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Section # B

Submitted To

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Assignment # 04

Q No 1

Required Data

Determine the minimum and maximum reaction

Soln:-

Member BC

$$\sum F_x = 0$$

$$B_x = 0$$

Member AB:

$$\sum F_x = 0$$

$$A_x = 0$$

FBD 1:

$$\sum M_A = 0$$

$$F_H(1) - B_y(10) - 30(5) = 0$$

FBD 2

$$\sum M_C = 0$$

$$-F_H(10) - B_y(30) + 90(15) = 0$$

$$B_y = 0$$

$$\text{So } f_H = f_{\min} = 135 \text{ K}$$

$$\begin{aligned} \text{So } w_0 &= \frac{2f_H h}{L^2} \\ &= \frac{2(135)(10)}{30^2} \\ &= 3 \text{ K/ft} \end{aligned}$$

Now

$$\begin{aligned} f_{\max} &= 100 \left(\sqrt{1 + \left(\frac{L}{2h} \right)^2} \right) \\ &= f_{\max} = (30) \sqrt{1 + \left(\frac{30}{2 \cdot 10} \right)^2} \end{aligned}$$

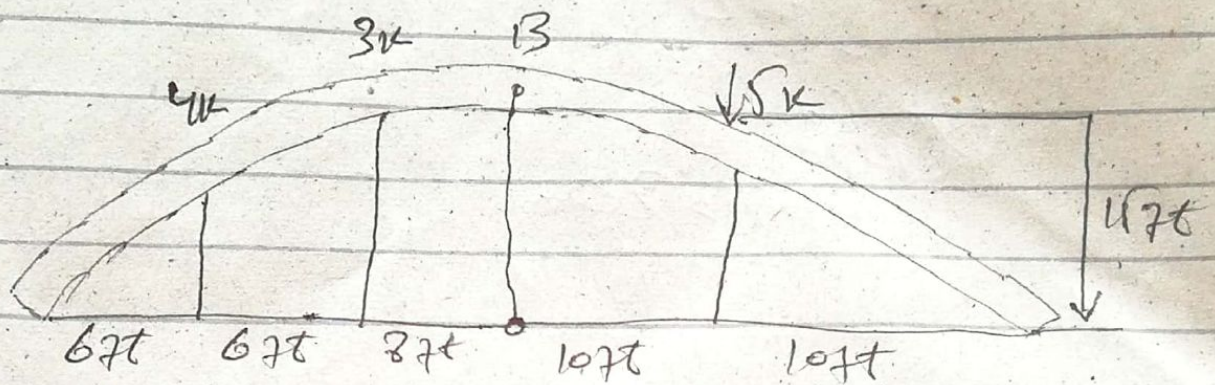
$$= f_{\max} = 162.24 \text{ K}$$

Each hanger carries

f_H of w_0

$$T = (3 \text{ K/ft})(L) = 18 \text{ K}$$

Q No. # 02



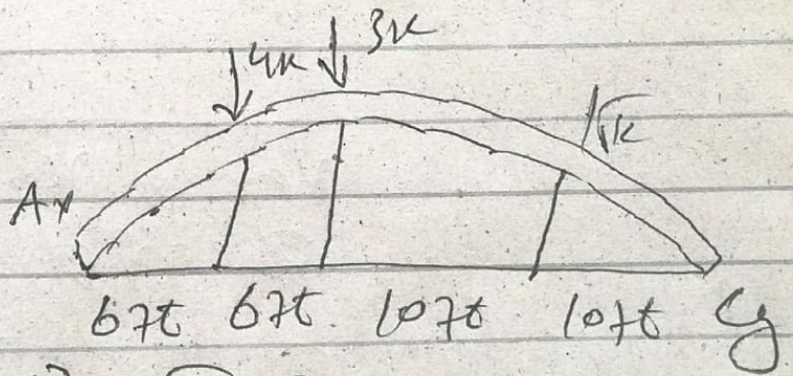
Entire Arch

$$\sum M_A = 0;$$

$$-4(6) - 3(12) - 5(30) + Y(40) = 0$$

$$Y = 5.5 \text{ k}$$

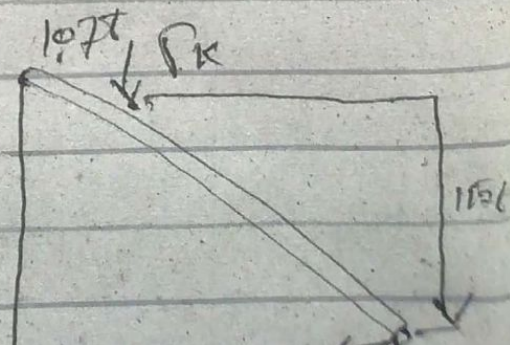
$$+\uparrow \sum F_y = 0;$$



$$A_y + 5.5(40) - 4 - 3 - 5 = 0$$

$$A_y = 6.7 \text{ k}$$

$$+\rightarrow \sum F_x = 0; \quad A_x = 0$$



Section B.C

$$\sum M_B = 0;$$

$$-T(10) - T(15) + (2T)(20) = 0$$

$$T = 3.67 \text{ k}$$