Description: Diseño Sísmico de Viga al Corte

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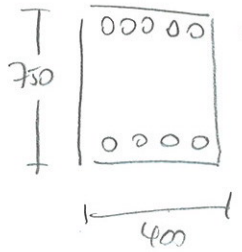

$f'_c = 30\ MPa$

$f_y = 420\ MPa$

$d = 750 - 40 - \frac{25}{2} = 698\ mm$

$L = 8{,}5\ m$

Carga gravitacional

$W_{D+L} = 332\ \frac{kN}{m}$.

$M_{pro} = 1{,}25 \cdot M_n$

$5\varphi32 \Rightarrow M_n^- = 935\ kN\text{-}m \rightarrow M_n^- = \frac{M_n^-}{0{,}9} = 1039\ kN\text{-}m$

$4\varphi25 \Rightarrow M_n^+ = 488\ kN\text{-}m \rightarrow M_n^+ = \frac{M_n^+}{0{,}9} = 542\ kN\text{-}m$.

Carga de Corte Sismo

$$V_{uE} = \frac{M_{pro}^- + M_{pro}^+}{L} = \frac{1{,}25\,(1039 + 542)}{8{,}5}$$

$V_{uE} = 232\ kN$.

Carga gravitacional

$$V_{uD+L} = \frac{W_{D+L} \cdot L}{2} = \frac{332 \cdot 8{,}5}{2} = 141\ kN.$$

$\Rightarrow V_u = V_{uD+L} + V_{uE} = 141 + 232$

$\boxed{V_u = 373\ kN}$ Carga de Diseño.

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Suponemos $P_u = 0$

$V_{ue} = 232,1 \text{ kN} > \frac{V_u}{2} = \frac{373}{2} = 186,5 \text{ kN}$.

$\rightarrow V_c = 0$.

$$V_u = \phi V_n = \phi(\cancel{V_c}^{0} + V_s) = \frac{\phi A_v \cdot f_{yd}}{s}$$

$$\rightarrow s = \frac{\phi A_v \cdot f_{yd}}{V_u}$$

$E\phi 10 = 15,8 \text{ cm}^2 \rightarrow \frac{0,85 \cdot 158 \cdot 420 \cdot 698}{373 \cdot 10^3} = 105 \text{ mm}$

$\rightarrow s = 100 \text{ m}$.

$\rightarrow E\phi 10 \text{ a } 100$.

$$s = \begin{cases} \frac{d}{4} = \frac{698}{4} = 175 \\ 8 d_b = 8 \cdot 25 = 200 \\ 24 \, d_{b\,trans} = 24 \cdot 10 = 240 \\ 300 \text{ mm}. \end{cases}$$

cumple !!