

MEMORIA de CALCULO - PREDIMENSIONADO

Techos / ESTR. METALICA

Cargas gravitatorias:

$$\text{Chapa + correas} = 10 \text{ Kg/m}^2$$

$$\text{Cidorraso} = 10 \text{ " "}$$

$$q = 20 \text{ Kg/m}^2$$

$$\text{Sobrecarga accid} \quad \begin{aligned} &= 30 \text{ " "} \\ &q = 30 \text{ Kg/m}^2 \end{aligned}$$

Acc. del viento

$$\beta = 25 \text{ m/s} \quad V_0 = 1.65 \times 25 = 41.25 \text{ m/s}$$

$$\begin{aligned} q_z &= 0.669 \times 0.95 \times 1.04 = 0.665 \text{ Kg/m}^2 \\ q_0 &= 0.00613 \times 41.25^2 = 1.04 \text{ KN/m}^2 \\ &\approx 10.4 \text{ Kg/m}^2 \end{aligned}$$

Cubiertas: Inclinación 20%; $\alpha = 11^\circ$

$$C_e = -0.5 \text{ a barl} \quad C_s = -0.3 \text{ a sotav.$$

$$\begin{aligned} C_i &= 0.6 (1.8 - 1.3 \times 1.0) = 0.3 \\ &= -0.6 (1.3 \times 1.0 - 0.8) = -0.3 \end{aligned}$$

$$W = -(0.5 + 0.3) 0.665 = -53.2 \text{ Kg/m}^2$$

$$W - q = -53.2 + 20 = -33.2 \text{ Kg/m}^2$$

Correas

$$\text{Aulas: } \text{Esp: } 0.80 \text{ m} \quad l = 7.50$$

$$q = 0.8 \times 50 = 40 \text{ Kg/m}$$

$$M = 281 \text{ Kg/m}$$

$$W_{acc} = \frac{28100}{7500} = 3.75 \text{ cm}^3$$

$$f_{adm} = \frac{750}{300} = 2.5 \text{ cm}$$

$$J_{acc} = \frac{28100 \times 750^2}{9.6 \times 2.1 \times 10^6 \times 2.5} = 31400 \text{ cm}^4$$

$$17180 \text{ } f_{adm} = 2.5 \text{ cm } (M = 281 \text{ Kg/m}^3 \quad T = 2.18 \text{ cm}^4)$$



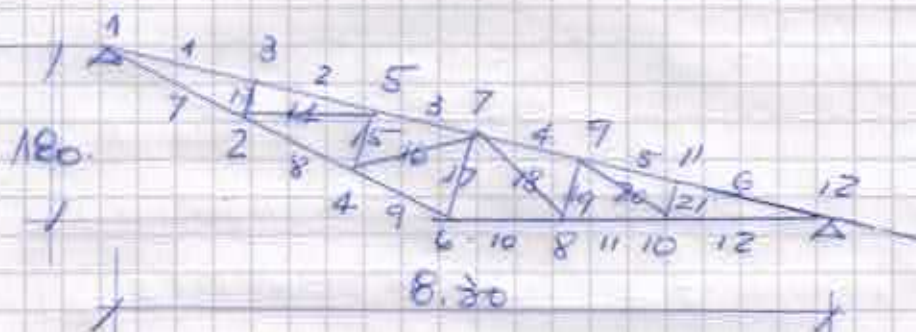
$$80M: L = 5.35 \quad q = 40 \text{ Kg/m}$$

$$82p: 0.80m \quad M = 14.8 \text{ Kg/m}$$

$$W_{rec} = 9.6 \text{ cm}^3 \quad F_{adu} = 1.78 \quad I_{rec} = 114 \text{ cm}^4$$

$$\square 140.60.20.2 - W_x = 25.2 \text{ cm}^3, J_x = 176 \text{ cm}^4$$

Viga metálica



$$\text{Corden Sup: } N = -5660 \text{ Kg}$$

$$S_k = 147 \quad i = 5.73 \quad \lambda = 26 \quad \omega = 1.25 \quad F = 11.48 \text{ cm}^2$$

$$T = \frac{1.25 \times 5660}{11.48} = 616 \text{ Kg/cm}^2$$

Corden inferior:

$$N_{mic} = -3322 \text{ Kg} \quad i = 5.73 \quad \omega = 4.06 \quad \lambda = 145$$

$$T = \frac{4.06 \times 3322}{11.48} = 1175 \text{ Kg/cm}^2$$

Diagonales-Paranteles

$$N = -840 \text{ Kg} \quad C 80.40.15.2.0 \quad F = 3.54 \text{ cm}^2$$

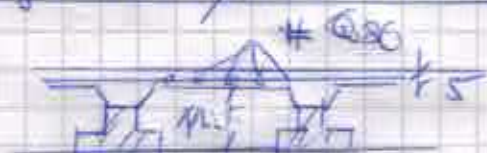
$$i = 1.51 \quad \lambda = 85 \quad \omega = 1.56$$

$$T = \frac{1.56 \times 840}{3.54} = 370 \text{ Kg/cm}^2$$

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Losa de viguetas pretensadas

11+5



S/Tabla fabricante:

$$M_{adm} = 10.57 \text{ Kg/m}$$

$$M_{max} = \frac{540 \times 3.75^2}{8} = 949 \text{ Kg/m}$$

$$f_p = 200$$

$$f_{ck} = 40$$

$$C_{ub} = 200$$

$$S_{ob} = 100$$

$$q = 540 \text{ Kg/m}$$

Vigas

25x40

$$q = 0.4 \text{ t/m}$$

	0.4		0.4	
	7.50		7.50	
M(tm)	2.0	-2.80	2.0	

$$M_{adm} = 7.2 \text{ tm}$$

$$l = 4.50 \text{ m (25x40) 1NV}$$

$$f_p + losa + muro = 0.25 + 0.65 + 0.70 = 1.60 \text{ tm}$$

$$M = 3.0 \text{ tm} \quad M_{adm} = 7.2 \text{ tm}$$

$$l = 4.80 \text{ m (25x40) 1NV} \quad q = f_p + losa$$

$$M = 2.72 \text{ tm} \quad M_{adm} = 7.2 \text{ tm} \quad = 0.25 + 0.7 = 0.95 \text{ tm}$$

$$l = 5.20 \text{ m (cont.) (25x40) 1NV}$$

$$q = f_p + losa + muro = 0.25 + 1.03 + 0.67 = 2.0 \text{ tm}$$

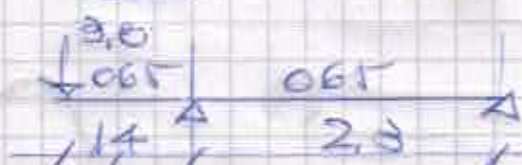
$$M = 5.4 \text{ tm} \quad M_{adm} = 7.2 \text{ tm}$$

$$l = 5.8 \text{ m (13x40) (T: b = 30 cm)}$$

$$q = f_p + losa = 0.15 + 1.40 = 1.55 \text{ tm}$$

$$M = 6.53 \text{ tm} \quad M_{adm} = 14 \text{ tm}$$

$$25 \times 40 \quad l = 1.4 \text{ (mns)}$$



$$q = p + u = 0.85$$

$$M = -4.85 \text{ tm}, \quad M_{adm} = 7.2 \text{ tm}$$

Columnas

$$N_{max} = 11 \text{ t.} \quad 25 \times 25 - 4 \phi 12$$

$$\text{estr } 1 \phi 6 / 15$$

Vigas de fundación

caso + desfavorable

$$30 \times 40$$



$$M. (tm) \quad 2.1 \quad -4.2 \quad 2.8$$

$$M_{adm} = 8.6 \text{ tm.}$$

$$Q(t) \quad 2.6 \quad 5.0 \quad 5.5 \quad 3.7$$

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Bases

Según Estudio de Suelos, tenemos la napa freática a -2.0 m y una estructura independiente c/cargas puntuales, por lo que descartamos el uso de platea. Adoptamos una fundación de bases aisladas vinculadas entre si por

vigas de fundación o vigas riostras.
La cota de fundación no puede su-
perar los -2.00 m por la napa.

La tensión admisible es de 0.8 Kg/cm^2
a esa profundidad. Recurrimos a
un relleno de terreno mejorado bajo
y base que supere las dimensiones
de estas de modo de trabajar bajo
bases con 0.8 Kg/cm^2 .

Adoptamos para bases centradas
2 dimensiones:

para cargas hasta 8 t : 120×120 .

" " " 12 t : 140×140 .

Para bases excéntricas:

p/cargas hasta 8 t : 0.90×1.50

" " " 12 t : 1.00×2.00 .

Bases excéntricas y triga de vincu-
lación s/detalle.


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DEFORMACIONES Y SOLICITACIONES

Proyecto : D: CABEDUCA
 Hipotesis No. : 1
 Unidades : KGN M GRAD

Nodo	Coord X	Coord Y	Desp X	Desp Y	Rotacion
1	0.000	1.800	0.000000	0.000000	-0.566525
2	1.380	1.200	-0.003479	-0.009162	-0.184204
3	1.470	1.480	-0.002510	-0.009490	-0.195114
4	2.770	0.600	-0.003893	-0.011013	-0.030067
5	2.940	1.200	-0.003287	-0.011218	-0.033545
6	4.150	0.000	-0.003699	-0.011235	-0.005769
7	4.410	0.850	-0.003673	-0.011356	0.016145
8	5.530	0.000	-0.003446	-0.011284	0.019422
9	5.650	0.570	-0.003948	-0.011214	0.010035
10	6.920	0.000	-0.003112	-0.009819	0.193289
11	6.970	0.250	-0.004022	-0.009654	0.211306
12	8.300	0.000	-0.002653	0.000000	0.589005

No.	N1	N2	M1	Q1	M2	N3	Q3	M3
1	1	3	-27.05167	-216.5244	-4921.864	-33.03262	224.47556	-5017.864
2	3	5	-26.00989	-196.5188	-5019.011	-61.89593	244.48111	-5103.011
3	5	7	-52.08110	-220.3823	-3864.457	-52.25896	220.61769	-3969.457
4	7	9	-44.51152	-193.2563	-4013.329	-35.28708	178.74363	-4097.329
5	9	11	-51.10543	-229.5659	-5527.510	-8.231416	166.43400	-5623.510
6	11	12	-10.94427	-191.3530	-5660.649	-21.96942	207.64691	-5735.649
7	1	2	27.051678	1.4233116	5293.7311	24.909889	1.4233116	5293.7311
8	2	4	25.249850	19.602660	4022.4602	-4.427955	19.602660	4022.4602
9	4	6	6.6987190	7.1073524	3045.9863	-3.696370	7.1073524	3045.9863
10	6	8	-2.076554	-5.714892	3157.5894	5.8099970	-5.714892	3157.5894
11	8	10	-7.505468	-29.20351	4136.9952	33.087414	-29.20351	4136.9952
12	10	12	36.676164	10.657054	5598.5700	21.969429	10.657054	5598.5700
13	2	3	-10.31293	-58.94301	-548.8906	7.0227300	-58.94301	-548.8906
14	2	5	9.9729694	7.2947711	1266.2822	-1.406873	7.2947711	1266.2822
15	4	5	-11.71631	-36.78213	-531.7055	11.221697	-36.78213	-531.7055
16	4	7	0.2896437	-1.140183	1025.7384	2.1811453	-1.140183	1025.7384
17	6	7	-1.619815	-6.104757	-1255.401	3.8065543	-6.104757	-1255.401
18	7	8	-1.759739	-2.650197	1005.9908	1.9664978	-2.650197	1005.9908
19	8	9	15.281963	54.924729	-611.2119	-16.71139	54.924729	-611.2119
20	9	10	-0.893048	-9.671058	1417.2178	12.569536	-9.671058	1417.2178
21	10	11	8.9807862	45.866238	-650.6193	-2.712856	45.866238	-650.6193

No. REACC - X REACC - Y REACC - M

1: 0.0000001; 1274.1050; 0.0000000;
 12: 0.0000000; 1274.3032; 0.0000000;

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DEFORMACIONES Y SOLICITACIONES

Proyecto : D: CABE BUCA

Hipotesis No. : 2

Unidades : KG M GRAD

No.	Coord X	Coord Y	Desp X	Desp Y	Rotacion
1	0.000	1.800	0.000000	0.000000	0.336138
2	1.380	1.200	0.002064	0.005436	0.109294
3	1.470	1.480	0.001489	0.005631	0.115768
4	2.770	0.600	0.002310	0.006534	0.017840
5	2.440	1.200	0.001950	0.006656	0.019903
6	4.150	0.000	0.002195	0.006666	0.003423
7	4.410	0.850	0.002179	0.006738	-0.009579
8	5.530	0.000	0.002045	0.006695	-0.011524
9	5.650	0.570	0.002342	0.006653	-0.005954
10	6.920	0.000	0.001846	0.005826	-0.114685
11	6.970	0.250	0.002387	0.005728	-0.125375
12	8.300	0.000	0.001580	0.000000	-0.349477

No.	Ni	Nf	Mi	Qi	Ni	Nj	Qj	Nj
1	1	3	16.050662	128.47116	2920.3060	19.599357	-133.1888	2977.2660
2	3	5	15.452537	116.60120	2977.9470	36.724919	-145.0587	3027.7870
3	5	7	30.901457	130.76016	2292.9112	31.006983	-130.8998	2355.2112
4	7	9	26.410169	114.66544	2381.7419	20.937003	-108.0545	2451.0819
5	9	11	30.322556	136.20915	3279.6563	4.8839740	-98.75084	3336.6163
6	11	12	6.4936019	113.53616	3358.6510	13.035194	-123.2038	3403.1518
7	1	2	-16.05066	-0.844498	-3140.947	-14.77986	-0.844498	-3140.947
8	2	4	-14.98157	-11.63091	-2386.659	2.6272535	-11.63091	-2386.659
9	4	6	-4.152573	-4.217029	-1807.285	2.1931798	-4.217029	-1807.285
10	6	8	1.2320891	3.3908362	-1873.503	-3.447264	3.3908362	-1873.503
11	8	10	4.4532448	17.327417	-2454.617	-19.63186	17.327417	-2454.617
12	10	12	-21.76119	-6.323185	-3321.818	-13.03519	-6.323185	-3321.818
13	2	3	6.1190054	34.972855	325.67514	-4.166819	34.972855	325.67514
14	3	5	-5.917295	-4.328230	-751.3274	0.8347449	-4.328230	-751.3274
15	4	5	6.9516821	21.824063	315.47860	-6.658207	21.824063	315.47860
16	4	7	-0.171855	0.6765086	-608.6048	-1.294146	0.6765086	-608.6048
17	6	7	0.9610907	3.6221558	744.87173	-2.258555	3.6221558	744.87173
18	7	8	1.0441123	1.5724503	-596.8878	-1.166788	1.5724503	-596.8878
19	8	9	-9.067298	-32.58867	362.65244	9.9154286	-32.58867	362.65244
20	9	10	0.5298756	5.7381610	-840.8825	-7.457924	5.7381610	-840.8825
21	10	11	-5.328599	-27.21396	386.03412	1.6096279	-27.21396	386.03412

No.	REACC - X	REACC - Y	REACC - M
1	-0.000000	-755.9690	0.0000000
12	0.000000	-756.0866	0.0000000

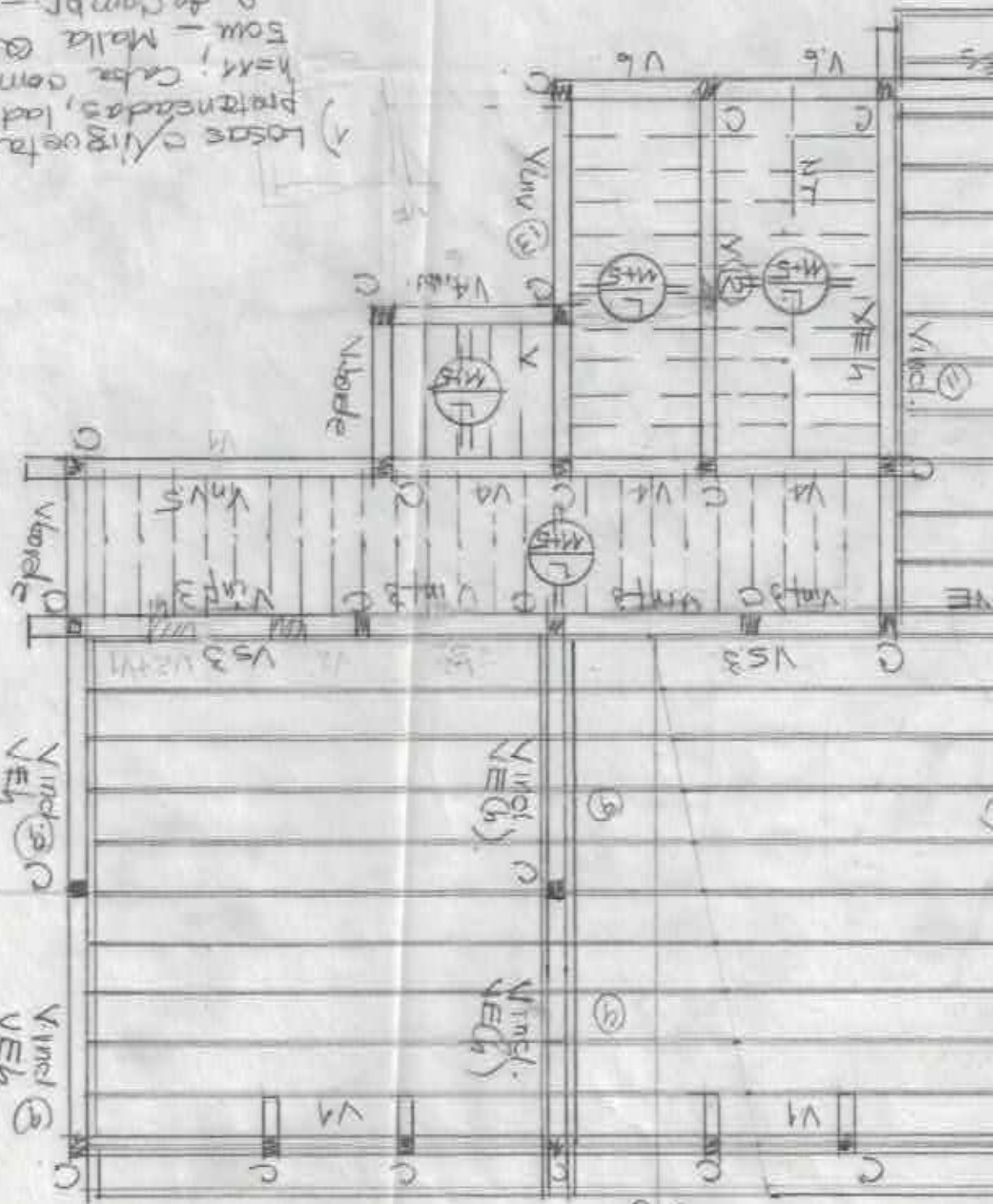


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A S/F. BAJA

- 1) Losas o viguetas protendidas, ladrillos h=41. Caba compresin Bow - Malla cada en c. de compr. - lvaro franu 240-240/1.70m Acero 420 420.
- 2) Formigon H17 a 3.00m de altura s/n.p.
- 3) Todas las columnas (c) sean de 25x25 con armadura 4x8 - 25x 4.65/15



Correas
Oxido 75 a 12

25

Viguetas
Viguetas

Viguetas
Viguetas

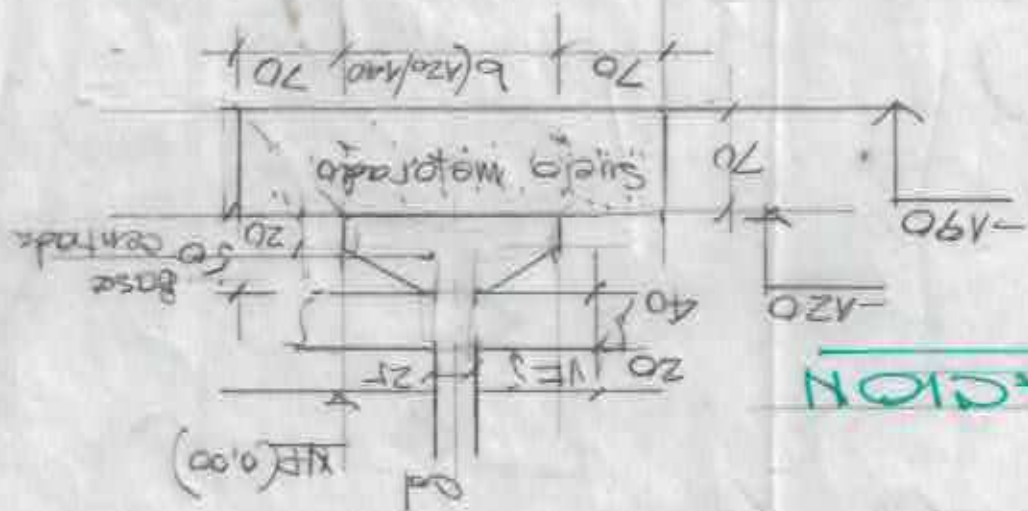
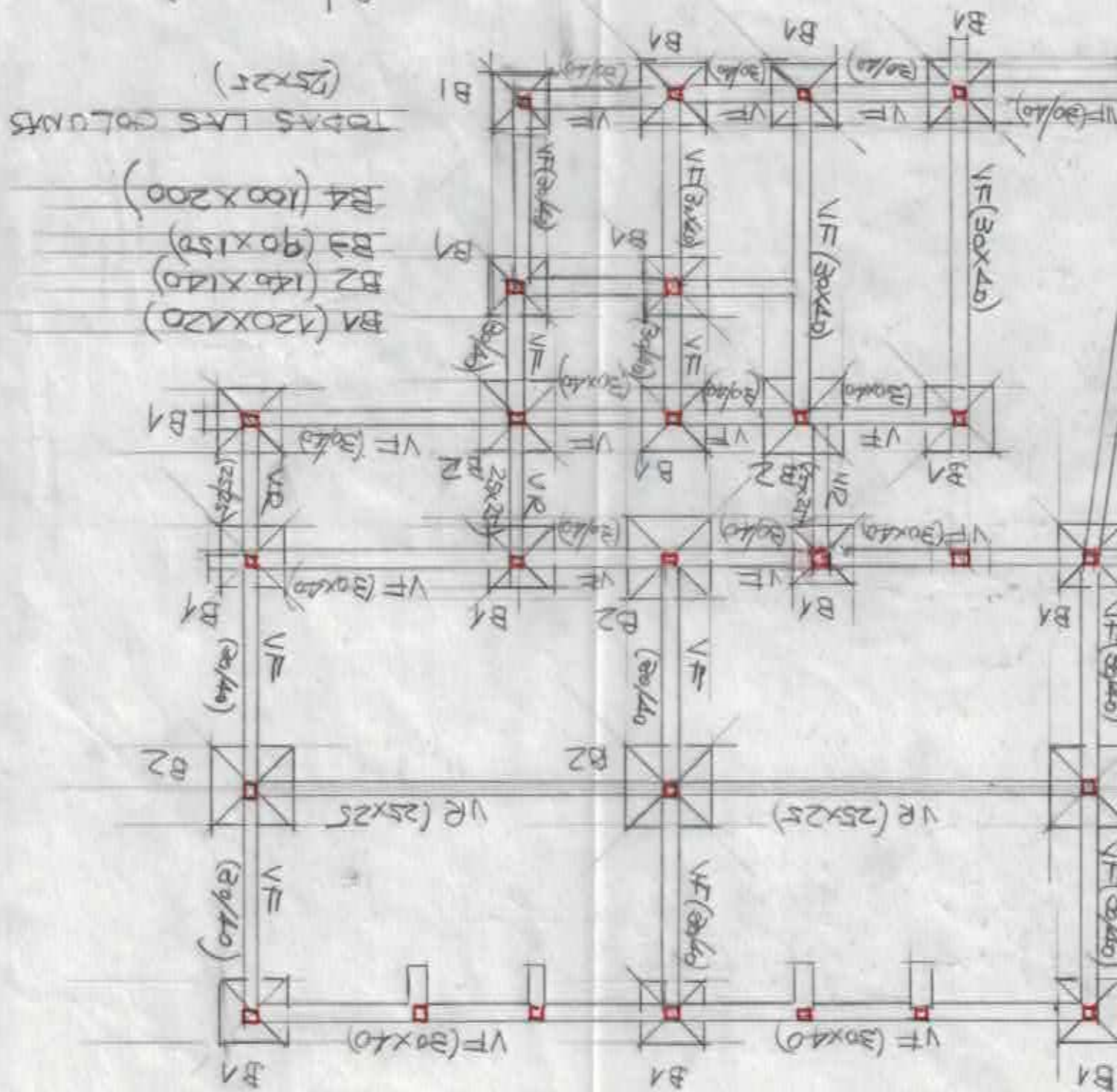
Viguetas
Viguetas

V1

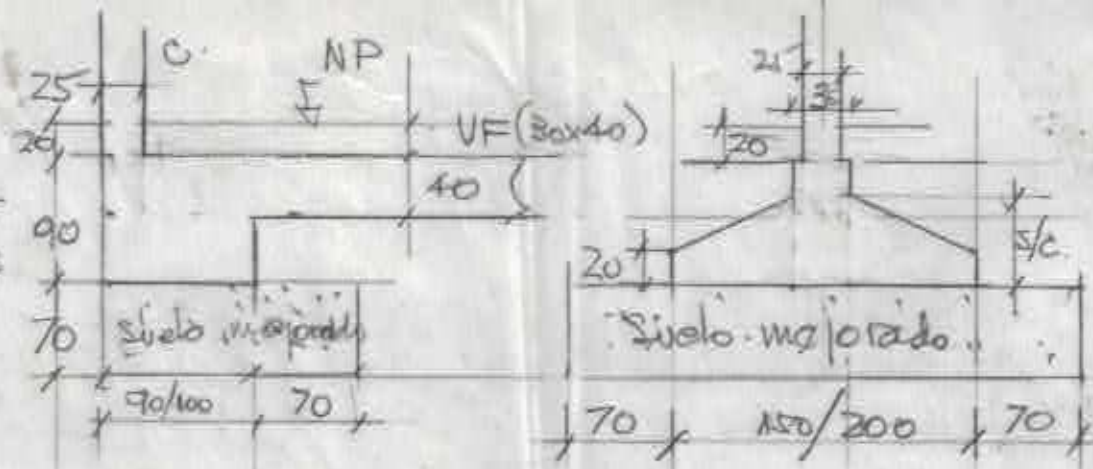
V2

V3

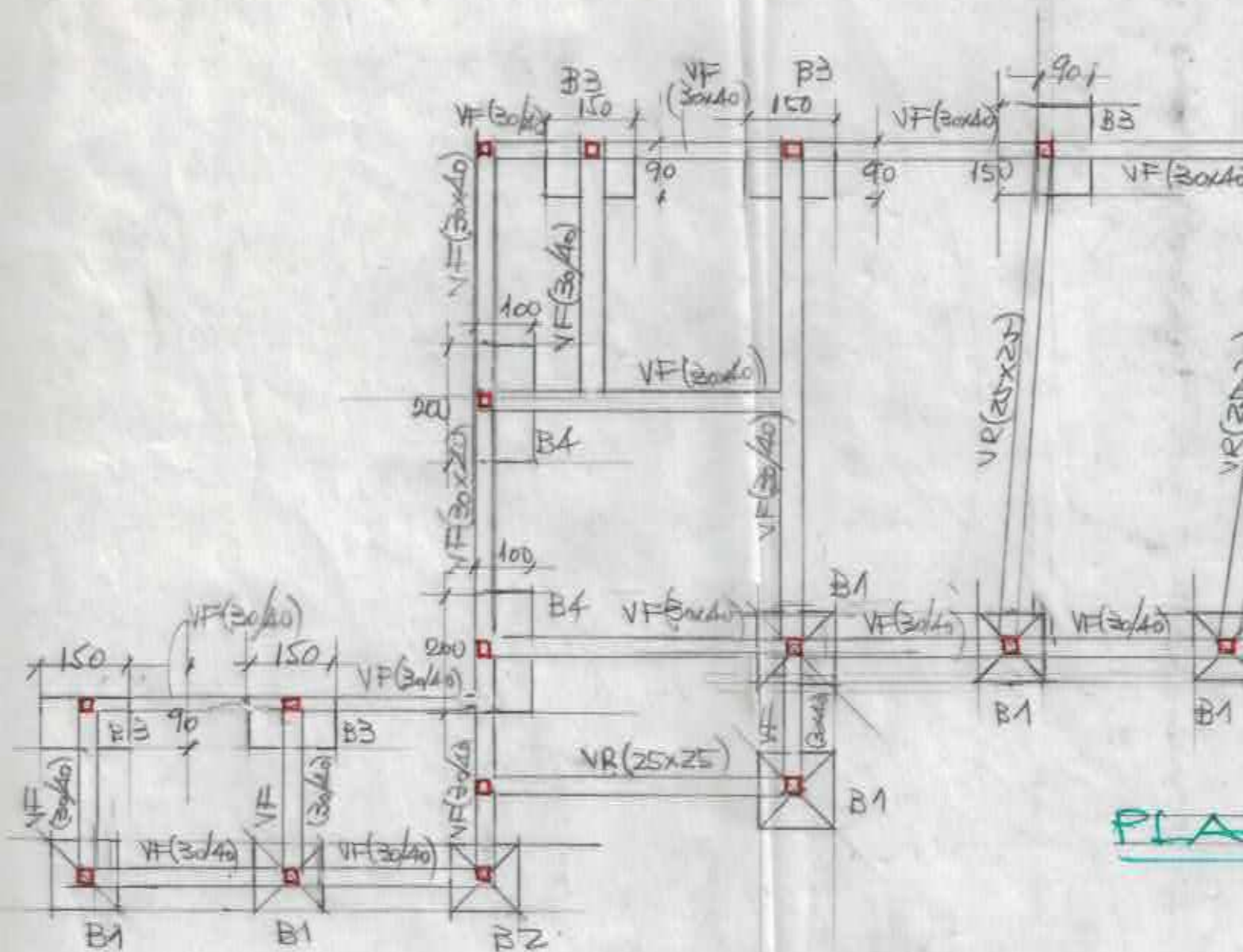
WTA FUNDATION



BASE
EXCENTRICA



B2



PLA

Suelo w
020 a 5