city reduction factor β which is based upon the slenderness ratio value. It is obtained from BS 5628 Part 1 Table 7, reproduced here as Table 4.8.

A load applied eccentrically will increase the tendency for a wall or column to buckle and reduce the load capacity further. This is catered for by using a modified capacity reduction factor β from Table 4.8 which depends on the ratio of the eccentricity e_x to the member thickness.

Table 4.8 Capacity reduction factor β (BS 5628 Part 1 1978 Table 7)

Slenderness ratio h_{ef}/t_{ef}	Eccentricity at top of wall e_x Up to 0.05t (see note 1)	0.1t	0.2t	0.3t
0	1.00	0.88	0.66	0.44
6	1.00	0.88	0.66	0.44
8	1.00	0.88	0.66	0.44
10	0.97	0.88	0.66	0.44
12	0.93	0.87	0.66	0.44
14	0.89	0.83	0.66	0.44
16	0.83	0.77	0.64	0.44
18	0.77	0.70	0.57	0.44
20	0.70	0.64	0.51	0.37
22	0.62	0.56	0.43	0.30
24	0.53	0.47	0.34	
26	0.45	0.38		
27	0.40	0.33		

Note 1: It is not necessary to consider the effects of eccentricities up to and including 0.05t.
Note 2: Linear interpolation between eccentricities and slenderness ratios is permitted.
Note 3: The derivation of β is given in Appendix B of BS 5628.

Whilst ideally the actual eccentricity should be calculated, BS 5628 allows it to be assumed at the discretion of the designer. Thus for a wall supporting a single floor or roof it may be assumed that the load will act at one-third of the bearing length from the edge of the supporting wall or leaf, as illustrated in Figure 4.17. When a floor of uniform thickness is continuous over a supporting wall, each span of the floor may be taken as being supported on half the total bearing area, as shown in Figure 4.18.

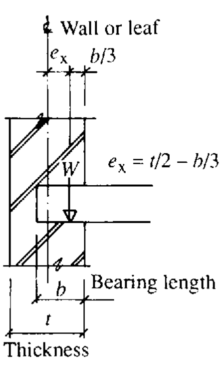


Figure 4.17 *Assumed load eccentricity from a single floor or roof spanning on to a wall*

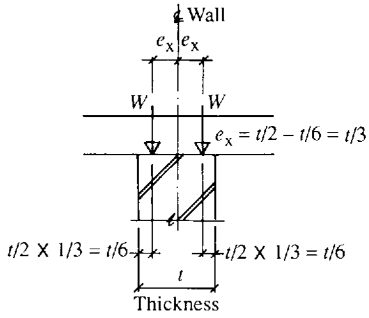


Figure 4.18 *Assumed load eccentricity from a floor or roof continuous over a wall*

Where joist hangers are used the resultant load should be assumed to be applied at a distance of 25 mm from the face of the wall, as shown in Figure 4.19.

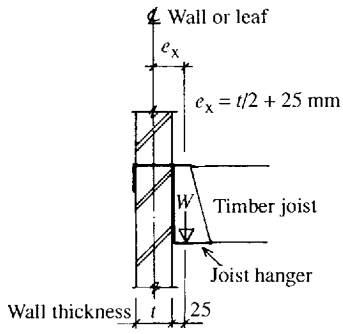
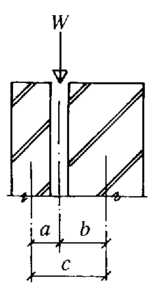
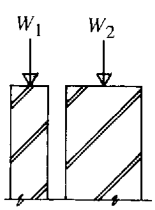


Figure 4.19 *Assumed load eccentricity from joist hangers*

4.10 Vertical load resistance



(a) Load acting on centroid of cavity wall



$W_1 = Wb/c$ and $W_2 = Wa/c$

(b) Equivalent axial load acting on each leaf

Figure 4.20 *Cavity wall with both leaves loaded*

The design vertical resistance of a wall per unit length is given by the following expression:

$$\text{Vertical design strength per unit length of wall} = \frac{\beta t f_k}{\gamma_m} \qquad (4.1)$$

where

- β capacity reduction factor from Table 4.8
- f_k characteristic strength of masonry units from the appropriate part of Table 4.5
- γ_m material partial safety factor from Table 4.6
- t actual thickness of leaf or wall

For a rectangular masonry column the design vertical load resistance is given by the following expression:

$$\text{Vertical design strength of column} = \frac{\beta b t f_k}{\gamma_m} \qquad (4.2)$$

where b is the width of the column, t is the thickness of the column, and the other symbols are the same as those defined after expression 4.1 for walls.

The design vertical load resistance of a cavity wall or column is determined in relation to how the vertical load is applied. When the load acts on the centroid of the two leaves (Figure 4.20a) it should be replaced by two statically equivalent axial loads acting on each of the leaves (Figure 4.20b). Each leaf should then be designed to resist the equivalent