

CONSÓRCIO SAÚDE

CONCREMAT | MEP

MEMORIAL DESCRITIVO

PROJETO EXECUTIVO DE
ESTRUTURA DE CONCRETO

UNIDADE BÁSICA DE SAÚDE (UBS)
ESPECIAL

AGOSTO/2026
VERSÃO R00

ASSUNTO:	MEMORIAL DESCRITIVO – PROJETO EXECUTIVO – ESTRUTURA DE CONCRETO					
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1. INTRODUÇÃO

O objetivo do presente documento é apresentar o memorial descritivo, de especificações e cálculos do Projeto Executivo de Estruturas para a construção da Unidade Básica de Saúde - UBS – Especial.

2. CONCEPÇÃO ESTRUTURAL DA SUPRA-ESTRUTURA

A supra-estrutura foi concebida em concreto armado “in loco” compreendendo lajes (maciças e treliçadas), vigas e pilares (concreto armado), estando as locações e dimensões compatibilizadas com o projeto arquitetônico.

Acompanha este memorial descritivo, os arquivos magnéticos e impressões contendo as pranchas que compõem o projeto estrutural, e a respectiva relação.

3. CONCEPÇÃO ESTRUTURAL DA INFRA-ESTRUTURA

A fundação e os pilares de arranque deverão ser dimensionados e detalhados de acordo com as implantações sugeridas e relatórios de sondagem específicos para cada terreno.

4. ESPECIFICAÇÕES TÉCNICAS

4.1 CONCRETO ARMADO

O concreto armado a ser utilizado na obra deverá atender às normas e especificações da ABNT e NBR 6118, em sua versão mais atual – Projeto e execução de obras em concreto armado.

O concreto armado moldado “in loco” deverá atingir a tensão característica de projeto $f_{ck} \geq 35$ Mpa (350 kgf/cm²).

Com o uso cada vez mais frequente do concreto dosado em central, as etapas de concretagem realizadas com grandes volumes de concreto bombeado e de uma só vez, reduzem as juntas de concretagem permitindo maior homogeneidade da estrutura concretada, com menor perda de água por evaporação e menores defasagens para início das reações do cimento.

Caso o concreto seja produzido no local, o transporte entre a betoneira até o local do lançamento, através de carros de mão, deverá ser feito observando-se alguns cuidados

visando amortecer as trepidações que poderão provocar a segregação do concreto.

Recomendamos o uso de carrinhos com rodas pneumáticas transitando em caminhos bem preparados e com rampas suaves.

Qualquer que seja a forma de produção do concreto, julgamos necessário se fazer o controle tecnológico, com especificação da dosagem do traço, definição do fator água/cimento (A/C) e rompimentos de corpos de prova para aferição da resistência à compressão aos 7, 14, 21 e 28 dias, por Empresa tecnicamente idônea e atuante neste segmento.

4.2 MATERIAIS

4.2.1 AÇO PARA ARMADURA DO CONCRETO ARMADO

Todos os aços a serem aplicados na estrutura, deverão apresentar tensão de escoamento, real ou convencional, igual ou superior a 500 MPa (5.000 kgf/cm²) ou 600 MPa (6.000 kgf/cm²).

Além das recomendações das normas, deverão ser atendidas as exigências seguintes:

- As barras de aço não deverão apresentar excesso de ferrugem, manchas de óleo, argamassa aderente ou qualquer outra substância que impeça uma perfeita aderência ao concreto.
- Antes e durante o lançamento do concreto as plataformas de serviço (balancins, andaimes, etc.) deverão estar dispostas de modo a não provocarem deslocamento das armaduras.
- A armadura não poderá ficar em contato direto com a forma, obedecendo-se para isso, a distância mínima prevista pela NBR-6118:2010.
- No caso de cobrimento superior a 6cm (distância entre fôrma e a barra de aço), colocar-se-á uma armadura de pele complementar, em rede, cujo cobrimento não deve ser inferior aos limites mencionados na Norma.
- Nos casos de estruturas resistentes ao fogo, o cobrimento deverá atender às exigências da NBR-5627 (NB-503), além das especificadas neste item.
- Nos casos de estruturas sujeitas a abrasão, a altas temperaturas, a correntes elétricas ou a ambientes fortemente agressivos, deverão ser tomadas medidas especiais para aumentar a proteção da armadura, além de cobrimento mínimo.
- Deverão ser adotadas precauções para evitar oxidação excessiva das barras de espera. Antes do reinício da concretagem elas deverão estar razoavelmente limpas.
- As diferentes partidas de ferro deverão ser depositadas e arrumadas de acordo com a bitola, em lotes aproximadamente iguais, de acordo com a NBR-6118:2007, separadas umas das outras, de modo a ser estabelecida fácil correspondência entre os lotes e as amostras retiradas para ensaios.

4.2.2 AGREGADOS

A dimensão máxima característica do agregado deverá obedecer a NBR-6118:2019.

A qualidade dos agregados deverá ser avaliada através de índices, definidos por normas da ABNT, de acordo com os respectivos valores de qualidade que devem possuir os mesmos. Entretanto, em casos especiais, deverá se recorrer a normas estrangeiras para orientação mais precisa. Os índices de qualidade são assim definidos:

– Resistência aos esforços mecânicos:

Deverão ser executados ensaios conforme NBR-6465 (MB-170), devendo os valores obtidos se encontrarem dentro das prescrições da NBR-7211 (EB-4).

– Teor de substâncias nocivas:

Deverão ser executados ensaios para medição do teor de materiais nocivos, tais como torrões de argila, material pulverulento, etc.

Os ensaios obedecerão as normas NBR-7211 (EB-4), NBR-7218 (MB-8) e NBR-7219 (MB-9).

– Impurezas orgânicas:

Deverão ser executados ensaios para determinação do teor de impurezas orgânicas, conforme NBR-7220 (MB-10), sendo que os resultados obtidos deverão estar dentro dos limites prescritos na NBR-7220 (MB-10) e NBR-7211 (EB-4).

4.2.3 ÁGUA

- A água destinada ao amassamento do concreto obedecerá ao disposto nas NBR 6118 (NB-1) e NBR-6587 (PB-19), além das recomendações a seguir:

- A água considerada satisfatória para os fins aqui previstos será potável, limpa e isenta de ácidos, óleos, álcalis, sais, siltes, açúcares, materiais orgânicos, e outras substâncias agressivas ao concreto e que possam ocasionar alterações na pega do cimento.

– As quantidades máximas de matéria sólida em suspensão e sulfatos, serão respectivamente, 2.000 mg/l e 0,5%.

– Caso ocorra durante a estação chuvosa uma turbidez excessiva da água, deverá ser providenciada decantação ou filtração.

– A água contaminada não deverá ser utilizada para a finalidade aqui referida, no caso de suspeita de contaminação, deverão ser efetuados ensaios comparativos periódicos para verificação.

4.2.4 CIMENTO

O cimento destinado ao uso do concreto deverá obedecer ao disposto na NBR-6118:2019, além das recomendações a seguir:

– Nas peças sujeitas a ambientes agressivos, recomenda-se o uso de cimentos que atendam às especificações das Normas NBR-5736 (EB-758) e NBR-5737 (EB-903).

– Não será conveniente, em uma mesma concretagem, a mistura de tipos diferente de cimento, nem de marcas diferentes e ainda que do mesmo tipo.

– Não será conveniente o uso de traços de meio saco ou fração, os volumes mínimos a misturar de cada vez deverão corresponder a um saco de cimento.

- O cimento deverá ser obrigatoriamente medido em peso, não sendo, portanto, recomendável a sua medição em volume.
- A embalagem quando for em sacos deverão estar perfeitos na ocasião da inspeção e ter impressos de forma bem visíveis as seguintes características:
 - Indicação correspondente a 25, 32, 40 MPa (250, 320, 400 kgf/cm²) com 6 cm de altura no mínimo em cada extremidade;
 - No centro, a denominação normalizada, o nome e a marca do fabricante.
- Os sacos de cimento deverão ser armazenados em locais bem secos, protegidos e de forma a permitir fácil acesso à inspeção e identificação de cada embarque. As pilhas deverão ser colocadas sobre um estrado de madeira e não deverão conter mais de 10 sacos.
- A plataforma de madeira deverá ser montada, pelo menos, a 30cm do solo e das paredes do depósito.
- O cimento que não satisfizer a qualquer exigência das normas deverá ser rejeitado.
- O cimento armazenado em sacos por mais de três meses, deverá ser reensaiado, devendo ser igualmente rejeitado se não satisfizer a qualquer exigência das normas.
- As amostras de cimento a ser ensaiado deverão ser colhidas de acordo com a NBR-5741 (MB-508).

4.2.5 FORMA E ESCORAMENTO

Uma laje em processo de concretagem deverá ser suportada por, no mínimo três outras abaixo, quando houver.

Só é possível a total retirada das escoras sob uma laje, quando o concreto atingir 80% do Fck especificado em projeto, respeitando sempre o prazo mínimo de 14 dias.

A substituição das formas por escoras só deve acontecer quando o Fck do concreto for superior a 60% do Fck especificado em projeto, respeitando sempre o prazo mínimo de 4 dias.

As formas laterais de vigas e pilares podem ser retiradas no prazo mínimo de 48 horas (2 dias), após a concretagem.

As formas e escoramentos deverão obedecer às normas, especificações e critérios da NBR-7190 (NB-11) e / ou NB-14.

As formas deverão ser estanques e dimensionadas de modo que não possam sofrer deformações prejudiciais, quer sob a ação dos fatores ambientais, quer sob efeito de cargas, especialmente a do concreto fresco, considerado nesta o efeito do adensamento sobre o empuxo do concreto.

As formas absorventes deverão ser molhadas até a saturação, antes da concretagem, visando evitar absorção da água do concreto.

Nas peças de grandes vãos, sujeitas a deformações provocadas pelo material nelas introduzido, as formas deverão ser dotadas de contra-flecha necessária.

Antes do início da concretagem, as formas deverão estar limpas e estanques, de modo a evitar eventuais fugas de pasta.

Os escoramentos deverão obedecer aos critérios estabelecidos pela NBR-6118:2019

5. MEMÓRIA DE CÁLCULO (PRÉDIO PRINCIPAL)

Pavimento TÉRREO

Vigas do pavimento TÉRREO

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VA1	106.11 1909.92 961.84	2 ø 10.0 2 ø 10.0 2 ø 10.0		-577.69 -509.19 -3258.75 -3391.21 -1264.38	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA2	2345.43 1608.45 811.65 1679.48	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-661.30 -1415.86 -3647.80 -3018.87 -1232.52 -3126.42 -2288.43	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA3	1499.33	2 ø 10.0		-153.08 -1618.17	2 ø 10.0 2 ø 10.0		26
VA4	33.59 656.42 699.03 784.32 0.11	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-1710.45 -1472.75 -1729.44 -1005.58 -1264.91 -51.47	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA5	1034.26	2 ø 10.0		-1245.70 -1216.01	2 ø 10.0 2 ø 10.0		26
VA6	81.79	3 ø 8.0		-12.51 -202.70	2 ø 10.0 2 ø 10.0		26, 48
VA7	897.72	2 ø 10.0		-1429.28 -1364.05	2 ø 10.0 2 ø 10.0		26
VA8	984.16	2 ø 10.0		-1322.68 -1312.47	2 ø 10.0 2 ø 10.0		26
VA9	131.40	3 ø 8.0		-55.78	2 ø 10.0		26
VA10	973.38	2 ø 10.0		-1331.73 -1300.32	2 ø 10.0 2 ø 10.0		26
VA11	26.14 771.07 820.91	2 ø 10.0 2 ø 10.0 2 ø 10.0		-22.31 -1453.43 -1398.98 -1093.44	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	26, 48

VA12	1739.26 0.11 1578.22	2 ø 10.0 2 ø 10.0 2 ø 10.0		-1914.18 -1653.53 -1905.43 -1760.59	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26, 38
VA13	439.20 491.46 220.46 3184.22	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-643.91 -1062.91 -619.22 -4265.14 -4050.03	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0 3 ø 10.0		26
VA14	733.65 297.78 167.60 846.43 0.11 1955.69	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-1647.64 -818.16 -1235.73 -630.47 -1434.55 -1337.98 -3028.74 -3685.18	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26, 38
VA15	845.33	2 ø 10.0		-2571.19 -1258.90	2 ø 10.0 2 ø 10.0		26
VA16	503.71	2 ø 10.0		-135.89	2 ø 10.0		26
VA17	649.32	2 ø 10.0		-17.70 -23.32	2 ø 10.0 2 ø 10.0		26
VA18	4148.69	3 ø 10.0		-401.39 -50.87	2 ø 10.0 2 ø 10.0		26
VA19	0.11 3318.54	3 ø 10.0 2 ø 12.5		-35.77 -3061.37 -423.73	2 ø 12.5 2 ø 12.5 2 ø 12.5		
VA20	491.94 459.13 304.42 2826.07 151.95 460.90 349.42 236.81 763.22 269.32 592.24	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	-579.97 -1109.86 -679.13 -3362.87 -3248.94 -709.13 -1016.79 -540.29 -1513.16 -1326.84 -999.91 -861.19	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	26
VA21	601.08	2 ø 10.0					26
VA22	1641.84 2071.52 2661.56 458.22 435.00 1117.48	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-1747.44 -3007.15 -5265.80 -3492.79 -933.00 -1907.71 -979.26	2 ø 10.0 2 ø 10.0 2 ø 12.5 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA23	3908.48	2 ø 10.0		-407.70 -343.34	2 ø 10.0 2 ø 10.0		26
VA24	198.36	2 ø 10.0		-59.56	2 ø 10.0		26
VA25	1790.96	2 ø 10.0		-141.31	2 ø 10.0		26
VA26	971.81	2 ø 10.0		-2056.23	2 ø 10.0		26

VA27	147.35 178.19	2 ø 10.0 2 ø 10.0		-327.05 -2356.78	2 ø 10.0 2 ø 10.0		26, 02
VA28	0.11 192.22	3 ø 10.0 3 ø 10.0	2 ø 8.0	-20.27 -3220.55 -4310.32	2 ø 12.5 2 ø 12.5 2 ø 12.5	2 ø 6.3 2 ø 6.3 2 ø 6.3	26, 98
VA29	349.62 555.49	2 ø 10.0 2 ø 10.0		-48.33 -3057.95 -188.78	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA30	364.37	2 ø 10.0		-498.08 -22.18	2 ø 10.0 2 ø 10.0		26
VA31	264.24 2162.11 2373.90	2 ø 10.0 2 ø 10.0 2 ø 10.0		-249.36 -2801.32 -4973.81 -2616.79	2 ø 10.0 2 ø 10.0 3 ø 10.0 2 ø 10.0		26
VA32	687.09 2163.64 107.07 2409.17	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-693.86 -3794.91 -3503.48 -3965.01 -2953.29	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26, 03
VA33	616.90 279.94 890.72	2 ø 10.0 2 ø 10.0 2 ø 10.0		-900.99 -1252.89 -1657.85 -1323.56	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA34	525.82 791.55	2 ø 10.0 2 ø 10.0		-781.05 -1699.81 -8.90	2 ø 10.0 2 ø 10.0 2 ø 10.0		26, 38
VA35	898.00	2 ø 10.0		-1541.15 -1556.06	2 ø 10.0 2 ø 10.0		26
VA36	2480.94 6.75	2 ø 10.0 2 ø 10.0		-3673.75 -4091.90 -20.64	2 ø 10.0 3 ø 10.0 2 ø 10.0		26
VA37	986.60	2 ø 10.0		-1416.43 -1413.33	2 ø 10.0 2 ø 10.0		26
VA38	3838.23	2 ø 10.0		-158.92 -206.73	2 ø 10.0 2 ø 10.0		26
VA39	8791.35 376.98	3 ø 16.0 2 ø 10.0		-9000.62 -7575.52 -152.19	3 ø 16.0 3 ø 12.5 2 ø 10.0		26
VA40	1688.02	2 ø 10.0		-4591.61	3 ø 10.0		26
VA41	1165.83	2 ø 10.0		-1826.00 -1830.86	2 ø 10.0 2 ø 10.0		26
VA42	5771.80	2 ø 12.5		-202.21 -270.62	2 ø 10.0 2 ø 10.0		26
VA43	465.06 1430.15	2 ø 10.0 2 ø 10.0		-950.78 -2504.16 -1850.72	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA44	2721.71	2 ø 10.0		-102.33 -89.68	2 ø 10.0 2 ø 10.0		26
VA45	567.26	2 ø 10.0		-38.82 -74.99	2 ø 10.0 2 ø 10.0		26
VA46	1291.75	2 ø 10.0		-16.46 -1690.72	2 ø 10.0 2 ø 10.0		26

VA47	3950.67 88.96 965.17 148.50 358.52 1328.66	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-4653.18 -5885.98 -1551.89 -1495.71 -865.13 -2518.44 -1984.70	3 ø 10.0 3 ø 12.5 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA48	1743.98	2 ø 10.0		-243.03 -232.95	2 ø 10.0 2 ø 10.0		26
VA49	32.01 897.73 130.09 617.59 159.33 56.58	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-31.06 -1750.80 -1473.44 -1193.27 -849.36 -1791.20	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA50	908.61	2 ø 10.0		-1557.02 -1385.86	2 ø 10.0 2 ø 10.0		26
VA51	578.83	2 ø 10.0		-93.12 -7.65	2 ø 10.0 2 ø 10.0		26
VA52	57.88 1049.53	2 ø 10.0 2 ø 10.0		-18.94 -1915.90 -1236.78	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA53	704.89 858.27	2 ø 10.0 2 ø 10.0		-141.27 -1753.49 -1345.74	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA54	706.35 297.06 152.09	2 ø 10.0 2 ø 10.0 2 ø 10.0		-1110.32 -996.27 -708.66 -46.62	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA55	774.17	2 ø 10.0		-1323.44 -1339.71	2 ø 10.0 2 ø 10.0		26
VA56	255.65 1341.59	2 ø 10.0 2 ø 10.0		-6.93 -2449.32 -1386.46	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA57	508.97 823.92 51.39	2 ø 10.0 2 ø 10.0 2 ø 10.0		-292.11 -1580.91 -1352.40 -877.99	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA58	1392.18	2 ø 10.0		-2203.81 -2005.92	2 ø 10.0 2 ø 10.0		26
VA59	609.36 922.26	2 ø 10.0 2 ø 10.0		-1872.53 -1935.32 -1332.78	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA60	77.99 827.10	2 ø 10.0 2 ø 10.0		-71.66 -1441.04 -1102.16	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA61	1273.35 639.04 716.31 59.45	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		-1031.43 -2110.98 -67.55 -1590.55 -2029.11	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA62	3372.03	2 ø 10.0		-3324.74	2 ø 10.0		26

	228.82 907.11	2 ø 10.0 2 ø 10.0		-3294.16 -1602.40 -1579.40	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VA63	998.85	2 ø 10.0		-1542.33 -33.68 -1536.69	2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA64	207.06 509.55 117.15	2 ø 10.0 2 ø 10.0 2 ø 10.0		-969.75 -948.03 -819.11 -38.68	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		26
VA65	715.08 470.97 454.45	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	-35.66 -2430.57 -680.71 -477.44	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	26, 48
VA66	1260.09 197.85 904.83 3627.79	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0	2 ø 8.0 2 ø 8.0	-1.52 -2683.30 -11.97 -1076.50 -5183.43 -2932.64	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0 3 ø 12.5 3 ø 10.0	2 ø 6.3 2 ø 6.3 2 ø 8.0	26
VA67	785.46	3 ø 8.0		-97.84 -774.57	2 ø 10.0 2 ø 10.0		26, 48
VA68	3164.50	2 ø 10.0		-140.88 -15.13	2 ø 10.0 2 ø 10.0		26
VA69	943.96	2 ø 10.0		-104.72 -1064.15	2 ø 10.0 2 ø 10.0		26
VA70	2611.52 4432.48	2 ø 10.0 3 ø 10.0	2 ø 8.0	-3566.26 -7993.61 -4446.45 -6158.90	2 ø 10.0 2 ø 16.0 2 ø 12.5 3 ø 12.5	2 ø 6.3 2 ø 6.3 2 ø 6.3	26

Pavimento COB. CASA DE GÁS

Resultados dos Pilares

COB. CASA DE GÁS	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 2		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P17 1:20	15.00 X 25.00	159.00 164.00	164.00 RR 164.00 RR	2.25 1.22	210 134	741 413	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 27	37.83 22.70

Vigas do pavimento COB. CASA DE GÁS

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VB1	122.58	2 ø 8.0		-191.69	2 ø 8.0		
VB2	199.22	2 ø 8.0		-46.50 -8.60	2 ø 8.0 2 ø 8.0		
VB4	970.49	2 ø 8.0		-1919.03 -153.53 -448.49 -1139.85	2 ø 10.0 2 ø 8.0 2 ø 8.0 2 ø 8.0		38
VB5	539.43	2 ø 8.0	2 ø 6.3	-115.67 -649.98	2 ø 8.0 2 ø 8.0	2 ø 6.3	
VB6	569.18	2 ø 8.0		-653.71 -981.12	2 ø 8.0 2 ø 8.0		

Resultados da Laje

COB. CASA DE GÁS	$f_{ck} = 350.00$ kgf/cm ²	$E = 294029$ kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 2		cobr = 2.00 cm	

Nome	Espessura (cm)	Carga (kgf/m ²)	Mdx (kgf.m/m)	Mdy (kgf.m/m)	Asx	Asy
LB1	10	531.50	83	111	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LB2	10	531.50	79	121	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LB3	10	531.50	41	138	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)

ARMADURA NEGATIVA							
Dados				Resultados			
Viga	Trecho	Laje 1	Laje 2	Reação 1 (kgf/m)	Reação 2 (kgf/m)	Md (kgf.m/m)	As (cm ²)
VB5	2	LB1	LB3	167	144	-142	As = 1.72 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)
VB1	1	LB1	LB3	103	91	-65	As = 1.72 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)
VB5	1	LB2	LB3	69	34	-5	As = 1.72 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)

Pavimento COBERTURA

Resultados dos Pilares

COBERTURA	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 3		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P1 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	4.83 2.28	280 269	840 891	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P2 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 572.00 RR	11.86 6.24	791 741	252 310	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 65.97
P3 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.44 7.36	445 433	434 419	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P4 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	6.51 3.26	644 548	350 422	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P6 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	18.05 10.03	824 379	2242 1460	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67

							0.5 4 ø 12.5		
P7 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	17.81 8.60	908 593	422 483	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P8 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	12.86 7.41	292 212	282 396	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P10 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	5.16 2.33	837 823	254 315	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P11 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	12.30 5.53	772 378	1260 925	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P12 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.99 5.23	350 235	340 365	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P13 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.87 6.21	228 192	543 492	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P14 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	12.56 6.30	144 227	476 558	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P15 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	13.58 6.99	181 162	246 321	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P16 1:20	20.00 X	417.00 422.00	258.00 RR	10.29 4.76	614 249	362 410	1.57 2 ø 10.0	ø 5.0 c/12 ø 5.0 c/12	44.63 48.67

	30.00		422.00 RR				1.57 2 ø 10.0 0.5 4 ø 10.0	60	
P18 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	11.41 6.33	807 593	952 837	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P19 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	15.40 8.56	745 566	1490 1070	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P20 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	8.48 3.79	185 178	1079 673	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P21 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	8.82 4.00	99 137	1051 658	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P22 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	11.15 6.26	134 315	422 449	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P23 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.78 7.51	183 335	389 452	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P24 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	13.71 6.89	666 470	902 778	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P27 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	6.92 3.46	1383 977	345 411	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67

P28 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	5.57 3.02	574 407	242 239	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P29 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	9.57 4.26	1194 801	673 581	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P30 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	7.27 3.14	1139 840	581 554	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P31 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	6.89 3.11	311 293	735 659	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P32 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.22 4.56	179 206	1360 865	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P33 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	9.18 4.25	60 95	1154 740	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P34 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.87 7.13	846 910	1187 782	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P35 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	18.42 9.50	952 959	688 589	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P36 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	11.39 5.08	259 307	783 611	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67

							0.5 4 ø 12.5		
P37 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	11.27 5.20	224 283	1173 886	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P38 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	8.74 4.37	87 94	631 569	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P39 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.71 7.48	386 339	409 409	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P40 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	12.66 5.80	518 465	815 558	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P41 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	16.77 8.01	1205 910	512 605	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P42 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	19.27 10.06	1168 881	2275 1705	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P43 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.98 5.84	370 388	2383 2369	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P44 1:20	30.00 X 35.00	417.00 422.00	422.00 RR 422.00 RR	12.52 6.52	524 261	659 608	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 41.72
P45 1:20	30.00 X	417.00 422.00	422.00 RR	10.16 4.22	298 260	1380 884	2.45 2 ø 12.5	ø 5.0 c/10 ø 5.0 c/10	48.67 48.67

	30.00		422.00 RR				2.45 2 ø 12.5 0.5 4 ø 12.5	60	
P46 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	9.58 4.27	72 88	1179 771	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P47 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	15.79 7.53	1136 919	1356 1058	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P48 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	16.48 8.12	1204 956	847 760	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P49 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	7.93 3.24	299 310	1325 886	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P50 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	12.75 6.07	383 259	1156 822	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P51 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	9.76 5.05	157 128	511 463	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P52 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	11.93 5.51	615 418	954 864	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P53 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	21.33 11.75	535 419	2074 708	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 80	48.67 48.67

P54 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	33.54 19.18	998 594	1424 635	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 48.67
P55 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	17.30 9.05	2268 1288	1639 1414	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P56 1:20	30.00 X 35.00	417.00 422.00	422.00 RR 422.00 RR	11.94 6.76	253 526	479 485	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 41.72
P57 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	16.39 9.19	493 393	3428 1994	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P58 1:20	30.00 X 42.00	417.00 422.00	422.00 RR 422.00 RR	25.21 14.51	5056 3802	867 877	2.45 2 ø 12.5 3.68 3 ø 12.5 0.6 6 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 34.76
P59 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	22.06 13.13	966 752	1447 1323	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P60 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.28 5.73	80 75	1221 785	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P61 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	13.23 7.63	490 271	710 522	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P62 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	16.79 9.65	1209 402	979 682	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67

							0.5 4 ø 12.5		
P63 1:20	30.00 X 30.00	417.00 422.00	572.00 RR 422.00 RR	9.59 5.56	81 91	469 528	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	65.97 48.67
P64 1:20	30.00 X 30.00	417.00 422.00	572.00 RR 422.00 RR	20.04 12.11	439 416	748 900	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	65.97 48.67
P65 1:20	15.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.25 8.54	72 66	487 362	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	97.34 48.67
P66 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	9.15 4.93	232 286	1085 919	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P67 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	2.55 0.40	285 249	556 515	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P68 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.05 8.07	494 408	333 340	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P69 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	10.10 5.82	287 320	1268 831	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P70 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	8.14 4.19	416 413	1129 822	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P71 1:20	20.00 X	417.00 422.00	572.00 RR	13.83 7.83	438 147	1020 702	1.57 2 ø 10.0	ø 5.0 c/12 ø 5.0 c/12	98.96 48.67

	30.00		422.00 RR				1.57 2 ø 10.0 0.5 4 ø 10.0	60	
P72 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	13.42 7.91	150 163	428 427	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P73 1:20	20.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	3.93 1.89	88 104	555 471	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	73.01 48.67
P74 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.78 8.67	679 642	3458 2179	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P75 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	25.16 15.38	410 428	4900 3876	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 80	48.67 48.67
P76 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	31.23 19.60	528 800	995 1573	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 48.67
P77 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	20.89 12.55	496 183	1979 957	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 80	48.67 48.67
P78 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	27.29 16.62	1277 991	1736 905	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 80	48.67 48.67
P79 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 572.00 RR	41.40 25.81	1470 1134	1562 124	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 65.97

P80 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	14.29 8.41	605 729	370 376	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 80	48.67 48.67
P81 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	13.75 8.22	948 1014	1800 1529	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	48.67 48.67
P104 1:20	15.00 X 35.00	417.00 422.00	422.00 RR 422.00 RR	7.56 4.39	162 216	862 740	1.57 2 ø 10.0 1.57 2 ø 10.0 0.6 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	97.34 41.72
P105 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 422.00 RR	7.45 3.43	578 482	703 790	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 48.67
P109 1:20	30.00 X 30.00	417.00 422.00	258.00 RR 258.00 RR	15.99 6.54	1028 676	327 369	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 60	29.76 29.76
P110 1:20	30.00 X 30.00	417.00 422.00	422.00 RR 258.00 RR	6.34 2.07	520 508	625 599	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 60	48.67 29.76

Vigas do pavimento COBERTURA

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VC1	11.14 2924.46 1569.36	2 ø 10.0 3 ø 10.0 2 ø 10.0	2 ø 8.0 2 ø 8.0 2 ø 6.3	-294.81 -473.61 -4177.97 -23.95 -4874.52 -1567.54	3 ø 10.0 3 ø 10.0 2 ø 12.5 2 ø 10.0 2 ø 12.5 2 ø 10.0	2 ø 6.3 2 ø 6.3 3 ø 6.3 2 ø 8.0 2 ø 6.3 2 ø 6.3	04
VC2	1635.45 4105.55 1785.80 1109.28	2 ø 10.0 3 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 8.0 2 ø 6.3	-310.97 -2059.23 -4939.87 -6759.96 -2666.38 -379.90 -1601.67	3 ø 10.0 3 ø 10.0 2 ø 12.5 3 ø 12.5 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3	04, 98
VC3	1593.34	2 ø 10.0	2 ø 6.3	-127.38 -1596.52	2 ø 10.0 2 ø 10.0	 2 ø 6.3	04
VC4	2158.28 863.02 166.59	2 ø 10.0 2 ø 10.0 2 ø 10.0		-1345.50 -2101.31 -3139.95 -1207.44 -405.99 -422.59	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0		04
VC5	951.04 958.71	2 ø 10.0 2 ø 10.0		-143.47 -1686.41 -790.01	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC6	1679.24	2 ø 10.0		-1308.80 -1269.91	2 ø 10.0 2 ø 10.0		
VC7	3271.95	2 ø 10.0		-1408.40 -1492.19	2 ø 10.0 2 ø 10.0		
VC8	121.97	2 ø 10.0		-731.78 -428.65	2 ø 10.0 2 ø 10.0		
VC9	1310.94 568.25	2 ø 10.0 2 ø 10.0		-884.84 -1928.83 -690.75	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC10	3535.57	2 ø 10.0		-2013.53 -714.39	2 ø 10.0 2 ø 10.0		04, 38
VC11	2978.76	2 ø 10.0	2 ø 6.3	-1566.42 -1768.58	2 ø 10.0 2 ø 10.0		04
VC12	817.66 747.08 679.39 3299.42 1.53	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	 2 ø 6.3	-787.29 -1483.78 -1169.55 -4814.93 -4845.05	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 12.5 2 ø 12.5	 2 ø 6.3 2 ø 6.3	04

	968.10 1211.26	2 ø 10.0 2 ø 10.0		-1390.09 -1675.37 -1124.03	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC13	0.11 1726.47 0.11 4400.24	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0	2 ø 6.3	-840.42 -2194.11 -2230.76 -6638.55 -6505.80	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 12.5 3 ø 12.5	2 ø 6.3 2 ø 6.3	
VC14	574.34	2 ø 10.0		-3904.20 -830.34	2 ø 10.0 2 ø 10.0		
VC15	619.24	2 ø 10.0		-149.22	2 ø 10.0		
VC16	888.06	2 ø 10.0		-48.55 -50.88	2 ø 10.0 2 ø 10.0		
VC17	4301.53	3 ø 10.0		-407.14 -74.30	2 ø 10.0 2 ø 10.0		
VC18	0.11 4962.57	2 ø 16.0 3 ø 10.0		-178.72 -5415.07 -278.10	2 ø 12.5 2 ø 12.5 2 ø 12.5		
VC19	11.42	3 ø 10.0		-2324.96	3 ø 10.0		98
VC20	469.63 1046.17 672.05 4109.23 0.11 732.26 2371.87 0.11 2204.38 0.11 3359.45	2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3	-2414.81 -1572.50 -1309.78 -5066.16 -4813.20 -1009.88 -2553.41 -823.96 -2811.44 -2223.89 -3714.65 -1499.95	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 12.5 3 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3	04
VC21	508.21	2 ø 10.0					
VC22	0.11	3 ø 10.0		-11.42 -2414.33	3 ø 10.0 3 ø 10.0		98
VC23	1615.01 3488.77 3778.70 0.11 1079.06 0.11 2715.44	3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0		-2954.18 -3574.11 -7941.10 -4205.14 -1114.19 -382.66 -213.19 -5025.00 -190.50	2 ø 12.5 2 ø 12.5 3 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5		
VC24	4477.52	3 ø 10.0	2 ø 6.3	-526.50 -378.17	2 ø 10.0 2 ø 10.0	2 ø 6.3	
VC25	2997.71	2 ø 10.0		-369.84	2 ø 10.0		
VC26	1188.36	2 ø 10.0		-1595.43	2 ø 10.0		
VC27	344.45 160.02	2 ø 10.0 2 ø 10.0		-40.22 -4586.62	2 ø 10.0 3 ø 10.0		
VC28	106.94 236.29	2 ø 8.0 2 ø 8.0		-1314.47	2 ø 8.0		
VC29	0.11	2 ø 10.0		-105.73	2 ø 10.0		

	439.82	2 ø 10.0		-2034.44	2 ø 10.0		
VC30	289.02 3409.67 0.11	2 ø 10.0 2 ø 10.0 2 ø 10.0		-75.89 -5035.68 -4473.19 -13.98	2 ø 10.0 2 ø 12.5 3 ø 10.0 2 ø 10.0		
VC31	101.98 3559.64 4180.09 3884.26 0.11 14814.62 0.11 2648.06	3 ø 12.5 3 ø 12.5 3 ø 12.5 3 ø 12.5 3 ø 12.5 3 ø 16.0 3 ø 12.5 3 ø 12.5		-114.36 -2993.34 -7534.55 -8912.52 -3868.24 -12690.84 -12970.94 -2306.37 -4542.50 -2152.29	3 ø 12.5 3 ø 12.5 3 ø 12.5 2 ø 16.0 2 ø 16.0 2 ø 16.0 2 ø 16.0 2 ø 16.0 3 ø 12.5 3 ø 12.5		
VC32	4543.96 1130.09 1199.61 47.05	3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0	2 ø 6.3 2 ø 6.3	-181.71 -1199.24 -164.12 -1407.61 -3943.49	3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0 3 ø 10.0	2 ø 6.3 2 ø 6.3	98
VC33	754.24	3 ø 10.0		-24.19 -10.53	3 ø 10.0 3 ø 10.0		98
VC34	789.29 200.44 1586.70	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	-912.37 -1104.58 -2252.26 -1685.71	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	
VC35	960.80 1637.32	2 ø 10.0 2 ø 10.0		-387.72 -2048.88	2 ø 10.0 2 ø 10.0		38
VC36	3019.70	2 ø 10.0		-1783.40 -1835.03	2 ø 10.0 2 ø 10.0		
VC37	4958.61	3 ø 10.0		-3922.92 -3859.32	2 ø 10.0 2 ø 10.0		
VC38	3456.07	2 ø 10.0		-1569.72 -1559.50	2 ø 10.0 2 ø 10.0		
VC39	8106.72	3 ø 12.5		-799.48 -393.63	2 ø 12.5 2 ø 12.5		
VC40	5921.46	4 ø 16.0		-3978.17 -5219.81	4 ø 12.5 4 ø 16.0		38
VC41	2746.72	2 ø 10.0		-2093.38 -1938.31	2 ø 10.0 2 ø 10.0		
VC42	8274.49	3 ø 12.5		-1499.41 -392.89	2 ø 12.5 2 ø 12.5		
VC43	100.72 2489.08	2 ø 10.0 2 ø 10.0	2 ø 6.3	-518.66 -44.27 -3757.80 -2761.63	2 ø 10.0 2 ø 10.0 3 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	04
VC44	4137.31	3 ø 10.0		-95.51 -169.53	2 ø 10.0 2 ø 10.0		
VC45	227.75	2 ø 10.0		-128.83 -42.42	2 ø 10.0 2 ø 10.0		12
VC46	1202.51	2 ø 10.0	2 ø 6.3	-325.97 -1289.66	2 ø 10.0 2 ø 10.0	2 ø 6.3	04, 12

VC47	0.11 1372.83	3 ø 10.0 2 ø 10.0		-201.18 -3646.05	3 ø 10.0 2 ø 10.0		98
VC48	130.68 5887.86 0.11 2796.65 697.60 4783.61	3 ø 10.0 3 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5	2 ø 6.3	-8022.21 -7059.39 -3476.23 -2881.68 -42.89 -5681.22 -2165.66	3 ø 12.5 3 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5	2 ø 6.3 2 ø 6.3	
VC49	2830.94	2 ø 10.0		-631.28 -360.31	2 ø 10.0 2 ø 10.0		
VC50	2629.87 0.11 1673.18 0.11 4426.61	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0		-1589.89 -2714.56 -1911.19 -1138.71 -4688.13 -306.53	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 3 ø 10.0 2 ø 10.0		
VC51	3602.18	2 ø 10.0		-1669.44 -1502.39	2 ø 10.0 2 ø 10.0		
VC52	712.51	2 ø 10.0	2 ø 6.3	-170.89	2 ø 10.0	2 ø 6.3	12
VC53	2384.33	2 ø 10.0		-1767.32 -1353.12	2 ø 10.0 2 ø 10.0		
VC54	126.87 2781.71 0.11 2236.64	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	-10759.41 -3241.68 -3473.94 -1814.04 -554.45	3 ø 16.0 2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	12
VC55	1108.00 404.31	2 ø 10.0 2 ø 10.0	2 ø 6.3	-1273.56 -1295.90 -823.04	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	04
VC56	514.00 1240.85	2 ø 10.0 2 ø 10.0		-49.36 -1972.50 -1199.91	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC57	520.37 1899.76	2 ø 10.0 2 ø 10.0		-197.67 -2217.05 -1232.67	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC58	68.63 3037.63 0.11	2 ø 10.0 2 ø 10.0 2 ø 10.0		-6342.76 -2128.35 -3354.24 -1538.06	3 ø 12.5 2 ø 10.0 2 ø 10.0 2 ø 10.0		
VC59	2321.43	2 ø 10.0		-2750.58 -3195.88	2 ø 10.0 2 ø 10.0		
VC60	1137.36 1553.53	2 ø 10.0 2 ø 10.0	2 ø 6.3	-2960.40 -2941.17 -1761.14	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	04
VC61	1022.82 421.32	2 ø 10.0 2 ø 10.0		-198.72 -1076.54 -553.14	2 ø 10.0 2 ø 10.0 2 ø 10.0		04
VC62	0.11 12448.33 560.33 2283.03	2 ø 12.5 2 ø 16.0 2 ø 16.0 2 ø 16.0		-167.30 -6794.56 -12164.40 -5587.78	2 ø 12.5 3 ø 12.5 3 ø 16.0 2 ø 12.5		

	1936.00 576.76	2 ø 16.0 3 ø 10.0		-2146.57 -4164.30 -426.36 -3835.18	2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5		
VC63	36.20 13490.99 1813.95 124.79 2933.60	2 ø 12.5 2 ø 16.0 2 ø 16.0 2 ø 16.0 2 ø 16.0	2 ø 6.3 2 ø 6.3	-12853.37 -15004.72 -3104.54 -1322.96 -3857.07 -2620.54	3 ø 16.0 4 ø 16.0 2 ø 12.5 2 ø 12.5 2 ø 12.5 2 ø 12.5	2 ø 6.3	
VC64	1457.55	2 ø 10.0		-2677.35 -611.61	2 ø 10.0 2 ø 10.0		
VC65	6.95	3 ø 10.0		-1559.24	3 ø 10.0		98
VC66	204.65 754.19 957.56	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3	-927.53 -1000.43 -4366.45	2 ø 10.0 2 ø 10.0 3 ø 10.0		
VC67	1871.79 6.51	2 ø 10.0 2 ø 10.0	2 ø 6.3	-2375.00 -2182.37 -504.50	2 ø 10.0 2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	04
VC68	1690.94 300.24 684.07 4914.03	2 ø 10.0 2 ø 10.0 2 ø 10.0 2 ø 12.5	2 ø 6.3 2 ø 8.0 2 ø 8.0	-32.16 -2120.84 -1077.45 -5633.21 -1656.22	2 ø 10.0 2 ø 10.0 3 ø 10.0 3 ø 12.5 3 ø 10.0	2 ø 6.3 2 ø 6.3 2 ø 8.0	
VC69	3151.45	2 ø 10.0		-166.84 -26.94	2 ø 10.0 2 ø 10.0		
VC70	498.97	2 ø 10.0		-144.72 -377.57	2 ø 10.0 2 ø 10.0		
VC71	3517.41 4160.65	2 ø 10.0 3 ø 10.0	2 ø 6.3 2 ø 8.0	-4332.72 -7921.80 -4477.26 -5469.31	3 ø 10.0 2 ø 16.0 2 ø 12.5 3 ø 12.5	2 ø 6.3 2 ø 6.3 2 ø 6.3 3 ø 6.3	

Resultados da Laje

COBERTURA	$f_{ck} = 350.00$ kgf/cm ²	$E = 294029$ kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 3		cobr = 2.00 cm	

Nome	Espessura (cm)	Carga (kgf/m ²)	Mdx (kgf.m/m)	Mdy (kgf.m/m)	Asx	Asy
LC1	17	598.30	313		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC2	17	598.30	719		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC3	10	701.50	587	594	As = 2.15 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 2.14 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)
LC4	17	598.30	1213		As = 0.61 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø5.0 c/N - 0.39 cm ² /N)	
LC5	17	598.30	1595		As = 0.99 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø6.3 c/N - 0.62 cm ² /N)	
LC6	17	598.30	502		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC7	10	701.50	355	216	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC8	17	598.30	471		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC9	17	598.30	1333		As = 0.68 cm ² /N (TR 12645 - 0.39 cm ² /N)	

					(2ø5.0 c/N - 0.39 cm ² /N)	
LC10	10	701.50	305	185	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC11	17	598.30	478		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC12	10	701.50	390	233	As = 1.26 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)	As = 1.02 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC13	17	598.30	1465		As = 0.74 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø5.0 c/N - 0.39 cm ² /N)	
LC14	10	701.50	586	232	As = 1.84 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 1.27 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)
LC15	17	598.30	1609		As = 0.97 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø6.3 c/N - 0.62 cm ² /N)	
LC16	17	598.30	1065		As = 0.54 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC17	10	701.50	497	462	As = 1.94 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 1.60 cm ² /m (ø6.3 c/19 - 1.64 cm ² /m)
LC18	17	598.30	1491		As = 0.75 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø5.0 c/N - 0.39 cm ² /N)	
LC19	17	598.30	898		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC20	17	598.30	388		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC21	10	701.50	176	146	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)

LC22	10	701.50	414	380	As = 1.40 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)	As = 1.30 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)
LC23	10	701.50	423	265	As = 1.32 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)	As = 1.02 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC24	10	701.50	525	546	As = 1.76 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 1.95 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)
LC25	10	701.50	238	173	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC26	10	701.50	459	415	As = 1.48 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)	As = 1.43 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)
LC27	10	701.50	376	202	As = 1.02 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC28	10	701.50	423	253	As = 1.37 cm ² /m (ø6.3 c/20 - 1.56 cm ² /m)	As = 1.03 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC29	10	701.50	161	96	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC30	10	701.50	214	115	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC31	10	701.50	212	178	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC32	10	701.50	749	717	As = 2.48 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 2.59 cm ² /m (ø8.0 c/19 - 2.65 cm ² /m)
LC33	10	701.50	272	195	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC34	10	701.50	641	524	As = 2.11 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)	As = 1.92 cm ² /m (ø8.0 c/20 - 2.51 cm ² /m)
LC35	10	701.50	323	193	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC36	17	598.30	230		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC37	17	598.30	261		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	

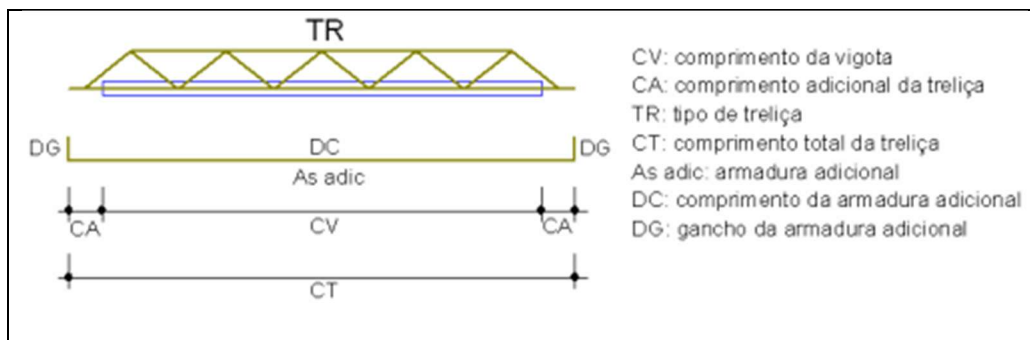
LC38	17	598.30	249		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC39	17	598.30	89		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC40	17	598.30	94		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC41	17	598.30	83		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC42	10	531.50	135	87	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC43	17	598.30	520		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC44	17	598.30	520		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC45	17	598.30	236		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC46	17	598.30	538		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC47	17	598.30	521		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC48	17	598.30	613		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N)	

					(1ø5.0 c/N - 0.20 cm ² /N)	
LC49	17	598.30	476		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC50	10	602.98	354	151	As = 1.03 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC51	17	598.30	387		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC52	17	598.30	280		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC53	17	598.30	669		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC54	17	598.30	916		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC55	17	598.30	233		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC56	17	598.30	222		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC57	17	598.30	587		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC58	17	598.30	1057		As = 0.53 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC59	17	598.30	967		As = 0.48 cm ² /N	

					(TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC60	17	598.30	1362		As = 0.69 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø5.0 c/N - 0.39 cm ² /N)	
LC61	17	598.30	1398		As = 0.71 cm ² /N (TR 12645 - 0.39 cm ² /N) (2ø5.0 c/N - 0.39 cm ² /N)	
LC62	17	598.30	561		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC63	17	598.30	1159		As = 0.58 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC64	10	648.26	264	261	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC65	17	598.30	409		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC66	17	598.30	223		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC67	17	598.30	1162		As = 0.58 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC68	17	598.30	595		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC69	17	598.30	238		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	

LC70	17	598.30	227		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC71	17	598.30	503		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC72	17	598.30	516		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC73	17	598.30	588		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC74	17	598.30	468		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC75	17	598.30	385		As = 0.48 cm ² /N (TR 12645 - 0.39 cm ² /N) (1ø5.0 c/N - 0.20 cm ² /N)	
LC76	10	531.50	75	110	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC77	10	531.50	265	192	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC78	10	531.50	206	187	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC79	10	531.50	215	158	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC80	10	531.50	131	138	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)
LC81	10	531.50	198	154	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)	As = 1.01 cm ² /m (ø5.0 c/19 - 1.03 cm ² /m)

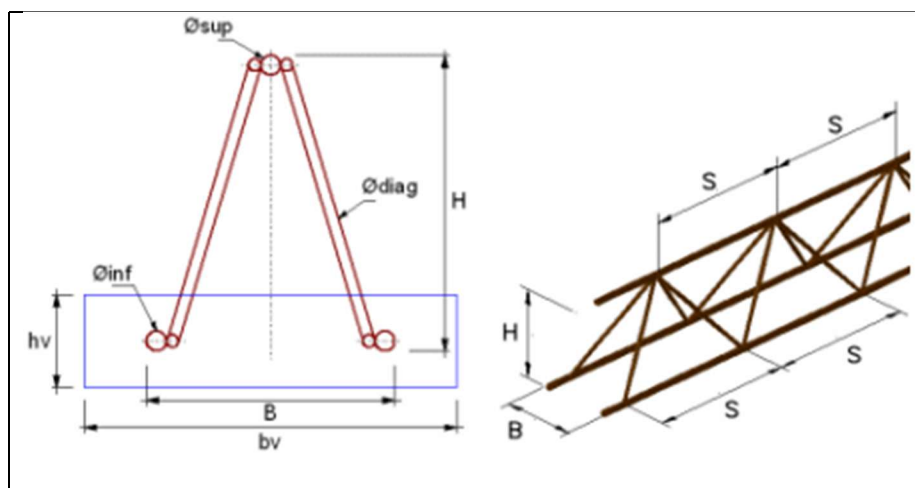
Vigotas pré-moldadas - Lajes do pavimento COBERTURA



Laje	Vigota	Quant.	Compr. (cm)	Compr. Adic. (cm)	Treliça		Armadura adicional			
					Tipo	Compr. (cm)	Armadura	Compr. (cm)	Gancho (cm)	Total (cm)
LC1	VTC1a	8	162	6	TR 12645	173	1ø5.0 c/N	173	6	182
LC2	VTC2a	8	253	10	TR 12645	272	1ø5.0 c/N	272	6	281
LC4	VTC4a	9	339	6	TR 12645	350	2ø5.0 c/N	350	6	359
LC5	VTC5a	5	364	6	TR 12645	375	2ø6.3 c/N	375	7	386
	VTC5b	6	364	10	TR 12645	383	2ø6.3 c/N	383	7	394
LC6	VTC6a	24	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC8	VTC8a	9	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC9	VTC9a	5	323	6	TR 12645	334	2ø5.0 c/N	334	6	343
LC11	VTC11a	9	194	6	TR 12645	205	1ø5.0 c/N	205	6	214
LC13	VTC13a	9	359	6	TR 12645	370	2ø5.0 c/N	370	6	379
LC15	VTC15a	9	359	6	TR 12645	370	2ø6.3 c/N	370	7	381
LC16	VTC16a	9	299	6	TR 12645	310	1ø5.0 c/N	310	6	319
LC18	VTC18a	9	359	6	TR 12645	370	2ø5.0 c/N	370	6	379
LC19	VTC19a	2	281	6	TR 12645	292	1ø5.0 c/N	292	6	301

	VTC19b	1	265	6	TR 12645	276	1ø5.0 c/N	276	6	285
	VTC19c	12	281	10	TR 12645	300	1ø5.0 c/N	300	6	309
LC20	VTC20a	1	170	10	TR 12645	189	1ø5.0 c/N	189	6	198
	VTC20b	4	186	10	TR 12645	205	1ø5.0 c/N	205	6	214
LC36	VTC36a	5	133	6	TR 12645	144	1ø5.0 c/N	144	6	153
LC37	VTC37a	8	142	10	TR 12645	161	1ø5.0 c/N	161	6	170
	VTC37b	1	127	10	TR 12645	146	1ø5.0 c/N	146	6	155
LC38	VTC38a	5	146	10	TR 12645	165	1ø5.0 c/N	165	6	174
LC39	VTC39a	3	83	6	TR 12645	94	1ø5.0 c/N	94	6	103
LC40	VTC40a	5	70	6	TR 12645	81	1ø5.0 c/N	81	6	90
LC41	VTC41a	13	70	10	TR 12645	89	1ø5.0 c/N	89	6	98
LC43	VTC43a	15	206	10	TR 12645	225	1ø5.0 c/N	225	6	234
	VTC43b	18	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC44	VTC44a	3	206	10	TR 12645	225	1ø5.0 c/N	225	6	234
	VTC44b	12	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC45	VTC45a	5	130	6	TR 12645	141	1ø5.0 c/N	141	6	150
LC46	VTC46a	5	202	10	TR 12645	221	1ø5.0 c/N	221	6	230
LC47	VTC47a	9	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC48	VTC48a	5	206	10	TR 12645	225	1ø5.0 c/N	225	6	234
LC49	VTC49a	7	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC51	VTC51a	5	172	6	TR 12645	183	1ø5.0 c/N	183	6	192
LC52	VTC52a	7	144	6	TR 12645	155	1ø5.0 c/N	155	6	164
LC53	VTC53a	7	227	6	TR 12645	238	1ø5.0 c/N	238	6	247
LC54	VTC54a	14	283	6	TR 12645	294	1ø5.0 c/N	294	6	303
LC55	VTC55a	8	122	6	TR 12645	133	1ø5.0 c/N	133	6	142
LC56	VTC56a	8	120	6	TR 12645	131	1ø5.0 c/N	131	6	140

LC57	VTC57a	7	230	10	TR 12645	249	1ø5.0 c/N	249	6	258
LC58	VTC58a	9	293	6	TR 12645	304	1ø5.0 c/N	304	6	313
LC59	VTC59a	9	283	6	TR 12645	294	1ø5.0 c/N	294	6	303
LC60	VTC60a	8	346	6	TR 12645	357	2ø5.0 c/N	357	6	366
	VTC60b	1	316	6	TR 12645	327	2ø5.0 c/N	327	6	336
LC61	VTC61a	9	344	6	TR 12645	355	2ø5.0 c/N	355	6	364
LC62	VTC62a	9	206	6	TR 12645	217	1ø5.0 c/N	217	6	226
LC63	VTC63a	9	312	6	TR 12645	323	1ø5.0 c/N	323	6	332
LC65	VTC65a	7	175	6	TR 12645	186	1ø5.0 c/N	186	6	195
LC66	VTC66a	7	125	6	TR 12645	136	1ø5.0 c/N	136	6	145
LC67	VTC67a	8	328	6	TR 12645	339	1ø5.0 c/N	339	6	348
LC68	VTC68a	6	227	6	TR 12645	238	1ø5.0 c/N	238	6	247
LC69	VTC69a	5	122	6	TR 12645	133	1ø5.0 c/N	133	6	142
LC70	VTC70a	5	120	10	TR 12645	139	1ø5.0 c/N	139	6	148
LC71	VTC71a	8	200	6	TR 12645	211	1ø5.0 c/N	211	6	220
	VTC71b	1	185	6	TR 12645	196	1ø5.0 c/N	196	6	205
LC72	VTC72a	9	200	6	TR 12645	211	1ø5.0 c/N	211	6	220
LC73	VTC73a	5	200	6	TR 12645	211	1ø5.0 c/N	211	6	220
LC74	VTC74a	7	200	6	TR 12645	211	1ø5.0 c/N	211	6	220
LC75	VTC75a	4	170	6	TR 12645	181	1ø5.0 c/N	181	6	190
	VTC75b	1	165	6	TR 12645	176	1ø5.0 c/N	176	6	185



Laje	bv (cm)	hv (cm)	Treliça	Altura (cm)	Base (cm)	Armaduras treliça (mm)			S (cm)
						øsup	ødiag	øinf	
LC1	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC2	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC4	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC5	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC6	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC8	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC9	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC11	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC13	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC15	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC16	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC18	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC19	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC20	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC36	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC37	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC38	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC39	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC40	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC41	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC43	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC44	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC45	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC46	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC47	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC48	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC49	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC51	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC52	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC53	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC54	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC55	13	3	TR 12645	12	8	6.0	4.2	5.0	20

LC56	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC57	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC58	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC59	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC60	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC61	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC62	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC63	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC65	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC66	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC67	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC68	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC69	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC70	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC71	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC72	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC73	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC74	13	3	TR 12645	12	8	6.0	4.2	5.0	20
LC75	13	3	TR 12645	12	8	6.0	4.2	5.0	20

Pavimento PLAT. INF.

Resultados dos Pilares

PLAT. INF.	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 4		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P1 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.72 0.26	26 200	177 581	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P2 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	1.56 0.72	726 1254	78 104	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 25	11.88 23.76
P3 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	1.73 0.80	449 723	99 99	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 23.76
P4 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.72 0.24	201 918	28 77	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P8 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.98 0.43	172 397	67 99	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88

							0.5 4 ø 12.5		
P10 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.74 0.27	129 801	132 136	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P12 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.74 0.27	156 377	91 232	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P13 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.95 0.41	72 145	171 775	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P16 1:20	20.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	0.69 0.30	370 636	41 67	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	17.82 23.76
P18 1:20	30.00 X 30.00	520.00 103.00	206.00 EL 103.00 RR	0.76 0.28	30 50	587 1643	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 25	23.76 11.88
P21 1:20	20.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	0.67 0.25	170 265	49 121	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	17.82 23.76
P22 1:20	30.00 X 30.00	520.00 103.00	206.00 EL 103.00 RR	0.92 0.41	43 59	225 435	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	23.76 11.88
P27 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.53 0.11	90 615	23 149	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88
P30 1:20	30.00 X	520.00 103.00	103.00 RR	0.75 0.24	72 521	179 582	2.45 2 ø 12.5	ø 5.0 c/10 ø 5.0 c/10	11.88 11.88

	30.00		103.00 RR				2.45 2 ø 12.5 0.5 4 ø 12.5	25	
P35 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 183.00 RR	2.00 1.18	520 1828	153 591	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	11.88 21.11
P36 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	0.80 0.32	22 282	21 118	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.88 23.76
P37 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	1.27 0.59	113 80	23 534	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.88 23.76
P48 1:20	30.00 X 30.00	520.00 103.00	366.00 EL 183.00 RR	1.09 0.51	71 111	347 1258	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10	42.21 21.11
P59 1:20	30.00 X 30.00	520.00 103.00	366.00 EL 103.00 RR	2.11 1.24	124 131	380 2205	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	42.21 11.88
P69 1:20	20.00 X 30.00	520.00 103.00	103.00 RR 206.00 EL	0.92 0.49	169 287	75 172	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	17.82 23.76
P76 1:20	30.00 X 30.00	520.00 103.00	183.00 RR 103.00 RR	2.31 1.40	95 505	862 1182	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 11.88
P82 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.25	2 108	1074 1581	2.45 2 ø 12.5 2.45 2 ø 12.5 1.3 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	47.52 14.26

P83 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -1.03	18 107	57 113	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P84 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.12 -0.18	3 17	1032 1493	2.45 2 ø 12.5 2.45 2 ø 12.5 1.3 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	47.52 14.26
P85 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.02 -0.14	4 11	118 274	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P86 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.02 -0.19	3 18	93 131	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P87 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.27 0.08	7 5	104 167	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P88 1:20	15.00 X 25.00	520.00 103.00	103.00 RR 103.00 RR	0.56 0.25	215 312	10 184	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	23.76 14.26
P92 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.12 -0.08	16 22	300 704	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P93 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.41	6 22	38 133	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P94 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.22 0.03	4 10	113 216	1.57 2 ø 10.0 1.57 2 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26

							0.8 4 ø 10.0		
P95 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.23	3 9	132 250	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P96 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.34	6 20	82 145	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P97 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.52 0.23	9 13	87 73	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P98 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.06 -0.23	4 5	57 98	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P99 1:20	15.00 X 25.00	520.00 103.00	103.00 RR 103.00 RR	0.35 0.13	42 37	68 606	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	23.76 14.26
P100 1:20	15.00 X 25.00	520.00 103.00	103.00 RR 103.00 RR	0.29 0.05	185 307	57 513	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	23.76 14.26
P101 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.14 -0.02	4 5	90 165	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P104 1:20	15.00 X 35.00	520.00 103.00	103.00 RR 103.00 RR	0.81 0.40	62 138	473 1821	2.45 2 ø 12.5 2.45 2 ø 12.5 0.9 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	23.76 10.18
P105 1:20	30.00 X	520.00 103.00	103.00 RR	1.26 0.55	238 235	281 690	2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15	11.88 11.88

	30.00		103.00 RR				2.45 2 ø 12.5 0.5 4 ø 12.5	25	
P106 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.48 0.21	3 8	444 657	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P107 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.25	7 37	277 387	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P108 1:20	15.00 X 25.00	520.00 103.00	206.00 EL 103.00 RR	0.00 -0.26	4 34	257 365	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 25	47.52 14.26
P109 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.88 0.36	293 1082	123 49	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 25	11.88 11.88
P110 1:20	30.00 X 30.00	520.00 103.00	103.00 RR 103.00 RR	0.68 0.23	109 367	50 50	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 25	11.88 11.88

Vigas do pavimento PLAT. INF.

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VD1	19.39 622.48 203.35	2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3	-34.75 -712.05 -370.52 -374.50 -674.71 -186.27	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	
VD2	5.71	2 ø 8.0		-63.21 -22.59	2 ø 8.0 2 ø 8.0		
VD3	255.05	2 ø 8.0	2 ø 6.3	-175.74 -277.01 -4.45 -16.98 -292.48	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	
VD4	228.69	2 ø 8.0		-17.23 -57.68 -127.35	2 ø 8.0 2 ø 8.0 2 ø 8.0		
VD5	86.20 0.11	2 ø 8.0 2 ø 8.0	2 ø 6.3	-135.78 -26.43 -82.99 -0.77	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	02
VD6	37.76	2 ø 8.0		-81.50 -56.17	2 ø 8.0 2 ø 8.0		
VD7	0.11	2 ø 8.0		-82.13 -49.20	2 ø 8.0 2 ø 8.0		
VD8	3.50	2 ø 8.0		-44.78 -77.78	2 ø 8.0 2 ø 8.0		
VD9	296.19 64.68 69.52 254.73 69.45	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	-553.10 -608.54 -135.89 -275.17 -256.52 -40.09	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3 2 ø 6.3 2 ø 6.3	
VD10	181.30	2 ø 16.0	2 ø 6.3	-243.54 -338.46	2 ø 16.0 2 ø 16.0	2 ø 6.3 2 ø 6.3	
VD11	58.53 86.48	2 ø 8.0 2 ø 8.0	2 ø 6.3	-404.67	2 ø 8.0	2 ø 6.3	
VD12	16.46 102.08 340.23	2 ø 8.0 2 ø 8.0 2 ø 8.0		-14.93 -123.79 -442.11 -433.67	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0		
VD13	77.41	2 ø 8.0		-19.82 -3.77	2 ø 8.0 2 ø 8.0		

VD14	188.57	2 ø 8.0		-212.75 -170.18	2 ø 8.0 2 ø 8.0		
VD15	432.28	2 ø 8.0		-894.51 -827.94	2 ø 8.0 2 ø 8.0		
VD16	180.66	2 ø 8.0	2 ø 6.3	-77.81	2 ø 8.0	2 ø 6.3	
VD17	153.20 28.76	2 ø 8.0 2 ø 8.0		-170.29 -188.73 -94.29	2 ø 8.0 2 ø 8.0 2 ø 8.0		
VD18	110.16 231.88	2 ø 8.0 2 ø 8.0	2 ø 6.3	-162.52 -297.45 -199.18	2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	
VD19	52.47 55.16 14.92	2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3	-32.65 -106.73 -42.93 -41.90	2 ø 8.0 2 ø 8.0 2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	
VD20	18.70	2 ø 8.0		-252.05	2 ø 8.0		
VD21	265.77 44.12	2 ø 8.0 2 ø 8.0		-281.78 -320.91 -128.50	2 ø 8.0 2 ø 8.0 2 ø 8.0		
VD22	76.20	2 ø 8.0	2 ø 6.3	-38.22 -107.42	2 ø 8.0 2 ø 8.0	2 ø 6.3 2 ø 6.3	

Pavimento PLAT. INT.

Resultados dos Pilares

PLAT. INT.	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 5		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P31 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	1.07 0.33	77 306	237 866	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 21.11
P32 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	0.96 0.27	20 16	39 151	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 42.21
P33 1:20	20.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	0.80 0.30	19 32	41 119	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	31.66 42.21
P34 1:20	30.00 X 30.00	600.00 183.00	103.00 RR 366.00 EL	1.83 0.40	165 1393	46 177	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	11.88 42.21
P35 1:20	30.00 X 30.00	600.00 80.00	80.00 RR 183.00 RR	0.84 0.40	271 192	151 217	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	9.23 21.11

							0.5 4 ø 12.5		
P38 1:20	20.00 X 30.00	600.00 183.00	103.00 RR 366.00 EL	1.68 0.27	16 179	43 345	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	17.82 42.21
P39 1:20	30.00 X 30.00	600.00 183.00	103.00 RR 160.00 EL	1.41 0.23	178 664	28 398	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	11.88 18.45
P40 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.12 0.36	77 510	53 142	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 42.21
P41 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.06 0.31	485 1867	38 138	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 42.21
P42 1:20	30.00 X 30.00	600.00 183.00	103.00 RR 366.00 EL	1.65 0.37	270 1770	27 242	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	11.88 42.21
P43 1:20	30.00 X 30.00	600.00 183.00	103.00 RR 183.00 RR	1.88 0.52	193 83	581 2933	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	11.88 21.11
P44 1:20	30.00 X 35.00	600.00 183.00	366.00 EL 183.00 RR	1.14 0.29	29 38	136 538	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	42.21 18.09
P48 1:20	30.00 X 30.00	600.00 80.00	366.00 EL 183.00 RR	0.76 0.33	45 71	368 347	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	42.21 21.11
P56 1:20	30.00 X	600.00 183.00	366.00 EL	1.04 0.24	24 78	88 280	2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15	42.21 18.09

	35.00		183.00 RR				2.45 2 ø 12.5 0.5 4 ø 12.5	30	
P59 1:20	30.00 X 30.00	600.00 80.00	366.00 EL 80.00 RR	0.94 0.45	53 64	407 520	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	42.21 9.23
P61 1:20	30.00 X 30.00	600.00 183.00	366.00 EL 183.00 RR	1.20 0.40	43 56	355 291	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	42.21 21.11
P63 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 566.00 EL	2.60 1.40	241 122	114 153	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 65.28
P64 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	3.47 1.96	120 408	225 374	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 21.11
P65 1:20	15.00 X 30.00	600.00 183.00	566.00 EL 183.00 RR	1.80 0.98	16 92	137 445	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	130.56 21.11
P67 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	1.05 0.30	27 513	187 515	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 21.11
P68 1:20	20.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	0.67 0.16	127 502	201 308	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	31.66 21.11
P70 1:20	30.00 X 30.00	600.00 183.00	160.00 EL 183.00 RR	1.31 0.39	39 312	490 2072	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	18.45 21.11

P72 1:20	20.00 X 30.00	600.00 183.00	566.00 EL 183.00 RR	1.87 1.03	24 243	152 178	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	97.92 21.11
P73 1:20	20.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	0.72 0.20	31 15	91 272	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	31.66 21.11
P74 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.14 0.39	187 556	67 352	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 42.21
P75 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.29 0.50	39 64	81 215	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 42.21
P76 1:20	30.00 X 30.00	600.00 80.00	183.00 RR 80.00 RR	1.07 0.58	302 46	439 127	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	21.11 9.23
P77 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	1.06 0.29	235 503	168 2949	4.02 2 ø 16.0 4.02 2 ø 16.0 0.9 4 ø 16.0	ø 5.0 c/10 ø 5.0 c/10 30	21.11 21.11
P78 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.26 0.48	576 2118	21 126	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 42.21
P79 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 366.00 EL	1.24 0.45	444 1861	79 334	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 42.21
P80 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	2.90 1.55	429 871	209 422	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 21.11

							0.5 4 ø 12.5		
P81 1:20	30.00 X 30.00	600.00 183.00	183.00 RR 183.00 RR	3.57 2.10	412 797	821 2453	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/10 ø 5.0 c/10 30	21.11 21.11
P102 1:20	15.00 X 30.00	600.00 183.00	103.00 RR 183.00 RR	0.40 -0.15	31 39	164 770	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	23.76 21.11
P103 1:20	15.00 X 30.00	600.00 183.00	366.00 EL 183.00 RR	0.58 0.13	5 61	572 1192	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	84.42 21.11

Vigas do pavimento PLAT. INT.

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VE1	36.66	2 ø 8.0		-90.62	2 ø 8.0		
	42.08	2 ø 8.0		-93.66	2 ø 8.0		
	57.74	2 ø 8.0		-106.72	2 ø 8.0		
	131.80	2 ø 8.0		-269.18	2 ø 8.0		
				-262.76	2 ø 8.0		
VE2	32.15	2 ø 8.0		-126.94	2 ø 8.0		
	41.10	2 ø 8.0		-146.50	2 ø 8.0		
	72.58	2 ø 8.0		-190.57	2 ø 8.0		
	103.65	2 ø 8.0		-373.04	2 ø 8.0		
	150.88	2 ø 8.0		-296.65	2 ø 8.0		
	70.57	2 ø 8.0		-212.03	2 ø 8.0		
VE3	36.33	2 ø 8.0		-409.64	2 ø 8.0	2 ø 6.3	
	156.09	2 ø 8.0	2 ø 6.3	-250.53	2 ø 8.0	2 ø 6.3	
VE4	119.78	2 ø 8.0	2 ø 6.3	-39.91	2 ø 8.0	2 ø 6.3	
VE5	50.26	2 ø 8.0		-33.67	2 ø 8.0		
	125.01	2 ø 8.0		-260.47	2 ø 8.0		
	141.62	2 ø 8.0		-283.88	2 ø 8.0		
				-309.52	2 ø 8.0		
VE6	133.27	2 ø 8.0	2 ø 6.3	-230.29	2 ø 8.0	2 ø 6.3	
	212.17	2 ø 8.0		-535.19	2 ø 8.0	2 ø 6.3	
	101.96	2 ø 8.0		-440.10	2 ø 8.0		
	354.61	2 ø 8.0		-772.39	2 ø 8.0		
				-666.32	2 ø 8.0		
VE7	54.92	2 ø 8.0		-180.71	2 ø 8.0		
	46.66	2 ø 8.0		-89.97	2 ø 8.0		
	78.68	2 ø 8.0		-157.47	2 ø 8.0		
				-225.24	2 ø 8.0		
VE8	58.78	2 ø 8.0		-67.36	2 ø 8.0		
				-177.45	2 ø 8.0		
VE9	220.17	2 ø 8.0		-421.92	2 ø 8.0		
	74.18	2 ø 8.0		-444.76	2 ø 8.0		
	100.45	2 ø 8.0	2 ø 6.3	-319.41	2 ø 8.0	2 ø 6.3	
				-106.50	2 ø 8.0	2 ø 6.3	
VE10	166.42	2 ø 8.0	2 ø 6.3	-407.68	2 ø 8.0	2 ø 6.3	
	82.61	2 ø 8.0	2 ø 6.3	-347.49	2 ø 8.0	2 ø 6.3	
	284.80	2 ø 8.0	2 ø 6.3	-265.45	2 ø 8.0	2 ø 6.3	
				-146.15	2 ø 8.0	2 ø 6.3	
VE11	89.62	2 ø 8.0	2 ø 6.3	-57.07	2 ø 8.0	2 ø 6.3	
	106.70	2 ø 8.0	2 ø 6.3	-246.90	2 ø 8.0	2 ø 6.3	
	6.31	2 ø 8.0	2 ø 6.3	-281.01	2 ø 8.0	2 ø 6.3	
VE12	460.65	2 ø 8.0		-1007.01	2 ø 8.0		
	211.99	2 ø 8.0		-908.58	2 ø 8.0		

				-558.16	2 ø 8.0		
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Pavimento PLAT. SUP.

Resultados dos Pilares

PLAT. SUP.	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 6		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P63 1:20	30.00 X 30.00	700.00 100.00	100.00 RR 566.00 EL	0.91 0.40	73 143	43 30	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.53 65.28
P64 1:20	30.00 X 30.00	700.00 100.00	100.00 RR 100.00 RR	0.97 0.42	65 104	420 279	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.53 11.53
P65 1:20	15.00 X 30.00	700.00 100.00	566.00 EL 100.00 RR	0.58 0.26	19 7	57 73	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	130.56 11.53
P72 1:20	20.00 X 30.00	700.00 100.00	566.00 EL 100.00 RR	0.61 0.28	11 47	80 38	1.57 2 ø 10.0 1.57 2 ø 10.0 0.5 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 30	97.92 11.53
P80 1:20	30.00 X 30.00	700.00 100.00	100.00 RR 100.00 RR	0.86 0.35	387 182	48 119	2.45 2 ø 12.5 2.45 2 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.53 11.53

							0.5 4 ø 12.5		
P81 1:20	30.00 X 30.00	700.00 100.00	100.00 RR 100.00 RR	1.17 0.59	284 249	491 209	2.45 2 ø 12.5 2.45 2 ø 12.5 0.5 4 ø 12.5	ø 5.0 c/15 ø 5.0 c/15 30	11.53 11.53

Vigas do pavimento PLAT. SUP.

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VF1	18.66	2 ø 8.0		-257.71	2 ø 8.0		
	83.87	2 ø 8.0		-83.95	2 ø 8.0		
VF2	172.18	2 ø 8.0		-374.07	2 ø 8.0		
				-296.82	2 ø 8.0		
VF3	46.63	2 ø 8.0		-24.91	2 ø 8.0		
	46.95	2 ø 8.0		-122.28	2 ø 8.0		
	2.92	2 ø 8.0		-136.68	2 ø 8.0		
				-1.28	2 ø 8.0		
VF4	223.39	2 ø 8.0		-490.02	2 ø 8.0		
				-411.51	2 ø 8.0		

6. MEMÓRIA DE CÁLCULO (EDÍCULA DE RESIDUOS)

Pavimento TÉRREO

Vigas do pavimento TÉRREO

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VA1	85.95	2 ø 8.0		-181.96	2 ø 8.0		48
				-172.45	2 ø 8.0		
VA2	168.87	2 ø 8.0		-4.75	2 ø 16.0		
				-53.39	2 ø 16.0		
VA3	59.92	2 ø 8.0		-208.89	2 ø 16.0		48
				-183.48	2 ø 16.0		
VA4	175.60	2 ø 8.0		-48.15	2 ø 16.0		
VA5	90.52	2 ø 8.0		-198.49	2 ø 8.0		48
				-160.64	2 ø 8.0		
VA6	612.02	2 ø 8.0		-511.58	2 ø 8.0		48
	393.03	2 ø 8.0		-880.63	2 ø 8.0		
				-324.49	2 ø 8.0		
VA7	502.75	2 ø 8.0		-262.81	2 ø 8.0		26, 48

	510.04	3 ø 8.0		-0.04	2 ø 8.0		
	474.30	3 ø 8.0		-1079.35	2 ø 10.0		
				-183.40	2 ø 10.0		

Pavimento COB. RESIDUOS

Resultados dos Pilares

COB. RESIDUOS	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 2		cobr = 2.50 cm	

Dados				Resultados					
Pilar	Seção (cm)	Nível Altura (cm)	leb vínc leh vínc (cm)	Nd máx Nd mín (tf)	MBd topo MBd base (kgf.m)	MHd topo MHd base (kgf.m)	As b Armaduras As h % armad total	Estribo Topo Base cota	Esb b Esb h
P1 1:20	15.00 X 25.00	279.00 284.00	284.00 RR 284.00 RR	1.42 0.52	100 132	88 84	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	65.51 39.31
P2 1:20	15.00 X 25.00	279.00 284.00	284.00 RR 284.00 RR	1.40 0.51	79 86	92 90	1.57 2 ø 10.0 1.57 2 ø 10.0 0.8 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	65.51 39.31
P3 1:20	14.00 X 30.00	279.00 284.00	284.00 RR 284.00 RR	3.14 1.57	62 71	190 145	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	70.19 32.75
P4 1:20	14.00 X 30.00	279.00 284.00	284.00 RR 284.00 RR	3.09 1.54	57 58	198 151	1.57 2 ø 10.0 1.57 2 ø 10.0 0.7 4 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 57	70.19 32.75
P5 1:20	15.00 X 25.00	279.00 284.00	284.00 RR 284.00 RR	1.64 0.67	137 204	90 84	1.57 2 ø 10.0 1.57 2 ø 10.0	ø 5.0 c/12 ø 5.0 c/12 60	65.51 39.31

							0.8 4 ø 10.0		
P6	15.00	279.00	284.00	1.61	102	89	1.57 2 ø 10.0	ø 5.0 c/12	65.51
1:20	X 25.00	284.00	284.00 RR	0.64	121	89	1.57 2 ø 10.0	ø 5.0 c/12	39.31
							0.8 4 ø 10.0	60	

Vigas do pavimento COB. RESIDUOS

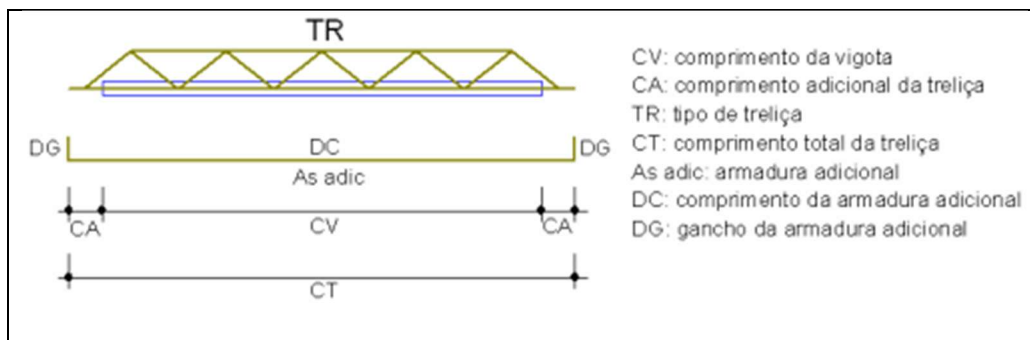
Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VB1	50.63	2 ø 10.0		-123.23 -126.91	2 ø 10.0 2 ø 10.0		
VB2	19.84	2 ø 8.0		-16.89 -14.70	2 ø 8.0 2 ø 8.0		
VB3	34.77	2 ø 8.0		-116.08 -109.29	2 ø 8.0 2 ø 8.0		
VB4	21.79	2 ø 8.0		-15.17 -10.50	2 ø 8.0 2 ø 8.0		
VB5	44.94	2 ø 10.0		-134.23 -133.97	2 ø 10.0 2 ø 10.0		
VB6	590.25 308.36	2 ø 10.0 2 ø 10.0		-134.32 -702.89 -99.37	2 ø 10.0 2 ø 10.0 2 ø 10.0		
VB7	584.60 306.44	2 ø 10.0 2 ø 10.0		-104.98 -695.88 -80.02	2 ø 10.0 2 ø 10.0 2 ø 10.0		

Resultados da Laje

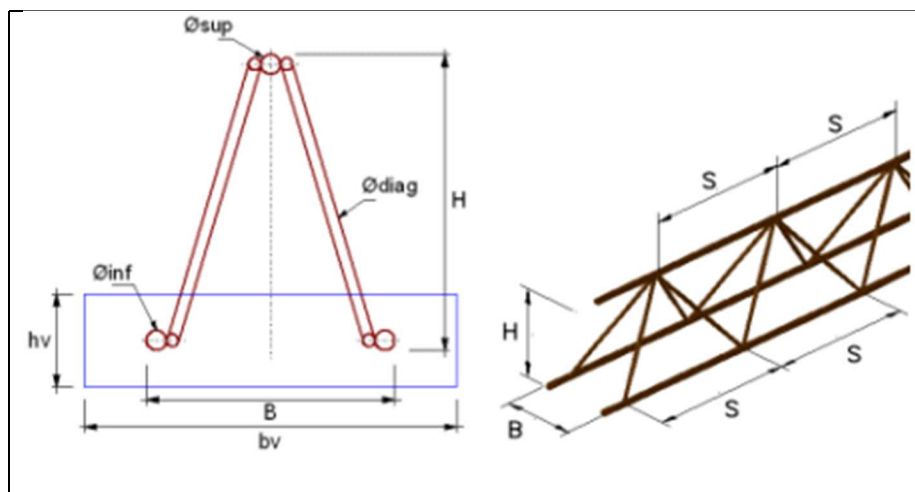
COB. RESIDUOS	fck = 350.00 kgf/cm ²	E = 294029 kgf/cm ²	Peso Espec = 2500.00 kgf/m ³
Lance 2		cobr = 2.00 cm	

Nome	Espessura (cm)	Carga (kgf/m ²)	Mdx (kgf.m/m)	Mdy (kgf.m/m)	Asx	Asy
LB1	13	447.78	134		As = 0.50 cm ² /N (TR 08844 - 0.28 cm ² /N) (1ø6.3 c/N - 0.31 cm ² /N)	
LB2	13	447.78	131		As = 0.50 cm ² /N (TR 08844 - 0.28 cm ² /N) (1ø6.3 c/N - 0.31 cm ² /N)	
LB3	13	447.78	191		As = 0.50 cm ² /N (TR 08844 - 0.28 cm ² /N) (1ø6.3 c/N - 0.31 cm ² /N)	
LB4	13	447.78	137		As = 0.50 cm ² /N (TR 08844 - 0.28 cm ² /N) (1ø6.3 c/N - 0.31 cm ² /N)	

Vigotas pré-moldadas - Lajes do pavimento COB. RESIDUOS



Laje	Vigota	Quant.	Compr. (cm)	Compr. Adic. (cm)	Treliça		Armadura adicional			
					Tipo	Compr. (cm)	Armadura	Compr. (cm)	Gancho (cm)	Total (cm)
LB1	VTB1a	2	130	6	TR 08844	141	1ø6.3 c/N	141	7	152
LB2	VTB2a	2	130	6	TR 08844	141	1ø6.3 c/N	141	7	152
LB3	VTB3a	3	130	6	TR 08844	141	1ø6.3 c/N	141	7	152
LB4	VTB4a	2	130	6	TR 08844	141	1ø6.3 c/N	141	7	152



Laje	bv (cm)	hv (cm)	Treliça	Altura (cm)	Base (cm)	Armaduras treliça (mm)			S (cm)
						øsup	ødiag	øinf	
LB1	13	3	TR 08844	8	8	8.0	4.2	4.2	20

LB2	13	3	TR 08844	8	8	8.0	4.2	4.2	20
LB3	13	3	TR 08844	8	8	8.0	4.2	4.2	20
LB4	13	3	TR 08844	8	8	8.0	4.2	4.2	20