

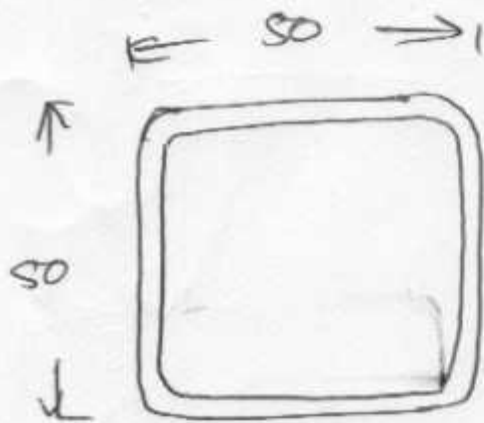
④

13.12.09

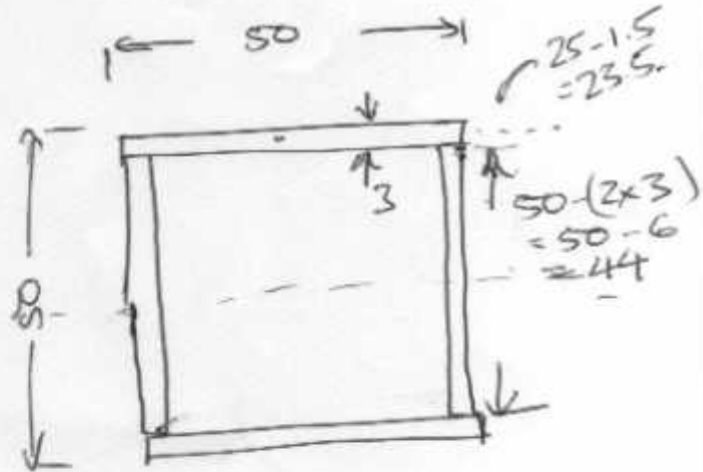
Slenderness ratio  $\frac{L}{r}$

$r$  is least radius of gyration of section

$$r = \sqrt{\frac{I}{A}}$$



say 3mm thick.



5

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3

"0" for "offset"

$$I_n = I_o + I_g$$

$$= 50.3 \cdot 23.5^2 + \frac{50.3}{12} + 44.3 \cdot 0^2 + \frac{3.44^3}{12}$$

Handwritten calculations in a cloud:

$$\frac{50.3 \cdot 24}{4.7}$$

$$\frac{450}{4} = 112.5$$

(x2)

$$= 82837.5^{K1} + 112.5^{K2} + 0 + 21296^{K3} (x2)$$

$$= 104246 \times 2$$

$$I_n = 208492 \text{ mm}^4$$

Handwritten addition in a cloud:

$$\begin{array}{r} 82837.5 \\ 112.5 \\ \hline 21296 \\ \hline 104246.0 \times 2 \end{array}$$

$$r = \sqrt{\frac{I}{A}} = \sqrt{\frac{208492}{564}}$$

$$r = 19.5 \text{ mm}$$

① 0.51.21

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①

$$f_{cr} = \frac{\pi^2 E I_{min}}{L_e^2}$$

Previous error -  $I$  -  $m^4$   
 currently -  $mm^4$   $\cdot 10^3^4$   $\cdot 10^{12}$

$$E_{steel} = 200 \times 10^9 \text{ Pa} = 2 \times 10^{11} \text{ Pa}$$

$$I_n = 208492 \text{ mm}^4$$

$$2.1 \times 10^5 \text{ mm}^4$$

$$\frac{2.1 \times 10^5}{10^{12}} = 2.1 \times 10^{-7} \text{ m}^4$$

$$f_{cr} = \frac{\pi^2 \cdot 2 \times 10^{11} \cdot 2.1 \times 10^{-7}}{5^2}$$

$$f_{cr} = \frac{\pi^2 \cdot 4.2 \times 10^4}{25} \left[ = \frac{4.15 \times 10^5}{L_e^2} \right]$$

$$f_{cr} = 1.65 \times 10^4 \text{ N}$$

$$= 1.65 \text{ Ternes-force}$$

$$\left[ \text{Crush load} = 15.5 \text{ Ternes force} \right]$$