

Diseño de losa maciza

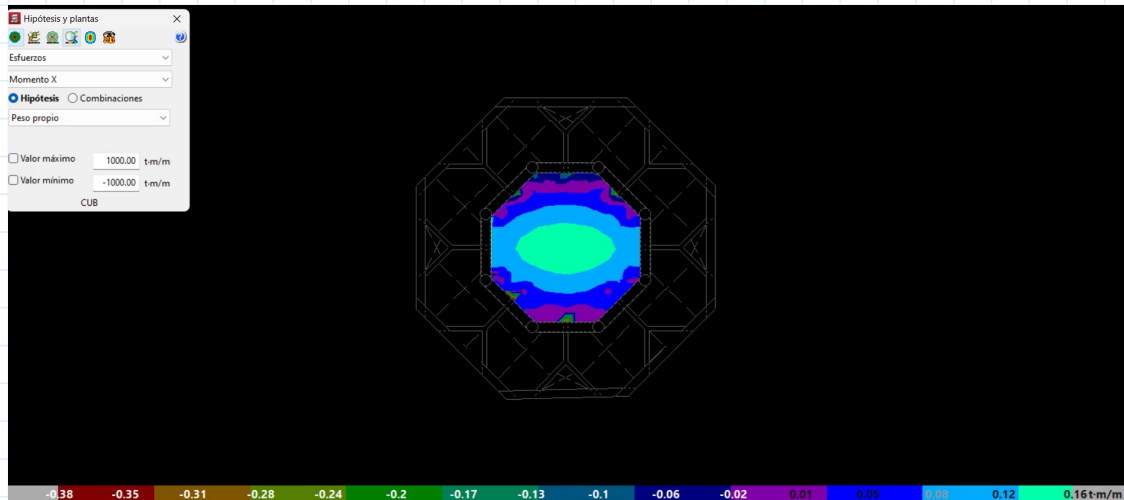
$$f_c := 21 \text{ MPa} \quad f_y := 420 \text{ MPa}$$

$$h := 15 \text{ cm} \quad \text{Espesor de la torta}$$

$$L := 0.55 \text{ m} \quad \text{Distancia en voladizo}$$

$$\lambda := 1.00 \quad \text{Concreto de peso normal}$$

CARGAS



Momento Ultimo

$$Mult := 0.16 \text{ tonf} \cdot \text{m} = 1.423 \text{ kN} \cdot \text{m}$$

$$m1 := \frac{f_y}{0.85 \cdot f_c} = 23.529$$

$$d := h - 0.04 \text{ m} = 0.11 \text{ m}$$

$$b := 1 \text{ m} \quad K := \frac{Mult}{b \cdot d^2} = 117.639 \frac{\text{kN}}{\text{m}^2}$$

$$\rho := \frac{1}{m1} \left(1 - \sqrt{1 - \frac{2 \cdot m1 \cdot K}{0.9 \cdot f_y}} \right) = 3.124 \cdot 10^{-4}$$

$$\rho_{min} := 0.002$$

$$\rho := \text{if}(\rho < \rho_{min}, \rho_{min}, \rho) = 0.002$$

$$As := \rho \cdot d \cdot b = 2.2 \text{ cm}^2$$

$$Astemp := \rho_{min} \cdot h \cdot b = 3 \text{ cm}^2 \quad \text{Por ml}$$

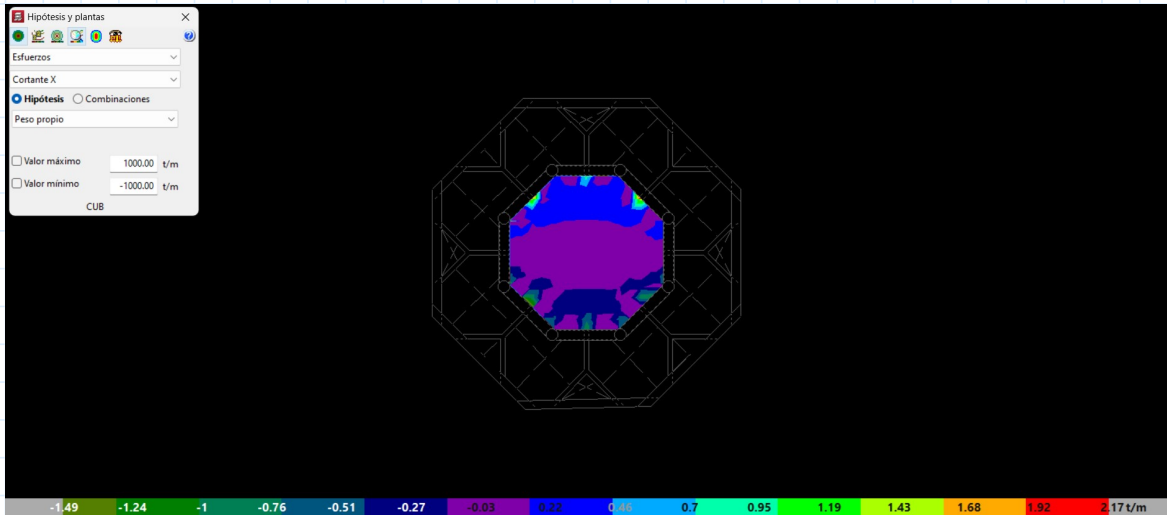
$$Asdis := \text{if}(As < Astemp, Astemp, As) = 3 \text{ cm}^2$$

$$Acol := \frac{100}{12.5} \cdot 71 \text{ mm}^2 = 5.68 \text{ cm}^2$$

El acero colocado #3 @ 12.5

$$\text{if}(Asdis < Acol, \text{"Cumple"}, \text{"No cumple"}) = \text{"Cumple"}$$

Chequeo a cortante



$$Vult := 2.16 \text{ tonf} = 19.216 \text{ kN}$$

Esfuerzo

$$vd := \frac{Vult}{(b \cdot 100 \text{ m})} = 192.163 \text{ Pa}$$

Esfuerzo de cortante del concreto

$$\Phi := 0.75$$

$$\phi Vc := \Phi \cdot \lambda \cdot \frac{\sqrt{\frac{fc}{\text{MPa}}} \cdot \text{kN}}{d \cdot b} = 31.245 \frac{\text{kN}}{\text{m}^2}$$

$$\text{if}(vd < \phi Vc, \text{"Cumple"}, \text{"No cumple"}) = \text{"Cumple"}$$