S is the plastic modulus of the section about the relevant axis;

Z is the elastic modulus of the section about the relevant axis.

When the depth to thickness ratio, d/t, of a web exceeds 63ϵ then it should be checked for shear buckling in accordance with **4.4.5**.

4.2.6 Moment capacity with high shear load

Where $F_v > 0.6P_v$ the moment capacity, M_c, should be taken as follows.

(a) For plastic or compact sections:

$$M_c = p_y(S - S_v\rho_1) \text{ but} \leqslant 1.2p_yZ$$

where $\rho_1 = \frac{2.5F_v}{P_v} - 1.5$

and S_v is taken as follows:

For sections with equal flanges: the plastic modulus of the shear area, A_v (see figure 4(a));

For sections with unequal flanges: the plastic modulus of the gross section less the plastic modulus of that part of the section remaining after deduction of the shear area (see figure 4(b)).

(b) For semi-compact sections:

$$M_c = p_yZ$$

(c) For slender sections:

$$M_c = p_yZ$$

where p_y and Z are as defined in **4.2.5**.

When the depth to thickness ratio, d/t, of a web exceeds 63ϵ then it should be checked for shear buckling in accordance with **4.4.5**.

4.3 Lateral torsional buckling

4.3.1 General

A beam not provided with full lateral restraint as defined in **4.2.2** should be checked for resistance to lateral torsional buckling.

When a beam requires lateral restraint within its span, such restraint should have sufficient strength and stiffness to inhibit lateral movement of the compression flange relative to the supports. This may be provided by lateral restraints or torsional restraints (see **4.3.2** and **4.3.3**).

All beams should also satisfy the requirements of **4.2.1** and **4.2.3** to **4.2.6** inclusive.

4.3.2 Lateral restraints

4.3.2.1 Where one or more lateral restraints are required at intervals within the span of a beam, these intermediate lateral restraints should be capable of resisting a total force of not less than 2.5 % of the maximum factored force in the compression flange, divided between the intermediate lateral restraints in proportion to their spacing.

The intermediate lateral restraints should either be connected to an appropriate system of bracing capable of transferring the restraint forces to the beam's effective points of support, or else connected to an independent robust part of the structure capable of fulfilling a similar function.

Where two or more parallel members require lateral restraint at intervals, it is not adequate merely to connect the members together such that they become mutually dependent.

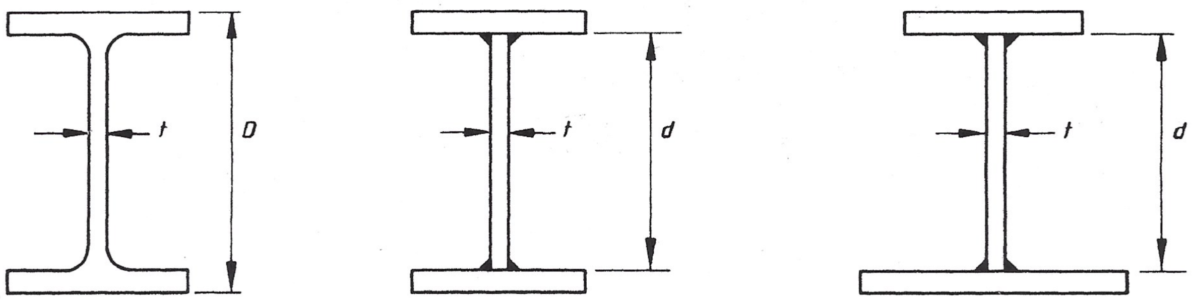
4.3.2.2 Where three or more intermediate lateral restraints are provided, each intermediate lateral restraint should be capable of resisting a force of not less than 1 % of the maximum factored force in the compression flange.

In this case, the bracing system should be capable of resisting the greater of the effects of:

(a) the 1 % restraint force considered as acting at only one point at a time;

(b) the restraint forces described in **4.3.2.1**.

4.3.2.3 Where more than three parallel members share the same system of restraints, the combined lateral restraint force should be taken as the sum of the three largest lateral restraint forces required for each individual restrained member, as determined in accordance with **4.3.2.1** and **4.3.2.2**.



Shear area = $A_v = tD$
Rolled section

Shear area = $A_v = td$
Welded section

(a) Equal flanges

Shear area = $A_v = td$
Welded section

(b) Unequal flanges

Figure 4. Effective shear area of typical sections