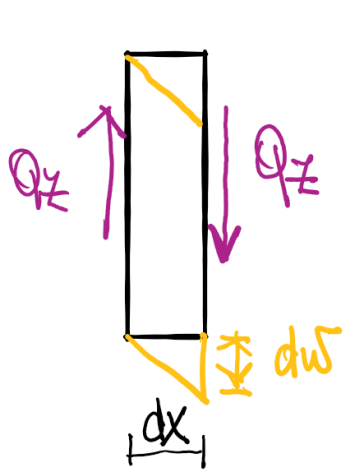


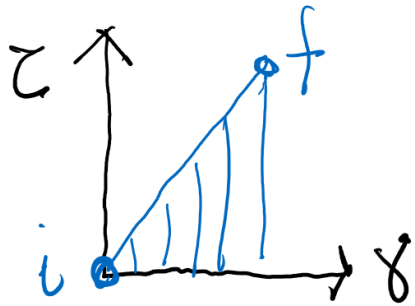
Deformación por CORTE



$$L_e = L_i$$

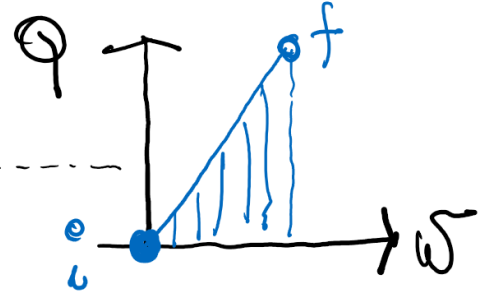
$$\frac{1}{2} Q_z \cdot dw = dL_e \quad dz \downarrow$$

$$dL_i = \int_A \frac{1}{2} \tau_{xz} dA \cdot \gamma_{xz} \cdot dx$$

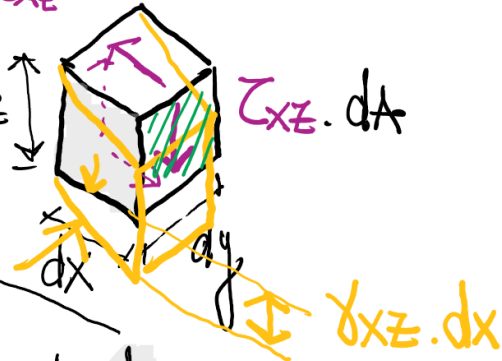


$$\tau = G \cdot \gamma$$

$$\tau_{REQ} = \frac{Q_z \cdot S_{y^{**}}}{J \cdot b}$$



$$dA = dy \cdot dz$$



$$\frac{1}{2} Q_z \cdot dw = \frac{1}{2} \int_A \tau_{xz} \cdot \gamma_{xz} \cdot dA \cdot dx$$

$$Q_z \cdot \frac{dw}{dx} = \int_A \tau_{xz} \cdot dA$$

$$Q_z \cdot \frac{dw}{dx} = \int_A \frac{Q_z \cdot (S_{y^{**}})^2}{G \cdot J \cdot b^2} \cdot dA$$

$$i_y^2 = \frac{J_y}{A} \rightarrow \boxed{J_y^2 = A^2 \cdot i_y^4}$$

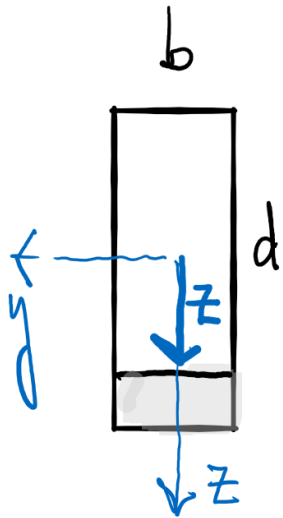
$$\frac{d\delta}{dx} = \frac{Qz}{G \cdot A} \cdot K$$

FACTOR DE FORMA DE LA DEFORMACION POR CORTE

$$K_y = \int_A \frac{(S_y^{A*})^2}{A \cdot i_y \cdot b^2} \cdot dA$$

$$K_y \rightarrow \frac{[L^3]^2}{L^2 \cdot L^4 \cdot L^2} \cdot L^2$$

ADIMENSIONAL



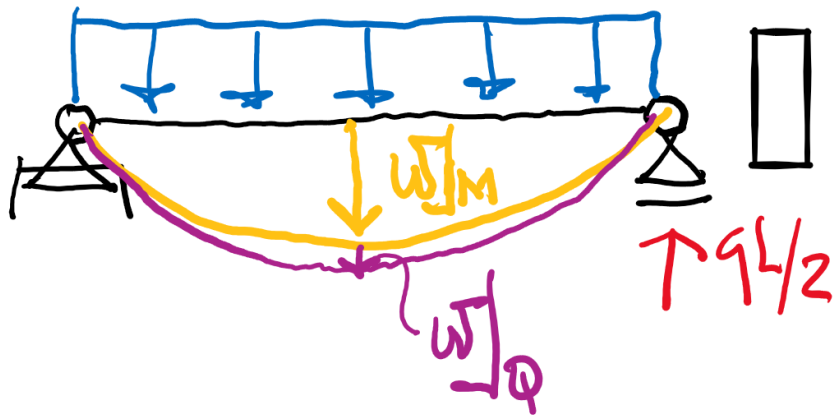
$$S_y^{A*} = ?$$

$$\begin{cases} A = bd \\ i_y^2 = \frac{bd^3/12}{bd} = \frac{d^2}{12} \rightarrow i_y^4 = \frac{d^4}{144} \\ b = b \end{cases}$$

$$K_y = 1,2$$

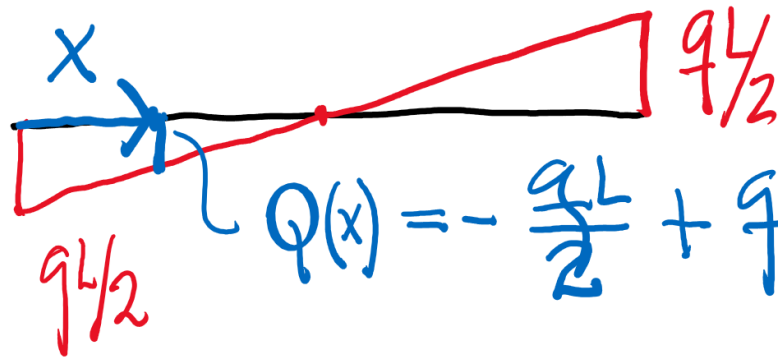
ANALIZO LA INFLUENCIA DE LA DEFORMACION POR CORTE COMPARADA CON LA DEFORMACION POR FLEXIÓN

$$w_{\text{M}} = \frac{5}{384} \frac{qL^4}{EI_y}$$



$$\frac{dw}{dx} = \frac{Qz}{G \cdot A} \cdot K_y$$

$$w' = \frac{q \cdot (L/2 - x)}{G \cdot A} \cdot 1,2$$



$$Q(x) = -\frac{qL}{2} + q \cdot (L - x) = q\left(\frac{L}{2} - x\right)$$

$$w(x)|_Q = \frac{1,2 q}{G \cdot A} \left[\frac{L}{2} \cdot x - \frac{x^2}{2} \right] + C$$

CONDICIÓN DE BORDE

$$x=0 \quad w(0)|_Q = 0 \rightarrow \boxed{C=0}$$

$$\boxed{w_{\text{max}}|_Q = \frac{1,2 q}{G \cdot A} \cdot \frac{L^2}{8}}$$

$$\boxed{x = L/2}$$

COMPARO

$$\frac{w_{max}|_Q}{w_{max}|_M} = \frac{\frac{1,2 G L^3}{GA \cdot 8}}{\frac{5 Q L^3}{384 EJ_y}} = \frac{12 \times 384}{5 \times 8} \frac{E \cdot J_y}{G \cdot A \cdot L^2} = \frac{12 \times 384}{40} \cdot 2,5 \frac{d^2}{12} \frac{1}{L^2}$$

$$\mu = 0,25$$

$$G = \frac{E}{2(1+\mu)}$$

$$\rightarrow \frac{E}{G} = 2,5$$

$$\frac{J_y}{A} = \frac{bd^3/12}{bd} = \frac{d^2}{12}$$

$$\frac{w_{max}|_Q}{w_{max}|_M} = \frac{2,4}{(L/d)^2}$$

L/d	10	8	6	4	2
w _Q /w _M	0,024	0,0375	0,07	0,15	0,6

TEORIA DE BARRAS L/d ≥ 4

barras esbeltas puedo despreciar la deformacion x corte