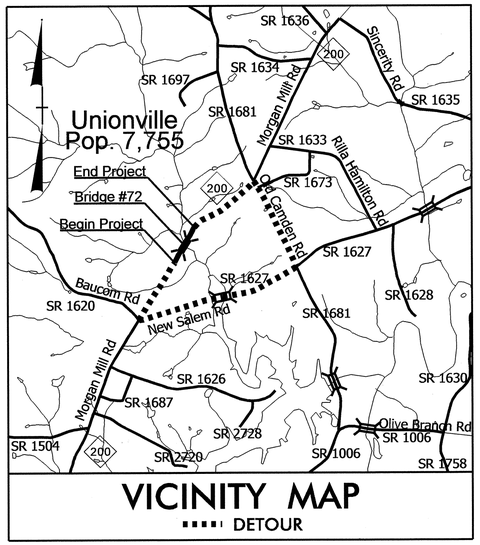
TIP PROJECT: B-5134

CONTRACT: C203368



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

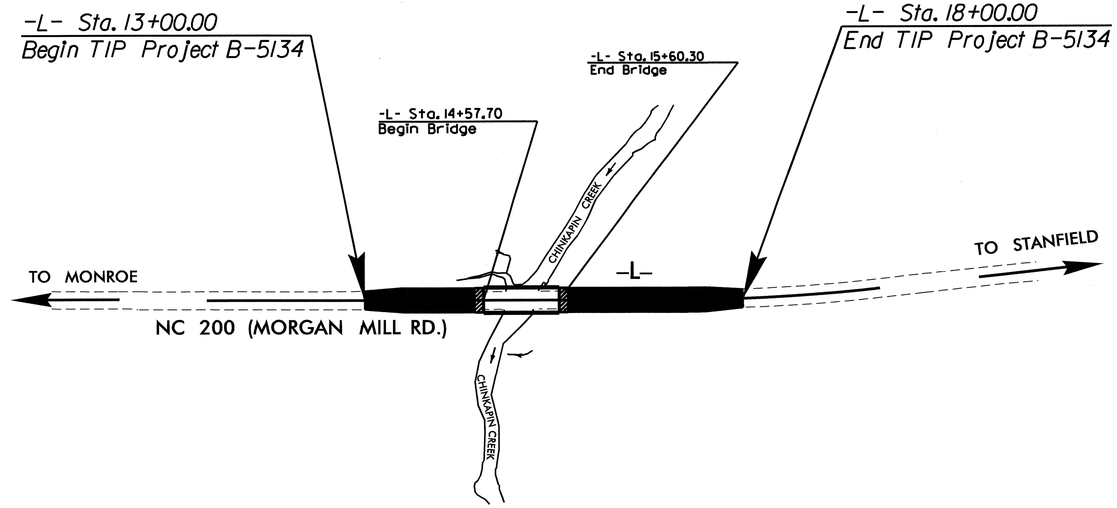
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5134		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42293.1.1	BRSTP-0200(2)	P.E.
42293.2.1	BRSTP-0200(2)	R/W & UTIL.
42293.3.FR1	BRSTP-0200(2)	CONST.

LOCATION: BRIDGE NO. 72 ON NC 200 (MORGAN MILL ROAD) OVER CHINKAPIN CREEK

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

NAD 83/
NSRS 2007



STRUCTURE

DESIGN DATA

ADT 2014 = 4981
ADT 2035 = 9100
K = 11 %
D = 70 %
T = 10 % *
V = 55 MPH
* TTST 5% DUAL 5%
FUNC CLASS =
MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5134 = 0.076 MI
LENGTH OF STRUCTURE TIP PROJECT B-5134 = 0.019 MI
TOTAL LENGTH TIP PROJECT B-5134 = 0.095 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
MARCH 18, 2014

L. E. SUTTON, P.E.
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
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*

22-JAN-2014 14:26
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$
lsutton

F.A. PROJECT No. BRSTP-0200(2)

14+50 15+00 15+50 16+00

GRADE DATA

-0.3067% +0.7097%

PI = 13+75.00 -L-
EL. 497.13
VC=120'

GRADE DATA

+0.7097% +4.5043%

PI = 16+85.00 -L-
EL. 499.33
VC=230'

510
500
490
480

FIX. SPAN A FIX.

STA. 14+57.70 -L-
FILL FACE @ END BENT 1
GRADE POINT EL. 497.72

STA. 15+60.30 -L-
FILL FACE @ END BENT 2
GRADE POINT EL. 498.45

EL. 496.0±
Q100
EL. 497.14
W.S. EL. 487.0
(4/13/12)
EL. 490.0±
EL. 496.0±
UNCLASSIFIED
STRUCTURE
EXCAVATION (TYP.)
TEMPORARY
ACCESS
LOW CHORD
EL. 493.46
1'-0"
(TYP.)
EL. 497.0±
APPROXIMATE
NATURAL GROUND
LINE
FLOOD PLAIN
BENCH EL. 490.3±
SLOPE 2:1
NORMAL TO CAP
(TYP.)
EL. 486.0±
EL. 484.0±
EXISTING
STRUCTURE
(TYP.)
TEMPORARY
ACCESS
EL. 485.0±
CLASS II
RIP RAP
(TYP.)
FLOOD PLAIN
BENCH EL. 490.8±
LOW CHORD
EL. 494.16
EL. 497.0±
HP 14 X 73
STEEL PILES
(TYP.)

END BENT 1 END BENT 2

SECTION ALONG -L-

(SECTIONS AT END BENTS ARE TAKEN AT RIGHT ANGLES)

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

TOP OF CAUSEWAY
EL. 489.0
CLASS B
RIP RAP
1'-0"
2'-0" MIN.
1½:1
SLOPE
NORMAL WATER
SURFACE EL. 487.0
CLASS II
RIP RAP
STREAM BED

DETAILS OF TEMPORARY CAUSEWAY

NOTE: ONLY ONE CAUSEWAY MAY
BE IN PLACE AT A TIME

CHINKAPIN
CREEK
TEMPORARY
CAUSEWAY 1
TEMPORARY
CAUSEWAY 2
CLASS II
RIP RAP
BEGIN APPROACH SLAB
STA. 14+33.85 -L-
TO SR 1627
W.P. #1
STA. 14+57.70 -L-
3'-0"
(MAX.)
-L-
FILL
FACE
BRIDGE ID
STA. 15+09.00 -L-
W.P. #2
STA. 15+60.30 -L-
TO SR 1608
END APPROACH SLAB
STA. 15+84.15 -L-
FILL
FACE
120°-00'-00"
(TYP.)
EXISTING
STRUCTURE
(TYP.)
CLASS II
RIP RAP
51'-3⅝"
51'-3⅝"
102'-7¼" (FILL FACE TO FILL FACE)

PLAN

(PILES NOT SHOWN FOR CLARITY)

NORTH CAROLINA PROFESSIONAL SEAL 21638 ENGINEER LAURA E. SUTTON 11/22/14

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 11/22/14

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #72

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
CHINKAPIN CREEK ON NC 200
(MORGAN MILL ROAD)
BETWEEN SR 1627 AND SR 1608

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

DRAWN BY : J.D. HAWK DATE : 7/21/13
CHECKED BY : L.E. SUTTON DATE : 9/18/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

22-JAN-2014 14:26
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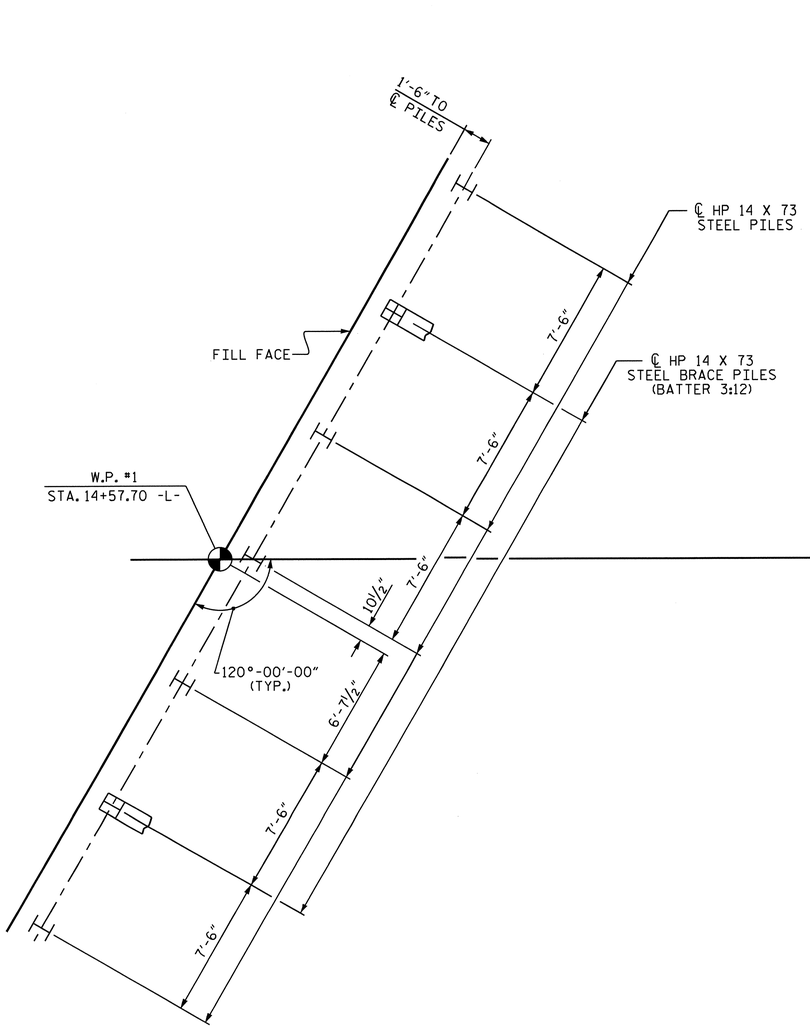
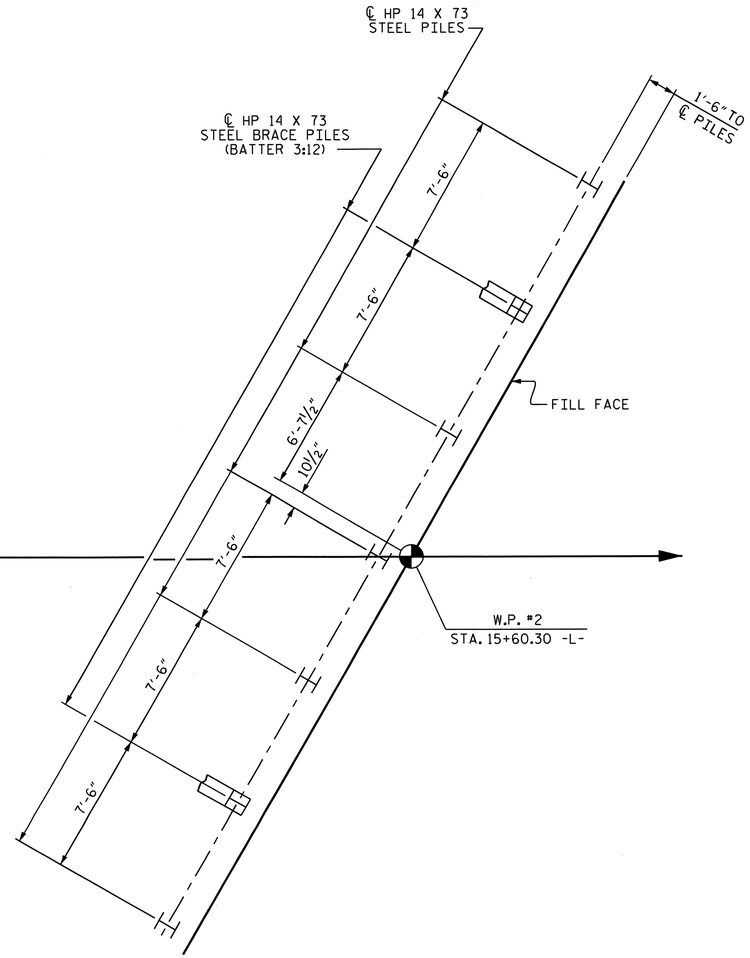
lsutton



END BENT 1



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE
SHOWN TO THE CENTERLINE OF PILES.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO 481.5 FT. (LT.) AND 480 FT. (RT.). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT 1 AND END BENT 2.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO 478 FT. (LT.) AND 477.5 FT. (RT.). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER TOANG T. DIEU 12/4/13

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
CHINKAPIN CREEK ON NC 200
(MORGAN MILL ROAD)
BETWEEN SR 1627 AND SR 1608

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

DRAWN BY :	J.D. HAWK	DATE : 7/21/13
CHECKED BY :	L.E. SUTTON	DATE : 9/18/13
DESIGN ENGINEER OF RECORD:	H.T. DIEU	DATE : 12/3/13

22-JAN-2014 14:26
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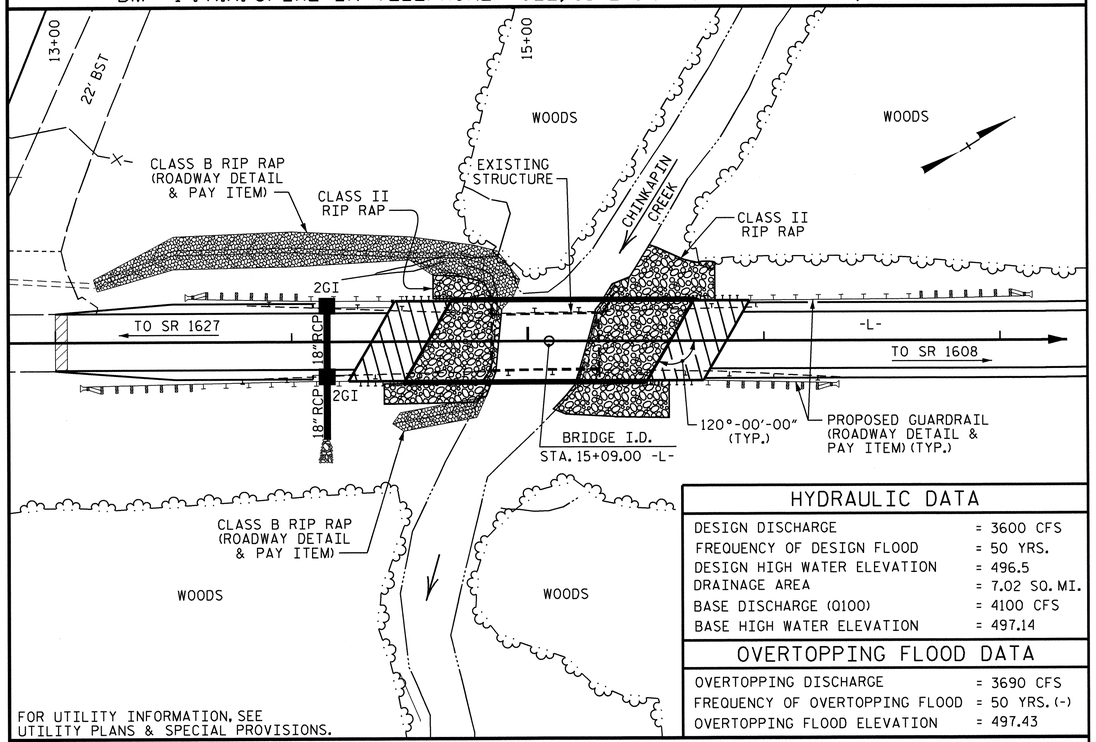
BM #1 : R.R. SPIKE IN TELEPHONE POLE, 31' LT. OF STA. 13+08 -L-, EL. 497.29



HYDRAULIC DATA	
DESIGN DISCHARGE	= 3600 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 496.5
DRAINAGE AREA	= 7.02 SQ. MI.
BASE DISCHARGE (Q100)	= 4100 CFS
BASE HIGH WATER ELEVATION	= 497.14

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 3690 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 50 YRS. (-)
OVERTOPPING FLOOD ELEVATION	= 497.43

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

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.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR "CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+09.00 -L-".

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+09.00 -L-".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 30 FEET EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 23'-6" WITH A 23'-11" CLEAR ROADWAY ON REINFORCED CONCRETE SLAB, WIDENED WITH REINFORCED CONCRETE DECK ON I-BEAMS, SUPPORTED ON REINFORCED CONCRETE FULL HEIGHT ABUTMENTS AND SOLID REINFORCED CONCRETE INTERIOR PIER, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 14 X 73 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE						3,348	4,489		LUMP SUM				200.00			LUMP SUM	LUMP SUM	12	1200.00
END BENT 1			25.0	35.0				34.9		4,723	7	85		240	265				
END BENT 2			51.0	35.0				34.9		4,723	7	105		420	465				
TOTAL	LUMP SUM	LUMP SUM	76.0	70.0	LUMP SUM	3,348	4,489	69.8	LUMP SUM	9,446	14	190	200.00	660	730	LUMP SUM	LUMP SUM	12	1200.00

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
CHINKAPIN CREEK ON NC 200
(MORGAN MILL ROAD)
BETWEEN SR 1627 AND SR 1608

NORTH CAROLINA PROFESSIONAL SEAL 038774 ENGINEER HOANG T. DIEU 1/23/14

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

DRAWN BY : J.D. HAWK DATE : 7/21/13
CHECKED BY : L.E. SUTTON DATE : 9/19/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

22-JAN-2014 14:26
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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III 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)	1.15	--	1.75	0.244	1.41	A	EL	49.135	0.614	1.15	A	EL	9.827	0.80	0.244	1.17	A	EL	49.135	
		HL-93 (OPERATING)	N/A		1.49	--	1.35	0.244	1.83	A	EL	49.135	0.614	1.49	A	EL	9.827	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.52	54.854	1.75	0.244	1.97	A	EL	49.135	0.614	1.52	A	EL	9.827	0.80	0.244	1.62	A	EL	49.135	
		HS-20 (OPERATING)	36.000		1.98	71.106	1.35	0.244	2.55	A	EL	49.135	0.614	1.98	A	EL	9.827	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.85	51.959	1.40	0.244	5.83	A	EL	49.135	0.614	4.68	A	EL	9.827	0.80	0.244	3.85	A	EL	49.135	
		SNGARBS2	20.000		2.79	55.773	1.40	0.244	4.22	A	EL	49.135	0.614	3.28	A	EL	9.827	0.80	0.244	2.79	A	EL	49.135	
		SNAGRIS2	22.000		2.61	57.394	1.40	0.244	3.95	A	EL	49.135	0.614	3.03	A	EL	9.827	0.80	0.244	2.61	A	EL	49.135	
		SNCOTTS3	27.250		1.91	52.128	1.40	0.244	2.9	A	EL	49.135	0.614	2.33	A	EL	9.827	0.80	0.244	1.91	A	EL	49.135	
		SNAGGRS4	34.925		1.57	54.760	1.40	0.244	2.37	A	EL	49.135	0.614	1.90	A	EL	9.827	0.80	0.244	1.57	A	EL	49.135	
		SNS5A	35.550		1.54	54.581	1.40	0.244	2.32	A	EL	49.135	0.614	1.91	A	EL	9.827	0.80	0.244	1.54	A	EL	49.135	
		SNS6A	39.950		1.40	55.777	1.40	0.244	2.11	A	EL	49.135	0.614	1.73	A	EL	9.827	0.80	0.244	1.40	A	EL	49.135	
		SNS7B	42.000		1.33	55.823	1.40	0.244	2.01	A	EL	49.135	0.614	1.68	A	EL	9.827	0.80	0.244	1.33	A	EL	49.135	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.70	56.064	1.40	0.244	2.57	A	EL	49.135	0.614	2.07	A	EL	9.827	0.80	0.244	1.70	A	EL	49.135	
		TNT4A	33.075		1.70	56.327	1.40	0.244	2.58	A	EL	49.135	0.614	2.03	A	EL	9.827	0.80	0.244	1.70	A	EL	49.135	
		TNT6A	41.600		1.38	57.440	1.40	0.244	2.09	A	EL	49.135	0.614	1.76	A	EL	9.827	0.80	0.244	1.38	A	EL	49.135	
		TNT7A	42.000		1.38	58.024	1.40	0.244	2.09	A	EL	49.135	0.614	1.73	A	EL	9.827	0.80	0.244	1.38	A	EL	49.135	
		TNT7B	42.000		1.41	59.398	1.40	0.244	2.14	A	EL	49.135	0.614	1.66	A	EL	9.827	0.80	0.244	1.41	A	EL	49.135	
		TNAGRIT4	43.000		1.36	58.328	1.40	0.244	2.05	A	EL	49.135	0.614	1.61	A	EL	9.827	0.80	0.244	1.36	A	EL	49.135	
		TNAGT5A	45.000		1.28	57.790	1.40	0.244	1.94	A	EL	49.135	0.614	1.58	A	EL	9.827	0.80	0.244	1.28	A	EL	49.135	
		TNAGT5B	45.000	(3)	1.27	57.303	1.40	0.244	1.93	A	EL	49.135	0.614	1.53	A	EL	9.827	0.80	0.244	1.27	A	EL	49.135	

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

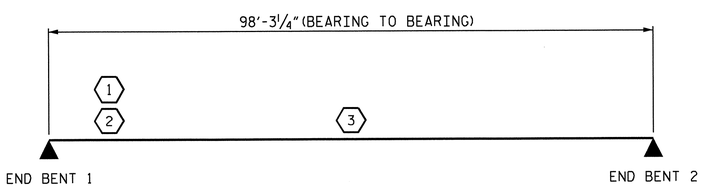
(2) DESIGN LOAD RATING (HS-20)

(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. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T DIEU 1/22/14

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

STD. NO. LRFR1

ASSEMBLED BY : H.T. DIEU DATE : 3/14/13
CHECKED BY : J.D. HAWK DATE : 9/25/13

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

22-JAN-2014 14:26
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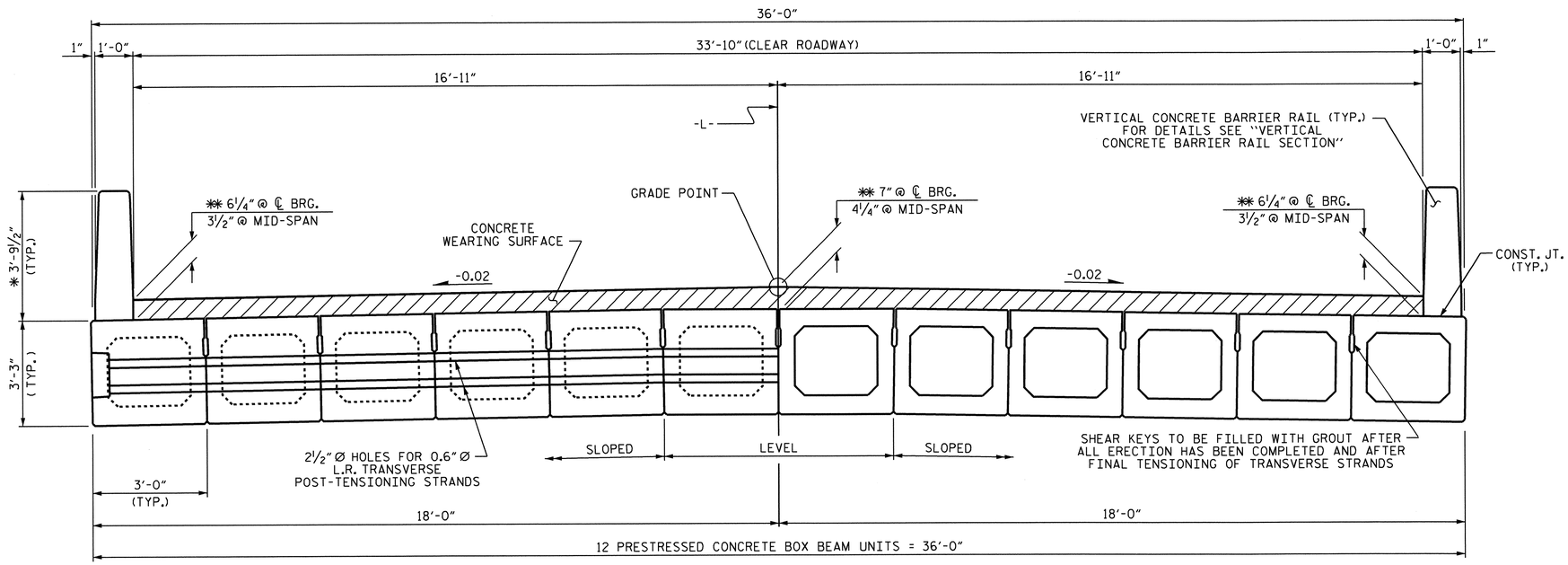


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

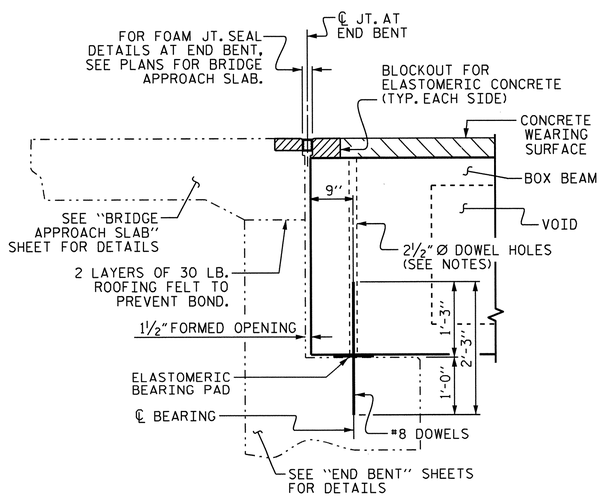
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* - THE MINIMUM HEIGHT OF THE VERTICAL CONCRETE BARRIER RAIL IS SHOWN. THE HEIGHT OF THE RAIL VARIES WHILE THE TOP OF THE RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE.

** - BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

FIXED END



SECTION AT END BENT

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS AND CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

THE TOP SURFACE OF THE BOX BEAM UNITS SHALL BE RAKED TO A DEPTH OF ⅜". SEE STANDARD SPECIFICATIONS ARTICLE 1078-15.

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. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE RAIL. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

ASSEMBLED BY : H.T. DIEU	DATE : 1/7/13		
CHECKED BY : J.D. HAWK	DATE : 1/8/13		
DRAWN BY : TLA 5/05	REV. 5/1/06R	KMM/GM	DESIGN ENGINEER OF RECORD:
CHECKED BY : GM 6/05	REV. 10/1/11	MAA/GM	H.T. DIEU DATE : 12/3/13
	REV. 6/13	MAA/GM	

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PROJECT NO. B-5134
UNION COUNTY
STATION: 15+09.00 -L-

SHEET 1 OF 5

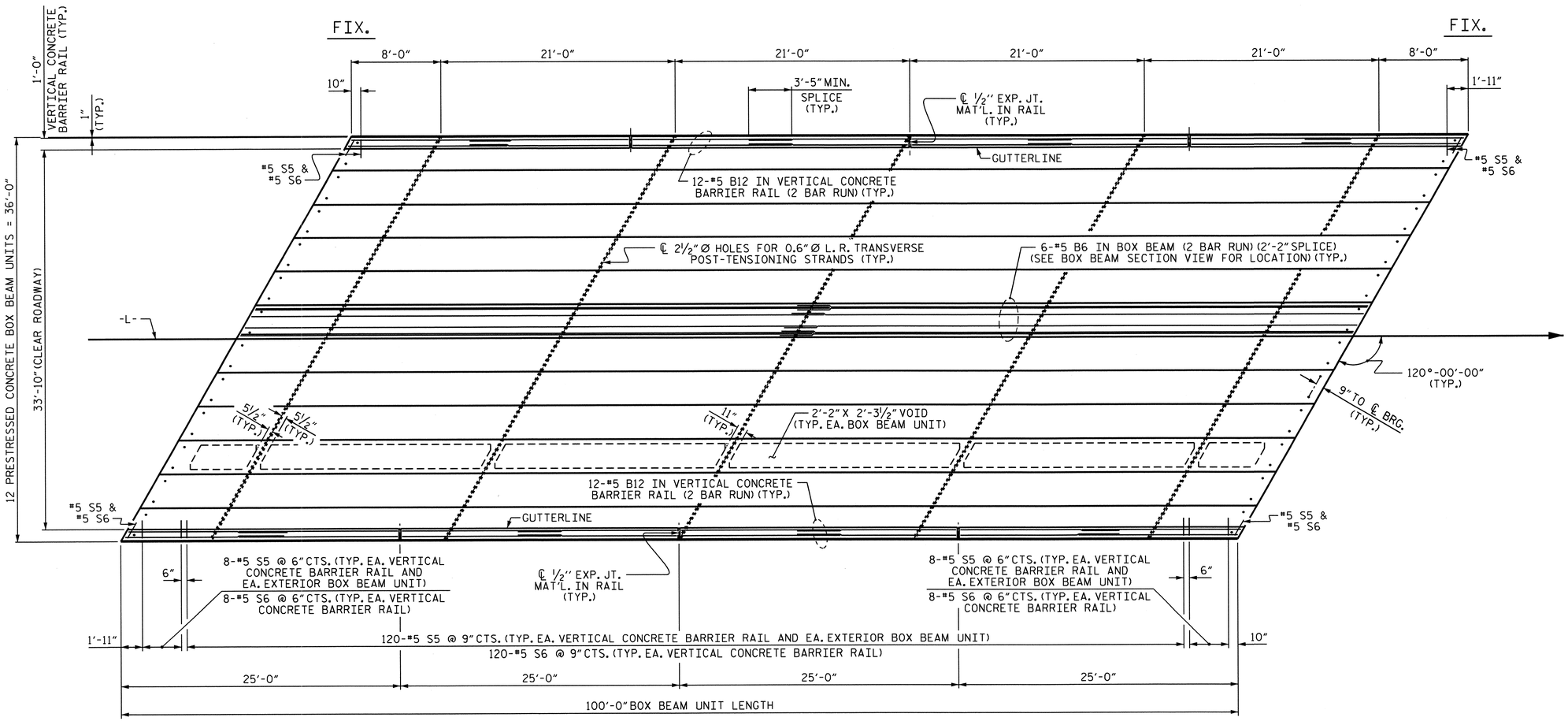
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT
120° SKEW

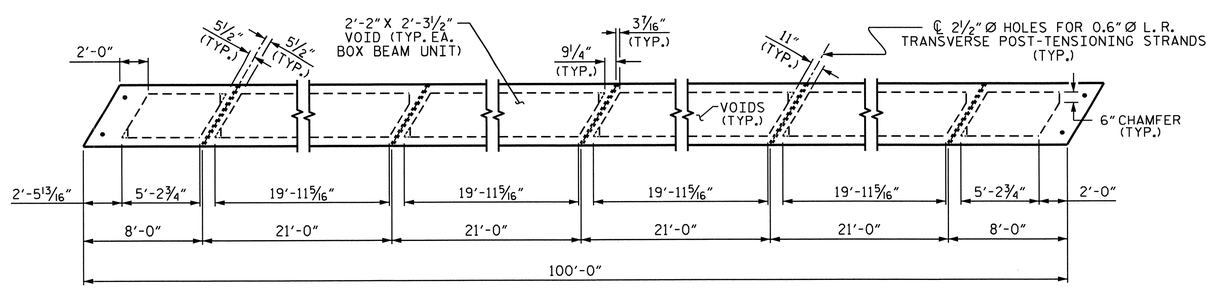
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			17

STD. NO. PCBB1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 1/7/14



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 100' UNIT 33'-10" CLEAR ROADWAY

120° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 12/3/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			17

DRAWN BY : H.T. DIEU DATE : 8/9/12
CHECKED BY : J.D. HAWK DATE : 1/8/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

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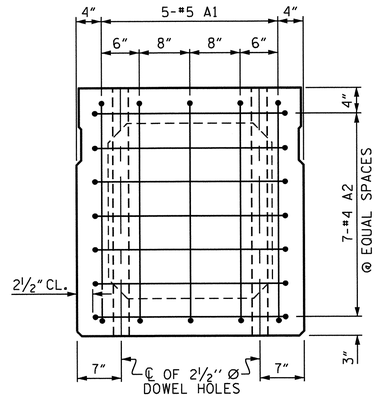
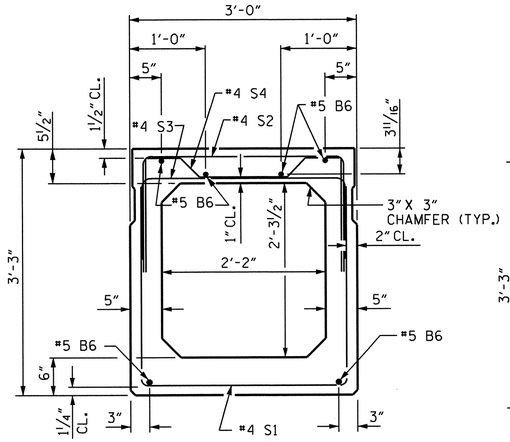


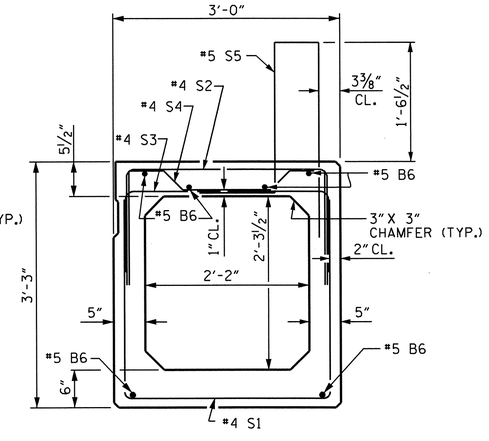
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



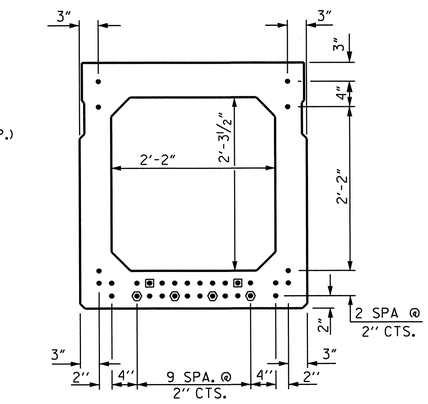
INTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)



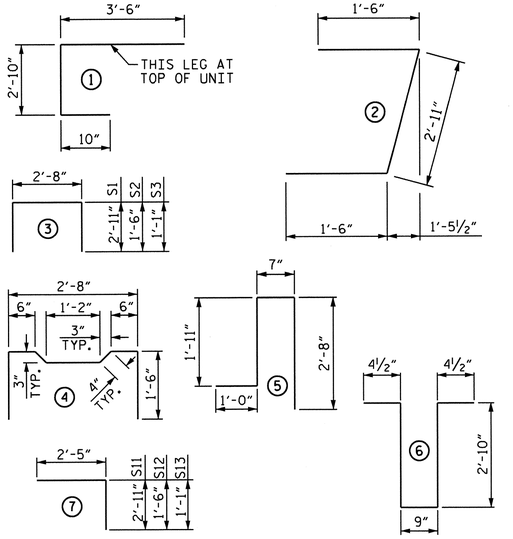
TYPICAL STRAND LOCATION

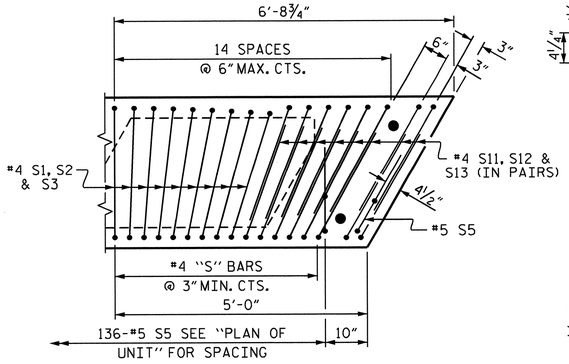
(32 STRANDS REQUIRED)

GRADE 270 STRANDS

	0.6"Ø L.R.
AREA (SQ. IN.)	0.217
ULTIMATE STRENGTH (LBS./STRAND)	58,600
APPLIED PRESTRESS (LBS./STRAND)	43,950

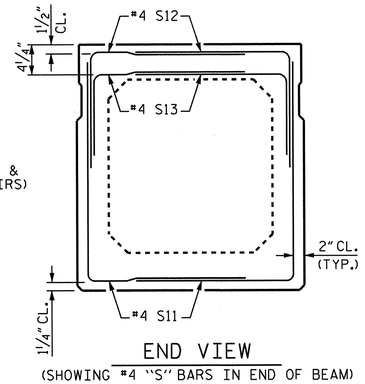
BAR TYPES





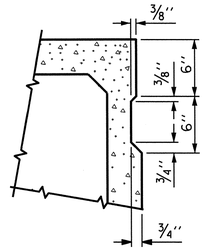
DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS



END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

0.6"Ø LOW RELAXATION STRAND LAYOUT

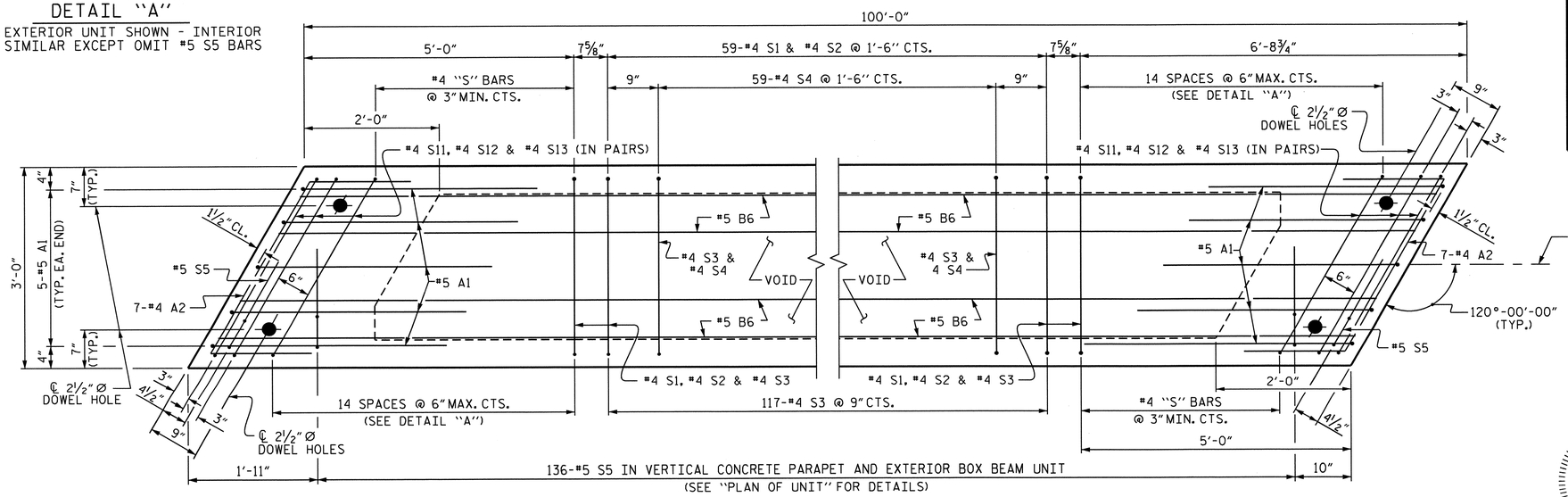
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◧ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-11"	174	5'-11"	174
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-10"	19	2'-10"	19
S1	77	#4	3	8'-6"	437	8'-6"	437
S2	77	#4	3	5'-8"	291	5'-8"	291
S3	135	#4	3	4'-10"	436	4'-10"	436
S4	58	#4	4	5'-10"	226	5'-10"	226
S11	32	#4	7	5'-4"	114	5'-4"	114
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
* S5	138	#5	5	6'-2"	888		
REINFORCING STEEL				LBS.	2,640	LBS.	2,640
* EPOXY COATED REINF. STEEL				LBS.	888		
7,500 P.S.I. CONCRETE				CU. YDS.	19.7	CU. YDS.	19.6
0.6"Ø L.R. STRANDS				No.	32	No.	32



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF UNIT.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT

120° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			17

STD. NO. PCBB6

ASSEMBLED BY : H.T. DIEU DATE : 11/7/12
CHECKED BY : J.D. HAWK DATE : 1/8/13

DRAWN BY : DGE II/II
CHECKED BY : TMG II/II

DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

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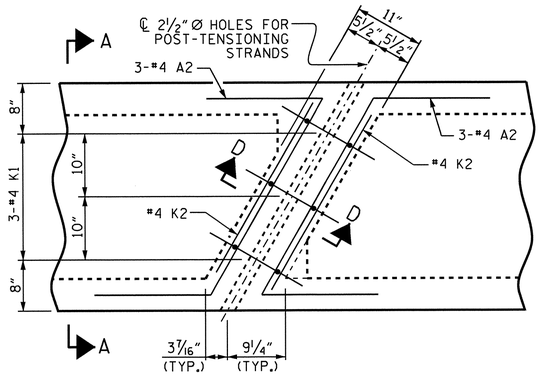
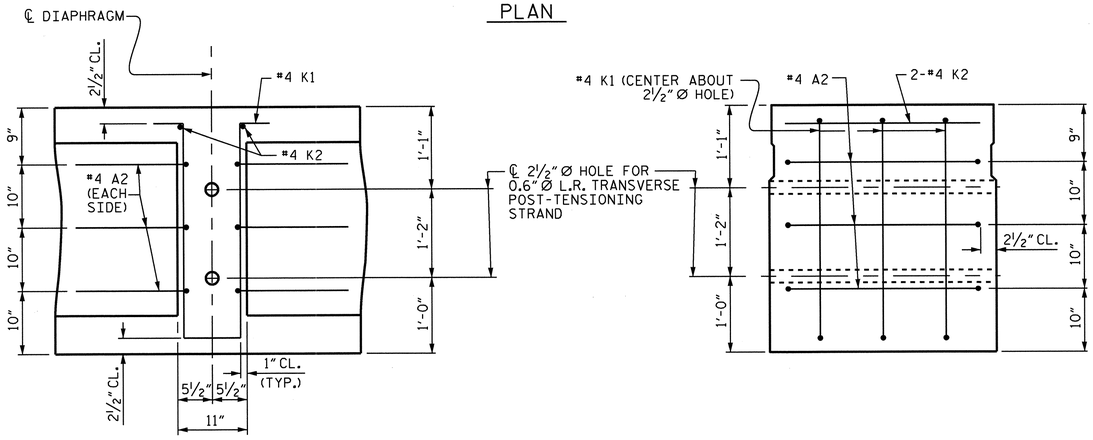


PLAN

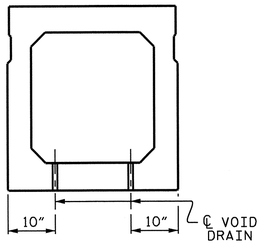


SECTION D-D

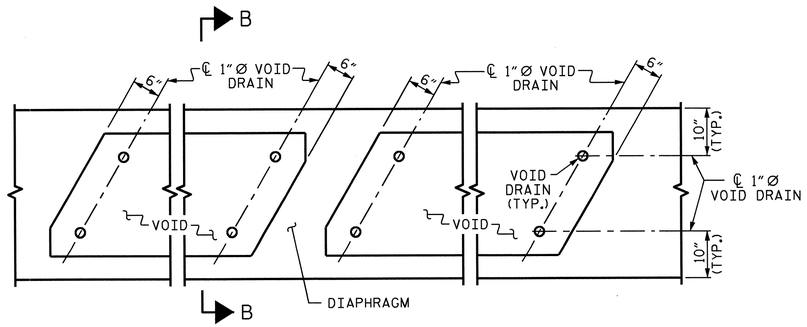
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



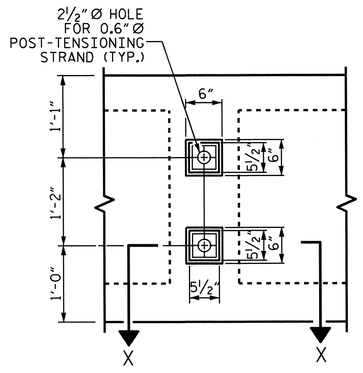
SECTION B-B



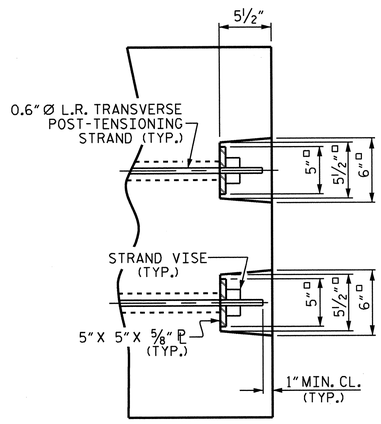
PART PLAN

VOID DRAIN DETAILS

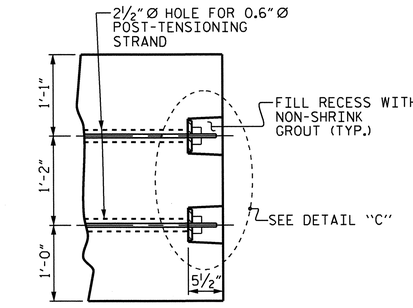
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



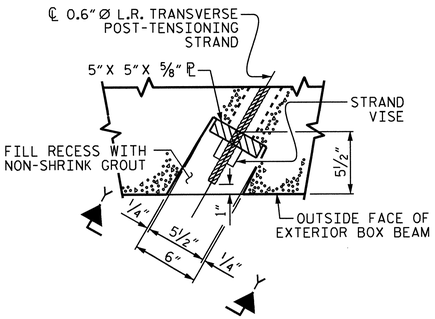
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3" 0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3⅝" ↑
DEFLECTION DUE TO CONCRETE WEARING SURFACE	9⁄16" ↓
FINAL CAMBER *	3⅛16" ↑

* DOES NOT INCLUDE DEFLECTION DUE TO RAIL & FUTURE WEARING SURFACE

PROJECT NO. B-5134
UNION COUNTY
STATION: 15+09.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT
120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			17

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 12/4/14

ASSEMBLED BY : H.T. DIEU	DATE : 8/9/12	DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13
CHECKED BY : J.D. HAWK	DATE : 1/8/13	
DRAWN BY : DGE 11/11		
CHECKED BY : TMG 11/11		

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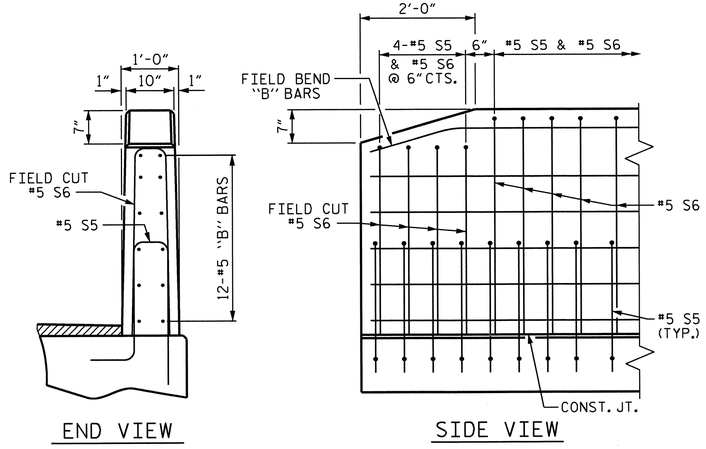
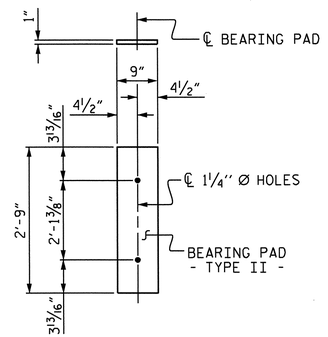


END VIEW

SIDE VIEW

END OF RAIL DETAILS



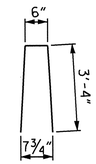
FIXED END
(TYPE II - 24 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	10	100'-0"	1000'-0"
TOTAL	12	——	1200'-0"

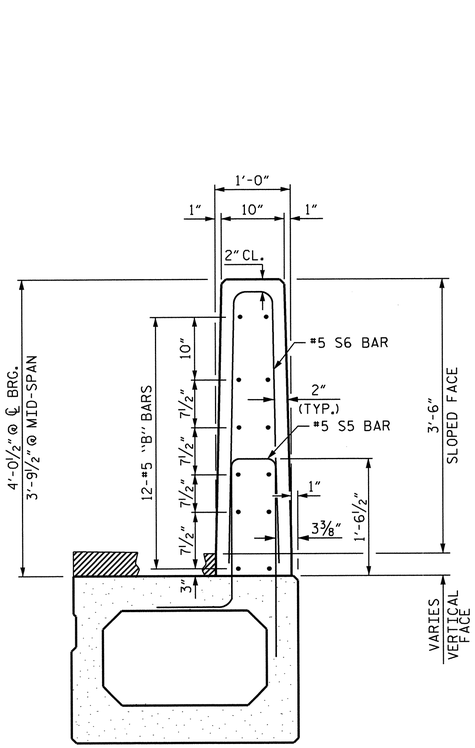
BAR TYPE



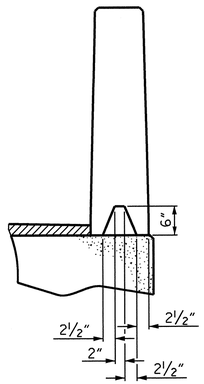
BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR
VERTICAL CONCRETE BARRIER RAIL

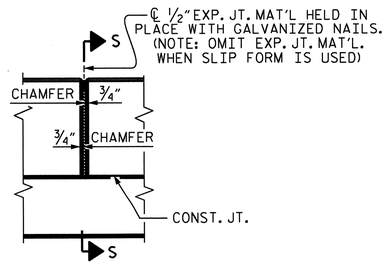
BAR	BARS PER PAIR OF 100' EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
✱B12	192	#5	STR	14'-3"	2854
✱ S6	268	#5	1	7'-2"	2003
✱EPOXY COATED REINFORCING STEEL				LBS.	4,857
CLASS AA CONCRETE				CU.YDS.	26.8
TOTAL VERTICAL CONCRETE BARRIER RAIL				LIN. FT.	200.00



SECTION THRU RAIL

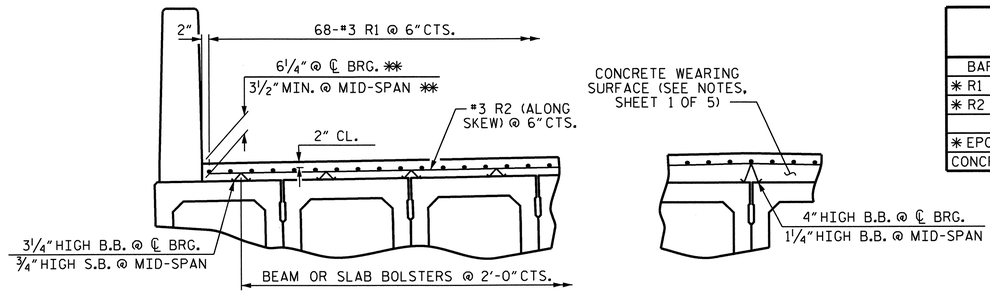


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS



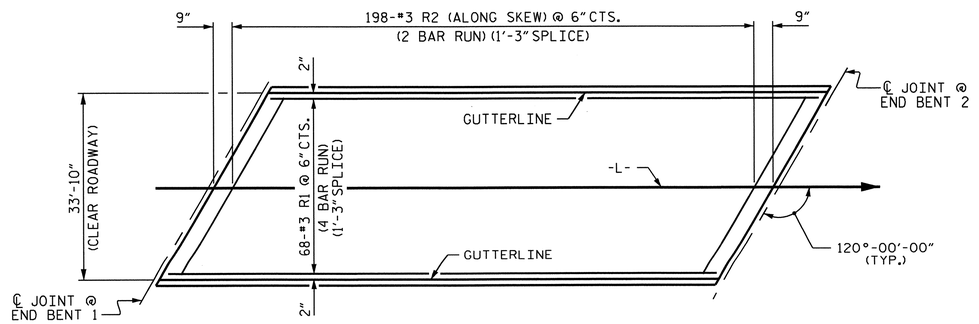
REINFORCING FOR CONCRETE WEARING SURFACE

** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

BILL OF MATERIAL FOR
CONCRETE WEARING SURFACE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ R1	272	#3	STR	25'-7"	2616
✱ R2	396	#3	STR	20'-0"	2978
✱EPOXY COATED REINFORCING STEEL			LBS.		5,594
CONCRETE WEARING SURFACE			SQ. FT.		3,348

GROOVING BRIDGE FLOORS		
APPROACH SLABS	SQ.FT.	1,450
WEARING SURFACE	SQ.FT.	3,039
TOTAL	SQ.FT.	4,489



PLAN VIEW

CONCRETE WEARING SURFACE DETAILS

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT
120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			17

STD. NO. PCBB8

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 1/22/14

ASSEMBLED BY : H.T. DIEU	DATE : 11/7/12	
CHECKED BY : J.D. HAWK	DATE : 1/8/13	
DRAWN BY : DGE 10/11		DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13
CHECKED BY : TMG 11/11		

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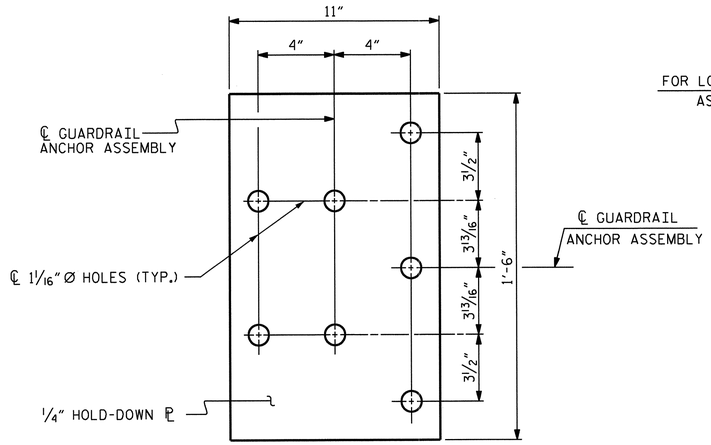
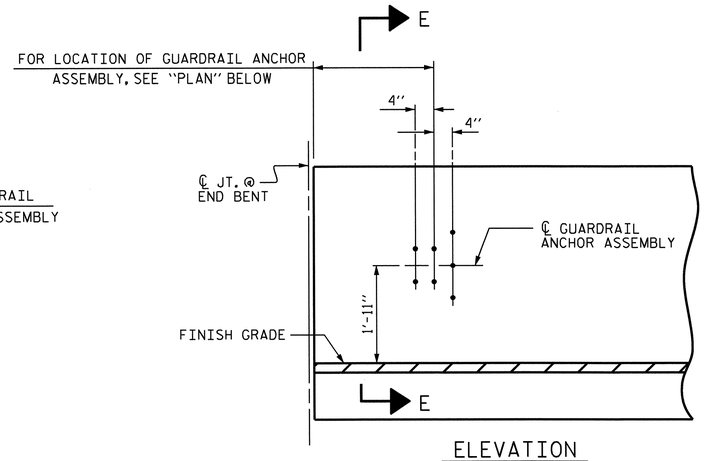


PLAN



ELEVATION

NOTES

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

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

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

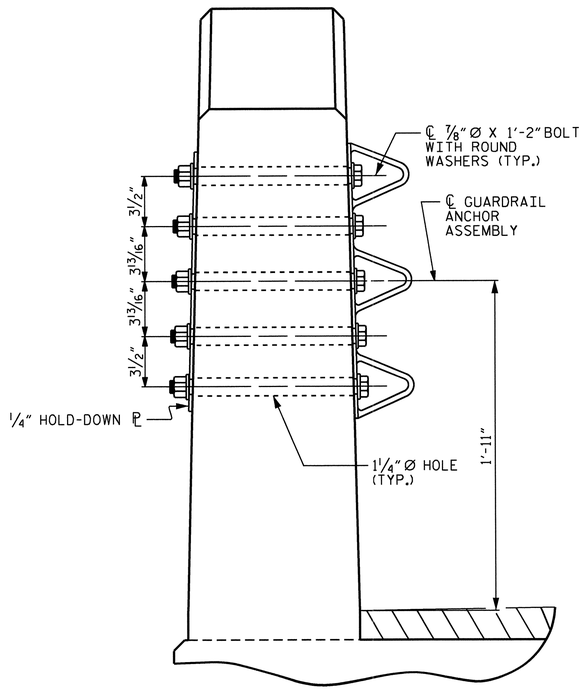
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 VERTICAL CONCRETE BARRIER RAIL.

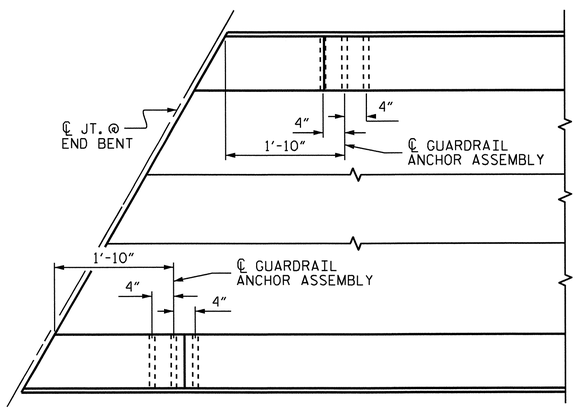
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

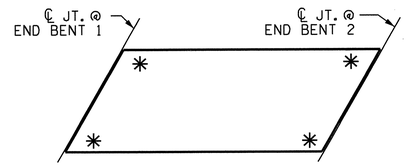
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			17

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 11/21/13

ASSEMBLED BY : H.T. DIEU		DATE : 8/9/12	
CHECKED BY : J.D. HAWK		DATE : 12/4/12	
DRAWN BY : MAA 5/10	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/10	REV. 12/5/11	MAA/GM	
	REV. 6/13	MAA/GM	

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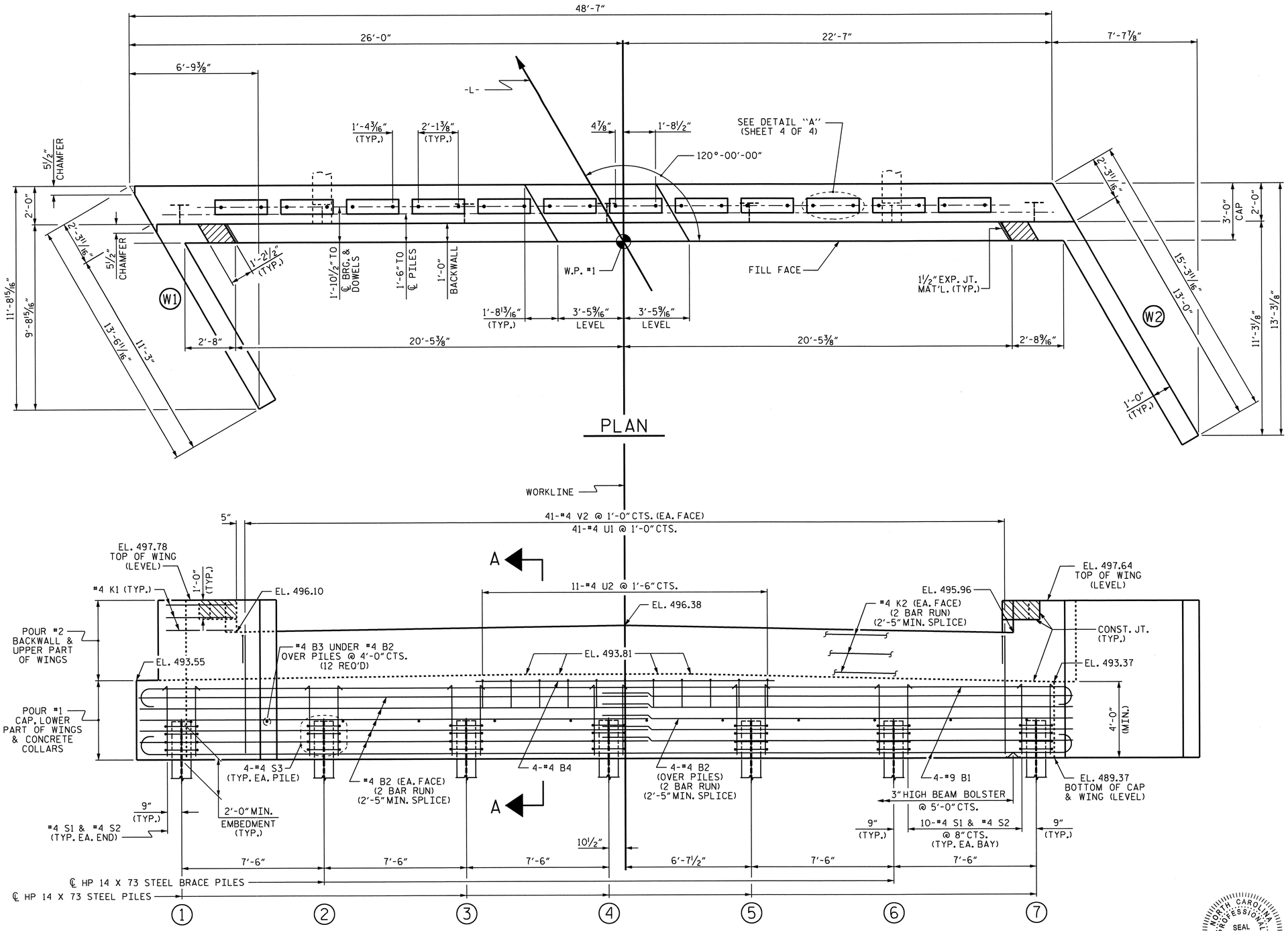
STD. NO. GRA3



ELEVATION

FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. 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.

PROJECT NO. B-5134
UNION COUNTY
STATION: 15+09.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HANG T. DIEU

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			17

DRAWN BY : H.T. DIEU DATE : 8/13/13
CHECKED BY : J.D. HAWK DATE : 9/25/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

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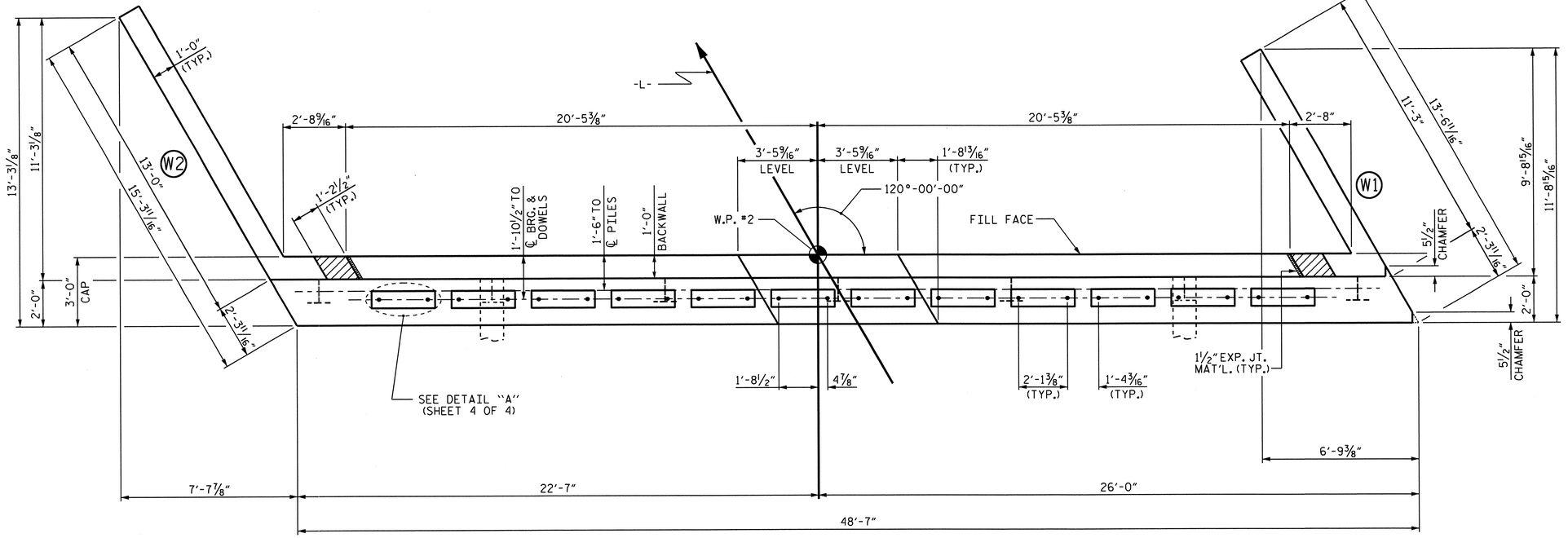
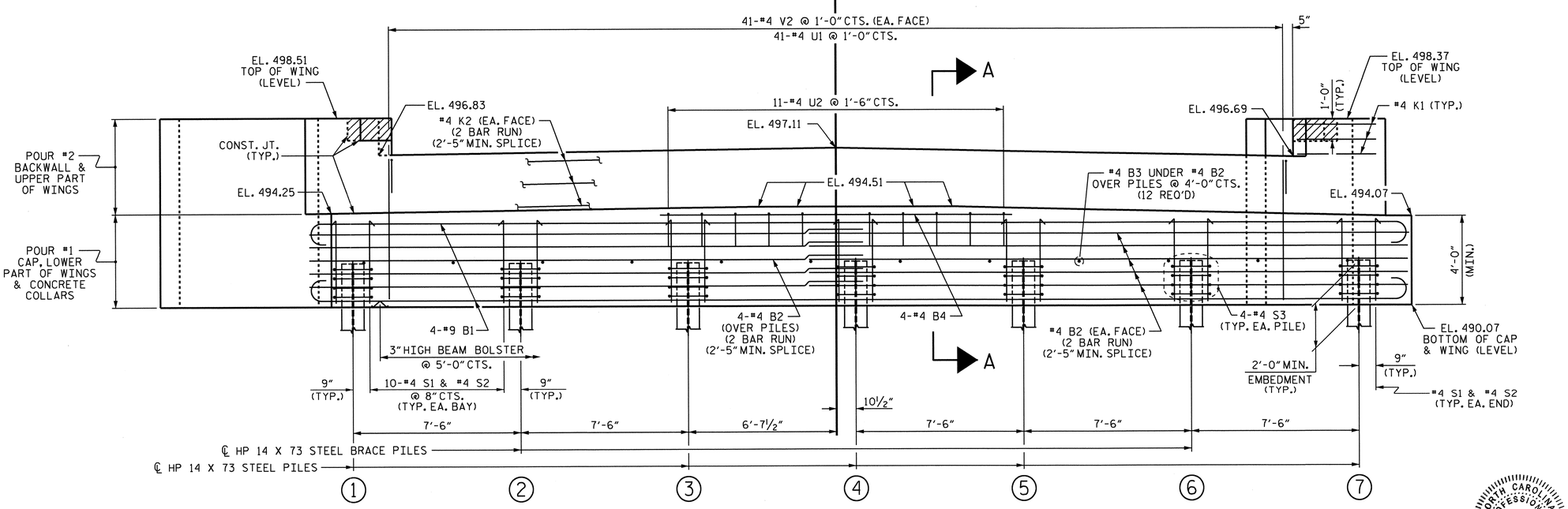


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. 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.

PROJECT NO. B-5134
UNION COUNTY
STATION: 15+09.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			17

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DRAWN BY : H.T. DIEU DATE : 8/13/13
CHECKED BY : J.D. HAWK DATE : 9/25/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

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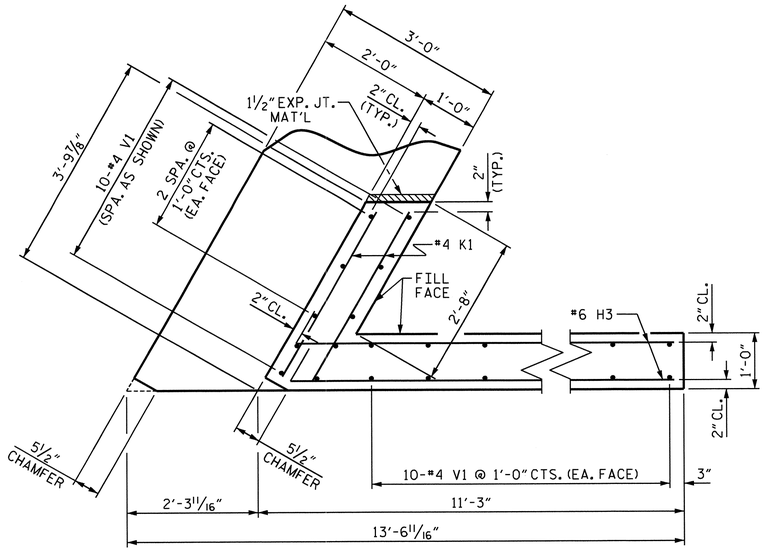
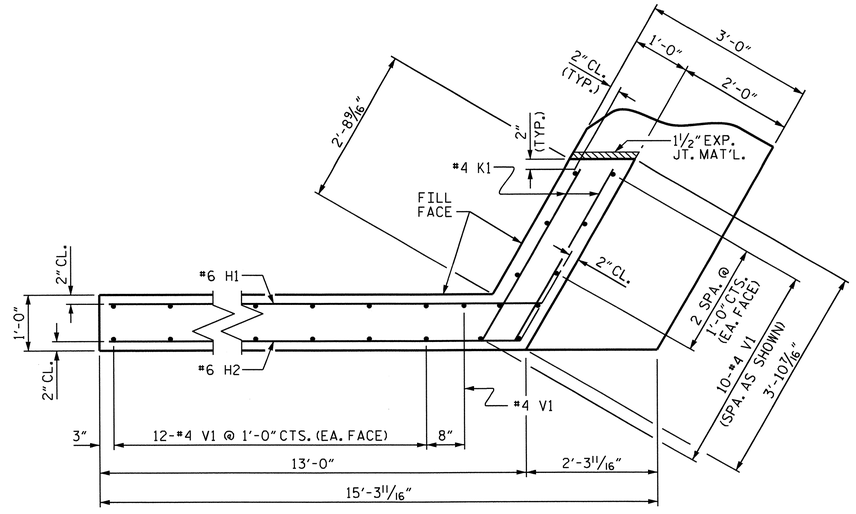
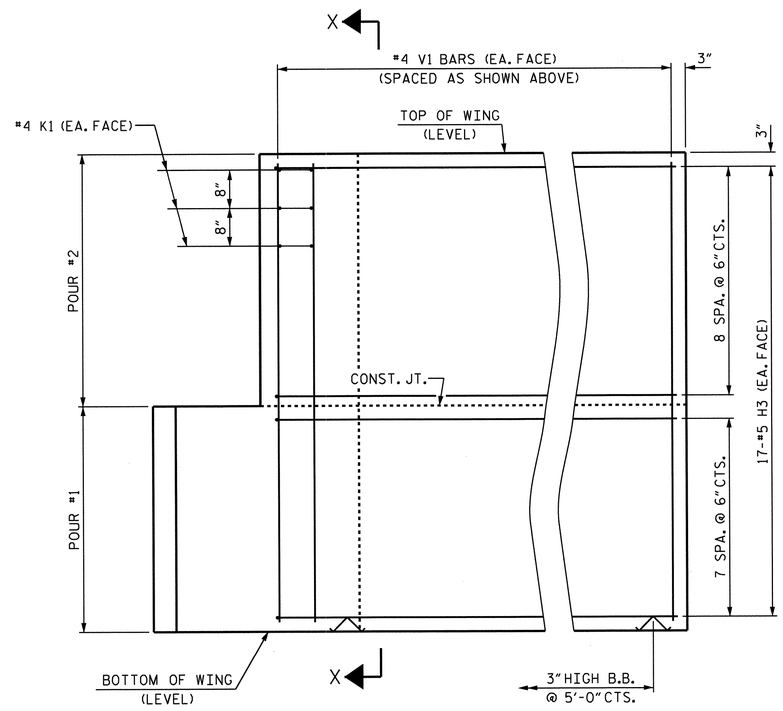


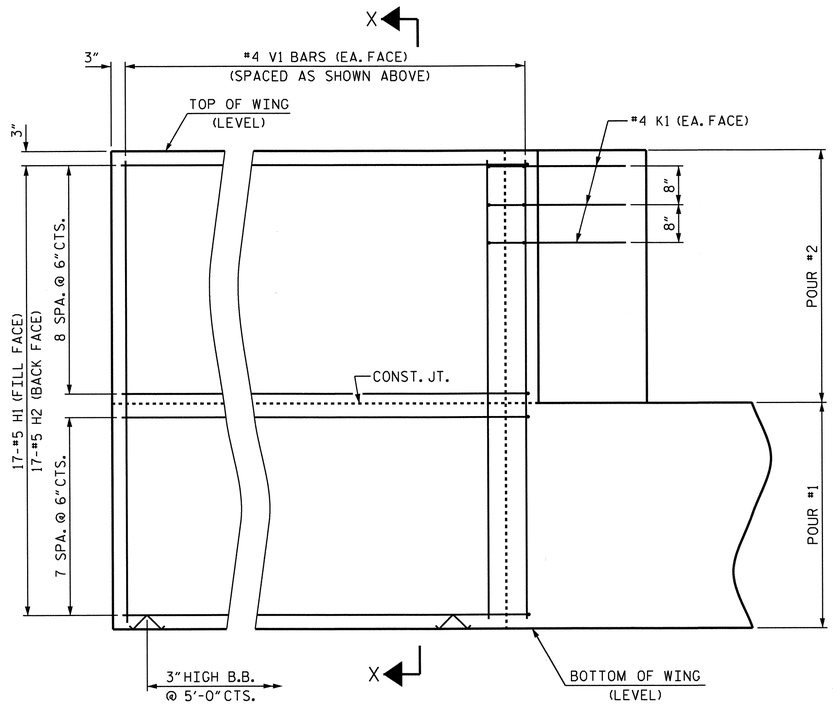
PLAN OF WING (W1)



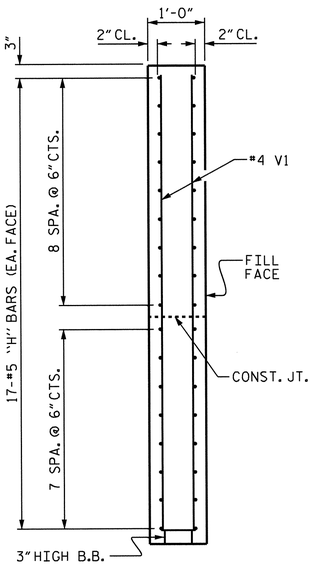
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

WING DETAILS

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			17

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

DRAWN BY :	H.T. DIEU	DATE : 8/13/13
CHECKED BY :	J.D. HAWK	DATE : 9/25/13
DESIGN ENGINEER OF RECORD:	H.T. DIEU	DATE : 12/3/13

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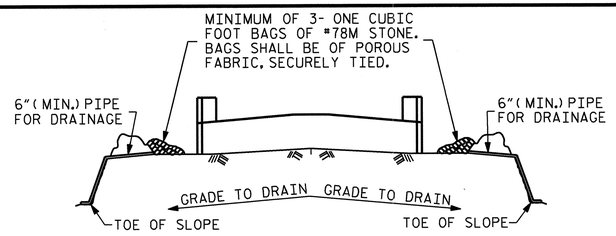
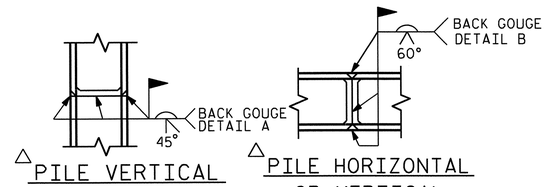


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

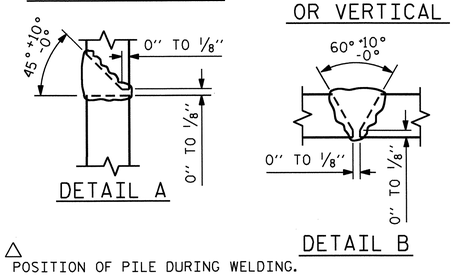
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



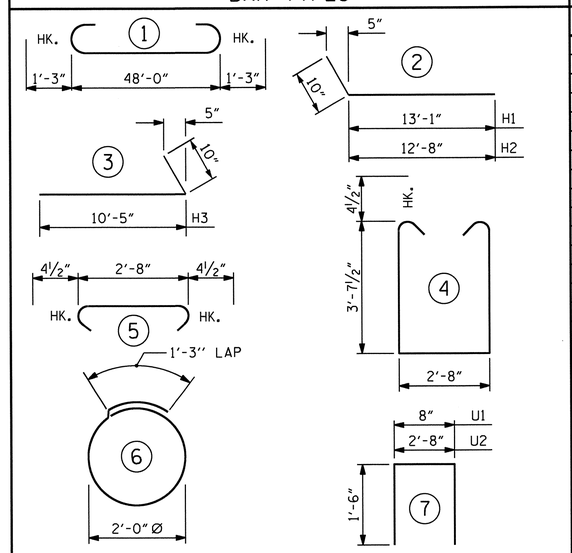
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'-6"	1374
B2	28	#4	STR	25'-4"	474
B3	12	#4	STR	2'-8"	21
B4	4	#4	STR	15'-9"	42
D1	24	#8	STR	2'-3"	144
H1	17	#5	2	13'-11"	247
H2	17	#5	2	13'-6"	239
H3	34	#5	3	11'-3"	399
K1	12	#4	STR	3'-3"	26
K2	12	#4	STR	25'-4"	203
S1	62	#4	4	10'-8"	442
S2	62	#4	5	3'-5"	142
S3	28	#4	6	7'-7"	142
U1	41	#4	7	3'-8"	100
U2	11	#4	7	5'-8"	42
V1	65	#4	STR	7'-11"	344
V2	82	#4	STR	6'-3"	342

REINFORCING STEEL (FOR ONE END BENT) LBS. 4,723

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS C.Y. 26.3

POUR #2 BACKWALL & UPPER PART OF WINGS C.Y. 8.6

TOTAL CLASS A CONCRETE C.Y. 34.9

END BENT 1

PILE EXCAVATION IN SOIL LIN.FT. 25

PILE EXCAVATION NOT IN SOIL LIN.FT. 35

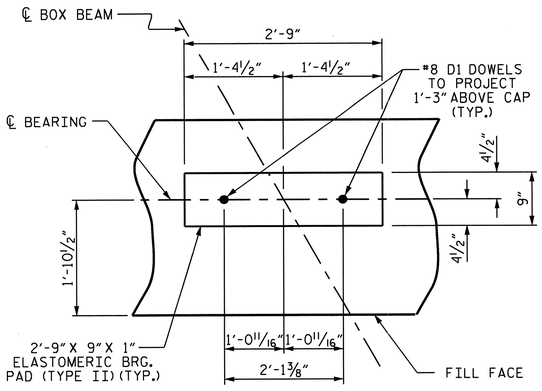
HP 14 X 73 STEEL PILES NO. = 7 LIN.FT. 85

END BENT 2

PILE EXCAVATION IN SOIL LIN.FT. 51

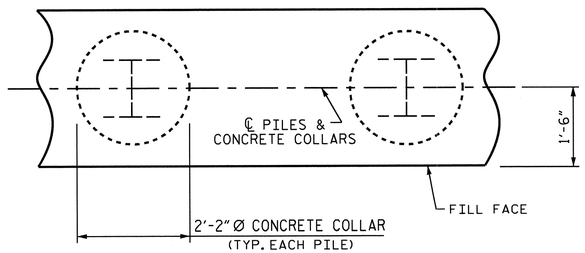
PILE EXCAVATION NOT IN SOIL LIN.FT. 35

HP 14 X 73 STEEL PILES NO. = 7 LIN.FT. 105

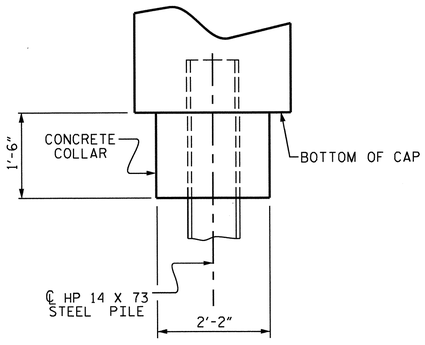


DETAIL "A"

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



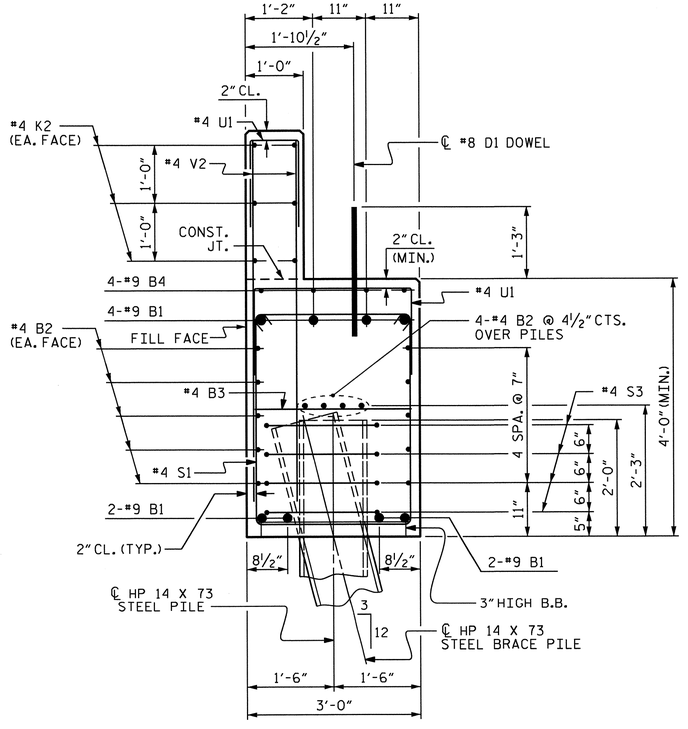
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU 12/3/13

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			17

DRAWN BY : H.T. DIEU DATE : 8/13/13
CHECKED BY : J.D. HAWK DATE : 9/25/13
DESIGN ENGINEER OF RECORD: H.T. DIEU DATE : 12/3/13

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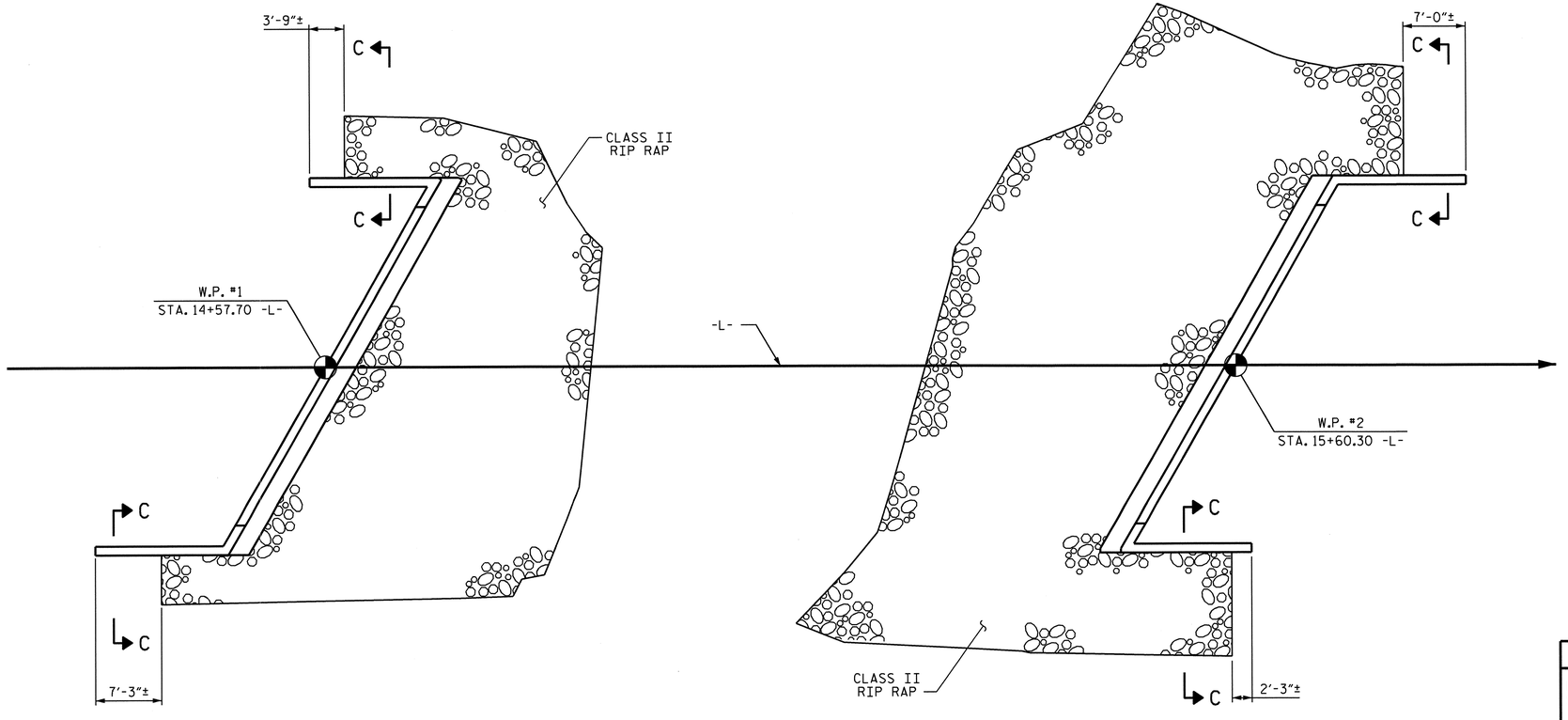
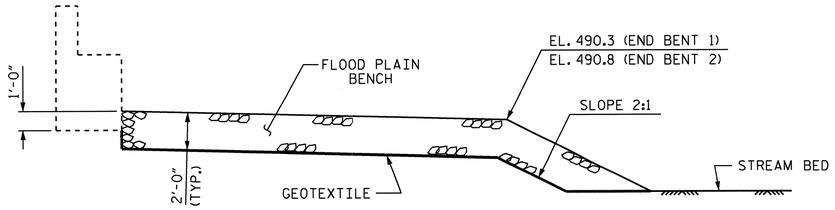


END BENT 1

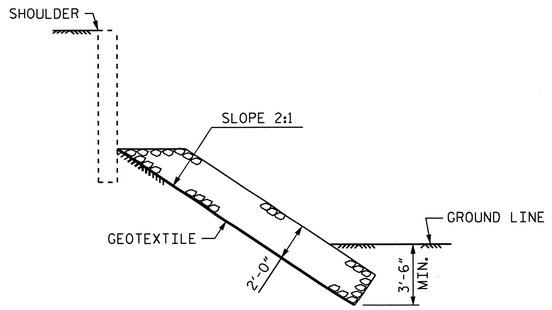
PLAN OF RIP RAP

END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+09.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQ. YDS.
END BENT 1	240	265
END BENT 2	420	465



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-5134
UNION COUNTY
STATION: 15+09.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			17

ASSEMBLED BY : L. E. SUTTON	DATE : 10/11/13	
CHECKED BY : J. D. HAWK	DATE : 10/21/13	
DRAWN BY : REK 1/84	REV. 5/1/06R	TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 21638 ENGINEER LAURA E. SUTTON 11/22/14

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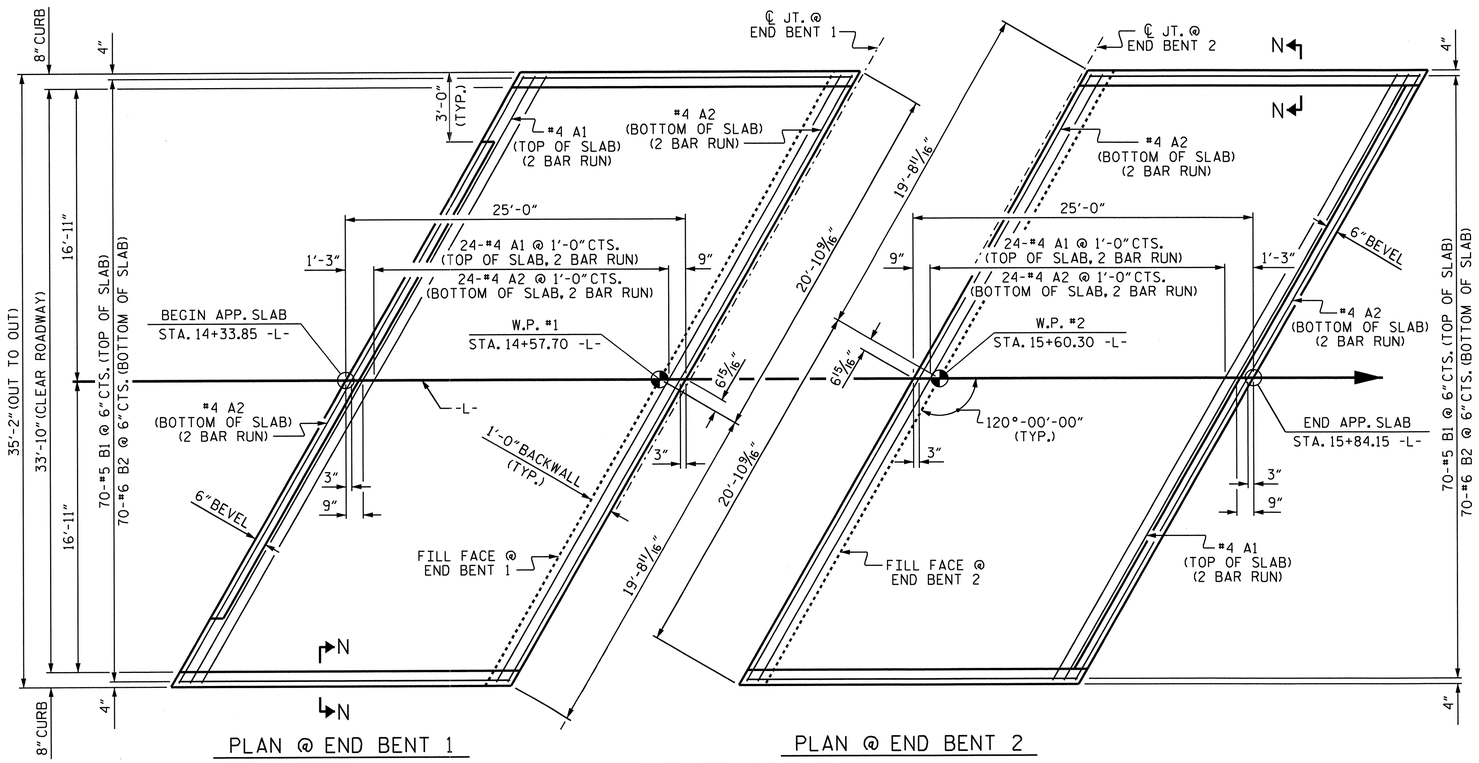
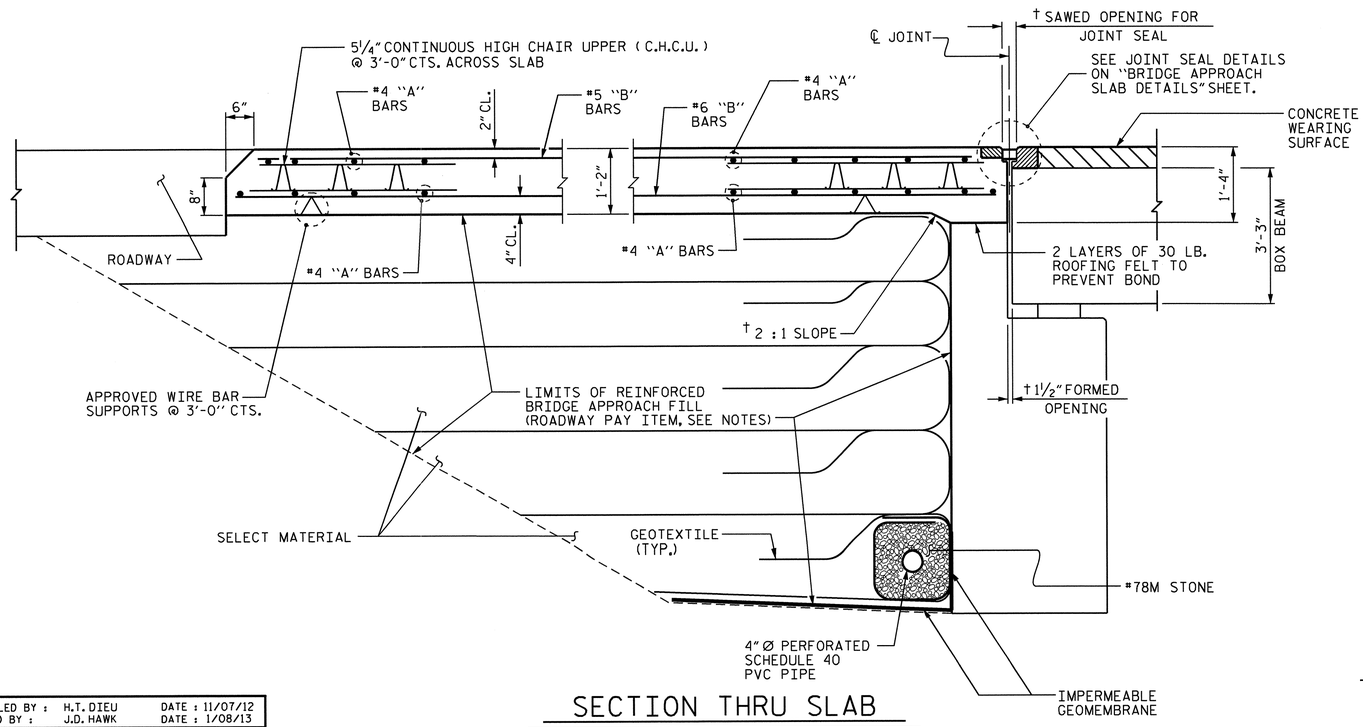
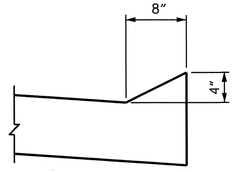
STD. NO. RR1



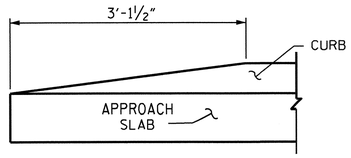
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

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

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

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	21'-2"	707
A2	52	#4	STR	21'-0"	729
* B1	70	#5	STR	23'-7"	1722
B2	70	#6	STR	24'-7"	2585
REINFORCING STEEL				LBS.	3,314
* EPOXY COATED REINFORCING STEEL				LBS.	2,429
CLASS AA CONCRETE				C. Y.	38.2

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	21'-2"	707
A2	52	#4	STR	21'-0"	729
* B1	70	#5	STR	23'-7"	1722
B2	70	#6	STR	24'-7"	2585
REINFORCING STEEL				LBS.	3,314
* EPOXY COATED REINFORCING STEEL				LBS.	2,429
CLASS AA CONCRETE				C. Y.	38.2

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

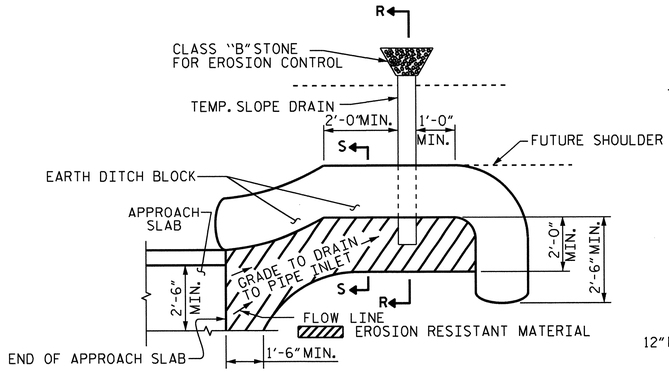
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			17

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

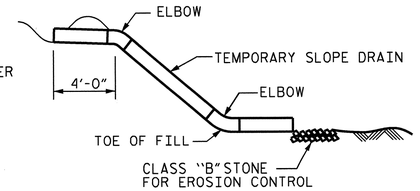
ASSEMBLED BY : H.T. DIEU		DATE : 11/07/12	
CHECKED BY : J.D. HAWK		DATE : 1/08/13	
DRAWN BY : EEM 3/95	REV. 10/1/11		MAA/GM
CHECKED BY : VAP 3/95	REV. 12/21/11		MAA/GM
	REV. 6/13		MAA/GM

STD. NO. BAS2

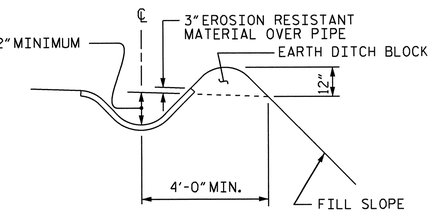


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



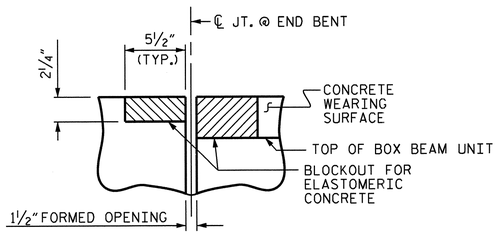
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

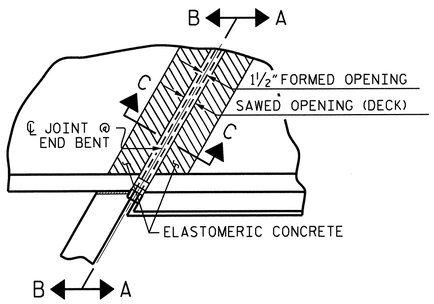
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



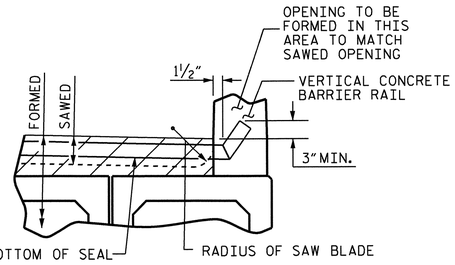
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	12.7
2	12.7
TOTAL	25.4

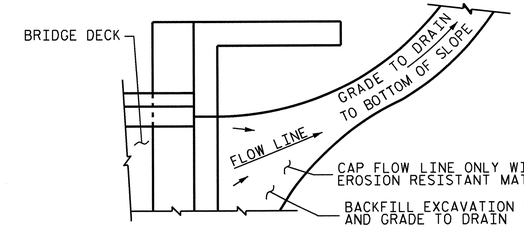
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



PLAN

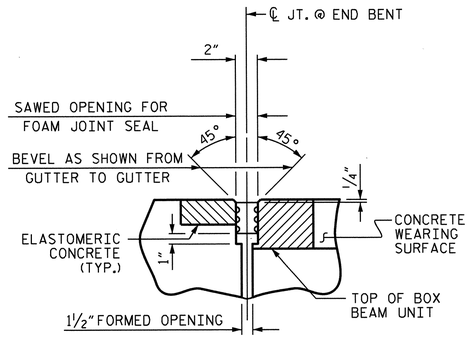


SECTION A-A

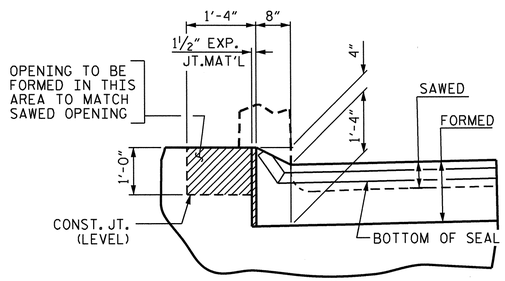


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



SECTION C-C
FOAM JOINT SEAL
(FIXED)



SECTION B-B

JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP AS SHOWN.

PROJECT NO. B-5134

UNION COUNTY

STATION: 15+09.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 039774 ENGINEER HOANG T. DIEU

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

STD. NO. BAS4

ASSEMBLED BY : H.T. DIEU		DATE : 11/07/12	
CHECKED BY : J.D. HAWK		DATE : 1/08/13	
DRAWN BY : FCJ 11/88	REV. 10/1/11		MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12		MAA/GM
	REV. 6/13		MAA/GM

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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 2012 "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 @ RGW REV. 5-7-03 RWW @ JTE REV. 10-1-11 MAA @ GM
REV. 8-16-99 RWW @ LES REV. 5-1-06 TLA @ GM