



NOMBRE DEL ALUMNO: JULIO ALBERTO AGUILAR VERA

NOMBRE DEL PROFESOR: PEDRO ALBERTO GARCIA

NOMBRE DEL TRABAJO: CÁLCULO DEL ACERO DE REFUERZO DE
UNA VIGA RECTANGULAR

MATERIA: ANALISIS

GRADO: 5TO CUATRIMESTRE

GRUPO: A

COMITAN DE DOMINGUEZ CHIAPAS A 11 DE FEBREO DE 2022

$$F_c = 0.8 F'_c \rightarrow 0.8 (200 \text{ kg/cm}^2) = 160 \text{ kg/cm}^2 \text{ [CONSTANTES]}$$

$$F_c = 0.85 F'_c \rightarrow \text{CONCRETO} \leq 250 \text{ kg/cm}^2 = 0.85 (160 \text{ kg/cm}^2) = 136 \text{ kg/cm}^2$$

$$P_b = \frac{F_c}{F_y} = \frac{4800}{F_y + 600} \rightarrow \frac{136 \text{ kg/cm}^2}{4,200 \text{ kg/cm}^2} \cdot \frac{4800}{(1,200 + 600)} = \underline{0.01584}$$

$$(0.0323) \cdot (0.01523)$$

$$P_{MIN} = \frac{0.7 \sqrt{F_c}}{F_y} \rightarrow \frac{0.7 \sqrt{200 \text{ kg/cm}^2}}{4,200 \text{ kg/cm}^2} = \underline{0.002357}$$

$$P_{MAX} = 0.75 P_b \rightarrow 0.75 (0.01584) = \underline{0.01188}$$

$$q = \sqrt{\frac{MU}{F_R \cdot B \cdot D^2 \cdot F'_c} \cdot z + 1}$$

$$q = \sqrt{\frac{1609517 \text{ kg/cm} \cdot z + 1}{(0.9)(15)(56)^2 (136 \text{ kg/cm}^2)}}$$

$$q = \sqrt{\frac{1609517}{5757696} \cdot z + 1}$$

$$q = \sqrt{0.4409} = 0.664$$

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

ACERO $F_y = 4,200 \text{ kg/cm}^2$

$MU = 1,609,517 \text{ kg/cm}$

$F_R = \text{FACTOR} = 0.9$

$B = \text{BASE} = 15 \text{ cm}$

$H = \text{ALTURA TRAZO} = 60 \text{ cm}$

$D = \text{PERALTE EFECTIVO} =$

$H - z = 54$

$D = \text{RECUBRIMIENTO} = 4$

$$P = \frac{(-q^2 + 1) \cdot F_c}{F_y}$$

$$P = \frac{(-0.664^2 + 1) \cdot 136 \text{ kg/cm}^2}{4,200 \text{ kg/cm}^2} = \underline{0.01038}$$

$$3.9619 \text{ T/M}$$

$$M = \frac{wL^2}{8} = \frac{(3.9618)(5)^2}{8}$$

$$= 12.3809 \text{ T} \cdot \text{M} = 124$$