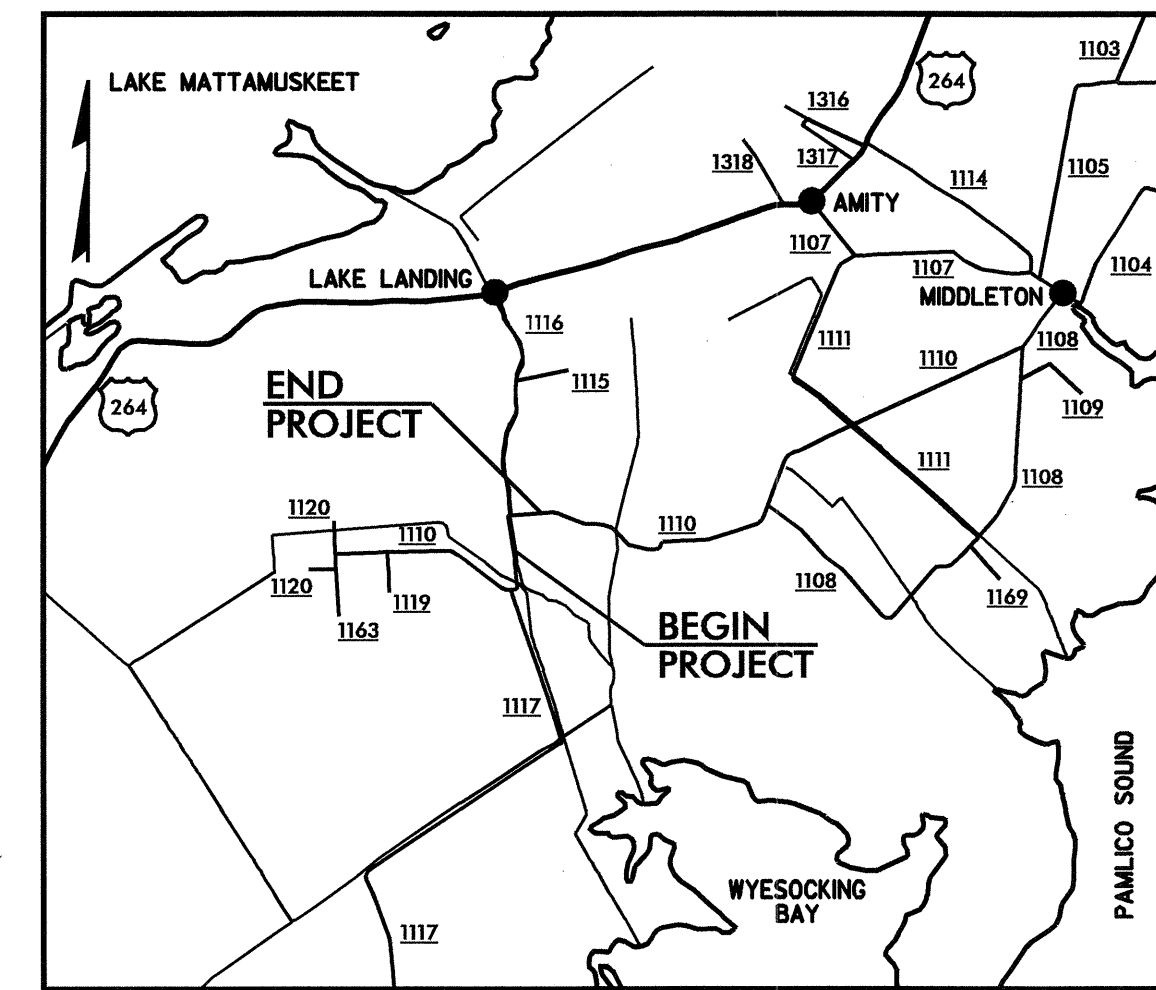


**CONTRACT: C201241 TIP PROJECT: B-3858**

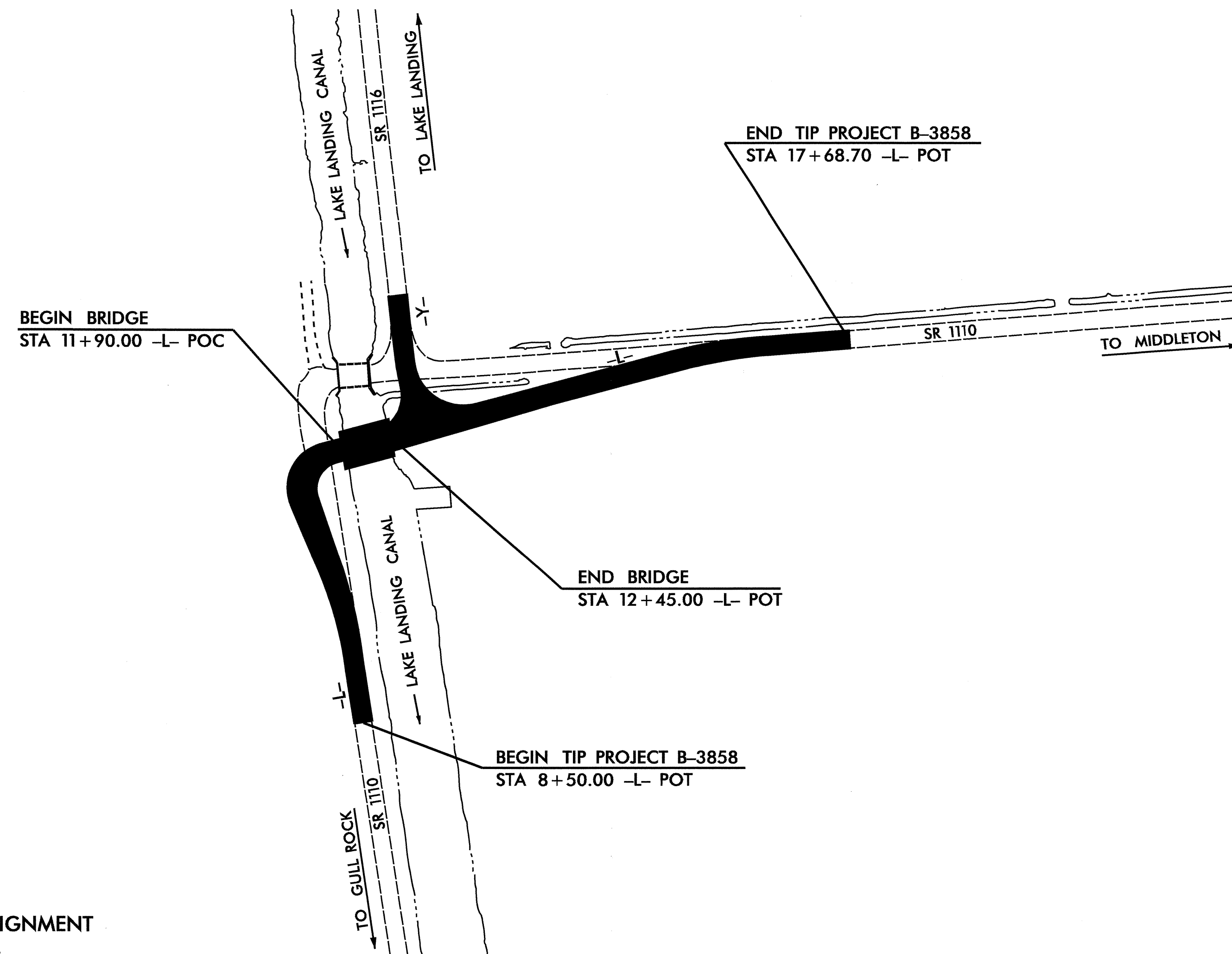


VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**HYDE COUNTY**

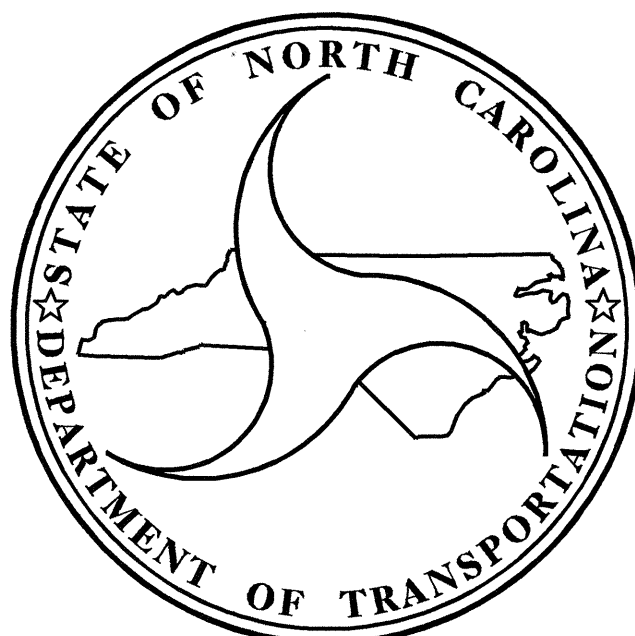
**LOCATION: REPLACE BRIDGE NO. 6 AND APPROACHES  
ON SR 1110 OVER LAKE LANDING CANAL**

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



**STRUCTURE**

\*\* DESIGN EXCEPTION FOR DESIGN SPEED, HORIZONTAL ALIGNMENT AND HORIZONTAL STOPPING SIGHT DISTANCE REQUIRED.



DESIGN DATA	
ADT 2005 =	679
ADT 2025 =	1,200
DHV =	12%
D =	60%
T =	5% *
V =	45 MPH**
* TTST 3%	DUAL 2%

PROJECT LENGTH	
LENGTH ROADWAY OF TIP PROJECT B-3858 =	0.164 MI
LENGTH STRUCTURE OF TIP PROJECT B-3858 =	0.010 MI
TOTAL LENGTH OF TIP PROJECT B-3858 =	0.174 MI

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**

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2002 STANDARD SPECIFICATIONS

<p>LETTING DATE : JUNE 20, 2006</p>	<p style="text-align: center;">Q.H. NGUYEN, P.E. <small>PROJECT ENGINEER</small></p> <hr/> <p style="text-align: center;">MARC G. CHEEK, P.E. <small>PROJECT DESIGN ENGINEER</small></p>
---	--

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

**GRPer**  
4.4.06

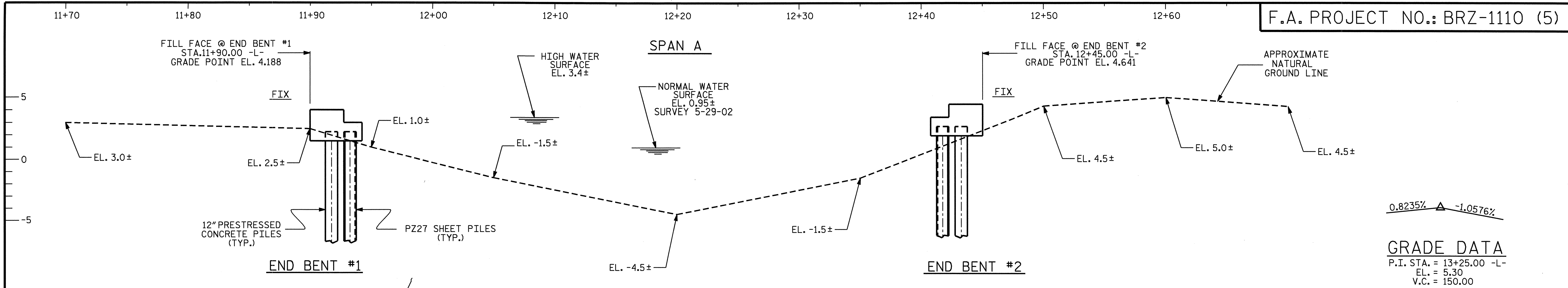
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

P.E.  
STATE DESIGN ENGINEER

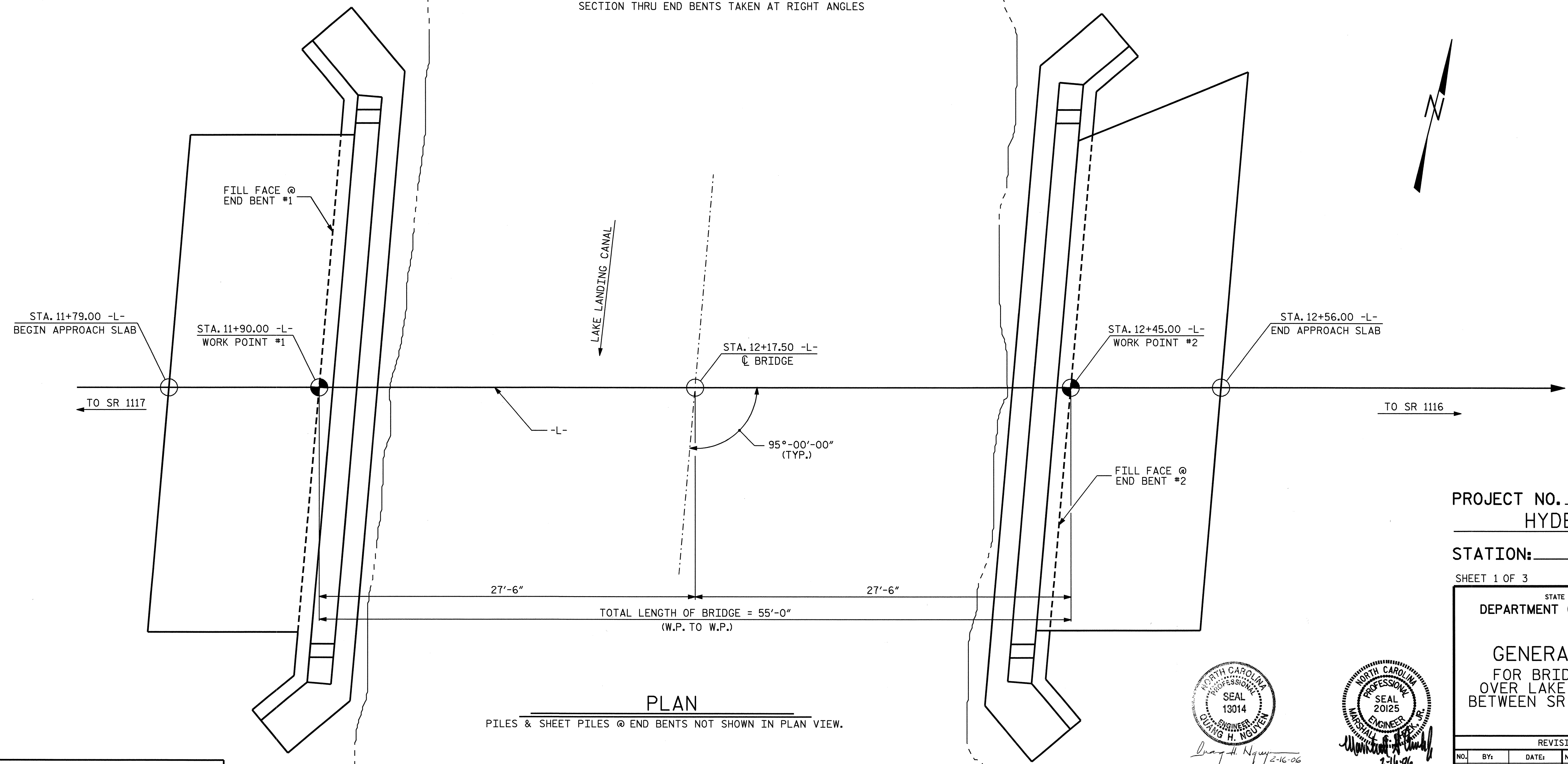
**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
DIVISION ADMINISTRATOR

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3858		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33305.1.1	BRZ-1110(3)	P.E.	
33305.2.1	BRZ-1110(3)	RW, UTIL.	
33305.3.1	BRZ-1110(5)	CONST.	



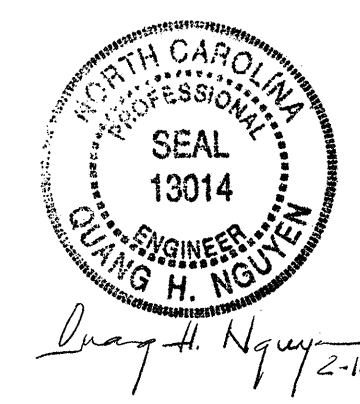
**SECTION ALONG -L-**  
SECTION THRU END BENTS TAKEN AT RIGHT ANGLES



PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50-L-  
SHEET 1 OF 3 REPLACES BRIDGE #6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

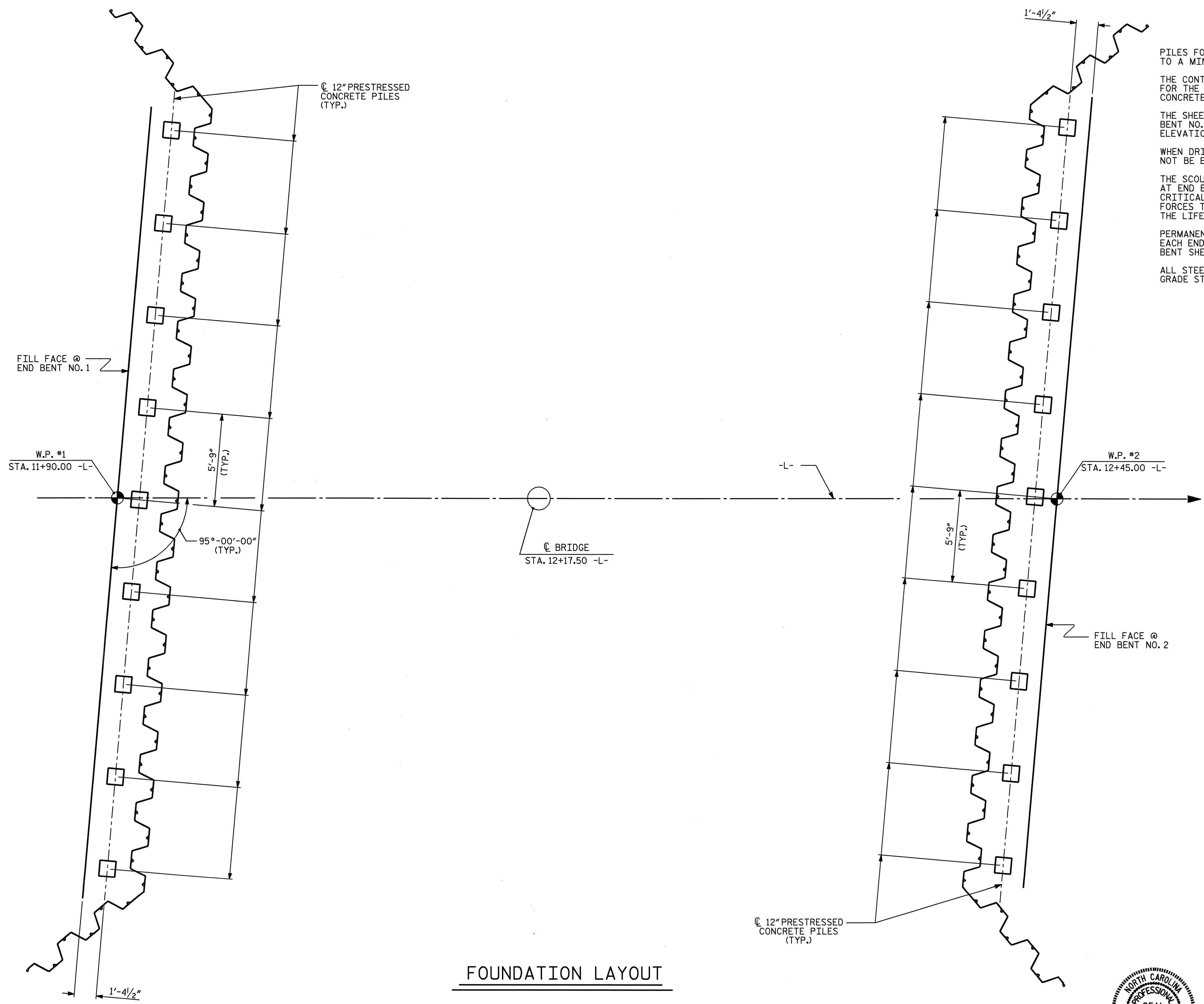
**GENERAL DRAWING**  
FOR BRIDGE ON SR 1110  
OVER LAKE LANDING CANAL  
BETWEEN SR 1116 AND SR 1117



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

16-FEB-2006 09:27  
C:\p01\12\103858\casrsenginh\103858\_sd.dgn

DRAWN BY : A. SORSENGINH DATE : 8/15/05  
CHECKED BY : D. HODGE DATE : 8/05



**NOTES**

- PILES FOR END BENT NO. 1 AND NO. 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.
- THE CONTRACTOR SHALL INSTALL THE SHEET PILING FOR THE ABUTMENT WALLS PRIOR TO DRIVING THE CONCRETE PILES.
- THE SHEET PILING FOR THE ABUTMENT WALLS AT END BENT NO. 1 AND NO. 2 SHALL BE INSTALLED TO ELEVATION -20 FT.
- WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.
- THE SCOUR CRITICAL ELEVATION FOR ABUTMENT WALLS AT END BENT NO. 1 AND NO. 2 IS -11 FT. THE SCOUR CRITICAL ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- PERMANENT STEEL SHEET PILING WILL BE REQUIRED AT EACH END BENT, FOR LOCATION AND DETAILS, SEE END BENT SHEETS.
- ALL STEEL SHEET PILES SHALL BE ASTM A690 MARINE GRADE STEEL AND SHALL BE HOT ROLLED.

**FOUNDATION LAYOUT**

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1110  
 OVER LAKE LANDING CANAL  
 BETWEEN SR 1116 AND SR 1117



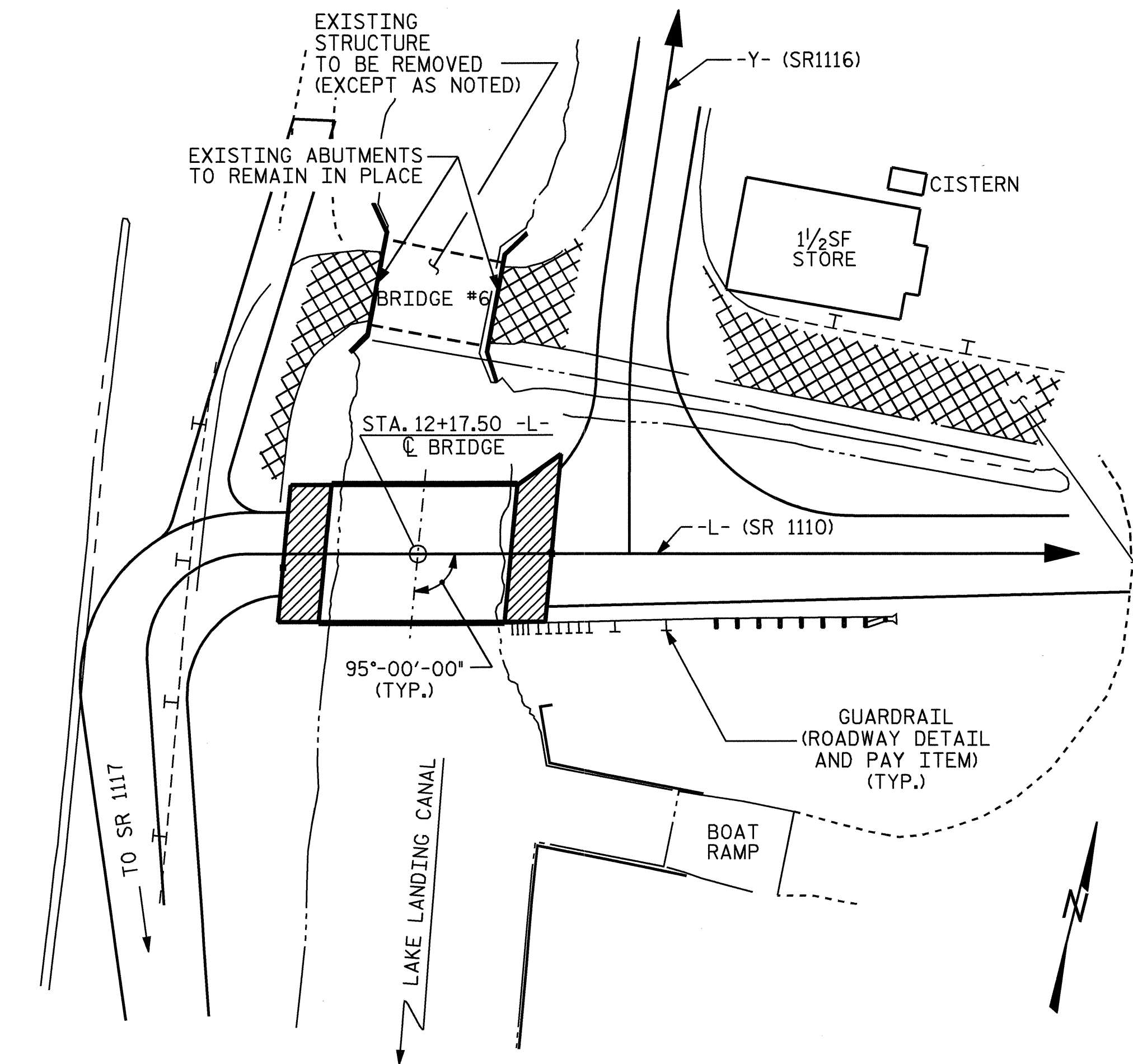
DRAWN BY : CR YARBROUGH DATE : 01/06  
 CHECKED BY : D. HODGE DATE : 01/06

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



BENCH MARK No. 9: CROSS CHISELED IN SW CORNER OF GAS PUMP ISLAND,  
288.17' RT OF -EL-STA. 14+76.25 EL. 3.84. NGVD 29

NOTES



HYDRAULIC DATA

DESIGN DISCHARGE	=	N/A
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	N/A
DRAINAGE AREA	=	N/A
BASIC DISCHARGE (Q100)	=	N/A
BASIC HIGH WATER ELEVATION	=	4.9

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	N/A
FREQUENCY OF OVERTOPPING FLOOD	=	<10 YRS.
OVERTOPPING FLOOD ELEVATION	=	2.7

REMOVE PAVEMENT AND GRADE TO DRAIN (ROADWAY DETAIL AND PAY ITEM)

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING.

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.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 35'-0", TIMBER DECK ON I-BEAMS ON TIMBER CAPS AND PILES AND LOCATED 75' UPSTREAM FROM THE PROPOSED SITE, SHALL BE REMOVED EXCEPT FOR EXISTING ABUTMENTS, WHICH ARE TO REMAIN IN PLACE. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY, DURING THE LIFE OF THE PROJECT.

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

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", NOVEMBER, 1995.

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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

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

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.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE END BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE SPECIAL PROVISIONS.

ALL BAR SUPPORTS USED IN THE PARAPET, END BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE SPECIAL PROVISIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

FOR SPECIAL STEEL 2-BAR METAL RAIL, SEE SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	12" PRESTRESSED CONCRETE PILES	18" STEEL SHEET PILES	1'-7" X 11 1/2" CONCRETE PARAPET	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	SPECIAL STEEL 2-BAR METAL RAIL		
	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	SQ. FT.	LIN.FT.	LUMP SUM	NO.	LIN.FT.	LIN.FT.
SUPERSTRUCTURE			LUMP SUM					105.48	LUMP SUM	14	738.35	90.22
END BENT NO. 1		22.9		3078	9	450	1386					
END BENT NO. 2		22.9		3076	9	450	1386					
TOTAL	LUMP SUM	45.8	LUMP SUM	6154	18	900	2772	105.48	LUMP SUM	14	738.35	90.22

PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE ON SR 1110  
OVER LAKE LANDING CANAL  
BETWEEN SR 1116 AND SR 1117

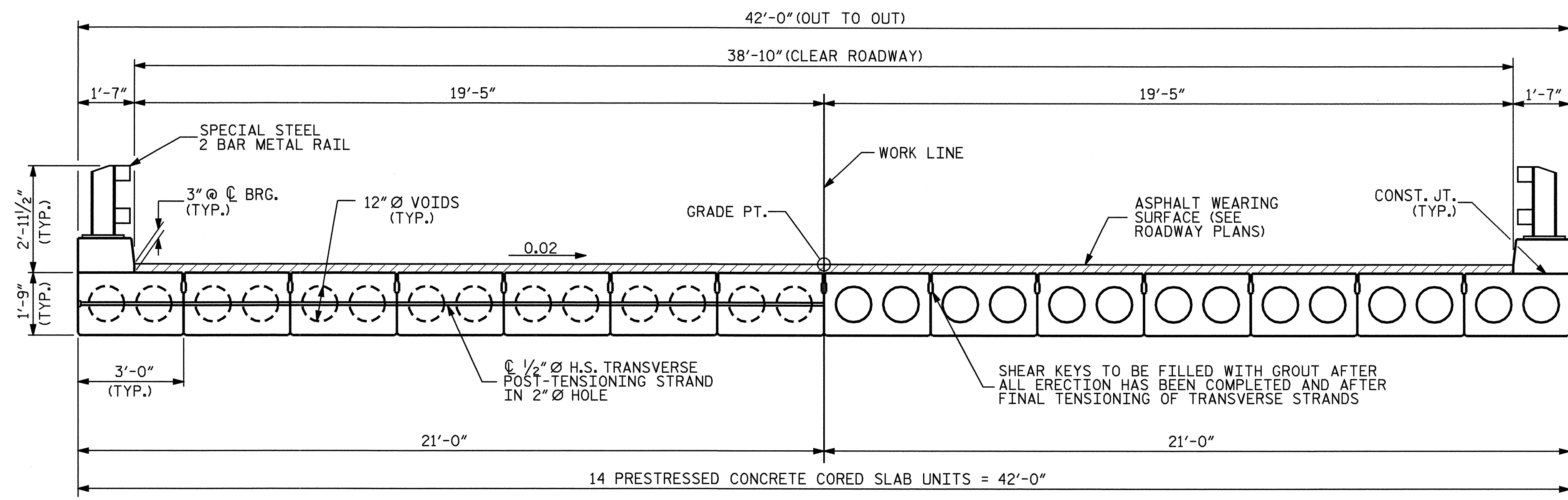


DRAWN BY : A. SORSENGINH DATE : 8/16/05  
CHECKED BY : D. HODGE DATE : 8/05

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

TOTAL SHEETS: 21

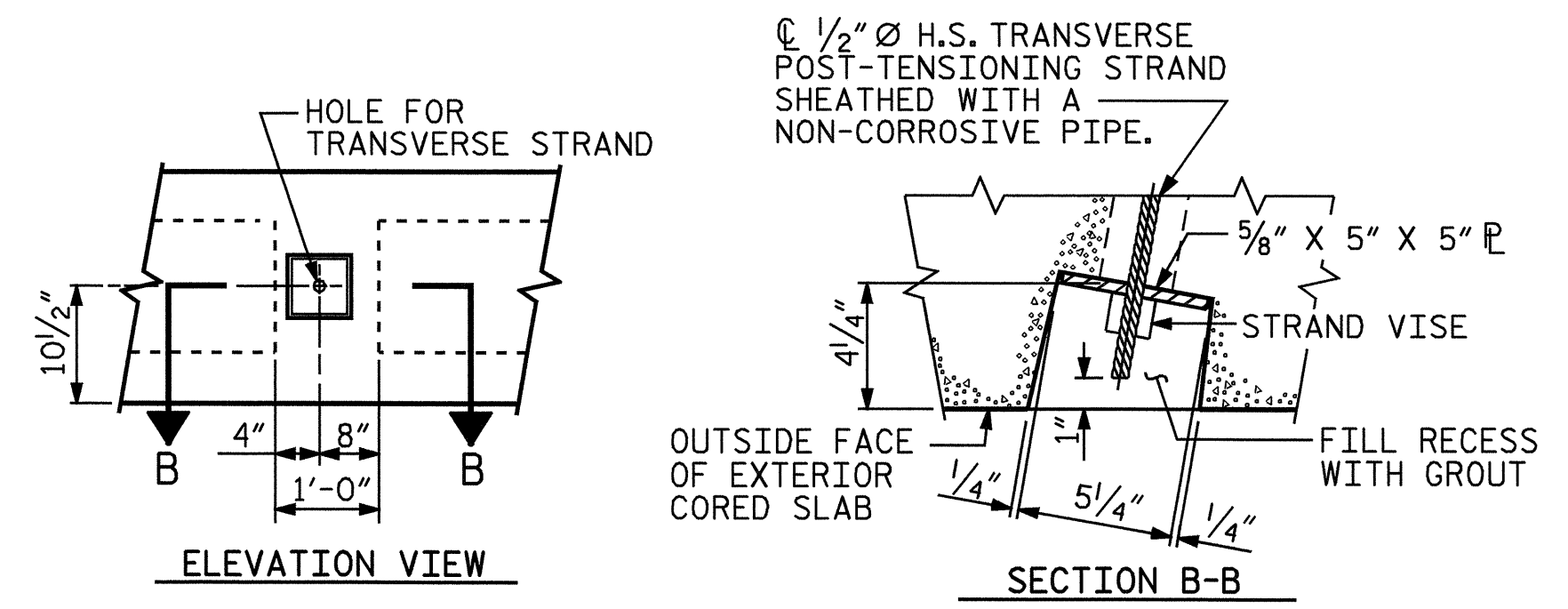




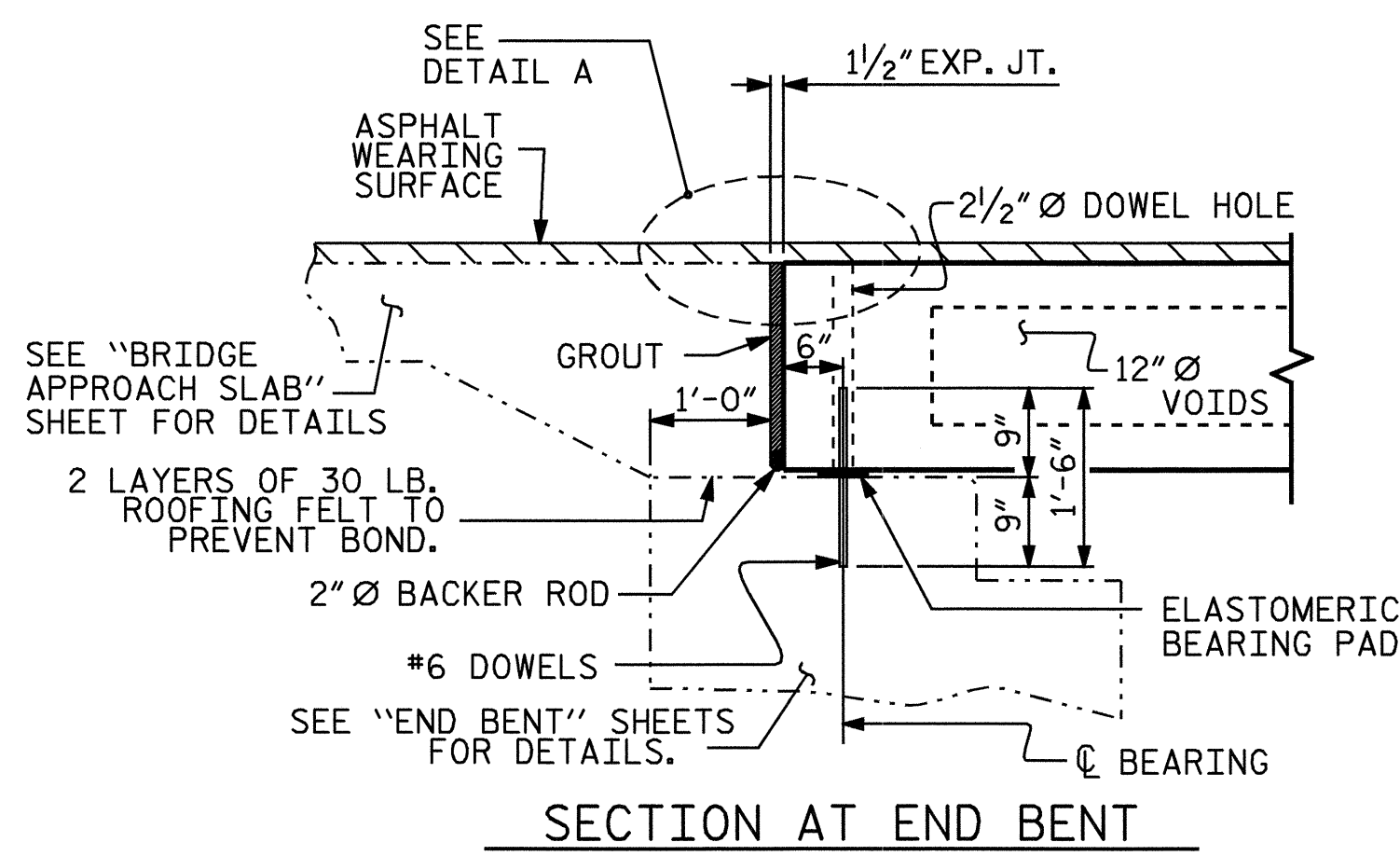
HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION AT VOIDS

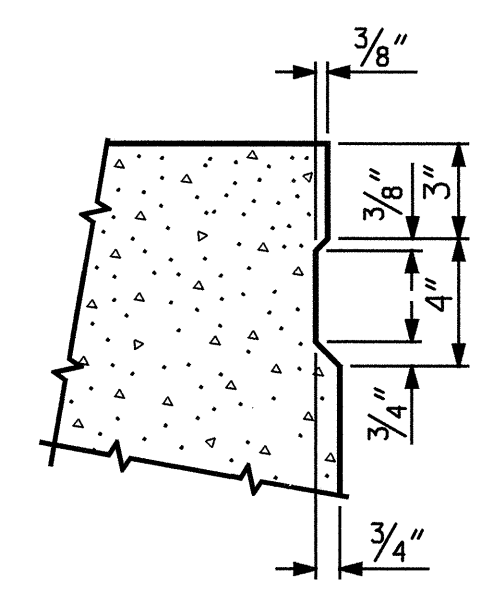
TYPICAL SECTION



GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

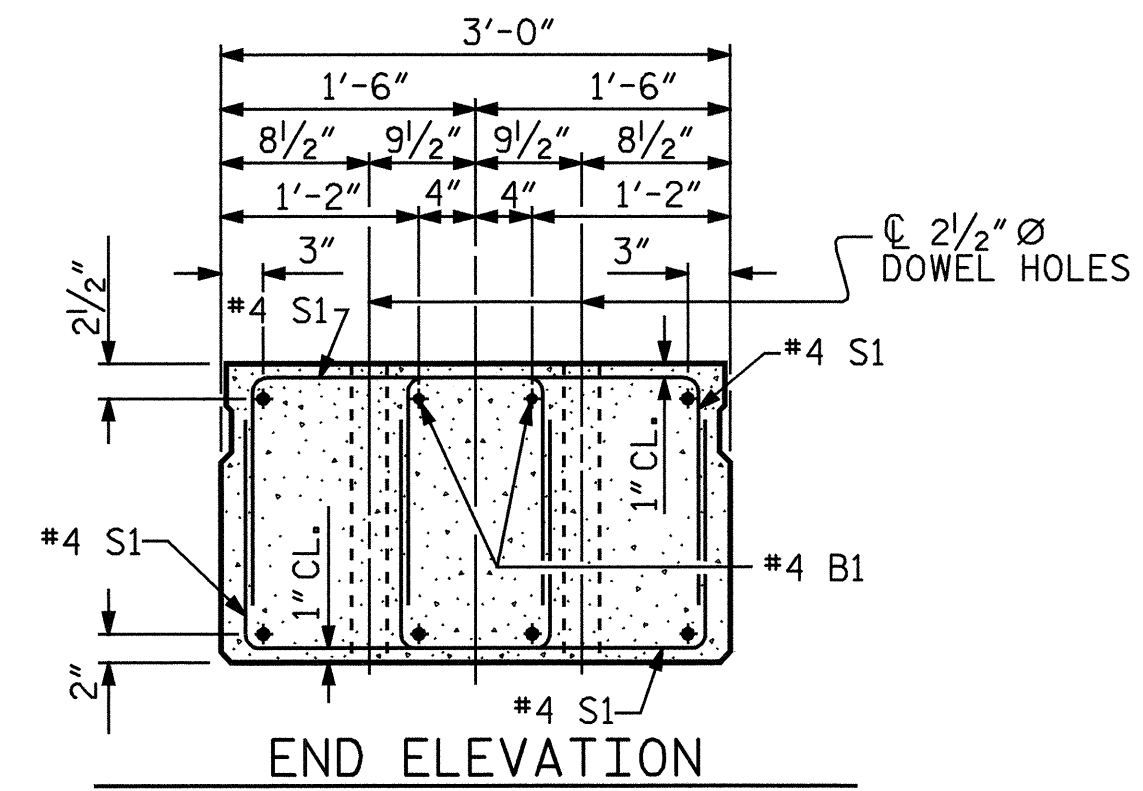


SECTION AT END BENT



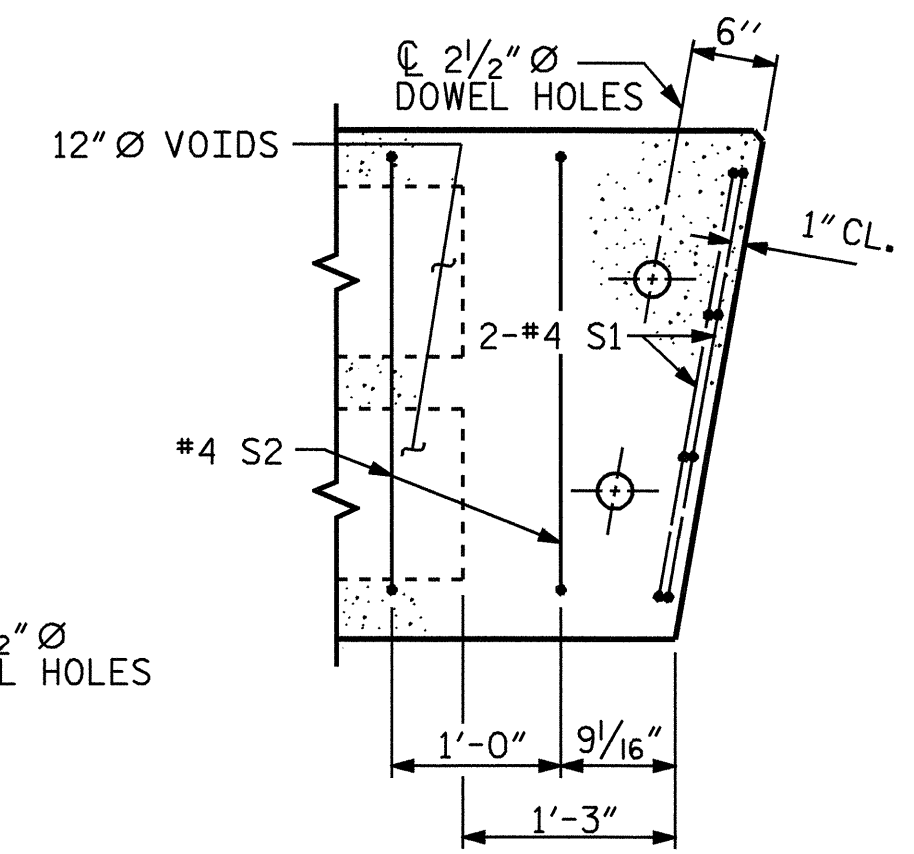
SHEAR KEY DETAIL

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

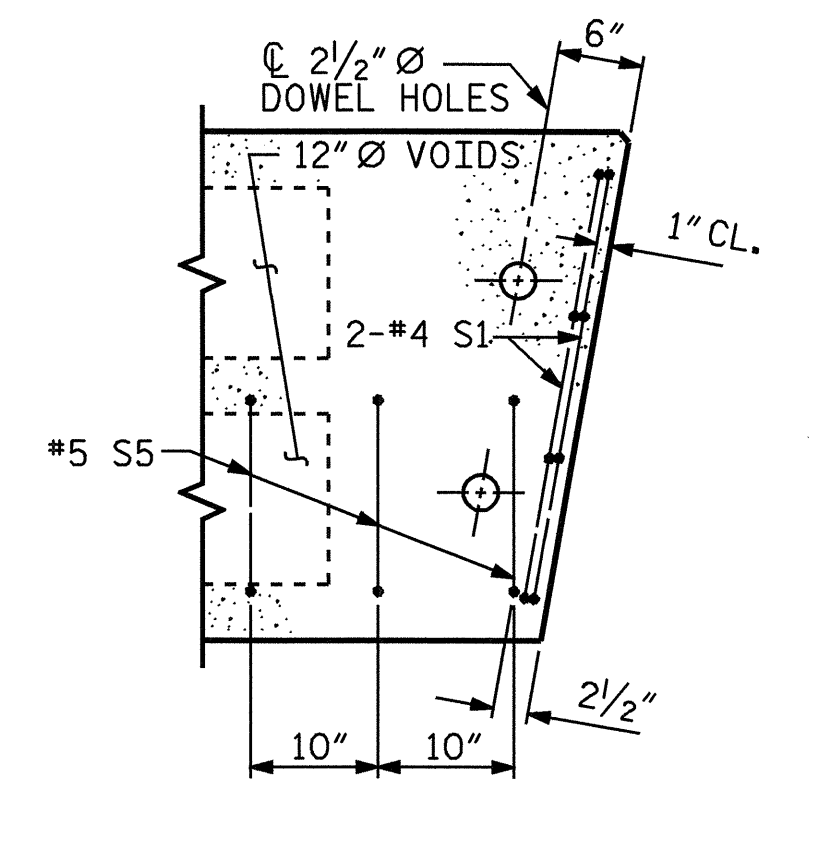


END ELEVATION

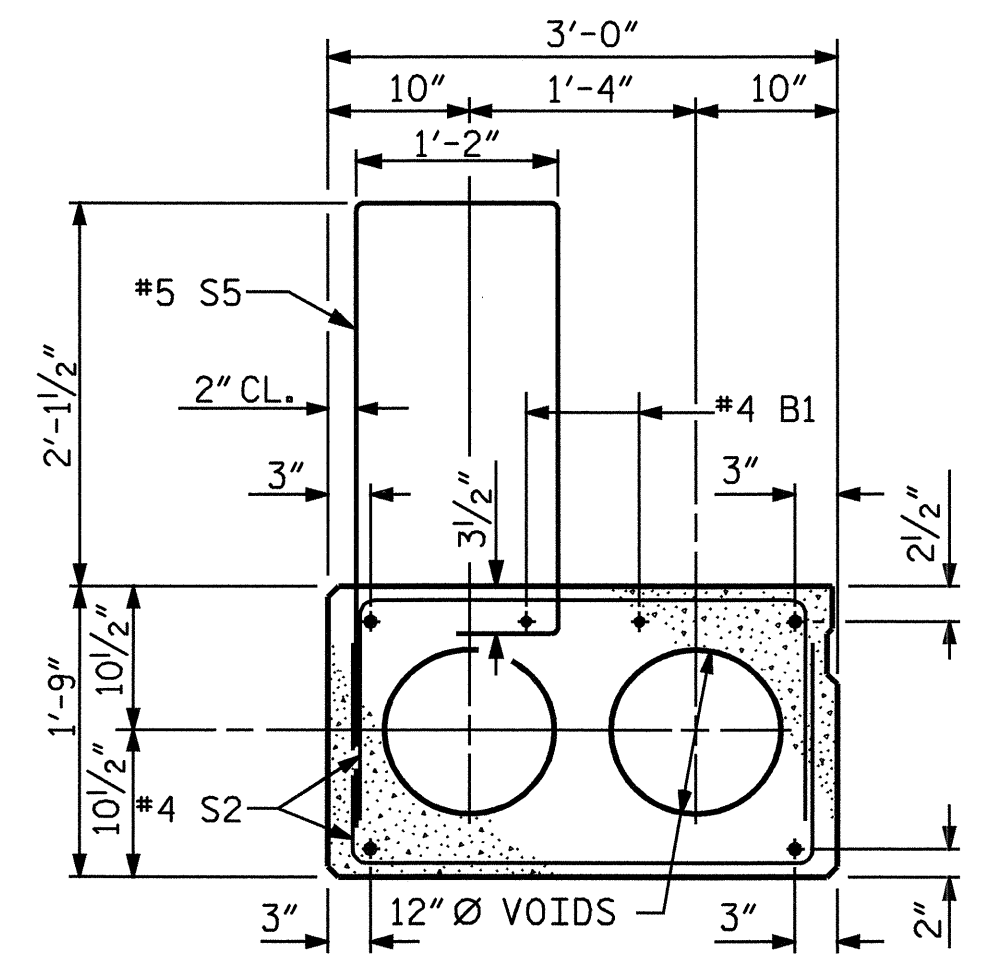
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



PART PLAN-INTERIOR SECTION

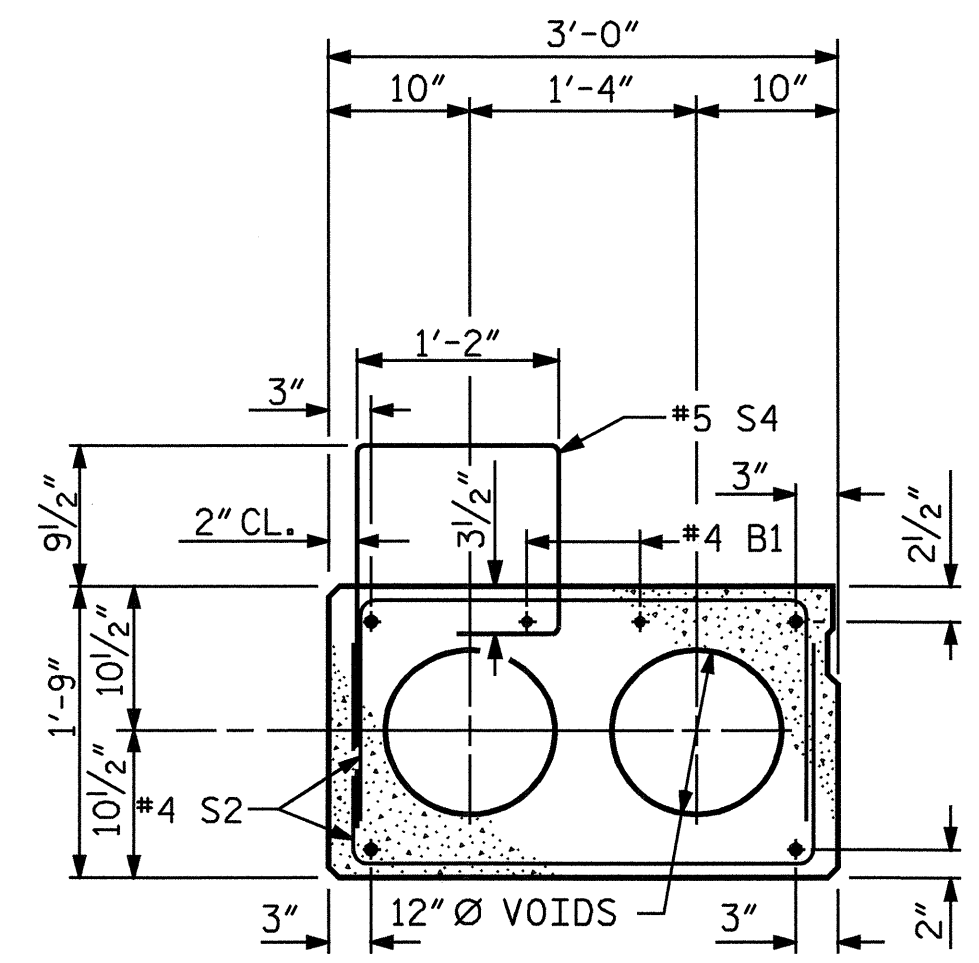


PART PLAN-EXTERIOR SECTION



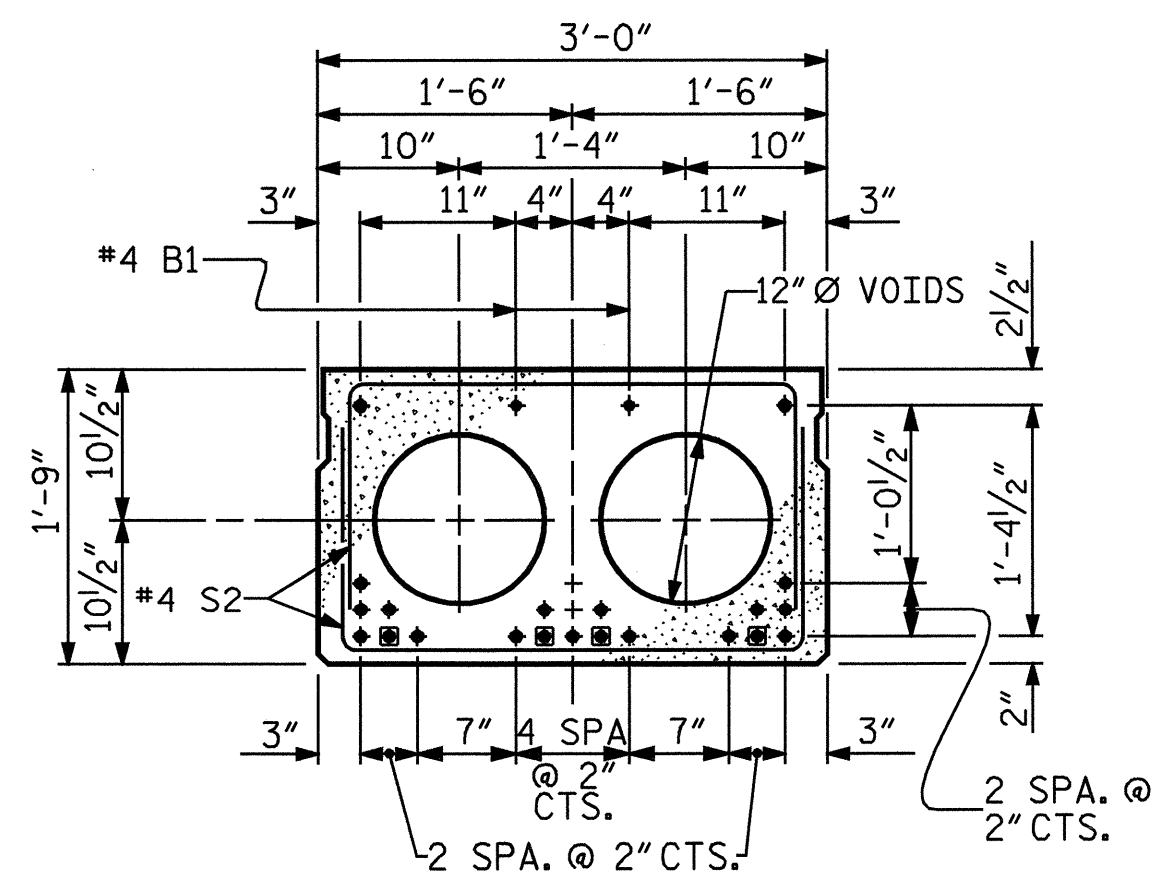
EXTERIOR SLAB SECTION @ END POST

(FOR PRESTRESSED STRAND LAYOUT, SEE SLAB SECTION.)



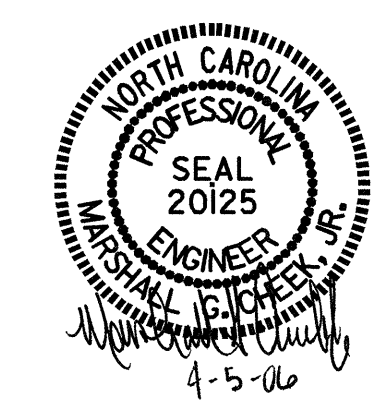
EXTERIOR SLAB SECTION @ PARAPET

(FOR PRESTRESSED STRAND LAYOUT, SEE SLAB SECTION.)



SLAB SECTION 1/2" Ø LOW RELAXATION STRAND LAYOUT

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.

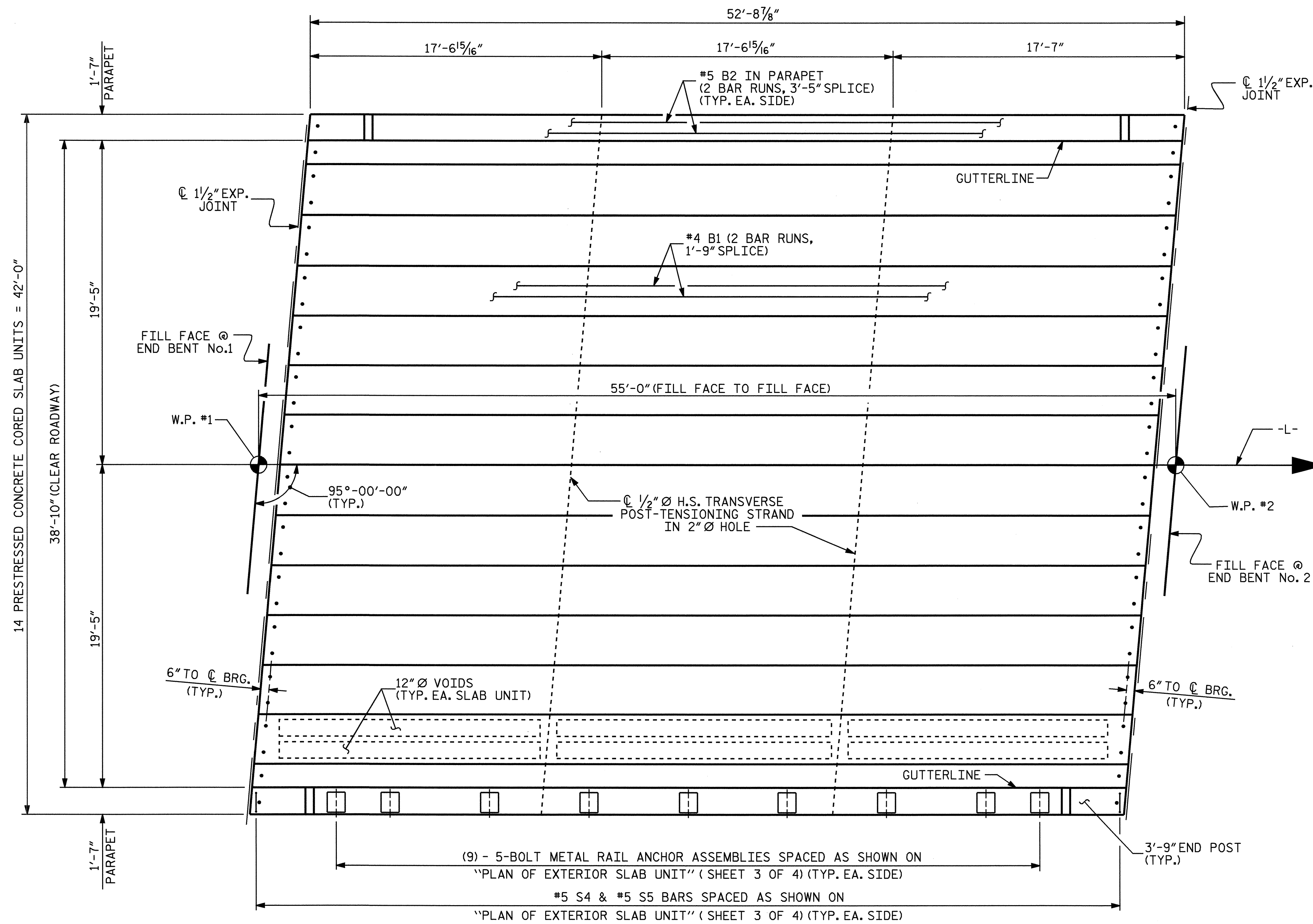


PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50 -L-

SHEET 1 OF 4

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

ASSEMBLED BY : C.R. YARBROUGH	DATE : 04-05
CHECKED BY : A. SORSENGINH	DATE : 05-05
DRAWN BY : WJH	4/89
CHECKED BY : FCJ	5/89
REV. 8/16/99	RWW/LES
REV. 10/17/00	RWW/LES
REV. 7/10/01RR	RWW/LES



**PLAN OF SPAN**

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

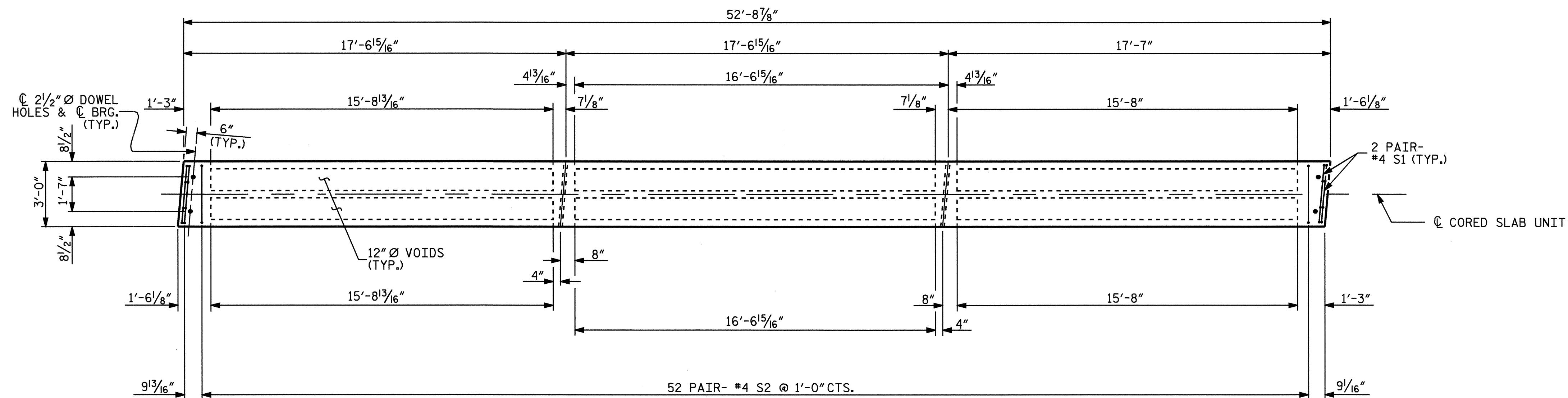
SUPERSTRUCTURE  
 PLAN OF SPAN



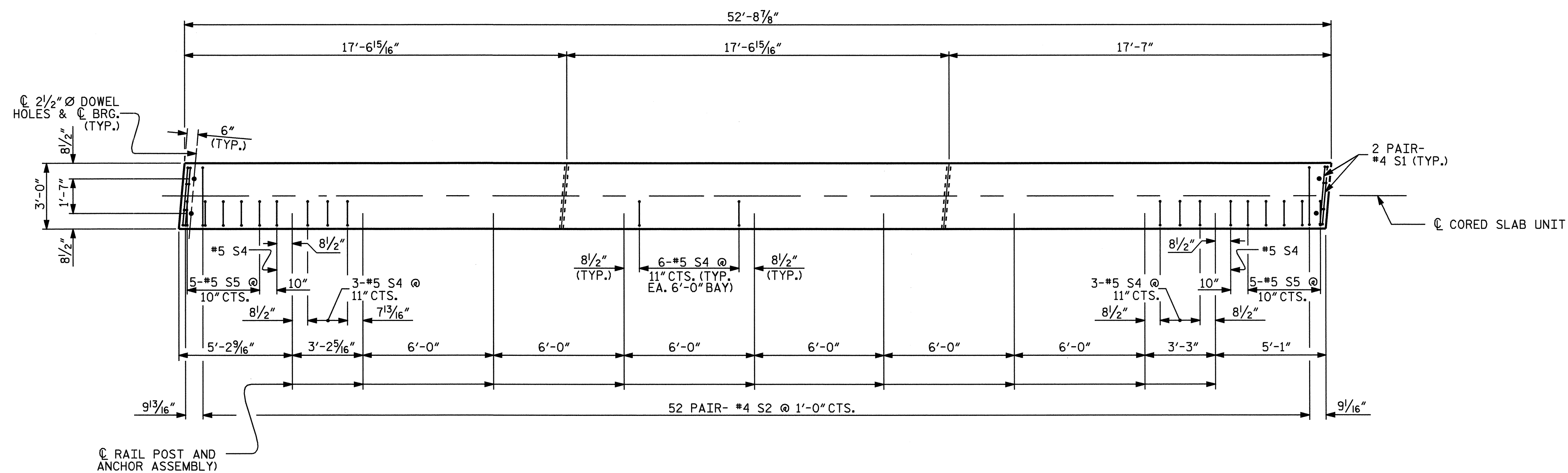
DRAWN BY : C.R. YARBROUGH DATE : 04-05  
 CHECKED BY : A. SORSENGINH DATE : 05/05

16-FEB-2006 08:28  
 RA\STRUCT\B3858\clewis\Microstation\B3858CS.dgn  
 dahodge

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



PLAN OF SLAB UNIT



PLAN OF EXTERIOR SLAB UNIT

(SHOWING S4 & S5 BAR SPACING)  
(VOIDS NOT SHOWN FOR CLARITY)

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

CORED SLAB  
 UNIT DETAILS



DRAWN BY : C.R. YARBROUGH DATE : 04-05  
 CHECKED BY : A. SORSENGINH DATE : 05/05

16-FEB-2006 08:29  
 RA:STRUCT\21\b3858\clewis\Microstation\B3858CS.dgn  
 cclhodge

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			21



**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 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.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

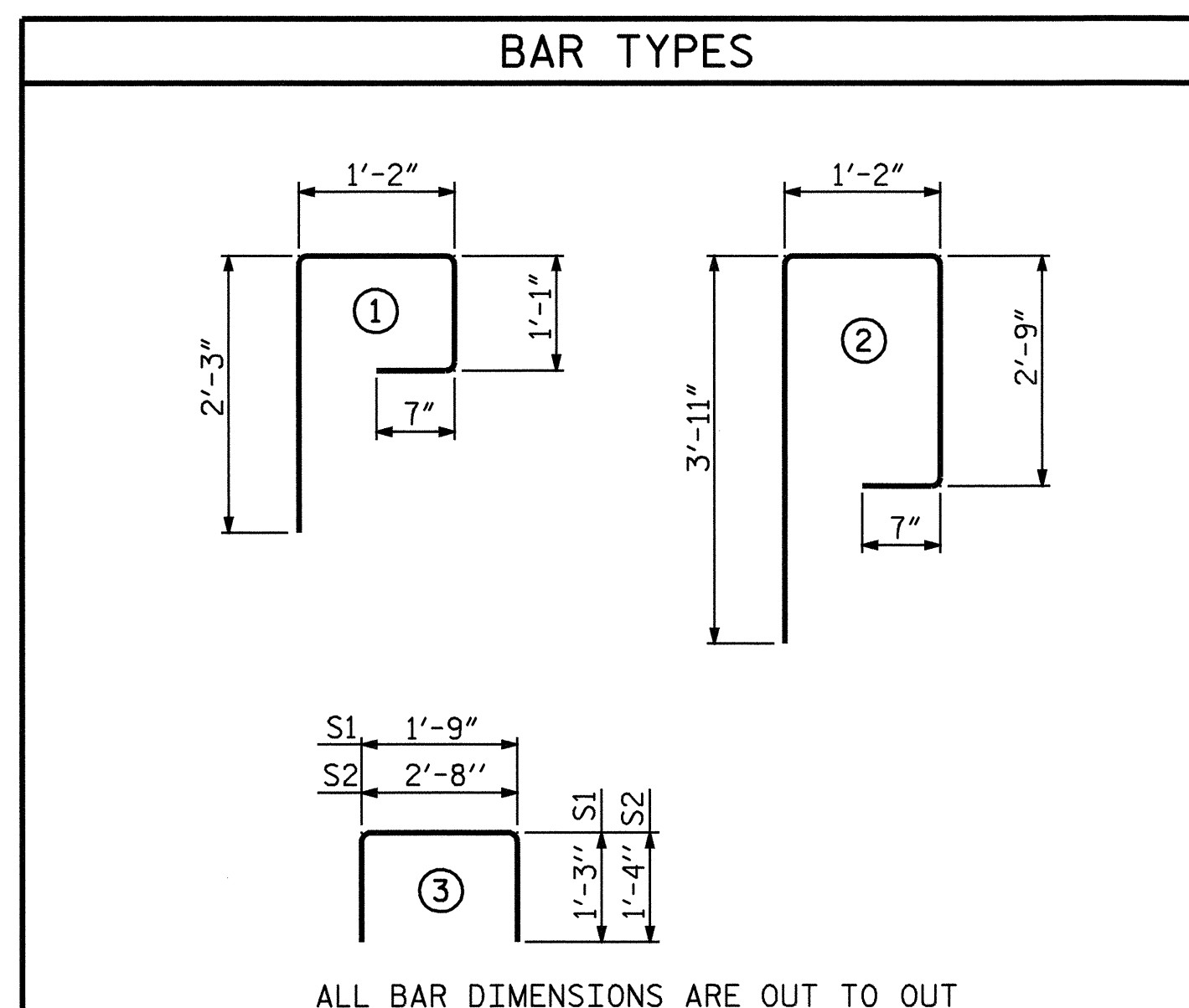
ALL REINFORCING STEEL IN THE PARAPET AND END POSTS SHALL BE EPOXY COATED.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE SPECIAL PROVISIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

GRADE 270 STRANDS	
AREA ( SQUARE INCHES )	1/2" Ø L.R. 0.153
ULTIMATE STRENGTH ( LBS. PER STRAND )	41,300
APPLIED PRESTRESS ( LBS. PER STRAND )	30,980



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

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	# 4	STR	27'-5"	73	27'-5"	73
S1	8	# 4	3	4'-3"	23	4'-3"	23
S2	104	# 4	3	5'-4"	371	5'-4"	371
* S4	44	# 5	1	5'-1"	233		
* S5	10	# 5	2	8'-5"	88		
REINFORCING STEEL				467 LBS.		467 LBS.	
* EPOXY COATED REINFORCING STEEL				321 LBS.			
5,000 P.S.I. CONCRETE				7.3 CU. YDS.		7.3 CU. YDS.	
1/2" Ø L.R. STRANDS				No.	21		21

**BILL OF MATERIAL FOR PARAPETS & END POSTS**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	8	# 5	STR	27'-11"	233
* E1	32	# 7	STR	2'-8"	174
* F1	24	# 6	STR	3'-5"	123
* EPOXY COATED REINFORCING STEEL				LBS.	530
CLASS AA CONCRETE				CU.YDS.	7.5
1'-7" X 1 1/2" CONCRETE PARAPET				LIN. FT.	105.48

\* THESE BARS ARE EPOXY COATED

**DEAD LOAD DEFLECTION AND CAMBER**

	3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	1 1/16"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	5/16"
FINAL CAMBER	1 3/8"

\*\* INCLUDES FUTURE WEARING SURFACE

**CORED SLABS REQUIRED**

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	52'-8 1/8"	105'-5 3/4"
INTERIOR C.S.	12	52'-8 1/8"	632'-10 1/2"
TOTAL	14		738.35'

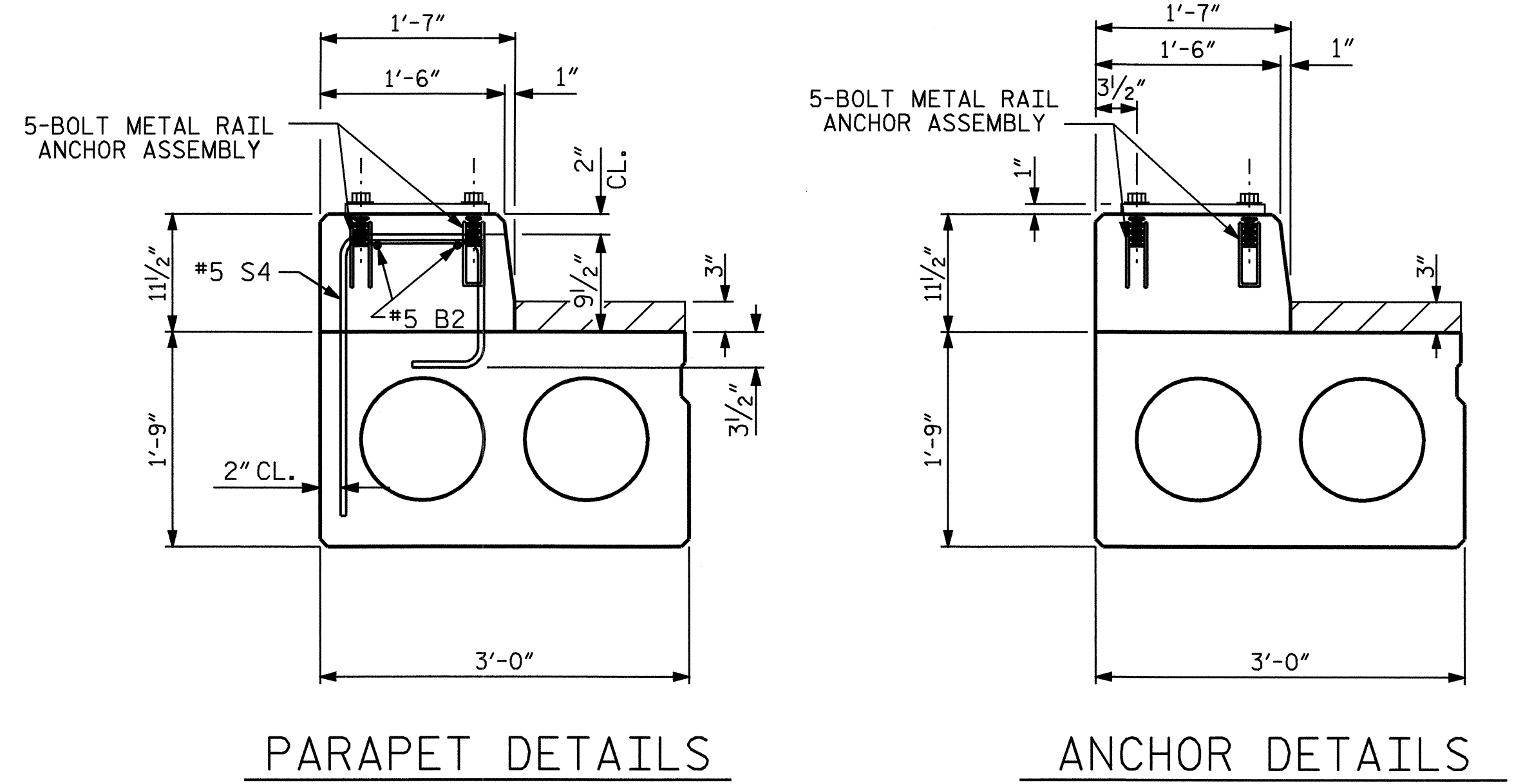
PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 4 OF 4

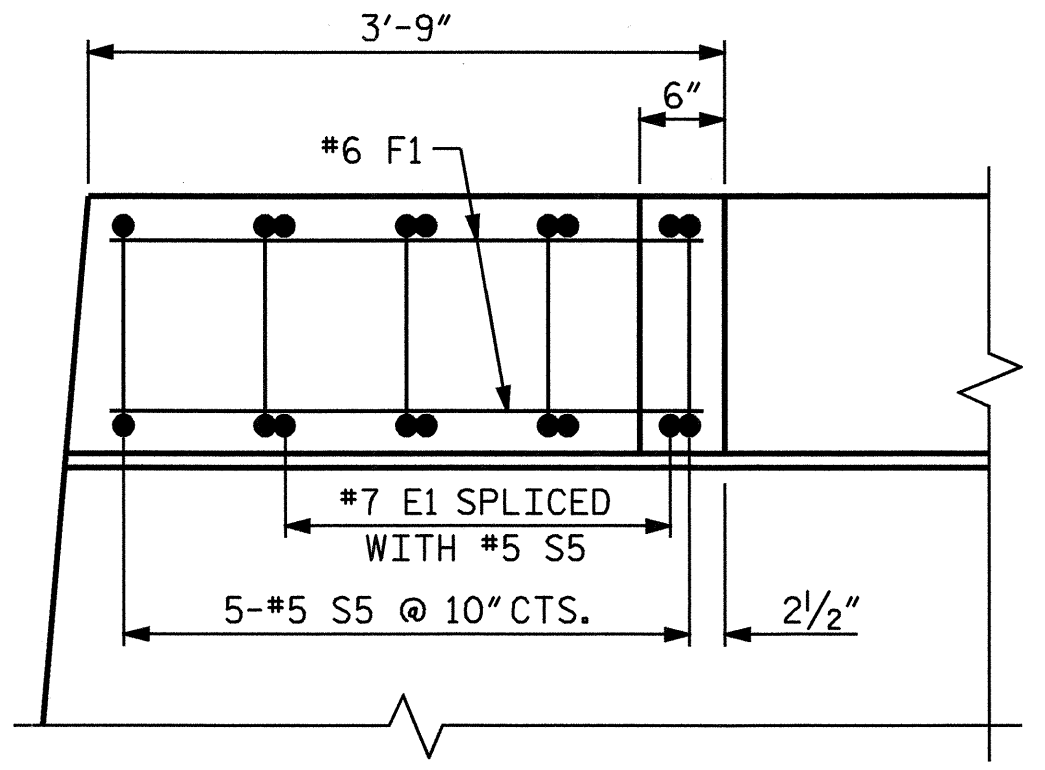
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT**

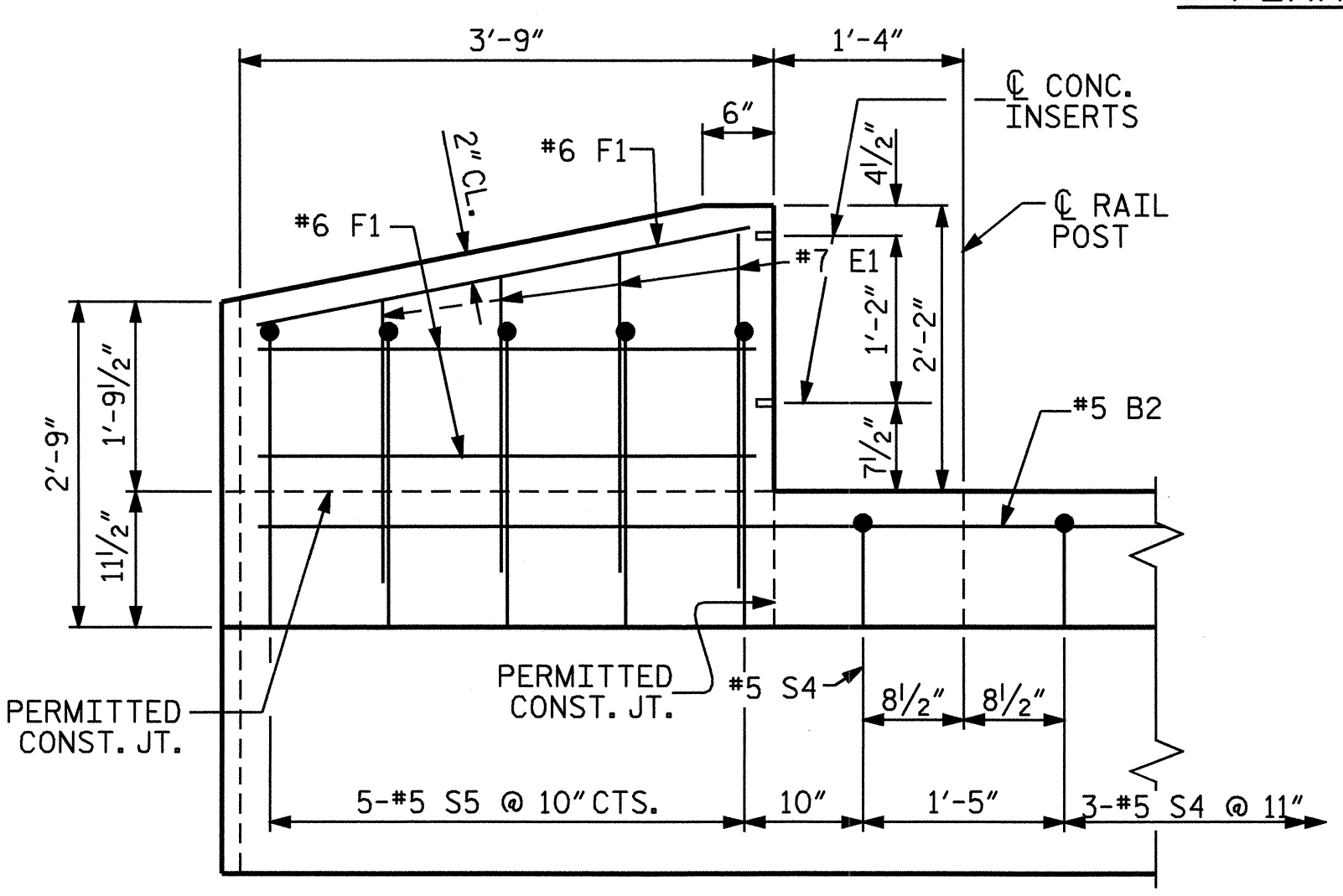
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS 21
2			4			



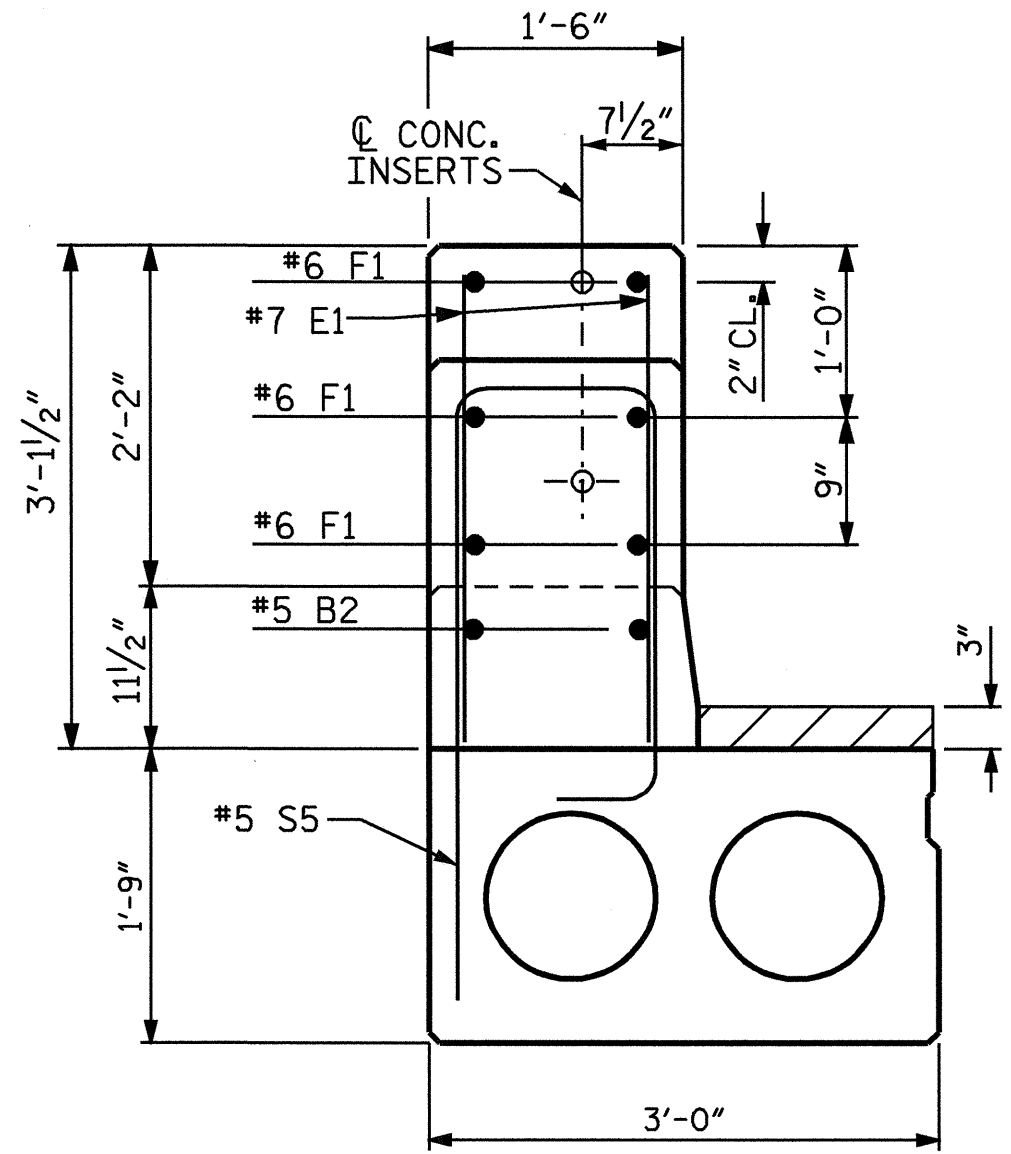
\*5B2 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR ASSEMBLY



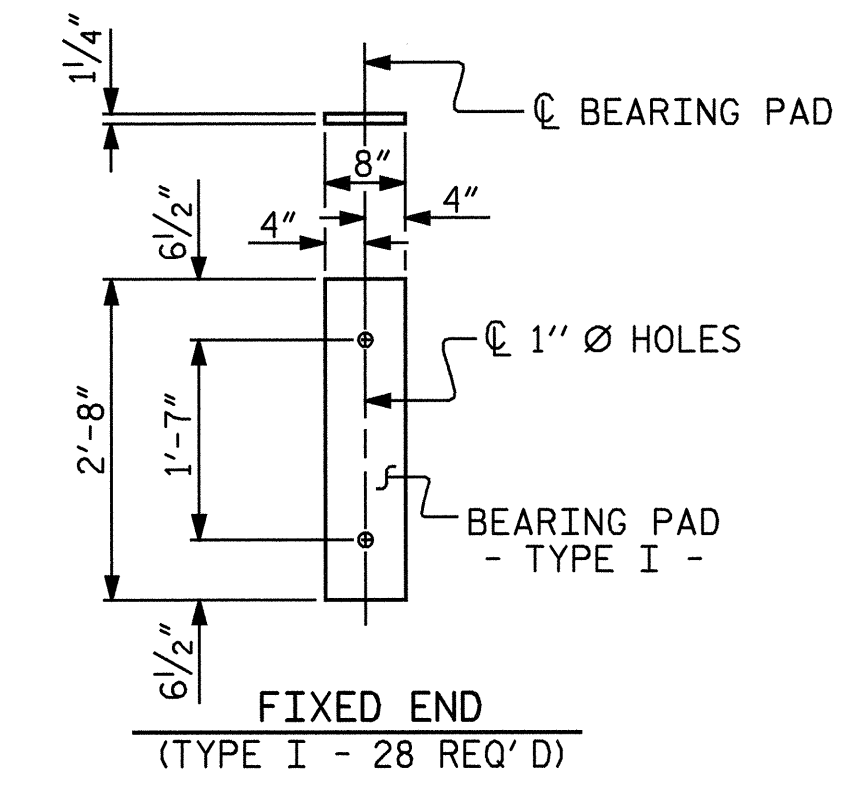
**PLAN**



**ELEVATION**

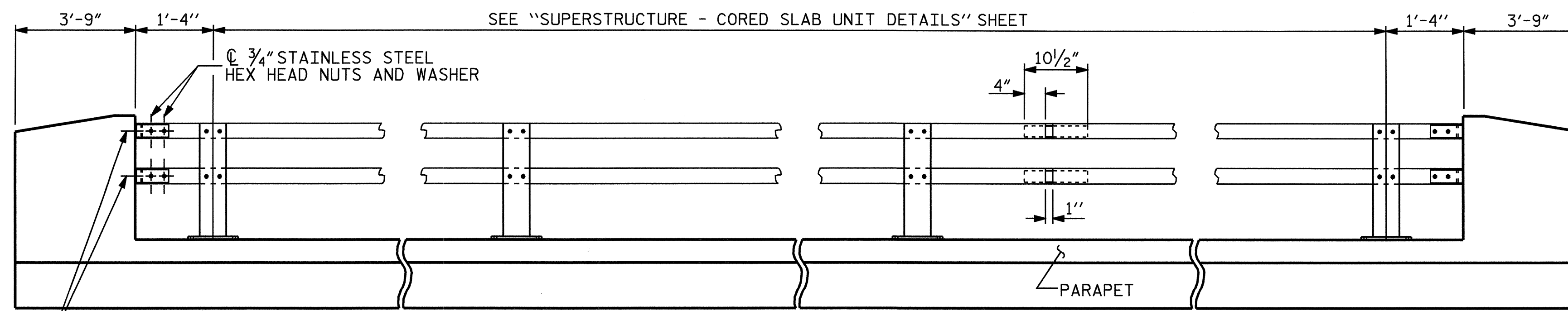


**END VIEW**



**ELASTOMERIC BEARING DETAILS**  
 (USE 60 DUROMETER ELASTOMERIC PAD)

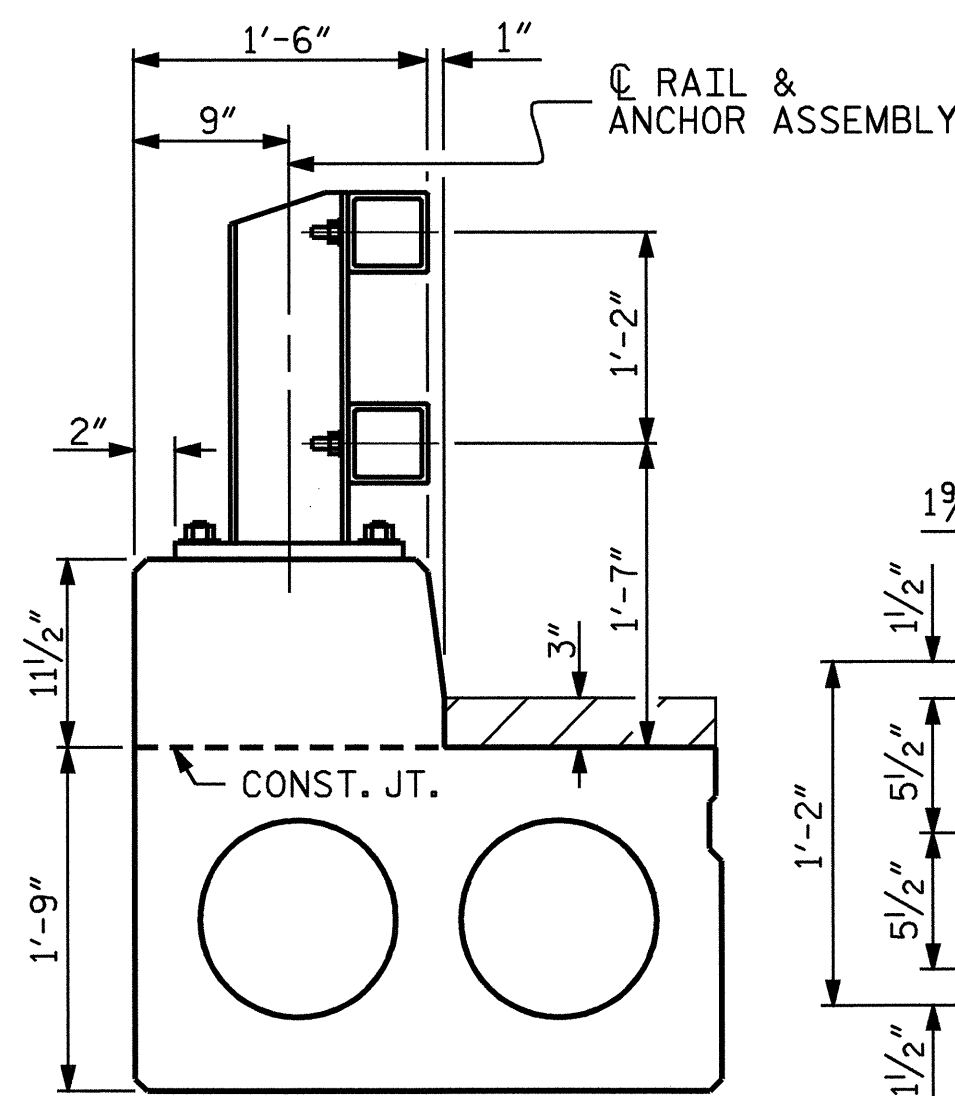
ASSEMBLED BY : C.R. YARBROUGH DATE : 04-05  
 CHECKED BY : A. SORSENGINH DATE : 05/05



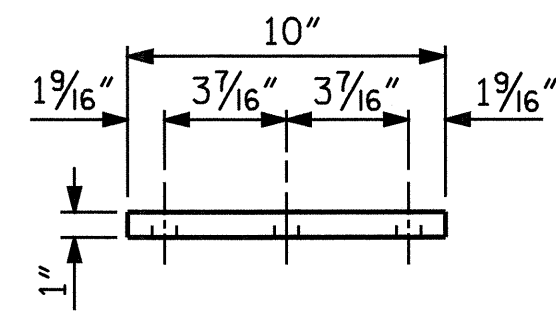
ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "SPECIAL STEEL 2 BAR METAL RAIL" (SHEET 2 OF 3).

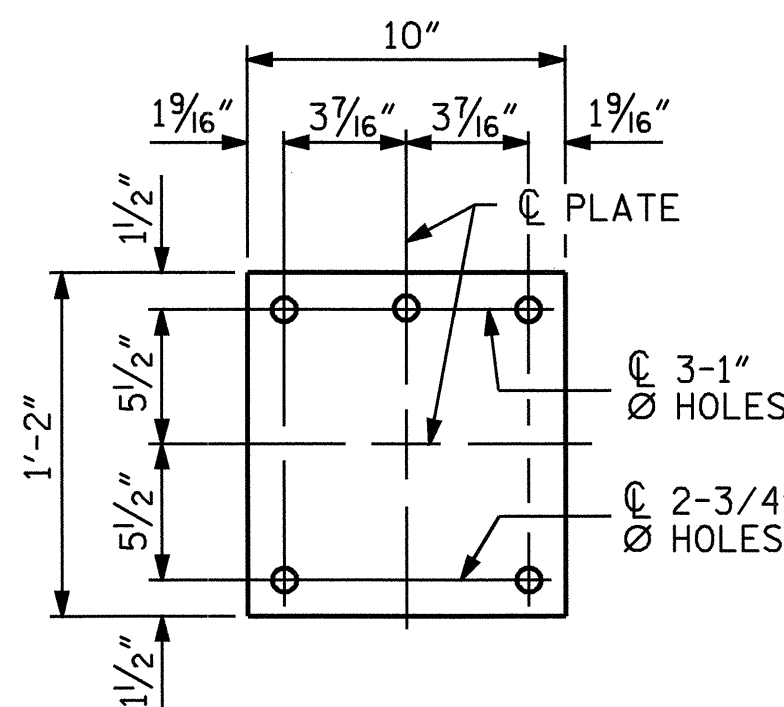
CONC. INSERTS, 3/4" Ø X 1 5/8" BOLT, AND 2" WASHER



SECTION THRU RAIL

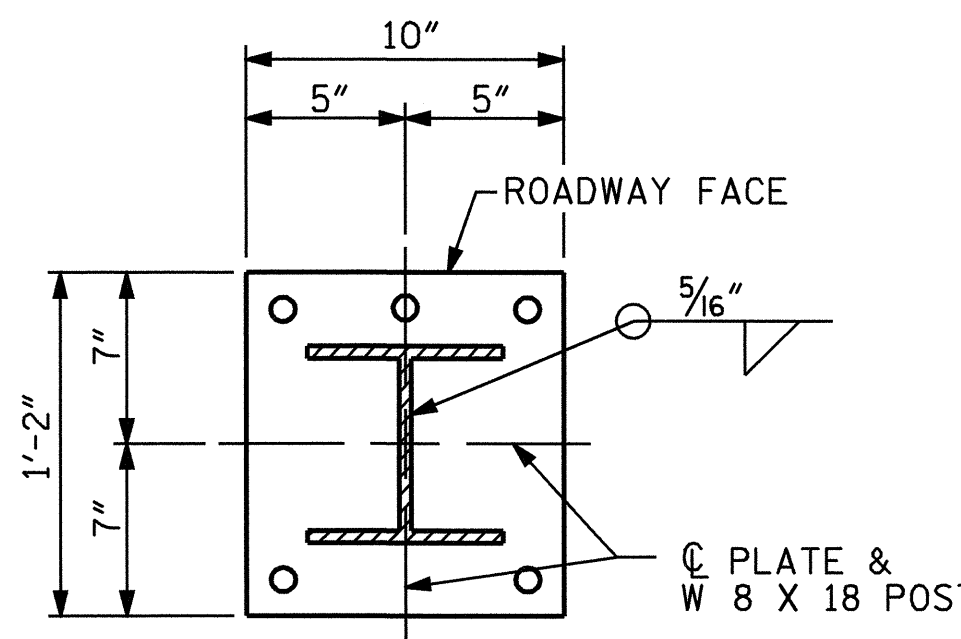


FRONT ELEVATION

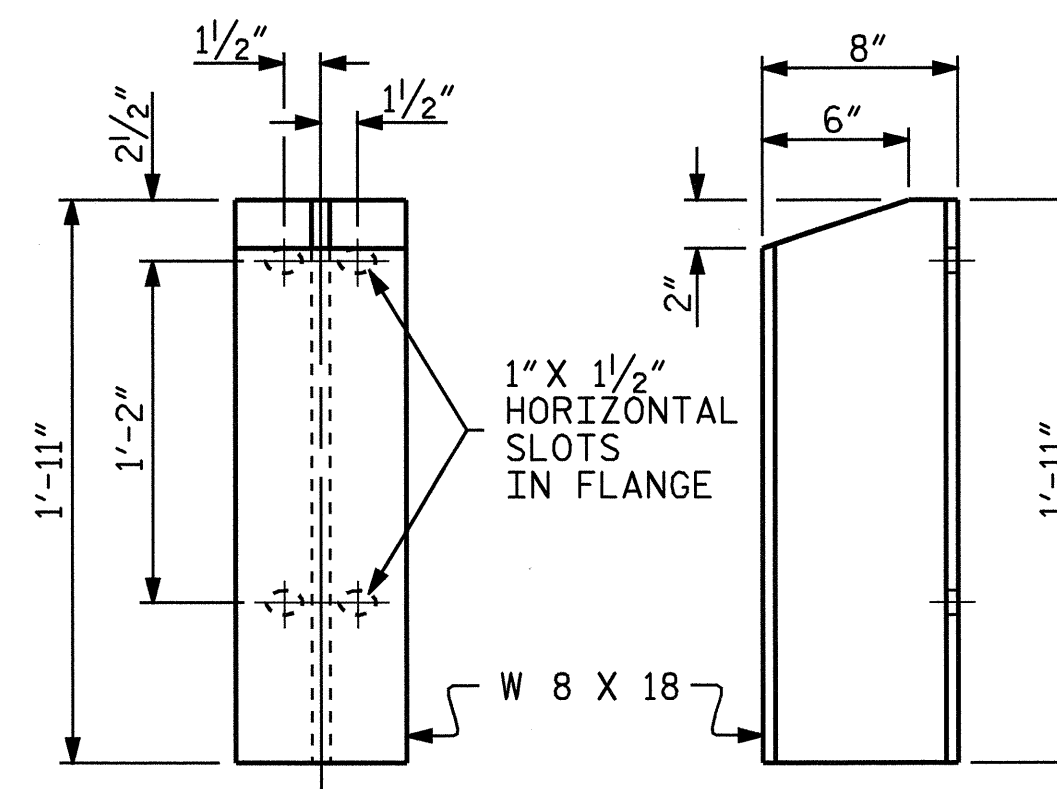


PLAN

POST BASE DETAILS

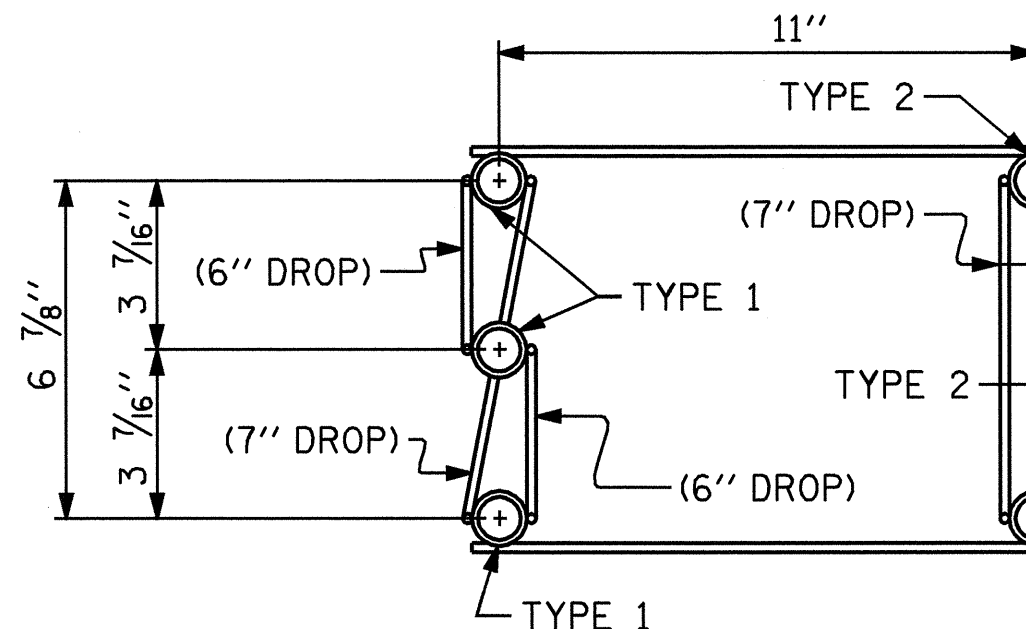


POST ATTACHMENT DETAIL

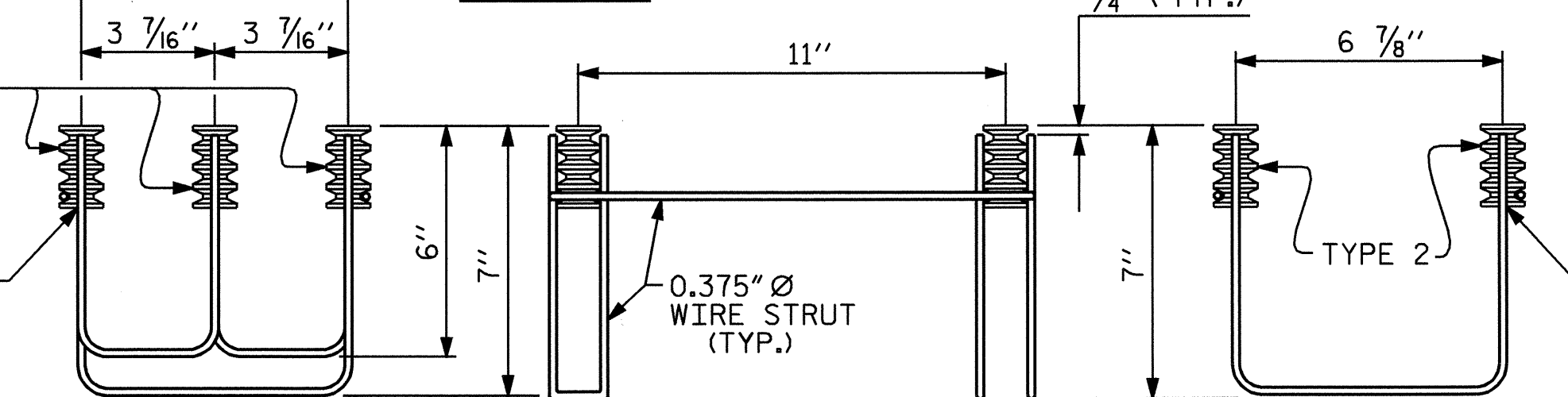


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



PLAN



LEFT SIDE VIEW

ELEVATION

RIGHT SIDE VIEW

5-BOLT METAL RAIL ANCHOR ASSEMBLY

( 18 ASSEMBLIES REQUIRED )

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

NOTES

METAL RAIL SHALL BE GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES AND RAIL SPLICE BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL GALVANIZED TO AASHTO M111

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

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

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

RAILS: ASTM A5000, A501 OR A618 - GALVANIZED TO AASHTO M111. ALUMINUM WILL NOT BE ALLOWED.

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

STUDS, NUTS, AND WASHERS: REDUCED BASE WELDED STUDS SHALL MEET THE REQUIREMENTS OF ASTM A108. NUTS SHALL CONFORM TO ASTM A563 DH AND WASHERS TO A436. NUTS AND WASHERS SHALL BE GALVANIZED.

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 "SPECIAL STEEL 2 BAR METAL RAIL", SHEET 2 OF 3.

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.

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

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 FEET IN LENGTH.

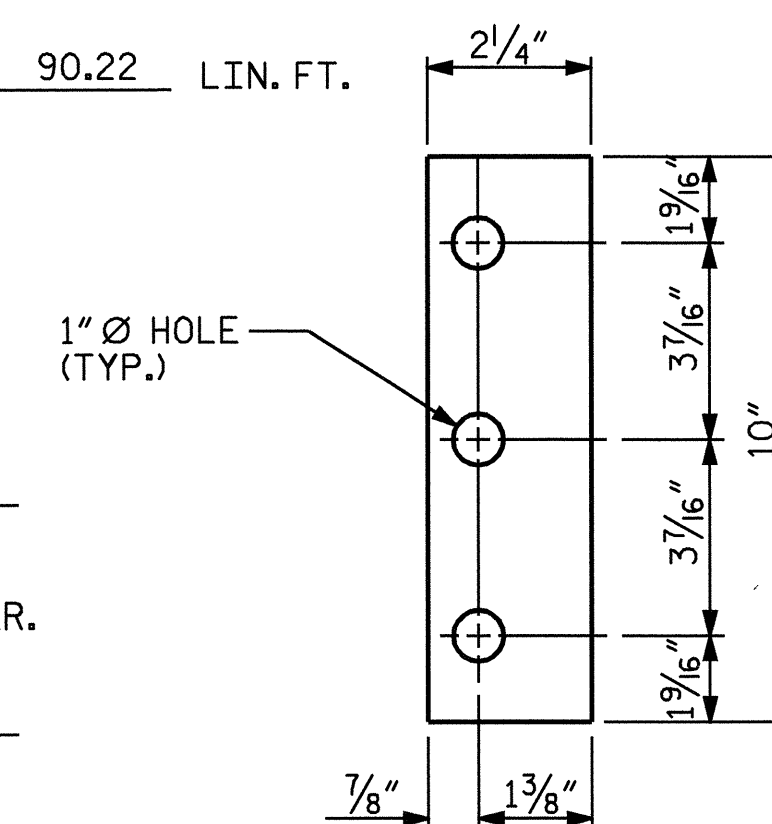
NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.
- 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

PAY LENGTH 90.22 LIN. FT.



SHIM DETAILS

PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

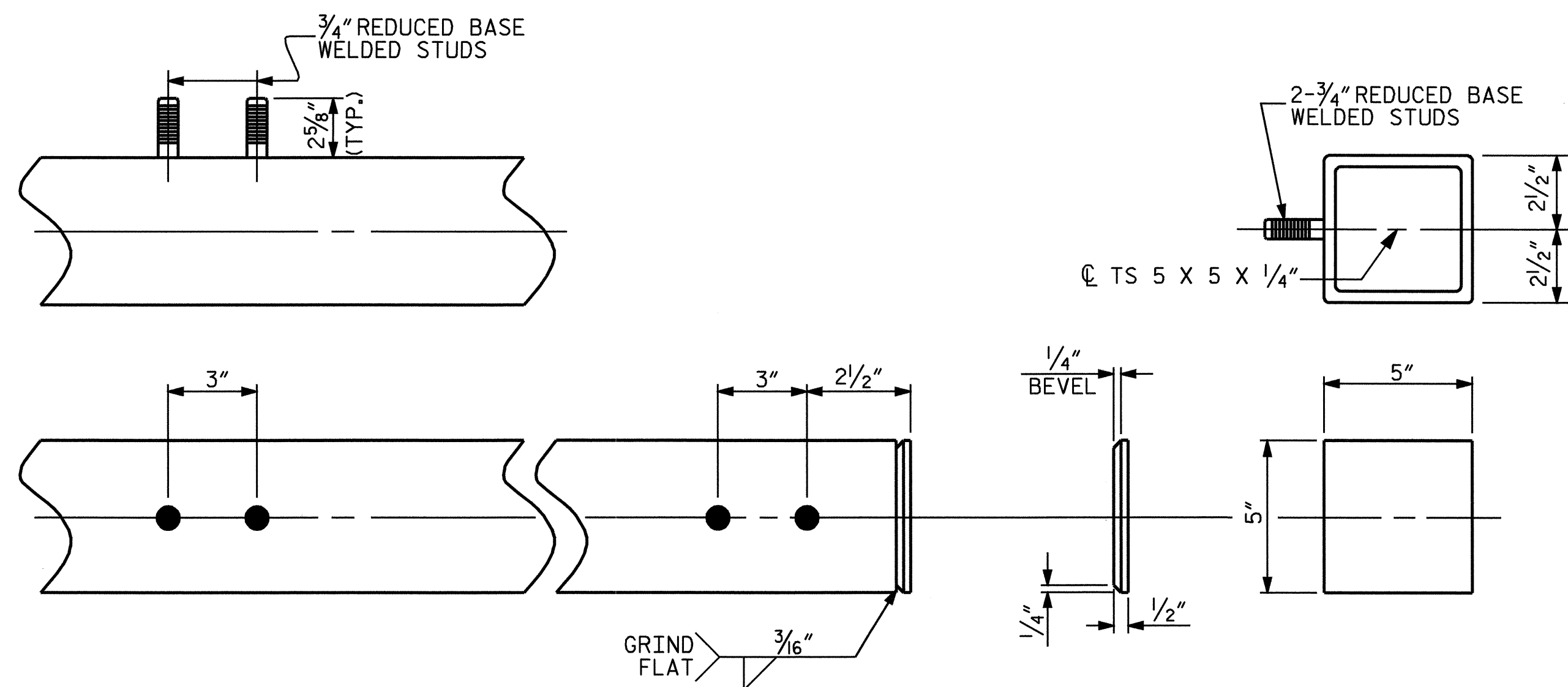
SPECIAL STEEL  
2 BAR METAL RAIL



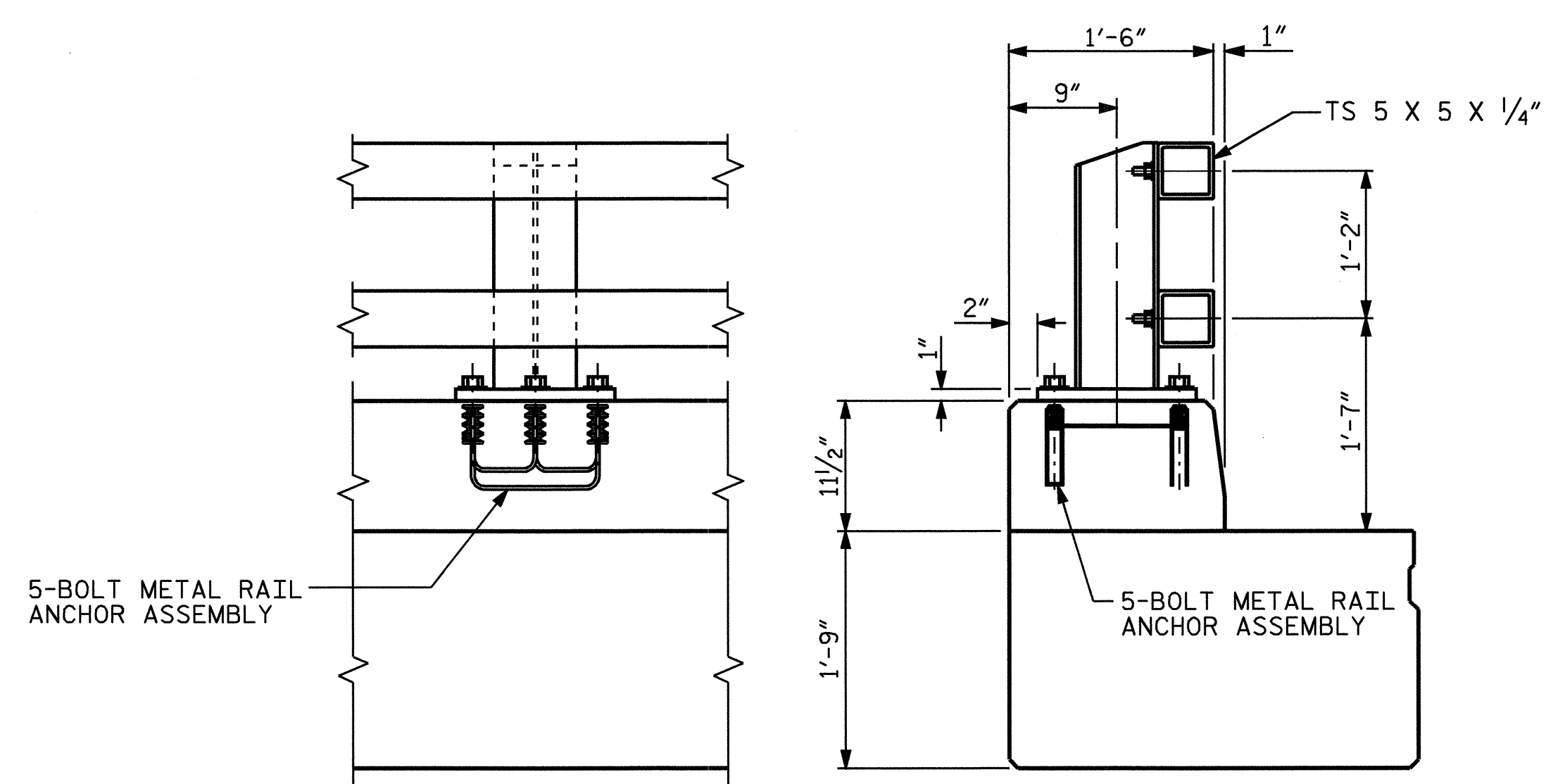
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS 21	
2			4				

DRAWN BY: C.R. YARBROUGH DATE: 05-05  
CHECKED BY: A. SORSENGIN DATE: 05-05

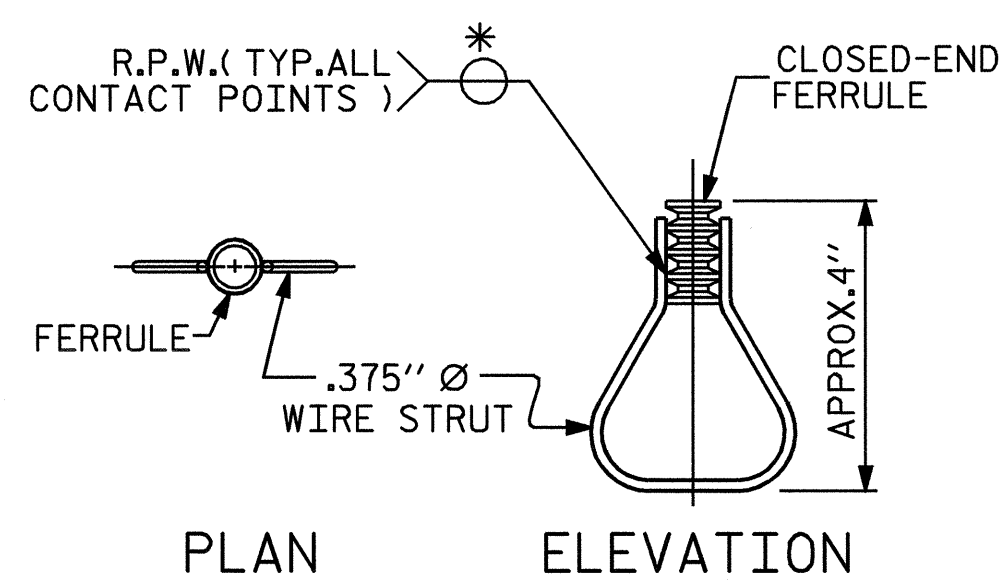




**RAIL CAP AND ATTACHMENT STUD DETAILS**

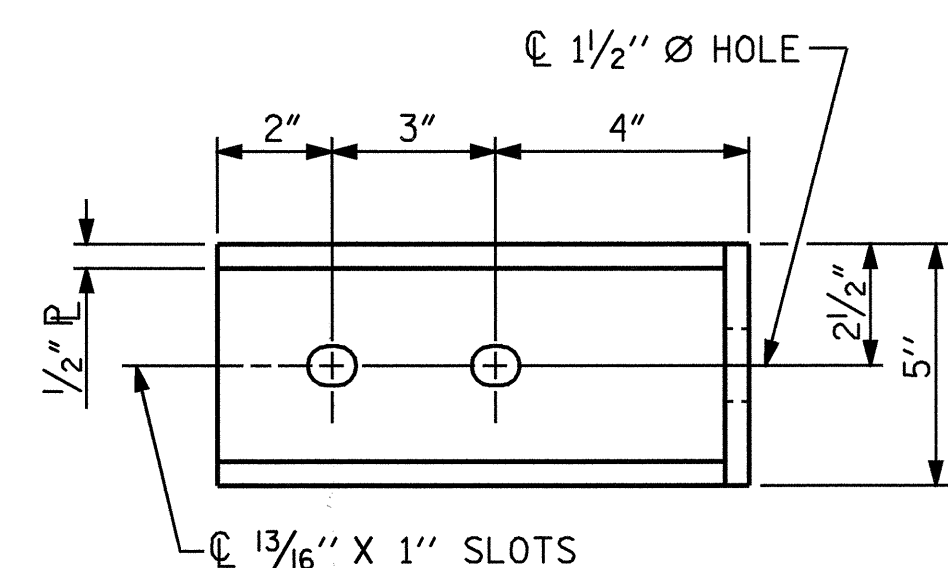


**RAIL POST ATTACHMENT DETAILS**

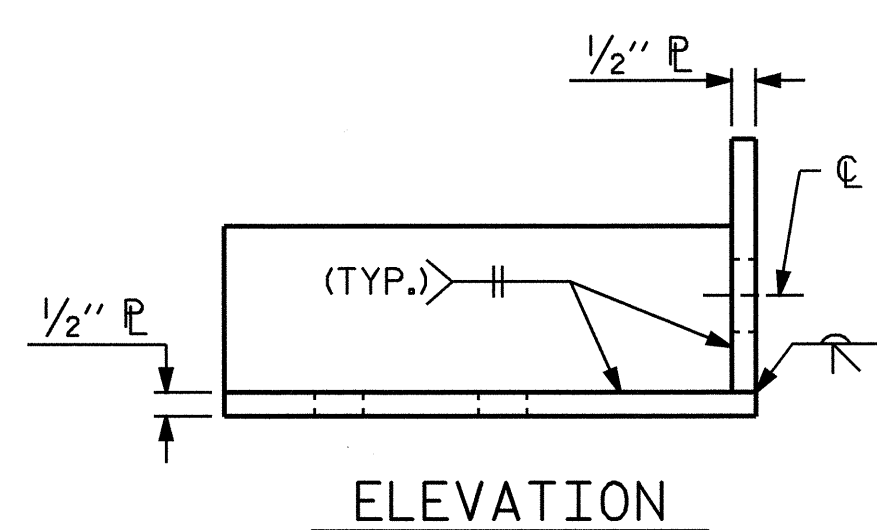


**STRUCTURAL CONCRETE INSERT**

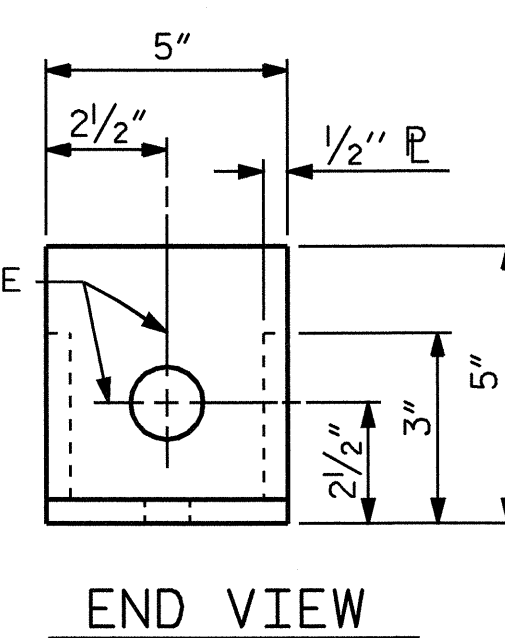
\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



**TOP VIEW**



**ELEVATION**



**END VIEW**

**DETAILS FOR ATTACHING METAL RAIL TO END POST**

**NOTES**

**STRUCTURAL CONCRETE INSERT**

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
- B. 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.)
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

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

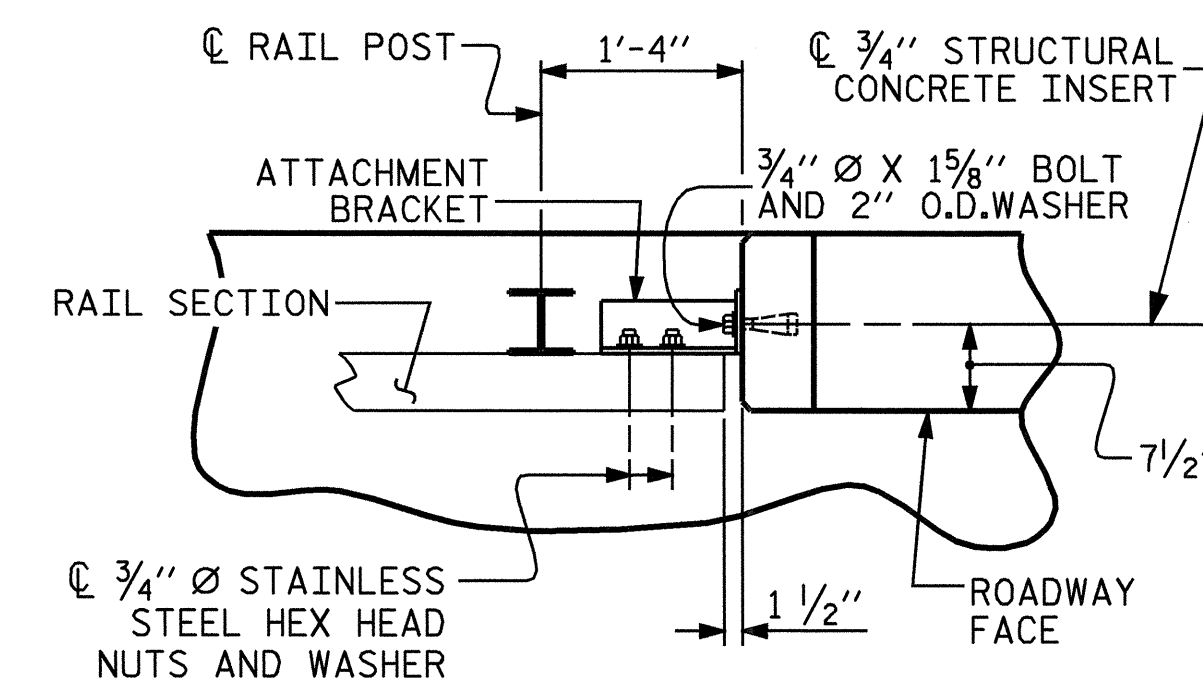
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. NUTS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 TYPE 305 STAINLESS STEEL.

THE COST OF THE ATTACHMENT BRACE AND NUTS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF SPECIAL STEEL 2 BAR METAL RAIL.

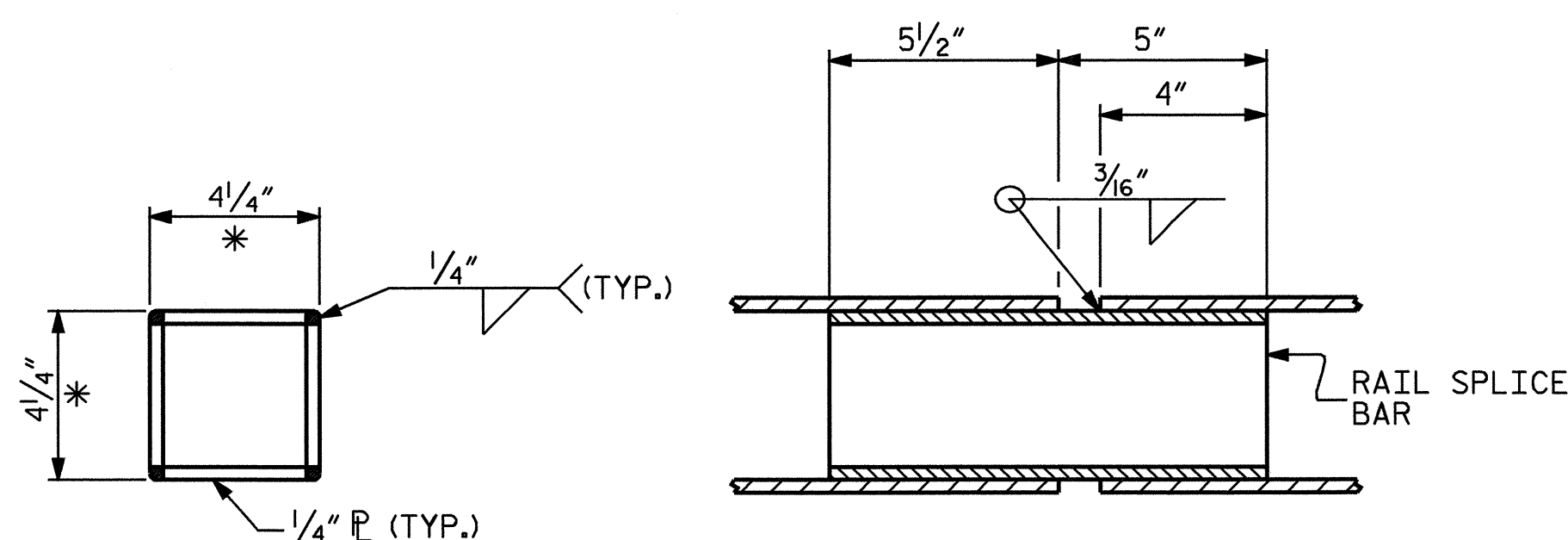
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 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. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



**PLAN - RAIL AND END POST**



**RAIL SPLICE DETAILS**

\* - DIMENSION AFTER GRINDING RADIUS ON CORNERS TO MATCH INSIDE OF METAL RAIL.

DRAWN BY : C.R. YARBROUGH DATE : 05-05  
 CHECKED BY : A. SORSENGINH DATE : 05-05

16-FEB-2006 08:30  
 R:\STRUCT\B3858\clewis\Microstation\B3858CS.dgn  
 dahodge

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SPECIAL STEEL  
 2 BAR METAL RAIL**



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			21



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.

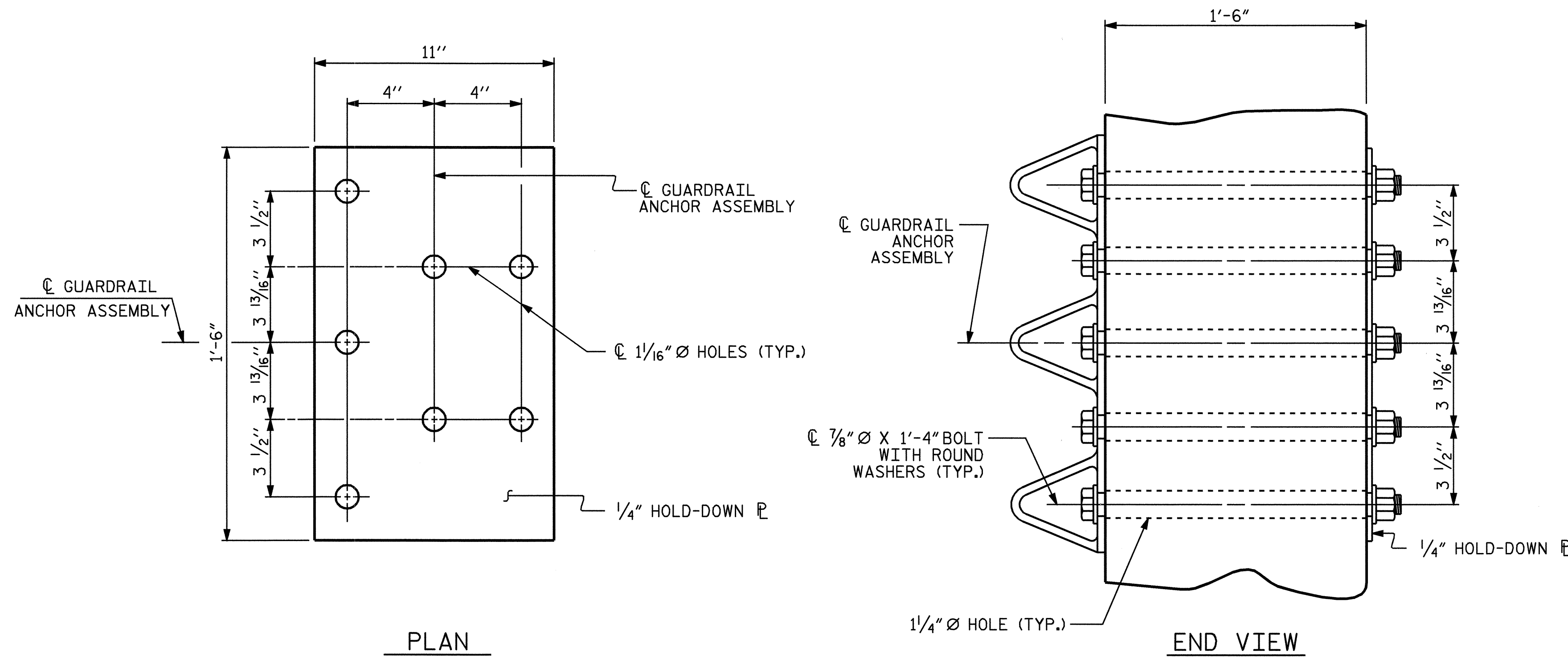
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

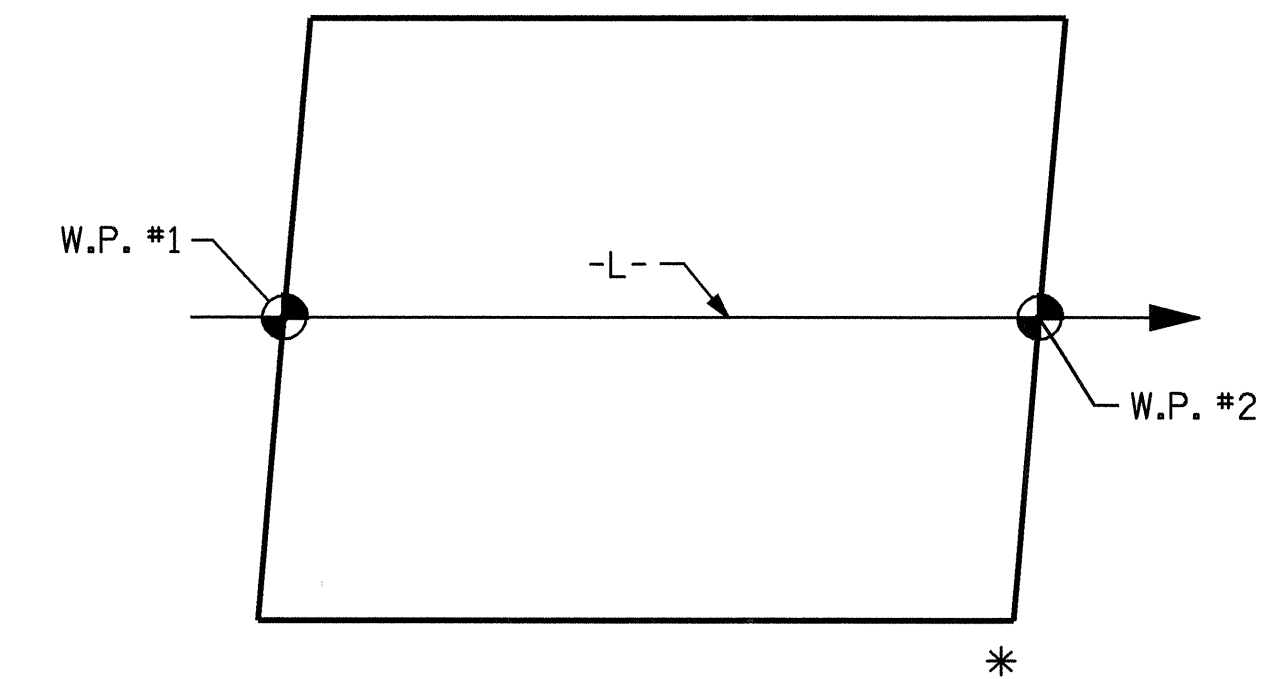
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

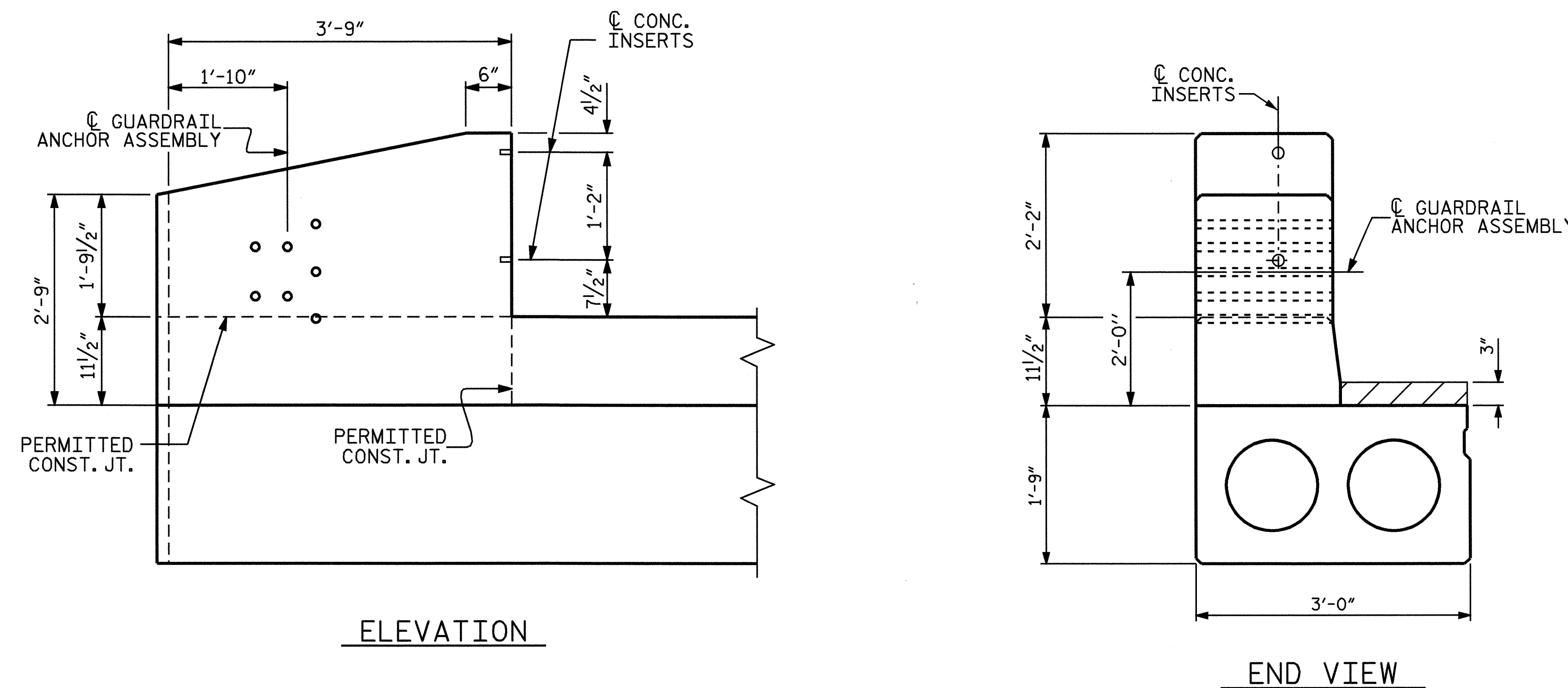
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



ELEVATION

END VIEW

LOCATION OF GUARDRAIL ANCHOR AT END POST

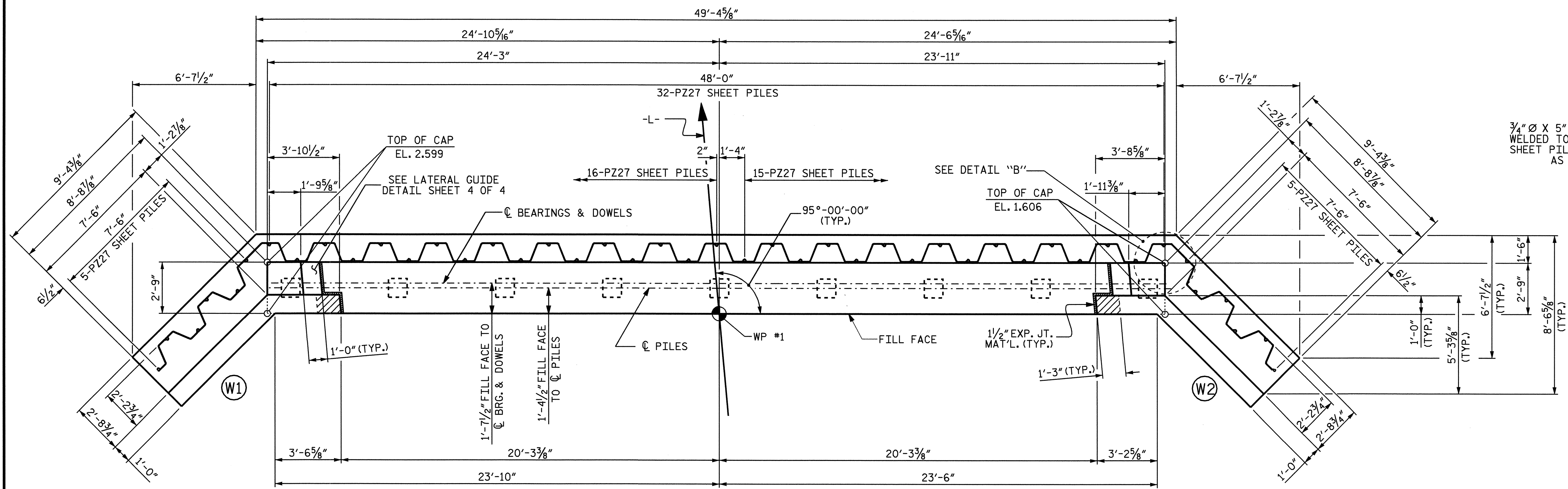
PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 SPECIAL STEEL  
 2 BAR METAL RAIL

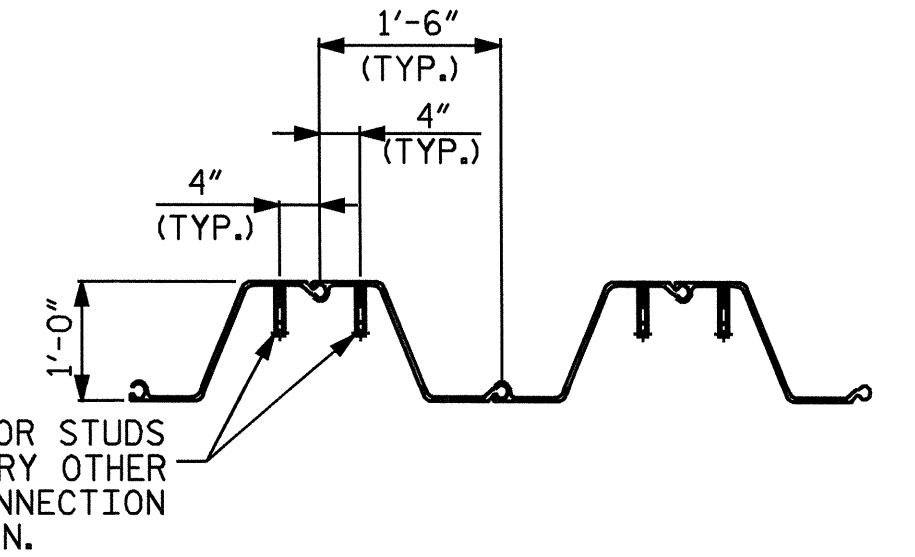


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			21

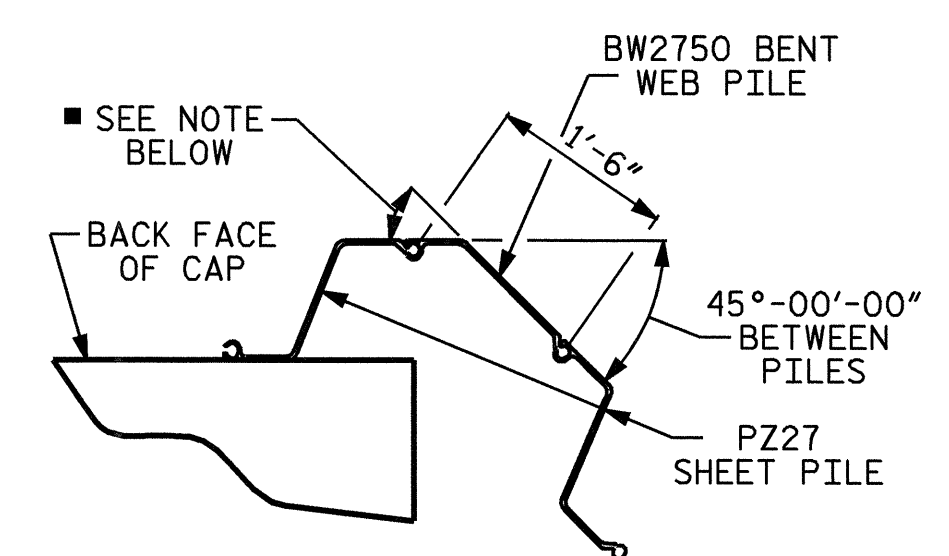


**PLAN**

(FOR CLARITY, BEARING PADS & DOWELS NOT SHOWN IN PLAN VIEW)



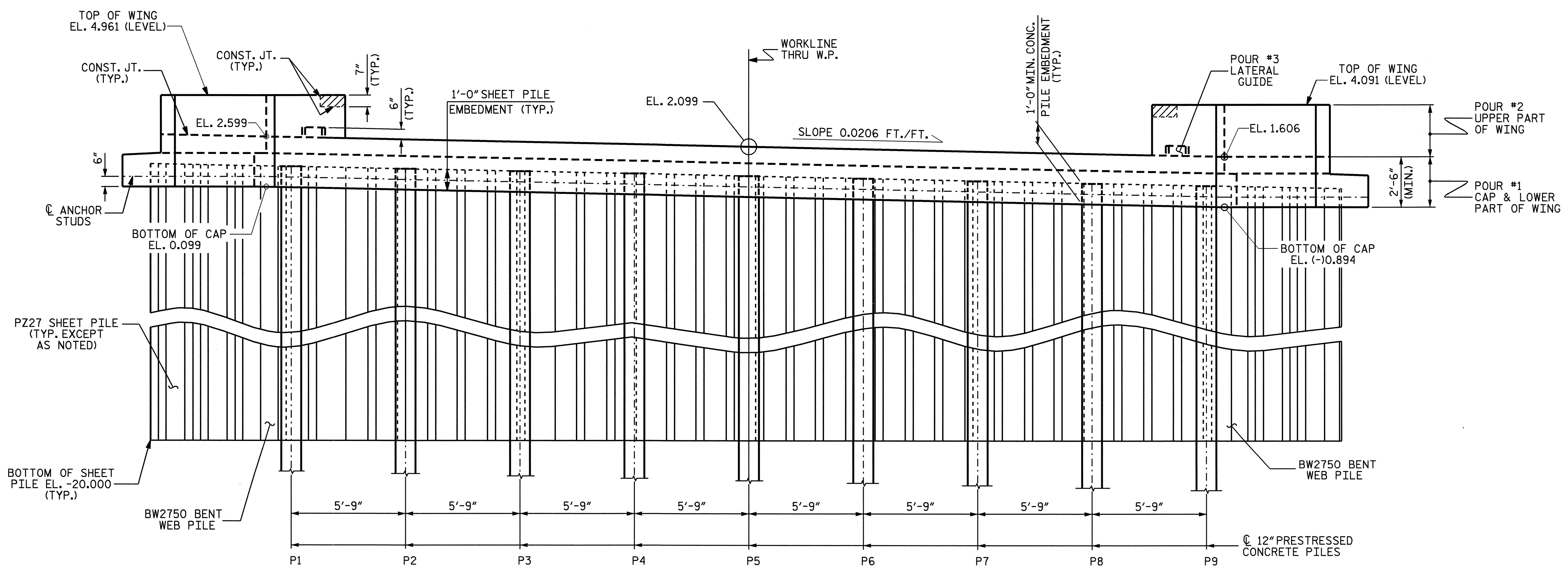
**ANCHOR STUD DETAIL**



**DETAIL "B"**

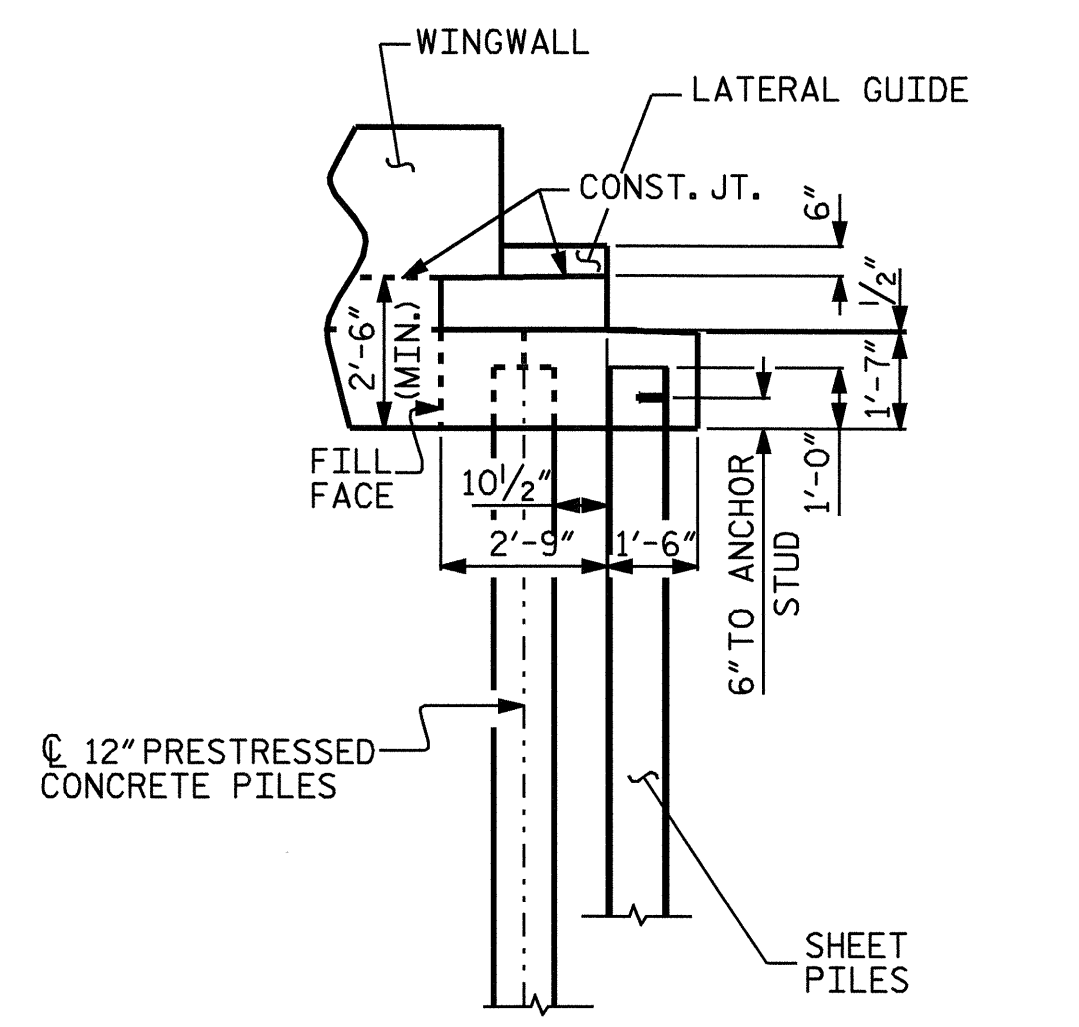
RIGHT SIDE SHOWN, LEFT SIDE SIMILAR

NOTE: THE BEND IN THE BENT WEB PILE SHALL BE DETERMINED BY THE FABRICATOR.



**ELEVATION**

(FOR REINFORCING STEEL IN CAP, SEE SHEET 2 OF 4)



**END ELEVATION**

PROJECT NO. B-3858  
 HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 1 OF 4

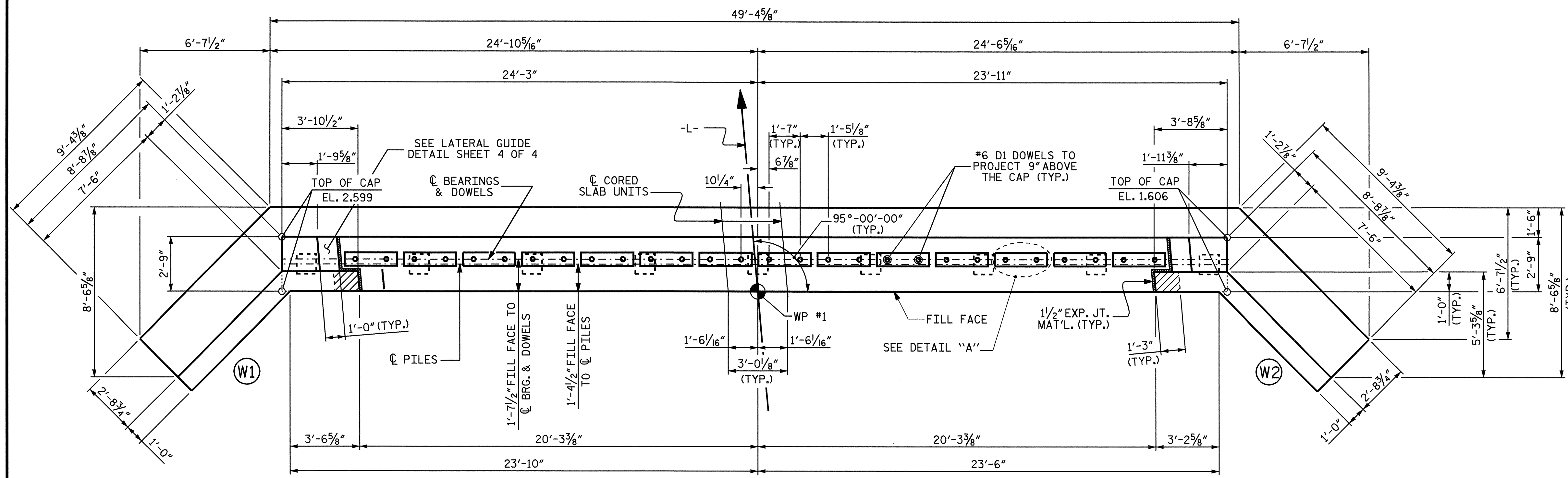
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT NO. 1**

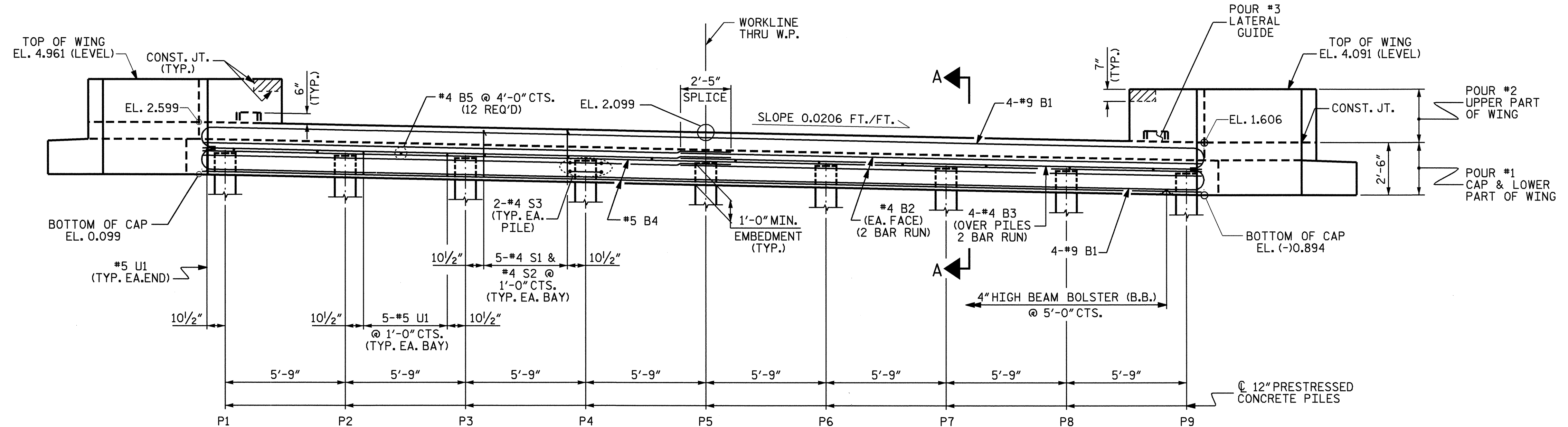
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS 21	
2			4				



DRAWN BY : A. SORSENGINH DATE : 10/05  
 CHECKED BY : D. HODGE DATE : 11/05



**PLAN**  
(FOR CLARITY, SHEET PILES NOT SHOWN)



**ELEVATION**  
(FOR SECTION A-A, SEE SHEET 4 OF 4)

**NOTES:**

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

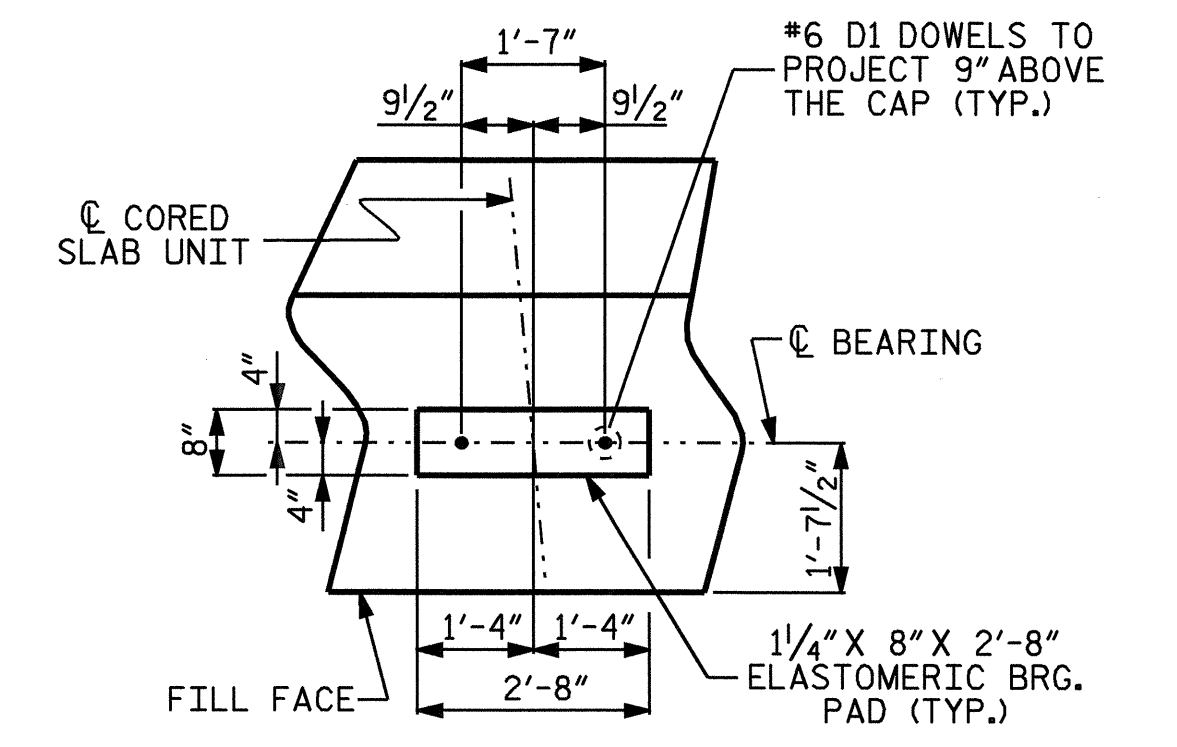
THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

CONCRETE DISPLACED BY THE 12" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

ALL STEEL SHEET PILES SHALL BE ASTM A690 MARINE GRADE STEEL.



**DETAIL "A"**

TOP OF PILE ELEVATION	
PILE	ELEVATION
P1	1.082
P2	0.964
P3	0.845
P4	0.727
P5	0.608
P6	0.490
P7	0.371
P8	0.253
P9	0.134

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

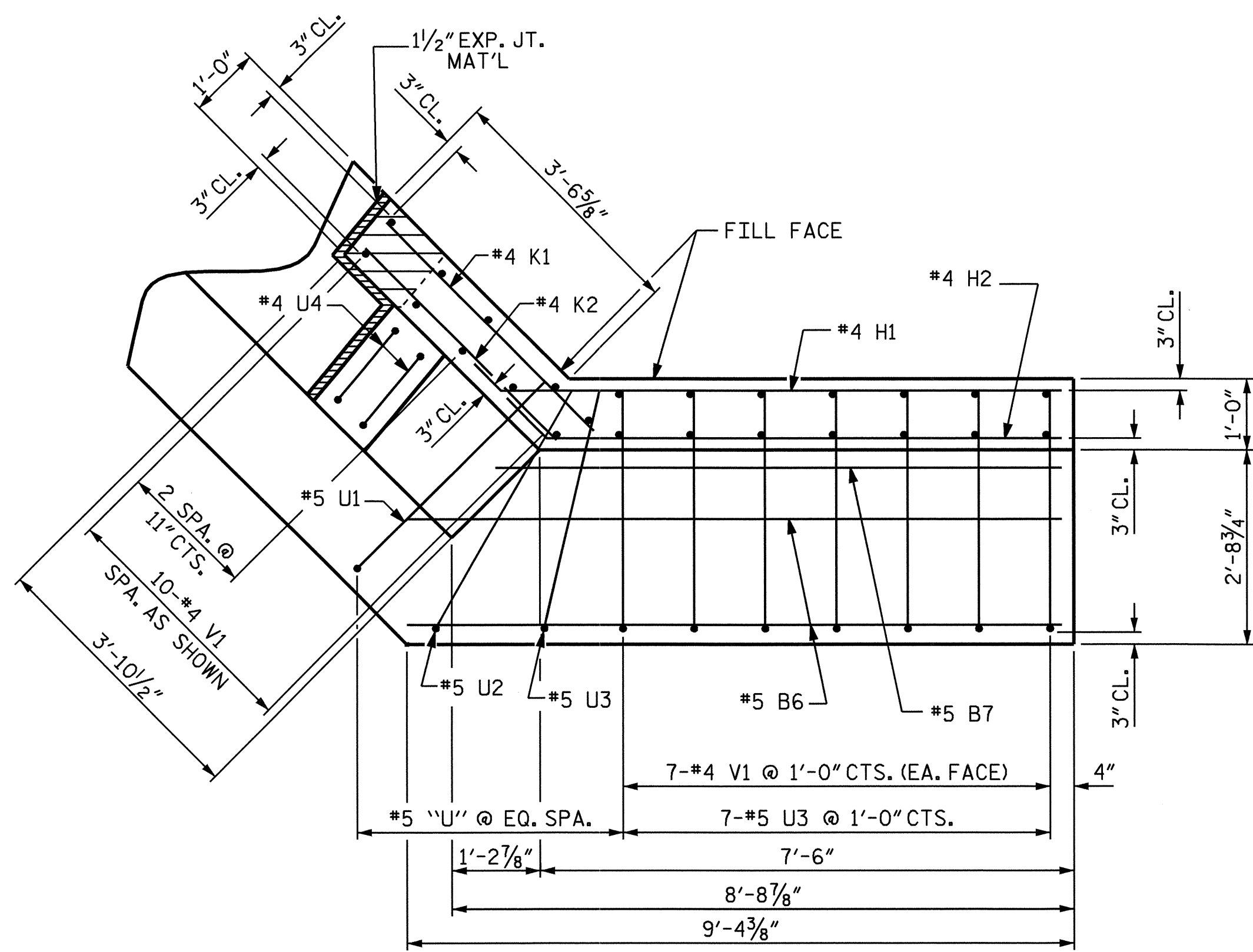
**SUBSTRUCTURE  
 END BENT NO. 1**

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

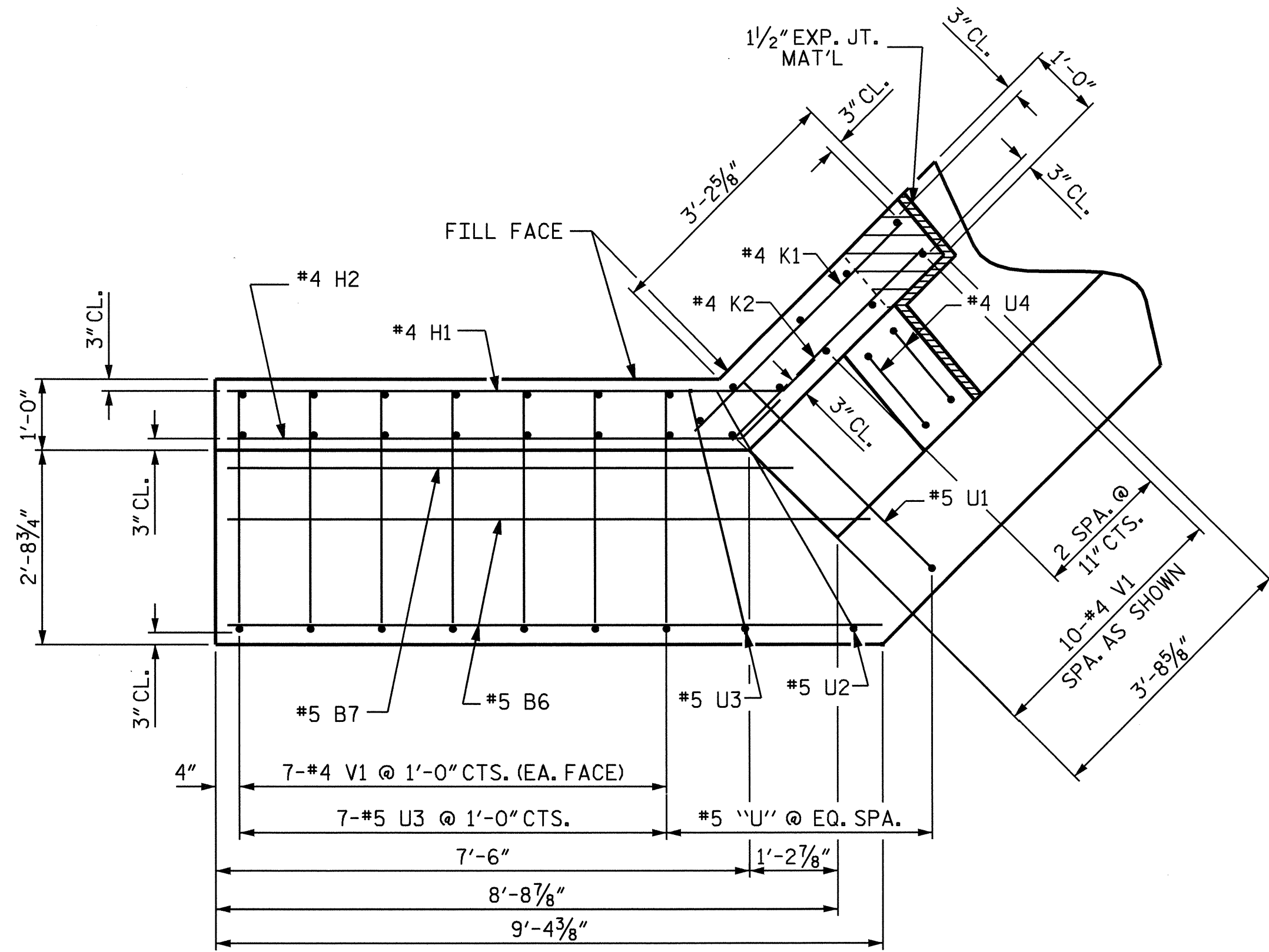


DRAWN BY: A. SORSENGINH DATE: 10/05  
 CHECKED BY: D. HODGE DATE: 11/05



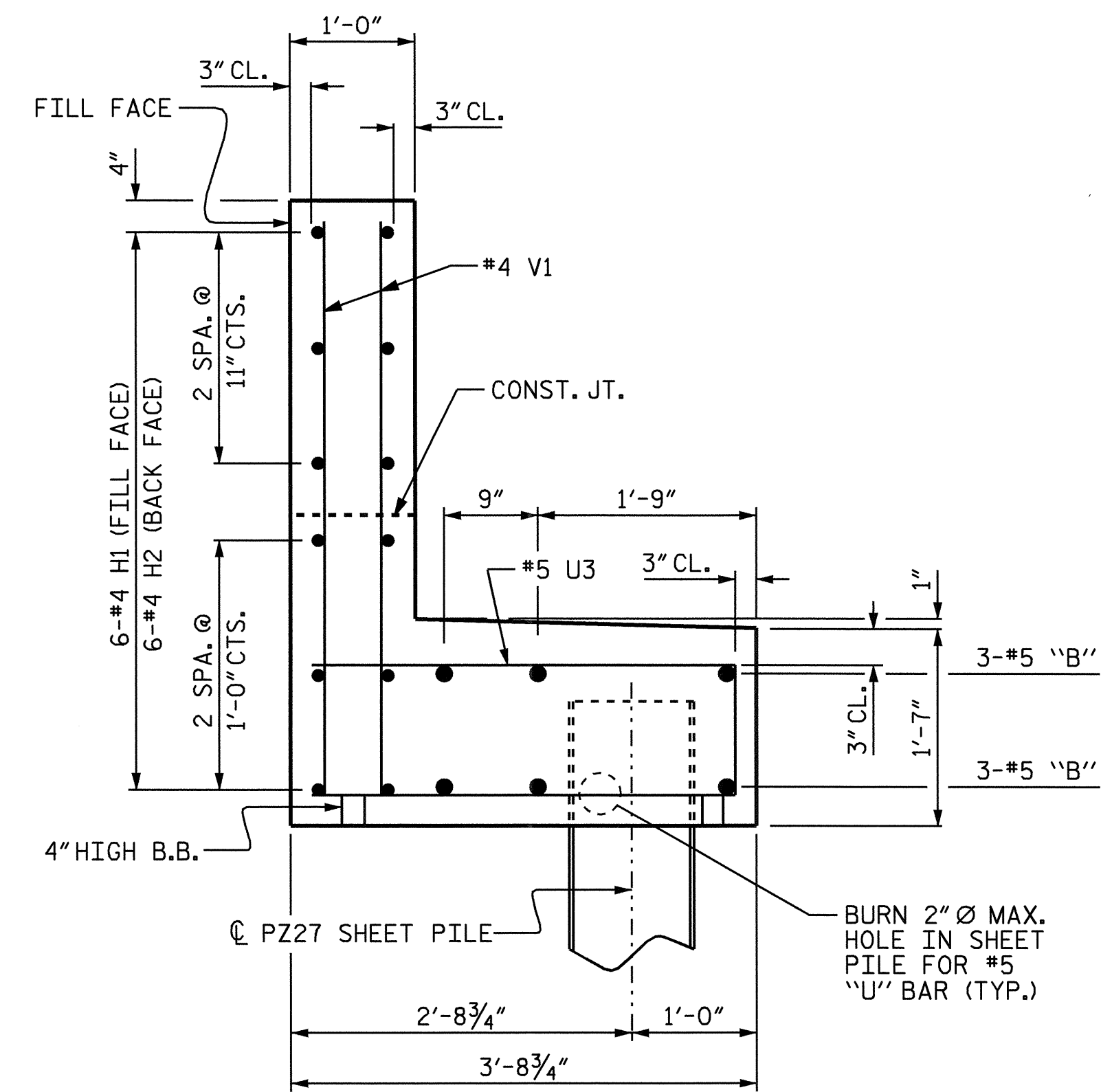


PLAN OF WING (W1)

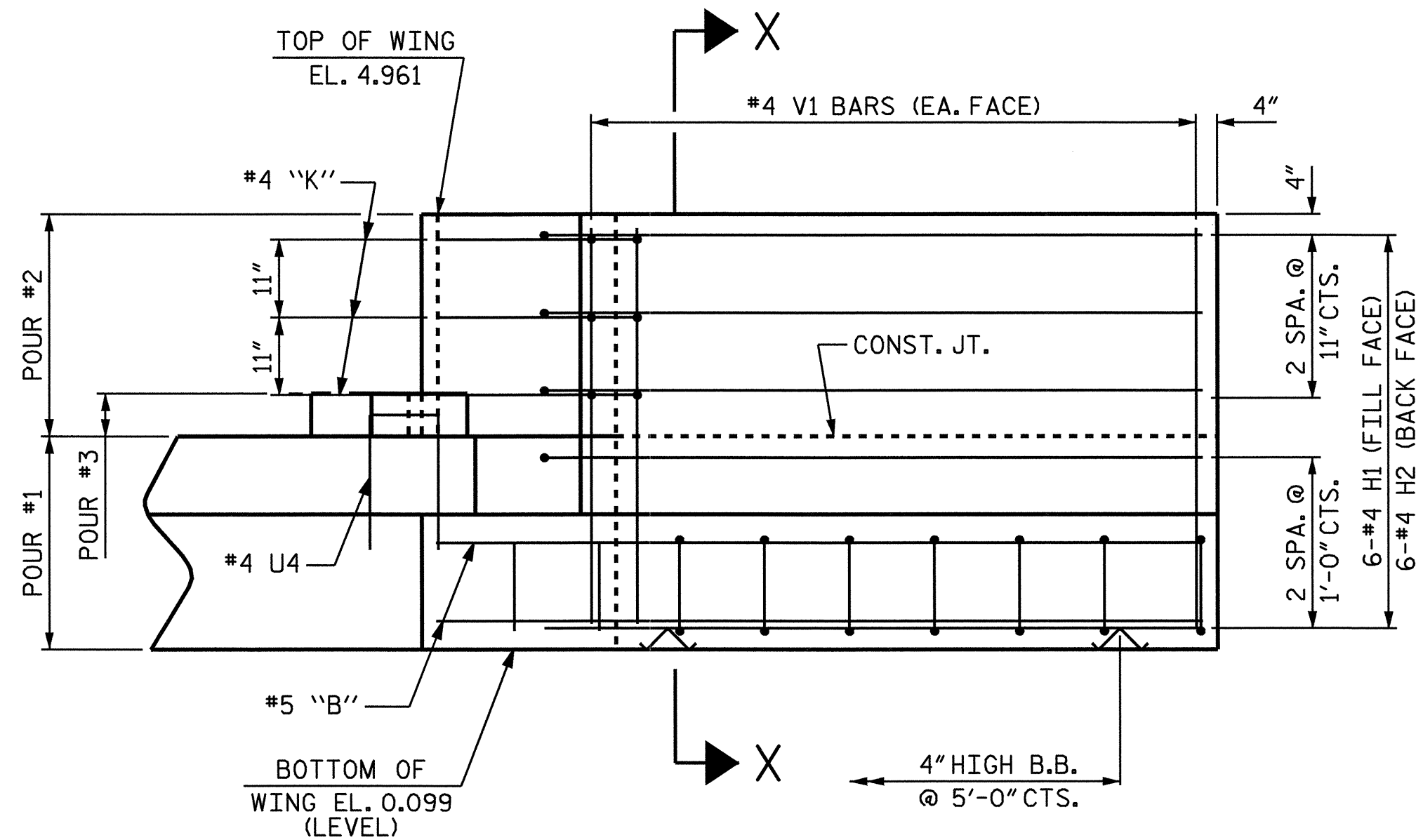


PLAN OF WING (W2)

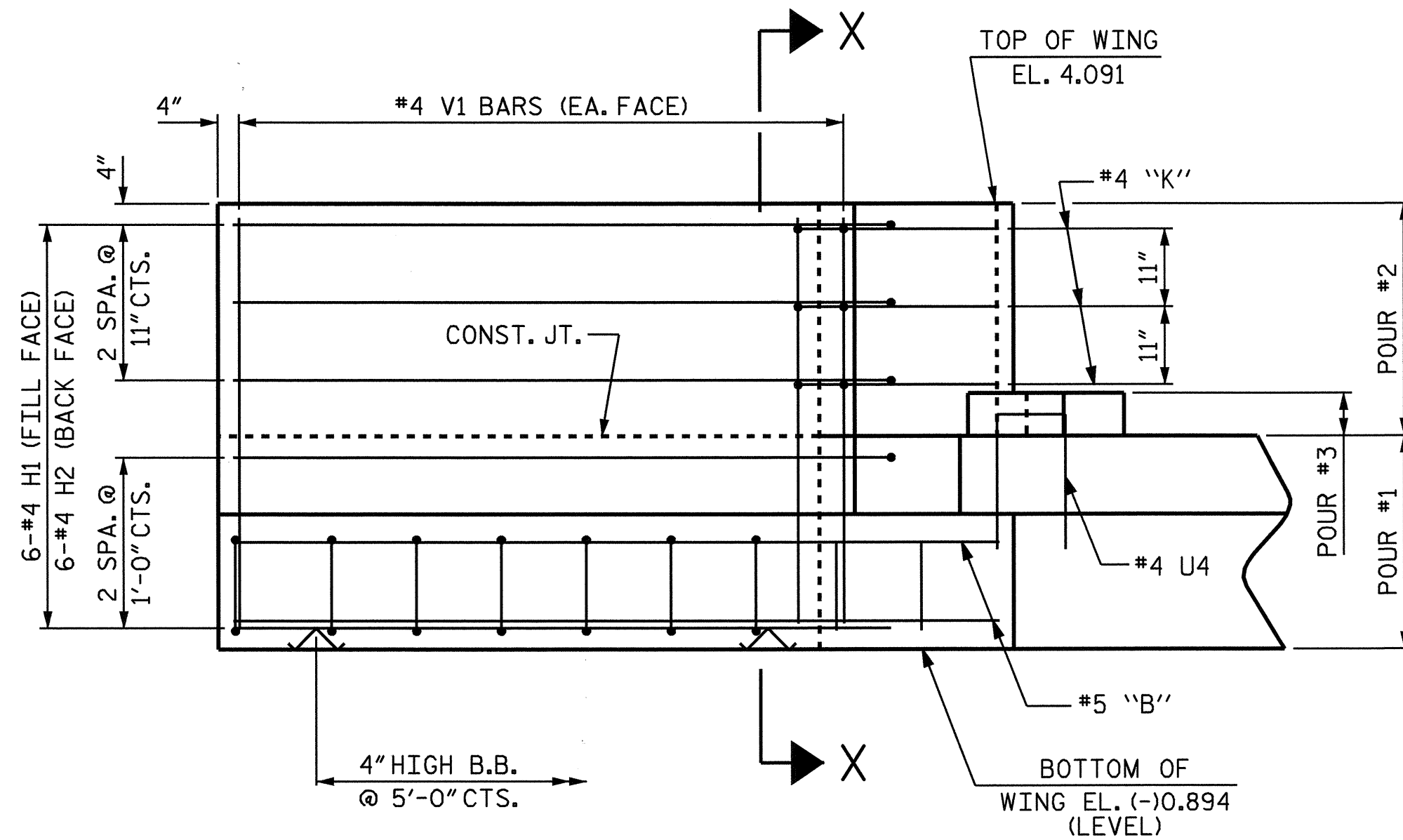
NOTE:  
FOR CLARITY, SHEET PILES ARE NOT  
SHOWN IN PLAN AND ELEVATION VIEWS.



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50 -L-

SHEET 3 OF 4

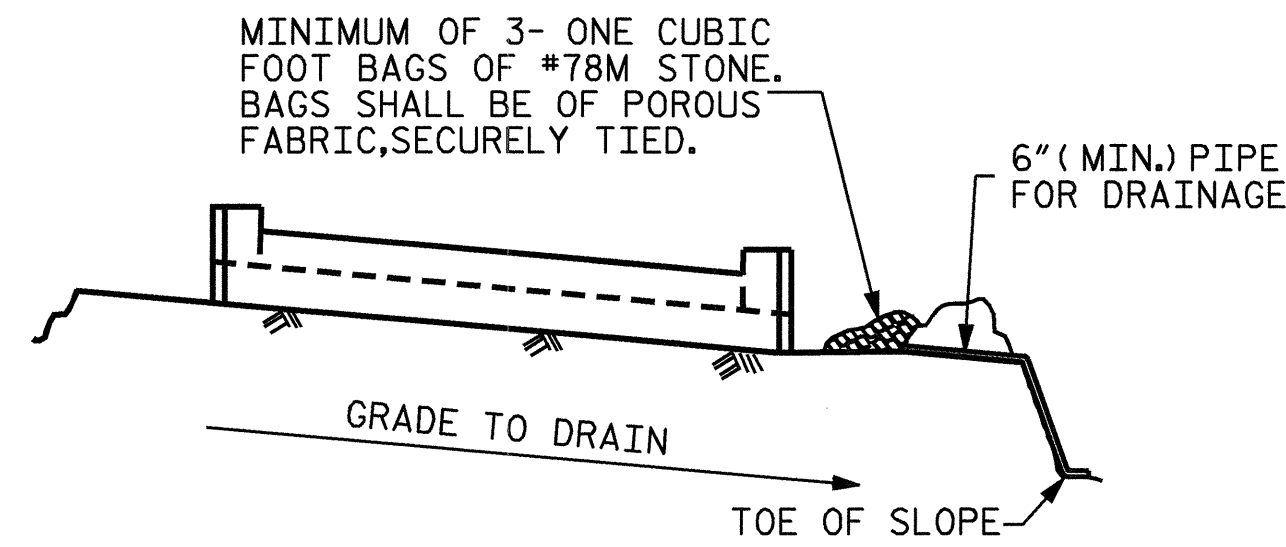
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			21



DRAWN BY : A. SORSENGIN DATE : 10/6/05  
CHECKED BY : D. HODGE DATE : 11/05

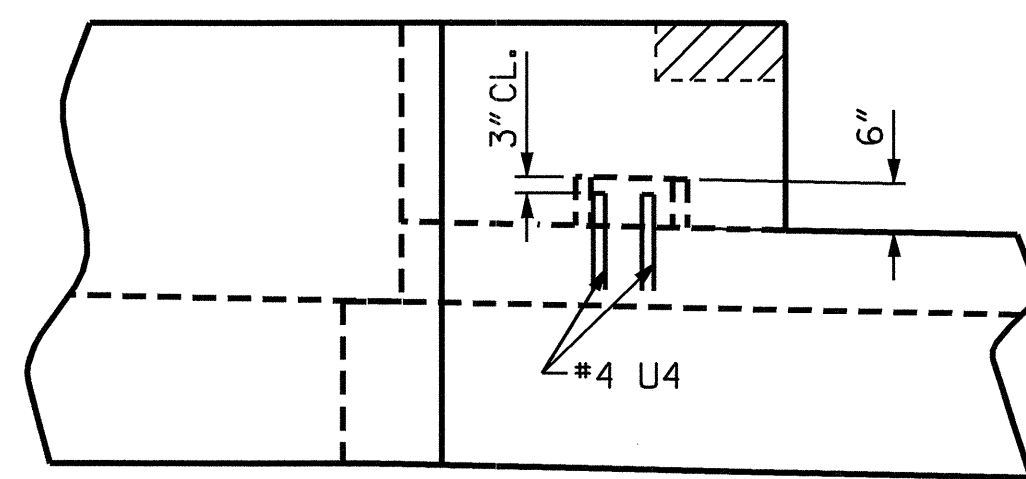
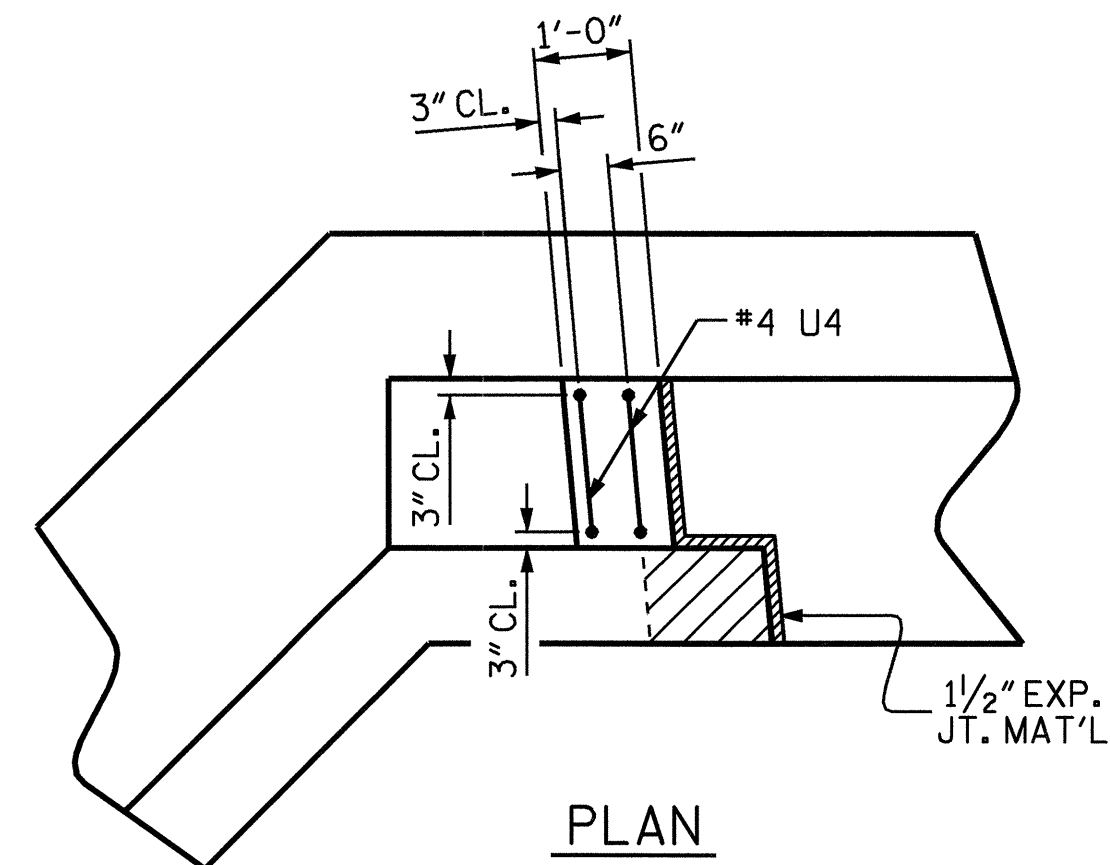


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



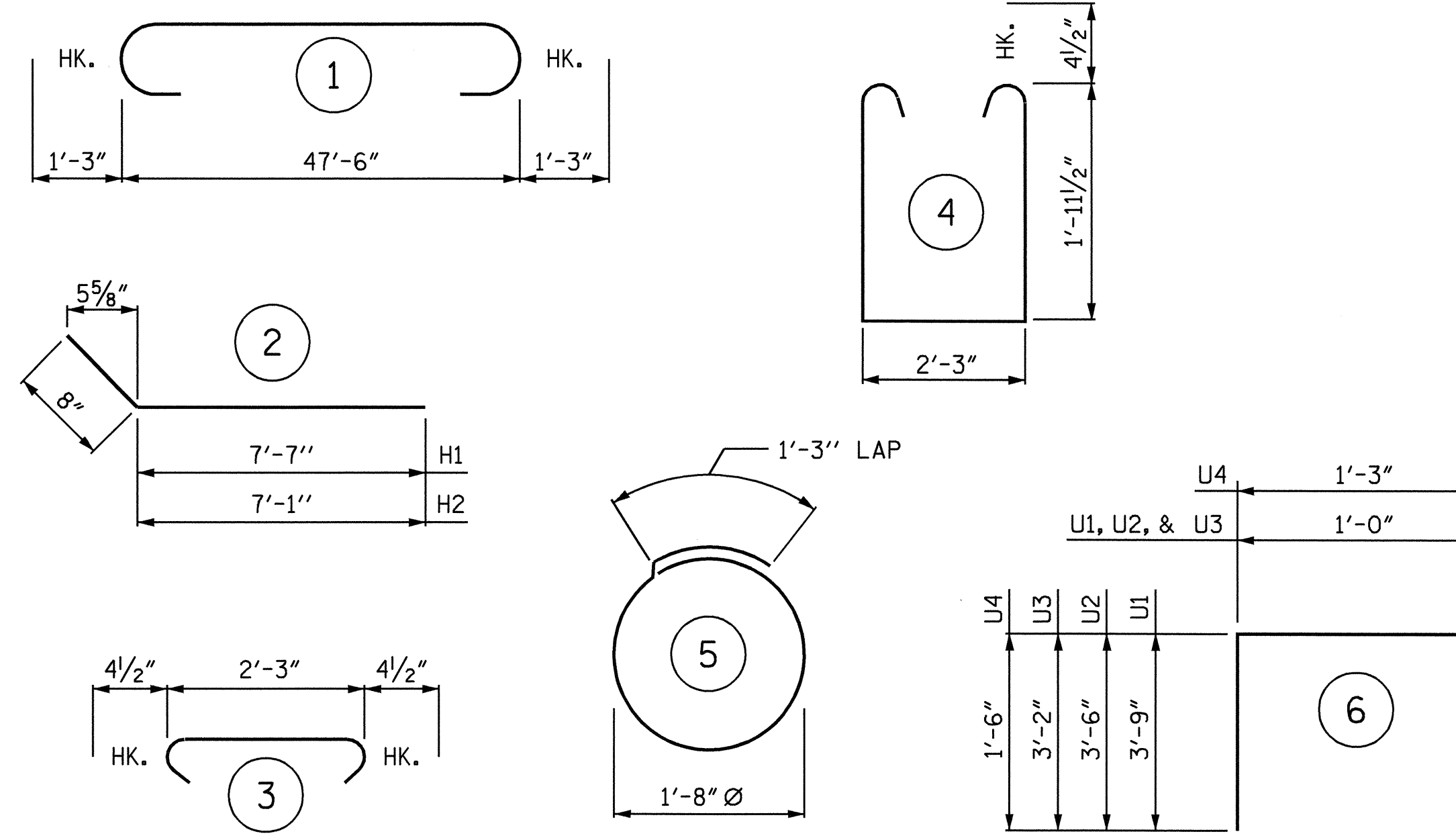
ELEVATION

### LATERAL GUIDE DETAIL

LEFT LATERAL GUIDE SHOWN, RIGHT LATERAL GUIDE SIMILAR

DRAWN BY : A. SORSENGINH DATE : 10/6/05  
 CHECKED BY : D. HODGE DATE : 11/05

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

#### END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	50'-0"	1360
B2	8	4	STR	25'-2"	134
B3	8	4	STR	25'-2"	134
B4	2	5	STR	49'-4"	103
B5	12	4	STR	2'-3"	18
B6	8	5	STR	9'-2"	76
B7	4	5	STR	7'-11"	33
D1	28	6	STR	1'-6"	63
H1	12	4	2	8'-3"	66
H2	12	4	2	7'-9"	62
K1	6	4	STR	3'-9"	15
K2	6	4	STR	3'-4"	13
S1	40	4	4	6'-11"	185
S2	40	4	3	3'-0"	80
S3	18	4	5	6'-6"	78
U1	42	5	6	8'-6"	372
U2	2	5	6	8'-0"	17
U3	16	5	6	7'-4"	122
U4	4	4	6	4'-3"	11
V1	48	4	STR	4'-3"	136

EPOXY COATED REINFORCING STEEL 3,078 LBS.

CLASS AA CONCRETE BREAKDOWN

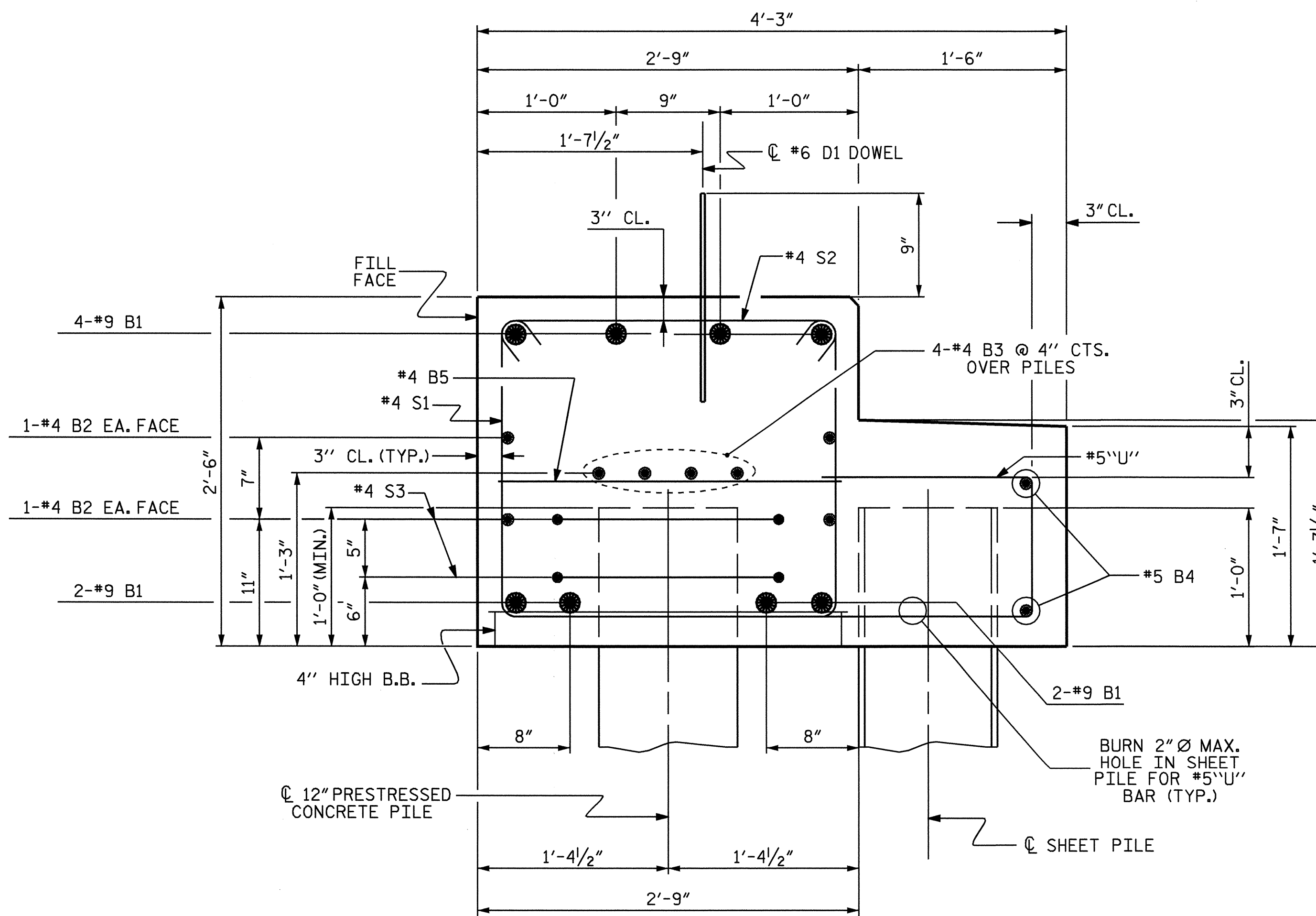
POUR #1 CAP & BOTT. OF WING	21.0 C.Y.
POUR #2 TOP OF WING	1.8 C.Y.
POUR #3 LATERAL GUIDE	0.1 C.Y.
<b>TOTAL CLASS AA CONCRETE</b>	<b>22.9 C.Y.</b>

18" STEEL SHEET PILES

NO. PZ27 = 42	SQ. FT. = 1323
NO. BW2750 = 2	SQ. FT. = 63
<b>TOTAL NO. = 44</b>	<b>SQ. FT. = 1386</b>

12" PRESTRESSED CONCRETE PILES

NO. = 9	LIN. FT. = 450
---------	----------------



### SECTION A-A

PROJECT NO. B-3858  
 HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 4 OF 4

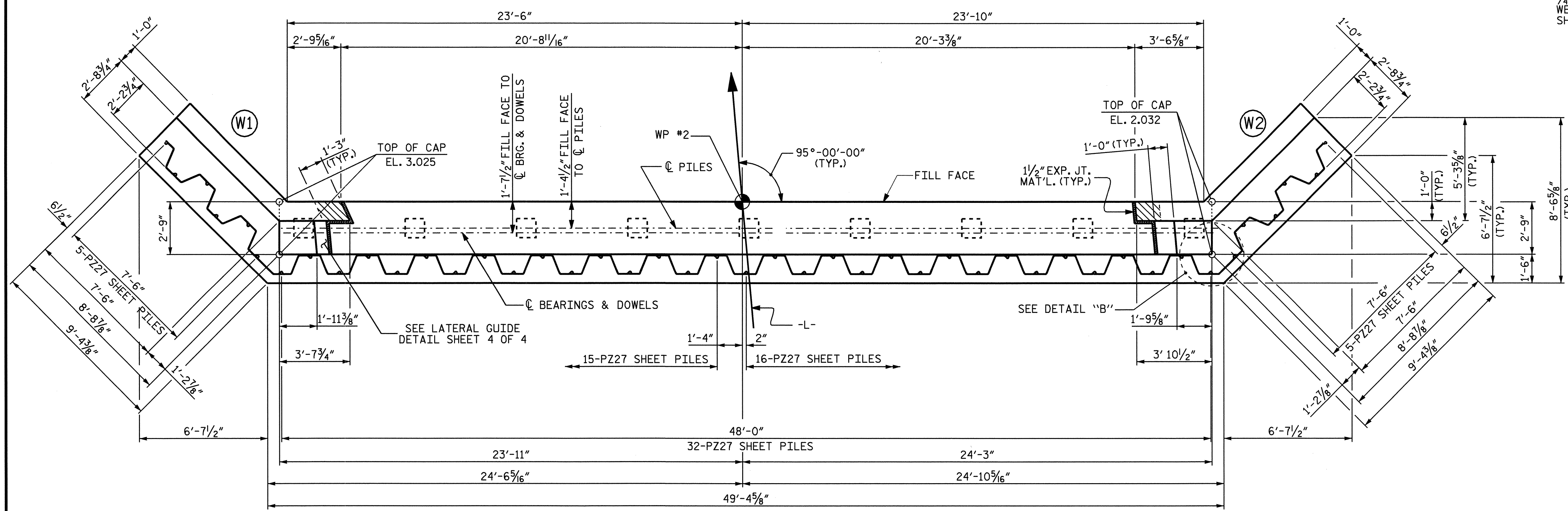
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SUBSTRUCTURE END BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 21
2			4			

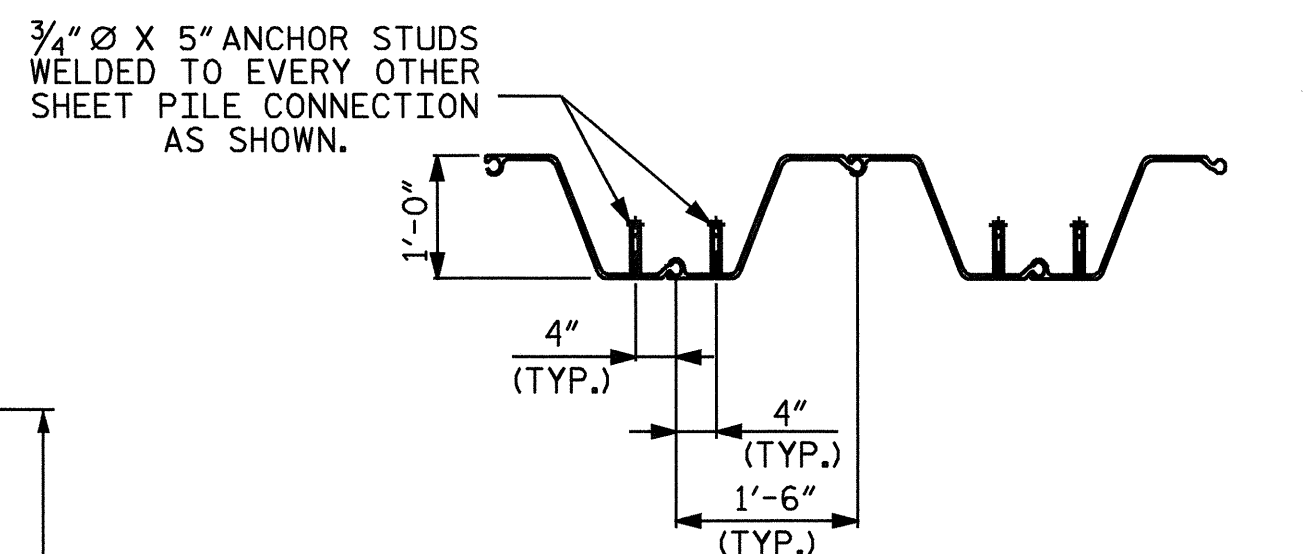




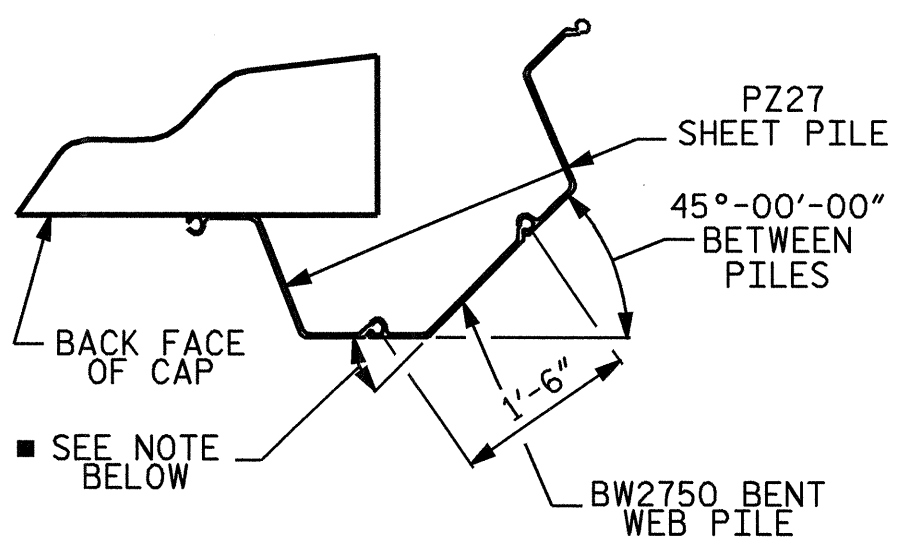


**PLAN**

(FOR CLARITY, BEARING PADS & DOWELS NOT SHOWN IN PLAN VIEW)



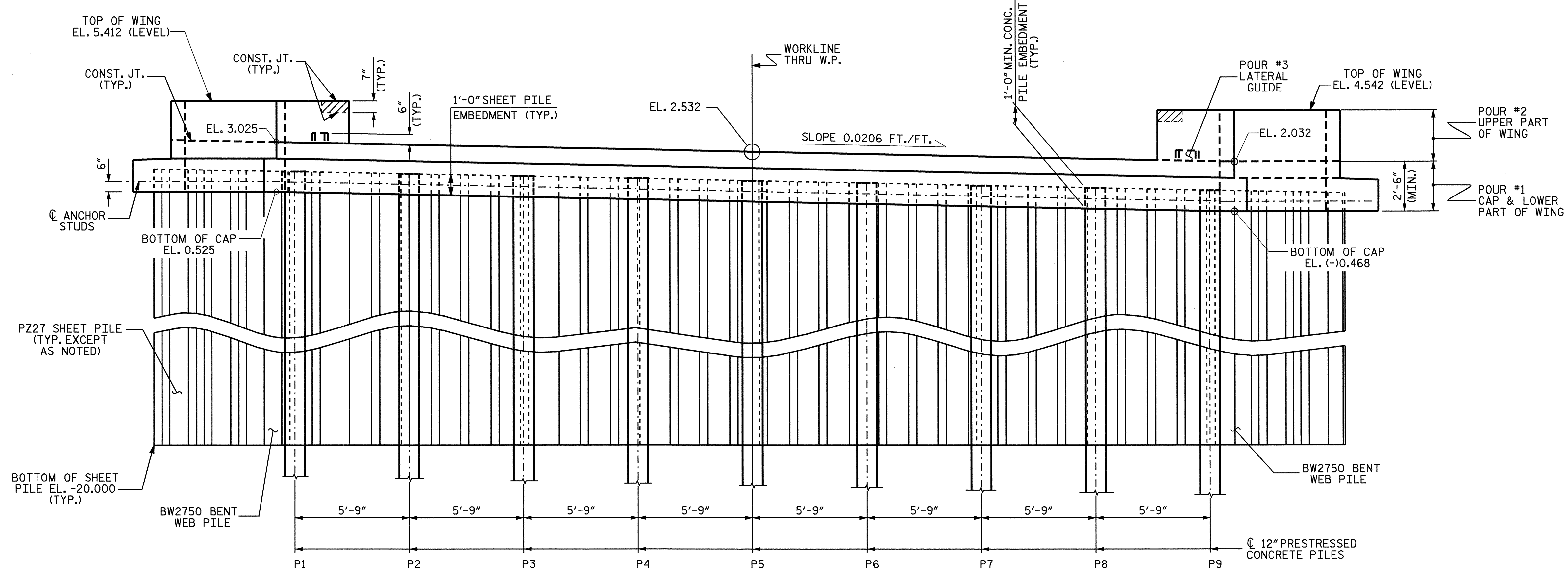
**ANCHOR STUD DETAIL**



**DETAIL "B"**

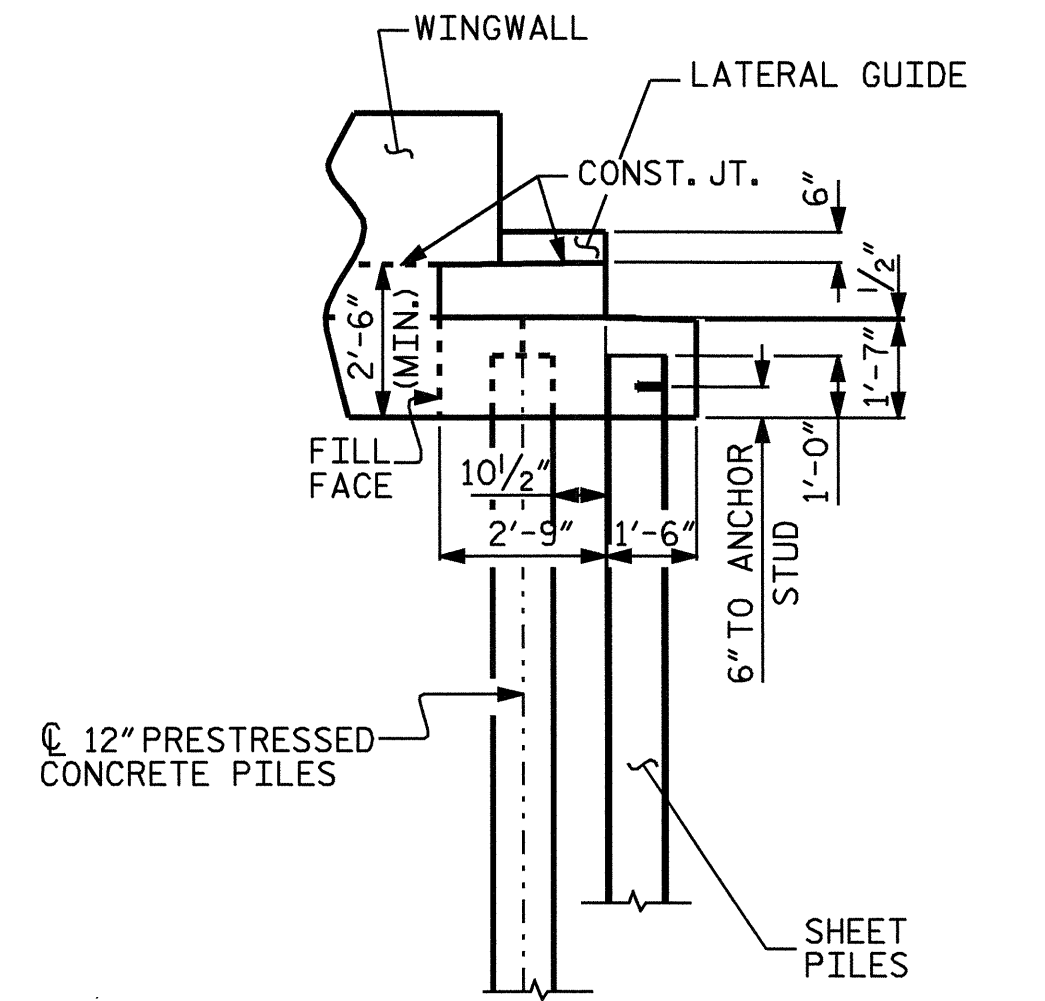
RIGHT SIDE SHOWN, LEFT SIDE SIMILAR

NOTE: THE BEND IN THE BENT WEB PILE SHALL BE DETERMINED BY THE FABRICATOR.



**ELEVATION**

(FOR REINFORCING STEEL IN CAP, SEE SHEET 2 OF 4)



**END ELEVATION**

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT NO. 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-15
					TOTAL SHEETS 21

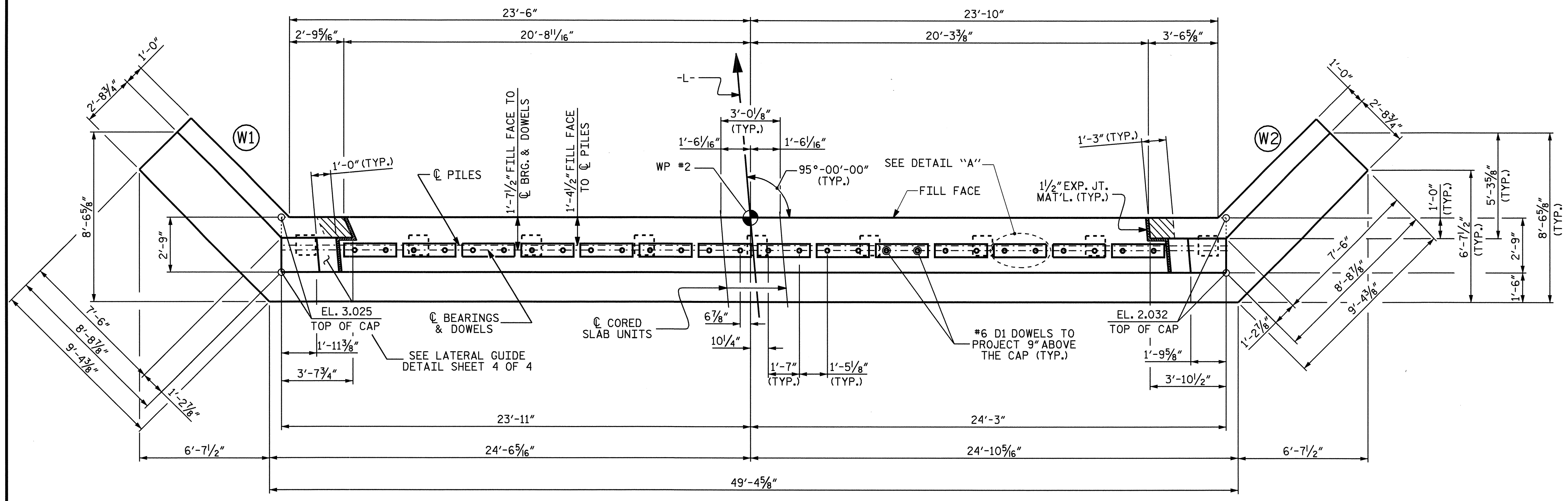


DRAWN BY: A. SORSENGINH DATE: 10/05  
 CHECKED BY: D. HODGE DATE: 11/05

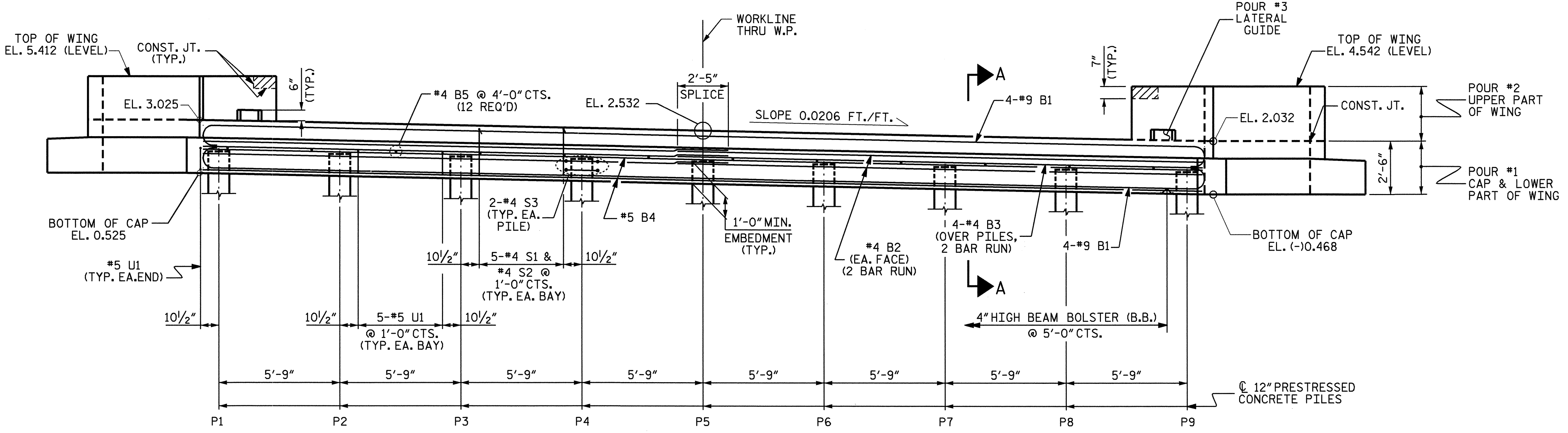
16-FEB-2006 08:25  
 R:\STRUCT\B3858\asorsenginh\B3858.sd.E\*.dgn  
 dahodge

NCBDS





**PLAN**  
(FOR CLARITY, SHEET PILES NOT SHOWN)



**ELEVATION**  
(FOR SECTION A-A, SEE SHEET 4 OF 4)

**NOTES:**

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

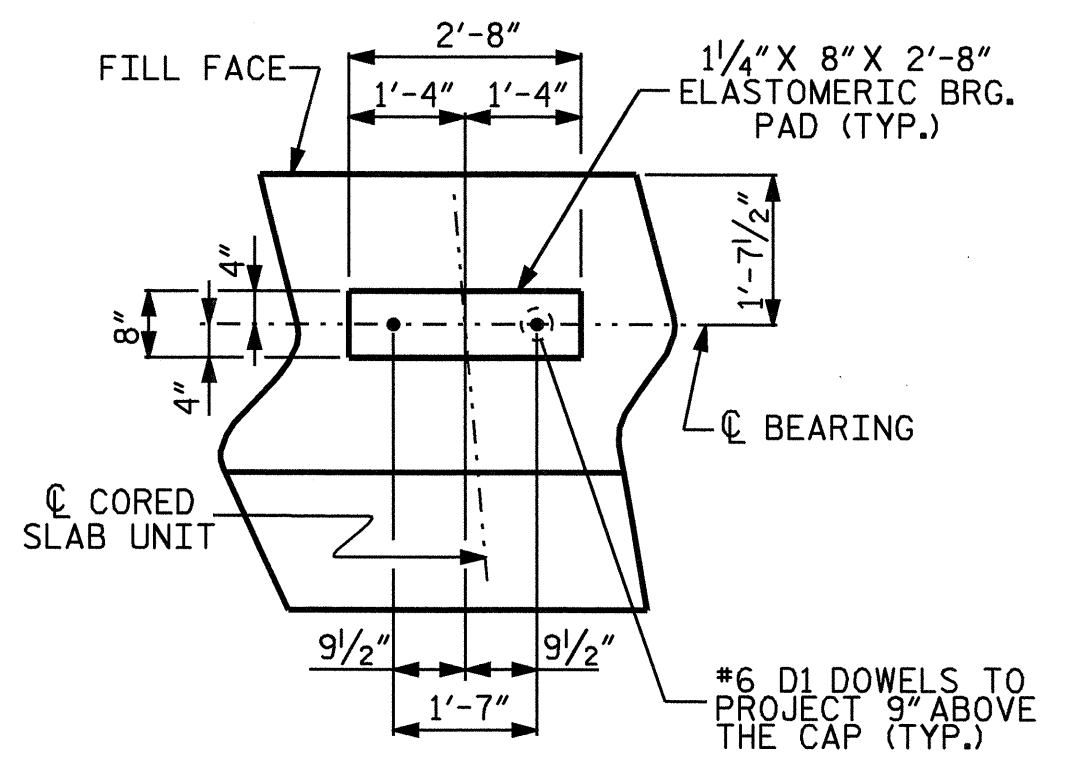
THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

CONCRETE DISPLACED BY THE 12" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

ALL STEEL SHEET PILES SHALL BE ASTM A690 MARINE GRADE STEEL.



**DETAIL "A"**

PILE	ELEVATION
P1	1.516
P2	1.397
P3	1.279
P4	1.160
P5	1.042
P6	0.923
P7	0.805
P8	0.686
P9	0.568

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 2 OF 4

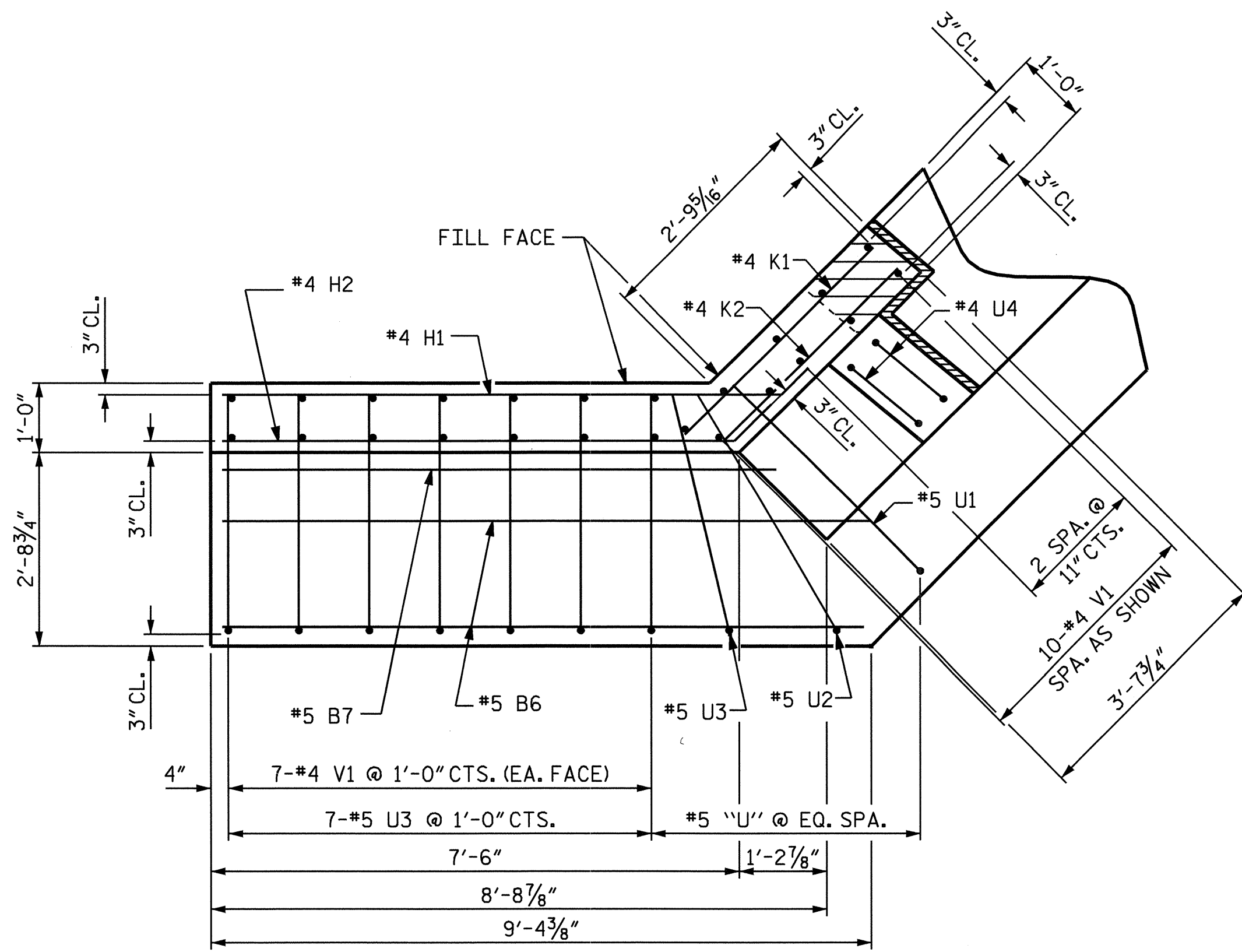
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT NO. 2**

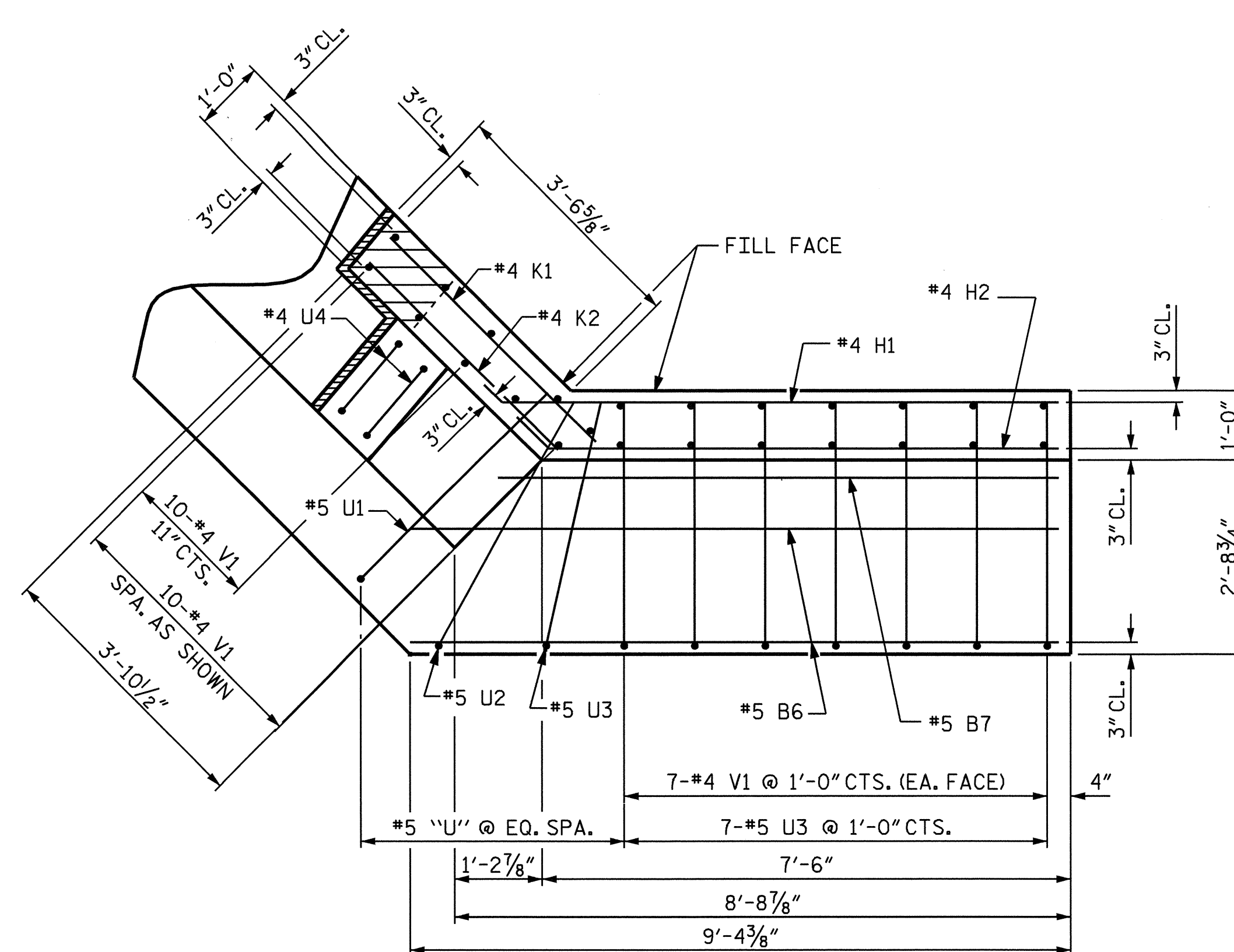
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			21



DRAWN BY: A. SORSENGINH DATE: 10/05  
 CHECKED BY: D. HODGE DATE: 11/05

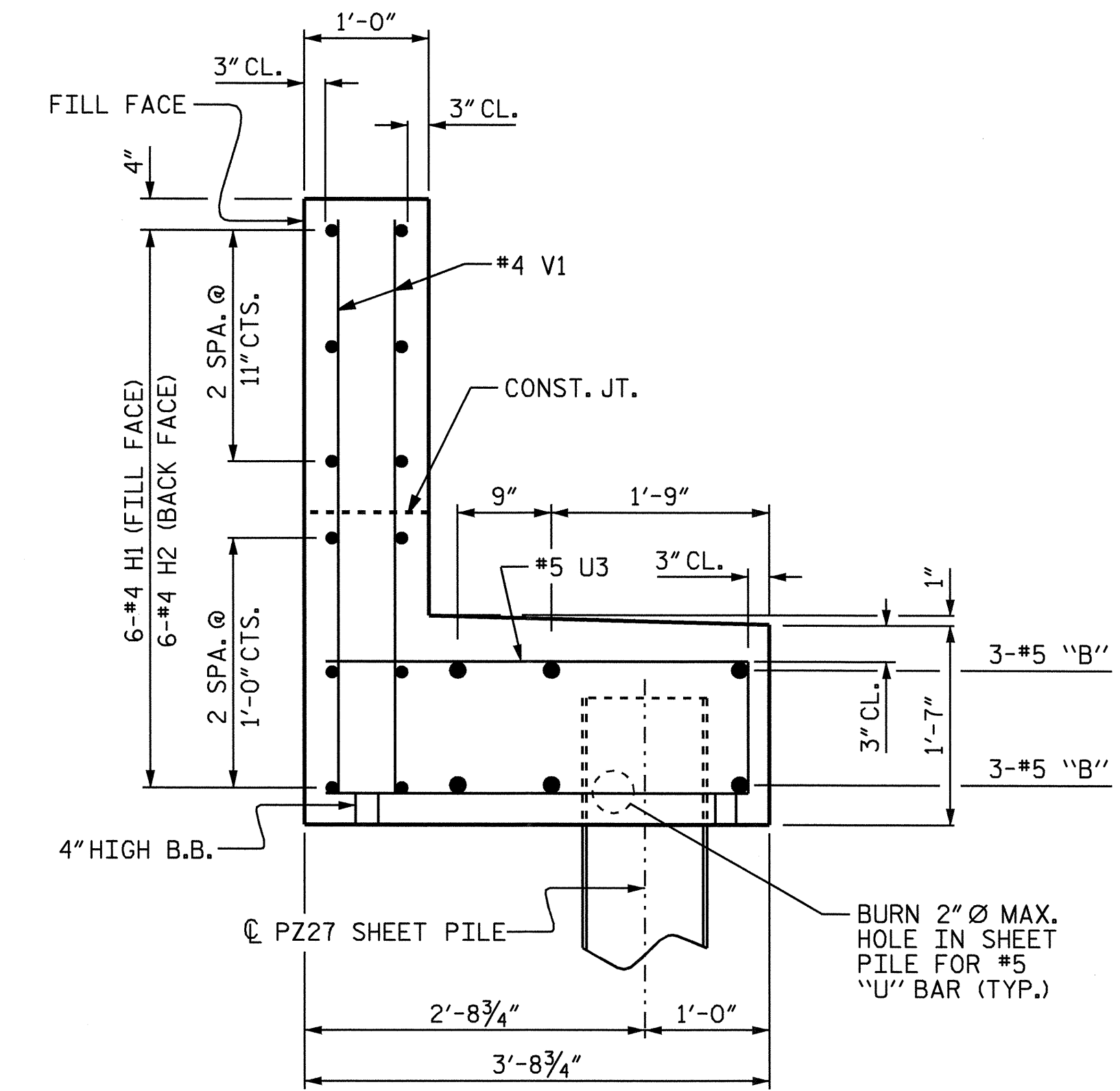


PLAN OF WING (W1)

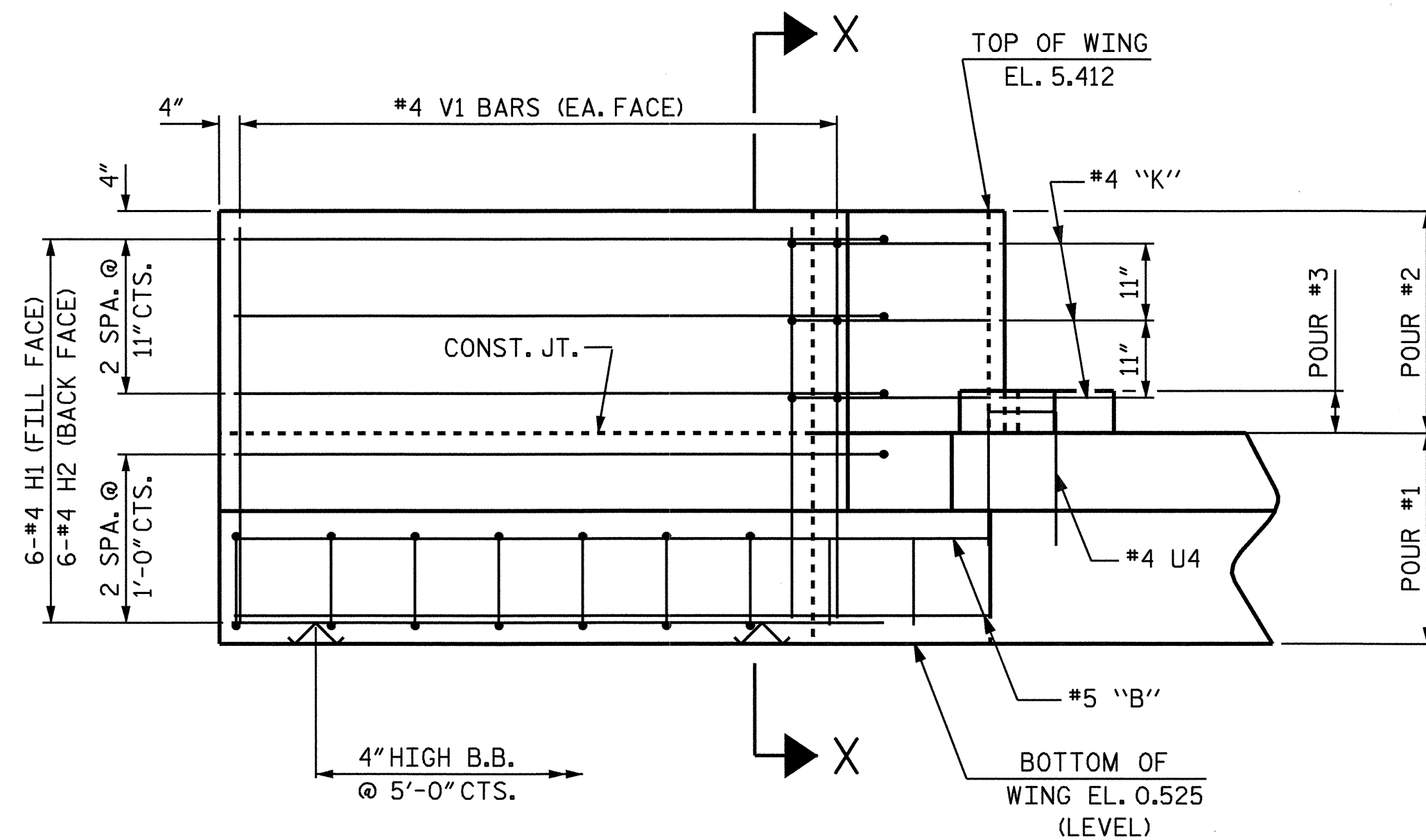


PLAN OF WING (W2)

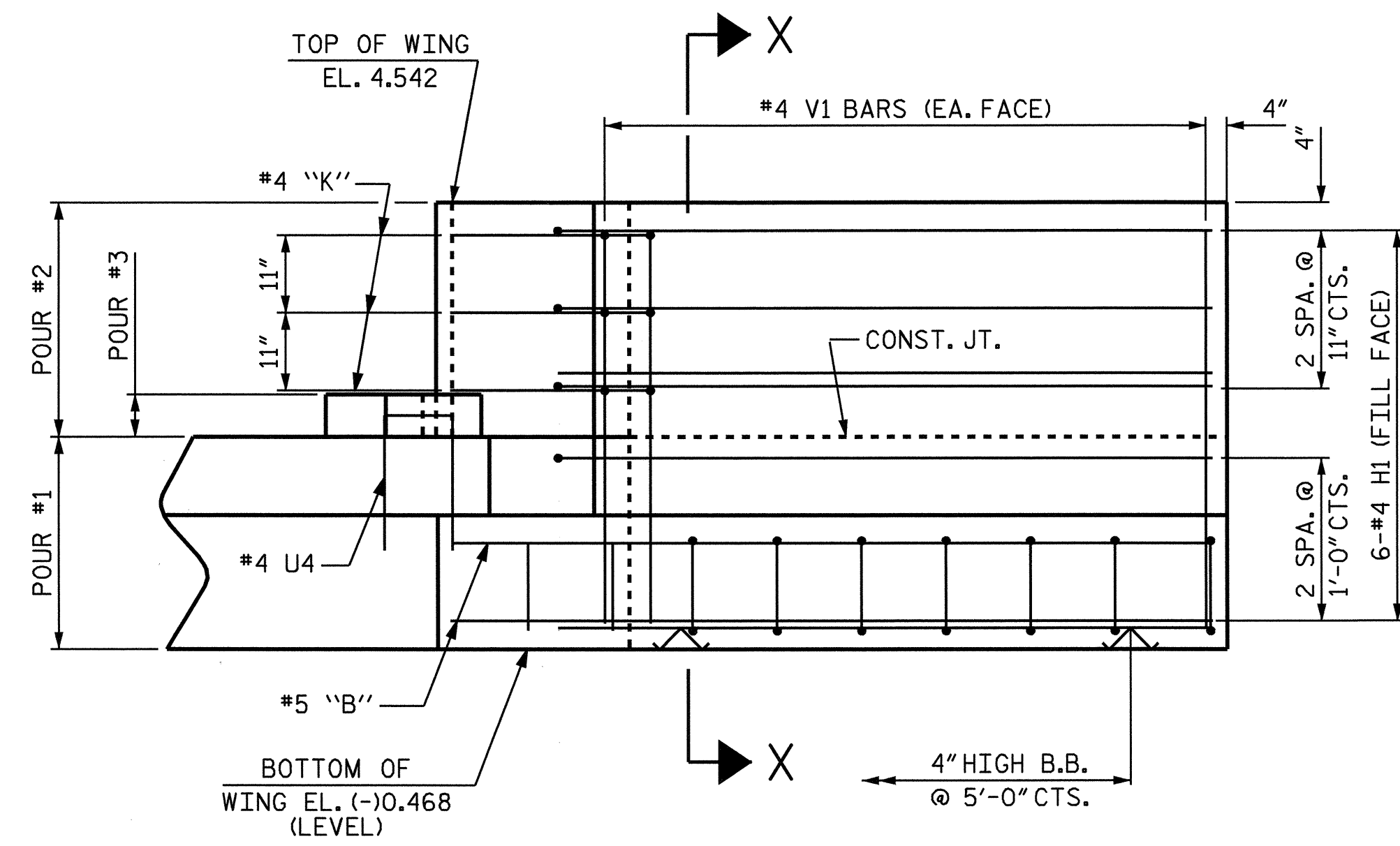
NOTE:  
FOR CLARITY, SHEET PILES ARE NOT  
SHOWN IN PLAN AND ELEVATION VIEWS.



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. B-3858  
HYDE COUNTY  
STATION: 12+17.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT NO. 2

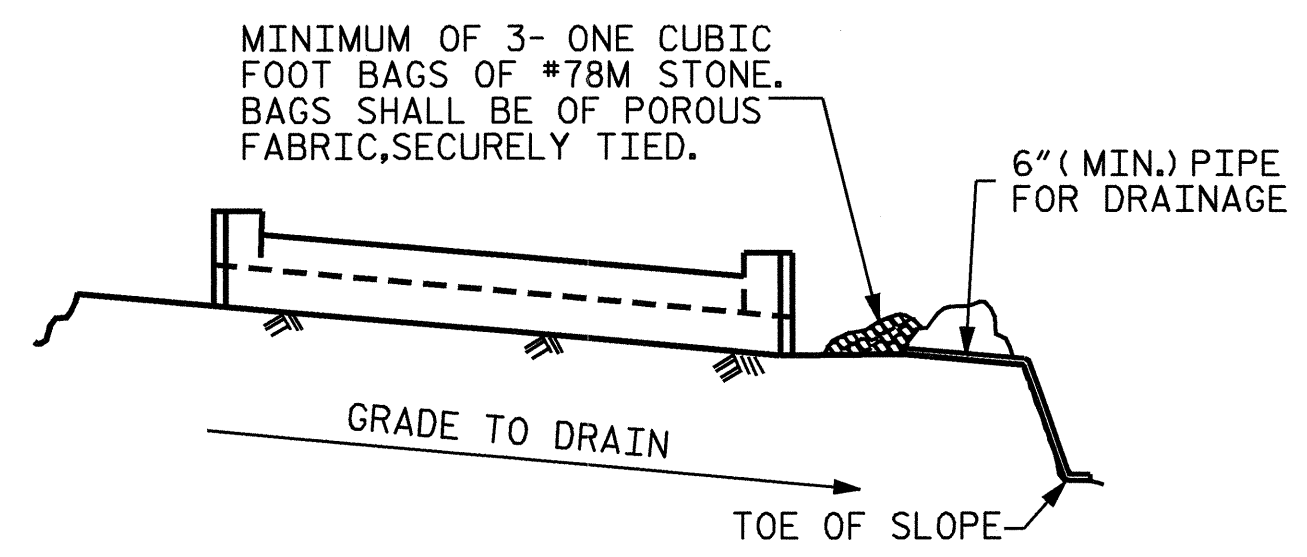


DRAWN BY: A. SORSENGINH DATE: 10/6/05  
CHECKED BY: D. HODGE DATE: 11/05

16-FEB-2006 08:26  
R:\STRUCT\B3858\asor\senginh\B3858.sd.E\*.dgn  
dahodge

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

SHEET NO. S-17

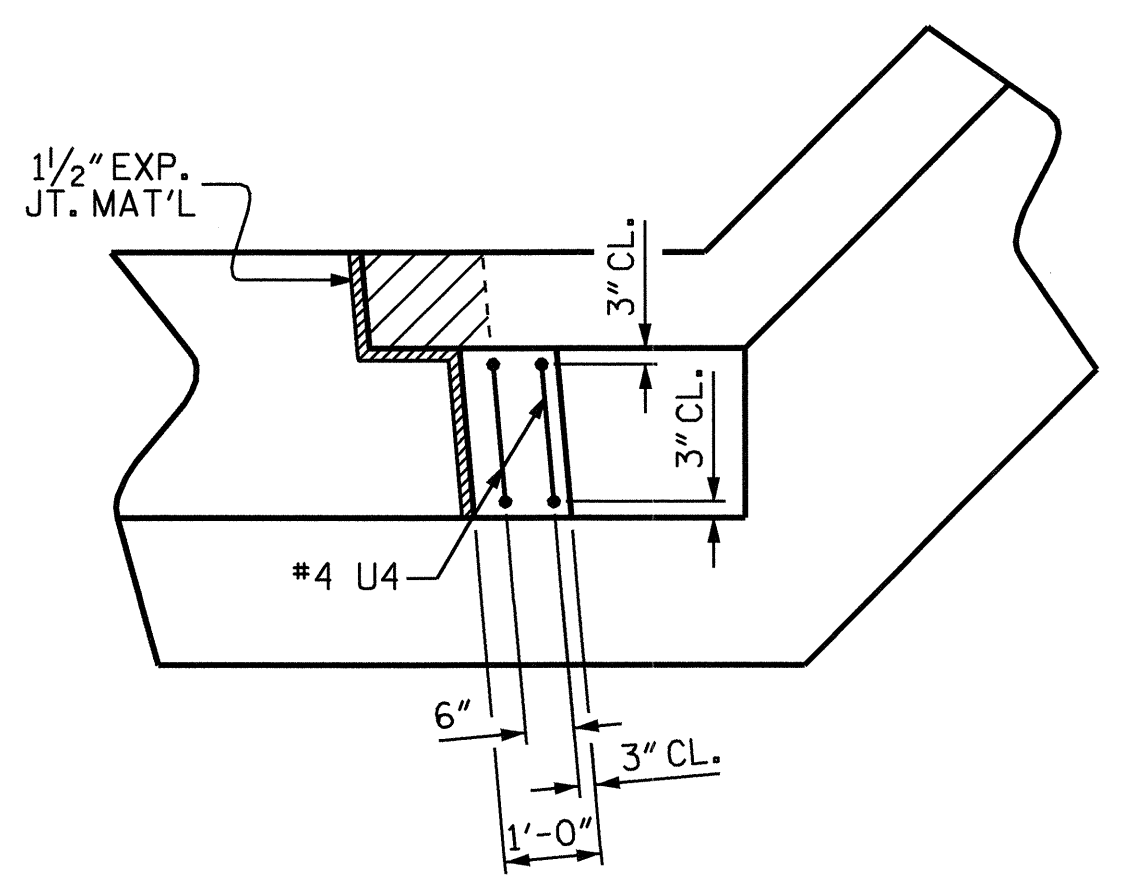


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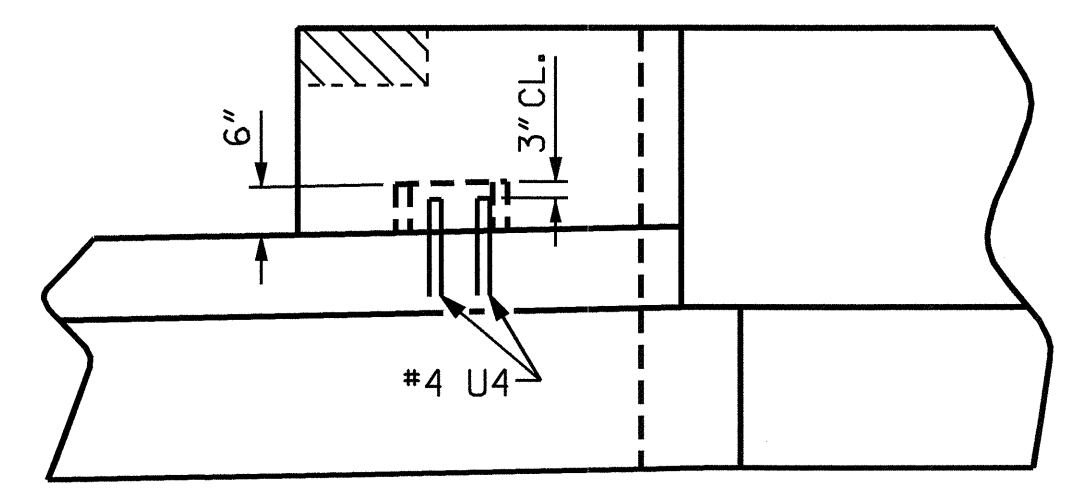
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



PLAN

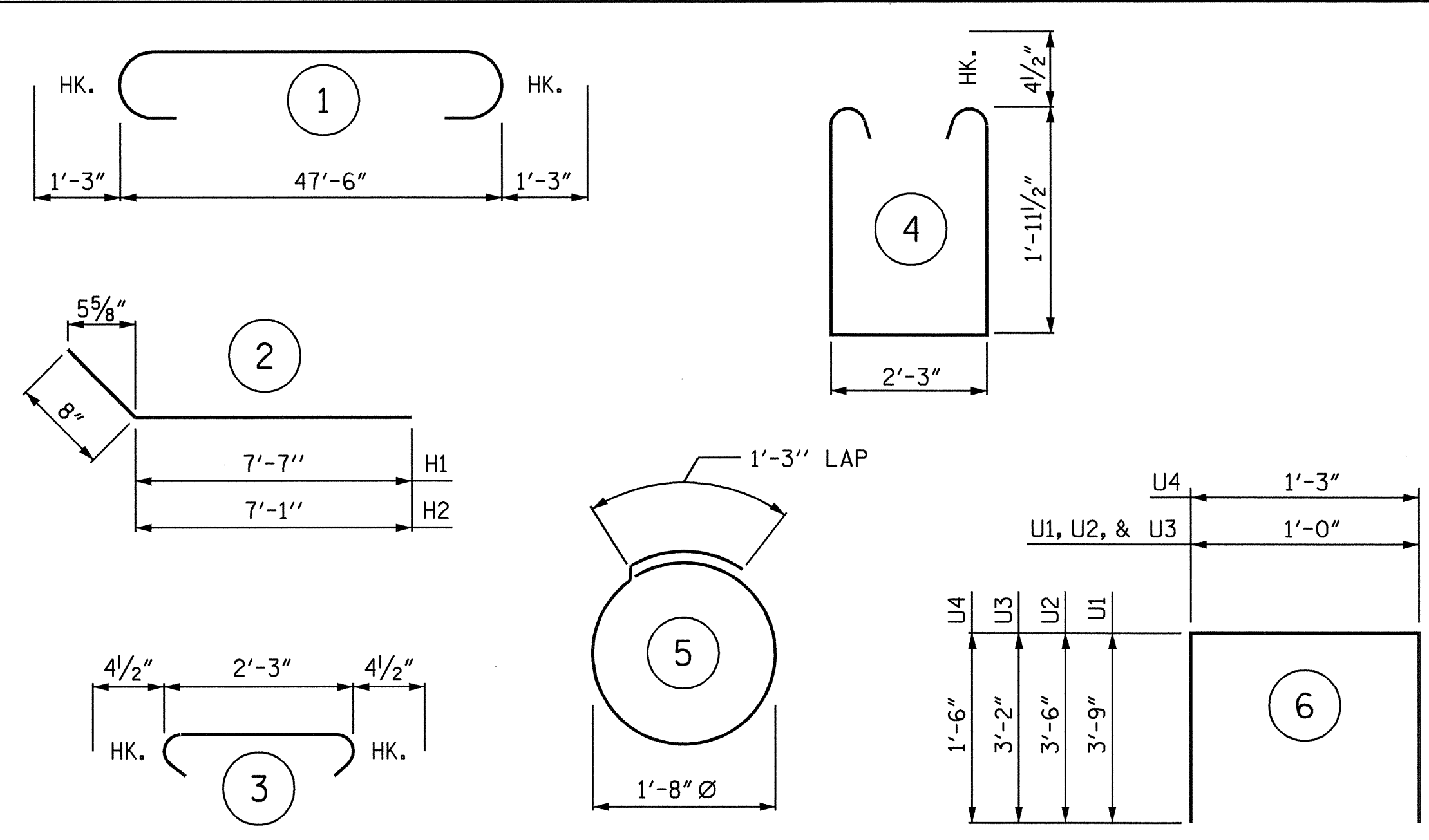


ELEVATION

**LATERAL GUIDE DETAIL**

RIGHT LATERAL GUIDE SHOWN, LEFT LATERAL GUIDE SIMILAR

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

END BENT NO. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	50'-0"	1360
B2	8	4	STR	25'-2"	134
B3	8	4	STR	25'-2"	134
B4	2	5	STR	49'-4"	103
B5	12	4	STR	2'-3"	18
B6	8	5	STR	9'-2"	76
B7	4	5	STR	7'-11"	33
D1	28	6	STR	1'-6"	63
H1	12	4	2	8'-3"	66
H2	12	4	2	7'-9"	62
K1	6	4	STR	3'-4"	13
K2	6	4	STR	3'-2"	13
S1	40	4	4	6'-11"	185
S2	40	4	3	3'-0"	80
S3	18	4	5	6'-6"	78
U1	42	5	6	8'-6"	372
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U3	16	5	6	7'-4"	122
U4	4	4	6	4'-3"	11
V1	48	4	STR	4'-3"	136

EPOXY COATED REINFORCING STEEL 3,076 LBS.

CLASS AA CONCRETE BREAKDOWN

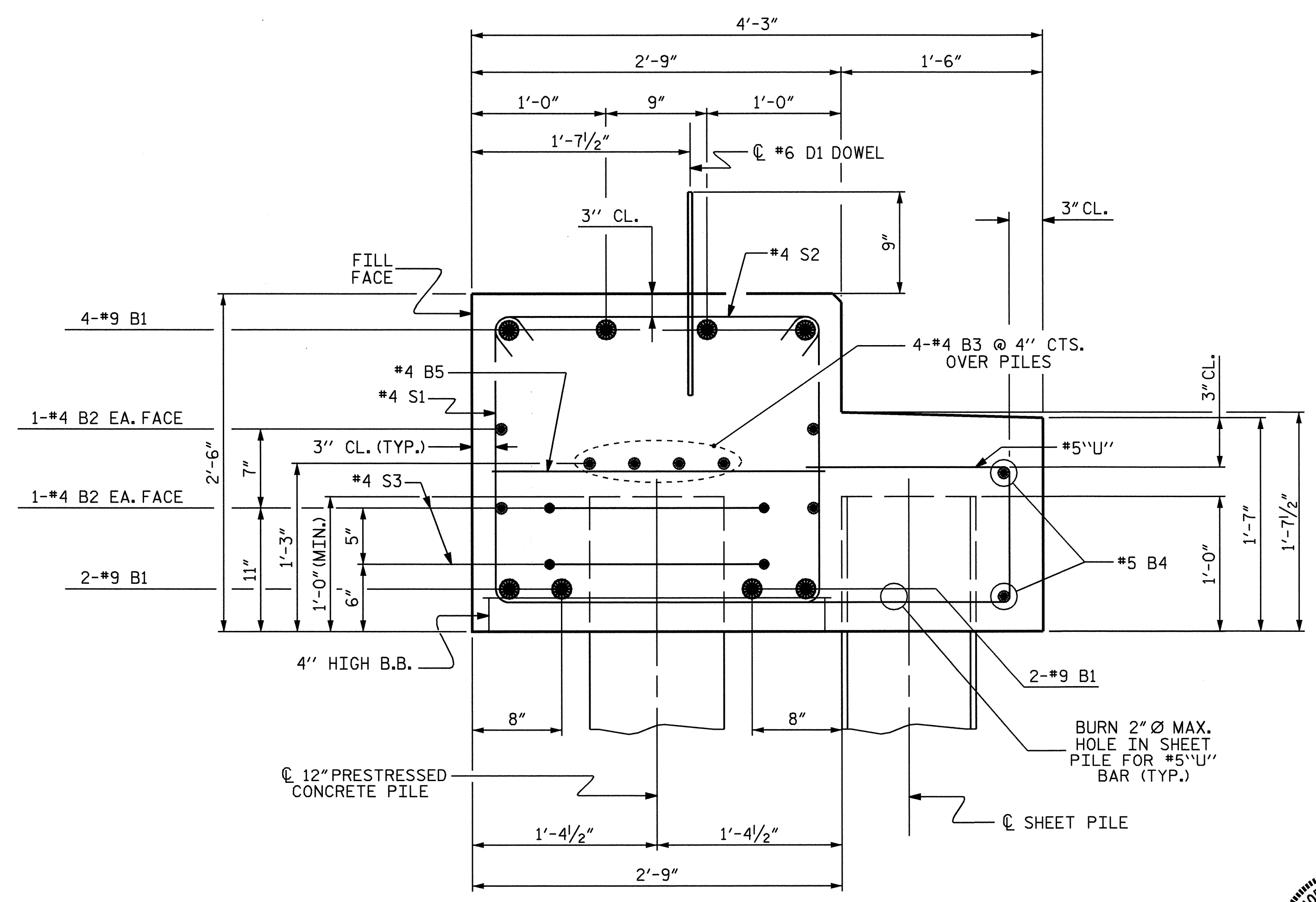
POUR #1 CAP & BOTT. OF WING	21.0 C.Y.
POUR #2 TOP OF WING	1.8 C.Y.
POUR #3 LATERAL GUIDE	0.1 C.Y.
<b>TOTAL CLASS AA CONCRETE</b>	<b>22.9 C.Y.</b>

18" STEEL SHEET PILES

NO. PZ27 = 42	SQ. FT. = 1323
NO. BW2750 = 2	SQ. FT. = 63
<b>TOTAL NO. = 44</b>	<b>SQ. FT. = 1386</b>

12" PRESTRESSED CONCRETE PILES

NO. = 9	LIN. FT. = 450
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SECTION A-A

PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT NO. 2**



DRAWN BY: A. SORSENGINH DATE: 10/6/05  
 CHECKED BY: D. HODGE DATE: 11/05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			21



**NOTES**

CONCRETE DESIGN DATA :  $f'_c = 5,000$  PSI ;  $f_c = 2,000$  PSI

IMPACT IN HANDLING = 50%

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE PILE SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,500 PSI.

IN DRIVING PILES, A METHOD APPROVED BY THE ENGINEER SHALL BE USED, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS TO BE INDICATED WITH A BLACK MARK 2" WIDE.

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 STANDARD SPECIFICATIONS.

THE CONTRACTOR MAY USE EITHER OF THE FOLLOWING STRAND CONFIGURATIONS:

SIZE	GRADE	NUMBER OF STRANDS	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
1/2"	270 L.R.	4	0.153	41,300* PER STRAND	30,980* PER STRAND
1/2"	270 L.R.	5	0.153	41,300* PER STRAND	30,980* PER STRAND

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED THE LAST STRAND MAY BE BURNED SINGLY, ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

BUILD-UPS SHALL BE 'CLASS A' CONCRETE WITH 20% ADDITIONAL CEMENT. NO DRIVING OF THE BUILT-UP PILE WILL BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 3,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

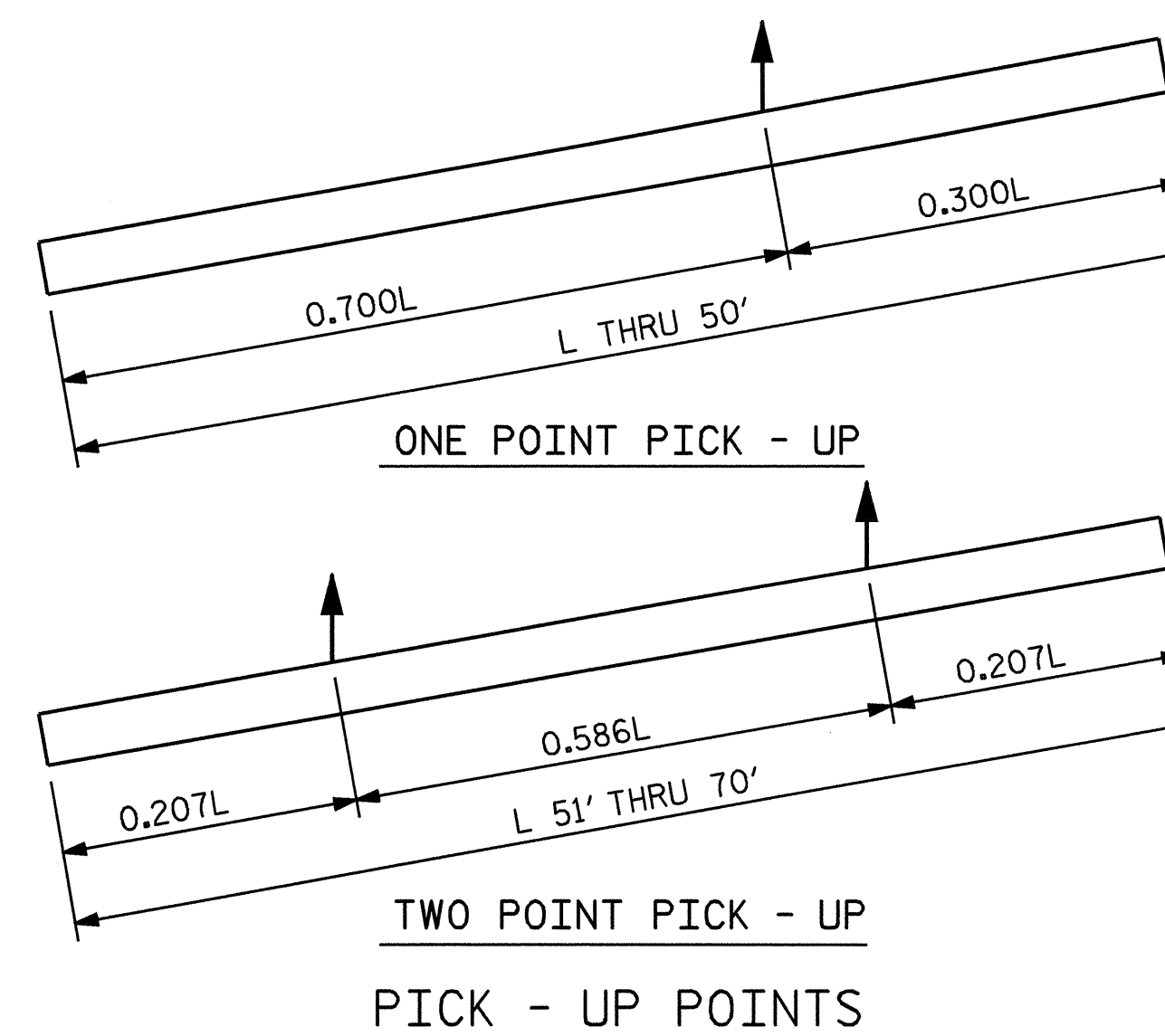
ALL CORNERS TO BE CHAMFERED 3/4".

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

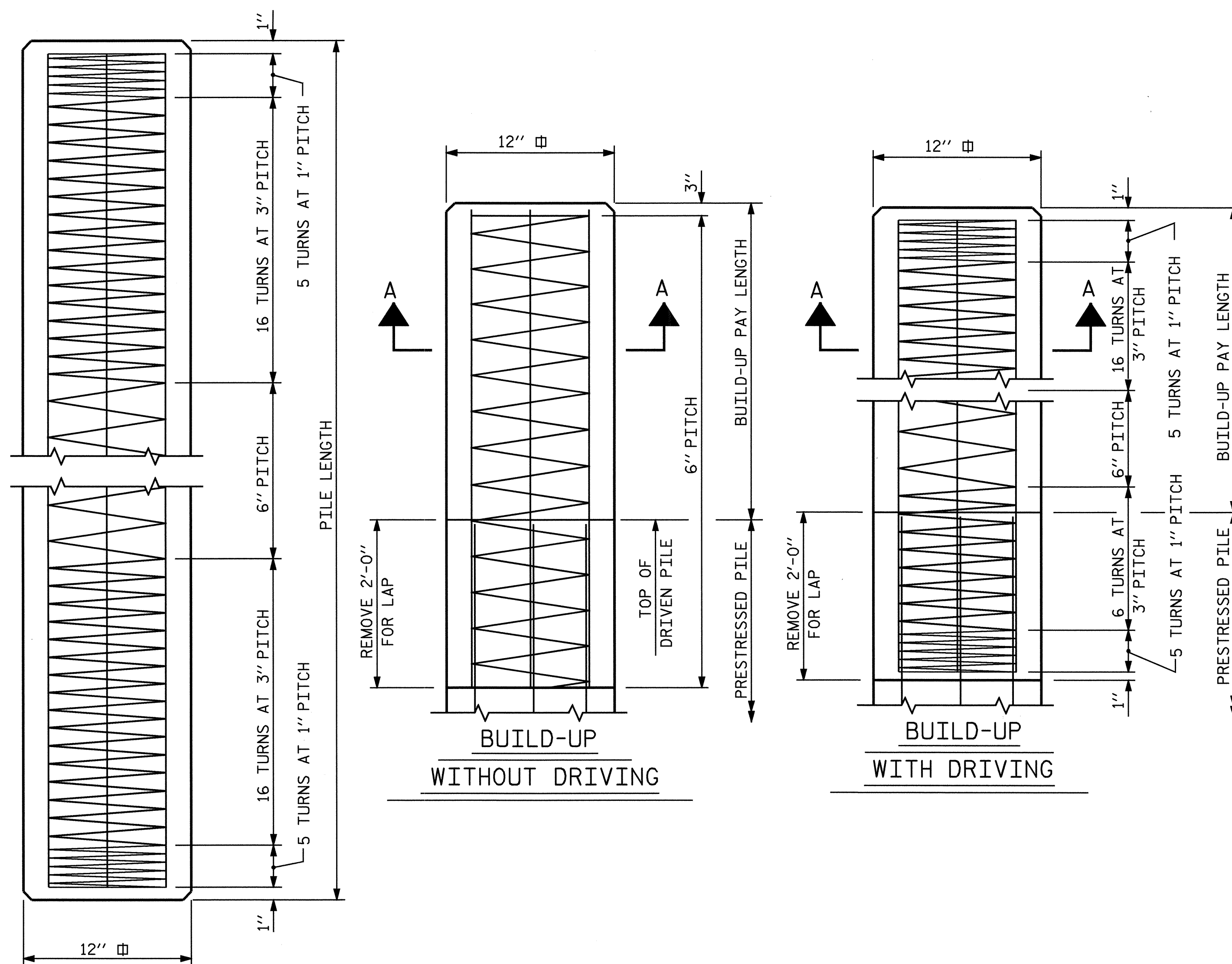
PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRATE CORROSION INHIBITOR. SEE SPECIAL PROVISIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40

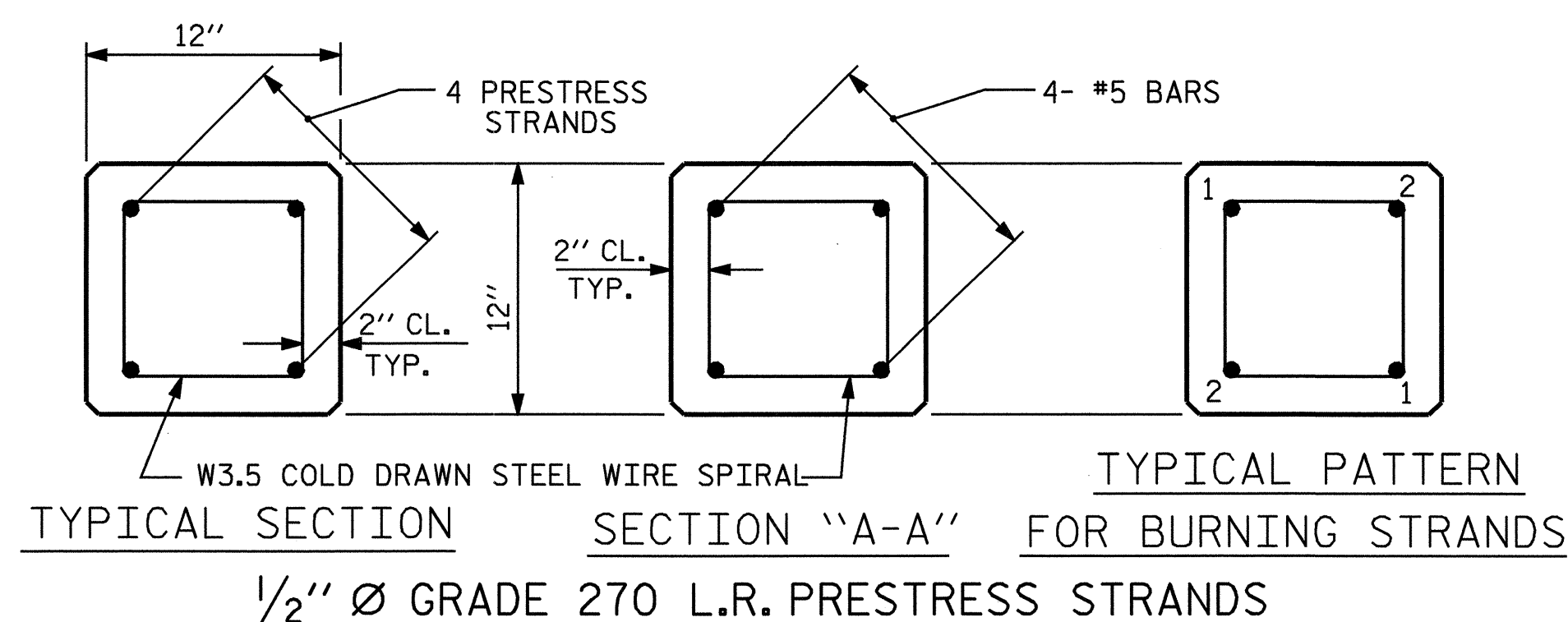
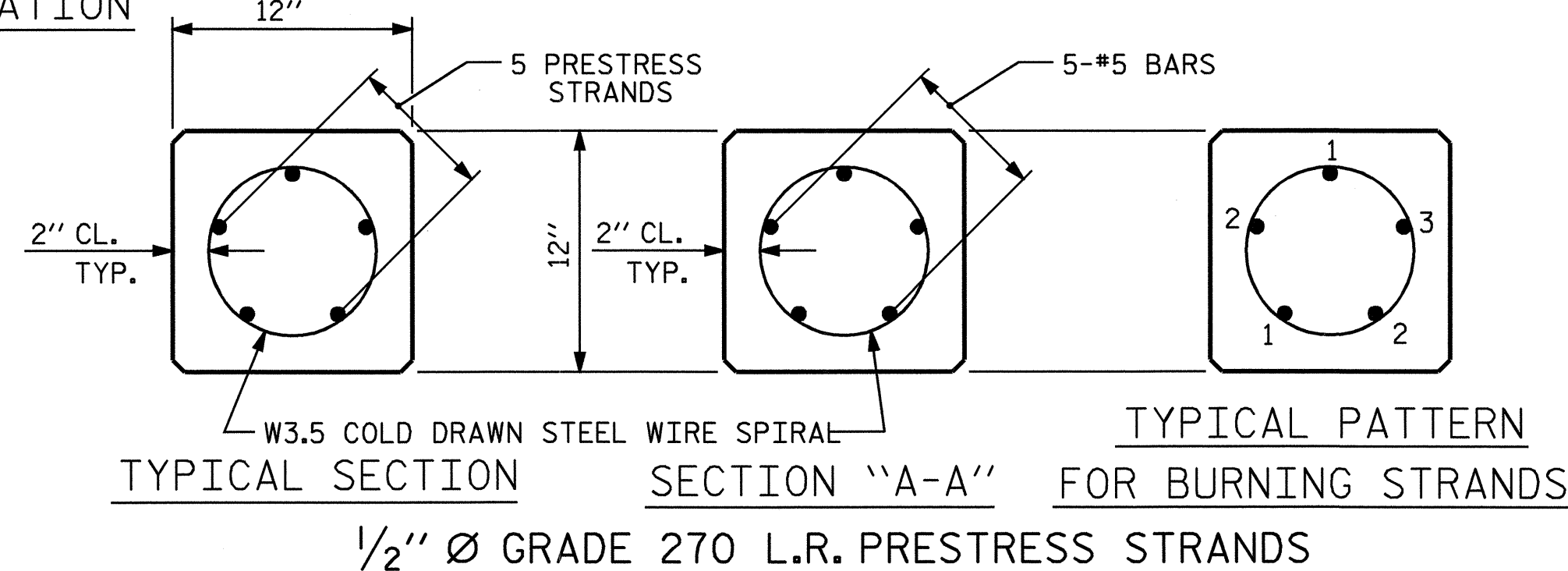
FOR PRESTRESSED CONCRETE PILES, SEE SPECIAL PROVISIONS.



QUANTITIES FOR ONE 12" PRESTRESSED PILE						
LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE PICK-UP POINT		TWO PICK-UP POINT	
			0.300L	0.700L	0.207L	0.586L
25'-0"	0.91	1.85	7'-6"	17'-6"		
30'-0"	1.10	2.22	9'-0"	21'-0"		
35'-0"	1.28	2.59	10'-6"	24'-6"		
40'-0"	1.46	2.96	12'-0"	28'-0"		
45'-0"	1.64	3.33	13'-6"	31'-6"		
50'-0"	1.83	3.70	15'-0"	35'-0"		
55'-0"	2.01	4.07			11'-4 1/2"	32'-3"
60'-0"	2.19	4.44			12'-5"	35'-2"
65'-0"	2.37	4.81			13'-5 1/2"	38'-1"
70'-0"	2.56	5.18			14'-6"	41'-0"



**ELEVATION**

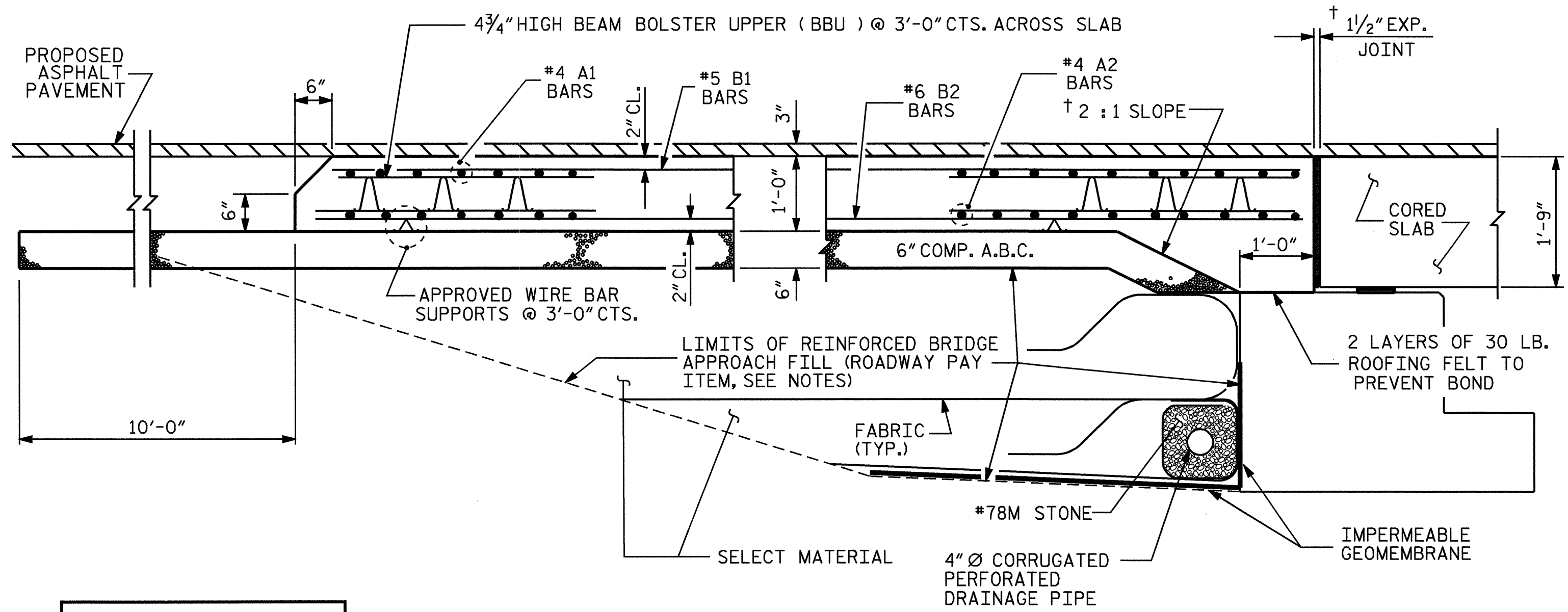


PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-



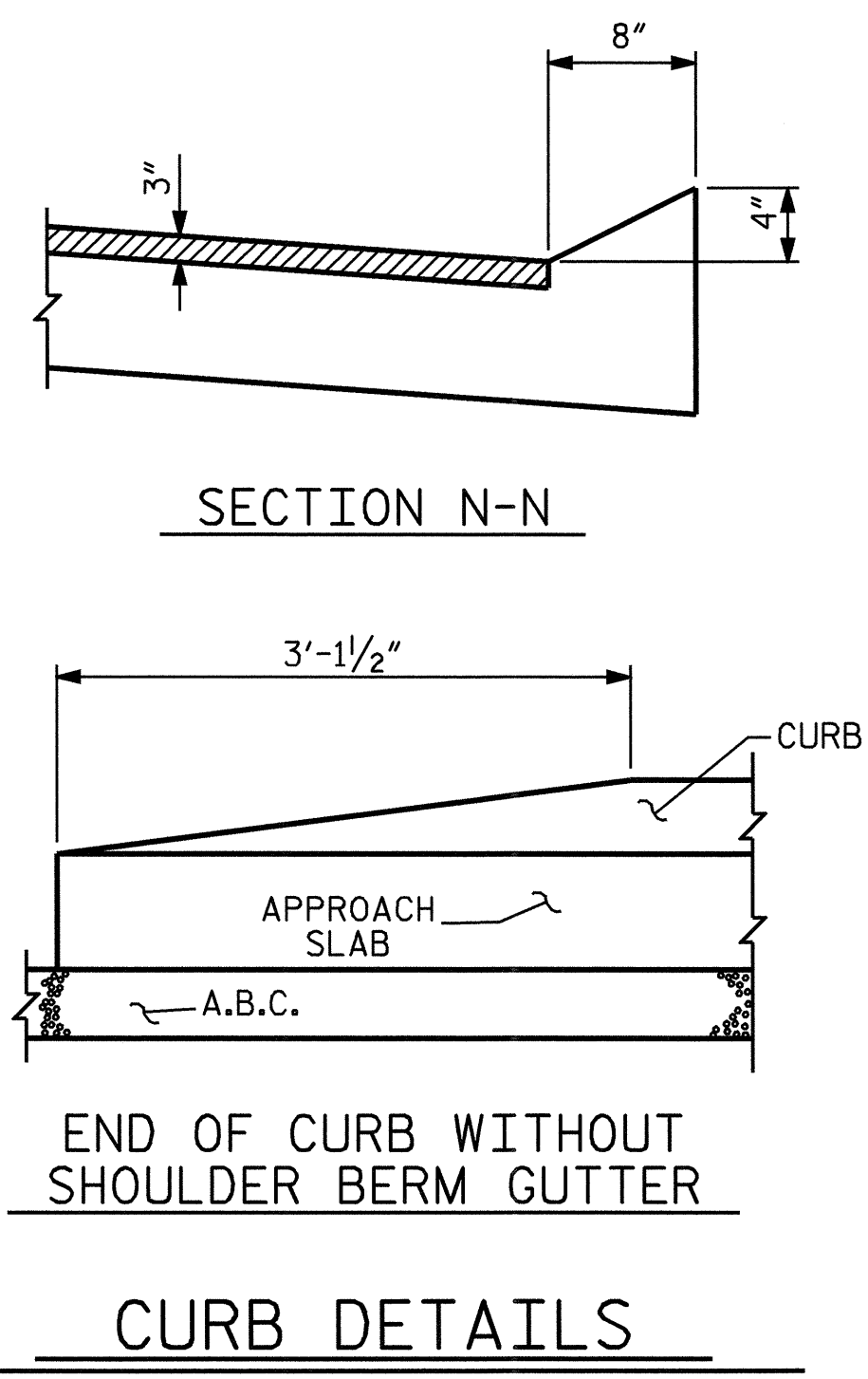
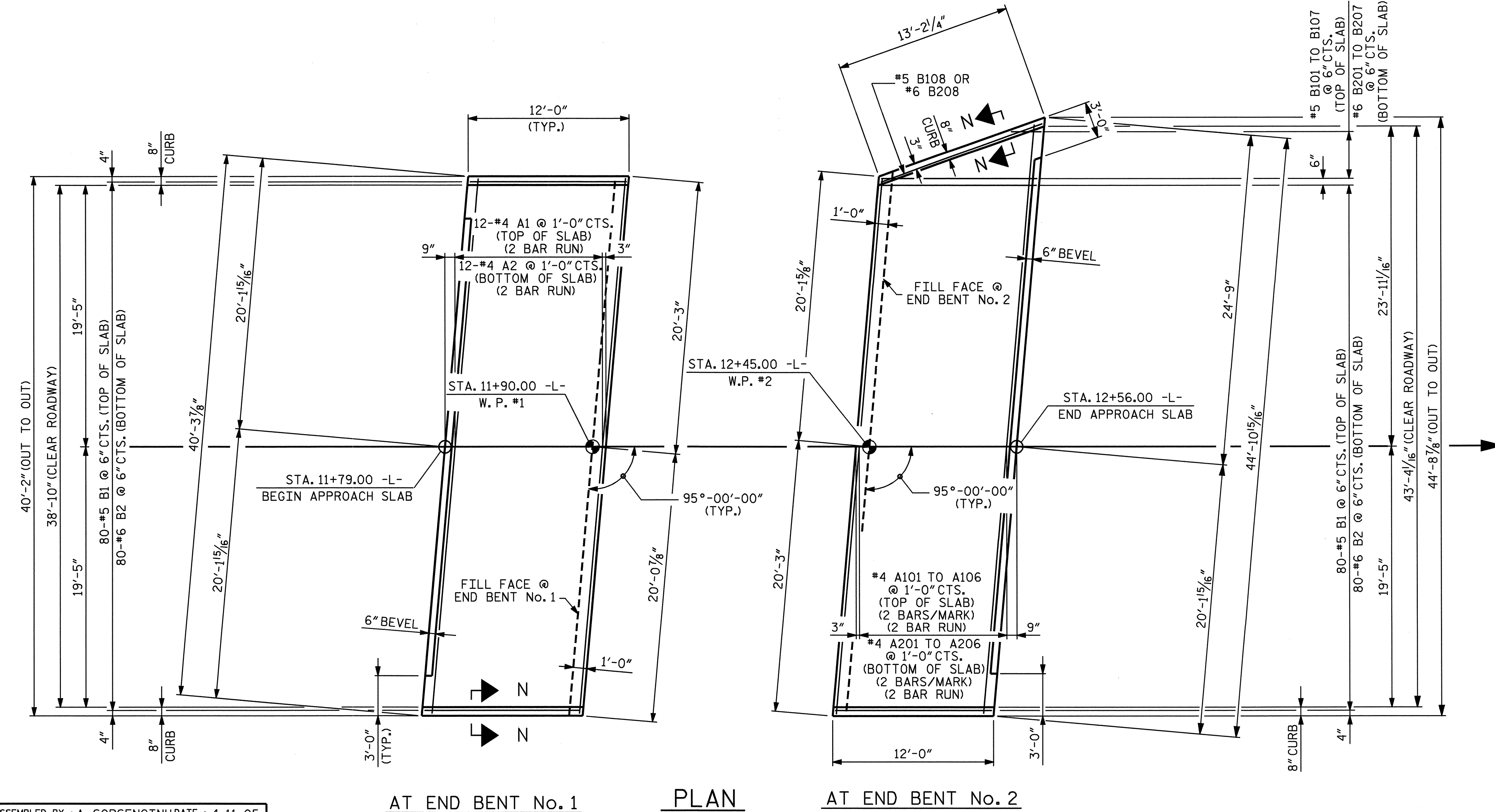
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 12" PRESTRESSED CONCRETE PILE					
OCT. 1977					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-19
					TOTAL SHEETS 21

ASSEMBLED BY : D. HODGE	DATE : 2/06
CHECKED BY : M. CHEEK	DATE : 2/06
DRAWN BY : FCJ 7/88	REV. 2/6/97 EEM/RGW
CHECKED BY : CRK 3/89	REV. 7/17/98 RWW/LES
	REV. 8/16/99R RWW/LES



† NORMAL TO END BENT

SECTION THRU SLAB



CURB DETAILS



PROJECT NO. B-3858  
HYDE COUNTY  
 STATION: 12+17.50 -L-

SHEET 1 OF 2

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS 21	
2			4				

APPROACH SLAB @ END BENT No. 1						APPROACH SLAB @ END BENT No. 2											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	24	#4	STR	21'-0"	337	*A101	4	#4	STR	23'-2"	62	*B105	1	#5	STR	5'-9"	6
A2	24	#4	STR	20'-11"	335	*A102	4	#4	STR	22'-10"	61	*B106	1	#5	STR	4'-5"	5
*B1	80	#5	STR	11'-2"	932	*A103	4	#4	STR	22'-5"	60	*B107	1	#5	STR	3'-1"	3
B2	80	#6	STR	11'-8"	1402	*A104	4	#4	STR	22'-1"	59	*B108	1	#5	STR	12'-9"	13
REINFORCING STEEL LBS. 1,737						*A105	4	#4	STR	21'-8"	58	B21	80	#6	STR	11'-8"	1402
* EPOXY COATED REINFORCING STEEL LBS. 1,269						A201	4	#4	STR	23'-1"	62	B201	1	#6	STR	11'-0"	17
CLASS AA CONCRETE C.Y. 20.1						A202	4	#4	STR	22'-8"	61	B202	1	#6	STR	9'-9"	15
SPLICE CHART						A203	4	#4	STR	22'-5"	60	B203	1	#6	STR	8'-5"	13
			EPOXY COATED			A204	4	#4	STR	21'-11"	59	B204	1	#6	STR	7'-1"	11
			UNCOATED			A205	4	#4	STR	21'-7"	58	B205	1	#6	STR	5'-9"	9
#4				2'-0"	1'-9"	A206	4	#4	STR	21'-2"	57	B206	1	#6	STR	4'-5"	7
						*B1	80	#5	STR	11'-2"	932	B207	1	#6	STR	3'-1"	5
						*B101	1	#5	STR	10'-6"	11	B208	1	#6	STR	12'-9"	19
						*B102	1	#5	STR	9'-3"	10	REINFORCING STEEL LBS. 1,855					
						*B103	1	#5	STR	7'-11"	8	* EPOXY COATED REINFORCING STEEL LBS. 1,352					
						*B104	1	#5	STR	7'-1"	7	CLASS AA CONCRETE C.Y. 21.1					

\* THESE BARS ARE EPOXY COATED

ASSEMBLED BY : A. SORSENGINH DATE : 4-11-05  
 CHECKED BY : CR. YARBROUGH DATE : 5-05-05  
 DRAWN BY : LES 8/01 REV. 10/17/00 RWW/LES  
 CHECKED BY : RDR 8/01 REV. 7/10/01 LES/RDR  
 REV. 5/7/03R RWW/JTE



**NOTES**

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

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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 EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

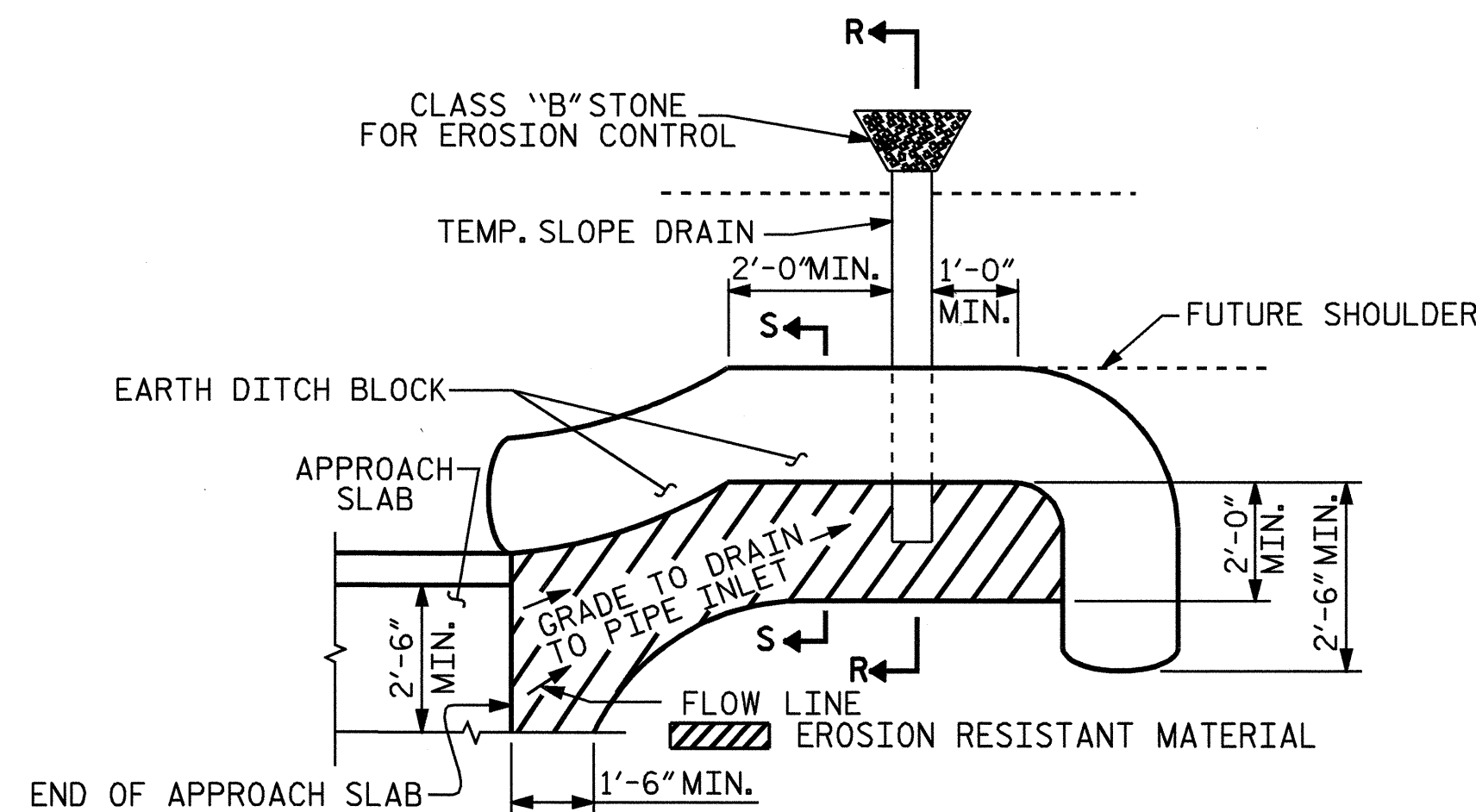
THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

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 EXTEND 1'-0" BEYOND THE 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 SEALED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

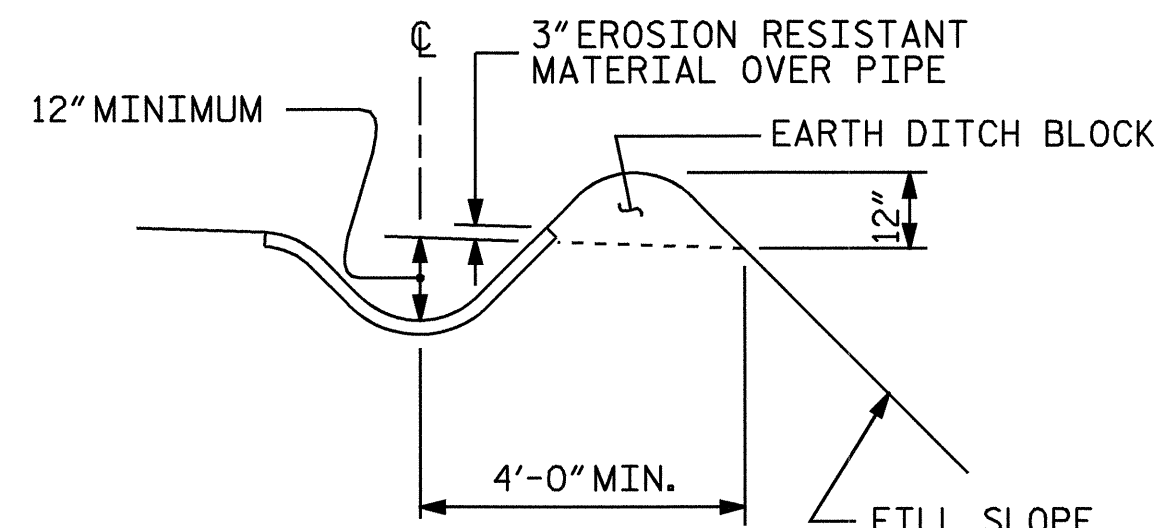
APPROACH SLAB GROOVING IS NOT REQUIRED.



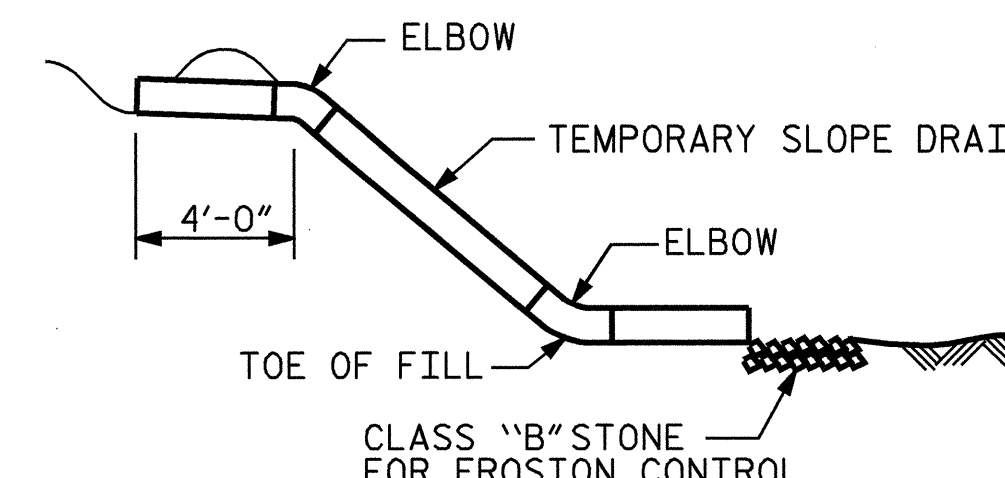
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

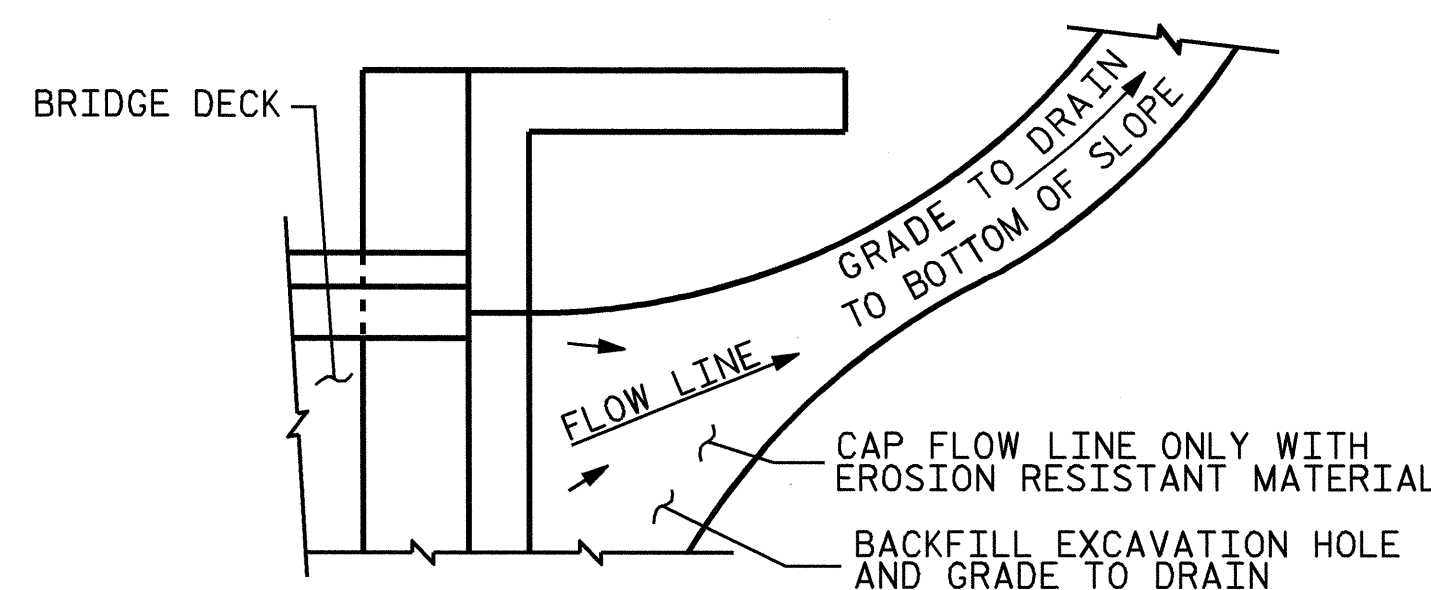
**TEMPORARY BERM AND SLOPE DRAIN DETAILS**



SECTION S-S



SECTION R-R



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-3858  
HYDE COUNTY  
 STATION: 12+17.50-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH  
 SLAB DETAILS**



ASSEMBLED BY : A. SORSENGH	DATE : 4-12-05
CHECKED BY : CR. YARBROUGH	DATE : 5-05-05
DRAWN BY : FCJ	11/88
CHECKED BY : ARB	11/88
REV. 8/16/99	MAB/LES
REV. 10/17/00	RWW/LES
REV. 5/7/03	RWW/JTE

REVISIONS						1988
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-21
2			4			TOTAL SHEETS
						21



## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

STD. NO. SN