Simply Supported Concrete Plank

Section is 1000x100 mm2 and 50000mm long

Input data:

$L := 5\ \text{m}$

$width := 1\ \text{m}$

$height := 0.1\ \text{m}$

$load := 5\ \text{kN}$

$load := load \cdot \frac{width}{2\ \text{m}} = 5\ \frac{\text{kN}}{\text{m}}$

$E := 34800\ \text{MPa}$

$I := \frac{width \cdot height^{3}}{12} = 8.333 \cdot 10^{7}\ \text{mm}^{4}$

Output data:

$M := \frac{load \cdot L^{2}}{8} = 15.625\ \text{kN m}$ Bending Moment formula

$T := \frac{load \cdot L}{2} = 12.5\ \text{kN}$ Shear Force formula

$deflection := \frac{5 \cdot load \cdot L^{4}}{384 \cdot E \cdot I} = 14.03\ \text{mm}$

$Stress\_top\_or\_bottom := \frac{M \cdot \left(\frac{height}{2} \right)}{I} = 9.375\ \text{MPa}$