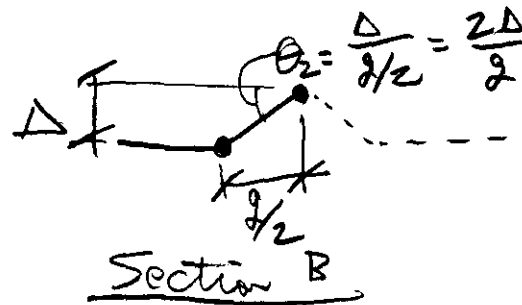
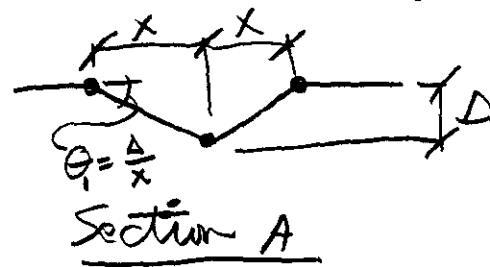
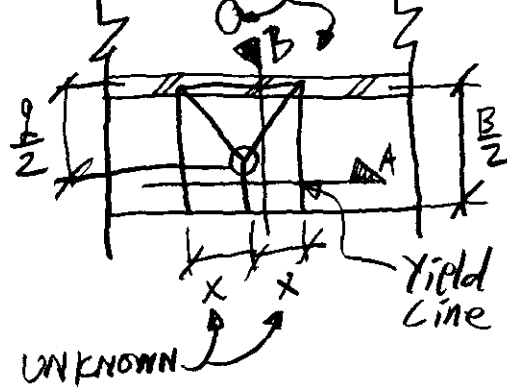


# YLA EXAMPLE

BOLT FORCE = T (FIND  $t_{req}$ )



$$EW = T \Delta$$

$$IW = \phi m_p \frac{B}{2} (2) \left( \frac{\Delta}{x} \right) (2 \text{ panels}) + \phi m_p (2x) (2) \frac{2\Delta}{g}$$

$$= \phi m_p \Delta \left( \frac{2B}{x} + \frac{8x}{g} \right)$$

$$EW = IW$$

$$T \Delta = 2 \phi m_p \Delta \left( \frac{B}{x} + \frac{4x}{g} \right)$$

$$T = 2 \phi m_p \left( \frac{B}{x} + \frac{4x}{g} \right) \quad (\text{min } T \text{ is the collapse load})$$

$$\frac{dT}{dx} = 2 \phi m_p \left( \frac{-B}{x^2} + \frac{4}{g} \right) = 0 \Rightarrow \frac{B}{x^2} = \frac{4}{g}$$

FIND x TO MINIMIZE T.

$$T = 2 \phi m_p \left[ \frac{B}{\frac{1}{2} \sqrt{Bg}} + \frac{4}{g} \frac{1}{2} \sqrt{Bg} \right]$$

$$= 2 \phi m_p \left( \frac{2B}{\sqrt{Bg}} + \frac{2}{g} \sqrt{Bg} \right) = \cancel{\phi F_y t_{req}^2} \left( \frac{B}{\sqrt{Bg}} + \frac{\sqrt{Bg}}{g} \right)$$

$$= \phi F_y t_{req}^2 \left( \frac{B}{\sqrt{Bg}} + \frac{\sqrt{Bg}}{g} \right) \Rightarrow t_{req} = \sqrt{\frac{B g}{\phi F_y \left( \frac{B}{\sqrt{Bg}} + \frac{\sqrt{Bg}}{g} \right)}}$$