

**GENERAL:** This drawing provides design and construction details. The Project plans shall show the location of splices plus a reference to this drawing where applicable. For splicing beams of different sizes, the project plans shall also include a splice detail showing splice plates, bolts, and fills.

**DESIGN SPECIFICATIONS:** This standard drawing conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated September 1, 1957, together with current revisions thereof, except; strength of splice is based on Section 1.6.31 of the A.A.S.H.O. "Standard Specifications for Highway Bridges" dated 1961, together with current revisions thereof.

# **DESIGN UNIT STRESSES:**

Structural Steel	ASTM A-36	20,000 psi	bending
		12,000 psi	shear
High Strength Bolts	ASTM A-325	15,500 psi	shear
		40,000 psi	bearing

**DESIGN:** The splice details shown are based on 75% of the strength of the beam. For each structure, the designer shall determine the splice location and calculate the maximum total stresses (moment and shear) at the splice. As required by the above Specifications, the splice strength shall be based on the average of the calculated stresses and the strength of the beam, but not less than 75% of the strength of the beam. For splices located near points of contraflexure, the latter requirement will generally govern and the splices shown hereon may be used. Where a splice strength exceeding 75% of the beam strength is required, the splice design shall be special. For splicing beams of different sizes, the design of the splice shall be based on the strength of the lighter weight beam. Beam strength at the splice, as noted above, is based on the net section for bending and gross section for shear.

**MATERIAL:** Splice plates, bolts, and fills shall be in accordance with the Construction and Material Specifications. Bolts shall be 1" diameter, high strength. The splice weight shown hereon, plus the weight of fills, where required, shall be included with the structural steel quantity for payment.

**FILLS** shown on the project plans and shop drawings shall be dimensioned to the nearest 1/8 inch in thickness, but not less than 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 clamping together of splice plates over material (including fills) that vary by more than 1/8 inch in thickness or relative position at the centerline of the splice, will not be permitted.

**VERTICAL CLEARANCE:** For grade separation structures an allowance of 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.

**ERECTION:** In the field erection of beams with bolted field splices, the beams shall be positioned to facilitate the placing of drift pins. Drifting done during erection shall be only such as to align the parts to be bolted and not to enlarge the holes or distort the metal. Heavy driving of drift pins will not be permitted.

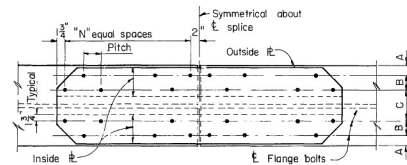
**FIELD ASSEMBLY:** In the final assembly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes (not less than 25 percent for field erection) to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact. Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts, tightened in the same manner.

## **BEAM SPLICE DATA**

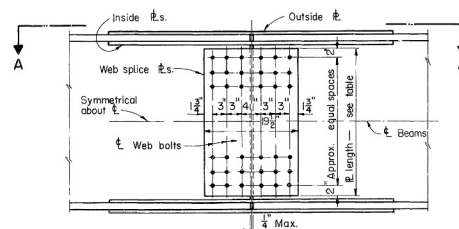
BEAM SPLICING DATA														
DETAILS													DESIGN	
Beam	TYPE	Flange Splice					Web Splice					Weight of splice material # lbs.	Beam Strength	
		Flange Plates		Flange Bolts			Web Plates		Web Bolts	Moment ft.-kips	Shear kips			
		Outside 2 required	Inside 4 required	Number	N Spacing	Dimensions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

\*Trim plates as required to fit beam flails.

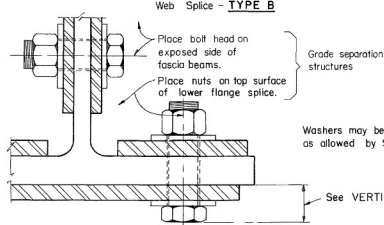
# Includes an allowance for weight of bolts and washers.



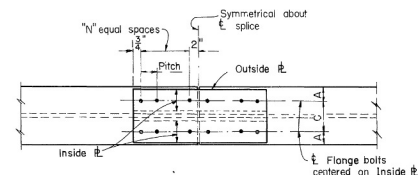
**VIEW A-A**  
Flange Splice - TYPE B



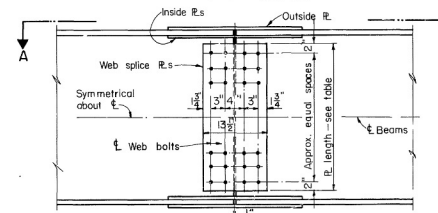
**BEAM SPLICE DETAIL**  
Web Splice - TYPE B



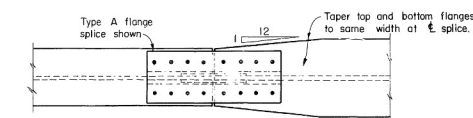
**PARTIAL SECTION**  
(at t of beam splice)



**VIEW A-A**  
Flange Splice - TYPE A



**BEAM SPLICE DETAIL**  
Web Splice - TYPE A



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

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: 11-25-64 BY: G. H. Alkhatib CHIEF OF BRIDGES	DRAWING NUMBER SD-2-64
DESIGNED BY: MTS	CHECKED BY: CAM
TRACED BY: CPD	REVIEWED BY: HHK
BY: BPS	BY: RVL