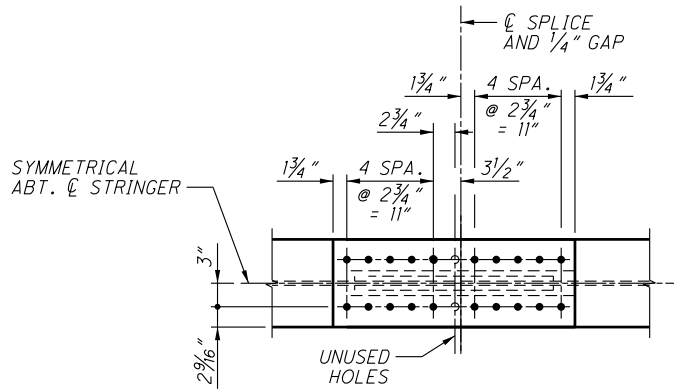
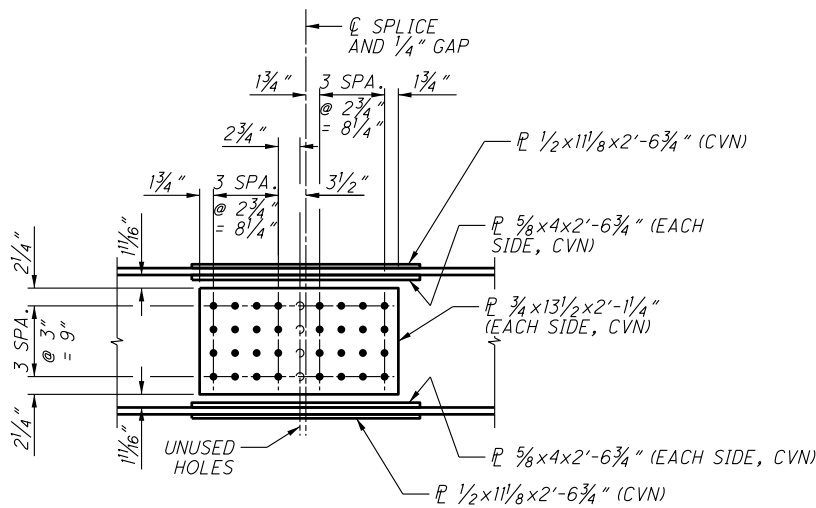
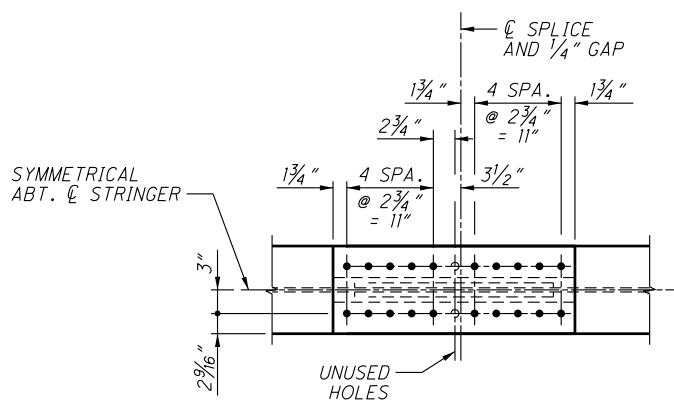


**RFI 447****PLAN - TOP FLANGE****ELEVATION****PLAN - BOTTOM FLANGE****NOTES:**

ALL STEEL SHALL BE A709, GRADE 50 AND SHALL BE PAINTED WITH AN IZEU COATING SYSTEM.

HIGH STRENGTH BOLTS FOR STRINGER FIELD SPLICES SHALL BE 1/8"  $\phi$  A325, GALVANIZED TYPE I BOLTS.

WHERE A SHAPE OR PLATE IS DESIGNATED (CVN), FURNISH MATERIAL THAT MEETS THE MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01.

FIELD SPLICE CONNECTION WEB PLATES SHALL HAVE BOLT THREAD EXCLUDED FROM THE SHEAR PLANES.

**STRINGER C FIELD SPLICE S35 DETAILS**

(HIGH STEEL SK-051413-A)

<b>HNTB</b>	The HNTB Companies Engineers Architects Planners	Made	KDG	Date	8/7/11	Job Number	49633
		Checked	TRG	Date	8/8/11		
For	Cleveland Innerbelt - Unit 2 Stringers	Backchk'd	FDG	Date	8-8-11	Sheet No.	

**Field Splice Input Summary**  
**Unit 2 Stringers (W18x97)**

**ODOT BDM 302.4.1.14**

Bolt allowable stresses for painted surfaces or unpainted weathering steel surfaces shall be based on AASHTO's values for Class A, Contact Surface, Standard Hole Type.

Field splices in beams and girders shall be bolted connections using high strength bolts, ASTM A325.

Bolts shall be A325, Type 1, galvanized for IZEU coated steel.

Use 7/8 inch diameter bolts.

**BDGS Field Splice Inputs**

Bolt Diameter = **0.88** in  
Hole diameter = **1.000** in

**Allowable shear stress** [AASHTO 6.13.2.7]

Allowable shear stress is entered per shear plane per bolt. Assume that threads are included in the shear plane for the flanges and excluded for the web. BDGS automatically includes the capacity reduction for a connection longer than 50 in and the  $\phi$  factor for bolts in shear.

threads included  $f_{allow} = 0.38 * F_{ub}$   
threads excluded  $f_{allow} = 0.48 * F_{ub}$   
 $F_{ub} = 120$  ksi [AASHTO 6.4.3.1]

included  $f_{allow} = 45.6$  ksi  
excluded  $f_{allow} = 57.6$  ksi

**Allowable slip stress** [AASHTO 6.13.2.8]

Allowable slip stress is entered per slip plane per bolt. Allowable stress is determined for a Class A surface and standard hole sizes.

$$f_{allow} = K_h * K_s * P_t / A_{bolt}$$

$K_h = 1.00$  [AASHTO Table 6.13.2.8-2]  
 $K_s = 0.33$  [AASHTO Table 6.13.2.8-3]  
 $P_t = 39$  kip [AASHTO Table 6.13.2.8-1]  
 $A_{bolt} = 0.601$  in<sup>2</sup>  
 $f_{allow} = 21.4$  ksi

**Minimum Design Strength** [AASHTO 6.13.1]

Except as specified otherwise, connections and splices for primary members shall be designed at the strength limit state for not less than 75 percent of the factored flexural, shear, or axial resistance of the member or element.

**Allowable Fatigue Stress** [AASHTO 6.6.1]

A bolted splice is considered to be a Class B fatigue detail. Fatigue 2 load combination.

$$f_{allow} = (\Delta F)_{TH}$$

$f_{allow} = 16.0$  ksi [AASHTO Table 6.6.1.2.5-3]

**Edge Distances** [AASHTO 6.13.2.6.6 & ODOT BDM 302.4.1.14.a]

The edge distances provided in LRFD 6.13.2.6.6 are absolute minimums allowed during fabrication. For design and detailing purposes, 0.25 in. shall be added to the minimum edge distances listed in Table 6.13.2.6.6-1.

7/8" diameter bolts used. Assume sheared edges used.

AASHTO Edge Dist. = **1.50** in

Minimum edge dist. = **1.75** in

Flanges: Max Edge Distance: **4.00** in [6.13.2.6.6]  
(4 x thickness of thinnest plate)

Max. Spacing for Sealing Requirement:  $s < 4.0 + 4.0t < 7.0$  in  
min. flange plate  $t = 0.50$  in  
 $s = 6.00$  in

RFI 447 - Stringer Field Splice  
 Threads included for Flanges  
 10" deck

Made : KDG 05-23-13  
 Checked: MCC 05-23-13  
 B'Chked: KDG 05-23-13

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

HNTB BRIDGE DESIGN PROGRAM SPLICE-1.111 PAGE 1  
 RUN TIME: 05/22/2013 19:37:36.163 PROGRAM'S INTERPRETATION OF INPUT DATA MADE BY: DATE  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesig CHECKED BY: DATE  
 BACKCHECKED BY: DATE  
 INPUT FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\stringers\_080711.bdf  
 INPUT FILE DATE: 05/22/2013 19:21:30  
 DLL VERSION: 1.1.1.1 DATE: 1/10/2013  
 SPLICE LABEL: String 8ft 10in deck BDFFILE ID: 4636  
 GIRDER DESIGN DATA OBTAINED FROM \*.DAT FILE:  
 FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\SteelDsn\Stringer A.dat  
 DATE: 05/22/2013 18:40:54 DATA: UNLOCKED

----- JOB DESCRIPTION -----  
 JOB NUMBER: 49633  
 JOB NAME: Cleveland Innerbelt  
 USER NAME: KDG  
 DESIGN CODE: AASHTO 2010  
 UNITS: (English)

----- DESIGN PARAMETERS -----  
 DESIGN CRITERIA: BOLT DATA:  
 DESIGN METHOD: LRF Design BOLT DIA: 0.875 (in)  
 DESIGN PERCENT: 75% HOLE DIA: 1.000 (in)  
 COMPOSITE: Yes ALLOW SHEAR STRESS: 45.6 (ksi)  
 DESIGN/CAPACITY? Capacity Check ALLOW SLIP STRESS: 21.4 (ksi)  
 INCLUDE REINFORCING STEEL IN NEGATIVE MOMENT REGIONS? No HOLE REDUCTION FACTOR Rp: 1.00  
 FATIGUE ALLOWABLE STRESS RANGE: 16.00 (ksi)  
 FATIGUE LIMIT STATE: FAT I

----- GIRDER AND SLAB DATA -----  
 LEFT GIRDER: RIGHT GIRDER: SLAB DATA:  
 TOP FLANGE: THICK: 0.870 (in) TOP FLANGE: THICK: 0.870 (in) OVERLAY: THICK: 0.00 (in)  
 WIDTH: 11.100 (in) WIDTH: 11.100 (in) WIDTH: 0.00 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) F'c: 0.0 (ksi)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) E: 0 (ksi)  
 E: 29000 (ksi) E: 29000 (ksi)  
 BOT FLANGE: THICK: 0.870 (in) BOT FLANGE: THICK: 0.870 (in) SLAB THICK: 9.00 (in)  
 WIDTH: 11.100 (in) WIDTH: 11.100 (in) WIDTH: 160.70 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) HAUNCH THICK: 2.00 (in)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) HAUNCH WIDTH: 11.10 (in)  
 E: 29000 (ksi) E: 29000 (ksi) F'c: 4.5 (ksi)  
 E: 3824 (ksi)  
 WEB: THICK: 0.535 (in) WEB: THICK: 0.535 (in) BAR LAYER(1) AREA: 0.00 (sq-in)  
 DEPTH: 16.850 (in) DEPTH: 16.850 (in) YBAR: 0.00 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) BAR LAYER(2) AREA: 0.00 (sq-in)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) YBAR: 0.00 (in)  
 E: 29000 (ksi) E: 29000 (ksi) Fu: 0.0 (ksi)  
 E: 0 (ksi)

----- SPLICE PLATE DATA -----  
 TOP FLANGE GEOMETRY: BOT FLANGE GEOMETRY: WEB GEOMETRY:  
 TOTAL NUM LONG ROWS: 2 TOTAL NUM LONG ROWS: 2 TOTAL NUM HORIZ ROWS: 4  
 TOTAL NUM TRAN COLS: 10 TOTAL NUM TRAN COLS: 10 TOTAL NUM VERT COLS: 4  
 LONG CROSSOVER DIST: 5.250 (in) LONG CROSSOVER DIST: 6.000 (in) TRAN CROSSOVER DIST: 5.250 (in)  
 TRAN CROSSOVER DIST: 6.000 (in) TRAN CROSSOVER DIST: 6.000 (in) COLUMN SPACING: 2.750 (in)  
 TRAN ROW SPACING: 0.000 (in) TRAN ROW SPACING: 0.000 (in) GAP BETWEEN GRDS: 2.000 (in)  
 TRAN EDGE DISTANCE: 2.562 (in) TRAN EDGE DISTANCE: 2.562 (in) HORZ EDGE DISTANCE: 1.750 (in)  
 LONG END DISTANCE: 1.625 (in) LONG END DISTANCE: 1.625 (in) VERT END DISTANCE: 2.250 (in)  
 LONG COL SPACING: 2.750 (in) LONG COL SPACING: 2.750 (in) WEB PL THK: 0.750 (in)  
 OUTSIDE PL WIDTH: 11.125 (in) OUTSIDE PL WIDTH: 11.125 (in) BOLT SPACING: 3.000 (in)  
 INSIDE PL WIDTH: 4.000 (in) INSIDE PL WIDTH: 4.000 (in) TOP CLR DIST: 1.675 (in)  
 OUTSIDE PL THK: 0.500 (in) OUTSIDE PL THK: 0.500 (in) BOT CLR DIST: 1.675 (in)  
 INSIDE PL THK: 0.625 (in) INSIDE PL THK: 0.625 (in)  
 STAGGER(1) DIST: 0.000 (in) STAGGER(1) DIST: 0.000 (in)  
 STAGGER(2) DIST: 0.000 (in) STAGGER(2) DIST: 0.000 (in)

SPLICE PLATE MATERIAL DATA:  
 TOP FLANGE SPLICE: BOTTOM FLANGE SPLICE: WEB SPLICE:  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) Fu: 50.0 (ksi)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) Fu: 65.0 (ksi)  
 E: 29000 (ksi) E: 29000 (ksi) E: 29000 (ksi)

----- INPUT CAPACITY PARAMETERS -----

LOAD NO.	LEFT GIRDER				RIGHT GIRDER			
	WEB SHEAR CAPACITY (kips)	TOP FL HYBRID FACTOR	BOT FL HYBRID FACTOR	FLANGE CAPACITY FACTOR	WEB SHEAR CAPACITY (kips)	TOP FL HYBRID FACTOR	BOT FL HYBRID FACTOR	FLANGE CAPACITY FACTOR
1	261	1.000	1.000	1.000	261	1.000	1.000	1.000
2	261	1.000	1.000	1.000	261	1.000	1.000	1.000
3	261	1.000	1.000	1.000	261	1.000	1.000	1.000
4	261	1.000	1.000	1.000	261	1.000	1.000	1.000
5	261	1.000	1.000	1.000	261	1.000	1.000	1.000
6	261	1.000	1.000	1.000	261	1.000	1.000	1.000
7	261	1.000	1.000	1.000	261	1.000	1.000	1.000
8	261	1.000	1.000	1.000	261	1.000	1.000	1.000
9	261	1.000	1.000	1.000	261	1.000	1.000	1.000
10	261	1.000	1.000	1.000	261	1.000	1.000	1.000

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

----- LOAD DATA -----

LOAD NO.	LIMIT STATE	DC-DEAD LOAD (NON-COMP)					FACTORED DEAD LOADS				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
1	CONSTR	0	19	64	0	0	0	0	0	0	0

HNTB BRIDGE DESIGN PROGRAM SPLICE-1.111 PAGE 2

RUN TIME: 05/22/2013 19:37:36.163 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- LOAD DATA -----

LOAD NO.	LIMIT STATE	DC-DEAD LOAD (NON-COMP)					FACTORED DEAD LOADS				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
2	CONSTR	0	19	64	0	0	0	0	1	0	0
3	STR I	0	16	53	0	0	0	0	1	0	0
4	STR I	0	16	53	0	0	0	0	1	0	0
5	STR I	0	16	53	0	0	0	0	1	0	0
6	STR I	0	16	53	0	0	0	0	1	0	0
7	STR I	0	10	35	0	0	0	0	1	0	0
8	STR I	0	10	35	0	0	0	0	1	0	0
9	STR I	0	10	35	0	0	0	0	1	0	0
10	STR I	0	10	35	0	0	0	0	1	0	0
11	SER II	0	12	40	0	0	0	0	1	0	0
12	SER II	0	12	40	0	0	0	0	1	0	0
13	SER II	0	12	40	0	0	0	0	1	0	0
14	SER II	0	12	40	0	0	0	0	1	0	0
15	FAT I	0	12	40	0	0	0	0	1	0	0
16	FAT I	0	12	40	0	0	0	0	1	0	0
17	FAT I	0	12	40	0	0	0	0	1	0	0
18	FAT I	0	12	40	0	0	0	0	1	0	0
19	FAT I	0	12	40	0	0	0	0	1	0	0
20	FAT I	0	12	40	0	0	0	0	1	0	0
21	FAT I	0	12	40	0	0	0	0	1	0	0
22	FAT I	0	12	40	0	0	0	0	1	0	0

----- FACTORED DEAD LOADS -----

LOAD NO.	LIMIT STATE	DC-DEAD LOAD (3n COMP)					FACTORED LIVE LOADS					OVER LOAD FACT
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	
1	CONSTR	0	0	0	0	0	0	0	0	0	0	1.000
2	CONSTR	0	8	23	0	0	0	0	0	0	0	1.000
3	STR I	0	8	23	0	0	0	41	364	0	0	1.000
4	STR I	0	0	0	0	0	0	7	-134	0	0	1.000
5	STR I	0	8	23	0	0	0	115	330	0	0	1.000
6	STR I	0	0	0	0	0	0	-33	272	0	0	1.000
7	STR I	0	3	9	0	0	0	37	330	0	0	1.000
8	STR I	0	0	0	0	0	0	6	-121	0	0	1.000
9	STR I	0	3	9	0	0	0	104	300	0	0	1.000
10	STR I	0	0	0	0	0	0	-30	246	0	0	1.000
11	SER II	0	5	14	0	0	0	29	257	0	0	1.000
12	SER II	0	0	0	0	0	0	5	-95	0	0	1.000
13	SER II	0	5	14	0	0	0	81	234	0	0	1.000
14	SER II	0	0	0	0	0	0	-23	192	0	0	1.000
15	FAT I	0	5	14	0	0	0	35	118	0	0	1.000
16	FAT I	0	5	14	0	0	0	3	-38	0	0	1.000
17	FAT I	0	5	14	0	0	0	35	116	0	0	1.000
18	FAT I	0	5	14	0	0	0	-13	112	0	0	1.000
19	FAT I	0	5	14	0	0	0	17	59	0	0	1.000
20	FAT I	0	5	14	0	0	0	1	-19	0	0	1.000
21	FAT I	0	5	14	0	0	0	17	58	0	0	1.000
22	FAT I	0	5	14	0	0	0	-7	56	0	0	1.000

----- TOTAL FACTORED LOADS -----

LOAD CASE	LIMIT STATE	TOTAL FACTORED LOADS					OVERLOADS (SLIP)				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
1	CONSTR	0	19	64	0	0	0	19	64	0	0
2	CONSTR	0	27	88	0	0	0	27	88	0	0
3	STR I	0	65	441	0	0	0	0	0	0	0
4	STR I	0	23	-79	0	0	0	0	0	0	0
5	STR I	0	139	408	0	0	0	0	0	0	0
6	STR I	0	-17	326	0	0	0	0	0	0	0
7	STR I	0	51	374	0	0	0	0	0	0	0
8	STR I	0	17	-86	0	0	0	0	0	0	0
9	STR I	0	118	344	0	0	0	0	0	0	0
10	STR I	0	-19	282	0	0	0	0	0	0	0
11	SER II	0	0	0	0	0	0	46	313	0	0
12	SER II	0	0	0	0	0	0	17	-53	0	0
13	SER II	0	0	0	0	0	0	98	290	0	0
14	SER II	0	0	0	0	0	0	-11	233	0	0
15	FAT I	0	52	174	0	0	0	0	0	0	0
16	FAT I	0	20	18	0	0	0	0	0	0	0
17	FAT I	0	52	172	0	0	0	0	0	0	0
18	FAT I	0	-1	168	0	0	0	0	0	0	0
19	FAT I	0	35	115	0	0	0	0	0	0	0
20	FAT I	0	19	37	0	0	0	0	0	0	0
21	FAT I	0	35	114	0	0	0	0	0	0	0
22	FAT I	0	11	112	0	0	0	0	0	0	0

----- SECTION PROPERTY DATA -----

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

	LEFT GIRDER: (POS STRENGTH - Ag)			RIGHT GIRDER: (POS STRENGTH - Ag)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (in³):	0	4410	1418	0	4410	1418
S TOP OF TOPFL (in³):	186	-2301	-6339	186	-2301	-6339
S MIDDLE TOPFL (in³):	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (in³):	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (in³):	205	397	348	205	397	348
S MIDDLE BOTFL (in³):	195	389	340	195	389	340
S BOT OF BOTFL (in³):	186	382	333	186	382	333

HNTB BRIDGE DESIGN PROGRAM SPLICE-1.111 PAGE 3  
 RUN TIME: 05/22/2013 19:37:36.163 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- SECTION PROPERTY DATA -----

	LEFT GIRDER: (NEG STRENGTH - Ag)			RIGHT GIRDER: (NEG STRENGTH - Ag)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1731	1731	1731	1731	1731	1731
S MIDDLE SLAB (in³):	0	0	0	0	0	0
S TOP OF TOPFL (in³):	186	186	186	186	186	186
S MIDDLE TOPFL (in³):	195	195	195	195	195	195
S TOP OF WEB (in³):	205	205	205	205	205	205
S BOT OF WEB (in³):	205	205	205	205	205	205
S MIDDLE BOTFL (in³):	195	195	195	195	195	195
S BOT OF BOTFL (in³):	186	186	186	186	186	186

	LEFT GIRDER: (POS STRENGTH - BOTH FL Ae)			RIGHT GIRDER: (POS STRENGTH - BOTH FL Ae)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1575	8019	6154	1575	8019	6154
S MIDDLE SLAB (in³):	0	4426	1407	0	4426	1407
S TOP OF TOPFL (in³):	169	-2100	-4897	169	-2100	-4897
S MIDDLE TOPFL (in³):	178	-1885	-3638	178	-1885	-3638
S TOP OF WEB (in³):	187	-1710	-2894	187	-1710	-2894
S BOT OF WEB (in³):	187	372	324	187	372	324
S MIDDLE BOTFL (in³):	178	365	317	178	365	317
S BOT OF BOTFL (in³):	169	358	310	169	358	310

	LEFT GIRDER: (NEG STRENGTH - BOTH FL Ae)			RIGHT GIRDER: (NEG STRENGTH - BOTH FL Ae)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1575	1575	1575	1575	1575	1575
S MIDDLE SLAB (in³):	0	0	0	0	0	0
S TOP OF TOPFL (in³):	169	169	169	169	169	169
S MIDDLE TOPFL (in³):	178	178	178	178	178	178
S TOP OF WEB (in³):	187	187	187	187	187	187
S BOT OF WEB (in³):	187	187	187	187	187	187
S MIDDLE BOTFL (in³):	178	178	178	178	178	178
S BOT OF BOTFL (in³):	169	169	169	169	169	169

----- GIRDER STRESS DATA -----

GIRDER FLANGE STRESSES AT END OF SPLICE:

ITEM	TOP FLANGE				BOTTOM FLANGE			
	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG
LT GIRDER FLEXURAL STRESS:	8	6.07	50.00		3	16.89	50.00	
LT GIRDER FLEXURAL STRESS 6.10.1.8:	8	5.52	44.76		3	15.72	44.76	
RT GIRDER FLEXURAL STRESS:	8	6.07	50.00		3	16.89	50.00	
RT GIRDER FLEXURAL STRESS 6.10.1.8:	8	5.52	44.76		3	15.72	44.76	

BOLT STAGGERING:  
 TOP FLANGE BOLTS WILL NOT REQUIRE STAGGERING.  
 BOTTOM FLANGE BOLTS WILL NOT REQUIRE STAGGERING.

SHEAR STRESS ON GIRDER WEB:

ITEM	SHEAR ON GIRDER WEB		
	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)
SHEAR STRESS ON LT GIRDER WEB Ag:	5	22.18	29.00
SHEAR STRESS ON LT GIRDER WEB An:	5	29.09	30.16
SHEAR STRESS ON RT GIRDER WEB Ag:	5	22.18	29.00
SHEAR STRESS ON RT GIRDER WEB An:	5	29.09	30.16

BEARING ON GIRDER FLANGES AND WEB:

ITEM	BEARING ON GIRDER PLATES				FAILURE CASE LEGEND:	
	LOAD CASE	FAIL CASE	APPLIED FORCE (kips)	RESISTANCE END (kips)	øRn	NG
BEARING ON LT GIRDER TOP FLANGE:	3	L	181.07	380.02	95.00	475.02
BEARING ON LT GIRDER BOT FLANGE:	4	L	181.07	380.02	95.00	475.02
BEARING ON LT GIRDER WEB PL:	5	R	50.02	0.00	58.42	58.42
FH: 34.98 (kips)						
FV: 35.76 (kips)						
EDGE DISTANCE: 1.82 (in)						
BEARING ON RT GIRDER TOP FLANGE:	3	L	181.07	380.02	95.00	475.02
BEARING ON RT GIRDER BOT FLANGE:	4	L	181.07	380.02	95.00	475.02
BEARING ON RT GIRDER WEB PL:	5	R	50.02	0.00	58.42	58.42
FH: 34.98 (kips)						
FV: 35.76 (kips)						
EDGE DISTANCE: 1.82 (in)						

----- GIRDER BLOCK SHEAR CHECK -----

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

GIRDER BLOCK SHEAR CHECK:	PLATE	LOAD	FAIL	AREA	AREA	AREA	AREA	BLOCK	ALLOW	NG
		CASE	MODE	Atn (sq-in)	Atg (sq-in)	Avn (sq-in)	Avg (sq-in)	FORCE (kips)	ØRn (kips)	
	LT GIRDER TOPFL	4	1	3.57	4.44	14.14	21.97	325	604	
	RT GIRDER TOPFL	4	1	3.57	4.44	14.14	21.97	325	604	
	LT GIRDER BOTFL	3	1	3.57	4.44	14.14	21.97	325	604	
	RT GIRDER BOTFL	3	1	3.57	4.44	14.14	21.97	325	604	
	LT GIRDER WEB	5	1	3.41	5.28	5.04	6.91	200	338	
	RT GIRDER WEB	5	1	3.41	5.28	5.04	6.91	200	338	

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 4  
RUN TIME: 05/22/2013 19:37:36.163 OUTPUT  
Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- FLANGE SPLICE DESIGN DATA -----

Note: Positive stresses are tensile.

LEFT GIRDER FLANGE DESIGN DATA:														
LOAD CASE	CONTROLLING FLANGE DATA						NON-CONTROLLING FLANGE DATA							
	TOP/BOT	f <sub>cf</sub> (ksi)	R <sub>h</sub>	alpha	F <sub>cf</sub> (ksi)	Area (sq-in)	P <sub>cf</sub> (kips)	TOP/BOT	f <sub>ncf</sub> (ksi)	R <sub>h</sub>	alpha	F <sub>ncf</sub> (ksi)	Area (sq-in)	P <sub>ncf</sub> (kips)
1	BOT	4.30	1.000	1.000	4.30	8.67	37	TOP	-4.30	1.000	1.000	-4.30	9.66	-42
2	BOT	5.22	1.000	1.000	5.22	8.67	45	TOP	-4.22	1.000	1.000	-4.22	9.66	-41
3	BOT	16.45	1.000	1.000	37.50	8.67	325	TOP	-1.19	1.000	1.000	-37.50	9.66	-362
4	BOT	-5.35	1.000	1.000	-37.50	9.66	-362	TOP	5.35	1.000	1.000	37.50	8.67	325
5	BOT	15.36	1.000	1.000	37.50	8.67	325	TOP	-1.40	1.000	1.000	-37.50	9.66	-362
6	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-1.85	1.000	1.000	-37.50	9.66	-362
7	BOT	13.56	1.000	1.000	37.50	8.67	325	TOP	-0.21	1.000	1.000	-37.50	9.66	-362
8	BOT	-5.78	1.000	1.000	-37.50	9.66	-362	TOP	5.78	1.000	1.000	37.50	8.67	325
9	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-0.40	1.000	1.000	-37.50	9.66	-362
10	BOT	10.47	1.000	1.000	37.50	8.67	325	TOP	-0.77	1.000	1.000	-37.50	9.66	-362

RIGHT GIRDER FLANGE DESIGN DATA:														
LOAD CASE	CONTROLLING FLANGE DATA						NON-CONTROLLING FLANGE DATA							
	TOP/BOT	f <sub>cf</sub> (ksi)	R <sub>h</sub>	alpha	F <sub>cf</sub> (ksi)	Area (sq-in)	P <sub>cf</sub> (kips)	TOP/BOT	f <sub>ncf</sub> (ksi)	R <sub>h</sub>	alpha	F <sub>ncf</sub> (ksi)	Area (sq-in)	P <sub>ncf</sub> (kips)
1	BOT	4.30	1.000	1.000	4.30	8.67	37	TOP	-4.30	1.000	1.000	-4.30	9.66	-42
2	BOT	5.22	1.000	1.000	5.22	8.67	45	TOP	-4.22	1.000	1.000	-4.22	9.66	-41
3	BOT	16.45	1.000	1.000	37.50	8.67	325	TOP	-1.19	1.000	1.000	-37.50	9.66	-362
4	BOT	-5.35	1.000	1.000	-37.50	9.66	-362	TOP	5.35	1.000	1.000	37.50	8.67	325
5	BOT	15.36	1.000	1.000	37.50	8.67	325	TOP	-1.40	1.000	1.000	-37.50	9.66	-362
6	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-1.85	1.000	1.000	-37.50	9.66	-362
7	BOT	13.56	1.000	1.000	37.50	8.67	325	TOP	-0.21	1.000	1.000	-37.50	9.66	-362
8	BOT	-5.78	1.000	1.000	-37.50	9.66	-362	TOP	5.78	1.000	1.000	37.50	8.67	325
9	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-0.40	1.000	1.000	-37.50	9.66	-362
10	BOT	10.47	1.000	1.000	37.50	8.67	325	TOP	-0.77	1.000	1.000	-37.50	9.66	-362

LEFT GIRDER FLANGE OVERLOAD SLIP DATA:												
LOAD CASE	TOP FLANGE DATA						BOTTOM FLANGE DATA					
	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)
1	-3.91	1.000	9.66	-38	3.91	1.000	9.66	38				
2	-3.85	1.000	9.66	-37	4.77	1.000	9.66	46				
11	-0.94	1.000	9.66	-9	10.96	1.000	9.66	106				
12	3.26	1.000	9.66	31	-3.26	1.000	9.66	-31				
13	-1.08	1.000	9.66	-10	10.23	1.000	9.66	99				
14	-1.36	1.000	9.66	-13	8.44	1.000	9.66	81				

RIGHT GIRDER FLANGE OVERLOAD SLIP DATA:												
LOAD CASE	TOP FLANGE DATA						BOTTOM FLANGE DATA					
	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)
1	-3.91	1.000	9.66	-38	3.91	1.000	9.66	38				
2	-3.85	1.000	9.66	-37	4.77	1.000	9.66	46				
11	-0.94	1.000	9.66	-9	10.96	1.000	9.66	106				
12	3.26	1.000	9.66	31	-3.26	1.000	9.66	-31				
13	-1.08	1.000	9.66	-10	10.23	1.000	9.66	99				
14	-1.36	1.000	9.66	-13	8.44	1.000	9.66	81				

TOP FLANGE SPLICE PLATES:  
TOTAL DESIGN FORCE: 325 (kips) (T)      -362 (kips) (C)  
TOTAL SLIP FORCE: -38 (kips)

TOP OUTSIDE PLATES:  
PLATE DIMS:      WIDTH: 11.125 (in)      THICK: 0.500 (in)      LENGTH: 30.500 (in)  
FILL PLATE LEFT: NONE REQUIRED  
FILL PLATE RIGHT: NONE REQUIRED  
TOTAL PLATE AREA:      An: 4.56 (sq-in)      Ae: 4.99 (sq-in)      Ag: 5.56 (sq-in)  
TOTAL NUM COLS OF BOLTS: 10 (BOTH SIDES)  
TOTAL NUM ROWS OF BOLTS: 2  
DESIGN FORCE: -191 (kips)  
SLIP FORCE: -19 (kips)

TOP INSIDE PLATES:  
PLATE DIMS:      WIDTH: 4.000 (in)      THICK: 0.625 (in)      LENGTH: 30.500 (in)  
TOTAL PLATE AREA:      An: 3.75 (sq-in)      Ae: 4.11 (sq-in)      Ag: 5.00 (sq-in) (Both Plates)  
DESIGN FORCE: -171 (kips)  
SLIP FORCE: -19 (kips)

TOP FLANGE SPLICE PLATE STRESS SUMMARY: (BOLT STRESSES BASED ON 10 BOLTS)

LOAD	OUTSIDE PLATES			INSIDE PLATES		
	ACTUAL	ALLOW		ACTUAL	ALLOW	

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

ITEM	CASE	STRESS (ksi)	STRESS (ksi)	NG	CASE	STRESS (ksi)	STRESS (ksi)	NG
AXIAL STRESS ON SPLICE PLATE Ag:	3	-34.29	45.00		3	-34.29	45.00	
SHEAR STRESS ON BOLT:	3	31.72	36.48		3	28.51	36.48	
SLIP STRESS ON BOLT:	1	3.14	21.40		1	3.14	21.40	

BEARING ON TOP FLANGE SPLICE PL:

ITEM	CASE	FAIL CASE	BEARING ON TOP FLANGE SPLICE PLATES		RESISTANCE øRn	END HOLES	TOTAL HOLES	NG	FAILURE CASE
			APPLIED FORCE Ru (kips)	INT HOLES (kips)					
BEARING ON OUTSIDE FLANGE SPL PL:	10	L	95.36	218.40	54.60	273.00			L: Longitudinal
BEARING ON INSIDE FLANGE SPL PL:	10	L	85.71	273.00	68.25	341.25			T: Transverse R: Resultant

HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 05/22/2013 19:37:36.163  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- FLANGE SPLICE DESIGN DATA -----

BOTTOM FLANGE SPLICE PLATES:

TOTAL DESIGN FORCE: 325 (kips) (T) -362 (kips) (C)  
 TOTAL SLIP FORCE: 106 (kips)

BOTTOM OUTSIDE PLATES:

PLATE DIMS: WIDTH: 11.125 (in) THICK: 0.500 (in) LENGTH: 30.500 (in)  
 FILL PLATE LEFT: NONE REQUIRED  
 FILL PLATE RIGHT: NONE REQUIRED  
 TOTAL PLATE AREA: An: 4.56 (sq-in) Ae: 4.99 (sq-in) Ag: 5.56 (sq-in)  
 TOTAL NUM COLS OF BOLTS: 10 (BOTH SIDES)  
 TOTAL NUM ROWS OF BOLTS: 2  
 DESIGN FORCE: -191 (kips)  
 SLIP FORCE: 53 (kips)

BOTTOM INSIDE PLATES:

PLATE DIMS: WIDTH: 4.000 (in) THICK: 0.625 (in) LENGTH: 30.500 (in)  
 TOTAL PLATE AREA: An: 3.75 (sq-in) Ae: 4.11 (sq-in) Ag: 5.00 (sq-in) (Both Plates)  
 DESIGN FORCE: -171 (kips)  
 SLIP FORCE: 53 (kips)

BOTTOM FLANGE SPLICE PLATE STRESS SUMMARY: (BOLT STRESSES BASED ON 10 BOLTS)

ITEM	CASE	OUTSIDE PLATES			INSIDE PLATES		
		LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)
AXIAL STRESS ON SPLICE PLATE Ag:	4	-34.29	45.00		4	-34.29	45.00
SHEAR STRESS ON BOLT:	4	31.72	36.48		4	28.51	36.48
SLIP STRESS ON BOLT:	11	8.80	21.40		11	8.80	21.40

BEARING ON BOTTOM FLANGE SPLICE PL:

ITEM	CASE	FAIL CASE	BEARING ON BOT FLANGE SPLICE PLATES		RESISTANCE øRn	END HOLES	TOTAL HOLES	NG	FAILURE CASE
			APPLIED FORCE Ru (kips)	INT HOLES (kips)					
BEARING ON OUTSIDE FLANGE SPL PL:	8	L	95.36	218.40	54.60	273.00			L: Longitudinal
BEARING ON INSIDE FLANGE SPL PL:	8	L	85.71	273.00	68.25	341.25			T: Transverse R: Resultant

----- SPLICE PLATE BLOCK SHEAR CHECK -----

SPLICE PLATE BLOCK SHEAR CHECK:

PLATE	LOAD CASE	FAIL MODE	AREA Atn (sq-in)	AREA Atg (sq-in)	AREA Avn (sq-in)	AREA Avg (sq-in)	BLOCK FORCE (kips)	ALLOW øRn (kips)	NG
TOP OUTSIDE	4	1	2.06	2.56	8.12	12.62	171	348	
TOP INSIDE	4	1	1.88	2.50	10.16	15.78	154	406	
BOT OUTSIDE	3	1	2.06	2.56	8.12	12.62	171	348	
BOT INSIDE	3	1	1.88	2.50	10.16	15.78	154	406	
WEB PLATE	5	1	4.88	7.50	5.81	8.44	100	449	

----- WEB SPLICE DESIGN DATA -----

WEB SPLICE STRENGTH DESIGN DATA:

LOAD CASE	DESIGN FLANGE	ECCENTRIC SHEAR		PROPORTION OF FLEXURAL MOMENT					TOTAL	
		Vuv (kips)	Muv (ft-k)	Rh	Fcf (ksi)	Rcf	fnf (ksi)	Muv (ft-k)	Huv (kips)	Muv+Muv (ft-k)
1	TOP	19	11	1.000	4.30	1.000	-4.30	9	0	20
	BOT	19	11	1.000	4.30	1.000	-4.30	9	0	20
2	TOP	27	15	1.000	5.22	1.000	-4.22	10	5	25
	BOT	27	15	1.000	5.22	1.000	-4.22	10	5	25
3	TOP	97	55	1.000	37.50	2.279	-1.19	42	157	97
	BOT	97	55	1.000	37.50	2.279	-1.19	42	157	97
4	TOP	35	20	1.000	-37.50	7.012	5.35	79	0	99
	BOT	35	20	1.000	-37.50	7.012	5.35	79	0	99
5	TOP	200	112	1.000	37.50	2.442	-1.40	43	154	155
	BOT	200	112	1.000	37.50	2.442	-1.40	43	154	155
6	TOP	25	14	1.000	37.50	2.986	-1.85	45	144	59
	BOT	25	14	1.000	37.50	2.986	-1.85	45	144	59
7	TOP	76	43	1.000	37.50	2.766	-0.21	40	166	83
	BOT	76	43	1.000	37.50	2.766	-0.21	40	166	83
8	TOP	25	14	1.000	-37.50	6.484	5.78	79	0	93
	BOT	25	14	1.000	-37.50	6.484	5.78	79	0	93
9	TOP	176	99	1.000	37.50	2.985	-0.40	41	164	140
	BOT	176	99	1.000	37.50	2.985	-0.40	41	164	140

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out 5/22/2013, 7:37:36PM

LOAD DESIGN	Vwo	Mvo	fo	Fof	Mwo	Hwo	Mwo+Mvo
CASE FLANGE	(kips)	(ft-k)	(ksi)	(ksi)	(ft-k)	(kips)	(ft-k)
10 TOP	29	16	1.000	37.50	3.582	-0.77	42 157
10 BOT	29	16	1.000	37.50	3.582	-0.77	42 157

WEB SPLICE OVERLOAD SLIP STRESS DATA:

LOAD DESIGN	Vwo	Mvo	fo	Fof	Mwo	Hwo	Mwo+Mvo
CASE FLANGE	(kips)	(ft-k)	(ksi)	(ksi)	(ft-k)	(kips)	(ft-k)
11 TOP	46	26	-0.94	10.96	13	45	39
11 BOT	46	26	10.96	-0.94	13	45	39
12 TOP	17	10	3.26	-3.26	7	0	17
12 BOT	17	10	-3.26	3.26	7	0	17
13 TOP	98	55	-1.08	10.23	12	41	67
13 BOT	98	55	10.23	-1.08	12	41	67
14 TOP	11	6	-1.36	8.44	10	32	16
14 BOT	11	6	8.44	-1.36	10	32	16

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 6  
 RUN TIME: 05/22/2013 19:37:36.163 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- WEB SPLICE DESIGN DATA -----

WEB SPLICE PLATES:  
 PLATE DIMS: WIDTH: 25.250 (in) DEPTH: 13.500 (in) THICK: 0.750 (in)  
 LEFT FILL PLATE: NONE REQUIRED  
 RIGHT FILL PLATE: NONE REQUIRED  
 AREA OF ONE WEB SPLICE PL: An: 7.12 (sq-in) Ag: 10.12 (sq-in)  
 TOTAL NUM COLS OF BOLTS: 8 (BOTH SIDES)  
 TOTAL NUM ROWS OF BOLTS: 4  
 EXTREME BOLT DATA: Xmax: 4.125 (in) Ymax: 4.500 (in)  
 POLAR INERTIA OF BOLT GROUP: 331 (bolt-in<sup>2</sup>)

STRESSES:

ITEM	LOAD DESIGN	ACTUAL	ALLOW	NG
	CASE FLANGE	STRESS	STRESS	
		(ksi)	(ksi)	
WEB SPLICE PL FLEXURAL STRESS:	5 TOP	48.58	50.00	
SHEAR STRESS ON WEB SPLICE PL Ag:	5 TOP	9.88	29.00	
SHEAR STRESS ON WEB SPLICE PL An:	5 TOP	14.03	30.16	
SHEAR STRESS ON BOLT:	5 TOP	41.59	36.48	NG
SLIP STRESS ON BOLT:	13 BOT	17.55	21.40	

OK, This run not used for Web plate design.

BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)

ITEM	LOAD CASE	FAIL CASE	APPLIED FORCE Ru (kips)	INT HOLES (kips)	END HOLES (kips)	TOTAL (kips)	NG
BEARING ON WEB SPLICE PL:	5	RS	25.01	0.00	81.90	81.90	
FH:	17.49 (kips)						
FV:	17.88 (kips)						
EDGE DISTANCE:	2.00 (in)						

FAILURE CASE LEGEND:  
 H: Horizontal  
 V: Vertical  
 RS: Resultant (side)  
 RT: Resultant (top/bot)

----- SPLICE PLATE SECTION PROPERTY DATA -----

	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in <sup>4</sup> ):	1980	10841	7992
S MIDDLE SLAB (in <sup>3</sup> ):	0	4074	1358
S TOP/TOP SPL PL (in <sup>3</sup> ):	202	4390	10597
S BOT/BOT SPL PL (in <sup>3</sup> ):	202	491	424

----- FATIGUE STRESSES -----

TOP SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.  
 BOTTOM SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.

ITEM	DC	DC+DW	LOAD	FAT LL	LOAD	FAT LL	TOTAL	ALLOW	NG
	STRESS (ksi)	STRESS (ksi)	CASE	STRESS (ksi)	CASE	STRESS (ksi)	RANGE (ksi)	RANGE (ksi)	
FLEXURAL STRESS AT TOP OF TOP SPL PL:	-2.40	-0.02	15	0.32	16	-0.10	0.43	16.00	
FLEXURAL STRESS AT BOT OF BOT SPL PL:	2.40	0.44	15	2.89	16	-0.92	3.81	16.00	

Fatigue stress in Splice Plates Checked.  
 Loads will be carried by splice plates. No stresses will be in the beam ends. Therefore fatigue stress at the open holes is not an issue.

----- SPLICE PLATE DIMENSIONAL SUMMARY -----

\*\*\*\*\* SPLICE PLATE DIMENSIONAL SUMMARY SUPPRESSED DUE TO PROBLEM WITH WEB SPLICE DESIGN \*\*\*\*\*

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 7  
 RUN TIME: 05/22/2013 19:37:36.163 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_flange.out

----- WARNING MESSAGES -----

COMMENT NUMBER: 0  
 FIELD SPLICE run completed with 0 error(s) and 0 warning(s)!

BEGIN TIME: 05/22/2013 19:37:35  
 END TIME: 05/22/2013 19:37:36  
 ELAPSED TIME: 00:00:01



RFI 447 - Stringer Field Splice  
 Threads Excluded for Web  
 10" Deck

Made: KDG 05-23-13  
 Checked: MCC 05-23-13  
 B'Chked: KDG 05-23-13

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

HNTB BRIDGE DESIGN PROGRAM SPLICE-1.111 PAGE 1  
 RUN TIME: 05/22/2013 19:39:49.581 PROGRAM'S INTERPRETATION OF INPUT DATA MADE BY: \_\_\_\_\_ DATE \_\_\_\_\_  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesig CHECKED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
BACKCHECKED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
 INPUT FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\stringers\_080711.bdf  
 INPUT FILE DATE: 05/22/2013 19:21:30  
 DLL VERSION: 1.1.1.1 DATE: 1/10/2013  
 SPLICE LABEL: String 8ft 10in deck BDFFILE ID: 4636  
 GIRDER DESIGN DATA OBTAINED FROM \*.DAT FILE:  
 FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\SteelDsn\Stringer A.dat  
 DATE: 05/22/2013 18:40:54 DATA: UNLOCKED

----- JOB DESCRIPTION -----  
 JOB NUMBER: 49633  
 JOB NAME: Cleveland Innerbelt  
 USER NAME: KDG  
 DESIGN CODE: AASHTO 2010  
 UNITS: (English)

----- DESIGN PARAMETERS -----  
 DESIGN CRITERIA: BOLT DATA:  
 DESIGN METHOD: LRF Design BOLT DIA: 0.875 (in)  
 DESIGN PERCENT: 75% HOLE DIA: 1.000 (in)  
 COMPOSITE: Yes ALLOW SHEAR STRESS: 57.6 (ksi)  
 DESIGN/CAPACITY? Capacity Check ALLOW SLIP STRESS: 21.4 (ksi)  
 INCLUDE REINFORCING STEEL IN NEGATIVE MOMENT REGIONS? No HOLE REDUCTION FACTOR Rp: 1.00  
 FATIGUE ALLOWABLE STRESS RANGE: 16.00 (ksi)  
 FATIGUE LIMIT STATE: FAT I

----- GIRDER AND SLAB DATA -----  
 LEFT GIRDER: RIGHT GIRDER: SLAB DATA:  
 TOP FLANGE: THICK: 0.870 (in) TOP FLANGE: THICK: 0.870 (in) OVERLAY: THICK: 0.00 (in)  
 WIDTH: 11.100 (in) WIDTH: 11.100 (in) WIDTH: 0.00 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) F'c: 0.0 (ksi)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) E: 0 (ksi)  
 E: 29000 (ksi) E: 29000 (ksi)  
 BOT FLANGE: THICK: 0.870 (in) BOT FLANGE: THICK: 0.870 (in) SLAB THICK: 9.00 (in)  
 WIDTH: 11.100 (in) WIDTH: 11.100 (in) WIDTH: 160.70 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) HAUNCH THICK: 2.00 (in)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) HAUNCH WIDTH: 11.10 (in)  
 E: 29000 (ksi) E: 29000 (ksi) F'c: 4.5 (ksi)  
E: 3824 (ksi)  
 WEB: THICK: 0.535 (in) WEB: THICK: 0.535 (in) BAR LAYER(1) AREA: 0.00 (sq-in)  
 DEPTH: 16.850 (in) DEPTH: 16.850 (in) YBAR: 0.00 (in)  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) BAR LAYER(2) AREA: 0.00 (sq-in)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) YBAR: 0.00 (in)  
 E: 29000 (ksi) E: 29000 (ksi) Fu: 0.0 (ksi)  
E: 0 (ksi)

----- SPLICE PLATE DATA -----  
 TOP FLANGE GEOMETRY: BOT FLANGE GEOMETRY: WEB GEOMETRY:  
 TOTAL NUM LONG ROWS: 2 TOTAL NUM LONG ROWS: 2 TOTAL NUM HORIZ ROWS: 4  
 TOTAL NUM TRAN COLS: 10 TOTAL NUM TRAN COLS: 10 TOTAL NUM VERT COLS: 4  
 LONG CROSSOVER DIST: 5.250 (in) LONG CROSSOVER DIST: 5.250 (in) TRAN CROSSOVER DIST: 5.250 (in)  
 TRAN CROSSOVER DIST: 6.000 (in) TRAN CROSSOVER DIST: 6.000 (in) COLUMN SPACING: 2.750 (in)  
 TRAN ROW SPACING: 0.000 (in) TRAN ROW SPACING: 0.000 (in) GAP BETWEEN GRDS: 2.000 (in)  
 TRAN EDGE DISTANCE: 2.562 (in) TRAN EDGE DISTANCE: 2.562 (in) HORIZ EDGE DISTANCE: 1.750 (in)  
 LONG END DISTANCE: 1.625 (in) LONG END DISTANCE: 1.625 (in) VERT END DISTANCE: 2.250 (in)  
 LONG COL SPACING: 2.750 (in) LONG COL SPACING: 2.750 (in) WEB PL THK: 0.750 (in)  
 OUTSIDE PL WIDTH: 11.125 (in) OUTSIDE PL WIDTH: 11.125 (in) BOLT SPACING: 3.000 (in)  
 INSIDE PL WIDTH: 4.000 (in) INSIDE PL WIDTH: 4.000 (in) TOP CLR DIST: 1.675 (in)  
 OUTSIDE PL THK: 0.500 (in) OUTSIDE PL THK: 0.500 (in) BOT CLR DIST: 1.675 (in)  
 INSIDE PL THK: 0.625 (in) INSIDE PL THK: 0.625 (in)  
 STAGGER(1) DIST: 0.000 (in) STAGGER(1) DIST: 0.000 (in)  
 STAGGER(2) DIST: 0.000 (in) STAGGER(2) DIST: 0.000 (in)

SPLICE PLATE MATERIAL DATA:  
 TOP FLANGE SPLICE: BOTTOM FLANGE SPLICE: WEB SPLICE:  
 Fu: 50.0 (ksi) Fu: 50.0 (ksi) Fu: 50.0 (ksi)  
 Fu: 65.0 (ksi) Fu: 65.0 (ksi) Fu: 65.0 (ksi)  
 E: 29000 (ksi) E: 29000 (ksi) E: 29000 (ksi)

----- INPUT CAPACITY PARAMETERS -----

LOAD NO.	LEFT GIRDER				RIGHT GIRDER			
	WEAR SHEAR CAPACITY (kips)	TOP FL HYBRID FACTOR	BOT FL HYBRID FACTOR	FLANGE CAPACITY FACTOR	WEAR SHEAR CAPACITY (kips)	TOP FL HYBRID FACTOR	BOT FL HYBRID FACTOR	FLANGE CAPACITY FACTOR
1	261	1.000	1.000	1.000	261	1.000	1.000	1.000
2	261	1.000	1.000	1.000	261	1.000	1.000	1.000
3	261	1.000	1.000	1.000	261	1.000	1.000	1.000
4	261	1.000	1.000	1.000	261	1.000	1.000	1.000
5	261	1.000	1.000	1.000	261	1.000	1.000	1.000
6	261	1.000	1.000	1.000	261	1.000	1.000	1.000
7	261	1.000	1.000	1.000	261	1.000	1.000	1.000
8	261	1.000	1.000	1.000	261	1.000	1.000	1.000
9	261	1.000	1.000	1.000	261	1.000	1.000	1.000
10	261	1.000	1.000	1.000	261	1.000	1.000	1.000

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

----- LOAD DATA -----

LOAD NO.	LIMIT STATE	DC-DEAD LOAD (NON-COMP)					FACTORED DEAD LOADS				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
1	CONSTR	0	19	64	0	0	0	0	0	0	0

HNTB BRIDGE DESIGN PROGRAM PAGE 2  
 RUN TIME: 05/22/2013 19:39:49.581 SPLICE-1.111  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out OUTPUT

----- LOAD DATA -----

LOAD NO.	LIMIT STATE	DC-DEAD LOAD (NON-COMP)					FACTORED DEAD LOADS				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
2	CONSTR	0	19	64	0	0	0	0	1	0	0
3	STR I	0	16	53	0	0	0	0	1	0	0
4	STR I	0	16	53	0	0	0	0	1	0	0
5	STR I	0	16	53	0	0	0	0	1	0	0
6	STR I	0	16	53	0	0	0	0	1	0	0
7	STR I	0	10	35	0	0	0	0	1	0	0
8	STR I	0	10	35	0	0	0	0	1	0	0
9	STR I	0	10	35	0	0	0	0	1	0	0
10	STR I	0	10	35	0	0	0	0	1	0	0
11	SER II	0	12	40	0	0	0	0	1	0	0
12	SER II	0	12	40	0	0	0	0	1	0	0
13	SER II	0	12	40	0	0	0	0	1	0	0
14	SER II	0	12	40	0	0	0	0	1	0	0
15	FAT I	0	12	40	0	0	0	0	1	0	0
16	FAT I	0	12	40	0	0	0	0	1	0	0
17	FAT I	0	12	40	0	0	0	0	1	0	0
18	FAT I	0	12	40	0	0	0	0	1	0	0
19	FAT I	0	12	40	0	0	0	0	1	0	0
20	FAT I	0	12	40	0	0	0	0	1	0	0
21	FAT I	0	12	40	0	0	0	0	1	0	0
22	FAT I	0	12	40	0	0	0	0	1	0	0

LOAD NO.	LIMIT STATE	FACTORED DEAD LOADS					FACTORED LIVE LOADS					OVER LOAD FACT
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	
1	CONSTR	0	0	0	0	0	0	0	0	0	0	1.000
2	CONSTR	0	8	23	0	0	0	0	0	0	0	1.000
3	STR I	0	8	23	0	0	0	41	364	0	0	1.000
4	STR I	0	0	0	0	0	0	7	-134	0	0	1.000
5	STR I	0	8	23	0	0	0	115	330	0	0	1.000
6	STR I	0	0	0	0	0	0	-33	272	0	0	1.000
7	STR I	0	3	9	0	0	0	37	330	0	0	1.000
8	STR I	0	0	0	0	0	0	6	-121	0	0	1.000
9	STR I	0	3	9	0	0	0	104	300	0	0	1.000
10	STR I	0	0	0	0	0	0	-30	246	0	0	1.000
11	SER II	0	5	14	0	0	0	29	257	0	0	1.000
12	SER II	0	0	0	0	0	0	5	-95	0	0	1.000
13	SER II	0	5	14	0	0	0	81	234	0	0	1.000
14	SER II	0	0	0	0	0	0	-23	192	0	0	1.000
15	FAT I	0	5	14	0	0	0	35	118	0	0	1.000
16	FAT I	0	5	14	0	0	0	3	-38	0	0	1.000
17	FAT I	0	5	14	0	0	0	35	116	0	0	1.000
18	FAT I	0	5	14	0	0	0	-13	112	0	0	1.000
19	FAT I	0	5	14	0	0	0	17	59	0	0	1.000
20	FAT I	0	5	14	0	0	0	1	-19	0	0	1.000
21	FAT I	0	5	14	0	0	0	17	58	0	0	1.000
22	FAT I	0	5	14	0	0	0	-7	56	0	0	1.000

LOAD CASE	LIMIT STATE	TOTAL FACTORED LOADS					OVERLOADS (SLIP)				
		P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)	P (kips)	V (kips)	M (ft-k)	T (ft-k)	LFM (ft-k)
1	CONSTR	0	19	64	0	0	0	19	64	0	0
2	CONSTR	0	27	88	0	0	0	27	88	0	0
3	STR I	0	65	441	0	0	0	0	0	0	0
4	STR I	0	23	-79	0	0	0	0	0	0	0
5	STR I	0	139	408	0	0	0	0	0	0	0
6	STR I	0	-17	326	0	0	0	0	0	0	0
7	STR I	0	51	374	0	0	0	0	0	0	0
8	STR I	0	17	-86	0	0	0	0	0	0	0
9	STR I	0	118	344	0	0	0	0	0	0	0
10	STR I	0	-19	282	0	0	0	0	0	0	0
11	SER II	0	0	0	0	0	0	46	313	0	0
12	SER II	0	0	0	0	0	0	17	-53	0	0
13	SER II	0	0	0	0	0	0	98	290	0	0
14	SER II	0	0	0	0	0	0	-11	233	0	0
15	FAT I	0	52	174	0	0	0	0	0	0	0
16	FAT I	0	20	18	0	0	0	0	0	0	0
17	FAT I	0	52	172	0	0	0	0	0	0	0
18	FAT I	0	-1	168	0	0	0	0	0	0	0
19	FAT I	0	35	115	0	0	0	0	0	0	0
20	FAT I	0	19	37	0	0	0	0	0	0	0
21	FAT I	0	35	114	0	0	0	0	0	0	0
22	FAT I	0	11	112	0	0	0	0	0	0	0

----- SECTION PROPERTY DATA -----

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

	LEFT GIRDER: (POS STRENGTH - Ag)			RIGHT GIRDER: (POS STRENGTH - Ag)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (in³):	0	4410	1418	0	4410	1418
S TOP OF TOPFL (in³):	186	-2301	-6339	186	-2301	-6339
S MIDDLE TOPFL (in³):	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (in³):	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (in³):	205	397	348	205	397	348
S MIDDLE BOTFL (in³):	195	389	340	195	389	340
S BOT OF BOTFL (in³):	186	382	333	186	382	333

HNTB BRIDGE DESIGN PROGRAM PAGE 3  
 RUN TIME: 05/22/2013 19:39:49.581 SPLICE-1.111  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out OUTPUT

----- SECTION PROPERTY DATA -----

	LEFT GIRDER: (NEG STRENGTH - Ag)			RIGHT GIRDER: (NEG STRENGTH - Ag)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1731	1731	1731	1731	1731	1731
S MIDDLE SLAB (in³):	0	0	0	0	0	0
S TOP OF TOPFL (in³):	186	186	186	186	186	186
S MIDDLE TOPFL (in³):	195	195	195	195	195	195
S TOP OF WEB (in³):	205	205	205	205	205	205
S BOT OF WEB (in³):	205	205	205	205	205	205
S MIDDLE BOTFL (in³):	195	195	195	195	195	195
S BOT OF BOTFL (in³):	186	186	186	186	186	186

	LEFT GIRDER: (POS STRENGTH - BOTH FL Ae)			RIGHT GIRDER: (POS STRENGTH - BOTH FL Ae)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1575	8019	6154	1575	8019	6154
S MIDDLE SLAB (in³):	0	4426	1407	0	4426	1407
S TOP OF TOPFL (in³):	169	-2100	-4897	169	-2100	-4897
S MIDDLE TOPFL (in³):	178	-1885	-3638	178	-1885	-3638
S TOP OF WEB (in³):	187	-1710	-2894	187	-1710	-2894
S BOT OF WEB (in³):	187	372	324	187	372	324
S MIDDLE BOTFL (in³):	178	365	317	178	365	317
S BOT OF BOTFL (in³):	169	358	310	169	358	310

	LEFT GIRDER: (NEG STRENGTH - BOTH FL Ae)			RIGHT GIRDER: (NEG STRENGTH - BOTH FL Ae)		
	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in4):	1575	1575	1575	1575	1575	1575
S MIDDLE SLAB (in³):	0	0	0	0	0	0
S TOP OF TOPFL (in³):	169	169	169	169	169	169
S MIDDLE TOPFL (in³):	178	178	178	178	178	178
S TOP OF WEB (in³):	187	187	187	187	187	187
S BOT OF WEB (in³):	187	187	187	187	187	187
S MIDDLE BOTFL (in³):	178	178	178	178	178	178
S BOT OF BOTFL (in³):	169	169	169	169	169	169

----- GIRDER STRESS DATA -----

GIRDER FLANGE STRESSES AT END OF SPLICE:

ITEM	TOP FLANGE				BOTTOM FLANGE			
	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG
LT GIRDER FLEXURAL STRESS:	8	6.07	50.00		3	16.89	50.00	
LT GIRDER FLEXURAL STRESS 6.10.1.8:	8	5.52	44.76		3	15.72	44.76	
RT GIRDER FLEXURAL STRESS:	8	6.07	50.00		3	16.89	50.00	
RT GIRDER FLEXURAL STRESS 6.10.1.8:	8	5.52	44.76		3	15.72	44.76	

BOLT STAGGERING:  
 TOP FLANGE BOLTS WILL NOT REQUIRE STAGGERING.  
 BOTTOM FLANGE BOLTS WILL NOT REQUIRE STAGGERING.

SHEAR STRESS ON GIRDER WEB:

ITEM	SHEAR ON GIRDER WEB		
	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)
SHEAR STRESS ON LT GIRDER WEB Ag:	5	22.18	29.00
SHEAR STRESS ON LT GIRDER WEB An:	5	29.09	30.16
SHEAR STRESS ON RT GIRDER WEB Ag:	5	22.18	29.00
SHEAR STRESS ON RT GIRDER WEB An:	5	29.09	30.16

BEARING ON GIRDER FLANGES AND WEB:

ITEM	LOAD CASE	FAIL CASE	APPLIED FORCE		RESISTANCE		TOTAL NG
			Ru (kips)	INT HOLES (kips)	END HOLES (kips)	øRn (kips)	
BEARING ON LT GIRDER TOP FLANGE:	3	L	181.07	380.02	95.00	475.02	
BEARING ON LT GIRDER BOT FLANGE:	4	L	181.07	380.02	95.00	475.02	
BEARING ON LT GIRDER WEB PL:	5	R	50.02	0.00	58.42	58.42	
FH: 34.98 (kips)							
FV: 35.76 (kips)							
EDGE DISTANCE: 1.82 (in)							
BEARING ON RT GIRDER TOP FLANGE:	3	L	181.07	380.02	95.00	475.02	
BEARING ON RT GIRDER BOT FLANGE:	4	L	181.07	380.02	95.00	475.02	
BEARING ON RT GIRDER WEB PL:	5	R	50.02	0.00	58.42	58.42	
FH: 34.98 (kips)							
FV: 35.76 (kips)							
EDGE DISTANCE: 1.82 (in)							

----- GIRDER BLOCK SHEAR CHECK -----

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

GIRDER BLOCK SHEAR CHECK:	PLATE	LOAD	FAIL	AREA	AREA	AREA	AREA	BLOCK	ALLOW	NG
		CASE	MODE	Atn (sq-in)	Atg (sq-in)	Avn (sq-in)	Avg (sq-in)	FORCE (kips)	ØRn (kips)	
	LT GIRDER TOPFL	4	1	3.57	4.44	14.14	21.97	325	604	
	RT GIRDER TOPFL	4	1	3.57	4.44	14.14	21.97	325	604	
	LT GIRDER BOTFL	3	1	3.57	4.44	14.14	21.97	325	604	
	RT GIRDER BOTFL	3	1	3.57	4.44	14.14	21.97	325	604	
	LT GIRDER WEB	5	1	3.41	5.28	5.04	6.91	200	338	
	RT GIRDER WEB	5	1	3.41	5.28	5.04	6.91	200	338	

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 4  
 RUN TIME: 05/22/2013 19:39:49.581 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out

----- FLANGE SPLICE DESIGN DATA -----

Note: Positive stresses are tensile.

LEFT GIRDER FLANGE DESIGN DATA:														
LOAD CASE	CONTROLLING FLANGE DATA						NON-CONTROLLING FLANGE DATA							
	TOP/BOT	fcf (ksi)	Rh	alpha	Fcf (ksi)	Area (sq-in)	Pcf (kips)	TOP/BOT	fncf (ksi)	Rh	alpha	Fncf (ksi)	Area (sq-in)	Pncf (kips)
1	BOT	4.30	1.000	1.000	4.30	8.67	37	TOP	-4.30	1.000	1.000	-4.30	9.66	-42
2	BOT	5.22	1.000	1.000	5.22	8.67	45	TOP	-4.22	1.000	1.000	-4.22	9.66	-41
3	BOT	16.45	1.000	1.000	37.50	8.67	325	TOP	-1.19	1.000	1.000	-37.50	9.66	-362
4	BOT	-5.35	1.000	1.000	-37.50	9.66	-362	TOP	5.35	1.000	1.000	37.50	8.67	325
5	BOT	15.36	1.000	1.000	37.50	8.67	325	TOP	-1.40	1.000	1.000	-37.50	9.66	-362
6	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-1.85	1.000	1.000	-37.50	9.66	-362
7	BOT	13.56	1.000	1.000	37.50	8.67	325	TOP	-0.21	1.000	1.000	-37.50	9.66	-362
8	BOT	-5.78	1.000	1.000	-37.50	9.66	-362	TOP	5.78	1.000	1.000	37.50	8.67	325
9	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-0.40	1.000	1.000	-37.50	9.66	-362
10	BOT	10.47	1.000	1.000	37.50	8.67	325	TOP	-0.77	1.000	1.000	-37.50	9.66	-362

RIGHT GIRDER FLANGE DESIGN DATA:														
LOAD CASE	CONTROLLING FLANGE DATA						NON-CONTROLLING FLANGE DATA							
	TOP/BOT	fcf (ksi)	Rh	alpha	Fcf (ksi)	Area (sq-in)	Pcf (kips)	TOP/BOT	fncf (ksi)	Rh	alpha	Fncf (ksi)	Area (sq-in)	Pncf (kips)
1	BOT	4.30	1.000	1.000	4.30	8.67	37	TOP	-4.30	1.000	1.000	-4.30	9.66	-42
2	BOT	5.22	1.000	1.000	5.22	8.67	45	TOP	-4.22	1.000	1.000	-4.22	9.66	-41
3	BOT	16.45	1.000	1.000	37.50	8.67	325	TOP	-1.19	1.000	1.000	-37.50	9.66	-362
4	BOT	-5.35	1.000	1.000	-37.50	9.66	-362	TOP	5.35	1.000	1.000	37.50	8.67	325
5	BOT	15.36	1.000	1.000	37.50	8.67	325	TOP	-1.40	1.000	1.000	-37.50	9.66	-362
6	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-1.85	1.000	1.000	-37.50	9.66	-362
7	BOT	13.56	1.000	1.000	37.50	8.67	325	TOP	-0.21	1.000	1.000	-37.50	9.66	-362
8	BOT	-5.78	1.000	1.000	-37.50	9.66	-362	TOP	5.78	1.000	1.000	37.50	8.67	325
9	BOT	12.56	1.000	1.000	37.50	8.67	325	TOP	-0.40	1.000	1.000	-37.50	9.66	-362
10	BOT	10.47	1.000	1.000	37.50	8.67	325	TOP	-0.77	1.000	1.000	-37.50	9.66	-362

LEFT GIRDER FLANGE OVERLOAD SLIP DATA:												
LOAD CASE	TOP FLANGE DATA						BOTTOM FLANGE DATA					
	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)
1	-3.91	1.000	9.66	-38	3.91	1.000	9.66	38				
2	-3.85	1.000	9.66	-37	4.77	1.000	9.66	46				
11	-0.94	1.000	9.66	-9	10.96	1.000	9.66	106				
12	3.26	1.000	9.66	31	-3.26	1.000	9.66	-31				
13	-1.08	1.000	9.66	-10	10.23	1.000	9.66	99				
14	-1.36	1.000	9.66	-13	8.44	1.000	9.66	81				

RIGHT GIRDER FLANGE OVERLOAD SLIP DATA:												
LOAD CASE	TOP FLANGE DATA						BOTTOM FLANGE DATA					
	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)	fs (ksi)	Rh	Ag (sq-in)	Pfs (kips)
1	-3.91	1.000	9.66	-38	3.91	1.000	9.66	38				
2	-3.85	1.000	9.66	-37	4.77	1.000	9.66	46				
11	-0.94	1.000	9.66	-9	10.96	1.000	9.66	106				
12	3.26	1.000	9.66	31	-3.26	1.000	9.66	-31				
13	-1.08	1.000	9.66	-10	10.23	1.000	9.66	99				
14	-1.36	1.000	9.66	-13	8.44	1.000	9.66	81				

TOP FLANGE SPLICE PLATES:  
 TOTAL DESIGN FORCE: 325 (kips) (T)      -362 (kips) (C)  
 TOTAL SLIP FORCE: -38 (kips)

TOP OUTSIDE PLATES:  
 PLATE DIMS:      WIDTH: 11.125 (in)      THICK: 0.500 (in)      LENGTH: 30.500 (in)  
 FILL PLATE LEFT: NONE REQUIRED  
 FILL PLATE RIGHT: NONE REQUIRED  
 TOTAL PLATE AREA:      An: 4.56 (sq-in)      Ae: 4.99 (sq-in)      Ag: 5.56 (sq-in)  
 TOTAL NUM COLS OF BOLTS: 10 (BOTH SIDES)  
 TOTAL NUM ROWS OF BOLTS: 2  
 DESIGN FORCE: -191 (kips)  
 SLIP FORCE: -19 (kips)

TOP INSIDE PLATES:  
 PLATE DIMS:      WIDTH: 4.000 (in)      THICK: 0.625 (in)      LENGTH: 30.500 (in)  
 TOTAL PLATE AREA:      An: 3.75 (sq-in)      Ae: 4.11 (sq-in)      Ag: 5.00 (sq-in) (Both Plates)  
 DESIGN FORCE: -171 (kips)  
 SLIP FORCE: -19 (kips)

TOP FLANGE SPLICE PLATE STRESS SUMMARY: (BOLT STRESSES BASED ON 10 BOLTS)

OUTSIDE PLATES			INSIDE PLATES		
LOAD	ACTUAL	ALLOW	LOAD	ACTUAL	ALLOW

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

ITEM	CASE	STRESS (ksi)	STRESS (ksi)	NG	CASE	STRESS (ksi)	STRESS (ksi)	NG
AXIAL STRESS ON SPLICE PLATE Ag:	3	-34.29	45.00		3	-34.29	45.00	
SHEAR STRESS ON BOLT:	3	31.72	46.08		3	28.51	46.08	
SLIP STRESS ON BOLT:	1	3.14	21.40		1	3.14	21.40	

BEARING ON TOP FLANGE SPLICE PL:

ITEM	BEARING ON TOP FLANGE		SPLICE PLATES		FAILURE CASE		
	LOAD CASE	APPLIED FORCE Ru (kips)	INT HOLES (kips)	RESISTANCE END (kips)	øRn	TOTAL NG	LEGEND:
BEARING ON OUTSIDE FLANGE SPL PL:	10 L	95.36	218.40	54.60	273.00		L: Longitudinal
BEARING ON INSIDE FLANGE SPL PL:	10 L	85.71	273.00	68.25	341.25		T: Transverse R: Resultant

HNTB BRIDGE DESIGN PROGRAM SPLICE-1.111 PAGE 5  
 RUN TIME: 05/22/2013 19:39:49.581 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out

----- FLANGE SPLICE DESIGN DATA -----

BOTTOM FLANGE SPLICE PLATES:  
 TOTAL DESIGN FORCE: 325 (kips) (T)          -362 (kips) (C)  
 TOTAL SLIP FORCE: 106 (kips)

BOTTOM OUTSIDE PLATES:  
 PLATE DIMS: WIDTH: 11.125 (in)    THICK: 0.500 (in)    LENGTH: 30.500 (in)  
 FILL PLATE LEFT: NONE REQUIRED  
 FILL PLATE RIGHT: NONE REQUIRED  
 TOTAL PLATE AREA: An: 4.56 (sq-in)    Ae: 4.99 (sq-in)    Ag: 5.56 (sq-in)  
 TOTAL NUM COLS OF BOLTS: 10 (BOTH SIDES)  
 TOTAL NUM ROWS OF BOLTS: 2  
 DESIGN FORCE: -191 (kips)  
 SLIP FORCE: 53 (kips)

BOTTOM INSIDE PLATES:  
 PLATE DIMS: WIDTH: 4.000 (in)    THICK: 0.625 (in)    LENGTH: 30.500 (in)  
 TOTAL PLATE AREA: An: 3.75 (sq-in)    Ae: 4.11 (sq-in)    Ag: 5.00 (sq-in) (Both Plates)  
 DESIGN FORCE: -171 (kips)  
 SLIP FORCE: 53 (kips)

BOTTOM FLANGE SPLICE PLATE STRESS SUMMARY: (BOLT STRESSES BASED ON 10 BOLTS)

ITEM	OUTSIDE PLATES				INSIDE PLATES			
	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG	LOAD CASE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG
AXIAL STRESS ON SPLICE PLATE Ag:	4	-34.29	45.00		4	-34.29	45.00	
SHEAR STRESS ON BOLT:	4	31.72	46.08		4	28.51	46.08	
SLIP STRESS ON BOLT:	11	8.80	21.40		11	8.80	21.40	

BEARING ON BOTTOM FLANGE SPLICE PL:

ITEM	BEARING ON BOT FLANGE		SPLICE PLATES		FAILURE CASE		
	LOAD CASE	APPLIED FORCE Ru (kips)	INT HOLES (kips)	RESISTANCE END (kips)	øRn	TOTAL NG	LEGEND:
BEARING ON OUTSIDE FLANGE SPL PL:	8 L	95.36	218.40	54.60	273.00		L: Longitudinal
BEARING ON INSIDE FLANGE SPL PL:	8 L	85.71	273.00	68.25	341.25		T: Transverse R: Resultant

----- SPLICE PLATE BLOCK SHEAR CHECK -----

SPLICE PLATE BLOCK SHEAR CHECK:

PLATE	LOAD CASE	FAIL MODE	AREA Atn (sq-in)	AREA Atg (sq-in)	AREA Avn (sq-in)	AREA Avg (sq-in)	BLOCK FORCE (kips)	ALLOW øRn (kips)	NG
TOP OUTSIDE	4	1	2.06	2.56	8.12	12.62	171	348	
TOP INSIDE	4	1	1.88	2.50	10.16	15.78	154	406	
BOT OUTSIDE	3	1	2.06	2.56	8.12	12.62	171	348	
BOT INSIDE	3	1	1.88	2.50	10.16	15.78	154	406	
WEB PLATE	5	1	4.88	7.50	5.81	8.44	100	449	

----- WEB SPLICE DESIGN DATA -----

WEB SPLICE STRENGTH DESIGN DATA:

LOAD CASE	DESIGN FLANGE	ECCENTRIC SHEAR		PROPORTION OF FLEXURAL MOMENT					TOTAL	
		Vuw (kips)	Muv (ft-k)	Rh	Fcf (ksi)	Rcf	fncf (ksi)	Muw (ft-k)	Huw (kips)	Muw+Muv (ft-k)
1	TOP	19	11	1.000	4.30	1.000	-4.30	9	0	20
	BOT	19	11	1.000	4.30	1.000	-4.30	9	0	20
2	TOP	27	15	1.000	5.22	1.000	-4.22	10	5	25
	BOT	27	15	1.000	5.22	1.000	-4.22	10	5	25
3	TOP	97	55	1.000	37.50	2.279	-1.19	42	157	97
	BOT	97	55	1.000	37.50	2.279	-1.19	42	157	97
4	TOP	35	20	1.000	-37.50	7.012	5.35	79	0	99
	BOT	35	20	1.000	-37.50	7.012	5.35	79	0	99
5	TOP	200	112	1.000	37.50	2.442	-1.40	43	154	155
	BOT	200	112	1.000	37.50	2.442	-1.40	43	154	155
6	TOP	25	14	1.000	37.50	2.986	-1.85	45	144	59
	BOT	25	14	1.000	37.50	2.986	-1.85	45	144	59
7	TOP	76	43	1.000	37.50	2.766	-0.21	40	166	83
	BOT	76	43	1.000	37.50	2.766	-0.21	40	166	83
8	TOP	25	14	1.000	-37.50	6.484	5.78	79	0	93
	BOT	25	14	1.000	-37.50	6.484	5.78	79	0	93
9	TOP	176	99	1.000	37.50	2.985	-0.40	41	164	140
	BOT	176	99	1.000	37.50	2.985	-0.40	41	164	140

File: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out 5/22/2013, 7:39:49PM

10	TOP	29	16	1.000	37.50	3.582	-0.77	42	157	58
	BOT	29	16	1.000	37.50	3.582	-0.77	42	157	58

WEB SPLICE OVERLOAD SLIP STRESS DATA:

LOAD DESIGN	Vwo	Mvo	fo	Fof	Mwo	Hwo	Mwo+Mvo
CASE FLANGE	(kips)	(ft-k)	(ksi)	(ksi)	(ft-k)	(kips)	(ft-k)
11 TOP	46	26	-0.94	10.96	13	45	39
11 BOT	46	26	10.96	-0.94	13	45	39
12 TOP	17	10	3.26	-3.26	7	0	17
12 BOT	17	10	-3.26	3.26	7	0	17
13 TOP	98	55	-1.08	10.23	12	41	67
13 BOT	98	55	10.23	-1.08	12	41	67
14 TOP	11	6	-1.36	8.44	10	32	16
14 BOT	11	6	8.44	-1.36	10	32	16

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 6  
 RUN TIME: 05/22/2013 19:39:49.581 OUTPUT  
 Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out

----- WEB SPLICE DESIGN DATA -----

WEB SPLICE PLATES:  
 PLATE DIMS: WIDTH: 25.250 (in) DEPTH: 13.500 (in) THICK: 0.750 (in)  
 LEFT FILL PLATE: NONE REQUIRED  
 RIGHT FILL PLATE: NONE REQUIRED  
 AREA OF ONE WEB SPLICE PL: An: 7.12 (sq-in) Ag: 10.12 (sq-in)  
 TOTAL NUM COLS OF BOLTS: 8 (BOTH SIDES)  
 TOTAL NUM ROWS OF BOLTS: 4  
 EXTREME BOLT DATA: Xmax: 4.125 (in) Ymax: 4.500 (in)  
 POLAR INERTIA OF BOLT GROUP: 331 (bolt-in<sup>2</sup>)

STRESSES:

ITEM	LOAD DESIGN CASE	FLANGE	ACTUAL STRESS (ksi)	ALLOW STRESS (ksi)	NG
WEB SPLICE PL FLEXURAL STRESS:	5	TOP	48.58	50.00	
SHEAR STRESS ON WEB SPLICE PL Ag:	5	TOP	9.88	29.00	
SHEAR STRESS ON WEB SPLICE PL An:	5	TOP	14.03	30.16	
SHEAR STRESS ON BOLT:	5	TOP	41.59	46.08	
SLIP STRESS ON BOLT:	13	BOT	17.55	21.40	

BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)

ITEM	LOAD CASE	FAIL CASE	APPLIED FORCE Ru (kips)	INT HOLES (kips)	END HOLES (kips)	TOTAL (kips)	NG	FAILURE CASE	
BEARING ON WEB SPLICE PL:	5	RS	25.01	0.00	81.90	81.90			
FH:	17.49 (kips)								
FV:	17.88 (kips)								
EDGE DISTANCE:	2.00 (in)								

LEGEND:  
 H: Horizontal  
 V: Vertical  
 RS: Resultant (side)  
 RT: Resultant (top/bot)

----- SPLICE PLATE SECTION PROPERTY DATA -----

	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
I STEEL (in <sup>4</sup> ):	1980	10841	7992
S MIDDLE SLAB (in <sup>3</sup> ):	0	4074	1358
S TOP/TOP SPL PL (in <sup>3</sup> ):	202	4390	10597
S BOT/BOT SPL PL (in <sup>3</sup> ):	202	491	424

----- FATIGUE STRESSES -----

TOP SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.  
 BOTTOM SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.

ITEM	DC STRESS (ksi)	DC+DW COMP STRESS (ksi)	LOAD CASE	FAT STRESS (ksi)	LOAD CASE	FAT STRESS (ksi)	TOTAL STRESS (ksi)	ALLOW RANGE (ksi)	NG
FLEXURAL STRESS AT TOP OF TOP SPL PL:	-2.40	-0.02	15	0.32	16	-0.10	0.43	16.00	
FLEXURAL STRESS AT BOT OF BOT SPL PL:	2.40	0.44	15	2.89	16	-0.92	3.81	16.00	

----- SPLICE PLATE DIMENSIONAL SUMMARY -----

PLATE	WIDTH (in)	PLATES THICK (in)	LENGTH (in)	ROWS	BOLTS COLUMNS	TOTAL
TOP OUTSIDE	11.125	0.500	30.500	2	10	20
TOP INSIDE	4.000	0.625	30.500			
BOT OUTSIDE	11.125	0.500	30.500	2	10	20
BOT INSIDE	4.000	0.625	30.500			
WEB PLATE	25.250	0.750	13.500	4	8	32

\*\*\*\*\* NOTE: NUMBER OF COLUMNS, ROWS, AND TOTAL BOLTS ARE FOR THE ENTIRE SPLICE. \*\*\*\*\*

FLANGE BOLT SPACING:

	NCOLS	SPACE(2) (in)	STAGGER(2) (in)	NCOLS	SPACE(1) (in)	STAGGER(1) (in)
TOP FLANGE (CENTER DISTANCE = 5.250 (in))						
LEFT SIDE	0	0.000	0.000	5	2.750	0.000
RIGHT SIDE	0	0.000	0.000	5	2.750	0.000

Fatigue stress in Splice Plates Checked.  
 Loads will be carried by splice plates. No stresses will be in the beam ends. Therefore fatigue stress at the open holes is not an issue.

BOTTOM FLANGE (CENTER DISTANCE = 5.250 (in))  
NCOLS SPACE(2) STAGGER(2) NCOLS SPACE(1) STAGGER(1)  
(in) (in) (in) (in) (in)  
LEFT SIDE 0 0.000 0.000 5 2.750 0.000  
RIGHT SIDE 0 0.000 0.000 5 2.750 0.000

□

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 7  
RUN TIME: 05/22/2013 19:39:49.581 OUTPUT  
Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out

----- SPLICE PLATE DIMENSIONAL SUMMARY -----

WEB BOLT SPACING:  
TOP/WEB TO BOT/WEB TO  
CL TOP ROW NROWS SPACING CL BOT ROW  
(in) (in) (in)  
WEB: 3.925 4 3.000 3.925

□

HNTB BRIDGE DESIGN PROGRAM SPlice-1.111 PAGE 8  
RUN TIME: 05/22/2013 19:39:49.581 OUTPUT  
Filename: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\RFI447\FSDesign\String 8ft 10in deck\_web.out

----- WARNING MESSAGES -----

COMMENT NUMBER: 0  
FIELD SPLICE run completed with  
0 error(s) and 0 warning(s)!

BEGIN TIME: 05/22/2013 19:39:49  
END TIME: 05/22/2013 19:39:50  
ELAPSED TIME: 00:00:01



**FORM DQP 2.01-1  
LEVEL 1 CHECK PRINT SIGN-OFF SHEET**

Client Name: Ohio Department of Transportation

Job Title: Cleveland Innerbelt Design-Build Contract

Job Number: CUY-90-14.90

Document Title: Unit 2 - Stringer Field Splice Design

Check Level (Mark One):  1A 100% Document Check  
 1B 100% Input Check

Enter description below:

---

	Print Name	Signature	Date
<input checked="" type="checkbox"/> Originator	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>8-8-11</u>
<input checked="" type="checkbox"/> Checker	<u>Tirzah Gregory</u>	<u>[Signature]</u>	<u>8/8/11</u>
<input checked="" type="checkbox"/> Backchecker	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>8-8-11</u>
<input checked="" type="checkbox"/> Updater	<u>Kolbe Gravatt</u>	<u>[Signature]</u>	<u>8-8-11</u>
<input checked="" type="checkbox"/> Validater	<u>Tirzah Gregory</u>	<u>[Signature]</u>	<u>8/8/11</u>

Insert an "X" in the box to indicate a required QC activity.



<b>HNTB</b>	The HNTB Companies Engineers Architects Planners	Made	KDG	Date	8/7/11	Job Number	49633
		Checked	TRG	Date	8/8/11		
For	Cleveland Innerbelt - Unit 2 Stringers	Backchk'd	FDG	Date	8-8-11	Sheet No.	

**Field Splice Input Summary**  
**Unit 2 Stringers (W18x97)**

**ODOT BDM 302.4.1.14**

Bolt allowable stresses for painted surfaces or unpainted weathering steel surfaces shall be based on AASHTO's values for Class A, Contact Surface, Standard Hole Type.

Field splices in beams and girders shall be bolted connections using high strength bolts, ASTM A325.

Bolts shall be A325, Type 1, galvanized for IZEU coated steel.

Use 7/8 inch diameter bolts.

**BDGS Field Splice Inputs**

Bolt Diameter = **0.88** in  
Hole diameter = **1.000** in

**Allowable shear stress** [AASHTO 6.13.2.7]

Allowable shear stress is entered per shear plane per bolt. Assume that threads are included in the shear plane for the flanges and excluded for the web. BDGS automatically includes the capacity reduction for a connection longer than 50 in and the  $\phi$  factor for bolts in shear.

threads included	$f_{allow} = 0.38 * F_{ub}$	
threads excluded	$f_{allow} = 0.48 * F_{ub}$	
$F_{ub} =$	<b>120</b>	ksi [AASHTO 6.4.3.1]
included	$f_{allow} =$	<b>45.6</b> ksi
excluded	$f_{allow} =$	<b>57.6</b> ksi

**Allowable slip stress** [AASHTO 6.13.2.8]

Allowable slip stress is entered per slip plane per bolt. Allowable stress is determined for a Class A surface and standard hole sizes.

$$f_{allow} = K_h * K_s * P_t / A_{bolt}$$

$K_h =$	<b>1.00</b>	[AASHTO Table 6.13.2.8-2]
$K_s =$	<b>0.33</b>	[AASHTO Table 6.13.2.8-3]
$P_t =$	<b>39</b>	kip [AASHTO Table 6.13.2.8-1]
$A_{bolt} =$	<b>0.601</b>	in <sup>2</sup>
$f_{allow} =$	<b>21.4</b>	ksi

**Minimum Design Strength** [AASHTO 6.13.1]

Except as specified otherwise, connections and splices for primary members shall be designed at the strength limit state for not less than 75 percent of the factored flexural, shear, or axial resistance of the member or element.

**Allowable Fatigue Stress** [AASHTO 6.6.1]

A bolted splice is considered to be a Class B fatigue detail. Fatigue 2 load combination.

$$f_{allow} = (\Delta F)_{TH}$$

$f_{allow} =$  **16.0** ksi [AASHTO Table 6.6.1.2.5-3]

**Edge Distances** [AASHTO 6.13.2.6.6 & ODOT BDM 302.4.1.14.a]

The edge distances provided in LRFD 6.13.2.6.6 are absolute minimums allowed during fabrication. For design and detailing purposes, 0.25 in. shall be added to the minimum edge distances listed in Table 6.13.2.6.6-1.

7/8" diameter bolts used. Assume sheared edges used.

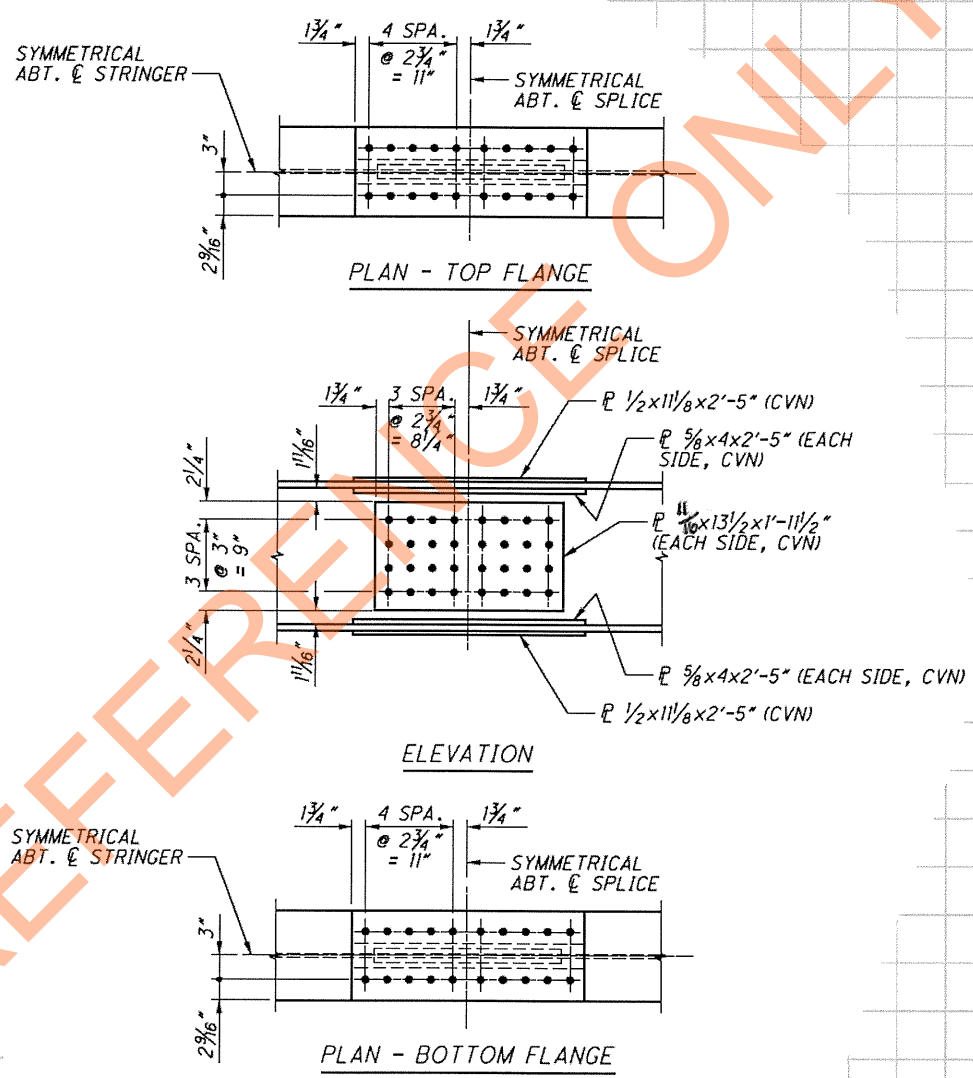
AASHTO Edge Dist. = **1.50** in  
Minimum edge dist. = **1.75** in

Flanges: Max Edge Distance: **4.00** in [6.13.2.6.6]  
(4 x thickness of thinnest plate)

Max. Spacing for Sealing Requirement:  $s < 4.0 + 4.0t < 7.0$  in  
min. flange plate  $t =$  **0.50** in  
 $s =$  **6.00** in

For <i>Cleveland Innebelt</i>	Job no. <i>49633</i>	Sheet no.
Made by <i>KDG</i>	Checked by <i>TRG</i>	Backchecked by <i>KDG</i>
Date <i>8-8-11</i>	Date <i>8/8/11</i>	Date <i>8-8-11</i>

Unit 2 Stringer Field Splice



TYPICAL STRINGER FIELD SPLICE DETAILS

Note:  
 Field Splice Connection Web Plates shall have the bolt threads excluded from the shear plane.





ITEM	DC	DC+SW	MAX	MIN	TOTAL	ALLOW
	NONCOMP	COMP	LOAD	FAT LL	LOAD	RANGE
	STRESS	STRESS	STRESS	STRESS	STRESS	STRESS
	CASE	CASE	CASE	CASE	CASE	CASE
FLEXURAL STRESS AT TOP OF TOP SPL PL:	-2.43	-0.01	15	0.34	16	-0.11
FLEXURAL STRESS AT BOT OF BOT SPL PL:	2.43	0.45	15	2.98	16	-0.95
SPLICE PLATE DIMENSIONAL SUMMARY						3.93
						16.00

BEARING ON OUTSIDE FLANGE SPL PL:	L	95.36	202.80	54.60	257.40
BEARING ON INSIDE FLANGE SPL PL:	L	95.71	253.50	68.25	321.75
----- SPLICE PLATE BLOCK SHEAR CHECK -----					
SPLICE PLATE BLOCK SHEAR CHECK:					
PLATE	AREA	AREA	AREA	BLACK	ALLOW
	(sq-in)	(sq-in)	(sq-in)	FORCE	(kips)
TOP OUTSIDE	4	2.06	8.25	12.75	171
BOT OUTSIDE	3	2.06	8.25	12.75	171
TOP INSIDE	3	1.68	2.50	10.31	154
BOT INSIDE	3	1.68	2.50	10.31	154
WEB PLATE	5	4.47	6.88	5.33	7.73

\*\*\*\*\* SPLICE PLATE DIMENSIONAL SUMMARY SUPPRESSED DUE TO PROBLEM WITH WEB SPLICE DESIGN \*\*\*\*\*  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 09/08/2011 08:39:09.561  
 File Name: N:\19633\Bridges\Design\Final Design\Unit 2\Stringers\FSDesignString 8ft 10in deck.out  
 SPICE-1.108  
 OUTPUT

\*\*\*\*\* SPLICE PLATE DIMENSIONAL SUMMARY SUPPRESSED DUE TO PROBLEM WITH WEB SPLICE DESIGN \*\*\*\*\*  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 09/08/2011 08:39:09.561  
 File Name: N:\19633\Bridges\Design\Final Design\Unit 2\Stringers\FSDesignString 8ft 10in deck.out  
 SPICE-1.108  
 OUTPUT

COMMENT NUMBER: 6  
 FIELD SPLICE fun completed with  
 0 error(s) and 0 warning(s)!

COMMENT NUMBER: 6  
 FIELD SPLICE fun completed with  
 0 error(s) and 0 warning(s)!

LOAD DESIGN	(kips)	(ft-k)	(ksi)	(ft-k)	(ft-k)	(ft-k)	(ft-k)
CASE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE
1	TOP	13	1.000	-4.30	1.000	4.30	0
2	TOP	13	1.000	5.22	1.000	-4.22	10
3	BOT	27	1.000	-4.22	1.000	4.22	23
4	BOT	27	1.000	4.22	1.000	-4.22	23
5	BOT	97	4.8	-2.79	2.79	1.19	42
6	TOP	35	17	1.000	37.50	7.012	-5.35
7	TOP	35	17	1.000	37.50	7.012	-5.35
8	TOP	200	98	1.000	37.50	2.442	-1.40
9	TOP	25	12	1.000	37.50	2.986	-1.85
10	TOP	25	12	1.000	37.50	2.986	-1.85
11	TOP	46	23	10.96	-0.94	13	45
12	BOT	46	23	10.96	-0.94	13	45
13	TOP	97	48	-3.26	3.26	7	0
14	BOT	97	48	-3.26	3.26	7	0
15	TOP	98	48	-1.08	10.23	12	41
16	BOT	98	48	-1.08	10.23	12	41
17	TOP	176	86	1.000	37.50	2.985	-0.40
18	BOT	176	86	1.000	37.50	2.985	-0.40
19	TOP	29	14	1.000	37.50	3.582	-0.77
20	BOT	29	14	1.000	37.50	3.582	-0.77

LOAD DESIGN	(kips)	(ft-k)	(ksi)	(ft-k)	(ft-k)	(ft-k)	(ft-k)
CASE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE	FLANGE
11	TOP	46	23	-0.94	10.96	13	45
12	BOT	46	23	-0.94	10.96	13	45
13	TOP	97	48	-3.26	3.26	7	0
14	BOT	97	48	-3.26	3.26	7	0
15	TOP	98	48	-1.08	10.23	12	41
16	BOT	98	48	-1.08	10.23	12	41
17	TOP	176	86	1.000	37.50	2.985	-0.40
18	BOT	176	86	1.000	37.50	2.985	-0.40
19	TOP	29	14	1.000	37.50	3.582	-0.77
20	BOT	29	14	1.000	37.50	3.582	-0.77

WEB SPLICE OVERLOAD SLIP STRESS DATA:  
 LOAD DESIGN | Eccentric Shear | (ft-k) | (ksi) | (ft-k) | (ft-k) | (ft-k) | (ft-k) |

WEB SPLICE OVERLOAD SLIP STRESS DATA:  
 LOAD DESIGN | Eccentric Shear | (ft-k) | (ksi) | (ft-k) | (ft-k) | (ft-k) | (ft-k) |

HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 09/08/2011 08:39:09.561  
 File Name: N:\19633\Bridges\Design\Final Design\Unit 2\Stringers\FSDesignString 8ft 10in deck.out  
 SPICE-1.108  
 OUTPUT

HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 09/08/2011 08:39:09.561  
 File Name: N:\19633\Bridges\Design\Final Design\Unit 2\Stringers\FSDesignString 8ft 10in deck.out  
 SPICE-1.108  
 OUTPUT

WEB SPLICE PLATES:  
 PLATE DIMS: WIDTH: 23.500 (in) DEPTH: 13.500 (in) THICK: 0.688 (in)  
 LEFT FILL PLATE: NONE REQUIRED  
 RIGHT FILL PLATE: NONE REQUIRED  
 AREA OF ONE WEB SPLICE PL: 6.53 (sq-in)  
 TOTAL NUM COILS OF BOLTS: 8 (BOTH SIDES)  
 NUMBER OF BOLTS: 4  
 POLAR INERTIA OF BOLT GROUP: 4.125 (in<sup>4</sup>)  
 POLAR INERTIA OF BOLT GROUP: 331 (bolt-in<sup>4</sup>)

WEB SPLICE PLATES:  
 PLATE DIMS: WIDTH: 23.500 (in) DEPTH: 13.500 (in) THICK: 0.688 (in)  
 LEFT FILL PLATE: NONE REQUIRED  
 RIGHT FILL PLATE: NONE REQUIRED  
 AREA OF ONE WEB SPLICE PL: 6.53 (sq-in)  
 TOTAL NUM COILS OF BOLTS: 8 (BOTH SIDES)  
 NUMBER OF BOLTS: 4  
 POLAR INERTIA OF BOLT GROUP: 4.125 (in<sup>4</sup>)  
 POLAR INERTIA OF BOLT GROUP: 331 (bolt-in<sup>4</sup>)

ITEM	LOAD DESIGN	ACTUAL	ALLOW	STRESS	NG
	CASE	FLANGE	FLANGE	FLANGE	FLANGE
WEB SPLICE PL FLEXURAL STRESS:	5	TOP	48.81	50.00	
SHEAR STRESS ON WEB SPLICE PL Ag:	5	TOP	10.77	29.00	
SHEAR STRESS ON WEB SPLICE PL Ah:	5	TOP	15.31	30.16	
SLIP STRESS ON BOLT:	13	TOP	16.25	23.40	NG

ITEM	LOAD DESIGN	ACTUAL	ALLOW	STRESS	NG
	CASE	FLANGE	FLANGE	FLANGE	FLANGE
WEB SPLICE PL FLEXURAL STRESS:	5	TOP	48.81	50.00	
SHEAR STRESS ON WEB SPLICE PL Ag:	5	TOP	10.77	29.00	
SHEAR STRESS ON WEB SPLICE PL Ah:	5	TOP	15.31	30.16	
SLIP STRESS ON BOLT:	13	TOP	16.25	23.40	NG

BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)  
 BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)  
 LOAD FALL APPLIED | INT | END | FORCE | HOLES | TOTAL | NG |

BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)  
 BEARING ON WEB SPLICE PLATES: (PER 1 PLATE)  
 LOAD FALL APPLIED | INT | END | FORCE | HOLES | TOTAL | NG |

EV: 16.79 (kips)  
 EDGE DISTANCE: 2.04 (in)

EV: 16.79 (kips)  
 EDGE DISTANCE: 2.04 (in)

STEEL (link): 1954  
 NON-COMPOSITE COMPOSITE 3n  
 10059 7826  
 200 4126  
 200 12666  
 200 4177  
 412

STEEL (link): 1954  
 NON-COMPOSITE COMPOSITE 3n  
 10059 7826  
 200 4126  
 200 12666  
 200 4177  
 412

TOP SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.  
 BOTTOM SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.

TOP SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.  
 BOTTOM SPLICE PLATE THICKNESS ADEQUATE FOR FATIGUE.

**REFERENCE ONLY**

*OK, threads included here. don't use this design for web pl*



SPICE-1.108

PROGRAM'S INTERPRETATION OF INPUT DATA  
 FileName: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\FESDesign\String 8ft 10in deck\_wbz2.out  
 INVP FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\FESDesign\String 8ft 10in deck\_wbz2.out  
 INVP FILE DATE: 08/08/2011, 08:16:36  
 GIBER DESIGN DATA OBTAINED FROM \*.DRT FILE: 4636  
 FILE: N:\49633\Bridges\Design\Final Design\Unit 2\Stringers\FESDesign\String 8ft 10in deck\_wbz2.out  
 DATE: 08/07/2011 23:01:57 DATA: LOCKED

DESIGN PARAMETERS

DESIGN METHOD: LRFD Design  
 DESIGN PERCENT: 75%  
 COMPOSITE: Yes  
 CHECK: LRFD  
 INCLUDE BEARING STRESS IN NEGATIVE MOMENT REGIONS? No  
 FATIGUE ALLOWABLE STRESS RANGE: 16,000 (ksi)

DESIGN DATA

SLAB DATA  
 OVERLAY: THICK: 0.075 (in)  
 HOLE DIA: 1.000 (in)  
 ALLOW SHEAR STRESS: 57.6 (ksi)  
 HOLE REDUCTION FACTOR Rsr: 1.000

RIGHT GIRDER:  
 TOP FLANGE: THICK: 0.870 (in) WE: 0.855 (in) FBAR: 50.0 (ksi)  
 WIDTH: 11.500 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)  
 BOT FLANGE: THICK: 0.870 (in) WE: 0.855 (in) FBAR: 50.0 (ksi)  
 WIDTH: 11.500 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)

LEFT GIRDER:  
 TOP FLANGE: THICK: 0.870 (in) WE: 0.855 (in) FBAR: 50.0 (ksi)  
 WIDTH: 11.500 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)  
 BOT FLANGE: THICK: 0.870 (in) WE: 0.855 (in) FBAR: 50.0 (ksi)  
 WIDTH: 11.500 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)

BAR LAYER(1) AREA: 0.855 (sq-in)  
 BAR LAYER(2) AREA: 0.855 (sq-in)  
 BAR LAYER(3) AREA: 0.855 (sq-in)  
 BAR LAYER(4) AREA: 0.855 (sq-in)

DESIGN DATA

BAR LAYER(1) AREA: 0.855 (sq-in)  
 BAR LAYER(2) AREA: 0.855 (sq-in)  
 BAR LAYER(3) AREA: 0.855 (sq-in)  
 BAR LAYER(4) AREA: 0.855 (sq-in)

WE: THICK: 0.855 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)

DESIGN DATA

BAR LAYER(1) AREA: 0.855 (sq-in)  
 BAR LAYER(2) AREA: 0.855 (sq-in)  
 BAR LAYER(3) AREA: 0.855 (sq-in)  
 BAR LAYER(4) AREA: 0.855 (sq-in)

WE: THICK: 0.855 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)

INPUT CAPACITY PARAMETERS

LOAD NO.	STATE	P (kips)	M (ft-k)	T (ft-k)	V (kips)	DC-DEAD LOAD (3in COMP) (kips)	DC-DEAD LOAD (NON-COMP) (kips)	FACTORED DEAD LOADS (ft-k)	FACTORED LIVE LOADS (ft-k)	LRM (ft-k)	LRM FACT (ft-k)
1	CONSTR	0	64	0	0	0	0	0	0	0	0
2	STR I	0	65	0	0	0	0	0	0	0	0
3	STR II	0	63	0	0	0	0	0	0	0	0
4	STR I	0	23	-79	0	0	0	0	0	0	0
5	STR II	0	139	408	0	0	0	0	0	0	0
6	STR I	0	-51	374	0	0	0	0	0	0	0
7	STR II	0	117	-86	0	0	0	0	0	0	0
8	STR I	0	118	244	0	0	0	0	0	0	0
9	STR II	0	-13	282	0	0	0	0	0	0	0
10	STR I	0	46	313	0	0	0	0	0	0	0
11	STR II	0	0	-53	0	0	0	0	0	0	0
12	STR I	0	36	239	0	0	0	0	0	0	0
13	STR II	0	-11	239	0	0	0	0	0	0	0
14	STR I	0	52	174	0	0	0	0	0	0	0
15	STR II	0	20	18	0	0	0	0	0	0	0
16	STR I	0	172	0	0	0	0	0	0	0	0
17	STR II	0	-1	168	0	0	0	0	0	0	0
18	STR I	0	0	0	0	0	0	0	0	0	0
19	STR II	0	0	0	0	0	0	0	0	0	0

DESIGN DATA

BAR LAYER(1) AREA: 0.855 (sq-in)  
 BAR LAYER(2) AREA: 0.855 (sq-in)  
 BAR LAYER(3) AREA: 0.855 (sq-in)  
 BAR LAYER(4) AREA: 0.855 (sq-in)

WE: THICK: 0.855 (in) DEPTH: 16.250 (in) FBAR: 50.0 (ksi)  
 Fu: 65.0 (ksi) E: 29000 (ksi)

SECTION PROPERTY DATA

SECTION	LEFT GIRDER: (POS STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n	RIGHT GIRDER: (NEG STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n
I STEEL (I <sub>n</sub> )	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (I <sub>n</sub> )	0	4410	3439	0	4410	3439
S MIDDLE TOEFL (I <sub>n</sub> )	18	18	18	18	18	18
S MIDDLE TOEFL (I <sub>n</sub> )	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (I <sub>n</sub> )	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (I <sub>n</sub> )	349	349	349	349	349	349
S MIDDLE BOEFL (I <sub>n</sub> )	195	389	389	195	389	389
S BOT OF BOEFL (I <sub>n</sub> )	186	382	382	186	382	382
S BOT OF BOEFL (I <sub>n</sub> )	313	313	313	313	313	313

SECTION PROPERTY DATA

SECTION	LEFT GIRDER: (POS STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n	RIGHT GIRDER: (NEG STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n
I STEEL (I <sub>n</sub> )	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (I <sub>n</sub> )	0	4410	3439	0	4410	3439
S MIDDLE TOEFL (I <sub>n</sub> )	18	18	18	18	18	18
S MIDDLE TOEFL (I <sub>n</sub> )	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (I <sub>n</sub> )	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (I <sub>n</sub> )	349	349	349	349	349	349
S MIDDLE BOEFL (I <sub>n</sub> )	195	389	389	195	389	389
S BOT OF BOEFL (I <sub>n</sub> )	186	382	382	186	382	382
S BOT OF BOEFL (I <sub>n</sub> )	313	313	313	313	313	313

LOAD DATA

LOAD NO.	STATE	P (kips)	M (ft-k)	T (ft-k)	V (kips)	DC-DEAD LOAD (3in COMP) (kips)	DC-DEAD LOAD (NON-COMP) (kips)	FACTORED DEAD LOADS (ft-k)	FACTORED LIVE LOADS (ft-k)	LRM (ft-k)	LRM FACT (ft-k)
1	CONSTR	0	64	0	0	0	0	0	0	0	0
2	STR I	0	65	0	0	0	0	0	0	0	0
3	STR II	0	63	0	0	0	0	0	0	0	0
4	STR I	0	23	-79	0	0	0	0	0	0	0
5	STR II	0	139	408	0	0	0	0	0	0	0
6	STR I	0	-51	374	0	0	0	0	0	0	0
7	STR II	0	117	-86	0	0	0	0	0	0	0
8	STR I	0	118	244	0	0	0	0	0	0	0
9	STR II	0	-13	282	0	0	0	0	0	0	0
10	STR I	0	46	313	0	0	0	0	0	0	0
11	STR II	0	0	-53	0	0	0	0	0	0	0
12	STR I	0	36	239	0	0	0	0	0	0	0
13	STR II	0	-11	239	0	0	0	0	0	0	0
14	STR I	0	52	174	0	0	0	0	0	0	0
15	STR II	0	20	18	0	0	0	0	0	0	0
16	STR I	0	172	0	0	0	0	0	0	0	0
17	STR II	0	-1	168	0	0	0	0	0	0	0
18	STR I	0	0	0	0	0	0	0	0	0	0
19	STR II	0	0	0	0	0	0	0	0	0	0

LOAD DATA

LOAD NO.	STATE	P (kips)	M (ft-k)	T (ft-k)	V (kips)	DC-DEAD LOAD (3in COMP) (kips)	DC-DEAD LOAD (NON-COMP) (kips)	FACTORED DEAD LOADS (ft-k)	FACTORED LIVE LOADS (ft-k)	LRM (ft-k)	LRM FACT (ft-k)
1	CONSTR	0	64	0	0	0	0	0	0	0	0
2	STR I	0	65	0	0	0	0	0	0	0	0
3	STR II	0	63	0	0	0	0	0	0	0	0
4	STR I	0	23	-79	0	0	0	0	0	0	0
5	STR II	0	139	408	0	0	0	0	0	0	0
6	STR I	0	-51	374	0	0	0	0	0	0	0
7	STR II	0	117	-86	0	0	0	0	0	0	0
8	STR I	0	118	244	0	0	0	0	0	0	0
9	STR II	0	-13	282	0	0	0	0	0	0	0
10	STR I	0	46	313	0	0	0	0	0	0	0
11	STR II	0	0	-53	0	0	0	0	0	0	0
12	STR I	0	36	239	0	0	0	0	0	0	0
13	STR II	0	-11	239	0	0	0	0	0	0	0
14	STR I	0	52	174	0	0	0	0	0	0	0
15	STR II	0	20	18	0	0	0	0	0	0	0
16	STR I	0	172	0	0	0	0	0	0	0	0
17	STR II	0	-1	168	0	0	0	0	0	0	0
18	STR I	0	0	0	0	0	0	0	0	0	0
19	STR II	0	0	0	0	0	0	0	0	0	0

SECTION PROPERTY DATA

SECTION	LEFT GIRDER: (POS STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n	RIGHT GIRDER: (NEG STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n
I STEEL (I <sub>n</sub> )	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (I <sub>n</sub> )	0	4410	3439	0	4410	3439
S MIDDLE TOEFL (I <sub>n</sub> )	18	18	18	18	18	18
S MIDDLE TOEFL (I <sub>n</sub> )	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (I <sub>n</sub> )	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (I <sub>n</sub> )	349	349	349	349	349	349
S MIDDLE BOEFL (I <sub>n</sub> )	195	389	389	195	389	389
S BOT OF BOEFL (I <sub>n</sub> )	186	382	382	186	382	382
S BOT OF BOEFL (I <sub>n</sub> )	313	313	313	313	313	313

SECTION PROPERTY DATA

SECTION	LEFT GIRDER: (POS STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n	RIGHT GIRDER: (NEG STRENGTH - Ft)	COMPOSITE n	COMPOSITE 3n
I STEEL (I <sub>n</sub> )	1731	8512	6525	1731	8512	6525
S MIDDLE SLAB (I <sub>n</sub> )	0	4410	3439	0	4410	3439
S MIDDLE TOEFL (I <sub>n</sub> )	18	18	18	18	18	18
S MIDDLE TOEFL (I <sub>n</sub> )	195	-2059	-4456	195	-2059	-4456
S TOP OF WEB (I <sub>n</sub> )	205	-1863	-3435	205	-1863	-3435
S BOT OF WEB (I <sub>n</sub> )	349	349	349	349	349	349
S MIDDLE BOEFL (I <sub>n</sub> )	195	389	389	195	389	389
S BOT OF BOEFL (I <sub>n</sub> )	186	382	382	186	382	382
S BOT OF BOEFL (I <sub>n</sub> )	313	313	313	313	313	313

Stringer F.S. located 8' from support  
 in 30'2" Bay, 10" Deck  
 Threads excluded for Web Plates

EDG 8-E-11  
 TRG 8/8/11  
 EDG 8-8-11

ITEM	NON-COMPOSITE	COMPOSITE 3n	NON-COMPOSITE	COMPOSITE n	COMPOSITE 3n
1 STEEL (Incl: 1575)	1575	1575	1575	1575	1575
2 TOP OF TOPEL (Incl: 169)	169	169	169	169	169
3 MIDDLE TOPEL (Incl: 178)	178	178	178	178	178
4 TOP OF WEB (Incl: 187)	187	187	187	187	187
5 MIDDLE BOTFL (Incl: 178)	178	178	178	178	178
6 BOT OF BOTFL (Incl: 169)	169	169	169	169	169

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

ITEM	LOAD	TOP FLANGE	STRESS	NG	ALLOW	NG
1	5	22.18	29.00			
2	5	25.09	30.16			
3	5	25.09	30.16			
4	5	25.09	30.16			

BEARING ON OUTSIDE FLANGE SPL PL: 4 L 95.36 202.80 54.60 257.40  
 BEARING ON INSIDE FLANGE SPL PL: 4 L 85.71 253.50 68.25 321.75  
 SPICE PLATE BLOCK SHEAR CHECK  
 SPICE PLATE DIMENSIONAL SUMMARY

ITEM	DC (in)	DC-EM (in)	NONCOMP (in)	LOAD CASE (in)	MAX (in)	MIN (in)	TOTAL (in)	ALLOW (in)
DC	2.43	0.45	15	2.88	16	-0.95	3.93	16.00
NONCOMP	-2.43	-0.01	15	0.34	16	-0.11	---	---
LOAD CASE	---	---	---	---	---	---	---	---

SPICE PLATE DIMENSIONAL SUMMARY  
 PLATE THICKNESS (in) 0.500  
 TOP OUTSIDE 11.125  
 TOP INSIDE 4.000  
 BOT INSIDE 4.000  
 BOT OUTSIDE 11.125  
 WEB PLATE 23.500

PLATE	WIDTH (in)	LENGTH (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)
TOP OUTSIDE	11.125	0.500	2	10	20	20	20	20
TOP INSIDE	4.000	0.625	2	10	20	20	20	20
BOT INSIDE	4.000	0.625	2	10	20	20	20	20
BOT OUTSIDE	11.125	0.500	2	10	20	20	20	20
WEB PLATE	23.500	0.688	4	8	32	32	32	32

\*\*\*\*\* NOTE: NUMBER OF COLUMNS, ROWS, AND TOTAL BOLTS ARE FOR THE ENTIRE SPICE. \*\*\*\*\*

FLANGE BOLT SPACING	TOP FLANGE	NCOLS	SPACE (2)	STAGGER (2)	NCOLS	SPACE (1)	STAGGER (1)
LEFT SIDE	0	0.000	0.000	0.000	5	2.750	0.000
RIGHT SIDE	0	0.000	0.000	0.000	5	2.750	0.000

BOTTOM FLANGE	NCOLS	SPACE (2)	STAGGER (2)	NCOLS	SPACE (1)	STAGGER (1)
LEFT SIDE	0	0.000	0.000	5	2.750	0.000
RIGHT SIDE	0	0.000	0.000	5	2.750	0.000

\*\*\*\*\* NOTE: NUMBER OF COLUMNS, ROWS, AND TOTAL BOLTS ARE FOR THE ENTIRE SPICE. \*\*\*\*\*  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 08/08/2011 08:37:53.046  
 File Name: N:\149633\Bridges\Design\Final\_Design\Unit 2\Stringers\FDesign\String 8ft 10in deck.out

SPICE PLATE DIMENSIONAL SUMMARY  
 WEB BOLT SPACING: TOP/WEB TO CL TOP ROW NROWS SPACING CL BOT ROW  
 3.825 4 3.000 3.825  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 08/08/2011 08:37:53.046  
 File Name: N:\149633\Bridges\Design\Final\_Design\Unit 2\Stringers\FDesign\String 8ft 10in deck.out

COMMENT NUMBER: 0  
 FIELD SPICE run completed with 0 error(s) and 0 warning(s):  
 BEGIN TIME: 08/08/2011 08:37:52  
 END TIME: 08/08/2011 08:37:53  
 ELAPSED TIME: 00:00:01

BEARING ON OUTSIDE FLANGE SPL PL: 4 L 95.36 202.80 54.60 257.40  
 BEARING ON INSIDE FLANGE SPL PL: 4 L 85.71 253.50 68.25 321.75  
 SPICE PLATE BLOCK SHEAR CHECK  
 SPICE PLATE DIMENSIONAL SUMMARY

ITEM	DC (in)	DC-EM (in)	NONCOMP (in)	LOAD CASE (in)	MAX (in)	MIN (in)	TOTAL (in)	ALLOW (in)
DC	2.43	0.45	15	2.88	16	-0.95	3.93	16.00
NONCOMP	-2.43	-0.01	15	0.34	16	-0.11	---	---
LOAD CASE	---	---	---	---	---	---	---	---

SPICE PLATE DIMENSIONAL SUMMARY  
 PLATE THICKNESS (in) 0.500  
 TOP OUTSIDE 11.125  
 TOP INSIDE 4.000  
 BOT INSIDE 4.000  
 BOT OUTSIDE 11.125  
 WEB PLATE 23.500

PLATE	WIDTH (in)	LENGTH (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)	BOUNDS (in)
TOP OUTSIDE	11.125	0.500	2	10	20	20	20	20
TOP INSIDE	4.000	0.625	2	10	20	20	20	20
BOT INSIDE	4.000	0.625	2	10	20	20	20	20
BOT OUTSIDE	11.125	0.500	2	10	20	20	20	20
WEB PLATE	23.500	0.688	4	8	32	32	32	32

\*\*\*\*\* NOTE: NUMBER OF COLUMNS, ROWS, AND TOTAL BOLTS ARE FOR THE ENTIRE SPICE. \*\*\*\*\*

FLANGE BOLT SPACING	TOP FLANGE	NCOLS	SPACE (2)	STAGGER (2)	NCOLS	SPACE (1)	STAGGER (1)
LEFT SIDE	0	0.000	0.000	0.000	5	2.750	0.000
RIGHT SIDE	0	0.000	0.000	0.000	5	2.750	0.000

BOTTOM FLANGE	NCOLS	SPACE (2)	STAGGER (2)	NCOLS	SPACE (1)	STAGGER (1)
LEFT SIDE	0	0.000	0.000	5	2.750	0.000
RIGHT SIDE	0	0.000	0.000	5	2.750	0.000

\*\*\*\*\* NOTE: NUMBER OF COLUMNS, ROWS, AND TOTAL BOLTS ARE FOR THE ENTIRE SPICE. \*\*\*\*\*  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 08/08/2011 08:37:53.046  
 File Name: N:\149633\Bridges\Design\Final\_Design\Unit 2\Stringers\FDesign\String 8ft 10in deck.out

SPICE PLATE DIMENSIONAL SUMMARY  
 WEB BOLT SPACING: TOP/WEB TO CL TOP ROW NROWS SPACING CL BOT ROW  
 3.825 4 3.000 3.825  
 HNTB BRIDGE DESIGN PROGRAM  
 RUN TIME: 08/08/2011 08:37:53.046  
 File Name: N:\149633\Bridges\Design\Final\_Design\Unit 2\Stringers\FDesign\String 8ft 10in deck.out

COMMENT NUMBER: 0  
 FIELD SPICE run completed with 0 error(s) and 0 warning(s):  
 BEGIN TIME: 08/08/2011 08:37:52  
 END TIME: 08/08/2011 08:37:53  
 ELAPSED TIME: 00:00:01