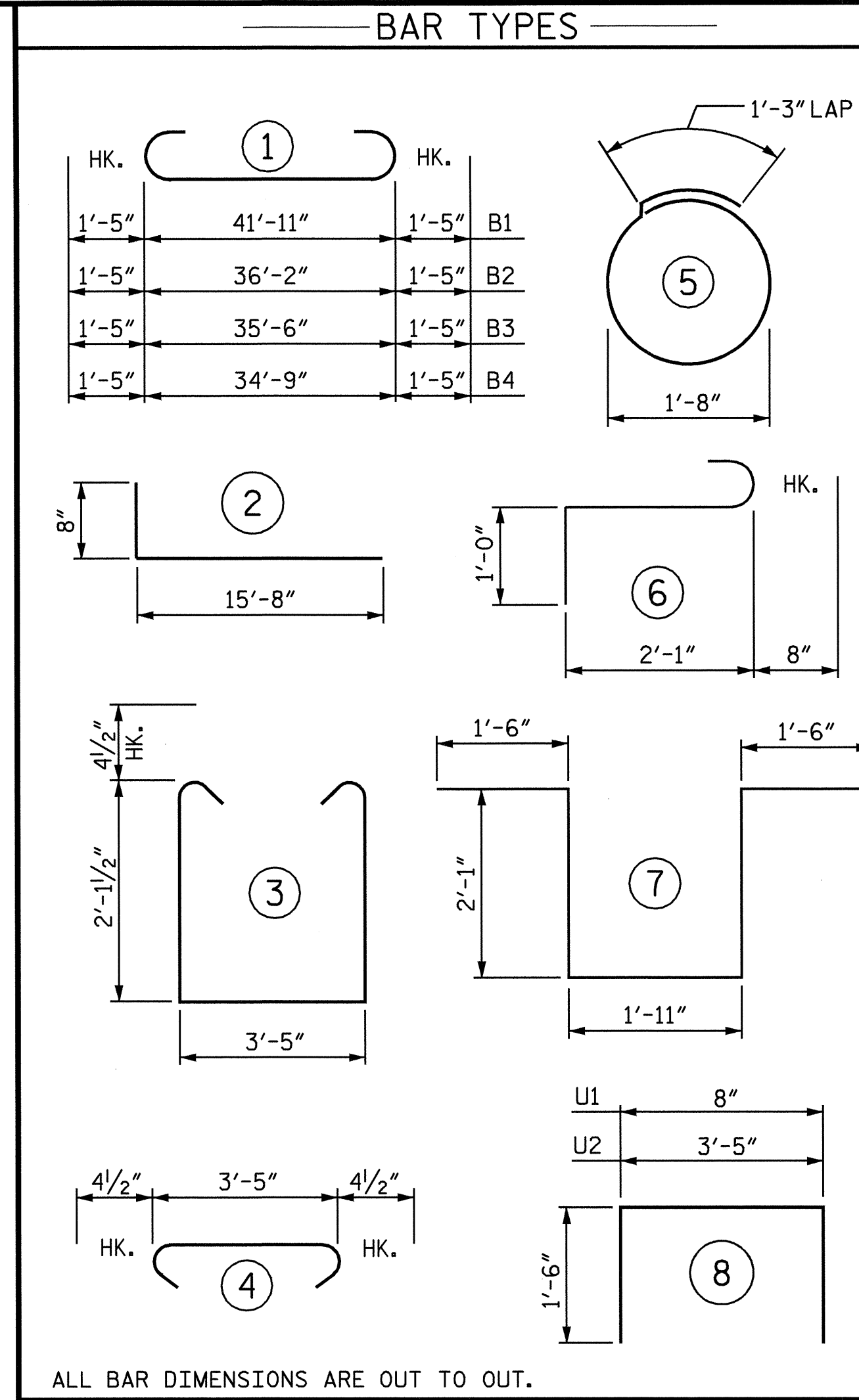
THE GALVANIZED REINFORCING STRAPS SHALL BE DESIGNED WITH THE FOLLOWING SOIL PARAMETERS:

- FRICITION ANGLE = 36 DEGREES
- COHESION $c = 0.0$
- UNIT WEIGHT OF SOIL = 110 PCF

FOR CONFLICTS WITH PILES IN THE END BENT WINGS, SEE PLAN VIEW AND FOUNDATION LAYOUT SHEETS.

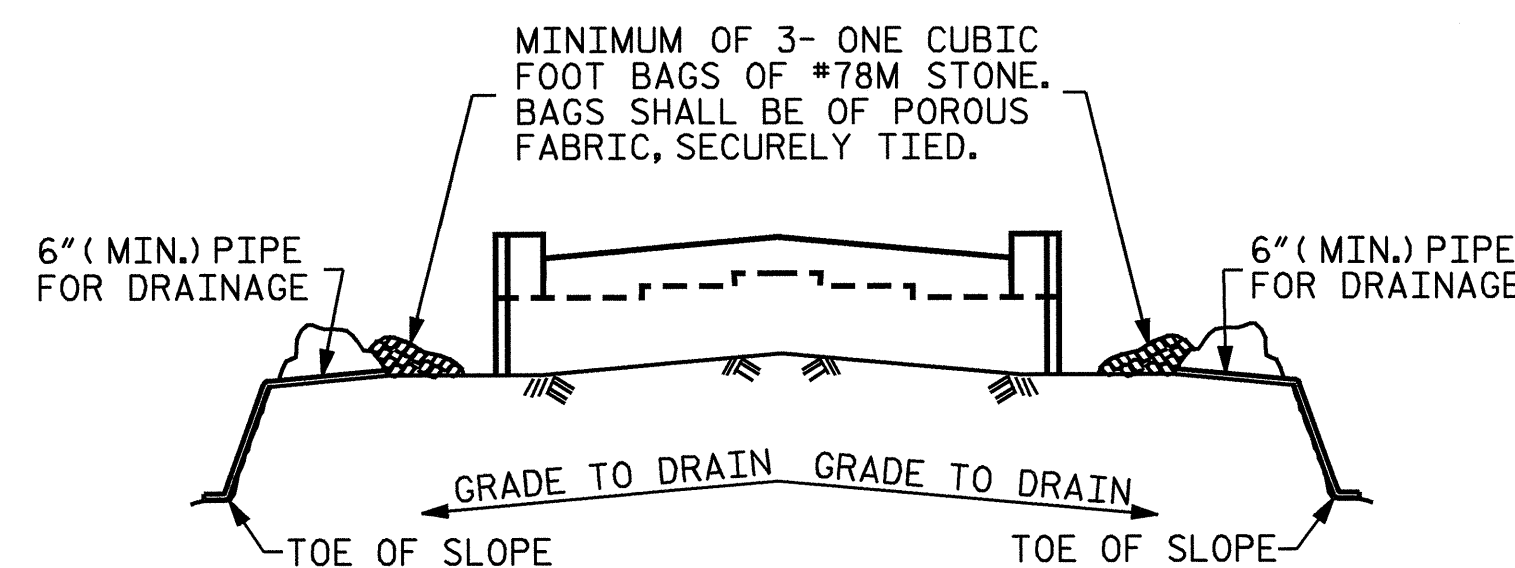


SECTION THRU BENT



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	2	#10	1	44'-9"	385
B2	2	#10	1	39'-0"	336
B3	2	#10	1	38'-4"	330
B4	2	#10	1	37'-7"	323
B5	10	#4	STR.	19'-4"	129
B6	9	#4	STR.	3'-5"	21
B7	4	#4	STR.	2'-5"	6
B8	2	#4	STR.	22'-3"	30
H1	20	#5	STR.	16'-4"	297
H2	7	#5	STR.	8'-3"	10
K1	20	#4	STR.	22'-3"	464
K2	4	#4	STR.	3'-9"	10
S1	42	#4	3	8'-5"	236
S2	42	#4	4	4'-2"	117
S3	10	#4	5	6'-6"	43
S4	3	#6	6	3'-9"	17
S5	1	#6	7	9'-1"	14
U1	28	#4	8	3'-8"	69
U2	3	#4	8	6'-5"	13
V1	56	#5	STR.	6'-9"	394
V2	59	#5	STR.	8'-5"	518
REINFORCING STEEL				LBS.	3,689
CLASS "A" CONCRETE					
POUR #1 CAP & LOWER WINGS				C. Y.	15.1
POUR #2 UPPER WINGS				C. Y.	14.4
TOTAL				C. Y.	29.5
HP 12x53 STEEL PILES					
No. 6				LIN. FT.	90
STEEL PILE POINTS					
No. 6				EA.	

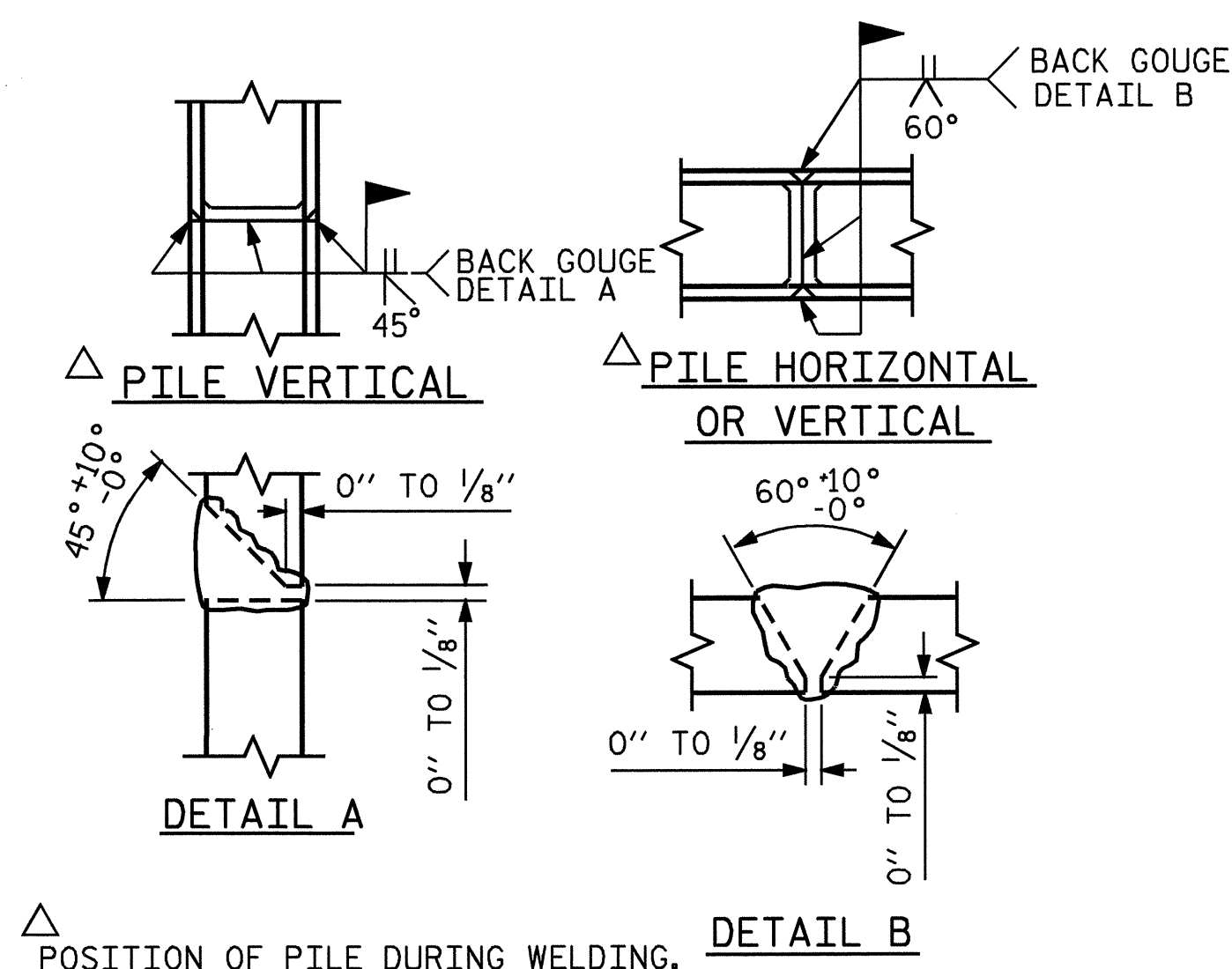


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

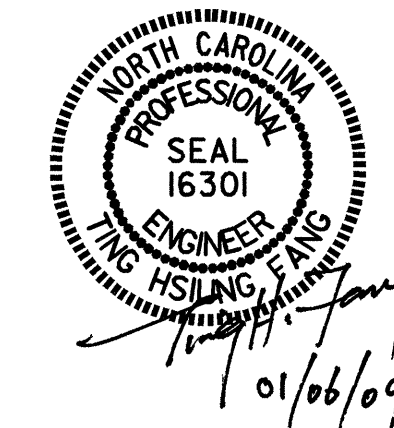
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

DRAWN BY: S. DOMBROWSKI DATE: 10/21/08
 CHECKED BY: T. H. FANG DATE: 12/02/08

06-JAN-2009 12:05
 K:\tpp\projects-b\4239\structures\final plans\4239.ed.e*.dgn
 tfang



PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 3 OF 3

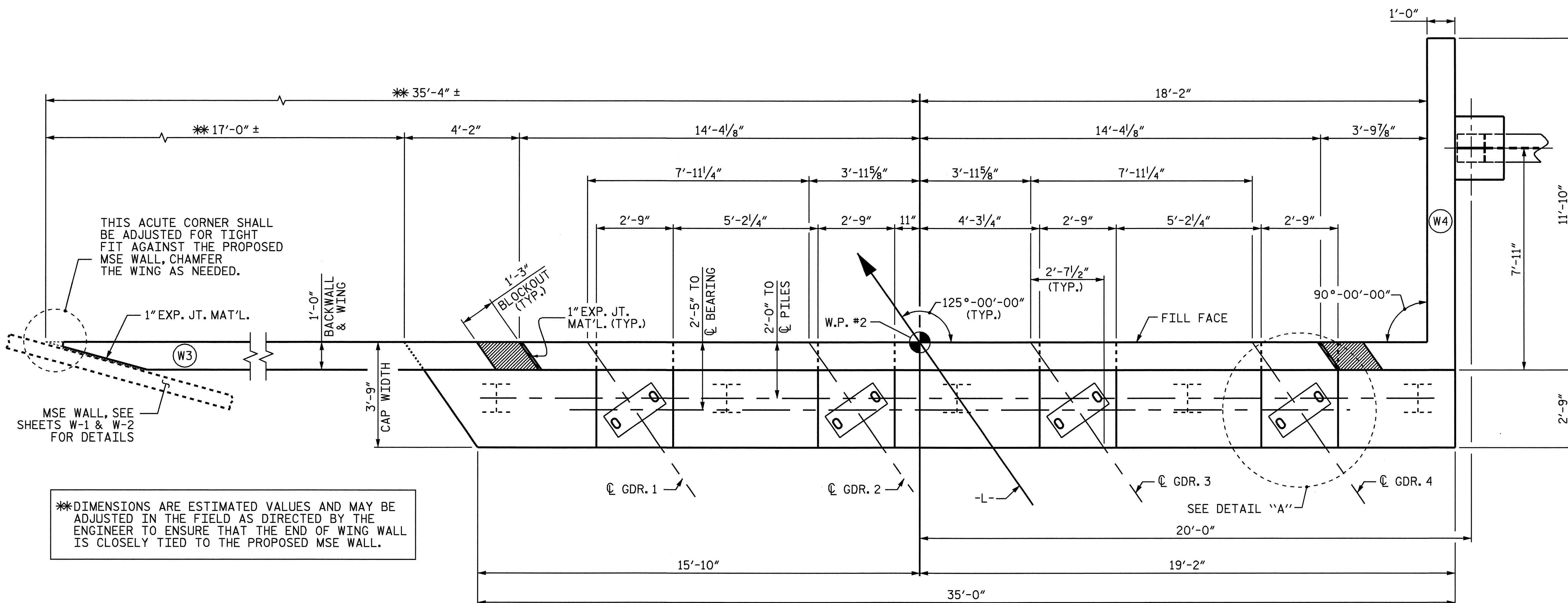
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			24

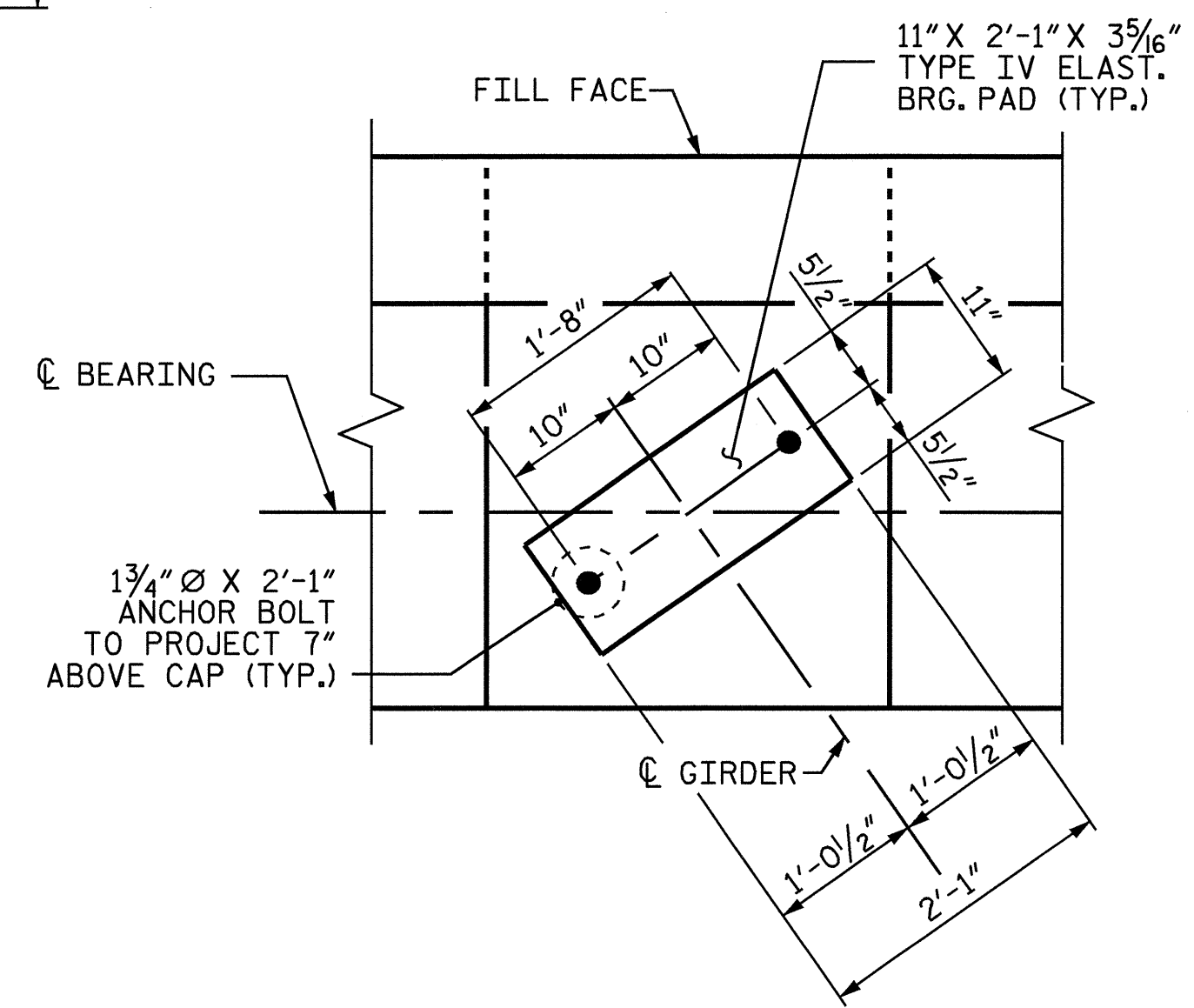
NOTES

- 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 AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- * THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS 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.
- STRAPS FOR LATERAL SUPPORT SHALL BE CONNECTED TO END BENT AND WINGS, SEE MSE WALL PLANS.

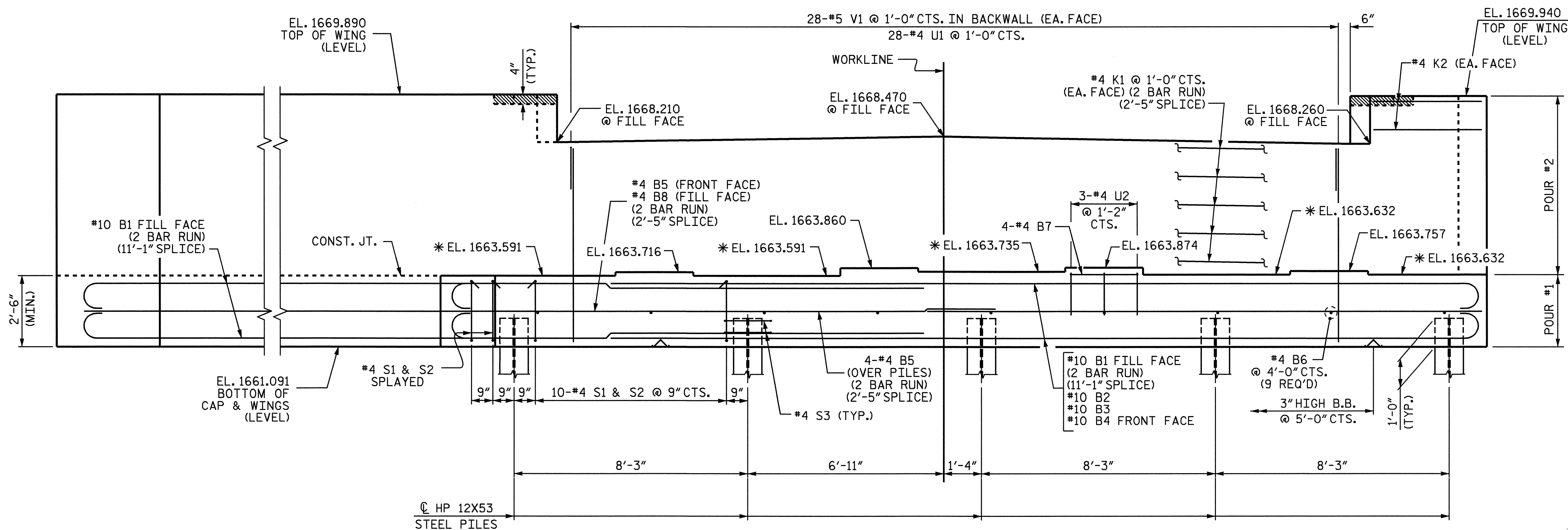


**DIMENSIONS ARE ESTIMATED VALUES AND MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER TO ENSURE THAT THE END OF WING WALL IS CLOSELY TIED TO THE PROPOSED MSE WALL.

PLAN



DETAIL "A"



ELEVATION

WING BRACE PILE NOT SHOWN FOR CLARITY

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SHEET 3 OF 3

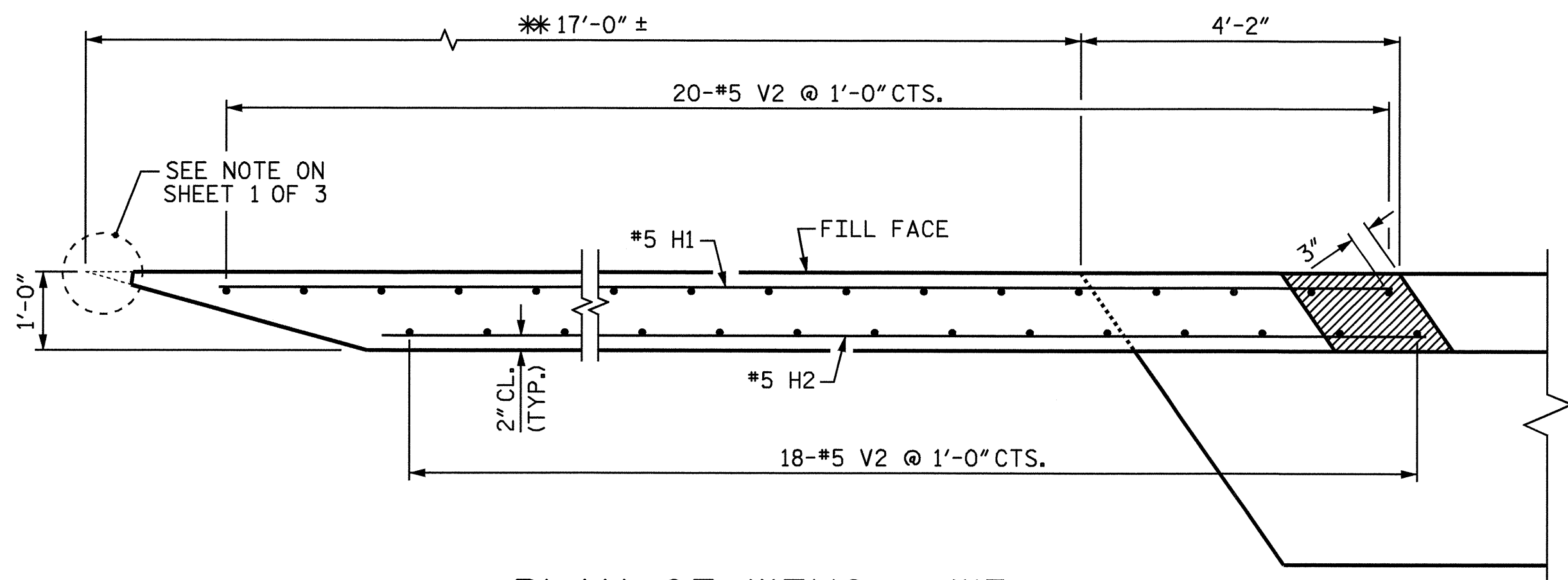
PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-19
TOTAL SHEETS					24

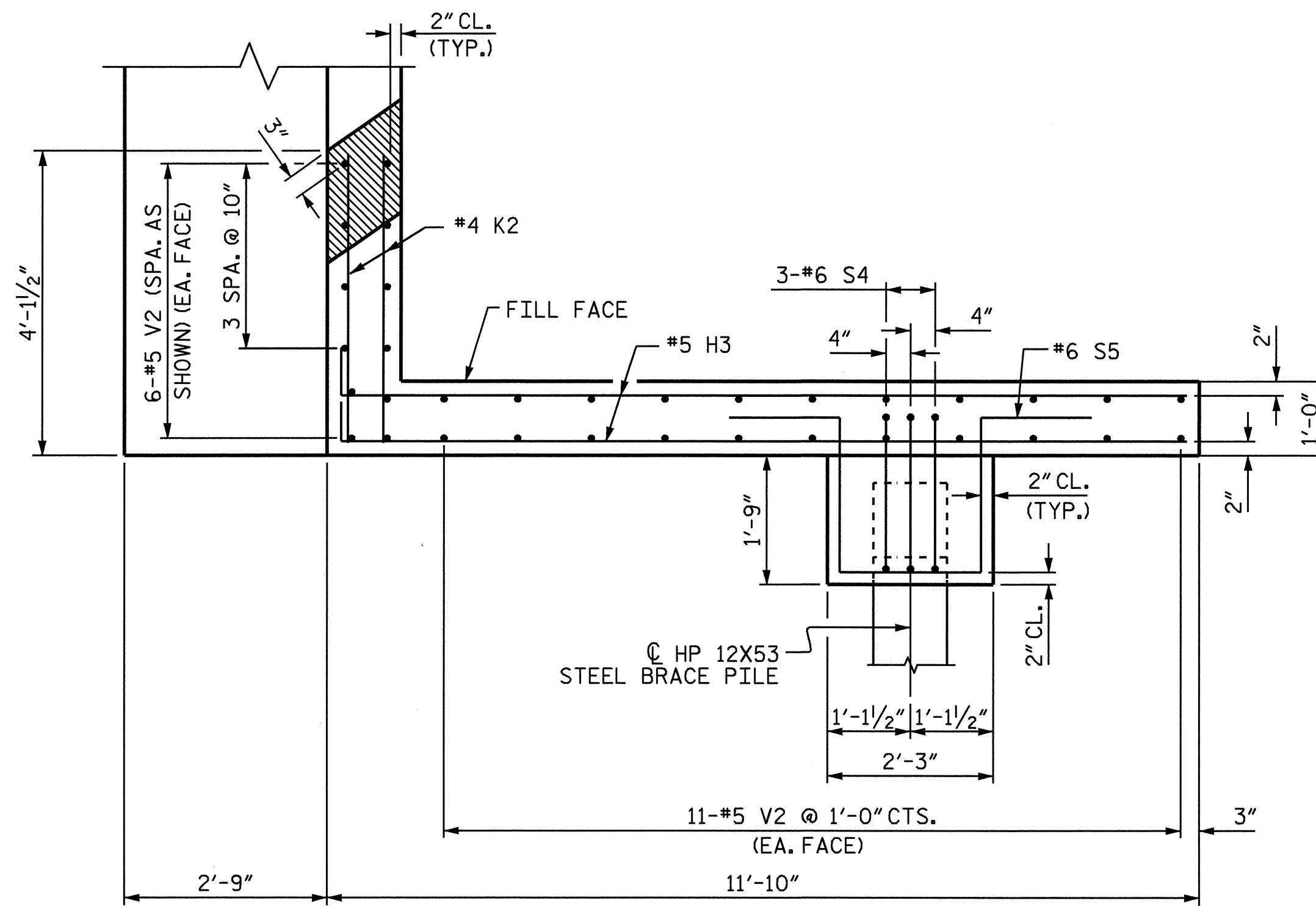


DRAWN BY: S. DOMBROWSKI DATE: 10/21/08
 CHECKED BY: T. H. FANG DATE: 12/02/08

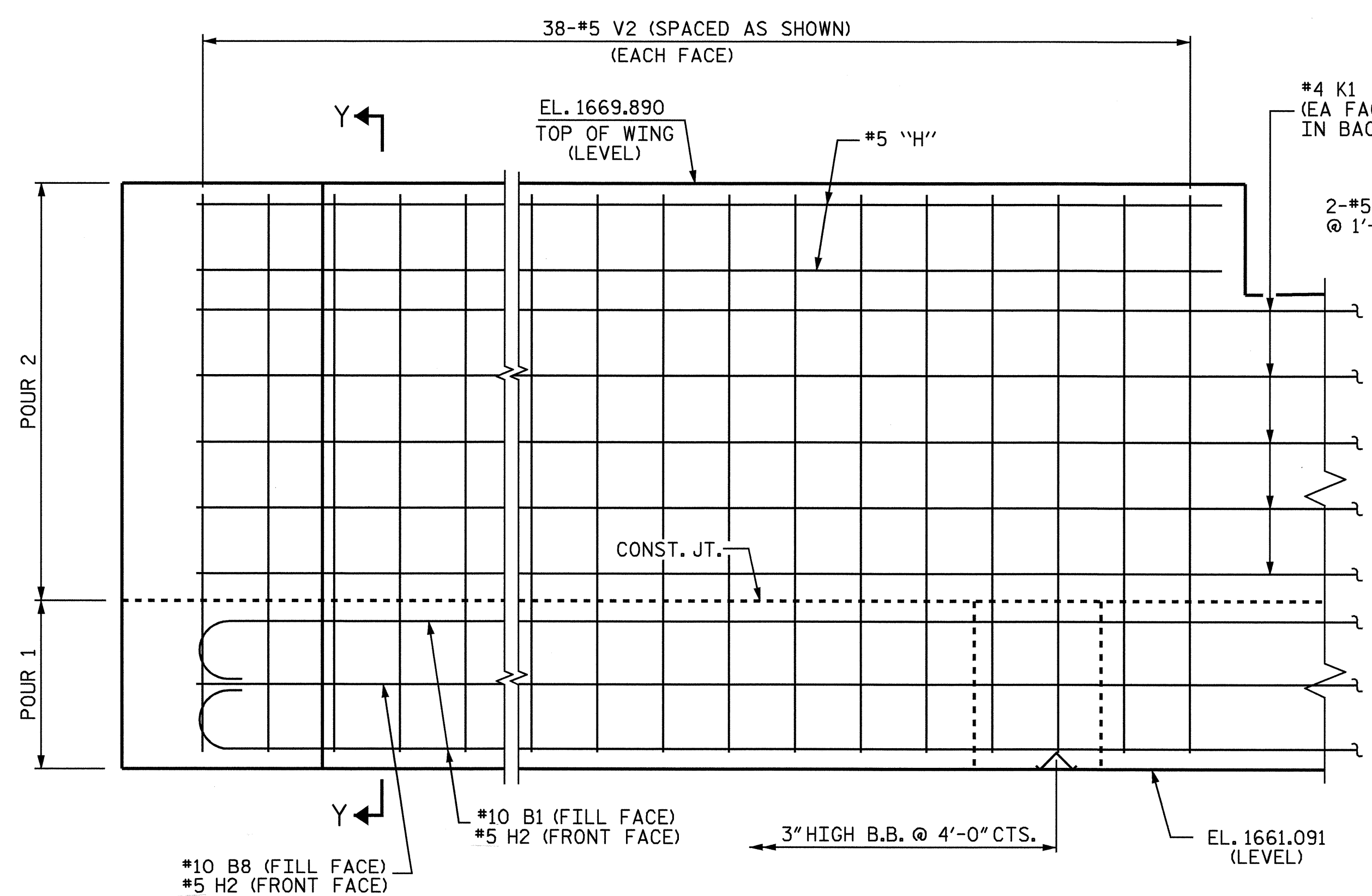


PLAN OF WING - W3

** SEE NOTE ON SHEET 1 OF 3

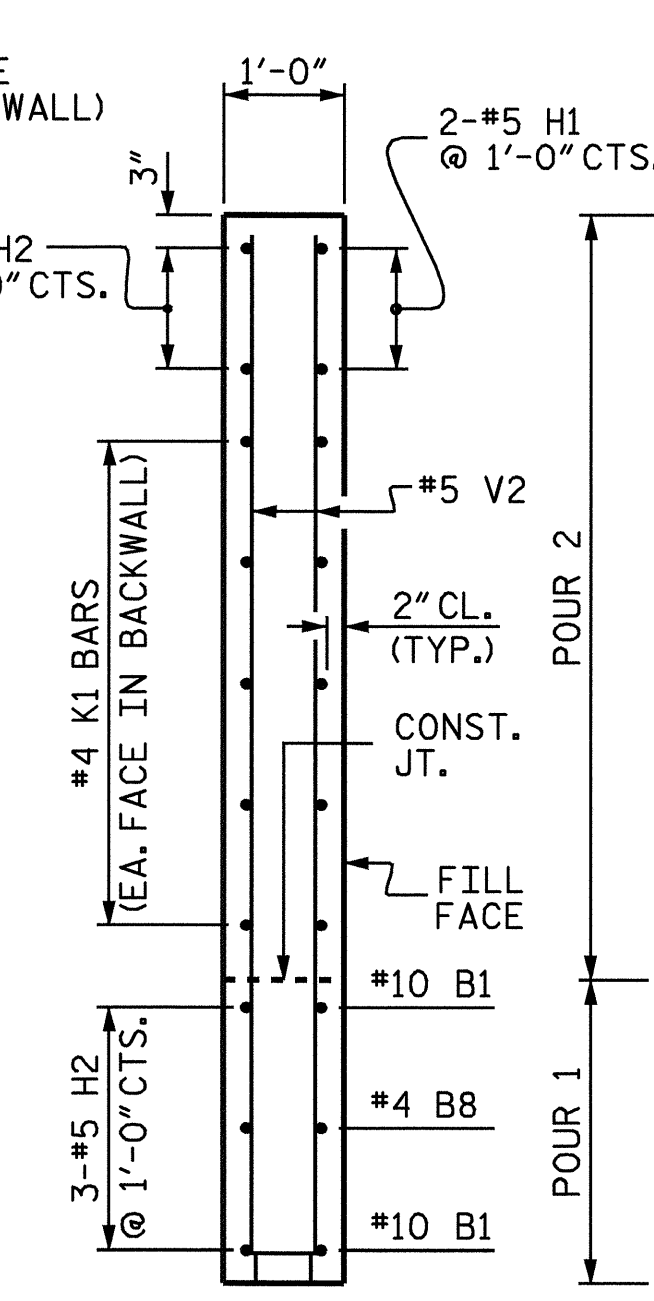


PLAN OF WING - W4

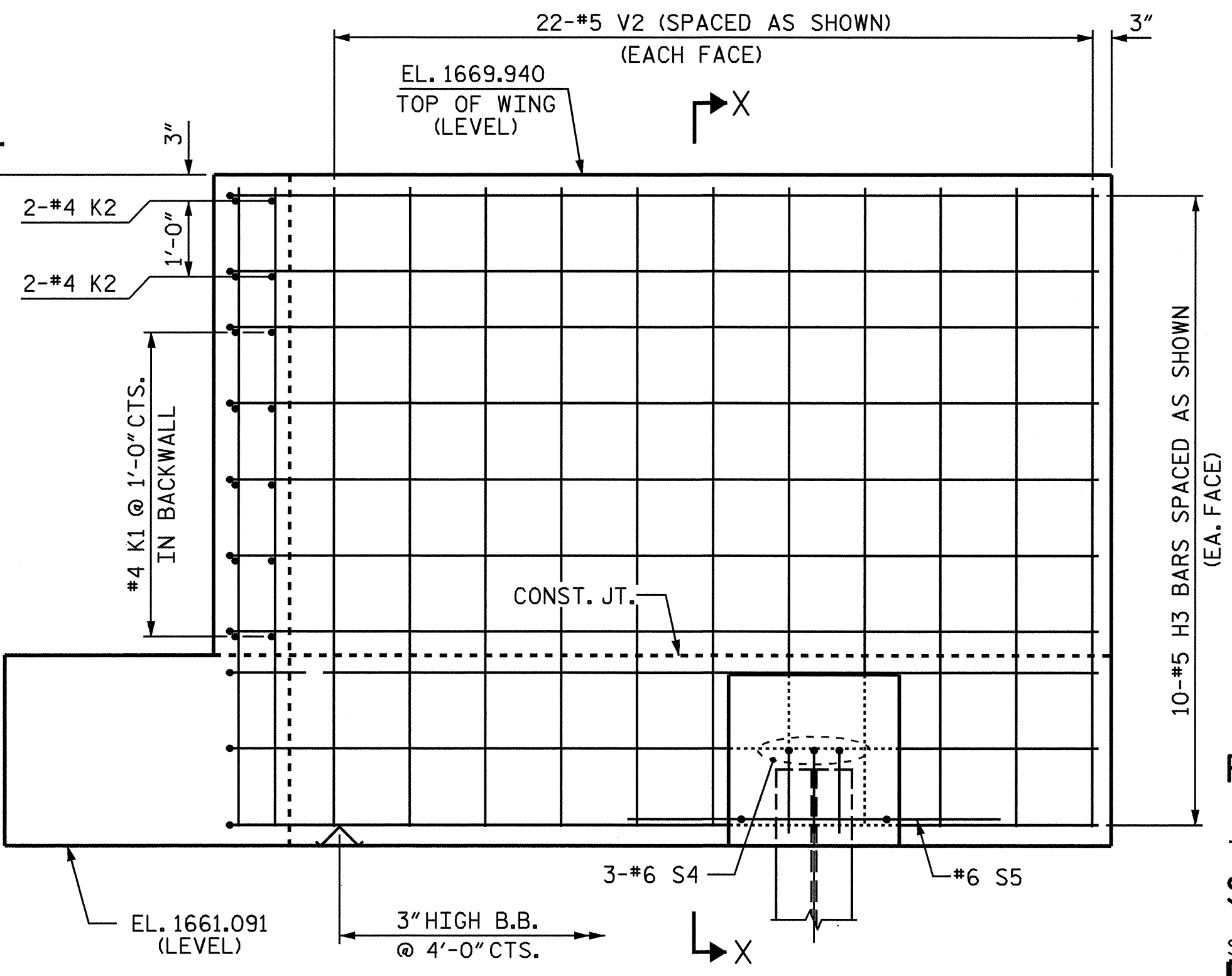


ELEVATION OF WING - W3

V2 BARS ALONG FILL FACE SHOWN

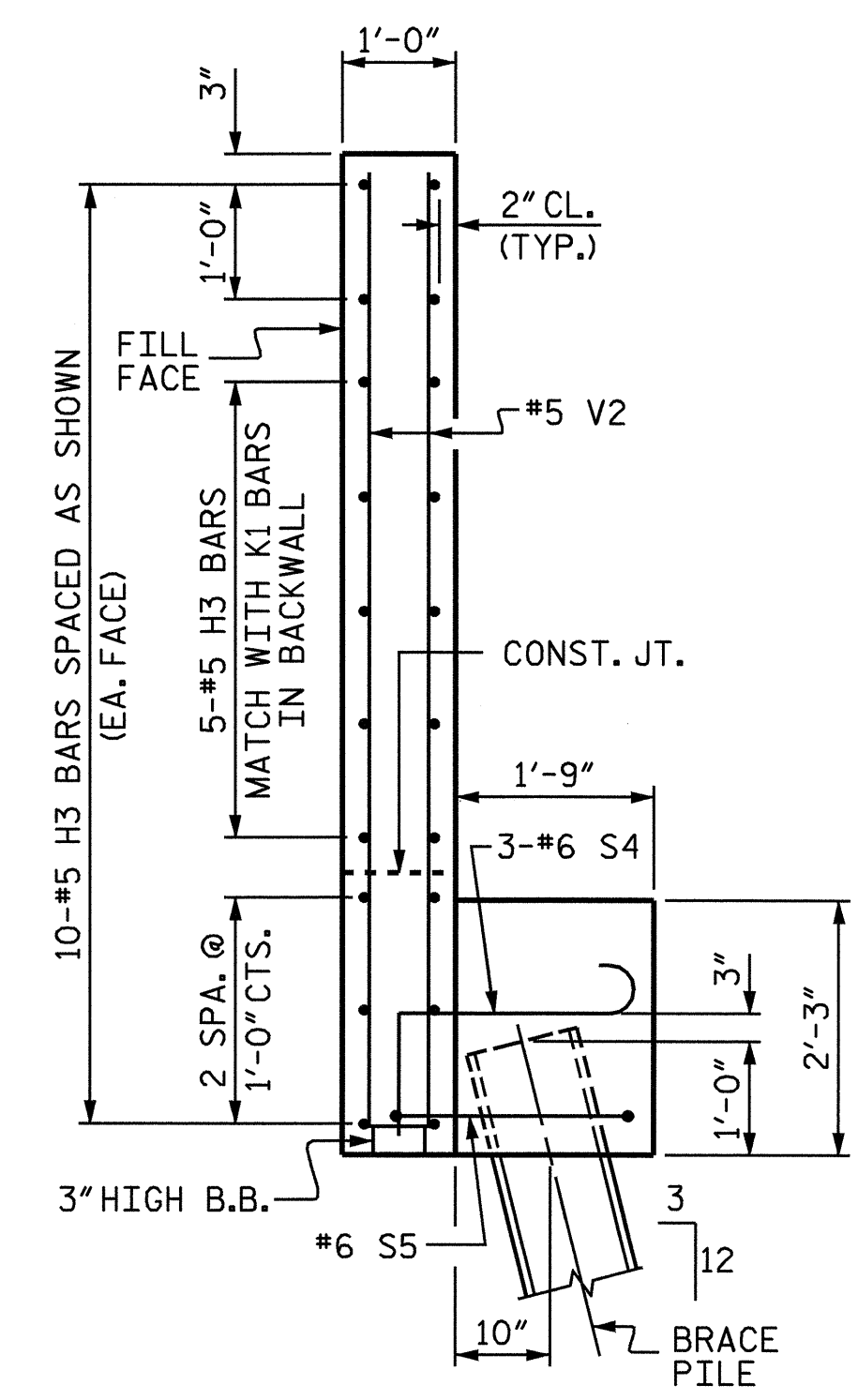


SECTION Y-Y



ELEVATION OF WING - W4

V2 BARS ALONG FILL FACE SHOWN



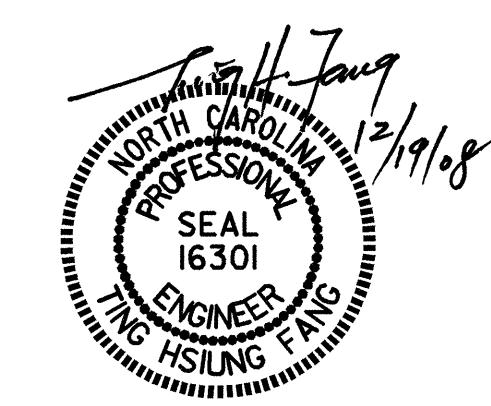
SECTION X-X

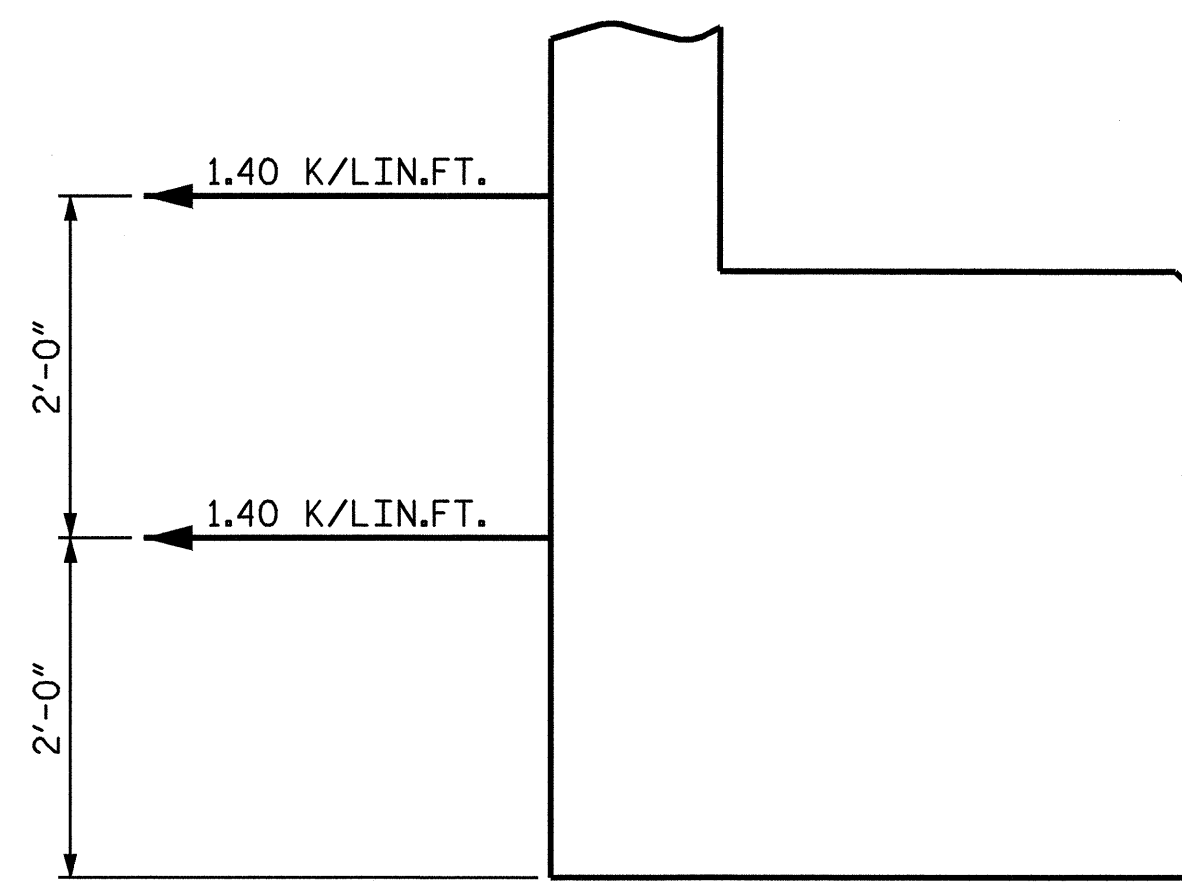
PROJECT NO. B-4239
 POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-20					TOTAL SHEETS 24

DRAWN BY : S. DOMBROWSKI DATE : 10/21/08
 CHECKED BY : I. H. FANG DATE : 12/05/08





GALVANIZED REINFORCING STRAP LOAD DETAIL

GALVANIZED REINFORCING STRAP NOTES

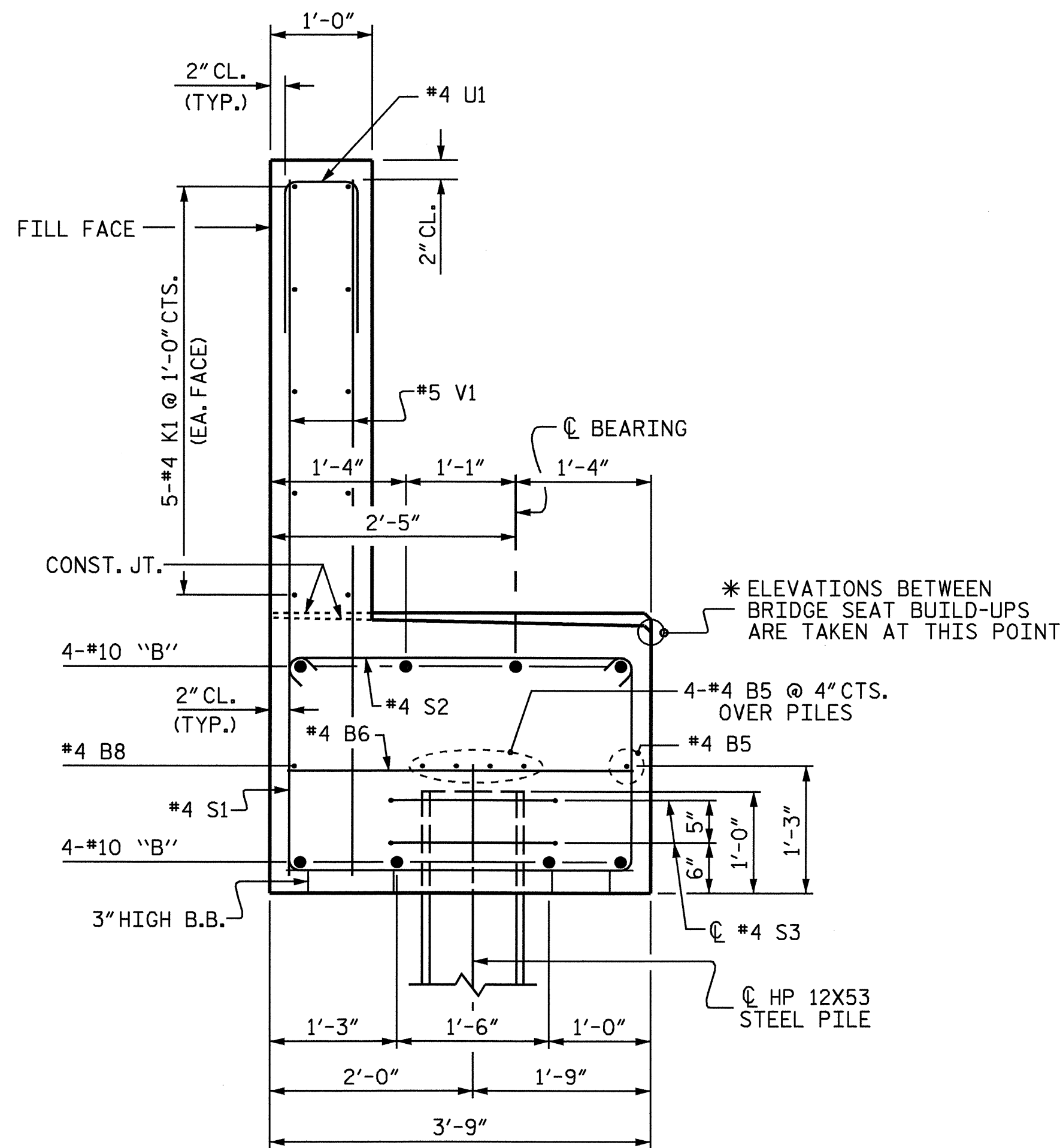
GALVANIZED REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE "MECHANICALLY STABILIZED EARTH RETAINING WALL" SPECIAL PROVISIONS.

PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

THE GALVANIZED REINFORCING STRAPS SHALL BE DESIGNED WITH THE FOLLOWING SOIL PARAMETERS:
 FRICTION ANGLE = 36 DEGREES
 COHESION $c = 0.0$
 UNIT WEIGHT OF SOIL = 110 PCF

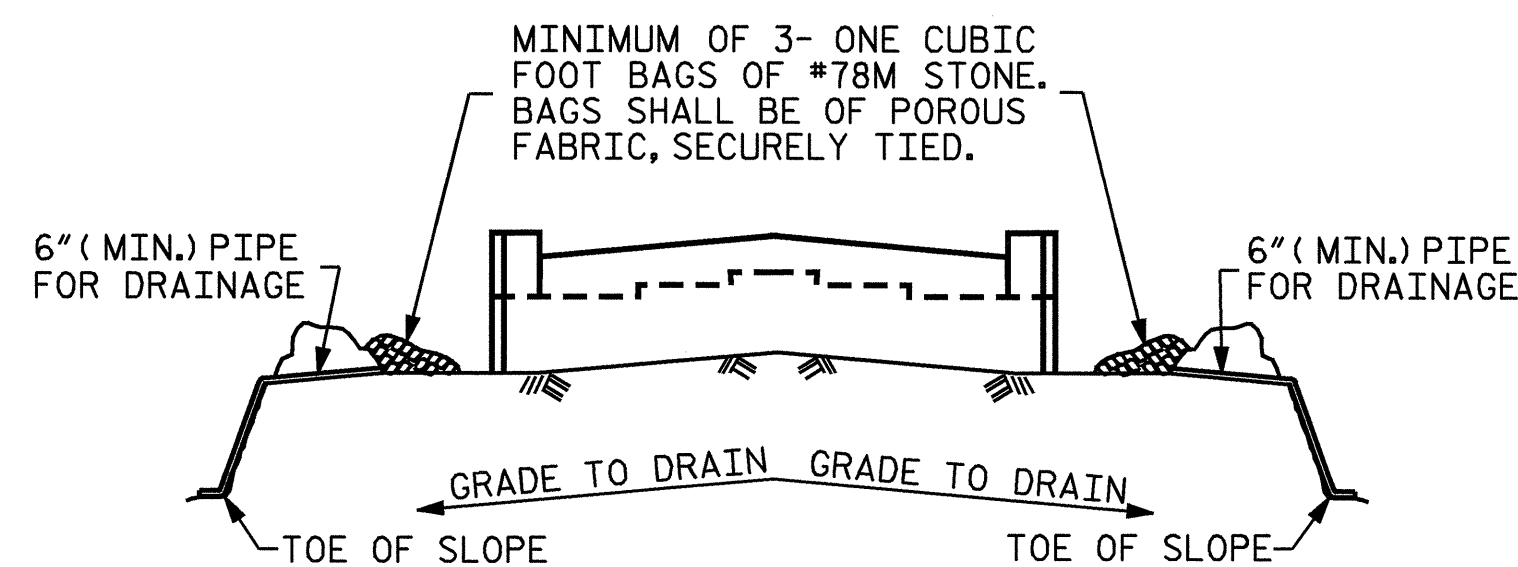
FOR CONFLICTS WITH PILES IN THE END BENT WINGS, SEE PLAN VIEW AND FOUNDATION LAYOUT SHEETS.



SECTION THRU BENT

BAR TYPES		BILL OF MATERIAL				
		END BENT 2				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	#10	9	33'-3"	572		
B2	#10	1	39'-1"	336		
B3	#10	1	38'-4"	330		
B4	#10	1	37'-5"	322		
B5	#4	STR.	19'-3"	129		
B6	#4	STR.	3'-5"	21		
B7	#4	STR.	2'-5"	6		
B8	#4	STR.	27'-7"	37		
H1	#5	STR.	20'-0"	42		
H2	#5	STR.	17'-0"	53		
H3	#5	2	12'-2"	254		
K1	#4	STR.	27'-7"	369		
K2	#4	STR.	3'-9"	10		
S1	#4	3	8'-5"	236		
S2	#4	4	4'-2"	117		
S3	#4	5	6'-6"	43		
S4	#6	6	3'-9"	17		
S5	#6	7	9'-1"	14		
U1	#4	8	3'-8"	69		
U2	#4	8	6'-5"	13		
V1	#5	STR.	6'-9"	394		
V2	#5	STR.	8'-5"	632		
REINFORCING STEEL				LBS.	4,016	
CLASS "A" CONCRETE						
POUR #1 CAP & LOWER WINGS				C. Y.	15.8	
POUR #2 UPPER WINGS				C. Y.	13.4	
TOTAL				C. Y.	29.2	
HP12x53 STEEL PILES						
No. 6				LIN. FT.	90	
STEEL PILE POINTS						
No. 6				EA.		

ALL BAR DIMENSIONS ARE OUT TO OUT.

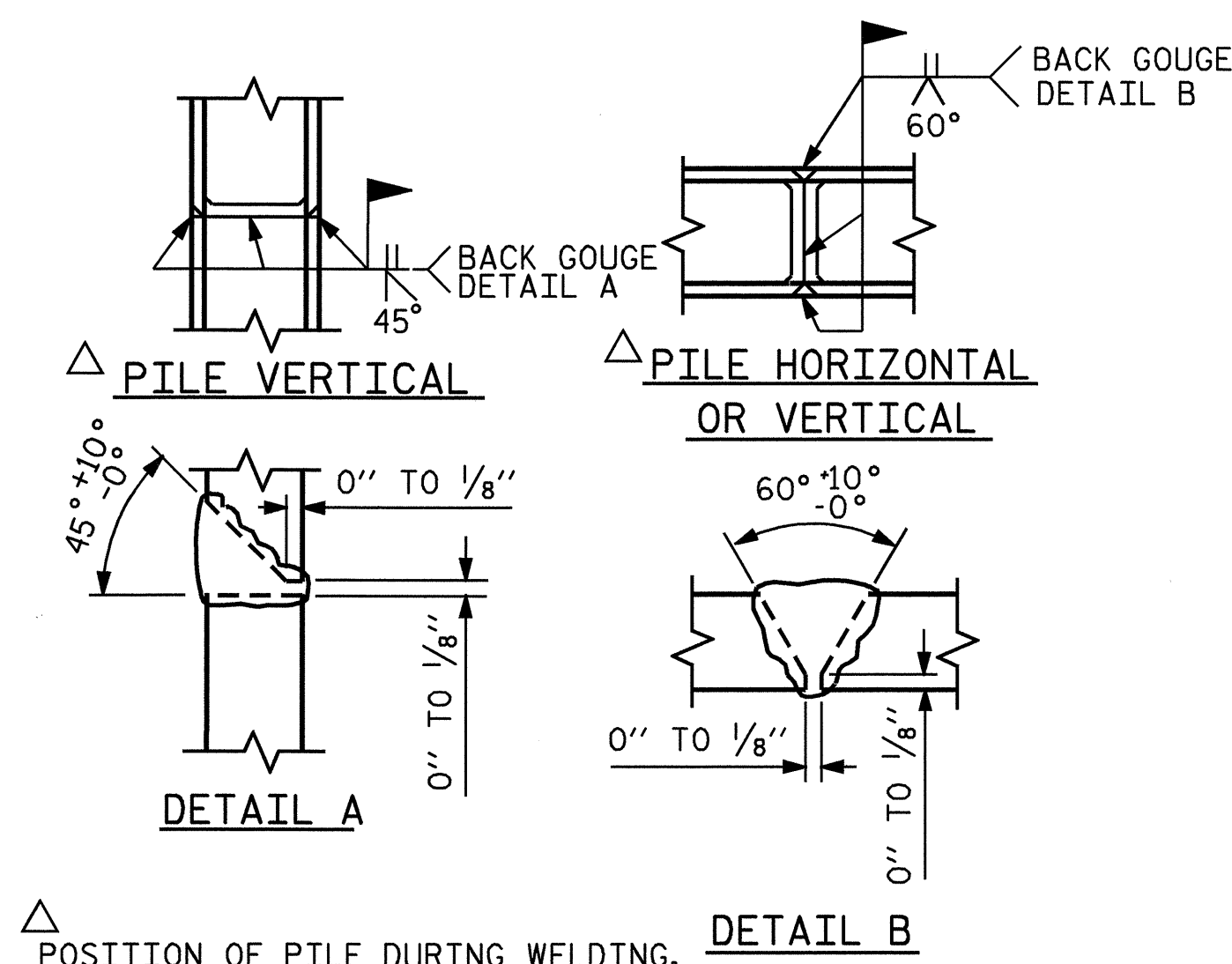


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

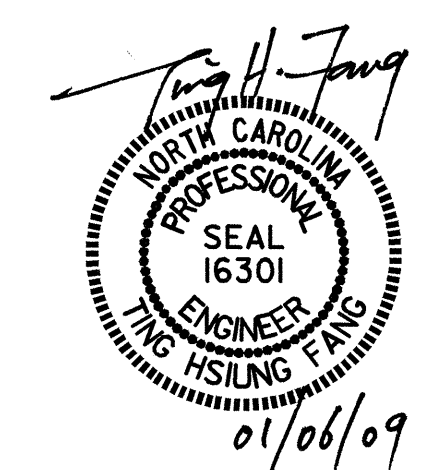


PILE SPLICE DETAILS

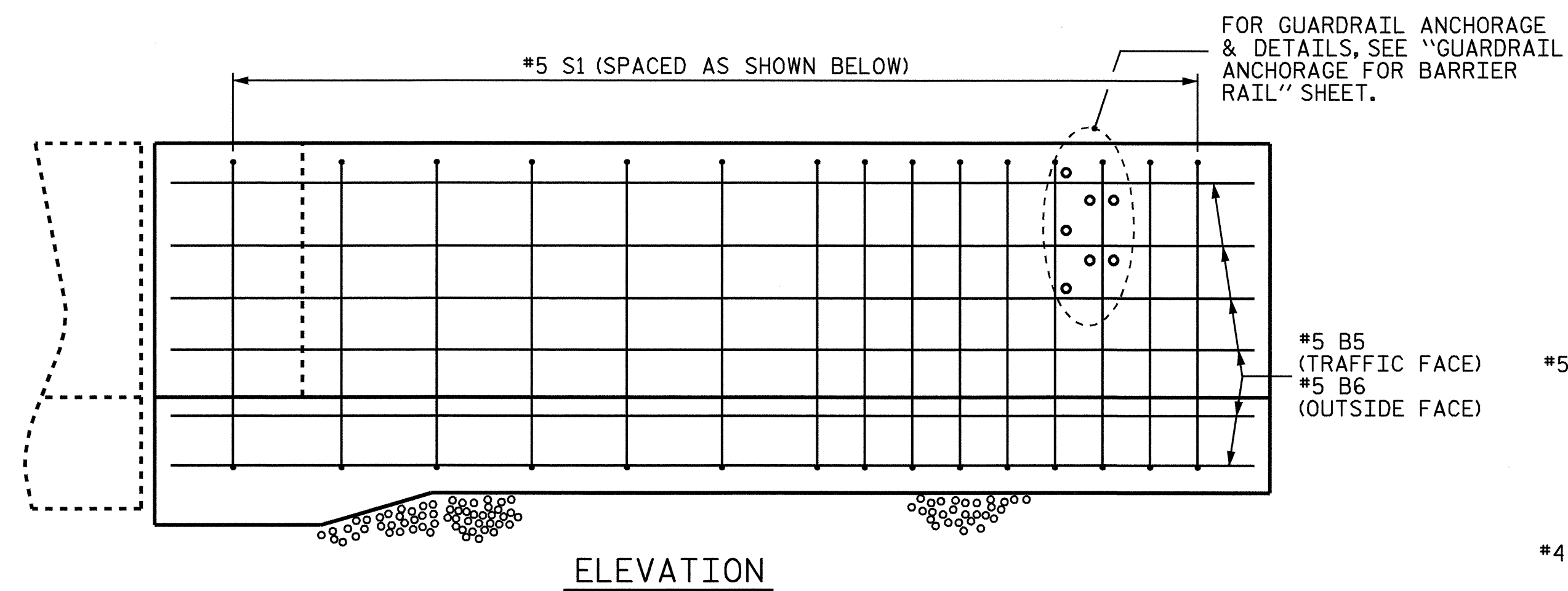
PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 3 OF 3

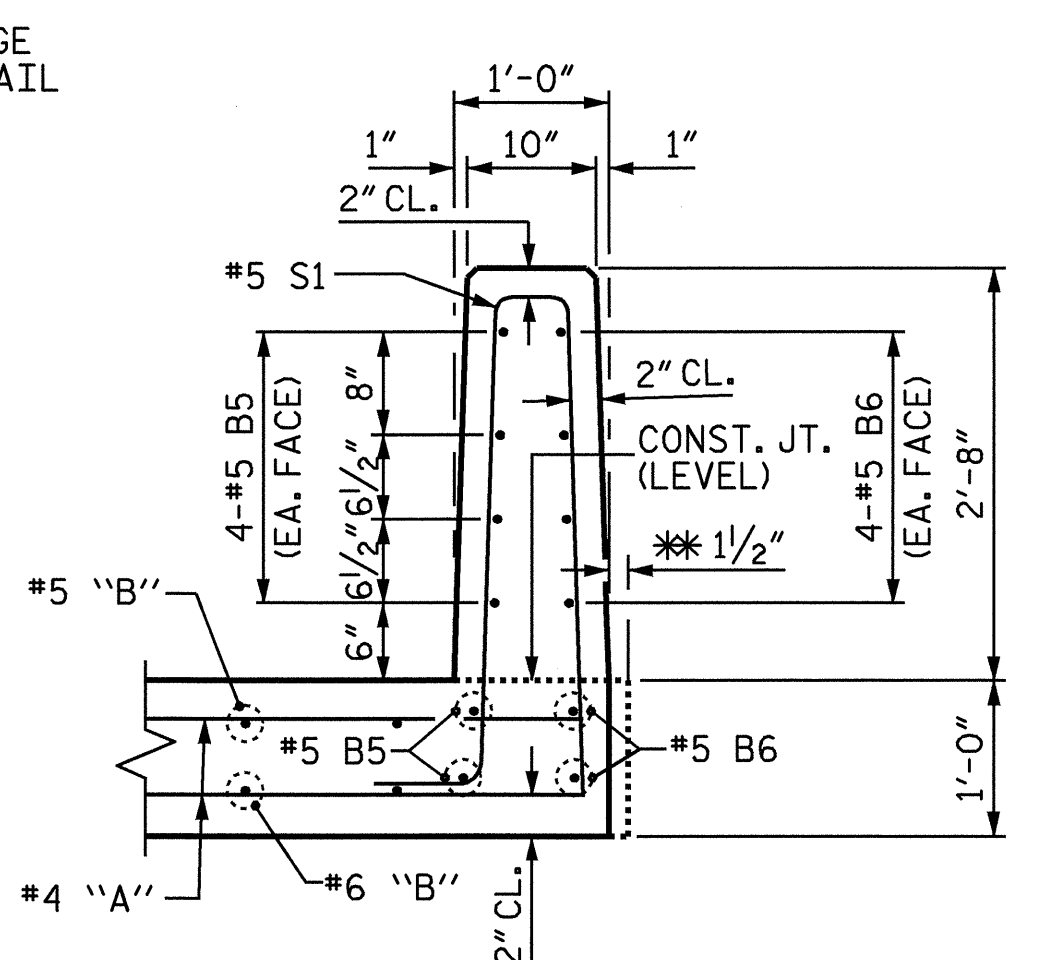
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					24



DRAWN BY: S. DOMBROWSKI DATE: 10/21/08
 CHECKED BY: T. H. FANG DATE: 12/01/08



ELEVATION

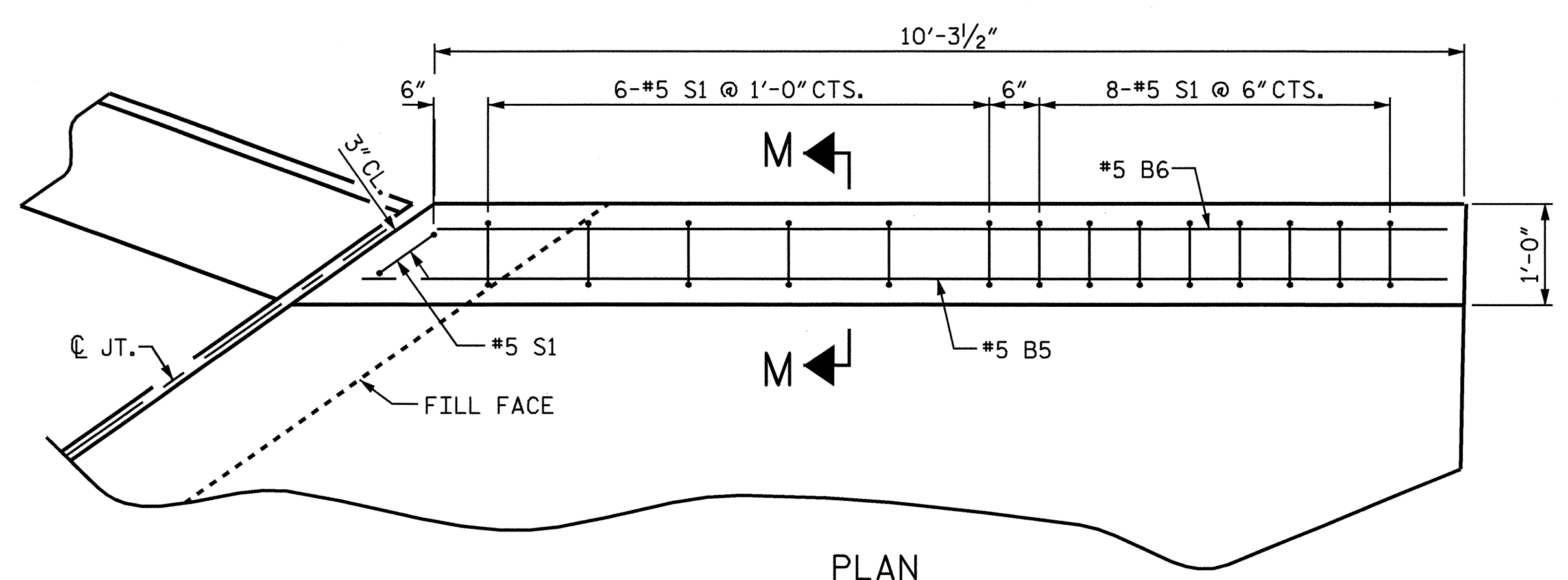


SECTION M-M

** THE CONTRACTOR HAS AN OPTION, AT NO ADDITIONAL COST TO THE DEPARTMENT, TO EXTEND A LENGTH OF 1/2" FROM THE OUTSIDE EDGE OF SLAB FOR SETTING UP THE SLIP FORM FOR VERTICAL CONCRETE BARRIER RAIL.

BAR TYPES		BILL OF MATERIAL										
		APPROACH SLAB 1					APPROACH SLAB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	4	*4	STR	29'-6"	79	*A7	12	*4	STR	29'-0"	232	
A2	4	*4	STR	29'-6"	79	A8	13	*4	STR	29'-0"	252	
*A3	5	*4	STR	28'-10"	96	*A11	2	*4	STR	3'-1"	4	
A4	5	*4	STR	28'-10"	96	*A12	2	*4	STR	4'-3"	6	
*A5	3	*4	STR	28'-1"	56	*A13	2	*4	STR	5'-6"	7	
A6	4	*4	STR	28'-1"	75	*A14	2	*4	STR	6'-1"	8	
*B1	47	*5	STR	11'-0"	539	*A15	2	*4	STR	4'-0"	5	
B2	47	*6	STR	11'-6"	812	A21	2	*4	STR	3'-1"	4	
*B3	2	*5	STR	6'-0"	13	A22	2	*4	STR	4'-3"	6	
B4	2	*6	STR	6'-0"	18	A23	2	*4	STR	5'-6"	7	
REINFORCING STEEL					LBS.	1,080	A24	2	*4	STR	6'-1"	8
EPOXY COATED REINFORCING STEEL					LBS.	783	A25	2	*4	STR	4'-0"	5
CLASS AA CONCRETE					C. Y.	11.2						

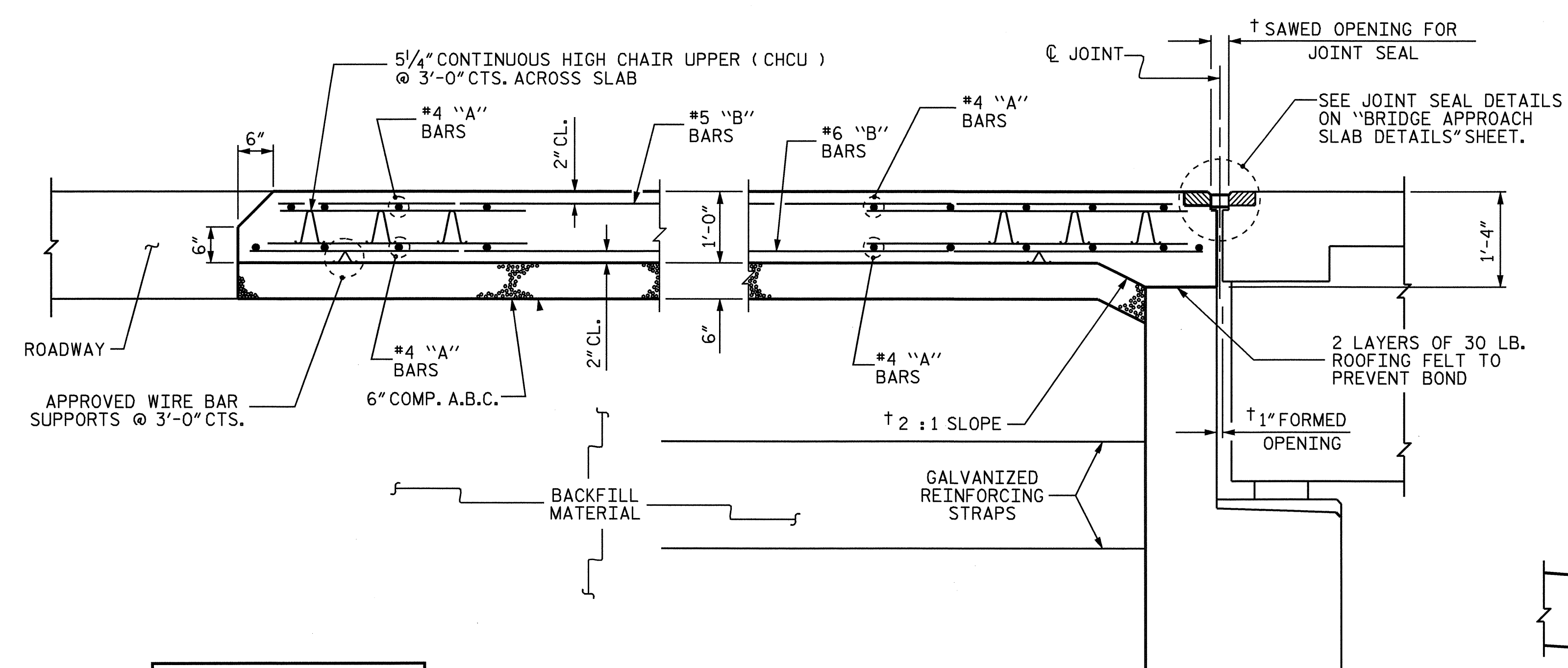
ALL BAR DIMENSIONS ARE OUT TO OUT



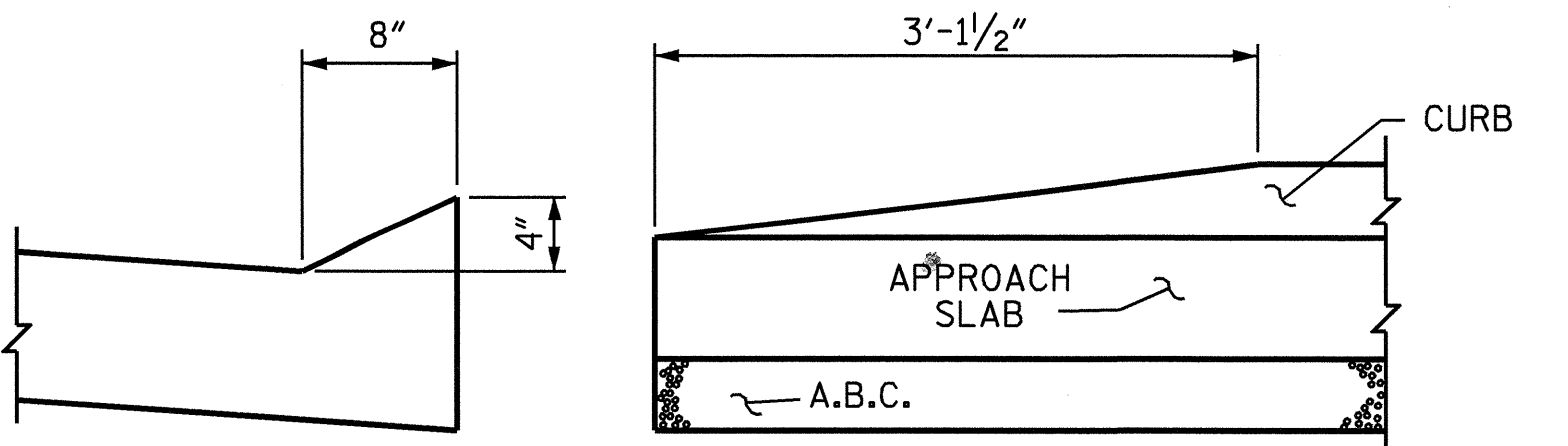
PLAN

SEE PLAN OF APPROACH SLAB ON SHEET 2 OF 3

VERTICAL CONCRETE BARRIER RAIL DETAILS



SECTION THRU SLAB



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

FOR THE BACKFILL MATERIAL UNDERNEATH APPROACH SLABS, SEE MSE WALL SPECIAL PROVISIONS.

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 SAWED PRIOR TO THE CASTING OF THE VERTICAL CONCRETE BARRIER RAIL.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

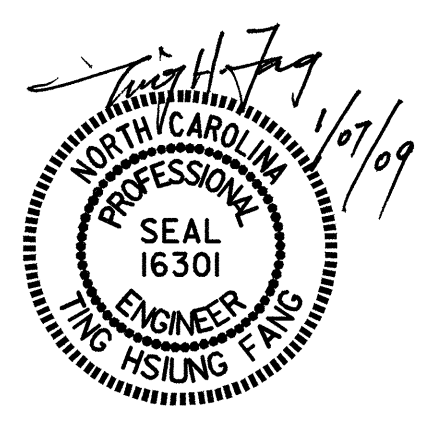
PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 1 OF 3

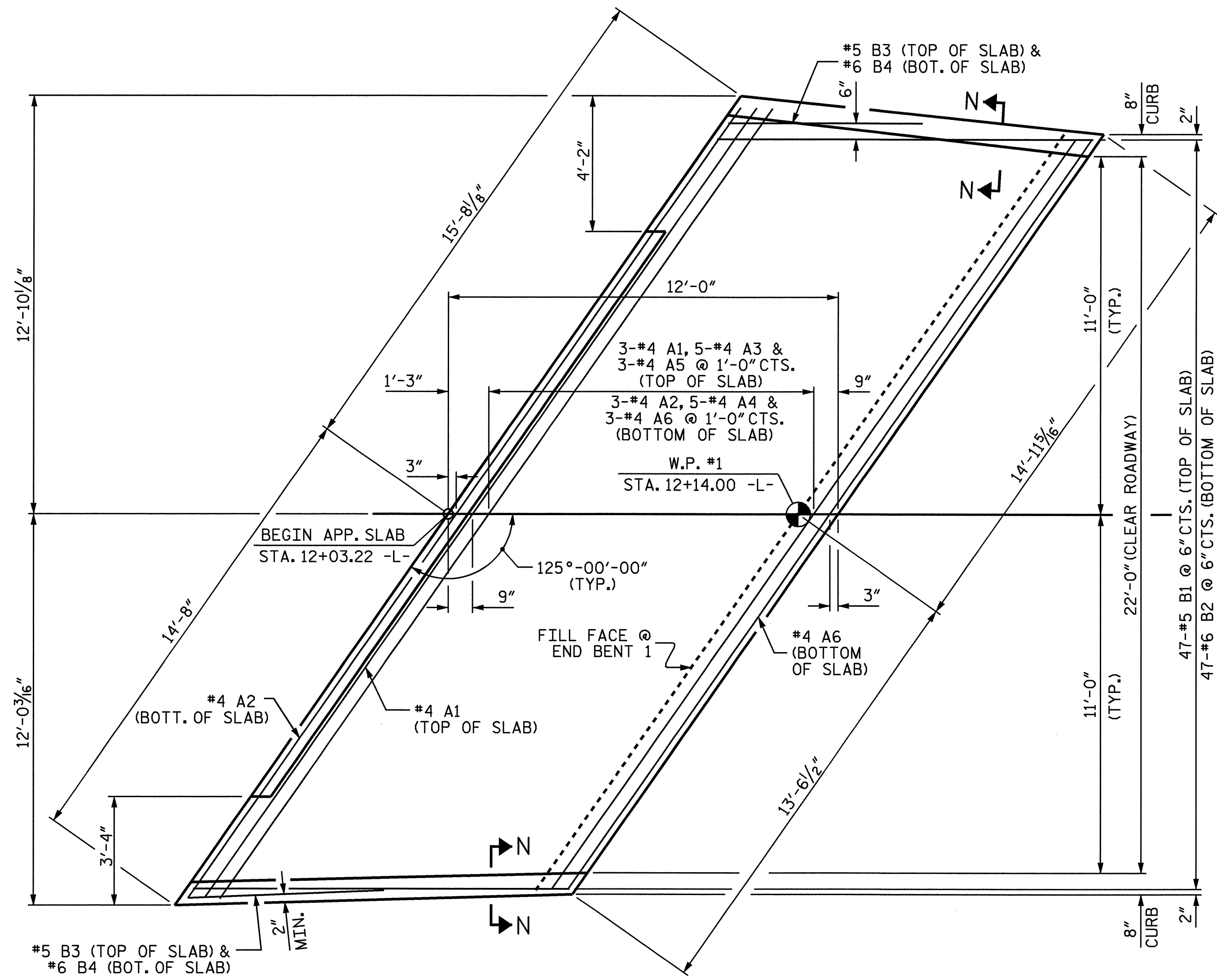
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

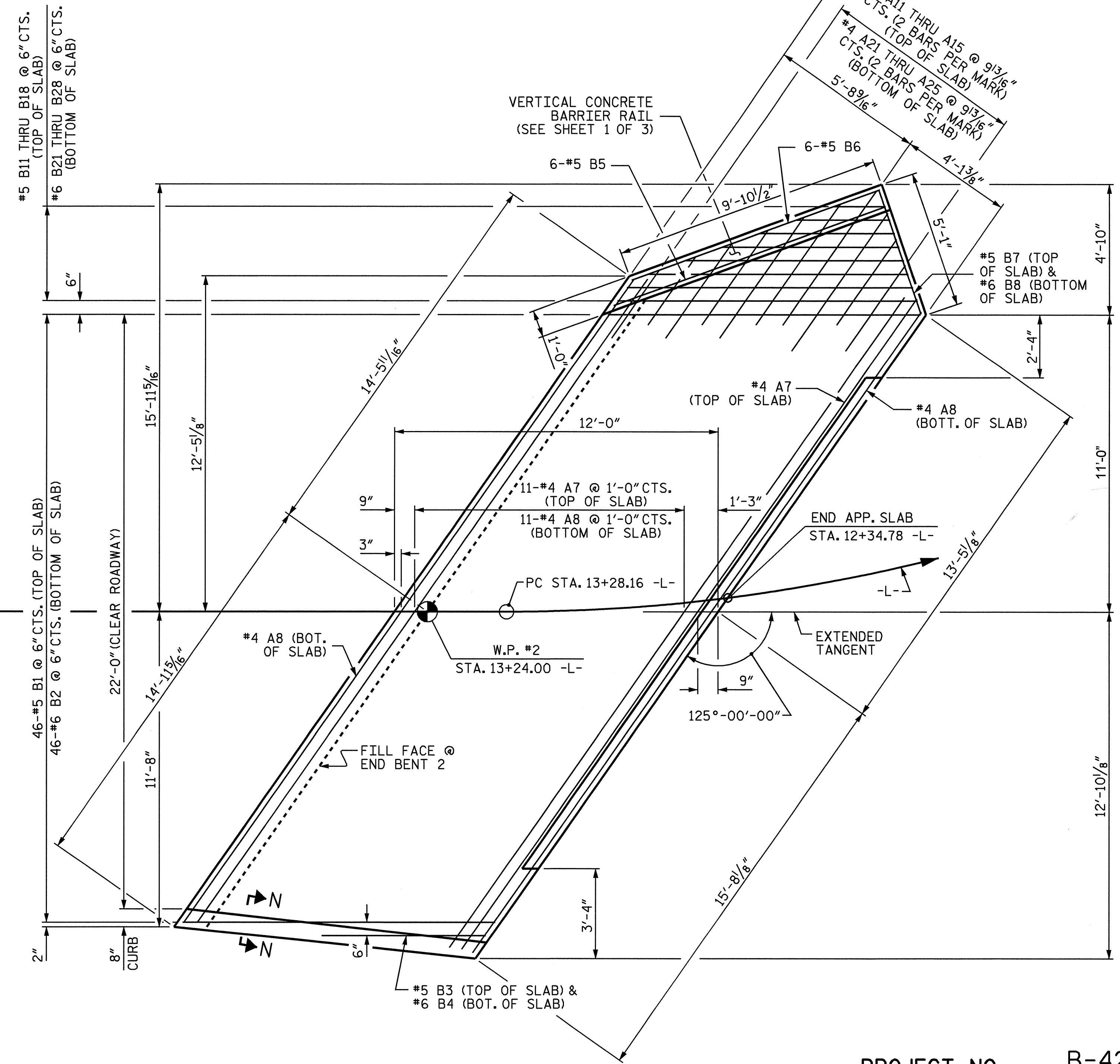
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS 24
2			4			



ASSEMBLED BY : S. DOMBROWSKI DATE : 8/5/08
 CHECKED BY : T.H. FANG DATE : 8/6/08
 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



PLAN @ END BENT 1



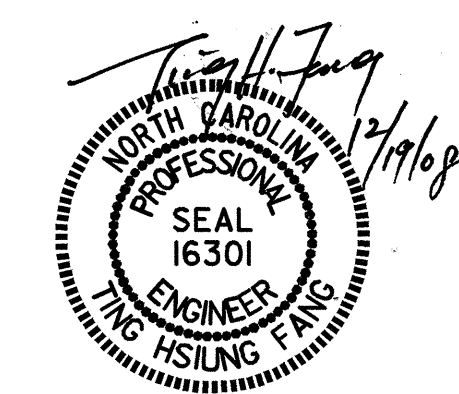
PLAN @ END BENT 2

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

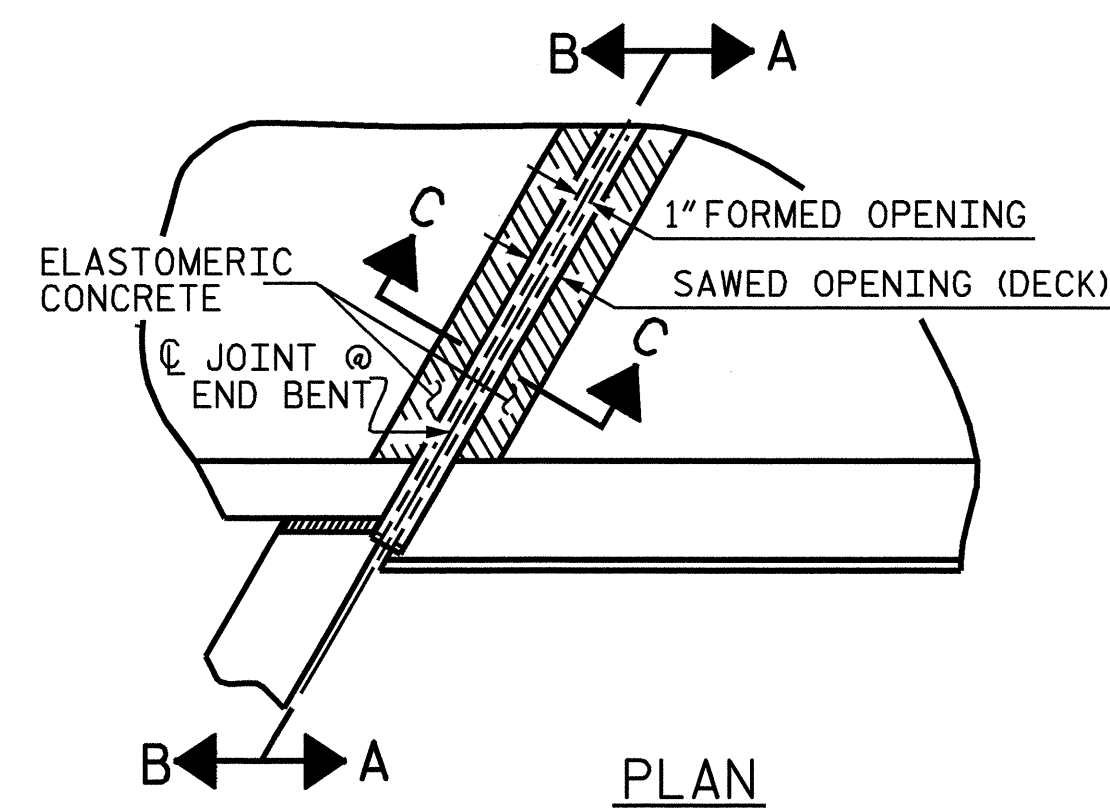
BRIDGE APPROACH
 SLAB DETAILS



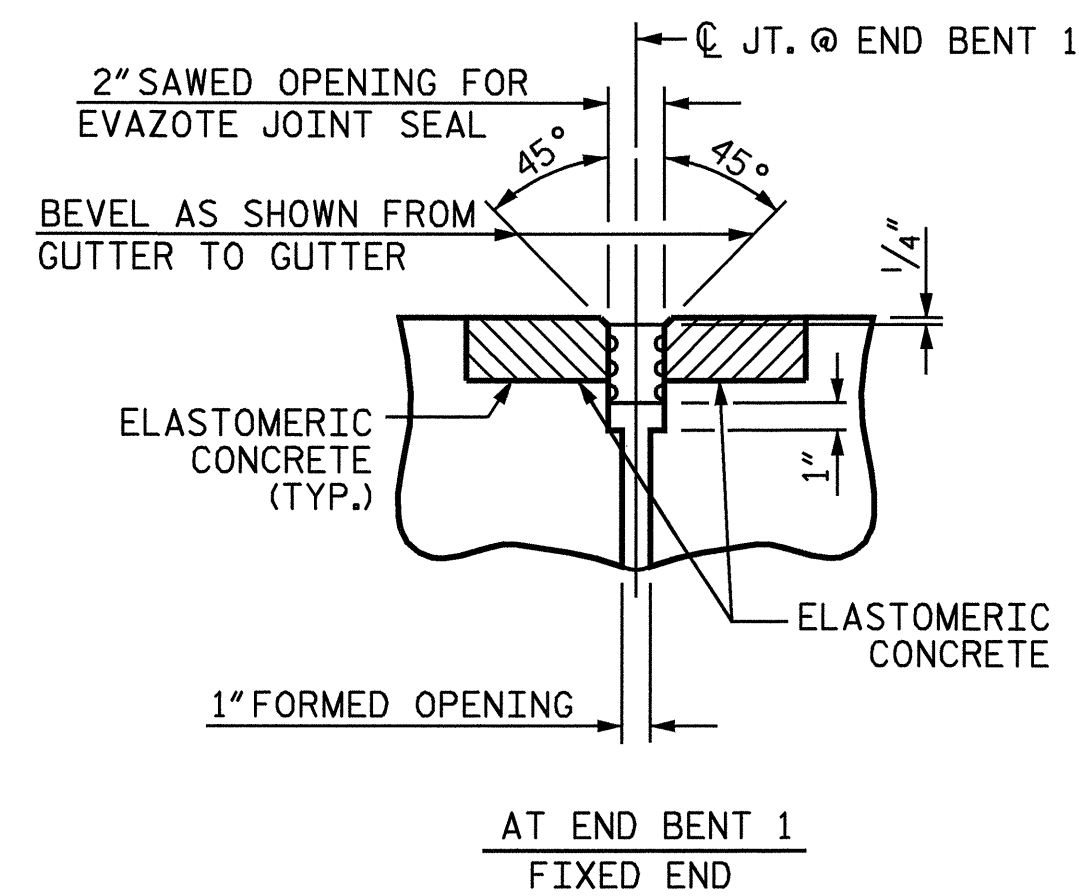
DRAWN BY : S. DOMBROWSKI DATE : 11/08
 CHECKED BY : T. H. FANG DATE : 12/05/08

13-DEC-2008 10:43
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 sdombrowski

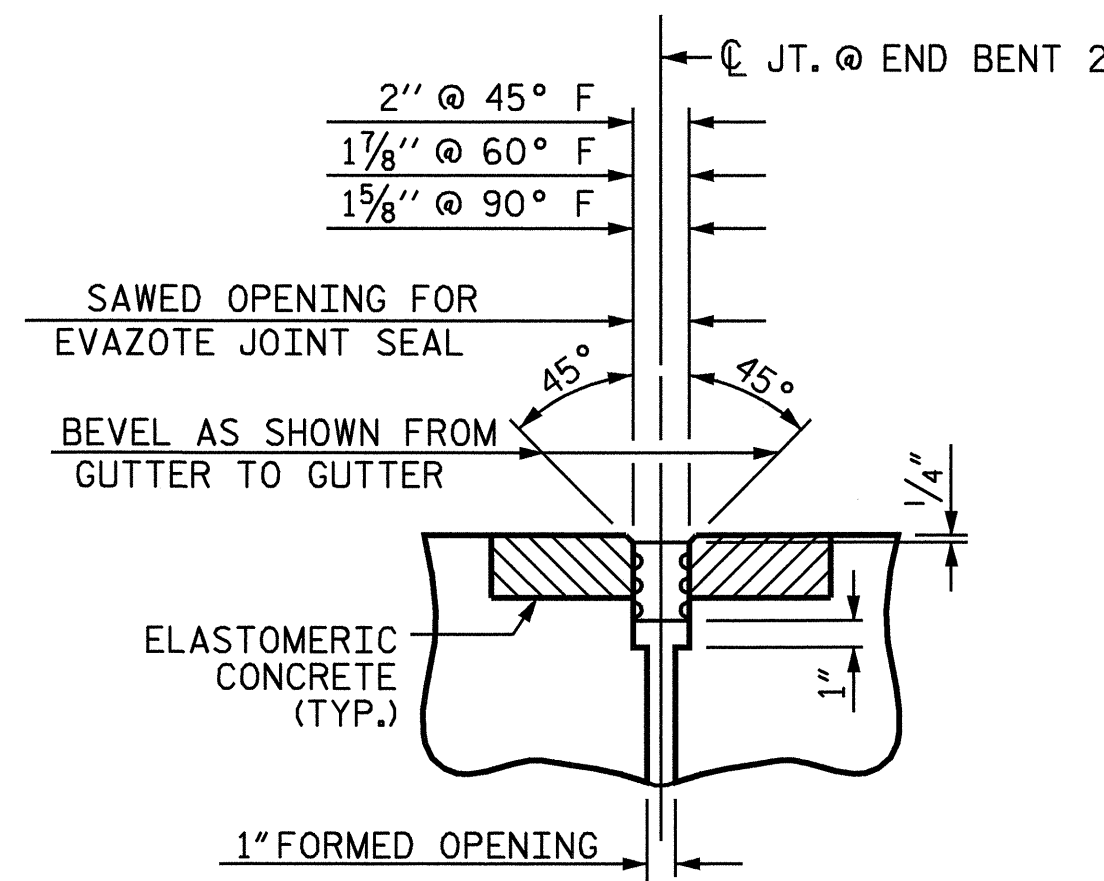
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			24



PLAN

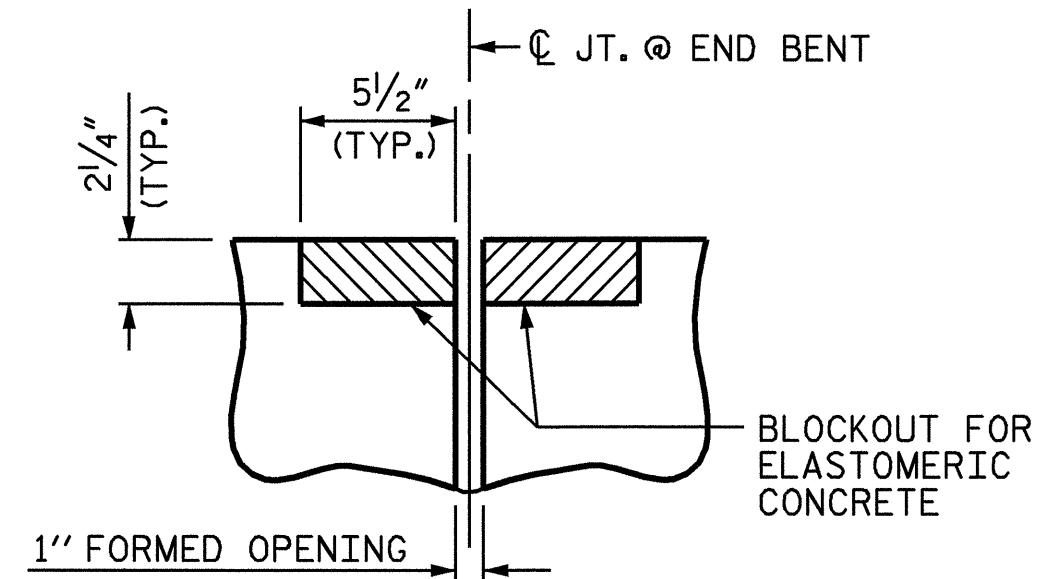


AT END BENT 1
FIXED END



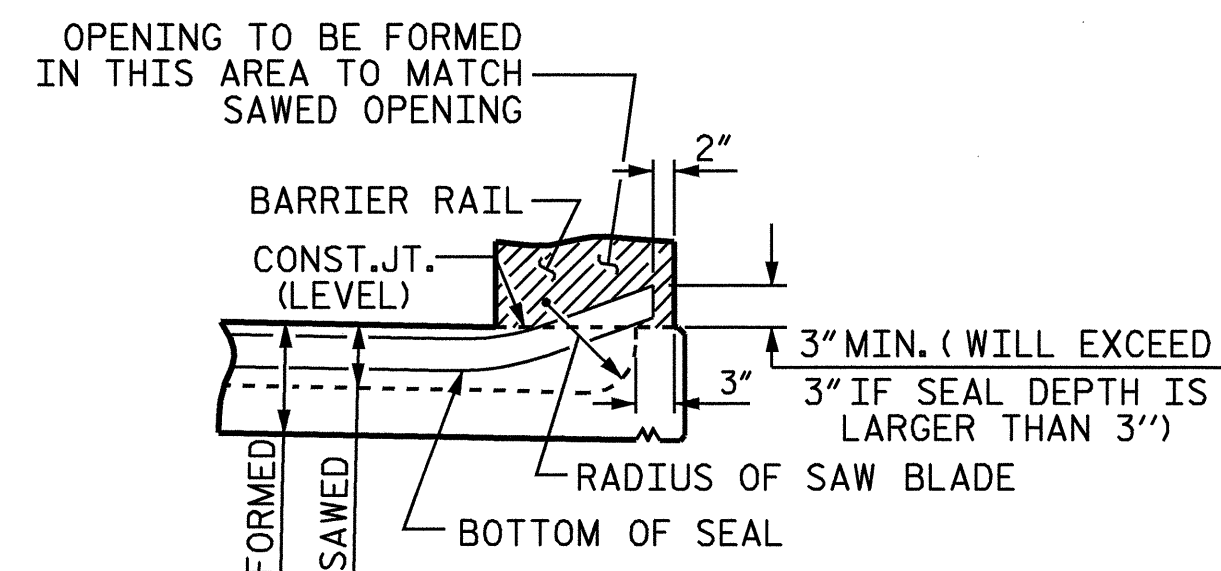
AT END BENT 2
EXPANSION END

SECTION C-C

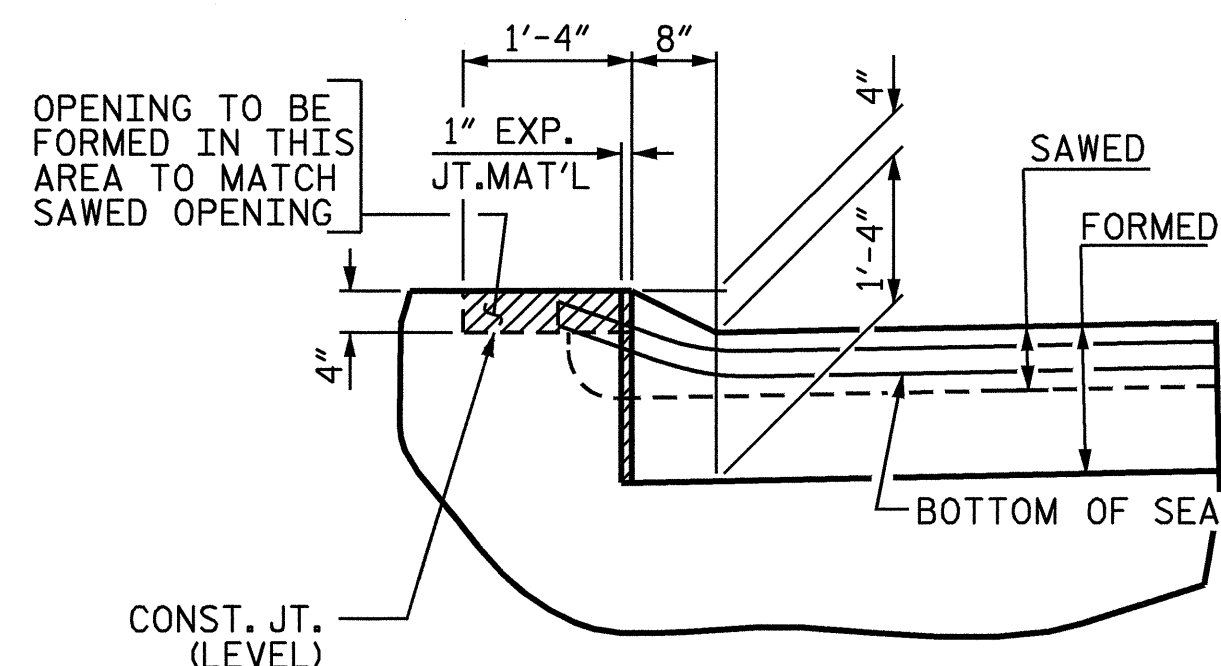


SECTION C-C

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)

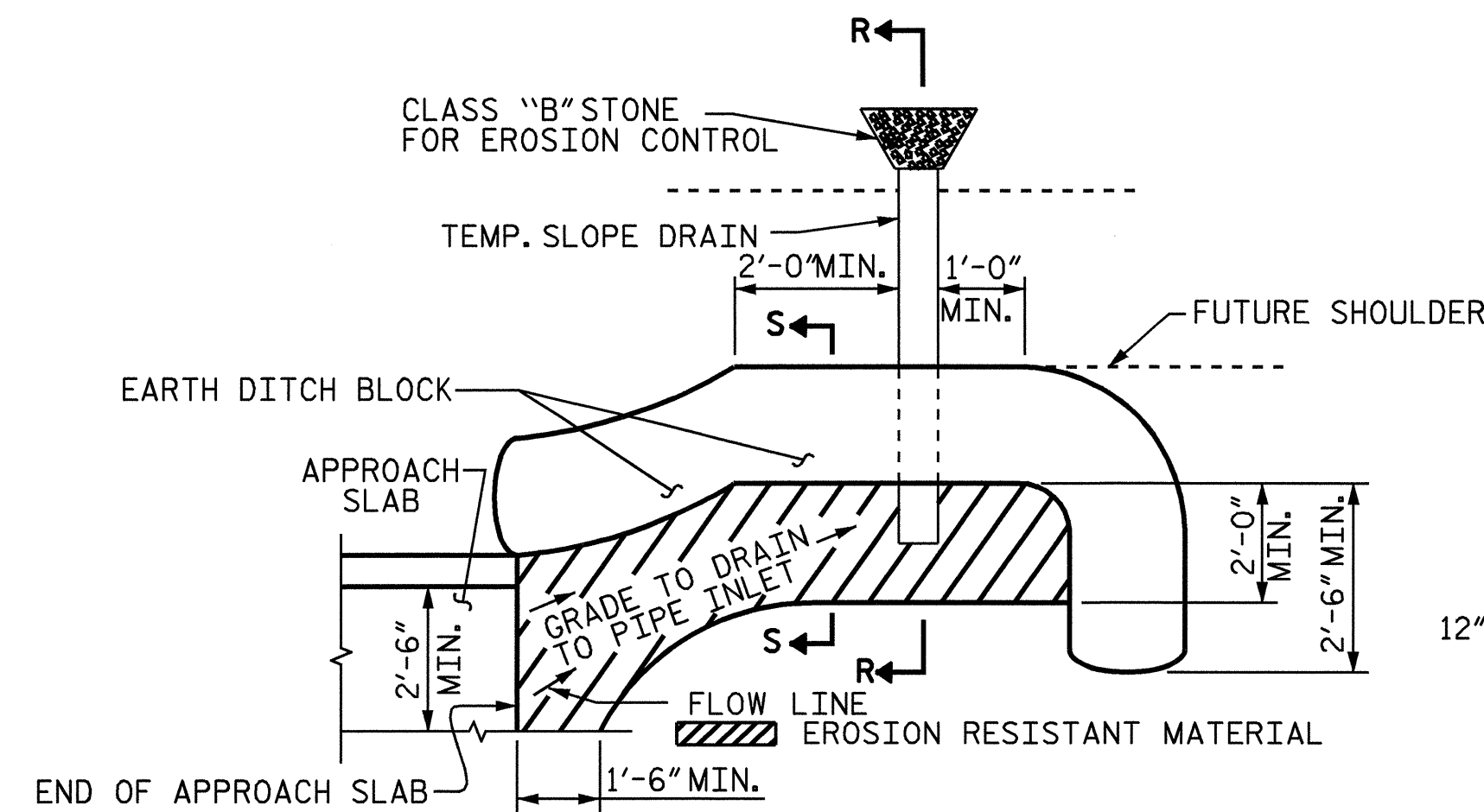


SECTION A-A



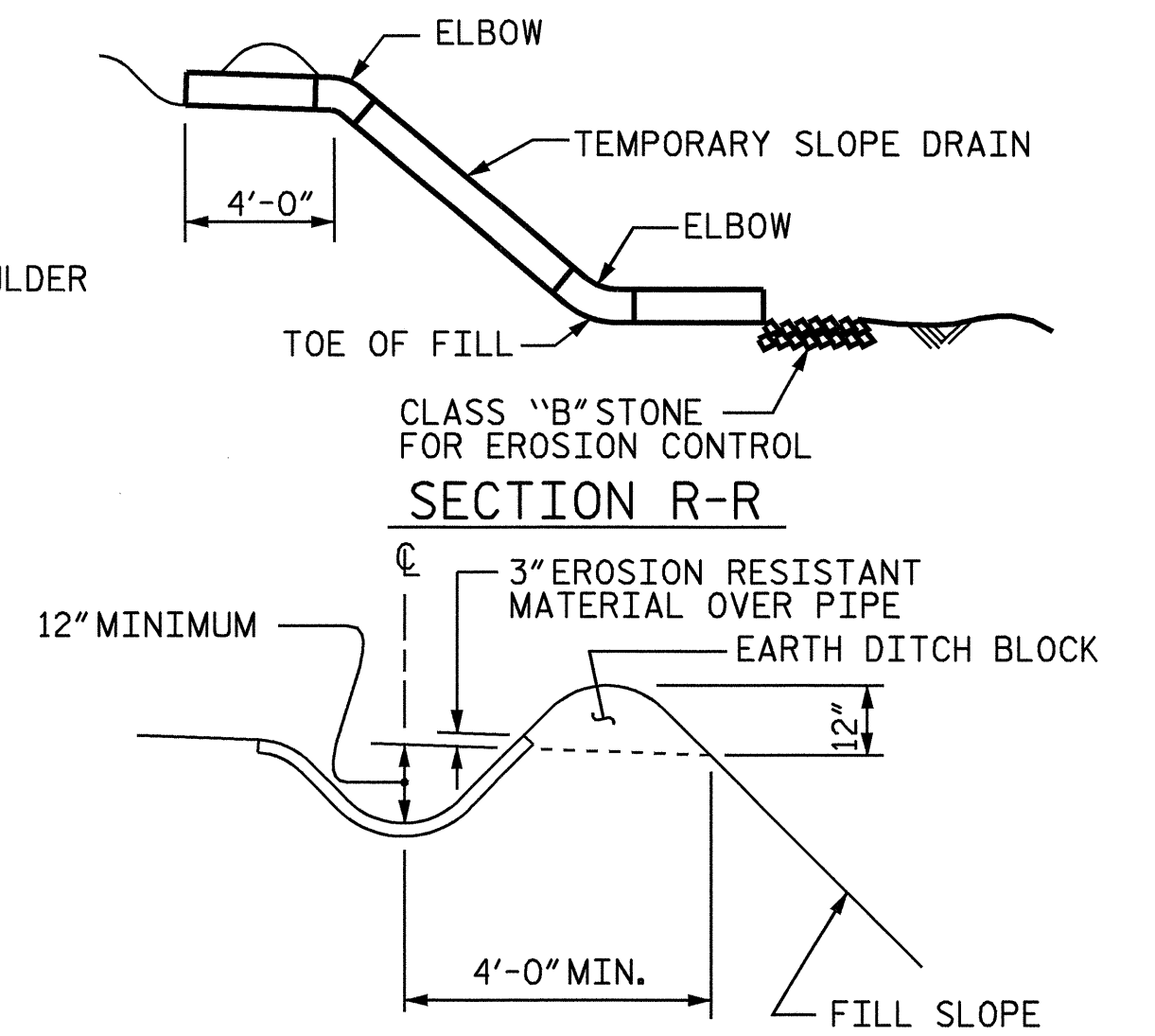
SECTION B-B

JOINT SEAL DETAILS @ END BENTS



PLAN VIEW

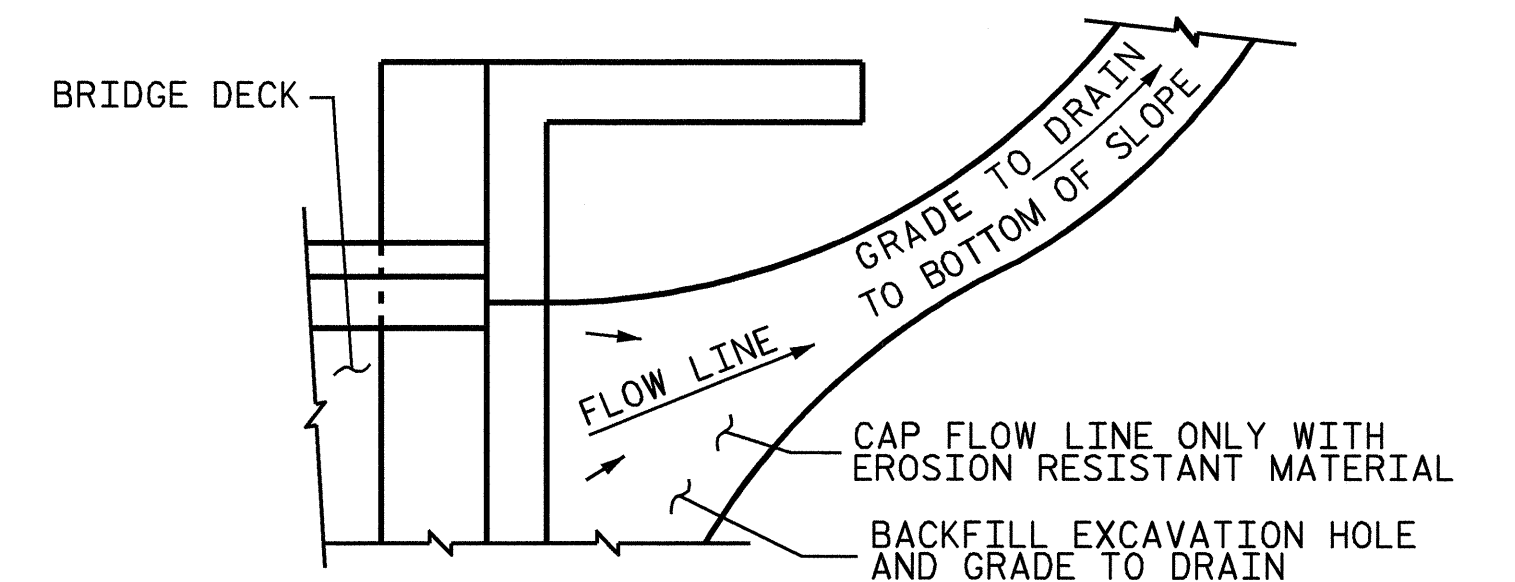
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

ELASTOMERIC CONCRETE	
END BENT NO.	(CU. FT.)*
1	4.62
2	4.62
TOTAL	9.24

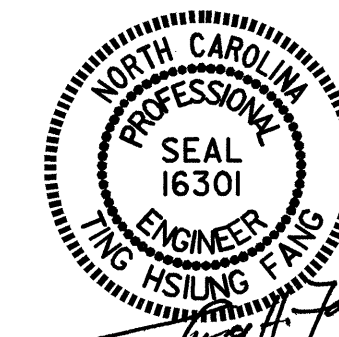
* BASED ON THE MINIMUM BLOCKOUT SHOWN

PROJECT NO. B-4239
POLK COUNTY
 STATION: 12+69.00 -L-

SHEET 3 OF 3

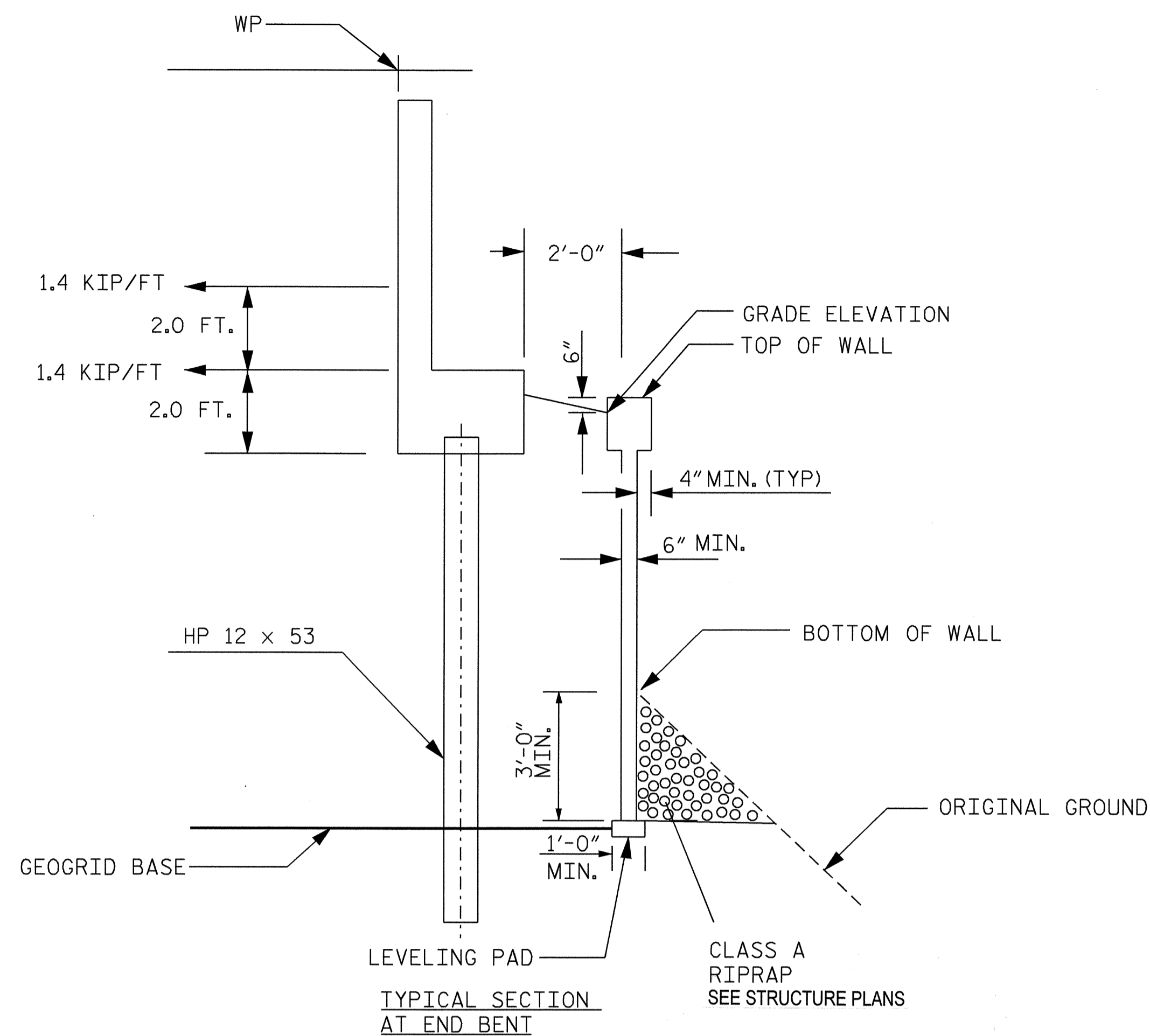
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH
 SLAB DETAILS



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

ASSEMBLED BY :	H. B. SHAH	DATE :	8/28/08
CHECKED BY :	T. H. FANG	DATE :	11/12/08
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06R	MAA/KMM



TYPICAL SECTION AT END BENT
NTS

NOTES

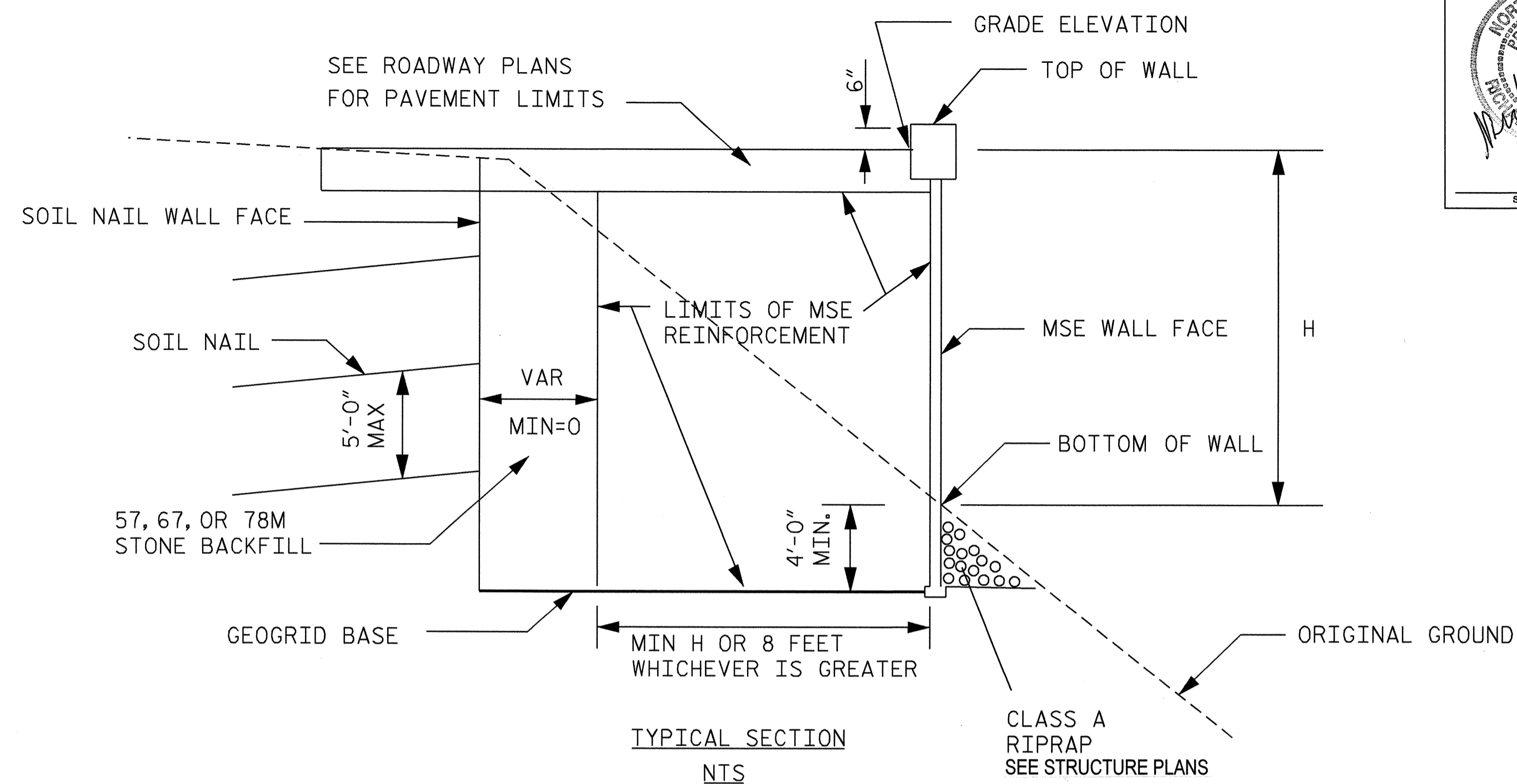
- FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.
- DO NOT USE A MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR WALL NO.1 OR WALL NO. 2.
- DO NOT USE STANDARD SIZE 2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO.1 OR NO. 2.
- BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 OR WALL NO. 2, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO.1 AND NO. 2 FOR A WALL HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).
- USE THE MINIMUM EMBEDMENT SHOWN IN LIEU OF OTHER DESIGN GUIDELINES FOR CALCULATING EMBEDMENT.
- PLACE UNIAXIAL GEOGRID WITH A MINIMUM ULTIMATE TENSILE STRENGTH IN THE MACHINE DIRECTION OF 14.0 KIP/FT ALONG THE BASE OF THE WALL. CAST THE GEOGRID BASE A MINIMUM 3 INCHES INTO THE LEVELING PAD. EXTEND THE GEOGRID BASE TO THE SOIL NAIL WALL. THE GEOGRID BASE IS FOR GLOBAL STABILITY. DO NOT CONSIDER THE GEOGRID BASE IN INTERNAL OR EXTERNAL STABILITY CALCULATIONS.

8. DESIGN RETAINING WALL NO.1 AND NO.2 FOR THE FOLLOWING:

- MINIMUM SERVICE LIFE = 100 YEARS
- MINIMUM REINFORCEMENT LENGTH = WALL HEIGHT (H) OR EIGHT FEET, WHICHEVER IS GREATER.
- MINIMUM EMBEDMENT DEPTH:
 WALL NO.1 1+00.00 TO 1+29.40 : 4 FEET
 WALL NO.1 1+29.40 TO 1+83.67: 3 FEET
 WALL NO. 2 3+00.00 TO 3+49.25: 4 FEET
 WALL NO. 2 3+49.25 TO 4+05.58: 3 FEET
- WALL BACKFILL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
57, 67 AND 78M	110	36	0

FOUNDATION SOIL	UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PSF)
WALL NO.1 1+00.00 TO 1+29.40	60	28	0
WALL NO.1 1+29.40 TO 1+83.67	60	36	0
WALL NO. 2 3+00.00 TO 3+49.25	60	28	0
WALL NO. 2 3+49.25 TO 4+05.58	60	36	0



TYPICAL SECTION
NTS

9. DESIGN RETAINING WALL NO.1 AND NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

10. DESIGN REINFORCEMENT CONNECTED TO THE END BENT CAPS FOR THE LOADING SHOWN AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT NO.1 AND END BENT NO. 2 .MAINTAIN A MINIMUM CLEARANCE OF 3" BETWEEN THE HARDWARE AND THE REINFORCING STEEL IN THE CAP. TWO LAYERS OF REINFORCEMENT ARE REQUIRED. BACKFILL BEHIND THE CAP WITH 57, 67, OR 78M TO THE LIMITS OF THE REINFORCEMENT.

11. FOUNDATIONS FOR END BENT NO.1 AND END BENT NO. 2 WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

12. DO NOT PLACE LEVELING PAD CONCRETE, WALL BACKFILL, BASE FABRIC, OR FIRST REINFORCEMENT LAYER FOR RETAINING WALL NO.1 OR NO. 2 UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

13. SOIL NAIL WALLS ARE REQUIRED FOR TEMPORARY SHORING BEHIND RETAINING WALL NO.1 AND NO. 2. SOIL NAILS MUST BE A MINIMUM OF SIXTEEN FEET LONG, BE ENCAPSULATED OR EPOXY COATED, HAVE A MINIMUM DESIGN TEST LOAD OF 20 TONS AND A MAXIMUM HORIZONTAL AND VERTICAL SPACING OF FIVE FEET. AT LEAST TWO ROWS OF NAILS MUST BE USED. SEE TRAFFIC CONTROL PLANS AND THE TEMPORARY SOIL NAIL WALL SPECIAL PROVISION.

14. IF THE MINIMUM TIP ELEVATION (SEE STRUCTURE PLANS) FOR THE PILES CANNOT BE REACHED DUE TO BOULDERS, EXCAVATE BOULDERS AND BACKFILL WITH SELECT MATERIAL CLASS IV.

15. IF PILES ARE INSTALLED AFTER MSE WALL CONSTRUCTION, USE A FORM TO BLOCK OUT PILE LOCATIONS DURING WALL CONSTRUCTION. DRIVE PILES INSIDE FORM AND FILL FORM WITH NON-EXCAVATABLE FLOWABLE FILL PER ARTICLE 340-2 OF THE STANDARD SPECIFICATIONS.

PROJECT NO.: B-4239 (33582.1.1)
 POLK COUNTY

SHEET 1 OF 2

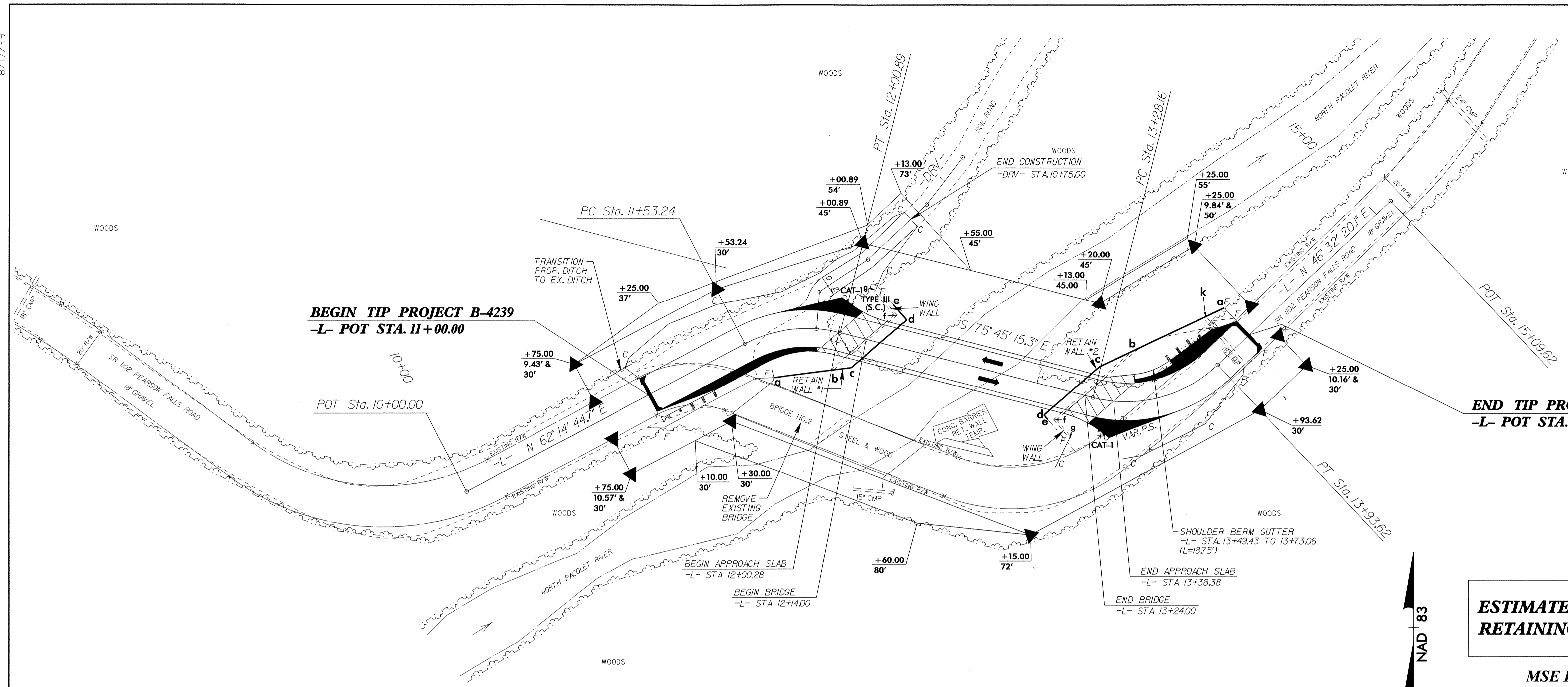
GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CENTRAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE WALL #1 and #2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			2

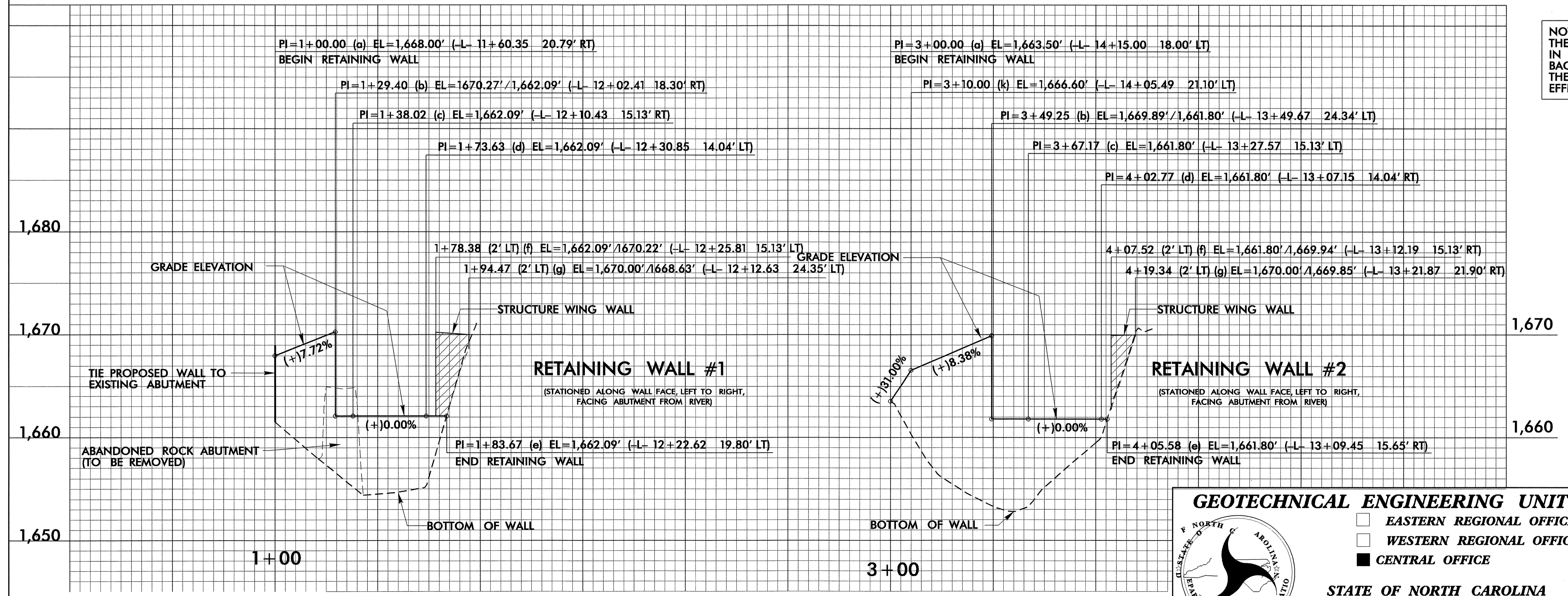
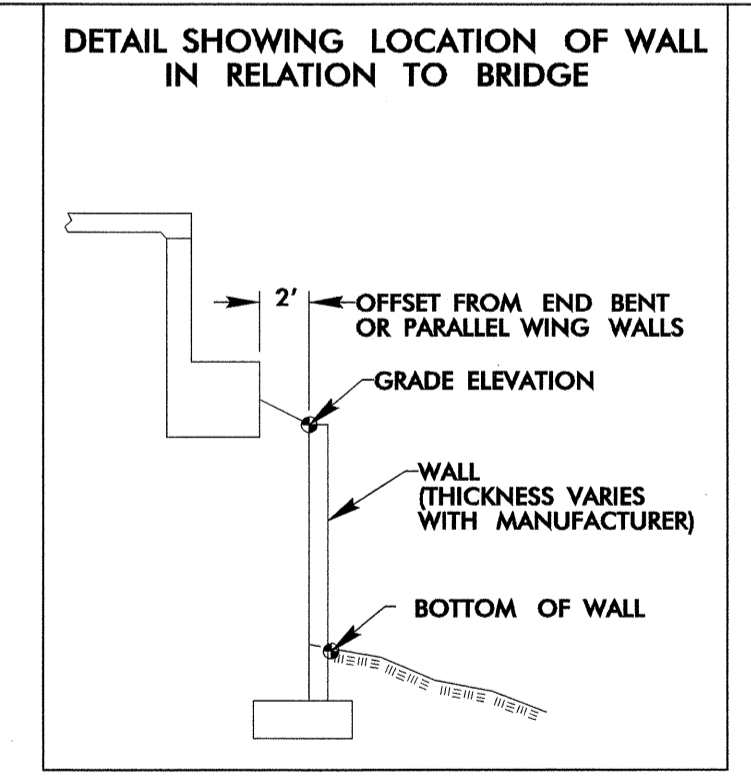
8/17/99



ESTIMATED QUANTITY
RETAINING WALL #1 AND #2 = 1600 SQUARE FEET

MSE RETAINING WALL #1 = 700 SQUARE FEET
 MSE RETAINING WALL #2 = 900 SQUARE FEET

NOTE:
 THE HEAVY LINE REPRESENTING THE RETAINING WALL IN THE PLAN VIEW ABOVE CORRESPONDS WITH THE BACK OF THE CONCRETE FACING PANELS. THEREFORE, THE THICKNESS OF THE FACING PANELS HAS NO EFFECT ON THE STATIONS OR OFFSETS AS SHOWN.



PROJECT NO.: **B-4239**
POLK COUNTY

SHEET 2 OF 2

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CENTRAL OFFICE
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

SHEET NO. **W-2**
 TOTAL SHEETS **2**

PREPARED BY: R. WEBB DATE: 9/08
 REVIEWED BY: C. CHEN DATE: 9/08

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991.

THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

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