

## Punto P1

total 30 pts //

Para la sección W 10 x 22 el momento de inercia es:

$$I_z = 2 \cdot \frac{5.75 \times 0.36^3}{12} + \frac{0.24 \cdot (10.17 - 0.36 \cdot 2)^3}{12} + (4.905)^2 \cdot 5.75 \times 0.36$$

$$I_z \approx 118 \text{ [in}^4\text{]} \quad 2 // \text{ pts.}$$

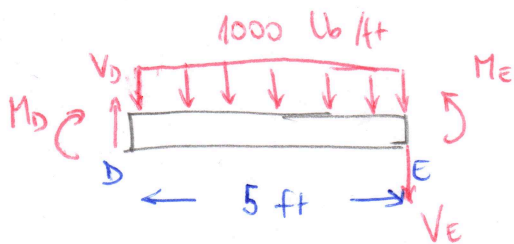
Tenemos que:  $\sigma = - \frac{M y}{I_z}$

Los momentos flectores en D y E son:

$$M_D = \frac{2.07 \text{ [Kpsi]} \cdot 118 \text{ [in}^4\text{]}}{\frac{10.17 \text{ [in]}}{2}} = 48 \text{ Kip} \cdot \text{in} = 4 \text{ [Kip} \cdot \text{ft}] \quad 1 //$$

$$M_E = \frac{0.776 \text{ [Kpsi]} \cdot 118 \text{ [in}^4\text{]}}{\frac{10.17 \text{ [in]}}{2}} = 18 \text{ Kip} \cdot \text{in} = 1.5 \text{ [Kip} \cdot \text{ft}] \quad 1 //$$

D.C.L sobre la sección DE

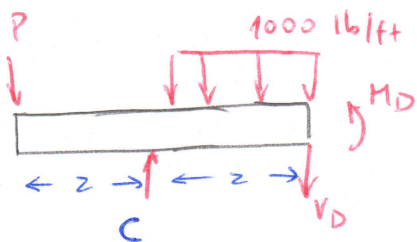


2.0 // x DCL

$$\sum M_z = 0 \Rightarrow -M_D + M_E - 5V_D + (2.5)(5)(1) = 0$$
$$V_D = 2 \text{ [Kip]} \quad 1 //$$

$$\sum M_z = -M_D + M_E - 5V_E - (2.5)(5)(1) = 0$$
$$V_E = -3 \text{ [Kip]} \quad 1 //$$

D.C.L sobre la sección ACD



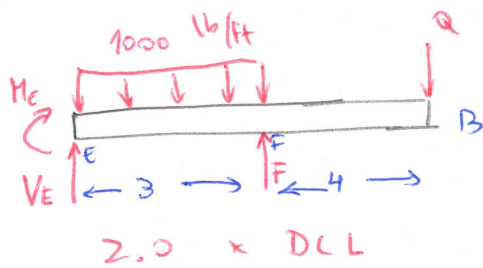
2.0 // x dcl

$$\sum M_z = 0 \quad 2P + (1)(2)(1) + M_D - 2V_D = 0$$
$$P = 1 \text{ Kip} \quad 1.0 //$$

$$\sum F_y = 0 \quad -P + C - (2)(1) - V_D = 0$$
$$C = 5 \text{ [Kip]} \quad 1.0 //$$

- 1 -

DCL sección EFB



$$\sum_F M_E = 0$$

$$-4Q + (1.7)(3)(1) - 3V_E - M_E = 0$$

$$Q = 3 \text{ [kip]} \quad 1.0 //$$

$$\sum F_y = 0$$

$$F + V_E - (3)(1) - Q = 0$$

$$F = 9 \text{ [kip]} \quad 1.0 //$$

Fuerza de corte interna V.

Entre A y C

$$V = -1 \text{ kip}$$

C<sup>+</sup>

$$V = -1 + 5 = 4 \text{ kip}$$

F<sup>-</sup>

$$V = 4 - (10)(1) = -6 \text{ kip}$$

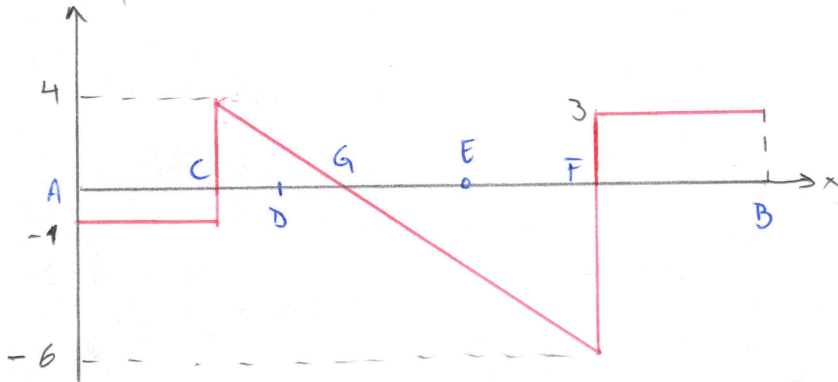
F<sup>+</sup>

$$V = -6 + 9 = 3 \text{ kip}$$

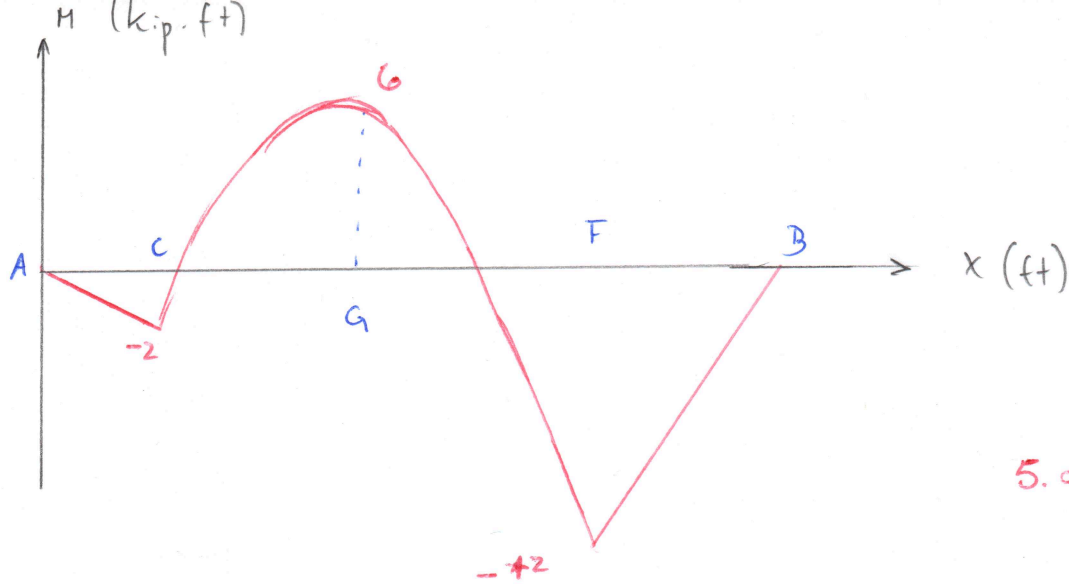
F a B

$$V = 3 \text{ kip}$$

$\Rightarrow V \text{ (kip)}$



5.0 // x gráfico



• El valor máximo del momento flector es  $12 \text{ kip-ft}$  1.0''  
 $= 144 \text{ kip-in}$

∴ El esfuerzo normal máximo es:

$$\sigma_{\max} = \frac{M_{\max}}{I} \cdot \frac{10.17}{2} [\text{in}]$$

$110 [\text{in}^4]$

$$\sigma_{\max} = 6, 2 [\text{ksi}] \quad 3.0'' \text{ pto.}$$