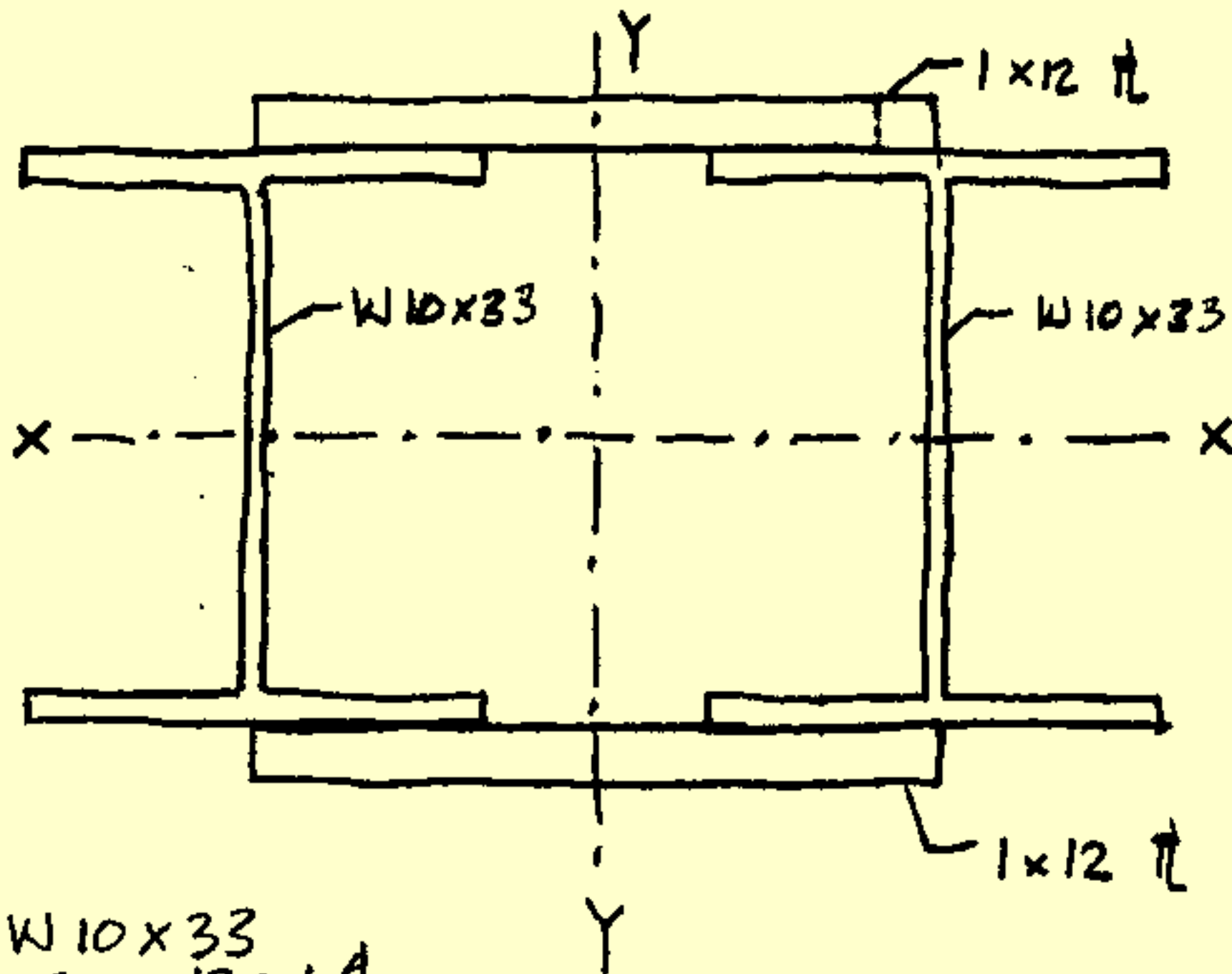


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FWD PULL LOAD:

COLUMN:

LENGTH 30'

 $K = 1.0$ $f_y = 36 \text{ KSI}$ $E = 29000 \text{ KSI}$

F.S. 3

NO BRACING

W10x33
 $I_x = 170 \text{ in}^4$
 $I_y = 36.6 \text{ in}^4$
 $A = 9.71 \text{ in}^2$

$$\text{TOTAL AREA} = 2(9.71) + 2(12) = 43.42 \text{ in}^2$$

$$I_x = 2(170) + 2\left(\frac{12(12)^3}{12}\right) + 2\left(12\left(\frac{9.73}{2} + .5\right)^2\right) = 1032.80 \text{ in}^4 \leftarrow \text{CONTROLS}$$

$$I_y = 2(36.6) + 2\left(\frac{1(12)^3}{12}\right) + 2(9.71(6)^2) = 1060.32 \text{ in}^4$$

$$r_x = \sqrt{\frac{1032.8}{43.42}} = 4.877 \text{ in}$$

$$P_{cr} = \frac{\pi^2 EA}{(KL/r)^2} = \frac{\pi^2 29000(43.42)}{(1(360)/4.877)^2} = 2281 \text{ K}$$

$$P_y = f_y A = 36(43.42) = 1563 \text{ K} \leftarrow \text{CONTROLS}$$

$$P_{\text{ALLOW.}} = 1563 / 3 = 521 \text{ K}$$