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subject structure...

section "B" civil

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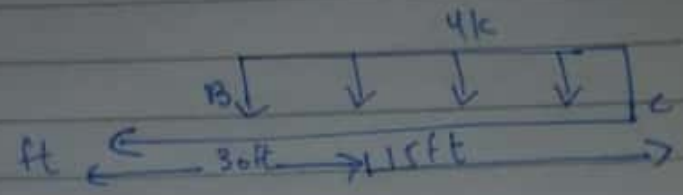
assignment NO # 04

Q = 1.



Slop (θ_c) = ?

Displacement (Δ_c) = ?

first we have to draw M|ES diagram.

So

$+\circlearrowright \sum MA = 0$

$-VB \times 30 + (4 \times 15) \times 37.5 = 0$

$$\boxed{VB = 75k}$$

$+\circlearrowright \sum MB = 0$

$VA \times 30 + (4 \times 15) \times 7.5 = 0$

$$\Rightarrow \boxed{VA = -15k}$$

$$DC = -\frac{194062.5}{2} - \left(\frac{67500}{EI}\right) \times \frac{3}{2}$$

$$DC = -\frac{295312.5 \text{ k } ft^3}{EI}$$

Slop at point B

$$\theta B = \frac{DC}{15}$$

$$= \left(\frac{295312.5}{EI}\right) / 15$$

$$\theta B = \frac{19687.5 \text{ k} \cdot ft^2}{EI}$$

For displacement

$$t_{c/A} = DC + D'$$

$$DC = t_{o/A} = D'$$

(3)

Proportunality of hirsles:

$$\frac{D}{45} = \frac{t_{B/A}}{30}$$

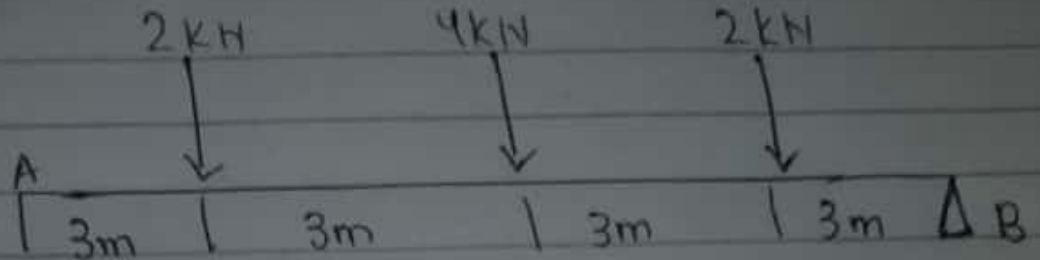
$$D' = 3/2\ t_{BA}$$

er (1) =>

$$DC = t_{c/A} - 3/2\ t_{B/A} \longrightarrow (1)$$

(4)

Q=2



$E = 200\ GPa$

$I = 6(10^6)\ mm^4$

$$\theta_{Ak} = \frac{1}{2}\left(\frac{12}{EI} \times 3\right) + \left(\frac{12}{EI} \times 3\right) + \frac{1}{2}\left(\frac{6}{EI} \times 3\right)$$

$$= \frac{18}{EI} + \frac{36}{EI} + 9$$

$$= \frac{63}{EI} = \frac{63}{(200 \times 10^6)\left(6 \times 10^6\right)\left(1/1000\right)^4}$$

$\theta_A = 0.0525$ radian

$$t_{AIC} = \frac{1}{2}\left(\frac{12}{EI} \times 3\right)\left(\frac{2}{3} \times 3\right) + \left(\frac{12}{EI} \times 3\right)\left(3 + \frac{1}{2} \times 3\right) + \frac{1}{2}\left(\frac{6}{EI} \times 3\right)\left(3 + \frac{2}{3} + 3\right)$$

$t_{AIC} = 0.202\ m$

$\Delta_C = t_{AIC} = 0.202\ m$

or $\Delta_C = 202\ mm$