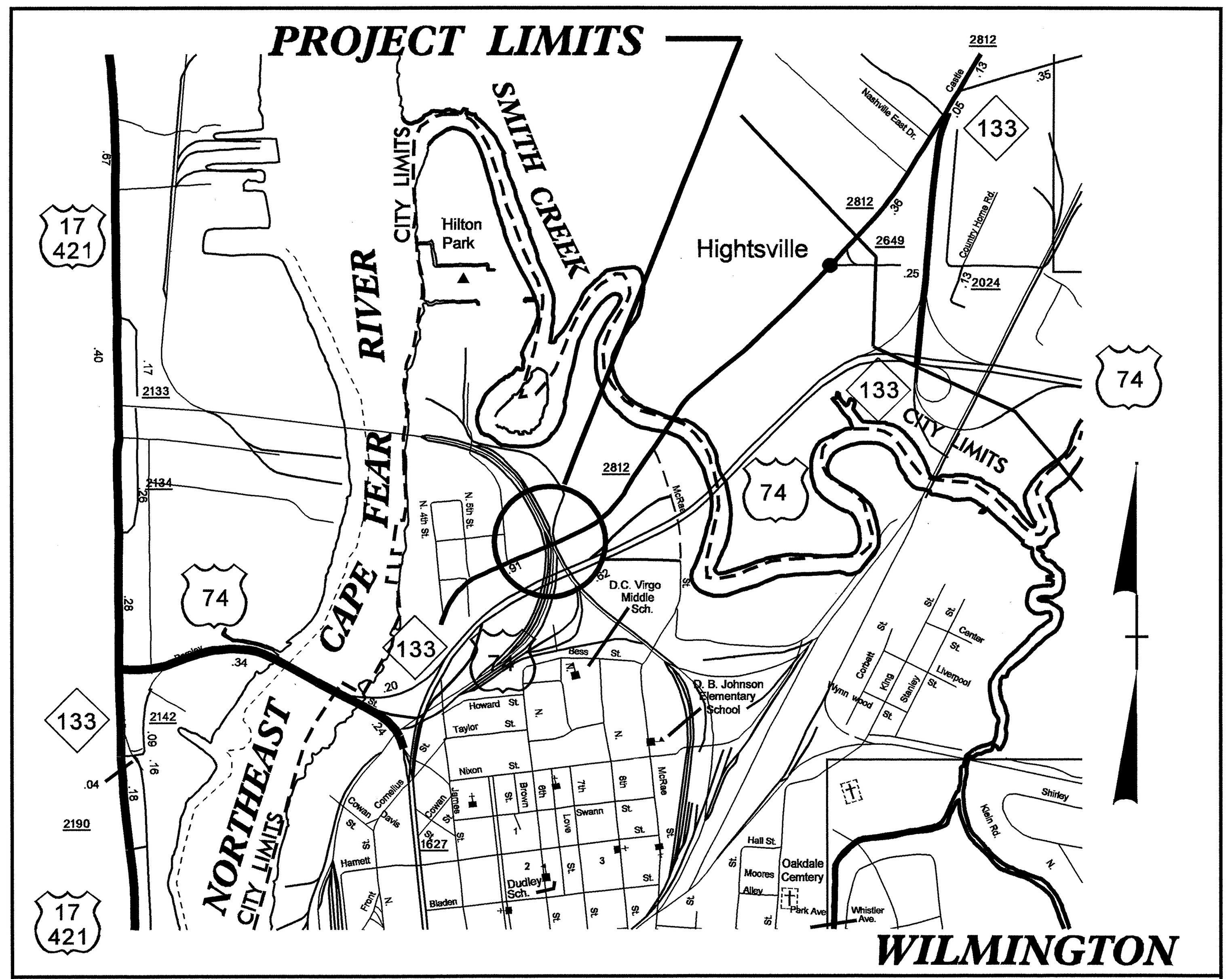
CONTRACT: C201921 TIP NO: B-3881

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3881		

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33323.1.1	BRSTP-117(9)	PE
33323.2.2	BRSTP-117(9)	R/W, UTIL
33323.3.1	BRSTP-117(14)	CONST.



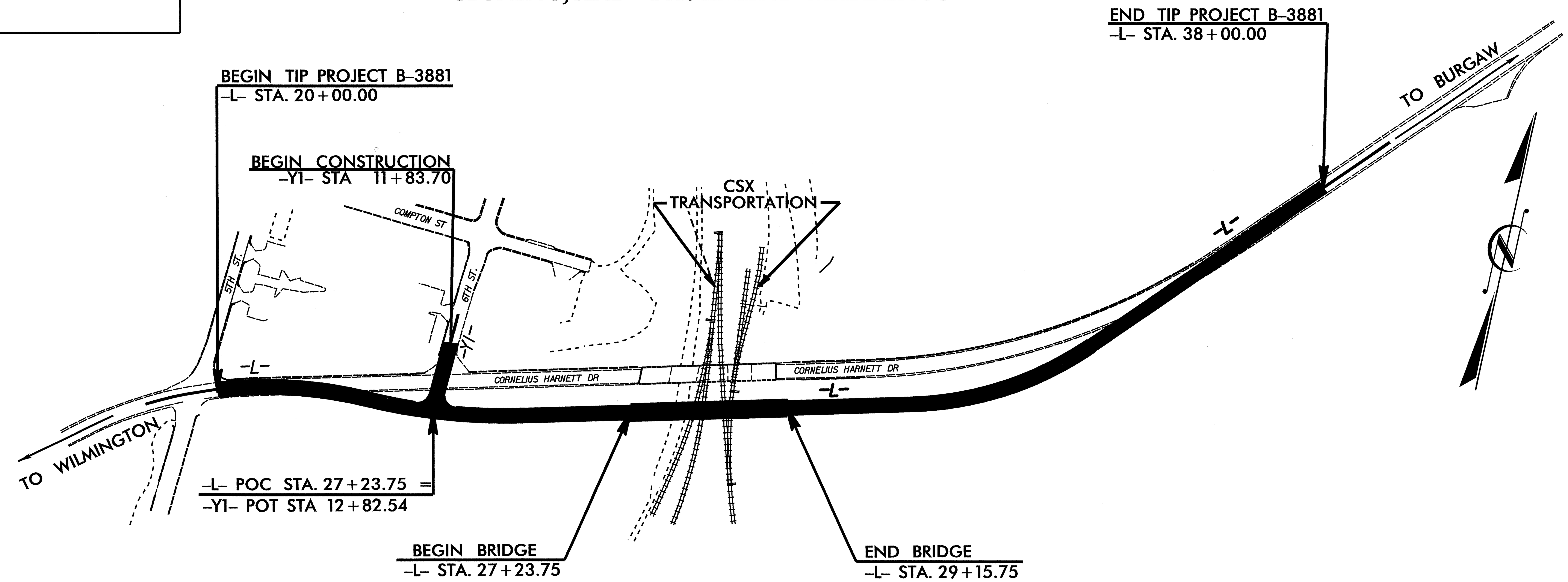
VICINTIY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

***LOCATION:* BRIDGE 26 OVER CSX TRANSPORTATION TRACKS ON CORNELIUS HARNETT DRIVE (OLD NC 133)**

***TYPE OF WORK:* GRADING, DRAINAGE, PAVING, STRUCTURE, SIGNING, AND PAVEMENT MARKINGS**



STRUCTURES

DESIGN DATA

ADT 2003 = 20600
ADT 2025 = 800
DHV = 30 %
D = 60 %
T = 5 % *
V = 40 MPH
* TTST 3% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3881 = 0.305 MILES
LENGTH STRUCTURE TIP PROJECT B-3881 = 0.036 MILES
TOTAL LENGTH OF TIP PROJECT B-3881 = 0.341 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :

OCTOBER 21, 2008

Q. H. NGUYEN, PE
PROJECT ENGINEER

J. R. DUGGINS JR., PE
PROJECT DESIGN ENGINEER

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

SIGNATURE:

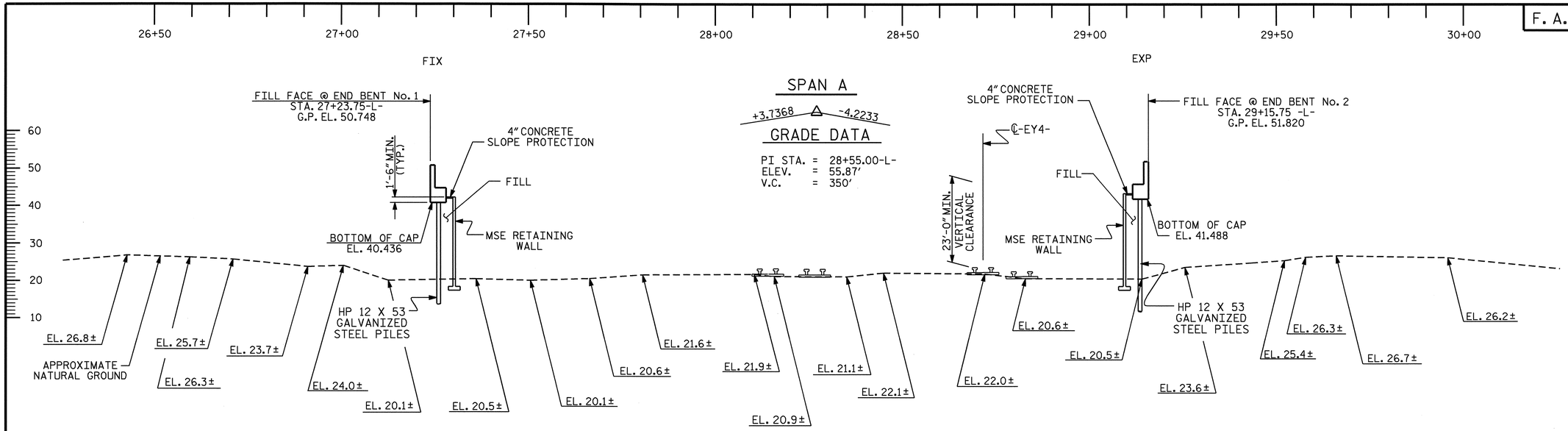
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

F. A. PROJECT NO. : BRSTP-117(9)

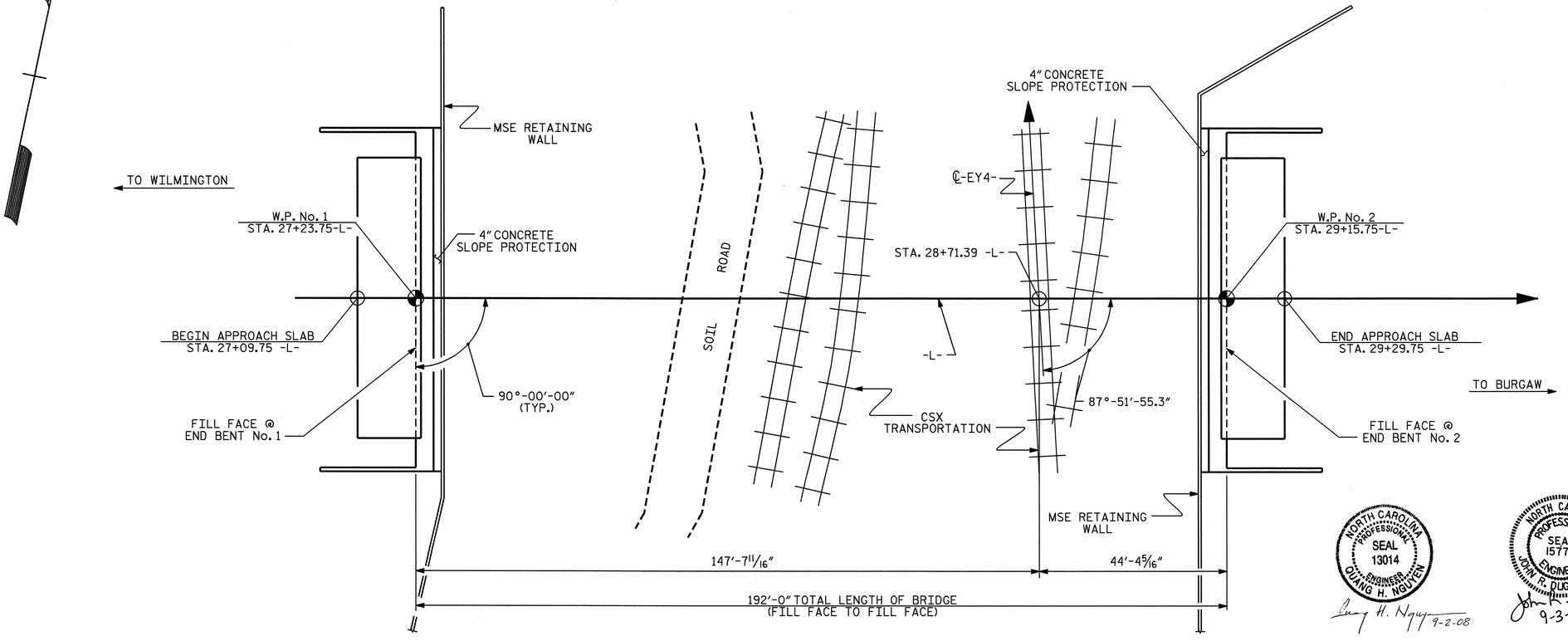


END BENT 1

END BENT 2

SECTION ALONG -L-

SECTION THRU END BENTS TAKEN @ RIGHT ANGLES



PLAN

(PILES FOR END BENTS NOT SHOWN FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 13014 ENGINEER QUANG H. NGUYEN
Quang H. Nguyen 9-2-08

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9-3-08

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 1 OF 4 M.P. 363.56 REPLACES BR. NO. 26

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER CSX TRANSPORTATION TRACKS ON CORNELIUS HARNETT DRIVE BETWEEN 6th STREET AND McRAE STREET

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

DRAWN BY : J. LAMBERT DATE : 11/07
CHECKED BY : S.W. PEARCE DATE : 11/07

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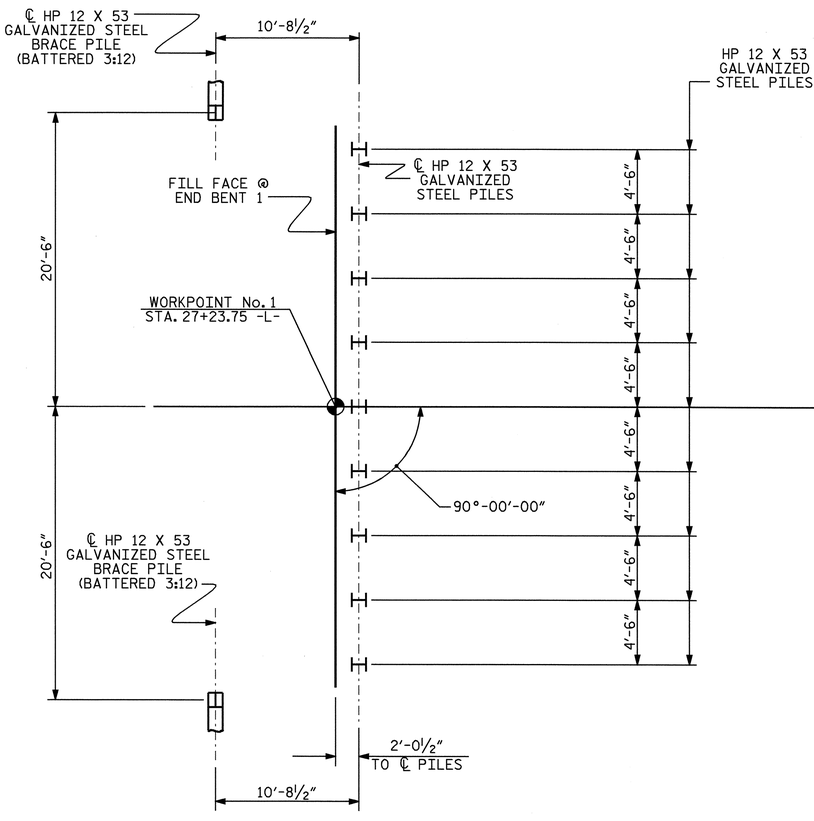
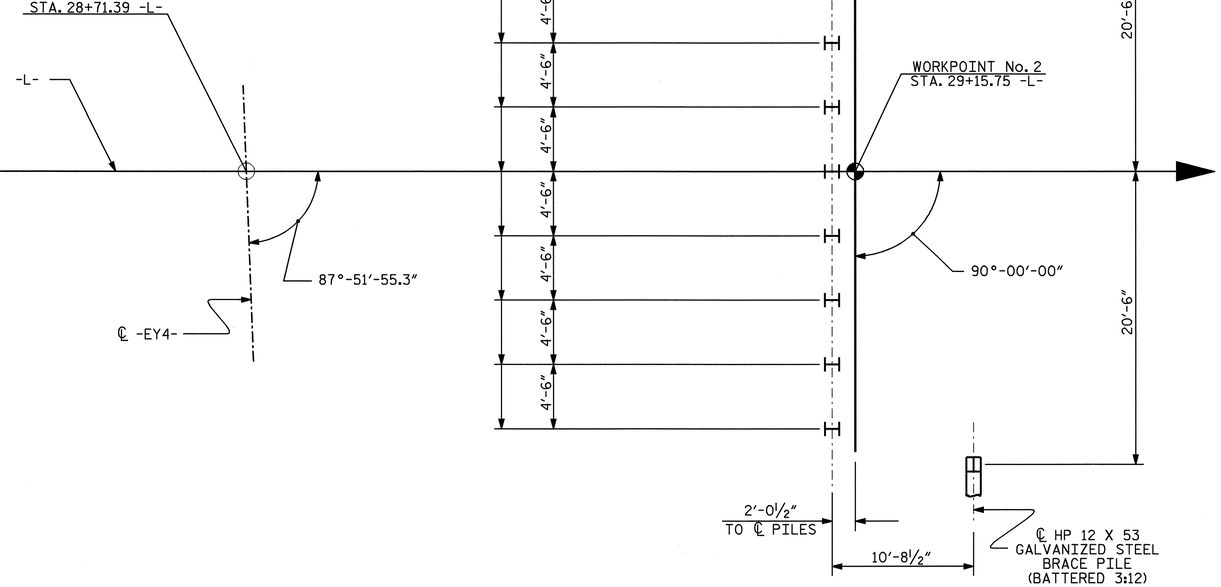


END BENT No. 1



END BENT No. 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT BOTTOM OF CAP.

NOTES

DRIVE PILES AT END BENT No. 1 AND END BENT No. 2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No. 1 AND END BENT No. 2 IS 75 TONS PER PILE.

STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR STEEL PILES AT END BENT No. 1 AND 2.

GALVANIZED STEEL PILES ARE REQUIRED IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR GALVANIZED STEEL PILES, A MINIMUM OF 40' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER CSX TRANSPORTATION TRACKS ON CORNELIUS HARNETT DRIVE BETWEEN 6th STREET AND McRAE STREET

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

DRAWN BY : J. LAMBERT DATE : 6/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

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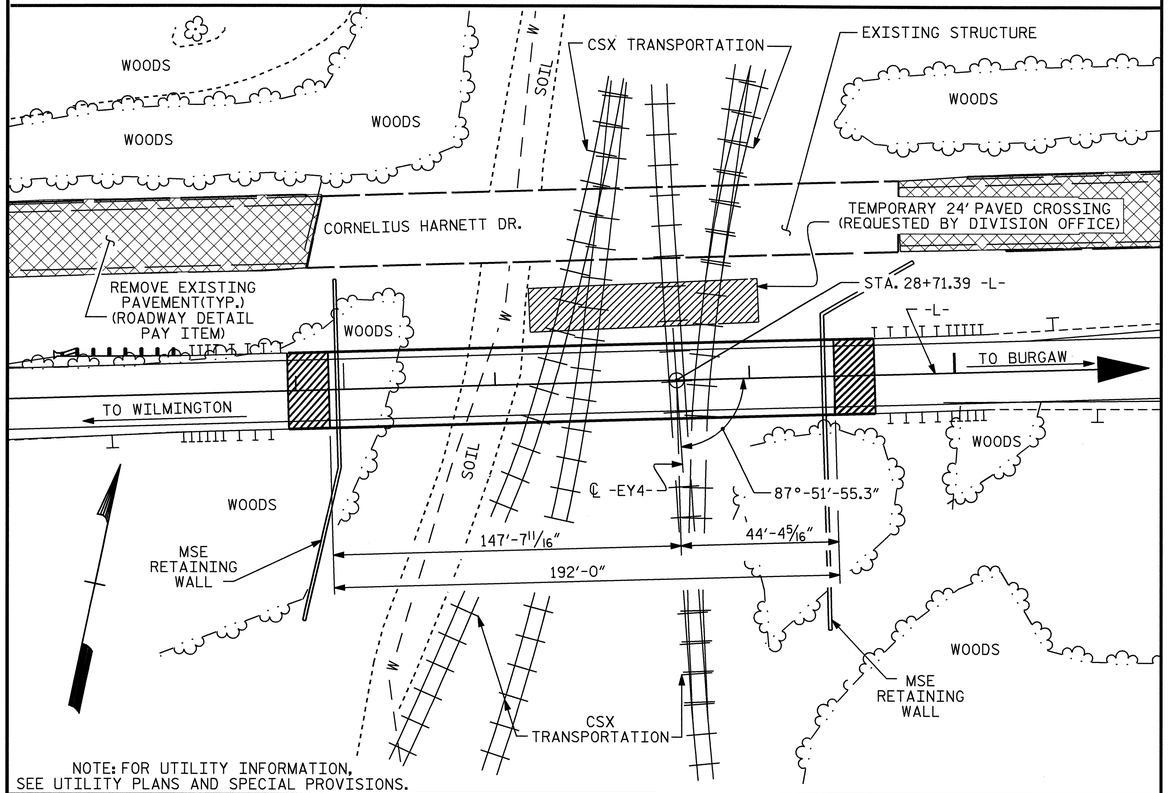
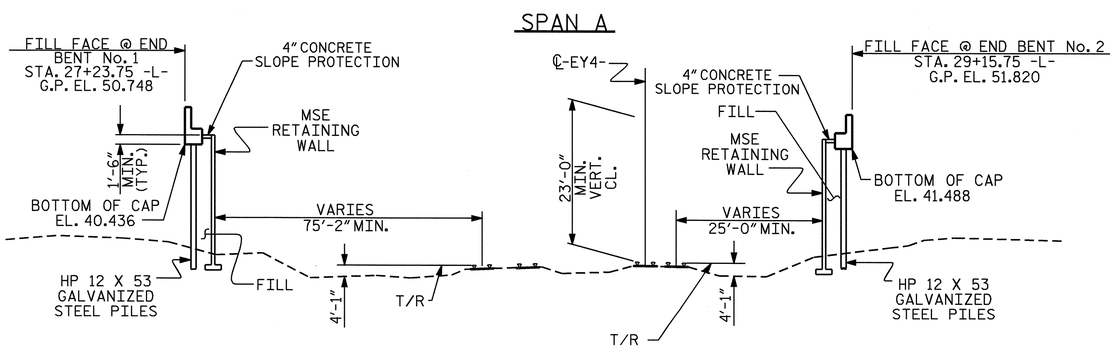
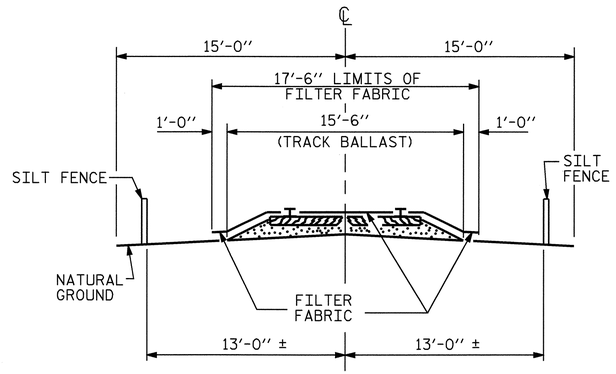


LOCATION SKETCH



HORIZONTAL CLEARANCE - RAILROAD

LOOKING IN DIRECTION OF INCREASING STATIONS ON RAILROAD
(SPAN LENGTH BASED ON THIS SECTION)



RAILROAD EROSION CONTROL DETAIL

NOTES

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 10'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

TOP OF RAIL ELEVATIONS		
TRACK STA. @ -EY4-	LEFT RAIL	RIGHT RAIL
0+00.00	22.515	22.260
0+20.01	22.313	22.233
0+40.22	22.254	22.237
0+59.86	22.288	22.246
1+08.96	22.183	22.094
1+48.94	22.023	22.011
2+08.95	21.931	21.921
2+39.01	21.886	21.882

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

9/3/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER CSX TRANSPORTATION TRACKS ON CORNELIUS HARNETT DRIVE BETWEEN 6th STREET AND McRAE STREET

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

DRAWN BY : J. LAMBERT DATE : 11/07

CHECKED BY : S.W. PEARCE DATE : 11/07

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TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 GALVANIZED STEEL PILES		STEEL PILE POINTS	CONCRETE BARRIER RAIL	60" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	SQ.FT.	SQ.FT.	CU. YDS.	LUMP SUM	LBS.	APPROX.LBS.	NO.	LIN.FT.	EA.	LIN.FT.	LIN.FT.	SQ.YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	6314	5840		LUMP SUM		381,000				379.79	372.0		LUMP SUM	LUMP SUM
END BENT NO.1				34.3		4223		11	715	11			8		
END BENT NO.2				34.3		4223		11	715	11			8		
TOTAL	LUMP SUM	6314	5840	68.6	LUMP SUM	8446	381,000	22	1430	22	379.79	372.0	16	LUMP SUM	LUMP SUM

NOTES :

ASSUMED LIVE LOAD = HS-20 OR ALTERNATE LOADING.

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

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 5 SPANS, 1 @ 50'-3", 1 @ 47'-2", 1 @ 50'-10", 1 @ 40'-2", AND 1 @ 41'-0" WITH 4 LINES OF REINFORCED CONCRETE DECK GIRDERS AND ASPHALT WEARING SURFACE, AND A CLEAR ROADWAY WIDTH OF 28'-4" ON A SUBSTRUCTURE OF REINFORCED CONCRETE CAP ON PRESTRESSED CONCRETE PILES, END BENTS AND INTERIOR BENTS, AND LOCATED ADJACENT TO THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR SETTLEMENT PLATES, SEE ROADWAY PLANS.

OBSERVE A 6 MONTH WAITING PERIOD AND 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENTS TO THE BOTTOM OF CAP ELEVATION AT END BENTS No. 1 AND 2, RESPECTIVELY. CONSTRUCTION SEQUENCE SHALL INCLUDE DRIVING PILES, CONSTRUCTING MSE WALLS WITH TEMPORARY FACINGS, PLACING FILL UP TO THE BOTTOM OF CAP ELEVATIONS AND OBSERVING THE ABOVE WAITING PERIODS. FOLLOWING COMPLETION OF THE WAITING PERIODS, THE PERMANENT WALL FACINGS FOR THE MSE WALL MAY BE CONSTRUCTED.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

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 GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

9/3/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER CSX TRANSPORTATION TRACKS ON CORNELIUS HARNETT DRIVE BETWEEN 6th STREET AND McRAE STREET

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

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

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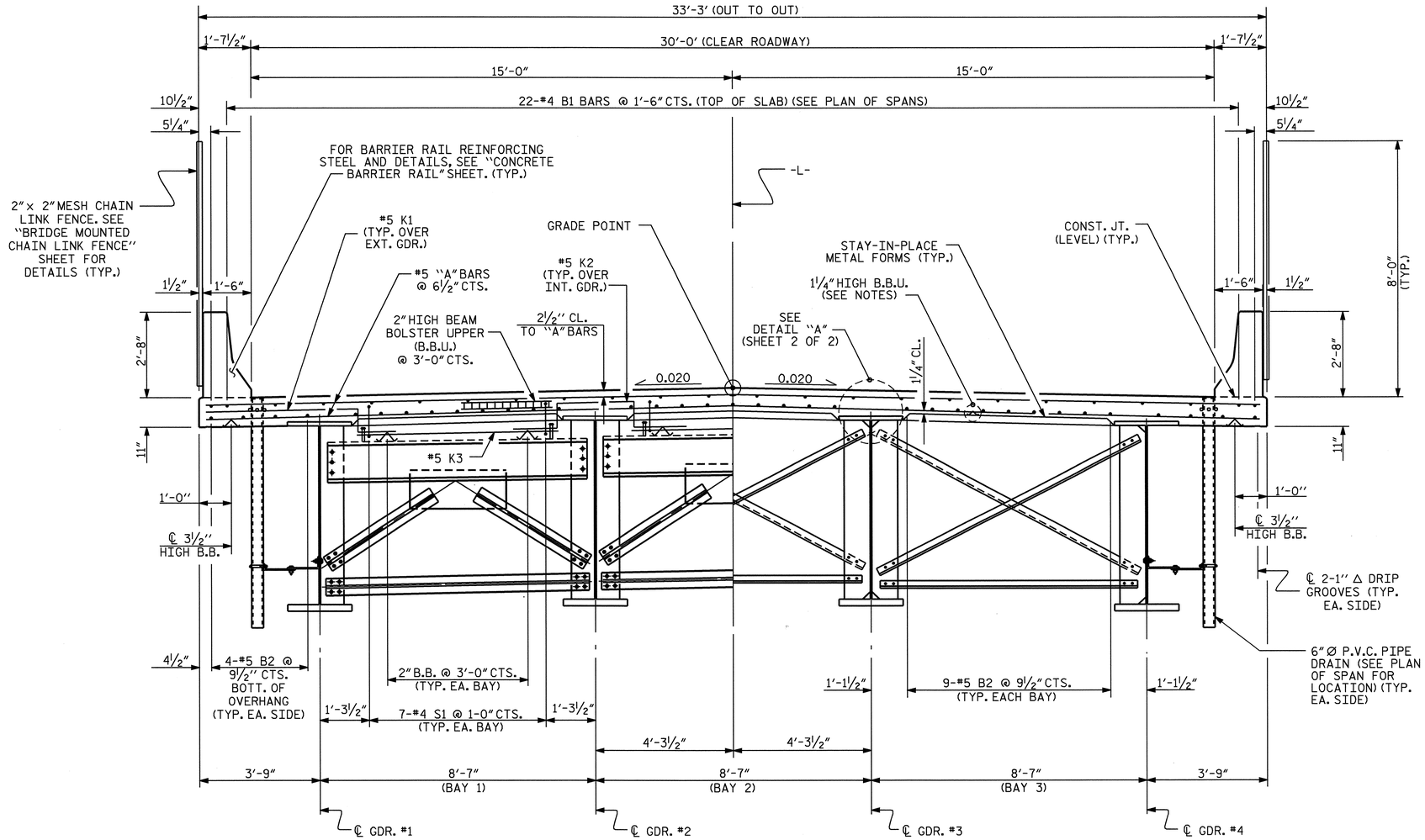

HALF TYPICAL SECTION
SHOWING END BENT DIAPHRAGMS

HALF TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE STAY-IN-PLACE METAL 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 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL 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 STAY-IN-PLACE METAL FORM WORKING DRAWINGS.

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

PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF GRAY PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPARATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

DIRECTION OF CASTING DECK CONCRETE SHALL BE FROM THE FIXED BEARING END TOWARD THE EXPANSION BEARING END OF THE SPAN.

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			26

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CHECKED BY : S.W. PEARCE DATE : 7/2008

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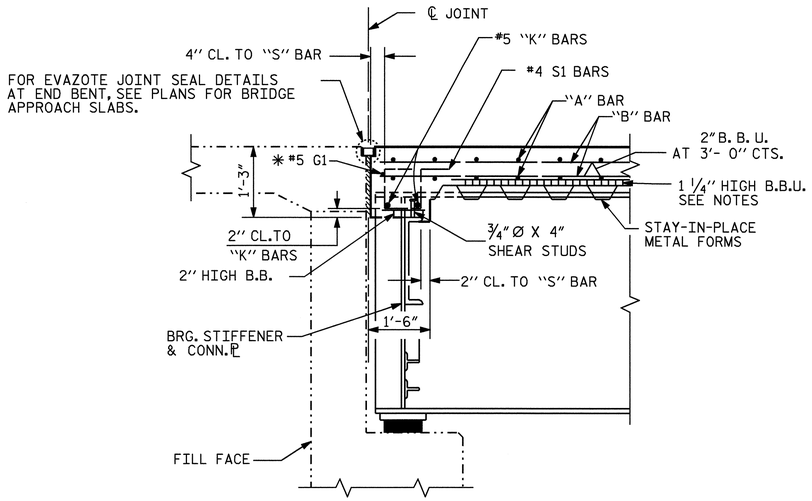
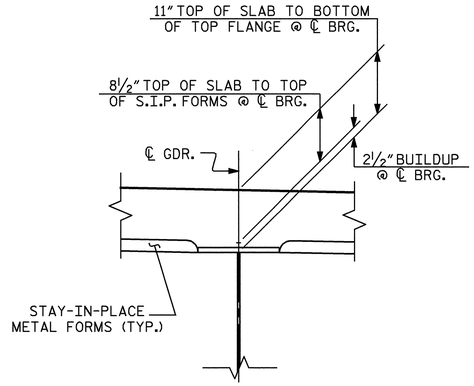
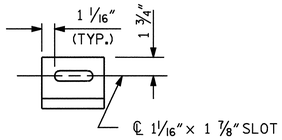


SECTION @ END BENTS

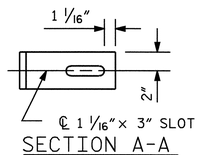
* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



DETAIL A



SECTION B-B



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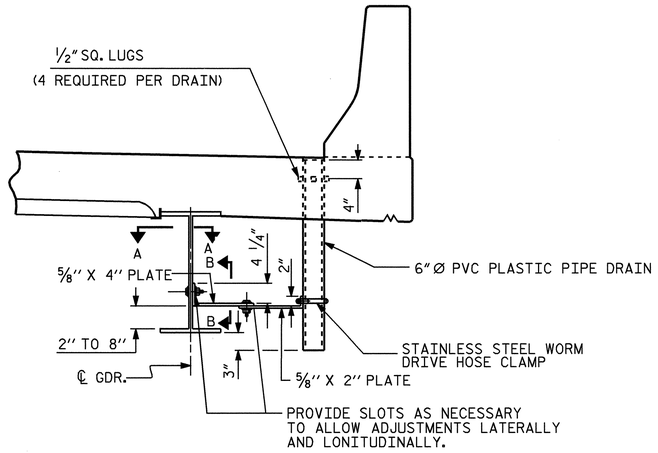

DRAIN CONNECTOR DETAIL

COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

TOP OF FLOOR DRAIN TO BE SET 3/8'' BELOW SURFACE OF SLAB.

4 - 1/2'' SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SOACES AROUND THE PIPE DRAIN APPROXIMATELY 4'' FROM THE TOP OF THE PIPE.

BOLT SIZE TO BE SAME AS DIAPHRAGM AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

THE 6'' Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 1/2008
CHECKED BY : S.W. PEARCE DATE : 7/2008

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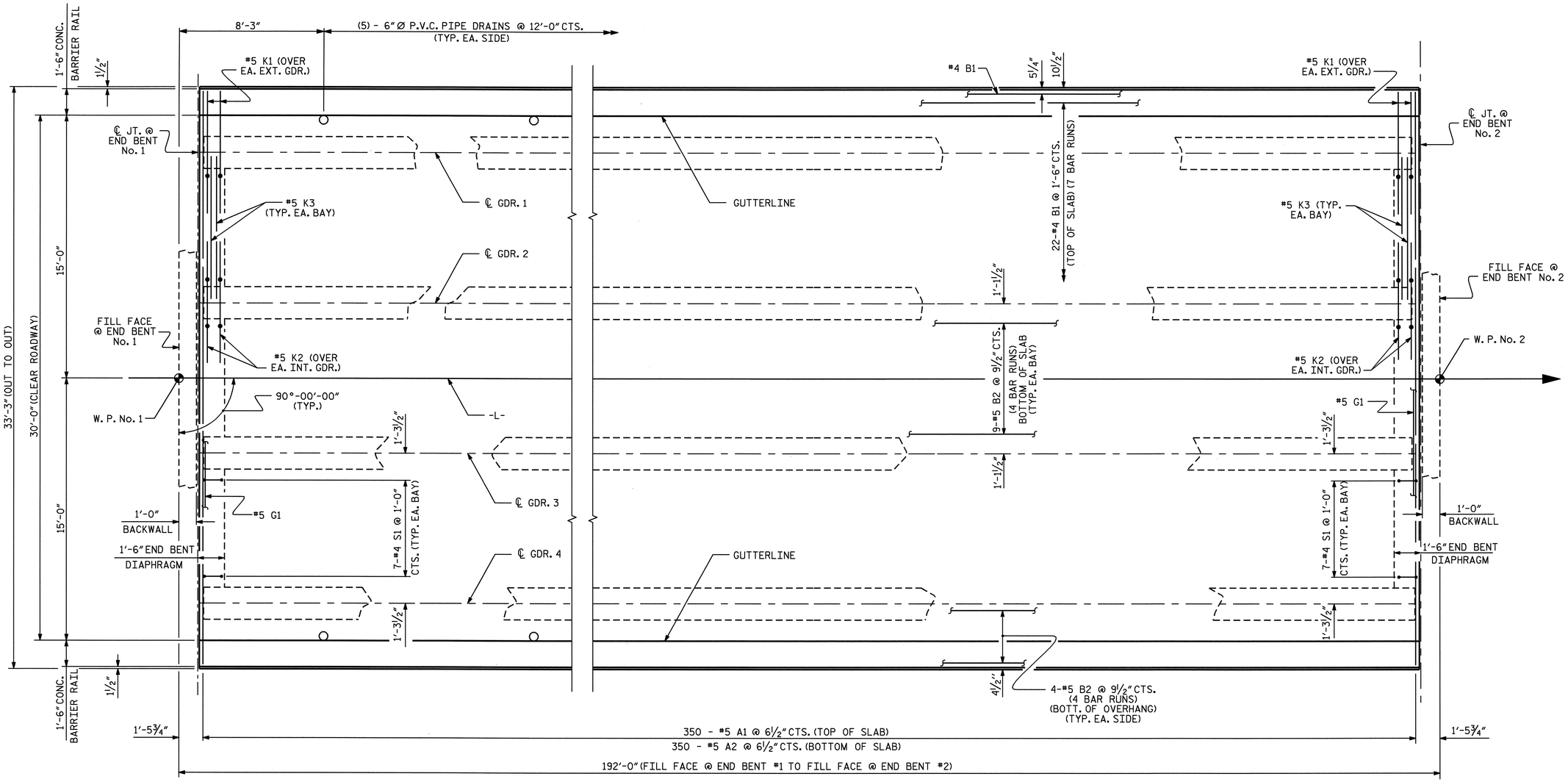

PLAN OF SPAN A

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTUCTURE
PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J.LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

03-SEP-2008 11:35
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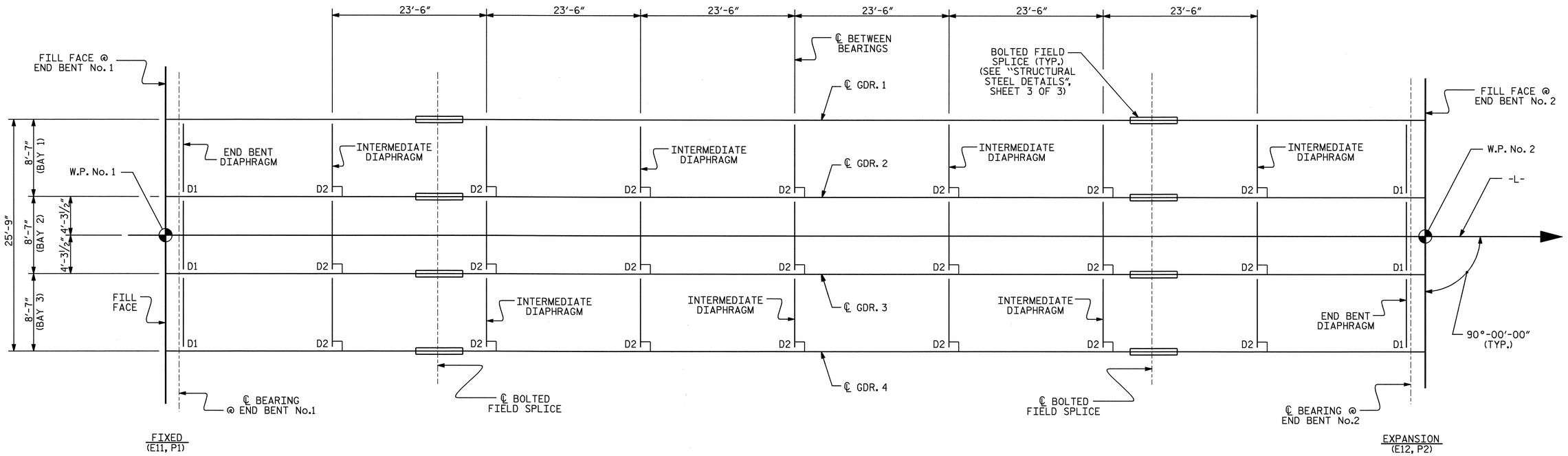

FRAMING PLAN

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

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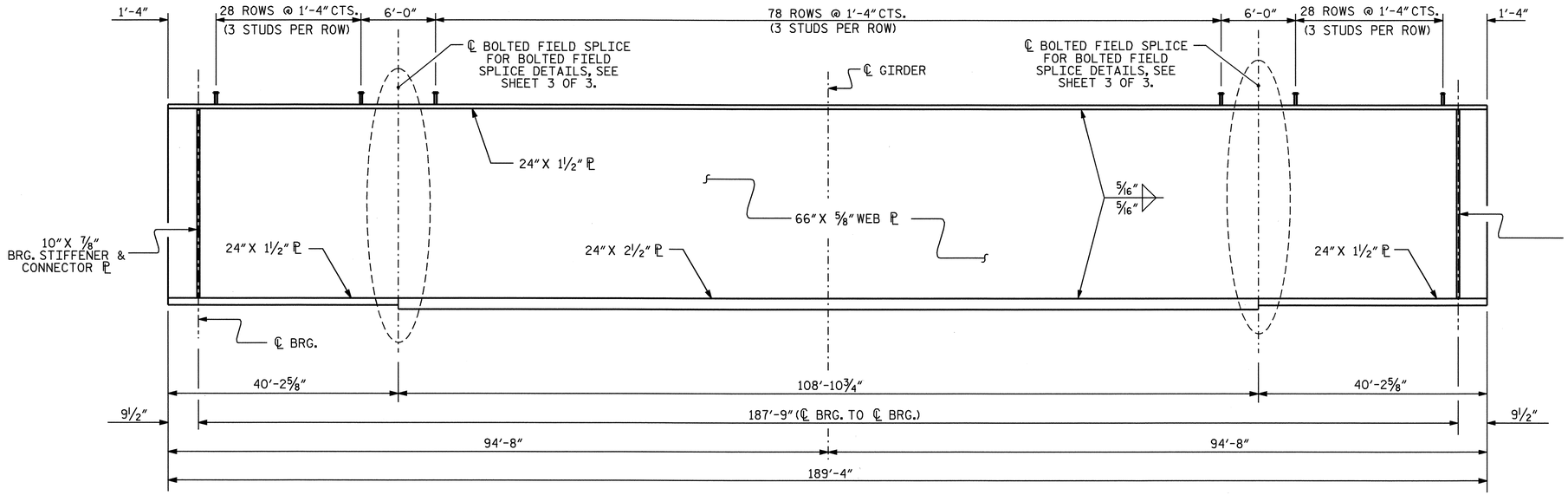
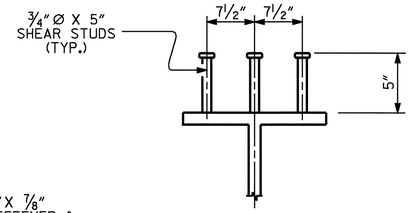
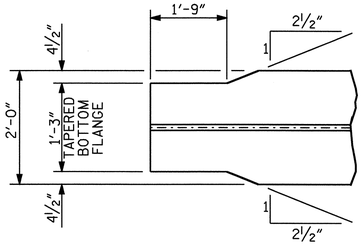


PLATE GIRDER ELEVATION

(INTERMEDIATE DIAPHRAGMS NOT SHOWN)

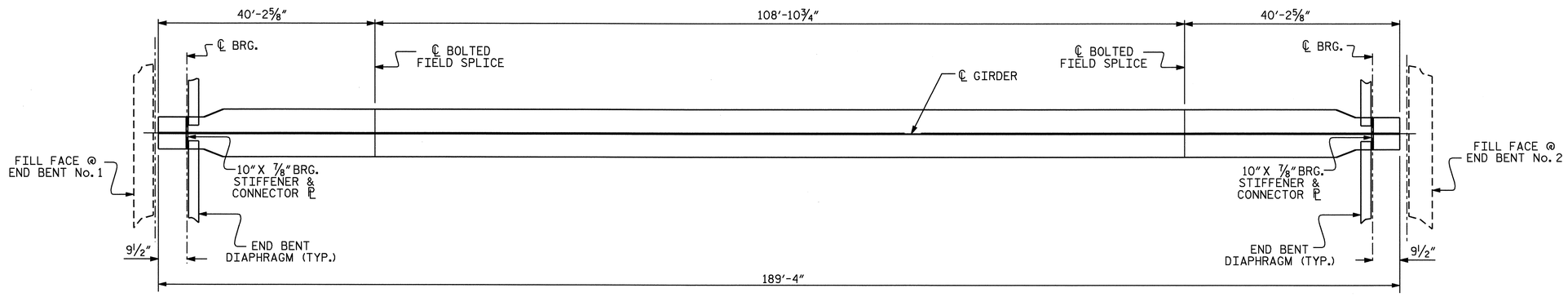


SHEAR STUD DETAILS



END OF GIRDER DETAIL

(BOTTOM FLANGE ONLY)



PLAN - BOTTOM FLANGE

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

15-AUG-2008 08:34
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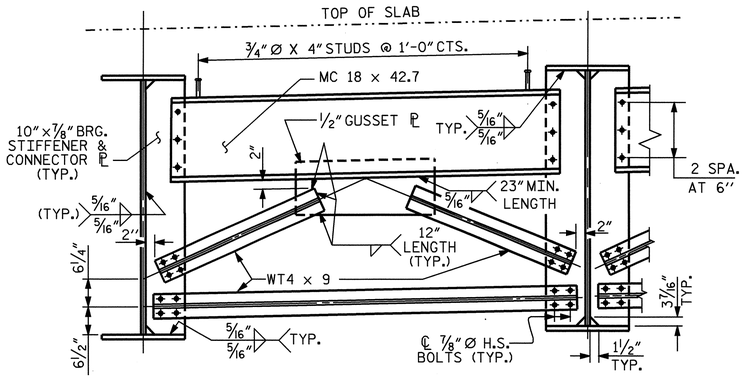
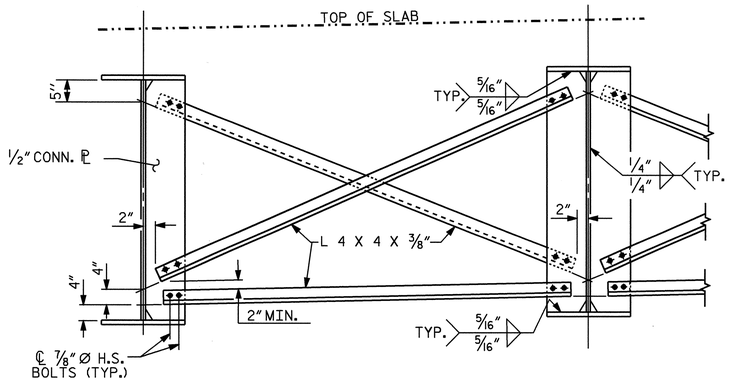
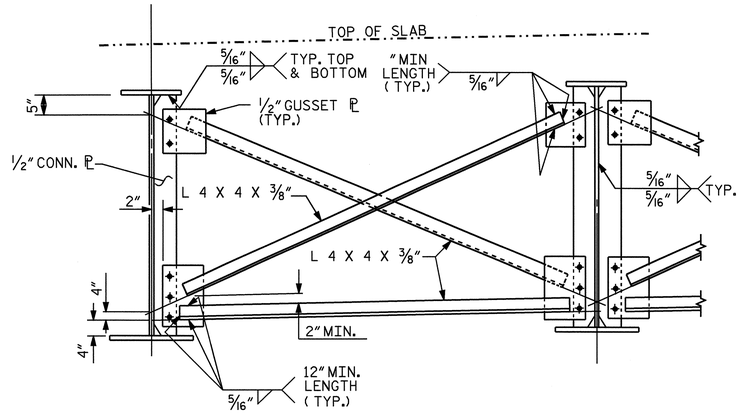
dahodge



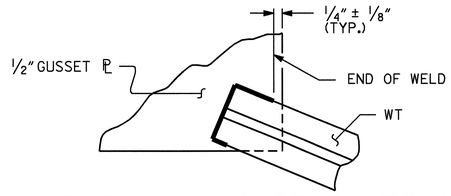
TYPICAL END BENT DIAPHRAGM (D1)



TYPICAL INTERMEDIATE CROSSFRAME (D2)



TYPICAL OPTIONAL INTERMEDIATE CROSSFRAME (D2)



TYPICAL "TEE" TO GUSSET PLATE CONNECTION

NOTES

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

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

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

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

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

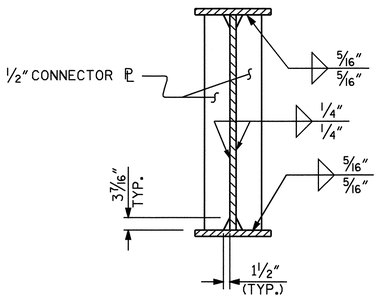
SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

END OF GIRDERS SHALL BE PLUMB.

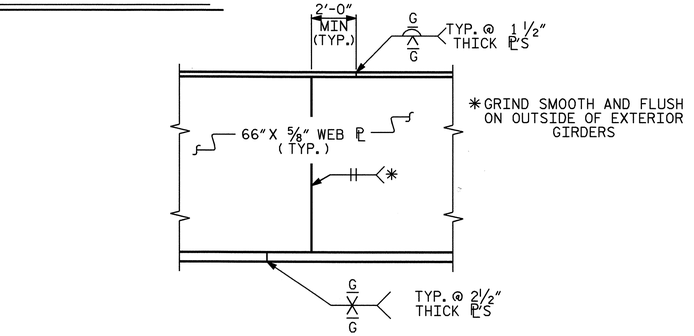
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 AND PAINTED IN ACCORDANCE WITH SYSTEM 1 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

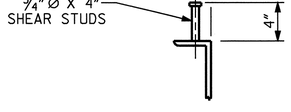
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.



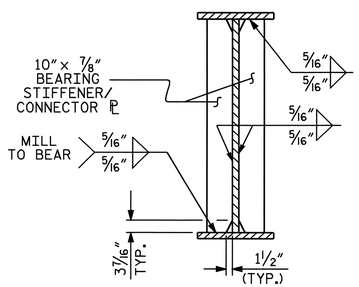
CONNECTOR PLATE DETAILS



PERMISSIBLE SHOP FLANGE & WEB SPLICE

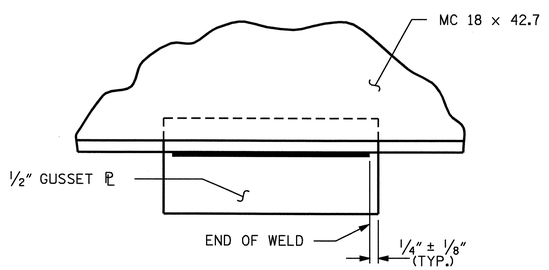


STUDS ON DIAPHRAGMS

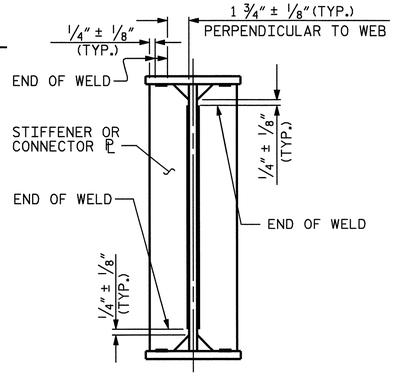


BEARING STIFFENER & CONNECTOR PL DETAILS

(END BENTS #1 & #2)



TYPICAL GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 2 OF 3

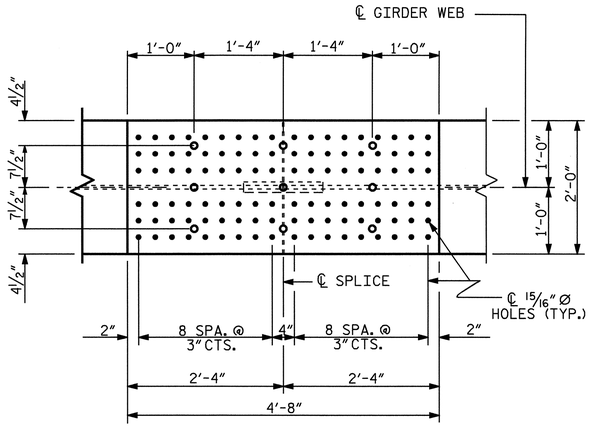
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

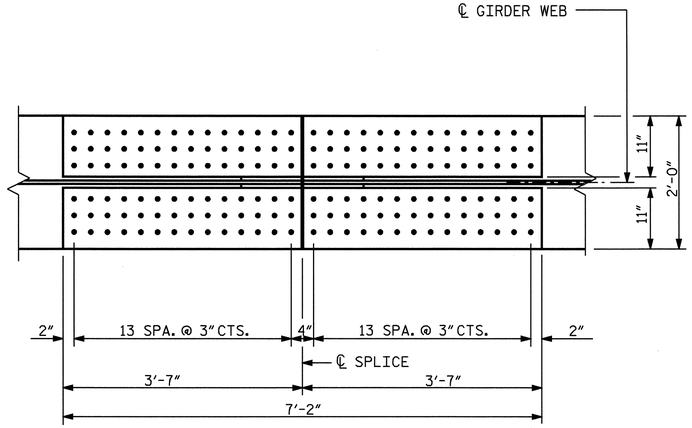
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			26

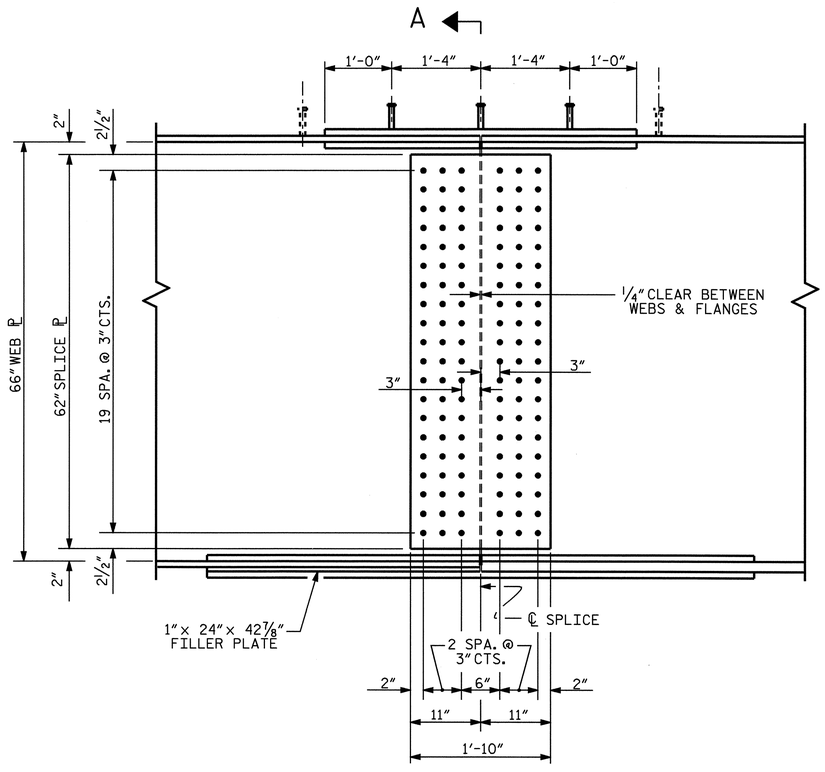
NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08



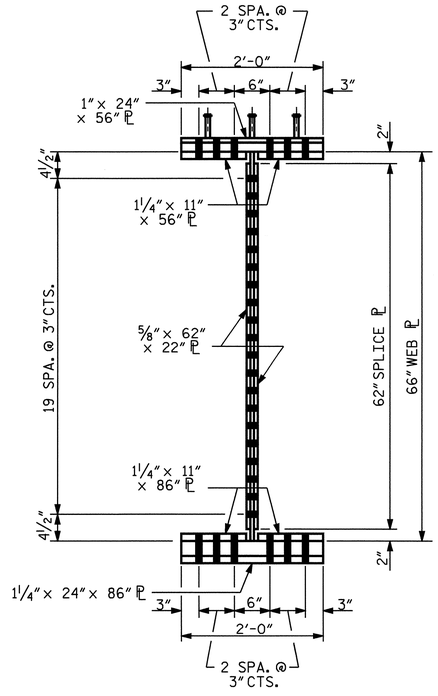
PLAN (TOP OF TOP FLANGE)



PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

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

BOLTED FIELD SPLICE DETAILS

(TYPICAL EACH FIELD SPLICE)

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

8/15/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 7/2008

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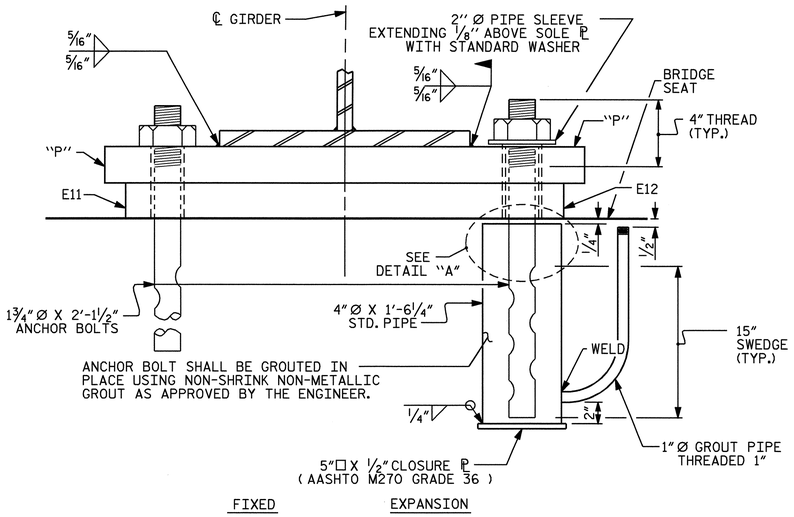
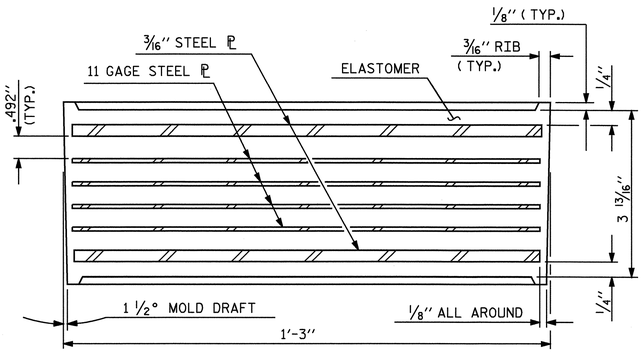
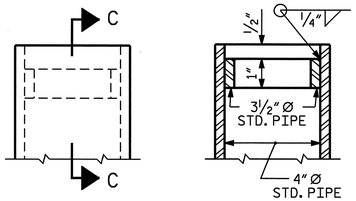


END VIEW

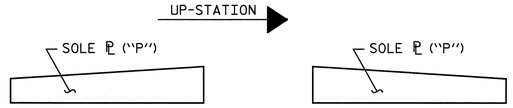


TYPICAL SECTION OF ELASTOMERIC BEARING

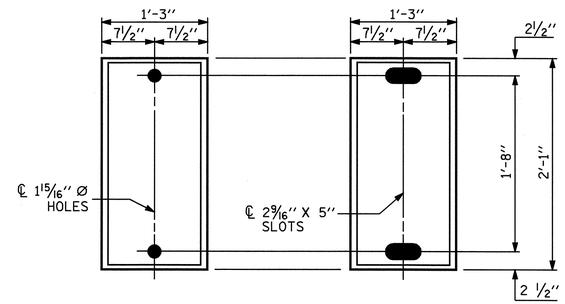


SECTION C-C

DETAIL "A"



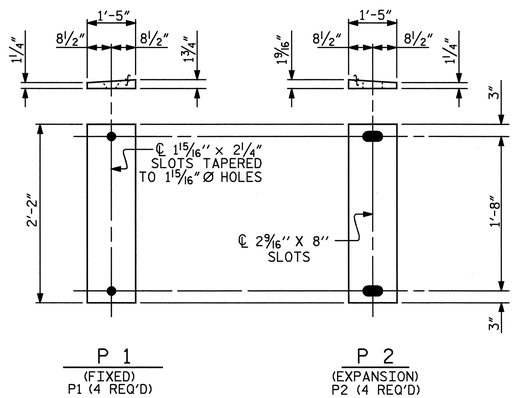
SOLE ℙ PLACEMENT DETAIL



E11 (4 REQ'D) E12 (4 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI



P 1 (FIXED) P1 (4 REQ'D)

P 2 (EXPANSION) P2 (4 REQ'D)

SOLE PLATE DETAILS ("P")

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ 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 PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, 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 VI	262 k

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

8/15/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY : J. LAMBERT	DATE : 4/2008	
CHECKED BY : S. W. PEARCE	DATE : 6/2008	
DRAWN BY : EEM 10/95	REV. 10/17/00	RWW/LES
CHECKED BY : PEK 10/95	REV. 7/10/01	LES/RDR
	REV. 5/1/06	TLA/GM

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STD. NO. EB2 (SHT 3a)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	GIRDERS #1 & #4																				
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.055	0.109	0.159	0.204	0.243	0.276	0.303	0.322	0.334	0.338	0.334	0.322	0.303	0.276	0.243	0.204	0.159	0.109	0.055	0
✳ DEFLECTION DUE TO WEIGHT OF SLAB	0	0.113	0.228	0.334	0.431	0.514	0.585	0.642	0.683	0.708	0.717	0.708	0.683	0.642	0.585	0.514	0.431	0.334	0.228	0.113	0
DEFLECTION DUE TO WEIGHT OF RAIL	0	0.016	0.032	0.046	0.059	0.070	0.080	0.087	0.093	0.096	0.097	0.096	0.093	0.087	0.080	0.070	0.059	0.046	0.032	0.016	0
TOTAL DEAD LOAD DEFLECTION	0	0.184	0.369	0.539	0.694	0.827	0.941	1.032	1.098	1.138	1.152	1.138	1.098	1.032	0.941	0.827	0.694	0.539	0.369	0.184	0
VERTICAL CURVE ORDINATE	0	0.190	0.361	0.511	0.641	0.752	0.842	0.912	0.962	0.992	1.002	0.992	0.962	0.912	0.842	0.752	0.641	0.511	0.361	0.190	0
REQUIRED CAMBER	0	4½″	8¾″	12 1/16″	16″	18 15/16″	21⅜″	23 5/16″	24¾″	25 5/16″	25⅞″	25 5/16″	24¾″	23 5/16″	21⅜″	18 15/16″	16″	12 1/16″	8¾″	4½″	0
	GIRDERS #2 & #3																				
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.055	0.109	0.159	0.204	0.243	0.276	0.303	0.322	0.334	0.338	0.334	0.322	0.303	0.276	0.243	0.204	0.159	0.109	0.055	0
✳ DEFLECTION DUE TO WEIGHT OF SLAB	0	0.113	0.228	0.335	0.431	0.515	0.586	0.643	0.684	0.710	0.718	0.710	0.684	0.643	0.586	0.515	0.431	0.335	0.228	0.113	0
DEFLECTION DUE TO WEIGHT OF RAIL	0	0.016	0.031	0.046	0.058	0.069	0.079	0.086	0.092	0.095	0.096	0.095	0.092	0.086	0.079	0.069	0.058	0.046	0.031	0.016	0
TOTAL DEAD LOAD DEFLECTION	0	0.184	0.368	0.540	0.693	0.827	0.941	1.032	1.098	1.139	1.152	1.139	1.098	1.032	0.941	0.827	0.693	0.540	0.368	0.184	0
VERTICAL CURVE ORDINATE	0	0.190	0.361	0.511	0.641	0.752	0.842	0.912	0.962	0.992	1.002	0.992	0.962	0.912	0.842	0.752	0.641	0.511	0.361	0.190	0
REQUIRED CAMBER	0	4½″	8¾″	12 1/16″	16″	18 15/16″	21⅜″	23 5/16″	24¾″	25 5/16″	25⅞″	25 5/16″	24¾″	23 5/16″	21⅜″	18 15/16″	16″	12 1/16″	8¾″	4½″	0

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

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008

15-AUG-2008 08:33
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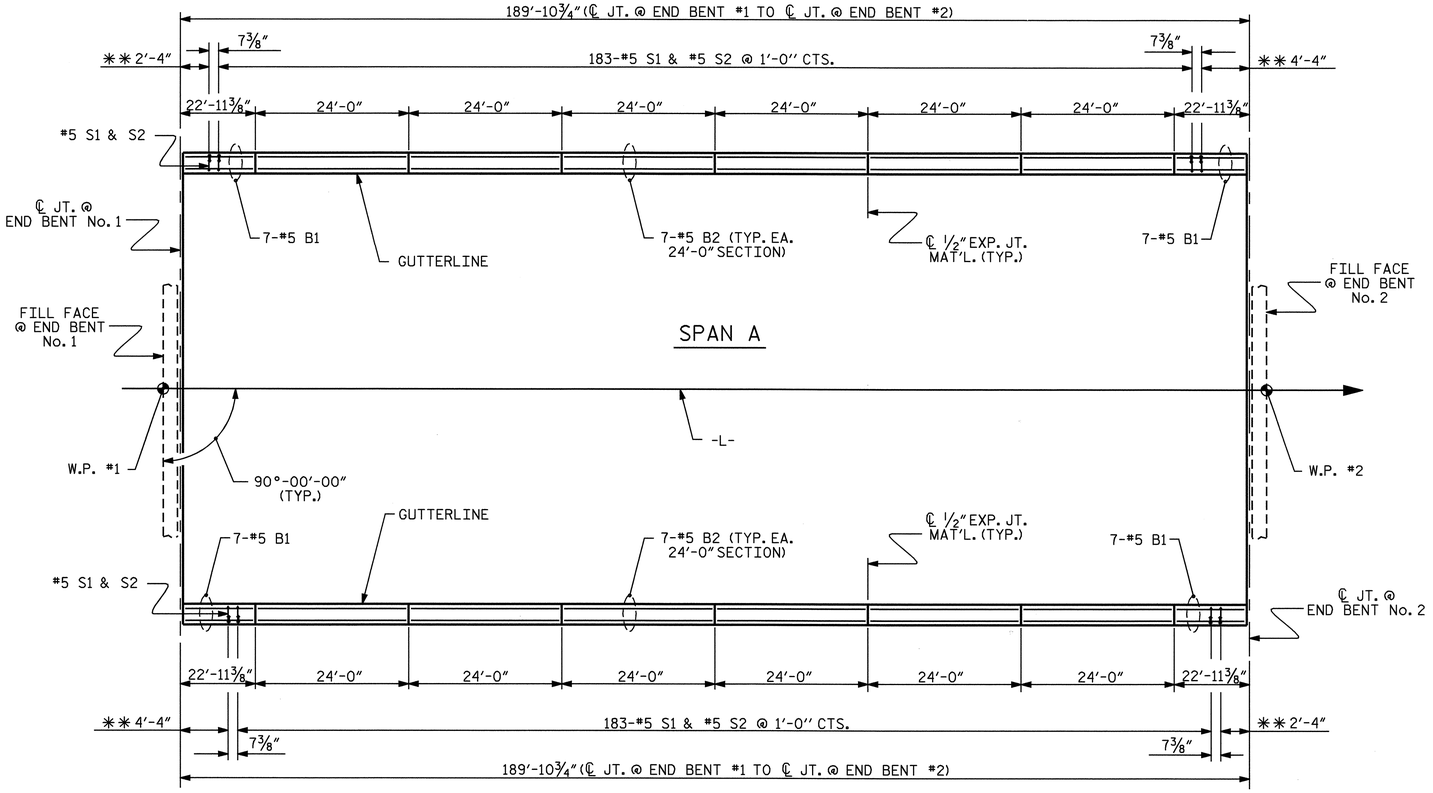
dahodge



PLAN

** FOR REINFORCING STEEL IN THIS AREA, SEE "BARRIER RAIL - END OF RAIL DETAILS"

NOTES

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

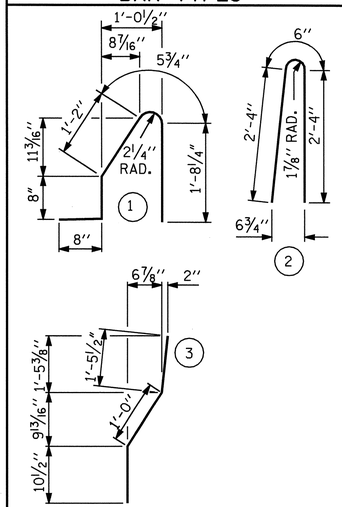
WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

VERTICAL GROOVED CONTRACTION JOINTS, ½" 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



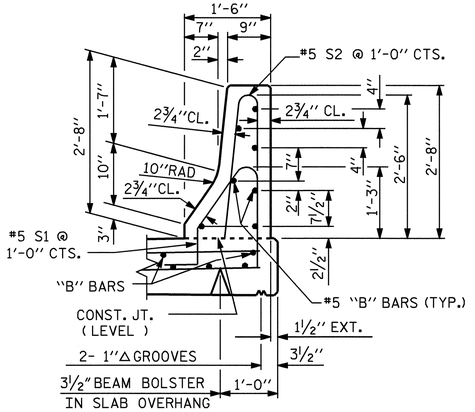
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

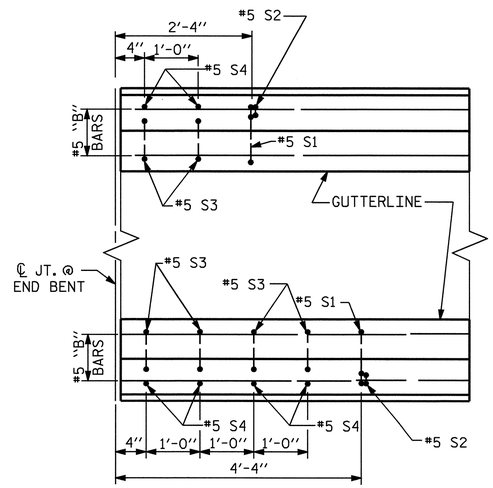
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	370	#5	1	4'-8"	1801
* S2	370	#5	2	5'-2"	1994
* S3	12	#5	3	3'-4"	42
* S4	12	#5	STR	3'-2"	40
* B1	28	#5	STR	22'-6"	657
* B2	84	#5	STR	23'-7"	2066

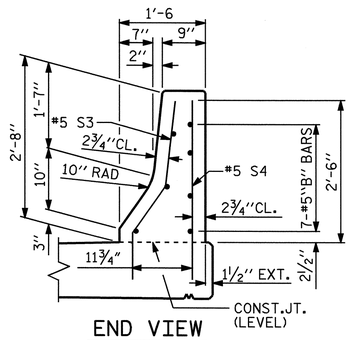
* EPOXY COATED REINFORCING STEEL	6600 LBS.
CLASS AA CONCRETE	38.0 CU. YDS.
CONCRETE BARRIER RAIL	379.79 LIN. FT.



SECTION THRU RAIL



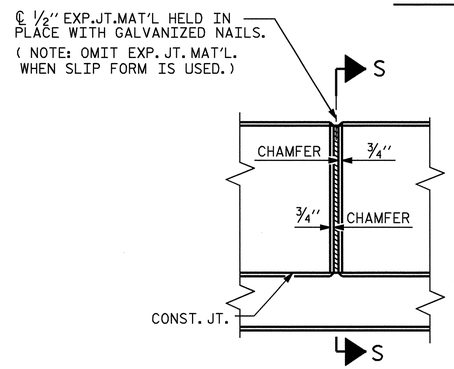
PLAN



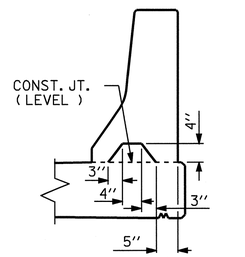
END VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

BARRIER RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY : J. LAMBERT	DATE : 5/2008		
CHECKED BY : S.W. PEARCE	DATE : 7/2008		
DRAWN BY : ARB 5/87	REV. 10/17/00	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/17/03R	RWW/LTE	
	REV. 5/1/06	TLA/GM	

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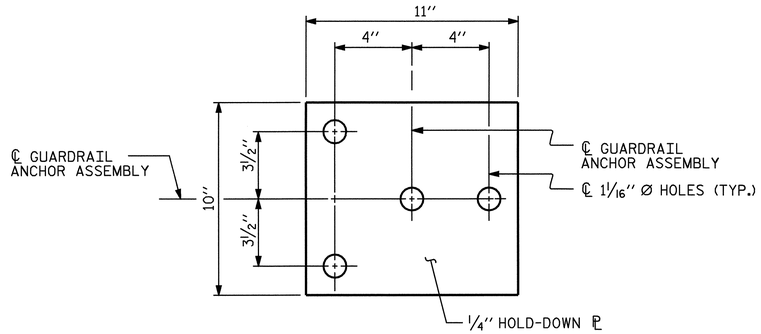
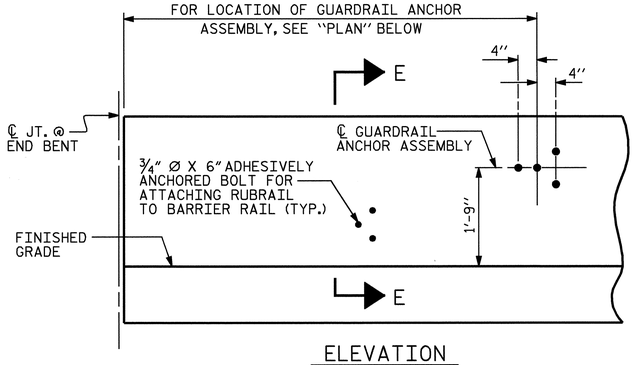
dahodge

STD. NO. CBR1 (SHT 1)



PLAN



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

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.)

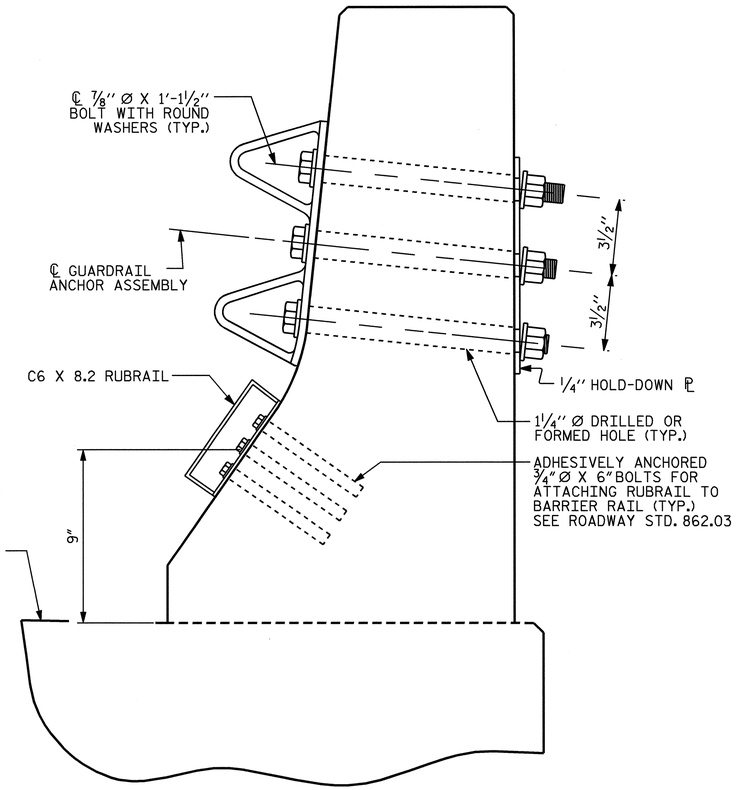
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

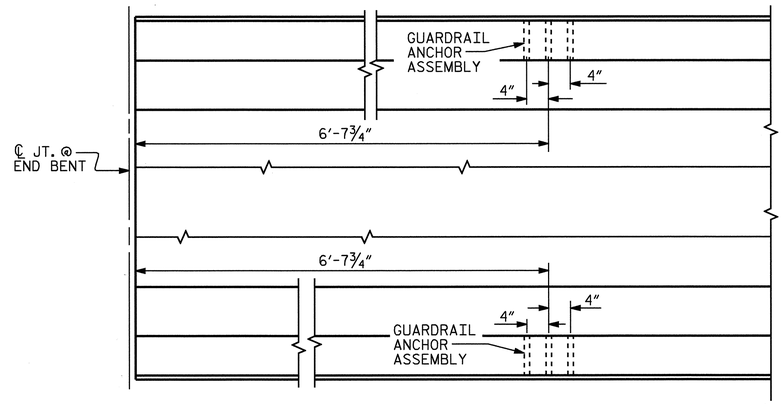
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.

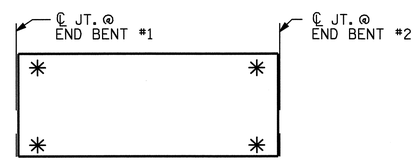


SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

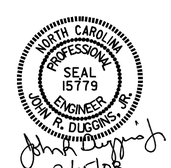
LOCATION OF ANCHORS FOR GUARDRAIL

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

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -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-15
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY : J. LAMBERT	DATE : 7/2008
CHECKED BY : S.W. PEARCE	DATE : 7/2008
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

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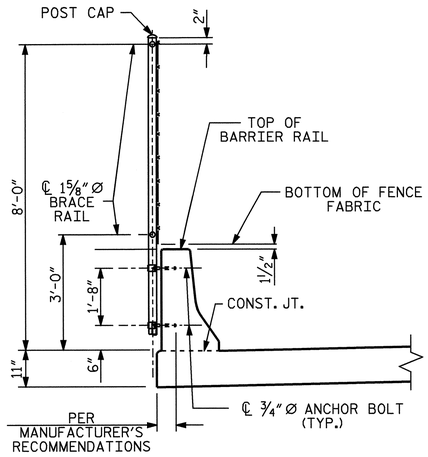
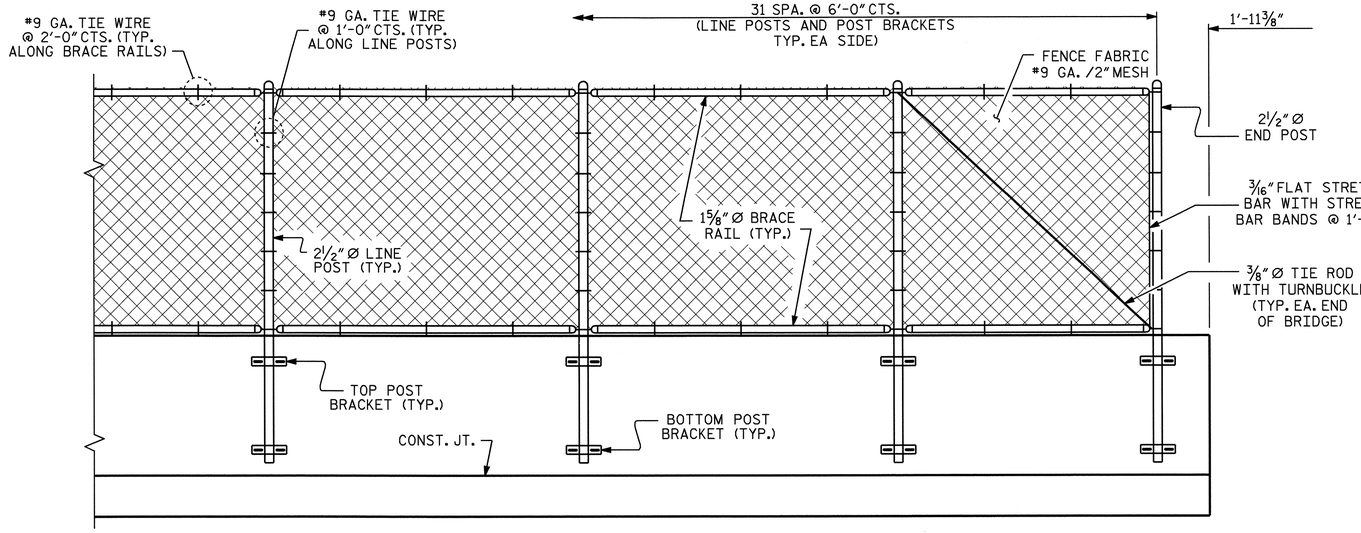
(SHT 1) STD. NO. GRA2



SECTION THRU FENCE



PARTIAL ELEVATION

NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS, INTO CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS. CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

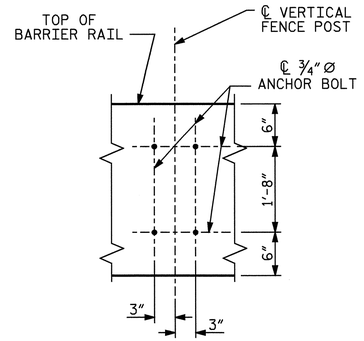
ADHESIVE ANCHOR SYSTEM SHALL HAVE A MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE ANCHOR SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. EXCLUDING STAINLESS STEEL COMPONENTS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

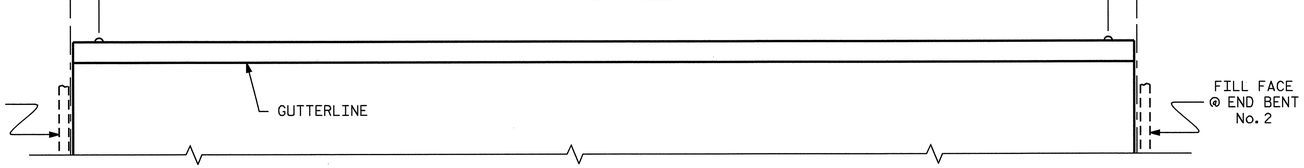
WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATION SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

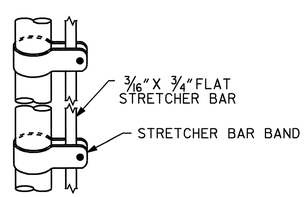
TOTAL PAY LENGTH = 372 LF.



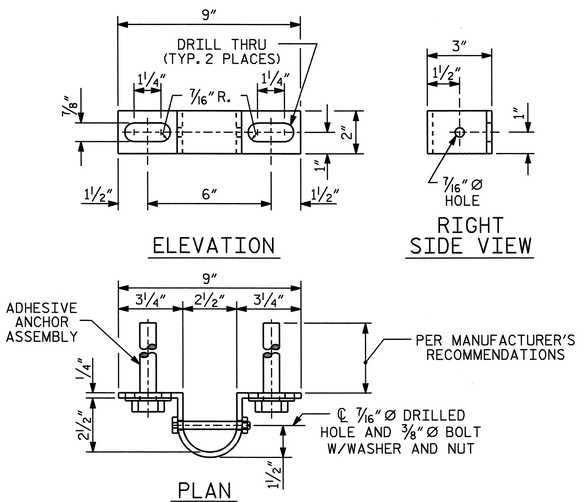
BOLT SETTING DETAIL



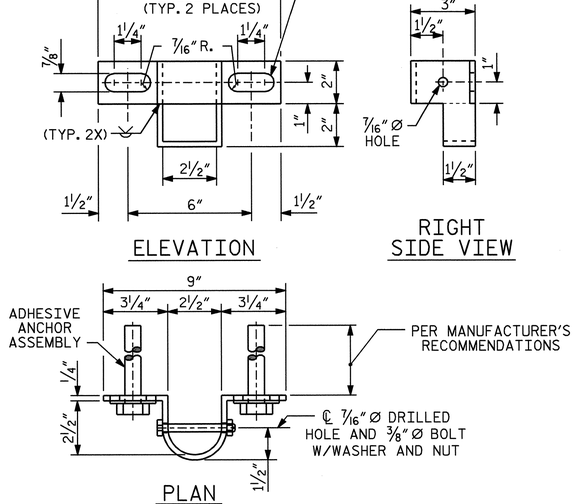
PLAN OF FENCE POST BRACKET SPACINGS



TERMINAL POST WITH STRETCHER BAR ATTACHMENT



TOP POST BRACKET



BOTTOM POST BRACKET

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BRIDGE MOUNTED CHAIN LINK FENCE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S.W. PEARCE DATE : 7/2008

03-SEP-2008 12:14
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dahodge

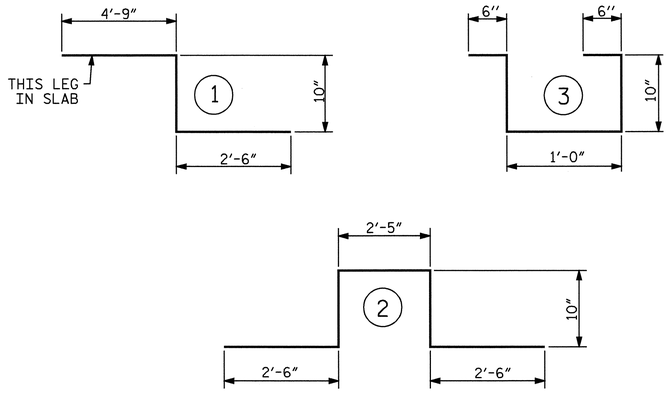
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	745	SQ.FT.
BRIDGE DECK	5095	SQ.FT.
TOTAL	5840	SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

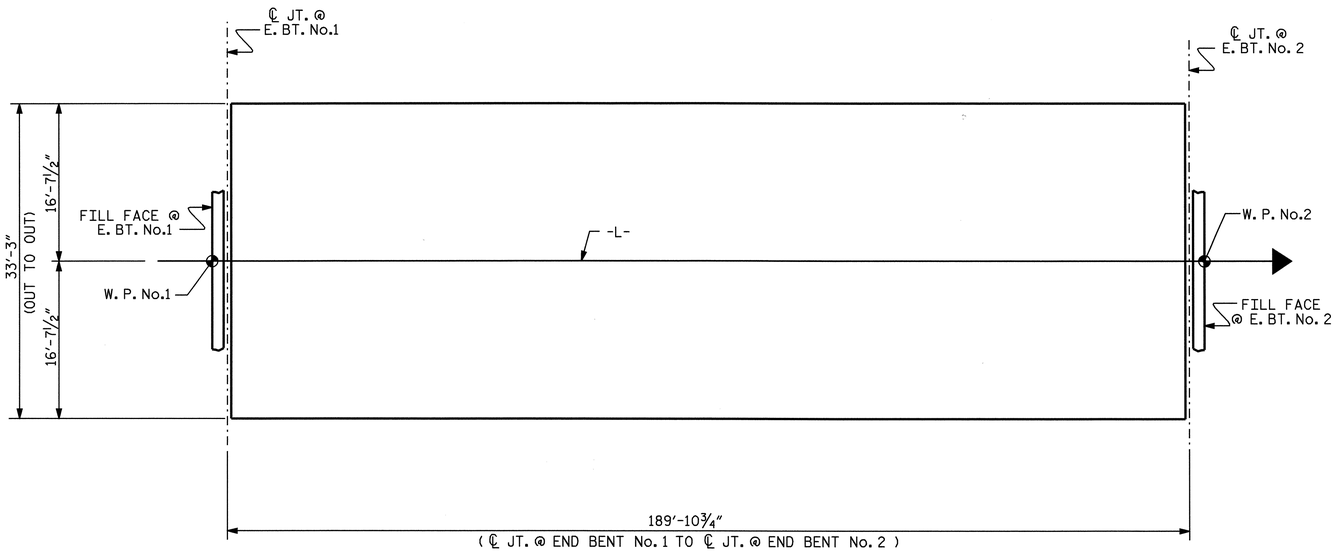
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	350	5	STR	32′-10″	11986
A2	350	5	STR	32′-10″	11986
✳B1	168	4	STR	28′-10″	3236
B2	140	5	STR	49′- 1″	7167
✳G1	2	5	STR	32′-10″	68
✳K1	8	5	1	8″- 1″	67
✳K2	8	5	2	9′- 1″	76
✳K3	12	5	STR	6′- 3″	78
✳S1	42	4	3	3′- 8″	103
REINFORCING STEEL (LBS.)					19,153
✳EPOXY COATED REINFORCING STEEL (LBS.)					15,614

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(cu. yards)	(lbs)	(lbs)
SPAN A	198.4	19,153	15,614
TOTALS ✳✳	198.4	19,153	15,614

✳✳QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6314)

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

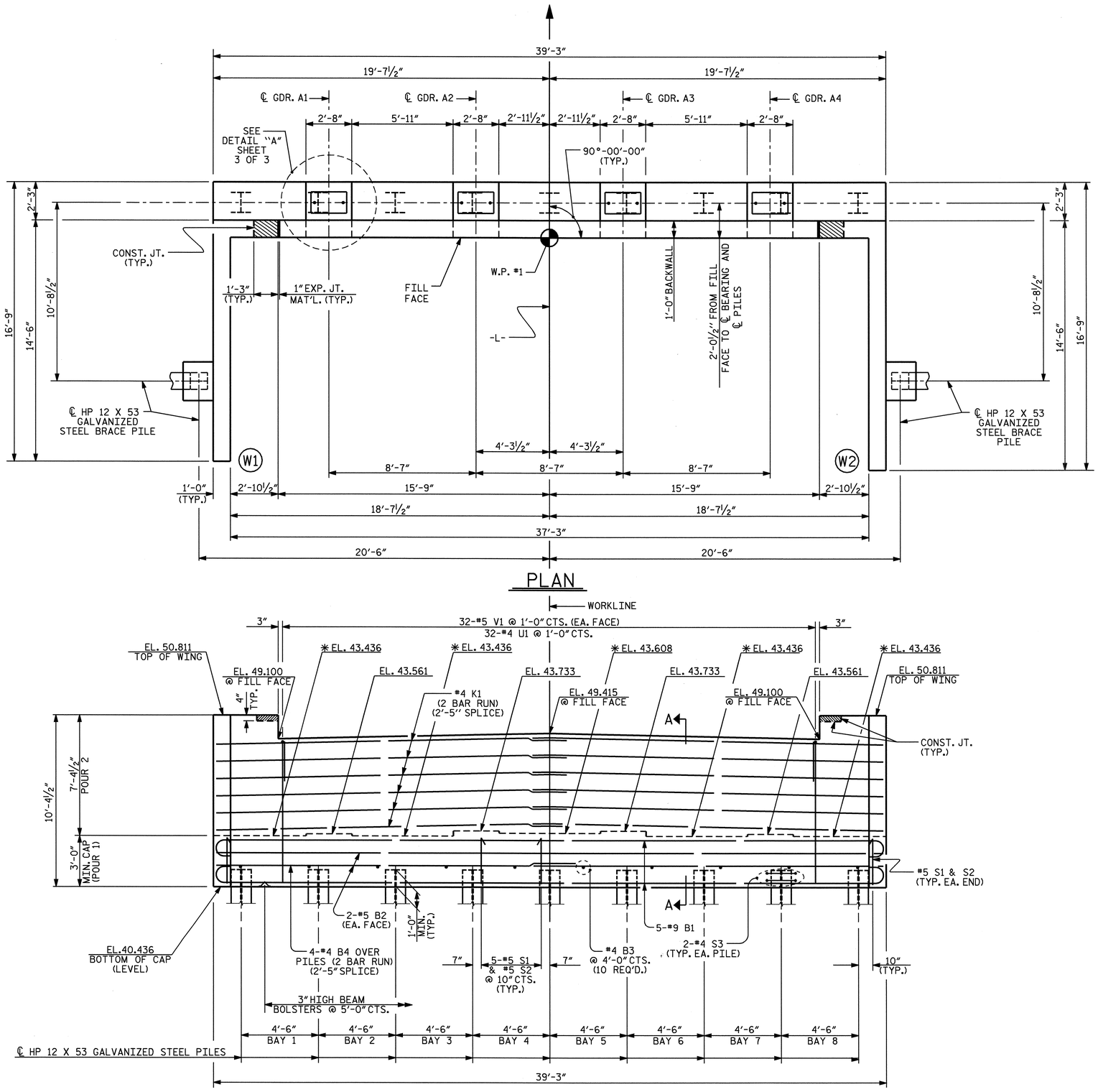
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 4/2008
CHECKED BY : S. W. PEARCE DATE : 6/2008



PLAN

ELEVATION

(WING BRACE PILES NOT SHOWN FOR CLARITY)

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

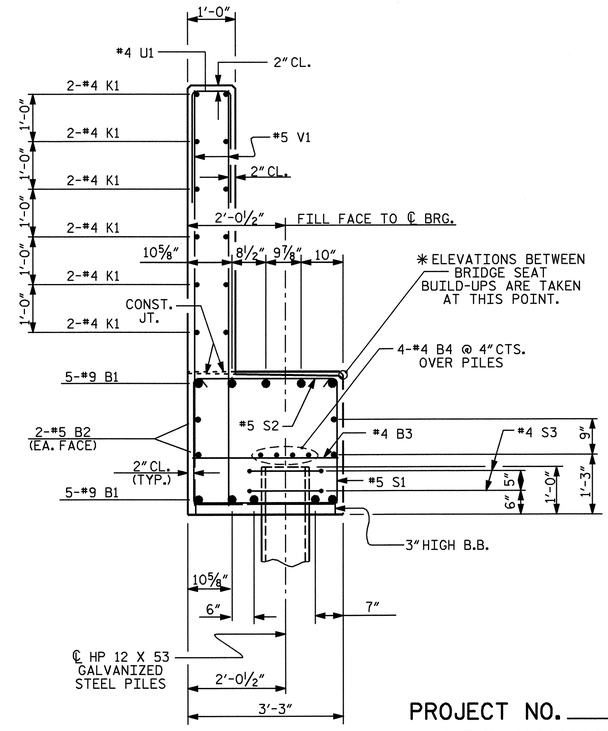
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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

A MINIMUM OF 40′ OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



✱ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS ARE TAKEN AT THIS POINT.

SECTION A-A

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S.W. PEARCE DATE : 7/2008

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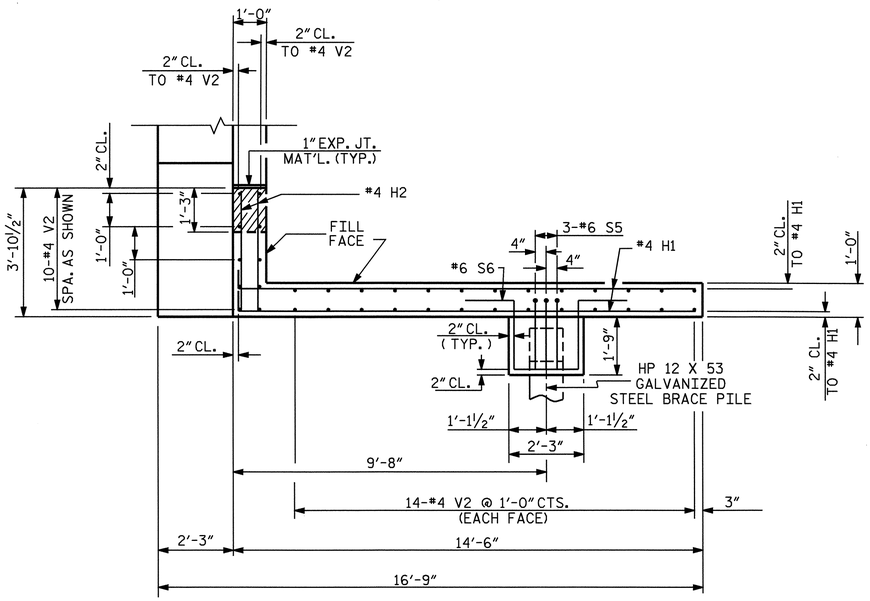
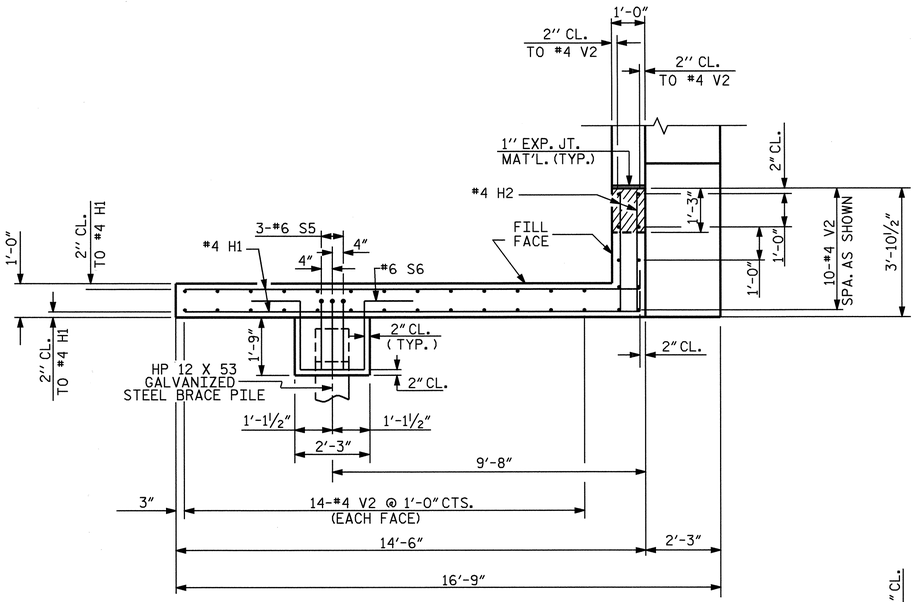
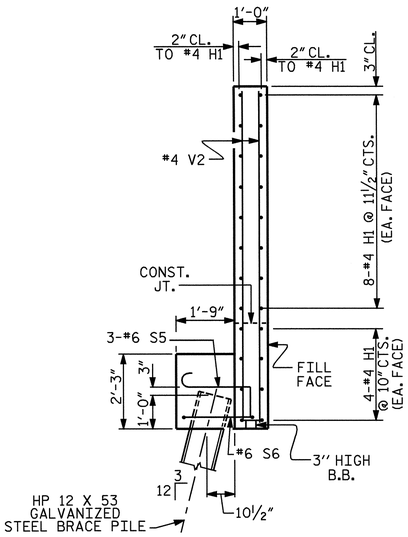


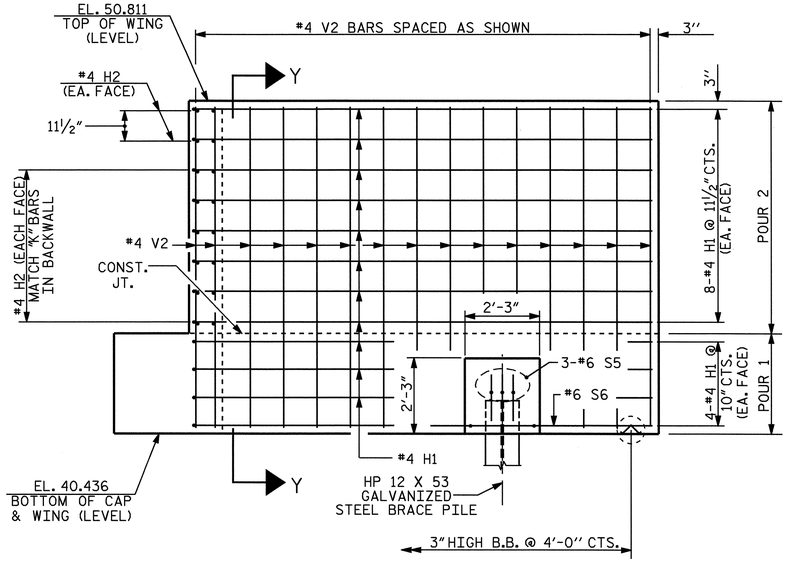
PLAN OF LEFT WING - W1



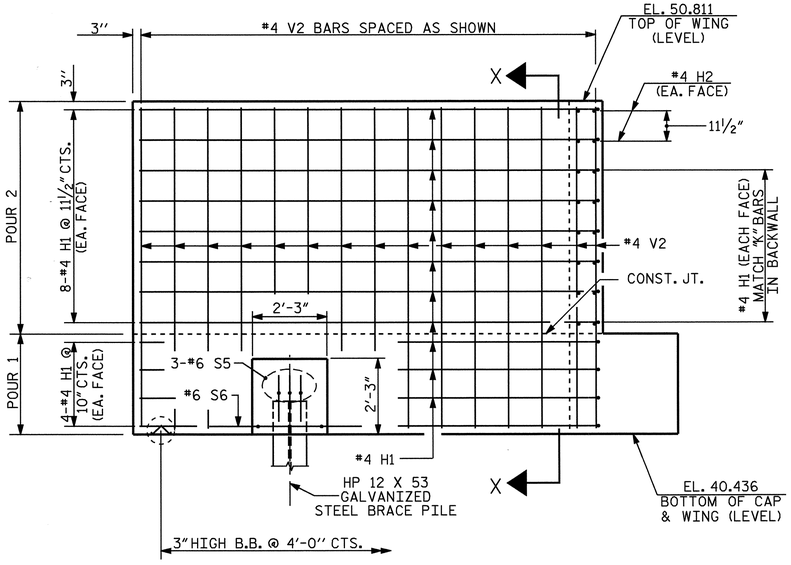
PLAN OF LEFT WING - W2



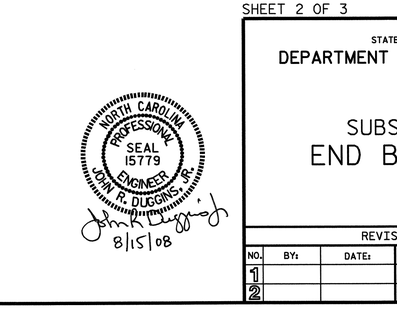
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF LEFT WING - W2



SECTION Y-Y

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S. W. PEARCE DATE : 7/2008

15-AUG-2008 08:26
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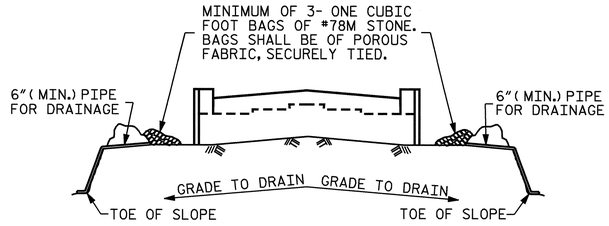
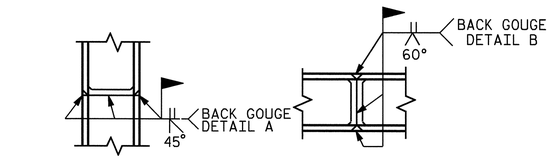


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

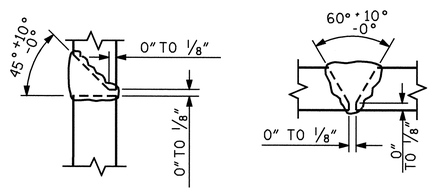
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



**PILE VERTICAL

**PILE HORIZONTAL OR VERTICAL

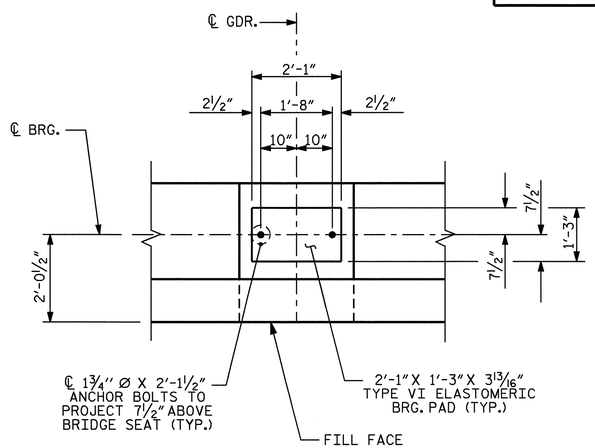


DETAIL A

DETAIL B

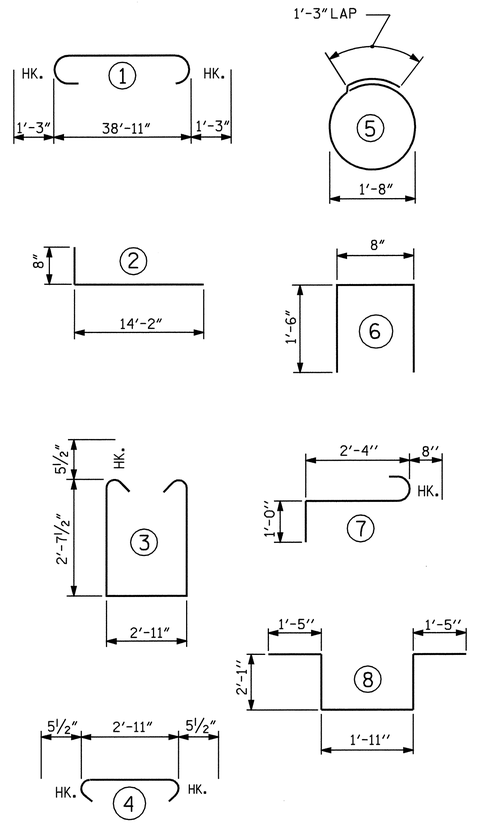
PILE SPLICE DETAILS

**POSITION OF PILE DURING WELDING.



DETAIL A
(TYP. EA. GDR.)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	41'-5"	1408
B2	4	#5	STR	38'-10"	162
B3	10	#4	STR	2'-11"	19
B4	8	#4	STR	20'-8"	110
H1	48	#4	2	14'-10"	476
H2	8	#4	STR	3'-6"	19
K1	24	#4	STR	20'-8"	331
S1	42	#5	3	9'-1"	398
S2	42	#5	4	3'-10"	168
S3	18	#4	5	6'-6"	78
S5	6	#6	7	4'-0"	36
S6	2	#6	8	8'-11"	27
U1	32	#4	6	3'-8"	78
V1	64	#5	STR	8'-2"	545
V2	56	#4	STR	9'-10"	368

REINFORCING STEEL 4223 LBS.

CLASS A CONCRETE BREAKDOWN
POUR 1
(CAP & LOWER WINGS) 18.2 C.Y.
POUR 2
(BACKWALL & UPPER WINGS) 16.1 C.Y.
TOTAL 34.3 C.Y.

HP 12 x 53 GALVANIZED STEEL PILES
NO. 11 715 LIN FT.

STEEL PILE POINTS 11 EACH

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S. W. PEARCE DATE : 7/2008

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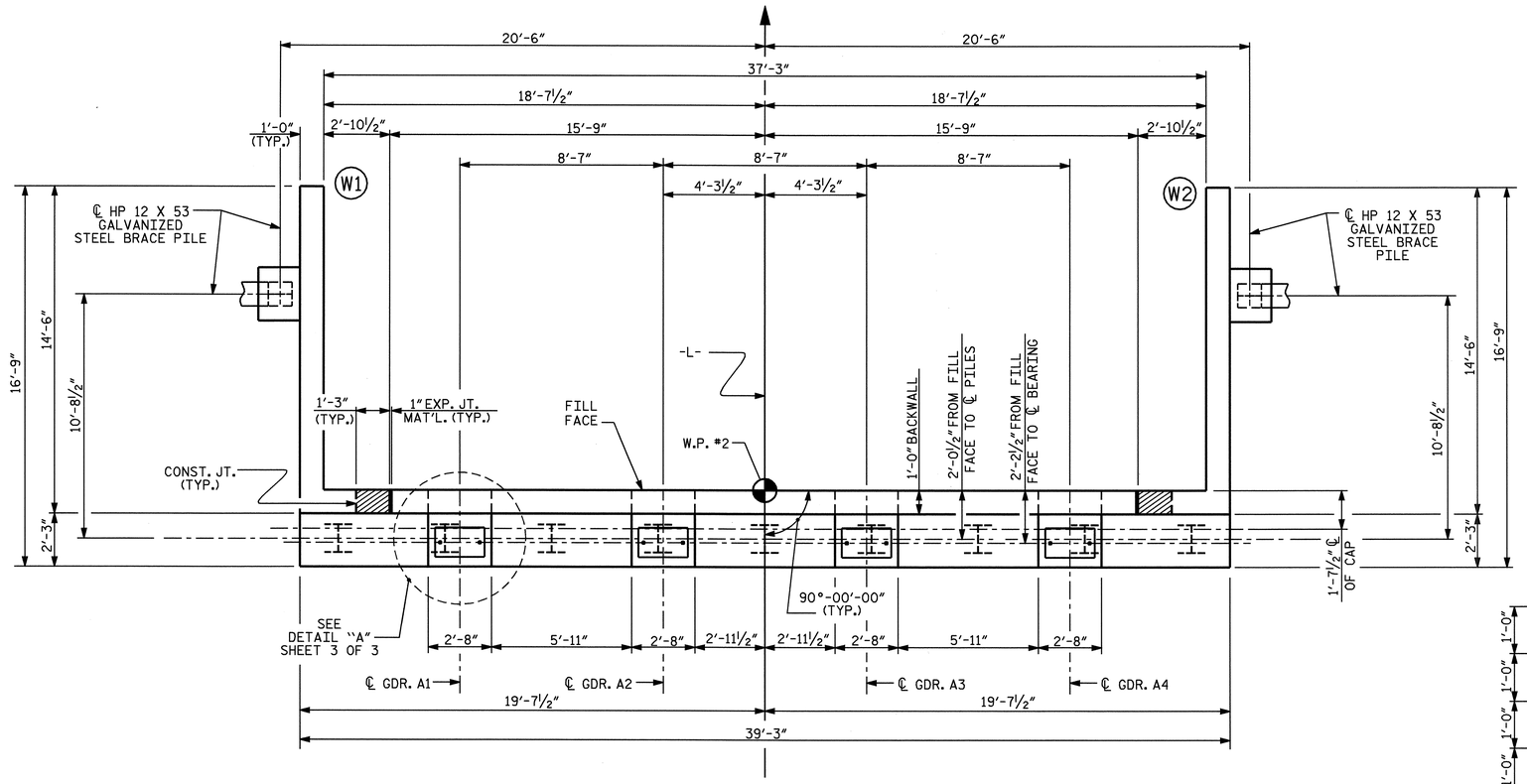
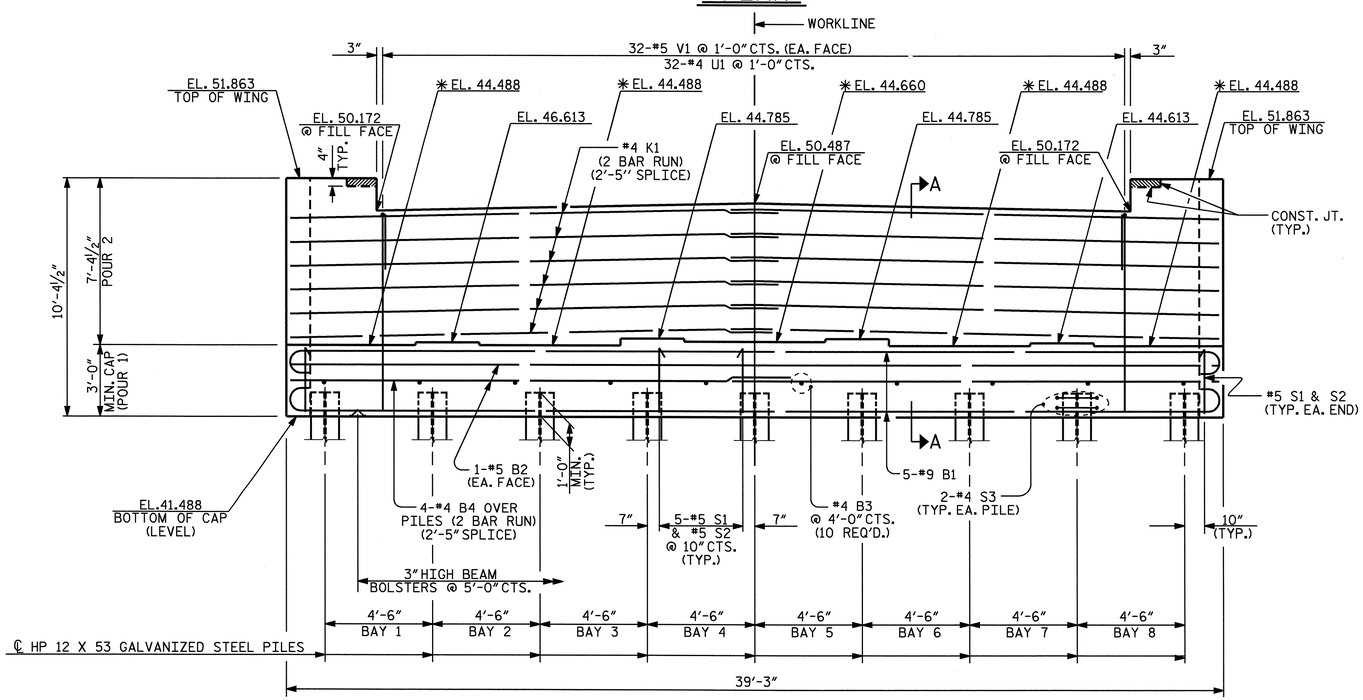
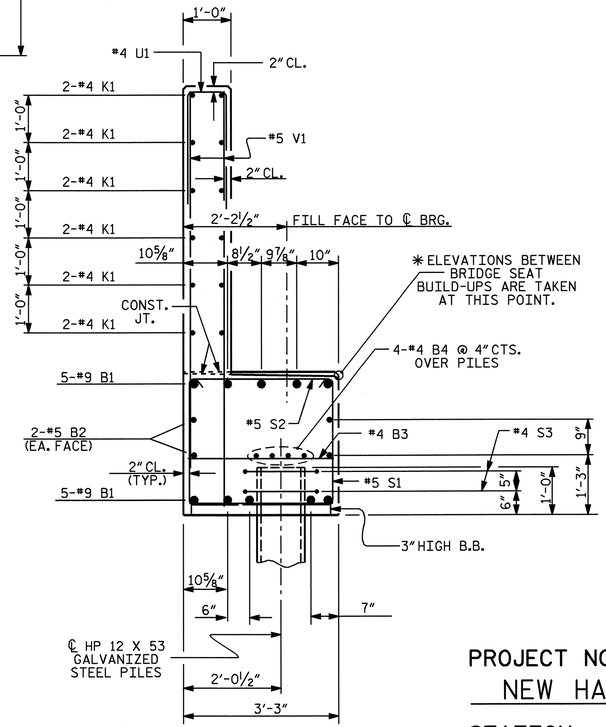


PLAN



ELEVATION

(WING BRACE PILES NOT SHOWN FOR CLARITY)



✱ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS ARE TAKEN AT THIS POINT.

SECTION A-A

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

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

A MINIMUM OF 40' OF THE TOP OF EACH PILE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
9/3/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
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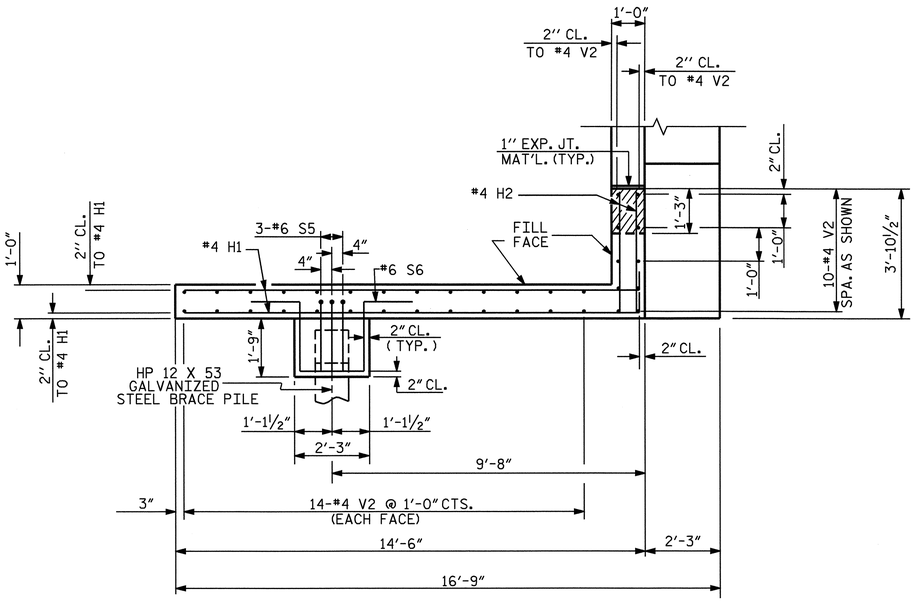
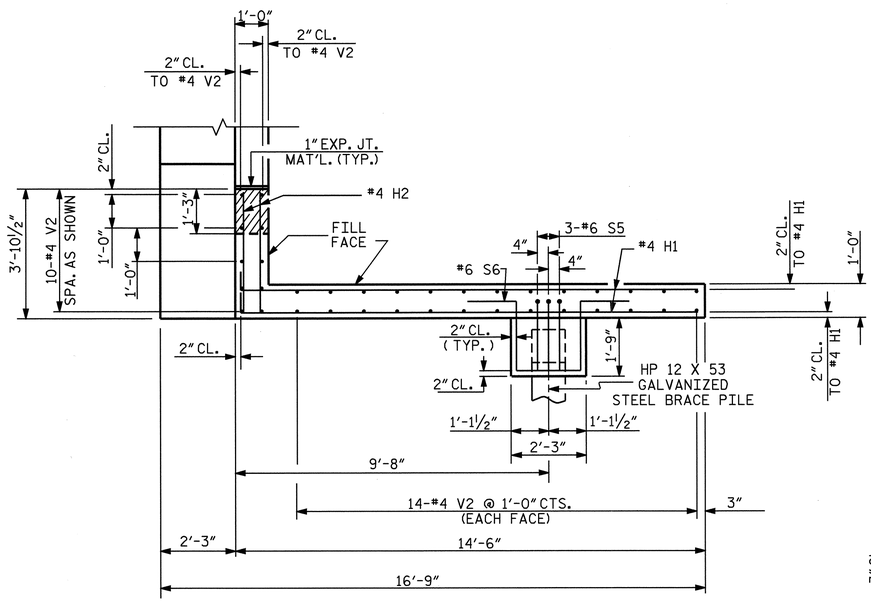
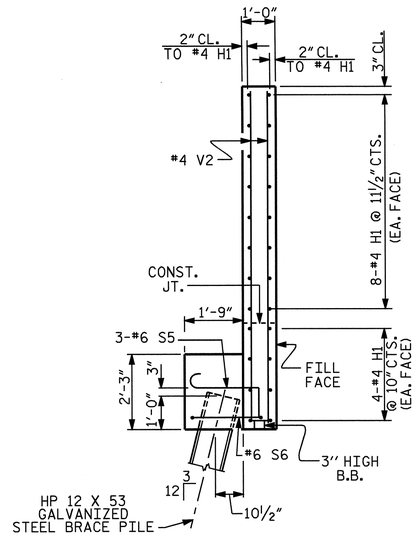


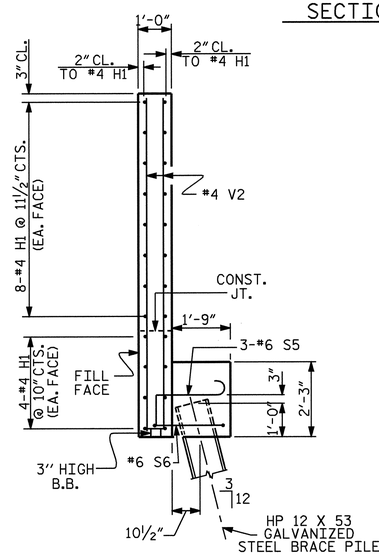
PLAN OF LEFT WING - W1



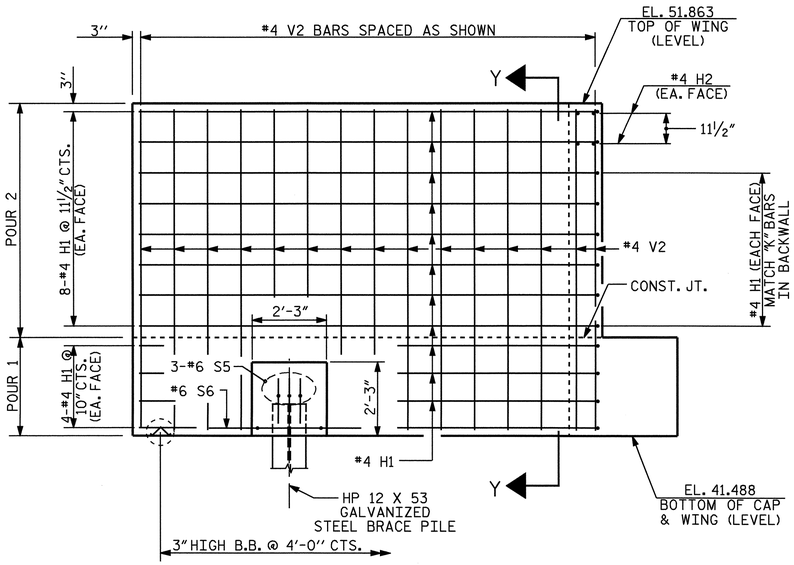
PLAN OF LEFT WING - W2



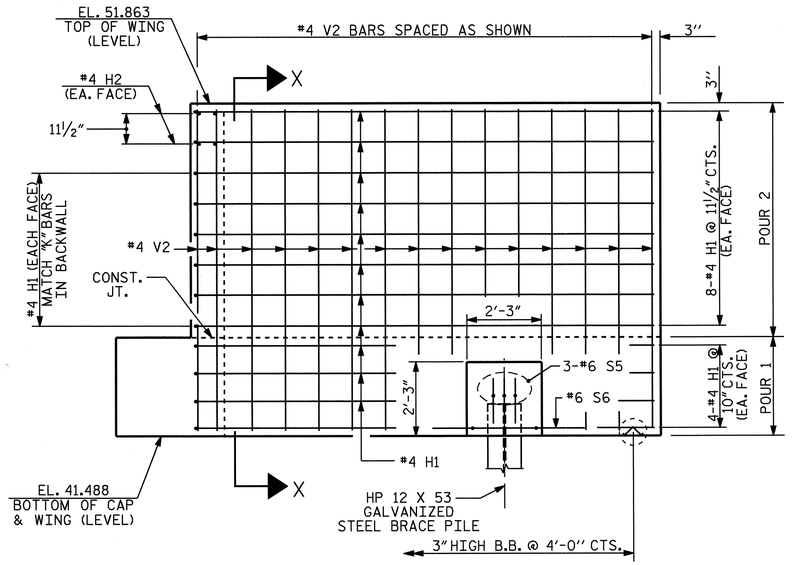
SECTION Y-Y



SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF LEFT WING - W2

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S. W. PEARCE DATE : 7/2008

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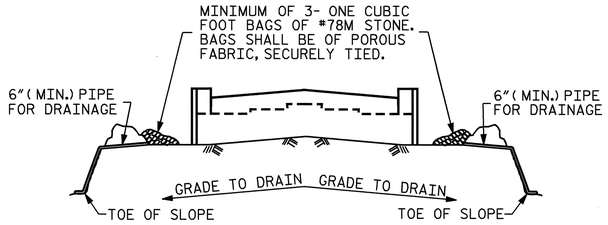
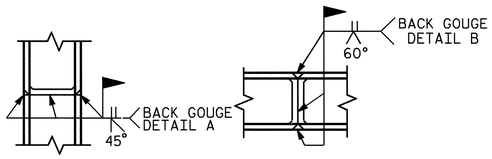


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

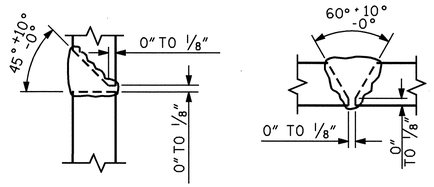
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



**PILE VERTICAL

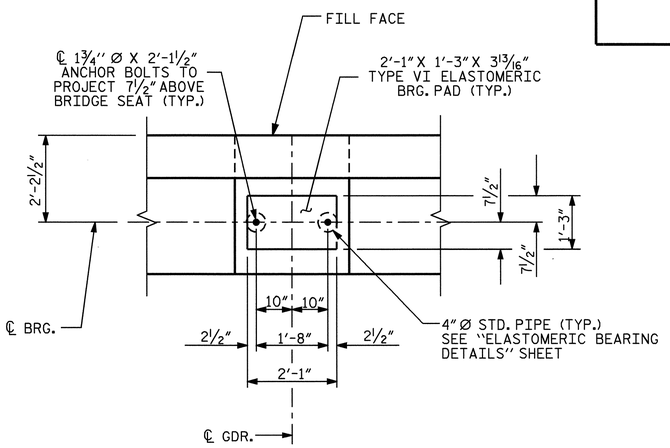
**PILE HORIZONTAL OR VERTICAL



DETAIL A DETAIL B

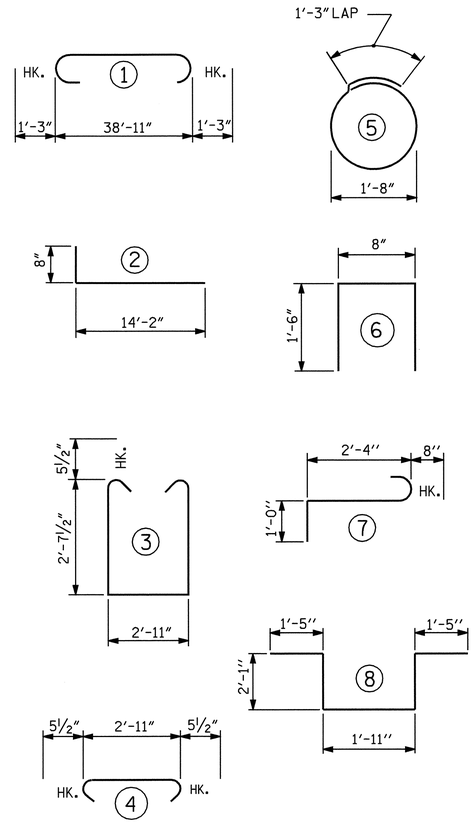
PILE SPLICE DETAILS

** POSITION OF PILE DURING WELDING.



DETAIL A
(TYP. EA. GDR.)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	41'-5"	1408
B2	4	#5	STR	38'-10"	162
B3	10	#4	STR	2'-11"	19
B4	8	#4	STR	20'-8"	110
H1	48	#4	2	14'-10"	476
H2	8	#4	STR	3'-6"	19
K1	24	#4	STR	20'-8"	331
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S3	18	#4	5	6'-6"	78
S5	6	#6	7	4'-0"	36
S6	2	#6	8	8'-11"	27
U1	32	#4	6	3'-8"	78
V1	64	#5	STR	8'-2"	545
V2	56	#4	STR	9'-10"	368

REINFORCING STEEL 4223 LBS.

CLASS A CONCRETE BREAKDOWN
POUR 1
(CAP & LOWER WINGS) 18.2 C.Y.
POUR 2
(BACKWALL & UPPER WINGS) 16.1 C.Y.
TOTAL 34.3 C.Y.

HP 12 x 53 GALVANIZED STEEL PILES
NO. 11 715 LIN FT.

STEEL PILE POINTS 11 EACH

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : J. LAMBERT DATE : 5/2008
CHECKED BY : S. W. PEARCE DATE : 7/2008

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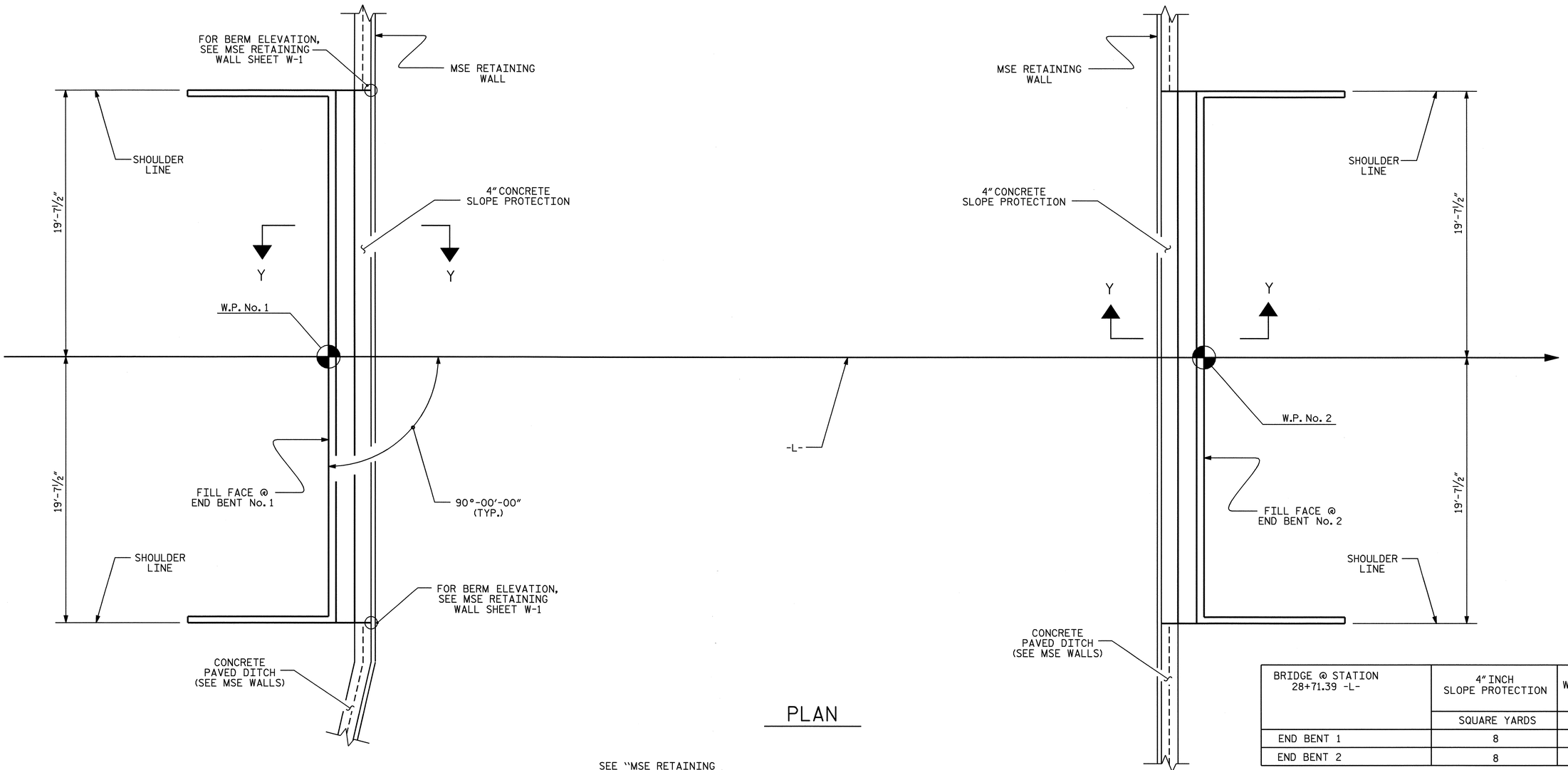
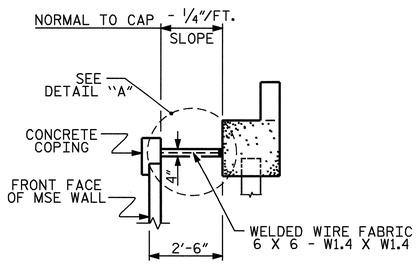
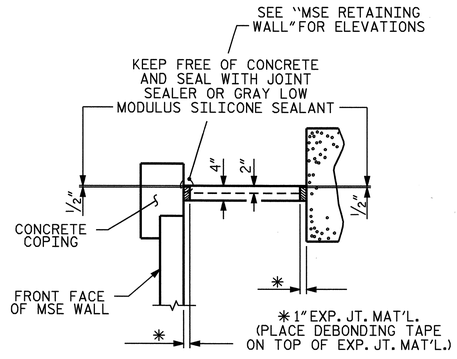


PLAN

BRIDGE @ STATION 28+71.39 -L-	4" INCH SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	8	16
END BENT 2	8	16



SECTION Y-Y



DETAIL A

GENERAL NOTES

SLOPE PROTECTION SHALL BE BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAIL. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATED A NEED FOR IT. METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION

SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 x W1.4, 60" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8/15/08

PROJECT NO. B-3881
NEW HANOVER COUNTY
STATION: 28+71.39 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			26

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CHECKED BY : D. HODGE DATE : 8/2008

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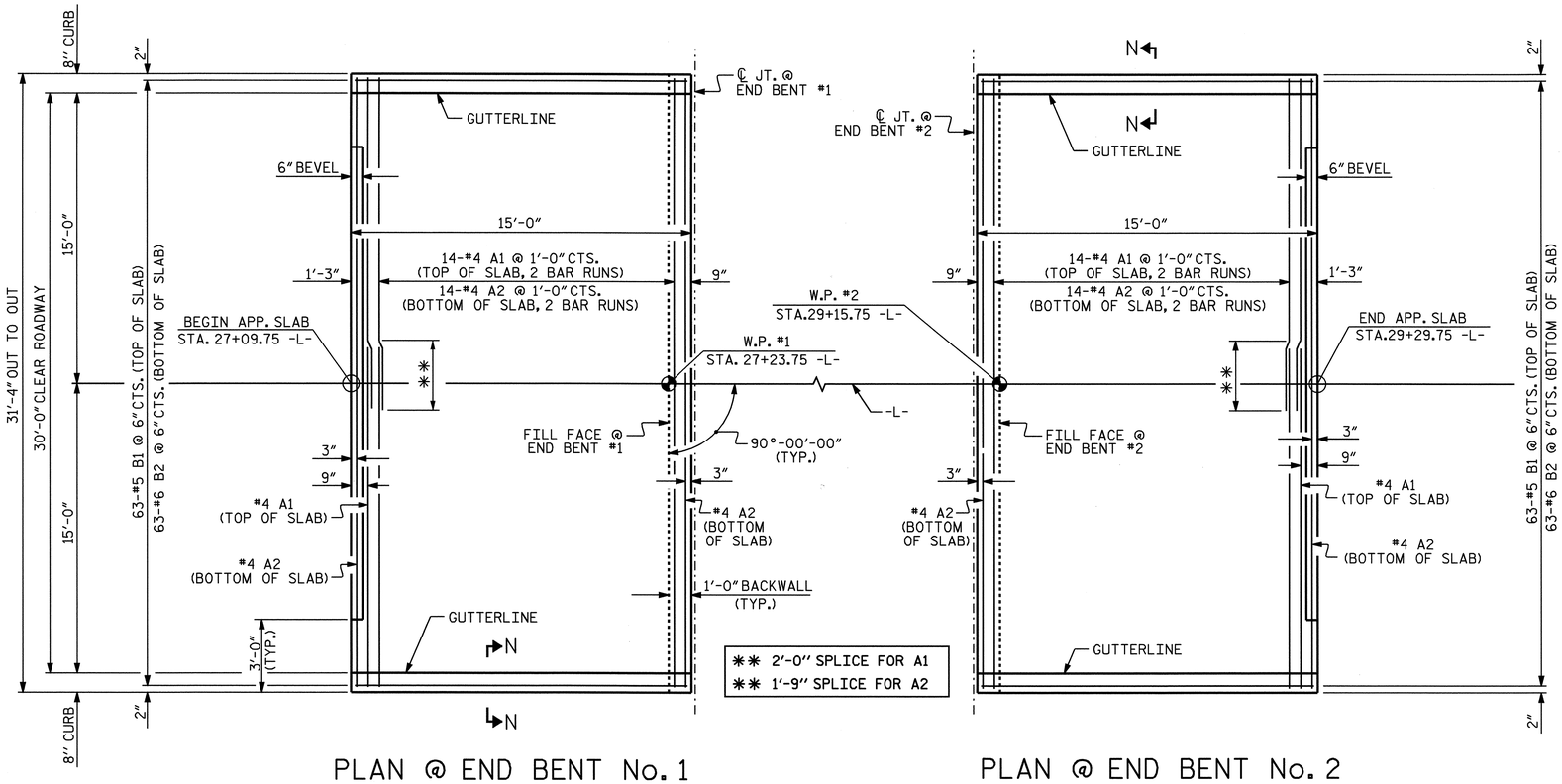


PLAN @ END BENT No. 1

PLAN @ END BENT No. 2

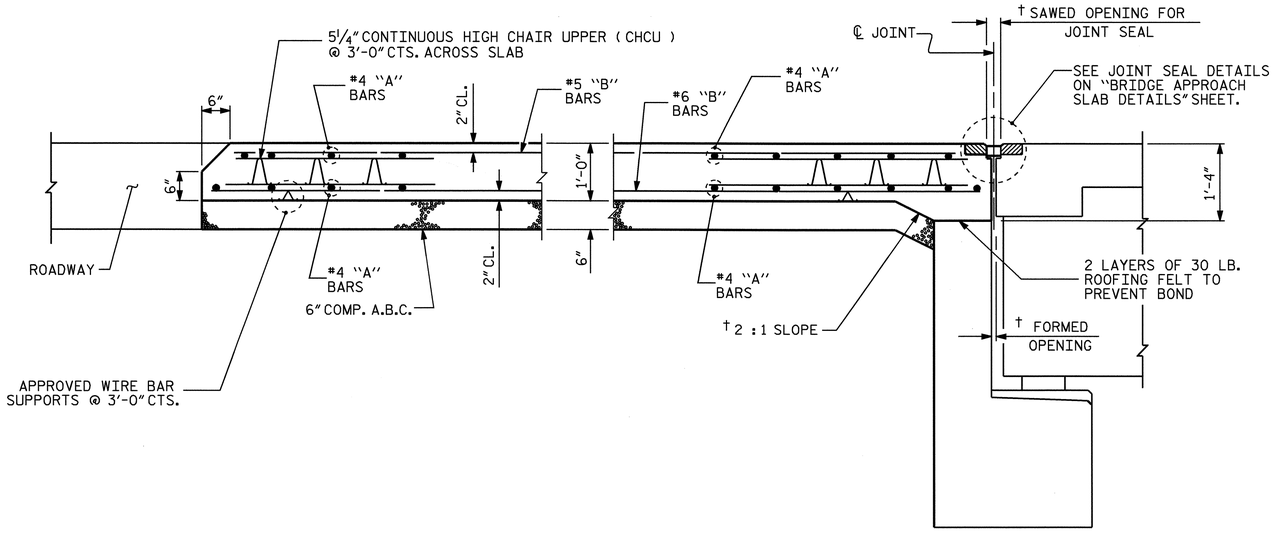
BILL OF MATERIAL

APPROACH SLAB AT END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	30	#4	STR	16′-6″	331
A2	32	#4	STR	16′-5″	351
* B1	63	#5	STR	13′-10″	909
B2	63	#6	STR	14′-8″	1388
REINFORCING STEEL				LBS.	1739
* EPOXY COATED REINFORCING STEEL				LBS.	1240
CLASS AA CONCRETE				C. Y.	17.8

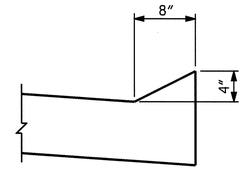
APPROACH SLAB AT END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	30	#4	STR	16′-6″	331
A2	32	#4	STR	16′-5″	351
* B1	63	#5	STR	13′-10″	909
B2	63	#6	STR	14′-8″	1388
REINFORCING STEEL				LBS.	1739
* EPOXY COATED REINFORCING STEEL				LBS.	1240
CLASS AA CONCRETE				C. Y.	17.8

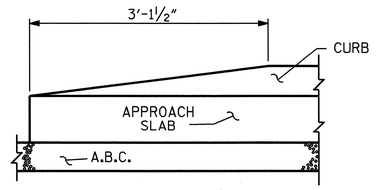


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.
8|15|08

ASSEMBLED BY : J. LAMBERT DATE : 3/2008	
CHECKED BY : S. W. PEARCE DATE : 7/2008	
DRAWN BY : LES 8/01	REV. 5/7/03R RWW/JTE
CHECKED BY : RDR 8/01	REV. 5/1/06R KMM/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			26

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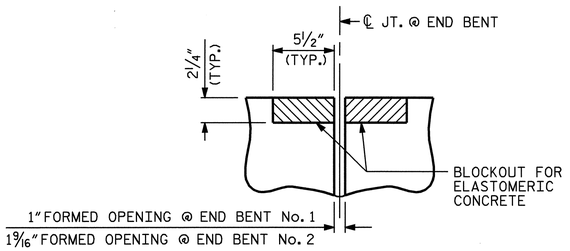
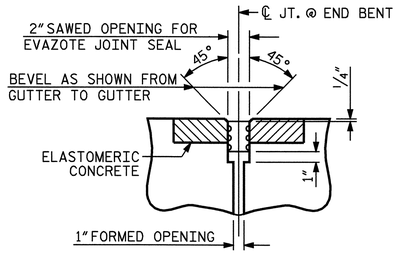


SECTION C-C

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

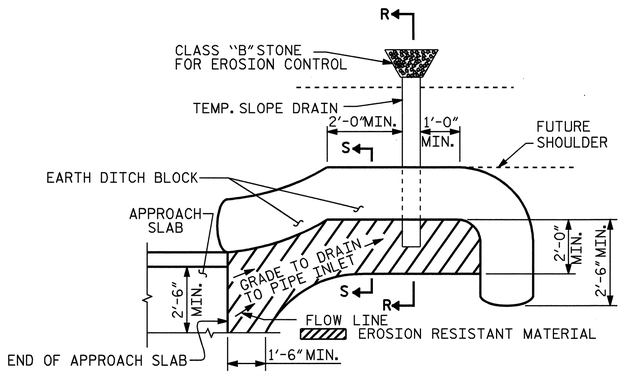
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.2
2	5.2
TOTAL	10.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION C-C

EVAZOTE JOINT SEAL
(FIXED)



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

PLAN VIEW

NOTES

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

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

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

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

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

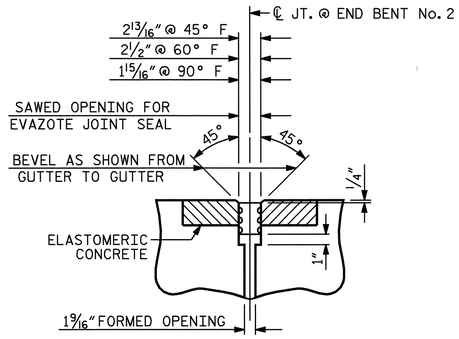
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½" AT END BENT No. 1 AND 3 3/16" AT END BENT No. 2.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

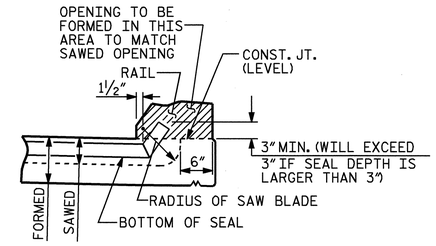
TEMPORY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLABS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL AND THE CURB.

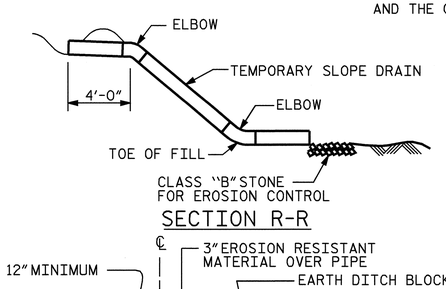


SECTION C-C

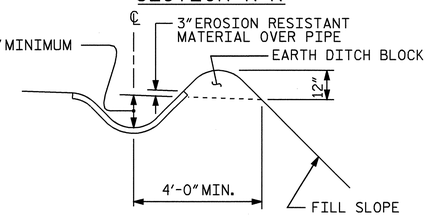
EVAZOTE JOINT SEAL
(EXPANSION)



SECTION A-A



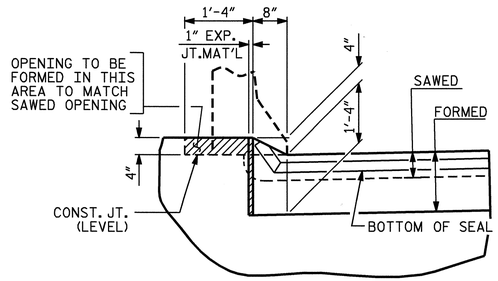
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

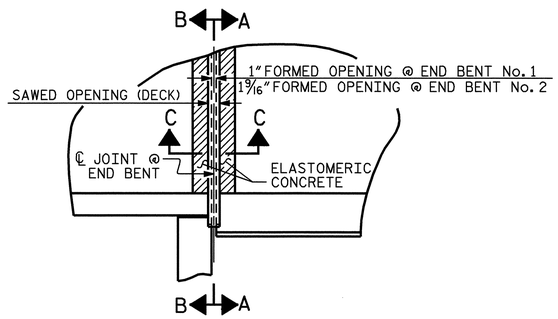


SECTION B-B

JOINT SEAL DETAILS @ END BENT

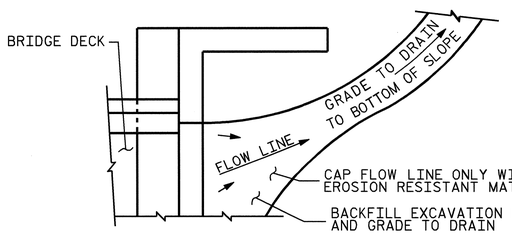
EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



PLAN

JOINT SEAL DETAILS @ END BENT



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

NORTH CAROLINA PROFESSIONAL SEAL 15779 ENGINEER JOHN R. DUGGINS, JR.

8/15/08

PROJECT NO. B-3881

NEW HANOVER COUNTY

STATION: 28+71.39 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

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

ASSEMBLED BY : J. LAMBERT		DATE : 7/2008	
CHECKED BY : S. W. PEARCE		DATE : 7/2008	
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES	
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06R	MAA/KMM	

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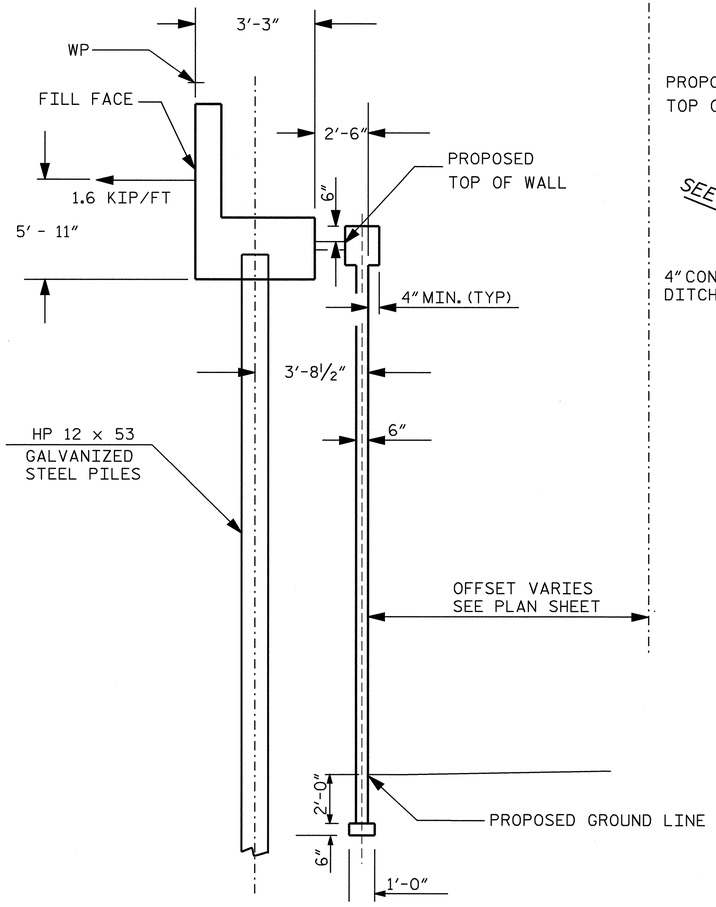
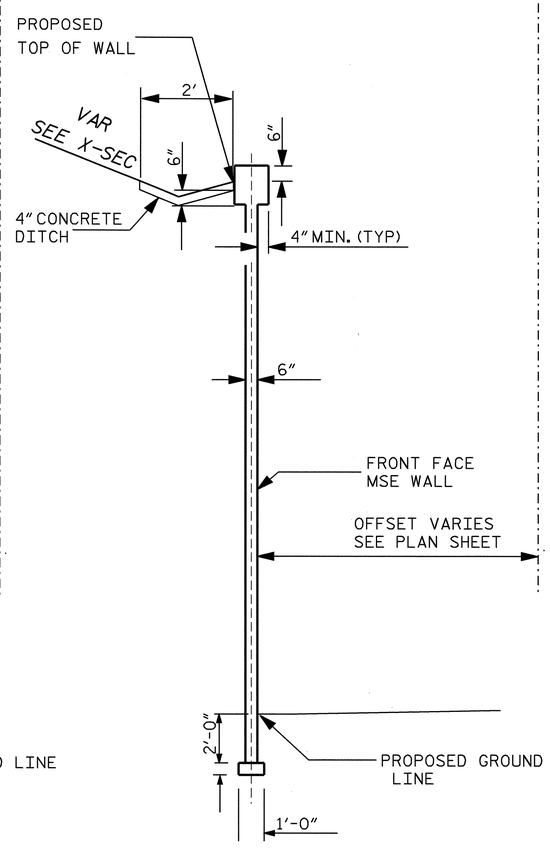
STD. NO. BAS10



TYPICAL SECTION A-A



TYPICAL SECTION B-B

8. DESIGN RETAINING WALL NO. 1 AND NO.2 FOR THE FOLLOWING:
   1) MINIMUM SERVICE LIFE = 100 YEARS
   2) ALLOWABLE BEARING CAPACITY = 2000 PSF
   3) WALL BACKFILL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION PSF
57, 67 AND 78M	110	38	0

   4) IN-SITU ASSUMED SOIL MATERIAL PARAMETERES:

MATERIAL TYPE	UNIT WEIGHT PCF	FRICTION ANGLE DEGREES	COHESION (c) PSF
RETAINED AND RANDOM BACKFILL	120	30	0
FOUNDATION	120	30	0

9. DESIGN RETAINING WALL NO. 1 AND NO.2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

10. DESIGN REINFORCEMENT CONNECTED TO THE END BENT CAPS FOR THE LOADING SHOWN AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT NO. 1 AND END BENT NO.2 LOCATED AT STATION 27+23.75 -L- AND STATION 29+15.75 -L-, RESPECTIVELY. MAINTAIN A MINIMUM CLEARANCE OF 3" BETWEEN THE HARDWARE AND THE REINFORCING STEEL IN THE CAP. A MINIMUM OF 2 LAYERS OF REINFORCING IS REQUIRED.

11. FOUNDATIONS FOR END BENT NO.1 AND END BENT NO.2 LOCATED AT STATION 27+23.75 -L- AND STATION 29+15.75 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

12. DO NOT PLACE LEVELING PAD CONCRETE, WALL BACKFILL, OR FIRST REINFORCEMENT LAYER FOR RETAINING WALL NO. 1 OR NO. 2 UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

13. THE MINIMUM REINFORCEMENT RATIO SHALL BE 0.9:1 (L:H) TO SATISFY EXTERNAL STABILITY.

14. DESIGN THE WALL PANELS TO BE RECTANGULAR. THE JOINTS BETWEEN ALL ROWS OF PANELS SHOULD LINE UP IN THE VERTICAL DIRECTION. HORIZONTAL JOINTS SHOULD BE STAGGERED.

NOTES

1. FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.

2. FOR MSE WALL NO. 2, THE BOTTOM OF THE LEVELING PAD SHALL NOT BE BELOW ELEVATION 22.0 FROM STATION 29+35 -L- TO STATION 29+45 -L- (BEGIN MSE WALL #2)

3. DO NOT USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR WALL NO. 1 OR WALL NO. 2.

4. DO NOT USE STANDARD SIZE 2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO. 1 OR NO. 2.

5. BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 OR WALL NO.2 , SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE ENVELOPE IS ACCEPTED.

6. CAST IN PLACE CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO. 1 AND NO. 2. DO NOT CAST THE COPING UNTIL AFTER THE END BENT WAITING PERIODS HAVE ENDED. ADJUST COPING AS NECESSARY TO ACCOUNT FOR SETTLEMENT.

7. DESIGN RETAINING WALL NO. 1 AND NO. 2 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

TOTAL BILL OF MATERIAL		
MSE RETAINING WALL END BENT #1	1699	S.F.
MSE RETAINING WALL END BENT #2	2934	S.F.
MSE RETAINING WALL TOTAL	4633	S.F.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027869 ENGINEER DAVID L. TEAGUE

SIGNATURE 4/3/08 DATE

ENGINEER

SIGNATURE DATE

PROJECT NO.: B-3881 (33323.1.1)

NEW HANOVER COUNTY

STATION: 27+29.50 -L- and 29+10.00 -L-

SHEET 1 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ EASTERN REGIONAL OFFICE
☐ WESTERN REGIONAL OFFICE
■ CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE WALL #1 and #2

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

PREPARED BY:	D. TEAGUE	DATE: 6-08
REVIEWED BY:	E. WILLIAMS	DATE: 6-08

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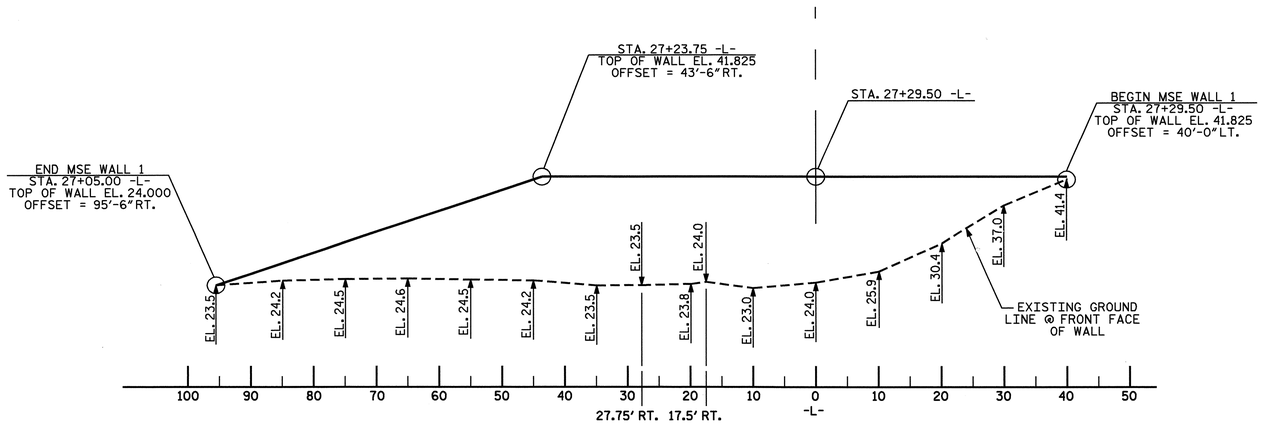
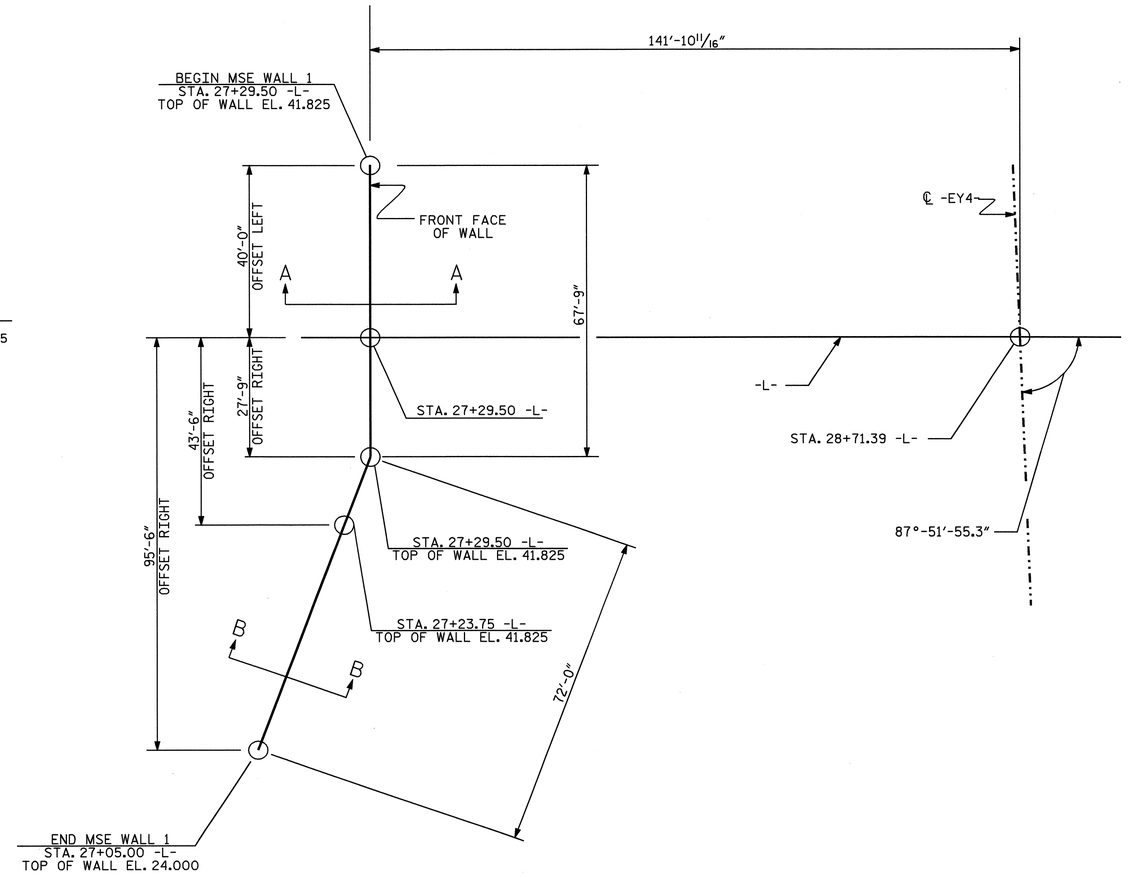
GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027869 ENGINEER DAVID L. TEAGUE — D.L. Teague 9/3/08	
SIGNATURE DATE	SIGNATURE DATE



WALL #1 ELEVATION VIEW (FRONT FACE)
@ END BENT No.1



WALL #1 PLAN VIEW
@ END BENT No. 1

PREPARED BY: D. TEAGUE	DATE: 6/08		
REVIEWED BY: E.WILLIAMS	DATE: 6/08		

PROJECT NO.: B-3881 (33323.1.1)

NEW HANOVER ***COUNTY***

STATION: 27+29.50 -L-

SHEET 2 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
☐ ***WESTERN REGIONAL OFFICE***
■ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE WALL #1
@END BENT 1

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

GEOTECHNICAL ENGINEER

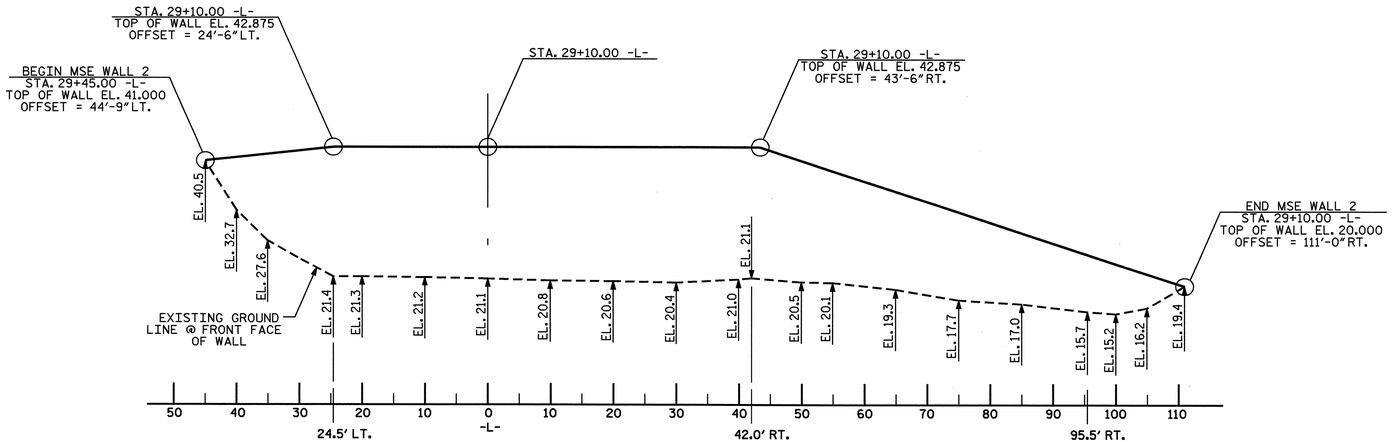
NORTH CAROLINA PROFESSIONAL SEAL 027869 ENGINEER DAVID L. TEAGUE

David L. Teague 9/3/08

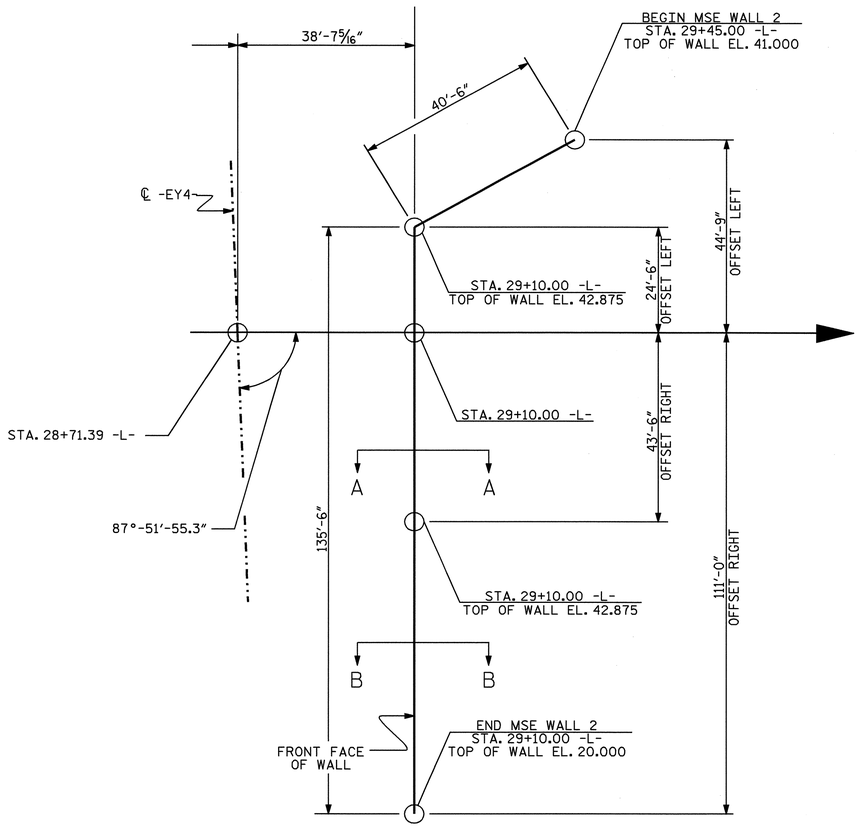
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



WALL #2 ELEVATION VIEW (FRONT FACE)
@ END BENT No.2



WALL #2 PLAN VIEW
@ END BENT No. 2

PROJECT NO.: B-3881 (33323.1.1)

NEW HANOVER ***COUNTY***

STATION: 29+10 -L-

SHEET 3 OF 3

PREPARED BY: D. TEAGUE	DATE: 6/08
REVIEWED BY: E. WILLIAMS	DATE: 6/08

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GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
☐ ***WESTERN REGIONAL OFFICE***
■ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE WALL #2
@ END BENT 2

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM ω RGW REV. 6-27-02 RWW ω JTE
REV. 8-16-99 RWW ω LES