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MATERIA: Análisis de estructuras

ACTIVIDAD: Ejercicios

PASIÓN POR EDUCAR

CUATRIMESTRE: 5

GRUPO: LAR04EMC0121-A

LUGAR Y FECHA: Comitán de Domínguez Chiapas, a; 19 de febrero de 2023

Análisis de Estructuras

08 de febrero de 2022.

Diseño a momento

- $f'c = 200 \text{ kg/cm}^2$
- $f_r = 4200 \text{ kg/cm}^2$
- $f'c = 160 \text{ kg/cm}^2$
- $f'c = 136 \text{ kg/cm}^2$
- $P_{min} = 0.00235$
- $P_{max} = 0.01143$

$$M_u = M(F_0) \quad | \quad \text{kg.cm}$$

↓
1.2

$$11150.88$$

$$1,206,15341.4$$

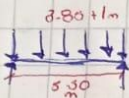
$$q^2 = - \frac{M_u}{F_r \cdot b \cdot d^2 \cdot f'c} (2) + 1 \quad \rightarrow \quad q = \sqrt{- \frac{M_u}{F_r \cdot b \cdot d^2 \cdot f'c} (2) + 1}$$

$$0.7692924227607$$

$$P = \frac{(q + 1) \cdot f'c}{F_y} \quad \rightarrow \quad > P_{min}$$

$$< P_{max}$$

1000 . 100 . Resultado



① momento

$$\frac{1}{8} (3.85 \text{ t/m}) (3.50^2)$$

$$\frac{471,508}{800} \text{ MN}$$

$$74.56 \cdot 1.2^3 = 1,747,200 \text{ kg/cm}$$

Momento = 74.56 t/m \rightarrow 1.2 exp 5

$b = 20 \text{ cm}$

$h = 45 \text{ cm}$

$r = 4 \text{ cm}$

$a = (h - r) = 41 \text{ cm}$

③ $q = \sqrt{- \frac{1,747,200 \text{ kg/cm}}{0.9 \cdot 20 \cdot 41^2 \cdot 136 \text{ kg/cm}^2} (2) + 1} = 0.3884 = q$

④

$$P = \frac{(-0.3884 + 1) (136 \text{ kg/cm}^2)}{4,200 \text{ kg/cm}^2}$$

$$h = \frac{L}{12} = \frac{5.50}{12} = 0.45 \text{ cm}$$

$P = 0.0981$

$$0.1949885109890$$

$1.20 \times 1.20 = 1.44$
 $1.20 \times 0.001 = 0.0012$

$V = 0.16 \text{ ton}$
 $V_{20} = 0.16$
 $V_{28} = 0.16 \text{ ton} (1.4) = 0.224 \text{ ton}$

$$0.52040120797$$

$$\frac{1.44 \cdot 1.20}{1.4 \cdot 20 \cdot 16 \cdot 136} (2)11 = 0.0704 = q$$

$$R = \frac{(-0.0704 + 1) 136}{4200 \text{ kg/m}} = 0.01374$$

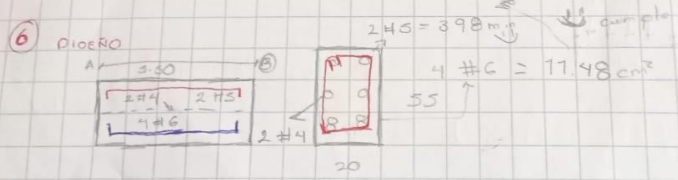
$$\sqrt{\frac{1.44 \cdot 1.20}{1.4 \cdot 20 \cdot 16 \cdot 136} (2)11} = 0.6624$$

124.848
 150.060
 $0.226.394$

5) ΔS

$$\Delta S = f(b)(d)$$

$$\Delta S = 0.01063 (20 \text{ cm}) (51 \text{ cm}) = 10.84 \text{ cm}^2$$



$$6 \times 4 = 17.48 \text{ cm}^2$$

$$\Delta S_{\min} = \rho_{\min}(b)(d)$$

$$\Delta S_{\min} = 2.397 \text{ cm}^2$$

$$\rho = \frac{\Delta S}{bd} = \frac{17.48}{20 \cdot 51} = 0.01725$$

$$2 \#5 = 3.98 > \min$$

$5.77 =$
 6.135
 1.05

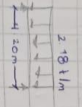
period
 $r = 300 \text{ kg/cm}^3$
 $F = 1,000 \text{ kg/cm}^2$
 $v = 30 \text{ cm}$
 $h = 10 \text{ cm}$

$\frac{v}{h}$

$R_4 = R_8 = \frac{383 \times 550}{2} = 1058125$

$V = 1058125 \times 1481 \text{ cm}$

$V_{EK} = 0.70 \cdot 0.80 \cdot 10 \cdot 51 \cdot (2.130(0.0125) + 1701) = 524.3713$
 0.530102



① Monoblo

$\frac{1}{8} (2.181 \text{ mm}) (4.20) = 1.807 \text{ cm/m}$

② MV

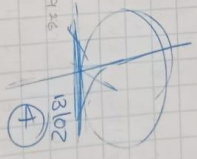
$4.80 - 1.25 = 3.55 \text{ cm}$

$h = \frac{L}{4} = \frac{4.20}{4} = 1.05$

$\frac{1}{8} \cdot \frac{570 \cdot 24000}{69 \cdot 20 \cdot 25 \cdot 106} \cdot (2) \cdot 11 = 0.158$
 4.200

④

$\rho = (0.2708 + 1) (136 \text{ kg/cm}^3) = 0.00918$



⑤ AS

$A_s = \rho (b) (h)$

$A_s = 0.00926(20)(181) = 3.3711$

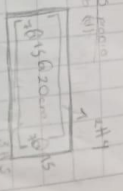
⑥

0.05670

$5.20 \cdot 1.86 = 2.86 = 5.74 = 0.00956$

$5.73 = 1.71 = 3.46 = 5.97 = 0.00962$

$A_s = 0.00935(20)(181) = 3.3711$
 $A_s = 0.00935(20)(181) = 3.3711$



$$Q = 1.4 \times 10^6 \text{ m}^3 \text{ (1760)} = 9.14 \times 10^6$$

$$1.4 \times 10^6 \text{ m}^3 \times 620 \text{ kg/m}^3 = 8.68 \times 10^8 \text{ kg}$$

$$V = 5.36 \text{ km}$$

$$VU = 4.11 \text{ km}$$

$$VCP = 1.18 \text{ km}$$

$$\sqrt{V^2} = 0.12 \cdot Td \cdot b \cdot d \cdot (2.140) / \sqrt{r^2}$$

$$V = \frac{1}{2} \cdot (1) = 2.18(4.20) = 4.378$$

$$VU = \sqrt{411} = 4.578 \text{ (1.1)} = 6.91$$

$$VCP = 0.7 \cdot 0.18 \cdot 20 = 1.31 \text{ (2.130 (1000000))} \sqrt{170} = 2.10195 \text{ km}$$

$$VCP = 1.5 \cdot \sqrt{18} \cdot b \cdot d \cdot \sqrt{r^2}$$

$$1.5 = 0.8 + 20 \cdot 31 \sqrt{170} = 9.891 \text{ km}$$

tsl. obos

Deponicion estiercos

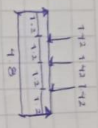
$$\frac{420}{1} = 105 \quad 0 = \frac{105}{0.15} = 7$$

tsl. obos

$$2.5 \text{ pizos (104)} = 26 = 28.6 = 2.88 \cdot 10 \text{ pizos}$$

$$107\% = 12$$

$\rho_{min} = 0.004$
 $\rho_{max} = 0.02$
 $f_c = 15 \text{ MPa}$
 $f_y = 240 \text{ MPa}$
 $h = 100 \text{ mm}$



$$M_u = \frac{C_u}{Z}$$

$$Q_u = R_u = \frac{8.5}{2}$$

cálculo y diseño a flexión (1)
 Revisión a cricante (2)

1 Momento

$$M_u = 1.42(1.8) = 2.41$$

2 MU

$$3.41 \cdot 1.25 = 409.200$$

3 ρ

$$\rho = \frac{409.200}{1.12 \cdot 140 \cdot 142} = 0.861$$

4

$$\rho = \frac{409.200}{1.12 \cdot 140 \cdot 142} = 0.0045$$

5 AS

$$A_s = \rho(b) = 3.24$$

$$0.0045(140)(142) = 3.24$$

6 Diseño

$$3.24 \cdot 162 = 245.5 = 1.99 \cdot 12 = 3.98$$

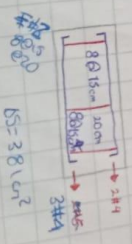
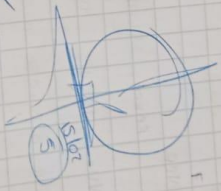
$$\frac{3.98}{2} = 0.0035$$

$$\frac{2.086}{2}$$

$$A_g = 0.0035(140)(142) = 1.992$$

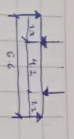
$$0.846 = 1.992 \cdot 0.846 = 1.694 = 1.64$$

DATOS:
 $f_c = 240 \text{ kg/cm}^2$
 $f_y = 160 \text{ kg/cm}^2$
 $\rho_{min} = 0.00285$
 $\rho_{max} = 0.01575$
 $b = 90 \text{ mm}$
 $h = 100 \text{ mm}$
 $d = 86 \text{ mm}$
 $h = \frac{1}{11} = 1.18 \cdot 110$



$$IS = 38 \text{ cm}^2$$

$D_{min} = 200 \text{ kg/cm}^2$
 $F_c = 41,900 \text{ kg/cm}^2$
 $V = 2,5 \text{ cm}$
 $H = 75 \text{ cm}$



$M \leq F_c A_c$
 $R_A = R_B = F$

1 Momento
 $M = 1.00 (1.20) = 1.98 \text{ t.m}$

2 Mu
 $M_u = 198 \text{ t.m} (1.2^2) = 287,600 \text{ kg.cm}$

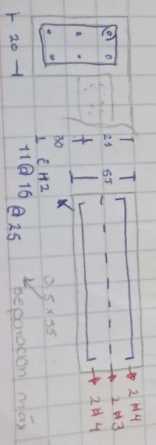
3 h = $\frac{0.8}{12} = 0.55$
 $V_{req} = 0.00335$

4 $\rho = \frac{287,600}{240 \cdot 20 \cdot 57^2 \cdot 136} (2) (1) = 0.962$

5 $\rho = 1.0 \cdot 962 (1) (136) = 0.00130$ No cumple
 4,200
 En caso de que el ρ sea menor que el establecido se tomará 0.00335
 dato

6 AS
 $AS = 0.00335 (20) (57) = 2.393 \text{ cm}$

7 Doseño
 $\frac{2.393}{2} = 1.19 \text{ cm} = 1H1 = 1.23 = 2H4 = 2.64$



Dato:
 $F_c = 200 \text{ kg/cm}^2$
 $F_y = 41,900 \text{ kg/cm}^2$

$b = 20 \text{ cm}$
 $h = 75 \text{ cm}$
 $V = 4 \text{ cm}$
 $d = 57 \text{ cm}$
 $M = 1.98 \text{ t.m}$
 $V =$
 $V_{req} = 0.00335$

$$m(160) = 9.44 \text{ m}^2$$
$$= 44.4 \text{ kcal/m}^2$$

$$V = 5.36 \text{ ton}$$
$$VU = V(F)$$
$$Nu = 9.16 \text{ ton (1.4)} = 8.06 \text{ ton}$$

$$VGR = 0.10 \cdot 0.8 \cdot 20 \cdot 51 (2.130 (0.00235) \sqrt{10}) = 2.01$$
$$511.2 \times 0.2305 \times 13.03$$

$$v = 2.5 \text{ m}$$
$$m = 0.008$$