MEMÓRIA DE CÁLCULO – ESTRUTURA DE CONCRETO ARMADO E FUNDAÇÕES

CEM QUADRA 04 AE 02 - ESTRUTURAL

(CAIXA ELEVADA DE REUSO)

Autor do Projeto: Eng. Civil Dalmo Blanco Cinnanti

CREA: 7962/D-DF

MEMÓRIA DE CALCULO ESTRUTURAL

R01	29/12/2022	Versão inicial	DALMO CINNANTI
REVISÃO	DATA	DESCRIÇÃO	RESPONSÁVEL
Nome do projeto		*MEMÓRIA DE CÁLCULO – ESTRUTURA DE CONCRETO ARMADO – CEM ESTRUTURAL*	
Número do projeto		*314-SEEDF-CEM-ESTRUTURAL QD. 04 - MEM-CAIXA D'ÁGUA REUSO-EST-R01*	
Local		**Quadra 04 AE 02 - RA XXV - SCIA / ESTRUTURAL - Vila Estrutural - DF**	

Sumário

Memorial de cálculo

Resumo de resultados

1. Cargas verticais:

Peso próprio = 78.75 tf

Adicional = 16.35 tf

Acidental = 6.41 tf

Água = 37.60 tf

Total = 139.11 tf

Área aproximada = 48.41 m²

Relação = 2873.39 kgf/m²

AVISO: Relação de carga por área não usual para edifícios

2. Deslocamento horizontal:

X+ = 0.10 cm (limite 0.83)

X- = 0.10 cm (limite 0.83)

Y+ = 0.13 cm (limite 0.83)

Y- = 0.13 cm (limite 0.83)

3. Verificação de estabilidade (Gama-Z):

X+ = 1.03 (limite 1.10)

X- = 1.03 (limite 1.10)

Y+ = 1.05 (limite 1.10)

Y- = 1.03 (limite 1.10)

4. Análise de 2ª ordem:

Processo P-Delta

Deslocamentos no topo da edificação:

Acidental: 0.01 »» 0.01 (+1.76%)

Água: 0.16 »» 0.16 (+1.94%)

Vento X+: 0.73 »» 0.75 (+2.95%)

Vento X-: 0.73 »» 0.75 (+2.95%)

Vento Y+: 0.82 »» 0.86 (+4.60%)

Vento Y-: 0.82 »» 0.86 (+4.60%)

Desaprumo X+: 0.08 »» 0.08 (+2.95%)

Desaprumo X-: 0.08 »» 0.08 (+2.95%)

Desaprumo Y+: 0.10 »» 0.10 (+4.58%)

Desaprumo Y-: 0.10 »» 0.10 (+4.58%)

Verificação da Estabilidade Global da Estrutura

a) Maior coeficiente Gama-Z

Combinação: 1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3							
Pavimento	**Altura relativa (cm)**	**Carga vertical (tf)**	**Carga horizontal (tf)**	**Deslocamento horizontal (cm)**	**Momento 2a. ordem (kgf.m)**	**Momento tombamento (kgf.m)**	**Gama-Z**
NV-1324	1419.00	70.27	0.64	1.10	771.48	9143.77	
NV-921	1016.00	45.54	0.95	0.80	363.41	9614.97	
NV-701	796.00	25.49	0.91	0.71	180.25	7224.82	1.05
NV-245	340.00	22.42	0.82	0.26	57.26	2800.63	(lim=1.10)
NV-000	80.00	15.65	0.07	0.02	3.27	53.29	
TOTAL					**1375.67**	**28837.48**	

b) Limitações

Em estruturas com Gama-Z maior que 1.10 é necessário fazer a verificação dos efeitos de 2ª ordem com a análise P-Delta.

O Gama-Z é um parâmetro de estabilidade para avaliação de estruturas simétricas (tanto geometria quanto carregamento) e edificações com mais de 4 pavimentos. Nos demais casos, recomenda-se a verificação dos efeitos de 2ª ordem com a análise P-Delta.

c) Coeficiente Gama-Z por combinação

Combinação	Momento 2a. ordem (kgf.m)	Momento tombamento (kgf.m)	Gama-Z
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+1.11D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+1.11D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+1.11D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+1.11D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+1.4V1+0.67D1	1444.24	58599.75	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+1.4V2+0.67D2	1444.27	58599.75	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+1.4V3+0.67D3	2003.12	48062.46	1.04
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T1+1.4V4+0.67D4	1252.24	48062.46	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+1.11D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+1.11D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+1.11D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+1.11D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+1.4V1+0.67D1	1444.24	58599.75	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+1.4V2+0.67D2	1444.27	58599.75	1.03
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+1.4V3+0.67D3	2003.12	48062.46	1.04
1.3G1+1.4G2+1.4S+0.98Q+1.2A+1.1AS+0.72T2+1.4V4+0.67D4	1252.24	48062.46	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+1.11D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+1.11D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+1.11D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+1.11D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V1+0.67D1	1444.24	58599.75	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V2+0.67D2	1444.27	58599.75	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V3+0.67D3	2003.12	48062.46	1.04
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V4+0.67D4	1252.24	48062.46	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+1.11D1	926.81	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+1.11D2	926.83	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+1.11D3	1351.65	28837.48	1.05
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+1.11D4	602.35	28837.48	1.02
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V1+0.67D1	1444.24	58599.75	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V2+0.67D2	1444.27	58599.75	1.03
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V3+0.67D3	2003.12	48062.46	1.04
1.3G1+1.4G2+1.4S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V4+0.67D4	1252.24	48062.46	1.03
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	942.69	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	942.71	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	**1375.67**	**28837.48**	**1.05**
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	607.75	28837.48	1.02

1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	942.69	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	942.71	35159.85	1.03
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1375.67	28837.48	1.05
1.3G1+1.4G2+1.4S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	607.75	28837.48	1.02
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	942.69	35159.85	1.03
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	942.71	35159.85	1.03
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	1375.67	28837.48	1.05
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	607.75	28837.48	1.02
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	942.69	35159.85	1.03
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	942.71	35159.85	1.03
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1375.67	28837.48	1.05
1.3G1+1.4G2+1.4S+1.4Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	607.75	28837.48	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	771.04	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V1+1.11D1	771.04	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	771.06	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V2+1.11D2	771.06	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	1115.08	28837.48	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V3+1.11D3	1115.08	28837.48	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	538.67	28837.48	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+0.84V4+1.11D4	538.67	28837.48	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V1+0.67D1	1215.32	58599.75	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V2+0.67D2	1215.34	58599.75	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V3+0.67D3	1666.68	48062.46	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T1+1.4V4+0.67D4	1089.36	48062.46	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	771.04	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V1+1.11D1	771.04	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	771.06	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V2+1.11D2	771.06	35159.85	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1115.08	28837.48	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V3+1.11D3	1115.08	28837.48	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	538.67	28837.48	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+0.84V4+1.11D4	538.67	28837.48	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V1+0.67D1	1215.32	58599.75	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V2+0.67D2	1215.34	58599.75	1.02
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V3+0.67D3	1666.68	48062.46	1.04
G1+G2+S+1.2R+0.98Q+1.2A+1.1AS+0.72T2+1.4V4+0.67D4	1089.36	48062.46	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V1+0.67D1	786.15	35159.85	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V2+0.67D2	786.17	35159.85	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V3+0.67D3	1138.00	28837.48	1.04
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T1+0.84V4+0.67D4	545.14	28837.48	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V1+0.67D1	786.15	35159.85	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V2+0.67D2	786.17	35159.85	1.02
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V3+0.67D3	1138.00	28837.48	1.04
G1+G2+S+1.2R+1.4Q+1.2A+1.1AS+0.72T2+0.84V4+0.67D4	545.14	28837.48	1.02

Pavimento NV-000

1. Resultado dos Blocos

NV-000	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 1		cobr = 4.50 cm	

Blocos	ne Estaca	LB LH (cm)	hb (cm)	Principal (cm²)		Estribo (cm²)		Superior (cm²)		As dist. (cm²)
				X	Y	Hor.	Vert.	X	Y	
B1	3 C40-17m	200.83 173.92	65.00	7.85 (10 ø 10.0)	-	3.93 (5 ø 10.0)	-	7.07 (9 ø 10.0)	7.85 (10 ø 10.0)	2.01 (ø 8.0 c/20)
B2	3 C40-17m	200.83 173.92	65.00	7.85 (10 ø 10.0)	-	3.93 (5 ø 10.0)	-	7.07 (9 ø 10.0)	7.85 (10 ø 10.0)	2.01 (ø 8.0 c/20)
B5	3 C40-17m	200.83 173.92	65.00	8.64 (11 ø 10.0)	-	3.93 (5 ø 10.0)	-	7.07 (9 ø 10.0)	7.85 (10 ø 10.0)	2.26 (ø 8.0 c/20)
B6	3 C40-17m	200.83 173.92	65.00	8.64 (11 ø 10.0)	-	3.93 (5 ø 10.0)	-	7.07 (9 ø 10.0)	7.85 (10 ø 10.0)	2.26 (ø 8.0 c/20)

2. Cálculo dos Pilares

	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 1		cobr = 3.00 cm	

Pilar	Seção (cm)	vínc esb B vínc esb H	Nd máx Nd mín (tf)	Msd(x) Msd(y) (kgf.m)	Mrd(x) Mrd(y) (kgf.m)	Mrd/Msd	As b As h (cm²)
P1	20.00 X 60.00	RR 13.49 RR 4.50	45.22 21.51	1771 5086	3132 8996	(*) 1.77	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P2	20.00 X 60.00	RR 13.49 RR 4.50	45.22 21.51	1771 5086	3132 8997	(*) 1.77	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P5	20.00 X 60.00	RR 12.97 RR 4.33	55.36 24.20	2452 5045	3685 7582	(*) 1.50	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P6	20.00 X 60.00	RR 12.97 RR 4.33	55.36 24.20	2452 5045	3685 7582	(*) 1.50	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)

(*) Quantidade de barras alterada pelo usuário (para mais)

3. Vigas do pavimento NV-000

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
VB1	840.69	2 ø 10.0		-1295.43 -1295.40	2 ø 10.0 2 ø 10.0		Aviso 26
VB2	838.25	2 ø 10.0		-1154.86 -1154.89	2 ø 10.0 2 ø 10.0		Aviso 26
VB3	15156.25	2 ø 22.2		-4766.18 -4234.57	2 ø 12.5 2 ø 12.5		Avisos 13, 38
VB4	15156.09	2 ø 22.2		-4766.12 -4234.59	2 ø 12.5 2 ø 12.5		Avisos 13, 38

Pavimento NV-245

1. Cálculo dos Pilares

NV-245	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 2		cobr = 3.00 cm	

Pilar	Seção (cm)	vínc esb B vínc esb H	Nd máx Nd mín (tf)	Msd(x) Msd(y) (kgf.m)	Mrd(x) Mrd(y) (kgf.m)	Mrd/Msd	As b As h (cm²)
P1	20.00 X 60.00	RR 44.98 RR 14.99	36.73 16.09	2778 1208	4573 1988	(*) 1.65	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P2	20.00 X 60.00	RR 44.98 RR 14.99	36.73 16.09	2778 1208	4573 1988	(*) 1.65	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P5	20.00 X 60.00	RR 44.98 RR 14.99	39.96 15.67	2087 2068	4134 4096	(*) 1.98	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P6	20.00 X 60.00	RR 44.98 RR 14.99	39.96 15.67	2087 2068	4134 4096	(*) 1.98	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P7	15.00 X 60.00	RR 59.97 RR 14.99	21.66 7.54	441 10340	540 12647	(*) 1.22	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P8	15.00 X 60.00	RR 59.97 RR 14.99	21.66 7.54	441 10340	540 12647	(*) 1.22	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)

(*) Quantidade de barras alterada pelo usuário (para mais)

2. Vigas do pavimento NV-245

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
V101	1369.29	2 ø 10.0		-2616.67 -2616.58	2 ø 10.0 2 ø 10.0		
V102	1158.89	2 ø 10.0		-1068.55 -1068.57	2 ø 10.0 2 ø 10.0		
V103	1907.74	2 ø 10.0		-4314.86 -4314.97	2 ø 12.5 2 ø 12.5		Avisos 26, 48
V104	3924.79	2 ø 10.0		-2293.49 -3917.05	2 ø 10.0 2 ø 12.5		
V105	3924.88	2 ø 10.0		-2293.41 -3917.12	2 ø 10.0 2 ø 12.5		

3. Cálculos das Lajes

	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 2		cobr = 2.50 cm	

Laje	Direção	Momento positivo		Momento negativo	Armadura inferior	Cisalhamento
		Seção	Flexão	Seção		
L101	X	bw = 100.0 cm h = 15.0 cm	Md = 757 kgf.m/m As = 1.45 cm²/m A's = 0.00 cm²/m	bw = 100.0 cm h = 15.0 cm	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 324.53 kgf.m/m F = 0.00 tf fiss = 0.04 mm	vsd = 0.98 tf/m vrd1 = 8.16 tf/m Modelo II vrd2 = 59.49 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	bw = 100.0 cm h = 15.0 cm	Md = 757 kgf.m/m As = 1.53 cm²/m A's = 0.00 cm²/m	bw = 100.0 cm h = 15.0 cm	As = 1.53 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 341.99 kgf.m/m F = 0.00 tf fiss = 0.04 mm	vsd = 1.03 tf/m vrd1 = 7.79 tf/m vrd2 = 56.29 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m

Pavimento NV-701

1. Cálculo dos Pilares

NV-701	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 3		cobr = 3.00 cm	

Pilar	Seção (cm)	vínc esb B vínc esb H	Nd máx Nd mín (tf)	Msd(x) Msd(y) (kgf.m)	Mrd(x) Mrd(y) (kgf.m)	Mrd/Msd	As b As h (cm²)
P1	20.00 X 60.00	RR 78.89 RR 26.30	30.02 12.64	3404 1552	4206 1918	(*) 1.24	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P2	20.00 X 60.00	RR 78.89 RR 26.30	30.02 12.64	3404 1552	4206 1918	(*) 1.24	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P5	20.00 X 60.00	RR 78.89 RR 26.30	34.96 12.74	2581 1468	4386 2494	(*) 1.70	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P6	20.00 X 60.00	RR 78.89 RR 26.30	34.96 12.74	2581 1468	4386 2494	(*) 1.70	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P7	15.00 X 60.00	RR 105.18 RR 26.30	16.01 4.82	1438 2431	2016 3409	(*) 1.40	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P8	15.00 X 60.00	RR 105.18 RR 26.30	16.01 4.82	1438 2431	2016 3409	(*) 1.40	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)

(*) Quantidade de barras alterada pelo usuário (para mais)

2. Vigas do pavimento NV-701

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
V201	2109.47	2 ø 12.5		-3194.92 -3194.77	2 ø 12.5 2 ø 12.5		
V202	1341.44	2 ø 10.0		-664.63 -664.64	2 ø 10.0 2 ø 10.0		
V203	1622.22	2 ø 20.0	2 ø 20.0	-2892.88 -2892.97	2 ø 20.0 2 ø 20.0	2 ø 20.0 2 ø 20.0	Aviso 26
V204	11944.58	2 ø 20.0		-4163.93 -4617.69	2 ø 12.5 2 ø 12.5		Aviso 04
V205	11944.63	2 ø 20.0		-4163.84 -4617.74	2 ø 12.5 2 ø 12.5		Aviso 04

3. Cálculos das Lajes

NV-701	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 3		cobr = 2.50 cm	

Laje	Direção	Momento positivo		Momento negativo	Armadura inferior	Cisalhamento
		Seção	Flexão	Seção		
L201	X	bw = 100.0 cm h = 15.0 cm	Md = 757 kgf.m/m As = 1.45 cm²/m A's = 0.00 cm²/m	bw = 100.0 cm h = 15.0 cm	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 331.50 kgf.m/m F = 0.00 tf fiss = 0.04 mm	vsd = 1.08 tf/m vrd1 = 8.16 tf/m Modelo II vrd2 = 59.49 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	bw = 100.0 cm h = 15.0 cm	Md = 757 kgf.m/m As = 1.53 cm²/m A's = 0.00 cm²/m	bw = 100.0 cm h = 15.0 cm	As = 1.53 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 332.79 kgf.m/m F = 0.00 tf fiss = 0.04 mm	vsd = 1.09 tf/m vrd1 = 7.79 tf/m vrd2 = 56.29 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m

Pavimento NV-921

1. Cálculo dos Pilares

NV-921	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 4		cobr = 3.00 cm	

Pilar	Seção (cm)	vínc esb B vínc esb H	Nd máx Nd mín (tf)	Msd(x) Msd(y) (kgf.m)	Mrd(x) Mrd(y) (kgf.m)	Mrd/Msd	As b As h (cm²)
P1	20.00 X 60.00	RR 107.78 RR 12.69	13.24 6.47	2613 1250	3196 1528	(*) 1.22	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P2	20.00 X 60.00	RR 107.78 RR 12.69	13.23 6.47	2613 1250	3196 1528	(*) 1.22	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P3	15.00 X 60.00	RR 50.75 RR 12.69	21.57 6.67	1095 5617	1321 6776	(*) 1.21	1.57 (2 ø 10.0) 2.36 (3 ø 10.0)
P4	15.00 X 60.00	RR 50.75 RR 12.69	21.57 6.67	1095 5617	1321 6776	(*) 1.21	1.57 (2 ø 10.0) 2.36 (3 ø 10.0)
P5	20.00 X 60.00	RR 38.06 RR 12.69	30.37 11.00	749 4705	2000 12555	(*) 2.67	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P6	20.00 X 60.00	RR 38.06 RR 12.69	30.37 11.00	749 4705	2000 12555	(*) 2.67	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)

(*) Quantidade de barras alterada pelo usuário (para mais)

Vigas do pavimento NV-921

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
V301	1153.29	2 ø 10.0		-2016.54 -2016.47	2 ø 10.0 2 ø 10.0		

Pavimento NV-1324

1. Cálculo dos Pilares

NV-1324	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 5		cobr = 3.00 cm	

Pilar	Seção (cm)	vínc esb B vínc esb H	Nd máx Nd mín (tf)	Msd(x) Msd(y) (kgf.m)	Mrd(x) Mrd(y) (kgf.m)	Mrd/Msd	As b As h (cm²)
P1	20.00 X 60.00	RR 107.78 RR 23.24	9.54 3.63	2045 3606	2589 4566	(*) 1.27	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P2	20.00 X 60.00	RR 107.78 RR 23.24	9.54 3.63	2045 3606	2589 4566	(*) 1.27	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P3	15.00 X 60.00	RR 92.96 RR 23.24	9.14 -1.51	906 1772	1377 2692	(*) 1.52	1.57 (2 ø 10.0) 2.36 (3 ø 10.0)
P4	15.00 X 60.00	RR 92.96 RR 23.24	9.14 -1.51	906 1772	1377 2692	(*) 1.52	1.57 (2 ø 10.0) 2.36 (3 ø 10.0)
P5	20.00 X 60.00	RR 69.72 RR 23.24	22.33 0.10	1464 2247	3263 5010	(*) 2.23	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)
P6	20.00 X 60.00	RR 69.72 RR 23.24	22.33 0.10	1464 2247	3263 5010	(*) 2.23	2.45 (2 ø 12.5) 3.68 (3 ø 12.5)

(*) Quantidade de barras alterada pelo usuário (para mais)

2. Vigas do pavimento NV-1324

Viga	Vãos			Nós			Avisos
	Md (kgf.m)	As	Als	Md (kgf.m)	As	Als	
V401	1157.87	2 ø 10.0	2 ø 10.0	-1581.53 -1581.46	2 ø 10.0 2 ø 10.0	2 ø 6.3 2 ø 6.3	
V402	0.11	4 ø 6.3		-3.04 -15.74	4 ø 6.3 4 ø 6.3		Aviso 02
V403	1933.73	8 ø 10.0	8 ø 10.0	-1075.13	8 ø 10.0	8 ø 6.3	Aviso 38
V404	0.11	4 ø 6.3		-3.04 -15.74	4 ø 6.3 4 ø 6.3		Aviso 02
V405	1933.73	8 ø 10.0	8 ø 10.0	-1075.13	8 ø 10.0	8 ø 6.3	Aviso 38

Cálculos do Reservatório

NV-1324	fck = 300.00 kgf/cm²	E = 268384 kgf/cm²	Peso Espec = 2500.00 kgf/m³
Lance 5		cobr = 3.00 cm	

1. Reservatório SUPERIOR

ARMADURAS POSITIVAS (LAJE)										
Trecho	Direção	Momento positivo			Momento negativo			Armadura inferior	Armadura superior	Cisalhamento
		Flexão	Verificação axial (compressão)	Verificação axial (tração)	Flexão	Verificação axial (compressão)	Verificação axial (tração)			
L301	X	Md = 757 kgf.m/m As = 1.54 cm²/m A's = 0.00 cm²/m		Fd = 8.35 tf Situação: GE As = 2.34 cm²/m A's = 0.00 cm²/m	Md = 1419 kgf.m/m As = 2.96 cm²/m A's = 0.00 cm²/m		Fd = 8.35 tf Situação: GE As = 4.19 cm²/m A's = 0.00 cm²/m	As = 2.34 cm²/m ø10.0 c/20 (3.93 cm²/m) M = 437.63 kgf.m/m F = 5.55 tf fiss = 0.05 mm		vsd = 4.71 tf/m vrd1 = 8.26 tf/m Modelo II vrd2 = 56.01 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.67 cm²/m A's = 0.00 cm²/m		Fd = 6.35 tf Situação: PE As = 1.21 cm²/m A's = 0.38 cm²/m	Md = 692 kgf.m/m As = 1.54 cm²/m A's = 0.00 cm²/m	Fd = 0.31 tf Situação: GE As = 1.49 cm²/m A's = 0.00 cm²/m	Fd = 6.35 tf Situação: GE As = 2.57 cm²/m A's = 0.00 cm²/m	As = 1.67 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 103.82 kgf.m/m F = 3.76 tf fiss = 0.02 mm		vsd = 3.16 tf/m vrd1 = 7.42 tf/m vrd2 = 51.42 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L302	X	Md = 757		Fd = 8.35 tf	Md = 1419		Fd = 8.35 tf	As = 2.34 cm²/m ø10.0 c/20		vsd = 4.71 tf/m

		kgf.m/m As = 1.54 cm²/m A's = 0.00 cm²/m		Situação: GE As = 2.34 cm²/m A's = 0.00 cm²/m	kgf.m/m As = 2.96 cm²/m A's = 0.00 cm²/m		Situação: GE As = 4.19 cm²/m A's = 0.00 cm²/m	(3.93 cm²/m) M = 437.65 kgf.m/m F = 5.55 tf fiss = 0.05 mm		vrd1 = 8.26 tf/m Modelo II vrd2 = 56.01 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.67 cm²/m A's = 0.00 cm²/m		Fd = 6.35 tf Situação: PE As = 1.21 cm²/m A's = 0.38 cm²/m	Md = 692 kgf.m/m As = 1.54 cm²/m A's = 0.00 cm²/m	Fd = 0.31 tf Situação: GE As = 1.49 cm²/m A's = 0.00 cm²/m	Fd = 6.35 tf Situação: GE As = 2.57 cm²/m A's = 0.00 cm²/m	As = 1.67 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 103.84 kgf.m/m F = 3.76 tf fiss = 0.02 mm		vsd = 3.16 tf/m vrd1 = 7.42 tf/m vrd2 = 51.42 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L405	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m	Fd = 1.72 tf Situação: GE As = 0.21 cm²/m A's = 0.00 cm²/m	Fd = 0.75 tf Situação: GE As = 0.57 cm²/m A's = 0.00 cm²/m	Md = 368 kgf.m/m As = 0.60 cm²/m A's = 0.00 cm²/m	Fd = 1.72 tf Situação: GE As = 0.40 cm²/m A's = 0.00 cm²/m	Fd = 0.75 tf Situação: GE As = 0.69 cm²/m A's = 0.00 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 173.38 kgf.m/m F = 0.48 tf fiss = 0.01 mm		vsd = 2.66 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 828 kgf.m/m As = 1.77 cm²/m A's = 0.00 cm²/m	Fd = 4.26 tf Situação: GE As = 1.11 cm²/m A's = 0.00 cm²/m		Md = 149 kgf.m/m As = 0.26 cm²/m A's = 0.00 cm²/m			As = 1.77 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 601.59 kgf.m/m F = 0.00 tf fiss = 0.08 mm		vsd = 2.79 tf/m vrd1 = 7.65 tf/m vrd2 = 53.31 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L406	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m	Fd = 1.72 tf Situação: GE As = 0.21 cm²/m A's = 0.00 cm²/m	Fd = 0.75 tf Situação: GE As = 0.57 cm²/m A's = 0.00 cm²/m	Md = 368 kgf.m/m As = 0.60 cm²/m A's = 0.00 cm²/m	Fd = 1.72 tf Situação: GE As = 0.40 cm²/m A's = 0.00 cm²/m	Fd = 0.75 tf Situação: GE As = 0.69 cm²/m A's = 0.00 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 173.38 kgf.m/m F = 0.48 tf fiss = 0.01 mm		vsd = 2.66 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 828 kgf.m/m As = 1.77 cm²/m A's = 0.00 cm²/m	Fd = 4.26 tf Situação: GE As = 1.11 cm²/m A's = 0.00 cm²/m		Md = 149 kgf.m/m As = 0.26 cm²/m A's = 0.00 cm²/m			As = 1.77 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 601.57 kgf.m/m F = 0.00 tf fiss = 0.08 mm		vsd = 2.79 tf/m vrd1 = 7.65 tf/m vrd2 = 53.31 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L407	X	Md = 2329 kgf.m/m	Fd = 0.30 tf Situação: GE As = 5.01 cm²/m	Fd = 0.31 tf Situação: GE	Md = 707 kgf.m/m	Fd = 0.30 tf Situação: GE As = 1.37 cm²/m	Fd = 0.31 tf Situação: GE	As = 5.10 cm²/m ø16.0 c/20 (10.05 cm²/m)	A's = 2.25 cm²/m ø8.0 c/20 (2.51 cm²/m)	vsd = 4.30 tf/m vrd1 = 9.41 tf/m Modelo II

		As = 5.06 cm²/m A's = 0.00 cm²/m	A's = 0.00 cm²/m	As = 5.10 cm²/m A's = 0.00 cm²/m	As = 1.41 cm²/m A's = 0.00 cm²/m	A's = 0.00 cm²/m	As = 1.46 cm²/m A's = 0.00 cm²/m	M = 1702.91 kgf.m/m F = 0.16 tf fiss = 0.08 mm	M = 529.72 kgf.m/m F = 0.16 tf fiss = 0.08 mm	vrd2 = 54.48 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 1133 kgf.m/m As = 2.72 cm²/m A's = 0.00 cm²/m		Fd = 0.20 tf Situação: GE As = 2.75 cm²/m A's = 0.00 cm²/m	Md = 1474 kgf.m/m As = 3.63 cm²/m A's = 0.00 cm²/m		Fd = 0.20 tf Situação: GE As = 3.66 cm²/m A's = 0.00 cm²/m	As = 2.75 cm²/m ø10.0 c/20 (3.93 cm²/m) M = 832.82 kgf.m/m F = 0.13 tf fiss = 0.10 mm	A's = 5.15 cm²/m ø12.5 c/20 (6.14 cm²/m) M = 1031.22 kgf.m/m F = 0.13 tf fiss = 0.08 mm	vsd = 9.02 tf/m vrd1 = 7.31 tf/m vrd2 = 47.86 tf/m vsw = 0.86 tf/m asw = 4.06 cm²/m
L408	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m			Md = 22 kgf.m/m As = 0.04 cm²/m A's = 0.00 cm²/m			As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 4.54 kgf.m/m F = 0.00 tf fiss = 0.00 mm	A's = 2.25 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 14.58 kgf.m/m F = 0.00 tf fiss = 0.00 mm	vsd = 0.27 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m	Fd = 0.62 tf Situação: GE As = 0.33 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.43 cm²/m A's = 0.00 cm²/m	Md = 251 kgf.m/m As = 0.44 cm²/m A's = 0.00 cm²/m	Fd = 0.62 tf Situação: GE As = 0.36 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.44 cm²/m A's = 0.00 cm²/m	As = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 148.96 kgf.m/m F = 0.00 tf fiss = 0.01 mm	A's = 2.38 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 145.61 kgf.m/m F = 0.00 tf fiss = 0.03 mm	vsd = 0.36 tf/m vrd1 = 7.51 tf/m vrd2 = 53.74 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L409	X	Md = 565 kgf.m/m As = 1.12 cm²/m A's = 0.00 cm²/m	Fd = 0.02 tf Situação: GE As = 0.14 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.15 cm²/m A's = 0.00 cm²/m	Md = 69 kgf.m/m As = 0.11 cm²/m A's = 0.00 cm²/m	Fd = 0.02 tf Situação: GE As = 0.11 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.12 cm²/m A's = 0.00 cm²/m	As = 1.12 cm²/m ø6.3 c/25 (1.25 cm²/m) M = 51.67 kgf.m/m F = 0.03 tf fiss = 0.00 mm	A's = 2.25 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 50.76 kgf.m/m F = 0.03 tf fiss = 0.00 mm	vsd = 3.34 tf/m vrd1 = 7.80 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 2538 kgf.m/m As = 5.92 cm²/m A's = 0.00 cm²/m	Fd = 4.35 tf Situação: GE As = 5.25 cm²/m A's = 0.00 cm²/m	Fd = 1.99 tf Situação: GE As = 6.22 cm²/m A's = 0.00 cm²/m	Md = 1009 kgf.m/m As = 2.17 cm²/m A's = 0.00 cm²/m	Fd = 4.35 tf Situação: GE As = 1.50 cm²/m A's = 0.00 cm²/m	Fd = 1.99 tf Situação: GE As = 2.47 cm²/m A's = 0.00 cm²/m	As = 12.26 cm²/m ø16.0 c/16 (12.57 cm²/m) M = 1850.92 kgf.m/m F = 1.12 tf fiss = 0.07 mm	A's = 2.39 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 775.11 kgf.m/m F = 1.12 tf fiss = 0.09 mm	vsd = 2.70 tf/m vrd1 = 9.58 tf/m vrd2 = 51.27 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L410	X	Md = 565 kgf.m/m	Fd = 0.02 tf Situação: GE As = 0.14 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.15 cm²/m	Md = 69 kgf.m/m	Fd = 0.02 tf Situação: GE As = 0.11 cm²/m A's = 0.00 cm²/m	Fd = 0.05 tf Situação: GE As = 0.12 cm²/m	As = 1.12 cm²/m ø6.3 c/25 (1.25 cm²/m) M = 51.67 kgf.m/m	A's = 2.25 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 50.76 kgf.m/m	vsd = 3.34 tf/m vrd1 = 7.80 tf/m Modelo II vrd2 = 56.95 tf/m

		As = 1.12 cm²/m A's = 0.00 cm²/m		A's = 0.00 cm²/m	As = 0.11 cm²/m A's = 0.00 cm²/m		A's = 0.00 cm²/m	F = 0.03 tf fiss = 0.00 mm	F = 0.03 tf fiss = 0.00 mm	vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 2538 kgf.m/m As = 5.92 cm²/m A's = 0.00 cm²/m	Fd = 4.35 tf Situação: GE As = 5.25 cm²/m A's = 0.00 cm²/m	Fd = 1.99 tf Situação: GE As = 6.22 cm²/m A's = 0.00 cm²/m	Md = 1009 kgf.m/m As = 2.17 cm²/m A's = 0.00 cm²/m	Fd = 4.35 tf Situação: GE As = 1.50 cm²/m A's = 0.00 cm²/m	Fd = 1.99 tf Situação: GE As = 2.47 cm²/m A's = 0.00 cm²/m	As = 12.26 cm²/m ø16.0 c/16 (12.57 cm²/m) M = 1850.92 kgf.m/m F = 1.12 tf fiss = 0.07 mm	A's = 2.39 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 775.11 kgf.m/m F = 1.12 tf fiss = 0.09 mm	vsd = 2.70 tf/m vrd1 = 9.58 tf/m vrd2 = 51.27 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
L411	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 0.02 tf Situação: GE As = 0.01 cm²/m A's = 0.00 cm²/m	Md = 11 kgf.m/m As = 0.02 cm²/m A's = 0.00 cm²/m		Fd = 0.02 tf Situação: GE As = 0.02 cm²/m A's = 0.00 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 3.25 kgf.m/m F = 0.01 tf fiss = 0.00 mm	A's = 2.25 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 7.50 kgf.m/m F = 0.01 tf fiss = 0.00 mm	vsd = 0.23 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m			Md = 98 kgf.m/m As = 0.17 cm²/m A's = 0.00 cm²/m			As = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 1.49 kgf.m/m F = 0.00 tf fiss = 0.00 mm	A's = 2.38 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 67.48 kgf.m/m F = 0.00 tf fiss = 0.01 mm	vsd = 0.60 tf/m vrd1 = 7.51 tf/m vrd2 = 53.74 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR1 -A	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m	Fd = 1.53 tf Situação: GE As = 0.35 cm²/m A's = 0.00 cm²/m	Fd = 4.62 tf Situação: GE As = 1.25 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m	Fd = 1.53 tf Situação: GE As = 0.21 cm²/m A's = 0.00 cm²/m	Fd = 4.62 tf Situação: GE As = 1.12 cm²/m A's = 0.00 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 238.91 kgf.m/m F = 2.99 tf fiss = 0.06 mm	A's = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 109.84 kgf.m/m F = 2.99 tf fiss = 0.03 mm	vsd = 3.59 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.62 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.14 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.41 cm²/m A's = 0.49 cm²/m	As = 2.14 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 296.75 kgf.m/m F = 5.07 tf fiss = 0.06 mm	A's = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 105.02 kgf.m/m F = 5.07 tf fiss = 0.05 mm	vsd = 4.22 tf/m vrd1 = 7.65 tf/m vrd2 = 53.31 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR1 -B	X	Md = 757 kgf.m/m	Fd = 1.53 tf Situação: GE As = 0.34 cm²/m A's = 0.00 cm²/m	Fd = 4.62 tf Situação: GE As = 1.25 cm²/m	Md = 757 kgf.m/m	Fd = 1.53 tf Situação: GE As = 0.21 cm²/m A's = 0.00 cm²/m	Fd = 4.62 tf Situação: GE As = 1.12 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m)	A's = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m)	vsd = 3.59 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m

		As = 1.51 cm²/m A's = 0.00 cm²/m		A's = 0.00 cm²/m	As = 1.51 cm²/m A's = 0.00 cm²/m		A's = 0.00 cm²/m	M = 238.90 kgf.m/m F = 2.99 tf fiss = 0.06 mm	M = 109.85 kgf.m/m F = 2.99 tf fiss = 0.03 mm	vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.62 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.14 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.41 cm²/m A's = 0.49 cm²/m	As = 2.14 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 296.74 kgf.m/m F = 5.07 tf fiss = 0.06 mm	A's = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 105.02 kgf.m/m F = 5.07 tf fiss = 0.05 mm	vsd = 4.22 tf/m vrd1 = 7.65 tf/m vrd2 = 53.31 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR2-A	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 6.08 tf Situação: GE As = 1.48 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 6.08 tf Situação: PE As = 1.02 cm²/m A's = 0.38 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 243.62 kgf.m/m F = 4.00 tf fiss = 0.08 mm	A's = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 75.63 kgf.m/m F = 4.00 tf fiss = 0.03 mm	vsd = 2.70 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 3.66 tf Situação: GE As = 0.86 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 3.66 tf Situação: GE As = 0.84 cm²/m A's = 0.00 cm²/m	As = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 115.07 kgf.m/m F = 2.35 tf fiss = 0.02 mm	A's = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 86.37 kgf.m/m F = 2.35 tf fiss = 0.02 mm	vsd = 2.68 tf/m vrd1 = 7.51 tf/m vrd2 = 53.74 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR2-B	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 6.08 tf Situação: GE As = 1.48 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 6.08 tf Situação: PE As = 1.02 cm²/m A's = 0.38 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 243.63 kgf.m/m F = 4.00 tf fiss = 0.08 mm	A's = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 75.63 kgf.m/m F = 4.00 tf fiss = 0.03 mm	vsd = 2.70 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 3.66 tf Situação: GE As = 0.86 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 3.66 tf Situação: GE As = 0.84 cm²/m A's = 0.00 cm²/m	As = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 115.08 kgf.m/m F = 2.35 tf fiss = 0.02 mm	A's = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 86.37 kgf.m/m F = 2.35 tf fiss = 0.02 mm	vsd = 2.68 tf/m vrd1 = 7.51 tf/m vrd2 = 53.74 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR3	X	Md = 757 kgf.m/m As = 1.52 cm²/m	Fd = 5.36 tf Situação: GE As = 0.42 cm²/m A's = 0.00 cm²/m	Fd = 6.77 tf Situação: GE As = 2.20 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.52 cm²/m		Fd = 6.77 tf Situação: GE As = 1.69 cm²/m A's = 0.00 cm²/m	As = 2.20 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 497.86 kgf.m/m	A's = 1.69 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 181.23 kgf.m/m	vsd = 3.31 tf/m vrd1 = 8.02 tf/m Modelo II vrd2 = 56.51 tf/m

		A's = 0.00 cm²/m			A's = 0.00 cm²/m			F = 3.32 tf fiss = 0.09 mm	F = 3.32 tf fiss = 0.02 mm	vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.64 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.21 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.64 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.33 cm²/m A's = 0.56 cm²/m	As = 2.21 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 349.58 kgf.m/m F = 5.07 tf fiss = 0.08 mm	A's = 1.64 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 77.81 kgf.m/m F = 5.07 tf fiss = 0.02 mm	vsd = 4.14 tf/m vrd1 = 7.54 tf/m vrd2 = 52.44 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR4	X	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 5.16 tf Situação: PE As = 0.63 cm²/m A's = 0.56 cm²/m	Md = 757 kgf.m/m As = 1.51 cm²/m A's = 0.00 cm²/m		Fd = 5.16 tf Situação: PE As = 0.63 cm²/m A's = 0.56 cm²/m	As = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 0.41 kgf.m/m F = 3.57 tf fiss = 0.01 mm	A's = 1.51 cm²/m ø6.3 c/20 (1.56 cm²/m) M = 2.57 kgf.m/m F = 3.57 tf fiss = 0.01 mm	vsd = 0.03 tf/m vrd1 = 7.86 tf/m Modelo II vrd2 = 56.95 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.62 cm²/m A's = 0.00 cm²/m		Fd = 9.69 tf Situação: GE As = 2.28 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.60 cm²/m A's = 0.00 cm²/m		Fd = 9.69 tf Situação: PE As = 1.58 cm²/m A's = 0.65 cm²/m	As = 2.28 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 0.49 kgf.m/m F = 6.49 tf fiss = 0.02 mm	A's = 1.60 cm²/m ø6.3 c/19 (1.64 cm²/m) M = 105.02 kgf.m/m F = 6.49 tf fiss = 0.07 mm	vsd = 0.03 tf/m vrd1 = 7.65 tf/m vrd2 = 53.31 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
PAR5	X	Md = 757 kgf.m/m As = 1.52 cm²/m A's = 0.00 cm²/m	Fd = 5.36 tf Situação: GE As = 0.42 cm²/m A's = 0.00 cm²/m	Fd = 6.77 tf Situação: GE As = 2.20 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.52 cm²/m A's = 0.00 cm²/m		Fd = 6.77 tf Situação: GE As = 1.69 cm²/m A's = 0.00 cm²/m	As = 2.20 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 497.85 kgf.m/m F = 3.32 tf fiss = 0.09 mm	A's = 1.69 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 181.21 kgf.m/m F = 3.32 tf fiss = 0.02 mm	vsd = 3.31 tf/m vrd1 = 8.02 tf/m Modelo II vrd2 = 56.51 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m
	Y	Md = 757 kgf.m/m As = 1.64 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.21 cm²/m A's = 0.00 cm²/m	Md = 757 kgf.m/m As = 1.64 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.33 cm²/m A's = 0.56 cm²/m	As = 2.21 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 349.57 kgf.m/m F = 5.07 tf fiss = 0.08 mm	A's = 1.64 cm²/m ø8.0 c/20 (2.51 cm²/m) M = 77.80 kgf.m/m F = 5.07 tf fiss = 0.02 mm	vsd = 4.14 tf/m vrd1 = 7.54 tf/m vrd2 = 52.44 tf/m vsw = 0.00 tf/m asw = 0.00 cm²/m

ARMADURAS NEGATIVAS (NA CONTINUIDADE)					
Viga	**Laje 1**	**Momento negativo**			**Armaduras finais**
Trecho	**Laje 2**	**Flexão**	**Flexo compressão**	**Flexo tração**	
Barra	L301 PAR4	Md = 1151 kgf.m/m As = 2.39 cm²/m	Fd = 5.12 tf Situação: GE As = 1.63 cm²/m	Fd = 9.61 tf Situação: GE As = 3.81 cm²/m	As = 3.81 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.07 mm

		A's = 0.00 cm²/m	A's = 0.00 cm²/m	A's = 0.00 cm²/m	
Barra	PAR4 L302	Md = 1151 kgf.m/m As = 2.39 cm²/m A's = 0.00 cm²/m	Fd = 5.12 tf Situação: GE As = 1.63 cm²/m A's = 0.00 cm²/m	Fd = 9.61 tf Situação: GE As = 3.81 cm²/m A's = 0.00 cm²/m	As = 3.81 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.07 mm
Barra	L302 L301	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.35 tf Situação: PE As = 0.99 cm²/m A's = 0.93 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	L301 PAR1-B	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.60 cm²/m A's = 0.00 cm²/m	As = 2.60 cm²/m (ø8.0 c/19 - 2.65 cm²/m) fiss = 0.10 mm
Barra	PAR1-B L301	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.70 cm²/m A's = 0.49 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.04 mm
Barra	L301 PAR3	Md = 1443 kgf.m/m As = 3.01 cm²/m A's = 0.00 cm²/m	Fd = 9.84 tf Situação: GE As = 1.58 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 4.22 cm²/m A's = 0.00 cm²/m	As = 4.22 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.09 mm
Barra	PAR3 L301	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.26 cm²/m A's = 0.63 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm
Barra	L301 PAR2-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 8.67 tf Situação: GE As = 0.13 cm²/m A's = 0.00 cm²/m	Fd = 3.59 tf Situação: GE As = 1.92 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.07 mm
Barra	PAR2-A L301	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 3.59 tf Situação: GE As = 1.36 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.03 mm
Barra	L302 PAR5	Md = 1443 kgf.m/m As = 3.01 cm²/m A's = 0.00 cm²/m	Fd = 9.84 tf Situação: GE As = 1.58 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 4.22 cm²/m A's = 0.00 cm²/m	As = 4.22 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.09 mm
Barra	PAR5 L302	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.46 cm²/m A's = 0.49 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.03 mm
Barra	L302 PAR1-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: GE As = 2.60 cm²/m A's = 0.00 cm²/m	As = 2.60 cm²/m (ø8.0 c/19 - 2.65 cm²/m) fiss = 0.10 mm
Barra	PAR1-A L302	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 8.21 tf Situação: PE As = 1.70 cm²/m A's = 0.49 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.04 mm
Barra	L302 PAR2-B	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 8.67 tf Situação: GE As = 0.13 cm²/m A's = 0.00 cm²/m	Fd = 3.59 tf Situação: GE As = 1.92 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.07 mm
Barra	PAR2-B	Md = 1130 kgf.m/m		Fd = 3.59 tf	As = 2.29 cm²/m

	L302	As = 2.29 cm²/m A's = 0.00 cm²/m		Situação: GE As = 1.36 cm²/m A's = 0.00 cm²/m	(ø8.0 c/20 - 2.51 cm²/m) fiss = 0.03 mm
Barra	L406 L407	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 0.29 tf Situação: GE As = 0.12 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	L407 PAR1-A	Md = 2100 kgf.m/m As = 4.53 cm²/m A's = 0.00 cm²/m	Fd = 10.42 tf Situação: GE As = 3.02 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 5.73 cm²/m A's = 0.00 cm²/m	As = 5.73 cm²/m (ø16.0 c/20 - 10.05 cm²/m) fiss = 0.08 mm
Barra	PAR1-A L406	Md = 1130 kgf.m/m As = 2.31 cm²/m A's = 0.00 cm²/m	Fd = 10.42 tf Situação: GE As = 0.16 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 2.90 cm²/m A's = 0.00 cm²/m	As = 2.90 cm²/m (ø10.0 c/20 - 3.93 cm²/m) fiss = 0.07 mm
Barra	PAR1-A PAR5	Md = 1149 kgf.m/m As = 2.38 cm²/m A's = 0.00 cm²/m	Fd = 5.36 tf Situação: GE As = 1.59 cm²/m A's = 0.00 cm²/m	Fd = 6.77 tf Situação: GE As = 3.39 cm²/m A's = 0.00 cm²/m	As = 3.39 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm
Barra	PAR5 PAR1-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.77 tf Situação: PE As = 0.87 cm²/m A's = 0.68 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	PAR1-A PAR1-B	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 4.62 tf Situação: PE As = 0.58 cm²/m A's = 0.48 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	PAR1-B PAR4	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.42 tf Situação: GE As = 0.90 cm²/m A's = 0.00 cm²/m	Fd = 5.14 tf Situação: GE As = 1.86 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	PAR4 PAR1-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.42 tf Situação: GE As = 0.90 cm²/m A's = 0.00 cm²/m	Fd = 5.14 tf Situação: GE As = 1.86 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	L405 L407	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 0.29 tf Situação: GE As = 0.12 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	L407 PAR1-B	Md = 2100 kgf.m/m As = 4.53 cm²/m A's = 0.00 cm²/m	Fd = 10.42 tf Situação: GE As = 3.02 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 5.73 cm²/m A's = 0.00 cm²/m	As = 5.73 cm²/m (ø16.0 c/20 - 10.05 cm²/m) fiss = 0.08 mm
Barra	PAR1-B L405	Md = 1130 kgf.m/m As = 2.31 cm²/m A's = 0.00 cm²/m	Fd = 10.42 tf Situação: GE As = 0.16 cm²/m A's = 0.00 cm²/m	Fd = 8.21 tf Situação: GE As = 2.90 cm²/m A's = 0.00 cm²/m	As = 2.90 cm²/m (ø10.0 c/20 - 3.93 cm²/m) fiss = 0.07 mm
Barra	PAR1-B PAR3	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.77 tf Situação: PE As = 0.87 cm²/m A's = 0.68 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	PAR3 PAR1-B	Md = 1149 kgf.m/m As = 2.38 cm²/m A's = 0.00 cm²/m	Fd = 5.36 tf Situação: GE As = 1.59 cm²/m A's = 0.00 cm²/m	Fd = 6.77 tf Situação: GE As = 3.39 cm²/m A's = 0.00 cm²/m	As = 3.39 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm

Barra	L405 L411	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 0.80 tf Situação: GE As = 0.18 cm²/m A's = 0.00 cm²/m	Fd = 0.95 tf Situação: GE As = 0.44 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	L411 PAR2-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.83 tf Situação: PE As = 1.14 cm²/m A's = 0.43 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm
Barra	PAR2-A L405	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.83 tf Situação: PE As = 1.10 cm²/m A's = 0.47 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm
Barra	PAR2-A PAR3	Md = 1202 kgf.m/m As = 2.50 cm²/m A's = 0.00 cm²/m	Fd = 3.91 tf Situação: GE As = 1.92 cm²/m A's = 0.00 cm²/m	Fd = 5.76 tf Situação: GE As = 3.35 cm²/m A's = 0.00 cm²/m	As = 3.35 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm
Barra	PAR3 PAR2-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 5.76 tf Situação: PE As = 0.81 cm²/m A's = 0.51 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	PAR2-B PAR4	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.41 tf Situação: GE As = 0.90 cm²/m A's = 0.00 cm²/m	Fd = 6.08 tf Situação: GE As = 2.00 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	PAR4 PAR2-A	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.41 tf Situação: GE As = 0.90 cm²/m A's = 0.00 cm²/m	Fd = 6.08 tf Situação: GE As = 2.00 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	PAR2-A PAR2-B	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.08 tf Situação: PE As = 0.74 cm²/m A's = 0.66 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	L406 L411	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 0.80 tf Situação: GE As = 0.18 cm²/m A's = 0.00 cm²/m	Fd = 0.95 tf Situação: GE As = 0.44 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	L411 PAR2-B	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.83 tf Situação: PE As = 1.14 cm²/m A's = 0.43 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm
Barra	PAR2-B L406	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 6.83 tf Situação: PE As = 1.10 cm²/m A's = 0.47 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm
Barra	PAR5 PAR2-B	Md = 1202 kgf.m/m As = 2.50 cm²/m A's = 0.00 cm²/m	Fd = 3.91 tf Situação: GE As = 1.92 cm²/m A's = 0.00 cm²/m	Fd = 5.76 tf Situação: GE As = 3.35 cm²/m A's = 0.00 cm²/m	As = 3.35 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm
Barra	PAR2-B PAR5	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 5.76 tf Situação: PE As = 0.81 cm²/m A's = 0.51 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	L405	Md = 1130 kgf.m/m	Fd = 1.08 tf Situação: GE	Fd = 0.64 tf Situação: GE	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m)

	L409	As = 2.29 cm²/m A's = 0.00 cm²/m	As = 0.51 cm²/m A's = 0.00 cm²/m	As = 0.76 cm²/m A's = 0.00 cm²/m	fiss = 0.01 mm
Barra	L409 PAR3	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 12.29 tf Situação: PE As = 2.20 cm²/m A's = 0.73 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.07 mm
Barra	PAR3 L405	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 12.29 tf Situação: PE As = 1.98 cm²/m A's = 0.84 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	L406 L410	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.08 tf Situação: GE As = 0.51 cm²/m A's = 0.00 cm²/m	Fd = 0.64 tf Situação: GE As = 0.76 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	L410 PAR5	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 12.29 tf Situação: PE As = 2.20 cm²/m A's = 0.73 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.07 mm
Barra	PAR5 L406	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 12.29 tf Situação: PE As = 1.98 cm²/m A's = 0.84 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.06 mm
Barra	L405 L406	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 1.41 tf Situação: GE As = 0.53 cm²/m A's = 0.00 cm²/m		As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
Barra	L406 PAR4	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 3.75 tf Situação: PE As = 0.44 cm²/m A's = 0.42 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.00 mm
Barra	PAR4 L405	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m		Fd = 3.75 tf Situação: GE As = 0.86 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.01 mm
V403 1	L409 L407	Md = 1474 kgf.m/m As = 3.08 cm²/m A's = 0.00 cm²/m	Fd = 1.23 tf Situação: GE As = 2.90 cm²/m A's = 0.00 cm²/m	Fd = 0.20 tf Situação: GE As = 3.11 cm²/m A's = 0.00 cm²/m	As = 3.11 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm
V405 1	L407 L410	Md = 1474 kgf.m/m As = 3.08 cm²/m A's = 0.00 cm²/m	Fd = 1.23 tf Situação: GE As = 2.90 cm²/m A's = 0.00 cm²/m	Fd = 0.20 tf Situação: GE As = 3.11 cm²/m A's = 0.00 cm²/m	As = 3.11 cm²/m (ø12.5 c/20 - 6.14 cm²/m) fiss = 0.06 mm
V401 1	L408 L407	Md = 1130 kgf.m/m As = 2.29 cm²/m A's = 0.00 cm²/m	Fd = 0.02 tf Situação: GE As = 0.85 cm²/m A's = 0.00 cm²/m	Fd = 0.06 tf Situação: GE As = 0.86 cm²/m A's = 0.00 cm²/m	As = 2.29 cm²/m (ø8.0 c/20 - 2.51 cm²/m) fiss = 0.02 mm