



PLANTA DE ALBAÑILERIA

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Nombre del tema:

PLANTA DE ALBAÑILERIA

Parcial: 1°

Nombre de la Materia: Taller de Construcción de Materiales Básicos

Nombre del profesor: Arq. Perla Marisol Barajas

Nombre de la Licenciatura: Arquitectura

Cuatrimestre: 5to

Fecha: Comitán de Domínguez a 15 de febrero de 2025

fuerza / distancia = momento

DISEÑO
ASFO

$$R_B = 1.78 \text{ ton}$$

$$R_A = 1.78 \text{ ton}$$

$$M_0 = 1.24 \text{ ton} \cdot \text{m}$$

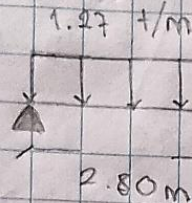
EN B



$$\sum F = 0$$

$$\sum M = 0$$

ARMADA DE ACERO
DE TRABE

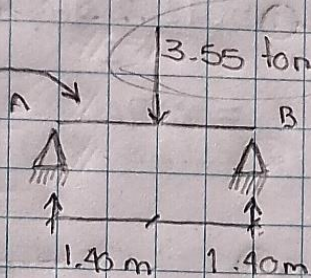


$$P = W/L$$

$$= 1.27 \text{ t/m} (2.80 \text{ m}) = 3.55 \text{ ton}$$

$$U_p = L/2 = 2.80 \text{ m} / 2 = 1.40 \text{ m}$$

$$M = P(+)$$



$$\sum M = 0$$

$$-3.55 \text{ ton} (1.40 \text{ m}) + R_B (2.80 \text{ m}) = 0$$

$$-4.97 \text{ ton} \cdot \text{m} + R_B (2.80) = 0$$

$$R_B = \frac{4.97 \text{ ton} \cdot \text{m}}{2.80 \text{ m}} = 1.77 \text{ ton}$$

SUMATORIA DE FUERZA

$$\sum F = 0$$

$$P_A = -3.55 \text{ ton} + 1.77 \text{ ton} = 0$$

$$R_A = -1.78 \text{ ton} = 0$$

$$R_A = 1.78 \text{ ton}$$

$$M_0 = \frac{W L^2}{8}$$

$$f''_c = 136$$

$$f^*_c =$$

$$\text{FORMULA GENERAL} = M_0 = \frac{W L^2}{8}$$

$$f'_c = 200 \text{ kg/cm}^2$$

$$f^*_c = 200 \text{ kg/cm}^2 (0.80) = 160 \text{ kg/cm}^2$$

$$f''_c = 0.85 (160 \text{ kg/cm}^2) = 136 \text{ kg/cm}^2$$

$$f^*_c = 0.8 f'_c$$

$$f'_c = 0.85 f^*_c \text{ si } f^*_c \leq 250 \text{ kg/cm}^2$$

$$f'_c = \left(\frac{1.05 - f^*_c}{1250} \right) f^*_c \text{ si } f^*_c > 250 \text{ kg/cm}^2$$

Acero = 5000
 Varilla corrugado = 4200

Momento encontrado + Factor de Seguridad.



$f_y = 4,200$

Recubrimiento
2 cm



As M_{ax}
 As M_{in}
 As Balanceado

(Por ser $f'c < 250 \text{ kg/cm}^2$)

$$P_b = \frac{f'_c}{f_y} \cdot \frac{4800}{f_y + 6000} = \frac{136}{4,200} \cdot \frac{4800}{10200} = 0.01524$$

$$P_{\text{máx}} = 0.75 P_b = 0.75 \times 0.01524 = 0.01143$$

$$P_{\text{mín}} = \frac{0.7 \sqrt{f'_c}}{f_y} = \frac{0.7 \sqrt{200}}{4200} = 0.002357$$

$$\rho = \frac{(-q + 1) \cdot F''c}{F_y} \rightarrow \frac{136 \text{ k/cm}^2}{4,200 \text{ k/cm}^2}$$

$V.F.R = 0.80$
 $M.F.R = 0.90$

$F.S = 1.35$
 $= 130,000$

$$q^2 = \frac{M_u}{F.R \cdot b \cdot d^2 \cdot F''c} \cdot x^2 + 1 \rightarrow q = \sqrt{\frac{M_u}{F.R \cdot b \cdot d^2 \cdot F''c} \cdot 2 + 1}$$

$$M_0 = 1.24 \text{ t.m} \times 1.3 \cdot 10^5 = M_0 = 161,200 \text{ K-cm}$$

$$q = \sqrt{\frac{-161,200 \text{ K-cm}}{0.90 \cdot 15 \cdot 16^2 \cdot 136}} = \frac{-401.49719799769}{470.016} = -342.96709793028$$

$$q = 0.560$$

$$-684.9340958605$$

$$= 686.93409586056$$

$$\frac{(-0.560 + 1) \cdot 136 \text{ k/cm}^2}{4,200 \text{ k/cm}^2} = 0.014247$$

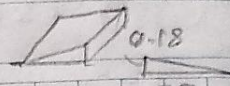
4,200 k/cm²

Junta 1.5
Block 20

30% Abundamiento

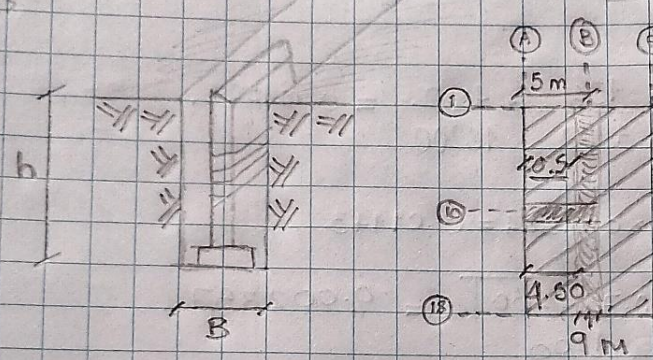


TALLER DE CONSTRUCCIÓN



compactación → 95%

zóna 1.5 - 1.18



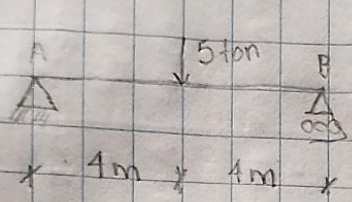
15 x 20 cm	16.2 m ³
AREA	COMPACT
20M	1.80 m ²
	31.59 m ³

CONCEPTO	UNIDAD	EJE	TRAMO	LARGO	ANCHO	ALTURA	PIEZAS	TOTAL	OBSERVACION
Limpieza	m ²	1-18	A-E	20 m	9.0 m	0	1	180 m ²	
TRAZO	m ²	10	A-B	5.0 m			1	5.0	
NIVELACION	m ³	1-18	A-E	20.0 m	9.0 m	9.0 m	1	16.2 m ³ +95%	
EXCAVACION	m ³	10	A-B	4.50 m	1 m	1.18 m	1	5.31 m	ZC-1
PLANTILLA CONCRETO POBRE 14	m ³	B	1-18	20 m	1 m	1.18 m	1	23.6 m	ZC-1
		10	A-B	4.5 m	10 m	0.05	1	28.91 m ³ +30%	
								37.67 m ³	
		B	1-18	70 m	10	0.05	1	0.225	ZC-1
								5%	ZC-1



CARGA PUNTUAL

Martes, 11 febrero



$$\sum M = 0$$

$$-5 \text{ ton} (4 \text{ m}) + R_B (8 \text{ m}) = 0$$

$$-20 \text{ ton} \cdot \text{m} + R_B (8 \text{ m}) = 0$$

$$R_B = \frac{20}{8} = +2.5 \text{ ton}$$

Estática
 tres Apoyos
 Isostáticos

Sumatoria F
 $\sum F = 0$

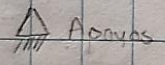
$$R_A = -5 \text{ ton} + 2.5 \text{ ton} = 0$$

$$R_A = -2.5 = 0$$

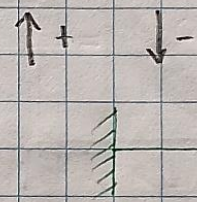
$$R_A = +2.5 \text{ ton}$$

Ecuaciones de la estática

- Sumatoria de momentos.
-
-



fijo, Empotre



Estático

DESPALME: 25cm

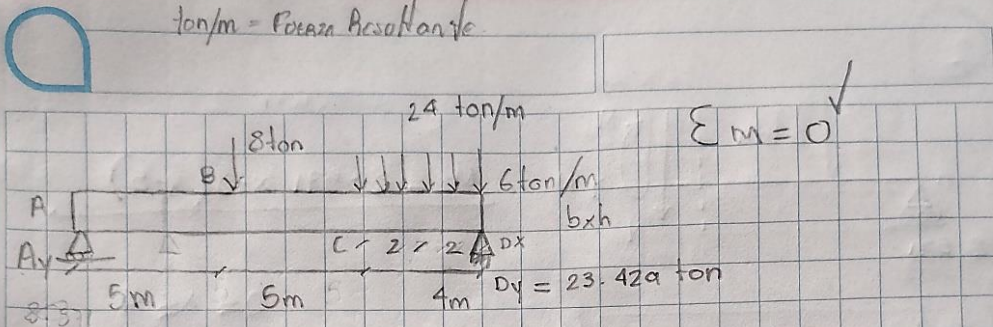
COD	CONCEPTO	EJE	TRAMO	LARGO	ANCHO	ALTO	Pza	U.M	RESULTADO	OBSERVACION
	Limpieza trazo y Niv.	A-B	1-2	10	8	-	1	M ²	80 m ²	
	DESPALME DEL TERRENO	A-B	1-2	10	8	.25cm	1	M ³	20 m ³	
	Excavación	A-B	1-2	10	1.20	1.26	2	M ³	30.24 m ³	
		1-2	A-B	5.60	1.20	1.26	2		16.94 m ³	
	Plantilla	A-B	1-2	10	1.20	0.20	2	M ³	TOTAL: 47.18 m ³ 4.80 m ³	
		1-2	A-B	5.60	1.20	0.20			2.69 m ³	
	Plantilla c	A-B	1-2	10	1.20	-	2	M ²	TOTAL: 7.49 m ³ 24 m ²	
		1-2	A-B	5.60	1.20	-	2		13.44 m ²	
									37.44 m ²	
	Limpieza	A-B	1-3	12	9	-	1	m ²	108 m ²	
	Despalme	A-B	1-3	12	8	.25	1	m ³	24 m ³	
	Excavación	A-B	1-3		1.30	1.46				

Estrella

COD	CONCEPTO	EJE	TRAMO	LARGO	ANCHO	ALTO	Pza	U.M	RESULTADO	OBSERVACIÓN
	Limpieza	A-B	1-3	12	9	-	1	m ²	108 m ²	
	Trazo y N									
	DESPLANTE	A-B	1-3	12	9	0.25	1	m ³	27 m ³	
	EXCAVACIÓN	A-B	1-3	12	1.30	1.40	2	m ³	45.852	
		1-3	A-B	6.40	1.30	1.40	3	m ³	36.44	
									81.99 m ³	
	PLANTILLA									
	PLANTILLA	A-B	1-3	12	1.30	0.20	2	m ³	6.24 m ³	
		1-3	A-B	6.40	1.30	0.20	3	m ³	4.99 m ³	
									11.23 m ³	
	Plantilla C	A+B	1-3	12	1.30	-	2	m ²	31.2 m ²	
		1-3	A-B	6.40	1.30	-	3	m ²	24.96	
									56.16 m ²	

328
828

ton/m = Fuerza Resultante



① Intervalo = $0 \leq x \leq 5$

② $4 \times 6 \text{ ton/m} = 24 \text{ ton/m}$
 $\sum M = 0$
 $\rightarrow \sum MA = 0$

$D_y (14m) - 24 \text{ ton} (12m) - 8 \text{ ton} (5m) = 0$

$\sum F_y = 0$

$D_y (14m) - 288 \text{ ton} \cdot m - 40 \text{ ton} \cdot m = 0$

$D_y (14m) - 328 \text{ ton} \cdot m = 0$

Comprobación

$D_y (14m) = 328 \text{ ton} \cdot m$

$D_y = \frac{328 \text{ ton} \cdot m}{14m} = 23.429 \text{ ton}$

$8.571 - 8 - 24 + 23.429 = 0$

$D_y = 23.429 \text{ ton}$

$\uparrow \sum F_y = 0$

$A_y = -8 \text{ ton} - 24 \text{ ton} + 23.429 \text{ ton} = 0$

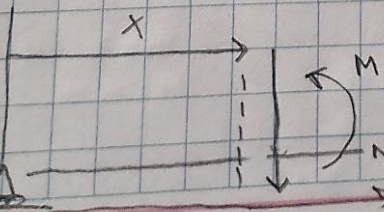
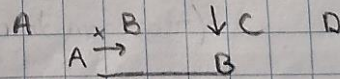
INTERVALO

$A_y = -8.571 \text{ ton}$

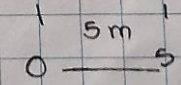
$0 \leq x \leq 5$

SISTEMA REAL

$EI = CA_c$
 Ecuación de momento



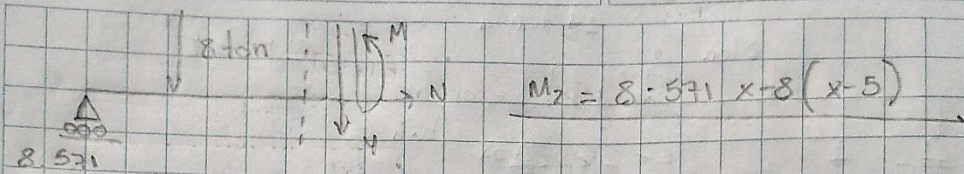
$M_1 = 8.571$
 $M_1 = 8.571x$



8.571

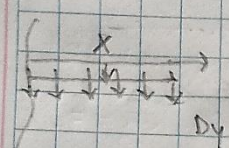
5

Estrella

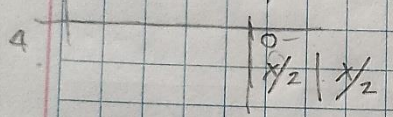


$$M_2 = 8 \cdot 571 x + 8(x-5)$$

$$0 \leq x \leq 4$$



$$M_3 = 6x$$
$$6x - 2(x/2)$$

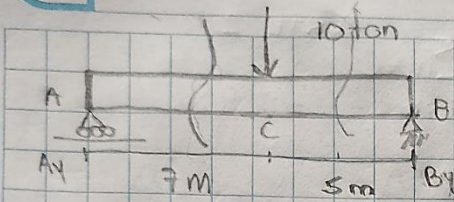


$$M_3 = 23.429 x - 6x(x/2)$$
$$M_3 = 23.430 x - 3x^2$$

$$6x(x/2) = \frac{6x^2}{2}$$

WPS

$$M_2 = 4.17(x) - 10 \text{ ton} (x-7)$$



① $\sum M = 0$

1) $\sum M_A = 0$

$$B_y (12\text{m}) - 10 \text{ ton} (7\text{m}) = 0$$

$$B_y (12\text{m}) - 70 \text{ ton} \cdot \text{m} = 0$$

$$B_y = \frac{70 \text{ ton} \cdot \text{m}}{12 \text{ m}} = 5.83$$

$$B_y = +5.83 \text{ ton}$$

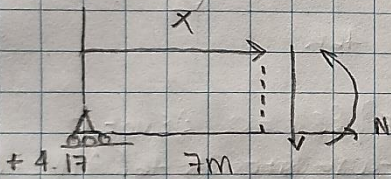
② $\sum F_y = 0$

$$A_y = -10 \text{ ton} + 5.83 \text{ ton}$$

$$A_y = -4.17 \text{ ton}$$

Sistema Real

INTERVALO = $0 \leq x \leq 7$



$$M_1 = 4.17$$

$$M_2 = 4.17(x) - 10(x-7)$$

$$M_2 = 5.83x - 10 \text{ ton} (x-7)$$

M_2