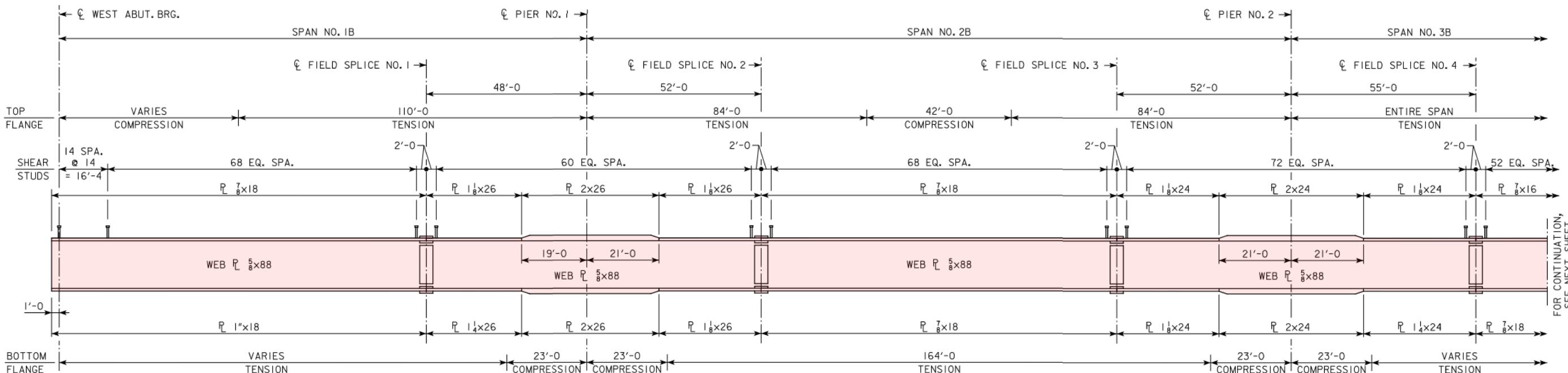


### STRUCTURAL STEEL LAYOUT



### NOTES:

NOTES:  
ALL DIMENSIONS SHOWN ARE MEASURED IN A HORIZONTAL PLANE UNLESS NOTED OTHERWISE.  
MEASURED WITH RESPECT TO LOCAL TANGENT.  
CONTRACTOR TO NOTE CROSS FRAME ERECTION AT THESE LOCATIONS MAY REQUIRE SPECIAL CONSIDERATION DURING GIRDERS ERECTION. BEARING AND JACKING STIFFENERS MAY CONFLICT WITH CROSS FRAME PLACEMENT AFTER THE GIRDERS ARE ERECTED.  
ALL CROSSFRAMES SHALL BE TYPE ① UNLESS NOTED OTHERWISE.  
ALL INTERMEDIATE STIFFENERS SHALL BE AT EQUAL SPACES BETWEEN CROSS FRAMES UNLESS NOTED OTHERWISE.  
CHARPY V-NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4152.02, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO ALL CROSS FRAMES, DIAPHRAGMS, CONNECTION STIFFENERS AND CONNECTION PLATES AT CROSS FRAMES AND DIAPHRAGMS.

### GIRDERS A, D, F & H ELEVATION

- For the full plan set and additional structure information, see Br3-Steel and Concrete-Iowa DOT.pdf.
- Each Girder Segment has its own Name "GS-A05" based on Girder Name "A" and the Field Splice bay "5" in which it is located.

Oversized holes for bolted connections shall not be allowed unless noted otherwise.

The contractor's erection plans shall be designed by a professional engineer registered in the state of Iowa. Erection plans shall be submitted to the engineer for review and approval prior to or with structural steel shop drawings.

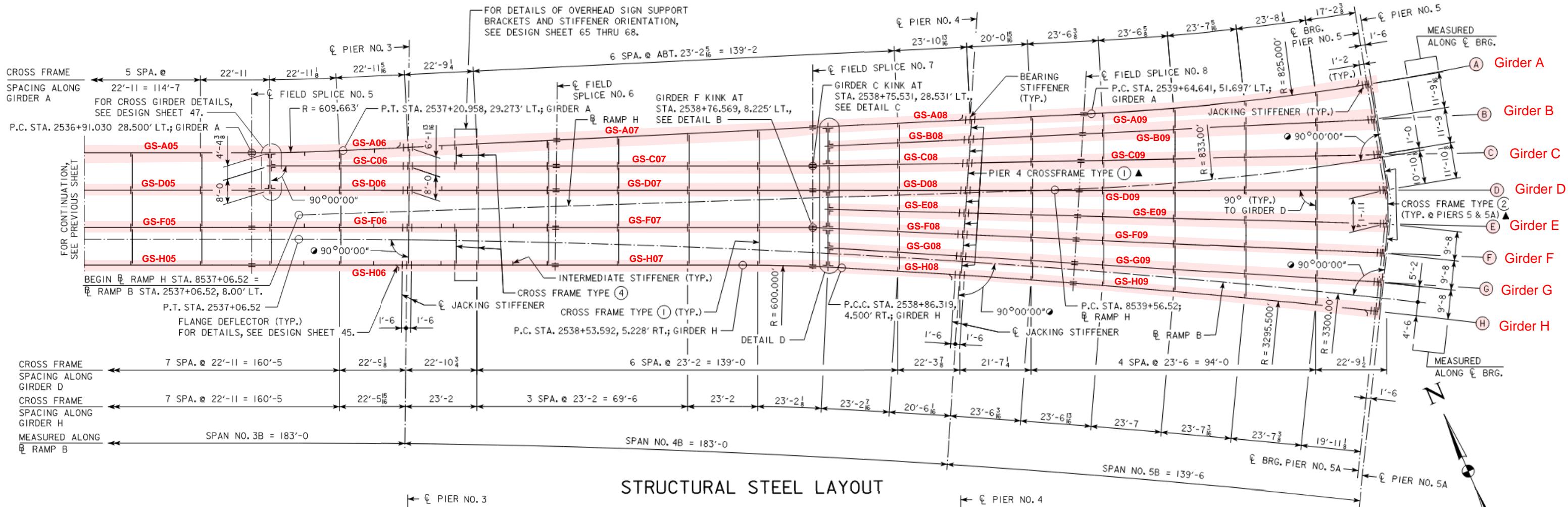
Cross frames are 90° to girder "D" except at Pier nos. 4, 5 & 5A.

The fabricator may request the substitution of a single plate option for the top and bottom flange in the negative region between field bolted splice plates. The request shall include design calculations signed by a registered professional engineer in the state of Iowa verifying the plate size substitution and bolted field splice are satisfactory.

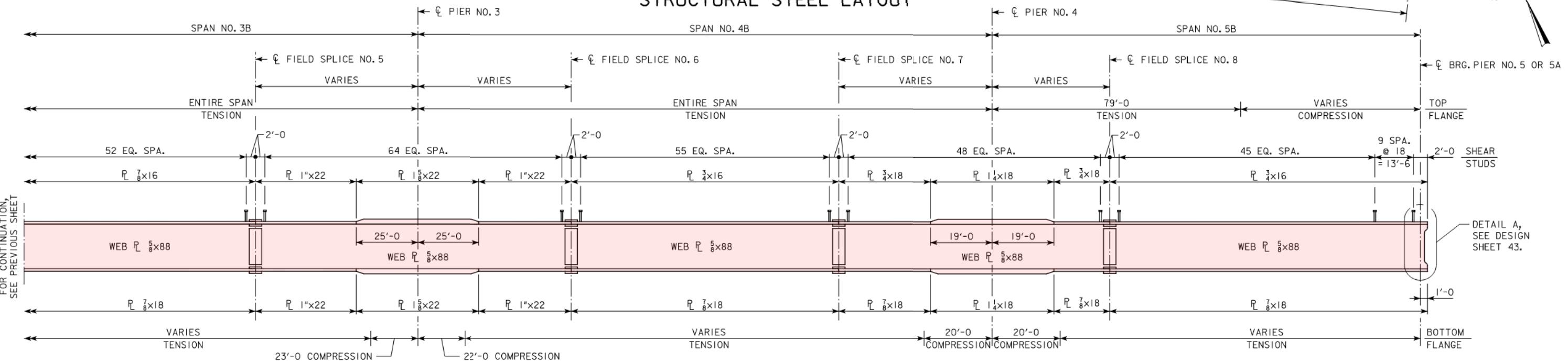
#### Unit Test Instruction for the Design-to-Construction Data Exchange

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No.	Date	Issue / Revision Notes
Unit Test Description		Unit Test / Sheet No.
Level 2 Girders 02		
Drawn By	Reviewed By	
DHC	MJY	





## STRUCTURAL STEEL LAYOUT

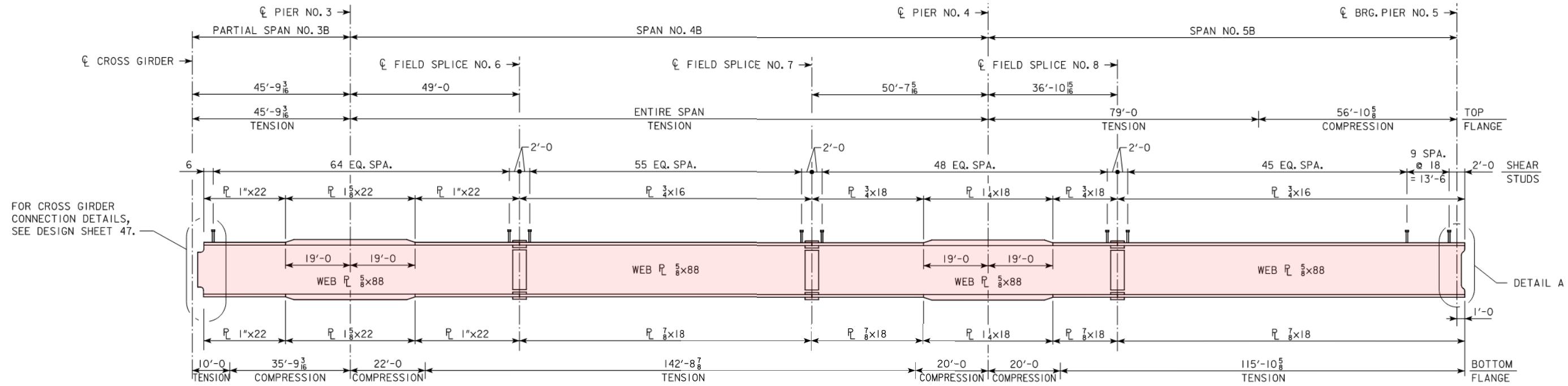


## GIRDERS A, D, F & H ELEVATION

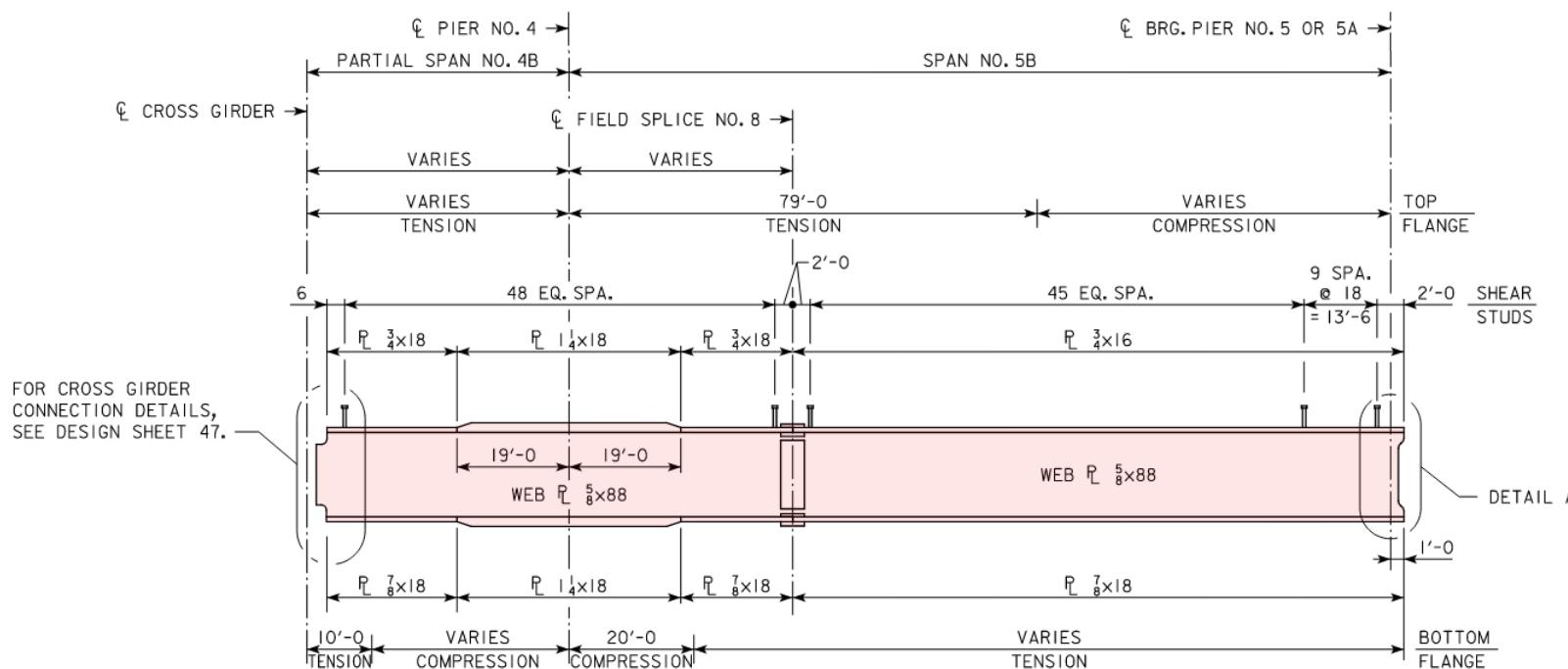
## **NOTES:**

1. Each Girder Segment has its own Name "GS-A05" based on Girder Name "A" and the Field Splice bay "5" in which it is located.

Unit Test Instruction for the Design-to-Construction Data Exchange			 TPF-5(372)
1	1/9/24	.	 
No.	Date	Issue / Revision Notes	
Unit Test Description <b>Level 2 Girders 02</b>			Unit Test / Sheet No. L2-Br03-Girders02 / 02
Drawn By DHC		Reviewed By M.IY	



GIRDER C ELEVATION



GIRDERS B, E & G ELEVATION

NOTES:

1. Each Girder Segment has its own Name "GS-A05" based on Girder Name "A" and the Field Splice bay "5" in which it is located.

NOTE:  
FOR NOTES, SEE DESIGN SHEET 41.

Unit Test Instruction for the Design-to-Construction Data Exchange		
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1	11/8/23	.
No.	Date	Issue / Revision Notes
Unit Test Description		
Level 2 Girders 02		
Drawn By	Reviewed By	Unit Test / Sheet No.
DHC	MJY	

**BIM**  
FOR  
BRIDGES  
AND STRUCTURES  
TPF-5(372)

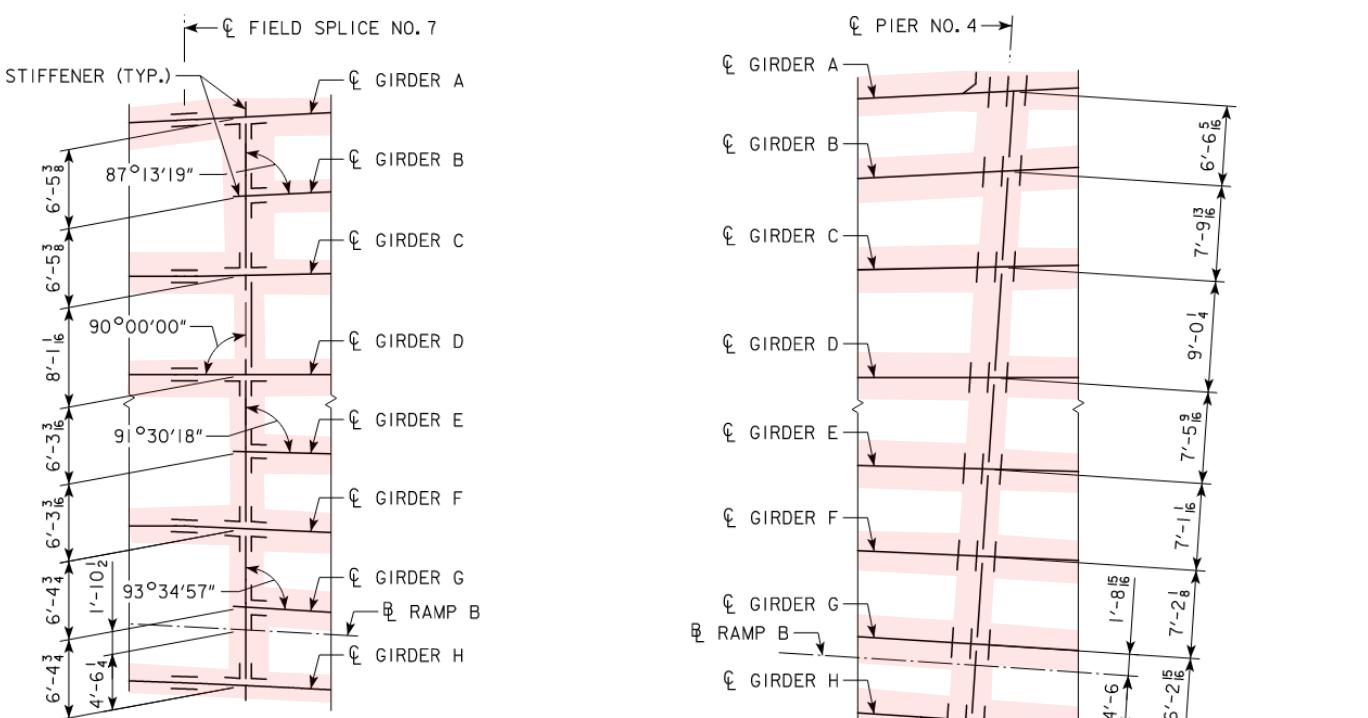
**HDR**

**jō consulting**

**L2-Br03-Girders02 / 03**

GIRDER DATA													
GIRDER	SPAN NO. 1B				SPAN NO. 2B				SPAN NO. 3B				
	Q W. ABUT. BRG. TO F.S. NO. 1	F.S. NO. 1 TO P.T.	P.T. TO Q PIER NO. 1	SPAN LENGTH	Q PIER NO. 1 TO F.S. NO. 2	F.S. NO. 2 TO F.S. NO. 3	F.S. NO. 3 TO Q PIER NO. 2	SPAN LENGTH	Q PIER NO. 2 TO F.S. NO. 4	F.S. NO. 4 TO F.S. NO. 5 (P.C. GIRDER A)	P.C. TO P.T. (GIRDER A)	F.S. NO. 5 TO Q PIER NO. 3	SPAN LENGTH
A	111'-3 <sup>1</sup> <sub>2</sub>	5'-0	43'-0	159'-3 <sup>1</sup> <sub>2</sub>	52'-0	106'-0	52'-0	210'-0	55'-0	76'-6 <sup>1</sup> <sub>8</sub>	30'-0 <sup>13</sup> <sub>16</sub>	51'-10 <sup>5</sup> <sub>16</sub>	183'-4 <sup>7</sup> <sub>16</sub>
B	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	45'-9 <sup>3</sup> <sub>16</sub>
D	110'-8 <sup>13</sup> <sub>16</sub>	5'-0	43'-0	158'-8 <sup>13</sup> <sub>16</sub>	52'-0	106'-0	52'-0	210'-0	55'-0	76'-6 <sup>1</sup> <sub>8</sub>	-	51'-8	183'-2 <sup>8</sup>
E	-	-	-	-	-	-	-	-	-	-	-	-	-
F	110'-2 <sup>1</sup> <sub>16</sub>	5'-0	43'-0	158'-2 <sup>1</sup> <sub>16</sub>	52'-0	106'-0	52'-0	210'-0	55'-0	76'-6 <sup>1</sup> <sub>8</sub>	-	51'-6 <sup>3</sup> <sub>8</sub>	183'-0 <sup>1</sup> <sub>2</sub>
G	-	-	-	-	-	-	-	-	-	-	-	-	-
H	109'-7 <sup>3</sup> <sub>8</sub>	5'-0	43'-0	157'-7 <sup>3</sup> <sub>8</sub>	52'-0	106'-0	52'-0	210'-0	55'-0	76'-6 <sup>1</sup> <sub>8</sub>	-	51'-4 <sup>13</sup> <sub>16</sub>	182'-10 <sup>5</sup> <sub>16</sub>

GIRDER DATA									
GIRDER	SPAN NO. 4B					SPAN NO. 5B			
	Q PIER NO. 3 TO F.S. NO. 6	F.S. NO. 6 TO P.C. (GIRDER H)	P.C. TO P.C.C. (GIRDER H)	F.S. NO. 6 TO F.S. NO. 7	F.S. NO. 7 TO Q PIER NO. 4	SPAN LENGTH	Q PIER NO. 4 TO F.S. NO. 8	F.S. NO. 8 TO Q BRG. PIER NO. 5 OR 5A	SPAN LENGTH
A	49'-1	-	-	85'-1 <sup>11</sup> <sub>16</sub>	51'-7 <sup>3</sup> <sub>8</sub>	185'-10 <sup>1</sup> <sub>16</sub>	35'-11 <sup>5</sup> <sub>16</sub>	4'-0	95'-7 <sup>15</sup> <sub>16</sub>
B	-	-	-	-	-	46'-7 <sup>15</sup> <sub>16</sub>	36'-5 <sup>8</sup> <sub>8</sub>	-	97'-1 <sup>3</sup> <sub>8</sub>
C	49'-0	-	-	85'-1 <sup>9</sup> <sub>16</sub>	50'-7 <sup>5</sup> <sub>16</sub>	184'-8 <sup>8</sup> <sub>8</sub>	36'-10 <sup>15</sup> <sub>16</sub>	-	98'-11 <sup>11</sup> <sub>16</sub>
D	49'-0	-	-	85'-2 <sup>5</sup> <sub>8</sub>	50'-0	184'-2 <sup>5</sup> <sub>8</sub>	37'-6	-	100'-10 <sup>3</sup> <sub>4</sub>
E	-	-	-	-	-	45'-0 <sup>1</sup> <sub>16</sub>	38'-0 <sup>1</sup> <sub>8</sub>	-	101'-1 <sup>5</sup> <sub>16</sub>
F	49'-0	-	-	85'-4 <sup>1</sup> <sub>4</sub>	49'-1	183'-5 <sup>1</sup> <sub>4</sub>	38'-6 <sup>1</sup> <sub>16</sub>	-	100'-1 <sup>3</sup> <sub>8</sub>
G	-	-	-	-	-	44'-1 <sup>9</sup> <sub>16</sub>	39'-0 <sup>1</sup> <sub>16</sub>	-	99'-1 <sup>15</sup> <sub>16</sub>
H	49'-0	61'-10 <sup>9</sup> <sub>16</sub>	32'-8 <sup>5</sup> <sub>16</sub>	85'-5 <sup>15</sup> <sub>16</sub>	48'-2 <sup>11</sup> <sub>16</sub>	182'-8 <sup>5</sup> <sub>8</sub>	39'-5 <sup>2</sup> <sub>2</sub>	-	98'-4 <sup>15</sup> <sub>16</sub>
									137'-9 <sup>11</sup> <sub>16</sub>

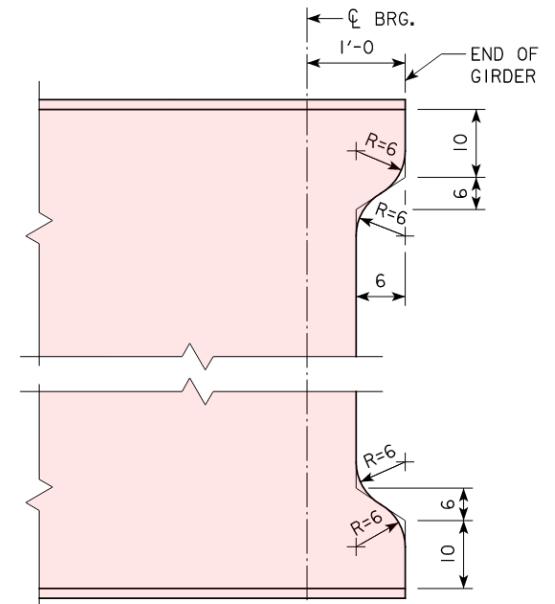


**DETAIL D**  
(FOR CROSS GIRDERS DETAILS,  
SEE DESIGN SHEET 47)

#### NOTES:

- Each Girder Segment has its own Name "GS-A05" based on Girder Name "A" and the Field Splice bay "5" in which it is located.

**PIER NO. 4 DETAIL**



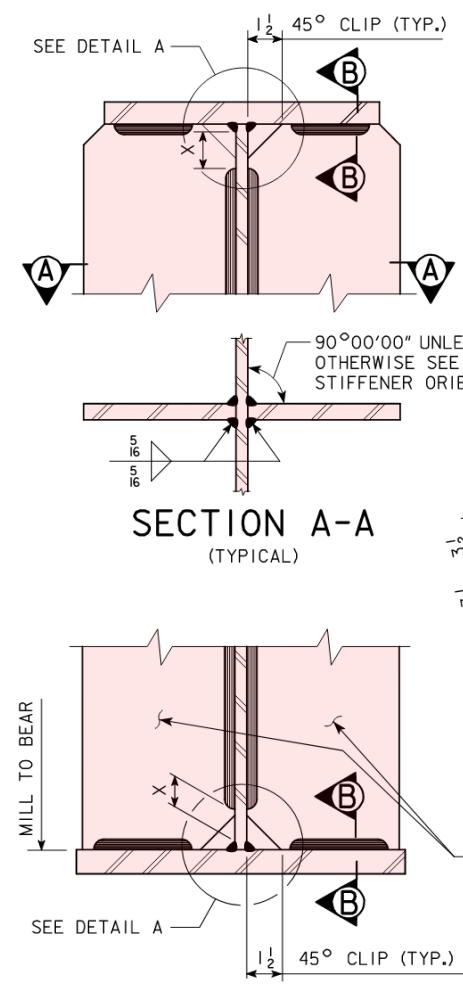
**DETAIL A**

Unit Test Instruction for the  
Design-to-Construction Data Exchange

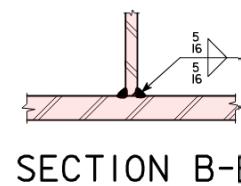


jō consulting

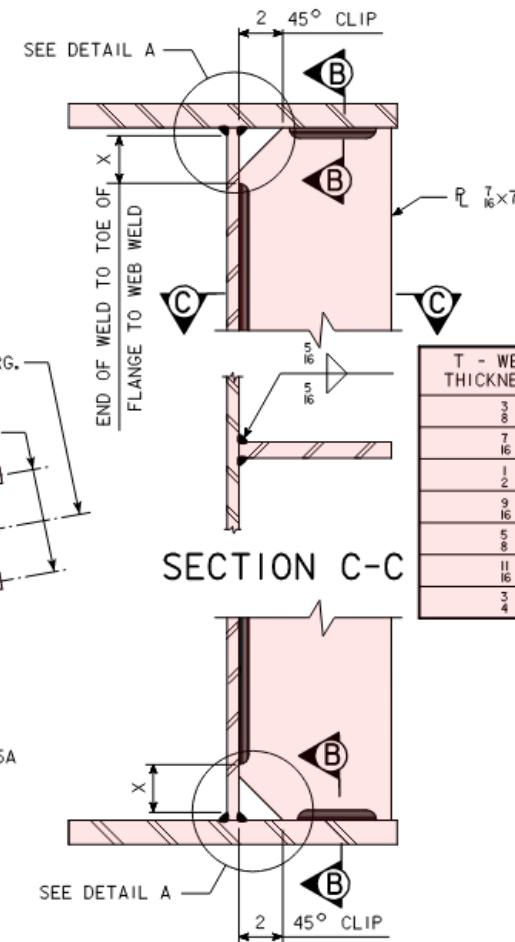
No.	Date	Issue / Revision Notes	Unit Test / Sheet No.
1	11/8/23		
Level 2 Girders 02			Unit Test / Sheet No.
Drawn By DHC Reviewed By MJY			
L2-Br03-Girders02 / 04			



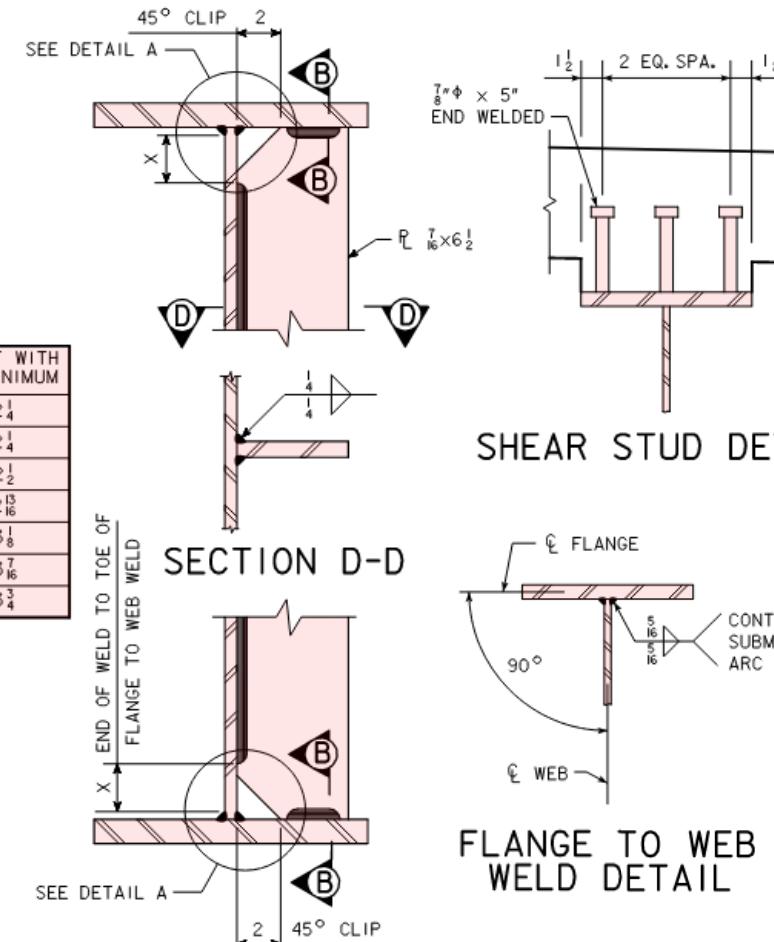
**BEARING AND JACKING STIFFENER**



**SECTION B-B**

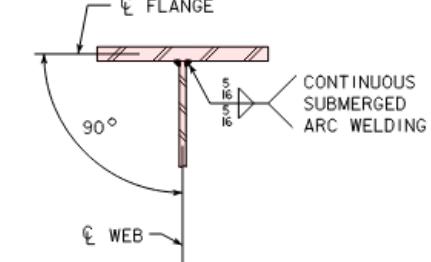


**SECTION C-C**



**INTERMEDIATE STIFFENER**

**SHEAR STUD DETAIL**

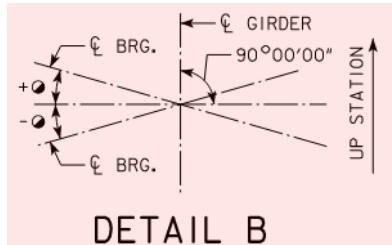


**FLANGE TO WEB WELD DETAIL**

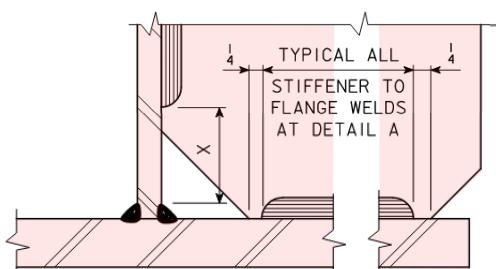
<b>BEARING &amp; JACKING STIFFENER DATA TABLE</b>		
LOCATION	BEARING STIFFENER SIZE	JACKING STIFFENER SIZE
WEST ABUT.	P L 3/8 x 8 1/2	P L 3/4 x 7
PIER NO. 1	P L 1 1/8 x 12 1/2	P L 3/4 x 7
PIER NO. 2	P L 1 x 11 1/2	P L 3/4 x 7
PIER NO. 3	P L 1 x 10 1/2	P L 3/4 x 7
PIER NO. 4	P L 3/8 x 8 1/2	P L 3/4 x 7
PIER NO. 5	P L 3/8 x 8 1/2	P L 3/4 x 7
PIER NO. 5A	P L 3/4 x 8 1/2	P L 3/4 x 7

<b>BEARING STIFFENER ORIENTATION TABLE</b>			
GIRDER	PIER NO. 3	PIER NO. 4	PIER NOS. 5 & 5A
A	03°27'03"	06°37'42"	-00°13'56" □
B	-	06°34'50"	-06°38'44"
C	00°37'30"	04°56'03"	-08°17'31"
D	00°37'30"	03°48'09"	-
E	-	02°17'51"	■
F	00°37'30"	01°14'38"	03°39'57"
G	-	00°13'12"	02°38'31"
H	00°37'30"	00°00'00"	00°01'34" □

● FOR DETAILS, SEE DETAIL B.  
▲ FOR DETAILS, SEE DETAIL C.  
■ FOR DETAILS, SEE DETAIL D.  
□ MEASURED WITH RESPECT TO THE LOCAL TANGENT.

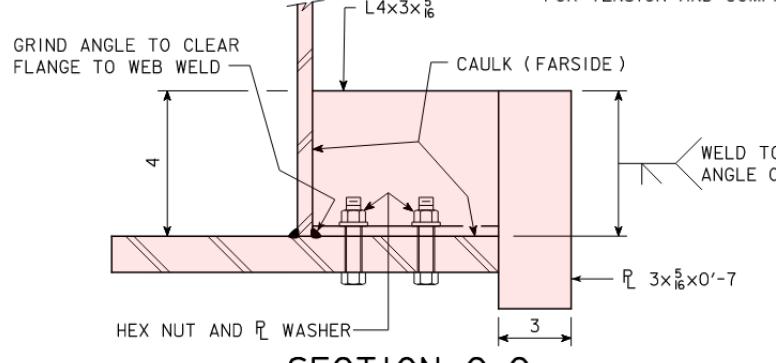


**DETAIL B**



**FLANGE PLATE TRANSITION AT SHOP SPLICES**

ALL FLANGE BUTT WELDED JOINTS SUBJECT TO TENSION OR REVERSAL OF STRESS ARE TO BE RADIOPHOTOGRAPHED FULL WIDTH. ALL BUTT WELDED JOINTS SUBJECT TO COMPRESSION ONLY ARE TO BE RADIOPHOTOGRAPHED FOR A MINIMUM OF 50 PERCENT OF THE WIDTH.  
FOR TENSION AND COMPRESSION LIMITS OF GIRDERS, SEE GIRDER ELEVATIONS.



**SECTION G-G**

FLANGE DEFLECTORS ARE REQUIRED ON THE OUTSIDE OF THE EXTERIOR GIRDERS AT THE ABUTMENT AND PIERS AS SHOWN ON THE STRUCTURAL STEEL LAYOUT.  
FLANGE DEFLECTOR COMPONENTS ARE TO BE PAINTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS.  
GRADE 50W "WEATHERING STEEL" MAY BE USED IN LIEU OF PAINTED GRADE 36 STEEL FOR FLANGE DEFLECTORS.

### NOTES:

1.

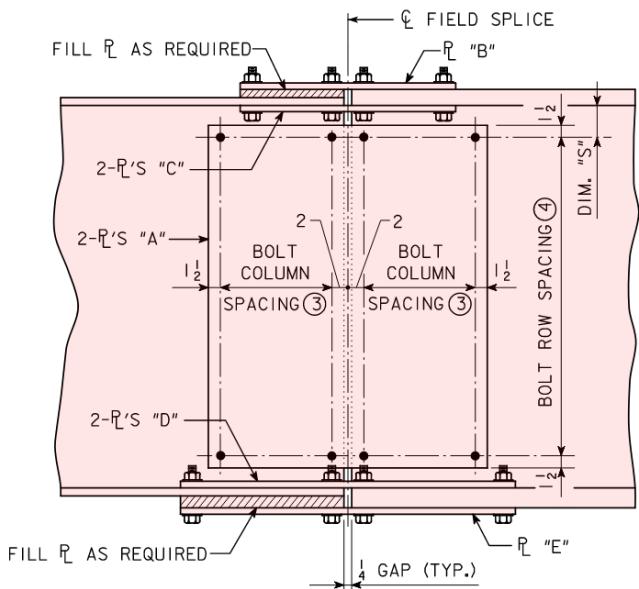
Unit Test Instruction for the Design-to-Construction Data Exchange

1	11/8/23	.
No.	Date	Issue / Revision Notes
Unit Test Description		Unit Test / Sheet No.
Level 2 Girders 02		
Drawn By	Reviewed By	
DHC	MJY	

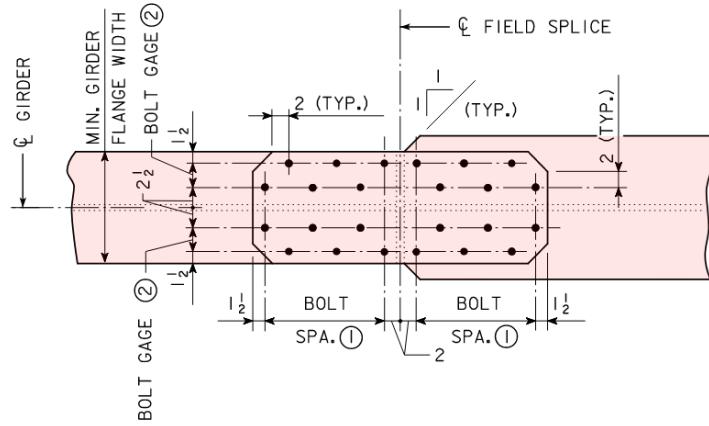
**BIM**  
FOR  
BRIDGES  
AND STRUCTURES  
TPF-5(372)

**HDR** consulting

**L2-Br03-Girders02 / 05**

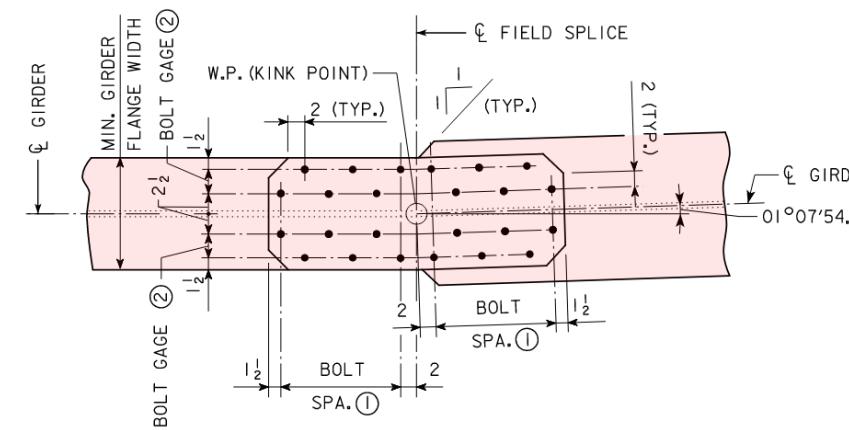


FIELD SPICE ELEVATION

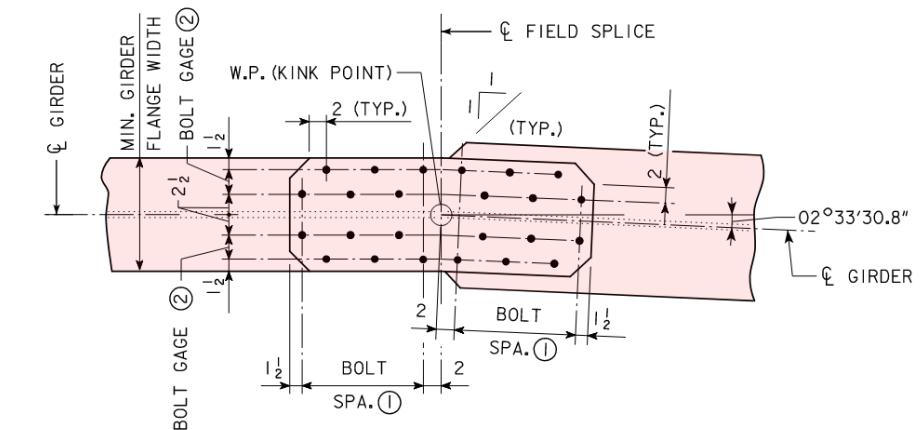


FLANGE SPLICE 16" & 18" MIN.  
GIRDER FLANGE WIDTH

FIELD SPICE NO.	TOP FLANGE SPLICE				WEB PLATE SPLICE			BOTTOM FLANGE SPLICE						
	MIN. GIRDER FLANGE WIDTH	PLATE "B"	PLATE "C" (2 REQUIRED)	BOLT SPACING ①	BOLT GAGE ②	WEB PLATE "A" (2 REQUIRED)	BOLT COLUMN SPACING ③	BOLT ROW SPACING ④	DIM. "S"	MIN. GIRDER FLANGE WIDTH	PLATE "D" (2 REQUIRED)	PLATE "E"	BOLT SPACING ①	BOLT GAGE ②
1	18	$\frac{3}{8} \times 18 \times 3'-7$	$\frac{7}{16} \times 8 \times 3'-7$	9 @ 2 = 1'-6	5	$\frac{3}{8} \times 13 \times 7'-0$	1 @ 3 = 0'-3	27 @ 3 = 6'-9	$3\frac{1}{2}$	18	$\frac{1}{2} \times 8 \times 3'-7$	$\frac{7}{16} \times 18 \times 3'-7$	9 @ 2 = 1'-6	5
2, 3	18	$\frac{3}{8} \times 18 \times 3'-7$	$\frac{7}{16} \times 8 \times 3'-7$	9 @ 2 = 1'-6	5	$\frac{3}{8} \times 13 \times 7'-0$	1 @ 3 = 0'-3	27 @ 3 = 6'-9	$3\frac{1}{2}$	18	$\frac{3}{8} \times 8 \times 3'-7$	$\frac{3}{8} \times 18 \times 3'-7$	9 @ 2 = 1'-6	5
4-8	16	$\frac{3}{8} \times 16 \times 2'-11$	$\frac{7}{16} \times 7 \times 2'-11$	7 @ 2 = 1'-2	4	$\frac{3}{8} \times 13 \times 7'-0$	1 @ 3 = 0'-3	27 @ 3 = 6'-9	$3\frac{1}{2}$	18	$\frac{7}{16} \times 8 \times 3'-7$	$\frac{3}{8} \times 18 \times 3'-7$	9 @ 2 = 1'-6	5



FLANGE SPLICE NO. 7 AT GIRDER C



FLANGE SPLICE NO. 7 AT GIRDER F

#### NOTES:

1. Each Girder Segment has its own Name "GS-A05" based on Girder Name "A" and the Field Splice bay "5" in which it is located.

Unit Test Instruction for the  
Design-to-Construction Data Exchange

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1	11/8/23	.

No. Date Issue / Revision Notes

Unit Test Description Unit Test / Sheet No.

Level 2 Girders 02

Drawn By Reviewed By

DHC MJY

**BIM**  
FOR  
BRIDGES  
AND STRUCTURES  
TPP-5(372)

**HDR** **jō** consulting

**L2-Br03-Girders02 / 06**

# SPECIFICATIONS:

DESIGN:	AASHTO LRFD 7TH ED, SERIES OF 2016, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.
CONSTRUCTION:	IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS, INCLUDING THE FOLLOWING SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT: -"DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES", -"DEVELOPMENTAL SPECIFICATIONS FOR MASS CONCRETE-CONTROL OF HEAT OF HYDRATION", -"DEVELOPMENTAL SPECIFICATIONS FOR MODULAR EXPANSION JOINT ASSEMBLY", -"SPECIAL PROVISIONS FOR E-BUILDER", -"DEVELOPMENTAL SPECIFICATIONS FOR PROGRESS SCHEDULING", -"DEVELOPMENTAL SPECIFICATIONS FOR STRUCTURAL CONCRETE COATING", -"DEVELOPMENTAL SPECIFICATIONS FOR CONCRETE SURFACE PREPARATION AND TESTING PRIOR TO COATING APPLICATION", -"SPECIAL PROVISIONS FOR GIRDER ERECTION PLAN", -"SPECIAL PROVISIONS FOR AESTHETIC TREATMENT OF CONCRETE BARRIER".

## DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH ED, SERIES OF 2016, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

- REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
- CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5,  $f'_c = 4.0$  KSI.
- STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6, ASTM A709 GRADE 50W (AASHTO M270 GRADE 50W), EXCEPT AS NOTED.
- FATIGUE STRESSES BASED ON INFINITE LIFE.

## GENERAL NOTES:

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY BRIDGE CONTRACTOR OF THE STARTING DATE.

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

THIS STRUCTURE SHALL BE BUILT WITH WEATHERING STEEL. ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. PAINTING REQUIREMENTS FOR THIS STRUCTURE SHALL BE IN ACCORDANCE WITH ARTICLE 2408.02, Q, OF THE STANDARD SPECIFICATIONS.

SUBSTRUCTURE CONCRETE SHALL BE PROTECTED FROM STAINING BY A WRAPPING OF POLYETHYLENE OR SIMILAR MATERIALS WHICH SHALL BE LEFT IN PLACE AND KEPT IN A SERVICEABLE CONDITION UNTIL AFTER THE DECK HAS BEEN PLACED. IF SUBSTRUCTURE CONCRETE IS STAINED, THE STAINS SHALL BE REMOVED BY METHODS APPROVED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH THE PROTECTION AND ANY REQUIRED CLEANING OF THE SUBSTRUCTURE CONCRETE SHALL BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL STEEL".

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2 OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS AND THE CRASH CUSHION END POST SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORM METHOD) OR THE CRASH CUSHION END POST. THE CONCRETE BARRIERS AND THE CRASH CUSHION END POST ARE TO BE INTEGRALLY COLORED. SEE "SPECIAL PROVISIONS FOR AESTHETIC TREATMENT OF CONCRETE BARRIER" FOR ADDITIONAL INFORMATION.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 is  $\frac{5}{8}$  inch diameter bar). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THE STEEL GIRDER DEFLECTIONS SHOWN IN THE DEFLECTION DIAGRAMS AND MISCELLANEOUS DATA TABLES IN THESE PLANS WERE COMPUTED ASSUMING THAT THE INSPECTION WALKWAYS WOULD BE INSTALLED PRIOR TO CONCRETE DECK SLAB. IF AN ALTERNATE SEQUENCE IS CHOSEN WHEN ERECTING THE BRIDGE, THE CONTRACTOR SHALL PROVIDE CALCULATIONS FOR REVISED CAMBER AND BLOCKING DATA, DEFLECTION DATA AND GIRDER LINE HAUNCH DATA WITH THE SHOP DRAWINGS.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. SEE COORDINATED OPERATIONS TAB III-OI ELSEWHERE IN THESE PLANS FOR A LIST OF PROJECTS.

IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 1105, THE CONTRACTOR SHALL SUBMIT A GIRDER ERECTION PLAN (GEP) CONSISTING OF ERECTION PLANS, ERECTION PROCEDURES, AND ERECTION ENGINEERING CALCULATIONS TO THE ENGINEER ACCORDING TO SPECIAL PROVISION "GIRDER ERECTION PLAN".

Faint lines on plans indicate the existing roadways and structures.

GUARDRAIL IS TO BE PLACED BY PROJECT IM-080-6(243)239--13-52.

ROADWAY EXCAVATION IS TO BE DONE AS PART OF THE TIED PROJECT IM-080-6(243)239--13-52. EXCAVATION QUANTITIES FOR THE PIERS ARE BASED ON THE ASSUMPTION THAT ROADWAY EXCAVATION WILL HAVE BEEN COMPLETED AND ABUTMENT FILLS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.

THE APPROACH FILLS AS SHOWN ARE TO BE DONE AS PART OF THE TIED PROJECT IM-080-6(243)239--13-52 AND ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

THE CONTRACTOR IS RESPONSIBLE TO PROVIDE SUFFICIENT TEMPORARY BRACING TO MINIMIZE LATERAL DEFLECTION AND ROTATION OF EXTERIOR STEEL GIRDERS DURING DECK PLACEMENT. LATERAL DEFLECTION AND ROTATION OF EXTERIOR GIRDERS MAY RESULT IN THIN DECKS AND AN UPWARDS SHIFT IN BAR MATS WHICH CAN DECREASE CONCRETE COVER. PARTIALLY OR FULLY INSTALLED PERMANENT BRACING AS SHOWN IN THESE DESIGN PLANS SHALL NOT BE ASSUMED SUFFICIENT TO MINIMIZE LATERAL DEFLECTION AND ROTATION OF EXTERIOR GIRDERS DURING DECK PLACEMENT. TEMPORARY BRACING SHALL NOT BE WELDED TO THE STEEL GIRDERS OR ITS ATTACHMENTS INCLUDING THE STUDS.

ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF 6 MONTHS FOLLOWING THE COMPLETION OF THE APPROACH FILL AND 4'-0 SURCHARGE. THE TIME PERIOD BETWEEN THE COMPLETION OF THE APPROACH FILL SURCHARGE AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF THE SETTLEMENT PLATES.

RESEARCHERS FROM IOWA STATE UNIVERSITY WILL BE OBSERVING PLACEMENT OF DECK CONCRETE FOR THIS PROJECT. CONTRACTOR IS REQUIRED TO CONTACT BRENT PHARES AT (515) 294-5879 APPROXIMATELY 3 DAYS PRIOR TO DECK CONCRETE PLACEMENT AND WHENEVER A CHANGE IN DECK PLACEMENT SCHEDULE IS MADE. ACTIVITIES BY IOWA STATE UNIVERSITY WILL BE TO OBSERVE ONLY AND WILL NOT IMPACT CONSTRUCTION ACTIVITIES.

## SHOP DRAWING SUBMITTALS

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHOULD BE IN ACCORDANCE WITH 1105.03 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

1	STRUCTURAL STEEL
2	BEARINGS
3	EXPANSION JOINTS AND SLIDER PLATES
4	DECK DRAINS
5	MAINTENANCE CATWALKS AND INSPECTION CABLE
6	FORMWORK FOR AESTHETIC TREATMENT AT PIERS, ABUTMENTS AND BARRIERS
7	ERCTION PLANS

## BRIDGE DECK DIMENSIONS TABLE

ITEM	UNITS	QUANTITY
1 DECK LENGTH	L.F.	876.5
2 MINIMUM DECK WIDTH	L.F.	43.2
3 MAXIMUM DECK WIDTH	L.F.	80.4
4 DECK AREA	S.F.	42,540

1. DECK LENGTH IS MEASURED FROM FACE OF PAVING NOTCH TO  $\frac{1}{4}$  PIER NO. 5A ALONG BASELINE RAMP B.
- 2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO BASELINE RAMP B.
4. DECK AREA IS TO BE BASED ON THE DECK LENGTH AND OUT-TO-OUT DECK DIMENSIONS.

ALL PLAN DIMENSIONS ARE HORIZONTAL UNLESS NOTED OTHERWISE.

THE TIED ROAD PLANS, PROJECT NO. IM-080-6(243)239--13-52 CONTAIN THE POLLUTION PREVENTION PLAN.

### TRAFFIC CONTROL PLAN:

THE STRUCTURE IS BEING CONSTRUCTED ON A RELOCATION AND THE ROAD WILL NOT BE OPEN TO TRAFFIC UNTIL AFTER COMPLETION OF CONSTRUCTION. SEE TIED PROJECT IM-080-6(243)239--13-52 FOR TRAFFIC CONTROL PLAN.

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DHC	MJY	

**BIM** FOR BRIDGES AND STRUCTURES TPF-5(372)

**HDR** **jō** consulting

**L2-Br03-Girders02 / 07**

## GENERAL NOTES FOR TEXTURED CONCRETE FORM LINERS:

SEE INDIVIDUAL DESIGN SHEETS FOR SPECIFIC NOTES AND DETAILS DESCRIBING THE FEATURES WHICH INCORPORATE TEXTURED CONCRETE. WORK PERFORMED TO CREATE TEXTURED CONCRETE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR FORMWORK AND THE FOLLOWING:

FORM THE TEXTURED CONCRETE SURFACE USING A FORM LINER SYSTEM MADE OF HIGH-STRENGTH URETHANE ELASTOMER, PLASTIC OR FLEXIBLE FOAM MATERIALS CAPABLE OF WITHSTANDING ANTICIPATED CONCRETE POUR PRESSURES WITHOUT LEAKAGE OR CAUSING PHYSICAL DEFECTS. FORM LINERS SHALL EASILY ATTACH TO FORMS AND BE REMOVABLE WITHOUT CAUSING CONCRETE SURFACE DAMAGE. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ATTACHING FORM LINERS TO THE CONCRETE FORMS. IF RECOMMENDED BY THE FORM LINER MANUFACTURER, USE STRUCTURAL BACKERS TO PREVENT DEFORMATION OF THE LINER DURING LOADING OF THE FORMS. THE LINERS SHALL BE DESIGNED TO FORM SURFACES CONFORMING TO THE DESIGN INTENT INCLUDING THE SHAPE, LINES AND DIMENSIONS SHOWN IN THE PLANS AND TO AVOID VISIBLE PATTERN REPEATS. MATCH PATTERN FEATURES AT FORM LINER JOINTS TO MINIMIZE PATTERN REPEATS AND MAKE THE FORMED CONCRETE SURFACE APPEAR UNIFORM AND CONTINUOUS WITHOUT VISIBLE SEAMS AND FORM MARKS. WHEN JOINTS ARE UNAVOIDABLE, MAKE JOINTS ALONG MAIN FEATURES OF THE PATTERN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DO NOT MIX FORM LINERS FROM DIFFERENT MANUFACTURERS WHEN FORMING ANY INDIVIDUAL TEXTURE ON THE PROJECT.

FORM LINER EDGES FOLLOWING CURVES ARE TO BE CUT CLEANLY AND PARALLEL TO THE CURVE. USE ADEQUATE BLOCKING, SEALING AND OTHER MEANS IN ORDER TO MAINTAIN THE APPROPRIATE DEPTH AND CHARACTER OF TEXTURE AT CUT EDGES OF LINERS AND TO PREVENT MORTAR LEAKAGE.

DURING LOADING OF FORMS WITH CONCRETE, TAKE EXTRA CARE TO ADEQUATELY VIBRATE CONCRETE IN ORDER TO MAINTAIN ALL INTENDED FEATURES OF THE FORM LINER IN THE FINAL SURFACE AND TO PREVENT VOIDS. FOLLOWING REMOVAL OF FORMS, FINISH MINOR DEFECTS TO BLEND WITH THE BALANCE OF THE SURFACE TEXTURE. THE COMPLETED SURFACE SHALL BE FREE OF BLEMISHES, SURFACE VOIDS AND CONSPICUOUS FORM MARKS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CORRECT ANY SURFACE DEFECTS AT NO ADDITIONAL COST TO THE PROJECT.

VERIFY THAT RELEASE AGENTS USED ARE COMPATIBLE WITH FORM LINER MATERIAL, AND ARE NON-STAINING. APPLY RELEASE AGENT IN ACCORDANCE WITH THE FORM LINER MANUFACTURER'S RECOMMENDATIONS.

IF USED, FORM TIES SHALL BE MADE OF NON-CORROSIVE MATERIALS WHEN THE PORTION PERMANENTLY EMBEDDED IN THE CONCRETE IS LESS THAN  $1\frac{1}{2}$  INCHES FROM THE FINISHED SURFACE. POSITION FORM TIES AND ACCESSORIES IN STONE PATTERN MORTAR JOINTS IF APPLICABLE AND AT HIGH POINTS OF FINISHED WALL.

STRIP FORMWORK USING TECHNIQUES IN ACCORDANCE WITH LINER MANUFACTURER'S RECOMMENDATIONS AFTER THE CONCRETE HAS ACHIEVED THE STRENGTHS AND CURE TIMES REQUIRED BY THE PLANS AND APPLICABLE SPECIFICATIONS. CLEAN AND REPAIR FORM LINER SURFACES PRIOR TO USE. DO NOT USE SPLIT, FRAYED, DELAMINATED OR OTHERWISE DAMAGED FORM LINERS.

ALL COSTS ASSOCIATED WITH CONCRETE TEXTURING AND FORM LINERS ARE TO BE INCLUDED IN THE BID ITEM, "STRUCTURAL CONCRETE (BRIDGE)".

## GENERAL NOTES FOR CONCRETE RUSTICATION:

STRIPS AND PANELS USED AS INSERTS WITHIN CONCRETE FORMS TO CREATE THE RUSTICATION FEATURES MAY BE MADE OF WOOD, STEEL, NYLON, PLASTIC OR OTHER NONPOROUS MATERIAL CAPABLE OF WITHSTANDING ANTICIPATED CONCRETE PORE PRESSURES WITHOUT PHYSICAL DEFECTS. WOOD INSERTS, IF USED, SHALL BE FREE OF WARP, TWIST, CHECKS OR CRACKS, AND SHALL BE PRESOAKED PRIOR TO PLACEMENT OF CONCRETE IN THE FORMS.

RUSTICATION INSERTS SHALL EASILY ATTACH TO FORMS AND SHALL NOT ALLOW LEAKAGE OF CONCRETE BETWEEN THE FORM AND THE INSERT. WHEN STEEL FORMS ARE USED, RUSTICATION STRIPS MAY BE RIDIGLY ATTACHED TO THE INSIDE SURFACES OF THE FORMS. WHEN STEEL FORMS ARE NOT USED, RUSTICATION STRIPS AND OTHER INSERTS FOR SMALL RECESSES ON EXPOSED CONCRETE SURFACES SHALL BE FASTENED TO THE FORMS IN A MANNER THAT WILL PERMIT THEM TO REMAIN IN PLACE WHEN THE FORMS ARE REMOVED. LEAVE INSERTS IN PLACE UNTIL THEY CAN BE REMOVED WITHOUT DAMAGE TO THE SURROUNDING CONCRETE.

THE INSERTS SHALL BE DESIGNED TO FORM SURFACES AND FEATURES CONFORMING TO THE DESIGN INTENT INCLUDING THE SHAPE, LINES, DEPTHS, DIMENSIONS SHOWN IN THE PLANS. CREATE INSERTS USING A MINIMUM NUMBER OF SPLICE JOINTS IN THEIR LENGTH. SPLICES, IF USED, SHALL BE TIGHTLY JOINED SO AS NOT TO ALLOW GAPS OR LEAKS, AND SHALL NOT CREATE ANY CHANGE IN ALIGNMENT OR SHAPE OF THE RUSTICATION FEATURE. DO NOT LOCATE FORM TIES WITHIN CONCRETE RUSTICATIONS.

FOR RUSTICATION FEATURES FOLLOWING THE PERIMETER OF ROUNDED SURFACES, IT MAY BE NECESSARY TO USE MULTIPLE LAYERS OF INSERT MATERIAL IN ORDER TO ACHIEVE THE RADIUS CURVE. THIS IS ACCEPTABLE, PROVIDED THAT THE FINAL SHAPE, LINE, DEPTH, AND DIMENSION OF THE FEATURES ARE MAINTAINED IN THE FINAL RESULT.

DURING LOADING OF FORMS WITH CONCRETE, TAKE EXTRA CARE TO ENSURE PROPER CONSOLIDATION OF CONCRETE AROUND ALL RUSTICATION INSERTS TO PRESERVE THE SHAPE, LINE AND DEPTH OF ALL INTENDED FEATURES IN THE FINAL CONCRETE SURFACE. FOLLOWING REMOVAL OF FORMS, REPAIR ALL DEFECTS TO ACHIEVE THE RUSTICATION FEATURES AS SPECIFIED IN THE PLANS. PATCH VOIDS, HONEYCOMB AREAS, ETC., IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. IF SURFACES WILL NOT RECEIVE A COATING, ADD WHITE CEMENT TO THE PATCHING MORTAR TO LIGHTEN IT IN ORDER TO MATCH OR BE SLIGHTLY LIGHTER THAN SURROUNDING CONCRETE WHEN DRY. COMPLETED SURFACE SHALL BE FREE FROM BLEMISHES, SURFACE VOIDS AND CONSPICUOUS FORM MARKS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CORRECT ANY SURFACE DEFECTS TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE PROJECT.

ALL COSTS ASSOCIATED WITH CONCRETE RUSTICATION ARE TO BE INCLUDED IN THE BID ITEM "STRUCTURAL CONCRETE (BRIDGE)".

## FUTURE JACKING NOTES:

PROVISIONS FOR JACKING HAVE BEEN INCLUDED IN THIS DESIGN TO ALLOW FOR FUTURE BEARING MAINTENANCE.

THE JACKING STIFFENERS ARE DESIGNED BASED ON THE COMBINED DEAD AND LIVE LOAD REACTIONS TABULATED IN THE MOMENT AND REACTION TABLES LISTED IN THESE PLANS.

JACKING IS ASSUMED TO BE ACCOMPLISHED BY APPLICATION OF ONE JACK PLACED ON EACH SIDE OF BEARING ASSEMBLY AT CONTINUOUS SUPPORTS AND BY APPLICATION OF A SINGLE JACK PLACED IN FRONT OF BEARING ASSEMBLY AT END SUPPORTS.

JACKS ARE ASSUMED TO BE CENTERED UNDER THE WEB AND JACKING STIFFENER LOCATIONS SHOWN IN THESE PLANS. SHIM PLATES ARE ASSUMED TO BE USED TO PROVIDE A LEVEL JACKING SURFACE AND TO LIMIT BEARING STRESSES ON CONCRETE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE JACKING TO SIZE AND DESIGN THE REQUIRED JACKING EQUIPMENT AND CRIBBING AND TO ESTABLISH THE PROCEDURE FOR JACKING AND BEARING REPLACEMENT OR REPAIRS SUBJECT TO APPROVAL OF THE ENGINEER. THE ACTUAL DESIGN LOADINGS SHALL BE BASED ON THE LOADINGS EXPECTED FROM THE CONTRACTOR'S PROPOSED JACKING AND MAINTENANCE OF TRAFFIC PLAN AND SHOULD CONSIDER ANY ADDITIONAL DEAD LOAD PRODUCED BY IMPOSING DIFFERENTIAL DISPLACEMENTS.

WHEN JACKING AT EXPANSION JOINTS, CONSIDERATION SHOULD BE GIVEN TO PROTECTING ANY BARRIER COVER PLATES, EMBEDDED CONDUIT, AND EXPANSION JOINTS THAT WILL REMAIN.

CONSIDERATION SHALL BE GIVEN TO ANY THERMAL MOVEMENTS AND VIBRATIONS THAT MAY OCCUR DURING THE PERIOD THAT THE STRUCTURE IS RESTING ON JACKS OR CRIBBING.

FUTURE MAINTENANCE OPERATIONS SHALL BE CONDUCTED IN A MANNER SUCH THAT THE STRUCTURE WILL NOT BE DAMAGED.

## WEATHERING STEEL NOTES:

ALL STRUCTURAL STEEL, EXCEPT AS NOTED, SHALL CONFORM TO ASTM A709 GRADE 50W. THE MINIMUM YIELD POINT FOR GRADE 50W STRUCTURAL STEEL IS 50 KSI FOR PLATES 4 INCHES AND UNDER IN THICKNESS, AND ALL STRUCTURAL SHAPES. THE GRADE 50W STEEL IS A WEATHERING STEEL AND IS TO REMAIN UNPAINTED, EXCEPT AS NOTED.

DECK DRAINS INCLUDING PLATES WELDED TO THE DRAIN FOR DRAIN SUPPORT ARE TO BE GRADE 36 STEEL.

ALL PIECES COMPRISING THE ABUTMENT AND PIER BEARINGS SHALL COMPLY WITH THE REQUIREMENTS AS STATED IN THE NOTES ON DESIGN SHEET 59.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.

THE FINISH ON DECK DRAINS, BEARINGS AND WEATHERING STEEL SHALL BE IN ACCORDANCE WITH THE PLAN NOTES AND SECTION 2408, OF THE STANDARD SPECIFICATIONS. EXTERIOR SURFACES OF ALL GALVANIZED COMPONENTS WHICH ARE DESIGNATED IN THE CONTRACT DOCUMENTS TO BE PAINTED SHALL BE PREPARED ACCORDING TO ARTICLE 2509.03, OF THE STANDARD SPECIFICATIONS.

BOLTS FOR USE WITH WEATHERING STEEL SHALL BE A325 TYPE III WITH A563 GRADE DH3 NUTS AND F436 TYPE III WASHERS.

BOLTS USED TO SPLICER GIRDER SECTIONS ARE TO BE INSTALLED SUCH THAT NUTS ARE ON THE INSIDE FACE OF THE GIRDER WEBS FOR THE EXTERIOR GIRDER, AND ON THE TOP OF BOTH TOP AND BOTTOM FLANGES OF ALL THE GIRDER.

THE STEEL SHALL BE KEPT FREE OF OIL, GREASE, DIRT, CRAYON OR CHALK MARKS, CONCRETE SPATTER AND ANY OTHER FOREIGN MATTER THAT MAY AFFECT THE NATURAL OXIDATION OF THE STEEL. ANY FOREIGN MATTER REMAINING ON THE STEEL AFTER COMPLETION OF BRIDGE CONSTRUCTION SHALL BE REMOVED BY THE BRIDGE CONTRACTOR AS DIRECTED BY THE ENGINEER. THE RESULTANT SURFACE SHALL BE FREE OF ALL VISIBLE RESIDUES. ALL COSTS ASSOCIATED WITH CLEANING STEEL SURFACES SHALL BE BORNE BY THE BRIDGE CONTRACTOR.

SEAL MATERIAL FOR CAULKING SHALL BE NEUTRAL CURE AND NON-SAG SILICONE. THREE PRODUCTS MEETING THESE CRITERIA ARE DOW 888, CRAFCO ROAD SAVER SILICONE, AND CSL342 JOINT SEALANT.

PAINTED SURFACES SHALL BE PROTECTED FROM DAMAGE DURING SHIPMENT AND DURING ERECTION. PADDING OR OTHER MATERIAL APPROPRIATE FOR PROTECTING PAINTED SURFACES SHALL BE PLACED BETWEEN THE DECK FORMWORK BRACING AND THE EXTERIOR GIRDER FACE DURING CONSTRUCTION OF THE DECK. AFTER ERECTION OF THE BRIDGE, PAINTING OF EXTERIOR FASTENERS AND TOUCHUP OF PAINTED SURFACES SHALL BE IN ACCORDANCE WITH SECTION 2408.02, Q, OF THE STANDARD SPECIFICATIONS.

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