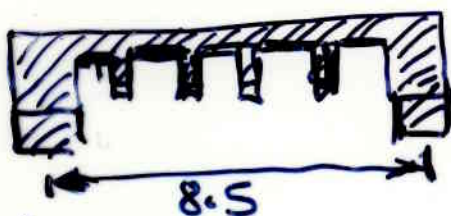
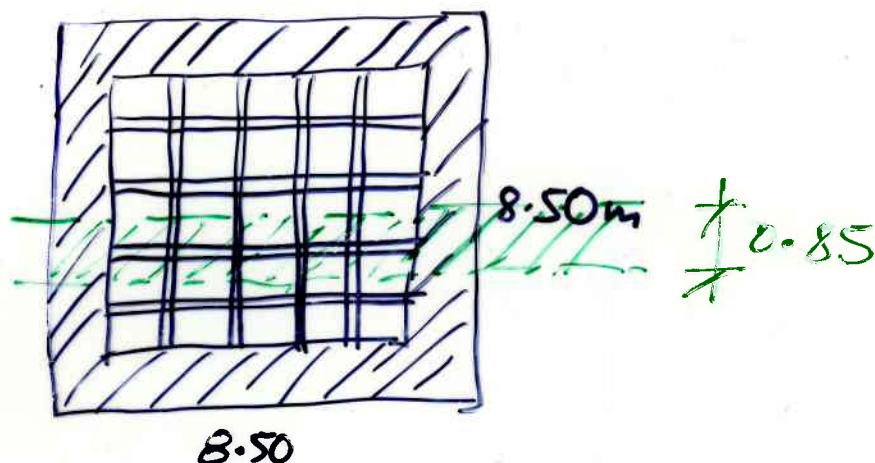


Δίνεται Πλάκα $8.50 \times 8.50 \text{ m}$ ελεύθερα
εδραζόμενη περιμετρικά.

$$g' = 1.50 \text{ kN/m}^2$$

C20 / S400

$$q = 5.00 \text{ "}$$



Απαιτήσεις:

$$1) \alpha l/d \leq 20 \quad \alpha = 1 \quad l = 8.50$$

$$d \geq \frac{\alpha l}{\frac{20}{30}} = \frac{1 \times 8500}{\frac{20}{30}} = \frac{425}{283} \text{ mm} \leadsto 450 \text{ mm}$$

$$2) \max a_L = 750 \text{ mm} \rightarrow \text{εκλέγεται } a_L = 700 \text{ mm}$$

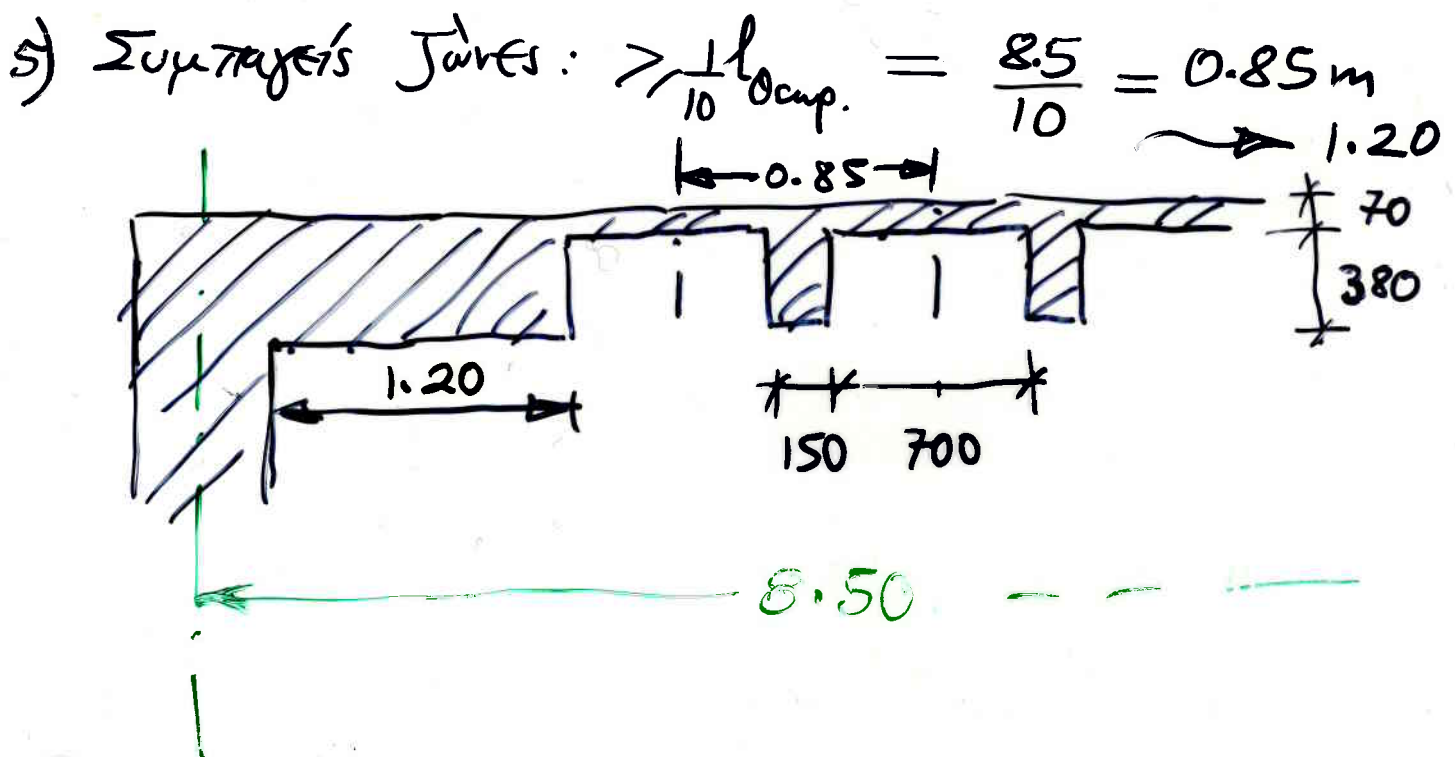
$$3) \text{ ~~εκλέγεται~~ } h_s \geq \max\left(\frac{a_L}{10}, 50\right) = 70 \text{ mm}$$

$$4) h_w \leq 4 b_w$$

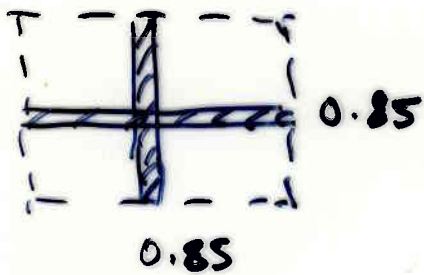
$$\leadsto b_w \geq \frac{h_w}{4} = \frac{1}{4} (h_0 - h_s) = \frac{1}{4} (450 - 70) = 85 \text{ mm}$$

$$\& b_w \geq 70$$

$$\leadsto \text{εκλέγεται } b_w = 150 \text{ mm}$$



Φορτία



$$1. \text{ B. : } \left\{ 0.07 \times 0.85^2 + 0.15 \times 0.380 \times (0.85 + 0.70) \right\} 25 / 0.85^2 = 4.81 \quad \text{kN/m}^2$$

$$q' = 1.50$$

$$q = 5.00$$

Φορτία σχεδιασμού:

$$q_d = 1.35(4.81 + 1.50) + 1.50(5.00) = 16.02 \text{ kN/m}^2$$

$$\max M = \frac{q \cdot l^2}{8} = \left(\frac{q_d}{2} \right) \frac{l^2}{8} = \frac{16.02}{2} \times 0.85 \times \frac{8.50^2}{8}$$

$$= 61.5 \text{ kNm}$$

ροπή αντί νεύρωση

$$\frac{M}{I} = \frac{72.34 \times 10^{-3}}{0.85 \times 0.425^2} = 0.400 \rightarrow \rho_1 = 0.119\%$$

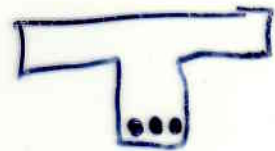
$$\rightarrow A_{s1} = \frac{0.119}{100} \times 85 \times 42.5 = 4.3 \text{ cm}^2$$


$$\max \frac{M}{b} = \frac{q_d}{2} \cdot \frac{l^2}{8} = \frac{16.02}{2} \times \frac{8.50^2}{8} = 72.34 \text{ kN/m/m}$$

$$\rho_{min} = \frac{1}{2} \cdot \frac{f_{ctm}}{f_{yk}} = \frac{1}{2} \times \frac{2.2}{400} = 0.00275$$

$$A_{smin} = 0.00275 \times 15 \times 42.5 = 1.75 \text{ cm}^2$$

$$\rightarrow 3 \phi 14 (=4.62 \text{ cm}^2)$$



Οπλισμός πλάκας

$$0.001 \times 7.0 \times 100.0 = 0.7 \text{ cm}^2/\text{m}$$

$$\begin{array}{r} 42 \\ 20 \\ \hline 30 \quad 40 \\ 92 \quad 102 \end{array} \rightarrow 48$$

$$\# \phi 4.2/150 \text{ (T92)} \quad c=1.5$$