UDS

Mi Universidad

Ejercicios

Alejandra Monserrath Aguilar Gómez

Momentos

Segundo Parcial

Resistencia de los materiales de construcción

Pedro Alberto García López

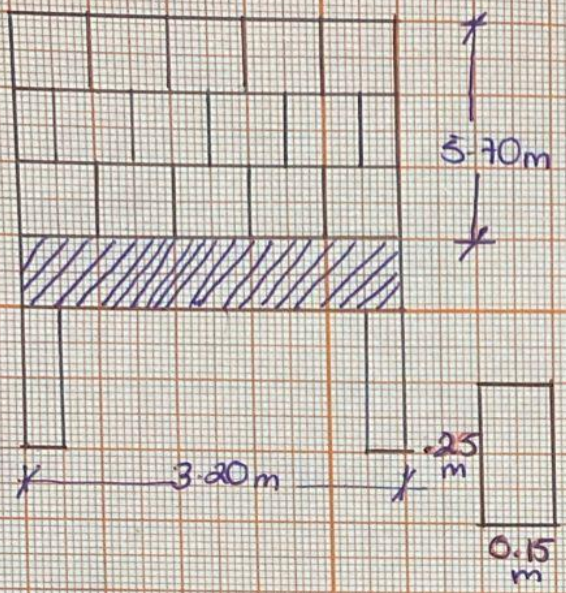
Arquitectura

Cuarto Cuatrimestre

Comitán de Domínguez, 13/Octubre/2023

1.

1.629 t/m



Concreto Preforzado
Muro de Block = 270 kg/m

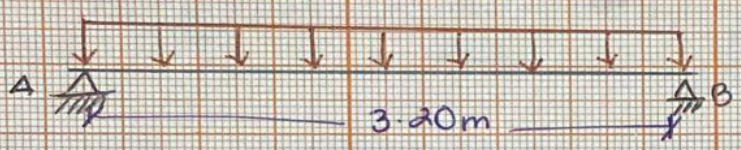
$h = \frac{L}{12} \rightarrow \frac{3.20m}{12} = 0.2666m$

$b = 0.5(h) \rightarrow 0.5(0.25m) = 0.125m$

P.P trabe = $0.25m \times 0.15m \times 2,400 kg/cm^2 = 90 kg/m$

P.P. muro = $5.70m\ (270 kg/m) = 1,539 kg/m$

1,539 kg/m
+ 90 kg/m
1,629 kg/m → 1.629 ton/m



$M = \frac{1}{8} q L^2 \rightarrow \frac{1.629\ ton/m\ (3.20m)^2}{8} = 2.085\ ton.m$

$RA = RB = \frac{q \times L}{2} \rightarrow \frac{1.629\ ton/m\ (3.20m)}{2} = 2.606\ ton$

$E = 3,100,000\ ton/m^2$

$I_x = \frac{bh^3}{12} \rightarrow \frac{(0.15m)(0.25m)^3}{12} = 0.0001953\ m^4$

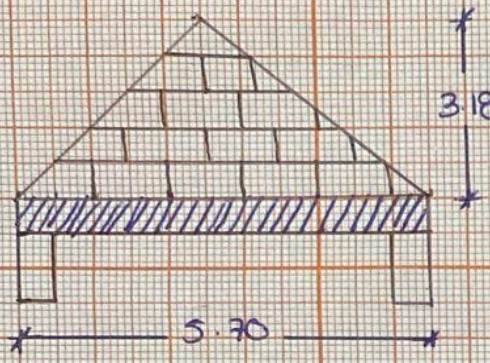
$\theta A = \theta B = \frac{q \times L^3}{24EI} \Rightarrow \frac{1629\ (3.20m)^3}{24\ (3,100,000\ ton/m^2)(0.0001953\ m^4)} = \frac{53.379072}{14,530.32} = 0.003673$

$F = \frac{5}{384} \cdot \frac{qL^4}{EI} \rightarrow \frac{5}{384} * \frac{1.629\ ton/m\ (3.20)^4}{(3,100,000\ ton/m^2)(0.0001953 m^4)} = 0.003673m = 36.73cm$

$\Delta per = \frac{L}{240} \rightarrow \frac{320cm}{240} = 1.33cm$

2.

1.1586 t/m



Concreto Reforzado
Muro de bloon = 270 kg/m

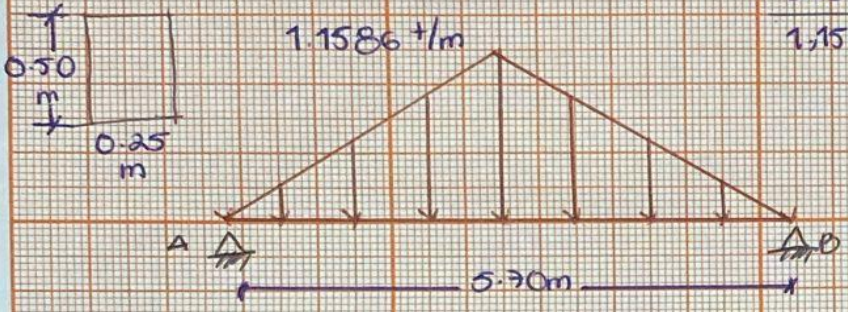
$h = \frac{L}{12} \rightarrow \frac{5.70m}{12} = 0.475m$

$b = 0.5(h) \rightarrow 0.5(0.50m) = 0.25m$

P.P. trabe $\rightarrow 0.50m \times 0.25m \times 2400 kg/m^2 = 300 kg/m$

P.P. muro $\rightarrow 3.18m(270 kg/m) = 858.6 kg/m$

858.6 kg/m
+ 300 kg/m
1,158.6 kg/m $\rightarrow$ 1.1586 ton/m



$M = \frac{qL^2}{12} \rightarrow \frac{1.1586 ton/m (5.70)^2}{12} = 3.136 ton.m$

$RA = RB = \frac{qL}{4} \rightarrow \frac{1.1586 ton/m (5.70)}{4} = 1.651 ton$

$E = 3,100,000 ton/m^2$

$Ix = \frac{bh^3}{12} \rightarrow \frac{0.25m(0.50)^3}{12} = 0.002604 m^4$

$\emptyset A = \emptyset B = \frac{5qL^3}{196 \cdot E \cdot I} \rightarrow \frac{5(1.1586 ton/m)(5.70)^3}{196(3,100,000 ton/m^2)(0.002604 m^4)} = \frac{1072.823049}{1582190.4} = 0.0006780$

$f = \frac{qL^4}{120EI} \rightarrow \frac{1.1586 ton/m (5.70m)^4}{120(3,100,000 ton/m^2)(0.002604 m^4)} = 0.001262m = 12.62 cm$

$Aper = \frac{L}{240} \rightarrow \frac{570m}{240} = 2.375 cm$