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ID : 7274

Subject : Structure 1

Assigment : 04

Cables and Arches

DATE:

Q1

Sol

Member BC

$\Sigma Fx = 0$

$Bx = 0$

Member Ab

$\xrightarrow{+}$

$\Sigma Fx = 0$

$Ax = 0$

Moment At A

$\circlearrowleft \overset{+}{\Sigma} M_A = 0 \quad F_H(1) - By(15) - 45(4.5) = 0$

FBD

$\circlearrowleft \overset{+}{M_C} = 0 - F_H(10) - 6y(30) + (45)$

$(30) = 20$ $\boxed{F_H = 153.4}$ $6y = 0$

DATE:

$$W_O = \frac{2Fyh}{L^2} = \frac{2(153.4)(10)}{30}$$

$$= \frac{3068}{900} = 3.40$$

$$\boxed{W_O = 3.40 \text{ K/ft}}$$

$$F_{max} = W_O L \sqrt{1 + \left(\frac{L}{24}\right)^2}$$

$$= 3.4(30)\sqrt{1 + \frac{(30)^2}{2(10)}}$$

$$F_{max} = 183.6 \text{ K}$$

Each hanger carries 5 ft of car

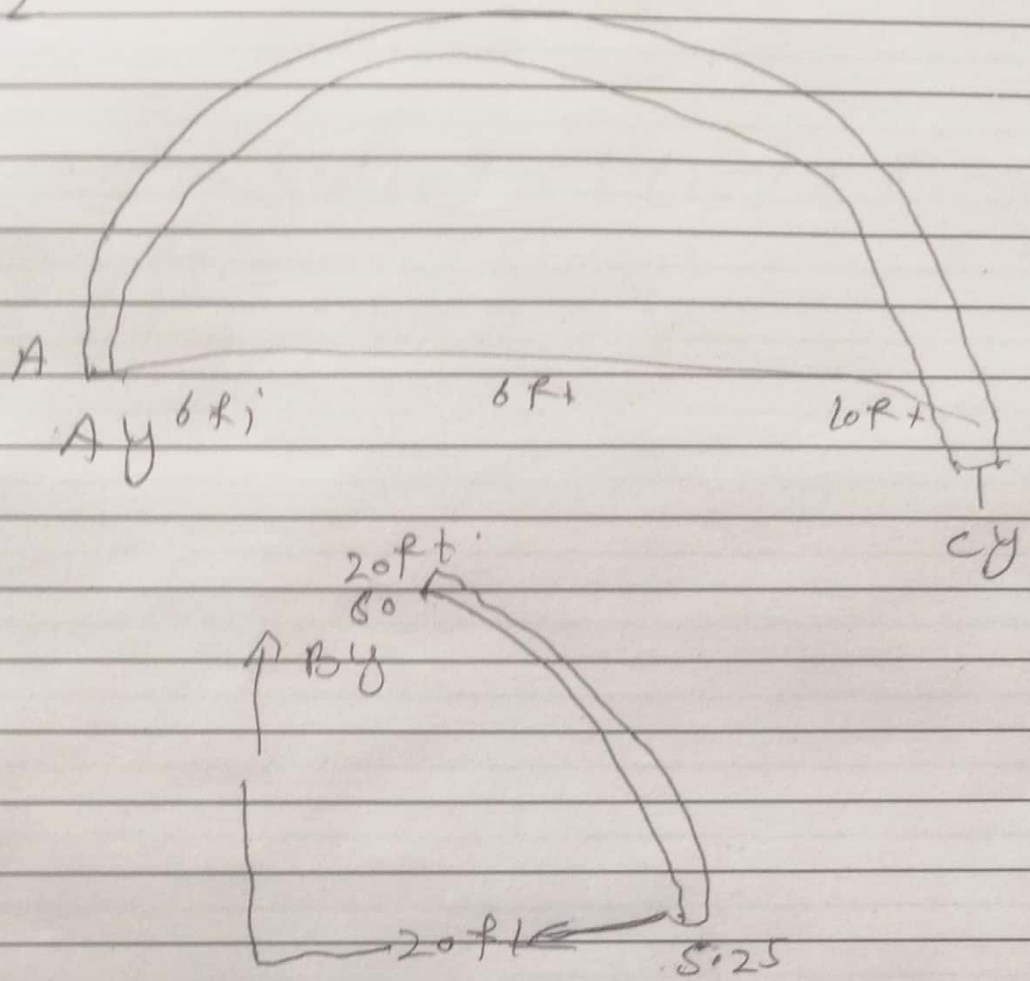
$$T = (5 \text{ ft})(3.4 \text{ K/ft})$$

$$\boxed{T = 17 \text{ K}}$$

DATE:

Q2

Sol:



Entire arch:

$\zeta \Sigma M_a = 0 \quad -4(6) - 3(2) - 5(30) + 6$

$Cy(40) = 0 \quad Cy = 5.25K$

$\pm \Sigma F_y = 0 \quad Ax = 0$

Sec Bc:

DATE: _____

$C_J + \Sigma M_B = 0$

$-5(10) - T(15) + 0.25(20) = 0$

$\boxed{T = 3.67 \text{ L}}$