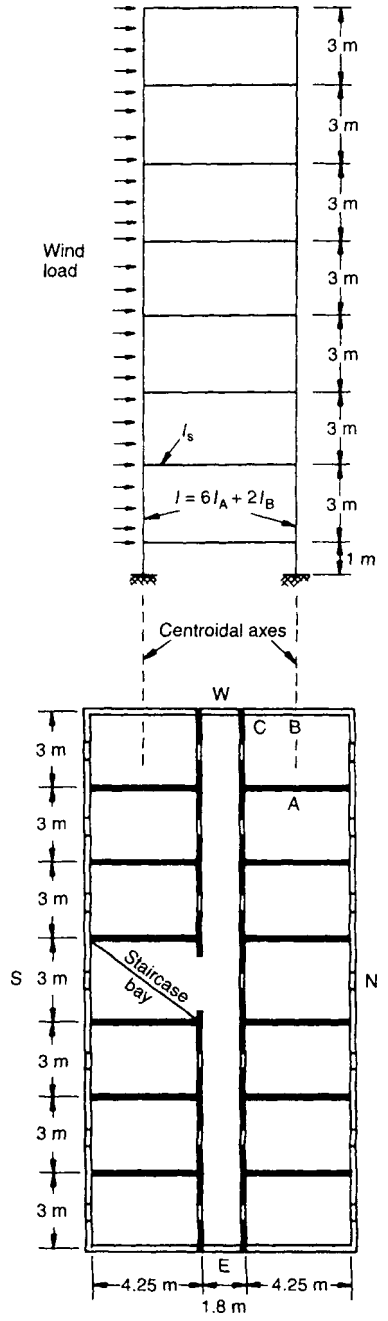

Fig. 12.8 Idealized structure for wind load design.

- Windward side

$$\text{permanent} + \text{variable} = 1G_{kj} - 1.5\,W_{ki}$$

$$\text{stress} = \frac{1 \times 168.08}{102.5} - 1.5 \times 4.96 = 1.64 - 0.744$$

$$= 0.896\,\text{N/mm}^2 \quad \text{(no tension)}$$

- Leeward side

$$\text{permanent} + \text{variable} = 1.35\,G_{kj} + 1.5\,W_{ki}$$

$$\text{stress} = 2.2 + 0.744 = 2.944\,\text{N/mm}^2$$

$$\text{permanent} + \text{all variable actions} = 1.35\,G_{kj} + 1.35\,Q_{ki} \pm 1.35\,W_{ki}$$

$$\text{stress} = \frac{1.35 \times 168.08}{102.5} + \frac{1.35 \times 22.68}{102.5} \pm 1.35 \times 0.496$$

$$= 2.20 + 0.3 \pm 0.67$$

$$= 3.17 \text{ or } 1.83\,\text{N/mm}^2 \quad \text{(no tension)}$$

Hence, most unfavourable action is $1.35G_{kj}+1.35Q_{ki}+1.35\ W_{ki}$ and the design load=$3.17\times102.5\times10^3/10^3$=324.9kN/m.

12.7.1 Selection of brick and mortar combination for wall A: according to EC6

Design vertical load resistance of wall $N_{Rd} = \phi_{i,m}\,t f_k/\gamma_m$, where $\phi_{i,m}$ depends on eccentricity and slenderness ratio $SR = \frac{3}{4} \times 2.85/102.5 \times 10^3 = 20.85$.

12.7.2 Calculation of eccentricity

Figure 12.9 shows the worst combination of loading for obtaining the value of eccentricity. Axial load

$$P = 1 \times 143.40 + 1.5 \times 19.44$$

$$= 172.56\,\text{kN}$$

$$P_1 = 1.35 \times 4.8 \times 1.2 \times 1.5 + 1.5 \times 2.7$$

$$= 11.66 + 4.05$$

$$= 15.71\,\text{kN}$$

$$P_2 = 1.35 \times G_k = 11.66\,\text{kN}$$