

TIP PROJECT: B-4037

CONTRACT: C201868

STATE OF NORTH CAROLINA

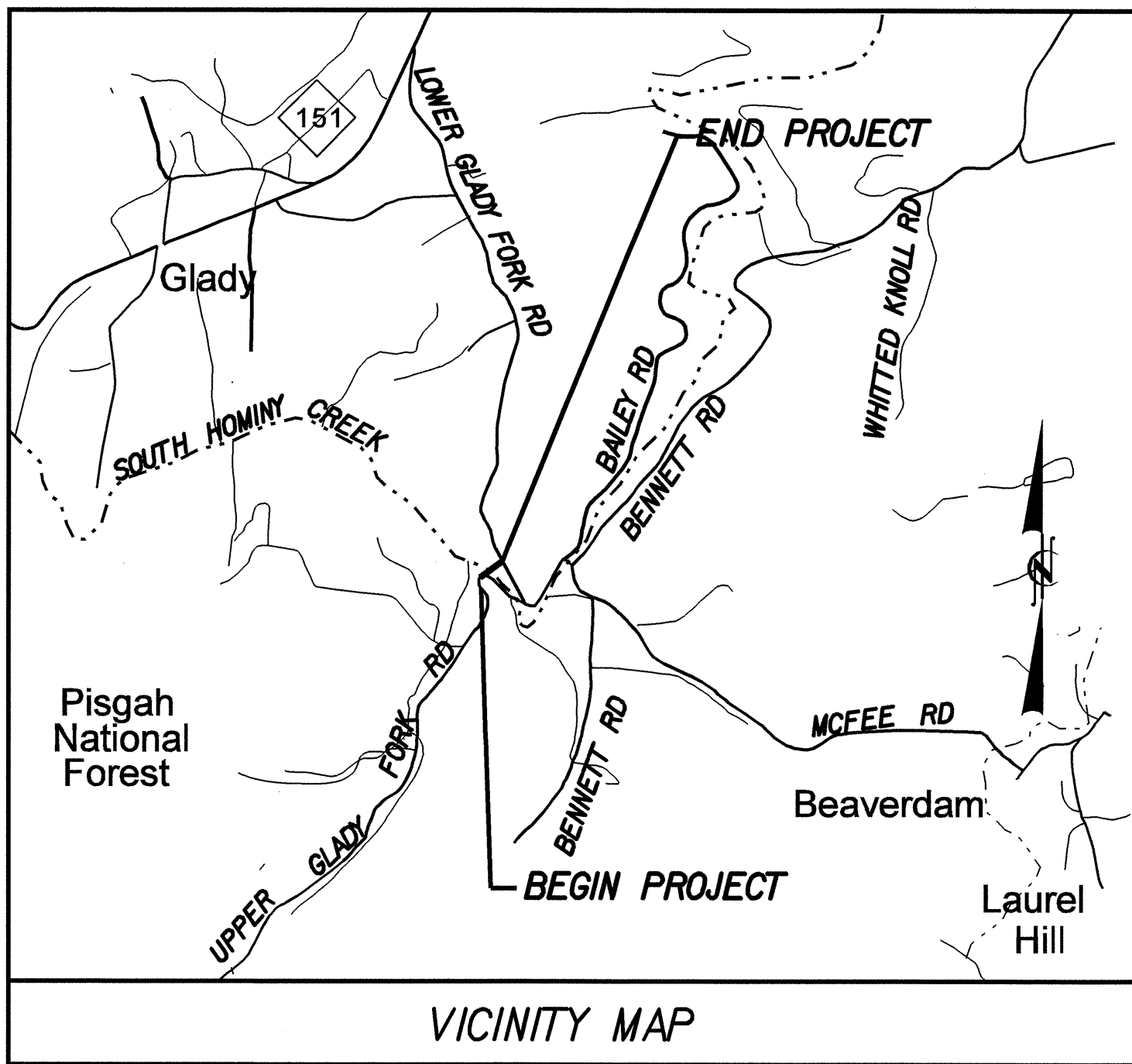
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

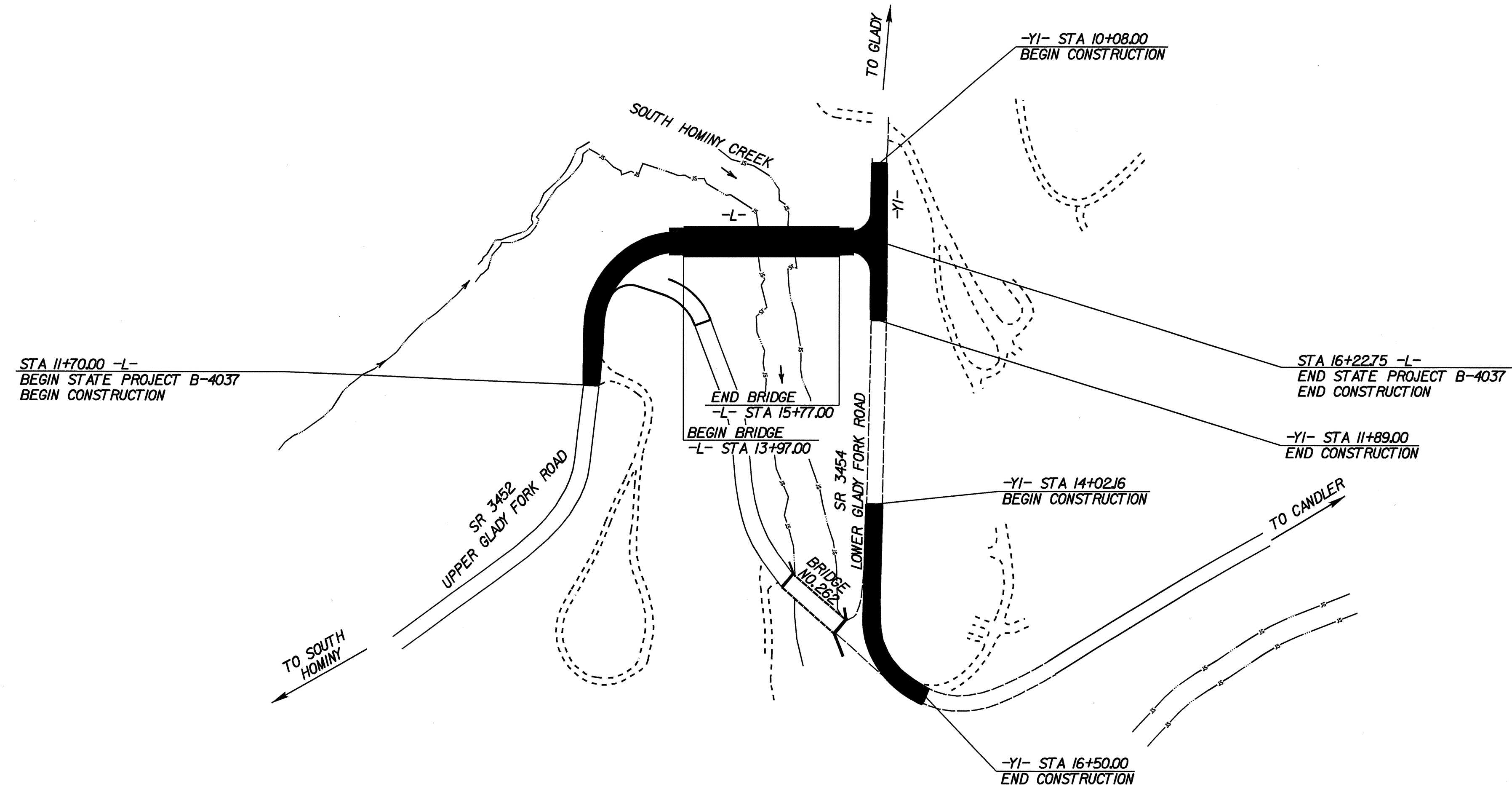
LOCATION: BRIDGE NO. 262 ON SR 3452 OVER SOUTH HOMINY CREEK

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

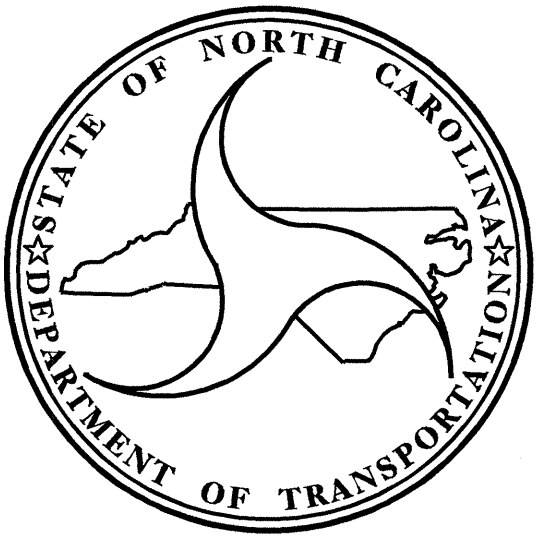
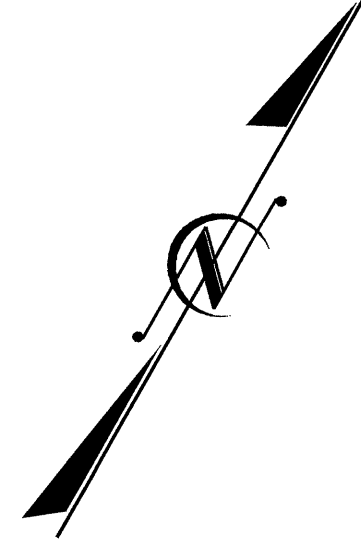
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4037		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33403.1.1	BRZ-3452(1)	P.E.	
33403.2.1	BRZ-3452(1)	R/W & UTILITIES	
33403.3.1	BRZ-3452(1)	CONSTRUCTION	



NEAREST SHIPPING POINT: CANDLER ON SOUTHERN RR 3.0 MILES FROM BRIDGE



STRUCTURE



DESIGN DATA
 ADT 2008 = 750 VPD
 ADT 2030 = 1,100 VPD
 DHV = 10%
 D = 60%
 T = 3% *
 V = 50 mph
 DESIGN EXCEPTION:
 HORIZONTAL RADIUS
 VERTICAL CURVE K
 FUNCTIONAL CLASSIFICATION:
 LOCAL RURAL
 * (TTST 1% + DUAL 2%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4037 = 0.052 MILE
 LENGTH OF STRUCTURE TIP PROJECT B-4037 = 0.034 MILE
 TOTAL LENGTH OF TIP PROJECT B-4037 = 0.086 MILE

Prepared In the Office of:
DIVISION OF HIGHWAYS
 1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE :
 JULY 15, 2008

N.N. BULLOCK, P.E.
PROJECT ENGINEER

A.K. PASCHAL, P.E.
PROJECT DESIGN ENGINEER

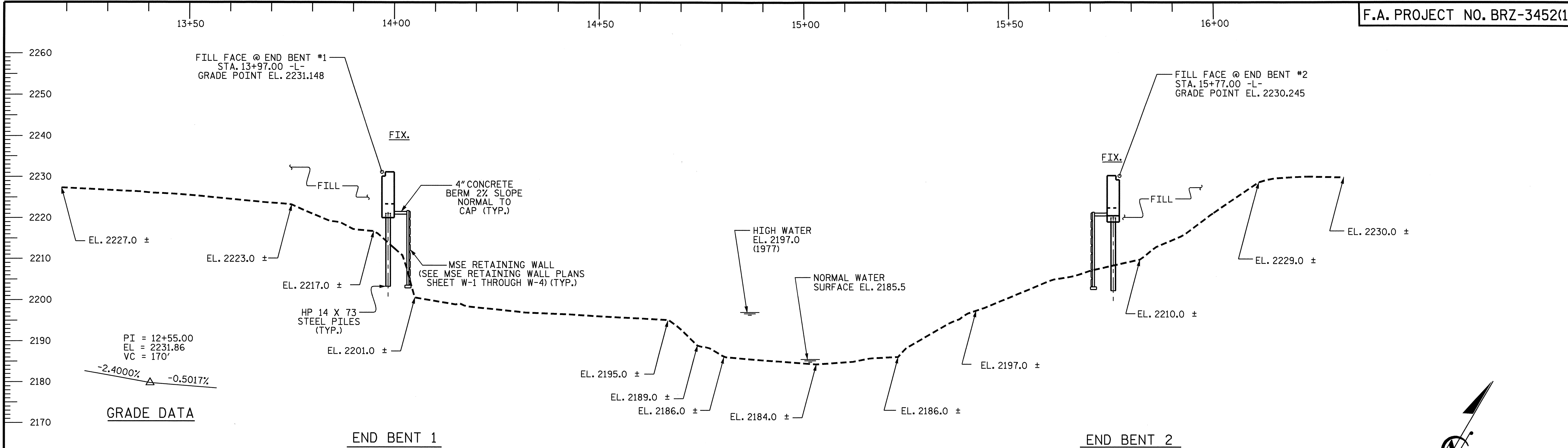
STRUCTURE DESIGN UNIT

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

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

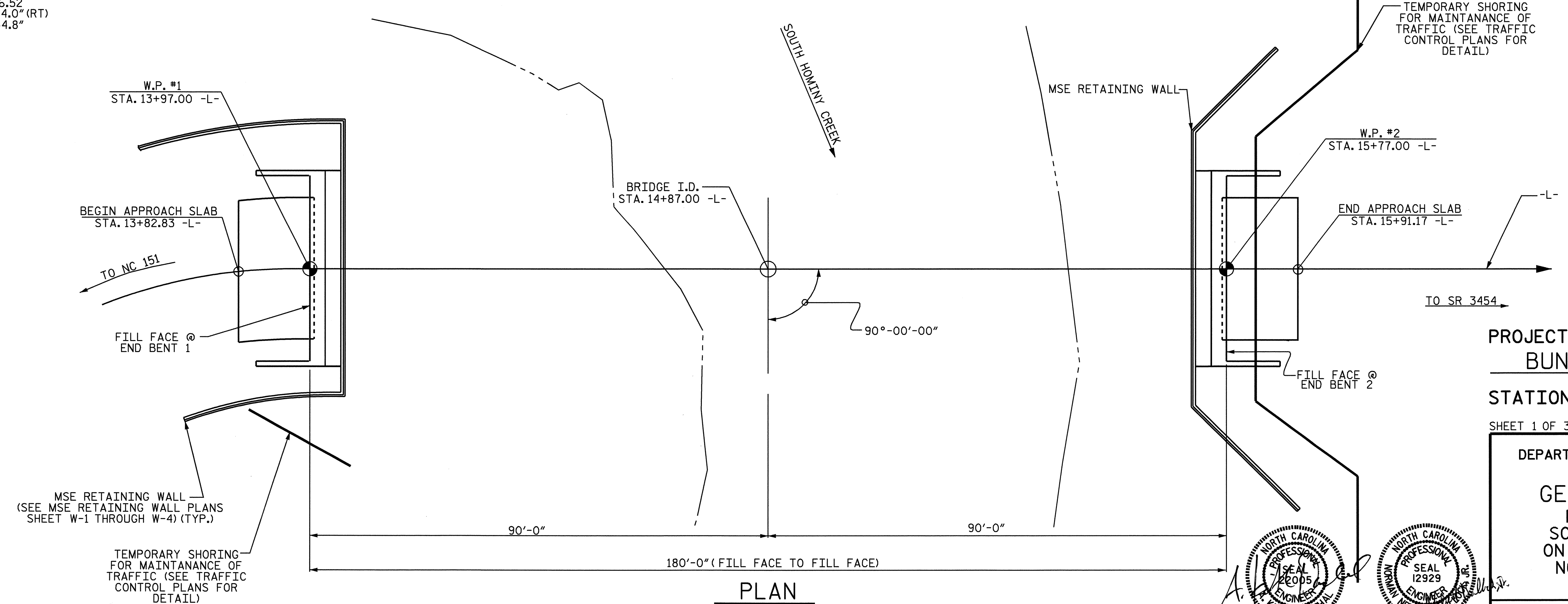
APPROVED
DIVISION ADMINISTRATOR DATE _____

03-JUN-2008 15:30 \$\$\$\$\$\$DGN\$\$\$\$\$\$\$\$\$ \$\$\$\$\$\$



HORIZONTAL CURVE DATA

PI Sta 13+36.52
 Δ = 87° 29' 14.0" (RT)
 D = 57' 17" 44.8"
 L = 152.69'
 T = 95.71'
 R = 100.00'
 SE = 0.04
 RO = 48'

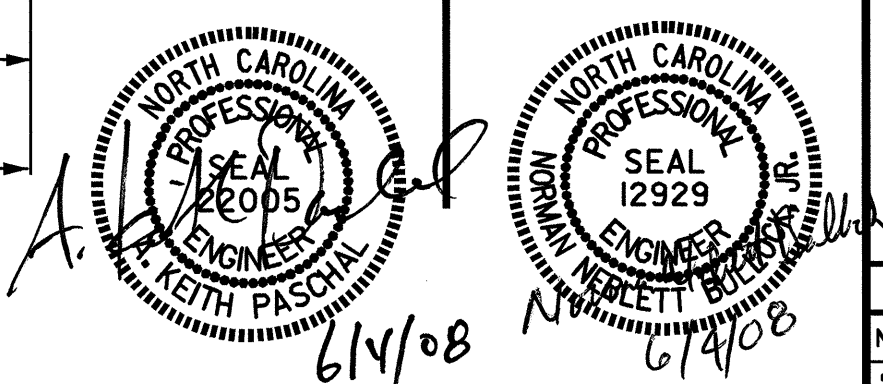


PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 262

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH HOMINY CREEK
 ON SR 3452 BETWEEN
 NC 151 AND SR 3454**



DRAWN BY: J. G. KHARVA DATE: 7/31/06
 CHECKED BY: J. D. HAWK DATE: 8/21/06

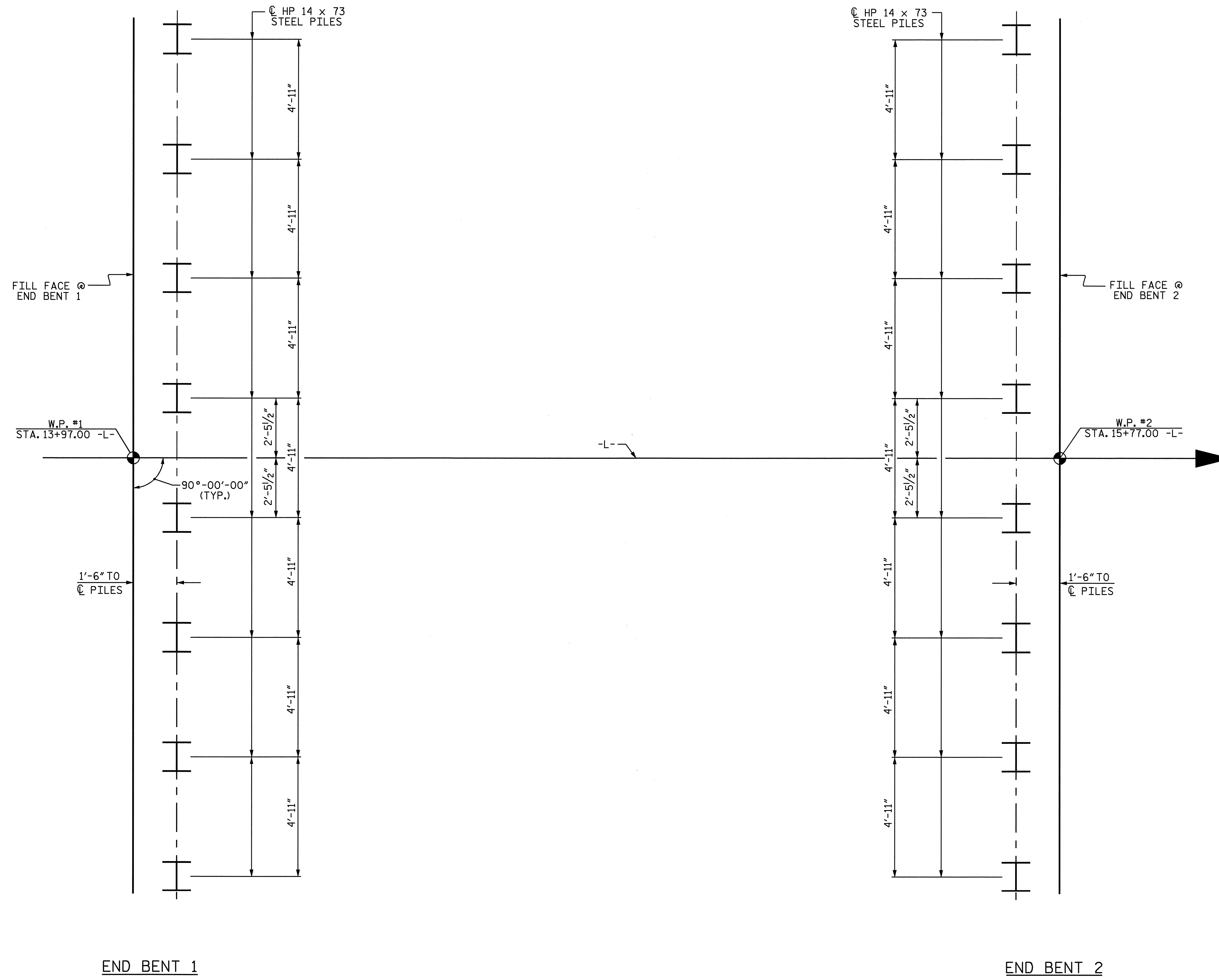
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			23

FOUNDATION NOTES :

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT 1 AND 2 IS 90 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND 2 TO A REQUIRED BEARING CAPACITY OF 180 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 1 AND END BENT 2. EXCAVATE HOLES TO ELEVATION 2210 FT. AND 2201.8 FT. RESPECTIVELY. SEE PILE EXCAVATION SPECIAL PROVISION.



END BENT 1

END BENT 2

FOUNDATION LAYOUT

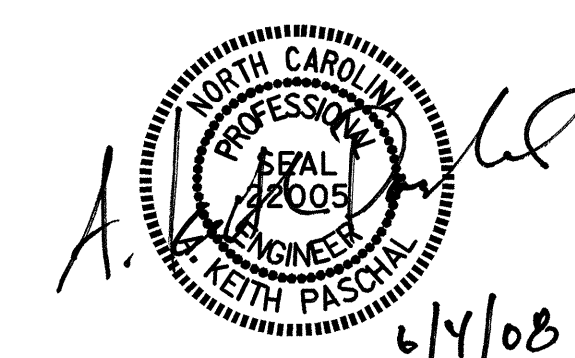
(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE)

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH HOMINY CREEK
 ON SR 3452 BETWEEN
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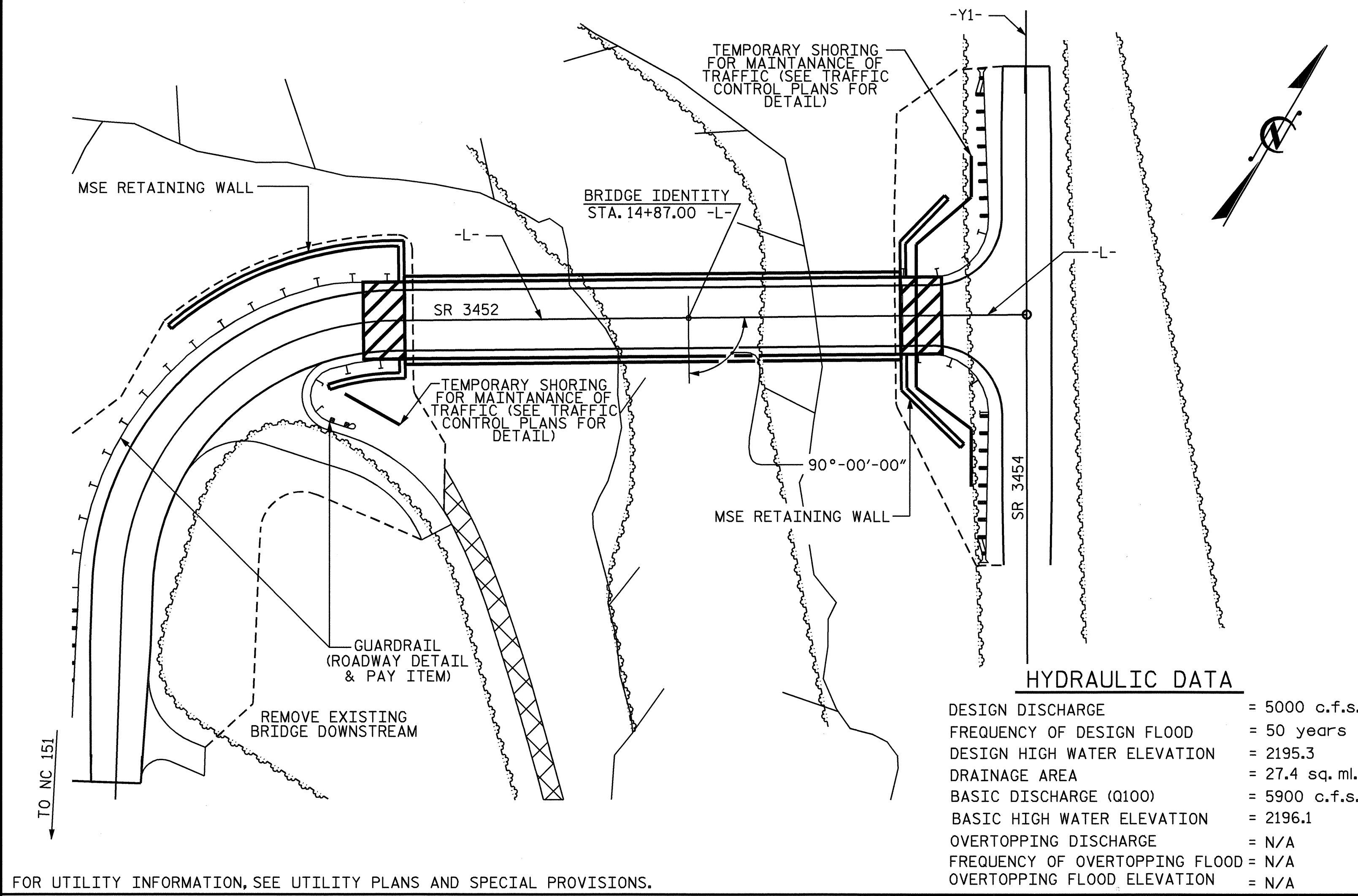


DRAWN BY : J.G. KHARVA DATE : 3/28/08
 CHECKED BY : J.D. HAWK DATE : 4/18/08

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 jkharva

REVISIONS						SHEET NO.
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2			4			23

BENCHMARK #2 : SPIKE NAIL IN 32" POPLAR 197.13 RT. STA. 11+23.88 -L- ELEV. = 2199.230.



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 5000 c.f.s.
FREQUENCY OF DESIGN FLOOD	= 50 years
DESIGN HIGH WATER ELEVATION	= 2195.3
DRAINAGE AREA	= 27.4 sq. ml.
BASIC DISCHARGE (Q100)	= 5900 c.f.s.
BASIC HIGH WATER ELEVATION	= 2196.1
OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= N/A
OVERTOPPING FLOOD ELEVATION	= N/A

NOTES

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

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

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

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 2 (2 @ 41'-0") TIMBER DECK SPANS ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH 19.1 FT. ON VERTICAL CONCRETE ABUTMENTS AND TIMBER CAPS AND PILES 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.

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

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.

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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 14+87.00 -L-."

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT TEMPORARY BRACING WILL BE REQUIRED BETWEEN THE ENDS OF THE GIRDERS WHILE THE DECK IS BEING POURED TO PREVENT ROTATION OF THE GIRDER ENDS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SHIPPING STRUCTURAL STEEL MEMBERS, SEE SPECIAL PROVISIONS.

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

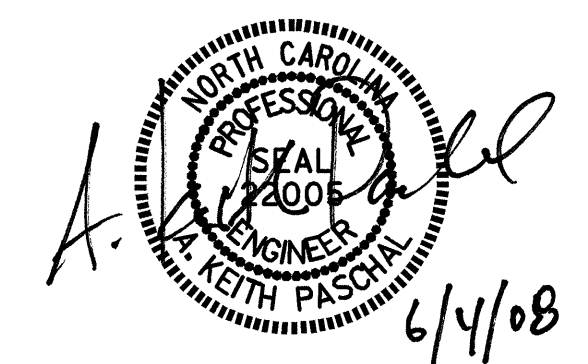
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 14 x 73 STEEL PILES	CONCRETE BARRIER RAIL	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	
	LUMP SUM	LIN. FT.	LIN. FT.	SQ. FT.	SQ. FT.	C.Y.	LUMP SUM	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				5625	5071		LUMP SUM		260097		356.67	LUMP SUM	LUMP SUM	
END BENT 1		40	40			17.0		3802		8	120			
END BENT 2		96	40			17.6		3858		8	160			
TOTAL	LUMP SUM	136	80	5625	5071	34.6	LUMP SUM	7660	260097	16	280	356.67	LUMP SUM	LUMP SUM

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

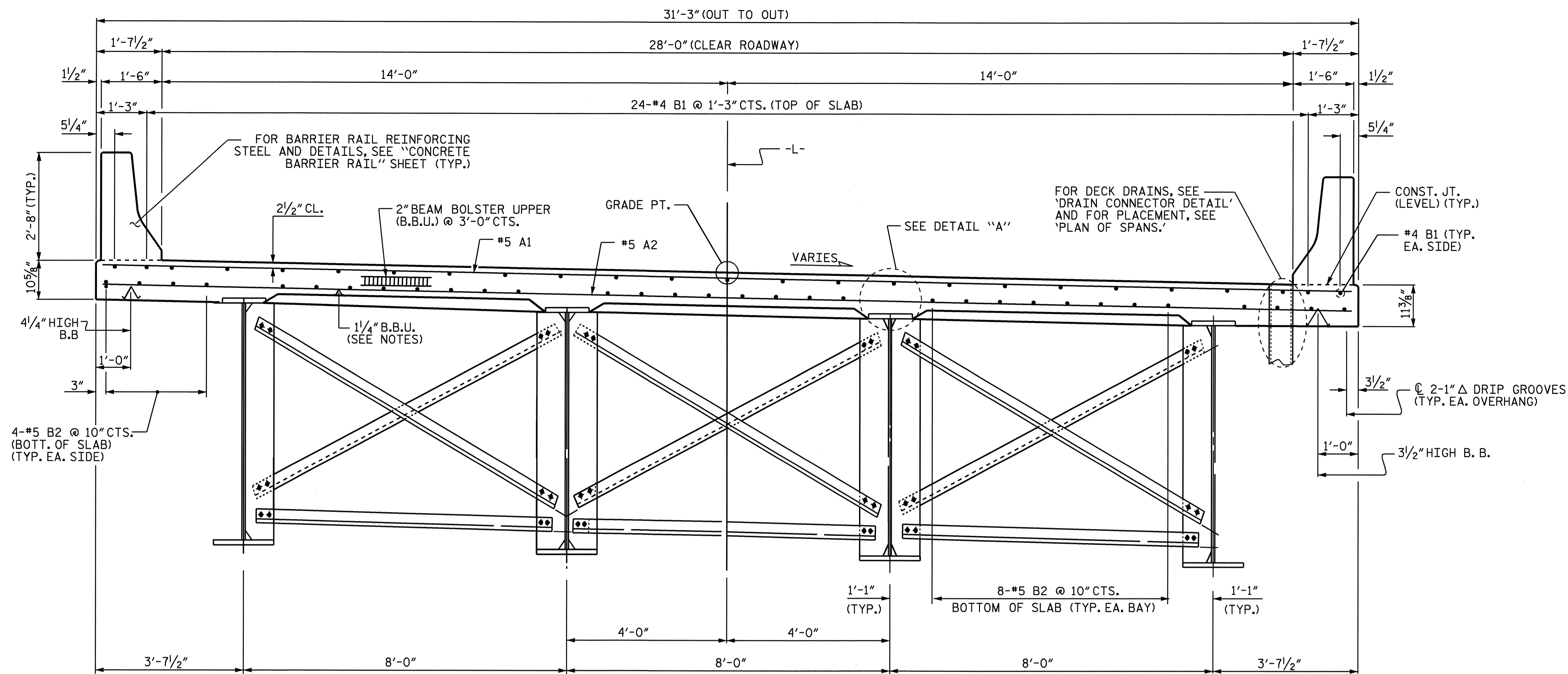
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 SOUTH HOMINY CREEK
 ON SR 3452 BETWEEN
 NC 151 AND SR 3454



DRAWN BY : J. G. KHARVA DATE : 7/31/06
 CHECKED BY : J. D. HAWK DATE : 8/21/06

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



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGMS

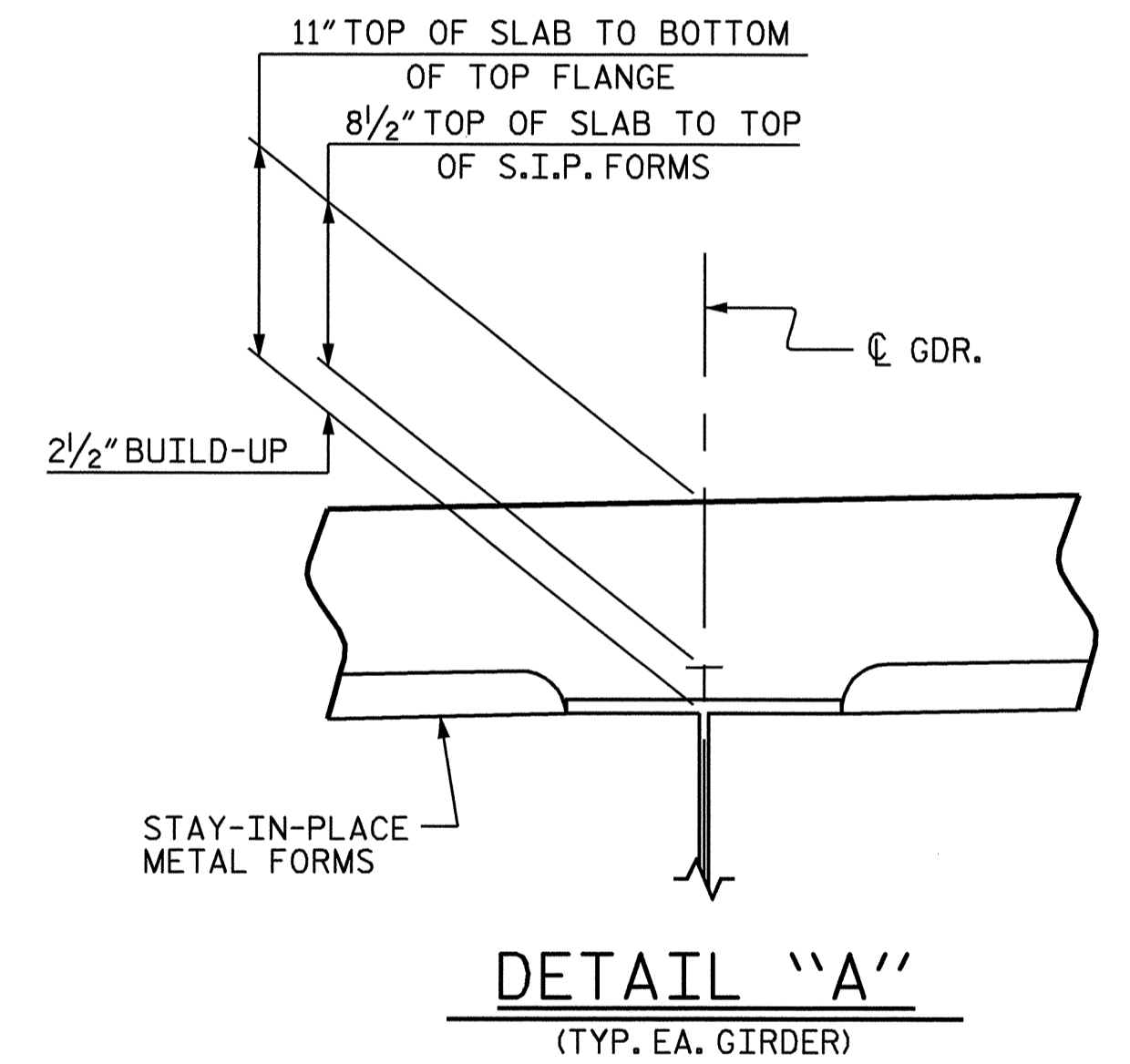
NOTES

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.

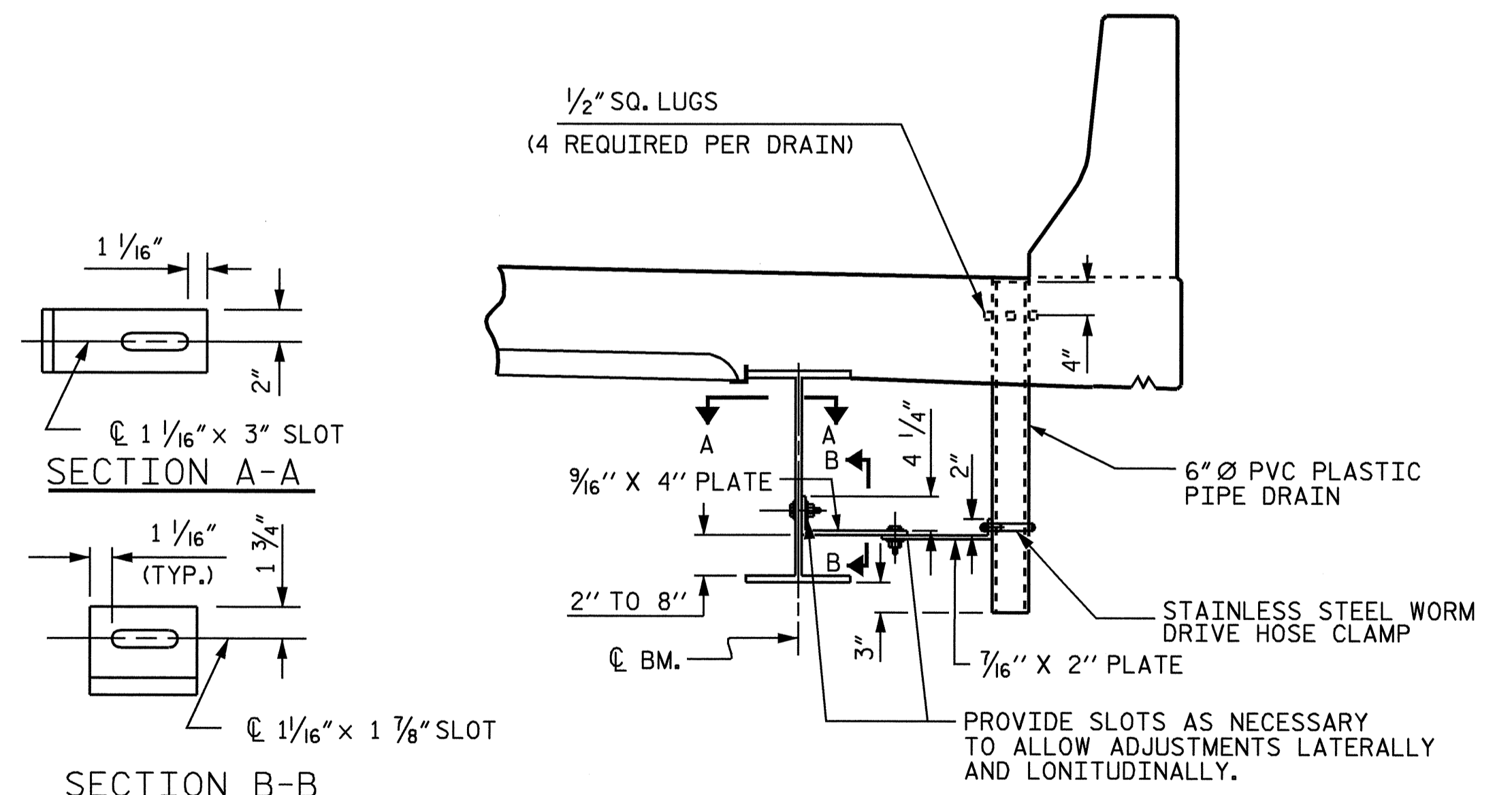
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

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

REINFORCING STEEL IN SLAB MAY BE SHIFTED AS NECESSARY TO CLEAR THE PVC DECK DRAINS WHERE SHOWN THROUGH THE SLAB.



DETAIL "A"
(TYP. EA. GIRDER)



DRAIN CONNECTOR DETAIL

(13 REQUIRED)

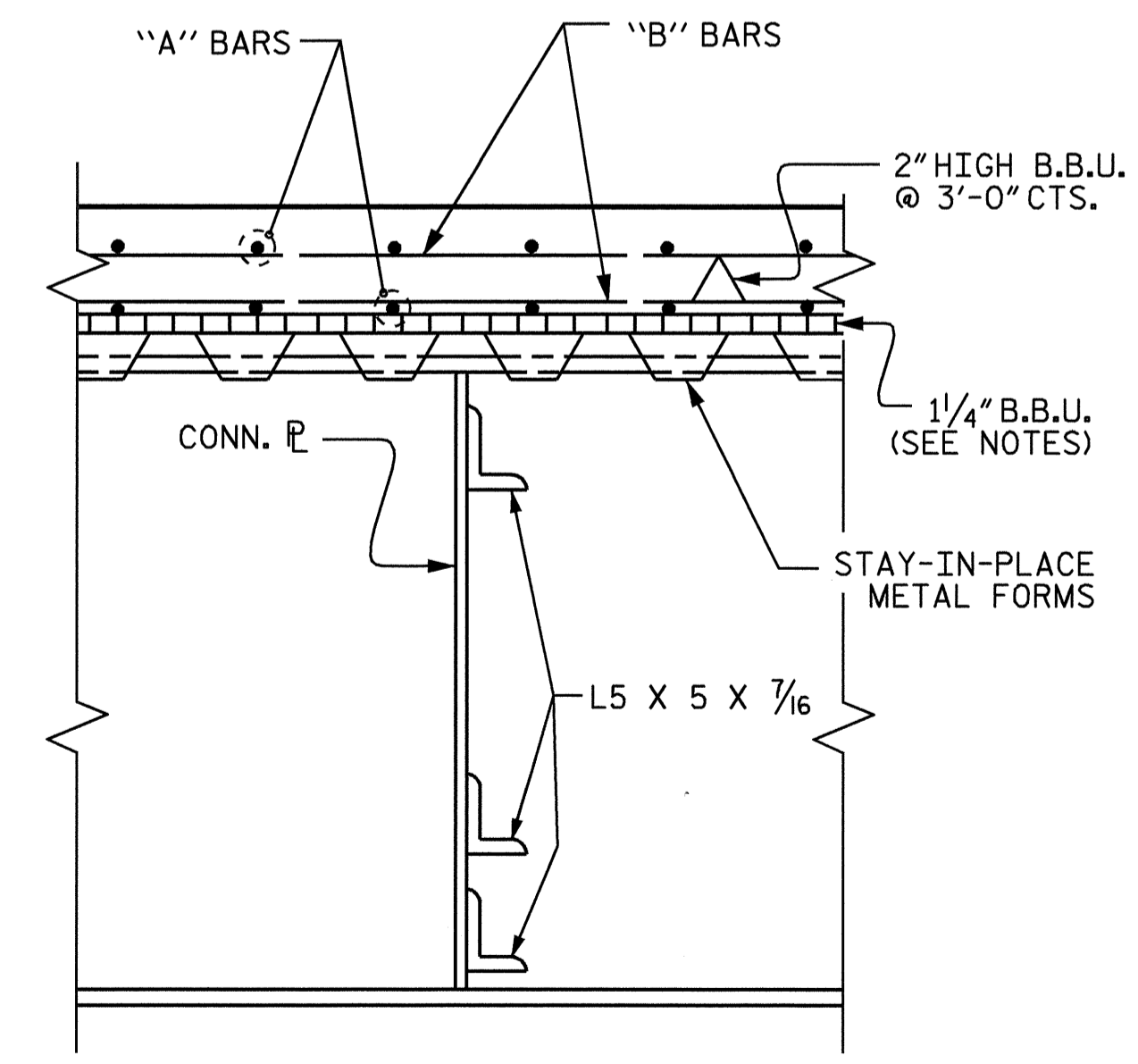
COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

TOP OF FLOOR DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.

4 - 1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

BOLT SIZE TO BE SAME AS DIAPHRAGM AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.



SECTION THRU INTERMEDIATE DIAPHRAGM

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

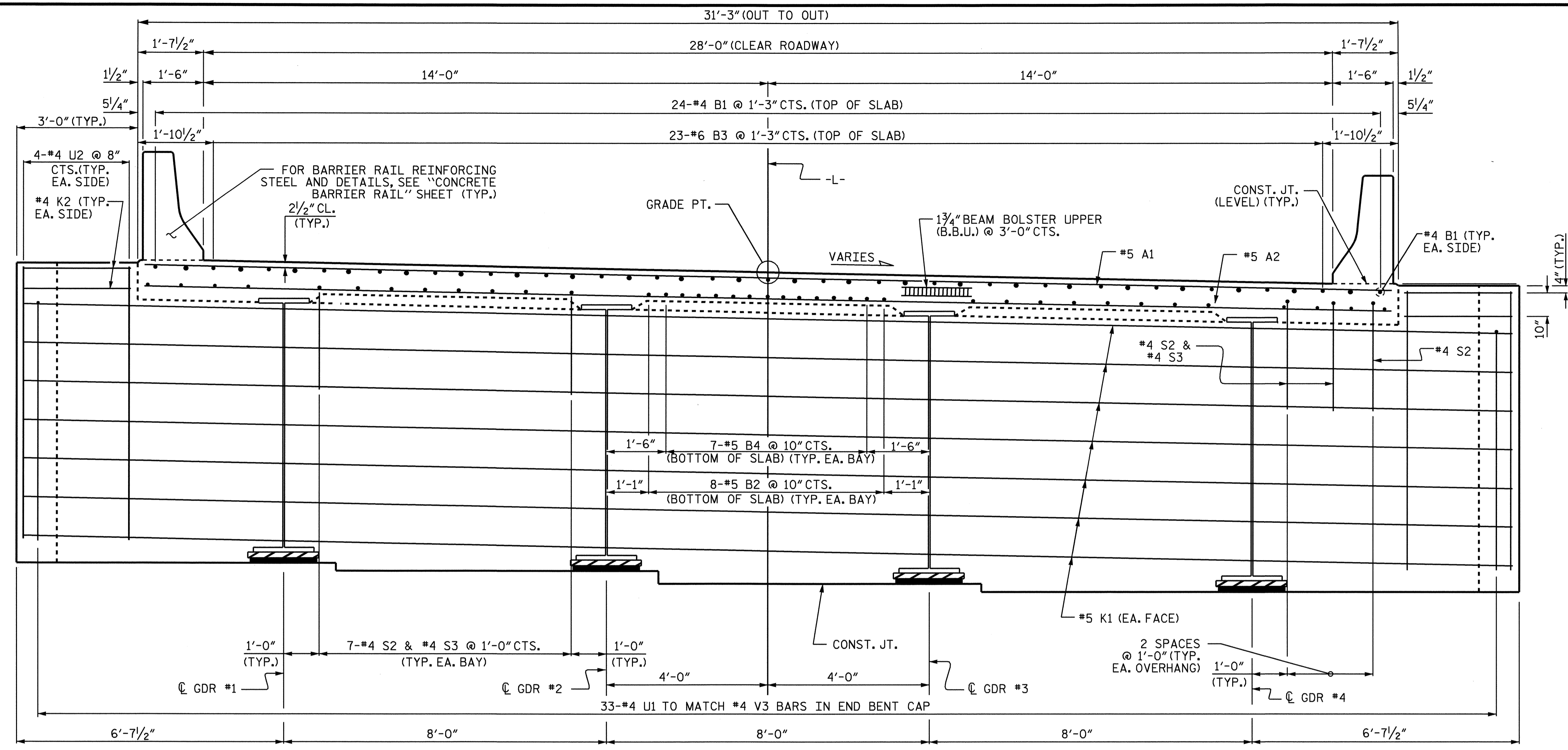
SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTIONS

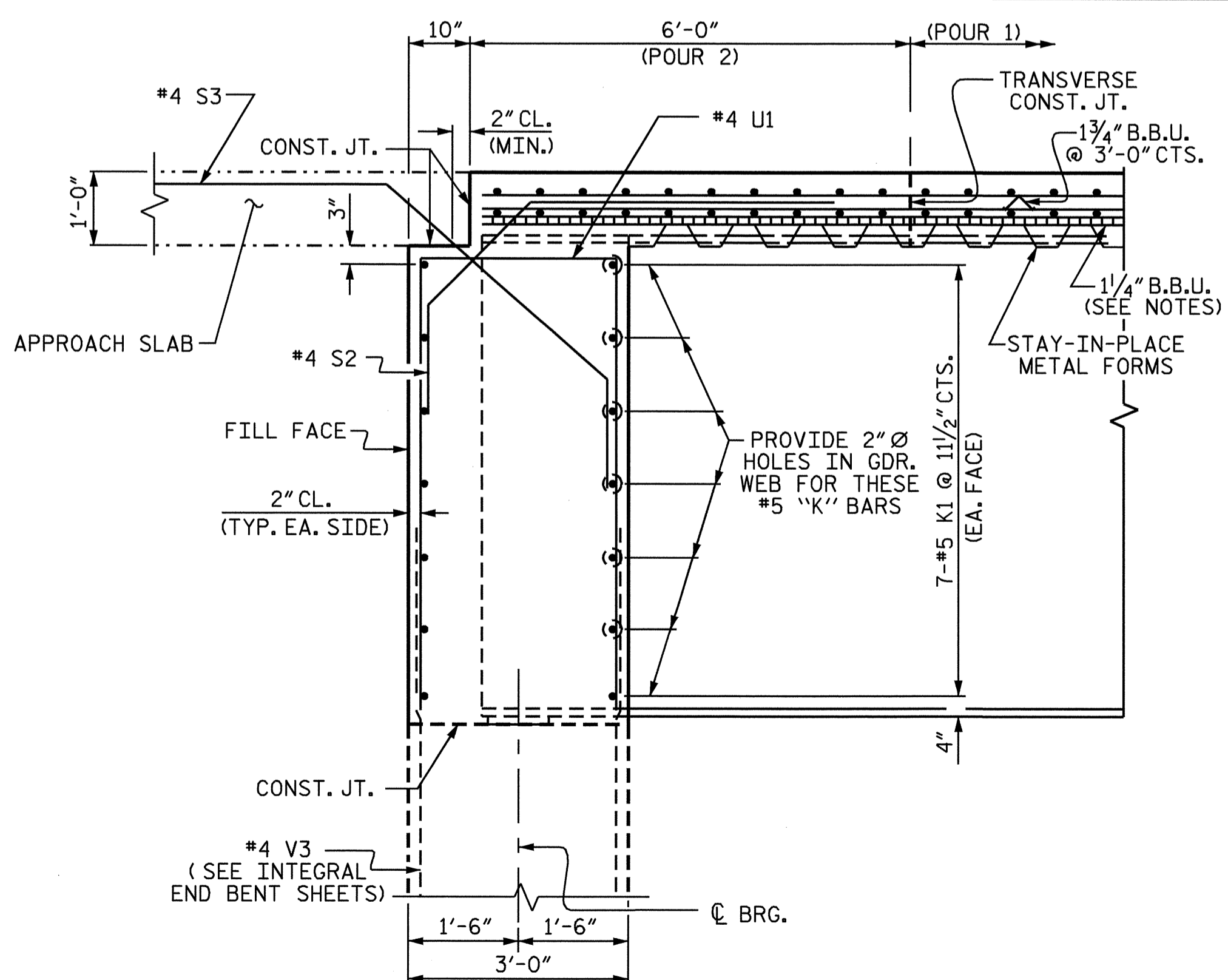
PROFESSIONAL ENGINEER
 KEITH PASCHAL
 6/4/08

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

DRAWN BY: J. G. KHARVA DATE: 07/21/06
 CHECKED BY: J. D. HAWK DATE: 08/21/06



TYPICAL SECTION @ INTEGRAL END BENT



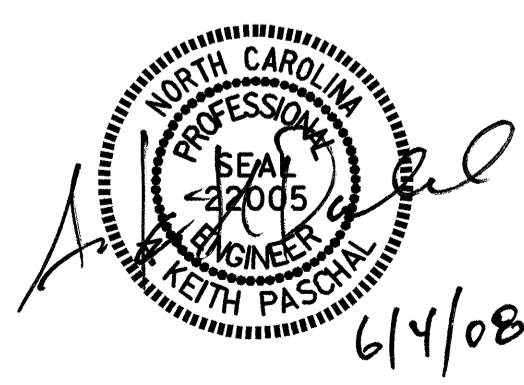
SECTION A-A

(INTEGRAL END BENT DIAPHRAGM)

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 2 OF 2

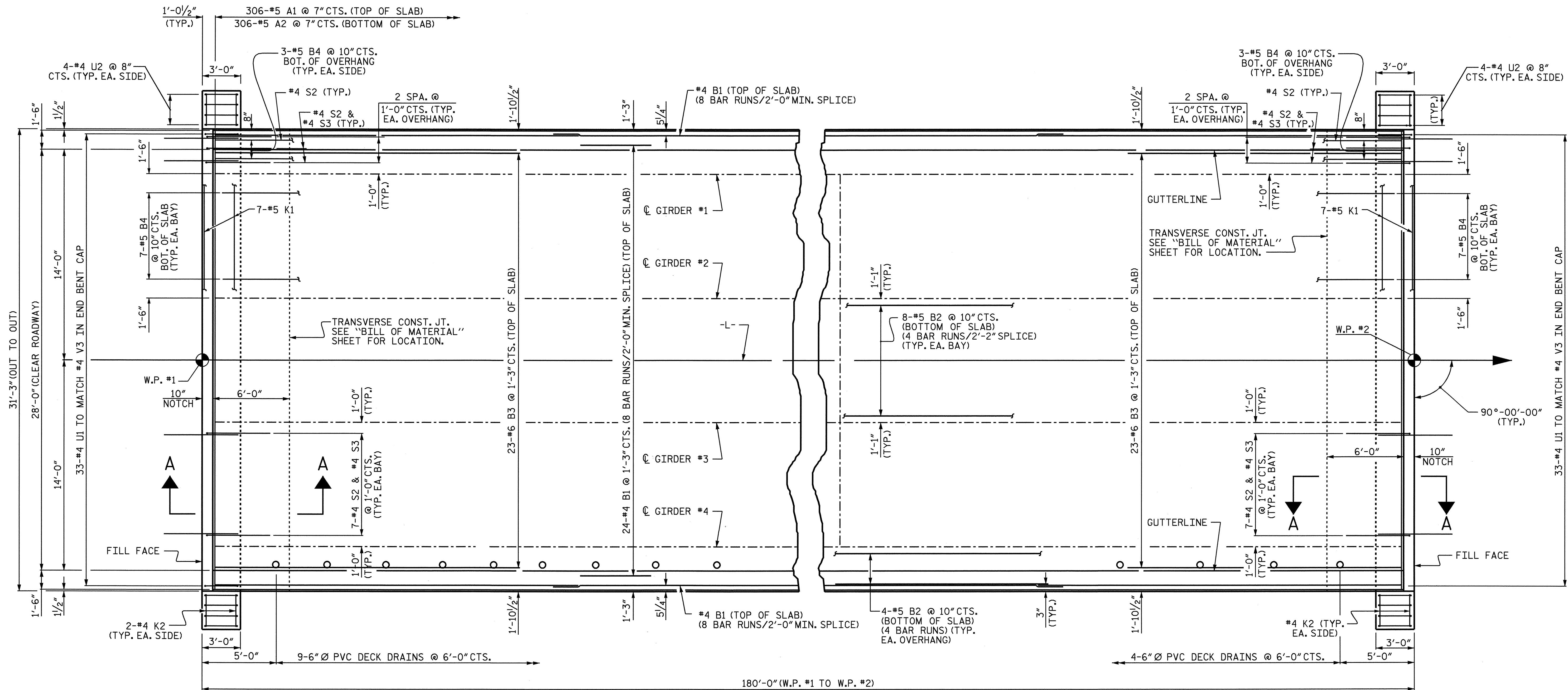
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTIONS



DRAWN BY: J. G. KHARVA DATE: 07/21/06
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NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

TOTAL SHEETS: 23



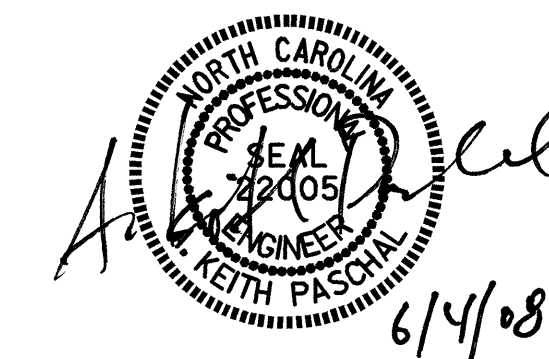
PLAN OF SPAN

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

NOTES:

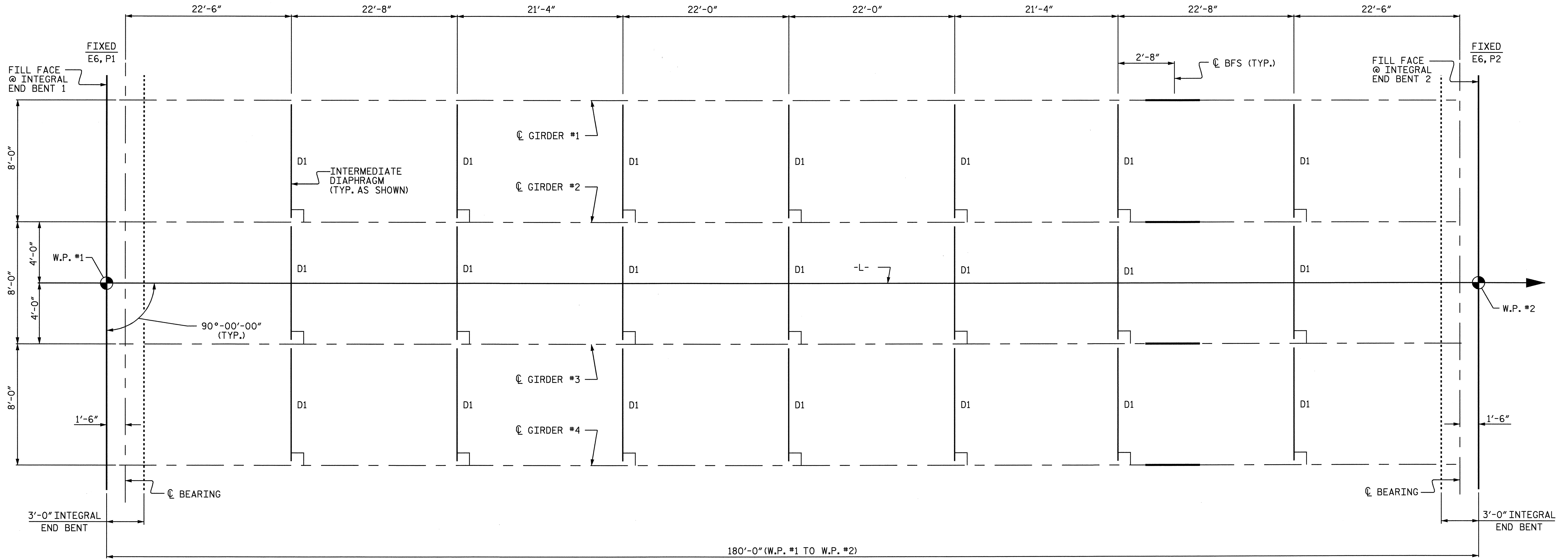
FOR SECTION A-A AND REINFORCING STEEL IN INTEGRAL END BENT SEE "TYPICAL SECTION" SHEET 1 OF 2.

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS SEE "STRUCTURE STEEL DETAILS" SHEET 1 OF 4.



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN					
REVISIONS					
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1			3		
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					TOTAL SHEETS 23

DRAWN BY: J. G. KHARVA DATE: 7/13/06
 CHECKED BY: J. D. HAWK DATE: 8/21/06



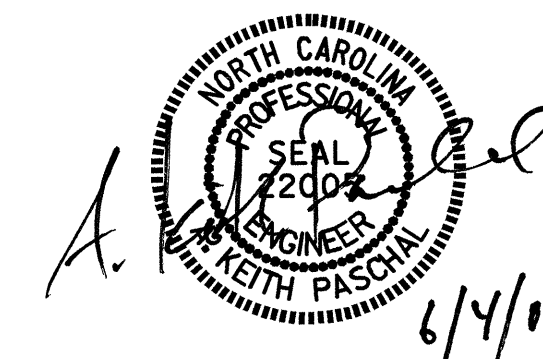
FRAMING PLAN

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

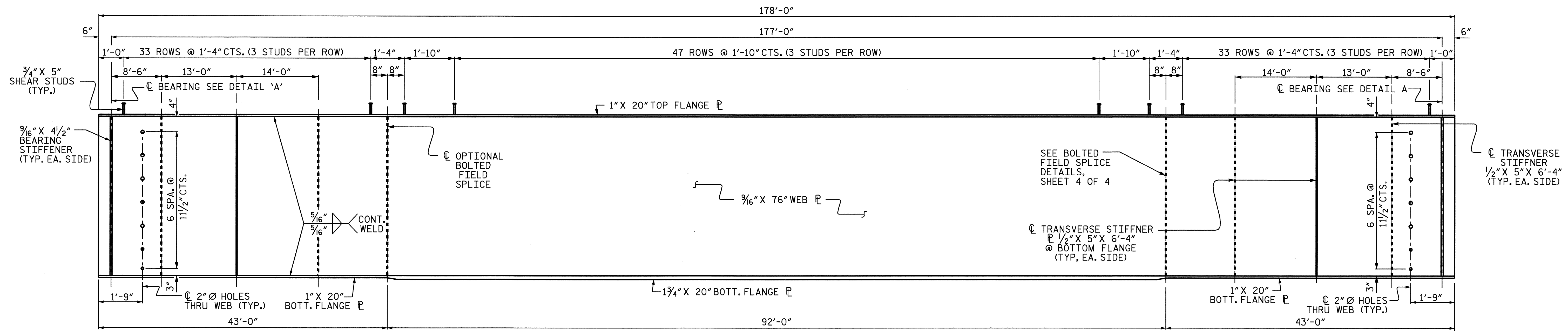
SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS



DRAWN BY : J. G. KHARVA DATE : 7/13/06
 CHECKED BY : J. D. HAWK DATE : 8/21/06

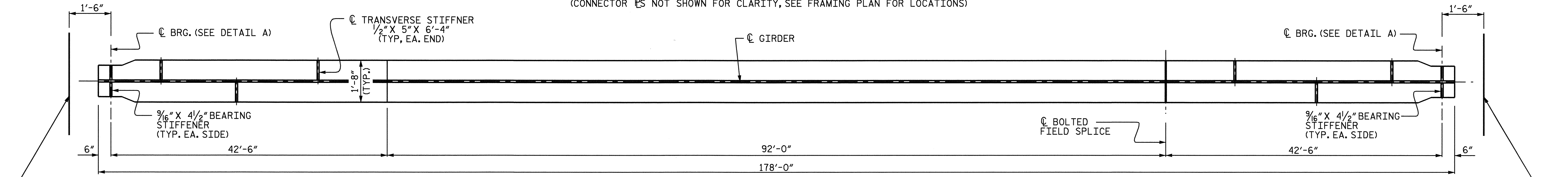
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 jkharva

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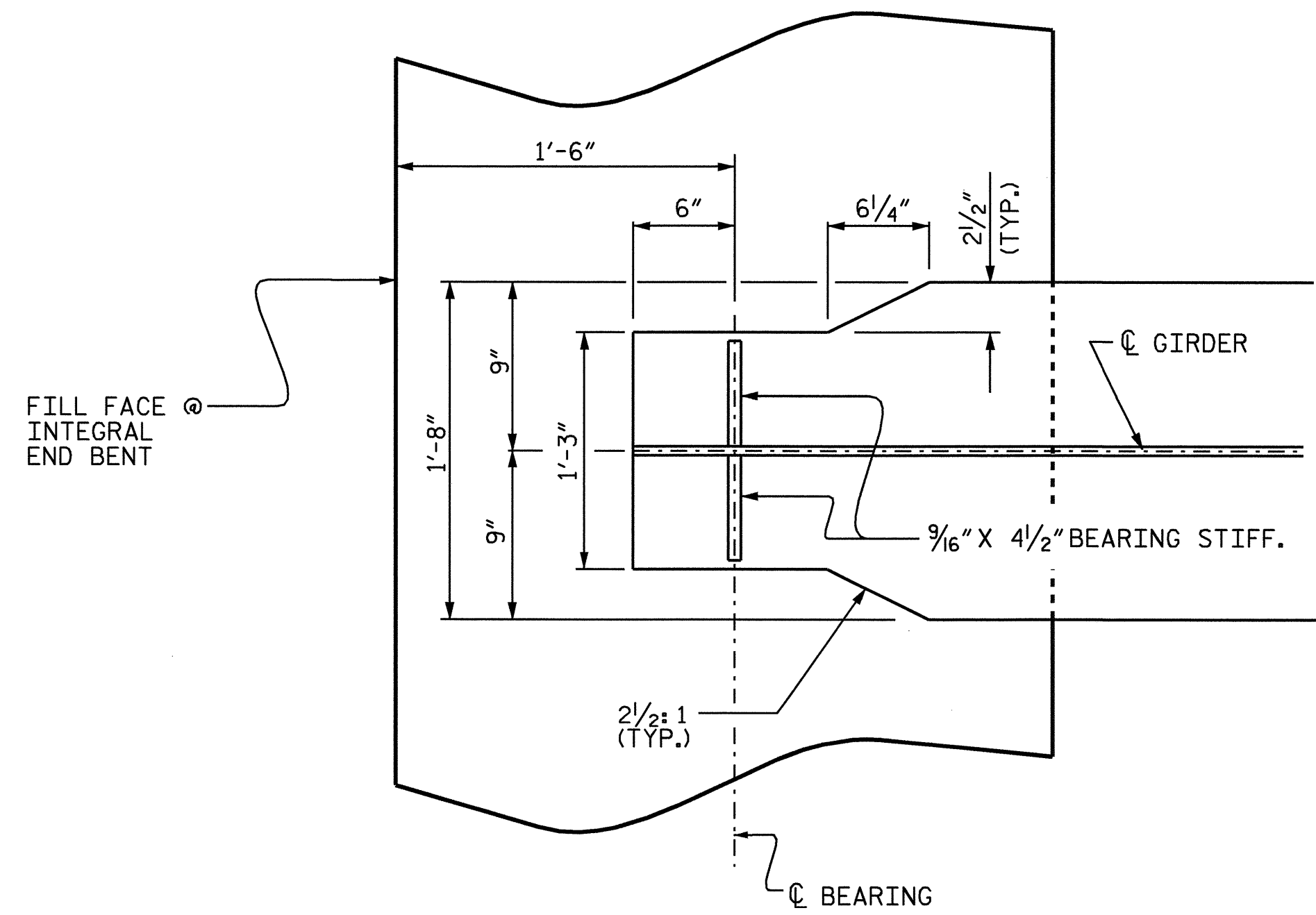
ELEVATION OF GIRDER

(CONNECTOR PS NOT SHOWN FOR CLARITY, SEE FRAMING PLAN FOR LOCATIONS)

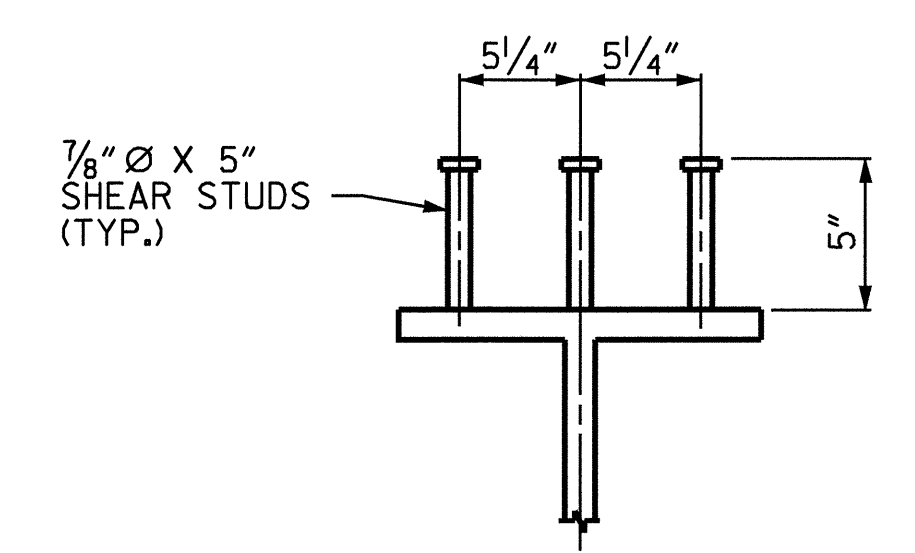


BOTTOM FLANGE DETAIL

(PLACE ALL TRANSVERSE STIFFENERS INSIDE EXTERIOR GIRDERS)



DETAIL A
(BOTTOM FLANGE OF GIRDER)

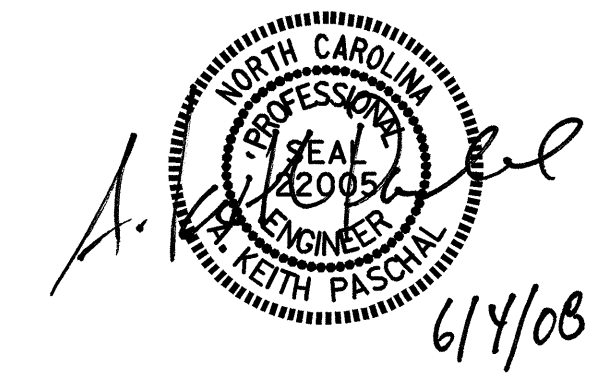


SHEAR STUD DETAIL

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 2 OF 4

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



DRAWN BY: J. G. KHARVA DATE 07/21/06
 CHECKED BY: J. D. HAWK DATE 08/21/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			23

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W

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

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

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

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 (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). 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.

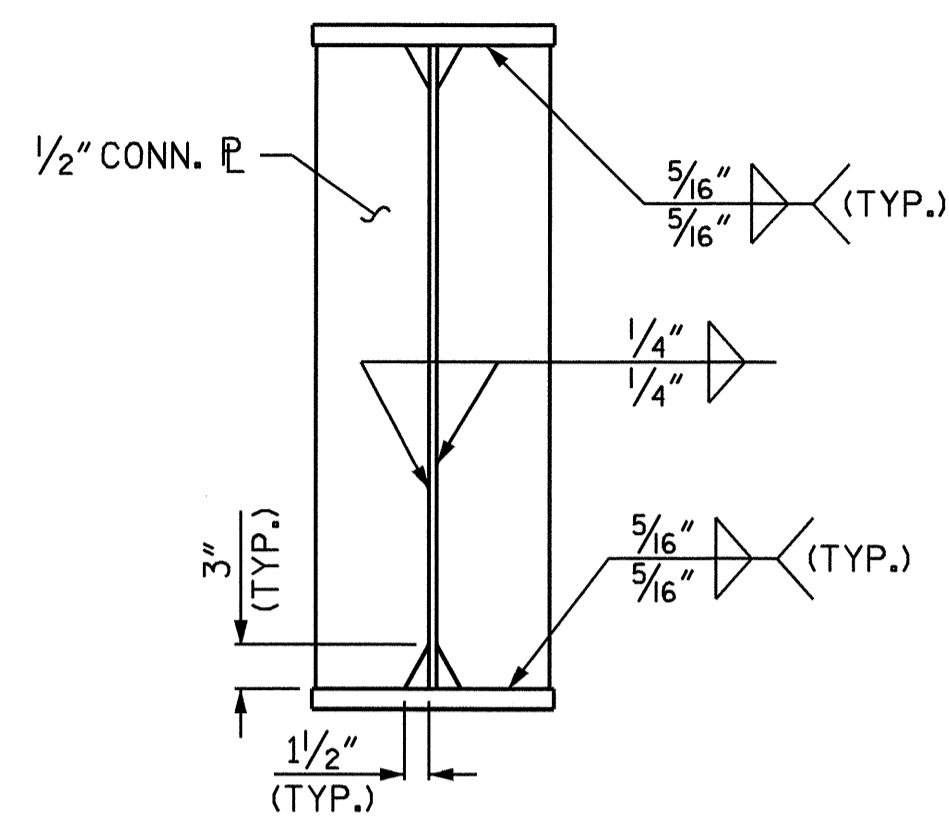
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

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

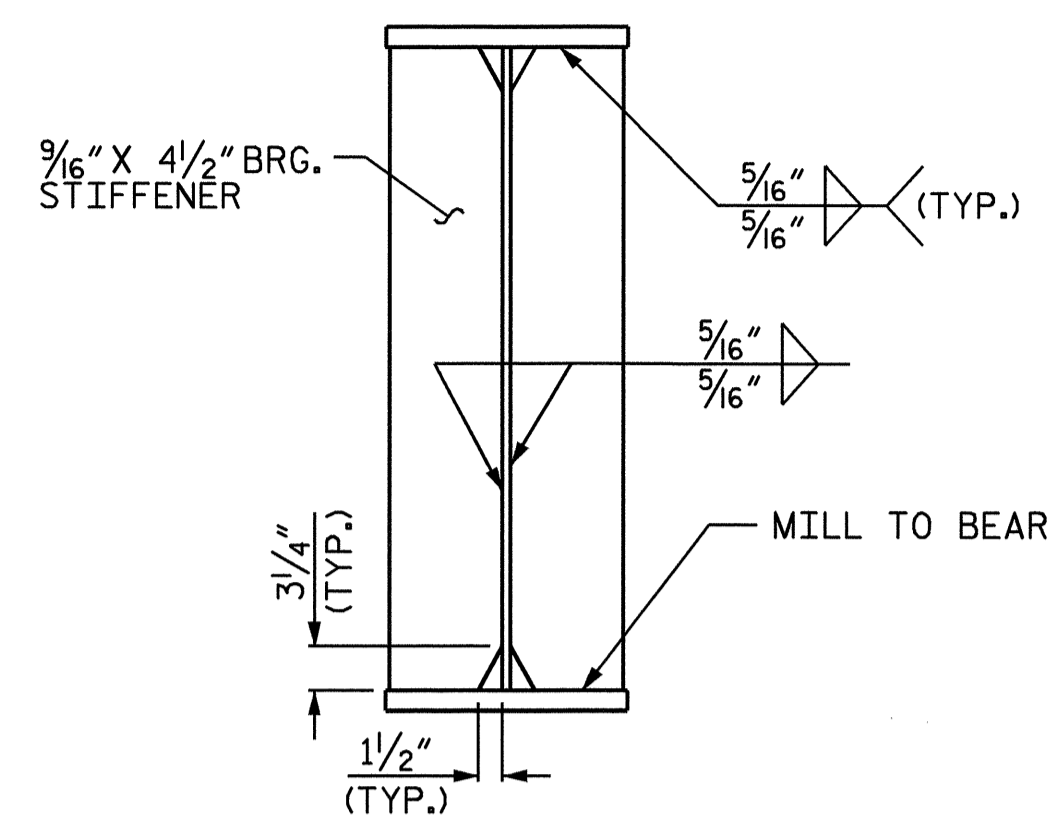
END OF GIRDERS SHALL BE PLUMB.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES TOP FLANGE PLATES WITHIN 42'-0" OF END OF GIRDERS AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

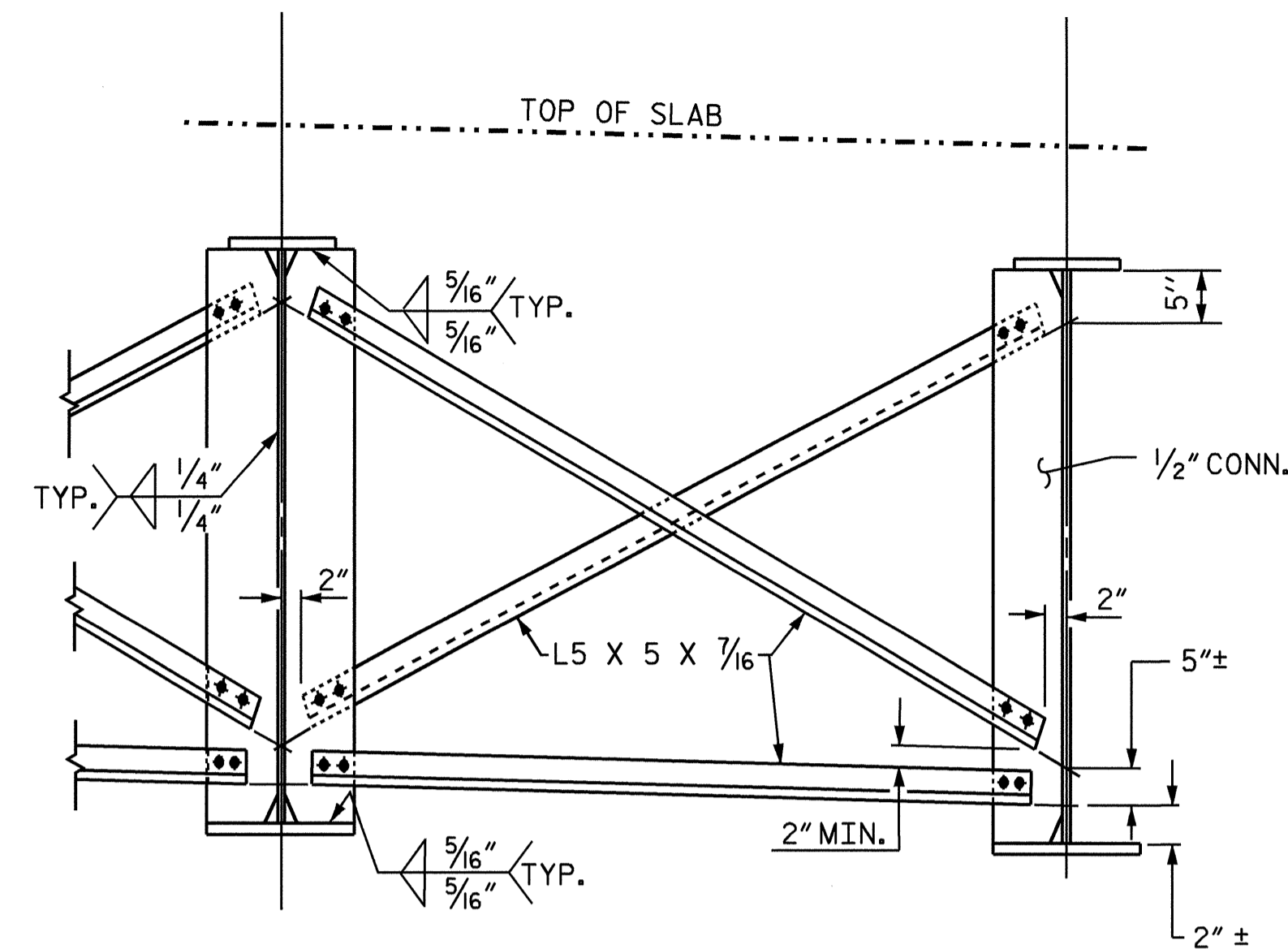


CONNECTOR PLATE

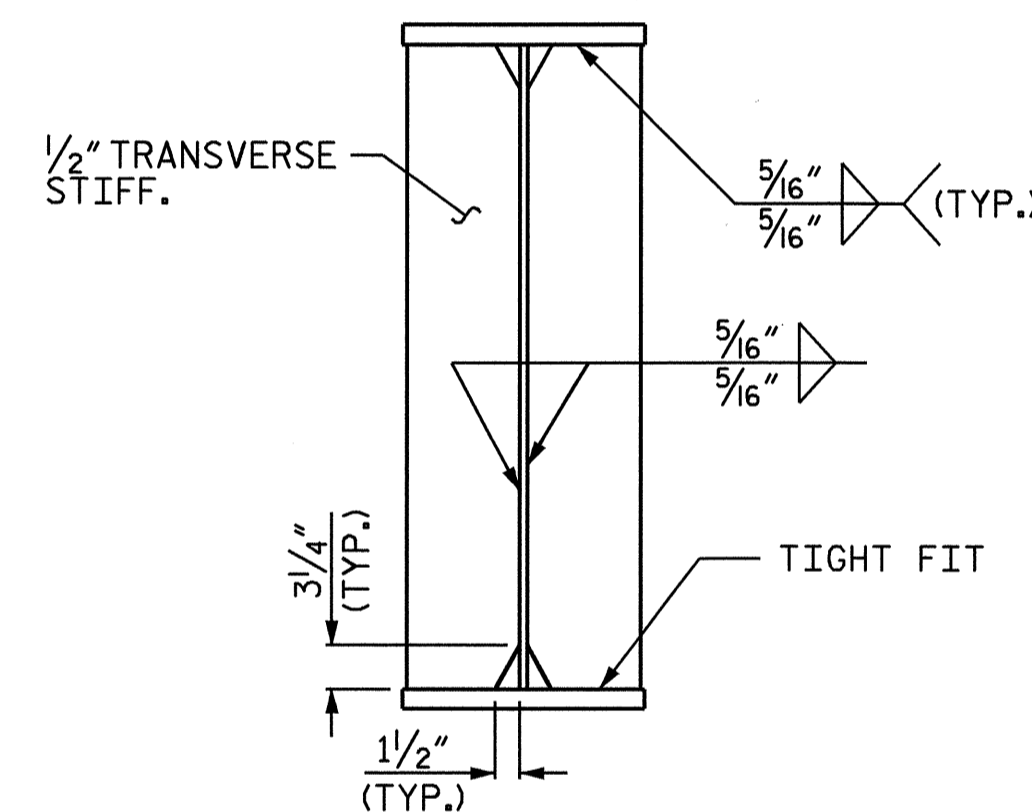


BEARING STIFFENER

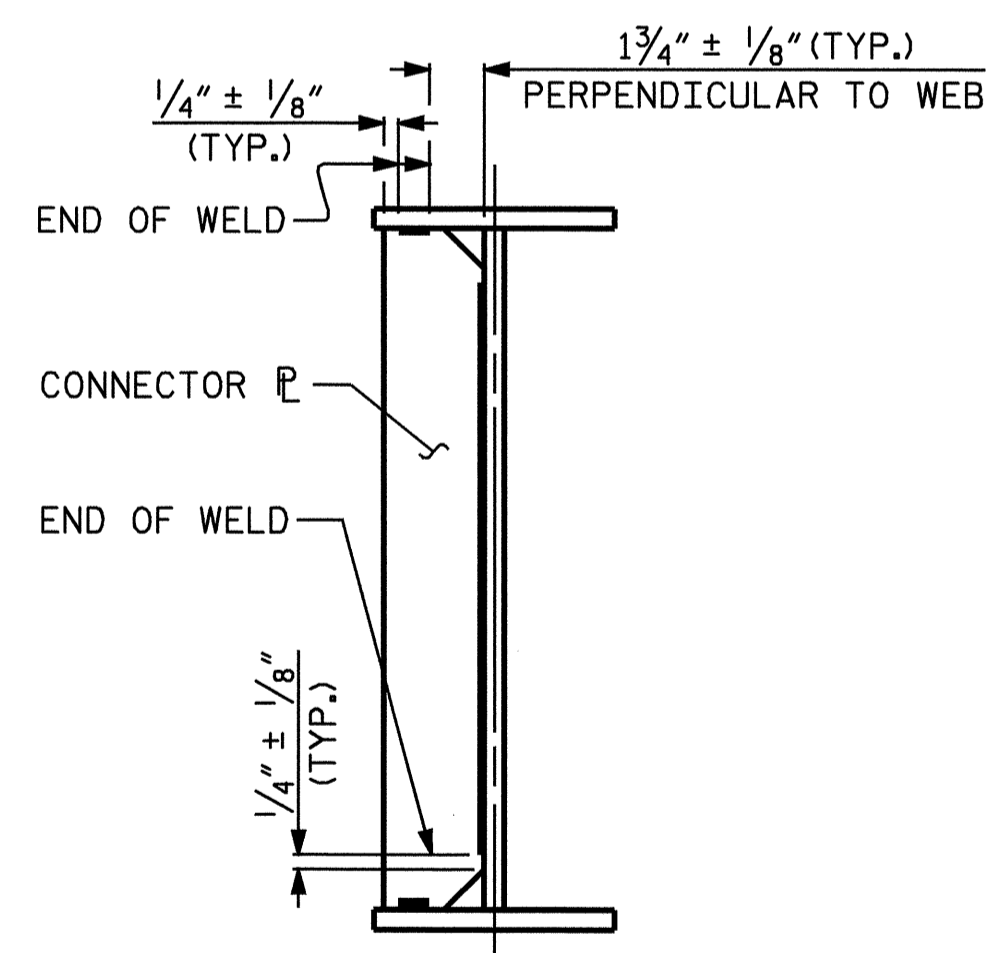
NOTE:-DO NOT CLIP PLATE AT TOP OUTSIDE CORNER OF STIFFENER PLATE.



INTERMEDIATE CROSSFRAME (D1)

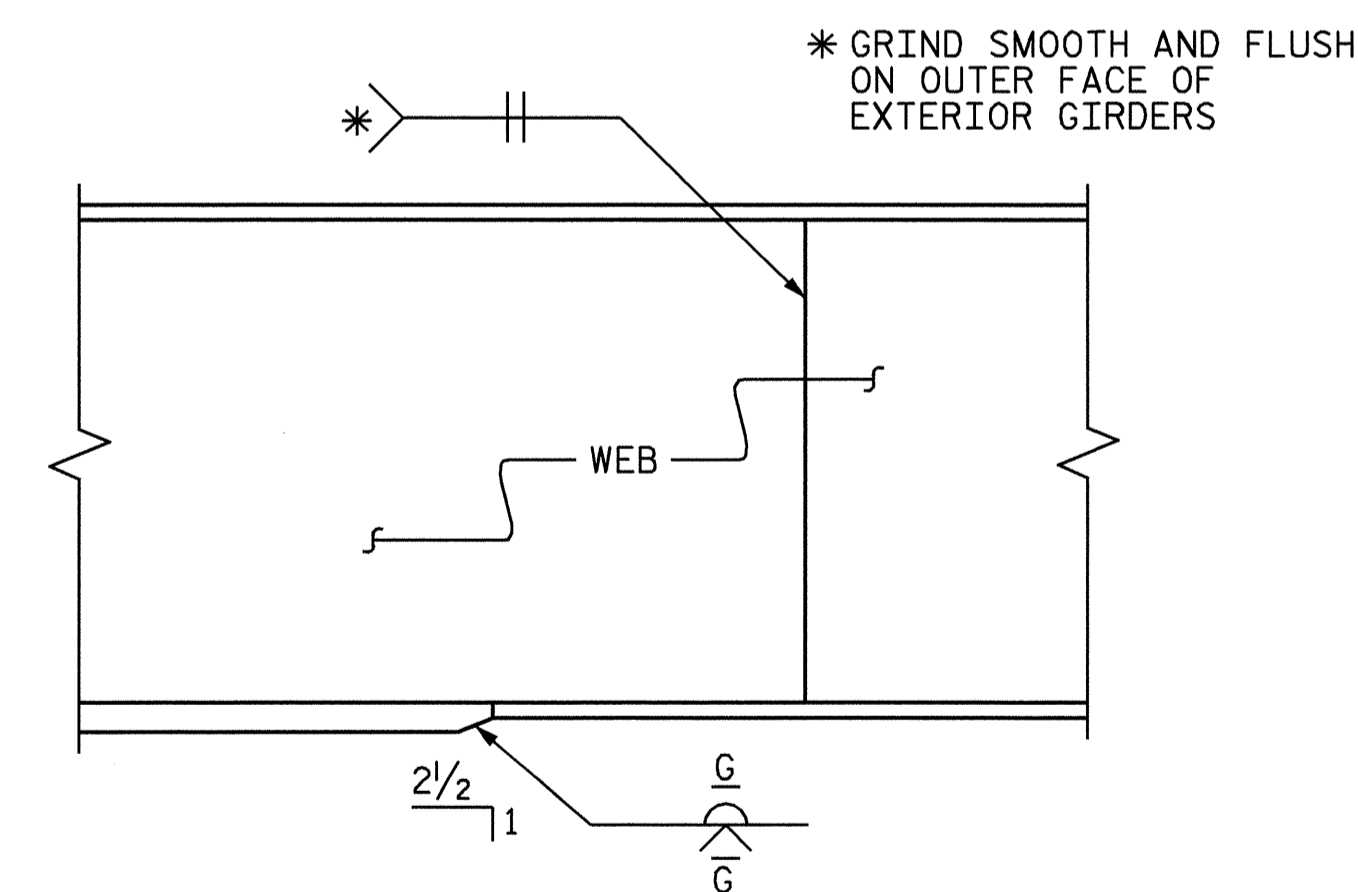


TRANSVERSE STIFFNER



TYPICAL CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



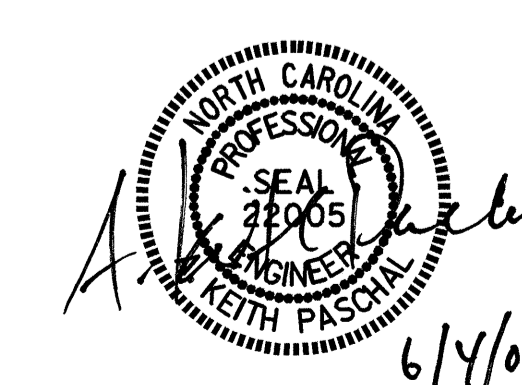
ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

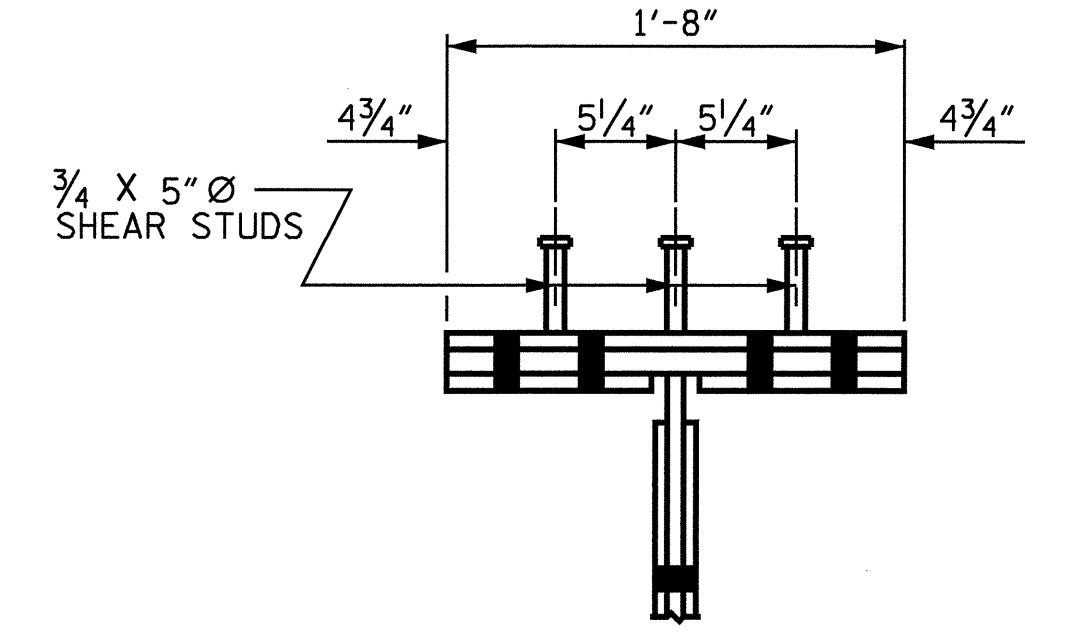
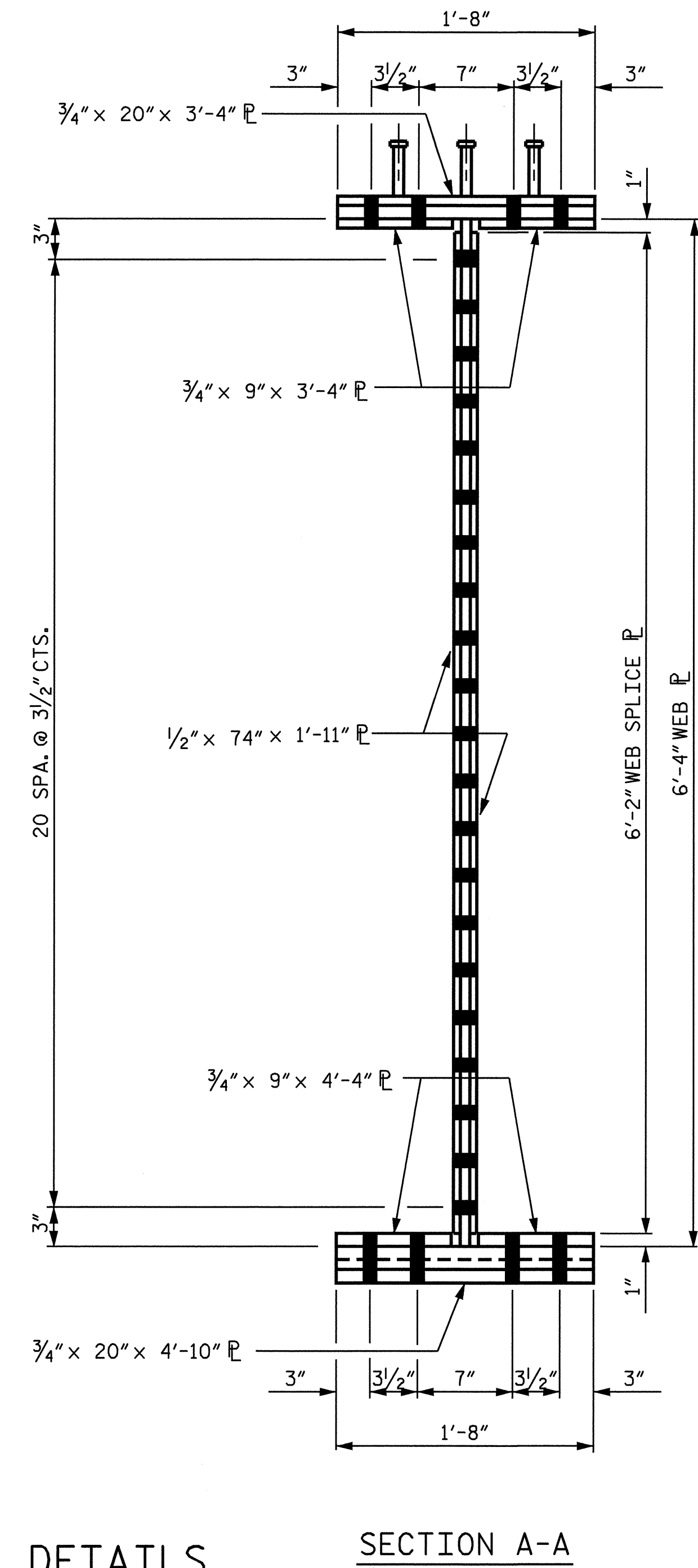
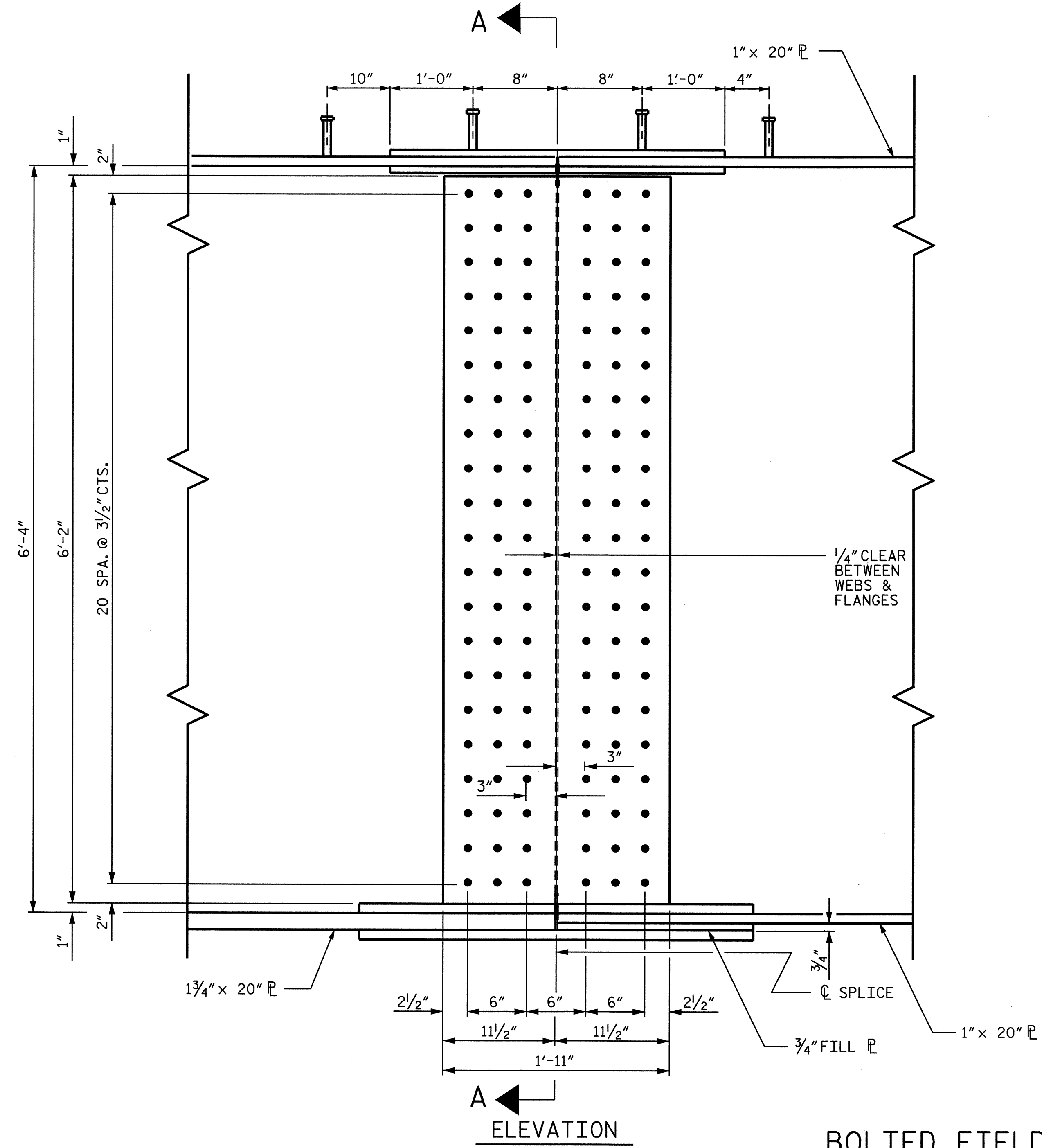
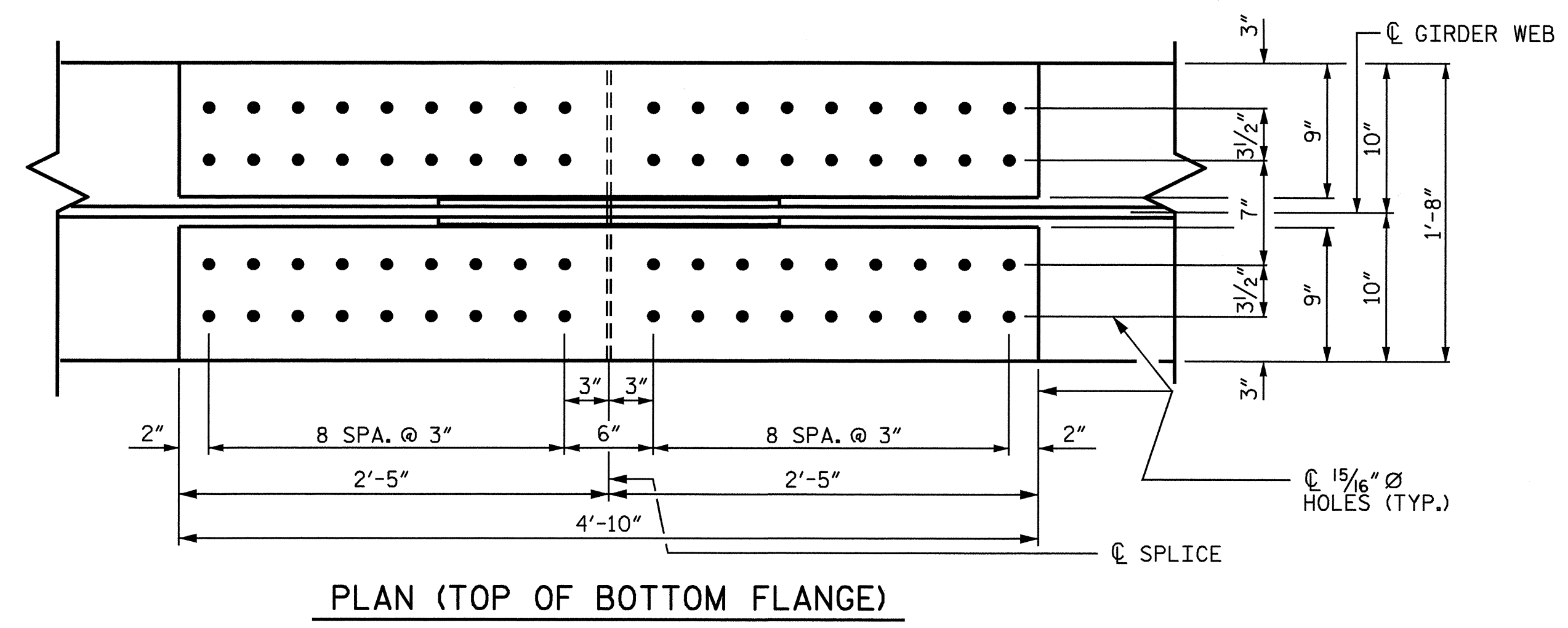
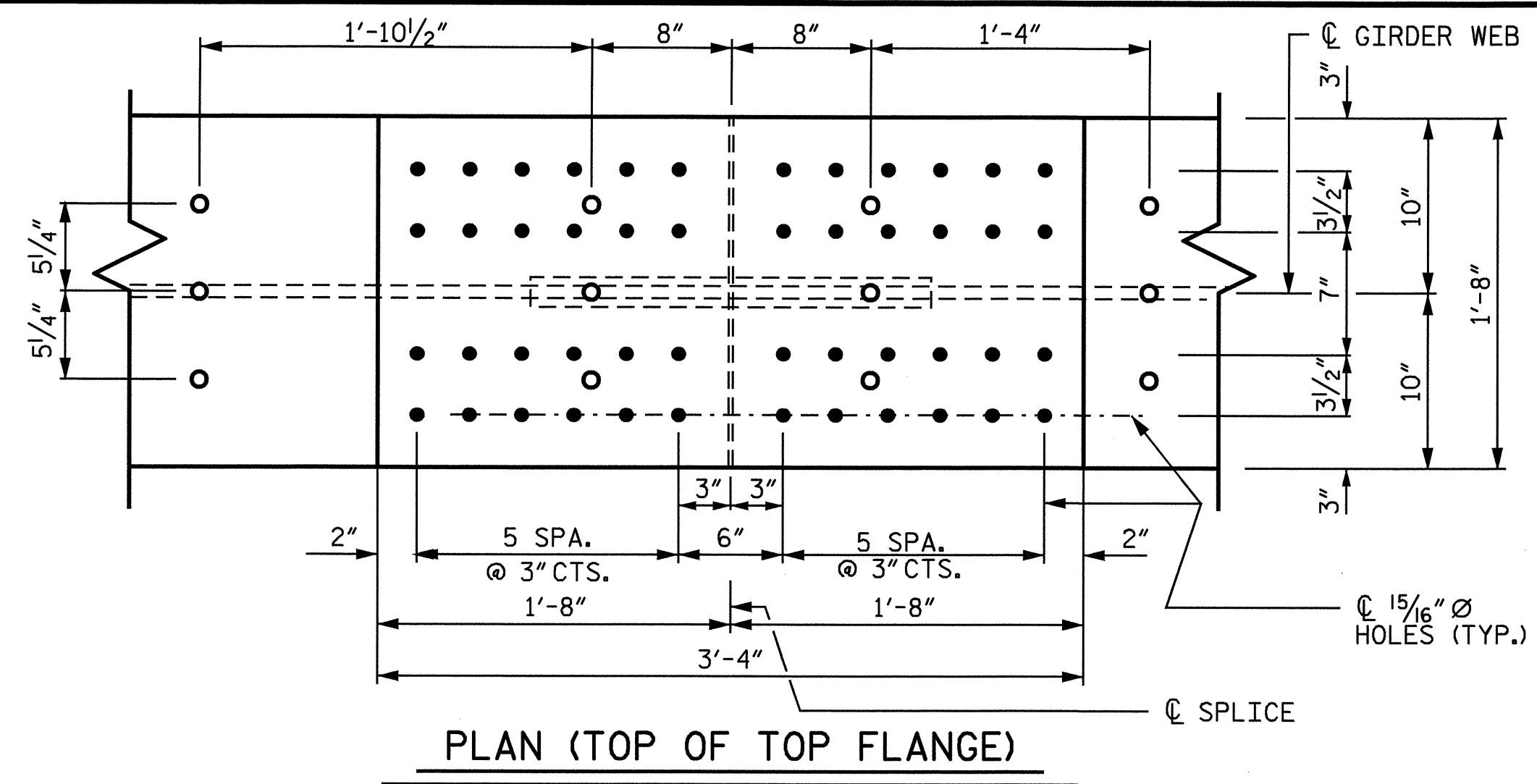
SHEET 3 OF 4

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



DRAWN BY : J. G. KHARVA DATE : 07/17/06
 CHECKED BY : J. D. HAWK DATE : 08/21/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE
 ▲ NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE ASSEMBLY.

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS					
SHEET NO. S-10					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 23

Professional Engineer Seal
 KEITH PASSAL
 6/4/08

DRAWN BY: J. G. KHARVA DATE: 07/21/06
 CHECKED BY: J. D. HAWK DATE: 08/21/06

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
GIRDER 1																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.039	0.076	0.111	0.142	0.169	0.192	0.210	0.223	0.231	0.234	0.231	0.223	0.210	0.192	0.169	0.142	0.111	0.076	0.039	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.102	0.207	0.305	0.394	0.471	0.535	0.587	0.624	0.647	0.655	0.647	0.624	0.587	0.535	0.471	0.394	0.305	0.207	0.102	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.016	0.017	0.018	0.019	0.018	0.017	0.016	0.014	0.011	0.008	0.005	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.141	0.285	0.421	0.544	0.651	0.740	0.812	0.865	0.897	0.907	0.897	0.865	0.812	0.740	0.651	0.544	0.421	0.285	0.141	0.000
SUPERELEVATION ORDINATE	0.000	-0.005	-0.010	-0.015	-0.020	-0.024	-0.029	-0.034	-0.039	-0.044	-0.049	-0.054	-0.059	-0.063	-0.068	-0.073	-0.078	-0.083	-0.088	-0.084	0.000
REQUIRED CAMBER ↑	0	1 5/8"	3 5/16"	4 7/8"	6 5/16"	7 1/2"	8 1/2"	9 5/8"	9 15/16"	10 1/4"	10 5/16"	10 3/8"	9 11/16"	9"	8 1/16"	6 15/16"	5 9/16"	4 1/16"	2 3/8"	1 1/16"	0
GIRDER 2																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.039	0.076	0.111	0.142	0.169	0.192	0.210	0.223	0.231	0.234	0.231	0.223	0.210	0.192	0.169	0.142	0.111	0.076	0.039	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.102	0.207	0.306	0.395	0.472	0.536	0.588	0.624	0.648	0.656	0.648	0.626	0.588	0.536	0.472	0.395	0.306	0.207	0.102	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.003	0.005	0.008	0.011	0.013	0.016	0.017	0.018	0.019	0.018	0.017	0.016	0.013	0.011	0.008	0.005	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.141	0.286	0.422	0.545	0.652	0.741	0.813	0.866	0.898	0.909	0.898	0.866	0.813	0.741	0.652	0.545	0.422	0.286	0.141	0.000
SUPERELEVATION ORDINATE	0.000	-0.002	-0.003	-0.005	-0.007	-0.008	-0.010	-0.011	-0.013	-0.015	-0.016	-0.018	-0.020	-0.021	-0.023	-0.024	-0.026	-0.028	-0.029	-0.028	0.000
REQUIRED CAMBER ↑	0	1 1/16"	3 3/8"	5"	6 7/16"	7 3/4"	8 7/8"	9 5/8"	10 1/4"	10 5/16"	10 11/16"	10 9/16"	10 3/8"	9 1/2"	8 5/8"	7 9/16"	6 1/4"	4 3/4"	3 1/16"	1 3/8"	0
GIRDER 3																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.039	0.076	0.111	0.142	0.169	0.192	0.210	0.223	0.231	0.234	0.231	0.223	0.210	0.192	0.169	0.142	0.111	0.076	0.039	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.102	0.207	0.306	0.395	0.472	0.536	0.588	0.626	0.648	0.656	0.648	0.626	0.588	0.536	0.472	0.395	0.306	0.207	0.102	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.003	0.005	0.008	0.011	0.013	0.016	0.017	0.018	0.019	0.018	0.017	0.016	0.013	0.011	0.008	0.005	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.141	0.286	0.422	0.545	0.652	0.741	0.813	0.866	0.898	0.909	0.898	0.866	0.813	0.741	0.652	0.545	0.422	0.286	0.141	0.000
SUPERELEVATION ORDINATE	0.000	0.002	0.003	0.005	0.007	0.008	0.010	0.011	0.013	0.015	0.016	0.018	0.020	0.021	-0.023	-0.024	-0.026	-0.028	-0.029	-0.028	0.000
REQUIRED CAMBER ↑	0	1 1/16"	3 1/2"	5 1/8"	6 5/8"	7 5/16"	9 1/16"	9 7/8"	10 9/16"	10 5/16"	11 1/8"	11"	10 5/8"	10"	9 3/16"	8 7/8"	6 7/8"	5 3/8"	3 13/16"	2"	0
GIRDER 4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.039	0.076	0.111	0.142	0.169	0.192	0.210	0.223	0.231	0.234	0.231	0.223	0.210	0.192	0.169	0.142	0.111	0.076	0.039	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.102	0.207	0.305	0.394	0.471	0.535	0.587	0.624	0.647	0.655	0.647	0.624	0.587	0.535	0.471	0.394	0.305	0.207	0.102	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.003	0.005	0.008	0.011	0.014	0.016	0.017	0.018	0.019	0.018	0.017	0.016	0.014	0.011	0.008	0.005	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.141	0.285	0.421	0.544	0.651	0.740	0.812	0.865	0.897	0.907	0.897	0.865	0.812	0.740	0.651	0.544	0.421	0.285	0.141	0.000
SUPERELEVATION ORDINATE	0.000	0.005	0.010	0.015	0.020	0.024	0.029	0.034	0.039	0.044	0.049	0.054	0.059	0.063	0.068	0.073	0.078	0.083	0.088	0.084	0.000
REQUIRED CAMBER ↑	0	1 3/4"	3 3/16"	5 1/4"	6 3/4"	8 1/8"	9 1/4"	10 1/8"	10 7/8"	11 5/16"	11 7/16"	11 1/16"	11 1/16"	10 1/2"	9 11/16"	8 11/16"	7 7/16"	6 1/16"	4 1/2"	2 11/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-4037
BUNCOMBE COUNTY
STATION: 14+87.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					23

DRAWN BY : J. G. KHARVA DATE : 6/19/06
CHECKED BY : J. D. HAWK DATE : 4/15/08

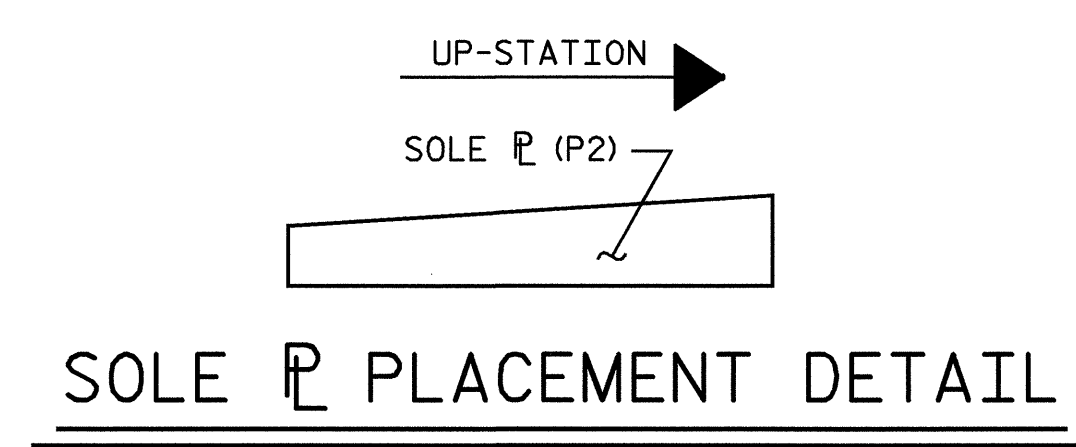
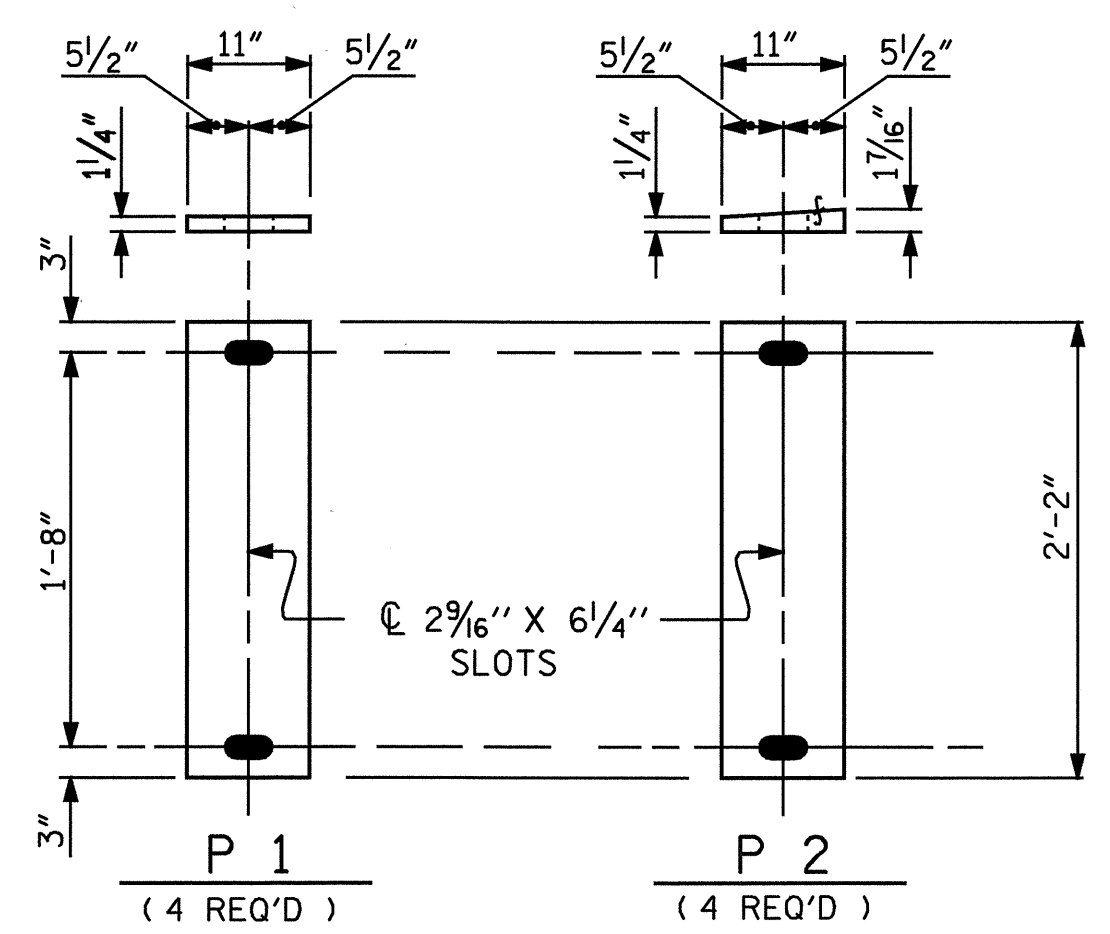
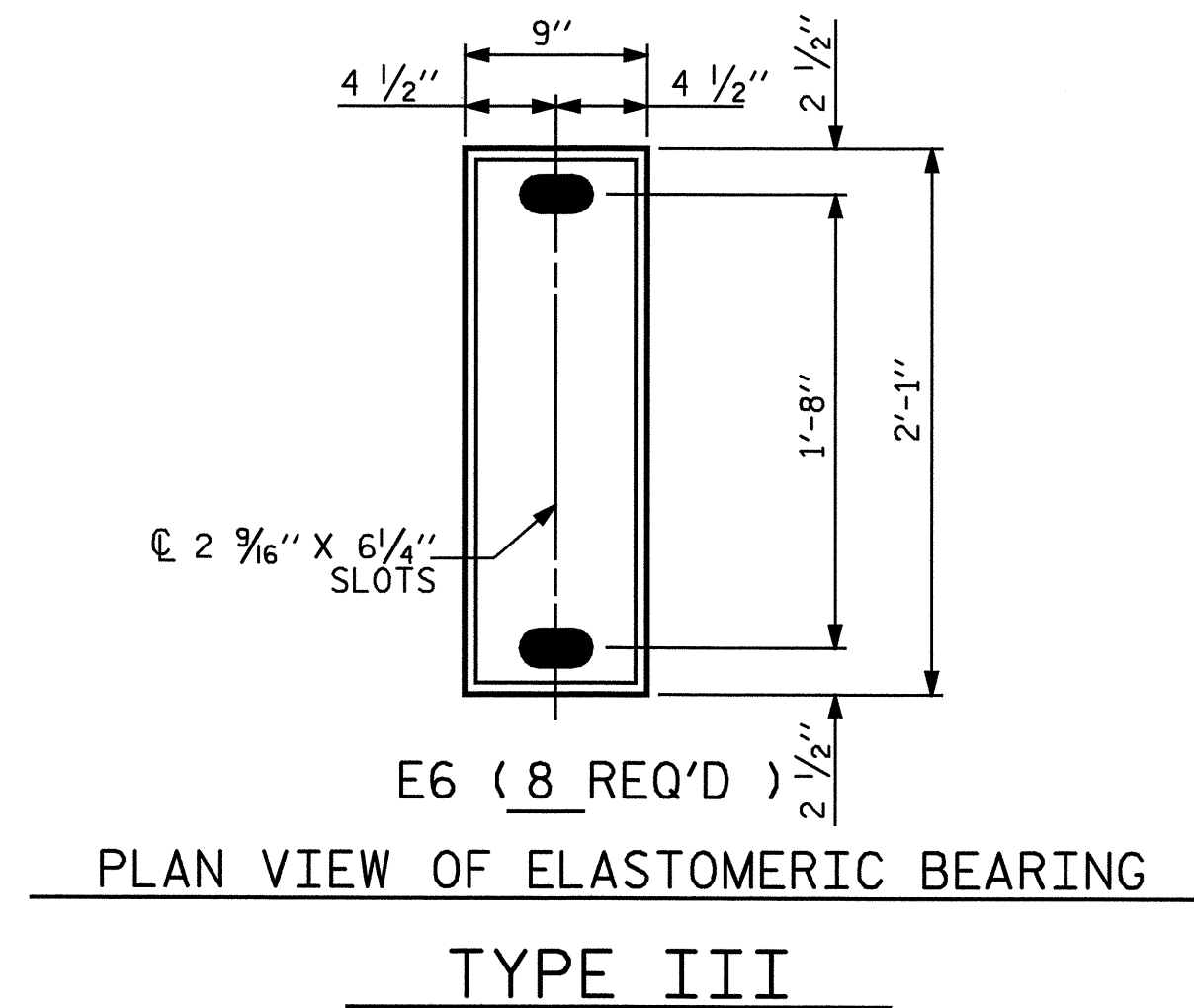
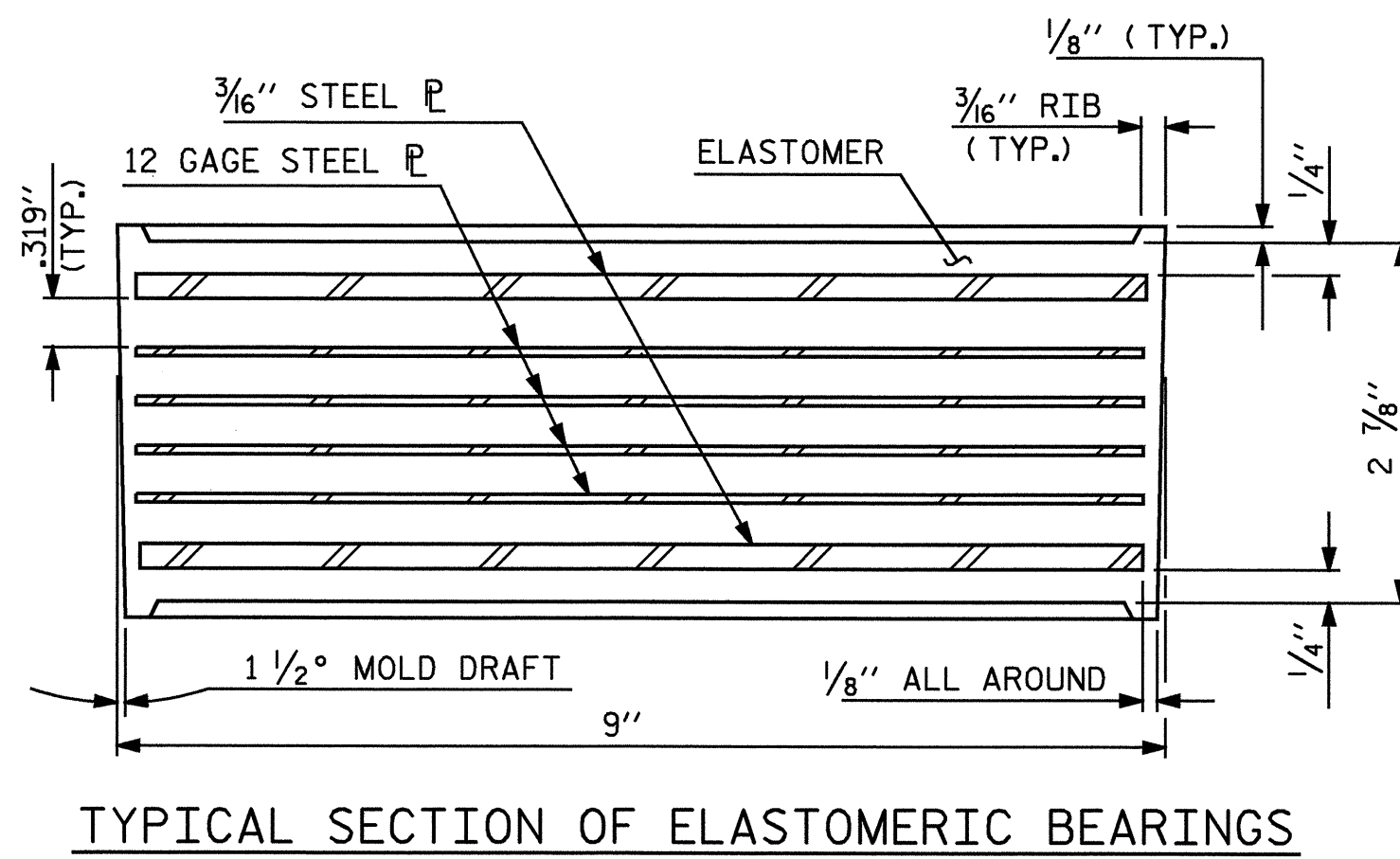
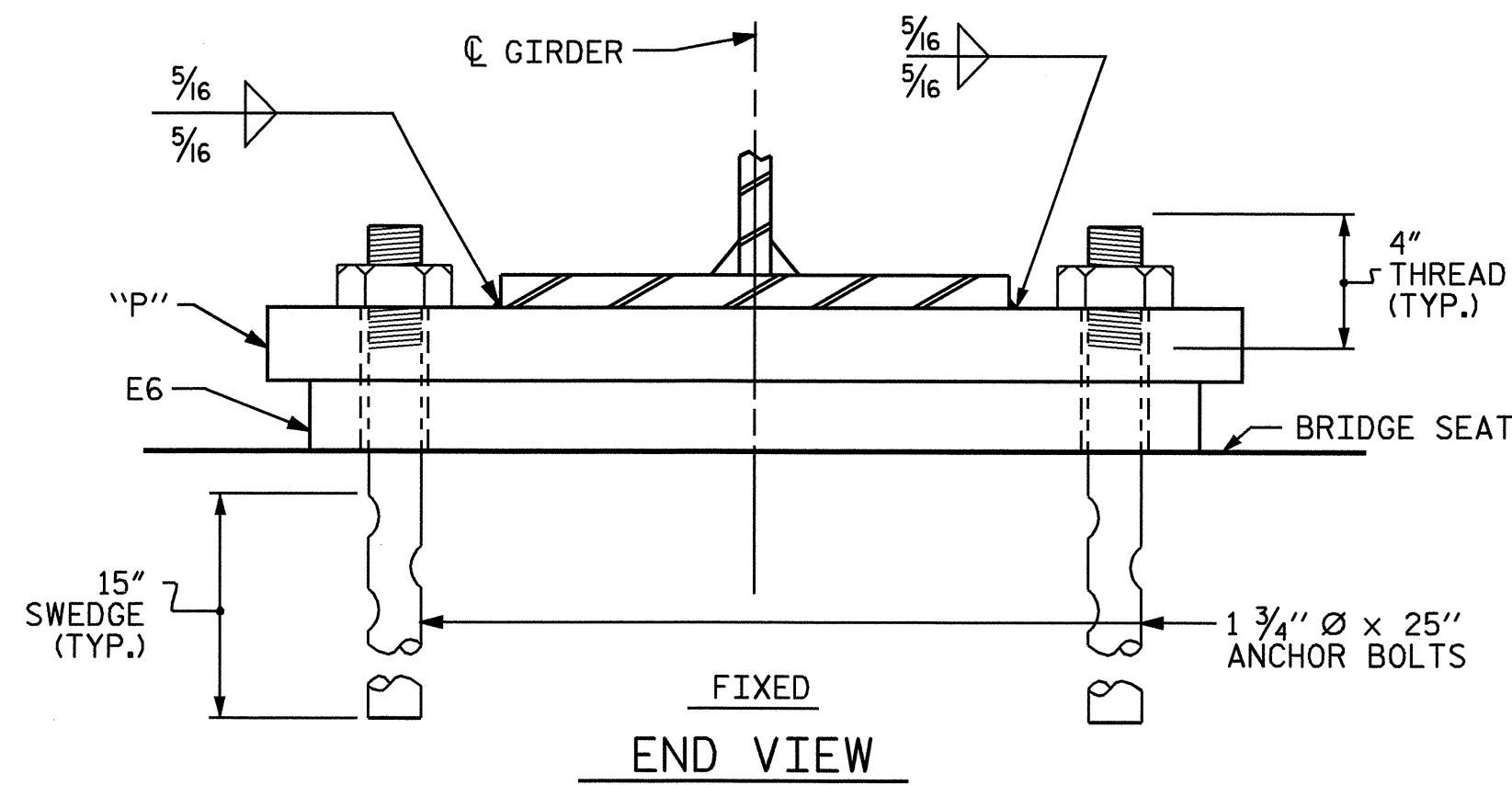
NOTES

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS 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. SHOP INSPECTION IS REQUIRED.

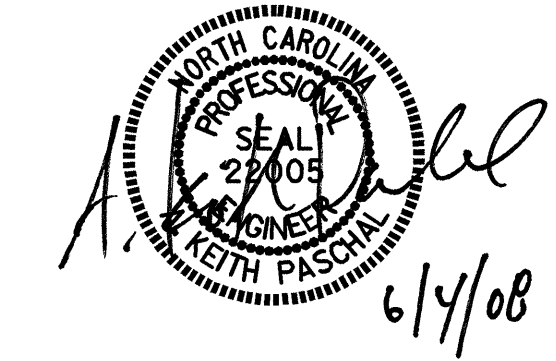
WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



-LOAD RATINGS-	
	MAX.D.L.+L.L.
TYPE III	144 K

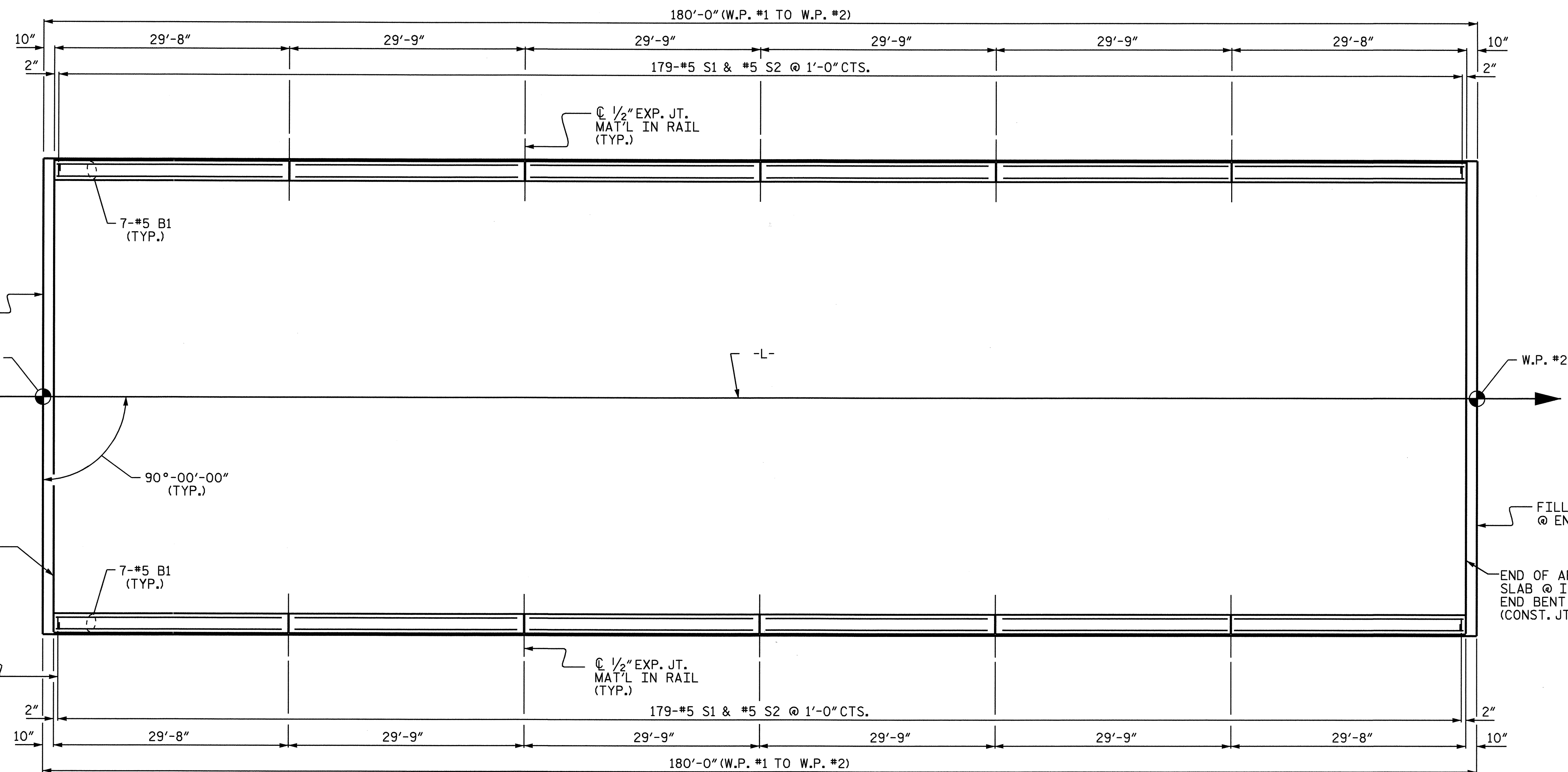
PROJECT NO. B-4037
 BUNCOMBE COUNTY
 STATION: 14+87.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ELASTOMERIC BEARING
 DETAILS
 (STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 23
2			4			

ASSEMBLED BY : J. G. KHARVA DATE : 03-20-08
 CHECKED BY : J. D. HAWK DATE : 04/16/08
 DRAWN BY : JMB 11/87 REV. 8/16/99 MAB/LES
 CHECKED BY : ARB 11/87 REV. 10/17/00 RWW/LES
 REV. 5/1/06 TLA/GM



PLAN OF BARRIER RAIL

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	#4	#5 STR	29'-3"	2563
* S1	#5	1	4'-7"	1711
* S2	#5	2	5'-2"	1929

* EPOXY COATED REINFORCING STEEL 6203 LBS.
CLASS AA CONCRETE 35.7 CU. YDS.
CONCRETE BARRIER RAIL 356.67 LIN. FT.

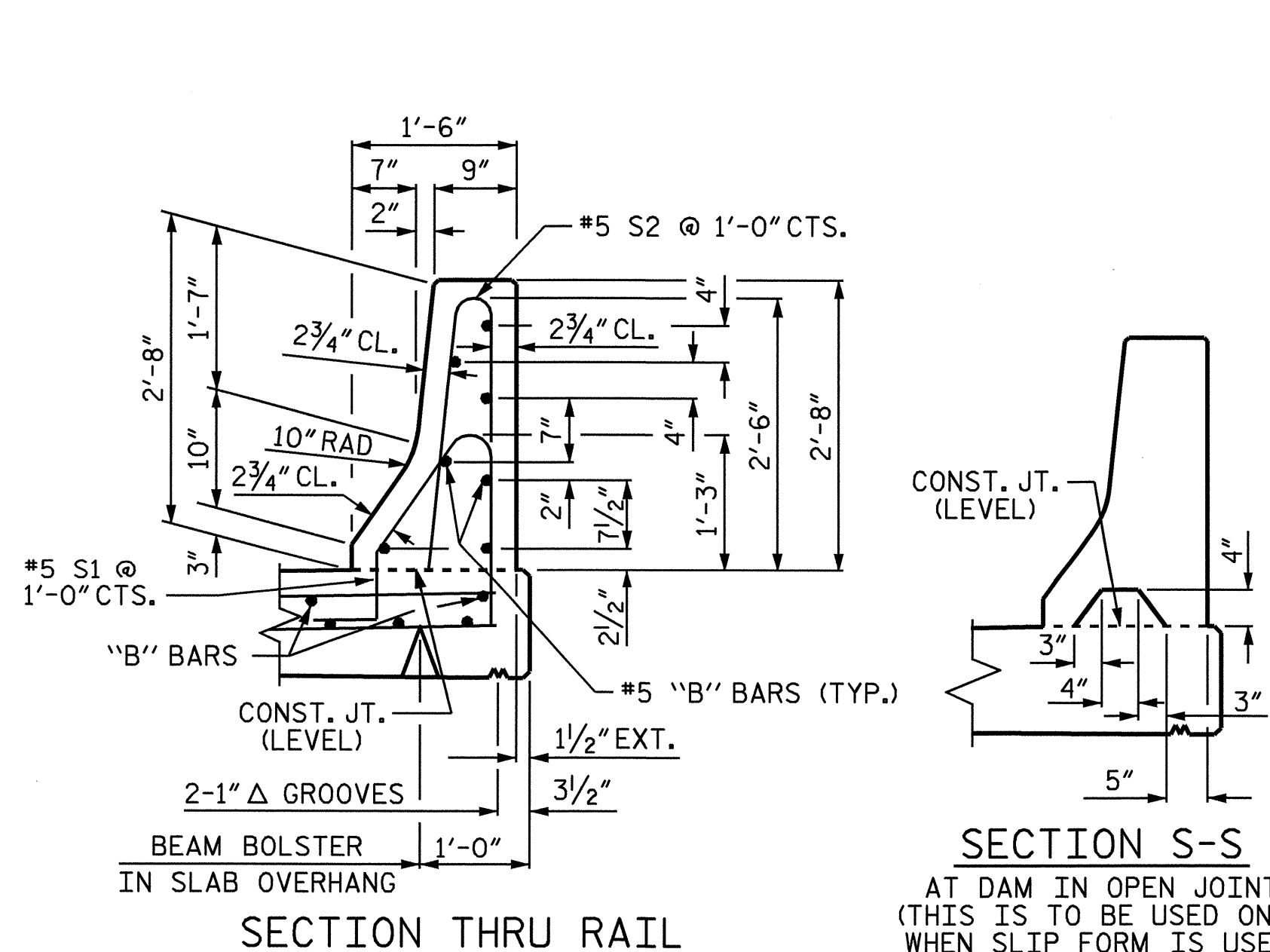
NOTES:

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

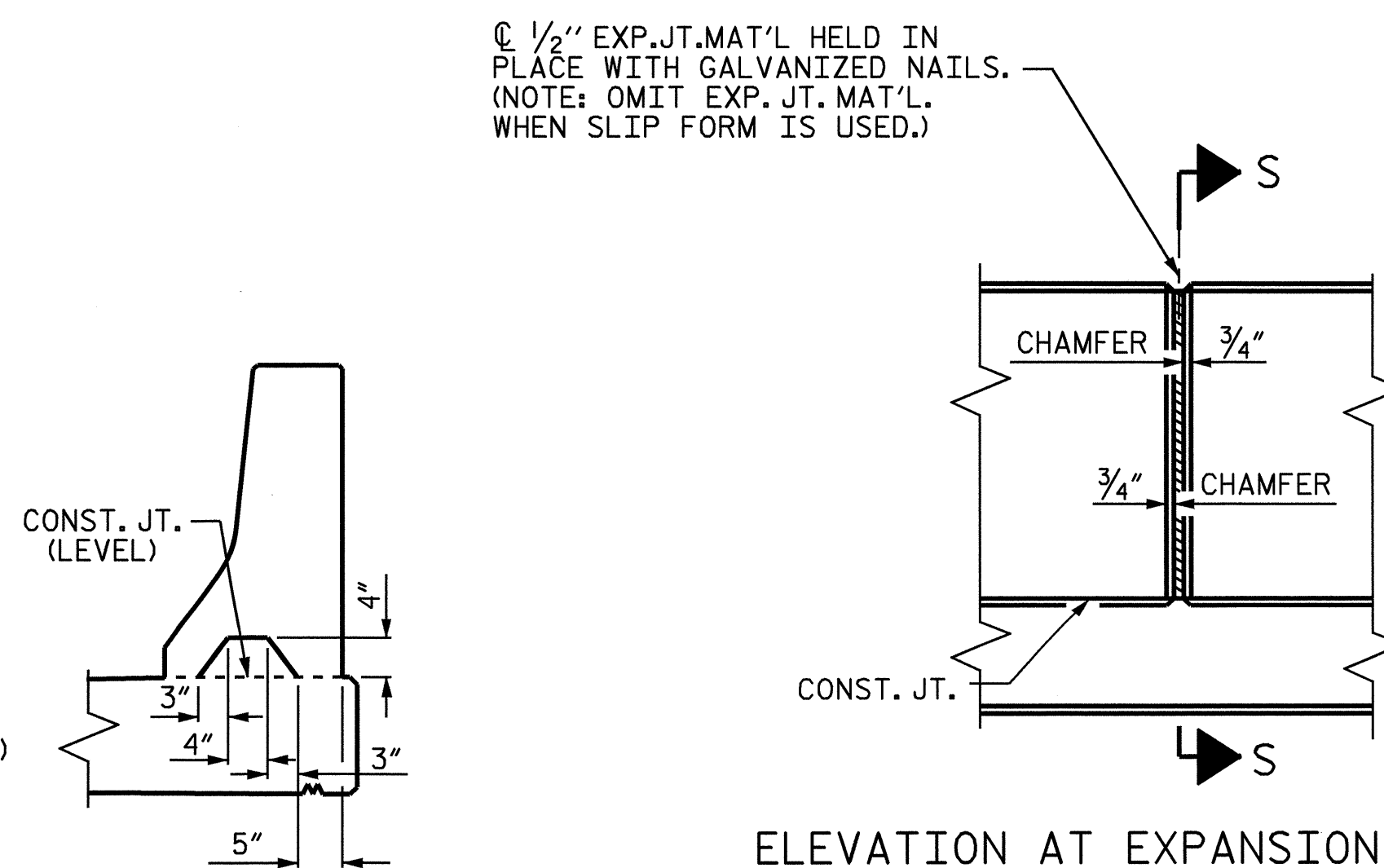
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.

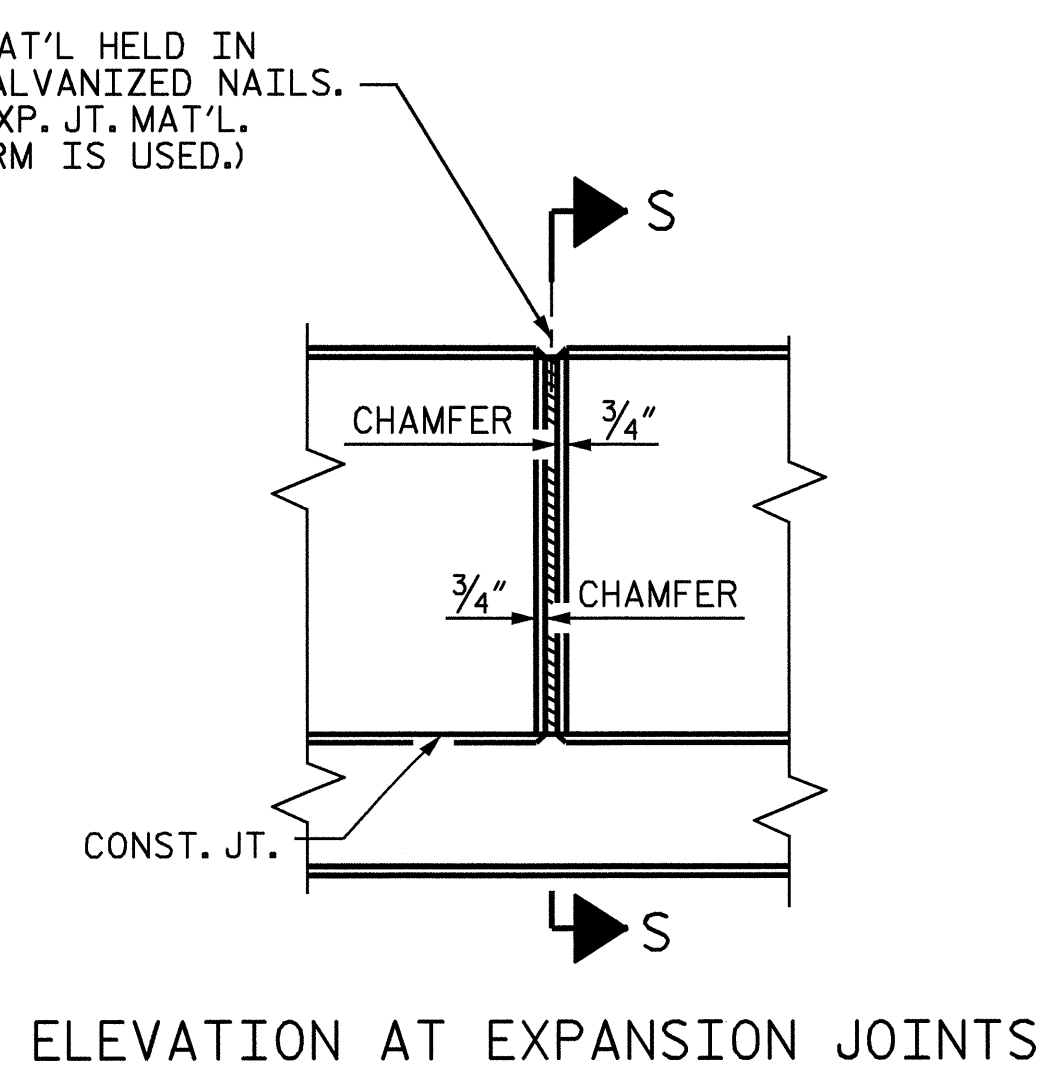
VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION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



SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)

BARRIER RAIL DETAILS

PROJECT NO. B-4037
BUNCOMBE COUNTY
STATION: 14+87.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL



ASSEMBLED BY : J. G. KHARVA DATE : 7/17/06
CHECKED BY : J. D. HAWK DATE : 8/21/06
DRAWN BY : ARB 5/87
CHECKED BY : SJD 9/87

REV. 10/17/00 RWW/LES
REV. 5/1/03R RWW/JTE
REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			23

NOTES

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

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 M11.

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

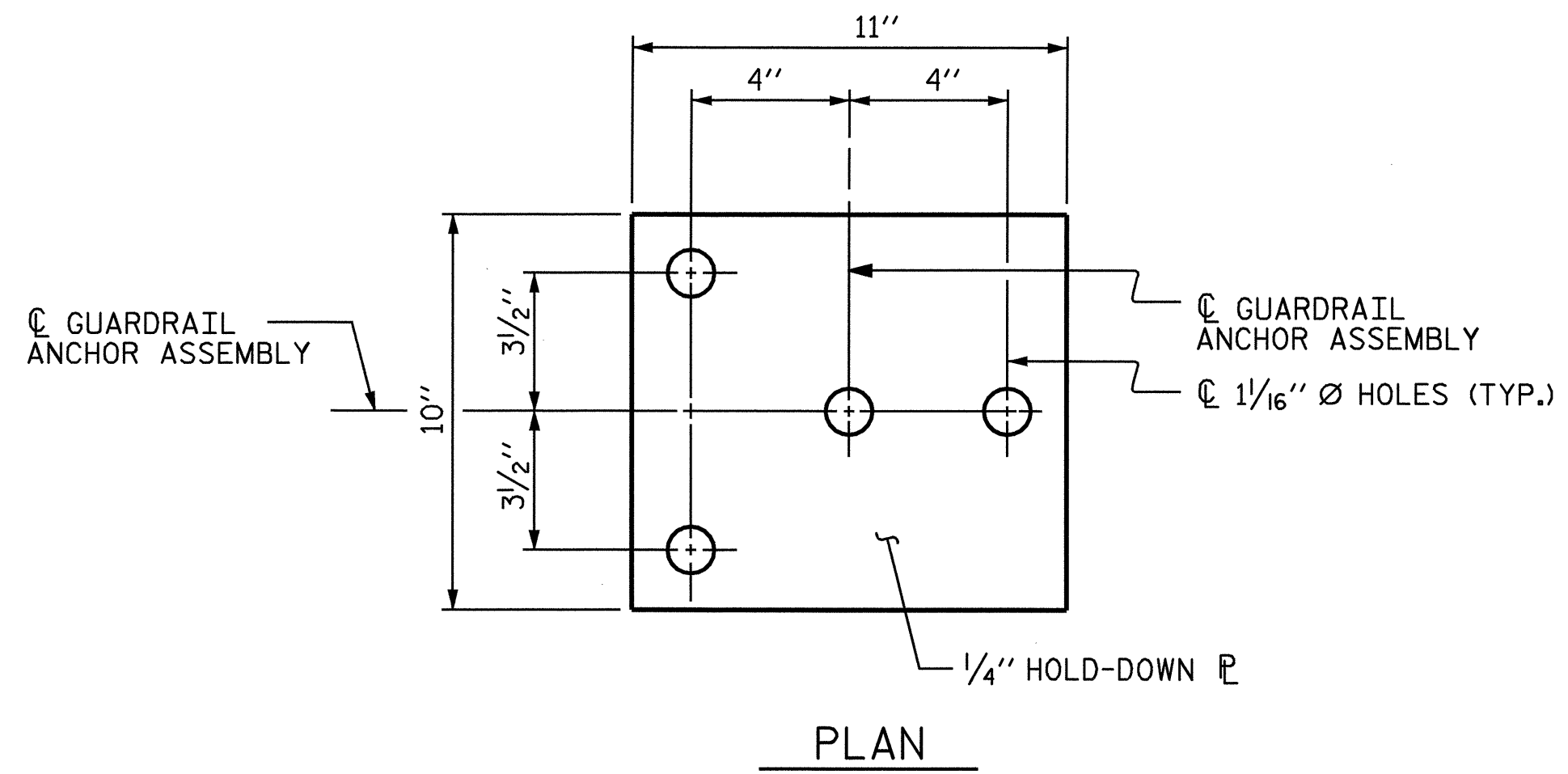
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

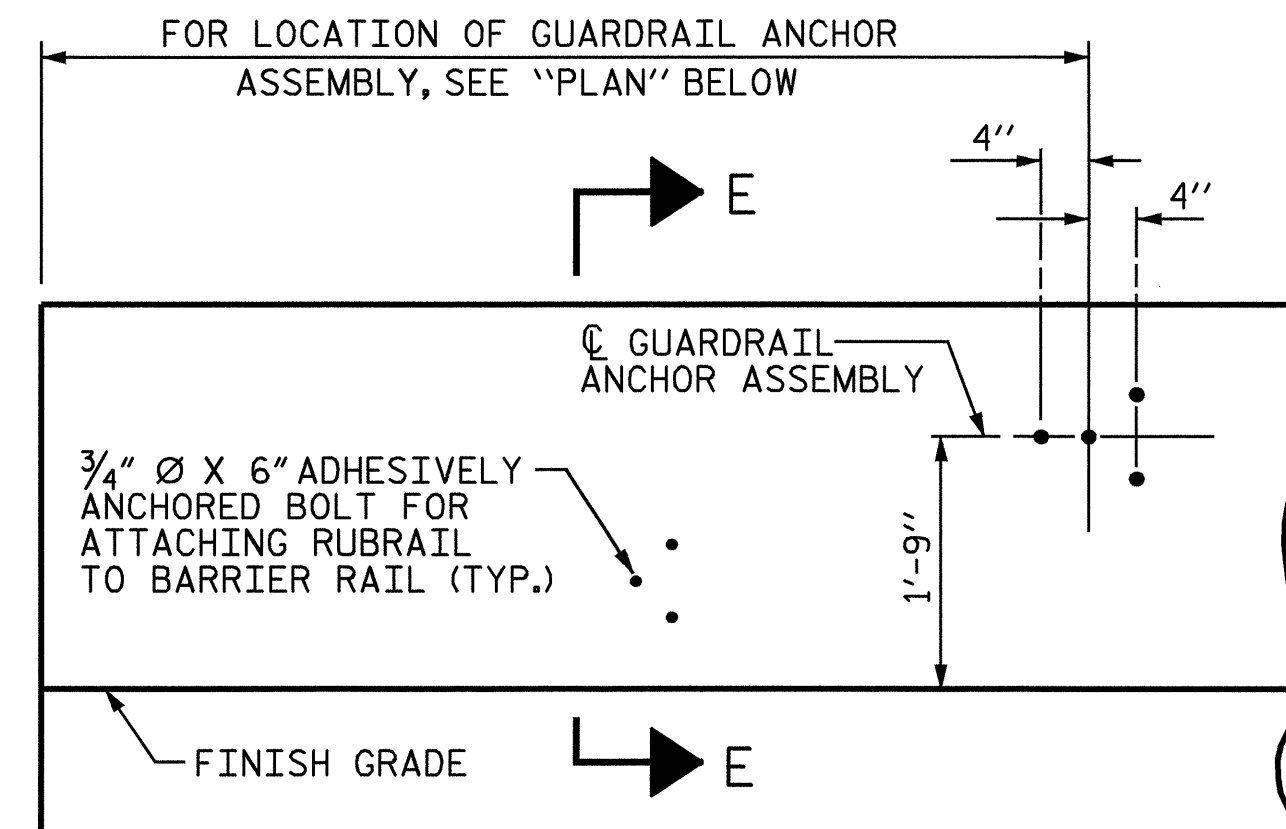
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

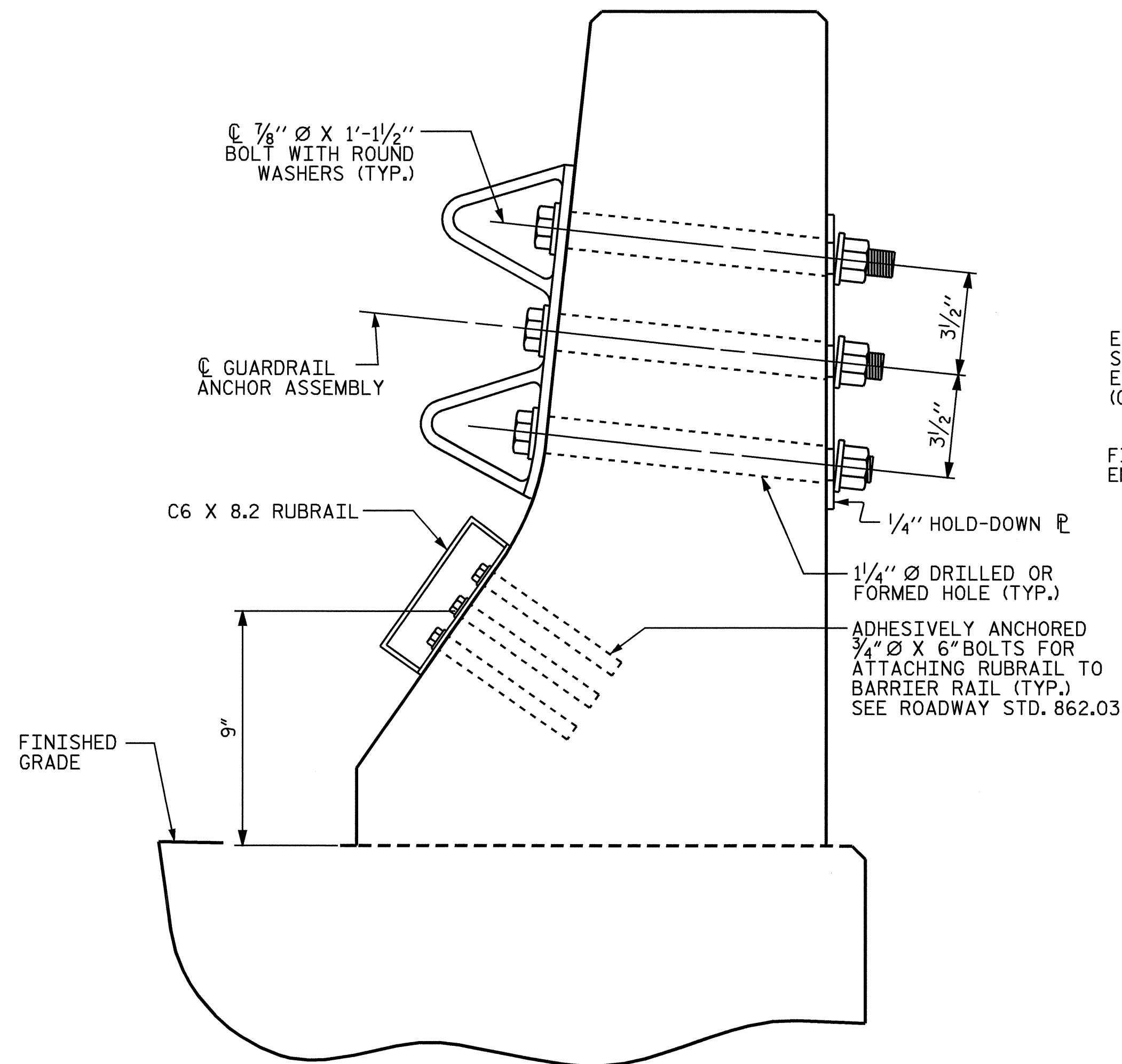


PLAN



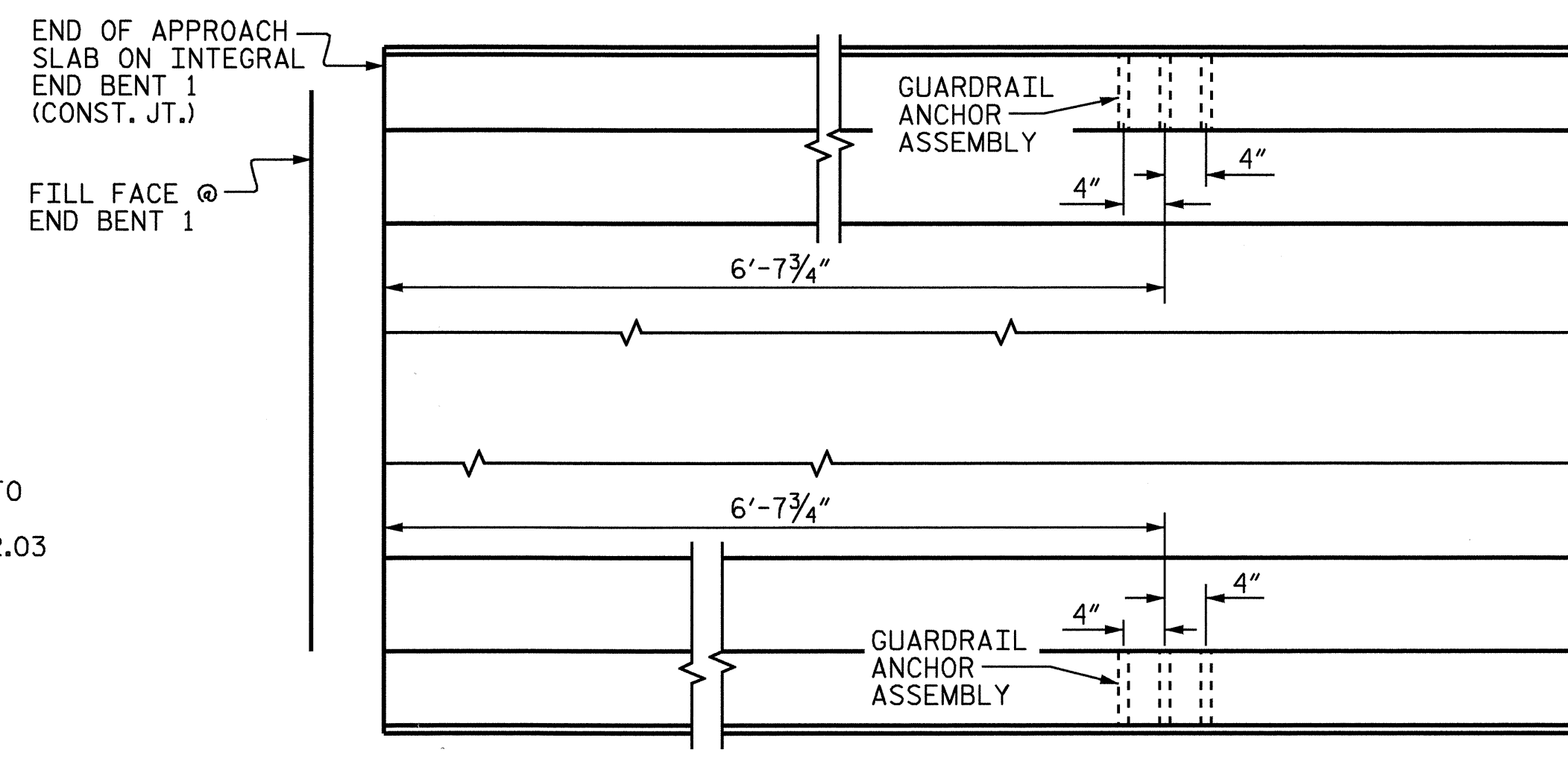
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

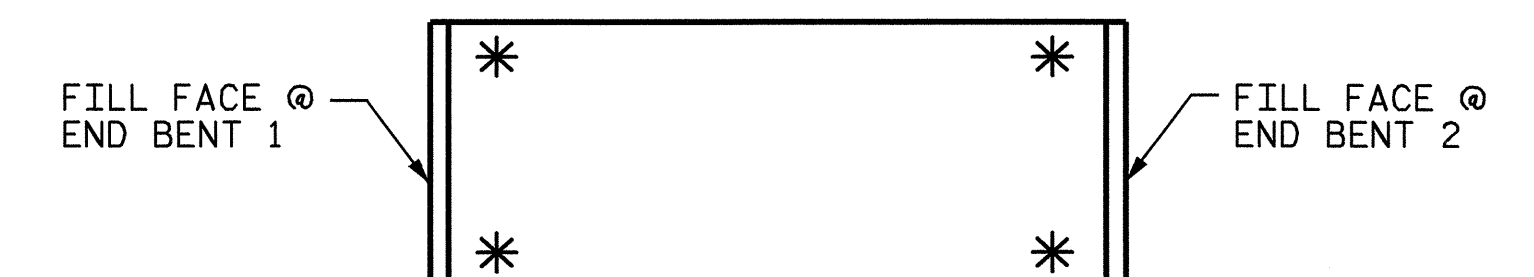
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



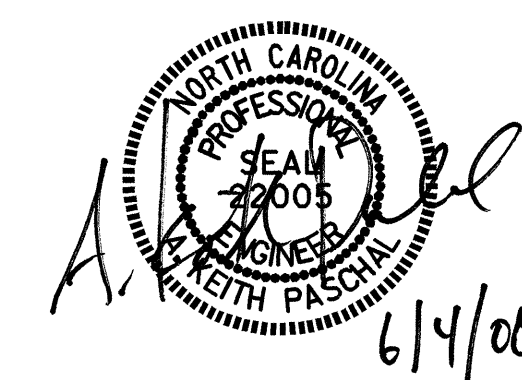
SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4037
 BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

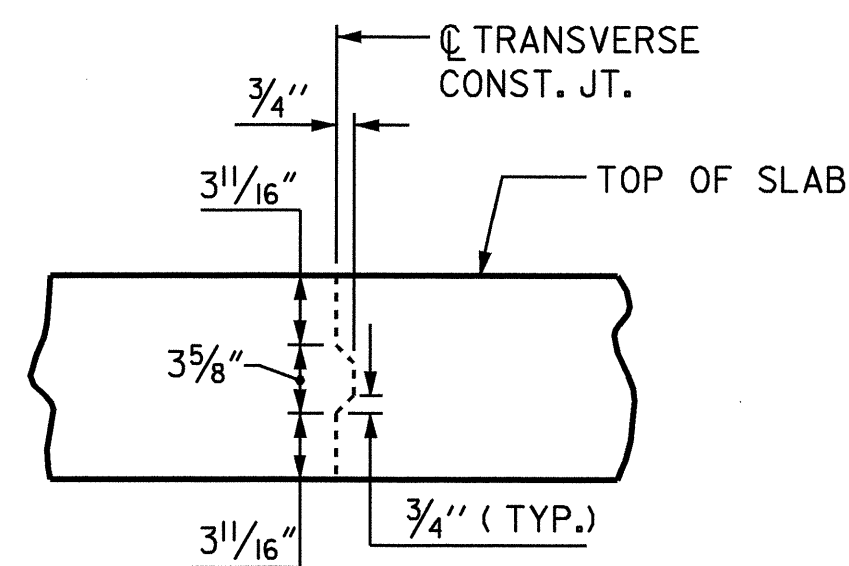
SHEET 2 OF 2

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



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
2			4			23	

ASSEMBLED BY : J.G. KHARVA	DATE : 4/15/08
CHECKED BY : J. D. HAWK	DATE : 4/15/08
DRAWN BY : TLA	5/06
CHECKED BY : GM	5/06
ADDED 5/1/06R	KMM/GM



TRANSVERSE CONSTRUCTION JOINT DETAIL

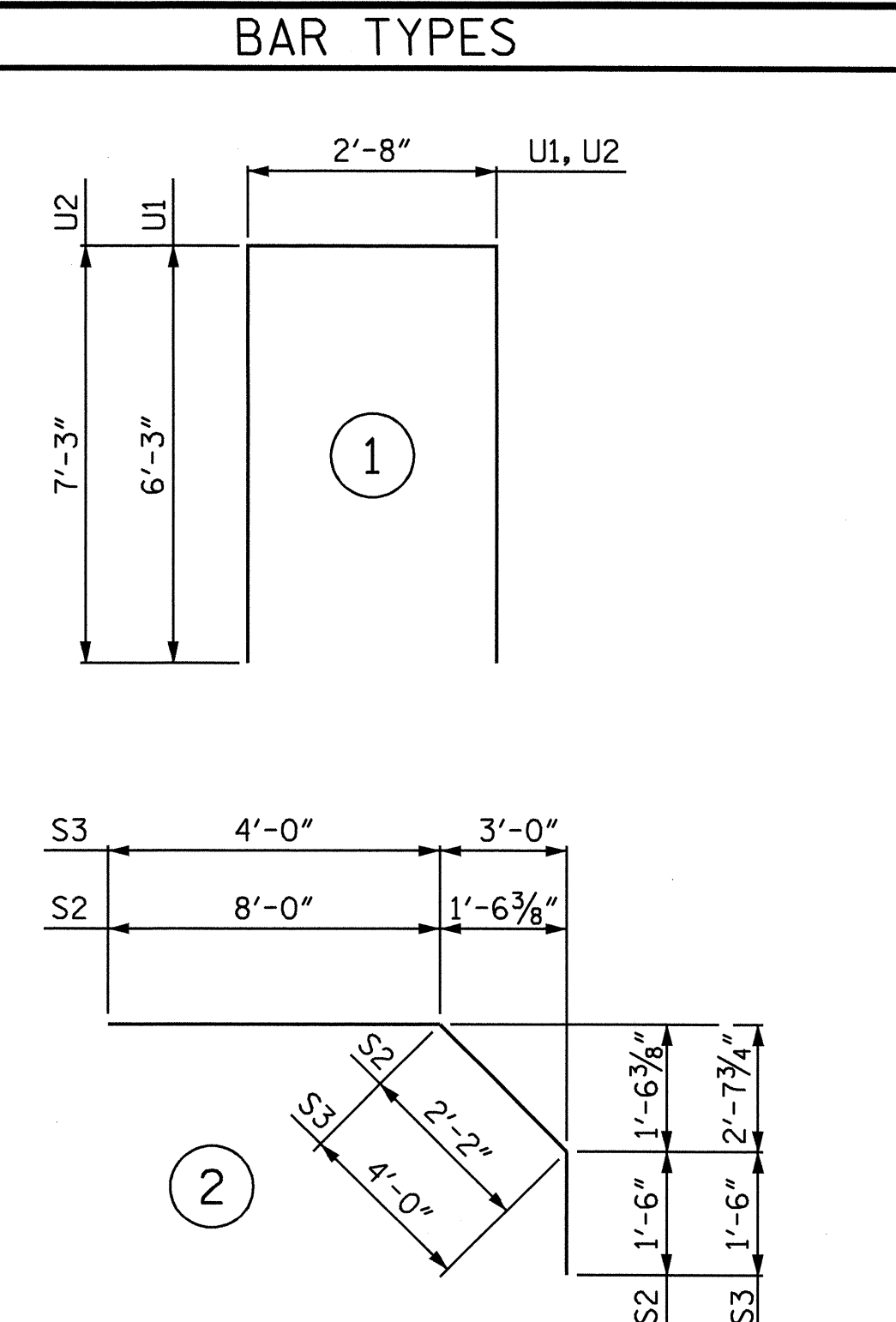
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

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"			

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	306	#5	STR	30'-11"	9867
A2	306	#5	STR	30'-11"	9867
* B1	208	#4	STR	24'-0"	3335
B2	128	#5	STR	46'-2"	6163
* B3	46	#6	STR	42'-0"	2902
B4	54	#5	STR	42'-0"	2366
K1	28	#5	STR	36'-11"	1078
K2	32	#4	STR	2'-8"	57
* S2	54	#4	2	11'-8"	421
* S3	50	#4	2	9'-6"	317
U1	66	#4	1	15'-2"	669
U2	16	#4	1	17'-2"	183
REINFORCING STEEL					20355 LBS.
* EPOXY COATED REINFORCING STEEL					16842 LBS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

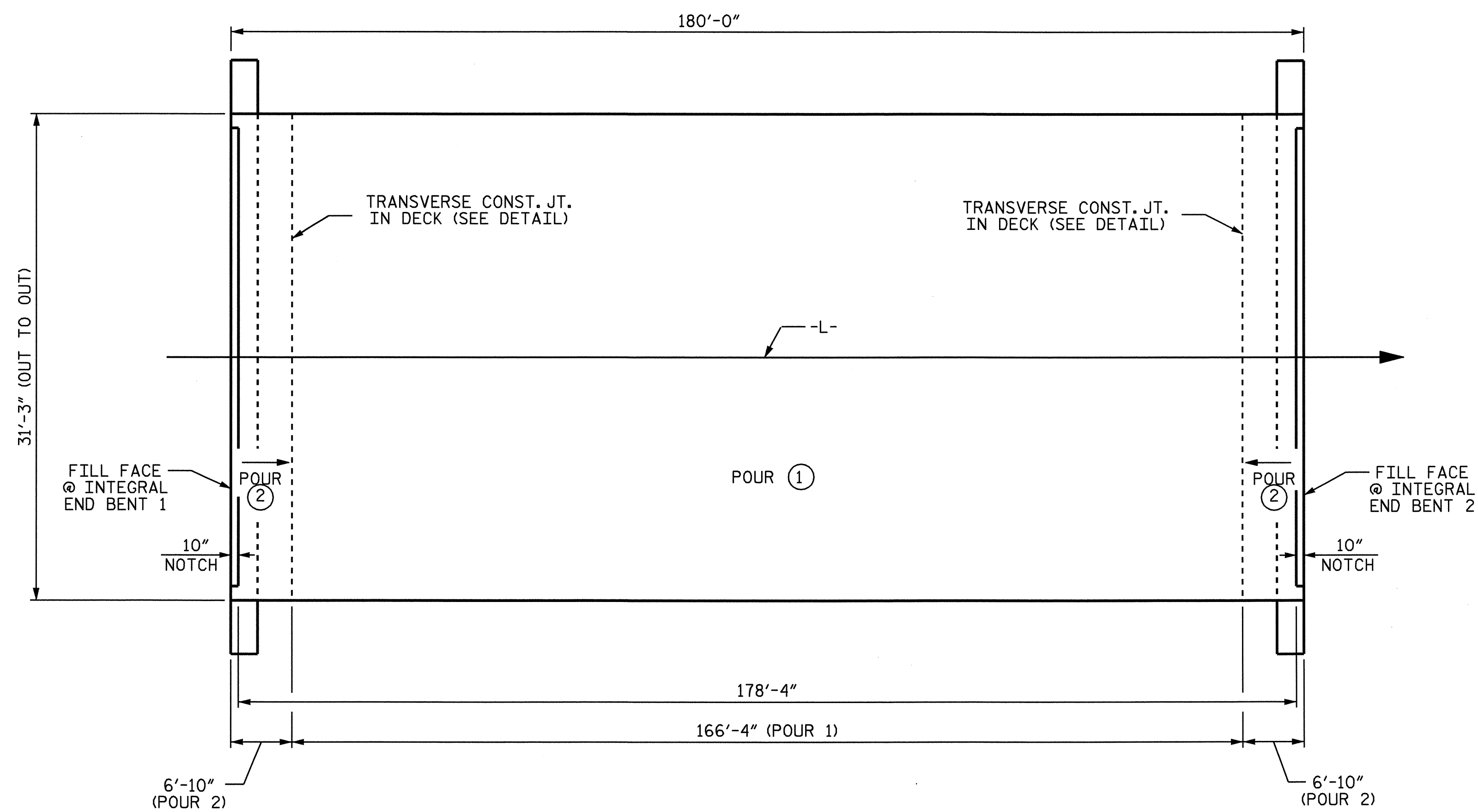
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	157.1		
POUR #2	76.9		
TOTALS **	234.0	20355	16842

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

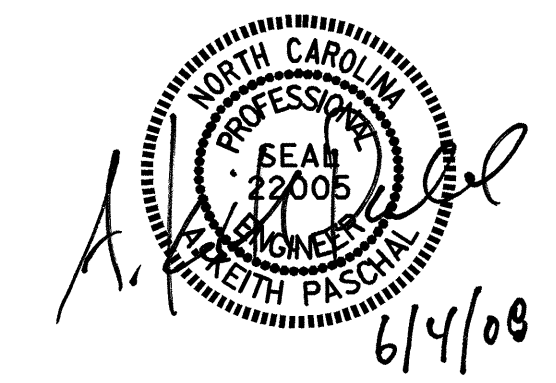
GROOVING BRIDGE FLOORS

APPROACH SLABS	621	SQ.FT.
BRIDGE DECK	4450	SQ.FT.
TOTAL	5071	SQ.FT.



LAYOUT FOR COMPUTING AREA
OF REINFORCED CONCRETE DECK SLAB
AND POURING SEQUENCE
(SQ. FT. = 5625)

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -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			23

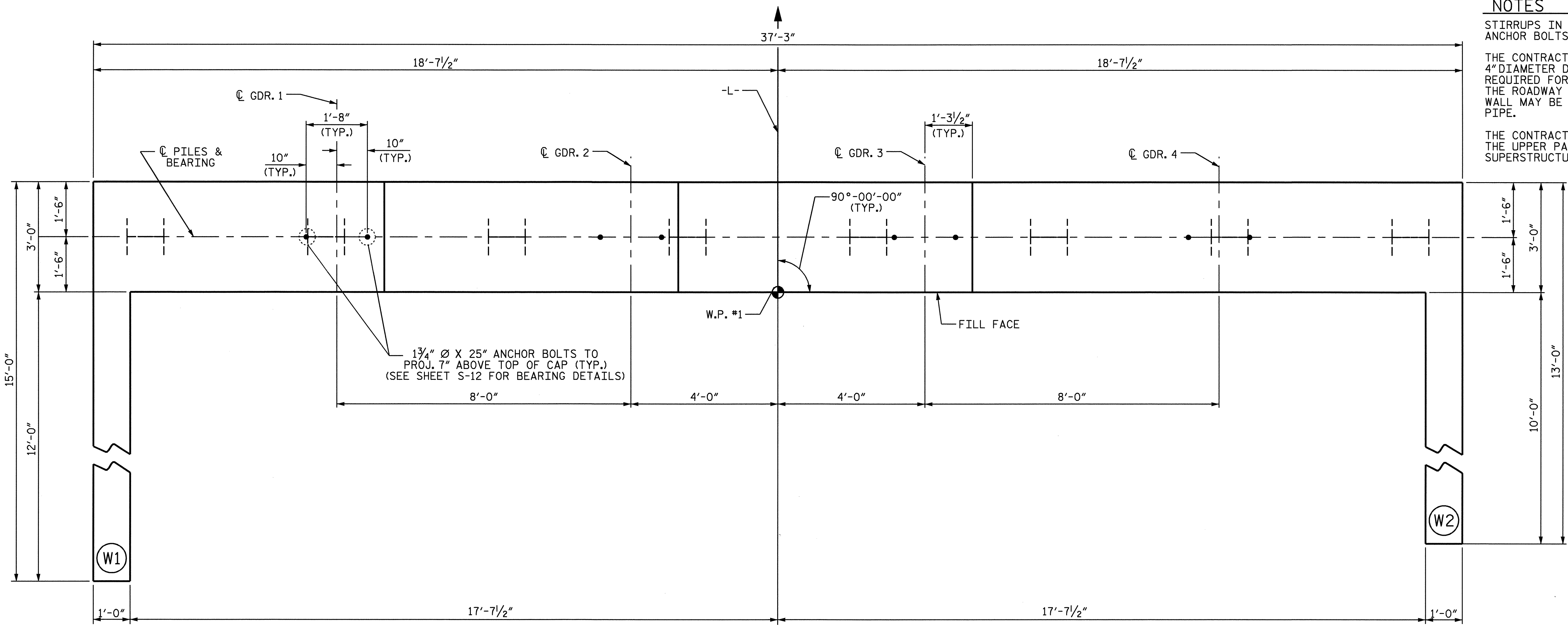
DRAWN BY : J. G. KHARVA DATE : 6/18/06
 CHECKED BY : J. D. HAWK DATE : 8/21/06

NOTES

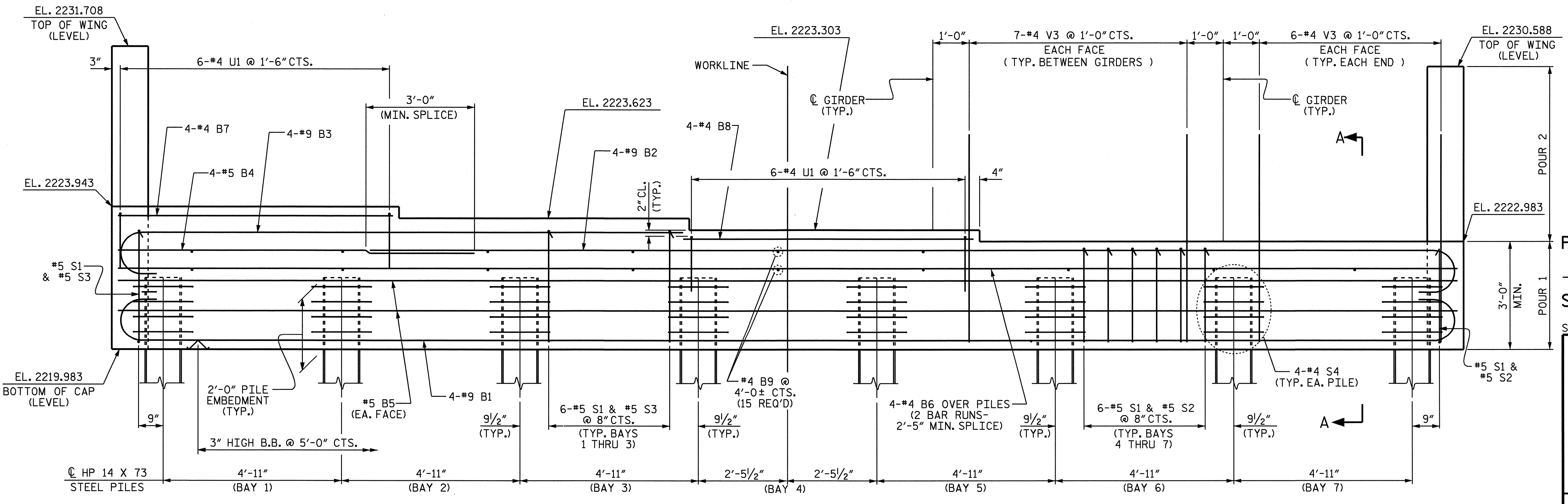
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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.

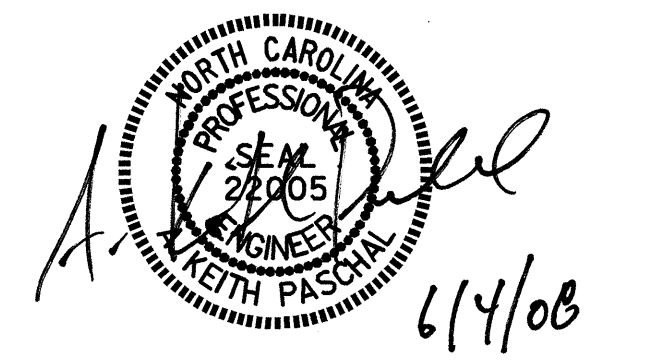
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS ARE TO BE POURED WITH SUPERSTRUCTURE.



PLAN



ELEVATION

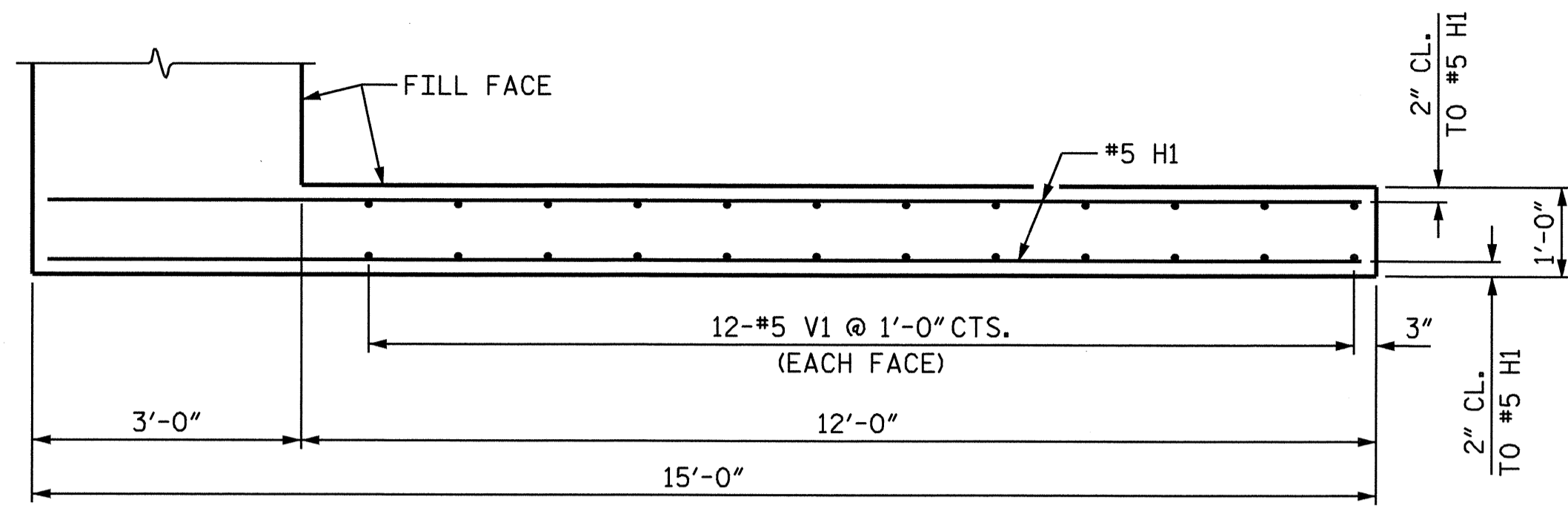


PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-
 SHEET 1 OF 3

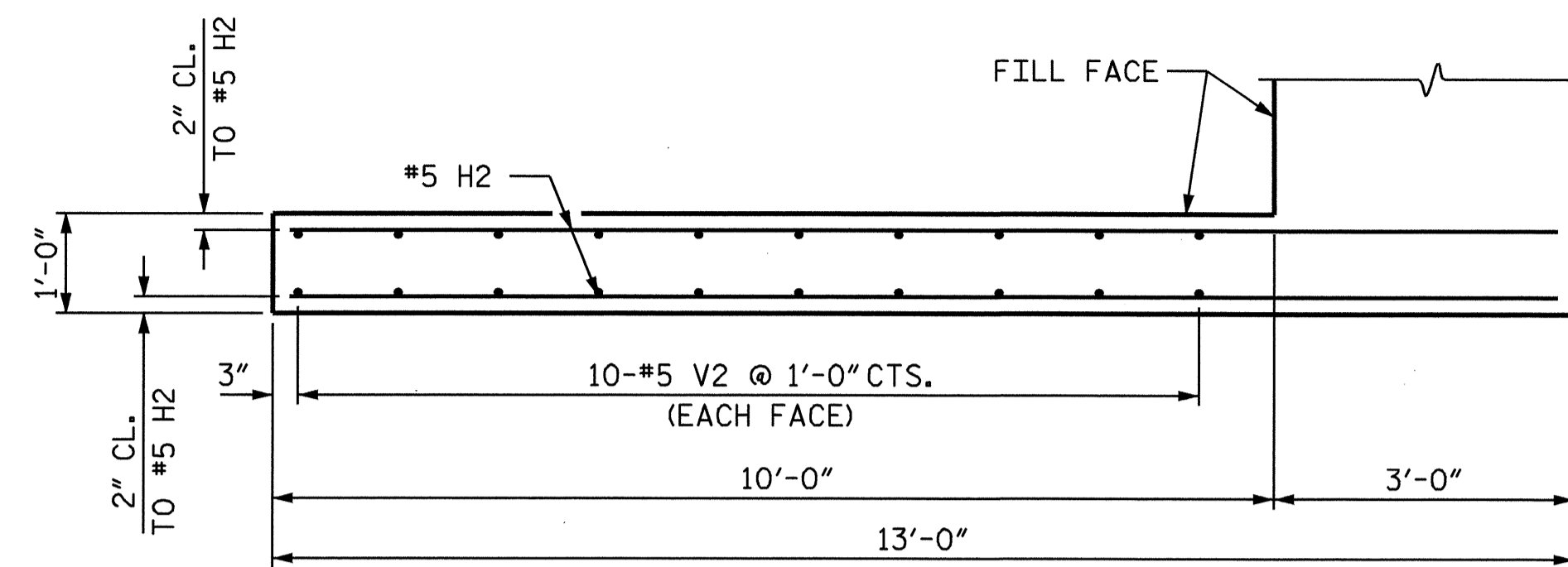
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 1

DRAWN BY: J.D. HAWK DATE: 3/20/08
 CHECKED BY: O. PUIGSERVER DATE: 4/7/08

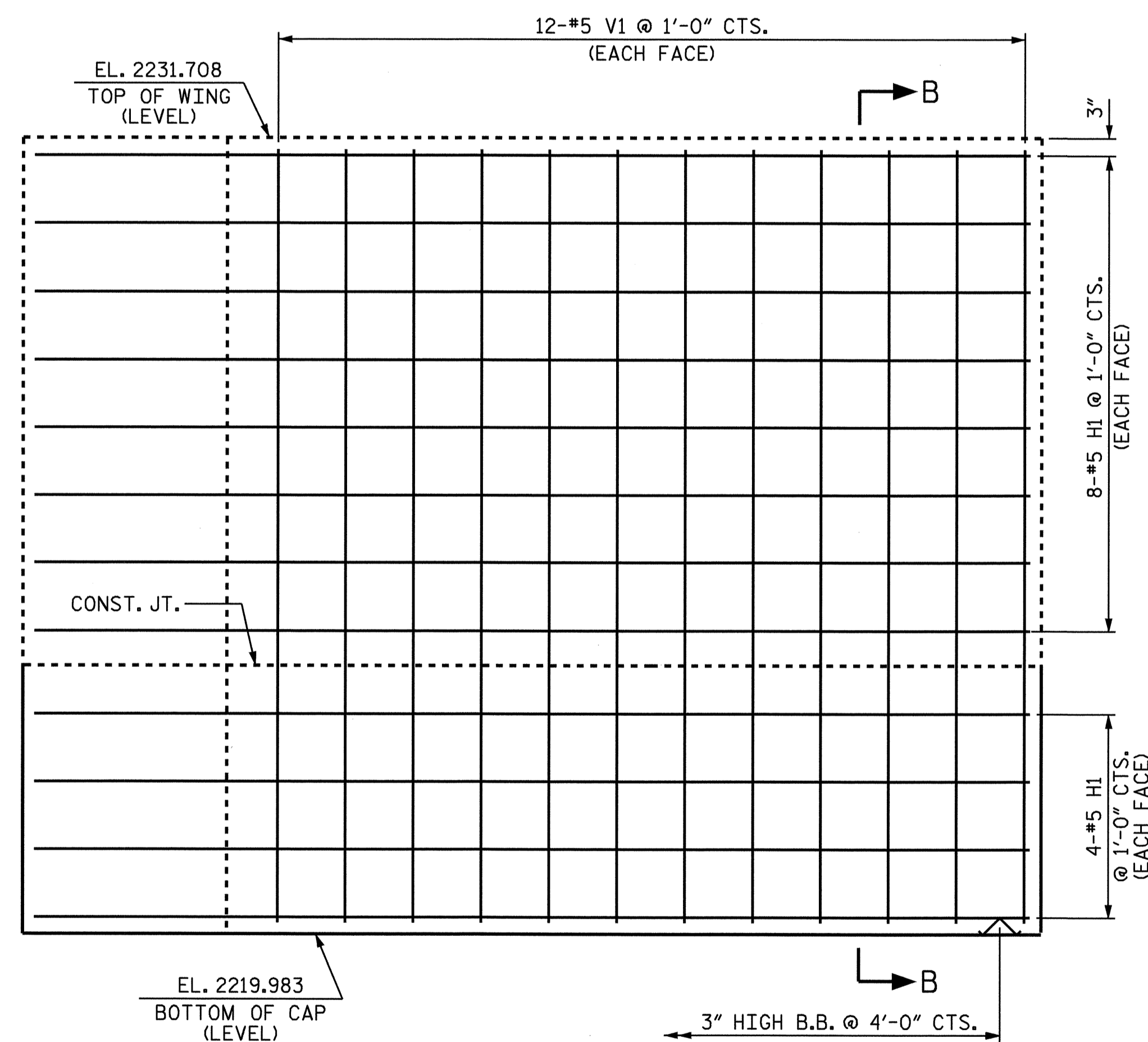
REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			



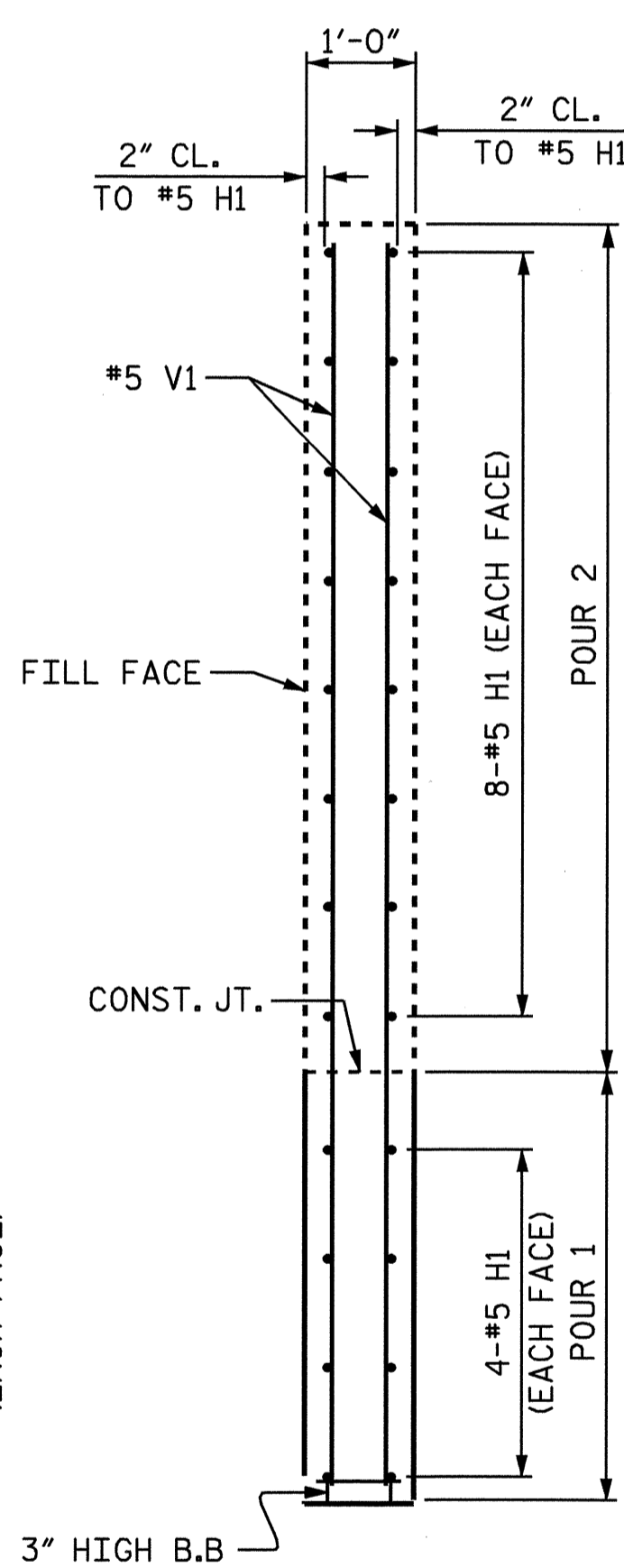
PLAN (W1)



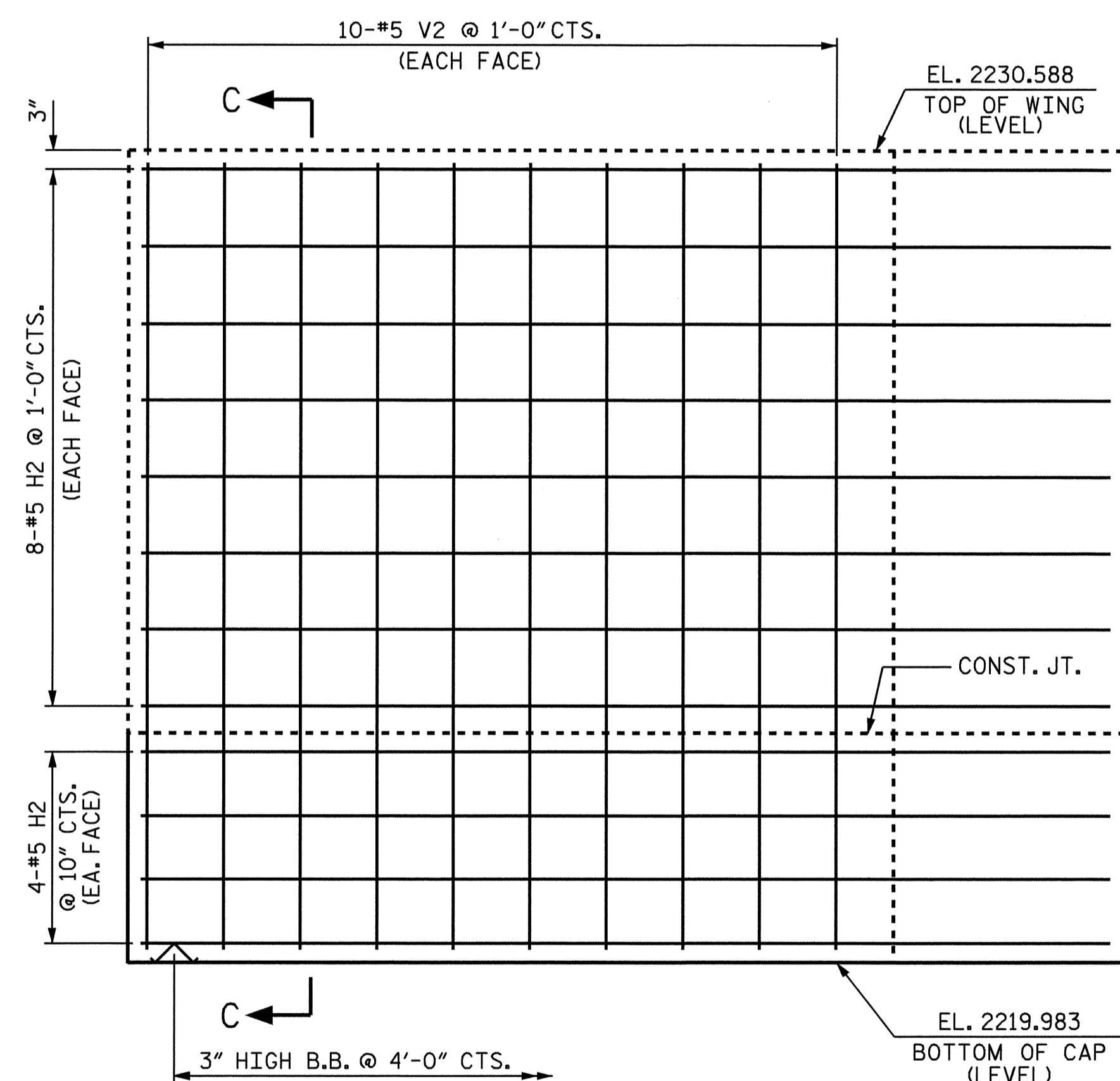
PLAN (W2)



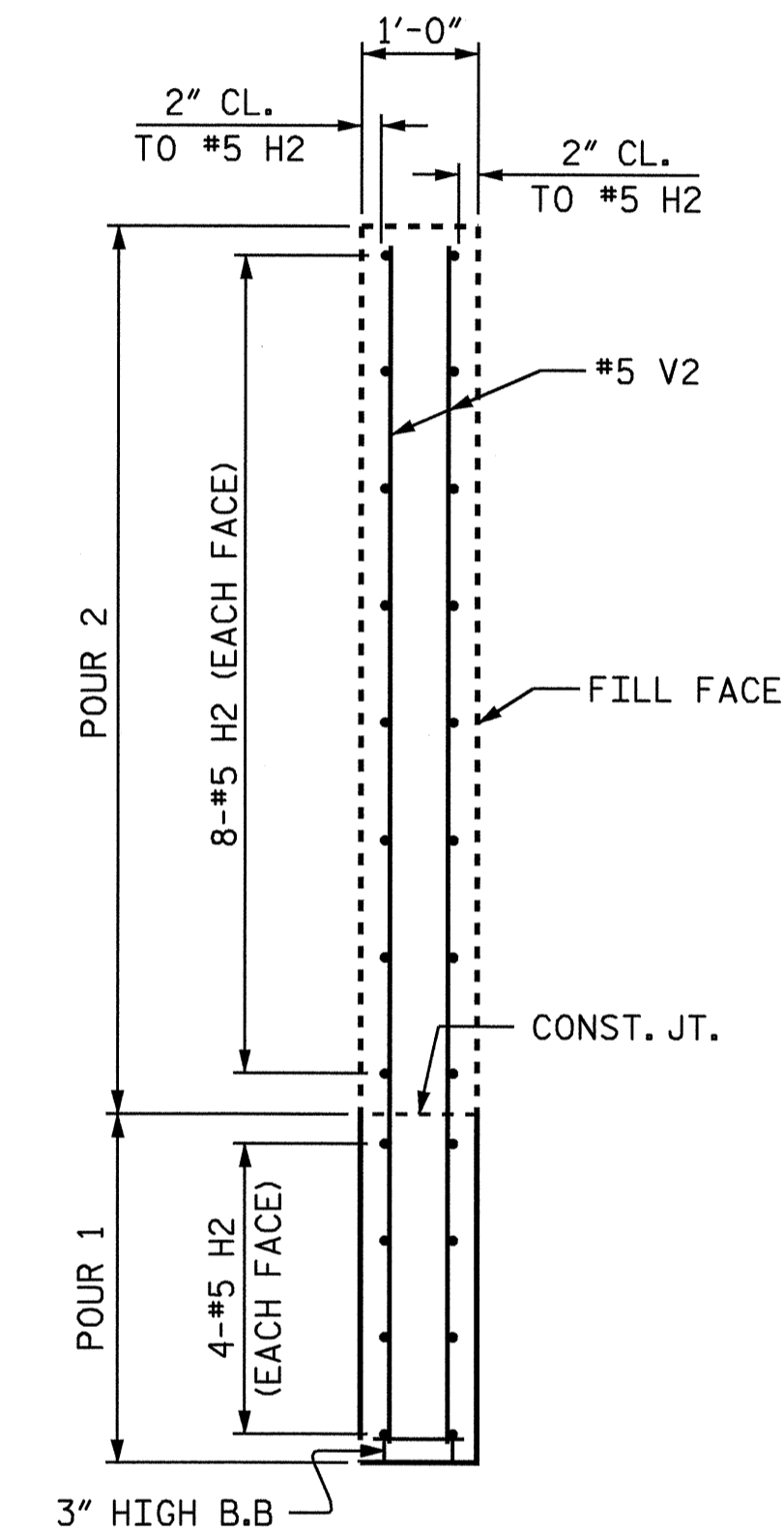
ELEVATION (W1)



SECTION B-B



ELEVATION (W2)



SECTION C-C

WING DETAILS



PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

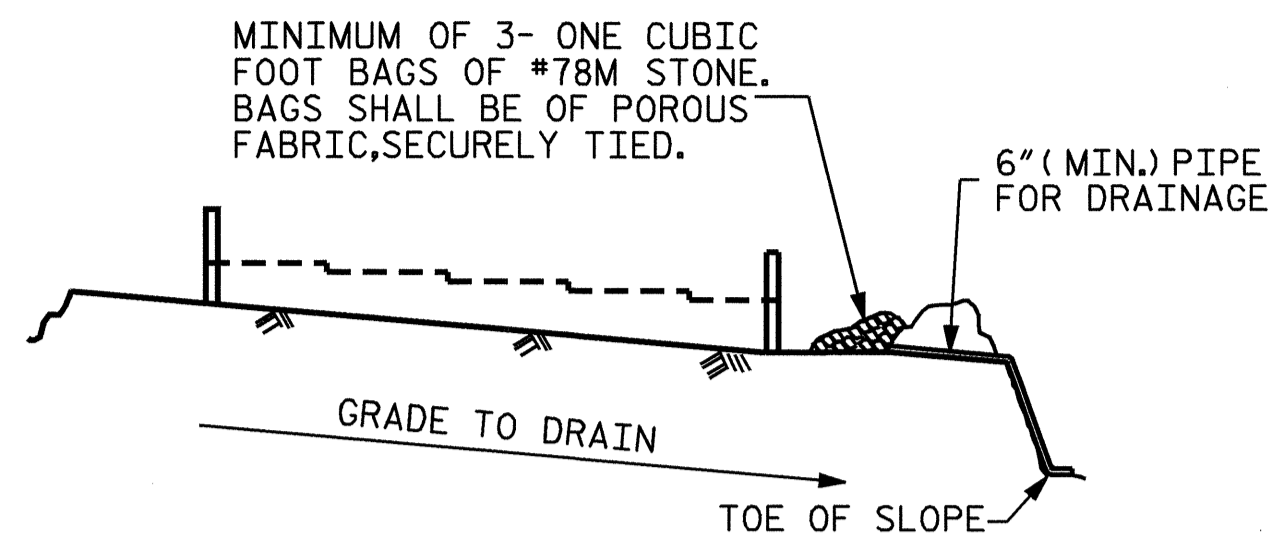
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : J.D. HAWK DATE : 3/20/08
 CHECKED BY : O. PUJGCERVER DATE : 4/7/08



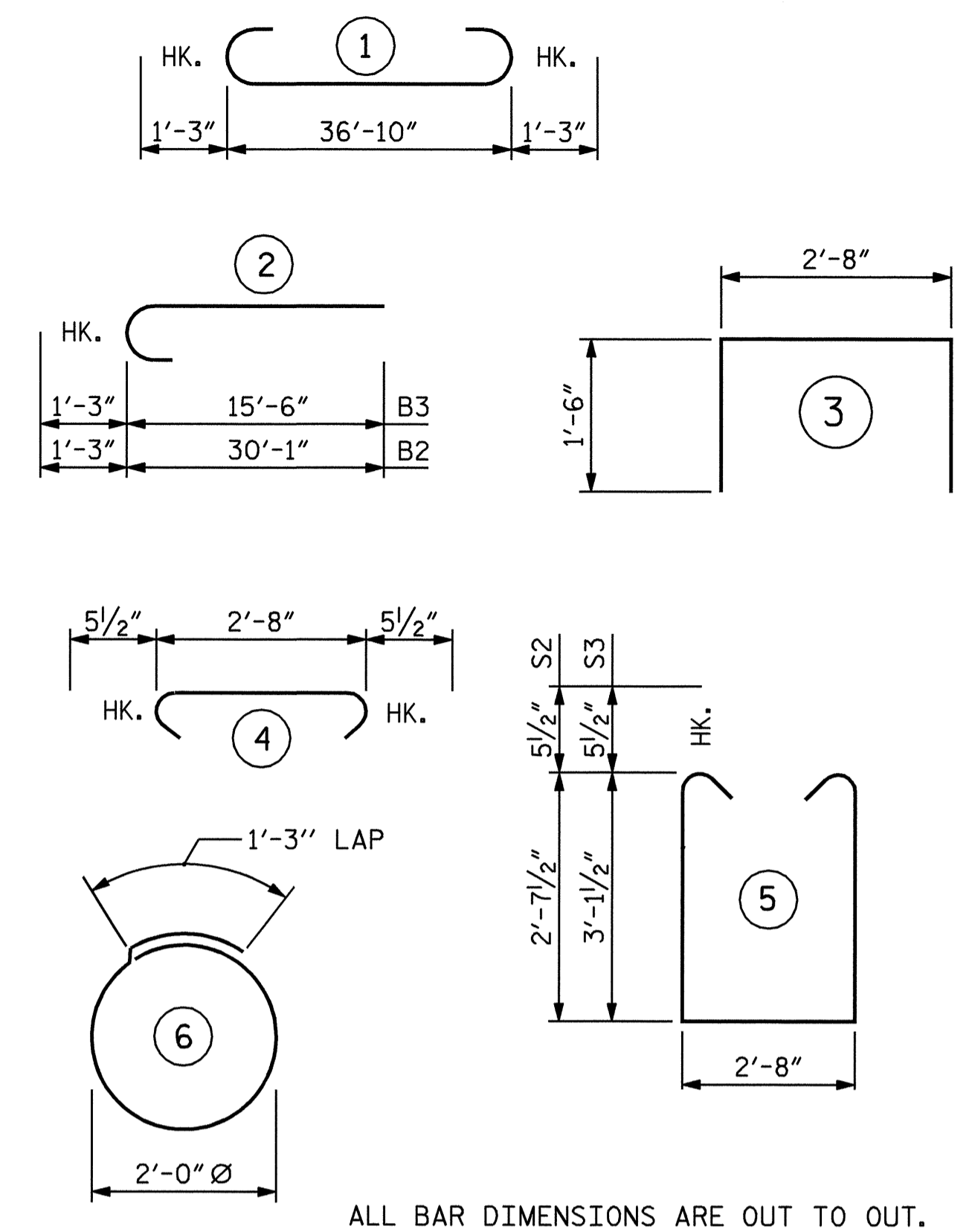
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

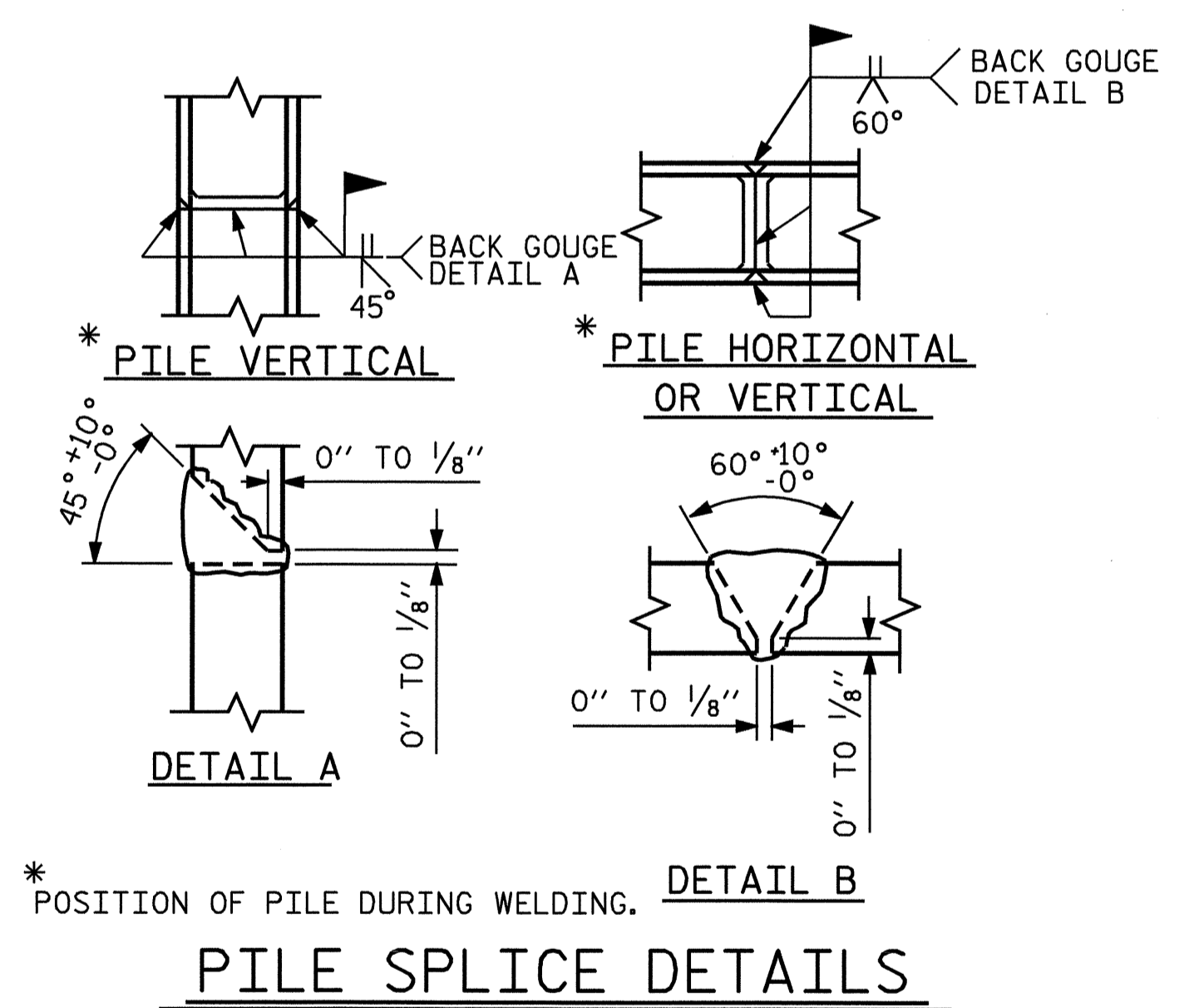
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

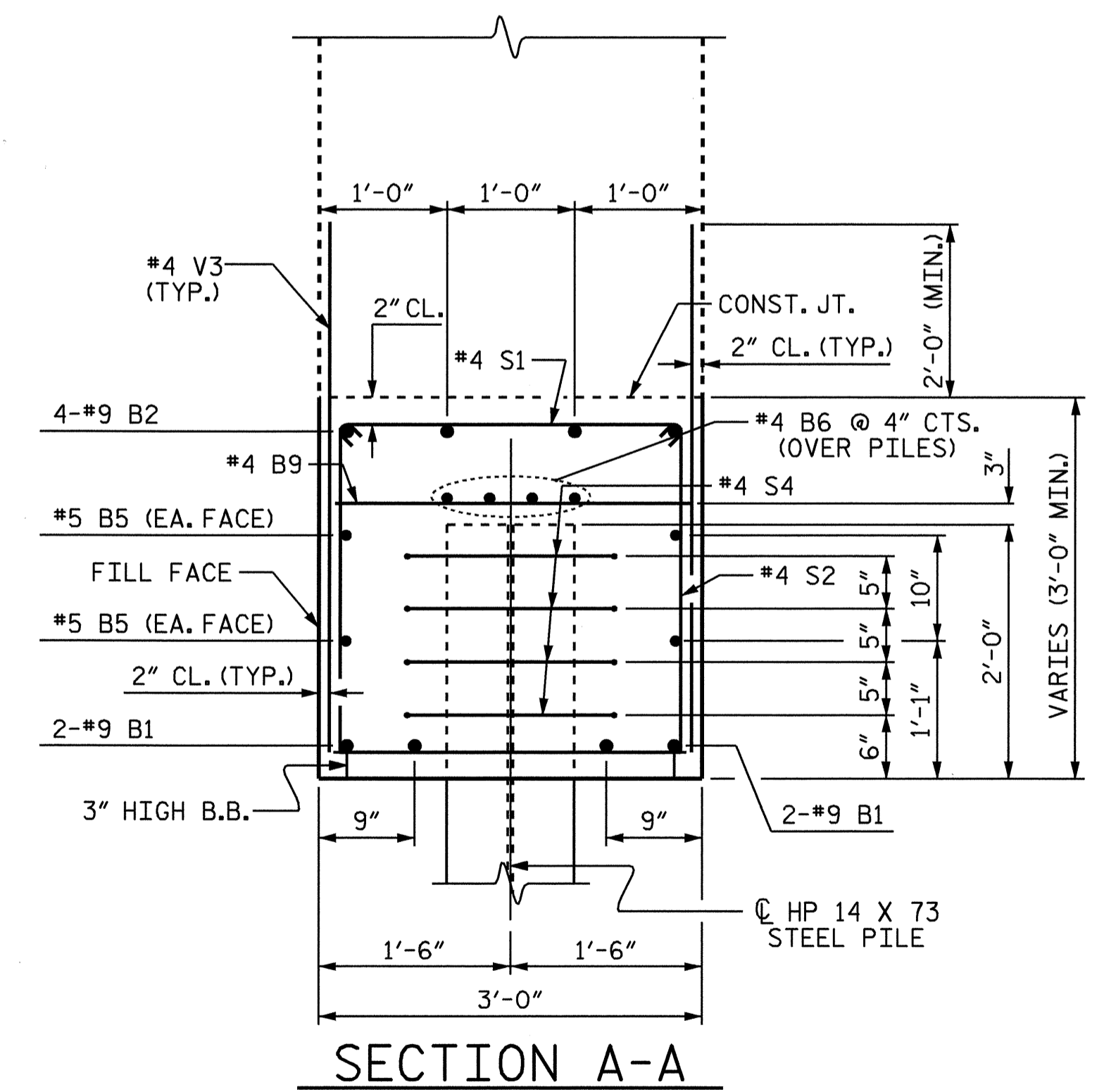
BILL OF MATERIAL					
INTEGRAL END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	39'-4"	535
B2	4	#9	2	31'-4"	426
B3	4	#9	2	16'-9"	228
B4	4	#5	STR	10'-0"	42
B5	4	#5	STR	36'-11"	154
B6	8	#4	STR	19'-8"	105
B7	4	#4	STR	7'-7"	20
B8	4	#4	STR	8'-0"	21
B9	15	#4	STR	2'-8"	27
H1	24	#5	STR	14'-8"	367
H2	24	#5	STR	12'-8"	317
S1	44	#5	4	3'-7"	164
S2	25	#5	5	8'-10"	230
S3	19	#5	5	9'-10"	196
S4	32	#4	6	7'-7"	162
U1	12	#4	3	5'-8"	45
V1	24	#5	STR	11'-4"	284
V2	20	#5	STR	10'-3"	214
V3	66	#4	STR	6'-0"	265
REINFORCING STEEL					= 3802 LBS
CLASS A CONCRETE BREAKDOWN					
▲ POUR 1 (CAP AND LOWER PART OF WINGS)				17.0 CU.YDS.	
TOTAL				17.0 CU.YDS.	
PILE EXCAVATION IN SOIL				40.0 LIN. FT.	
PILE EXCAVATION NOT IN SOIL				40.0 LIN. FT.	
HP 14 x 73 STEEL PILES					
NO. 8					120 FT.
▲ UPPER WINGS (POUR 2) TO BE POURED WITH SUPERSTRUCTURE					



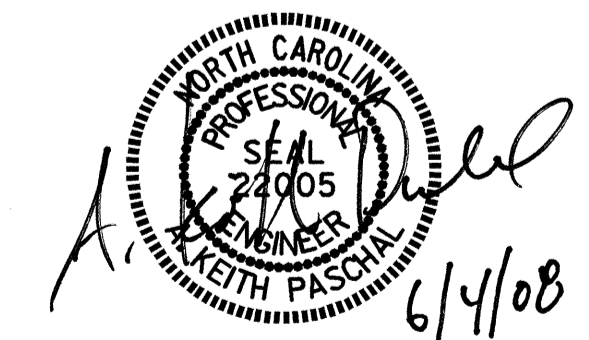
ALL BAR DIMENSIONS ARE OUT TO OUT.



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



SECTION A-A



PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-
 SHEET 3 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			23

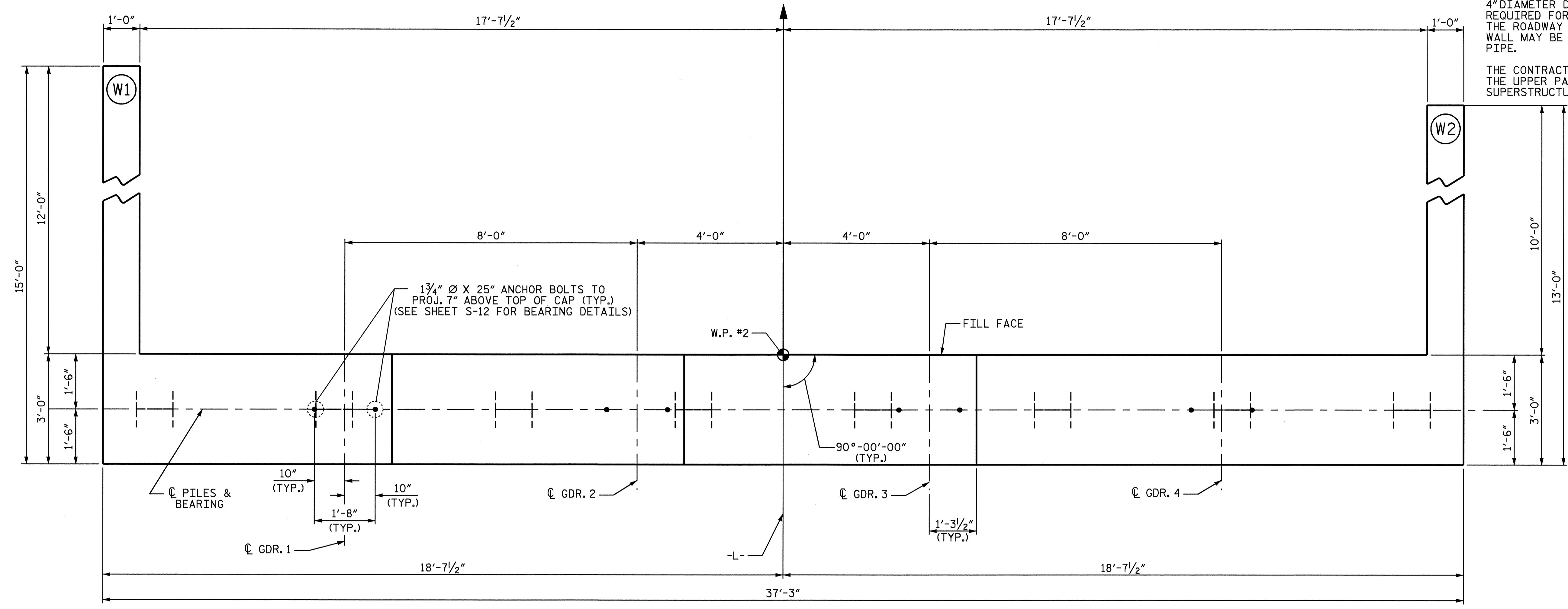
DRAWN BY: J.D. HAWK DATE: 3/20/08
 CHECKED BY: O. PUJGCERVER DATE: 4/7/08

NOTES

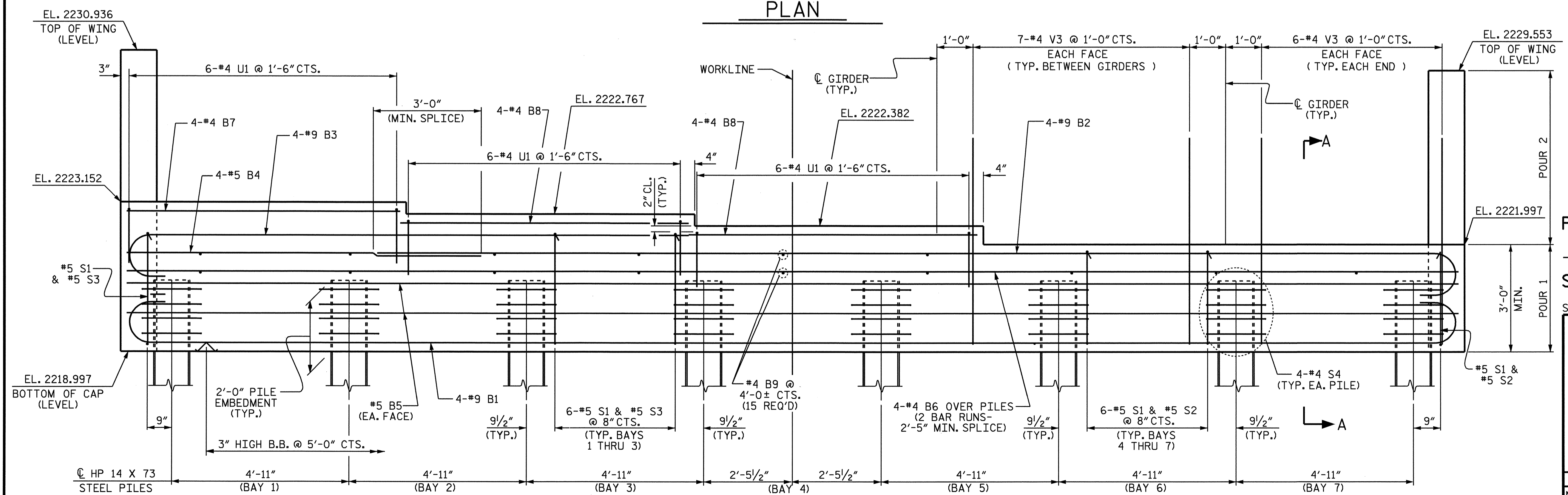
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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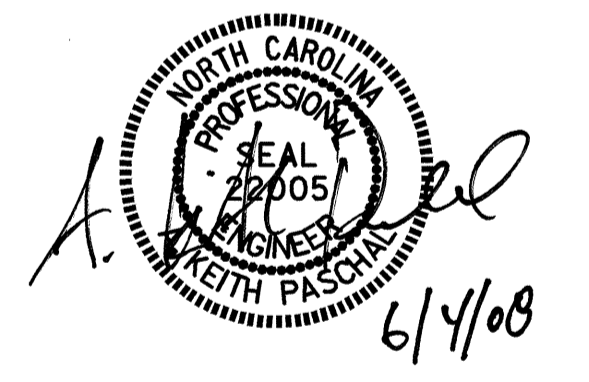
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS ARE TO BE POURED WITH SUPERSTRUCTURE.



PLAN



ELEVATION



PROJECT NO. B-4037
 BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

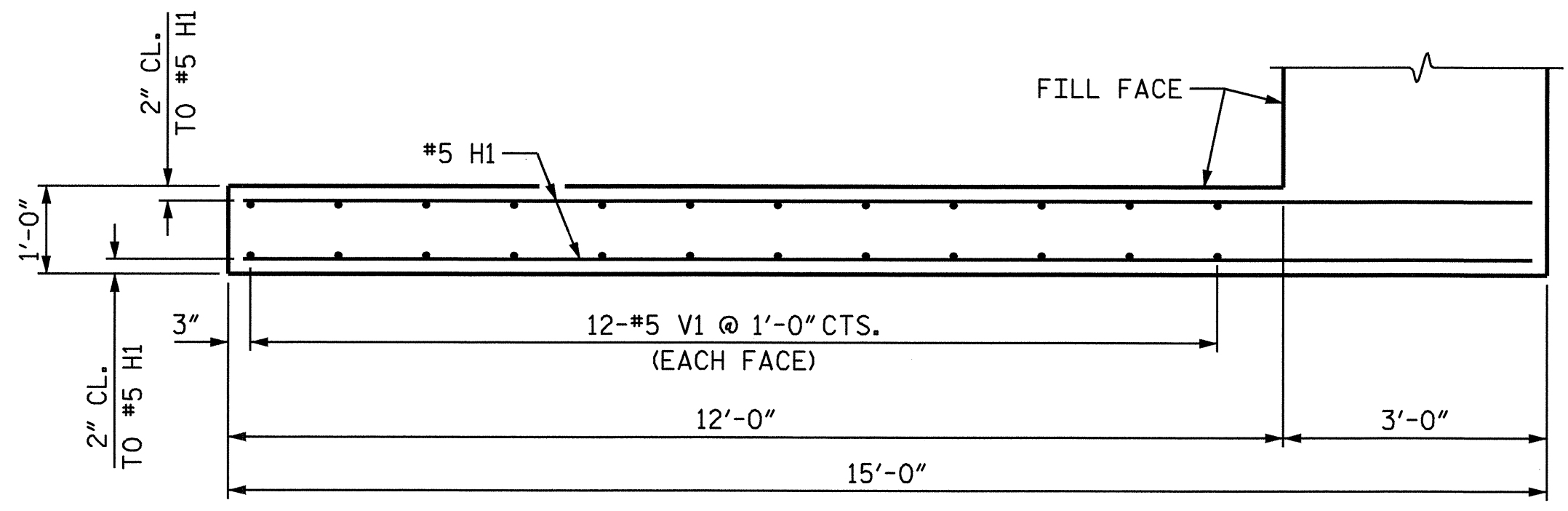
SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

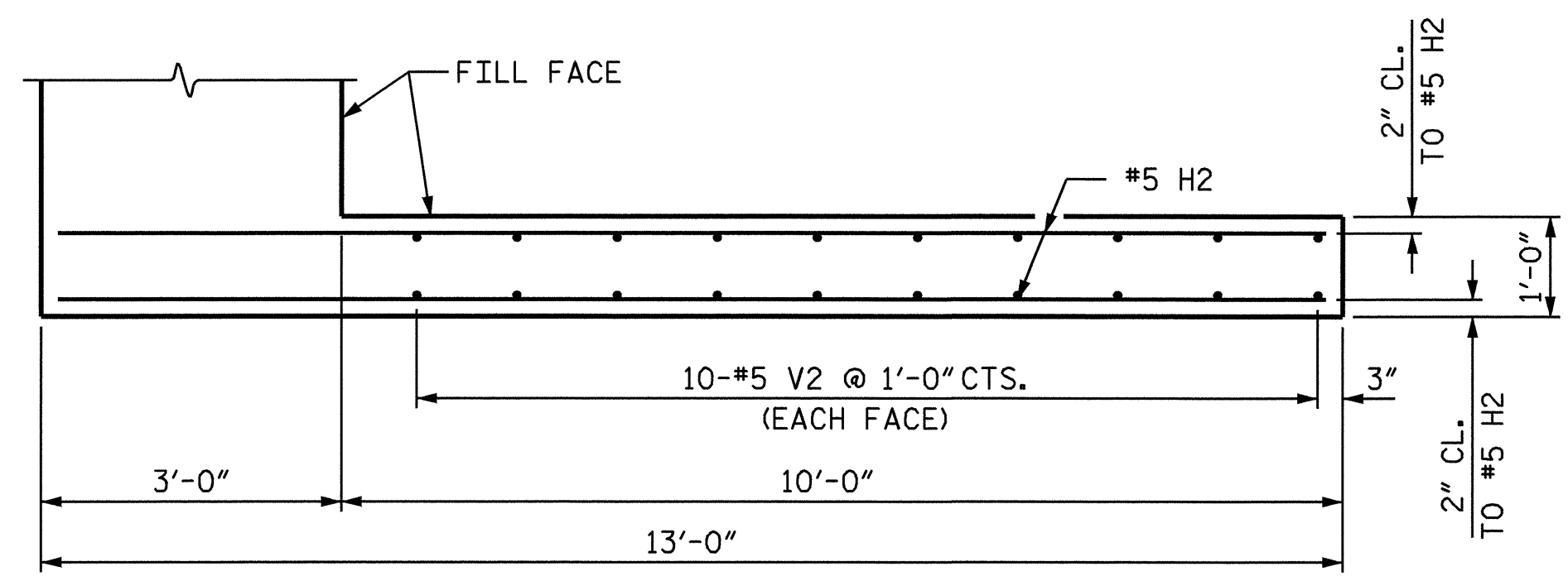
**SUBSTRUCTURE
 INTEGRAL END BENT 2**

REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			

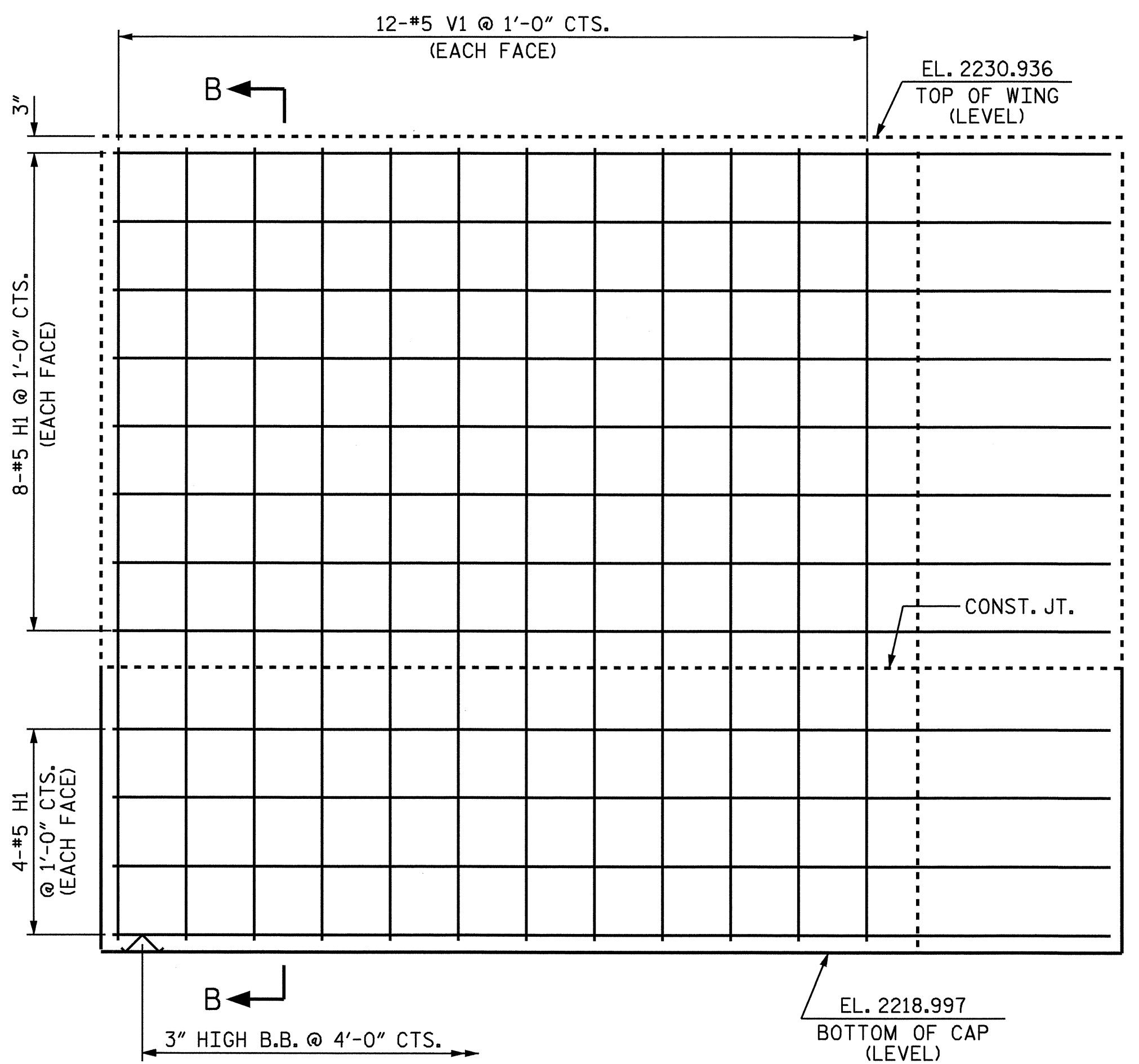
DRAWN BY: J.D. HAWK DATE: 3/20/08
 CHECKED BY: O. PUTIGSERVER DATE: 4/7/08



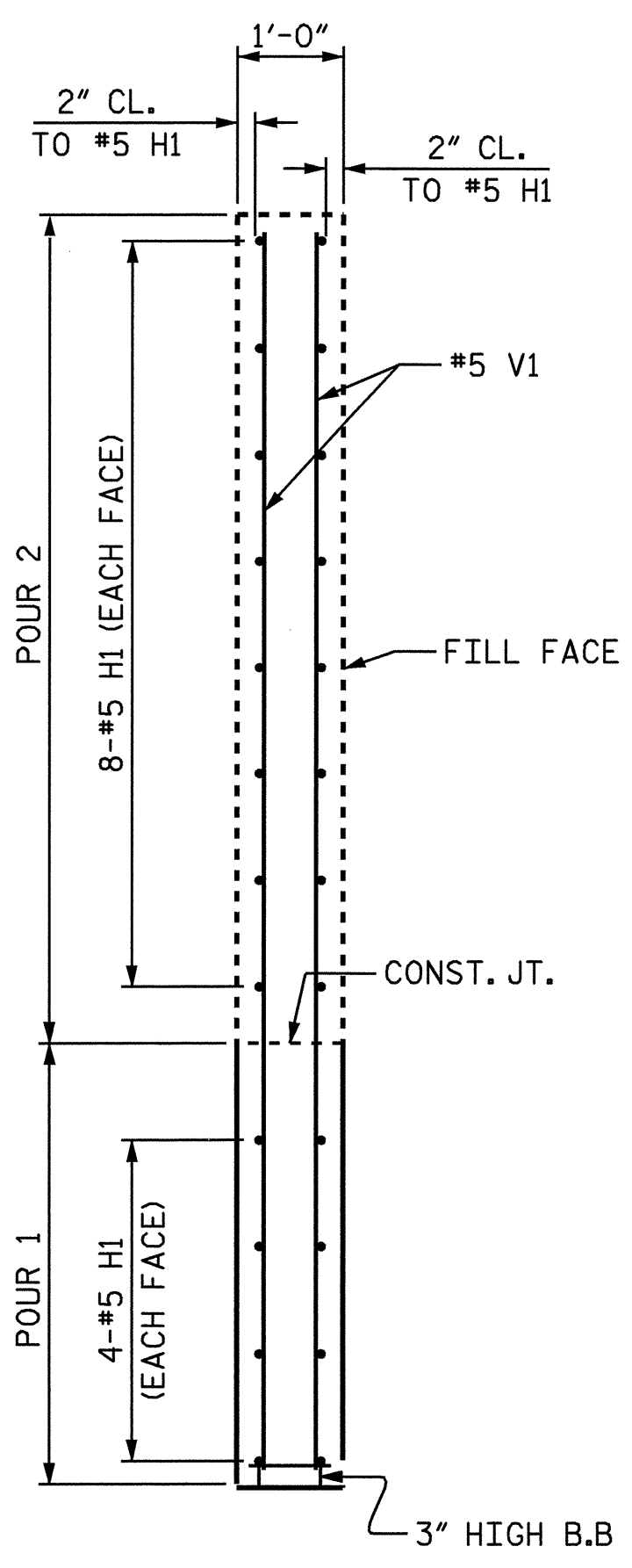
PLAN (W1)



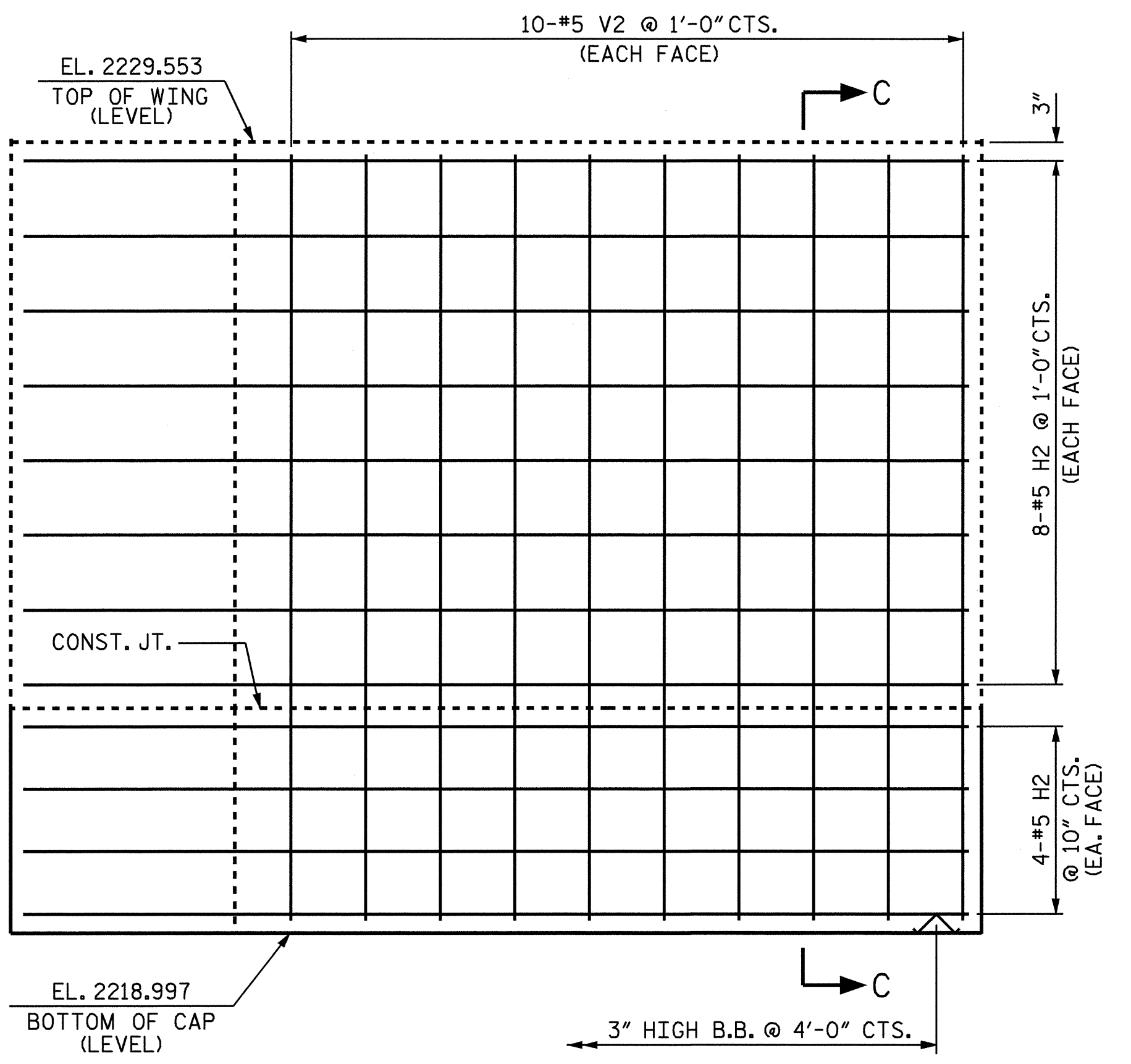
PLAN (W2)



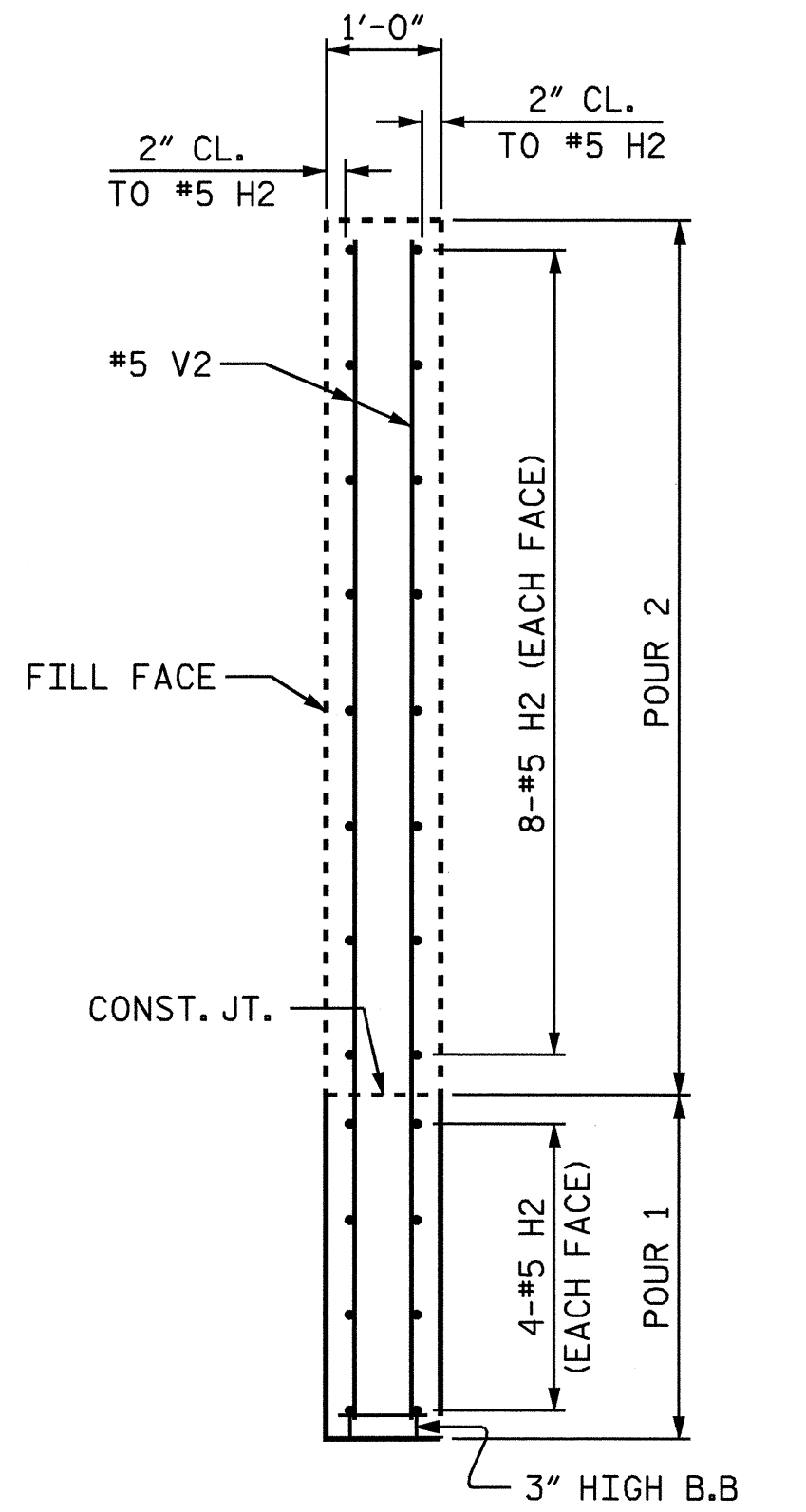
ELEVATION (W1)



SECTION B-B



ELEVATION (W2)



SECTION C-C

WING DETAILS

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 2 OF 3

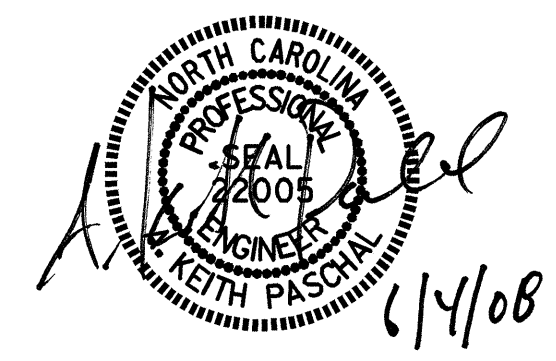
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

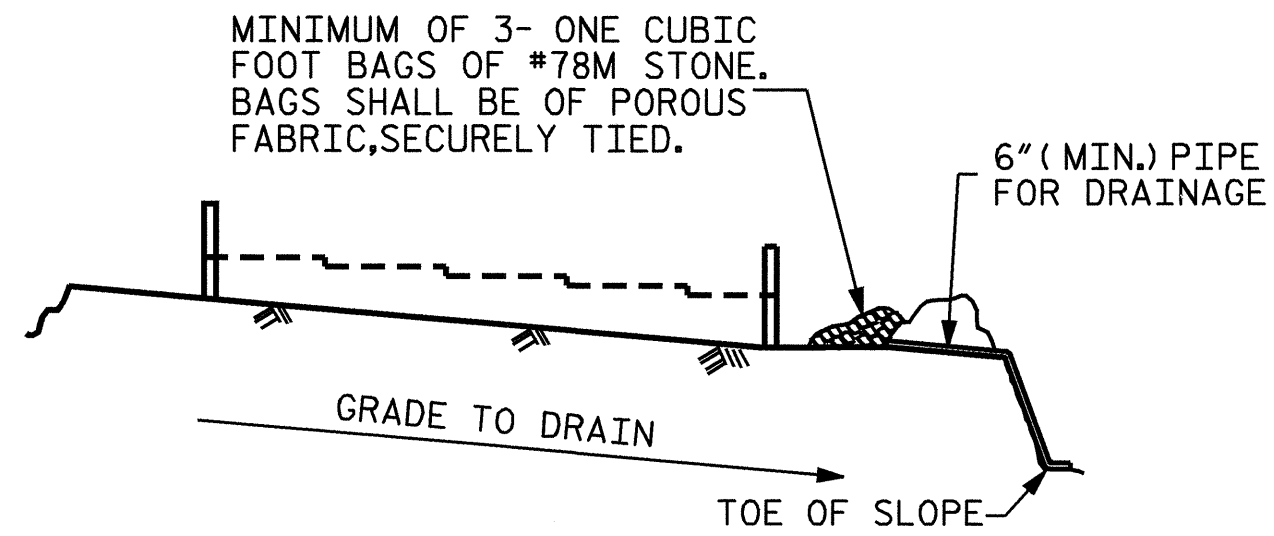
SUBSTRUCTURE
 INTEGRAL END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

DRAWN BY: J.D. HAWK DATE: 3/20/08
 CHECKED BY: O. PUIGCERVER DATE: 4/7/08

28-APR-2008 09:55
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 Jdhawk



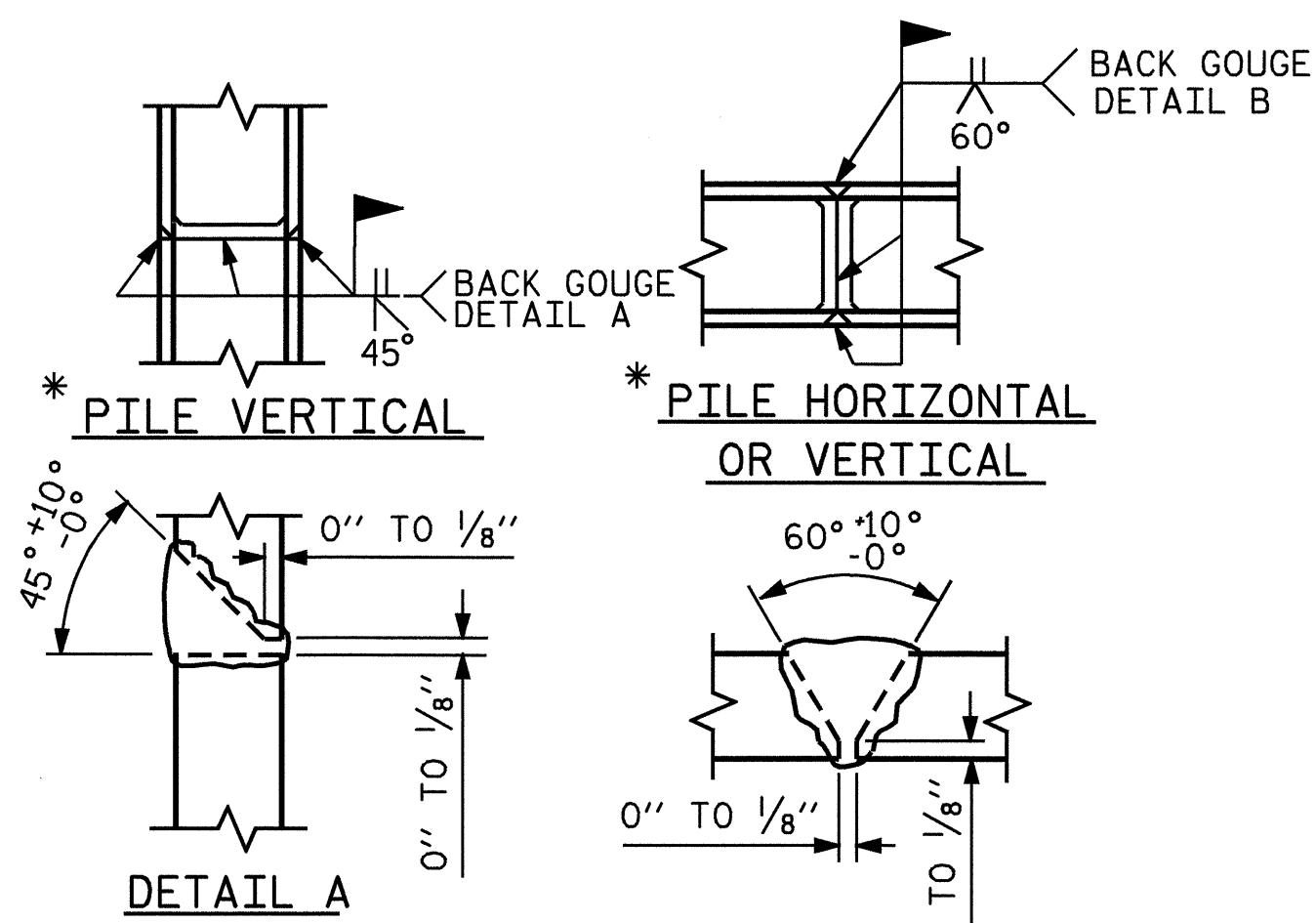


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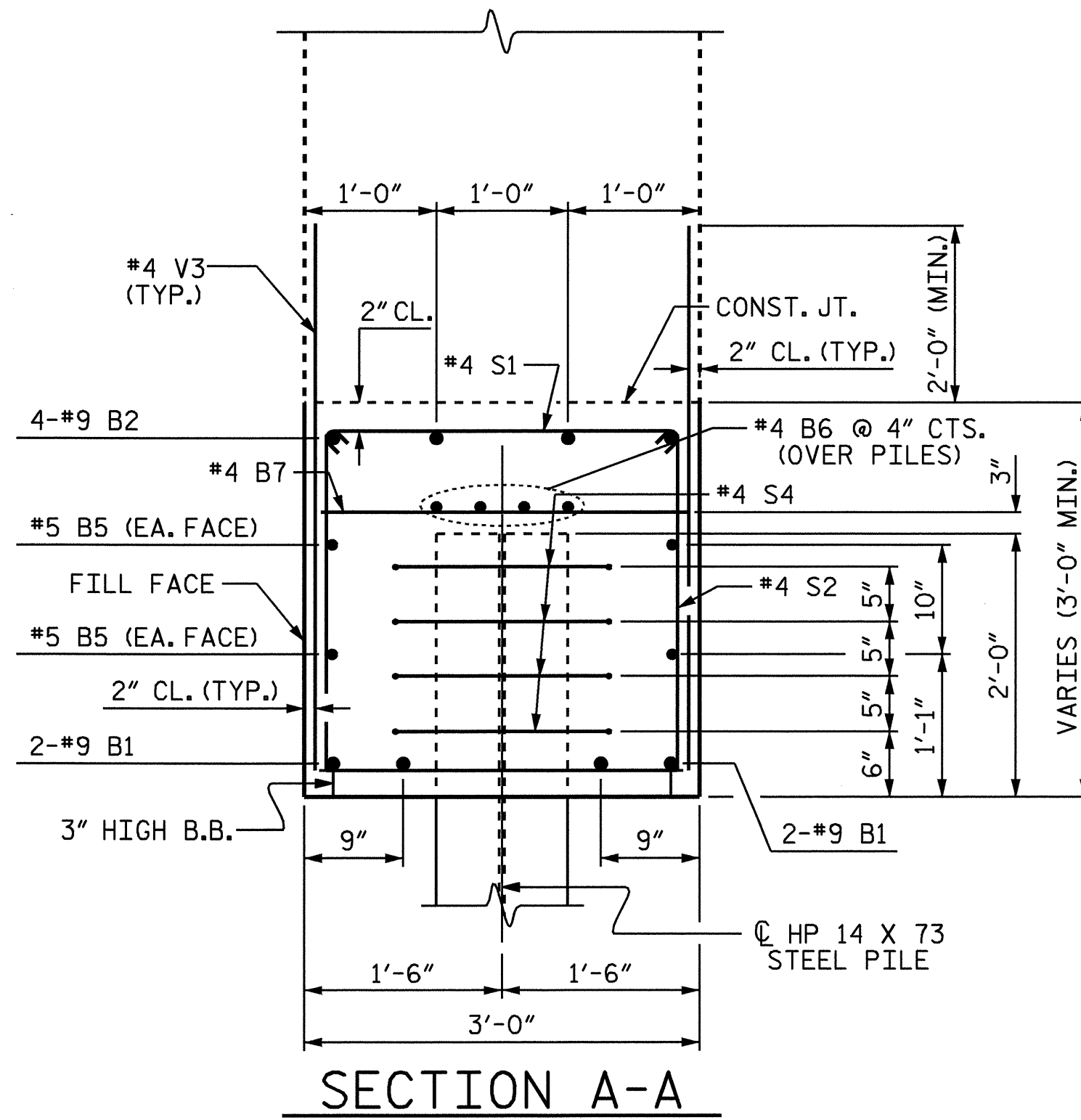
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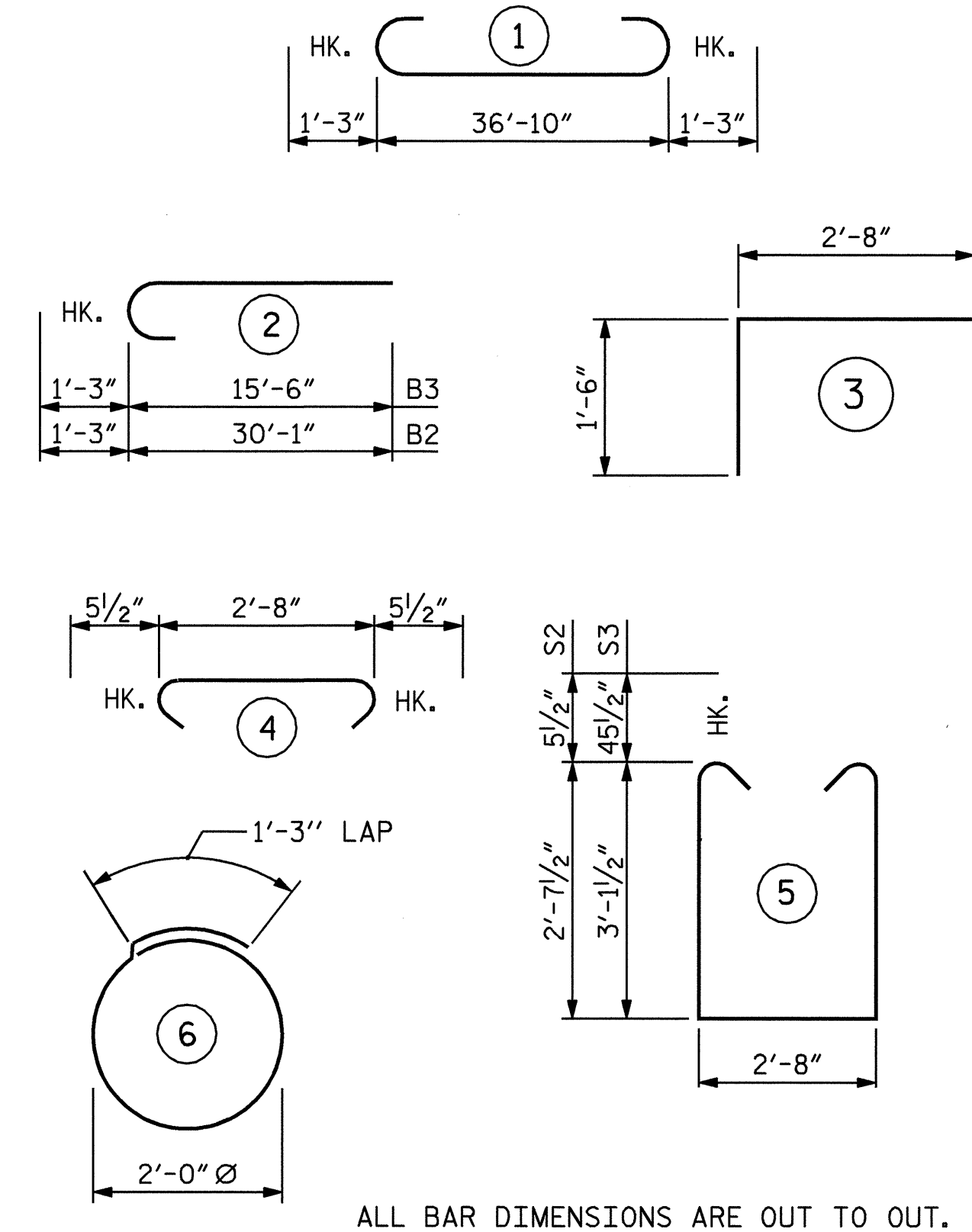
TEMPORARY DRAINAGE AT END BENT



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



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

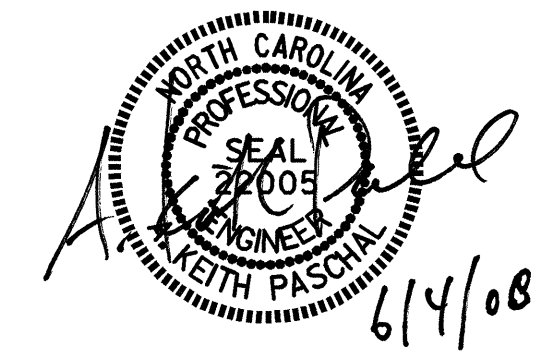
BILL OF MATERIAL					
INTEGRAL END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	39'-4"	535
B2	4	#9	2	31'-4"	426
B3	4	#9	2	16'-9"	228
B4	4	#5	STR	10'-0"	42
B5	4	#5	STR	36'-11"	154
B6	8	#4	STR	19'-8"	105
B7	4	#4	STR	7'-7"	20
B8	8	#4	STR	8'-0"	43
B9	15	#4	STR	2'-8"	27
H1	24	#5	STR	14'-8"	367
H2	24	#5	STR	12'-8"	317
S1	44	#5	4	3'-7"	164
S2	25	#5	5	8'-10"	230
S3	19	#5	5	9'-10"	196
S4	32	#4	6	7'-7"	162
U1	18	#4	3	5'-8"	68
V1	24	#5	STR	11'-7"	290
V2	20	#5	STR	10'-2"	212
V3	66	#4	STR	6'-2"	272
REINFORCING STEEL =					3858 LBS
CLASS A CONCRETE BREAKDOWN					
▲ POUR 1 (CAP AND LOWER PART OF WINGS)					17.6 CU.YDS.
TOTAL					17.6 CU.YDS.
PILE EXCAVATION IN SOIL					96.0 LIN. FT.
PILE EXCAVATION NOT IN SOIL					40.0 LIN. FT.
HP 14 x 73 STEEL PILES					
NO. 8					160 FT.
▲ UPPER WINGS (POUR 2) TO BE POURED WITH SUPERSTRUCTURE					

PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 3 OF 3

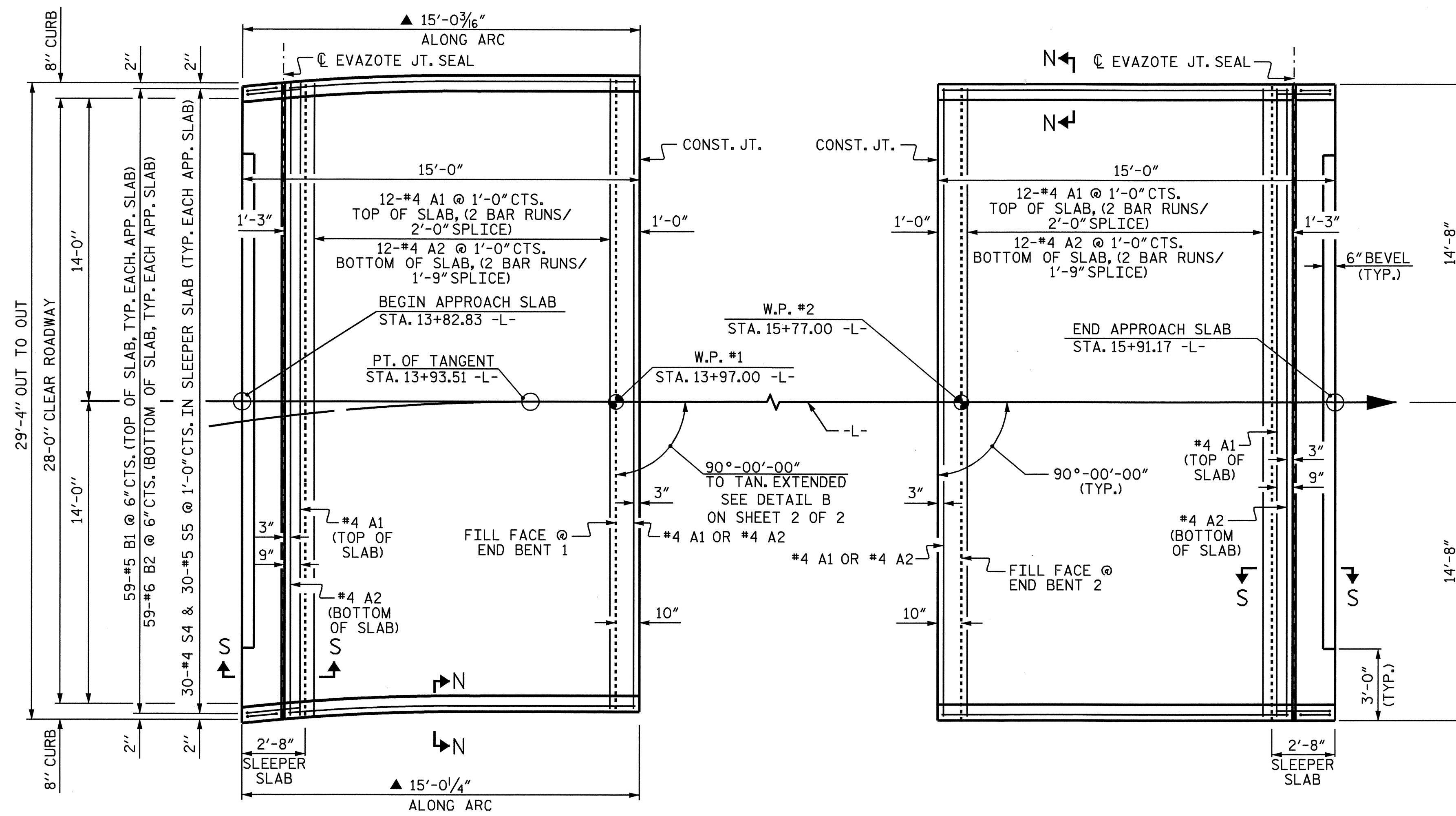
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL END BENT 2



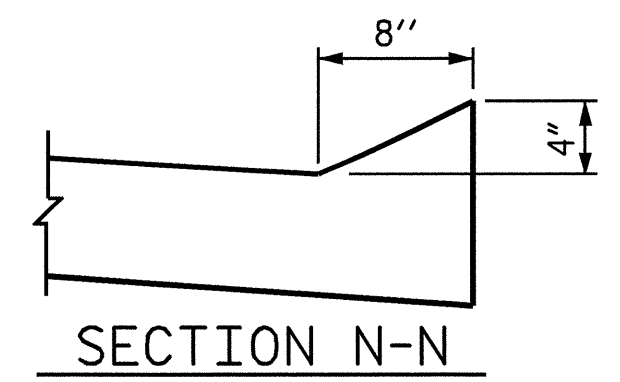
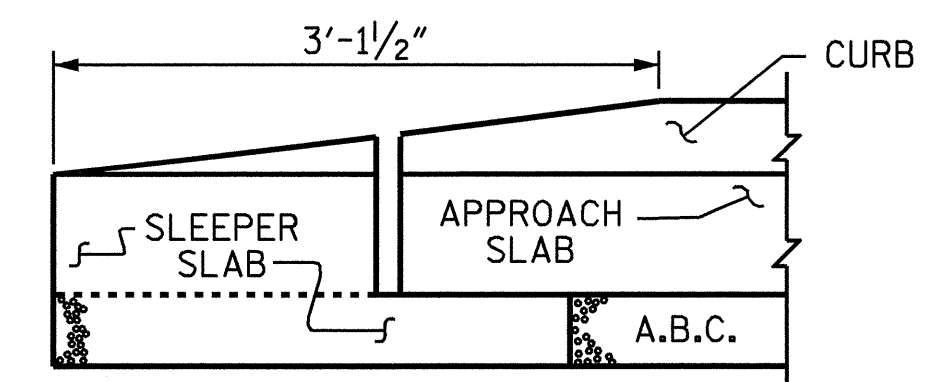
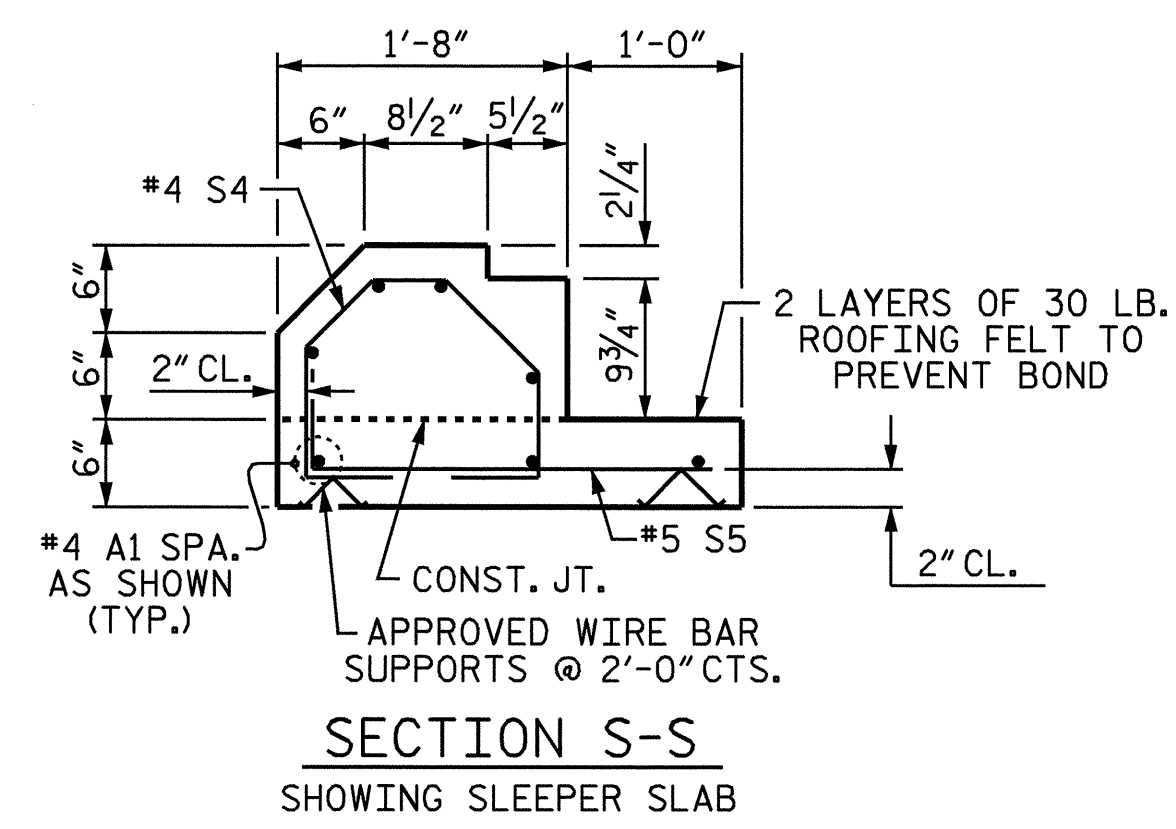
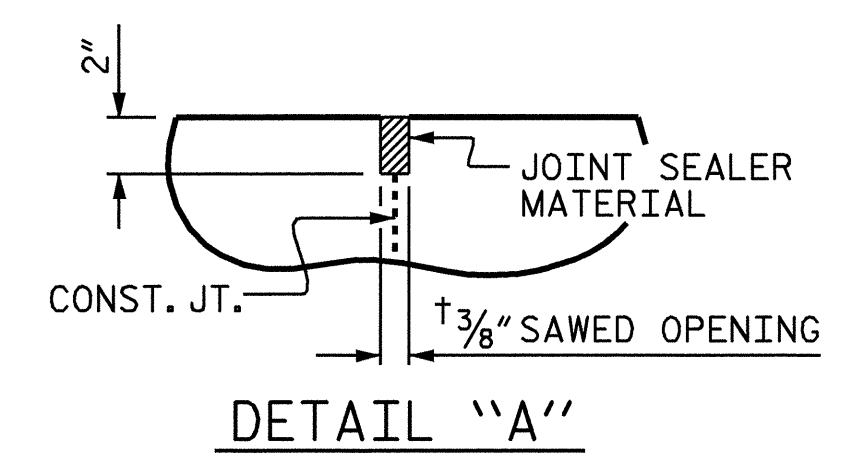
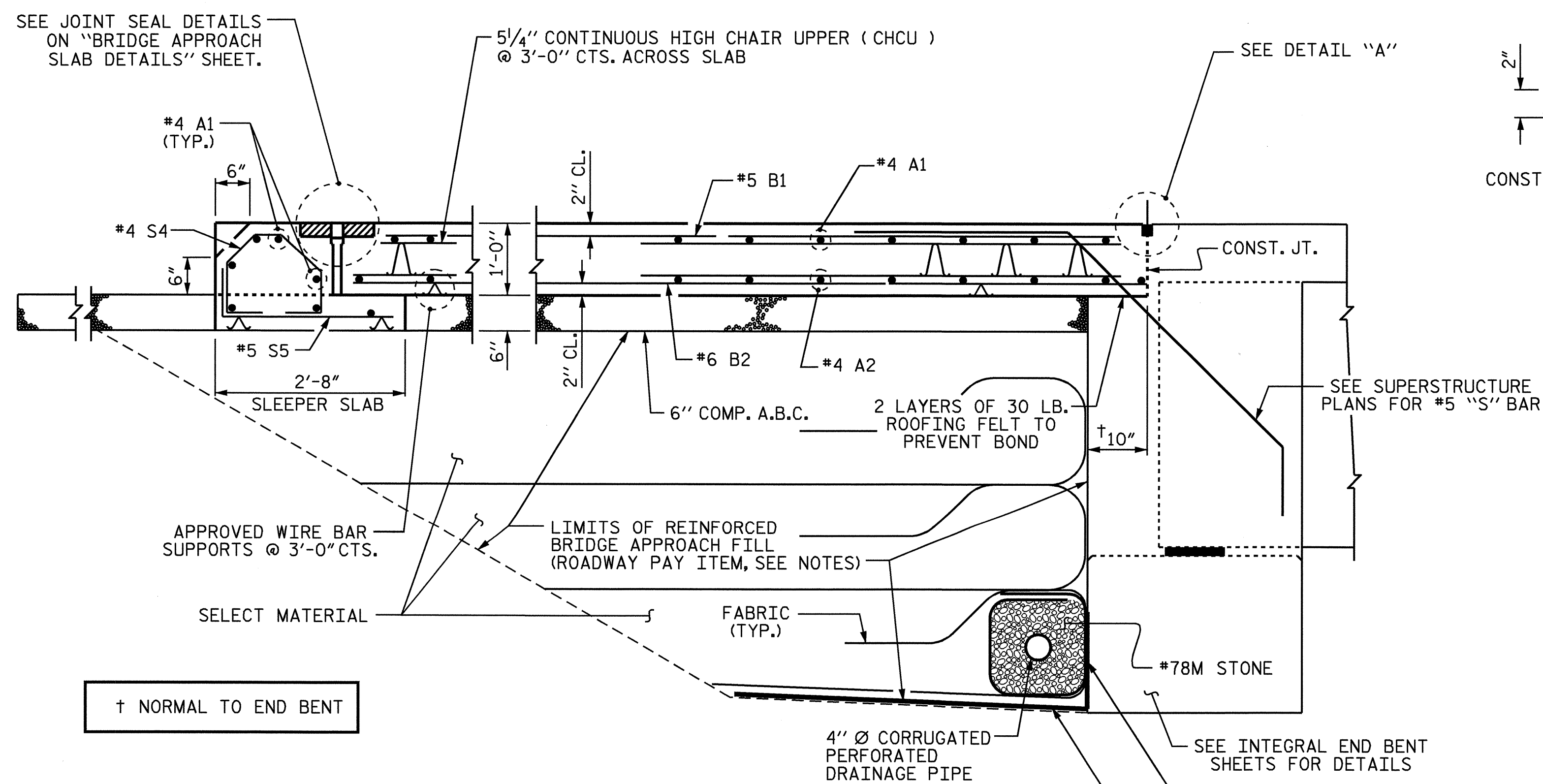
DRAWN BY: J.D. HAWK DATE: 3/20/08
 CHECKED BY: O. PUIGSERVER DATE: 4/7/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			23



▲ FOR ARC OFFSETS SEE SHEET 2 OF 2

PLAN @ END BENT 1
PLAN @ END BENT 2
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. #4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.



SECTION THRU SLAB

END OF CURB WITHOUT SHOULDER BERM GUTTER
 (OMIT TAPER WHEN SHOULDER BERM GUTTER IS REQUIRED)

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 SLEEPER SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF 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 SLEEPER 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 SLEEPER 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 VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE EVAZOTE JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWS NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

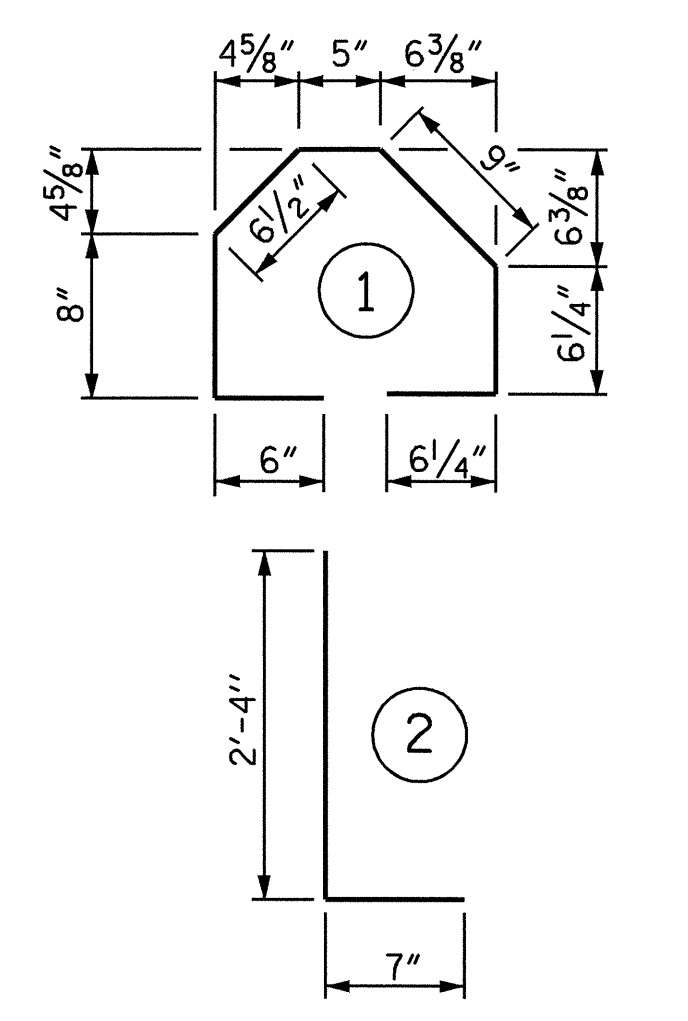
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	42	#4	STR	15'-6"	435
A2	28	#4	STR	15'-5"	288
* B1	59	#5	STR	12'-6"	769
B2	59	#6	STR	12'-11"	1145
* S4	30	#4	1	3'-11"	78
S5	30	#5	2	2'-11"	91
REINFORCING STEEL					LBS. 1524
* EPOXY COATED REINFORCING STEEL					LBS. 1282
CLASS AA CONCRETE					
POUR 1 - SLAB & CURB					C. Y. 14.6
POUR 2 - SLEEPER SLAB					C. Y. 3.3
TOTAL					C. Y. 17.9

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

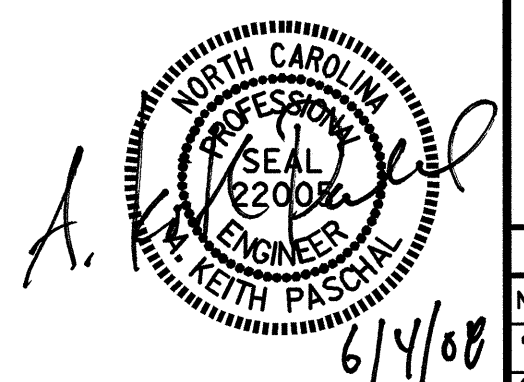
PROJECT NO. B-4037
BUNCOMBE COUNTY
 STATION: 14+87.00 -L-

SHEET 1 OF 2

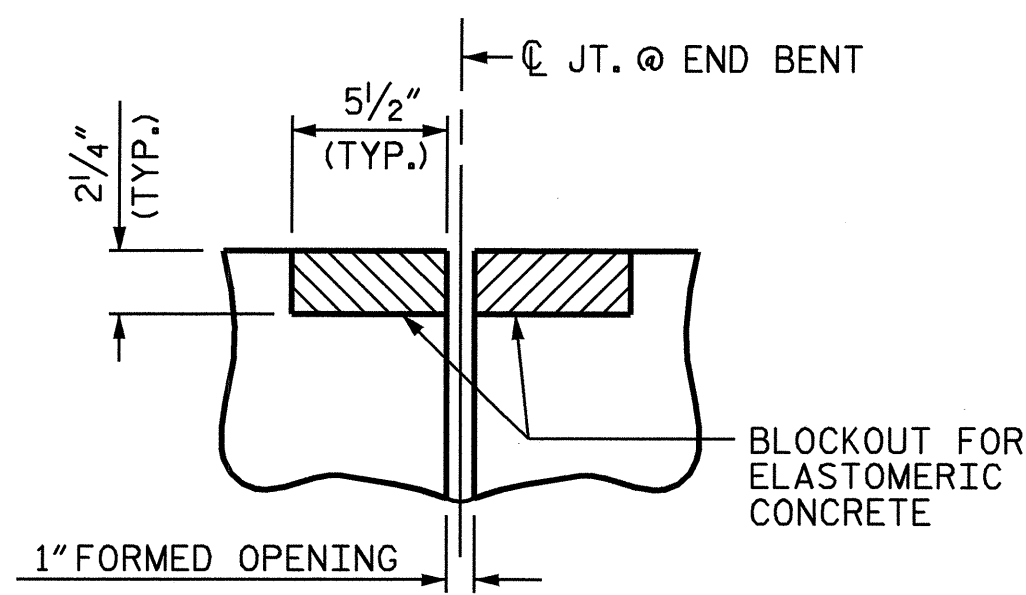
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH SLAB
 FOR INTEGRAL ABUTMENT

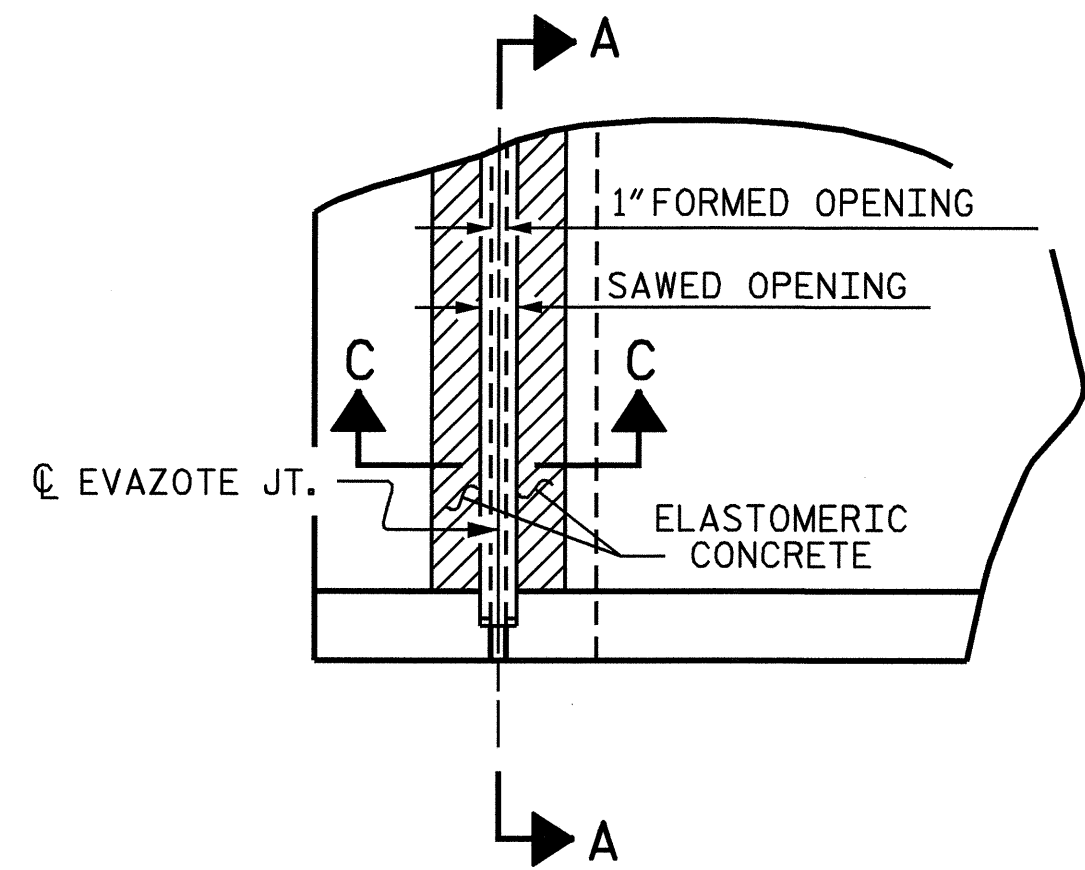
REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			



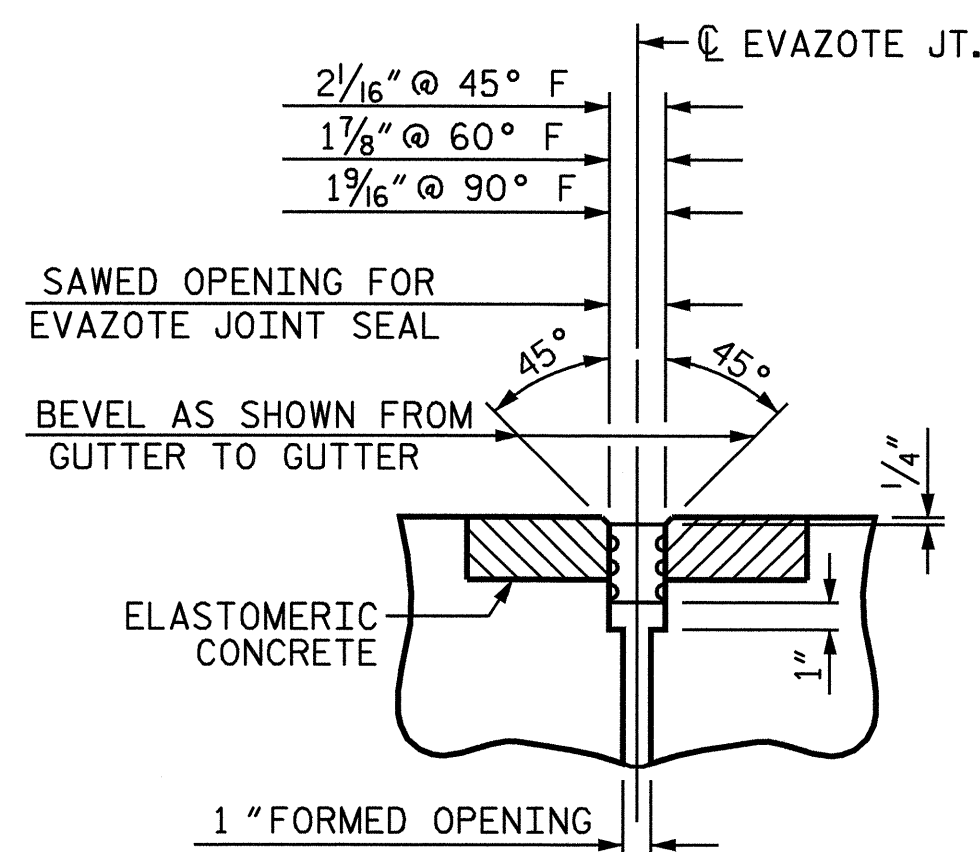
ASSEMBLED BY : M. FOWLER DATE : 4/9/08
 CHECKED BY : J.G. KHARVA DATE : 4/10/08
 DRAWN BY : TLA 10/05
 CHECKED BY : GM 5/06



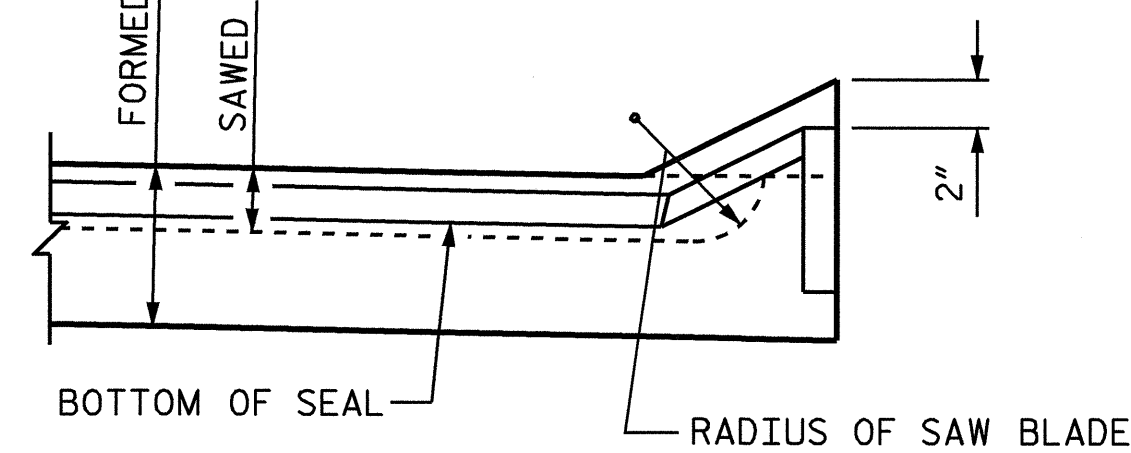
SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



PLAN



SECTION C-C
EVAZOTE JOINT SEAL

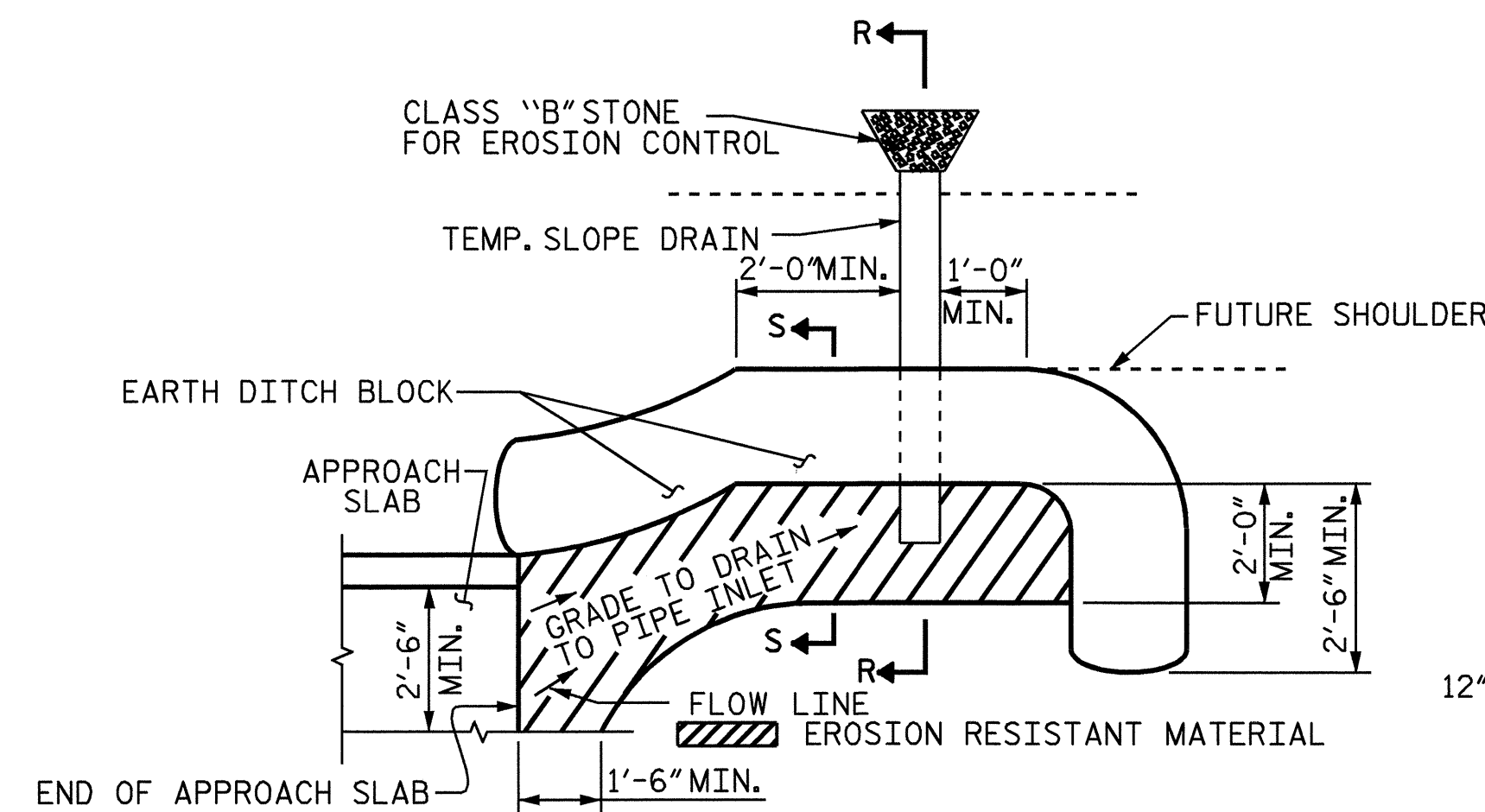


SECTION A-A

JOINT SEAL DETAILS @ SLEEPER SLAB

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	4.8
2	4.8
TOTAL	9.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

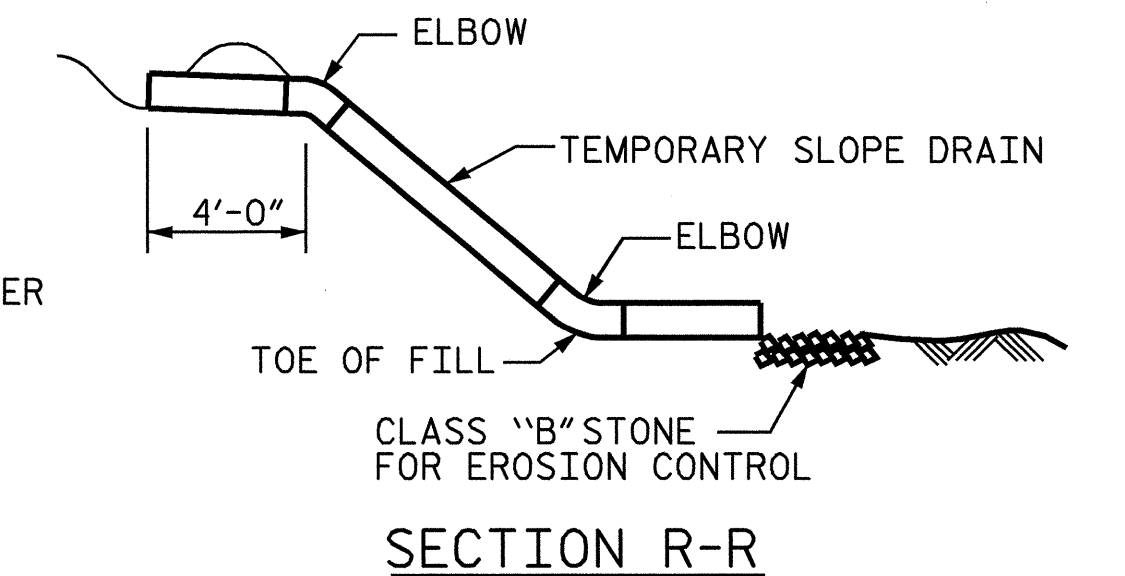


PLAN VIEW

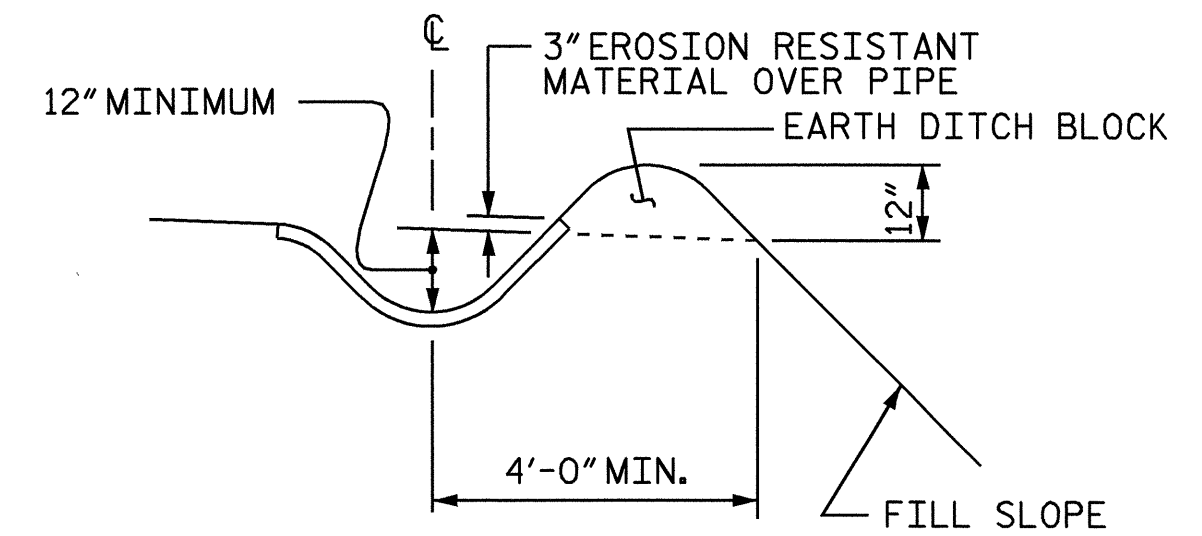
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL PROVIDE GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

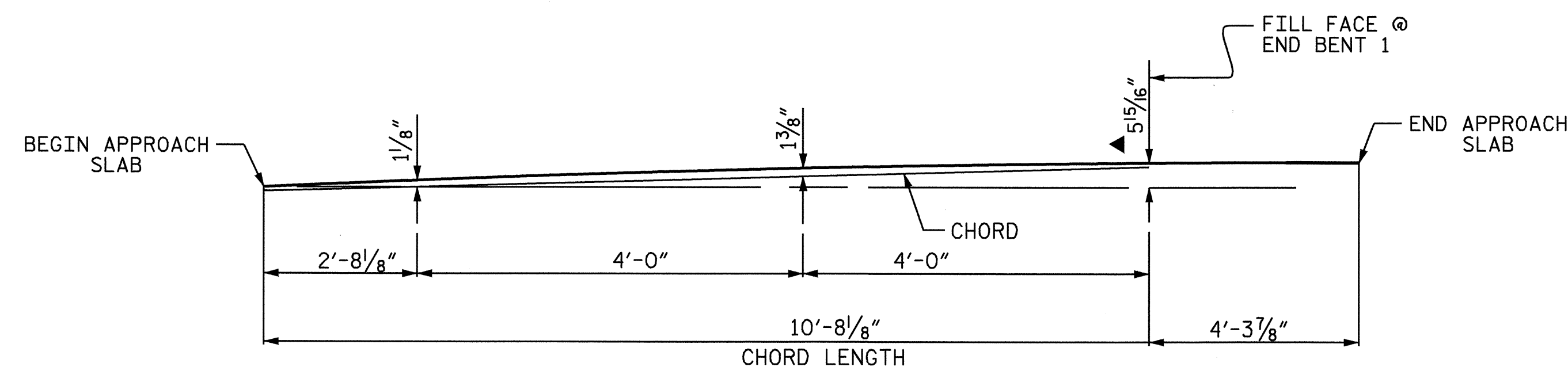
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R

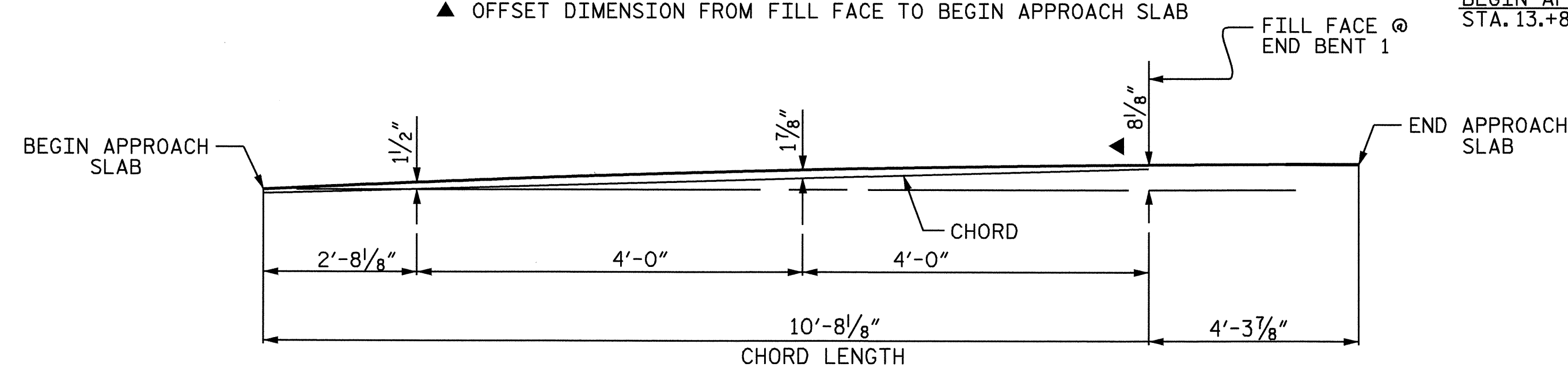


SECTION S-S



LEFT SIDE

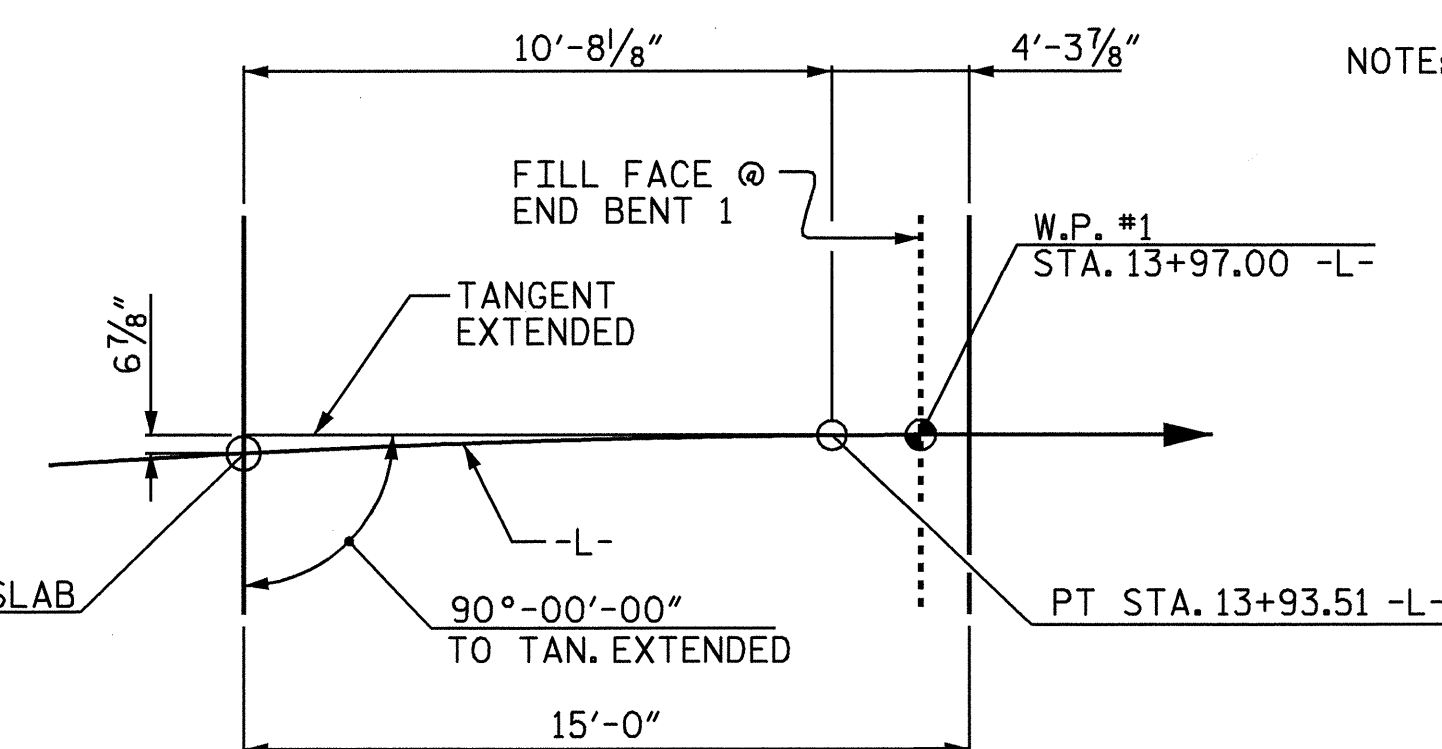
▲ OFFSET DIMENSION FROM FILL FACE TO BEGIN APPROACH SLAB



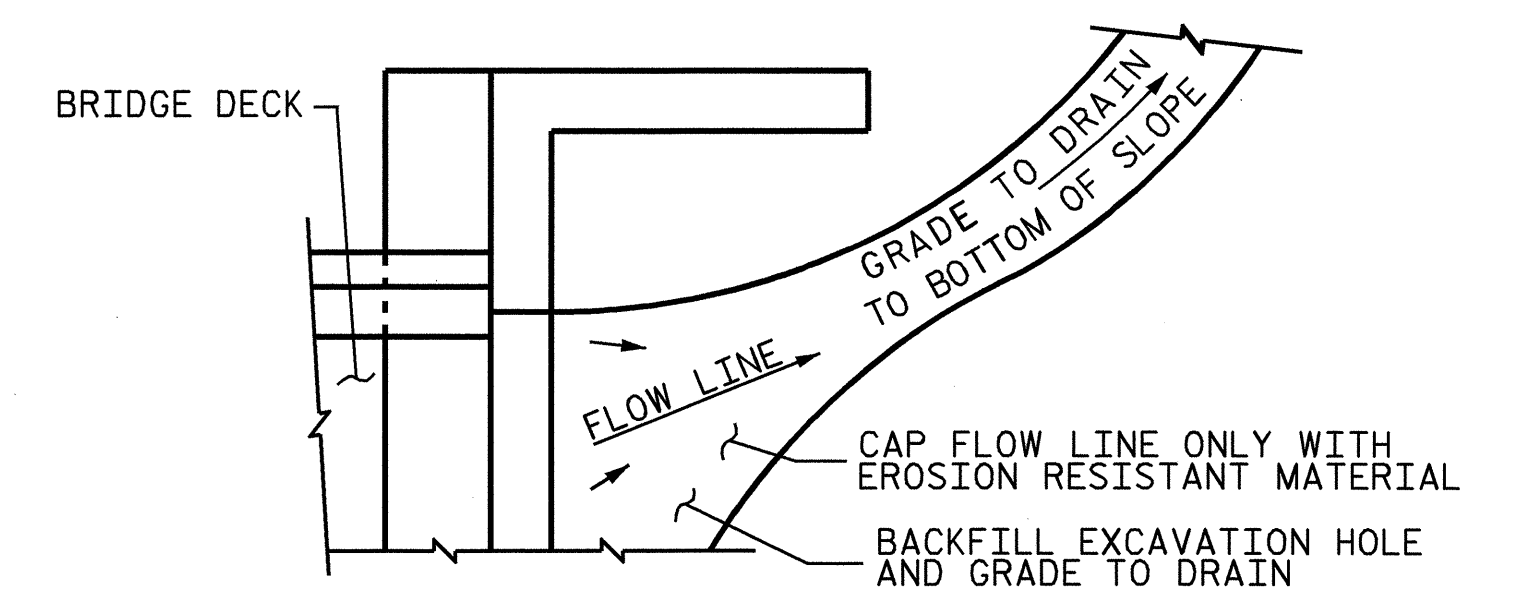
RIGHT SIDE

▲ OFFSET DIMENSION FROM FILL FACE TO BEGIN APPROACH SLAB

ARC OFFSETS @ END BENT 1



DETAIL B



TEMPORARY DRAINAGE DETAIL

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.

PROJECT NO. B-4037
BUNCOMBE COUNTY
STATION: 14+87.00 -L-

SHEET 2 OF 2

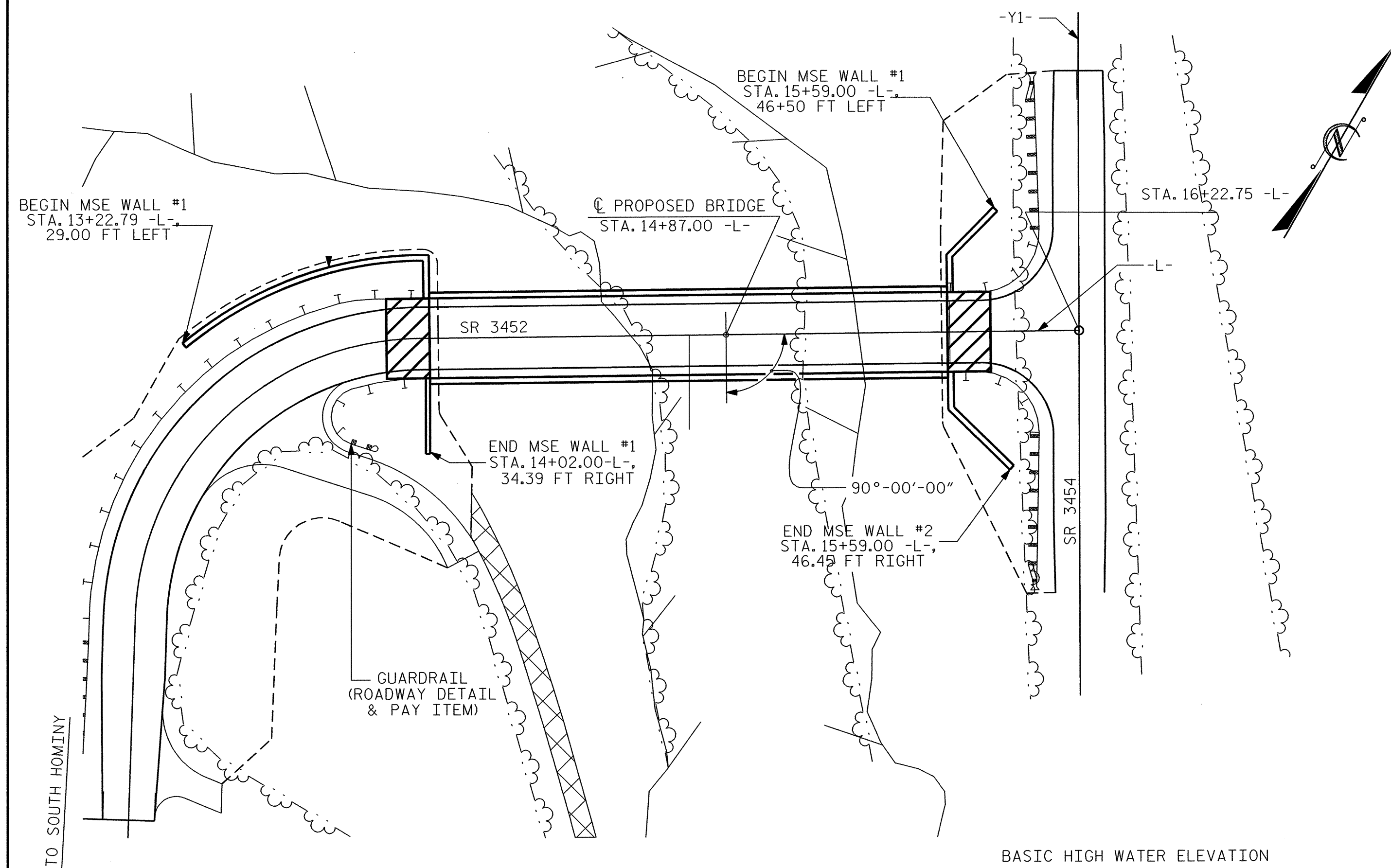
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH
SLAB DETAILS

REVISIONS						1988
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-23
2			4			TOTAL SHEETS 23

STD. NO. BAS10

ASSEMBLED BY: M. FOWLER DATE: 4/2/08
CHECKED BY: J.G. KHARVA DATE: 4/10/08
DRAWN BY: FCJ 11/88 REV. 8/16/99 MAB/LES
CHECKED BY: ARB 11/88 REV. 10/17/00 RWW/LES
REV. 5/7/03 RWW/JTE



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

MSE RETAINING WALL QUANTITIES		
LOCATION	-L- STA	AREA, SQ. FT.
END BENT #1	13+97	1533
END BENT #2	15+77	1107

PREPARED BY: E.J. SALVO DATE: 02/08
 REVIEWED BY: S.C. CLARK DATE: 04/08

MSE RETAINING WALL NOTES

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.

FOR GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

DO NOT USE STANDARD SIZE NO. 2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO. 1 OR NO. 2.

DO NOT USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR RETAINING WALL NO. 1 OR NO. 2.

A VERTICAL BROOMED FINISH IS REQUIRED ON THE FRONT FACE OF THE PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 1 AND NO. 2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 AND 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 THIS ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. 1 AND NO. 2 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

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

- 1) MINIMUM SERVICE LIFE = 100 YEARS
- 2) ALLOWABLE BEARING CAPACITY = 2000 PSF
- 3) WALL BACKFILL MATERIAL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
57, 67 AND 78M	110	38	0

- 4) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
RETAINED AND RANDOM BACKFILL	110	34	0
FOUNDATION	110	34	0

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

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR THE LOADING SHOWN AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT NO. 1 AND NO. 2 LOCATED AT STATION 13+97-L- AND 15+33-L-. MAINTAIN A MINIMUM CLEARANCE OF 3" BETWEEN THE HARDWARE AND REINFORCING STEEL IN THE CAP.

FOUNDATIONS AND WING WALLS FOR END BENT NO. 1 LOCATED AT STATION 13+97-L- AND END BENT NO. 2 LOCATED AT STATION 15+33-L- MAY INTERFERE WITH REINFORCEMENT PLACEMENT. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

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

"TEMPORARY SHORING FOR WALL CONSTRUCTION" MAYBE REQUIRED FOR RETAINING WALL NO. 1 AND NO. 2. FOR TEMPORARY SHORING FOR WALL CONSTRUCTION, SUBMIT WORKING DRAWINGS AND DESIGN CALCULATIONS WITH THE MSE WALL DESIGN SUBMITTAL AND DESIGN AND CONSTRUCT THE SHORING IN ACCORDANCE WITH THE TEMPORARY SHORING SPECIAL PROVISION. NO SEPARATE PAYMENT WILL BE MADE FOR TEMPORARY SHORING FOR WALL CONSTRUCTION. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE RETAINING WALL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE PRESENCE OF COLLUVIAL BOULDERS THAT MAY REQUIRE BLASTING. SEE ROCK BLASTING PROJECT SPECIAL PROVISION.

THE LEVELING PAD IS TO BE FOUNDED AS SHOWN IN PLANS OR A MINIMUM OF 1 FOOT INTO NON-SCOURABLE MATERIAL AS DETERMINED BY ENGINEER.

GEOTECHNICAL ENGINEER S.C. Clark SIGNATURE	ENGINEER DATE SIGNATURE
--	-------------------------------

PROJECT NO.: B-4037
 BUNCOMBE COUNTY
 STATION: 14+02-L- AND 15+72-L-
 SHEET 1 OF 4

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

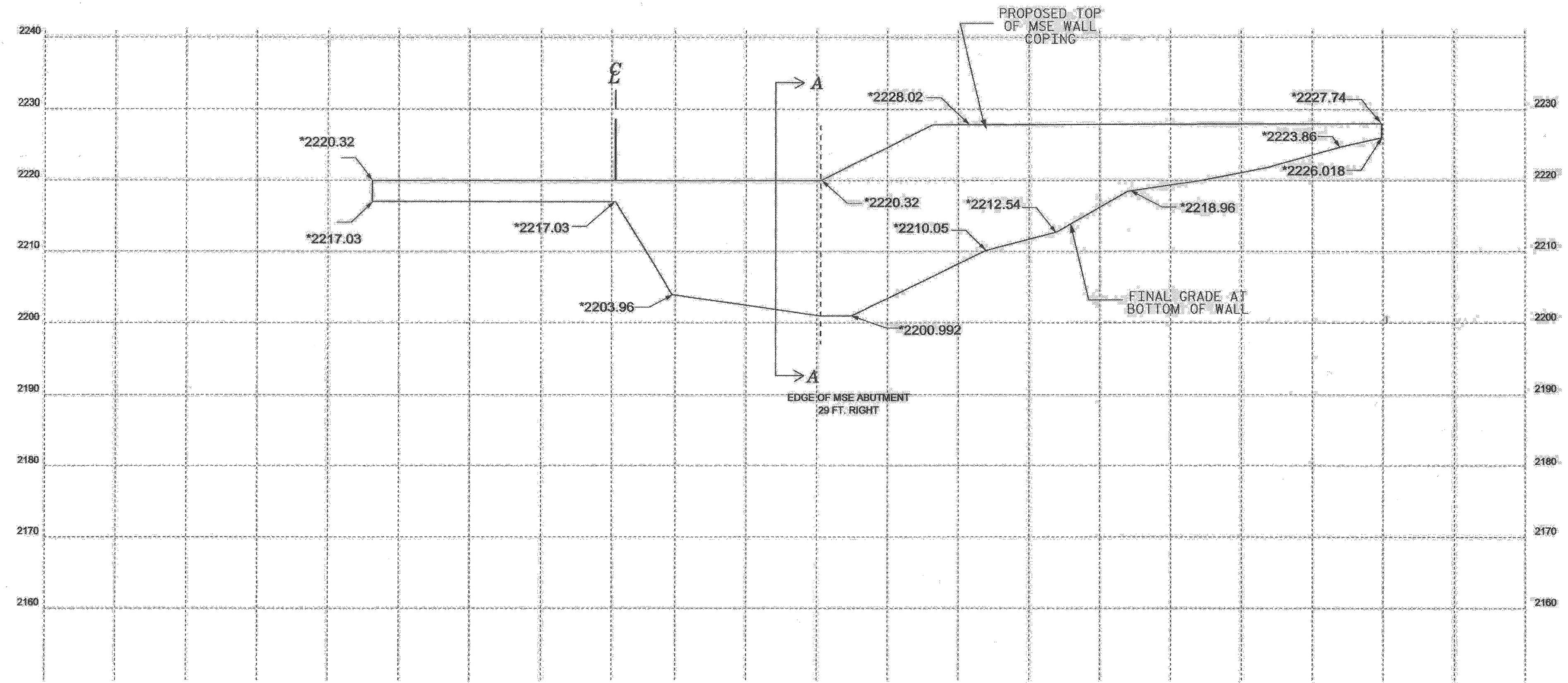
**MSE RETAINING WALLS
 END BENT #1 AND
 END BENT #2**

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

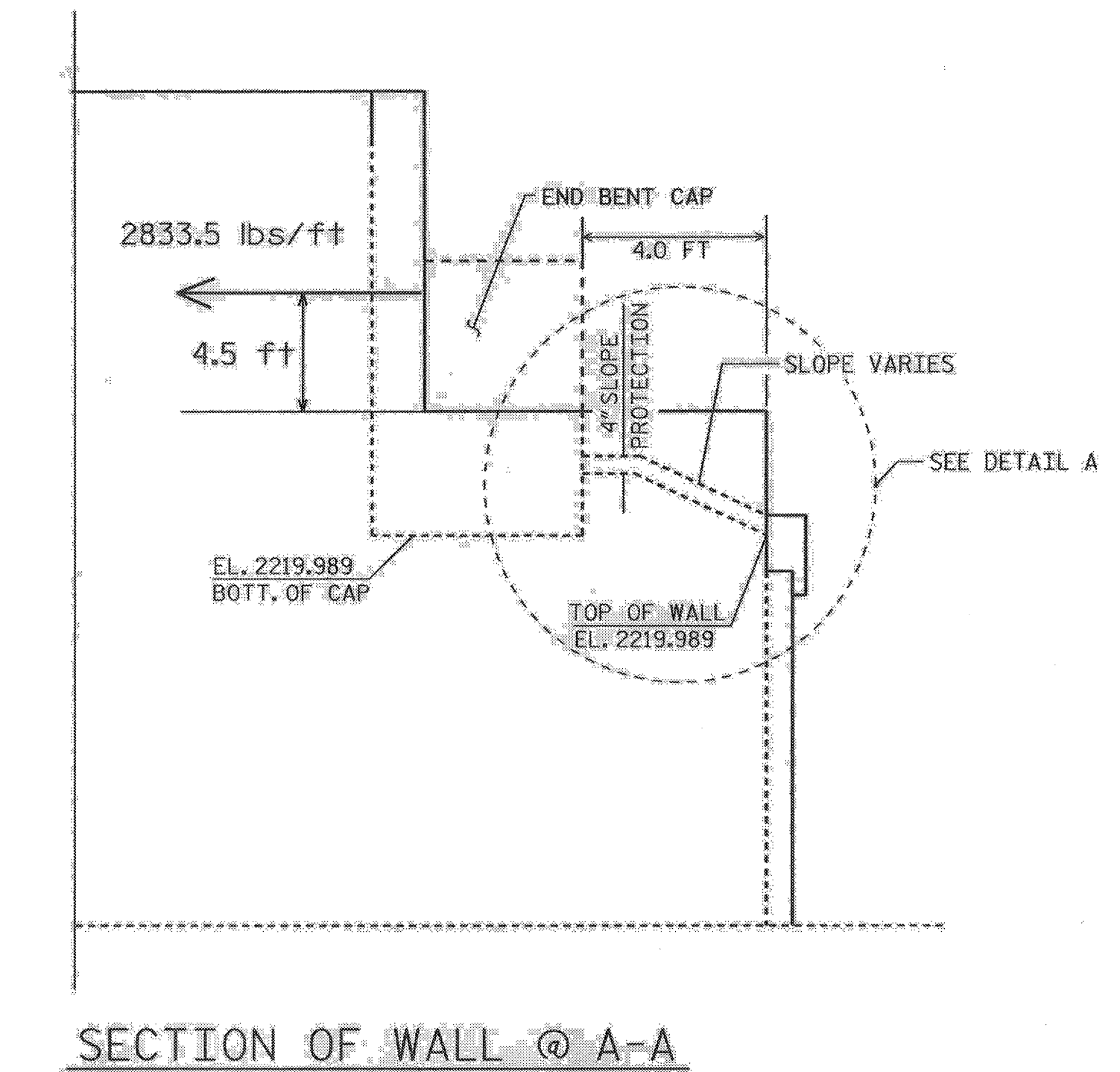
GEOTECHNICAL ENGINEER

ENGINEER

Signature: *E. J. Salvo* Date: 7/3/08



MSE WALL #1 ENVELOPE



1

MSE RETAINING WALL ELEVATIONS-END BENT#1

-L- STA, FT	OFFSET FROM C (FT)	ELEV @ TOP OF WALL (FT)	FINAL GRADE AT BOTTOM OF WALL (FT)	EXPOSED WALL HEIGHT (FT)	** DESIGN WALL HEIGHT "H"(FT)
13+22.79	29.000 LT	2227.740	2226.018	1.722	1.222
13+30.00	29.000 LT	2227.768	2223.860	3.908	3.408
13+50.00	29.000 LT	2227.832	2218.960	8.872	8.372
13+70.00	29.000 LT	2227.918	2212.540	15.416	14.916
13+85.00	29.000 LT	2228.020	2206.472	21.548	21.048
14+02.00	29.000 LT	2220.329	2200.992	19.337	18.837
14+02.00	8.000 LT	2220.329	2203.960	15.981	15.481
14+02.00	0.000	2220.329	2217.035	2.959	2.459
14+02.00	34.391 RT	2220.329	2217.035	2.959	2.459

1 TABLE REVISED 7/3/2008

*ELEVATIONS HAVE BEEN ESTIMATED BASED ON THE AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR SURVEYING THE ACTUAL WALL LOCATION AND SUBMITTING A REVISED ENVELOPE PRIOR TO BEGINNING DESIGN OR CONSTRUCTION. EMBEDMENT DEPTH NOT INCLUDED IN ELEVATION TABLES

** DESIGN HEIGHT - SEE DETAIL OF SECTION THROUGH WALL ALONG -L-, SHEET 4 OF 4

PROJECT NO.: B-4037
 BUNCOMBE COUNTY
 STATION: 14+02.00 -L-
 SHEET 2 OF 4

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

END BENT #1
 MSE WALL

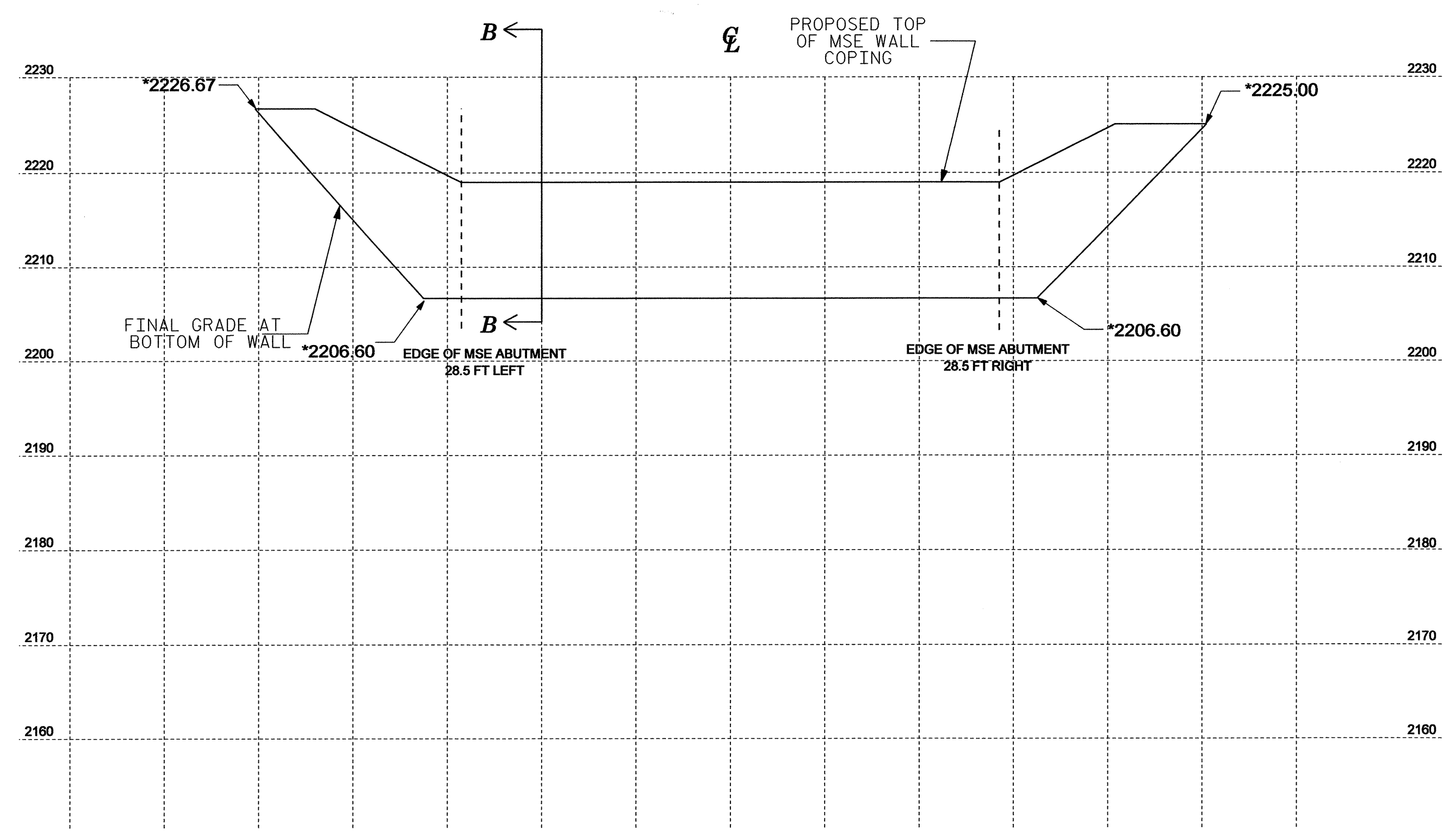
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEET
1			3			
2			4			

PREPARED BY: E.J. SALVO	DATE: 02/08
REVIEWED BY: S.C. CLARK	DATE: 04/08

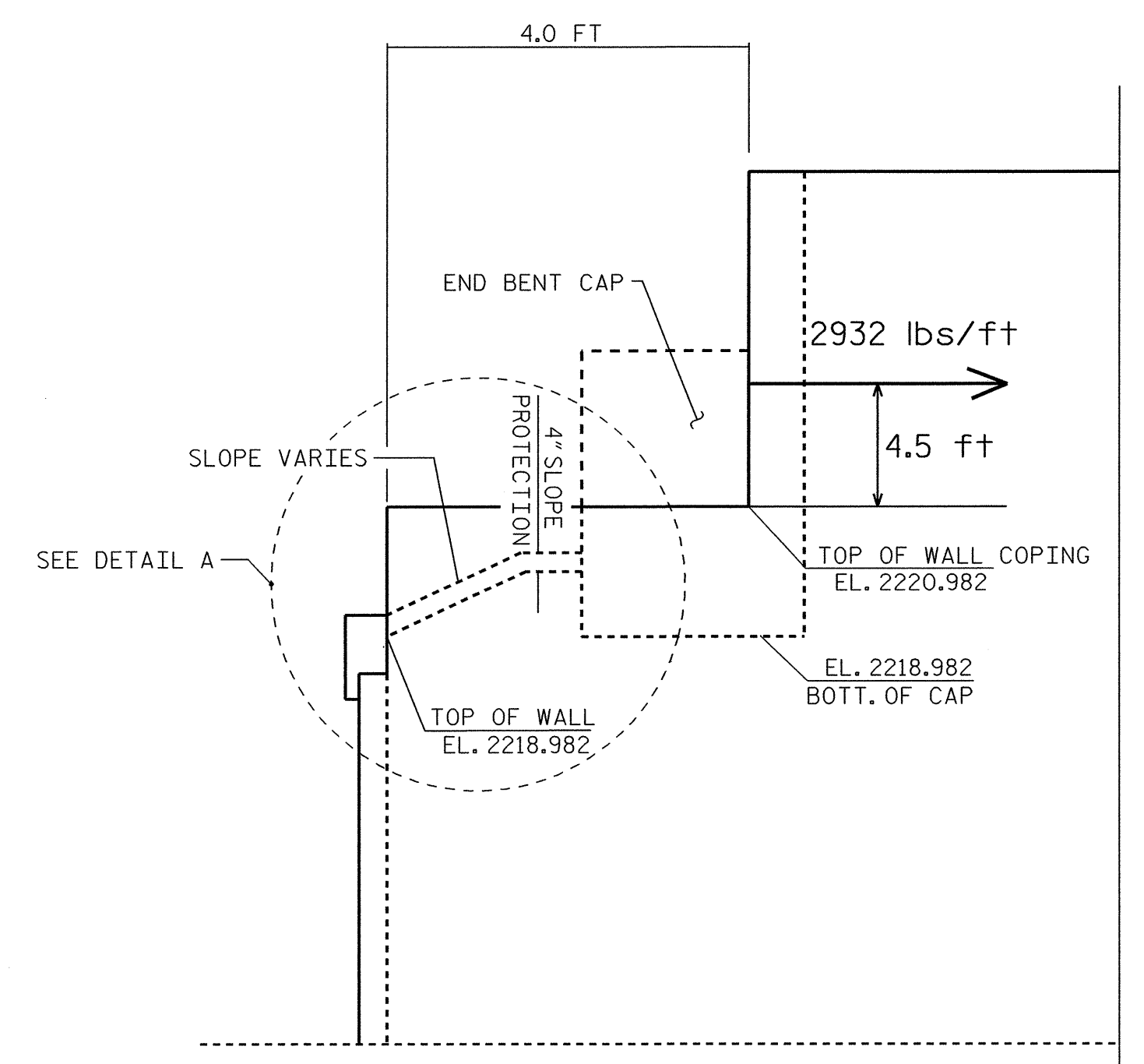
GEOTECHNICAL ENGINEER

ENGINEER

Shane Clark 4/05/08
SIGNATURE DATE



MSE WALL #2 ENVELOPE



SECTION OF WALL @ B-B

MSE RETAINING WALL ELEVATIONS-END BENT#2					
-L- STA, FT	OFFSET FROM C (FT)	ELEV @ TOP OF WALL (FT)	FINAL GRADE AT BOTTOM OF WALL (FT)	* EXPOSED WALL HEIGHT (FT)	** DESIGN WALL HEIGHT "H" (FT)
15+59.00	46.450 LT	2226.67	2226.67	0	0
15+72.00	28.500 LT	2218.982	2206.605	12.877	12.377
15+72.00	28.500 RT	2218.982	2206.605	12.877	12.377
15+59.00	46.450 RT	2225.00	2225.00	0	0

* ELEVATIONS HAVE BEEN ESTIMATED BASED ON THE AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR SURVEYING THE ACTUAL WALL LOCATION AND SUBMITTING A REVISED ENVELOPE PRIOR TO BEGINNING DESIGN OR CONSTRUCTION. EMBEDMENT DEPTH NOT INCLUDED IN ELEVATION TABLES

** DESIGN HEIGHT - SEE DETAIL OF SECTION THROUGH WALL ALONG -L-, SHEET 4 OF 4

PROJECT NO.: **B-4037**
BUNCOMBE COUNTY
 STATION: **15+72 -L-**
 SHEET 3 OF 4

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**END BENT #2
MSE WALL**

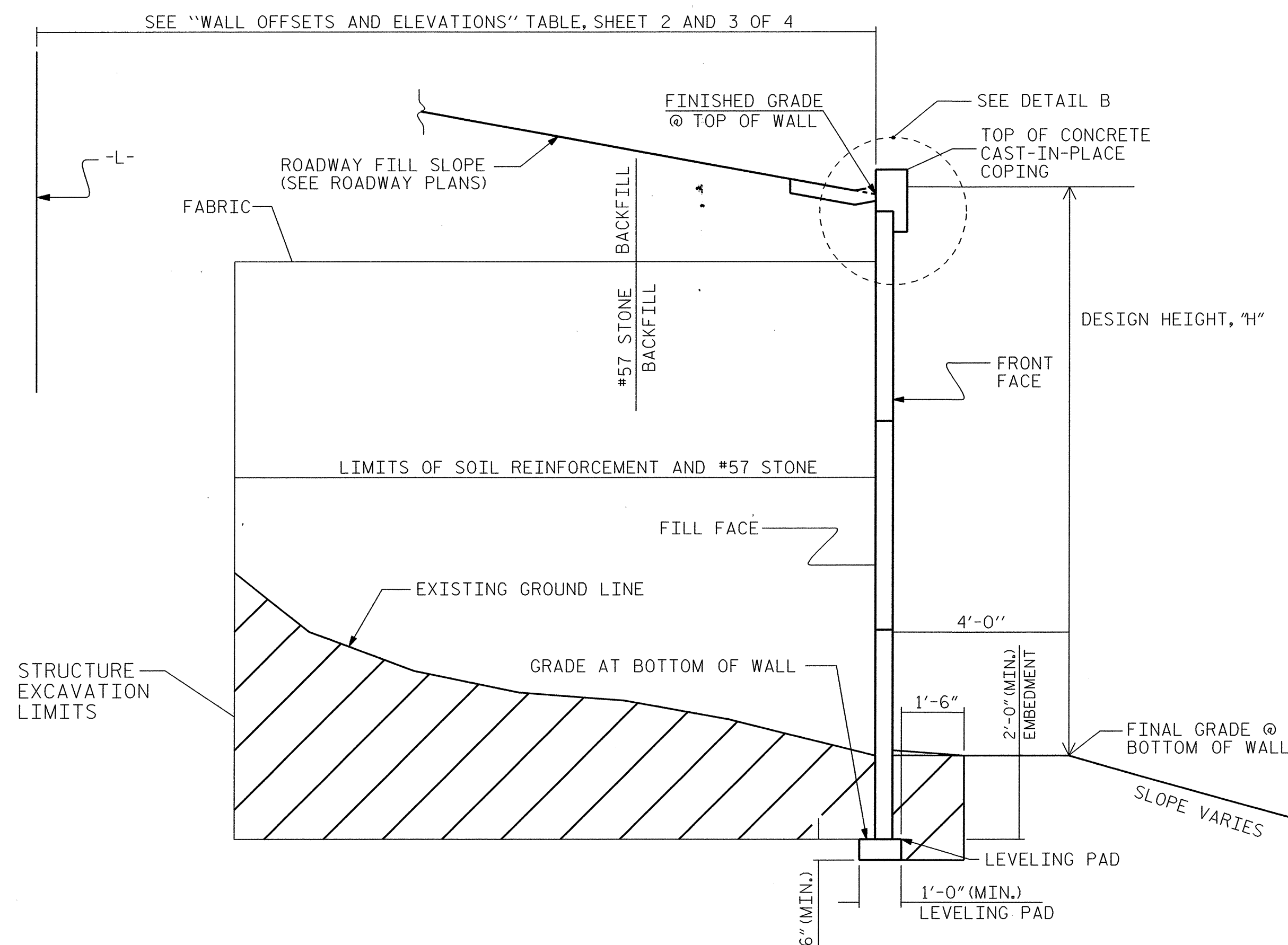
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

PREPARED BY: E.J. SALVO DATE: 02/08
 REVIEWED BY: S.C. CLARK DATE: 04/08

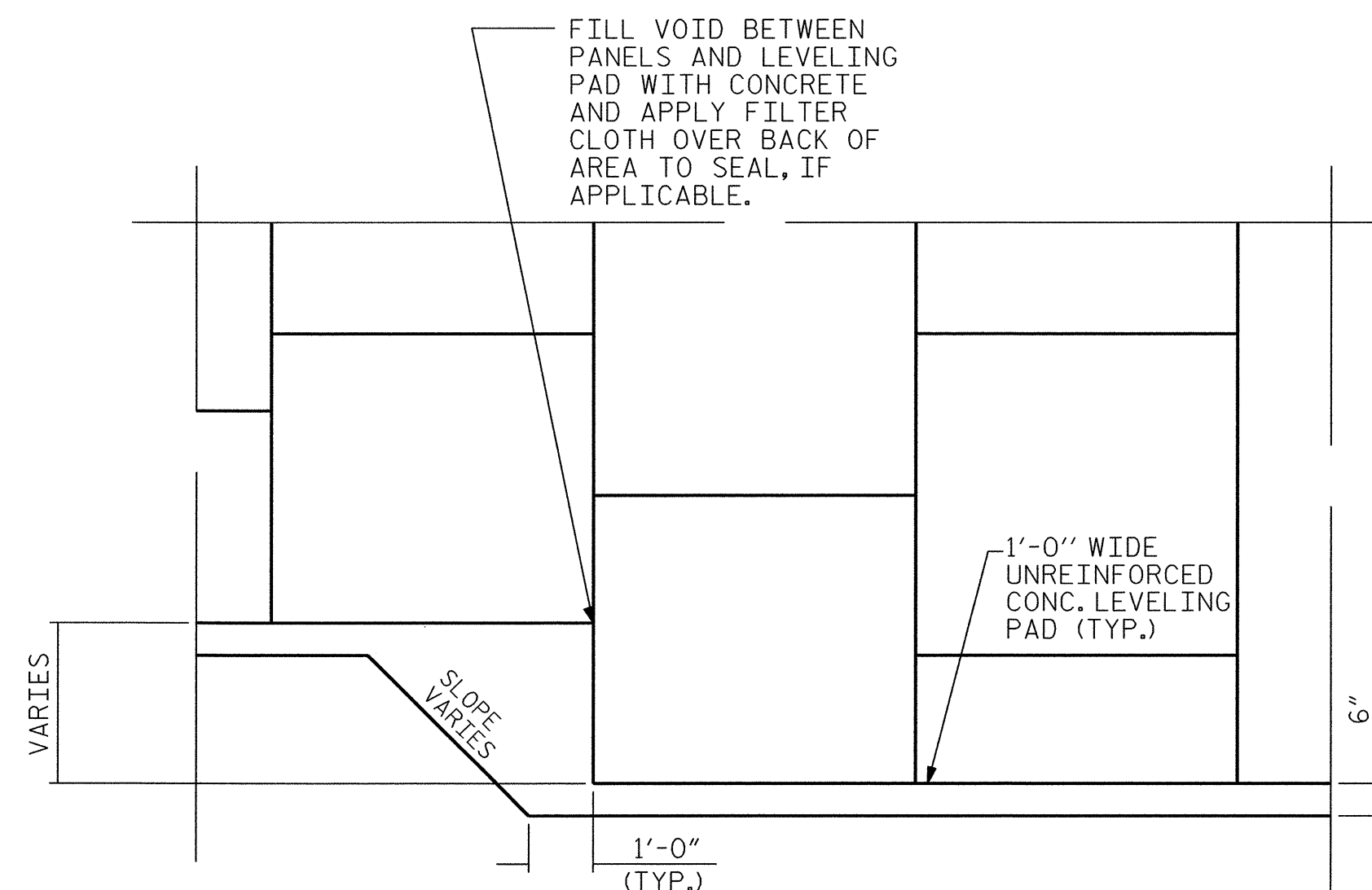


Shane Clark, Master
SIGNATURE DATE

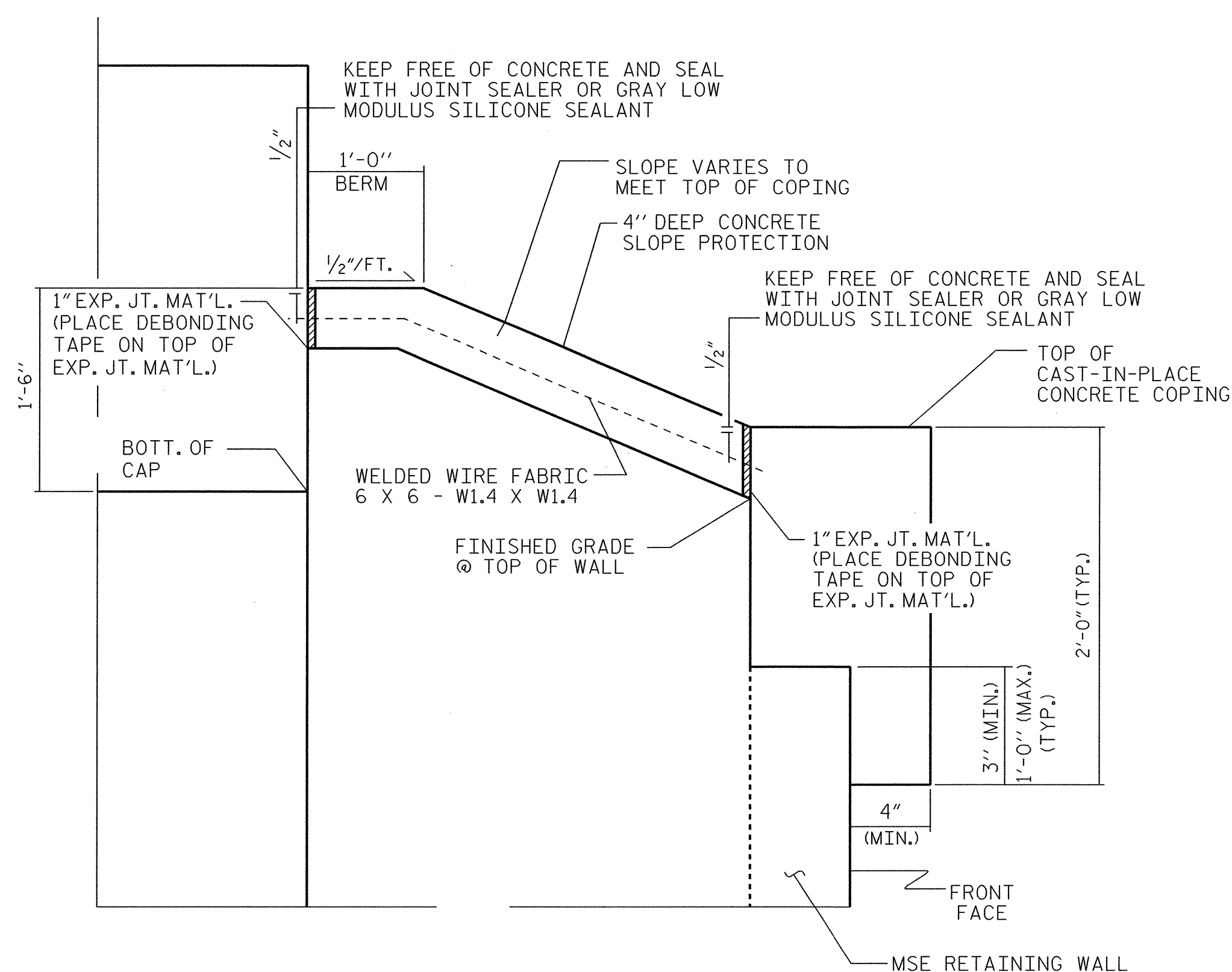
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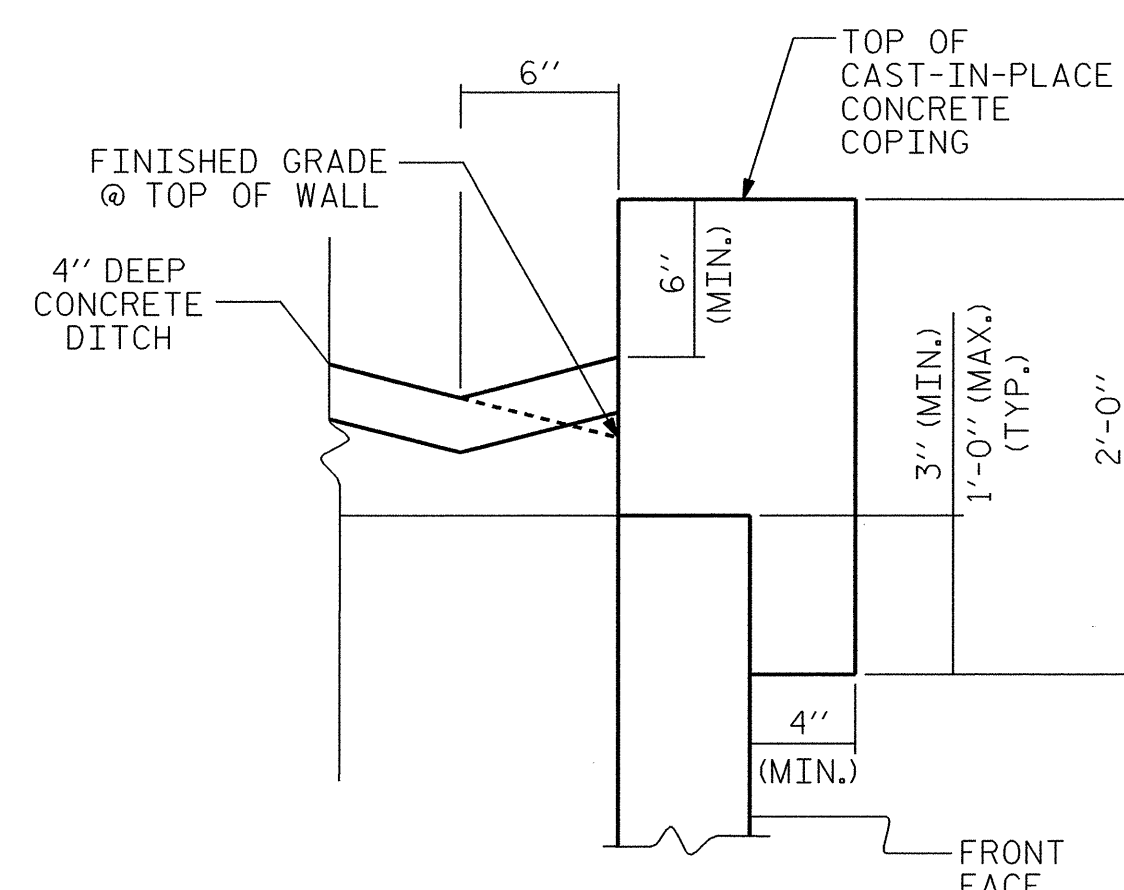
SECTION THROUGH WALL ALONG -L-



TYPICAL LEVELING PAD STEP DETAIL



DETAIL A - UNDER SUPERSTRUCTURE



DETAIL B

ESTIMATED QUANTITIES	
4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIRE
SQUARE YARDS	APPROX. LIN. FT.
5	75

PROJECT NO.: B-4037
 BUNCOMBE COUNTY
 STATION: 14+02 -L- AND 15+72-L-
 SHEET 4 OF 4

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE WALL DETAILS

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

PREPARED BY: E.J. SALVO DATE: 02/08
 REVIEWED BY: S.C. CLARK DATE: 04/08

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.

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