

Segmento Origen Lrmites  $M_0$   $M_x$   $M_y$   $M_m$

Segmento	Origen	Lrmites	$M_0$	$M_x$	$M_y$	$M_m$
A-C	A	0-30	$20x - 1800$	$-x$	40	1
C-D	D	0-40	$-1.5x(\frac{x}{2})$	$-30$	$x$	1
B-D	B	0-30	0	$x$	0	-1

$$\Delta_{Bx0} = \sum \int_0^L \frac{M_0 M_x}{EI} dx = \frac{870,000 \text{ Kft}^3}{EI}$$

$$\Delta_{By0} = \sum \int_0^L \frac{M_0 M_y}{EI} dx = -\frac{2,040,000 \text{ Kft}^3}{EI}$$

$$\theta_{Bm0} = \sum \int_0^L \frac{M_0 M_m}{EI} dx = -\frac{53,000 \text{ Kft}^2}{EI}$$

$$\delta_{Bx, Bx} = \sum \int_0^L \frac{M_x M_x}{EI} dx = \frac{36,000}{EI}$$

$$\delta_{Bx,By} = \delta_{By,Bx} = \sum \int_0^L \frac{m_x m_y}{EI} dx = \frac{-30,000}{EI}$$

$$\delta_{Bx,BM} = \delta_{BM,Bx} = \sum \int_0^L \frac{m_x m_m}{EI} dx = -\frac{1500}{EI}$$

$$\delta_{By,By} = \sum \int_0^L \frac{m_y m_y}{EI} dx = \frac{58,666.67}{EI}$$

$$\delta_{By,BM} = \delta_{BM,By} = \sum \int_0^L \frac{m_y m_m}{EI} dx = \frac{1600}{EI}$$

$$\delta_{BM,BM} = \sum \int_0^L \frac{m_m m_m}{EI} dx = \frac{80}{EI}$$

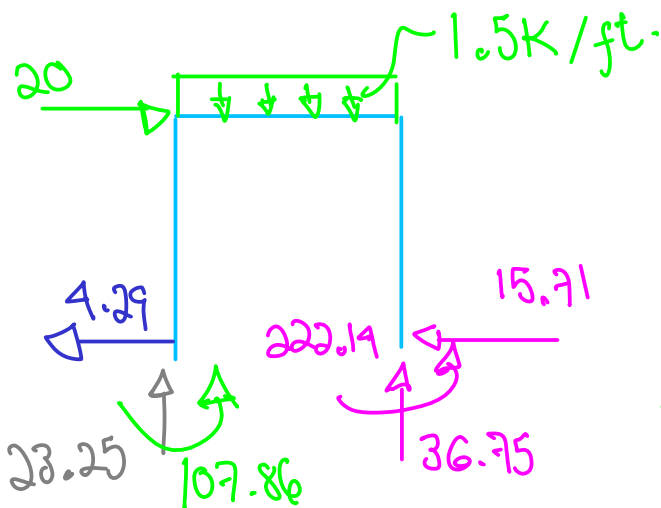
Ec. Compatibilidad

$$\Delta_{Bx0} + \delta_{Bx,Bx} B_x + \delta_{Bx,By} B_y + \delta_{Bx,BM} B_M = 0$$

$$\Delta_{By0} + \delta_{By,Bx} B_x + \delta_{By,By} B_y + \delta_{By,BM} B_M = 0$$

$$\Theta_{BM0} + \delta_{BM,Bx} B_x + \delta_{BM,By} B_y + \delta_{BM,BM} B_M = 0$$

$$\begin{bmatrix} 36000 & -30000 & -1500 \\ -30000 & 58666.67 & 1600 \\ -1500 & 1600 & 80 \end{bmatrix}^{-1} \begin{bmatrix} -870000 \\ 2040000 \\ 53000 \end{bmatrix} = \begin{bmatrix} 15.7143 \\ 36.75 \\ 222.1429 \end{bmatrix} \begin{matrix} B_x \leftarrow \\ B_y \uparrow \\ B_M \curvearrowright \end{matrix}$$



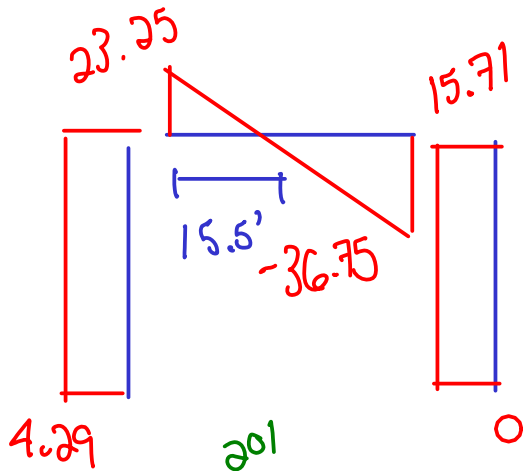
$$\sum F_x \rightarrow A_x = 20 - 15.71 = 4.29$$

$$\sum F_y = -60 + 36.75 + A_y = 0$$

$$A_y = 23.25$$

$$\sum M_A = M_A + 20(30) + 60(20) - 222.14 - 36.75(40) = 0$$

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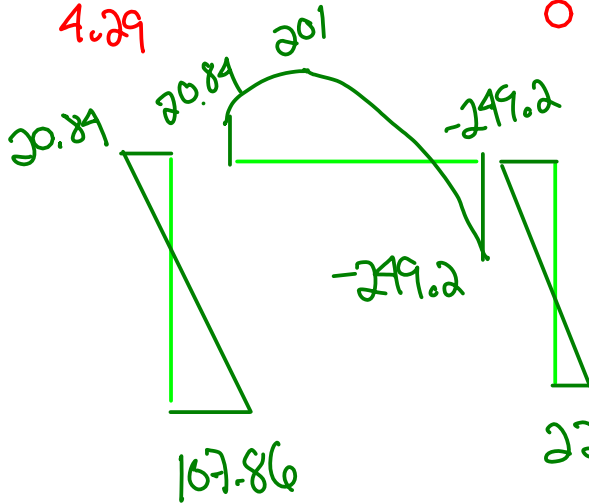
$$M_A = 107.86 \therefore 107.86 \text{ kN}$$

$$23.25 - 1.5(40) = -36.75$$

$$23.25 - 1.5(x) = 0$$

$$x = 15.5$$

M]



$$-107.86 + 4.29(30) = 20.84$$

$$20.84 + \frac{1}{2}(15.5)(23.25)$$

$$= 201$$

$$201 - \frac{1}{2}(40 - 15.5)(36.75) = -249.2$$

$$-249.2 + 15.71(30) = 222.1$$