lateral support shall be designed for the design axial force (N*) plus a design bending moment not less than the design bending moment (M*) where:

$$M^* = \frac{\delta N^* L_s}{1000}$$

S = appropriate amplification factor S_b or s_S determined in accordance with Clause 4.4 of AS 4100

L_S = Distance between points of effective lateral support

When members are not prepared for full contact the splice material and its fasteners shall be arranged to hold all parts in line and shall be designed to transmit a force of 0.3 times the member design capacity in axial compression.

(vi) Splices in flexural members - a bending moment of 0.3 times the member design capacity in bending. This provision shall not apply to splices designed to transmit shear force only.

A splice subjected to a shear force only shall be designed to transmit the design shear force together with any bending moment resulting from the eccentricity of the force with respect to the centroid of the connector group.

(vii) Splices in members subject to combined actions - a splice in a member subject to a combination of design axial tension or design axial compression and design bending moment shall satisfy (iv), (v) and (vi) simultaneously.

The action to be designed for is the greater of the calculated design actions or the minimum specified in (i) to (vii) as appropriate.

The minimum is generally expressed as a factor times the design capacity (Ru) for the minimum size of member required by the strength limit state. Hence, if a member is increased in size above the minimum size for whatever reason (rationalisation of member sizes, slenderness or serviceability considerations) it is only necessary to use the design capacity of the minimum size required by the strength limit state for the purpose of determining the minimum design action. For example, for columns which may be subject to large compressive forces and only minor tensile forces, any splice has to be designed for both the specified value for the minimum member size required to resist the compression and for the specified value for the minimum member size required to resist the tension.

Where the connection design is carried out by the structural engineer, the minimum design actions are as shown in Tables 11 to 13 in Simple Connections DCTs V3. These minima are based on the above provisions from AS 4100.

Where connection design is left to the shop detailer/ fabricator, the following design actions should be shown in the contract documents.

Simple construction	design reaction R*
Rigid construction and splices	design bending moment M*
	design shear force V*
	design axial force N*

(Different combinations of these actions might need to be specified to encompass all likely load combinations.)

Design Capacity Tables

Web Side Plate Connection

The web side plate (WSP) connection consists of a length of plate or flat bar, fillet welded on both sides to a supporting member with bolts connecting the supported beam web to the web side plate with some typical examples shown in Fig.14.

The supported member may require the flange and/or the web to be coped in order to enable the connection to be effected, illustrated in Fig.14(b).

Features of the connection are:

— Welds are fillet welds to both sides of the component connecting it to the supporting member.

— The component is either a standard size flat bar or a plate cut to suit.

— The bolting category normally used is 8.8/S.

— The connection can be used with skew beams.

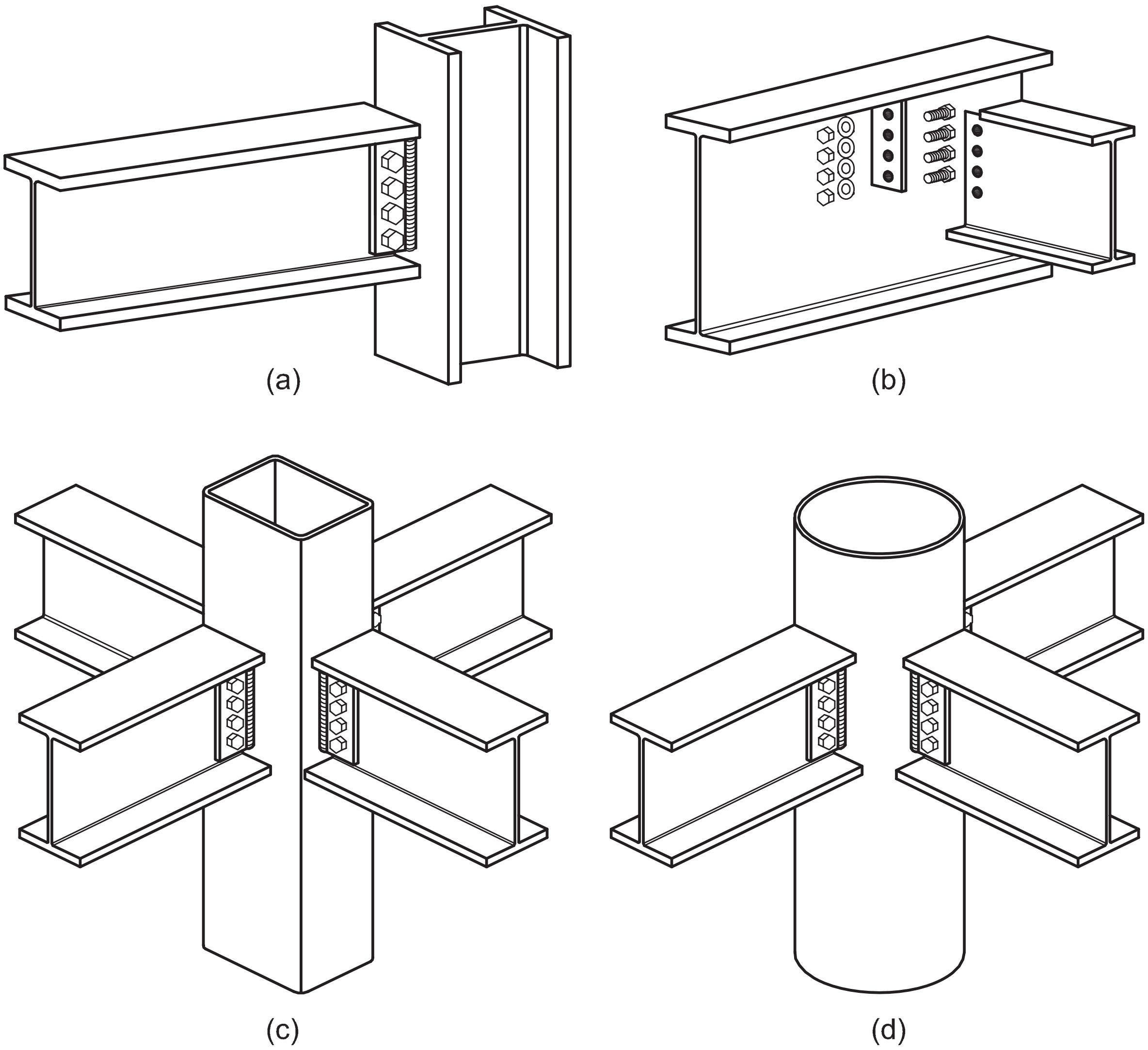

FIGURE 14. TYPICAL WEB SIDE PLATE CONNECTIONS

Summary of Design Checks for WSP Connection

Design is based on determining V_{des}, the design capacity of the connection which is the minimum of the design capacities V_a, V_b, V_c, V_d, V_e, V_f, V_g, V_h.

The design requirement is then $V_{des} \geq V^*$ (design shear force).

From AS 4100, Clause 9.1.4(b)(ii) (Ref. 1) this connection must be designed for a minimum design shear force of 40kN, or 0.15 x member design shear capacity, whichever is the lesser.

SUMMARY OF CHECKS REQUIRED (REF. 4)

DESIGN CHECK NO.1	Detailing limitations
DESIGN CHECK NO.2	Design capacity of weld to supporting member
DESIGN CHECK NO.3	Design capacity of bolt group - Alternatives A and B
DESIGN CHECK NO.4	Design capacity of web side plate (Shear, bending, block shear)
DESIGN CHECK NO.5	Design capacity of supported member (Shear - un-coped or coped)
DESIGN CHECK NO.6	Design capacity of supported member (Block shear - coped sections)
DESIGN CHECK NO.7	Design capacity of supported member (Bending of coped sections)
DESIGN CHECK NO.8	Beam rotation check
DESIGN CHECK NO.9	Local stability of coped supported member
DESIGN CHECK NO.10	Local capacity of supporting member

The design capacity tables in these Simple Connections DCTs, V3 are based on DESIGN CHECKS 1 to 6 inclusive. DESIGN CHECKS 7 to 10 must be carried out in addition.

Flexible End Plate Connection

The flexible end plate (FEP) connection consists of a length of plate or flat bar, fillet welded on both sides to the web of the supported member with bolts connecting the end plate to the supporting member with some typical examples shown in Fig 15.

The supported member may require the flange and/or the web to be coped in order to enable the connection to be effected.

Features of the connection are:

— Welds are fillet welds to both sides of the supported beam web.

— The component is either a standard size flat bar or plate cut to suit.

— The bolting category normally used is 8.8/S.

— The component does not extend to the bottom flange of the supported beam in order to ensure that the beam can rotate without touching the supporting member.

— The connection can be used to hollow section columns if studs or special bolts are used (not within the scope of the Simple Connections DCTs, V3).

— The connection can be used with skew beams to a limited extent.

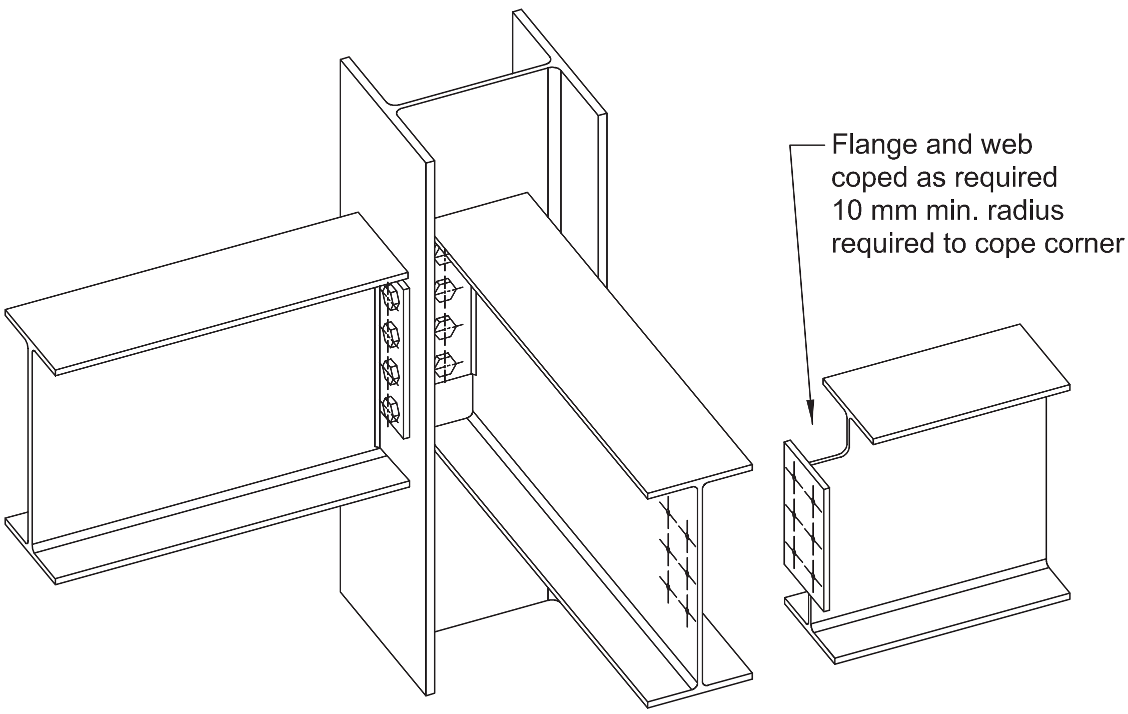

FIGURE 15. TYPICAL FLEXIBLE END PLATE CONNECTIONS