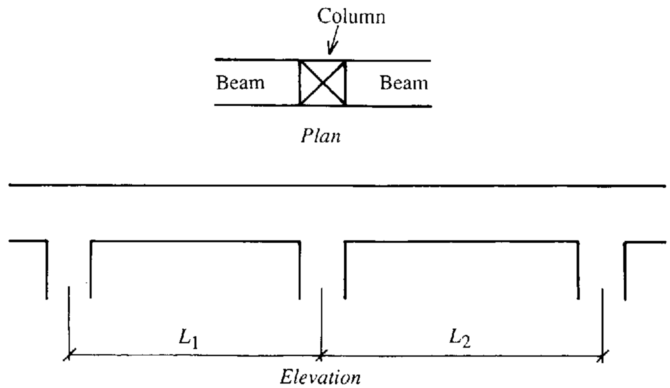


L_1 = shorter beam span; L_2 = longer beam span; difference $L_d = L_2 - L_1$
Percentage difference in spans = $L_d/L_1 \times 100 \not> 15\%$

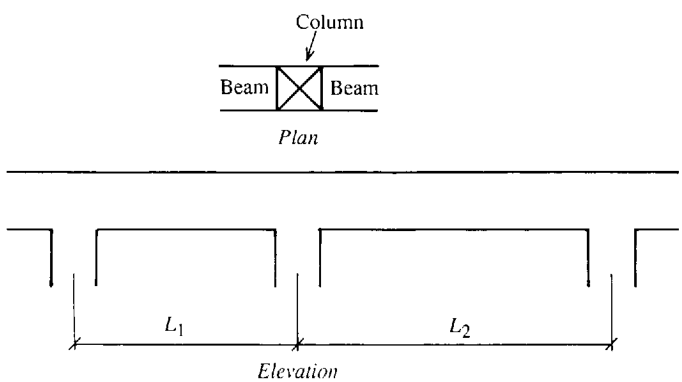
Figure 3.43 *Column supporting beams of differing spans where the difference is not greater than 15 per cent*

The terms have the same definition as those in the previous category, and again by substituting $A_c = A_g - A_{sc}$ in the expression it becomes:

Equation 39(a): $N = 0.35 f_{cu}(A_g - A_{sc}) + 0.67 A_{sc} f_y$

Short braced columns supporting vertical loads and subjected to either uniaxial or biaxial bending

In addition to vertical loading, columns supporting beams on adjacent sides whose spans vary by more than 15 per cent will be subjected to uniaxial bending, that is bending about one axis. Such an arrangement is shown in Figure 3.44.



L_1 = shorter beam span; L_2 = longer beam span; difference $L_d = L_2 - L_1$
Percentage difference in spans = $L_d/L_1 \times 100 > 15\%$

Figure 3.44 *Column supporting beams of differing spans where the difference is greater than 15 per cent*

Furthermore, columns around the outside of a building are often, owing to the configuration of the beams they support, subjected to biaxial bending as shown in Figure 3.45. In such instances the columns should be designed to resist bending about both axes. However, when such columns are symmetrically reinforced, BS 8110 Part 1 allows the adoption of a simplified analysis. The approach is to design the columns for an increased moment about one axis only, using the following procedure in relation to Figure 3.46. When

$$\frac{M_x}{h'} \geqslant \frac{M_y}{b'}$$

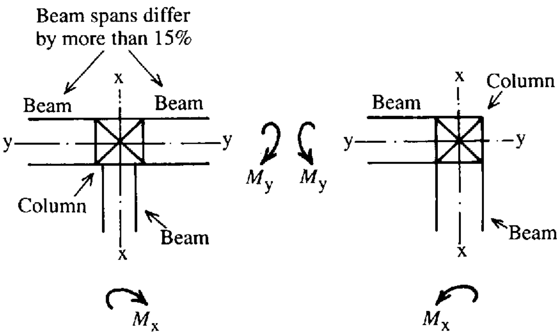


Figure 3.45 *Columns supporting beam arrangements that produce biaxial bending*

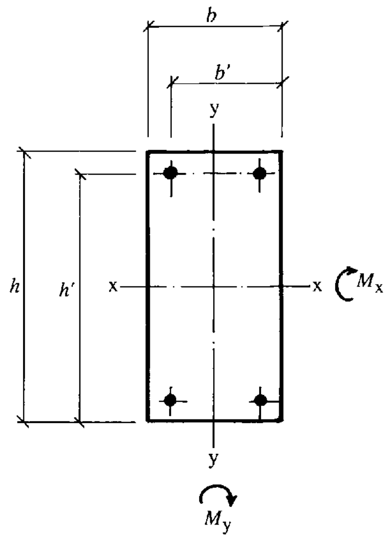


Figure 3.46 *Plan on column subject to biaxial bending*

the increased moment about the x–x axis is:

BS 8110 equation 40: $M'_x = M_x + \frac{\beta h'}{b'} M_y$

When

$$\frac{M_x}{h'} < \frac{M_y}{b'}$$

the increased moment about the y–y axis is:

BS 8110 equation 41: $M'_y = M_y + \frac{\beta b'}{h'} M_x$