Fig. 12.2 Typical section of a building.

support only its own weight. The design loads and design assumptions are given in section 12.2.

12.2 BASIS OF DESIGN: LOADINGS

- Roof: dead weight, 3.5kN/m^2
     imposed load, 1.5kN/m^2
- Floor: dead weight including finishings and partition, 4.8kN/m^2
     (see section 12.10 for sample calculation)
- Imposed load, 1.5kN/m^2
- Wall: 102.5mm with 13mm plaster both sides, 2.6kN/m^2
     102.5mm and inner skin of 255mm cavity wall, 2.42kN/m^2
     (i.e. 102.5 mm+one face plaster)
- Wind load: speed (Edinburgh area), 50m/s

12.3 QUALITY CONTROL: PARTIAL SAFETY FACTORS

Assume normal quality control both at the factory and on site. The partial safety factors for the materials are

$$\gamma_m=3.5 \text{ (table 4, BS 5628)}$$

$$\gamma_{mv} =2.5 \text{ (clause 27.4)}$$

12.4 CALCULATION OF VERTICAL LOADING ON WALLS

12.4.1 Loading on internal wall A

The loading on this wall is summarized in Table 12.1.

12.4.2 Loading on external cavity wall B

(a) Inner leaf

The loading on the inner leaf of this wall is shown in Table 12.2.

(b) Outer leaf

For the outer leaf of this wall

$$\text{load/m at floor}=2.42\times3=7.26\text{kN/m}$$

$$\text{imposed load}=0$$

12.4.3 Total dead weight of the building above GL

Neglecting openings, etc., we have

$$G_k=3.5\times21\times10.5+6\times4.8\times21\times10.5$$
$$+(12\times2.6\times4.25\times2.85+4\times2\times2.42\times4.25\times2.85$$
$$+2\times21\times2.6\times2.85+21\times2\times2\times2.42\times2.85)\times7$$
$$=17643\text{kN}$$

12.5 WIND LOADING

12.5.1 General stability

To explain the method, only walls A and B are considered in the calculation; hence wind blowing from either north or south direction is critical and evaluated. In the east-west direction the cavity and corridor