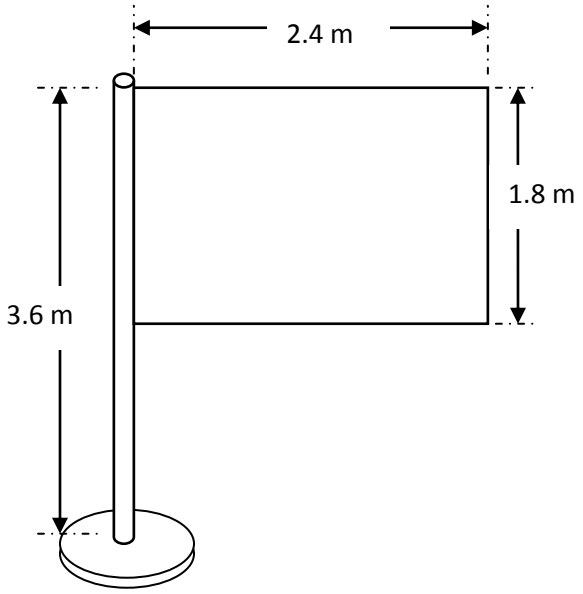
Determine the resultant force of the wind on the sign. Use an importance factor of 0.87 and V= 40 m/s. The sign is located on a flat ground and the wind is acting alone.



Solution:

$F = q_z G C_f A_f$

$q_z = 0.613 K_z K_{zt} K_d V^2 I$

$Z = 3.6 - 1.8/2 = 2.7\ m$ ➔ from table 1−5, K_z = 0.85

Flat ground ➔ K_{zt} = 1

The wind is acting alone ➔ K_d = 1

$q_z = 0.613 \times 0.85 \times 1 \times 1 \times 40^2 \times 0.87 = 725.3\ N/m^2$

Rigid Structure ➔ G = 0.85

M/N = 2.4/1.8 = 1.33, from table 1-6 ➔ C_f = 1.2

$F = 725.3 \times 0.85 \times 1.2 \times (2.4 \times 1.8) = 3195.96\ N$

The shown concrete floor plan is subjected to a uniform vertical load equal to 5 kN/m^2. The concrete density is 22 kN/m^3, it is required to:

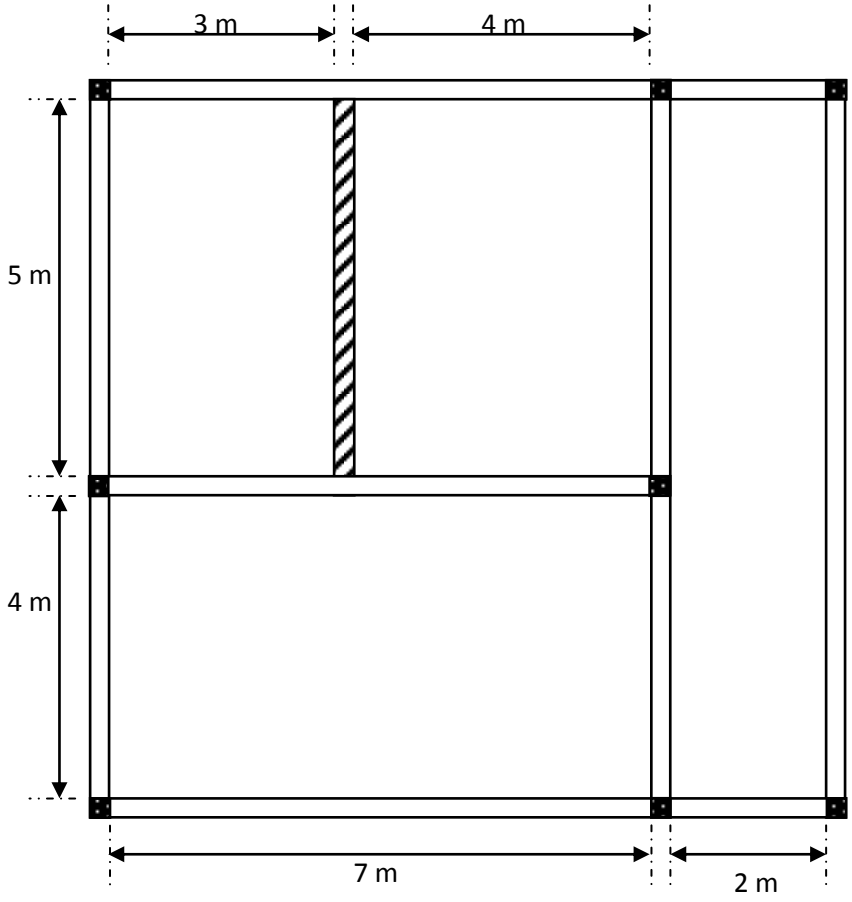
1- Draw the floor load distribution.
2- Determine reactions for the hashed beam.

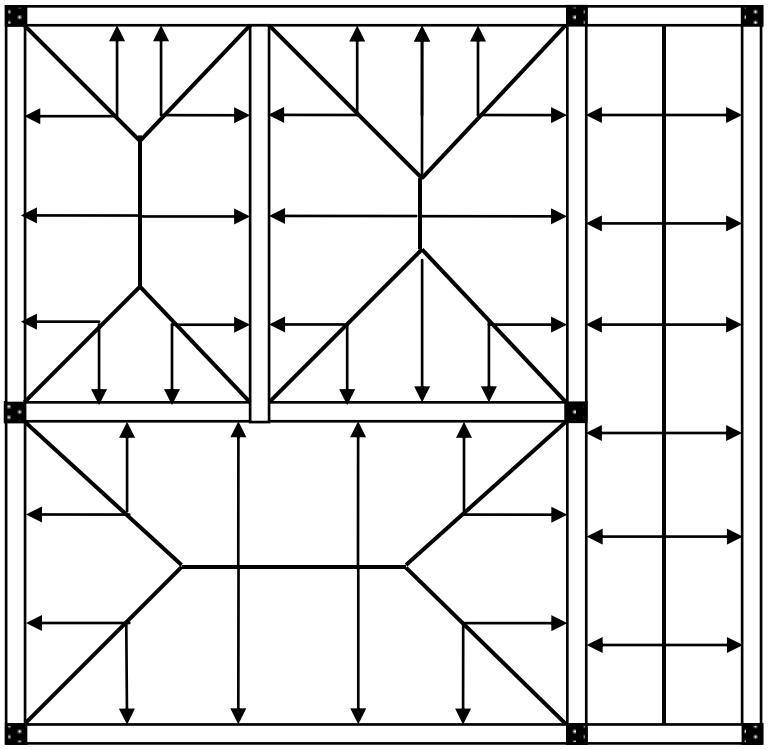
Notes:

Beams are 0.25 x 0.6 m

Columns are 0.25 x 0.25 m

Slab thickness = 0.15 m





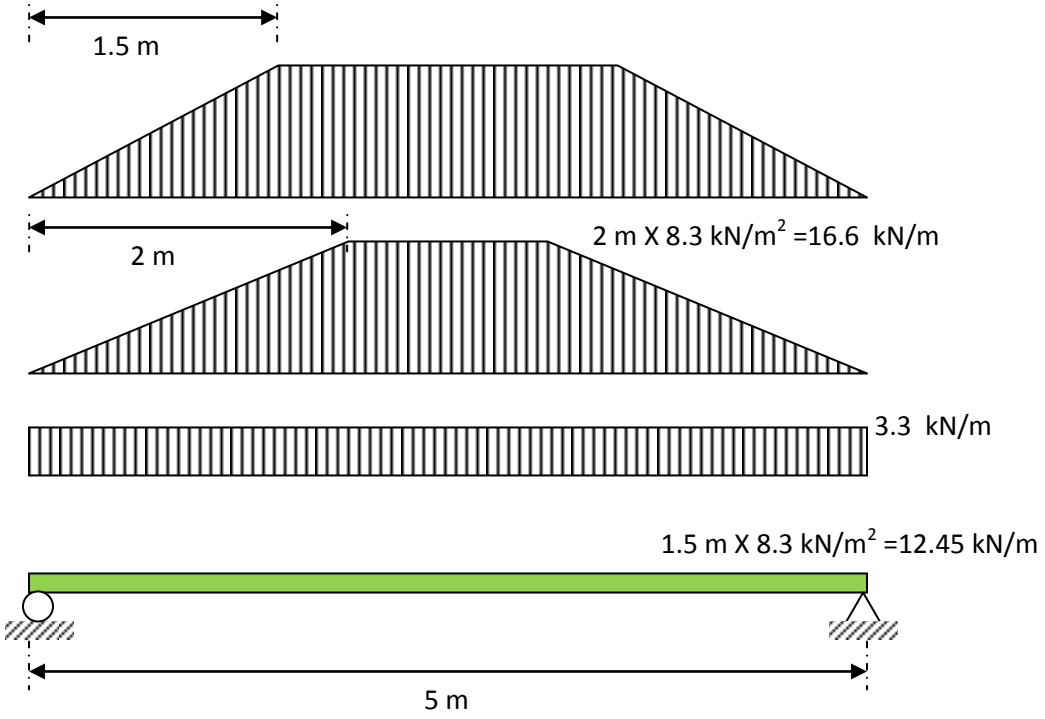
For the slab:

Own weight per m^2 = 0.15 m x 22 kN/m^3 = 3.3 kN/m^2

Total weight per m^2 = 3.3 + 5 = 8.3 kN/m^2

For the beam:

Own weight per m = 0.25 m x 0.6 m x 22 kN/m^3 = 3.3 kN/m



$$Y = \frac{1}{2}\left[(3.3 \times 5) + \left(\frac{16.6 \times 2}{2} \times 2 + 16.6 \times 1\right) + \left(\frac{12.45 \times 1.5}{2} \times 2 + 12.45 \times 2\right)\right]$$

Y = 93.875 kN