

ΥΠΟΥΡΓΕΙΟΝ ΑΝΟΙΚΟΔΟΜΗΣΕΩΣ ΔΙΚΤΥΩΝ

Πλάτος Π₁ (d=10) $g = 0,10 \times 2400 = 240$
Διεύθυνση χωροταξίας & προγράμματος $p = 250$

490 Kg/m^2

$M_1 = 0,70 \times 490 \times 230^2 = 270 \text{ Kg}$ $\gamma = \frac{9,5}{\sqrt{270}} = 0,516$

$\rho_1 = 0,30 \times 270 = 81 \text{ cm}^2$

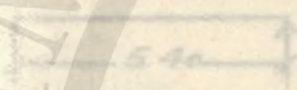
$\rho_2 = 0,12 \times 490 \times 230^2 = 293$ $\gamma = \frac{9,5}{\sqrt{293}} = 0,382$

$\rho_3 = 0,12 \times 293 = 35,16 \text{ cm}^2$

ΜΕΛΕΤΗ

ΕΣΩΤΕΡΙΚΟΥ ΔΙΚΤΥΟΥ ΠΟΛΕΩΣ ΧΑΝΙΩΝ

ΣΤΑΤΙΚΟΣ ΥΠΟΛΟΓΙΣΜΟΣ ΔΕΞΑΜΕΝΗΣ



$M = 0,25 \times 1500 \times 5,4^2 = 5470$ $\gamma = \frac{41}{\sqrt{5470}} = 0,555$

$\rho = 0,25 \times 41 = 10,25 \text{ cm}^2$ 4 φ20

ΠΛΑΞ ΕΠΙΚΑΛΥΨΕΩΣ ΔΕΞΑΜΕΝΗΣ

Πλάτος Π₂ (d=12) $g = 0,12 \times 2400 = 293$

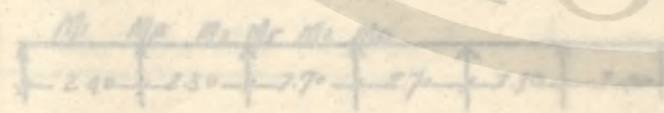
$p = 250$



$M = 0,12 \times 293 \times 2,9^2 = 375 \text{ Kg}$ $\gamma = \frac{10,5}{\sqrt{375}} = 0,412$

$\rho = 0,531 \times 375 = 198 \text{ cm}^2$

Πλάτος Π₃ Π₄ Π₅ Π₆ Π₇ Π₈ Π₉ Π₁₀ (d=10) $g = 0,10 \times 1200 = 1200$

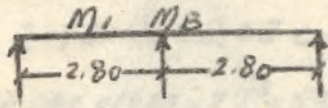


$M = 0,60 \times 1200 = 720$

1600 Kg/m^2

ΠΛΑΞ ΕΠΙΚΑΛΥΨΕΩΣ ΘΑΛΑΜΟΥ ΔΙΚΛΕΙΔΟΝ

Πλάξ Π₁ Π₁' (d=10)



$$g = 0,10 \times 2400 = 240$$

$$\text{Επικάλυψι κινητόν: } \underline{250}$$

$$490 \text{ Kg/m}^2$$

$$M_1 = 0,70 \times 490 \times 2,80^2 = 270 \text{ Kg/m}$$

$$z = \frac{8,5}{\sqrt{270}} = 0,516$$

$$f_e = 0,341 \times 8,5 = 2,90 \text{ cm}^2 \quad 7 \phi 8$$

$$M_{1B} = -0,125 \times 490 \times 2,80^2 = -480 \text{ Kg/m}$$

$$z = \frac{8,5}{\sqrt{480}} = 0,388$$

$$f_e = 0,617 \times 8,5 = 5,25 \text{ cm}^2 \quad 11 \phi 8$$

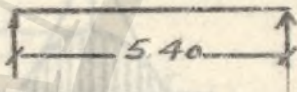
$$f_e' = 0,3 \times 5,25 \times 1,42 = 2,24 \text{ cm}^2 \quad 7 \phi 8$$

Δοκός Δ₁ (20/μς)

$$\text{φορτία πλακός: } 2,8 \times 490 = 1370$$

$$\text{ίδιοι βάρω} \quad \underline{130}$$

$$1500 \text{ Kg/m}$$



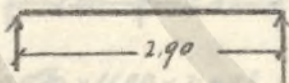
$$M = 0,125 \times 1500 \times 5,4^2 = 5470$$

$$z = \frac{41}{\sqrt{5470}} = 0,555$$

$$f_e = 0,302 \times 41 = 12,4 \text{ cm}^2 \quad 4 \phi 20$$

ΠΛΑΞ ΕΠΙΚΑΛΥΨΕΩΣ ΔΕΞΑΜΕΝΗΣ

Πλάξ Π₂ (d=12)



$$g = 0,12 \times 2400 = 298$$

$$p = \underline{250}$$

$$548 \text{ Kg/m}^2$$

$$M = 0,125 \times 548 \times 2,9^2 = 575 \text{ Kg/m}$$

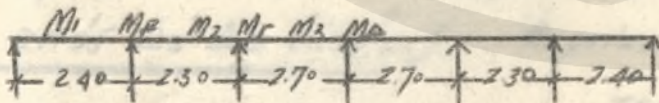
$$z = \frac{10,5}{\sqrt{575}} = 0,424$$

$$f_e = 0,521 \times 10,5 = 5,46 \text{ cm}^2 \quad 7 \phi 10$$

Πλάξ Π₃ Π₄ Π₅ Π₆ Π₇ Π₈ (d=13)

$$\text{φορτία:}$$

$$\text{Γαίων: } 0,60 \times 1800 = 1080$$



$$\text{ίδιοι τσιμεντοκάλυψη: } \underline{520}$$

$$1600 \text{ Kg/m}^2$$

$$M_1 = 0,078 \times 1600 \times 2,4^2 = 720 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{720}} = 0,428$$

$$f_e = 0,510 \times 11,5 = 5,86 \text{ cm}^2 \quad 8 \phi 10$$

$$M_2 = 0,033 \times 1600 \times 2,3^2 = 280 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{280}} = 0,686$$

$$f_e = 0,198 \times 11,5 = 2,28 \text{ cm}^2 \quad 7 \phi 8$$

$$z = \frac{11,5}{\sqrt{536}} = 0,496$$

$$M_3 = 0,046 \times 1600 \times 2,7^2 = 536 \text{ Kg}\cdot\text{m}$$

$$f_e = 0,381 \times 11,5 = 4,38 \text{ cm}^2 \quad 10 \phi 8$$

$$M_B = -0,105 \times 1600 \times 2,35^2 = -930 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{930}} = 0,377$$

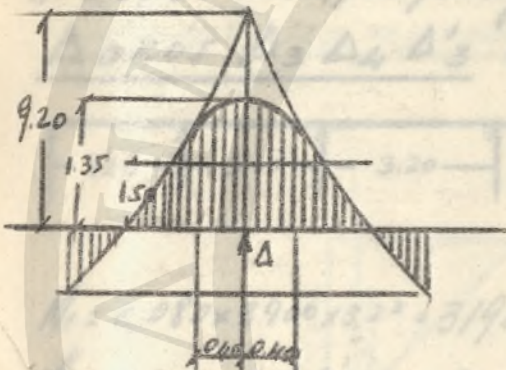
$$f_e = 0,667 \times 11,5 = 7,67 \text{ cm}^2 \quad 4 \phi 10 + 3 \frac{1}{2} \phi 8 + 3 \phi 8$$

$$f_e' = 0,5 \times 7,67 \times 1,1 = 4,22 \text{ cm}^2 \quad 4 \phi 10 + 3 \frac{1}{2} \phi 8$$

$$M_r = -0,079 \times 1600 \times 2,5^2 = -790 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{790}} = 0,409$$

$$f_e = 0,556 \times 11,5 = 6,40 \text{ cm}^2 \quad 8 \phi 8 + 3 \phi 8$$



$$M_D = -0,079 \times 1600 \times 2,7^2 = -920 \text{ Kg}\cdot\text{m}$$

$$\text{Είς παράπαν τοίχου: } \frac{2,3}{2,7} = 0,85$$

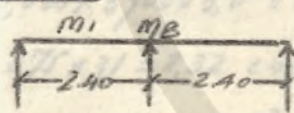
$$M = -0,013 \times 1600 \times 2,7^2 = -150 \text{ Kg}\cdot\text{m}$$

$$\text{Μειωτική ροπή: } - \frac{920 + 150}{2} = -535 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{535}} = 0,495$$

$$f_e = 0,381 \times 11,5 = 4,4 \text{ cm}^2 \quad 10 \phi 8$$

Πρόσ η6 η7 (d=13)



φορτία, ως αντιστήρι-

$$M_1 = 0,0070 \times 1600 \times 2,40^2 = 644 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{644}} = 0,454$$

$$f_e = 0,455 \times 11,5 = 5,2 \text{ cm}^2 \quad 7 \phi 10$$

$$M_B = -0,125 \times 1600 \times 2,35^2 = -1100 \text{ Kg}\cdot\text{m}$$

$$z = \frac{11,5}{\sqrt{1100}} = 0,347$$

$$f_e = 0,794 \times 11,5 = 9,14 \text{ cm}^2 \quad 12 \phi 10$$

$$f_e' = 0,9 \times 9,14 \times 1,10 = 9,05 \quad 3 \frac{1}{2} \phi 10 + 8 \phi 10$$

Δ οκόσ Δ2 Δ'2 (20/25)

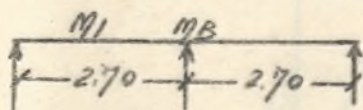
$$\text{φορτία: } \text{έν η}' = 2,8 \times 490 = 1370$$

$$\text{τοίχου: } 0,25 \times 3,30 \times 1600 = 1320$$

σύνολο:

$$110$$

$$\frac{1370 + 1320 + 110}{2800 \text{ Kg/m}}$$



$$M_1 = 0,070 \times 2800 \times 2,7^2 = 1400 \text{ Kg}\cdot\text{m}$$

$$\eta = \frac{21}{\sqrt{1400}} = 0,560$$

$$f_c = 0,284 \times 21 = 6,0 \text{ cm}^2 \quad 4 \phi 14$$

$$M_B = -0,125 \times 2800 \times 2,7^2 = -2540 \text{ Kg}\cdot\text{m}$$

Ροπή, επί προσαύτων τοίχου

2540

$$\frac{2,3}{2,7} = 0,85$$

$$M = -0,0425 \times 2800 \times 2,7^2 = -870 \text{ Kg}\cdot\text{m}$$

$$\text{Μειωμένη ροπή: } M = \frac{-2540 + 870}{2} = -1710 \text{ Kg}\cdot\text{m}$$

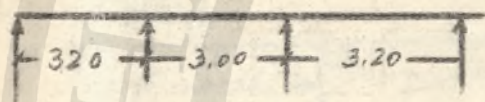
$$\eta = \frac{22}{\frac{\sqrt{1710}}{0,20}} = 0,267$$

$$f_c = 1,374 \times 0,20 \times 22 = 6,1 \text{ cm}^2 \quad 4 \phi 14$$

$$f_c' = f_c = 6,1 \text{ cm}^2 \quad 4 \phi 14$$

$$A = 0,375 \times 2800 \times 2,7 = 2960 \text{ Kg} \quad \text{Ανά } \phi 6 / 15 \text{ cm.}$$

Δοκός Δ₃ Δ₄ Δ'₃ (2φ/35) φορτία:



$$\text{Πλακών: } \frac{2,4 + 2,3}{2} \times 1600 = 3750$$

Ίδιον βάρος

150

$$3900 \text{ Kg/m.}$$

$$M_1 = 0,080 \times 3900 \times 3,2^2 = 3190 \text{ Kg}\cdot\text{m} \quad \eta = \frac{31}{\sqrt{3190}} = 0,550$$

$$f_c = 0,302 \times 31 = 9,35 \text{ cm}^2 \quad 6 \phi 14$$

$$M_2 = 0,025 \times 3900 \times 3,0^2 = 875 \text{ Kg}\cdot\text{m} \quad \eta = \frac{31}{\sqrt{875}} = 1,050$$

$$f_c = 0,075 \times 31 = 2,32 \text{ cm}^2 \quad 4 \phi 12$$

$$M_B = -0,100 \times 3900 \times 3,1^2 = -3750 \text{ Kg}\cdot\text{m} \quad \eta = \frac{50}{\frac{\sqrt{3750}}{0,20}} = 0,365$$

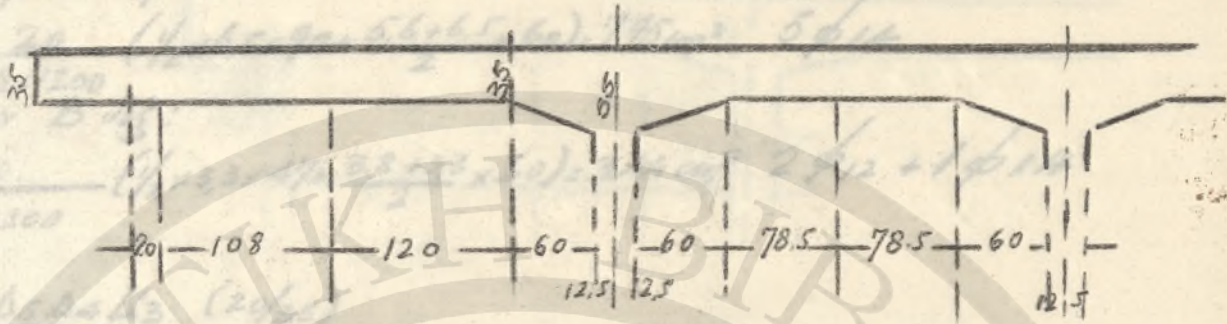
Αντίδρασεις:

$$A = 0,400 \times 3900 \times 3,2 = 5000 \text{ Kg.}$$

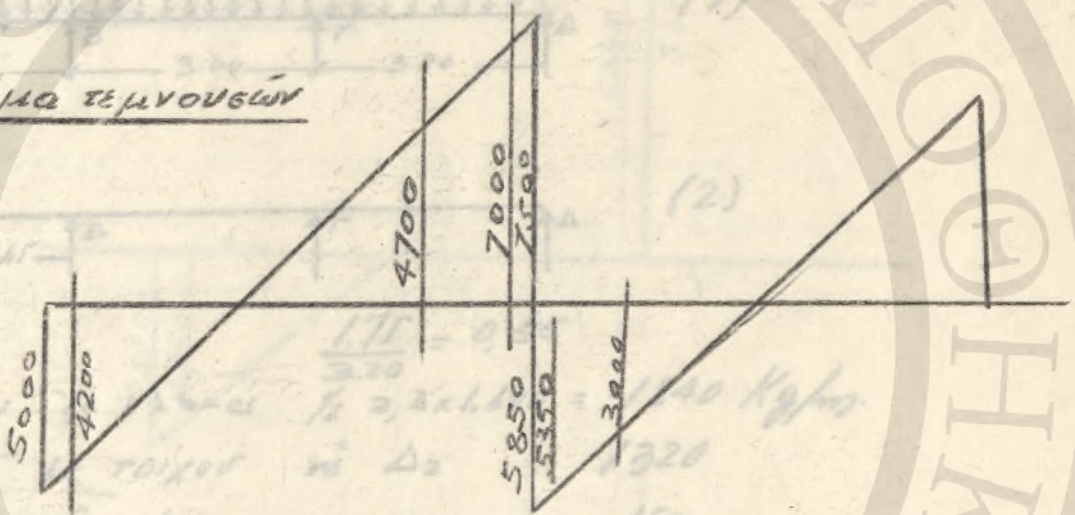
$$B_{op} = 0,600 \times 3900 \times 3,2 = 7500 \text{ Kg.}$$

$$B_{cl} = 0,500 \times 3900 \times 3,0 = 5850 \text{ Kg.}$$

ΔΟΚΟΣ Δ3 Δ4 Δ3

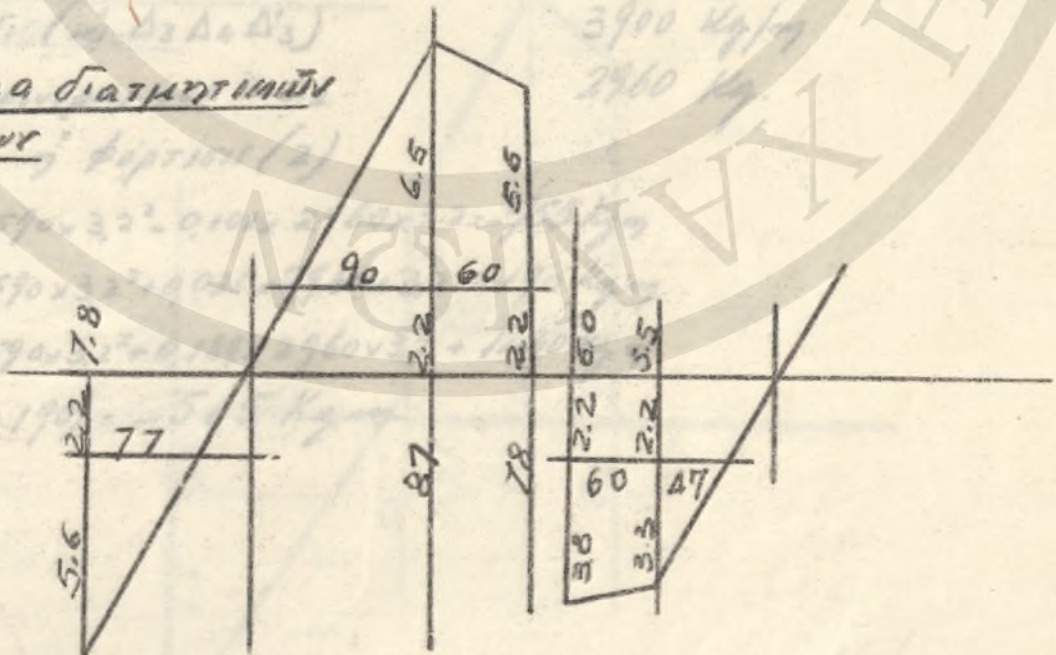


Διάγραμμα τεμνουσών



Διάγραμμα βιαιότητας

ΤΙΣΕΣΕΥ



ΔΟΚΟΣ Δ5 Δ4 Δ3

Υπολογισμός εις διατηρήσειν:

Στήριγμα Α:

$$f_s = \frac{20}{\sqrt{2} \times 1200} = \frac{1}{2} \times 5,6 \times 77 = 2,55 \text{ cm}^2 \quad 3 \phi 14$$

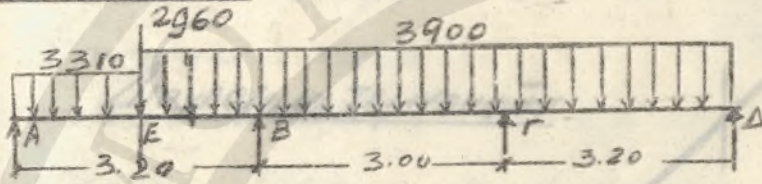
Στήριγμα Β άρ.:

$$f_s = \frac{20}{\sqrt{2} \times 1200} \left(\frac{1}{2} \times 6,5 \times 90 + \frac{5,6 + 6,5}{2} \times 60 \right) = 7,75 \text{ cm}^2 \quad 5 \phi 14$$

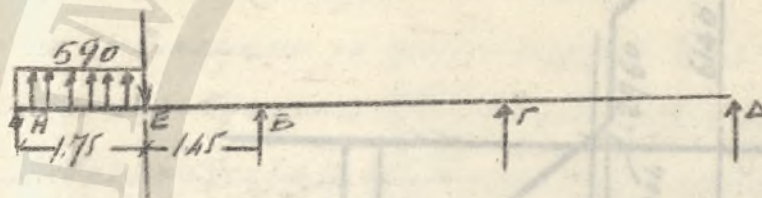
Στήριγμα Β δεξ.:

$$f_s = \frac{20}{\sqrt{2} \times 1200} \left(\frac{1}{2} \times 3,3 \times 47 + \frac{3,8 + 3,3}{2} \times 60 \right) = 3,44 \text{ cm}^2 \quad 2 \phi 12 + 1 \phi 14$$

Δοκός Δ5 Δ4 Δ3 (20/35)



(1)



(2)

$$\frac{1,75}{3,20} = 0,55$$

Φορτία ΑΕ: εκ πλακάς $\frac{1}{2} \times 2,3 \times 1,600 = 1840 \text{ Kg/m}$

εκ τοίχου ως Δ2 1320

ιδιον βάρος 150

3310 Kg/m

3900 Kg/m

2960 Kg.

Φορτία ΕΓ: (ως Δ3 Δ4 Δ3)

Φορτίον συγκεντρωμένην εκ Δ2

Εξιστά/εται η φόρτισις (2)

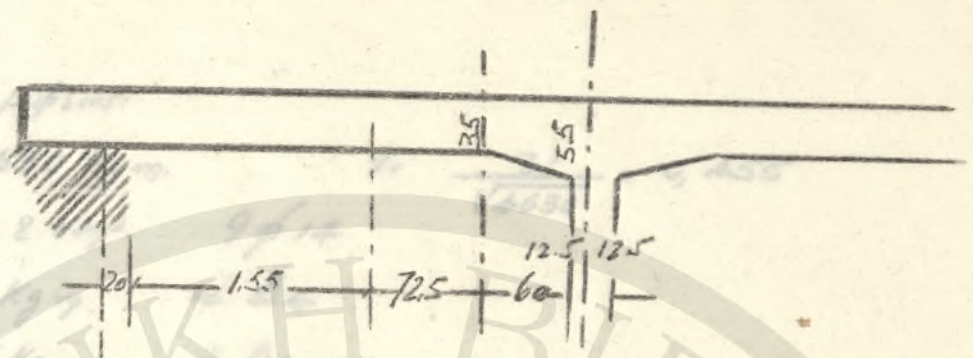
$$M_B = 0,034 \times 590 \times 3,2^2 - 0,101 \times 2960 \times 3,2 = -755 \text{ Kg m}$$

$$M_\Gamma = -0,008 \times 590 \times 3,2^2 + 0,025 \times 2960 \times 3,2 = +190 \text{ Kg m}$$

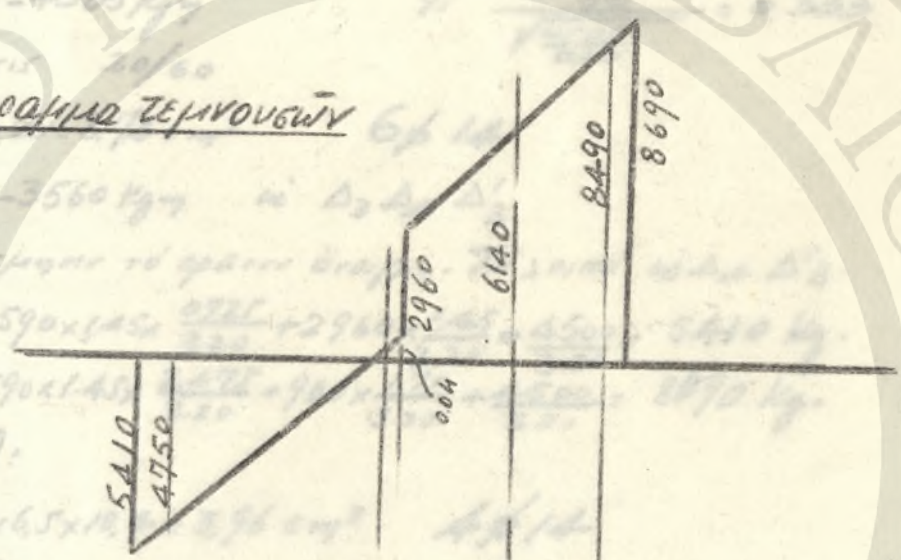
$$M_1 = -0,056 \times 590 \times 3,2^2 + 0,189 \times 2960 \times 3,2 + 1440 \text{ Kg m}$$

$$M_2 = \frac{1}{2} (-755 + 190) = -565 \text{ Kg m}$$

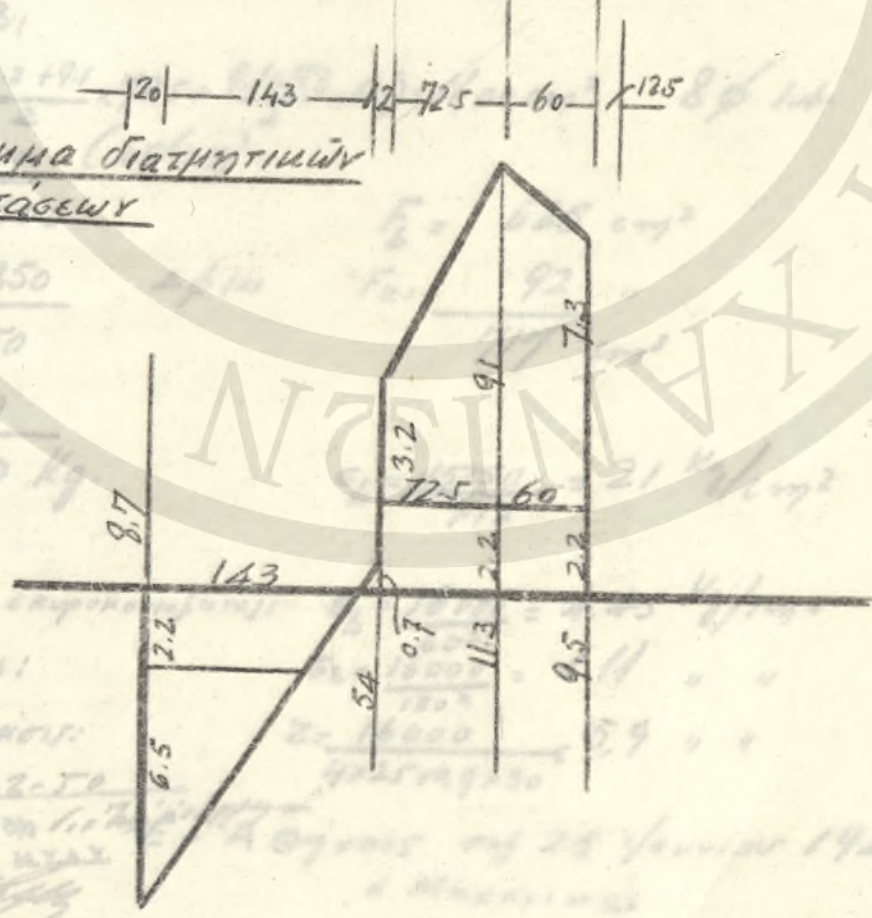
ΔΟΚΟΣ Δ5 Δ4 Δ3'



Διαγράμμα τεμνουσών



Διαγράμμα διαμητικίων τάσεων



5850
14150
1000
15150 Kg

Σε λανίος το 4-2-50
Τάσπαρδη 112
3 Κολοκωτρίτσος Μ.Υ.Α.Υ.

Αθήνας της 28/1/1949

$M_3 = 0,45 \times 190 = 85 \text{ Kg.}$

Αι ροπαί κάμφεως δια την φόρτιση (1) προκύπτουν εξ υπερθίωσης της (2) και της $\Delta_3 \Delta_4 \Delta'_3$.

Όλικαι ροπαί κάμφεως:

$M_1 = 3190 + 1440 = 4630 \text{ Kg. m.}$ $z = \frac{31}{\sqrt{4630}} = 0,455$

$f_e = 0,444 \times 31 = 13,8 \text{ cm}^2$ $9 \phi 14$

$M_2 = 875 - 565 = 310 \text{ Kg. m}$ $\omega \Delta_4$

$M_3 = 13190 + 85 = 3275 \text{ Kg. m}$ $\omega \Delta_3$

$M_B = -3750 - 755 = -4505 \text{ Kg. m}$ $y = \frac{50}{\sqrt{\frac{4505}{0,20}}} = 0,333$

Ένισχυσις 20/60

$f_e = 0,874 \times 50 \times 0,20 = 8,74 \text{ cm}^2$ $6 \phi 14$

$M_T = -3750 + 190 = -3560 \text{ Kg. m}$ $\omega \Delta_3 \Delta_4 \Delta'_3$

Έπιπύεται εις διαίτησιν το πρώτον άνοιγμα. Τα λοιπά $\omega \Delta_4 \Delta'_3$.

$A = \frac{1}{2} \times 3310 \times 3,2 + 590 \times 1,45 \times \frac{0,725}{3,20} + 2960 \times \frac{1,45}{3,20} + \frac{4500}{3,20} = 5410 \text{ Kg.}$

$B = \frac{1}{2} \times 3310 \times 3,2 + 590 \times 1,45 \times \frac{2,475}{3,20} + 960 \times \frac{1,75}{3,20} + \frac{4500}{3,20} = 8690 \text{ Kg.}$

Στήριγμα Α:

$f_s = \frac{20}{\sqrt{2} \times 1200} \times \frac{1}{2} \times 6,5 \times 10,4 = 3,96 \text{ cm}^2$ $4 \phi 14$

Στήριγμα Β:

$f_s = \frac{20}{\sqrt{2} \times 1200} \left(\frac{3,2 + 9,1}{2} \times 72,5 + \frac{9,1 + 7,3}{2} \times 60 \right) = 11,00 \text{ cm}^2$ $8 \phi 14$

Υποβυλιωμια (25/25)

Εκ Δ_5 : 8300 $F_b = 625 \text{ cm}^2$

" Δ_4 : 5850 $\Delta \phi 14$ $F_e = 92$

14150 717 cm^2

Ίδιον: 1000

15150 Kg. $G_b = \frac{15150}{717} = 21 \text{ Kg/cm}^2$

Πέδιλον:

Πίεσις επί άσπου έκυροκονιαρασι: $G_b = \frac{16000}{60^2} = 4,45 \text{ Kg/cm}^2$

" " Έδαφους: $G_e = \frac{16000}{120^2} = 1,11$ " "

Διατηρητική τάσις: $z = \frac{16000}{4 \times 25 \times 0,9 \times 30} = 5,9$ " "

Εν Χανίοκ τη 4-2-50

Γεωργίου Γεωργίου Μηχανικός & Προϊστάμενος Μ.Υ.Δ.Σ. εν Αθήναις τη 25 Ιουνίου 1949.

[Signature]

ο Μηχανικός

ΔΟΚΙΑΝΙΤΗΣ