

CONTRACT: D13POC.BM.31161 BRIDGE PROJECT: 18313.1011215.PR

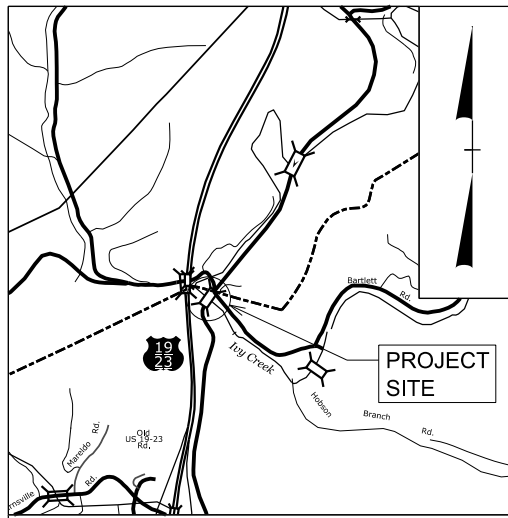
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

LOCATION: REPAIR BRIDGE #100734 ON OLD MARS HILL HWY  
OVER IVY CREEK

TYPE OF WORK: STRUCTURE REPAIR

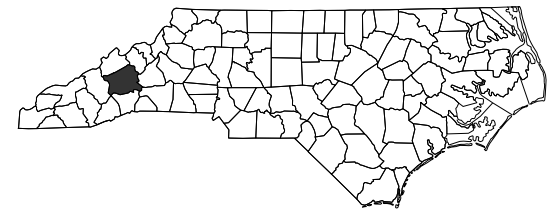
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.		1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
18313.1011215.PR	N/A	CONSTRUCTION	



VICINITY MAP (NTS)

NOTES:

- EXISTING DIMENSIONS AND BRIDGE CONDITIONS ARE FROM BEST INFORMATION AVAILABLE; THE CONTRACTOR SHALL FIELD VERIFY THE INFORMATION SHOWN ON THE PLANS AND NOTIFY THE ENGINEER IF ACTUAL DIMENSIONS AND CONDITIONS DIFFER; THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THAT SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- ORIGINAL PE SEALS FOUND HEREIN DO NOT APPLY TO PLANSET MARKUPS PROVIDED IN RED.
- SCOPE OF WORK
  - HEAT STRAIGHTEN GIRDER INCLUDING REMOVAL AND REPLACEMENT OF DIPHRAGMS AS NEEDED.
  - REPLACE METAL RAIL AND SUPPORTS.



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED


**DESIGN DATA**

ADT 2025 =	1900
ADT 2040 =	3800
-	-
-	-
-	-
V =	55 MPH
* TTST =	DUAL
FUNC CLASS =	URBAN COLLECTOR

**PROJECT LENGTH**

PROJECT LENGTHS FOR BRIDGE PROJECT 18313.1011139.PR:
TOTAL LENGTH PROJECT 18313.1011139.PR = 0.023 MILES

NCDOT Contact: JUSTIN RICE  
Prepared in the Office of:



vhb Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27605

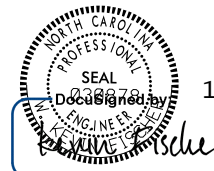
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2024 STANDARD SPECIFICATIONS

**CHIRAG PATEL, PE**  
PROJECT ENGINEER

LETTING DATE:  
JANUARY 21, 2026

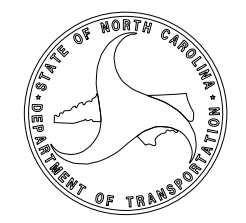
STRUCTURES ENGINEER



12/22/2025

339FA2D658AB4DC...

**W. KEVIN FISCHER, PE**  
SIGNATURE:





12+10 12+20 12+30 12+40 12+50 12+60 12+70 12+80 12+90 12+100 12+110

-3.9952 %  
-2.6154 %

**GRADE DATA**  
PI = 12+12.52  
EL = 1981.48'  
VC = 15'

RM # 1A STANDARD USC & GS  
DISK STAMPED "K138 1935" ON  
THE N.W. END OF THE N.E.  
ABUTMENT ON THE WINGWALL

-2.6154 %  
-2.3789 %

**GRADE DATA**  
PI = 13+60.87  
EL = 1977.60'  
VC = 25'

**NOTES**

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.  
THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

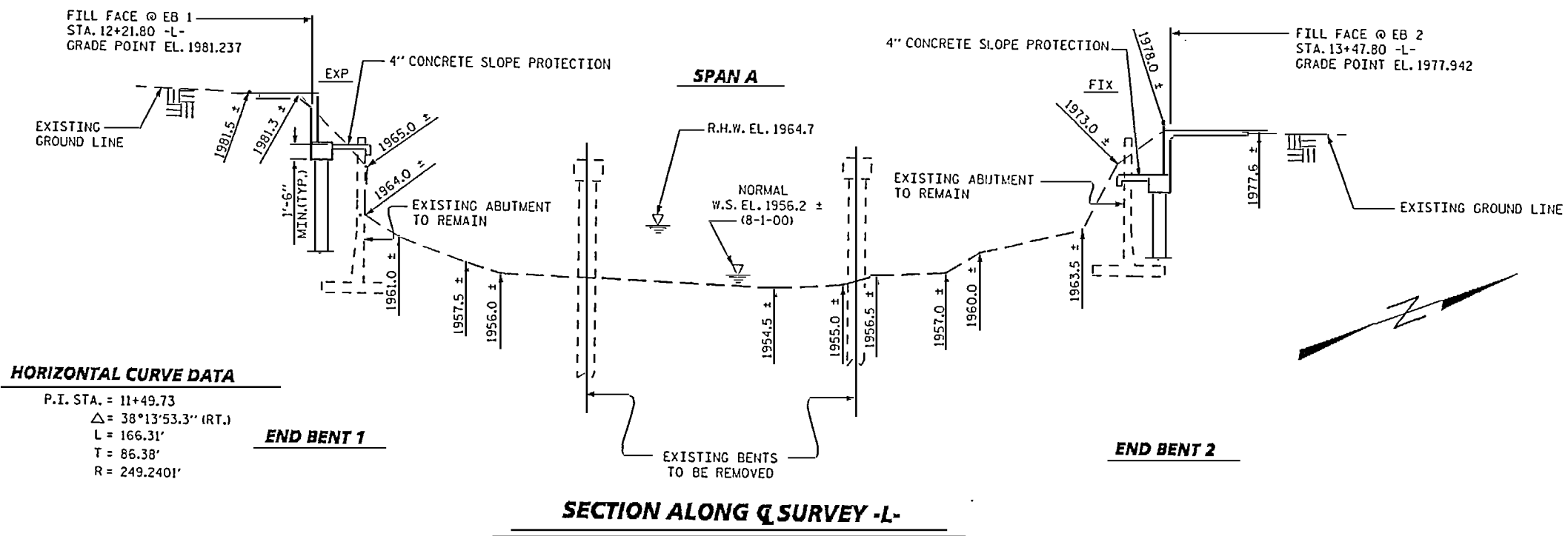
ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

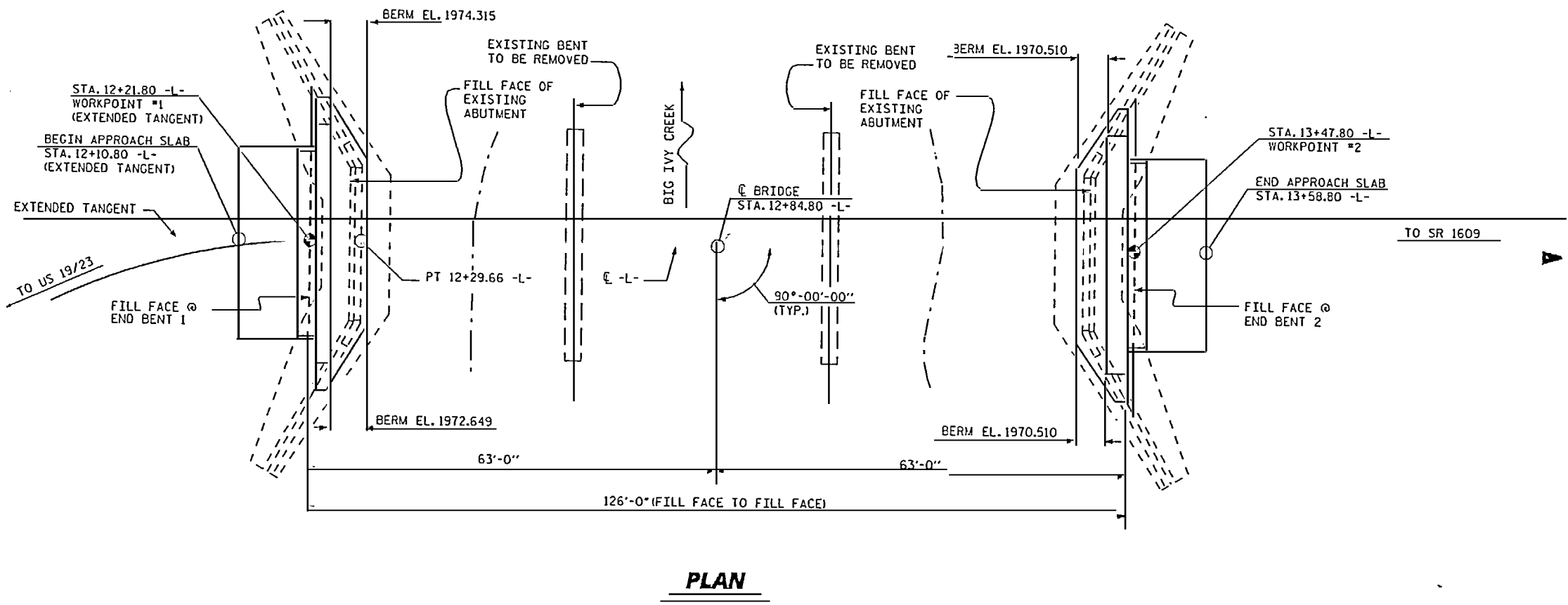
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.



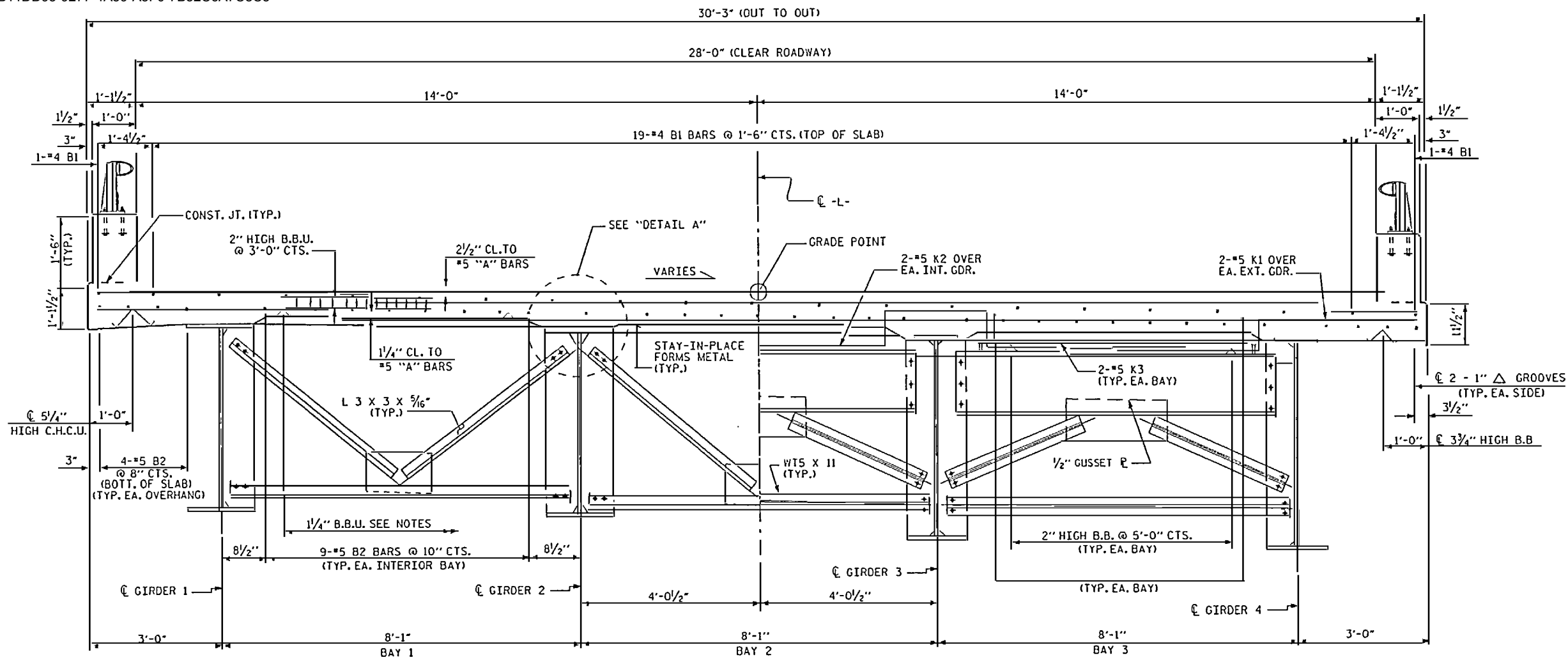
**HORIZONTAL CURVE DATA**  
P.I. STA. = 11+49.73  
Δ = 38°13'53.3" (RT.)  
L = 166.31'  
T = 86.38'  
R = 249.2401'



**PROJECT NO. 6.503394**  
**COUNTY: BUNCOMBE**  
**STATION: 12+84.80 -L-**  
**REPLACES BRIDGE No. 734**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHZET NO.
<b>GENERAL DRAWING</b>						<b>2</b>
FOR BRIDGE ON SR 2207 OVER BIG IVY CREEK BETWEEN SR 2148 AND SR 2150						TOTAL SHEETS
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

DRAWN BY : M. E. POOLE DATE : 1/2002  
CHECKED BY : J. R. DUGGINS DATE : 7/2002

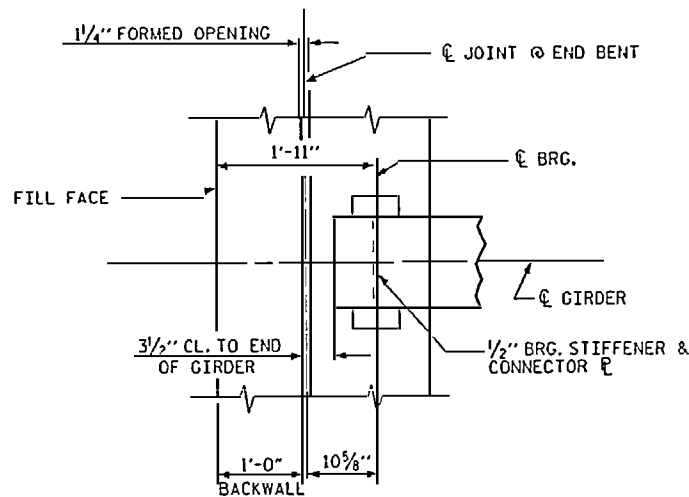


**TYPICAL HALF-SECTION**

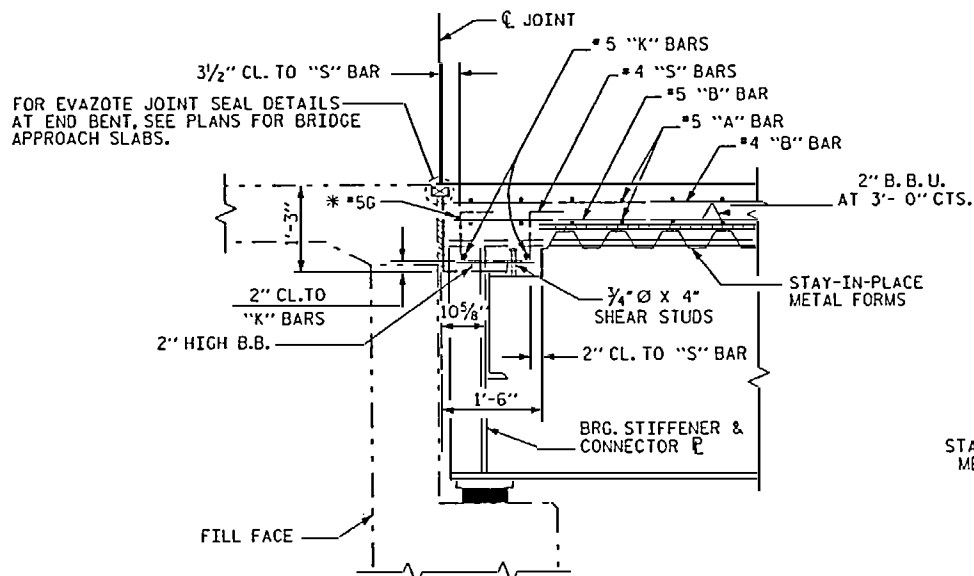
(SHOWING INTERMEDIATE DIAPHRAGMS CF-2)

**TYPICAL HALF-SECTION**

(SHOWING END BENT DIAPHRAGMS CF-1)

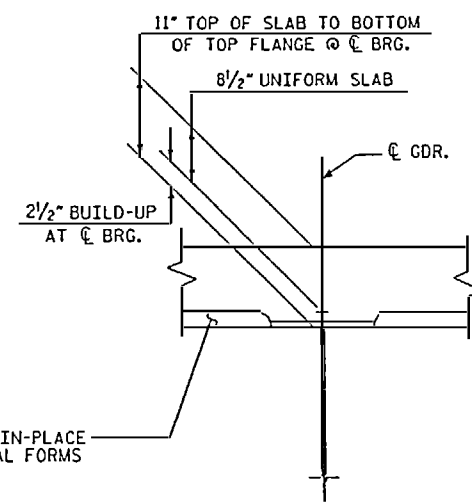


**END BENT JOINT DETAILS**



**SECTION THRU END BENT**

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



**DETAIL A**

**NOTES**

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

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.

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

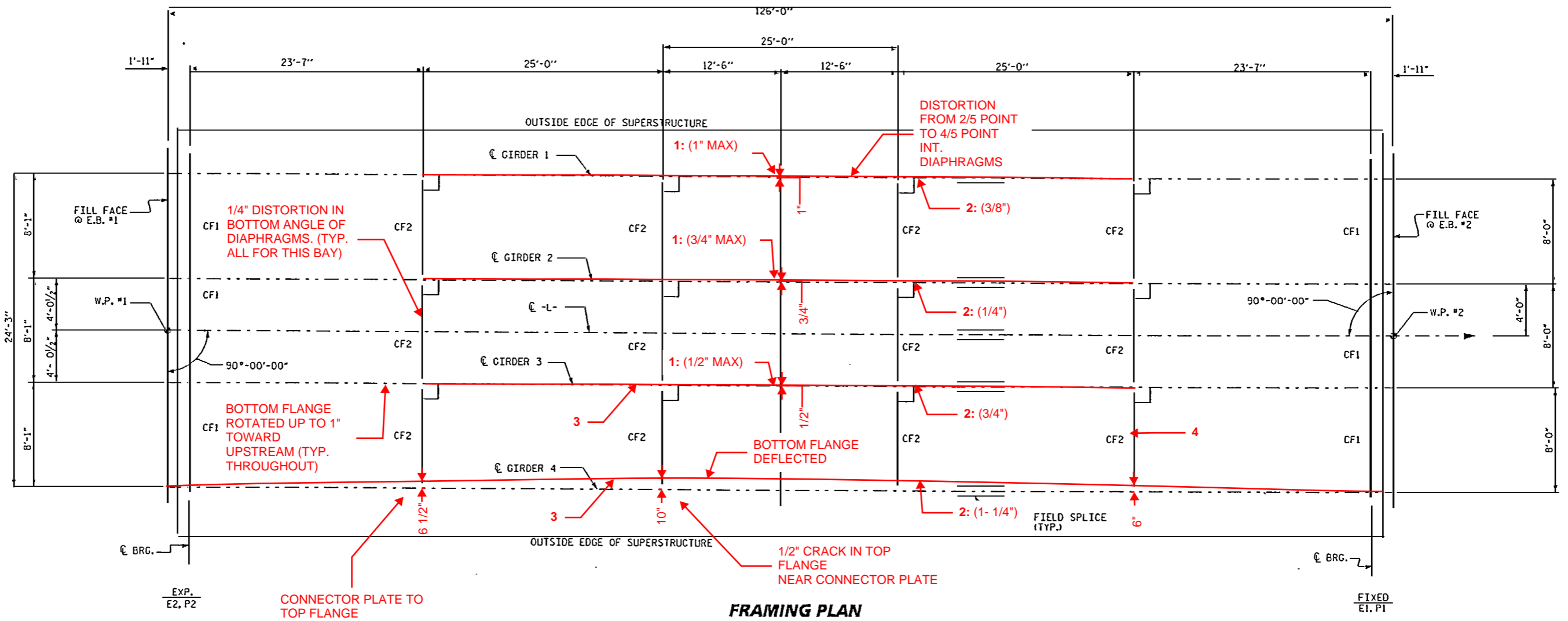
**PROJECT NO. 6.503394**  
**COUNTY: BUNCOMBE**  
**STATION: 12+84.80 -L-**  
**REPLACES BRIDGE No. 734**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION

**SUPERSTRUCTURE**  
**TYPICAL SECTION**

REVISIONS						SHEET NO. 4
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY : M.E. POOLE DATE : 2/2002  
 CHECKED BY : W.C. CARTER DATE : 5/2002



**FRAMING PLAN**

**LEGEND**

1: LOWER PORTION OF WEB DISTORTED ALONG LONGITUDINAL AXIS UP TO \_\_\_ " MAX.

2: WEB DISTORTED ABOUT VERTICAL AXIS \_\_\_ TOWARD LEFT AND RIGHT AT VERTICAL WELD SPLICE LOCATION

3: UP TO 1/2" WEB DISTORTION ABOUT VERTICAL AXIS TOWARD UPSTREAM AND DOWNSTREAM (TYP. BETWEEN ALL INT. DIAPHRAGMS)

4: ALL INT. DIAPHRAGMS IN BAY 3 HAVE BUCKLED W/ DISTORTION IN WEB STIFFENER PLATES AT BOLTED CONN'S.

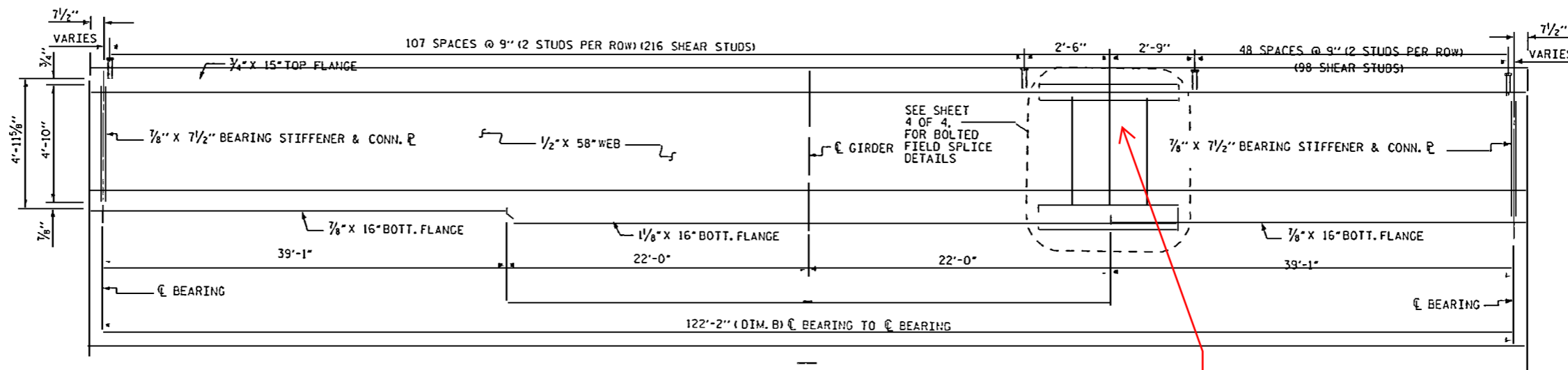
**PROJECT NO. 6.503394**  
**COUNTY: BUNCOMBE**  
**STATION: 12+84.80 -L-**  
**REPLACES BRIDGE No. 734**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALPHIN

**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 FRAMING PLAN**

DRAWN BY : M.E. POOLE DATE : 2/2002  
 CHECKED BY : W. C. CARTER DATE : 5/2002

REVISIONS						SHEET NO. <b>6</b>
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS <b>29</b>
2			4			

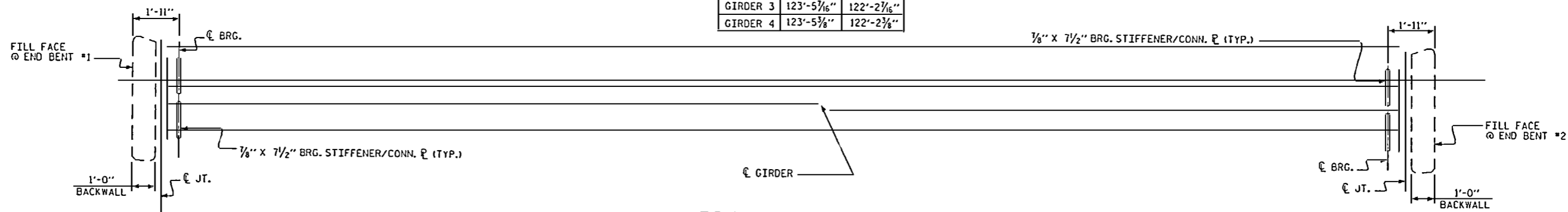


**GIRDER ELEVATION**

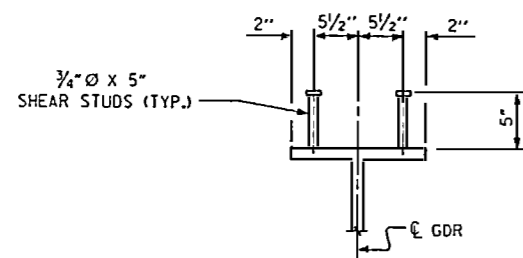
DIMENSIONS SHOWN IN ( ) ARE SLOPED DIMENSIONS

	DIM. A	DIM. B
GIRDER 1	123'-5 1/16"	122'-2 1/16"
GIRDER 2	123'-5 5/16"	122'-2 1/16"
GIRDER 3	123'-5 7/16"	122'-2 1/16"
GIRDER 4	123'-5 3/8"	122'-2 3/8"

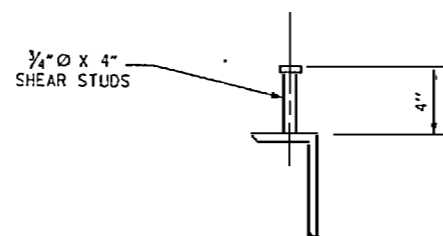
FIELD SPLICE NOT USED IN ORIGINAL CONSTRUCTION



**BOTTOM FLANGE DETAIL**

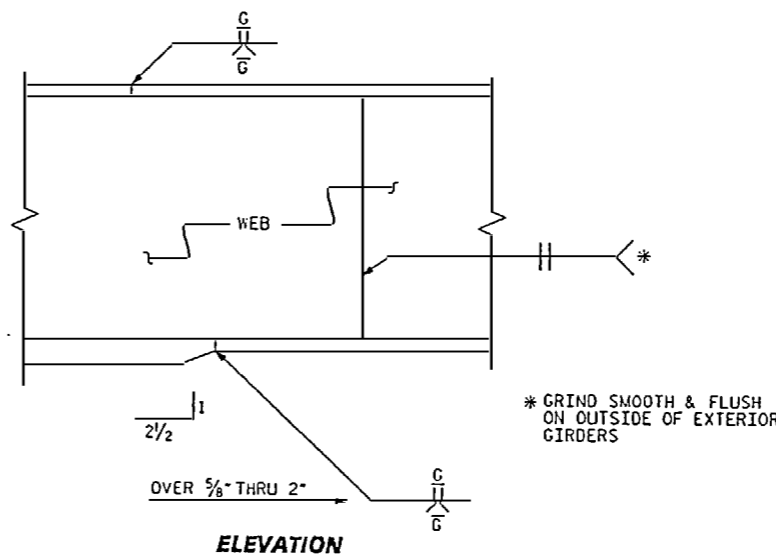


**STUDS ON GIRDER**



**STUDS ON C15 X 33.9**

**SHEAR STUD DETAILS**



**TYPICAL FLANGE AND WEB BUTT JOINT**

PROJECT NO. 6.503394  
 COUNTY: BUNCOMBE  
 STATION: 12+84.80 -L-  
 REPLACES BRIDGE No. 734

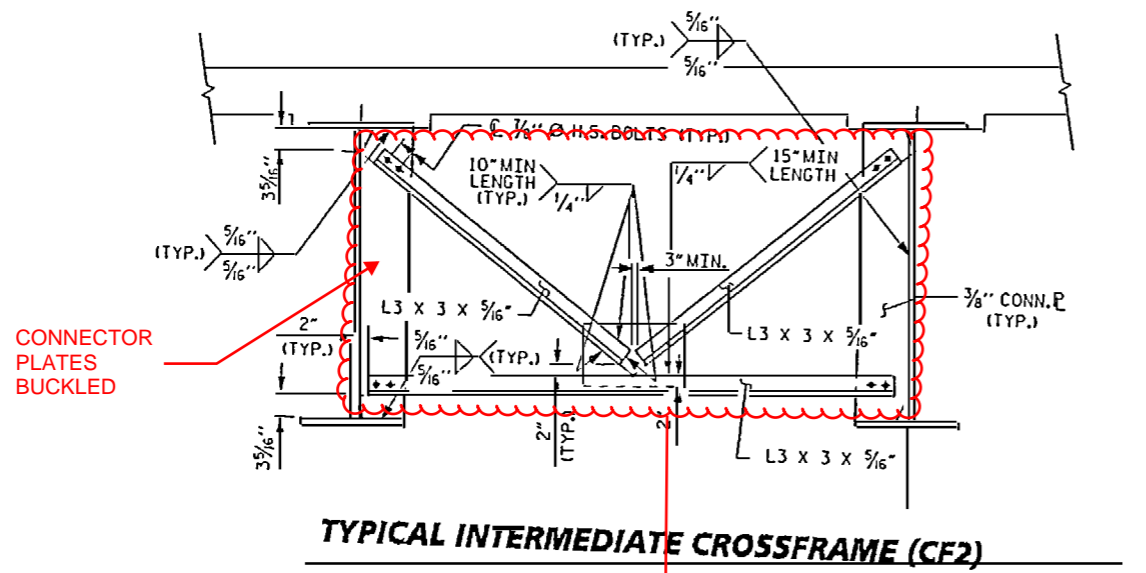
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 ALIGN

**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS**

DRAWN BY: M.E. POOLE DATE: 2/2002  
 CHECKED BY: W.C. CARTER DATE: 5/2002

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

TOTAL SHEETS: 7  
 SHEET NO.: 7  
 TOTAL SHEETS: 29

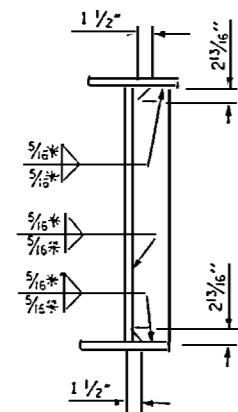


**TYPICAL INTERMEDIATE CROSSFRAME (CF2)**

\* = SHOW WELD SIZE.  
 \*\* = SET DIMENSION TO PROVIDE 2" MINIMUM AS SHOWN.  
 \*\*\* = CLIP SIZE + 1/2". FOR CLIP SIZE, SEE FIGURE 7-56.  
 SEE FIGURE 7-2 FOR WELD TERMINATION DETAILS.

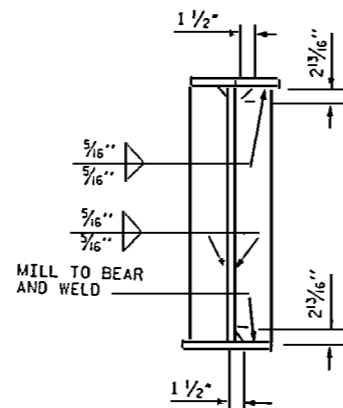
CONNECTOR PLATES BUCKLED

4 CROSSFRAMES IN BAY 3 TO BE REPLACED. REPLACEMENT OF DIAPHRAGMS IN BAY 1 AND 2 MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.



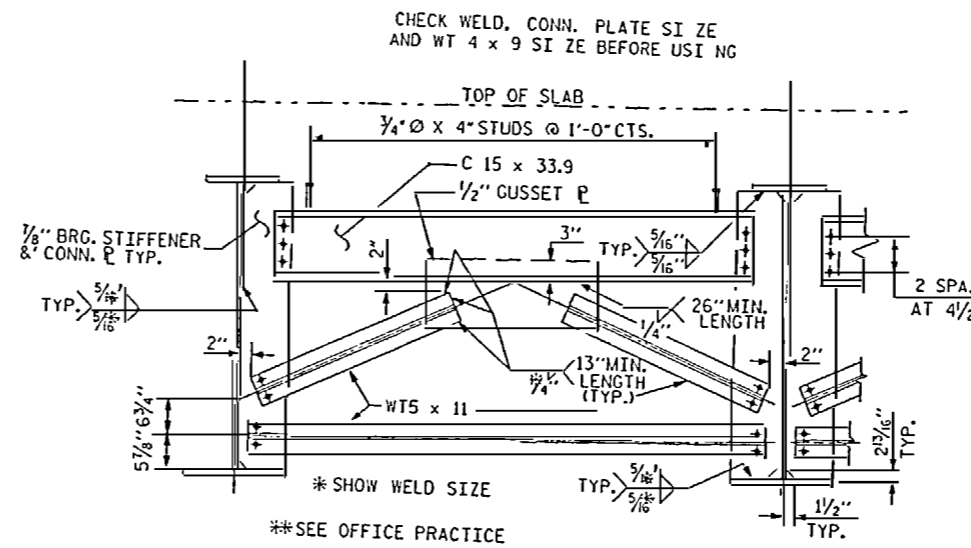
**CONNECTOR PLATE DETAIL**

\* SHOW WELD SIZE  
 \* SEE FIGURE 7-61 OFFICE MANUAL



**BEARING STIFFENER**

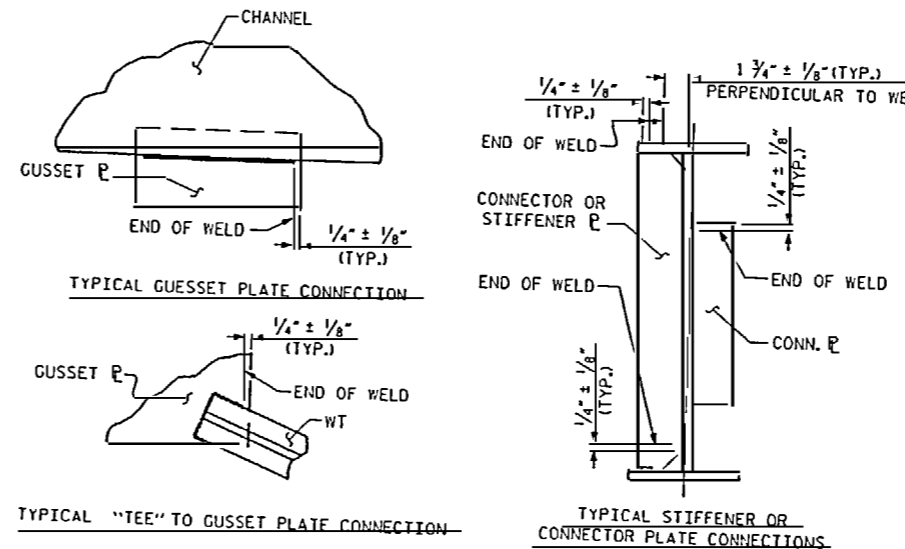
\* SHOW WELD SIZE  
 \*\* SEE FIGURE 7-61 OFFICE MANUAL



**TYPICAL END BENT CROSSFRAME (CF1)**

CHECK WELD, CONN. PLATE SIZE AND WT 4 x 9 SIZE BEFORE USING

\*\*SEE OFFICE PRACTICE



**WELD TERMINATION DETAILS**

**NOTES :**

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

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

ALL FIELD CONNECTIONS TO BE 3/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

ENDS OF GIRDERS SHALL BE PLUMB.

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.

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 (INOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-10 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 6.503394  
 COUNTY: BUNCOMBE  
 STATION: 12+84.80 -L-  
 REPLACES BRIDGE No. 734

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION

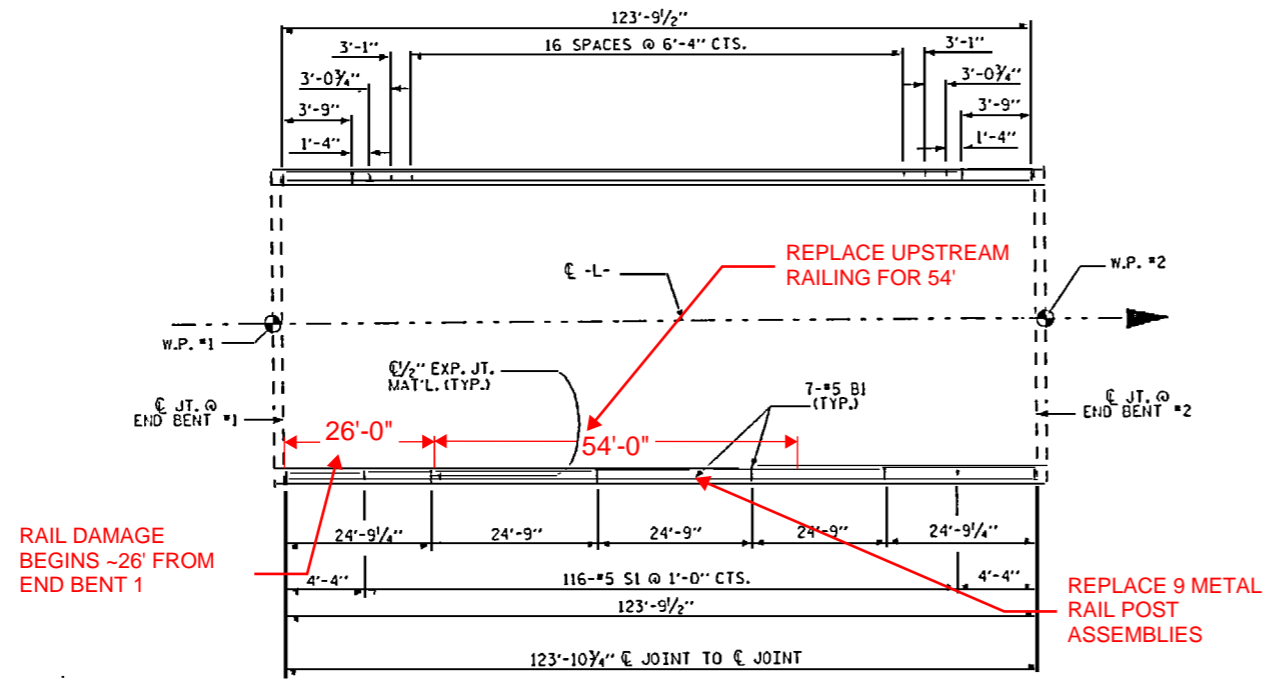
**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			8
2			4			29

DRAWN BY: M.E. POOLE DATE: 2/2002  
 CHECKED BY: W.C. CARTER DATE: 5/2002

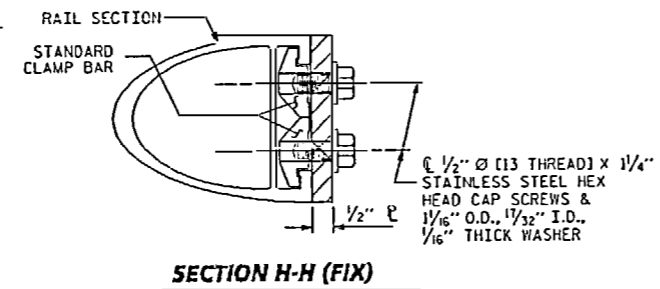
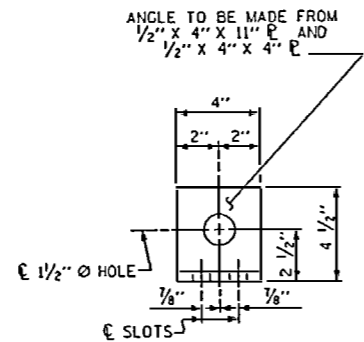
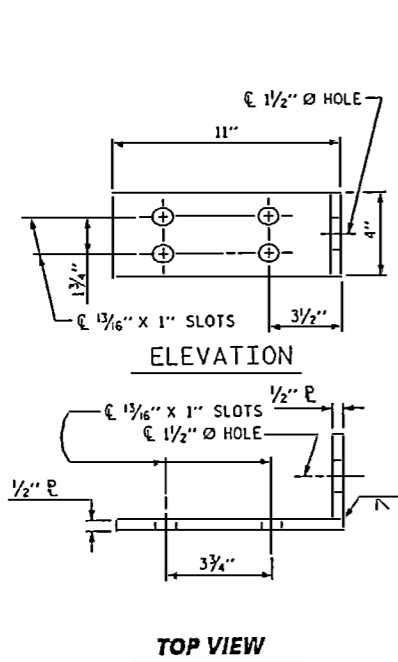




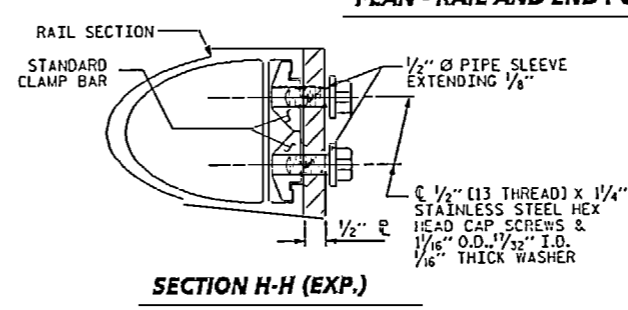
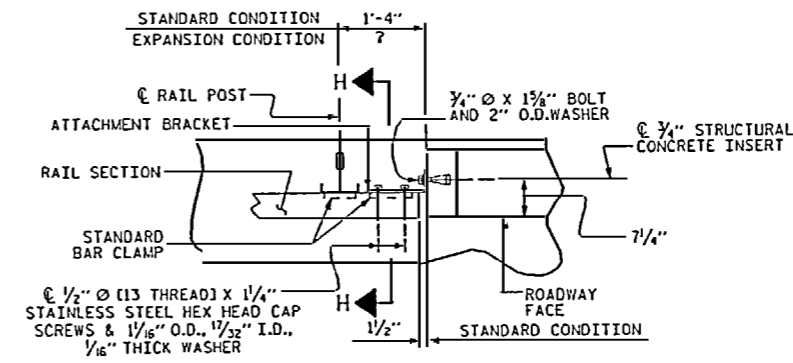


**PLAN OF PARAPET AND RAIL POST SPACINGS**

INFORMATION SHOWN IS TYPICAL FOR EACH SIDE OF BRIDGE



**FIXED**



**EXPANSION**

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

**NOTES**

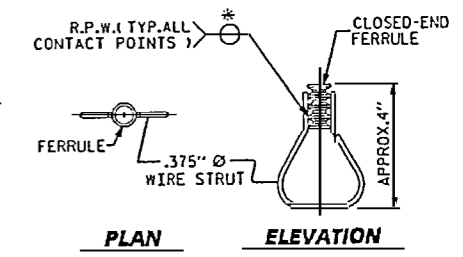
**STRUCTURAL CONCRETE INSERT**

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
  - B. 1 - 3/4" Ø X 1 1/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 1/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOYABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" BOLT SHALL HAVE N.C. THREADS.
  - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
  - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 1/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DONELS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



**STRUCTURAL CONCRETE INSERT**

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

**PROJECT NO. 6.503394**  
**COUNTY: BUNCOMBE**  
**STATION: 12+84.80 -L-**  
**REPLACES BRIDGE No. 734**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALPH HANCOCK

**RAIL POST SPACINGS AND END OF RAIL DETAILS**

ASSEMBLED BY: M.E. POOLE	DATE: 2/2002
CHECKED BY: W.C. CARTER	DATE: 9/2002
DRAWN BY: FCJ 1/88	REV. 2/6/97 EEM/RGW
CHECKED BY: CRK 3/89	REV. 8/16/99 RWN/LES
	REV. 10/17/00R LES/RDR

REVISIONS					SHEET NO. <b>13</b>
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS <b>29</b>
2			4		

1) Girder 4 along with all diaphragms except end diaphragm in bay 3 distorted up to 8”





2) Broken welds on 8 railing posts on the upstream end

