(ii) Dead and wind loads

- Windward side

$$\text{dead} + \text{wind} = 0.9\,G_k + 1.4\,W_k$$

$$\text{stress} = (0.9 \times 1.26)/1.4 - 1.4 \times 0.498 \text{ (from Table 12.3);}$$

(proportionately reduced from above)

$$= 0.81 - 0.70 = 0.11\,\text{N/mm}^2 \quad \text{(no tension develops)}$$

- Leeward side

$$\text{dead} + \text{wind} = 1.4\,G_k + 1.4\,W_k$$

$$\text{stress} = 1.26 + 1.4 \times 0.498 = 1.96\,\text{N/mm}^2$$

(iii) Dead, imposed and wind loads

$$\text{dead} + \text{imposed} + \text{wind} = 1.2\,G_k + 1.2\,Q_k + 1.2\,W_k$$

$$\text{stress} = (1.26 \times 1.2)/1.4 + (0.13 \times 1.2)/1.6 \pm 1.2 \times 0.498$$

$$= 1.08 + 0.098 \pm 0.98$$

$$= 1.78 \text{ or } 0.58\,\text{N/mm}^2 \text{ (no tension develops)}$$

The worst combination for this wall just above ground level also is dead+wind, and the design load is $(1.96\times102.5\times10^3)/10^3$=201kN/m.

12.6.4 Selection of brick and mortar for inner leaf of wall B

The design vertical load resistance of the wall is $(\beta t f_k)/\gamma_m$ (clause 32.2.1). The value of β depends on the eccentricity of loading; hence the value of e needs to be evaluated before design can be completed.

12.6.5 Calculation of eccentricity

The worst combination of loading for obtaining the value of e at top of the wall is shown in Fig. 12.6. Axial load

P=(0.9×78.54+1.6×7.29) (G_k and Q_k from Table 12.2)

=(70.69+11.66)=82.35kN/m

First floor load

P_1=(1.4×6.48+1.6×2.025) (see Table 12.2)

=12.31kN/m

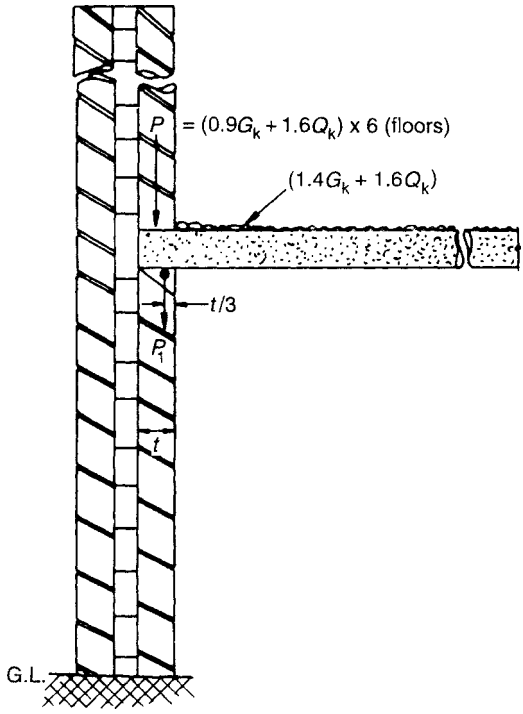

Fig. 12.6 Load combination for calculating the eccentricity.

Eccentricity

$$e = \frac{P_1 t}{6(P + P_1)} = \frac{12.31\,t}{6(82.35 + 12.31)} = 0.0217t = 2.22\,\text{mm}$$

(a) Wind blowing north-south direction

A part of the panel B will be subjected to suction, if the wind is blowing in N-S direction. Then

$V_s = VS_1S_2S_3 = 50 \times 1 \times 1 \times 0.64$ (ground roughness category A, CP3, Chapter V: Part 2)

$= 32\,\text{m/s}$

Note that the localized effect is considered here, hence S_2 for Category A is being used. Also

$$q = 0.613 \times (32)^2 = 627.8\,\text{N/mm}^2$$