and t are respectively the width and thickness of the member, f_k is the characteristic compressive strength and γ_m is the material partial safety factor.

The capacity reduction factor *ß* has been derived on the assumption that there is a load eccentricity varying from e_x at the top of the wall to zero at the bottom together with an additional eccentricity arising from the lateral deflection related to slenderness. This is neglected if the slenderness ratio (i.e. ratio of effective height to thickness) is less than 6. The additional eccentricity is further assumed to vary from zero at the top and bottom of the wall to a value e_a over the central fifth of the wall height, as indicated in Fig. 4.2. The additional eccentricity is given by an empirical relationship:

$$e_a = t[(1/2400)\ (h_{ef}/t)^2 - 0.015] \quad (4.2)$$

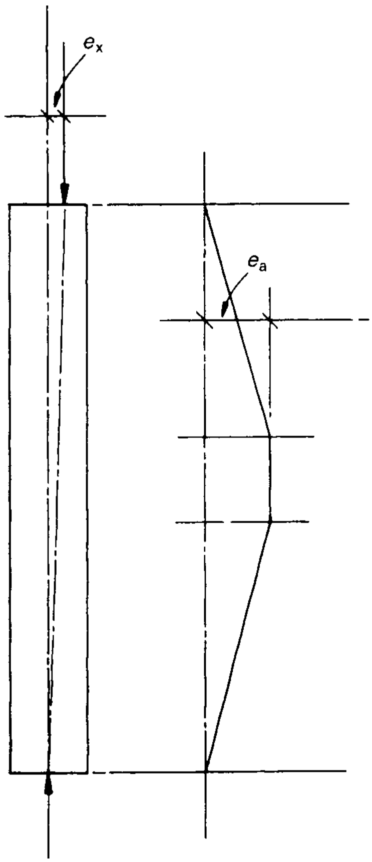

Fig. 4.2 Assumed eccentricities in BS 5628 formula for design vertical load capacity.

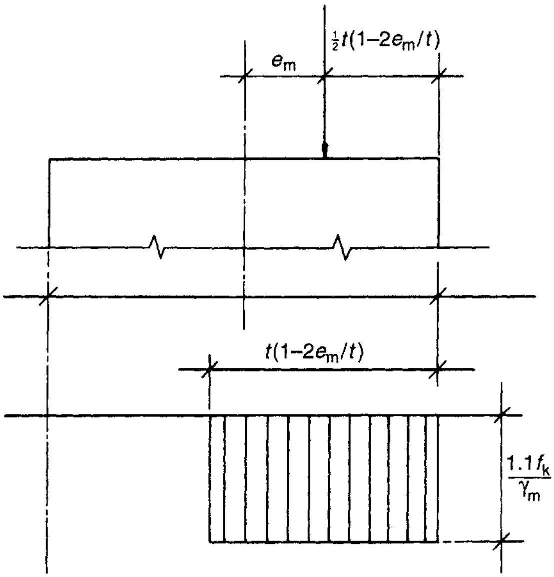

Fig. 4.3 Assumed stress block in BS 5628 formula for design vertical load capacity.

The total eccentricity is then:

$$e_t = 0.6e_x + e_a \tag{4.3}$$

It is possible for e_t to be smaller than e_x, in which case the latter value should be taken as the design eccentricity.

It is next assumed that the load on the wall is resisted by a rectangular stress block with a constant stress of $1.1f_k/\gamma_m$ (the origin of the coefficient 1.1 is not explained in the code but has the effect of making ß=1 with a minimum eccentricity of 0.05*t*).

The width of the stress block, as shown in Fig. 4.3, is

$$t(1 - 2e_m/t) \tag{4.4}$$

and the vertical load capacity of the wall is

$$1.1(1 - 2e_m/t)\,tf_k/\gamma_m \tag{4.5}$$

or

$$\beta\, tf_k/\gamma_m \tag{4.6}$$

It will be noted that e_m is the larger of e_x and e_t and is to be not less than 0.05t. If the eccentricity is less than 0.05f, ß is taken as 1.0 up to a slenderness ratio of 8. The resulting capacity reduction factors are shown in Fig. 4.4.