

Degree of restraint

Example 1

The beam considered has the following characteristics:

Beam section:

$$h = 60 \text{ cm}$$

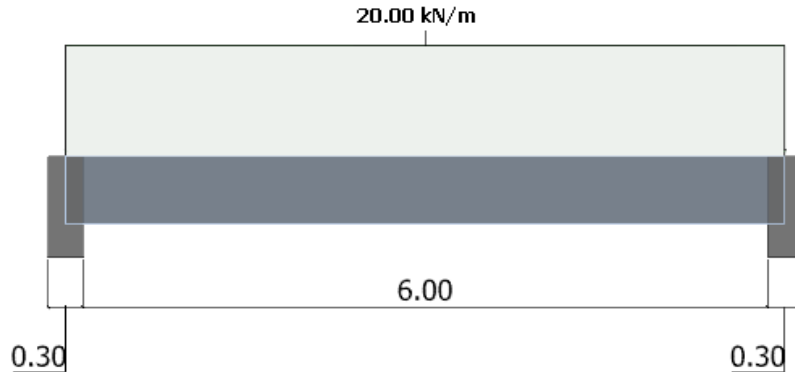
$$b_w = 30 \text{ cm}$$

Supports width:

$$t = 30 \text{ cm}$$

Length:

$$L_{\text{eff}} = L_n + 2 \cdot a_i$$



$$a_i = \min\left(\frac{1}{2} \cdot h; \frac{1}{2} \cdot t\right) \quad a_i = \min\left(\frac{1}{2} \cdot 60; \frac{1}{2} \cdot 30\right) \text{ cm} \quad a_i = \min(30; 15) \text{ cm} \quad a_i = 15 \text{ cm}$$

$$L_{\text{eff}} = 6 + 2 \cdot 0.15 = 6.3 \text{ m}$$

Loads:

Live loads - 20 kN/m

For 'Degree of Restraint' 50%

Bending moment at supports		
Support	Method	Spring Value
1	Degree of restraint	50.00 %
2	None	

$$L_e = \frac{3 \cdot E \cdot I_y}{\frac{3 \cdot E \cdot I_y \cdot x}{L \cdot (1 - x)}}$$

$$L_e = \frac{3 \cdot E \cdot I_y}{\frac{3 \cdot E \cdot I_y \cdot x}{L \cdot (1 - x)}} = \frac{1}{\frac{0.5}{6.3 \cdot (1 - 0.5)}} = 6.3 \text{ m}$$

L_e = Length of the virtual beam

Bending Moment [kN·m]

