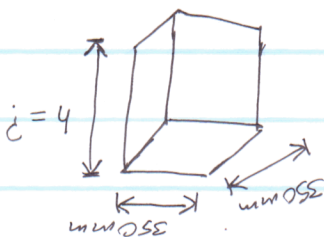


Q2

Plot a graph of failure load against height for an unreinforced 350mm square column constructed with concrete that has a compressive stress limit of

$$40 \text{ N/mm}^2$$



$$A_{\text{area}} = 122500$$

Height = ?

$$\text{Critical buckling load} = \pi^2 EI / L^2$$

Second moment of Area = $h^4 / 12$

$$L = 1924255.02$$

where $n = 1, 2, 3$

$$P = n^2 \frac{\pi^2 EI}{L^2}$$

$$P = (1)^2 \frac{\pi^2 \times 30,000 \times 1250520833}{1924255.02} = 192419598.9$$

$$P = (2)^2 \frac{\pi^2 \times 30,000 \times 1250520833}{1924255.02}$$