

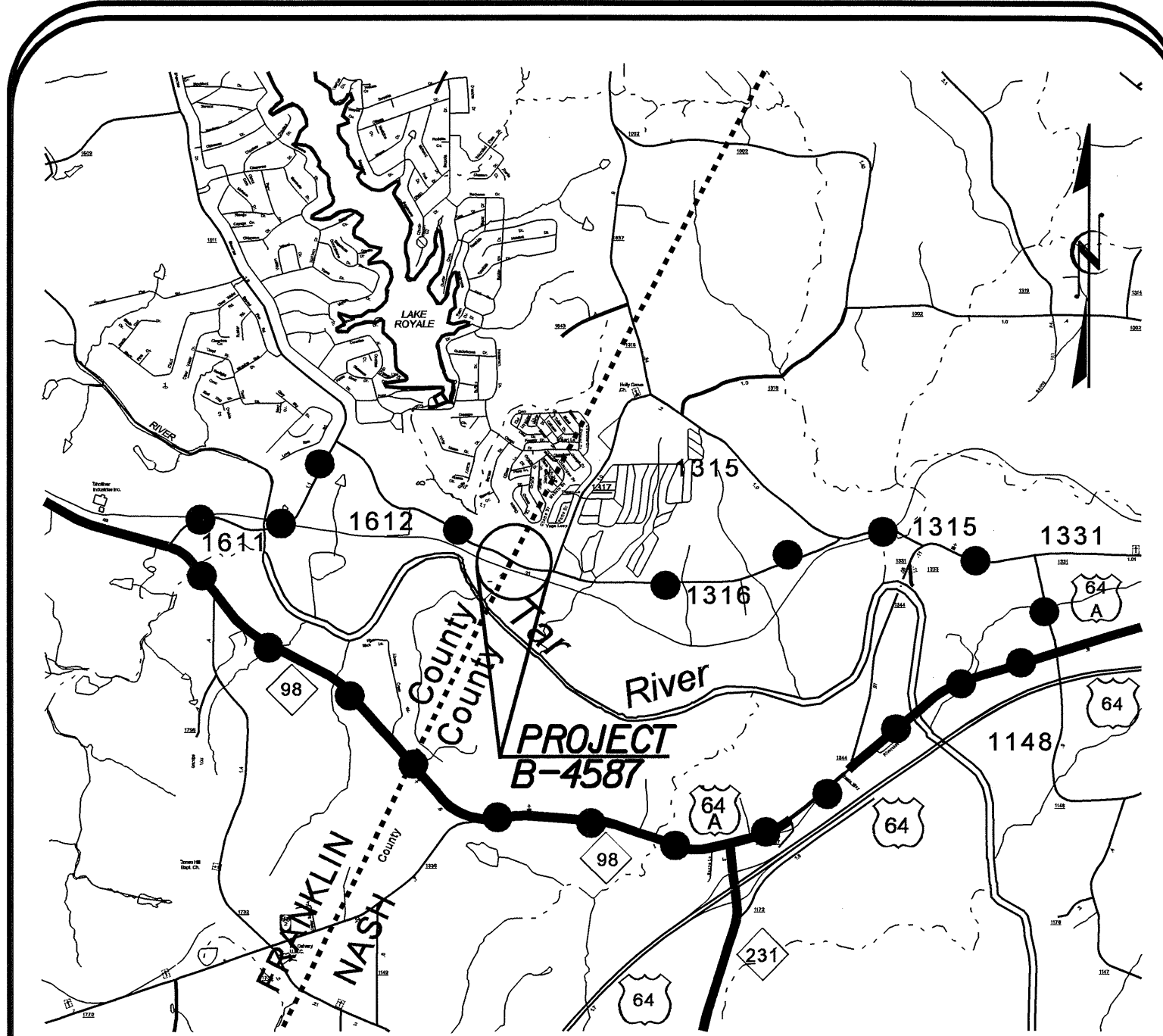
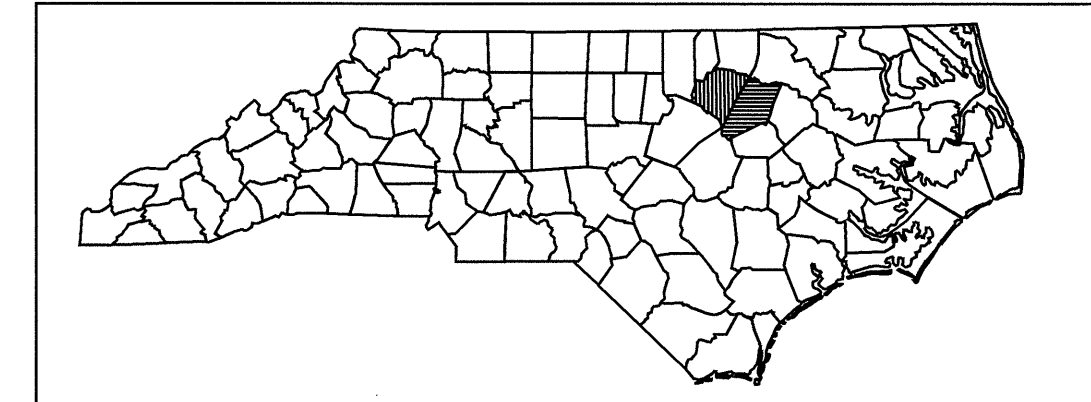
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**NASH / FRANKLIN COUNTIES**

LOCATION: BRIDGE 82 OVER CYPRESS CREEK ON SR 1316

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

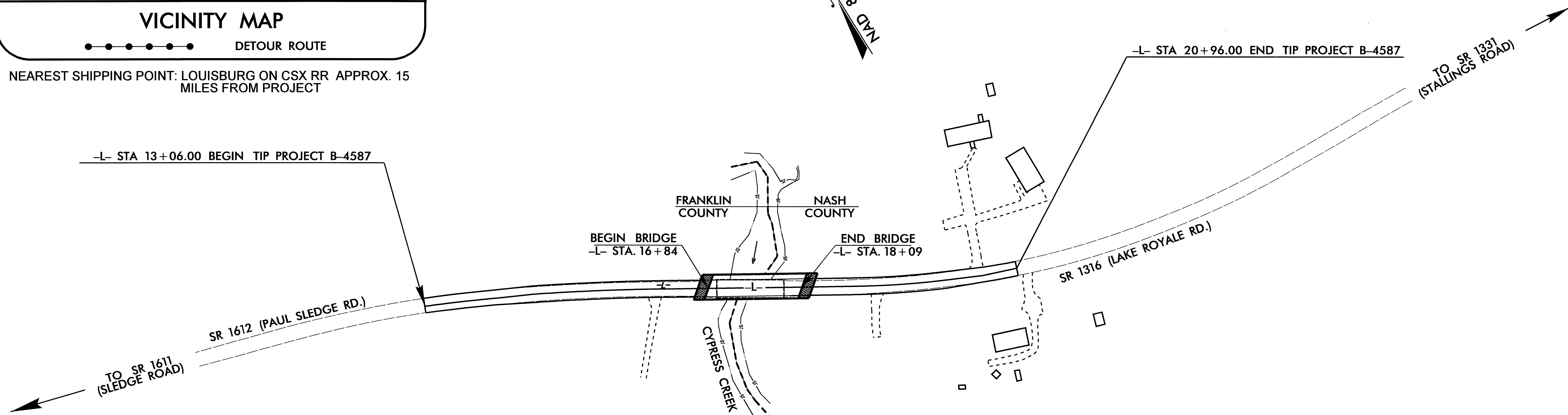
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4587		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33787.1.1	BRZ-1316 (4)	PE	
33787.2.1	BRZ-1316 (4)	RW & UTIL.	
33787.3.STI	STM-1316 (12)	CONST.	



VICINITY MAP

●●●●●●●● DETOUR ROUTE

NEAREST SHIPPING POINT: LOUISBURG ON CSX RR APPROX. 15 MILES FROM PROJECT



**STRUCTURE**

**DESIGN DATA**

ADT 2006 =	554
ADT 2030 =	1,200
DHV =	10 %
D =	60 %
T =	3 % *
V =	50 MPH
* TTST 1% DUAL 2%	
FUNC. CLASS =	LOCAL

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-4587 =	0.126 MI.
LENGTH OF STRUCTURE TIP PROJECT B-4587 =	0.024 MI.
TOTAL LENGTH OF TIP PROJECT B-4587 =	0.150 MI.

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

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2006 STANDARD SPECIFICATIONS

<b>LETTING DATE:</b> AUGUST 18, 2009	<b>N. N. BULLOCK, PE</b> PROJECT ENGINEER
	<b>D. R. CALHOUN, PE</b> PROJECT DESIGN ENGINEER

**STRUCTURE DESIGN UNIT**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

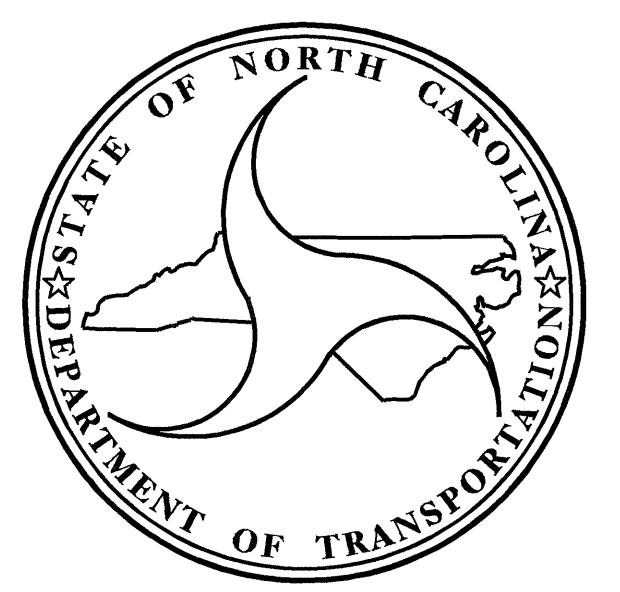
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STATE DESIGN ENGINEER  
**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

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APPROVED  
DIVISION ADMINISTRATOR

P.E.  
DATE



CONTRACT: C202160 TIP PROJECT: B-4587

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gallen

16+50

17+00

17+50

18+00

GRADE DATA

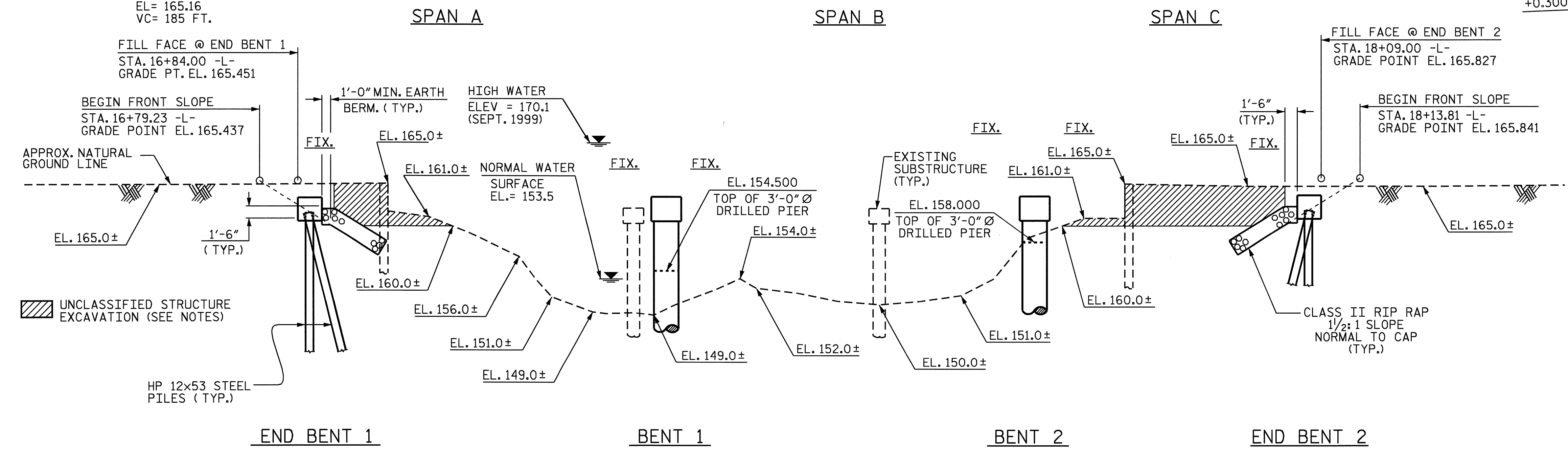
-1.1387 %  $\nabla$  +0.3003 %

PI= 15+87.00 -L-  
EL= 165.16  
VC= 185 FT.

GRADE DATA

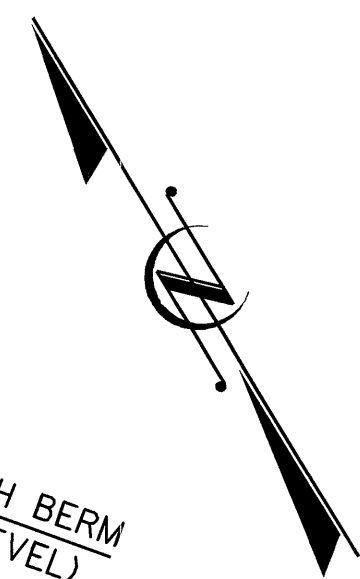
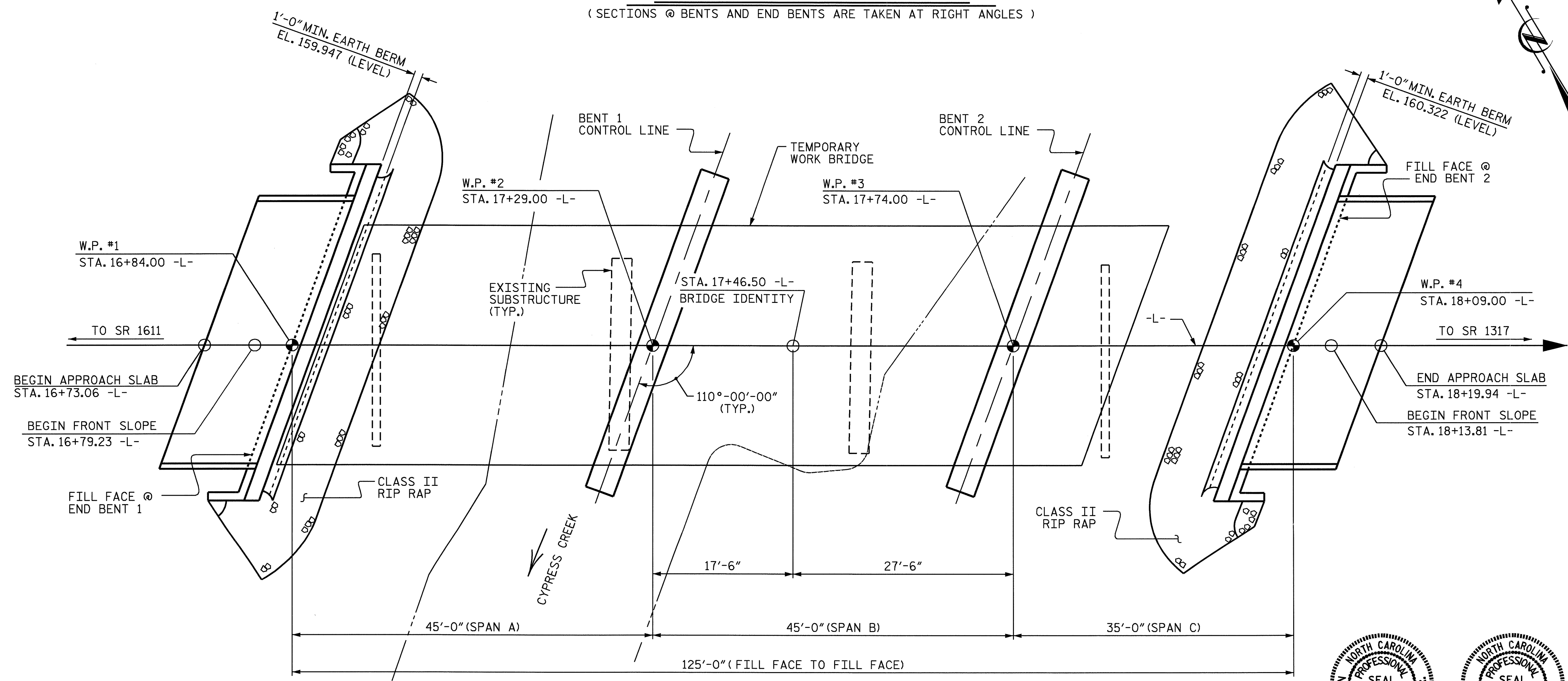
+0.3003 %  $\nabla$  +1.7333 %

PI= 19+10.00 -L-  
EL= 166.13  
VC= 175 FT.



SECTION ALONG -L-

(SECTIONS @ BENTS AND END BENTS ARE TAKEN AT RIGHT ANGLES)

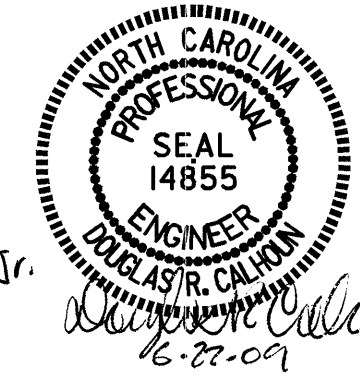
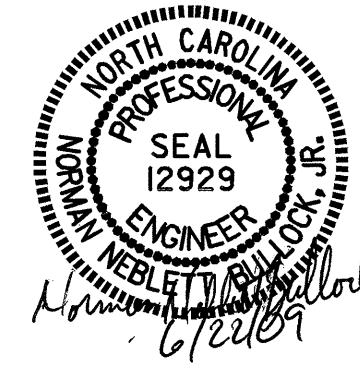


PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE No. 82

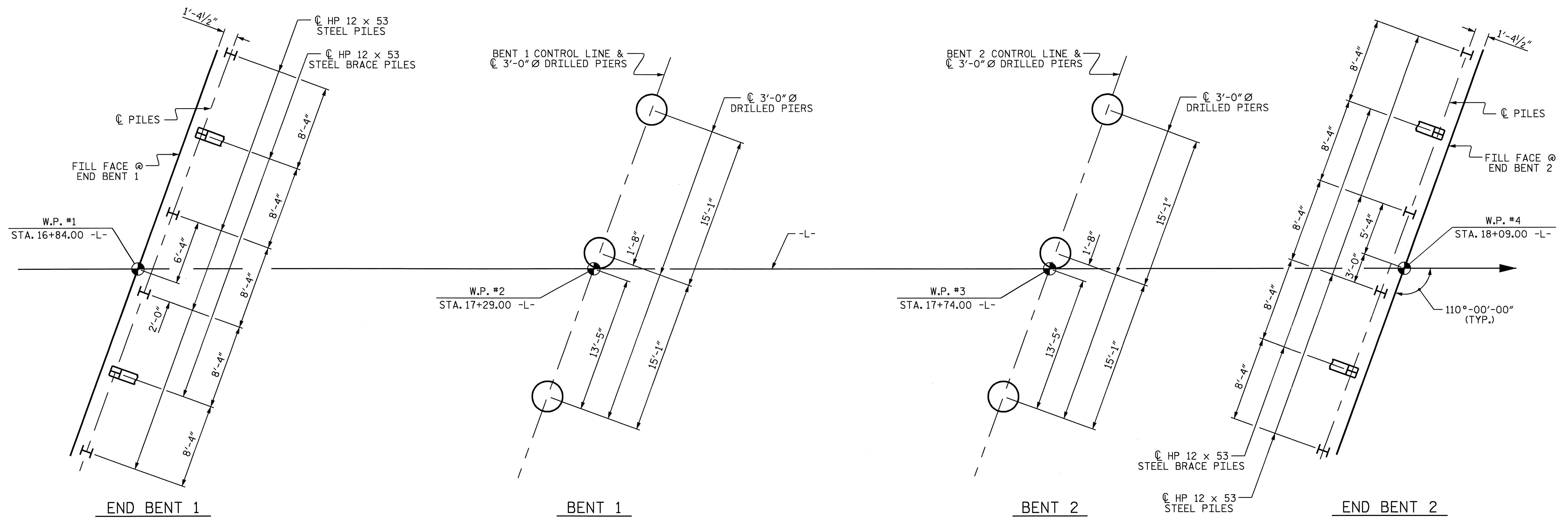
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON SR 1316  
 OVER CYPRESS CREEK  
 BETWEEN SR 1611 AND SR 1317



DRAWN BY : B.N. GRADY DATE : 2/2/09  
 CHECKED BY : J.L. WALTON DATE : 4/15/09

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



### FOUNDATION LAYOUT

(DIMENSIONS LOCATING END BENT PILES AND BENT DRILLED PIERS ARE SHOWN TO CENTERLINE PILES AND DRILLED PIERS)

### FOUNDATION NOTES:

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT 1 AND BENT 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 90 TSF.

DRILLED PIERS AT BENT 1 AND BENT 2 ARE DESIGNED FOR AN APPLIED LOAD OF 250 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2. DO NOT EXTEND CASING BELOW ELEVATION 144.4 FT. AND 146.0 FT. RESPECTIVELY WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 AND BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 138 FT. AND 140 FT. RESPECTIVELY AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATIONS FOR BENT 1 AND BENT 2 ARE 142 FT. AND 145 FT. RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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

INTEGRITY TESTING MAY BE REQUIRED FOR DRILLED PIERS. IF REQUIRED AND AFTER DRILLED PIER CONCRETE ACHIEVES 3000 PSI COMPRESSIVE STRENGTH, PROVIDE ACCESS TO AND PREPARE TOP OF PIERS AS DIRECTED BY THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR AND PERFORM INTEGRITY TESTING. DO NOT CONSTRUCT COLUMNS OR FOOTINGS ON TOP OF PIERS THAT ARE TESTED UNTIL TEST RESULTS ARE ACCEPTABLE. PAYMENT FOR COSTS ASSOCIATED WITH INTEGRITY TESTING WILL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE OF THE DRILLED PIERS.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

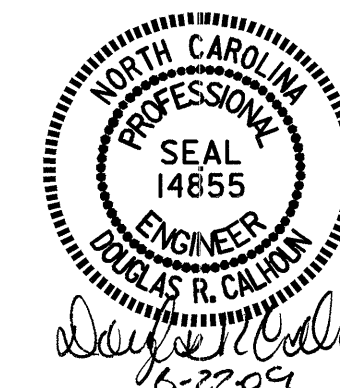
THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT 1 AND END BENT 2 IS 60 TONS PER PILE.

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON SR 1316  
 OVER CYPRESS CREEK  
 BETWEEN SR 1611 AND SR 1317



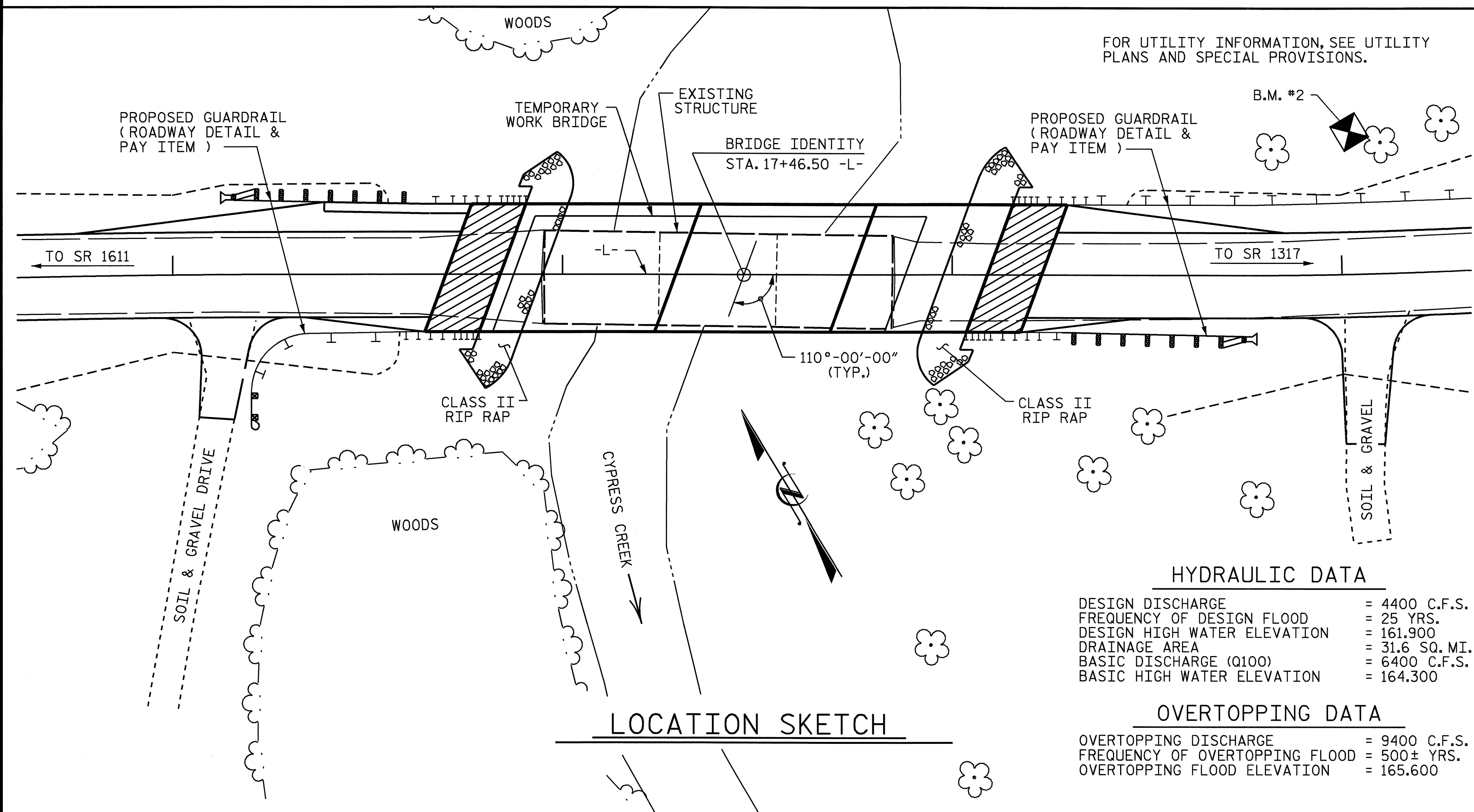
DRAWN BY : B.N. GRADY DATE : 2/22/09  
 CHECKED BY : J.L. WALTON DATE : 4/15/09

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



B.M. #2 : R. R. SPIKE IN BASE OF 10" OAK TREE 36.62' LT. STA. 19+02.72 -L- EL. 165.18



**HYDRAULIC DATA**

DESIGN DISCHARGE	=	4400 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	161.900
DRAINAGE AREA	=	31.6 SQ. MI.
BASIC DISCHARGE (Q100)	=	6400 C.F.S.
BASIC HIGH WATER ELEVATION	=	164.300

**OVERTOPPING DATA**

OVERTOPPING DISCHARGE	=	9400 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500± YRS.
OVERTOPPING FLOOD ELEVATION	=	165.600

**NOTES:**

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT CORED SLAB UNITS HAVE BEEN DESIGNED FOR HS25.

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.

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 35 FT. LEFT AND 30 FT. RIGHT 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 EXISTING STRUCTURE CONSISTING OF THREE (2 @ 31'-0", 1 @ 30'-0") PRESTRESSED CONCRETE CHANNEL SPANS WITH A CLEAR ROADWAY WIDTH OF 24'-2" SUPPORTED BY CONCRETE CAP ON TIMBER PILE END BENTS, AND BENTS (BENT 1 WITH STEEL CRUTCH BENT), AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

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

A TEMPORARY WORK BRIDGE SHALL BE PERMITTED FOR CONSTRUCTION OF BRIDGE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 17+46.50 -L-.

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

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" DIA. DRILLED PIERS IN SOIL	3'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER	SID INSPECTION	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		
												NO.	LIN. FT.					NO.	LIN. FT.	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	
SUPERSTRUCTURE									LUMP SUM					245.21				LUMP SUM	36	1468.00
END BENT 1							LUMP SUM	15.6		2307		6	120		59	65				
BENT 1			30.50	19.00	30.30			22.1		7579	1279									
BENT 2			33.00	21.00	36.00			19.5		7283	1165									
END BENT 2							LUMP SUM	15.6		2306		6	90		61	68				
<b>TOTAL</b>	LUMP SUM	LUMP SUM	63.50	40.00	66.30	1	LUMP SUM	72.8	LUMP SUM	19,475	2444	12	210	245.21	120	133	LUMP SUM	36	1468.00	

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

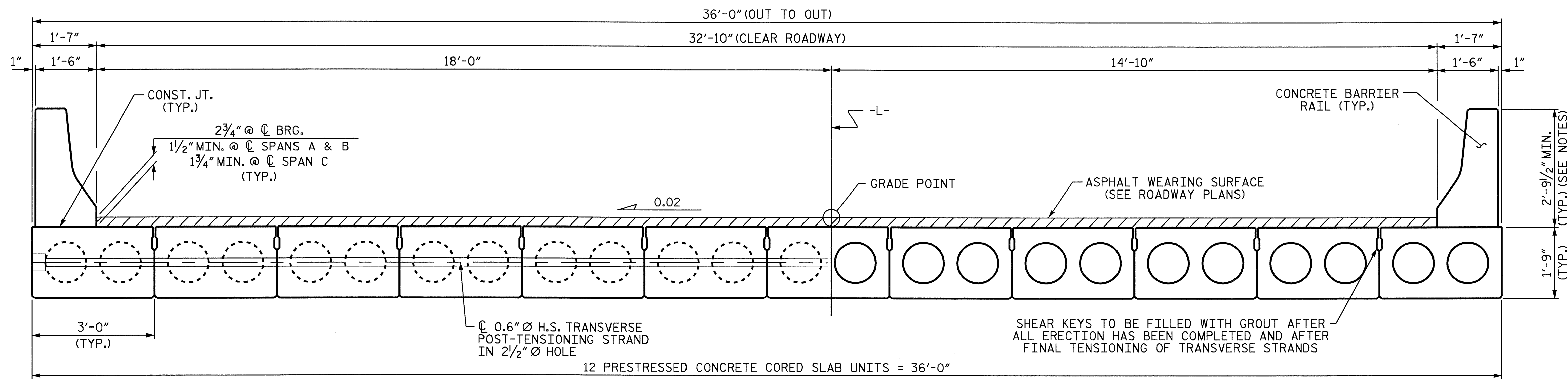
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1316  
 OVER CYPRESS CREEK  
 BETWEEN SR 1611 AND SR 1317

REVISIONS						SHEET NO. <b>S-3</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS <b>21</b>
2			4			



DRAWN BY : B.N. GRADY DATE : 2/2/09  
 CHECKED BY : J.L. WALTON DATE : 4/15/09

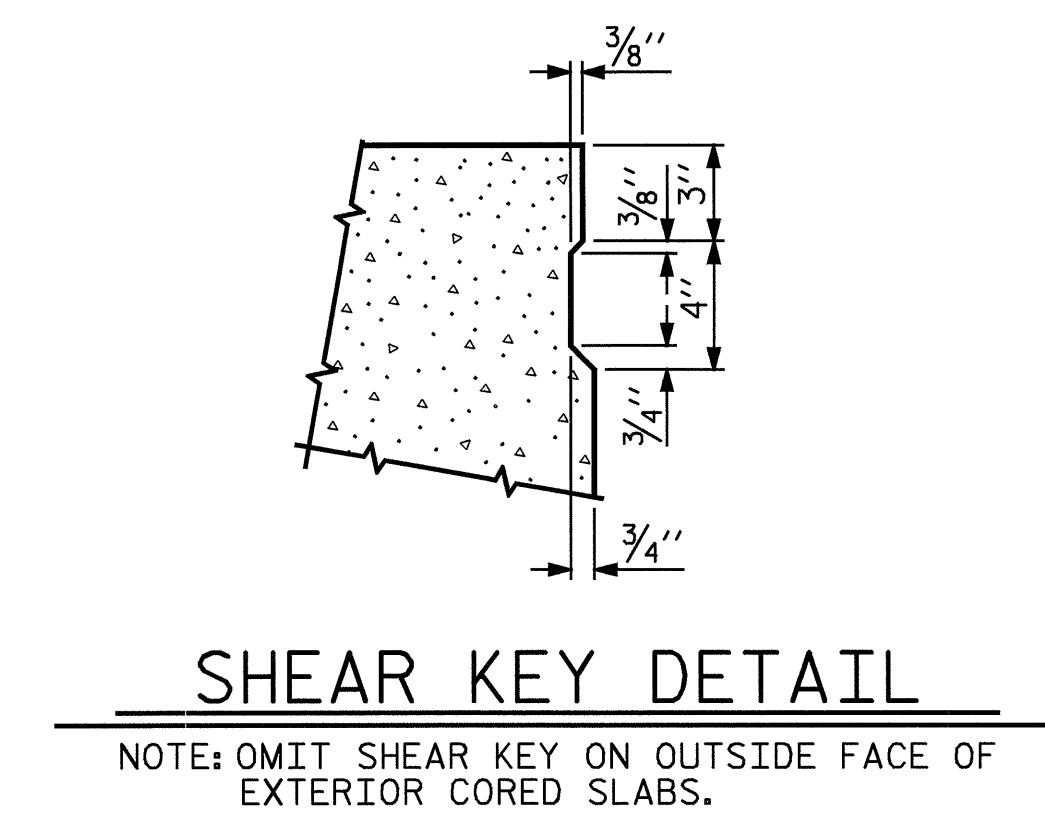
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AT INTERMEDIATE DIAPHRAGMS

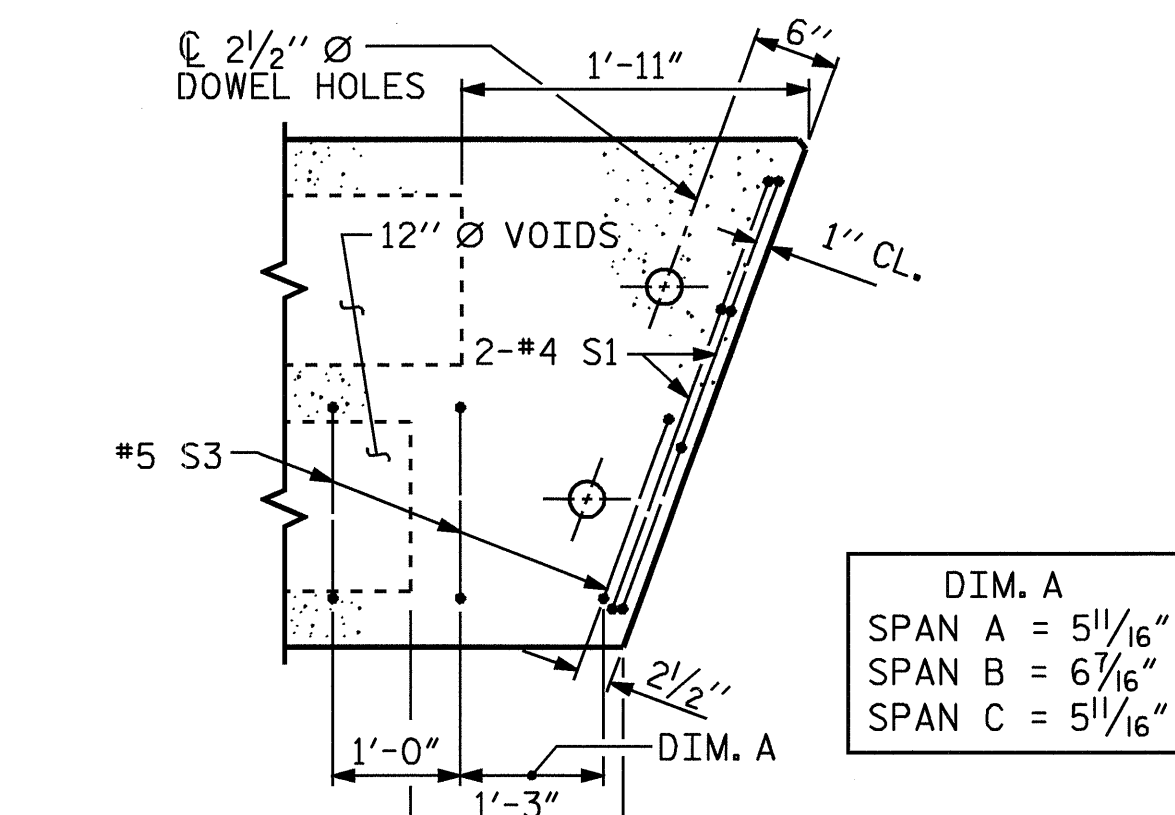
AT 12" Ø VOIDS

TYPICAL SECTION



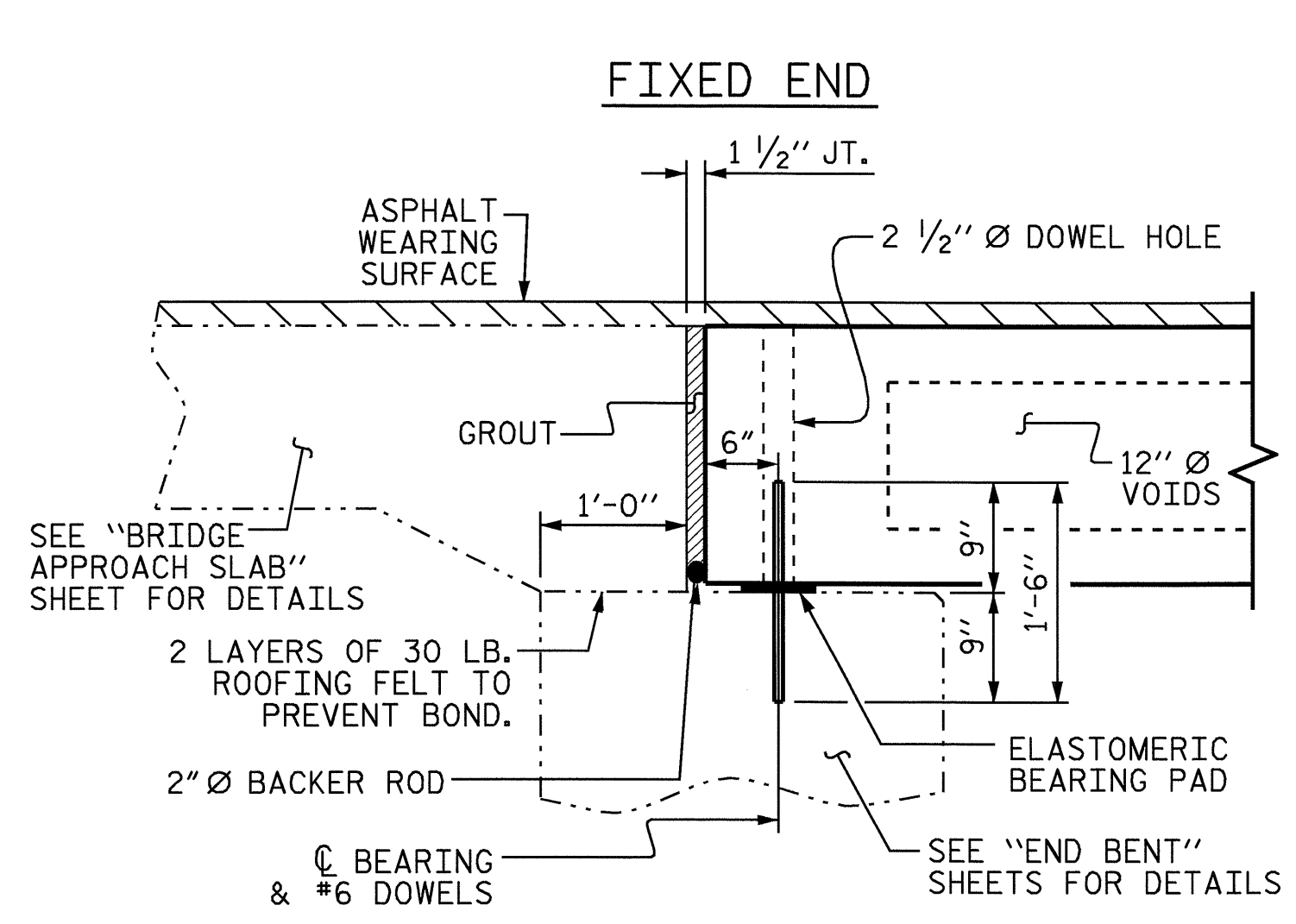
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

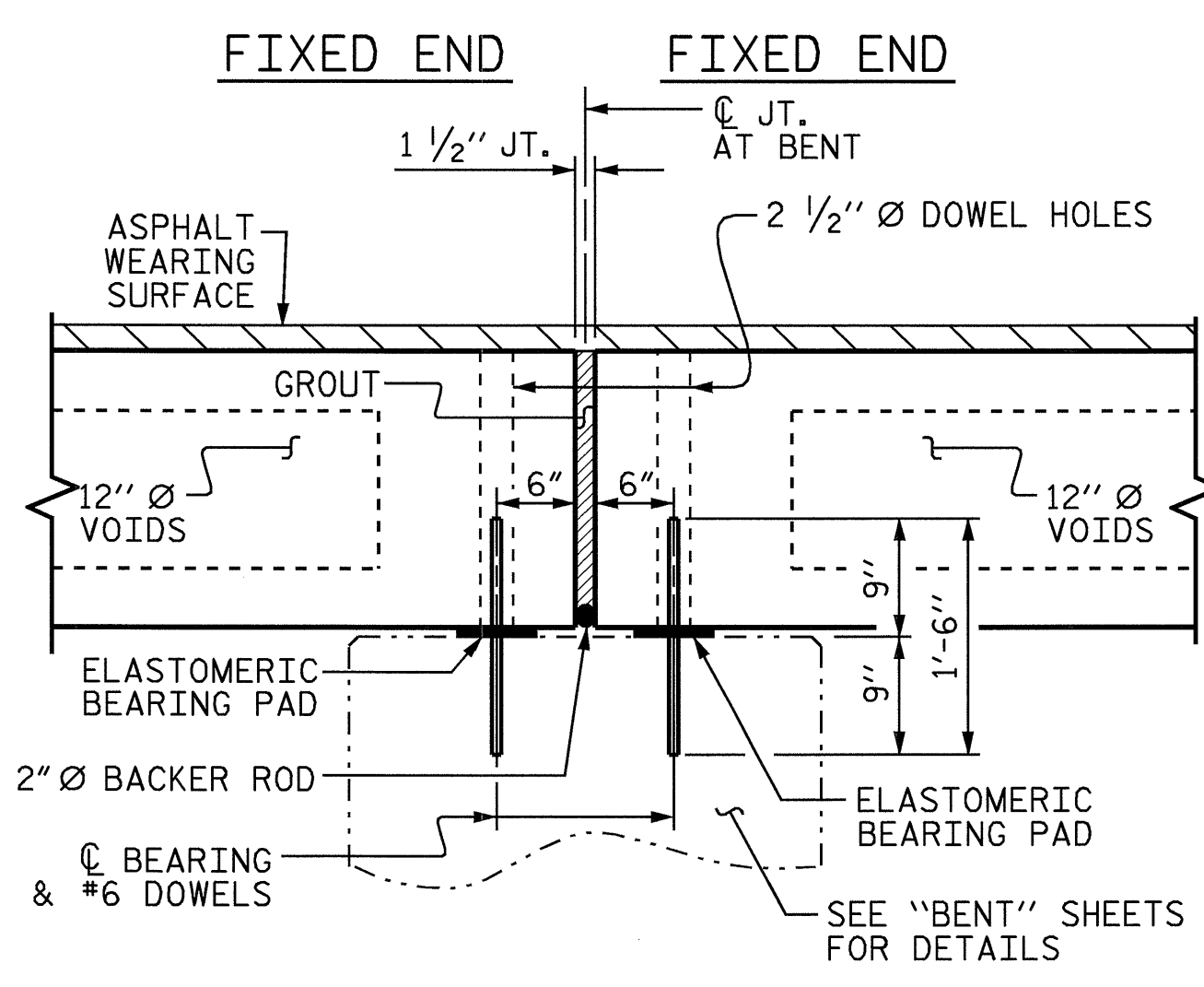


PART PLAN - EXTERIOR SECTION

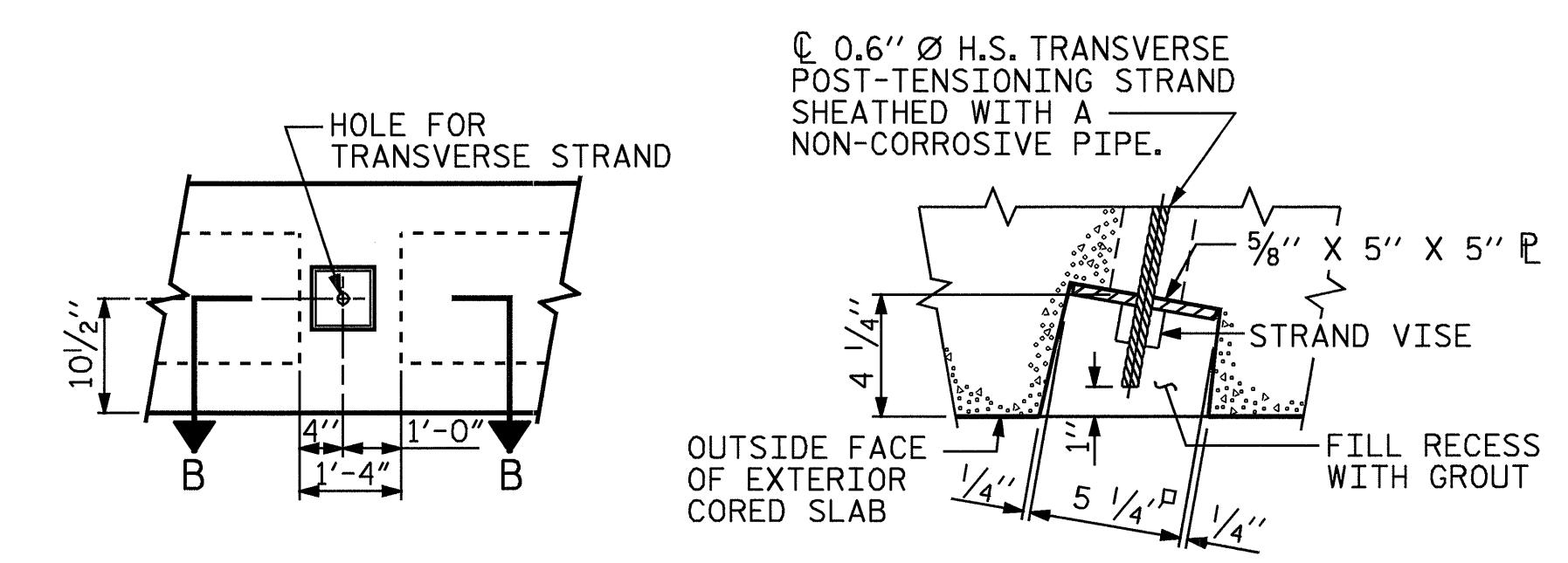
NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.



SECTION AT END BENT



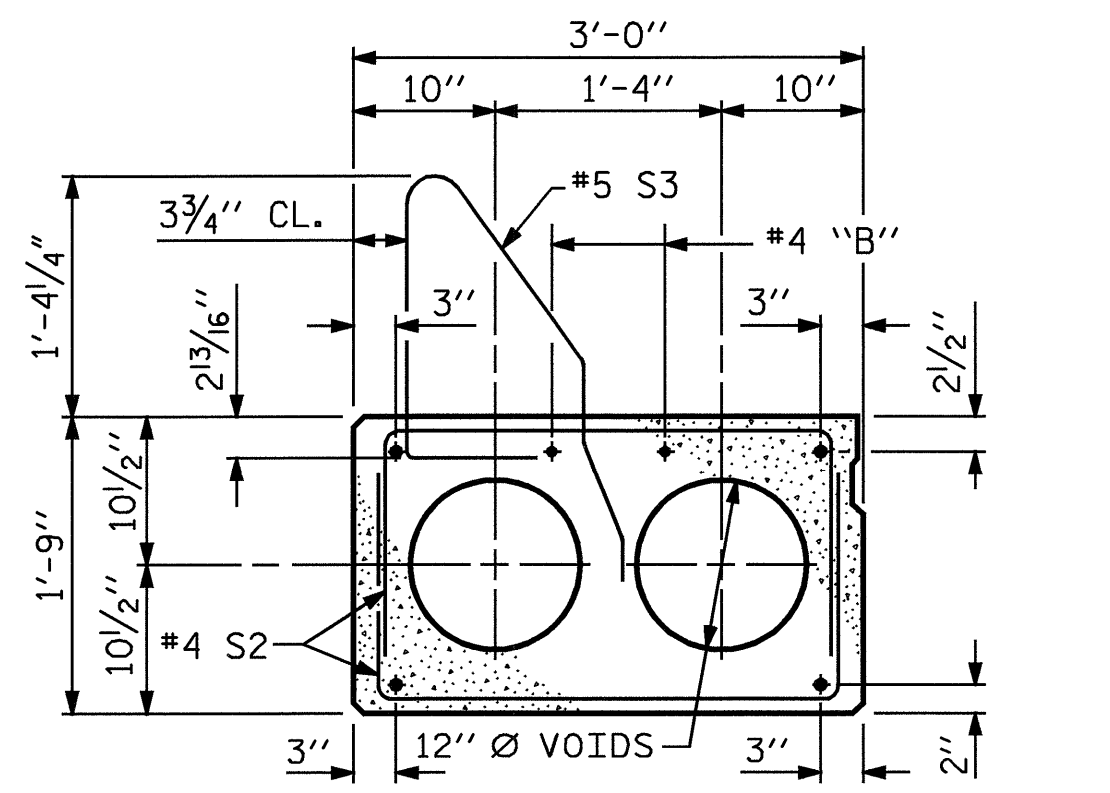
SECTION AT BENT



ELEVATION VIEW

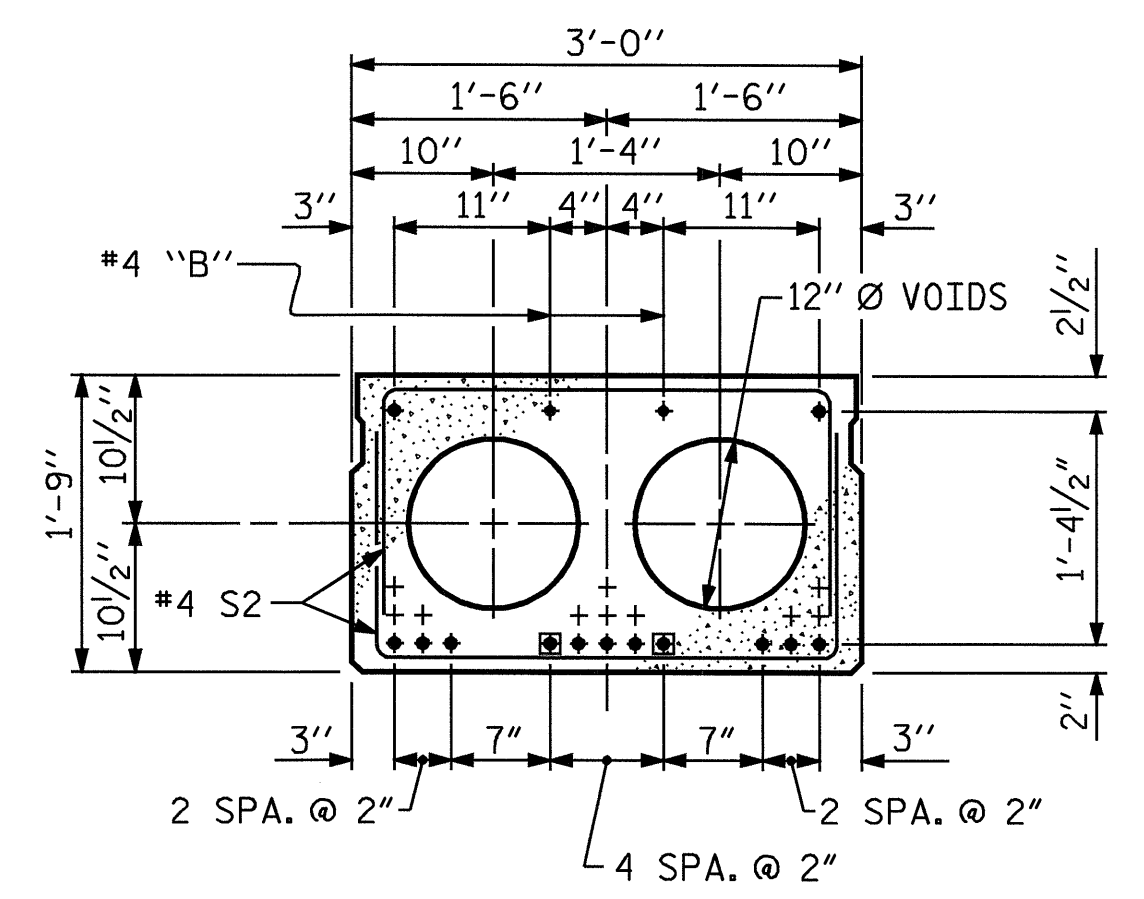
SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



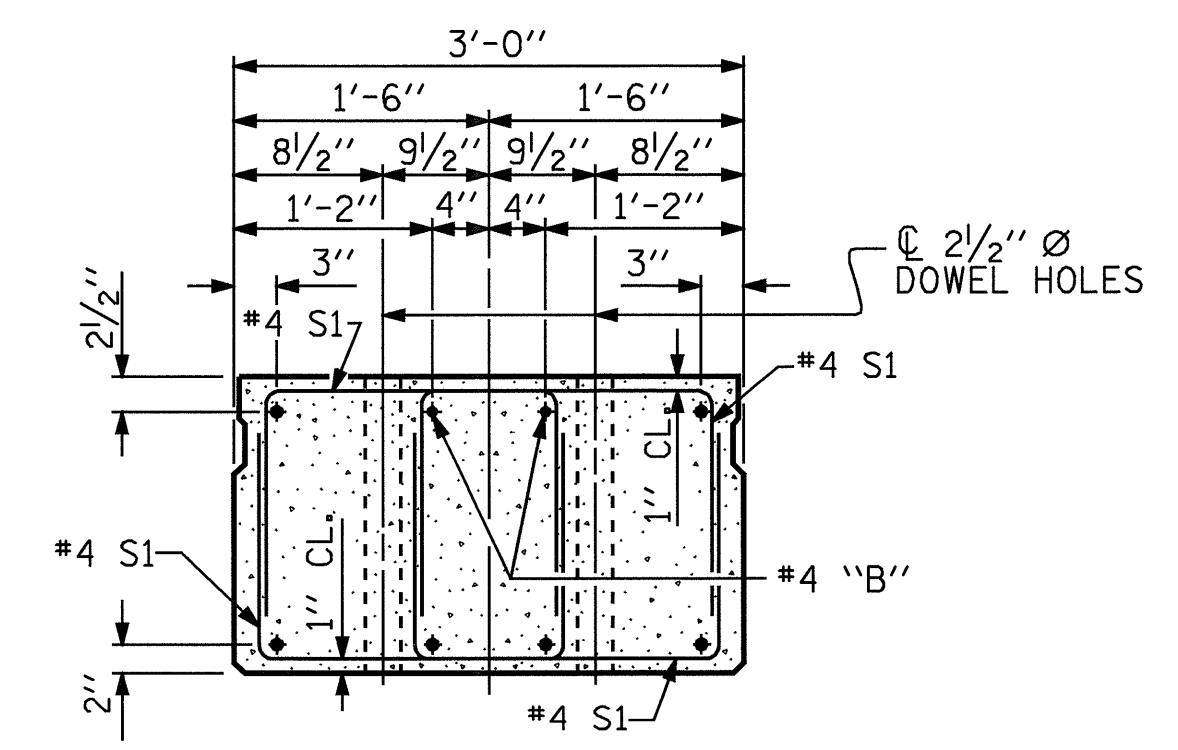
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION

0.6" Ø LOW RELAXATION STRAND LAYOUT

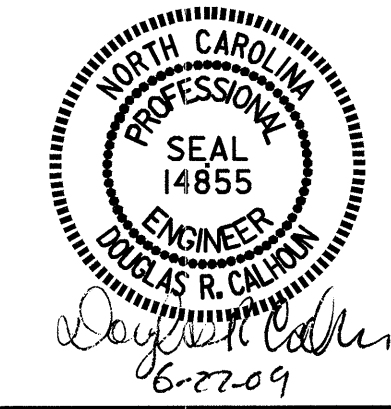


END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN). INTERIOR SLAB SECTION SHOWN - EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.

■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

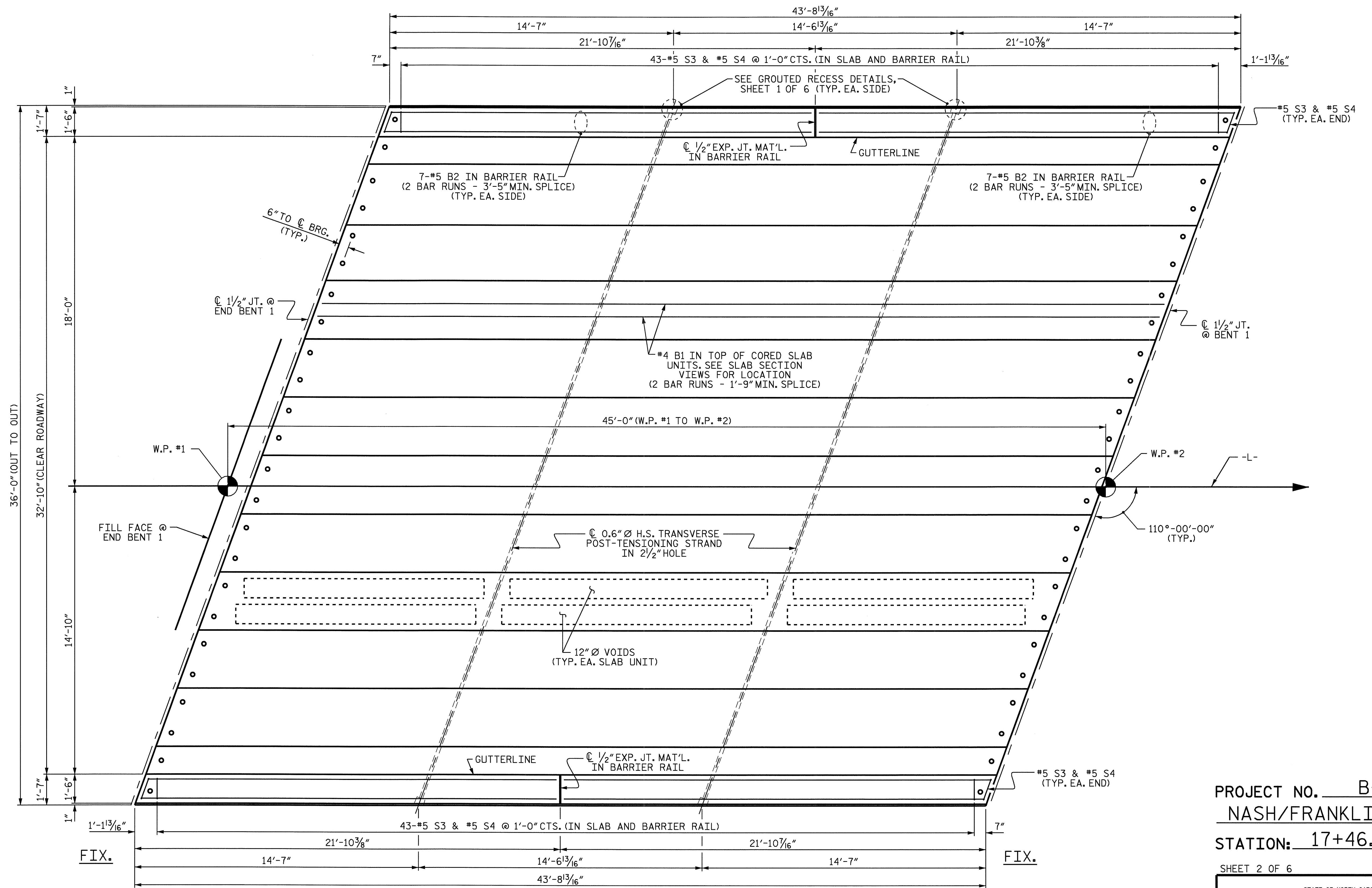
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CHECKED BY : J.L. WALTON	DATE : 3/24/09
DRAWN BY : WJH 4/89	REV. 10/17/00 RWW/LES
CHECKED BY : FCJ 5/89	REV. 7/10/01RR RWW/LES
	REV. 5/1/06 TLA/GM



PROJECT NO. B-4587  
 NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD			
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO. S-4			TOTAL SHEETS 21

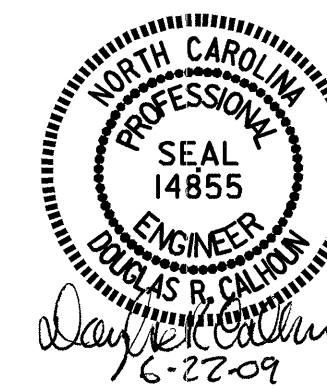


**PLAN OF SPAN A**  
 (FOR ADDITIONAL REINFORCING STEEL IN CORED SLAB, SEE SHEET 5 OF 6)

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-  
 SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN A

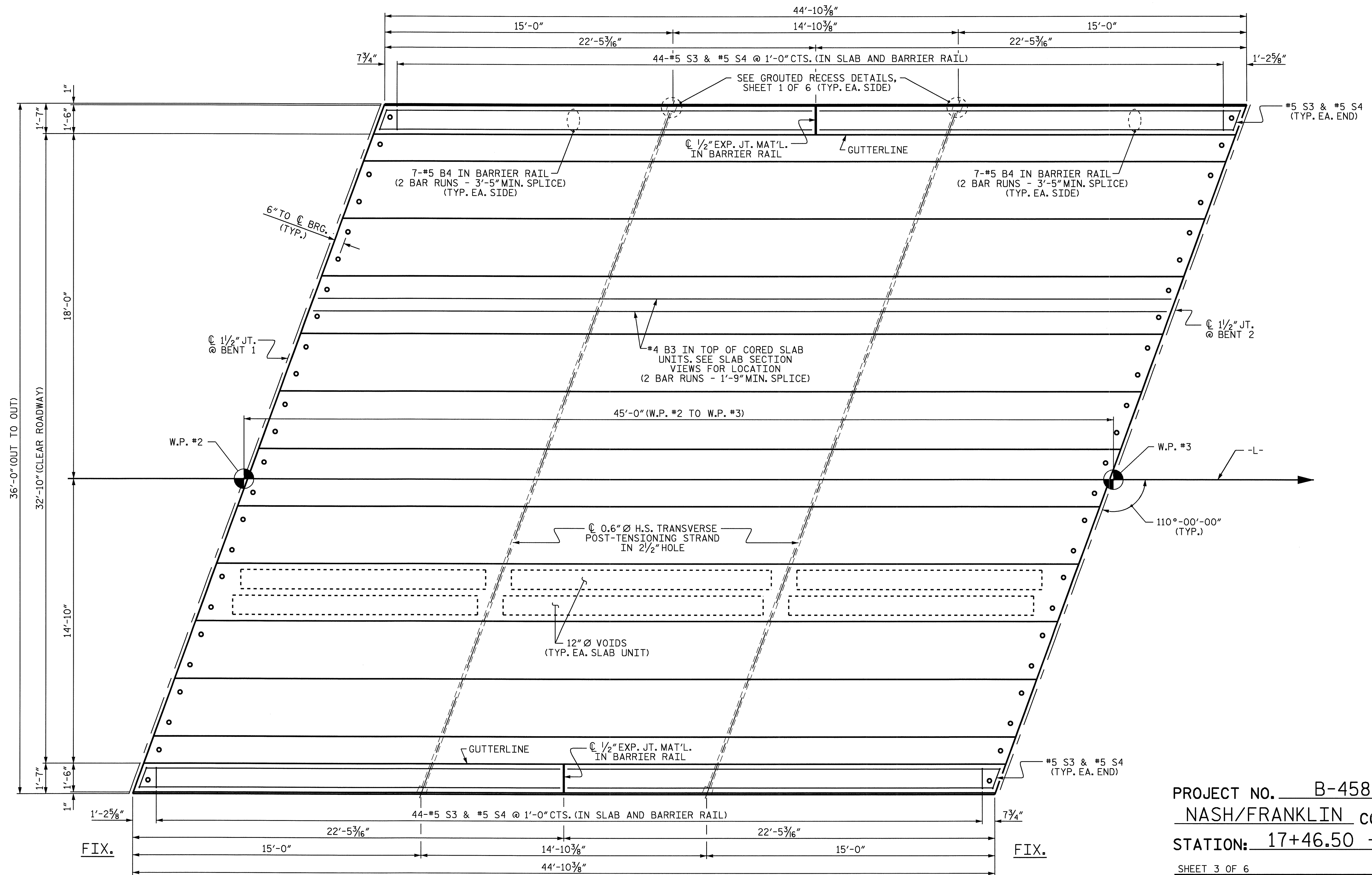


DRAWN BY : B.N. GRADY DATE : 2/16/09  
 CHECKED BY : J.L. WALTON DATE : 3/24/09

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REVISIONS						SHEET NO. <b>S-5</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 21
2			4			





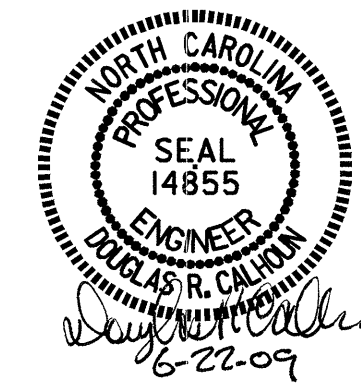
**PLAN OF SPAN B**

(FOR ADDITIONAL REINFORCING STEEL IN CORED SLAB, SEE SHEET 5 OF 6)

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

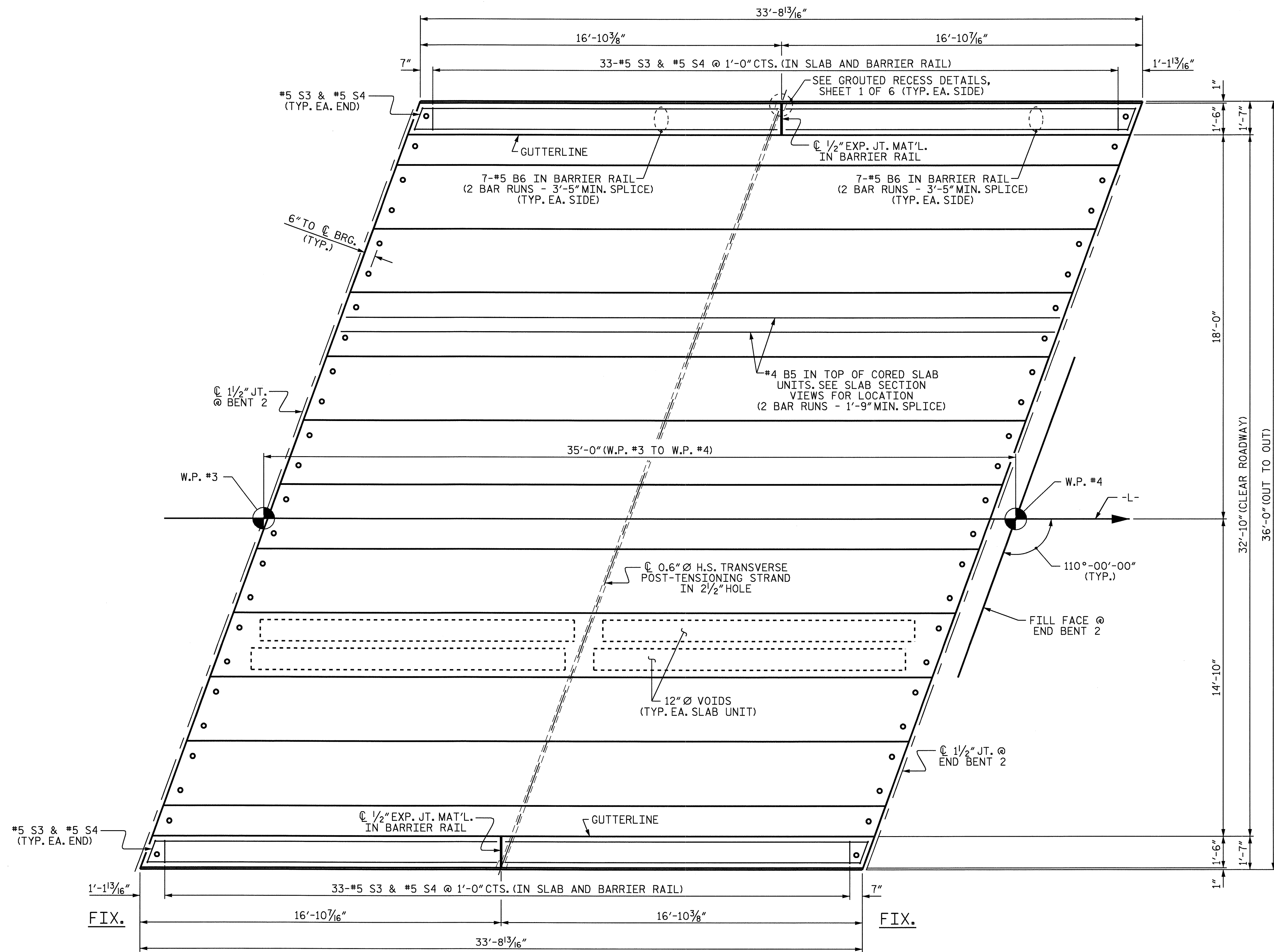
SHEET 3 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					21



DRAWN BY : B.N. GRADY DATE : 2/16/09  
 CHECKED BY : J.L. WALTON DATE : 3/24/09

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**PLAN OF SPAN C**

(FOR ADDITIONAL REINFORCING STEEL IN CORED SLAB, SEE SHEET 5 OF 6)

PROJECT NO. B-4587  
 NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-  
 SHEET 4 OF 6

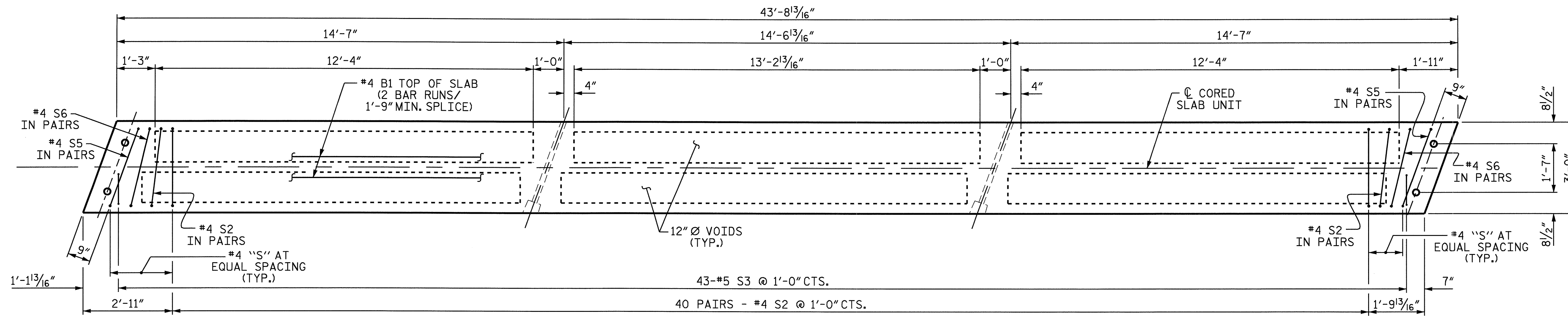
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN C



DRAWN BY : B.N. GRADY DATE : 2/16/09  
 CHECKED BY : J.L. WALTON DATE : 3/24/09

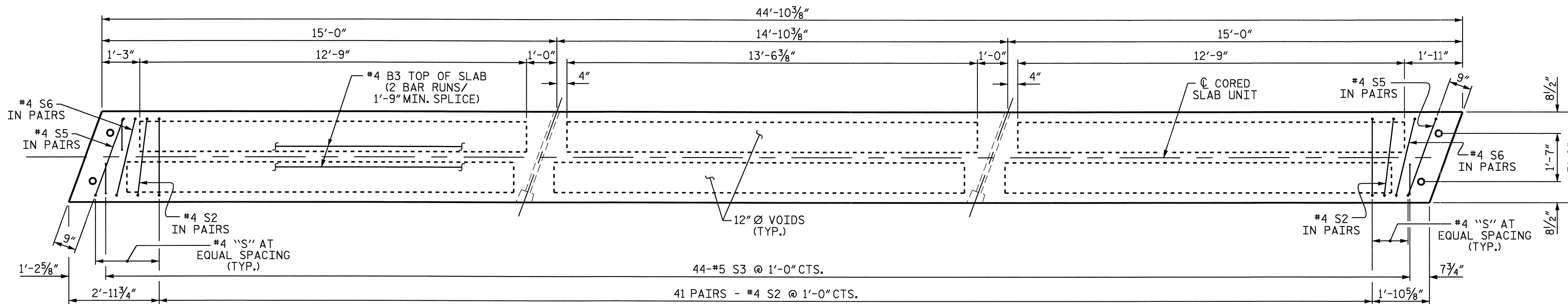
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			21





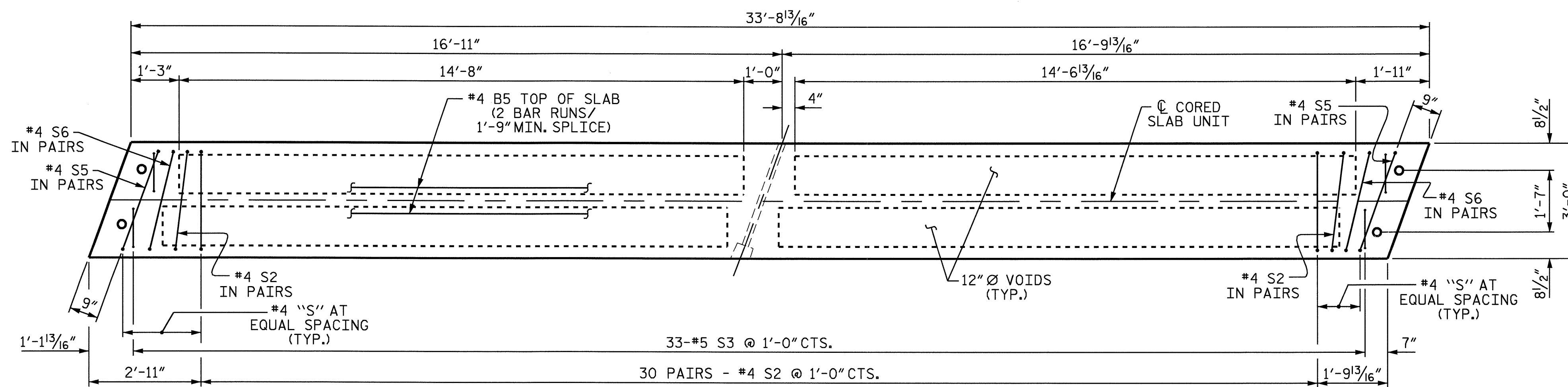
**PLAN OF CORED SLAB UNIT - SPAN A**

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
 FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 1 OF 6.



**PLAN OF CORED SLAB UNIT - SPAN B**

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
 FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 1 OF 6.



**PLAN OF CORED SLAB UNIT - SPAN C**

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
 FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 1 OF 6.

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-  
 SHEET 5 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>PLAN OF SPAN DETAILS</b>					
SHEET NO. <b>S-8</b>					
TOTAL SHEETS <b>21</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



DRAWN BY : B.N. GRADY DATE : 2/16/09  
 CHECKED BY : J.L. WALTON DATE : 3/24/09

12-MAY-2009 09:14  
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 jmyc

**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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

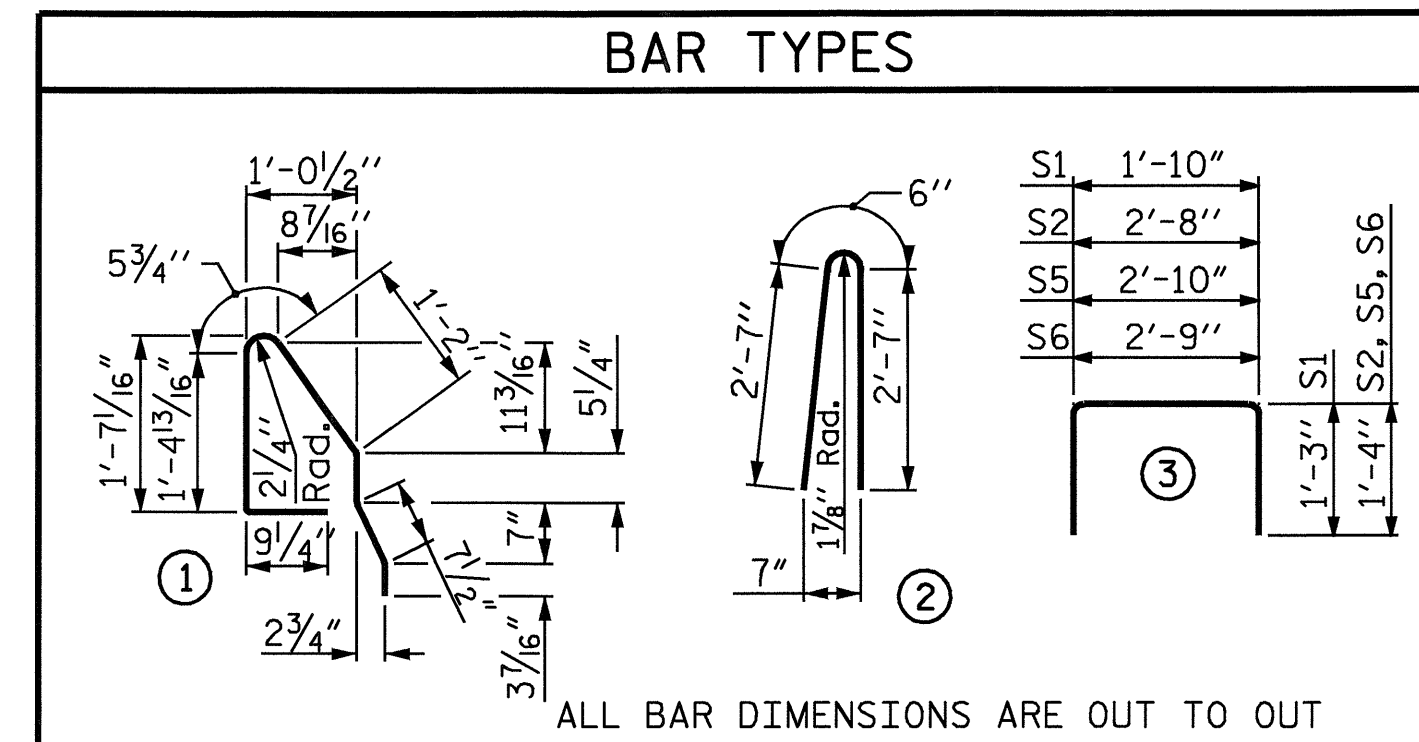
APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THE MINIMUM HEIGHT OF THE BARRIER RAIL IS SHOWN. THE HEIGHT OF THE BARRIER RAIL VARIES WHILE THE TOP OF THE RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**CORED SLABS REQUIRED**

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S. - SPAN A	2	43'-8 13/16"	87'-5 5/8"
INTERIOR C.S. - SPAN A	10	43'-8 13/16"	437'-4 1/8"
EXTERIOR C.S. - SPAN B	2	44'-10 3/8"	89'-8 3/4"
INTERIOR C.S. - SPAN B	10	44'-10 3/8"	448'-7 3/4"
EXTERIOR C.S. - SPAN C	2	33'-8 13/16"	67'-5 5/8"
INTERIOR C.S. - SPAN C	10	33'-8 13/16"	337'-4 1/8"
TOTAL	36		1468'-0"

**BILL OF MATERIAL FOR CONCRETE BARRIER RAIL**

BAR	BARS PER SPAN			TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A	SPAN B	SPAN C					
* B2	56			56	#5	STR	12'-8"	740
* B4		56		56	#5	STR	13'-0"	759
* B6			56	56	#5	STR	10'-2"	594
* S4	90	92	70	252	#5	2	5'-8"	1489
* EPOXY COATED REINFORCING STEEL							3582 LBS.	
CLASS AA CONCRETE							26.8 CU.YDS.	
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL							245.21 LIN. FT.	

**BILL OF MATERIAL FOR ONE CORED SLAB SECTION**

SPAN A				SPAN B				SPAN C											
		EXTERIOR UNIT		INTERIOR UNIT				EXTERIOR UNIT		INTERIOR UNIT									
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT						
B1	4	#4	STR	22'-7"	60	22'-7"	60	B3	4	#4	STR	23'-2"	62						
S1	8	#4	3	4'-4"	23	4'-4"	23	S1	8	#4	3	4'-4"	23						
S2	84	#4	3	5'-4"	299	5'-4"	299	S2	86	#4	3	5'-4"	306						
* S3	45	#5	1	5'-2"	242	5'-2"	242	* S3	46	#5	1	5'-2"	248						
S5	4	#4	3	5'-6"	15	5'-6"	15	S5	4	#4	3	5'-6"	15						
S6	4	#4	3	5'-5"	14	5'-5"	14	S6	4	#4	3	5'-5"	14						
REINFORCING STEEL				411 LBS.		411 LBS.		REINFORCING STEEL				420 LBS.		420 LBS.					
* EPOXY COATED REINFORCING STEEL				242 LBS.		* EPOXY COATED REINFORCING STEEL				248 LBS.		* EPOXY COATED REINFORCING STEEL				189 LBS.			
5000 P.S.I. CONCRETE				6.2 CU. YDS.		6.2 CU. YDS.		5000 P.S.I. CONCRETE				6.4 CU. YDS.		5000 P.S.I. CONCRETE				4.8 CU. YDS.	
0.6" Ø L.R. STRANDS				No. 13		13		0.6" Ø L.R. STRANDS				No. 13		13				13	

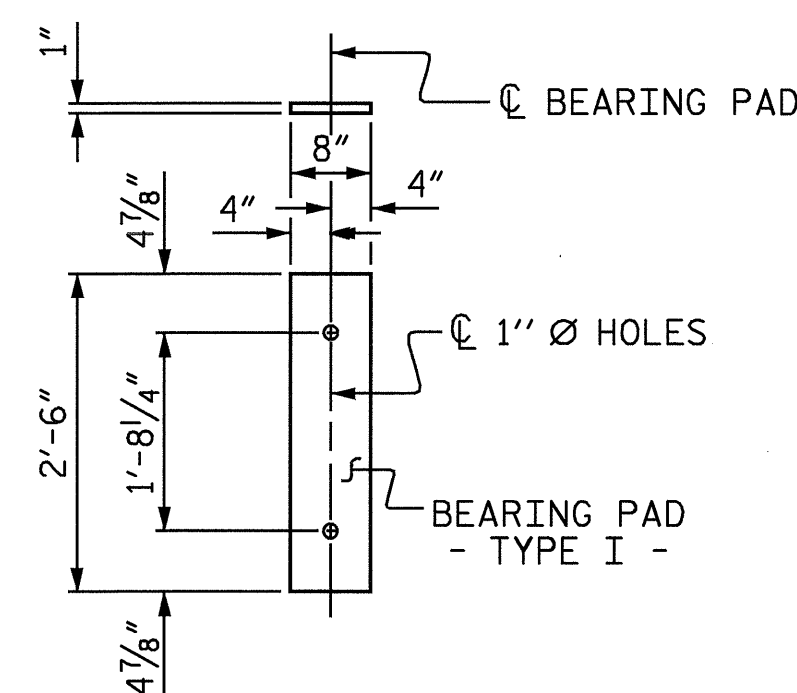
**GRADE 270 STRANDS**

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

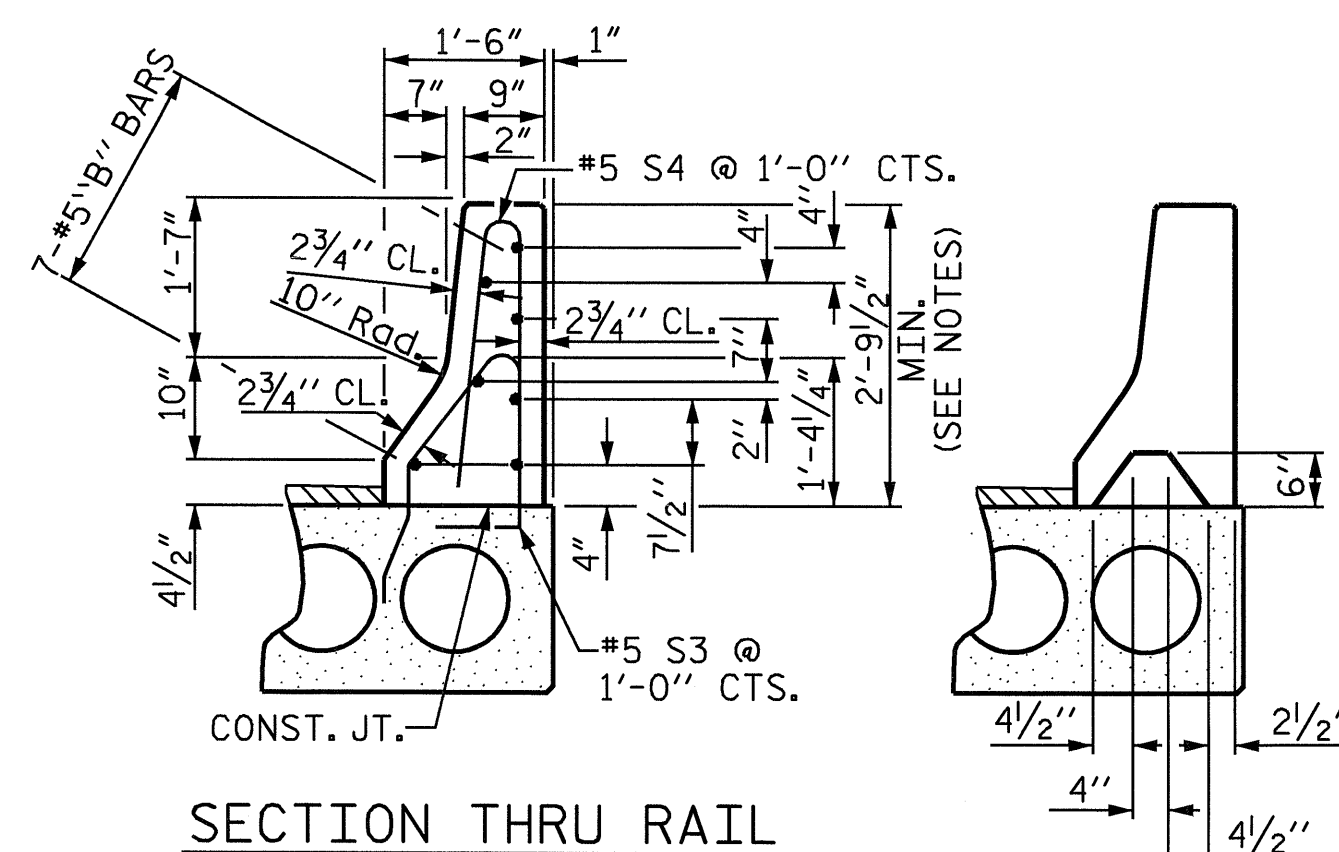
**DEAD LOAD DEFLECTION AND CAMBER**

	SPAN A	SPAN B	SPAN C
CAMBER (SLAB ALONE IN PLACE) ↑	1 5/16"	1 3/8"	1"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** ↓	1/8"	3/16"	1/16"
FINAL CAMBER ↑	1 3/16"	1 3/16"	1 5/16"

\*\* INCLUDES FUTURE WEARING SURFACE

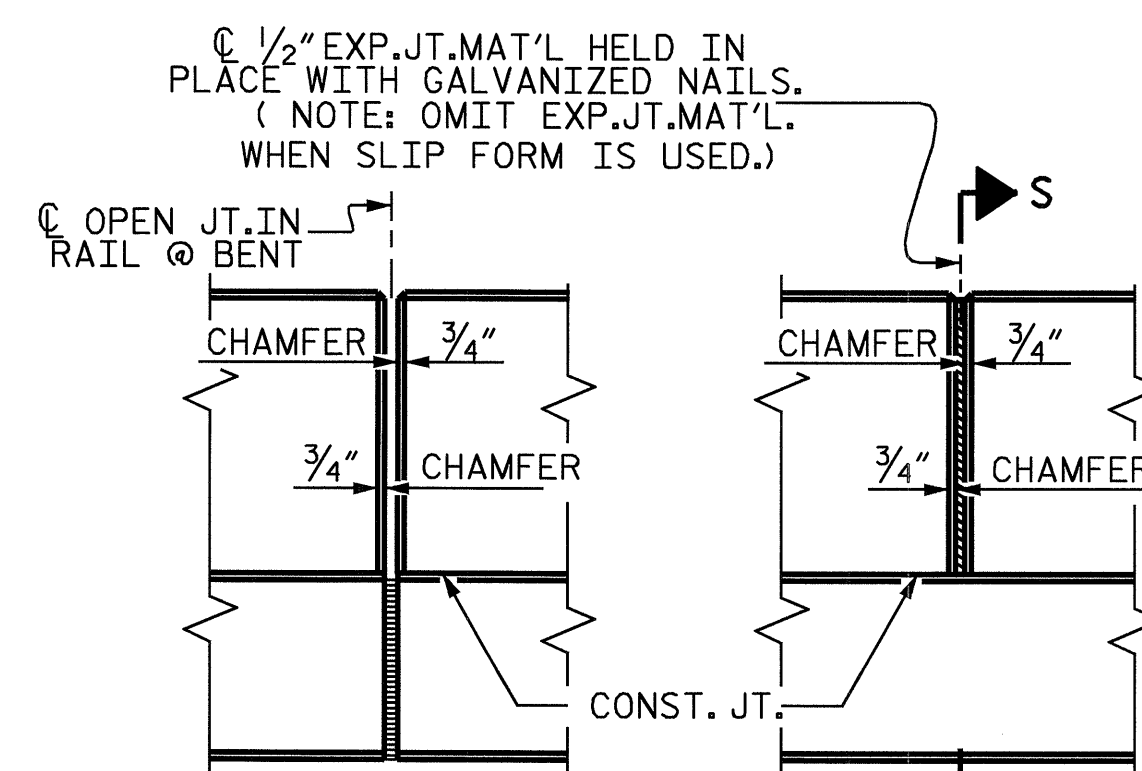


**FIXED END  
(TYPE I - 72 REQ'D)  
ELASTOMERIC BEARING DETAILS**



**SECTION THRU RAIL**

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

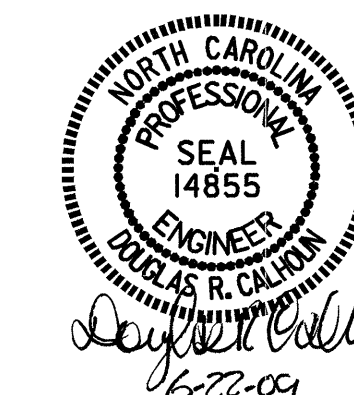


**ELEVATION AT EXPANSION JOINTS**

**BARRIER RAIL DETAILS**

ASSEMBLED BY : B.N. GRADY	DATE : 2/16/09
CHECKED BY : J.L. WALTON	DATE : 3/24/09
DRAWN BY : WJH 4/89	REV. 7/10/01 RWW/LES
CHECKED BY : FCJ 5/89	REV. 5/7/03RRR RWW/JTE
	REV. 5/1/06 TLA/GM

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galen



PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
STATION: 17+46.50 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

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

S-9  
TOTAL SHEETS  
21

STD. NO. PCS3

NOTES

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

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

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

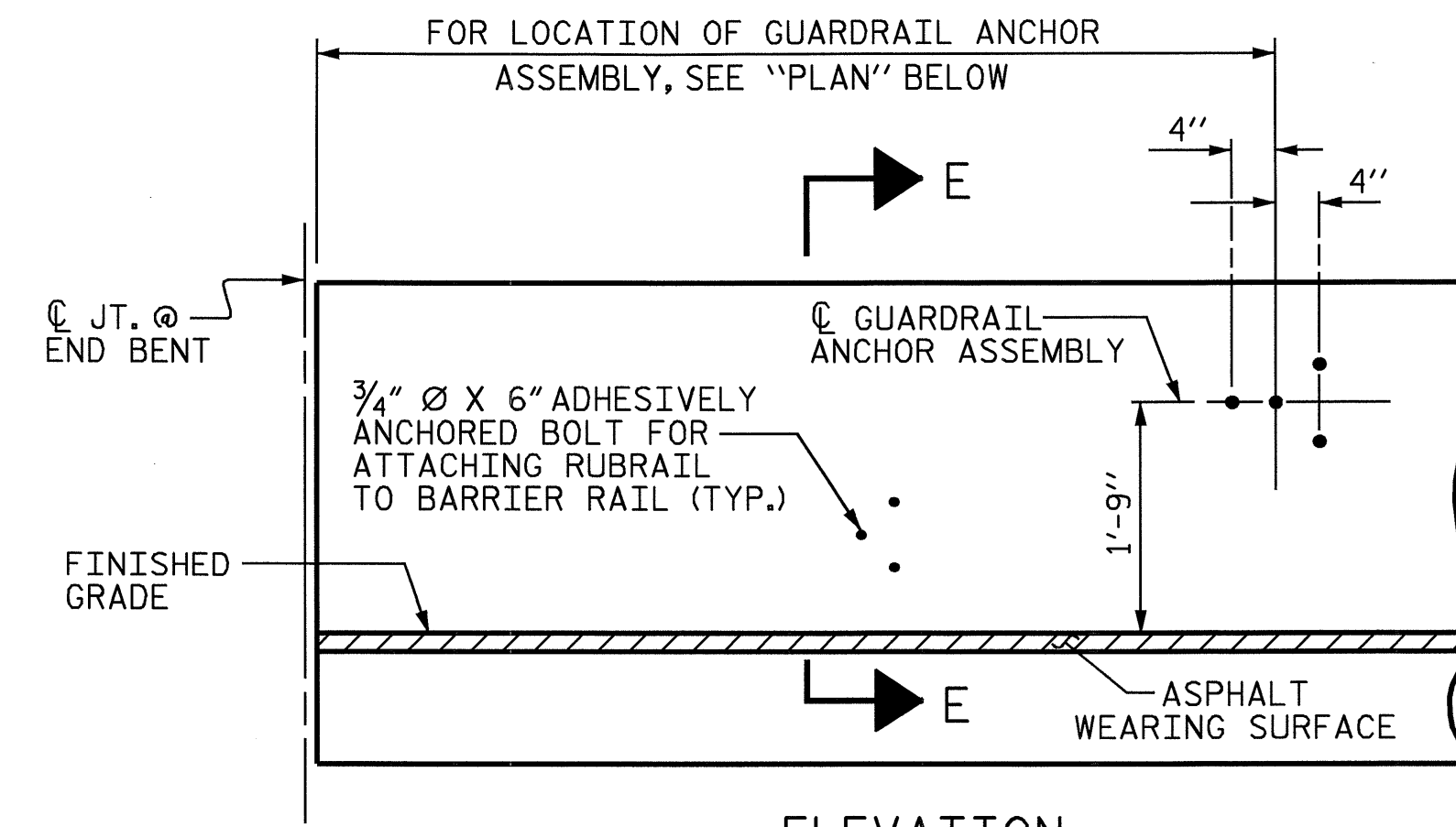
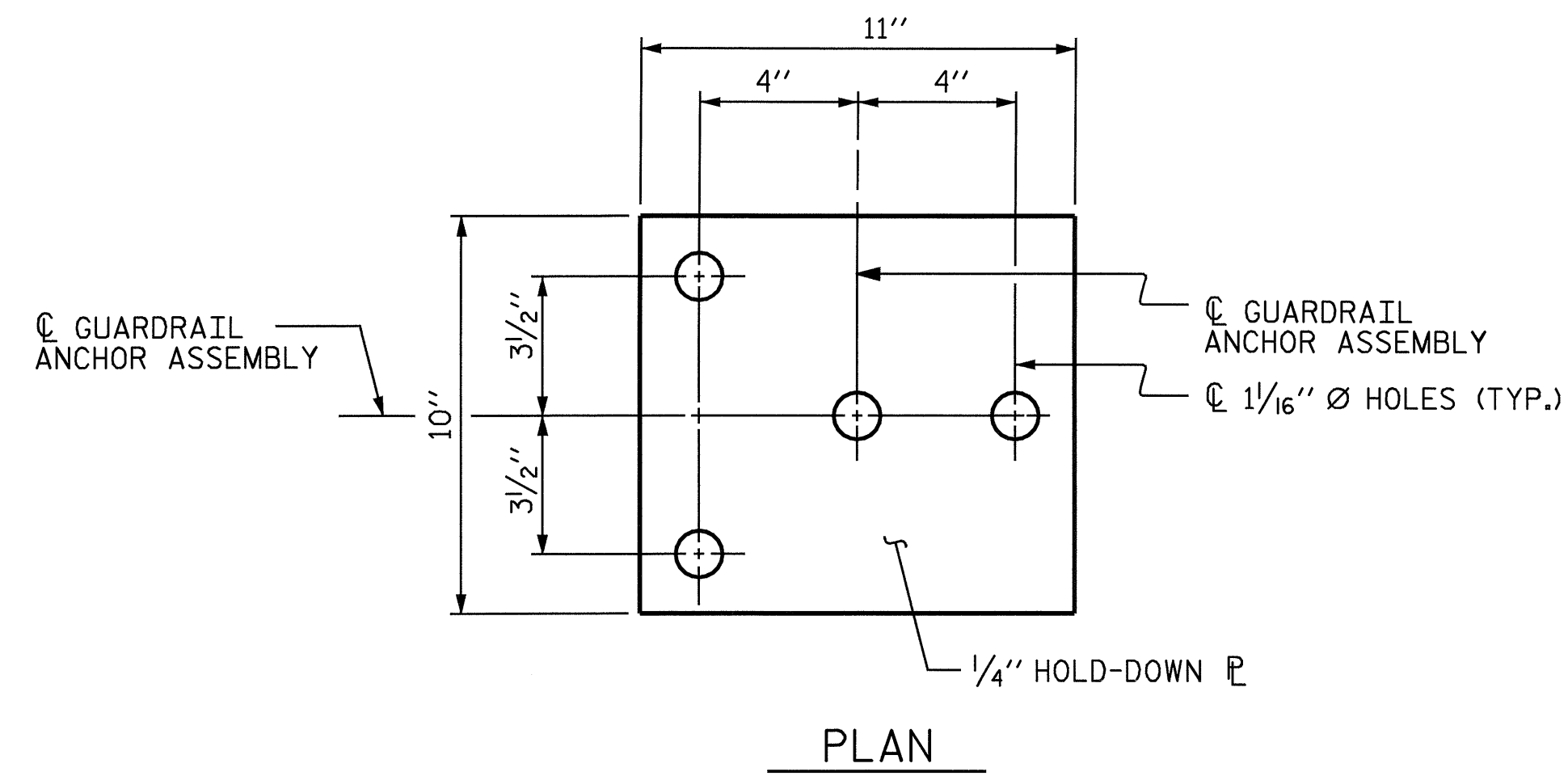
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

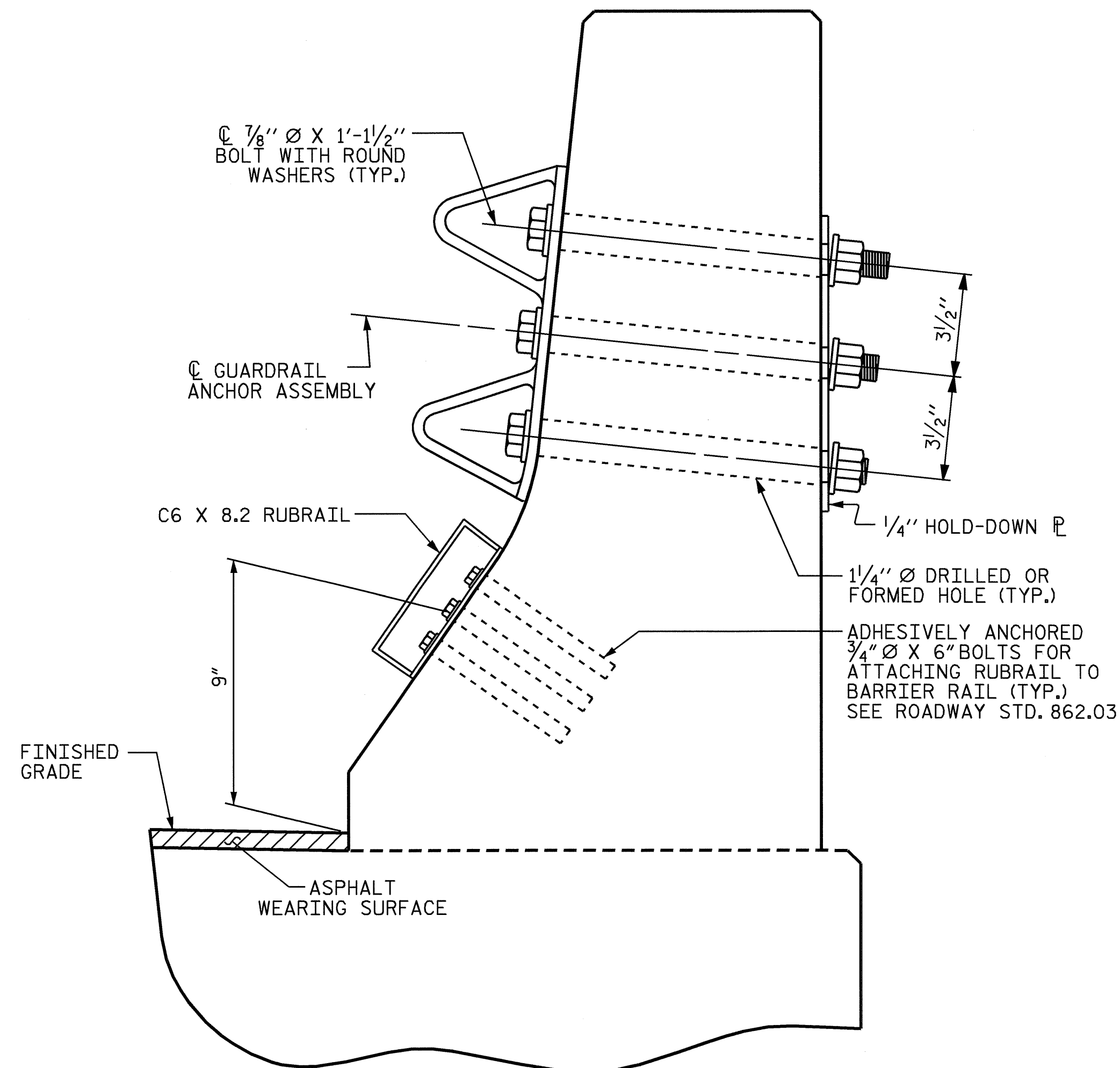
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

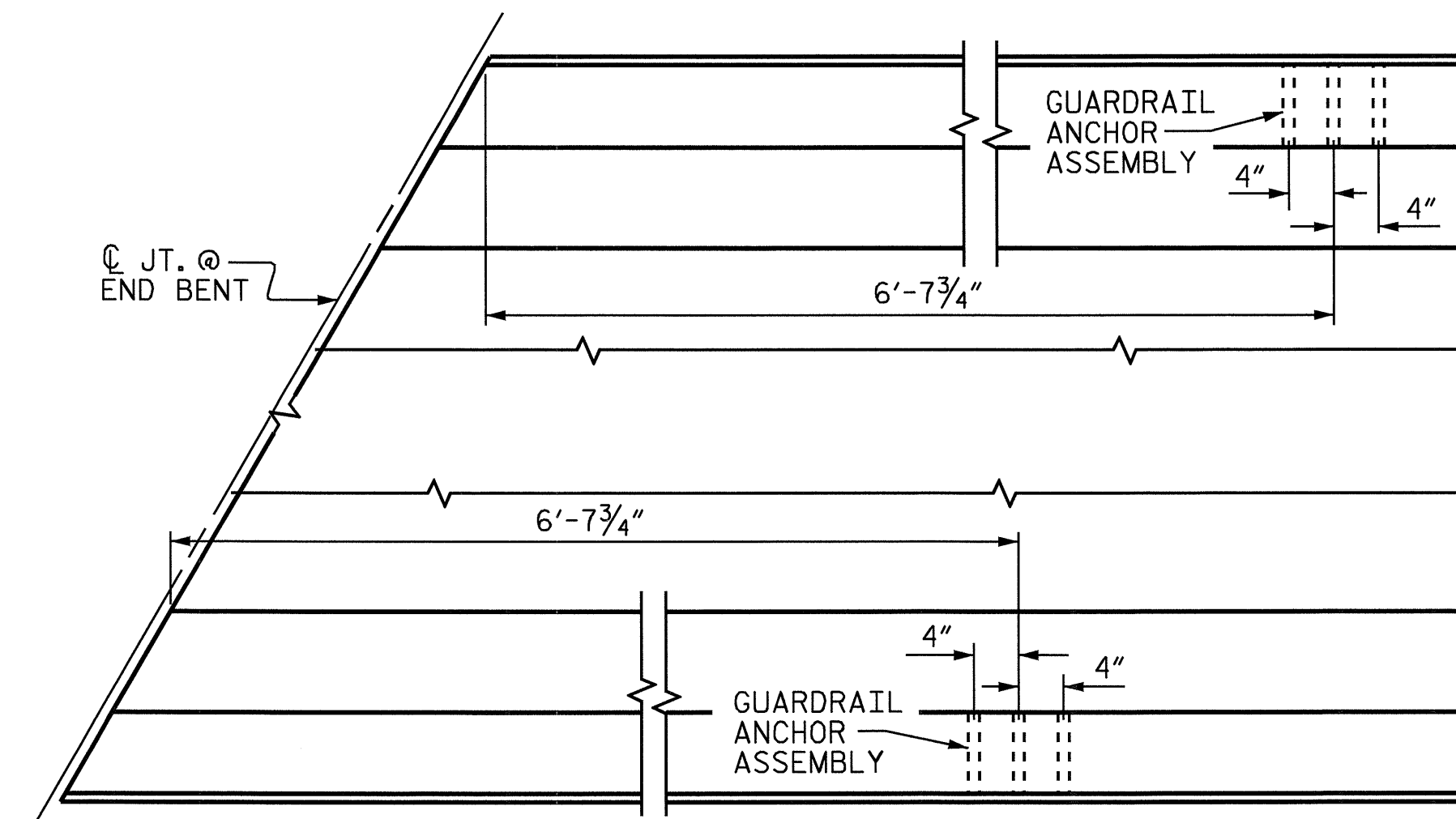
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS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



ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

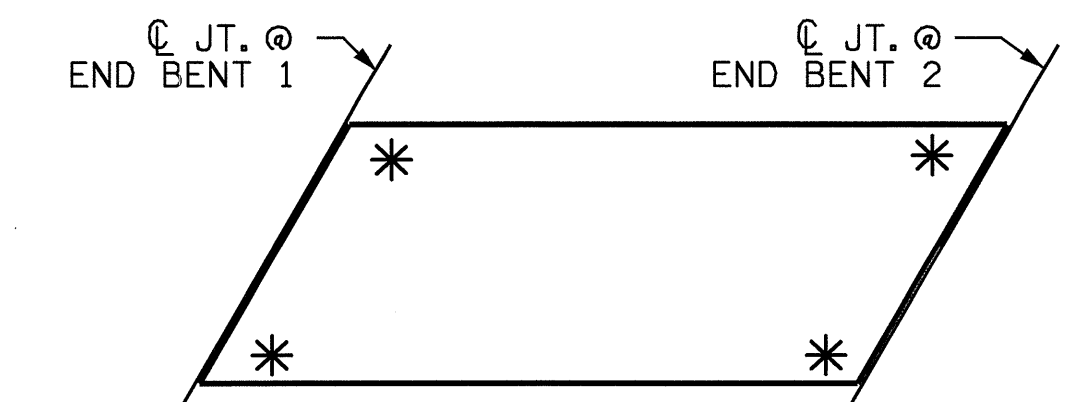


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN  
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
STATION: 17+46.50 -L-

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



ASSEMBLED BY : B.N. GRADY	DATE : 4/13/09
CHECKED BY : J.L. WALTON	DATE : 4/13/09
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

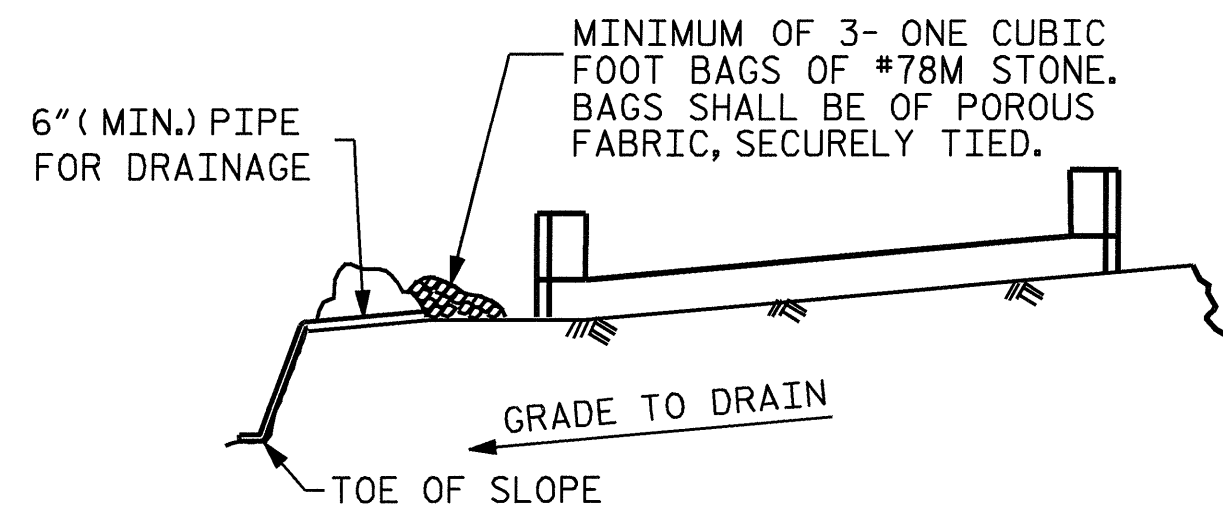
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REVISIONS					SHEET NO.
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S-10  
TOTAL SHEETS  
21





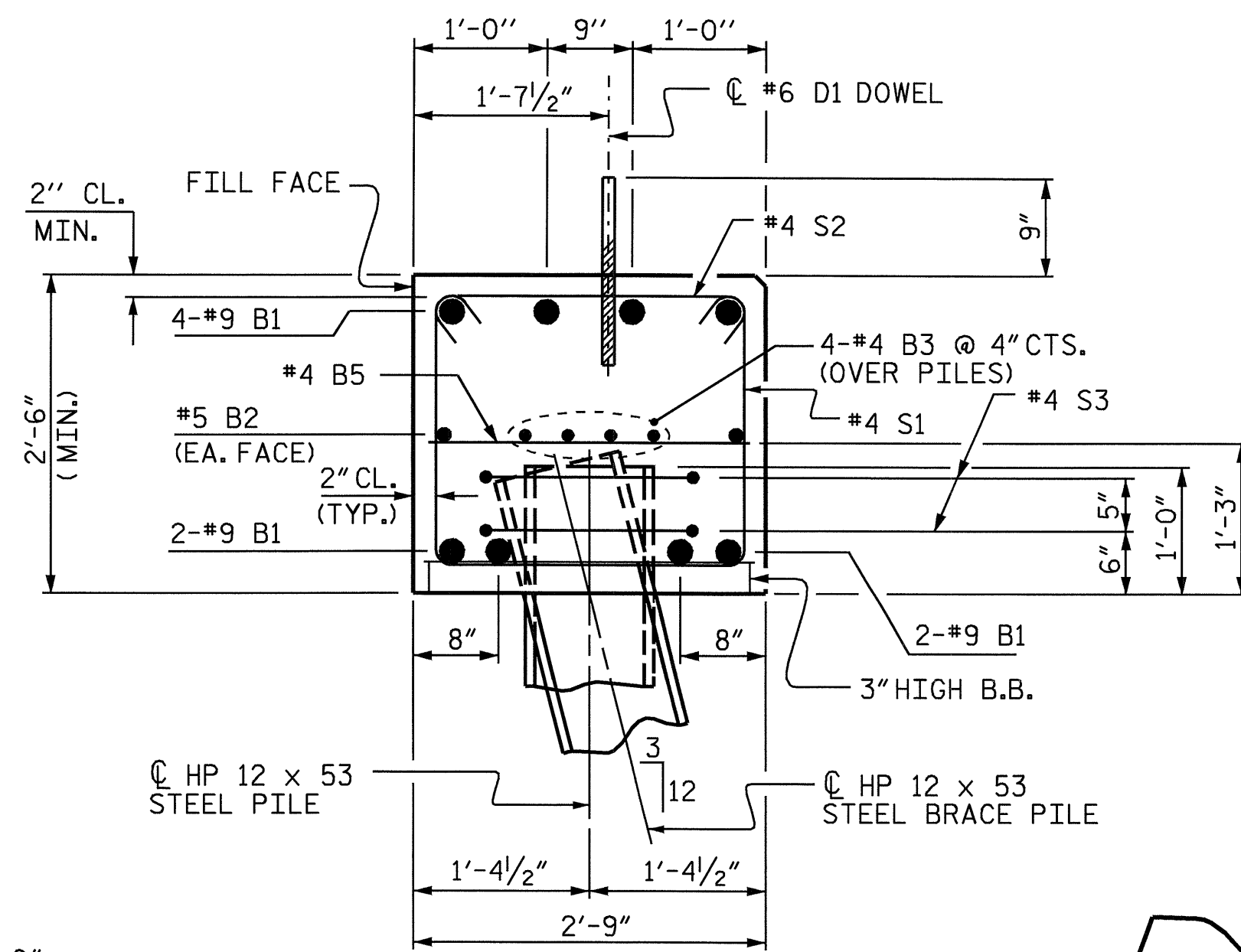


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

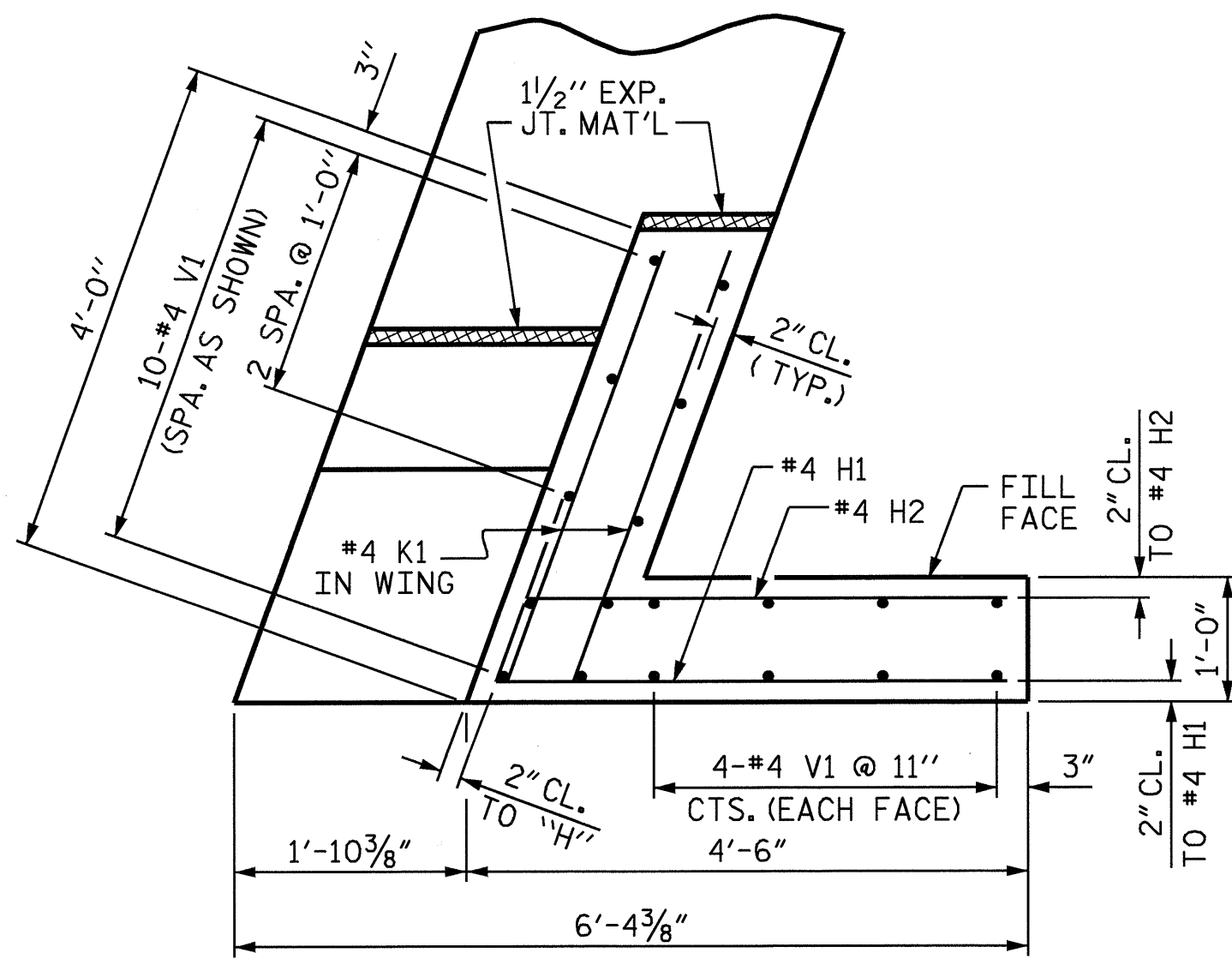
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

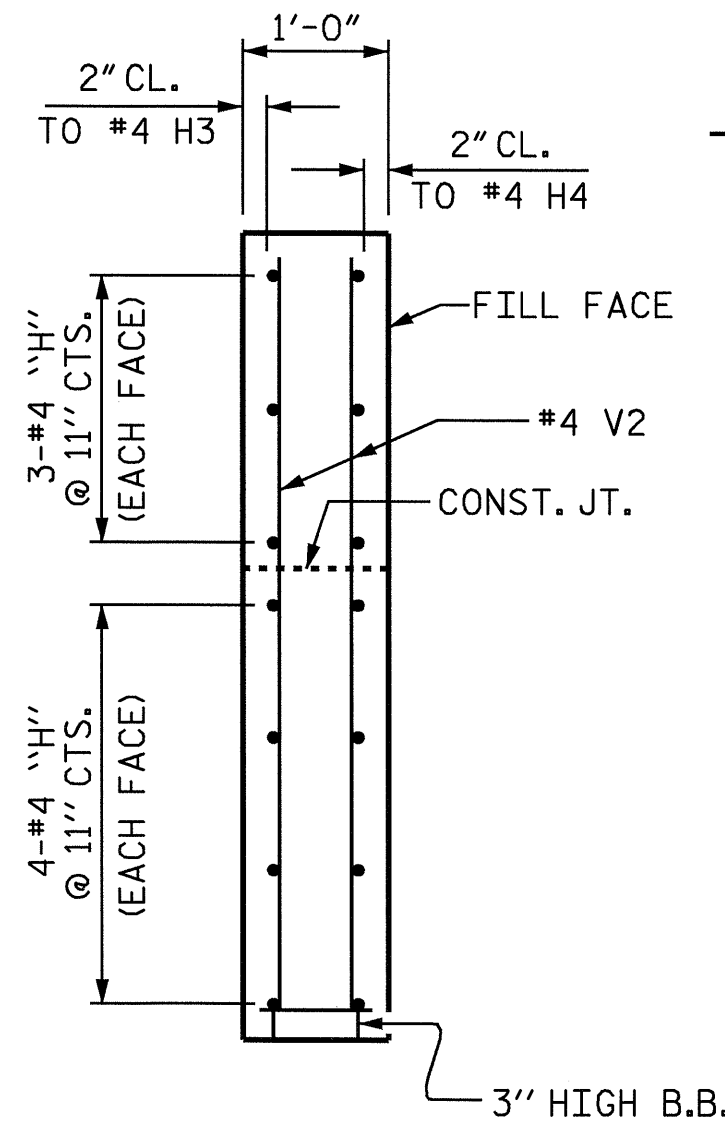
**TEMPORARY DRAINAGE AT END BENT**



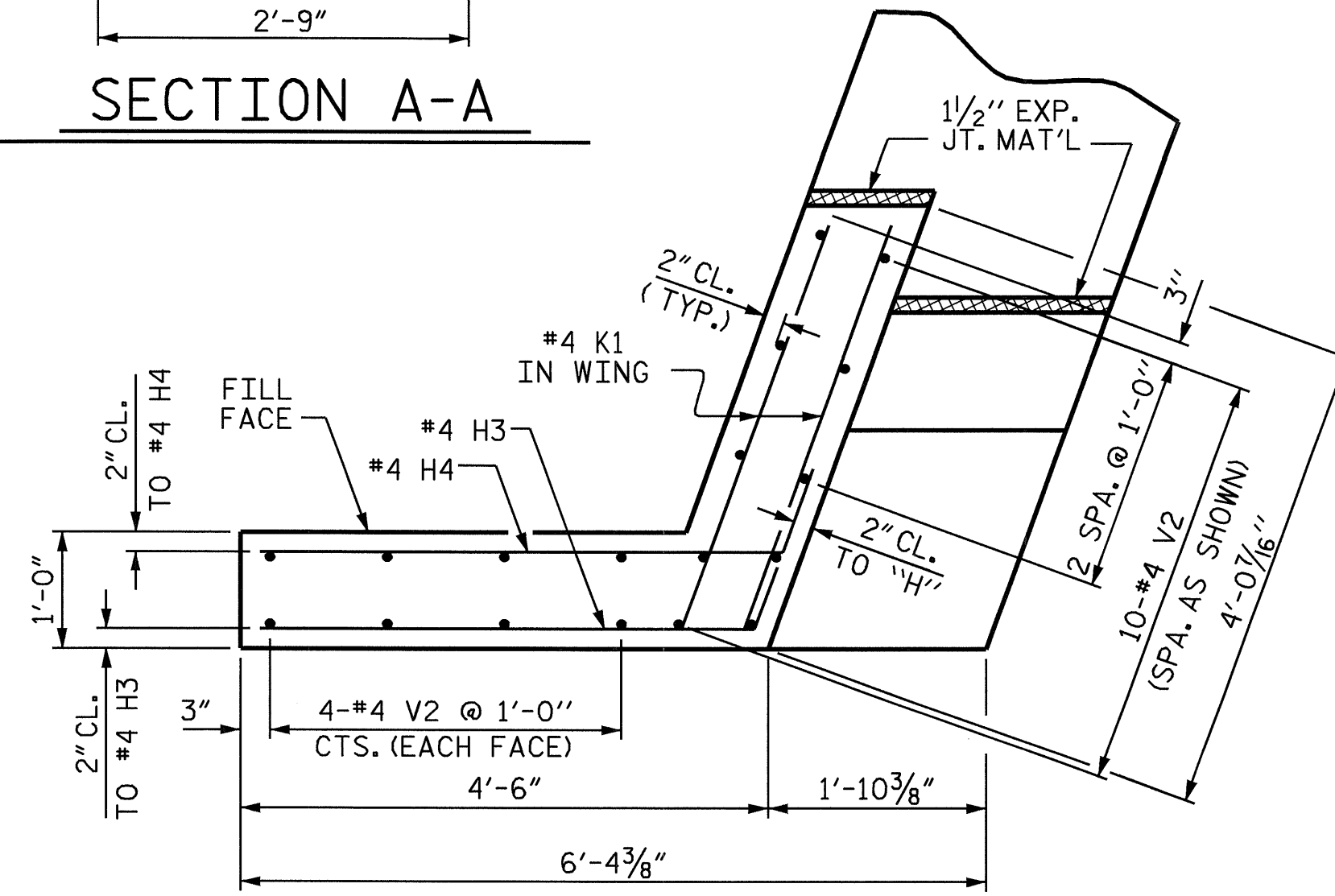
**SECTION A-A**



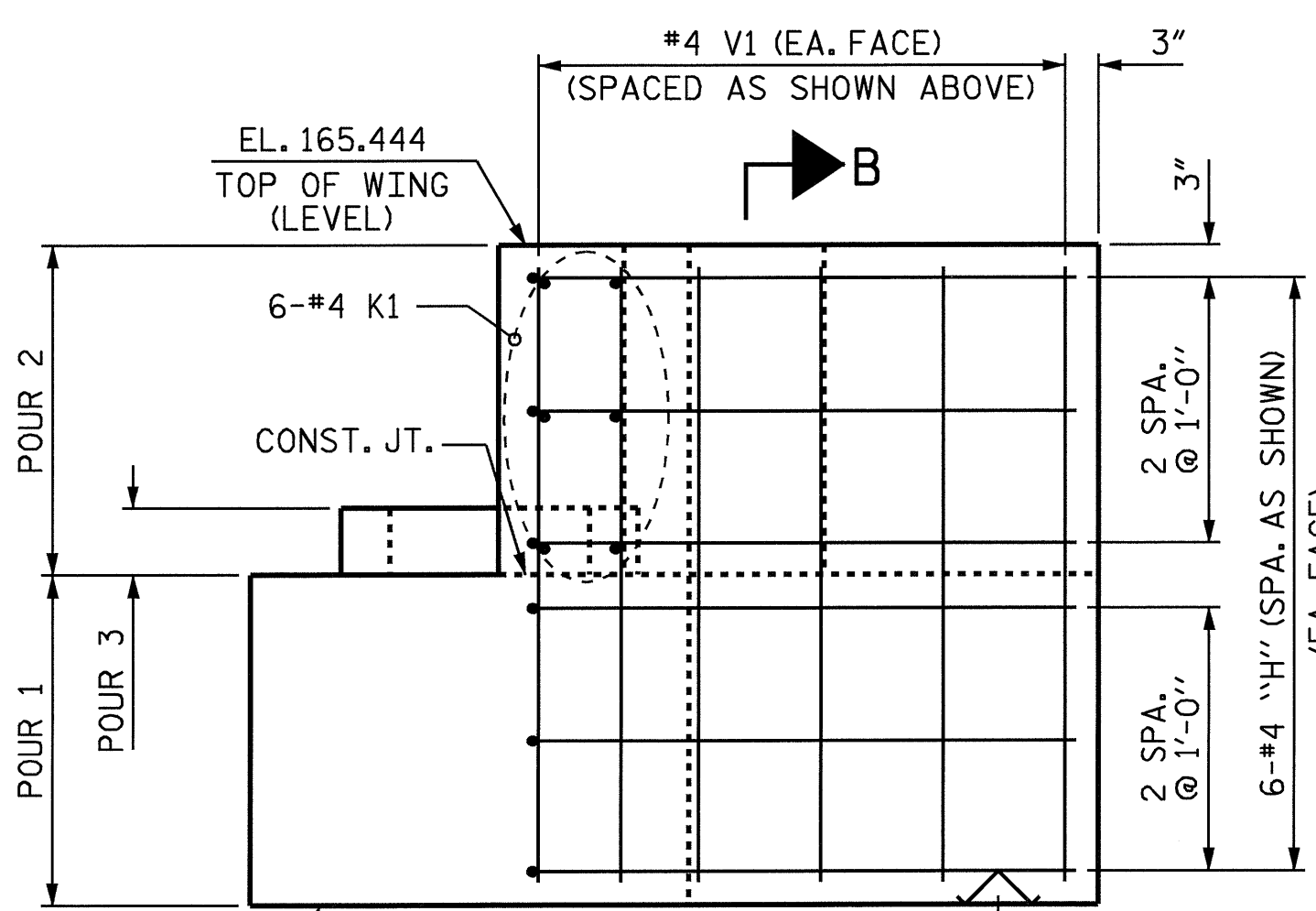
**PLAN OF WING - W1**



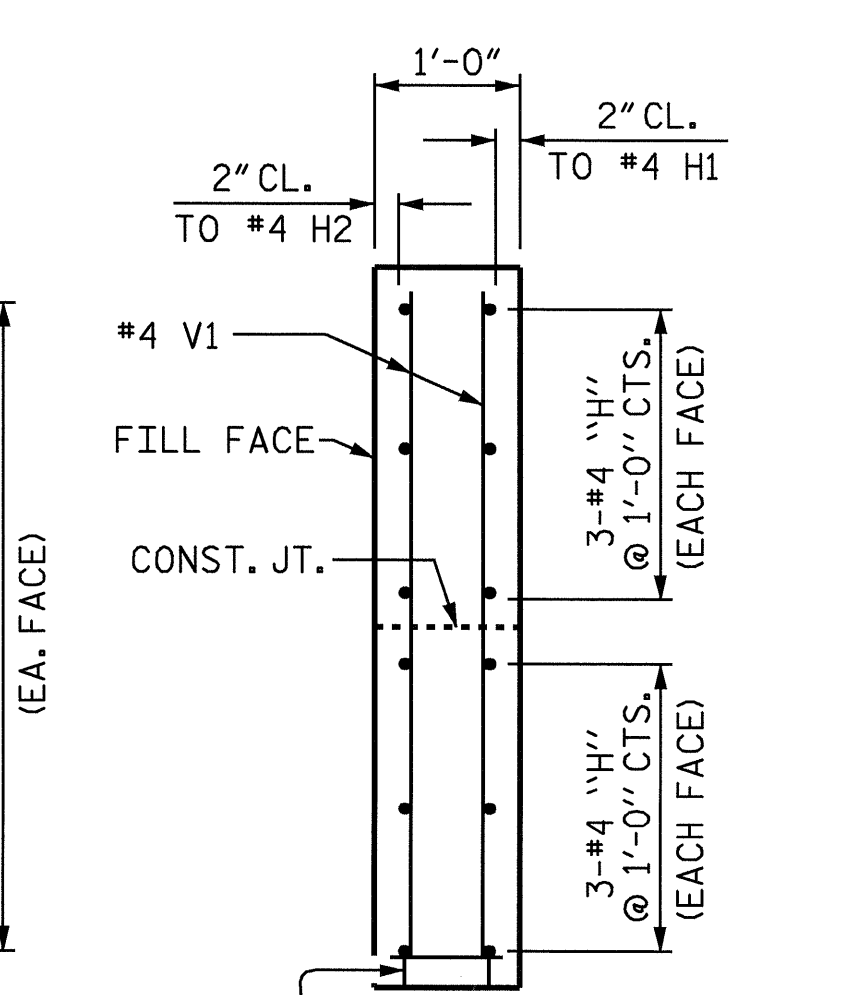
**SECTION C-C**



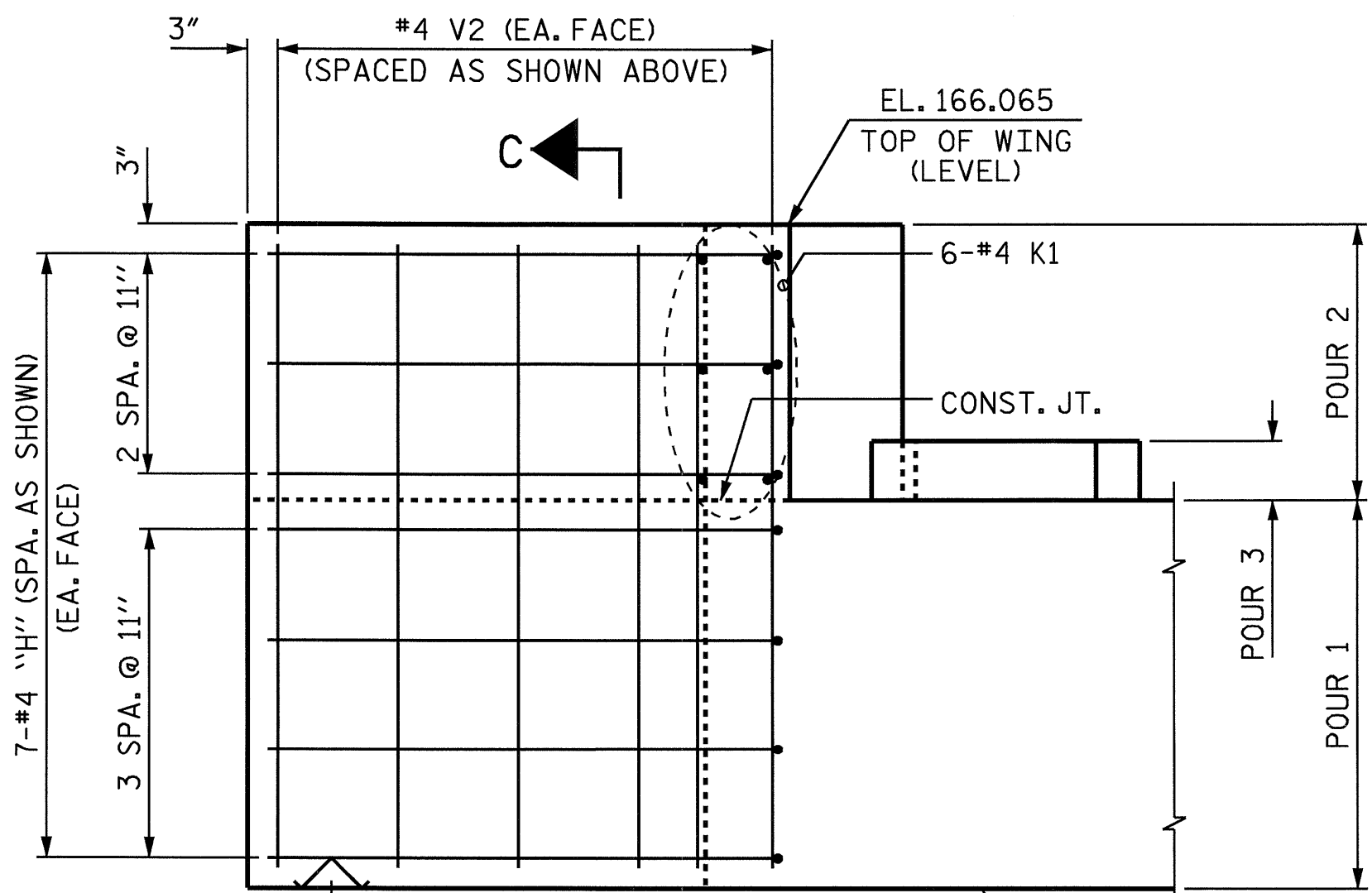
**PLAN OF WING - W2**



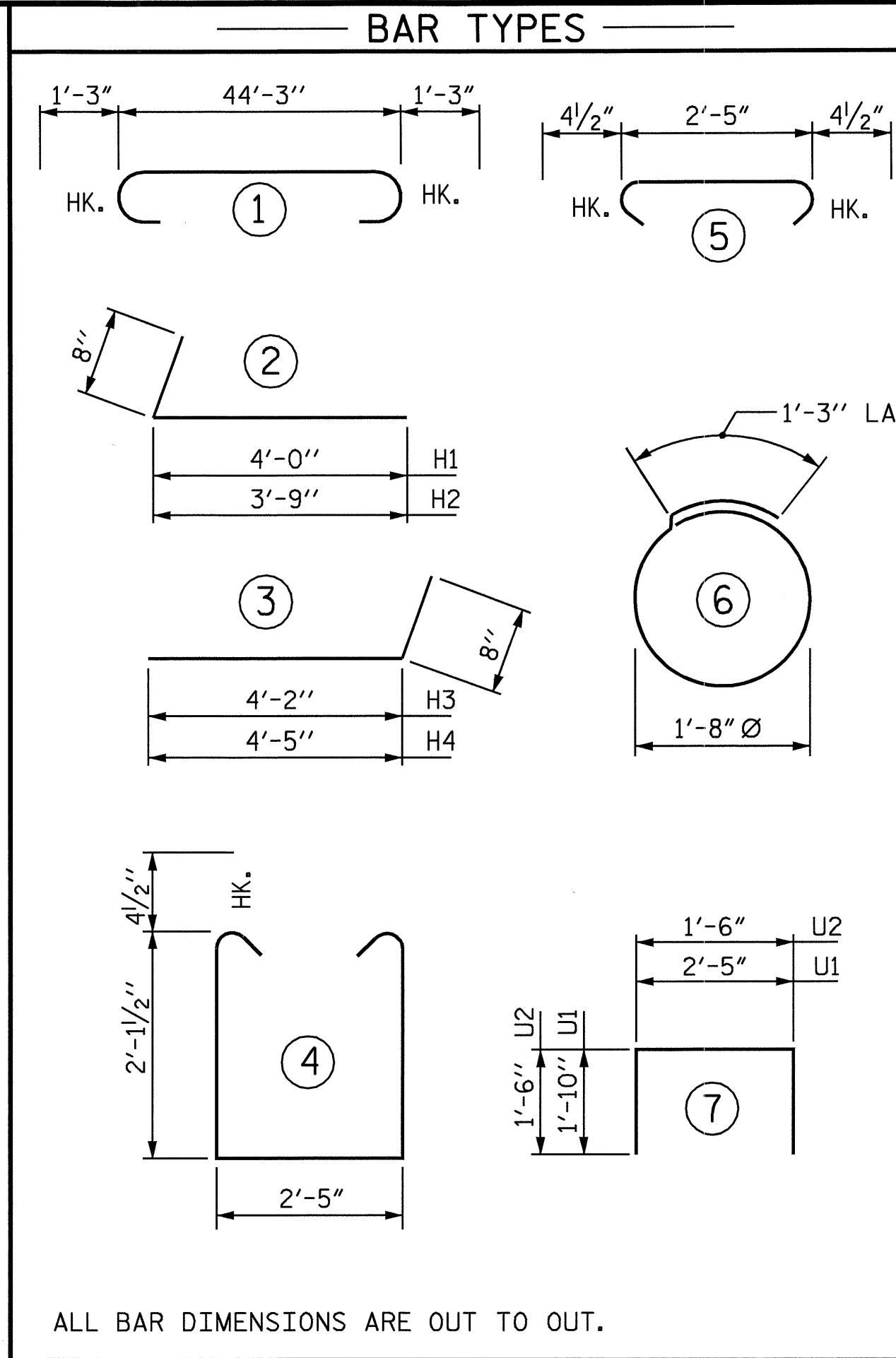
**ELEVATION OF WING - W1**



**SECTION B-B**



**ELEVATION OF WING - W2**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

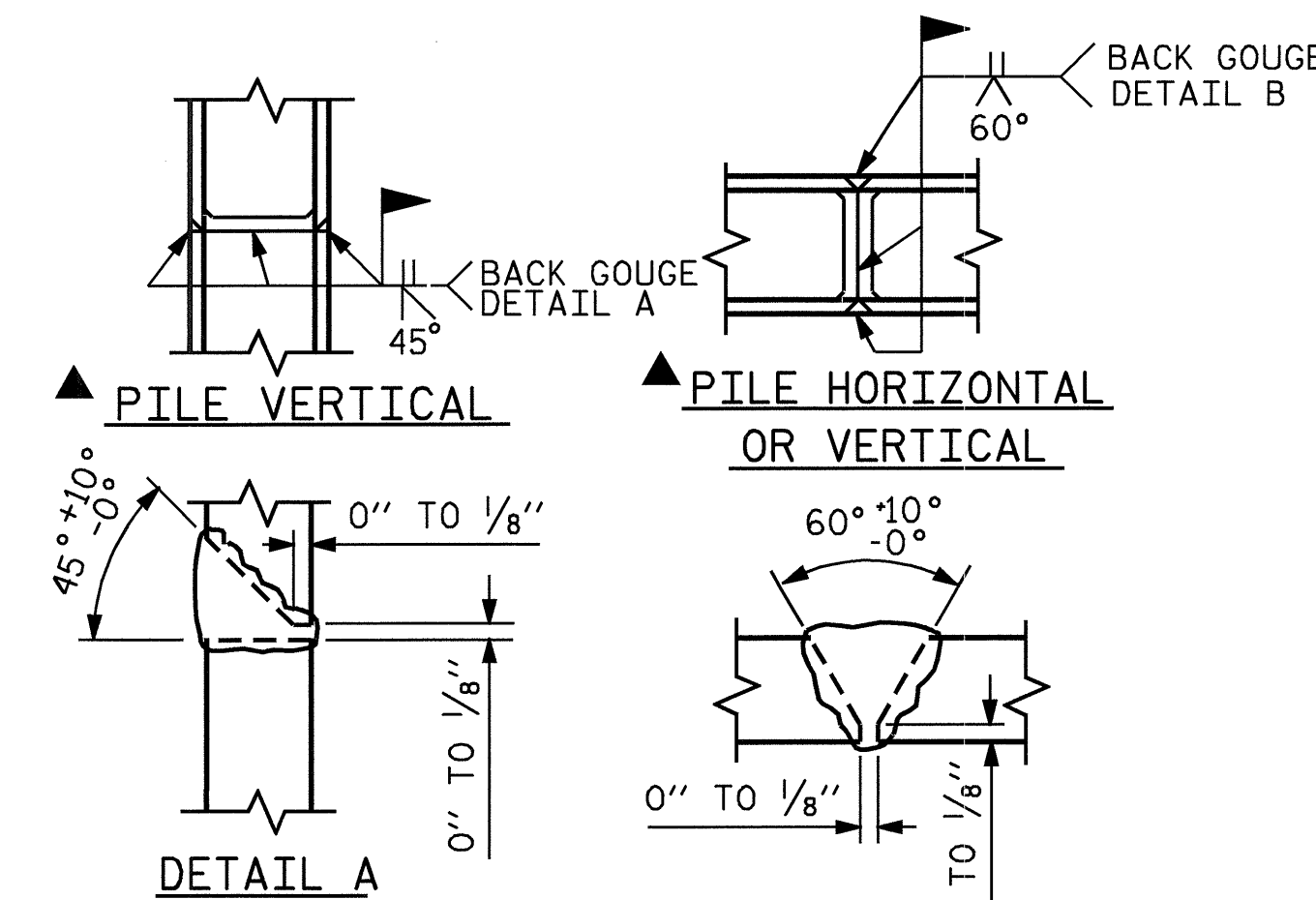
**END BENT 1**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#8		46'-9"	1272
B2	#5	STR	44'-3"	92
B3	#4	STR	23'-5"	125
B4	#4	STR	28'-10"	77
B5	#4	STR	2'-5"	18
D1	#6	STR	1'-6"	54
H1	#4	2	4'-8"	19
H2	#4	2	4'-5"	18
H3	#4	3	4'-10"	23
H4	#4	3	5'-1"	24
K1	#4	STR	3'-8"	29
S1	#4	4	7'-5"	208
S2	#4	5	3'-2"	89
S3	#4	6	6'-6"	52
U1	#4	7	6'-1"	77
U2	#4	7	4'-6"	12
V1	#4	STR	4'-7"	55
V2	#4	STR	5'-3"	63
REINFORCING STEEL			LBS	2307

**CLASS A CONCRETE BREAKDOWN**

POUR	DESCRIPTION	C.Y.	WEIGHT
POUR 1	(CAP & LOWER PART OF WINGS)	C.Y.	14.2
POUR 2	(UPPER PART OF WINGS)	C.Y.	1.3
POUR 3	(LATERAL GUIDES)	C.Y.	0.1
TOTAL		C.Y.	15.6

HP 12 X 53 STEEL PILES  
NO. : 6  
LIN. FT. : 120



**PILE SPLICE DETAILS**

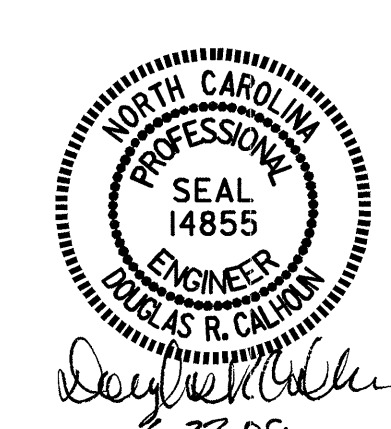
PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 2 OF 2

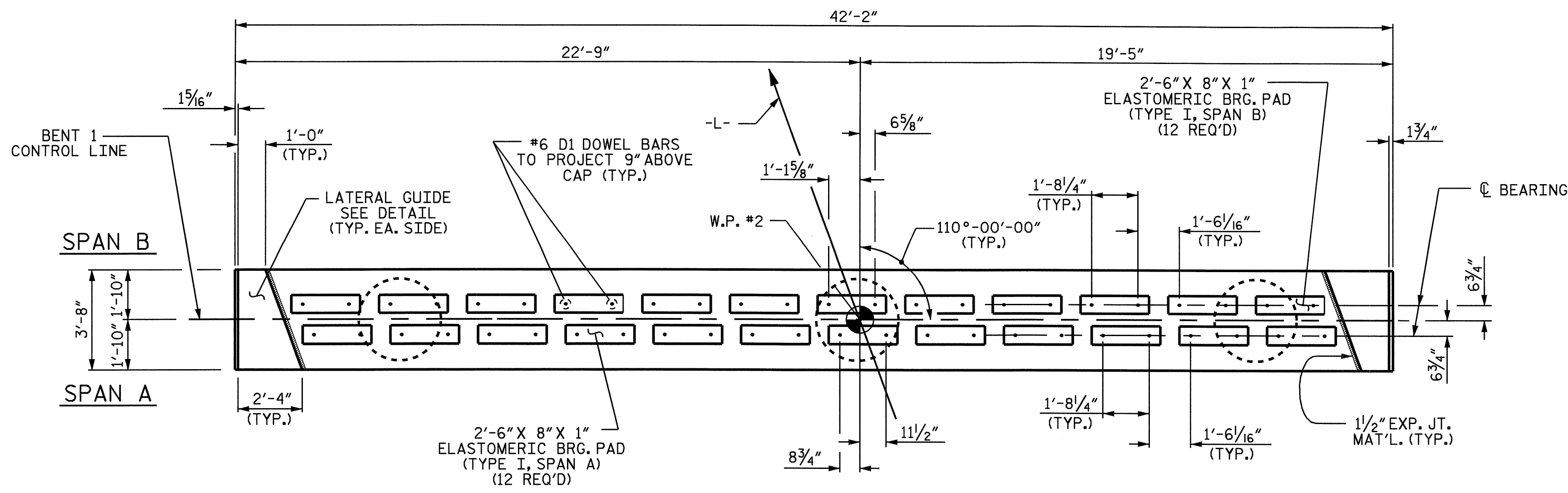
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1**

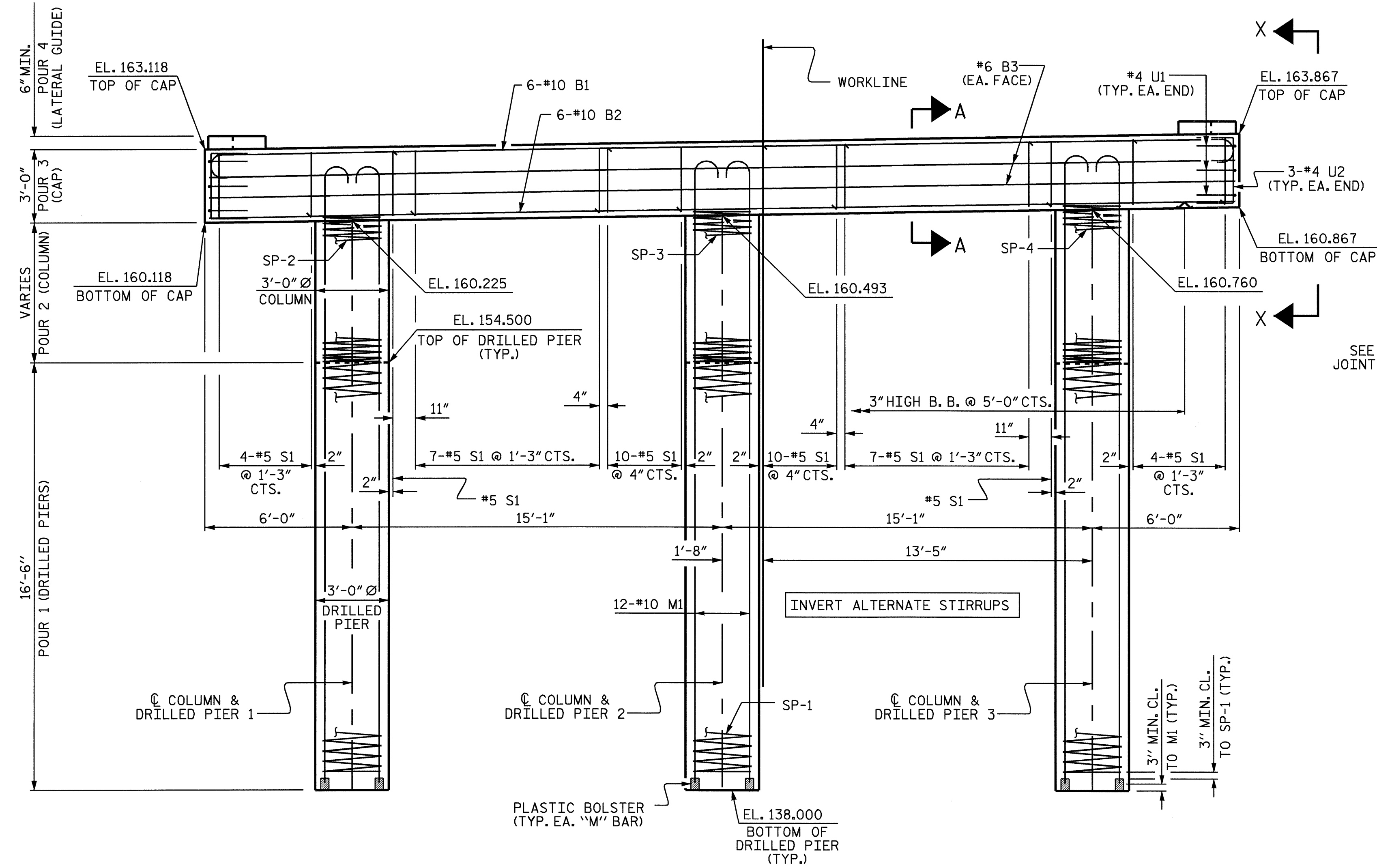
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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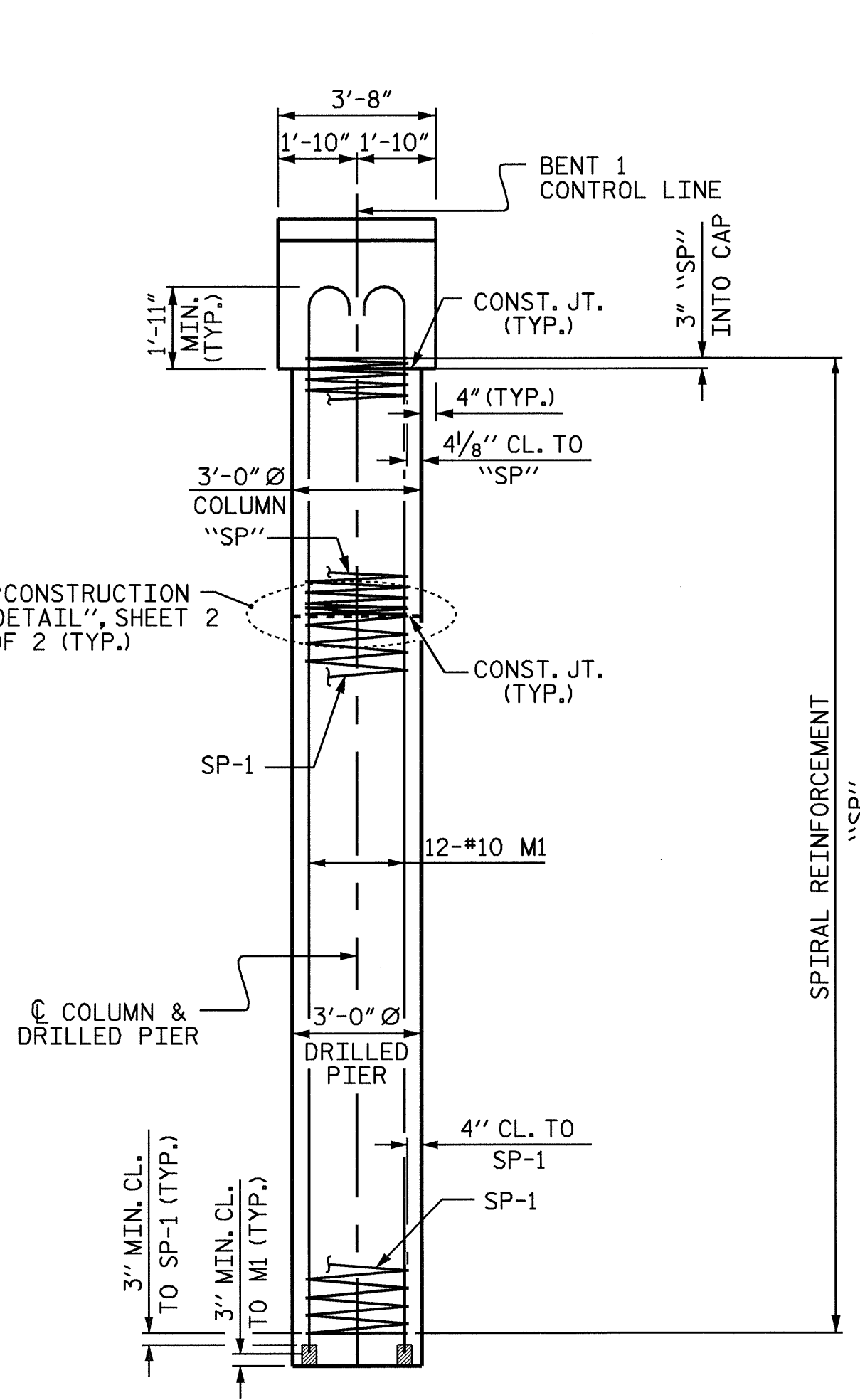
DRAWN BY: J.MYA DATE: 2-20-09  
 CHECKED BY: B.N. GRADY DATE: 3-4-09



PLAN



ELEVATION

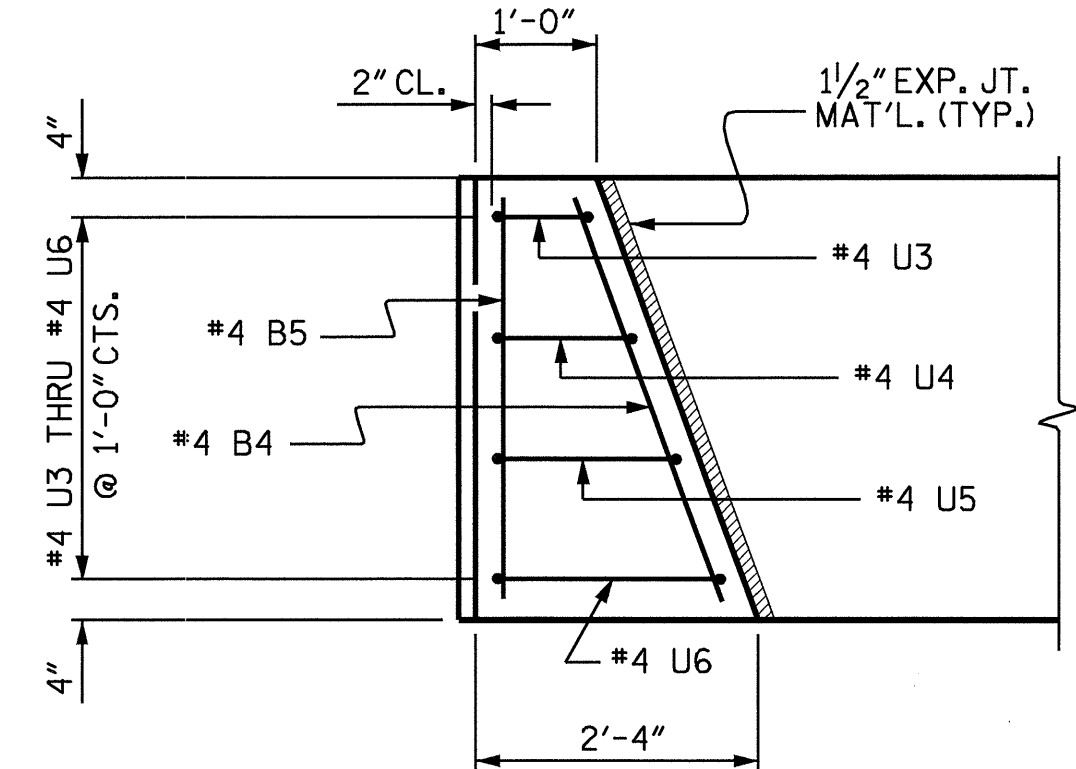


END ELEVATION

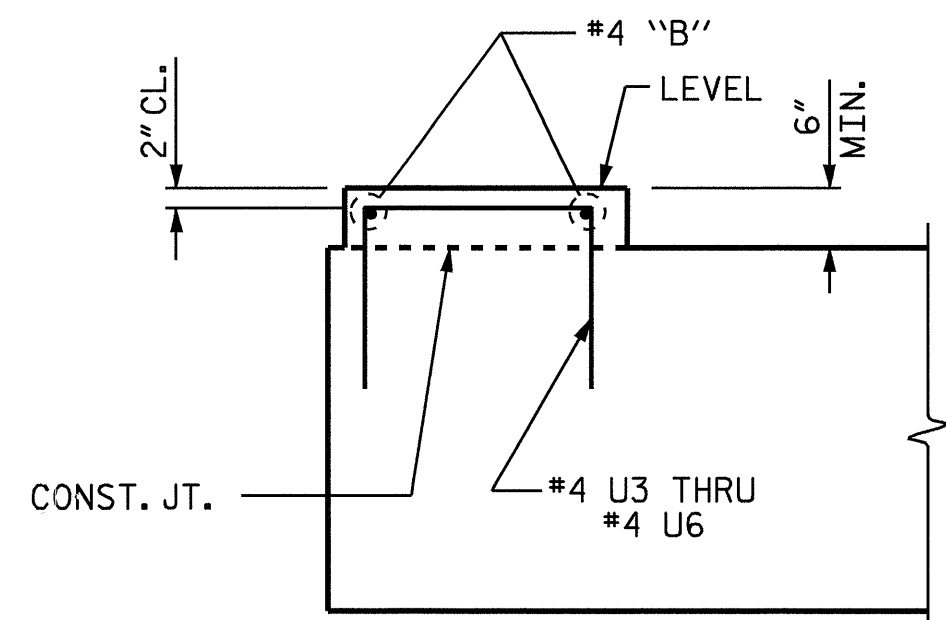
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS AND COLUMNS UNLESS OTHERWISE NOTED)

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "M" 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.
- THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.



PLAN



ELEVATION

LATERAL GUIDE

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

PROJECT NO. B-4587  
 NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 1 OF 2

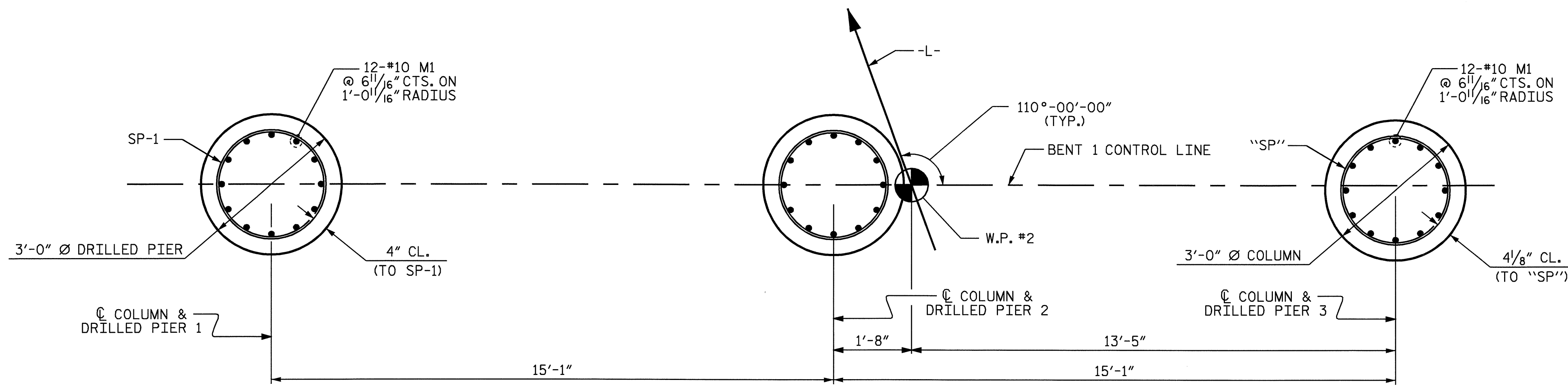


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. <b>S-13</b>
SUBSTRUCTURE BENT 1						
REVISIONS						TOTAL SHEETS <b>21</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: J.L. WALTON DATE: 2-25-09  
 CHECKED BY: B.N. GRADY DATE: 3-9-09

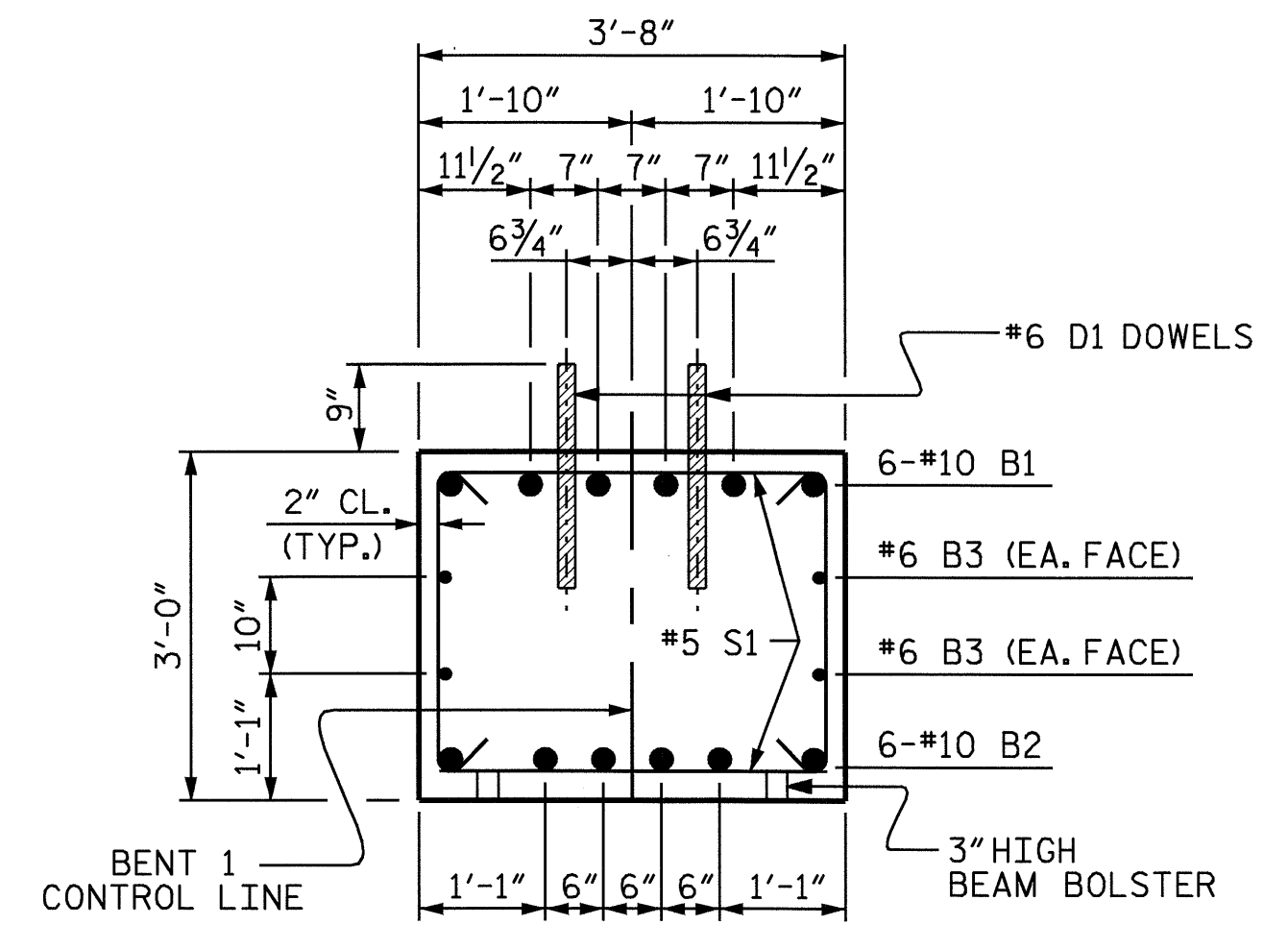
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS AND COLUMNS UNLESS OTHERWISE NOTED)



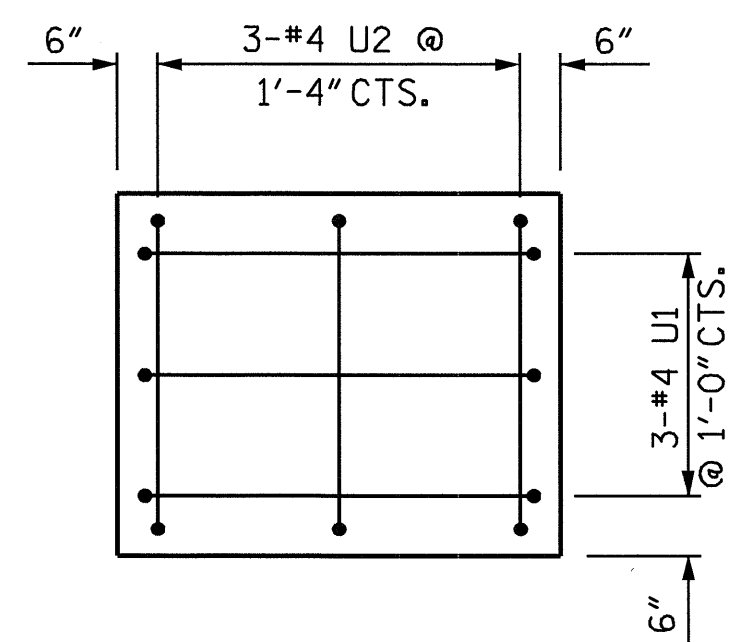


**PLAN OF COLUMNS AND DRILLED PIERS**

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS.

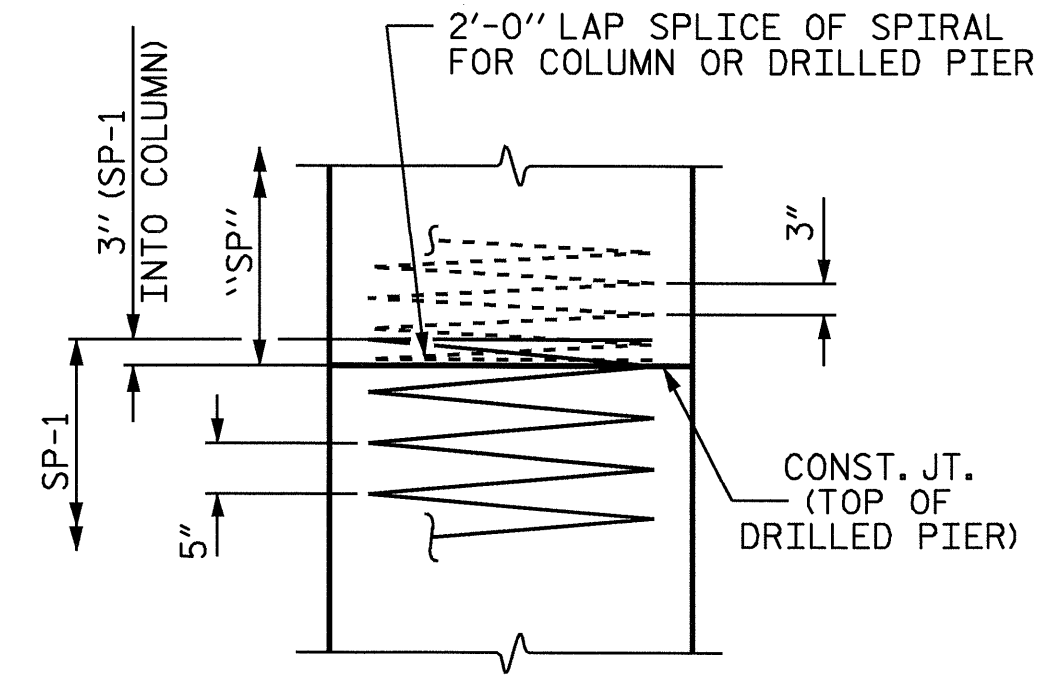


**SECTION A-A**



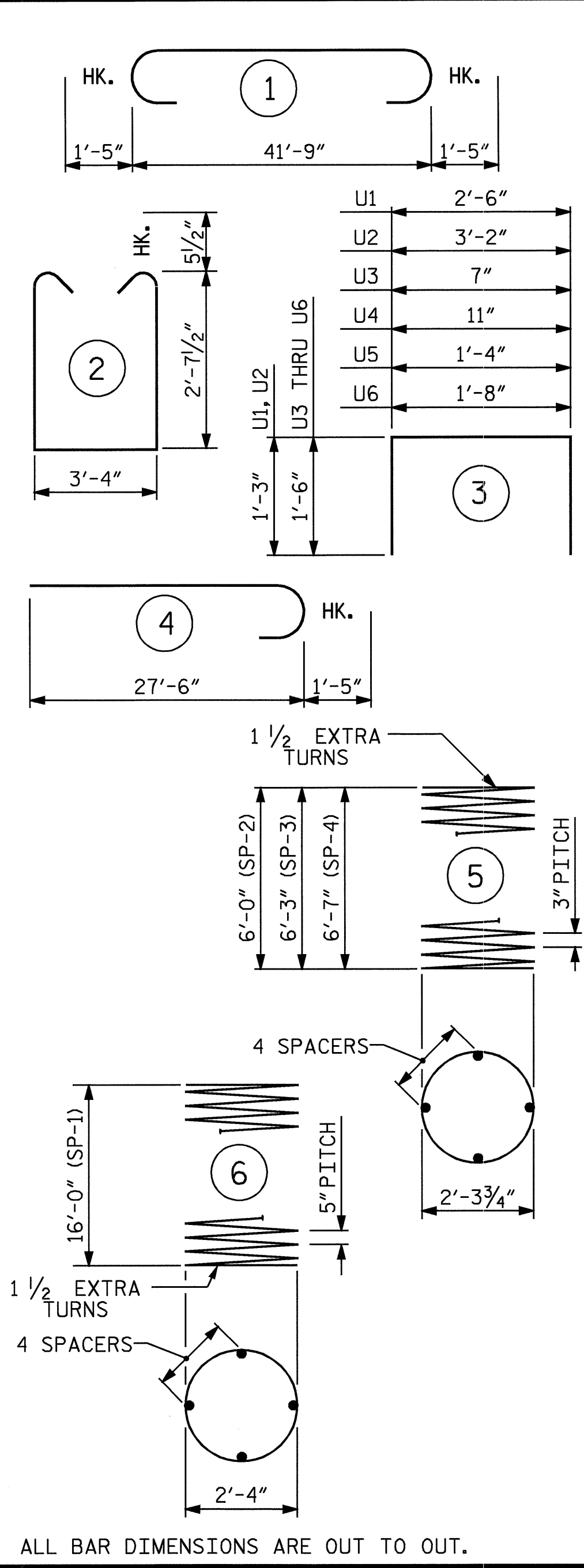
**VIEW X-X**

(TYP. EA. END)



**CONSTRUCTION JOINT DETAIL**

**BAR TYPES**



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

**BILL OF MATERIAL**

BENT 1					
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	44'-7"	1151
B2	6	#10	STR	41'-10"	1080
B3	4	#6	STR	41'-10"	251
B4	2	#4	STR	3'-6"	5
B5	2	#4	STR	3'-4"	4
D1	48	#6	STR	1'-6"	108
M1	36	#10	4	28'-11"	4479
S1	44	#5	2	9'-6"	436
U1	6	#4	3	5'-0"	20
U2	6	#4	3	5'-8"	23
U3	2	#4	3	3'-7"	5
U4	2	#4	3	3'-11"	5
U5	2	#4	3	4'-4"	6
U6	2	#4	3	4'-8"	6
REINFORCING STEEL				LBS.	7579
SP-1	3	**	6	287'-2"	899
SP-2	1	*	5	182'-1"	122
SP-3	1	*	5	189'-3"	126
SP-4	1	*	5	199'-2"	132
SPIRAL COLUMN REINFORCING STEEL				LBS.	1279

CLASS A CONCRETE BREAKDOWN			
POUR #2 (COLUMNS)	C.Y.		4.7
POUR #3 (CAP)	C.Y.		17.2
POUR #4 (LATERAL GUIDES)	C.Y.		0.2
TOTAL CLASS A CONCRETE	C.Y.		22.1

**DRILLED PIERS**

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	C.Y. 13.0
3'-0" Ø DRILLED PIERS IN SOIL: 30.50 LIN. FT.	
3'-0" Ø DRILLED PIERS NOT IN SOIL: 19.00 LIN. FT.	
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	30.3 LIN. FT.

PROJECT NO. B-4587  
 NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE BENT 1**

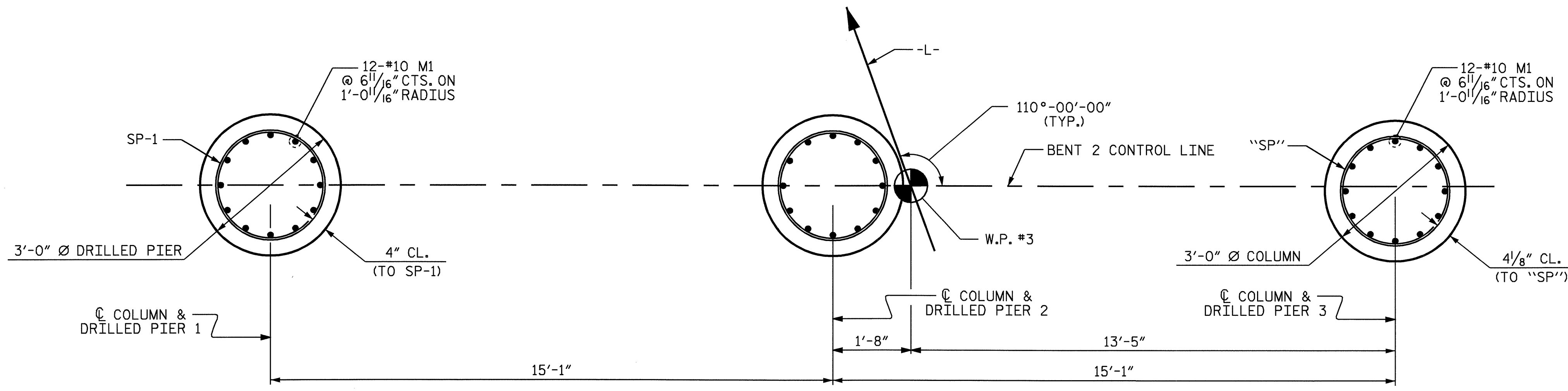


REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 21

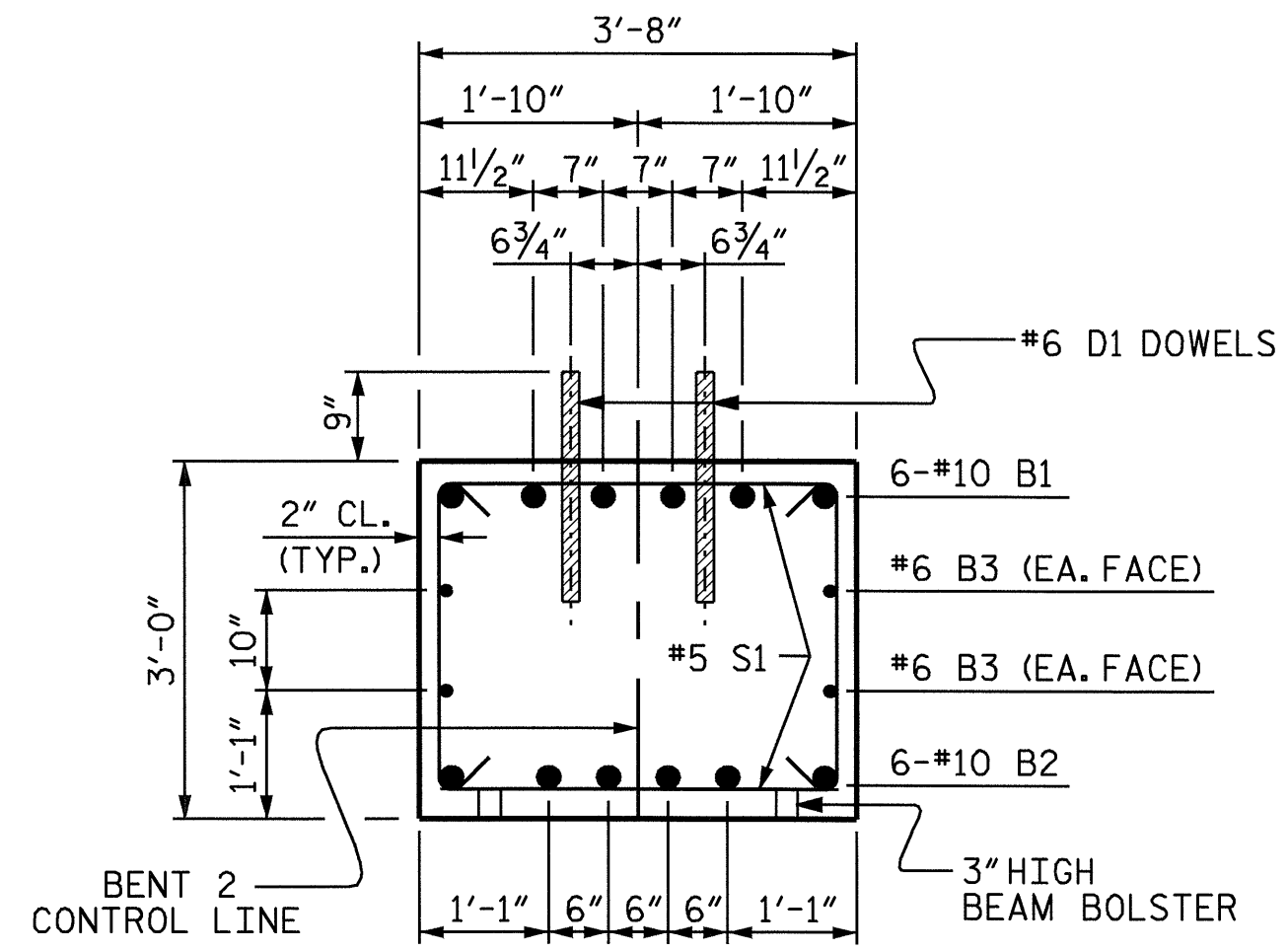
DRAWN BY: J.L. WALTON DATE: 2-25-09  
 CHECKED BY: B.N. GRADY DATE: 3-9-09



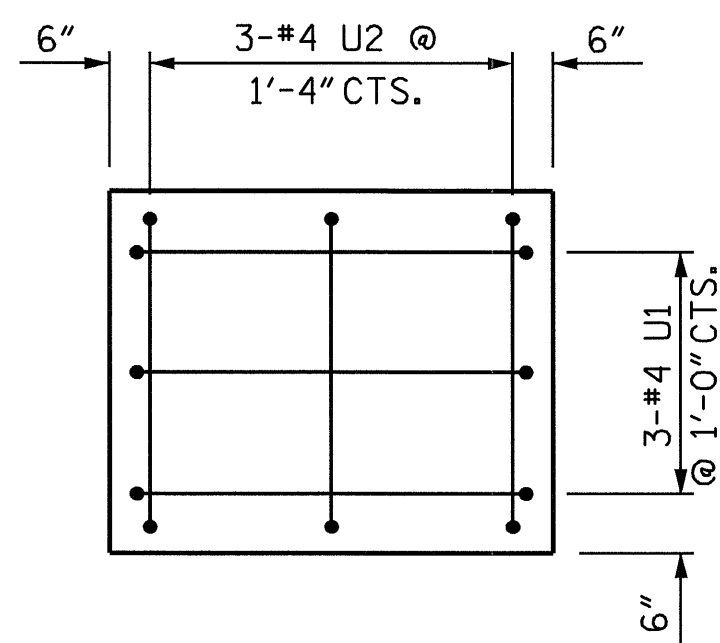


**PLAN OF COLUMNS AND DRILLED PIERS**

REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS.

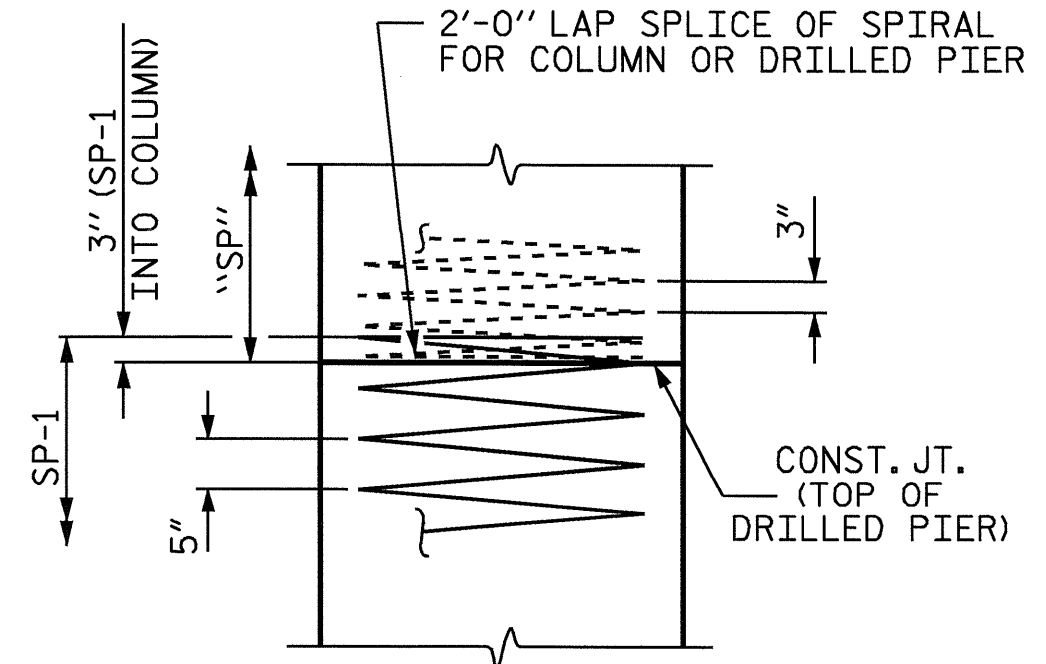


**SECTION A-A**



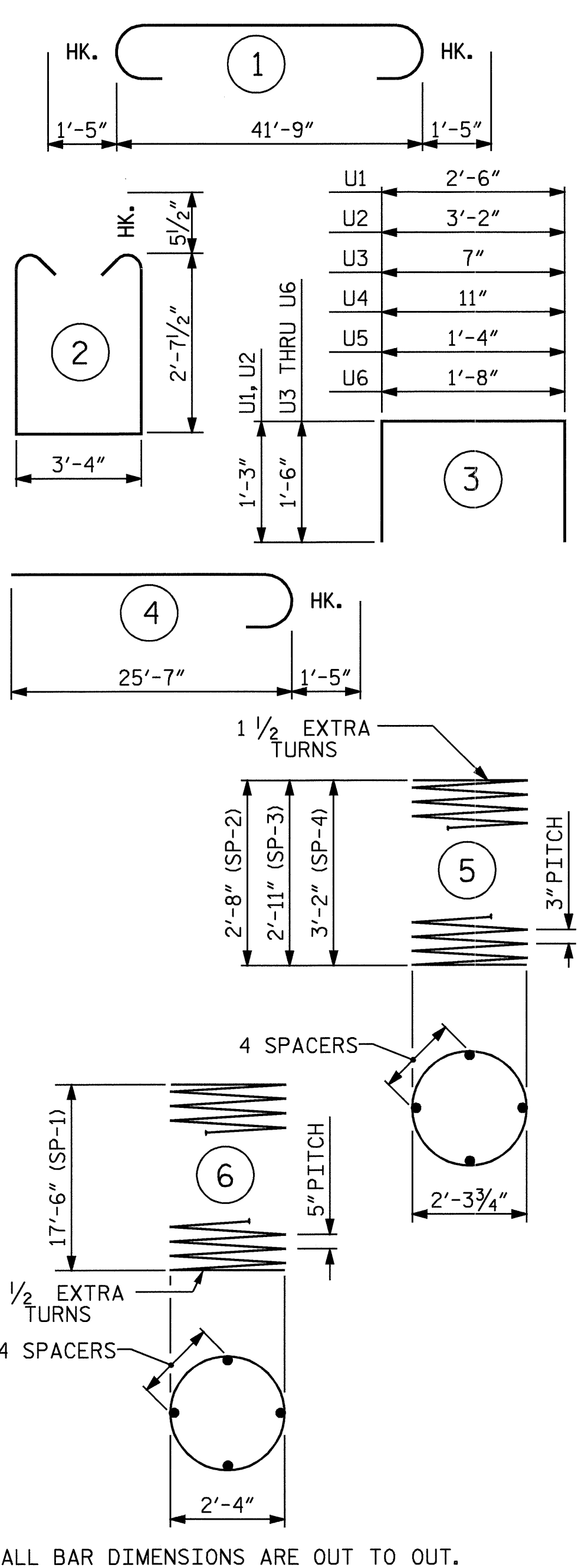
**VIEW X-X**

(TYP. EA. END)



**CONSTRUCTION JOINT DETAIL**

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

- \* 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,
- \* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR,

**BILL OF MATERIAL**

BENT 2						
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	#10	1	44'-7"	1151	
B2	6	#10	STR	41'-10"	1080	
B3	4	#6	STR	41'-10"	251	
B4	2	#4	STR	3'-6"	5	
B5	2	#4	STR	3'-4"	4	
D1	48	#6	STR	1'-6"	108	
M1	36	#10	4	27'-0"	4183	
S1	44	#5	2	9'-6"	436	
U1	6	#4	3	5'-0"	20	
U2	6	#4	3	5'-8"	23	
U3	2	#4	3	3'-7"	5	
U4	2	#4	3	3'-11"	5	
U5	2	#4	3	4'-4"	6	
U6	2	#4	3	4'-8"	6	
REINFORCING STEEL				LBS.	7283	
SP-1	3	**	6	312'-4"	977	
SP-2	1	*	5	85'-8"	57	
SP-3	1	*	5	94'-8"	63	
SP-4	1	*	5	101'-9"	68	
SPIRAL COLUMN				REINFORCING STEEL	LBS.	1165

CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)	C.Y.	2.1
POUR #3 (CAP)	C.Y.	17.2
POUR #4 (LATERAL GUIDES)	C.Y.	0.2
TOTAL CLASS A CONCRETE	C.Y.	19.5

DRILLED PIERS	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	C.Y. 14.1
3'-0" Ø DRILLED PIERS IN SOIL: 33.00 LIN. FT.	
3'-0" Ø DRILLED PIERS NOT IN SOIL: 21.00 LIN. FT.	
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER 36.0 LIN. FT.	

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

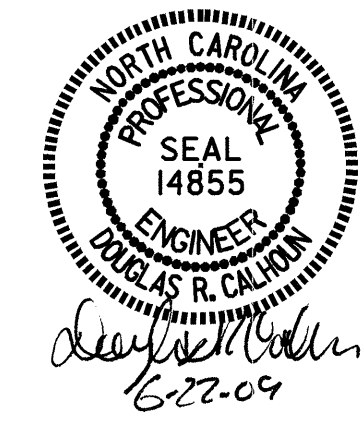
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 BENT 2**

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

SHEET NO. **S-16**  
 TOTAL SHEETS **21**

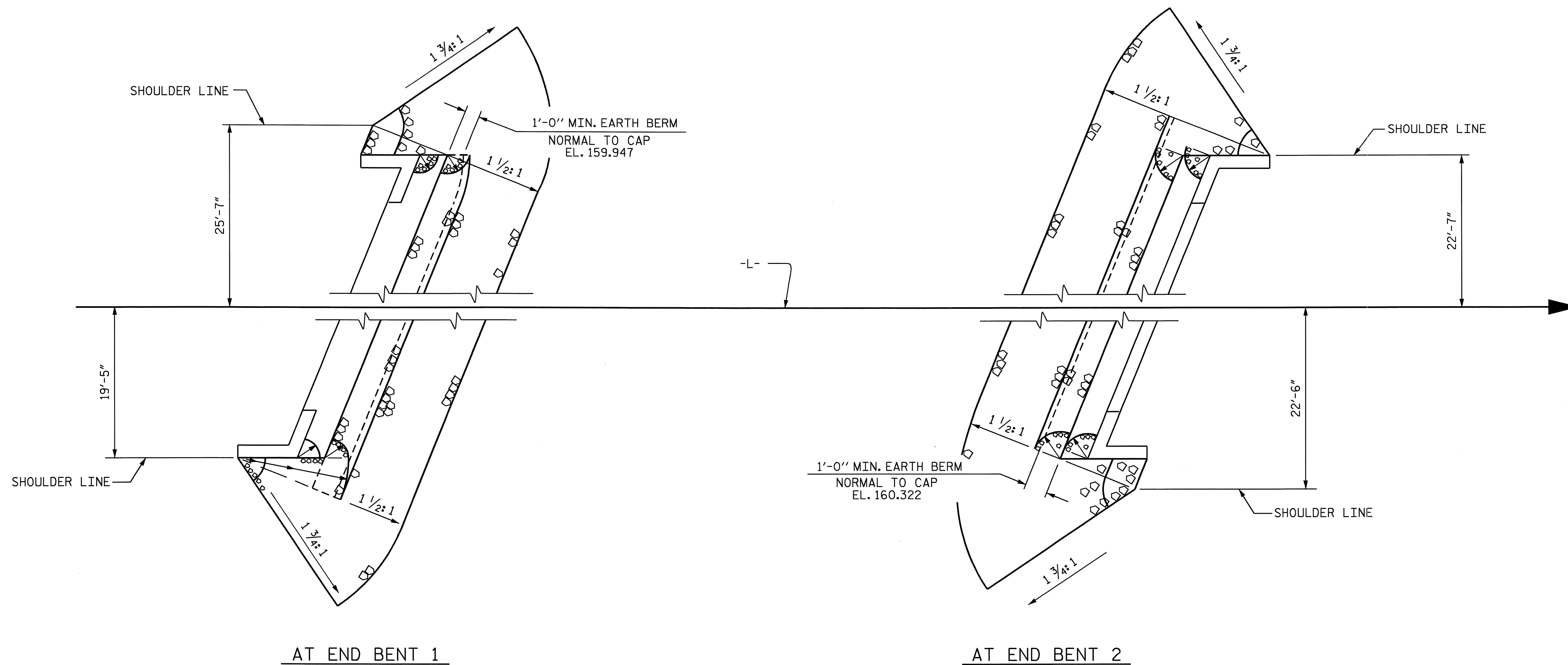


DRAWN BY: J.L. WALTON DATE: 2-25-09  
 CHECKED BY: B.N. GRADY DATE: 3-9-09



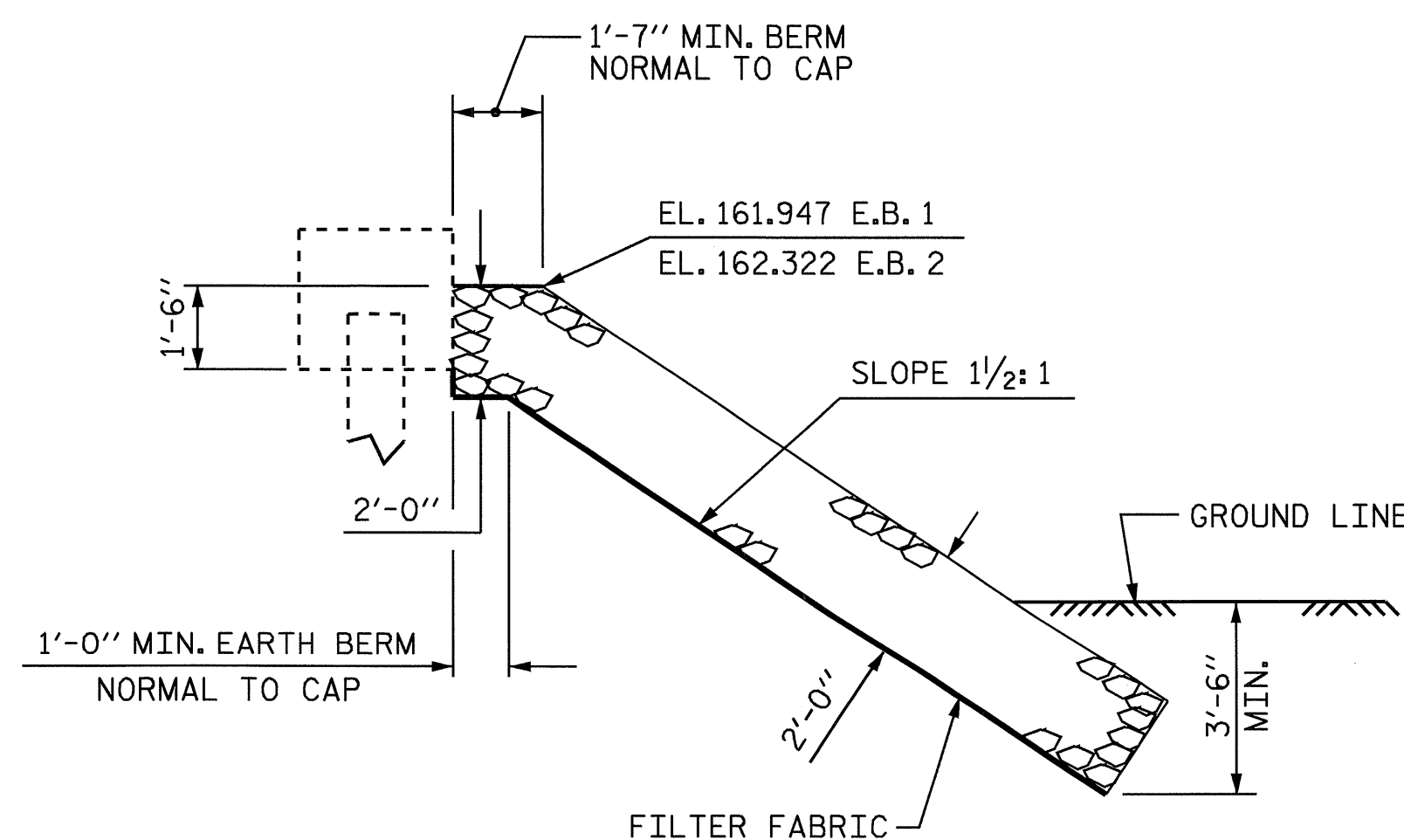






PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+46.50 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	59	65
END BENT 2	61	68



SECTION BERM RIP RAPPED

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

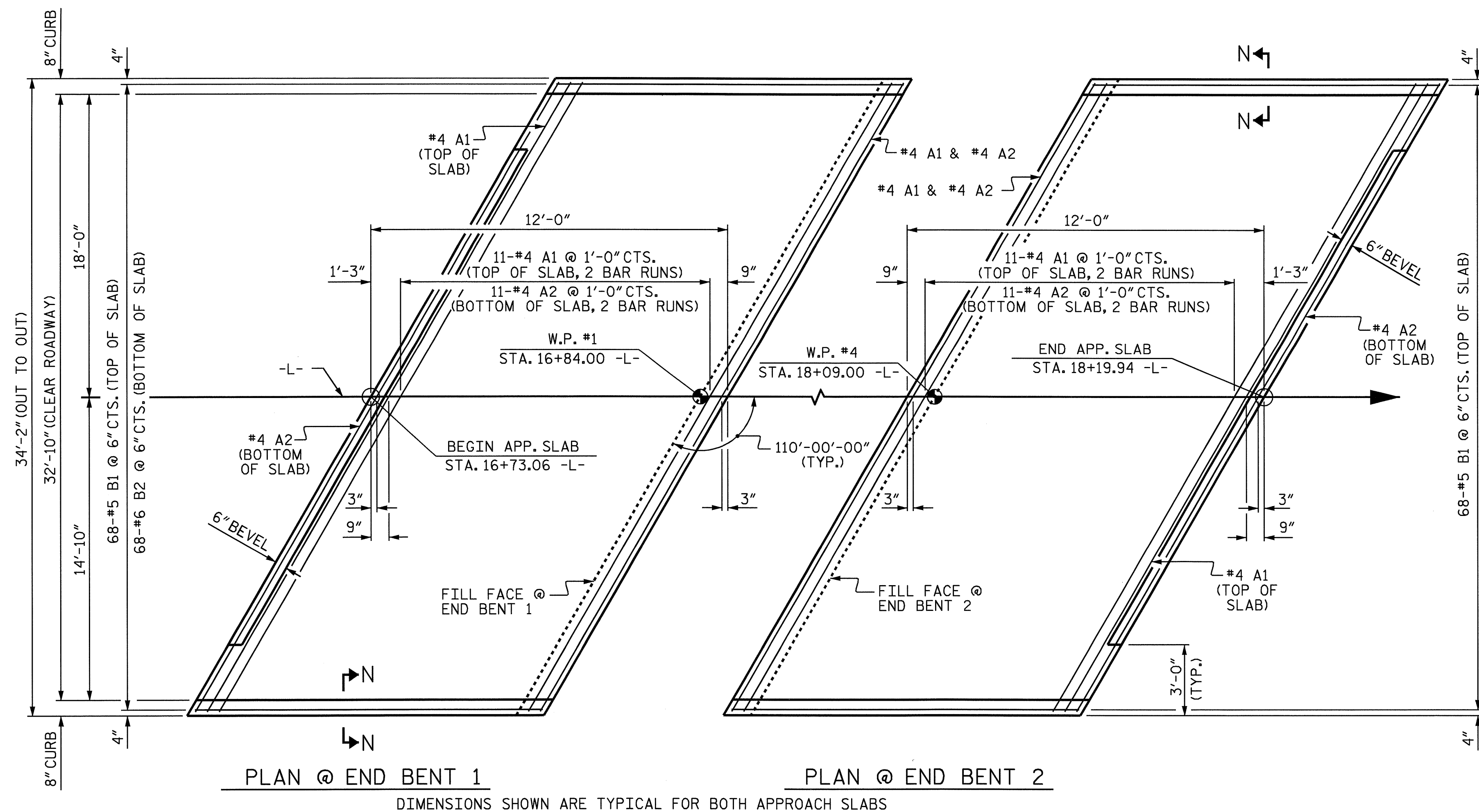


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 = RIP RAP DETAILS =

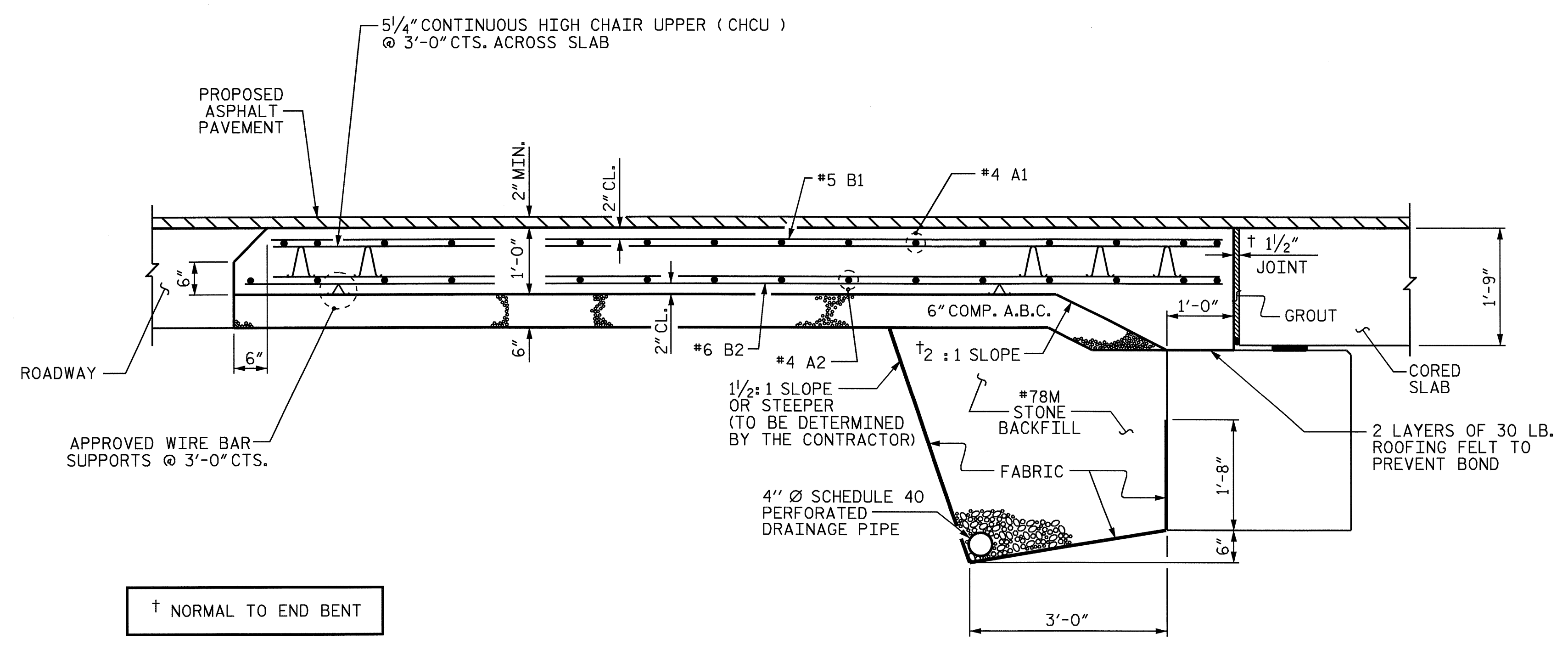
ASSEMBLED BY : B.N. GRADY DATE : 2/26/09  
 CHECKED BY : J.L. WALTON DATE : 4/8/09  
 DRAWN BY : REK 1/84 REV. 8/16/99 RWW/LES  
 CHECKED BY : RDU 1/84 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO. <b>S-19</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS <b>21</b>
2			4			

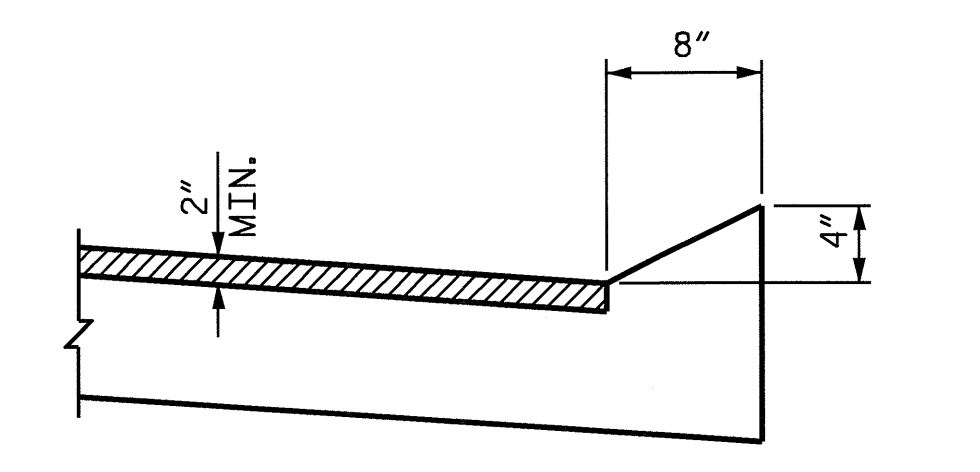




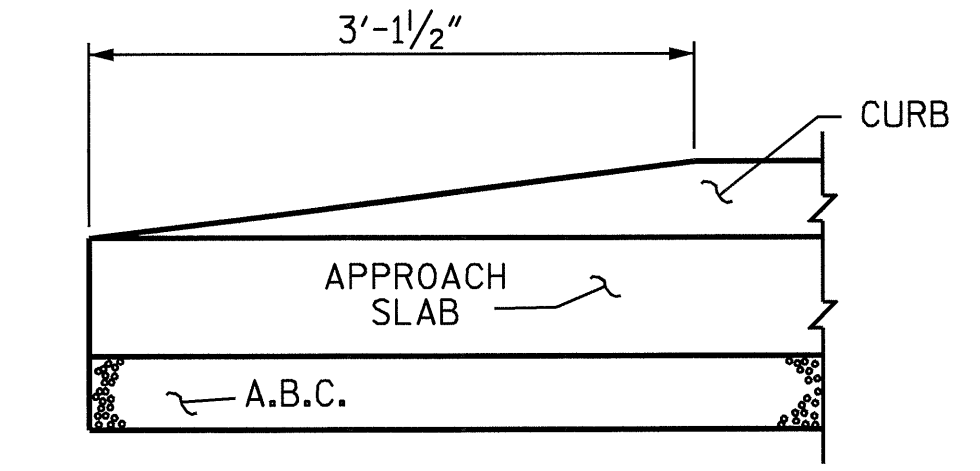
PLAN @ END BENT 1  
 PLAN @ END BENT 2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



SECTION N-N



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

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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 OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE 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.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL

FOR ONE APPROACH SLAB  
 (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	19'-1"	331
A2	26	#4	STR	18'-11"	329
*B1	68	#5	STR	11'-2"	792
B2	68	#6	STR	11'-7"	1183

REINFORCING STEEL LBS. 1512  
 \*EPOXY COATED REINFORCING STEEL LBS. 1123

CLASS AA CONCRETE C. Y. 16.9

SPLICE CHART

#4 A1	2'-0"
#4 A2	1'-9"

PROJECT NO. B-4587  
 NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

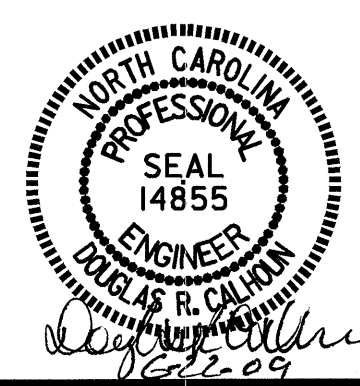
SHEET 1 OF 2

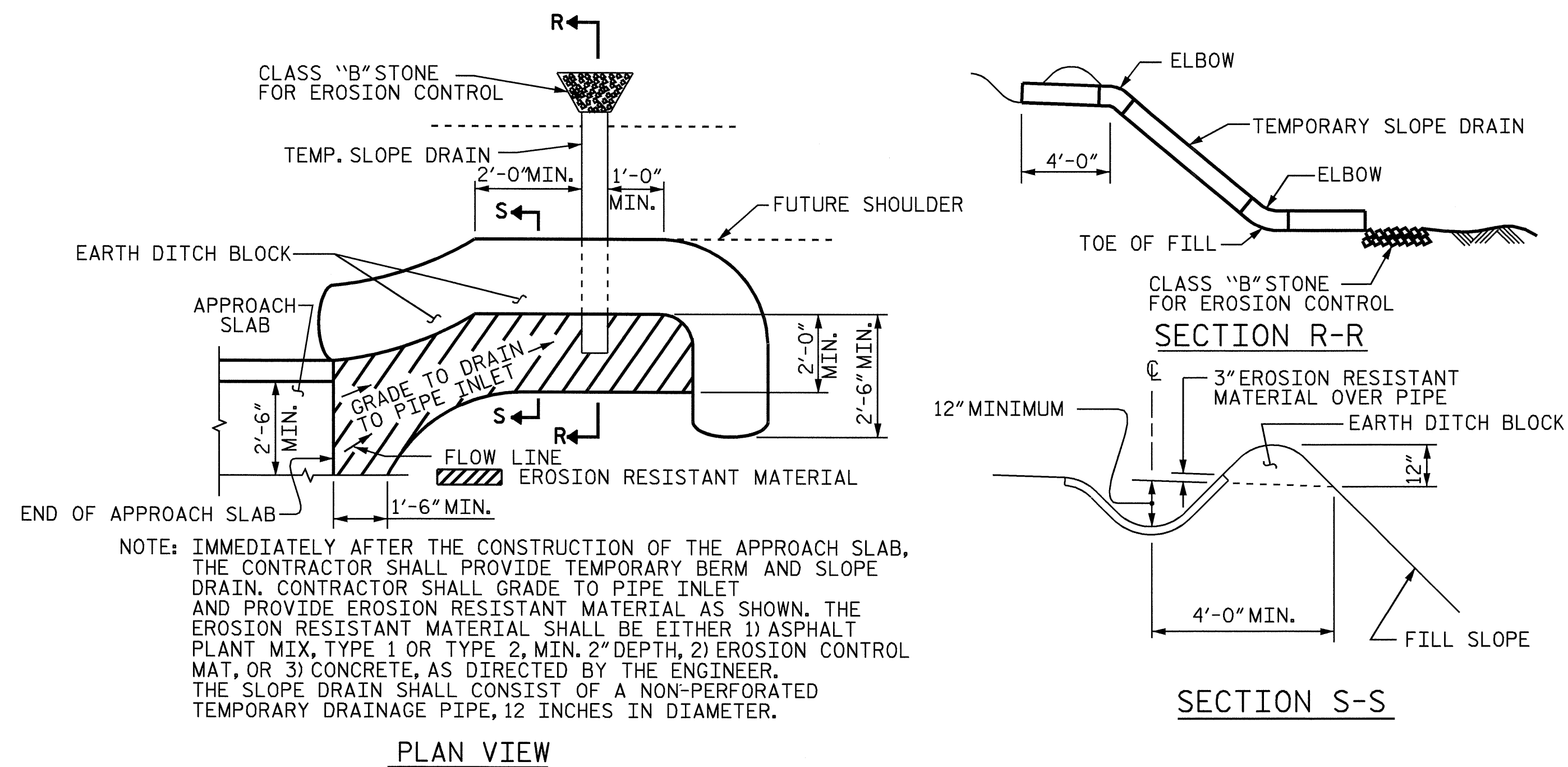
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 (SUB-REGIONAL TIER)

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

TOTAL SHEETS 21

ASSEMBLED BY : B.N. GRADY DATE : 2/25/09  
 CHECKED BY : J.L. WALTON DATE : 4/9/09  
 DRAWN BY : KMM 3-08  
 CHECKED BY : GM 3-08

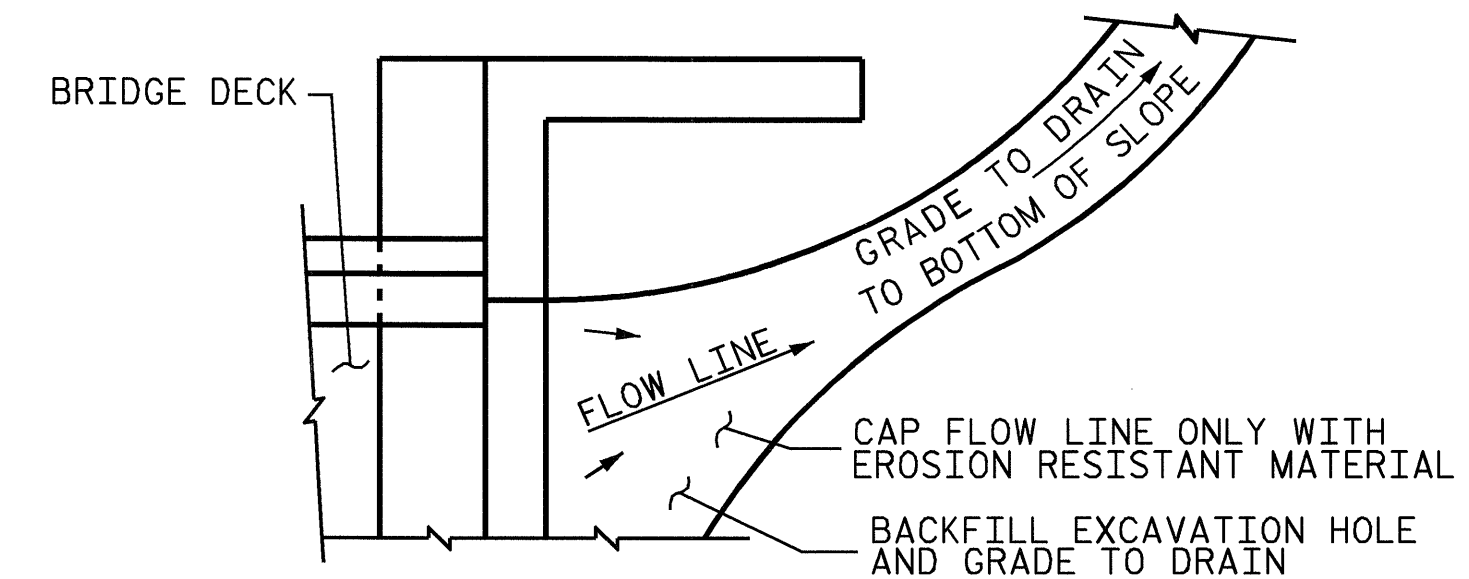




NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



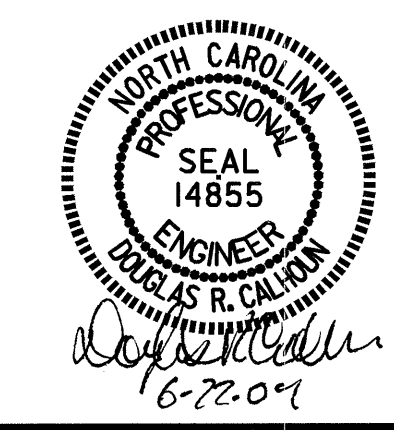
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. B-4587  
NASH/FRANKLIN COUNTY  
 STATION: 17+46.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					21



ASSEMBLED BY : B.N. GRADY	DATE : 2/25/09
CHECKED BY : J.L. WALTON	DATE : 4/9/09
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



## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.  
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.  
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.  
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".  
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.  
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.  
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

STD. NO. SN