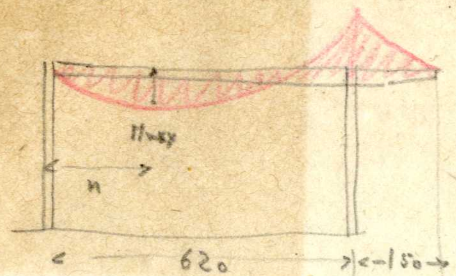
SANTONJA

cubierta pastelería —— Mayo-1942

JACENAS



Mayor p m² s/o = 500 K.

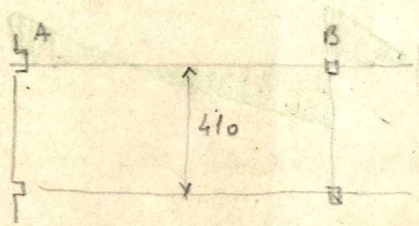
" " m. lin. viga = 4'10 x 500 = 2050 K.

Reacción en A $= \frac{2050}{2}\left(6'20 - \frac{1'50^2}{6'20}\right) = 1025 \times 5'83 = 5.975$ K.

(Folguera) Carga total $= (6'20 + 1'50) \times 2050 = 15.785$ K

Reacción en B = 15.785 − 5.975 = 9810 K.

$M_{xy} = \frac{2050\left(6'20 - \frac{1'50^2}{6'20}\right)^2}{8} = \frac{2050 \times 34'08}{8} = \frac{69.864}{8} = 8.733$ K.m.



$n = \frac{R_A}{p} = \frac{5.975}{2050} = 2'91$ m.

$M_B = \frac{2.050 \times 1'50^2}{2} = 2.306$ K.m.

ABACOS — 45 K/cm² — 0'80 m. alto — $M = 400 = \frac{8733}{21'82}$ — $\Omega = 37$ mm² por cm de ancho = 22 x 37 = 8'14 cm²

— 0'80 m. alto — $M = 105$ — 20'05 K/cm² — $\Omega = 20$ mm² por cm ancho = 20 x 22 = 4'40 cm²

ESFUERZO CORTANTE

$t_{xy} = \frac{2306}{22 \times 70} = \frac{2306}{1540} = 1'49$ K/cm²

$t_m = \frac{9.810 - 3075}{1.540} = \frac{6735}{1540} = 4'37$ K/cm²

$t_{xy} = \frac{3075}{1.540} = 1'99$ K/cm²

SANTARELLA

45 K/cm², 1200, b = 22 } { v = 0'423, t = 0'00217, tb = 0'04774 }

$h = v\sqrt{M/b} = 0'423 \times \sqrt{39695} = 0'423 \times 199 = 84'17$ cm.

$\Omega = tb\sqrt{M/b} = 0'04774\sqrt{39695} = 0'04774 \times 199 = 9'50$ cm²

$h = 0'423 \times \sqrt{10481} = 0'423 \times 102 = 45'26$ cm.

$\Omega = 0'04774 \times \sqrt{10481} = 0'04774 \times 102 = 5'10$ cm²

$\frac{873300}{22} = 39695$

$\frac{230600}{22} = 10481$

PLACA

$\frac{pl^2}{12} = \frac{500 \times 4'10^2}{12} = \frac{8405}{12} = 700$ K.m

$\frac{pl^2}{8} = \frac{500 \times 4'10^2}{8} = \frac{8405}{8} = 1050$ K.m.

ABACOS — 35 K/cm² — 0'13 m alto : $M = \frac{700}{100} = 7$

$\Omega = 6$ mm² = 6 x 100 = 6 cm²

— 42 K/cm² — 0'13 m alto — $M = \frac{1000}{100} = 10$

$\Omega = 8$ mm² = 8 x 100 = 8 cm²

Empleando piquetas de alambrada

de sección = 2'97 cm²

Área = 2'25 por entalladuras

4 piquetas — 9'00 cm²

2 " — 4'50 "

3 " — 6'75 "

1 φ 25 mm = 4'91 cm²

Cimientos pilares

adosados — 6.000 K

$\frac{6000}{100 \times 100} = 0'6$ K/cm²

libres — 10.000 K

$\frac{10000}{100 \times 100} = 1$ K/cm²

PILARES

Adosados fábrica de ladrillo

0'40 x 0'40 x 6 = 9.600 K.

libres - hormigón armado

25 x 25 x 30 = 18.750 K.

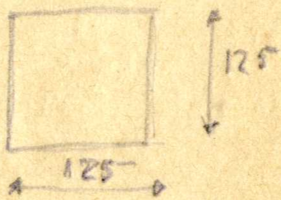
20 barras de 20 mm ϕ y 4 m.
20 " " 20 " " ϕ y 3 m.
80 " " 22 " " ϕ y 3'5 m.
80 " " 22 " " ϕ y 3'0 m.
20 " " 11 " " ϕ y 4 m. 6'5 m
20 " " 18 " " ϕ y 4 m. 6'5 m.

313 m. de redondo de 5 mm.
280 m " " " 5 " "

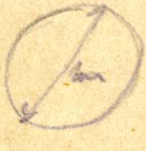
2100.000 | 0'785
5400 | 2687
6900
6200
785

90.000 | 44
200 | 2045
240
20

Zapata



Pilar



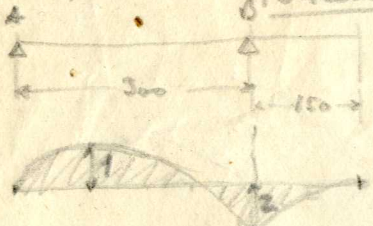
para 1500 K. aceptar.

$\frac{60}{44} = \frac{x}{1500}$; $x = \frac{1500 \cdot 60}{44} = \frac{90.000}{44} = 2046$ K.

luego 1 m. diámetro = 0'785 m²/sección

$\frac{2100}{0'785} = \frac{x}{1}$; $x = 2.687$ K. m².

Jacena



$$A = \frac{3 \cdot 4000 \cdot 4'50 \left(\frac{4'50}{2} - 1'50\right)}{4'50 - 1'50} = \frac{3 \cdot 18.000 \cdot 0'75}{3'00} =$$

$= 3 \times 6.000 \cdot 0'75 = 3 \times 4500 =$

$= 13500$ K.

$$B = \frac{3 \cdot 4000 \cdot 4'50 \times \frac{4'50}{2}}{4'50 - 1'50} = \frac{3 \cdot 18000 \times 2'25}{3'00}$$

$= 40.500$ K.

$$M_1 = \frac{\overline{13500}^2 \cdot 4'5}{2 \cdot 3 \cdot 4'5 \cdot 4.000} = \frac{182.250000}{24.000} =$$

$$= \frac{182.250}{24} = 7.593 \text{ K.m.}$$

$$M_2 = \frac{3 \cdot 4'5 \cdot 4.000 \cdot \overline{1'50}^2}{2 \cdot 4'5} = \frac{54.000 \times 2'25}{9} =$$

$= 6.000 \times 2'25 = 13.500$ K.m.

$$\frac{pl^2}{8} = \frac{4.000 \times 3 \times \overline{4'50}^2}{8} = \frac{1.000 \times 3 \cdot 20'25}{2} =$$

$$= \frac{60750}{2} = 30.375 \text{ K.m.}$$

100 x 25 — 13.800 — 8'24 cm²

5 jacenas de 100x25

bajo — 3 ϕ 20 mm. y 4 m.
arriba — 3 ϕ 20 — y 3 m.

5 x 4 = 20 barras de 20 mm y 4 m.
" 20 " " 20 mm y 3 m.
5 x 5 x 5 estribos de 2'50 m = 313 m. redond. 5 m.m.

60 litros / 44 K. cerillas = x / 2000 K. ; x = 120.000 / 44 = 2.727 litros

Deposito

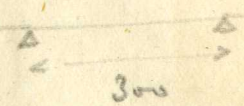
área = πr^2 = 3'14 x $\overline{0'50}^2$ = 0'785 m²

$$\frac{2'727}{0'785} = 3'47 \text{ m. alto} = 3.470 \text{ K.}$$

$$\left(\frac{3470}{0'785} = \frac{x}{1} \; ; \; x = 4420 \text{ K.}\right)$$

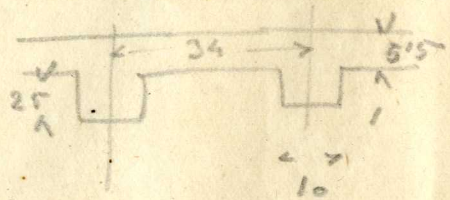
Peso del calentador — 3.470 K
" " depósito 1 x 3'47 — 130 K.
" " la caldera — 400 "
4.000 K.

Placa



$$\frac{pl^2}{10} = \frac{4000 \times 3^2}{10} = 3600 \text{ K.m.}$$

3600 x 0'35 = 1260 K.m.



Sección hierro = 3'53 cm²

1 redondo de 22 mm.
y 3'5 m.
1 " de 22 —
y 3 m.

4 x 5 x 4 = 80 barras de 22 mm y 3'5 m.
4 x 5 x 4 = 80 " " 22 mm. y 3'0 m.

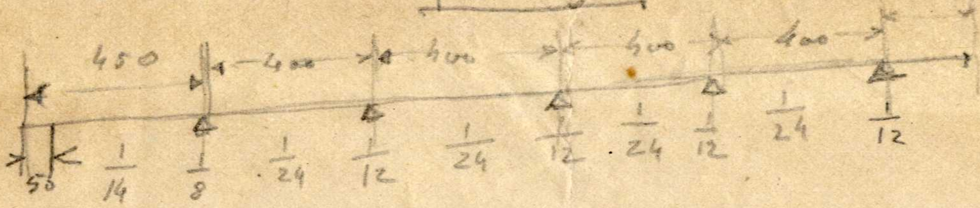
Pies

5 grupos pilares

Redimeno — 13'35 T — 4 ϕ 11 mm. — 20x20
Aislado — 46'50 T — 4 ϕ 18 mm — 35x35
h — 1'50 m

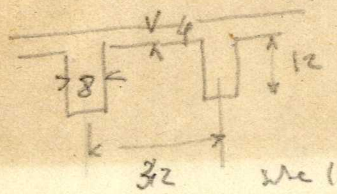
Redimeno — 5 x 4 = 20 barras de 11 mm y 4 m.
Aislado — 5 x 4 = 20 " " 18 mm y 4 m.
estribos —
5 x 2 x 4 x 5 x (35 x 4) =
= 200 x 1'40 = 280 m. redond. 5 m.m. ϕ

Santoja



1 redondo 12 mm = 1'13 cm²

3 " " = 3'39 cm²



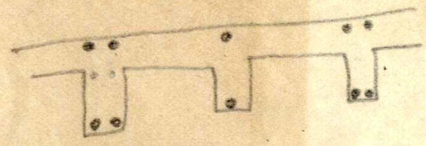
(39 - 1400)

sobrecarga = 300 K/m²

Seccion limo 1'43 cm²

Separacion de viguetas — 2'86 cm²

1200 | 0'32
240 | 37
16 | 5
185
93
278 de 4 m.
278 de 2 m.



$\frac{1}{12} p l^2 = \frac{1}{12}\, 0'32 \times 525 \times 4^2 = 224$ K.m. " $p = 525 \times 0'32 = 168$ K.m.l.

Voladizo $= \frac{1}{2} p l^2 = 2$… $= \frac{112}{168} = 0'66$ " $l = 0'80$ m.

$h = r\sqrt{\frac{M}{b}}$ " $F_e = t$… $\frac{p l^2}{12} = \frac{500 \times 4^2}{12} = 666$ K.m. | para 0'50 — 333 K.m; " 0'60 — 399 "; " 0'70 — 466 "

(38 - 1400)

Separacion de viguetas

50 cm. — $\sqrt{\frac{M}{b}} = \sqrt{\frac{33400}{20}} = \sqrt{1670} = 40'9$ " $h = 0'553 \times 40'9 = 22'61$ " $F_f = 0'00138 \times 20 \times 40'9 = 1'12$ cm²

60 cm — $\sqrt{\frac{M}{b}} = \sqrt{\frac{40.000}{20}} = \sqrt{2000} = 44'8$ " $h = 0'553 \times 44'8 = 24'77$ " $F_f = 0'00138 \times 20 \times 44'8 = 1'23$ cm²

70 cm — $\sqrt{\frac{M}{b}} = \sqrt{\frac{46700}{20}} = \sqrt{2335} = 48'3$ " $h = 0'553 \times 48'3 = 26'70$ " $F_f = 0'00138 \times 20 \times 48'3 = 1'33$ cm²

$h' = \sqrt{\frac{M}{b}} \cdot \begin{cases} \sqrt{\frac{12'5}{0'5}} \times V = \sqrt{15} \times 14'46 = 3'24 \times 14'66 = 54'82 \text{ cm.} \\ \sqrt{\frac{9'0}{0'5}} \times V = \sqrt{10} \times 14'66 = 3'16 \times 14'66 = 46'32 \text{ cm.} \end{cases}$

Jaseus fachady

$S = b\sqrt{Mb} \begin{cases} \sqrt{75 \times 65} \times b = \sqrt{325} \times 6'41 = 1'93 \times 6'41 = 12'37 \text{ cm}^2 \text{ — } 4\,\phi\, 20 \text{ m.m} = 12'52 \text{ cm}^2 \\ \sqrt{65 \times 0'5} \cdot b = \sqrt{2'50} \times 6'41 = 1'58 \times 6'41 = 10'12 \text{ cm}^2 \text{ — } 4\,\phi\, 18 \text{ m.m} = 10'18 \text{ cm}^2 \end{cases}$

Esfuerzo cortante

Pilares [illegible] $\nearrow 46 \times 46$

$$F_b = \frac{P}{\sigma_b(1+n\mu)} = \frac{85.000}{35(1+15 \cdot 0'01)} = \frac{85.000}{40'25} = 2.125\ cm^2 \quad . \quad 1\% = 21'25\ cm^2 \text{ hierro} =$$

4 red. a 26 ∅ = 21'24

Pilares [illegible]

$$F_b = \frac{P}{\sigma_b(1+n\mu)} = \frac{60000}{35(1+0'15)} = \frac{60000}{40'25} = 1500\ cm^2 \ (40 \times 40) \ . \ 1\% = 15\ cm^2 = 4 \text{ red. } 22 ∅ = 15'21$$

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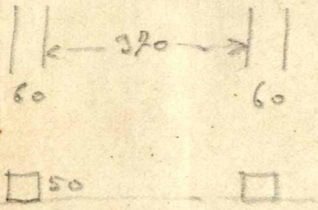
Fachada — Jácenas —



Piso m. l. = 3'00 × 400 = 1200 K.

Peso vigas — 0'50 × 0'50 × 2400 = 600 "

Peso muro — 0'40 × 3'20 × 1600 = 2048 "

3.848 K. m. lineal

3'70 m. l. à 3.848 K. son 14.237'60 Kgs, carga total

$$\frac{pl}{8} = \frac{15.000 \times 4'00}{8} = 7.500\ K.m. \quad \frac{pl}{12} = \frac{15.000 \times 4'00}{12} = \frac{15.000}{3} = 5.000\ K.m.$$
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Sr. Santojo

FACHADA

Pilar lateral | peso muro — (1'85+0'60)×0'50×25×1600 = 49.000 K.
" pisos — 2'45×3'00×4000×7 =
= 51'45×400 = 20.580 "
69.580 K — 70 T

Pilar central | peso muro — (2'45+1'10)×0'50×25×1600 = 70.720 K.
" pisos — 3'55×3'00×4000×7 =
= 74'55×400 = 29.820 K.
100540 K. = 100 T

Pilares 50×60

50×60. = 3.000 cm²

$\frac{1.000.000}{3000} = \frac{1000}{3} = 33'33$ K/cm²

$\frac{70.000}{3.000} = \frac{70}{3} = 23'33$ K/cm²

Jacenas

4×6 = 24 m² à 400 = 9.600 K.

30 — à 5 m = 10.448 K.
30 — à 6 m = 8.706 "
32 — à 6 m = 10.426 "

Pilares centrales

Cub | pisos 6'00×4'00×4000×7 = 67.200 K.
peso Nguis — 0'60×0'50×25×2400 = 18.000 "
85.200 K.

Pilar de 50×50 = 2500 cm² à 30 K/cm² — 75.000 Kg.

Cimbs | peso pisos y pilar — 85.200 K
peso cimbs — 2×2×2×3000 = 24.000 "
109.200 Kg.

cimbs de 2×2 = 40.000 cm² à | 2 K/cm² — 80.000 Kg
3 K/cm² — 120.000 Kg.

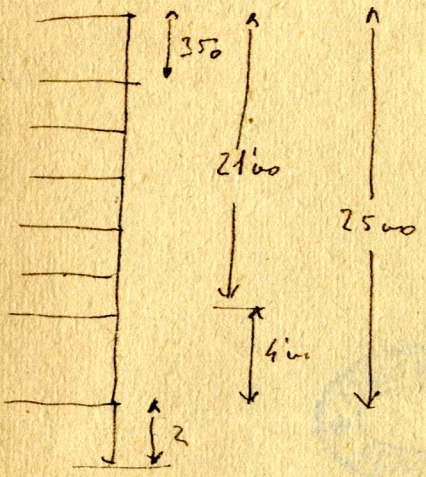
Pilares esquinales

Esq | pisos — 4'00×4'00×4'00×7 = 44.800 K.
peso pilar — 0'50×0'50×25×2400 = 15.000
59.800 Kg

Pilar de 0'40×0'40 = 1600 K/m²×35 = 56.000 Kg.

Obres de Rafelet en pissina de un edifici

Pilars medianers



35
6
210

Pilars
7 × 4 × 3 × 400 = 33.600

Peu pilars
25 × 0'5 × 0'5 × 1600 = 10.000

Jàntes
2'00 × 2 × 2 × 2.000 = 16.000
59'600 K

Pilars — 44.000 K.
60 × 60 = 12 K/cm²

Jàntes — 60.000 K
130 × 130 = 30 K/cm²

2 · 4 · 28 · 1200 · 56 · 28 · 33600

25 · 0'25 · 125 · 50 · 6'25 · 1600 · 3250 · 625 · 10000000

50 · 50 · 2500 · 44000 · 190 · 1 · 2500

60 · 60 · 3600 · 44000 · 80 · 18 · 3600 · 12

120 · 120 · 22 · 12 · 14400

14400 · 6000 · 04 · 4

130 · 130 · 39 · 0 · 16900

60.000 · 1 30 · 16900 · 30