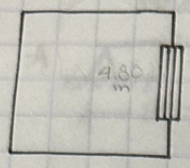
ESTÁTICA PARA LA ARQUITECTURA
ÁNGEL GABRIEL GRANADOS PÉREZ
3er.PARCIAl
ARQ. PEDRO ALBERTO GARCIA LOPEZ
JUlIO 2023



← Altura: 40 cm

$\frac{4.80}{12}$ = 0.40m

← Base: 20 cm

0.5(40cm) = 20cm

Acero mínimo

b ρ= (0.00235)

(20.36 · 0.00235

7.692 cm²

2#4(2.54)

Acero máximo

b.ρ. (0.01143)

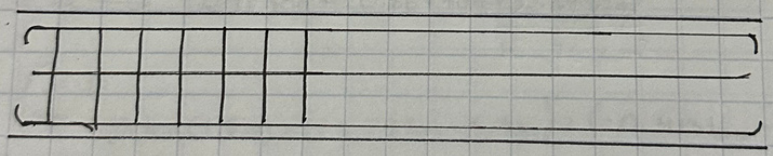
20 · 36 · 0.01143

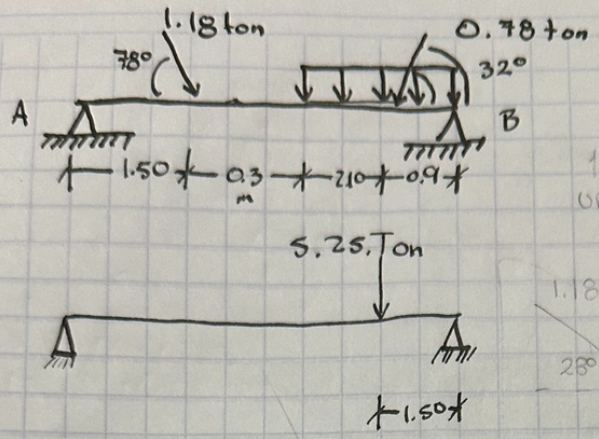
6.858 cm²

2#5(3.96)

Separación de estribos

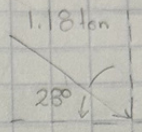
0.5(h) → 0.5(40cm) = @ 20 cm





$1.75\ T/m\ (3.0m) = 5.25\ ton$

$up = \frac{3.0m}{2} = 1.50m$



$CO = 1.18\ ton\ (sen\ 28°) = 0.553\ ton\ (H) \rightarrow CO = H(Sen\ \theta)$

$CA = 1.18\ ton\ (cos\ 28) = 1.041\ ton\ (x) \rightarrow CA = H(Cos\ \theta)$

$CO = 0.78\ ton\ (sen\ 32°) = 0.413\ ton\ (Y)$

$CA = 0.78\ ton\ (cos\ 32°) = 0.661\ ton\ (x)$

$\Sigma Fx \rightarrow 1.041\ ton - 0.661\ ton = \underline{0.38 ton}$

$\Sigma m = 0$

$(-0.553\ ton\ (1.5\ m) + (-5.25\ ton \cdot 3.3\ m) + (-0.413 ton \cdot 3.9\ m) + (RB\ 4.8\ m) = 0$

$-0.82\ ton \cdot m - 17.325\ ton \cdot m - 1.611\ ton \cdot m + RB \cdot 4.8m = 0$

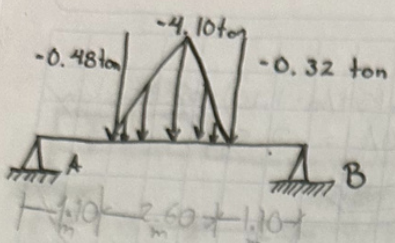
$-19.766\ ton \cdot m + RB \cdot 4.8\ m = 0$

$RB = \frac{19.966 ton \cdot m}{4.8 m} = \underline{4.1174\ ton}$

$\Sigma Fy = 0$

$RA = 0.553\ ton - 5.25 ton - 0.413 ton + 4.1174\ ton = 0$

$RA = \underline{-2.098\ ton}$



$P = \frac{W \cdot L}{2}$

$OP = L/2$

$P = \frac{(-4.10\ ton \cdot 2.60\ m)}{2} = -5.33\ ton$

$OP = \frac{2.60}{2} = 1.30\ m$

$(-98 \cdot 1.10) + (-5.33 \cdot 2.4) + (-32 \cdot 3.7) + (RB \cdot 4.8)$

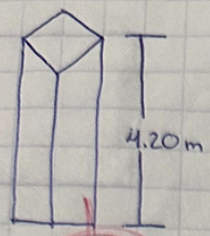
$15.054 + RB + 4.8$

$RB = \frac{15.054}{4.8} = 3.136\ ton$

$MA = RA - .98 - 5.33 - 32 + 3.136 = -3.494$

$RA = 3.494\ ton$

①



$15 \times 30 = 4.50$

$h \leq 13\ B.min$

$4.20 \leq 4.50$

$Bmin = \geq 0.10$

$Bmax =$

$Bmax = 0.40 - 0.30$

$Bmax = 0.12 + 0.30$

$Bmax = 0.42 = 0.40\ m$

$A = (0.30 \cdot 0.40) + 0.01 = \frac{12\ cm^2}{8}$

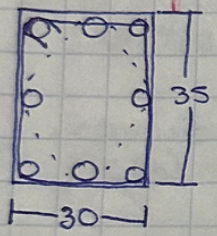
$A = 1.5$

$4\#4 = (1.27 \times 4) = 5.08\ cm^2$

$4\#3 = (1.98 \times 4) = 7.92\ cm^2$

$13.00\ cm^2$

79 06



$A = (0.30 \times 0.35) + 0.01 = \frac{10.5\ cm^2}{8}$

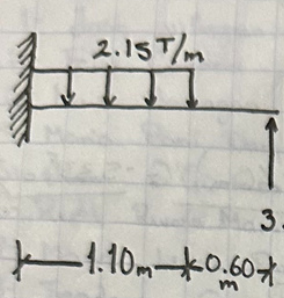
$A = 1.3125$

$4\#5 = (1.98 \times 4) = 7.92\ cm^2$

$4\#8 = (0.71 \times 4) = 2.84\ cm^2$

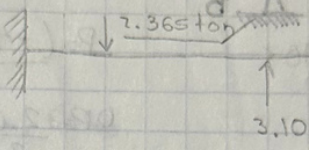
$10.76\ cm^2$

②



$P = W \cdot L = (2.15\ t/m \cdot 1.10)$ 2.365 ton

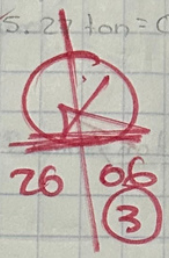
$OP = L/2 = 1.10/2 = 0.55$

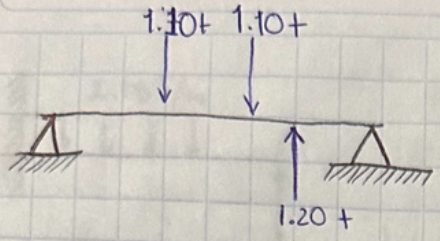


$MA = (-2.365\ ton \cdot 0.55m) + (3.10\ ton \cdot 1.70m) = 0$

$MA = -1.30075\ ton \cdot m + 5.27\ ton = 0$

$MA = 3.06923\ ton \cdot m$





$MA = (-1.10\ ton \cdot 1.2m) + (-1.10\ ton \cdot 2.4m) + (1.2\ ton \cdot 3.5m) + (RB \cdot 4.7m) = 0$

$MA = -1.32\ T \cdot m - 2.64\ t \cdot m + 4.2\ t \cdot m + (RB \cdot 4.7m) = 0$

$MA = 0.25\ t \cdot m + RB \cdot 4.7m = 0$

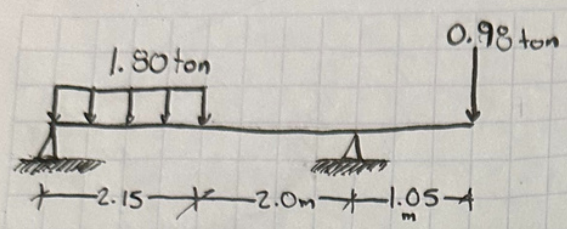
$RB = \frac{0.25\ t \cdot m}{4.70m} = 0.053\ ton$

$\Sigma FY = 0$

$RA = -1.10\ ton - 1.10\ ton + 1.20\ ton + 0.053\ ton = 0$

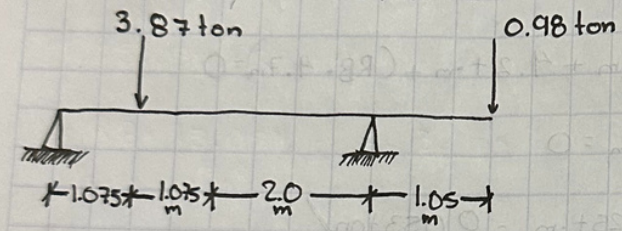
$RA = -0.947\ ton = 0$

$RA = 0.947\ ton$



W×L = 1.80 t/m x 2.15 m = 3.87 Ton

DP = 2.15 m/2 = 1.075 m



$\Sigma M = 0$

$$(-3.87 \cdot 1.075) + (RB \cdot 4.15) + (0.98\ \text{ton} \cdot 5.20\ \text{m}) = 0$$

$$-4.1602 + RB \cdot 4.15 - 5.046\ \text{t·m} = 0$$

$$-9.256\ \text{t·m} + RB \cdot 4.15\ \text{m} = 0$$

$$RB = \frac{9.256\ \text{t·m}}{4.15\ \text{m}} = 2.230\ \text{ton}$$