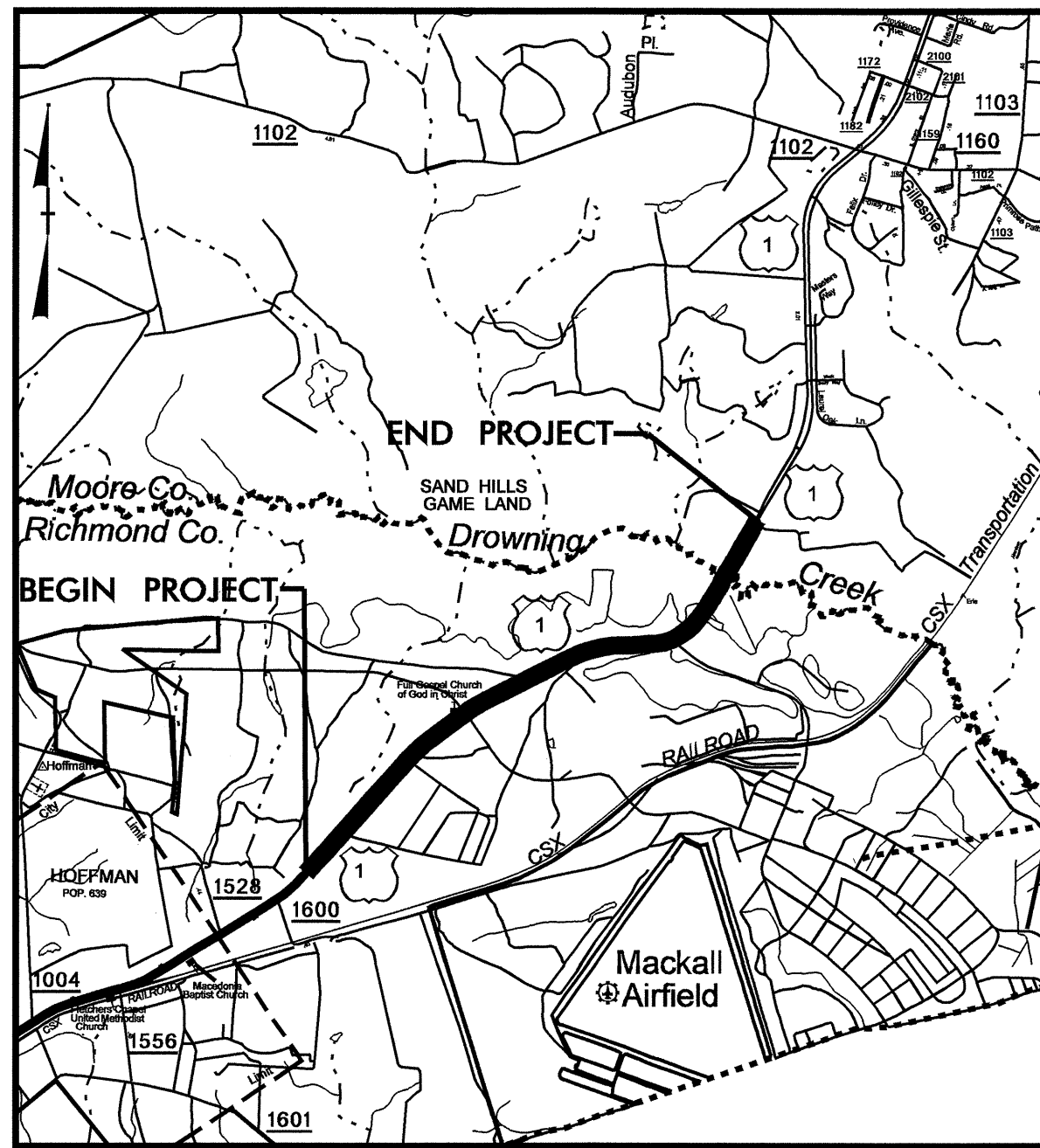
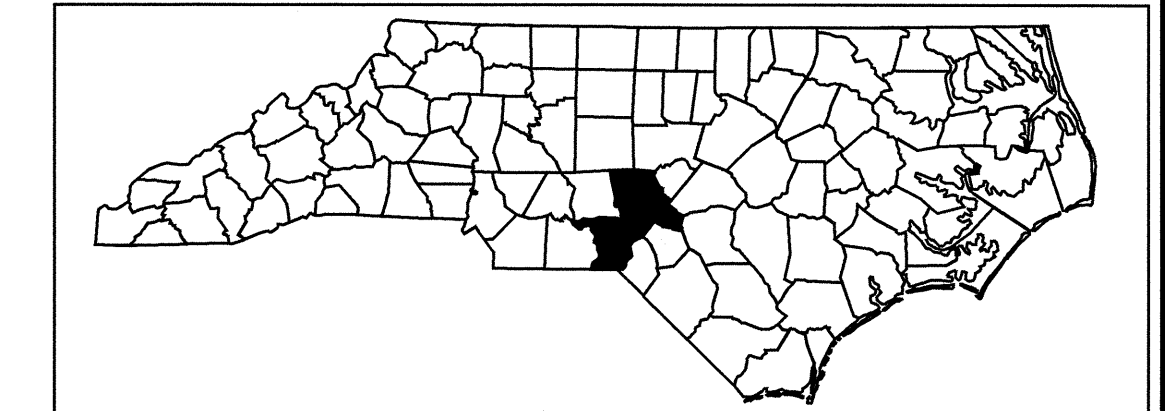


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# RICHMOND & MOORE COUNTIES

LOCATION: US 1 FROM NORTH OF SR 1528 JUST NORTH OF  
HOFFMAN TO THE EXISTING DIVIDED FACILITY NORTH OF  
THE RICHMOND/MOORE COUNTY LINE  
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2502B		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34438.1.1		PE	
34438.2.4		ROW & UTIL	
34438.3.3		CONST	



VICINITY MAP

NEAREST SHIPPING POINT: PINEBLUFF ON SEABOARD RR  
APPROX. 4.0 MILES FROM PROJECT

TIP PROJECT R-2502A -L- POT 289+49.18 LB=  
TIP PROJECT R-2502B -L- POT 298+00.00 LA

BEGIN TIP PROJECT R-2502B  
STA 298+00 -L-

BEGIN RW ACQUISITION  
STA. 299+35.00 -L-

END TIP PROJECT R-2502B

STA 456+50 -L- (LT)  
END CONSTRUCTION  
1550' NORTH OF  
STA. 456+50 -L- (LT)

-L- POT 445+74.00 LB=  
-L- (LT) TS 445+74.00 LA

-L- (LT) ST 427+59.62 LB=  
-L- POT 427+77.44 LA  
END TRANSITION LEFT

BEGIN BRIDGE  
-L- 432+07.00

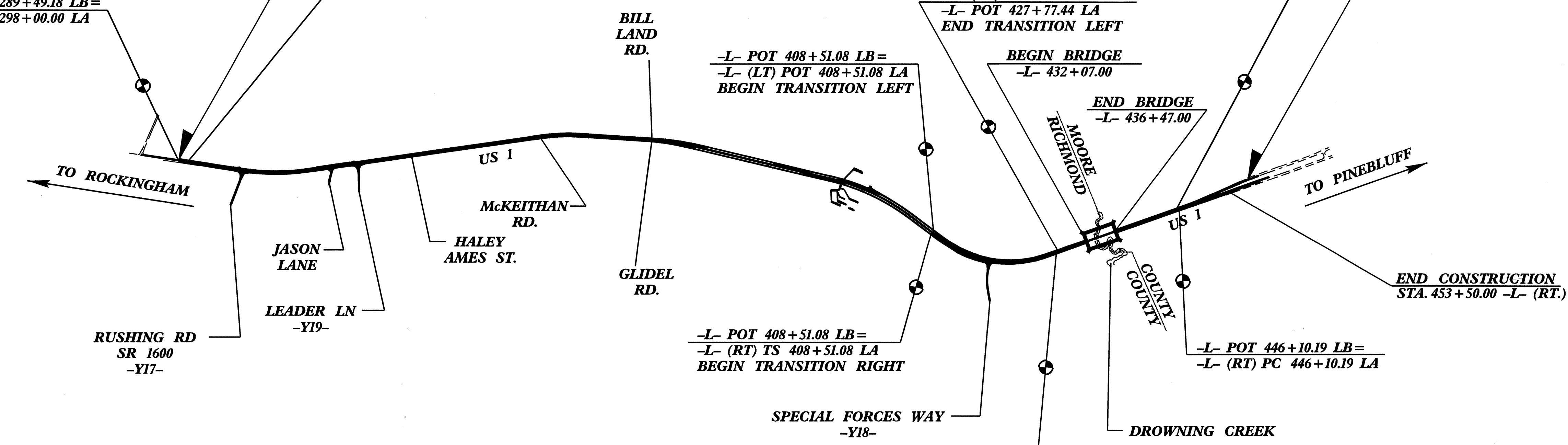
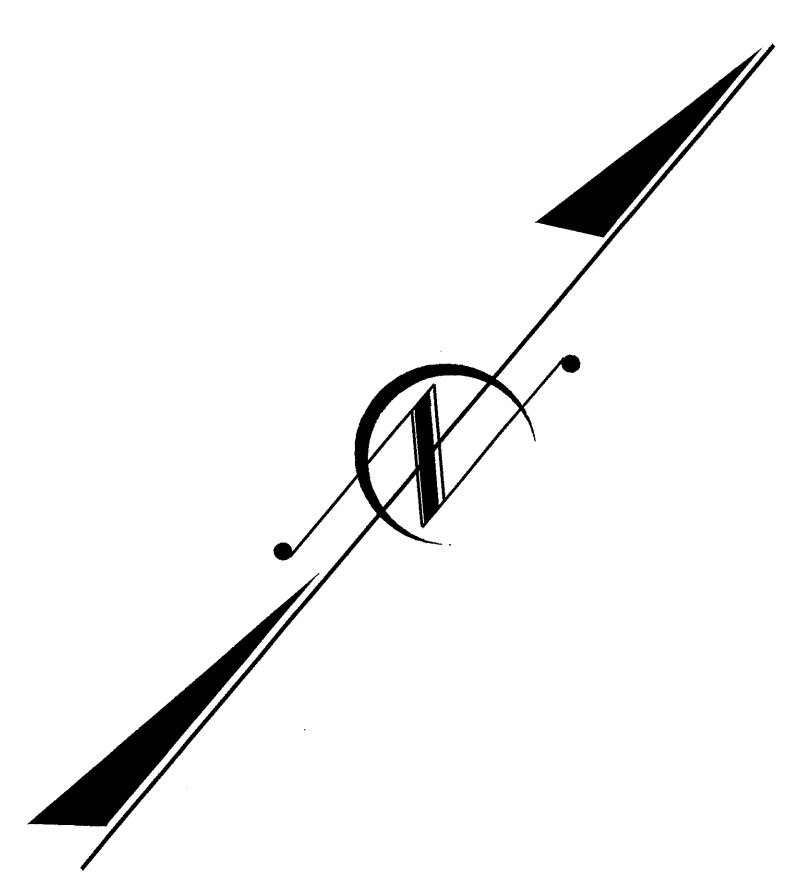
END BRIDGE  
-L- 436+47.00

-L- POT 408+51.08 LB=  
-L- (LT) POT 408+51.08 LA  
BEGIN TRANSITION LEFT

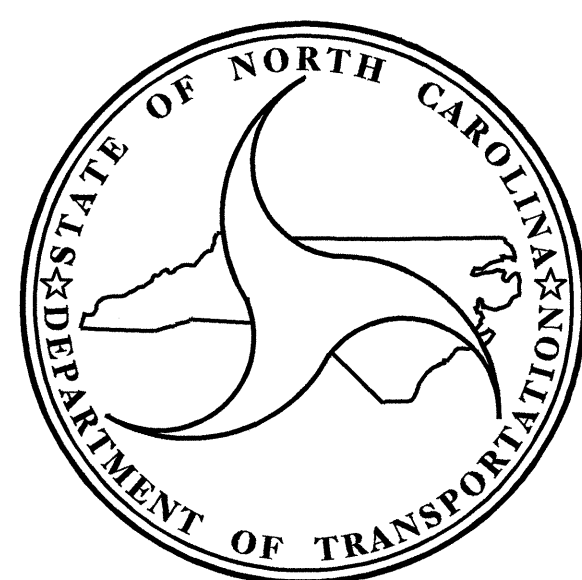
-L- POT 408+51.08 LB=  
-L- (RT) TS 408+51.08 LA  
BEGIN TRANSITION RIGHT

-L- POT 446+10.19 LB=  
-L- (RT) PC 446+10.19 LA

-L- (RT) ST 427+70.81 LB=  
-L- POT 427+58.51 LA  
END TRANSITION RIGHT



## STRUCTURES



DESIGN DATA

ADT 2008 = 11,600  
ADT 2028 = 18,200  
DHV = 11 %  
D = 60 %  
T = 10 % \*  
V = 60 MPH  
\* TTST 5% DUAL 5%  
FUNC CLASS - ARTERIAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2502B = 2.916 MILES  
LENGTH STRUCTURE TIP PROJECT R-2502B = 0.083 MILES  
TOTAL LENGTH TIP PROJECT R-2502B = 2.999 MILES

NOTE: PROJECT LENGTH BASED ON SOUTH BOUND LANES.

Prepared in the Office of:

DIVISION OF HIGHWAYS  
1000 BIRCH RIDGE DR. RALEIGH, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:  
OCTOBER 21, 2008

N. N. BULLOCK, PE  
PROJECT ENGINEER

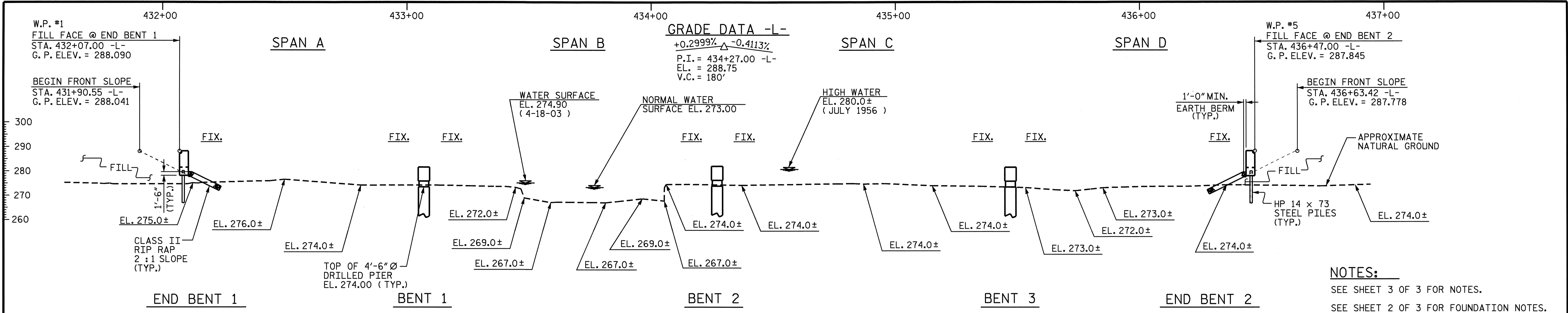
D. R. CALHOUN, PE  
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

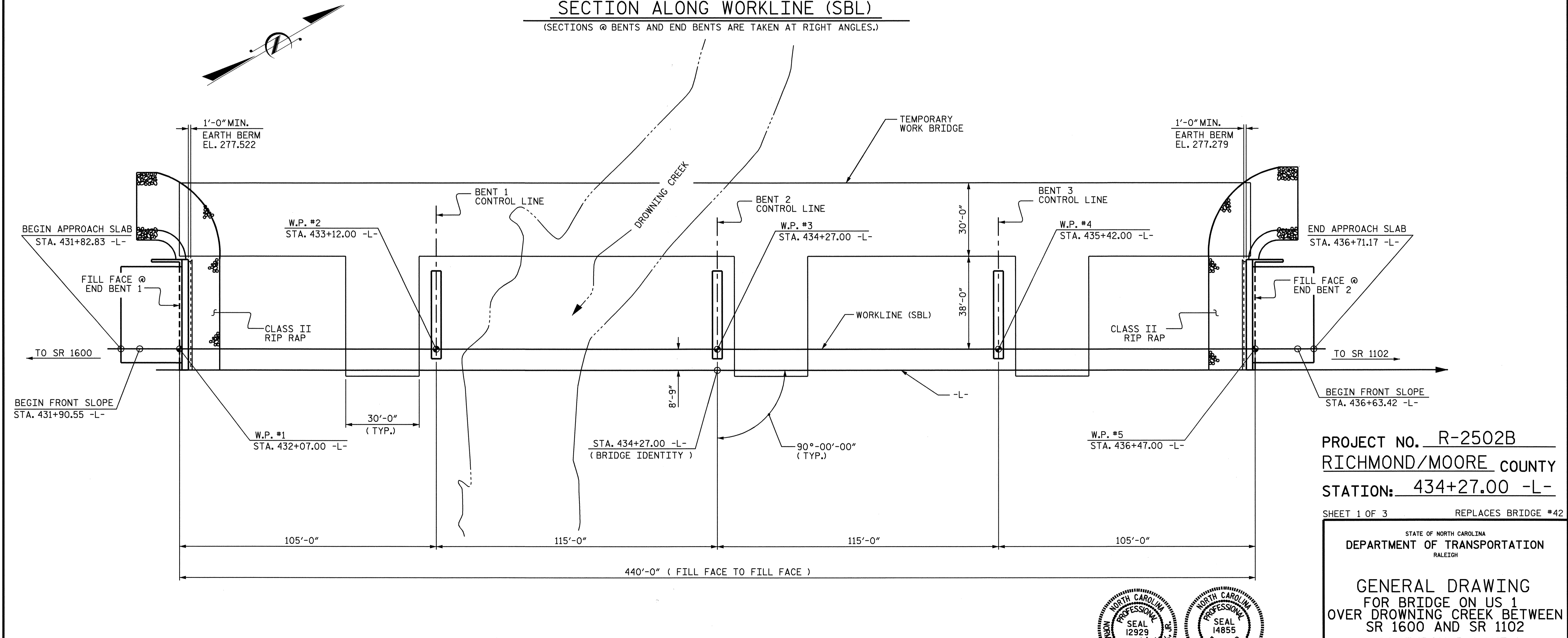
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED  
DIVISION ADMINISTRATOR DATE



**NOTES:**  
SEE SHEET 3 OF 3 FOR NOTES.  
SEE SHEET 2 OF 3 FOR FOUNDATION NOTES.



**PROJECT NO. R-2502B**  
**RICHMOND/MOORE COUNTY**  
**STATION: 434+27.00 -L-**

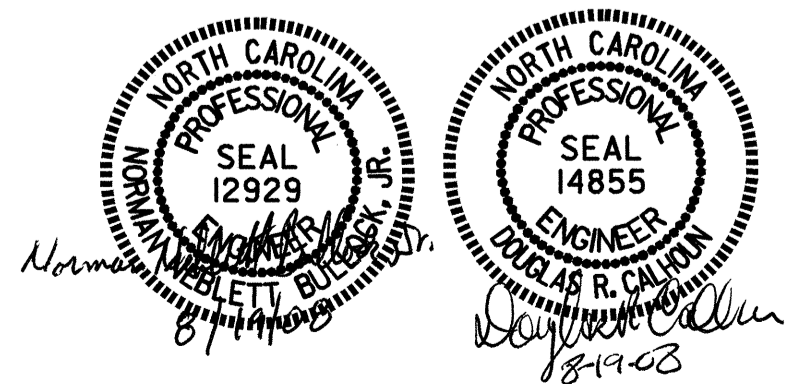
SHEET 1 OF 3 REPLACES BRIDGE #42

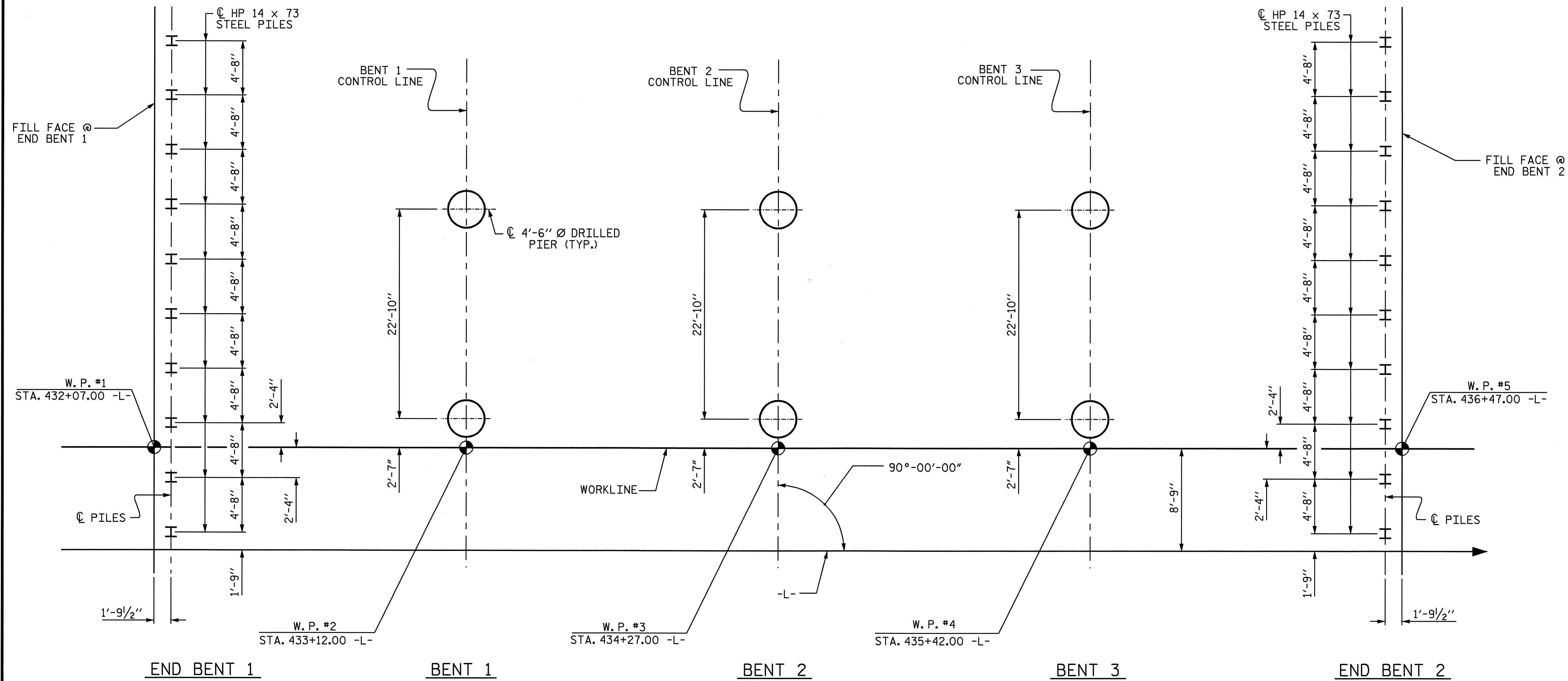
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
**FOR BRIDGE ON US 1**  
**OVER DROWNING CREEK BETWEEN**  
**SR 1600 AND SR 1102**  
**( SOUTHBOUND LANE )**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J. MYA DATE : 3/04/08  
CHECKED BY : D. R. CALHOUN DATE : 7/10/08





### FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES & DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES & DRILLED PIERS)

#### FOUNDATION NOTES

DRILLED PIERS AT BENT 1 AND 3 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 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 95 TSF.

DRILLED PIERS AT BENT 1 AND 3 ARE DESIGNED FOR AN APPLIED LOAD OF 474 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR AN APPLIED LOAD OF 490 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1, 2 & 3. IF REQUIRED, DO NOT EXTEND THE CASING BELOW ELEVATION 249.0 FT FOR BENT 1, 250.0 FT FOR BENT 2, AND 248.0 FT FOR BENT 3 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING. SEE DRILLED PIERS SPECIAL PROVISION.

IF PERMANENT STEEL CASING IS REQUIRED, INSTALL PERMANENT CASING AT BENT 1, 2, AND 3 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 270.0 FT. FOR BENT 1, 261.0 FT. FOR BENT 2, AND 269.0 FOR BENT 3.

DRILLED PIERS AT BENT 1 AND 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 244.5 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 245.5 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 AND 2 IS ELEVATION 250 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT 3 IS ELEVATION 249.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISION.

SPT TESTING IS REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT BENT 1, 2, & 3. SEE DRILLED PIERS SPECIAL PROVISION.

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

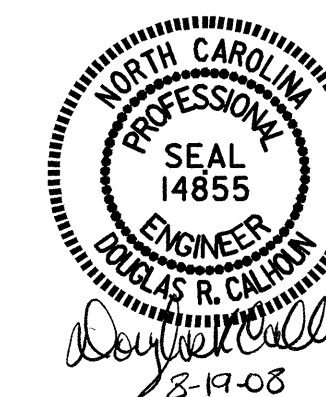
CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT 1 AND 2 IS 75 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND 2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

DRAWN BY : J. MYA DATE : 3/04/08  
 CHECKED BY : D.R. CALHOUN DATE : 7/10/08

19-AUG-2008 10:15  
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 bngfady



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-2
GENERAL DRAWING FOR BRIDGE ON US 1 OVER DROWNING CREEK BETWEEN SR 1600 AND SR 1102 ( SOUTHBOUND LANE )						TOTAL SHEETS 70
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	4'-6" Ø DRILLED PIERS IN SOIL	4'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	HP 14X73 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	STRUCTURE DRAINAGE SYSTEM	
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE								17,270	15,934					2,176.67			876.67			LUMP SUM	LUMP SUM	LUMP SUM
END BENT 1										20.9		3,754			10	250.00		162	180			
BENT 1		46.4	10.6	50.0		1				37.8		10,868	1,758									
BENT 2		46.4	10.6	48.0		1				37.9		10,896	1,769									
BENT 3		50.4	10.6	52.0		1				37.6		11,194	1,870									
END BENT 2										20.9		3,754			10	300.00		192	214			
TOTAL	LUMP SUM	143.2	31.8	150.0	3	3	3	17,270	15,934	155.1	LUMP SUM	40,466	5,397	2,176.67	20	550.00	876.67	354	394	LUMP SUM	LUMP SUM	LUMP SUM

**NOTES :**

ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS 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. PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

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

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

A TEMPORARY WORK BRIDGE SHALL BE PERMITTED FOR CONSTRUCTION OF BRIDGE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 434+27.00 -L-.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

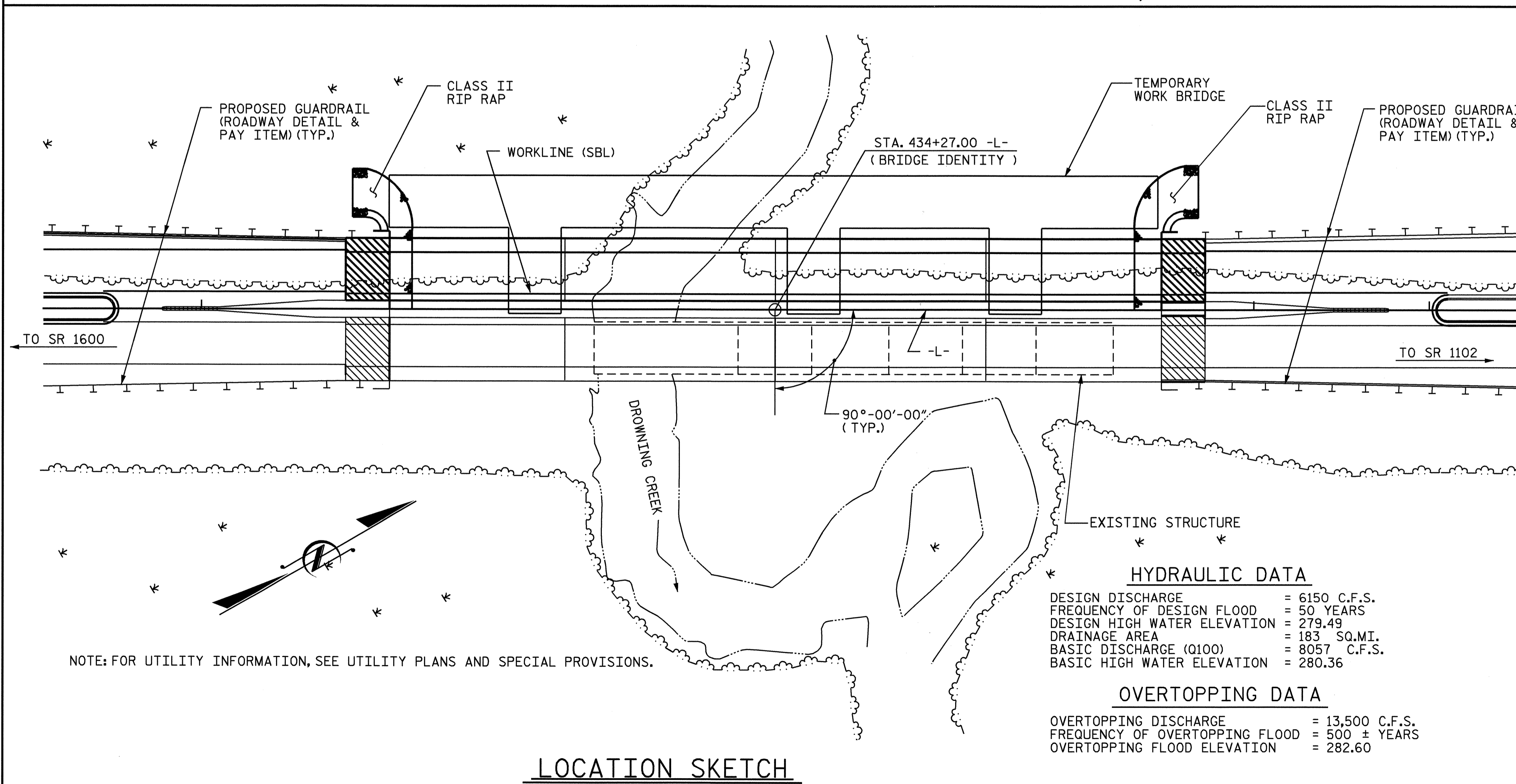
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

SEE SHEET 2 OF 3 FOR FOUNDATION NOTES.

**B. M. #27 : RR SPIKE IN BASE OF POWER POLE 236.68' LT. STA. 450+95.35 -L- , EL. 302.08**



**HYDRAULIC DATA**

DESIGN DISCHARGE = 6150 C.F.S.  
 FREQUENCY OF DESIGN FLOOD = 50 YEARS  
 DESIGN HIGH WATER ELEVATION = 279.49  
 DRAINAGE AREA = 183 SQ.MI.  
 BASIC DISCHARGE (Q100) = 8057 C.F.S.  
 BASIC HIGH WATER ELEVATION = 280.36

**OVERTOPPING DATA**

OVERTOPPING DISCHARGE = 13,500 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD = 500 ± YEARS  
 OVERTOPPING FLOOD ELEVATION = 282.60

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

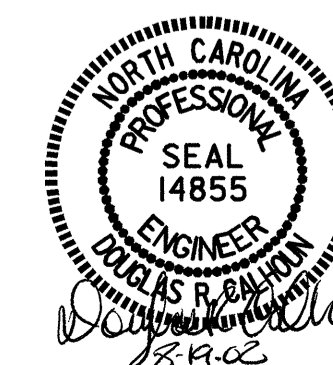
**LOCATION SKETCH**

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

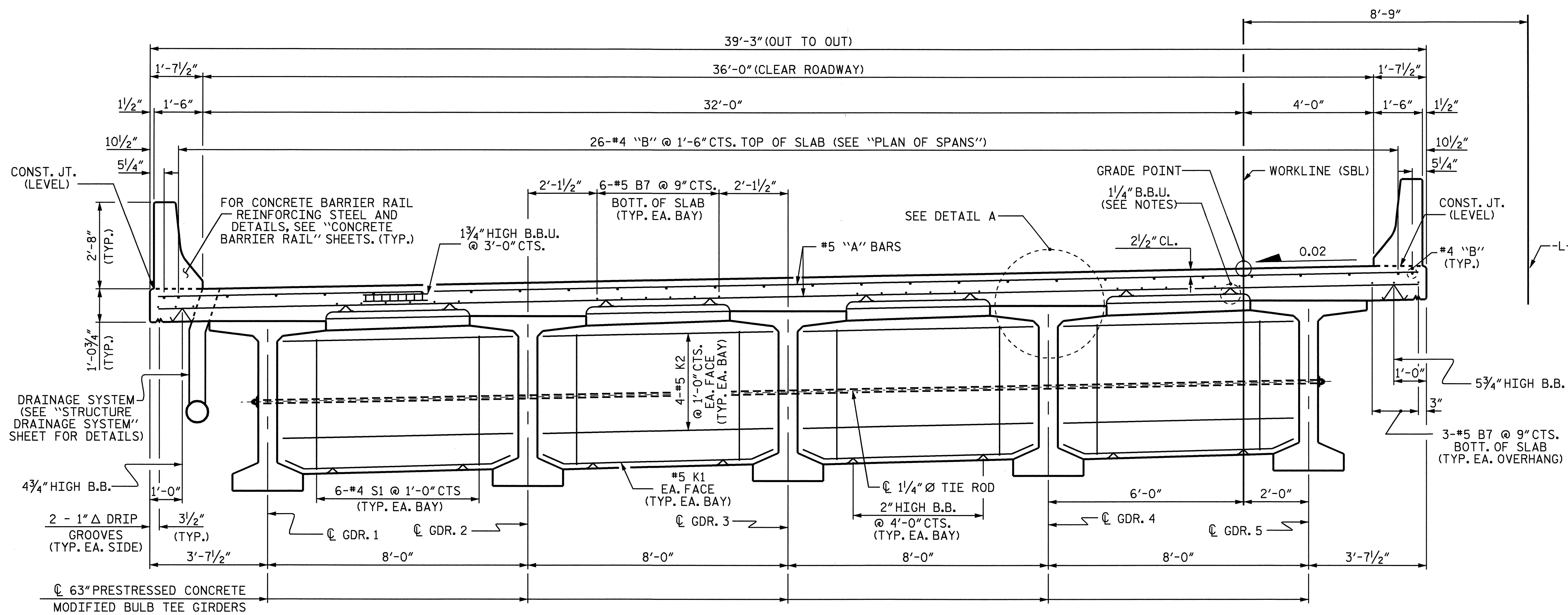
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON US 1  
 OVER DROWNING CREEK BETWEEN  
 SR 1600 AND SR 1102  
 (SOUTHBOUND LANE )

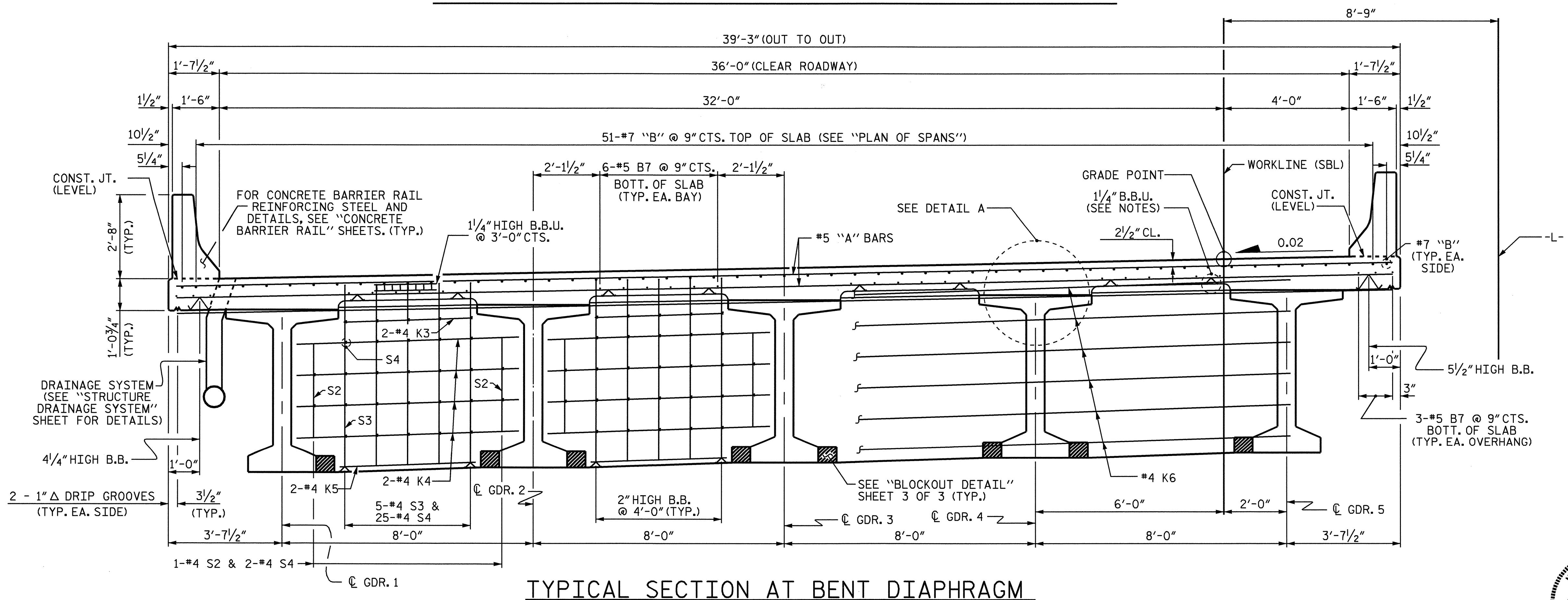


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J. MYA DATE : 3/04/08  
 CHECKED BY : D.R. CALHOUN DATE : 7/10/08



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



TYPICAL SECTION AT BENT DIAPHRAGM

**NOTES**

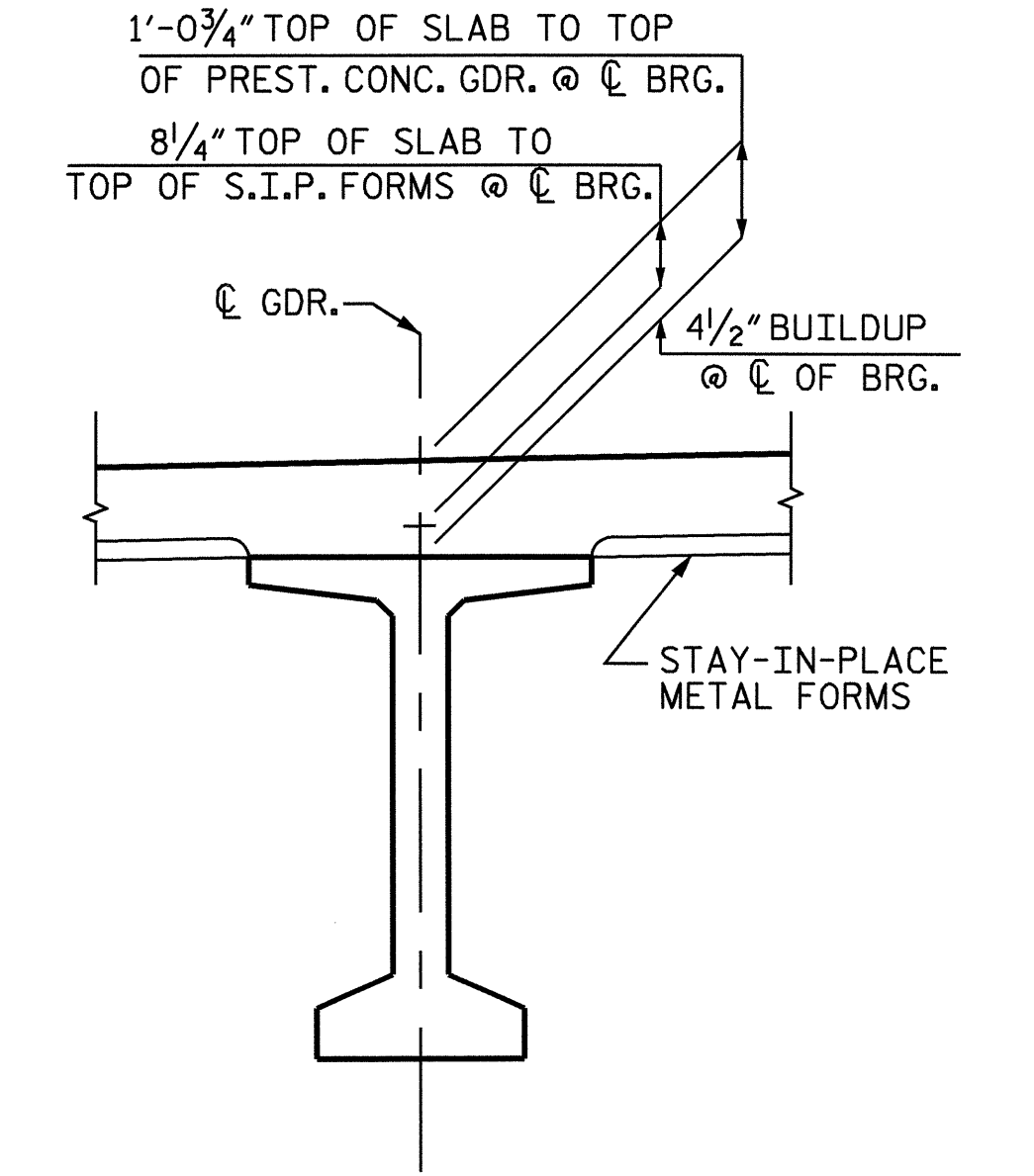
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS, AND THE NUTS ON THE 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.



DETAIL A

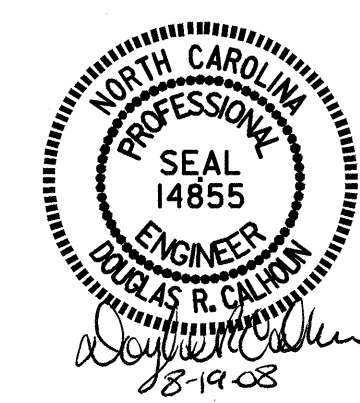
PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

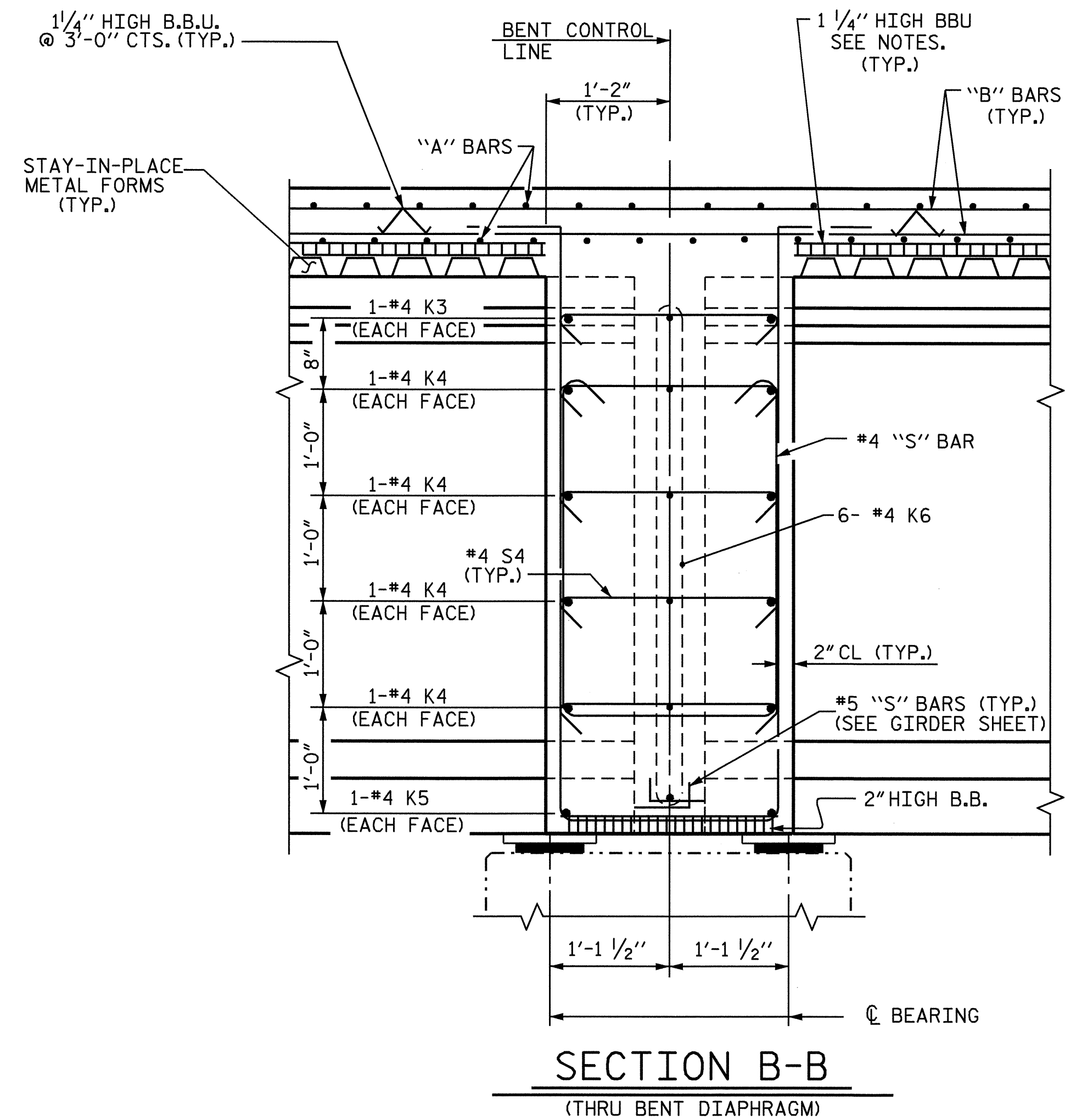
**SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SBL)**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4	
1			3			TOTAL SHEETS	
2			4			70	

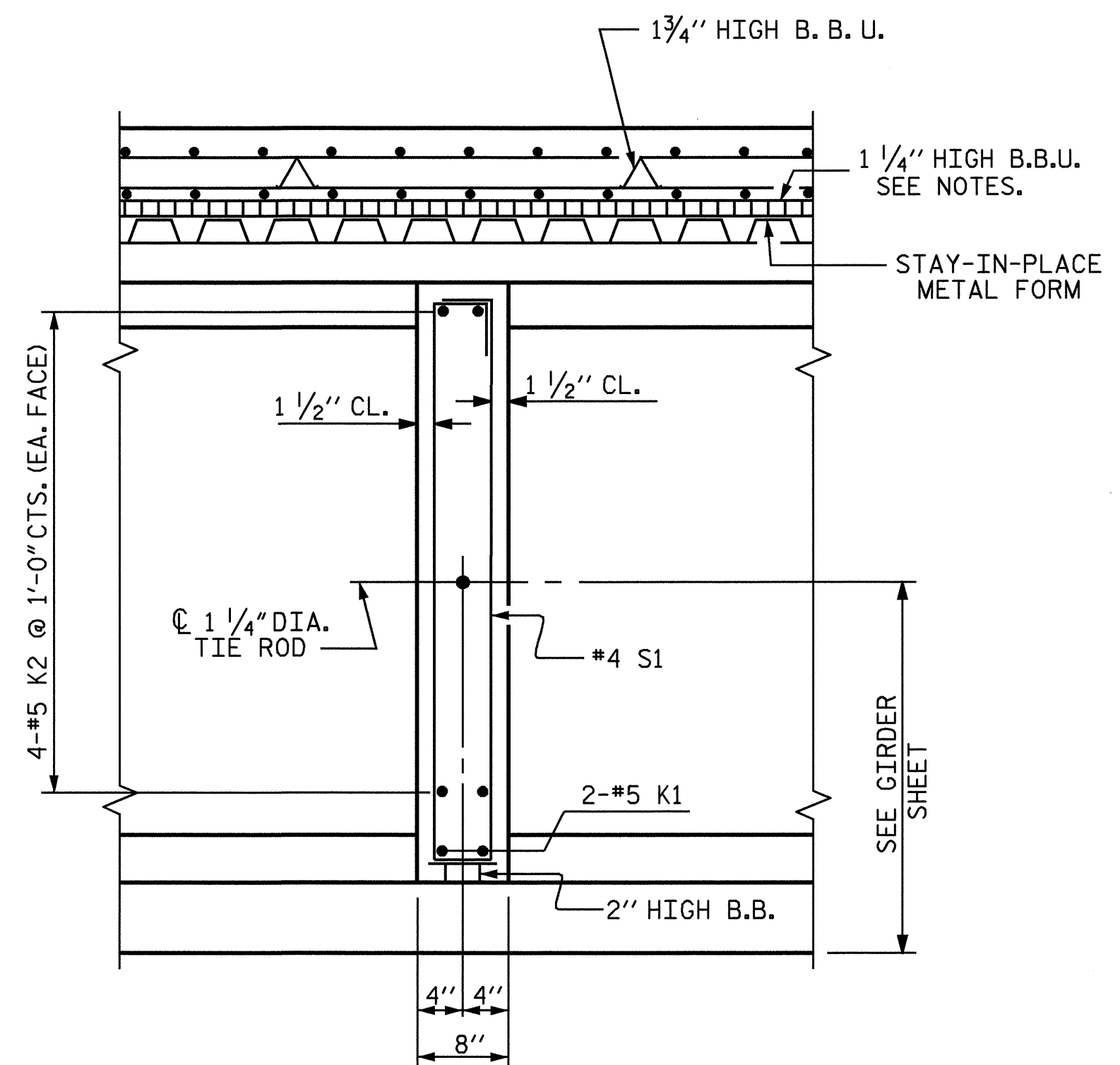


DRAWN BY: T.L.CLELLAND DATE: 5/18/05  
 CHECKED BY: T.A.HARRIS DATE: 8/31/05

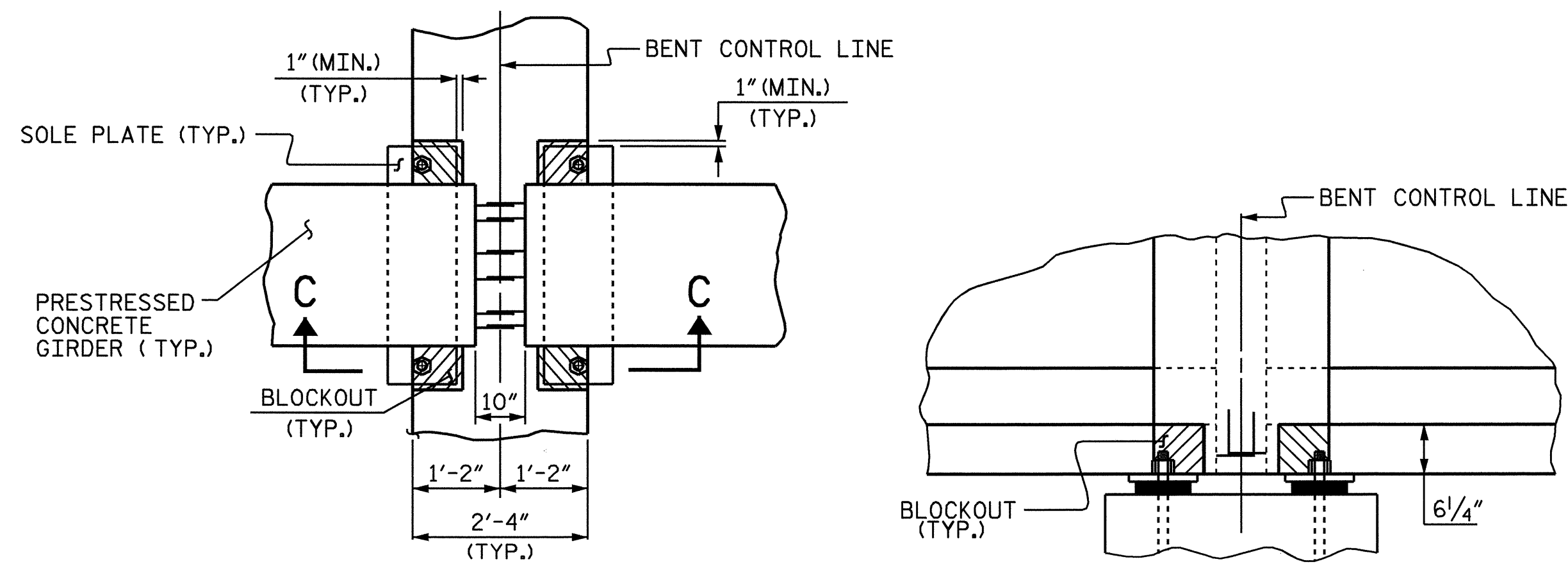




**SECTION B-B**  
(THRU BENT DIAPHRAGM)



**SECTION C-C**



**PLAN VIEW**

**SECTION C-C**

**BENT DIAPHRAGM BLOCKOUT DETAIL**

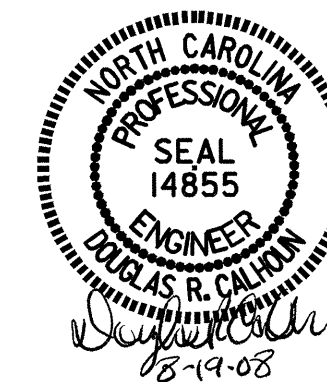
(PRESTRESSED GIRDERS WITH CONTINUOUS DECK SLAB)

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS  
 (SBL)**

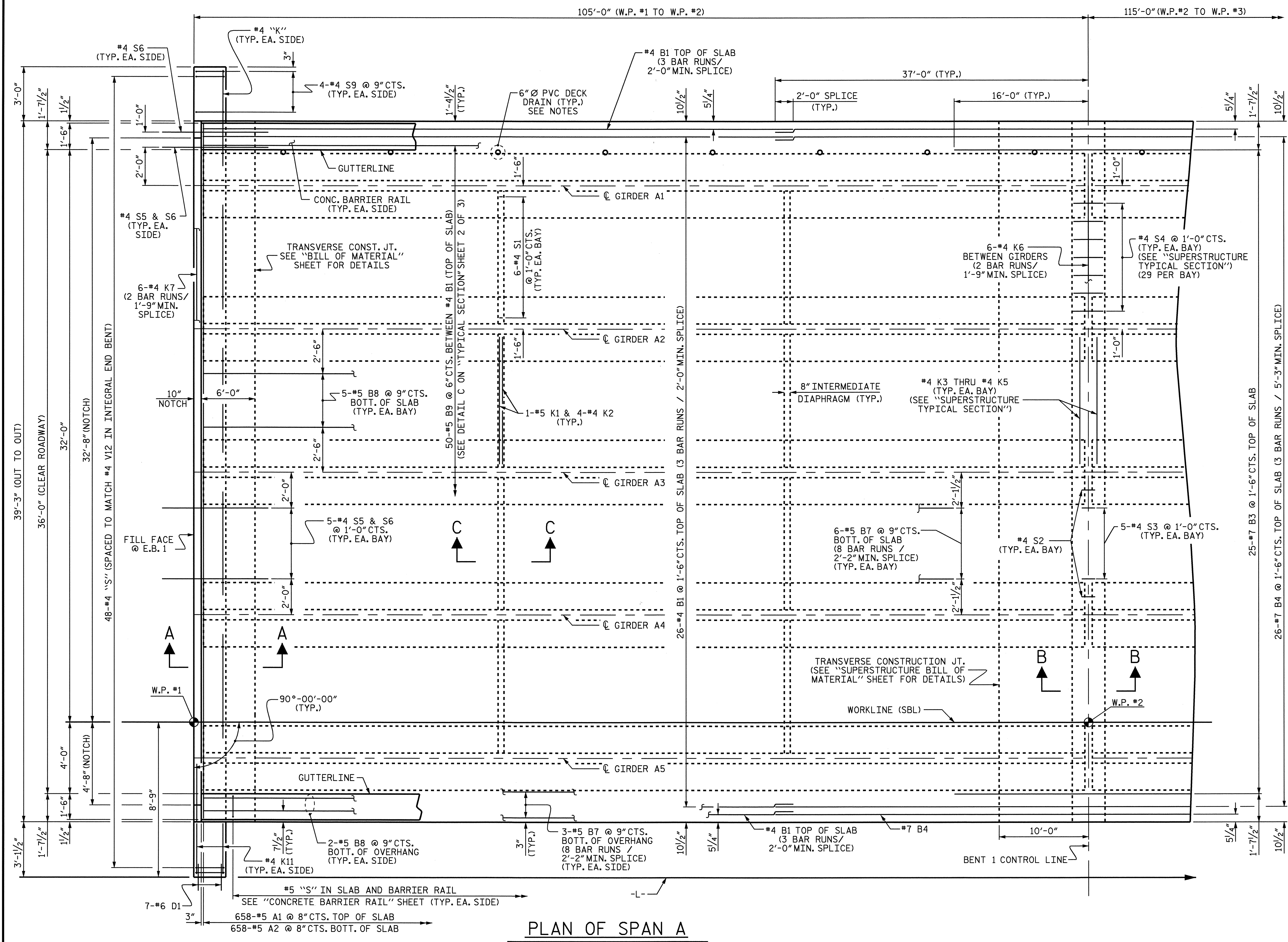


DRAWN BY : T.L.CLELLAND DATE : 5/31/05  
 CHECKED BY : T.A.HARRIS DATE : 9/1/05

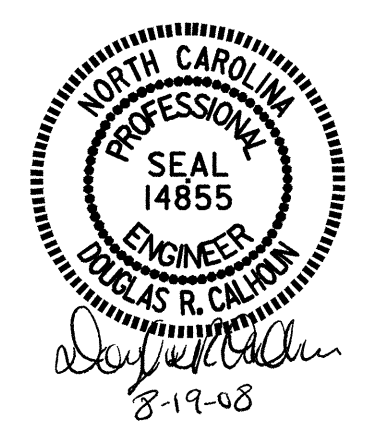
19-AUG-2008 10:15  
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 bngrady

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			70

STR. #1



**NOTES**  
 FOR SECTION A-A, SEE "TYPICAL SECTION" SHEET 2 OF 3. FOR OTHER SECTION VIEWS, SEE "TYPICAL SECTION" SHEET 3 OF 3.  
 FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEET.



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN A  
 (SBL)**

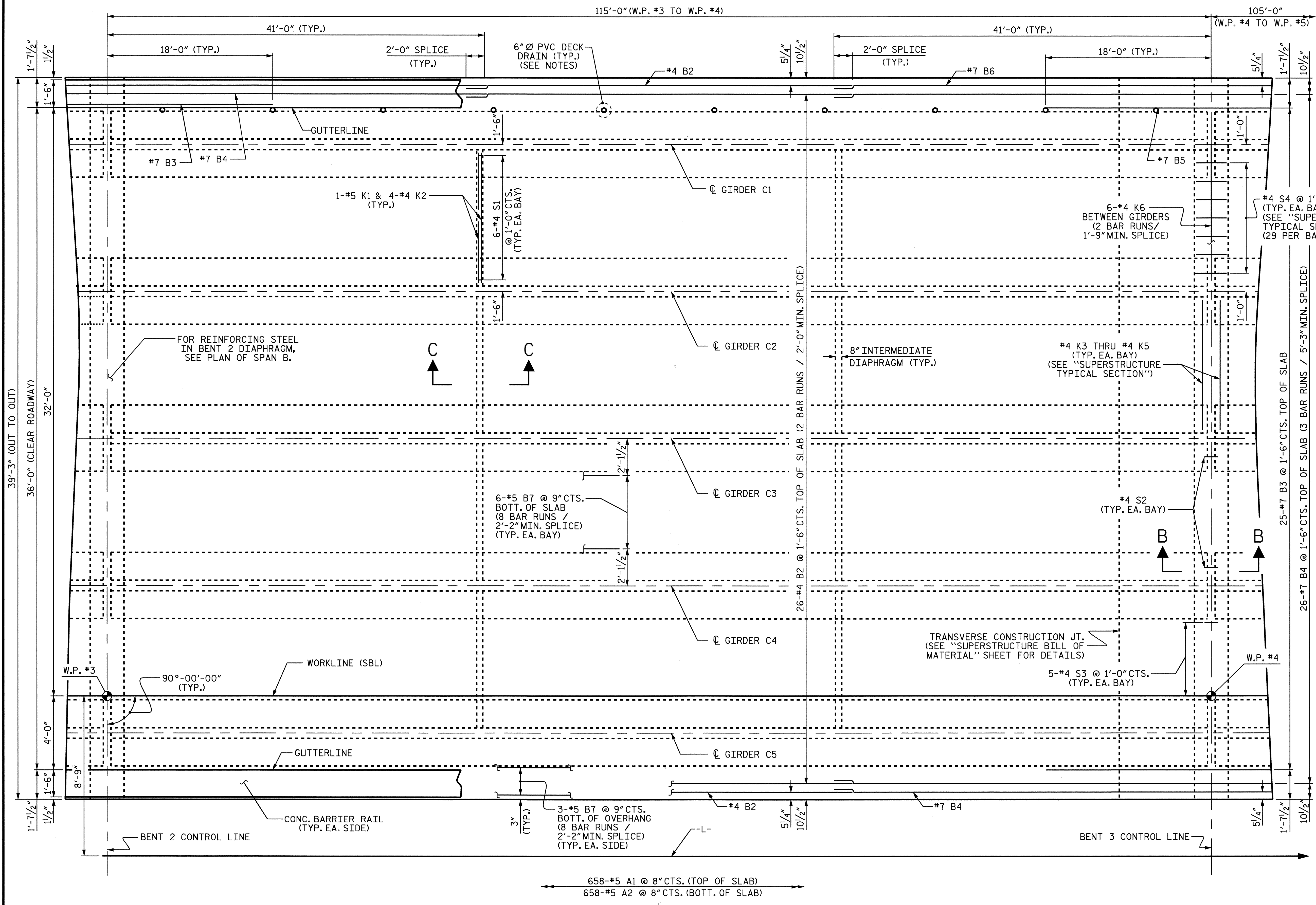
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			70

DRAWN BY: I.L. CLELLAND DATE: 7/15/05  
 CHECKED BY: I.A. HARRIS DATE: 8/31/05

19-AUG-2008 10:15  
 R:\Structures\FINAL PLANS\SBL\R2505B.ed.S.SBL.dgn  
 bngrady







**NOTES**  
 FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEET.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 4

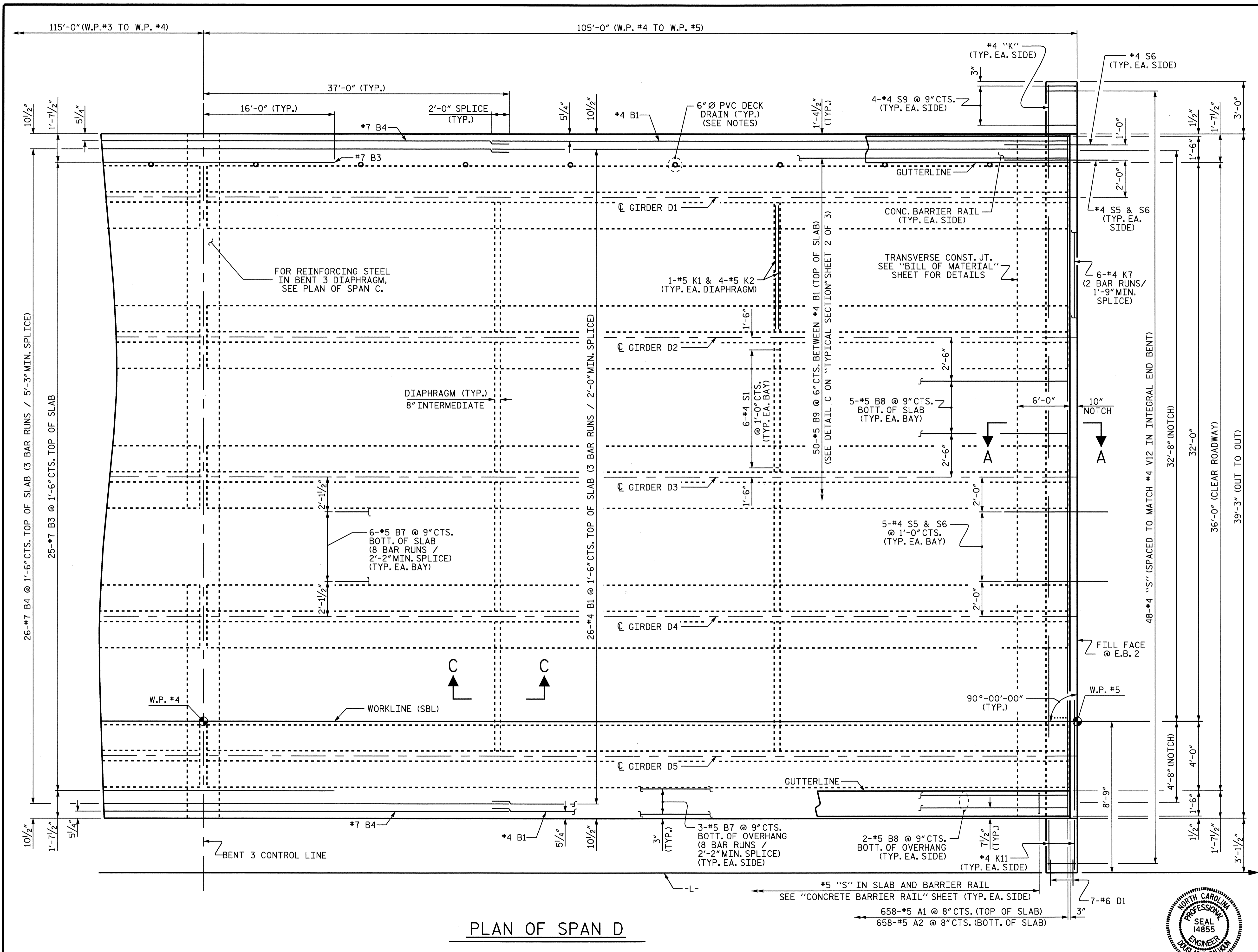
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN C  
 (SBL)**



DRAWN BY: T.L. CLELLAND DATE: 7/15/05  
 CHECKED BY: T.A. HARRIS DATE: 8/31/05

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			70



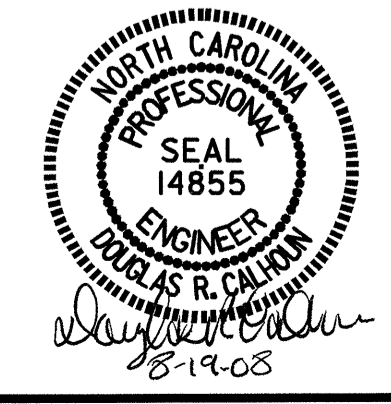
**NOTES**  
 FOR SECTION A-A, SEE "TYPICAL SECTION" SHEET 2 OF 3. FOR OTHER SECTION VIEWS, SEE "TYPICAL SECTION" SHEET 3 OF 3.  
 FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEET.

**PLAN OF SPAN D**

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-  
 SHEET 4 OF 4

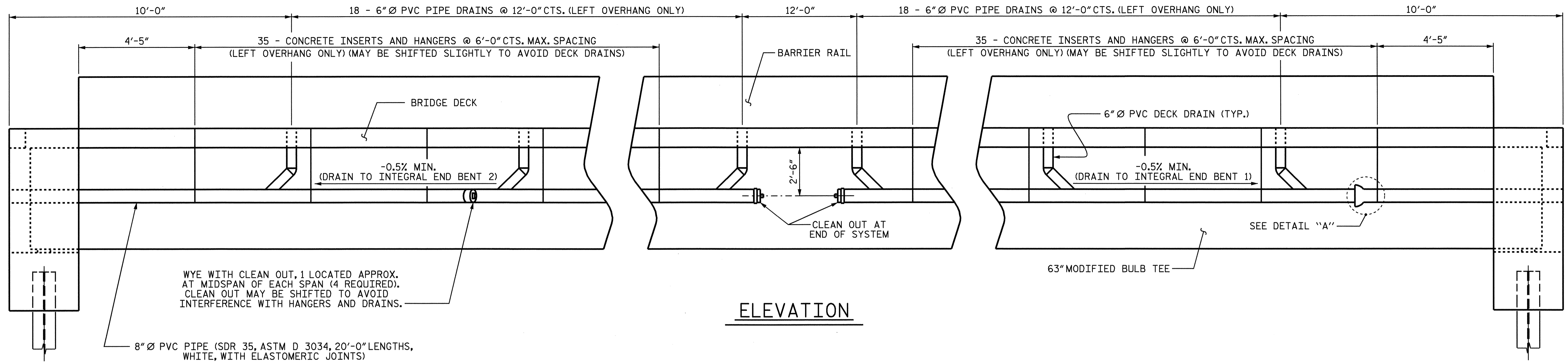
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE PLAN OF SPAN D (SBL)**

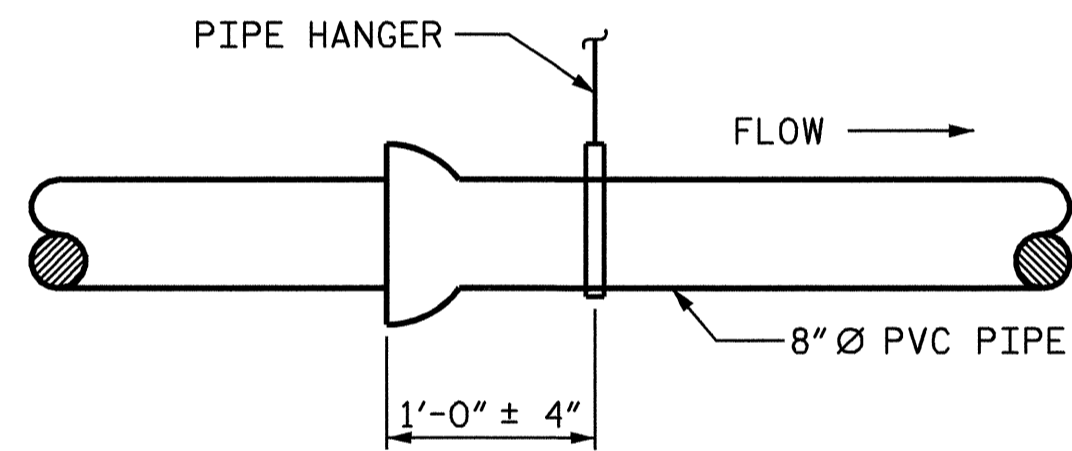


DRAWN BY: T.L. CLELLAND DATE: 7/15/05  
 CHECKED BY: I.A. HARRIS DATE: 8/31/05

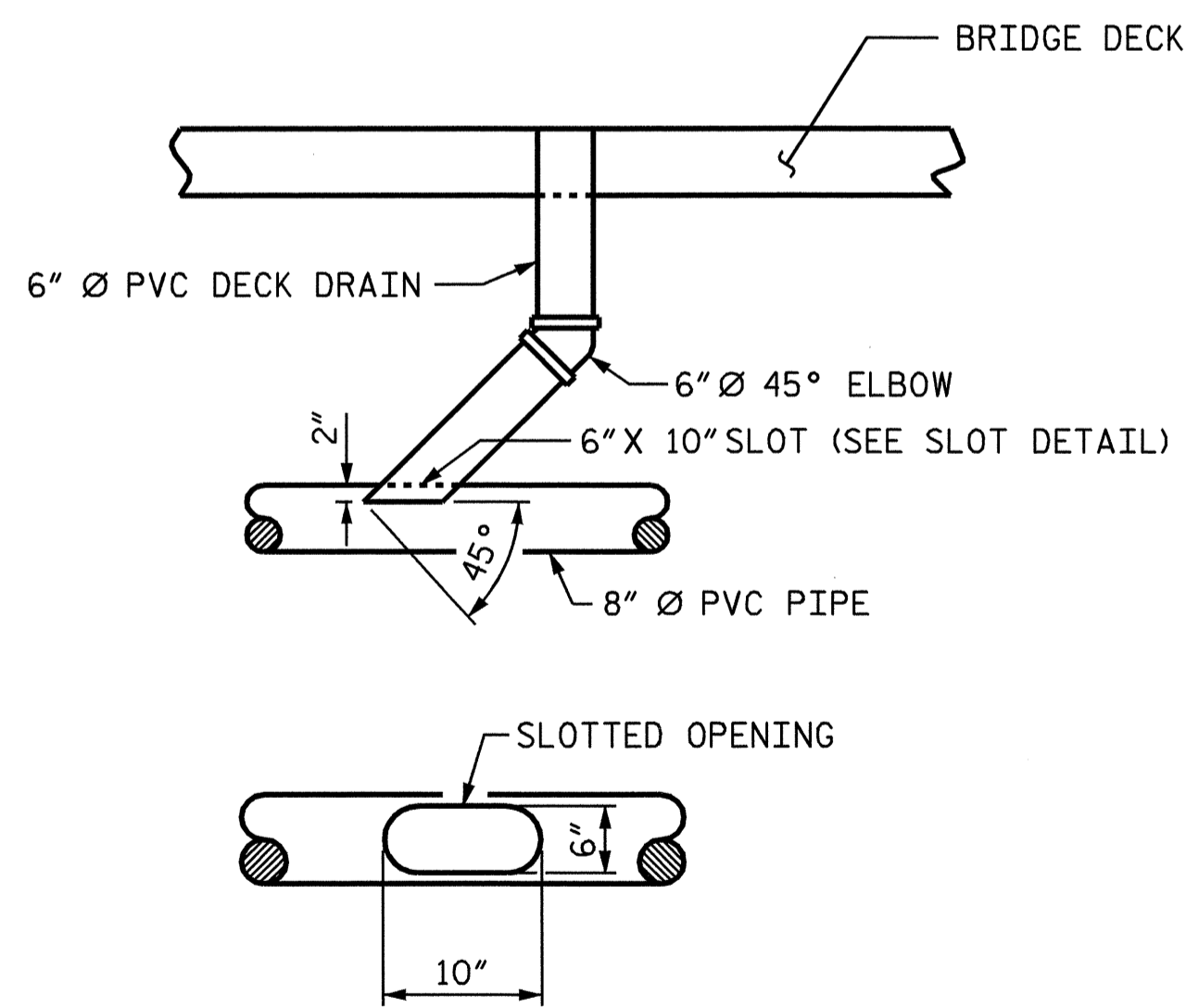
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			70



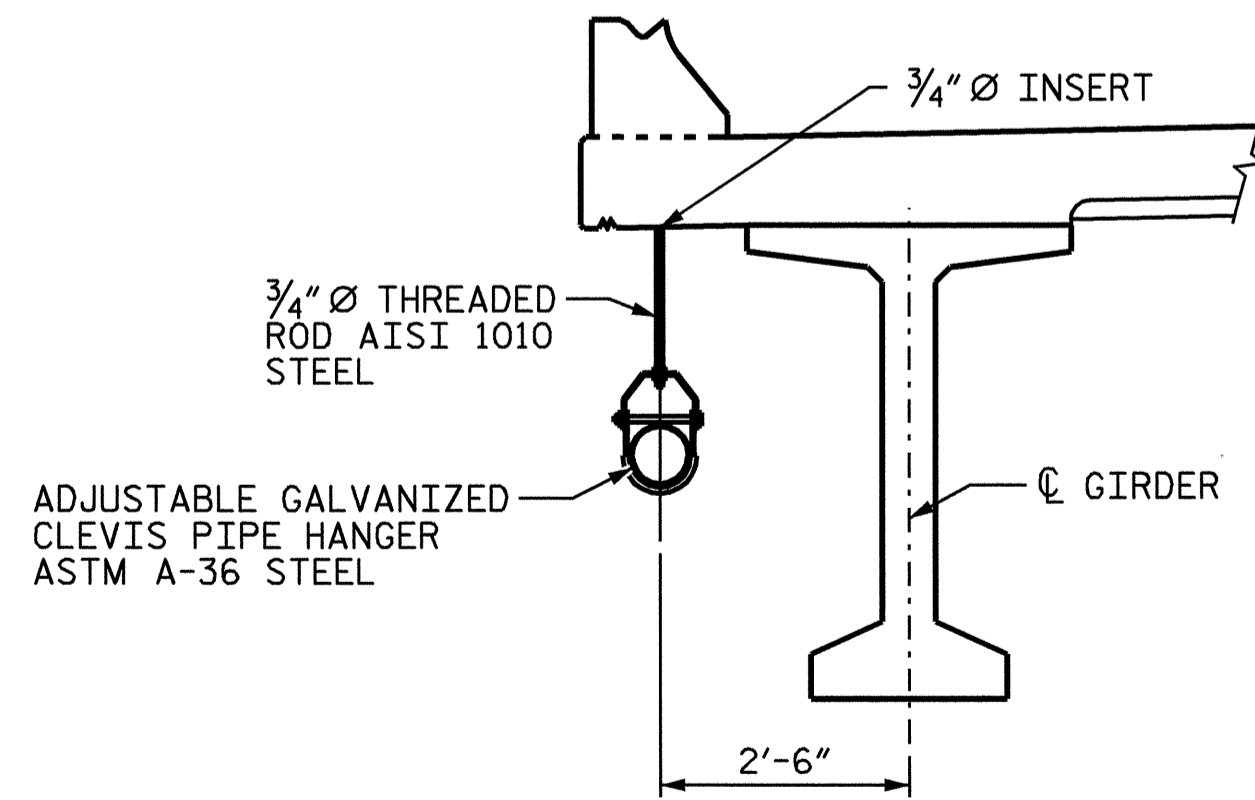
**ELEVATION**



**DETAIL "A"**

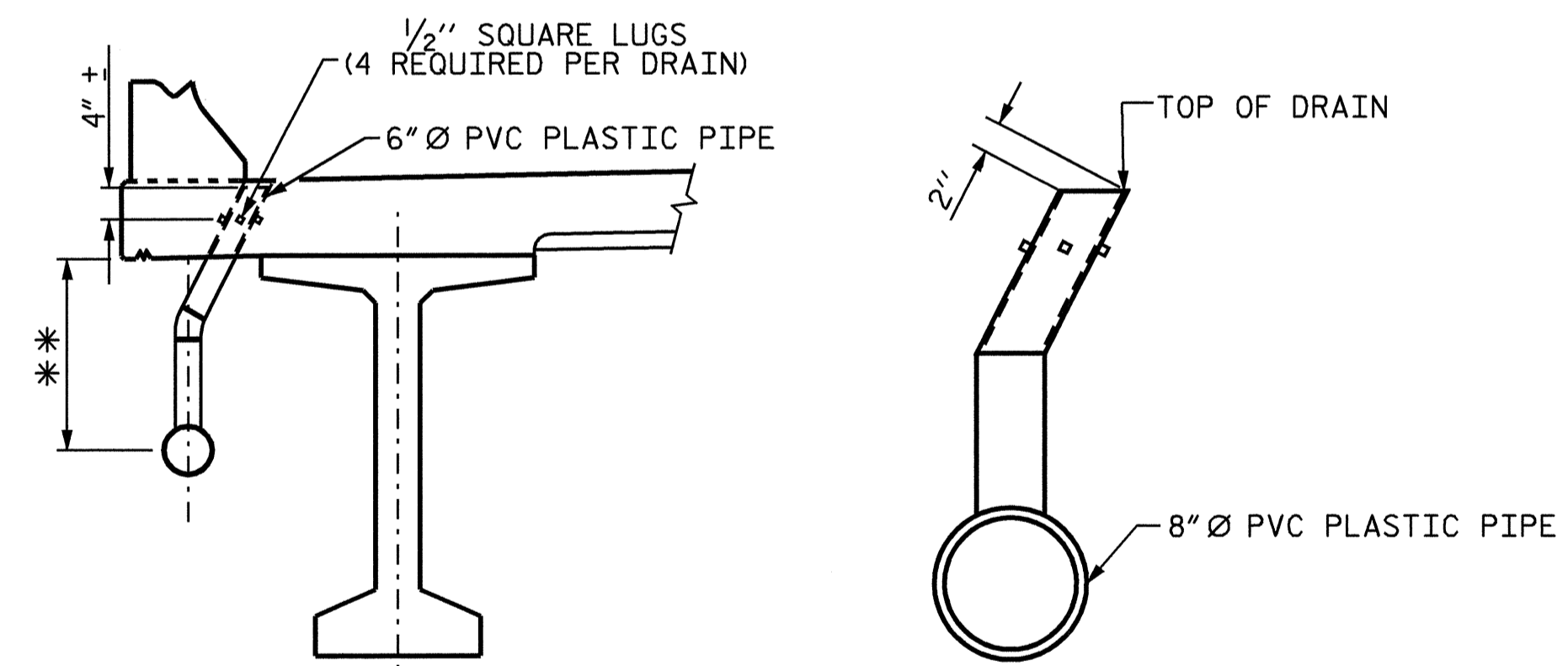


**ELEVATION VIEW OF DECK DRAIN AND DRAIN LINE INTERSECTION**



**HANGER DETAILS**

EACH CLEVIS PIPE HANGER, ROD, AND INSERT, SHOULD HAVE A MINIMUM TENSION WORK LOAD CAPACITY OF 2500 POUNDS.



**PIPE DETAIL**

\*\*SEE ELEVATION VIEW FOR DIMENSIONS.  
(36 DRAINS REQUIRED)

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

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

**DRAIN PIPE DETAILS**

**NOTES**

THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE DRAINAGE SYSTEM, INCLUDING, BUT NOT LIMITED TO, ATTACHMENTS TO THE BRIDGE, SCUPPER AND INLET GRATE DETAILS, SCUPPER SUPPORT SYSTEM, PIPE ALIGNMENT AND PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES AND JOINTS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

THE DRAINAGE SYSTEM DETAILS ARE SCHEMATIC DRAWINGS ONLY. THE CONTRACTOR SHALL DETERMINE THE PROPER ELBOW FITTINGS, PIPE LENGTHS, QUANTITY OF GUIDES, AND ATTACHMENT TYPES REQUIRED TO CARRY THE WATER FROM THE DECK DRAINS TO THE OUTLETS AT THE FILL FACE OF THE INTEGRAL END BENTS.

CLEVIS HANGERS, RODS, INSERTS, PIPE SUPPORT BRACKETS, CLAMPS, GUIDES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. CONCRETE INSERTS SHALL BE OF AN APPROVED GALVANIZED TYPE HAVING A MINIMUM WORKING LOAD TENSION CAPACITY OF 4.2 KIPS.

NO ANCHORAGE TO THE PRESTRESSED GIRDERS IS ALLOWED.

COUPLINGS PERMITTED AS APPROVED BY THE ENGINEER.

PIPE AND FITTINGS SHALL BE PVC, SDR 35, ASTM D 3034.

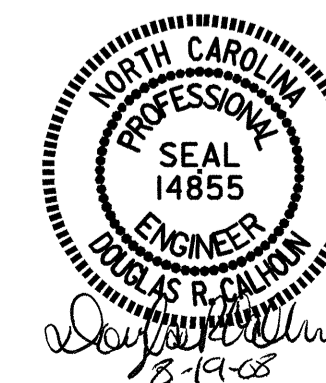
PIPE JOINTS SHALL BE ELASTOMERIC TYPE.

FITTING JOINTS SHALL BE SOLVENT CEMENT TYPE.

DRAIN SYSTEM WILL BE PAID FOR UNDER THE PAY ITEM "STRUCTURE DRAINAGE SYSTEM - LUMP SUM."

THE CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN THE DRAIN PIPES AT A MAXIMUM SPACING OF 25 FT.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-



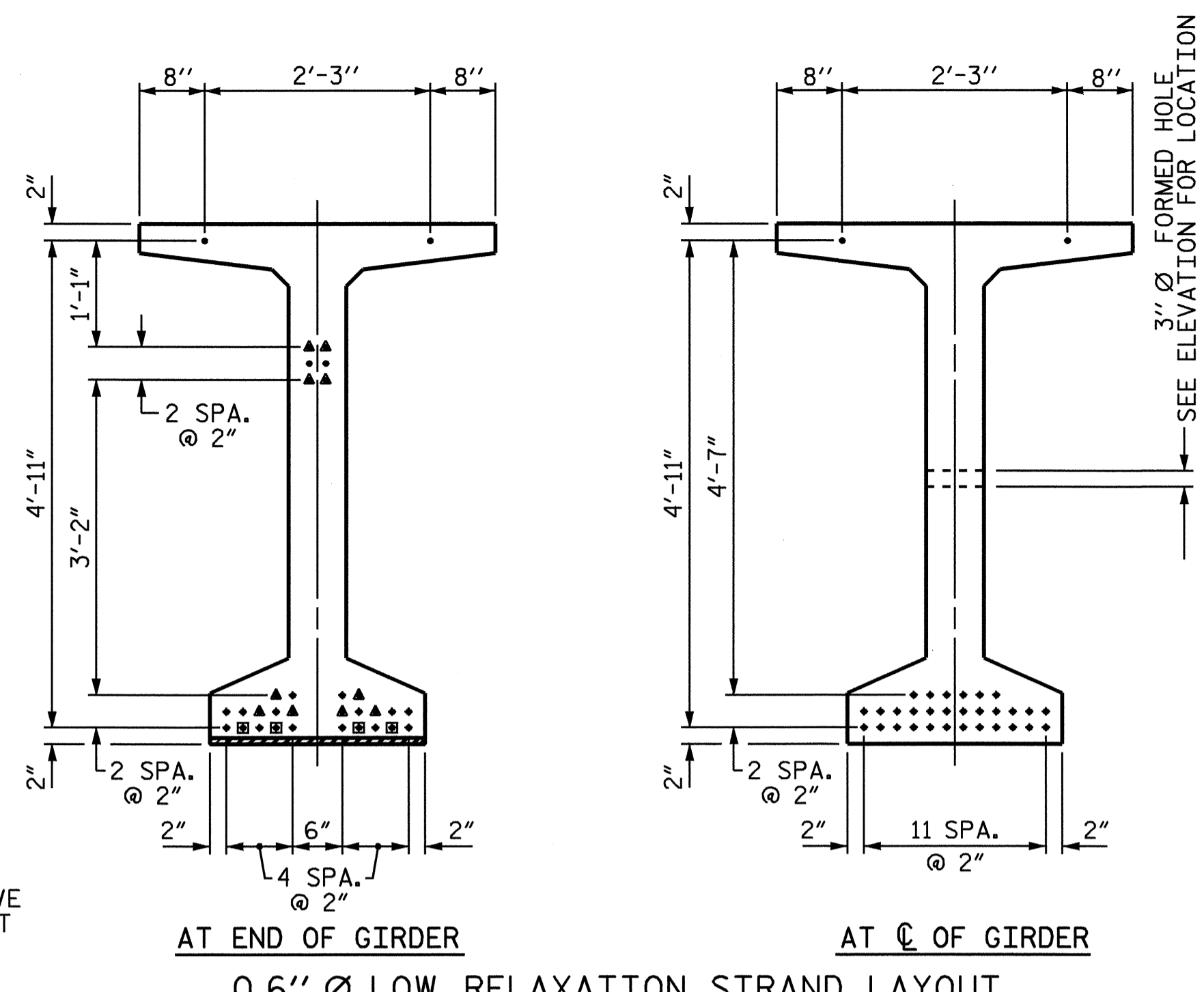
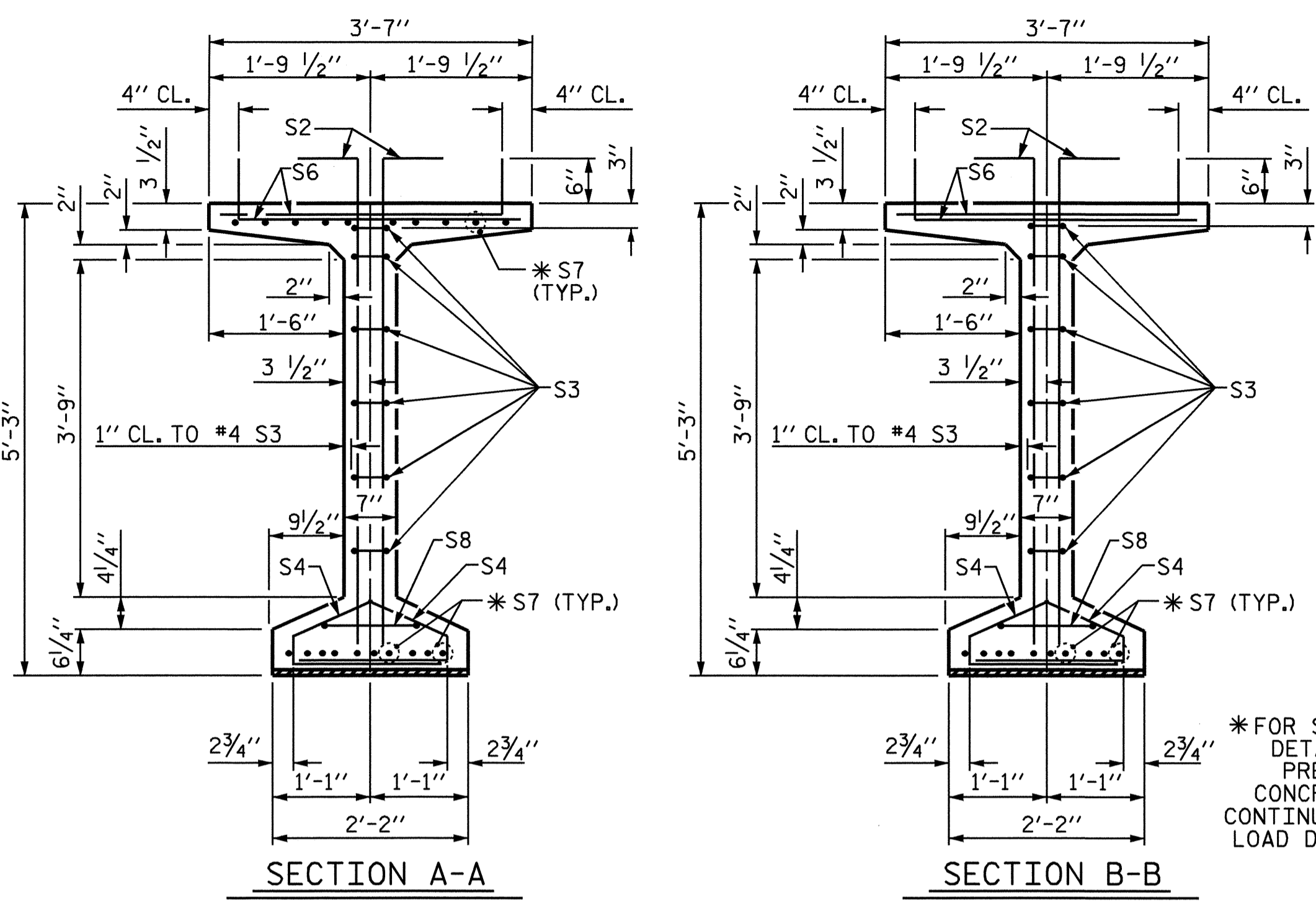
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 DRAINAGE SYSTEM  
 (SBL)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : T.L.CLELLAND DATE : 10/11/05  
 CHECKED BY : T.A.HARRIS DATE : 10/11/05

19-AUG-2008 10:15  
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 brngrady



**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

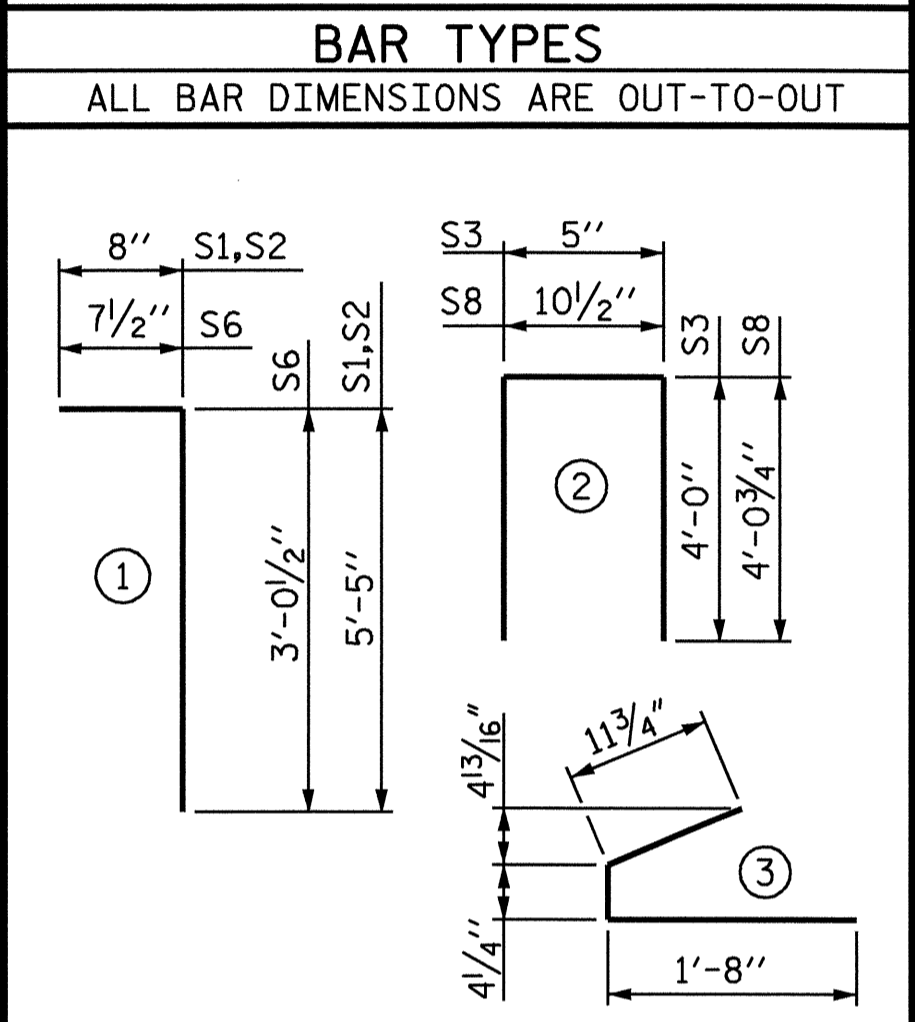
**0.6" Ø L. R. GRADE 270 STRANDS**

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

**REINFORCING STEEL FOR ONE GDR**

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	6'-1"	683
S2	24	#5	1	6'-1"	152
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	192	#5	1	3'-8"	734
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	45	#5	STR	3'-3"	153
S10	2	#3	STR	1'-10"	1

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

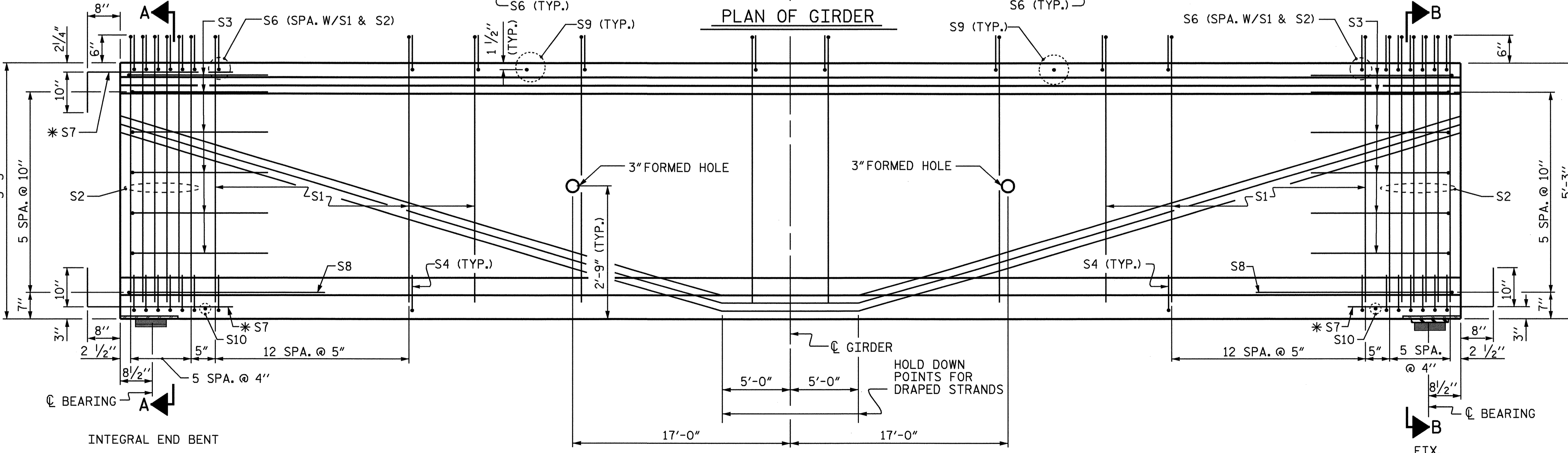
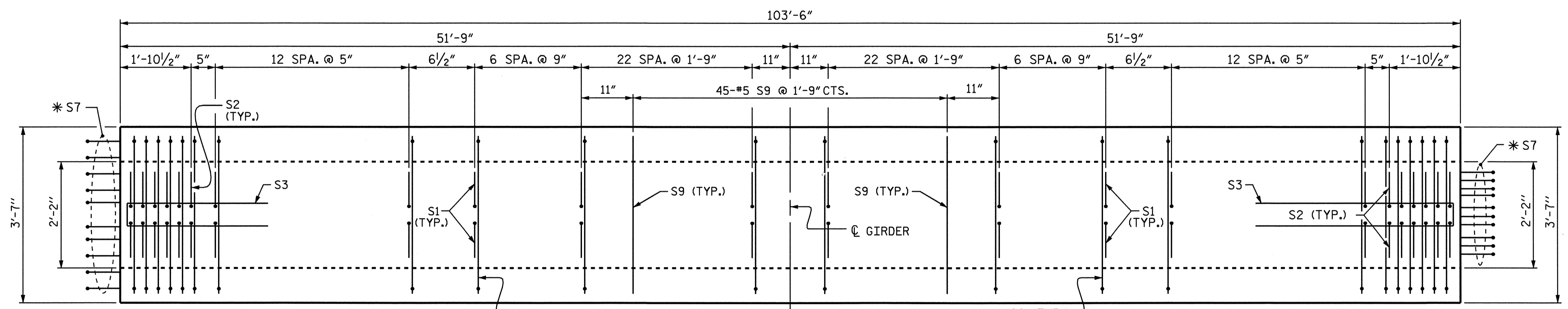


**QUANTITIES FOR ONE GIRDER**

REINFORCING STEEL	7500 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
2076	20.5	32

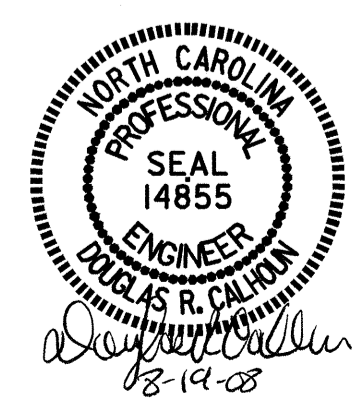
**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
A & D	10	103'-6"
		1035'-0"



ASSEMBLED BY : B.N. GRADY DATE : 3/4/08  
 CHECKED BY : E.G. ALLEN DATE : 6/8/08  
 DRAWN BY : EEM 2/6/97 REV. 8/16/99 RWW/LES  
 CHECKED BY : VAP 2/6/97 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 REV. 5/1/06 TLG/GM

19-AUG-2008 10:15  
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 bngrody

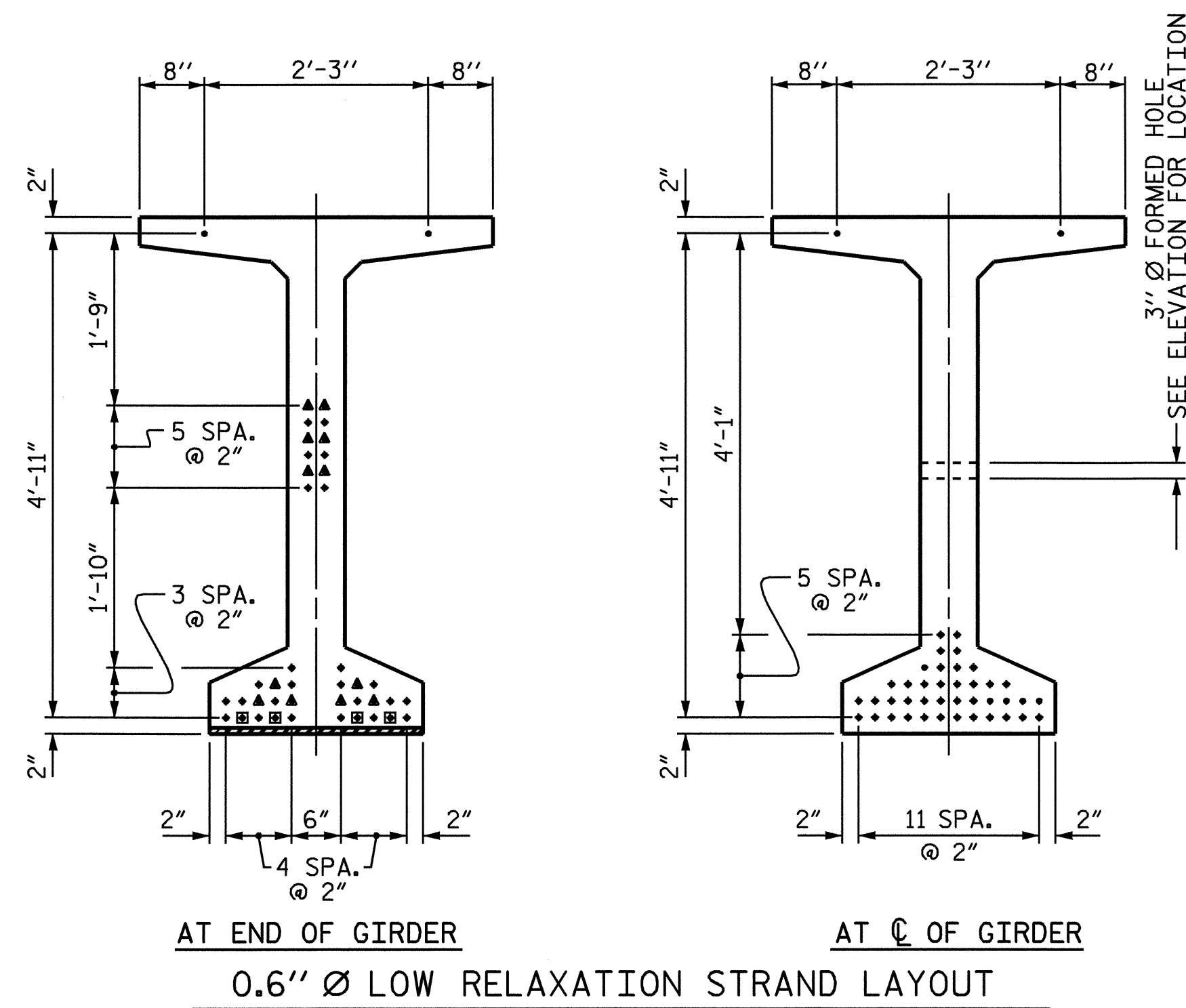
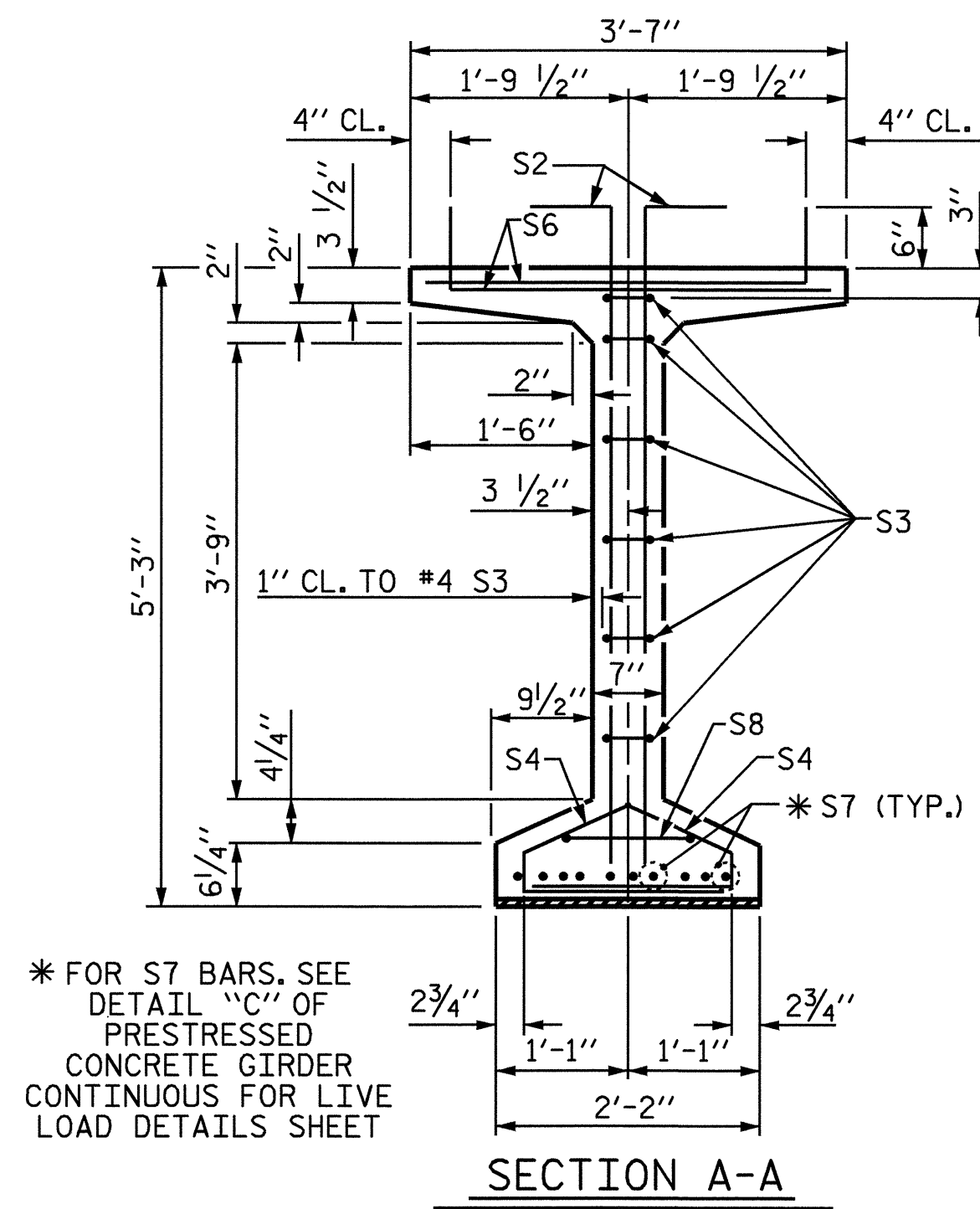


PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN A & D (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			70



**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

**0.6" Ø L. R. GRADE 270 STRANDS**

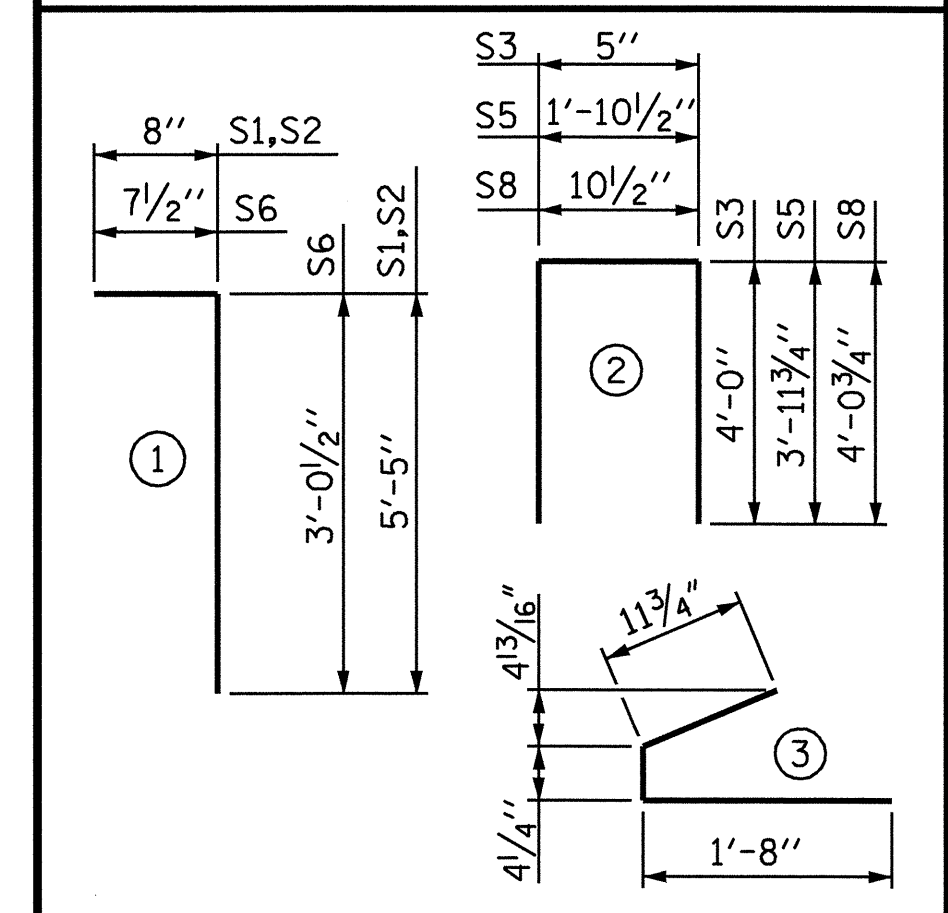
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

**REINFORCING STEEL FOR ONE GDR**

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	180	#4	1	6'-1"	731
S2	24	#5	1	6'-1"	152
S3	12	#4	2	8'-5"	67
S4	80	#4	3	3'-0"	160
S6	204	#5	1	3'-8"	780
*S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	51	#5	STR	3'-3"	173
S10	2	#3	STR	1'-10"	1

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

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT

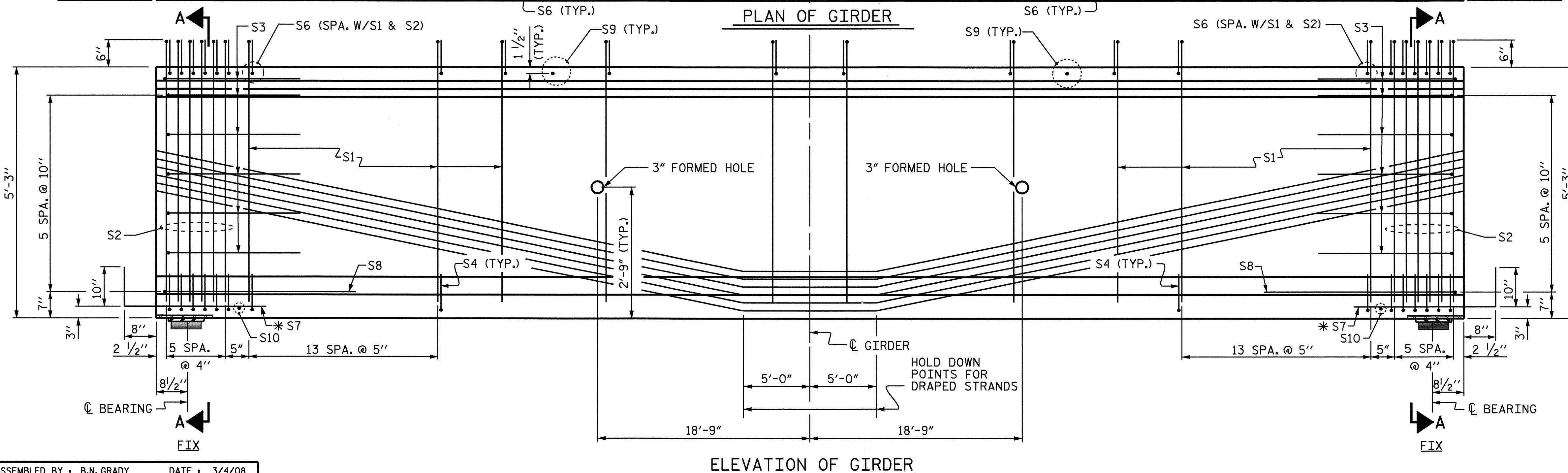
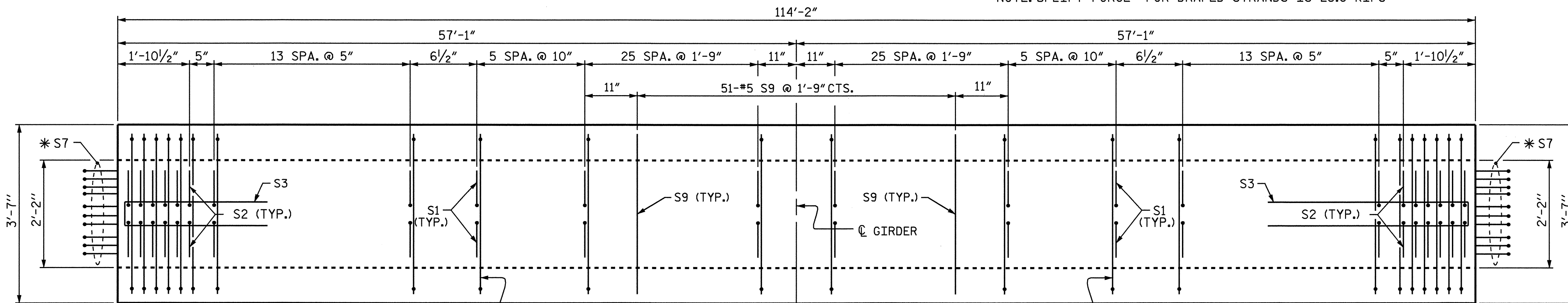


**QUANTITIES FOR ONE GIRDER**

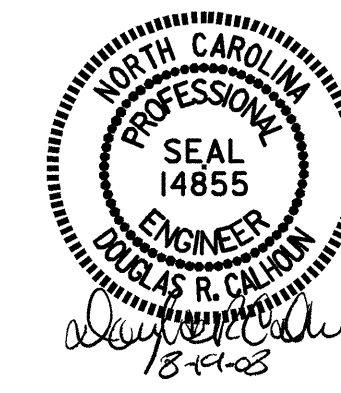
REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
2159	22.6	42

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
B & C	10	1141'-8"



ASSEMBLED BY : B.N. GRADY DATE : 3/4/08  
 CHECKED BY : E.G. ALLEN DATE : 6/8/08  
 DRAWN BY : EEM 2/6/97 REV. 8/16/99 RWW/LES  
 CHECKED BY : VAP 2/6/97 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 REV. 5/1/06 TLA/GM



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN B & C (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			70

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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5700 PSI FOR SPANS A & D, AND 7200 PSI FOR SPANS B & C.

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

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

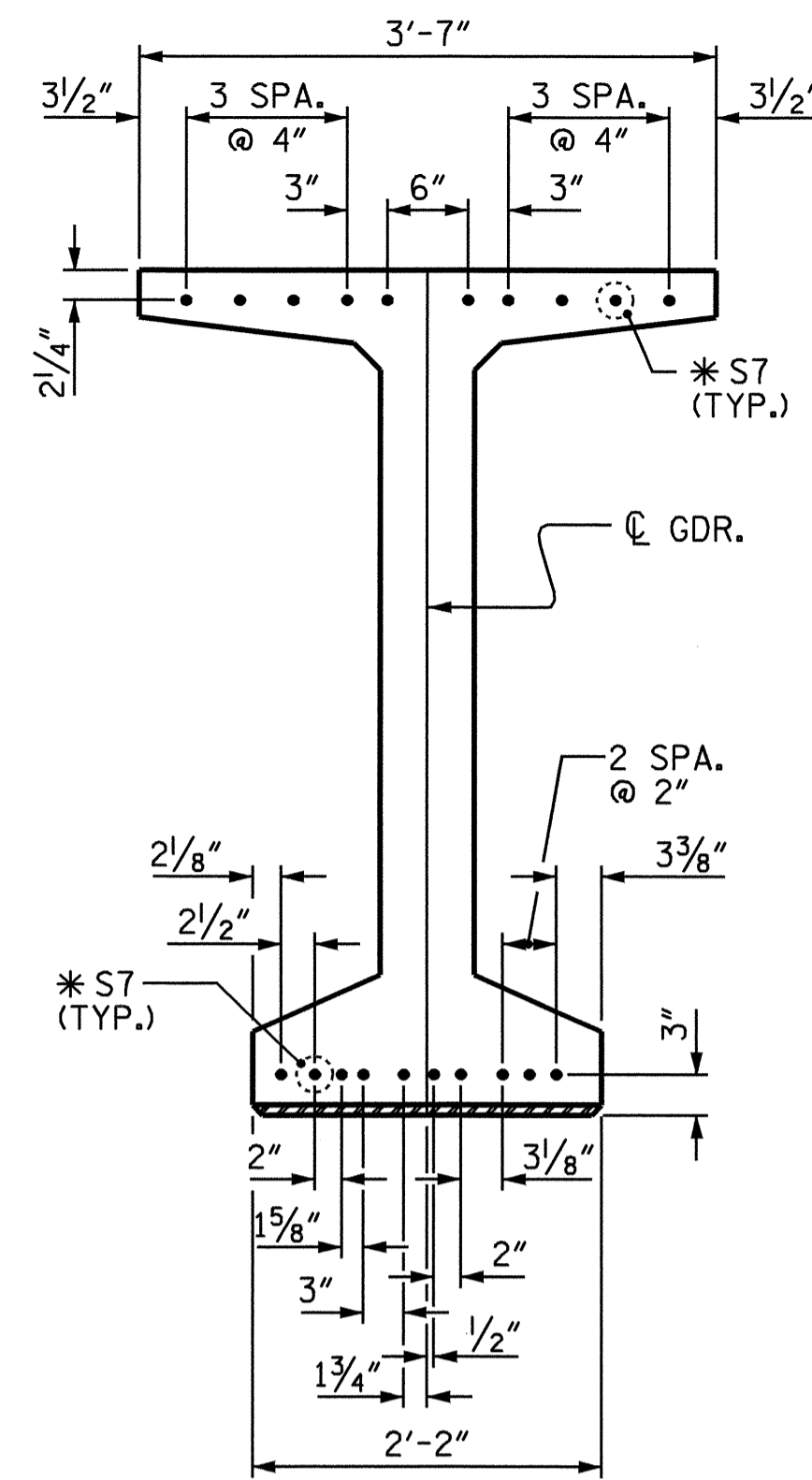
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

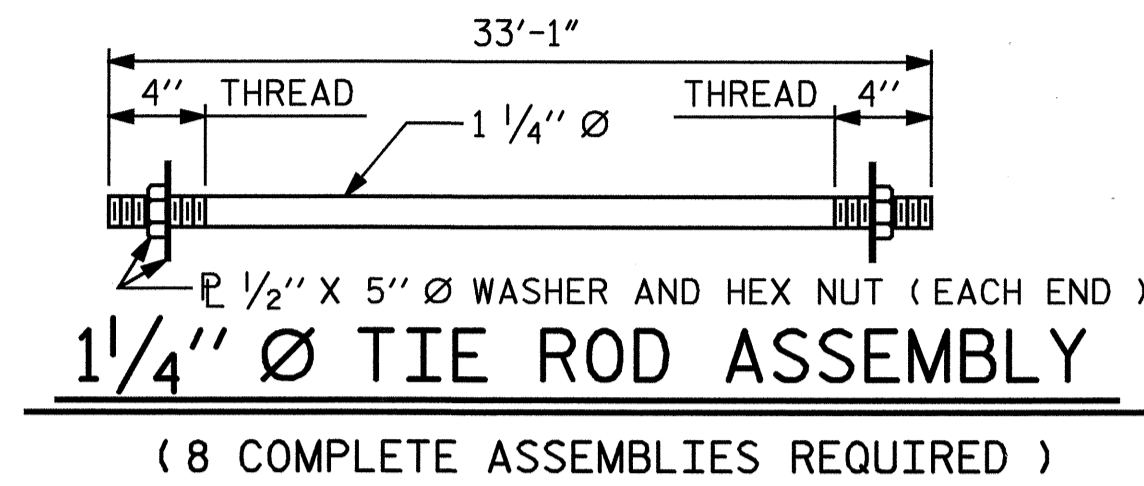
FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



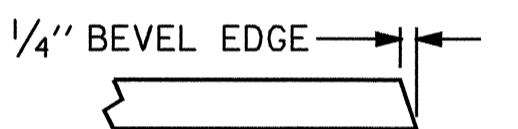
DETAIL "C"

(FOR 63" & 72" MODIFIED BULB TEES)

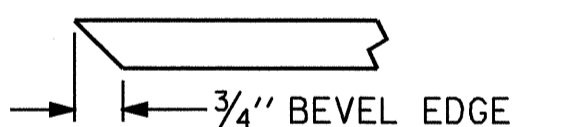


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" & 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "G"



SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPANS A & D																						
	GIRDERS 1 & 5											GIRDERS 2 THRU 4											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.120	0.226	0.310	0.363	0.381	0.363	0.310	0.226	0.120	0	0	0.120	0.226	0.310	0.363	0.381	0.363	0.310	0.226	0.120	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.043	0.082	0.112	0.131	0.138	0.131	0.112	0.082	0.043	0	0	0.043	0.082	0.112	0.132	0.138	0.132	0.112	0.082	0.043	0
FINAL CAMBER	↑	0	15/16"	13/4"	23/8"	23/4"	215/16"	23/4"	23/8"	13/4"	15/16"	0	0	15/16"	13/4"	23/8"	23/4"	215/16"	23/4"	23/8"	13/4"	15/16"	0

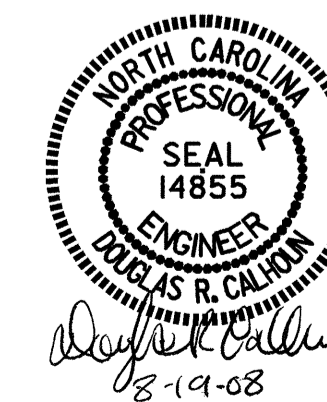
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPANS B & C																						
	GIRDERS 1 & 5											GIRDERS 2 THRU 4											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.168	0.318	0.435	0.510	0.536	0.510	0.435	0.318	0.168	0	0	0.168	0.318	0.435	0.510	0.536	0.510	0.435	0.318	0.168	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.059	0.111	0.152	0.178	0.187	0.178	0.152	0.111	0.059	0	0	0.059	0.111	0.153	0.179	0.188	0.179	0.153	0.111	0.059	0
FINAL CAMBER	↑	0	15/16"	21/2"	33/8"	4"	43/16"	4"	33/8"	21/2"	15/16"	0	0	15/16"	21/2"	33/8"	4"	43/16"	4"	33/8"	21/2"	15/16"	0

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

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS & DEAD LOAD  
DEFLECTION TABLES  
(SBL)

ASSEMBLED BY : B.N. GRADY	DATE : 3/4/08
CHECKED BY : E.G. ALLEN	DATE : 6/8/08
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-14
2			4			70

**NOTES**

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

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

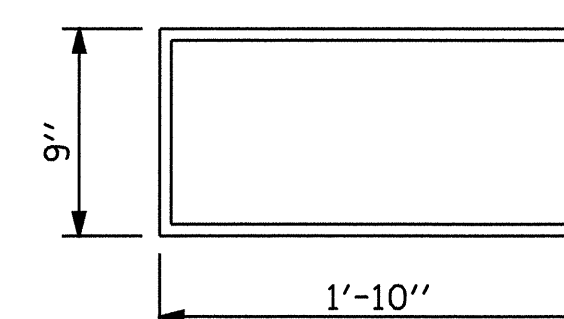
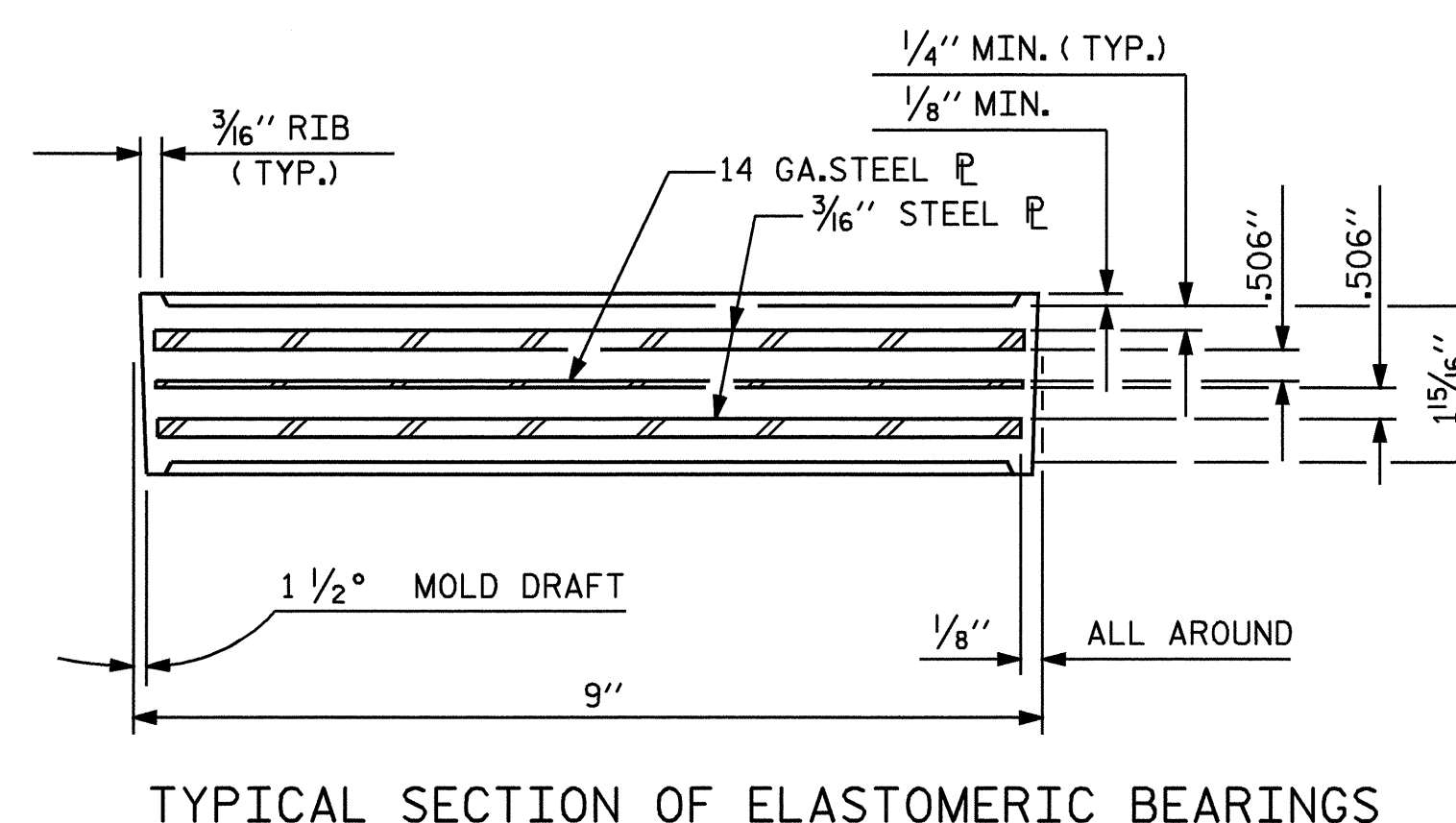
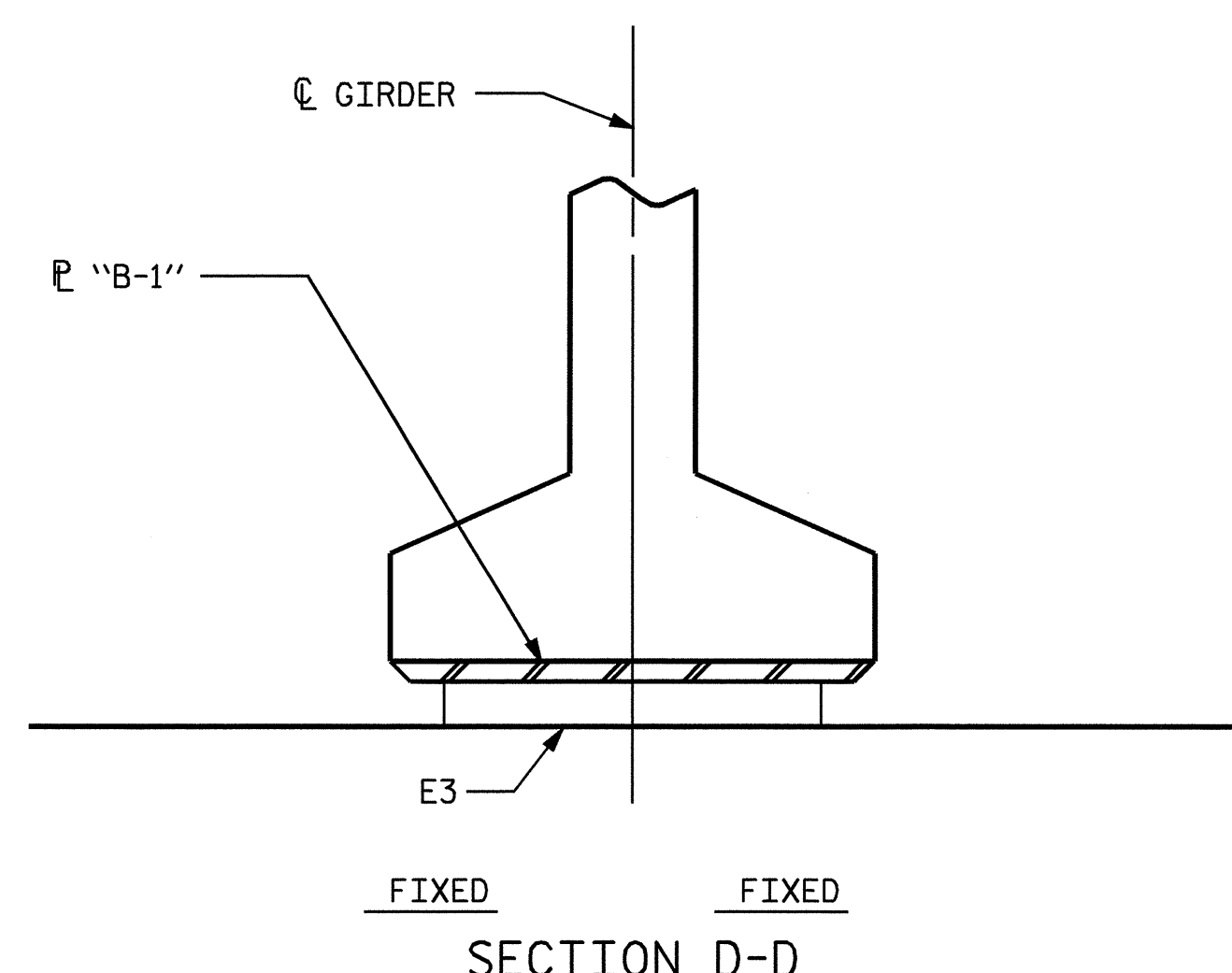
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



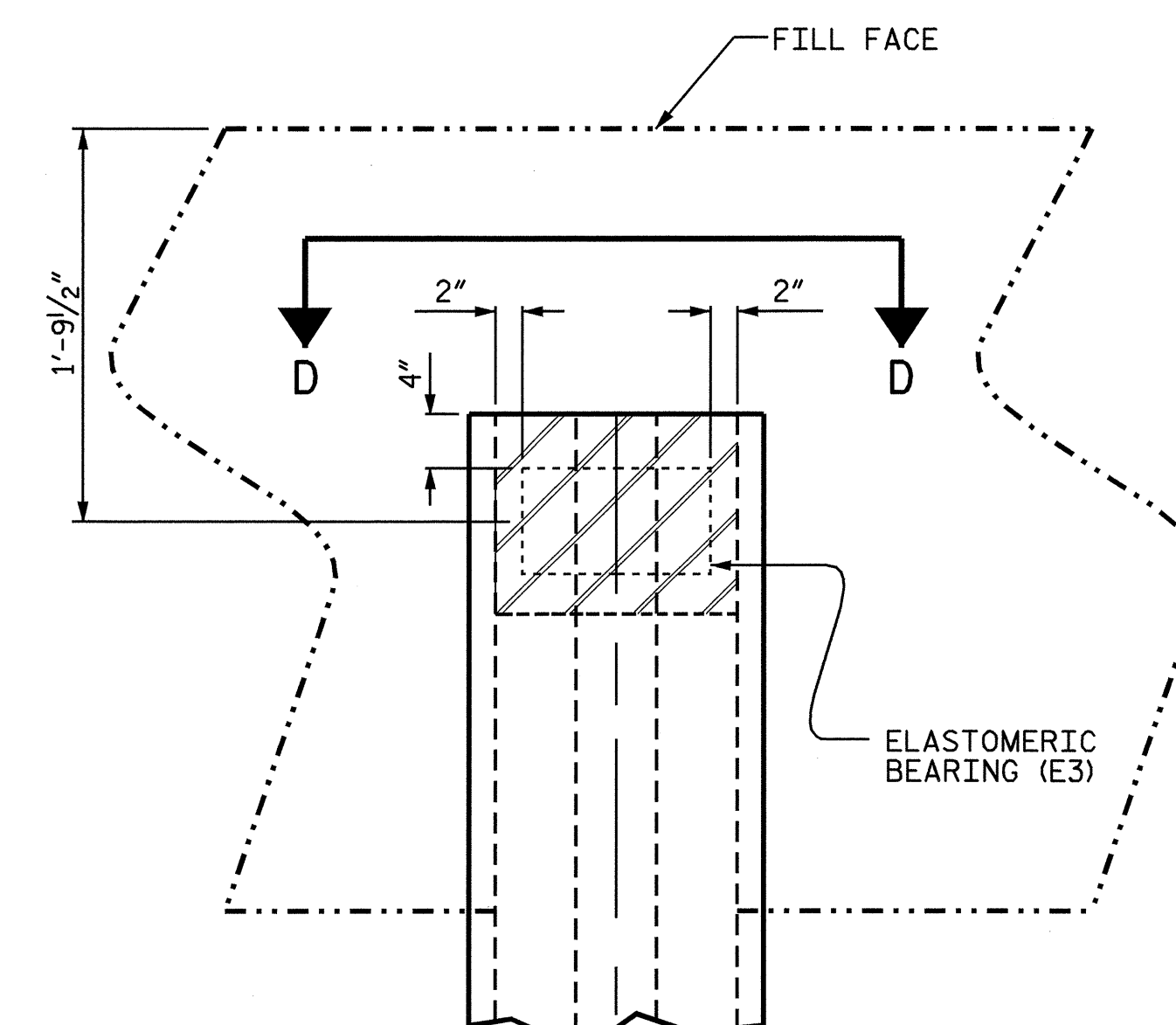
E3 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

**TYPE IV**

FOR SPAN A (NEAR) & SPAN D (FAR) ONLY

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE IV	137 K



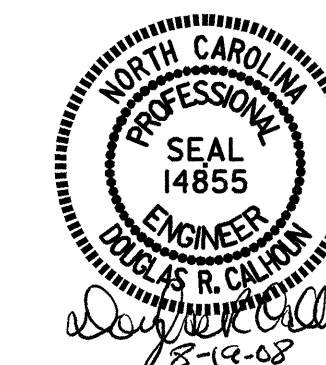
PLAN VIEW AT INTEGRAL END BENTS

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**ELASTOMERIC BEARING  
 DETAILS**  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE  
 (SBL)

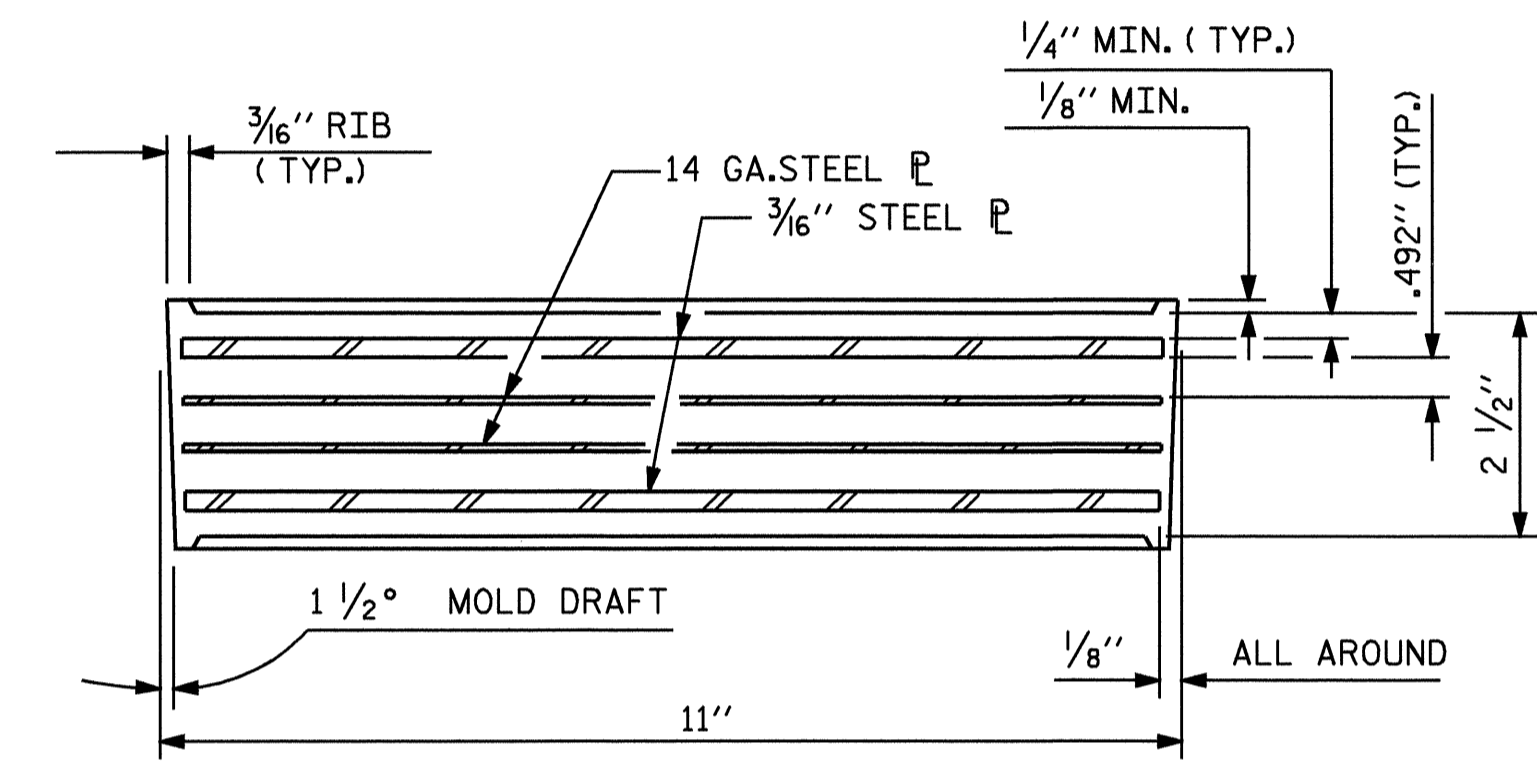
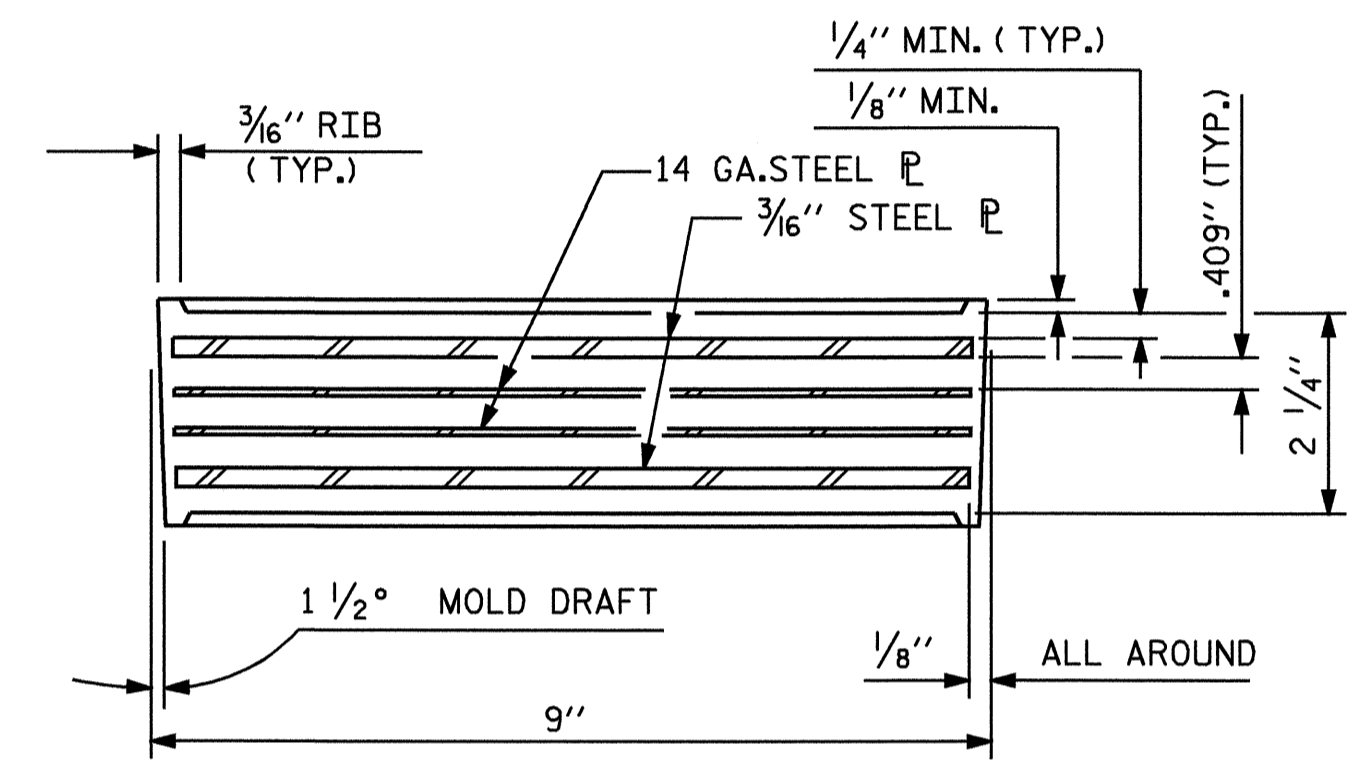
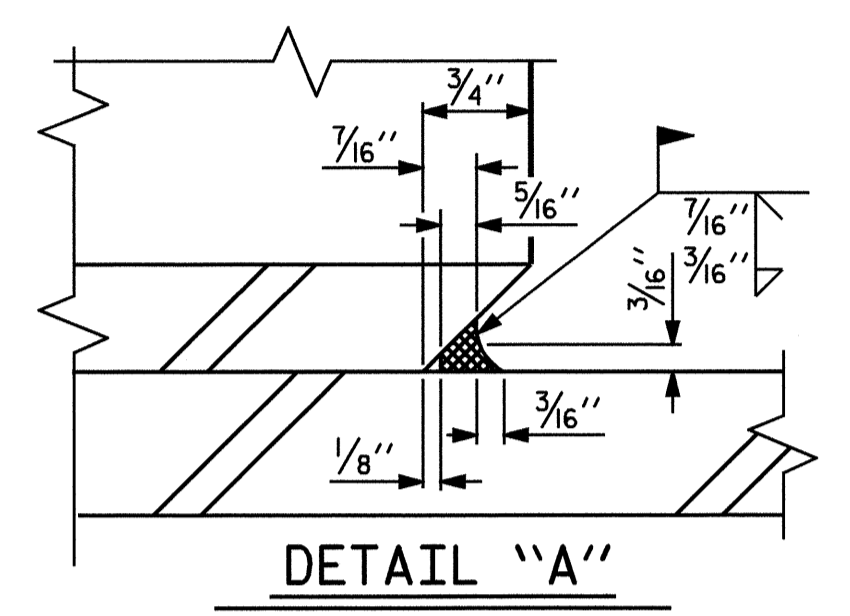
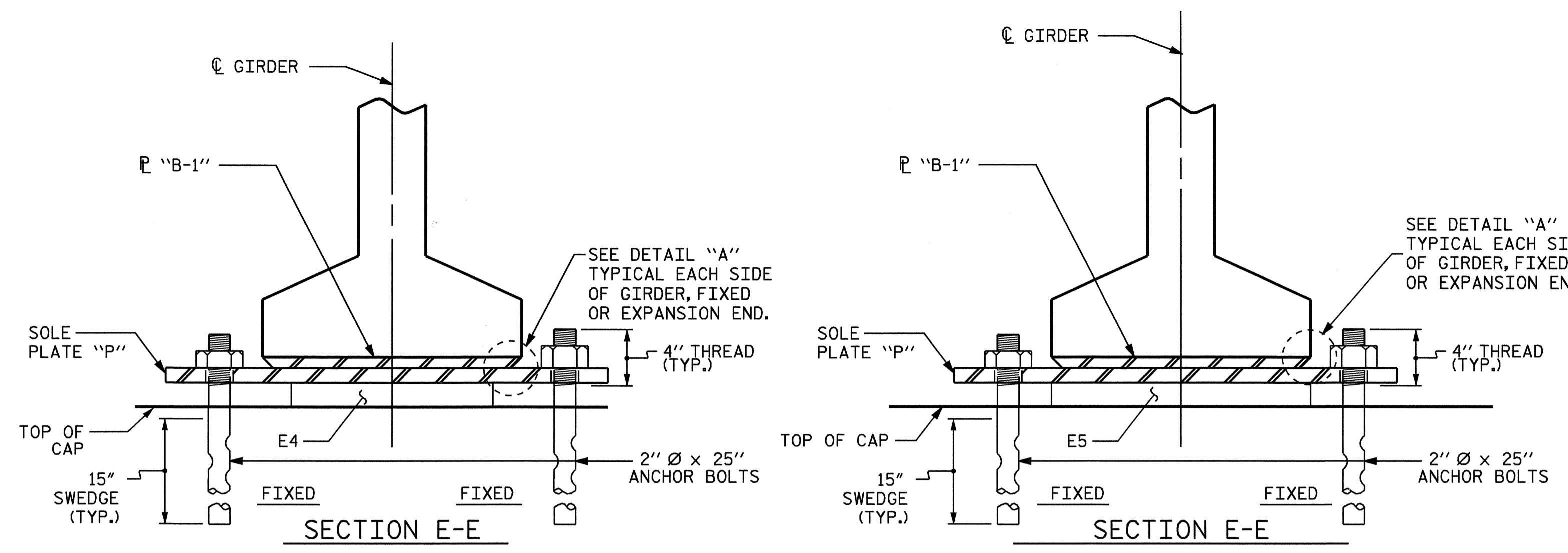


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS 70	
2			4				

ASSEMBLED BY : T.L.CLELLAND	DATE : 7/6/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : EEM 2/97	ADDED 2/6/97
CHECKED BY : VAP 2/97	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

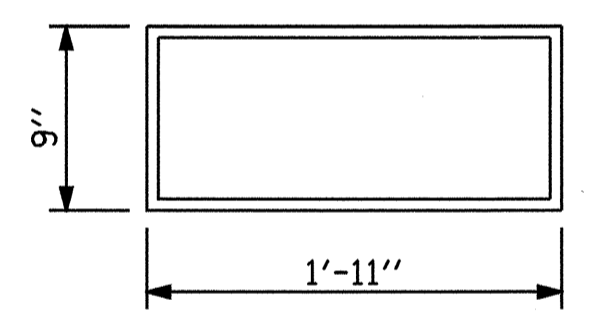


- LOAD RATINGS -	
TYPE V	MAX.D.L.+ L.L. 180 K
TYPE VI	211 K



TYPICAL SECTION OF ELASTOMERIC BEARINGS

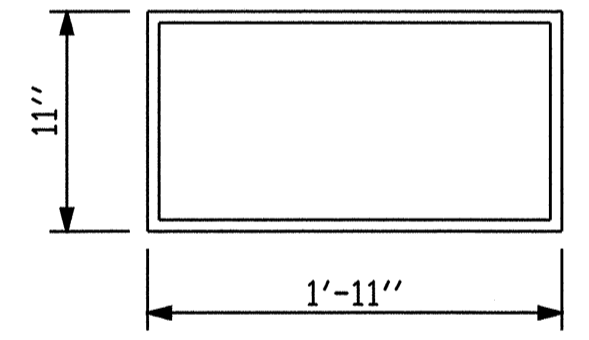
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (10 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

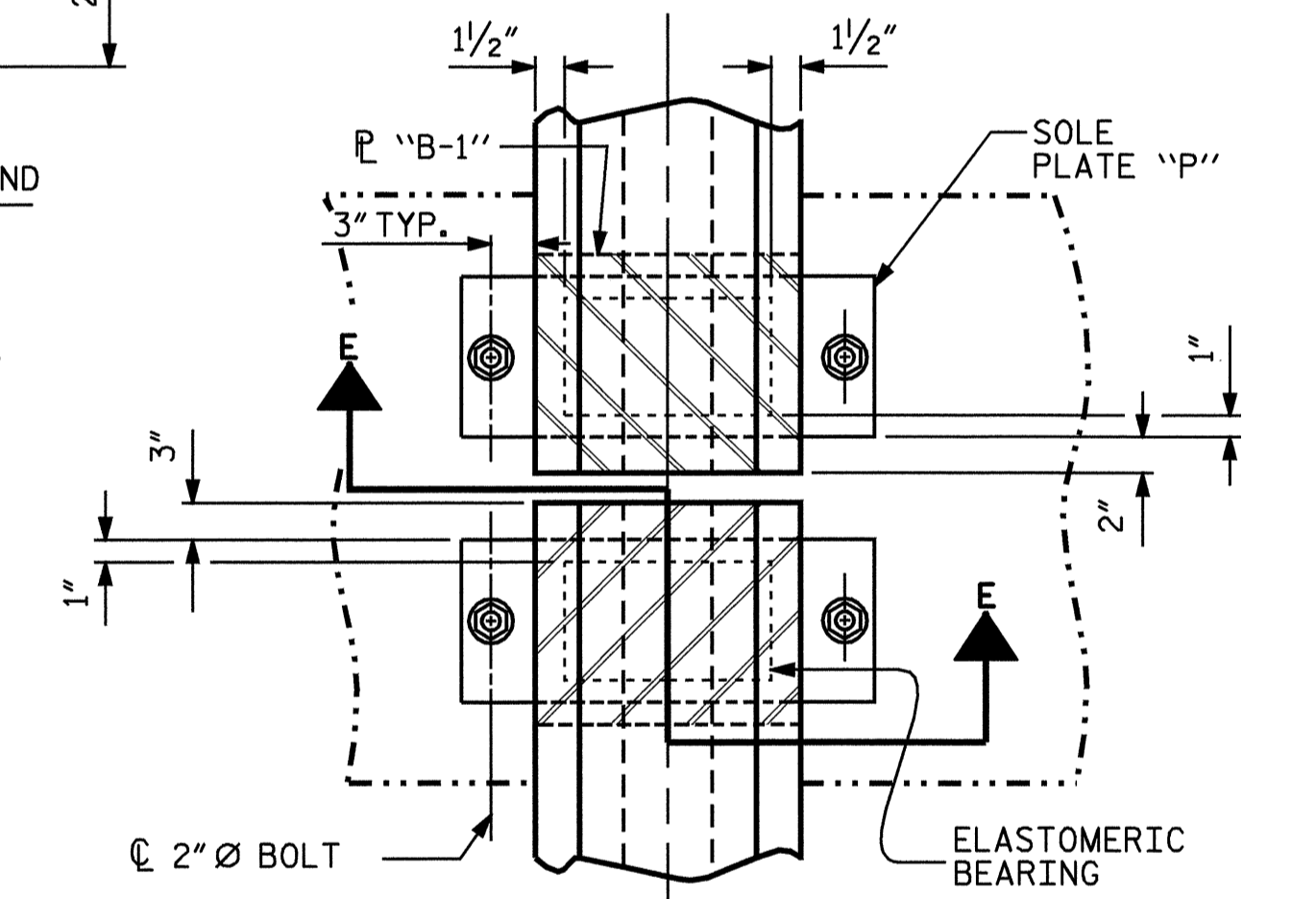
FOR SPAN A (FAR) & SPAN D (NEAR) ONLY



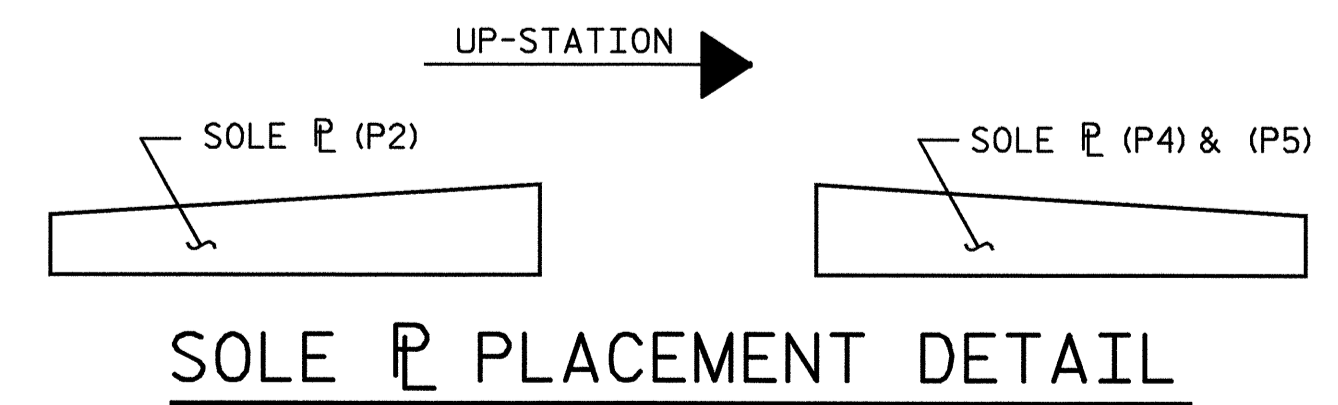
E5 (20 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

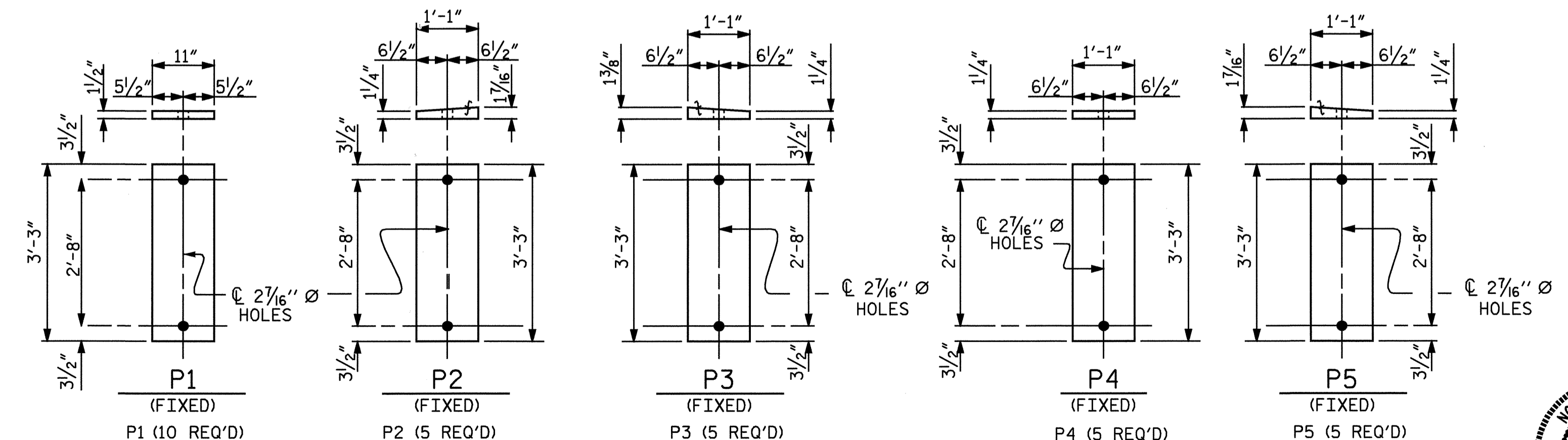
FOR SPANS B & C ONLY



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT FOR TYPE V PAD)  
TYPICAL HALF-PLAN (SHOWING CONTINUOUS SPAN BENT FOR TYPE VI PAD)



SOLE PLATE PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

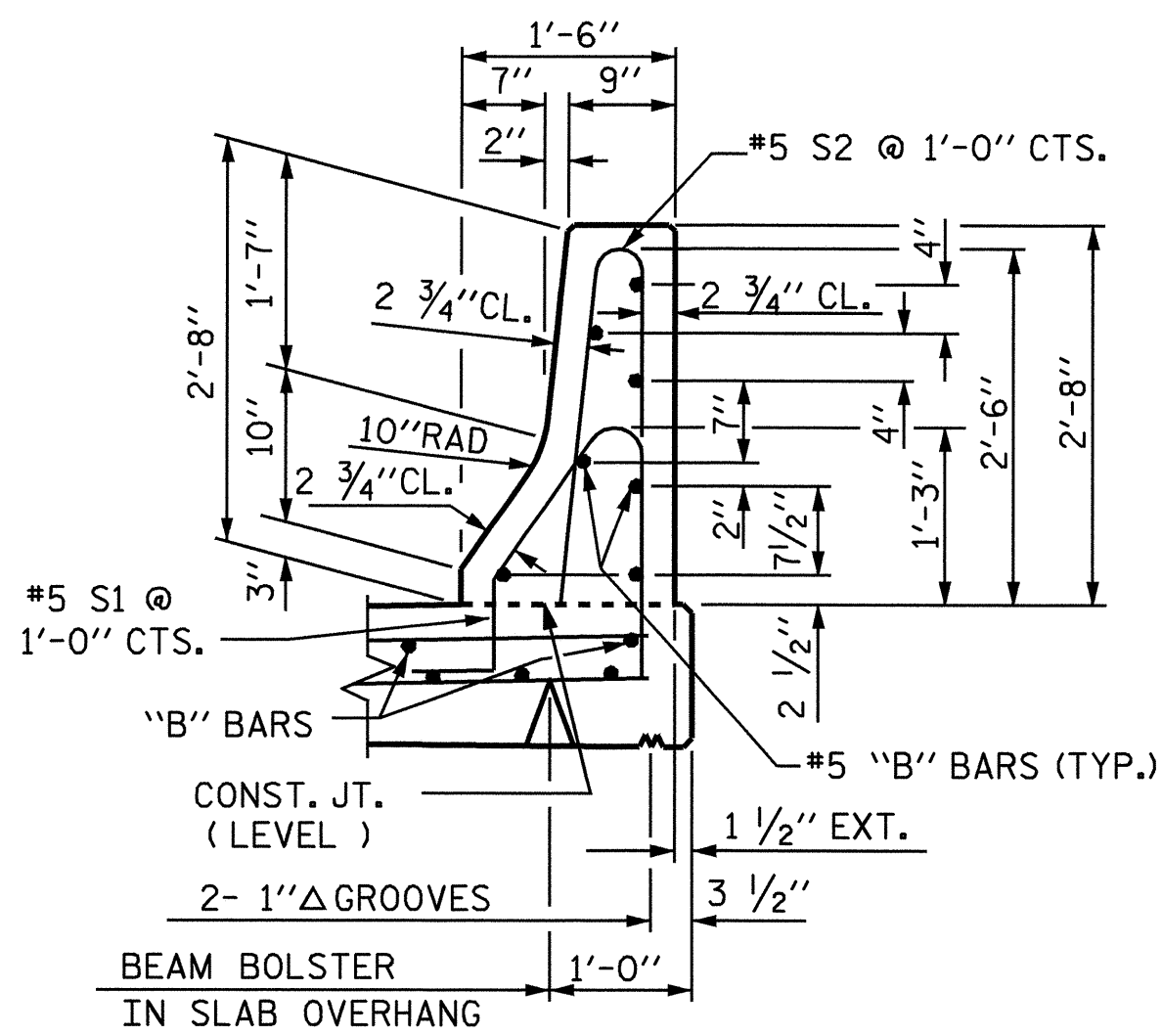
PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION 434+27.00 -L-

SHEET 2 OF 2  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE  
(SBL)

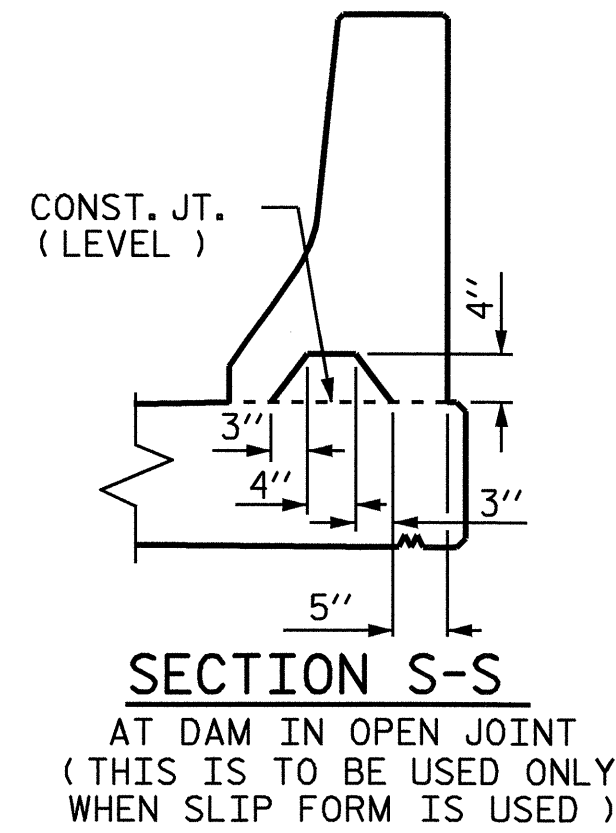


ASSEMBLED BY : T.L.CLELLAND	DATE : 7/6/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : EEM 2/97	ADDED 2/6/97
CHECKED BY : VAP 2/97	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			70

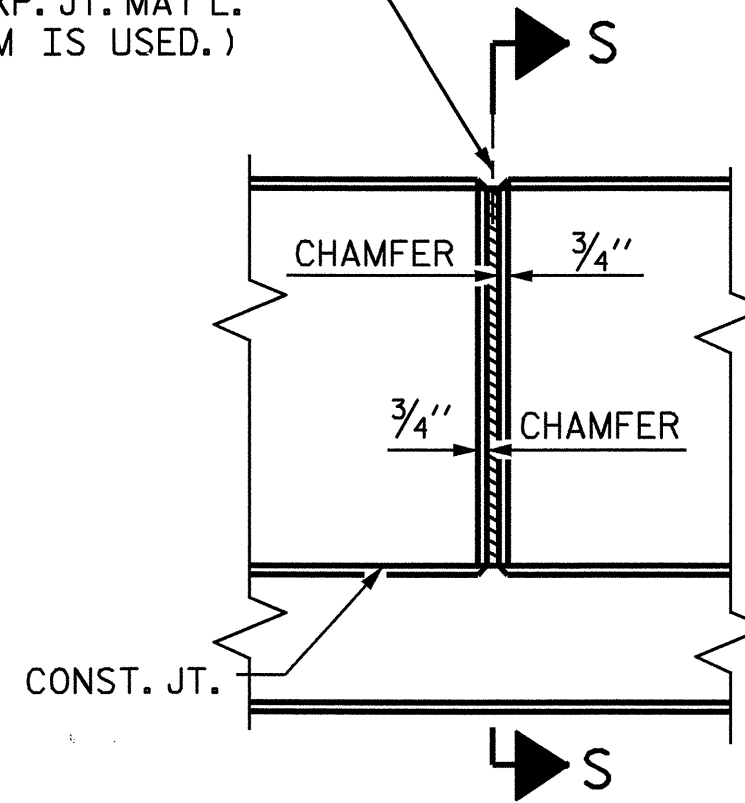


SECTION THRU RAIL



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

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



ELEVATION AT EXPANSION JOINTS

NOTES

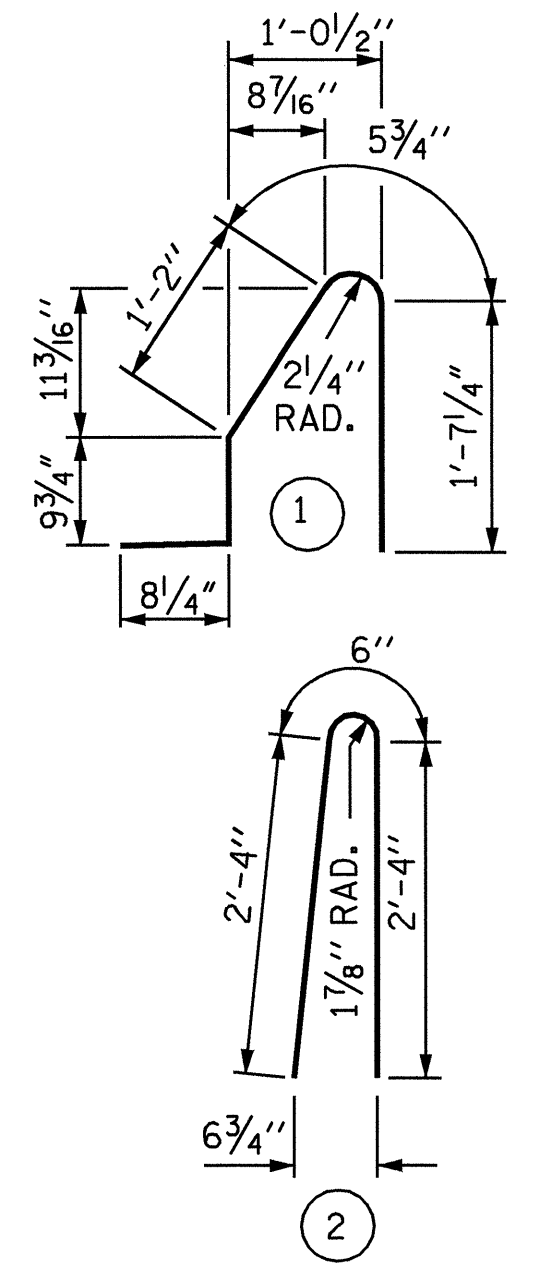
BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

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

BAR TYPES



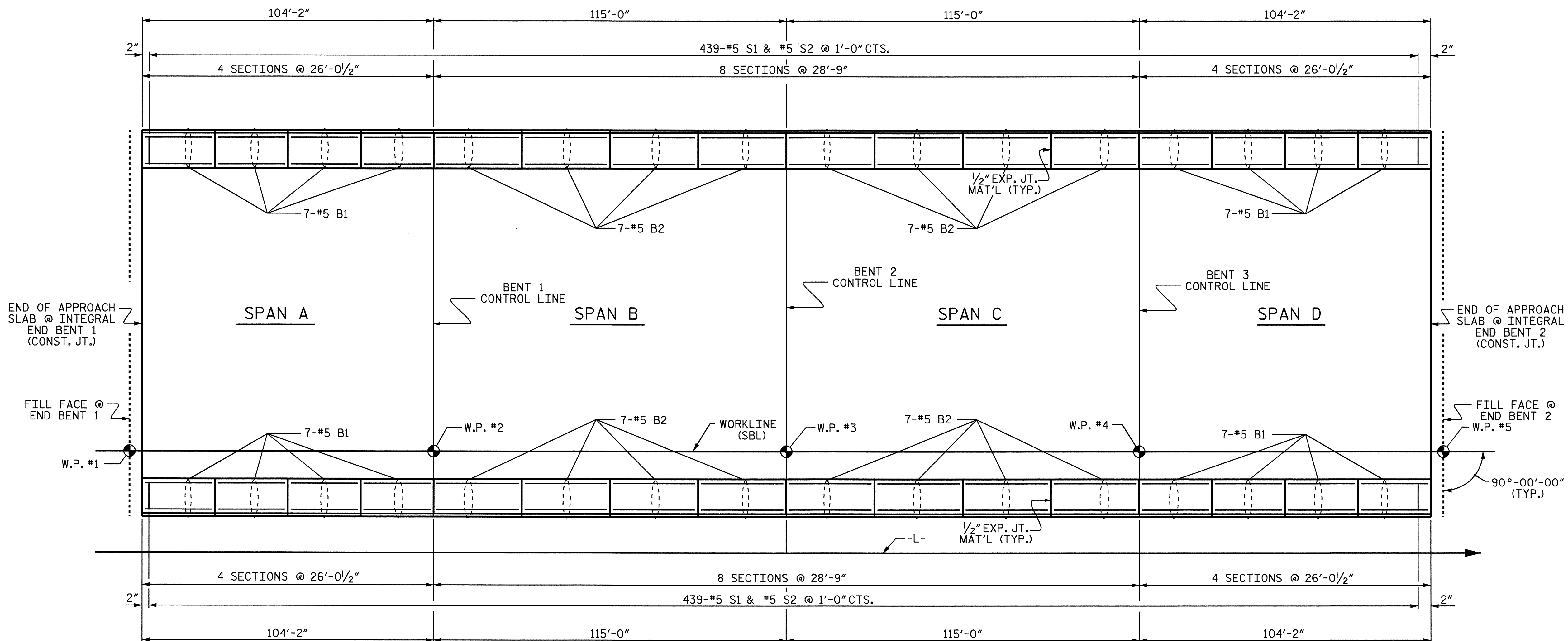
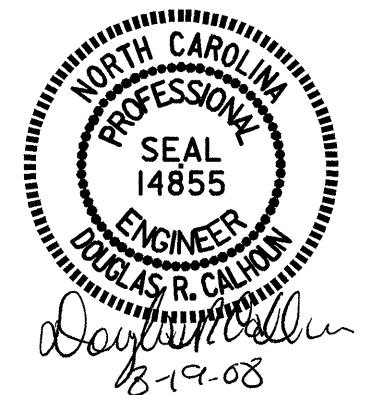
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	#5	STR	25'-7"	2889
* B2	#5	STR	28'-4"	3310
* S1	#5	1	4'-9"	4350
* S2	#5	2	5'-2"	4731

\* EPOXY COATED REINFORCING STEEL 15280 LBS.  
CLASS AA CONCRETE 87.8 CU. YDS.  
CONCRETE BARRIER RAIL 876.67 LIN. FT.



PLAN OF BARRIER RAIL

ASSEMBLED BY : T.L. CLELLAND DATE : 7/25/05  
CHECKED BY : T.A. HARRIS DATE : 9/2/05  
DRAWN BY : ARB 5/87 REV. 10/17/00 RWW/LES  
CHECKED BY : SJD 9/87 REV. 5/7/03R RWW/JTE  
REV. 5/1/06 TLA/GM

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bngrady

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
CONCRETE  
BARRIER RAIL  
(SBL)

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STD. NO. CBR1 STR. #1

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.)

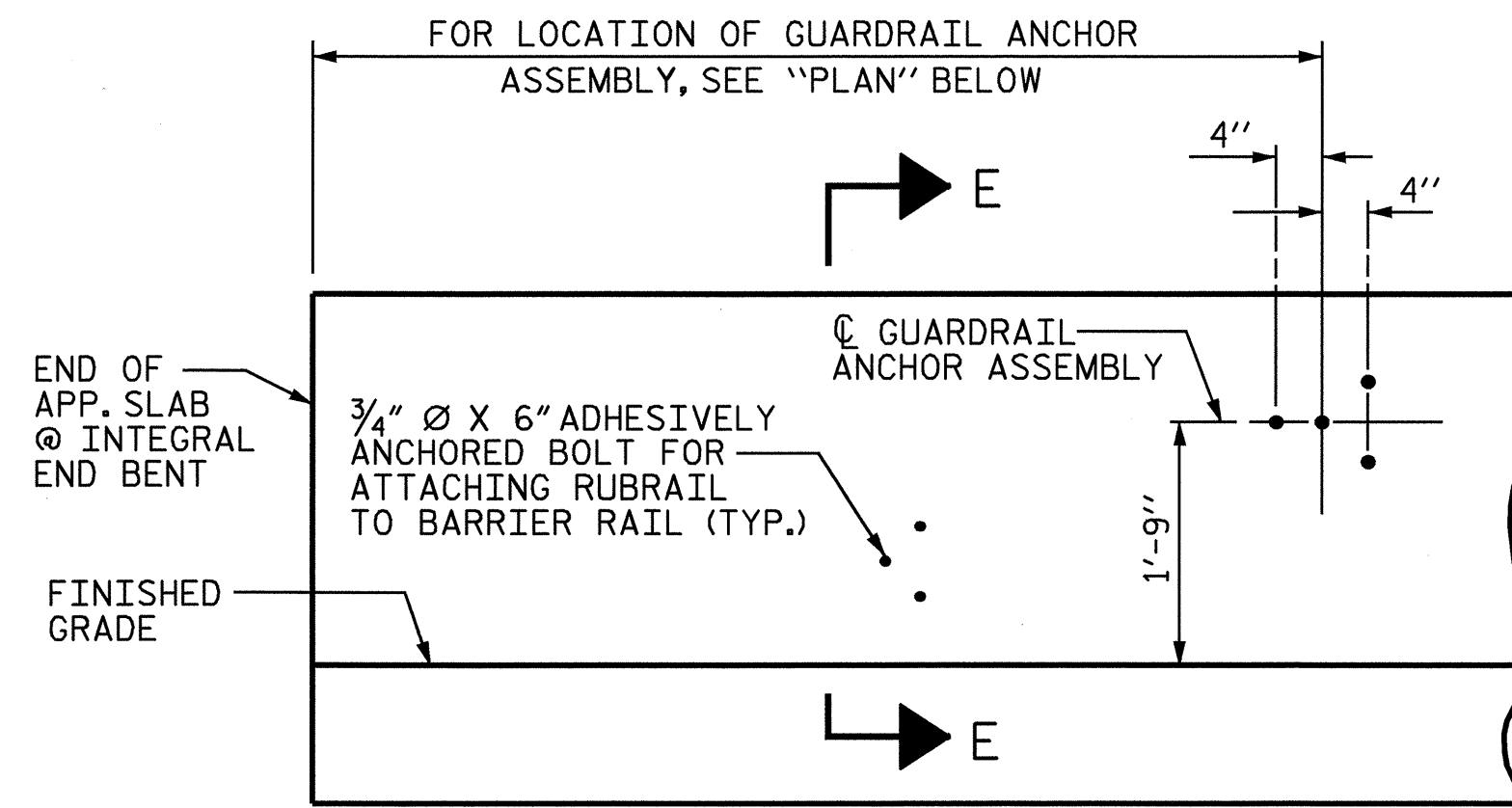
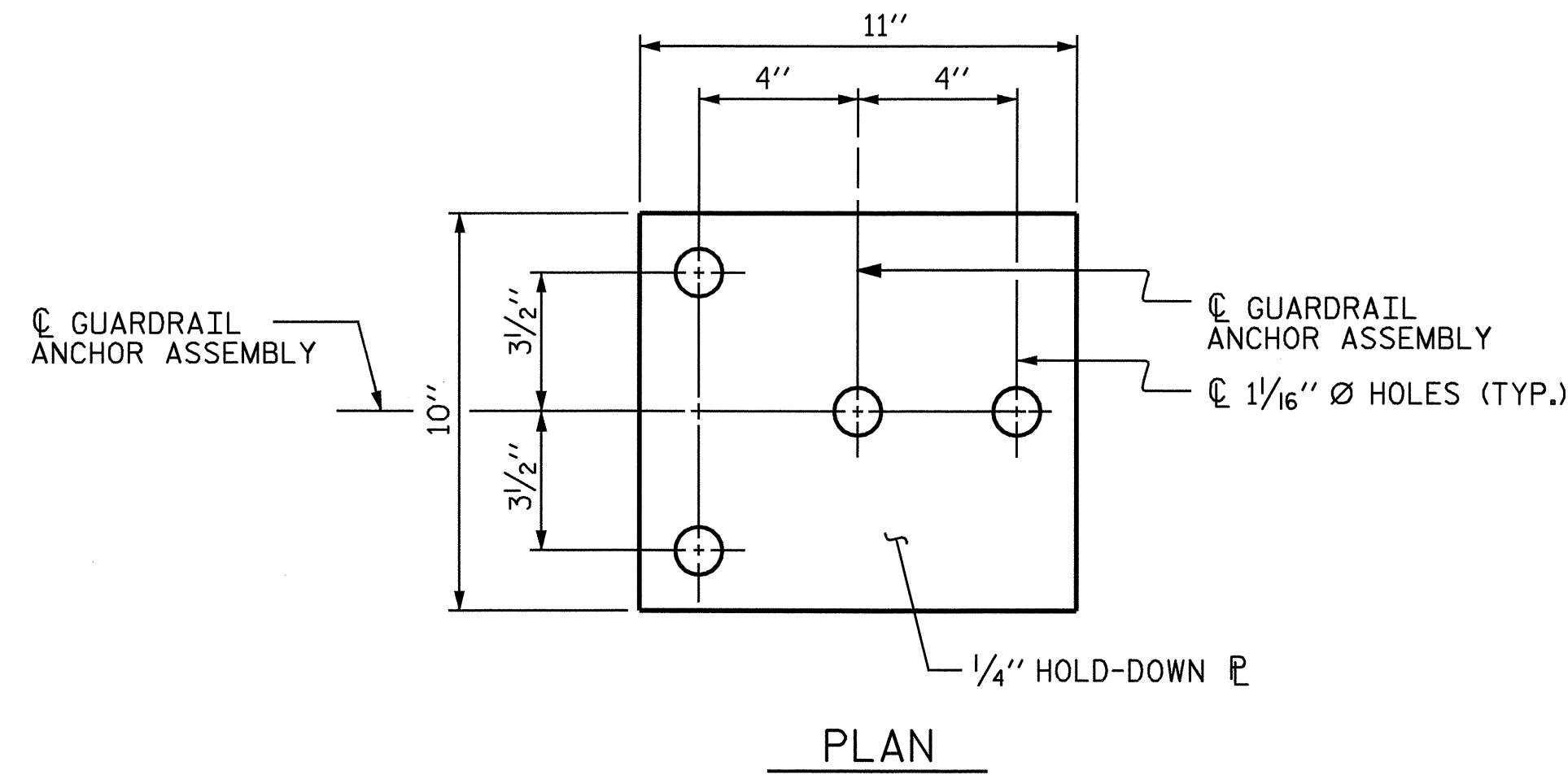
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

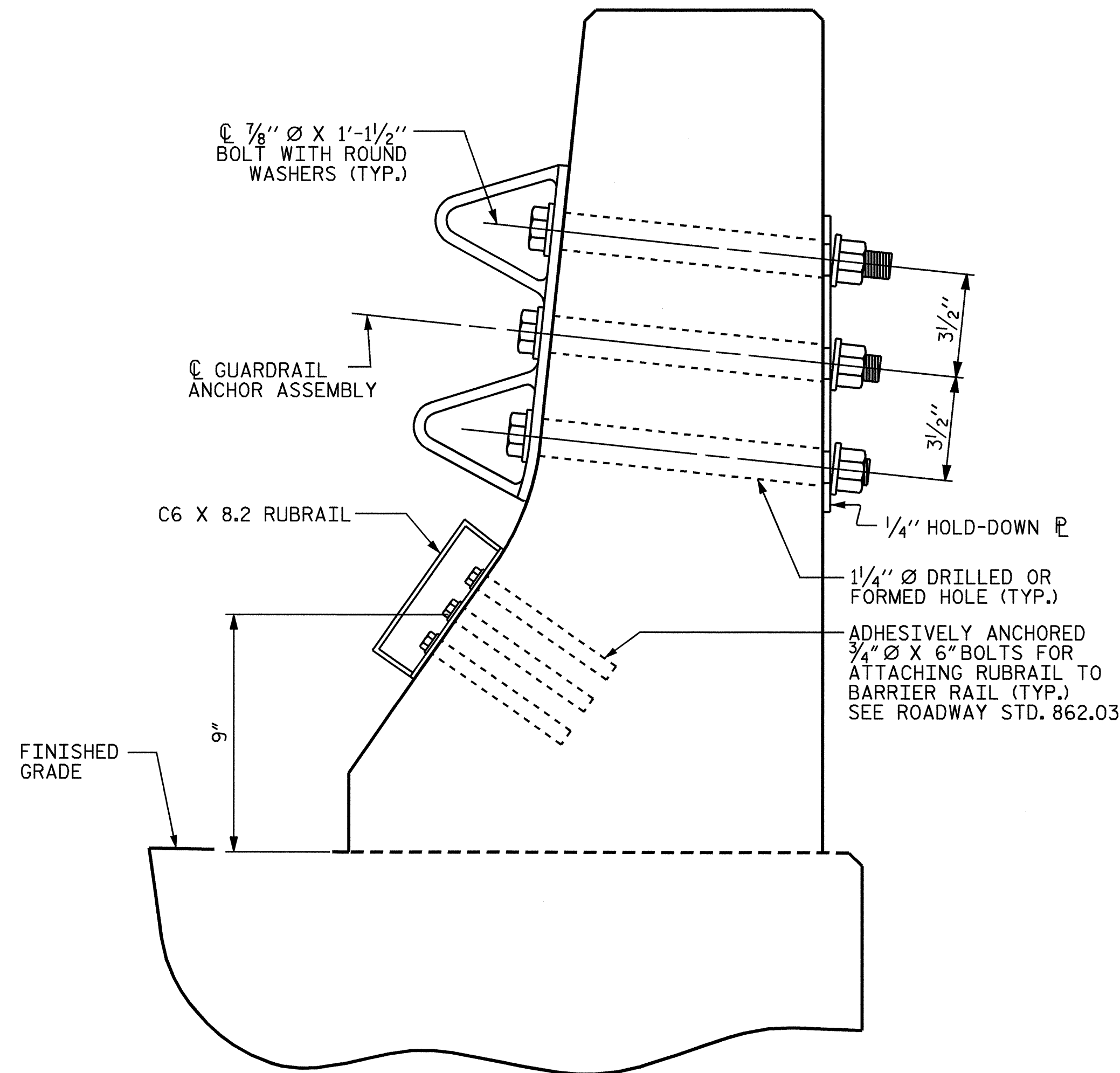
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.



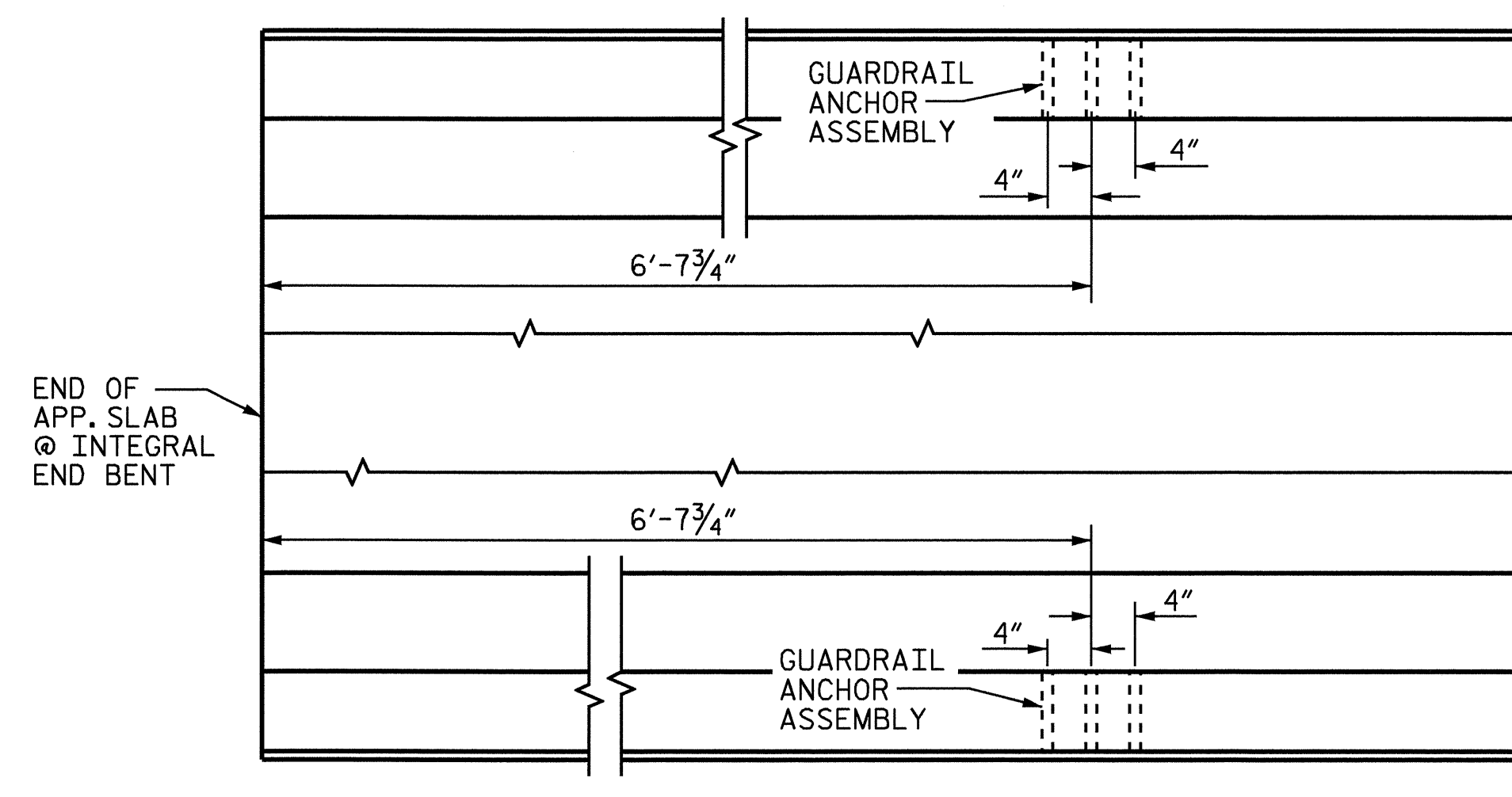
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

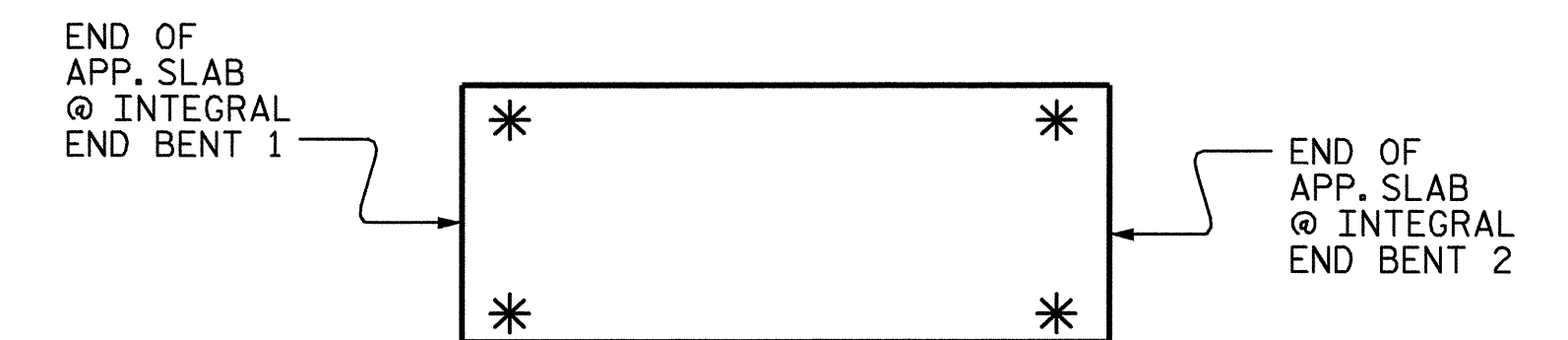
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 2

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

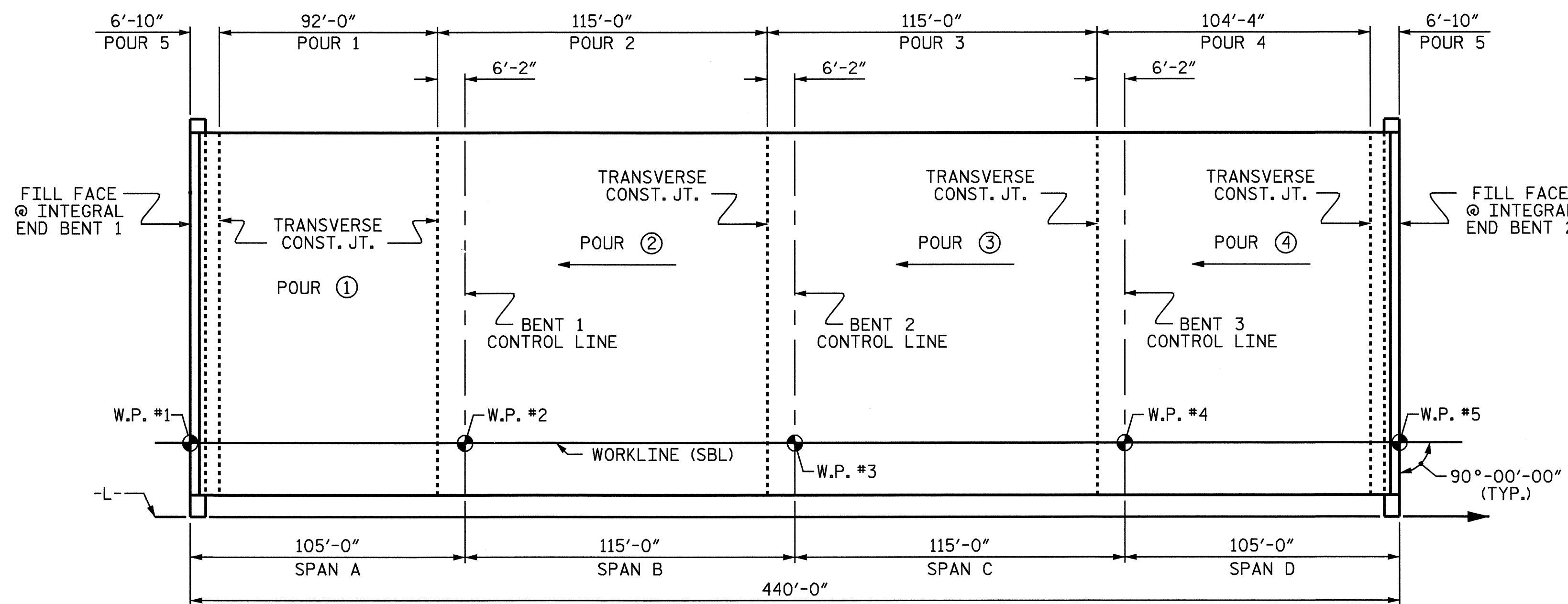


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
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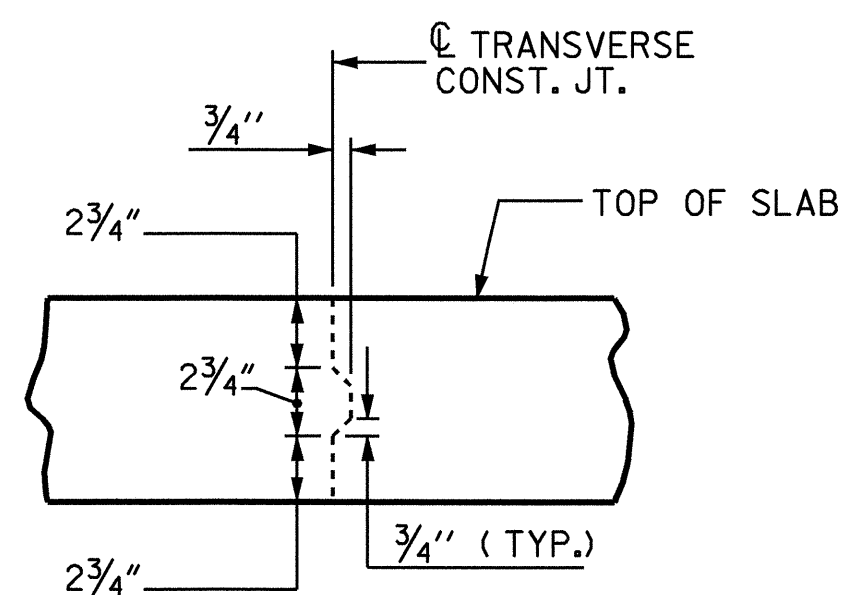
ASSEMBLED BY : B.N. GRADY	DATE : 4/9/08
CHECKED BY : E.G. ALLEN	DATE : 6/8/08
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

CONCRETE BREAKDOWN

CLASS AA CONCRETE	
POUR 1	128.4 C.Y.
POUR 2	171.7 C.Y.
POUR 3	171.7 C.Y.
POUR 4	156.7 C.Y.
POUR 5	81.5 C.Y.
<b>TOTAL CLASS AA CONCRETE</b>	<b>710.0 C.Y.</b>

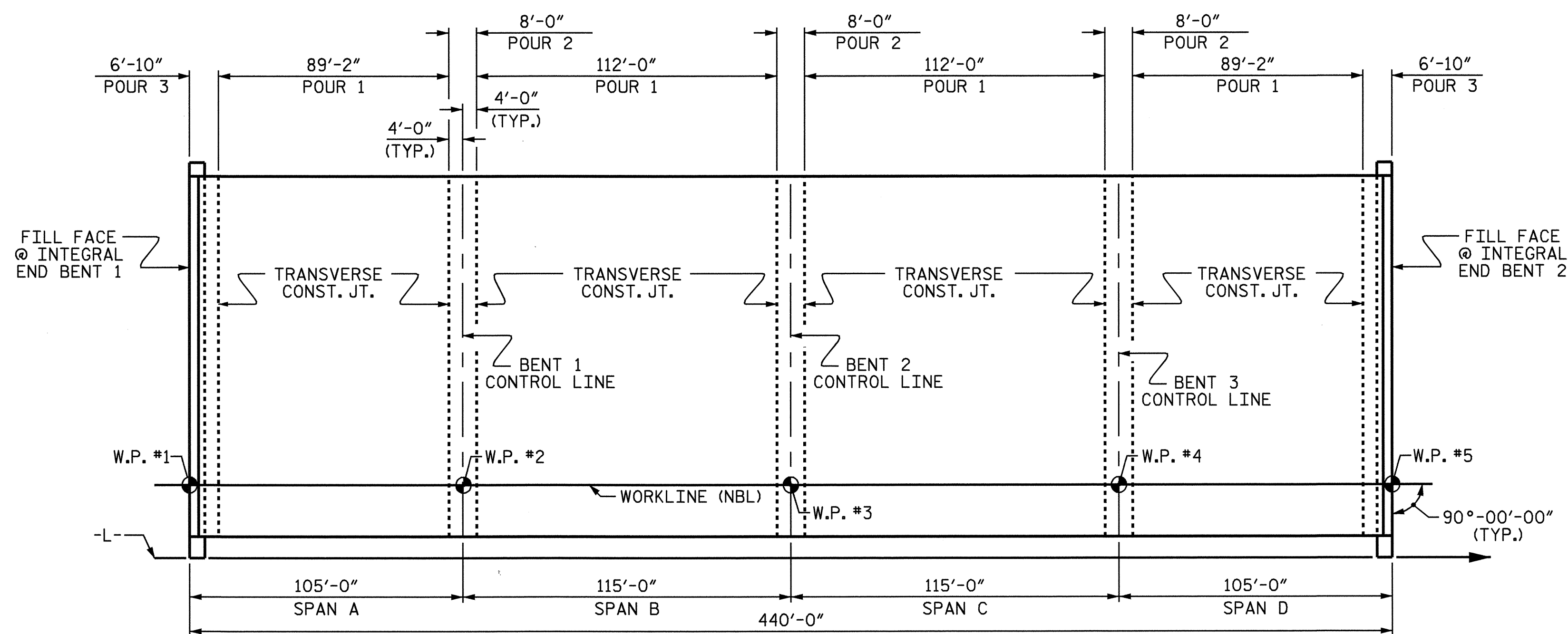


POURING SEQUENCE



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



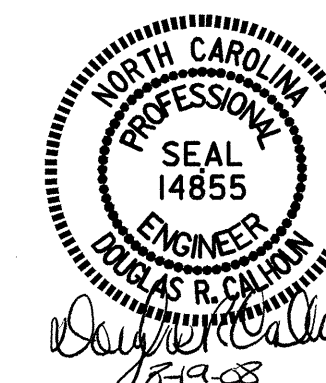
OPTIONAL POURING SEQUENCE

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 BILL OF MATERIAL  
 (SBL)



DRAWN BY : T.L.CLELLAND DATE : 8/1/05  
 CHECKED BY : T.A.HARRIS DATE : 9/2/05

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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-19
2			4			70

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

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

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1480 SQ.FT.
BRIDGE DECK	14454 SQ.FT.
TOTAL	15934 SQ.FT.

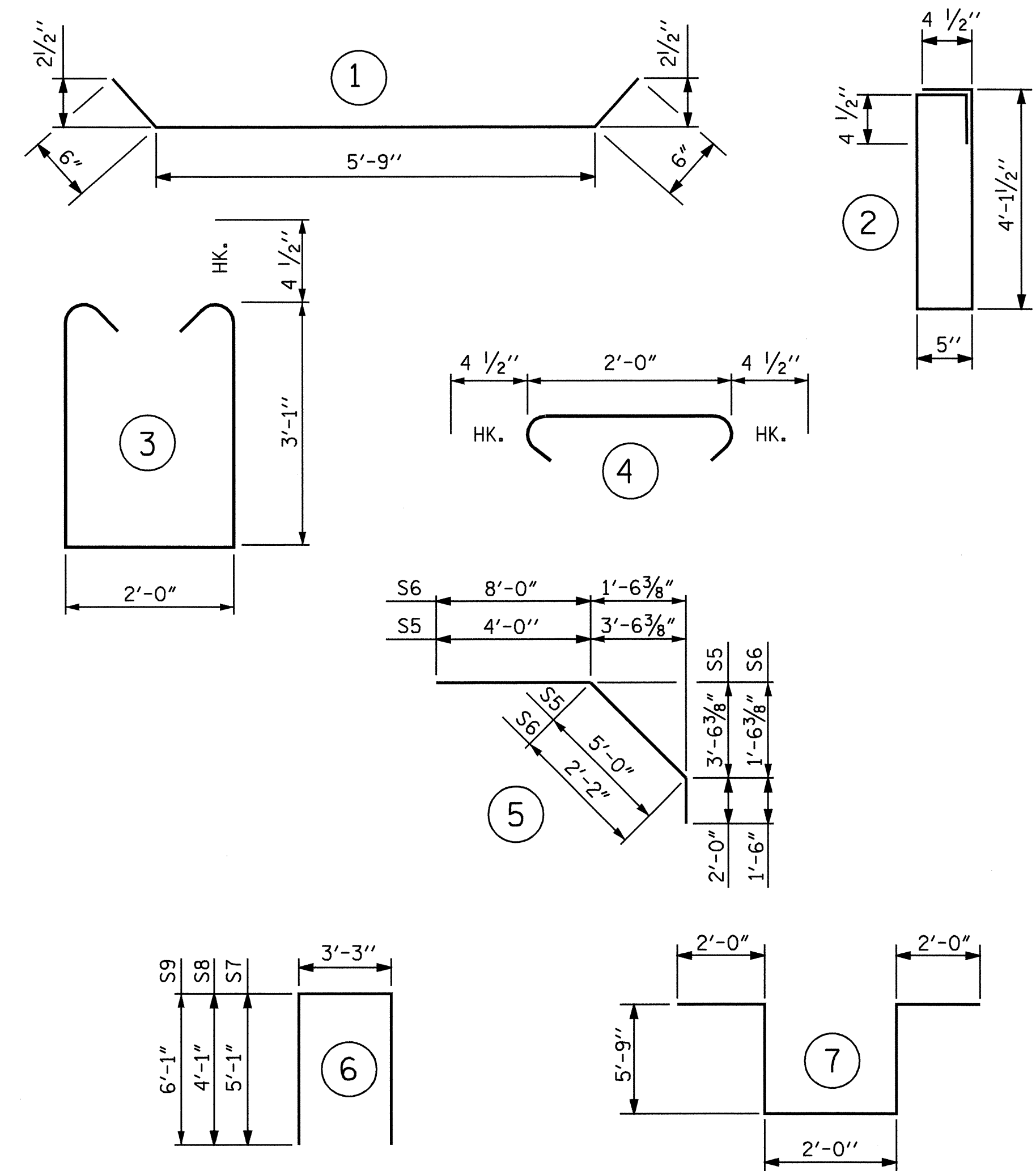
**BILL OF MATERIAL**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	658	#5 STR	38'-11"	26708
A2	658	#5 STR	38'-11"	26708
*B1	168	#4 STR	24'-4"	2731
*B2	112	#4 STR	19'-6"	1459
*B3	50	#7 STR	34'-0"	3475
*B4	168	#7 STR	29'-6"	10130
*B5	25	#7 STR	36'-0"	1840
*B6	84	#7 STR	30'-10"	5294
B7	240	#5 STR	56'-8"	14185
B8	48	#5 STR	21'-0"	1051
*B9	100	#5 STR	21'-0"	2190
D1	28	#6 STR	3'-0"	126
E1	32	#4 STR	3'-0"	64
K1	64	#5	6'-9"	451
K2	256	#5 STR	7'-1"	1891
K3	24	#4 STR	4'-1"	65
K4	96	#4 STR	7'-1"	454
K5	24	#4 STR	4'-4"	69
K6	36	#4 STR	17'-0"	409
K7	24	#4 STR	23'-5"	375
K8	8	#4 STR	4'-1"	22
K9	32	#4 STR	7'-1"	151
K10	8	#4 STR	5'-6"	29
K11	16	#4 STR	2'-8"	29
K12	4	#4 STR	4'-6"	12
K13	16	#4 STR	6'-0"	64
K14	4	#4 STR	5'-2"	14
S1	192	#4	9'-10"	1261
S2	24	#4	8'-11"	158
S3	60	#4	17'-6"	701
S4	348	#4	2'-9"	639
*S5	44	#4	11'-0"	323
*S6	48	#4	11'-8"	374
S7	76	#4	13'-5"	681
S8	20	#4	11'-5"	153
S9	24	#4	15'-5"	247

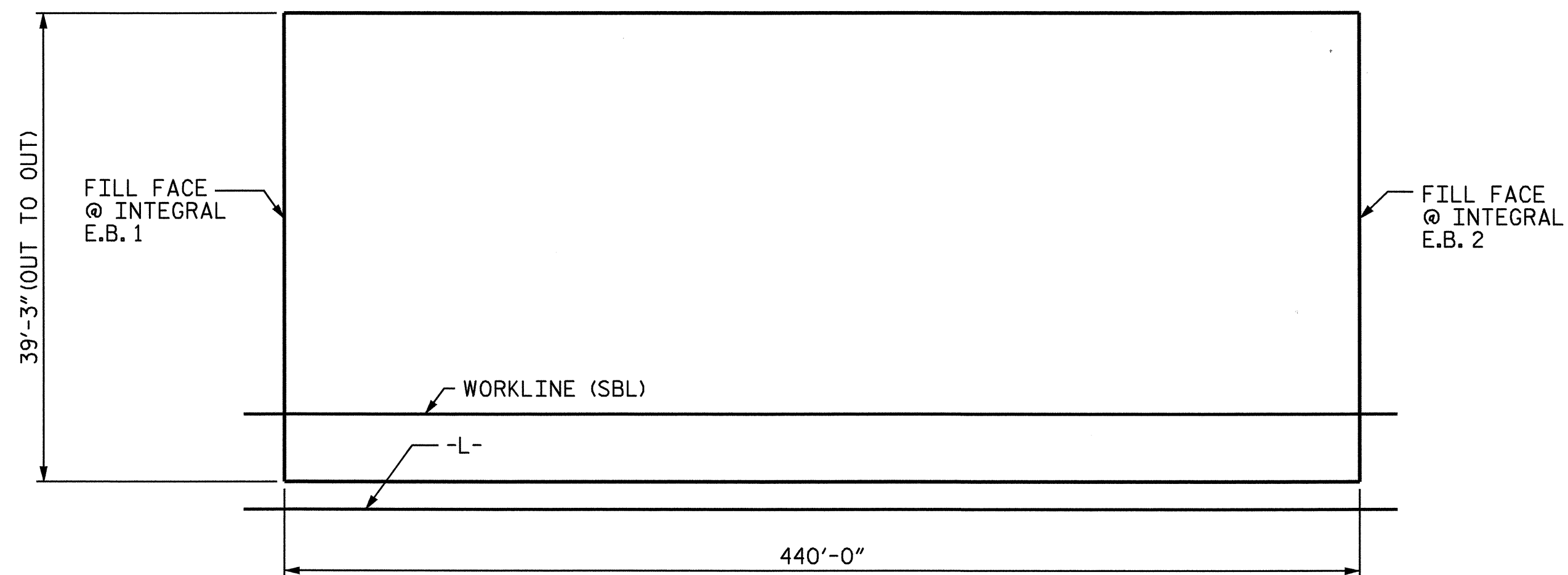
REINFORCING STEEL 49927 LBS.

\* EPOXY COATED REINFORCING STEEL 54524 LBS.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 17,270)

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	128.4		
POUR 2	171.7		
POUR 3	171.7		
POUR 4	156.7		
POUR 5	81.5		
TOTALS**	710.0	49927	54524

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL  
(SBL)

OCTOBER 1987

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			



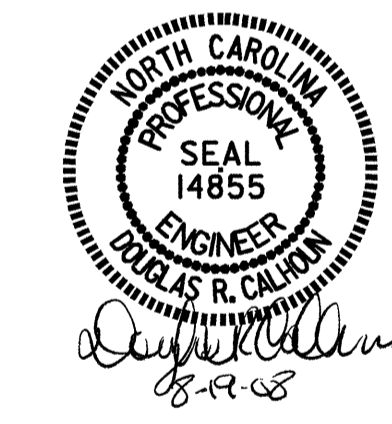
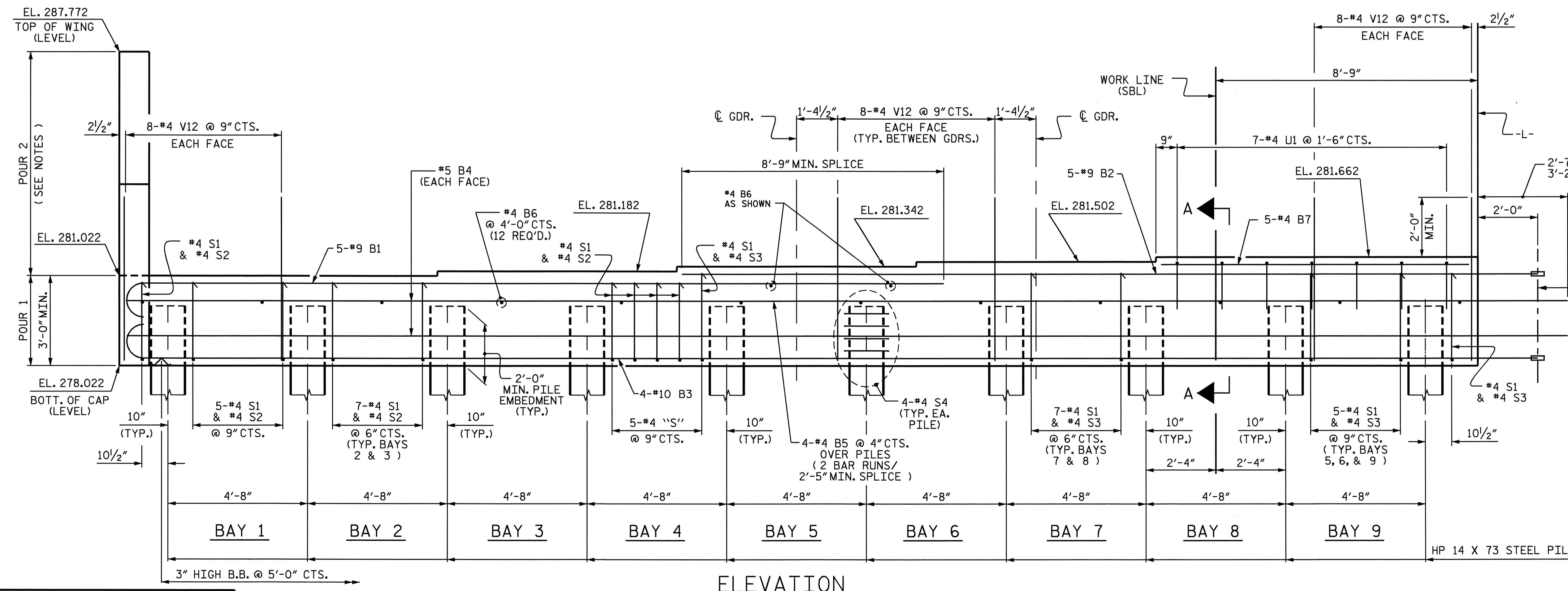
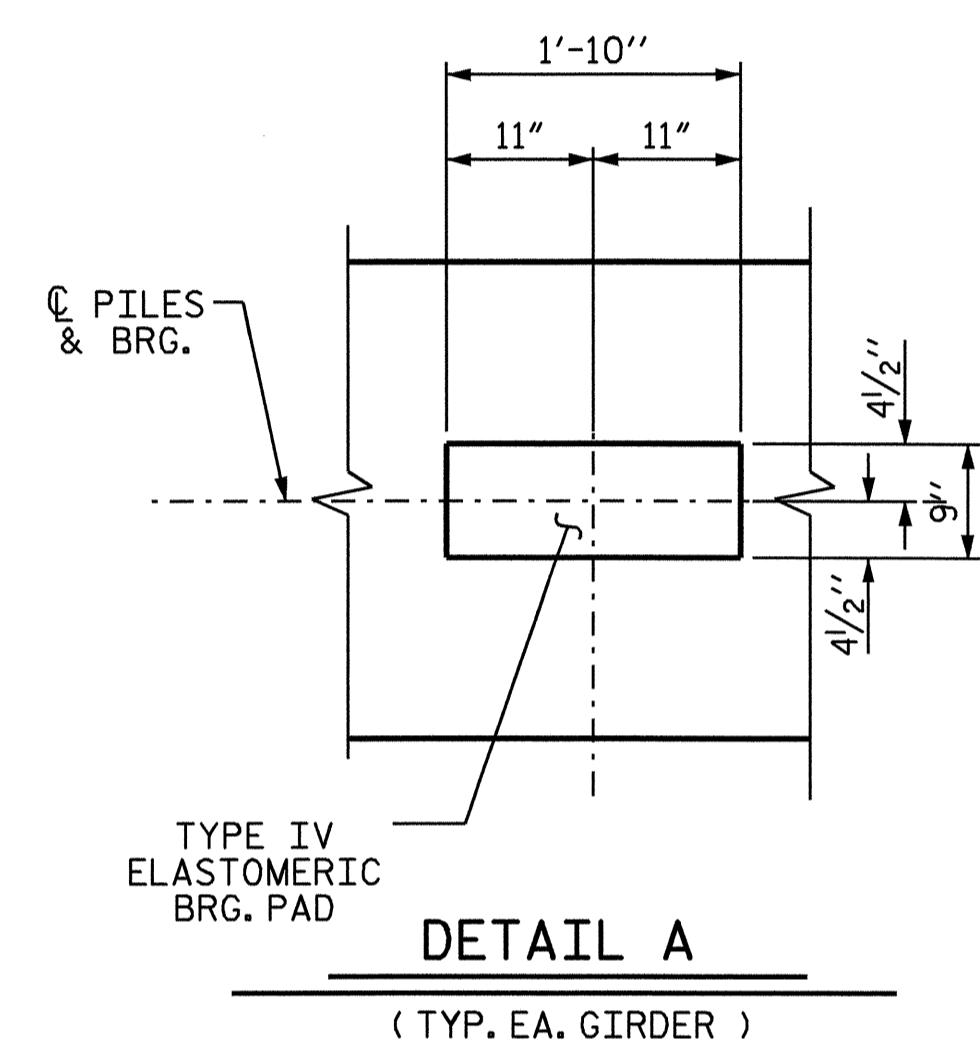
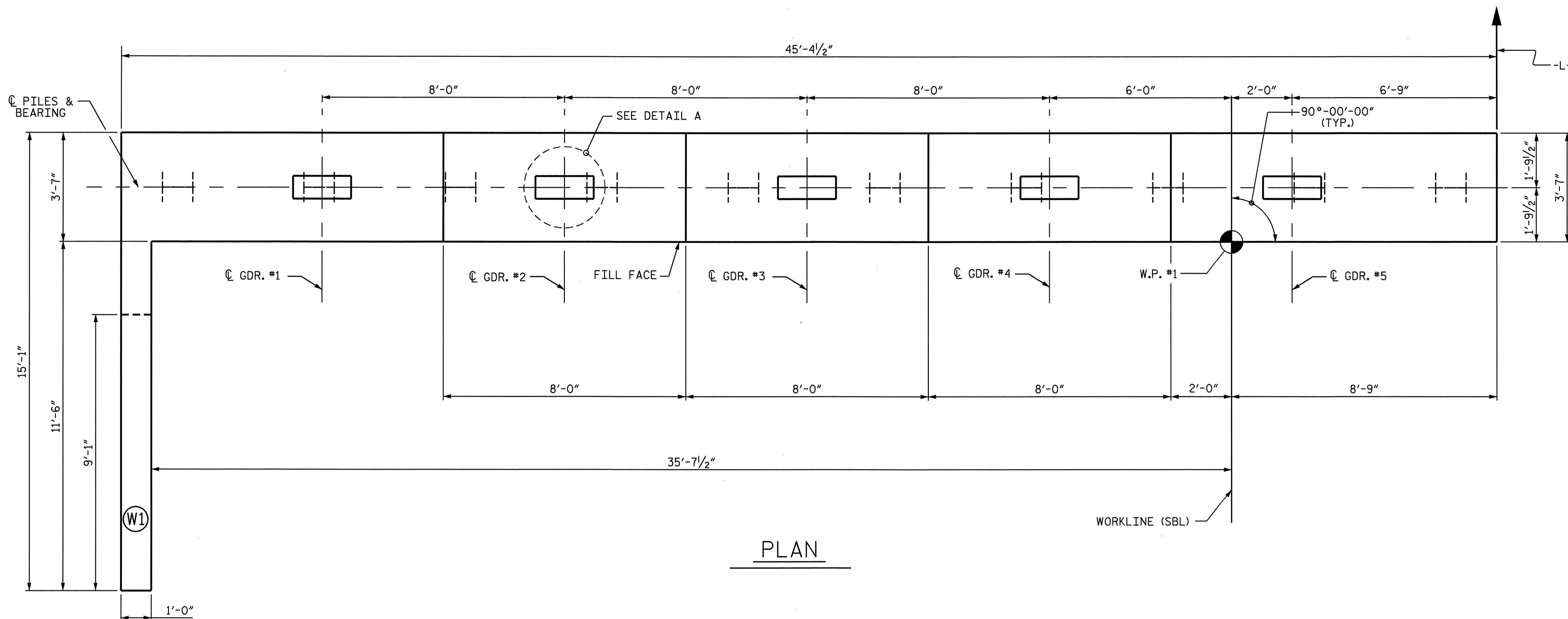
ASSEMBLED BY : T.L.CLELLAND	DATE : 8/1/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES

NOTES

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS (POUR 2) ARE TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE REINFORCING STEEL AS SHOWN ON THE PLANS AND ACCORDING TO SECTION 1070-10 OF THE STANDARD SPECIFICATIONS.



MECHANICAL BUTT SPLICE (SEE NOTES)

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

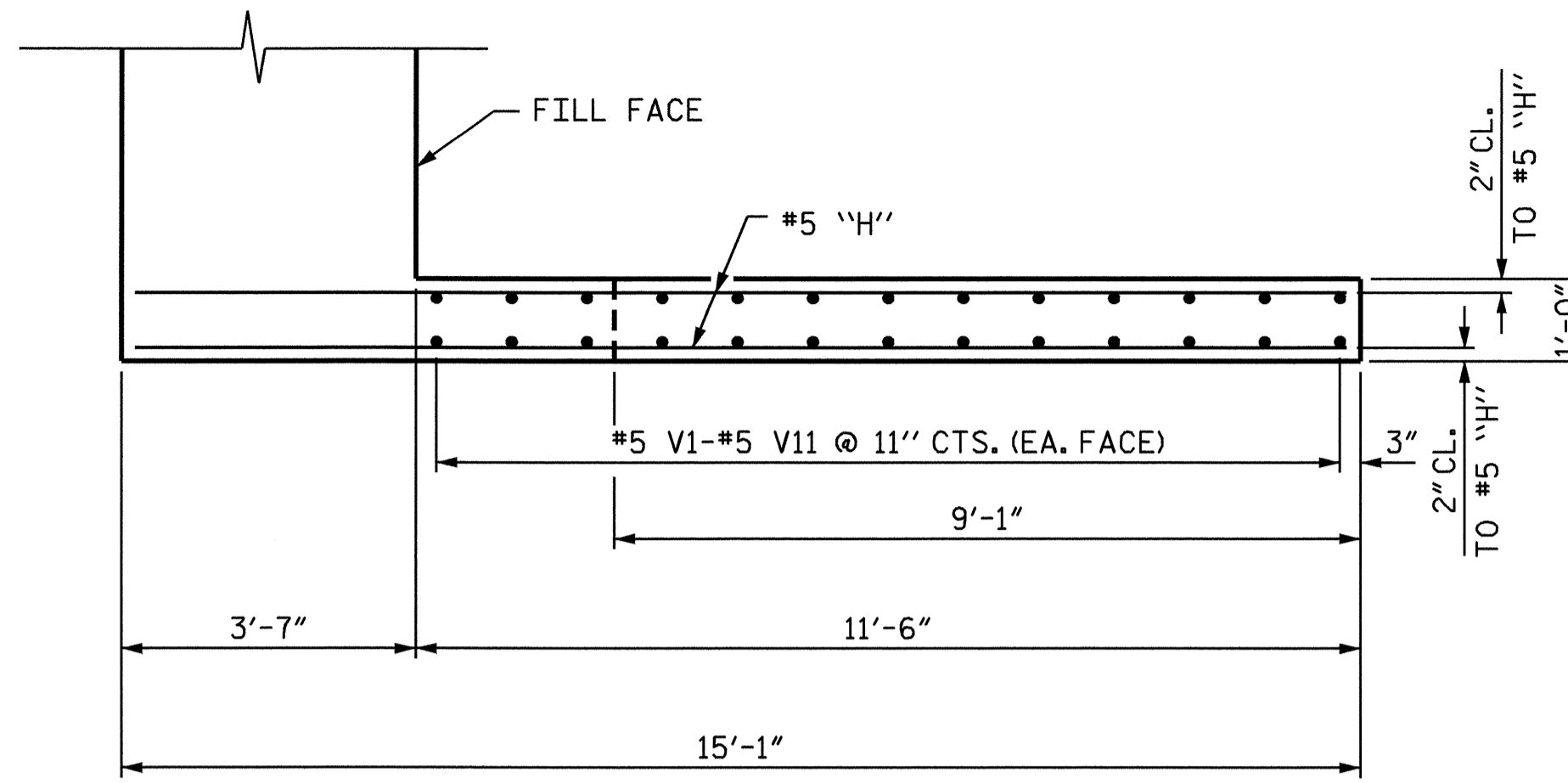
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1  
 (SBL)**

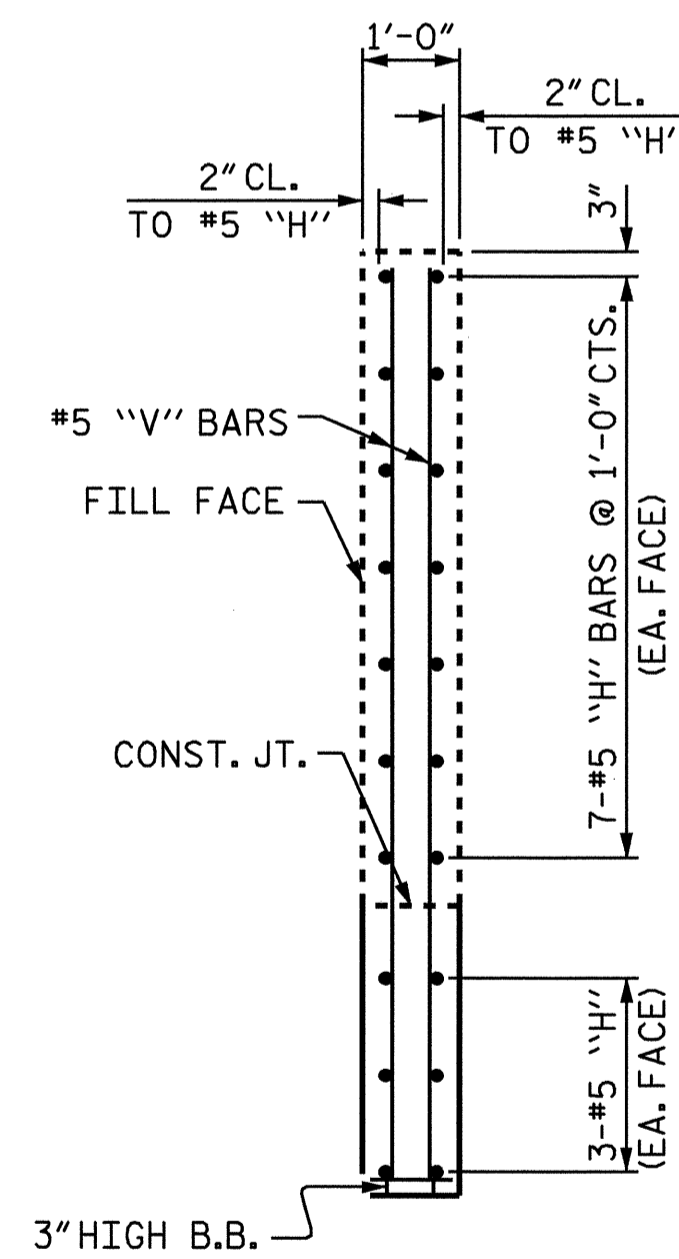
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			70

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05

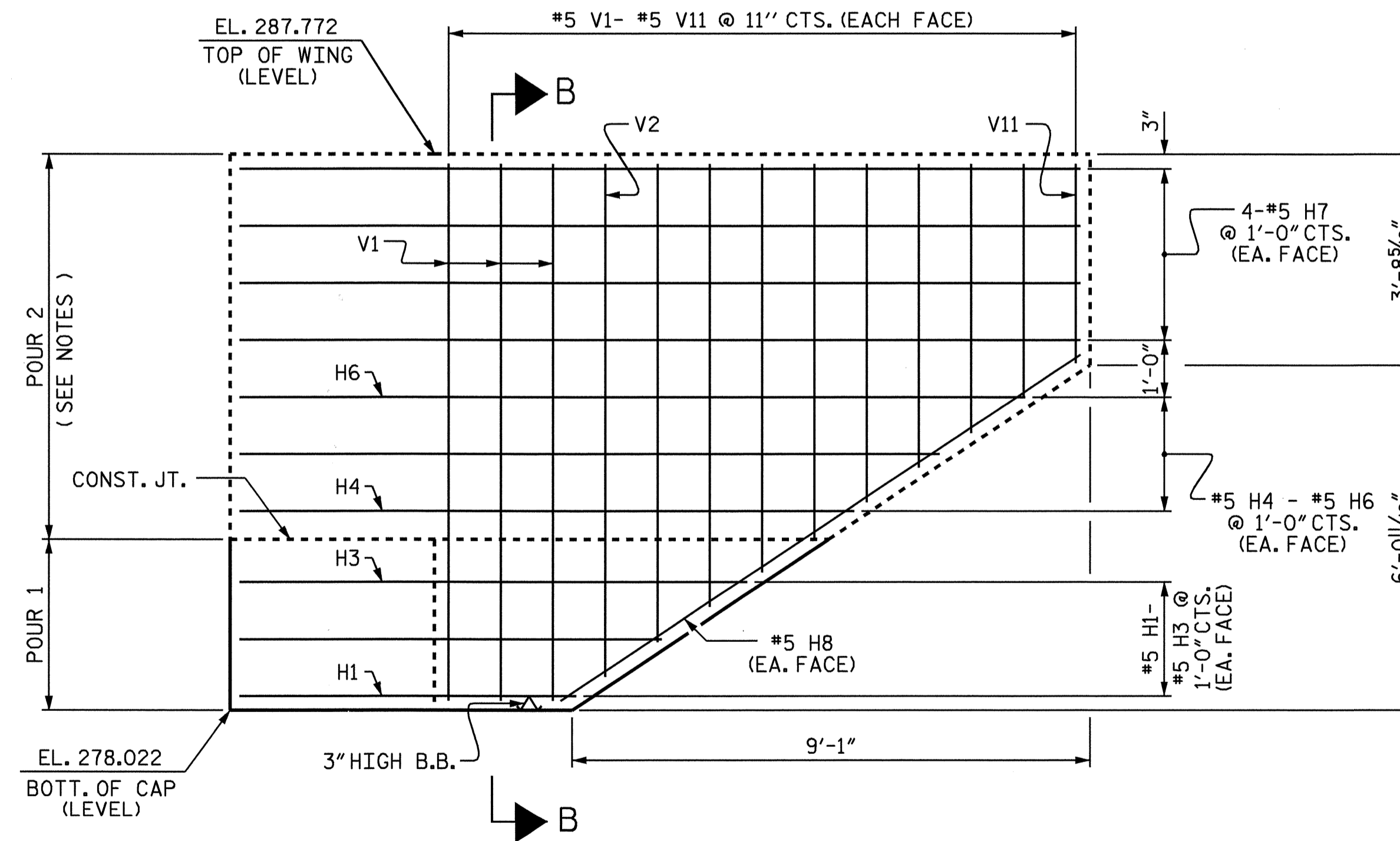
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 bng Brady



(W1) PLAN



SECTION B-B



(W1) ELEVATION

WING DETAILS

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

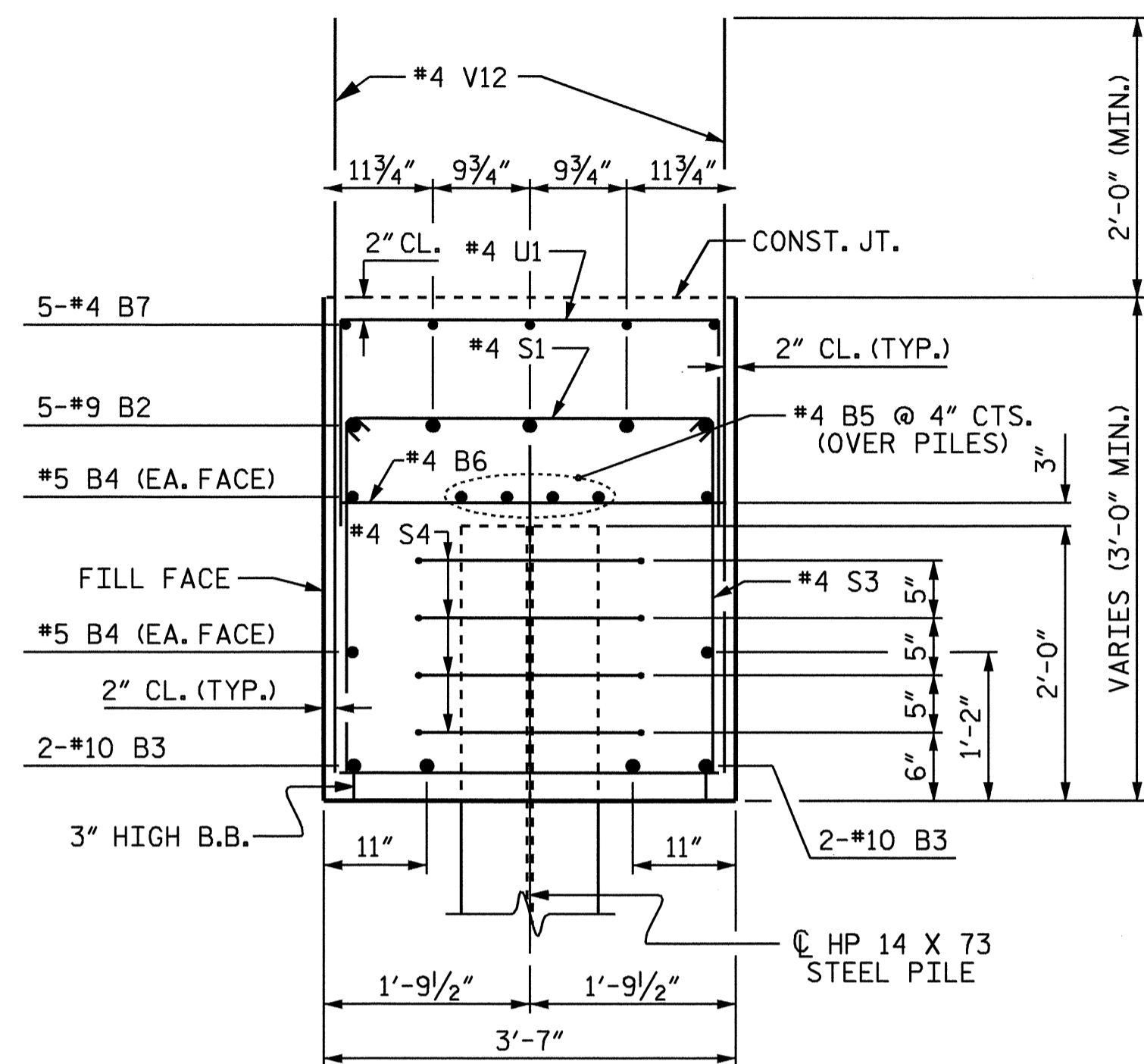
END BENT 1  
 (SBL)



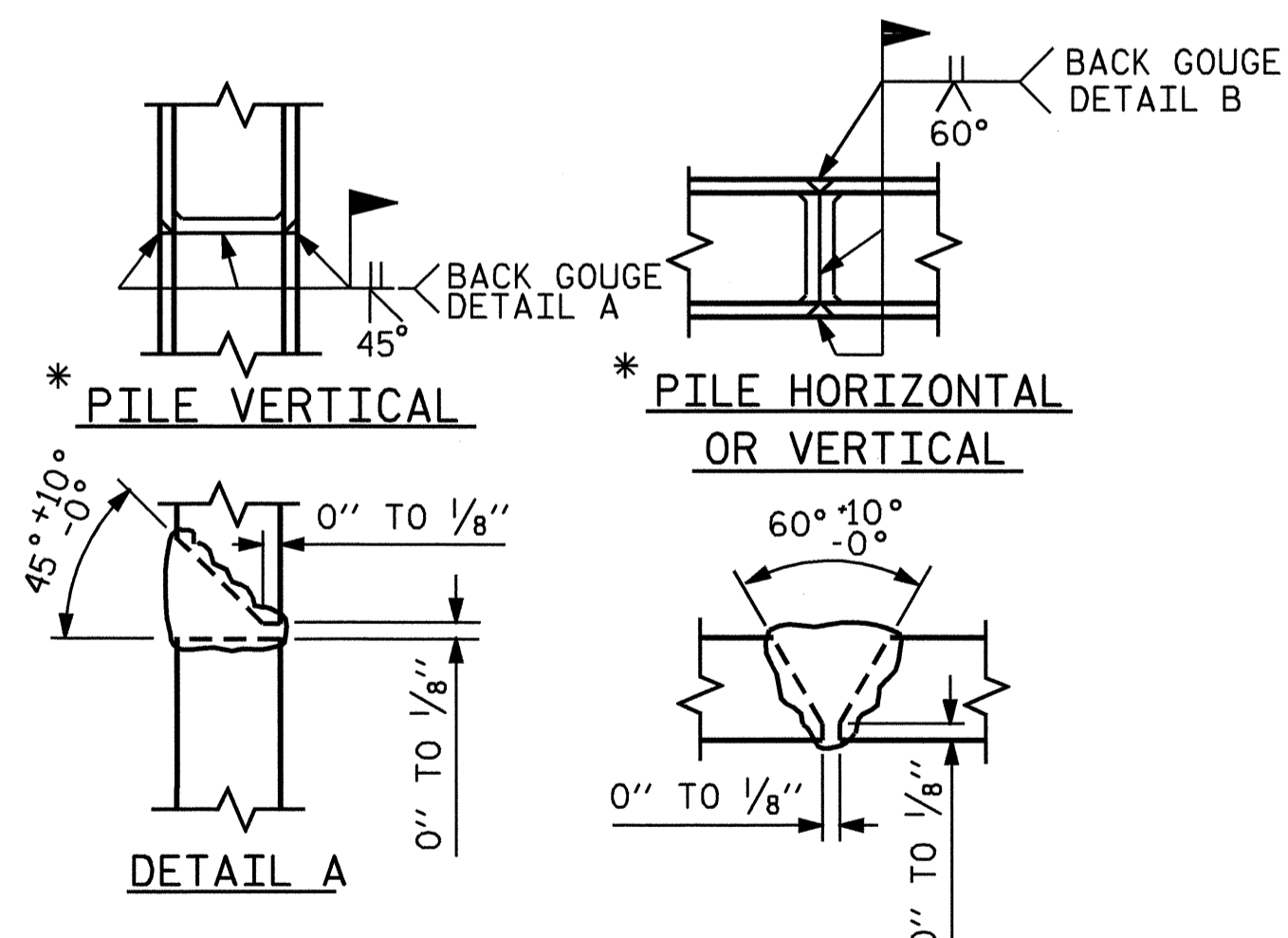
DRAWN BY : J.B. WILSON DATE : 10/06/05  
 CHECKED BY : J. MYA DATE : 10/31/05

19-AUG-2008 10:16  
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1			3			TOTAL SHEETS
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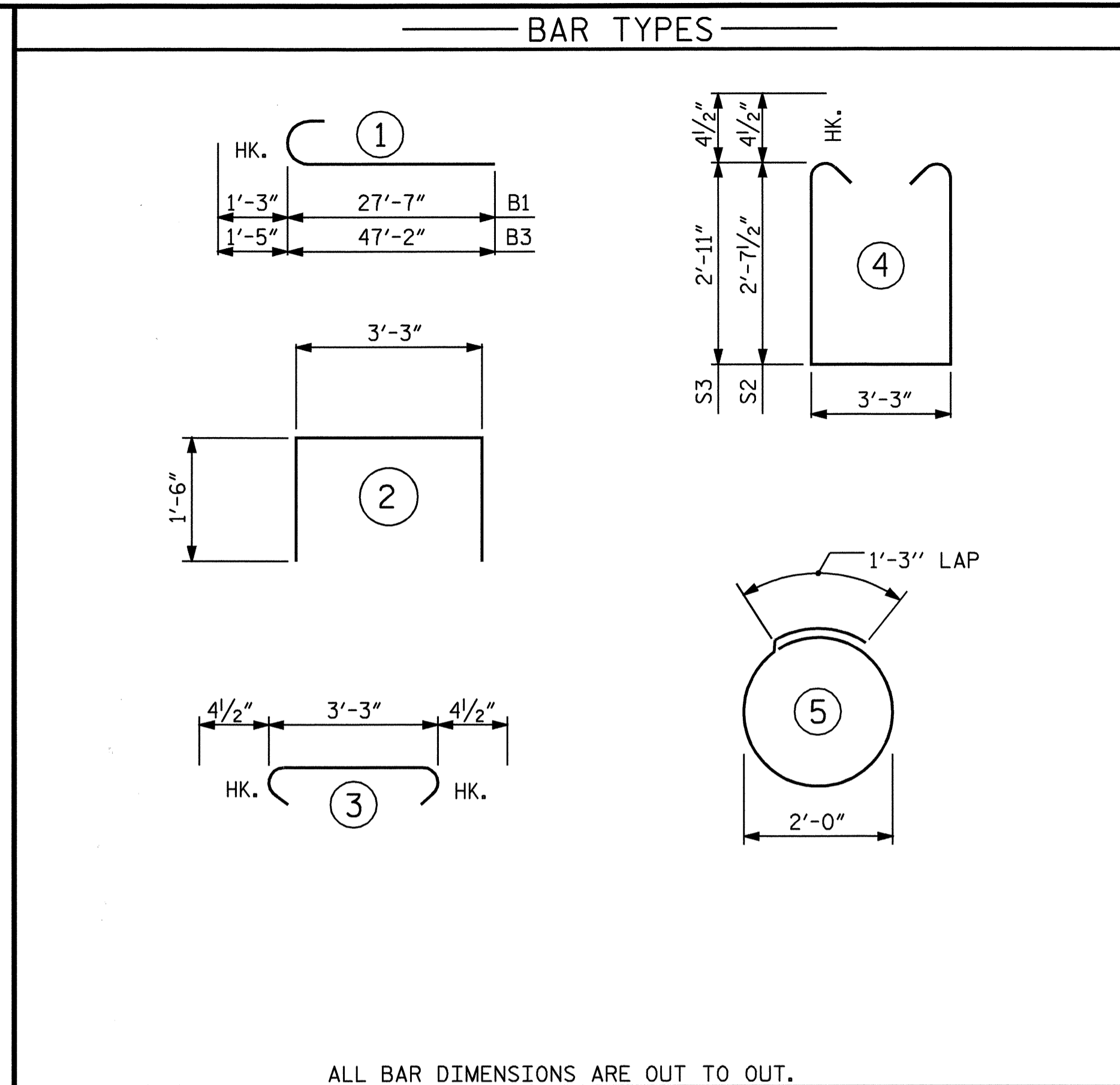


SECTION A-A



\* POSITION OF PILE DURING WELDING. DETAIL B

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	28'-10"	490	V1	6	#5	STR	9'-5"	59
B2	5	#9	STR	28'-7"	486	V2	2	#5	STR	8'-11"	19
B3	4	#10	1	48'-7"	836	V3	2	#5	STR	8'-4"	17
B4	4	#5	STR	48'-4"	202	V4	2	#5	STR	7'-9"	16
B5	8	#4	STR	25'-2"	134	V5	2	#5	STR	7'-1"	15
B6	14	#4	STR	3'-3"	30	V6	2	#5	STR	6'-6"	14
B7	5	#4	STR	10'-5"	35	V7	2	#5	STR	5'-11"	12
						V8	2	#5	STR	5'-3"	11
H1	2	#5	STR	5'-10"	12	V9	2	#5	STR	4'-8"	10
H2	2	#5	STR	7'-4"	15	V10	2	#5	STR	4'-1"	9
H3	2	#5	STR	8'-10"	18	V11	2	#5	STR	3'-5"	7
H4	2	#5	STR	10'-9"	22	V12	96	#4	STR	5'-6"	353
H5	2	#5	STR	12'-3"	26						
H6	2	#5	STR	13'-9"	29						
H7	8	#5	STR	14'-9"	123						
H8	2	#5	STR	10'-11"	23						

REINFORCING STEEL = 3754 LBS

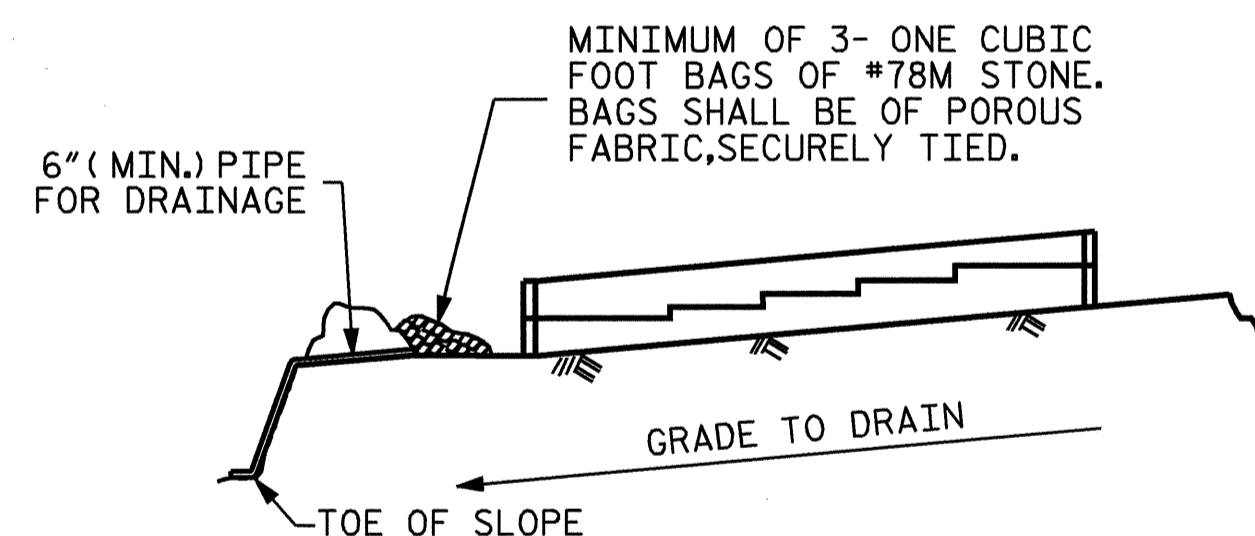
CLASS A CONCRETE BREAKDOWN

▲ POUR 1 (CAP AND LOWER PART OF WINGS) 20.9 CU.YDS.  
TOTAL 20.9 CU.YDS.

HP 14 x 73 STEEL PILES

NO. 10 250 FT.

▲ UPPER WINGS (POUR 2) TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE



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.

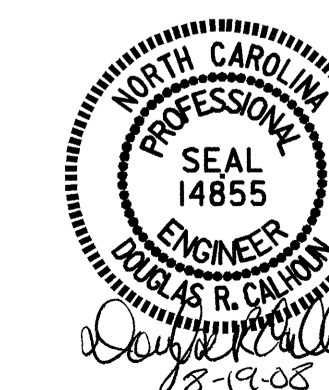
TEMPORARY DRAINAGE AT END BENT

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT 1  
(SBL)



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS	
2			4			70	

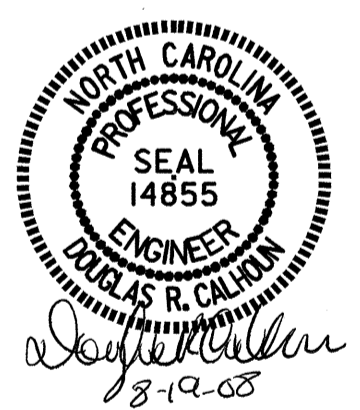
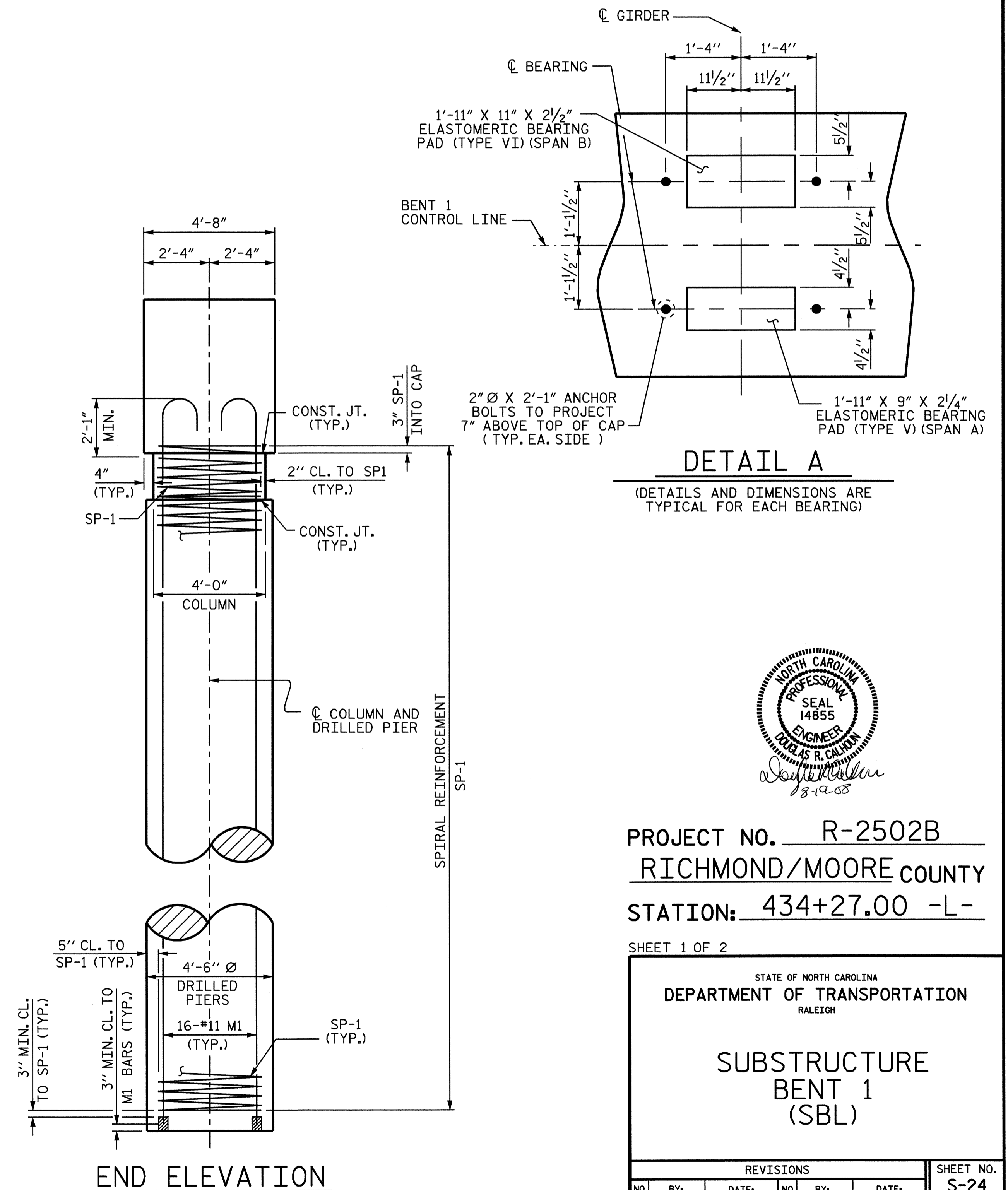
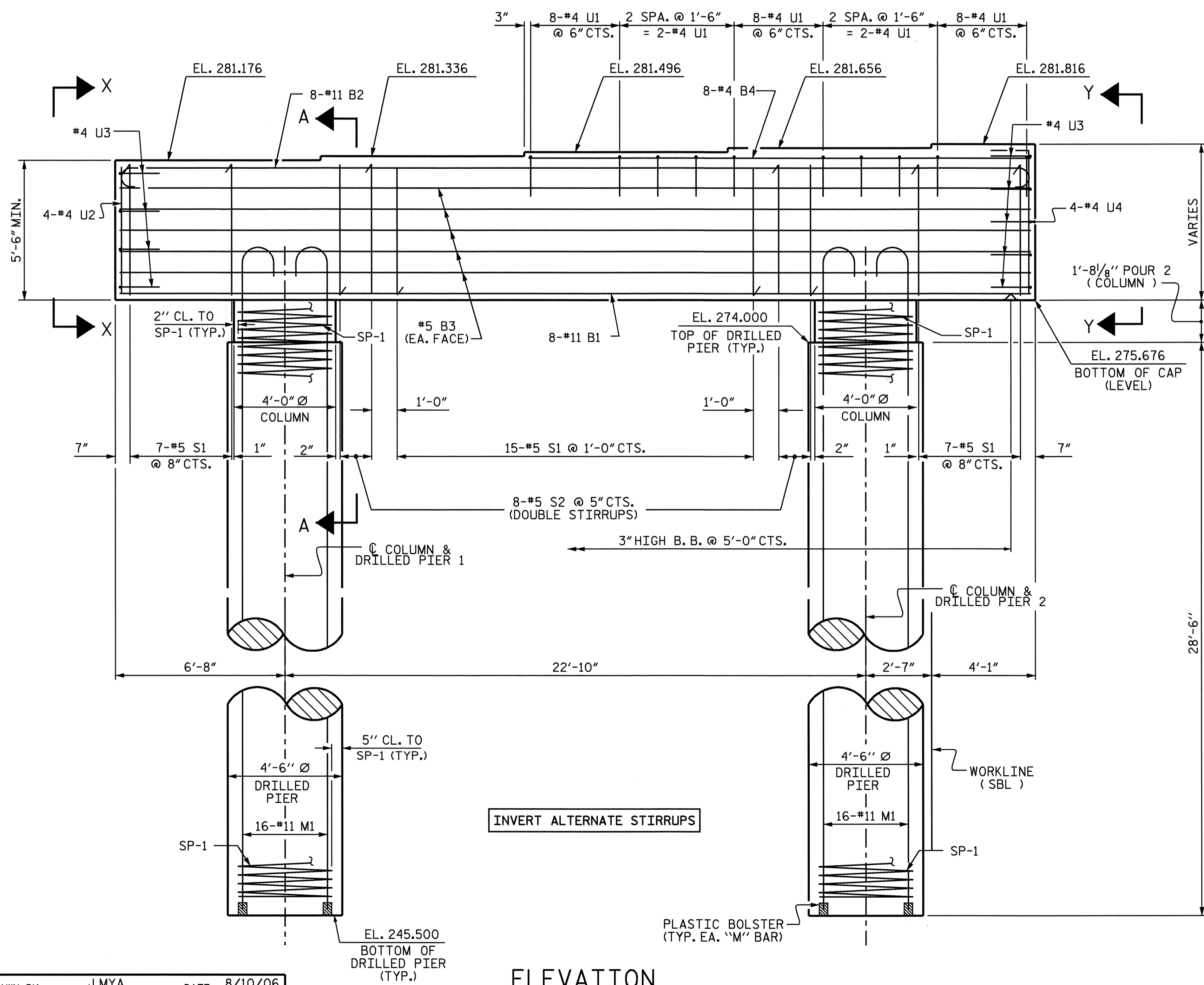
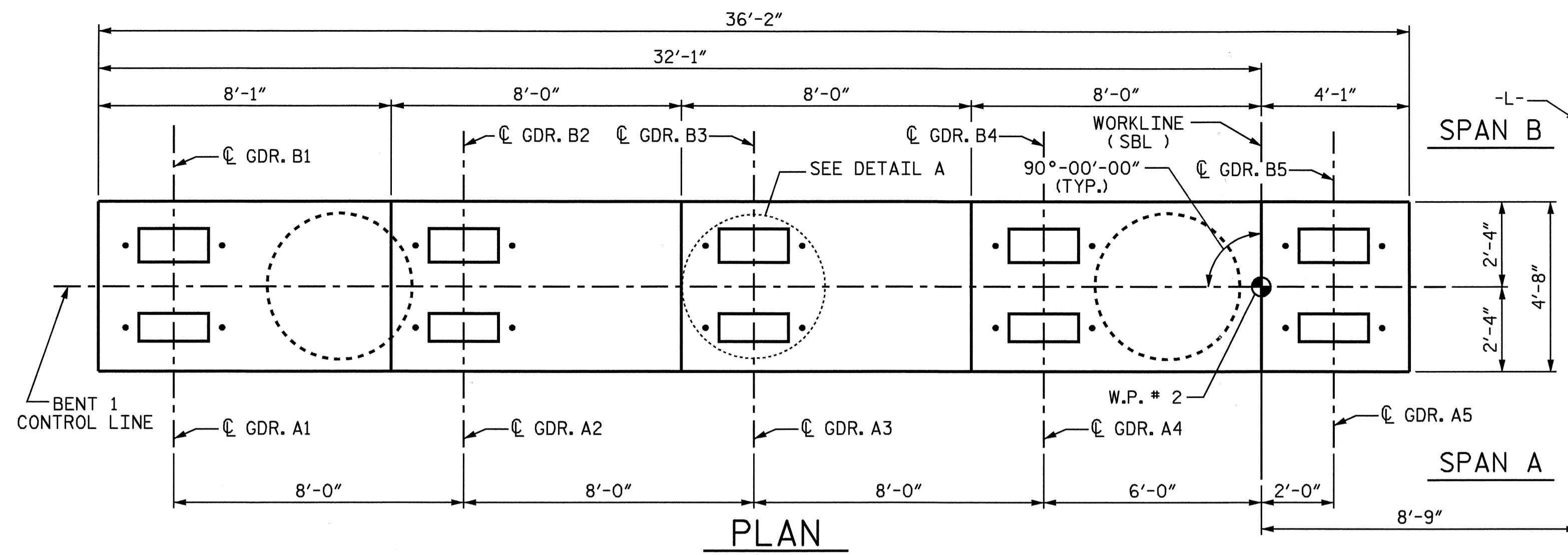
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CHECKED BY: J. MYA DATE: 10/31/05

19-AUG-2008 10:16  
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bngrddy



NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

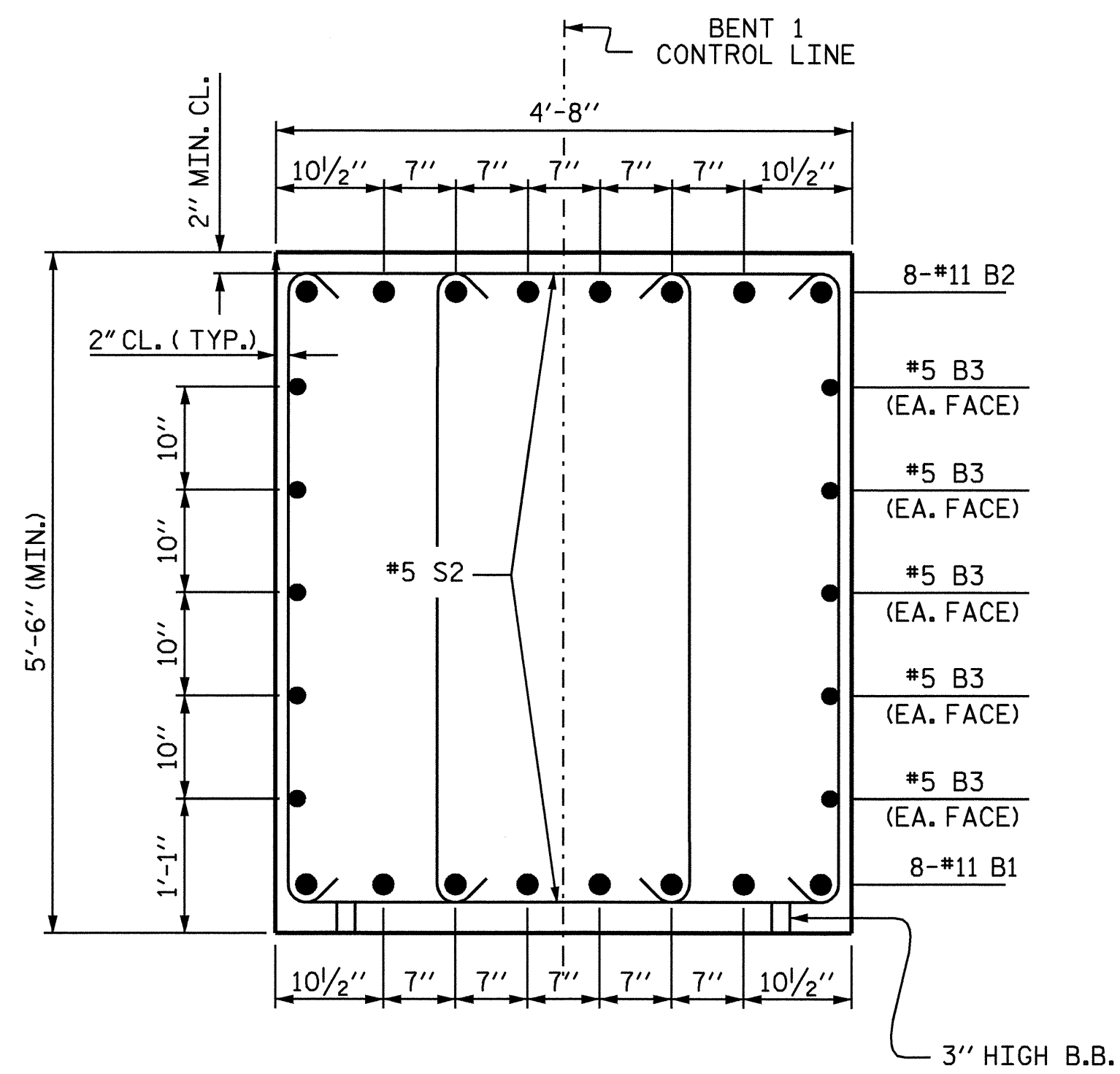
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1  
 (SBL)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS 70	
2			4				

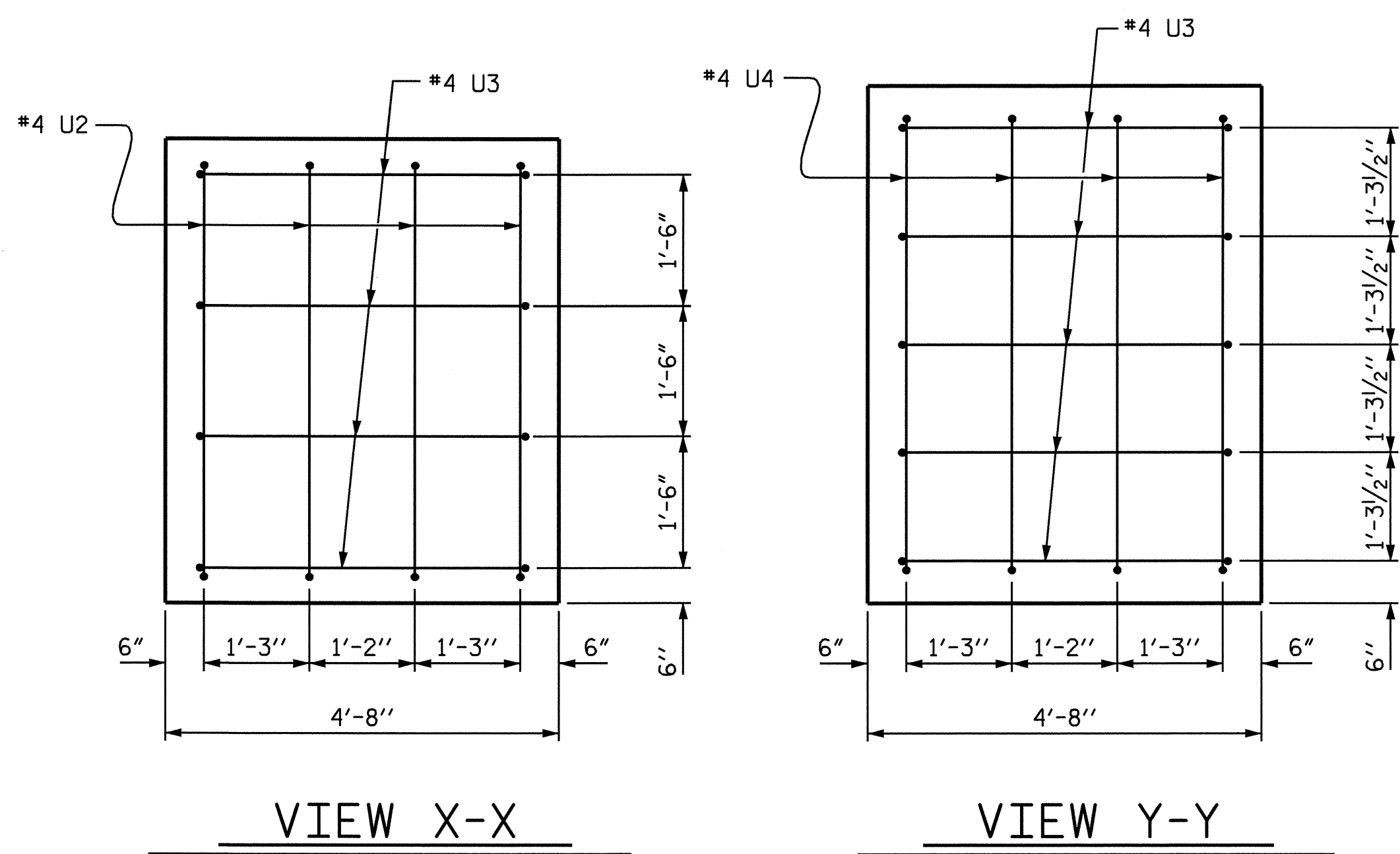
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19-AUG-2008 10:16  
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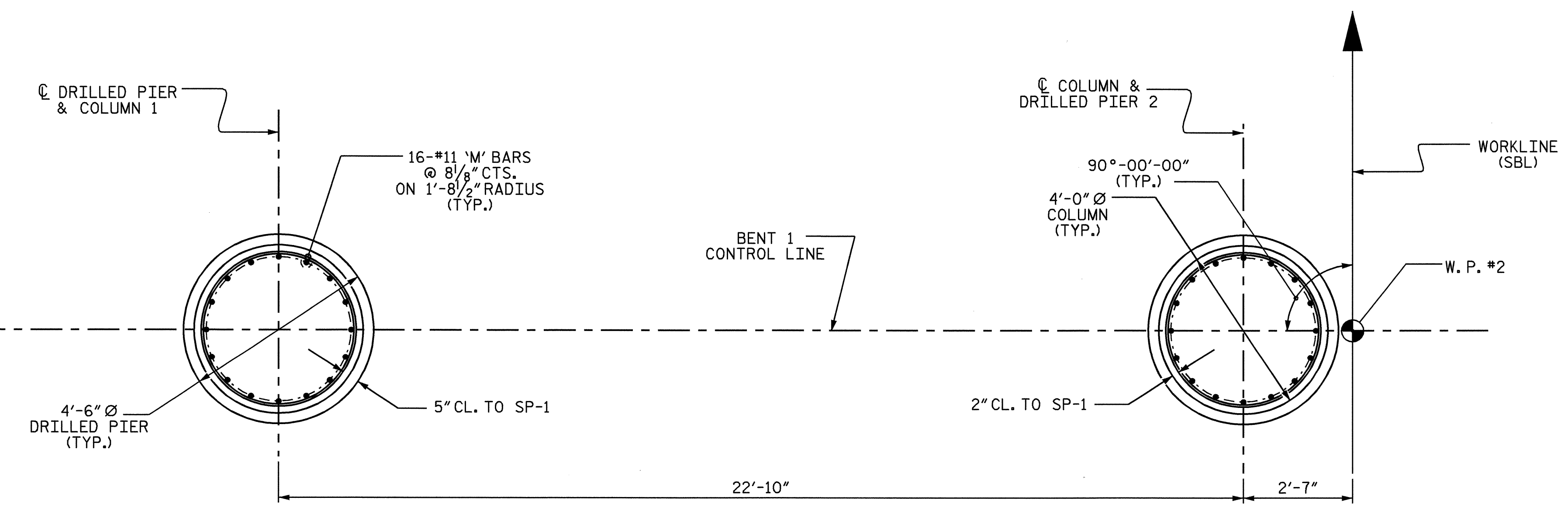
**SECTION A-A**

(SHOWING DOUBLE STIRRUPS (S2)  
SEE ELEVATION ON SHEET 1 OF 2  
FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**

**VIEW Y-Y**



**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY: J.MYA DATE: 8/10/06  
CHECKED BY: J.B. WILSON DATE: 8/29/06

19-AUG-2008 10:16  
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bngrdy

BAR TYPES						BILL OF MATERIAL																																																																													
						<p><b>BENT 1</b></p> <table border="1"> <thead> <tr> <th>BAR</th> <th>NO.</th> <th>SIZE</th> <th>TYPE</th> <th>LENGTH</th> <th>WEIGHT</th> </tr> </thead> <tbody> <tr><td>B1</td><td>8</td><td>#11</td><td>STR</td><td>35'-10"</td><td>1523</td></tr> <tr><td>B2</td><td>8</td><td>#11</td><td>1</td><td>38'-11"</td><td>1654</td></tr> <tr><td>B3</td><td>10</td><td>#5</td><td>STR</td><td>35'-10"</td><td>374</td></tr> <tr><td>B4</td><td>8</td><td>#4</td><td>STR</td><td>19'-9"</td><td>106</td></tr> <tr><td>M1</td><td>32</td><td>#11</td><td>2</td><td>36'-7"</td><td>6220</td></tr> <tr><td>S1</td><td>29</td><td>#5</td><td>3</td><td>15'-6"</td><td>469</td></tr> <tr><td>S2</td><td>16</td><td>#5</td><td>3</td><td>14'-4"</td><td>239</td></tr> <tr><td>U1</td><td>44</td><td>#4</td><td>4</td><td>6'-10"</td><td>201</td></tr> <tr><td>U2</td><td>4</td><td>#4</td><td>4</td><td>7'-6"</td><td>20</td></tr> <tr><td>U3</td><td>9</td><td>#4</td><td>4</td><td>6'-8"</td><td>40</td></tr> <tr><td>U4</td><td>4</td><td>#4</td><td>4</td><td>8'-2"</td><td>22</td></tr> </tbody> </table>						BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	B1	8	#11	STR	35'-10"	1523	B2	8	#11	1	38'-11"	1654	B3	10	#5	STR	35'-10"	374	B4	8	#4	STR	19'-9"	106	M1	32	#11	2	36'-7"	6220	S1	29	#5	3	15'-6"	469	S2	16	#5	3	14'-4"	239	U1	44	#4	4	6'-10"	201	U2	4	#4	4	7'-6"	20	U3	9	#4	4	6'-8"	40	U4	4	#4	4	8'-2"	22
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT																																																																														
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U4	4	#4	4	8'-2"	22																																																																														
						<p>REINFORCING STEEL = 10,868 LBS</p>																																																																													
						<p>SP-1 2 * 5 842'-7" 1758</p>																																																																													
						<p>SPIRAL COLUMN REINFORCING STEEL = 1758 LBS.</p>																																																																													
						<p>CLASS A CONCRETE BREAKDOWN</p>																																																																													
						<p>POUR #2 (COLUMNS) 1.6 C.Y.</p>																																																																													
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						<p>TOTAL 37.8 C.Y.</p>																																																																													
<p>ALL BAR DIMENSIONS ARE OUT TO OUT.</p>						<p>DRILLED PIERS</p>																																																																													
<p>* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.</p>						<p>DRILLED PIER CONCRETE</p>																																																																													
<p>▲ SEE NOTES</p>						<p>POUR #1 (DRILLED PIERS) 33.6 C.Y.</p>																																																																													
<p>▲ SEE NOTES</p>						<p>4'-6" Ø DRILLED PIERS IN SOIL 46.4 LIN. FT.</p>																																																																													
<p>▲ SEE NOTES</p>						<p>4'-6" Ø DRILLED PIERS NOT IN SOIL 10.6 LIN. FT.</p>																																																																													
<p>▲ SEE NOTES</p>						<p>PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS LIN. FT. = 50</p>																																																																													
<p>▲ SEE NOTES</p>						<p>SPT TESTING 1 EACH</p>																																																																													
<p>▲ SEE NOTES</p>						<p>CSL TUBES ▲ LIN. FT. = 248.0</p>																																																																													

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

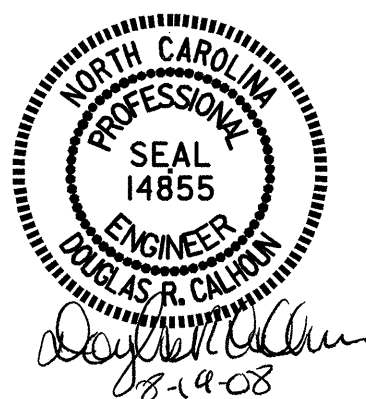
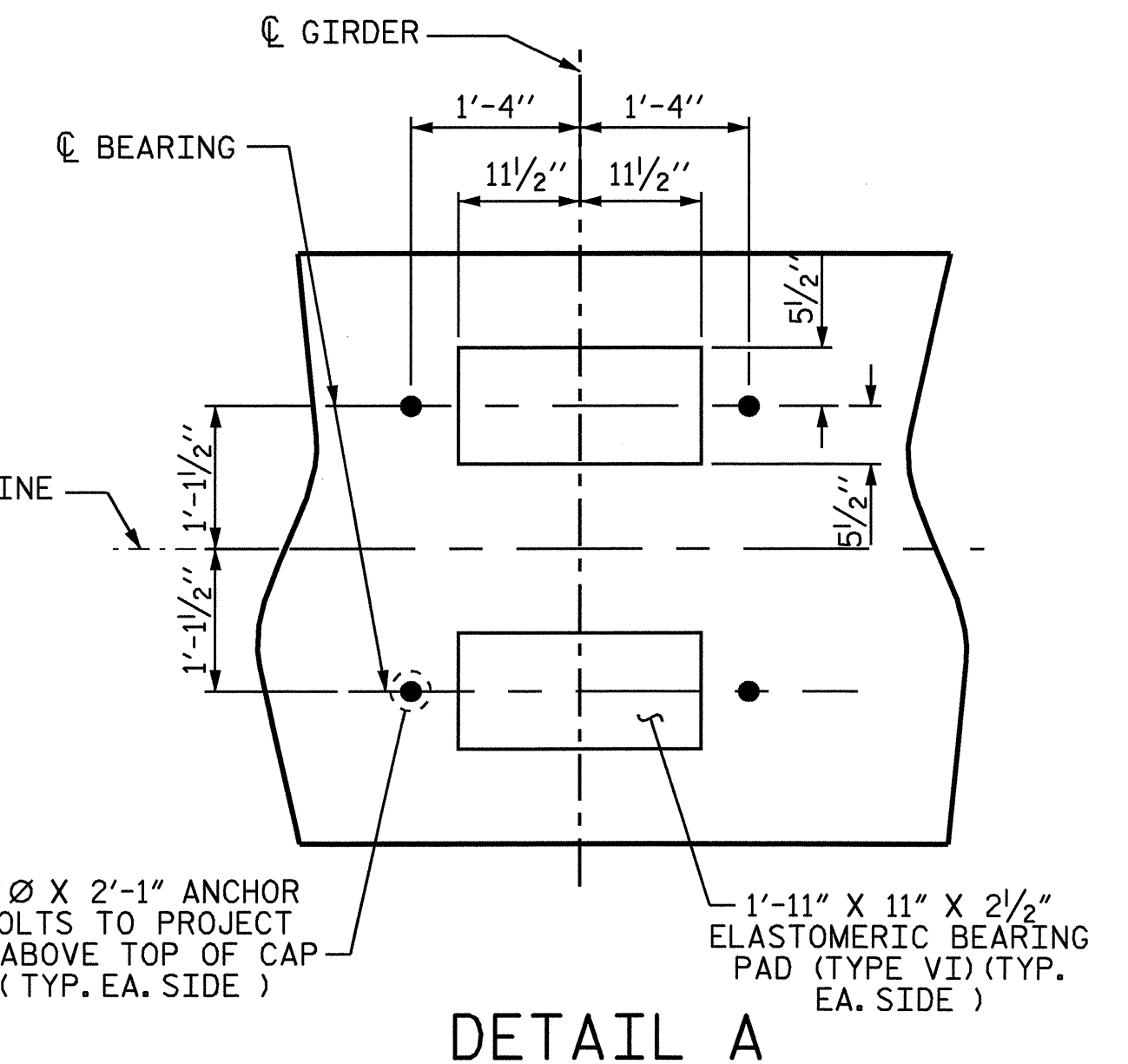
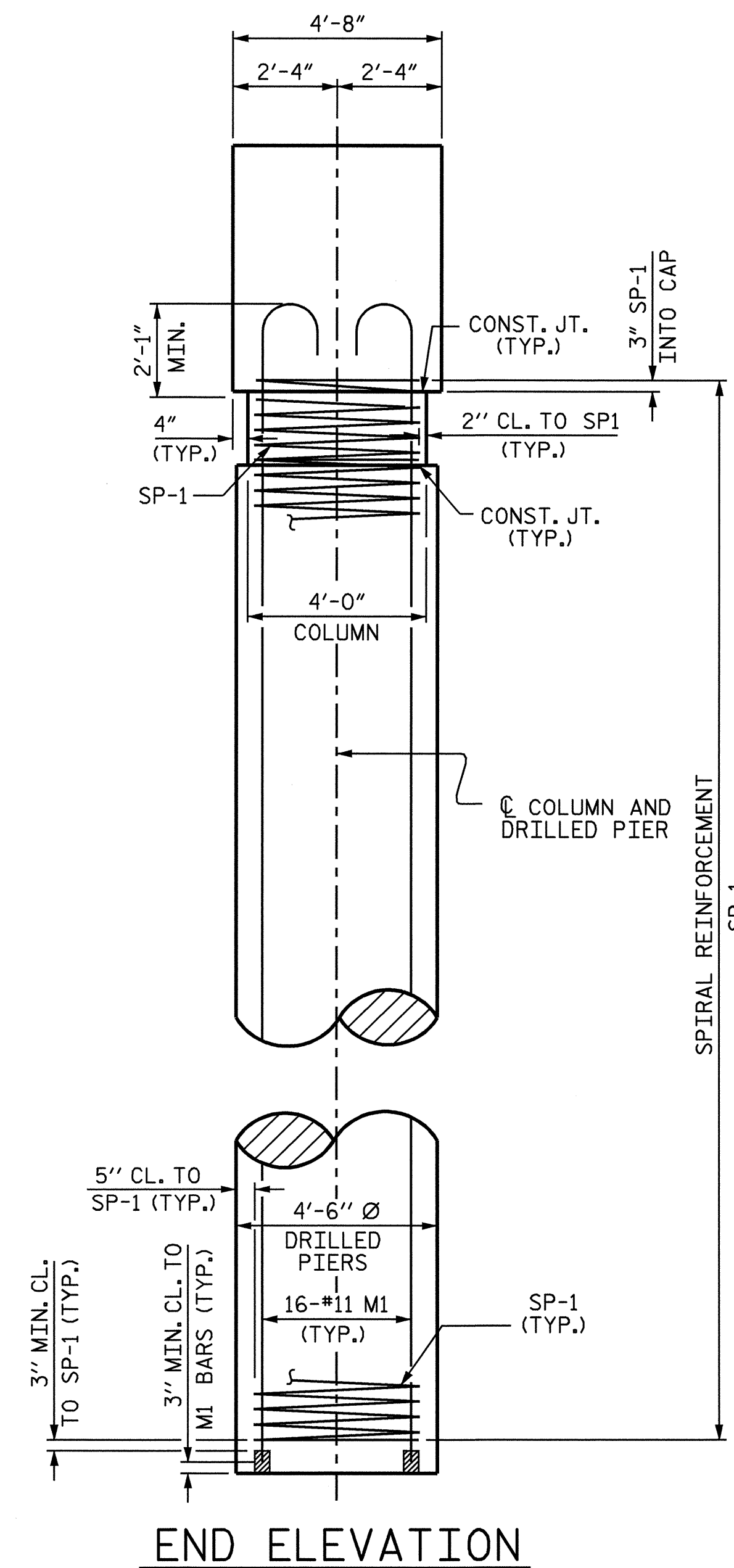
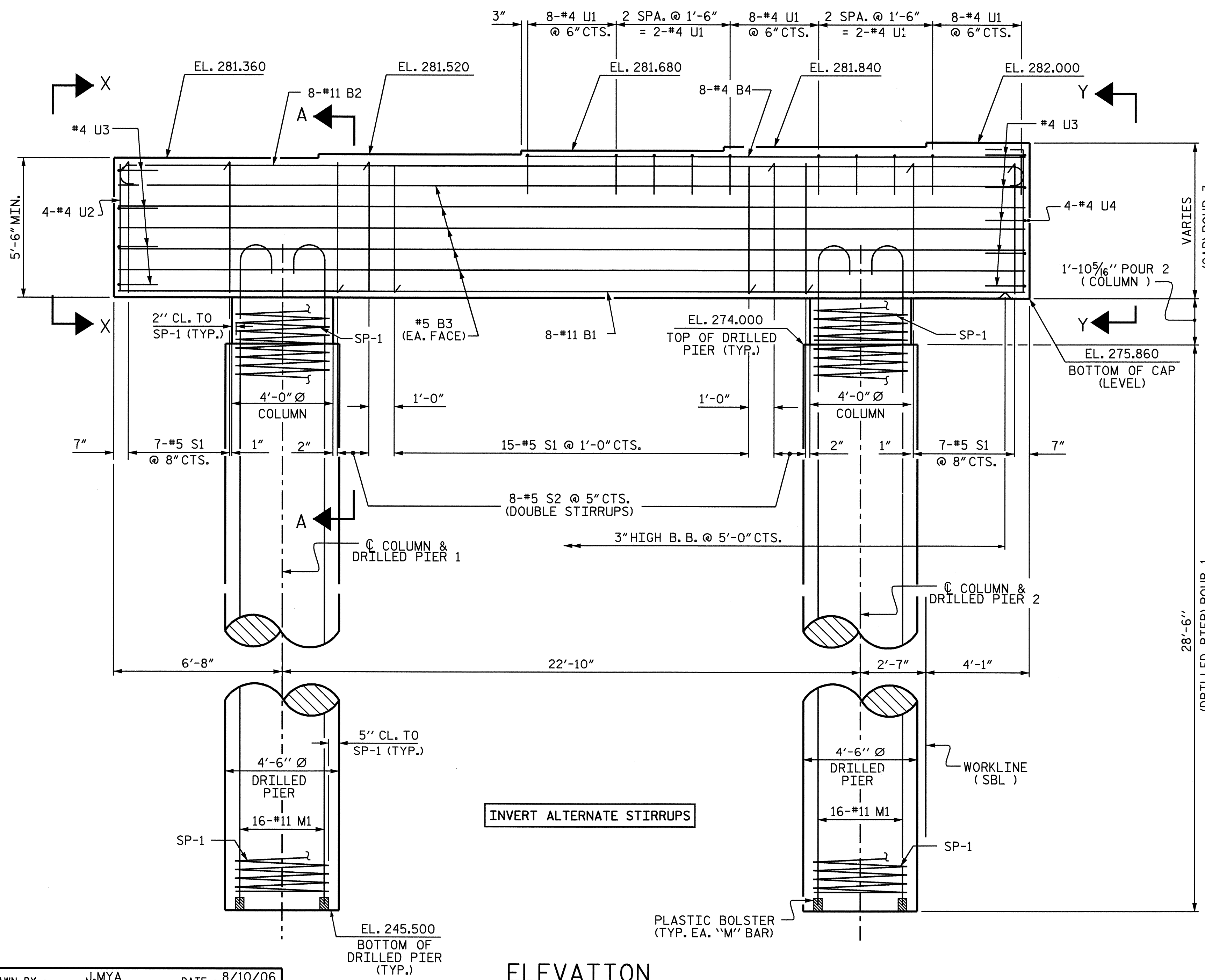
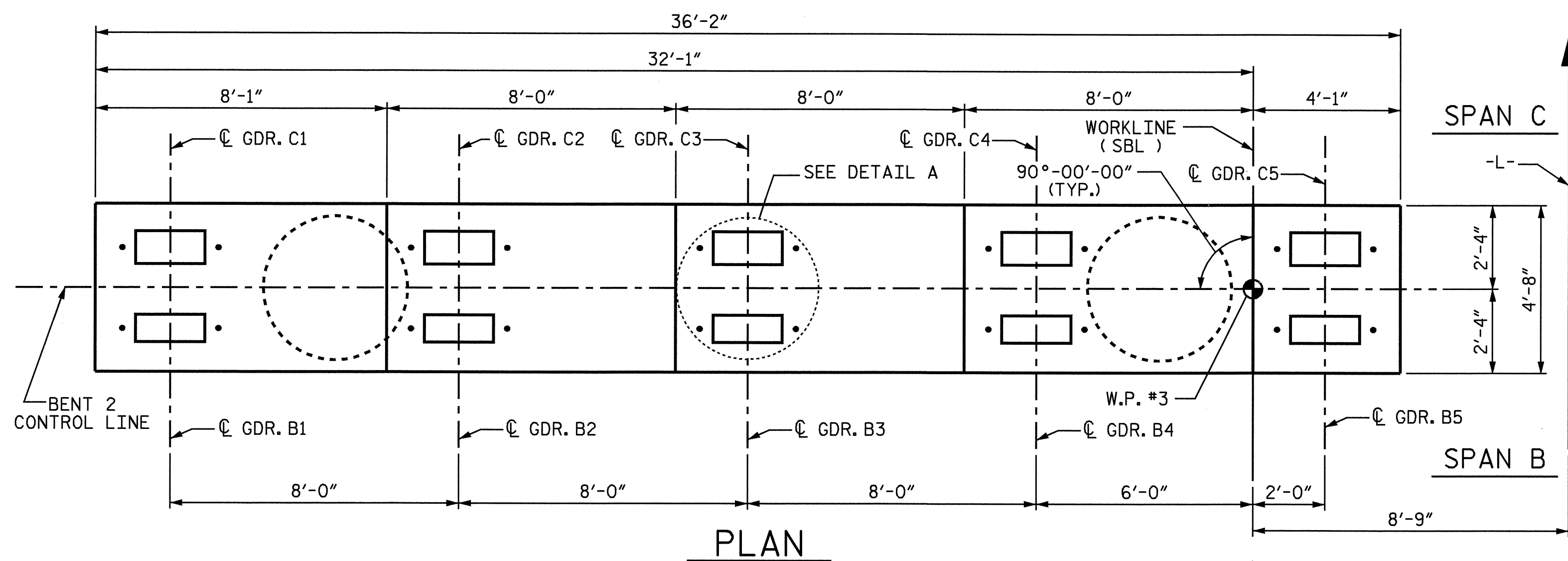
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>SUBSTRUCTURE BENT 1 (SBL)</b>					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS <b>70</b>



NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
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PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

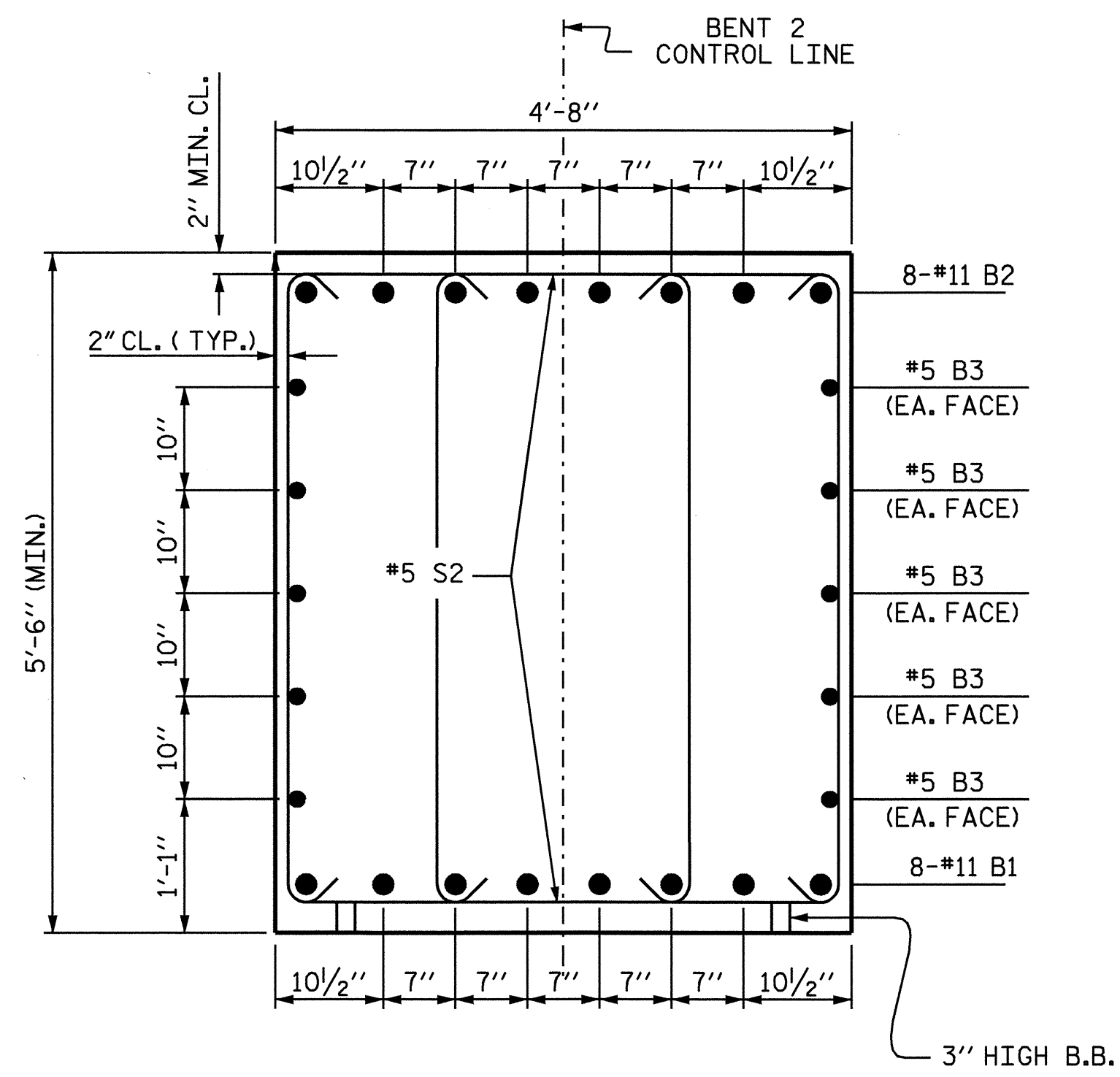
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 2  
 (SBL)

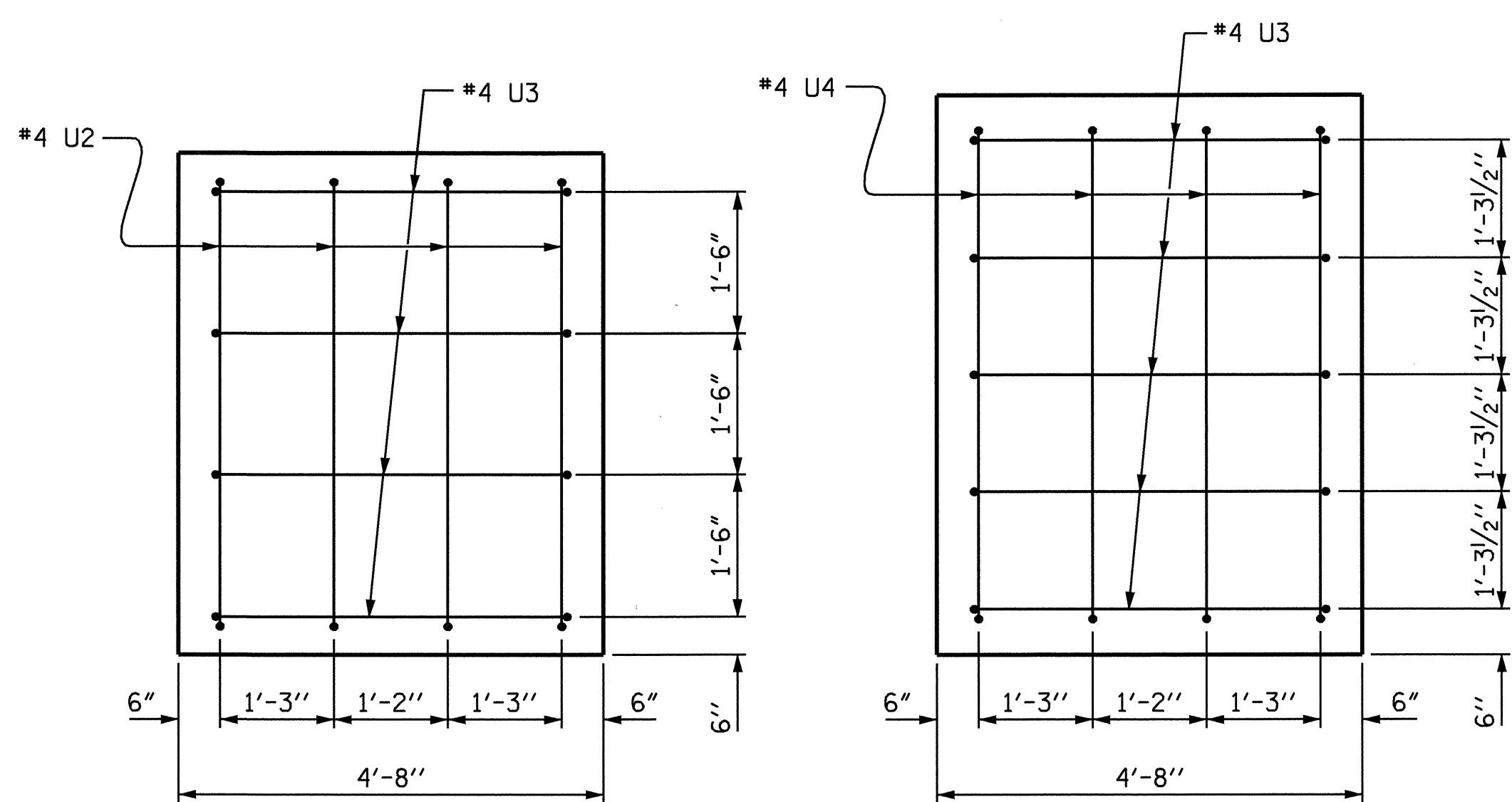
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS 70	
2			4				

DRAWN BY: J.MYA DATE: 8/10/06  
 CHECKED BY: J.B. WILSON DATE: 8/29/06



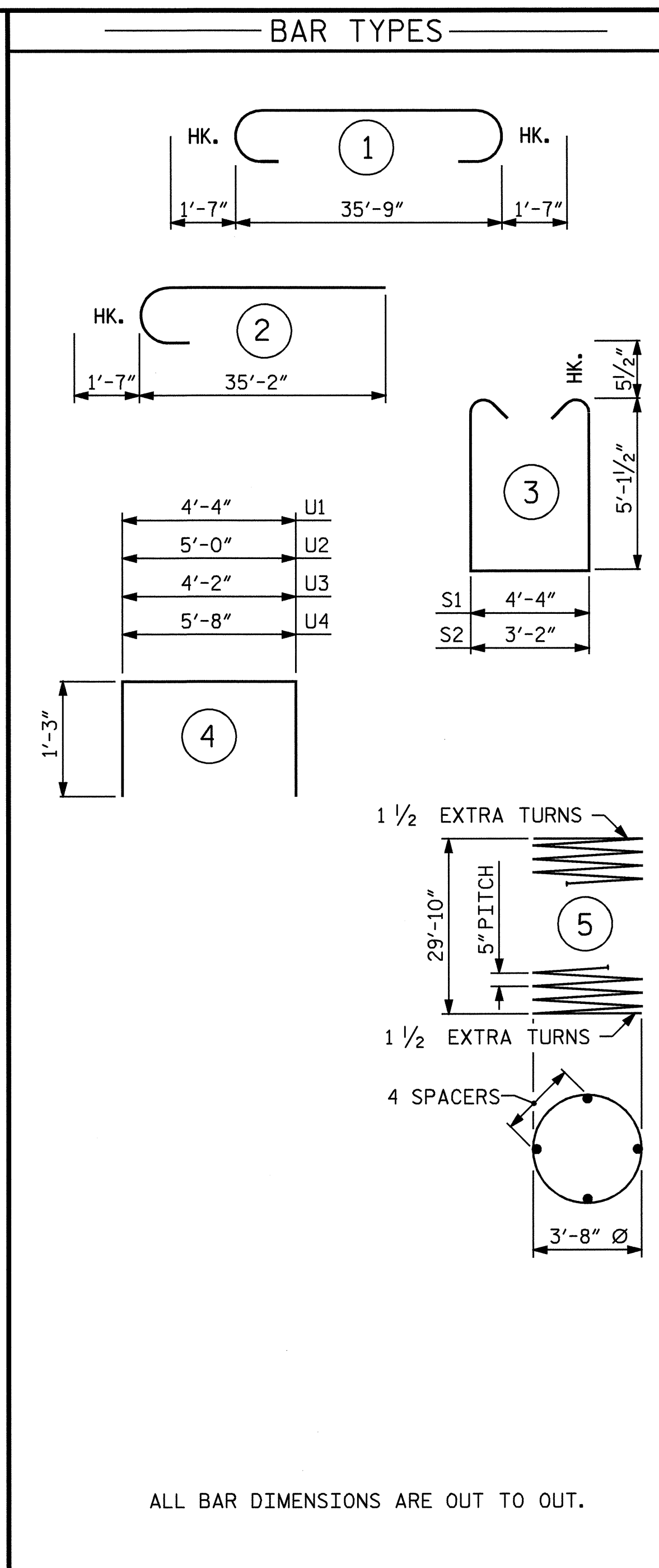
**SECTION A-A**

(SHOWING DOUBLE STIRRUPS (S2)  
SEE ELEVATION ON SHEET 1 OF 2  
FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**

**VIEW Y-Y**

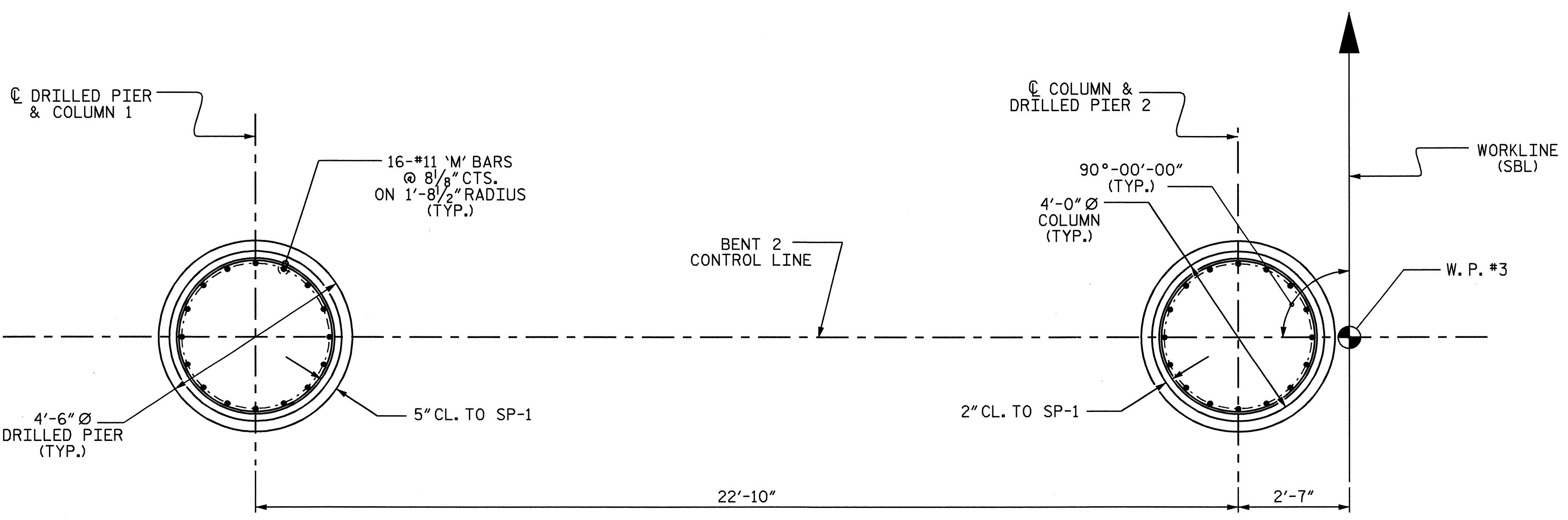


ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	35'-10"	1523
B2	8	#11	1	38'-11"	1654
B3	10	#5	STR	35'-10"	374
B4	8	#4	STR	19'-9"	106
M1	32	#11	2	36'-9"	6248
S1	29	#5	3	15'-6"	469
S2	16	#5	3	14'-4"	239
U1	44	#4	4	6'-10"	201
U2	4	#4	4	7'-6"	20
U3	9	#4	4	6'-8"	40
U4	4	#4	4	8'-2"	22
REINFORCING STEEL					= 10,896 LBS
SP-1	2	*	5	848'-3"	1769
SPIRAL COLUMN REINFORCING STEEL					= 1769 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				1.7 C.Y.	
POUR #3 (CAP)				36.2 C.Y.	
TOTAL				37.9 C.Y.	
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				33.6 C.Y.	
4'-6" Ø DRILLED PIERS IN SOIL					46.4 LIN. FT.
4'-6" Ø DRILLED PIERS NOT IN SOIL					10.6 LIN. FT.
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS					LIN. FT. = 48
SPT TESTING					1 EACH
CSL TUBES ▲					LIN. FT. = 248.0

▲ SEE NOTES

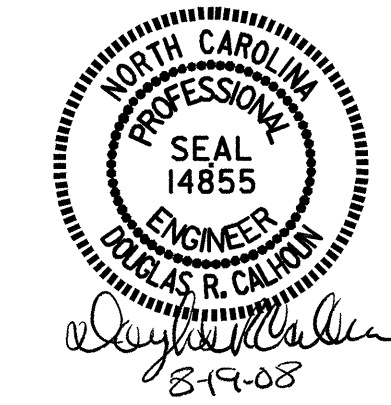


**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY : J.MYA DATE : 8/10/06  
CHECKED BY : J.B. WILSON DATE : 8/29/06

19-AUG-2008 10:16 R:\Structures\FINAL PLANS\SBL\R2502B.ed.B.SBL.dgn bngrody



PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

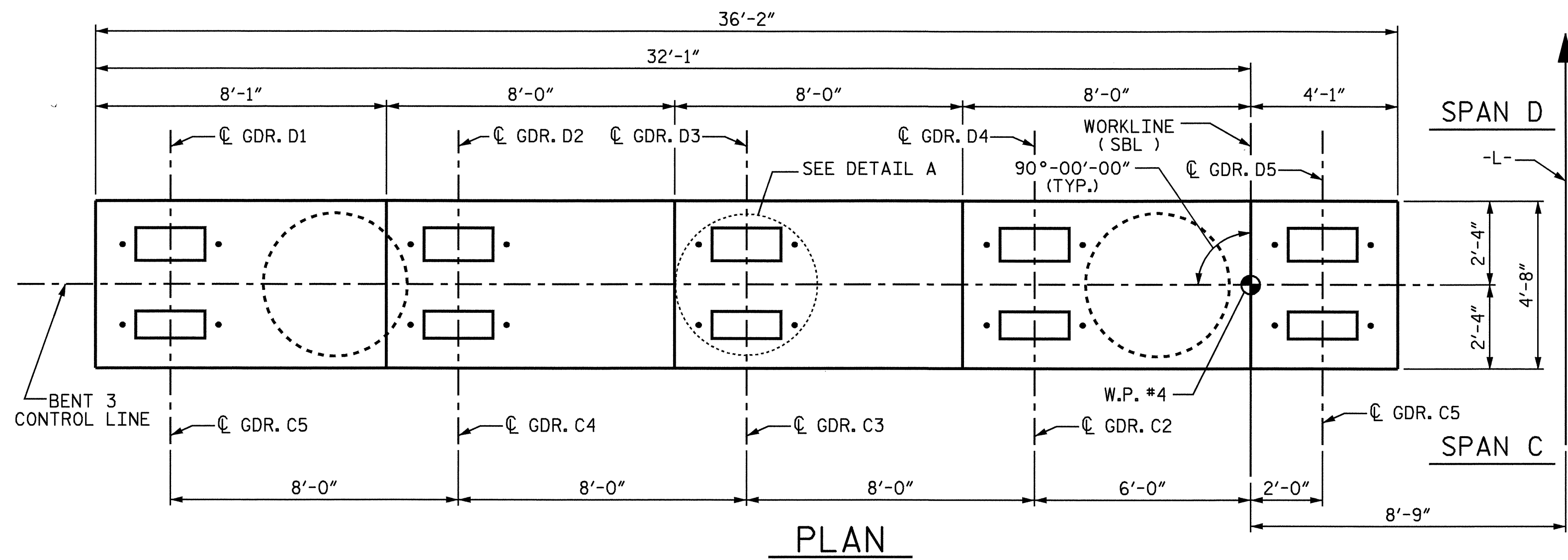
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (SBL)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

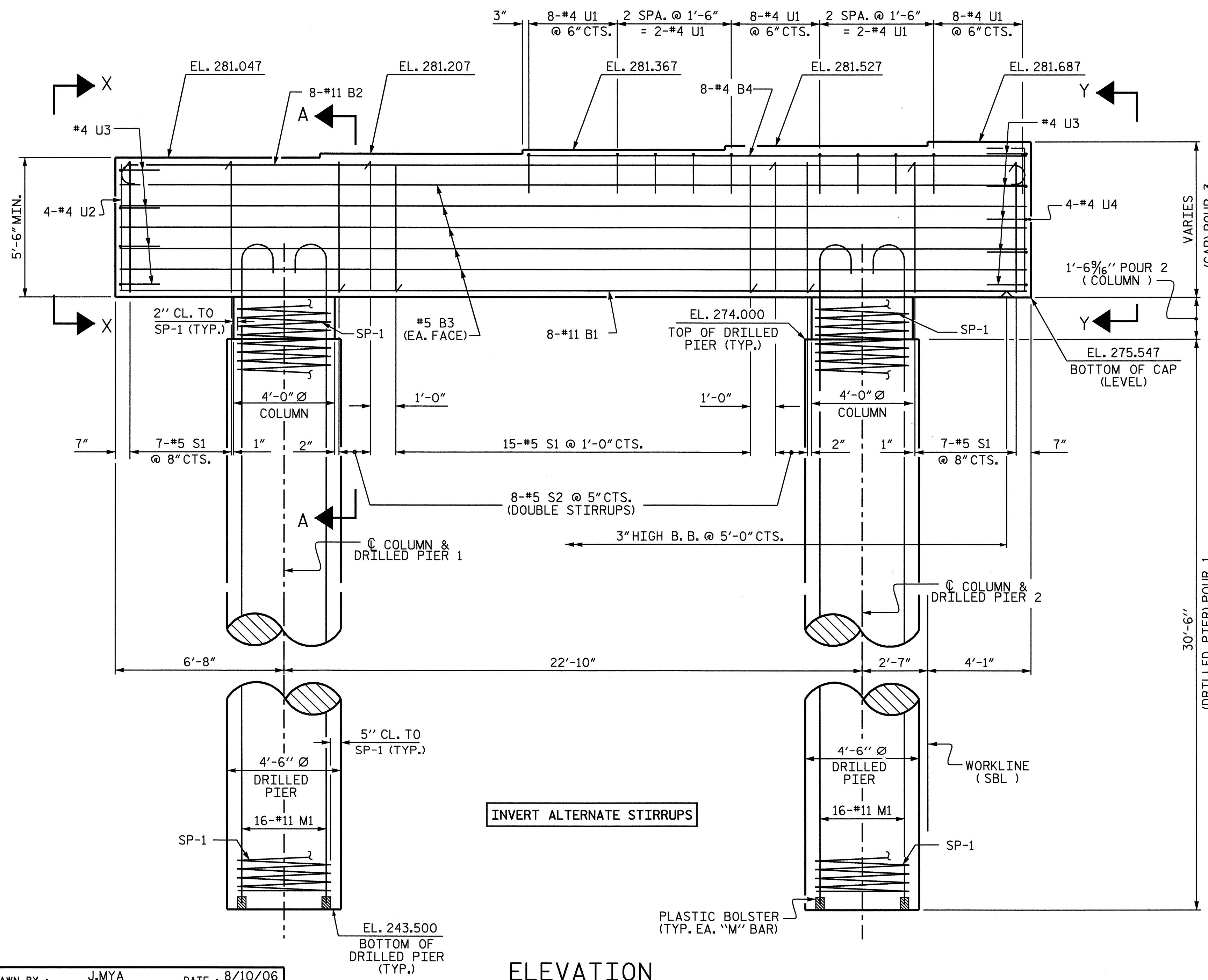
STR. #1

**NOTES**

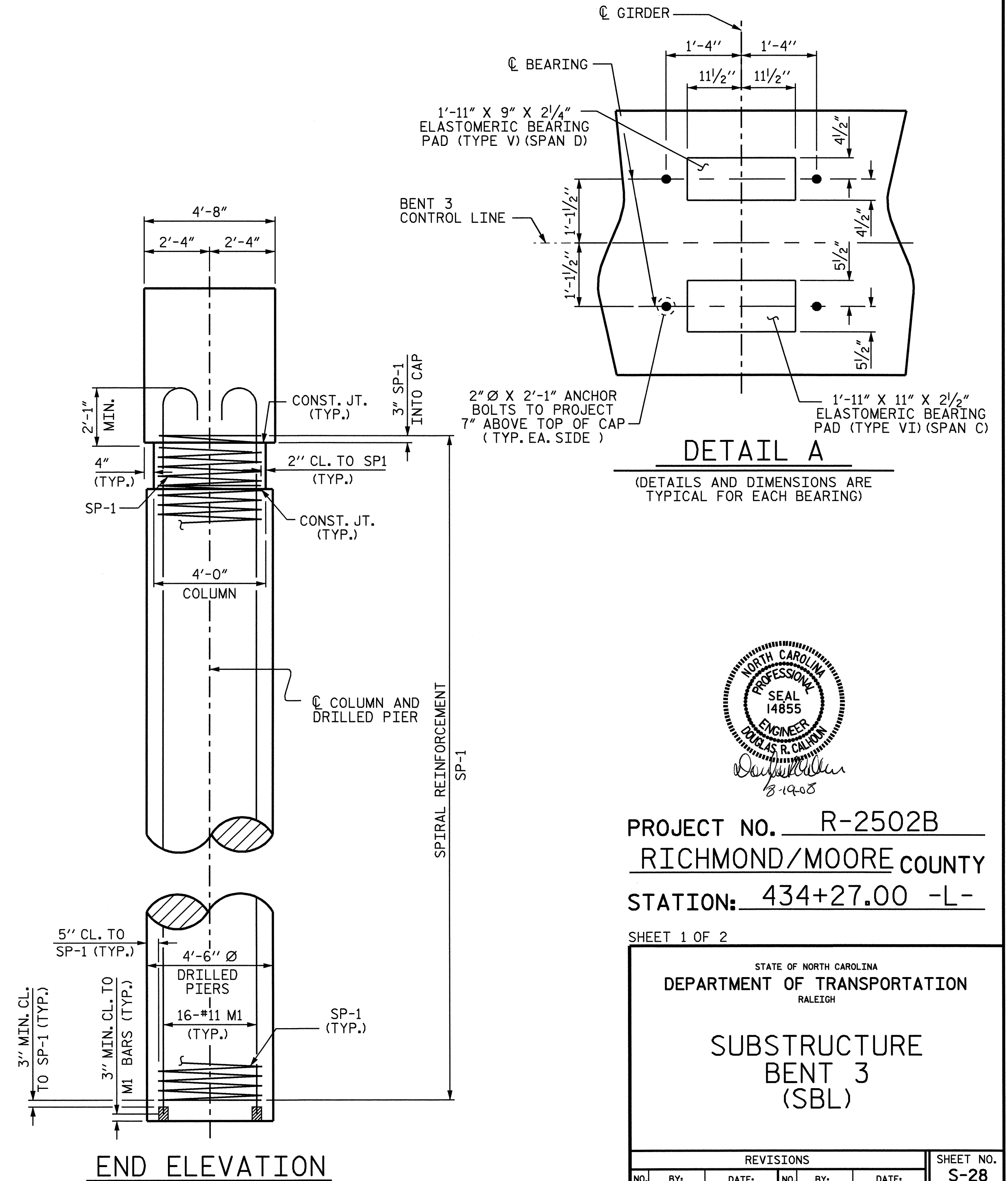
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
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- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.
- SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIERS WILL NOT BE PERMITTED.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



**PLAN**



**ELEVATION**



**DETAIL A**

(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

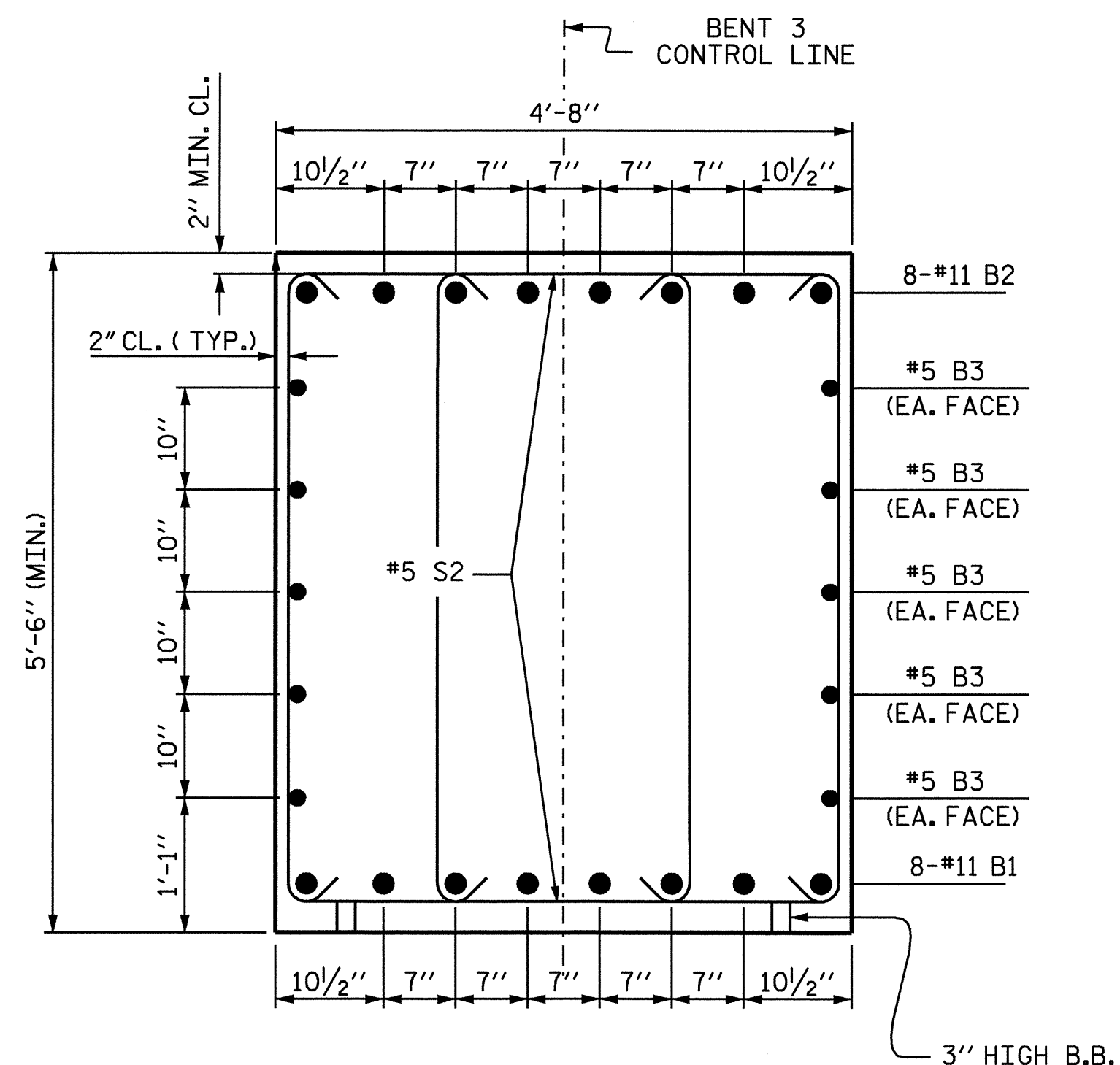
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 BENT 3  
 (SBL)**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28	
1			3			TOTAL SHEETS	
2			4			70	

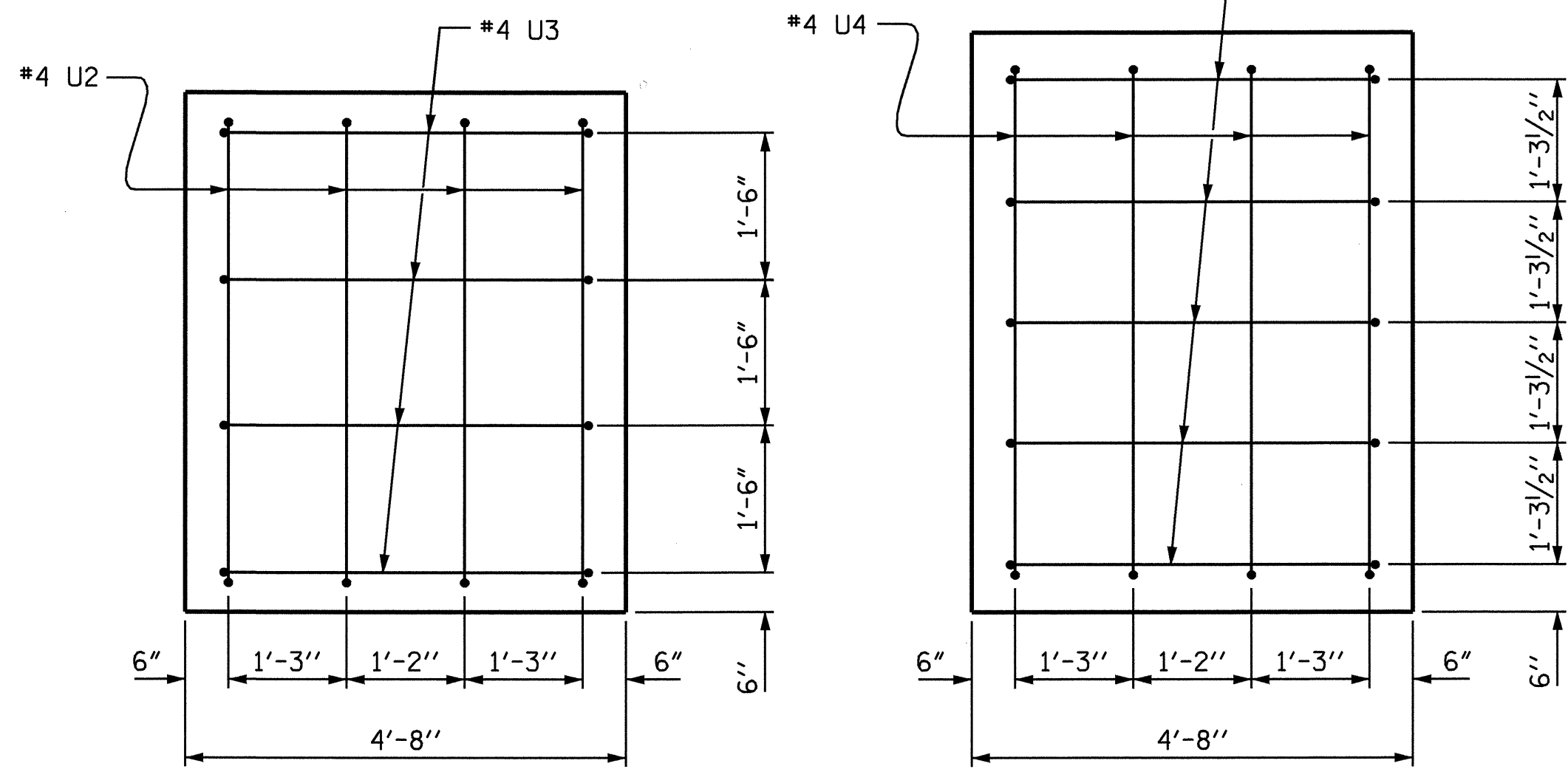
DRAWN BY : J.MYA DATE : 8/10/06  
 CHECKED BY : J.B. WILSON DATE : 8/29/06

19-AUG-2008 10:59  
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 bng Brady



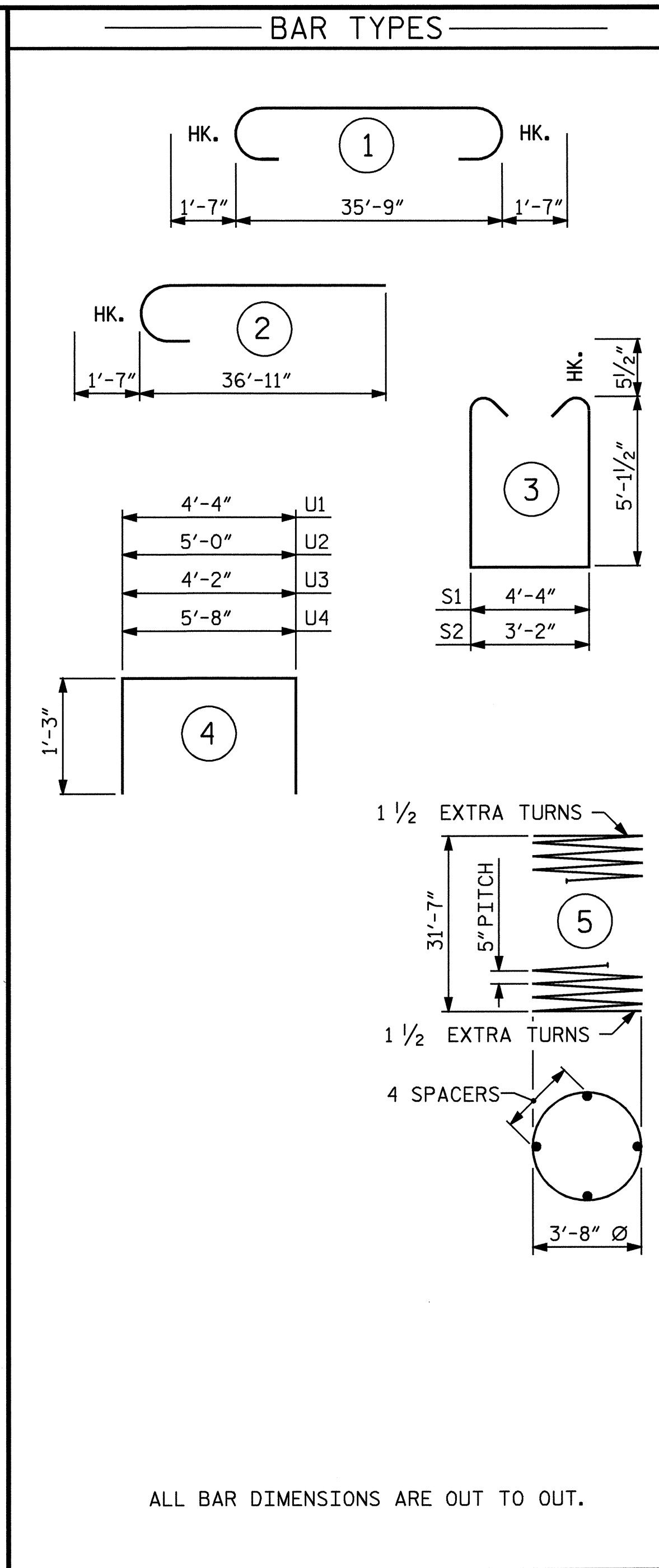
**SECTION A-A**

(SHOWING DOUBLE STIRRUPS (S2)  
SEE ELEVATION ON SHEET 1 OF 2  
FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**

**VIEW Y-Y**

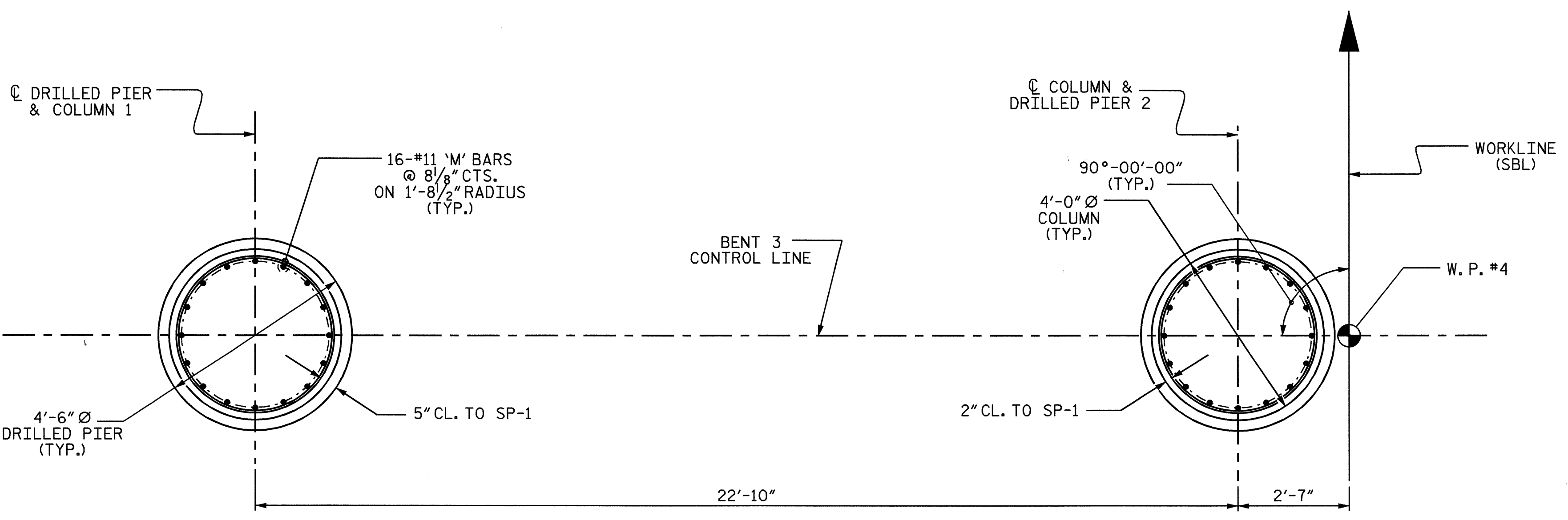


ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL					
BENT 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	35'-10"	1523
B2	8	#11	1	38'-11"	1654
B3	10	#5	STR	35'-10"	374
B4	8	#4	STR	19'-9"	106
M1	32	#11	2	38'-6"	6546
S1	29	#5	3	15'-6"	469
S2	16	#5	3	14'-4"	239
U1	44	#4	4	6'-10"	201
U2	4	#4	4	7'-6"	20
U3	9	#4	4	6'-8"	40
U4	4	#4	4	8'-2"	22
REINFORCING STEEL					= 11,194 LBS
SP-1					2 * 5 896'-5" 1870
SPIRAL COLUMN REINFORCING STEEL					= 1870 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					1.4 C.Y.
POUR #3 (CAP)					36.2 C.Y.
TOTAL					37.6 C.Y.
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					35.9 C.Y.
4'-6" Ø DRILLED PIERS IN SOIL					50.4 LIN. FT.
4'-6" Ø DRILLED PIERS NOT IN SOIL					10.6 LIN. FT.
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS					LIN. FT. = 52
SPT TESTING					1 EACH
CSL TUBES ▲					LIN. FT. = 264.0

▲ SEE NOTES

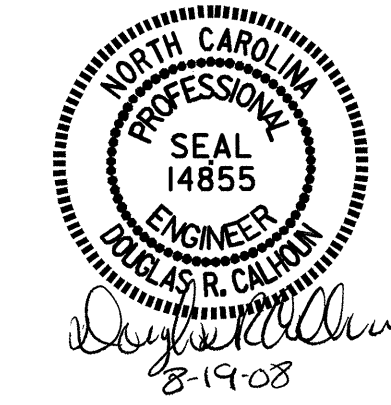


**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY: J.MYA DATE: 8/10/06  
CHECKED BY: J.B. WILSON DATE: 8/29/06

19-AUG-2008 10:16 R:\Structures\FINAL PLANS\SBL\R2502B.ed.B.SBL.dgn bng:rdy



PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 3 (SBL)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 70

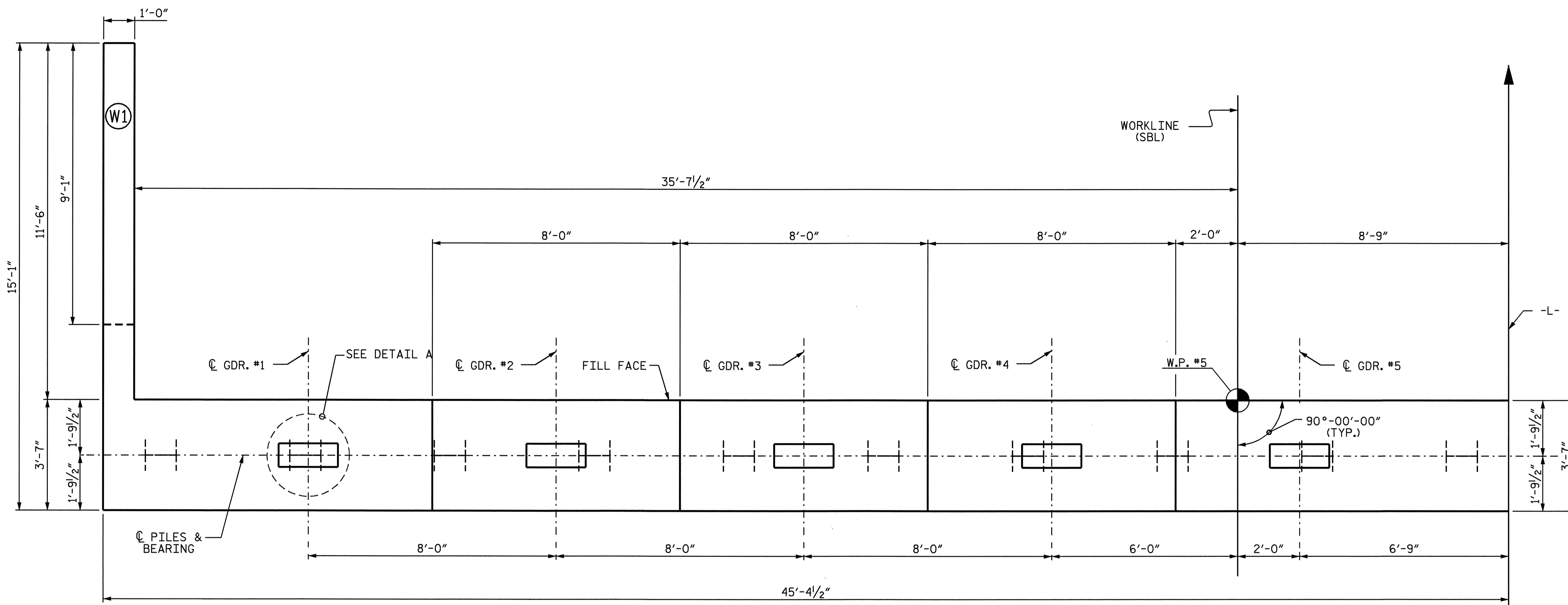
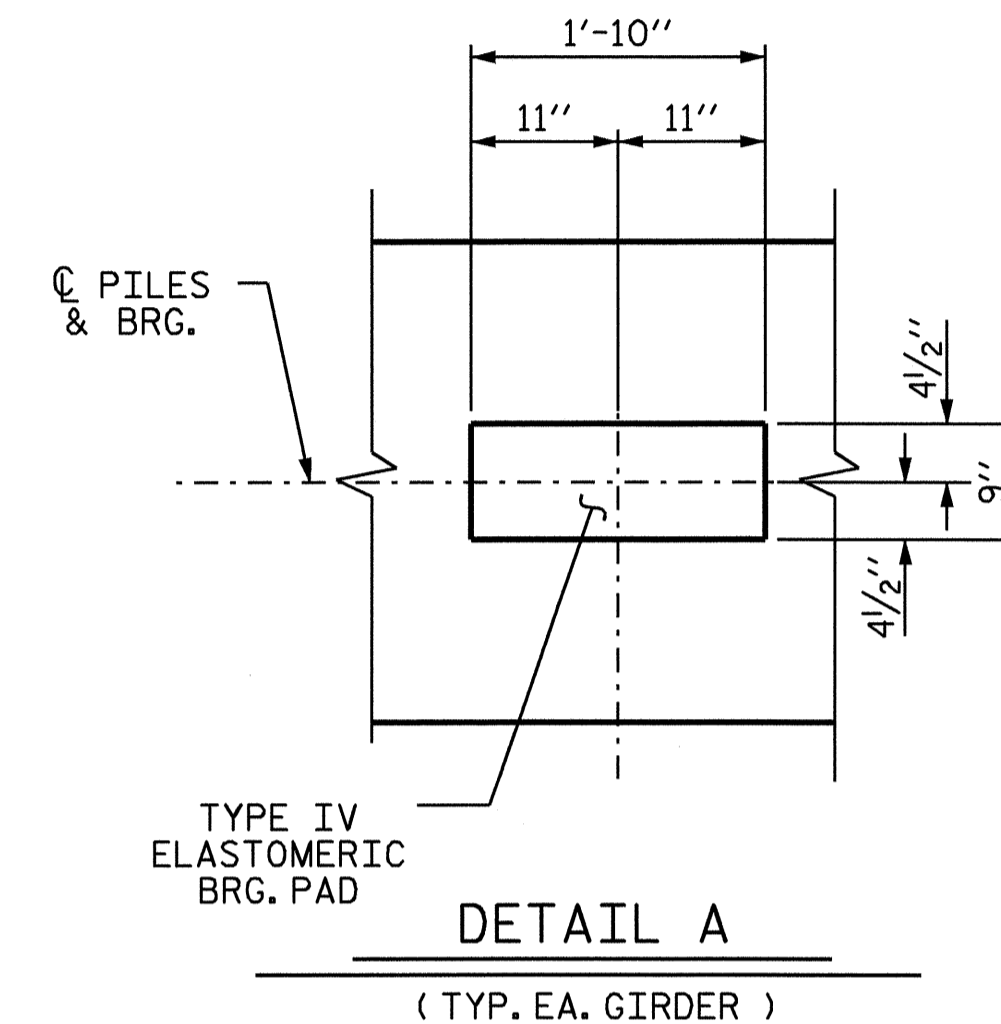
STR. #1

NOTES

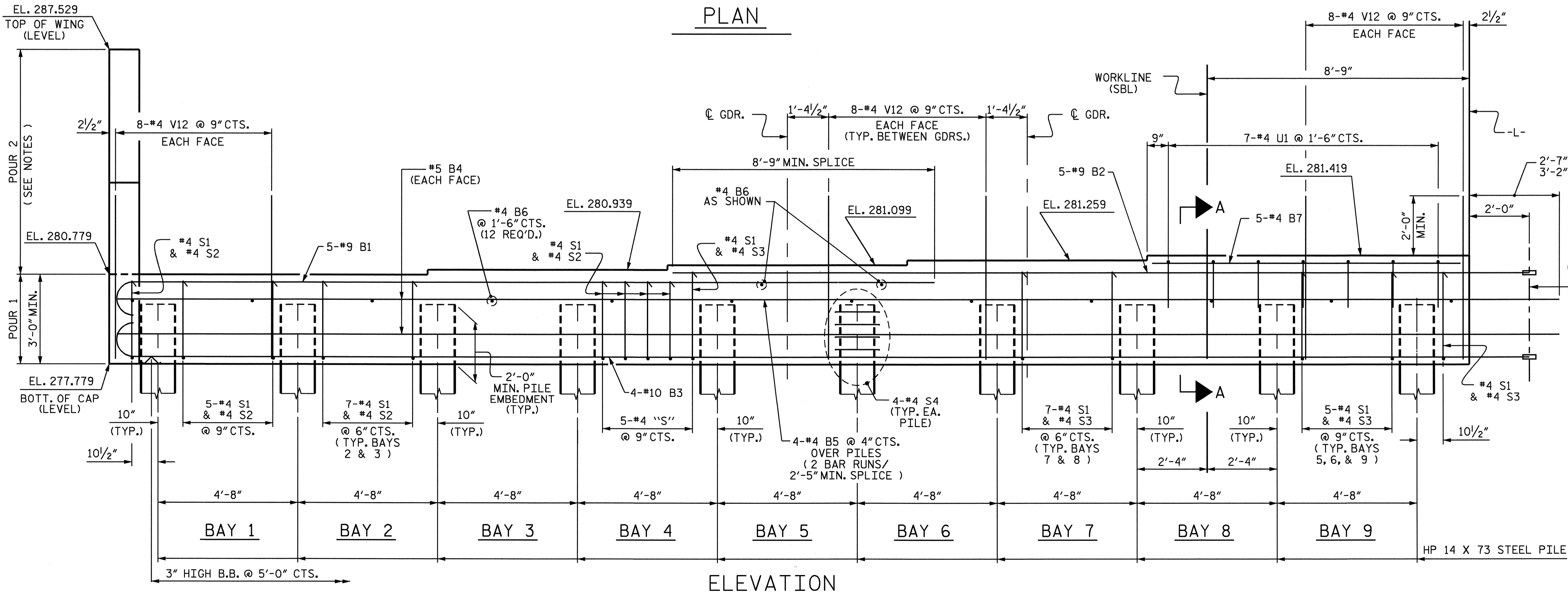
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE WINGS (POUR 2) ARE TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE REINFORCING STEEL AS SHOWN ON THE PLANS AND ACCORDING TO SECTION 1070-10 OF THE STANDARD SPECIFICATIONS.



PLAN



ELEVATION



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

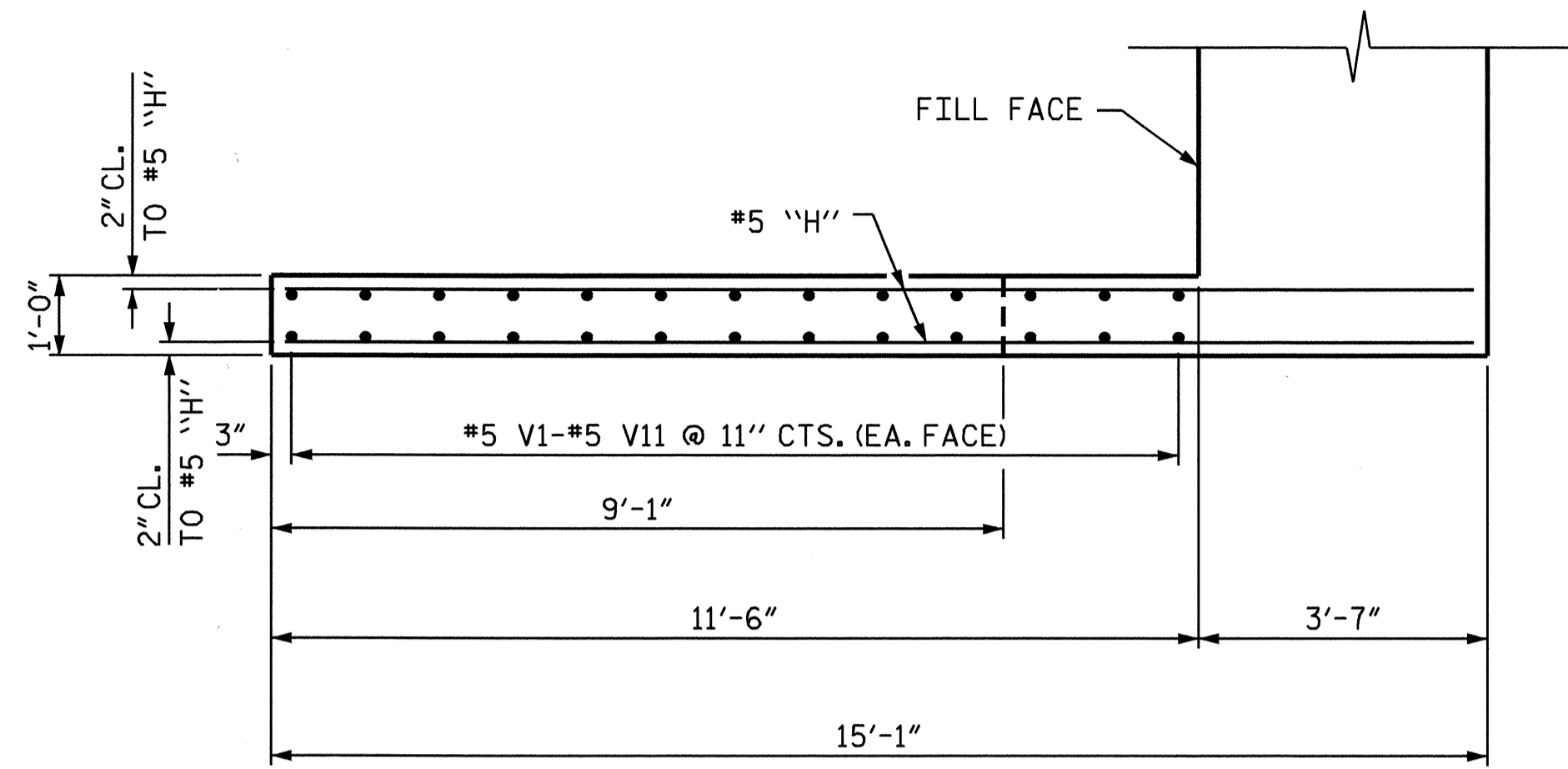
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 (SBL)

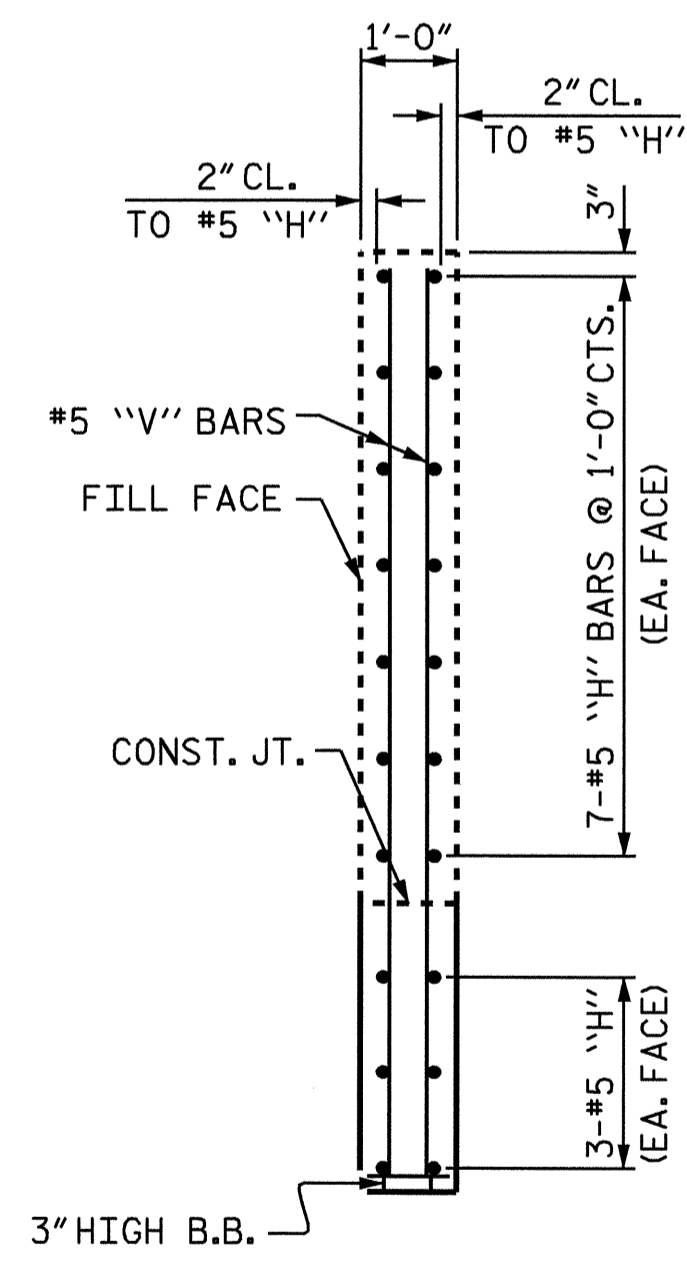
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS	
2			4			70	

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05

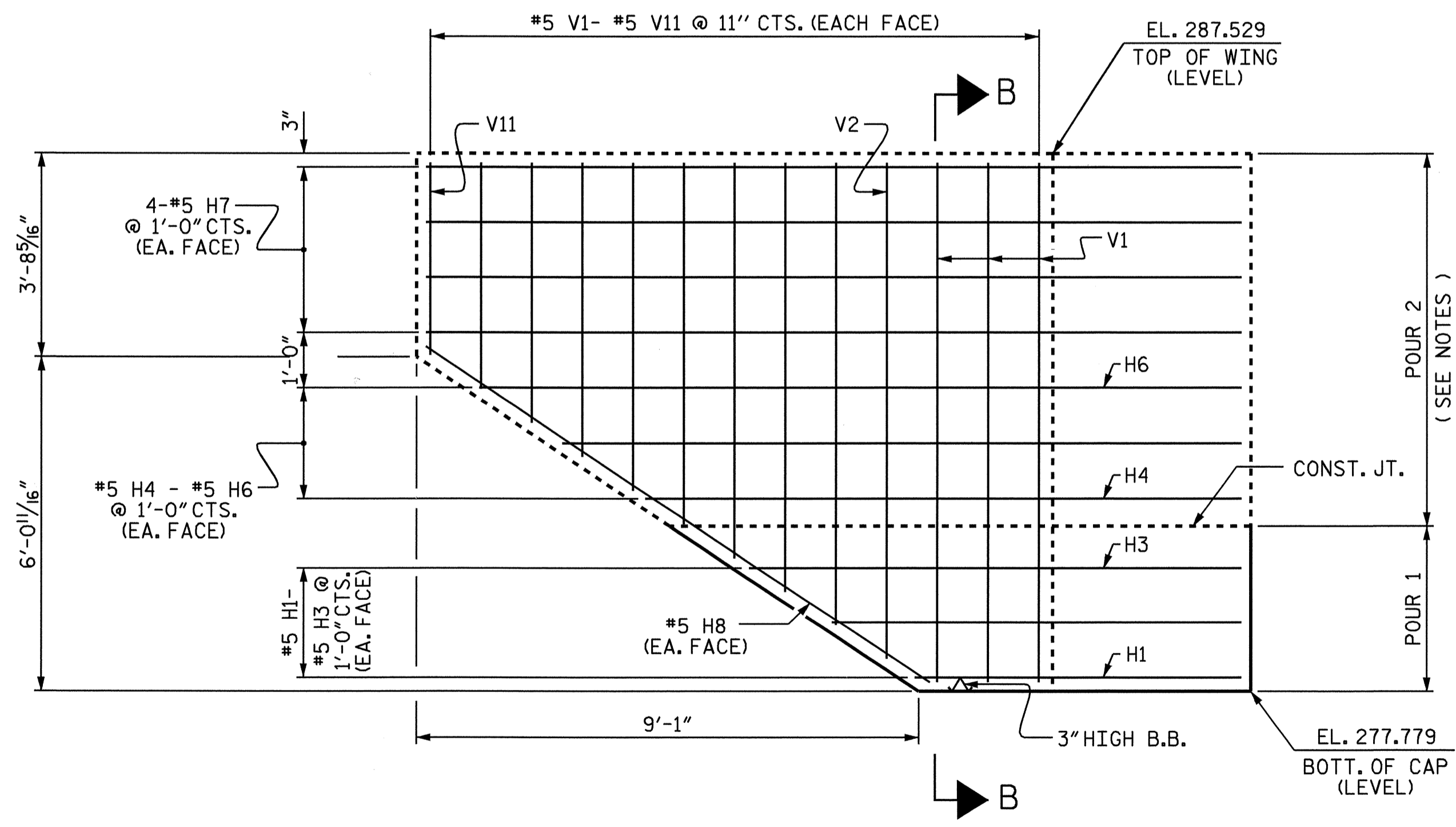
19-AUG-2008 10:16  
 R:\Structures\FINAL PLANS\SBL\R2502B.ed.E.SBL.dgn  
 bngrody



(W1) PLAN



SECTION B-B



(W1) ELEVATION

WING DETAILS

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 (SBL)

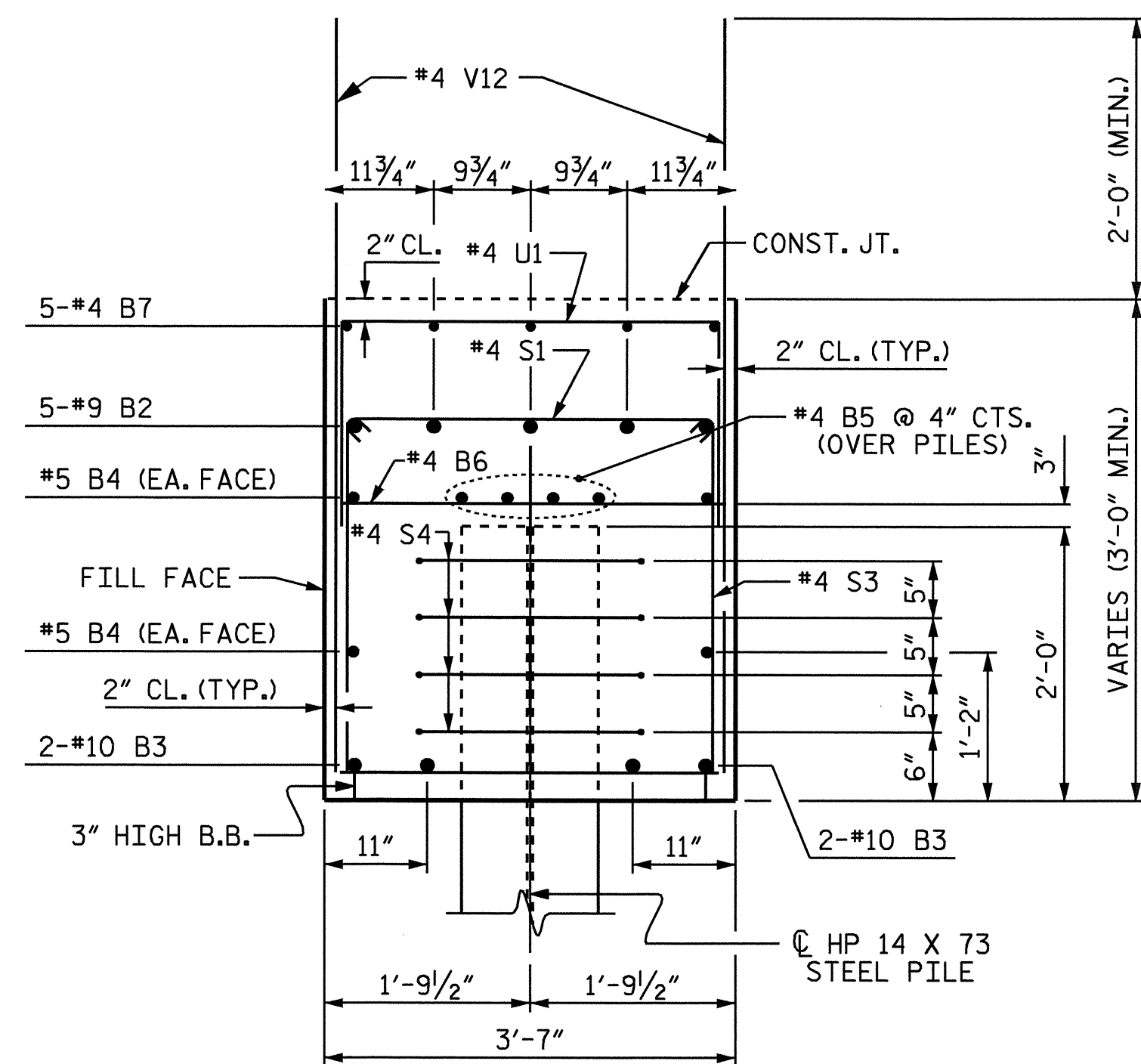


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31	
1			3			TOTAL SHEETS	
2			4			70	

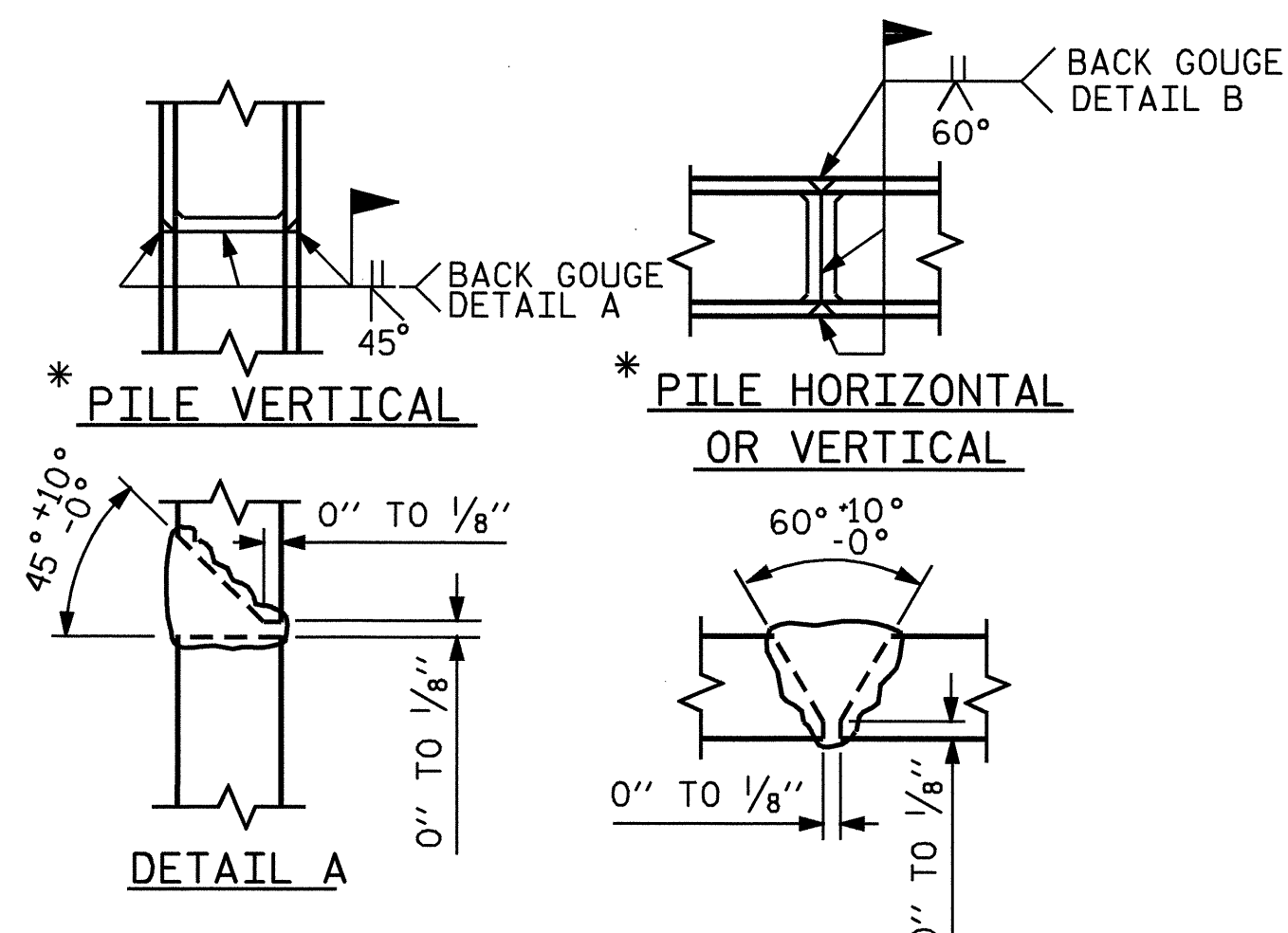
DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J.MYA DATE: 10/31/05

13-AUG-2008 10:16  
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 bngrady



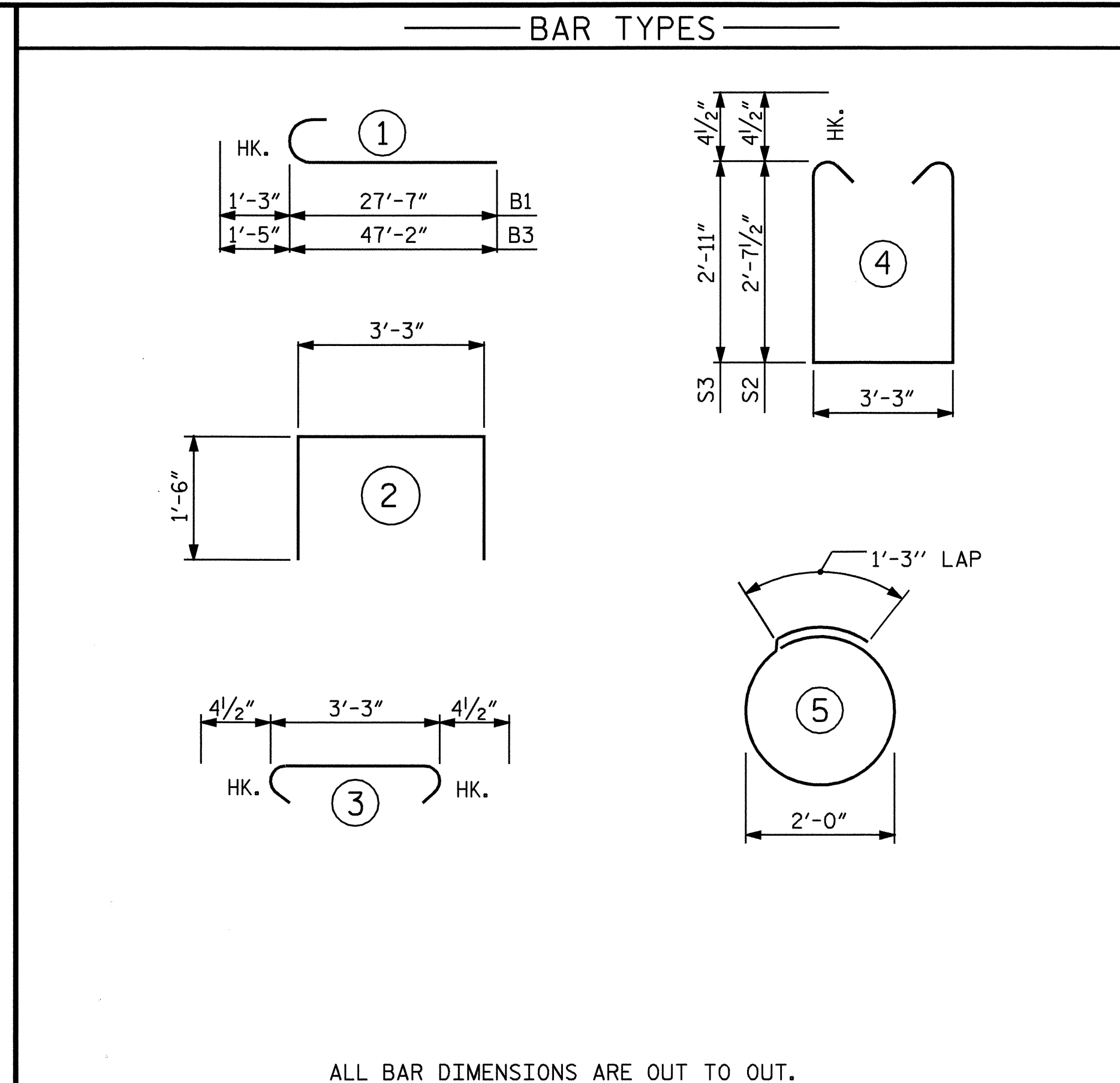


SECTION A-A



\* POSITION OF PILE DURING WELDING. **DETAIL B**

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

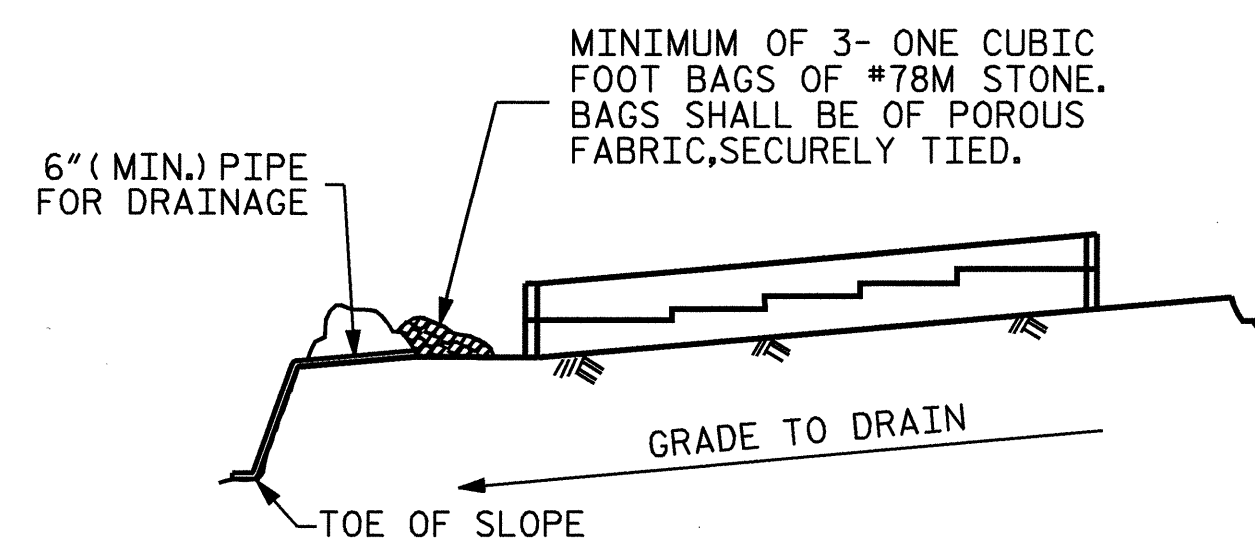
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	28'-10"	490	V1	6	#5	STR	9'-5"	59
B2	5	#9	STR	28'-7"	486	V2	2	#5	STR	8'-11"	19
B3	4	#10	1	48'-7"	836	V3	2	#5	STR	8'-4"	17
B4	4	#5	STR	48'-4"	202	V4	2	#5	STR	7'-9"	16
B5	8	#4	STR	25'-2"	134	V5	2	#5	STR	7'-1"	15
B6	14	#4	STR	3'-3"	30	V6	2	#5	STR	6'-6"	14
B7	5	#4	STR	10'-5"	35	V7	2	#5	STR	5'-11"	12
						V8	2	#5	STR	5'-3"	11
H1	2	#5	STR	5'-10"	12	V9	2	#5	STR	4'-8"	10
H2	2	#5	STR	7'-4"	15	V10	2	#5	STR	4'-1"	9
H3	2	#5	STR	8'-10"	18	V11	2	#5	STR	3'-5"	7
H4	2	#5	STR	10'-9"	22	V12	96	#4	STR	5'-6"	353
H5	2	#5	STR	12'-3"	26						
H6	2	#5	STR	13'-9"	29						
H7	8	#5	STR	14'-9"	123						
H8	2	#5	STR	10'-11"	23						

REINFORCING STEEL = 3754 LBS

CLASS A CONCRETE BREAKDOWN  
 ▲ POUR 1 (CAP AND LOWER PART OF WINGS) 20.9 CU.YDS.  
 TOTAL 20.9 CU.YDS.

HP 14 x 73 STEEL PILES  
 NO. 10 300 FT.

▲ UPPER WINGS (POUR 2) TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE



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.

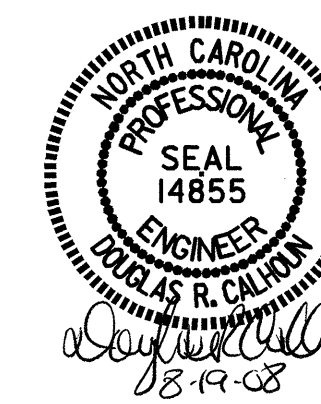
TEMPORARY DRAINAGE AT END BENT

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

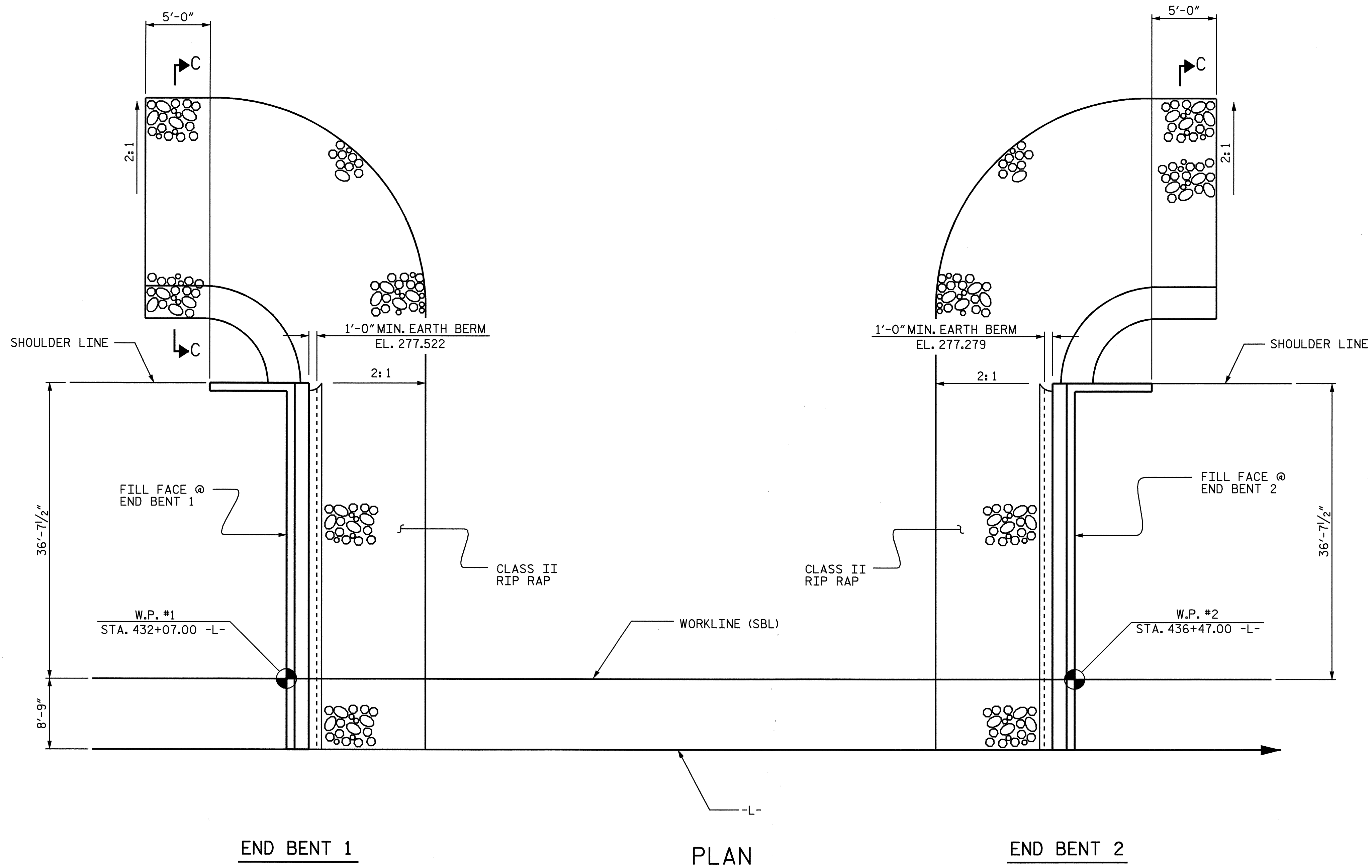
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 (SBL)

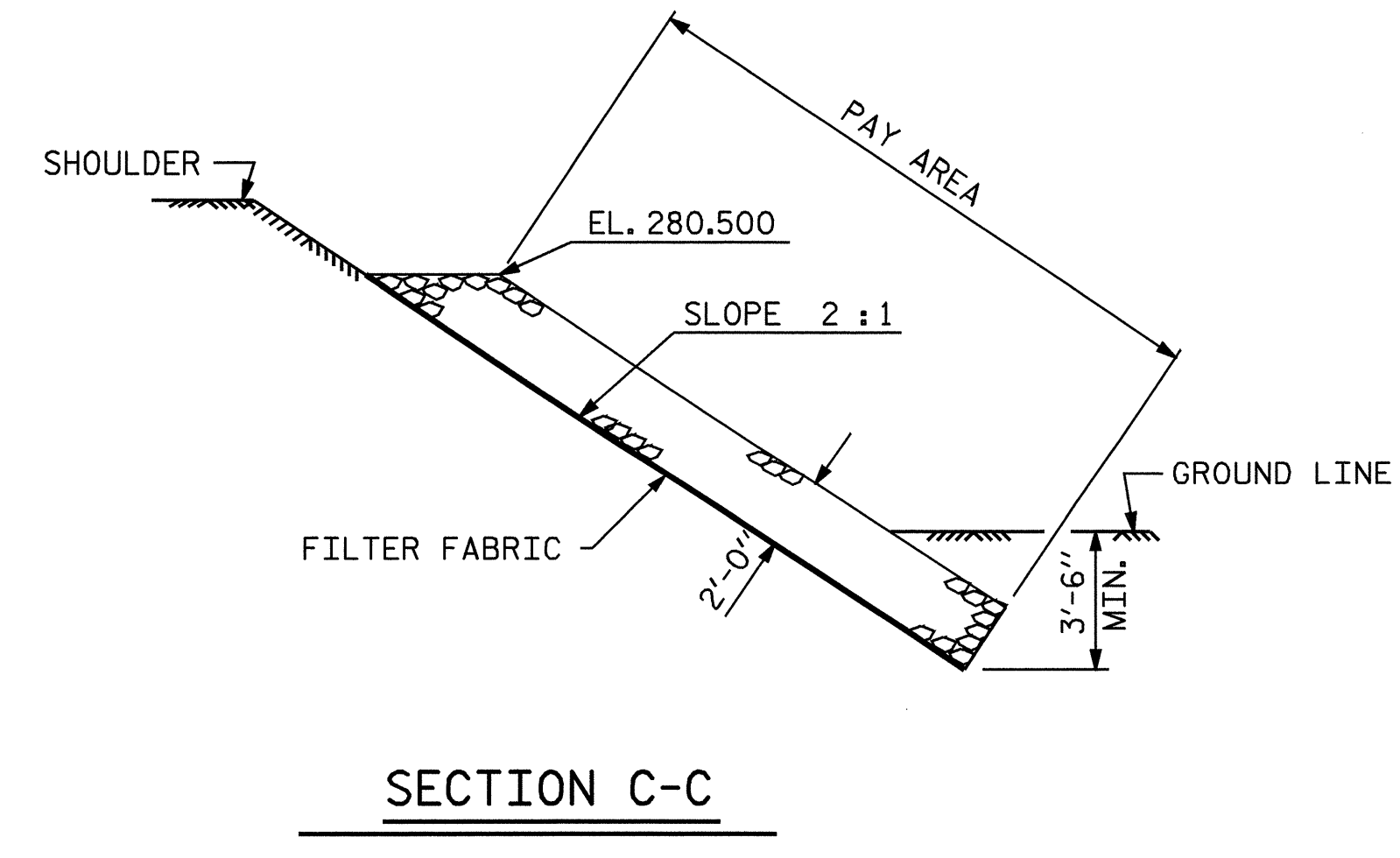
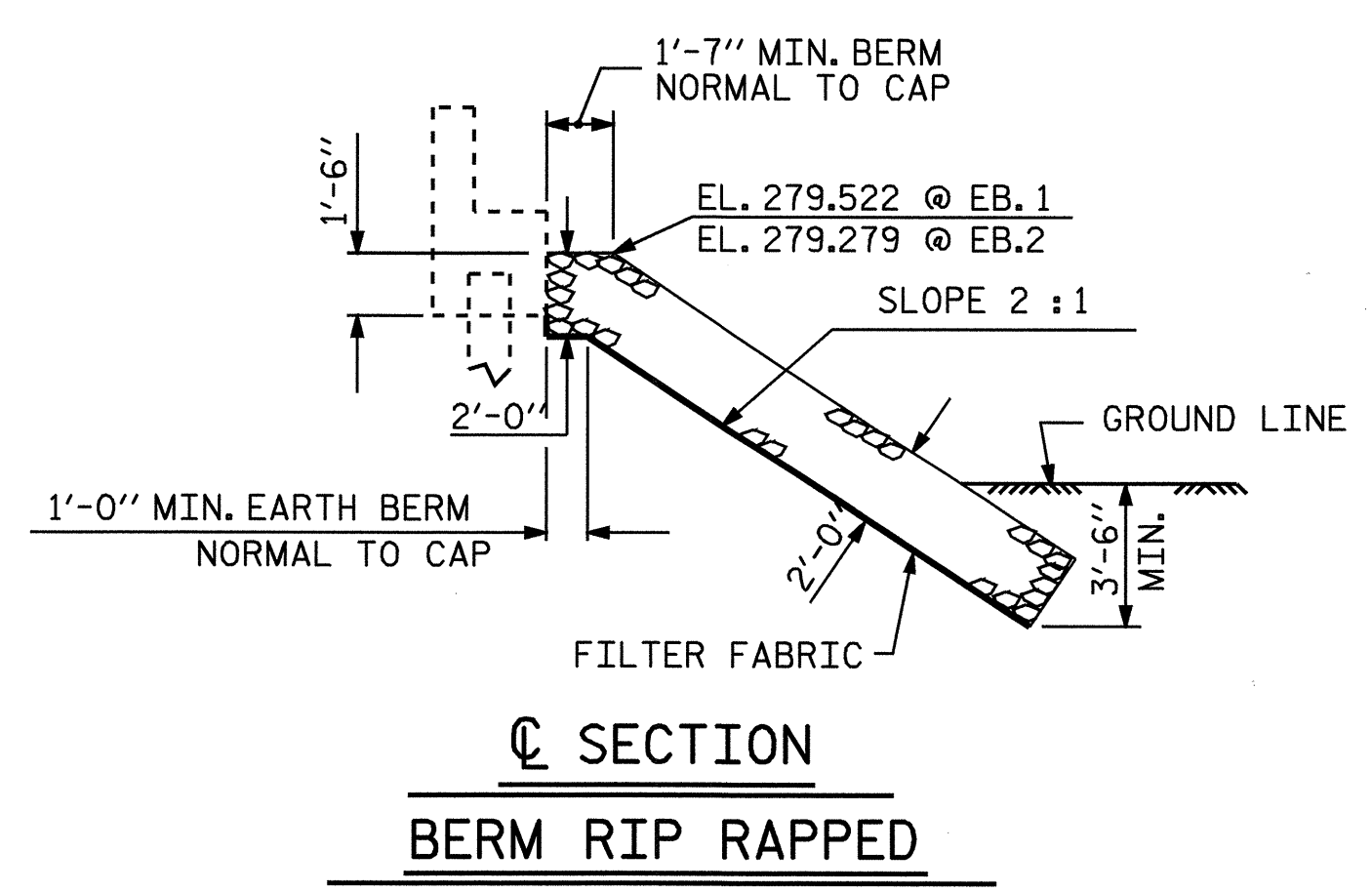


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32	
1			3			TOTAL SHEETS	
2			4			70	

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05



ESTIMATED QUANTITIES		
BRIDGE @ STA. 434+27.00 -L- (SBL)	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	162	180
END BENT 2	192	214



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

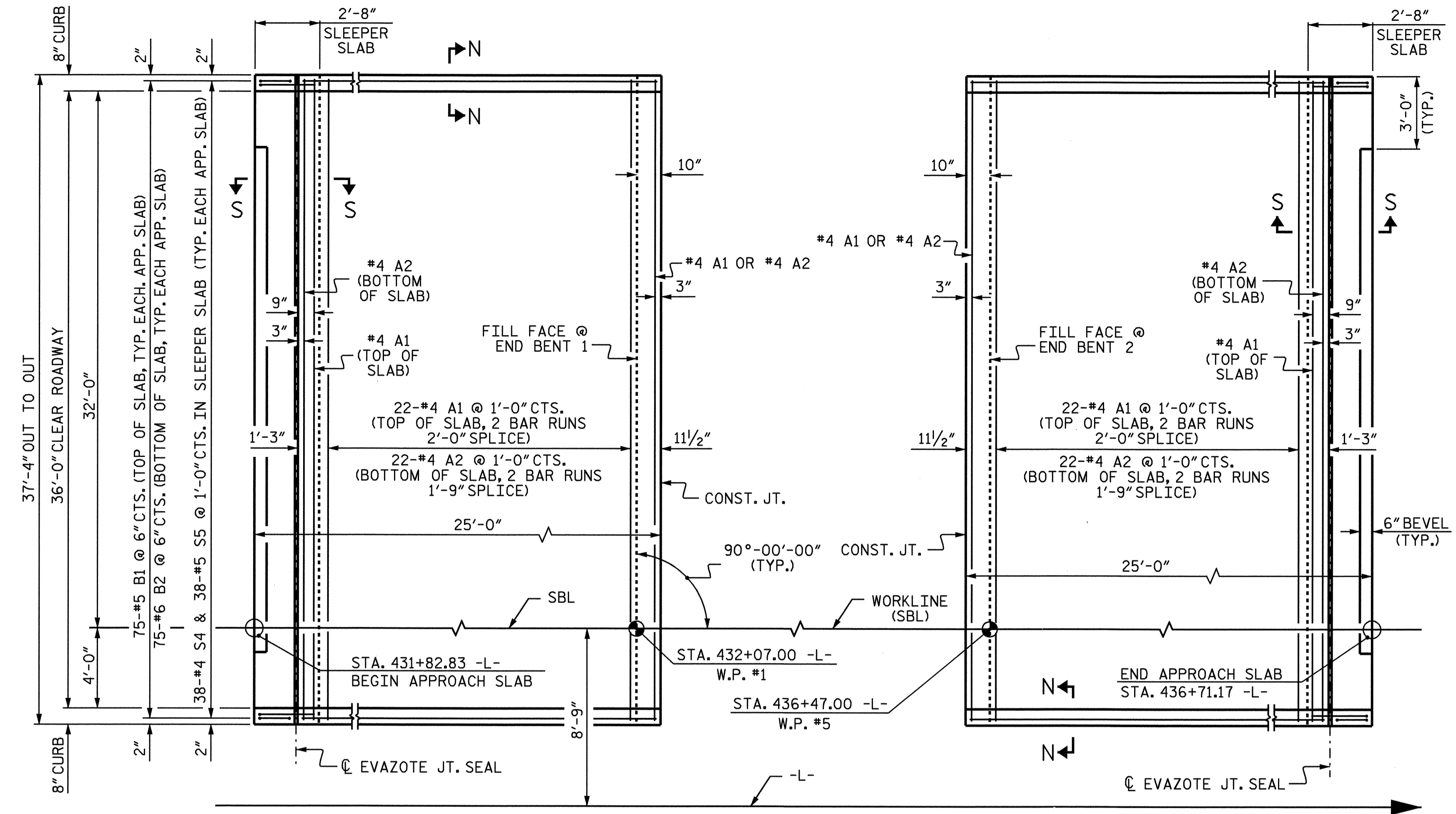
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS  
 (SBL)



ASSEMBLED BY : J. MYA DATE : 12/5/05  
 CHECKED BY : J. B. WILSON DATE : 12/15/05  
 DRAWN BY : FCJ 2/88  
 CHECKED BY : ARB 8/88

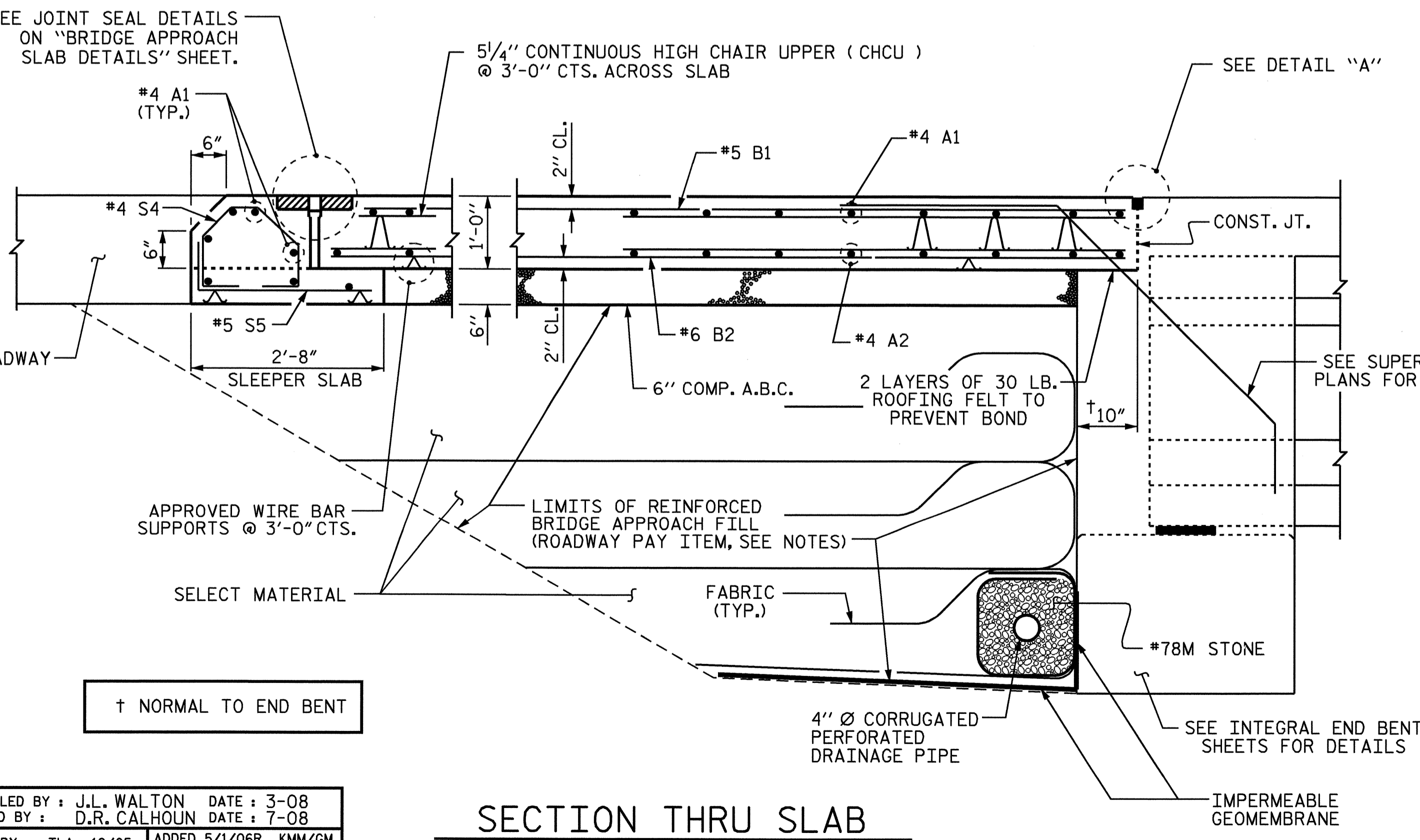
REV. 7/17/98 REK/RWW  
 REV. 8/16/99 RWW/LES  
 REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			70
2			4			

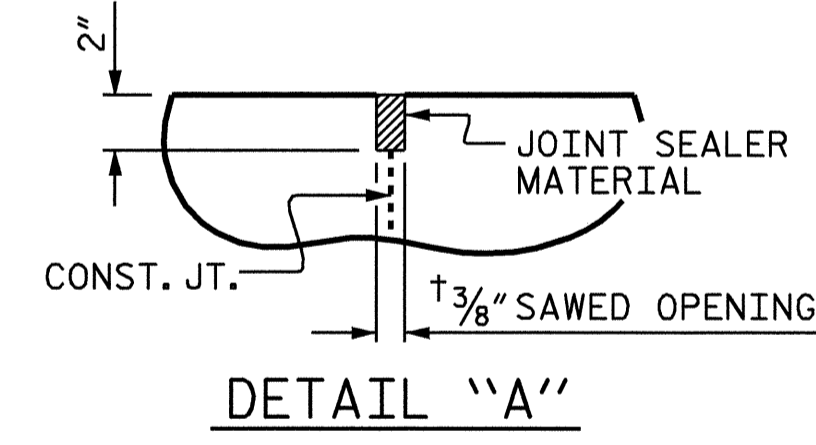


**PLAN @ END BENT 1**  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. #4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

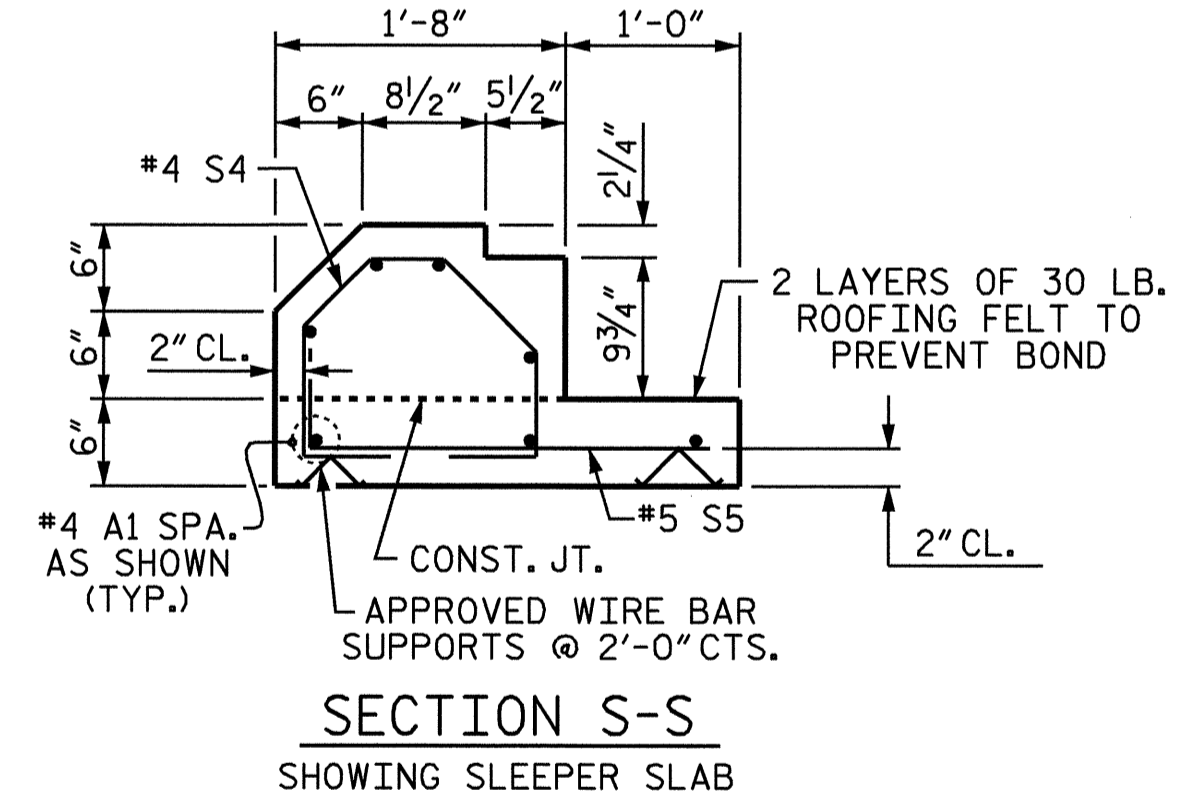
**PLAN @ END BENT 2**



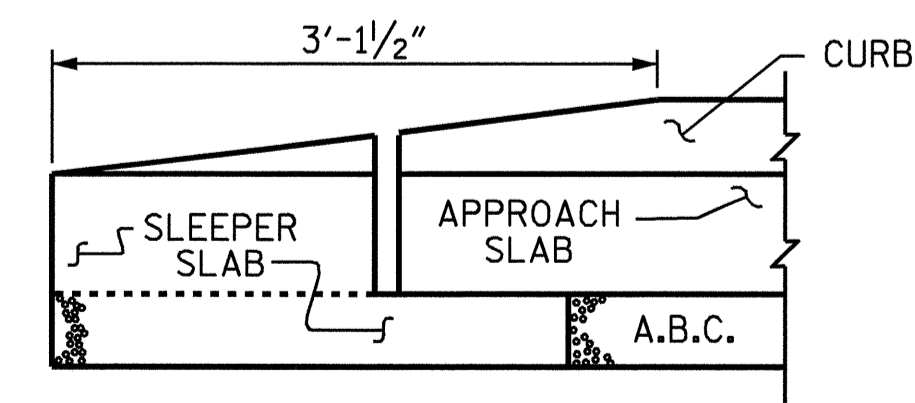
**SECTION THRU SLAB**



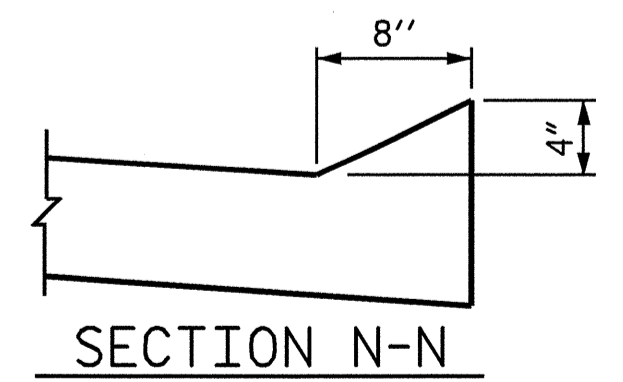
**DETAIL "A"**



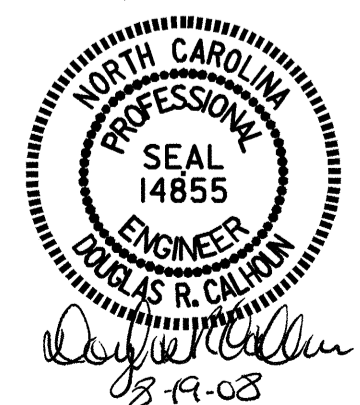
**SECTION S-S**  
SHOWING SLEEPER SLAB



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



**SECTION N-N**



**NOTES**

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

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

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

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

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

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

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

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

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3/16".

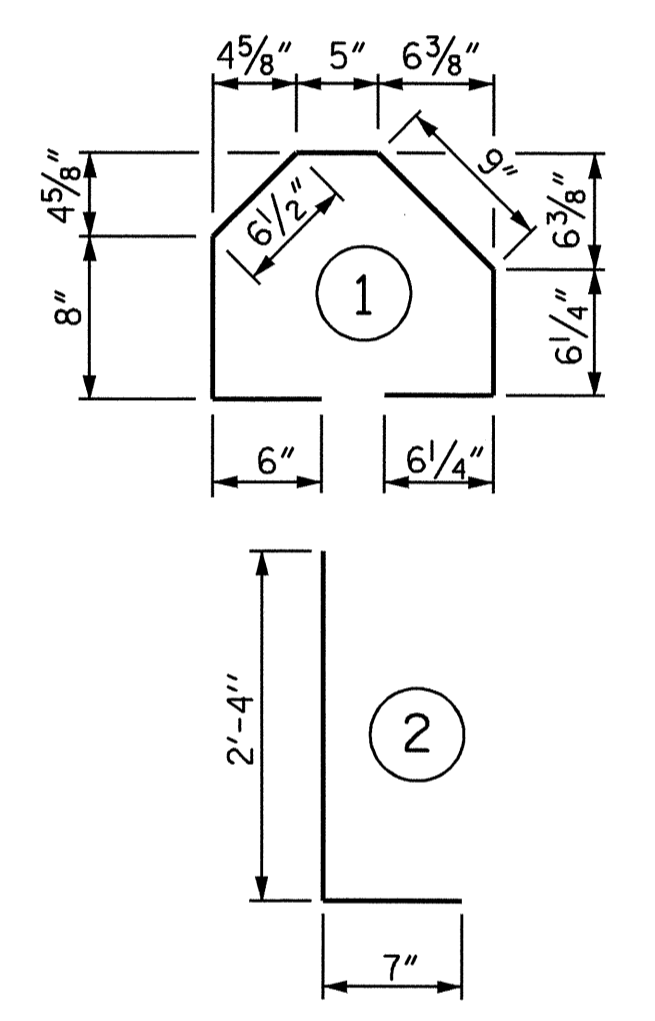
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

**BILL OF MATERIAL**

**FOR ONE APPROACH SLAB (2 REQ'D)**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	62	#4	STR	19'-6"	808
A2	48	#4	STR	19'-5"	623
* B1	75	#5	STR	22'-5"	1754
B2	75	#6	STR	22'-10"	2572
* S4	38	#4	1	3'-11"	99
S5	38	#5	2	2'-11"	116
<b>REINFORCING STEEL</b>					<b>3311</b>
<b>* EPOXY COATED REINFORCING STEEL</b>					<b>2661</b>
<b>CLASS AA CONCRETE</b>					
<b>POUR #1 - SLEEPER SLAB</b>					<b>C. Y. 3.8</b>
<b>POUR #2 - SLAB &amp; CURB</b>					<b>C. Y. 32.2</b>
<b>TOTAL</b>					<b>C. Y. 36.0</b>

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

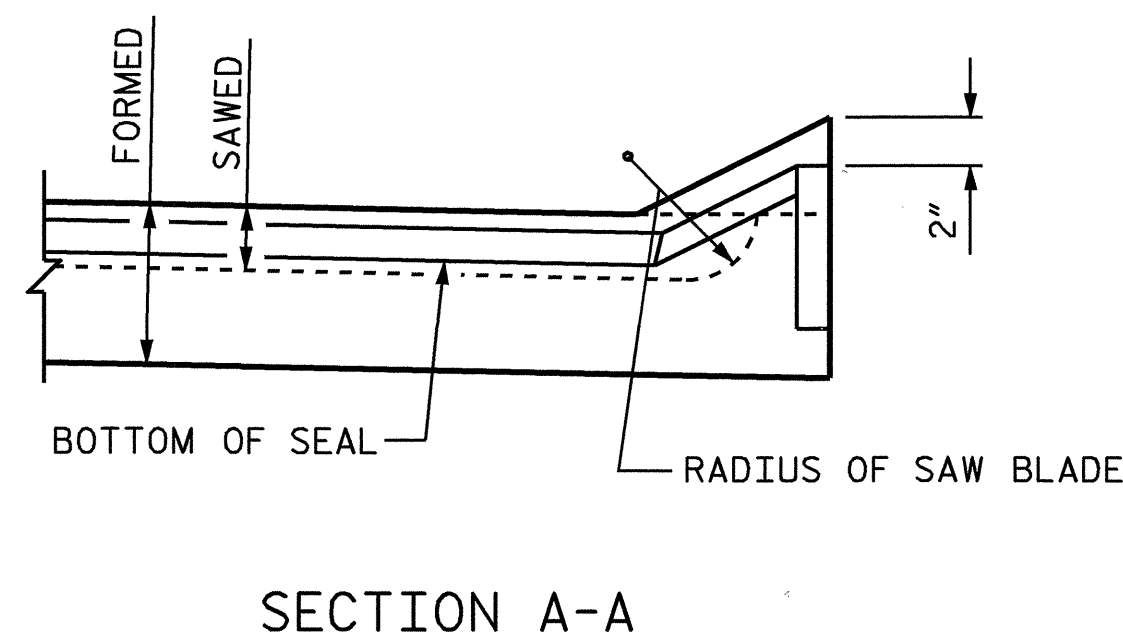
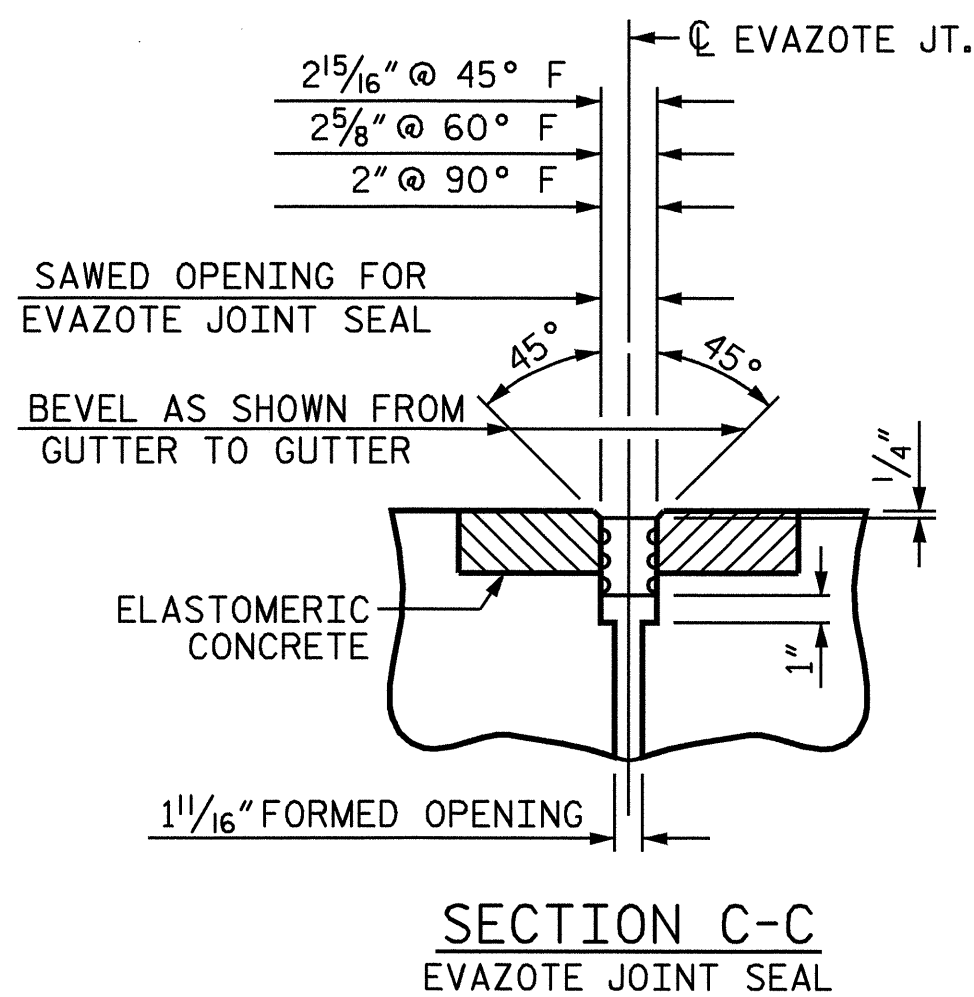
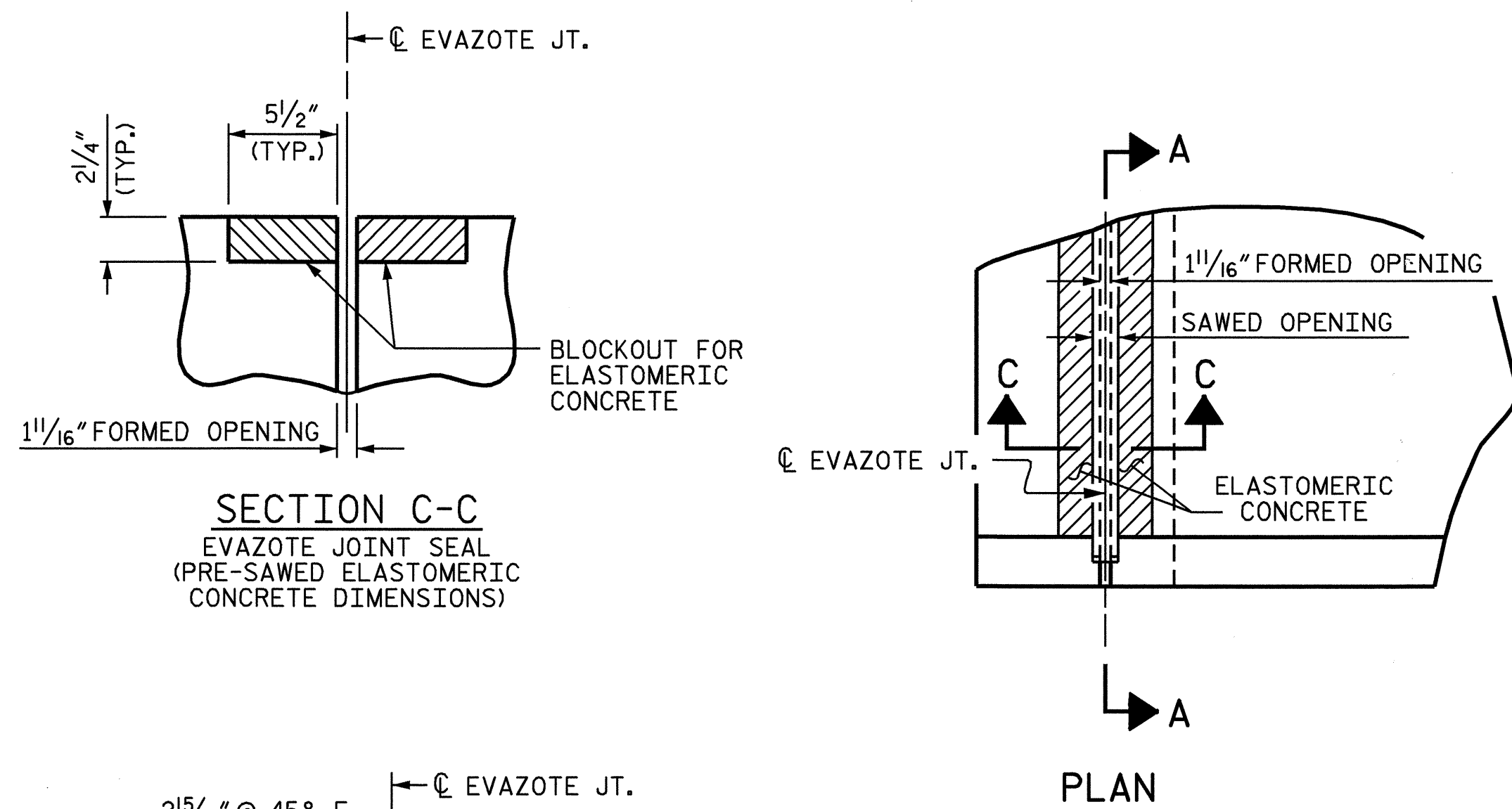
PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR INTEGRAL ABUTMENT (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : J.L. WALTON DATE : 3-08  
 CHECKED BY : D.R. CALHOUN DATE : 7-08  
 DRAWN BY : TLA 10/05  
 CHECKED BY : GM 5/06

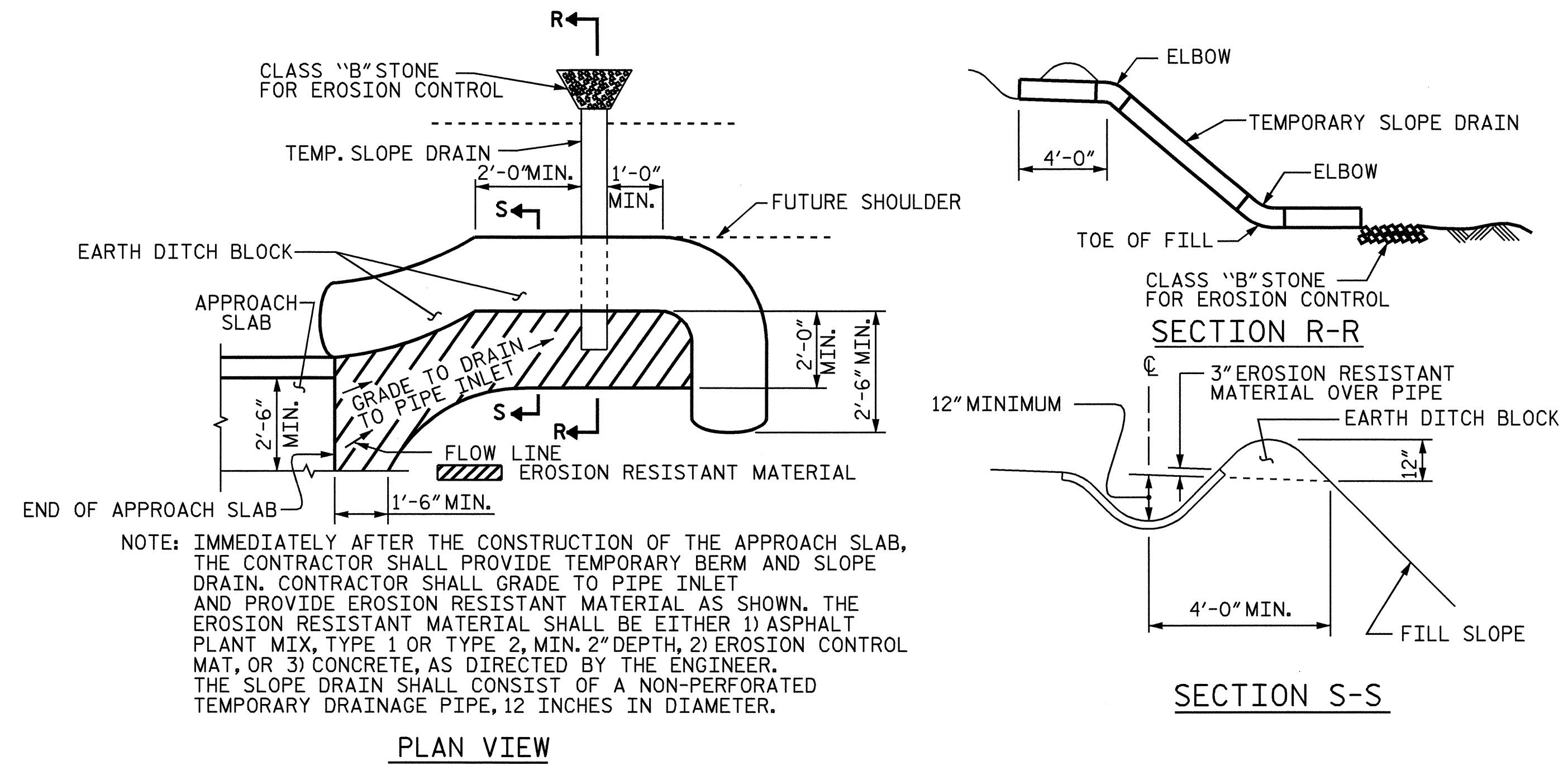


**JOINT SEAL DETAILS @ SLEEPER SLAB**

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED DOWN AS SHOWN IN SECTION A-A.

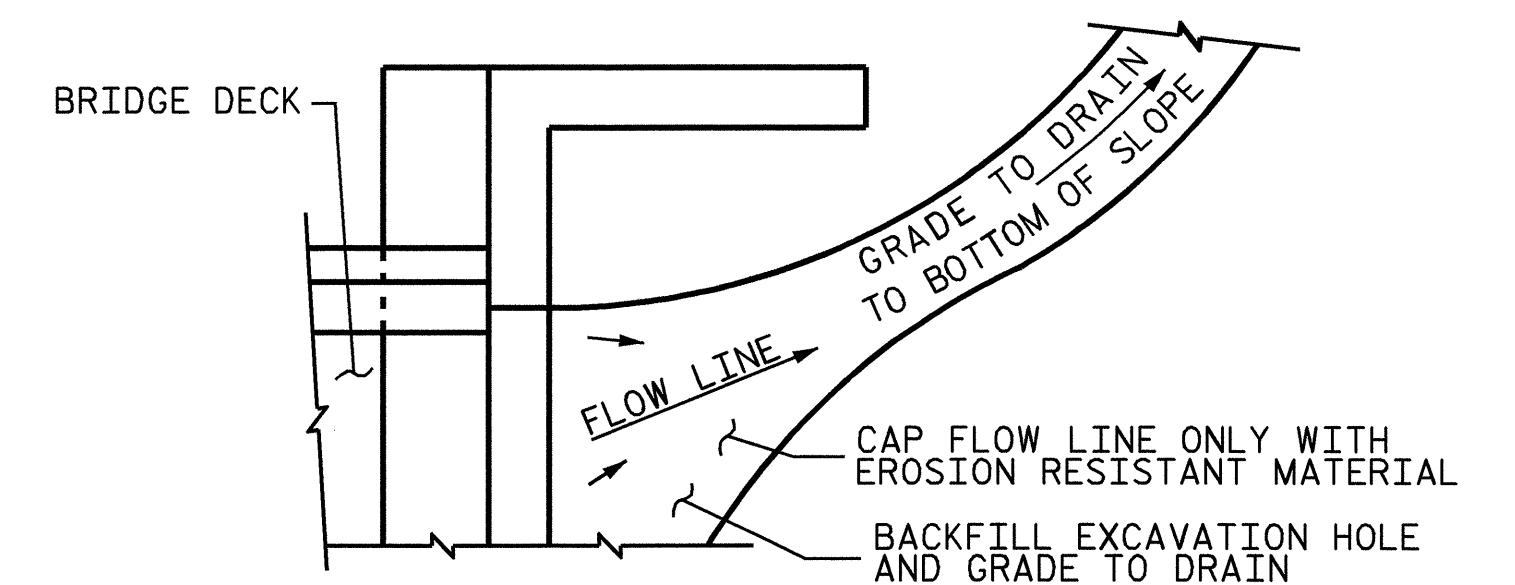
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	6.2
2	6.2
TOTAL	12.4

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

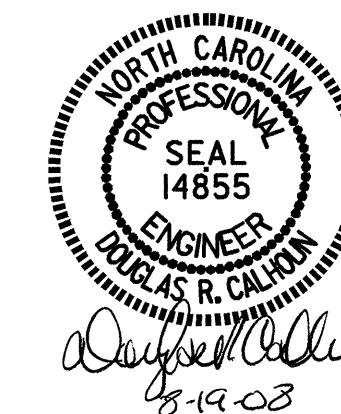
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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**

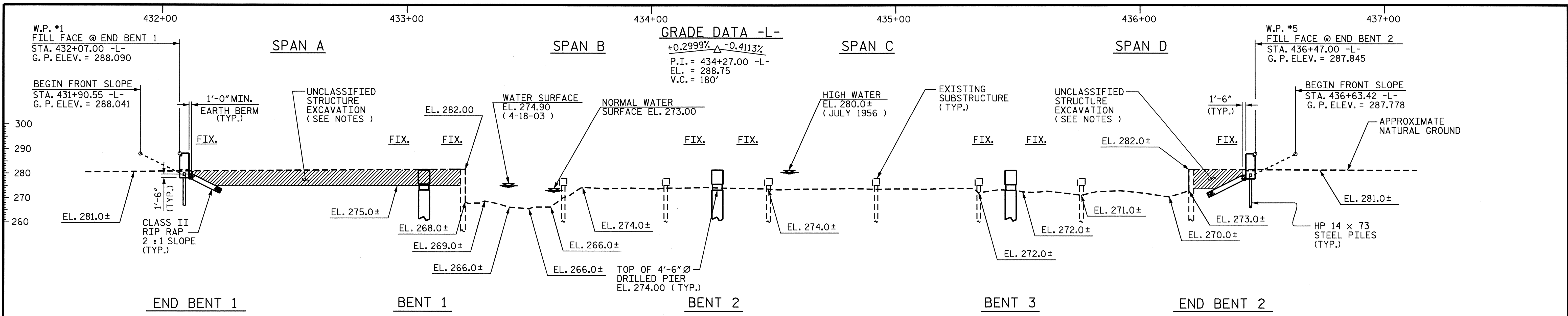
ASSEMBLED BY : J.L. WALTON	DATE : 3-08
CHECKED BY : D.R. CALHOUN	DATE : 7-08
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

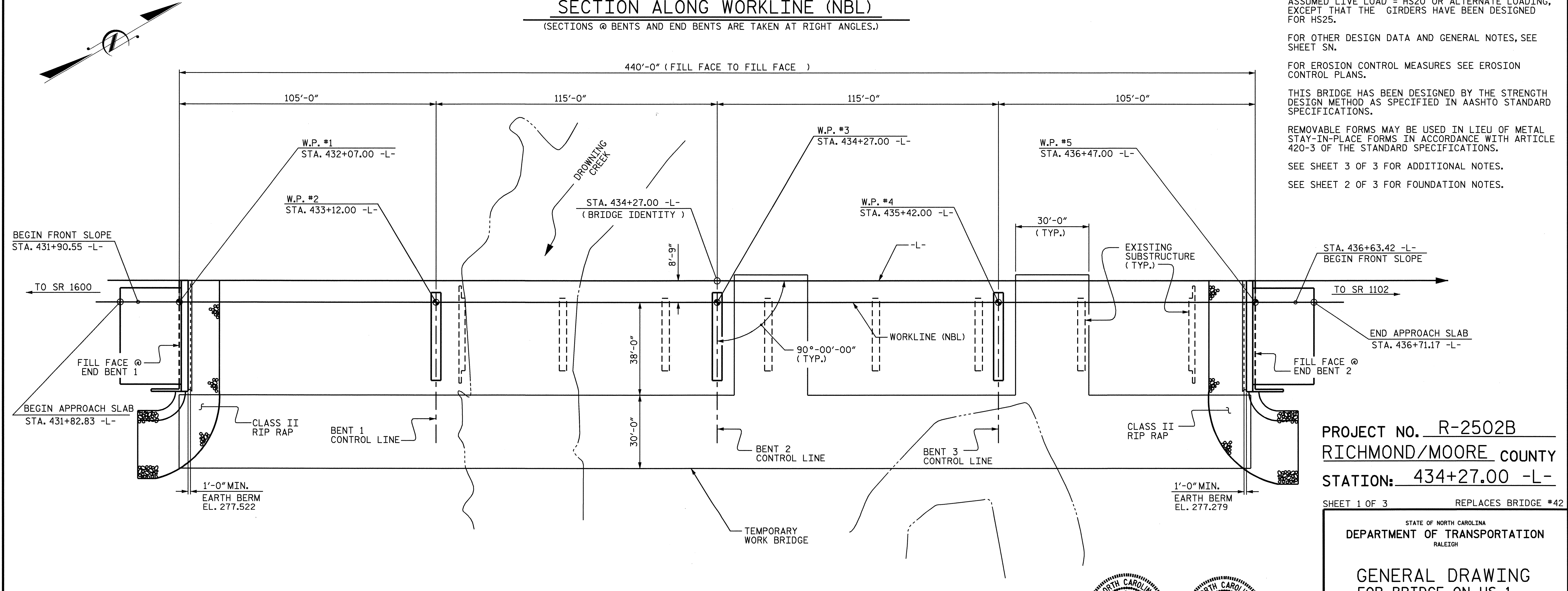
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. <b>S-35</b>
STANDARD BRIDGE APPROACH SLAB DETAILS (SBL)						TOTAL SHEETS <b>70</b>
REVISIONS						SHEET NO. <b>S-35</b> TOTAL SHEETS <b>70</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



**SECTION ALONG WORKLINE (NBL)**  
 (SECTIONS @ BENTS AND END BENTS ARE TAKEN AT RIGHT ANGLES.)

**NOTES:**  
 ASSUMED LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET 3N.  
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.  
 THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 SEE SHEET 3 OF 3 FOR ADDITIONAL NOTES.  
 SEE SHEET 2 OF 3 FOR FOUNDATION NOTES.



**PLAN**  
 (PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

**PROJECT NO. R-2502B**  
**RICHMOND/MOORE COUNTY**  
**STATION: 434+27.00 -L-**

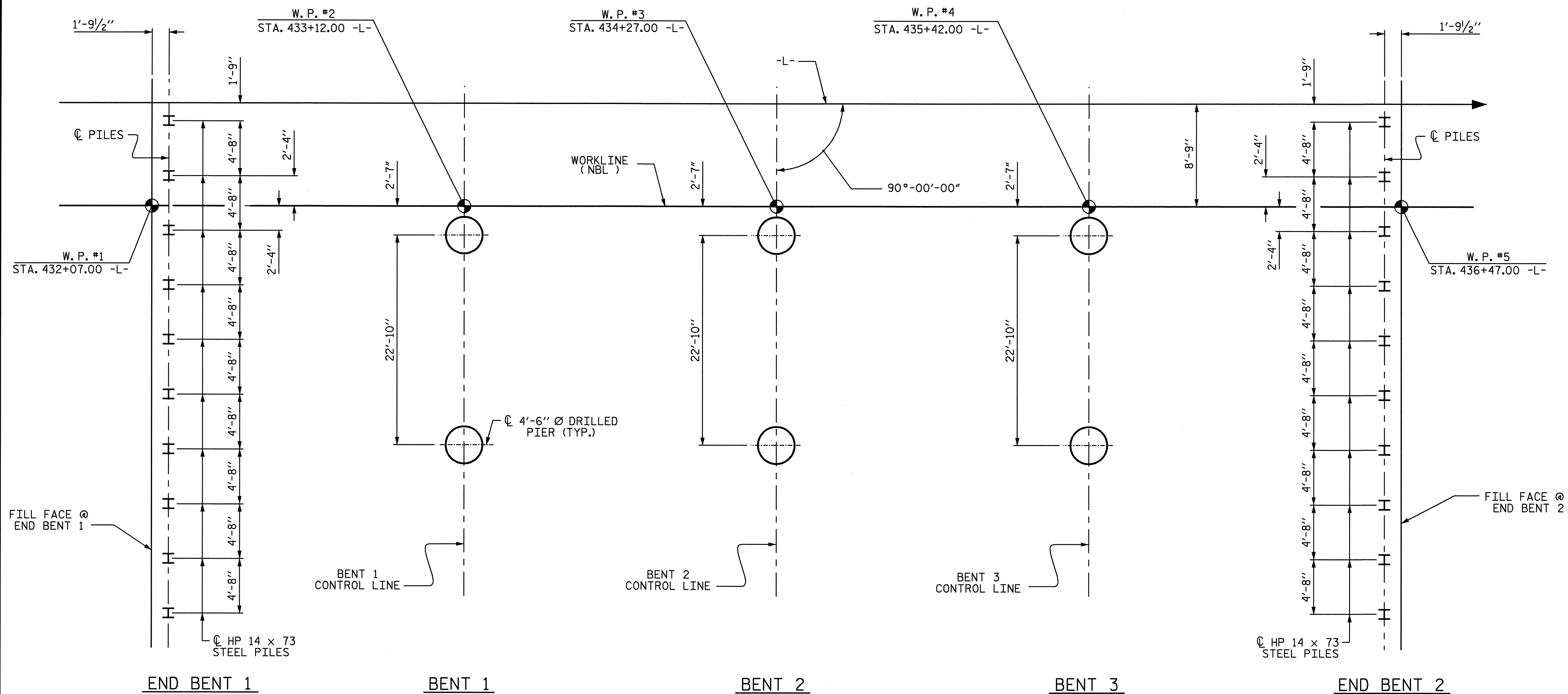
SHEET 1 OF 3 REPLACES BRIDGE #42

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON US 1 OVER DROWLING CREEK BETWEEN SR 1600 AND SR 1102 (NORTHBOUND LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 70
					S-36

DRAWN BY: J. MYA DATE: 2/19/08  
 CHECKED BY: D.R. CALHOUN DATE: 6/26/08

19-AUG-2008 10:17  
 R:\Structures\FINAL PLANS\NBL\NR2502B.ed.GD\_NBL.dgn  
 bngrody

*Professional Engineer Seal*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 14855  
 DUGLAS R. CALHOUN  
 8/11/08



**FOUNDATION LAYOUT**

( DIMENSIONS LOCATING PILES & DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES & DRILLED PIERS )

**FOUNDATION NOTES**

DRILLED PIERS AT BENT 1 AND 3 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 2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 95 TSF.

DRILLED PIERS AT BENT 1 AND 3 ARE DESIGNED FOR AN APPLIED LOAD OF 475 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR AN APPLIED LOAD OF 492 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1, 2 & 3. IF REQUIRED, DO NOT EXTEND THE CASING BELOW ELEVATION 249.0 FT FOR BENT 1, 250.0 FT FOR BENT 2, AND 248.0 FT FOR BENT 3 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING. SEE DRILLED PIERS SPECIAL PROVISION.

IF PERMANENT STEEL CASING IS REQUIRED, INSTALL PERMANENT CASING AT BENT 1, 2, AND 3 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 270.0 FT FOR BENT 1, 261.0 FT FOR BENT 2, AND 269.0 FOR BENT 3.

DRILLED PIERS AT BENT 1 AND 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 244.5 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 243.5 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 AND 2 IS ELEVATION 250 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT 3 IS ELEVATION 249.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISION.

SPT TESTING IS REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT BENT 1, 2, & 3. SEE DRILLED PIERS SPECIAL PROVISION.

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

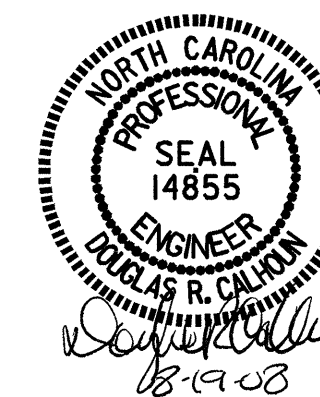
CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT 1 AND 2 IS 75 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND 2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

DRAWN BY : J. MYA DATE : 2/19/08  
 CHECKED BY : D.R. CALHOUN DATE : 6/26/08

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PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
GENERAL DRAWING FOR BRIDGE ON US 1 OVER DROWNING CREEK BETWEEN SR 1600 AND SR 1102 ( NORTHBOUND LANE )						S-37
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	70
1			3			
2			4			

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-6" Ø DRILLED PIERS IN SOIL	4'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	HP 14 X 73 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	STRUCTURE DRAINAGE SYSTEM	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										17,270	15,934					2,176.67			876.67					
END BENT 1									1230			20.9		3,598			10	250		162	180			
BENT 1			48.4	10.6	50.0		1					37.8		11,038	1,817									
BENT 2			48.4	10.6	48.0		1					37.9		11,066	1,823									
BENT 3			50.4	10.6	52.0		1					37.6		11,194	1,870									
END BENT 2									230			20.9		3,598			10	300		192	214			
TOTAL	LUMP SUM	LUMP SUM	147.2	31.8	150.0	3	3	3	1460	17,270	15,934	155.1	LUMP SUM	40,494	5,510	2,176.67	20	550	876.67	354	394	LUMP SUM	LUMP SUM	LUMP SUM

**NOTES (CONT.):**

THE EXISTING STRUCTURE CONSISTING OF 7 (4 @ 42'-6", 1 @ 42'-8", 1 @ 42'-4" AND 1 @ 42'-6" RESPECTIVELY) REINFORCED CONCRETE DECK SPANS ON REINFORCED CONCRETE DECK GIRDERS WITH A CLEAR ROADWAY WIDTH OF 26'-0" ON REINFORCED CONCRETE ABUTMENTS WITH PILE FOOTING AND REINFORCED CONCRETE POST AND WEB BENTS WITH PILE FOOTINGS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

REMOVAL OF THE EXISTING WALKWAY, DIP, AND 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.

PAYMENT FOR THE REMOVAL OF 8" DIP AND EXISTING WALKWAY SHALL BE INCLUDED IN THE PAY ITEM "REMOVAL OF EXISTING STRUCTURE AT STATION 434+27.00 -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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT. TO THE RIGHT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

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

A TEMPORARY WORK BRIDGE SHALL BE PERMITTED FOR CONSTRUCTION OF BRIDGE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 434+27.00 -L-.

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

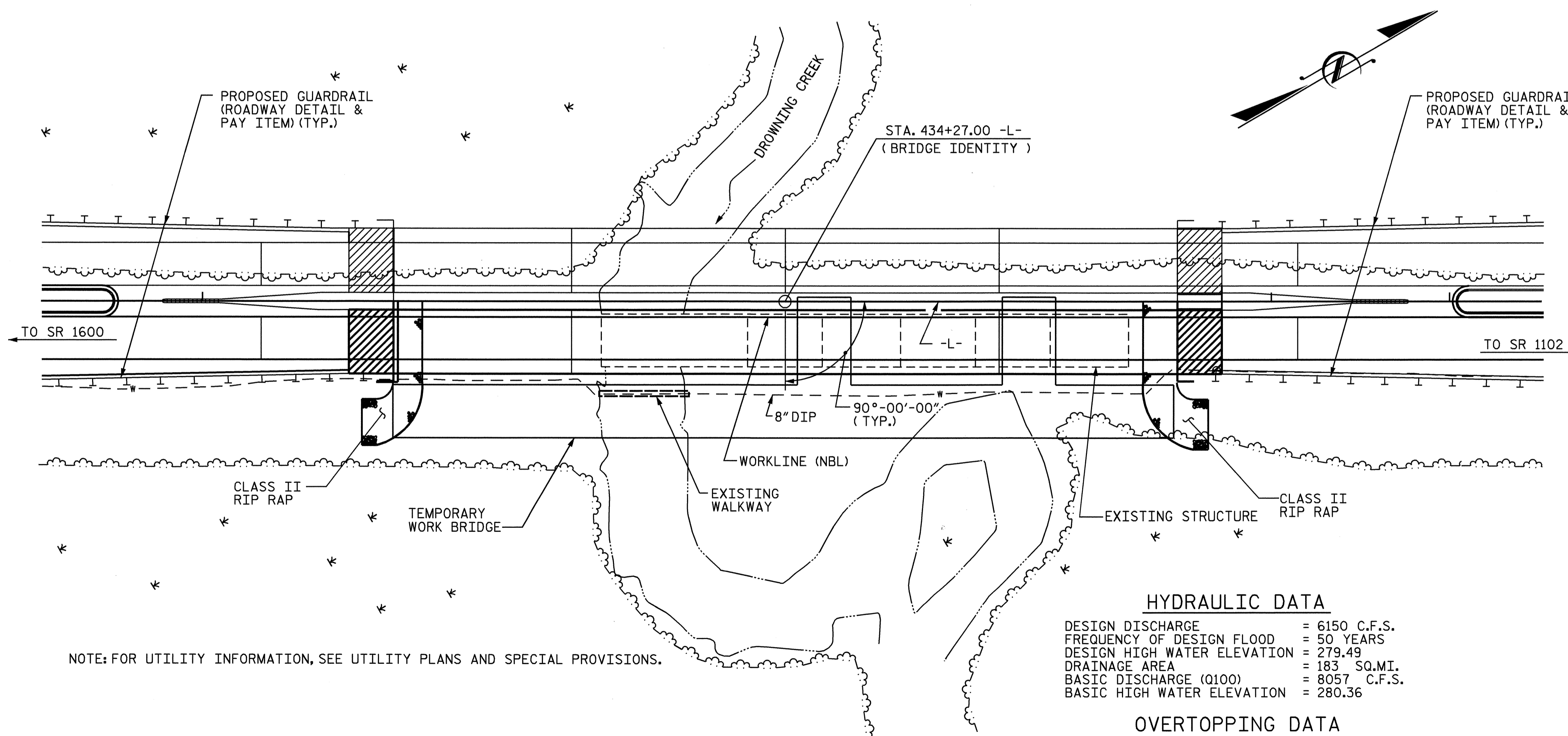
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

**B. M. #27 : RR SPIKE IN BASE OF POWER POLE 236.68' LT. STA. 450+95.35 -L- , EL. 302.08**



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**HYDRAULIC DATA**

DESIGN DISCHARGE = 6150 C.F.S.  
 FREQUENCY OF DESIGN FLOOD = 50 YEARS  
 DESIGN HIGH WATER ELEVATION = 279.49  
 DRAINAGE AREA = 183 SQ.MI.  
 BASIC DISCHARGE (Q100) = 8057 C.F.S.  
 BASIC HIGH WATER ELEVATION = 280.36

**OVERTOPPING DATA**

OVERTOPPING DISCHARGE = 13,500 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD = 500 ± YEARS  
 OVERTOPPING FLOOD ELEVATION = 282.60

**LOCATION SKETCH**

DRAWN BY : J. MYA DATE : 2/20/08  
 CHECKED BY : D.R. CALHOUN DATE : 6/26/08

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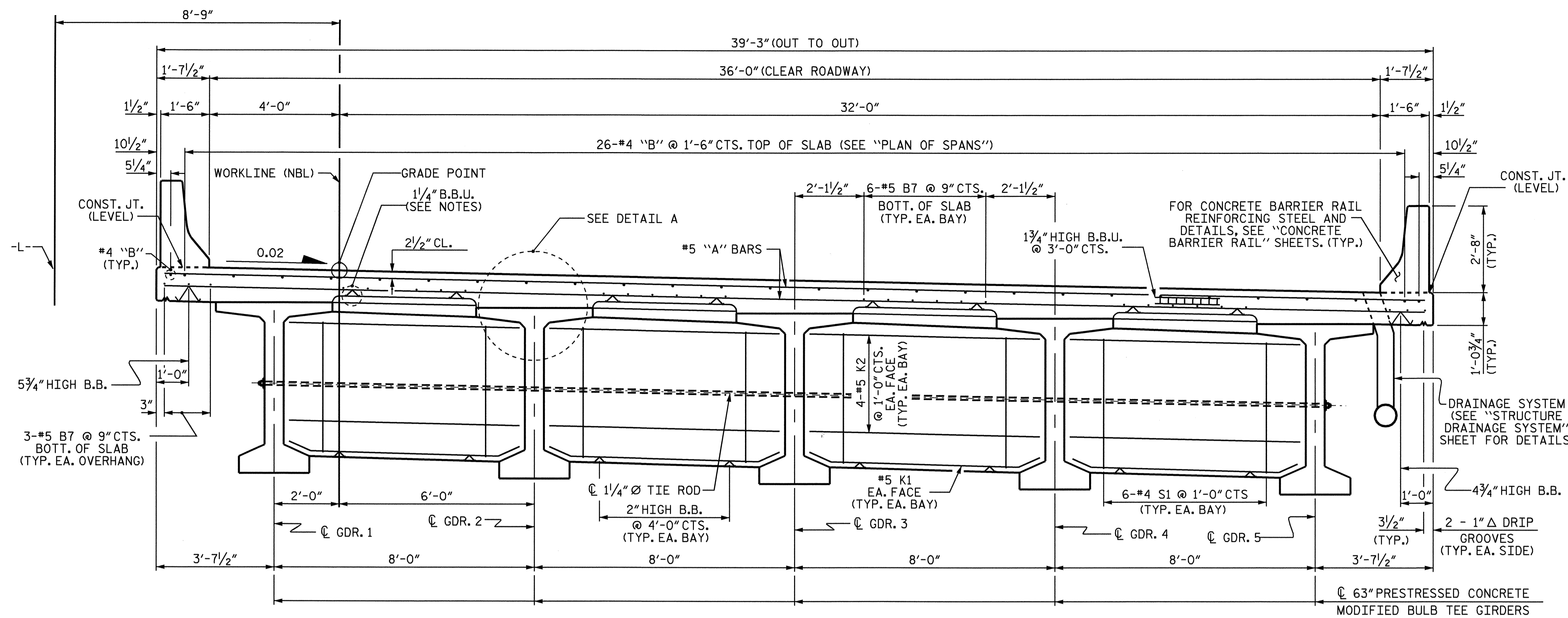


PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

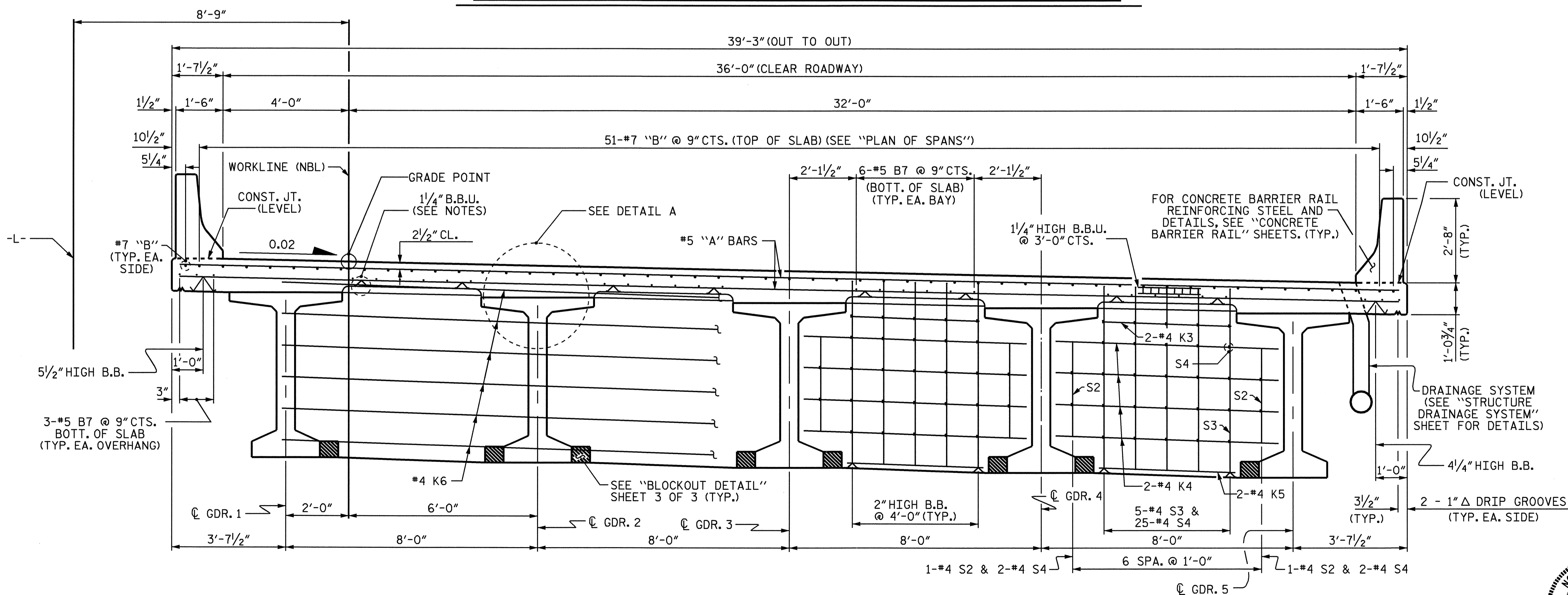
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON US 1  
 OVER DROWNING CREEK BETWEEN  
 SR 1600 AND SR 1102  
 (NORTHBOUND LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			70



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



TYPICAL SECTION AT BENT DIAPHRAGM

NOTES

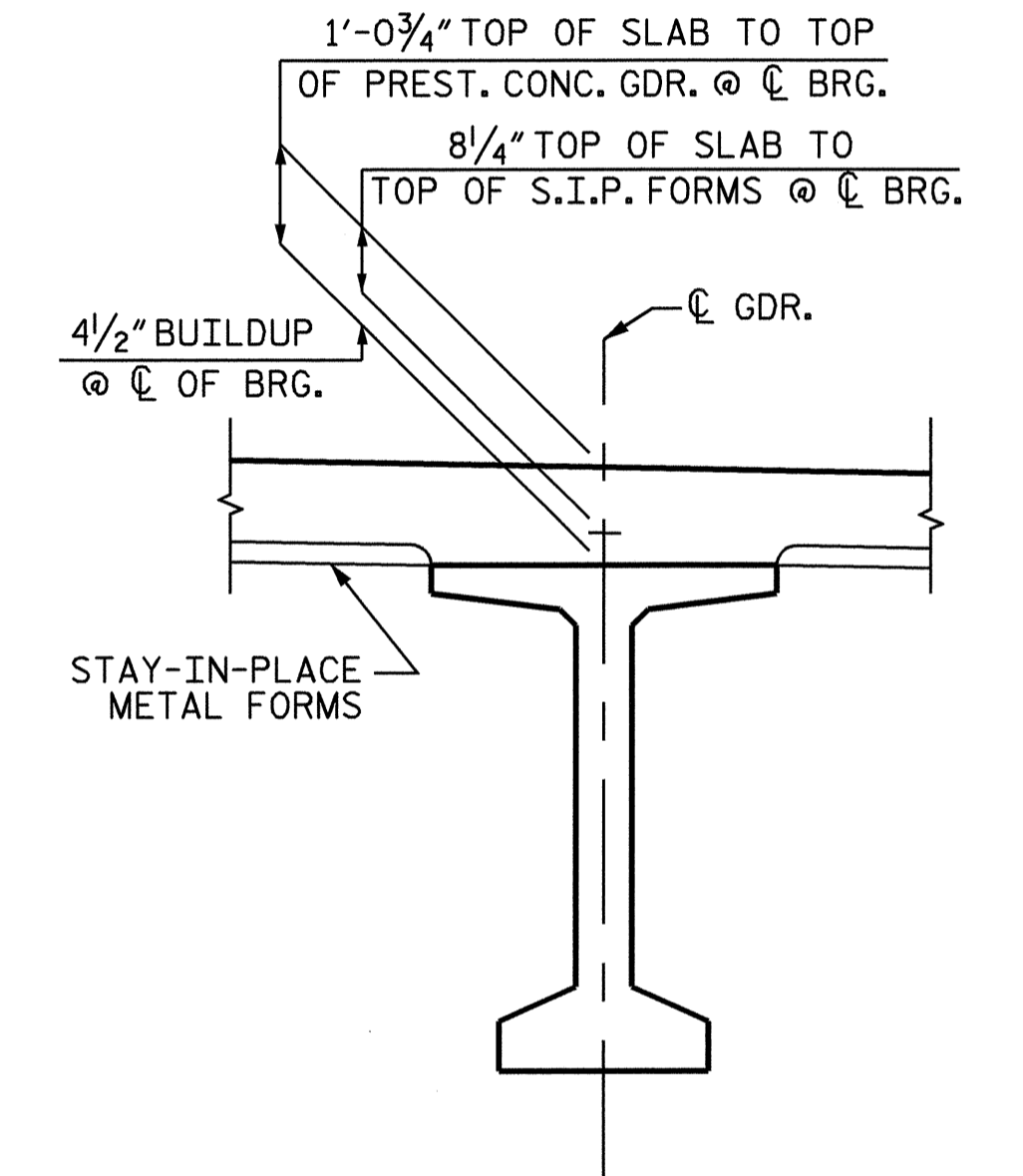
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS, AND THE NUTS ON THE 1/4" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.



DETAIL A

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

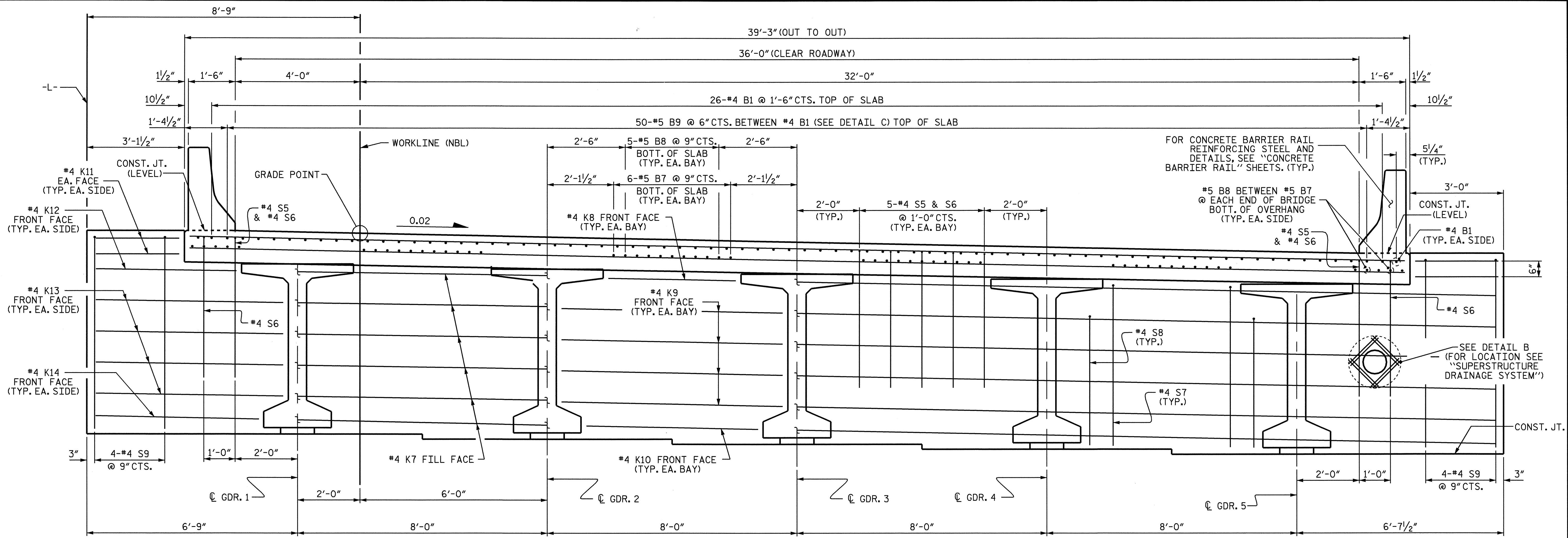
SUPERSTRUCTURE  
 TYPICAL SECTION  
 (NBL)



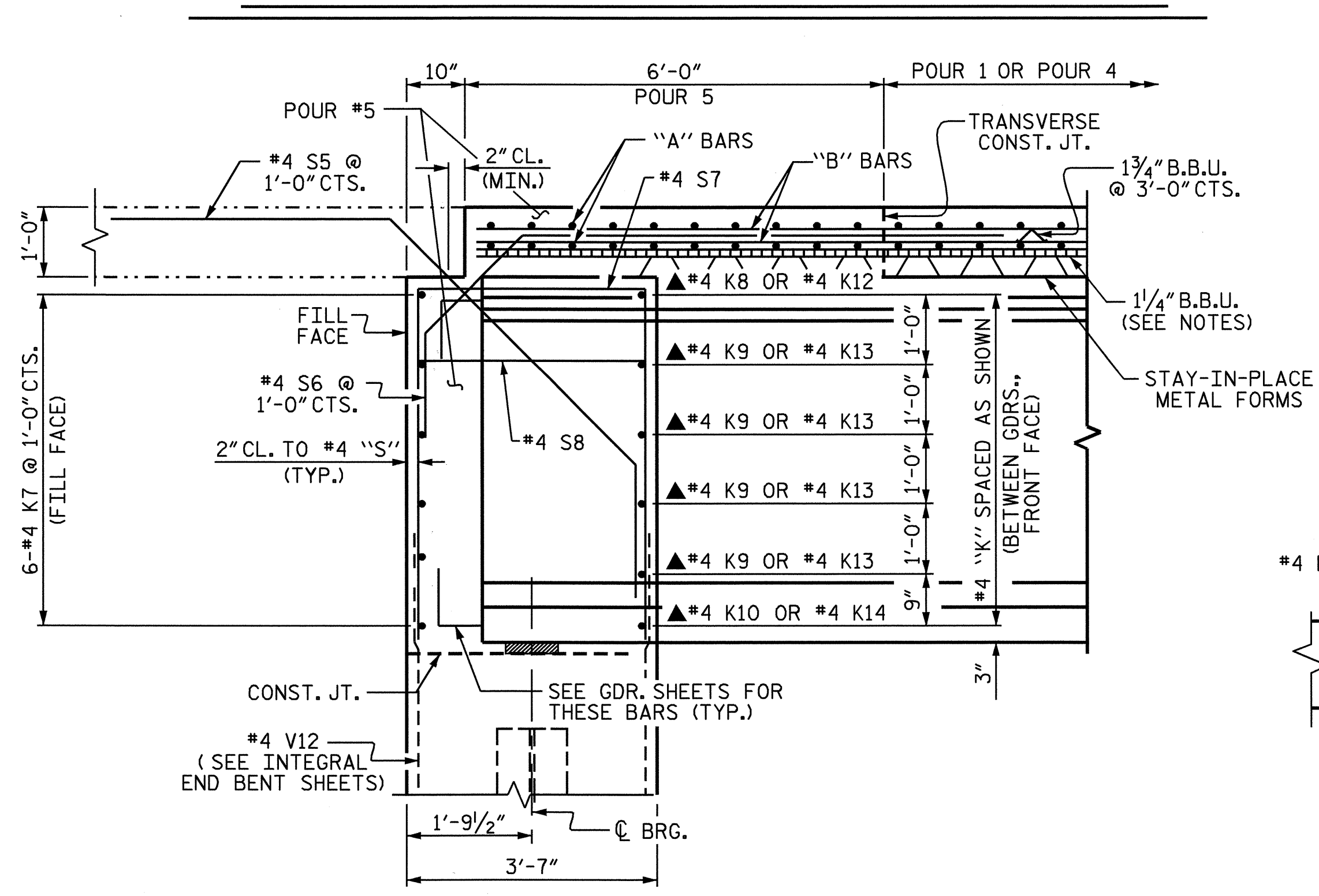
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39	
1			3			TOTAL SHEETS	
2			4			70	

DRAWN BY: T.L.CLELLAND DATE: 5/18/05  
 CHECKED BY: T.A.HARRIS DATE: 8/31/05



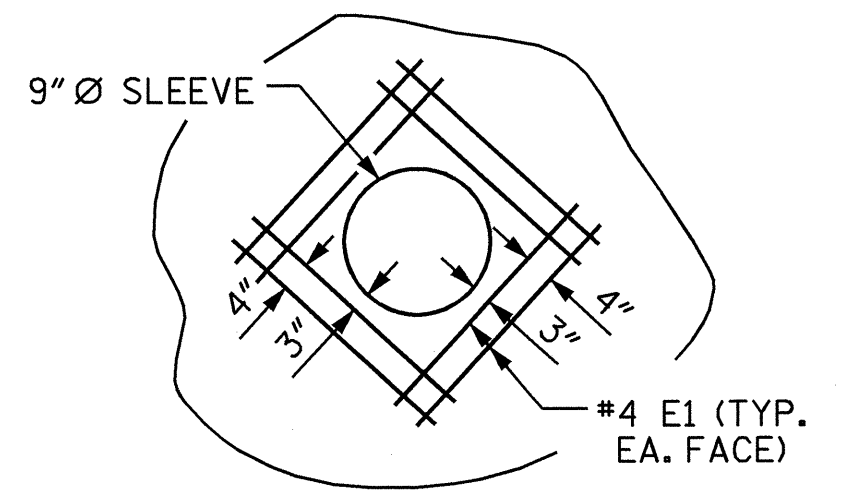


TYPICAL SECTION @ INTEGRAL END BENT



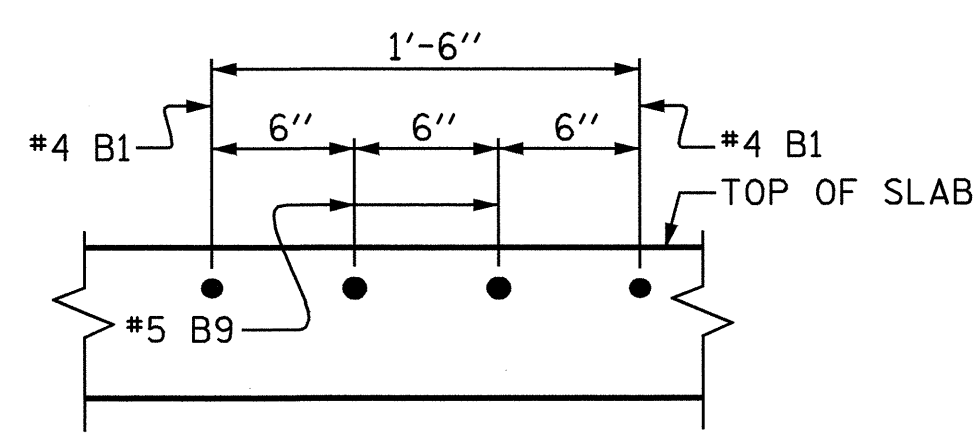
SECTION A-A  
(AT INTEGRAL END BENT)

▲ (#4K8 THRU #4K10 TYP. EA. BAY / #4K12 THRU #4K14 TYP. BOTH ENDS)



DETAIL B

THE 9" Ø SLEEVE THRU THE INTEGRAL END BENT IS TO BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR PIPE. THE AREA IS TO BE REINFORCED WITH ADDITIONAL BARS (E1) AS SHOWN.



DETAIL C

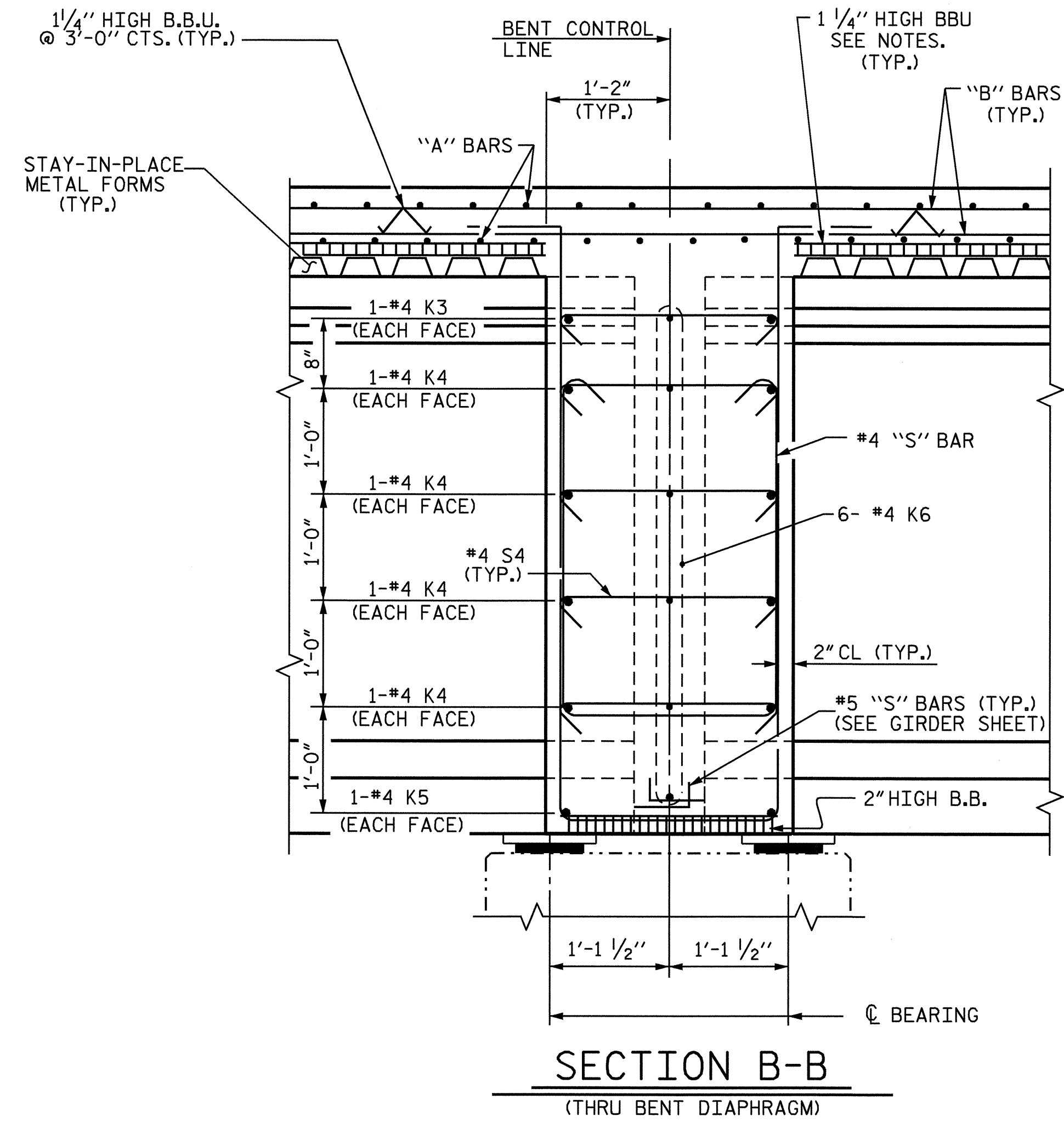
PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

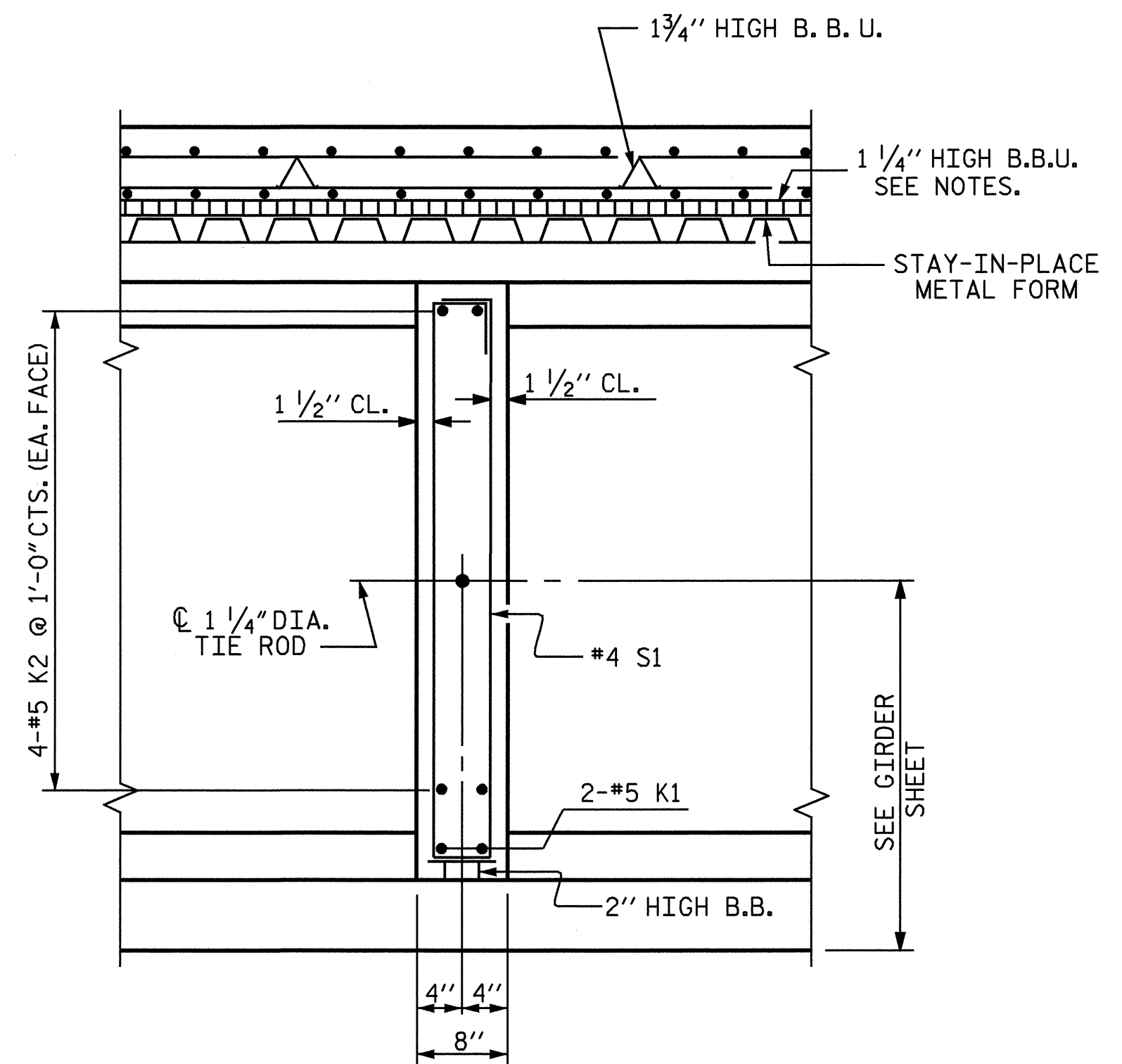
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION (NBL)					
SHEET NO. S-40					
TOTAL SHEETS 70					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



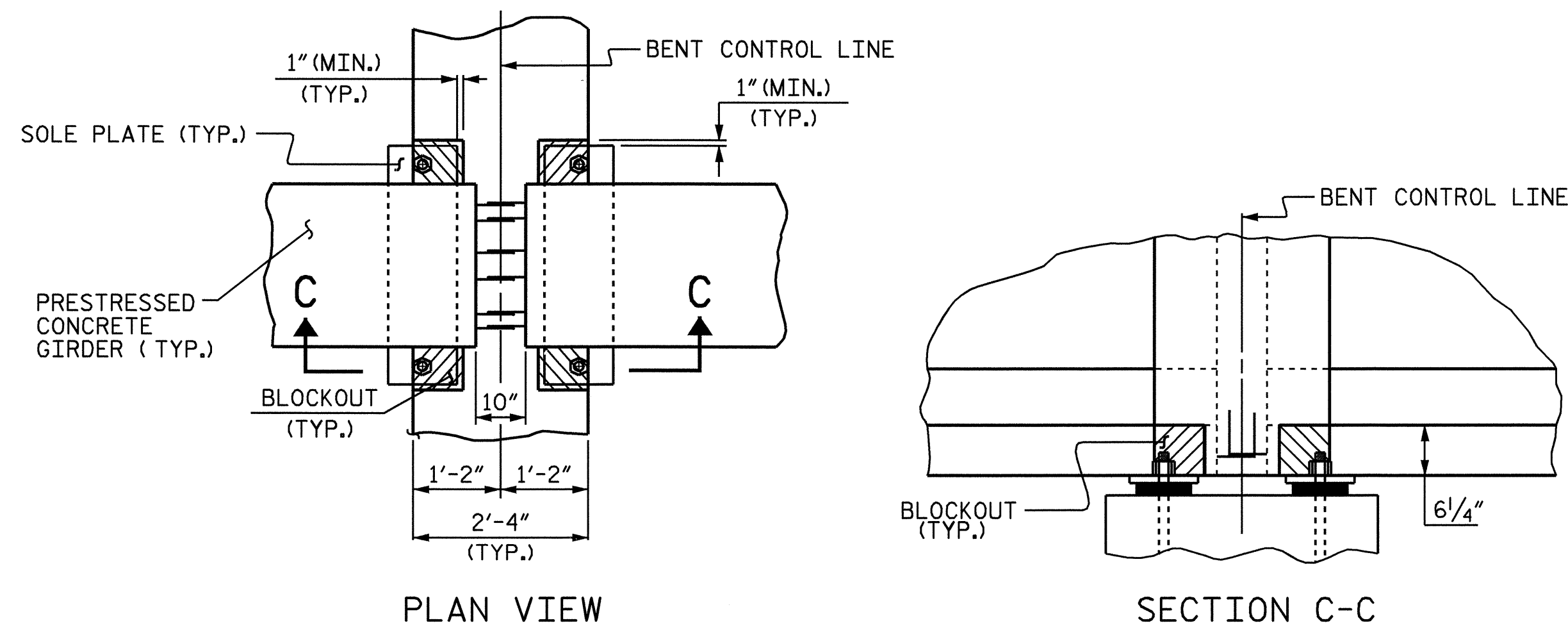
DRAWN BY: T.L. CLELLAND DATE: 5/18/05  
 CHECKED BY: I.A. HARRIS DATE: 8/31/05



**SECTION B-B**  
(THRU BENT DIAPHRAGM)



**SECTION C-C**



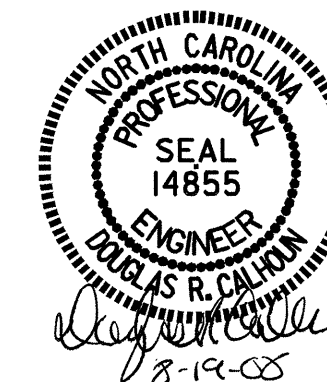
**BENT DIAPHRAGM BLOCKOUT DETAIL**  
(PRESTRESSED GIRDERS WITH CONTINUOUS DECK SLAB)

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS  
 (NBL)**



DRAWN BY : T.L.CLELLAND DATE : 5/31/05  
 CHECKED BY : T.A.HARRIS DATE : 9/1/05

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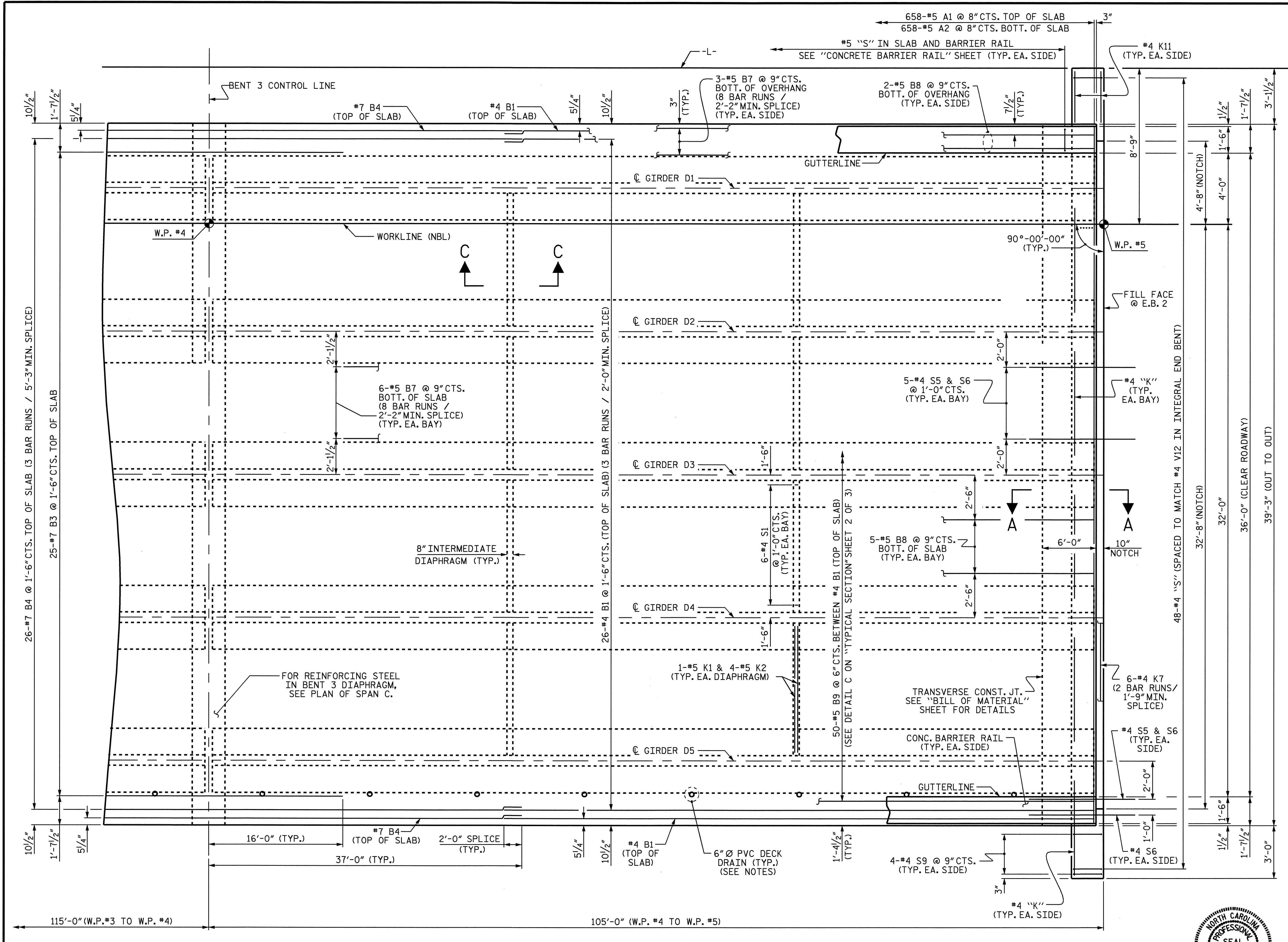
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			70

STR. #2









**NOTES**  
 FOR SECTION A-A, SEE "TYPICAL SECTION" SHEET 2 OF 3. FOR OTHER SECTION VIEWS, SEE "TYPICAL SECTION" SHEET 3 OF 3.  
 FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEET.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN D  
 (NBL)**

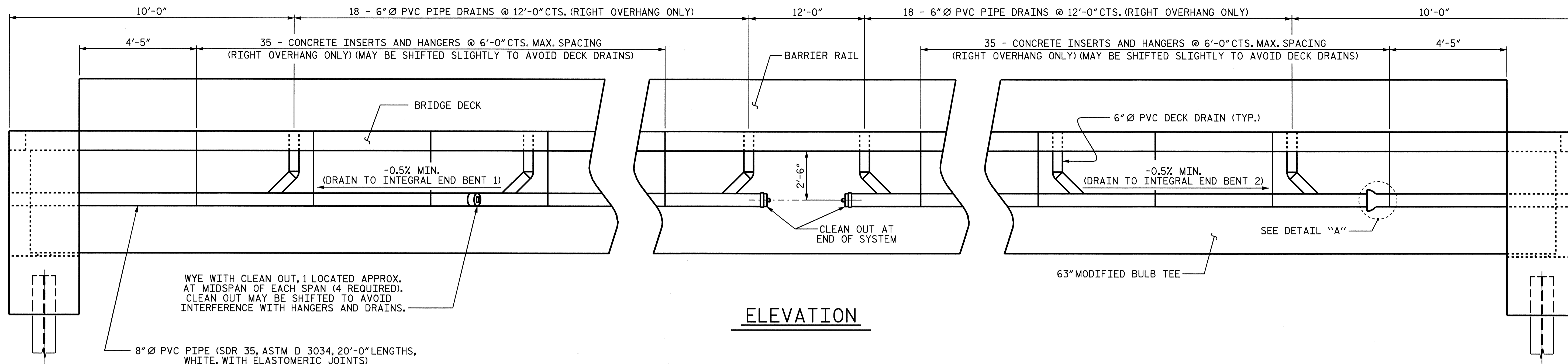
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			70



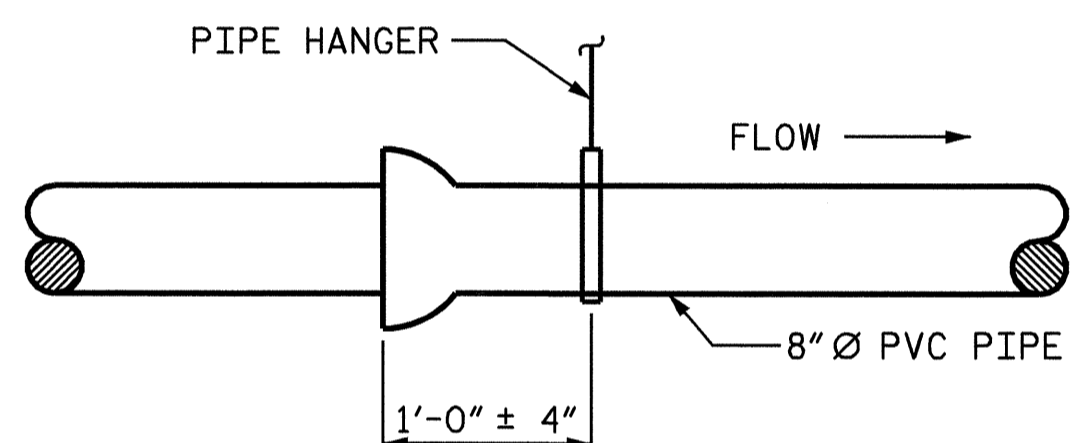
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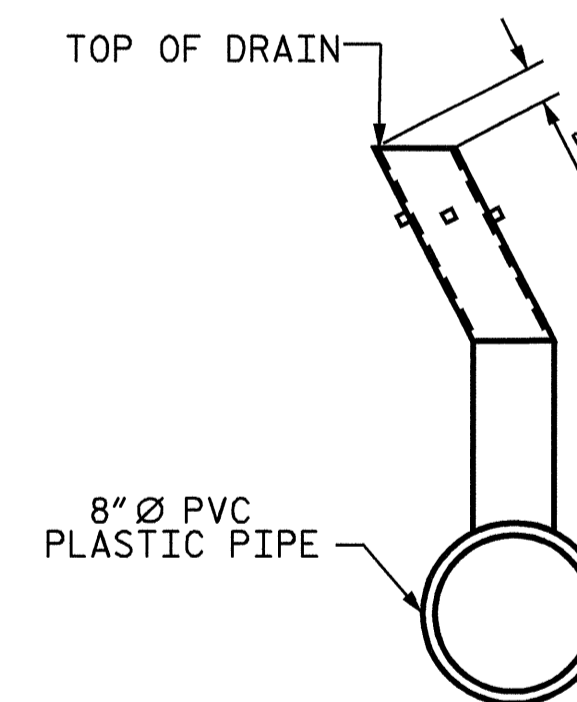
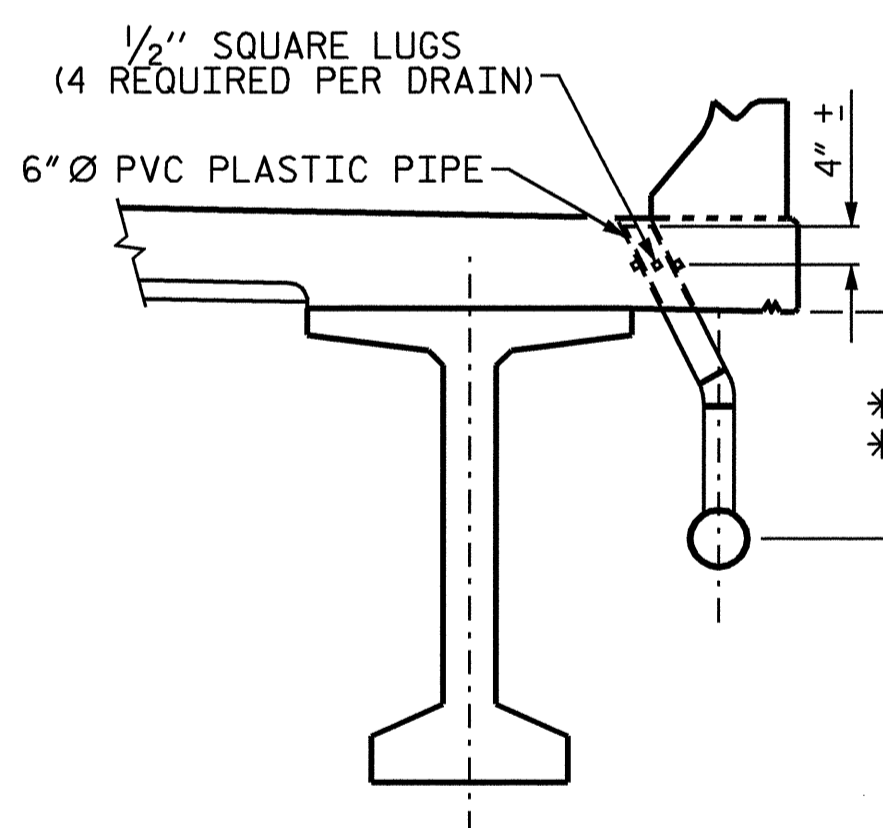
**PLAN OF SPAN D**



**ELEVATION**



**DETAIL "A"**



**PIPE DETAIL**

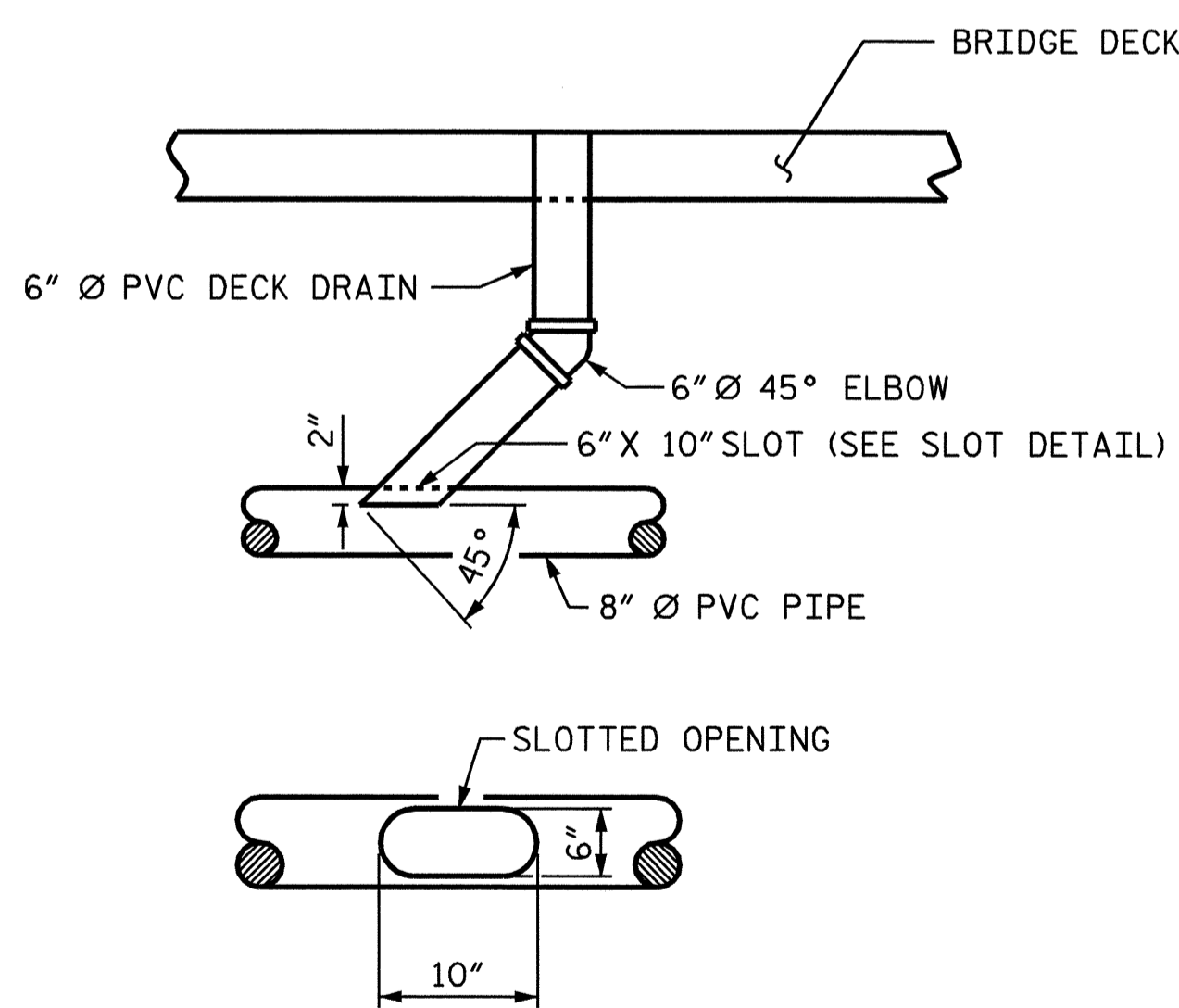
\*\* SEE ELEVATION VIEW FOR DIMENSIONS.

(36 DRAINS REQUIRED)

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

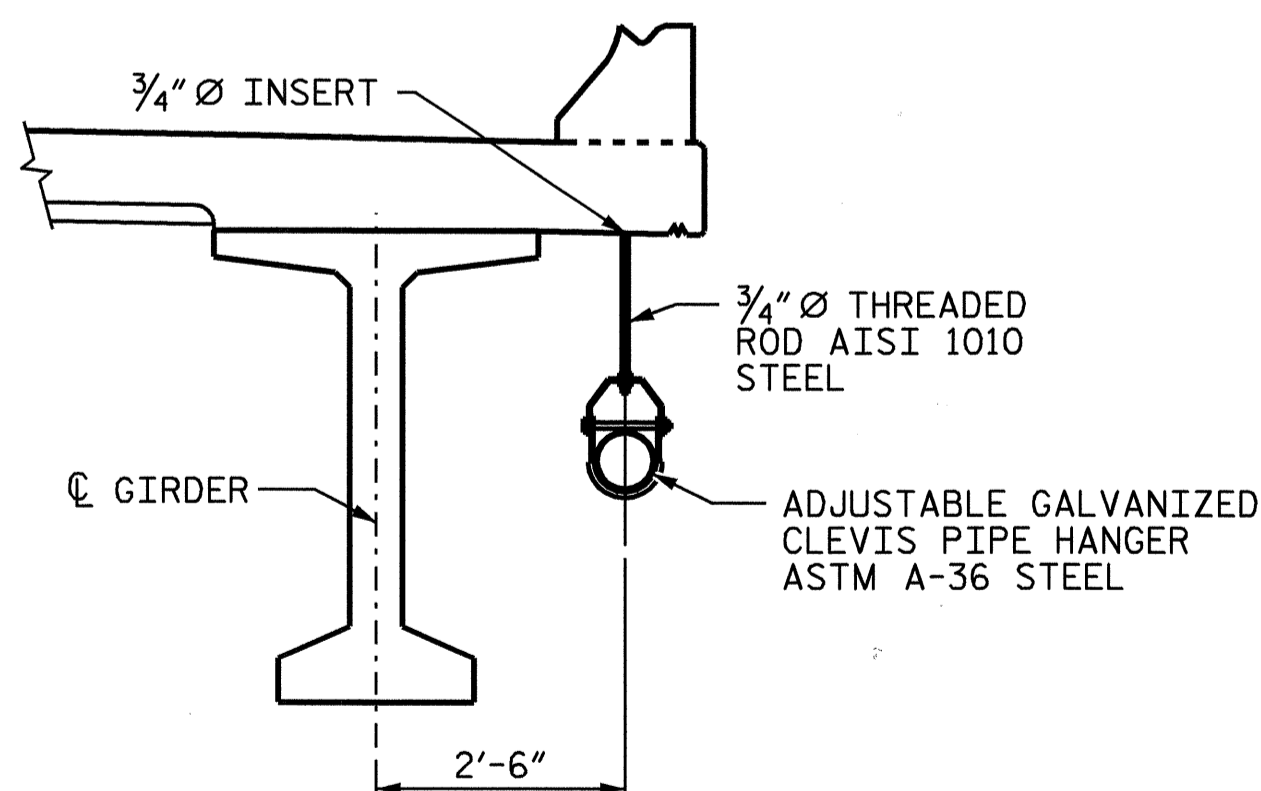
4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

**DRAIN PIPE DETAILS**



**SLOT DETAIL**

**ELEVATION VIEW OF DECK DRAIN AND DRAIN LINE INTERSECTION**



(70 HANGERS REQUIRED)

EACH CLEVIS PIPE HANGER, ROD, AND INSERT, SHOULD HAVE A MINIMUM TENSION WORK LOAD CAPACITY OF 2500 POUNDS.

**HANGER DETAILS**

**NOTES**

THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE DRAINAGE SYSTEM, INCLUDING, BUT NOT LIMITED TO, ATTACHMENTS TO THE BRIDGE, SCUPPER AND INLET GRATE DETAILS, SCUPPER SUPPORT SYSTEM, PIPE ALIGNMENT AND PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES AND JOINTS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

THE DRAINAGE SYSTEM DETAILS ARE SCHEMATIC DRAWINGS ONLY. THE CONTRACTOR SHALL DETERMINE THE PROPER ELBOW FITTINGS, PIPE LENGTHS, QUANTITY OF GUIDES, AND ATTACHMENT TYPES REQUIRED TO CARRY THE WATER FROM THE DECK DRAINS TO THE OUTLETS AT THE FILL FACE OF THE INTEGRAL END BENTS.

CLEVIS HANGERS, RODS, INSERTS, PIPE SUPPORT BRACKETS, CLAMPS, GUIDES, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. CONCRETE INSERTS SHALL BE OF AN APPROVED GALVANIZED TYPE HAVING A MINIMUM WORKING LOAD TENSION CAPACITY OF 4.2 KIPS.

NO ANCHORAGE TO THE PRESTRESSED GIRDERS IS ALLOWED.

COUPLINGS PERMITTED AS APPROVED BY THE ENGINEER.

PIPE AND FITTINGS SHALL BE PVC, SDR 35, ASTM D 3034.

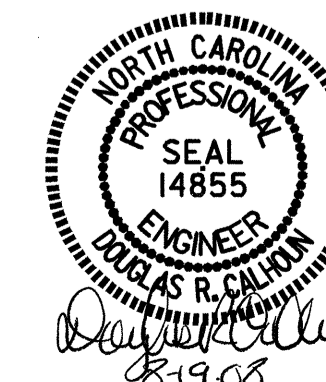
PIPE JOINTS SHALL BE ELASTOMERIC TYPE.

FITTING JOINTS SHALL BE SOLVENT CEMENT TYPE.

DRAIN SYSTEM WILL BE PAID FOR UNDER THE PAY ITEM "STRUCTURE DRAINAGE SYSTEM - LUMP SUM."

THE CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN THE DRAIN PIPES AT A MAXIMUM SPACING OF 25 FT.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
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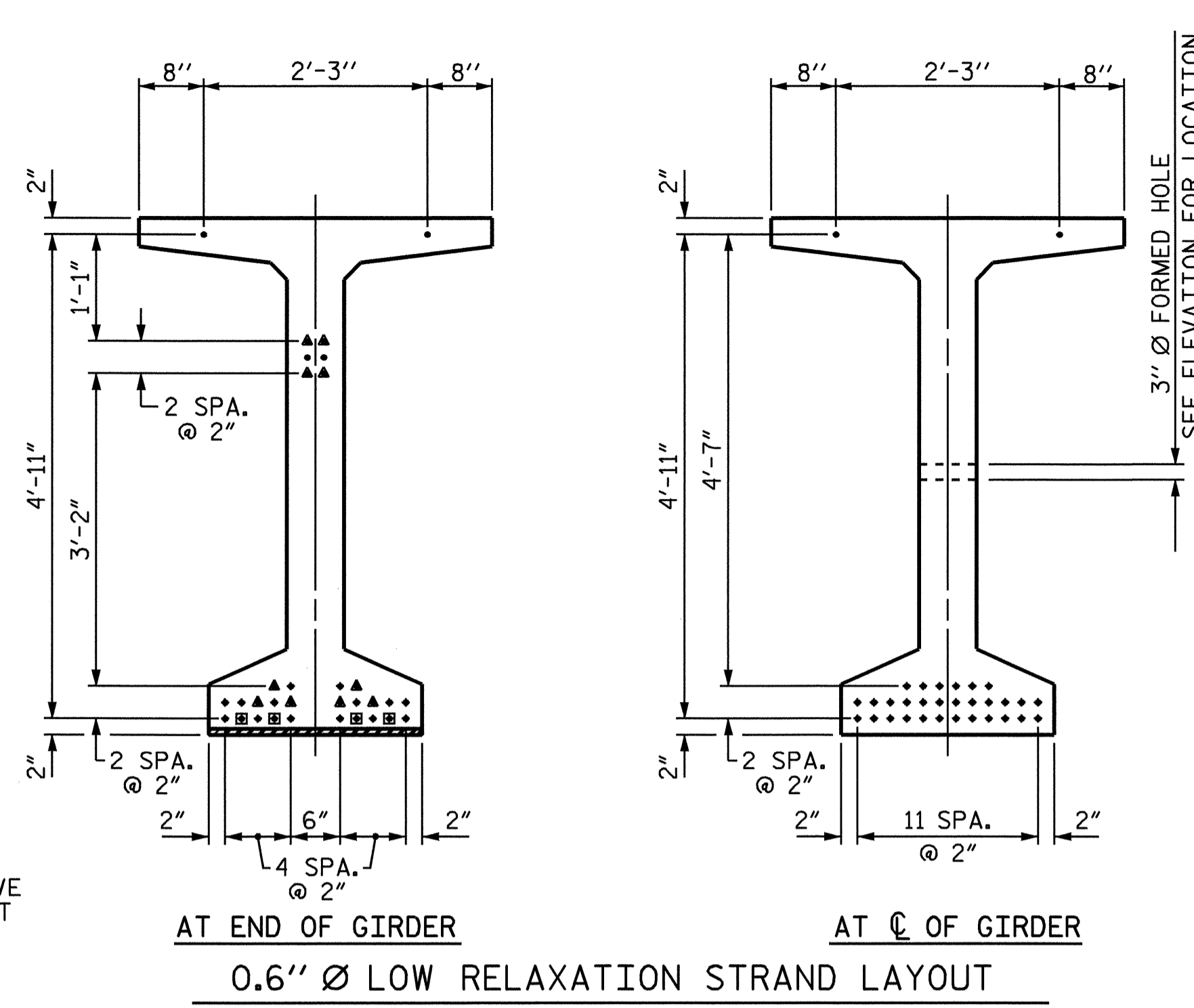
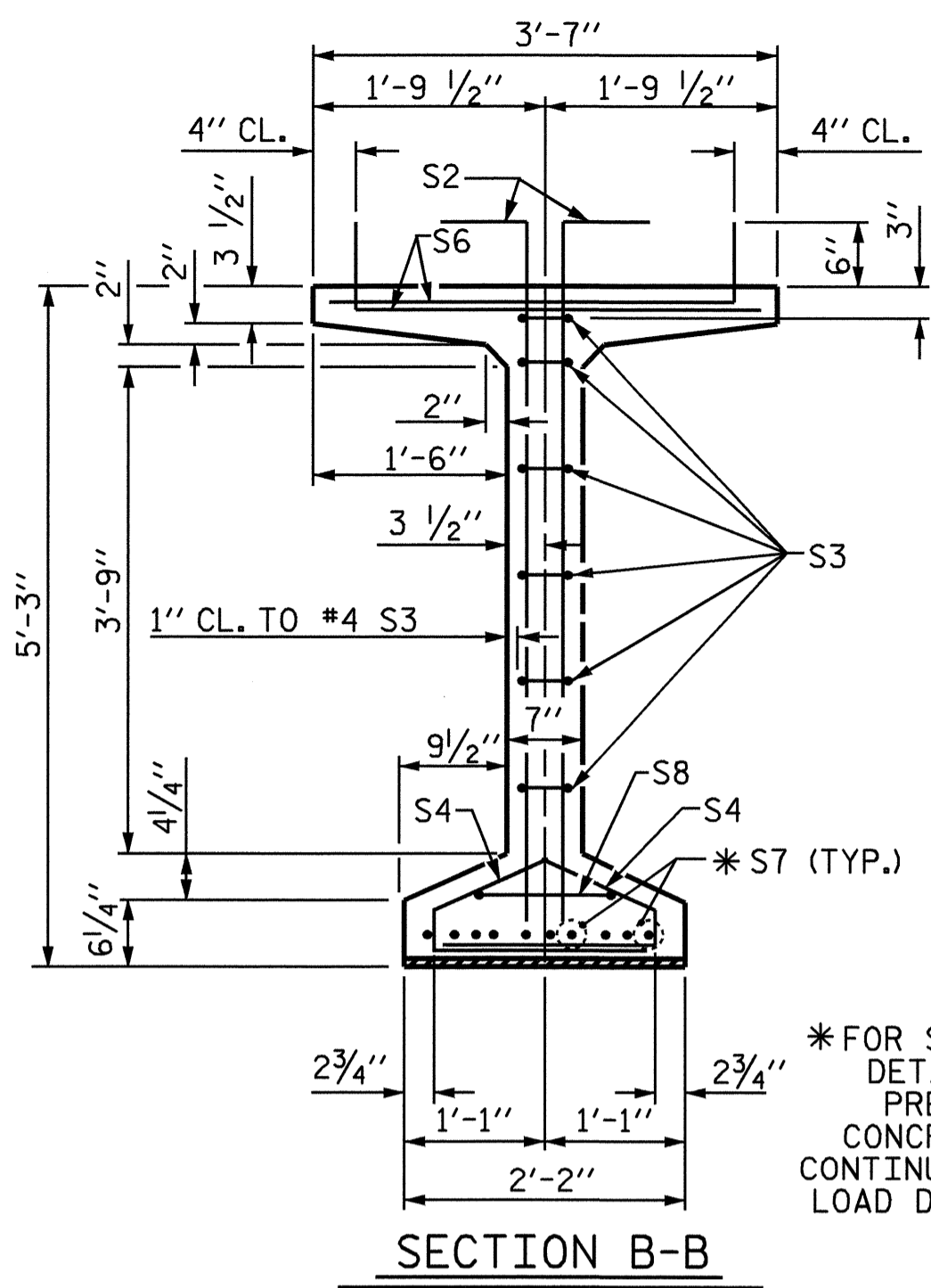
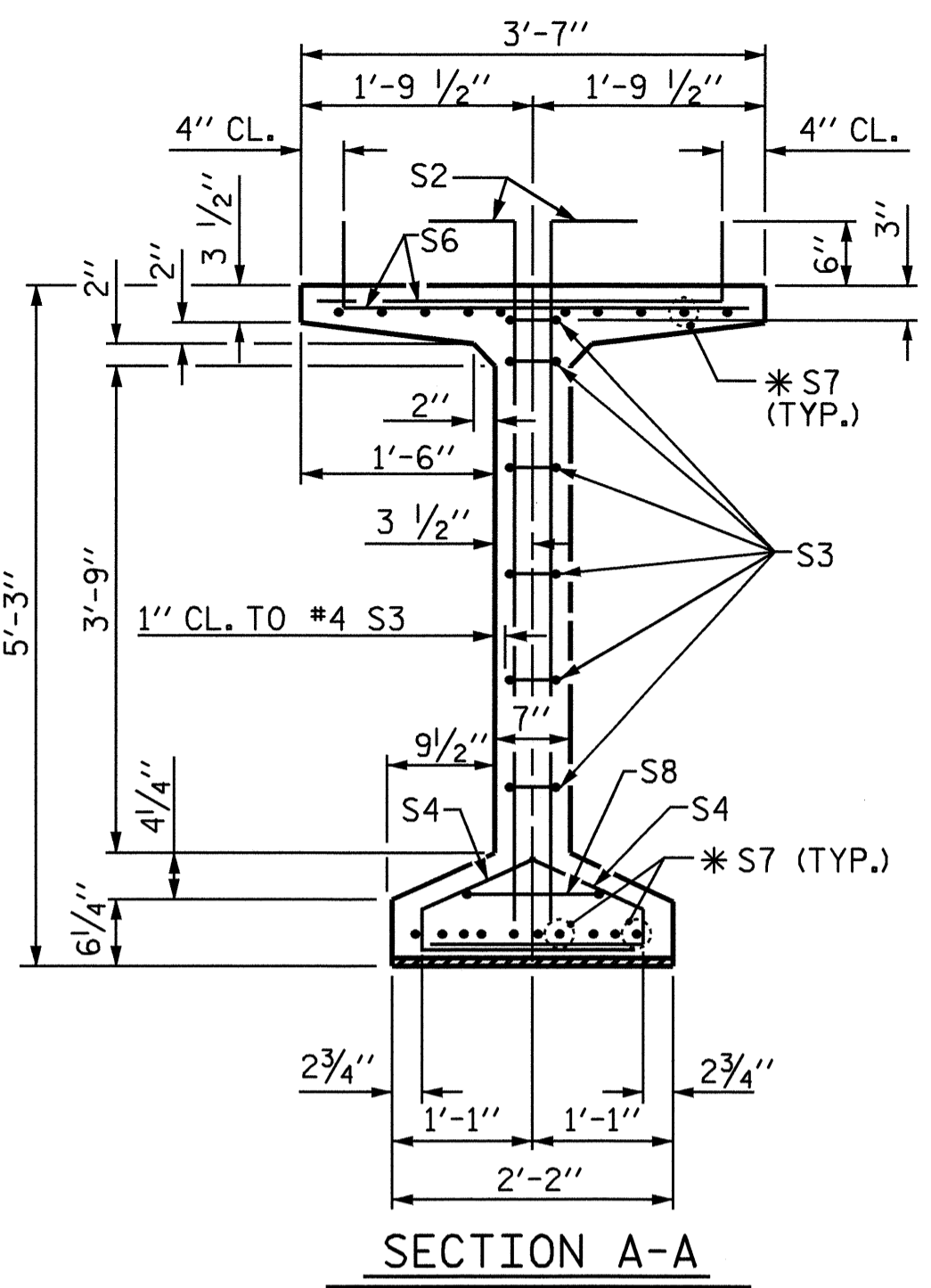


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 STRUCTURE  
 DRAINAGE SYSTEM  
 (NBL)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS 70
2			4			

DRAWN BY : T.L.CLELLAND DATE : 10/11/05  
 CHECKED BY : I.A.HARRIS DATE : 10/11/05



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

**0.6" Ø L. R. GRADE 270 STRANDS**

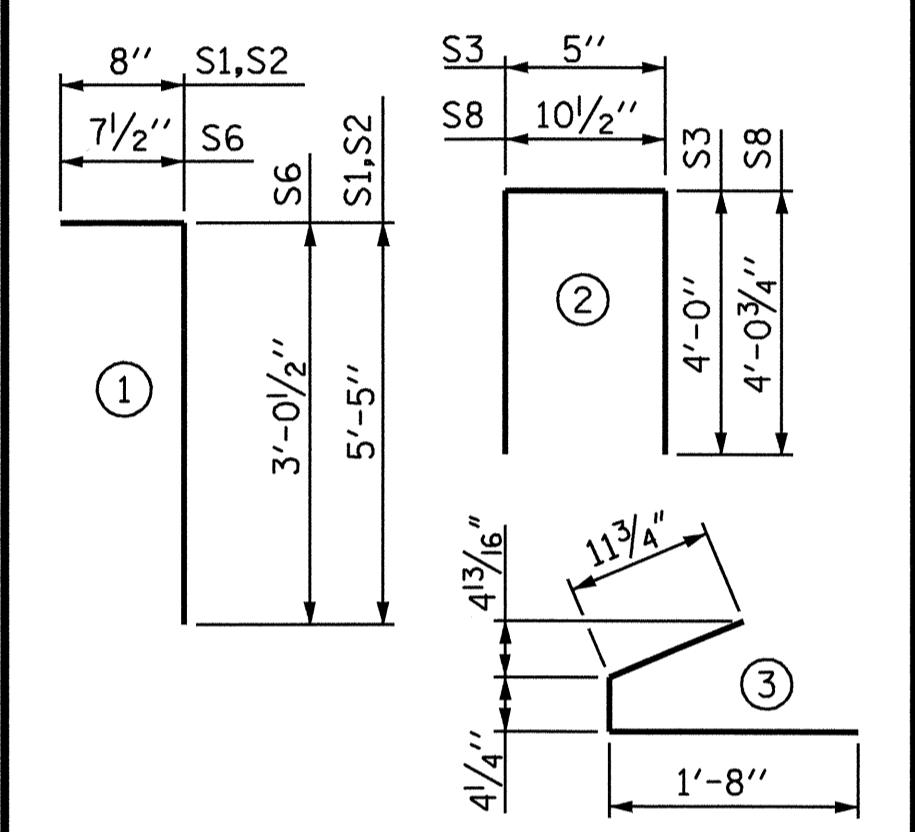
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

**REINFORCING STEEL FOR ONE GDR**

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	6'-1"	683
S2	24	#5	1	6'-1"	152
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	192	#5	1	3'-8"	734
*S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	45	#5	STR	3'-3"	153
S10	2	#3	STR	1'-10"	1

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

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT

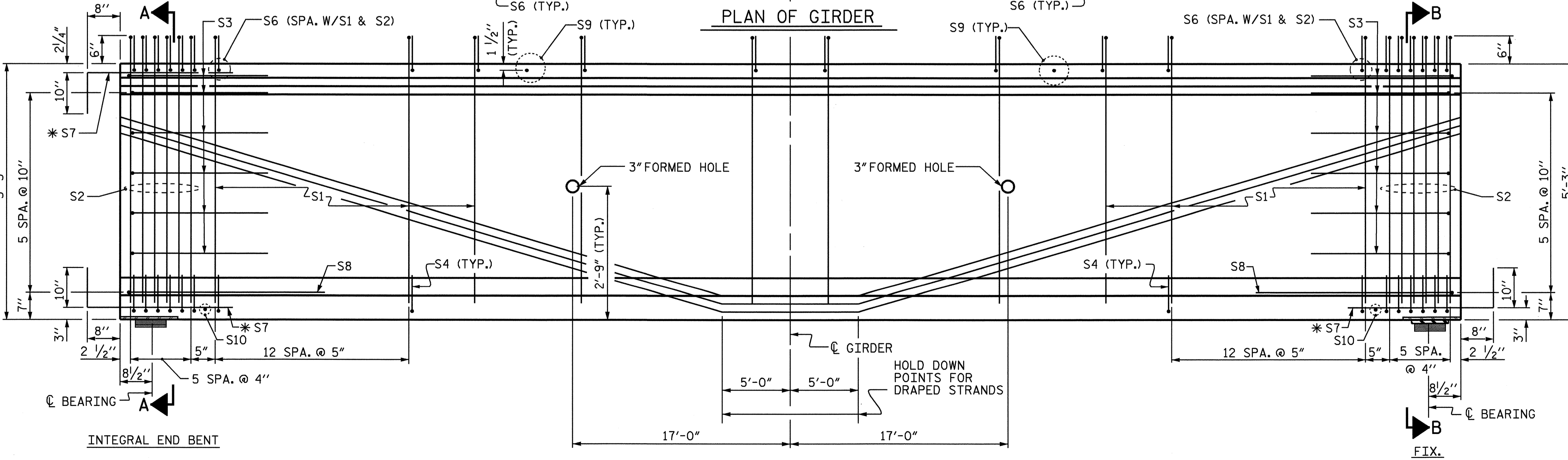
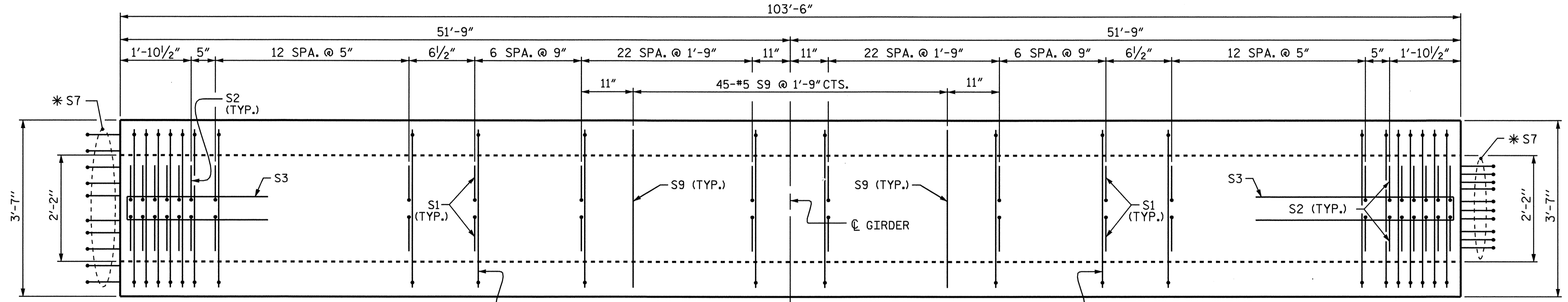


**QUANTITIES FOR ONE GIRDER**

REINFORCING STEEL	7500 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
2076	20.5	32

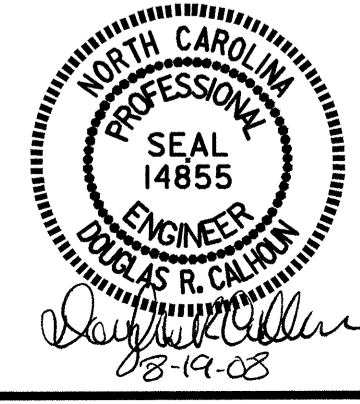
**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
A & D 10	103'-6"	1035'-0"



ASSEMBLED BY : B.N. GRADY	DATE : 3/4/08
CHECKED BY : E.G. ALLEN	DATE : 6/8/08
DRAWN BY : EEM 2/6/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLG/GM

19-AUG-2008 10:18  
R:\Structures\FINAL PLANS\NBL\R2502B\_sd-g.NBL.dgn  
bngrady



PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 1 OF 3  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
63" PRESTRESSED CONCRETE  
MODIFIED BULB TEE  
CONTINUOUS FOR LIVE LOAD  
SPAN A & D (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			70





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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5700 PSI FOR SPANS A & D, AND 7200 PSI FOR SPANS B & C.

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

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

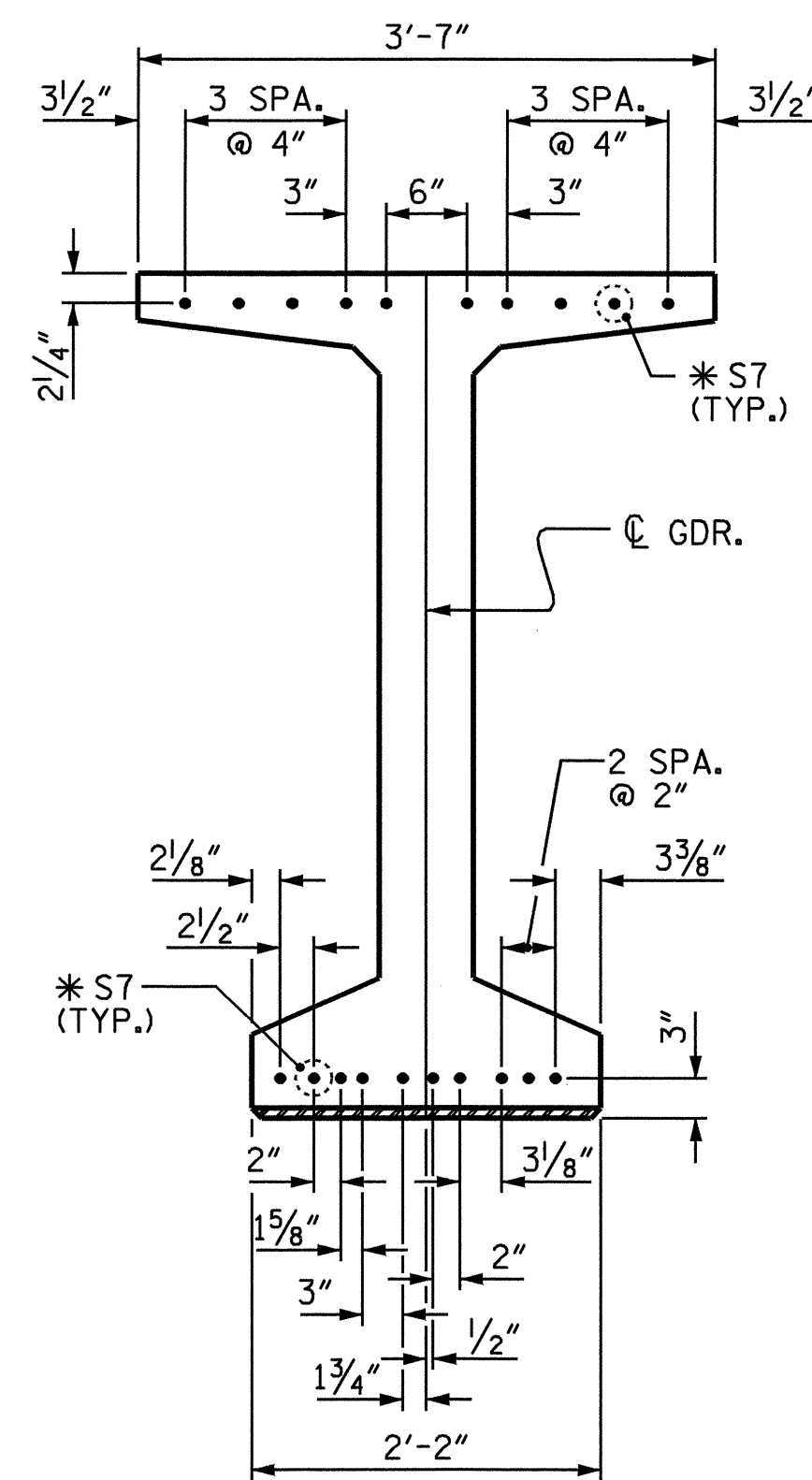
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

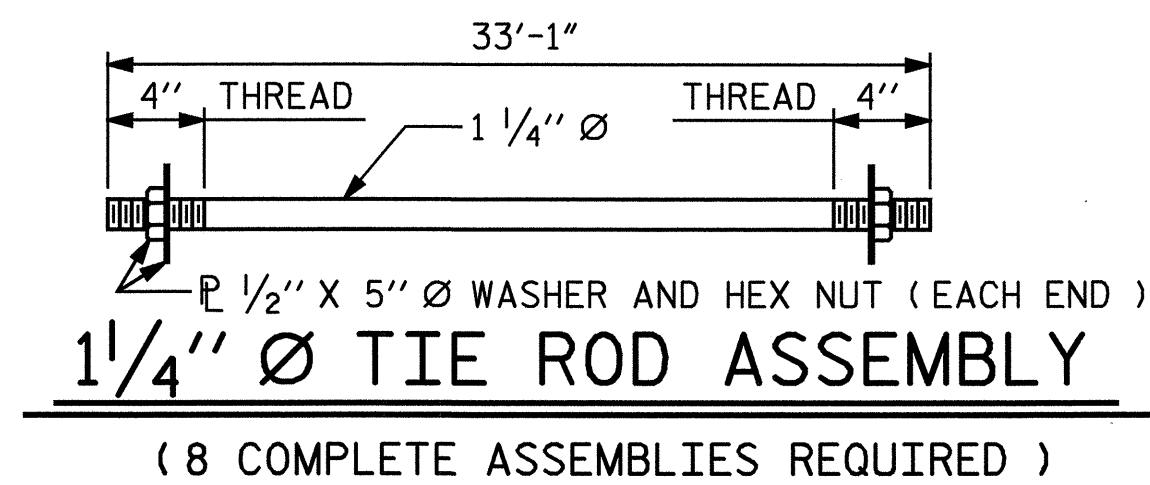
FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



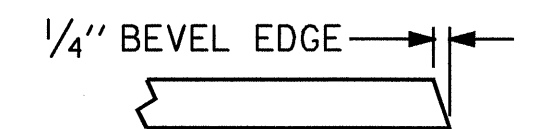
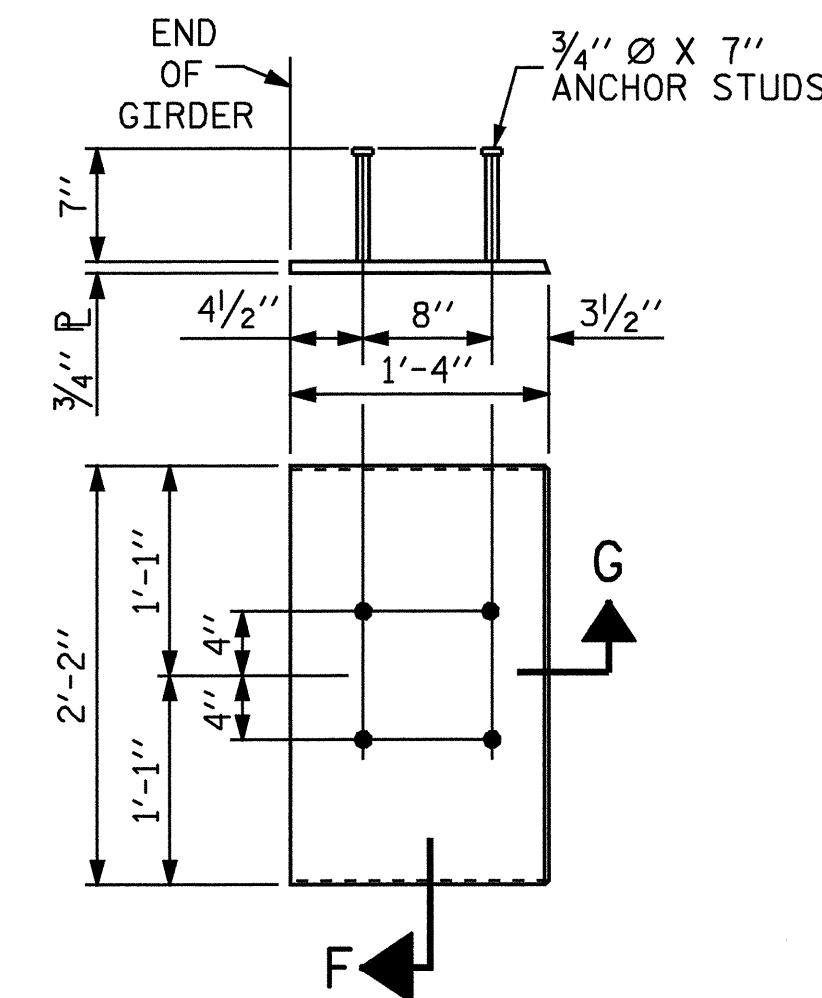
DETAIL "C"

(FOR 63" & 72" MODIFIED BULB TEES)

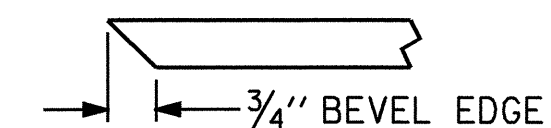


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" & 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "G"



SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPANS A & D																						
	GIRDERS 1 & 5											GIRDERS 2 THRU 4											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.120	0.226	0.310	0.363	0.381	0.363	0.310	0.226	0.120	0	0	0.120	0.226	0.310	0.363	0.381	0.363	0.310	0.226	0.120	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.043	0.082	0.112	0.131	0.138	0.131	0.112	0.082	0.043	0	0	0.043	0.082	0.112	0.132	0.138	0.132	0.112	0.082	0.043	0
FINAL CAMBER	↑	0	15/16"	1 3/4"	2 3/8"	2 3/4"	2 5/16"	2 3/4"	2 3/8"	1 3/4"	1 5/16"	0	0	1 5/16"	1 3/4"	2 3/8"	2 3/4"	2 5/16"	2 3/4"	2 3/8"	1 3/4"	1 5/16"	0

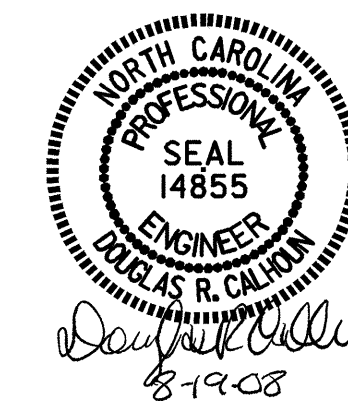
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPANS B & C																						
	GIRDERS 1 & 5											GIRDERS 2 THRU 4											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.168	0.318	0.435	0.510	0.536	0.510	0.435	0.318	0.168	0	0	0.168	0.318	0.435	0.510	0.536	0.510	0.435	0.318	0.168	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.059	0.111	0.152	0.178	0.187	0.178	0.152	0.111	0.059	0	0	0.059	0.111	0.153	0.179	0.188	0.179	0.153	0.111	0.059	0
FINAL CAMBER	↑	0	1 5/16"	2 1/2"	3 3/8"	4"	4 3/16"	4"	3 3/8"	2 1/2"	1 5/16"	0	0	1 5/16"	2 1/2"	3 3/8"	4"	4 3/16"	4"	3 3/8"	2 1/2"	1 5/16"	0

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

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS & DEAD LOAD  
DEFLECTION TABLES  
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-49
2			4			70

ASSEMBLED BY : B.N. GRADY	DATE : 3/4/08
CHECKED BY : E.G. ALLEN	DATE : 6/8/08
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

**NOTES**

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

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

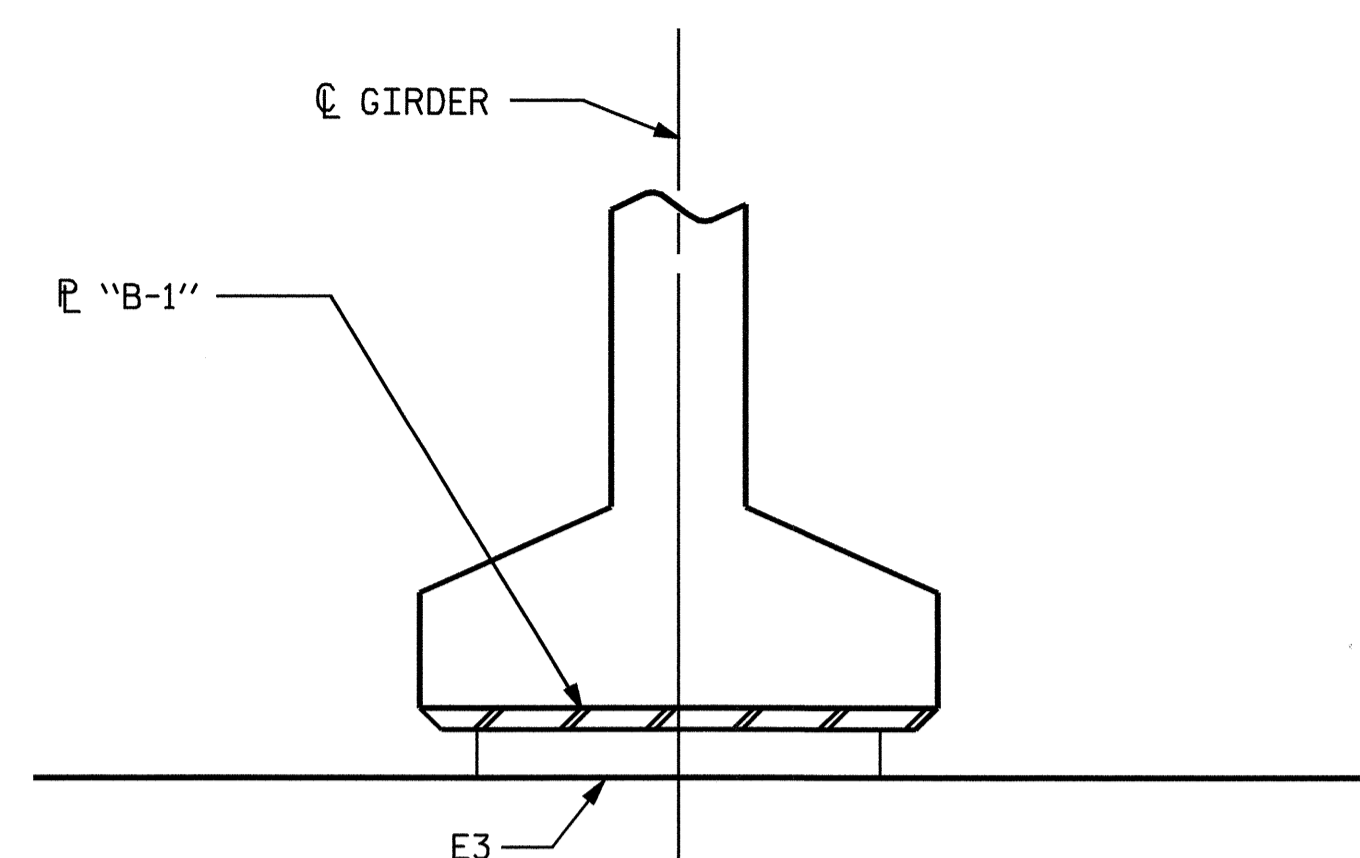
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

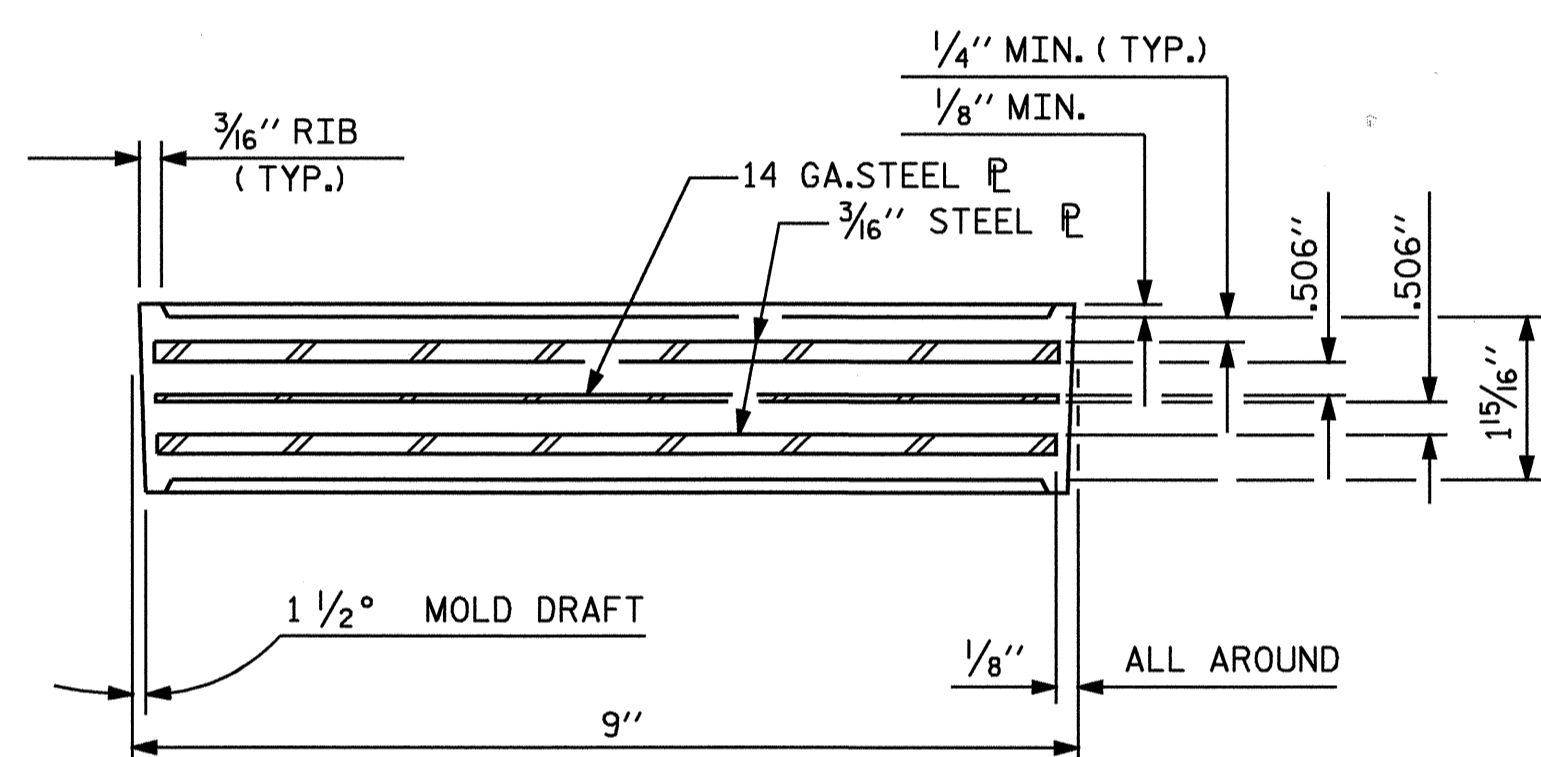
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS, SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

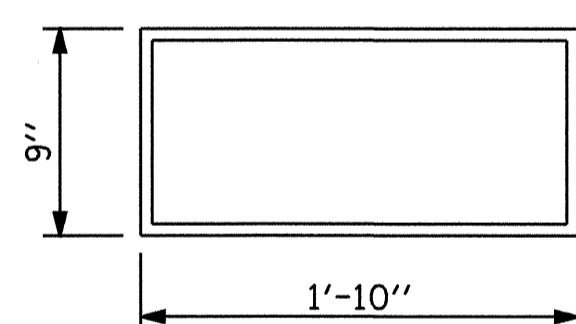
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



FIXED      FIXED  
**SECTION D-D**



**TYPICAL SECTION OF ELASTOMERIC BEARINGS**

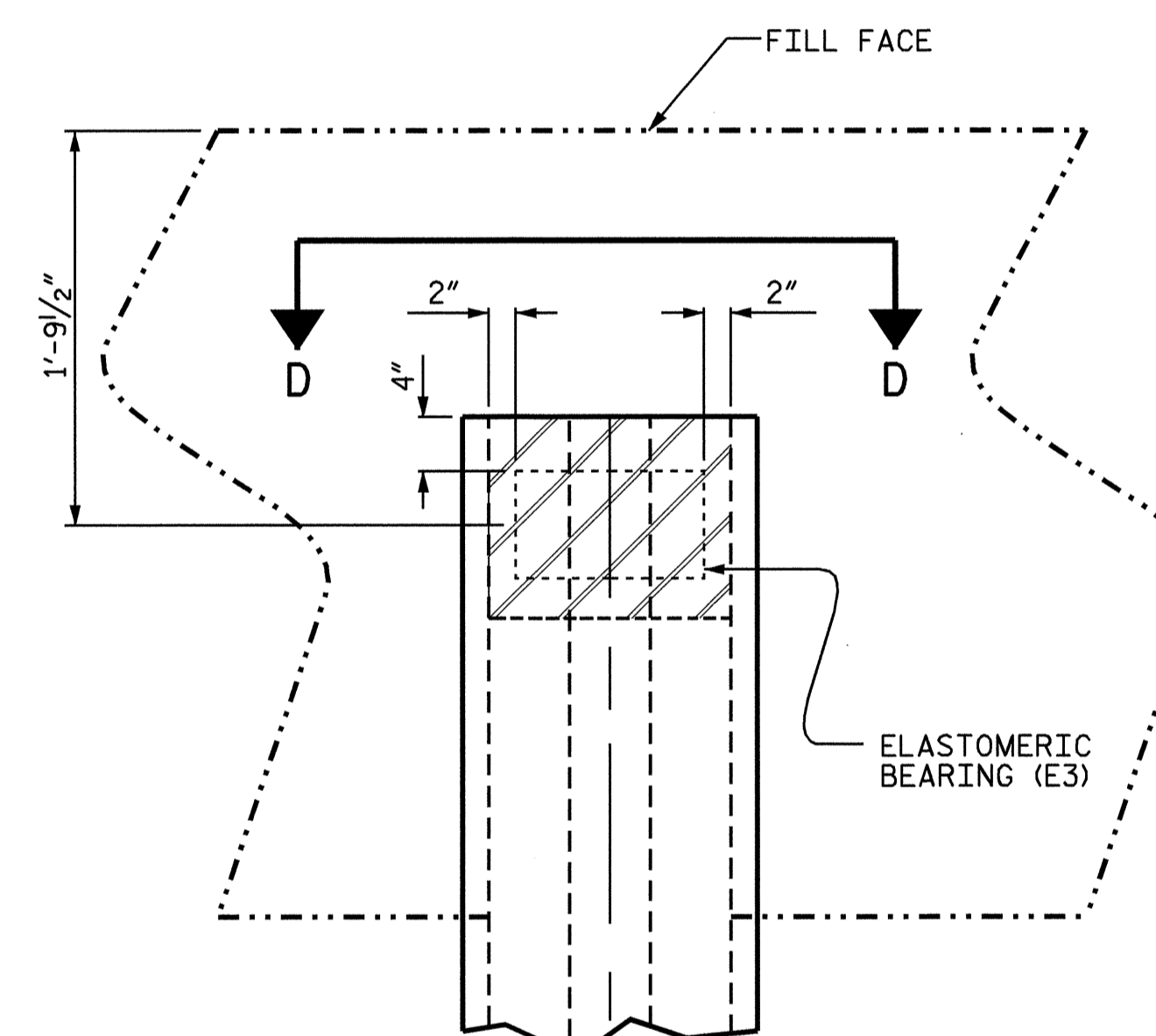


E3 (10 REQ'D)  
**PLAN VIEW OF ELASTOMERIC BEARING**

**TYPE IV**

FOR SPAN A (NEAR) & SPAN D (FAR) ONLY

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE IV	137 K



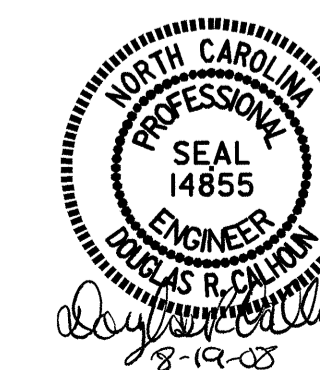
**PLAN VIEW AT INTEGRAL END BENTS**

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

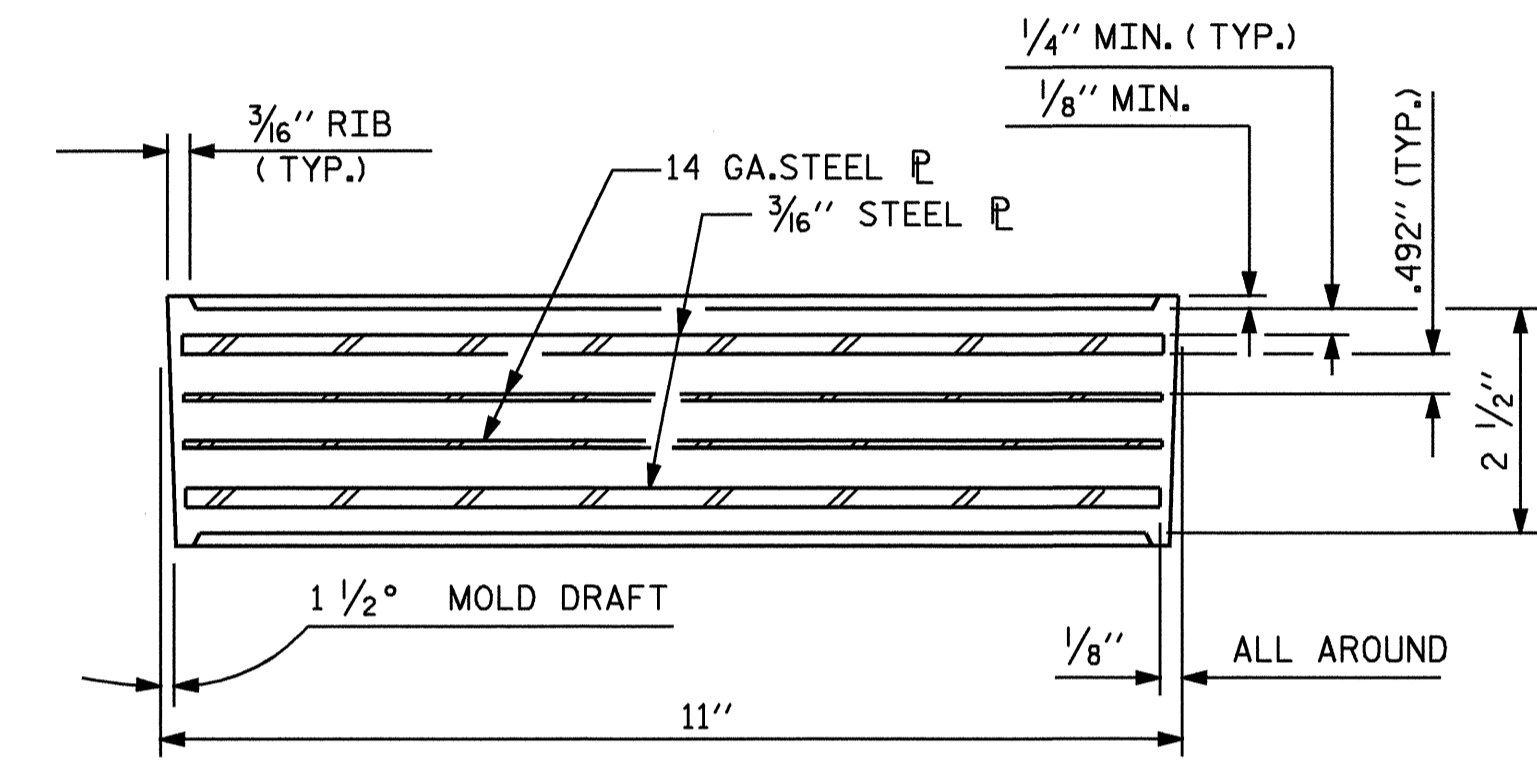
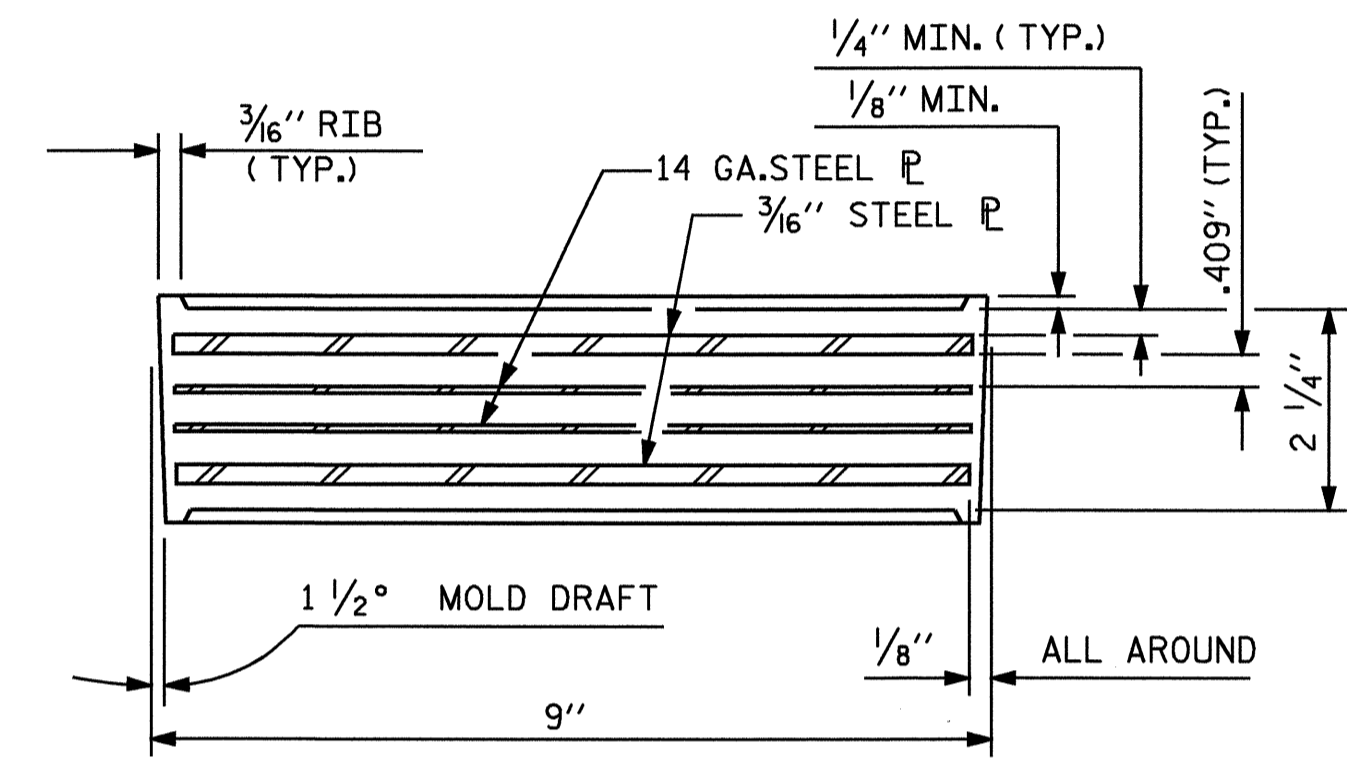
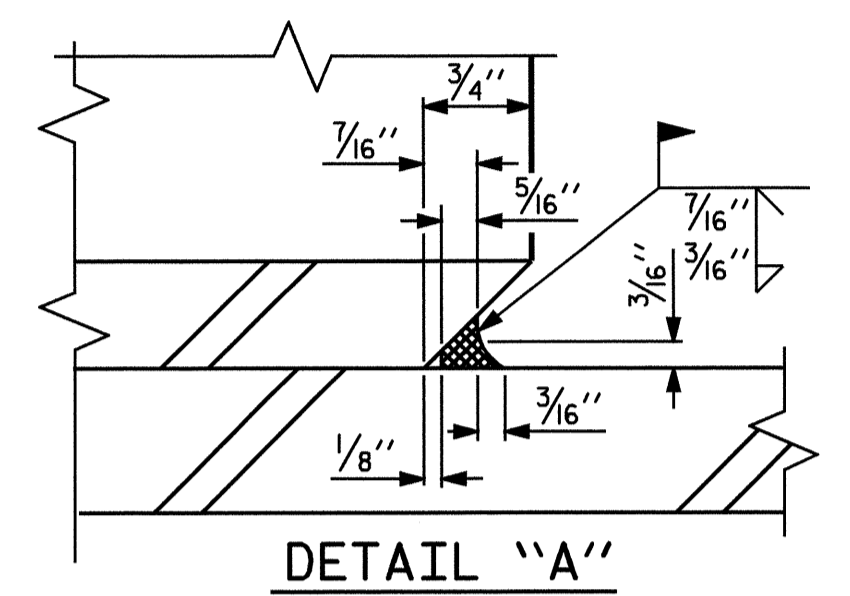
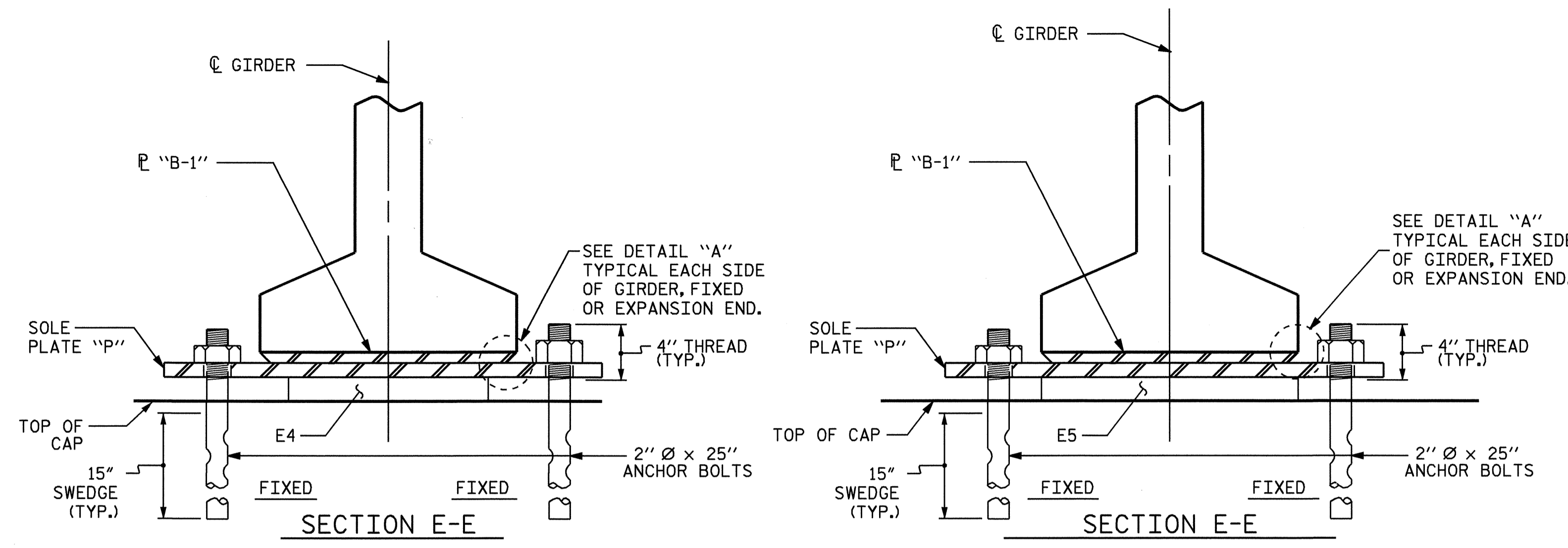
**ELASTOMERIC BEARING  
 DETAILS**  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE  
 (NBL)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-50
2			4			70

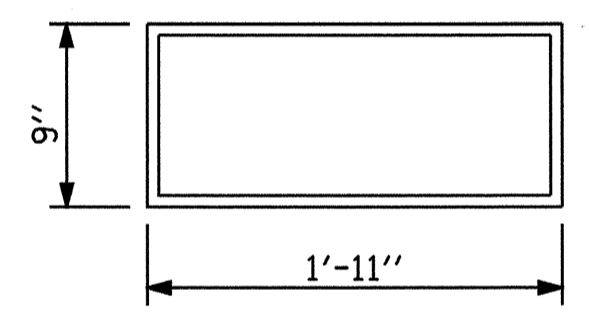
ASSEMBLED BY : T.L.CLELLAND	DATE : 7/6/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : EEM 2/97	ADDED 2/6/97
CHECKED BY : VAP 2/97	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE V	180 K
TYPE VI	211 K

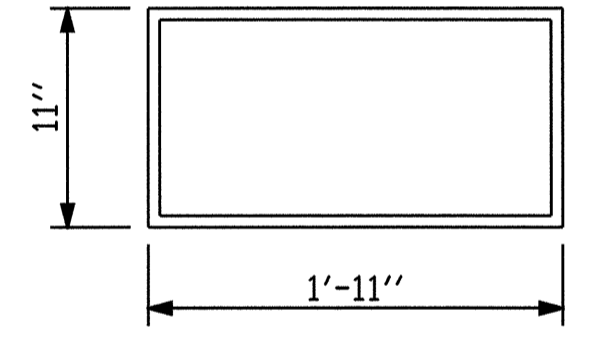


TYPICAL SECTION OF ELASTOMERIC BEARINGS

TYPICAL SECTION OF ELASTOMERIC BEARINGS



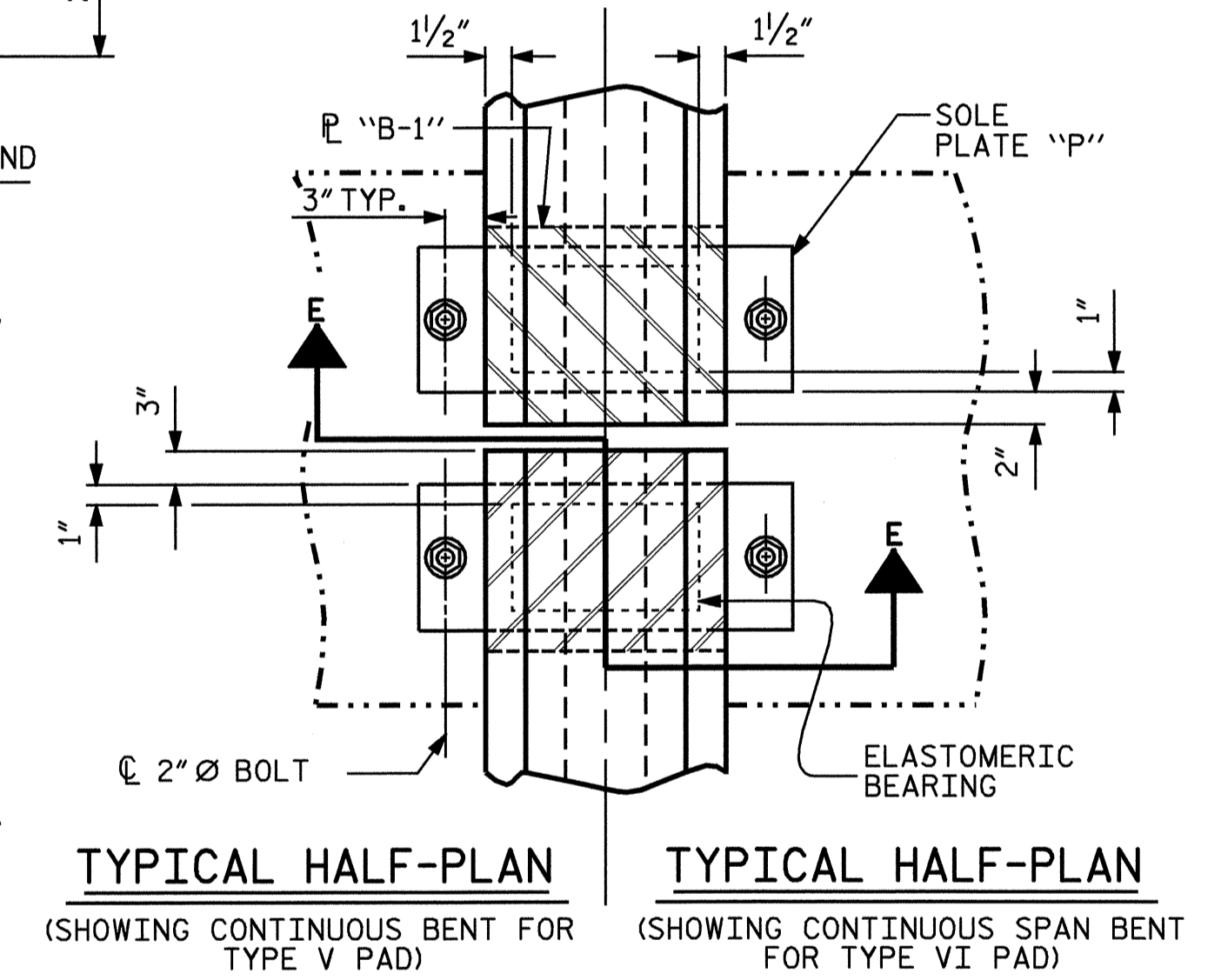
E4 (10 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING



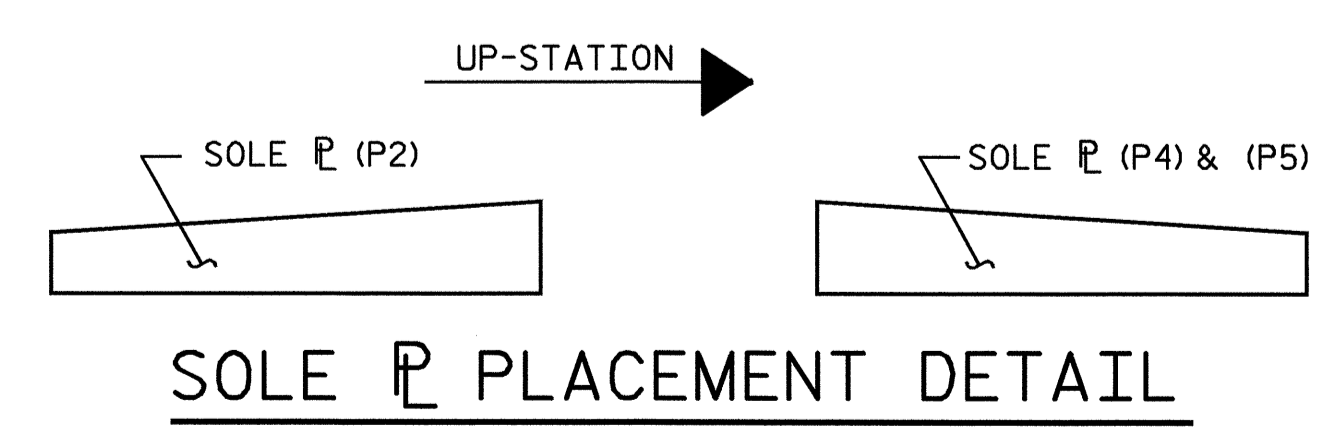
E5 (20 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V  
FOR SPAN A (FAR) & SPAN D (NEAR) ONLY

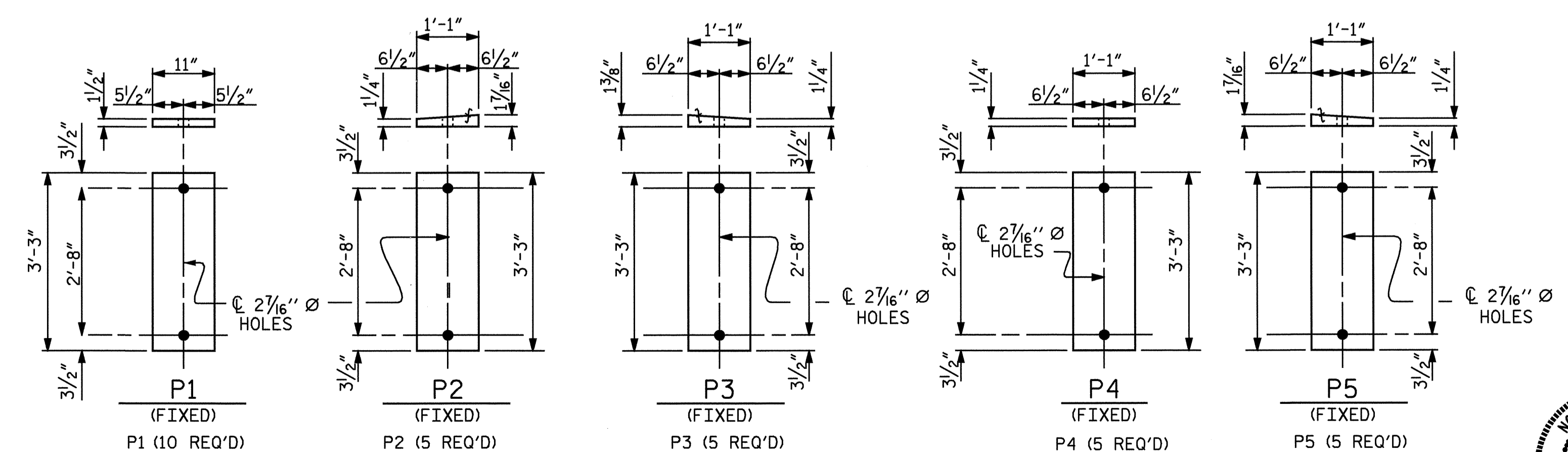
TYPE VI  
FOR SPANS B & C ONLY



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT FOR TYPE V PAD)  
TYPICAL HALF-PLAN (SHOWING CONTINUOUS SPAN BENT FOR TYPE VI PAD)



SOLE PLATE PLACEMENT DETAIL

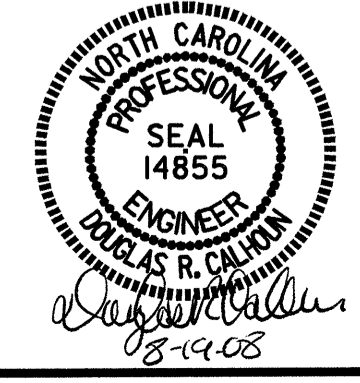


SOLE PLATE DETAILS ("P")

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

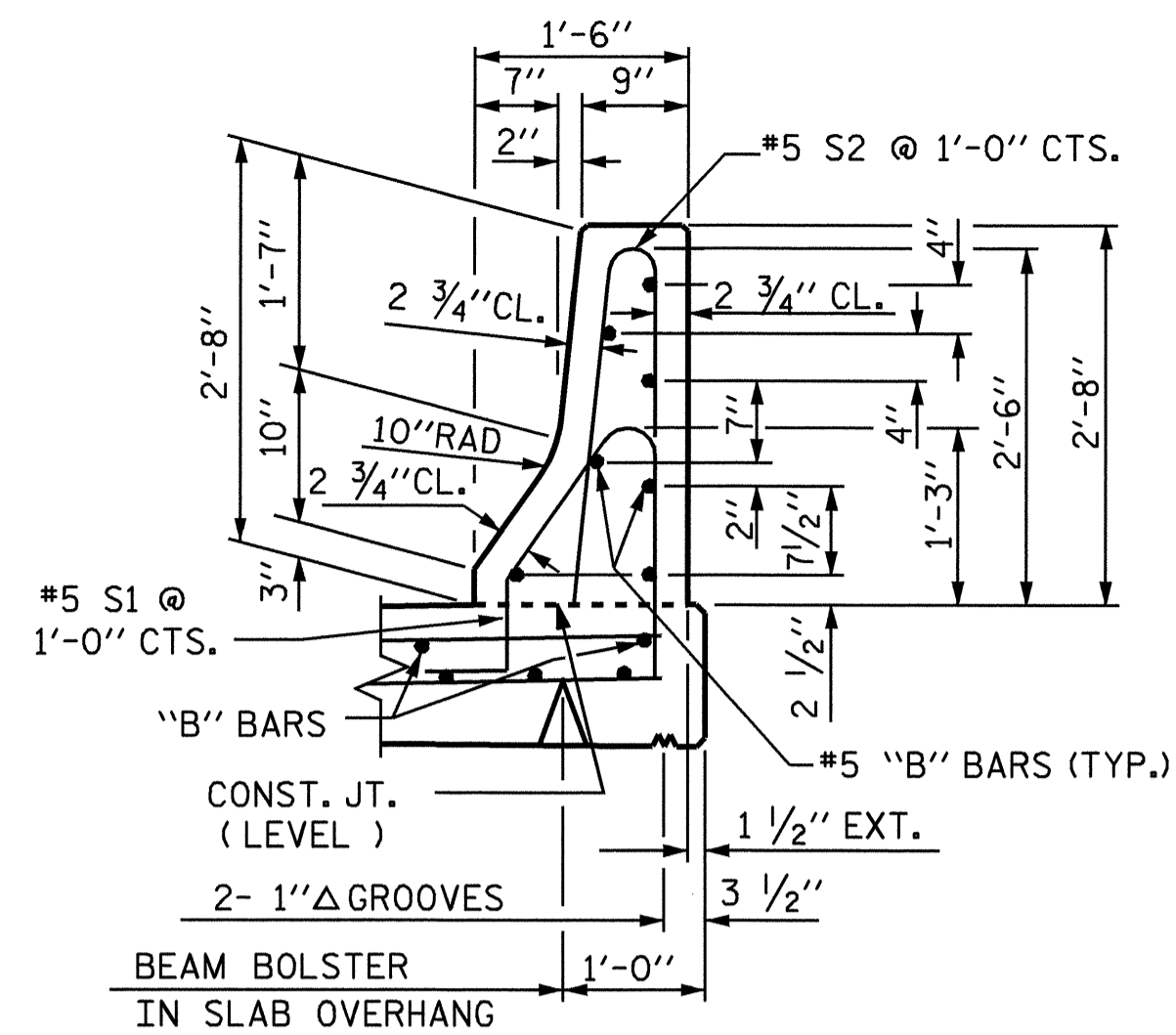
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**ELASTOMERIC BEARING DETAILS**  
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (NBL)

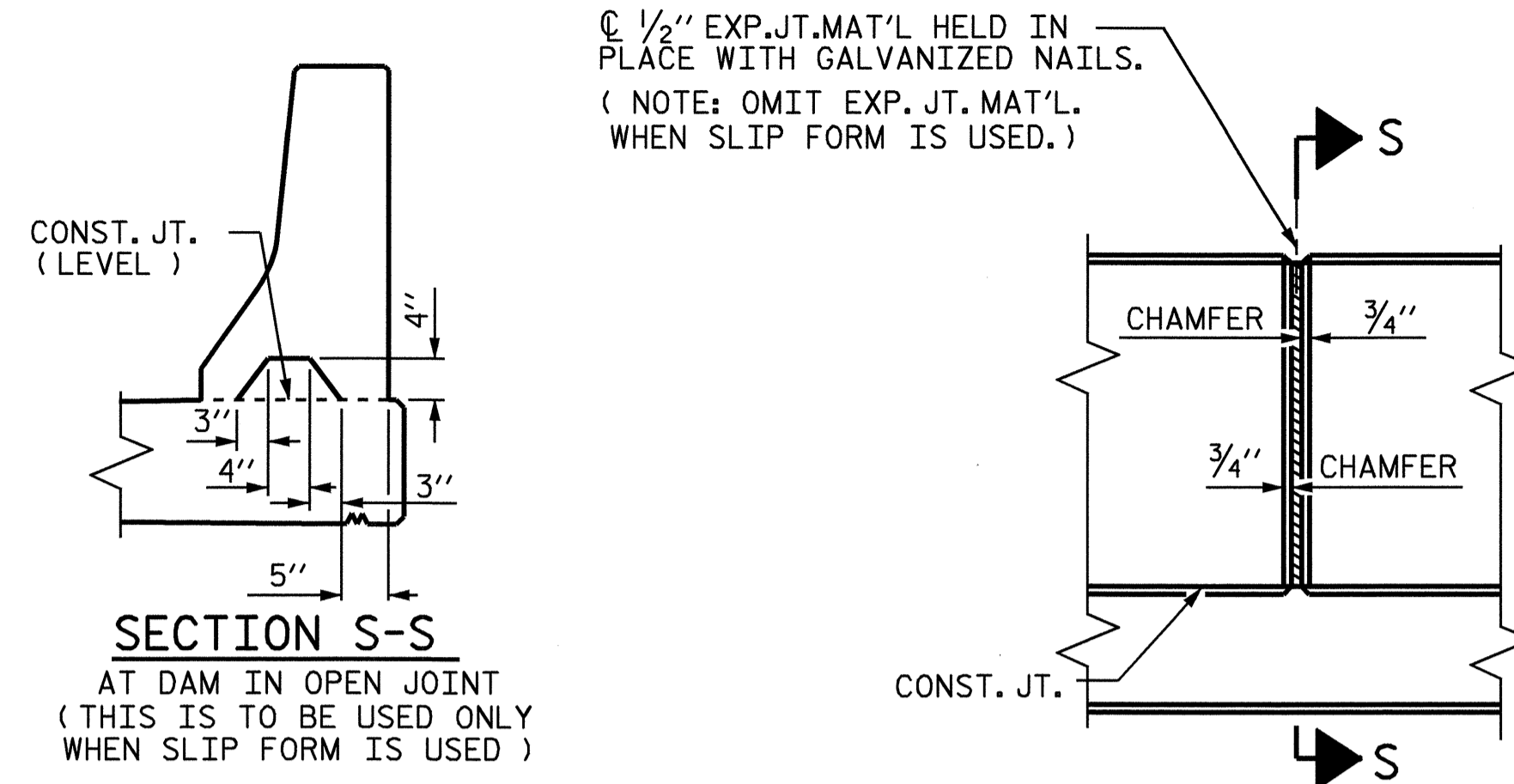


ASSEMBLED BY : T.L.CLELLAND	DATE : 7/6/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : EEM 2/97	ADDED 2/6/97
CHECKED BY : VAP 2/97	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			70



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

**BARRIER RAIL DETAILS**

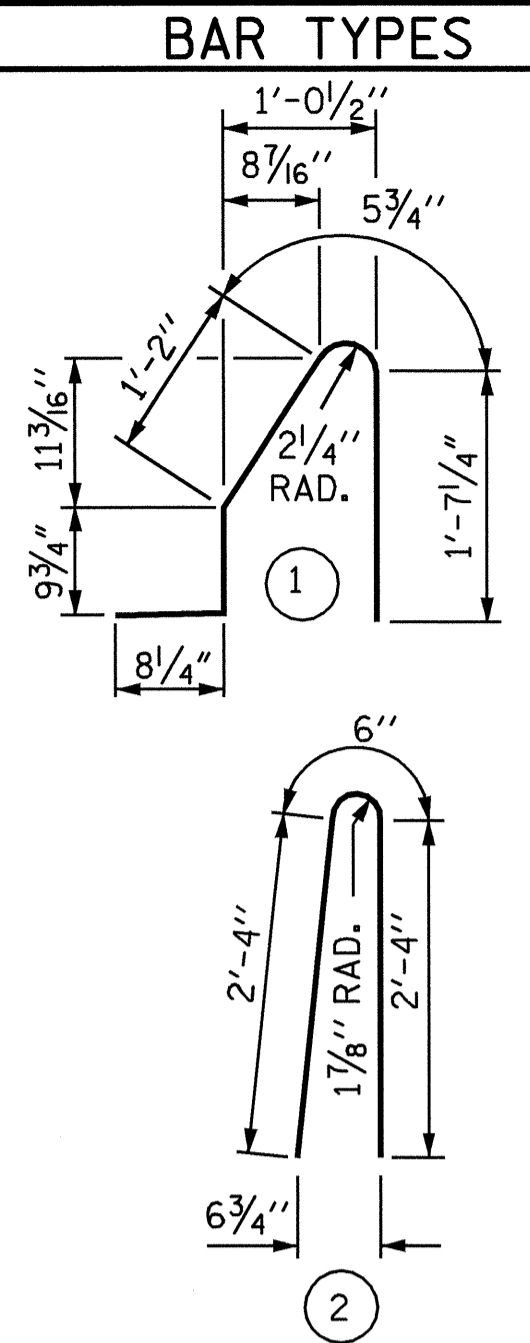
**NOTES**

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

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



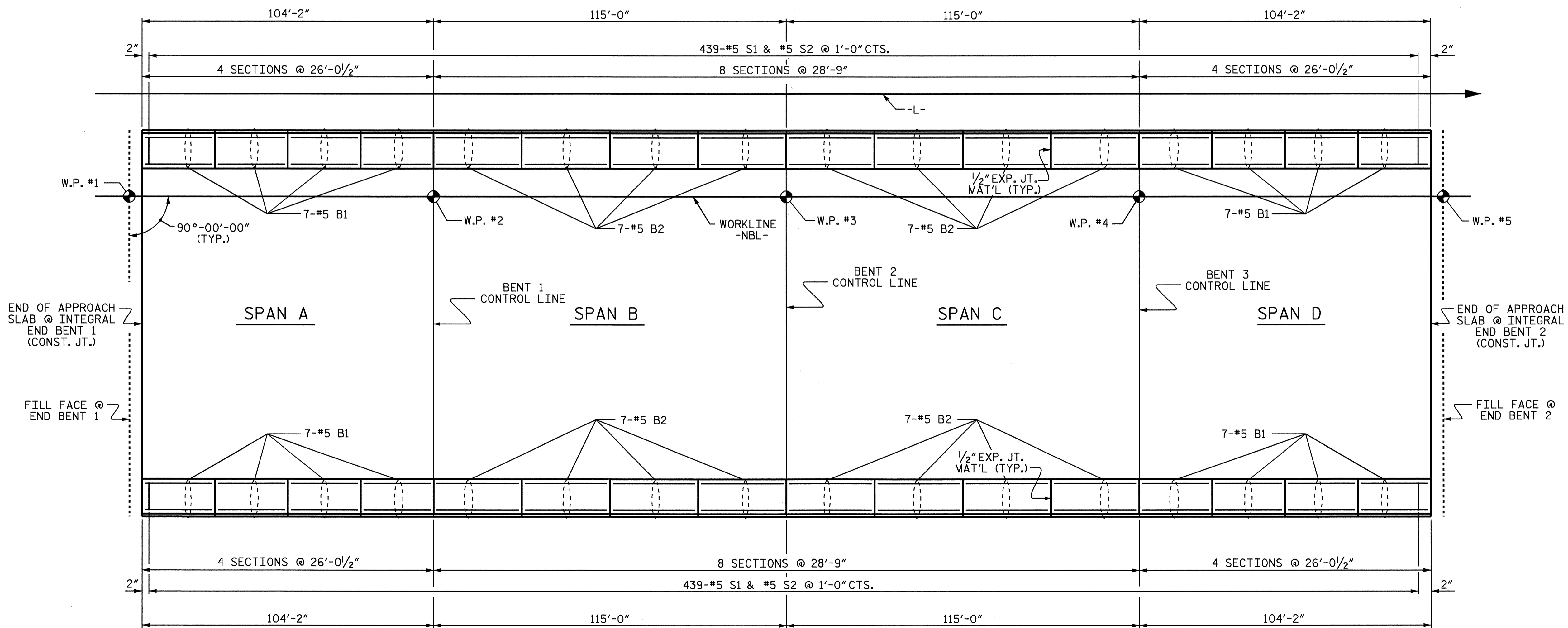
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	#5	STR	25'-7"	2889
* B2	#5	STR	28'-4"	3310
* S1	#5	1	4'-9"	4350
* S2	#5	2	5'-2"	4731

\* EPOXY COATED REINFORCING STEEL 15280 LBS.  
 CLASS AA CONCRETE 87.8 CU. YDS.  
 CONCRETE BARRIER RAIL 876.67 LIN. FT.



**PLAN OF BARRIER RAIL**

ASSEMBLED BY : T.L. CLELLAND DATE : 7/25/05  
 CHECKED BY : T.A. HARRIS DATE : 9/2/05  
 DRAWN BY : ARB 5/87 REV. 10/17/00 RWW/LES  
 CHECKED BY : SJD 9/87 REV. 5/1/03R RWW/JTE  
 REV. 5/1/06 TLA/GM

19-AUG-2008 10:18  
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PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 CONCRETE  
 BARRIER RAIL  
 (NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTALS
2			4			70

STD. NO. CBR1 STR. #2

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.)

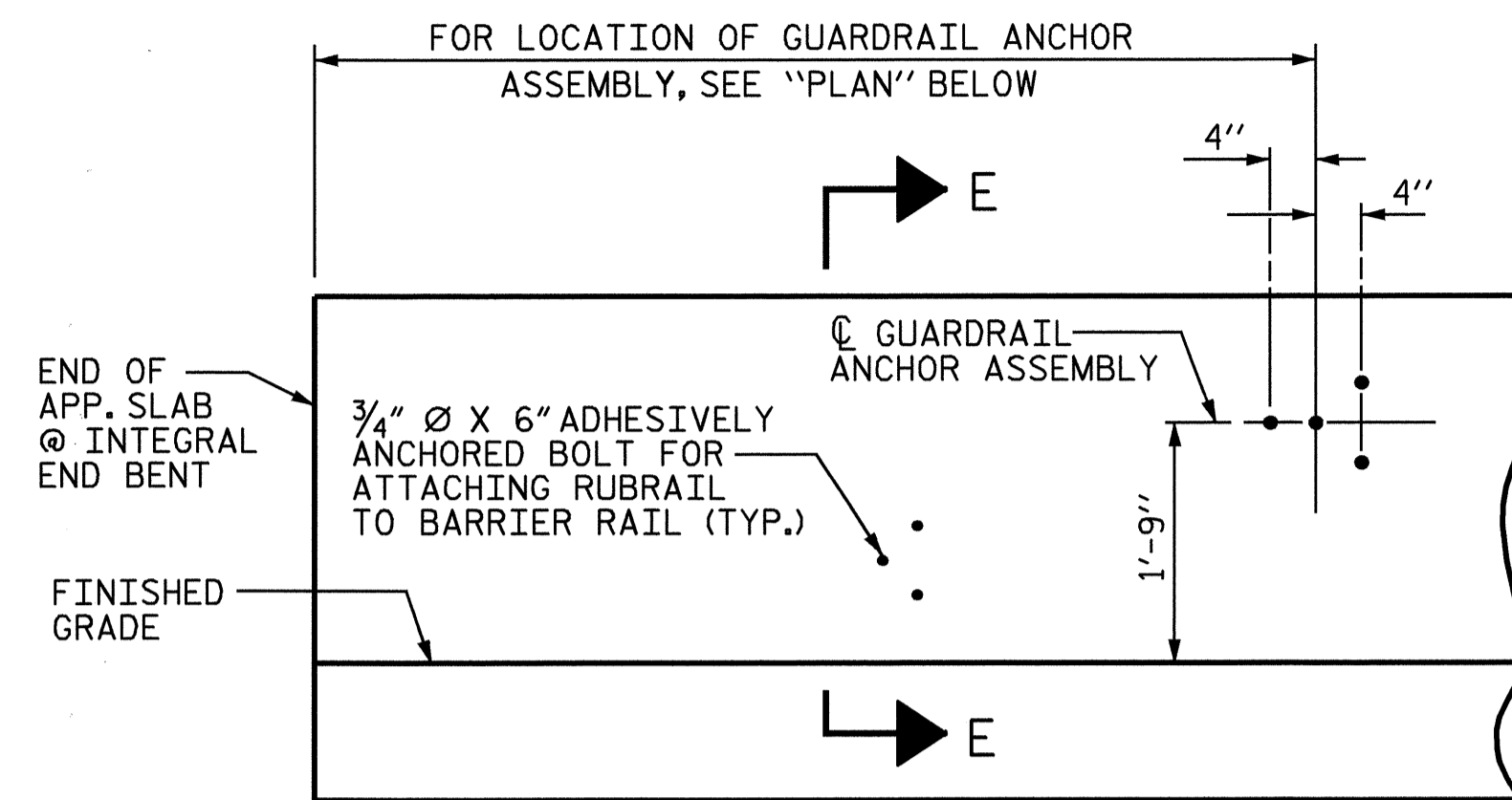
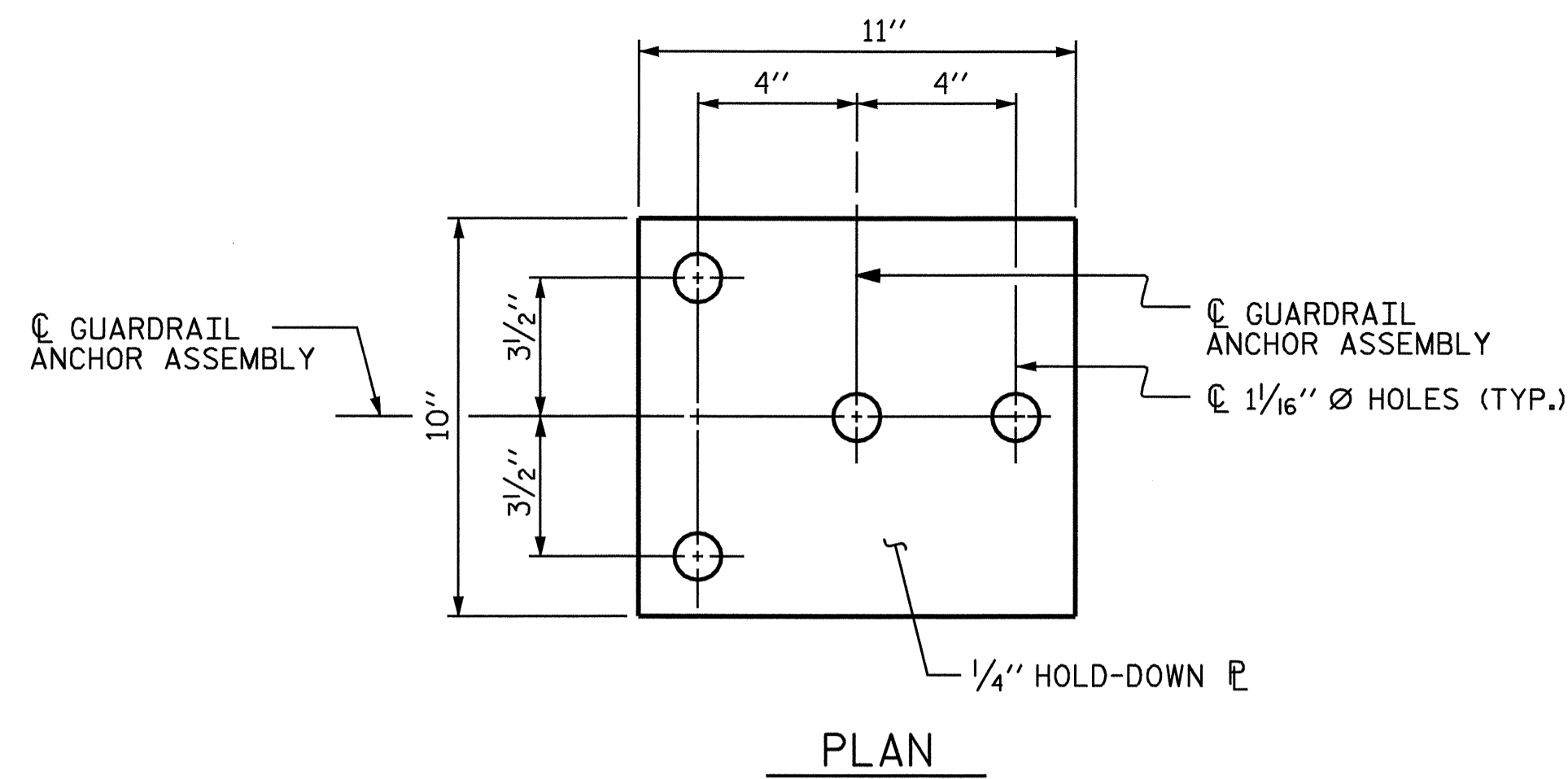
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

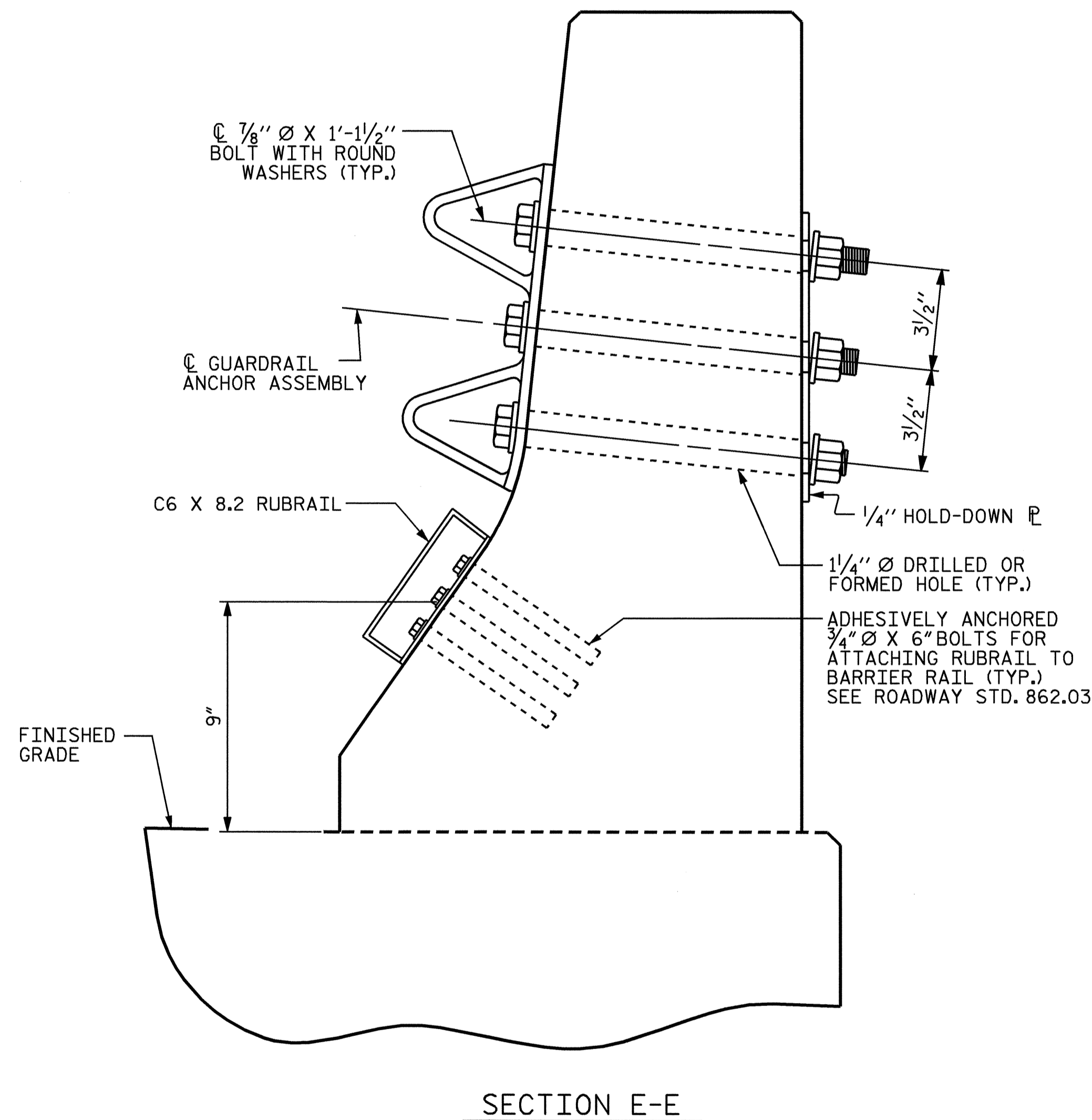
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 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.

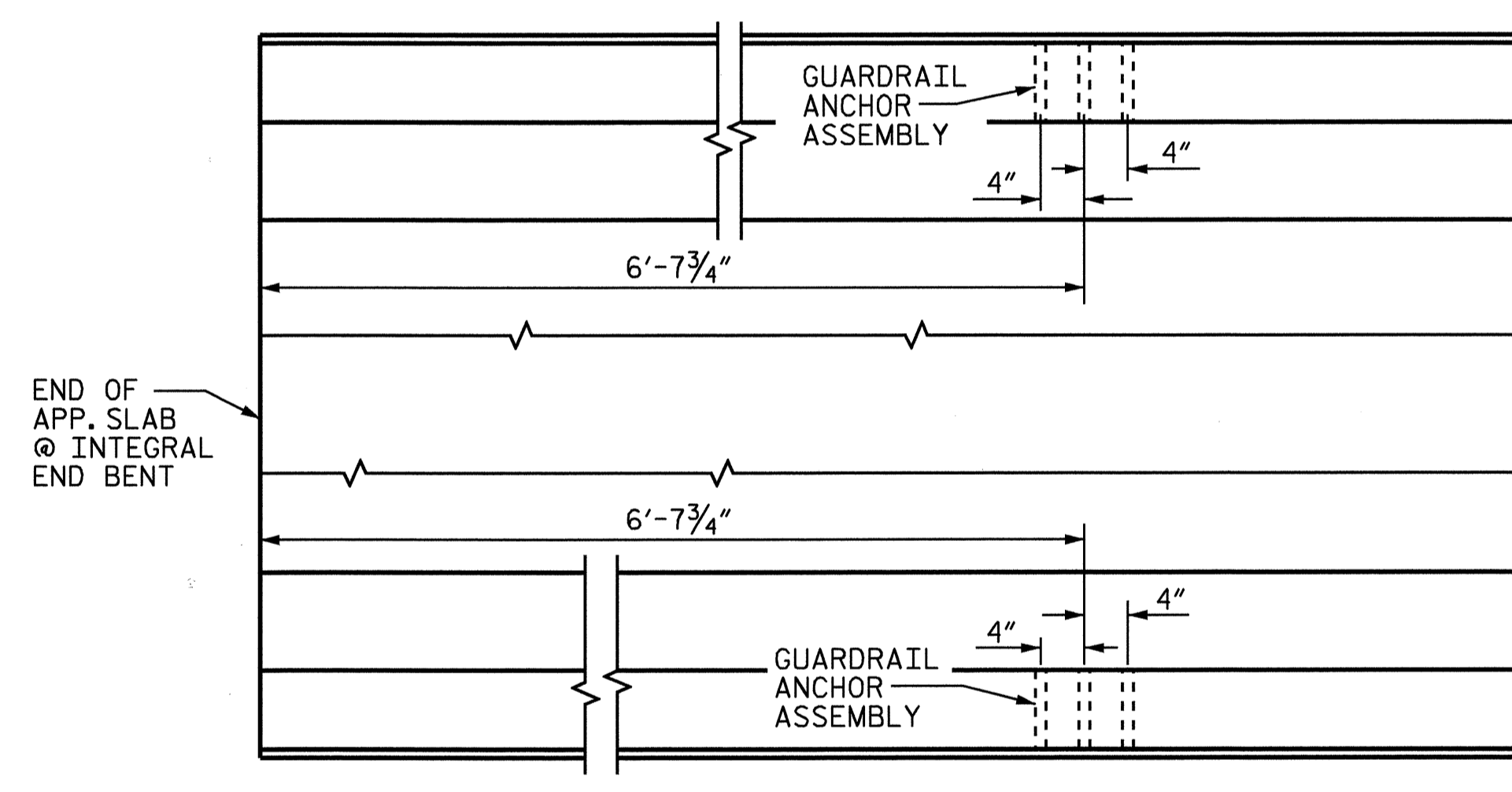
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS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



ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

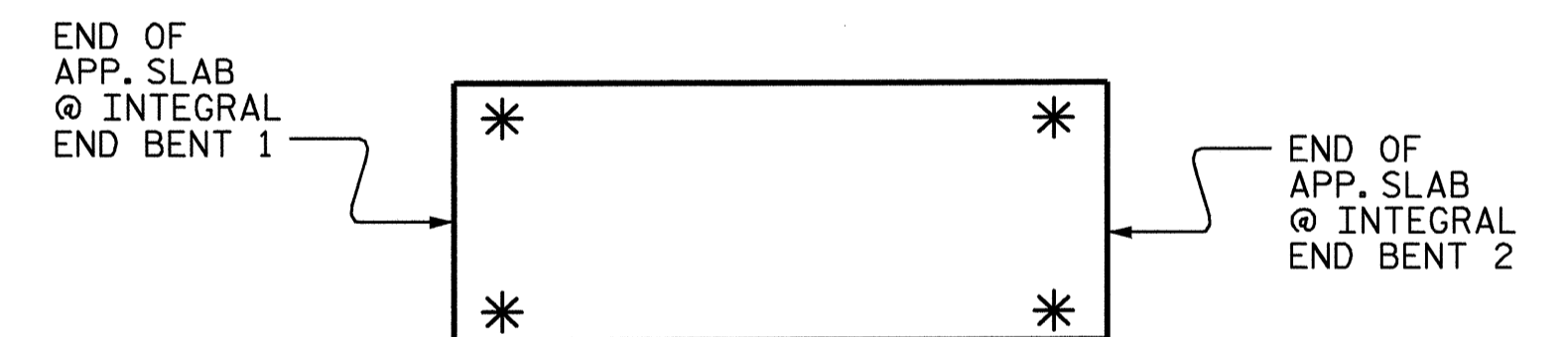


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL  
(NBL)



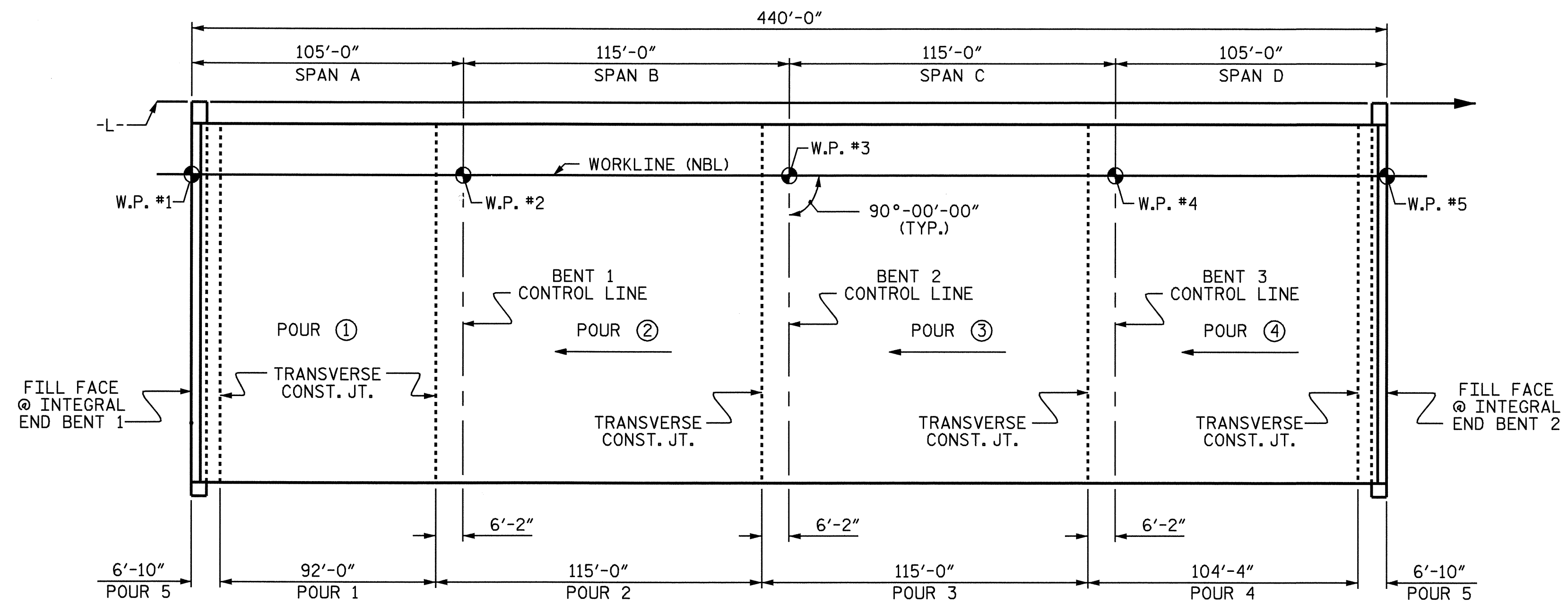
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : B.N. GRADY	DATE : 4/9/08
CHECKED BY : E.G. ALLEN	DATE : 6/8/08
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

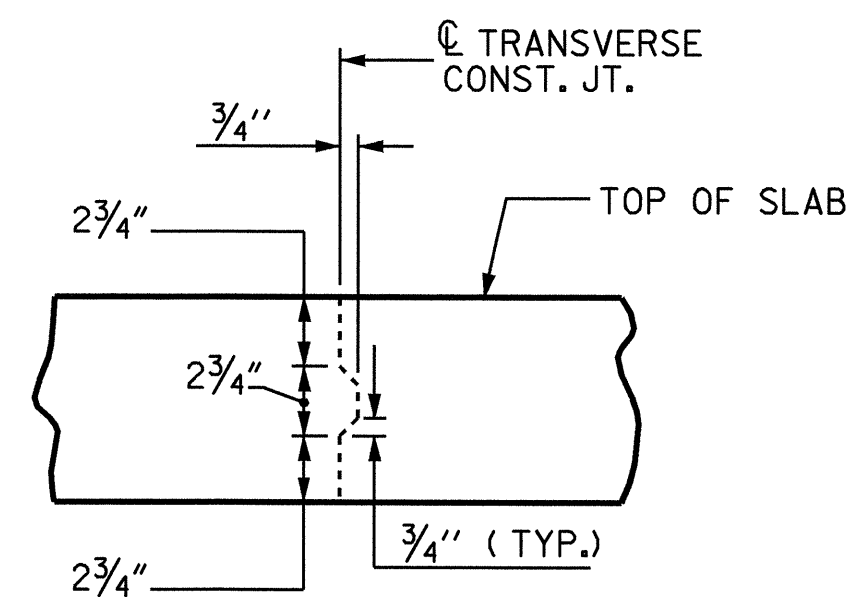
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bngrady

CONCRETE BREAKDOWN

CLASS AA CONCRETE	
POUR 1	128.4 C.Y.
POUR 2	171.7 C.Y.
POUR 3	171.7 C.Y.
POUR 4	156.7 C.Y.
POUR 5	81.5 C.Y.
<b>TOTAL CLASS AA CONCRETE</b>	<b>710.0 C.Y.</b>

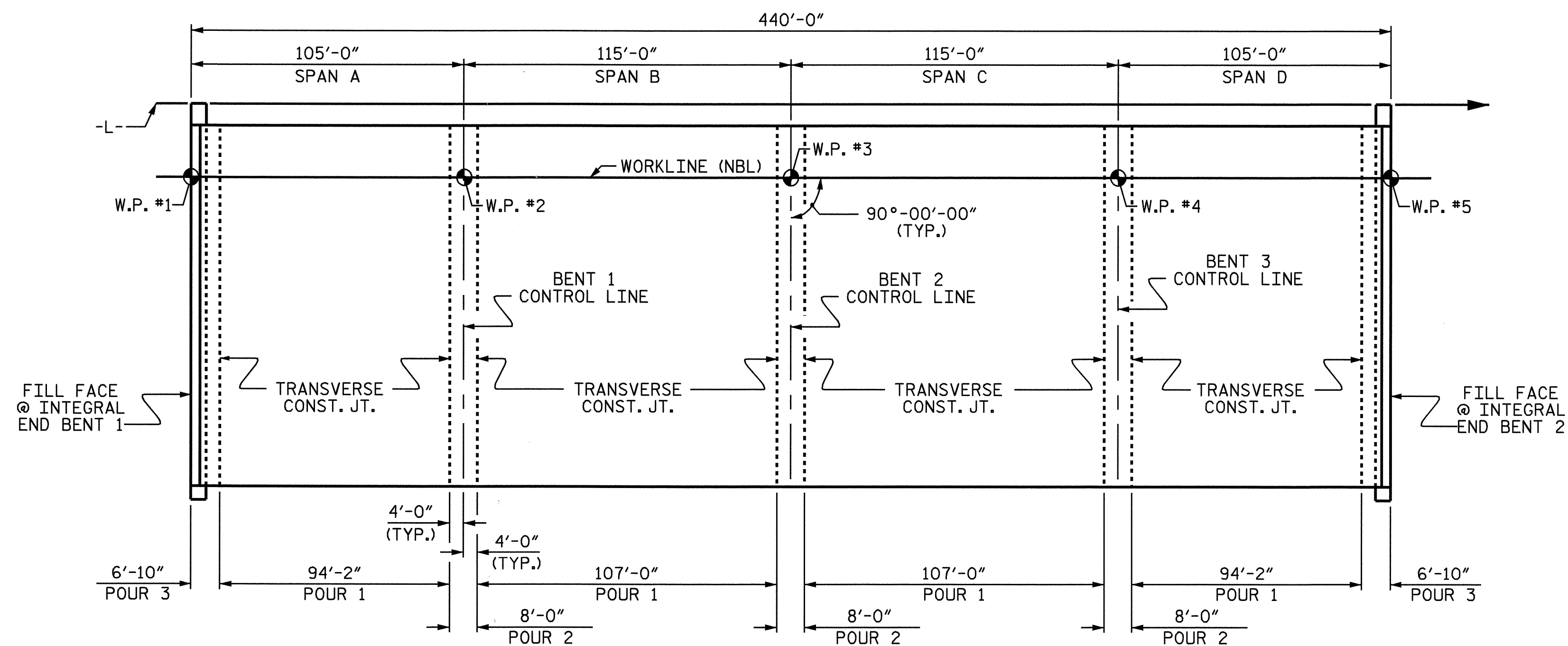


POURING SEQUENCE



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



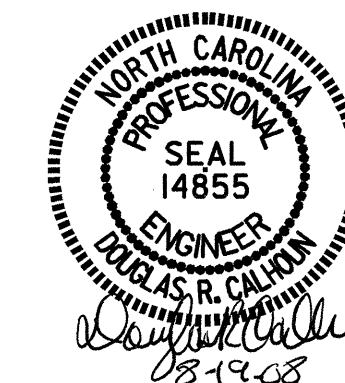
OPTIONAL POURING SEQUENCE

PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 BILL OF MATERIAL  
 (NBL)



DRAWN BY : T.L.CLELLAND DATE : 8/1/05  
 CHECKED BY : T.A.HARRIS DATE : 9/2/05

19-AUG-2008 10:18  
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 bng:ady

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			70

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

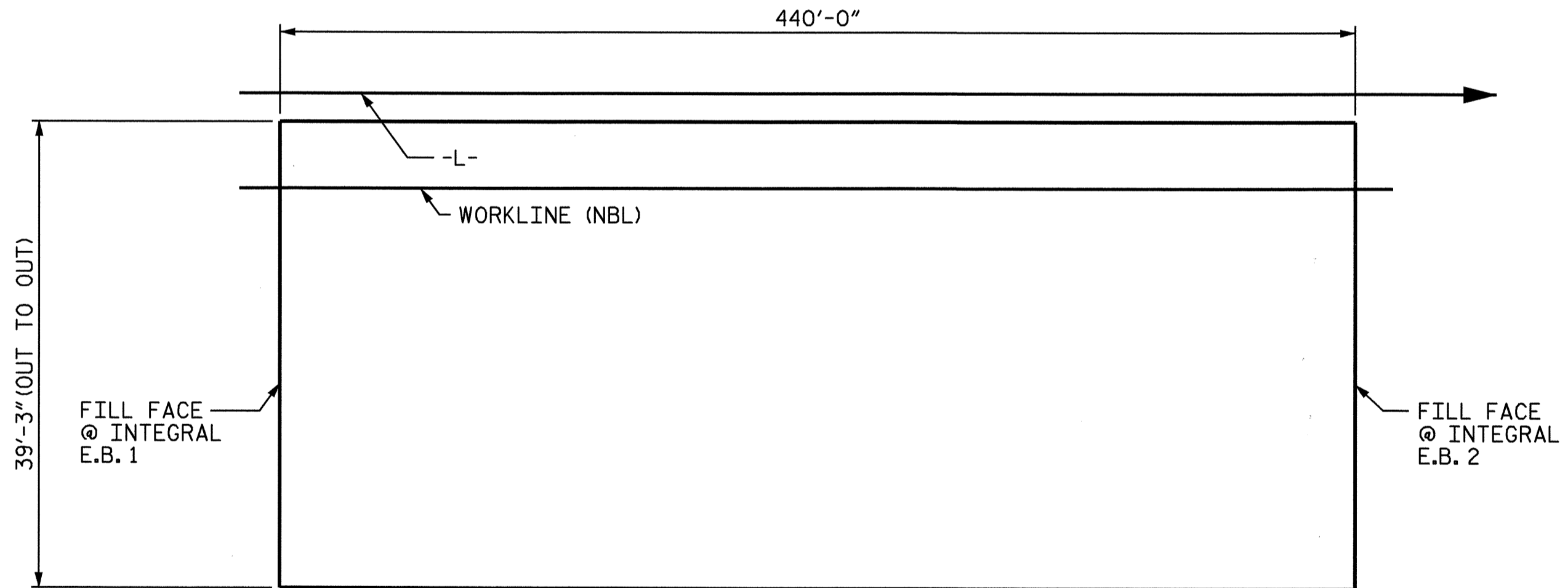
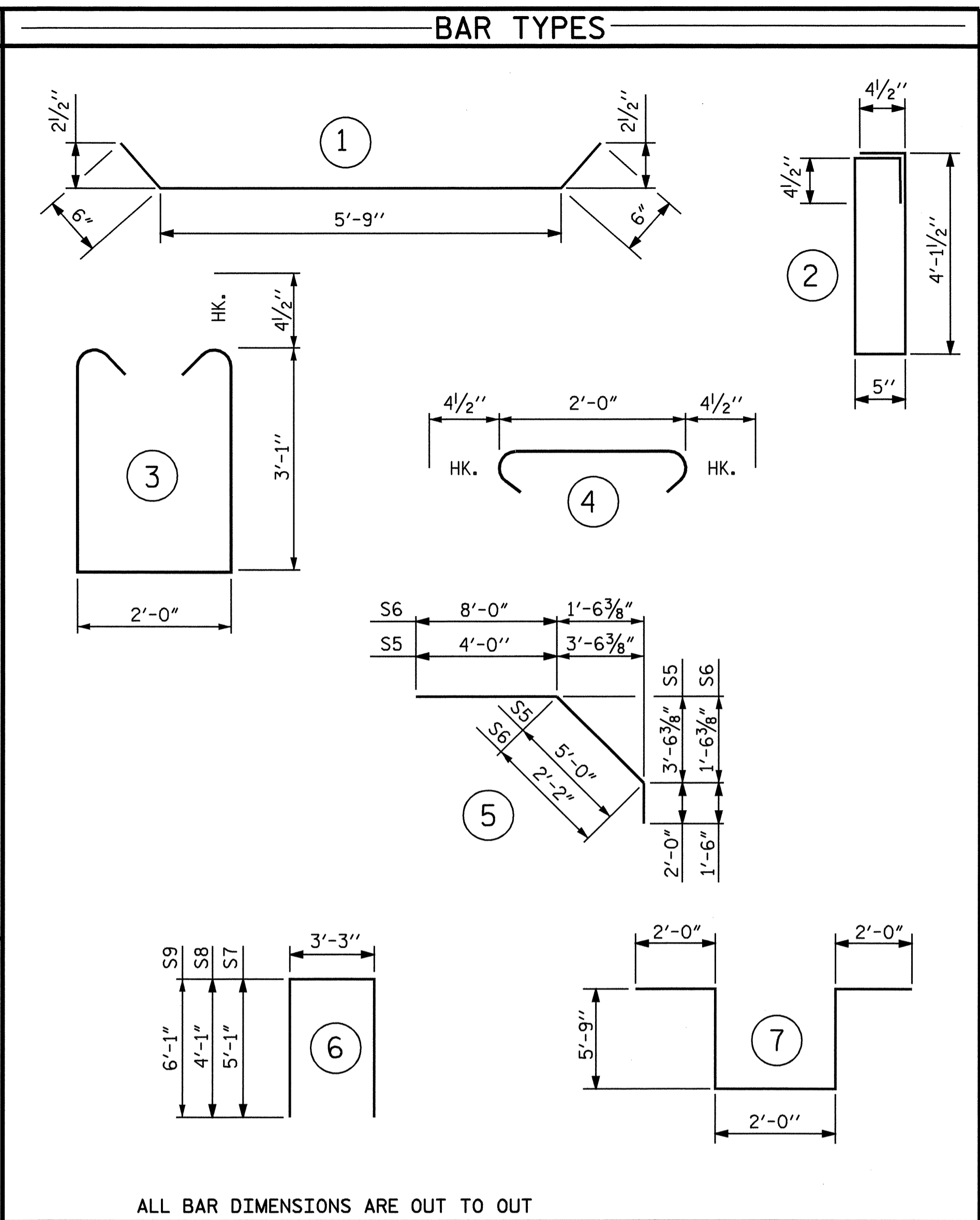
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1480 SQ.FT.
BRIDGE DECK	14454 SQ.FT.
TOTAL	15934 SQ.FT.

**BILL OF MATERIAL**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	658	#5	STR	38'-11"	26708
A2	658	#5	STR	38'-11"	26708
*B1	168	#4	STR	24'-4"	2731
*B2	112	#4	STR	19'-6"	1459
*B3	50	#7	STR	34'-0"	3475
*B4	168	#7	STR	29'-6"	10130
*B5	25	#7	STR	36'-0"	1840
*B6	84	#7	STR	30'-10"	5294
B7	240	#5	STR	56'-8"	14185
B8	48	#5	STR	21'-0"	1051
*B9	100	#5	STR	21'-0"	2190
E1	32	#4	STR	3'-0"	64
K1	64	#5	1	6'-9"	451
K2	256	#5	STR	7'-1"	1891
K3	24	#4	STR	4'-1"	65
K4	96	#4	STR	7'-1"	454
K5	24	#4	STR	4'-4"	69
K6	36	#4	STR	17'-0"	409
K7	24	#4	STR	23'-5"	375
K8	8	#4	STR	4'-1"	22
K9	32	#4	STR	7'-1"	151
K10	8	#4	STR	5'-6"	29
K11	16	#4	STR	2'-8"	29
K12	4	#4	STR	4'-6"	12
K13	16	#4	STR	6'-0"	64
K14	4	#4	STR	5'-2"	14
S1	192	#4	2	9'-10"	1261
S2	24	#4	3	8'-11"	158
S3	60	#4	7	17'-6"	701
S4	348	#4	4	2'-9"	639
*S5	44	#4	5	11'-0"	323
*S6	48	#4	5	11'-8"	374
S7	76	#4	6	13'-5"	681
S8	20	#4	6	11'-5"	153
S9	16	#4	6	15'-5"	165
REINFORCING STEEL					49801 LBS.
* EPOXY COATED REINFORCING STEEL					54524 LBS.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 17,270)

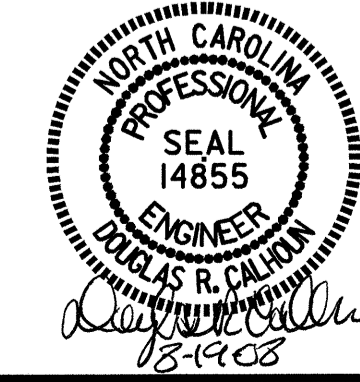
ALL BAR DIMENSIONS ARE OUT TO OUT

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	128.4		
POUR 2	171.7		
POUR 3	171.7		
POUR 4	156.7		
POUR 5	81.5		
TOTALS**	710.0	49801	54524

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED  
 PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 SUPERSTRUCTURE  
 BILL OF MATERIAL  
 (NBL)

OCTOBER 1987

REVISIONS						SHEET NO. S-55
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

ASSEMBLED BY : T.L.CLELLAND	DATE : 8/1/05
CHECKED BY : T.A.HARRIS	DATE : 9/2/05
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES

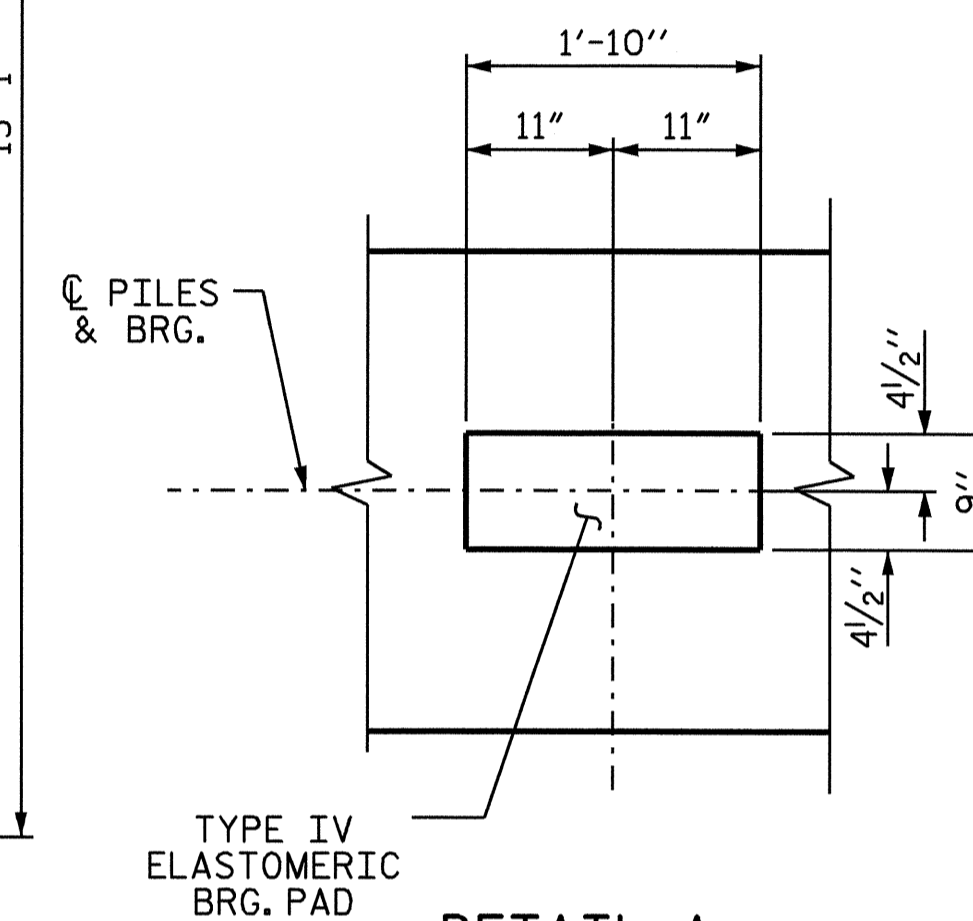


NOTES

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

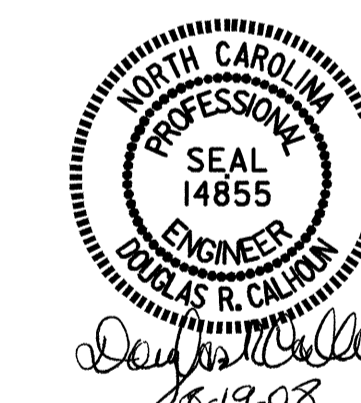
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS (POUR 2) ARE TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE REINFORCING STEEL AS SHOWN ON THE PLANS AND ACCORDING TO SECTION 1070-10 OF THE STANDARD SPECIFICATIONS.



DETAIL A

(TYP. EA. GIRDER)



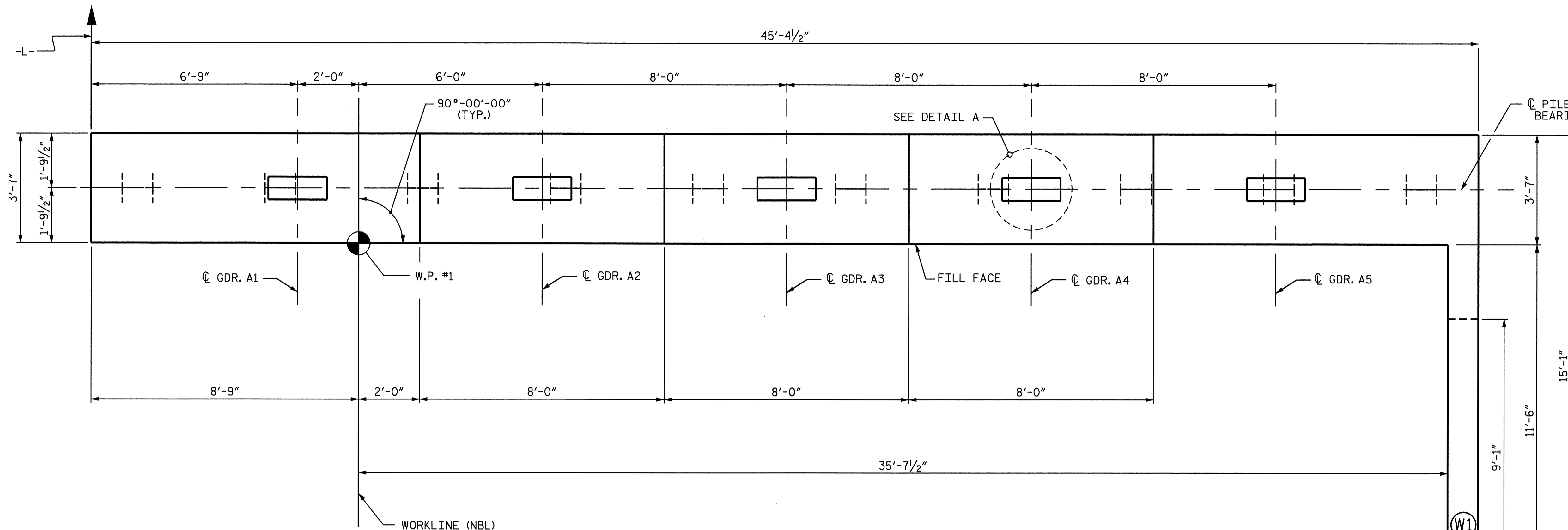
PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

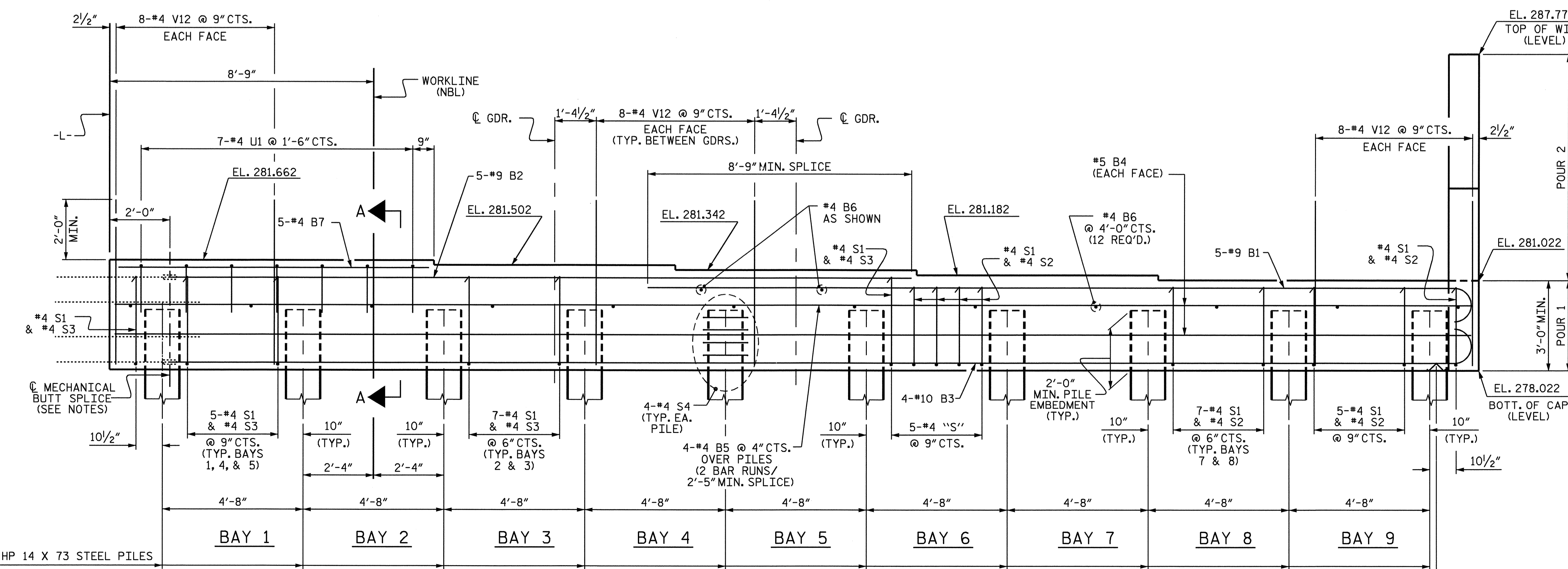
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (NBL)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56	
1			3			TOTAL SHEETS 70	
2			4				



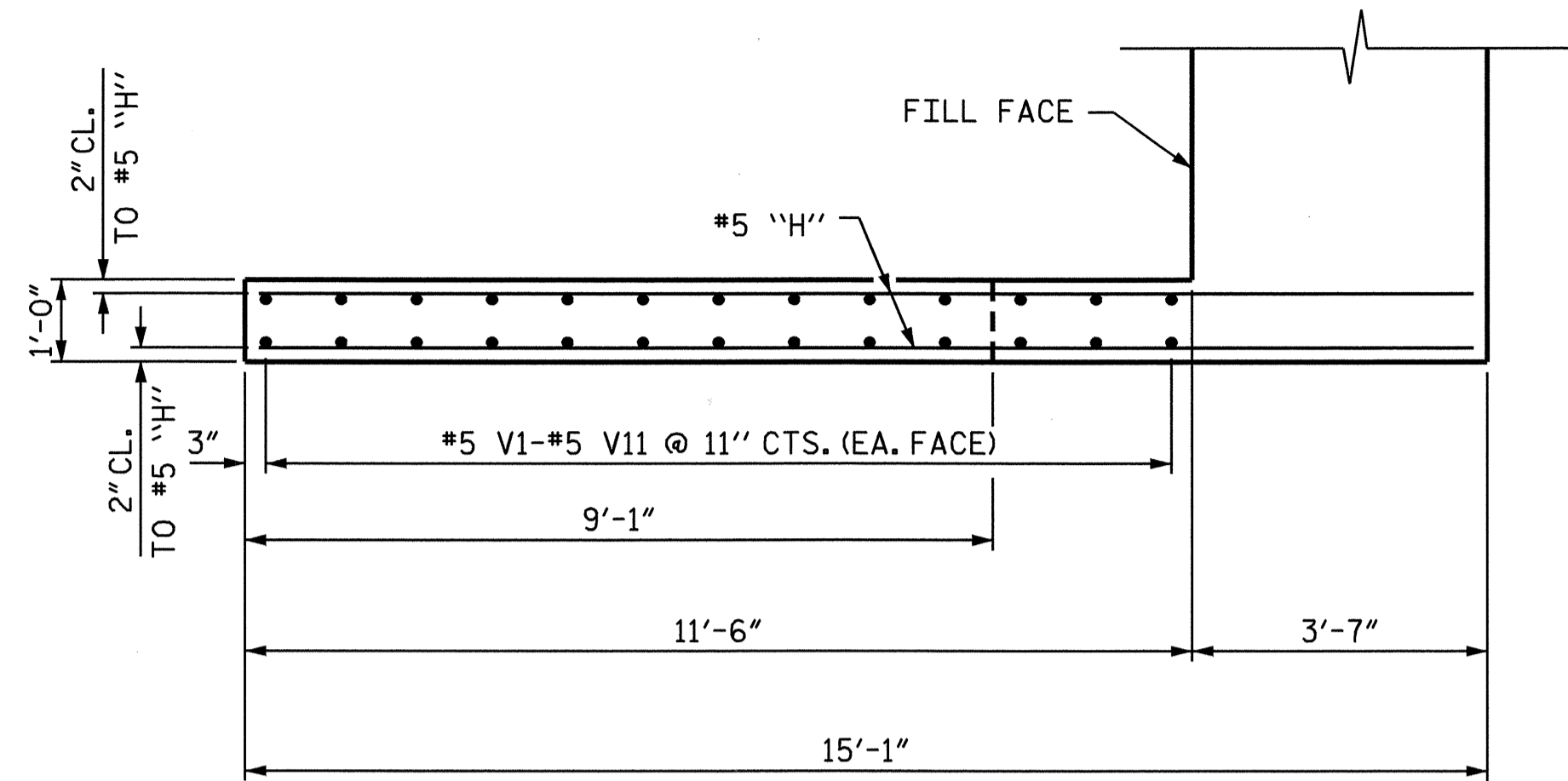
PLAN



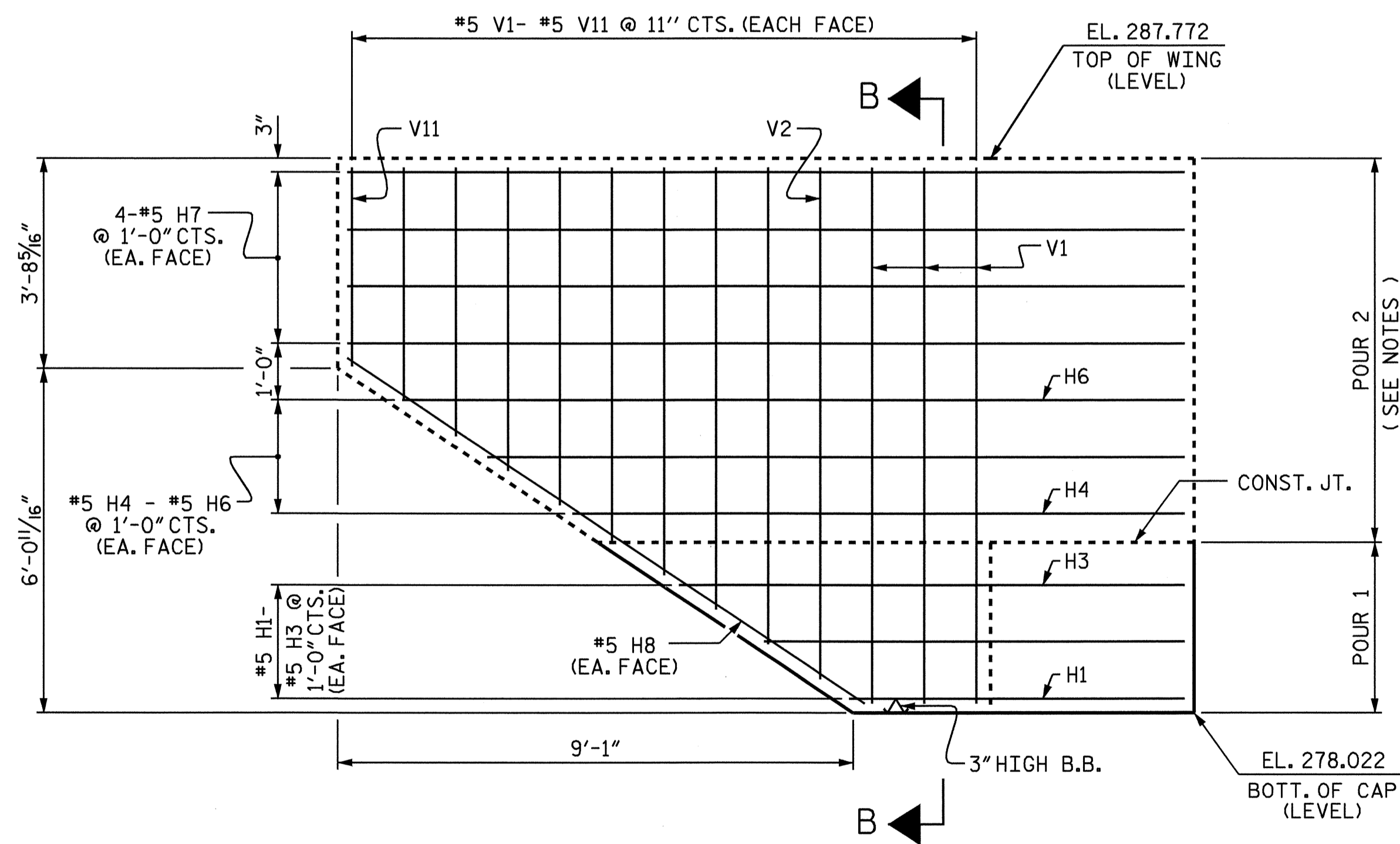
ELEVATION

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05

19-AUG-2008 10:18  
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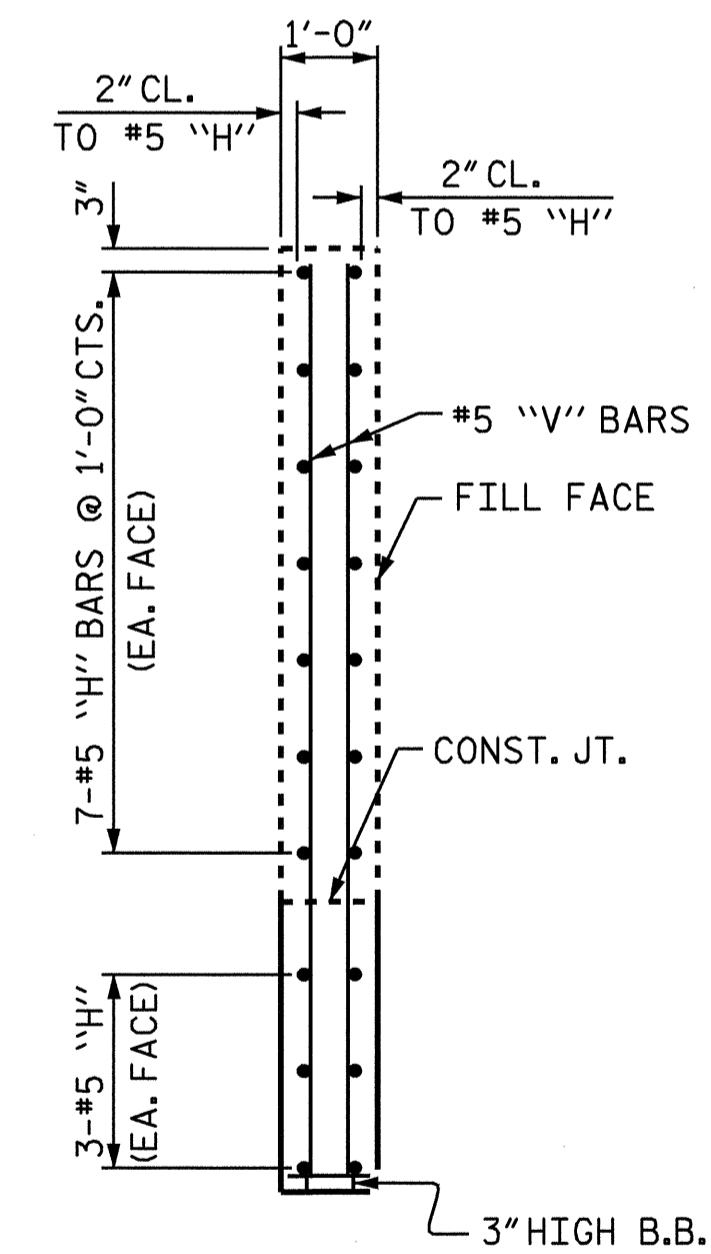


PLAN (W1)



ELEVATION (W1)

WING DETAILS



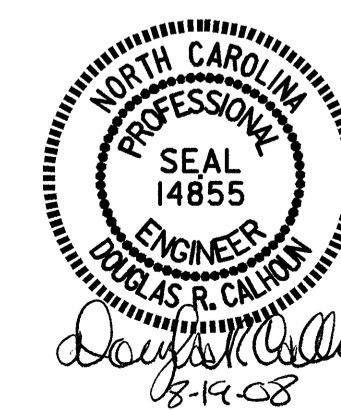
SECTION B-B

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

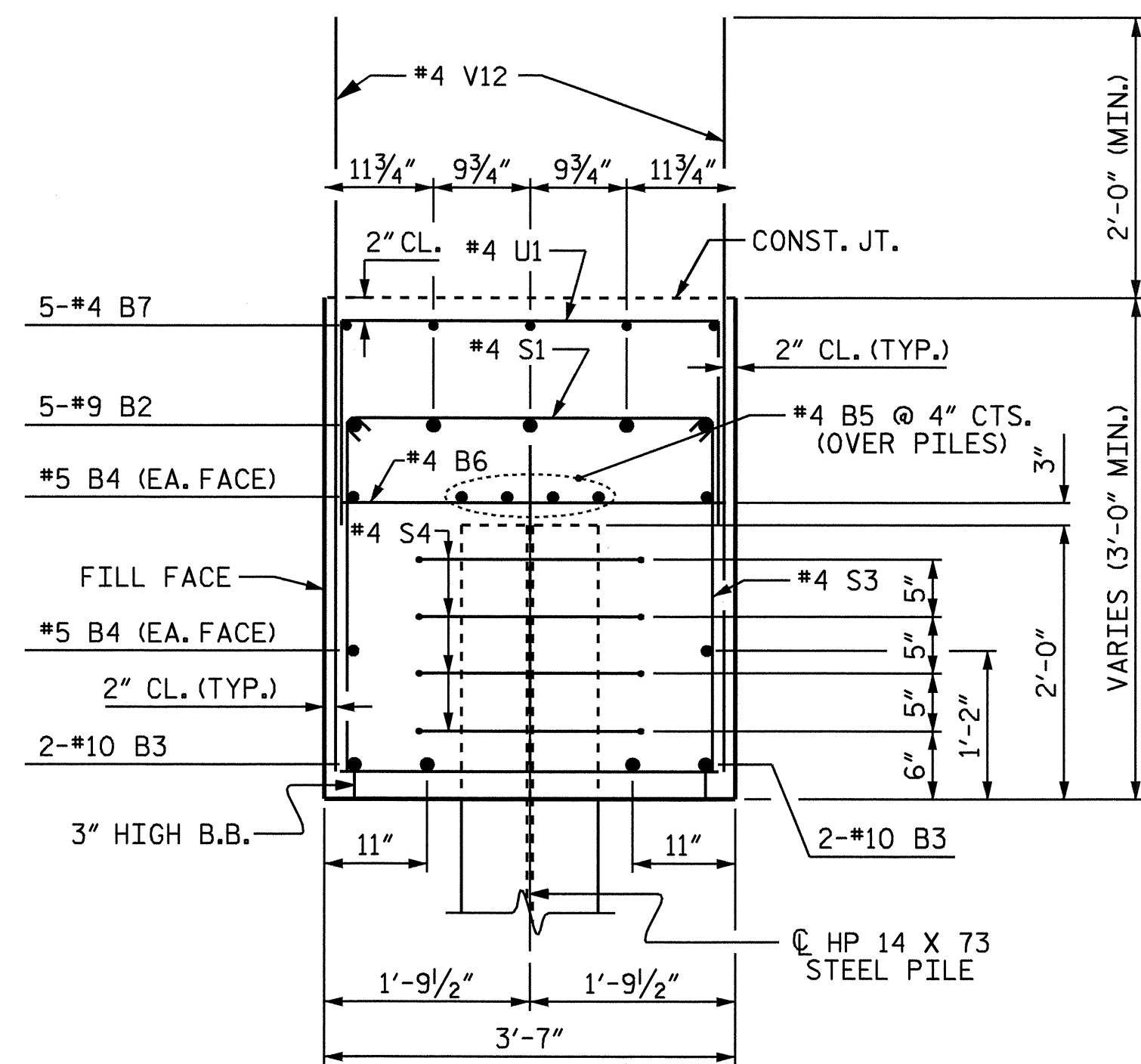
SUBSTRUCTURE  
 END BENT 1  
 (NBL)



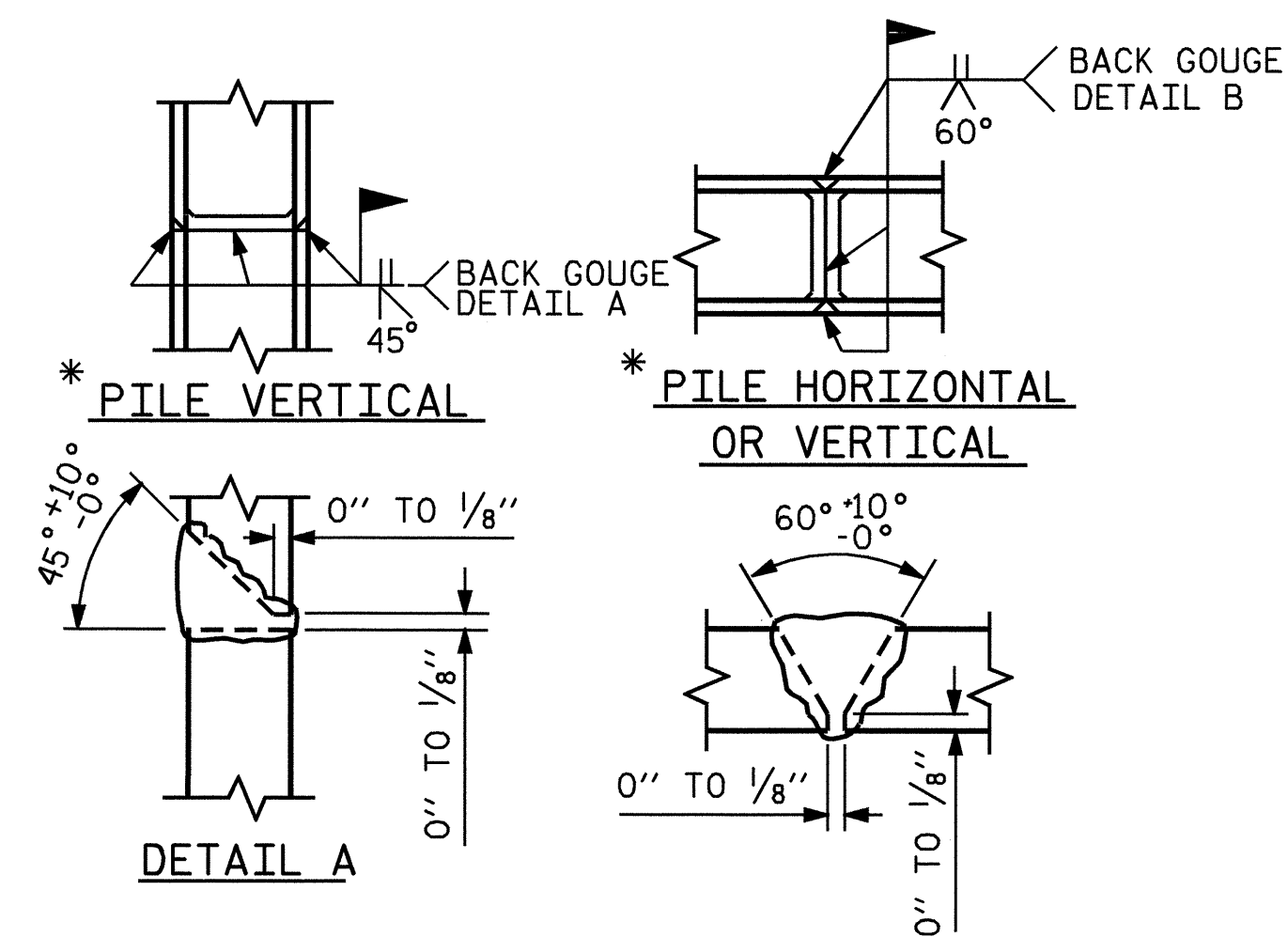
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57	
1			3			TOTAL SHEETS	
2			4			70	

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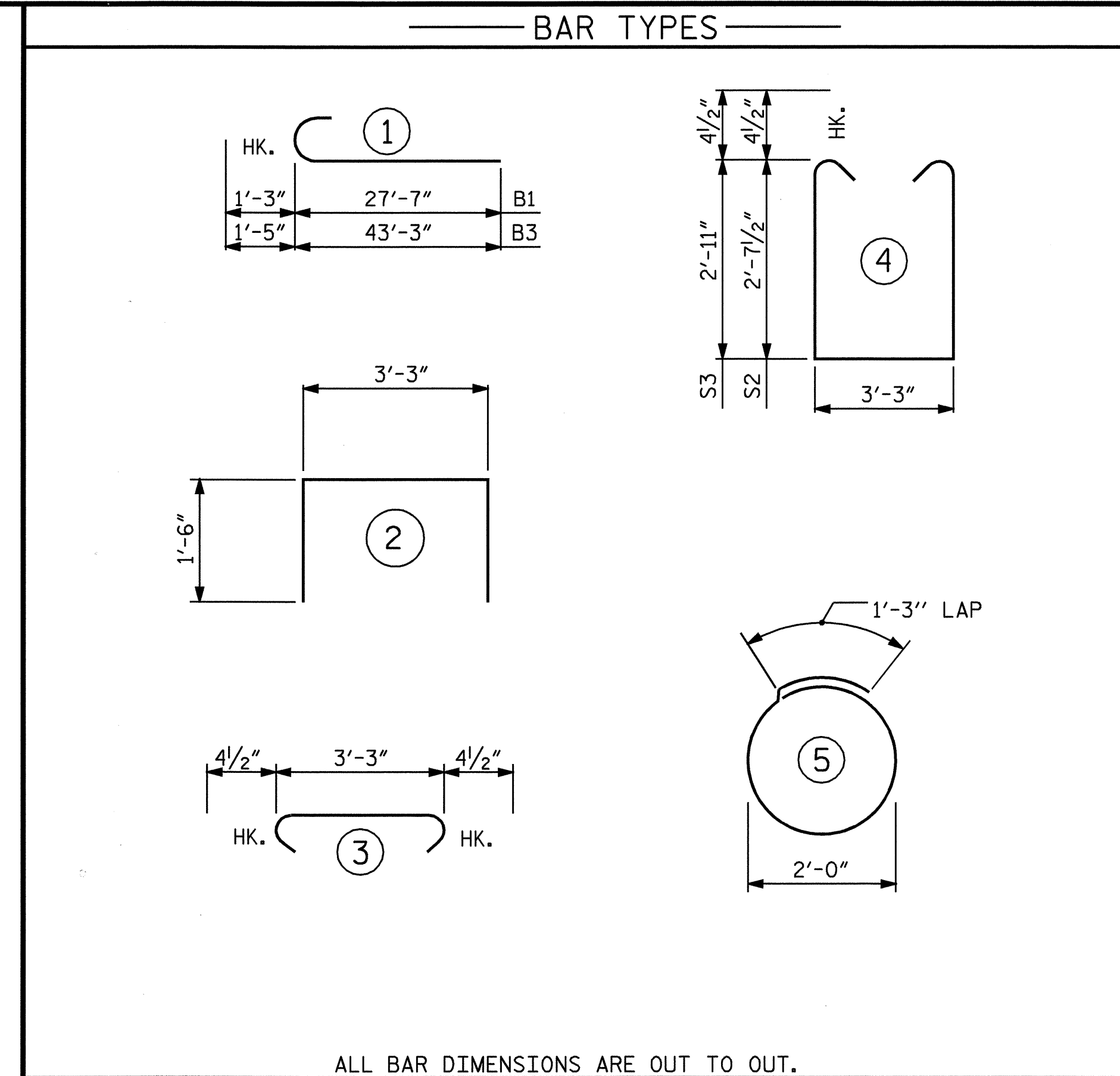
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SECTION A-A

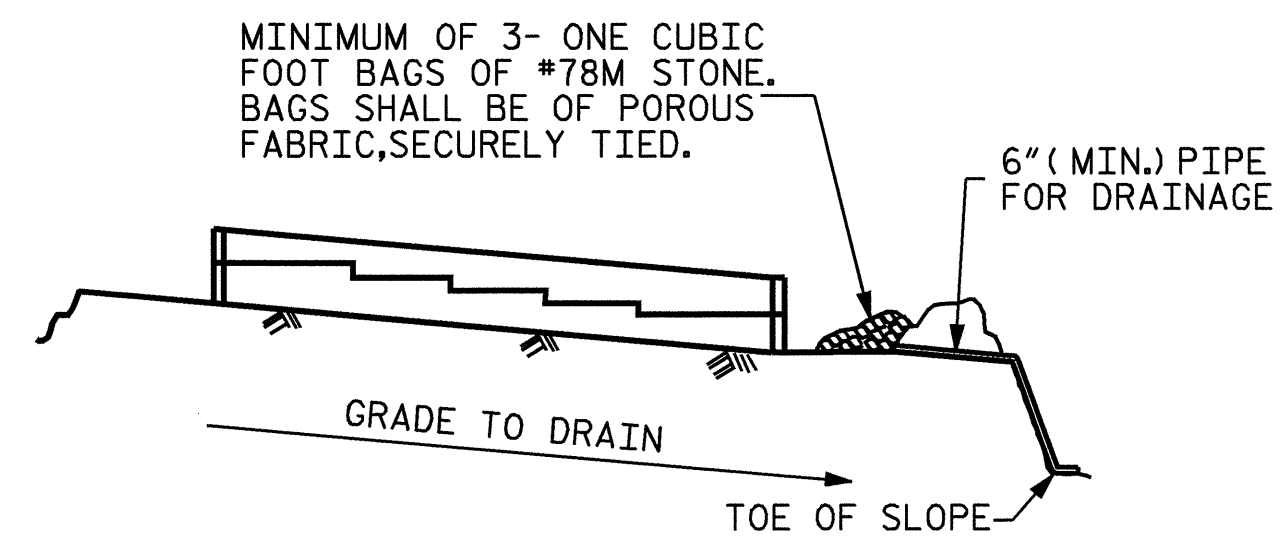


PILE SPLICE DETAILS



BILL OF MATERIAL											
END BENT 1											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	28'-10"	490	V1	6	#5	STR	9'-5"	59
B2	5	#9	STR	24'-7"	418	V2	2	#5	STR	8'-11"	19
B3	4	#10	1	44'-8"	769	V3	2	#5	STR	8'-4"	17
B4	4	#5	STR	45'-0"	188	V4	2	#5	STR	7'-9"	16
B5	8	#4	STR	23'-9"	127	V5	2	#5	STR	7'-1"	15
B6	14	#4	STR	3'-3"	30	V6	2	#5	STR	6'-6"	14
B7	5	#4	STR	10'-5"	35	V7	2	#5	STR	5'-11"	12
						V8	2	#5	STR	5'-3"	11
H1	2	#5	STR	5'-10"	12	V9	2	#5	STR	4'-8"	10
H2	2	#5	STR	7'-4"	15	V10	2	#5	STR	4'-1"	9
H3	2	#5	STR	8'-10"	18	V11	2	#5	STR	3'-5"	7
H4	2	#5	STR	10'-9"	22	V12	96	#4	STR	5'-6"	353
H5	2	#5	STR	12'-3"	26						
H6	2	#5	STR	13'-9"	29						
H7	8	#5	STR	14'-9"	123						
H8	2	#5	STR	10'-11"	23						
						REINFORCING STEEL = 3598 LBS					
						CLASS A CONCRETE BREAKDOWN					
						▲ POUR 1 (CAP AND LOWER PART OF WINGS) 20.9 CU.YDS.					
						TOTAL 20.9 CU.YDS.					
						HP 14 x 73 STEEL PILES					
						NO. 10 250 FT.					

▲ UPPER WINGS (POUR 2) TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

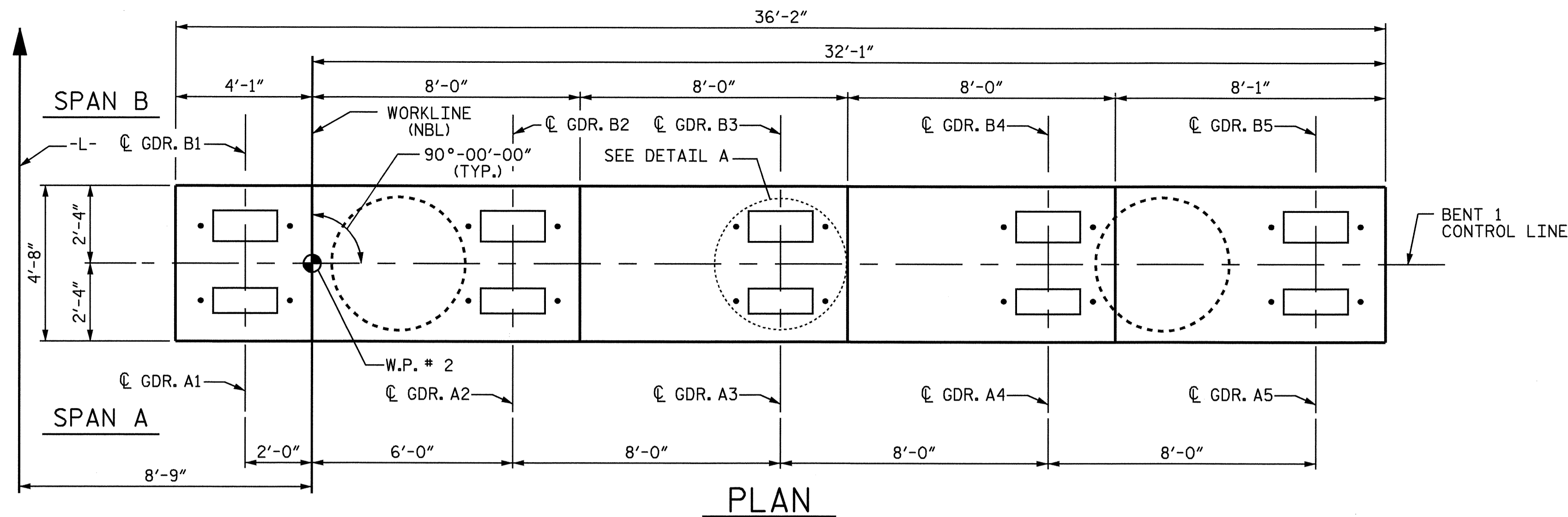
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (NBL)

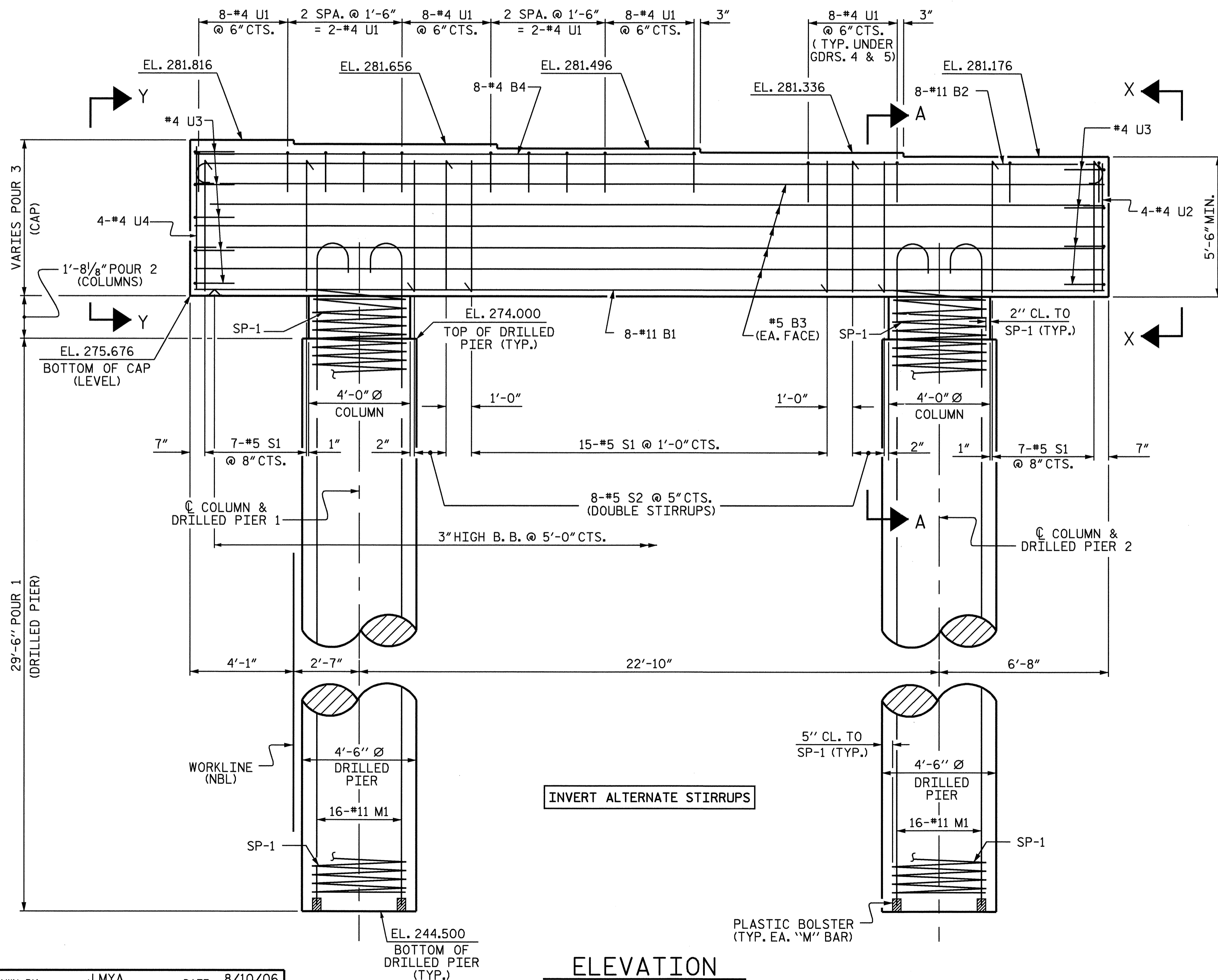
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			70

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05

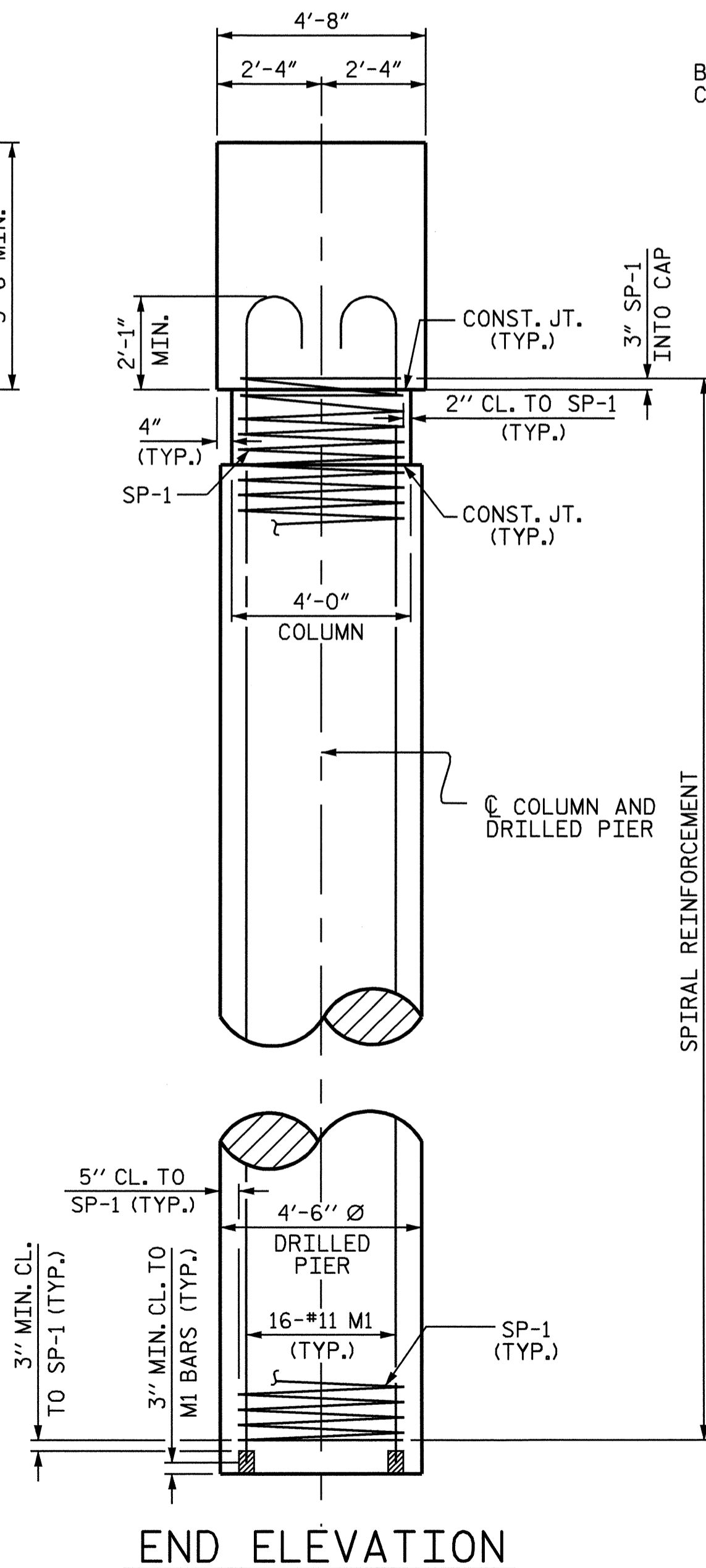




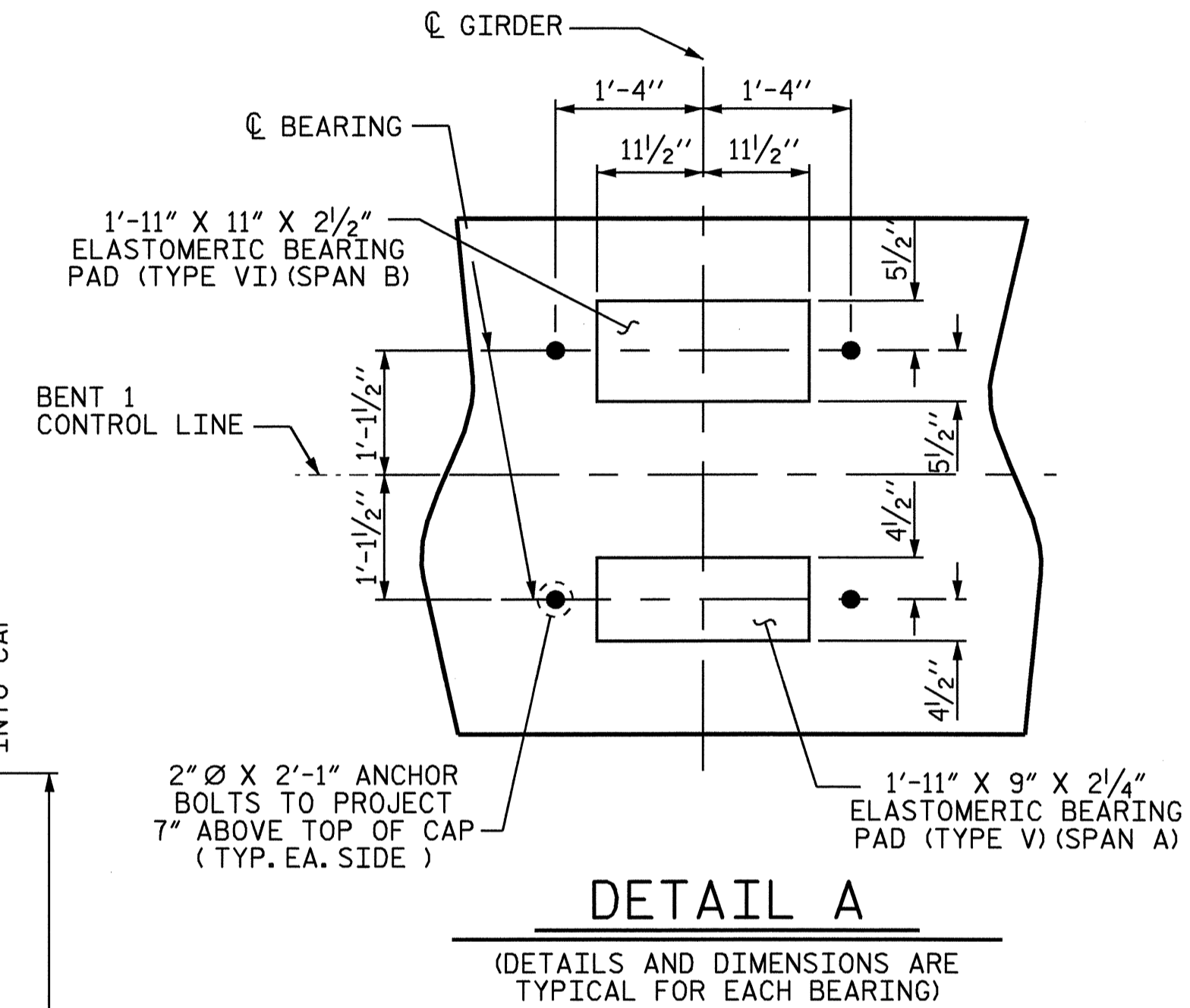
PLAN



ELEVATION



END ELEVATION



DETAIL A

(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

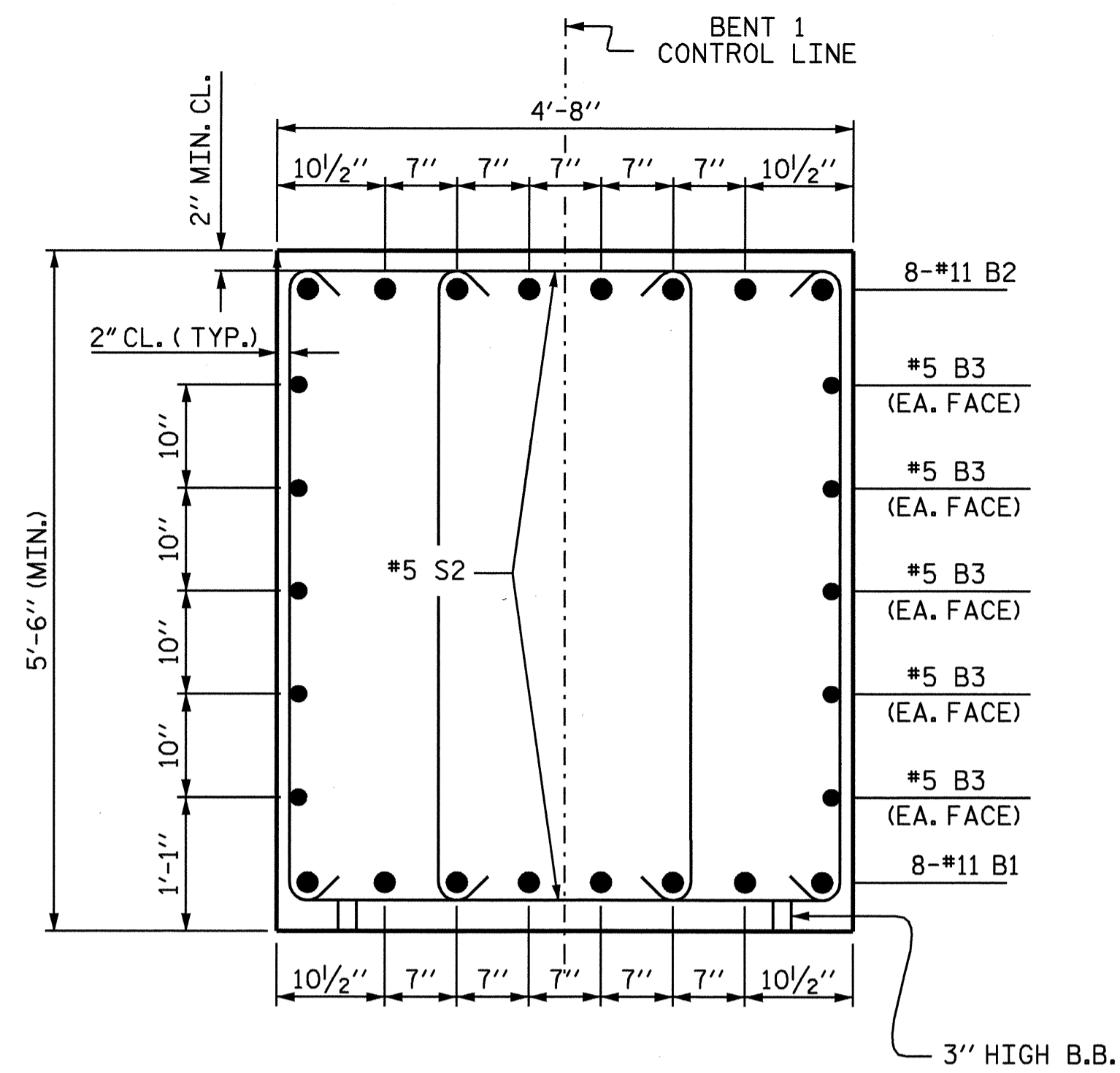
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1  
 (NBL)



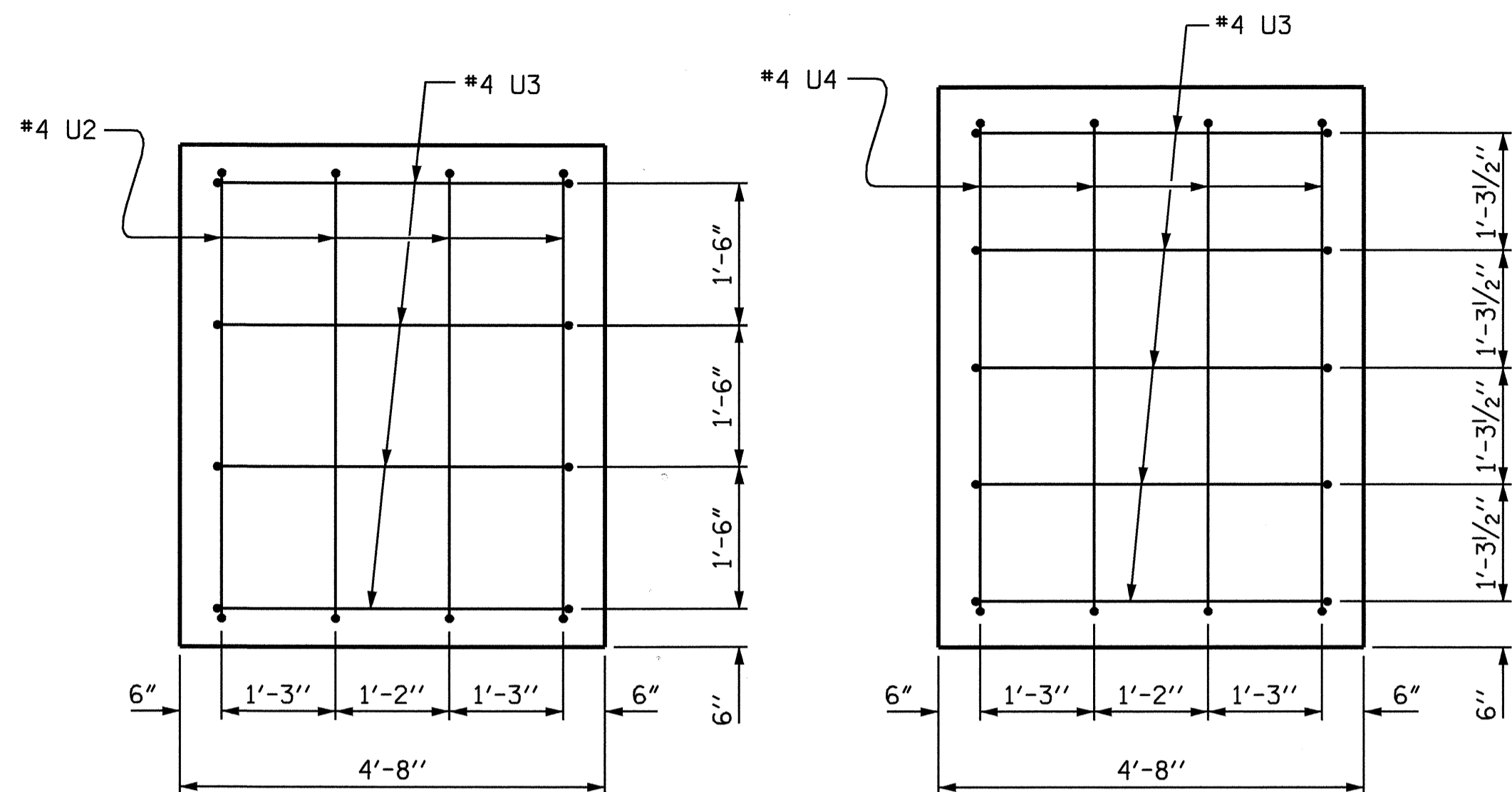
DRAWN BY: J.MYA DATE: 8/10/06  
 CHECKED BY: J.B. WILSON DATE: 8/28/06

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59	
1			3			TOTAL SHEETS 70	
2			4				



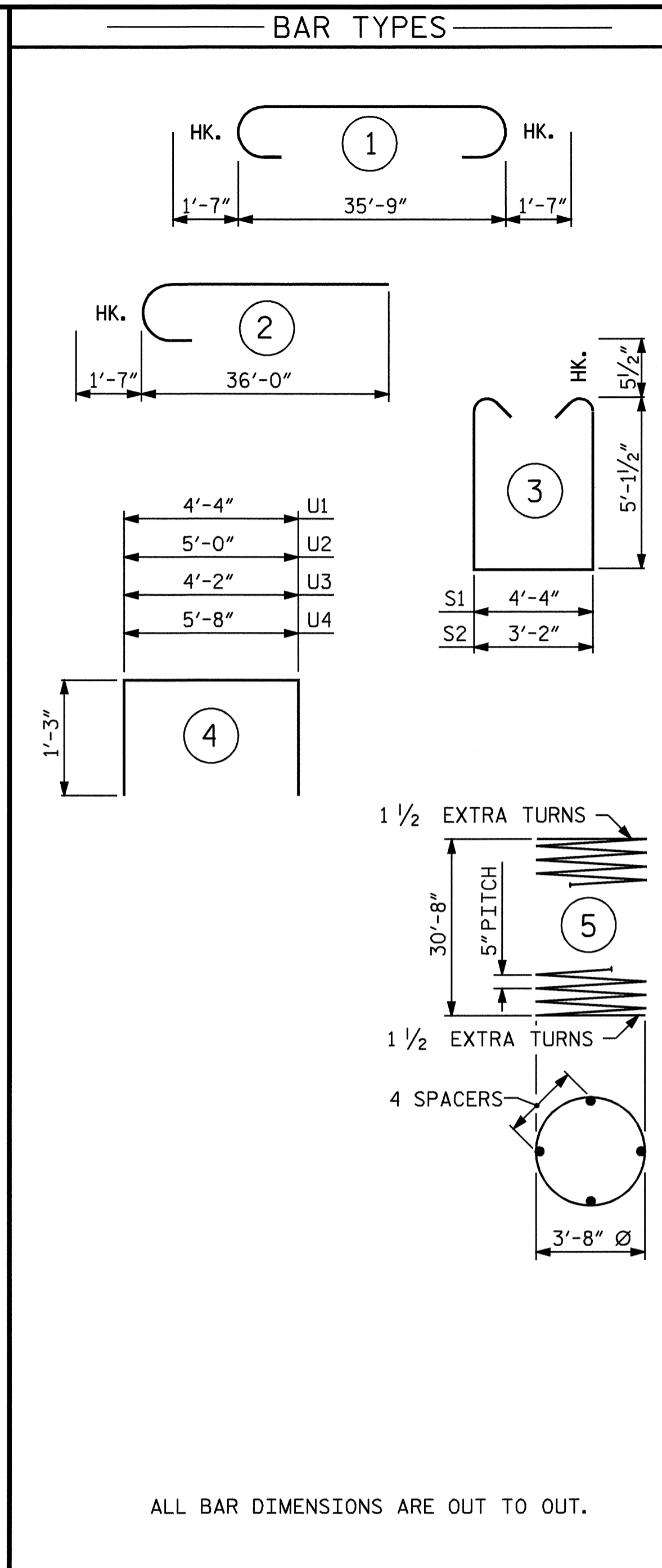
**SECTION A-A**

(SHOWING DOUBLE STIRRUPS (S2)  
SEE ELEVATION ON SHEET 1 OF 2  
FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**

**VIEW Y-Y**

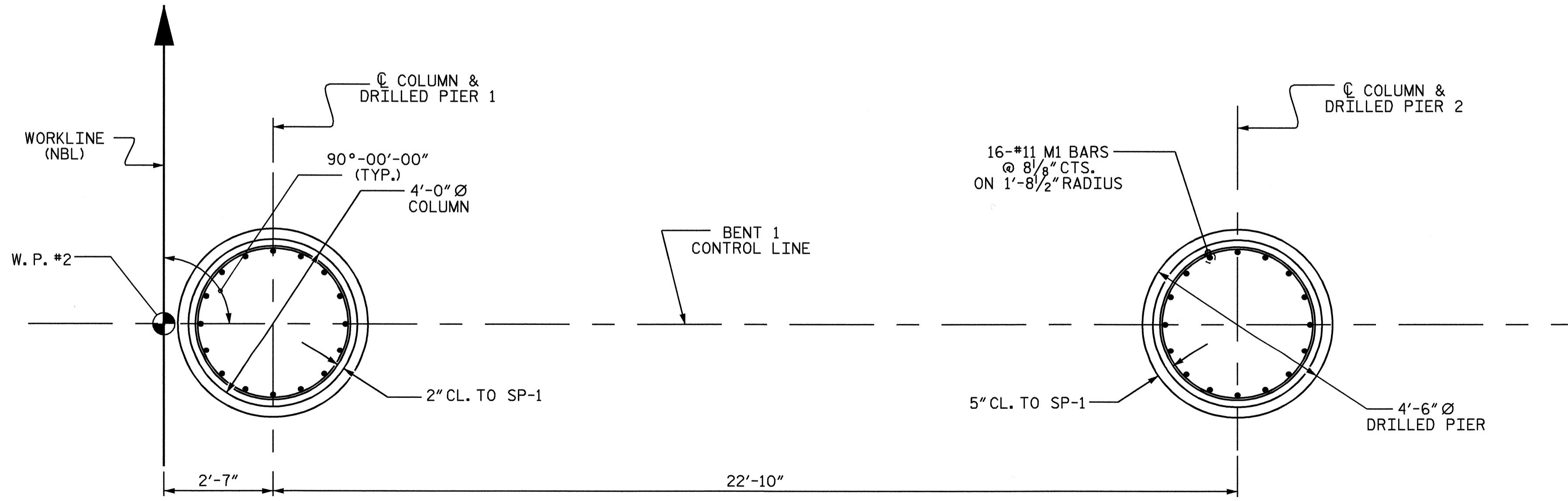


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	35'-10"	1523
B2	8	#11	1	38'-11"	1654
B3	10	#5	STR	35'-10"	374
B4	8	#4	STR	19'-9"	106
M1	32	#11	2	37'-7"	6390
S1	29	#5	3	15'-6"	469
S2	16	#5	3	14'-4"	239
U1	44	#4	4	6'-10"	201
U2	4	#4	4	7'-6"	20
U3	9	#4	4	6'-8"	40
U4	4	#4	4	8'-2"	22
REINFORCING STEEL				=	11,038 LBS
SP-1	2	*	5	870'-11"	1817
SPIRAL COLUMN REINFORCING STEEL				=	1817 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				1.6 C.Y.	
POUR #3 (CAP)				36.2 C.Y.	
TOTAL				37.8 C.Y.	
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				34.8 C.Y.	
4'-6" Ø DRILLED PIERS IN SOIL				48.4 LIN. FT.	
4'-6" Ø DRILLED PIERS NOT IN SOIL				10.6 LIN. FT.	
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS				LIN. FT. = 50	
SPT TESTING				1 EACH	
CSL TUBES ▲				LIN. FT. = 256.0	

▲ SEE NOTES

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



**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY : J.MYA DATE : 8/10/06  
CHECKED BY : J.B. WILSON DATE : 8/28/06

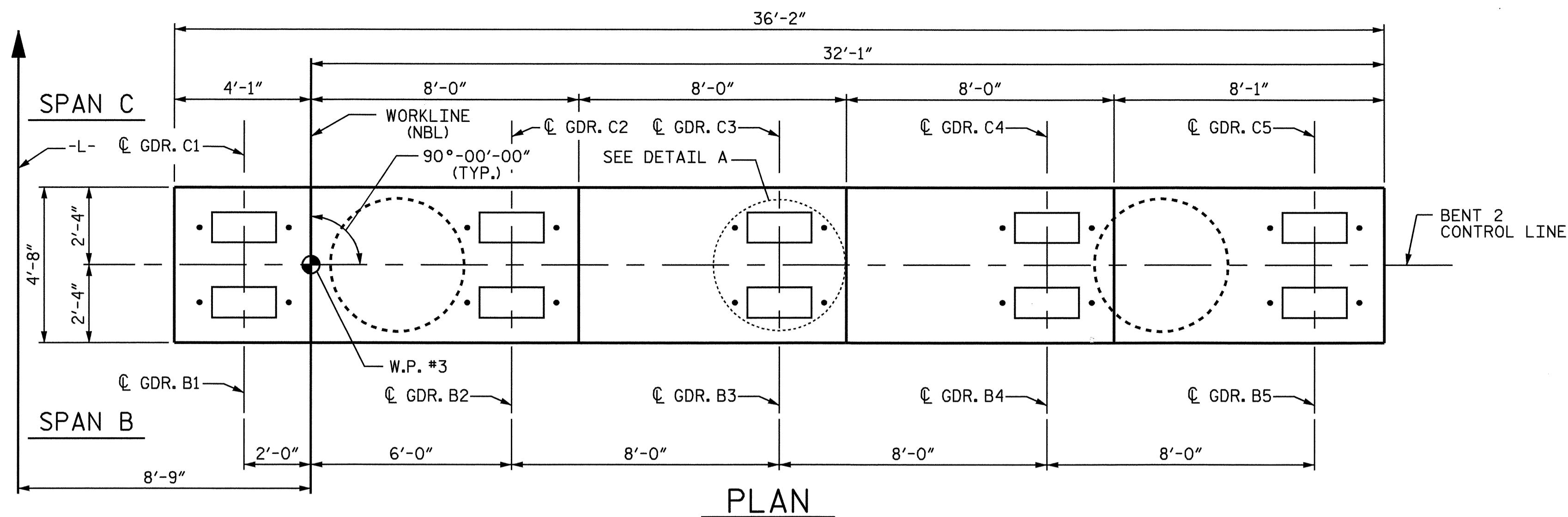
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bngrady



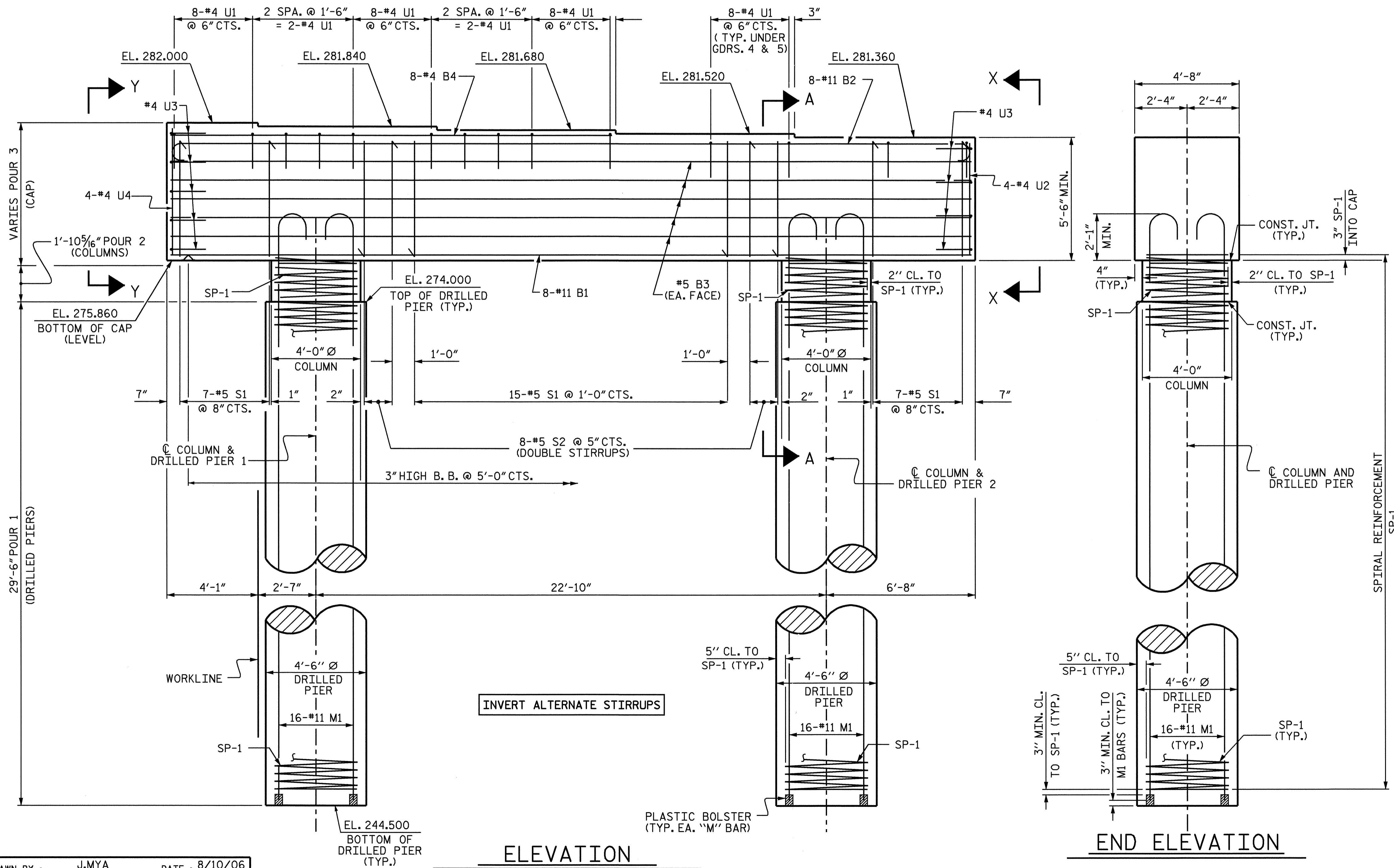
PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-

SHEET 2 OF 2

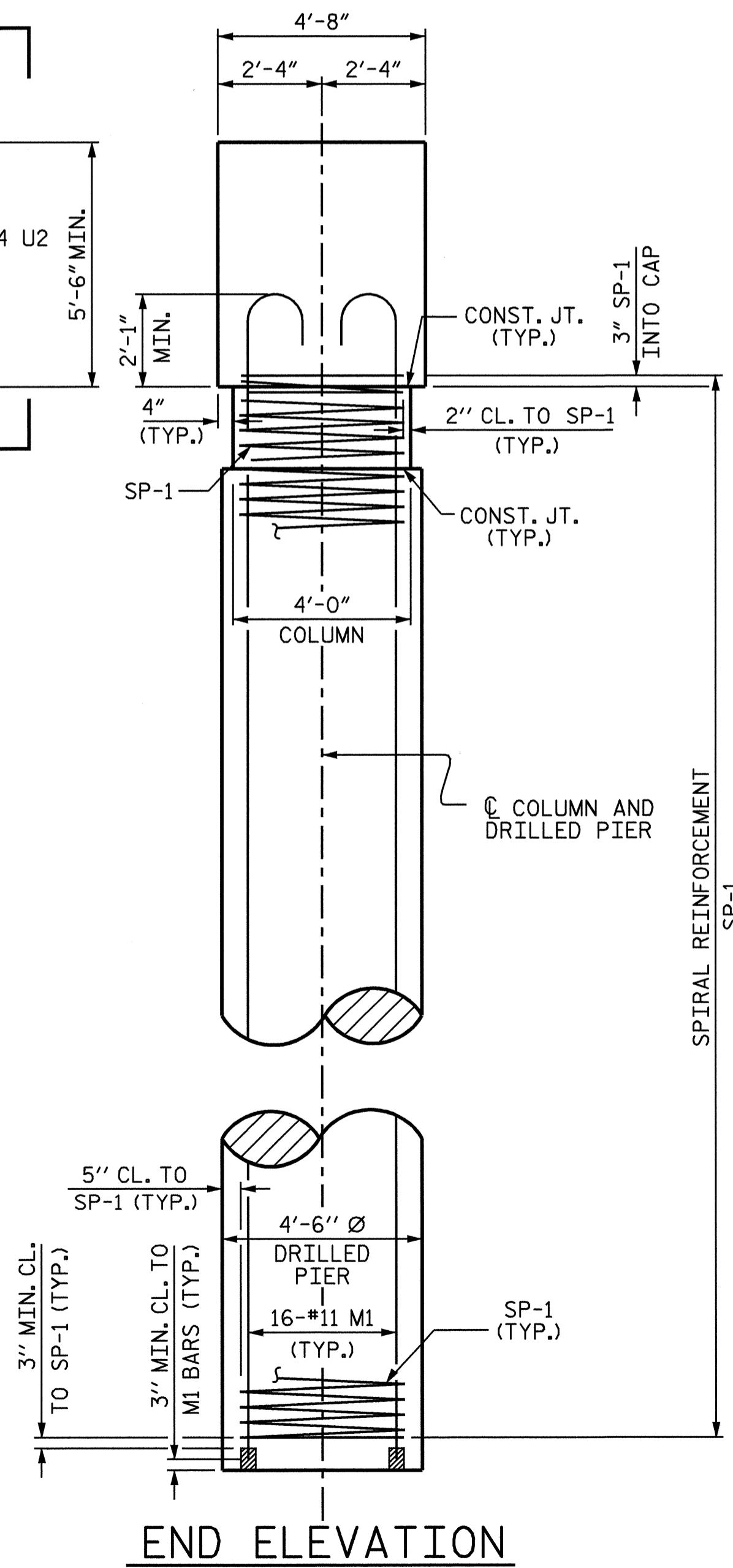
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 (NBL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



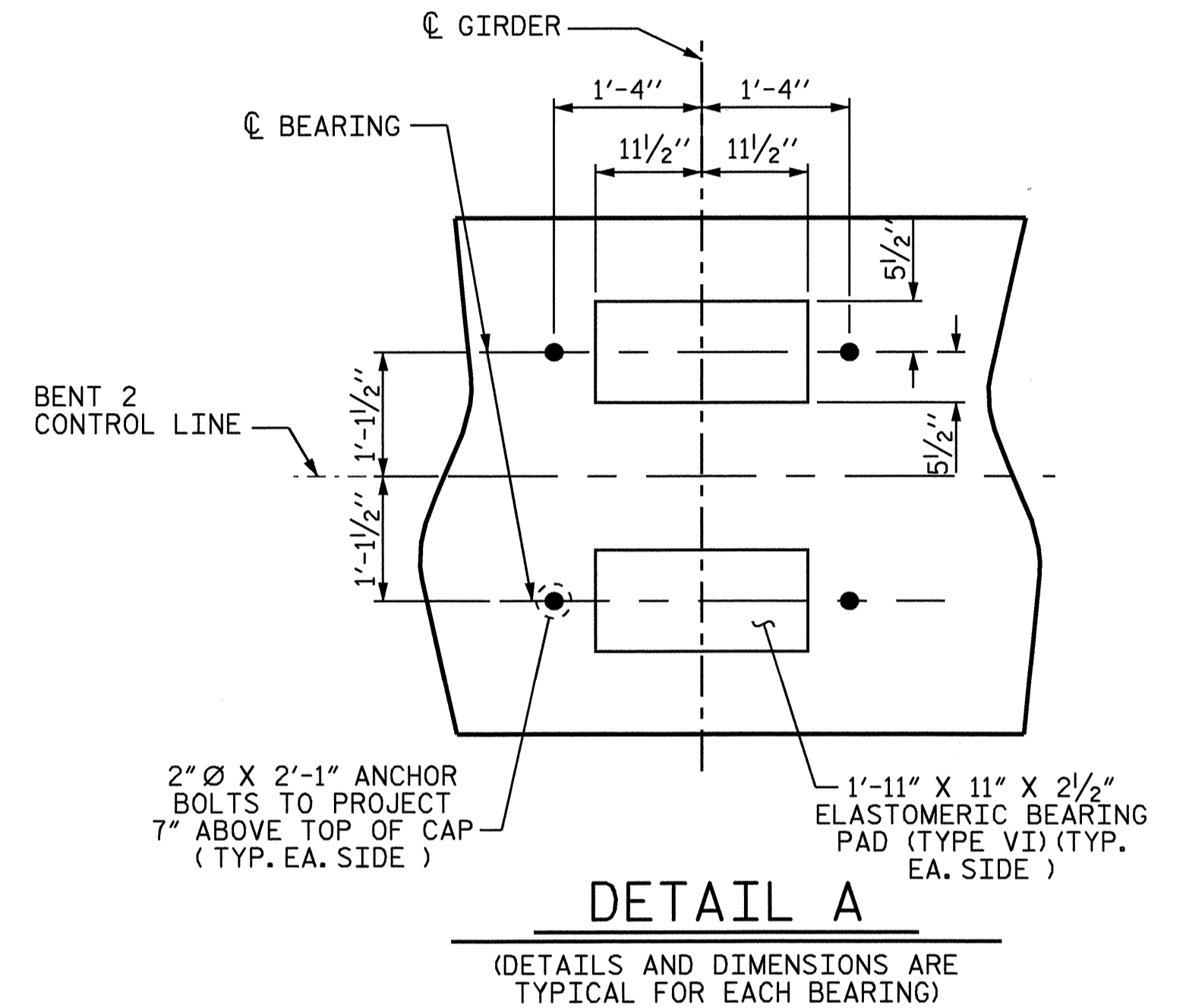
PLAN



ELEVATION



END ELEVATION



DETAIL A

(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)

NOTES

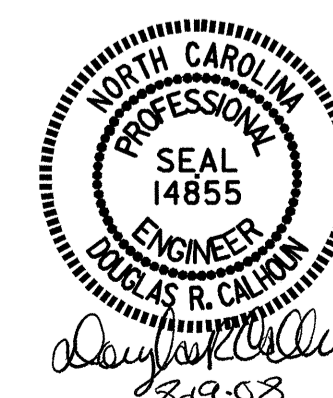
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

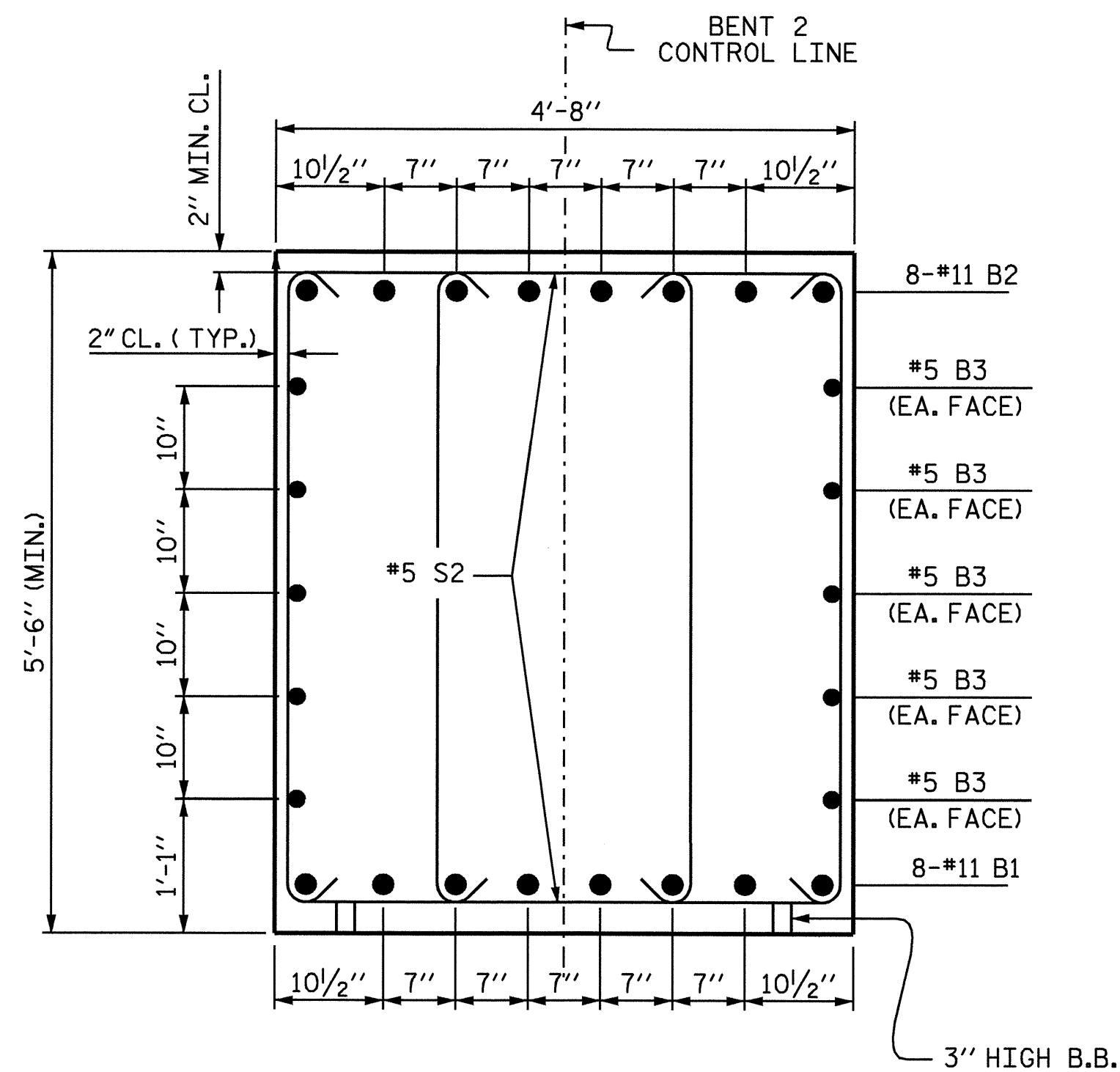
SUBSTRUCTURE  
 BENT 2  
 (NBL)



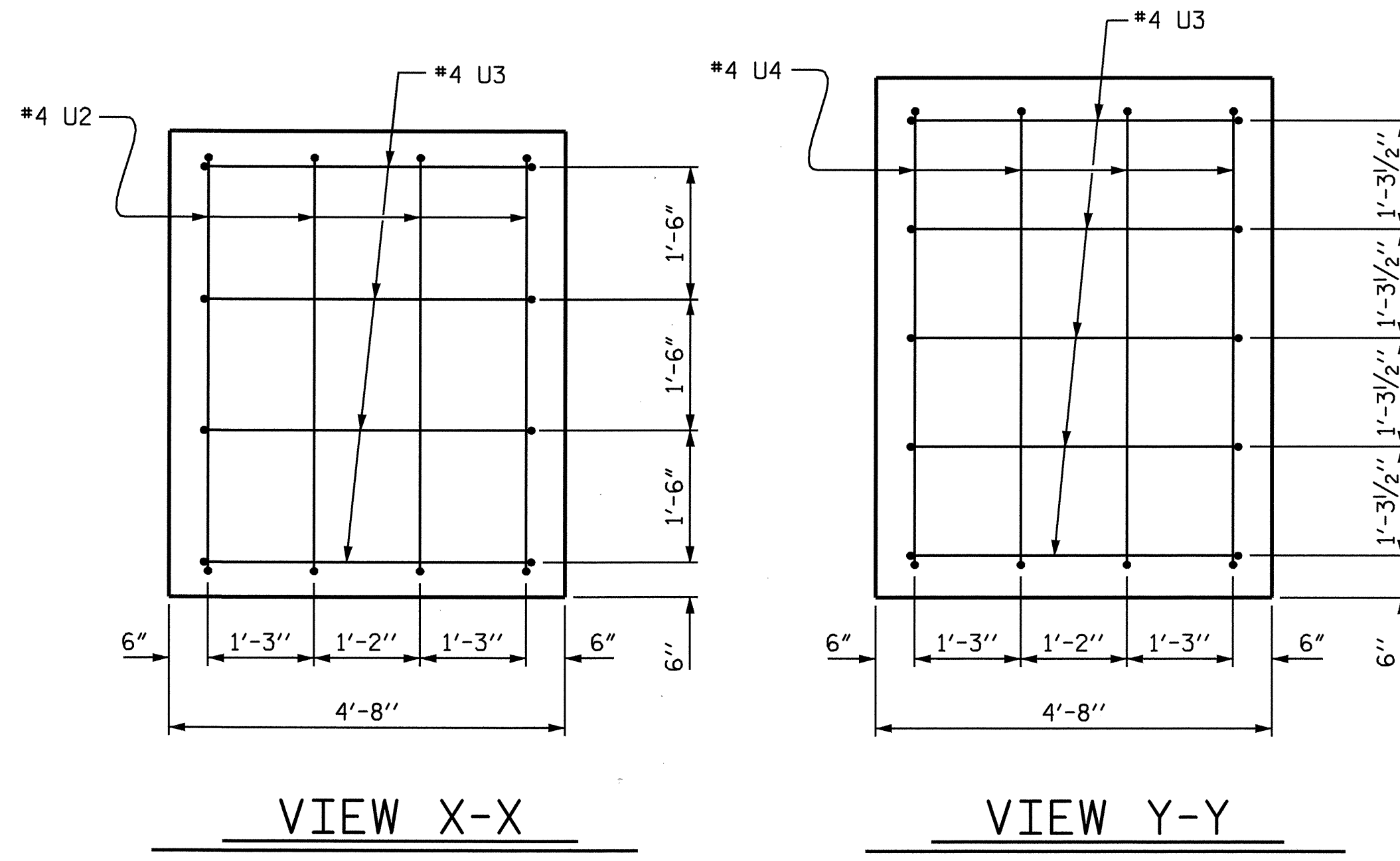
DRAWN BY: J.MYA DATE: 8/10/06  
 CHECKED BY: J.B. WILSON DATE: 8/28/06

19-AUG-2008 10:18  
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 bngrcdy

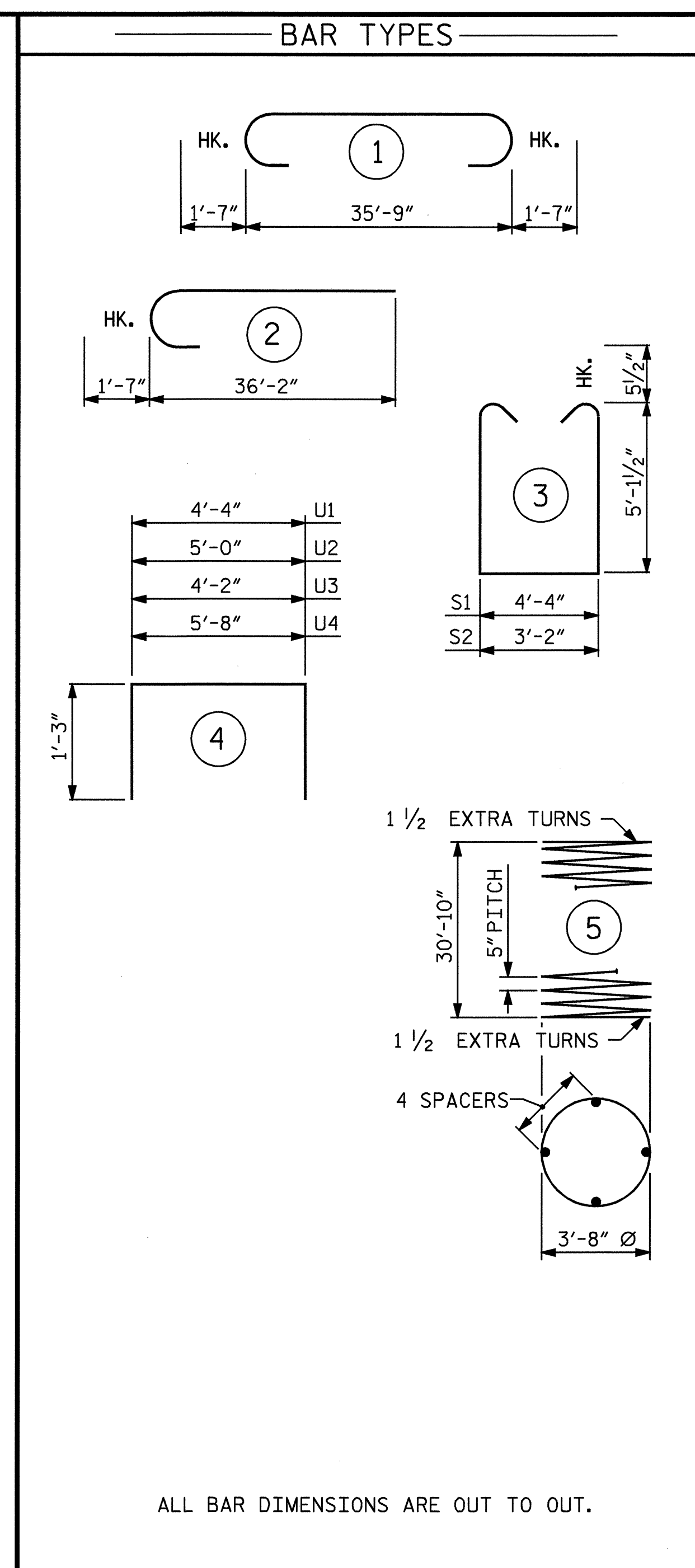
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTALS
2			4			70



**SECTION A-A**  
 (SHOWING DOUBLE STIRRUPS (S2)  
 SEE ELEVATION ON SHEET 1 OF 2  
 FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**      **VIEW Y-Y**

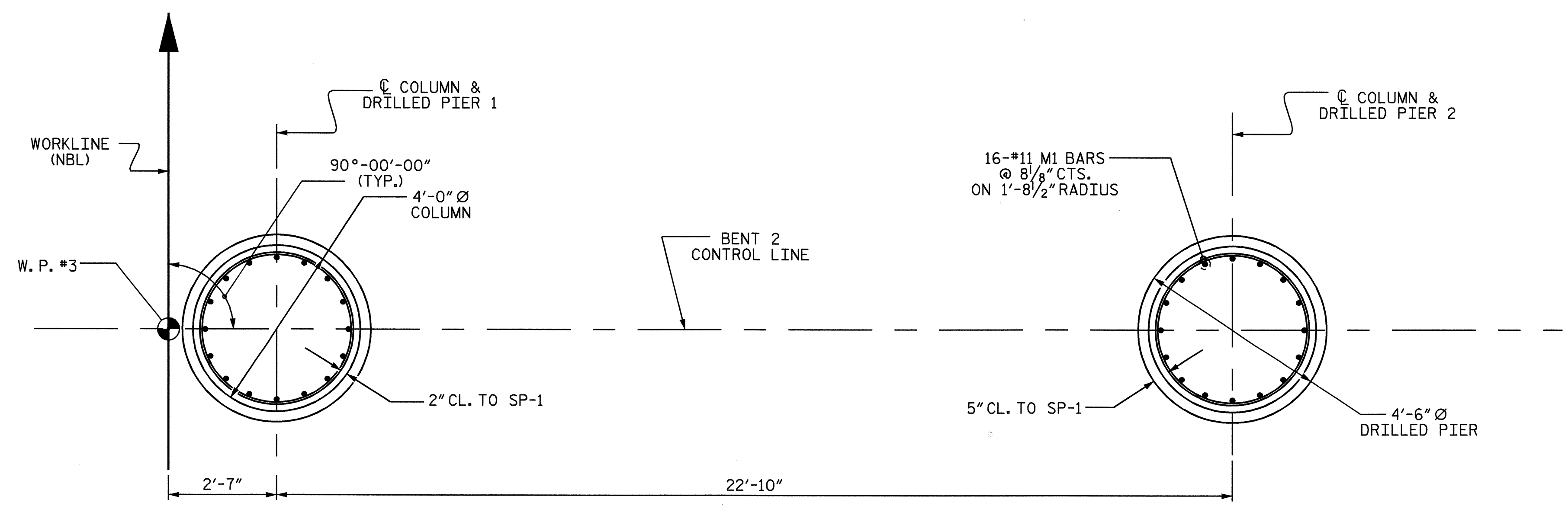


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	35'-10"	1523
B2	8	#11	1	38'-11"	1654
B3	10	#5	STR	35'-10"	374
B4	8	#4	STR	19'-9"	106
M1	32	#11	2	37'-9"	6418
S1	29	#5	3	15'-6"	469
S2	16	#5	3	14'-4"	239
U1	44	#4	4	6'-10"	201
U2	4	#4	4	7'-6"	20
U3	9	#4	4	6'-8"	40
U4	4	#4	4	8'-2"	22
REINFORCING STEEL				=	11,066 LBS
SP-1	2	*	5	873'-9"	1823
SPIRAL COLUMN REINFORCING STEEL				=	1823 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				1.7	C.Y.
POUR #3 (CAP)				36.2	C.Y.
TOTAL				37.9	C.Y.
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				34.8	C.Y.
4'-6" Ø DRILLED PIERS IN SOIL				48.4	LIN. FT.
4'-6" Ø DRILLED PIERS NOT IN SOIL				10.6	LIN. FT.
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS				LIN. FT. =	48
SPT TESTING				1	EACH
CSL TUBES ▲				LIN. FT. =	256.0

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

▲ SEE NOTES

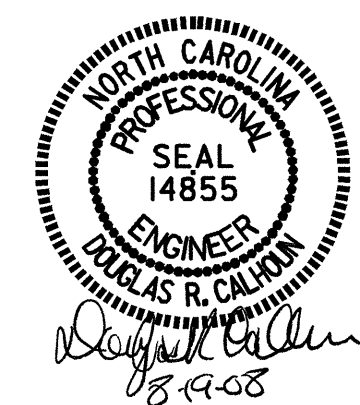


**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY : J.MYA      DATE : 8/10/06  
 CHECKED BY : J. B. WILSON      DATE : 8/28/06

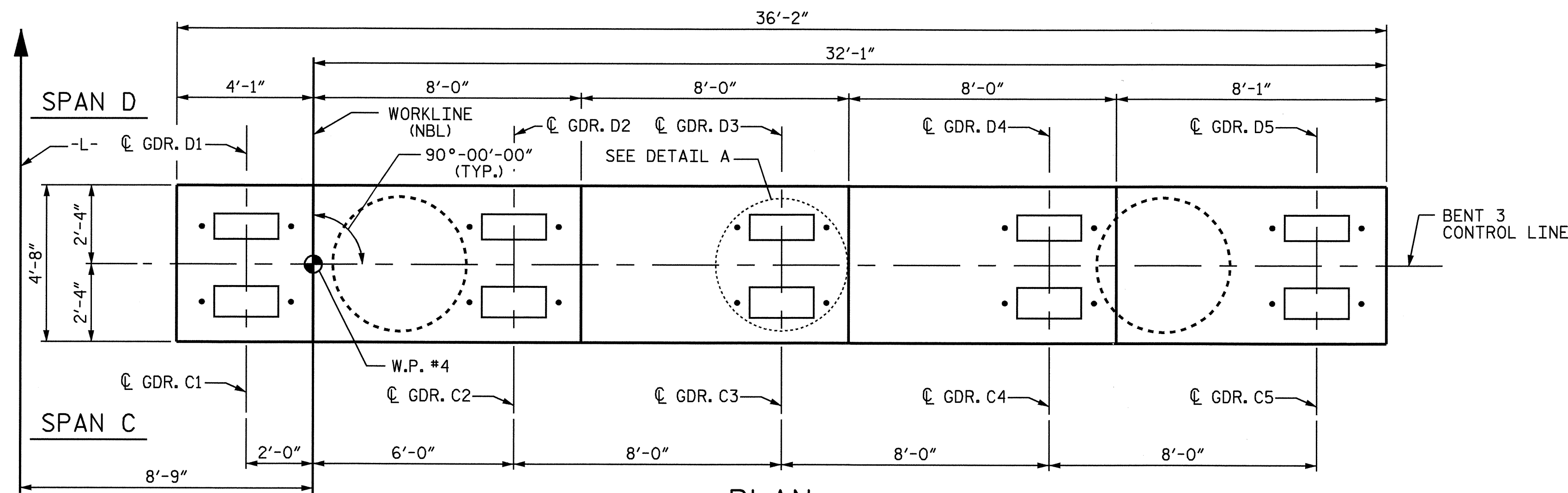
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 bngrody



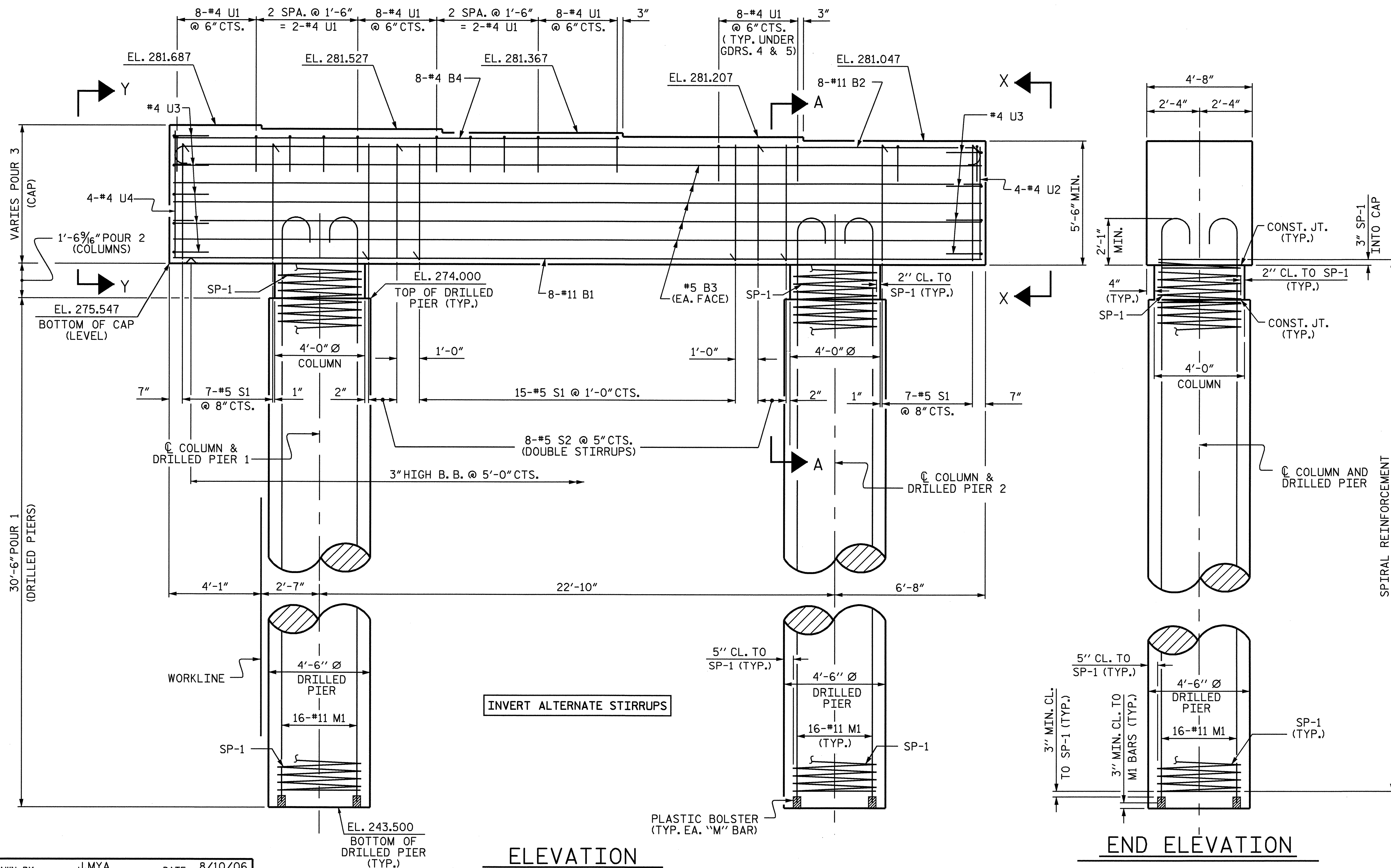
PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (NBL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

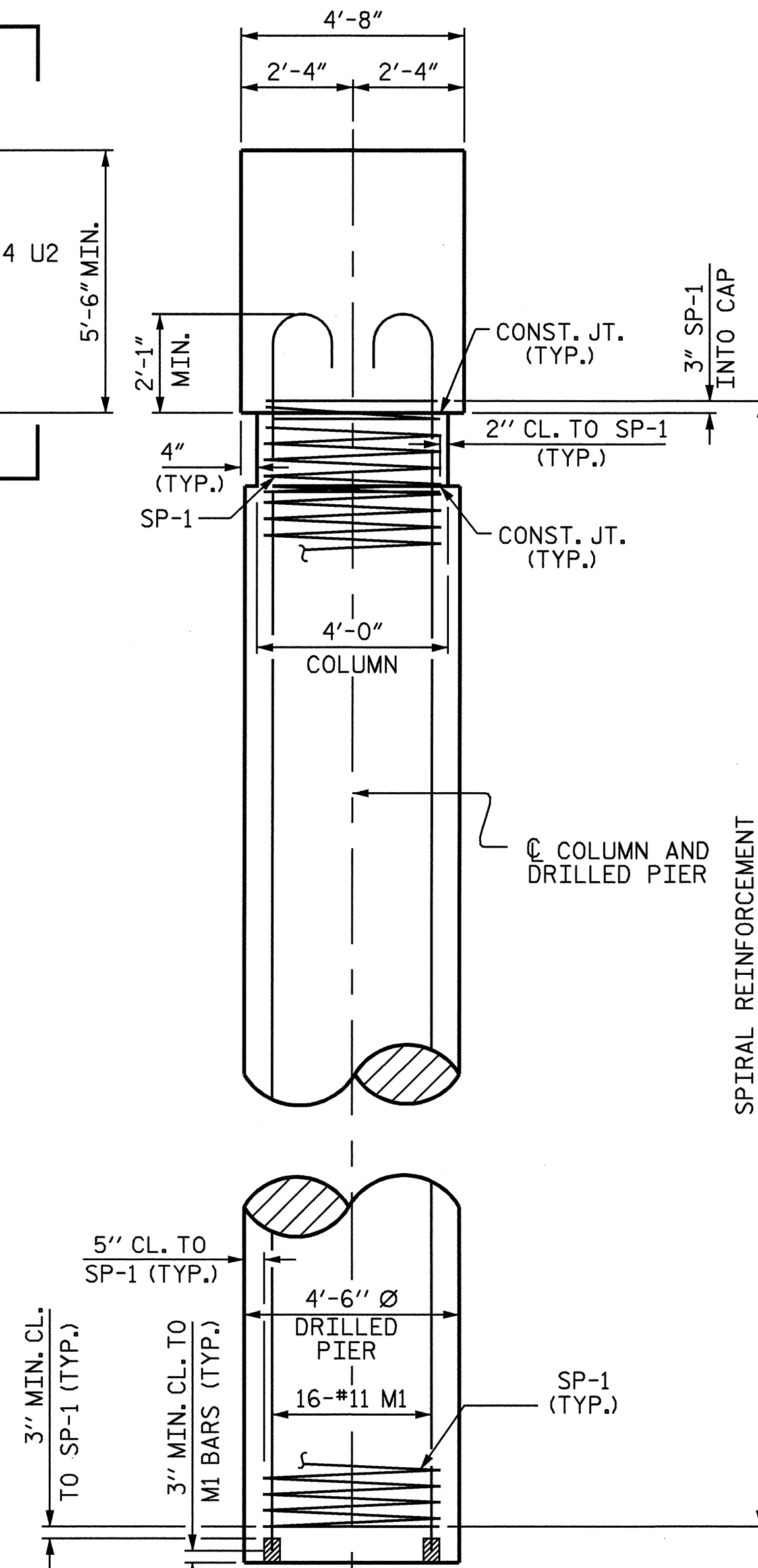
SHEET NO. **S-62**  
 TOTAL SHEETS **70**



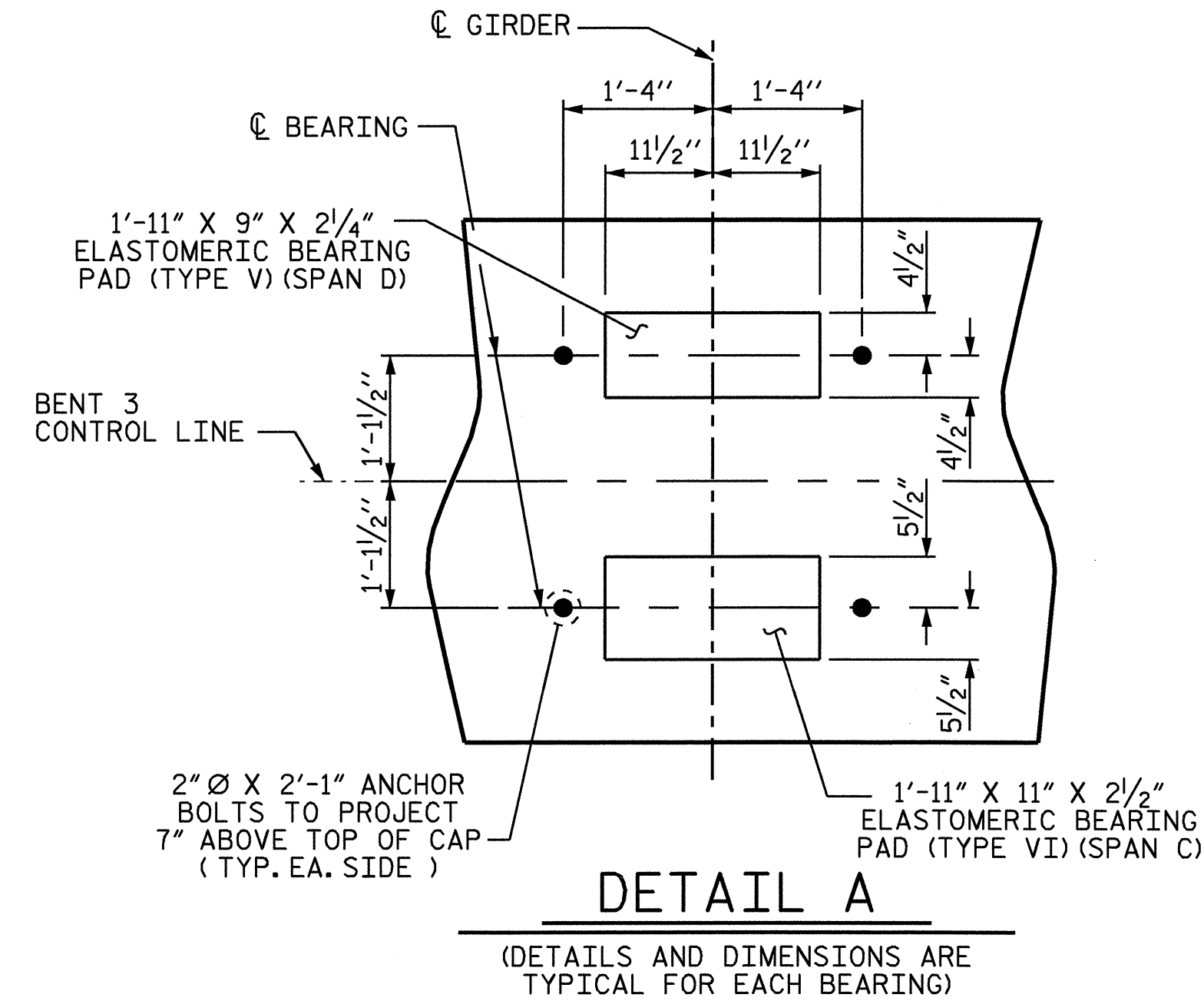
PLAN



ELEVATION



END ELEVATION



DETAIL A

(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.
- SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIERS WILL NOT BE PERMITTED.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

DRAWN BY: J.MYA DATE: 8/10/06  
 CHECKED BY: J.B. WILSON DATE: 8/28/06

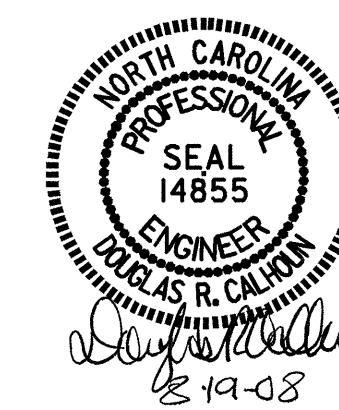
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 bngrady

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 2

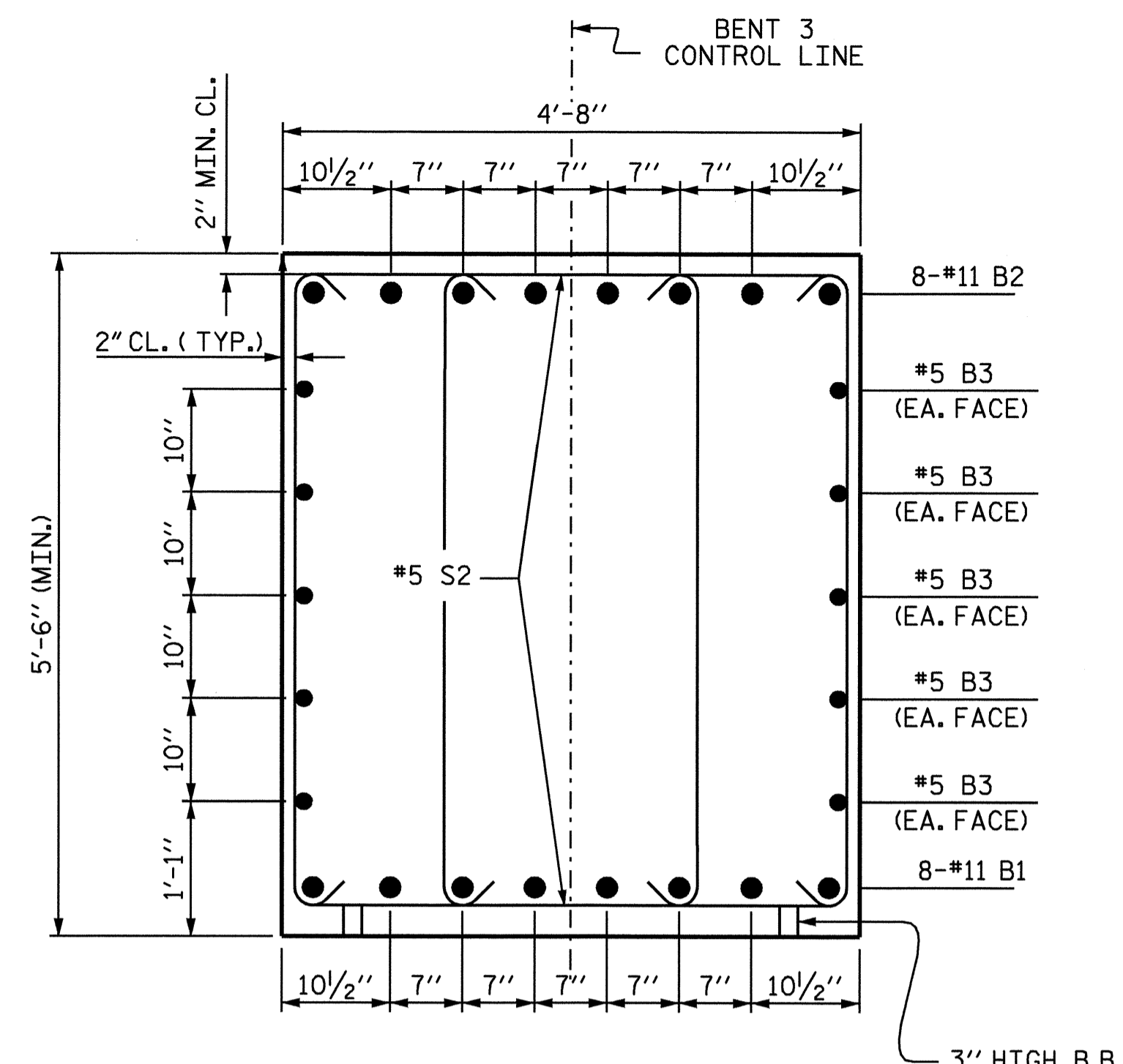
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 3  
 (NBL)



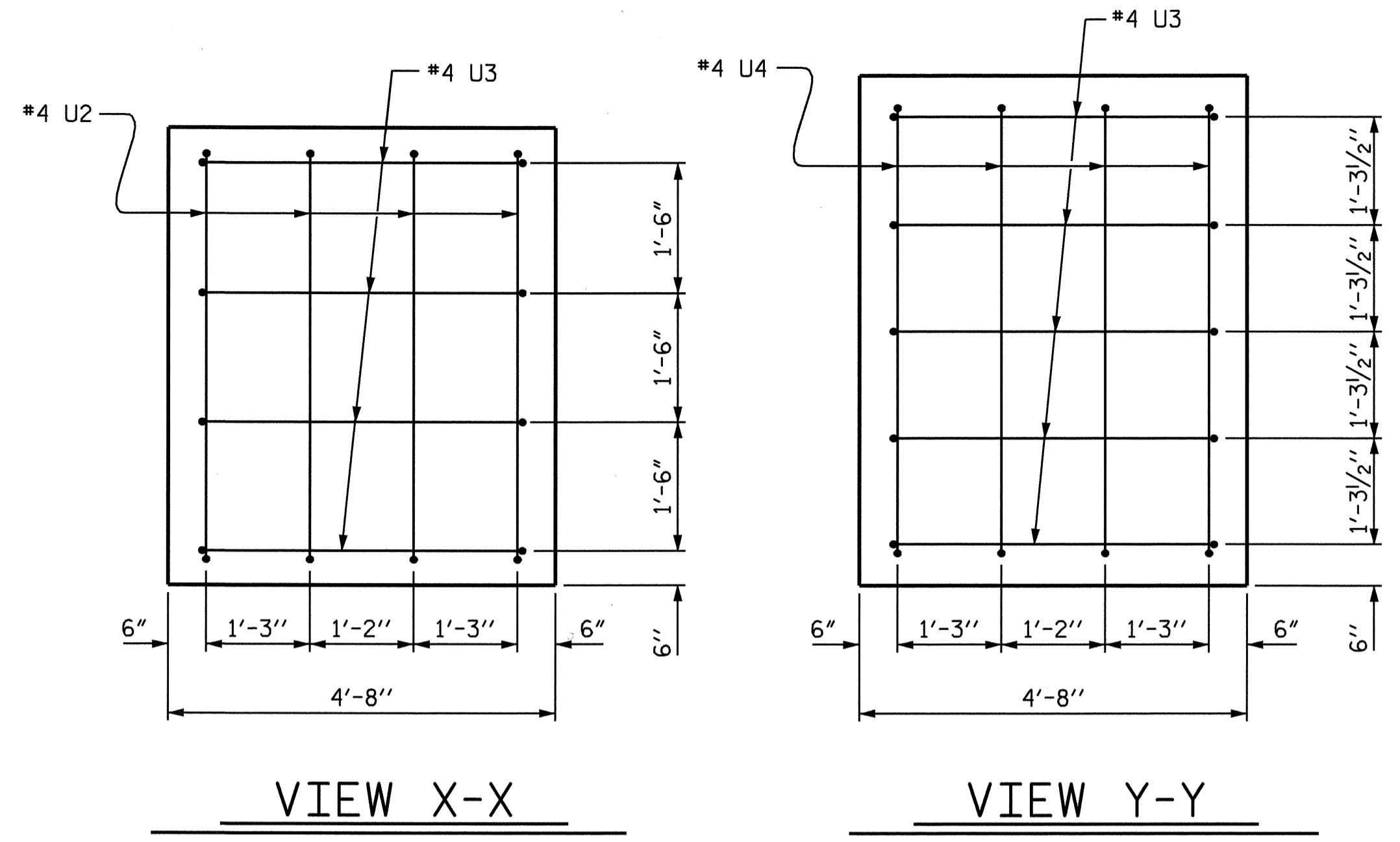
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63	
1			3			TOTAL SHEETS 70	
2			4				





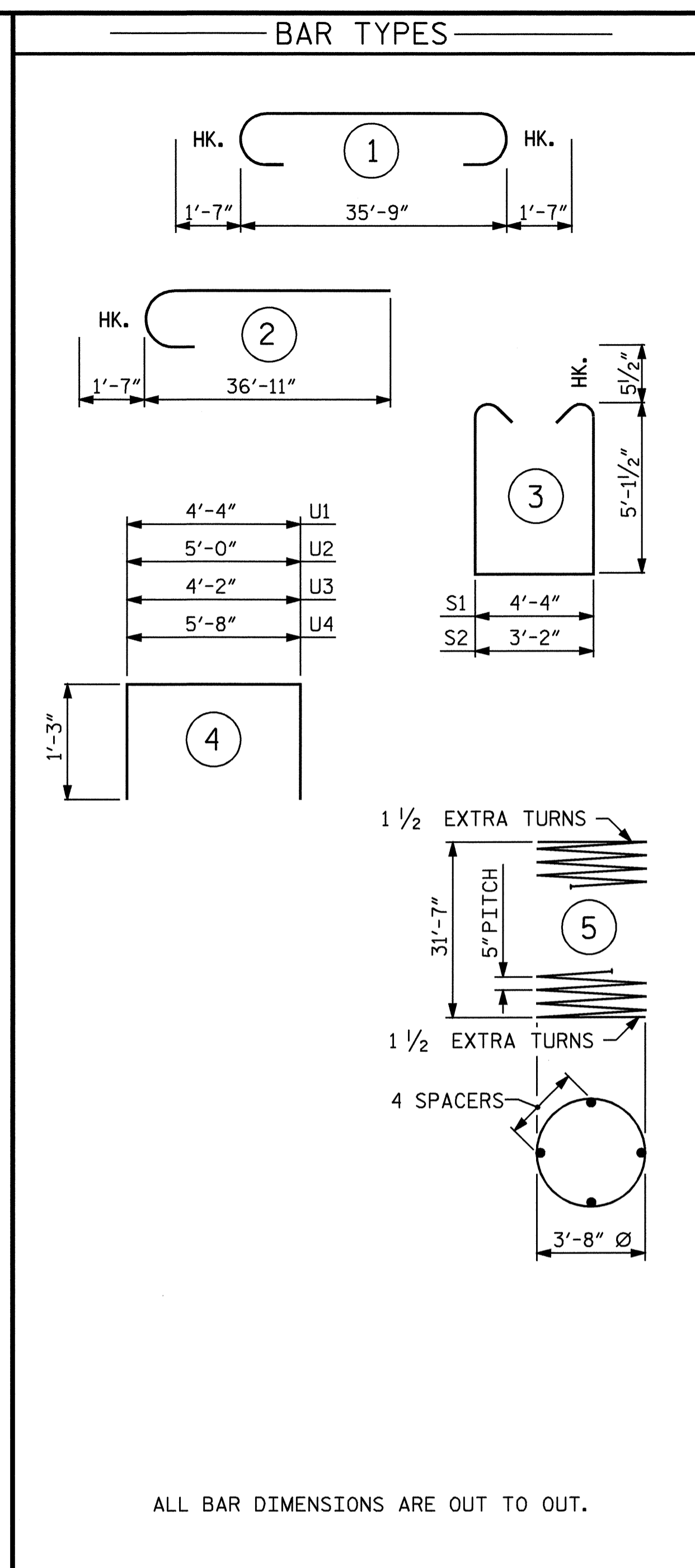
**SECTION A-A**

(SHOWING DOUBLE STIRRUPS (S2)  
SEE ELEVATION ON SHEET 1 OF 2  
FOR LOCATION OF S1 & S2 BARS)



**VIEW X-X**

**VIEW Y-Y**



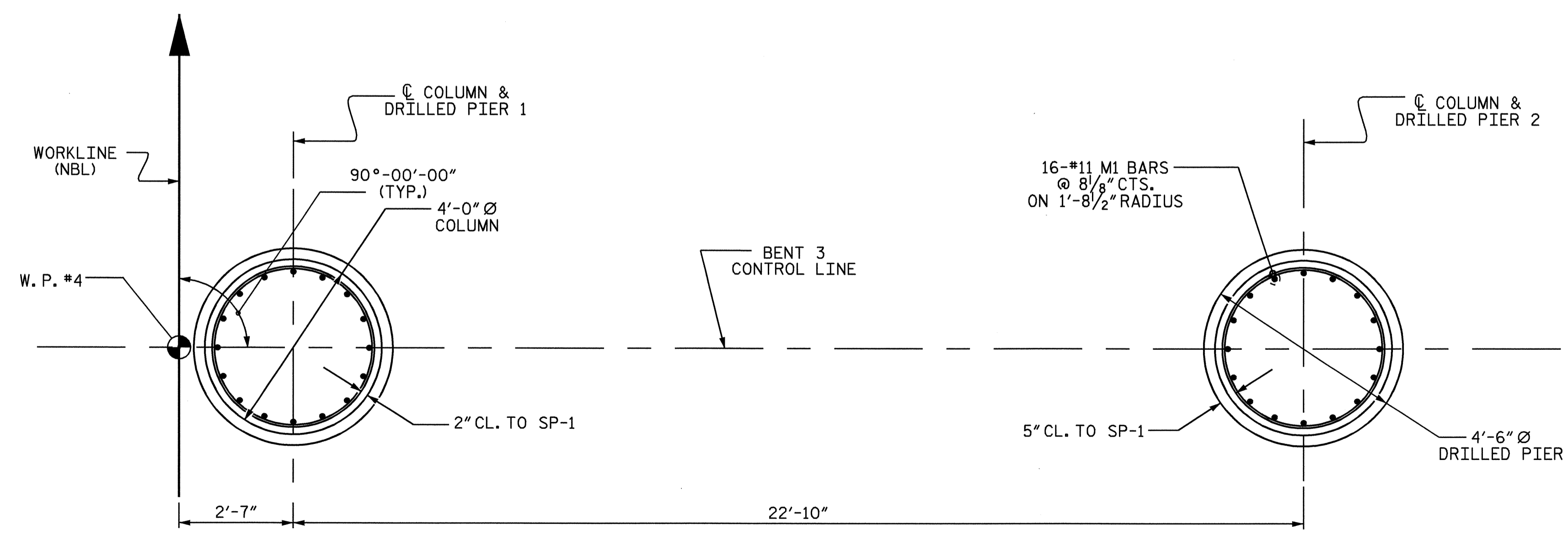
ALL BAR DIMENSIONS ARE OUT TO OUT.

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

**BILL OF MATERIAL**

BENT 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	35'-10"	1523
B2	8	#11	1	38'-11"	1654
B3	10	#5	STR	35'-10"	374
B4	8	#4	STR	19'-9"	106
M1	32	#11	2	38'-6"	6546
S1	29	#5	3	15'-6"	469
S2	16	#5	3	14'-4"	239
U1	44	#4	4	6'-10"	201
U2	4	#4	4	7'-6"	20
U3	9	#4	4	6'-8"	40
U4	4	#4	4	8'-2"	22
REINFORCING STEEL					= 11,194 LBS
SP-1					2 * 5 896'-5" 1870
SPIRAL COLUMN REINFORCING STEEL					= 1870 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				1.4 C.Y.	
POUR #3 (CAP)				36.2 C.Y.	
TOTAL				37.6 C.Y.	
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				35.9 C.Y.	
4'-6" Ø DRILLED PIERS IN SOIL					
50.4 LIN. FT.					
4'-6" Ø DRILLED PIERS NOT IN SOIL					
10.6 LIN. FT.					
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIERS					
LIN. FT. = 52					
SPT TESTING					1 EACH
CSL TUBES ▲					LIN. FT. = 264.0

▲ SEE NOTES

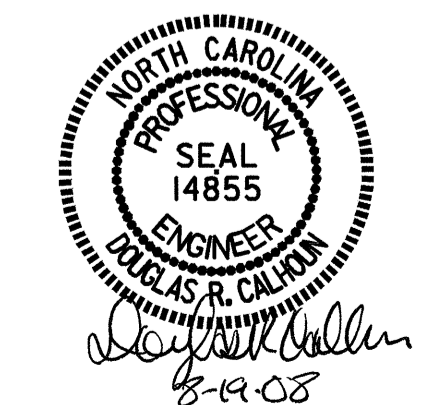


**PLAN OF COLUMNS AND DRILLED PIERS**

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

DRAWN BY: J.MYA DATE: 8/10/06  
CHECKED BY: J. B. WILSON DATE: 8/28/06

19-AUG-2008 10:18 R:\Structures\FINAL PLANS\NBL\R2502B.sd.B.NBL.dgn bngady



PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
STATION: 434+27.00 -L-  
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 3 (NBL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

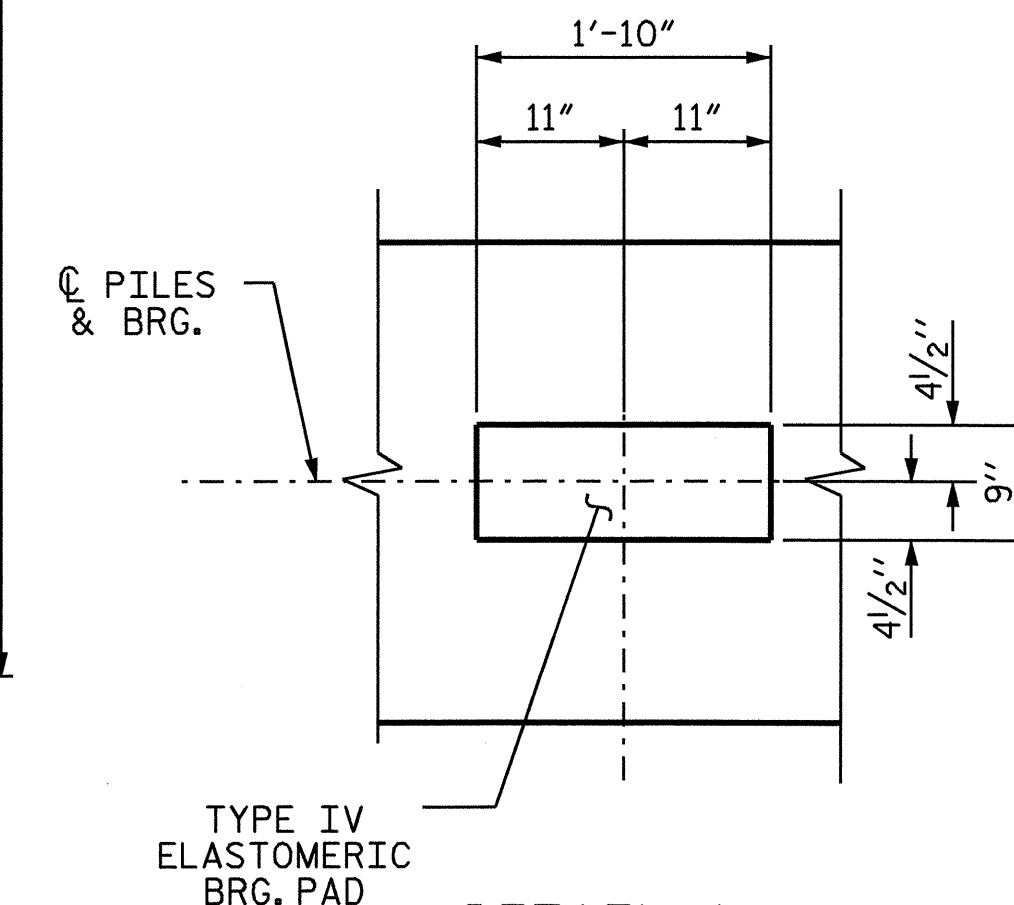
SHEET NO. **S-64**  
TOTAL SHEETS **70**

NOTES

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

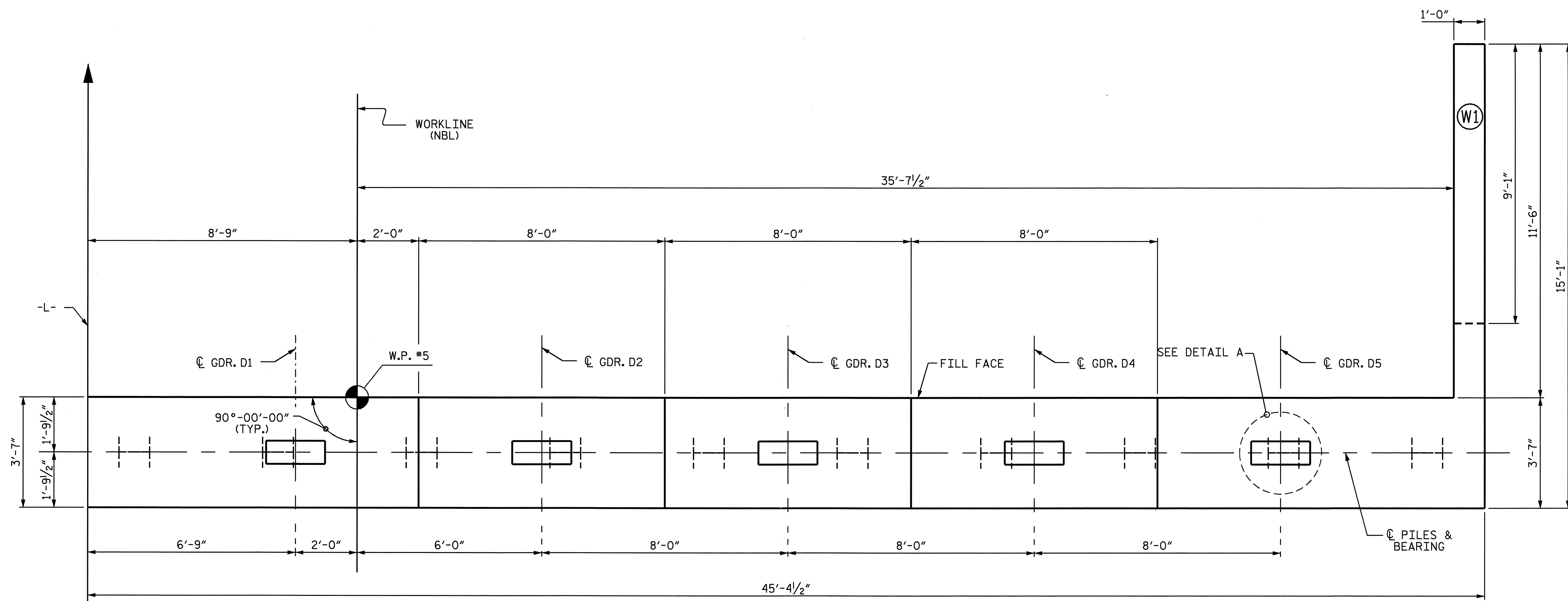
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS (POUR 2) ARE TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE REINFORCING STEEL AS SHOWN ON THE PLANS AND ACCORDING TO SECTION 1070-10 OF THE STANDARD SPECIFICATIONS.

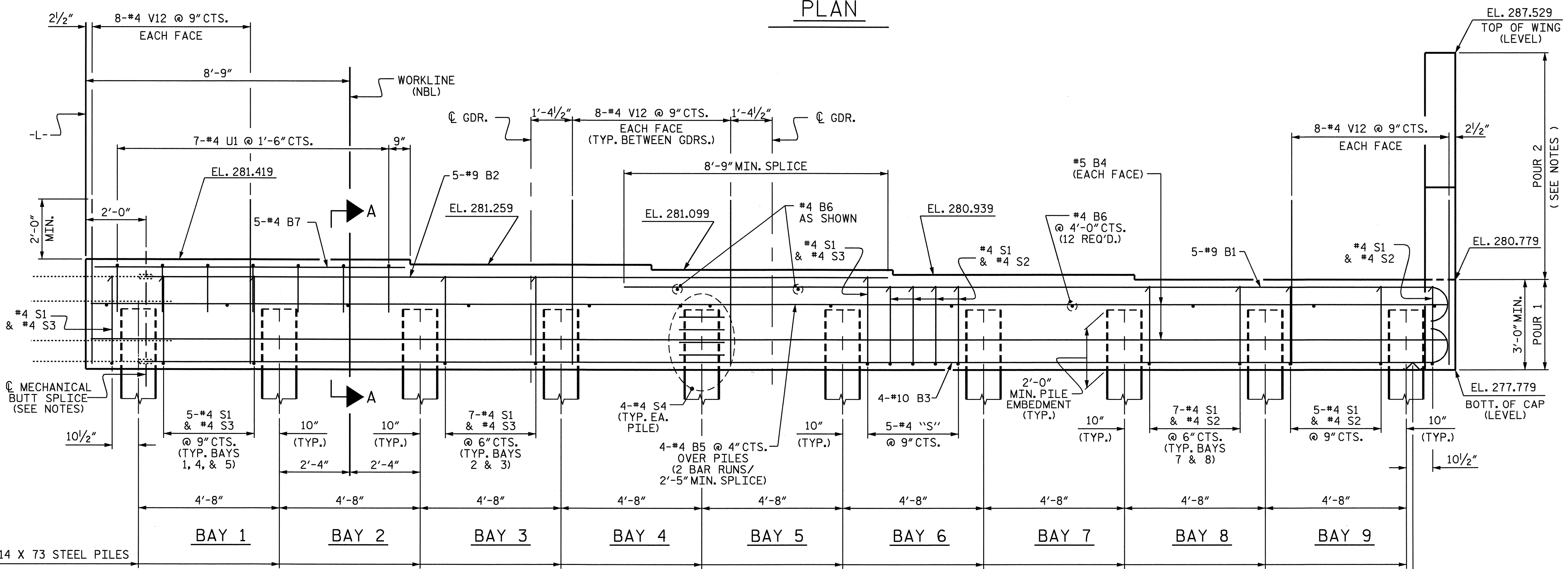


DETAIL A

( TYP. EA. GIRDER )



PLAN



ELEVATION



PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 1 OF 3

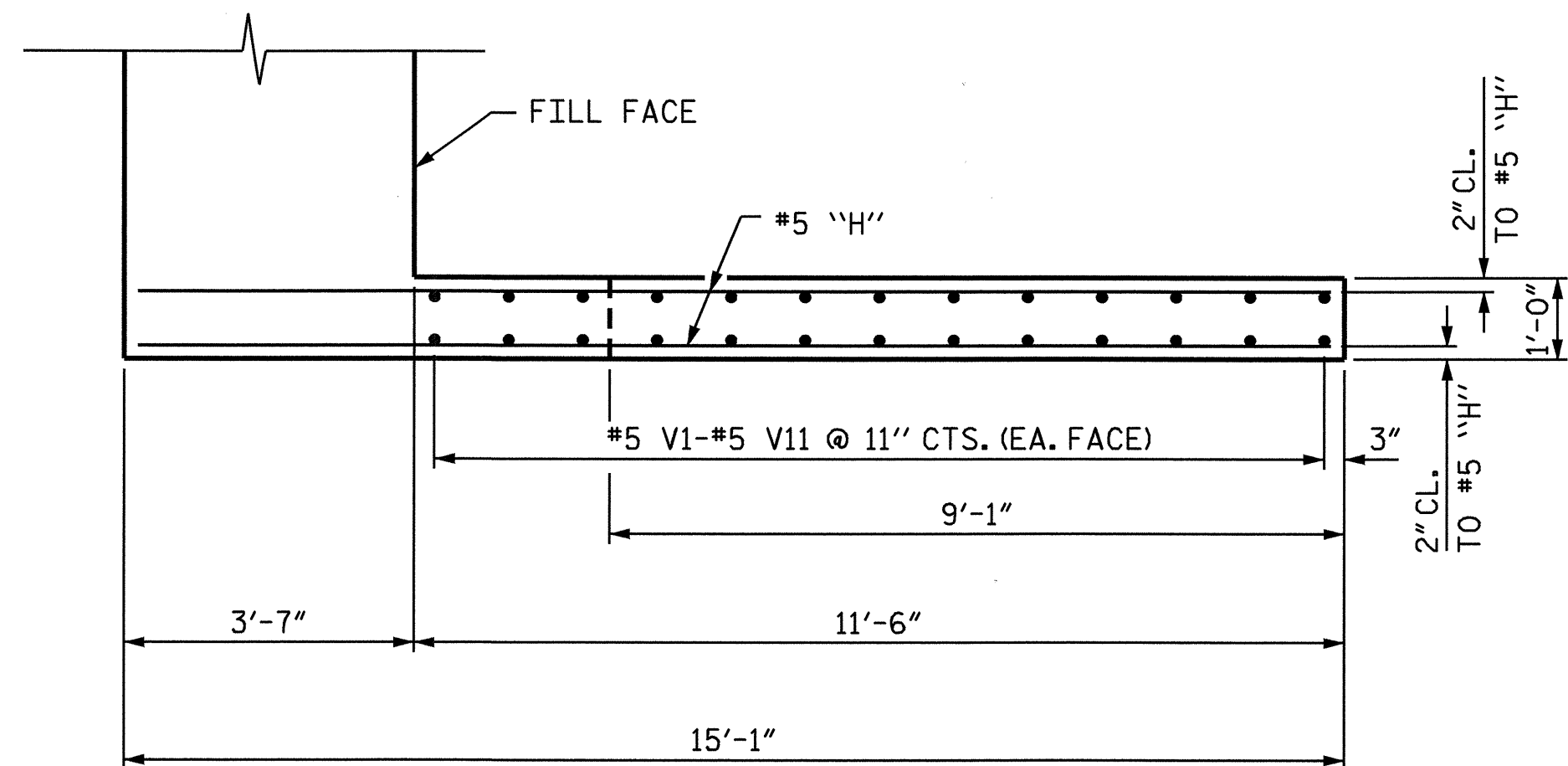
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2  
 (NBL)**

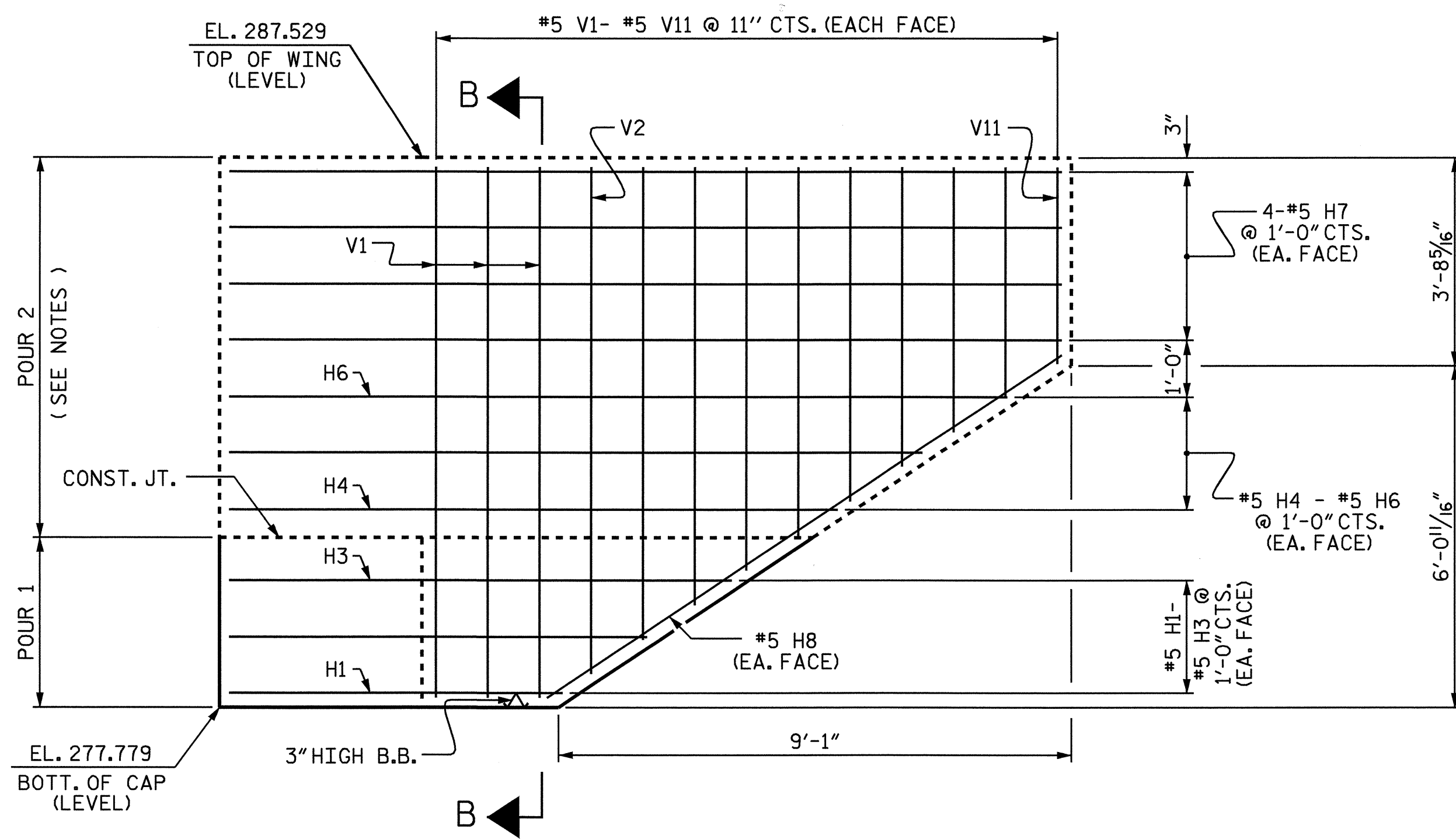
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-65	
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2			4				

DRAWN BY : J.B. WILSON DATE : 10/06/05  
 CHECKED BY : J. MYA DATE : 10/31/05

19-AUG-2008 10:18  
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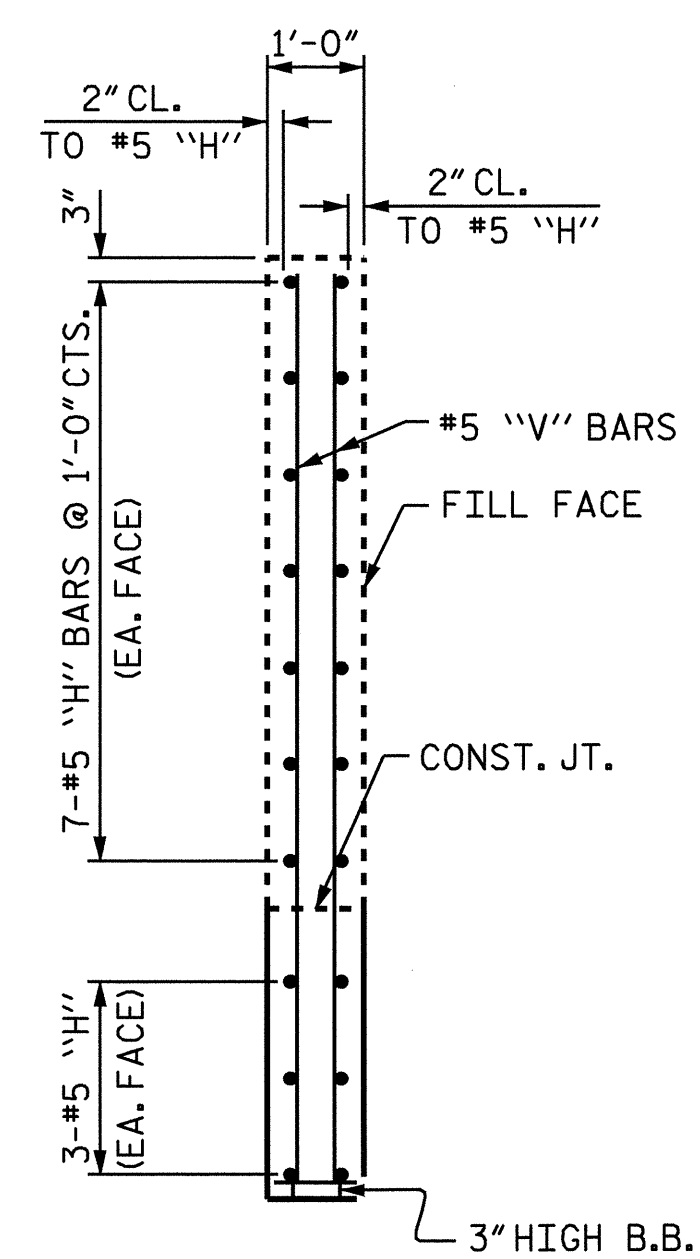


PLAN (W1)



ELEVATION (W1)

WING DETAILS



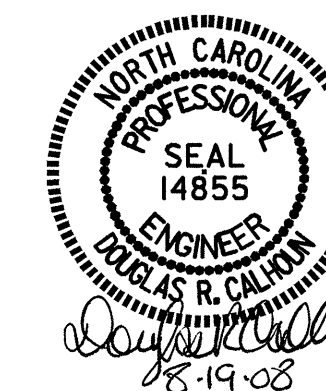
SECTION B-B

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

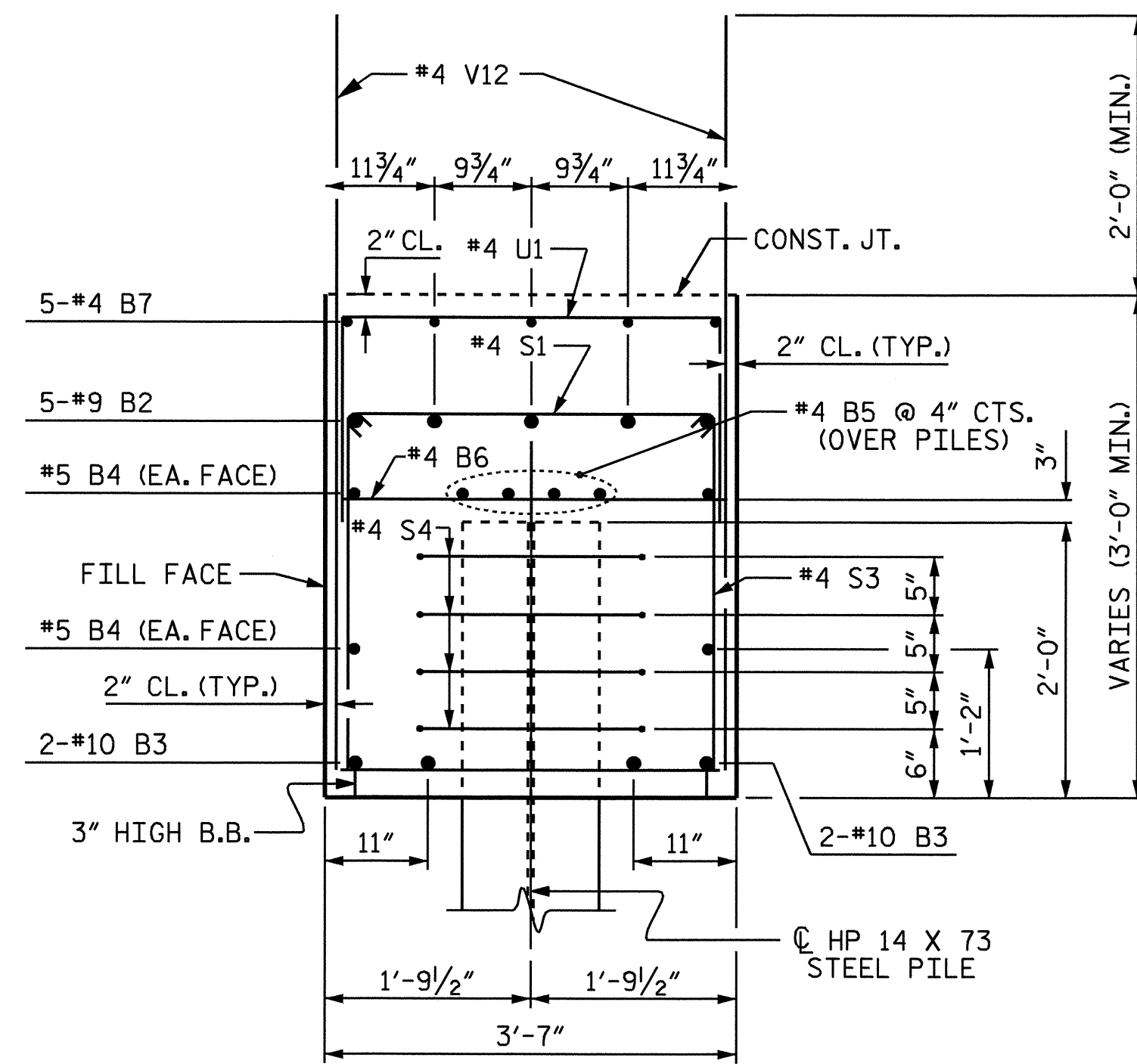
SUBSTRUCTURE  
 END BENT 2  
 (NBL)



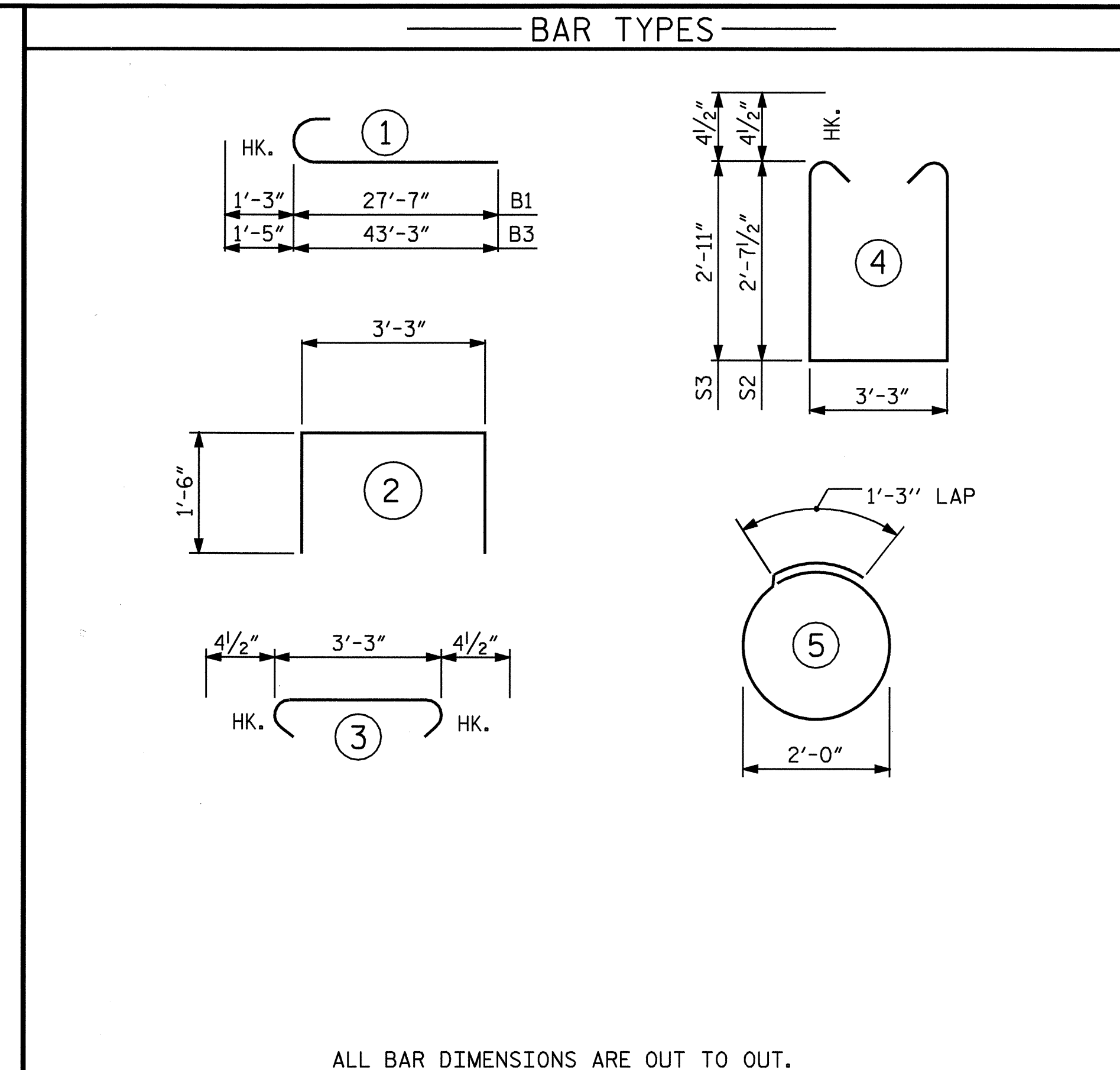
DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J.MYA DATE: 10/31/05

19-AUG-2008 10:18  
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 bngrady

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			70



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

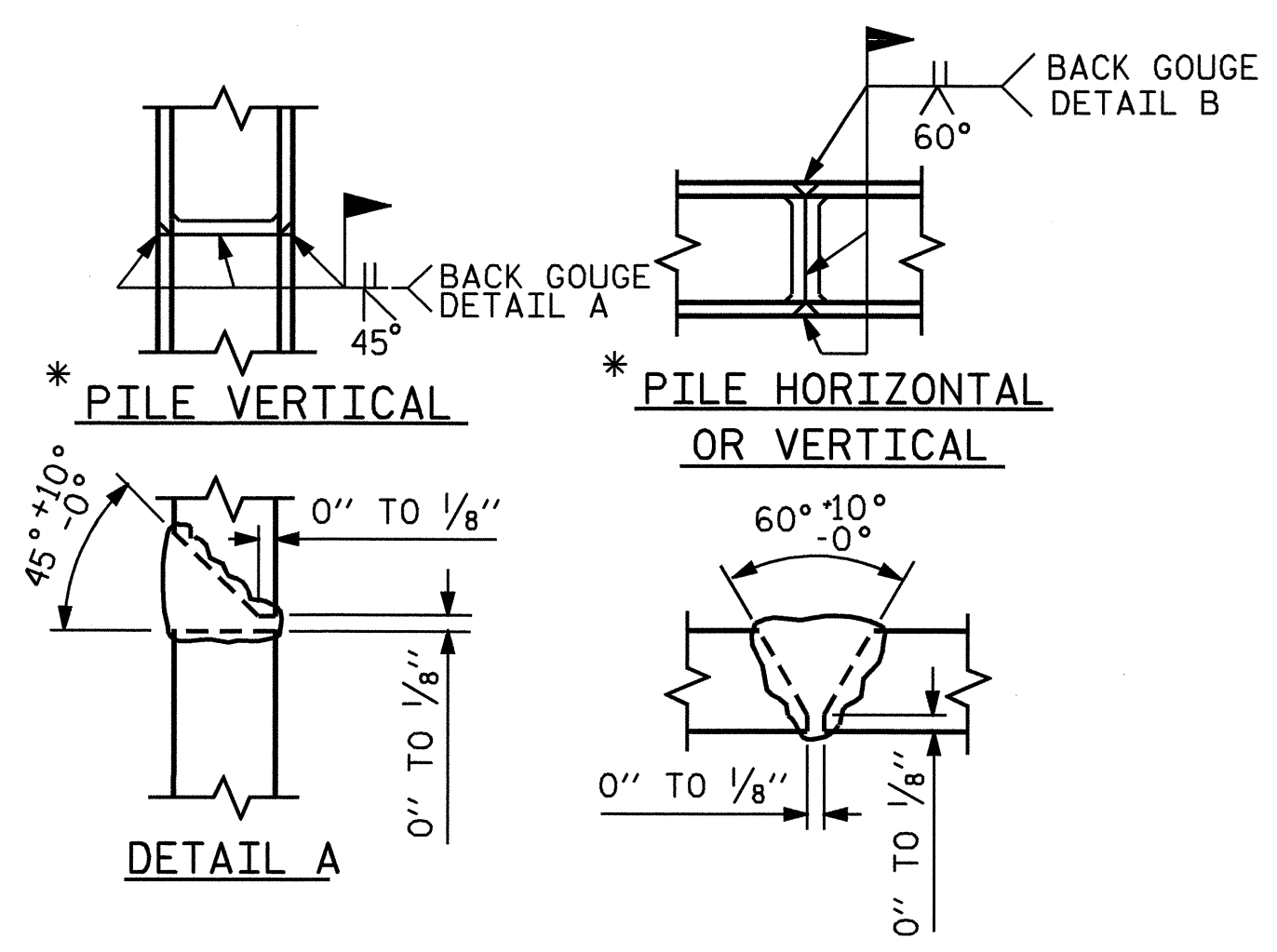
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	28'-10"	490	V1	6	#5	STR	9'-5"	59
B2	5	#9	STR	24'-7"	418	V2	2	#5	STR	8'-11"	19
B3	4	#10	1	44'-8"	769	V3	2	#5	STR	8'-4"	17
B4	4	#5	STR	45'-0"	188	V4	2	#5	STR	7'-9"	16
B5	8	#4	STR	23'-9"	127	V5	2	#5	STR	7'-1"	15
B6	14	#4	STR	3'-3"	30	V6	2	#5	STR	6'-6"	14
B7	5	#4	STR	10'-5"	35	V7	2	#5	STR	5'-11"	12
						V8	2	#5	STR	5'-3"	11
H1	2	#5	STR	5'-10"	12	V9	2	#5	STR	4'-8"	10
H2	2	#5	STR	7'-4"	15	V10	2	#5	STR	4'-1"	9
H3	2	#5	STR	8'-10"	18	V11	2	#5	STR	3'-5"	7
H4	2	#5	STR	10'-9"	22	V12	96	#4	STR	5'-6"	353
H5	2	#5	STR	12'-3"	26						
H6	2	#5	STR	13'-9"	29						
H7	8	#5	STR	14'-9"	123						
H8	2	#5	STR	10'-11"	23						
REINFORCING STEEL = 3598 LBS											

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	55	#4	3	4'-0"	147
S2	24	#4	4	9'-3"	148
S3	31	#4	4	9'-10"	204
S4	40	#4	5	7'-7"	203
U1	7	#4	2	6'-3"	29

CLASS A CONCRETE BREAKDOWN  
 ▲ POUR 1 (CAP AND LOWER PART OF WINGS) 20.9 CU.YDS.  
 TOTAL 20.9 CU.YDS.

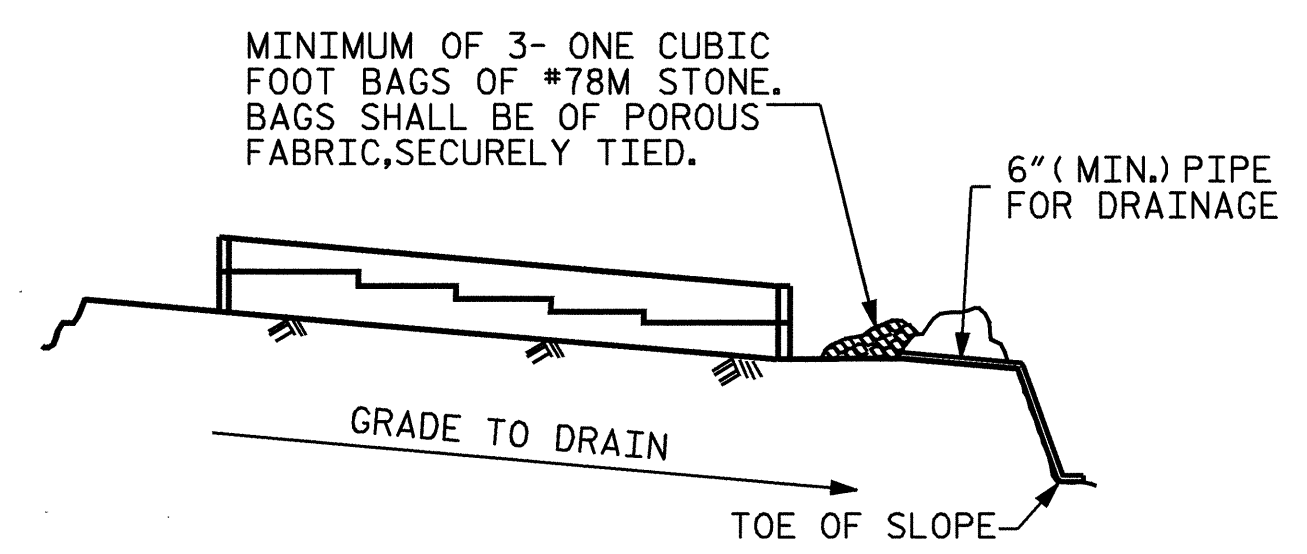
HP 14 x 73 STEEL PILES  
 NO. 10 300 FT.

▲ UPPER WINGS (POUR 2) TO BE POURED WITH POUR 5 OF SUPERSTRUCTURE



\* POSITION OF PILE DURING WELDING. DETAIL B

PILE SPLICE DETAILS



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.

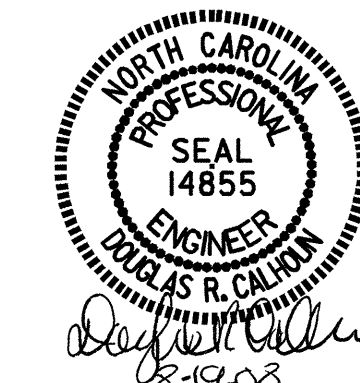
TEMPORARY DRAINAGE AT END BENT

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 3 OF 3

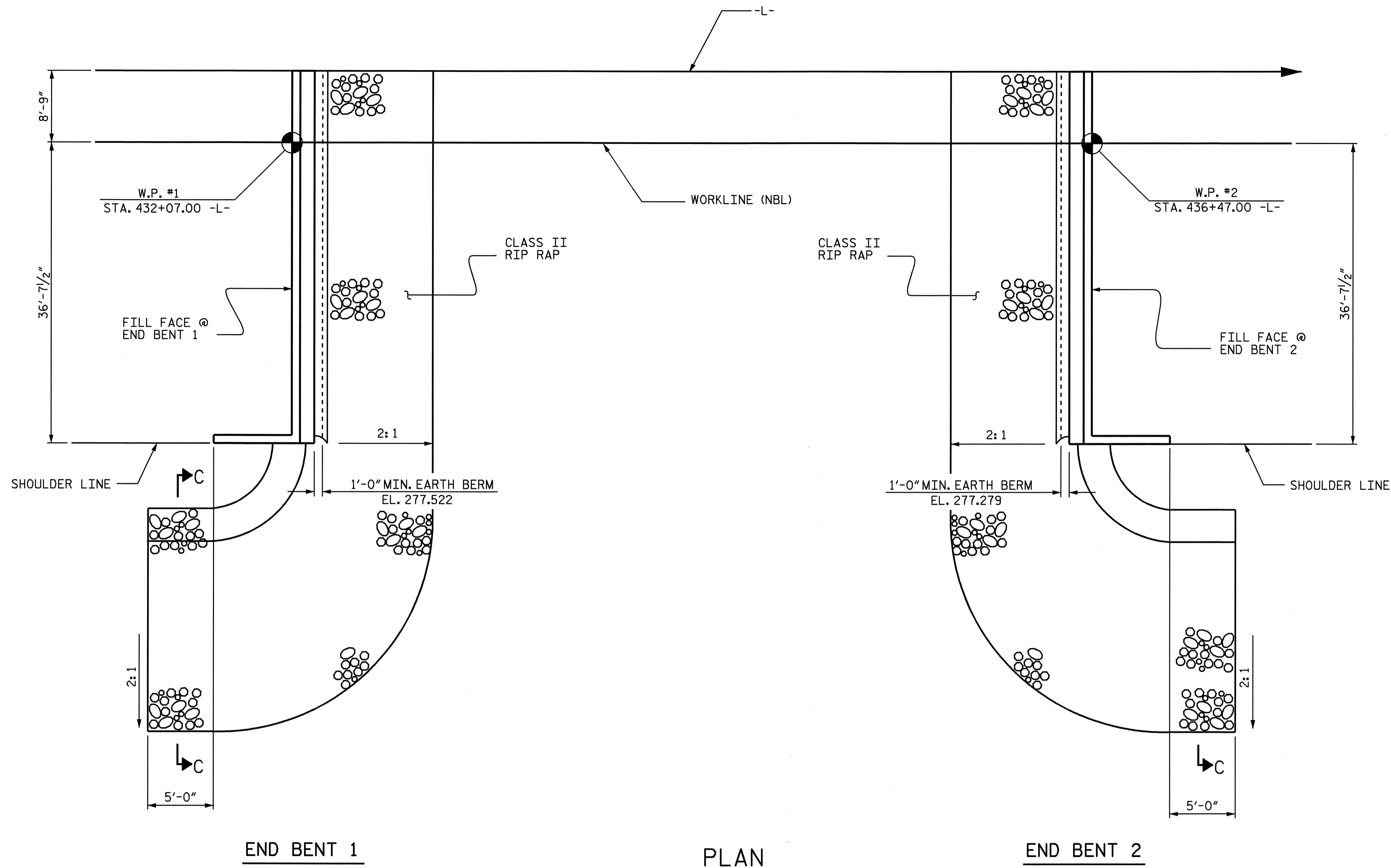
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 (NBL)



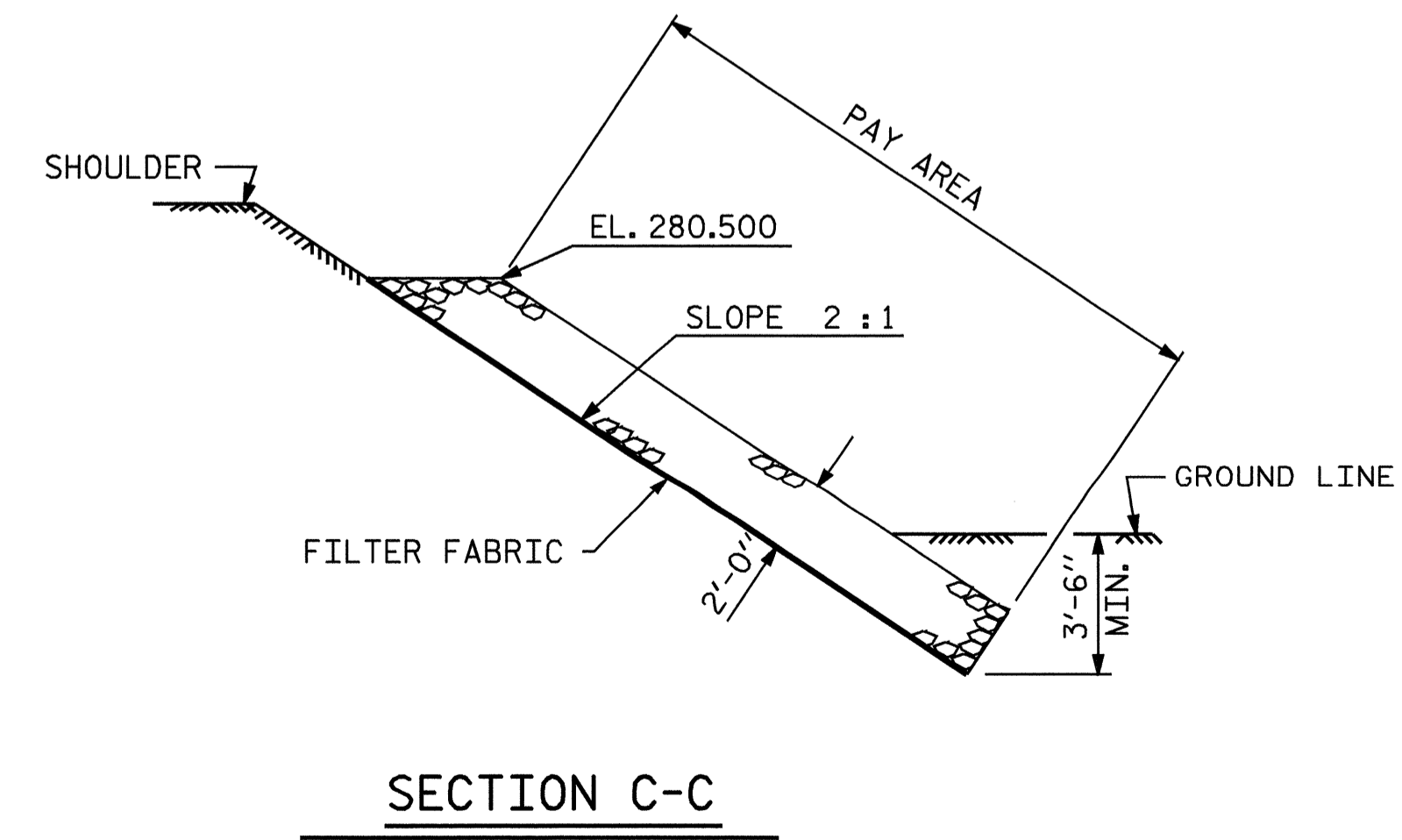
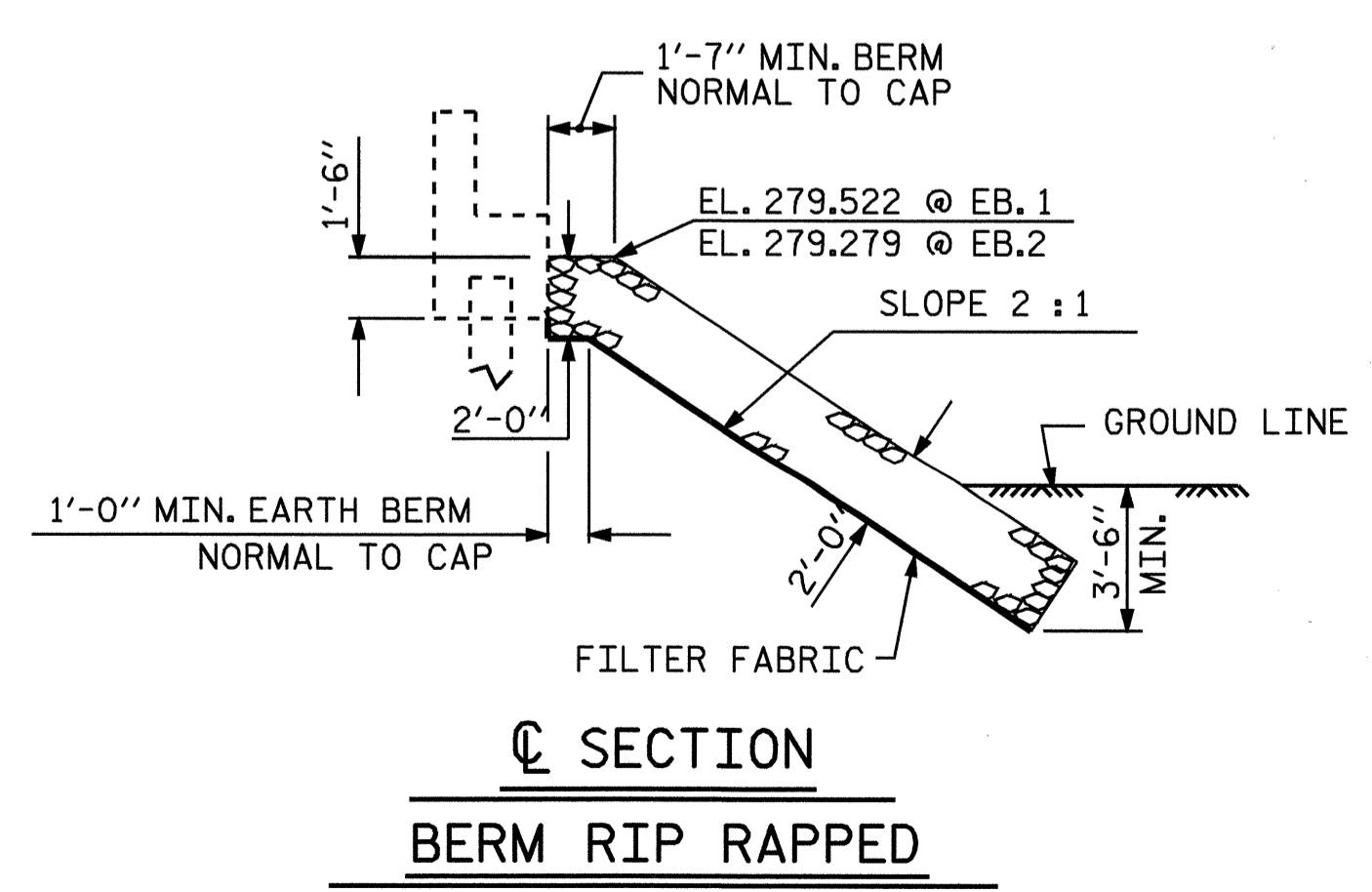
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67	
1			3			TOTAL SHEETS	70
2			4				

DRAWN BY: J.B. WILSON DATE: 10/06/05  
 CHECKED BY: J. MYA DATE: 10/31/05



ESTIMATED QUANTITIES		
BRIDGE @ STA. 434+27.00 -L- (NBL)	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	162	180
END BENT 2	192	214

END BENT 1 PLAN END BENT 2



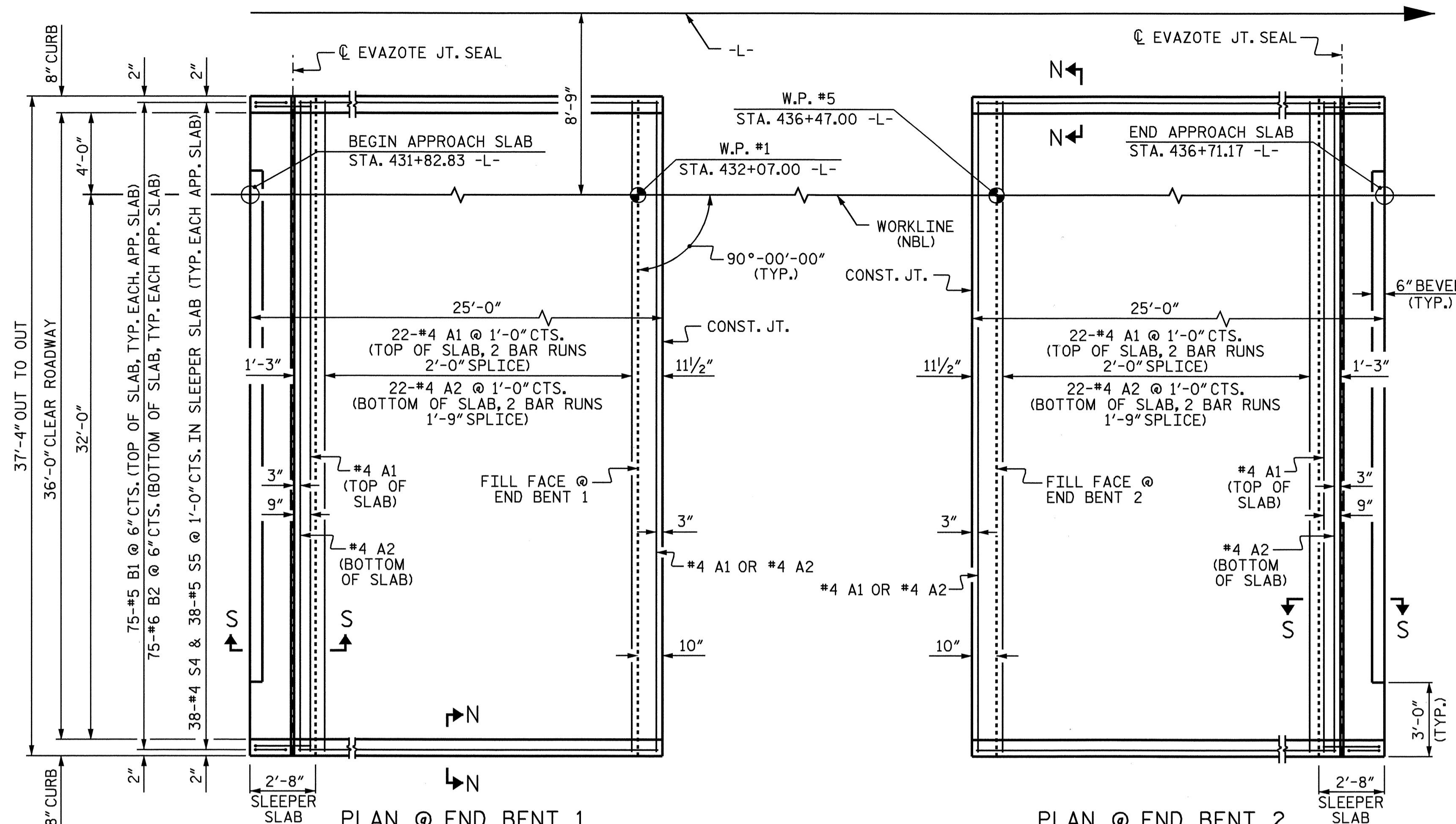
PROJECT NO. R-2502B  
RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS  
 (NBL)



ASSEMBLED BY : J. MYA	DATE : 12/5/05
CHECKED BY : J. B. WILSON	DATE : 12/15/05
DRAWN BY : FCJ 2/88	REV. 7/17/98 REK/RWW
CHECKED BY : ARB 8/88	REV. 8/16/99 RWW/LES
	REV. 10/17/00 RWW/LES

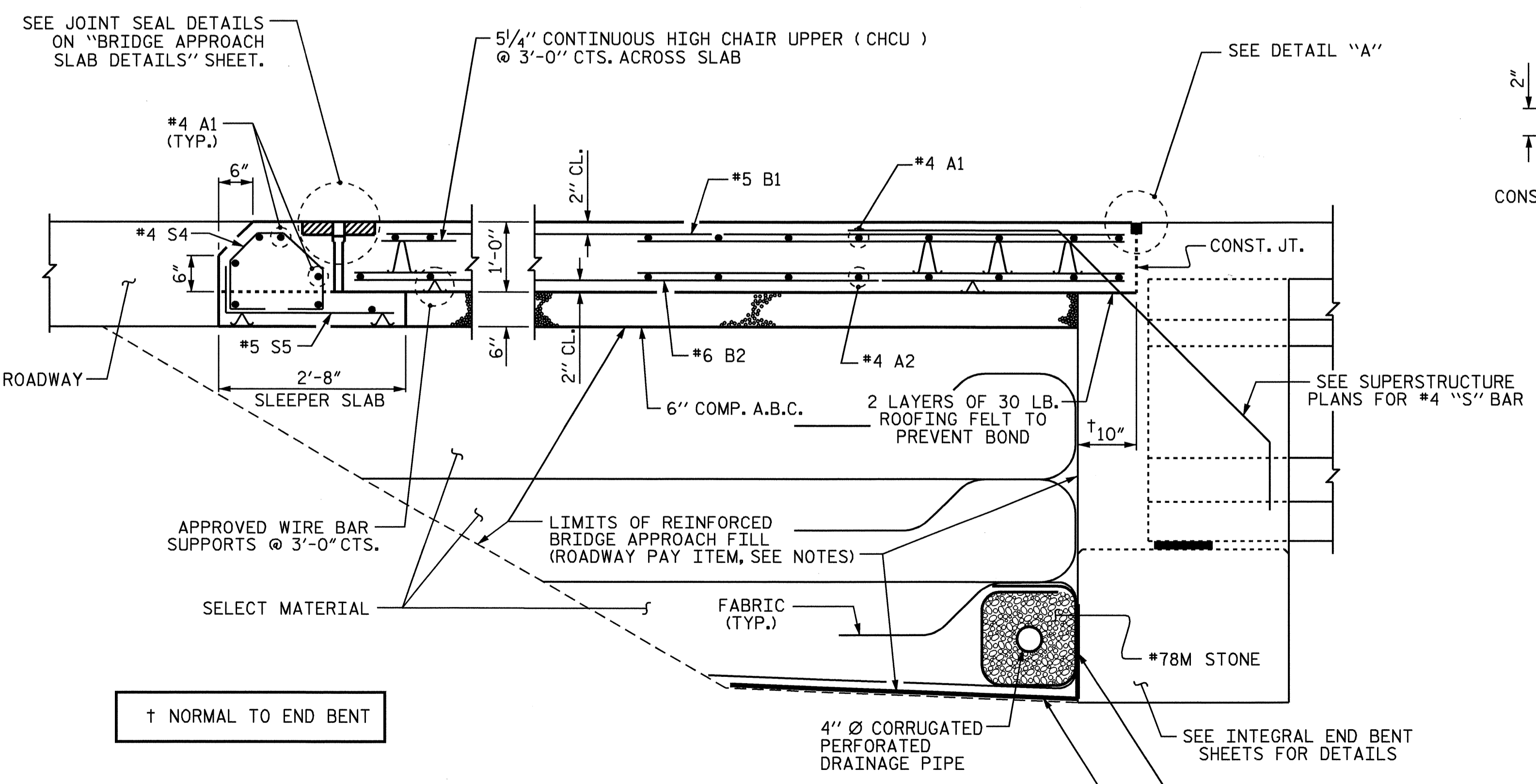
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			70



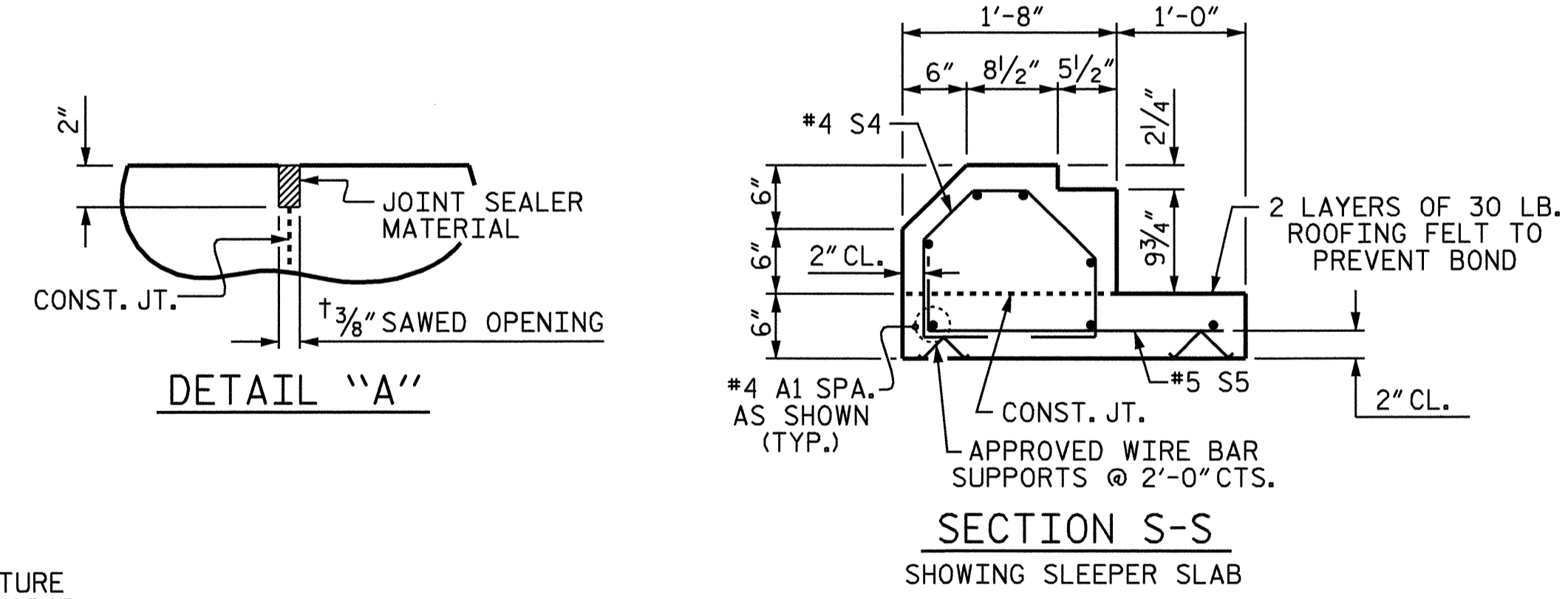
PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. #4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

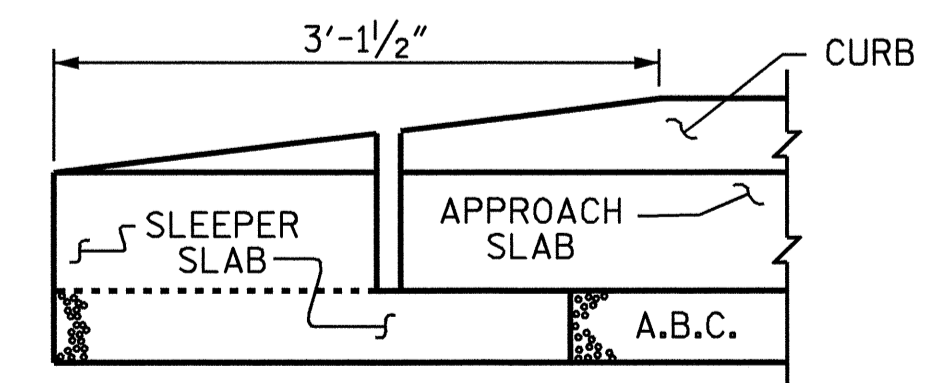


SECTION THRU SLAB

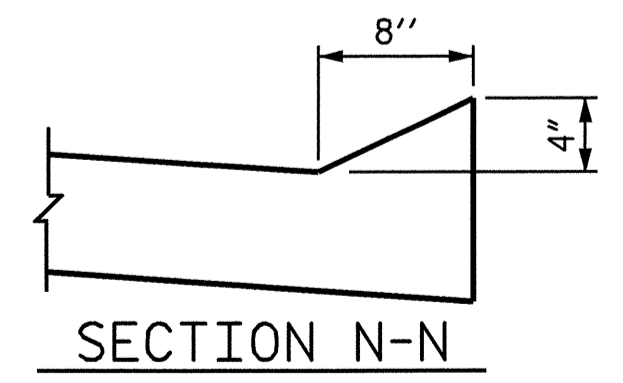


DETAIL "A"

SECTION S-S  
SHOWING SLEEPER SLAB



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



SECTION N-N

NOTES

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

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

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

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

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

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

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

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

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 3/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB  
(2 REQ'D)

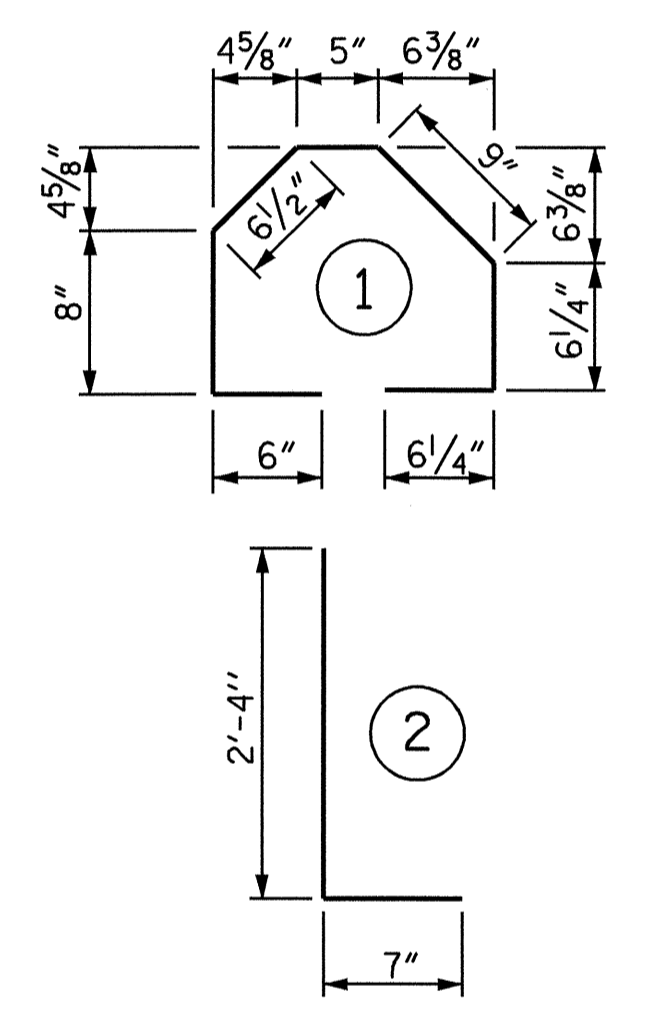
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	62	#4	STR	19'-6"	808
A2	48	#4	STR	19'-5"	623
* B1	75	#5	STR	22'-5"	1754
B2	75	#6	STR	22'-10"	2572
* S4	38	#4	1	3'-11"	99
S5	38	#5	2	2'-11"	116

REINFORCING STEEL	LBS.	3311
* EPOXY COATED REINFORCING STEEL	LBS.	2661

CLASS AA CONCRETE

POUR #1 - SLEEPER SLAB	C. Y.	3.8
POUR #2 - SLAB & CURB	C. Y.	32.2
TOTAL	C. Y.	36.0

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. R-2502B  
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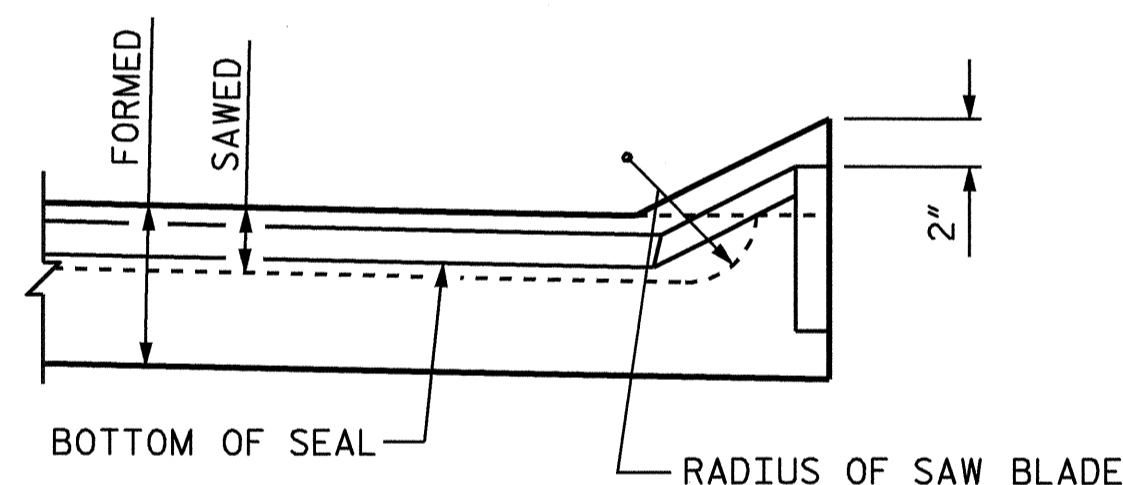
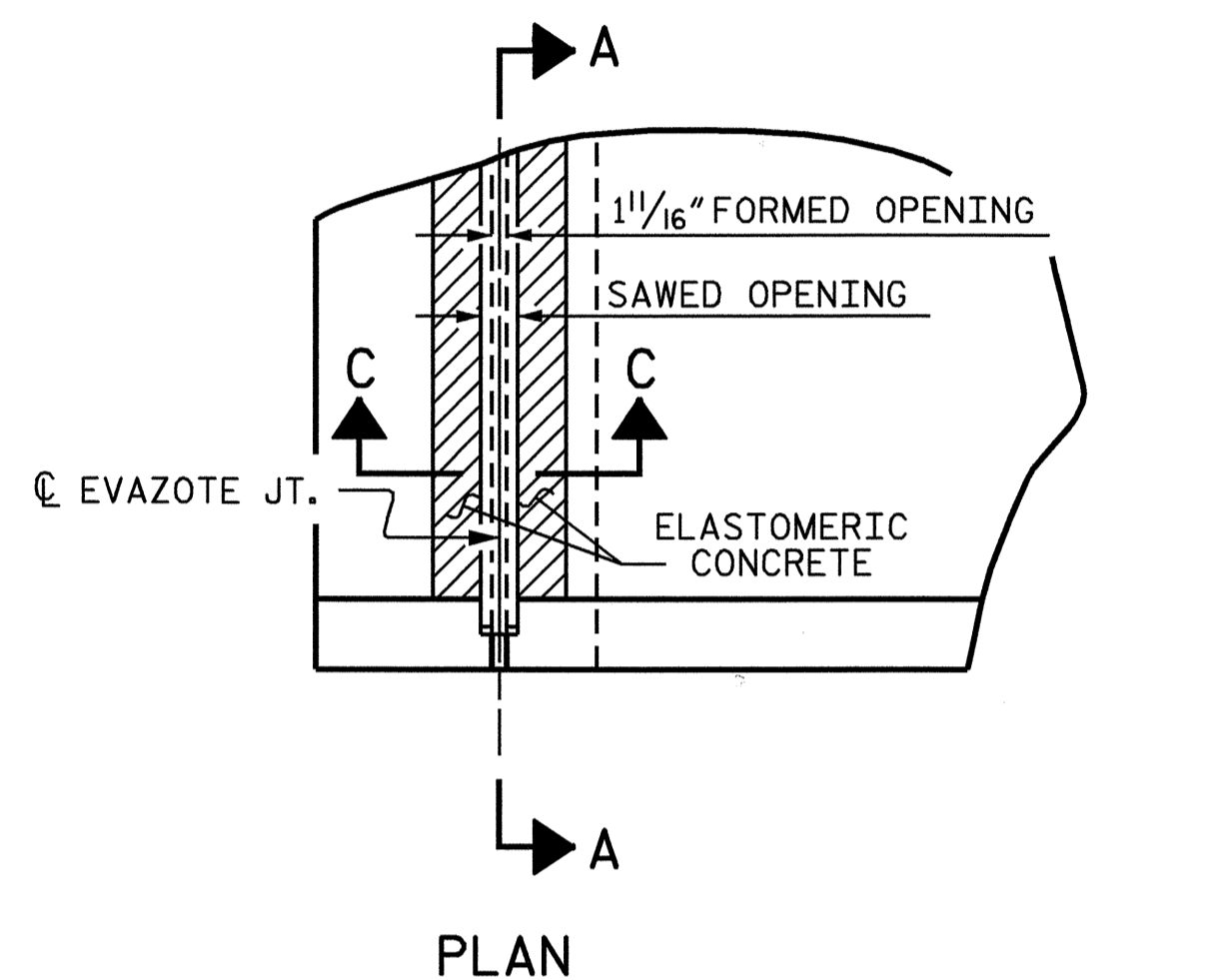
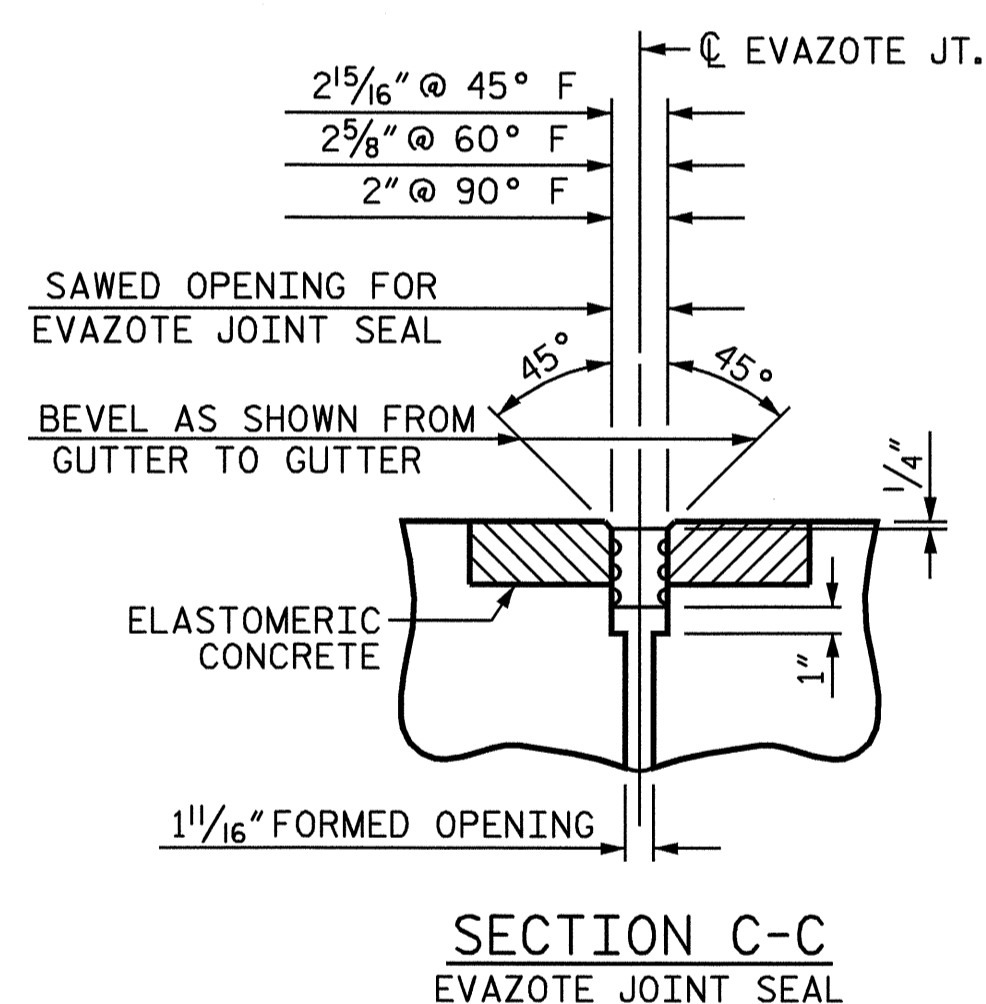
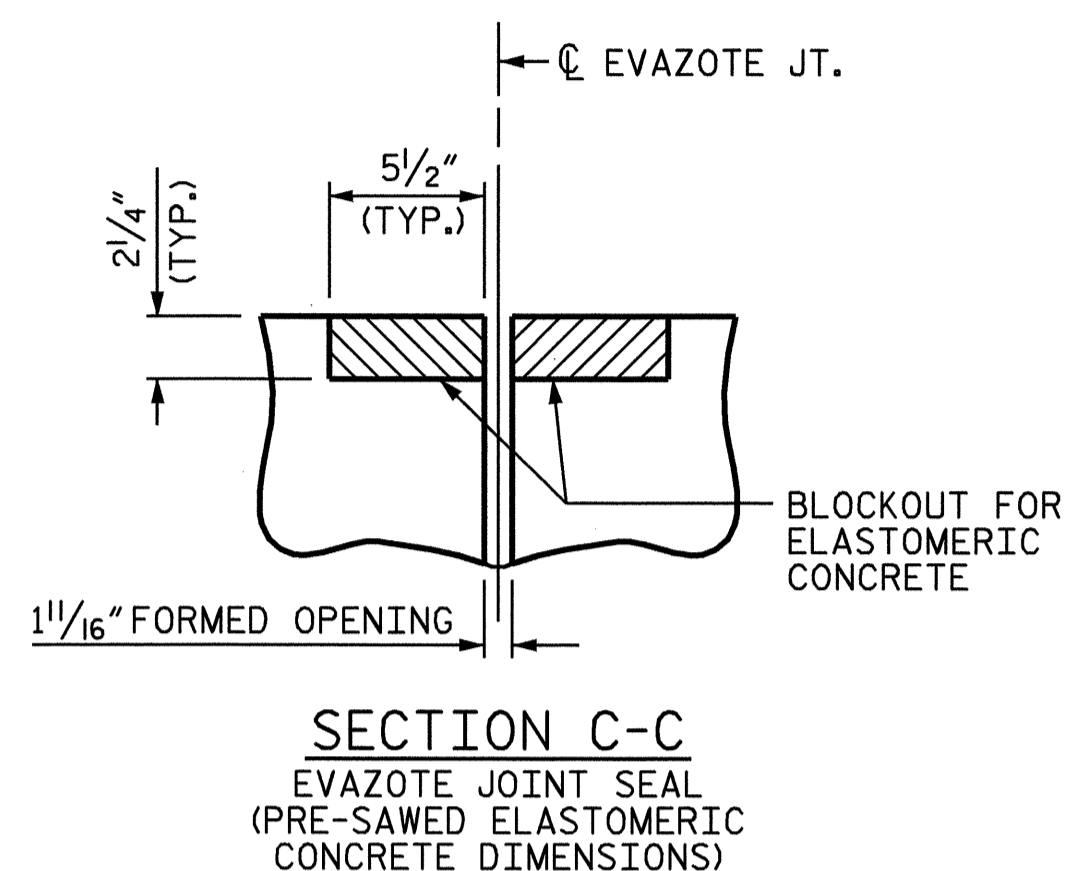
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR INTEGRAL ABUTMENT  
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTALS 70
2			4			



ASSEMBLED BY: J.L. WALTON DATE: 3-08  
CHECKED BY: D.R. CALHOUN DATE: 7-08  
DRAWN BY: TLA 10/05  
CHECKED BY: GM 5/06



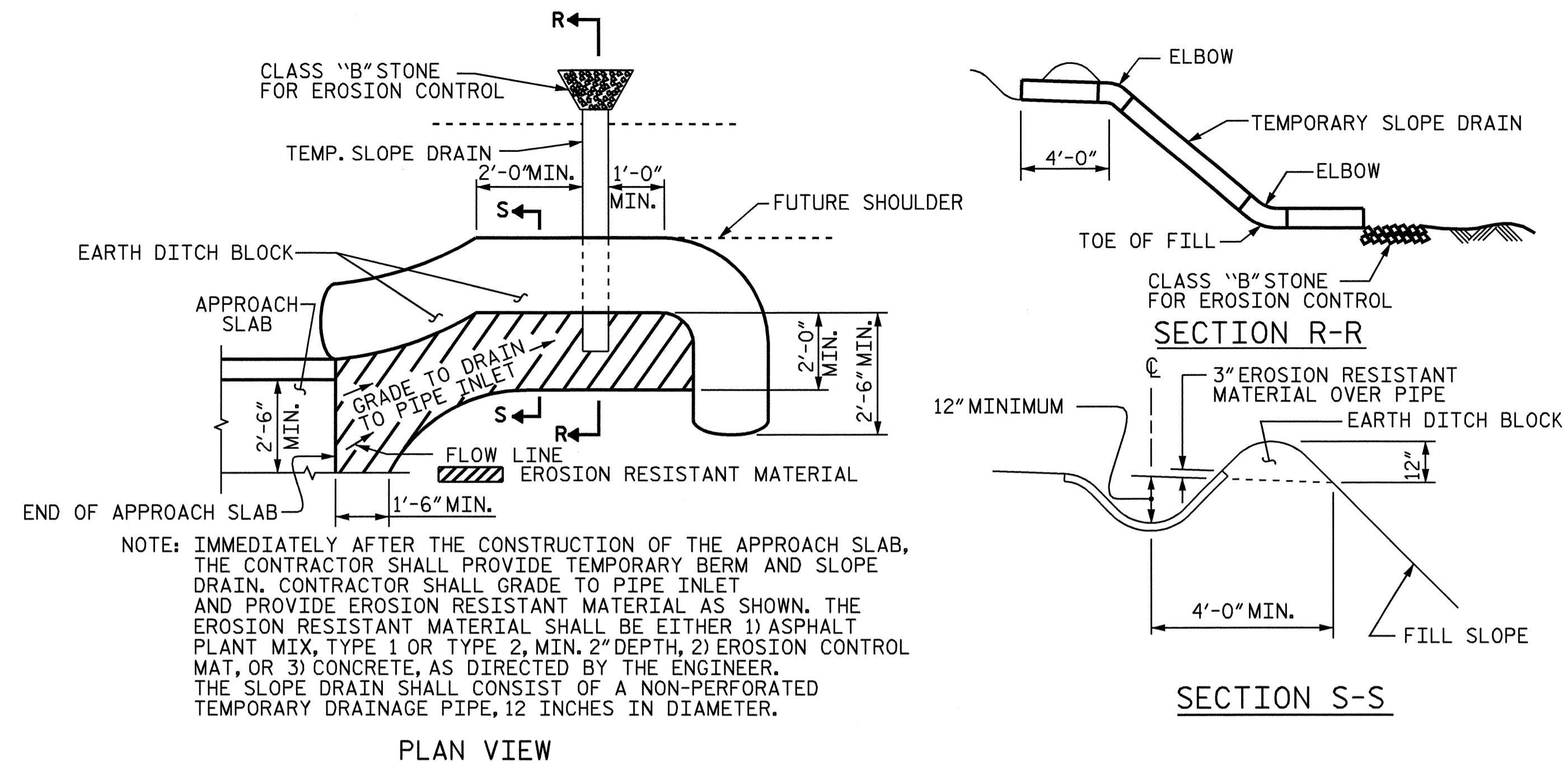
### JOINT SEAL DETAILS @ SLEEPER SLAB

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED DOWN AS SHOWN IN SECTION A-A.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	6.2
2	6.2
TOTAL	12.4

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

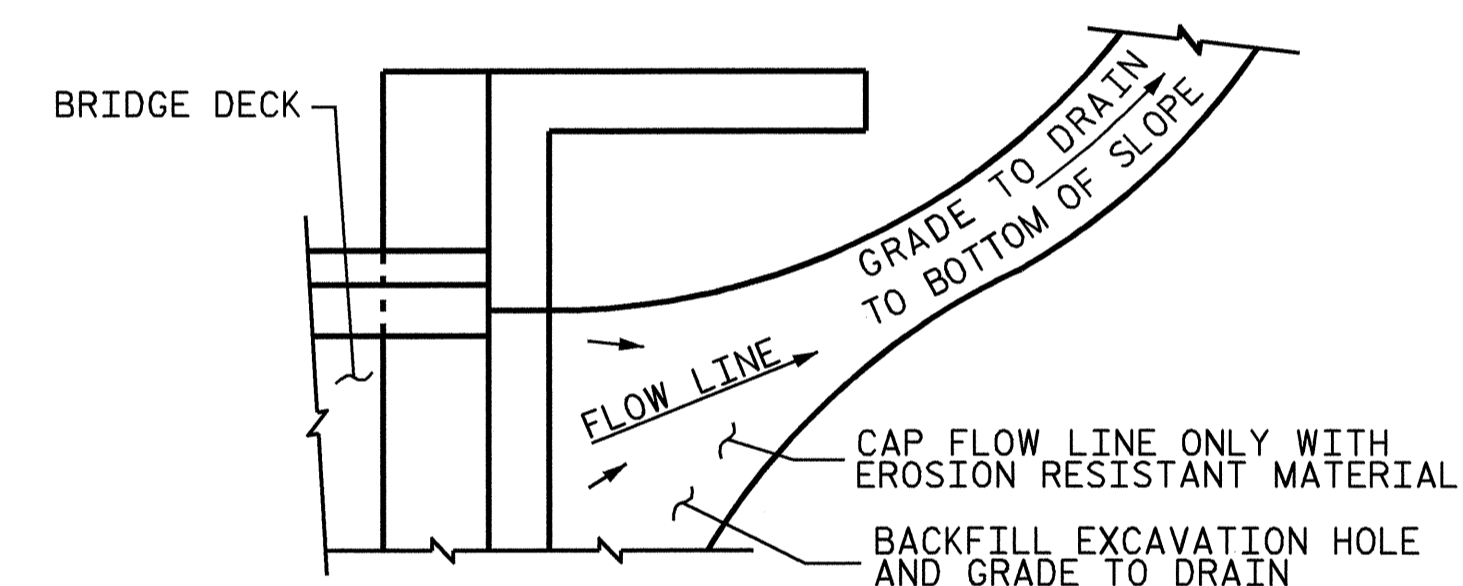
ASSEMBLED BY :	J.L. WALTON	DATE :	3-08
CHECKED BY :	D.R. CALHOUN	DATE :	7-08
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWN/LES
CHECKED BY :	ARB 11/88	REV. 5/1/03	RWN/JTE
		REV. 5/1/06R	MAA/KMM



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.

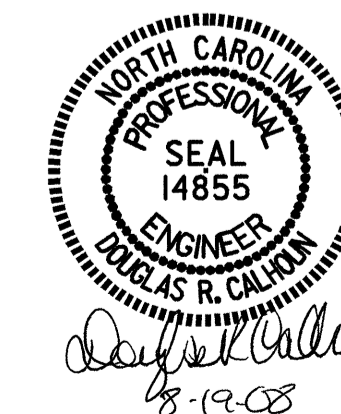
### TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-2502B  
 RICHMOND/MOORE COUNTY  
 STATION: 434+27.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS  
 (NBL)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-70
2			4			70

(STR #2)

STD. NO. BAS10 (SHT 9)

