

## 12 DESIGN CAPACITY TABLES

The following DESIGN CAPACITY TABLES are provided, derived using DESIGN CHECK NOS 1 to 9 inclusive.

### 12.1 Four bolt unstiffened end plate

Table 6 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Four bolt unstiffened end plate  
M24 bolts 8.8/TB category threads excluded from shear plane  
Welded beam/Universal beam sections > 300 mm deep

Table 7 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Four bolt unstiffened end plate  
M20 bolts 8.8/TB category threads excluded from shear plane  
Universal beam sections > 200 mm deep

### 12.2 Four bolt stiffened end plate

Table 8 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Four bolt stiffened end plate  
M24 bolts 8.8/TB category threads excluded from shear plane  
Welded beam/Universal beam sections > 300 mm deep

Table 9 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Four bolt stiffened end plate  
M20 bolts 8.8/TB category threads excluded from shear plane  
Universal beam sections > 200 mm deep

### 12.3 Six bolt unstiffened end plate

Table 10 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Six bolt unstiffened end plate  
M24 bolts 8.8/TB category threads excluded from shear plane  
Welded beam/Universal beam sections > 450 mm deep

Table 11 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Six bolt unstiffened end plate  
M20 bolts 8.8/TB category threads excluded from shear plane  
Universal beam sections > 350 mm deep

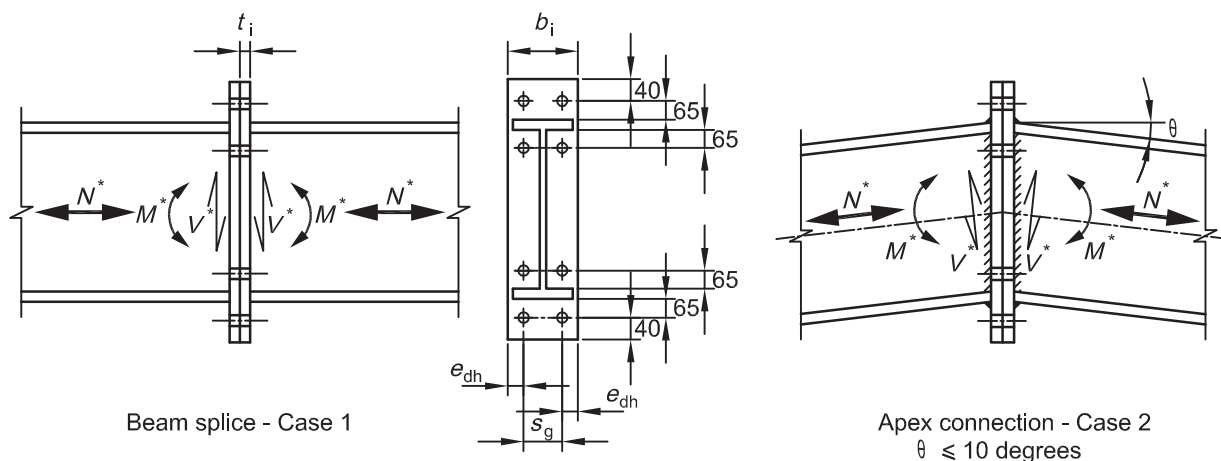
### 12.4 Eight bolt stiffened end plate

Table 12 Design moment capacity of connection  $\phi M_{\text{conn}}$ —Eight bolt stiffened end plate  
M24 bolts 8.8/TB category threads excluded from shear plane  
Welded beam and universal beam sections > 520 mm deep



TABLE 6

**DESIGN MOMENT CAPACITY OF CONNECTION  $\phi M_{conn}$**   
**FOUR BOLT UNSTIFFENED END PLATE**  
**M24 BOLTS 8.8/TB CATEGORY THREADS EXCLUDED FROM SHEAR PLANE**  
**WELDED BEAM/UNIVERSAL BEAM SECTIONS > 300 MM DEEP**  
**(TABLE DEVELOPED USING THICK PLATE THEORY)**



Section, Grade 300	$\phi M_s$ kNm	Welds		Grade 250 plate			CASE 1		CASE 2 $\theta \neq 0, N^* \neq 0$		
		Flange	Web	Width $b_i$	Thickness $t_i$	Gauge $s_g$	Max $V^*$ (plus or minus) kN	$\theta=0, N^*=0$ $\phi M_{conn}$ kN.m	Max $V^*$ (plus or minus) kN	Max $N^*$ (Tens or Comp) kN	$\phi M_{conn}$ Refer Note kNm
700WB130	1210	FPBW	8	270	28	170	660	636	165	224	557*
700WB115	1020	FPBW	8	270	28	170	582	632	165	197	563
610UB125	927	FPBW	8	250	28	170	399	554	177	201	492
610UB113	829	FPBW	8	250	28	170	343	551	165	182	495
610UB101	782	FPBW	8	250	28	170	222	549	165	175	495
530UB92.4	640	FPBW	10	230	28	150	563	484	140	159	441
530UB82.0	558	FPBW	10	230	28	150	525	481	131	142	444
460UB82.1	496	FPBW	10	220	28	140	472	415	118	141	383
460UB74.6	449	FPBW	10	220	28	140	431	414	108	128	385
460UB67.1	399	FPBW	8	220	28	140	400	399	100	116	386
410UB59.7	324	FPBW	8	220	28	140	328	324	328	103	324
410UB53.7	304	FPBW	8	220	28	140	317	304	317	99.0	304
360UB56.7	273	FPBW	8	220	28	140	297	273	297	98.0	273
360UB50.7	242	FPBW	8	220	25	140	269	242	269	87.5	242
360UB44.7	222	FPBW	8	220	25	140	252	222	252	82.5	222
310UB46.2	197	FPBW	6	220	25	140	213	197	213	80.0	197
310UB40.4	182	FPBW	6	220	25	140	192	182	192	75.0	182

## NOTES:

$\phi M_s$  = design section moment capacity,  $\phi M_{conn}$  = design moment capacity of connection.

\* indicates  $\phi M_{conn}$  is less than recommended minimum of 0.5 ( $\phi M_s$ ).

Case 1 applies to straight flexural member splices (i.e.  $\theta=0$ ) with no axial force ( $N^*=0$ ).

Case 2 applies to connections where  $\theta$  is within the range  $-10$  to  $10$  degrees, and design axial force ( $N^*$ ) does not exceed the value tabulated (approx 5% of design section capacity). Axial/moment combination to be checked separately, for the beam section.

Design shear force ( $V^*$ ) is the **MINIMUM** of **MAXIMUM** of  $0.15\phi V_v$  (design shear capacity) and 40 kN.

Maximum  $V^*$  limited to  $0.6\phi V_v$  to ensure  $M^*, V^*$  combination is satisfied for the beam section, and to bolt design shear capacity,

Welds: E48XX/W50X electrodes assumed.

Fillet weld size given is minimum required, a larger size or FPBW may be used.

FPBW = full penetration butt weld. All welds Category SP.

Horizontal edge distance  $e_{dh} = (b_i - s_g) / 2$ ; different for each section size but always  $\geq 36$  mm.



# **DESIGN GUIDE 10**

## **Bolted moment end plate beam splice connections**

**by**

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**Bolted moment end plate beam splice connections**

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