09/08/99

TIP PROJECT: R-4748

CONTRACT: C202556

STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

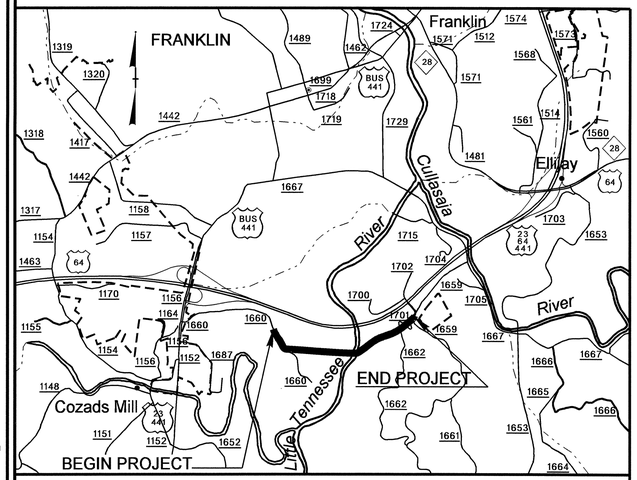
MACON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4748		

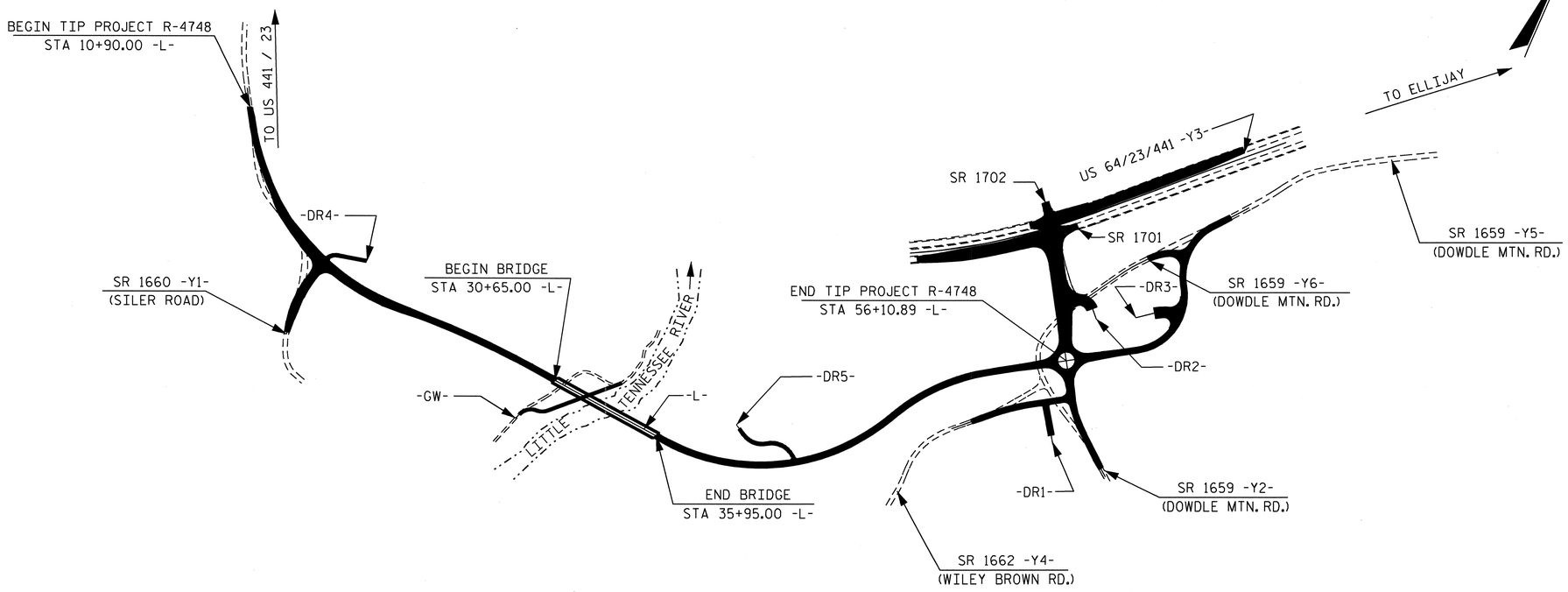
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
40118.1.1		PE
40118.2.1		R / W
40118.3.1		CONSTRUCTION

LOCATION: FRANKLIN – NEW ROUTE FROM SR 1660 (SILER ROAD) TO SR 1662 (WILEY BROWN ROAD) SOUTH OF US 441

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



VICINITY MAP



DESIGN DATA	
ADT 2010 =	4,080
ADT 2030 =	11,200
DHV =	10 %
D =	65 %
* T =	5 %
* * V =	40 MPH
* TTST 1%	DUAL 4%

FUNCTIONAL CLASSICATION
RURAL COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4748 = 0.756 MILES

LENGTH STRUCTURE TIP PROJECT R-4748 = 0.100 MILES

TOTAL LENGTH TIP PROJECT R-4748 = 0.856 MILES

PLANS PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
SEPTEMBER 21, 2010

Q. H. NGUYEN, P.E.
PROJECT ENGINEER

MARC G. CHEEK, P.E.
PROJECT DESIGN ENGINEER

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

04-JUN-2010 07:35
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dahodge

30+00 30+50 31+00 31+50 32+00 32+50 33+00 33+50

FILL FACE @ END BENT NO. 1
STA. 30+65.00 -L-
G.P. EL.= 2075.496

EXP.

BEGIN FRONT SLOPE
STA. 30+47.69 -L-
G.P. EL.= 2076.408

1'-7" BERM

APPROXIMATE NATURAL GROUND LINE

2,080 2,070 2,060 2,050 2,040 2,030 2,020 2,010 2,000 1,990

EL. 2065.2±

1'-6"

EL. 2047.7±

1½:1 SLOPE NORMAL TO CAP

FILL

2'-0"

CLASS II RIP RAP

HP 12 X 53 STEEL PILES

EL. 2019.5±

EL. 2019.4±

EL. 2013.7±

SPAN A

HIGH WATER SURFACE (100 YRS.) EL. 2019.5

EL. 2011.9±

FIX

TOP OF DRILLED PIER EL.= 2011.006

5'-6" Ø DRILLED PIER

EL. 2013.3±

SPAN B

NORMAL WATER SURFACE EL. 2002.0 (09/24/08)

EL. 2000.9±

EL. 1999.1±

EL. 1998.8±

EL. 1998.2±

EL. 1998.6±

EL. 1999.5±

EL. 1999.7±

EL. 2000.7±

EL. 2009.5±

PI STA. = 36+75.00
EL.= 2,043.35'
VC= 1000'

(-)5.2698% (+)7.1969%

GRADE DATA

MATCH LINE
SEE SHEET 2 OF 4

END BENT NO. 1

BENT NO. 1

SECTION ALONG -L-

SECTION THROUGH END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES

CLASS II RIP RAP

TO SR 1660

FILL FACE @ END BENT NO.1

STA. 30+65.00 -L-
W.P. #1

STA. 30+41.10 -L-
BEGIN APPROACH SLAB

STA. 30+47.69 -L-
BEGIN FRONT SLOPE

1½:1 SLOPE NORMAL TO CAP

1'-0" EARTH BERM ELEV.= 2062.784

POT STA. 32+22.65 -L-
POT STA. 11+78.76 -GW-

STA. 32+45.00 -L-
W.P. #2

BENT NO.1 CONTROL LINE

STA. 33+30.00 -L-
BRIDGE IDENTIFICATION

-L-

115°-00'-00' (TYP.)

-GW-

85'-0" 85'-0"

180'-0" 170'-0"

TOTAL BRIDGE LENGTH = 530'-0" (FILL FACE TO FILL FACE)

LITTLE TENNESSEE RIVER

MATCH LINE
SEE SHEET 2 OF 4

PLAN

PILES AND COLUMNS ARE NOT SHOWN IN PLAN VIEW.

NORTH CAROLINA PROFESSIONAL SEAL 13014 ENGINEER QUANG H. NGUYEN

Quang H. Nguyen 7/20/10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL IE CHEEK JR.

8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 01-29-09
CHECKED BY : M.G. CHEEK DATE : 02-03-09

27-JUL-2010 14:51
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ofigueroa

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 1 OF 4 BRIDGE NO. 368

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
LITTLE TENNESSEE RIVER
ON NEW LOCATION
BETWEEN SR 1660 AND SR 1662

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			44

33+00 33+50 34+00 34+50 35+00 35+50 36+00 36+50 37+00 37+50

2,080 2,070 2,060 2,050 2,040 2,030 2,020 2,010 2,000 1,990

SPAN B

FIX

SPAN C

MATCH LINE
SEE SHEET 1 OF 4

NORMAL
WATER SURFACE
EL. 2002.0
(09/24/08)

HIGH
WATER SURFACE
(100 YRS.)
EL. 2019.5

TOP OF
DRILLED PIER
EL.= 2008.980

5'-6" Ø
DRILLED PIER

EXP.

FILL FACE
@ END BENT NO. 2
STA. 35+95.00 -L-
G.P. EL.= 2058.562

1'-7"
BERM

BEGIN FRONT SLOPE
STA. 36+09.97 -L-
G.P. EL.= 2058.570

PI STA. = 36+75.00
EL.= 2,043.35'
VC= 1000'
(-)5.2698% (+)7.1969%

GRADE DATA

1½:1 SLOPE
NORMAL TO CAP

CLASS II
RIP RAP

2'-0"

FILL

APPROXIMATE NATURAL
GROUND LINE

HP 12 X 53
STEEL PILES

EL. 1998.2±
EL. 1998.6±
EL. 1999.5±
EL. 1999.7±
EL. 2000.7±
EL. 2009.5±
EL. 2010.3±
EL. 2009.8±
EL. 2012.9±
EL. 2016.9±
EL. 2023.2±
EL. 2027.1±

BENT NO. 2

SECTION ALONG -L-

SECTION THROUGH END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES

END BENT NO. 2

LITTLE TENNESSEE RIVER

BENT NO.2
CONTROL LINE

STA. 33+30.00 -L-
BRIDGE
IDENTIFICATION

-L-

STA. 34+15.00 -L-
W.P. #3

115°-00'-00"
(TYP.)

85'-0" 85'-0"

170'-0" 180'-0"

TOTAL BRIDGE LENGTH = 530'-0" (FILL FACE TO FILL FACE)

1½:1 SLOPE
NORMAL TO CAP

FILL FACE @
END BENT NO.2

STA. 35+95.00 -L-
W.P. #4

TO SR 1662

STA. 36+18.90 -L-
END APPROACH SLAB

STA. 36+09.97 -L-
BEGIN FRONT SLOPE

1'-0"
EARTH BERM
ELEV.= 2046.362

CLASS II
RIP RAP

PLAN

PILES AND COLUMNS ARE NOT SHOWN IN PLAN VIEW.

MATCH LINE
SEE SHEET 1 OF 4

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
LITTLE TENNESSEE RIVER
ON NEW LOCATION
BETWEEN SR 1660 AND SR 1662

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL L. CHEEK
8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 01-29-09
CHECKED BY : M.G. CHEEK DATE : 02-03-09

27-JUL-2010 14:51
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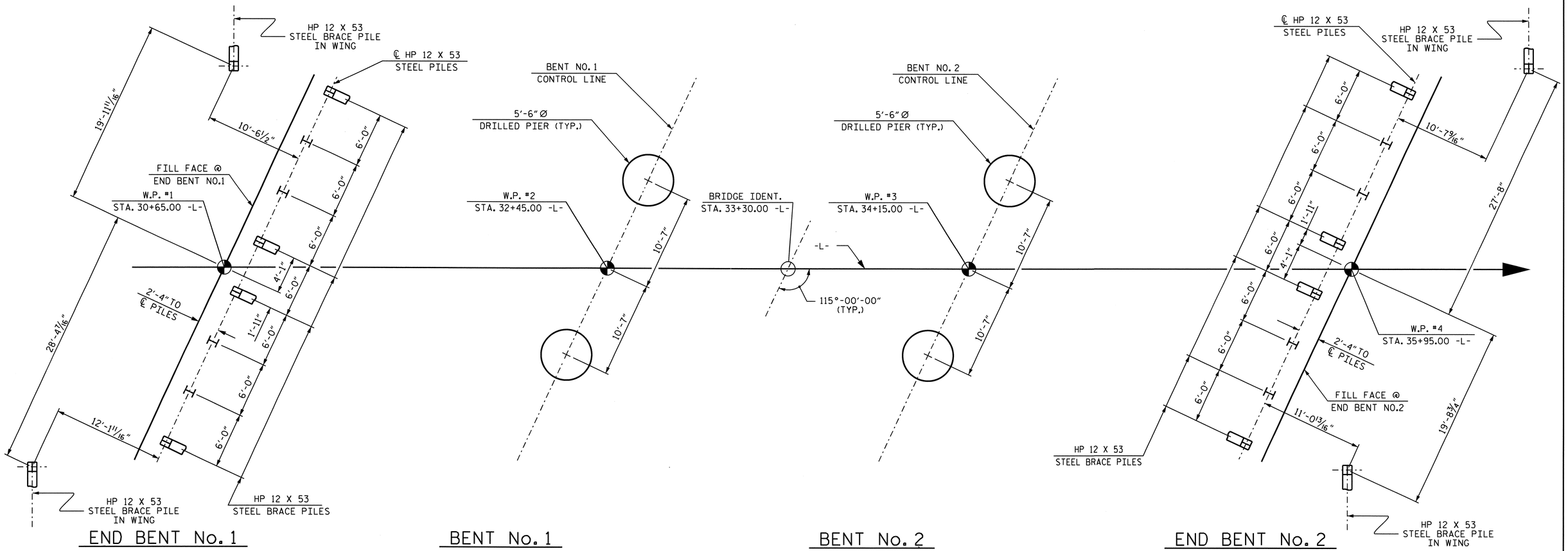

FOUNDATION LAYOUT

ALL END BENT PILES ARE HP 12 X 53
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP.
END BENT BRACE PILES ARE BATTERED 3:12.

NOTES

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE. DRIVE PILES TO REQUIRED DRIVING RESISTANCE OF 183 TONS PER PILE.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR FACTORED RESISTANCE OF 910 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND THE CASING BELOW ELEVATION 1995.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

DRILLED PIERS AT BENT NO.1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 1976.0 AND SATISFY THE REQUIRED END RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 1991.5 (LT) AND 1988.0 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR FACTORED RESISTANCE OF 910 TONS PER PIERS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. IF REQUIRED, DO NOT EXTEND THE CASING BELOW ELEVATION 1993.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

DRILLED PIERS AT BENT NO.2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 1968.0 (LT) AND 1955.0 (RT) AND SATISFY THE REQUIRED END RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 1984.0 (LT) AND 1973.5 (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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.

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
8-2-10

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
LITTLE TENNESSEE RIVER
ON NEW LOCATION
BETWEEN SR 1660 AND SR 1662

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A.L. FIGUEROA DATE : 02-24-10
CHECKED BY : M.G. CHEEK DATE : 03-23-10

14-JUN-2010 08:28
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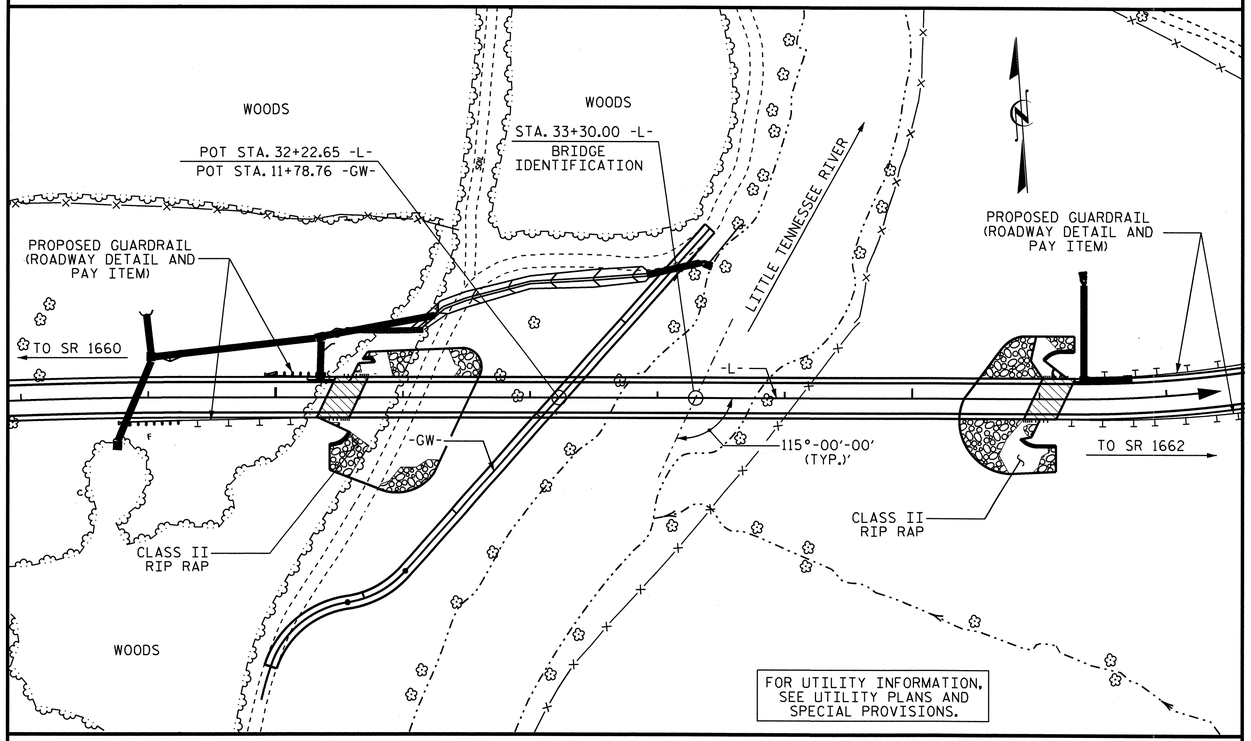
afigueroa

BENCH MARK No. 3: CHISELED "X" IN S.E. CORNER OF CONCRETE PAD, STA. 29+52.00 -L-, 357.00' RIGHT, EL. 2017.23.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

AT THE DIRECTION OF THE ENGINEER, CONSTRUCTION WARNING SIGNS SHALL BE PLACED APPROXIMATELY 300 FEET UPSTREAM OF THE BRIDGE SITE AND SHALL BE VISIBLE TO CANOEISTS IN THE RIVER. THE ENTIRE COST OF THE SIGNS SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

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.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

FOR PILES, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR INSTALLATION AND ATTACHMENT OF 10"D.I.R.J. WATER MAIN, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF WATERWAY TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 15,000 C.F.S
FREQUENCY OF DESIGN FLOOD _____ = 25 YRS.
DESIGN HIGH WATER ELEVATION _____ = 2019.5
DRAINAGE AREA _____ = 200.25 SQ. MI
BASIC DISCHARGE (Q100) _____ = 20,000 C.F.S.
BASIC HIGH WATER ELEVATION _____ = 2023.2

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = 205,000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD _____ = 500 YRS.±
OVERTOPPING FLOOD ELEVATION _____ = 2058.56

TOTAL BILL OF MATERIAL

	5'-6"Ø DRILLED PIERS IN SOIL	5'-6"Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-6"Ø DRILLED PIERS	SID INSPECTION	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE						18,598	16,639		LUMP SUM	
END BENT NO. 1								51.6		7,203
BENT NO. 1	43.17	27.00	32.01					100.2		21,716
BENT NO. 2	61.00	34.00	31.96					94.3		23,414
END BENT NO. 2								47.8		6,708
TOTAL	104.17	61.00	63.97	1	1	18,598	16,639	293.9	LUMP SUM	59,041

TOTAL BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	POT BEARINGS	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	STRUCTURE DRAINAGE SYSTEM	INSTALL 10"D.I.R.J. WATER MAIN
	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		955,300			1,055.19			LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1			10	275		2,463	2,737					
BENT NO. 1	5,761											
BENT NO. 2	6,392											
END BENT NO. 2			10	900		1,570	1,744					
TOTAL	12,153	955,300	20	1,175	1,055.19	4,033	4,481	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
LITTLE TENNESSEE RIVER
ON NEW LOCATION
BETWEEN SR 1660 AND SR 1662

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 01-29-09
CHECKED BY : M.G. CHEEK DATE : 02-03-09

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.09	--	1.75	0.827	1.54	C	EL	0.00	0.901	1.09	B	I	25.50	1.30	0.827	1.66	A	EL	70.93	
		HL-93 (OPERATING)	N/A		1.41	--	1.35	0.827	1.99	C	EL	0.00	0.901	1.41	B	I	25.50	1.00	0.827	2.15	A	EL	70.93	
		HS-20 (INVENTORY)	36.00	(2)	1.72	61.9	1.75	0.827	2.80	A	EL	70.93	0.901	1.72	B	I	25.50	1.30	0.827	2.73	A	EL	70.93	
		HS-20 (OPERATING)	36.00		2.23	80.3	1.35	0.827	3.63	A	EL	70.93	0.901	2.23	B	I	25.50	1.00	0.827	3.55	A	EL	70.93	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.48	74.0	1.40	0.827	8.71	A	EL	70.93	0.901	5.48	B	I	25.50	1.30	0.827	6.80	A	EL	70.93	
		SNGARBS2	20.000		3.77	75.4	1.40	0.827	6.11	A	EL	70.93	0.901	3.77	B	I	144.50	1.30	0.827	4.77	A	EL	70.93	
		SNAGRIS2	22.000		3.46	76.1	1.40	0.827	5.64	A	EL	70.93	0.901	3.46	B	I	25.50	1.30	0.827	4.40	A	EL	70.93	
		SNCOTTS3	27.250		2.72	74.1	1.40	0.827	4.34	A	EL	70.93	0.901	2.72	B	I	25.50	1.30	0.827	3.38	A	EL	70.93	
		SNAGGRS4	34.925		2.17	75.8	1.40	0.827	3.50	A	EL	70.93	0.901	2.17	B	I	25.50	1.30	0.827	2.73	A	EL	70.93	
		SNS5A	35.550		2.16	76.8	1.40	0.827	3.44	A	EL	70.93	0.901	2.16	B	I	25.50	1.30	0.827	2.69	A	EL	70.93	
		SNS6A	39.950		1.94	77.5	1.40	0.827	3.08	A	EL	70.93	0.901	1.94	B	I	25.50	1.30	0.827	2.40	A	EL	70.93	
		SNS7B	42.000		1.87	78.5	1.40	0.827	2.94	A	EL	70.93	0.901	1.87	B	I	25.50	1.30	0.827	2.29	A	EL	70.93	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.34	77.2	1.40	0.827	3.75	A	EL	70.93	0.901	2.34	B	I	25.50	1.30	0.827	2.93	A	EL	70.93	
		TNT4A	33.075		2.31	76.4	1.40	0.827	3.73	A	EL	70.93	0.901	2.31	B	I	25.50	1.30	0.827	2.91	A	EL	70.93	
		TNT6A	41.600		1.93	80.3	1.40	0.827	3.01	A	EL	70.93	0.901	1.93	B	I	25.50	1.30	0.827	2.35	A	EL	70.93	
		TNT7A	42.000		1.90	80.2	1.40	0.827	3.00	A	EL	70.93	0.901	1.90	B	I	25.50	1.30	0.827	2.34	A	EL	70.93	
		TNT7B	42.000		1.86	78.1	1.40	0.827	3.02	A	EL	70.93	0.901	1.86	B	I	25.50	1.30	0.827	2.35	A	EL	70.93	
		TNAGRIT4	43.000		1.81	77.8	1.40	0.827	2.93	A	EL	70.93	0.901	1.81	B	I	25.50	1.30	0.827	2.28	A	EL	70.93	
		TNAGT5A	45.000		1.75	78.8	1.40	0.827	2.80	A	EL	70.93	0.901	1.75	B	I	25.50	1.30	0.827	2.18	A	EL	70.93	
		TNAGT5B	45.000	(3)	1.72	77.4	1.40	0.827	2.77	A	EL	70.93	0.901	1.72	B	I	25.50	1.30	0.827	2.16	A	EL	70.93	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																				

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

	YEAR	ADTT
CURRENT	2010	155
FUTURE	2030	260

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **

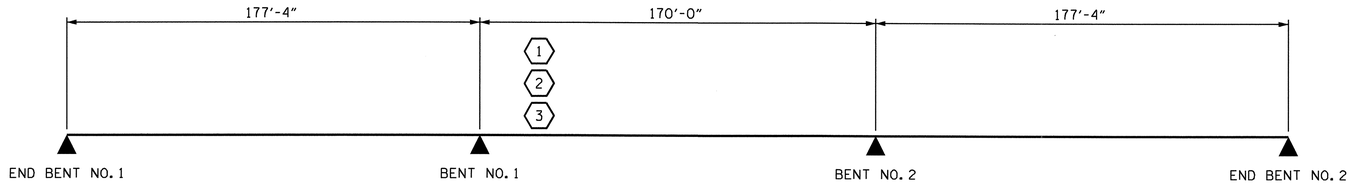
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			44

STD. NO. LRFR3

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. CHEEK, JR.
8-2-10

ASSEMBLED BY : A.L. FIGUEROA	DATE : 5-17-10
CHECKED BY : M.G. CHEEK	DATE : 5-18-10
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	

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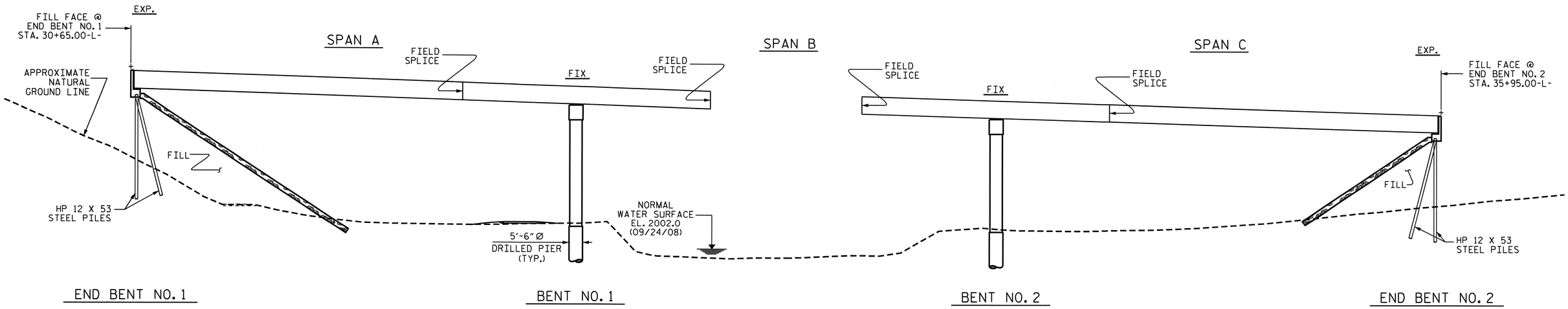
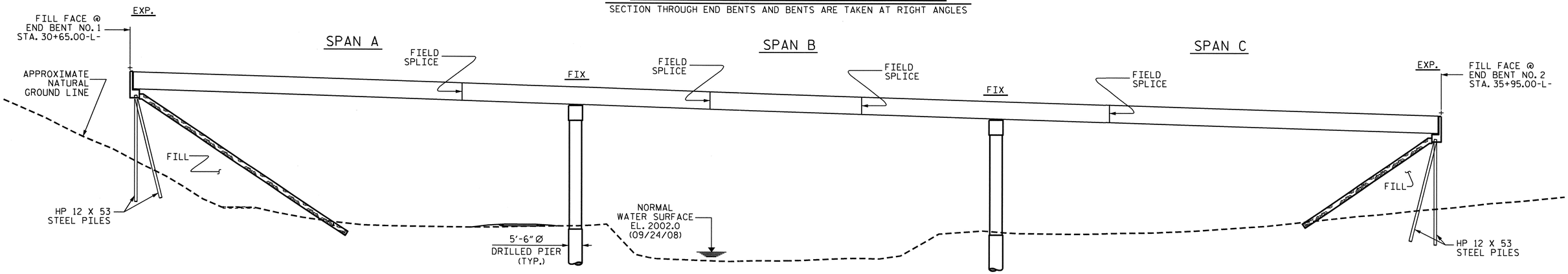
alfigueroa



STAGE I GIRDER ERECTION

SECTION THROUGH END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES



STAGE II GIRDER ERECTION

SECTION THROUGH END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES

NOTES

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT AS REQUIRED TO ENSURE STABILITY OF THE GIRDERS, AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

THE FIRST TWO GIRDERS SHALL BE ERECTED SIMULTANEOUSLY WITH ALL DIAPHRAGMS BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS. CONNECT ADDITIONAL GIRDERS ADJACENT TO THE PREVIOUSLY ERECTED GIRDERS AND TIGHTEN ALL BOLTS PRIOR TO RELEASING ADDITIONAL GIRDERS.

AFTER ERECTING THE END SPANS, THE DROP-IN SECTIONS SHALL BE INSTALLED INDIVIDUALLY.

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
8-7-10

DRAWN BY : A.L. FIGUEROA DATE : 06-08-10
CHECKED BY : M.G. CHEEK DATE : 06-09-10

14-JUN-2010 15:58
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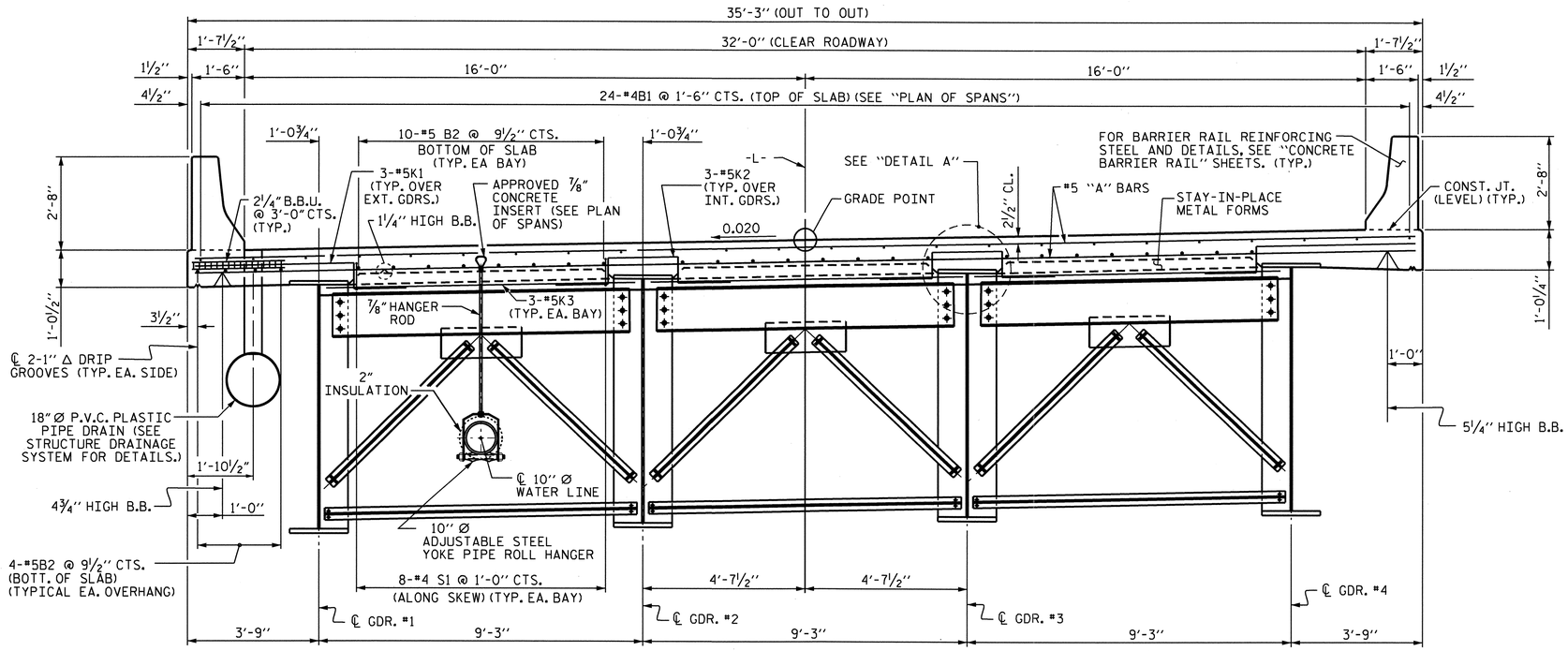
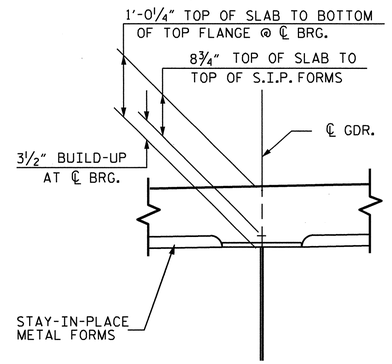
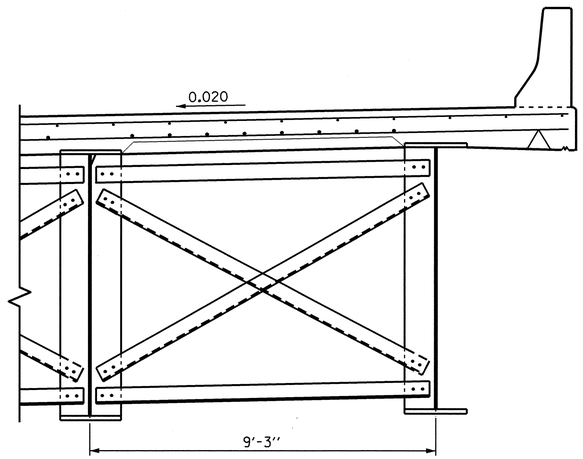


TYPICAL SECTION

(SHOWING END BENT DIAPHRAGMS)

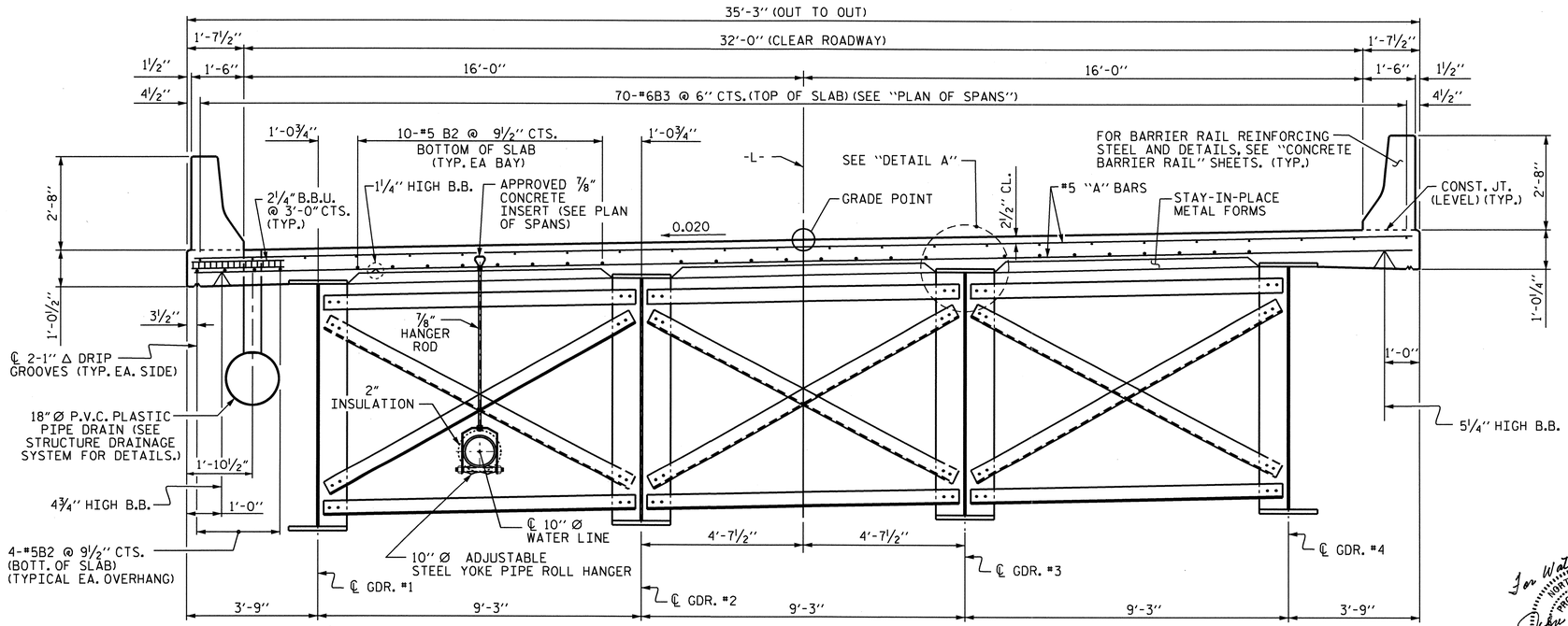


DETAIL A



PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)



TYPICAL SECTION

(SHOWING BENT DIAPHRAGMS)

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

For Water Line Attachment only

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HUNTON 8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL HIGH QUICK 8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : V.X. NGUYEN DATE : 1-19-10
CHECKED BY : D. HODGE DATE : 5-6-10

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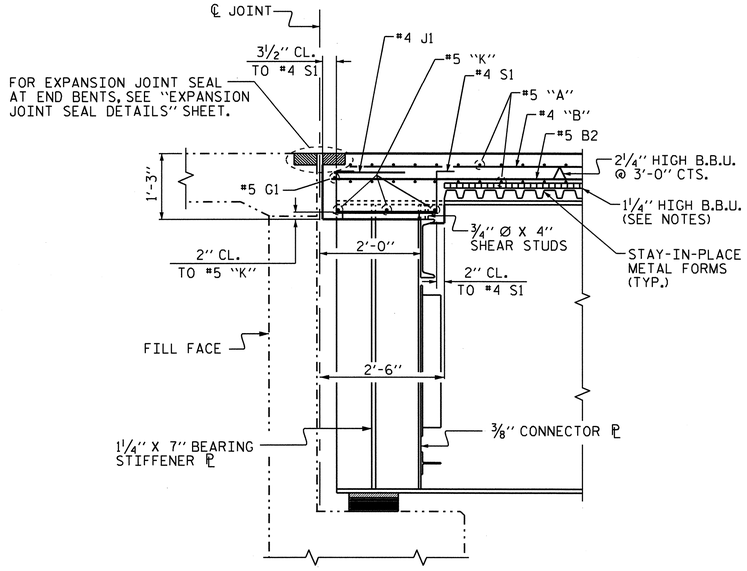
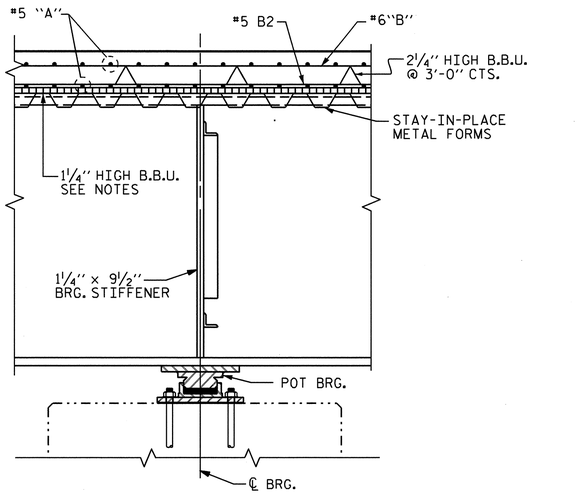
vnguyen

NCDOT



SECTION THRU END BENT



SECTION AT BENT

NOTES

PROVIDE 1 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.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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.

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.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

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

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. CREEK, JR.
8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : V.X. NGUYEN DATE : 1-19-10
CHECKED BY : D. HODGE DATE : 5-6-10

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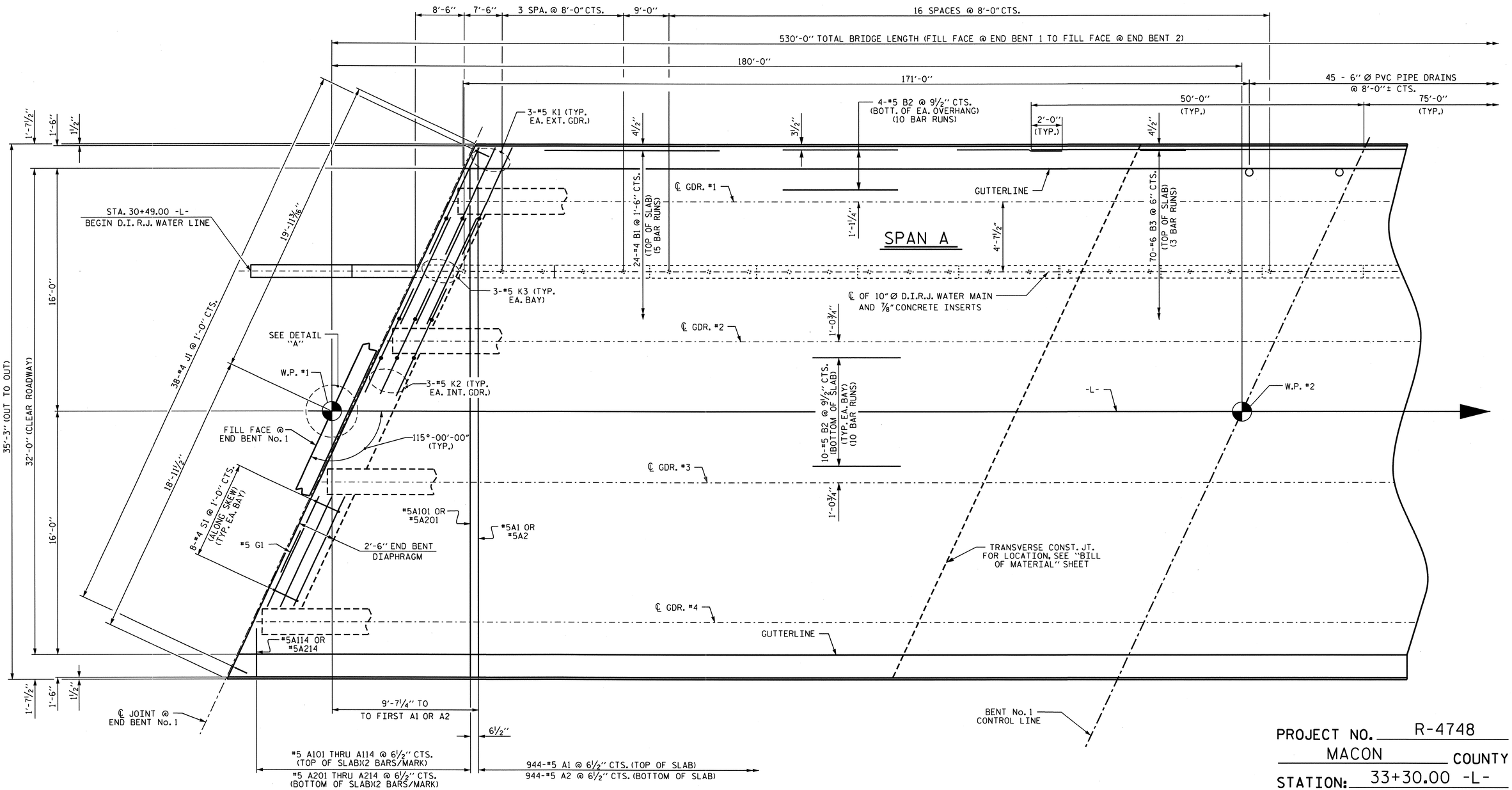

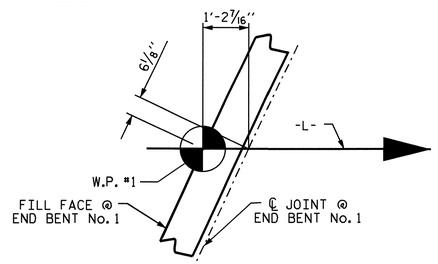

DETAIL "A"

PLAN OF SPAN A

FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

For Waterline Attachment only

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HINTON
8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL ICE CREEK, JR.
8-2-10

DRAWN BY : V.X. NGUYEN DATE : 2-3-10
CHECKED BY : D. HODGE DATE : 5-10

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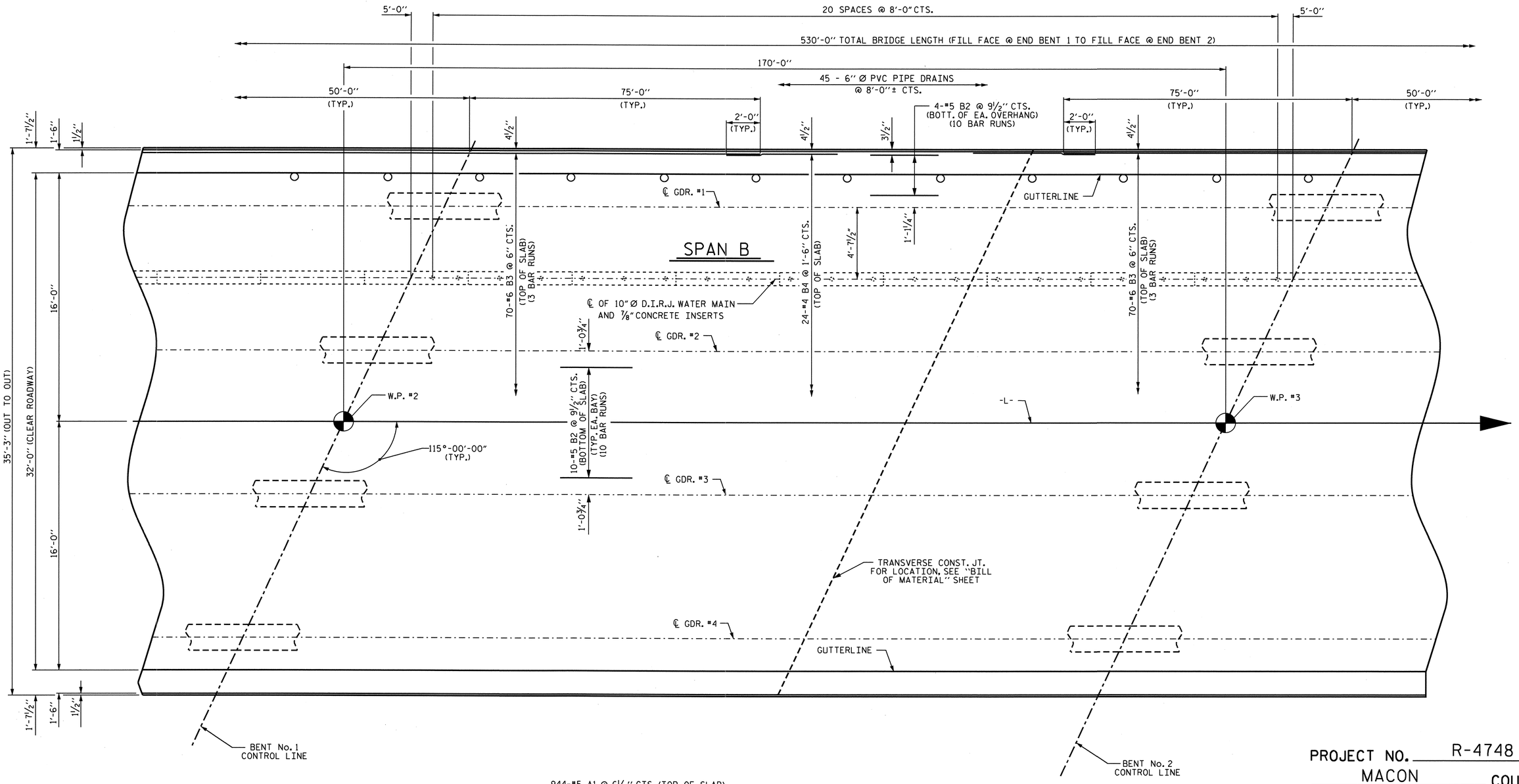
PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			44



PLAN OF SPAN B

FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

For Water Line Attachment only

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HINTON
8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER WARSHALL J. CREEL, JR.
8-2-10

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			44

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CHECKED BY : D. HODGE DATE : 5-10

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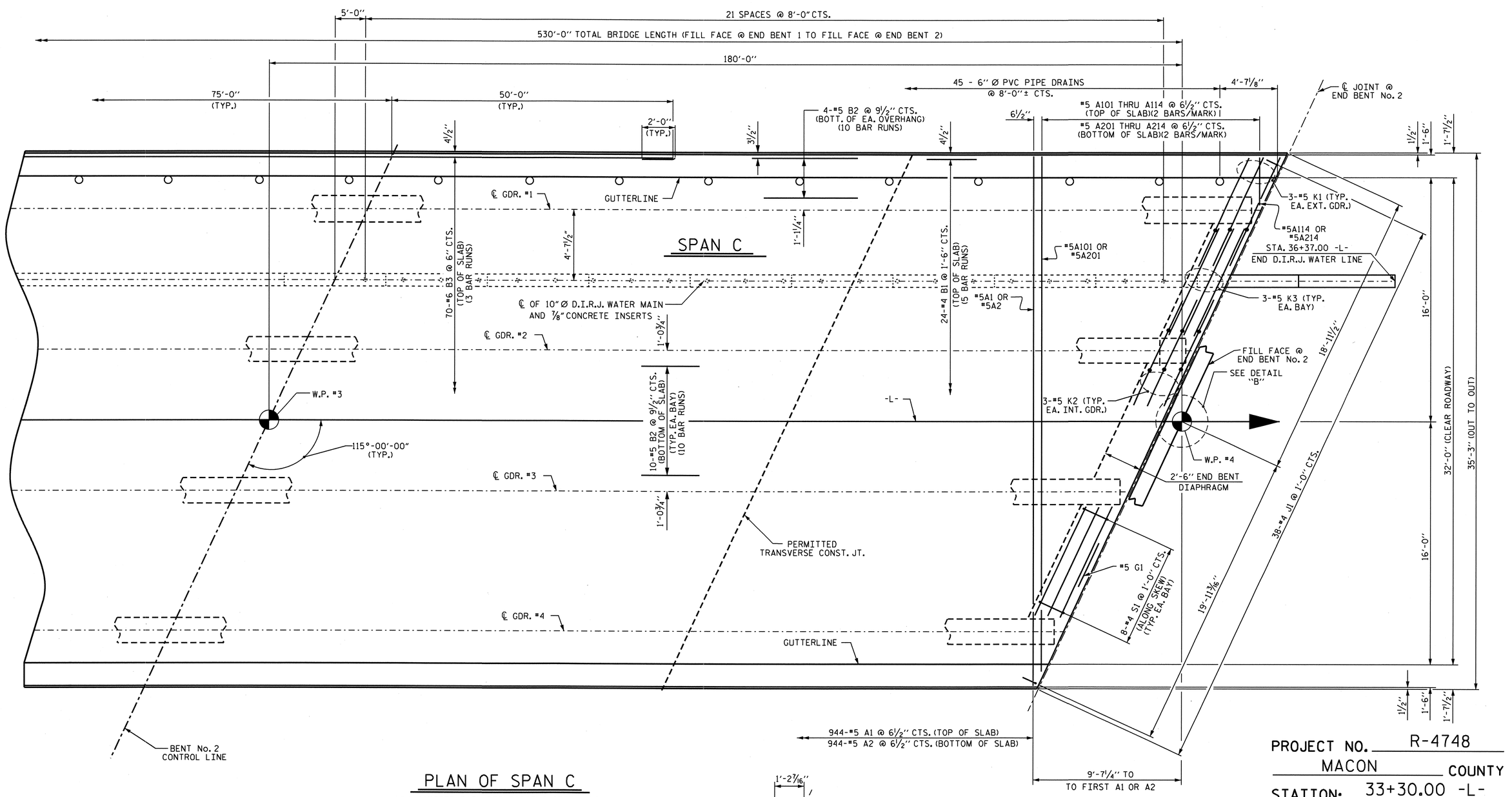
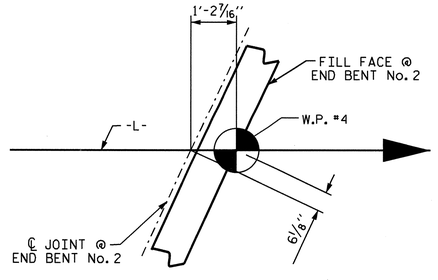


PLAN OF SPAN C

FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
FOR STRUCTURE DRAINAGE SYSTEM, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.



DETAIL "B"

In Water Line Attachment only
8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HINTON

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL IVEY COREY, JR.
8-2-10

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : V.X. NGUYEN DATE : 2-3-10
CHECKED BY : D. HODGE DATE : 5-10

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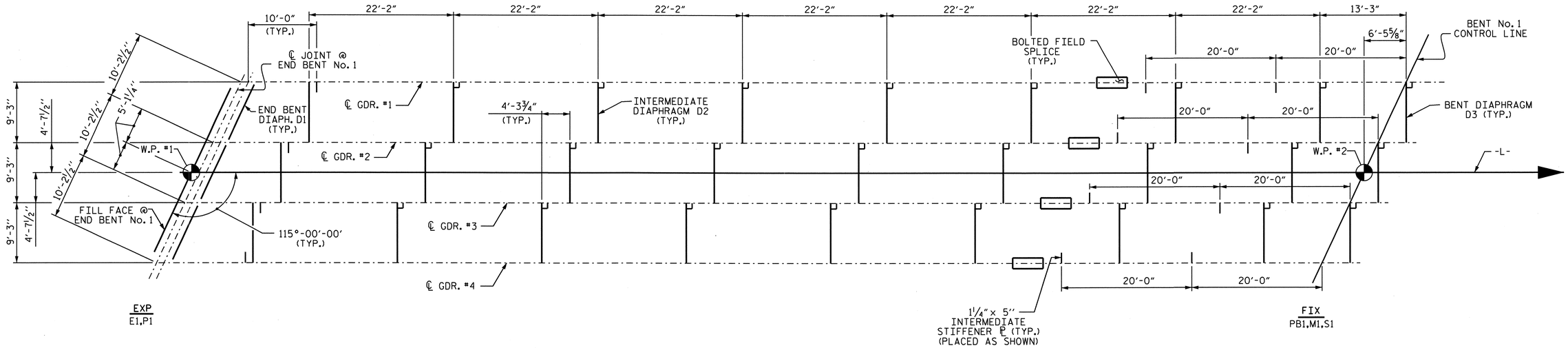

SPAN A

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL L. DEESE, JR.
8-2-10

DRAWN BY : V.X. NGUYEN DATE : 2-8-10
CHECKED BY : D. HODGE DATE : 5-10

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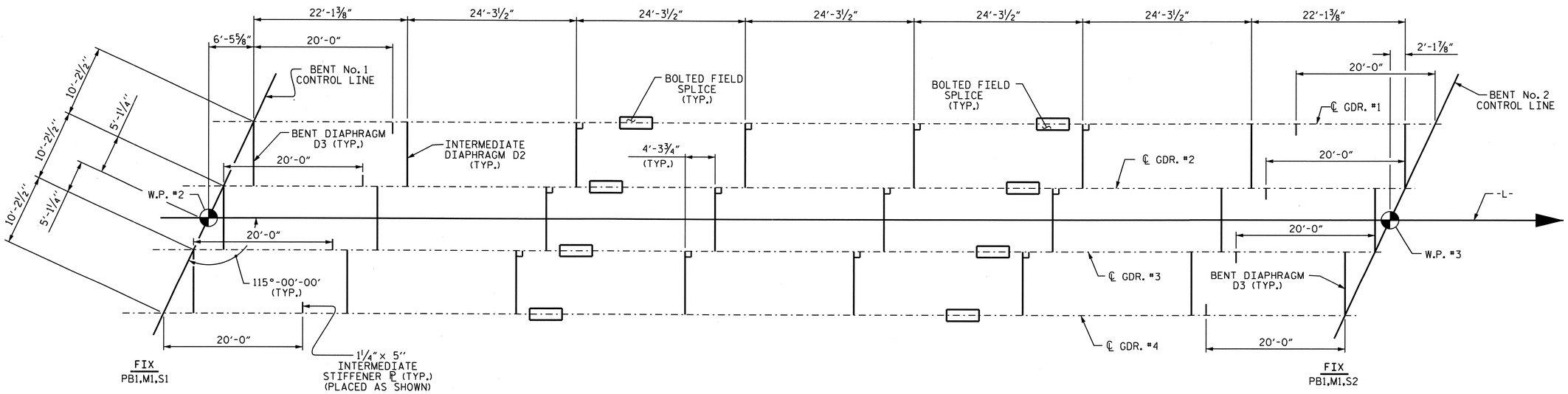

SPAN B

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL LICHTY, JR.
8-2-10

DRAWN BY : V.X. NGUYEN DATE : 2-8-10
CHECKED BY : D. HODGE DATE : 5-10

30-JUL-2010 09:42
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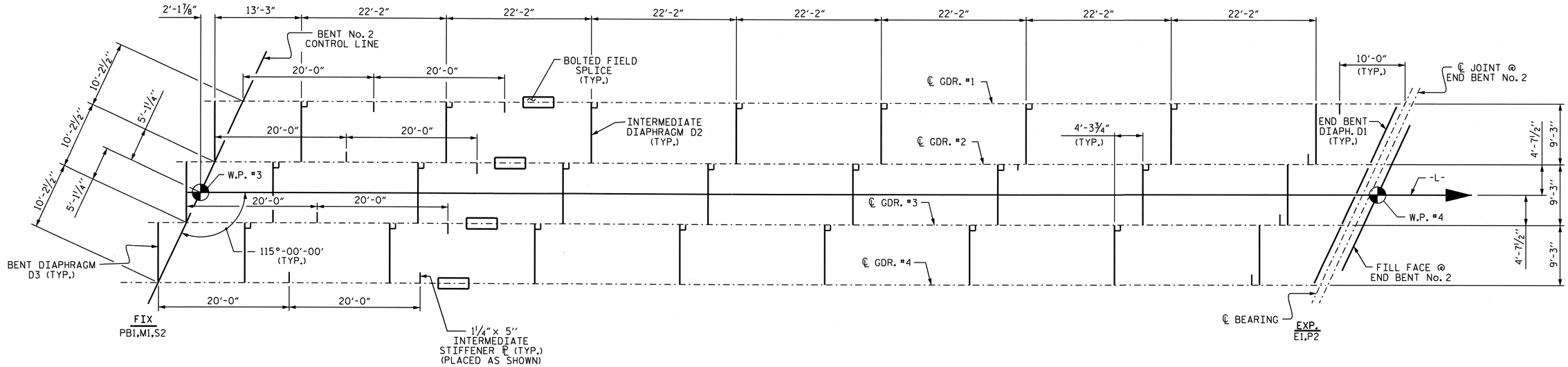
NC005



SPAN C

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN
SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. GREER, JR.
8-2-10

DRAWN BY : V.X. NGUYEN DATE : 2-8-10
CHECKED BY : D. HODGE DATE : 5-10

30-JUL-2010 09:42
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vnguyen

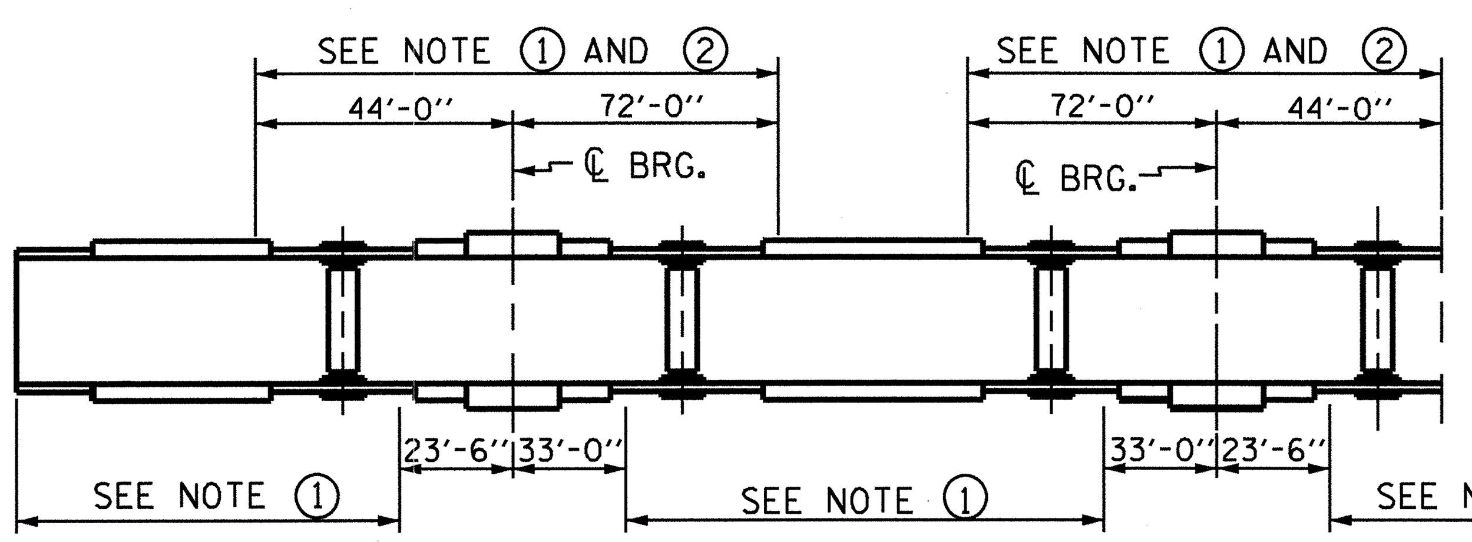
NCDOT

PLATE GIRDER ELEVATION

END BENT & INTERMEDIATE DIAPHRAGMS NOT SHOWN.

BOTTOM FLANGE

OMIT CONNECTOR PLATES ON OUTSIDE OF EXTERIOR GIRDERS
(INTERMEDIATE CROSSFRAMES NOT SHOWN)

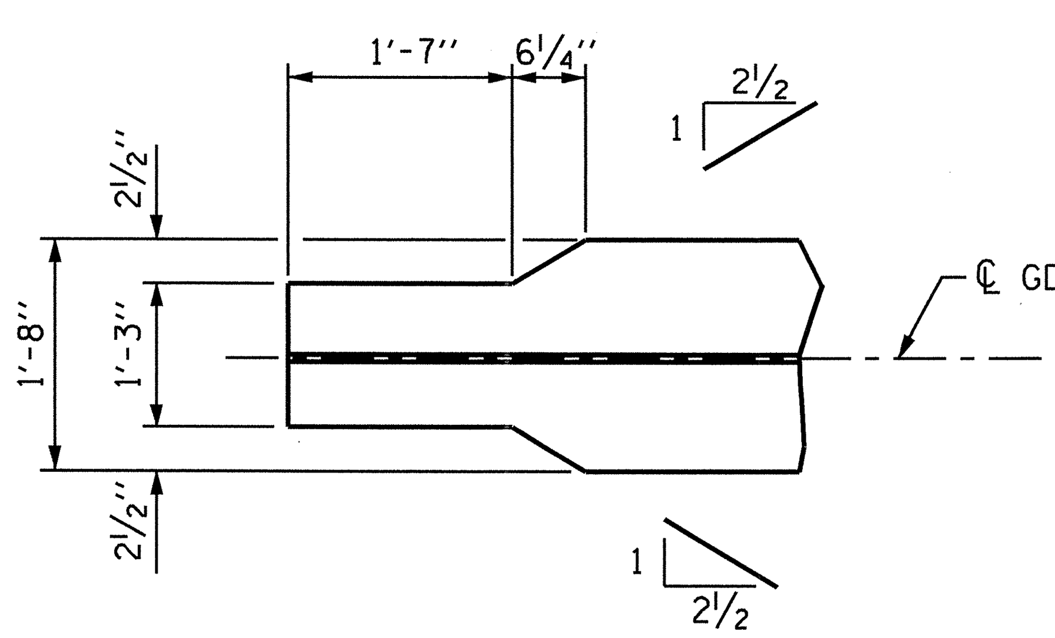


GIRDER MAKE UP

NOTE ①: CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

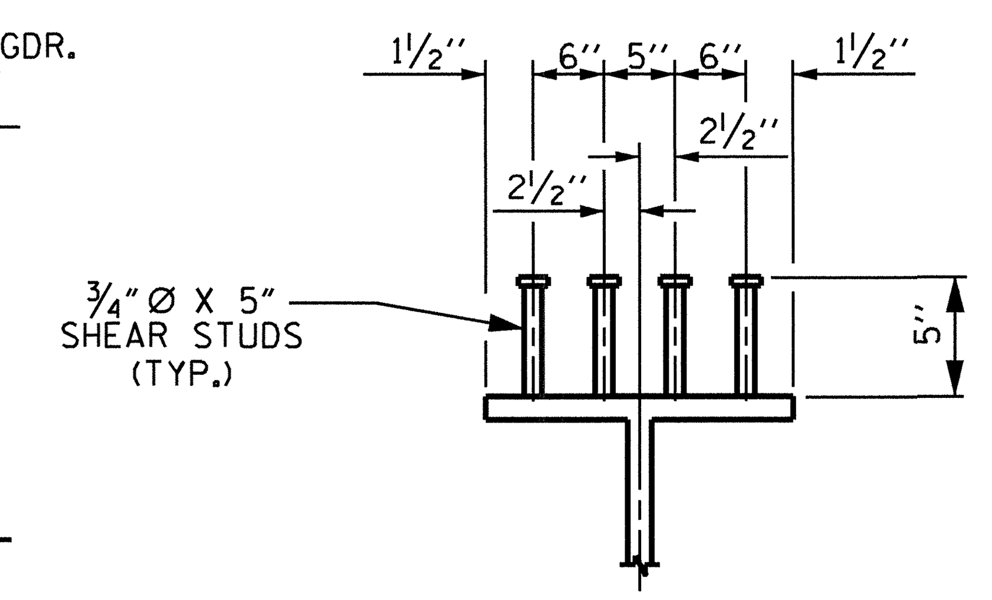
NOTE ②: NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS



END OF GIRDER DETAIL

(BOTTOM FLANGE ONLY)



SHEAR STUD DETAILS

NOTES

INTERMEDIATE STIFFENERS ARE TO BE PLACED ON ALTERNATING SIDES OF INTERIOR GIRDERS ONLY.

INTERMEDIATE STIFFENERS ARE NOT TO BE PLACED ON THE OUTSIDE OF EXTERIOR GIRDERS. (SEE FRAMING PLAN FOR LOCATION)

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CLEEK, JR. 8-2-10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-15
1			3			TOTAL SHEETS	44
2			4				

DRAWN BY: V.X. NGUYEN DATE: 3-3-10
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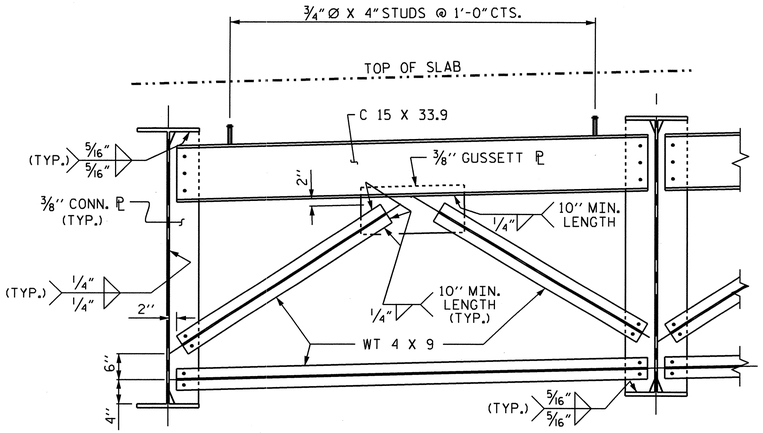
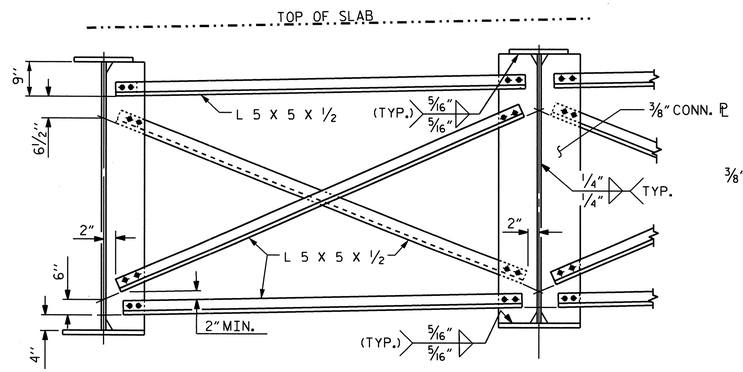
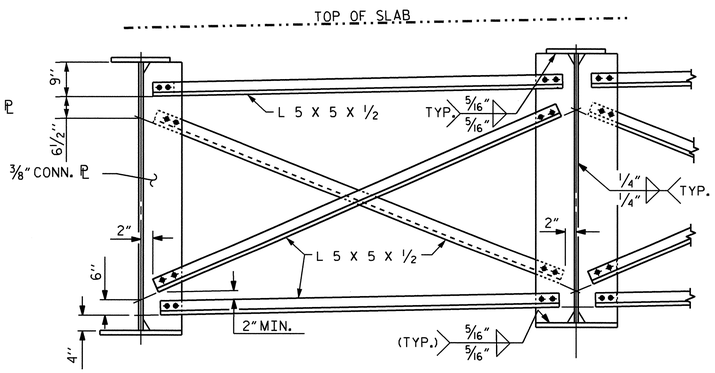


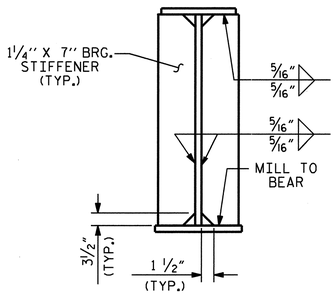
END BENT DIAPHRAGM (D1)



TYPICAL INTERMEDIATE CROSSFRAME (D2)

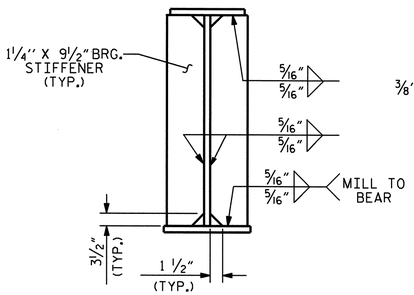


TYPICAL BENT CROSSFRAME (D3)



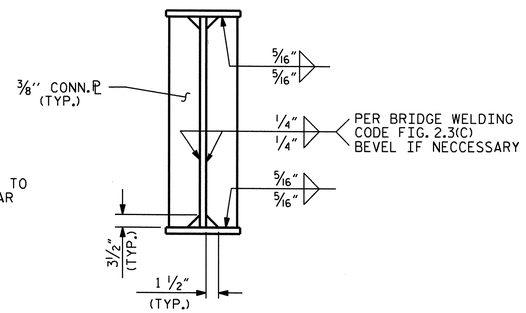
BEARING STIFFENER

(AT END BENTS)

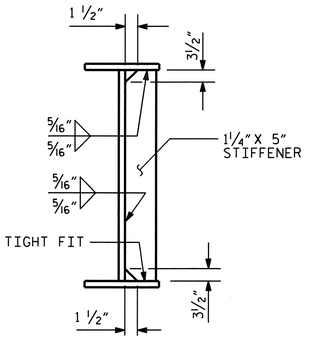


BEARING STIFFENER

(AT BENTS)

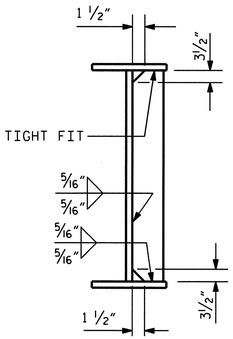


CONNECTOR PLATE



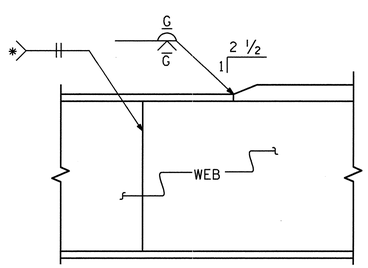
INTERMEDIATE STIFFENER

(AT END BENTS)



INTERMEDIATE STIFFENER

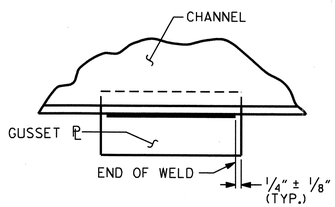
(AT BENTS)



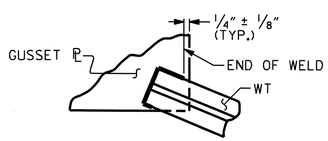
ELEVATION

PERMISSIBLE SHOP WEB AND FLANGE BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

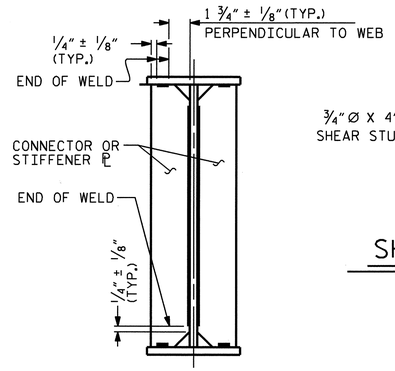


TYPICAL GUESSET PLATE CONNECTION

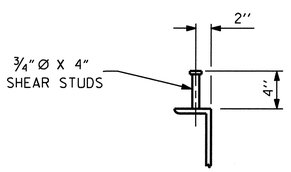


TYPICAL "TEE" TO GUSSET PLATE CONNECTION

WELD TERMINATION DETAILS



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



SHEAR STUD DETAILS

(TYP. EA. END BENT DIAPHRAGM)

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. CREEK, JR. 8-2-10

DRAWN BY : V.X. NGUYEN DATE : 3-3-10
CHECKED BY : D.HODGE DATE : 5-28-10

30-JUL-2010 09:43
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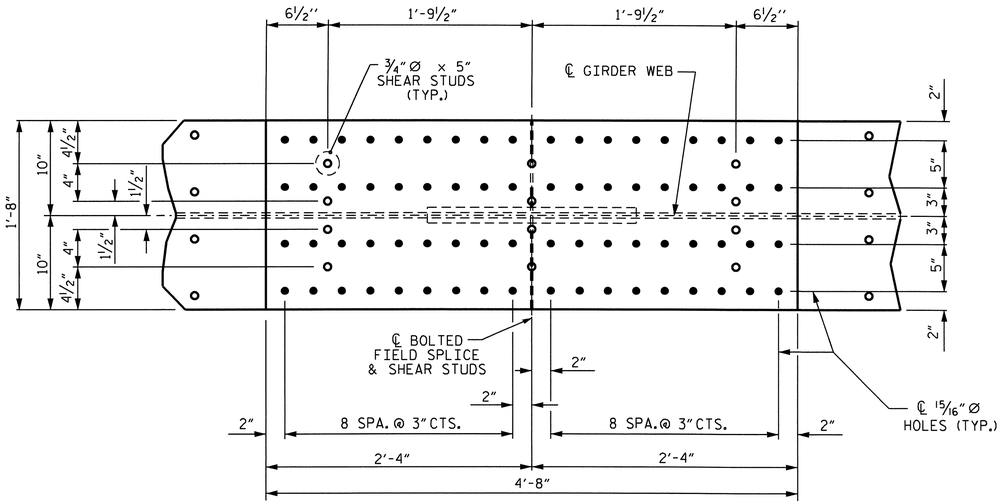
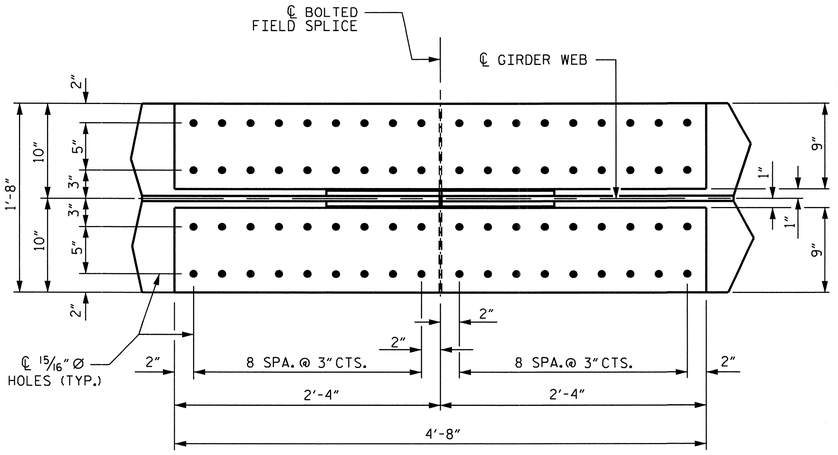
vnguyen



PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

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

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

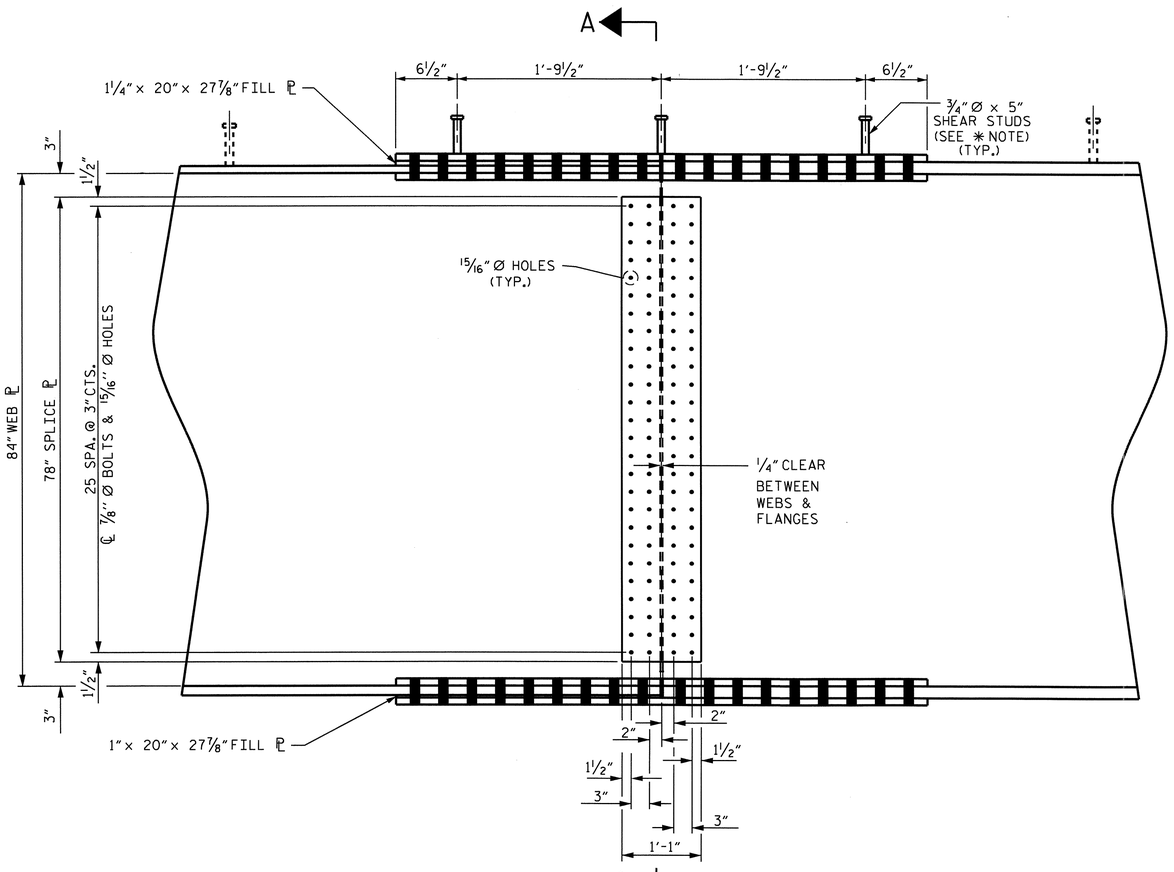
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

END OF GIRDERS SHALL BE PLUMB.

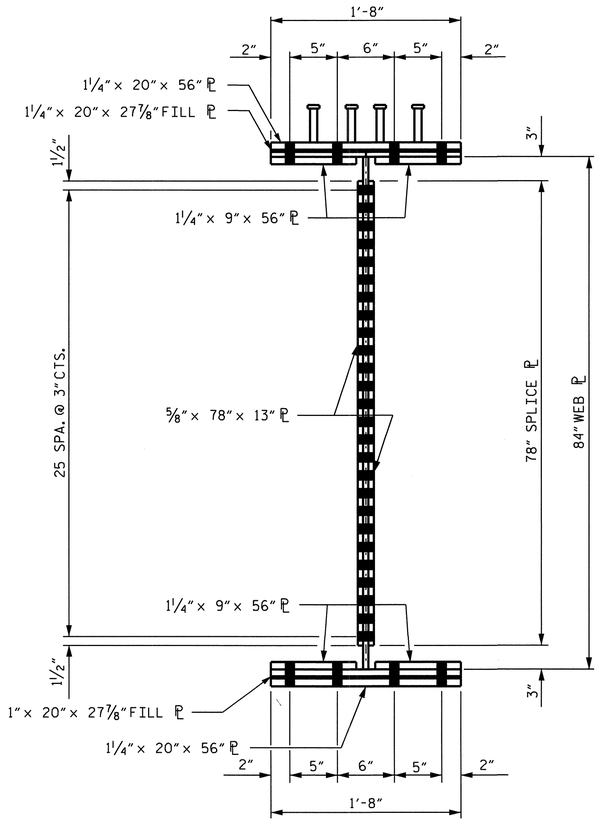
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

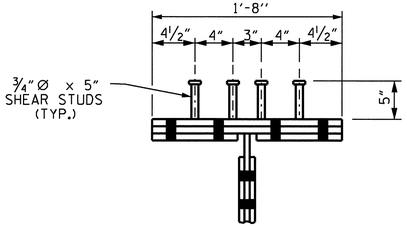
✱ NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY



ELEVATION



SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(BOLTED FIELD SPLICE #1 SHOWN; BOLTED FIELD SPLICE #4 SIMILAR)

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL D. CHEEK, JR.
8-31-10

DRAWN BY : V.X. NGUYEN DATE : 3-3-10
CHECKED BY : D. HODGE DATE : 5/10

31-AUG-2010 13:19
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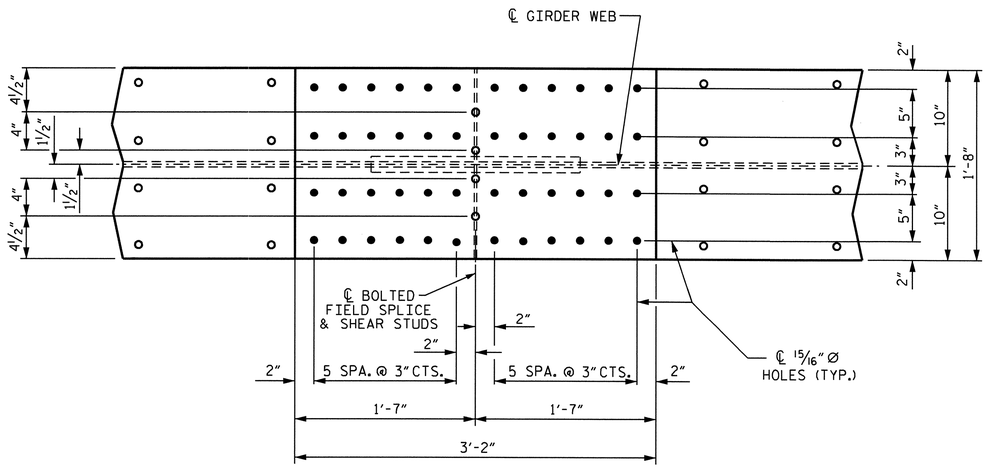
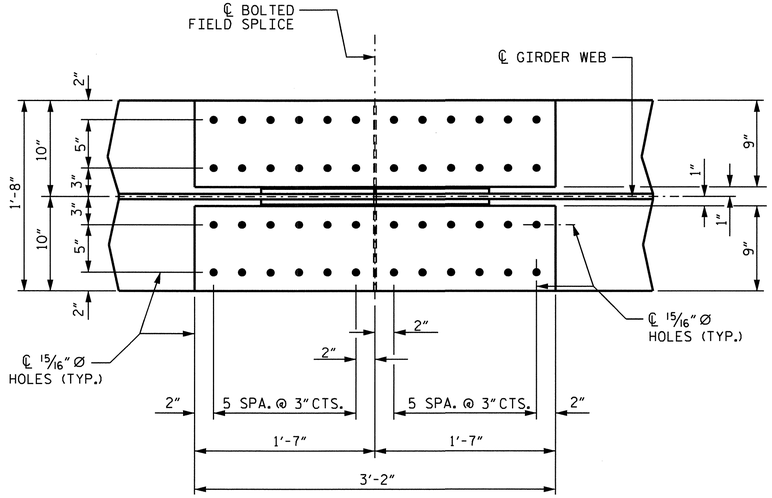
dfigueroa

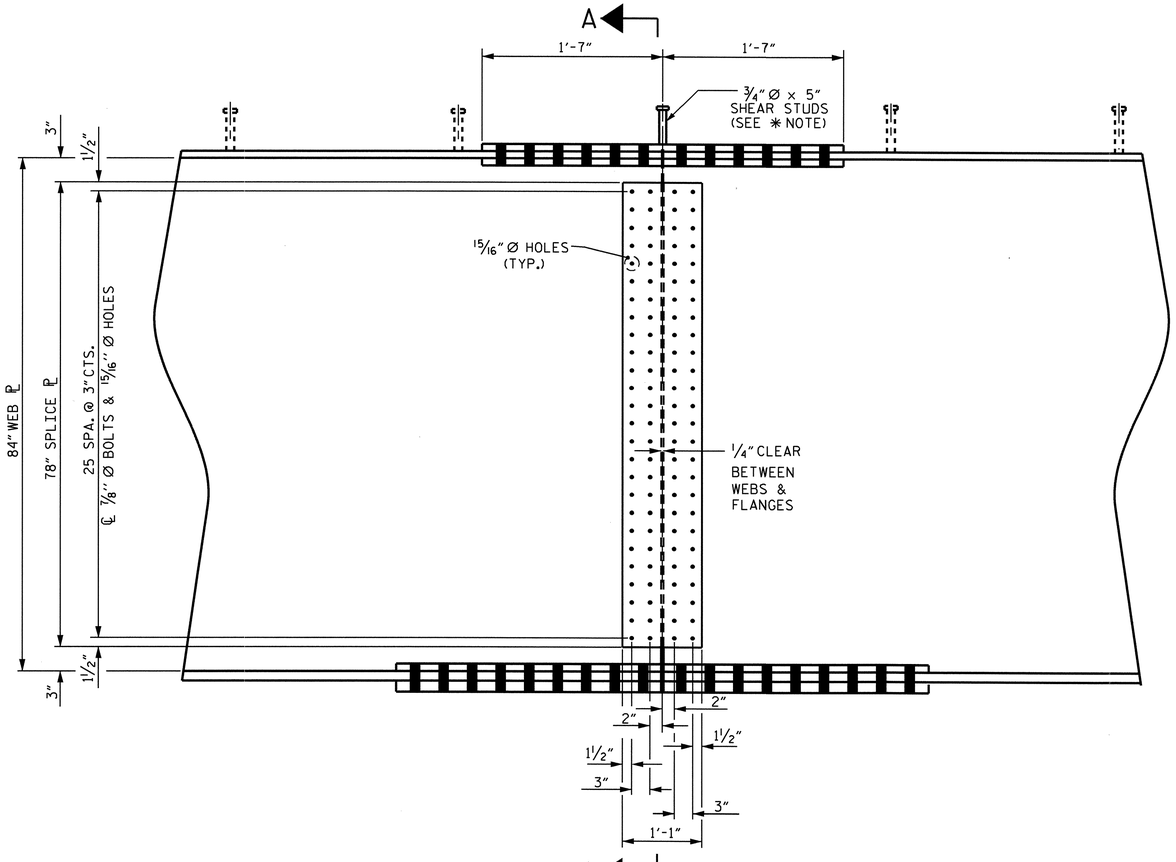
NC005



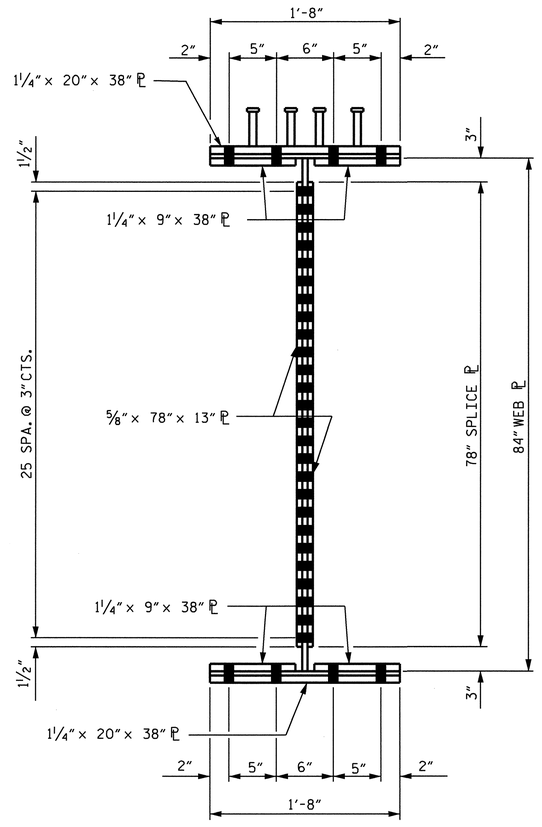
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

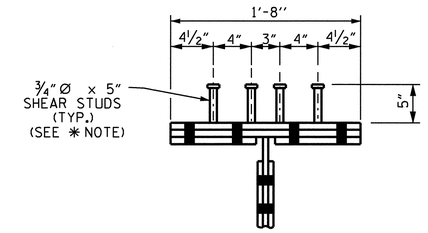


ELEVATION



SECTION A-A

* NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(BOLTED FIELD SPLICE #2 SHOWN; BOLTED FIELD SPLICE #3 SIMILAR)

DRAWN BY : V.X. NGUYEN DATE : 3-3-10
CHECKED BY : D. HODGE DATE : 5/10

14-JUN-2010 12:03
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NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL LEE HODGE JR.
8-2-10

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			44

NCDOT

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDER #1

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.019	0.038	0.056	0.071	0.084	0.094	0.102	0.106	0.108	0.106	0.101	0.094	0.084	0.073	0.060	0.047	0.034	0.021	0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.054	0.107	0.155	0.198	0.234	0.263	0.284	0.296	0.299	0.294	0.281	0.260	0.233	0.201	0.166	0.129	0.092	0.058	0.026	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.008	0.015	0.022	0.029	0.034	0.038	0.041	0.043	0.044	0.043	0.041	0.039	0.035	0.030	0.025	0.019	0.014	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.081	0.160	0.233	0.298	0.352	0.395	0.427	0.445	0.451	0.443	0.423	0.393	0.352	0.304	0.251	0.195	0.140	0.087	0.040	0.000
VERTICAL CURVE ORDINATE	0.000	-0.018	-0.037	-0.055	-0.073	-0.091	-0.109	-0.128	-0.146	-0.164	-0.182	-0.201	-0.217	-0.224	-0.221	-0.209	-0.187	-0.155	-0.113	-0.061	0.000
REQUIRED CAMBER	0	3/4"	1 1/2"	2 1/8"	2 11/16"	3 1/8"	3 7/16"	3 9/16"	3 9/16"	3 7/16"	3 1/8"	2 11/16"	2 1/8"	1 9/16"	1"	1/2"	1/8"	- 3/16"	- 5/16"	- 1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDER #2

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.020	0.040	0.058	0.074	0.088	0.099	0.107	0.111	0.113	0.111	0.106	0.098	0.088	0.076	0.063	0.049	0.035	0.022	0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.055	0.107	0.156	0.199	0.236	0.265	0.285	0.297	0.301	0.296	0.282	0.262	0.234	0.202	0.167	0.129	0.093	0.058	0.026	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.008	0.015	0.022	0.028	0.033	0.037	0.041	0.042	0.043	0.042	0.041	0.038	0.034	0.029	0.024	0.019	0.013	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.083	0.162	0.236	0.301	0.357	0.401	0.433	0.450	0.457	0.449	0.429	0.398	0.356	0.307	0.254	0.197	0.141	0.088	0.040	0.000
VERTICAL CURVE ORDINATE	0.000	-0.016	-0.033	-0.049	-0.065	-0.081	-0.097	-0.114	-0.130	-0.146	-0.162	-0.179	-0.195	-0.205	-0.205	-0.195	-0.176	-0.147	-0.108	-0.059	0.000
REQUIRED CAMBER	0	13/16"	1 9/16"	2 1/4"	2 13/16"	3 5/16"	3 5/8"	3 13/16"	3 7/8"	3 3/4"	3 7/16"	3"	2 7/16"	1 13/16"	1 1/4"	11/16"	1/4"	- 1/16"	- 1/4"	- 1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDER #3

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.020	.040	0.058	0.074	0.088	0.099	0.107	0.111	0.113	0.111	0.106	0.098	0.088	0.076	0.063	0.049	0.035	0.022	0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.055	0.108	0.156	0.200	0.237	0.266	0.287	0.299	0.302	0.297	0.284	0.263	0.235	0.203	0.167	0.130	0.093	0.058	0.027	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.008	0.015	0.022	0.028	0.033	0.037	0.041	0.042	0.043	0.042	0.041	0.038	0.034	0.029	0.024	0.019	0.013	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.083	0.163	0.236	0.302	0.358	0.402	0.435	0.452	0.458	0.450	0.431	0.399	0.357	0.308	0.254	0.198	0.141	0.088	0.041	0.000
VERTICAL CURVE ORDINATE	0.000	-0.014	-0.029	-0.043	-0.057	-0.072	-0.086	-0.100	-0.115	-0.129	-0.144	-0.158	-0.172	-0.184	-0.188	-0.181	-0.164	-0.138	-0.102	-0.056	0.000
REQUIRED CAMBER	0	13/16"	1 5/8"	2 5/16"	2 15/16"	3 7/16"	3 13/16"	4"	4 1/16"	3 15/16"	3 11/16"	3 1/4"	2 3/4"	2 1/16"	1 7/16"	7/8"	3/8"	1/16"	- 3/16"	- 3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A - GIRDER #4

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.019	.038	0.056	0.071	0.084	0.094	0.102	0.106	0.108	0.106	0.101	0.094	0.084	0.073	0.060	0.047	0.034	0.021	0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.055	0.108	0.157	0.201	0.238	0.267	0.288	0.300	0.304	0.298	0.285	0.264	0.237	0.204	0.168	0.131	0.094	0.058	0.027	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.008	0.015	0.022	0.029	0.034	0.038	0.041	0.043	0.044	0.043	0.041	0.039	0.035	0.030	0.025	0.019	0.014	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.082	0.161	0.235	0.301	0.356	0.399	0.431	0.449	0.456	0.447	0.427	0.397	0.356	0.307	0.253	0.197	0.142	0.087	0.041	0.000
VERTICAL CURVE ORDINATE	0.000	-0.013	-0.025	-0.038	-0.050	-0.063	-0.076	-0.088	-0.101	-0.113	-0.126	-0.138	-0.151	-0.163	-0.170	-0.166	-0.152	-0.129	-0.096	-0.053	0.000
REQUIRED CAMBER	0	13/16"	1 5/8"	2 3/8"	3"	3 1/2"	3 7/8"	4 1/8"	4 3/16"	4 1/8"	3 7/8"	3 7/16"	2 15/16"	2 5/16"	1 5/8"	1 1/16"	9/16"	1/8"	- 1/8"	- 1/8"	0

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

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL CHICHESTER, JR.
8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : V.X. NGUYEN/ALF DATE : 3/23/10
CHECKED BY : D.HODGE DATE : 6/14/10

15-JUN-2010 09:24
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TWENTIETH POINTS	SPAN B - GIRDER #1																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.007	-0.012	-0.016	-0.018	-0.019	-0.019	-0.018	-0.018	-0.018	-0.017	-0.018	-0.018	-0.018	-0.019	-0.019	-0.018	-0.016	-0.012	-0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.019	-0.033	-0.042	-0.048	-0.049	-0.048	-0.047	-0.045	-0.043	-0.043	-0.043	-0.045	-0.047	-0.048	-0.049	-0.048	-0.042	-0.033	-0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.002	-0.004	-0.005	-0.004	-0.004	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	-0.002	-0.002	-0.003	-0.004	-0.004	-0.005	-0.004	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.028	-0.049	-0.063	-0.070	-0.072	-0.070	-0.067	-0.065	-0.062	-0.061	-0.062	-0.065	-0.067	-0.070	-0.072	-0.070	-0.063	-0.049	-0.028	0.000
VERTICAL CURVE ORDINATE	0.000	-0.086	-0.162	-0.230	-0.288	-0.338	-0.378	-0.410	-0.432	-0.446	-0.450	-0.446	-0.432	-0.410	-0.378	-0.338	-0.288	-0.230	-0.162	-0.086	0.000
REQUIRED CAMBER	0	-1 3/8"	-2 9/16"	-3 1/2"	-4 5/16"	-4 15/16"	-5 3/8"	-5 11/16"	-5 15/16"	-6 1/8"	-6 1/8"	-6 1/8"	-5 15/16"	-5 11/16"	-5 3/8"	-4 15/16"	-4 5/16"	-3 1/2"	-2 9/16"	-1 3/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TWENTIETH POINTS	SPAN B - GIRDER #2																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.007	-0.013	-0.017	-0.019	-0.020	-0.020	-0.019	-0.019	-0.018	-0.018	-0.018	-0.019	-0.019	-0.020	-0.020	-0.019	-0.017	-0.013	-0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.019	-0.033	-0.043	-0.048	-0.049	-0.049	-0.047	-0.045	-0.044	-0.043	-0.044	-0.045	-0.047	-0.049	-0.049	-0.048	-0.043	-0.033	-0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.002	-0.004	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.003	-0.004	-0.004	-0.004	-0.004	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.028	-0.050	-0.064	-0.071	-0.073	-0.072	-0.068	-0.065	-0.063	-0.062	-0.063	-0.065	-0.068	-0.072	-0.073	-0.071	-0.064	-0.050	-0.028	0.000
VERTICAL CURVE ORDINATE	0.000	-0.086	-0.162	-0.230	-0.288	-0.338	-0.378	-0.410	-0.432	-0.446	-0.450	-0.446	-0.432	-0.410	-0.378	-0.338	-0.288	-0.230	-0.162	-0.086	0.000
REQUIRED CAMBER	0	-1 3/8"	-2 9/16"	-3 1/2"	-4 5/16"	-4 15/16"	-5 3/8"	-5 3/4"	-5 15/16"	-6 1/8"	-6 1/8"	-6 1/8"	-5 15/16"	-5 3/4"	-5 3/8"	-4 15/16"	-4 5/16"	-3 1/2"	-2 9/16"	-1 3/8"	0

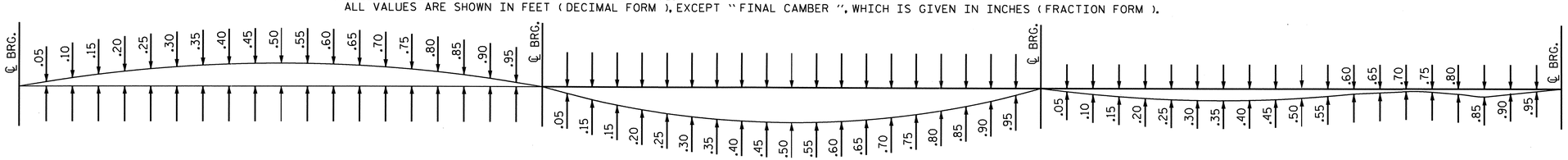
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TWENTIETH POINTS	SPAN B - GIRDER #3																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.007	-0.013	-0.017	-0.019	-0.020	-0.020	-0.019	-0.019	-0.018	-0.018	-0.018	-0.019	-0.019	-0.020	-0.020	-0.019	-0.017	-0.013	-0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.019	-0.033	-0.043	-0.048	-0.050	-0.049	-0.047	-0.045	-0.044	-0.043	-0.044	-0.045	-0.047	-0.049	-0.050	-0.048	-0.043	-0.033	-0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.002	-0.004	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.003	-0.004	-0.004	-0.004	-0.004	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.028	-0.050	-0.064	-0.071	-0.074	-0.072	-0.068	-0.065	-0.063	-0.062	-0.063	-0.065	-0.068	-0.072	-0.074	-0.071	-0.064	-0.050	-0.028	0.000
VERTICAL CURVE ORDINATE	0.000	-0.086	-0.162	-0.230	-0.288	-0.338	-0.378	-0.410	-0.432	-0.446	-0.450	-0.446	-0.432	-0.410	-0.378	-0.338	-0.288	-0.230	-0.162	-0.086	0.000
REQUIRED CAMBER	0	-1 3/8"	-2 9/16"	-3 1/2"	-4 5/16"	-4 15/16"	-5 3/8"	-5 3/4"	-6"	-6 1/8"	-6 1/8"	-6 1/8"	-6"	-5 3/4"	-5 3/8"	-4 15/16"	-4 5/16"	-3 1/2"	-2 9/16"	-1 3/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TWENTIETH POINTS	SPAN B - GIRDER #4																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.007	-0.012	-0.016	-0.018	-0.019	-0.019	-0.018	-0.018	-0.018	-0.017	-0.018	-0.018	-0.018	-0.019	-0.019	-0.018	-0.016	-0.012	-0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.019	-0.033	-0.043	-0.048	-0.050	-0.049	-0.047	-0.045	-0.044	-0.043	-0.044	-0.045	-0.047	-0.049	-0.050	-0.048	-0.043	-0.033	-0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.002	-0.004	-0.005	-0.004	-0.004	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	-0.002	-0.002	-0.003	-0.004	-0.004	-0.005	-0.004	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.028	-0.049	-0.064	-0.070	-0.073	-0.071	-0.067	-0.065	-0.063	-0.061	-0.063	-0.065	-0.067	-0.071	-0.073	-0.070	-0.064	-0.049	-0.028	0.000
VERTICAL CURVE ORDINATE	0.000	-0.086	-0.162	-0.230	-0.288	-0.338	-0.378	-0.410	-0.432	-0.446	-0.450	-0.446	-0.432	-0.410	-0.378	-0.338	-0.288	-0.230	-0.162	-0.086	0.000
REQUIRED CAMBER	0	-1 3/8"	-2 9/16"	-3 1/2"	-4 5/16"	-4 15/16"	-5 3/8"	-5 3/4"	-5 15/16"	-6 1/8"	-6 1/8"	-6 1/8"	-5 15/16"	-5 3/4"	-5 3/8"	-4 15/16"	-4 5/16"	-3 1/2"	-2 9/16"	-1 3/8"	0

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



SPAN A SPAN B SPAN C

SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD
DEFLECTION TABLES
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. FRENCH, JR.
8-2-10

DRAWN BY : V.X. NGUYEN/ALF DATE : 3/23/10
CHECKED BY : D.HODGE DATE : 6/14/10

27-JUL-2010 14:50
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDER #1

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.010	0.021	0.034	0.047	0.060	0.073	0.084	0.094	0.101	0.106	0.108	0.106	0.102	0.094	0.084	0.071	0.056	0.038	0.019	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.026	0.058	0.092	0.129	0.166	0.201	0.233	0.260	0.281	0.294	0.299	0.296	0.284	0.263	0.234	0.198	0.155	0.107	0.054	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.008	0.014	0.019	0.025	0.030	0.035	0.039	0.041	0.043	0.044	0.043	0.041	0.038	0.034	0.029	0.022	0.015	0.008	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.040	0.087	0.140	0.195	0.251	0.304	0.352	0.393	0.423	0.443	0.451	0.445	0.427	0.395	0.352	0.298	0.233	0.160	0.081	0.000
VERTICAL CURVE ORDINATE	0.000	-0.093	-0.176	-0.250	-0.314	-0.368	-0.412	-0.446	-0.471	-0.485	-0.490	-0.485	-0.471	-0.446	-0.412	-0.368	-0.314	-0.250	-0.176	-0.093	0.000
REQUIRED CAMBER	0	- 5/8''	- 1 1/16''	-1 5/16''	-1 7/16''	- 1 3/8''	-1 5/16''	-1 1/8"	- 1 5/16''	- 3/4''	- 9/16''	- 7/16''	- 5/16''	- 1/4''	- 3/16''	- 3/16''	- 3/16''	- 3/16''	- 3/16''	- 1/8''	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDER #2

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.010	0.022	0.035	0.049	0.063	0.076	0.088	0.098	0.106	0.111	0.113	0.111	0.107	0.099	0.088	0.074	0.058	0.040	0.020	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.026	0.058	0.093	0.129	0.167	0.202	0.234	0.262	0.282	0.296	0.301	0.297	0.285	0.265	0.236	0.199	0.156	0.107	0.055	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.008	0.013	0.019	0.024	0.029	0.034	0.038	0.042	0.042	0.043	0.042	0.041	0.037	0.033	0.028	0.022	0.015	0.008	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.040	0.088	0.141	0.197	0.254	0.307	0.356	0.398	0.430	0.449	0.457	0.450	0.433	0.401	0.357	0.301	0.236	0.162	0.083	0.000
VERTICAL CURVE ORDINATE	0.000	-0.093	-0.176	-0.250	-0.314	-0.368	-0.412	-0.446	-0.471	-0.485	-0.490	-0.485	-0.471	-0.446	-0.412	-0.368	-0.314	-0.250	-0.176	-0.093	0.000
REQUIRED CAMBER	0	- 5/8''	- 1 1/16''	-1 5/16''	-1 3/8''	- 1 3/8''	-1 1/4''	-1 1/16"	- 7/8''	- 1 1/16''	- 1/2''	- 5/16''	- 1/4''	- 1/8''	- 1/8''	- 1/8''	- 1/8''	- 3/16''	- 3/16''	- 1/8''	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDER #3

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.010	0.022	0.035	0.049	0.063	0.076	0.088	0.098	0.106	0.111	0.113	0.111	0.107	0.099	0.088	0.074	0.058	0.040	0.020	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.027	0.058	0.093	0.130	0.167	0.203	0.235	0.263	0.284	0.297	0.302	0.299	0.287	0.266	0.237	0.200	0.156	0.108	0.055	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.008	0.013	0.019	0.024	0.029	0.034	0.038	0.042	0.042	0.043	0.042	0.041	0.037	0.033	0.028	0.022	0.015	0.008	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.041	0.088	0.141	0.198	0.254	0.308	0.357	0.399	0.432	0.450	0.458	0.452	0.435	0.402	0.358	0.302	0.236	0.163	0.083	0.000
VERTICAL CURVE ORDINATE	0.000	-0.093	-0.176	-0.250	-0.314	-0.368	-0.412	-0.446	-0.471	-0.485	-0.490	-0.485	-0.471	-0.446	-0.412	-0.368	-0.314	-0.250	-0.176	-0.093	0.000
REQUIRED CAMBER	0	- 5/8''	- 1 1/16''	-1 5/16''	-1 3/8''	- 1 3/8''	-1 1/4''	-1 1/16"	- 7/8''	- 5/8''	- 1/2''	- 5/16''	- 1/4''	- 1/8''	- 1/8''	- 1/8''	- 1/8''	- 3/16''	- 3/16''	- 1/8''	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C - GIRDER #4

TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	0.010	0.021	0.034	0.047	0.060	0.073	0.084	0.094	0.101	0.106	0.108	0.106	0.102	0.094	0.084	0.071	0.056	0.038	0.019	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.027	0.058	0.094	0.131	0.168	0.204	0.237	0.264	0.285	0.298	0.304	0.300	0.288	0.267	0.238	0.201	0.157	0.108	0.055	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	0.004	0.008	0.014	0.019	0.025	0.030	0.035	0.039	0.041	0.043	0.044	0.043	0.041	0.038	0.034	0.029	0.022	0.015	0.008	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.041	0.087	0.142	0.197	0.253	0.307	0.356	0.397	0.427	0.447	0.456	0.449	0.431	0.399	0.356	0.301	0.235	0.161	0.082	0.000
VERTICAL CURVE ORDINATE	0.000	-0.093	-0.176	-0.250	-0.314	-0.368	-0.412	-0.446	-0.471	-0.485	-0.490	-0.485	-0.471	-0.446	-0.412	-0.368	-0.314	-0.250	-0.176	-0.093	0.000
REQUIRED CAMBER	0	- 5/8''	- 1 1/16''	-1 5/16''	-1 3/8''	- 1 3/8''	-1 1/4''	-1 1/16"	- 7/8''	- 11/16''	- 1/2''	- 3/8''	- 1/4''	- 3/16''	- 1/8''	- 1/8''	- 1/8''	- 3/16''	- 3/16''	- 1/8''	0

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

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. HODGES, JR.
6-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : V.X. NGUYEN/ALF DATE : 3/23/10
CHECKED BY : D.HODGE DATE : 6/14/10

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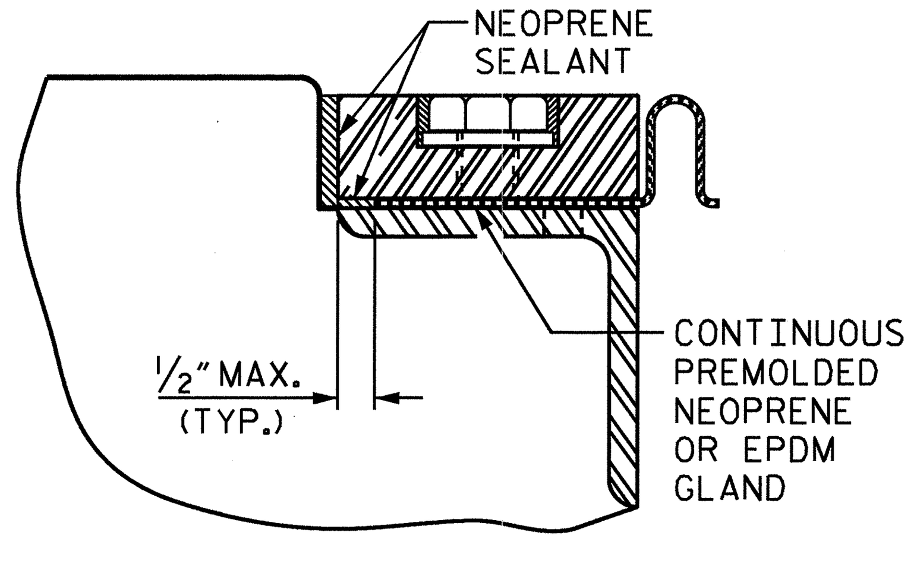

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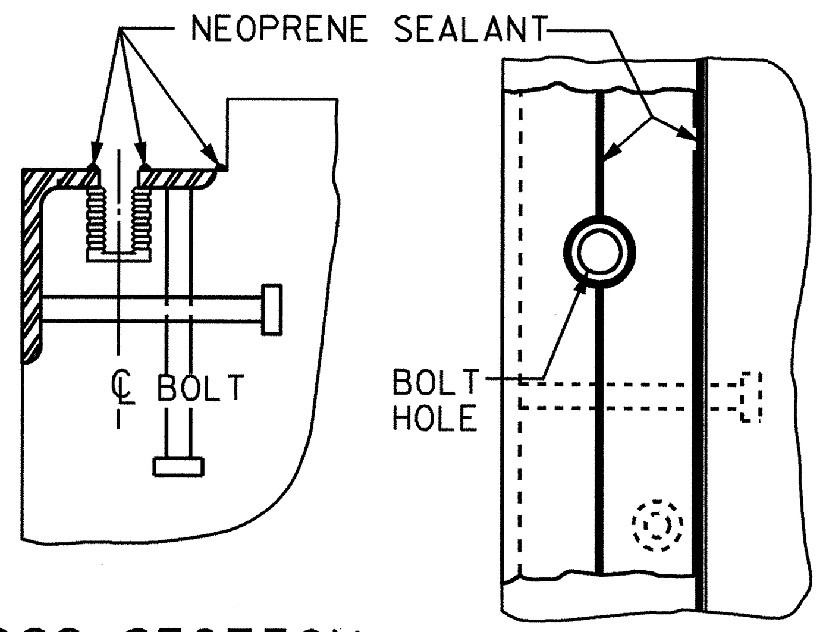
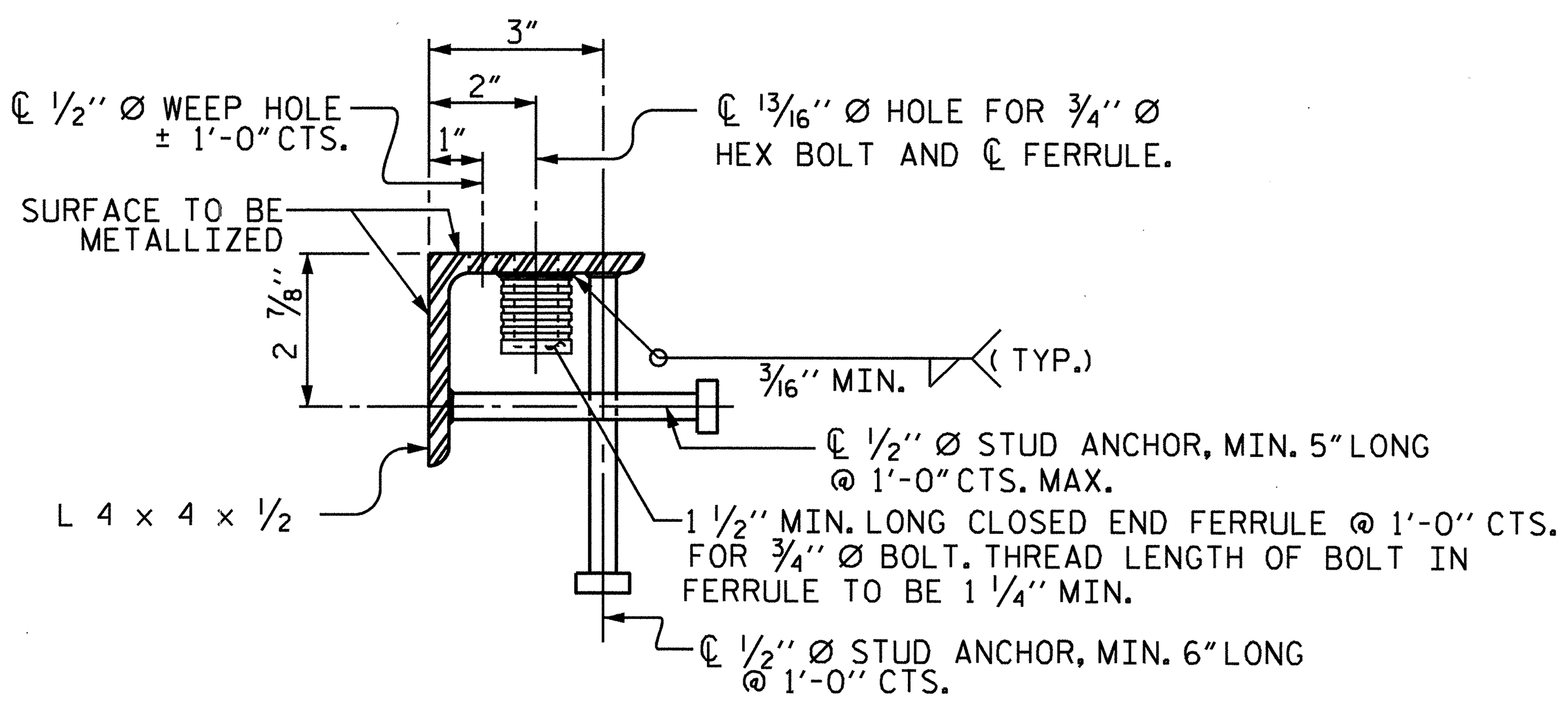


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

INSTALLATION PROCEDURE

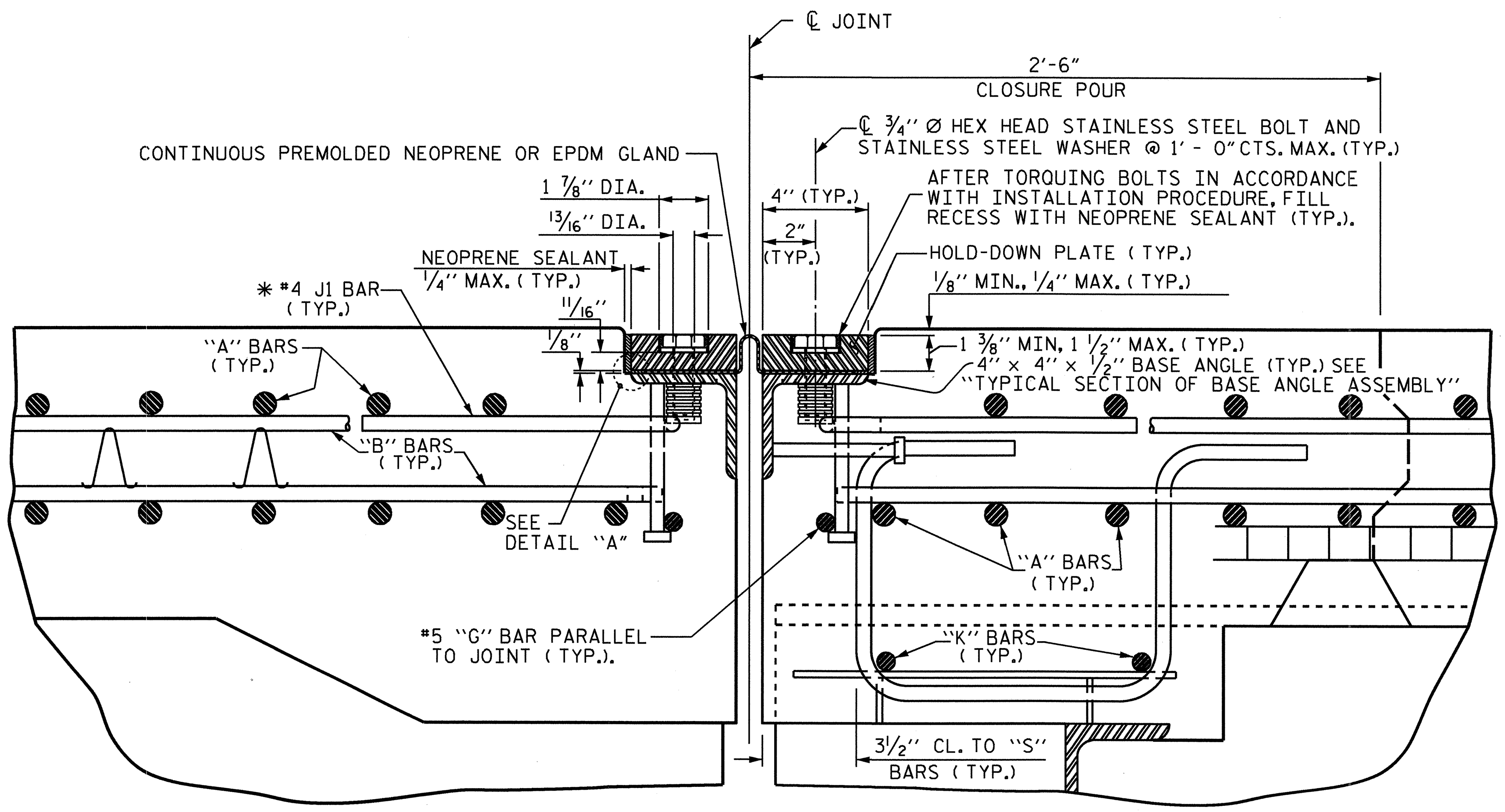
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

MOVEMENT AND SETTING AT JOINT

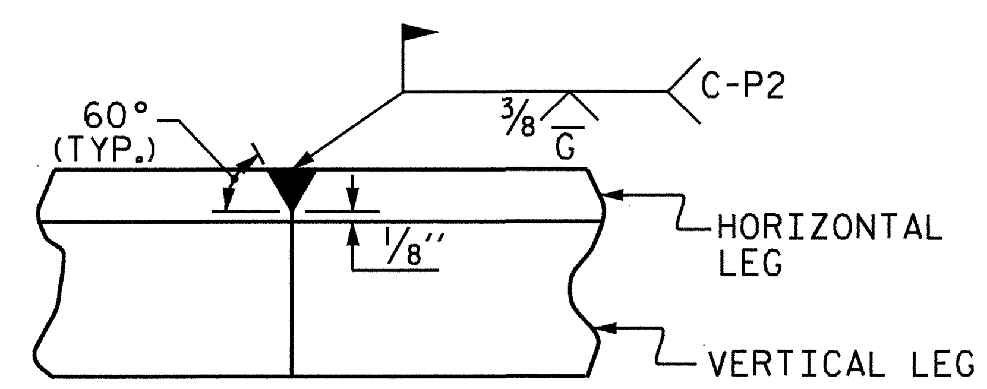
	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	115°-00'-00"	2 11/16"	2 9/16"	2 3/16"	1 1/2"
END BENT 2	115°-00'-00"	2 11/16"	2 9/16"	2 3/16"	1 1/2"



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL A. SHEEK, JR.
8-2-10

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-22
1			3			TOTAL SHEETS	44
2			4				

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-5-10		
CHECKED BY : D. HODGE	DATE : 5-10		
DRAWN BY : REK 9/87		REV. 10/17/00	RWW/LES
CHECKED BY : CRK 10/87		REV. 5/7/03R	RWW/JTE
		REV. 5/1/06	TLA/GM

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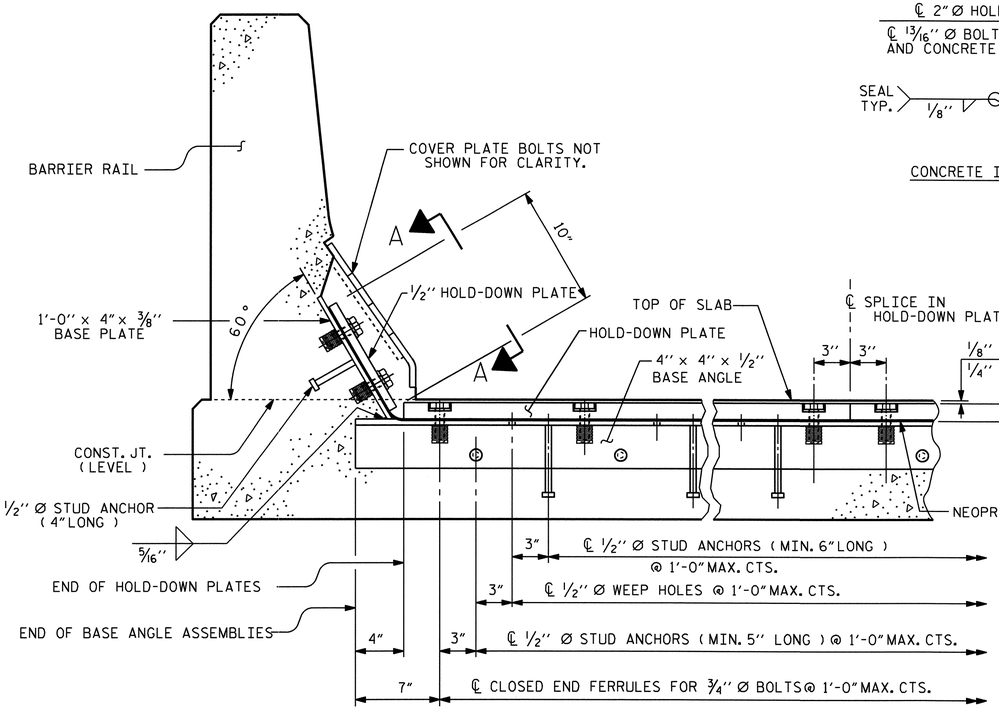
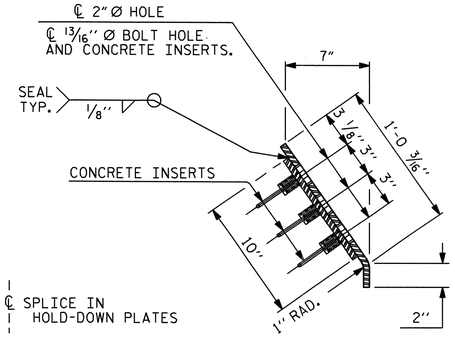
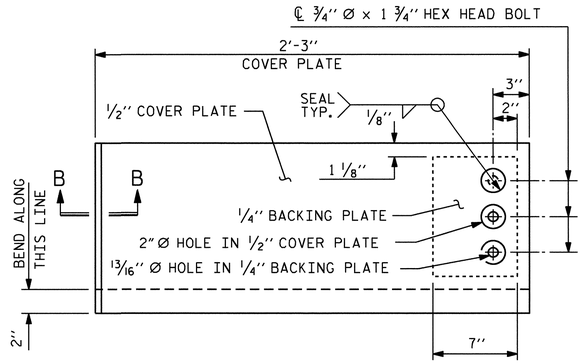
STD. NO. EJS1





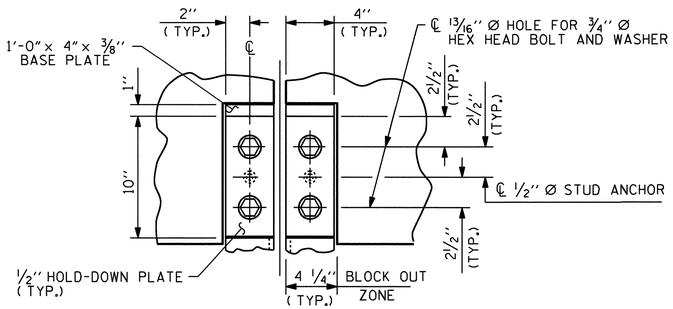
END VIEW

SECTION THRU RAIL NORMAL TO JOINT

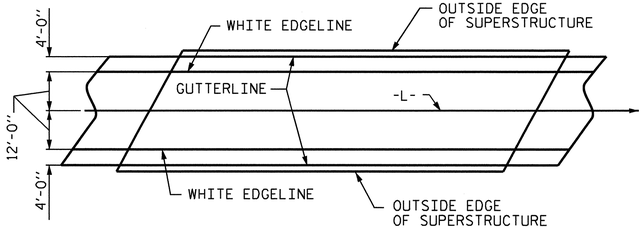


TYPE II - ELEVATION VIEW

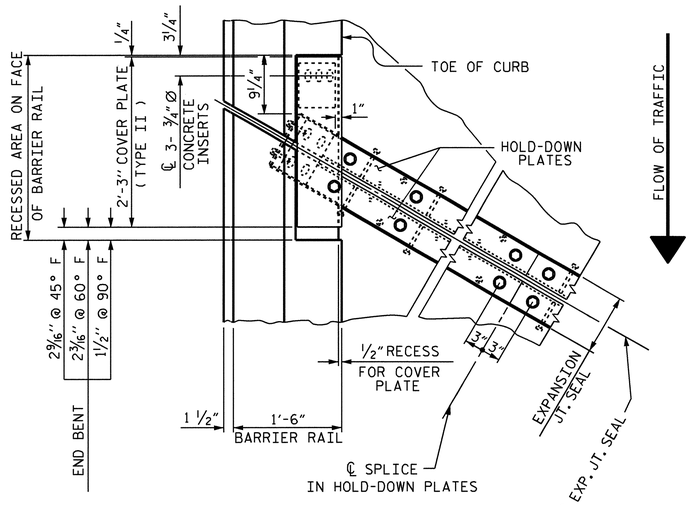
COVER PLATE DETAILS



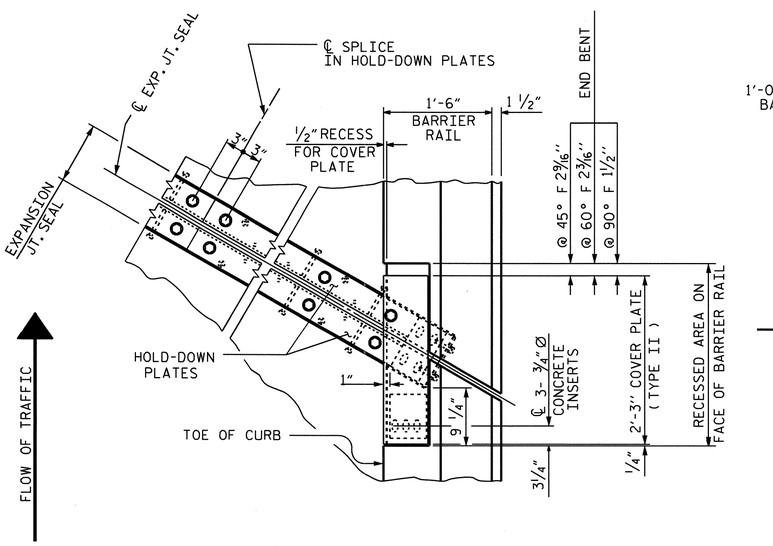
SECTION A - A



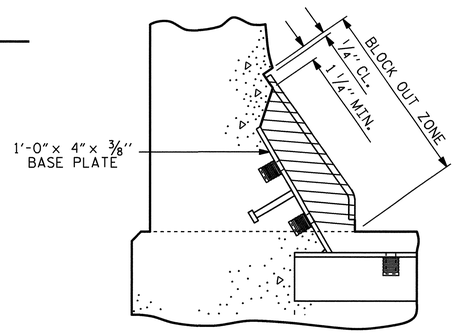
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

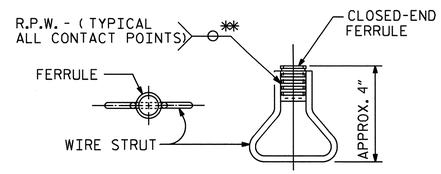


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL

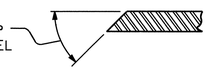
SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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



SECTION B - B

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER M. MARSHALL HODGE 8-2-10

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-8-10	REV. 7/17/98	RWW/LES
CHECKED BY : D. HODGE	DATE : 5-10	REV. 10/17/00	RWW/LES
DRAWN BY : REK 9/87		REV. 5/1/06	TLA/GM
CHECKED BY : CRK 10/87			

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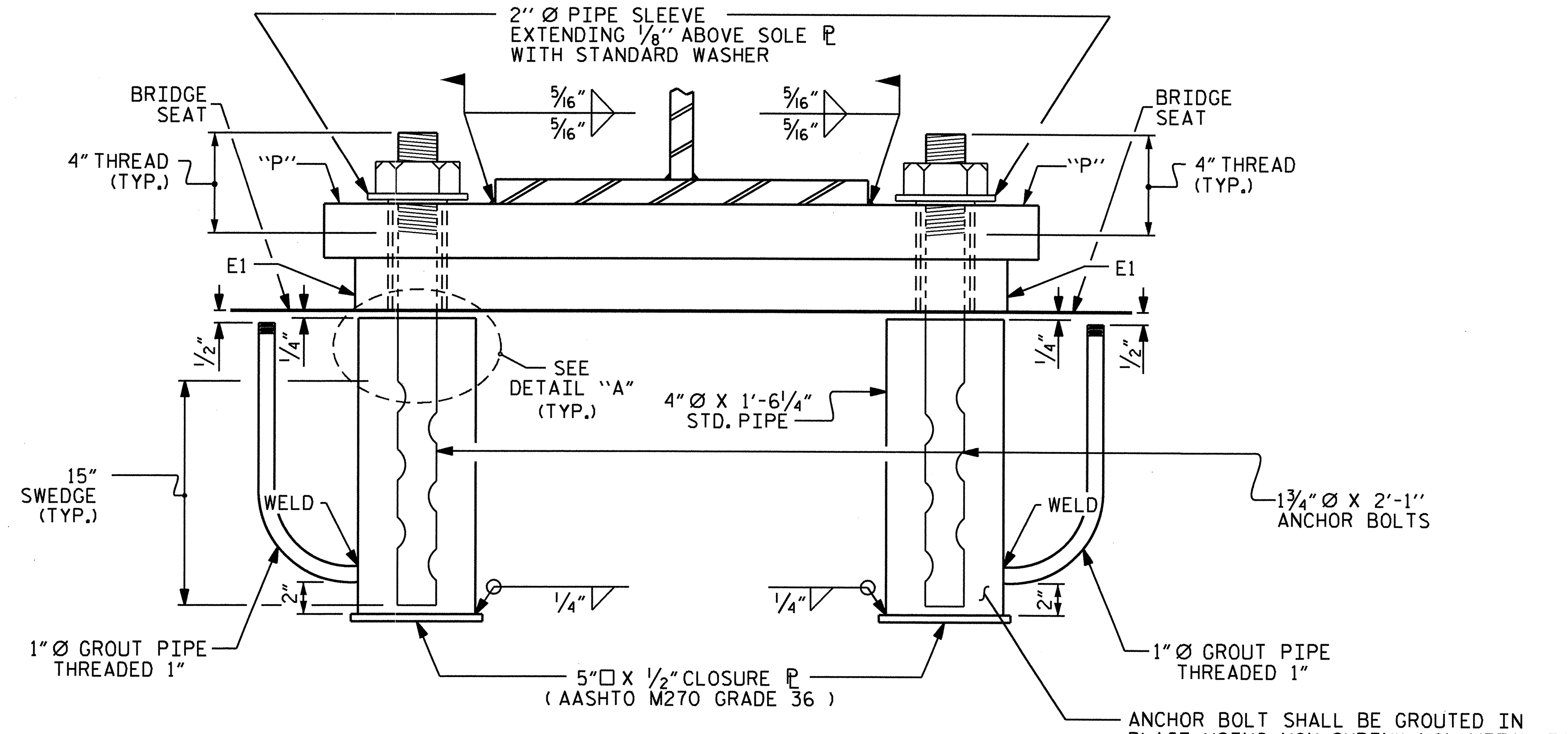
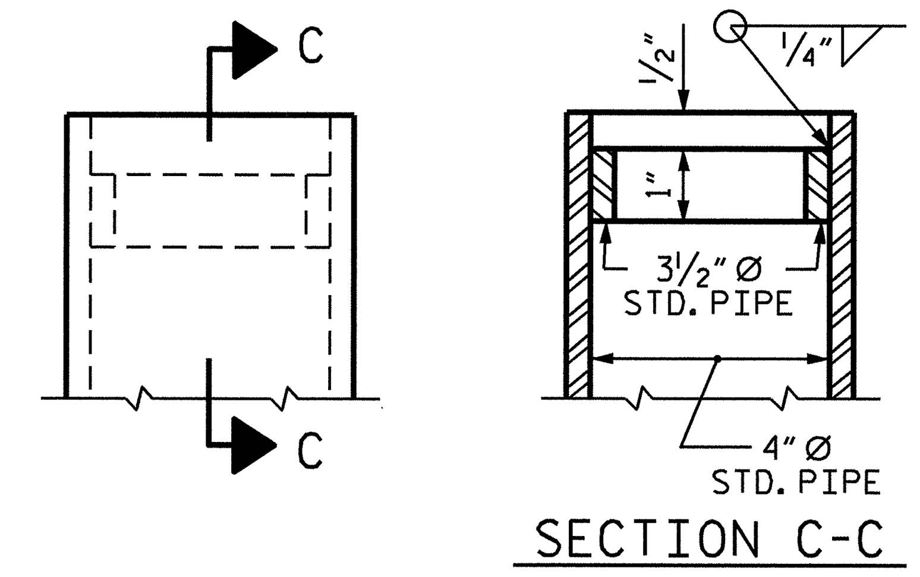


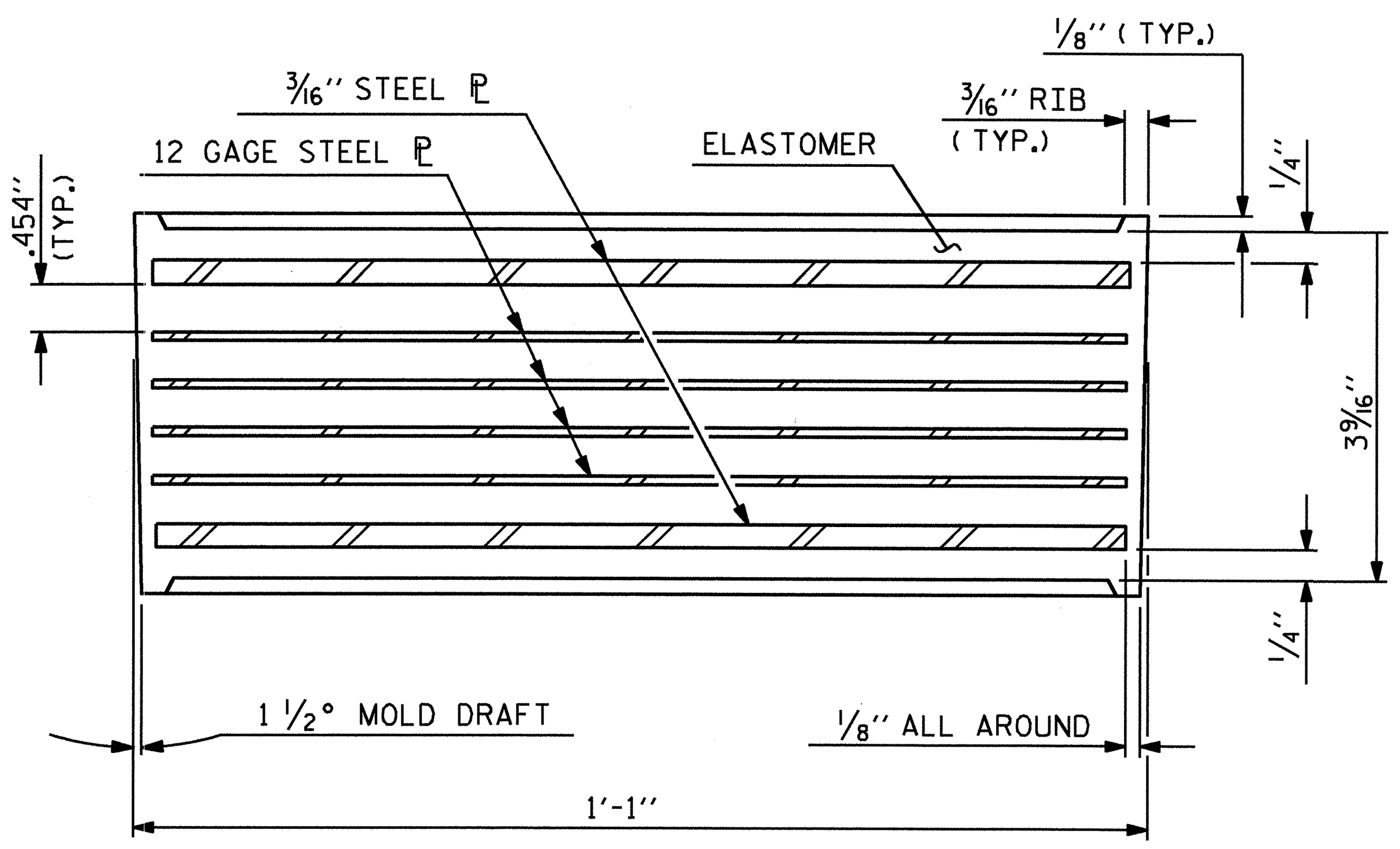
EXPANSION

END VIEW

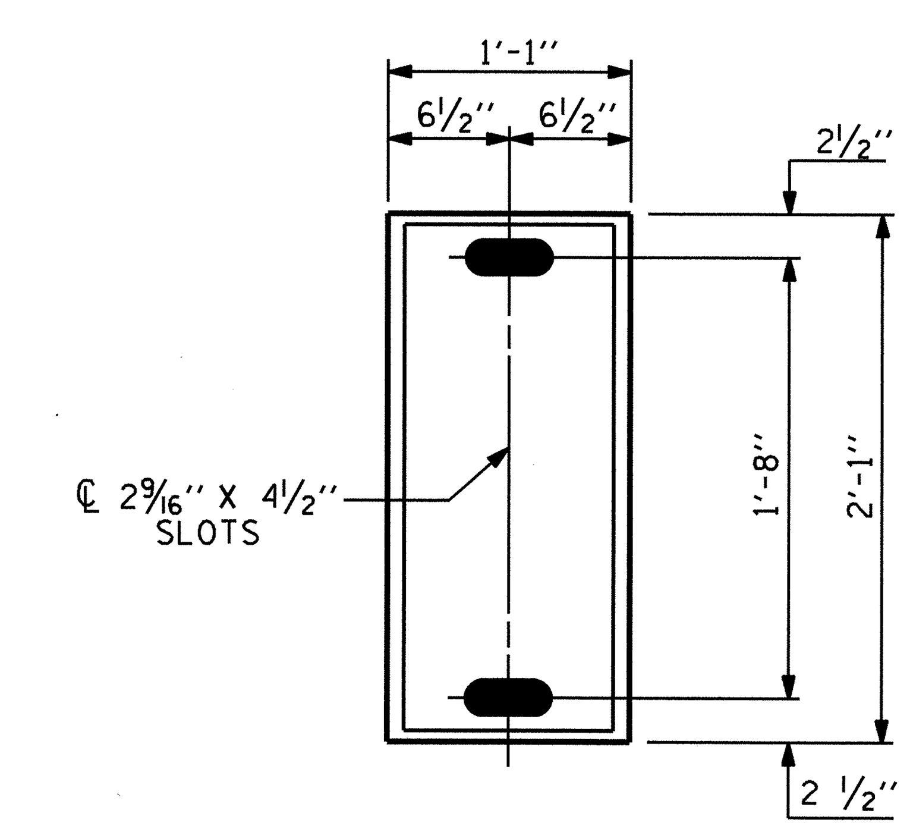


DETAIL "A"

NOTE TO CONTRACTOR: ELASTOMERIC IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



TYPICAL SECTION OF ELASTOMERIC BEARING

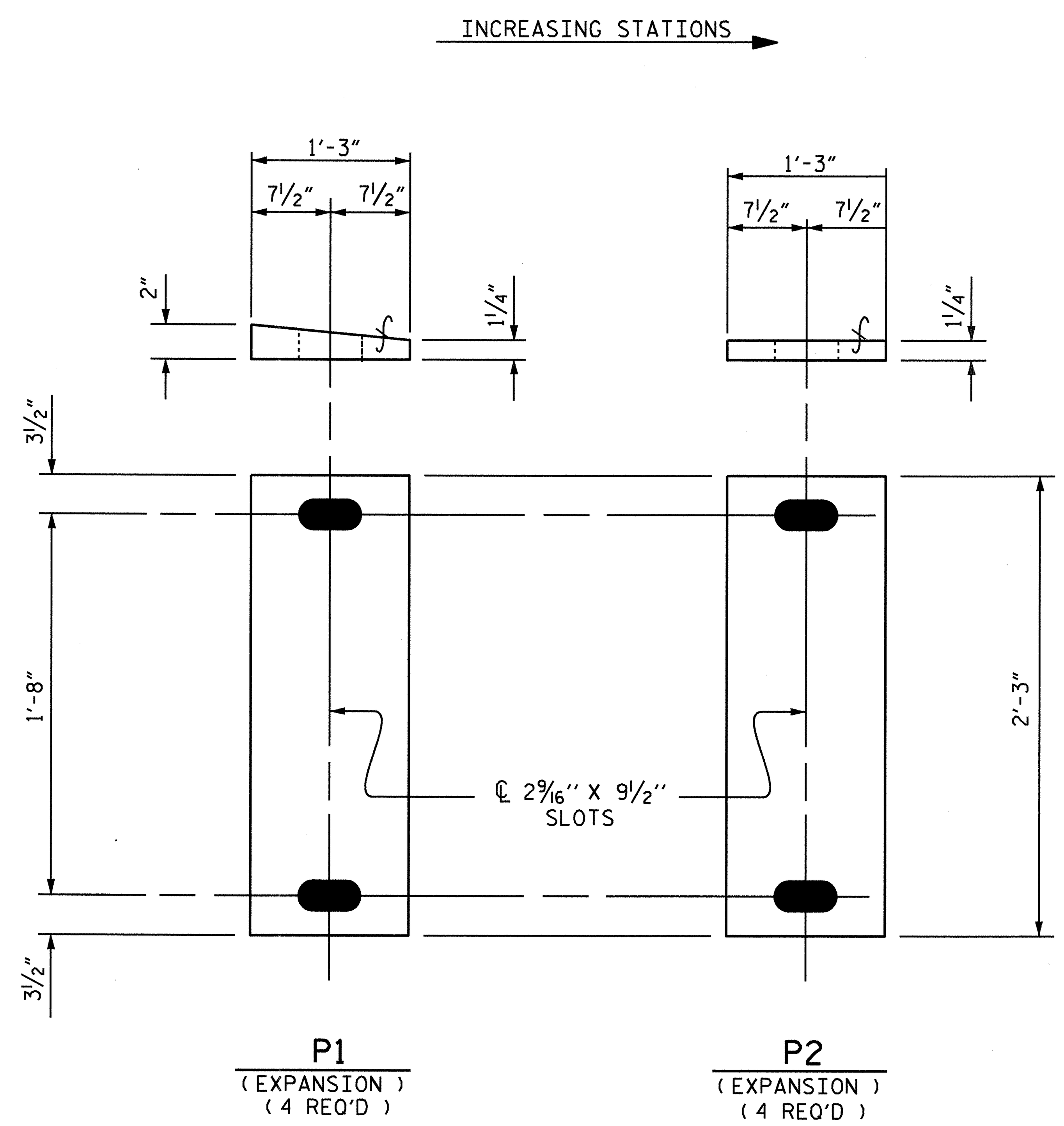


E1 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

(60 DUROMETER)

TYPE V



SOLE PLATE DETAILS ("P")

(FOR LOCATION OF SOLE PLATES, SEE "FRAMING PLAN" SHEETS)

NOTES

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

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

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES TO ACCOMODATE GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ANCHOR BOLTS, SOLE PLATE, AND ELASTOMERIC BEARING SLOTS SHALL BE CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
2. AFTER CENTERING THE SLOTS AND ANCHOR BOLTS, THE SOLE PLATES SHALL BE FIELD WELDED TO THE GIRDER FLANGES AND ANCHOR BOLTS GROUTED.

   THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

—LOAD RATINGS—

	MAX.D.L.+ L.L.
TYPE V	305 K

PROJECT NO. R-4748

MACON COUNTY

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STATE OF NORTH CAROLINA
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ELASTOMERIC BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL L. CLAWSON, JR. 8-2-10

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-24
1			3				TOTAL SHEETS
2			4				44

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-5-10		
CHECKED BY : D. HODGE	DATE : 5-10		
DRAWN BY : EEM 10/95	REV. 10/17/00	RWW/LES	
CHECKED BY : PEK 10/95	REV. 7/10/01	LES/RDR	
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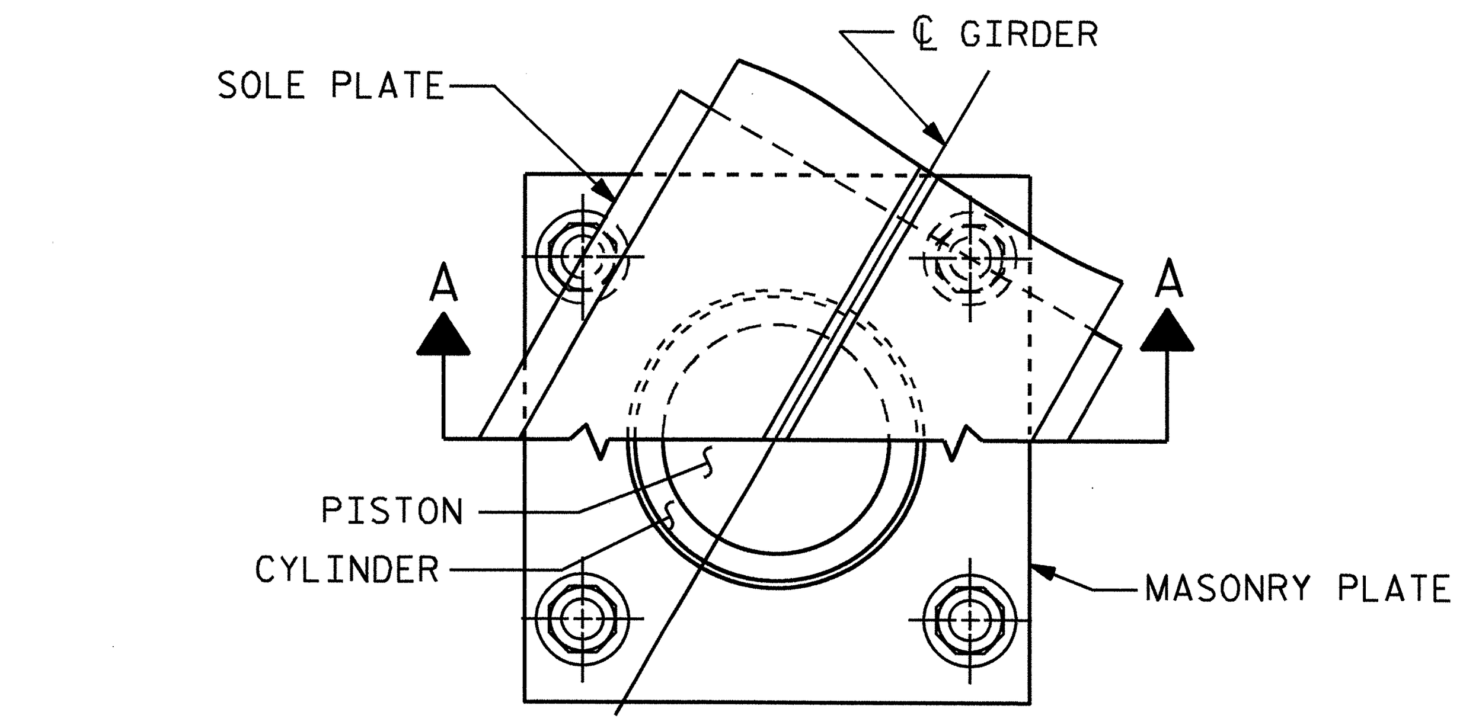
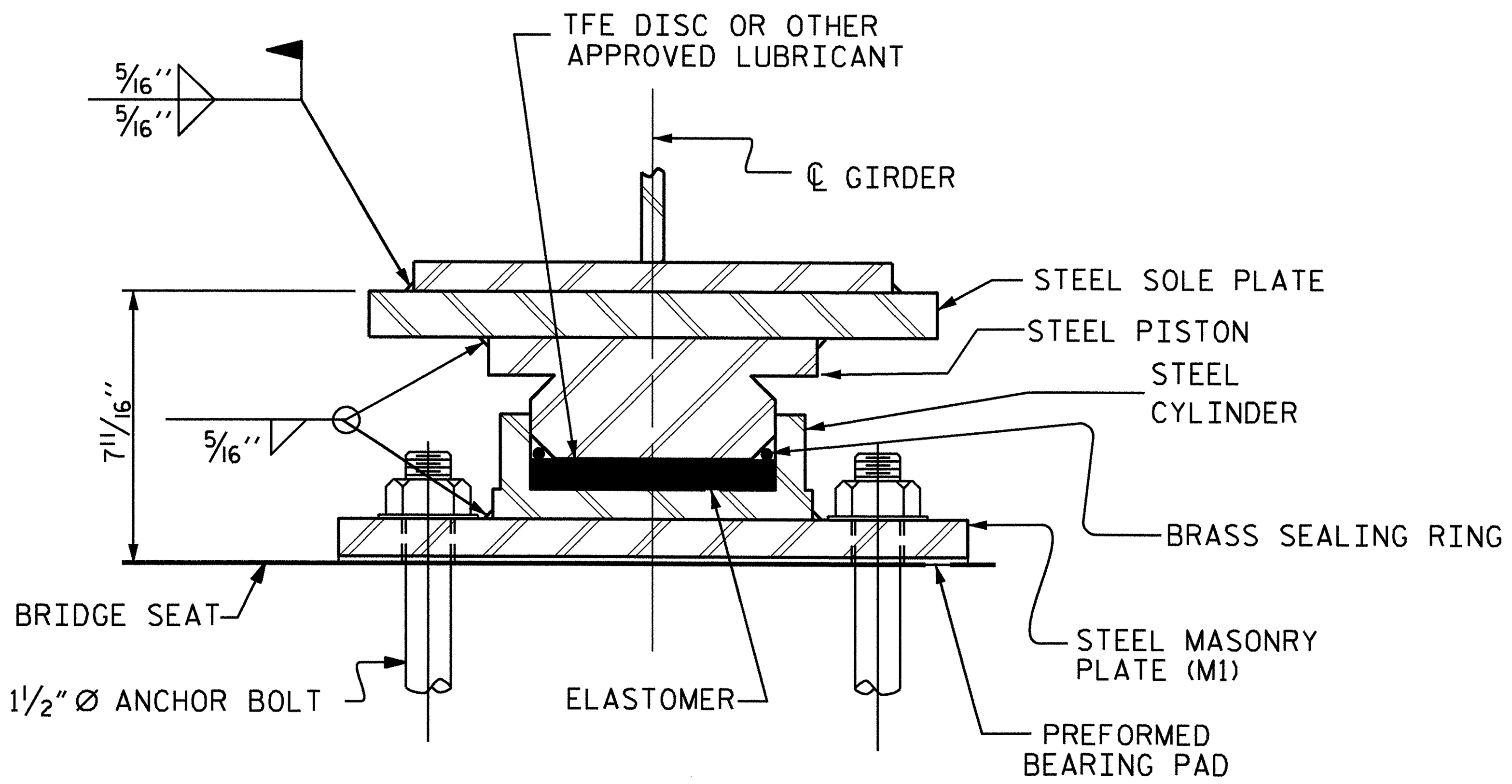


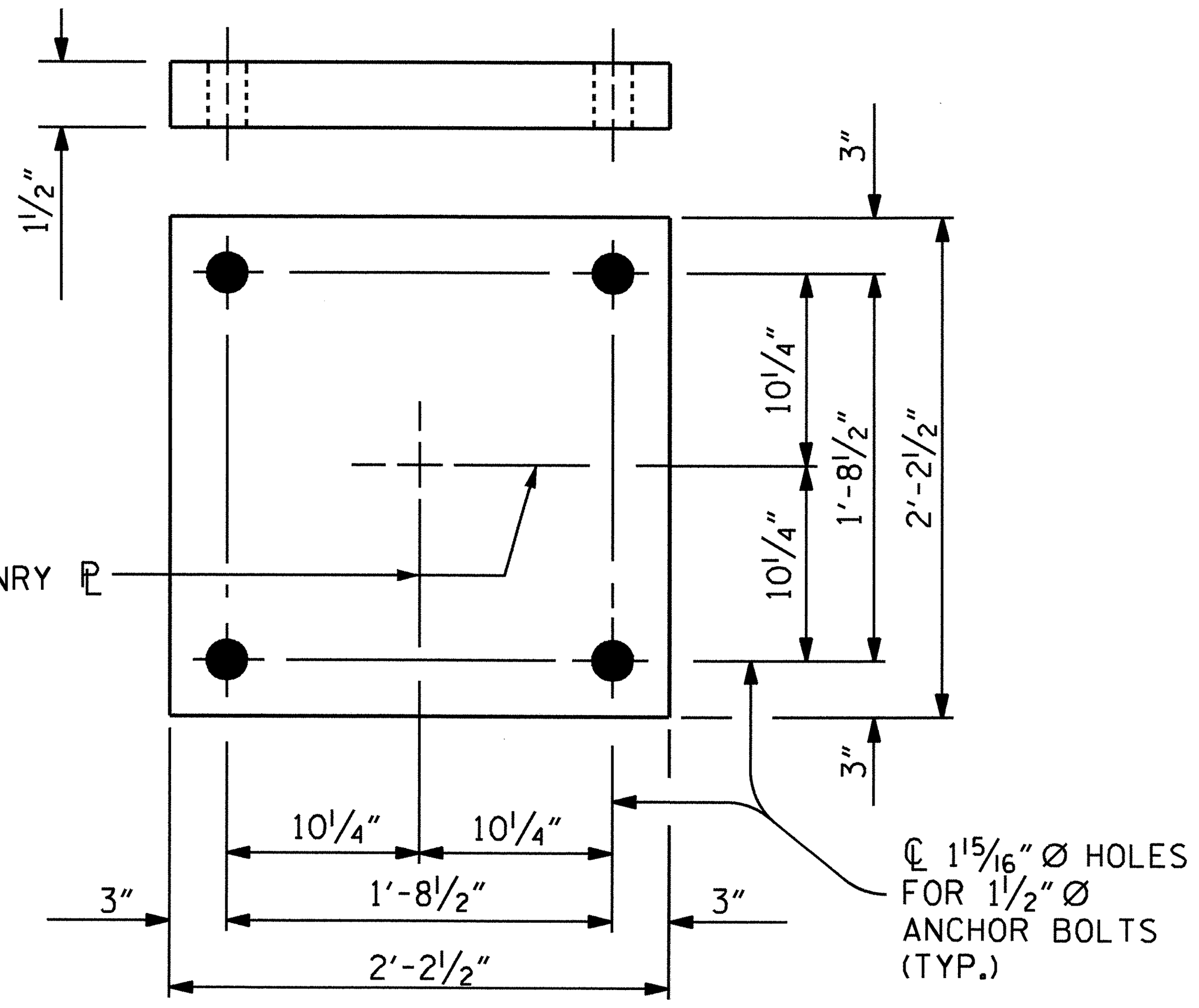
CUT-AWAY PLAN



SECTION A-A

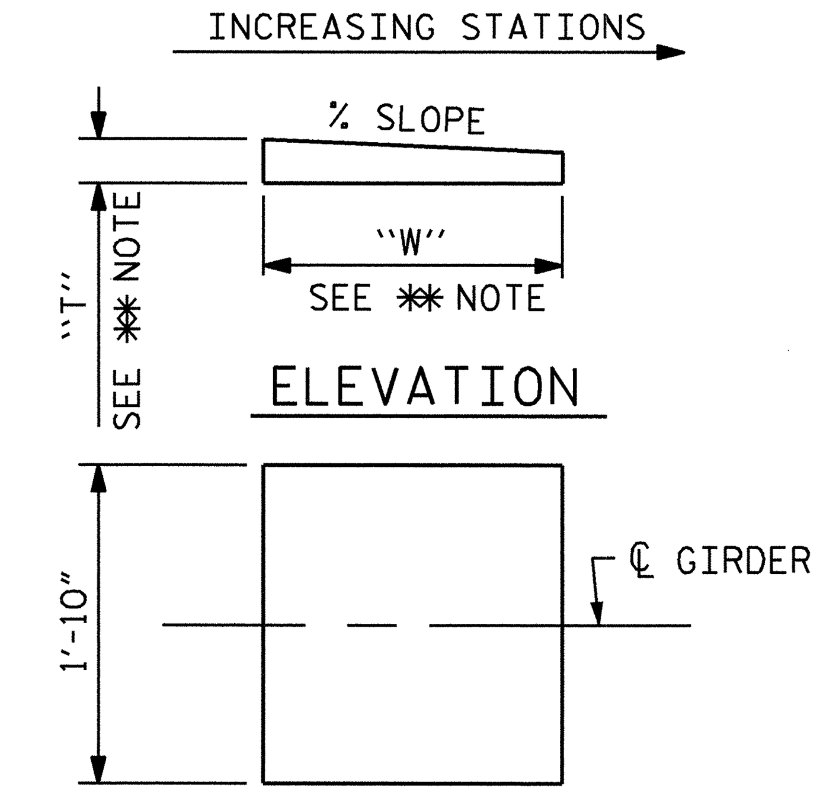
PB1, FIXED
(8 REQ'D.)

POT BEARING DETAILS



PLAN
M1 (8 REQ'D.)

MASONRY PLATE DETAILS



✱✱ NOTE:
DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

SOLE PLATE DETAILS "S"

LOCATION	% SLOPE
BENT 1 - S1	-4.5000
BENT 2 - S2	-3.5000

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2". SEE SPECIAL PROVISIONS.

TABLE FOR UNFACTORED LOADS AND MOVEMENT

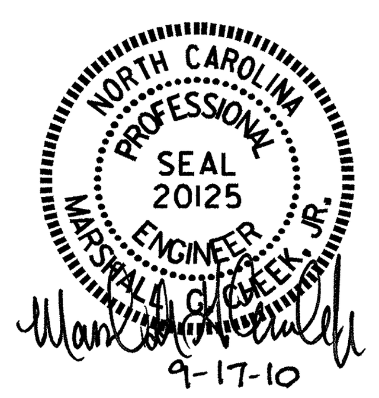
BEARING	LOCATION	VERTICAL LOAD (KIPS)				LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD		LIVE	TOTAL		
		DC	DW				
PB1 (FIXED)	BENT	325.5	94.5	246	666	84	0

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

POT BEARING DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-5-10
CHECKED BY : D. HODGE	DATE : 5-10
DRAWN BY : RWW 8/99	REV. 7/10/01 LES/RDR
CHECKED BY : LES 8/99	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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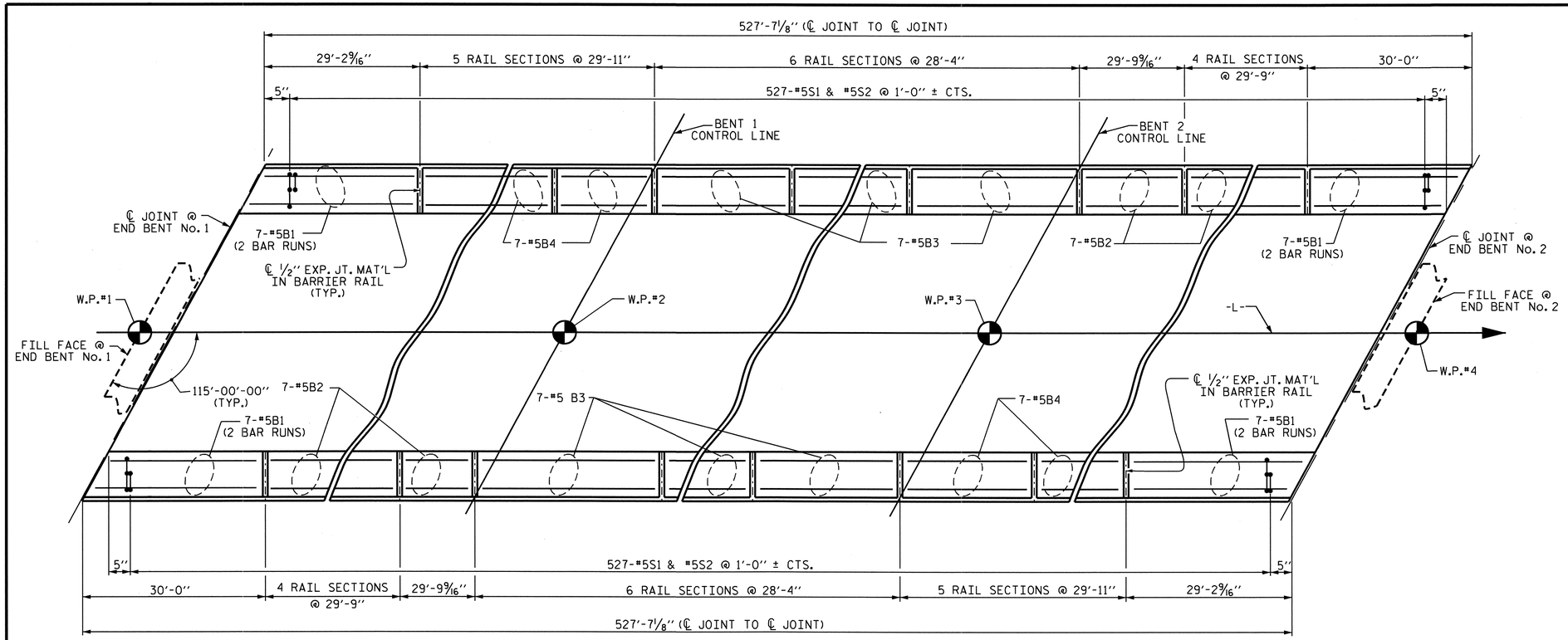
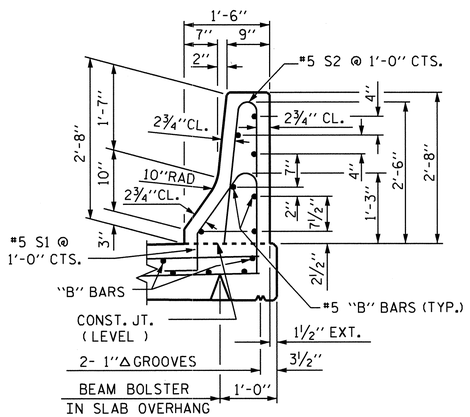
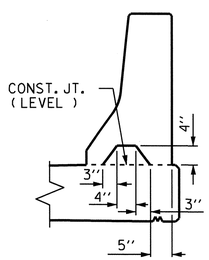


PLAN OF CONCRETE BARRIER RAIL

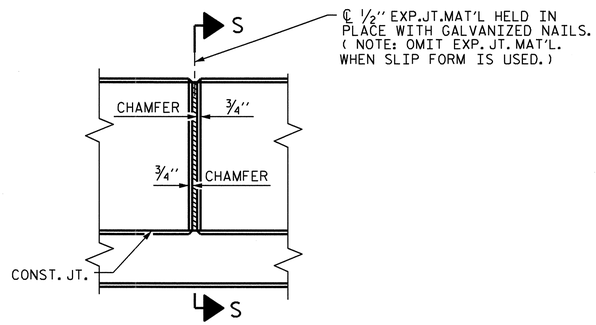


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

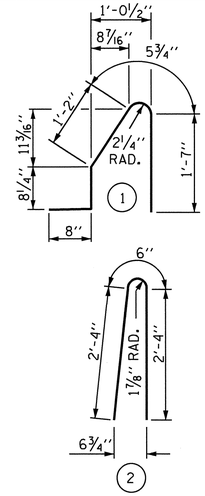
NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT 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.

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.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	1054	#5	1	4'-7"	5039
* S2	1054	#5	2	5'-2"	5680
* B1	56	#5	STR	16'-6"	964
* B2	70	#5	STR	29'-4"	2142
* B3	84	#5	STR	27'-11"	2446
* B4	70	#5	STR	29'-6"	2154

* EPOXY COATED REINFORCING STEEL	18,425 LBS.
CLASS AA CONCRETE	105.6 CU. YDS.
CONCRETE BARRIER RAIL	1055.19 LIN. FT.

PROJECT NO. R-4748

MACON COUNTY

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CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-9-10		
CHECKED BY : D. HODGE	DATE : 5-10		
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	

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL GRAY CREEK, JR. 8-2-10

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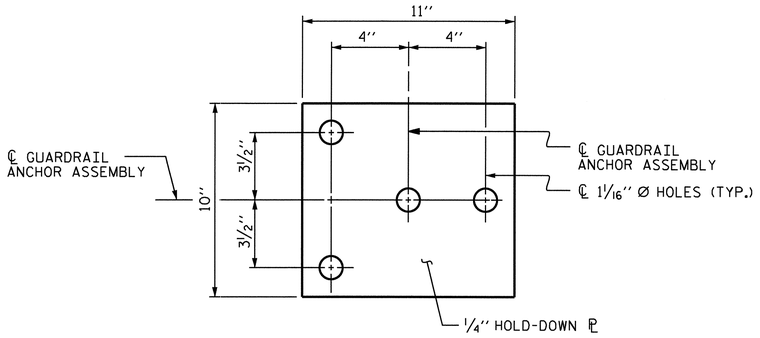
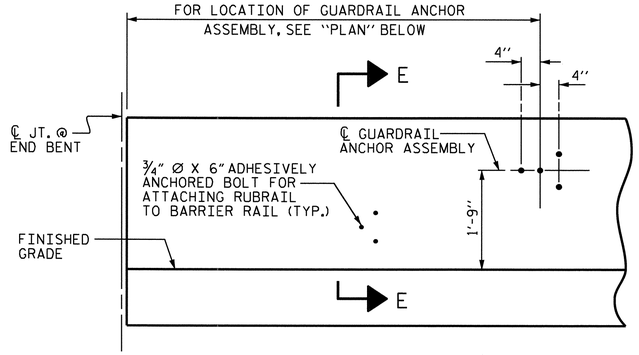
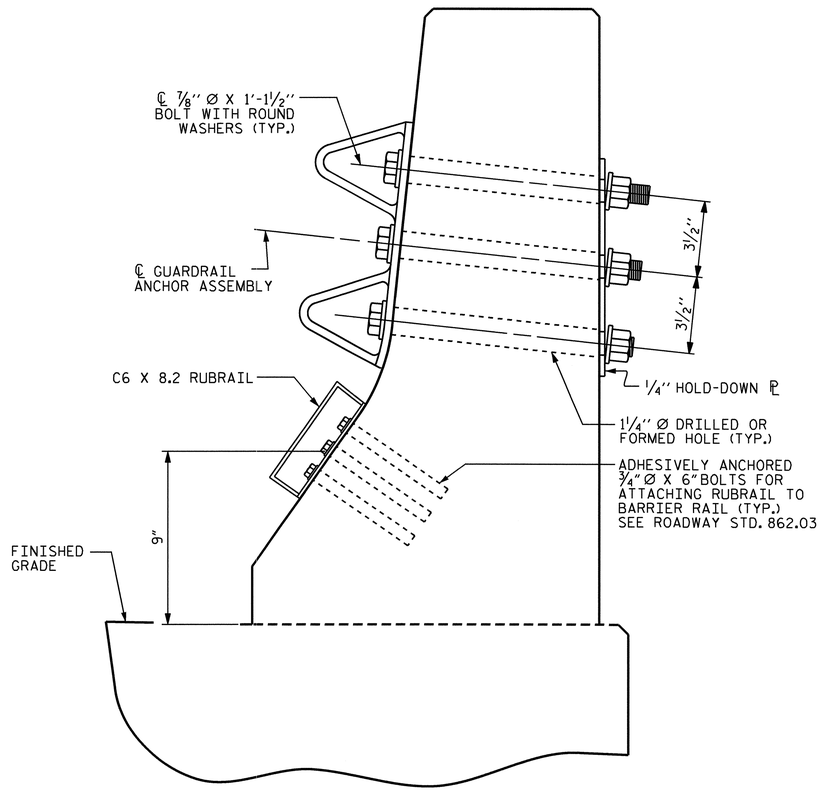


PLAN



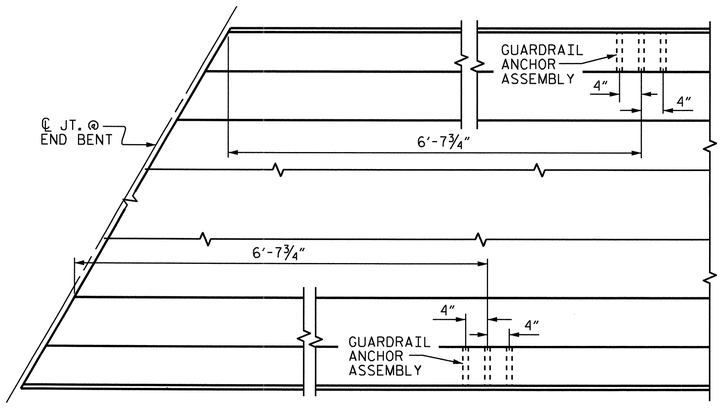
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

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.)

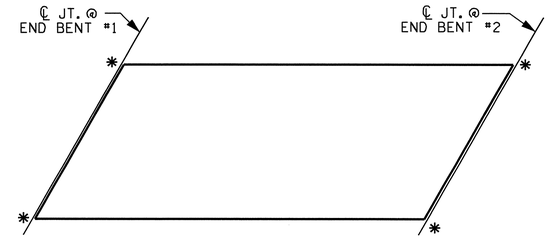
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. OREK, JR. 8-2-10

STD. NO. GRA2

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-9-10
CHECKED BY : D. HODGE	DATE : 5-10
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

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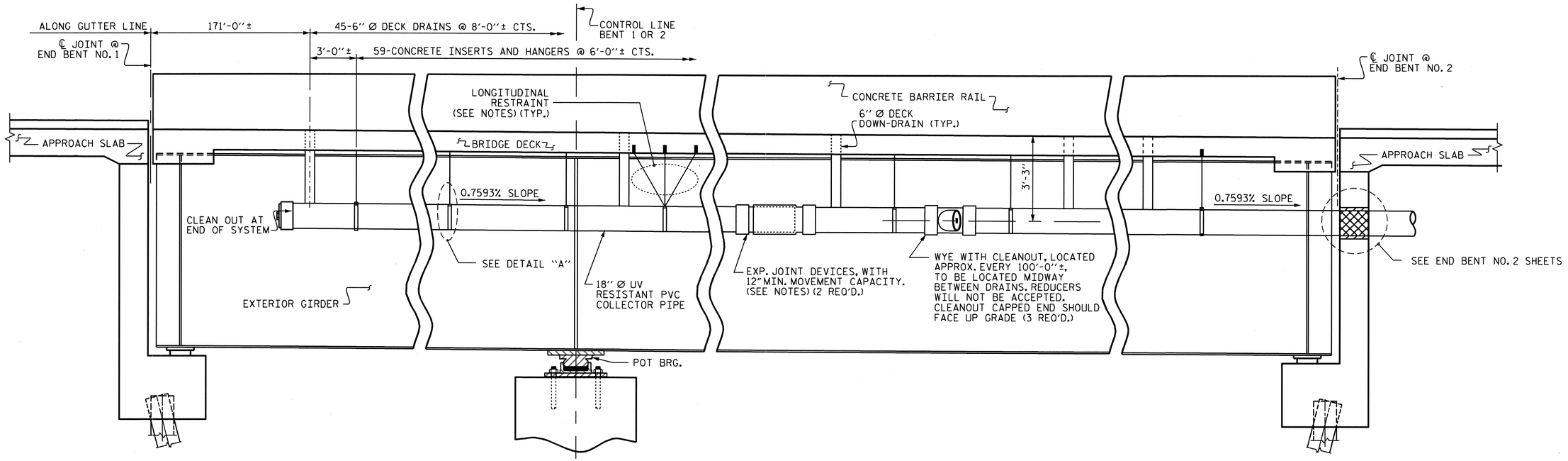

ELEVATION OF DRAINAGE SYSTEM

NOTES

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE DRAINAGE SYSTEM USING NECESSARY FITTINGS, TEES, AND WYES TO PROVIDE A CONTINUOUS DRAINAGE SYSTEM.

DRAINAGE SYSTEM WILL BE PAID FOR UNDER THE PAY ITEM "STRUCTURE DRAINAGE SYSTEM".

BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

CONCRETE INSERTS SHALL HAVE A MINIMUM WORKING LOAD TENSION CAPACITY OF 2.5 KIPS.

COLLECTOR PIPES SHALL BE ASTM D2241, SDR 26 OR ASTM D3034, SDR 35 WITH A BELL GASKET JOINT MEETING THE REQUIREMENTS OF STM D3139, AND SHALL BE FURNISHED IN LAYING LENGTHS OF 20 FEET.

GASKET MATERIALS SHALL BE ELASTOMERIC SEALS AND SHALL COMPLY WITH THE PHYSICAL REQUIREMENTS OF ASTM F477.

DECK DOWN-DRAIN PIPE SHALL BE ASTM D1785, SCHEDULE 40 OR ASTM D2665, SCHEDULE 40.

PIPES SUPPLIED FOR SOLVENT CEMENT JOINTS SHALL MEET ASTM D2672.

COLLECTOR PIPE SADDLE WYE CLEANOUT FITTINGS AND COLLECTOR PIPE END FITTINGS SHALL BE SOLVENT CEMENT TYPE.

SOLVENT CEMENT SHALL CONFORM TO ASTM D2235. PRIMER SHALL CONFORM TO ASTM F656.

THE ASSEMBLY OF SOLVENT CEMENT JOINTS SHALL BE IN ACCORDANCE WITH ASTM D2855.

MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENT CEMENT AND PRIMER SHALL BE FURNISHED.

ALL FITTINGS SHALL BE ASTM D2665, SCHEDULE 40 OR THICKER.

EXPANSION JOINT DEVICES SHALL BE LOCATED WITHIN THE FIRST 100 FEET OF THE BEGINNING AND ENDING OF ANY CONTINUOUS SECTION OF DRAINAGE SYSTEM THAT IS FIXED, IE. BACKWALL, THEN SPACED A MAXIMUM OF 200 FEET APART FOR THE FULL LENGTH OF EACH HORIZONTAL PIPE.

EXPANSION JOINT DEVICES IN THE COLLECTOR PIPE SHALL HAVE A MINIMUM EXPANSION CAPACITY OF 12 INCHES.

GASKETED JOINTS SHALL BE POSITIONED TO OCCUR APPROXIMATELY 12" FROM PIPE SUPPORTS. SEE DETAIL "A".

A LONGITUDINAL RESTRAINT SHALL BE LOCATED WITHIN THE FIRST 100 FEET OF THE BEGINNING AND ENDING OF ANY CONTINUOUS SECTION OF DRAINAGE SYSTEM THAT IS NOT FIXED, THEN SPACED AT MIDPOINTS BETWEEN THE EXPANSION JOINTS.

AN OPTIONAL DETAIL FOR THE LONGITUDINAL RESTRAINTS AND THE LATERAL GUIDE MAY BE SUBMITTED FOR APPROVAL.

COLLECTOR PIPE SUPPORTS SHALL BE LOCATED WITHIN 12 INCHES, ± 4-INCHES, OF A COLLECTOR PIPE JOINT.

DECK DOWN-DRAIN PIPES SHALL BE CENTERED IN SLOTTED OPENING IN COLLECTOR PIPE REGARDLESS OF TEMPERATURE AT TIME OF INSTALLATION.

THREADED RODS SHALL BE ASTM A193, GRADE B7 OR CARBON STEEL ALL-THREAD HANGER RODS.

NUTS SHALL BE ASTM A194, GRADE 2H, HEAVY HEX NUTS.

ALL METALLIC COMPONENTS IN THE DRAINAGE SYSTEM, EXCEPT STAINLESS STEEL AND MALLEABLE IRON PARTS, ARE REQUIRED TO BE HOT-DIPPED GALVANIZED. ELECTRO-PLATE COATING ON STEEL RODS, STEEL YOKE TYPE PIPE ROLLS, BRACKETS, OTHER STEEL HARDWARE IS CONSIDERED BY NCDOT AS TOO THIN FOR OUTDOOR APPLICATIONS.

THE DETAILS OF ALL PIPING, HARDWARE, OR OTHER MATERIAL SHALL BE PROVIDED BY THE CONTRACTOR AND IS SUBJECT TO THE APPROVAL OF THE ENGINEER.

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER M.G. CHEEK, JR. 8-2-10

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURE DRAINAGE SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A.L.FIGUEROA DATE : 05-06-10
CHECKED BY : M.G. CHEEK DATE : 05-20-10

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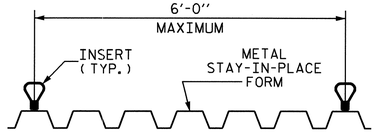
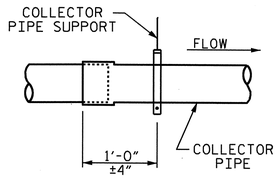
NCBDS

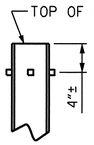


LOCATION OF INSERTS IN STAY-IN-PLACE FORMS

EXACT SPACING MAY VARY SLIGHTLY TO ENSURE THAT INSERTS ARE LOCATED ON PEAKS OF FORMS



DETAIL A

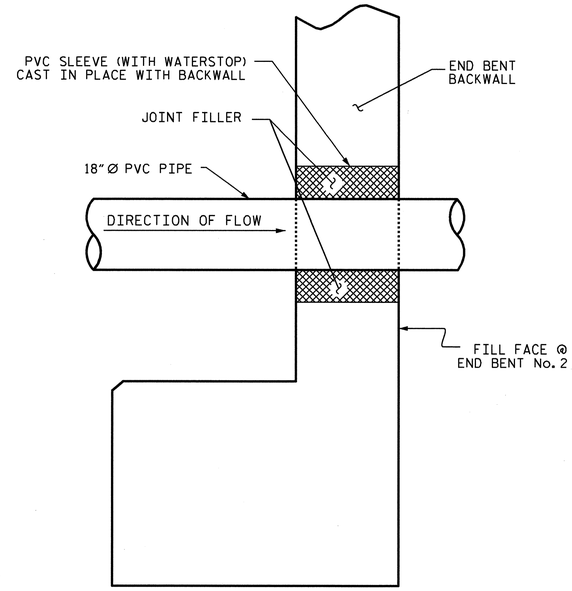


PIPE DETAIL

(45 DRAINS REQ'D)

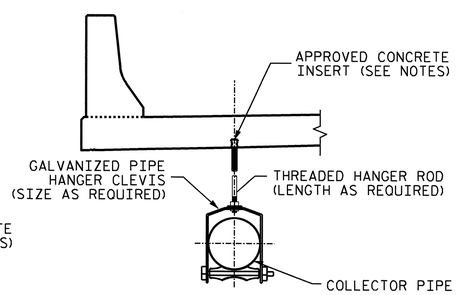
TOP OF DECK DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.

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

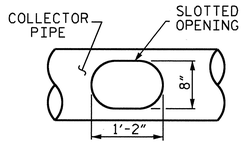


DETAIL OF PIPE THRU END BENT NO. 2 BACKWALL

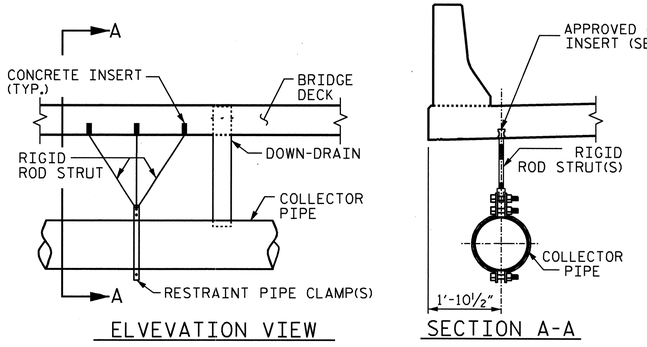
CENTER PIPE IN BLOCKOUT AND FILL ANNULAR SPACE AROUND PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1028-1.
* 22"Ø SLEEVE FOR "18"PVC PIPE"



COLLECTOR PIPE SUPPORT



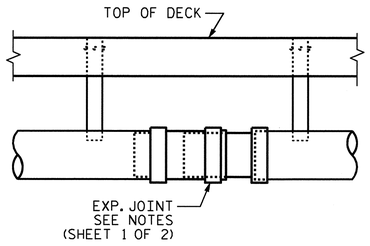
SLOT DETAIL



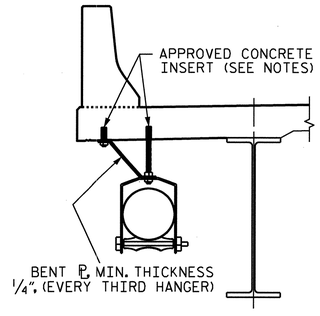
ELVEVATION VIEW

SECTION A-A

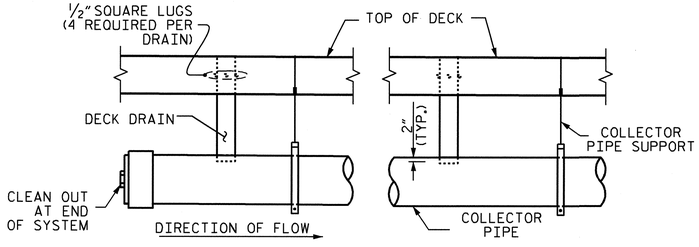
LONGITUDINAL RESTRAINT



EXPANSION DETAIL



LATERAL GUIDE



AT END OF SYSTEM

AT 6" Ø DECK DRAINS

ELEVATION THRU DRAINAGE SYSTEM

ASSEMBLED BY : A.L.FIGUEROA DATE : 05-06-10
CHECKED BY : M.G. CHEEK DATE : 05-20-10

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PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRUCTURE DRAINAGE SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
8-2-10

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″			

REINFORCING BAR SCHEDULE

SPANS A, B, & C

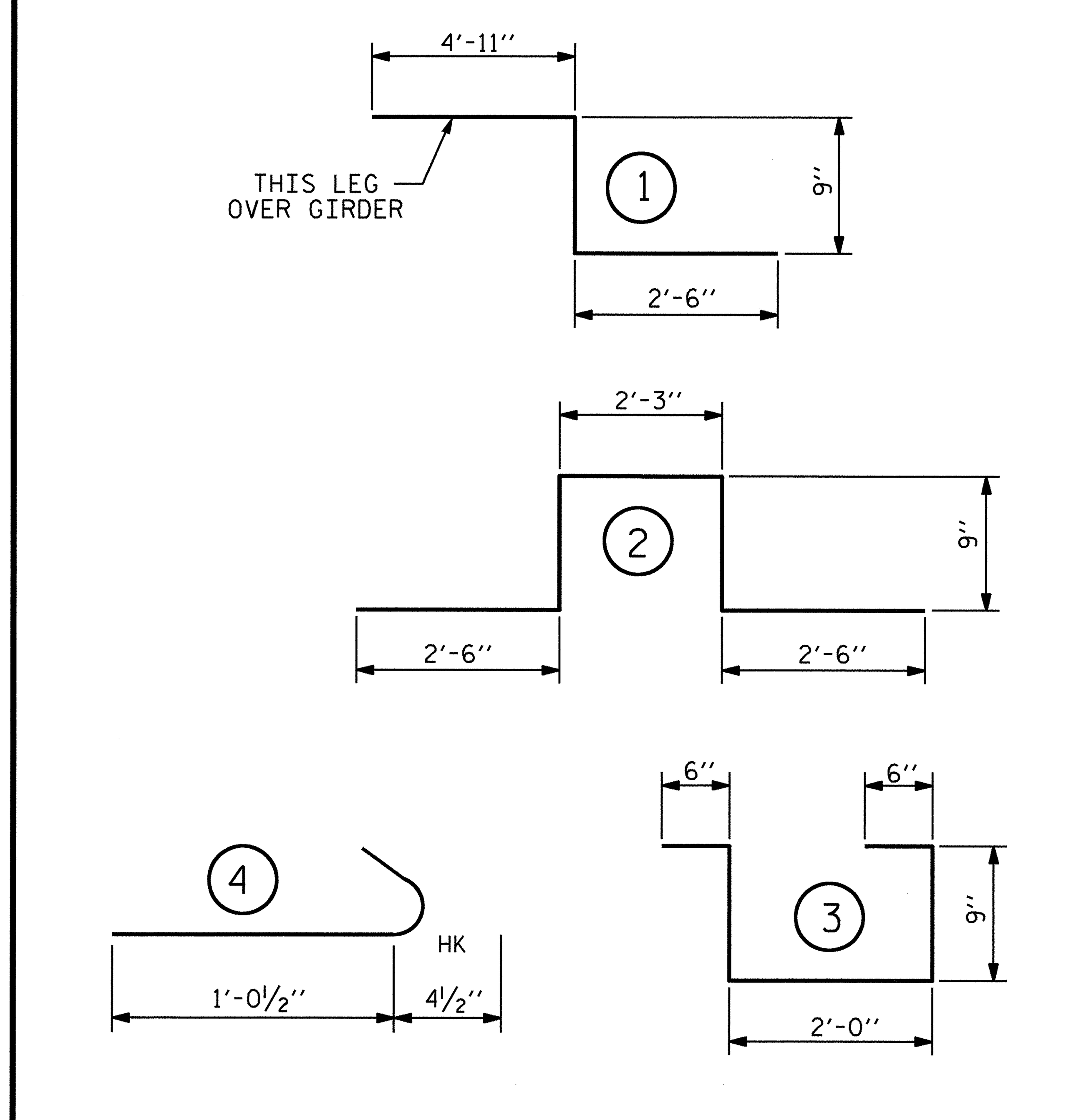
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
∗ A1	944	#5	STR	34′-11″	34,379
A2	944	#5	STR	34′-11″	34,379
∗ A101	4	#5	STR	32′-7″	136
∗ A102	4	#5	STR	30′-3″	126
∗ A103	4	#5	STR	27′-11″	116
∗ A104	4	#5	STR	25′-7″	107
∗ A105	4	#5	STR	23′-3″	97
∗ A106	4	#5	STR	20′-11″	87
∗ A107	4	#5	STR	18′-8″	78
∗ A108	4	#5	STR	16′-4″	68
∗ A109	4	#5	STR	14′-0″	58
∗ A110	4	#5	STR	11′-8″	49
∗ A111	4	#5	STR	9′-4″	39
∗ A112	4	#5	STR	7′-0″	29
∗ A113	4	#5	STR	4′-8″	19
∗ A114	4	#5	STR	2′-4″	10
A201	4	#5	STR	32′-7″	136
A202	4	#5	STR	30′-3″	126
A203	4	#5	STR	27′-11″	116
A204	4	#5	STR	25′-7″	107
A205	4	#5	STR	23′-3″	97
A206	4	#5	STR	20′-11″	87
A207	4	#5	STR	18′-8″	78
A208	4	#5	STR	16′-4″	68
A209	4	#5	STR	14′-0″	58
A210	4	#5	STR	11′-8″	49
A211	4	#5	STR	9′-4″	39
A212	4	#5	STR	7′-0″	29
A213	4	#5	STR	4′-8″	19
A114	4	#5	STR	2′-4″	10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
∗ B1	240	#4	STR	27′-9″	4449
B2	380	#5	STR	54′-9″	21,700
∗ B3	420	#6	STR	43′-8″	27,547
∗ B4	24	#4	STR	24′-0″	385
∗ G1	2	#5	STR	38′-6″	80
∗ J1	76	#4	4	1′-5″	72
∗ K1	12	#5	1	8′-2″	102
∗ K2	12	#5	2	8′-9″	110
∗ K3	18	#5	STR	9′-8″	181
∗ S1	48	#4	3	4′-6″	144

REINFORCING STEEL = 57,098 LBS
∗ EPOXY COATED REINF. STEEL = 68,468 LBS

∗ THESE BARS ARE EPOXY COATED

BAR TYPES

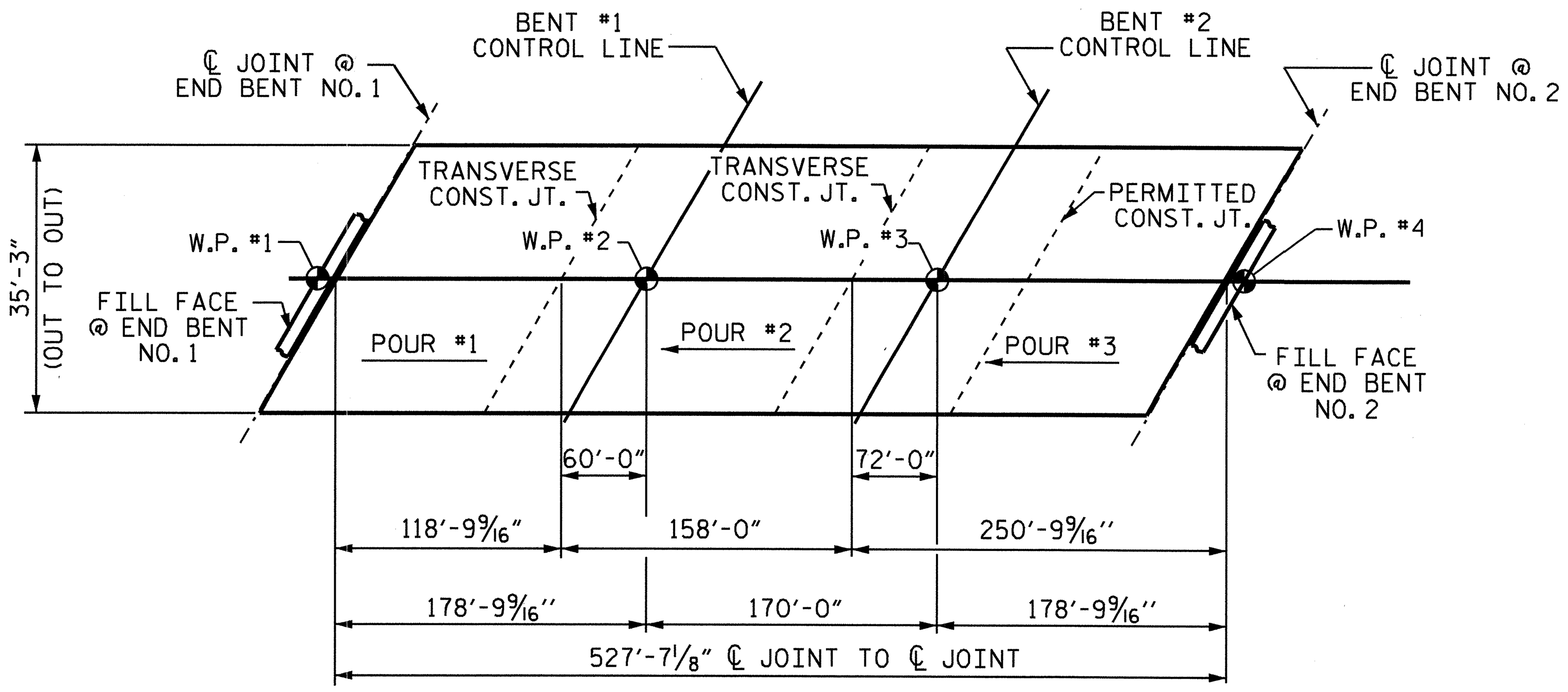


ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

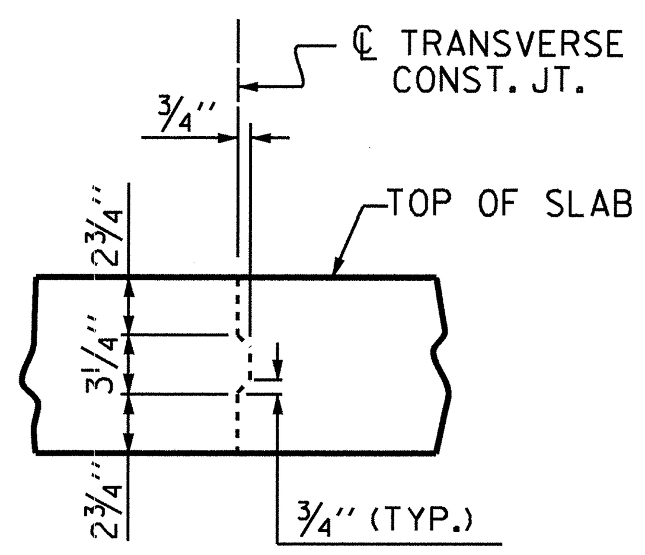
		CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
		(CU.YDS.)	(LBS.)	(LBS.)
SPAN A, B, & C	POUR #1	136.0	57,098	68,468
	POUR #2	180.0		
	POUR #3	285.3		
TOTALS∗∗		601.3	57,098	68,468

∗∗ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



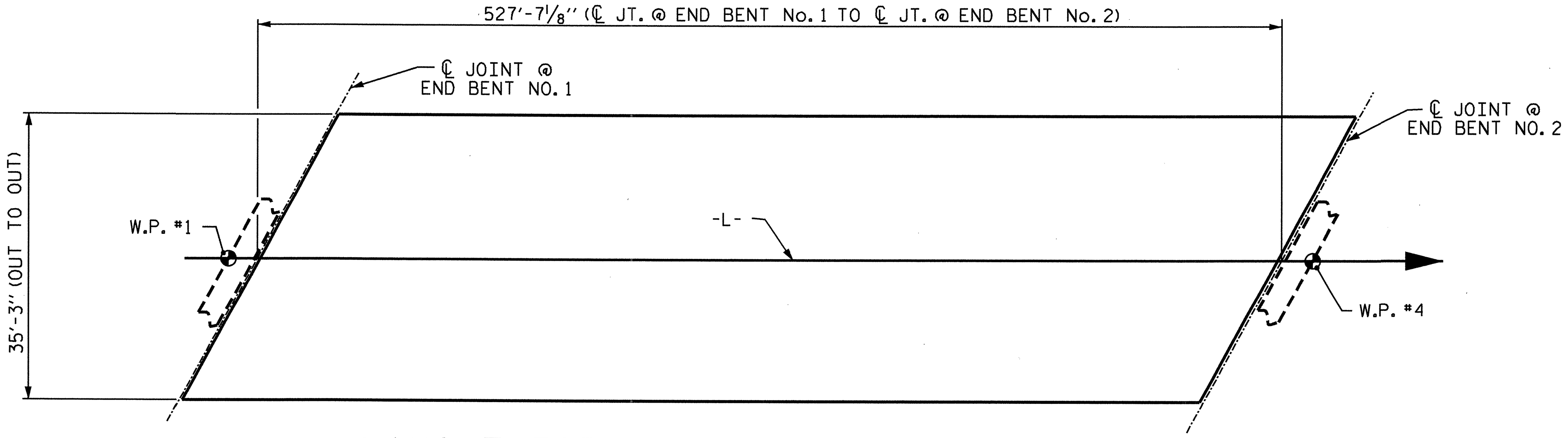
POUR SEQUENCE

GROOVING BRIDGE FLOORS		
APPROACH SLABS	1373	SQ.FT.
BRIDGE DECK	15,266	SQ.FT.
TOTAL	16,639	SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 18,598)

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-30
1			3				TOTAL SHEETS
2			4				44

ASSEMBLED BY : V.X. NGUYEN	DATE : 3-16-10	
CHECKED BY : D. HODGE	DATE : 5-10	
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES
	REV. 5/1/06	TLA/GM

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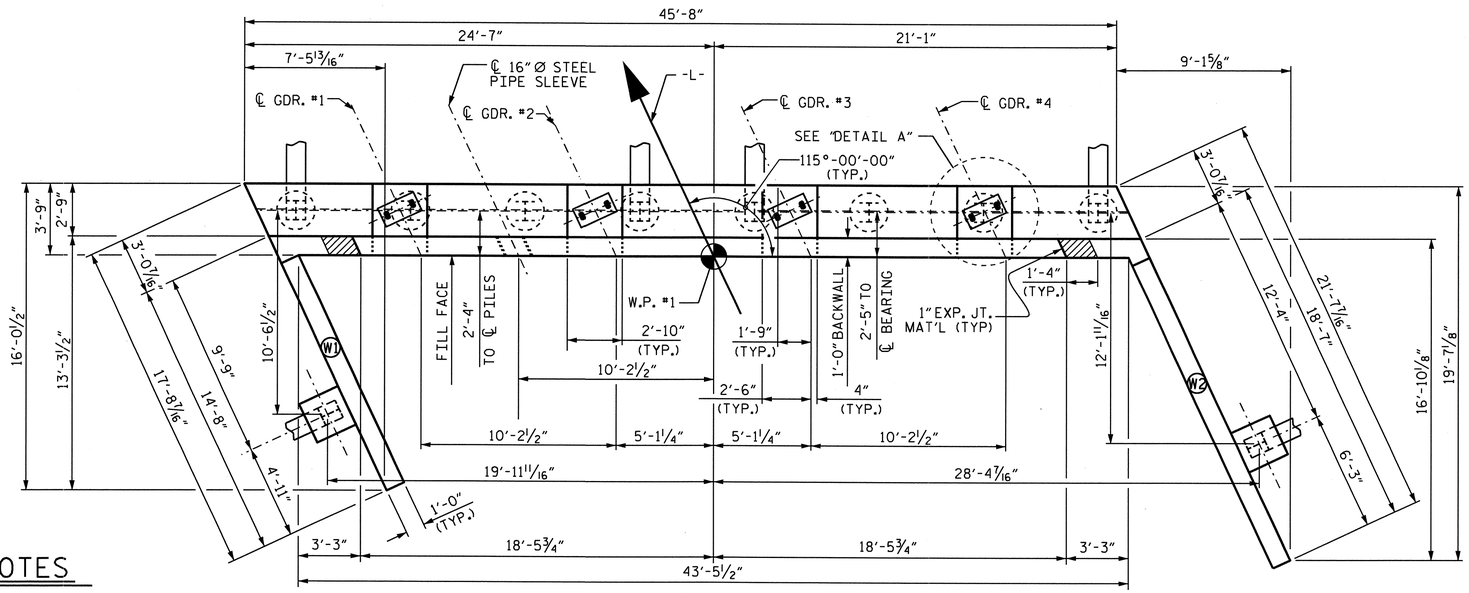
STD. NO. BOM1



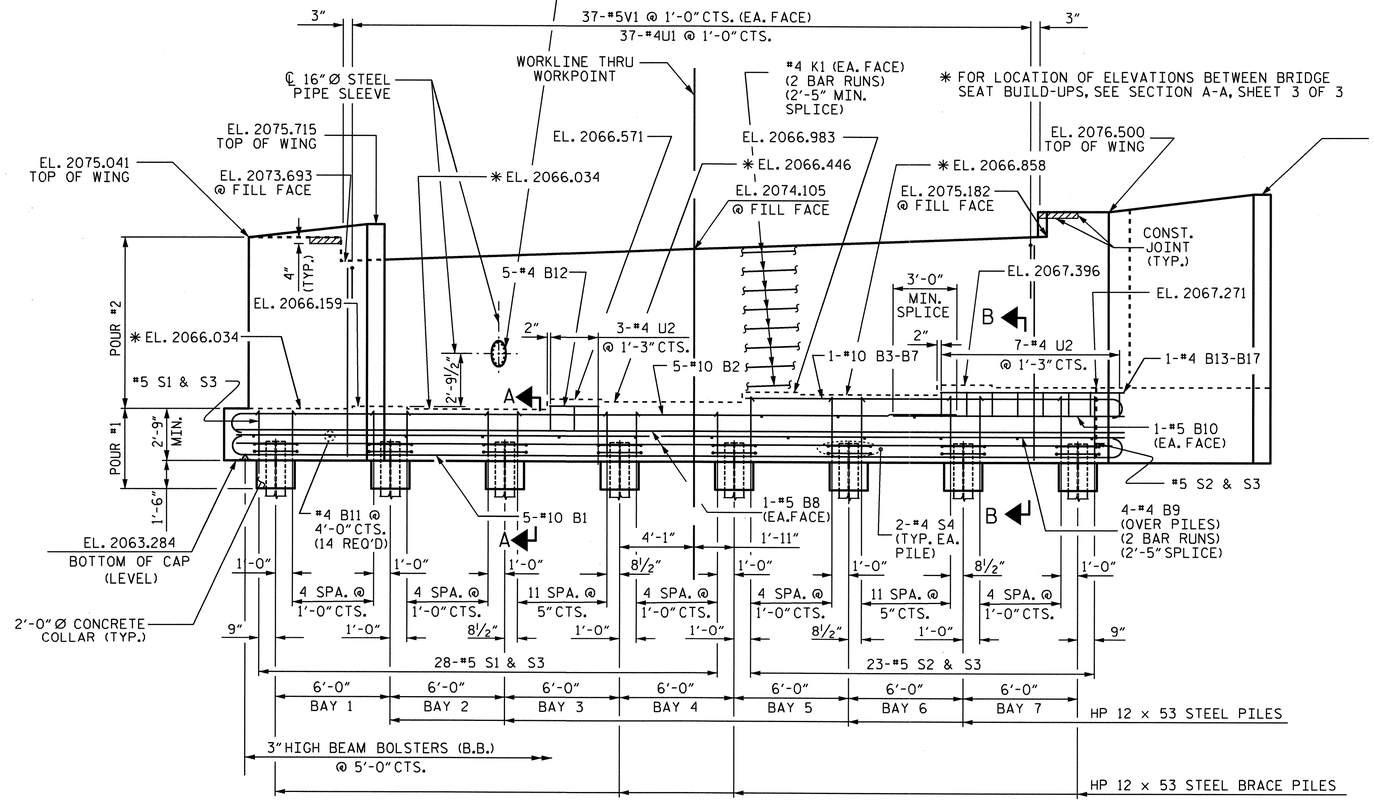
NOTES

THE DIMENSIONS AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR THE CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE CONSTRUED TO BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

FOR THE RESPONSIBILITIES FOR FURNISHING AND PLACING STEEL PIPE SLEEVES, SEE UTILITY SPECIAL PROVISIONS.

PLAN

16"Ø STEEL PIPE SLEEVE IS TO BE FLUSH WITH BOTH FACES OF BACKWALL. SLEEVE IS TO BE PLACED PARALLEL TO GIRDER.



ELEVATION

NOTES

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

FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

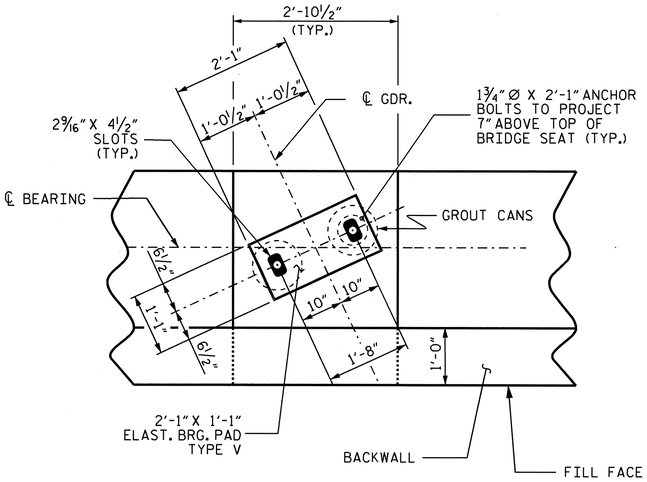
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY FOR INSTALLATION OF THE 16"Ø STEEL PIPE SLEEVE.



DETAIL A

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			44

For Water Line Attachment only

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HINTON
8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL LEE CHEEK
8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 02-22-10
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

29-JUL-2010 14:36
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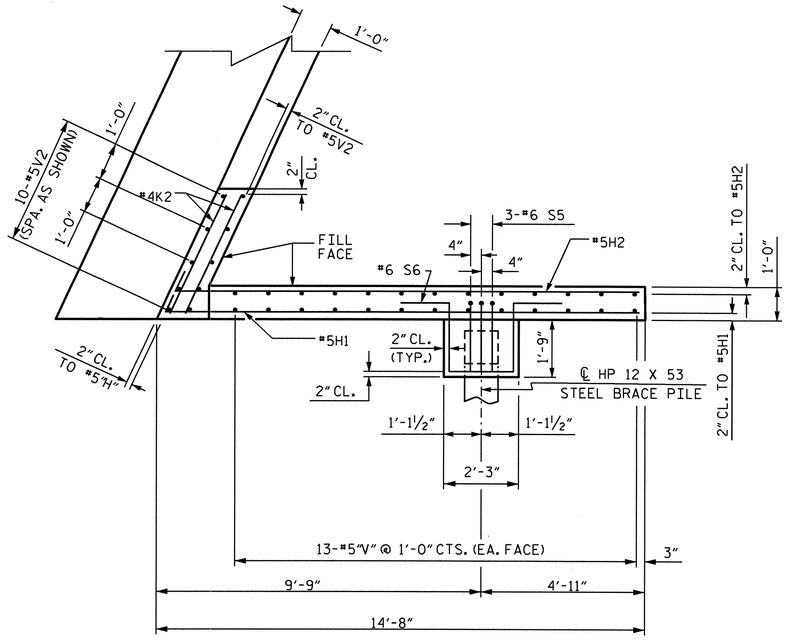
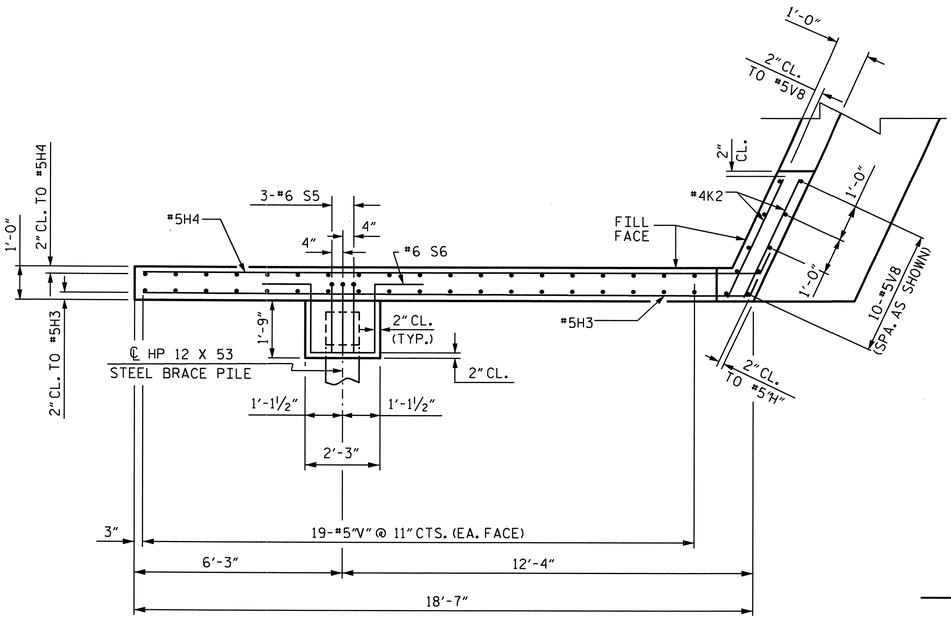
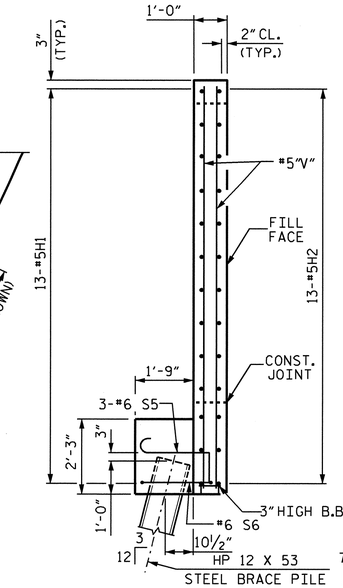


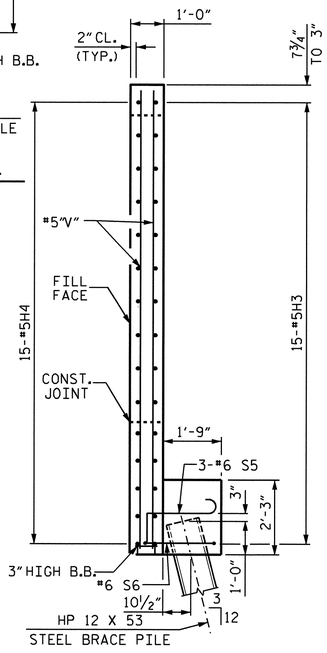
PLAN OF LEFT WING - W1



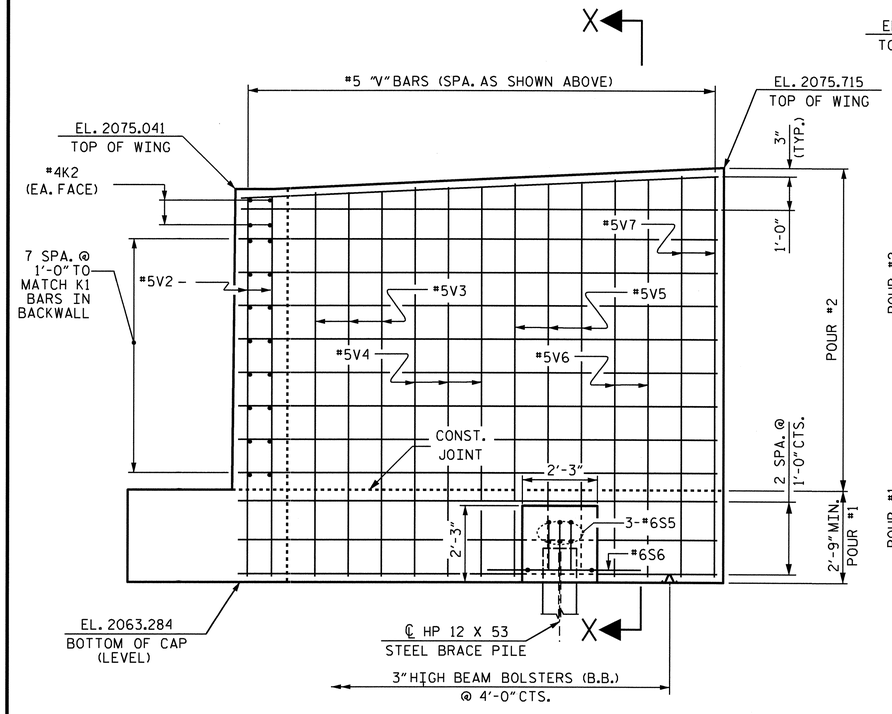
PLAN OF RIGHT WING - W2



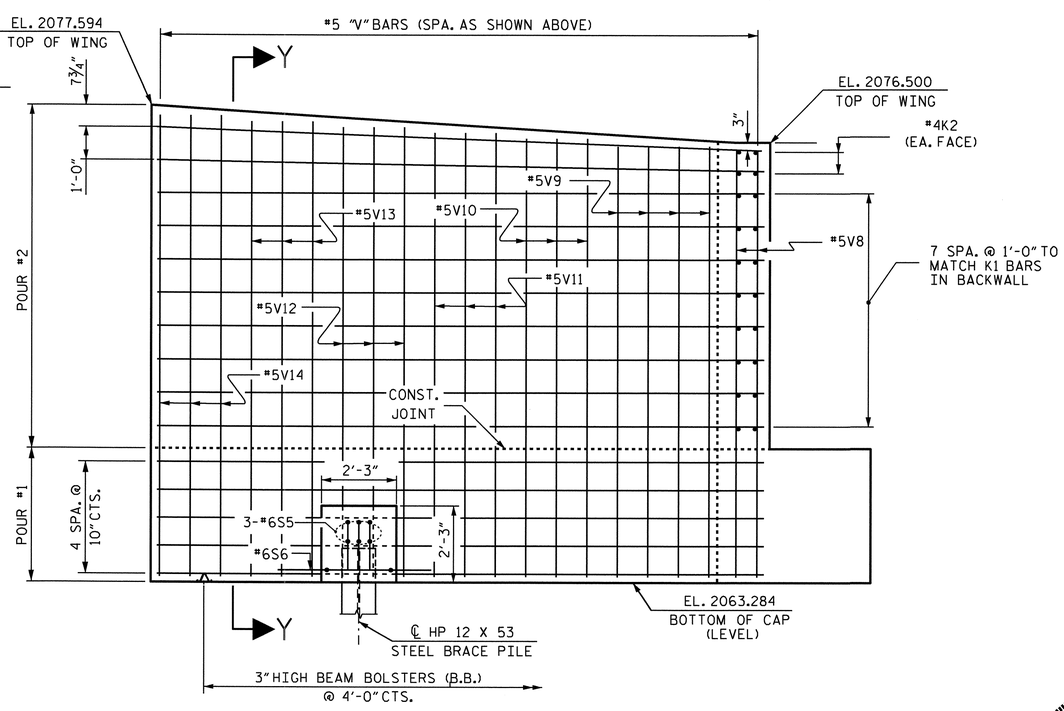
SECTION X-X



SECTION Y-Y



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL L. CHEEK, JR.
8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 02-22-10
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

14-JUN-2010 09:53
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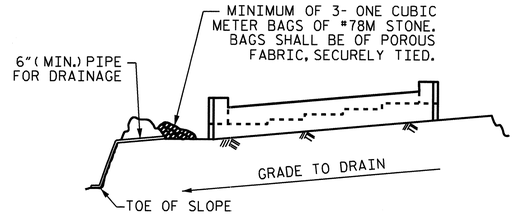
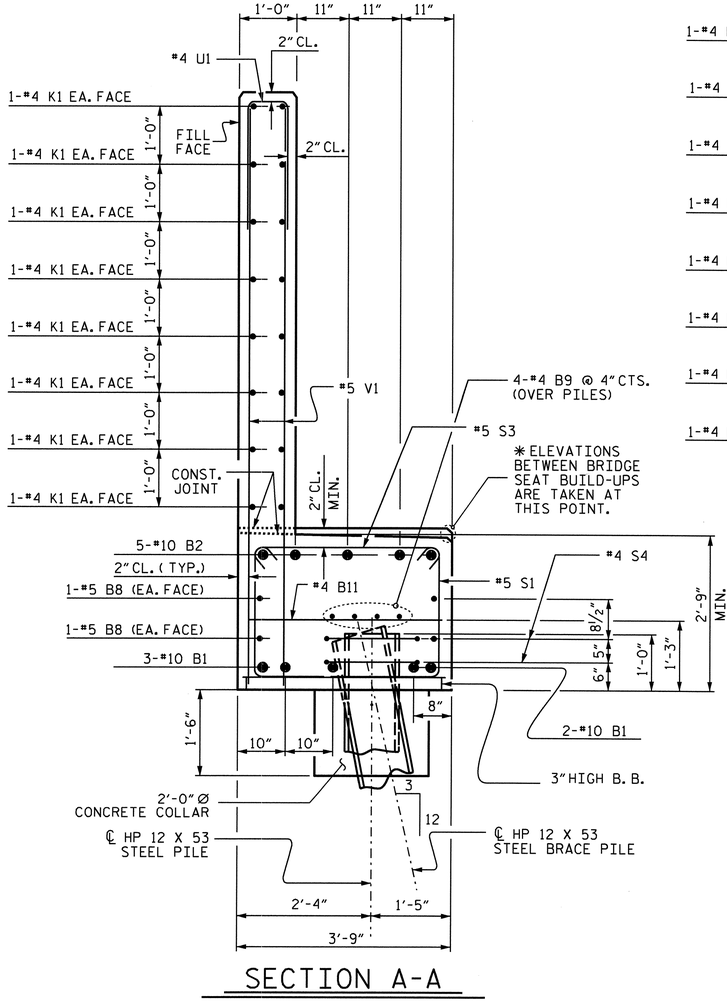


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

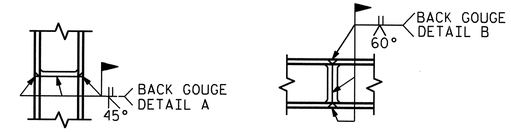
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

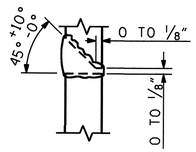
TEMPORARY DRAINAGE AT END BENT



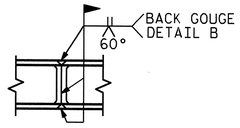
SECTION A-A



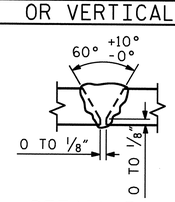
**PILE VERTICAL



DETAIL A



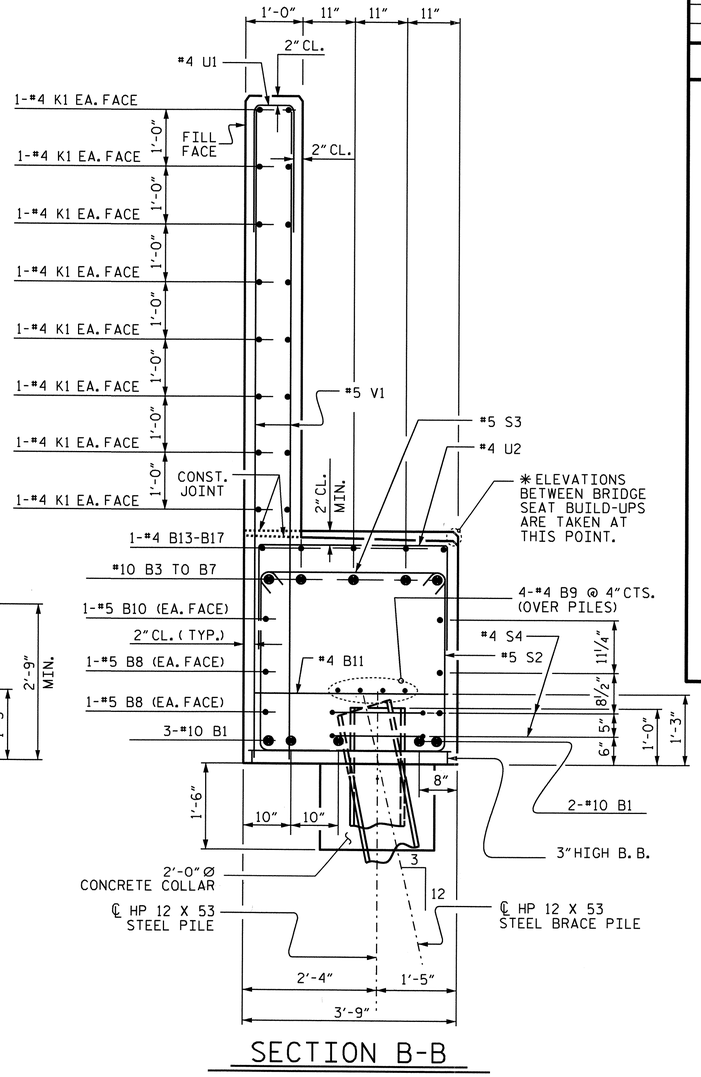
**PILE HORIZONTAL OR VERTICAL



DETAIL B

**POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION B-B

BILL OF MATERIAL
END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	3	48'-0"	1033	K1	32	#4	STR	23'-11"	511
B2	5	#10	1	39'-7"	852	K2	8	#4	STR	3'-11"	21
B3	1	#10	1	21'-1"	91						
B4	1	#10	1	20'-9"	89	S1	28	#5	2	9'-1"	265
B5	1	#10	1	20'-4"	87	S2	23	#5	2	10'-9"	258
B6	1	#10	1	19'-11"	86	S3	51	#5	4	4'-4"	231
B7	1	#10	1	19'-7"	84	S4	16	#4	6	6'-6"	69
B8	4	#5	STR	45'-4"	189	S5	6	#6	9	3'-9"	34
B9	8	#4	STR	23'-11"	128	S6	2	#6	10	9'-1"	27
B10	2	#5	STR	10'-1"	21						
B11	14	#4	STR	3'-5"	32	U1	37	#4	5	5'-6"	136
B12	5	#4	STR	2'-6"	8	U2	10	#4	5	6'-5"	43
B13	1	#4	STR	9'-5"	6						
B14	1	#4	STR	9'-1"	6	V1	74	#5	STR	10'-2"	785
B15	1	#4	STR	8'-8"	6	V2	10	#5	STR	11'-4"	118
B16	1	#4	STR	8'-3"	6	V3	6	#5	STR	11'-5"	71
B17	1	#4	STR	7'-11"	5	V4	6	#5	STR	11'-7"	72
						V5	6	#5	STR	11'-9"	74
H1	13	#5	7	14'-11"	202	V6	4	#5	STR	11'-11"	50
H2	13	#5	7	14'-7"	198	V7	4	#5	STR	12'-0"	50
H3	15	#5	8	18'-11"	296	V8	10	#5	STR	12'-10"	134
H4	15	#5	8	19'-2"	300	V9	8	#5	STR	12'-11"	108

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
V10	6	#5	STR	13'-1"	82
V11	6	#5	STR	13'-3"	83
V12	6	#5	STR	13'-5"	84
V13	6	#5	STR	13'-7"	85
V14	6	#5	STR	13'-10"	87

REINFORCING STEEL = 7,203 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1

CAP, CONCRETE COLLARS, LOWER PART OF WINGS & BRACE PILE BLOCKS 26.9 C.Y.

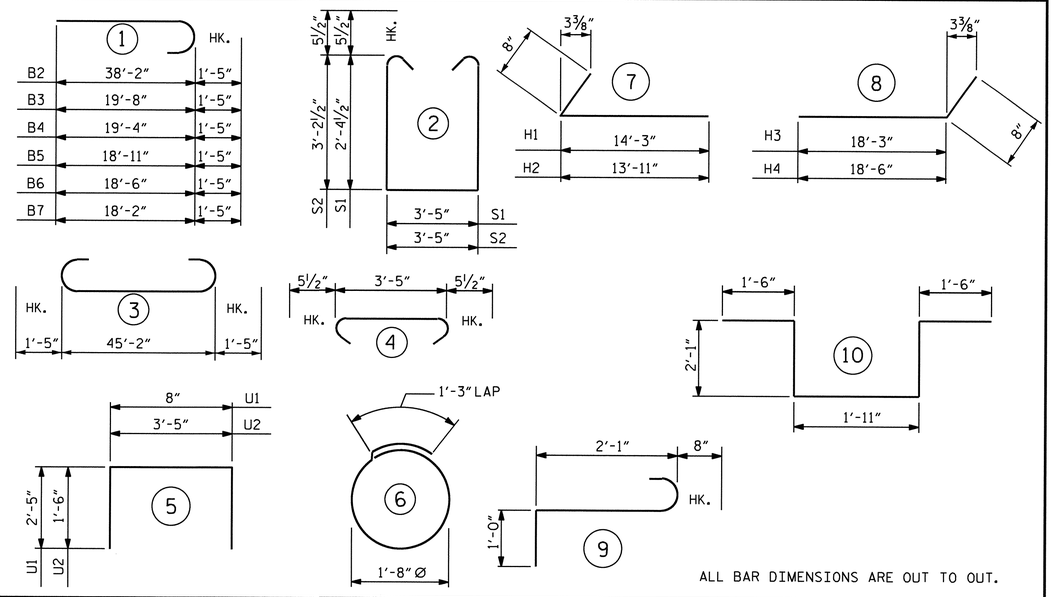
POUR #2

BACKWALL & UPPER PART OF WINGS 24.7 C.Y.

CLASS A CONCRETE TOTAL 51.6 C.Y.

HP 12 X 53 STEEL PILES
NO. 10 275 LIN. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL W. CHEEK, JR. 8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A.L. FIGUEROA DATE : 5-07-08
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

14-JUN-2010 09:53
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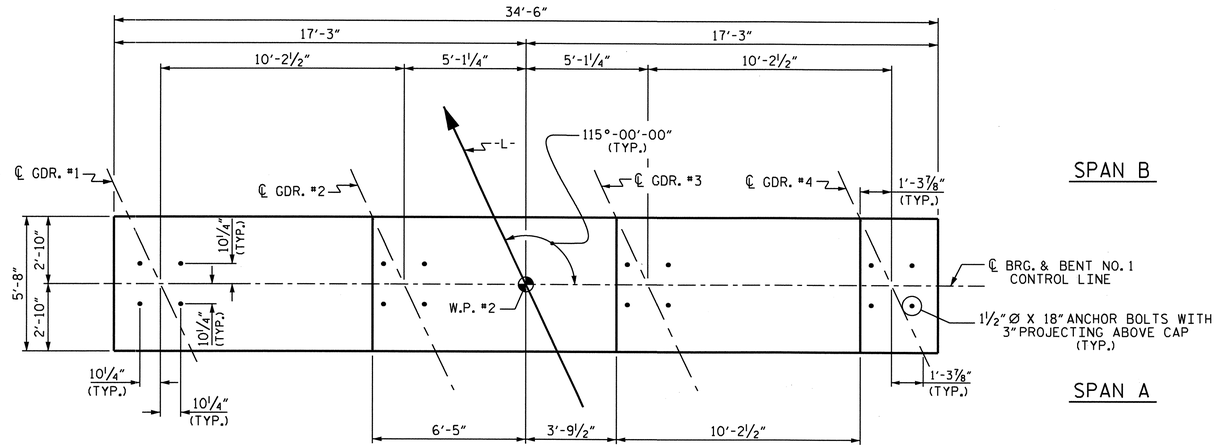
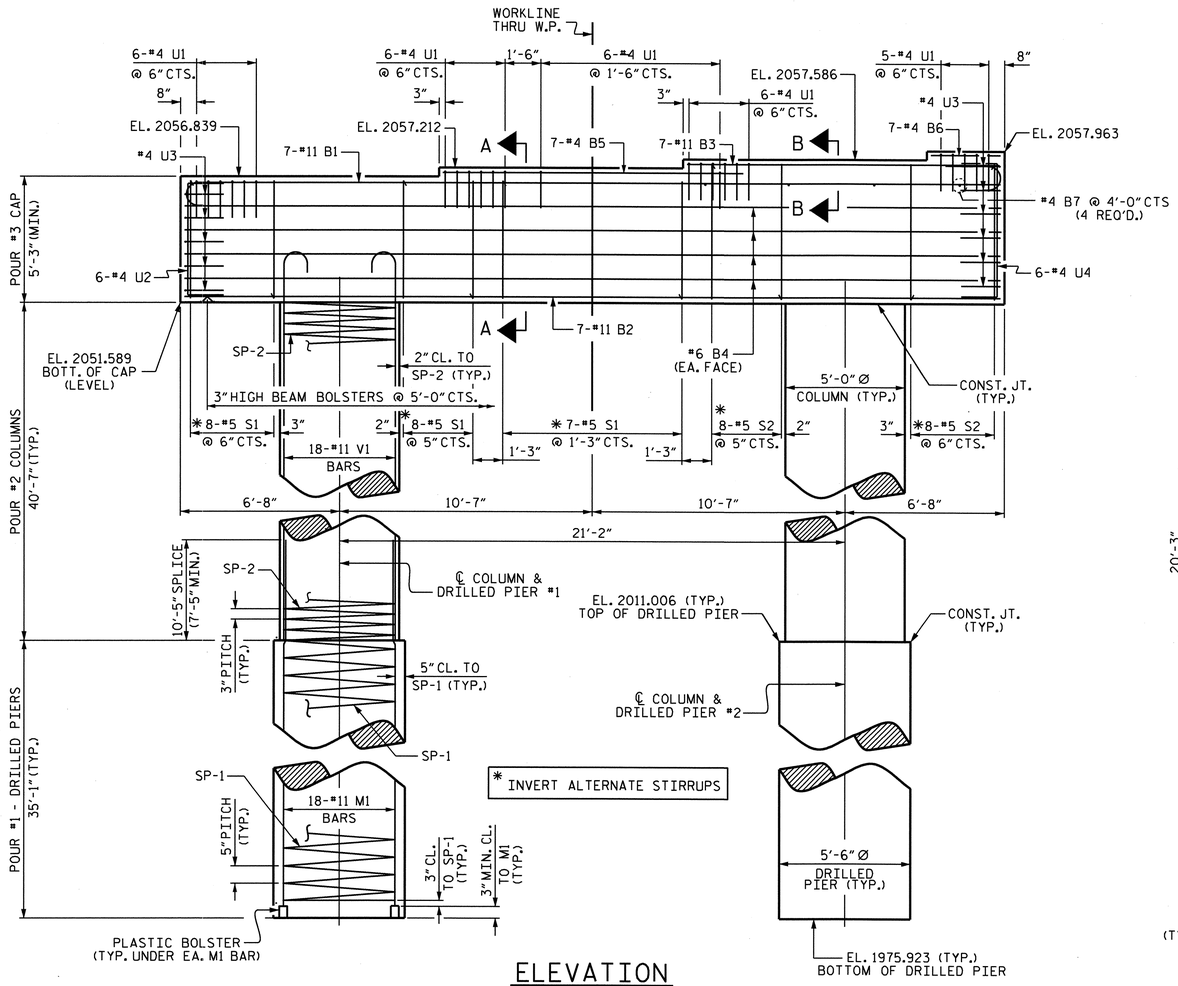
afigueroa



SPAN B

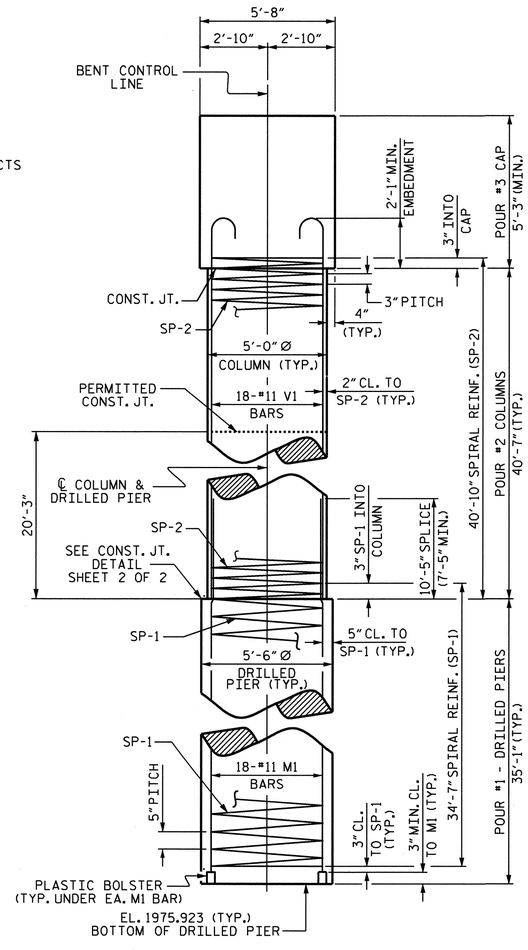
SPAN A

PLAN



ELEVATION

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER.



END ELEVATION

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.

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'-0" BELOW THE GROUND LINE.

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK JR.
8-2-10

DRAWN BY : A. SORSENGINH DATE : 2/18/10
CHECKED BY : M.G. CHEEK DATE : 3/10

27-JUL-2010 14:49
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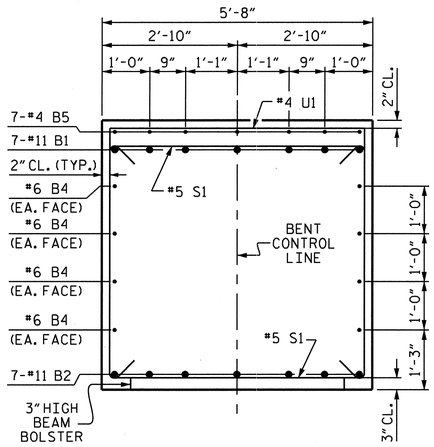
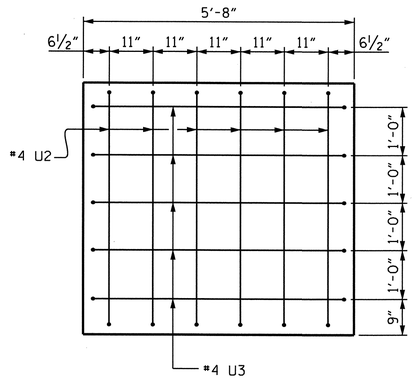
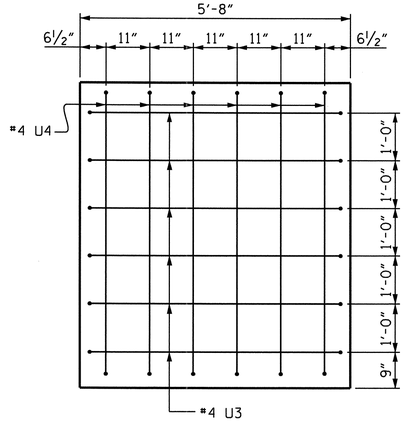


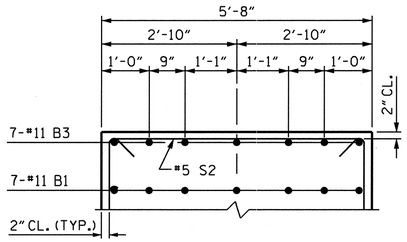
SECTION A-A



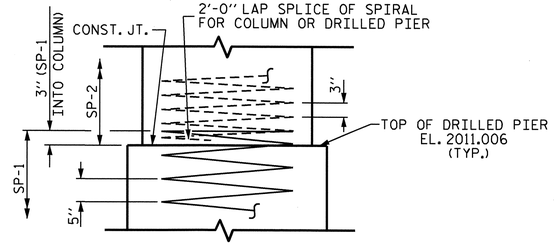
LEFT END VIEW



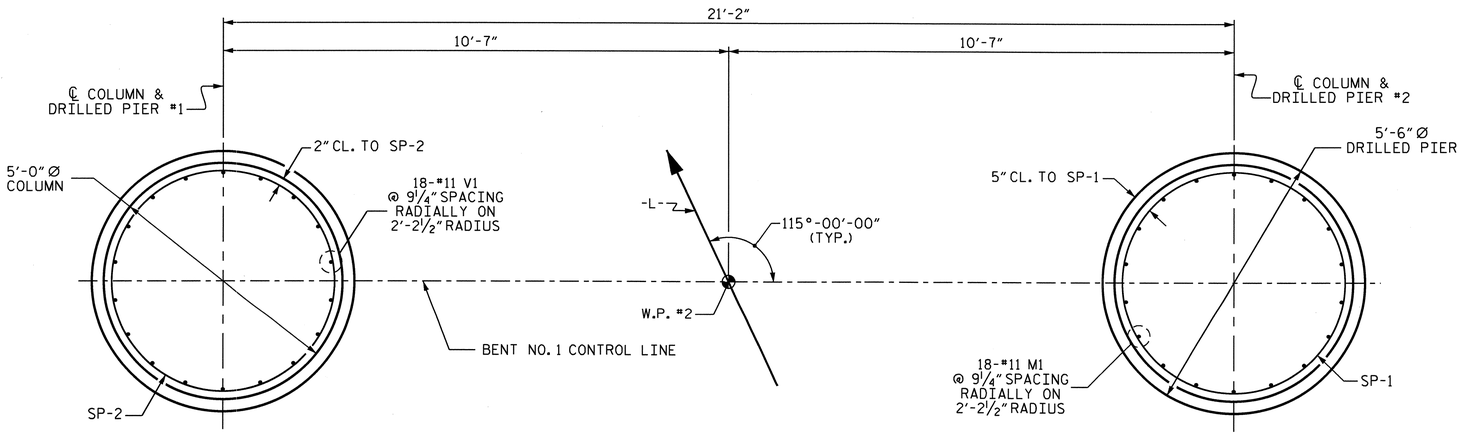
RIGHT END VIEW



SECTION B-B



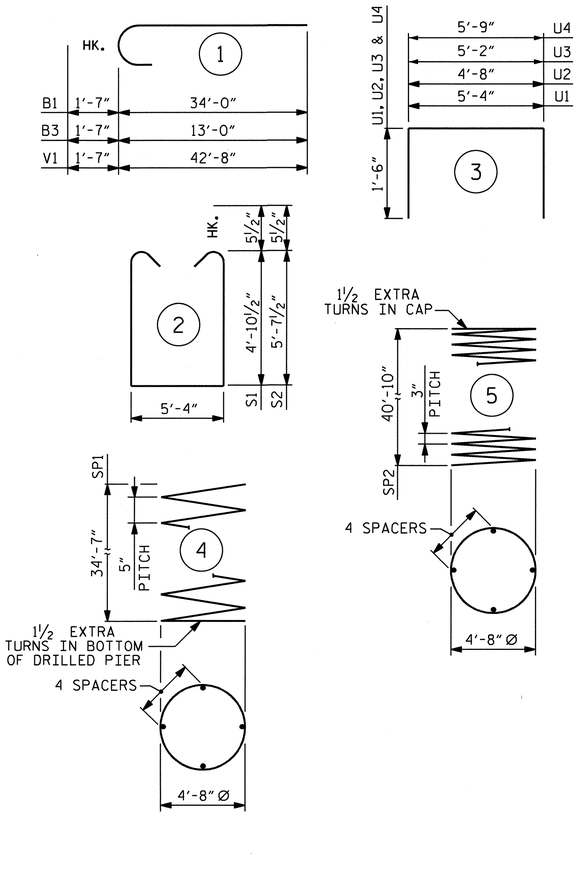
CONSTRUCTION JOINT DETAIL



PLAN OF COLUMNS AND DRILLED PIERS

DIMENSIONS AND REINFORCING ARE TYPICAL FOR EACH COLUMN & DRILLED PIER

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	35'-7"	1323
B2	7	#11	STR	34'-2"	1271
B3	7	#11	1	14'-7"	542
B4	8	#6	STR	34'-2"	411
B5	7	#4	STR	12'-7"	59
B6	7	#4	STR	2'-11"	14
B7	4	#4	STR	5'-4"	14
M1	36	#11	STR	45'-3"	8655
S1	23	#5	2	16'-0"	384
S2	16	#5	2	17'-6"	292
U1	29	#4	3	8'-4"	161
U2	6	#4	3	7'-8"	31
U3	11	#4	3	8'-2"	60
U4	6	#4	3	8'-9"	35
V1	36	#11	1	44'-3"	8464

REINFORCING STEEL (LBS.)	21,716

SP-1	2	*	4	1225'-7"	2557
SP-2	2	**	5	2397'-10"	3204

SPIRAL COLUMN REINFORCING STEEL (LBS.)	5761

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	59.0 C.Y.
POUR #3 (CAP)	41.2 C.Y.
TOTAL	100.2 C.Y.

DRILLED PIERS

DRILLED PIER CONCRETE (CU. YARDS)	
POUR #1 (DRILLED PIERS)	61.7 C.Y.
5'-6" Ø DRILLED PIERS IN SOIL	43.17 LIN. FT.
5'-6" Ø DRILLED PIERS NOT IN SOIL	27.00 LIN. FT.
PERMANENT STEEL CASING FOR 5'-6" Ø DRILLED PIERS	32.01 LIN. FT.
▲ CSL TUBES	451.00 LIN. FT.

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

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

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

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL GILCREEK JR.
8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A. SORSENGINH DATE : 2/19/10
CHECKED BY : M.G. CHEEK DATE : 3/10

27-JUL-2010 14:48
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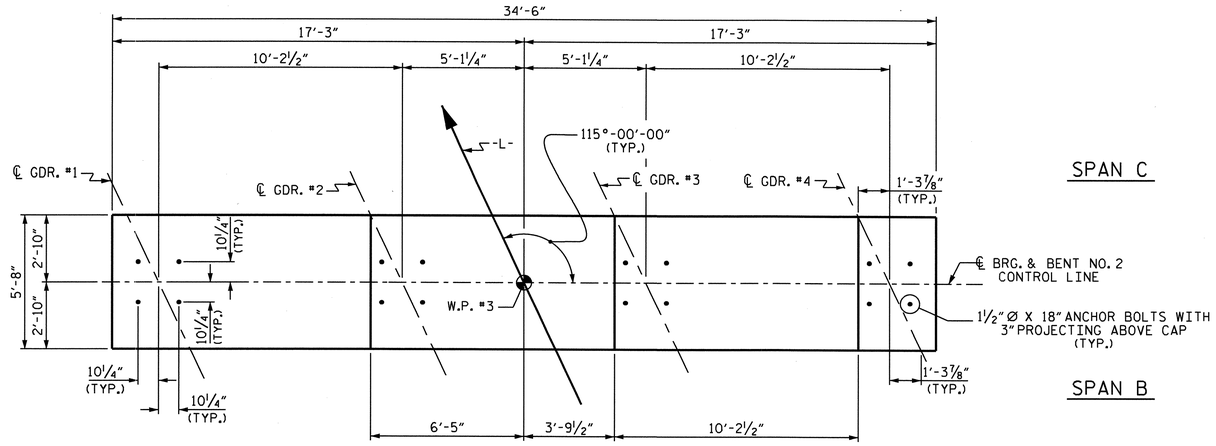
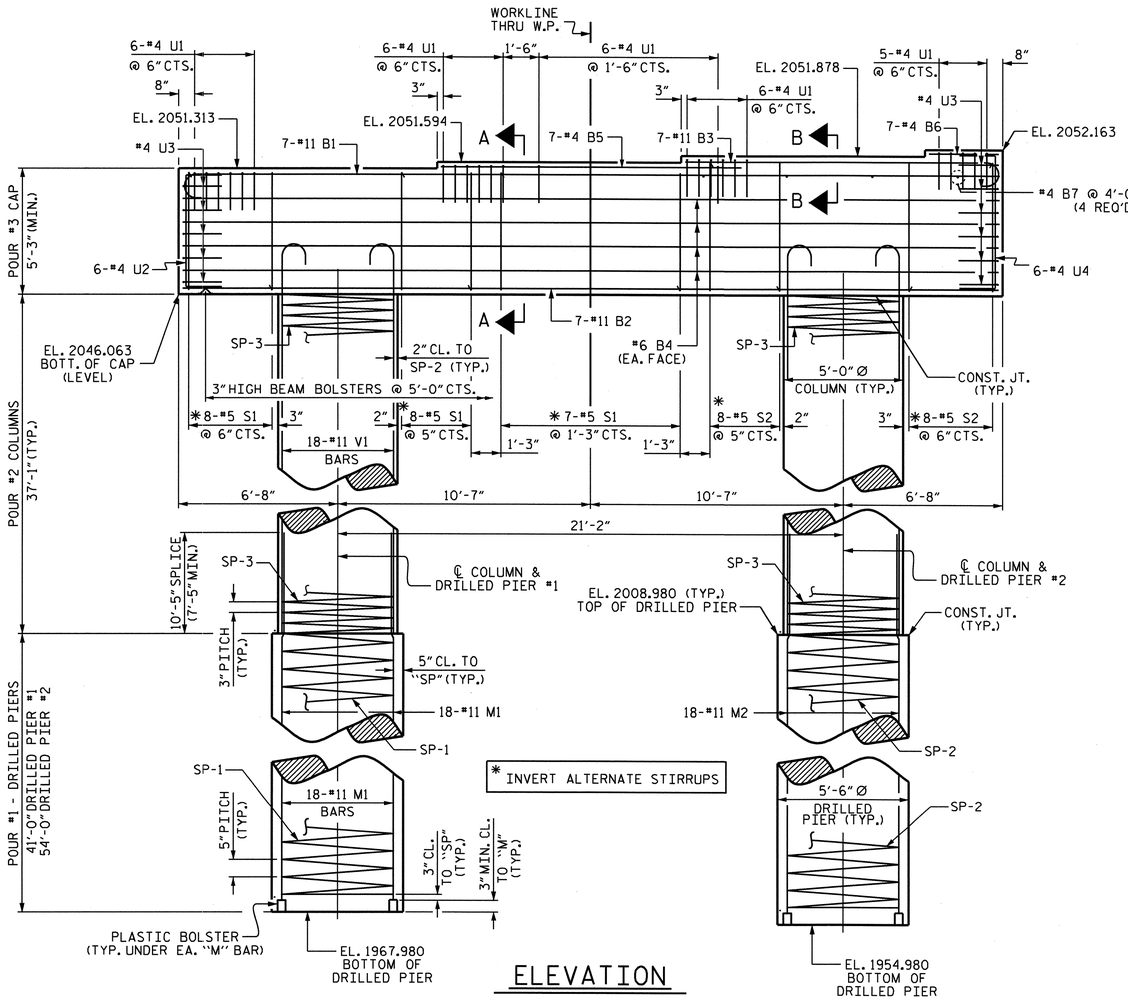
NCDOT



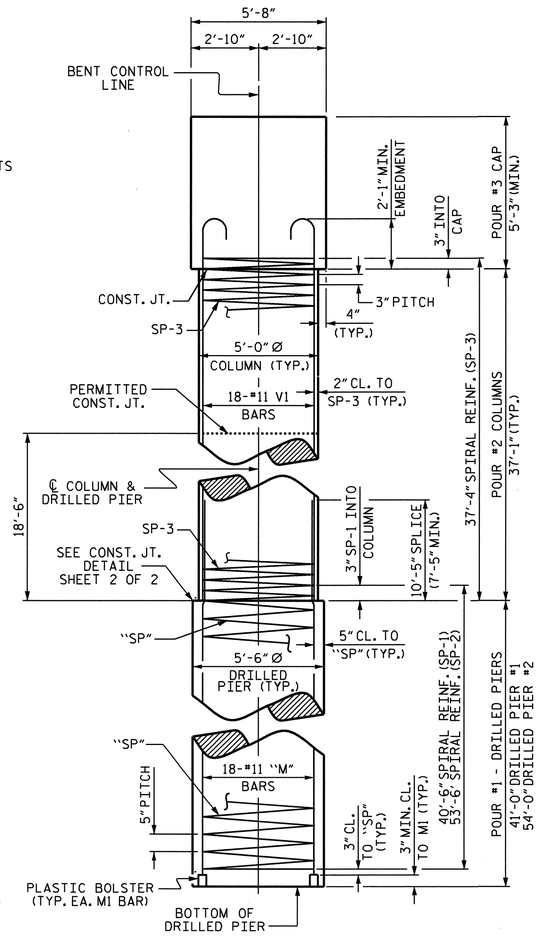
SPAN C

SPAN B

PLAN



ELEVATION



END ELEVATION

NOTES

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PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. 8-2-10

DRAWN BY : A. SORSENGINH DATE : 2/22/10
CHECKED BY : M.G. CHEEK DATE : 3/10

27-JUL-2010 14:48
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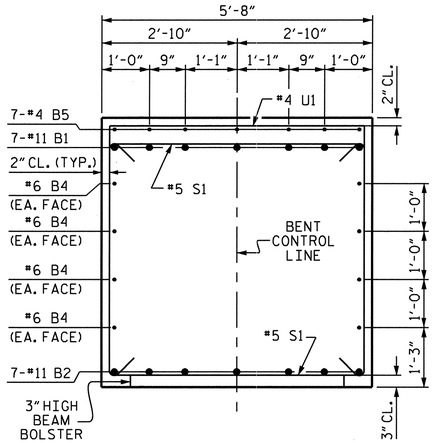
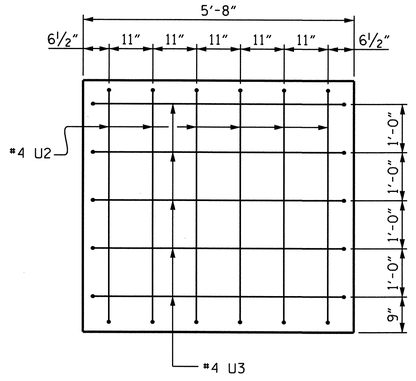
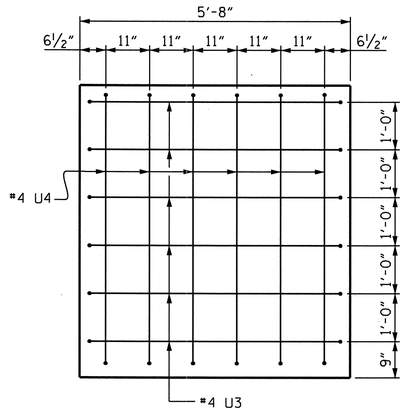
dfigueroa



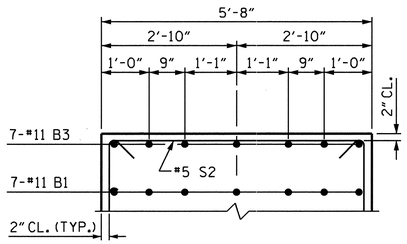
SECTION A-A



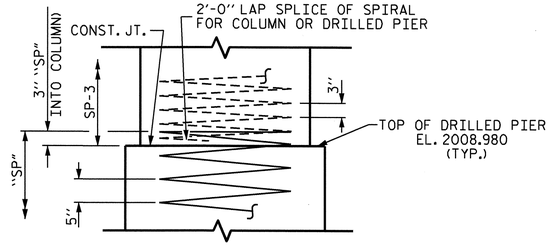
LEFT END VIEW



RIGHT END VIEW

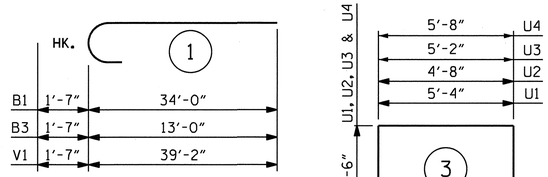


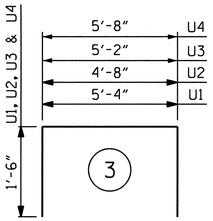
SECTION B-B

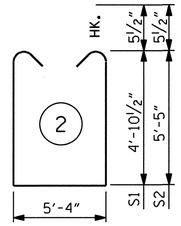


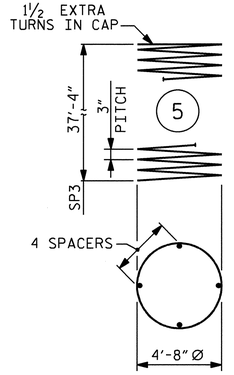
CONSTRUCTION JOINT DETAIL

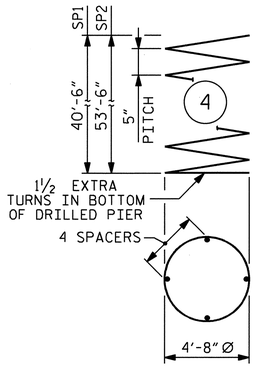
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	35'-7"	1323
B2	7	#11	STR	34'-2"	1271
B3	7	#11	1	14'-7"	542
B4	8	#6	STR	34'-2"	411
B5	7	#4	STR	12'-7"	59
B6	7	#4	STR	2'-11"	14
B7	4	#4	STR	5'-4"	14
M1	18	#11	STR	51'-2"	4893
M2	18	#11	STR	64'-2"	6137
S1	23	#5	2	16'-0"	384
S2	16	#5	2	17'-1"	285
U1	29	#4	3	8'-4"	161
U2	6	#4	3	7'-8"	31
U3	11	#4	3	8'-2"	60
U4	6	#4	3	8'-8"	35
V1	36	#11	1	40'-9"	7794
REINFORCING STEEL (LBS.)					23,414
SP-1	1	*	4	1432'-3"	1494
SP-2	1	*	4	1885'-5"	1966
SP-3	2	**	5	2194'-5"	2932

SPIRAL COLUMN REINFORCING STEEL (LBS.) 6392

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	53.9 C.Y.
POUR #3 (CAP)	40.4 C.Y.
TOTAL	94.3. C.Y.

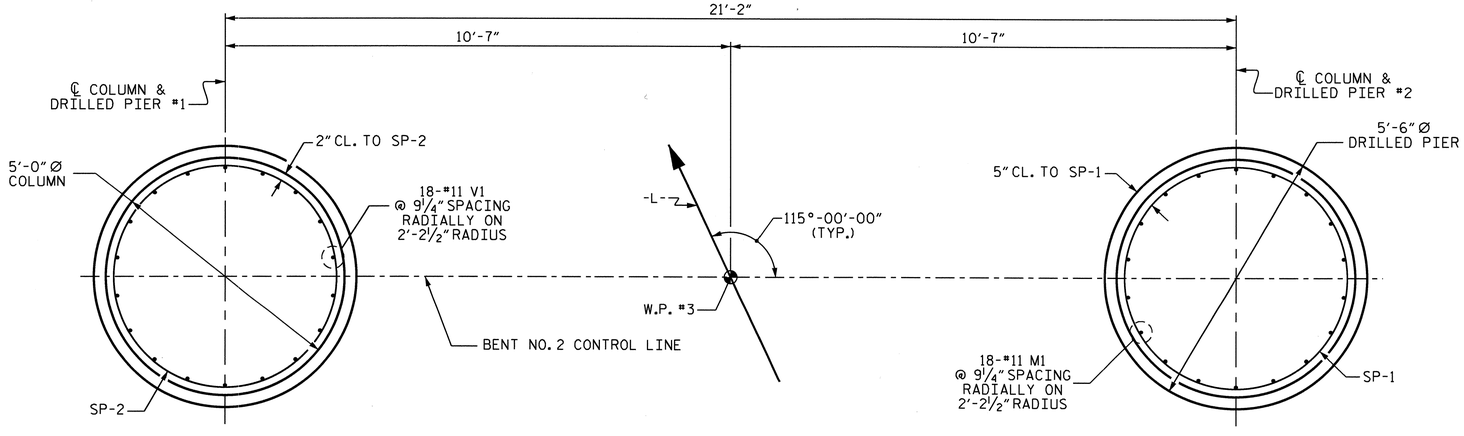
DRILLED PIERS

DRILLED PIER CONCRETE (CU. YARDS)	
POUR #1 (DRILLED PIERS)	83.6 C.Y.
5'-6" Ø DRILLED PIERS IN SOIL	61.00 LIN. FT.
5'-6" Ø DRILLED PIERS NOT IN SOIL	34.00 LIN. FT.
PERMANENT STEEL CASING FOR 5'-6" Ø DRILLED PIERS	31.96 LIN. FT.
▲ CSL TUBES	600.00 LIN. FT.

* THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

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



PLAN OF COLUMNS AND DRILLED PIERS

DIMENSIONS AND REINFORCING ARE TYPICAL FOR EACH COLUMN & DRILLED PIER

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. 8-2-10

DRAWN BY : A. SORSENGINH DATE : 2/22/10
CHECKED BY : M.G. CHEEK DATE : 3/10

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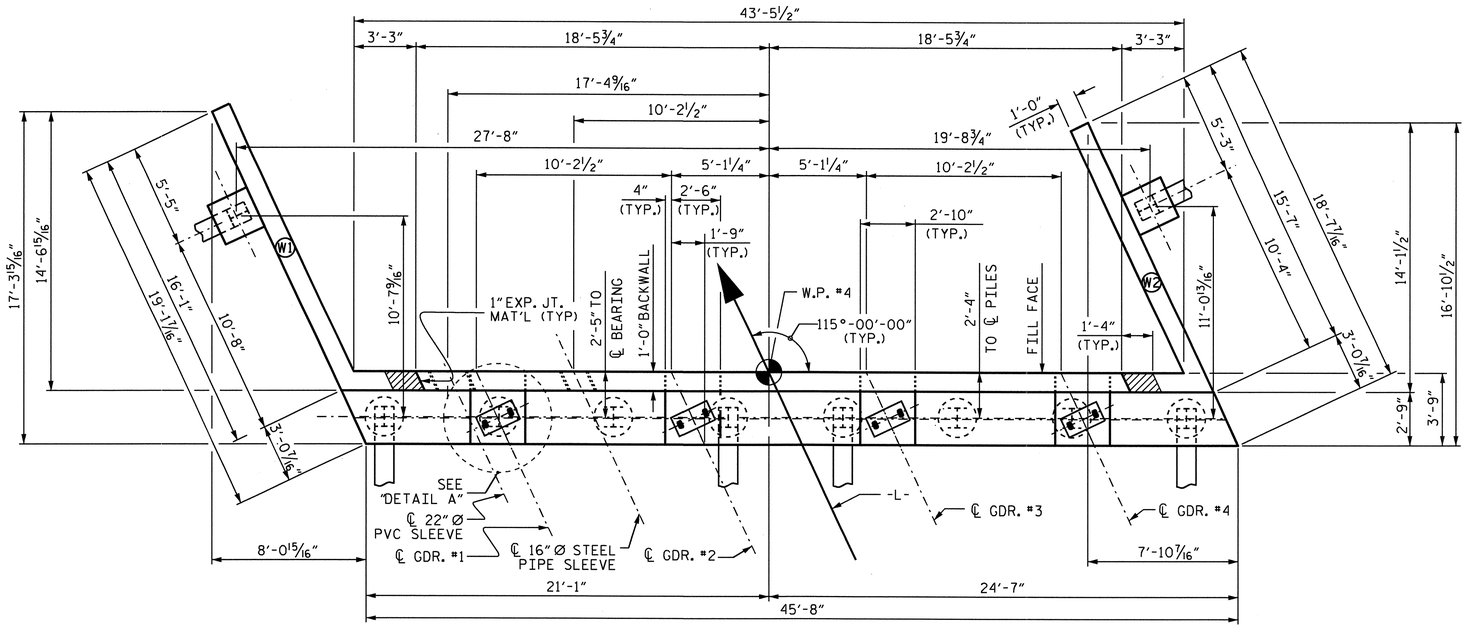
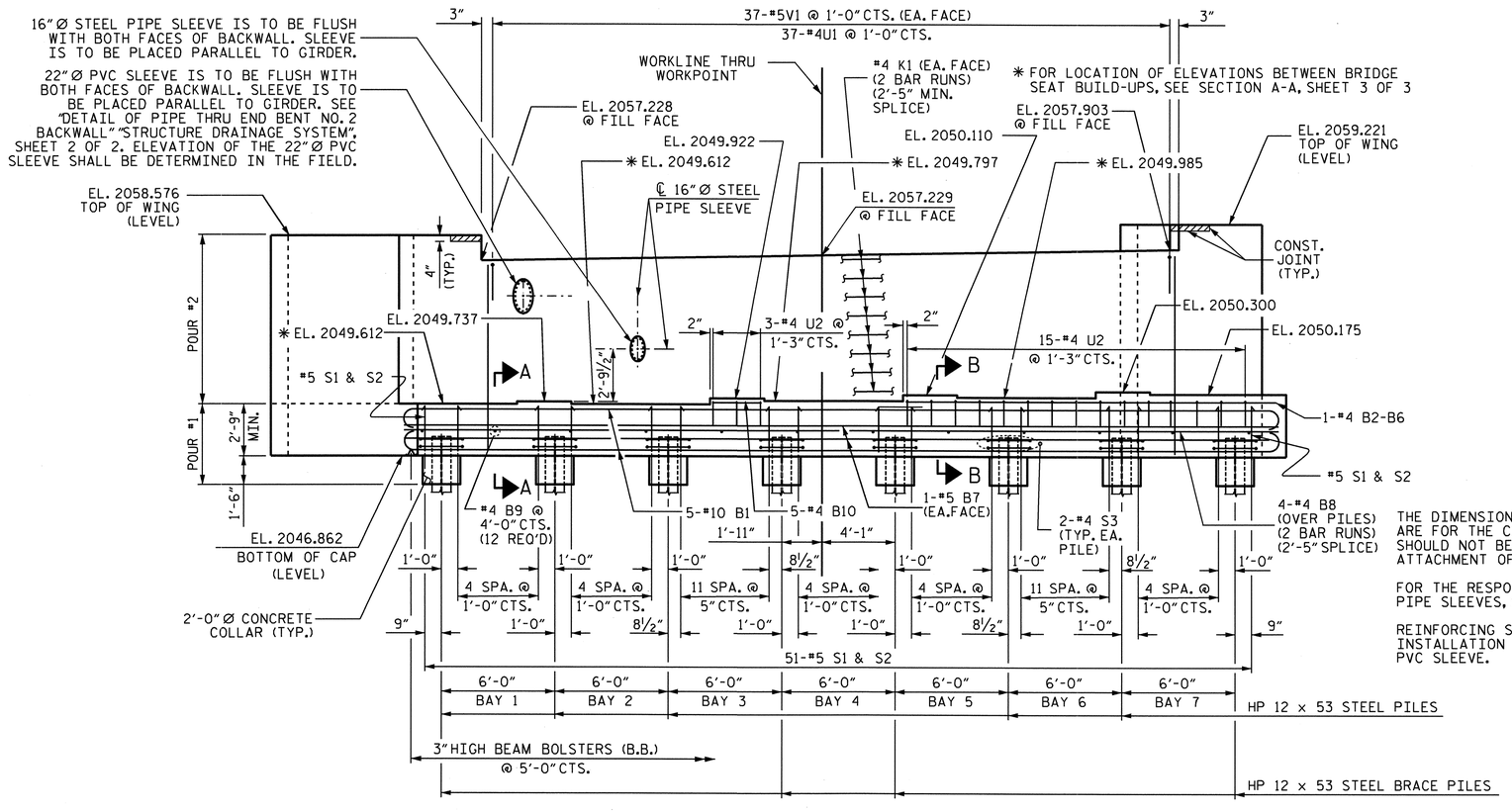


PLAN

16" Ø STEEL PIPE SLEEVE IS TO BE FLUSH WITH BOTH FACES OF BACKWALL. SLEEVE IS TO BE PLACED PARALLEL TO GIRDER.

22" Ø PVC SLEEVE IS TO BE FLUSH WITH BOTH FACES OF BACKWALL. SLEEVE IS TO BE PLACED PARALLEL TO GIRDER. SEE "DETAIL OF PIPE THRU END BENT NO. 2 BACKWALL" "STRUCTURE DRAINAGE SYSTEM", SHEET 2 OF 2. ELEVATION OF THE 22" Ø PVC SLEEVE SHALL BE DETERMINED IN THE FIELD.



ELEVATION

NOTES

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

FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE AT END BENTS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

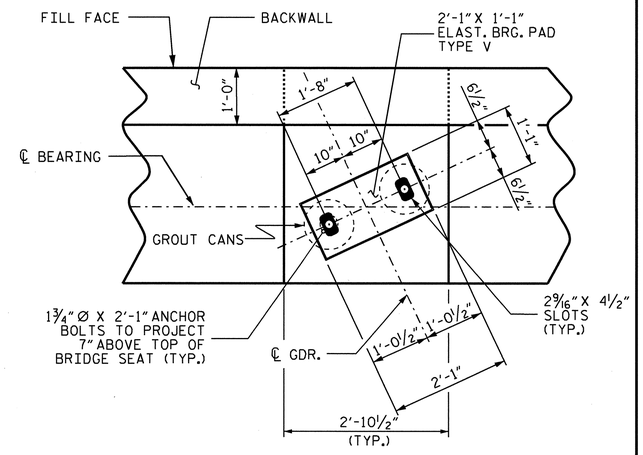
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.



DETAIL A

NOTES

THE DIMENSIONS AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR THE CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE CONSTRUED TO BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

FOR THE RESPONSIBILITIES FOR FURNISHING AND PLACING STEEL PIPE SLEEVES, SEE UTILITY SPECIAL PROVISIONS.

REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY FOR INSTALLATION OF THE 16" Ø STEEL PIPE SLEEVE AND THE 22" Ø PVC SLEEVE.

For Water Lines Attachment only

NORTH CAROLINA PROFESSIONAL SEAL 023052 ENGINEER JOHN LEWIS HINTON

8-3-10

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL D. CRAIG JR.

8-2-10

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A.L. FIGUEROA DATE : 02-22-10
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

29-JUL-2010 14:36
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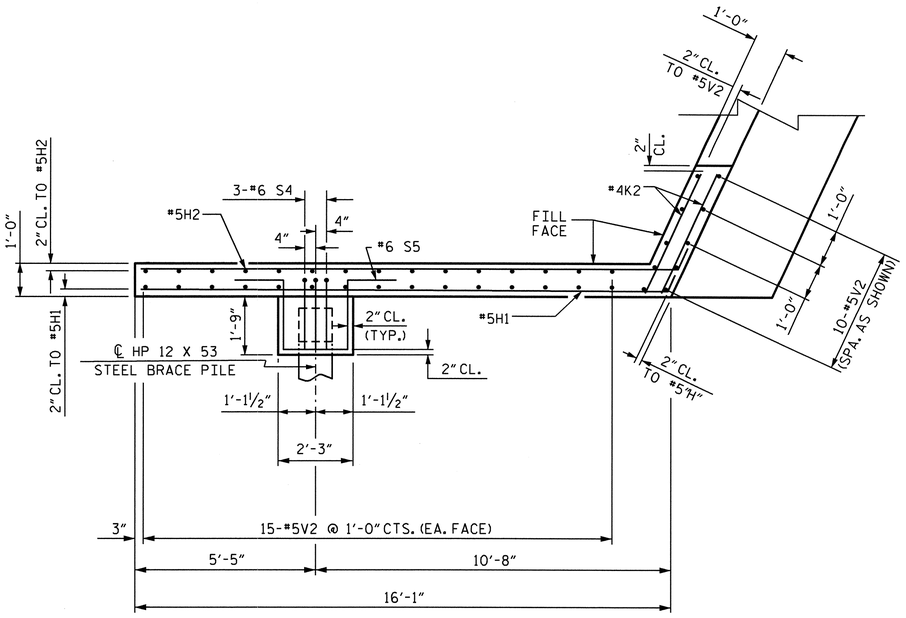
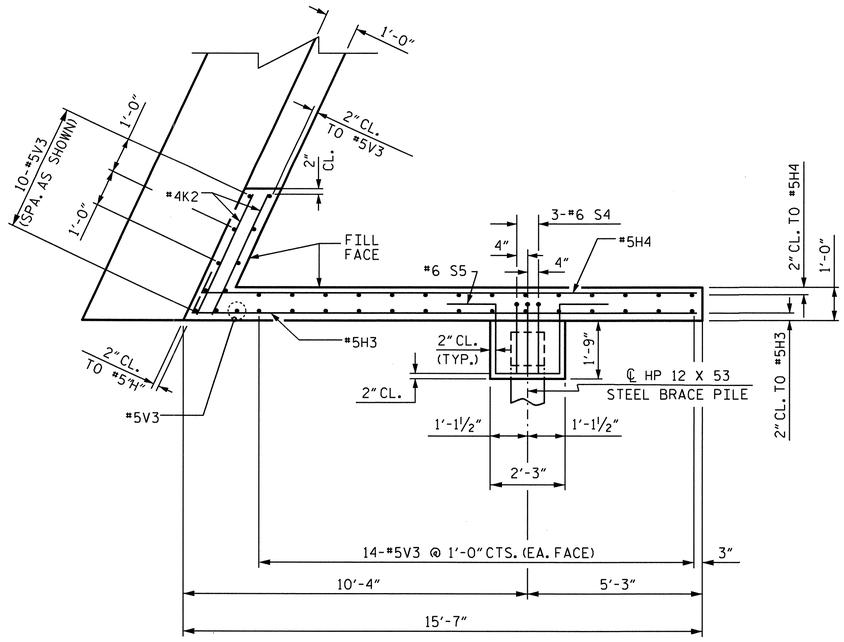
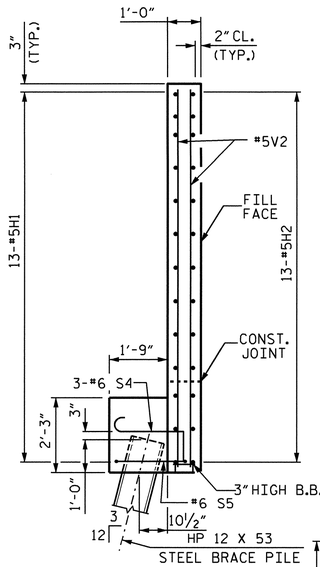


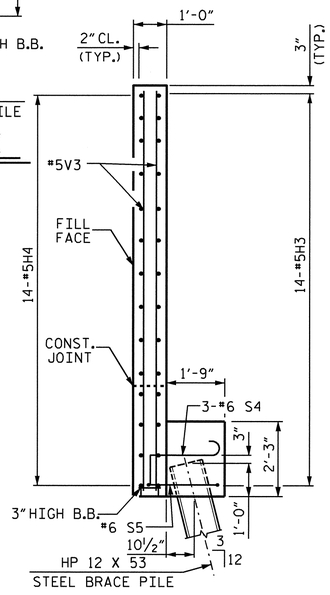
PLAN OF LEFT WING - W1



PLAN OF RIGHT WING - W2



SECTION X-X



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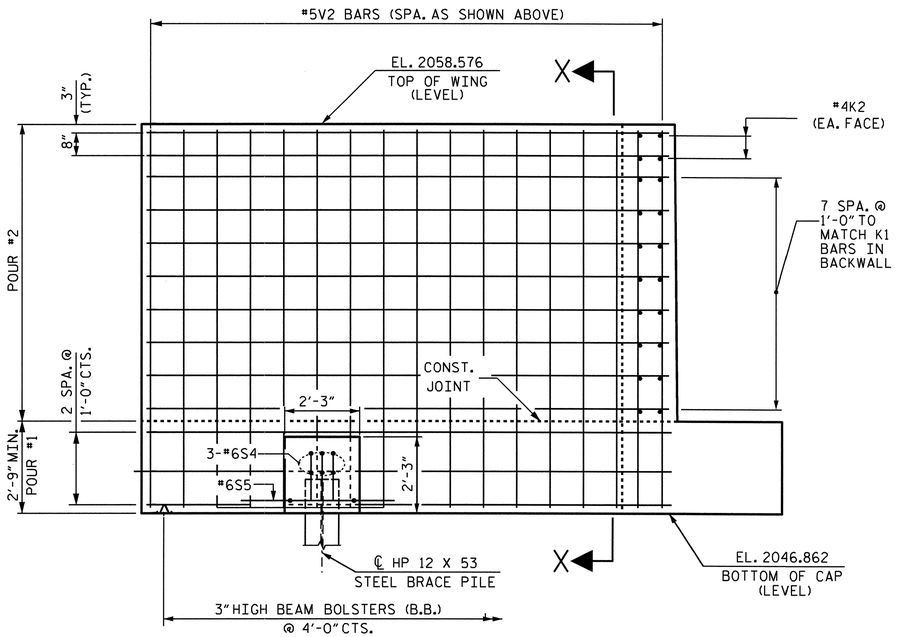
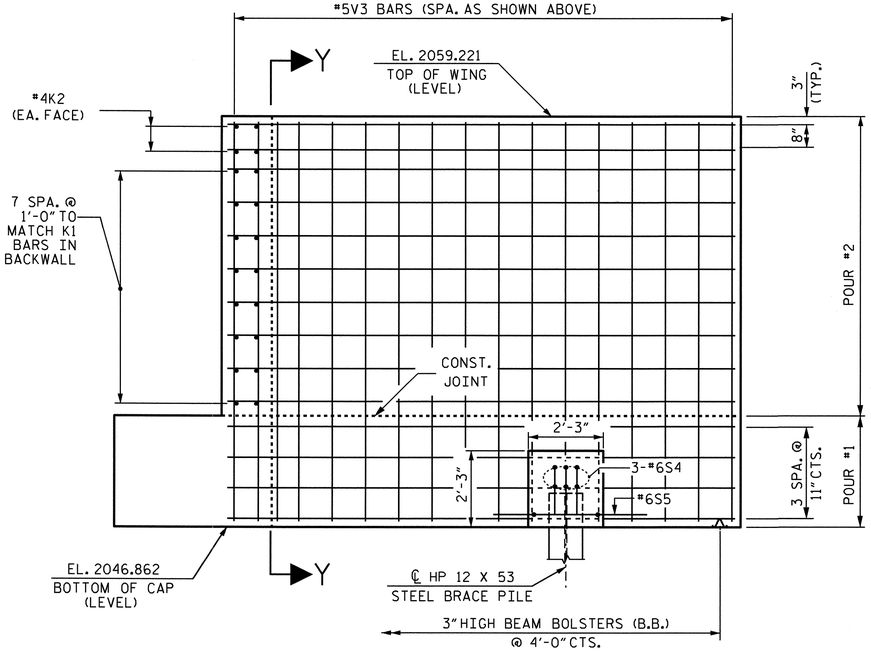


ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CRUTCHFIELD, JR.
8-2-10

DRAWN BY : A.L. FIGUEROA DATE : 02-22-10
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

14-JUN-2010 09:54
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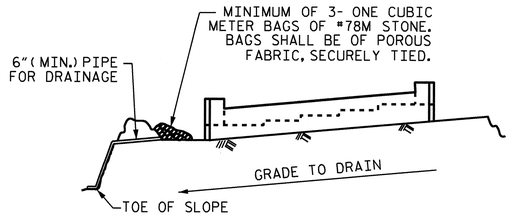
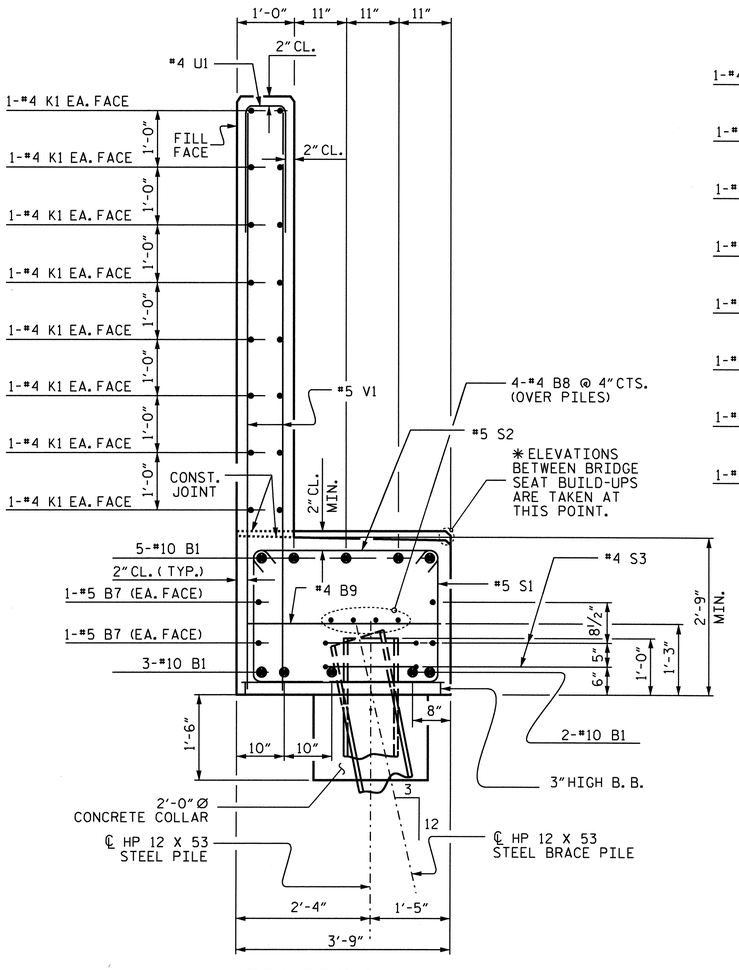


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

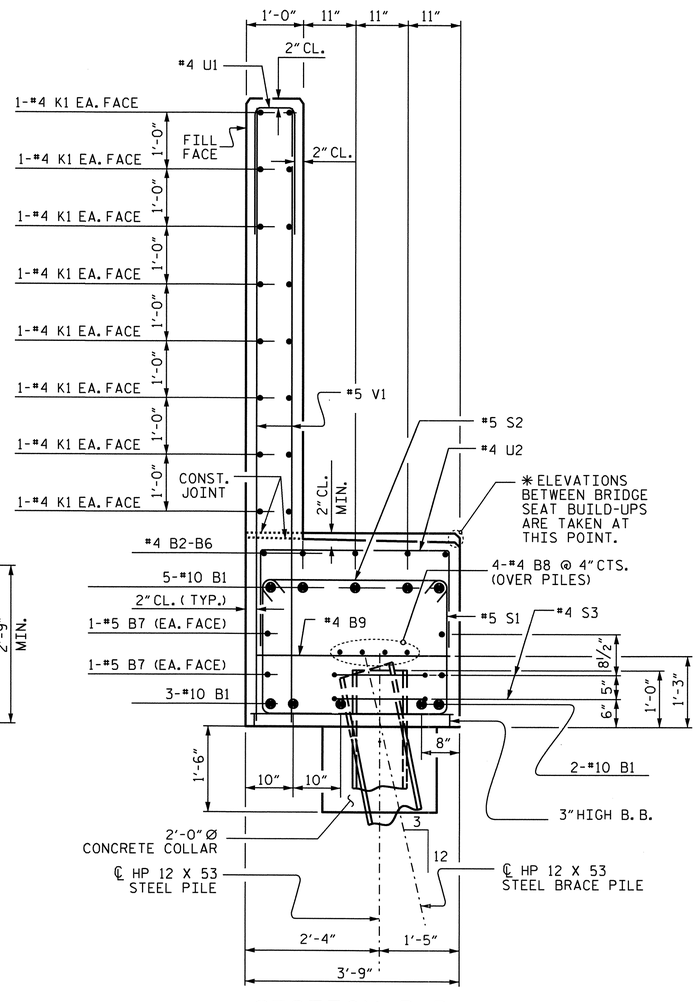
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



SECTION A-A



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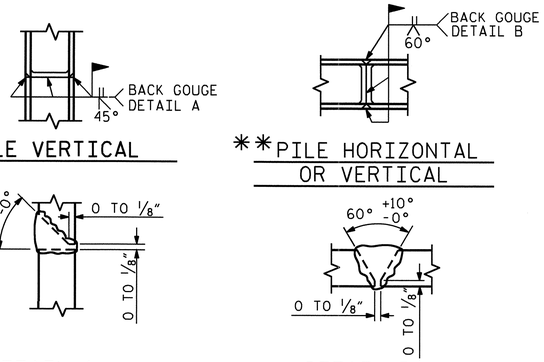


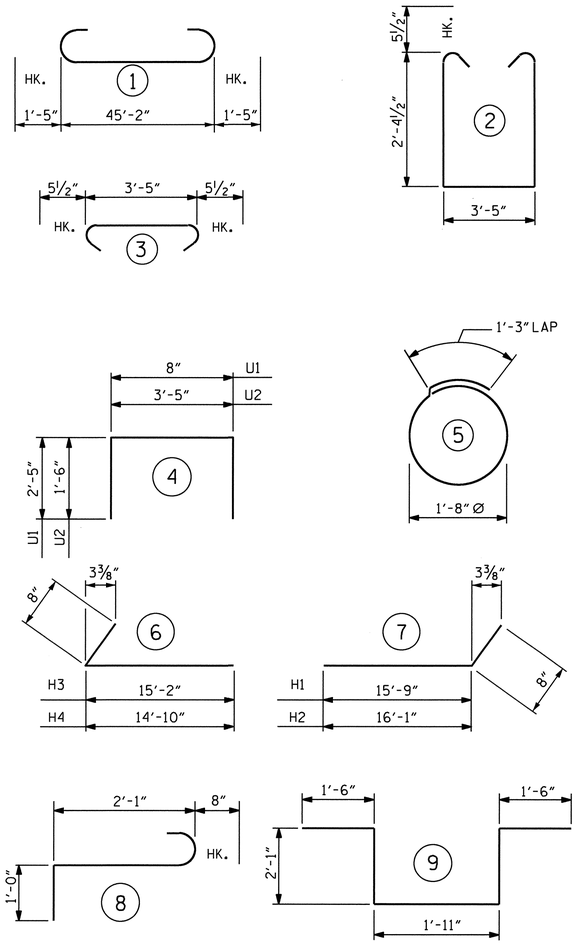
DETAIL A

DETAIL B

** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	48'-0"	2065
B2	1	#4	STR	17'-8"	12
B3	1	#4	STR	18'-0"	12
B4	1	#4	STR	18'-5"	12
B5	1	#4	STR	18'-11"	13
B6	1	#4	STR	19'-2"	13
B7	4	#5	STR	45'-4"	189
B8	8	#4	STR	23'-11"	128
B9	12	#4	STR	3'-5"	27
B10	5	#4	STR	2'-6"	8
H1	13	#5	6	16'-5"	223
H2	13	#5	6	16'-9"	227
H3	14	#5	7	15'-10"	231
H4	14	#5	7	15'-6"	226
K1	32	#4	STR	23'-11"	511
K2	8	#4	STR	3'-11"	21
S1	51	#5	2	9'-1"	483
S2	51	#5	3	4'-4"	231
S3	16	#4	5	6'-6"	69
S4	6	#6	8	3'-9"	34
S5	2	#6	9	9'-1"	27
U1	37	#4	4	5'-6"	136
U2	18	#4	4	6'-5"	77
V1	74	#5	STR	10'-0"	772
V2	40	#5	STR	11'-4"	473
V3	39	#5	STR	12'-0"	488

REINFORCING STEEL = 6,708 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1

CAP, CONCRETE COLLARS, LOWER PART OF WINGS & BRACE PILE BLOCKS 24.6 C.Y.

POUR #2

BACKWALL & UPPER PART OF WINGS 23.2 C.Y.

CLASS A CONCRETE TOTAL 47.8 C.Y.

HP 12 X 53 STEEL PILES

NO. 10 900 LIN. FT.

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT NO. 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL C. CREEK, JR.
8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			44

DRAWN BY : A.L. FIGUEROA DATE : 02-22-10
CHECKED BY : W.D. CRUTCHER DATE : 02-25-10

14-JUN-2010 09:54
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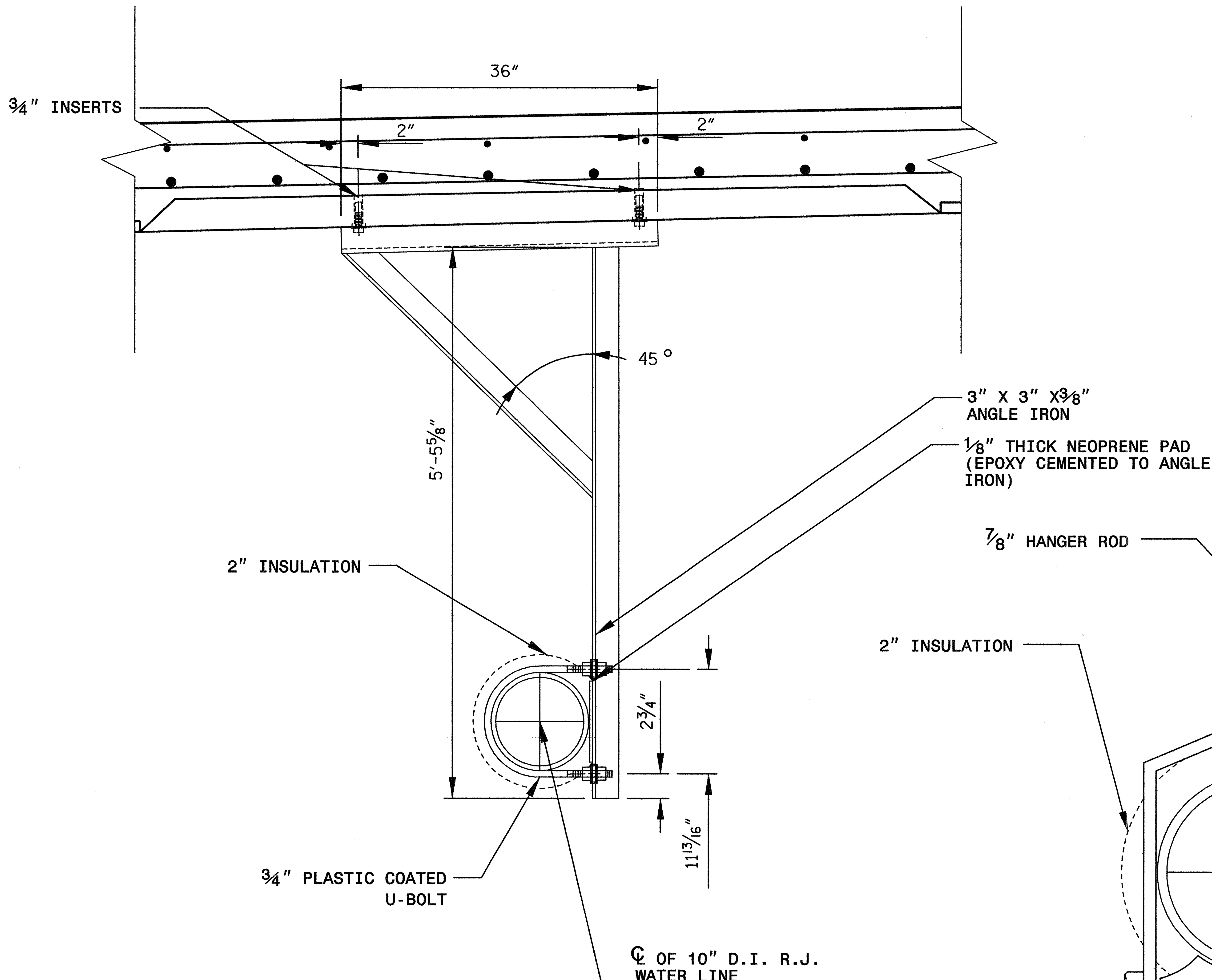
PROJECT REFERENCE NO.	SHEET NO.
R-4748	S-41

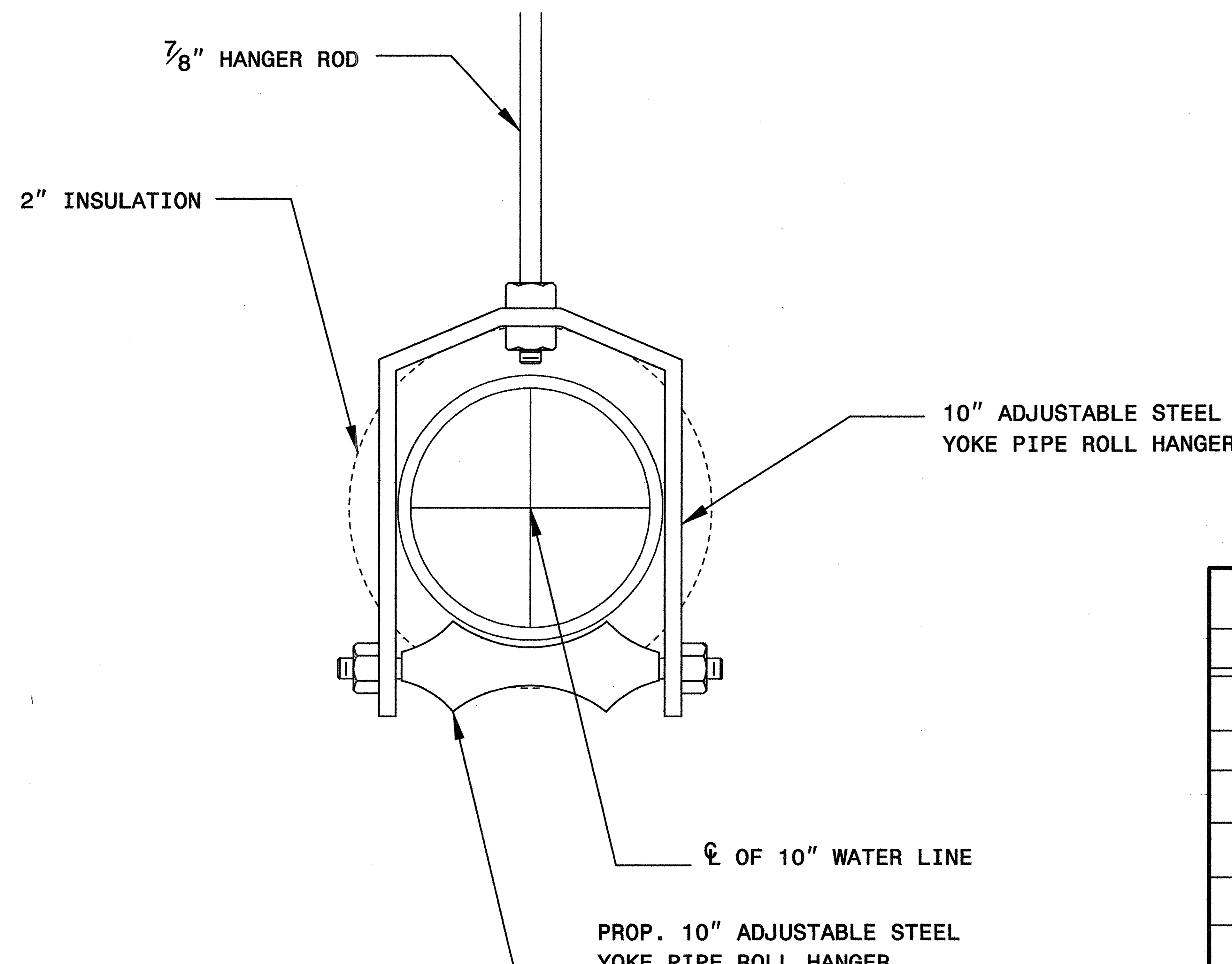
Municipal Services Engineering Company, P.A.

UTILITY CONSTRUCTION



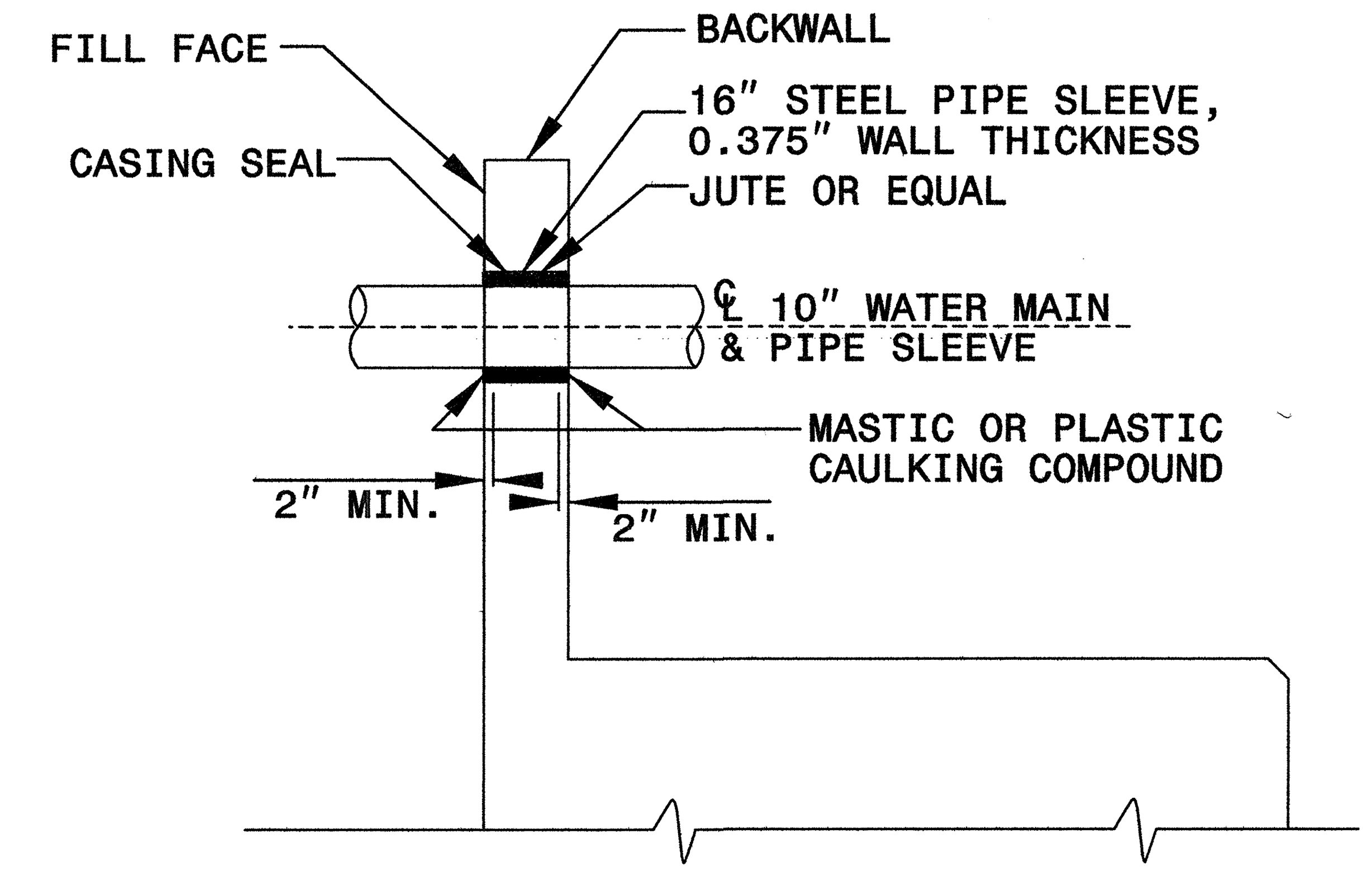
LATERAL BRACE DETAIL

NOT TO SCALE



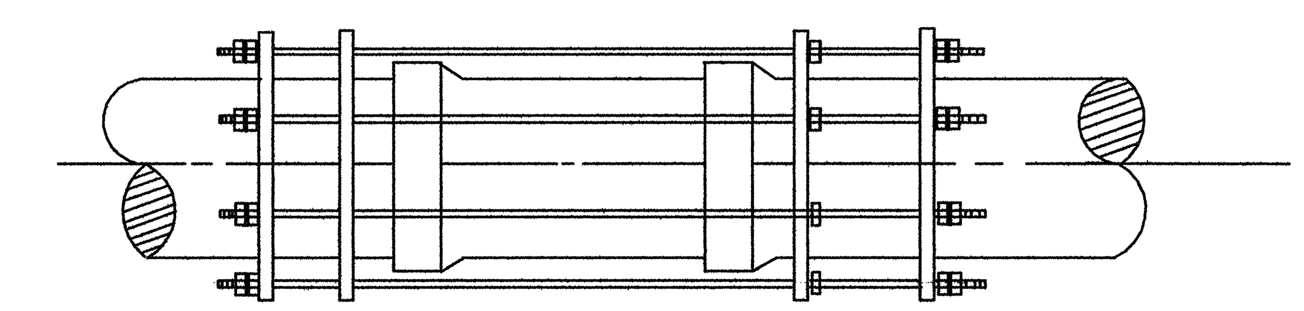
PIPE HANGER DETAIL

NOT TO SCALE



SECTION THRU BACKWALL

NOT TO SCALE



EXPANSION COUPLING DETAIL

NOT TO SCALE

1 REQUIRED

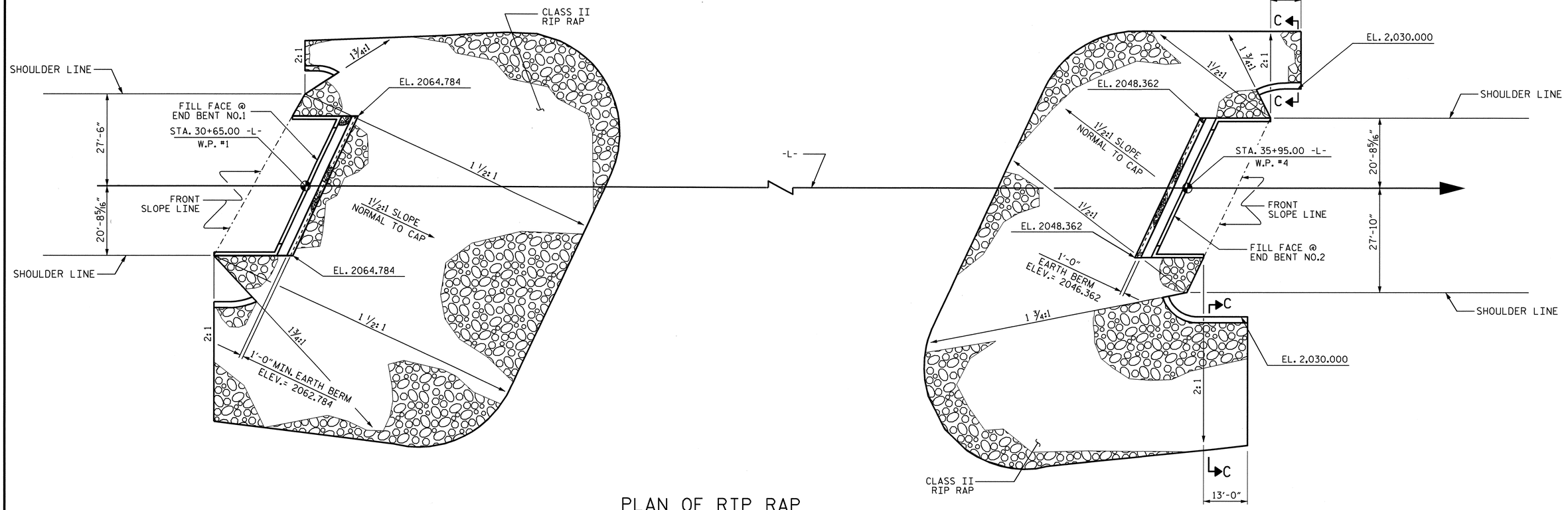
NOTES

1. ANGLES SHALL BE CONNECTED BY ARC WELDING.
2. HOLES IN ANGLE IRON SHALL BE DRILLED 1⁄16" LARGER THAN U-BOLTS AND ¾" INSERTS. NO BURNING OF HOLES WILL BE ALLOWED.
3. LATERAL BRACES SHALL BE INSTALLED ONE FOOT ON EITHER SIDE OF THE PIPE JOINT.

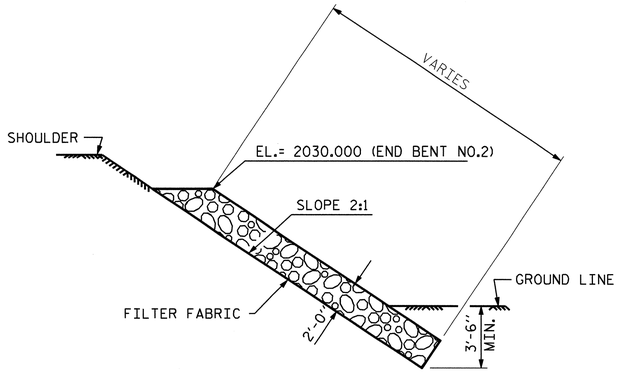
BILL OF MATERIALS FOR 10" WATER MAIN

NO.	UNITS	ITEMS
1	2 EA	16" STEEL PIPE SLEEVE, 0.375" WALL THICKNESS, 1'-0" LENGTH (END BENTS)
2	65 EA	⅞" APPROVED CONCRETE INSERTS (HANGER RODS)
3	65 EA	APPROVED ADJ. STEEL YOKE PIPE ROLL HANGER FOR 10" DIRJ WATER PIPE WITH ⅞" HANGER RODS
4	600'	10" DI RESTRAINED JOINT WATER PIPE, PRESSURE CLASS 350
5	2	APPROVED MODULAR TYPE CASING SEAL
6	30	JUTE
7	25	MASTIC OR PLASTIC CAULKING COMPOUND
8	2 EA	END PLUGS (OR CAPS) FOR 10" DI PIPE
9	29 EA	LATERAL BRACE ASSEMBLIES
10	58 EA	¾" APPROVED CONCRETE INSERTS (LATERAL BRACES)
11	1 EA	EXPANSION COUPLING
12	1 LOT	PAINT (AS REQUIRED)

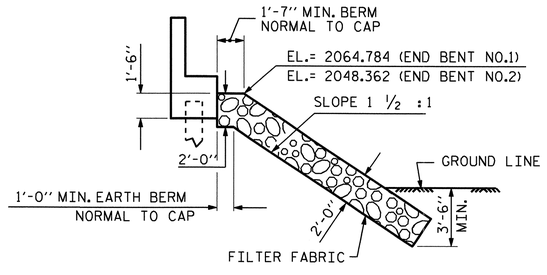
THESE QUANTITIES ARE FOR ESTIMATED QUANTITIES ONLY.



PLAN OF RIP RAP



SECTION C-C



℄ SECTION
BERM RIP RAPPED

ESTIMATED QUANTITIES		
BRIDGE @ STA. 33+30.00 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	2,463	2,737
END BENT 2	1,570	1,744

PROJECT NO. R-4748
MACON COUNTY
STATION: 33+30.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL LIGHTCAP, JR. 8-2-10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			44

SKEW > 90° STD. NO. RR3

DRAWN BY : A.L. FIGUEROA	DATE : 03/08/10	
CHECKED BY : D. HODGE	DATE : 03-16-10	
DRAWN BY : FCJ 2/88	REV. 8/16/99	RWW/LES
CHECKED BY : ARB 8/88	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

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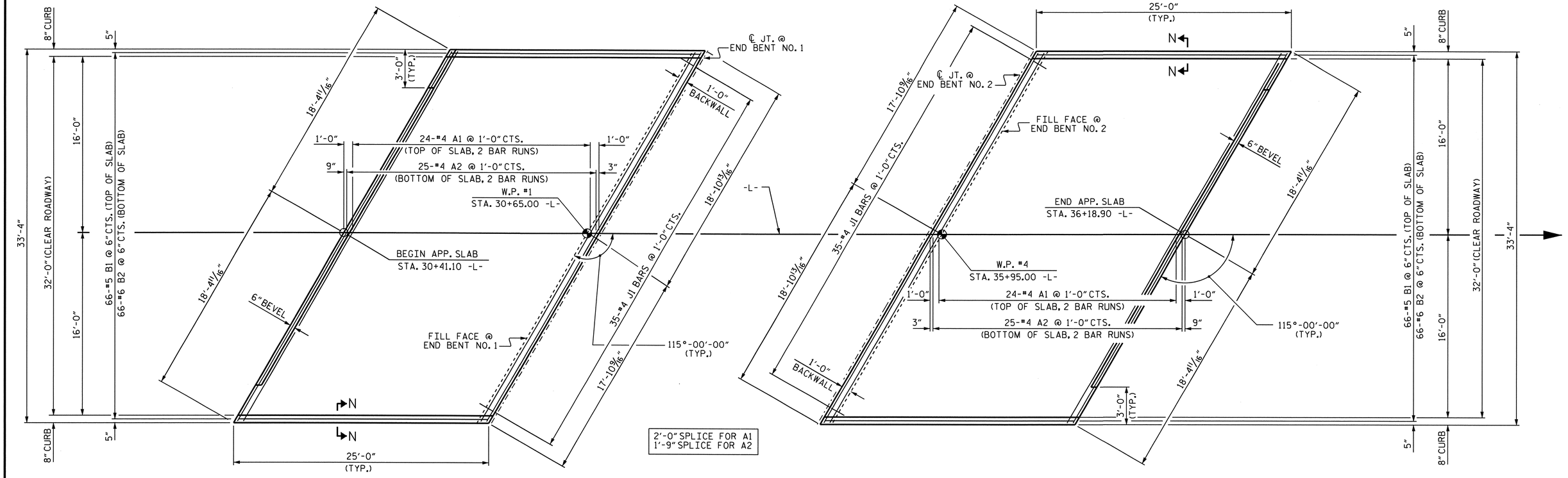
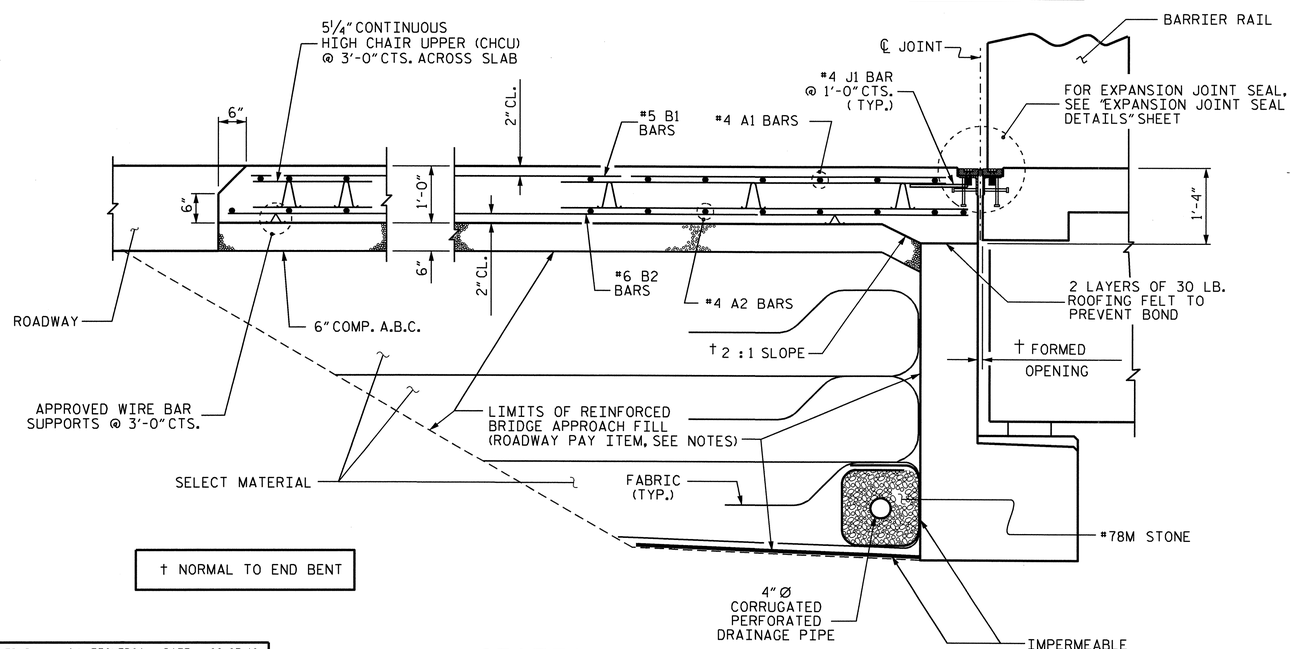


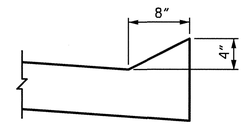
APPROACH SLAB @ END BENT NO. 1

PLAN

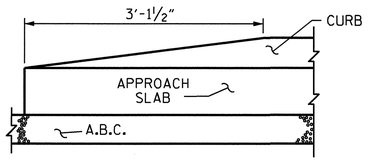
APPROACH SLAB @ END BENT NO. 2



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			44

STD. NO. BAS4

ASSEMBLED BY : A.L. FIGUEROA	DATE : 02-23-10		
CHECKED BY : M.G. CHEEK	DATE : 03-01-10		
DRAWN BY : FCJ 6/87	REV. 7/10/01	RWW/LES	
CHECKED BY : EGA 6/87	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06R	KMM/GM	

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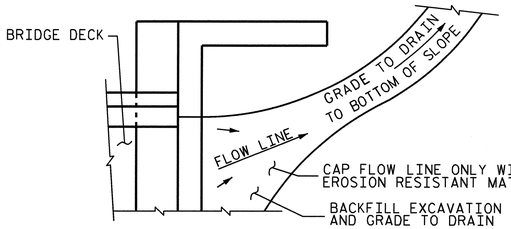


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

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.

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

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

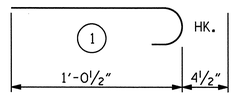
THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

APPROACH SLAB AT EB NO.1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	48	#4	STR	19'-3"	617
A2	50	#4	STR	19'-1"	637
✱ B1	66	#5	STR	24'-0"	1652
B2	66	#6	STR	24'-8"	2445
✱ J1	35	#4	1	1'-5"	33

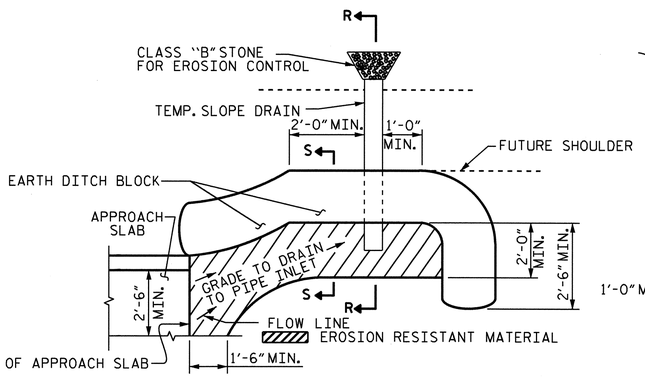
REINFORCING STEEL	3,082 LBS.
✱ EPOXY COATED REINFORCING STEEL	2,302 LBS.
CLASS AA CONCRETE	31.3 C.Y.

APPROACH SLAB AT EB NO.2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	48	#4	STR	19'-3"	617
A2	50	#4	STR	19'-1"	637
✱ B1	66	#5	STR	24'-0"	1652
B2	66	#6	STR	24'-8"	2445
✱ J1	35	#4	1	1'-5"	33

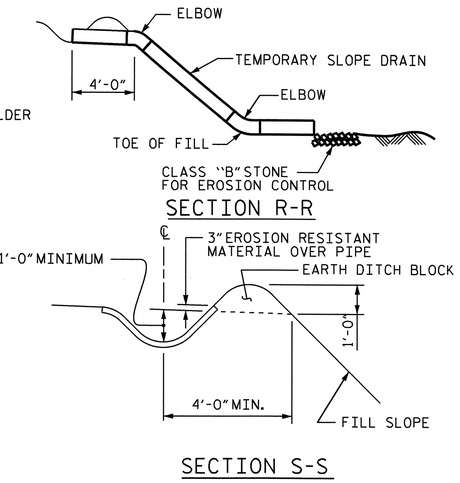
REINFORCING STEEL	3,082 LBS.
✱ EPOXY COATED REINFORCING STEEL	2,302 LBS.
CLASS AA CONCRETE	31.3 C.Y.

✱ THESE BARS ARE EPOXY COATED



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 DIAMETER.

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

PROJECT NO. R-4748

MACON COUNTY

STATION: 33+30.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY :	A.L. FIGUEROA	DATE :	02-23-10
CHECKED BY :	M.G. CHEEK	DATE :	03-01-10
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL GENE CHEEK, JR. 8-2-10

STD. NO. BAS10

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

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