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DOCENTE: PEDRO ALBERTO GARCÍA

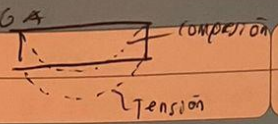
MATERIA: **ANALISIS DE ESTRUCTURAS**

ACTIVIDAD: **CALCULO DEL ACERO DE REFUERZO DE UNA VIGA RECTANGULAR**

CUATRIMESTRE: 5TO

GRUPO: A

200 kg / cm²



Constantes

* $f_c = 0.8\ F'c$ → Res

" $f_c = 0.85\ F'c$ → Concreto ≤ 250 kg/cm²

Concreto
$F'c = 200$ kg/cm²

Varilla de Acero
$F_y = 4200$

$$\rho_b = \frac{f''c}{Fy} \cdot \frac{4800}{Fy + 6000}$$

$$\rho_{min} = \frac{0.7\sqrt{F'c}}{Fy} = \frac{0.7\sqrt{F'c}}{Fy}$$

$$\rho_{max} = 0.75\ \rho_b$$

$0.8\ 200\ kg/cm^2 = 160\ kg/m^2$ → * f_c

$0.85\ (160)\ kg/cm^2$ → $F''c$

$= 136\ kg/cm^2$

$$\rho_b = \frac{F''c}{fy} \cdot \frac{4800}{Fy + 6000} = \frac{136}{4200} \cdot \frac{4800}{4200 + 6000}$$

$0.0323 \cdot 0.4705$

$= 0.01524$ ρ_b = Error balanceado

$$\rho_{min} \quad \frac{0.7\sqrt{200\ kg/m^2}}{4200} = 0.002357$$

$\rho_{max} = 0.75 \cdot 0.01524$

$= 0.01143$

Fe = Factor = 0.9

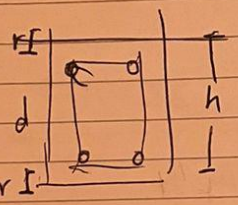
b = base

d = Peralte efectivo = h − R

R = Recubrimiento = 4 cm

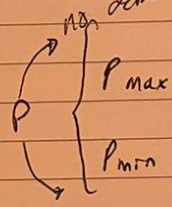
Error

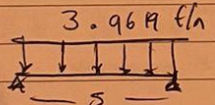
$$P = \frac{(-q2 + 1) \cdot F''c}{Fy}$$



$$q' = \frac{-qu}{Fr \cdot b \cdot dz \cdot F''c} \cdot 2 + 1$$

$$q = -\sqrt{\frac{Mu}{Fe \cdot b \cdot dz \cdot F''c}} \quad 2+1$$





DATOS

Mu = 1,609,517

b = 15 cm

h = 45 cm

d = 41 = 45 − 4

Momento

$$M = \frac{w L^2}{8}$$

$$M = \frac{3.9619(5)^2}{8} = 12.3809 \text{ t.m} \rightarrow \text{kg/cm} \quad 1000 \times 100$$

$$= 1,238,090$$

Momento Ultimo × 1.3 → factor Sismo

Momento Ultimo = 1,609,517 kg.cm

$$q = -\sqrt{\frac{Mu}{Fr \cdot b \cdot dz \cdot F''c}} \quad 2+1$$

$$q = -\sqrt{\frac{1,609,517}{(0.9)(15)(41)^2 (136)}} \quad 2+1 = -\sqrt{1.0430} + 1 = 0.2073$$

q

2 ×

3,086,316

$$\rho = \frac{(-q+1)\cdot f''c}{Fy}$$

Error

$$\rho = \frac{(-0.2073+1)\cdot 136}{4200} = 0.0256$$

es más de ρ_{max}

$$q = \frac{-\sqrt{mu}}{\phi r \cdot b \cdot d^2 \cdot f''c}$$

$$= \frac{-\sqrt{1,609,517}}{(0.9)(15)(46)^2(136)} \quad 2+1$$

3 884 976

=

$$= \frac{-\sqrt{1609517}}{(0.9)(15)(56)^2(136)} \quad 2+1 =$$

5 757 696

$0.2795 \rightarrow x^2$

$0.559 = -0.559 + 1 = 0.441$

0.6640

$$\rho = \frac{(-0.6640+1)\cdot 136}{4200}$$

$b = 15$
$h = 60$
$d = 56$

$= 0.01088$