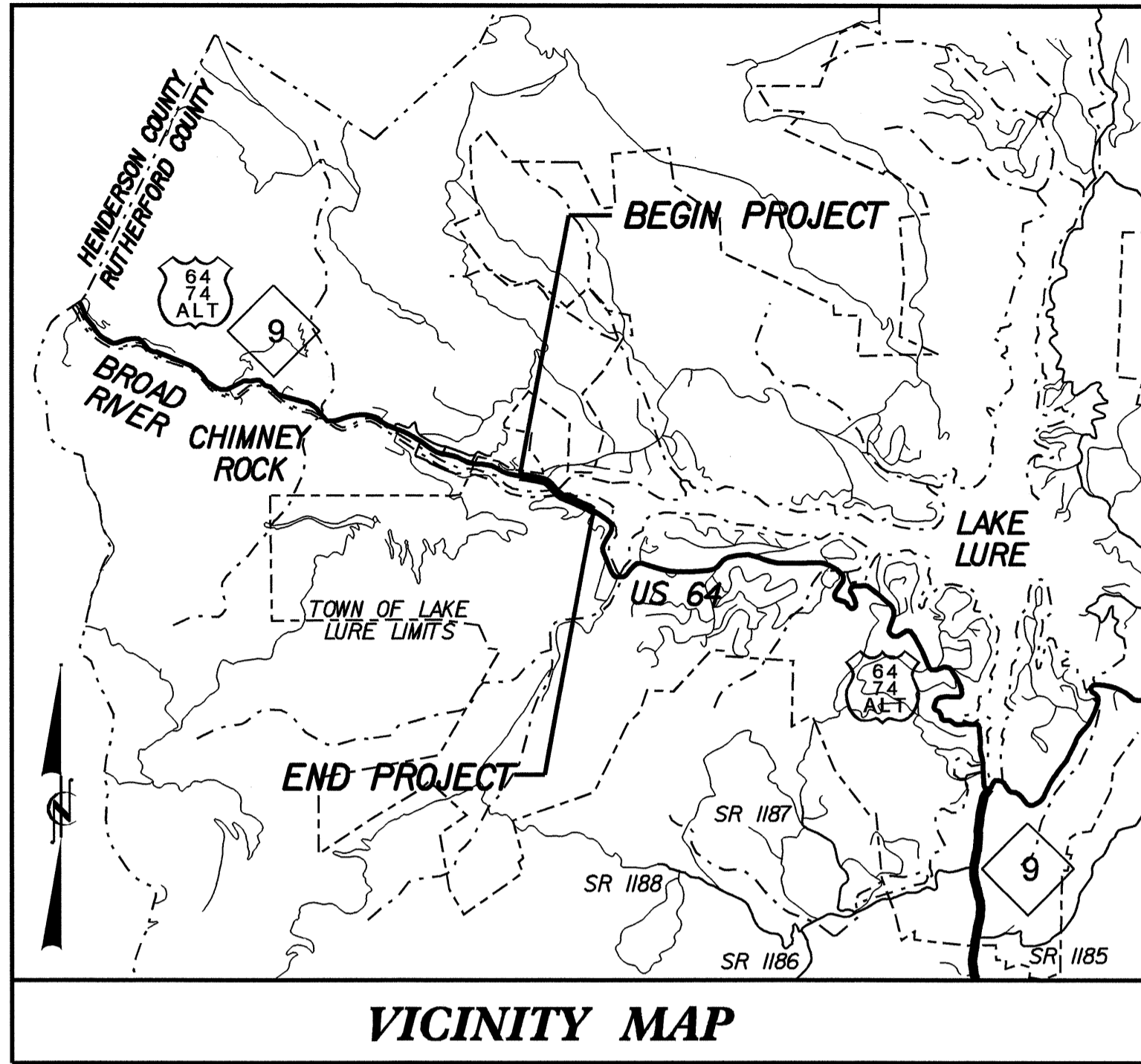


TIP PROJECT: B-4258

CONTRACT: C201927

STRUCTURES



VICINITY MAP

NEAREST SHIPPING POINT: HENDERSONVILLE
ON SOUTHERN RR 17.6 MILES FROM BRIDGE

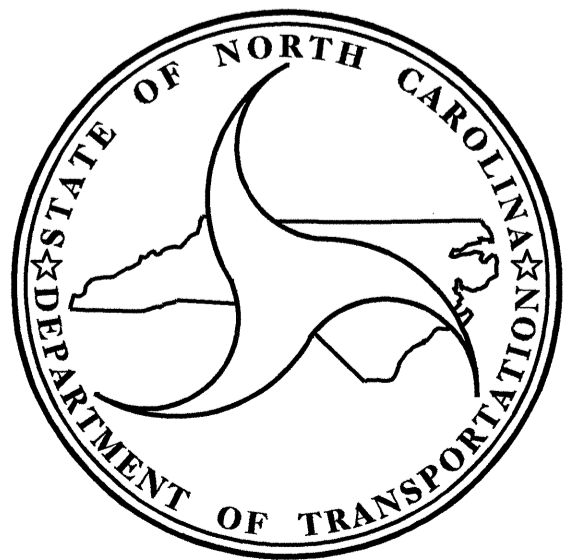
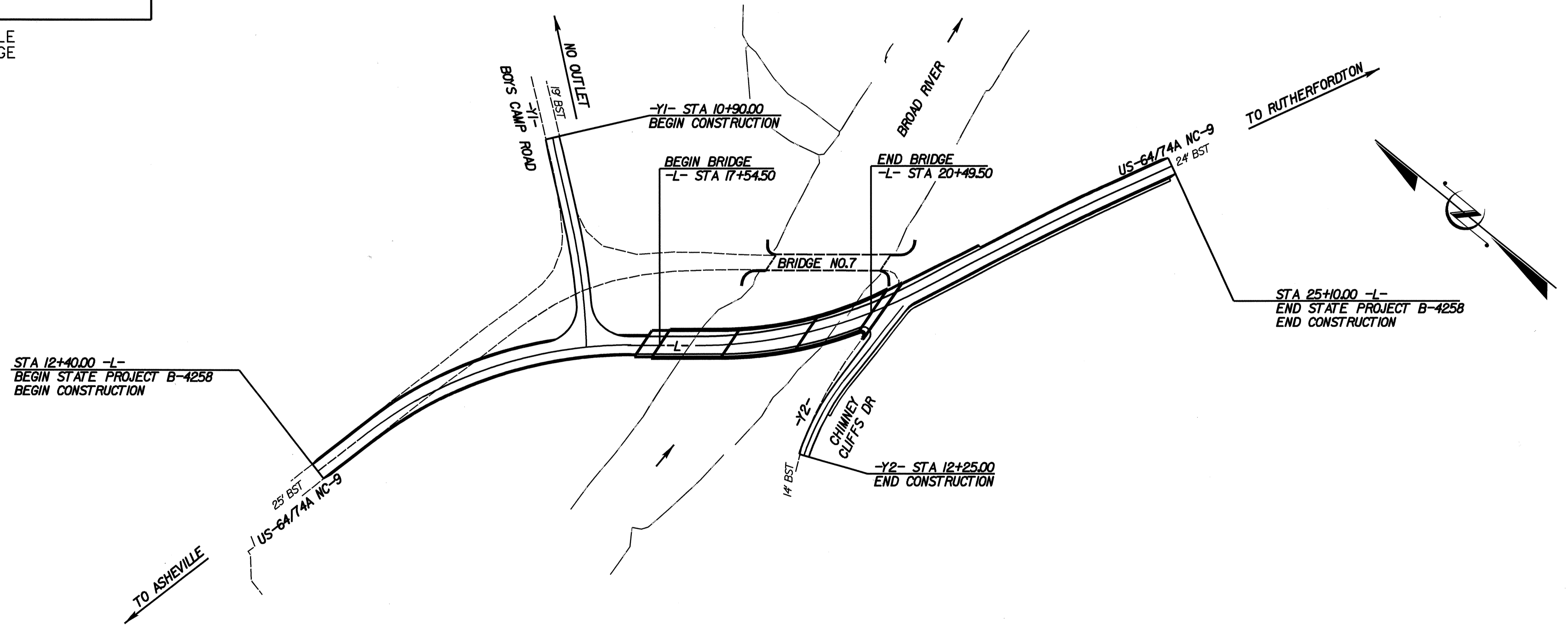
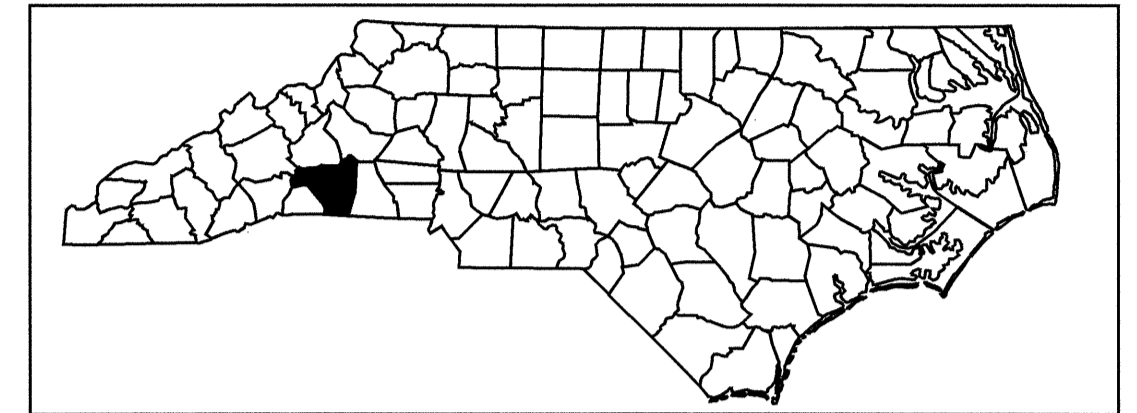
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

LOCATION: BRIDGE NO.7 OVER THE BROAD RIVER ON US-64

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4258		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33600.1.1	BRSTP-0064(61)	P.E.	
33600.2.1	BRSTP-0064(61)	RIGHT-OF-WAY	
33600.2.1	BRSTP-0064(61)	UTILITY	
33600.3.1	BRSTP-0064(61)	CONSTRUCTION	



DESIGN DATA

ADT 2007 = 4,300 VPD
 ADT 2030 = 6,300 VPD
 DHV = 9%
 D = 55%
 T = 5% *
 V = 40 mph

FUNCTIONAL CLASSIFICATION:
 RURAL MINOR ARTERIAL
 * (TTST 2% + DUAL 3%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4258 = 0.185 MILE
 LENGTH OF STRUCTURE TIP PROJECT B-4258 = 0.056 MILE
 TOTAL LENGTH OF TIP PROJECT B-4258 = 0.241 MILE

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

2006 STANDARD SPECIFICATIONS

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

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

LETTING DATE:
 SEPTEMBER 16, 2008

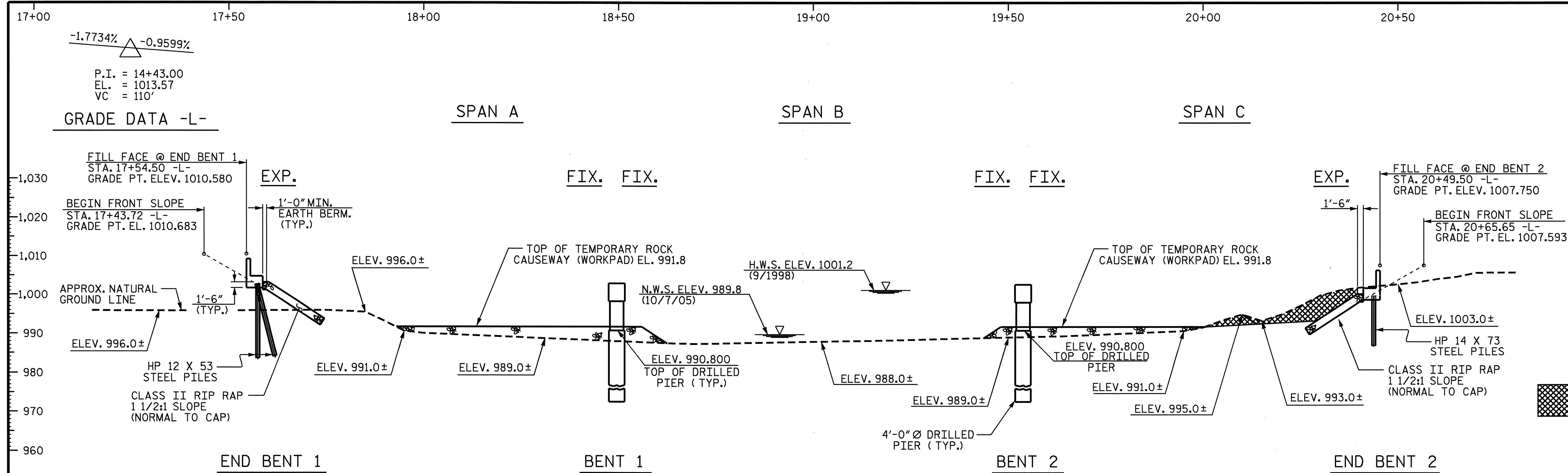
STRUCTURE DESIGN UNIT

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

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

APPROVED
 DIVISION ADMINISTRATOR
 DATE

FOR NOTES, SEE SHEET 4 OF 4.



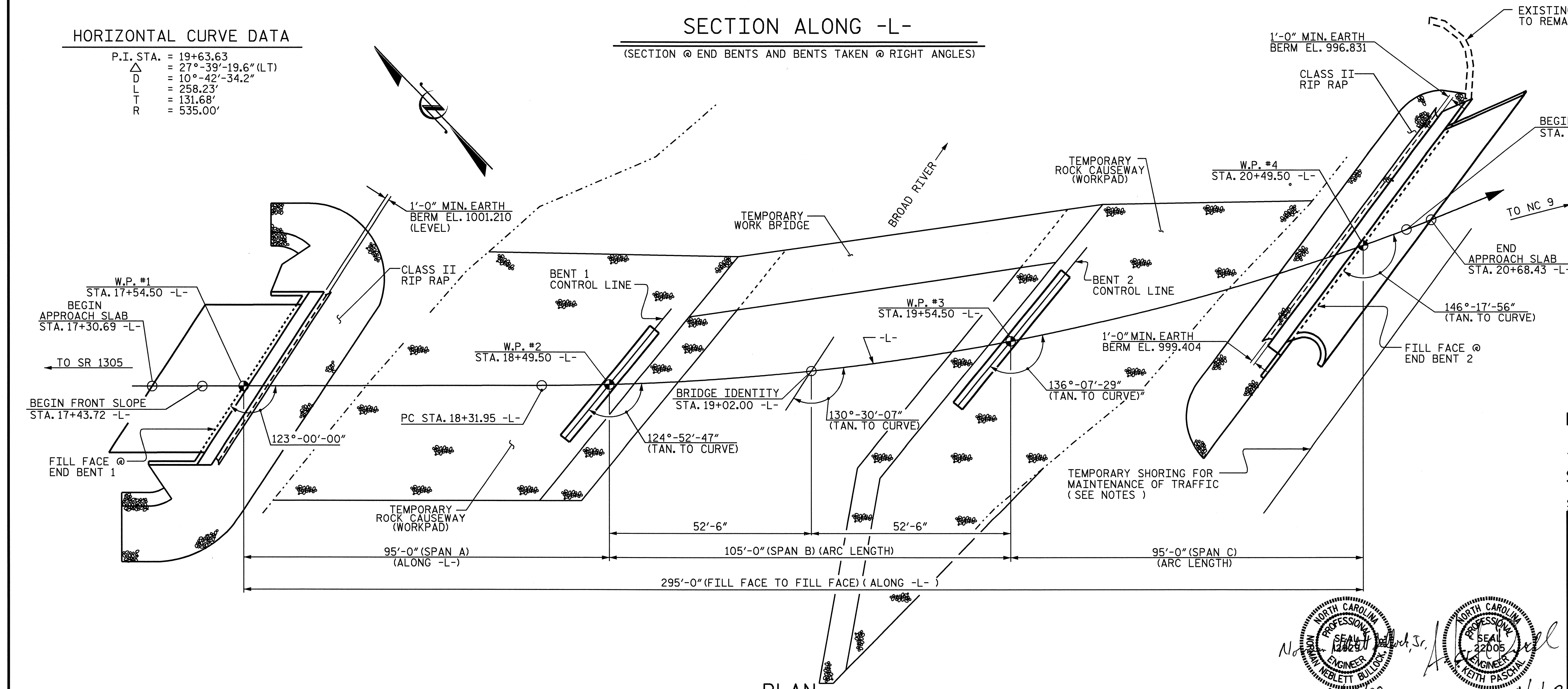
HORIZONTAL CURVE DATA

P.I. STA. = 19+63.63

Δ	= 27°-39'-19.6" (LT)
D	= 10°-42'-34.2"
L	= 258.23'
T	= 131.68'
R	= 535.00'

SECTION ALONG -L-

(SECTION @ END BENTS AND BENTS TAKEN @ RIGHT ANGLES)



PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 7

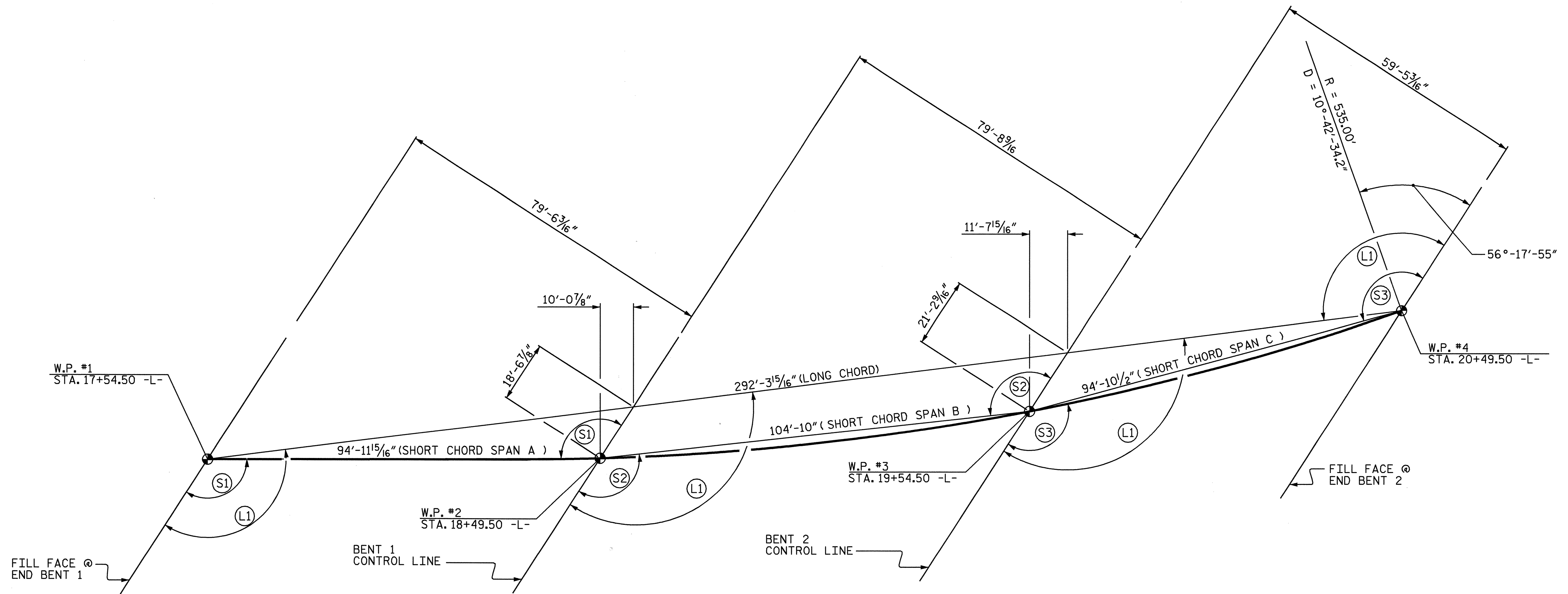
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON US 64
 OVER BROAD RIVER
 BETWEEN SR 1305
 AND NC 9

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

DRAWN BY : J.G. KHARVA DATE : 6/24/08
 CHECKED BY : A.K. PASCHAL DATE : 7/09/08

Professional Engineer Seal for Keith Paschal, No. 22005, dated 8/5/08.



NOTE : BENTS AND END BENTS ARE PARALLEL

LONG CHORD LAYOUT

ANGLES			
LONG CHORD		SHORT CHORD	
L1	131°-34'-58"	S1	123°-10'-25"
---	---	S2	130°-30'-08"
---	---	S3	141°-12'-43"

HORIZONTAL CURVE DATA

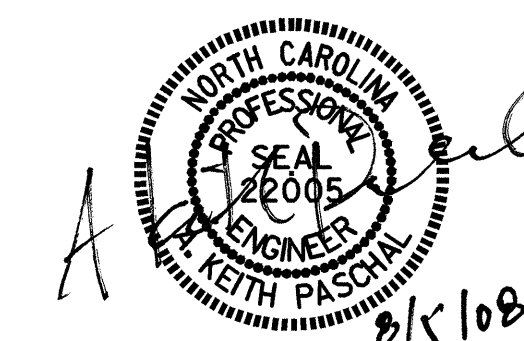
P.I. STA. = 19+63.63
 Δ = 27°-39'-19.6" (LT)
 D = 10°-42'-34.2"
 L = 258.23'
 T = 131.68'
 R = 535.00'

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON US 64
 OVER BROAD RIVER
 BETWEEN SR 1305
 AND NC 9



DRAWN BY : J.G. KHARVA DATE : 6/24/08
 CHECKED BY : A.K. PASCHAL DATE : 7/09/08

05-AUG-2008 15:09
 T:\struc\4258\fnalp\B-4258_sd.GD.dgn
 jkharva

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

FOUNDATION NOTES

DRILLED PIERS AT BENT 1 AND 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 46 TSF.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR AN APPLIED LOAD OF 366 TONS AT THE TOP OF THE COLUMN.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR AN APPLIED LOAD OF 378 TONS AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2. DO NOT EXTEND THE CASING BELOW ELEVATION 974.0 AT BENT 1 OR BELOW ELEVATION 970.0 FT. AT BENT 2 LEFT AND CENTER OR BELOW ELEVATION 978.0 FT. AT BENT 2 RIGHT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. SEE DRILLED PIERS SPECIAL PROVISION.

INSTALL PERMANENT CASING AT BENT 1 AND BENT 2 BY VIBRATING, SCREWING OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 982 FT. FOR BENT 1 OR BELOW ELEVATION 980 FT. FOR BENT 2.

DRILLED PIERS AT BENT 1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 968.0 FT. AND AT BENT 2 LEFT AND CENTER TO AN ELEVATION NO HIGHER THAN 964.0 FT. AND AT BENT 2 RIGHT TO AN ELEVATION NO HIGHER THAN 972.0 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 975.0 FT. AND THE BENT 2 LEFT AND CENTER ELEVATION IS 972.0 FT. AND THE BENT 2 RIGHT IS ELEVATION 978.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISIONS. SPT TESTING IS NOT REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT BENT 1 AND BENT 2.

SID INSPECTIONS MAY BE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. SEE DRILLED PIERS SPECIAL PROVISION.

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

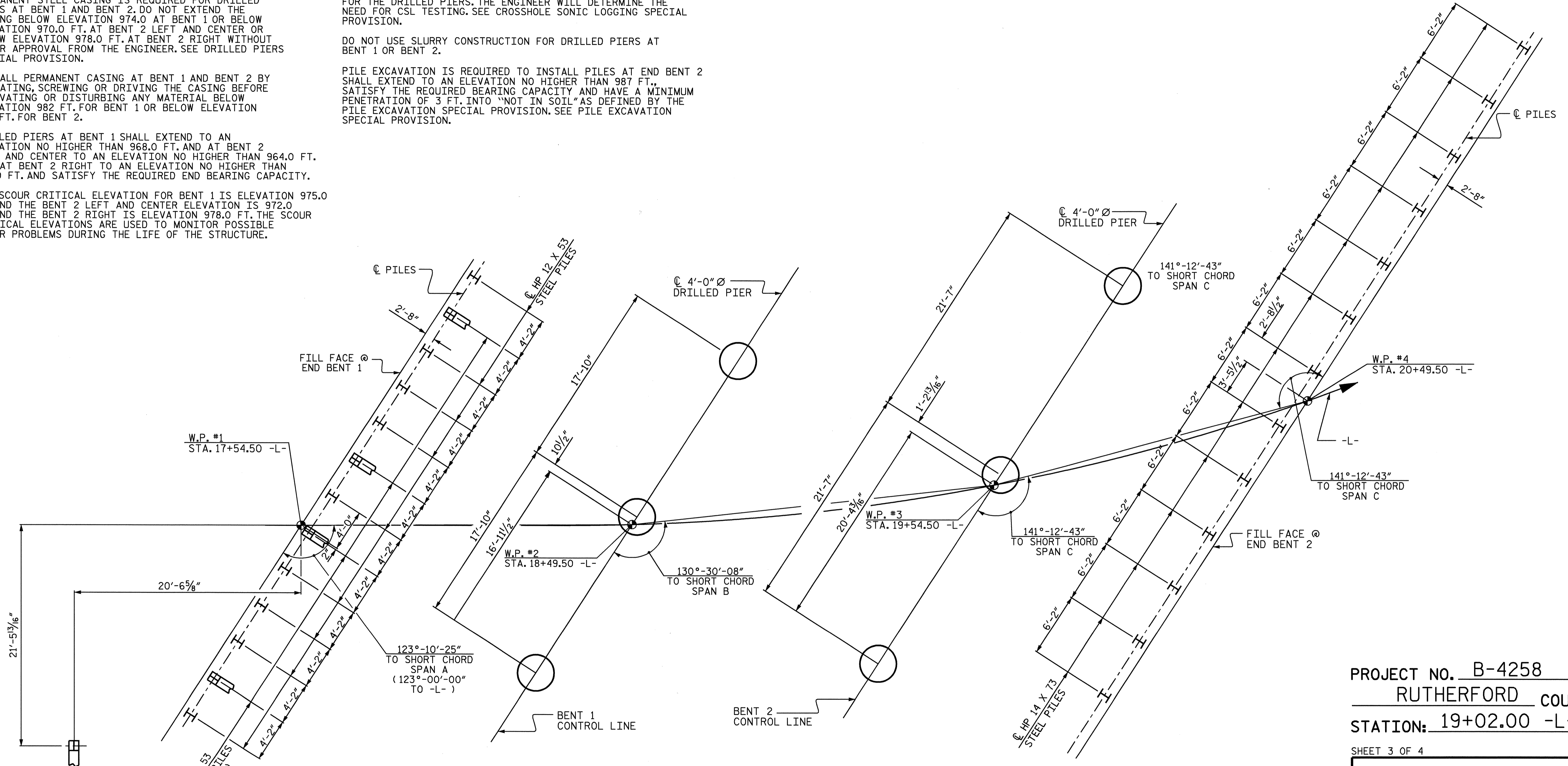
DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT 1 OR BENT 2.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 987 FT., SATISFY THE REQUIRED BEARING CAPACITY AND HAVE A MINIMUM PENETRATION OF 3 FT. INTO "NOT IN SOIL" AS DEFINED BY THE PILE EXCAVATION SPECIAL PROVISION. SEE PILE EXCAVATION SPECIAL PROVISION.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT 1 IS 50 TONS PER PILE AND AT END BENT 2 IS 90 TONS PER PILE.

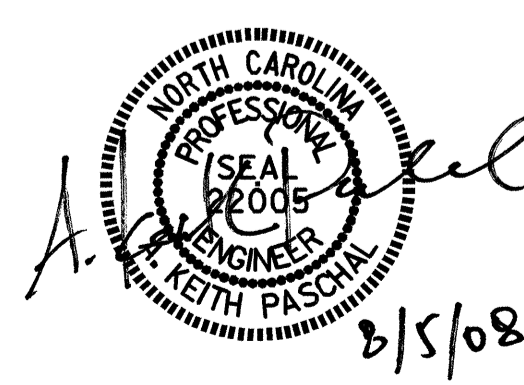
DRIVE PILES AT END BENT 1 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE AND AT END BENT 2 TO A REQUIRED BEARING CAPACITY OF 180 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR STEEL PILES AT END BENT 1. SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.



PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON US 64
 OVER BROAD RIVER
 BETWEEN SR 1305
 AND NC 9



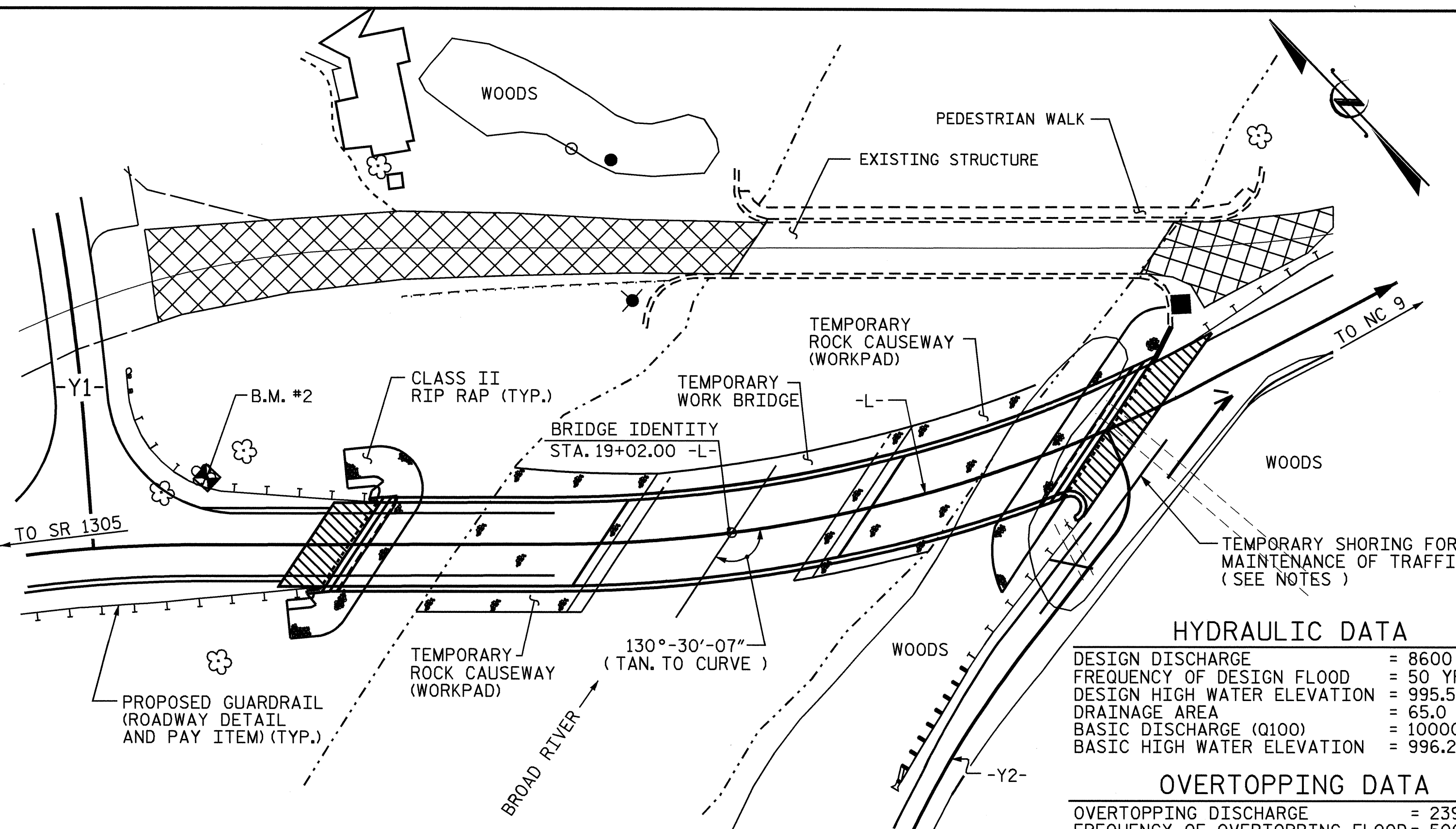
DRAWN BY : J.G. KHARVA DATE : 6/24/08
 CHECKED BY : A.K. PASCHAL DATE : 7/09/08

05-AUG-2008 15:09
 T:\STRUCT\B-4258\1\ndp\B-4258.sd.GD.dgn
 jkharva

FOUNDATION LAYOUT
 (DIMENSIONS LOCATING DRILLED PIERS AND PILES ARE SHOWN TO CENTERLINE OF DRILLED PIERS AND PILES)

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

BM #2 : RR SPIKE IN 42" OAK 25.50' LT. STA. 16+98.65 -L- ELEV. 1003.52'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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.

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 THREE (1 @ 52'-6", 1 @ 53'-0", 1 @ 52'-6") CONCRETE CLOSED SPANDREL ARCH DECK WITH A CLEAR ROADWAY WIDTH OF 20'-0" ON MASSIVE CONCRETE ABUTMENTS AND INTERIOR BENTS AND LOCATED APPROXIMATELY 140'-0" UPSTREAM FROM THE PROPOSED STRUCTURE BRIDGE IDENTITY STATION SHALL BE RETAINED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE EXISTING PEDESTRIAN WALK ON THE EXISTING BRIDGE SHALL BE REMOVED AFTER COMPLETION OF THE PROPOSED BRIDGE. SEE SPECIAL PROVISION "REMOVAL OF EXISTING STRUCTURE @ STA. 19+02.00 -L-".

REMOVAL OF THE PEDESTRIAN WALK 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 SUBSTRUCTURE OF THE EXISTING BRIDGE NOTED ON THE PLANS IS FROM THE BEST EXISTING INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE NOTED ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE 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.

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.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY WORK BRIDGE TO USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+02.00 -L-.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+02.00 -L-.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, 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.

HYDRAULIC DATA

DESIGN DISCHARGE	= 8600 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 995.5
DRAINAGE AREA	= 65.0 SQ.MI.
BASIC DISCHARGE (Q100)	= 10000 C.F.S.
BASIC HIGH WATER ELEVATION	= 996.2

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 23950 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING ELEVATION	= 1009.6

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" DIA. DRILLED PIERS IN SOIL	4'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM
SUPERSTRUCTURE										11,502	7629		LUMP SUM
END BENT 1												40.4	
BENT 1				26.5	42.0	50.4						45.1	
BENT 2				23.5	49.0	54.4						47.3	
END BENT 2		78	52						LUMP SUM			52.6	
TOTAL	LUMP SUM	78	52	50.0	91.0	104.8	1	2	LUMP SUM	11,502	7629	185.4	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12x53 STEEL PILES	HP 14x73 STEEL PILES	STEEL PILE POINTS	2 BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	PARTIAL REMOVAL OF EXISTING STRUCTURE
	LBS.	LBS.	No. LIN.FT.	No. LIN.FT.	No. LIN.FT.	EACH	LIN.FT.	LIN.FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			18 1726.2								LUMP SUM	LUMP SUM	
END BENT 1	5818			14 280.0		14	585.32	602.33	234	260			
BENT 1	13804	2392											
BENT 2	14447	2401											
END BENT 2	8024				13 130				229	254			
TOTAL	42093	4793	18 1726.2	14 280.0	13 130	14	585.32	602.33	463	514	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 4 OF 4



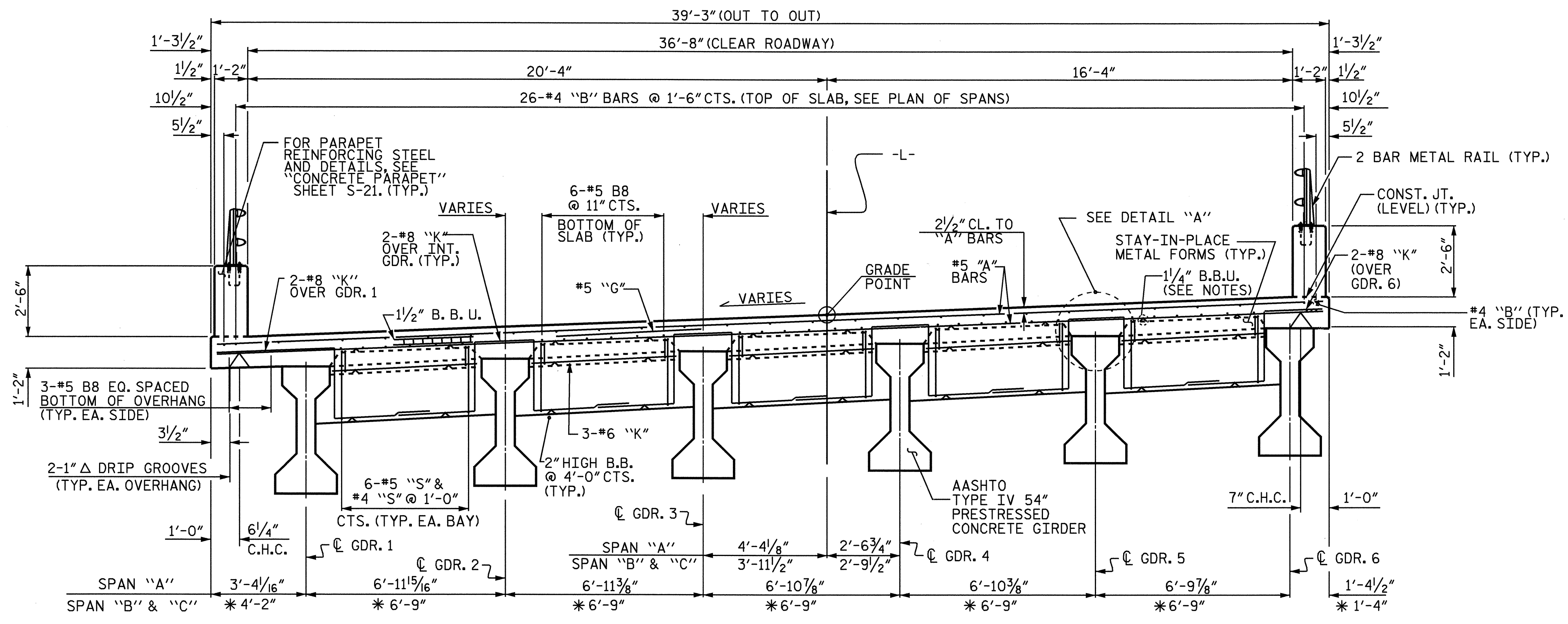
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON US 64
 OVER BROAD RIVER
 BETWEEN SR 1305
 AND NC 9

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

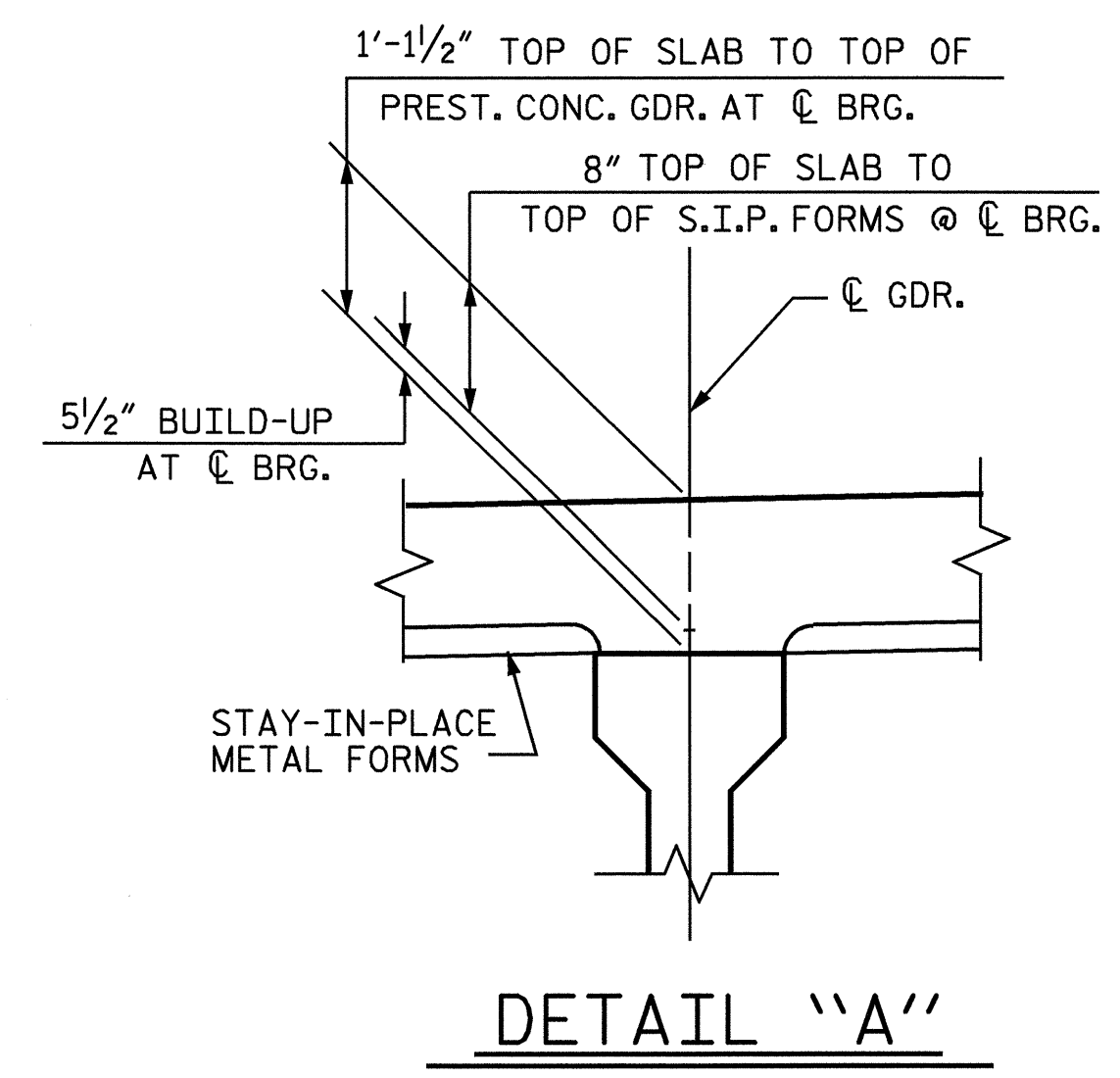
DRAWN BY : J.G. KHARVA DATE : 6/20/08
 CHECKED BY : A. K. PASCHAL DATE : 7/09/08

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.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 FOR TYPICAL SECTION OF INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER" SHEET 5 OF 5.

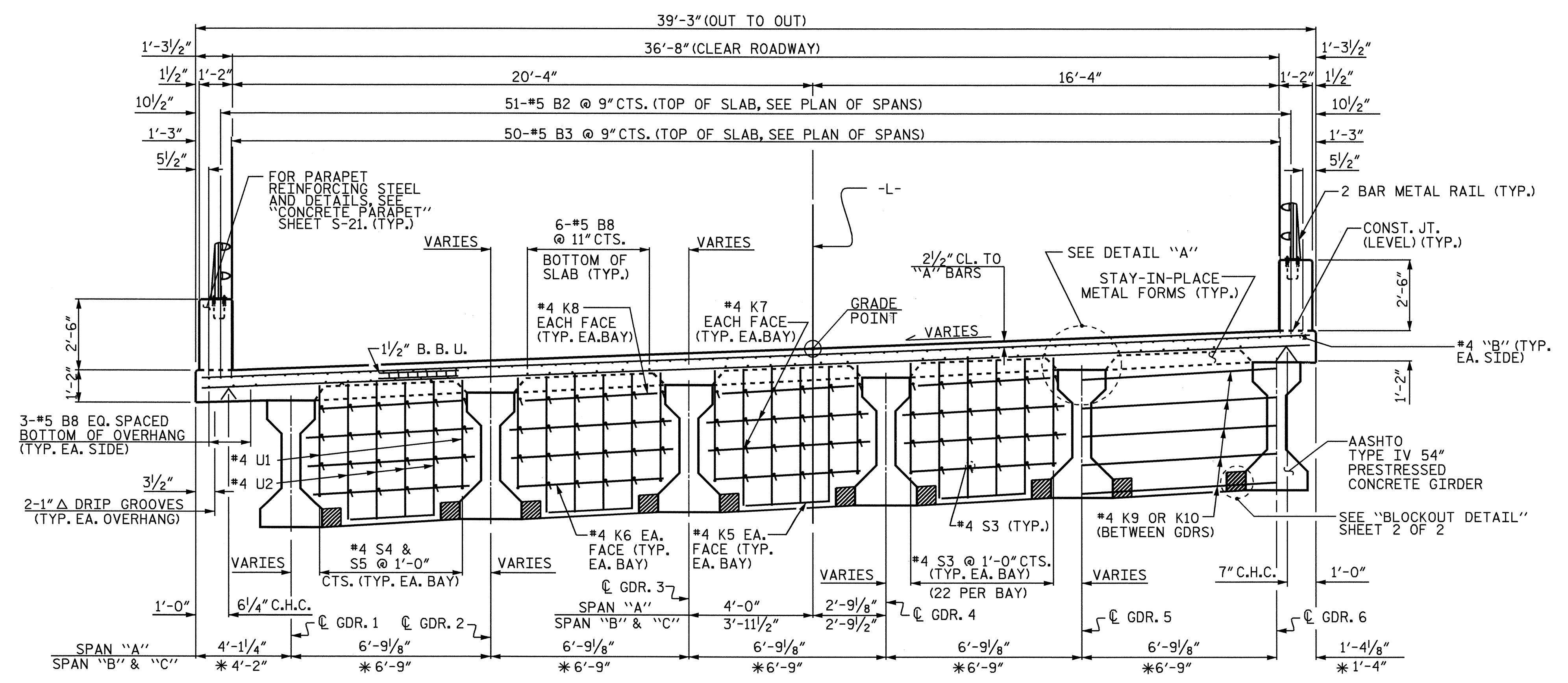


TYPICAL SECTION @ END BENT DIAPHRAGMS

* DIMENSIONS SHOWN ARE TO CURVES CONCENTRIC WITH -L-, GIRDERS ARE ON THE CHORDS OF THESE CURVES. ALL HORIZONTAL DIMENSIONS ARE NORMAL TO -L- EXCEPT AS NOTED.



DETAIL "A"

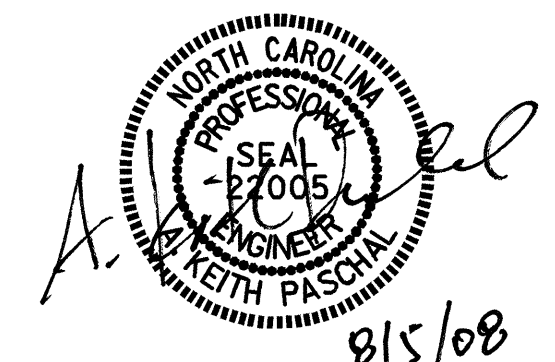


TYPICAL SECTION @ BENT DIAPHRAGMS

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-
 SHEET 1 OF 2

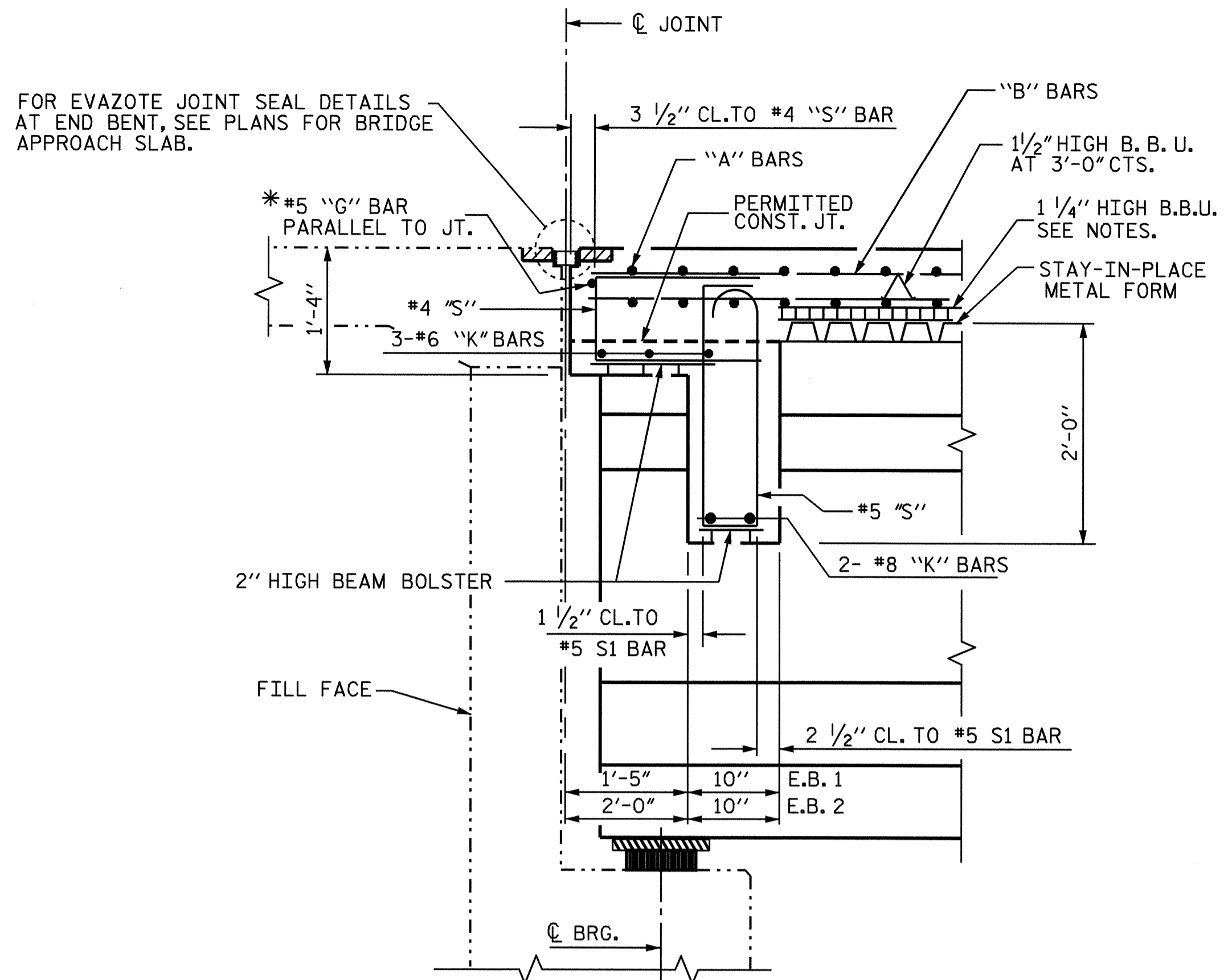
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 TYPICAL SECTION**



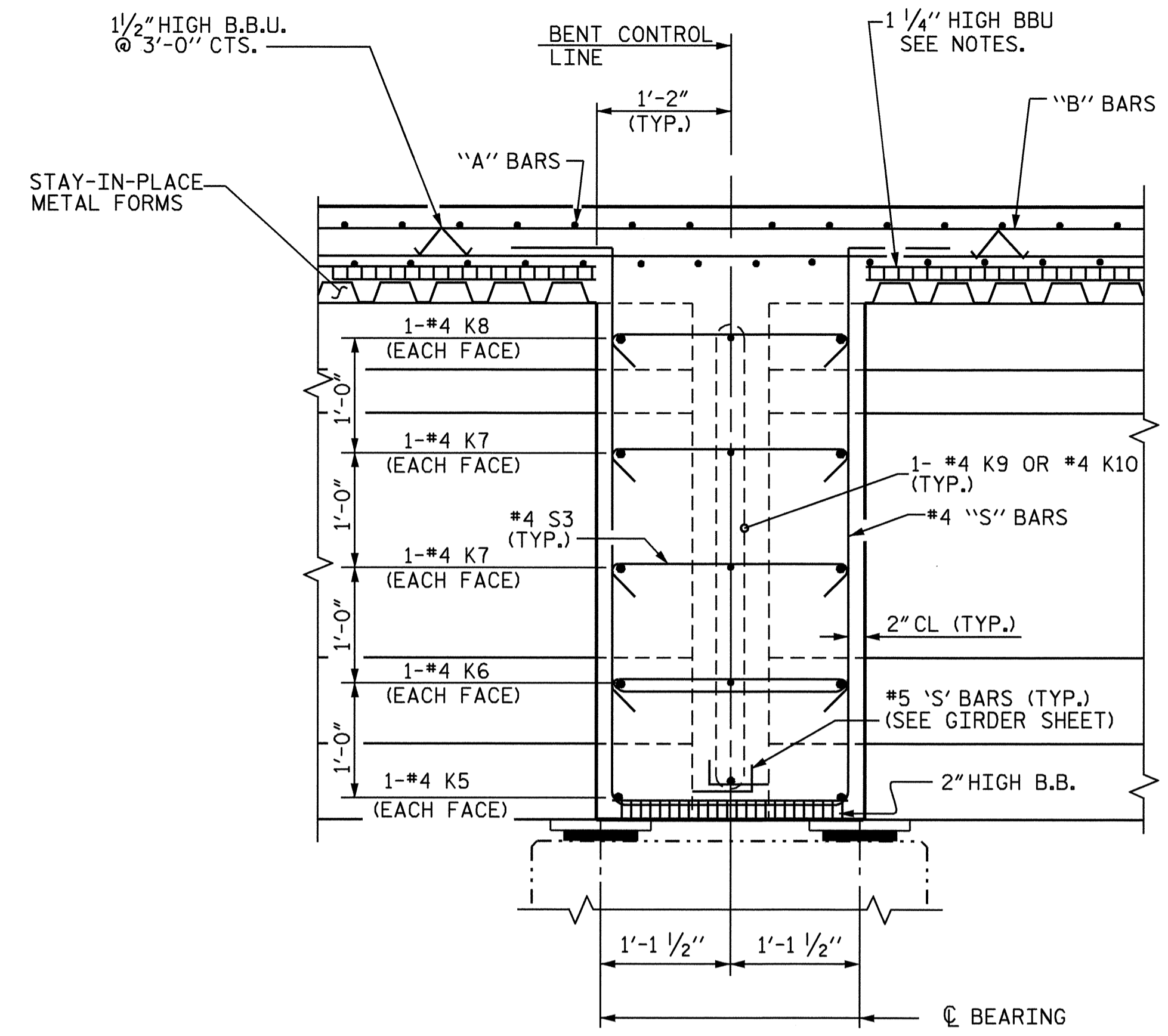
DRAWN BY : J. G. KHARVA DATE : 06/26/07
 CHECKED BY : J. D. HAWK DATE : 07/01/08

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

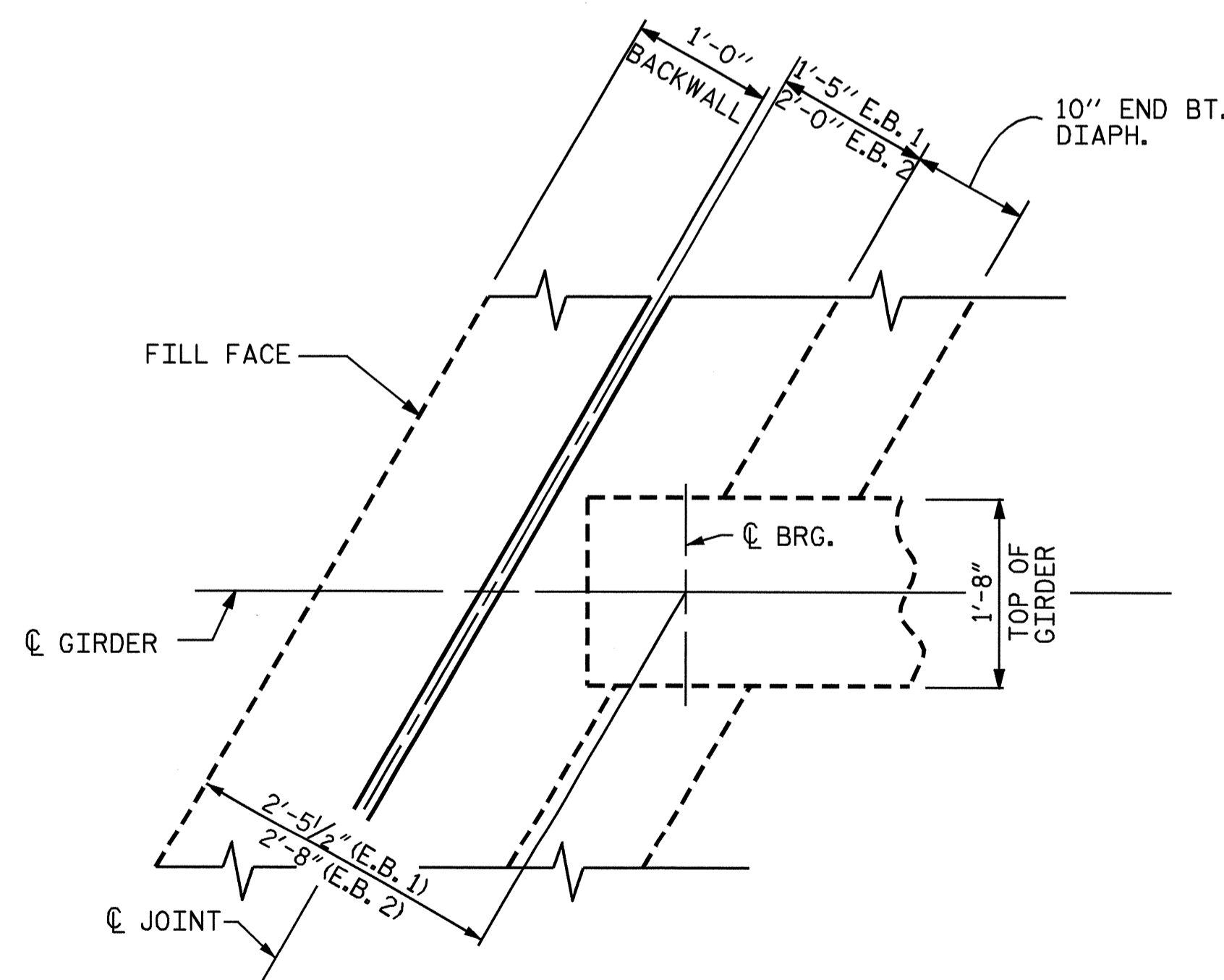


SECTION A-A
(THRU END BENT DIAPHRAGM)

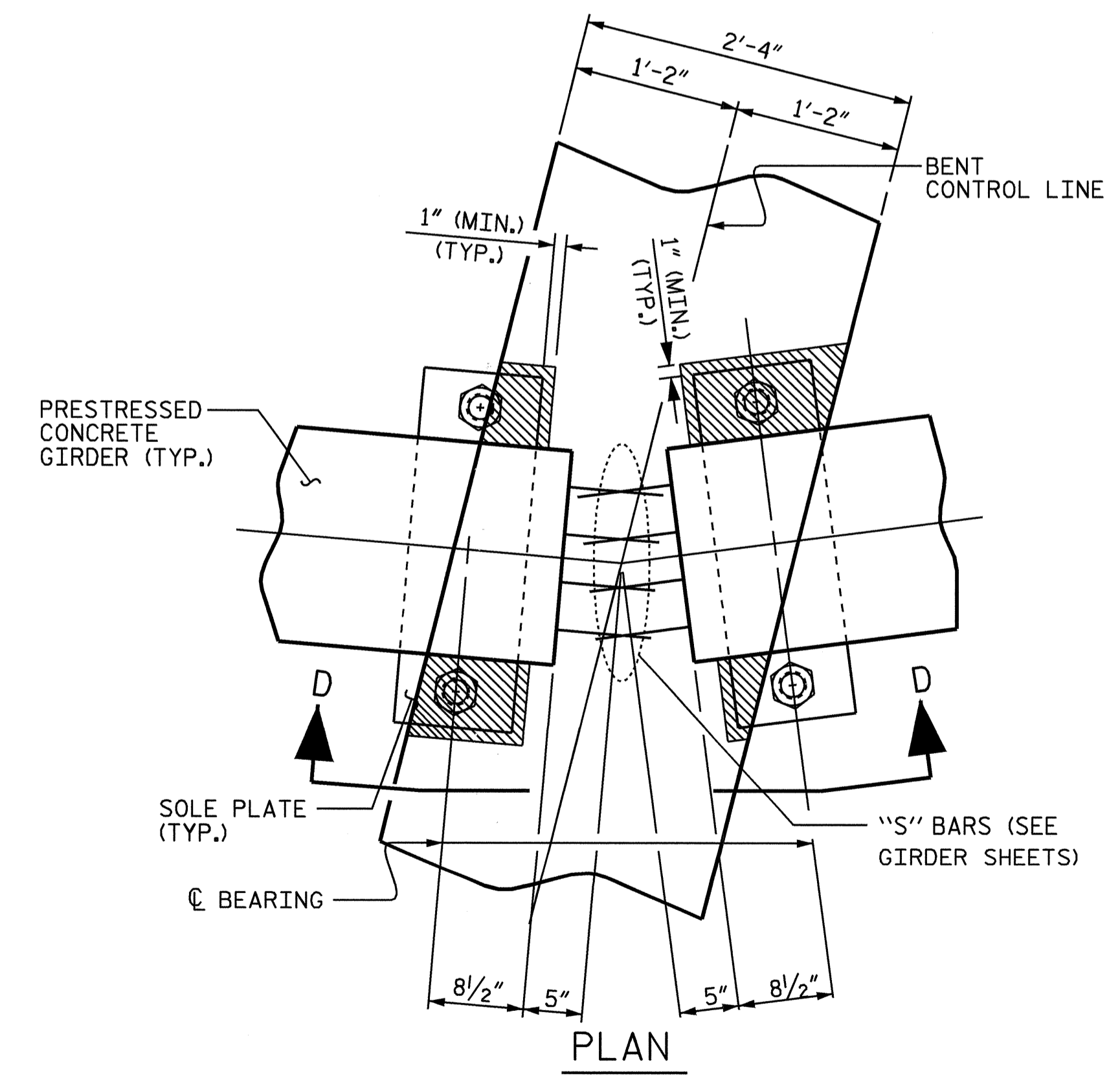
* #5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



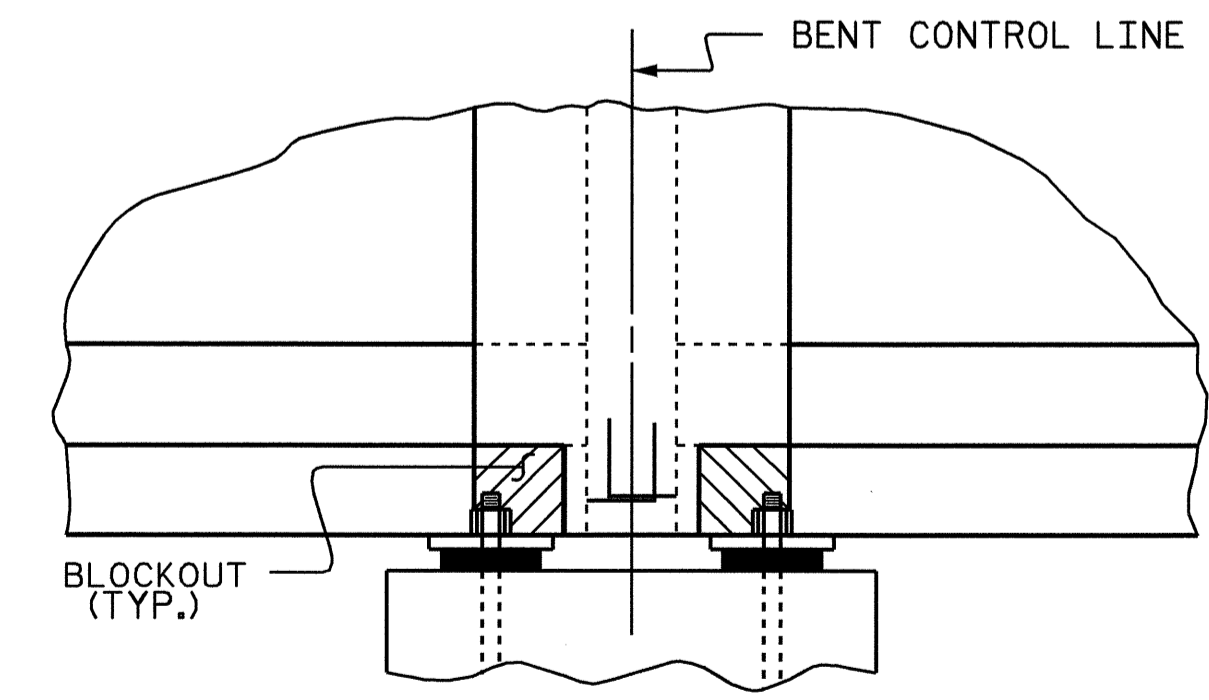
SECTION B-B
(THRU BENT DIAPHRAGM)



PLAN OF END BENT DIAPHRAGM



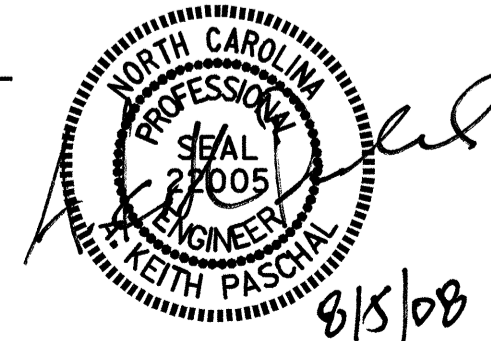
BENT DIAPHRAGM BLOCKOUT DETAIL



SECTION D-D

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-
 SHEET 2 OF 2

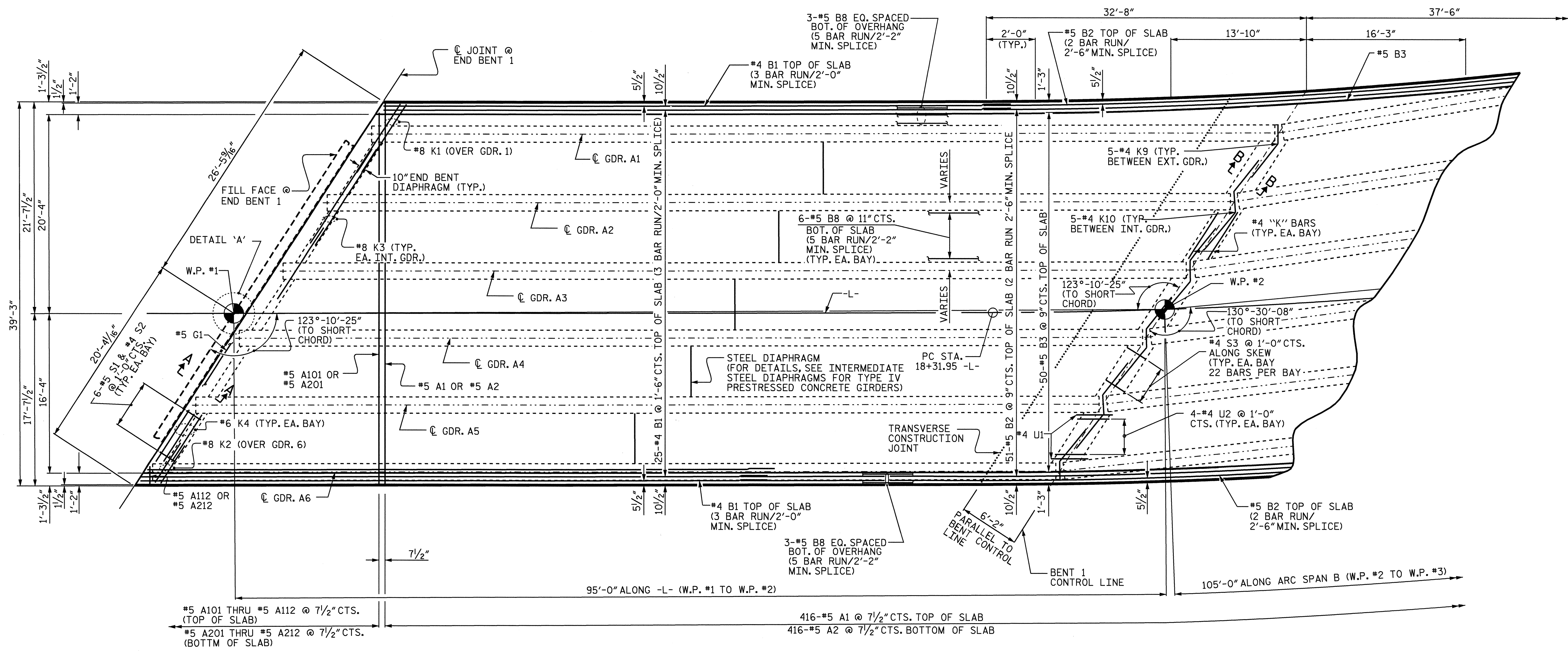
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION



DRAWN BY: J. G. KHARVA DATE: 06/26/07
 CHECKED BY: J. D. HAWK DATE: 07/01/08

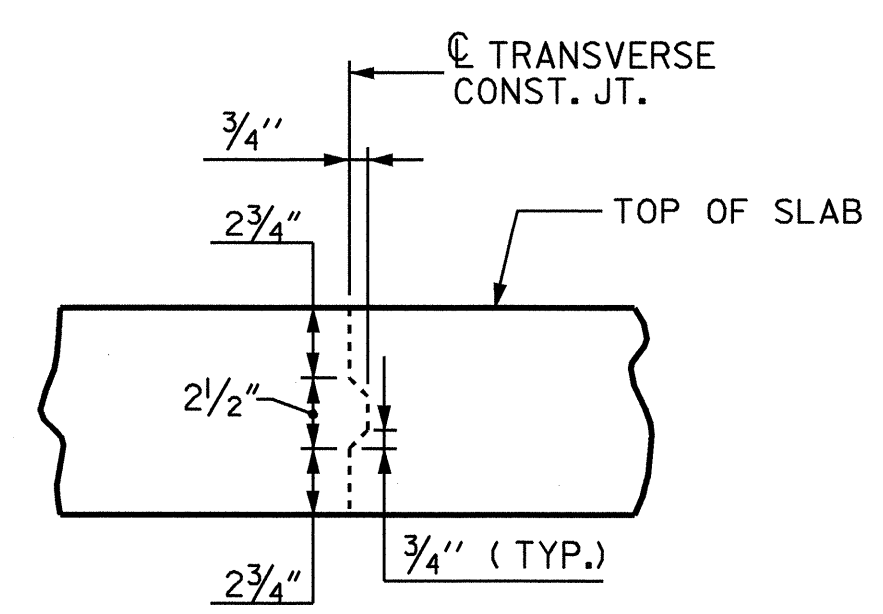
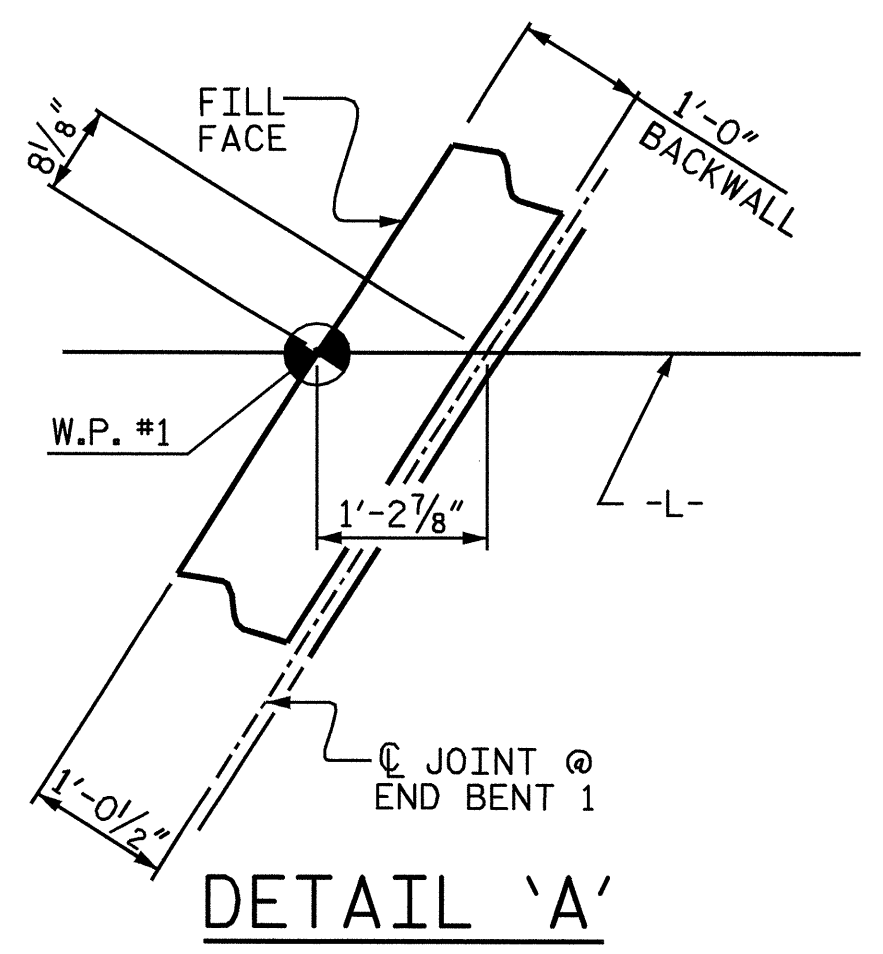
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 jkharva

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			40



NOTES
 "A" BARS ARE TO BE PLACED NORMAL TO ARC -L-, BEGINNING @ PC STA. 18+31.95 -L- AS SHOWN.

PLAN OF SPAN A

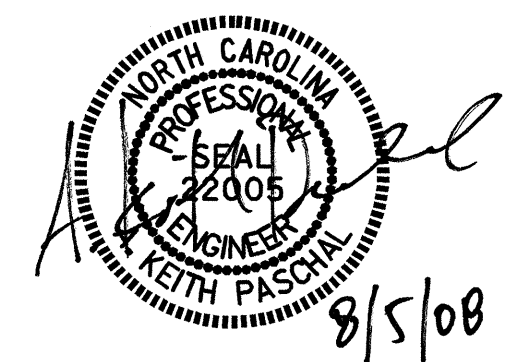


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

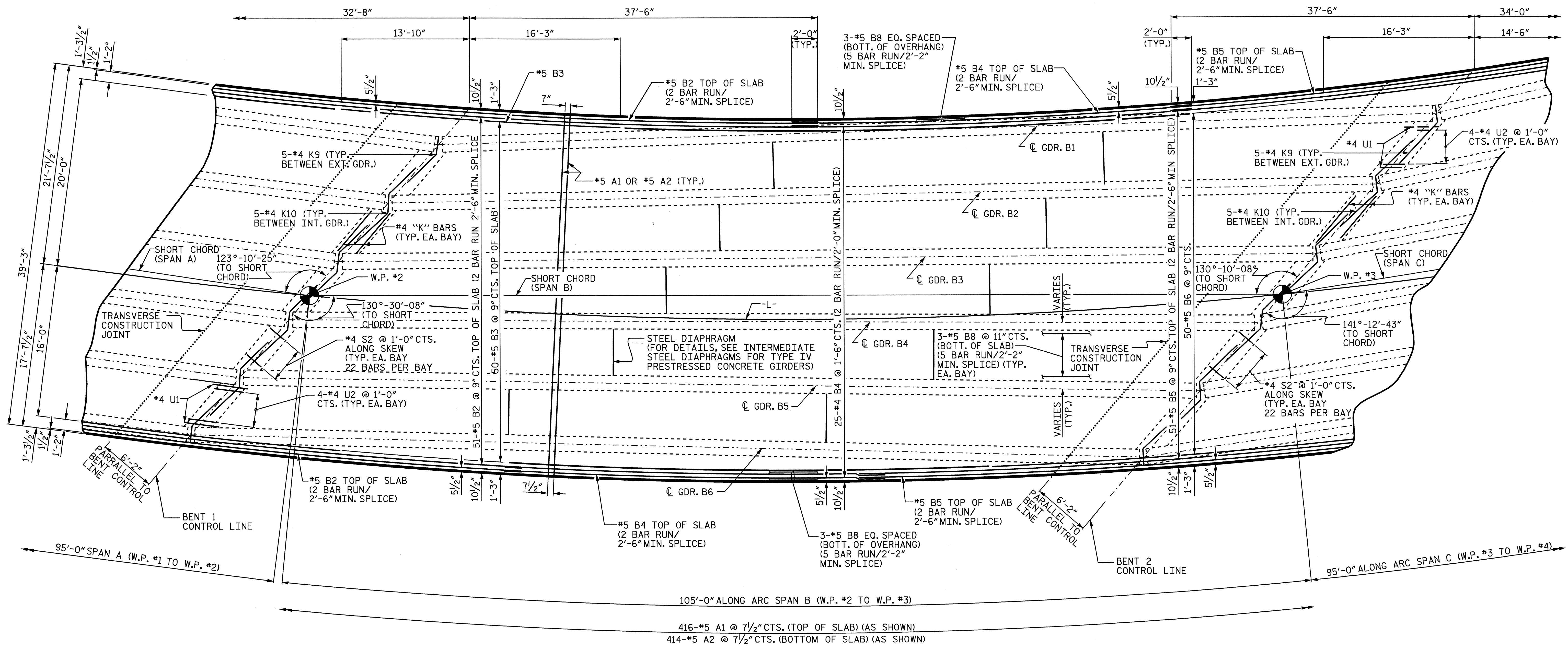
SHEET 1 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN A



DRAWN BY: J. G. KHARVA DATE: 06-29-07
 CHECKED BY: J. D. HAWK DATE: 07-01-08

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

ALL HORIZONTAL DIMENSIONS ARE NORMAL TO -L- EXCEPT AS NOTED.



PLAN OF SPAN B

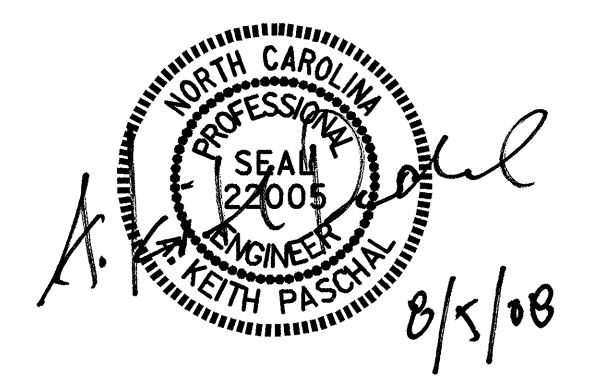
PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN B

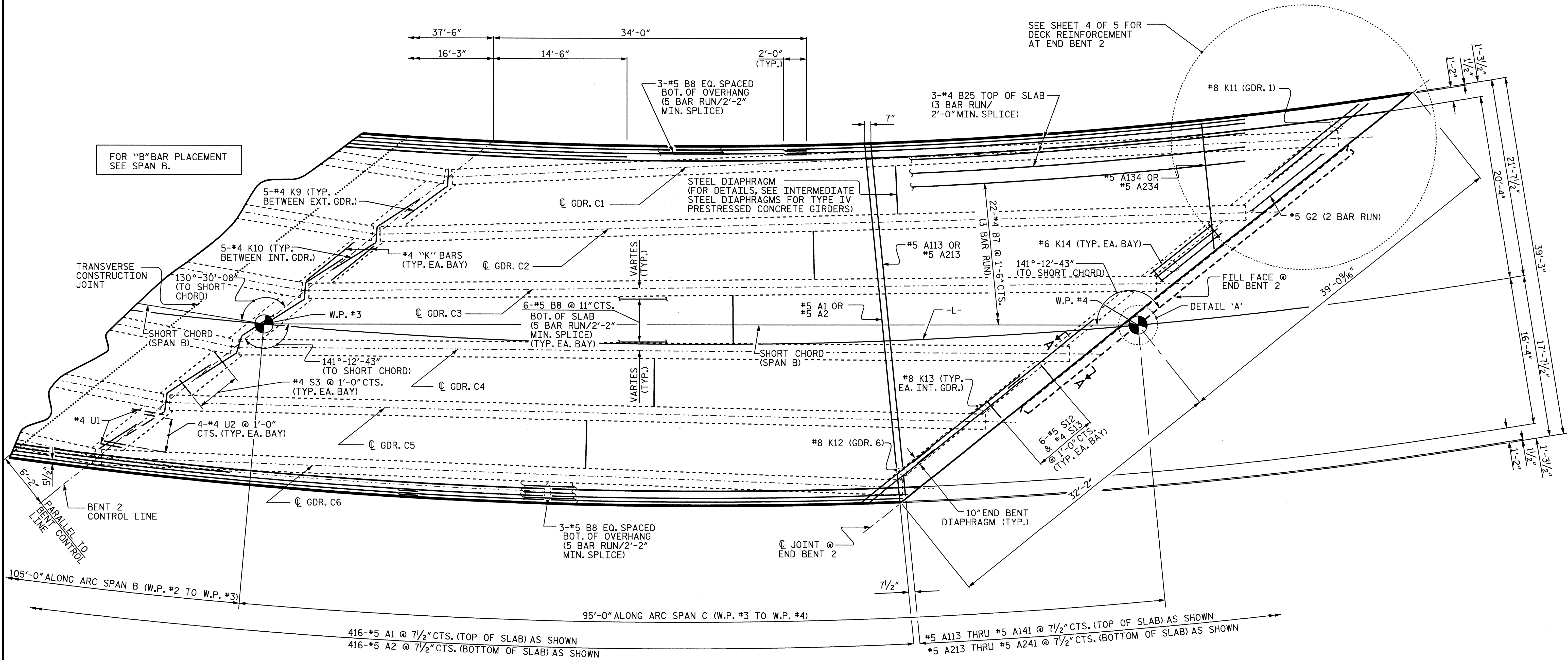
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			40



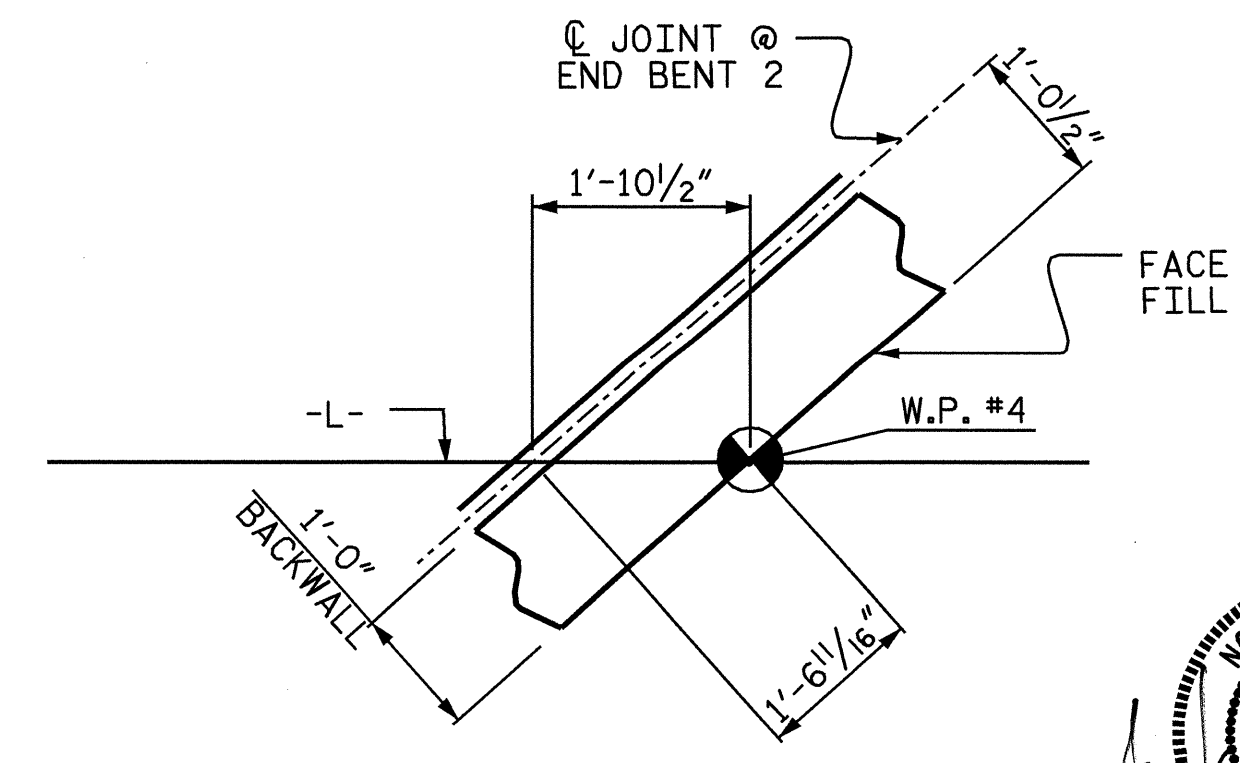
DRAWN BY: J. G. KHARVA DATE: 07-02-07
 CHECKED BY: J. D. HAWK DATE: 07-01-08

05-AUG-2008 15:10
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 jkharva

ALL HORIZONTAL DIMENSIONS ARE NORMAL TO -L- EXCEPT AS NOTED.



PLAN OF SPAN C



DETAIL A

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 5

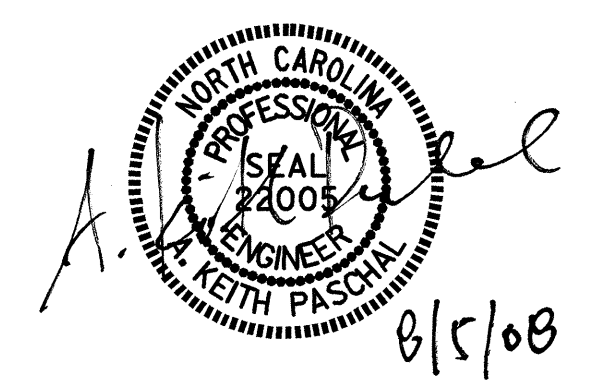
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

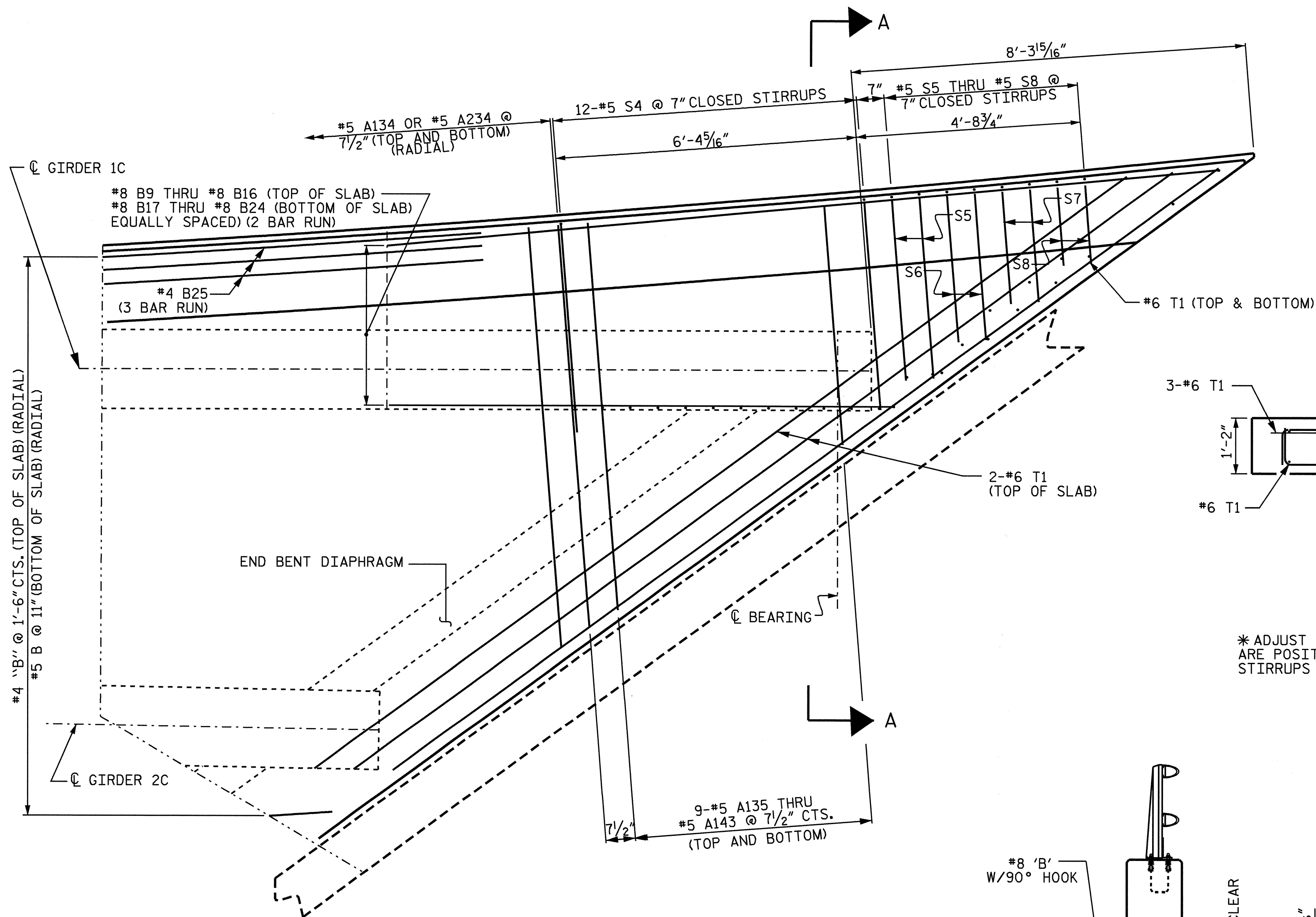
SUPERSTRUCTURE
 PLAN OF SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS 40
2			4			

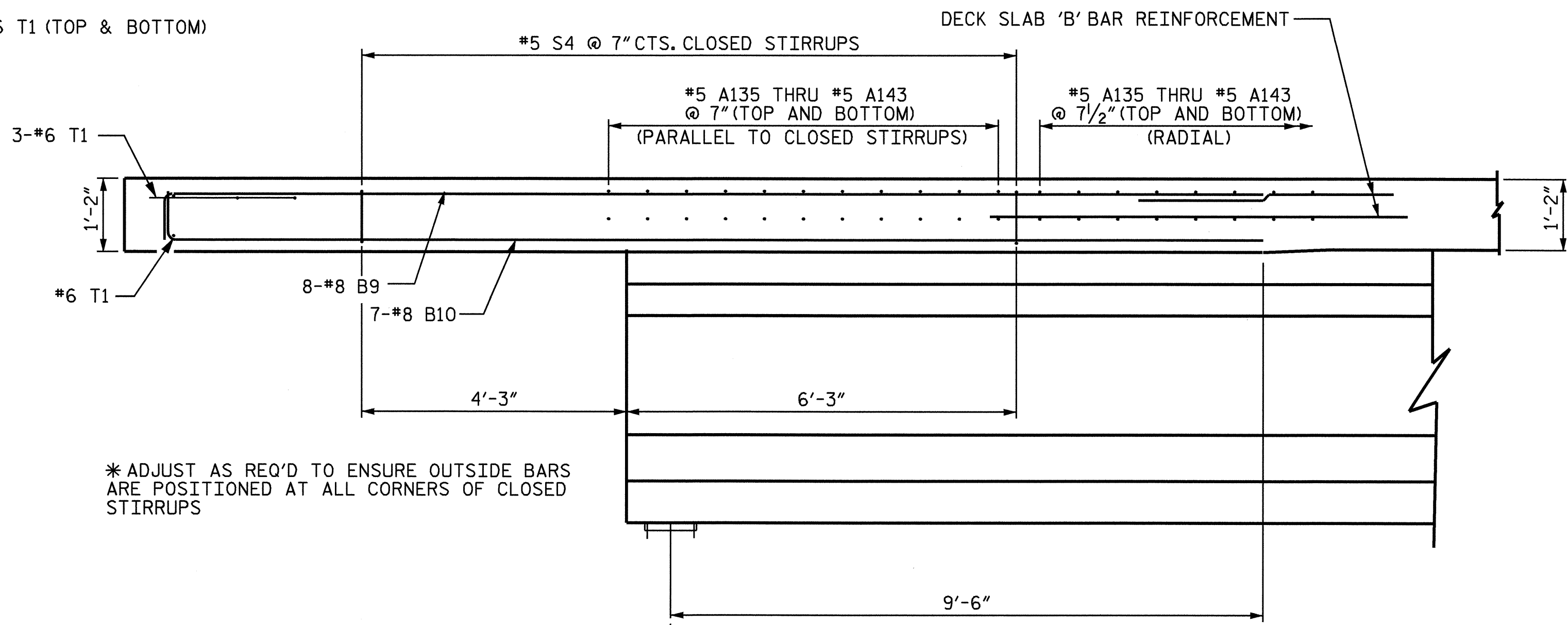
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 CHECKED BY : J. D. HAWK DATE : 07-01-08

05-AUG-2008 15:11
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 jkharva

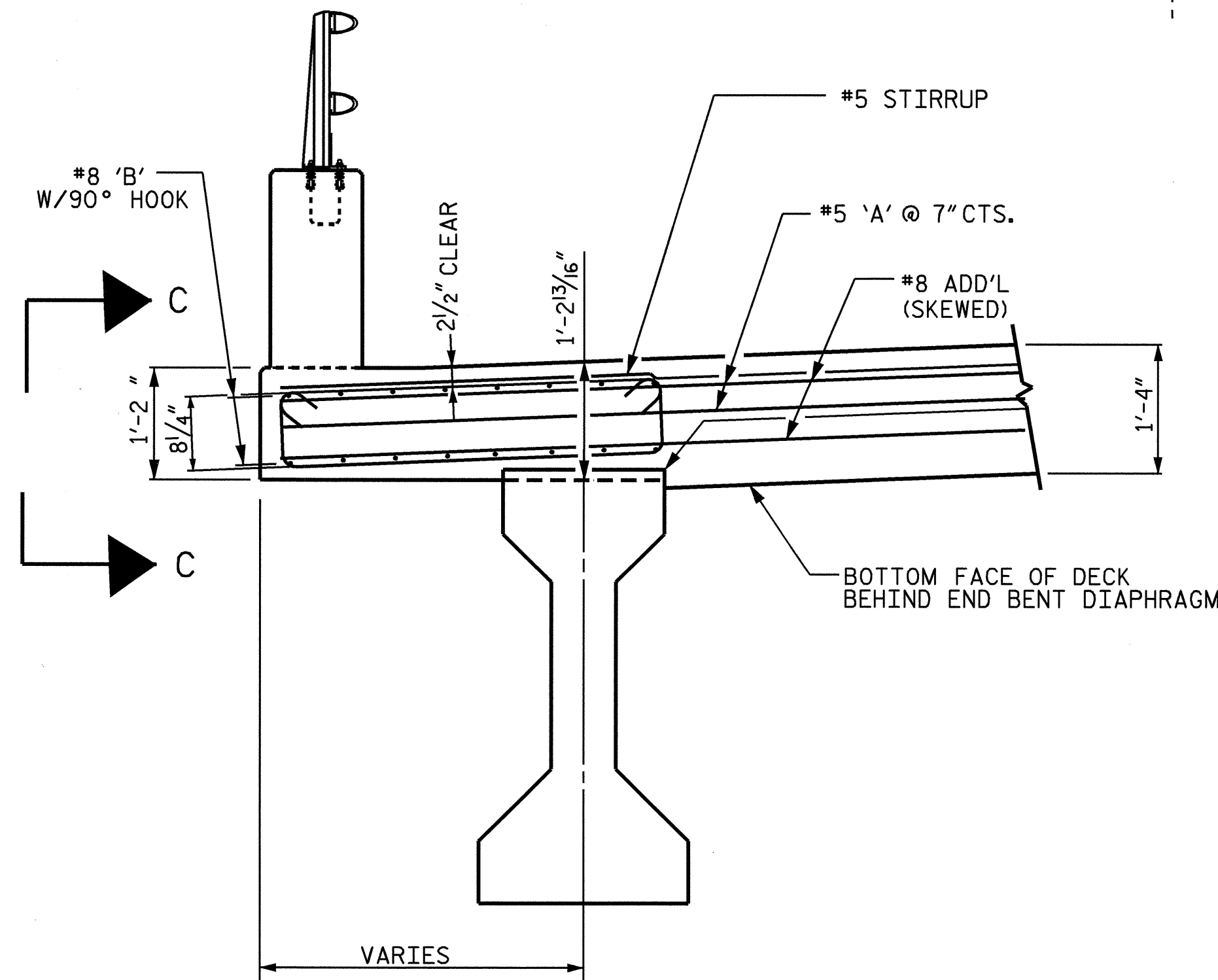




PARTIAL PLAN OF DECK



SECTION C-C

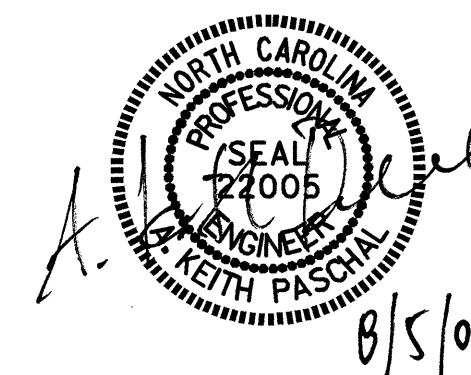


SECTION A-A

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
DECK REINFORCEMENT AT END BENT #2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-10
TOTAL SHEETS					40



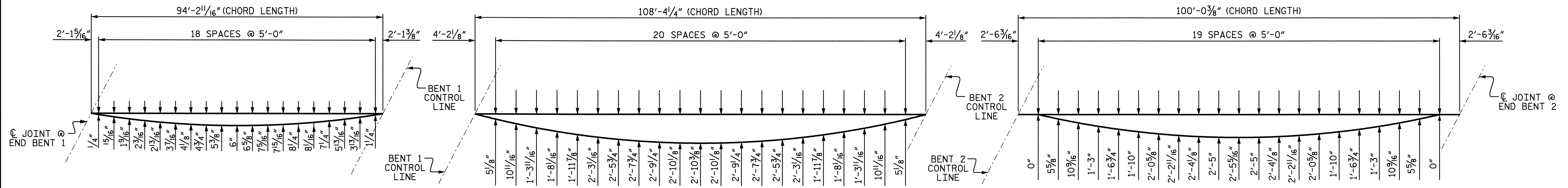
DRAWN BY: J. G. KHARVA DATE: 07/05/07
 CHECKED BY: J. D. HAWK DATE: 07/01/08

05-AUG-2008 15:11
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 jkharva

NC006

NOTES

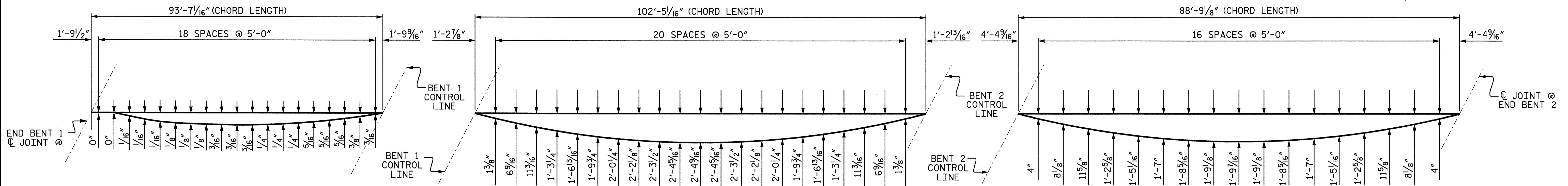
ARC OFFSETS ARE TAKEN ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE.



LEFT SIDE

LEFT SIDE

LEFT SIDE



RIGHT SIDE

RIGHT SIDE

RIGHT SIDE

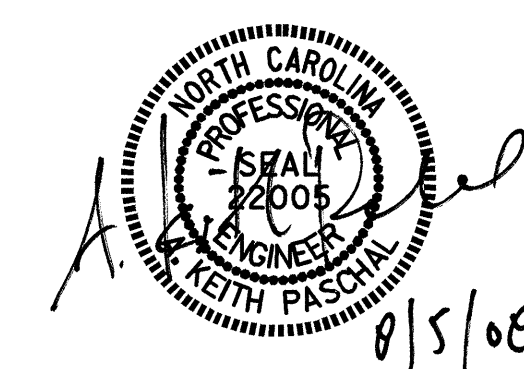
ARC OFFSETS - SPAN A

ARC OFFSETS - SPAN B

ARC OFFSETS - SPAN C

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

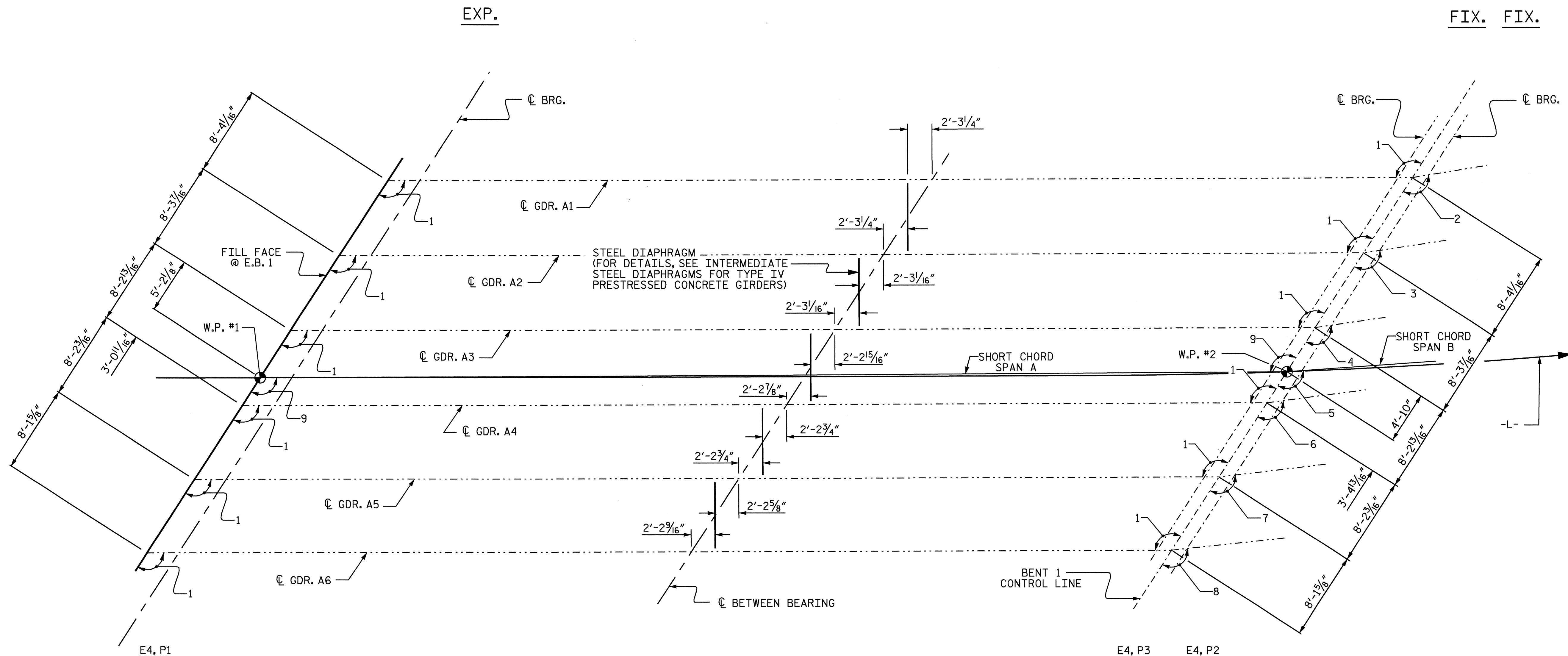
SHEET 5 OF 5



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE ARC OFFSETS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-11
					TOTAL SHEETS 40

DRAWN BY: J. G. KHARVA DATE: 7/1/08
 CHECKED BY: J. D. HAWK DATE: 7/03/08

05-AUG-2008 15:11
 T:\struct\B4258\final\B-4258_sd.ps.dgn
 jkharva



SPAN A

ANGLES	
1	123°-00'-00"
2	132°-12'-21"
3	131°-31'-39"
4	130°-52'-27"
5	130°-30'-08"
6	130°-14'-40"
7	129°-38'-11"
8	129°-02'-57"
9	123°-10'-25"

DRAWN BY : J. G. KHARVA DATE : 07/19/07
 CHECKED BY : J. D. HAWK DATE : 07/11/08

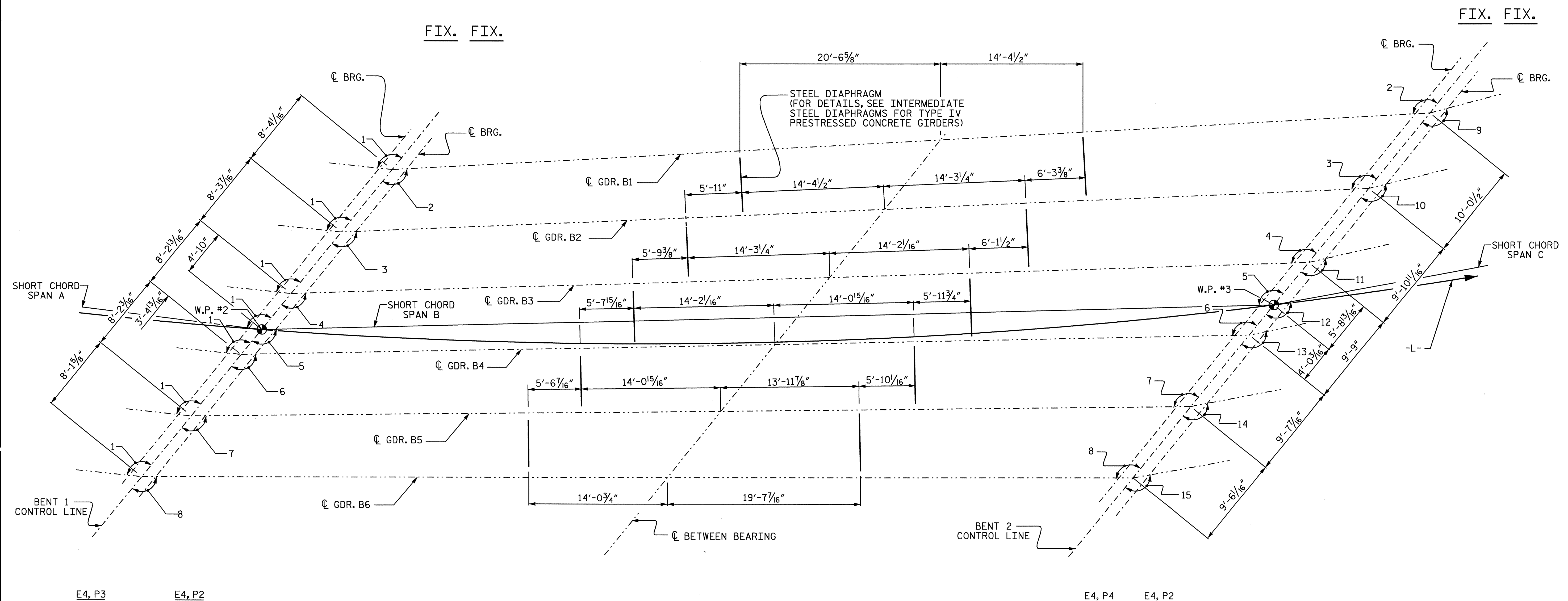
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 jkharva

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 (SPAN A)



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



SPAN B

ANGLES

1	123°-10'-25"	9	143°-44'-43"
2	132°-12'-21"	10	142°-43'-33"
3	131°-31'-39"	11	141°-45'-27"
4	130°-52'-27"	12	141°-12'-43"
5	130°-30'-08"	13	140°-50'-09"
6	130°-14'-40"	14	139°-57'-21"
7	129°-38'-11"	15	139°-06'-52"
8	129°-02'-57"		

DRAWN BY : J. G. KHARVA DATE : 07/19/07
 CHECKED BY : J. D. HAWK DATE : 07/11/08

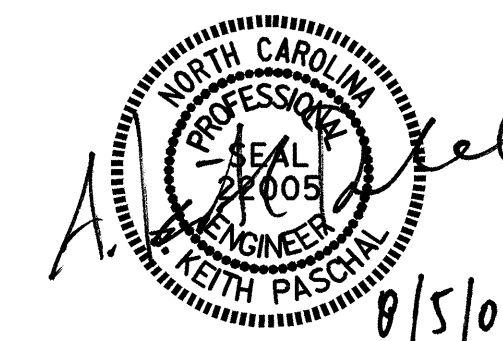
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 jkharva

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

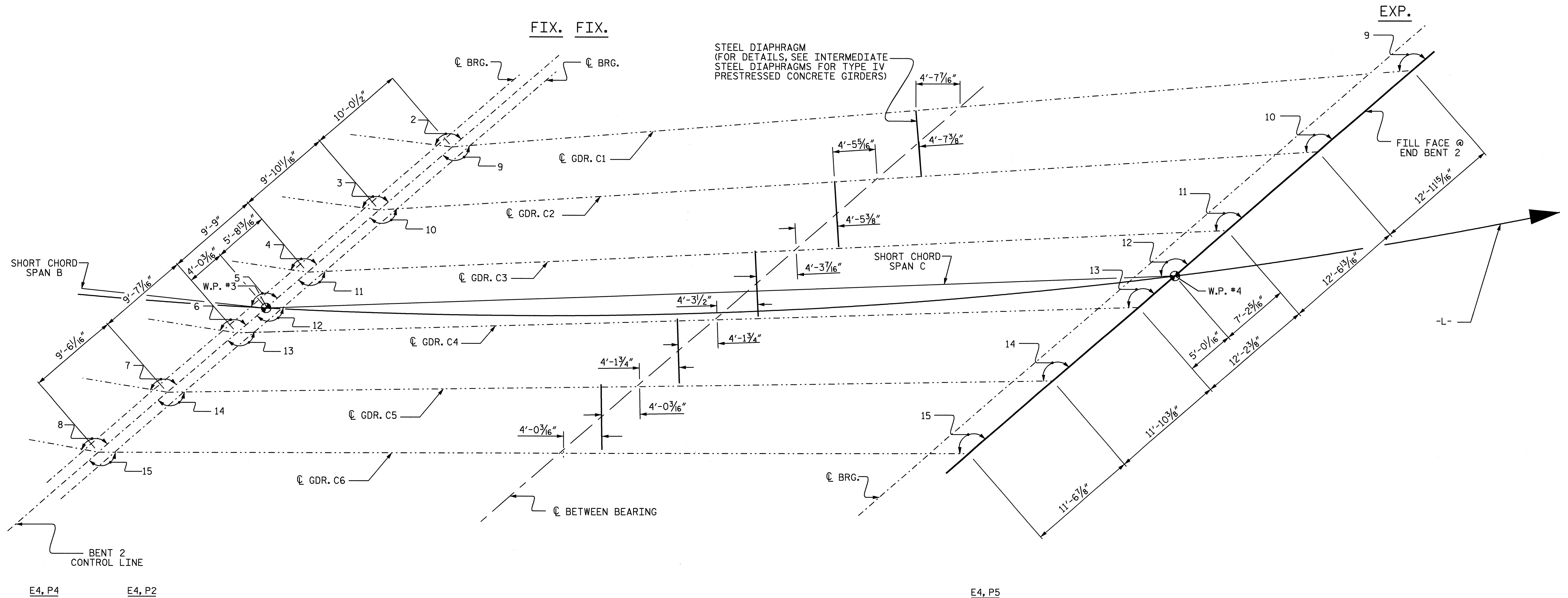
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 FRAMING PLAN
 (SPAN B)



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



STEEL DIAPHRAGM
(FOR DETAILS, SEE INTERMEDIATE
STEEL DIAPHRAGMS FOR TYPE IV
PRESTRESSED CONCRETE GIRDERS)

SPAN C

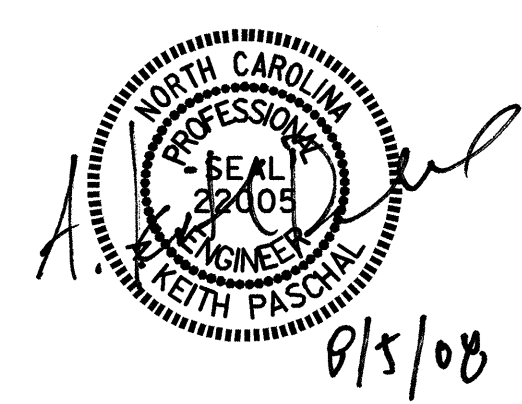
ANGLES			
2	132°-12'-21"	9	143°-44'-43"
3	131°-31'-39"	10	142°-43'-33"
4	130°-52'-27"	11	141°-45'-27"
5	130°-30'-08"	12	141°-12'-43"
6	130°-14'-40"	13	140°-50'-09"
7	129°-38'-11"	14	139°-57'-21"
8	129°-02'-57"	15	139°-06'-52"

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 3

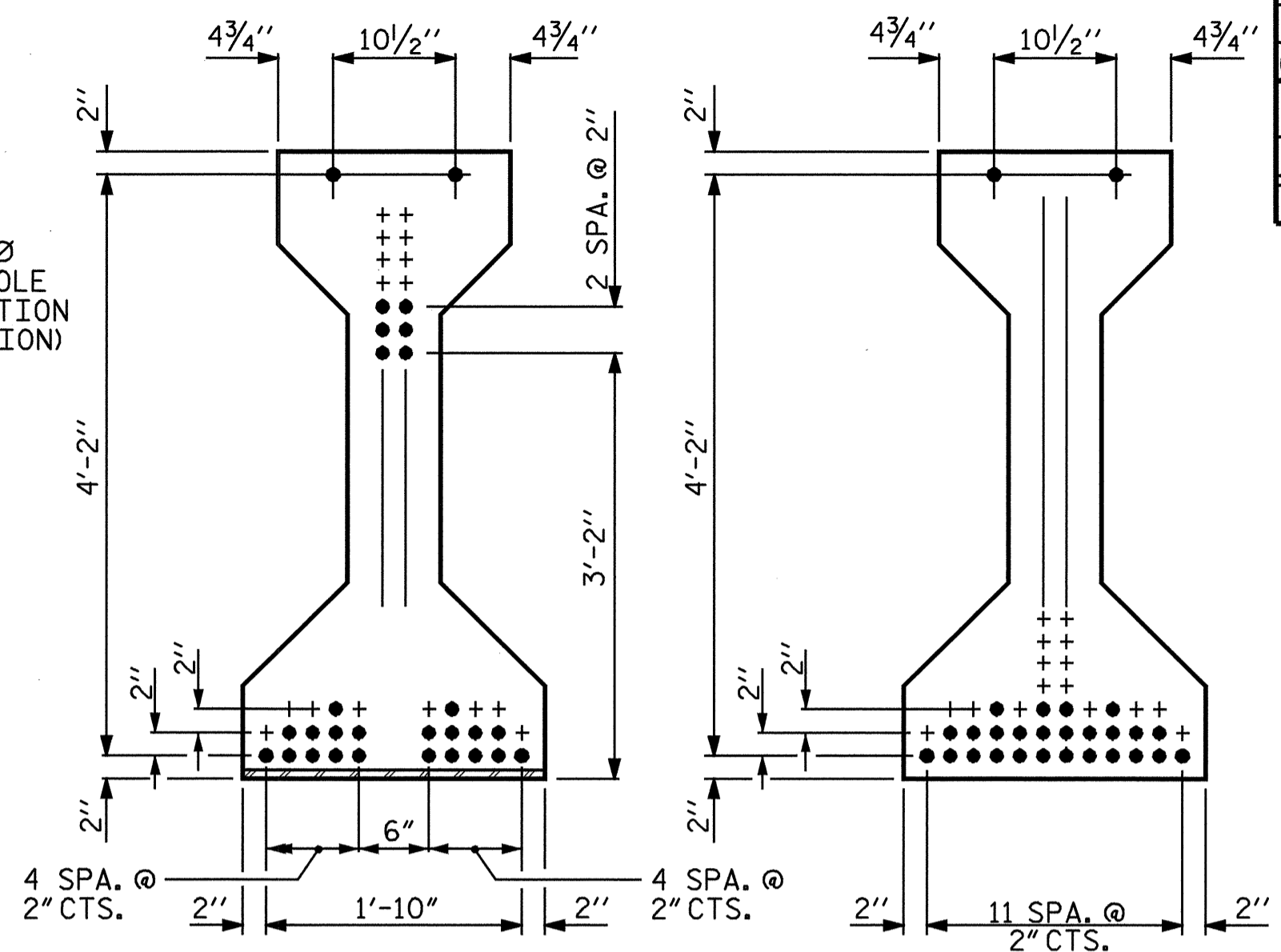
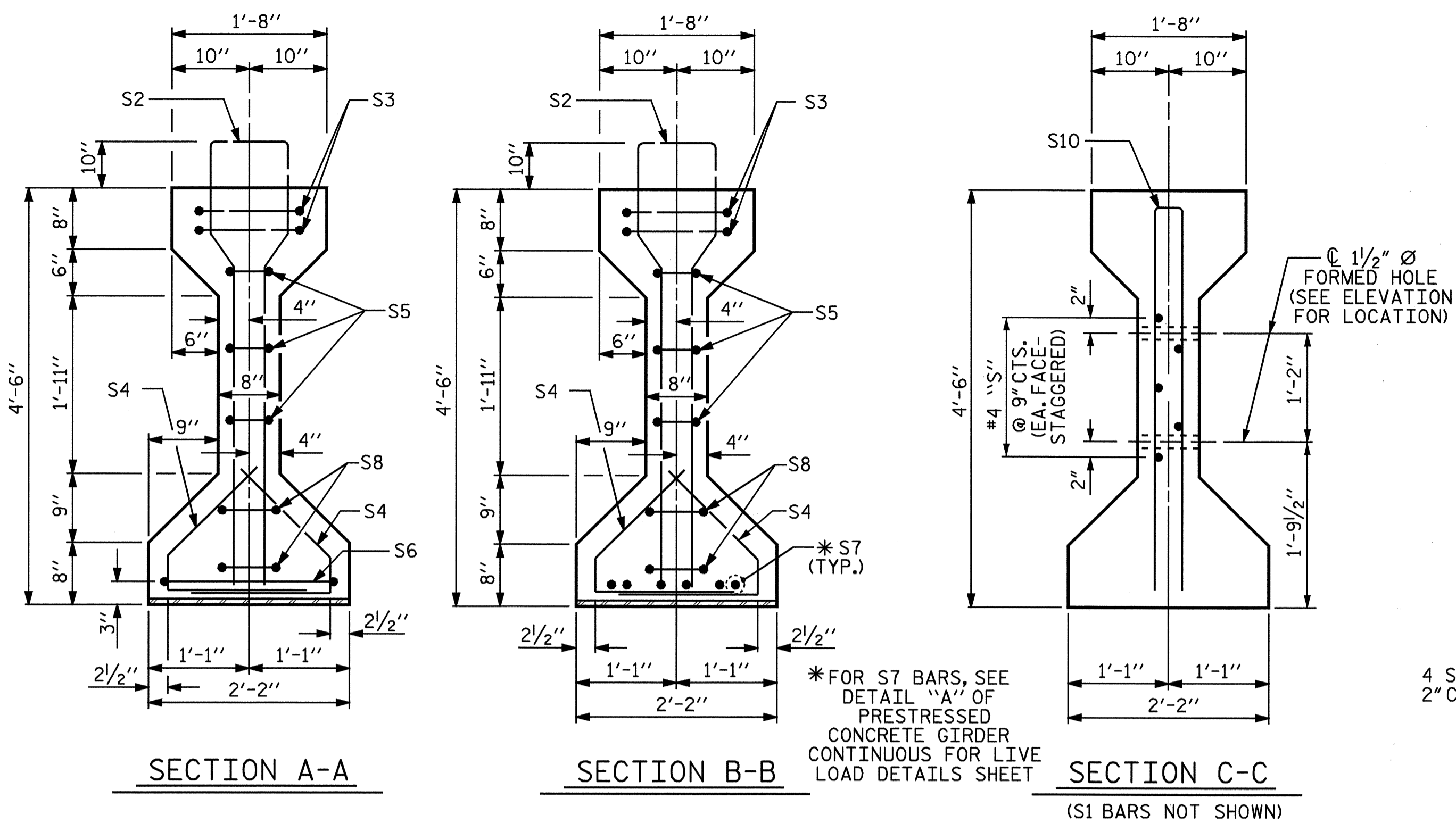
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 FRAMING PLAN
 (SPAN C)



DRAWN BY : J. G. KHARVA DATE : 07/19/07
 CHECKED BY : J. D. HAWK DATE : 07/01/08

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



0.6" Ø LOW RELAXATION STRAND LAYOUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9500 PST 1/2" Ø L.R. CONCRETE STRANDS	
	LB.	C.Y.	No.
GDR A1 & A6	988	18.7	28
GDR A2 THRU A5	1023	18.7	28
GIRDERS REQUIRED			
NUMBER	LENGTH	TOTAL LENGTH	
6	92'-2 1/8"	553'-0 3/4"	

.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	41,300	30,980

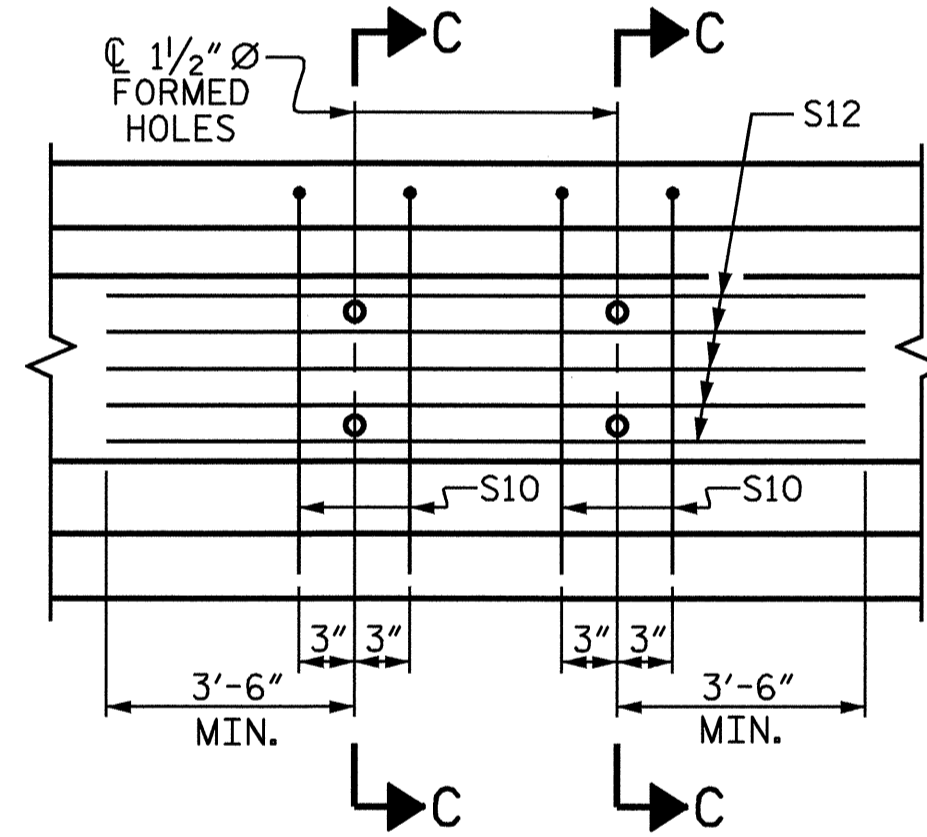
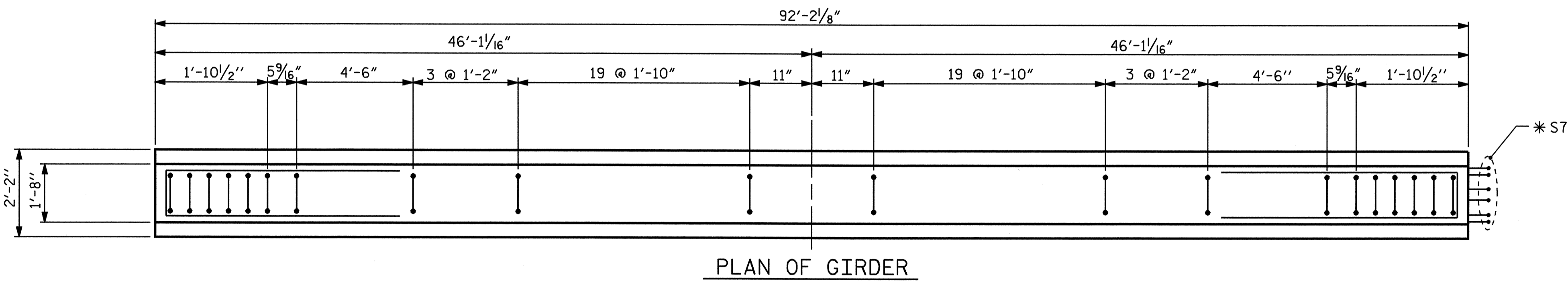
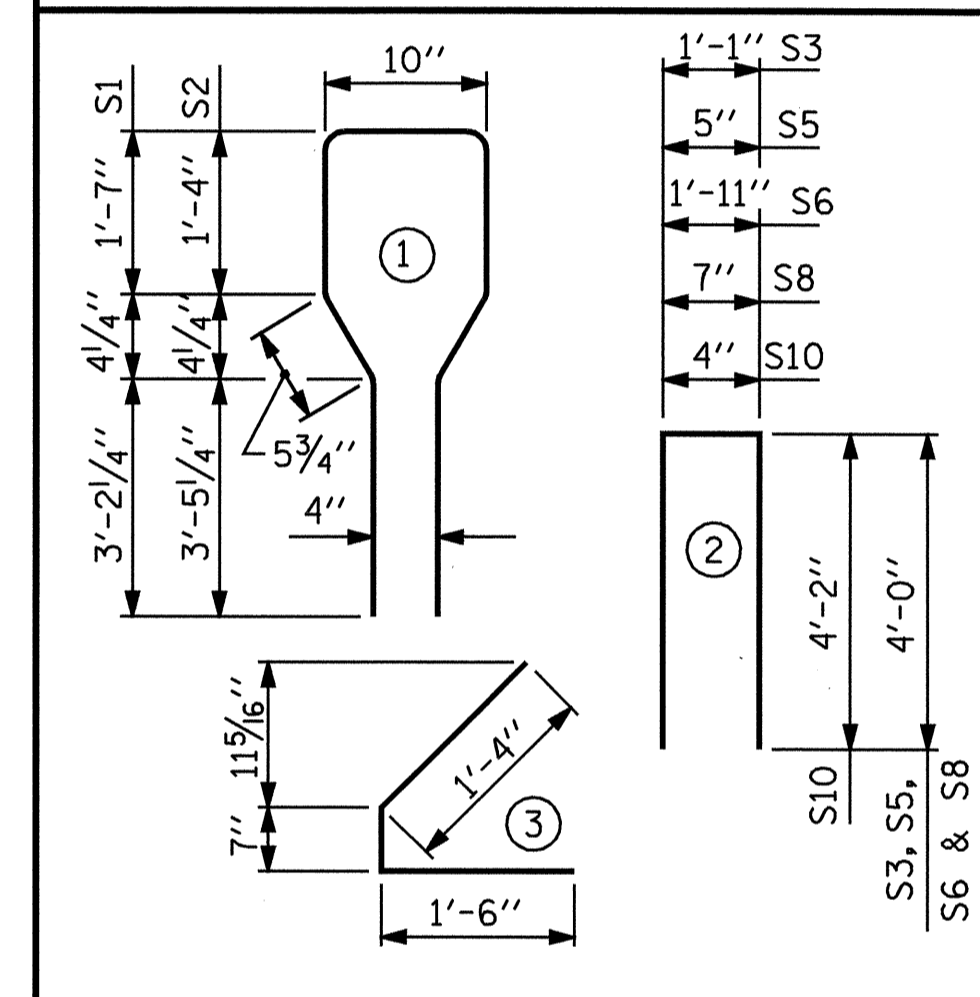
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	11'-4"	485
S2	12	#6	1	11'-4"	204
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	12'-0"	40

EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-0"	40

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

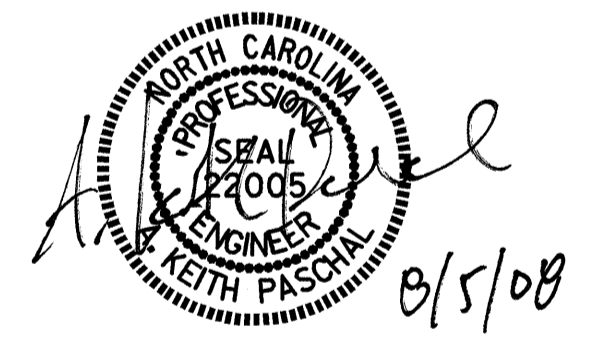
BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2,3,4,5

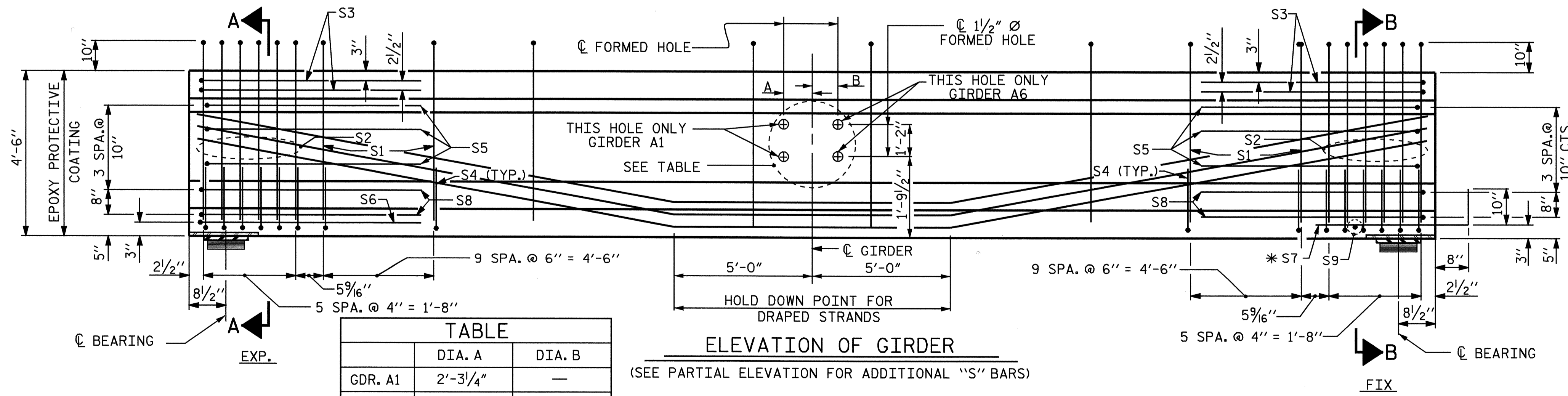


PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 1 OF 5

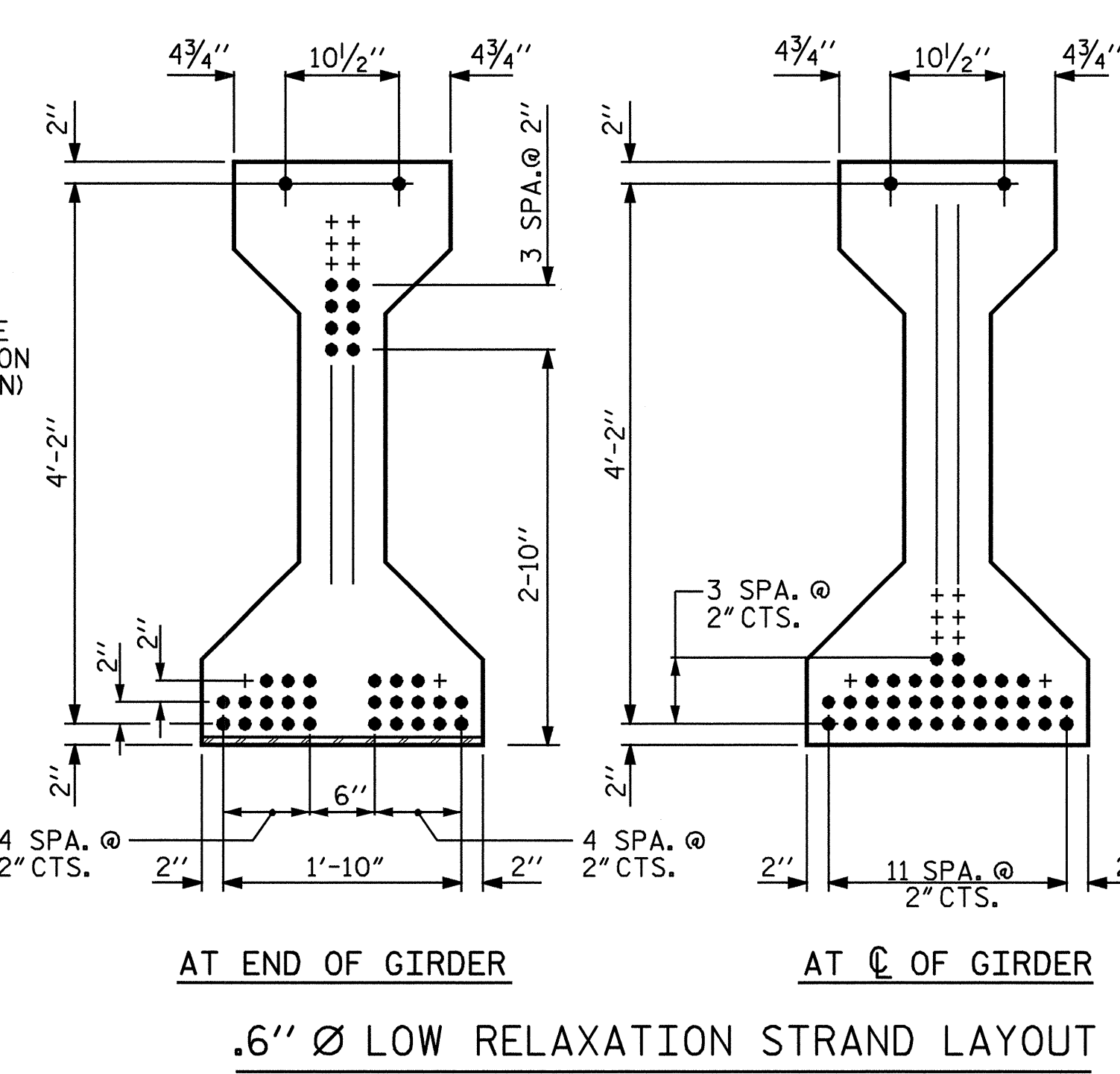
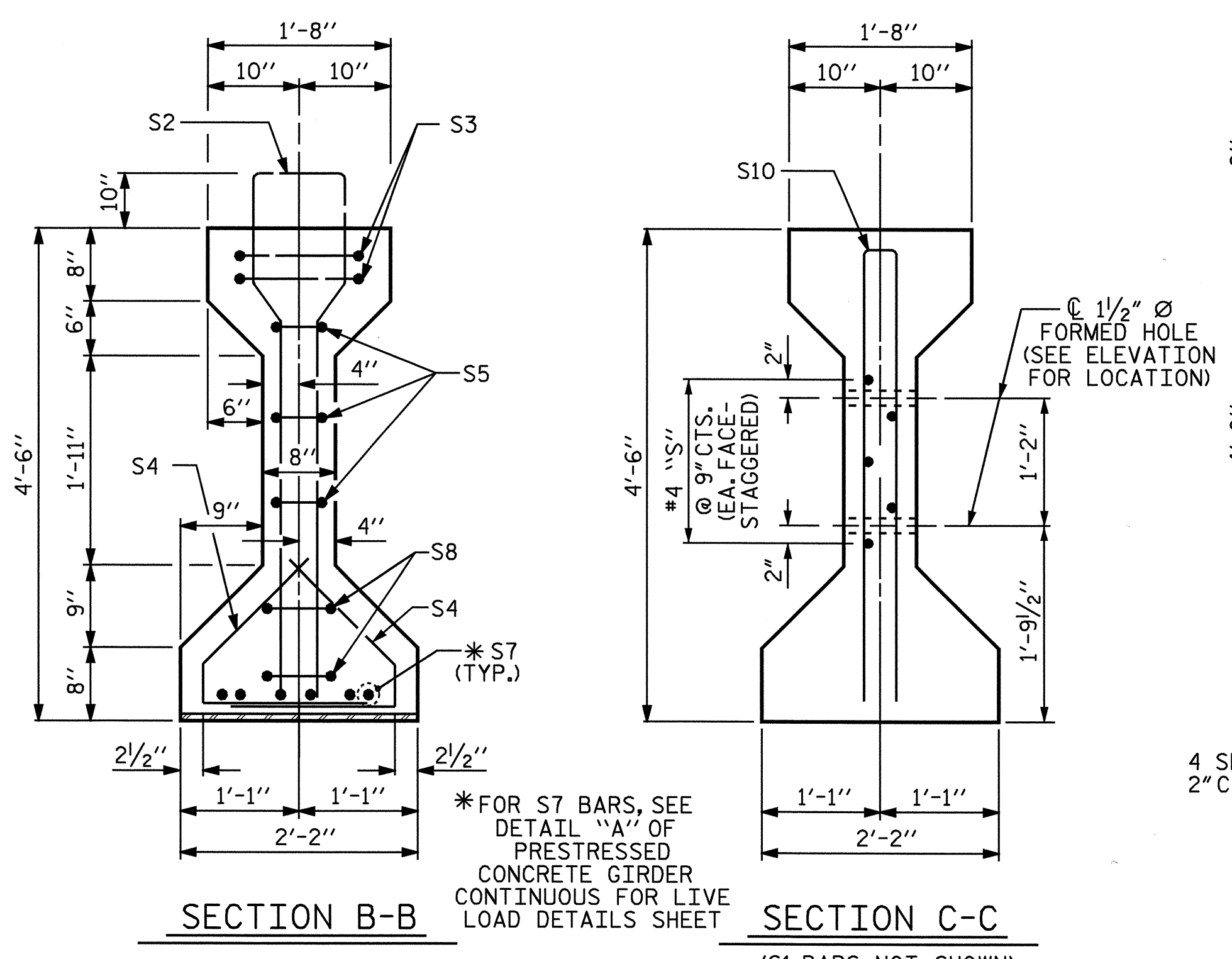
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE
GIRDER CONTINUOUS
FOR LIVE LOAD
SPAN A

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



	DIA. A	DIA. B
GDR. A1	2'-3 3/4"	—
GDR. A2	2'-3 1/16"	2'-3 1/4"
GDR. A3	2'-2 15/16"	2'-3 1/16"
GDR. A4	2'-2 3/4"	2'-2 1/8"
GDR. A5	2'-2 5/8"	2'-3 3/4"
GDR. A6	—	2'-2 9/16"

ASSEMBLED BY : J. G. KHARVA	DATE : 07/11/07
CHECKED BY : J. D. HAWK	DATE : 07/11/08
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM

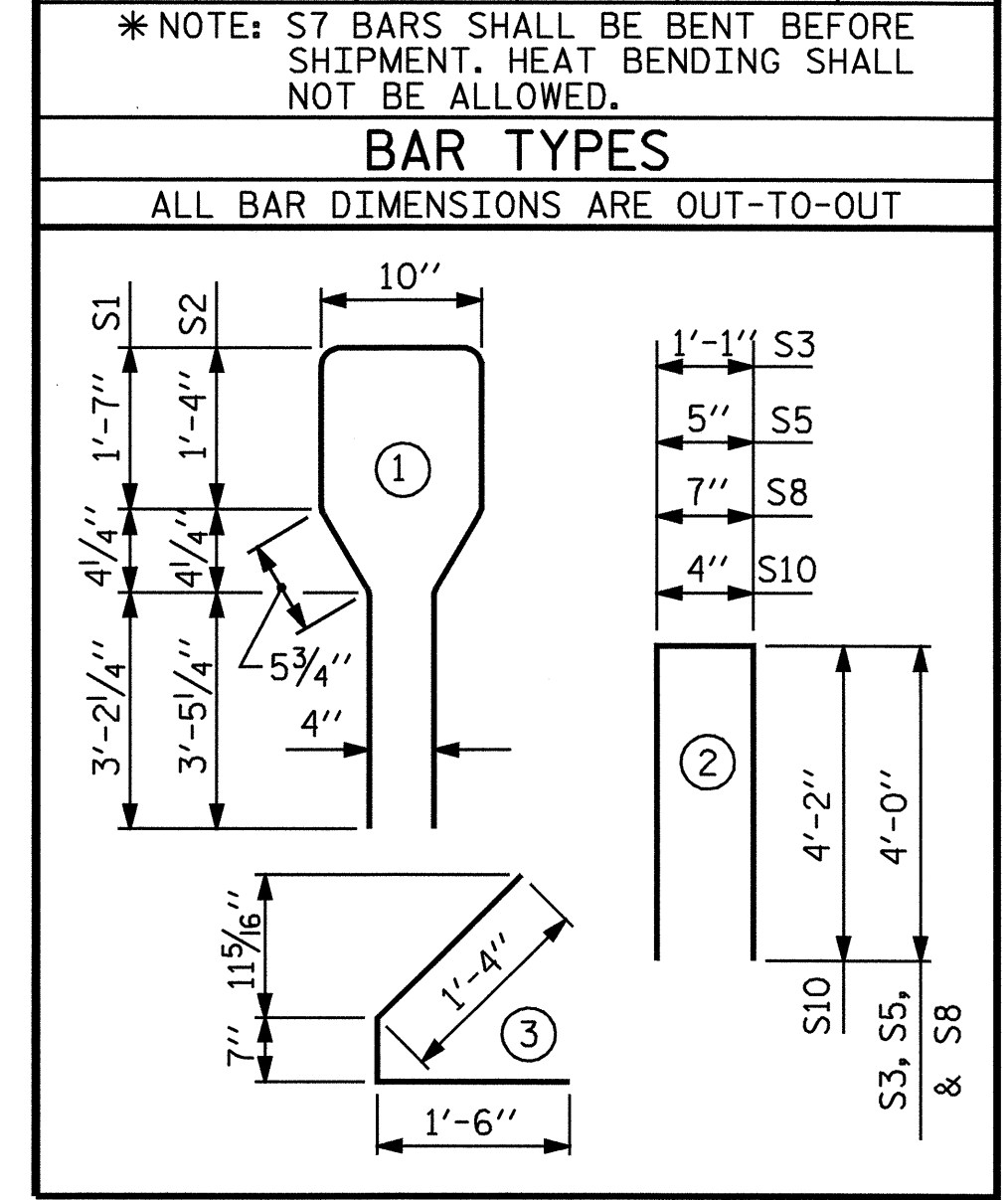
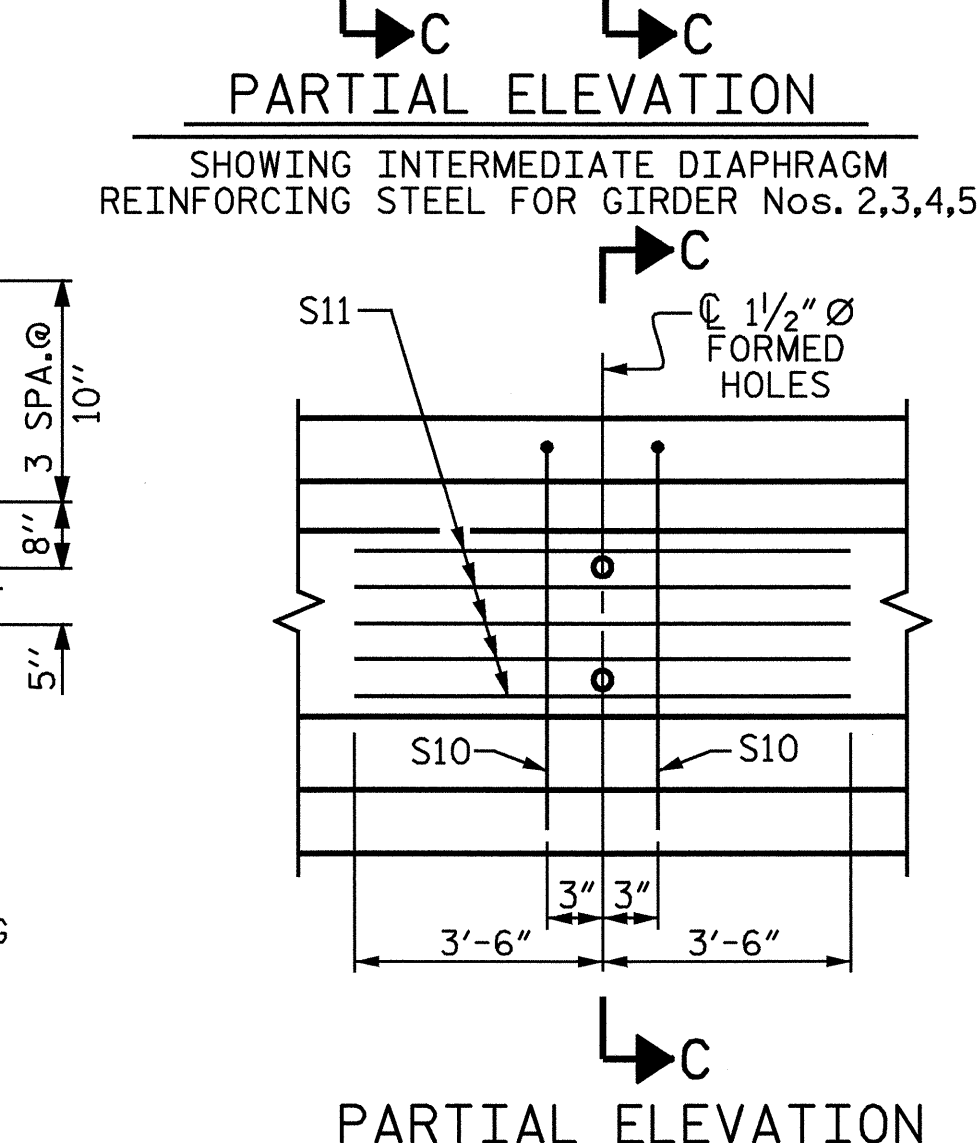
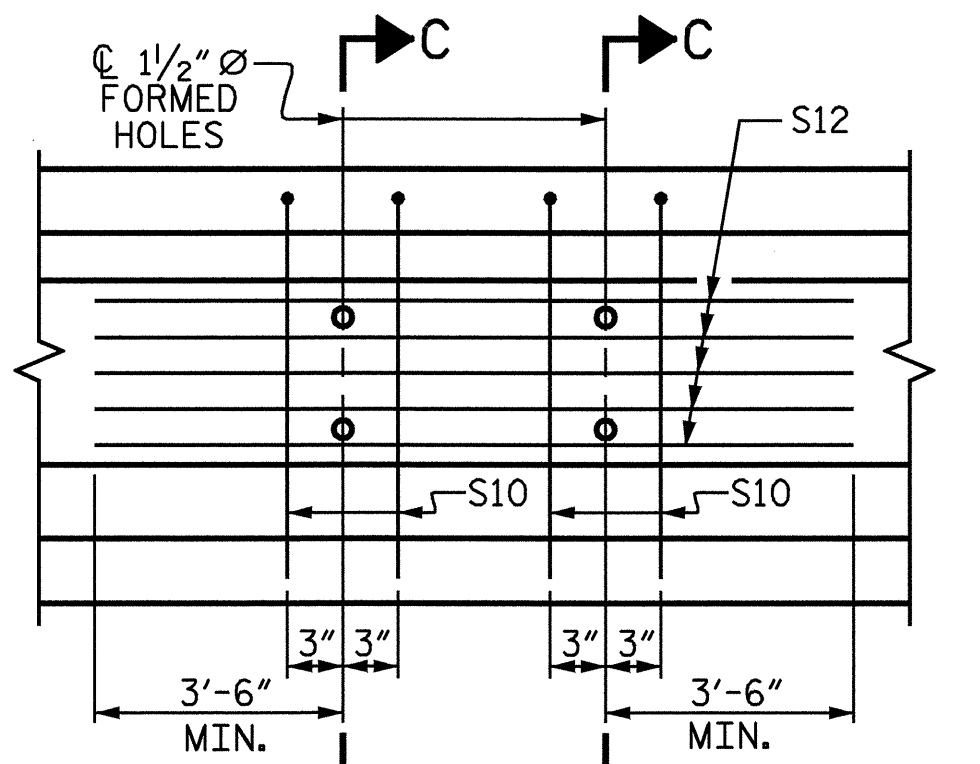
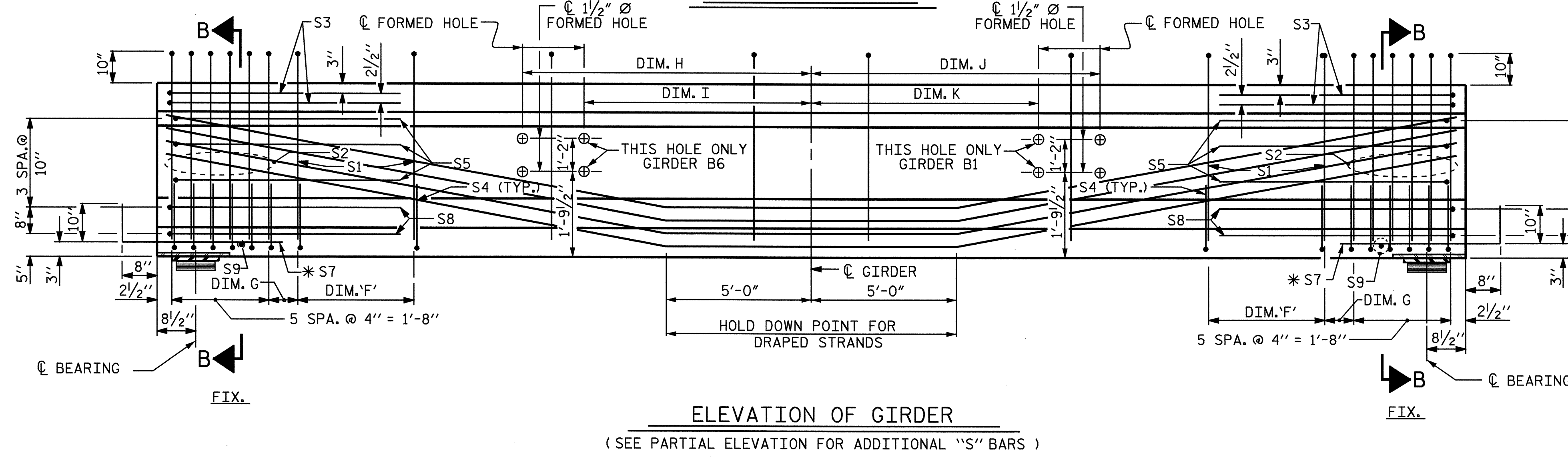
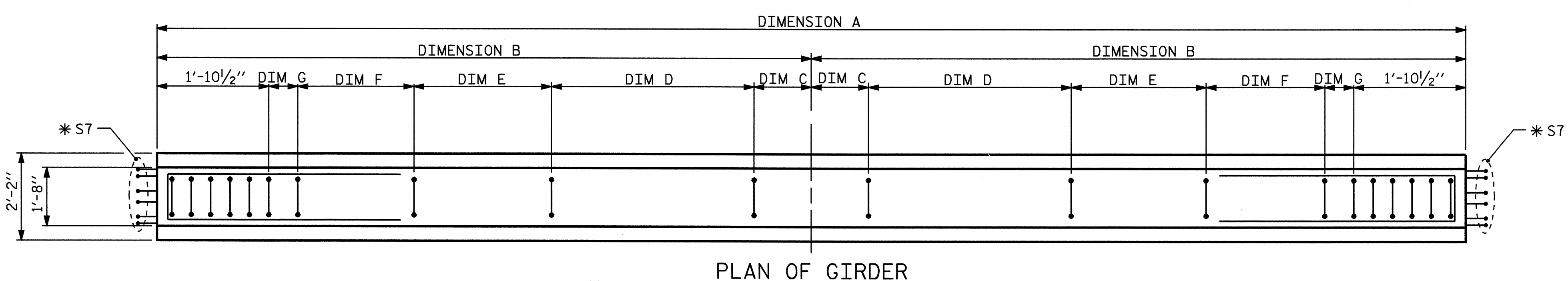


	QUANTITIES FOR ONE GIRDER		
	REINFORCING STEEL LB.	9500 PST CONCRETE C.Y.	16" Ø L.R. STRANDS No.
GDR B1	1061	21.7	36
GDR B2	1194	21.4	36
GDR B3	1179	21.2	36
GDR B4	1179	21.0	36
GDR B5	1164	20.8	36
GDR B6	1085	20.7	36

GIRDERS REQUIRED	
NUMBER	LENGTH
1	106'-9 3/8"
1	105'-7 3/4"
1	104'-7"
1	103'-7 1/4"
1	102'-8 1/8"
1	101'-9 3/4"
TOTAL LENGTH 625'-1 1/4"	

.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	41,300	30,980

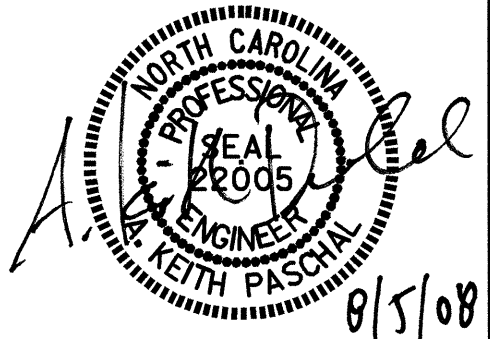
REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GDR. B1	S1	66	#4	1	11'-4"	500
GDR. B2	S1	68	#4	1	11'-4"	515
GDR. B3	S1	66	#4	1	11'-4"	500
GDR. B4	S1	66	#4	1	11'-4"	500
GDR. B5	S1	64	#4	1	11'-4"	485
GDR. B6	S1	68	#4	1	11'-4"	515
	S2	12	#6	1	11'-4"	204
	S3	4	#4	2	9'-1"	24
GDR. B1	S4	64	#4	3	3'-5"	146
GDR. B2	S4	64	#4	3	3'-5"	146
GDR. B3	S4	64	#4	3	3'-5"	146
GDR. B4	S4	64	#4	3	3'-5"	146
GDR. B5	S4	64	#4	3	3'-5"	146
GDR. B6	S4	68	#4	3	3'-5"	155
	S5	6	#4	2	8'-5"	34
	*S7	12	#5	STR	3'-8"	46
	S8	4	#4	2	8'-7"	23
	S9	2	#3	STR	1'-10"	1
EXTERIOR GDR.	S10	4	#5	2	8'-8"	36
INTERIOR GDR.	S10	8	#5	2	8'-8"	72
EXTERIOR GDR.	S11	10	#4	STR	7'-0"	47
INTERIOR GDR.	S12	10	#4	STR	19'-3"	129



GIRDER DIMENSIONS											
	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E	DIMENSION F	DIMENSION G	DIMENSION H	DIMENSION I	DIMENSION J	DIMENSION K
GIRDER B1	106'-9 3/8"	53'-4 11/16"	1'-0"	21 @ 2'-0"	2 @ 1'-10"	9 @ 6"	4 3/8"	-	20'-6 5/8"	-	14'-4 1/2"
GIRDER B2	105'-7 3/4"	52'-9 9/8"	1'-0"	15 @ 2'-0"	9 @ 1'-8"	9 @ 6"	5 3/8"	20'-3 1/2"	14'-4 1/2"	20'-6 5/8"	14'-3 1/4"
GIRDER B3	104'-7"	52'-3 1/2"	1'-0"	20 @ 2'-0"	3 @ 1'-6"	9 @ 6"	5"	20'-0"	14'-3 1/4"	20'-3 9/16"	14'-2 1/16"
GIRDER B4	103'-7 1/4"	51'-9 9/8"	1'-0"	20 @ 2'-0"	3 @ 1'-4"	9 @ 6"	5 1/8"	19'-10"	14'-2 1/16"	20'-0 11/16"	14'-0 5/16"
GIRDER B5	102'-8 1/8"	51'-4 1/16"	1'-0"	20 @ 2'-0"	2 @ 1'-9"	9 @ 6"	5 9/16"	19'-7 5/8"	14'-0 5/16"	19'-9 3/16"	13'-11 1/8"
GIRDER B6	101'-9 3/4"	50'-10 7/8"	1'-0"	19 @ 2'-0"	4 @ 1'-2"	10 @ 6"	4 3/8"	-	14'-0 3/4"	-	19'-7 1/16"

ASSEMBLED BY : J. G. KHARVA DATE : 07/11/07
 CHECKED BY : J. D. HAWK DATE : 07/10/08
 DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES
 CHECKED BY : GRP 8/91 REV. 10/17/00R RWW/LES
 REV. 5/1/06 TLA/GM

05-AUG-2008 15:14
 T:\s\tr\ug\2\B-4258\Final\B-4258_sd.gl_dgn
 jkharva

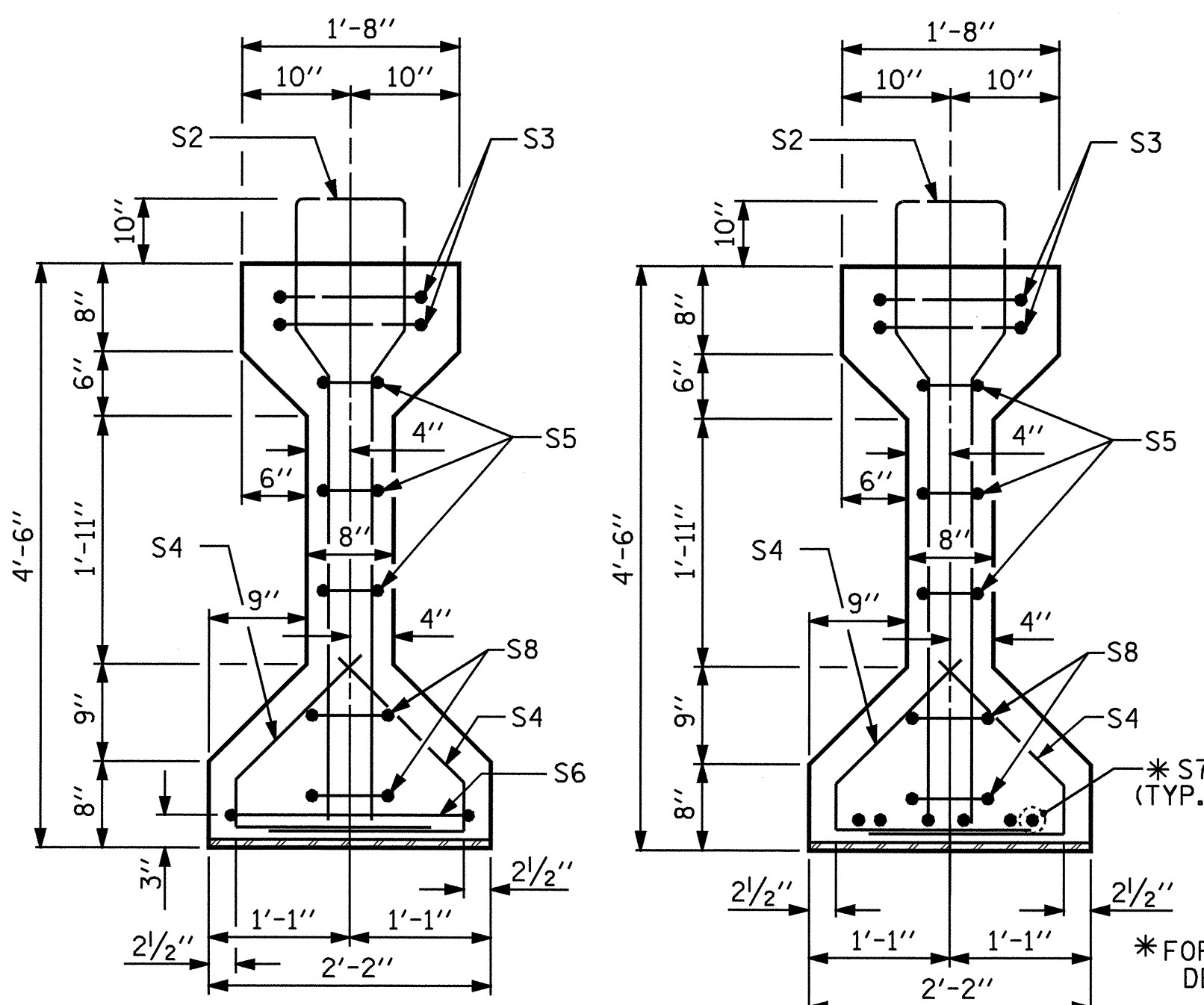


PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 2 OF 5

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

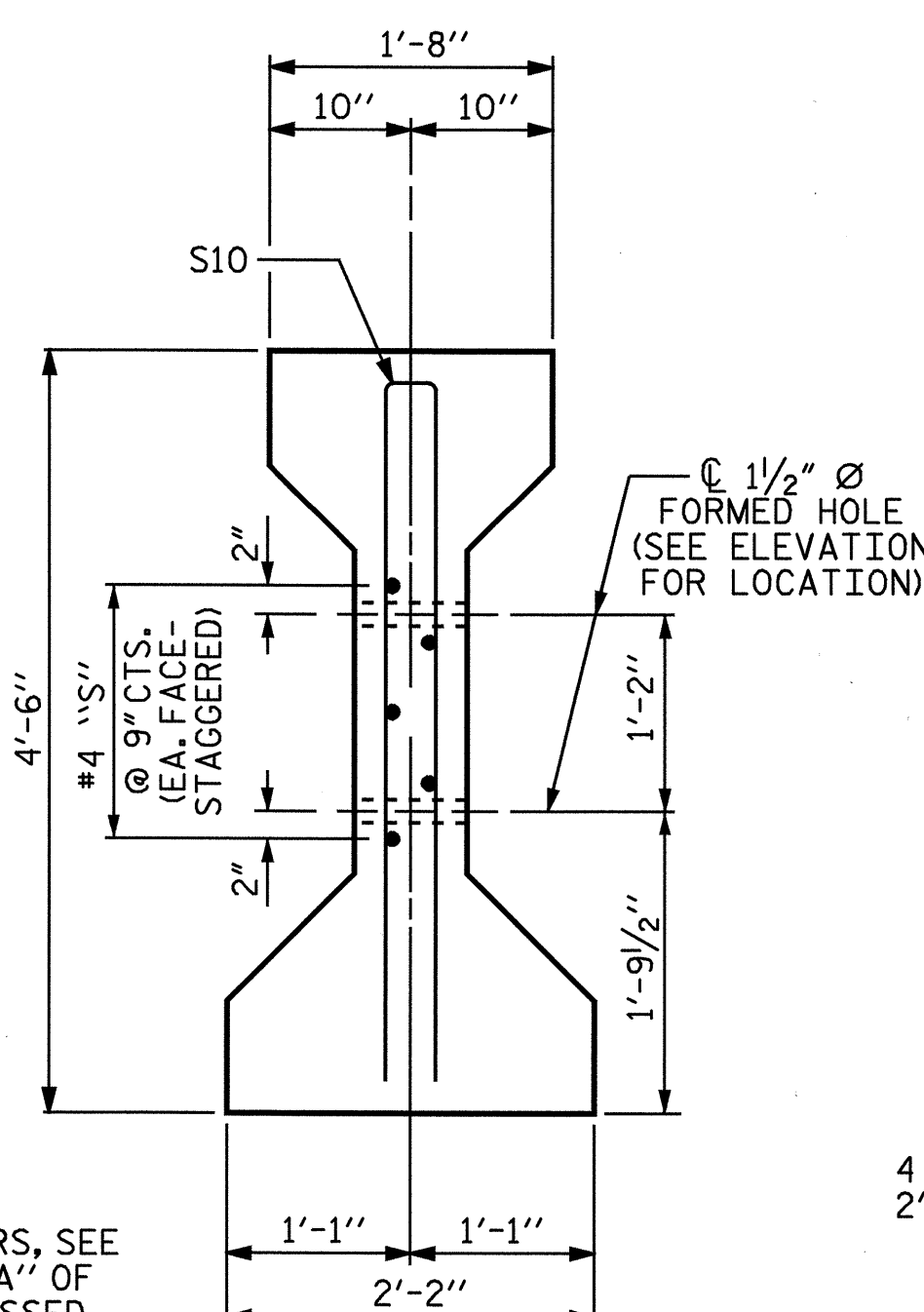
STD. NO. PCG6



SECTION A-A

SECTION B-B

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



SECTION C-C

(S1 BARS NOT SHOWN)

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

#4 @ 9" CTS.
(EA. FACE -
STAGGERED)

4 SPA. @
2" CTS.

4 SPA. @
2" CTS.

11 SPA. @
2" CTS.

AT END OF GIRDER

AT C OF GIRDER

.6" Ø LOW RELAXATION STRAND LAYOUT

	QUANTITIES FOR ONE GIRDER		
	REINFORCING STEEL LB.	9500 PSI CONCRETE C.Y.	16" Ø L.R. STRANDS No.
GDR C1	988	19.5	28
GDR C2	1006	19.1	28
GDR C3	1006	18.7	28
GDR C4	991	18.3	28
GDR C5	991	18.0	28
GDR C6	927	17.7	28

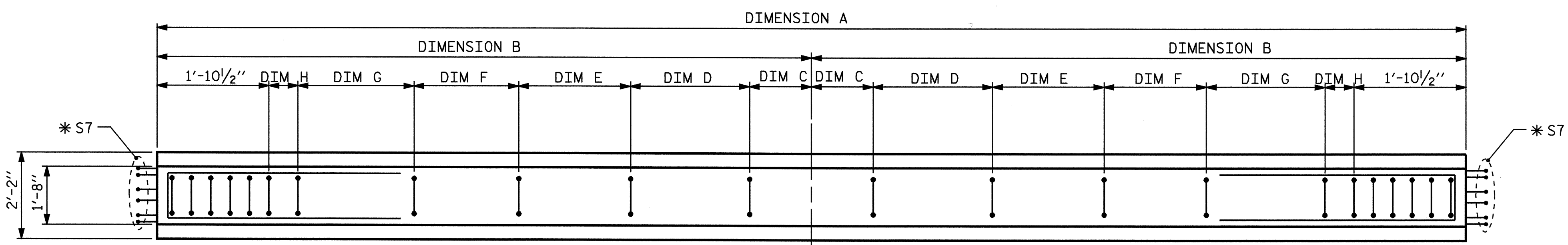
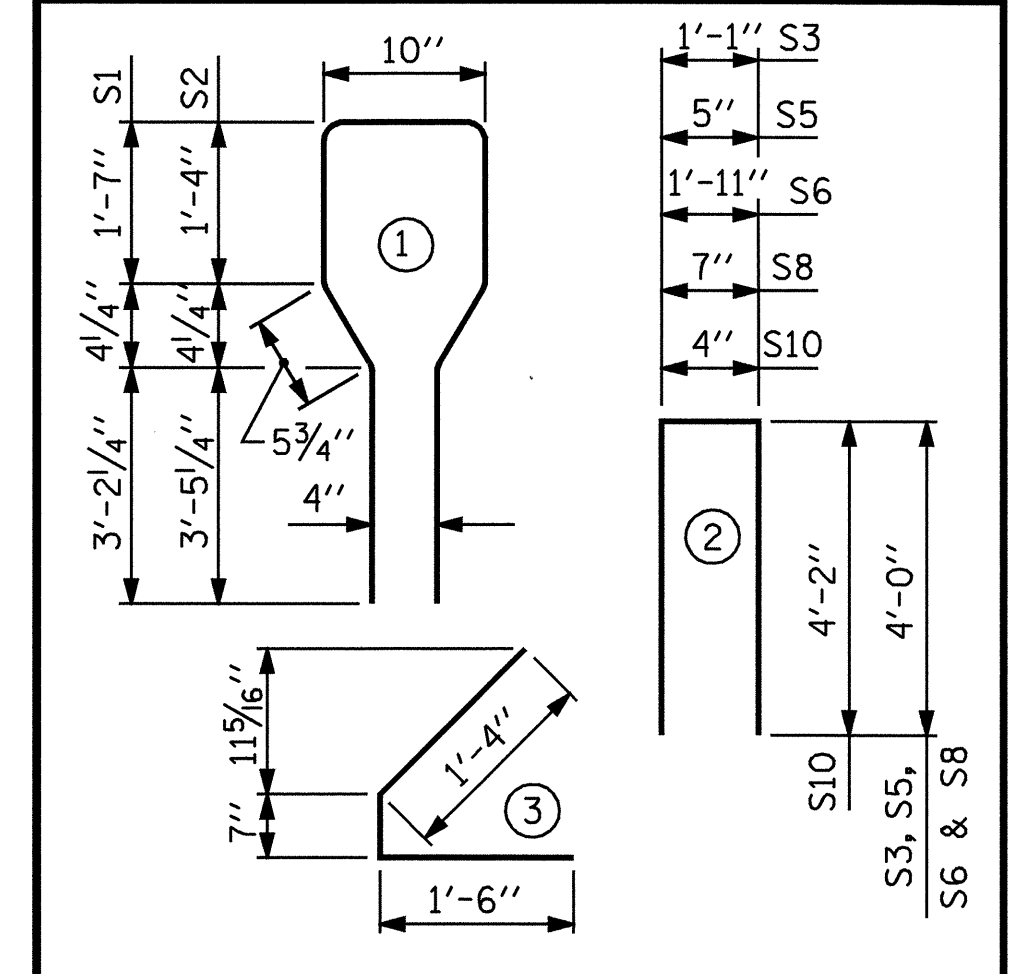
GIRDERS REQUIRED	
NUMBER	LENGTH
1	96'-3 3/8"
1	94'-0 5/8"
1	92'-0"
1	90'-2 1/8"
1	88'-6 3/8"
1	87'-0 1/4"
TOTAL LENGTH	
	548'-0 1/2"

.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	41,300	30,980

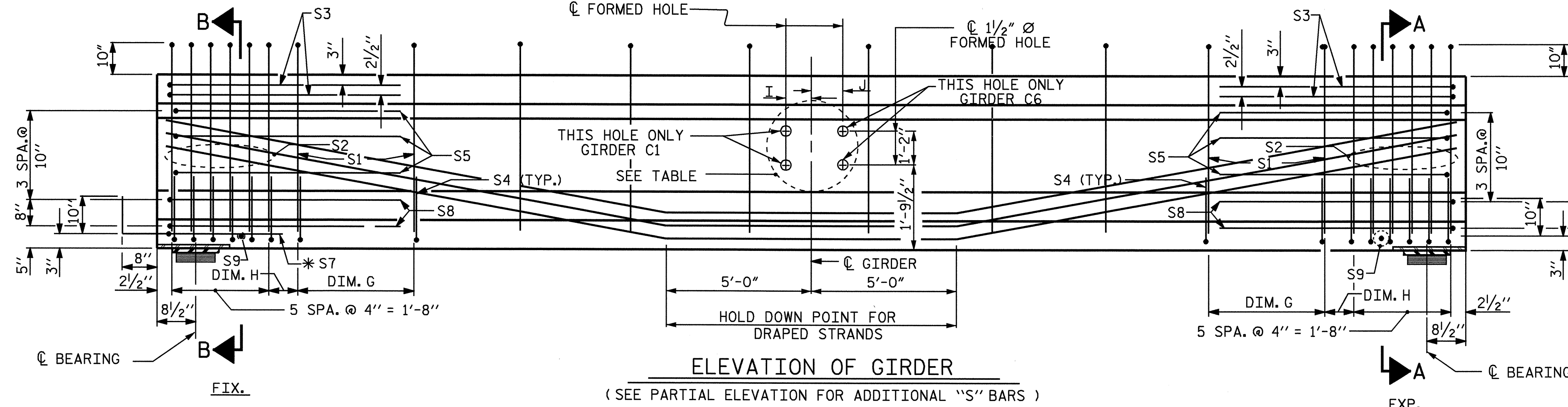
REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GDR. C1	S1	#4	1	11'-4"	485	
GDR. C2	S1	#4	1	11'-4"	454	
GDR. C3	S1	#4	1	11'-4"	454	
GDR. C4	S1	#4	1	11'-4"	439	
GDR. C5	S1	#4	1	11'-4"	439	
GDR. C6	S1	#4	1	11'-4"	424	
	S2	#6	1	11'-4"	204	
	S3	#4	2	9'-1"	24	
	S4	#4	3	3'-5"	146	
	S5	#4	2	8'-5"	34	
	S6	#4	2	9'-11"	7	
	*S7	#5	STR	3'-8"	23	
	S8	#4	2	8'-7"	23	
	S9	#3	STR	1'-10"	1	
EXTERIOR GDR.	S10	#5	2	8'-8"	18	
INTERIOR GDR.	S10	#5	2	8'-8"	36	
EXTERIOR GDR.	S11	#4	STR	7'-0"	23	
INTERIOR GDR.	S12	#4	STR	16'-3"	54	

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



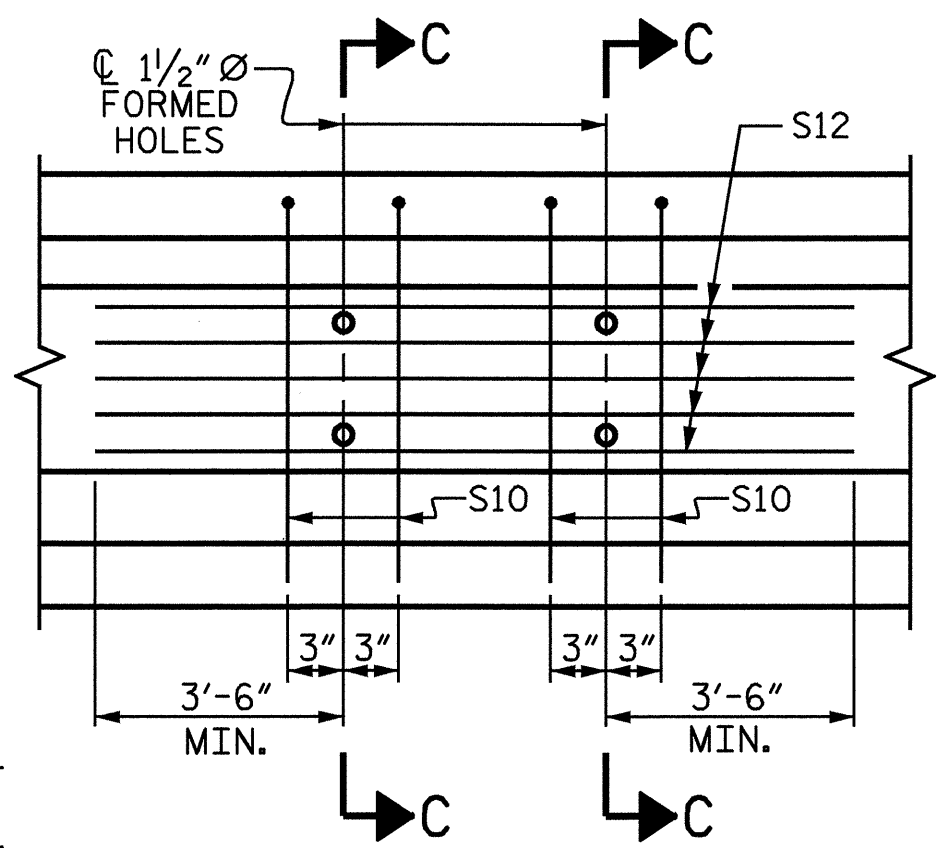
PLAN OF GIRDER



ELEVATION OF GIRDER

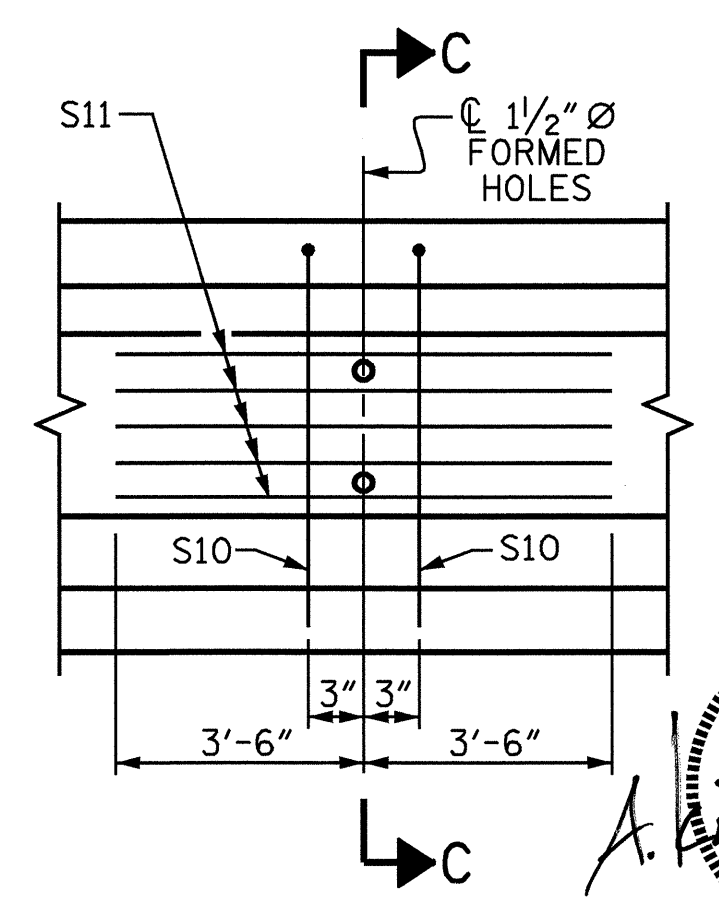
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER DIMENSIONS										
	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E	DIMENSION F	DIMENSION G	DIMENSION H	DIMENSION I	DIMENSION J
GIRDER C1	96'-3 3/8"	48' 1 1/16"	1'-0"	3 @ 2'-0"	16 @ 1'-11"	3 @ 1'-3"	9 @ 6"	4 3/16"	4'-7 3/16"	-
GIRDER C2	94'-0 5/8"	47' 0 7/16"	1'-0"	19 @ 2'-0"	1 @ 1'-3"	-	9 @ 6"	4 11/16"	4'-5 5/16"	4'-7 3/8"
GIRDER C3	92'-0"	46' 0"	1'-0"	4 @ 2'-0"	15 @ 1'-11"	1 @ 1'-6"	9 @ 6"	4 1/2"	4'-3 1/16"	4'-5 3/8"
GIRDER C4	90'-2 1/8"	45' 1 1/16"	1'-0"	18 @ 2'-0"	1 @ 1'-4"	-	9 @ 6"	4 3/16"	4'-1 3/4"	4'-3 1/2"
GIRDER C5	88'-6 3/8"	44' 3 3/16"	1'-0"	3 @ 2'-0"	15 @ 1'-11"	1 @ 1'-9"	9 @ 6"	4 11/16"	4'-0 3/16"	4'-1 3/4"
GIRDER C6	87'-0 1/4"	43' 6 7/8"	1'-0"	17 @ 2'-0"	1 @ 1'-9"	-	9 @ 6"	4 5/8"	-	4'-0 5/16"



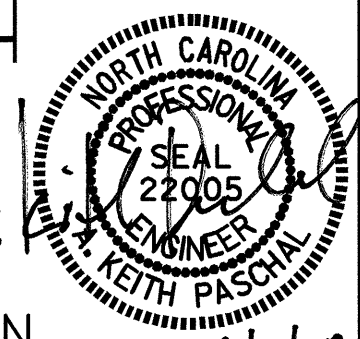
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2,3,4,5



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1,6



PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

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

ASSEMBLED BY : J. G. KHARVA DATE : 07/11/07
CHECKED BY : J. D. HAWK DATE : 07/10/08
DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91 REV. 10/17/00R RWW/LES
REV. 5/1/06 TLA/GM

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

STD. NO. PCG6

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5600 PSI.

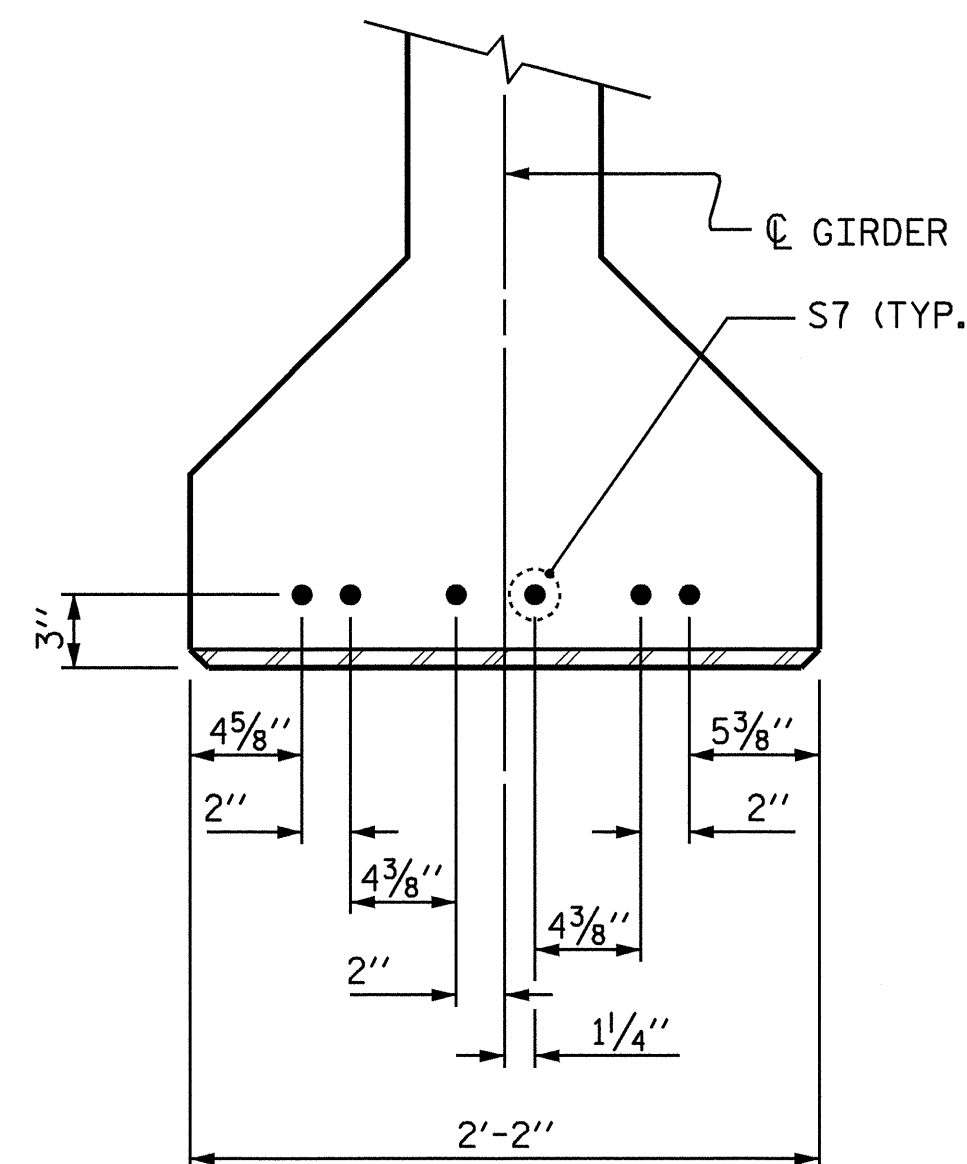
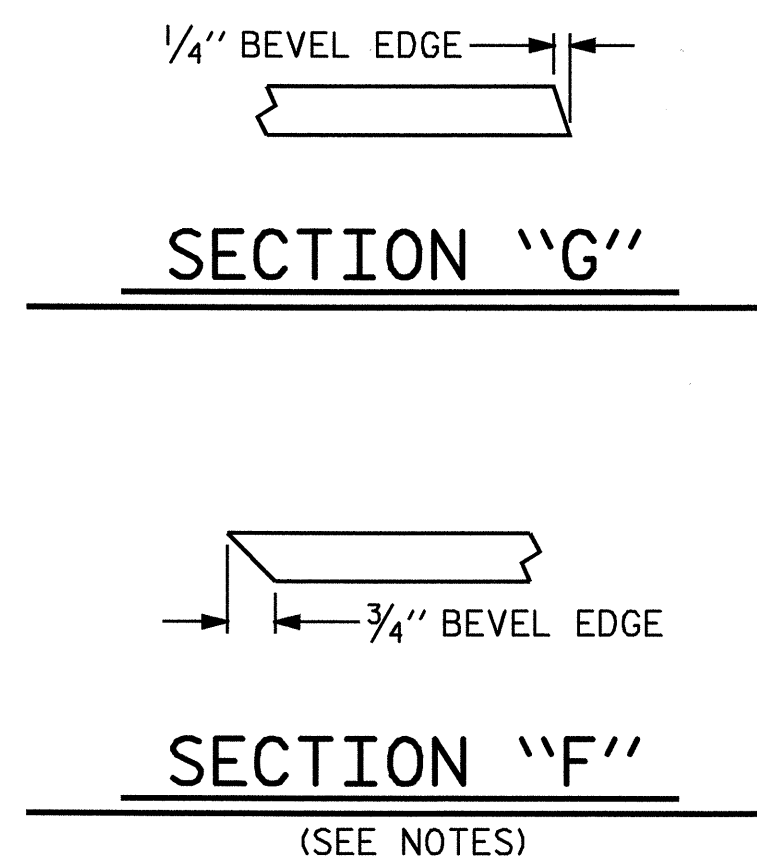
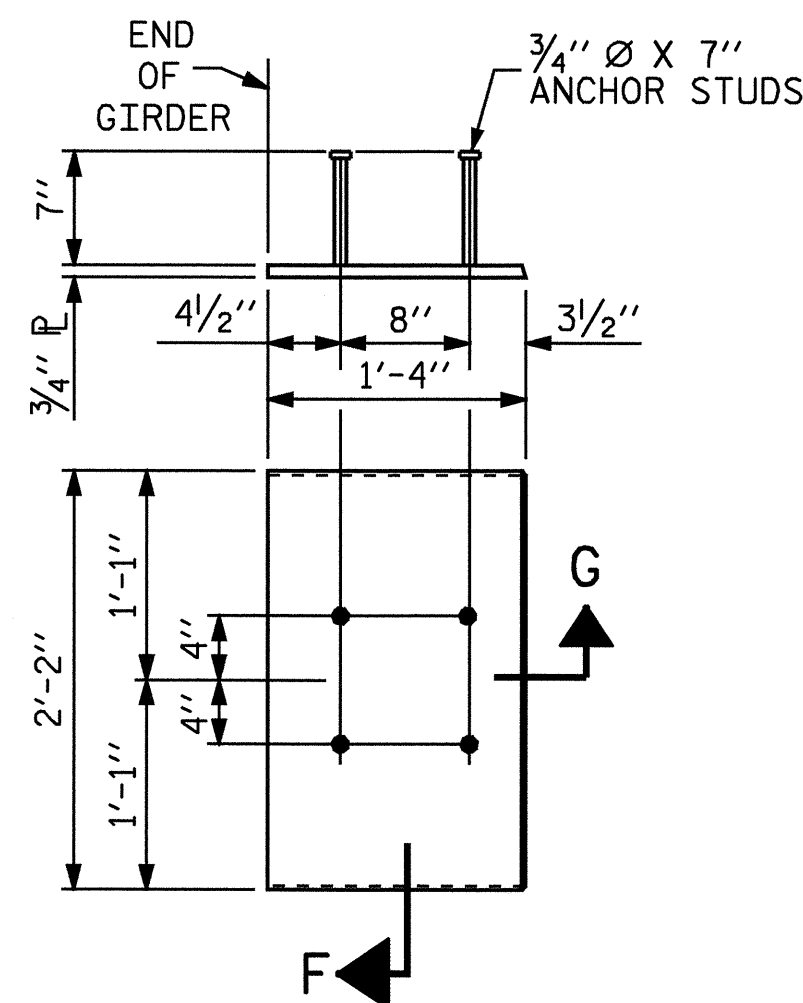
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

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

FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" & 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

DEAD LOAD DEFLECTION TABLE FOR SPAN A

.6" LOW RELAXATION	GIRDER A1											GIRDER A2 & A3 A4 & A5											GIRDER A6											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	.076	.143	.196	.229	.241	.229	.196	.143	.076	0.0	0.0	.076	.143	.196	.229	.241	.229	.196	.143	.076	0.0	0.0	.076	.143	.196	.229	.241	.229	.196	.143	.076	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	.032	.061	.083	.097	.102	.097	.083	.061	.032	0.0	0.0	.030	.056	.076	.090	.094	.090	.076	.056	.030	0.0	0.0	.024	.045	.061	.071	.075	.071	.061	.045	.024	0.0
FINAL CAMBER	↑	0.0	1/2"	1"	1 3/8"	1 9/16"	1 11/16"	1 9/16"	1 3/8"	1"	1/2"	0.0	0.0	9/16"	1 1/16"	1 1/16"	1 1/16"	1 3/4"	1 1/16"	1 1/16"	1 1/16"	9/16"	0.0	0.0	5/8"	1 1/16"	1 5/8"	1 7/8"	2"	1 7/8"	1 5/8"	1 1/16"	5/8"	0.0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

.6" LOW RELAXATION	GIRDER B1											GIRDER B2 & B3 B4 & B5											GIRDER B6											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	.125	.237	.324	.380	.380	.324	.237	.125	0.0	0.0	.125	.237	.324	.379	.398	.379	.324	.237	.125	0.0	0.0	.124	.234	.321	.376	.395	.376	.321	.234	.124	0.0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	.046	.087	.119	.139	.146	.139	.119	.087	.046	0.0	0.0	.049	.092	.126	.147	.155	.147	.126	.092	.046	0.0	0.0	.049	.093	.127	.148	.156	.148	.127	.093	.049	0.0
FINAL CAMBER	↑	0.0	15/16"	1 1/16"	2 1/16"	2 3/8"	3"	2 3/8"	2 1/16"	1 13/16"	1 5/16"	0.0	0.0	15/16"	1 3/4"	2 3/8"	2 3/16"	2 5/16"	2 3/16"	2 3/8"	1 3/4"	1 5/16"	0.0	0.0	7/8"	1 1/16"	2 5/16"	2 3/4"	2 1/8"	2 3/4"	2 5/16"	1 1/16"	7/8"	0.0

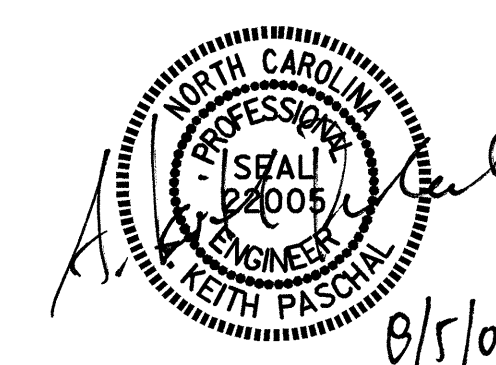
DEAD LOAD DEFLECTION TABLE FOR SPAN C

.6" LOW RELAXATION	GIRDER C1											GIRDER C2 & C3 C4 & C5											GIRDER C6											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	.074	.141	.193	.226	.237	.226	.193	.141	.074	0.0	0.0	.075	.141	.193	.227	.238	.227	.193	.141	.075	0.0	0.0	.073	.138	.189	.222	.233	.222	.189	.138	.073	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	.032	.060	.082	.096	.101	.096	.082	.060	.032	0.0	0.0	.029	.055	.075	.087	.092	.087	.075	.055	.029	0.0	0.0	.024	.046	.063	.074	.078	.074	.063	.046	.024	0.0
FINAL CAMBER	↑	0.0	1/2"	1"	1 5/16"	1 9/16"	1 5/8"	1 9/16"	1 5/16"	1"	1/2"	0.0	0.0	9/16"	1 1/16"	1 1/16"	1 1/16"	1 3/4"	1 1/16"	1 1/16"	1 1/16"	9/16"	0.0	0.0	9/16"	1 1/8"	1 1/2"	1 3/4"	1 7/8"	1 3/4"	1 1/2"	1 1/8"	9/16"	0.0

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

PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 4 OF 5



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

NOVEMBER 1991

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

ASSEMBLED BY : J. G. KHARVA	DATE : 09/11/07
CHECKED BY : J. D. HAWK	DATE : 07/10/08
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

STRUCTURAL STEEL NOTES

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

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

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

THE CHANNELS, ANGLES, WASHERS, PLATE WASHERS, AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

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

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

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

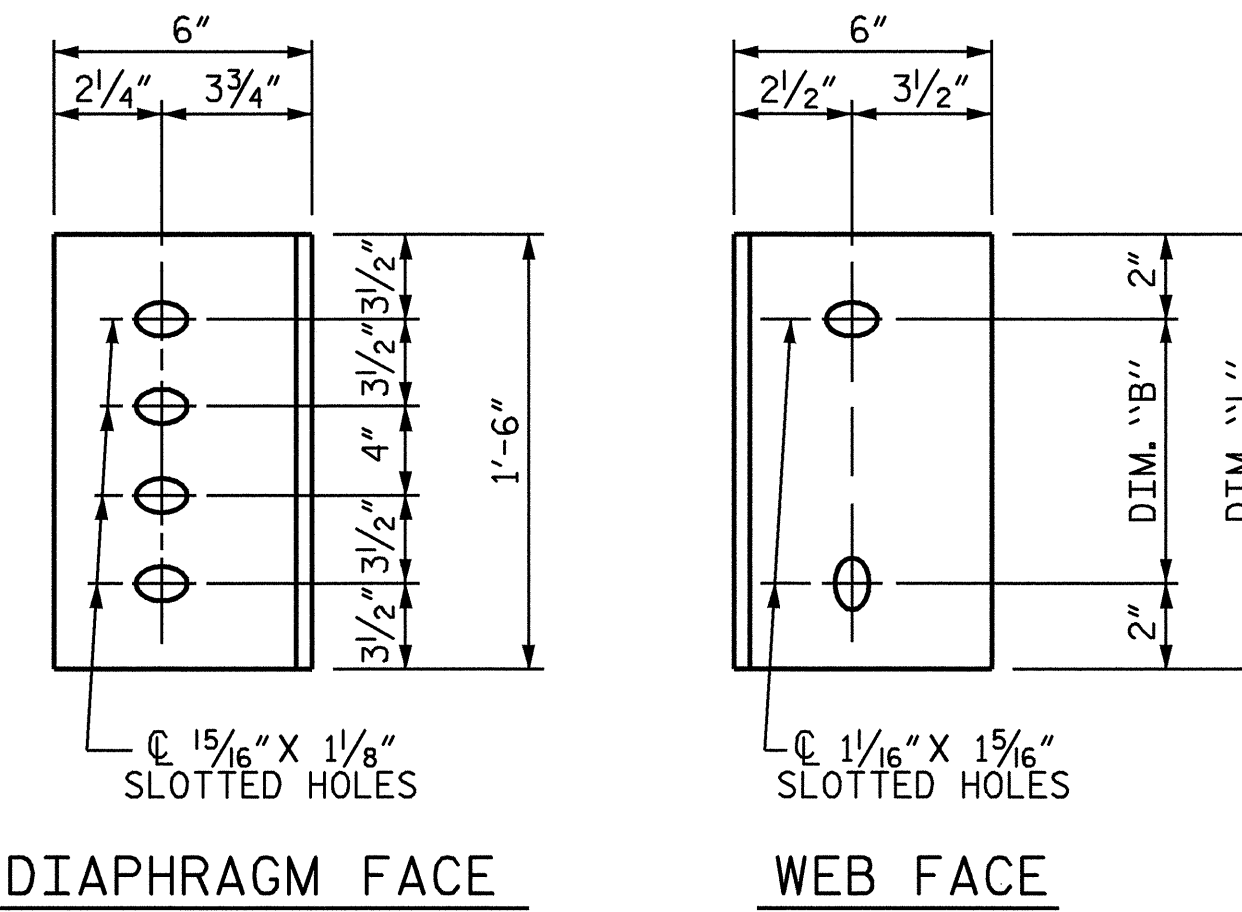
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

HOLES IN GIRDERS MAY BE SHIFTED SLIGHTLY TO AVOID DRAPED PRESTRESSING STRANDS.

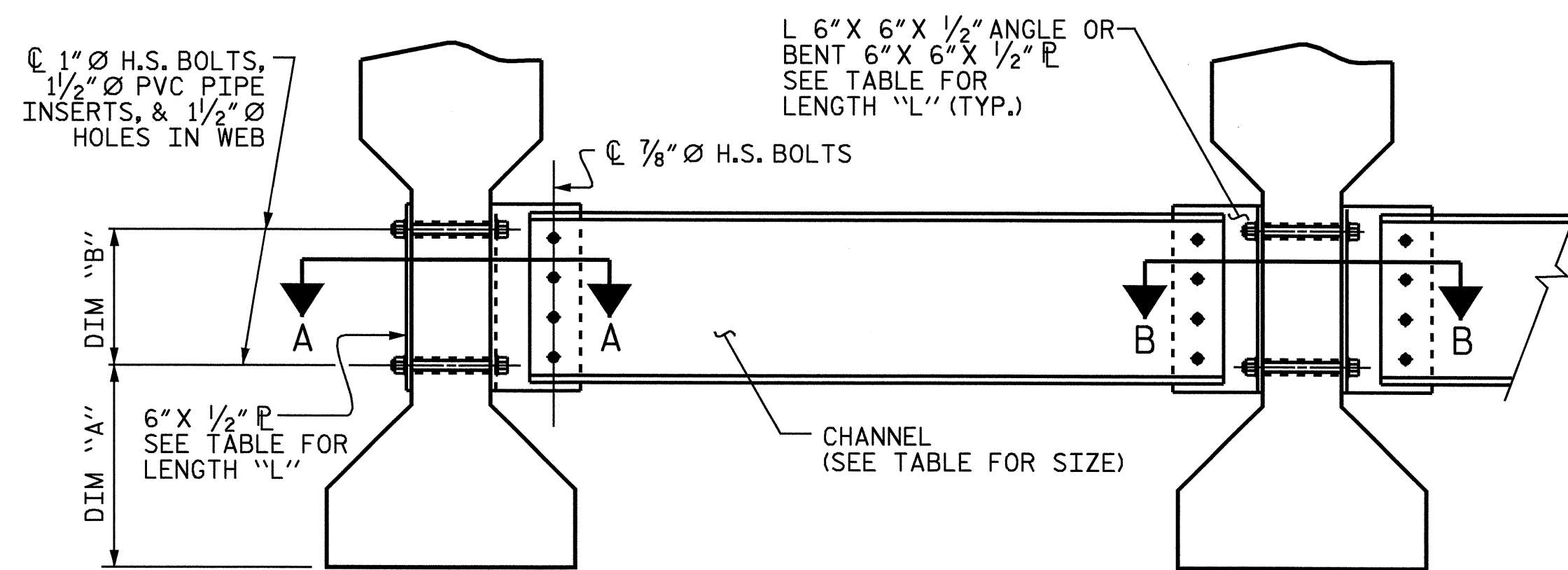
TABLE

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

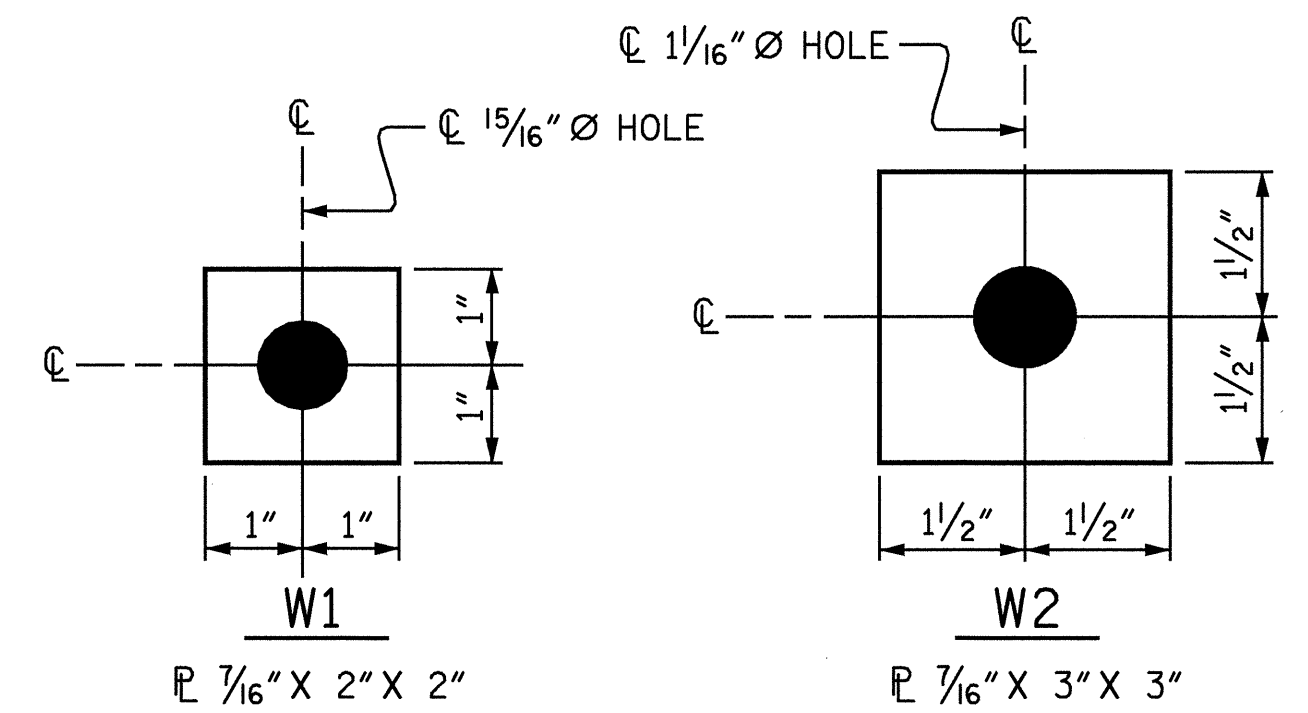


DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS



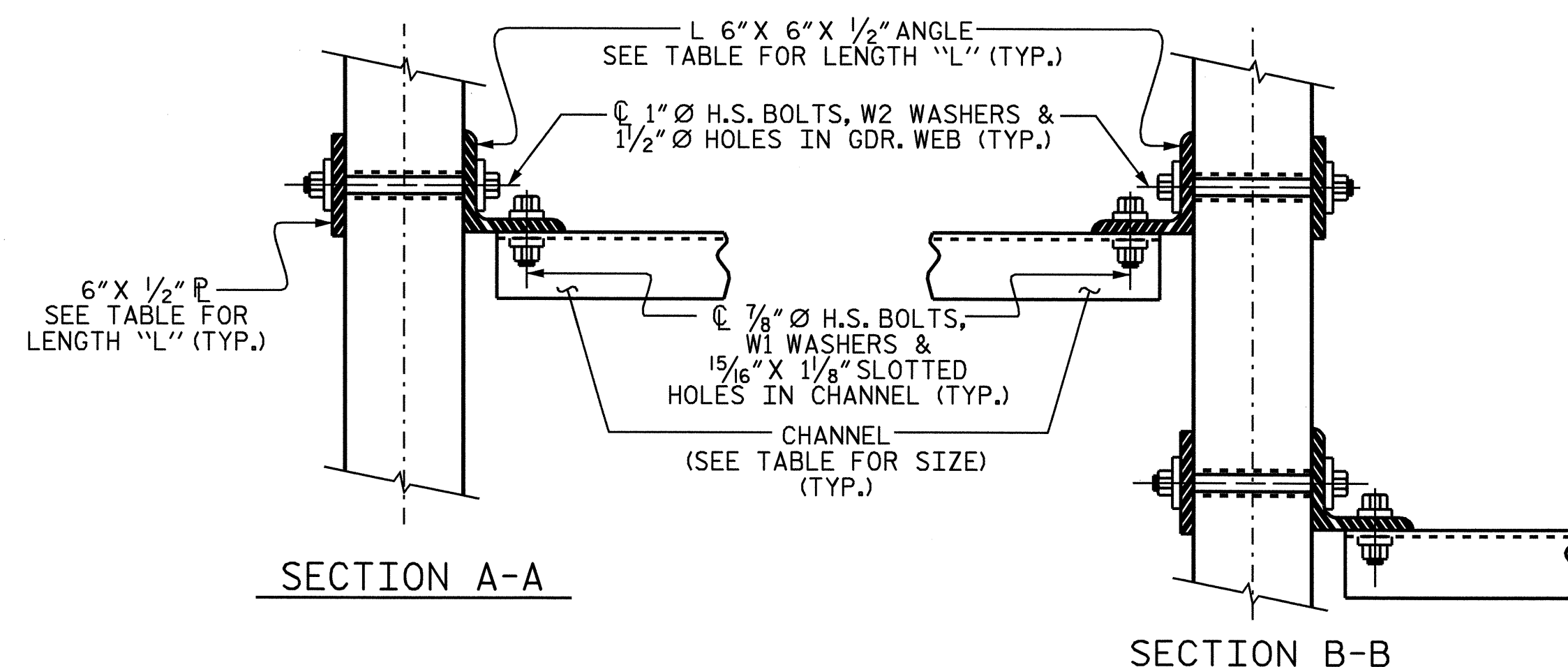
EXTERIOR GIRDER INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM



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

USE WITH 1" HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS



SECTION A-A SECTION B-B
CONNECTION DETAILS
(FOR SKEW < 70° OR SKEW > 110°)

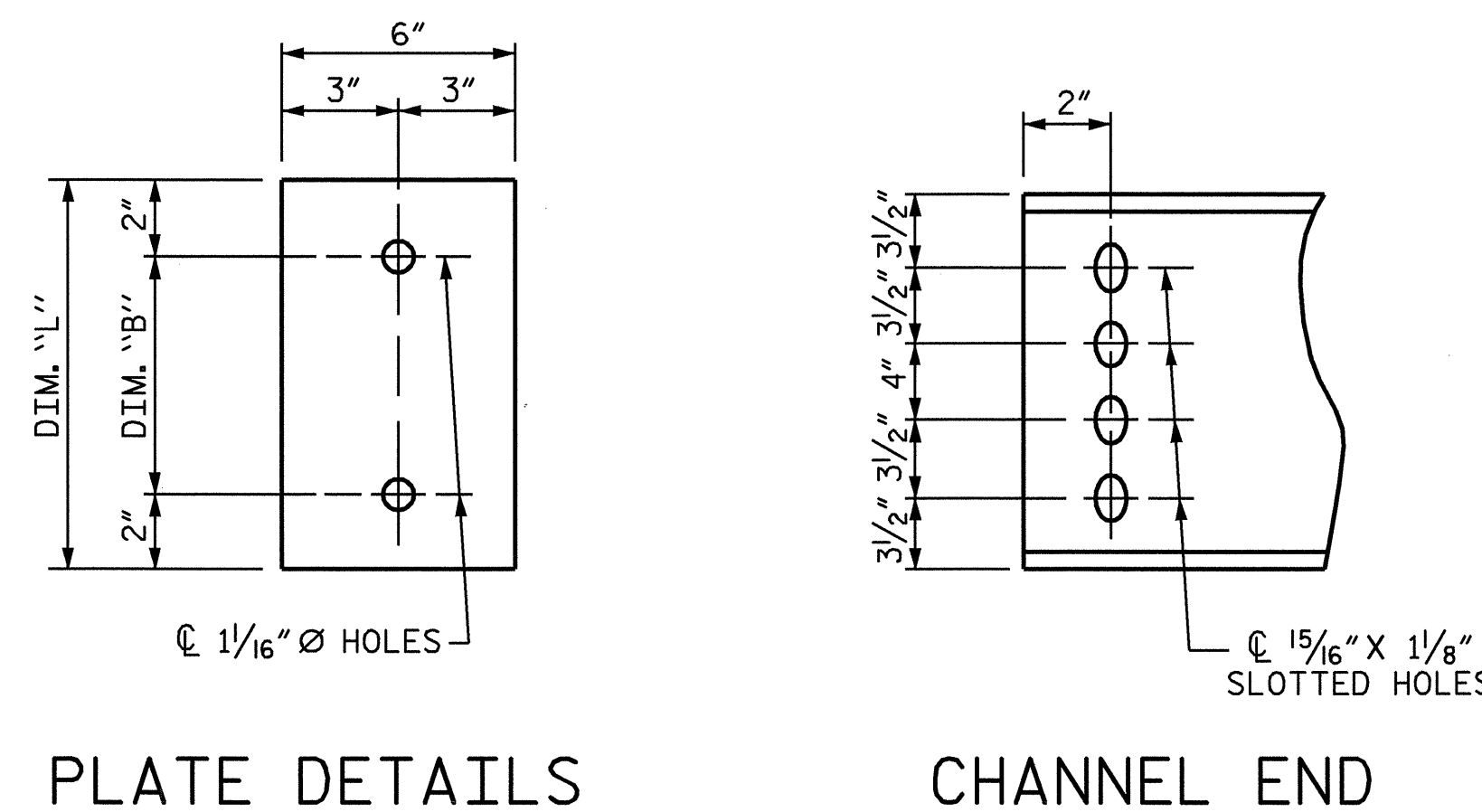
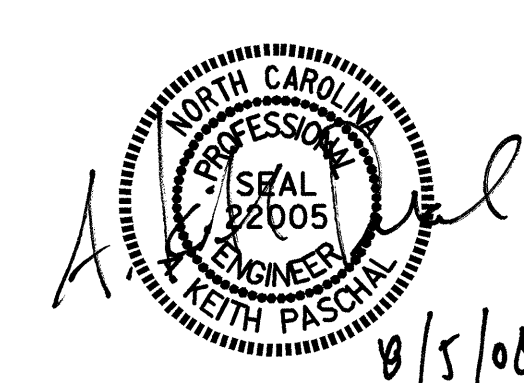


PLATE DETAILS CHANNEL END



PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-19
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS						
REVISIONS						TOTAL SHEETS 40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : J. G. KHARVA DATE : 07/19/07
CHECKED BY : J. D. HAWK DATE : 07/10/08
DRAWN BY : TLA 6/05 ADDED 10/21/05
CHECKED BY : VC 6/05 REV. 5/1/06 TLA/GM

NOTES

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

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

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

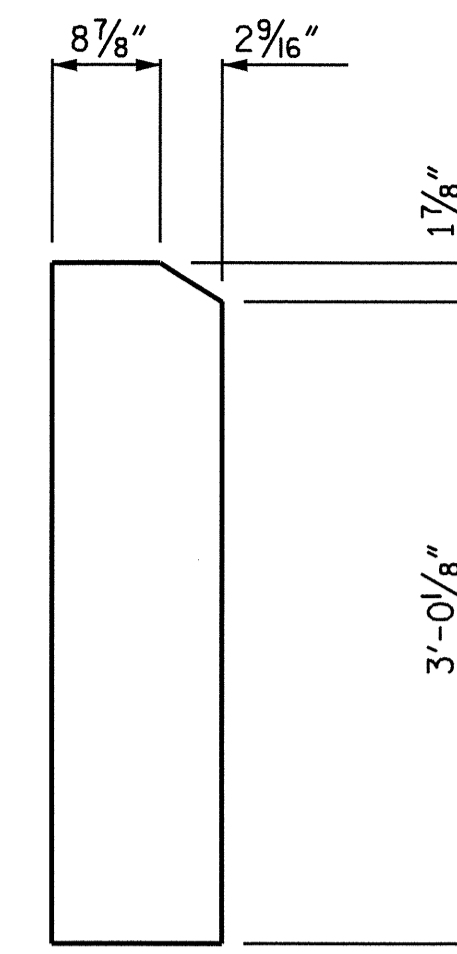
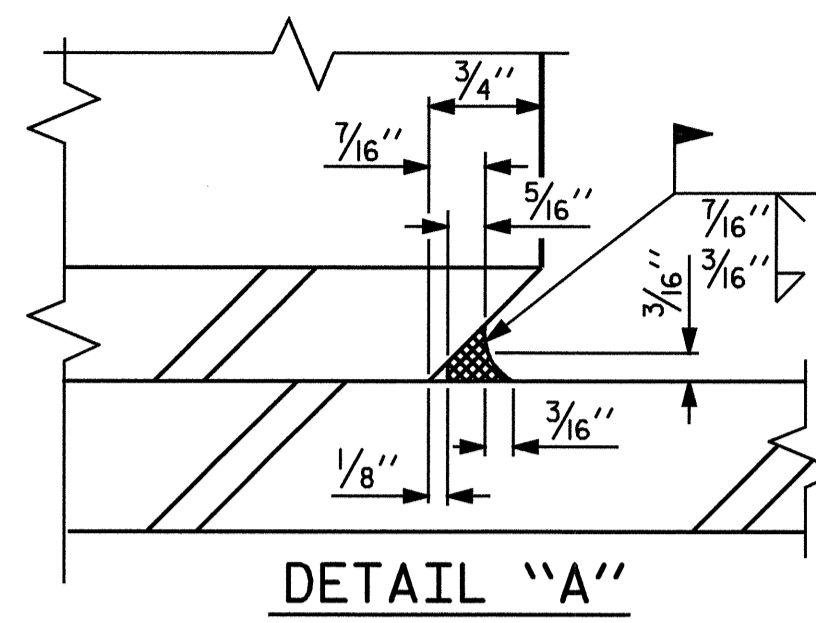
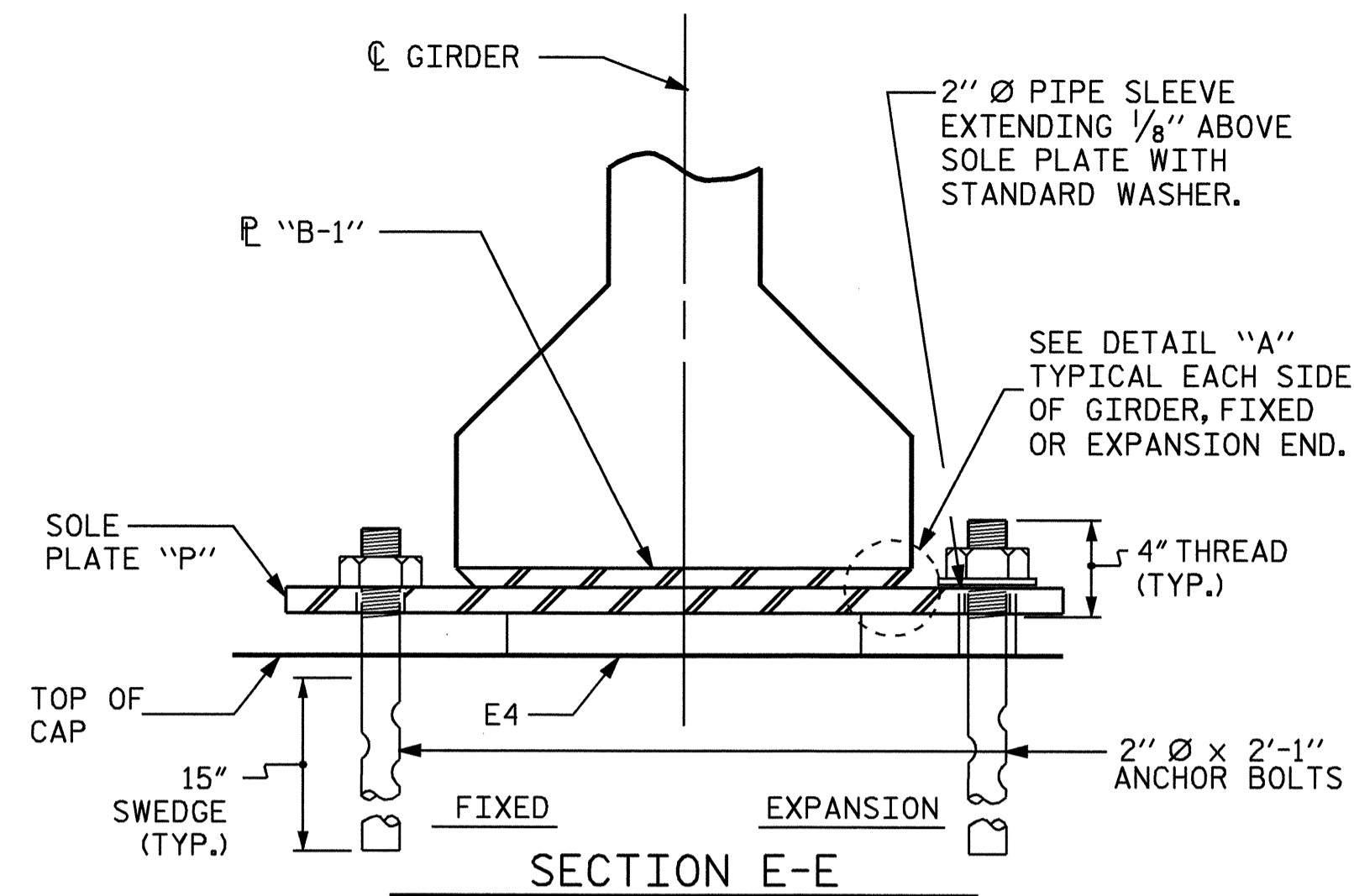
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

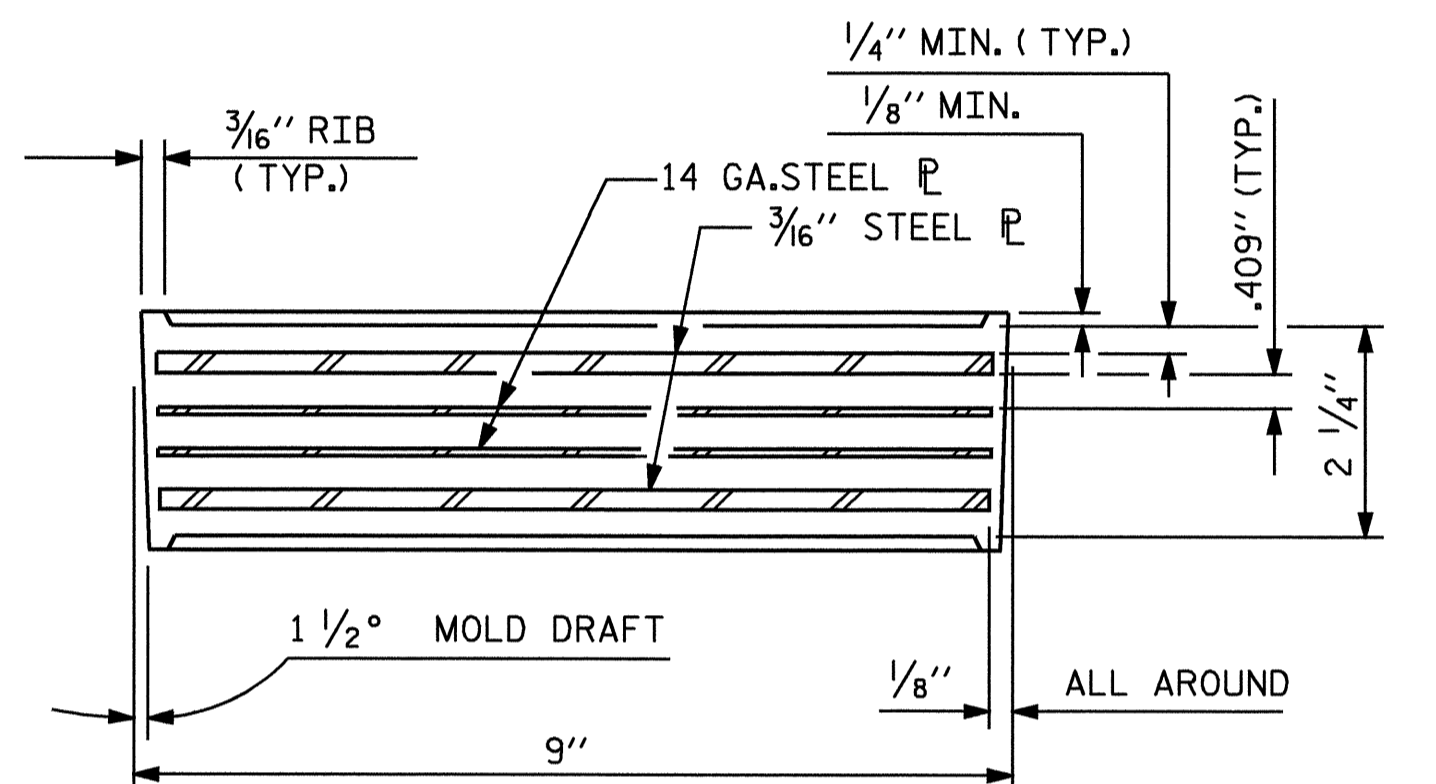
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

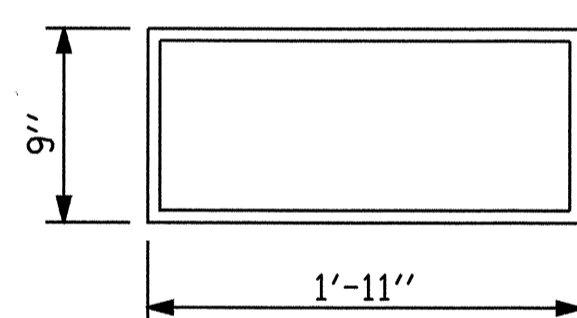


CHAMFER DETAILS

(TYP. P5)



TYPICAL SECTION OF ELASTOMERIC BEARINGS



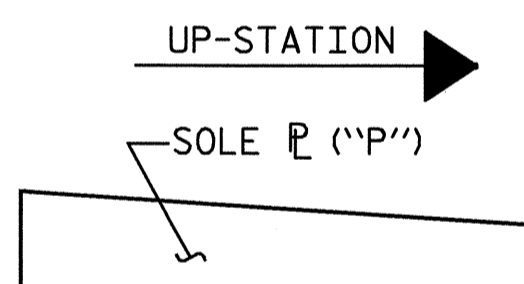
E4 (36 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

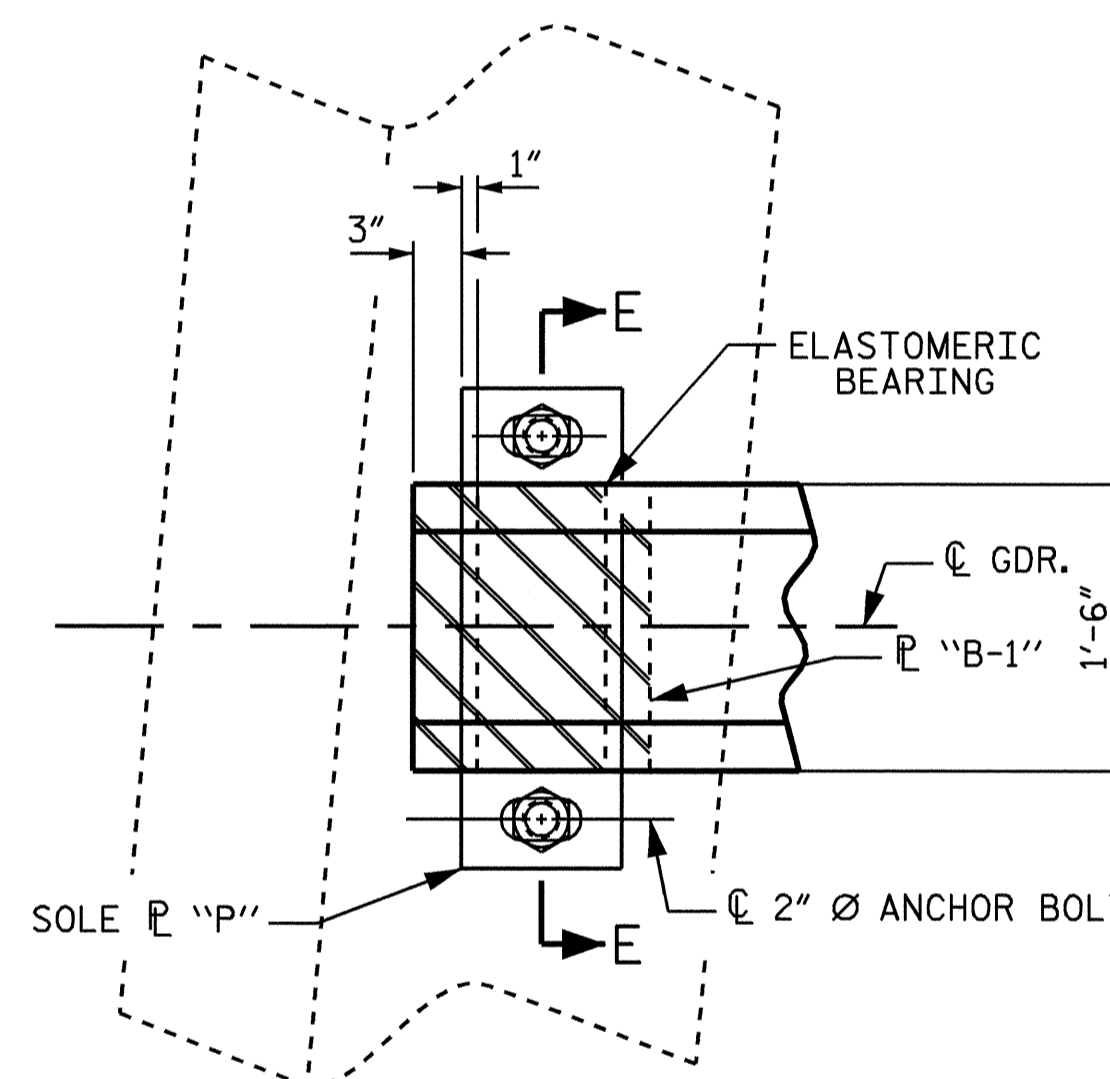
TYPE V

— LOAD RATINGS —

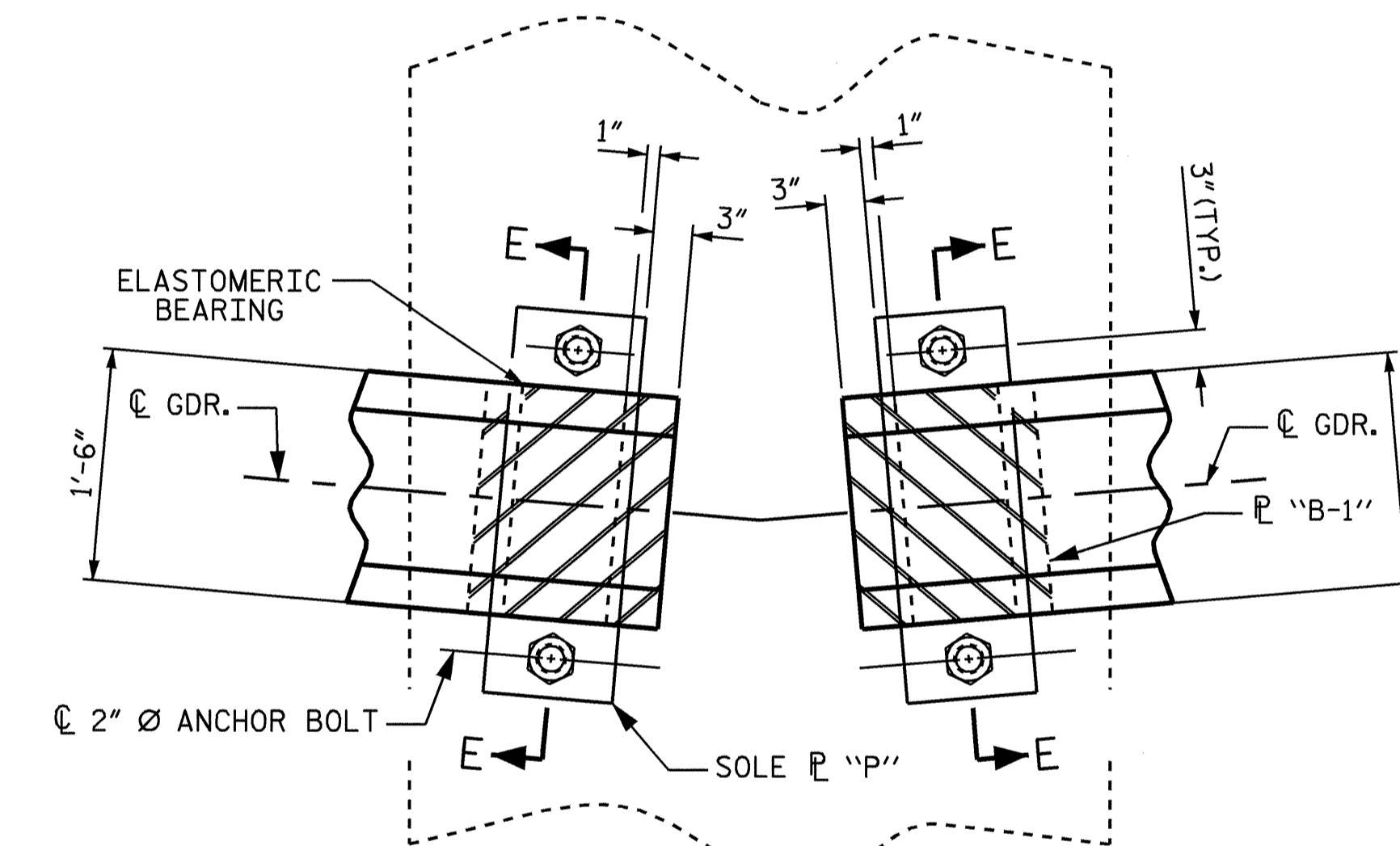
	MAX. D.L. + L.L.
TYPE V	180 K



SOLE 'P' PLACEMENT DETAIL

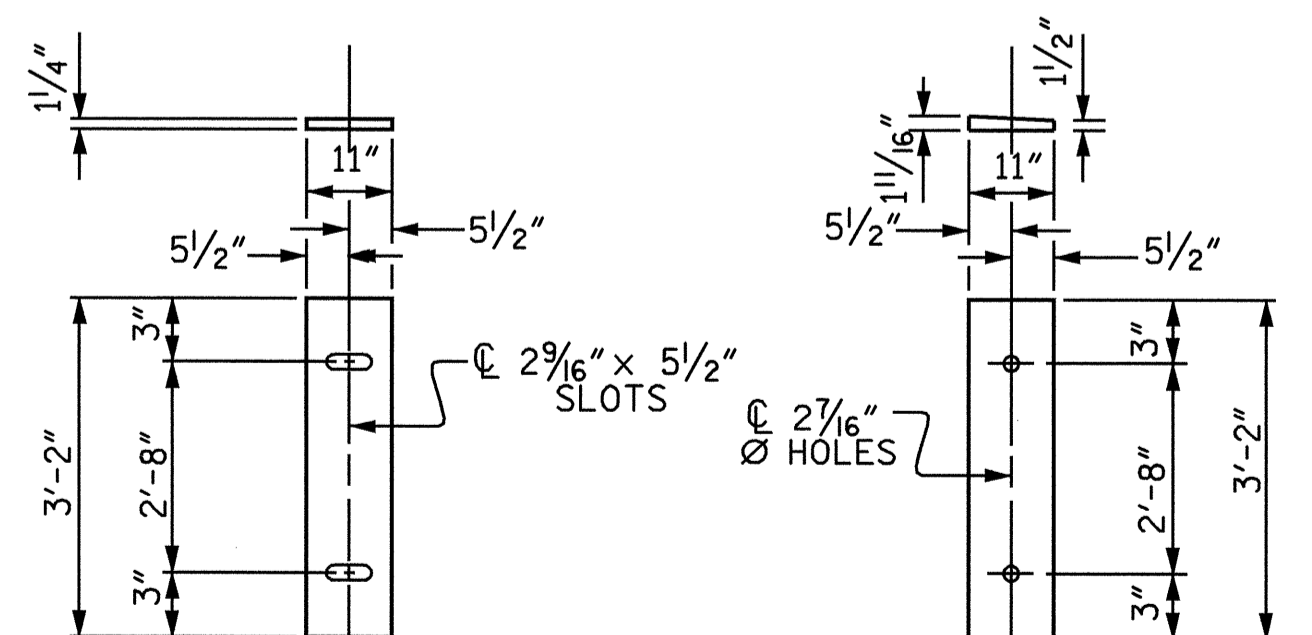


TYPICAL PLAN @ END BENT



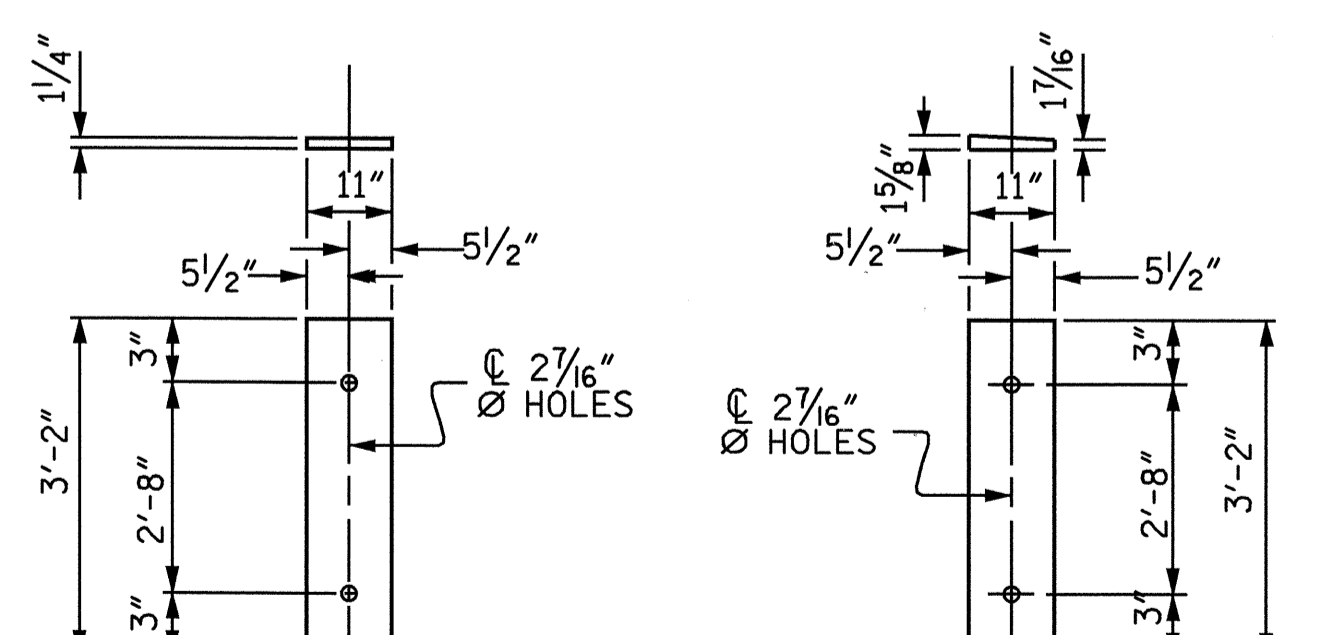
TYPICAL PLAN @ BENT

(SHOWING CONTINUOUS BENT)



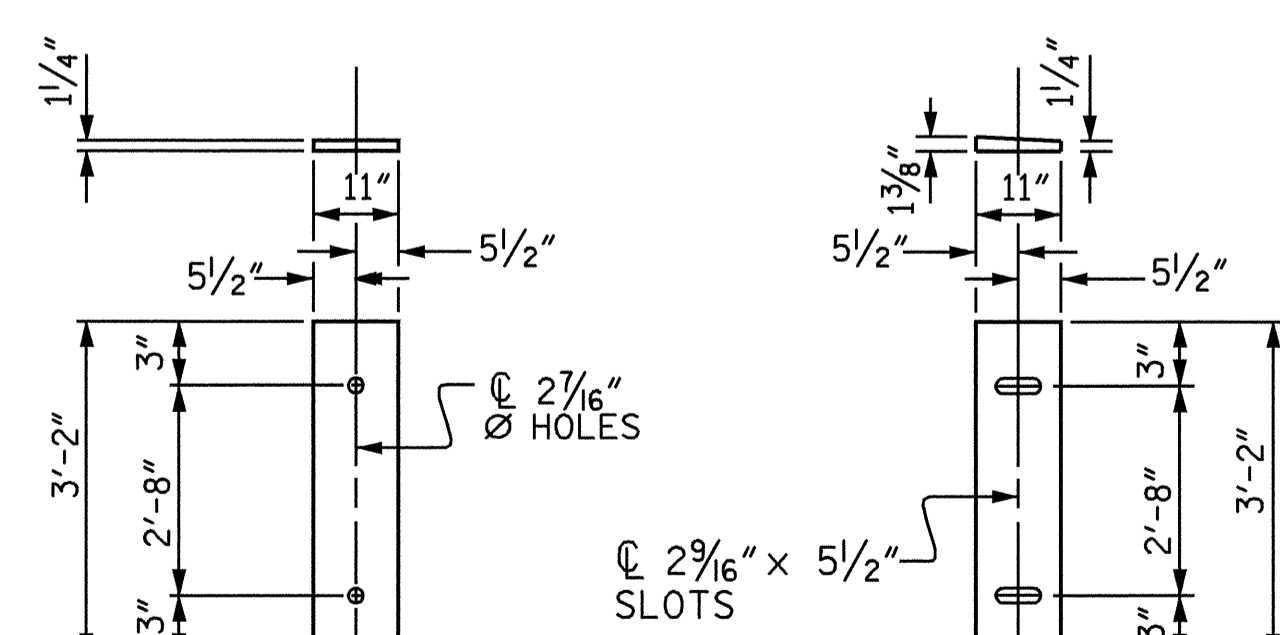
EXPANSION END (TYPE P1 - 6 REQ'D)

FIXED END (TYPE P3 - 6 REQ'D)



FIXED END (TYPE P2 - 6 REQ'D)

FIXED END (TYPE P4 - 6 REQ'D)



FIXED END (TYPE P2 - 6 REQ'D)

EXPANSION END (TYPE P5 - 6 REQ'D)

(SEE CHAMFER DETAILS)

SPAN A

SPAN B

SPAN C

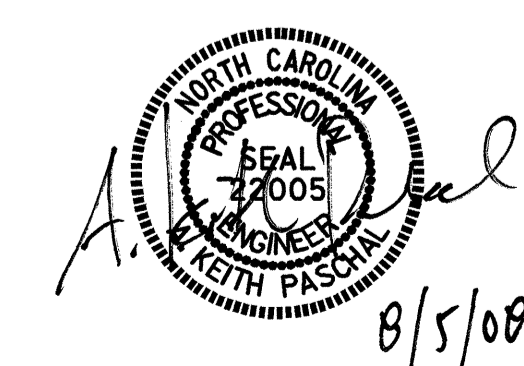
SOLE PLATE DETAILS ("P")

ASSEMBLED BY : J. G. KHARVA	DATE : 07/10/07
CHECKED BY : J. D. HAWK	DATE : 07/10/08
DRAWN BY : EEM 10/95	REV. 10/17/00 RWW/LES
CHECKED BY : PEK 10/95	REV. 7/10/01 LES/RDR
	REV. 5/1/06 TLA/GM

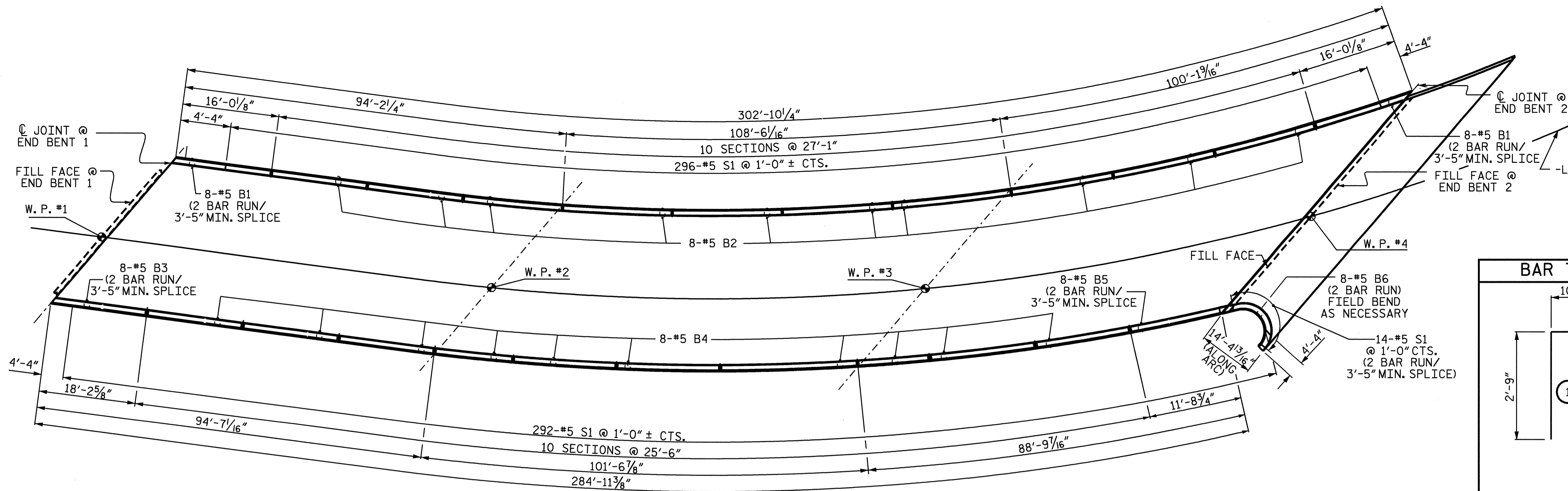
05-AUG-2008 15:15
 I:\structure\B4258\final\B4258.ed.bg.dgn
 jkharva

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

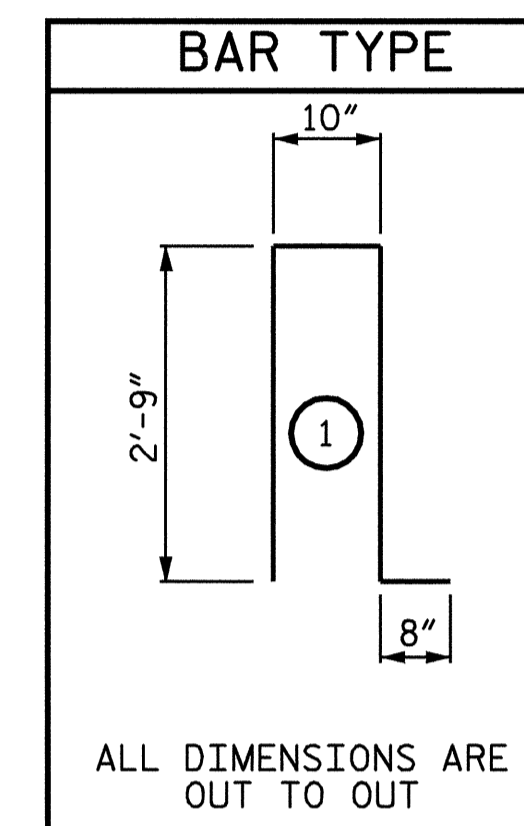
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING DETAILS
 PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			40

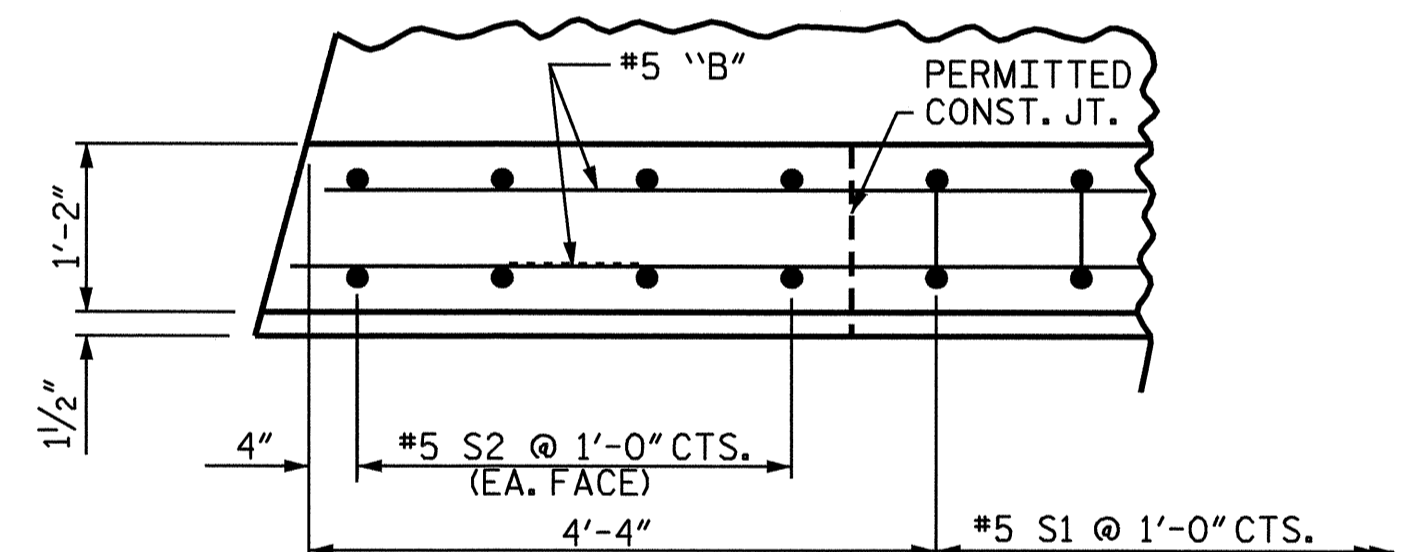


PLAN OF PARAPET

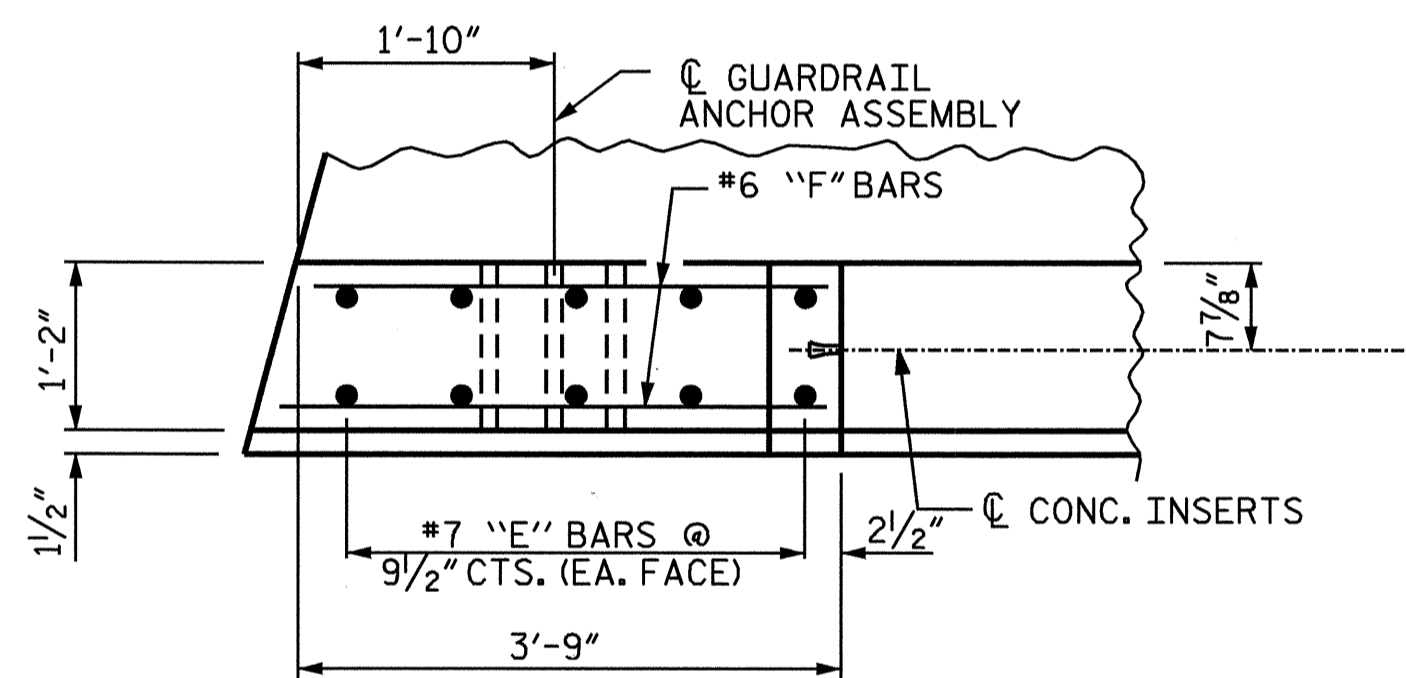


ALL DIMENSIONS ARE OUT TO OUT

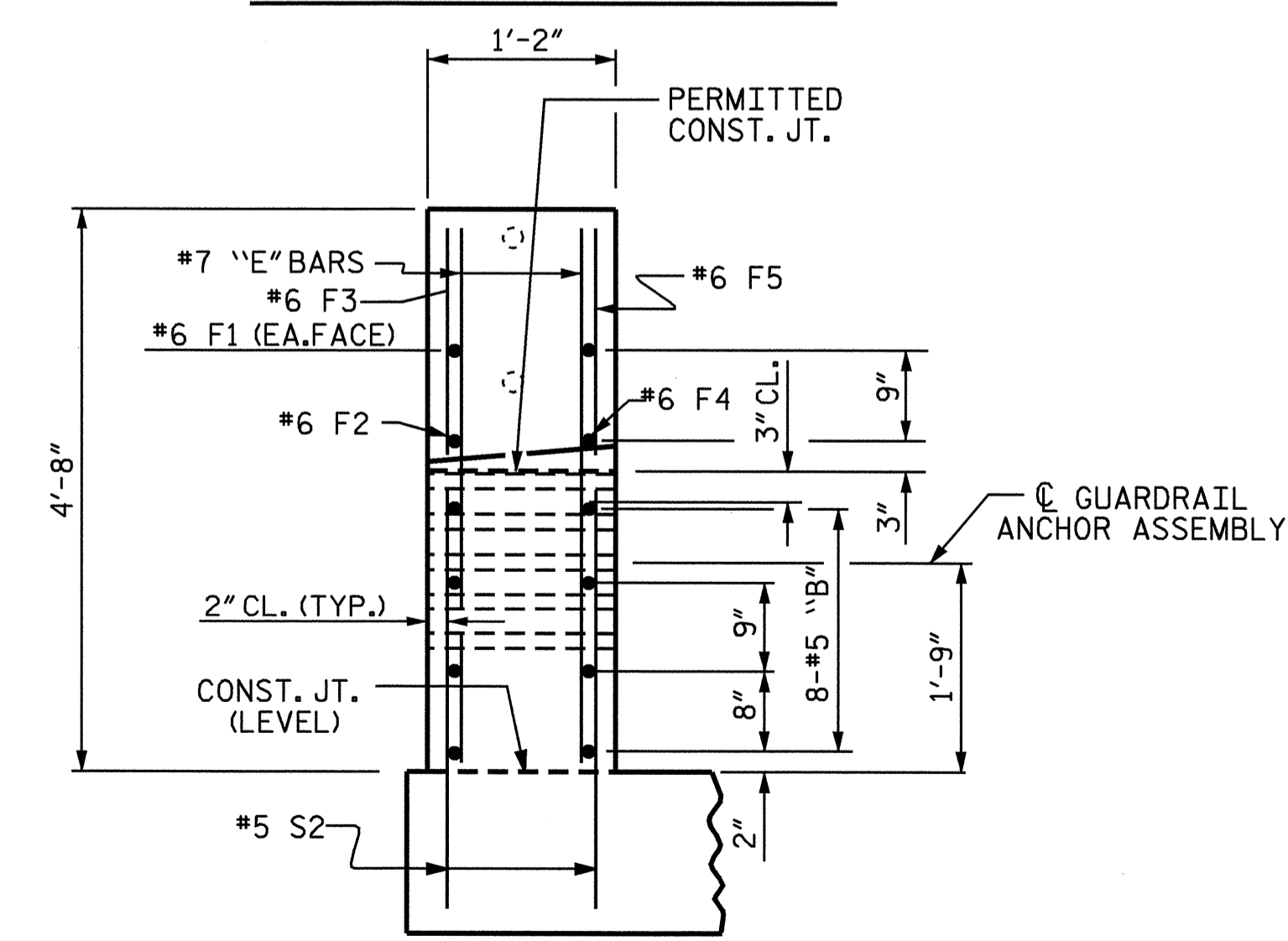
BILL OF MATERIAL FOR PARAPET AND FOUR END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	32	#5	STR	9'-11"	331
*B2	80	#5	STR	26'-8"	2225
*B3	16	#5	STR	10'-8"	178
*B4	80	#5	STR	25'-1"	2093
*B5	16	#5	STR	7'-5"	124
*B6	16	#5	STR	9'-4"	156
*S1	603	#5	1	7'-0"	4403
*S2	32	#5	STR	3'-0"	100
*E1	8	#7	STR	2'-7"	42
*E2	8	#7	STR	3'-1"	50
*E3	8	#7	STR	3'-6"	57
*E4	8	#7	STR	4'-0"	65
*E5	8	#7	STR	4'-4"	71
*F1	8	#6	STR	2'-0"	24
*F2	4	#6	STR	3'-5"	21
*F3	4	#6	STR	4'-4"	26
*F4	4	#6	STR	4'-1"	25
*F5	4	#6	STR	3'-8"	22
* EPOXY COATED REINFORCING STEEL 10013 LBS.					
CLASS AA CONCRETE				65.9 CU. YDS.	
CONCRETE PARAPET				602.33 LIN. FT.	



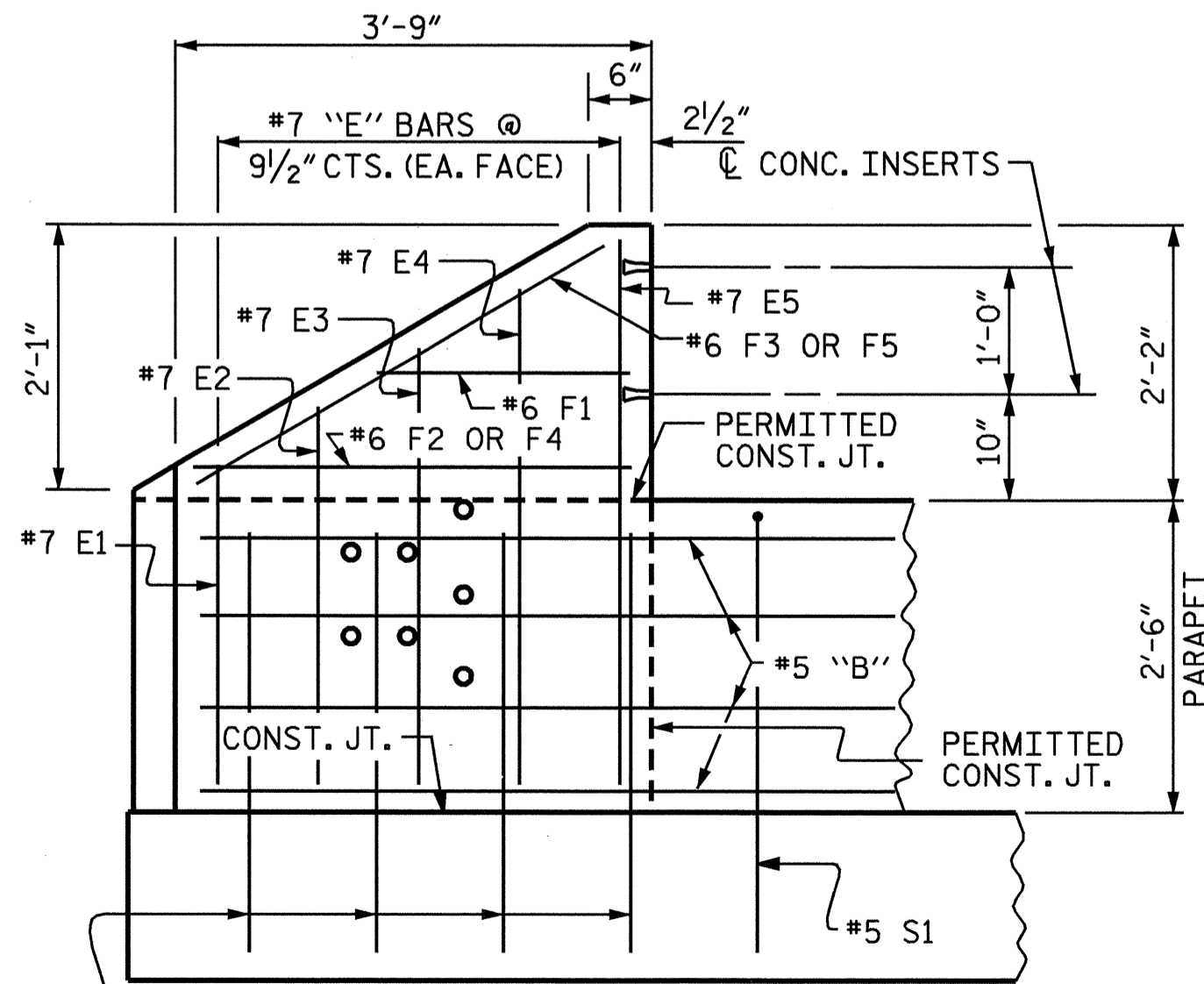
PLAN OF PARAPET



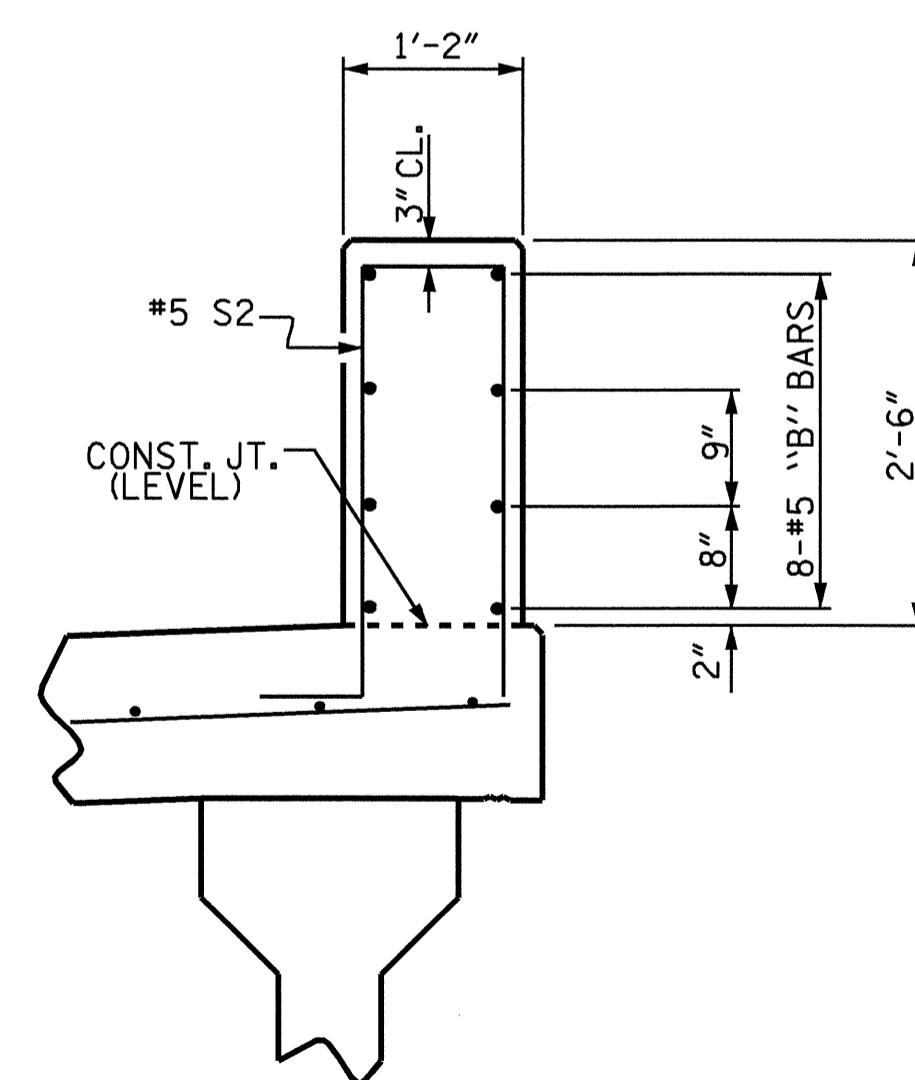
PLAN OF END POST



END VIEW



ELEVATION

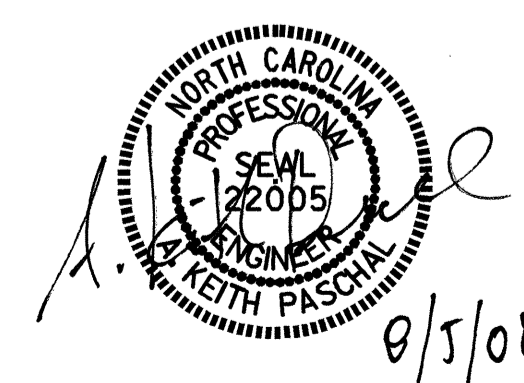


SECTION THRU PARAPET

NOTES:
 ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.
 FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE 'RAIL POST SPACINGS AND END OF RAIL DETAILS' SHEETS 2 OF 5 AND 4 OF 5.
 GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 FOR
 2 BAR METAL RAIL

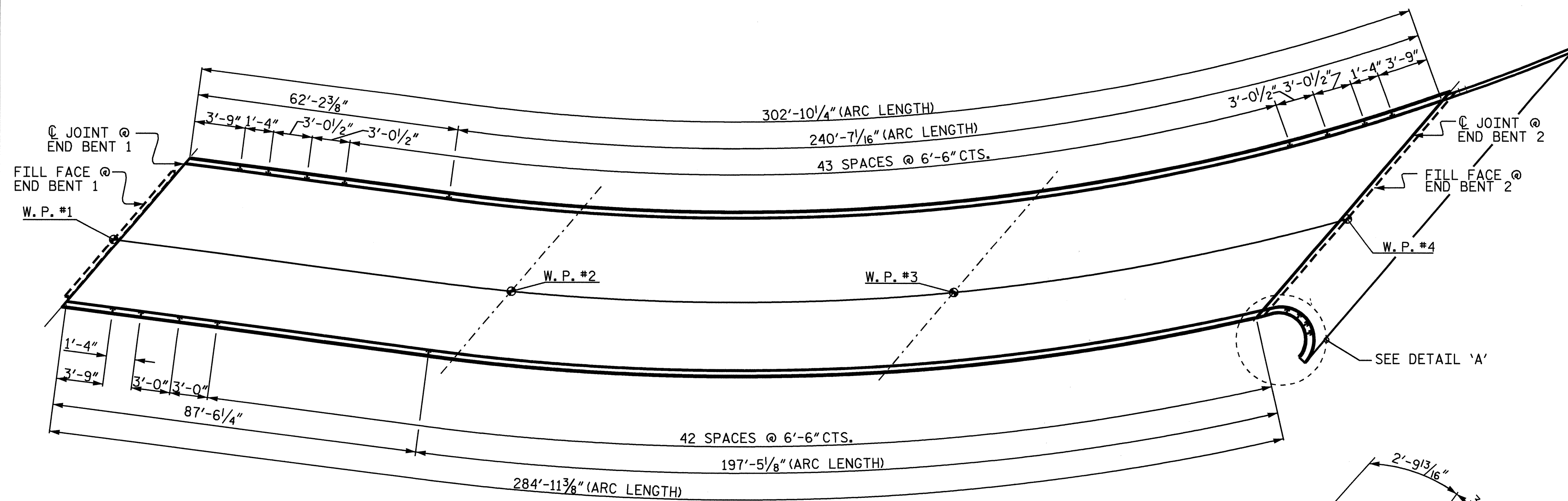


DRAWN BY : J.G. KHARVA DATE : 07/07/08
 CHECKED BY : J.D. HAWK DATE : 07/14/08

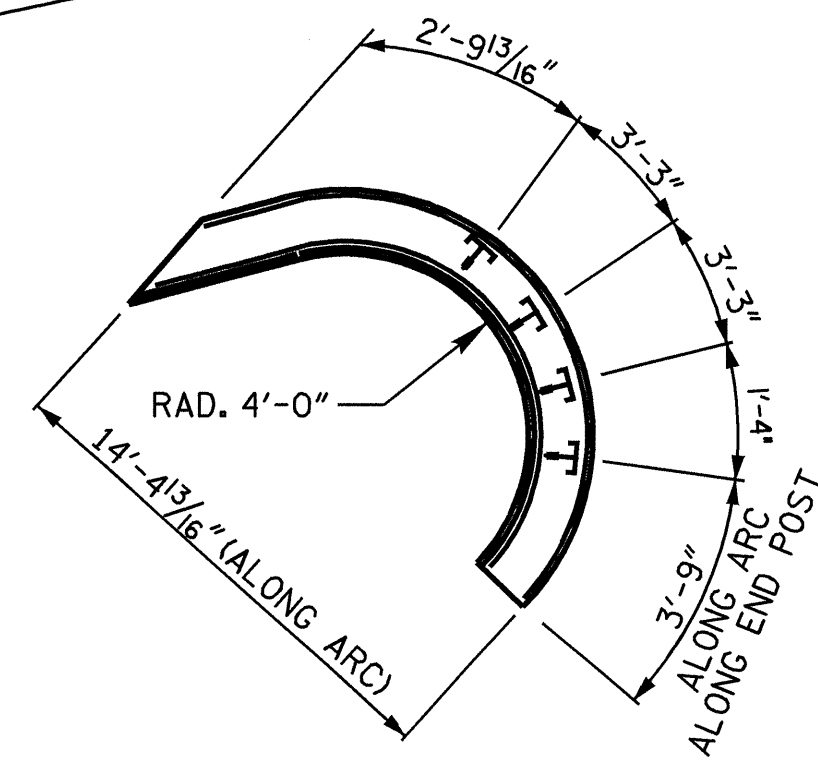
PARAPET AND END POST FOR TWO BAR METAL RAIL

REVISIONS						SHEET NO. S-21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

05-AUG-2008 15:16
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 jkharva



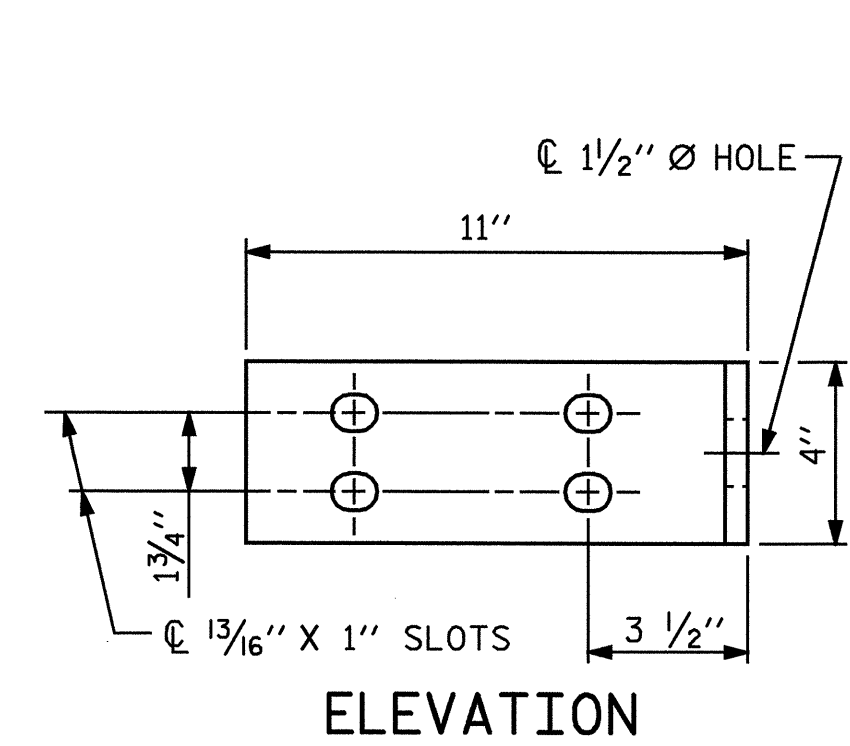
PLAN OF RAIL POST SPACINGS



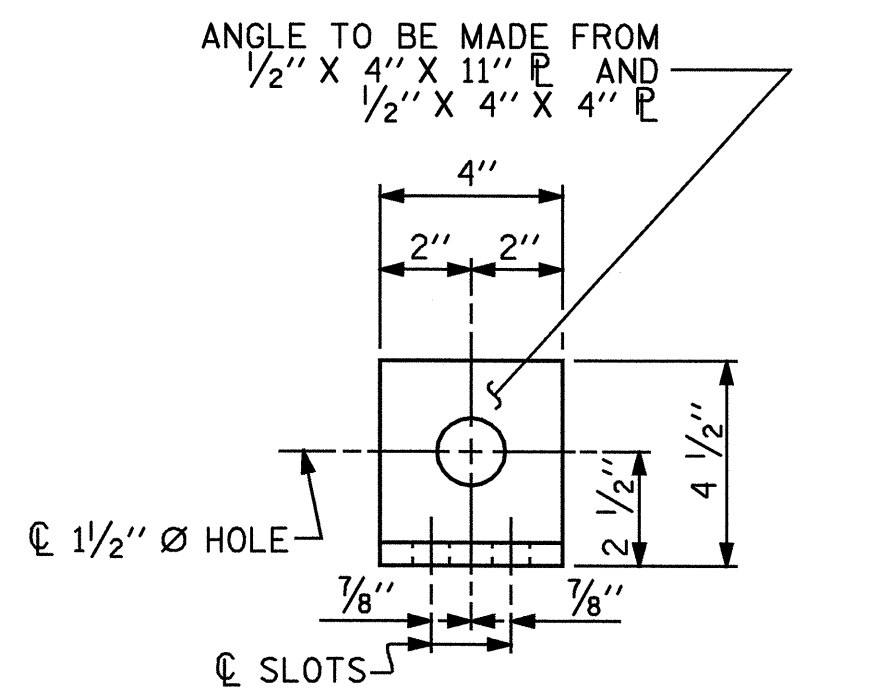
DETAIL 'A'

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

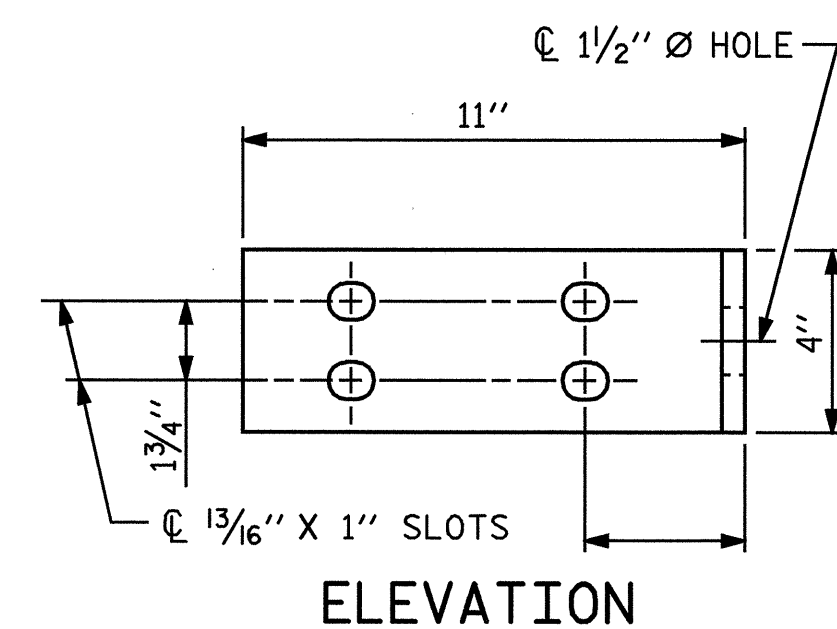
- NOTES**
METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF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



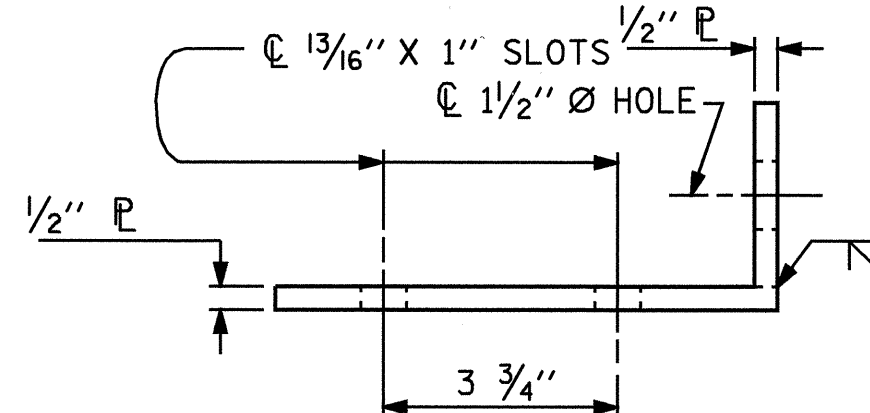
ELEVATION



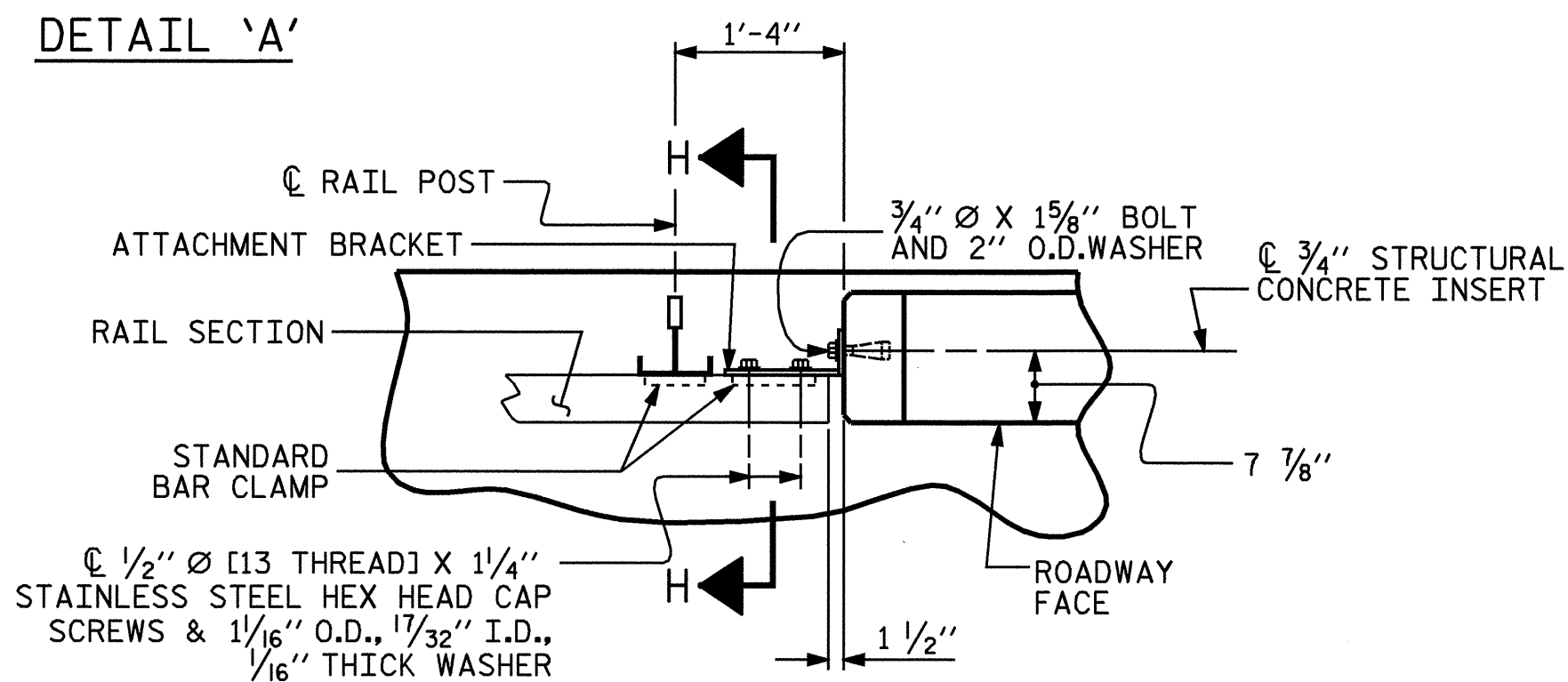
END VIEW (FIX AND EXP.)



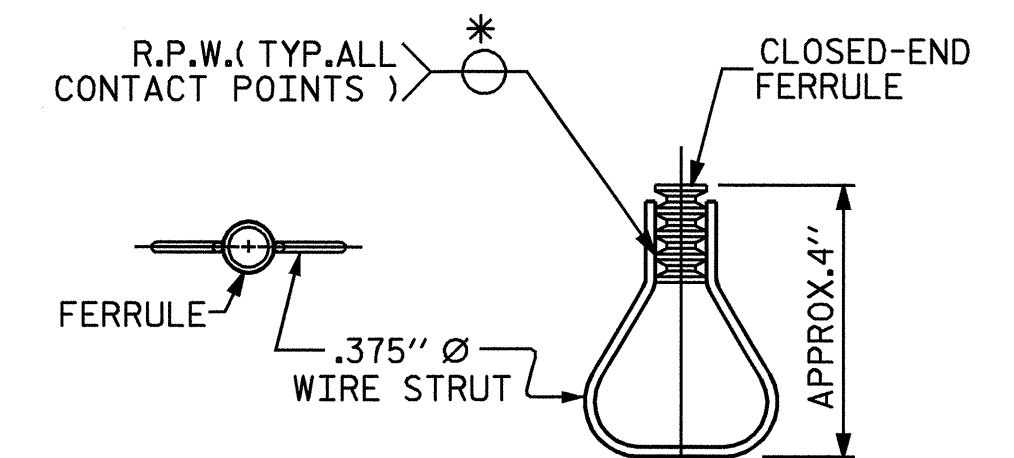
ELEVATION



TOP VIEW



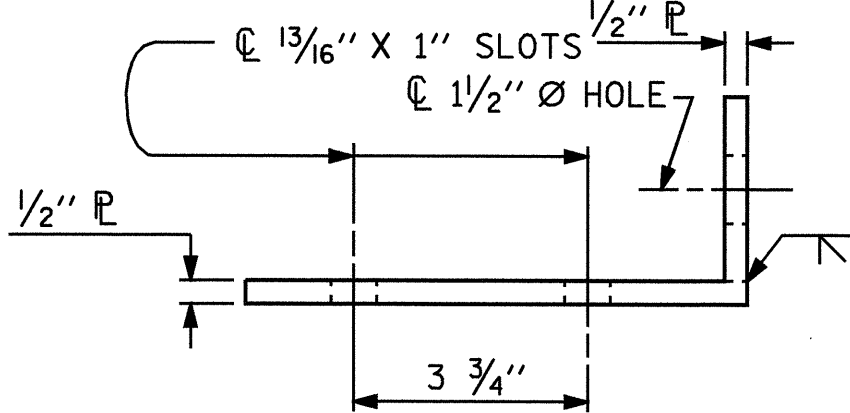
PLAN - RAIL AND END POST



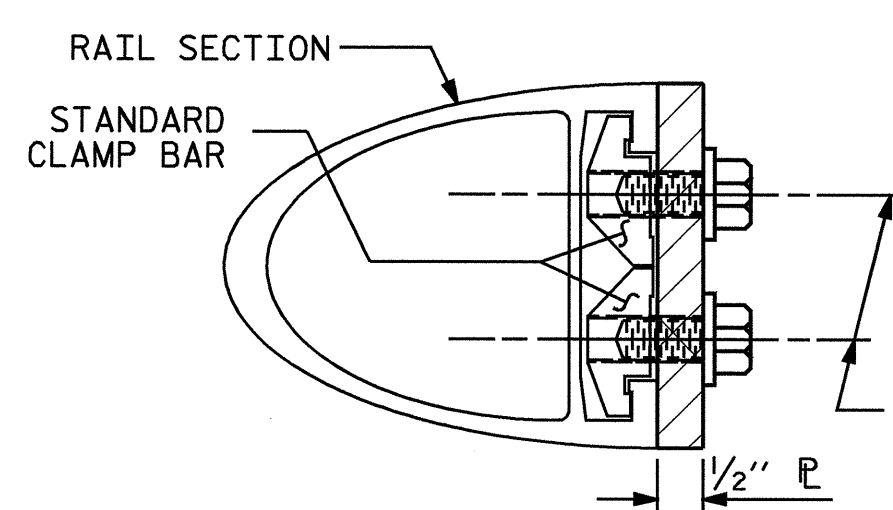
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

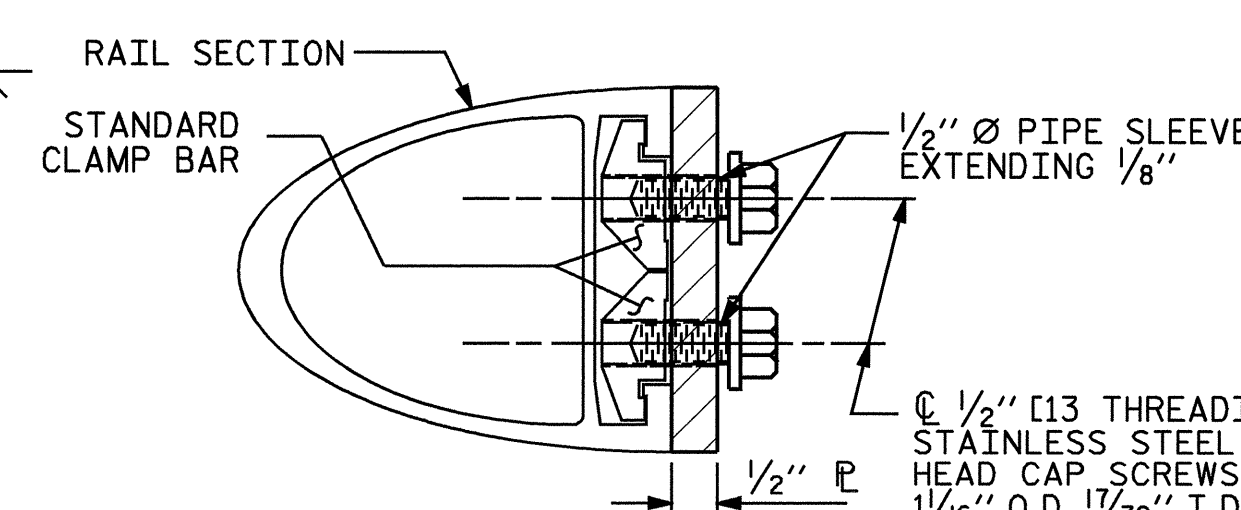


TOP VIEW



SECTION H-H (FIX)

FIXED



SECTION H-H (EXP.)

EXPANSION

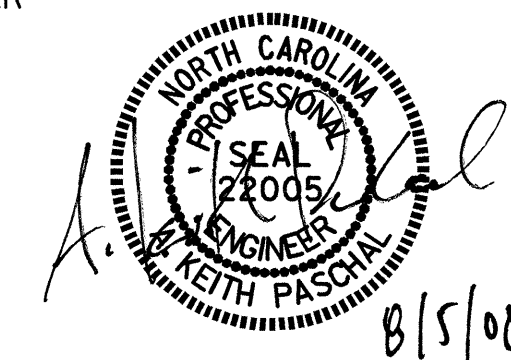
DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 2 OF 5

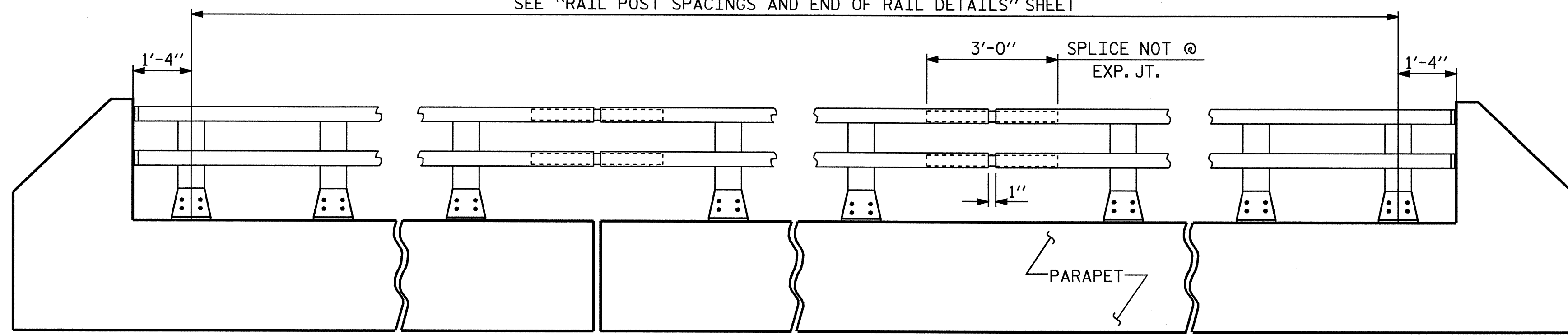
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			



ASSEMBLED BY : J. G. KHARVA	DATE : 07/01/08
CHECKED BY : J. D. HAWK	DATE : 07/14/08
DRAWN BY : FCJ 1/88	REV. 10/17/00 LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET



ELEVATION

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING. THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY. MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

ANODIZING

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, CLAMP BARS, RIVETS, CAPS, SHIMS, ATTACHMENT BRACKETS, AND HOLD-DOWN PLATES SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-221 6061-T6 ALUMINUM SAMPLES ANODIZED MEDIUM BRONZE, DARK BRONZE, AND EXTRA DARK BRONZE TO THE ENGINEER. THE ENGINEER SHALL SELECT FROM THE SAMPLES FURNISHED BY THE CONTRACTOR THE COLOR WHICH MOST CLOSELY MATCHES THE WEATHERDRAIL COLOR OF THE BRIDGE BEAMS AND ATTACHED GUARDRAIL.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OF COMPONENTS DURING CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

AFTER A SHADE OF BRONZE HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION THE ANODIZED ALUMINUM RAILING. ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

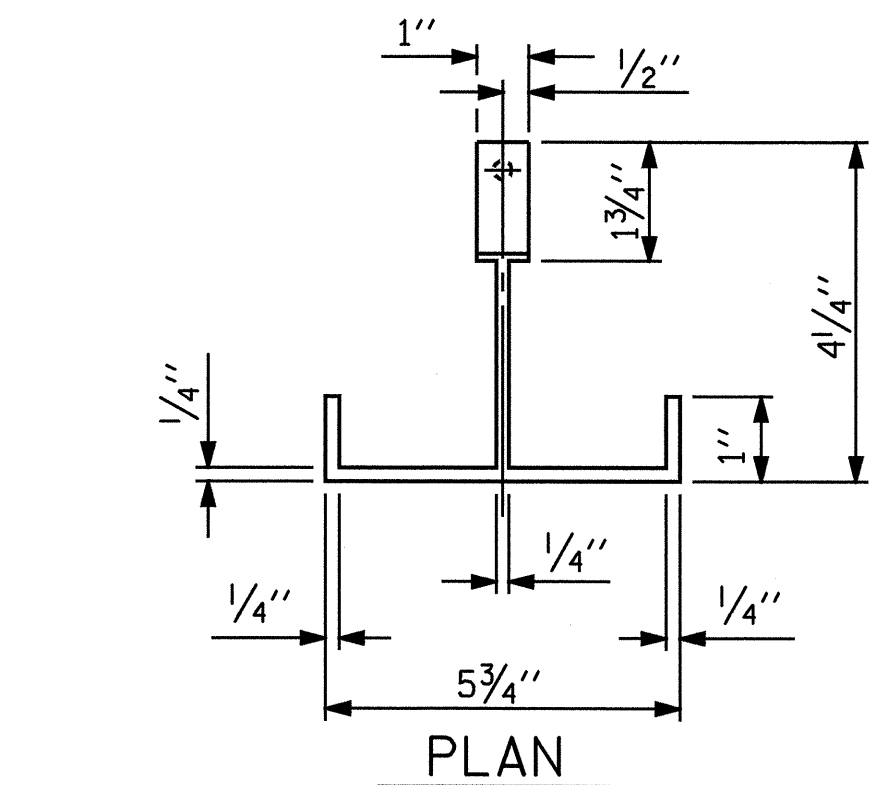
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

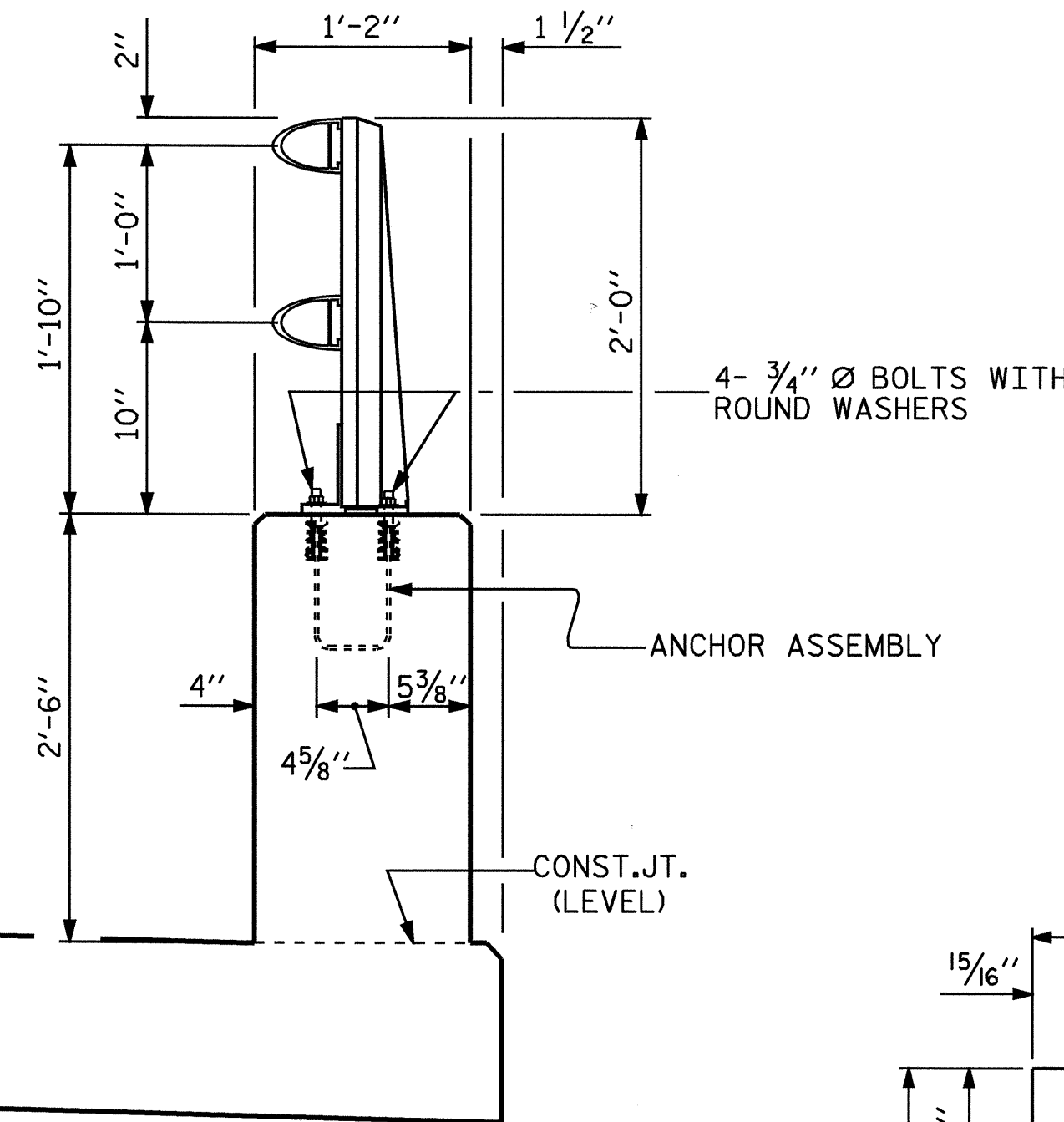
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

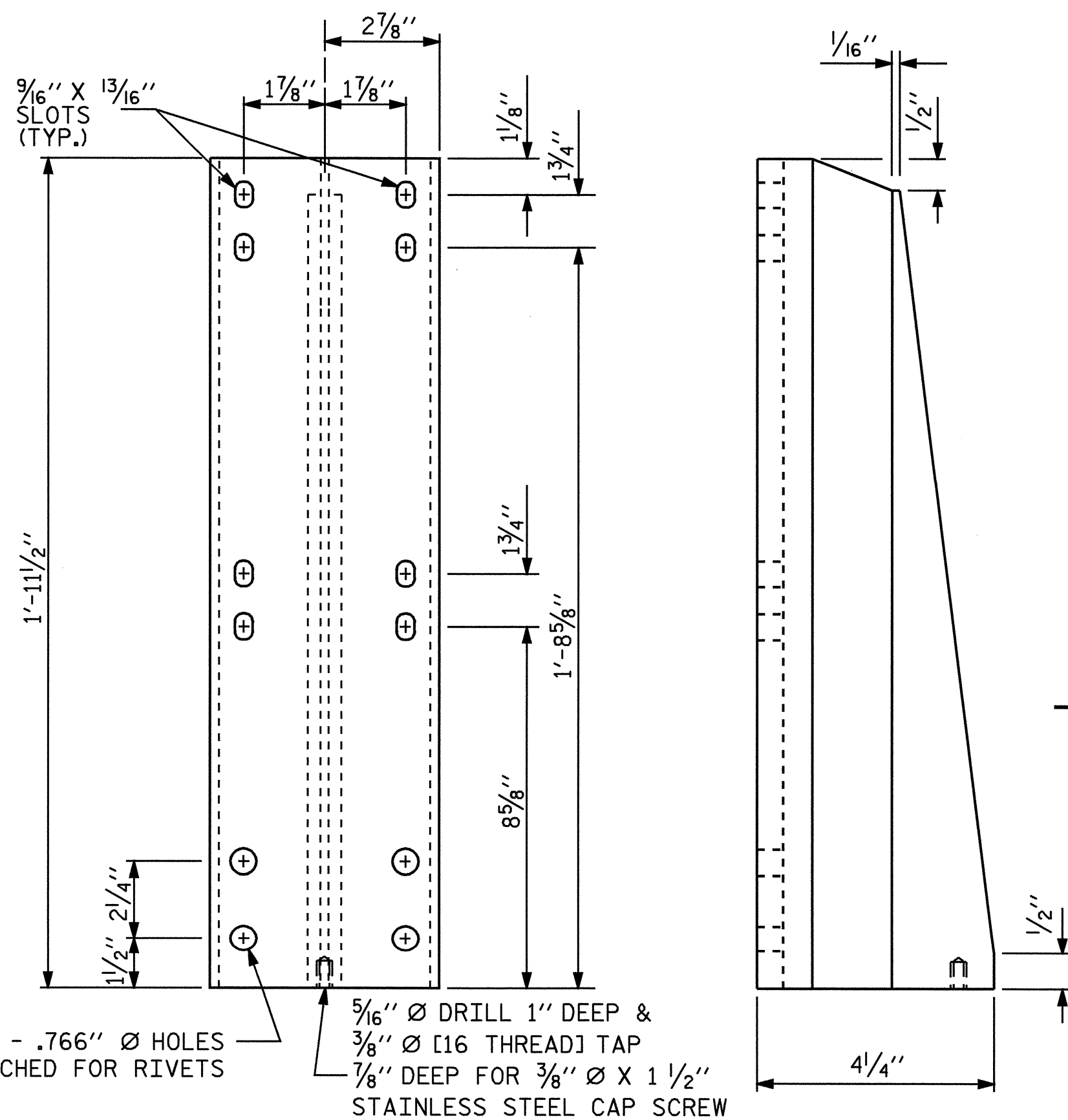
PAY LENGTH = 585.32 LIN. FT.



PLAN



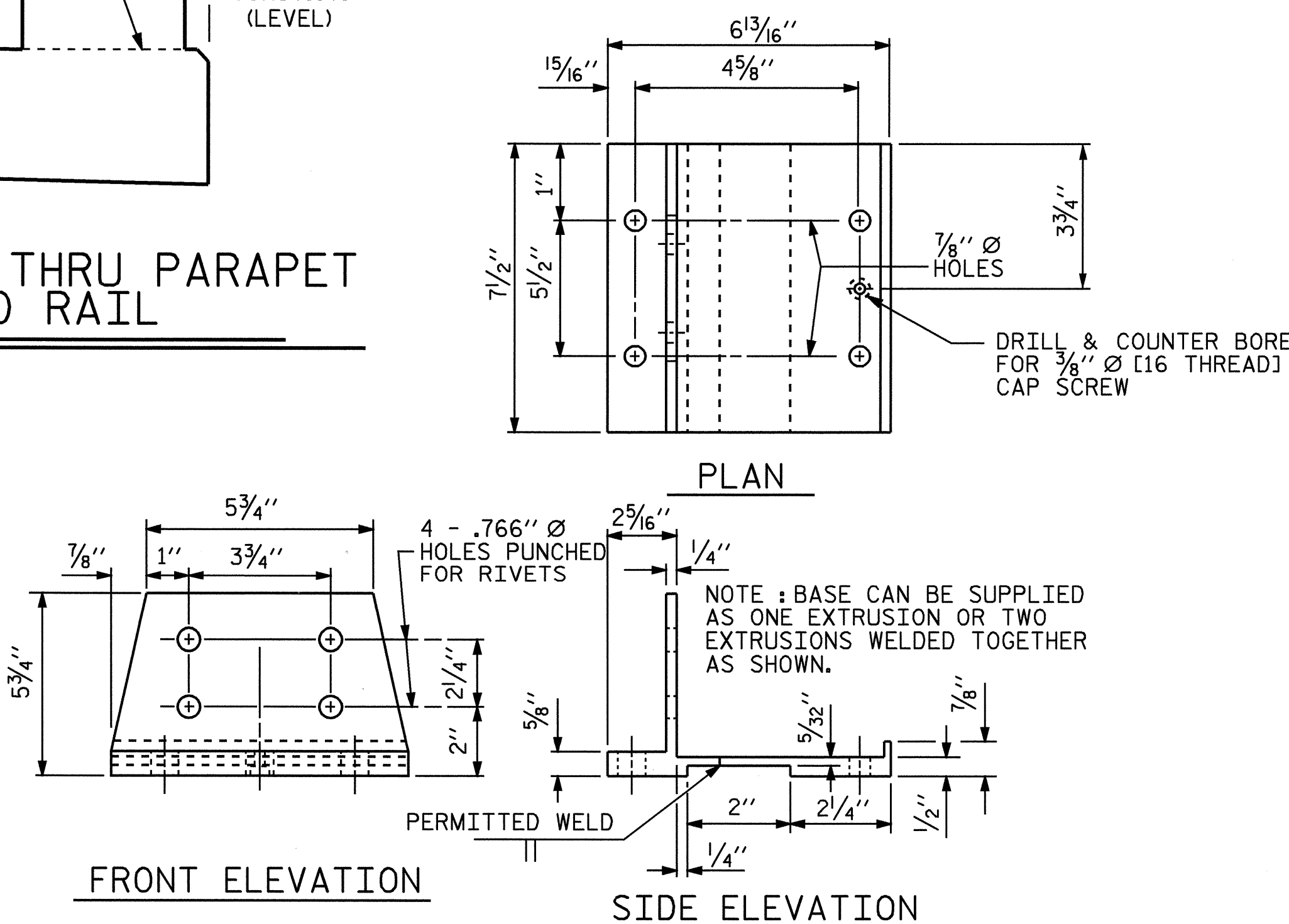
SECTION THRU PARAPET AND RAIL



FRONT ELEVATION

SIDE ELEVATION

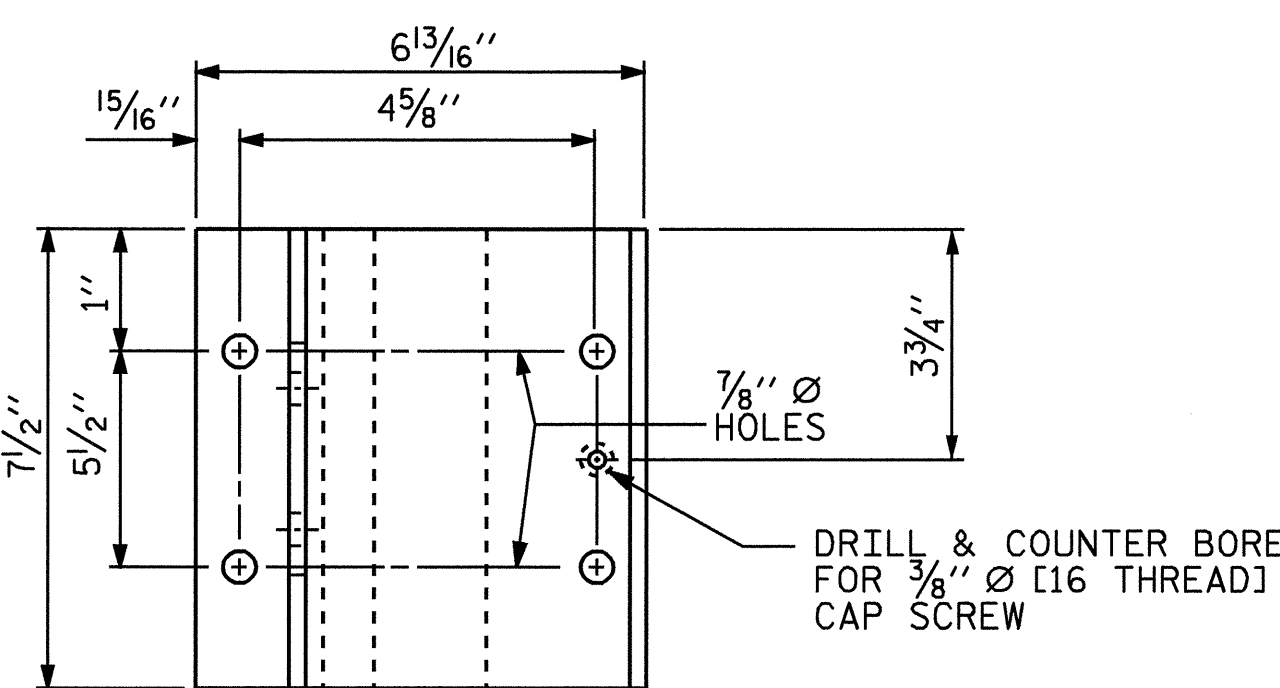
DETAILS OF POST



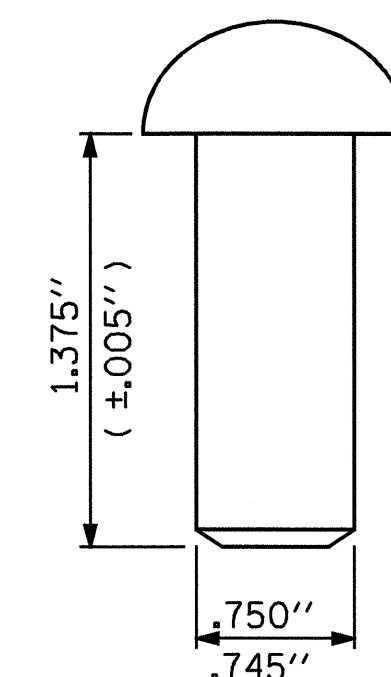
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



PLAN



RIVET DETAIL

ASSEMBLED BY : J. G. KHARVA	DATE : 07/01/08
CHECKED BY : J. D. HAWK	DATE : 07/03/08
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

05-AUG-2008 15:16
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jkharva



PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA						SHEET NO. S-23
DEPARTMENT OF TRANSPORTATION						
STANDARD						
2 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			40
2			4			

STD. NO. BMR3

NOTES

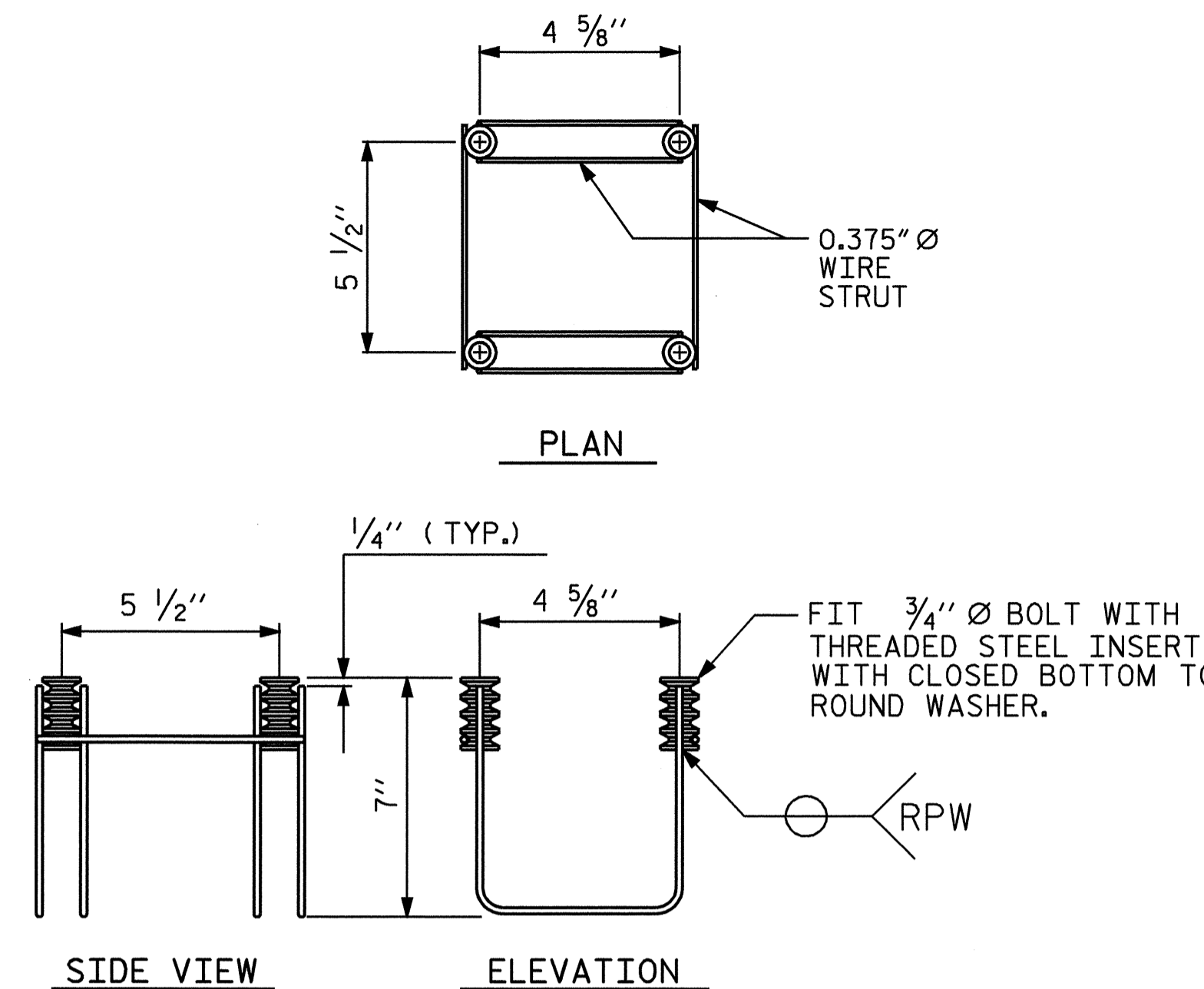
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

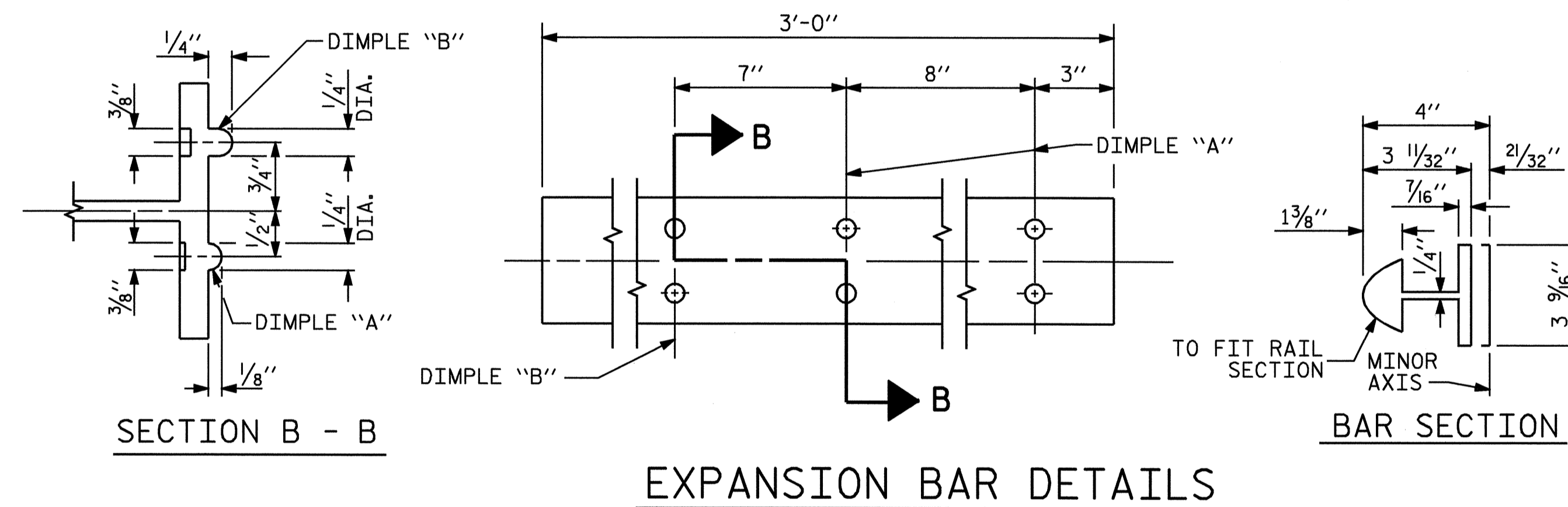
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



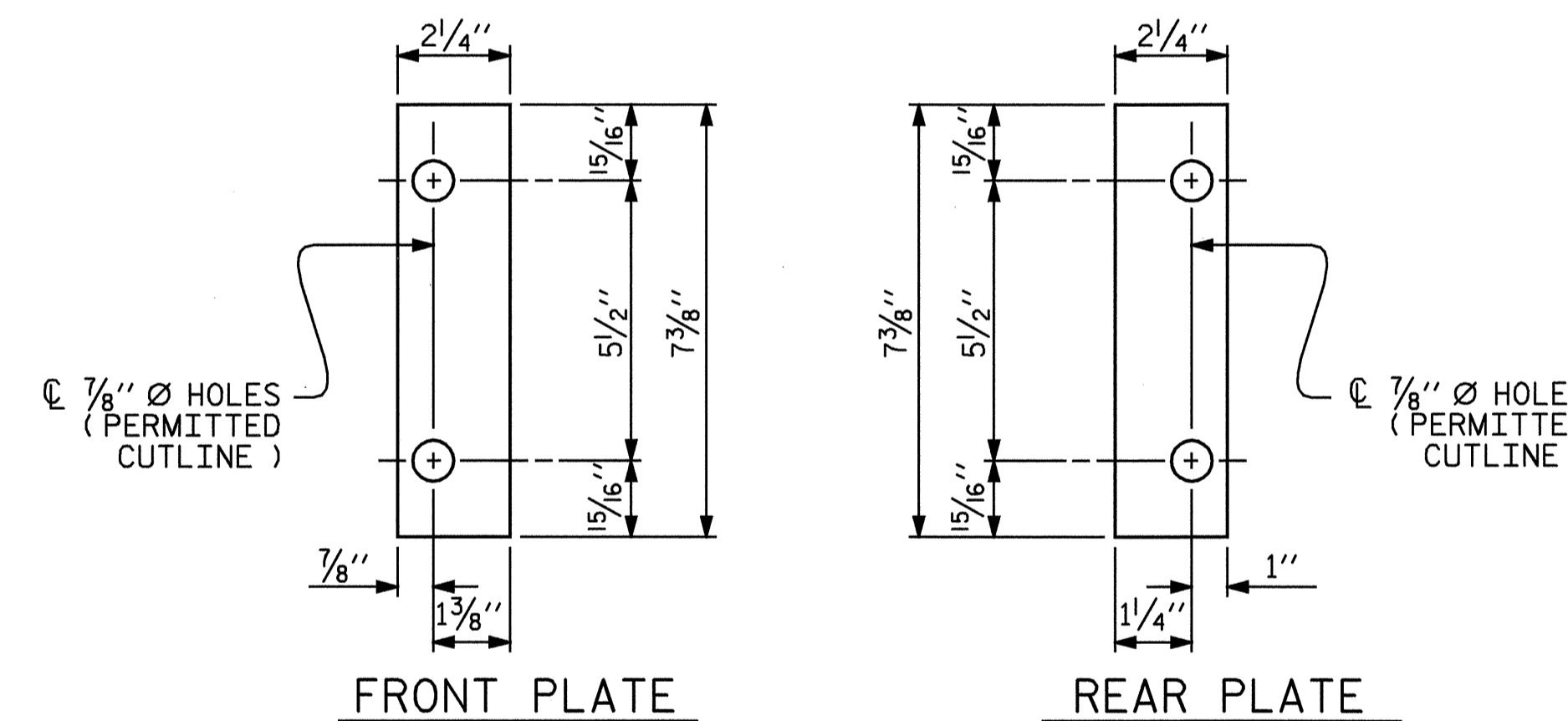
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(98 ASSEMBLIES REQUIRED)

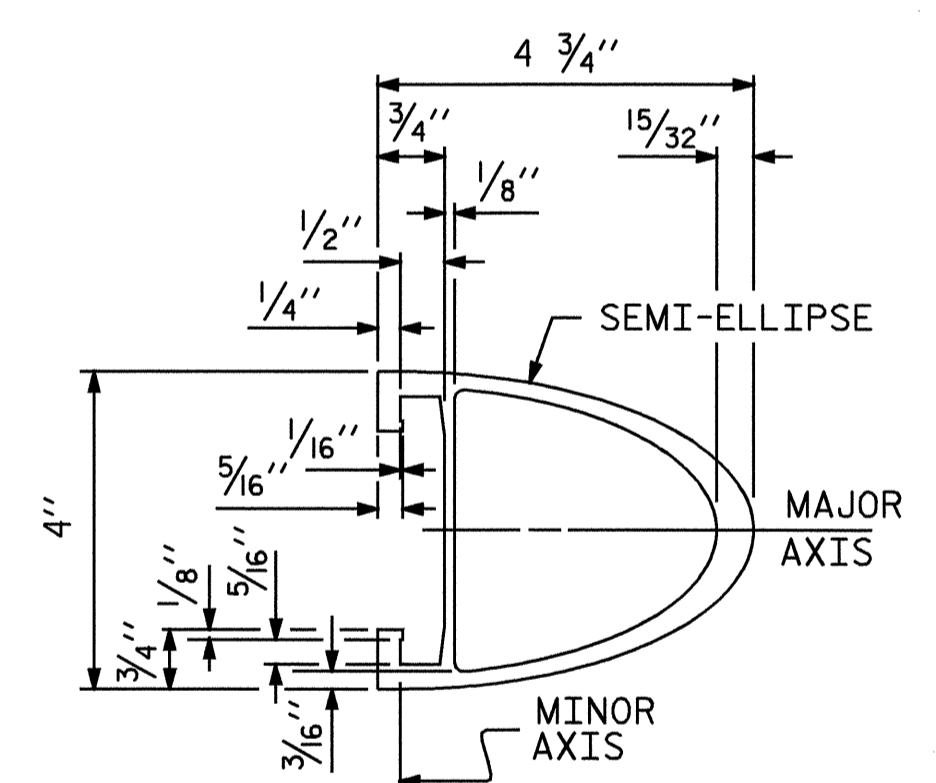


EXPANSION BAR DETAILS

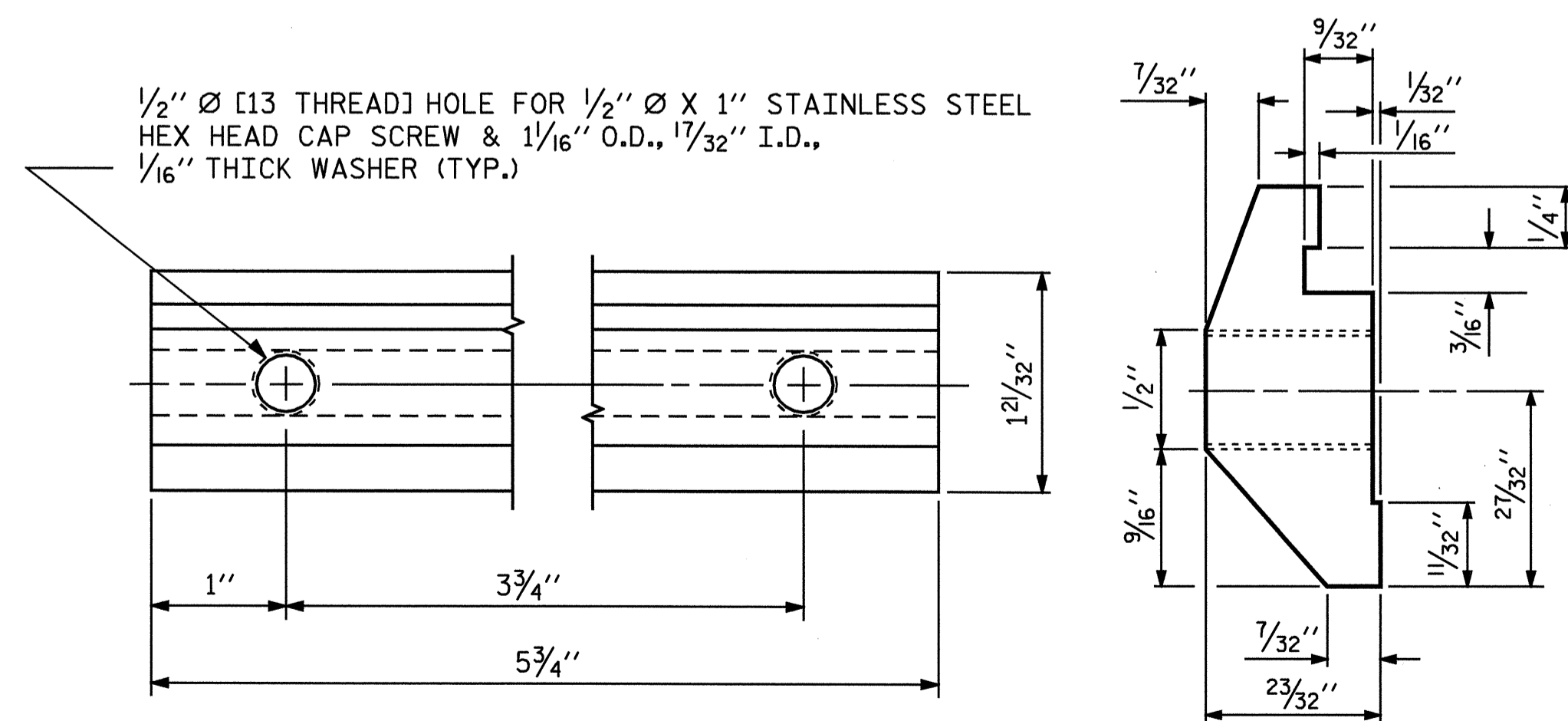


SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

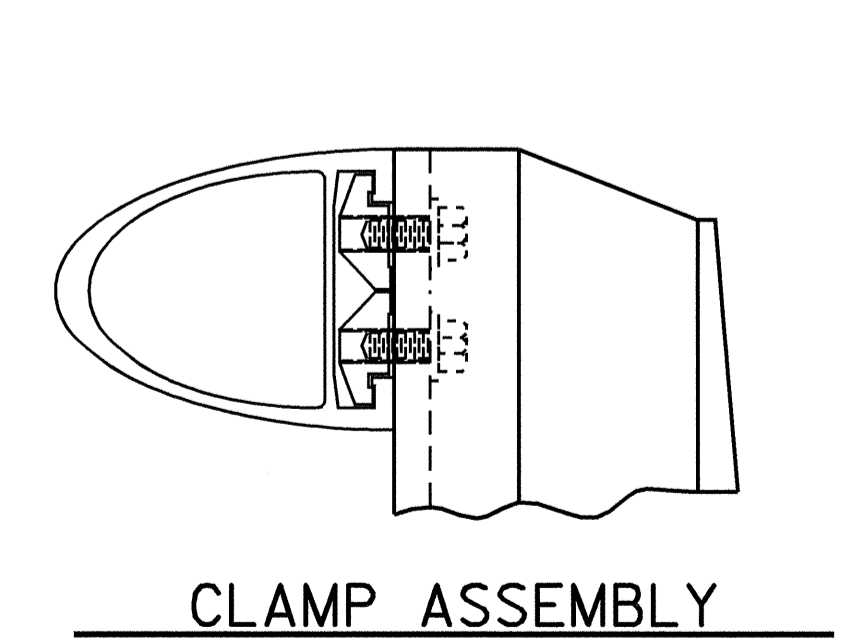


RAIL SECTION

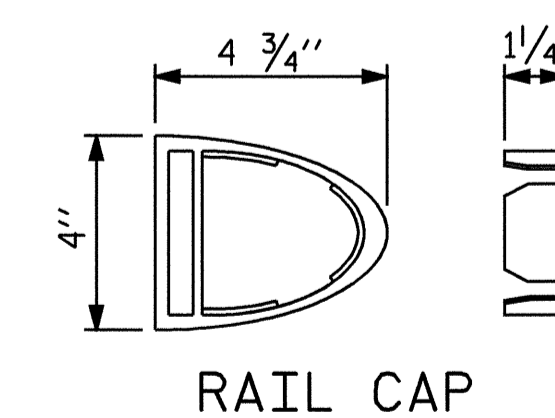


CLAMP BAR DETAIL

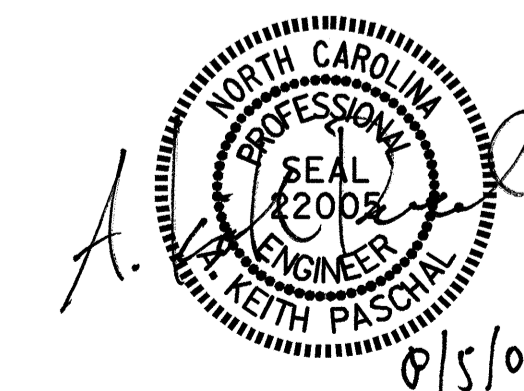
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
2 BAR METAL RAIL

ASSEMBLED BY : J. G. KHARVA	DATE : 07/01/08
CHECKED BY : J. D. HAWK	DATE : 07/03/08
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM

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

NOTES

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

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

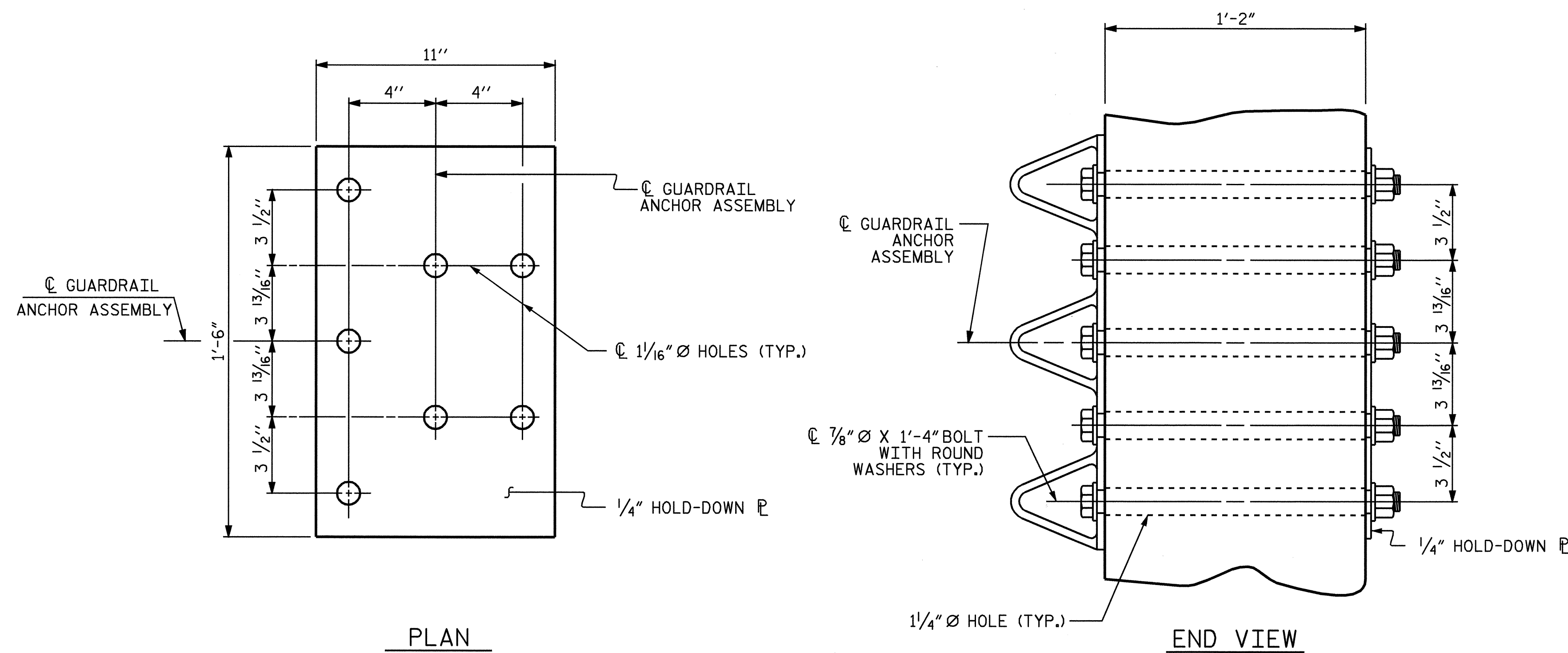
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

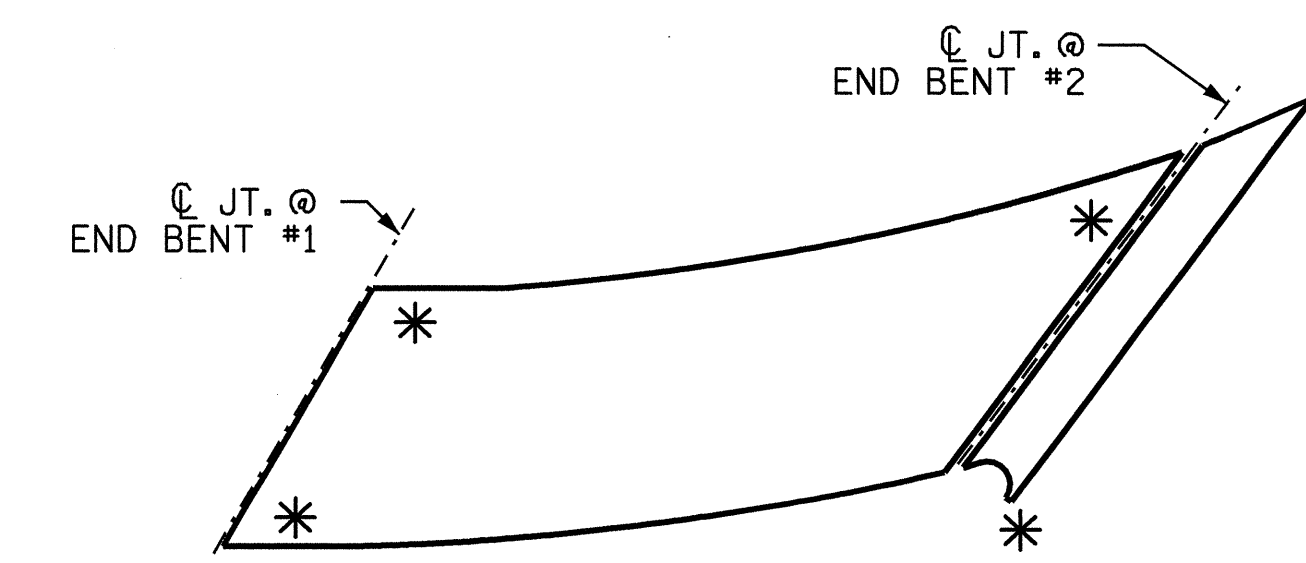
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

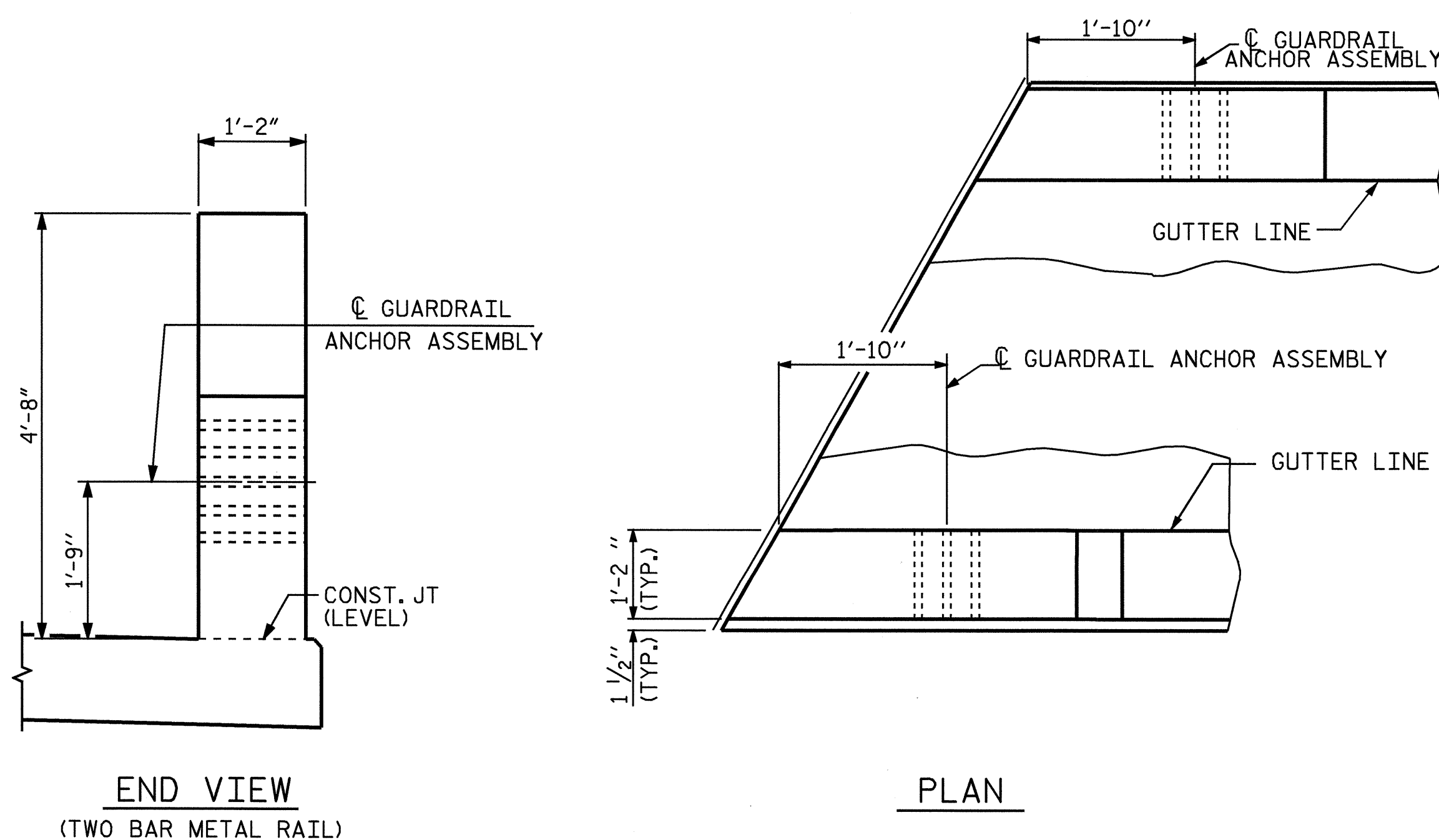


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

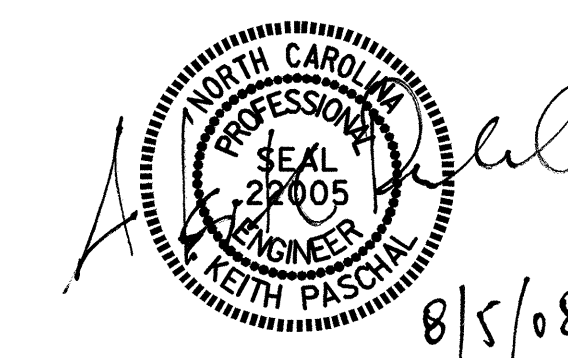


LOCATION OF GUARDRAIL ANCHOR AT END POST

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 5 OF 5



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

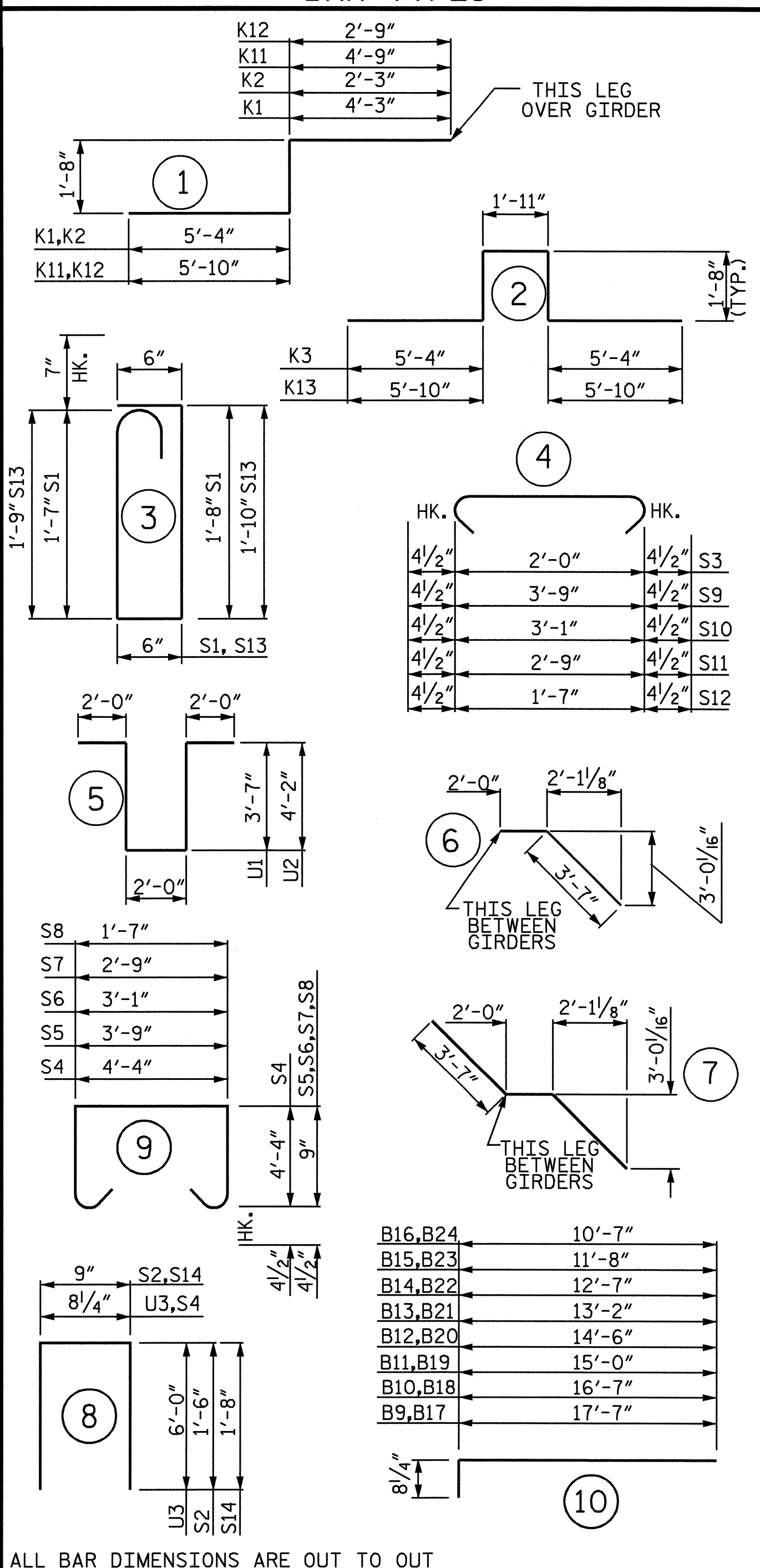
ASSEMBLED BY : J. G. KHARVA	DATE : 07/07/08
CHECKED BY : J. D. HAWK	DATE : 07/14/08
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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

REINFORCING BAR SCHEDULE

SPANS A THRU C											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	414	#5	STR	38'-11"	16804	A232	3	#5	STR	12'-9"	40
A2	414	#5	STR	38'-11"	16804	A233	3	#5	STR	11'-6"	36
*A101	3	#5	STR	36'-2"	113	A234	3	#5	STR	10'-4"	32
*A102	3	#5	STR	33'-3"	104	A235	1	#5	STR	8'-1"	8
*A103	3	#5	STR	30'-4"	95	A236	1	#5	STR	9'-6"	10
*A104	3	#5	STR	27'-6"	86	A237	1	#5	STR	9'-1"	9
*A105	3	#5	STR	24'-7"	77	A238	1	#5	STR	8'-8"	9
*A106	3	#5	STR	21'-8"	68	A239	1	#5	STR	8'-3"	9
*A107	3	#5	STR	18'-9"	59	A240	1	#5	STR	7'-10"	8
*A108	3	#5	STR	15'-11"	50	A241	1	#5	STR	7'-9"	8
*A109	3	#5	STR	13'-0"	41	A242	1	#5	STR	7'-0"	7
*A110	3	#5	STR	10'-2"	32	A243	1	#5	STR	6'-7"	7
*A111	3	#5	STR	7'-3"	23	*B1	81	#4	STR	21'-8"	1172
*A112	7	#5	STR	4'-4"	32	*B2	104	#5	STR	36'-1"	3914
*A113	3	#5	STR	37'-11"	119	*B3	51	#5	STR	30'-1"	1600
*A114	3	#5	STR	36'-6"	114	*B4	25	#4	STR	18'-5"	402
*A115	3	#5	STR	35'-1"	110	*B5	104	#5	STR	34'-7"	3751
*A116	3	#5	STR	33'-9"	106	*B6	51	#5	STR	30'-9"	1636
*A117	3	#5	STR	32'-5"	101	*B7	72	#4	STR	20'-8"	994
*A118	3	#5	STR	31'-0"	97	B8	176	#5	STR	56'-4"	10341
*A119	3	#5	STR	29'-8"	93	*B9	1	#8	10	18'-3"	49
*A120	3	#5	STR	28'-4"	89	*B10	1	#8	10	17'-3"	46
*A121	3	#5	STR	27'-0"	84	*B11	1	#8	10	15'-8"	41
*A122	3	#5	STR	25'-8"	80	*B12	1	#8	10	15'-2"	40
*A123	3	#5	STR	24'-4"	76	*B13	1	#8	10	13'-10"	37
*A124	3	#5	STR	23'-0"	72	*B14	1	#8	10	13'-3"	35
*A125	3	#5	STR	21'-8"	68	*B15	1	#8	10	12'-4"	33
*A126	3	#5	STR	20'-5"	64	*B16	1	#8	10	11'-3"	30
*A127	3	#5	STR	19'-2"	60	B17	1	#8	10	18'-3"	49
*A128	3	#5	STR	17'-10"	56	B18	1	#8	10	17'-3"	46
*A129	3	#5	STR	16'-7"	52	B19	1	#8	10	15'-8"	41
*A130	3	#5	STR	15'-3"	48	B20	1	#8	10	15'-2"	40
*A131	3	#5	STR	14'-0"	44	B21	1	#8	10	13'-10"	37
*A132	3	#5	STR	12'-9"	40	B22	1	#8	10	13'-3"	35
*A133	3	#5	STR	11'-6"	36	B23	1	#8	10	12'-4"	33
*A134	3	#5	STR	10'-2"	32	B24	1	#8	10	11'-3"	30
*A135	1	#5	STR	8'-1"	8	*B25	9	#4	STR	17'-7"	35
*A136	1	#5	STR	9'-6"	10	*G1	1	#5	STR	46'-5"	48
*A137	1	#5	STR	9'-1"	9	*G2	2	#5	STR	36'-9"	77
*A138	1	#5	STR	8'-8"	9	*K1	2	#8	1	11'-3"	60
*A139	1	#5	STR	8'-3"	9	*K2	2	#8	1	9'-3"	49
*A140	1	#5	STR	7'-10"	8	K3	8	#8	2	15'-11"	340
*A141	1	#5	STR	7'-9"	8	K4	30	#4	STR	6'-5"	129
*A142	1	#5	STR	7'-0"	7	K5	20	#4	STR	5'-7"	75
*A143	1	#5	STR	6'-7"	7	K6	60	#4	STR	7'-1"	284
A201	3	#5	STR	36'-2"	113	K7	20	#4	STR	6'-1"	81
A202	3	#5	STR	33'-3"	104	K8	20	#4	STR	5'-7"	75
A203	3	#5	STR	30'-4"	95	K9	20	#4	6	5'-7"	75
A204	3	#5	STR	27'-6"	86	K10	40	#4	7	9'-2"	245
A205	3	#5	STR	24'-7"	77	*K11	2	#8	1	12'-3"	65
A206	3	#5	STR	21'-8"	68	*K12	2	#8	1	10'-3"	55
A207	3	#5	STR	18'-9"	59	K13	8	#8	1	16'-11"	361
A208	3	#5	STR	15'-11"	50	*S1	36	#4	3	4'-10"	116
A209	3	#5	STR	13'-0"	41	*S2	36	#4	8	3'-9"	140
A210	3	#5	STR	10'-2"	32	S3	240	#4	4	2'-9"	441
A211	3	#5	STR	7'-3"	23	S4	12	#4	9	13'-9"	110
A212	3	#5	STR	4'-4"	32	S5	2	#4	9	6'-0"	8
A213	3	#5	STR	37'-11"	119	S6	2	#4	9	5'-4"	7
A214	3	#5	STR	36'-6"	114	S7	2	#4	9	5'-0"	7
A215	3	#5	STR	35'-1"	110	S8	2	#4	9	3'-10"	5
A216	3	#5	STR	33'-9"	106	S9	2	#4	8	8'-2"	10
A217	3	#5	STR	32'-5"	101	S10	2	#4	8	6'-10"	10
A218	3	#5	STR	31'-0"	97	S11	2	#4	8	6'-2"	8
A219	3	#5	STR	29'-8"	93	S12	2	#4	8	3'-8"	4
A220	3	#5	STR	28'-4"	89	S13	36	#4	8	5'-2"	124
A221	3	#5	STR	27'-0"	84	S14	36	#4	8	4'-3"	102
A222	3	#5	STR	25'-8"	80	U1	20	#4	5	13'-2"	176
A223	3	#5	STR	24'-4"	76	U2	40	#4	5	14'-4"	383
A224	3	#5	STR	23'-0"	72	U3	19	#4	5	12'-8"	161
A225	3	#5	STR	21'-8"	68	T1	4	#6	STR	22'-3"	134
A226	3	#5	STR	20'-5"	64						
A227	3	#5	STR	19'-2"	60						
A228	3	#5	STR	17'-10"	56						
A229	3	#5	STR	16'-7"	52						
A230	3	#5	STR	15'-3"	48						
A231	3	#5	STR	14'-0"	44						

BAR TYPES



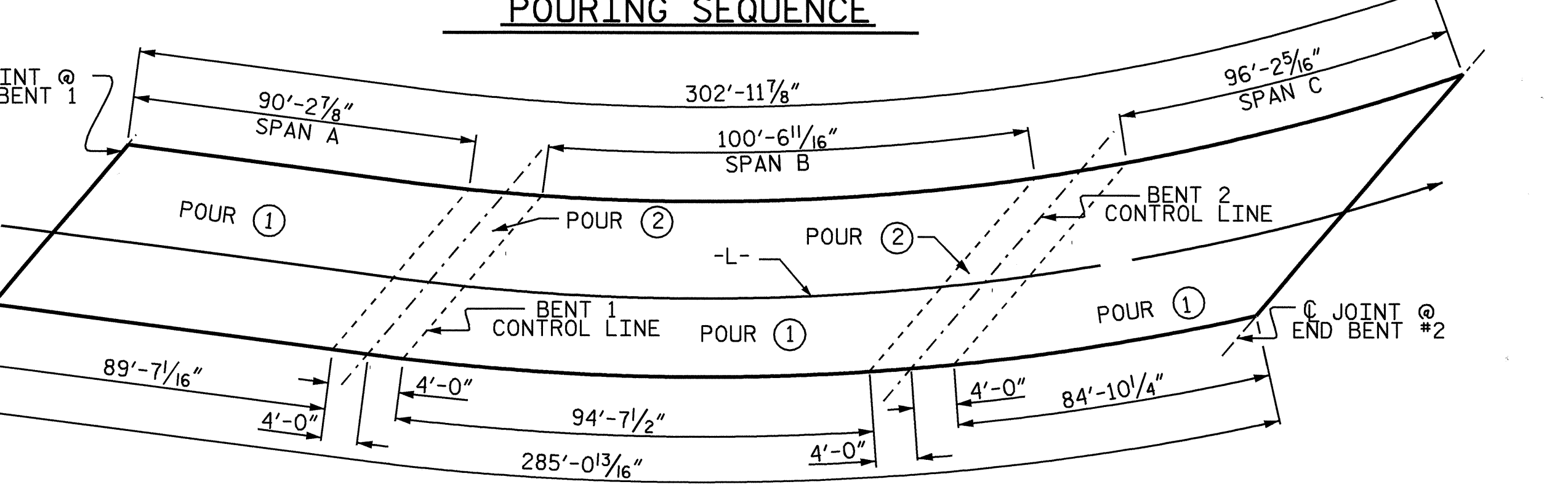
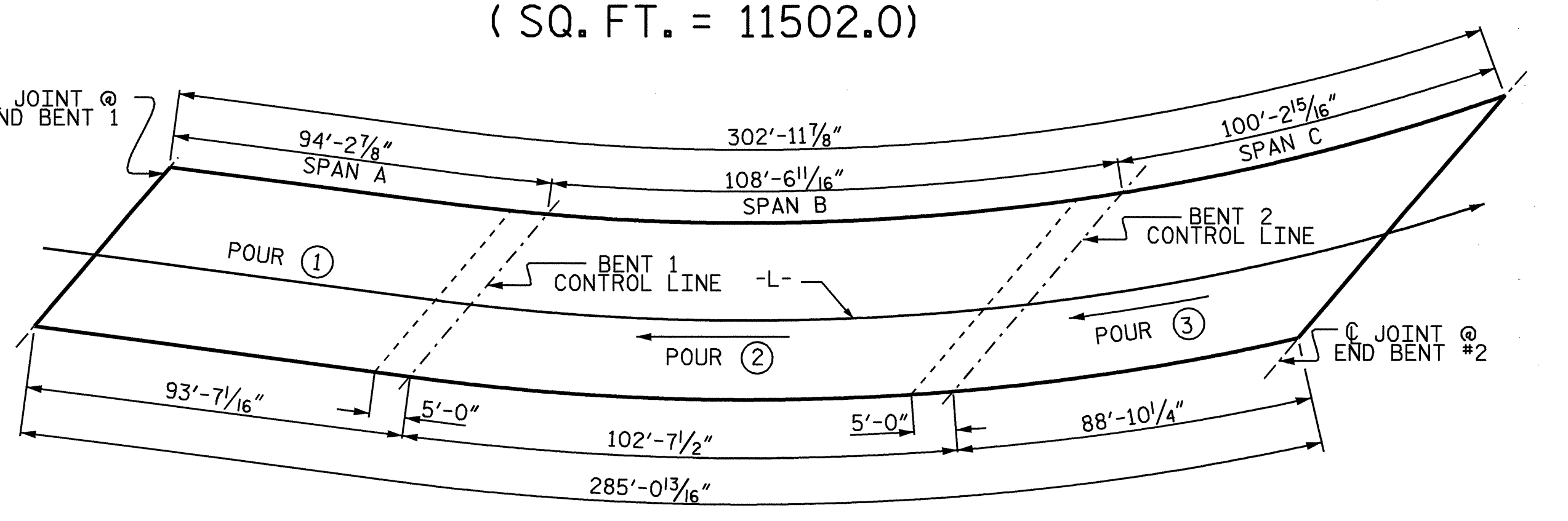
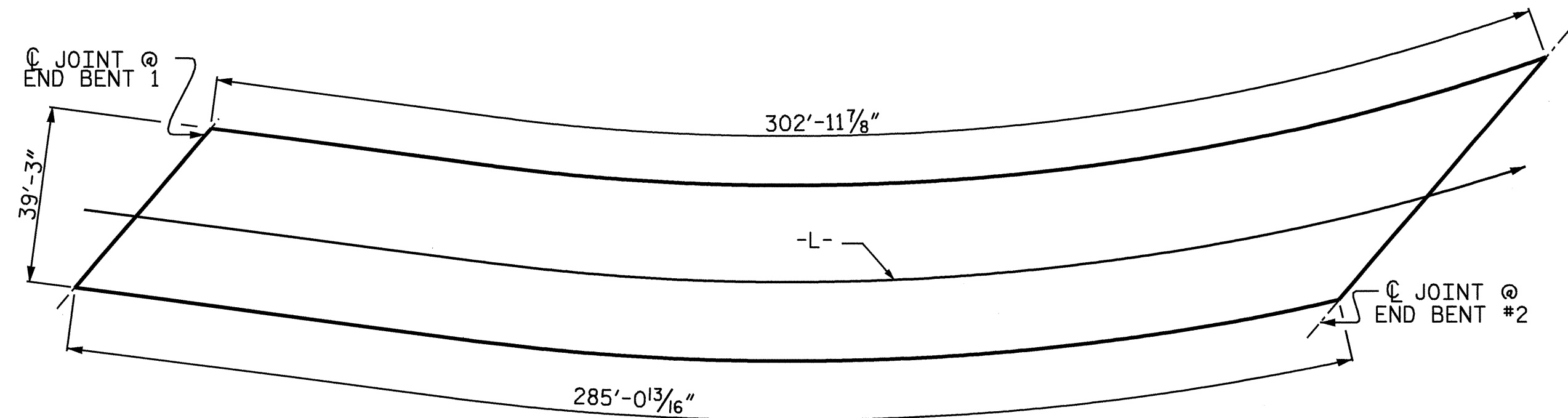
ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

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

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

TOTAL SHEETS: 40



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

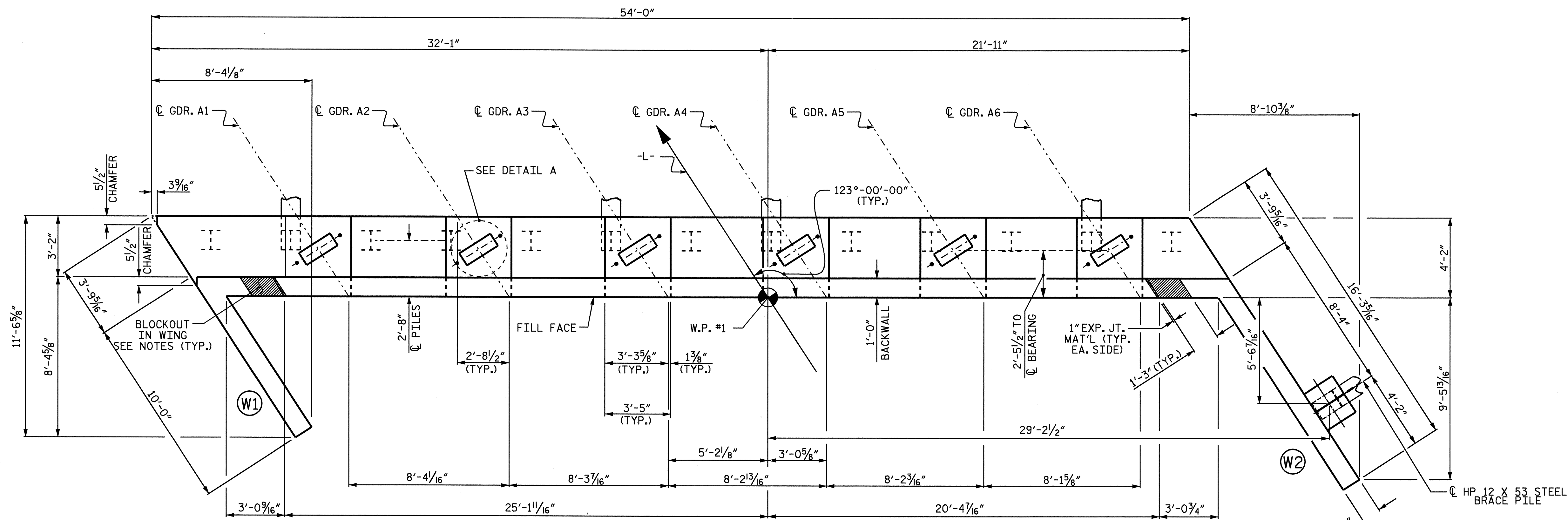
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	*EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	115.6	29253	32003
POUR 2	166.4		
POUR 3	163.8		
TOTALS**	445.8	29253	32003

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

	BRIDGE DECK	6724	SQ.FT.
	APPROACH SLAB	905	SQ.FT.
	TOTAL	7629	SQ.FT.

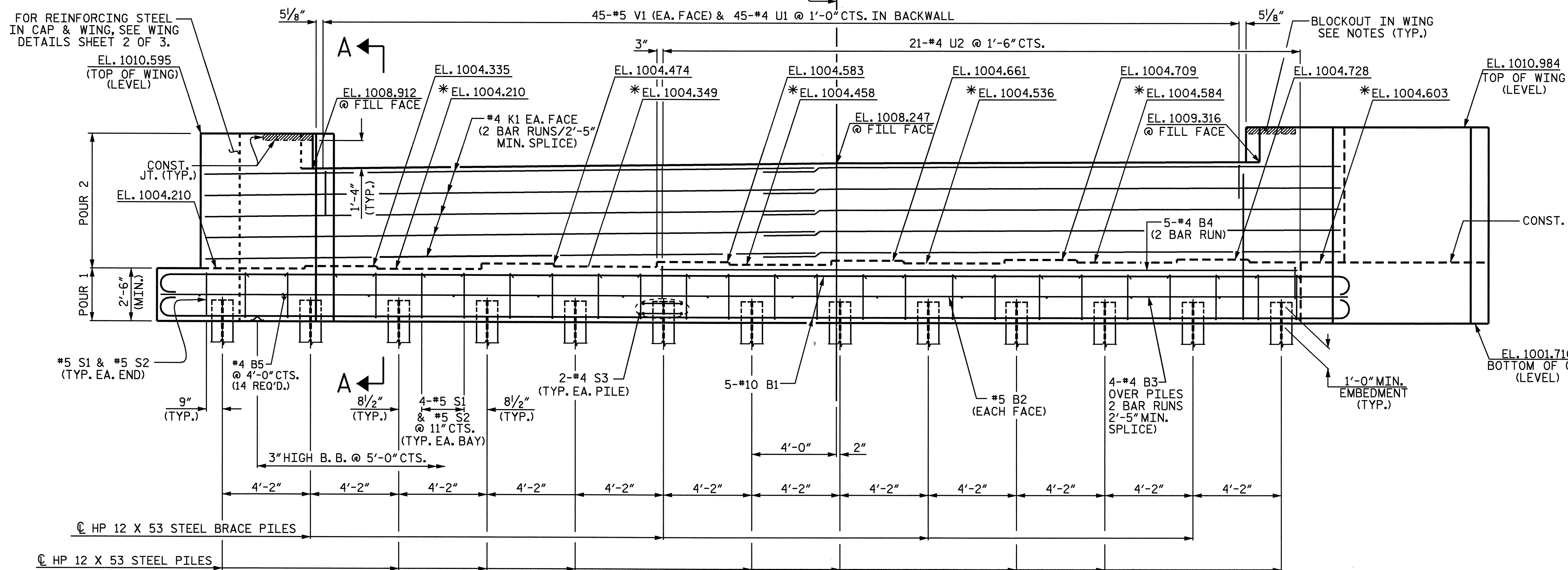
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

ASSEMBLED BY: J.G. KHARVA DATE: 7/16/7
 CHECKED BY: J.D. HAWK DATE: 7/11/08
 DRAWN BY: JMB 5/87 REV. 6/1/94 EEM/GRP
 CHECKED BY: SJD 9/87 REV. 8/16/99 RWW/LRS



PLAN

WORKLINE



ELEVATION

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS SEE SECTION A-A, SHEET 3 OF 3

NOTES:

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

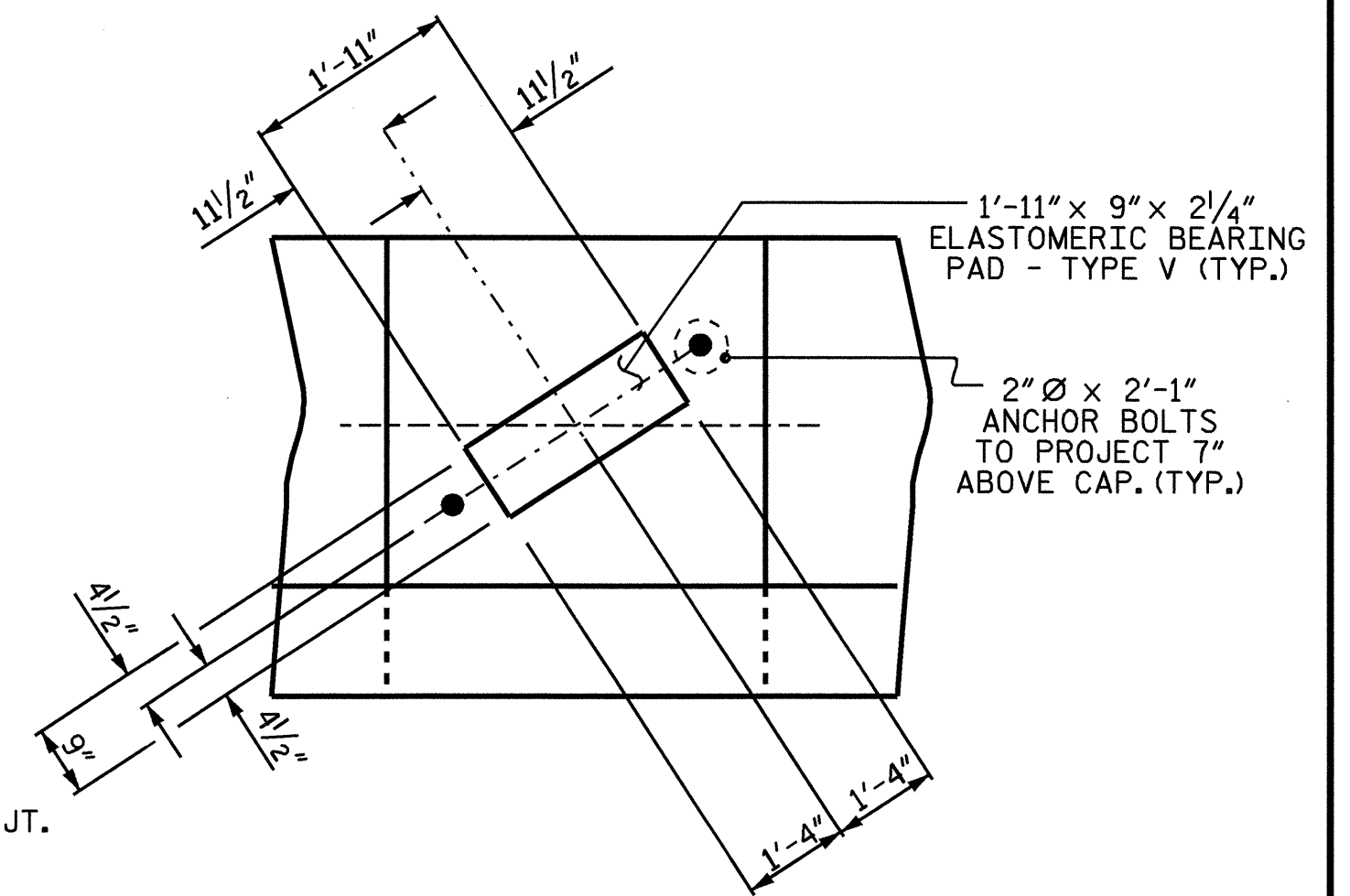
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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 IS CAST IF SLIP FORMING IS USED.



DETAIL A

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

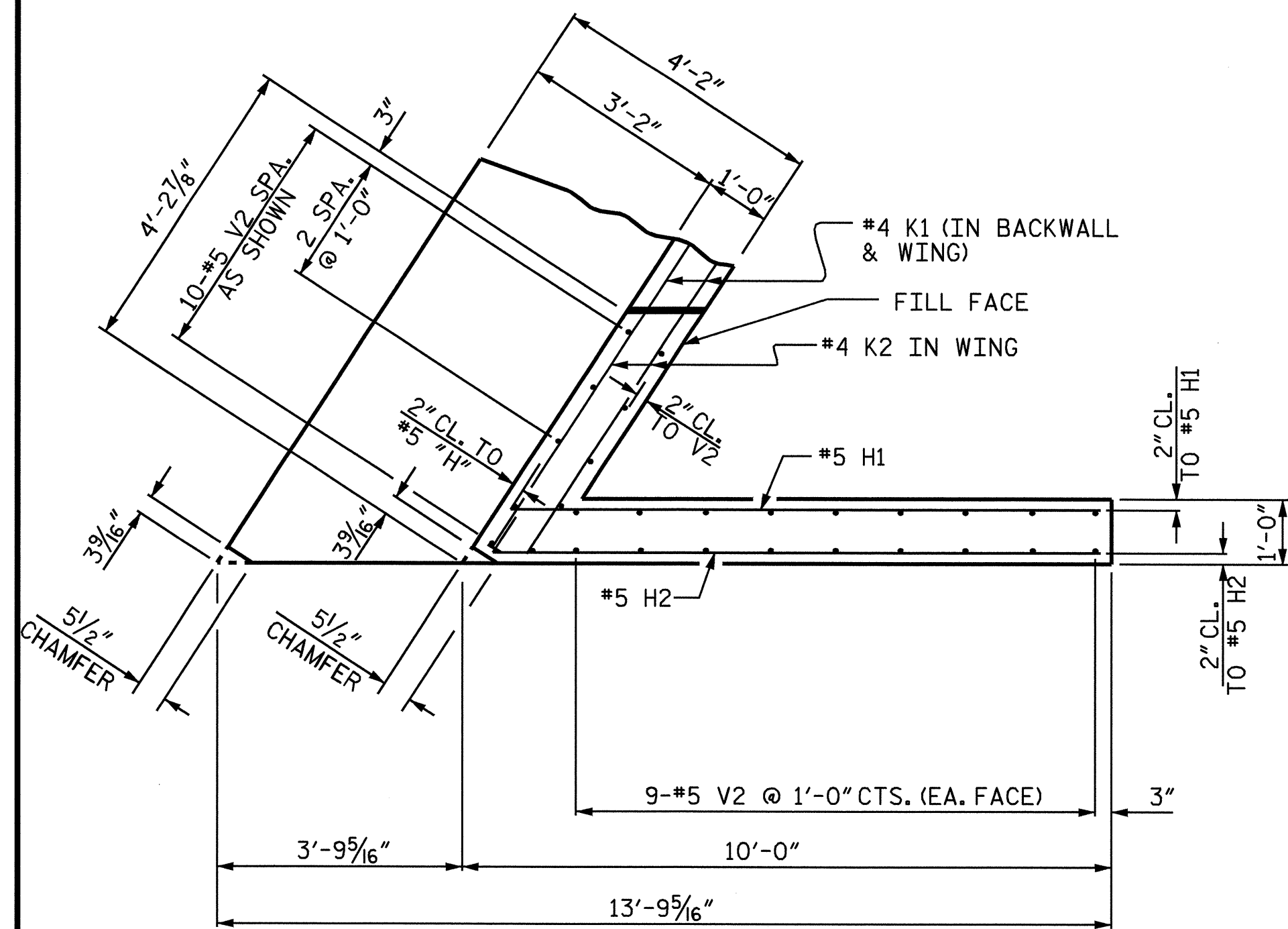
SUBSTRUCTURE
 END BENT 1



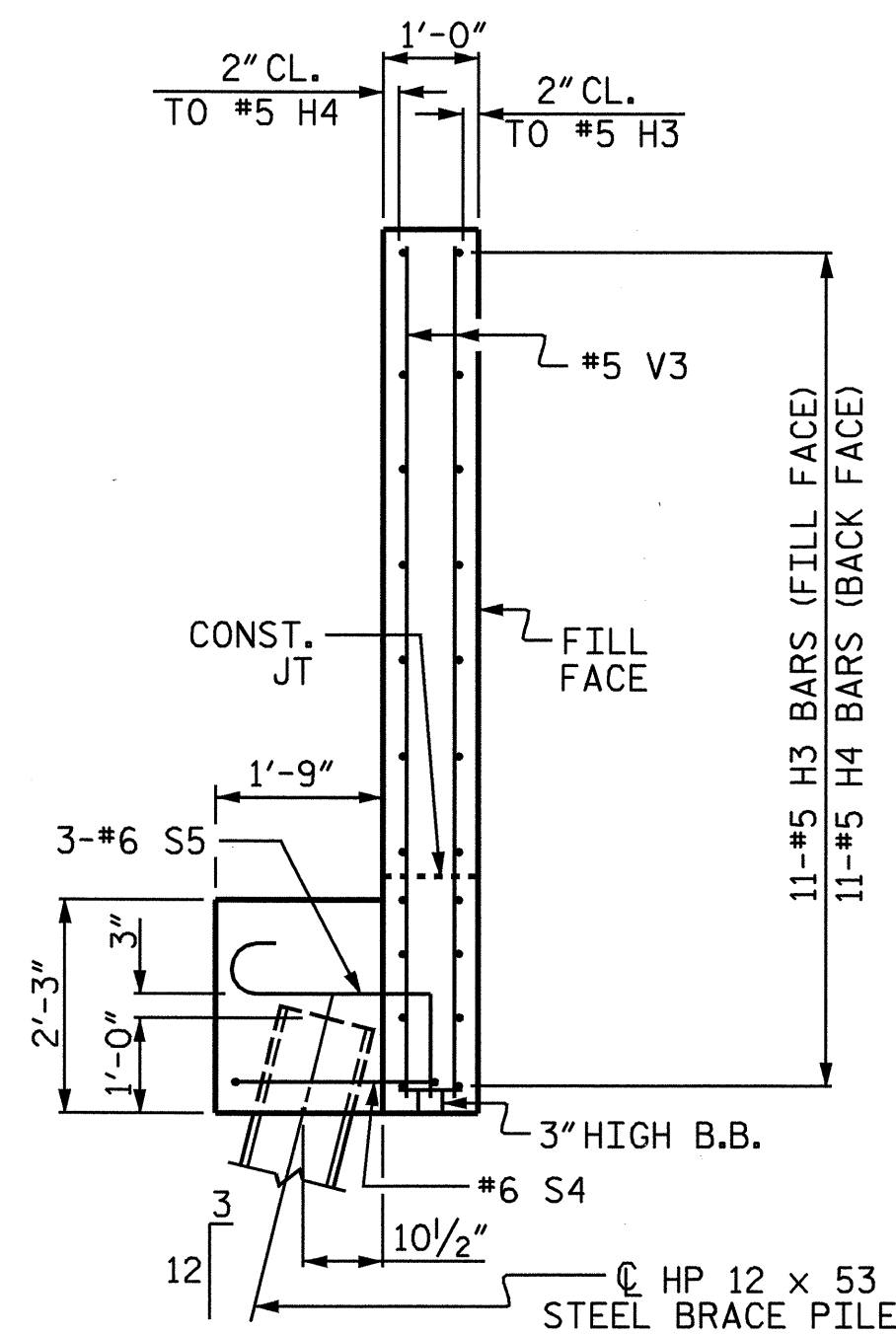
DRAWN BY: J. G. KHARVA DATE: 5/19/08
 CHECKED BY: J. MYA DATE: 7/18/08

05-AUG-2008 15:18
 T:\struc\12\B4258\1\B4258.ed_eb1&2.dgn
 jkharva

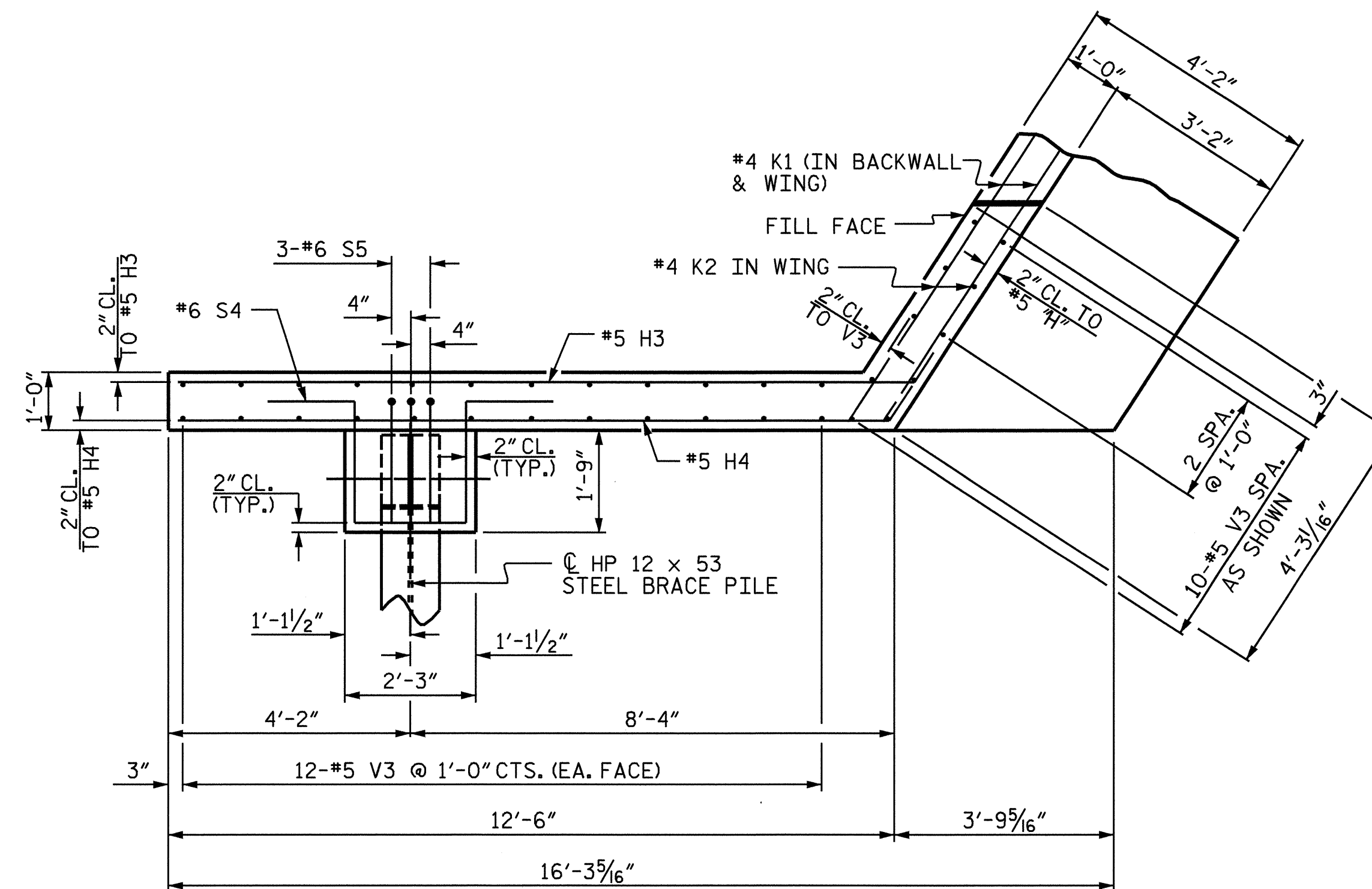
REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			



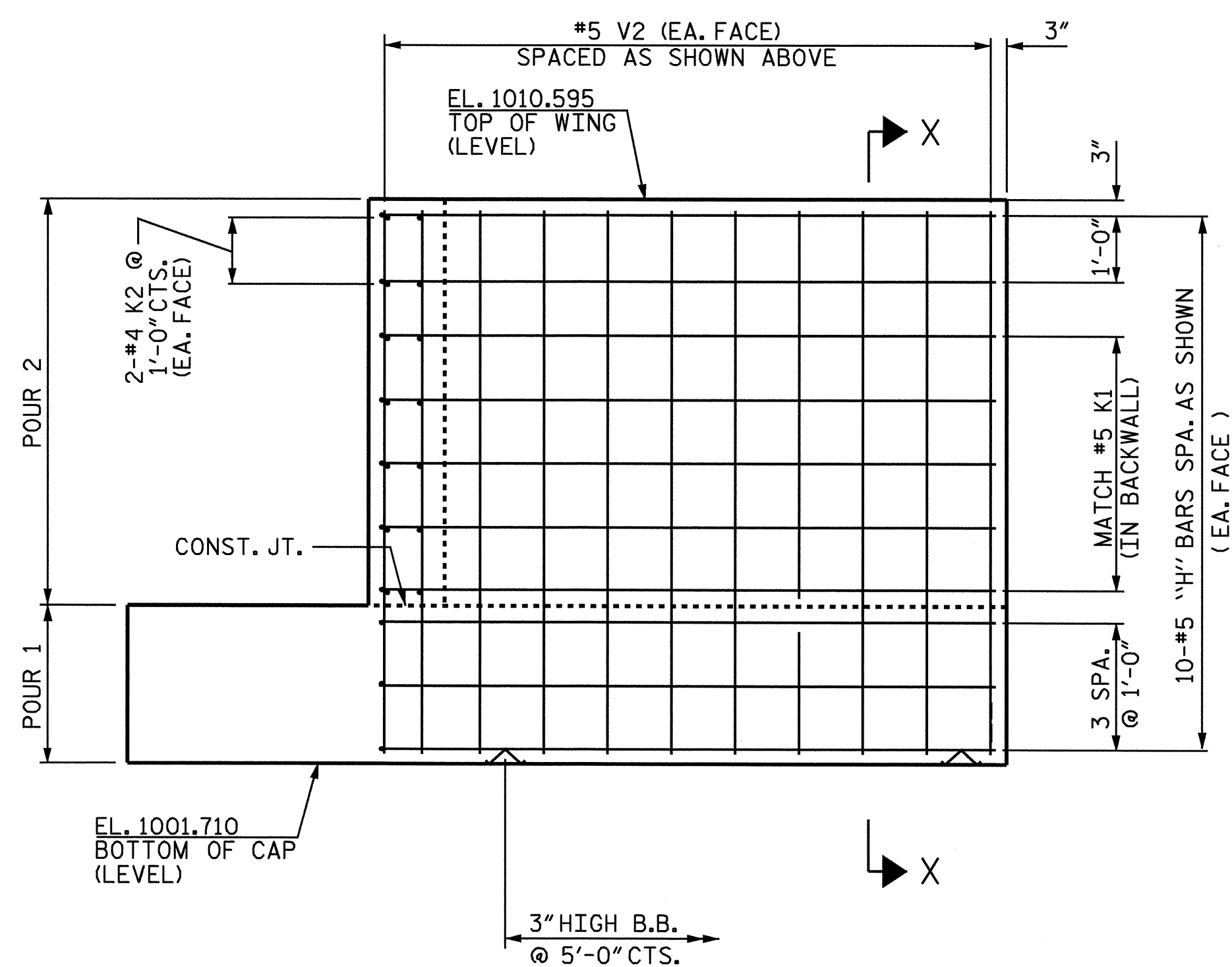
PLAN OF WING - W1



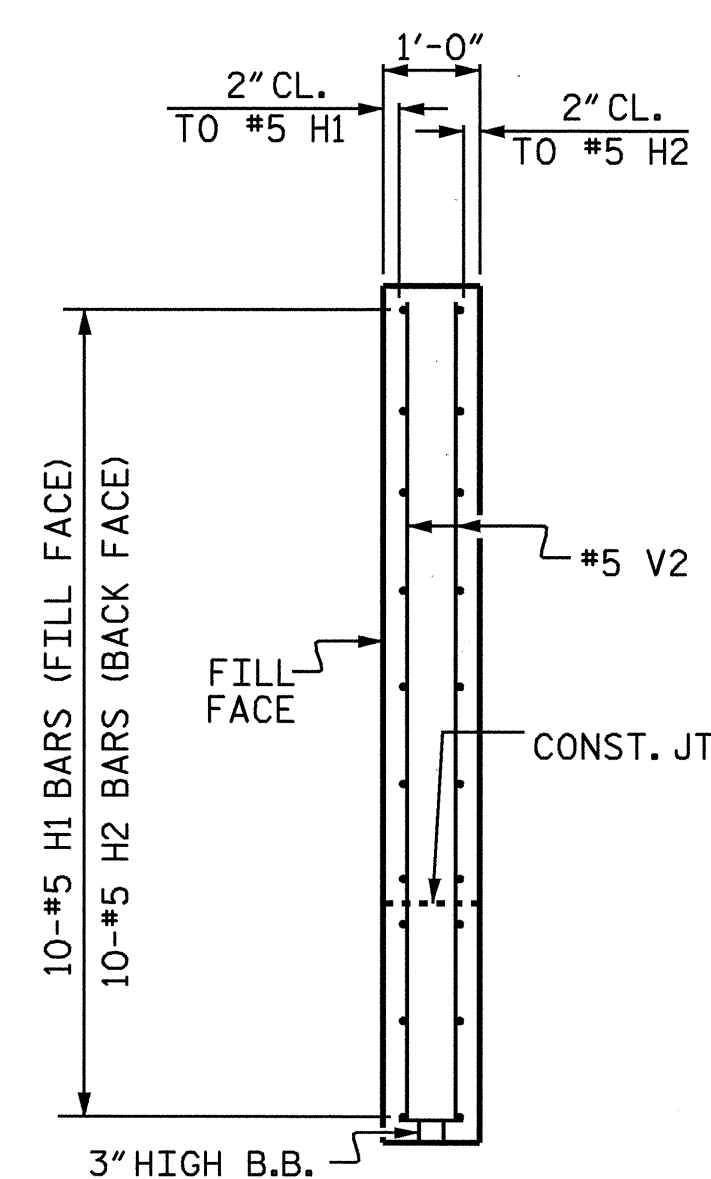
SECTION Y-Y



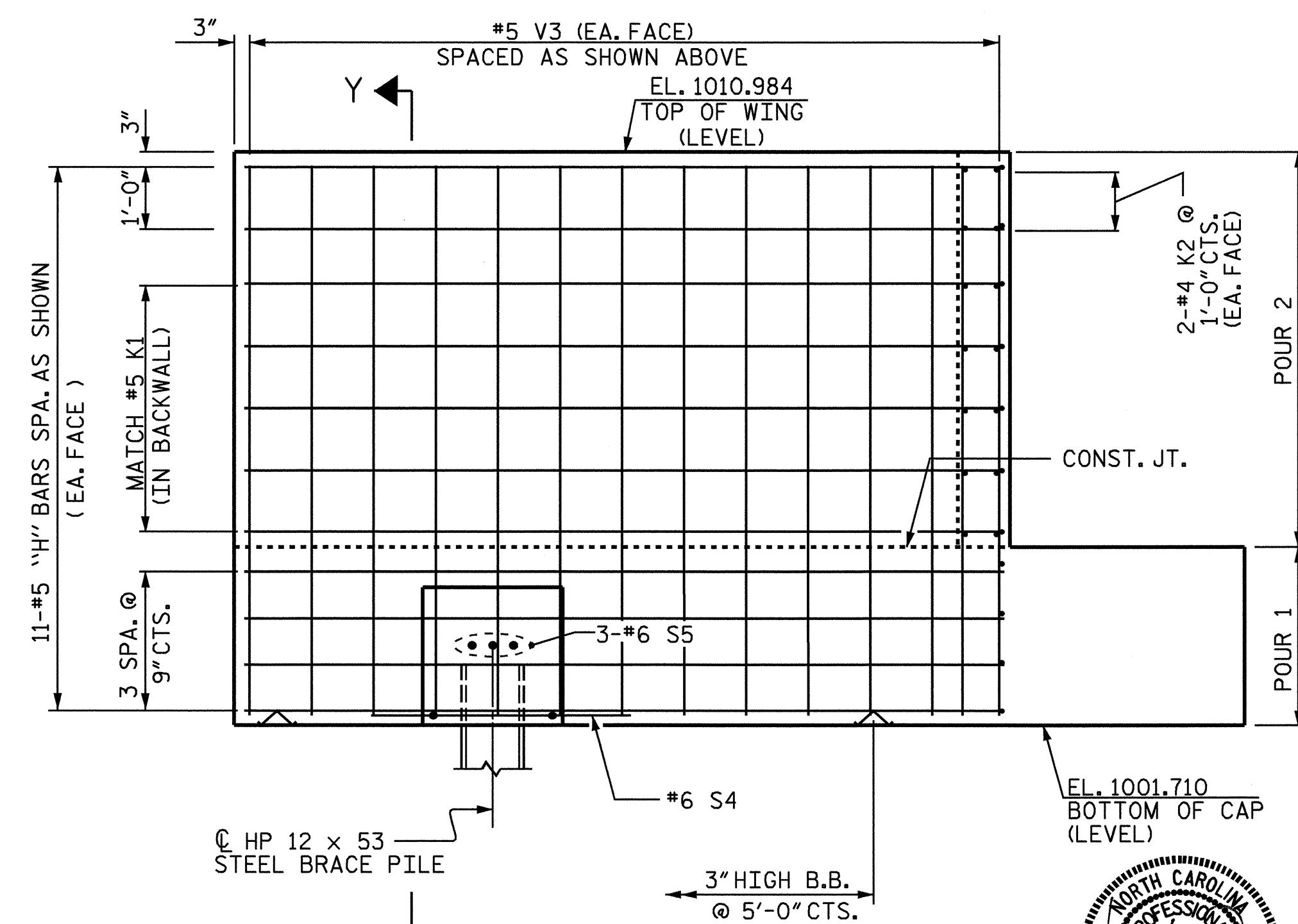
PLAN OF WING - W2



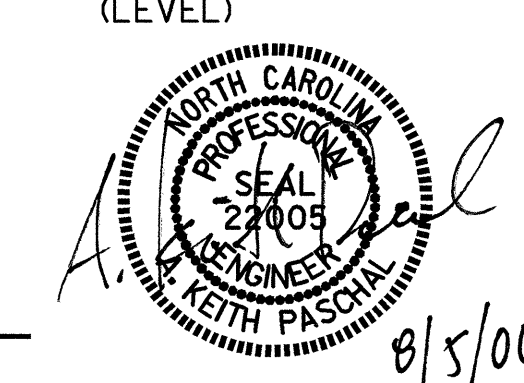
ELEVATION OF WING - W1



SECTION X-X



ELEVATION OF WING - W2

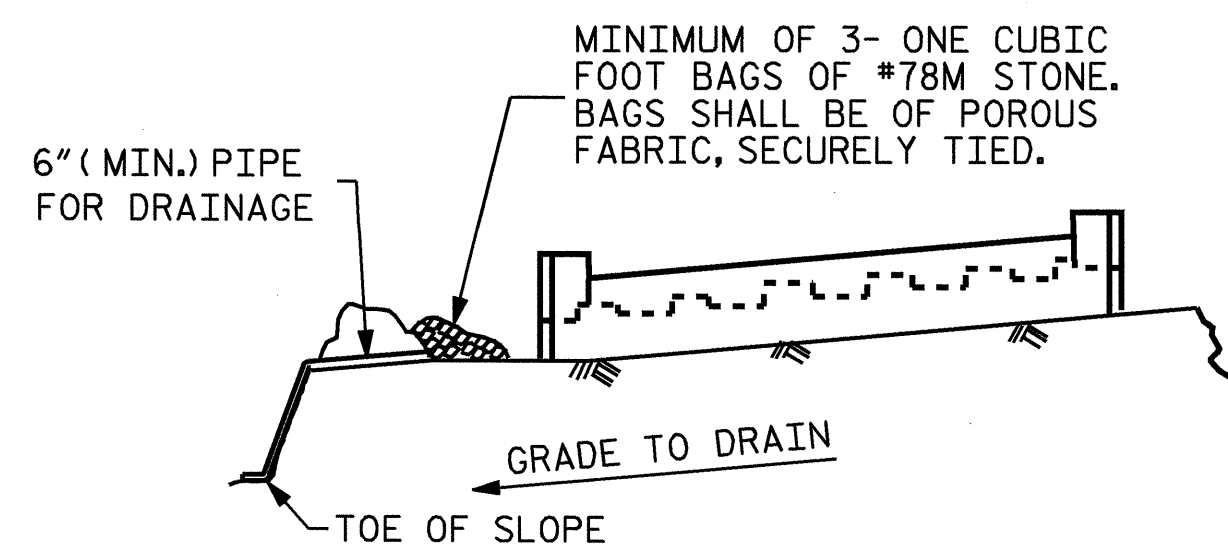


PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-28
					TOTAL SHEETS 40

DRAWN BY: J. G. KHARVA DATE: 5/19/08
 CHECKED BY: J. MYA DATE: 7/18/08

05-AUG-2008 15:18
 T:\STRUCT\B-4258\FINAL\B-4258.sd_eb1&2.dgn
 jkharva

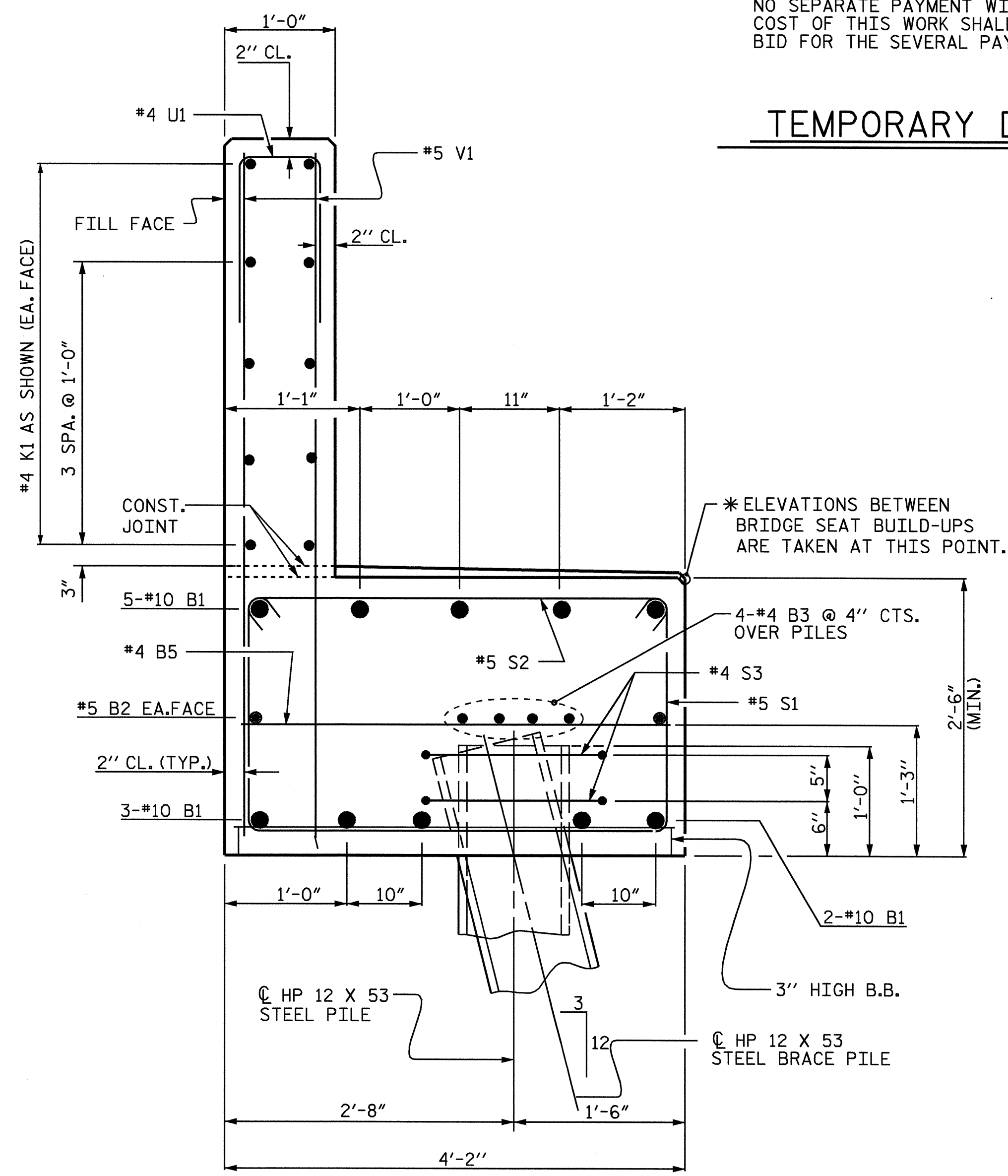


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

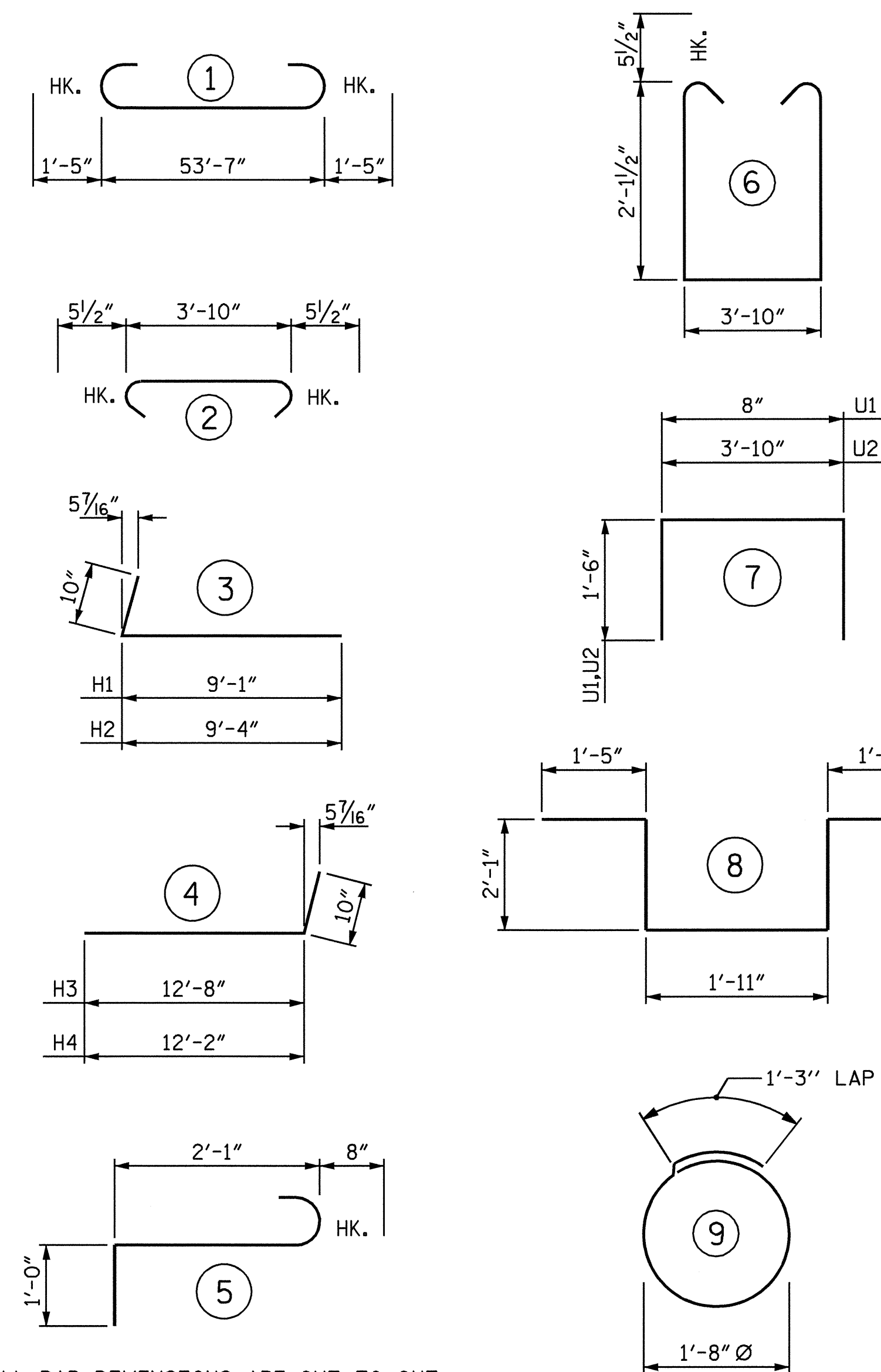
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

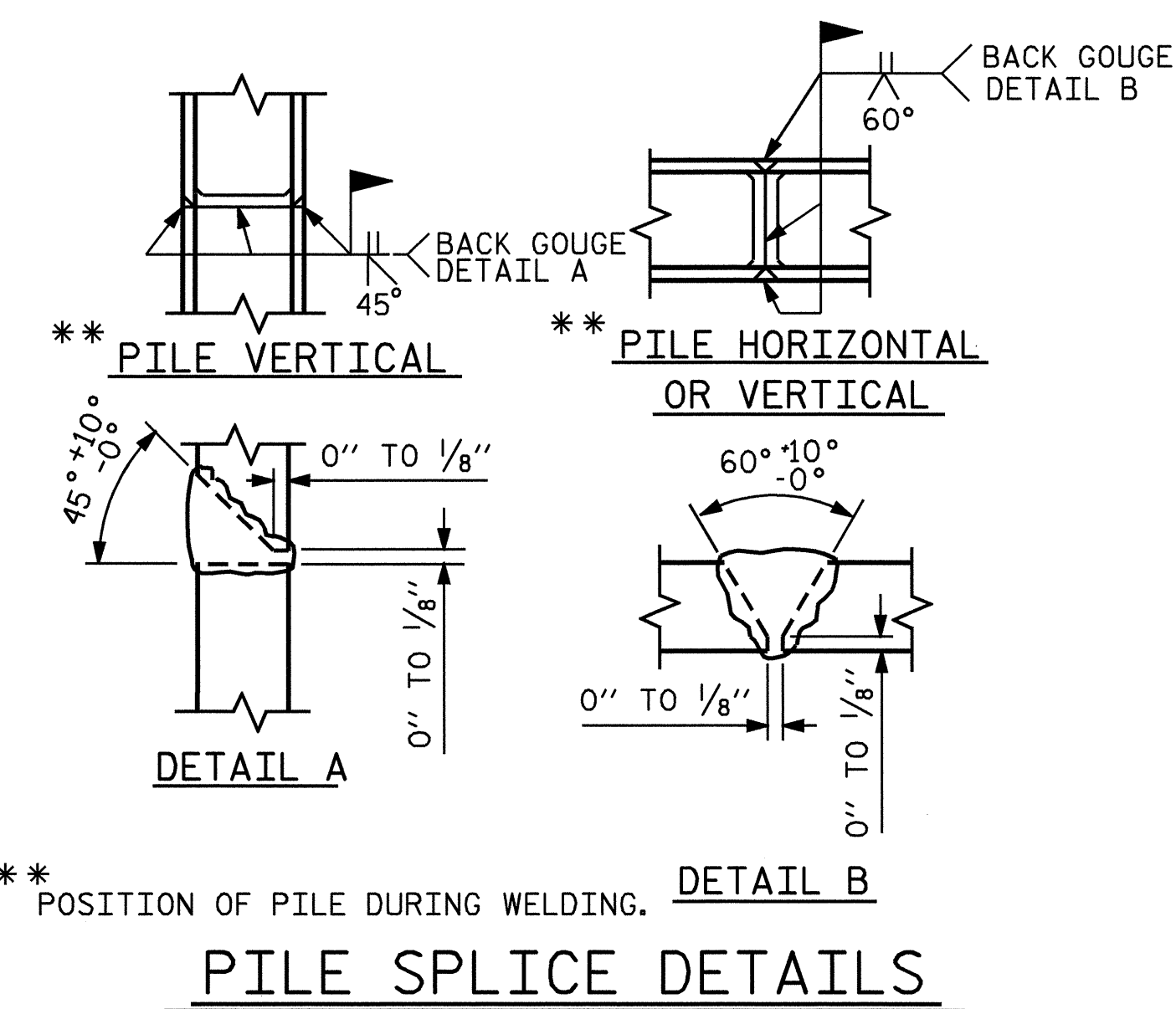
BILL OF MATERIAL

END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	56'-5"	2428
B2	2	#5	STR	53'-8"	112
B3	8	#4	STR	28'-1"	150
B4	5	#4	STR	30'-0"	100
B5	14	#4	STR	3'-10"	36
H1	10	#5	3	9'-11"	103
H2	10	#5	3	10'-2"	106
H3	11	#5	4	13'-6"	155
H4	11	#5	4	13'-0"	149
K1	10	#4	STR	28'-1"	188
K2	8	#4	STR	3'-10"	20
S1	50	#5	6	9'-0"	469
S2	50	#5	2	4'-9"	248
S3	26	#4	9	6'-6"	113
S4	1	#6	8	8'-11"	13
S5	3	#6	5	3'-9"	17
U1	45	#4	7	3'-8"	110
U2	21	#4	7	6'-10"	96
V1	90	#5	STR	6'-10"	641
V2	28	#5	STR	8'-6"	248
V3	34	#5	STR	8'-11"	316

REINFORCING STEEL		5818 LBS.
CLASS A CONCRETE (CU. YDS.)		
POUR 1		
CAP & LOWER PART OF WING		25.9
POUR 2		
BACKWALL & UPPER PART OF WING		14.5
TOTAL		40.4

HP 12 x 53 STEEL PILES		
No. 14	280 LIN. FT.	

STEEL PILE POINTS	NO.	14
-------------------	-----	----

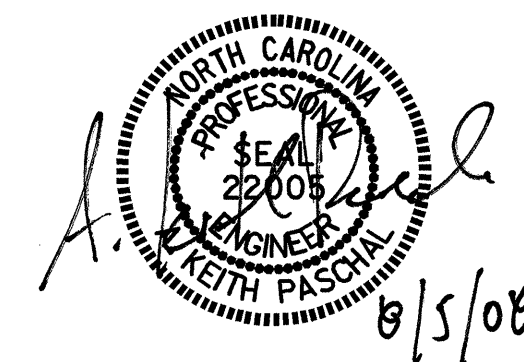


PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 3

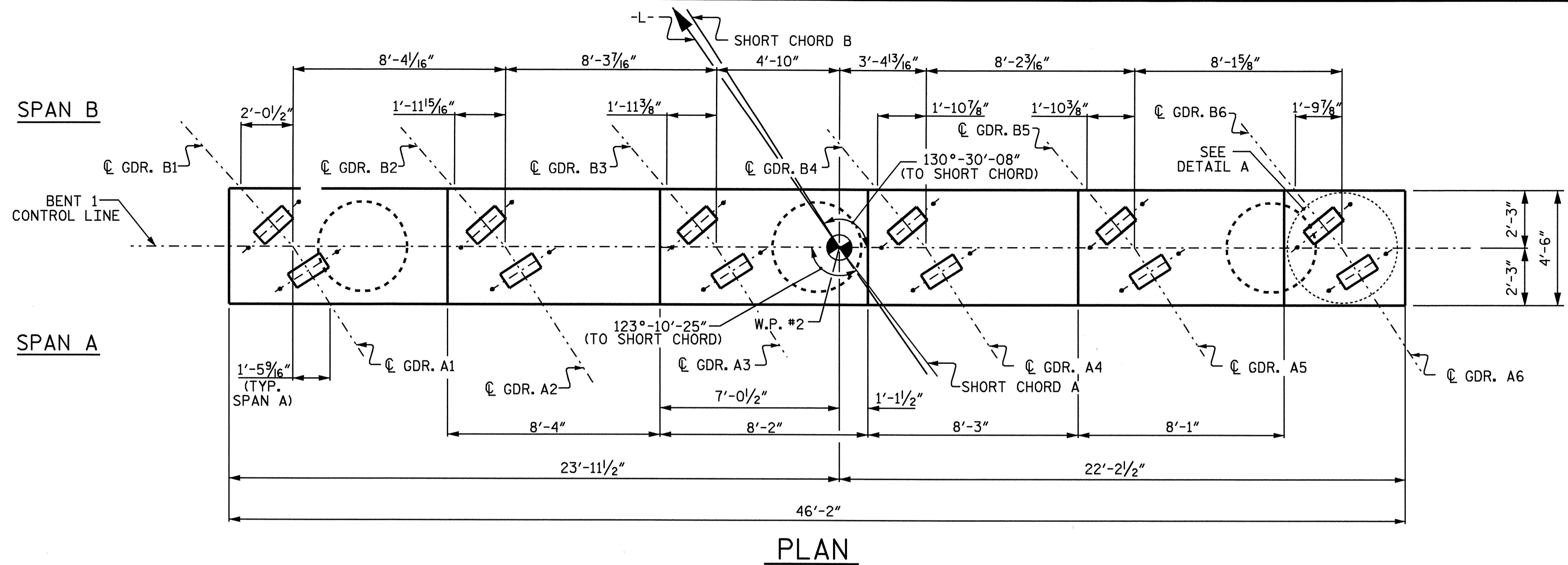
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1



DRAWN BY: J. G. KHARVA DATE: 5/19/08
 CHECKED BY: J. MYA DATE: 7/18/08

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



NOTES

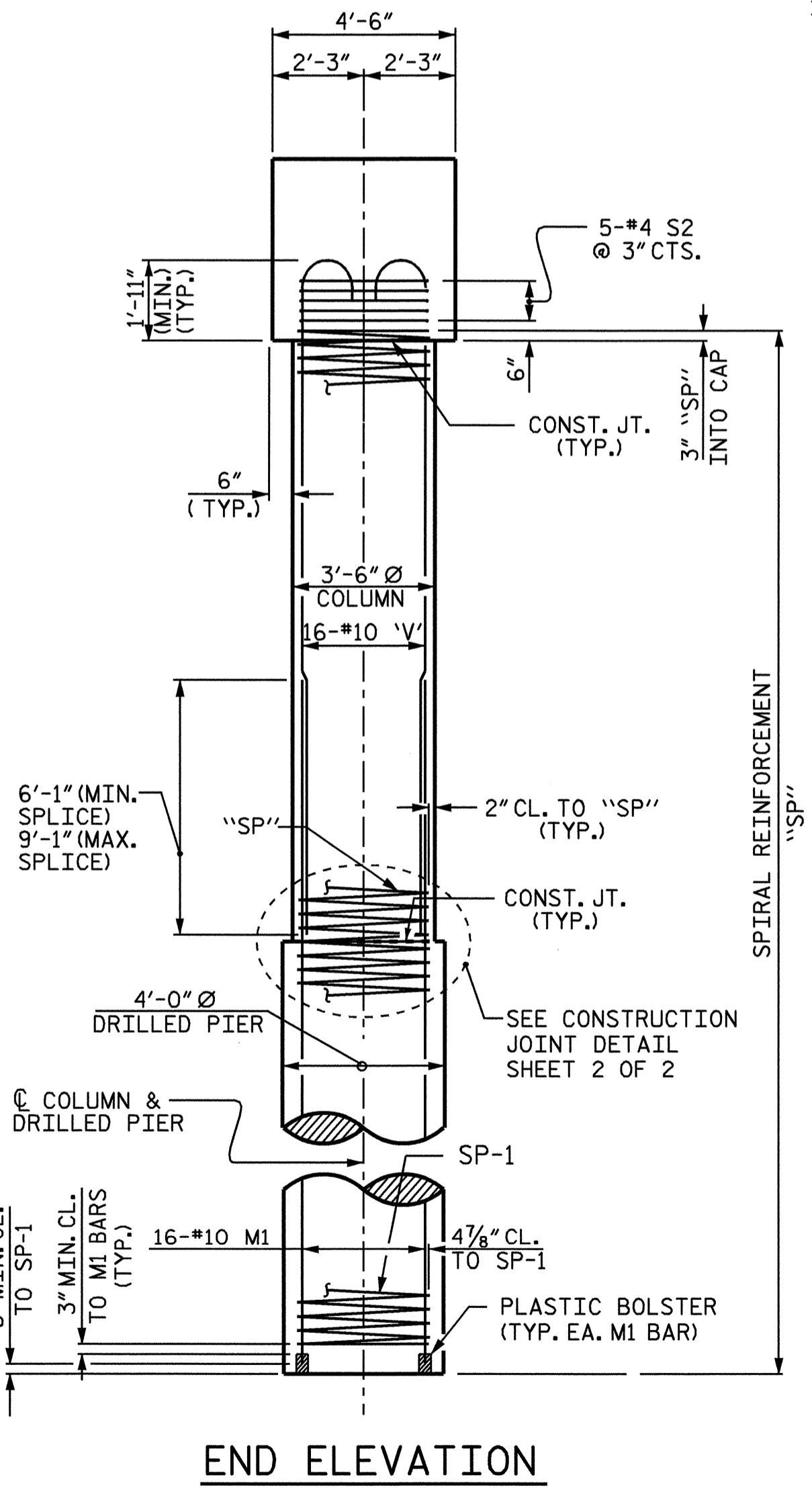
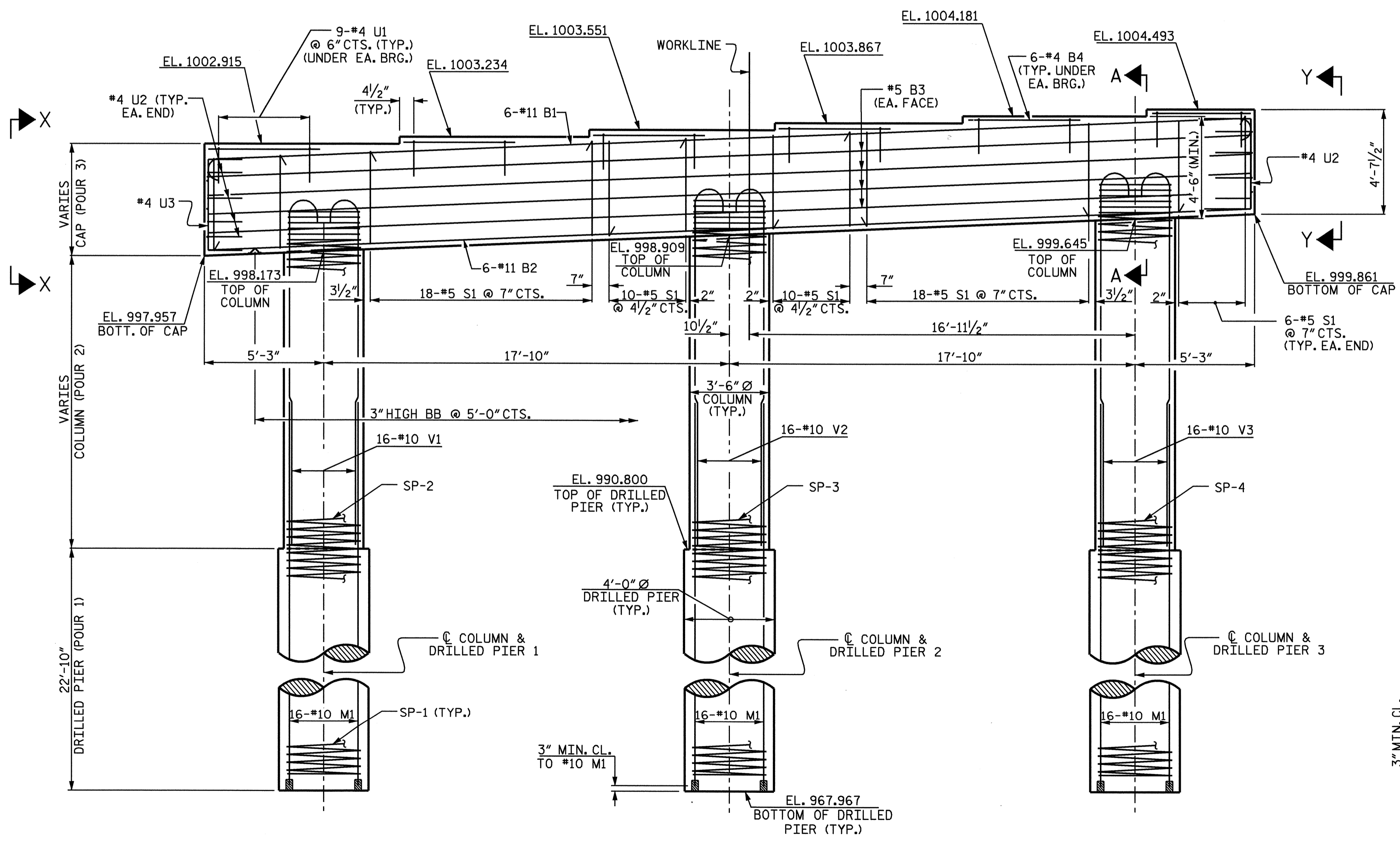
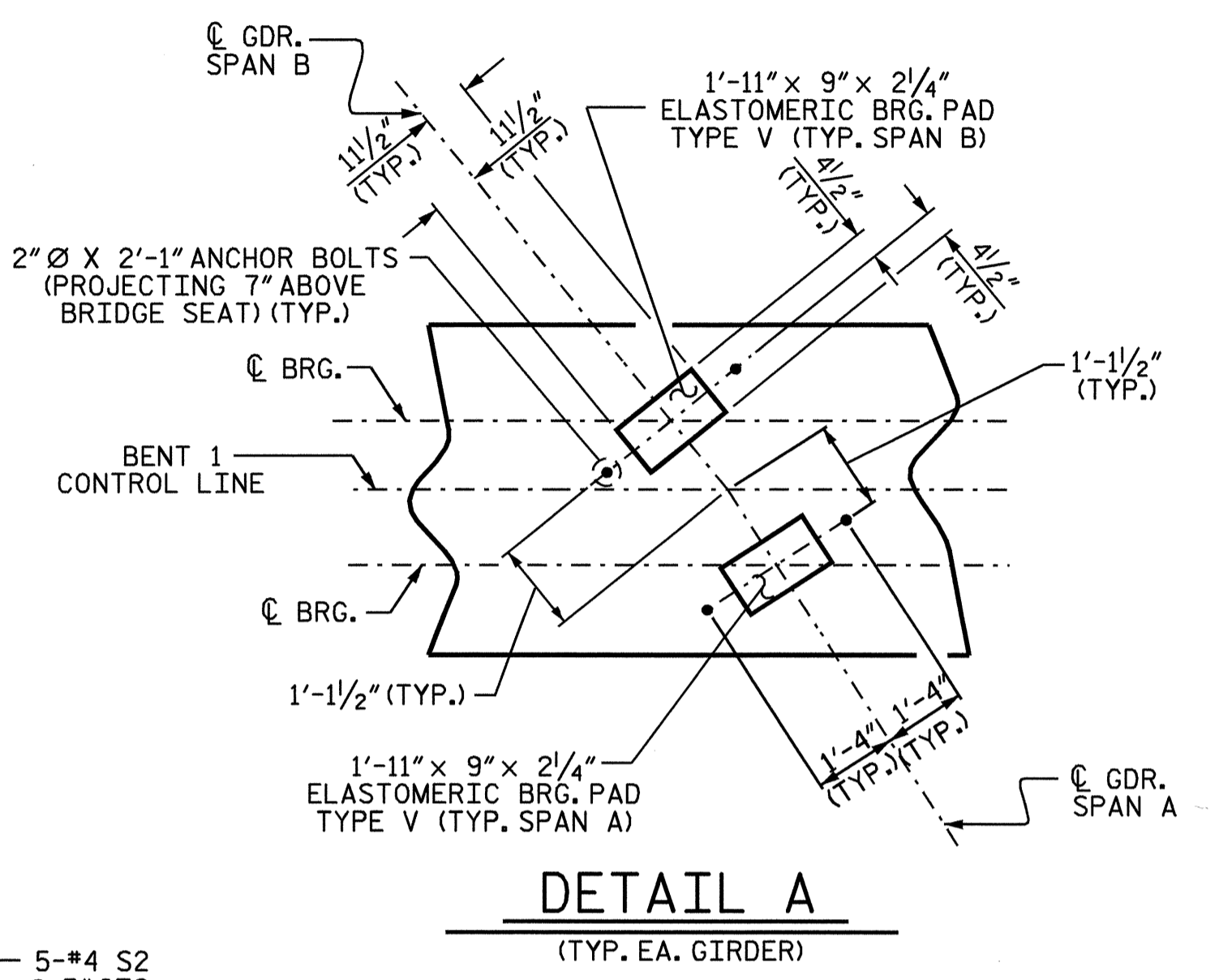
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

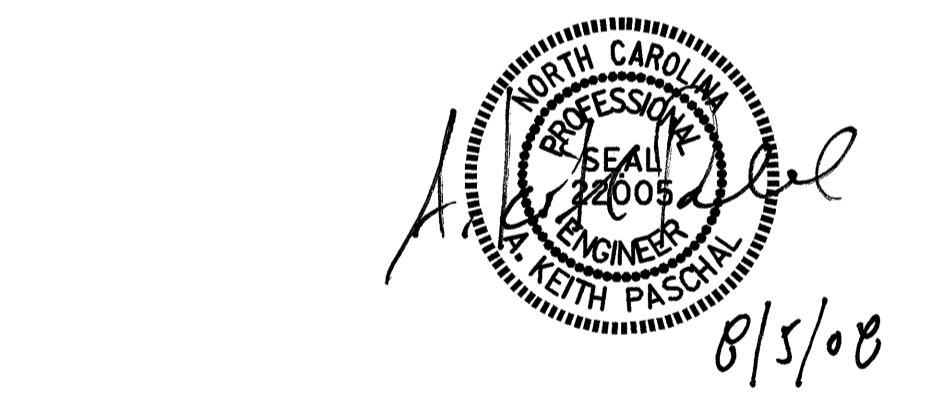
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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

NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



NOTE: INVERT ALTERNATE STIRRUPS



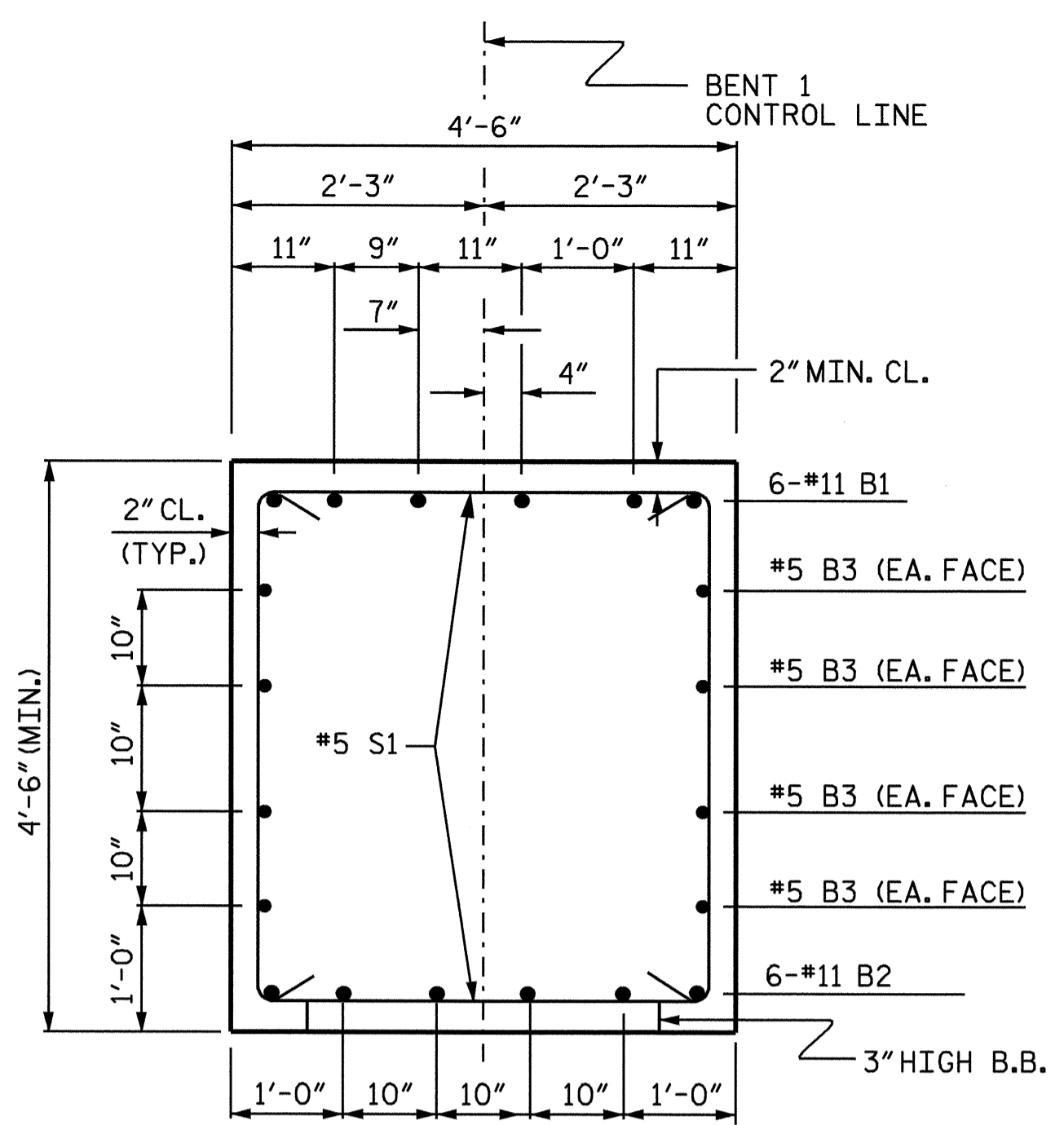
PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-30 TOTAL SHEETS 40
SUBSTRUCTURE BENT 1						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

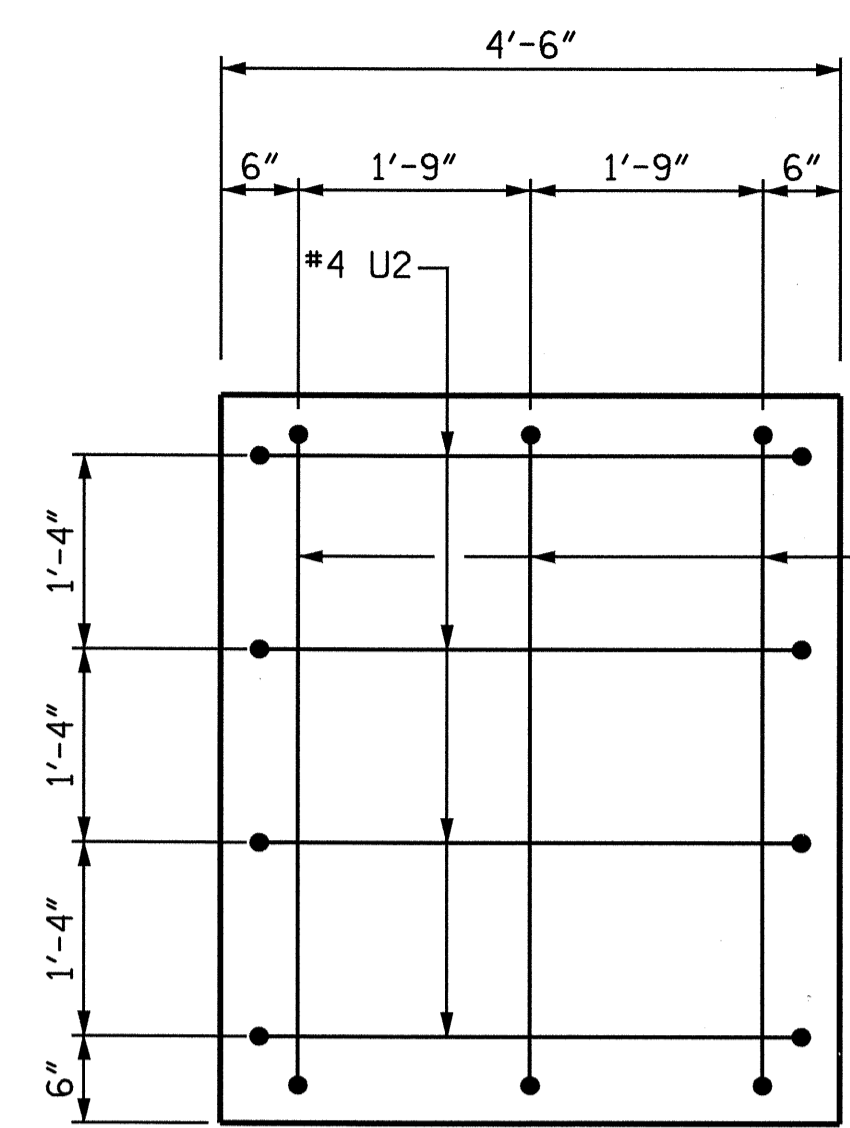
DRAWN BY: J. G. KHARVA DATE: 5/22/08
 CHECKED BY: J. MYA DATE: 7/17/08

05-AUG-2008 15:19
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 Jkharva

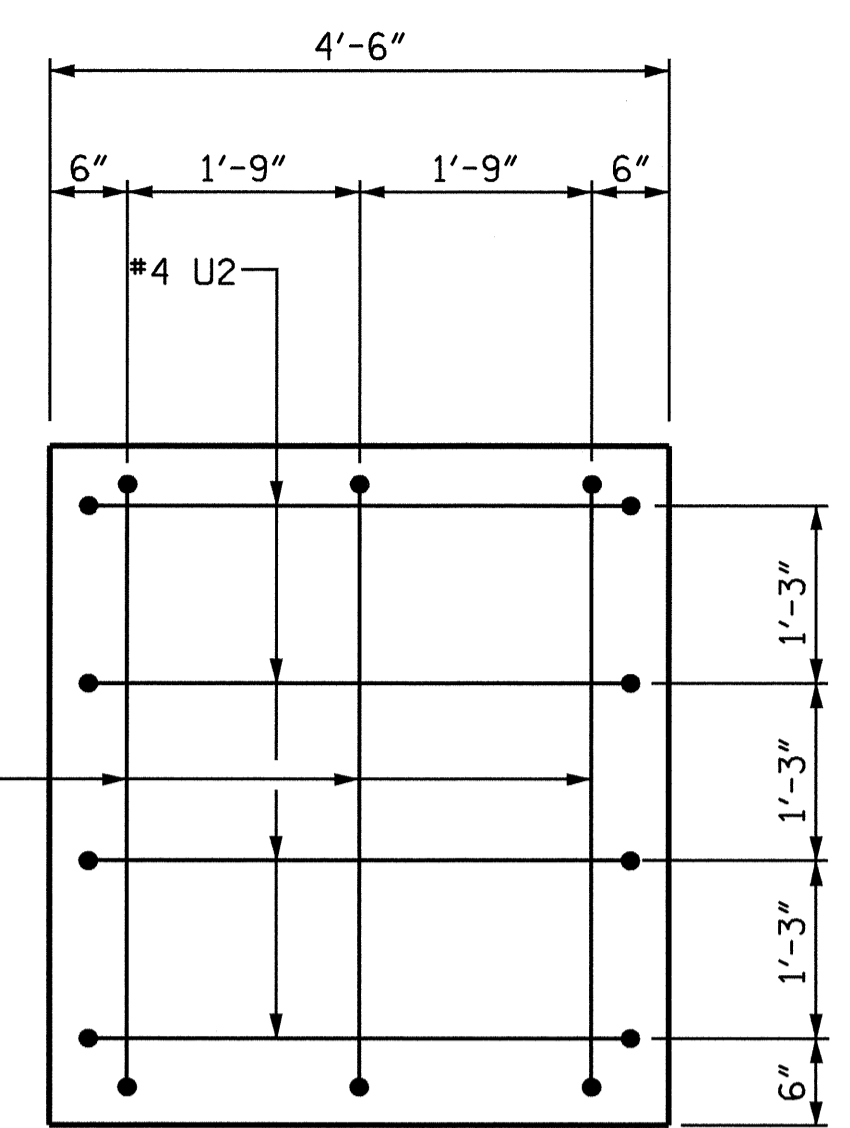
NC006



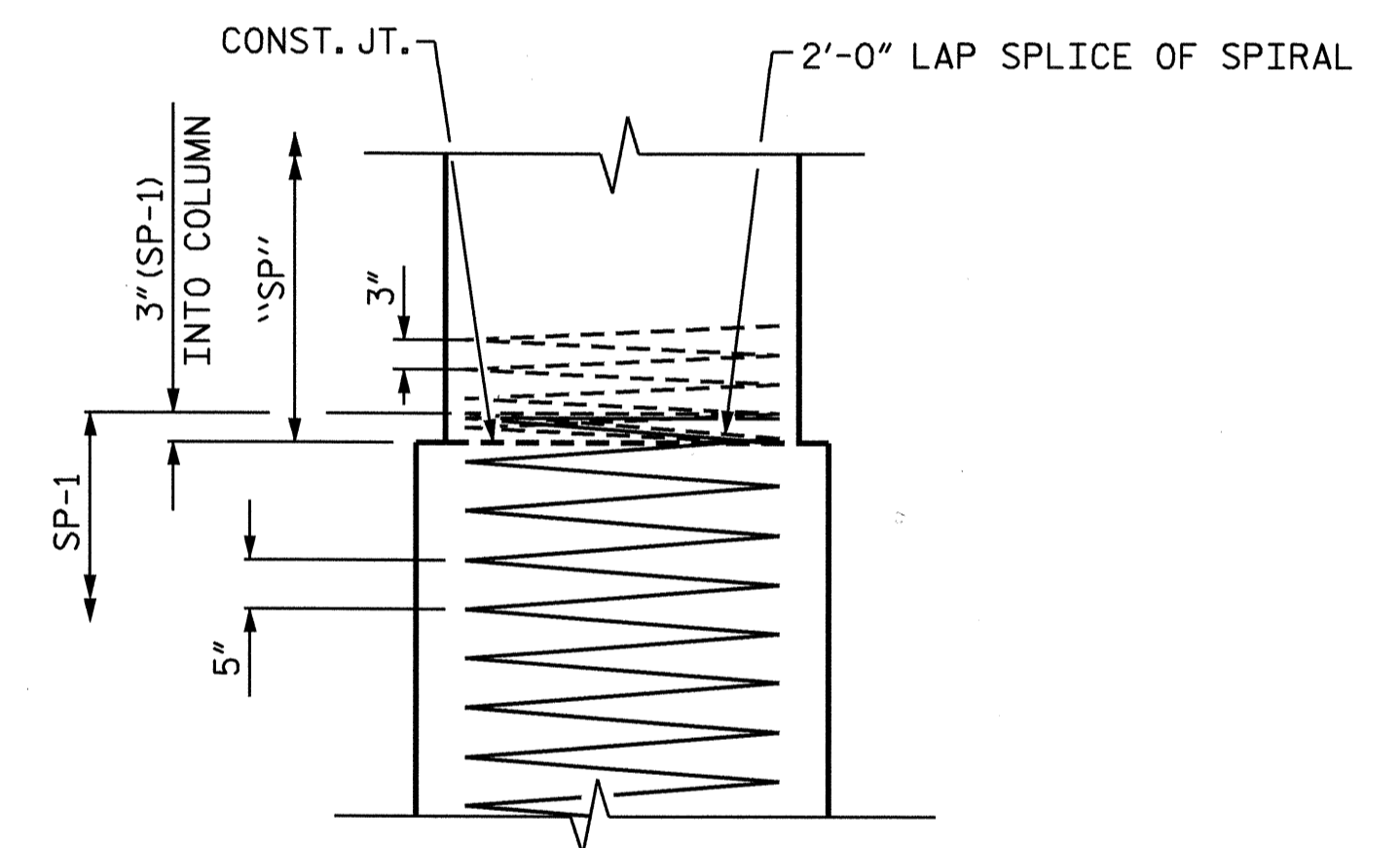
SECTION A-A



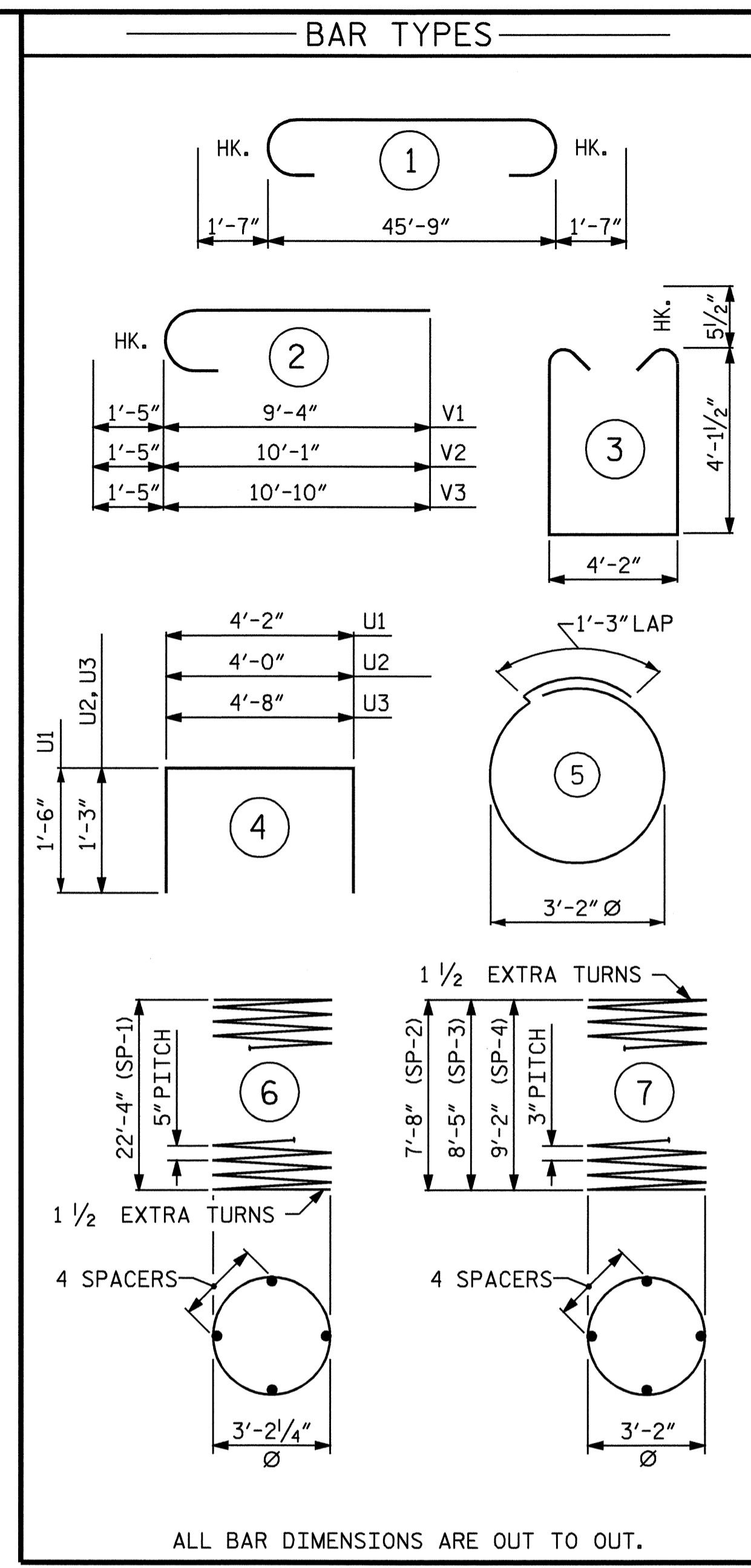
VIEW X-X



VIEW Y-Y



CONSTRUCTION JOINT DETAIL



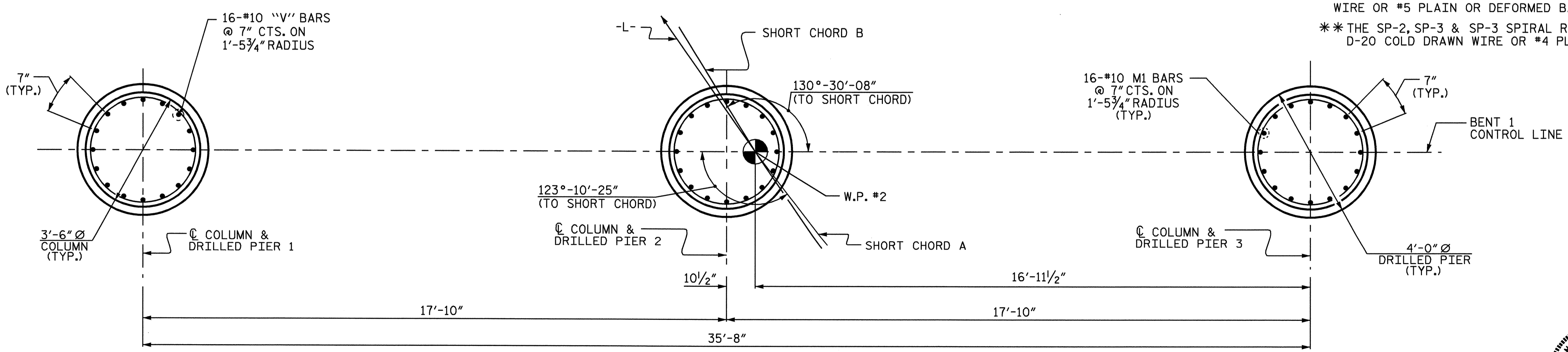
ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11		48'-11"	1559
B2	6	#11	STR	45'-10"	1461
B3	8	#5	STR	45'-10"	382
B4	36	#4	STR	4'-11"	106
M1	48	#10	STR	31'-8"	6541
S1	68	#5		13'-4"	946
S2	15	#4		11'-3"	113
U1	54	#4		7'-2"	259
U2	11	#4		6'-6"	48
U3	3	#4		7'-2"	14
V1	16	#10		10'-9"	740
V2	16	#10		11'-6"	792
V3	16	#10		12'-3"	843
SP-1	3	*	6	543'-3"	1700
SP-2	1	**	7	315'-11"	211
SP-3	1	**	7	345'-5"	231
SP-4	1	**	7	374'-10"	250
REINFORCING STEEL					= 13804 LBS
SPIRAL COLUMN REINFORCING STEEL					= 2392 LBS.
CLASS A CONCRETE :					
POUR #2 (COLUMNS)					8.7 C.Y.
POUR #3 (CAP)					36.4 C.Y.
TOTAL					45.1 C.Y.

DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 DRILLED PIERS :	31.9 C.Y.
4'-0" Ø DRILLED PIERS IN SOIL	26.5 LIN. FT.
4'-0" Ø DRILLED PIERS NOT IN SOIL	42.0 LIN. FT.
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER : 50.4 LIN. FT.	
CROSSHOLE SONIC LOGGING	1 EACH
CSL TUBES ▲	304.0 FT.

▲ SEE NOTES



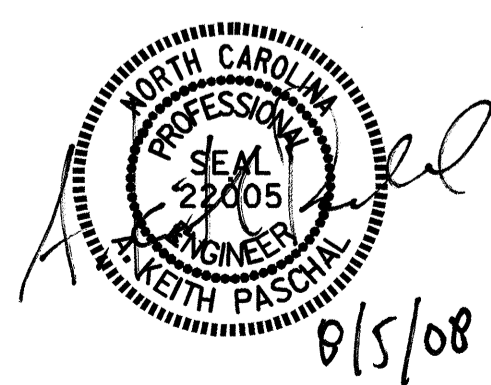
PLAN OF COLUMNS AND DRILLED PIERS

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 2 OF 2

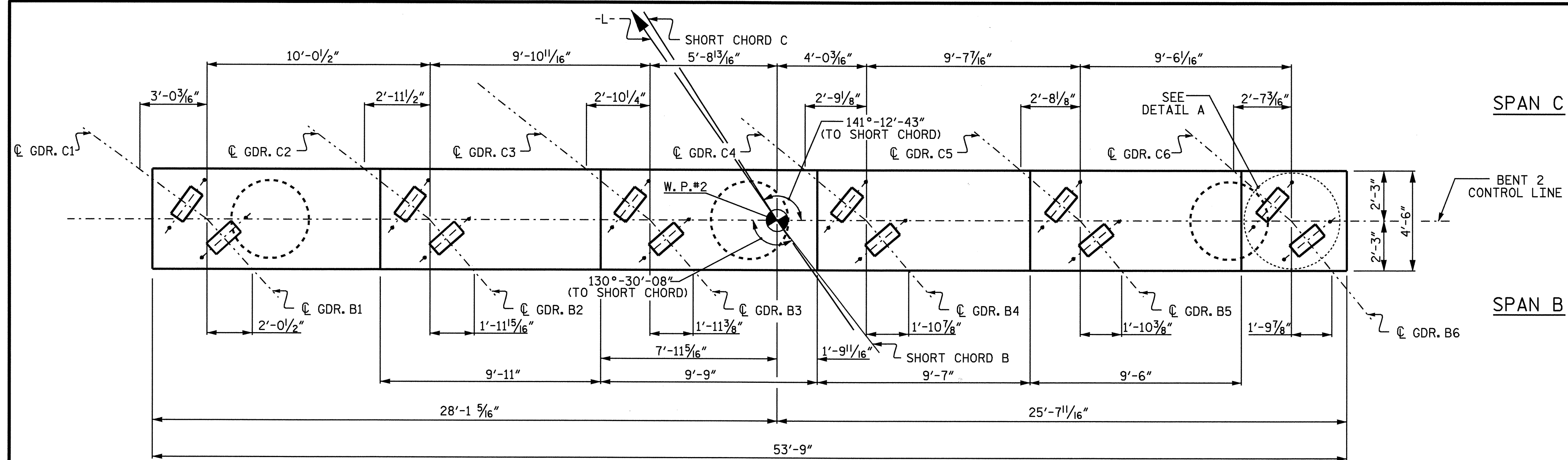
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 1

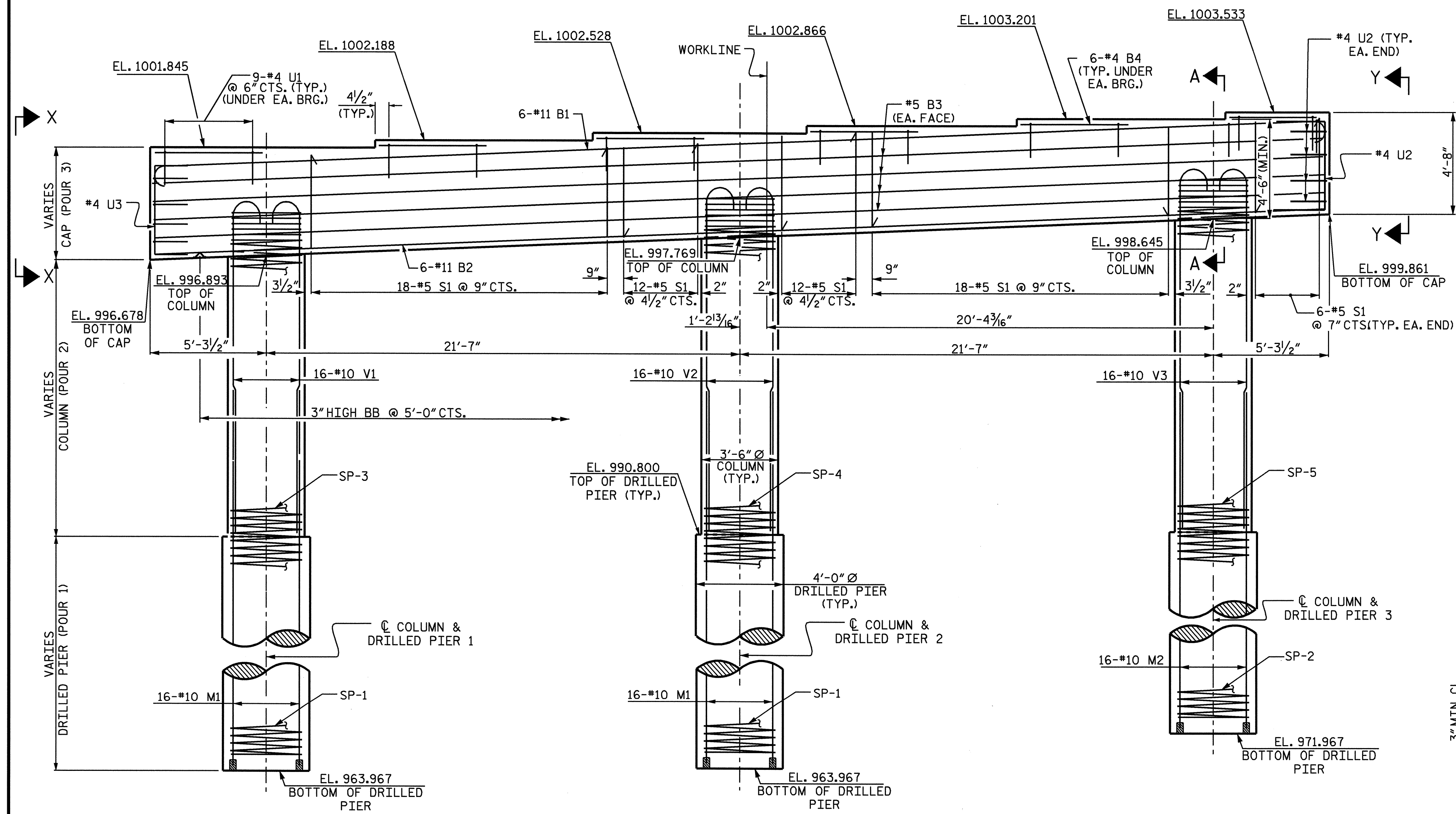


DRAWN BY : J. G. KHARVA DATE : 5/23/08
 CHECKED BY : J. MYA DATE : 7/17/08

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



PLAN



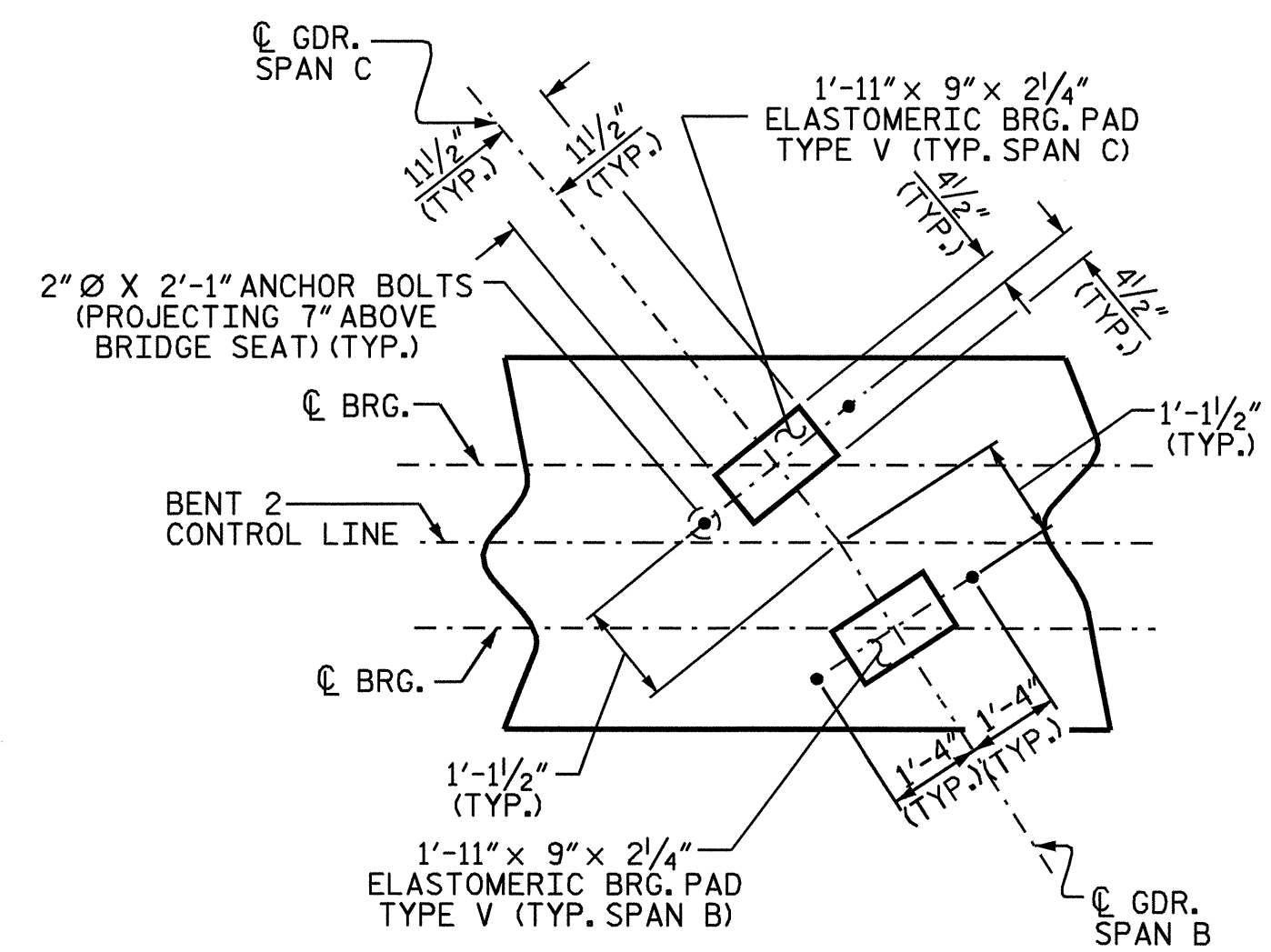
NOTE: INVERT ALTERNATE STIRRUPS

ELEVATION

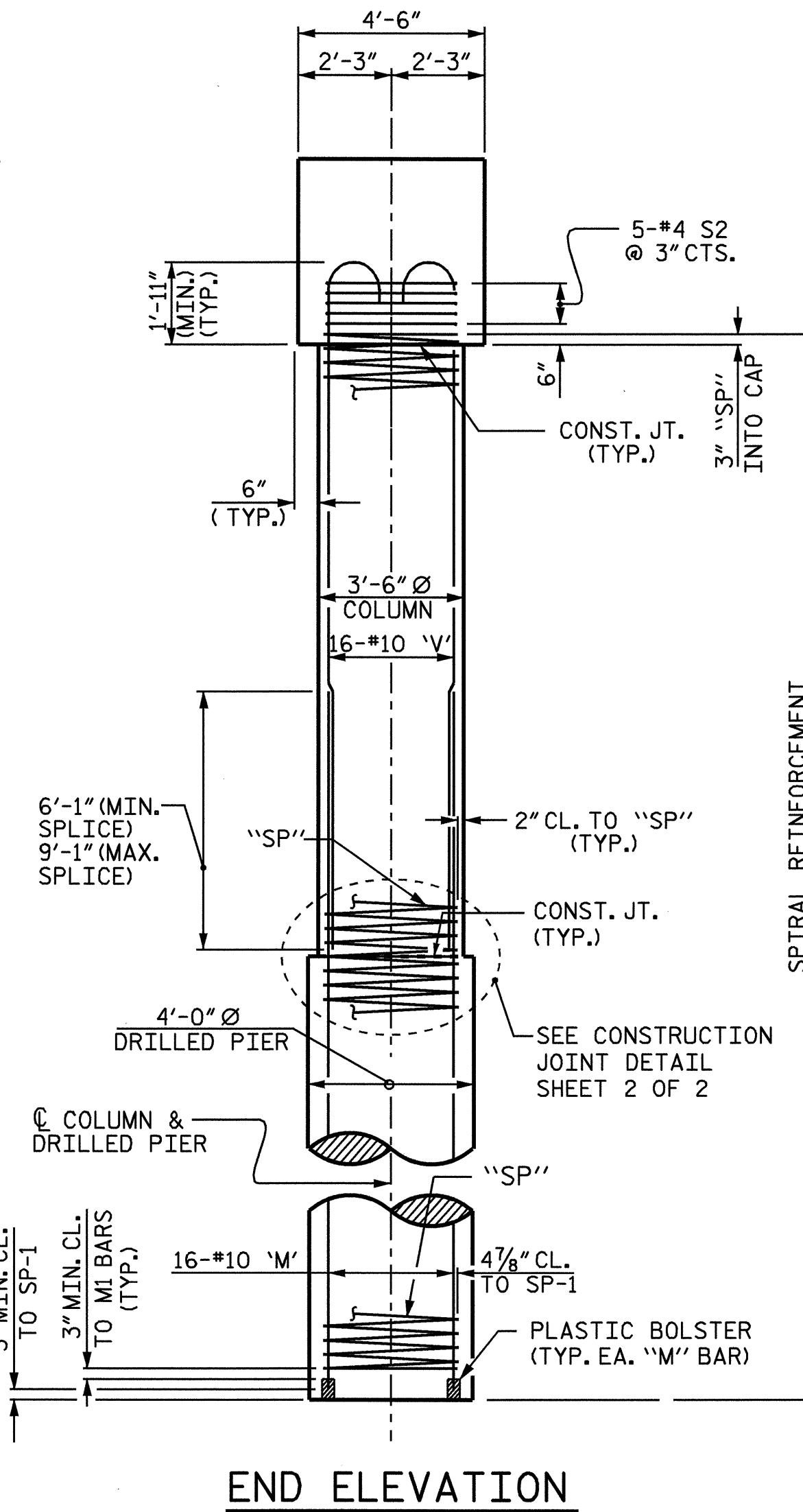
REINFORCING STEEL AND DIMENSIONS TYPICAL FOR ALL DRILLED PIERS AND COLUMNS

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



DETAIL A (TYP. EA. GIRDER)



END ELEVATION



PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

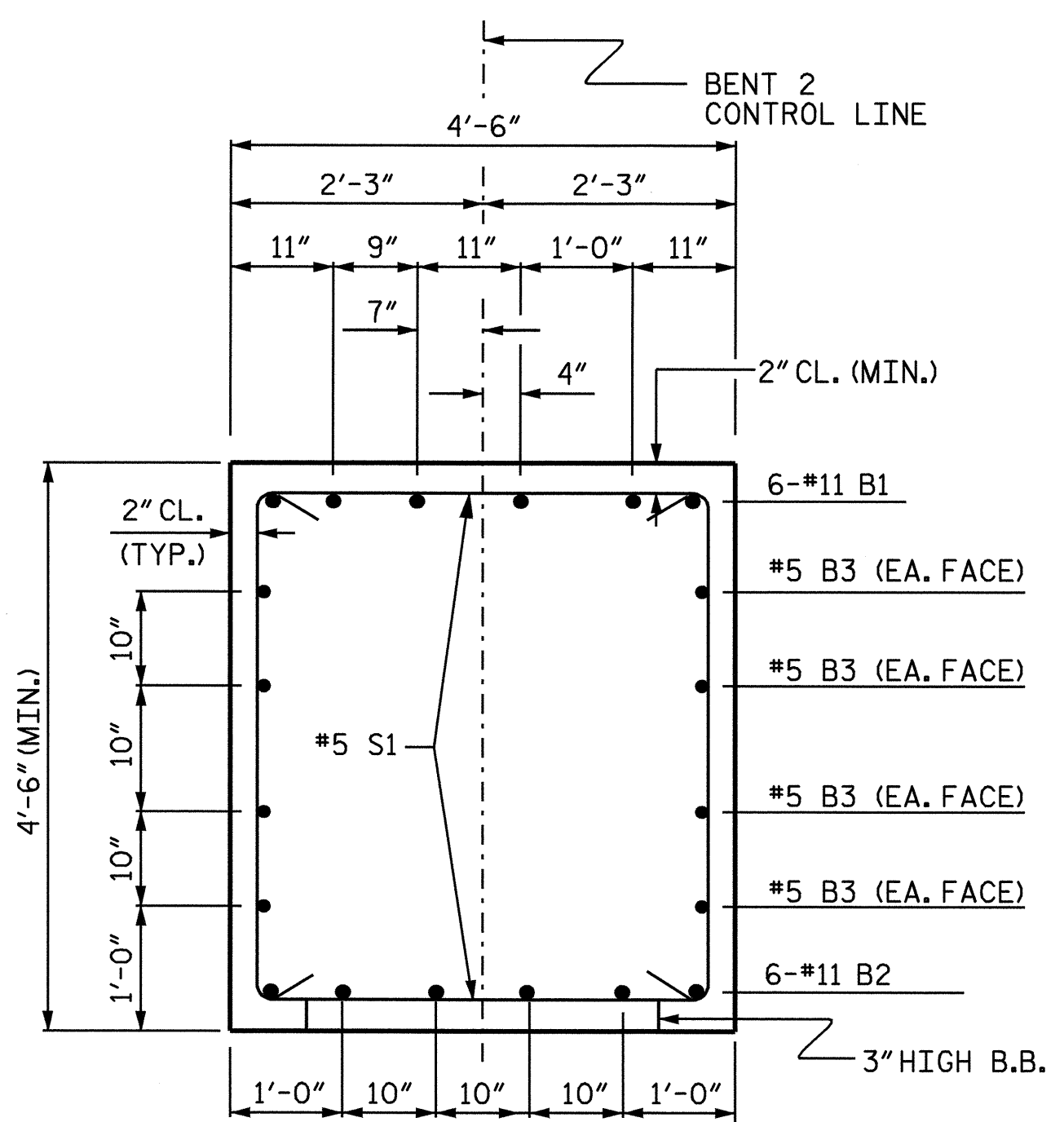
SUBSTRUCTURE
 BENT 2

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

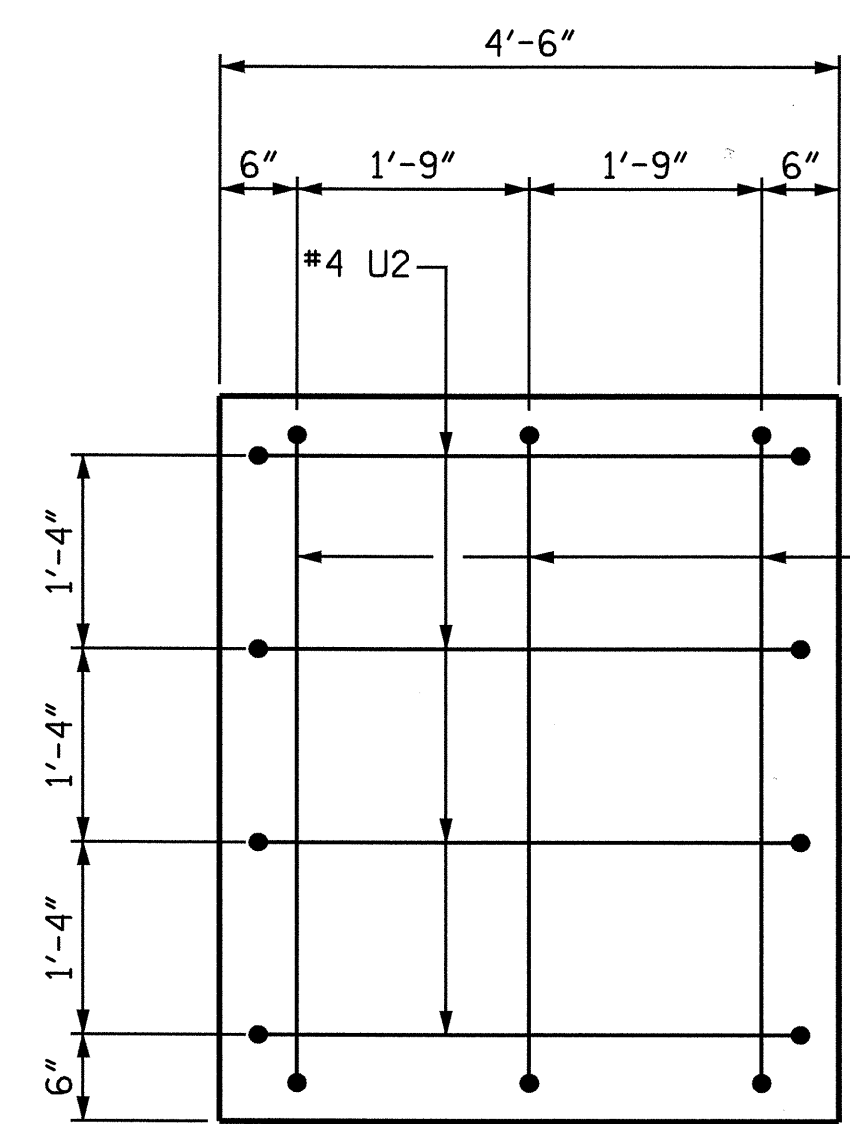
DRAWN BY: J. G. KHARVA DATE: 5/22/08
 CHECKED BY: J. MYA DATE: 7/17/08

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 jkharva

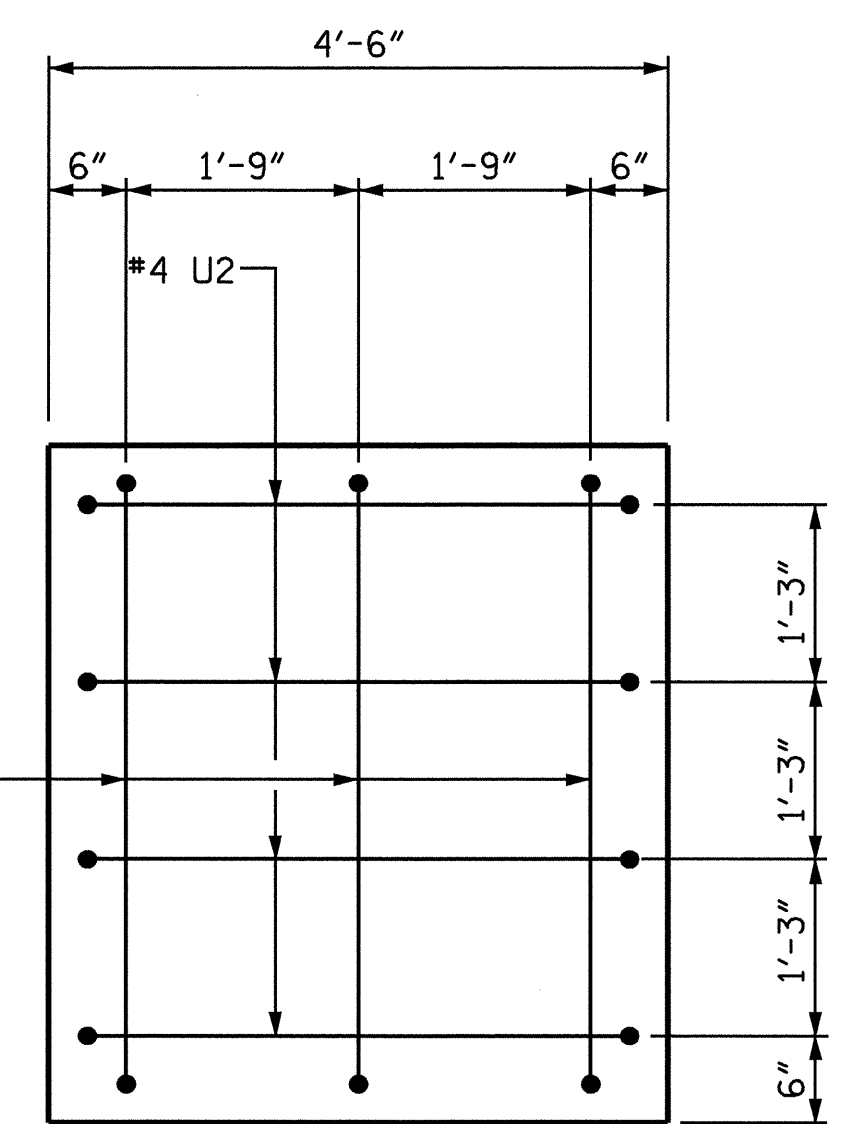
NC005



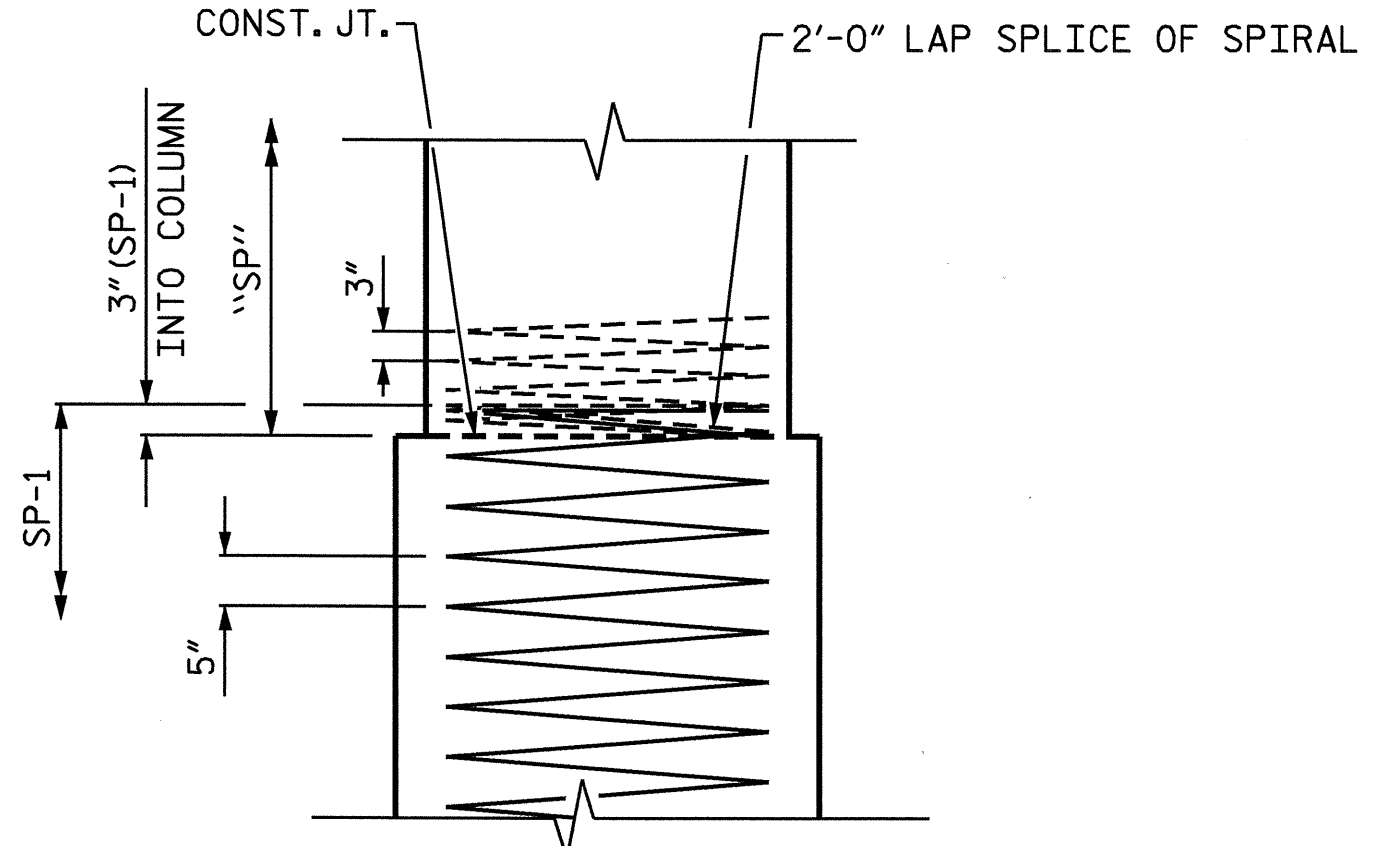
SECTION A-A



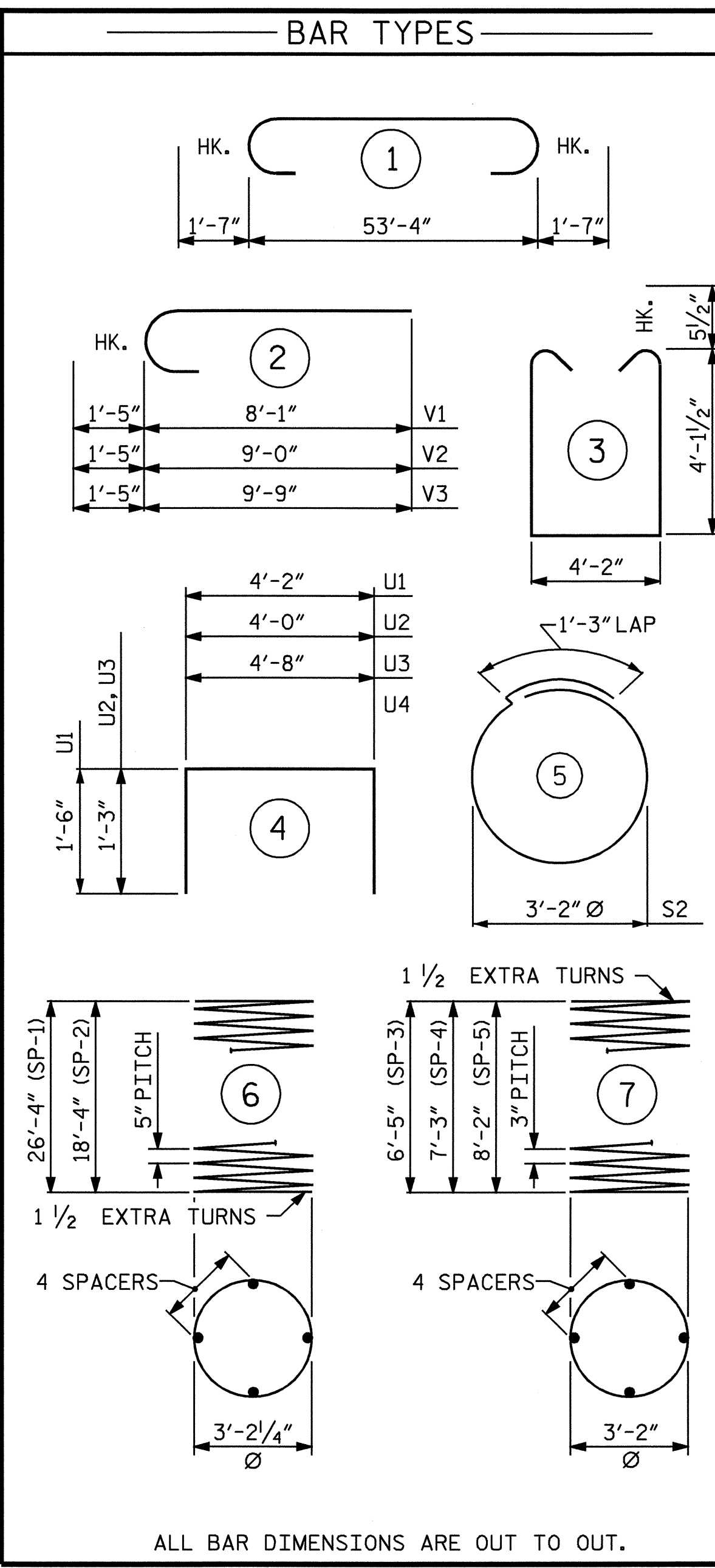
VIEW X-X



VIEW Y-Y



CONSTRUCTION JOINT DETAIL

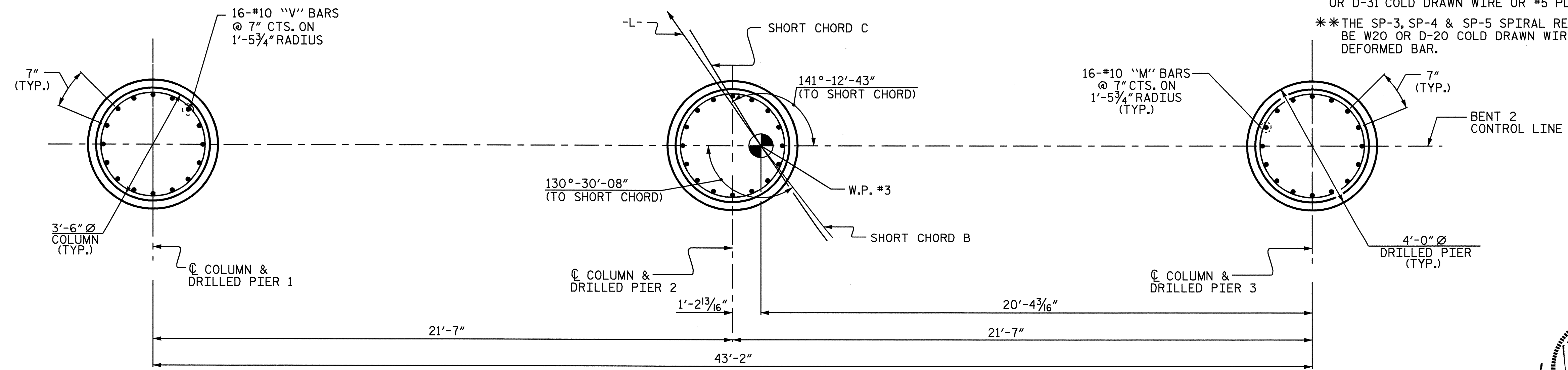


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	56'-6"	1801
B2	6	#11	STR	53'-5"	1703
B3	8	#5	STR	53'-5"	446
B4	36	#4	STR	4'-5"	106
M1	32	#10	STR	35'-8"	4911
M2	16	#10	STR	27'-8"	1905
S1	72	#5	3	13'-4"	1001
S2	15	#4	5	11'-3"	113
U1	54	#4	4	7'-2"	259
U2	11	#4	4	6'-6"	48
U3	3	#4	4	7'-2"	14
V1	16	#10	2	9'-6"	654
V2	16	#10	2	10'-5"	717
V3	16	#10	2	11'-2"	769
SP-1	2	*	6	637'-11"	1331
SP-2	1	*	6	448'-8"	468
SP-3	1	**	7	266'-10"	178
SP-4	1	**	7	299'-7"	200
SP-5	1	**	7	335'-7"	224
REINFORCING STEEL					= 14477 LBS
SPIRAL COLUMN REINFORCING STEEL					= 2401 LBS.
CLASS A CONCRETE :					
POUR #2 (COLUMNS)				8.5 C.Y.	
POUR #3 (CAP)				38.8 C.Y.	
TOTAL				47.3 C.Y.	
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 DRILLED PIERS :				33.7 C.Y.	
4'-0" Ø DRILLED PIERS IN SOIL				23.5 LIN. FT.	
4'-0" Ø DRILLED PIERS NOT IN SOIL				49.0 LIN. FT.	
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER :					54.4 LIN. FT.
CROSSHOLE SONIC LOGGING					1 EACH
CSL TUBES ▲					320.0 FT.

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

▲ SEE NOTES



PLAN OF COLUMNS AND DRILLED PIERS

(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)

DRAWN BY : J. G. KHARVA DATE : 5/23/08
 CHECKED BY : J. MYA DATE : 7/17/08

05-AUG-2008 15:20
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 jkharva



PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 2

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

NOTES:

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

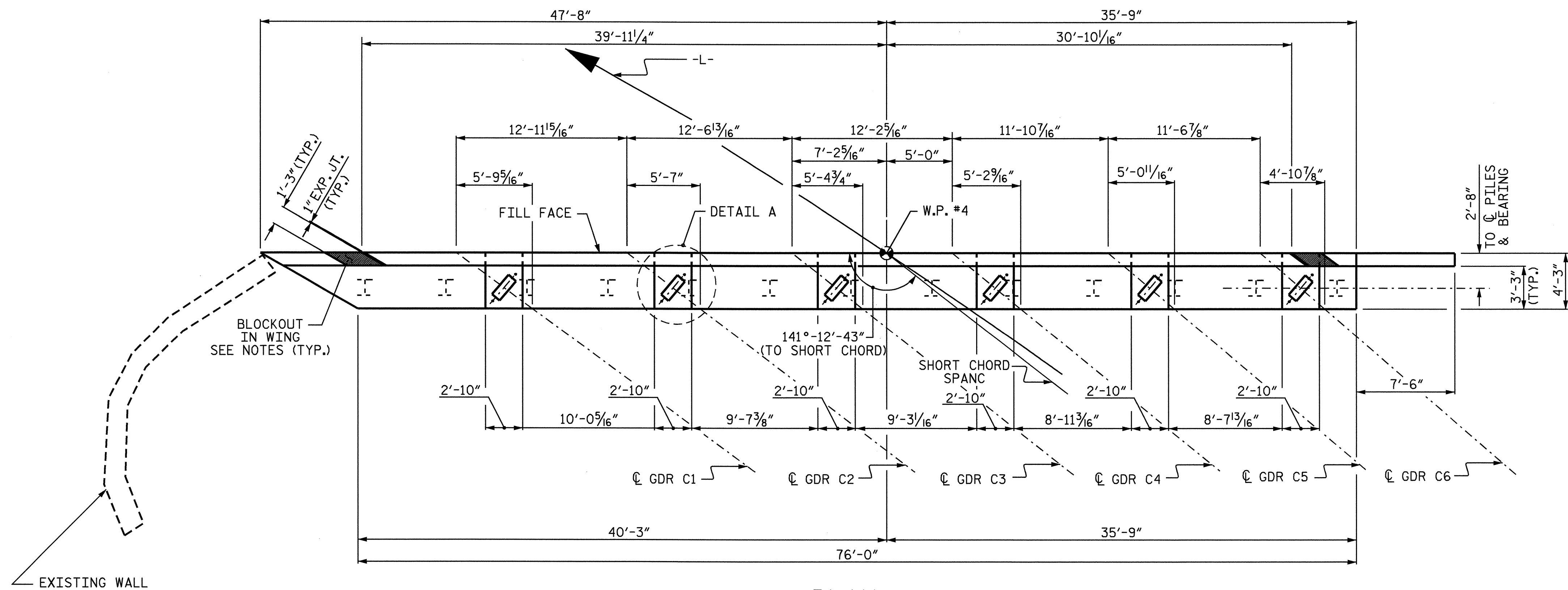
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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.

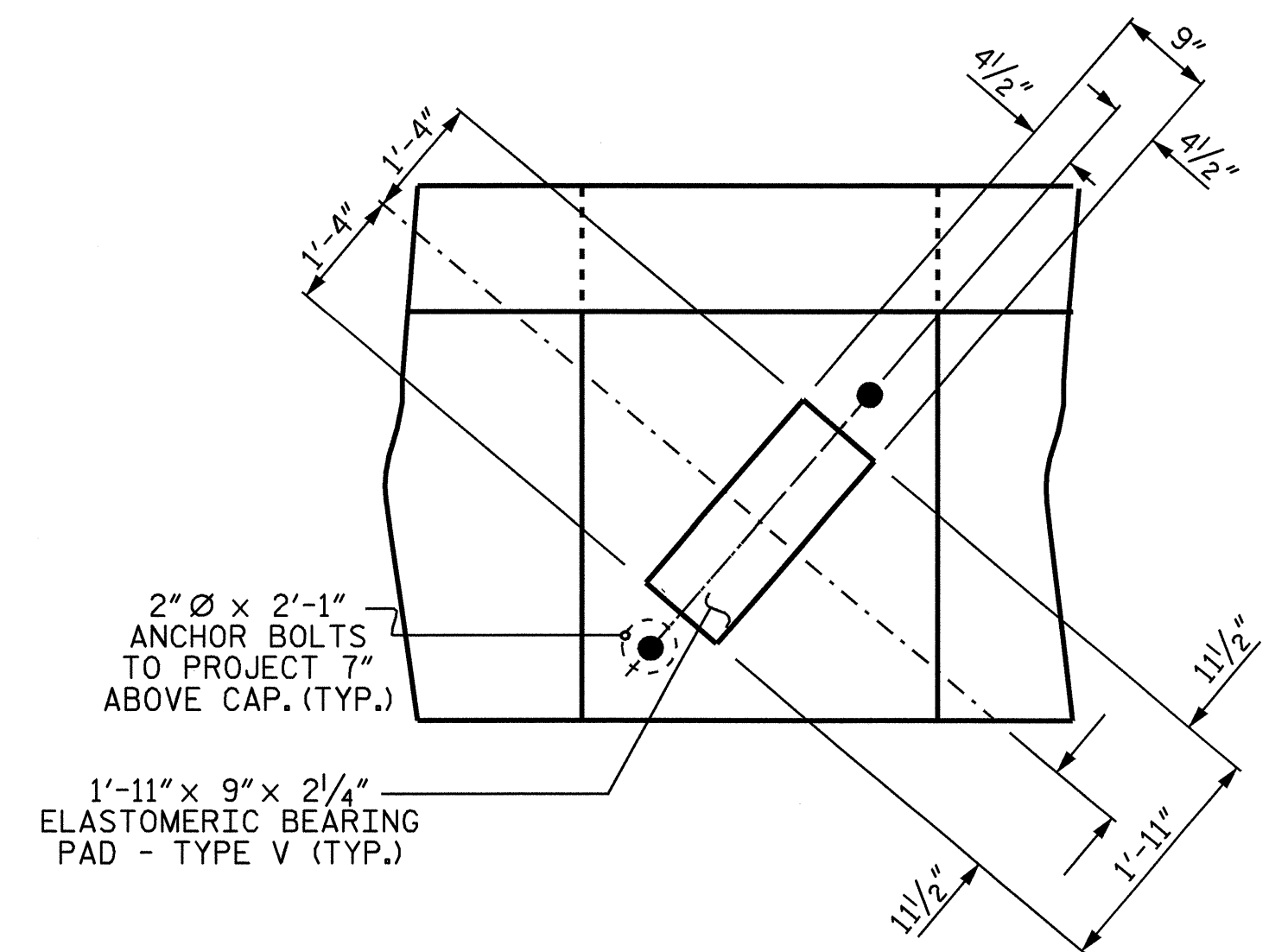
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

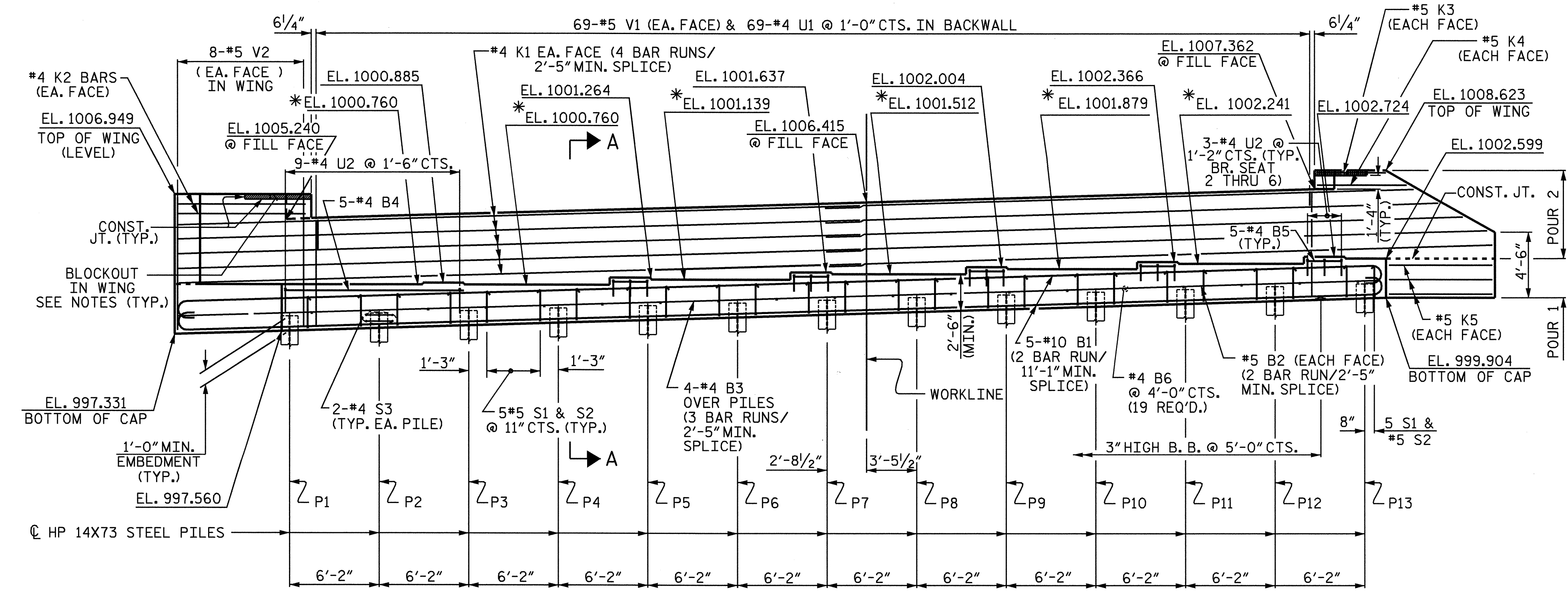
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET IS CAST IF SLIP FORMING IS USED.



PLAN



DETAIL A



ELEVATION

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS SEE SECTION A-A, SHEET 2 OF 2

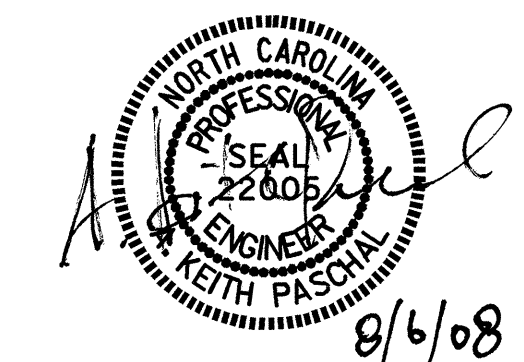
TOP OF PILE ELEVATIONS	
PILE	ELEVATION
P1	998.575
P2	998.765
P3	998.956
P4	999.146
P5	999.336
P6	999.527
P7	999.717
P8	999.907
P9	1000.098
P10	1000.288
P11	1000.478
P12	1000.669
P13	1000.859

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 2

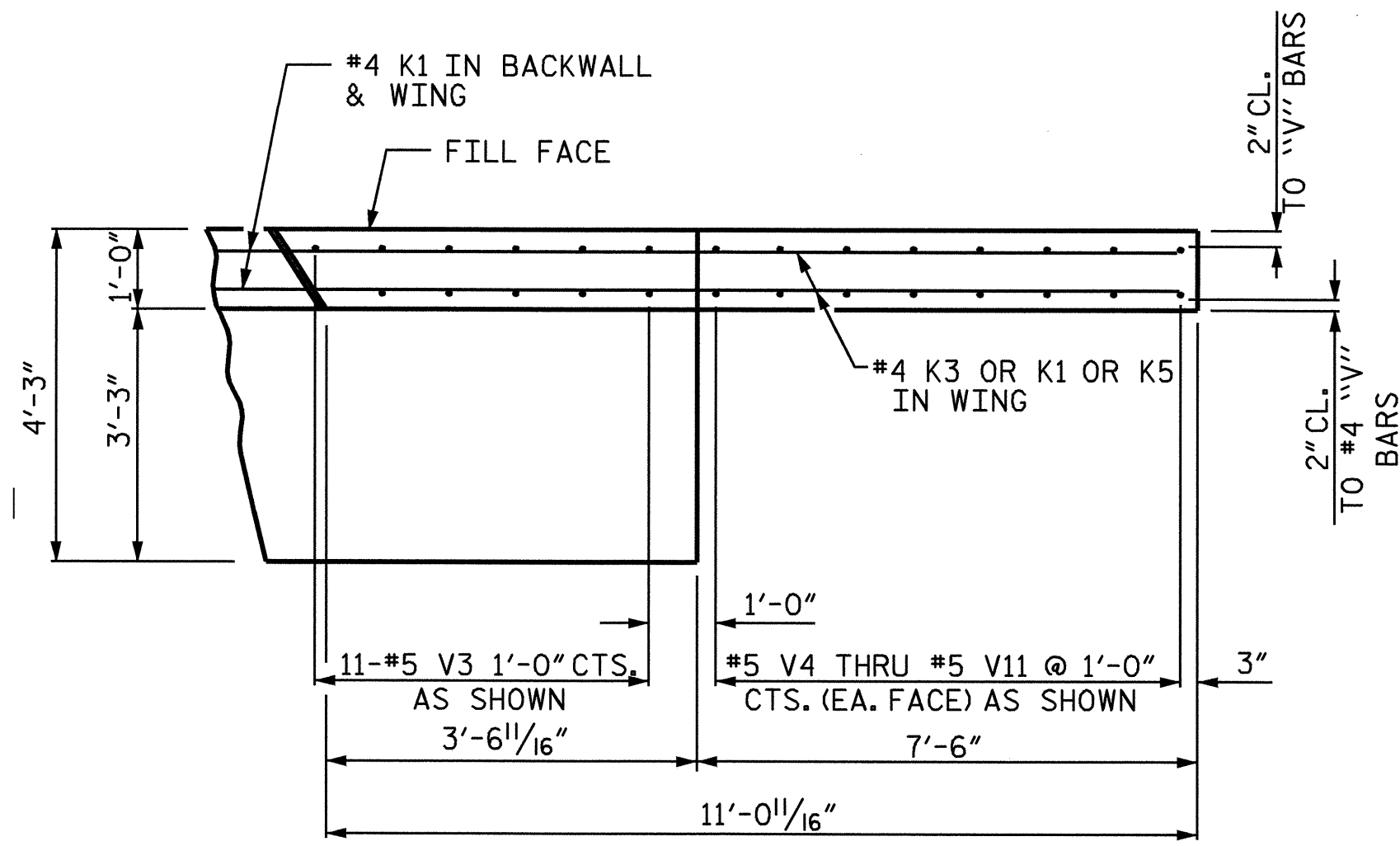
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**

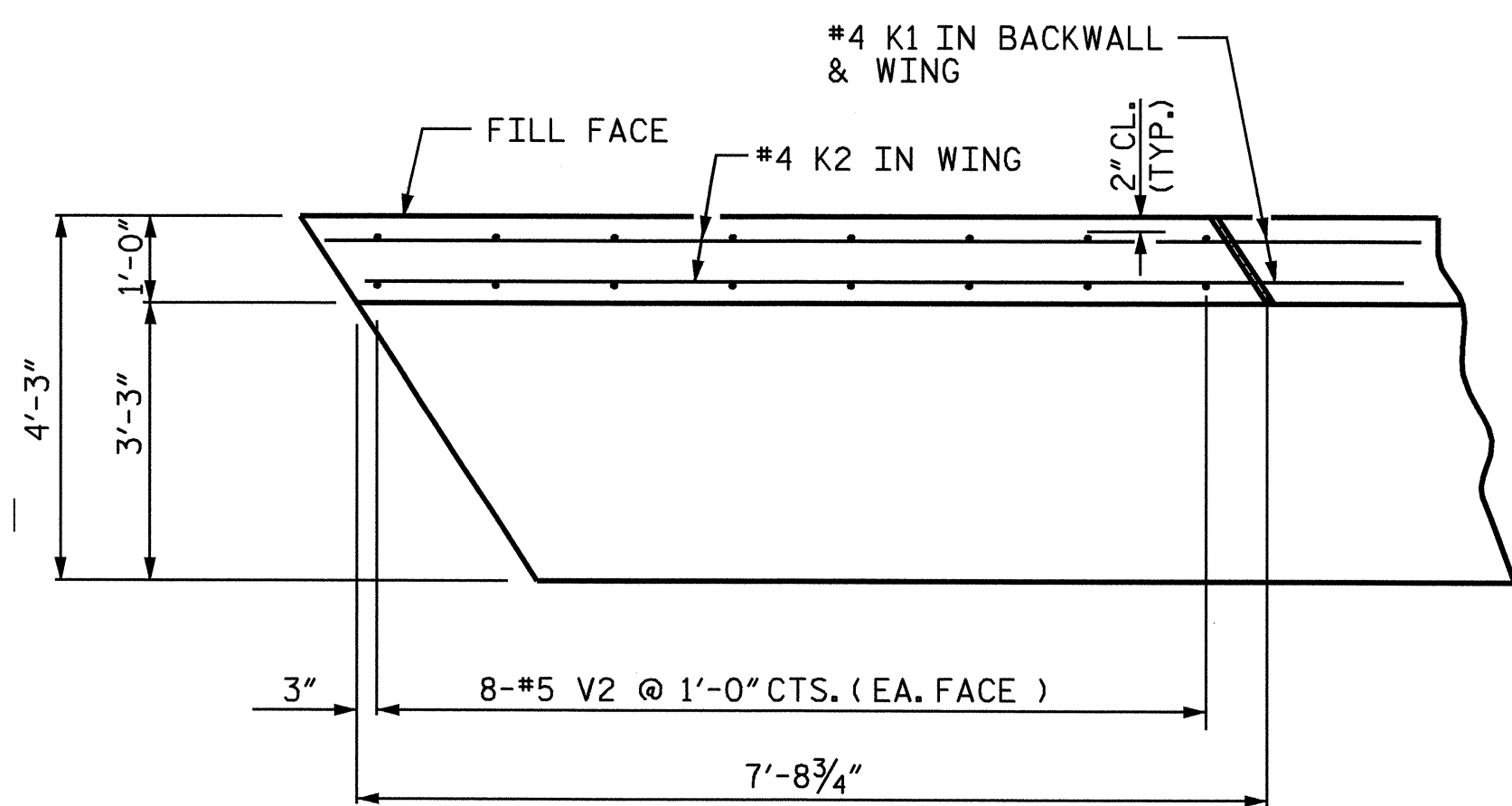


REVISIONS						SHEET NO. S-34
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 40
2			4			

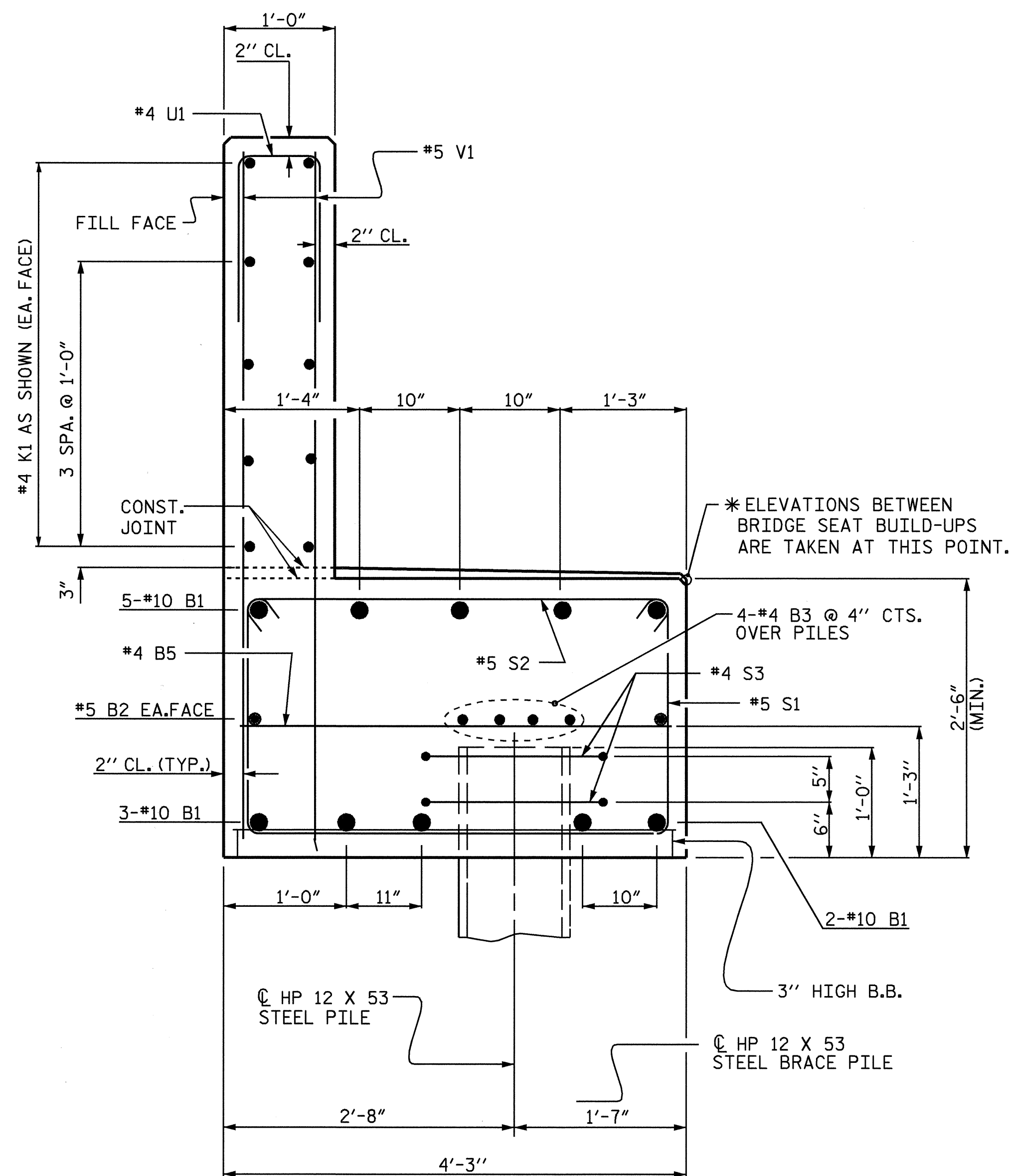
DRAWN BY: J. G. KHARVA DATE: 06/26/08
 CHECKED BY: J. MYA DATE: 07/18/08



PLAN OF WING (RIGHT)



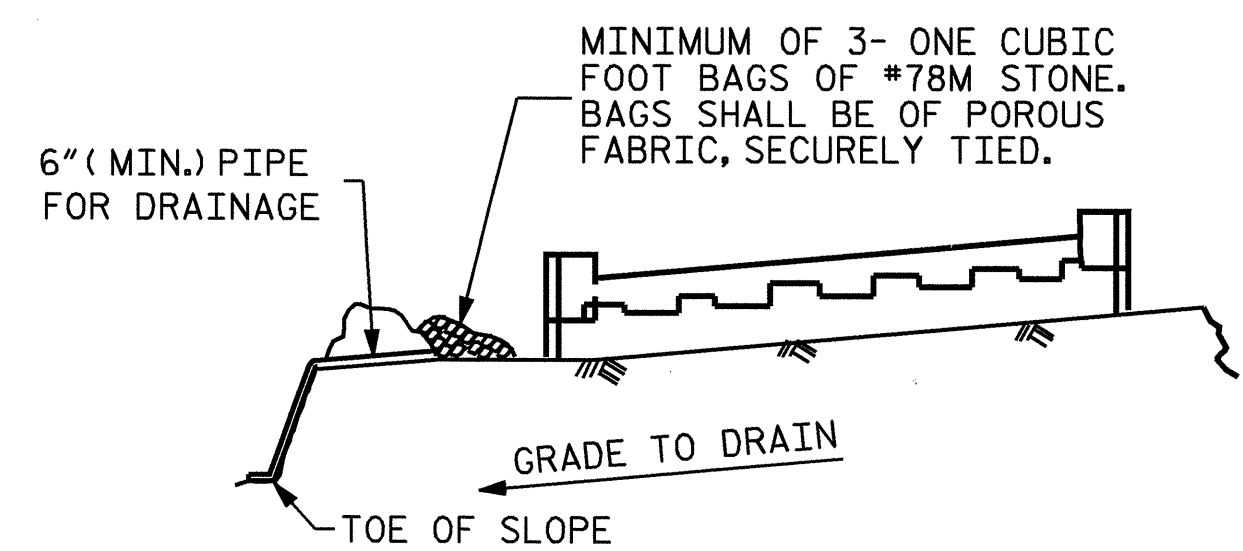
PLAN OF WING (LEFT)



SECTION A-A

BAR TYPES						BILL OF MATERIAL						
						END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	20	#10	1	47'-5"	4080	K1	40	#4	STR	24'-5"	652	
B2	4	#5	STR	42'-8"	178	K2	4	#4	STR	7'-0"	19	
B3	12	#4	STR	29'-3"	234	K3	2	#4	STR	4'-8"	6	
B4	5	#4	STR	12'-6"	42	K4	2	#4	STR	6'-2"	8	
B5	30	#4	STR	2'-6"	42	K5	6	#4	STR	7'-2"	29	
B6	19	#4	STR	3'-11"	50	S1	61	#5	3	9'-1"	578	
						S2	61	#5	2	4'-10"	308	
						S3	26	#4	5	6'-6"	113	
						U1	69	#4	4	3'-8"	169	
						U2	24	#4	4	6'-11"	111	
						V1	138	#5	STR	7'-4"	1056	
						V2	16	#5	STR	8'-11"	149	
						V3	11	#5	STR	8'-4"	96	
						V4	2	#5	STR	8'-2"	17	
						V5	2	#5	STR	7'-8"	16	
						V6	2	#5	STR	7'-1"	15	
						V7	2	#5	STR	6'-6"	14	
						V8	2	#5	STR	5'-11"	12	
						V9	2	#5	STR	5'-4"	11	
						V10	2	#5	STR	4'-10"	10	
						V11	2	#5	STR	4'-3"	9	
REINFORCING STEEL						8024 LBS.						
CLASS A CONCRETE						(CU. YDS.)						
POUR 1						CAP & LOWER PART OF WING						36.0
POUR 2						BACKWALL & UPPER PART OF WING						16.6
TOTAL												52.6
HP 14 x 73 STEEL PILES						No. 13						130
PILE EXCAVATION IN SOIL												78
PILE EXCAVATION NOT IN SOIL												52

ALL BAR DIMENSIONS ARE OUT TO OUT.

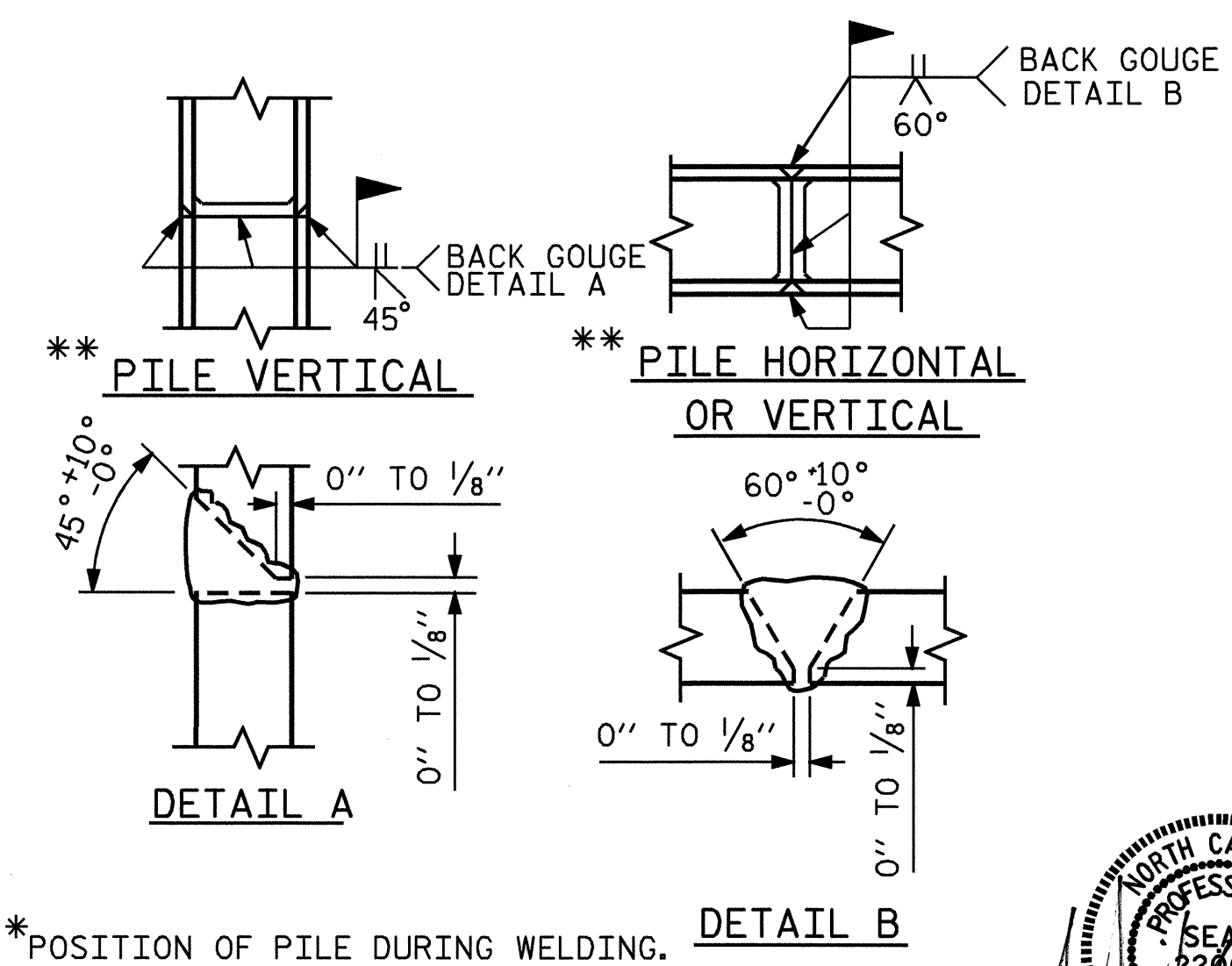


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



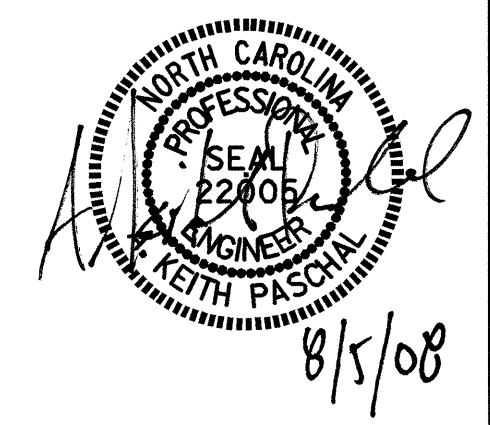
PILE SPLICE DETAILS

PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 2 OF 2

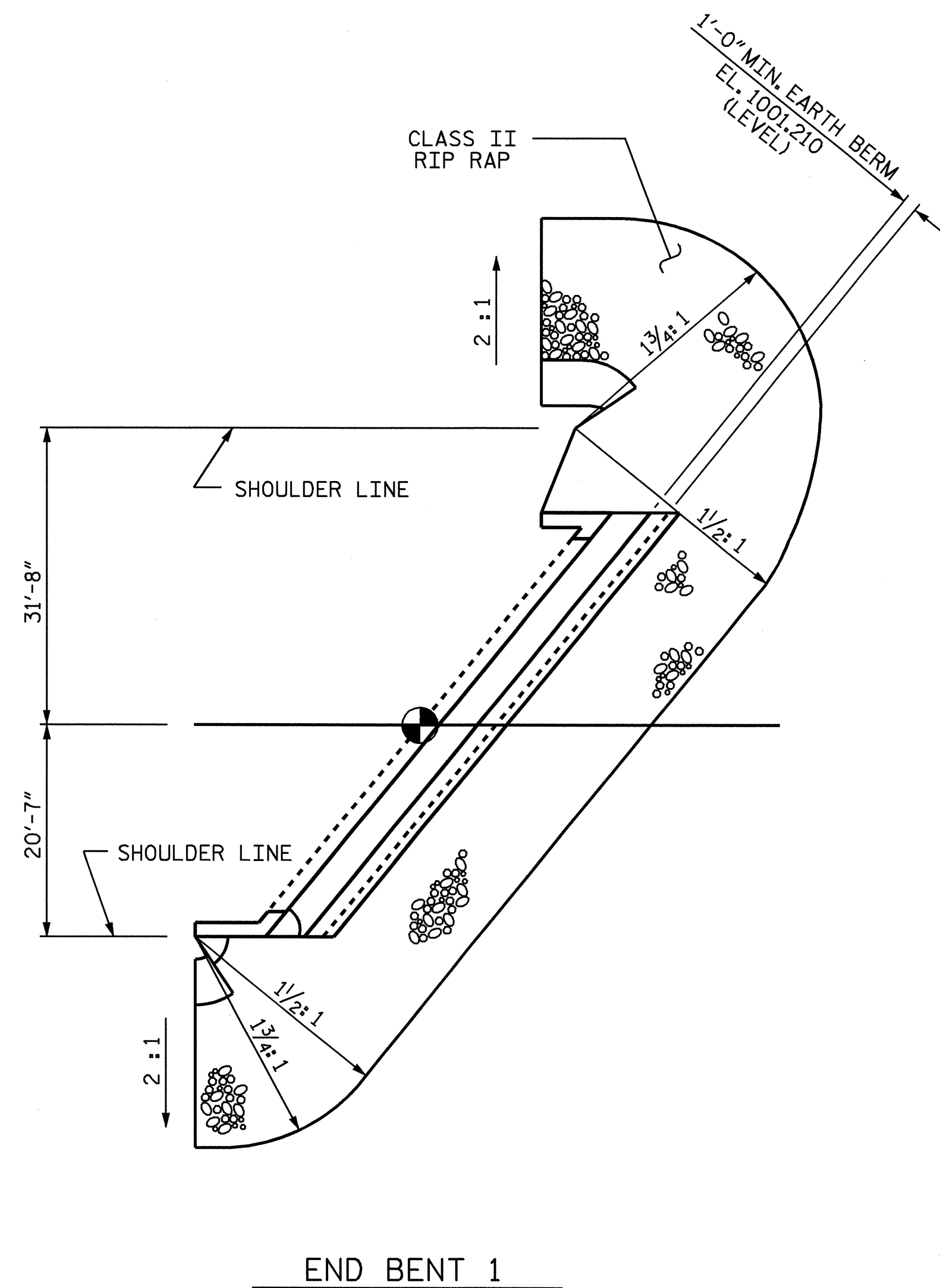
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

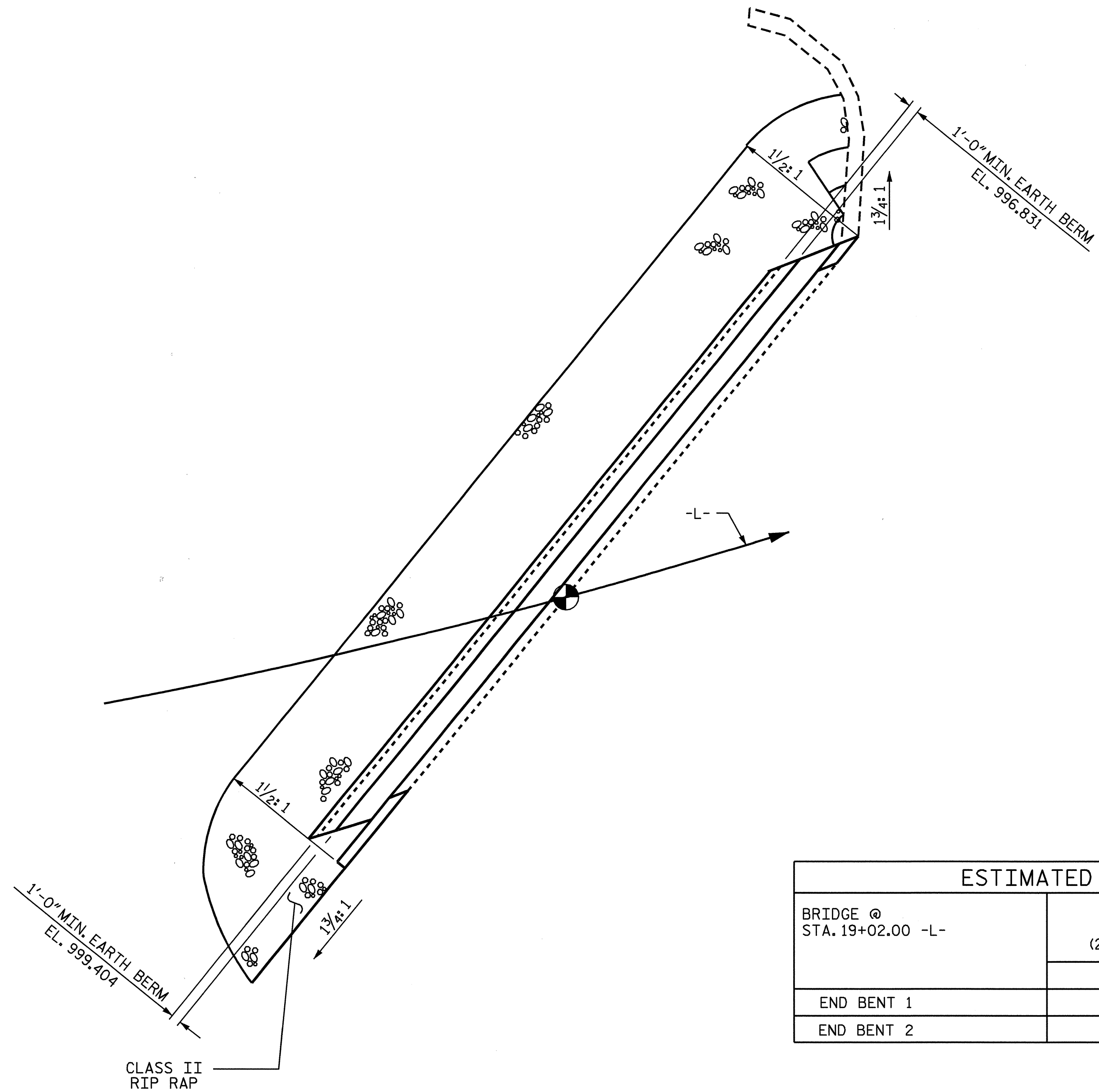


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			40

DRAWN BY: J. G. KHARVA DATE: 5/19/08
CHECKED BY: J. MIA DATE: 5/18/08



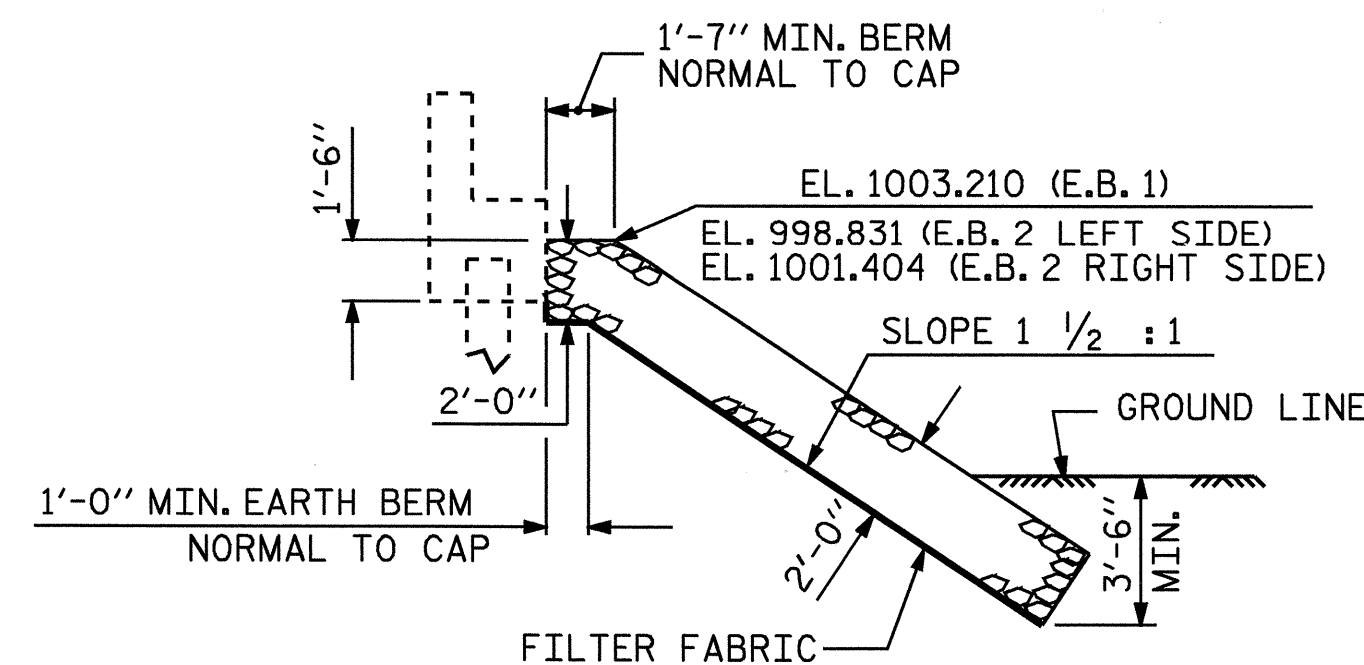
END BENT 1



END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+02.00 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	234	260
END BENT 2	229	254

PLAN

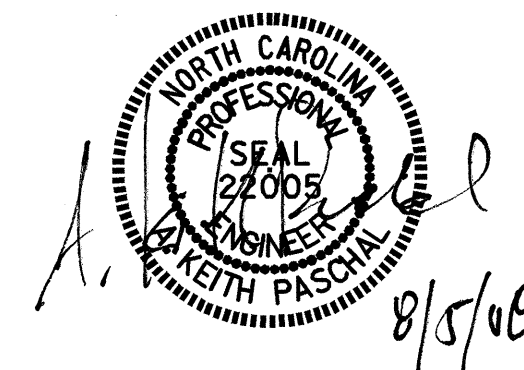


SECTION

BERM RIP RAPPED

PROJECT NO. B-4258
RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD = RIP RAP DETAILS =					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-36
					TOTAL SHEETS 40



ASSEMBLED BY : J.L. WALTON DATE : 7-08
 CHECKED BY : J.D. HAWK DATE : 7-08
 DRAWN BY : REK 1/84 REV. 8/16/99 RWW/LES
 CHECKED BY : RDU 1/84 REV. 10/17/00 RWW/LES
 REV. 5/1/06 TLA/GM

NOTES

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

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

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

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

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

THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE PARAPET AND END POST.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

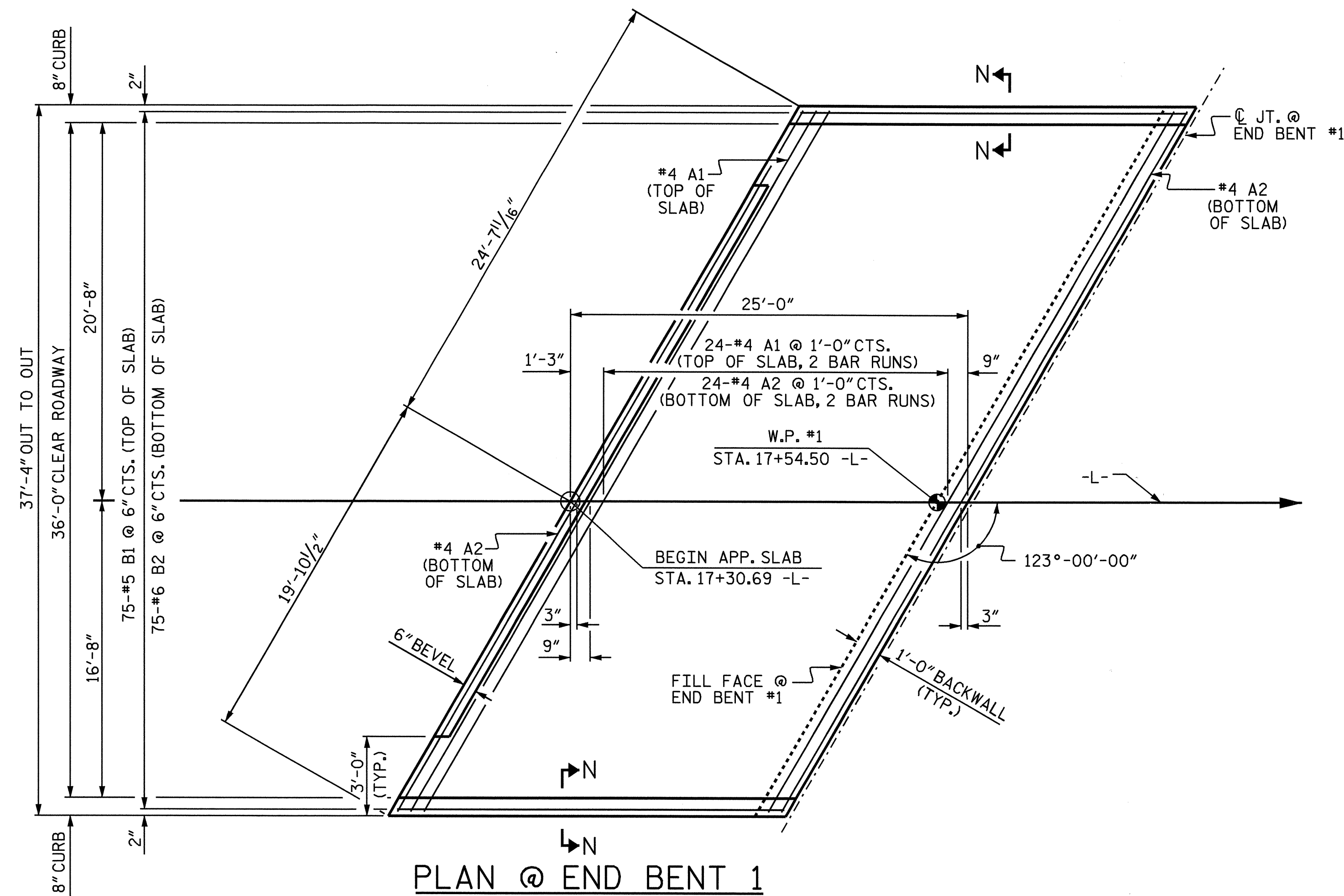
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

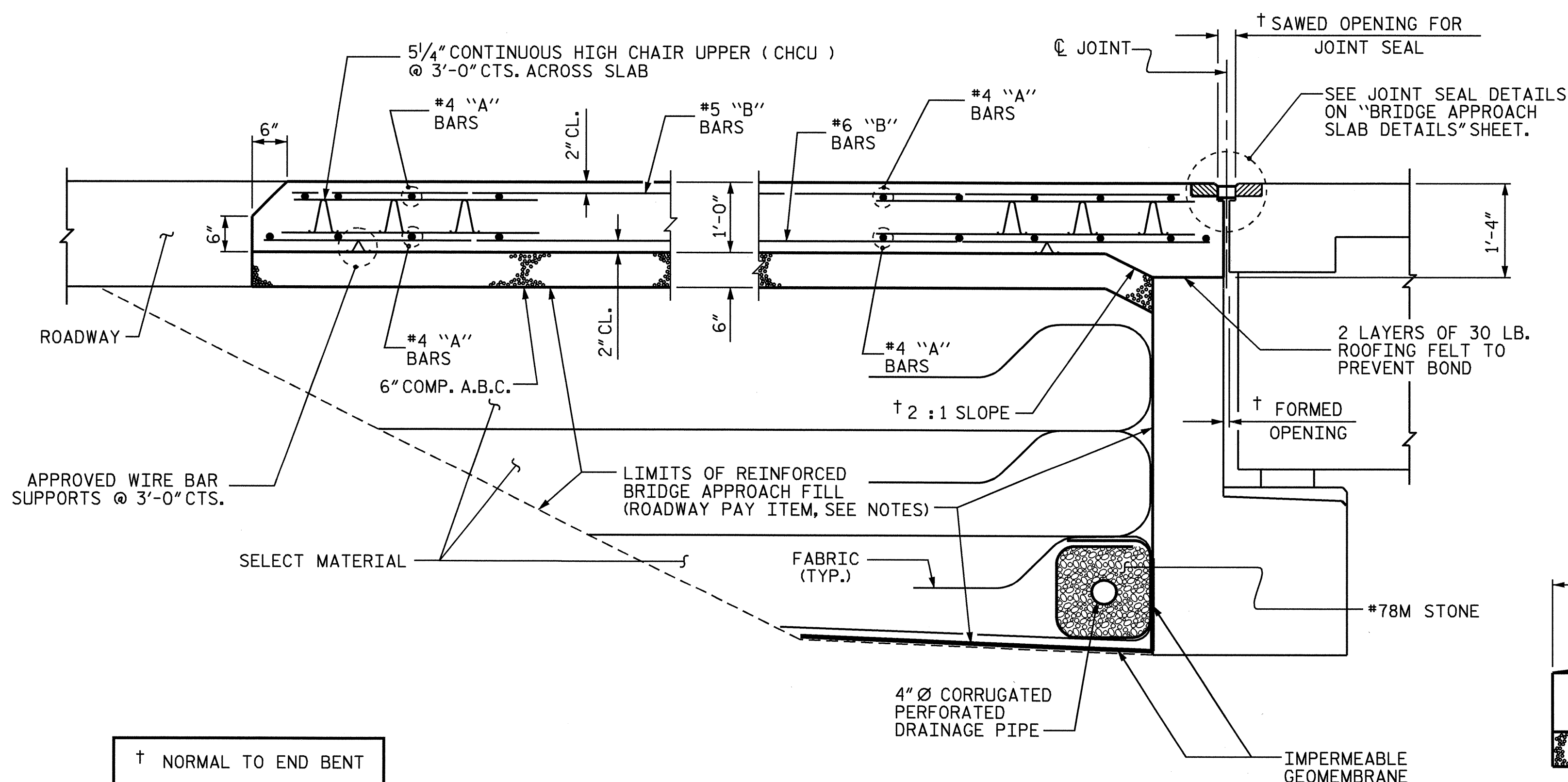
BILL OF MATERIAL

APPROACH SLAB AT EB 1

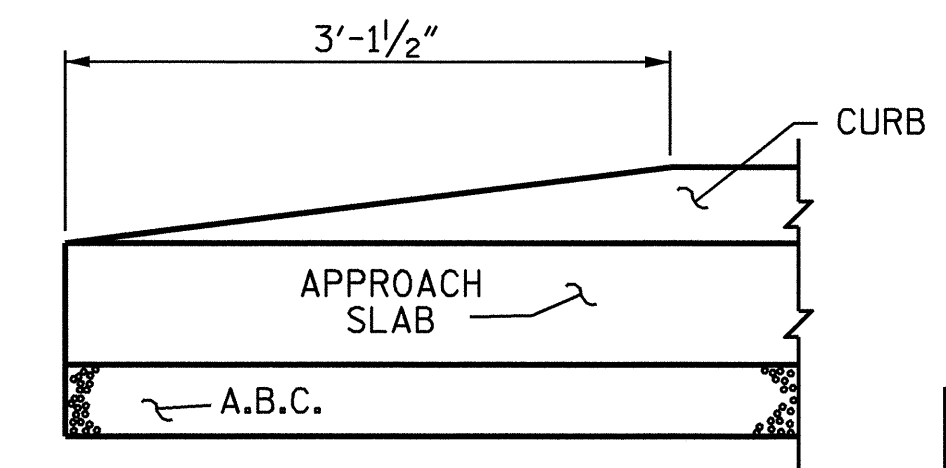
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	23'-1"	771
A2	52	#4	STR	23'-0"	799
*B1	75	#5	STR	24'-7"	1923
B2	75	#6	STR	24'-7"	2769
REINFORCING STEEL				LBS.	3568
*EPOXY COATED REINFORCING STEEL				LBS.	2694
CLASS AA CONCRETE				C. Y.	41.7



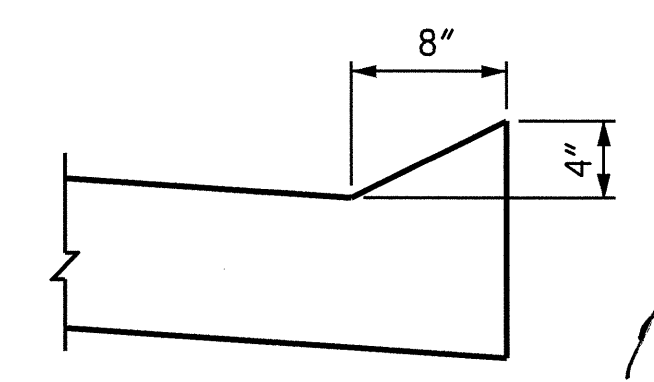
PLAN @ END BENT 1



SECTION THRU SLAB @ END BENT 1



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



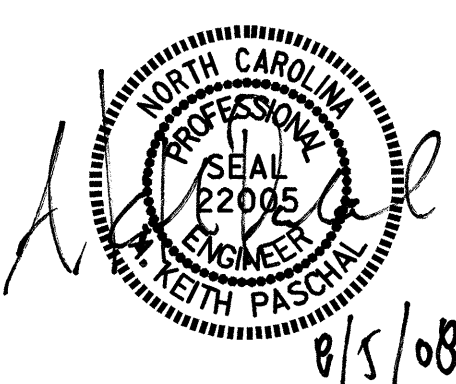
SECTION N-N

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

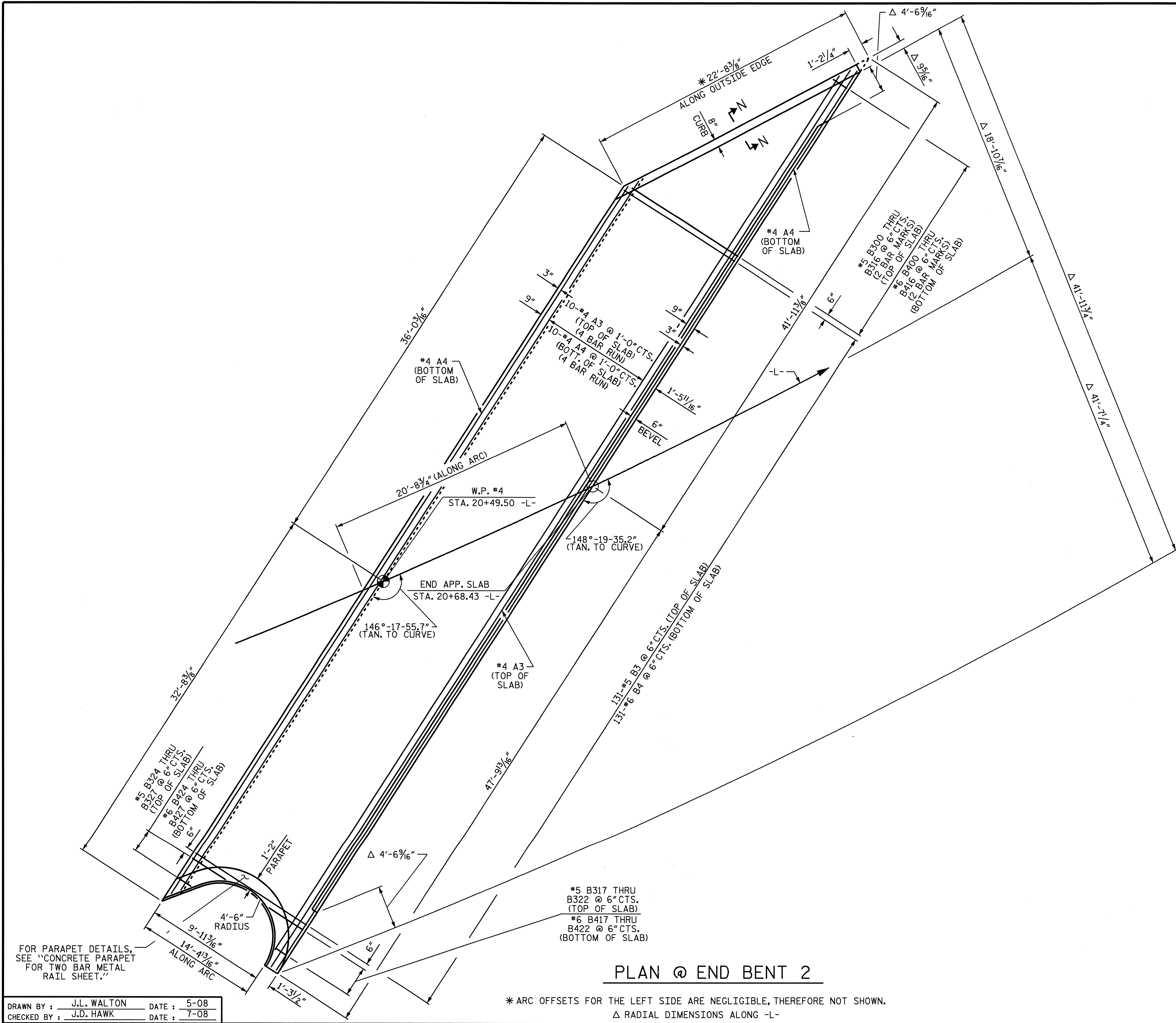


ASSEMBLED BY : J.L. WALTON	DATE : 5-08
CHECKED BY : J.D. HAWK	DATE : 7-08
DRAWN BY : EEM 3/95	REV. 7/10/01 LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R RWW/JTE
	REV. 5/1/06R KMM/GM

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

TOTAL SHEETS 40

STD. NO. BAS4 (SHT 2)



FOR PARAPET DETAILS,
SEE "CONCRETE PARAPET
FOR TWO BAR METAL
RAIL SHEET."

DRAWN BY : J.L. WALTON DATE : 5-08
CHECKED BY : J.D. HAWK DATE : 7-08

PLAN @ END BENT 2

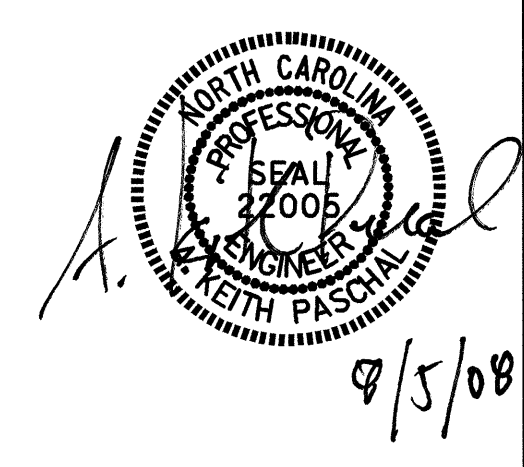
* ARC OFFSETS FOR THE LEFT SIDE ARE NEGLIGIBLE, THEREFORE NOT SHOWN.
Δ RADIAL DIMENSIONS ALONG -L-

PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH
SLAB FOR
FLEXIBLE PAVEMENT



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

NOTES

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

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

*78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

*78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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 PARAPET AND END POST.

WITH EVAZOTE JOINT SEAL

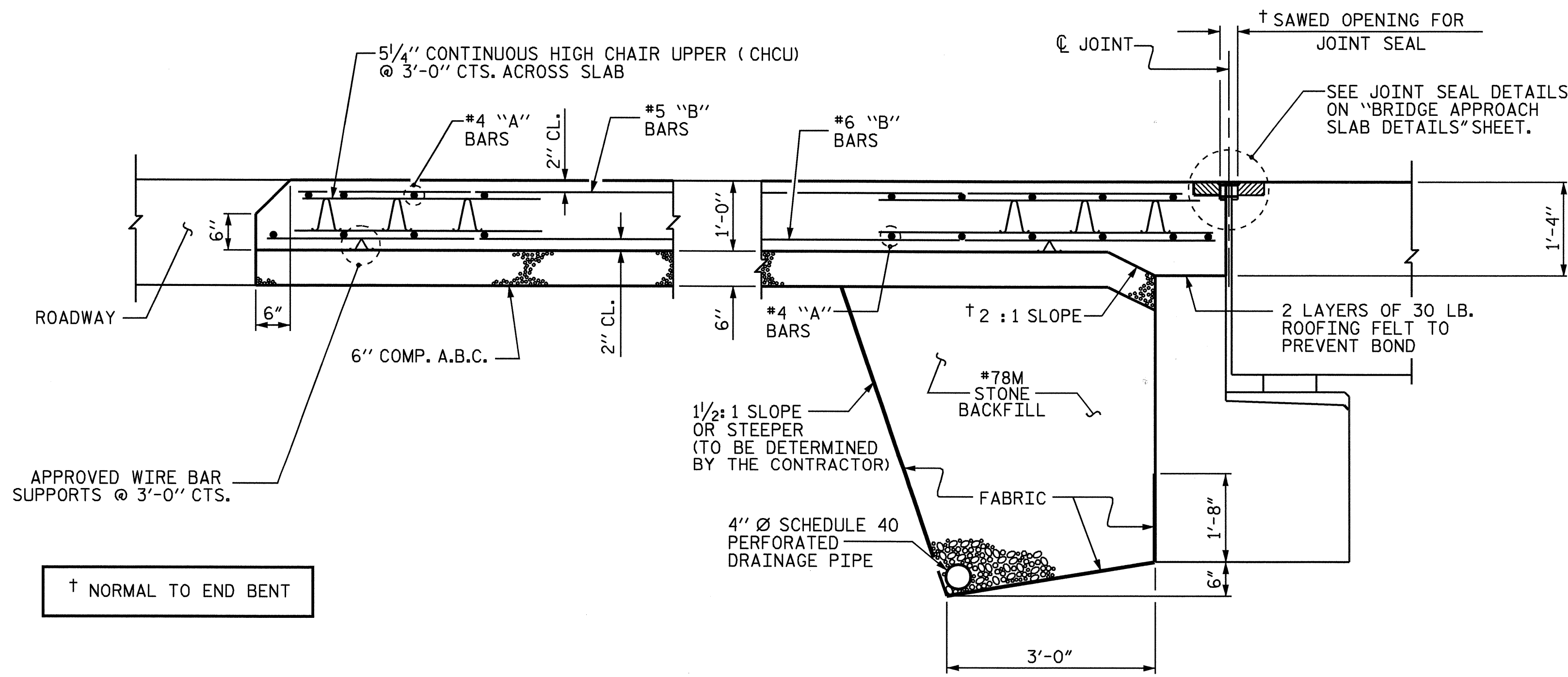
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

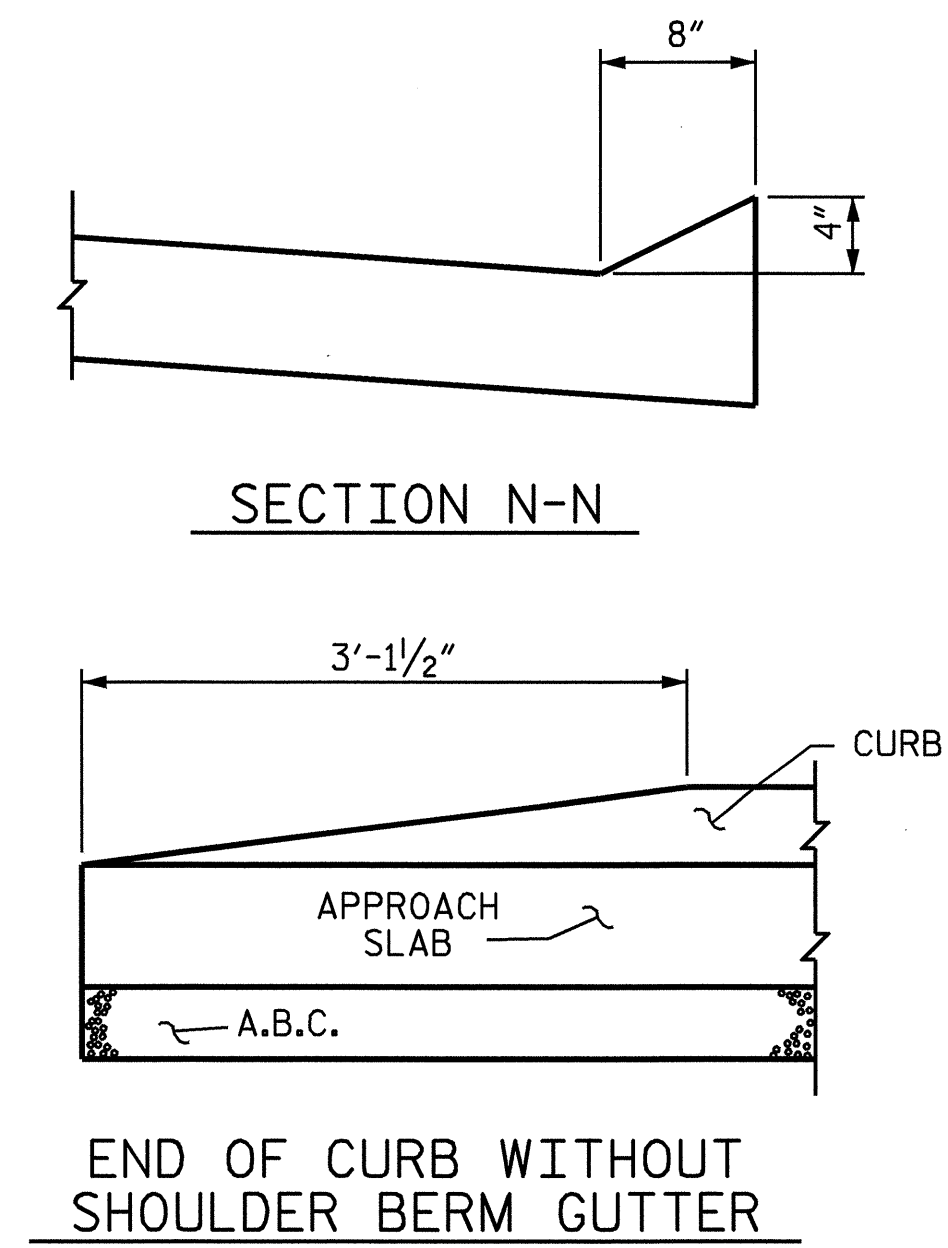
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	44	#4	STR	23'-6"	691	B400	2	#6	STR	10'-5"	31
A4	48	#4	STR	23'-4"	748	B401	2	#6	STR	9'-10"	30
						B402	2	#6	STR	9'-3"	28
*B3	131	#5	STR	10'-10"	1480	B403	2	#6	STR	8'-8"	26
B4	131	#6	STR	10'-10"	2132	B404	2	#6	STR	8'-1"	24
						B405	2	#6	STR	7'-6"	23
*B300	2	#5	STR	10'-5"	22	B406	2	#6	STR	7'-0"	21
*B301	2	#5	STR	9'-10"	21	B407	2	#6	STR	6'-5"	19
*B302	2	#5	STR	9'-3"	19	B408	2	#6	STR	5'-10"	18
*B303	2	#5	STR	8'-8"	18	B409	2	#6	STR	5'-3"	16
*B304	2	#5	STR	8'-1"	17	B410	2	#6	STR	4'-9"	14
*B305	2	#5	STR	7'-6"	16	B411	2	#6	STR	4'-2"	13
*B306	2	#5	STR	7'-0"	15	B412	2	#6	STR	3'-7"	11
*B307	2	#5	STR	6'-5"	13	B413	2	#6	STR	3'-0"	9
*B308	2	#5	STR	5'-10"	12	B414	2	#6	STR	2'-6"	8
*B309	2	#5	STR	5'-3"	11	B415	2	#6	STR	1'-11"	6
*B310	2	#5	STR	4'-9"	10	B416	2	#6	STR	1'-4"	4
*B311	2	#5	STR	4'-2"	9	B417	1	#6	STR	3'-4"	5
*B312	2	#5	STR	3'-7"	7	B418	1	#6	STR	2'-7"	4
*B313	2	#5	STR	3'-0"	6	B419	1	#6	STR	2'-0"	3
*B314	2	#5	STR	2'-6"	5	B420	1	#6	STR	1'-8"	3
*B315	2	#5	STR	1'-11"	4	B421	1	#6	STR	1'-4"	2
*B316	2	#5	STR	1'-4"	3	B422	1	#6	STR	1'-1"	2
*B317	1	#5	STR	3'-4"	3	B423	1	#6	STR	3'-3"	5
*B318	1	#5	STR	2'-7"	3	B424	1	#6	STR	2'-6"	4
*B319	1	#5	STR	2'-0"	2	B425	1	#6	STR	1'-11"	3
*B320	1	#5	STR	1'-8"	2	B426	1	#6	STR	1'-6"	2
*B321	1	#5	STR	1'-4"	1	B427	1	#6	STR	1'-2"	2
*B322	1	#5	STR	1'-1"	1						
*B323	1	#5	STR	3'-3"	3				REINFORCING STEEL	LBS.	3216
*B324	1	#5	STR	2'-6"	3				*EPOXY COATED REINFORCING STEEL	LBS.	2402
*B325	1	#5	STR	1'-11"	2						
*B326	1	#5	STR	1'-6"	2						
*B327	1	#5	STR	1'-2"	1				CLASS AA CONCRETE	C. Y.	34.0



SECTION THRU SLAB @ END BENT 2



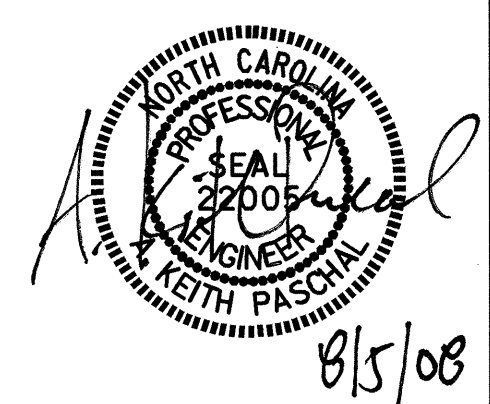
CURB DETAILS

PROJECT NO. B-4258
 RUTHERFORD COUNTY
 STATION: 19+02.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

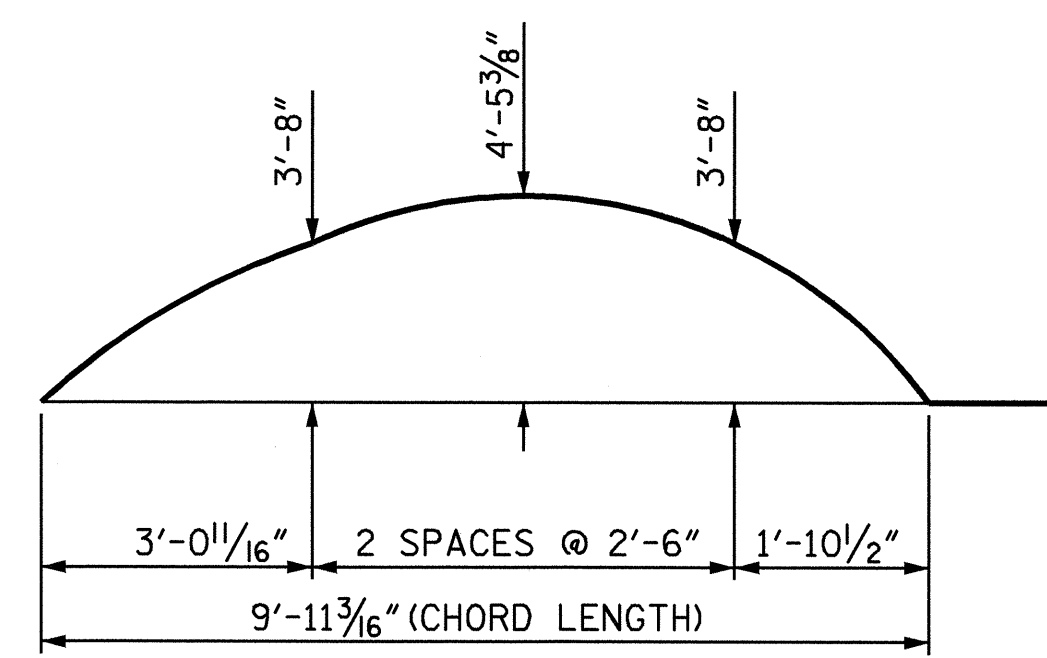
STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT
 (SUB-REGIONAL TIER)



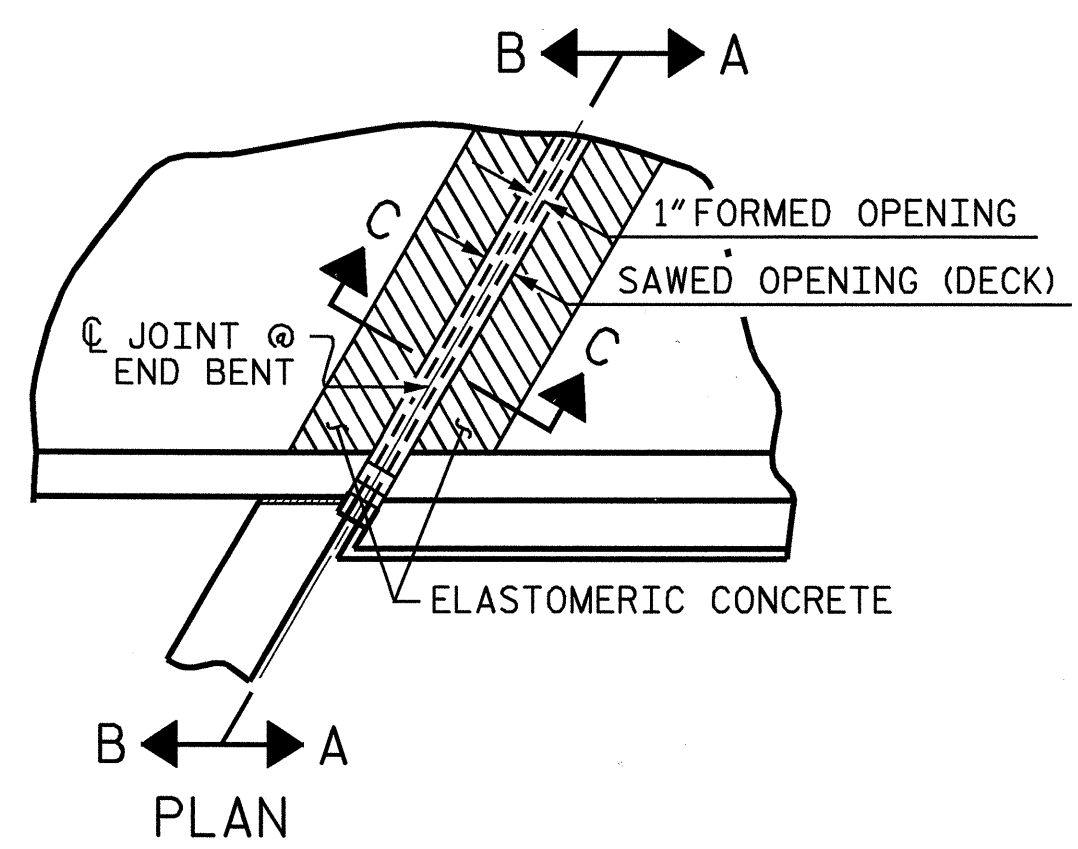
ASSEMBLED BY: J.L. WALTON DATE: 5-08
 CHECKED BY: J.D. HAWK DATE: 7-08
 DRAWN BY: KMM 3-08
 CHECKED BY: GM 3-08

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

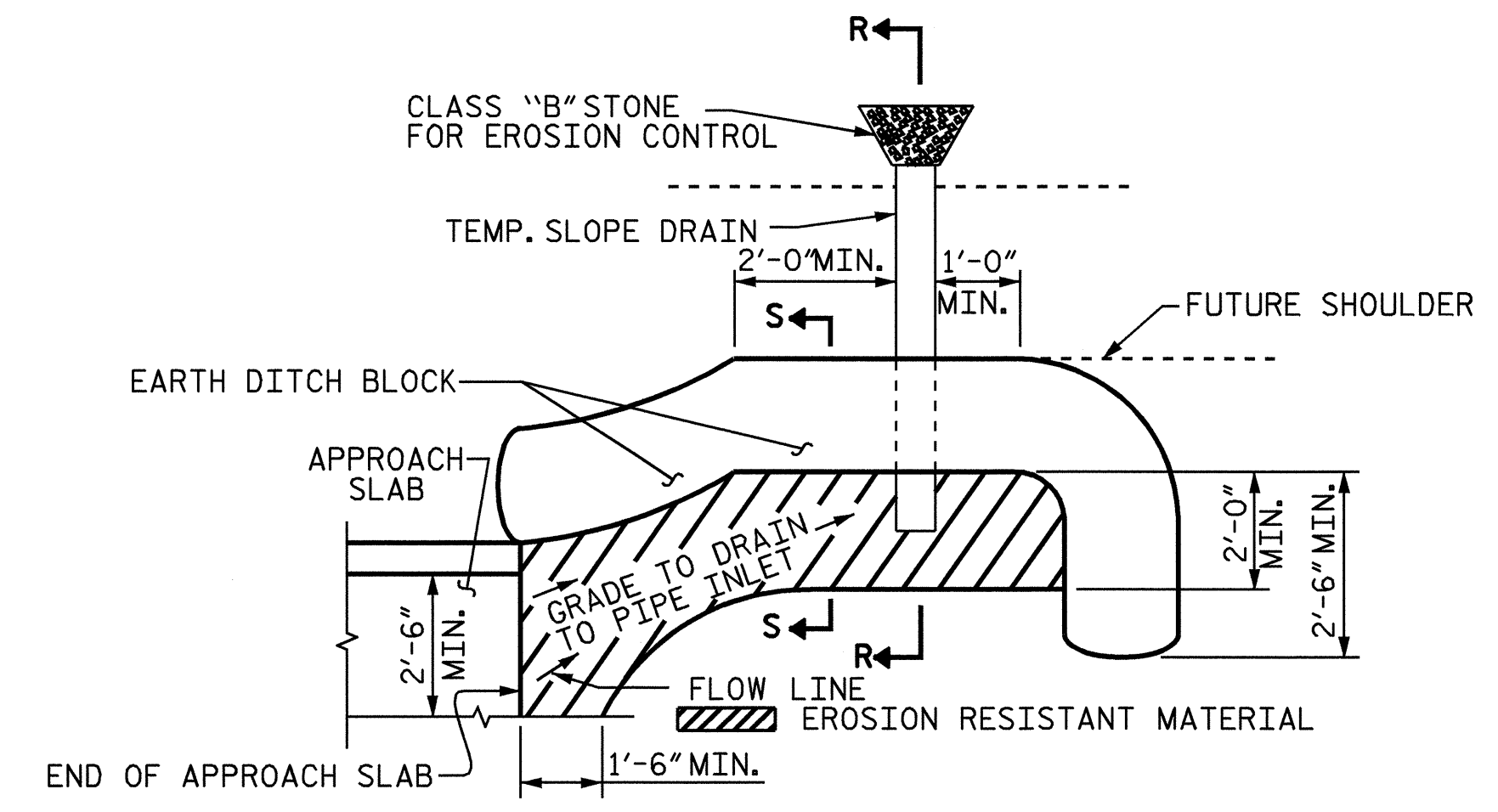
TOTAL SHEETS: 40



RIGHT SIDE
APPROACH SLAB @
END BENT 2
ARC OFFSET

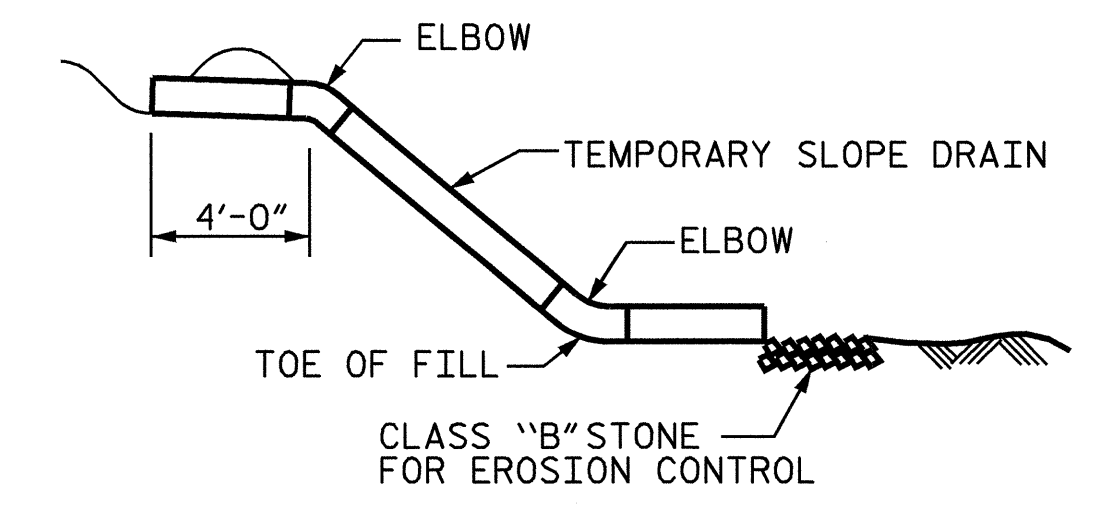


PLAN

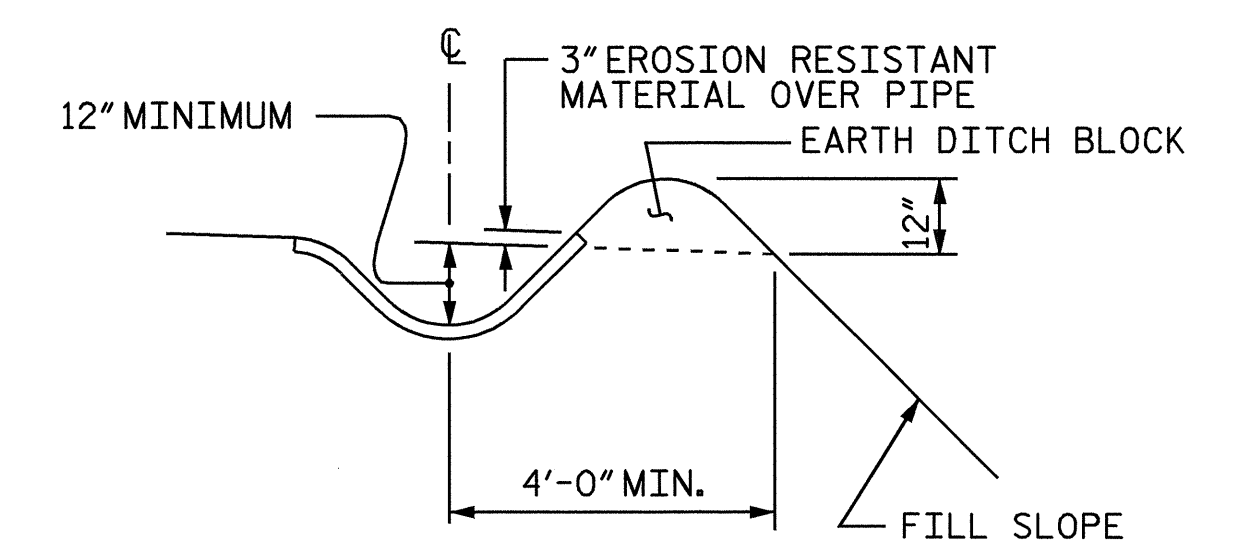


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



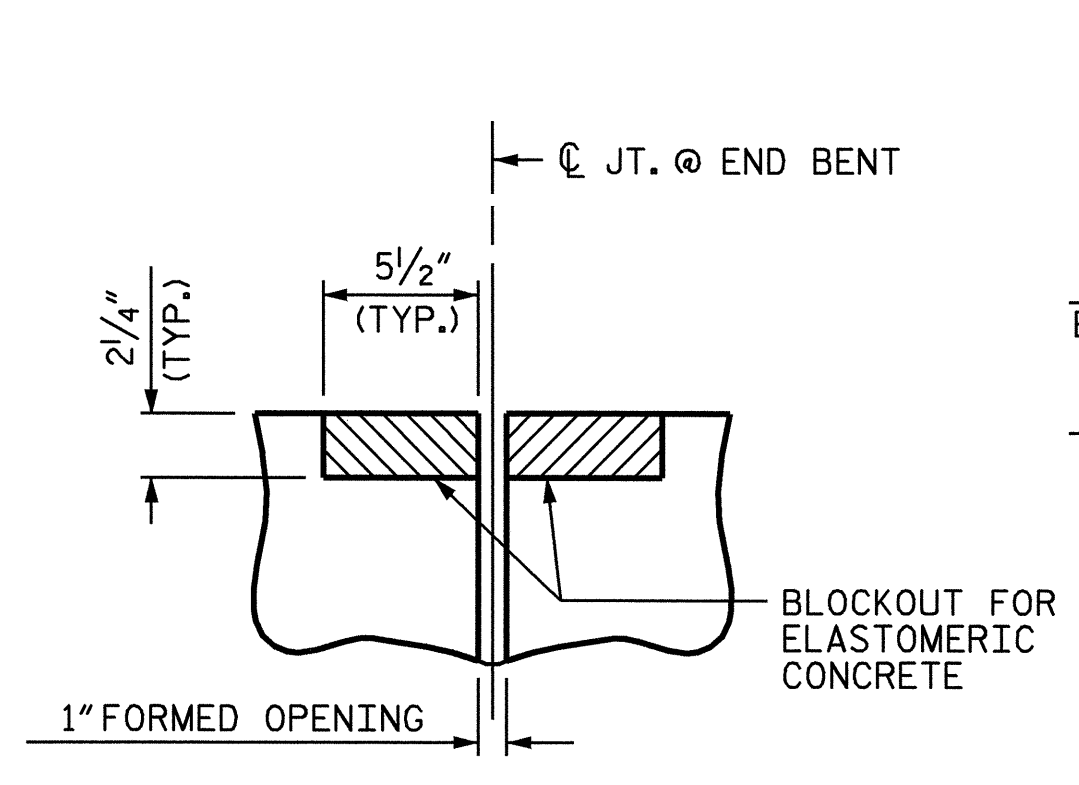
SECTION R-R



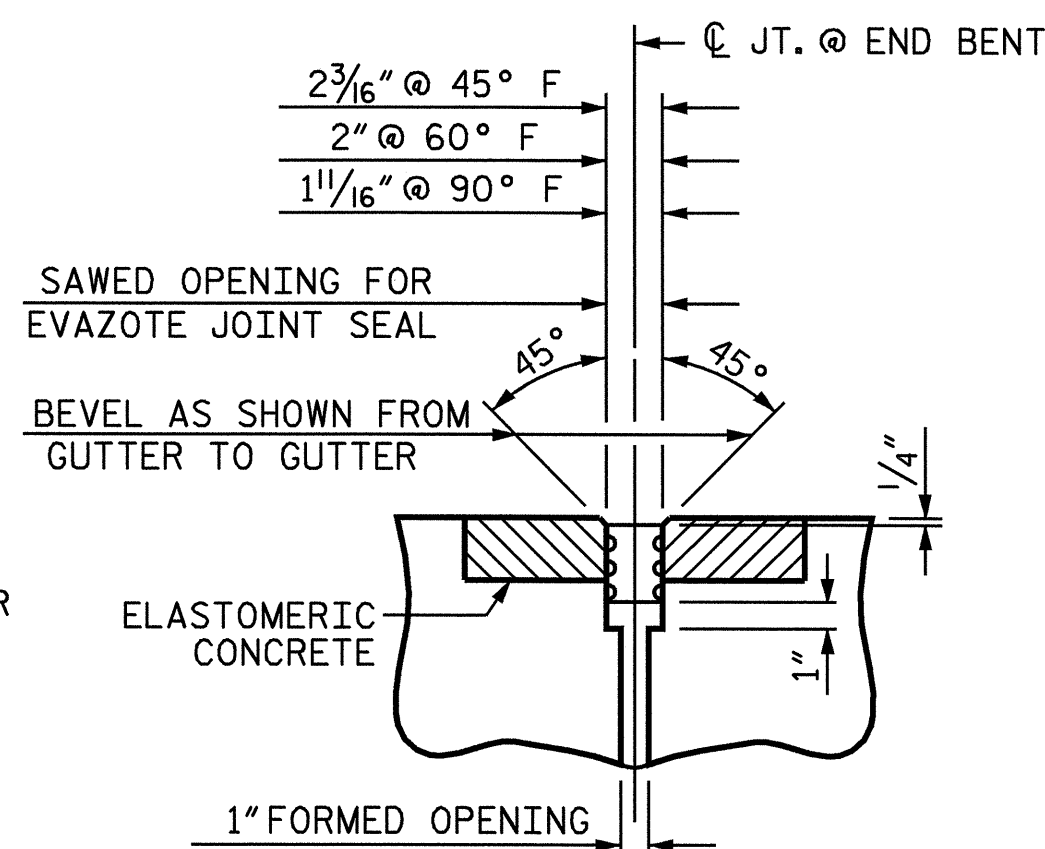
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

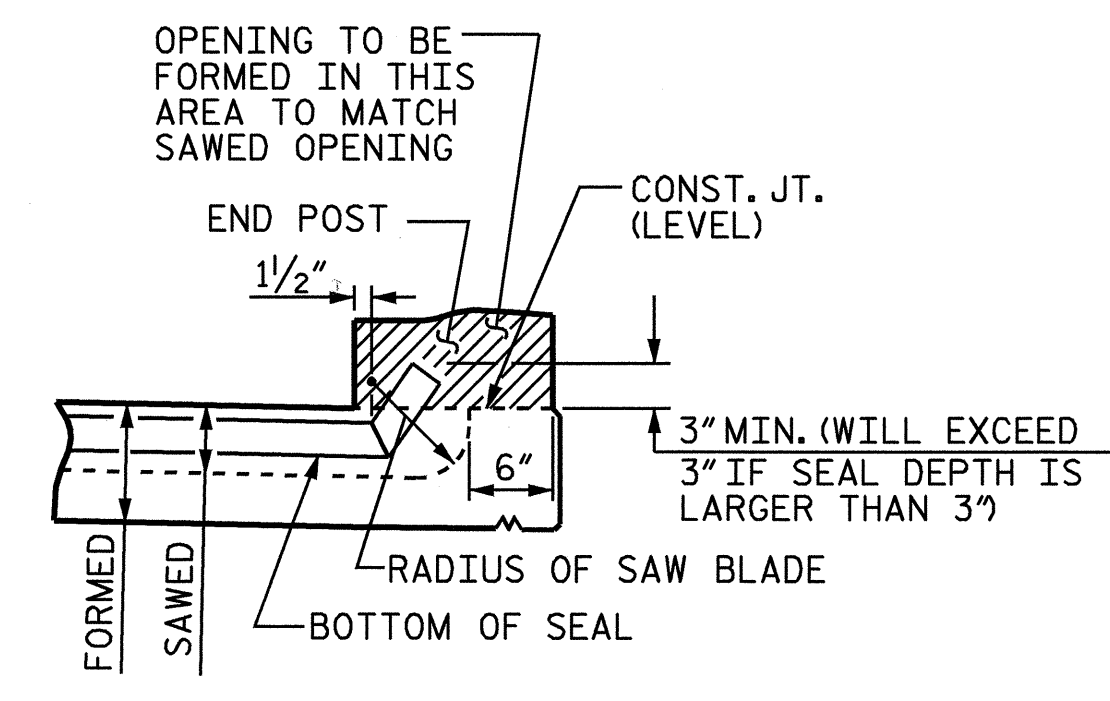
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



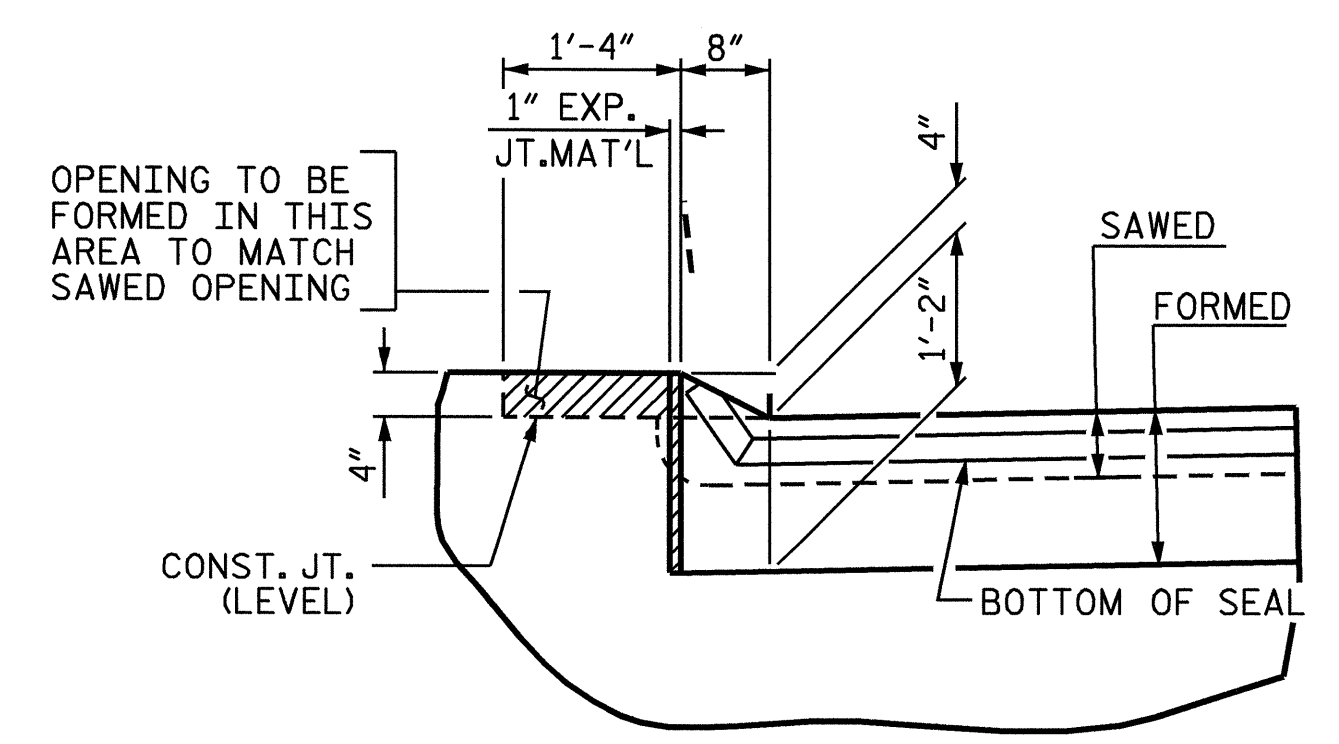
SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



SECTION C-C
EVAZOTE JOINT SEAL
(EXPANSION)

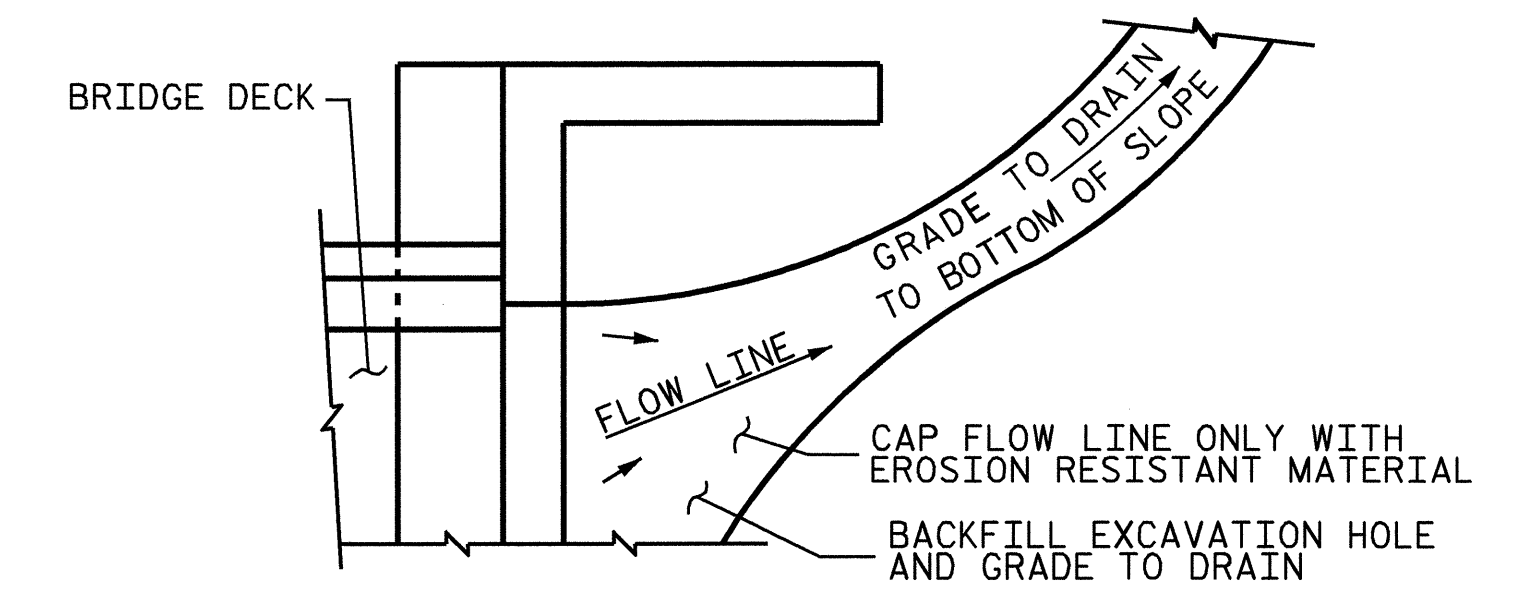


SECTION A-A



SECTION B-B

JOINT SEAL DETAILS @ END BENT
(FOR METAL RAILS WITH CURB)



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

TEMPORARY DRAINAGE DETAIL

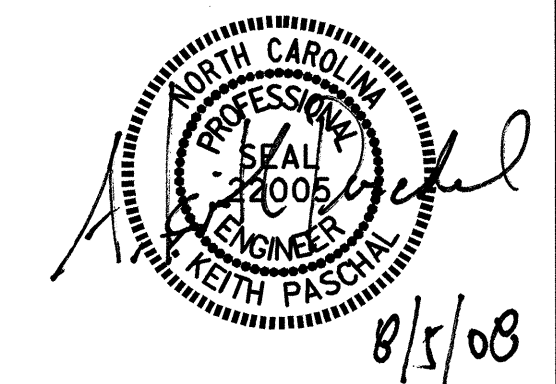
PROJECT NO. B-4258
RUTHERFORD COUNTY
STATION: 19+02.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH
SLAB DETAILS

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

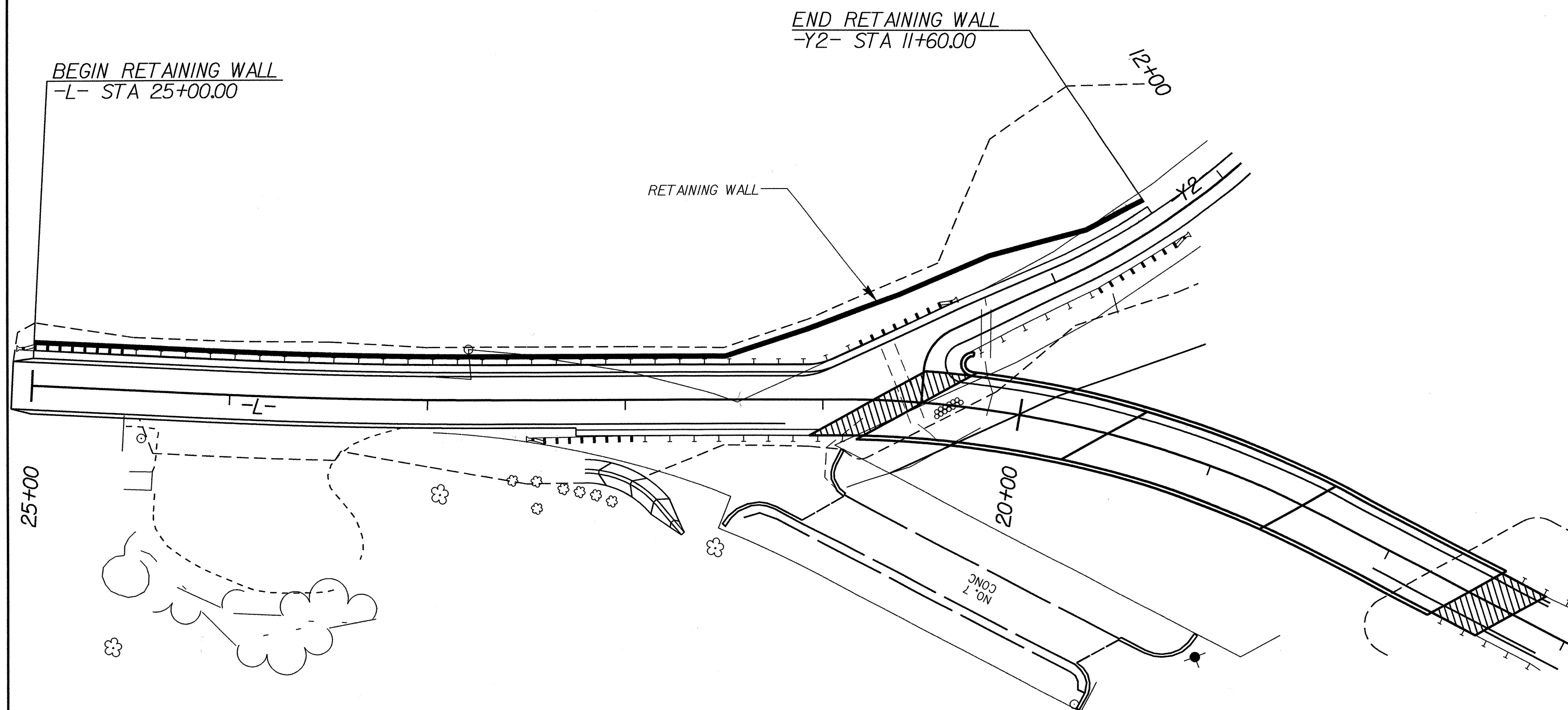


ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	7.7
2	15.4
TOTAL	23.1

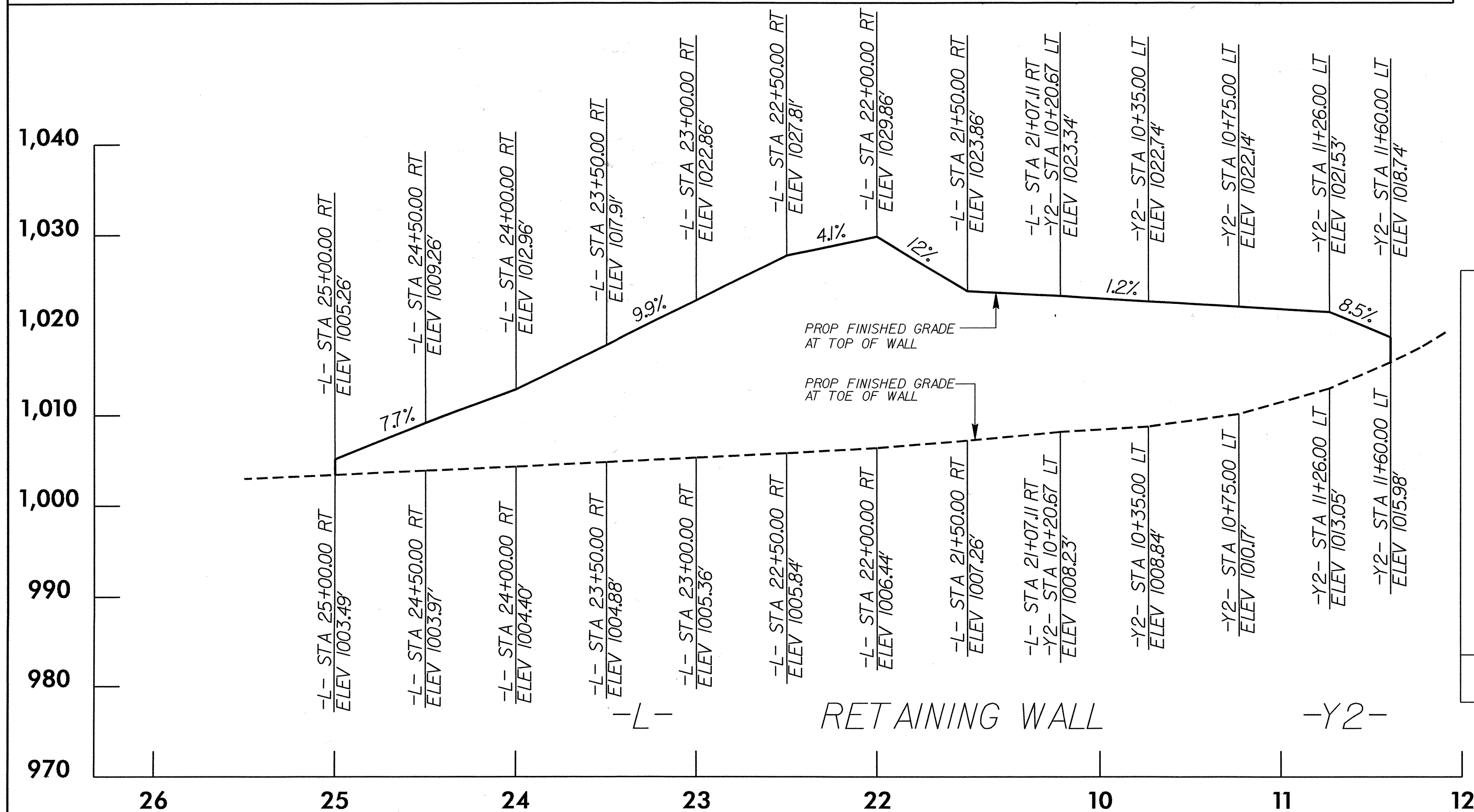
* BASED ON THE MINIMUM BLOCKOUT SHOWN.

ASSEMBLED BY : J. L. WALTON	DATE : 6-08
CHECKED BY : J. D. HAWK	DATE : 7-08
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

BM1 RR SPIKE IN 24" NEEDLE PINE STA. 28+18 -L- 77.85 FT RT.
 EL. = 998.80 FT N 628971 E 1037391



LOCATION SKETCH



RETAINING WALL

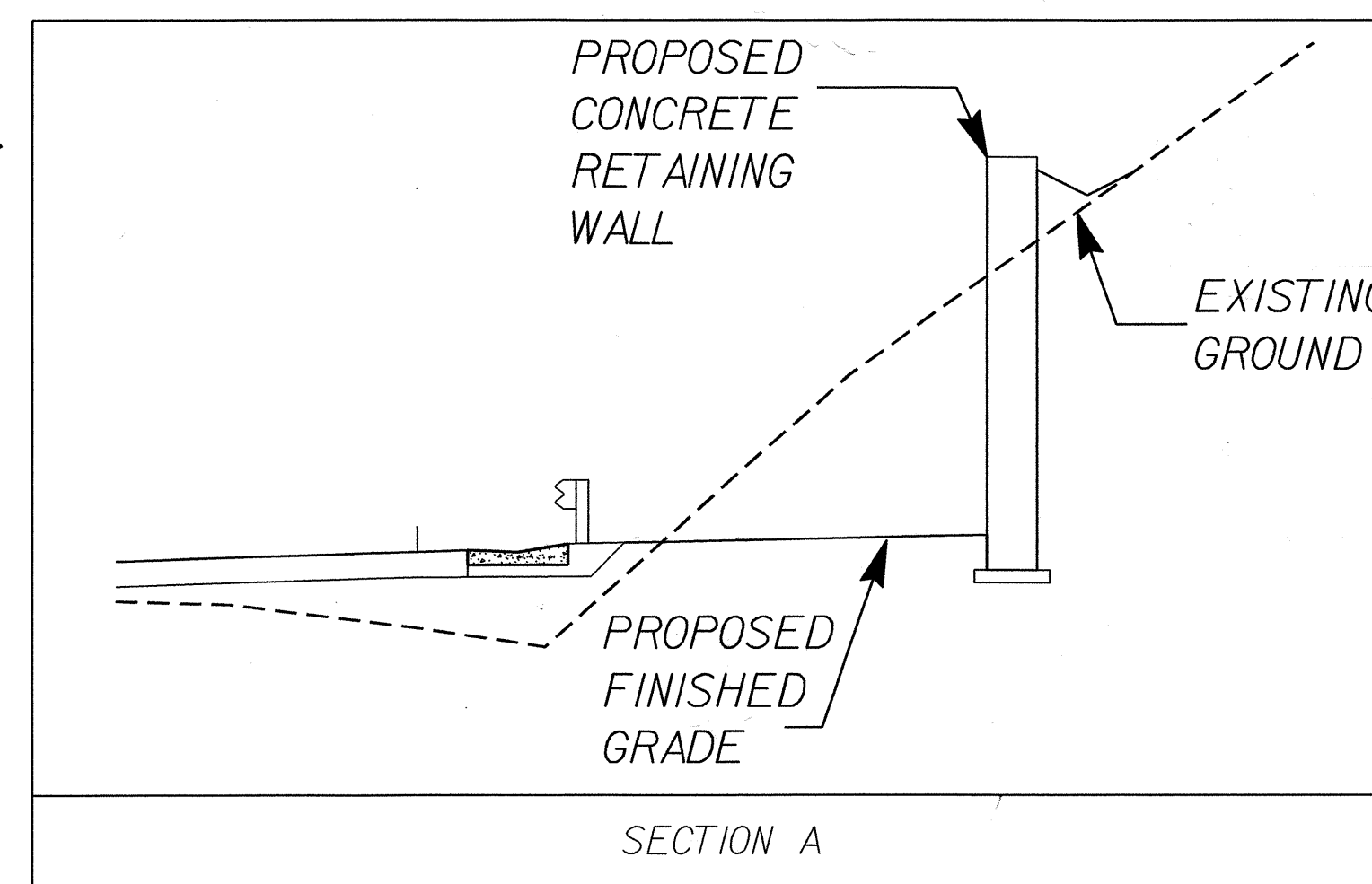
* EMBEDMENT DEPTH NOT INCLUDED IN ELEVATION TABLES.

SOIL NAIL RETAINING WALL ELEVATIONS

-Y2- STA	OFFSET FROM C (RIGHT)	ELEV @ TOP OF WALL	* PROPOSED FINISHED GRADE
10+50.00	25.75	1022.446	1009.322
11+00.00	21.00	1021.850	1011.512
11+50.00	14.00	1019.610	1015.086
11+60.00	14.00	1018.740	1015.996

SOIL NAIL RETAINING WALL ELEVATIONS

-L- STA	OFFSET FROM C (RIGHT)	ELEV @ TOP OF WALL	* PROPOSED FINISHED GRADE
21+07.11	34.75	1023.326	1008.224
21+50.00	21.00	1023.506	1007.257
22+00.00	21.00	1029.861	1006.454
22+50.00	21.00	1027.804	1005.849
23+00.00	21.00	1022.880	1005.373
23+50.00	21.00	1017.917	1004.884
24+00.00	21.00	1012.976	1004.405
24+50.00	21.00	1009.262	1003.973
25+00.00	21.00	1005.268	1003.516



TOTAL STRUCTURE QUANTITIES	
SOIL NAIL RETAINING WALLS	7815 SQ. FT.
SOIL NAIL VERIFICATION TESTS	2 EA.
SOIL NAIL PROOF TESTS	16 EA.

PROJECT NO.: B-4258
 RUTHERFORD COUNTY
 STATION: 10+50.00 -Y2- TO 11+50.00 -Y2-
 21+07.11 -L- TO 25+00.00 -L-

SOIL NAIL RETAINING WALL

PREPARED BY: J.T. WILLIAMS DATE: 02/19/08
 REVIEWED BY: S.C. CLARK DATE: 02/19/08

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

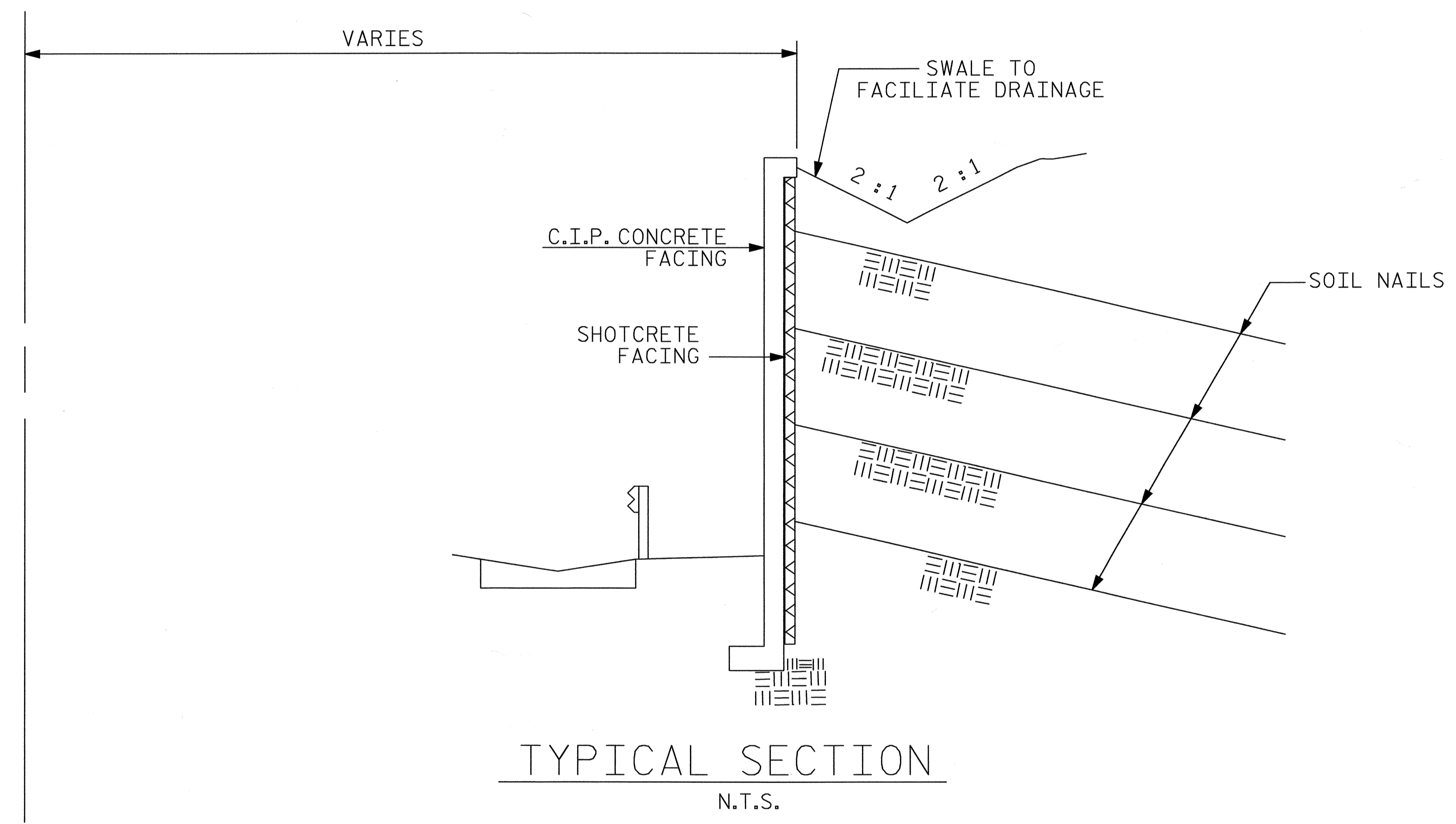
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			2

GEOTECHNICAL ENGINEER
 ENGINEER

SEAL
 29869
 ENGINEER
 SHANE C. CLARK

Signature: *S. Clark* 3/15/08
 DATE: 3/15/08

Q-L-
OR
Q-Y2-



NOTES

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS SPECIAL PROVISION.

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

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL NO. 1, 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.

A PLAIN GRAY BRUSHED FINISH IS REQUIRED ON THE FRONT FACE OF THE CONCRETE FACING FOR RETAINING WALL NO. 1.

DESIGN RETAINING WALL NO. 1 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 FOR THE FOLLOWING:

- 1) MINIMUM SERVICE LIFE = 100 YEARS
- 2) IN-SITU ASSUMED MATERIAL PARAMETERS:
 - UNIT WEIGHT OF MATERIAL, $\gamma = 120$ PCF
 - FRICTION ANGLE, $\phi = 30$ DEGREES
 - COHESION, $c = 0$ PSF

PROJECT NO.: B-4258
RUTHERFORD COUNTY
STATION: 11+60-Y2- TO 11+20-Y2-
SHEET 2 OF 2 21+07.11-L- TO 25+00 -L-

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL #1
SOIL NAIL WALL

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

PREPARED BY: E.J. SALVO	DATE: 08/07/06
REVIEWED BY: S.C. CLARK	DATE: 1/15/08

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN