

**GENERAL:** This drawing provides design and construction details. The Project plans shall show the location of splices plus a reference to this drawing for pertinent details and notes. For splicing beams of different sizes or where splices are located at beam bend points, the project plans shall include sufficient details supplementing this drawing to completely describe the splice.

**DESIGN SPECIFICATIONS:** This drawing conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway Officials, 1965, including the Ohio "Supplement" to these specifications.

**BASIC UNIT STRESSES:**  
 Structural Steel ASTM A-36 20,000 psi bending  
 12,000 psi shear  
 High Strength Bolts ASTM A-325 13,500 psi shear

**FATIGUE UNIT STRESSES:** Where the ratio of the minimum to the maximum moment R is <0 the splice design shall be based on the allowable fatigue unit stresses as required by Section 1.7.3 instead of on the basic unit stresses noted above. The effect of this change in the allowable unit stresses may be conveniently implemented in the design by increasing the calculated maximum stresses (moment and shear) by the ratio of the basic unit stress to the fatigue unit stress. These modified maximum stresses may then be used as specified in the DESIGN note to verify the adequacy of the splice design shown hereon, or to establish modified strength requirements for special designs using basic unit stresses.

**DESIGN:** For each structure the designer shall choose a splice location and determine the maximum total stresses (moment and shear) at that point. The splice shall be designed for not less than (1) the average of the calculated maximum stress and the static strength of the beam, (2) the modified maximum stress specified in the FATIGUE UNIT STRESSES note, or (3) 75% of the static strength of the beam. The splice designs shown hereon are designed for (3). If stresses (1) or (2) are more critical, this design shall not be used and such splices should be designed to meet the established requirements. The static beam strength at the splice is based on the net section for bending and the gross section for shear using the basic unit stresses. When splicing beams of different sizes, the splice design shall be based on the lighter weight beam.

**FASTENERS:** 1" diameter High Strength Bolts.

**SPLICE MATERIAL WEIGHT** plus the weight of fills, where required, shall be included with the structural steel quantity for payment.

**FABRICATION AND ASSEMBLY:** Beam ends at splices shall be cut and fit as per plan. The opening between beam ends after assembly shall not exceed  $\frac{1}{4}$ ".

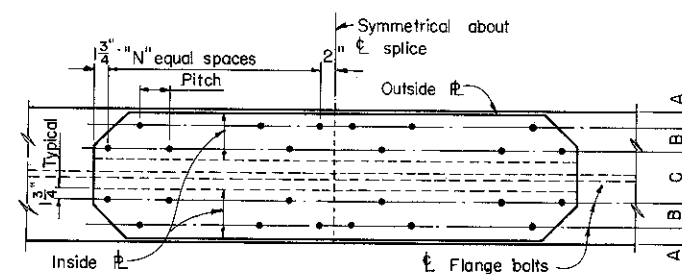
**FILLS** shown on the project plans and shop drawings shall be dimensioned to the nearest  $\frac{1}{16}$  inch in thickness, but not less than  $\frac{1}{8}$  inch thick, based on the dimensions for detailing and intended relative position of the abutting flanges and webs, to be spliced. However, in the final shop assembly, fills shall be furnished with thicknesses sufficient to compensate for any misalignment of abutting flanges and webs due to standard rolling mill tolerances. The actual fills used in the splice shall be such as to compensate for differences in total thickness or relative positions of  $\frac{1}{16}$  inch or more.

**VERTICAL CLEARANCE:** For grade separation structures an allowance of  $\frac{3}{4}$  inches plus the thickness of the outside flange splice plate shall be used in computing the actual vertical clearance under a beam splice.

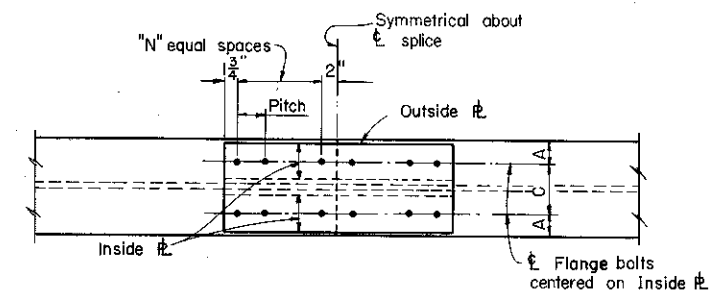
BEAM SPLICE DATA																
DETAILS												DESIGN				
Beam	TYPE	Flange Splice				Flange Bolts				Web Splice		Weight of splice material # lbs.	Beam Strength			
		Outside		Inside		Number	N	Dimensions (inches)			Web Plates		Web Bolts	Moment ft.-kips	Shear kips	
		2 required	4 required	Spa	Pitch			A	B	C						
36 WF	280	B	16x $\frac{11}{16}$ x 6'-3"	6 $\frac{1}{2}$ x $\frac{13}{16}$ x 6'-3"	80	9	3 $\frac{3}{4}$	2 $\frac{1}{8}$	3	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	60	1210	1455	354
	260	B	16x $\frac{9}{16}$ x 5'-0"	6 $\frac{1}{2}$ x $\frac{3}{4}$ x 5'-0"	64	7	3 $\frac{3}{4}$	2	3	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	60	950	1338	338
	245	B	16x $\frac{9}{16}$ x 5'-0"	6 $\frac{1}{2}$ x $\frac{11}{16}$ x 5'-0"	64	7	3 $\frac{3}{4}$	2	3	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	54	880	1261	321
	230	B	16x $\frac{9}{16}$ x 5'-0"	6 $\frac{1}{2}$ x $\frac{5}{8}$ x 5'-0"	64	7	3 $\frac{3}{4}$	2	3	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	54	840	1180	306
	194	A	11x $\frac{5}{8}$ x 2'-11 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{3}{4}$ x 2'-11 $\frac{1}{2}$ "	40	4	3 $\frac{1}{2}$	2 $\frac{9}{16}$	-	7	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	54	540	891	314
	182	A	11x $\frac{9}{16}$ x 2'-11 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{11}{16}$ x 2'-11 $\frac{1}{2}$ "	40	4	3 $\frac{1}{2}$	2 $\frac{9}{16}$	-	7	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	48	490	838	295
	170	A	11x $\frac{1}{2}$ x 2'-11 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{5}{8}$ x 2'-11 $\frac{1}{2}$ "	40	4	3 $\frac{1}{2}$	2 $\frac{1}{2}$	-	7	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	48	460	782	277
	160	A	11x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{2}$	-	7	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-7"	48	400	729	266
	150	A	11x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{2}$	-	7	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-7"	40	340	670	255
	135	A	11x $\frac{3}{8}$ x 2'-4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{2}$	-	7	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-7"	40	320	583	244
33 WF	240	B	15x $\frac{5}{8}$ x 4'-8 $\frac{1}{2}$ "	6 x $\frac{13}{16}$ x 4'-8 $\frac{1}{2}$ "	64	7	3 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{1}{2}$	6 $\frac{1}{4}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-4"	54	870	1140	306
	220	B	15x $\frac{9}{16}$ x 4'-8 $\frac{1}{2}$ "	6 x $\frac{11}{16}$ x 4'-8 $\frac{1}{2}$ "	64	7	3 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	6 $\frac{1}{4}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-4"	54	790	1040	286
	200	B	15x $\frac{1}{2}$ x 3'-6 $\frac{1}{2}$ "	6 x $\frac{9}{16}$ x 3'-6 $\frac{1}{2}$ "	48	5	3 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	6 $\frac{1}{4}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-4"	48	580	943	264
	152	A	10x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	4 x $\frac{11}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{8}$	-	6 $\frac{1}{4}$	B	19 $\frac{1}{2}$ x $\frac{7}{16}$ x 2'-4"	42	380	655	239
	141	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{5}{8}$	-	6 $\frac{1}{4}$	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-4"	36	320	595	228
	130	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{5}{8}$	-	6 $\frac{1}{4}$	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-4"	36	310	539	218
	118	A	10x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2 $\frac{5}{8}$	-	6 $\frac{1}{4}$	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 2'-4"	36	250	476	208
	132	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{4}$	-	6	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 2'-1"	42	350	501	209
	124	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 x $\frac{9}{16}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{1}{4}$	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 2'-1"	32	300	464	199
	116	A	10x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2 $\frac{1}{4}$	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 2'-1"	32	240	430	192
30 WF	108	A	10x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2 $\frac{1}{4}$	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 2'-1"	32	230	392	186
	99	A	10x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2 $\frac{1}{4}$	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 2'-1"	32	220	353	177
	114	A	9 $\frac{1}{2}$ x $\frac{7}{16}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2 $\frac{1}{8}$	-	6	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-11"	36	270	390	174
	102	A	9 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{7}{16}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-11"	28	220	345	158
	94	A	9 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{7}{16}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-11"	28	220	315	150
	84	A	9 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	4 x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	6	A	13 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-11"	28	210	273	141
	110	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{3}{4}$	-	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-8"	30	300	373	138
	100	A	10x $\frac{7}{16}$ x 2'-4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ x $\frac{1}{2}$ x 2'-4 $\frac{1}{2}$ "	32	3	3 $\frac{1}{2}$	2 $\frac{3}{4}$	-	6 $\frac{1}{2}$	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-8"	30	300	338	126
	94	A	8 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	3 $\frac{1}{2}$ x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	5	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-8"	30	230	282	140
	84	A	8 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	3 $\frac{1}{2}$ x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	5	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-8"	30	230	250	127
24 WF	76	A	8 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	3 $\frac{1}{2}$ x $\frac{1}{2}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	5	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-8"	30	230	223	119
	68	A	8 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	3 $\frac{1}{2}$ x $\frac{1}{8}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	2	-	5	A	13 $\frac{1}{2}$ x $\frac{9}{16}$ x 1'-8"	24	200	195	112
21 WF	68	A	8 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	3 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-9 $\frac{1}{2}$ "	24	2	3 $\frac{1}{2}$	1 $\frac{3}{4}$	-	4 $\frac{3}{4}$	B	19 $\frac{1}{2}$ x $\frac{3}{8}$ x 1'-5"	24	190	175	102

\* Trim plates as required to fit beam fillets.

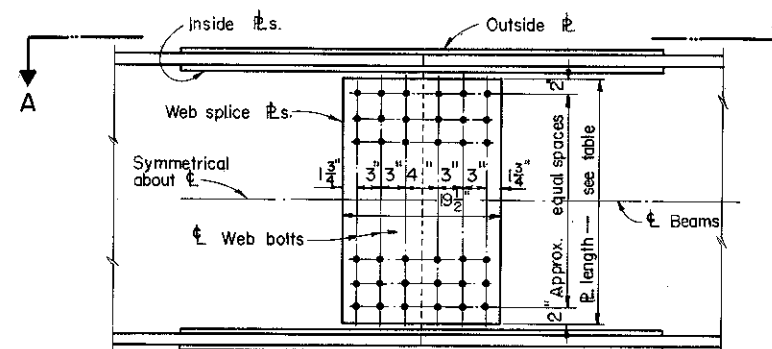
\* Tabulated weights are approximate and are for estimating purposes only. They include an allowance for weight of bolts and washers.



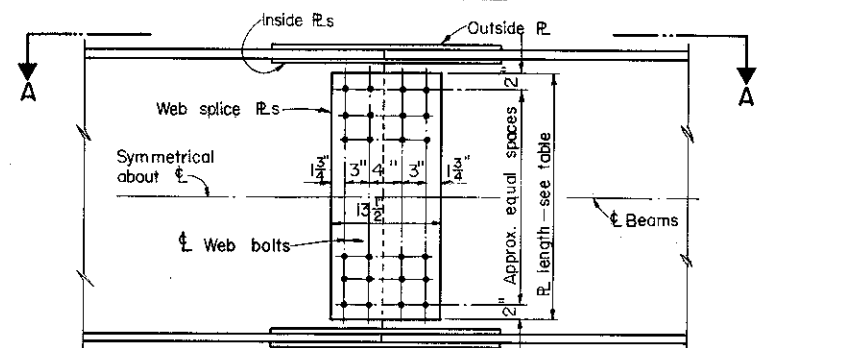
VIEW A-A  
Flange Splice-TYPE B



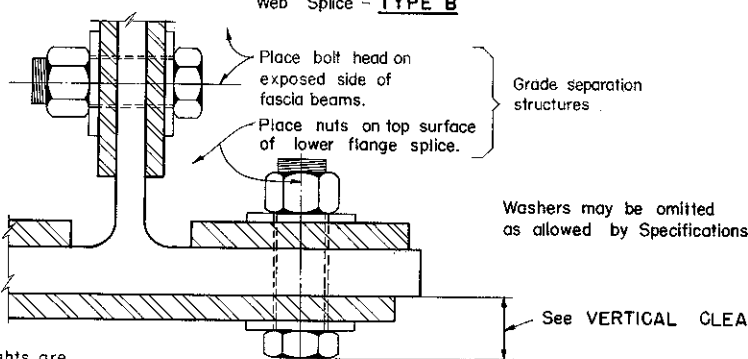
VIEW A-A  
Flange Splice-TYPE A



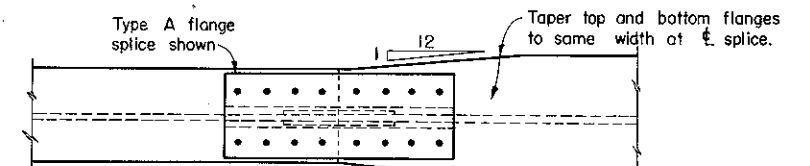
BEAM SPLICE DETAIL  
Web Splice-TYPE B



BEAM SPLICE DETAIL  
Web Splice-TYPE A



PARTIAL SECTION  
(at center of beam splice)



VIEW A-A  
Splice detail for beams having different flange widths

REVISIONS		STATE OF OHIO DEPARTMENT OF HIGHWAYS DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES			
STANDARD BOLTED BEAM SPLICE DETAILS FOR STEEL BEAM BRIDGES					
APPROVED:	DATE: 6-12-69				DRAWING NUMBER
PREPARED	TRACED	CHECKED	REVIEWED	9D-1-69	
MPB	CAM	CPD	HHH BFG RVH	SHEET NO 4 OF 4 SHEETS	