- Calculation of Slab Thickness.
- Calculation of Slab Dead Load.
Slab Thickness Calculation

<table>
<thead>
<tr>
<th>Beam (rib) Kind</th>
<th>Maximum Length (m)</th>
<th>Minimum Thickness (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simply Supported</td>
<td>0.0</td>
<td>0 / 16 = 0</td>
</tr>
<tr>
<td>One-End Continuous</td>
<td>4.66</td>
<td>466 / 18.5 = 25.2</td>
</tr>
<tr>
<td>Two-End Continuous</td>
<td>3.7</td>
<td>370 / 21 = 17.6</td>
</tr>
<tr>
<td>Cantilever</td>
<td>1.77</td>
<td>177 / 8 = 22.1</td>
</tr>
</tbody>
</table>
Take thickness of slab 26 cm

20 cm block + 6 cm topping slab

Calculation of Dead Load

Calculate the dead load of a one way ribbed slab of thickness = 23 cm

Given:

- $\gamma_{Reinforced\ Concrete} = 2.5 \ t/m^3$
- $\gamma_{Plain\ Concrete} = 2.4 \ t/m^3$
- $\gamma_{Sand} = 1.8 \ t/m^3$
- $\gamma_{Plaster} = 2.1 \ t/m^3$
**Weight of 1 m² of slab**

Covering material weights:
- Weight of Layer = Thickness \times Unit Weight \ ton/ m²
- Weight of plaster = 0.015 \times 2.1 = 0.0315 \ ton/ m²
- Weight of sand = 0.07 \times 1.8 = 0.126 \ ton/ m²
- Weight of mortar = 0.025 \times 2.1 = 0.0525 \ ton/ m²
- Weight of tiles = 0.025 \times 2.1 = 0.0525 \ ton/ m²
- Total weight = 0.2625 \ ton/ m²

**Ribbed Slab Calculations**

- Weight of block = 8 \times 20 = 160 \ kg /1.04 \ m²
- Volume of block = 8 \times 0.2 \times 0.25 \times 0.4 = 0.16 \ m³/1.04 \ m²
- Total Volume of slab = 1 \times 1.04 \times 0.26 = 0.2704 \ m³
- Volume of concrete = 0.2704 - 0.16 = 0.1104 \ m³/1.04 m²
- Weight of concrete = 0.1104 \times 2500 = 276 \ kg /1.04 m²
- Total weight of (1\times 1.04) m² = 276 + 160 = 436 \ kg /1.04 m²
- Weight of 1m² slab = 436/1.04 = 419.23 \ kg/m² = 0.4192 \ ton/m²
Total volume = 0.52 × 0.25 × 0.26 = 0.0338 m³
Volume of one hollow block = 0.4 × 0.25 × 0.2 = 0.02 m³
Net concrete volume = 0.0338 - 0.02 = 0.0138 m³
Weight of concrete = 0.0138 × 2.5 = 0.0345 ton
Weight of concrete/ m² = 0.0345/(0.52 × 0.25) = 0.2654 ton/m²
Weight of hollow blocks / m² = 0.02/(0.52 × 0.25) = 0.1538 ton/m²
Weight of 1 m² slab = 0.2654 + 0.1538 = 0.4192 ton/m²
**Weight of walls**

![Diagram of wall structure showing the weight of walls calculation](image)
For Block 10

Weight of blocks = 12.5 × 10 = 125 kg/m²
Weight of plaster = 2 × 1 × 1 × 0.015 × 2100 = 63 kg/m²
Total weight = 125 + 63 = 188 kg/m²
W / m' = 188 × 3 = 564 kg/m'

For Block 15

Weight of blocks = 12.5 × 15 = 187.5 kg/m²
Weight of plaster = 2 × 1 × 1 × 0.015 × 2100 = 63 kg/m²
Total weight = 187.5 + 63 = 250.5 kg/m²
W / m' = 250.5 × 3 = 751.5 kg/m'

For Block 20

Weight of blocks = 12.5 × 20 = 250 kg/m²
Weight of plaster = 2 × 1 × 1 × 0.015 × 2100 = 63 kg/m²
Total weight = 250 + 63 = 313 kg/m²
W / m' = 313 × 3 = 939 kg/m'

Partial partition Load Calculations

For block 10: 63 m

For block 15: 9 m

For block 20: 0 m

Weight of block = 63 × 564 + 9 × 751.5 = 42.3 ton
Total Area = 200.88 m²
Stairs Area = 9.83 m²

\[ W_{block} / m^2 = \frac{42.3}{200.88 - 9.83} = 0.221 \text{ t/m}^2 \]

Total Dead Load of 1 m² of Slab = 0.2625 + 0.4192 + 0.221 = 0.9027 ton/m²