



**ASSOCIAÇÃO BRASILEIRA DOS  
FABRICANTES DE TUBOS DE CONCRETO**

**RELATÓRIO DE DIMENSIONAMENTO DE  
ASSOCIAÇÃO DE TRÊS ADUELAS  
RETANGULARES MONOLÍTICAS DE CONCRETO**

**sexta-feira, 4 de outubro de 2019**



ASSOCIAÇÃO BRASILEIRA  
DOS FABRICANTES DE  
TUBOS DE CONCRETO

### DADOS DO FABRICANTE



NOME:  
CPF/CNPJ:  
ENDEREÇO: ,  
BAIRRO:  
CIDADE:  
ESTADO: Não Informado  
CEP:  
TEL.:  
CEL.:  
E-MAIL:  
SITE:

### DADOS DO CLIENTE



NOME: DEFESA CIVIL DO ESTADO DE SÃO PAULO  
CPF/CNPJ:  
ENDEREÇO: ,  
BAIRRO:  
CIDADE:  
ESTADO: Não Informado  
CEP:  
TEL.:  
CEL.:  
E-MAIL:  
SITE:

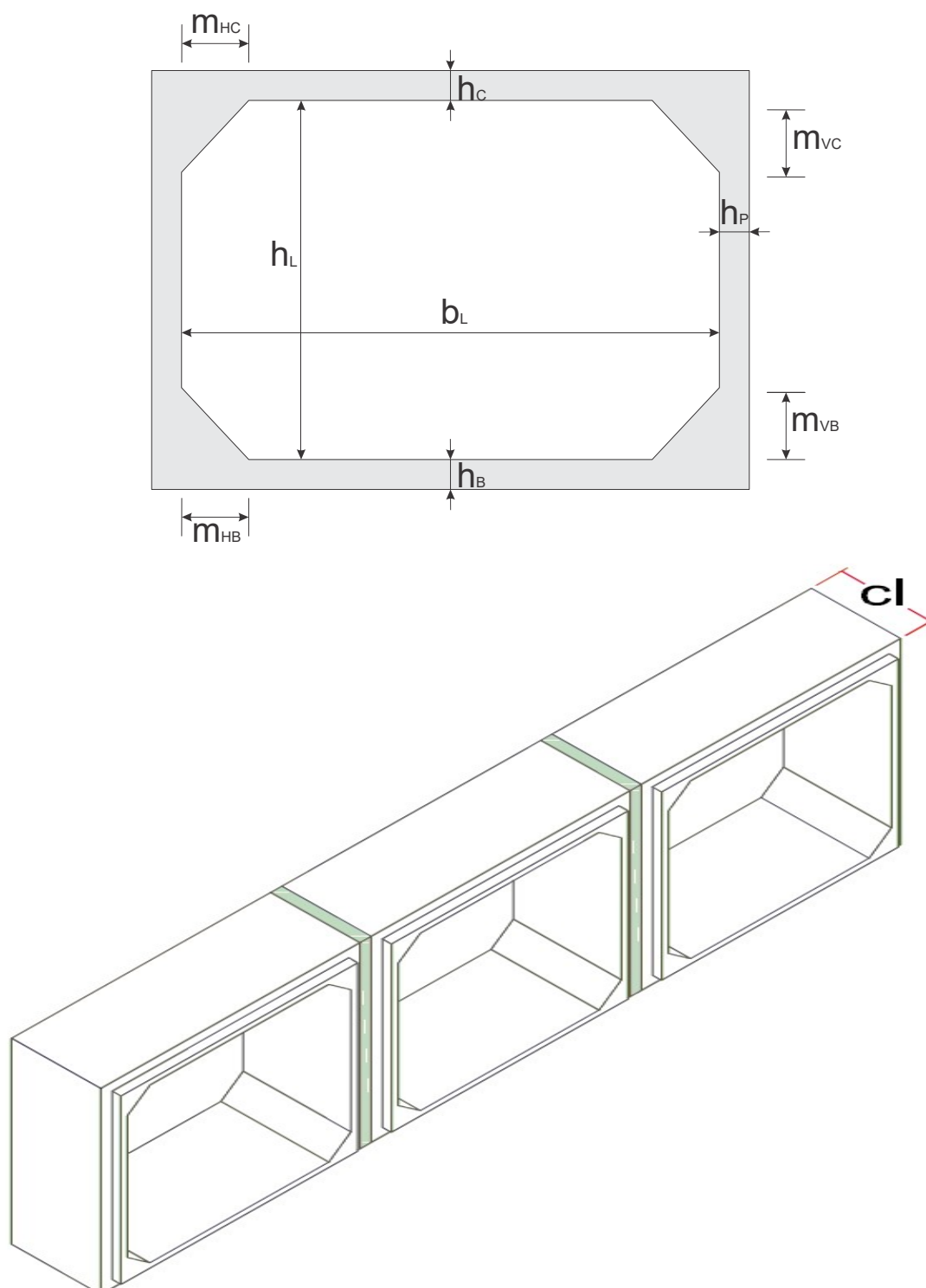
### DADOS DA OBRA



NOME: ADUELA 2,00 X 2,00 M PARA ATERRO DE 2,50 M - LINHA TRIPLA  
ENDEREÇO: ,  
BAIRRO:  
CIDADE:  
ESTADO: Não Informado  
CEP:  
TEL.:  
CEL.:  
E-MAIL:  
SITE:

**GEOMETRIA**

SEÇÃO CONSTANTE.....	: SIM
FINALIDADE.....	: ÁGUAS PLUVIAIS
COMPRIMENTO ( $c_l$ ).....	: 1.00 m
LARGURA LIVRE ( $b_l$ ).....	: 2.00 m
ALTURA LIVRE ( $h_l$ ).....	: 2.00 m
ALTURA DA LAJE DA COBERTURA ( $h_c$ ).....	: 0.15 m
ESPESSURA DAS PAREDES LATERAIS ( $h_p$ ).....	: 0.15 m
ALTURA DA LAJE DA BASE ( $h_b$ ).....	: 0.15 m
MÍSULA HOR. DA COBERTURA.....	: 0.20 m
MÍSULA VERT. DA COBERTURA.....	: 0.20 m
MÍSULA VERT. DA BASE.....	: 0.20 m
MÍSULA HOR. DA BASE.....	: 0.20 m



## INSTALAÇÃO E MANUSEIO

### ESPECIFICAÇÃO DO SOLO

PESO ESPECÍFICO.....	: 18.00 kN/m <sup>3</sup>
ÂNGULO DE ATRITO.....	: 30.00 graus
COEFICIENTE DE ATRITO ATIVO.....	: 0.33
COEFICIENTE DE ATRITO ESTÁTICO.....	: 0.50
COEFICIENTE DE ATRITO.....	: 0.58

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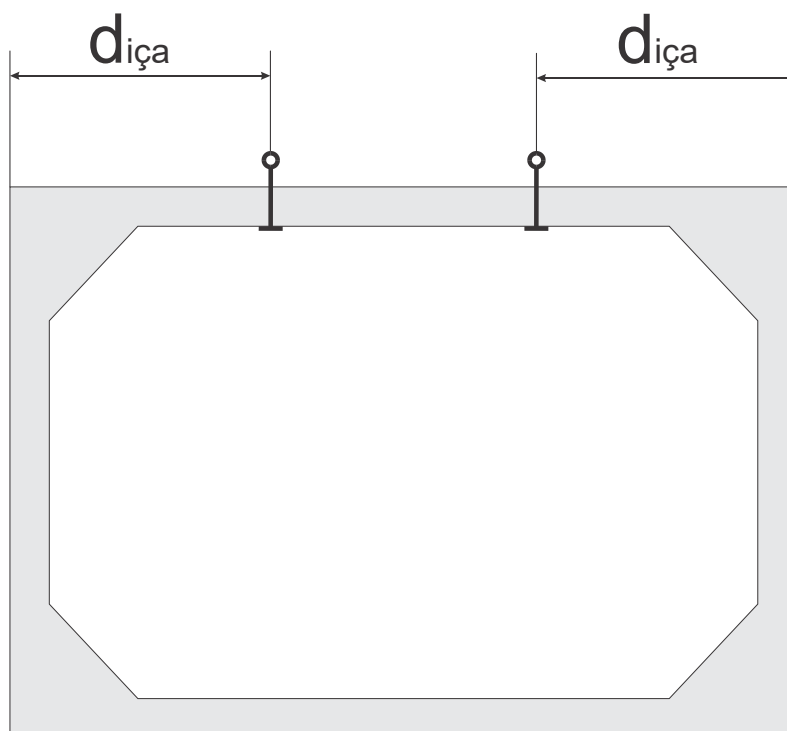
### DADOS DE INSTALAÇÃO

ALTURA DE TERRA.....	: 2.50 m
ESPESSURA DO PAVIMENTO.....	: 0.30 m
EFEITO DO ARQUEAMENTO.....	: NÃO CONSIDERADO
TIPO DE INSTALAÇÃO.....	: ---
LARGURA DA VALA.....	: ---
0.80 x $K_a$ x COEFICIENTE DE ATRITO.....	: 0.15
RAZÃO DE RECALQUE.....	: ---

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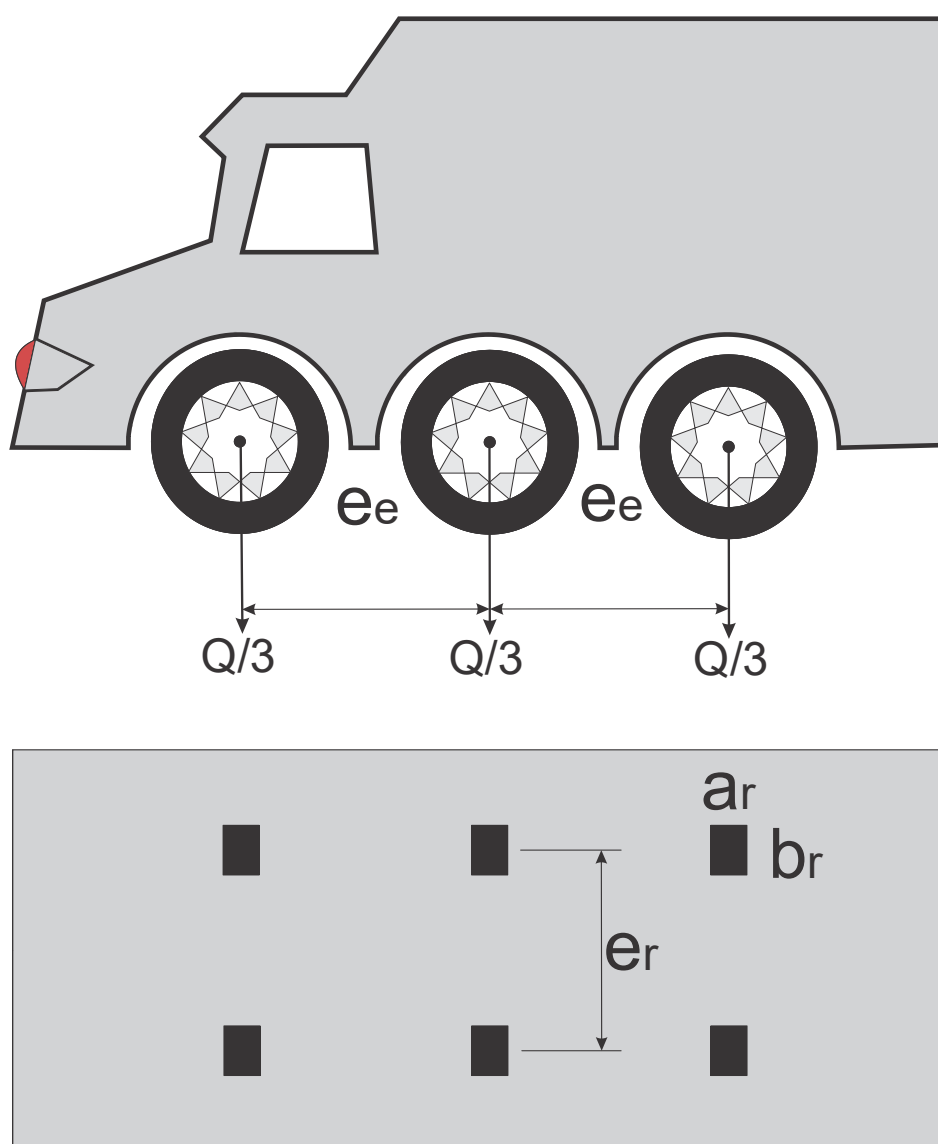
### INFORMAÇÕES DE MANUSEIO

RESISTÊNCIA DO CONCRETO ( $f_{cj}$ ).....	: 20.00 MPa
COEFICIENTE DE IMPACTO.....	: 1.20
DISTÂNCIA DE IÇAMENTO.....	: 50.00 cm



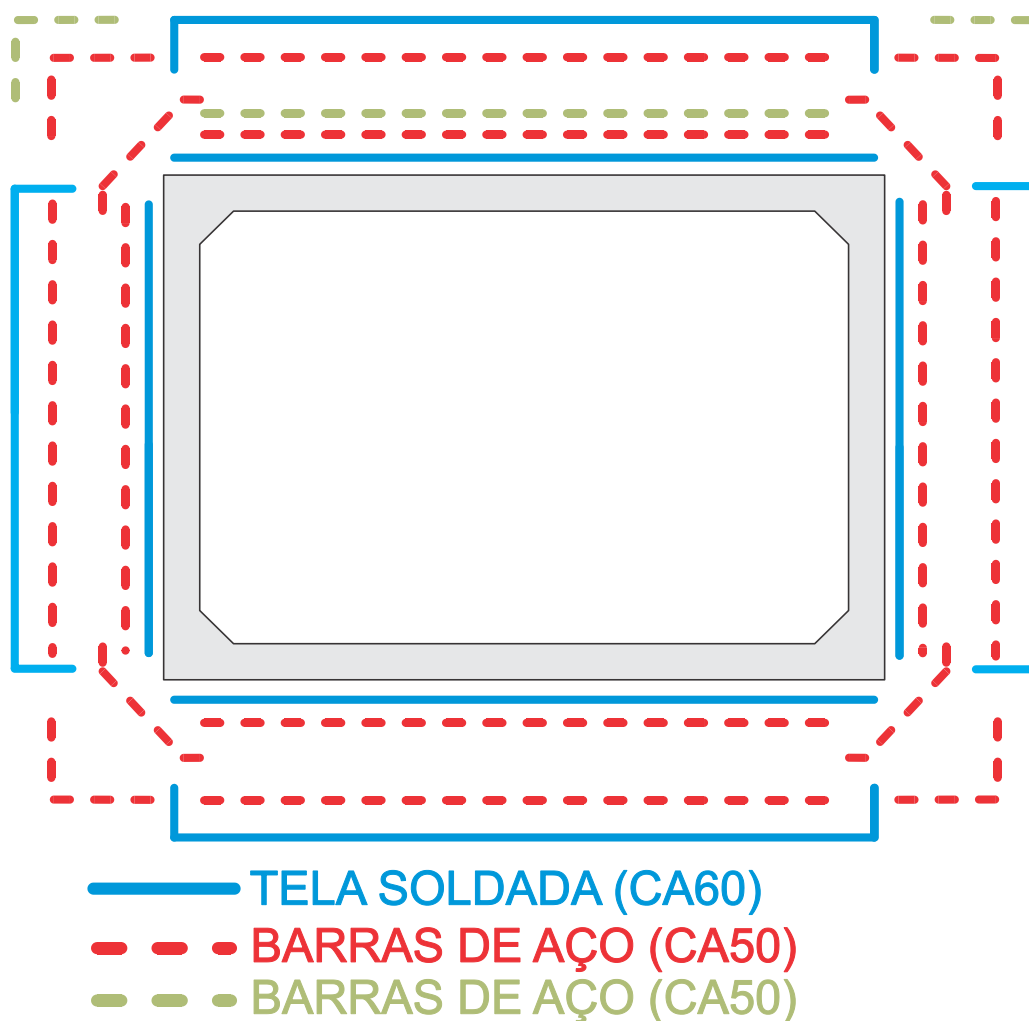
**SOBRECARGA**

TIPO DE SOBRECARGA.....: RODOVIÁRIO  
TIPO DE TRÁFEGO.....: CLASSE 45  
PESO DO VEÍCULO (Q).....: 450.00 kN  
DISTÂNCIA ENTRE EIXOS ( $e_e$ ).....: 1.50 m  
DISTÂNCIA ENTRE RODAS ( $e_r$ ).....: 2.00 m  
ÁREA DE CONTATO DA RODA ( $a_r$ ).....: 0.20 m  
ÁREA DE CONTATO DA RODA ( $b_r$ ).....: 0.50 m  
COEF. DE IMPACTO ADICIONAL.....: 1.25  
COEF. DE IMPACTO EMPREGADO.....: 1.00



## PARÂMETROS DA ARMADURA

ABERTURA MÁX. DAS FISSURAS.....	: 0.20 mm
DIMINUIÇÃO DA RIGIDEZ.....	: 1.00
RESISTÊNCIA DA ARMADURA DO COROAMENTO.....	: 190.00 MPa
RESISTÊNCIA DA ARMADURA DA QUINA.....	: 105.00 MPa
COEF. DE PONDERAÇÃO DO CONCRETO.....	: 1.40
COEF. DE PONDERAÇÃO DO AÇO.....	: 1.15
ESPAÇAMENTO MÍN. ENTRE ARMADURAS.....	: 5.00 cm
ESPAÇAMENTO MÁX. ENTRE ARMADURAS.....	: 35.00 cm
COBRIMENTO DAS ARMADURAS.....	: 4.00 cm
TELA PADRÃO INTERNA.....	: L283
TELA PADRÃO EXTERNA.....	: L283
CONSIDERAR ANCOR. DA ARM. INT. P/ CORTANTE..	: SIM



## CRITÉRIOS E CONSTANTES

RESISTÊNCIA CARACTERÍSTICA DO CONCRETO...	30.00 MPa
PESO ESPECÍFICO DO CONCRETO.....	25.00 kN/m <sup>3</sup>
PESO ESPECÍFICO DO AÇO.....	78.00 kN/m <sup>3</sup>
MÓDULO DE DEFORMAÇÃO LONGITUDINAL.....	26071.59 MPa
MÓDULO DE REAÇÃO DO SOLO.....	25.00 MPa/m
COMPRIMENTO DO ELEMENTO FINITO.....	20.00 cm

# ELS:

COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.00
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.00
COEFICIENTE DE PONDERAÇÃO FISSURAÇÃO.....	0.50
COEFICIENTE DE PONDERAÇÃO FADIGA.....	0.80

# ELU:

- VmaxHmin:

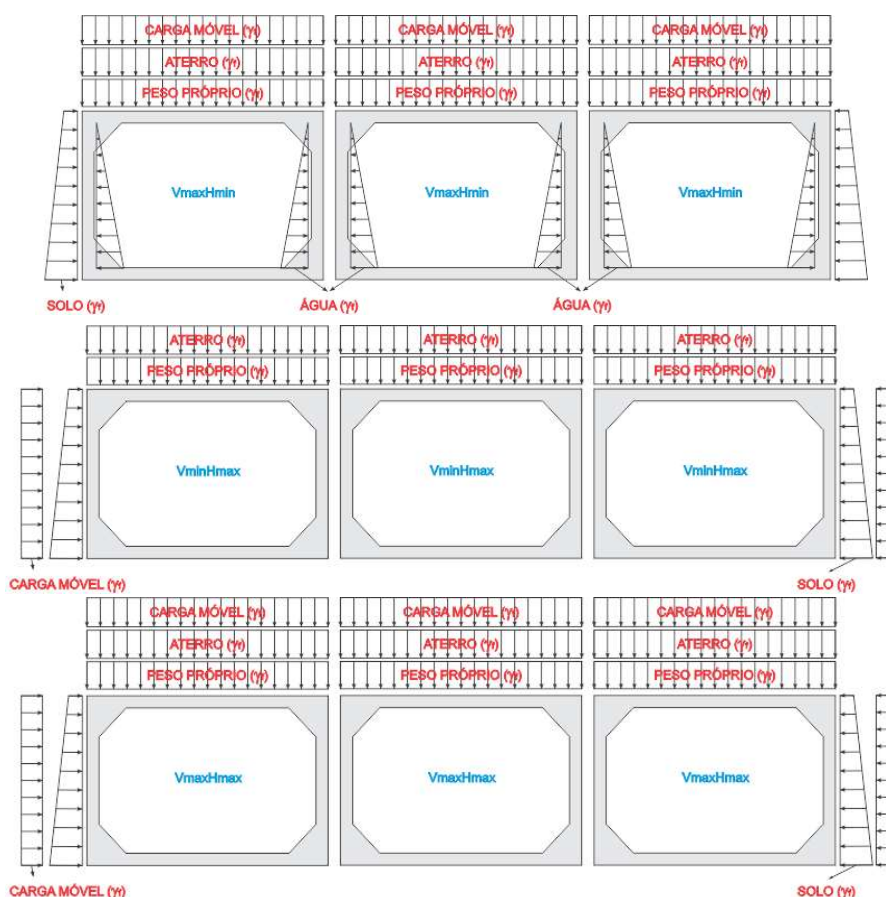
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL V.:	1.50
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.35
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.30
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.00
COEFICIENTE DE PONDERAÇÃO ÁGUA.....	1.20

- VminHmax:

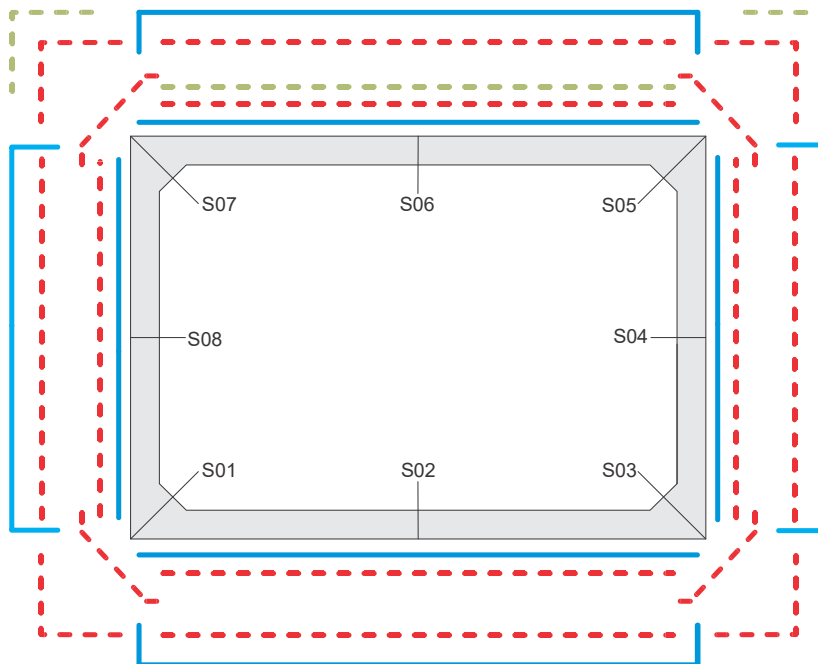
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.00
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.00
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.35
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL H.:	1.50

- VmaxHmax:

COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL V.:	1.50
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.35
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.30
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.35
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL H.:	1.50



## ESQUEMA P/ DETALHAMENTO



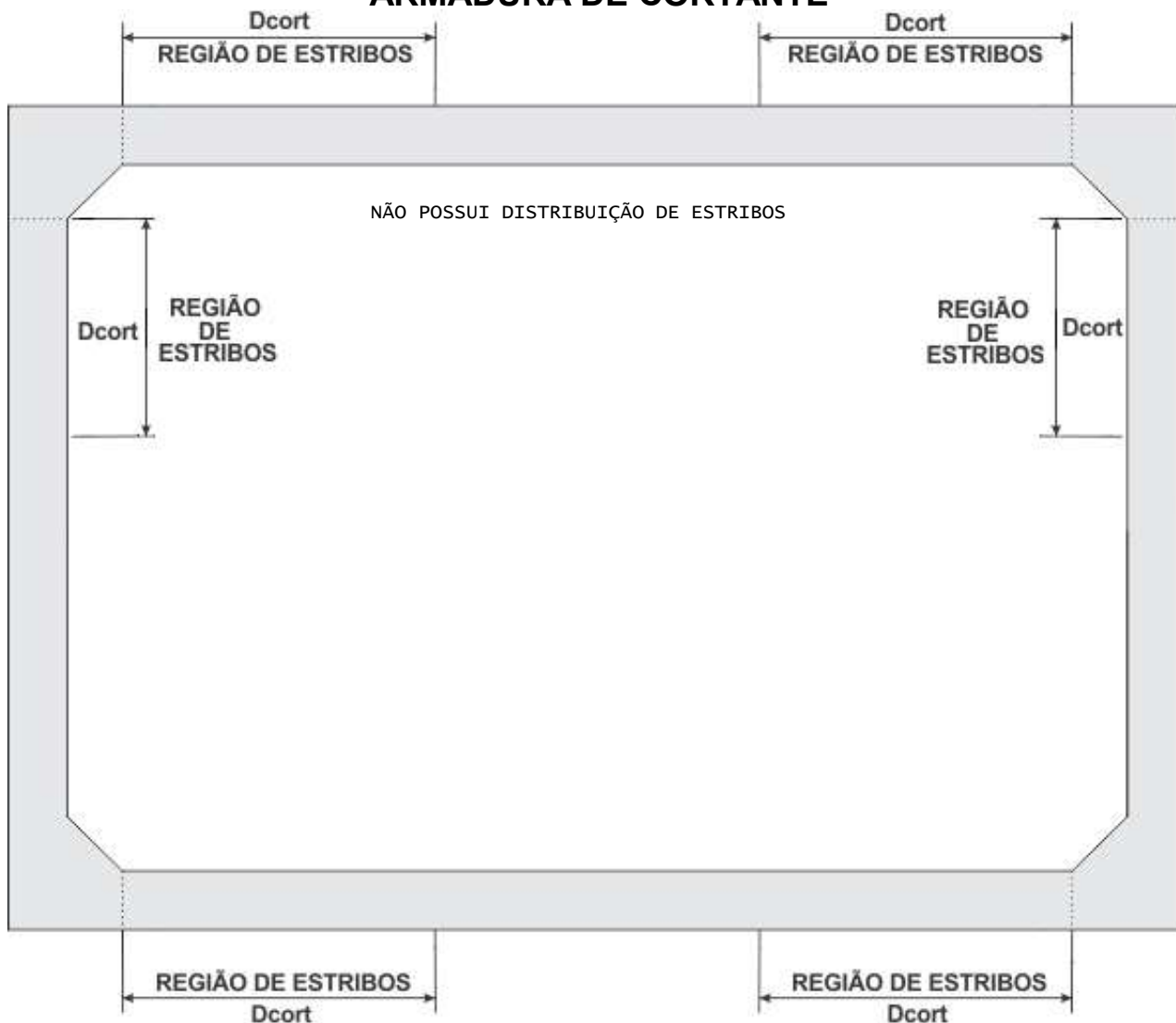
- TELA SOLDADA (CA60) ARMADURA BÁSICA  
 - - - BARRAS DE AÇO (CA50) ARMADURA COMPLEMENTAR  
 - - - BARRAS DE AÇO (CA50) ARMADURA DE FADIGA

OBS.: VALORES POR METRO DE ADUELA.

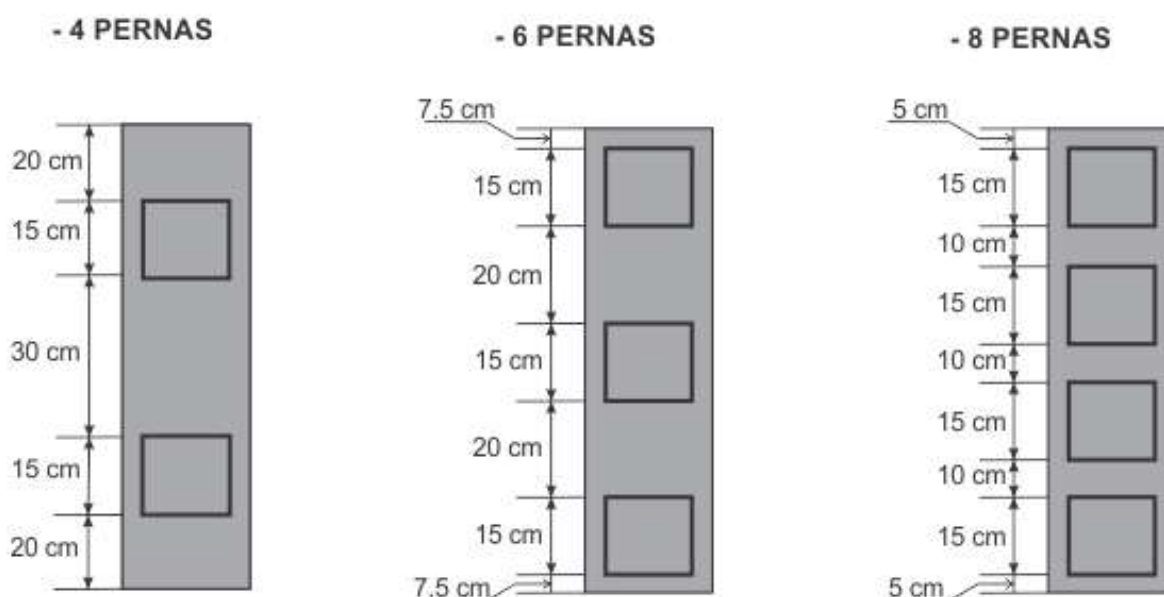
	TELA	ARMADURA COMPLEMENTAR	ARMADURA DE FADIGA
LADO EXTERNO	T-S02: L283	B-S01: 0.69 cm <sup>2</sup> de área acima	B-S05: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 0.81 cm <sup>2</sup> de área acima	B-S07: 0.00 cm <sup>2</sup> de área acima
	T-S06: L283	B-S03: 0.69 cm <sup>2</sup> de área acima	
	T-S08: L283	B-S04: 0.81 cm <sup>2</sup> de área acima B-S05: 0.69 cm <sup>2</sup> de área acima B-S06: 0.81 cm <sup>2</sup> de área acima B-S07: 0.69 cm <sup>2</sup> de área acima B-S08: 0.81 cm <sup>2</sup> de área acima	
LADO INTERNO	T-S02: L283	B-S01: 4 Ø6.30 c/ 31 cm ( 0.00%)	B-S06: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 7 Ø6.30 c/ 15 cm ( 2.37%)	
	T-S06: L283	B-S03: 4 Ø6.30 c/ 31 cm ( 0.00%)	
	T-S08: L283	B-S04: 0.81 cm <sup>2</sup> de área acima B-S05: 4 Ø6.30 c/ 31 cm ( 0.00%) B-S06: 4 Ø6.30 c/ 31 cm (10.35%) B-S07: 4 Ø6.30 c/ 31 cm ( 0.00%) B-S08: 0.81 cm <sup>2</sup> de área acima	

NOTA: Os valores entre parênteses representam a percentagem de área de aço que a seção apresenta acima (percentagem positiva) ou a menos (percentagem negativa) em relação ao necessário (calculado) para o tipo de armadura correspondente (armadura complementar ou armadura de fadiga) e não em relação a área total de aço na seção que é o resultado das áreas de tela, armadura complementar e armadura de fadiga. Assim sendo, se uma seção apresenta (X %) de área acima ou abaixo para armadura complementar, esta percentagem é calculada em função da área de armadura complementar necessária e não em relação a área total de aço.

## ARMADURA DE CORTANTE



DISTRIBUIÇÃO (POR METRO LONGITUDINAL) DOS ESTRIBOS AO LONGO DE UMA FIADA:

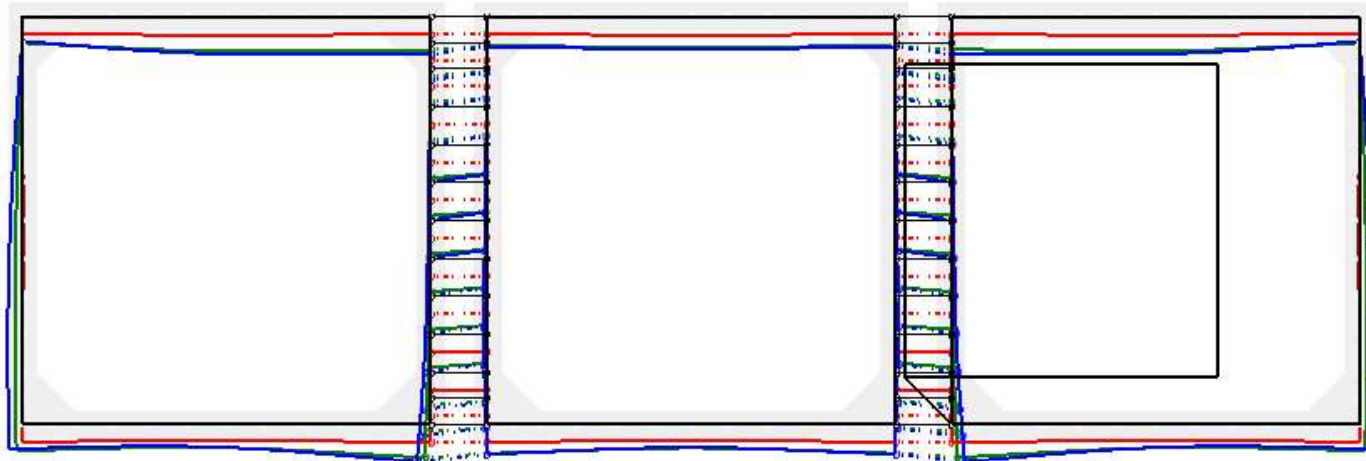
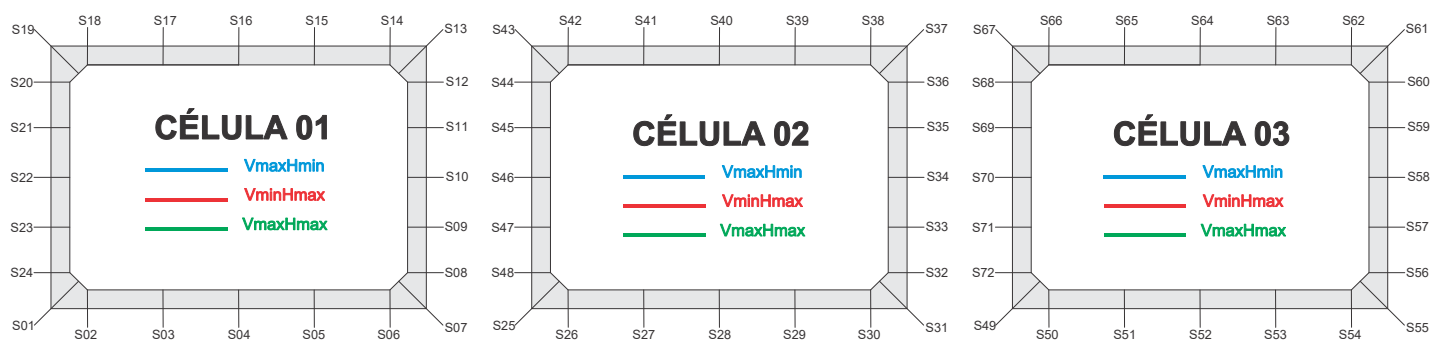


### OBSERVAÇÃO:

Quando houver necessidade de armadura transversal, esta deve necessariamente ser colocada na laje de cobertura e na laje de fundo nas regiões apontadas na figura esquemática acima (REGIÃO DE ESTRIBOS). É RECOMENDADO ainda a colocação de armadura transversal nas partes superiores das paredes, repedindo o arranjo da armadura transversal das lajes de cobertura, a partir das quinas, em função de possíveis concentrações de pressões mútuas entre as células.

## DESLOCAMENTOS

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



```
#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VmaxHmin                             #
#####
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-2.19E-003	-4.04E-003
2	-2.19E-003	-3.83E-003
3	-2.19E-003	-3.57E-003
4	-2.20E-003	-3.70E-003
5	-2.20E-003	-4.37E-003
6	-2.20E-003	-5.42E-003
7	-2.20E-003	-6.16E-003
8	-1.49E-003	-6.16E-003
9	-7.56E-004	-6.18E-003
10	-4.11E-004	-6.19E-003
11	-2.15E-004	-6.20E-003
12	-7.71E-005	-6.21E-003
13	-2.22E-005	-6.22E-003
14	-2.18E-005	-6.20E-003
15	-2.06E-005	-6.29E-003
16	-1.95E-005	-6.22E-003
17	-1.83E-005	-5.71E-003
18	-1.72E-005	-4.79E-003
19	-1.68E-005	-4.08E-003
20	-7.11E-004	-4.08E-003
21	-1.56E-003	-4.07E-003
22	-2.14E-003	-4.06E-003
23	-2.44E-003	-4.05E-003
24	-2.39E-003	-4.05E-003
25	4.43E-006	-4.93E-003
26	3.77E-006	-4.56E-003
27	1.88E-006	-4.02E-003
28	1.76E-010	-3.79E-003
29	-1.88E-006	-4.02E-003
30	-3.77E-006	-4.56E-003
31	-4.43E-006	-4.93E-003
32	3.33E-004	-4.93E-003
33	5.32E-004	-4.94E-003
34	4.01E-004	-4.95E-003
35	2.07E-004	-4.96E-003
36	7.37E-005	-4.97E-003
37	-9.37E-006	-4.98E-003
38	-9.08E-006	-5.09E-003
39	-8.26E-006	-5.35E-003
40	-7.44E-006	-5.49E-003
41	-6.62E-006	-5.35E-003
42	-5.80E-006	-5.09E-003
43	-5.51E-006	-4.98E-003
44	-8.77E-005	-4.98E-003
45	-2.24E-004	-4.97E-003
46	-4.14E-004	-4.96E-003
47	-5.38E-004	-4.95E-003
48	-3.35E-004	-4.93E-003
49	2.18E-003	-6.16E-003

50	2.18E-003	-5.41E-003
51	2.17E-003	-4.37E-003
52	2.17E-003	-3.70E-003
53	2.17E-003	-3.57E-003
54	2.17E-003	-3.83E-003
55	2.17E-003	-4.04E-003
56	2.37E-003	-4.05E-003
57	2.42E-003	-4.06E-003
58	2.12E-003	-4.07E-003
59	1.54E-003	-4.07E-003
60	6.95E-004	-4.08E-003
61	1.91E-006	-4.09E-003
62	2.32E-006	-4.79E-003
63	3.47E-006	-5.71E-003
64	4.62E-006	-6.22E-003
65	5.77E-006	-6.29E-003
66	6.93E-006	-6.19E-003
67	7.33E-006	-6.21E-003
68	6.27E-005	-6.21E-003
69	2.05E-004	-6.20E-003
70	3.98E-004	-6.19E-003
71	7.39E-004	-6.17E-003
72	1.46E-003	-6.16E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	7.57E-004
2	8.11E-004
3	2.86E-004
4	-9.96E-004
5	-2.29E-003
6	-2.74E-003
7	-2.66E-003
8	-2.50E-003
9	-1.24E-003
10	-6.06E-004
11	-3.96E-004
12	-2.54E-004
13	-1.42E-004
14	1.49E-005
15	2.14E-004
16	-6.78E-004
17	-1.87E-003
18	-2.57E-003
19	-2.56E-003
20	-2.48E-003
21	-1.79E-003
22	-1.11E-003
23	-3.39E-004
24	6.37E-004
25	1.30E-003
26	1.39E-003
27	1.10E-003
28	1.11E-006
29	-1.10E-003

30	-1.38E-003
31	-1.29E-003
32	-1.13E-003
33	3.06E-005
34	4.94E-004
35	4.33E-004
36	2.70E-004
37	3.46E-004
38	4.75E-004
39	6.34E-004
40	2.91E-006
41	-6.29E-004
42	-4.71E-004
43	-3.42E-004
44	-2.67E-004
45	-4.41E-004
46	-4.75E-004
47	-1.74E-005
48	1.14E-003
49	2.66E-003
50	2.74E-003
51	2.28E-003
52	9.95E-004
53	-2.86E-004
54	-8.12E-004
55	-7.58E-004
56	-6.38E-004
57	3.36E-004
58	1.11E-003
59	1.78E-003
60	2.47E-003
61	2.55E-003
62	2.57E-003
63	1.87E-003
64	6.75E-004
65	-2.15E-004
66	-1.34E-005
67	1.43E-004
68	2.56E-004
69	4.08E-004
70	5.91E-004
71	1.23E-003
72	2.49E-003

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#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VminHmax                             #
#####
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-2.31E-005	-2.82E-003
2	-2.55E-005	-2.79E-003
3	-3.23E-005	-2.66E-003
4	-3.90E-005	-2.59E-003
5	-4.58E-005	-2.69E-003
6	-5.26E-005	-2.85E-003
7	-5.50E-005	-2.91E-003
8	-1.55E-005	-2.92E-003
9	-1.43E-005	-2.92E-003
10	-1.27E-005	-2.93E-003
11	-4.00E-006	-2.94E-003
12	8.71E-006	-2.94E-003
13	7.46E-006	-2.94E-003
14	9.41E-006	-2.96E-003
15	1.49E-005	-3.07E-003
16	2.05E-005	-3.12E-003
17	2.60E-005	-3.03E-003
18	3.15E-005	-2.89E-003
19	3.35E-005	-2.85E-003
20	1.08E-005	-2.85E-003
21	7.16E-005	-2.84E-003
22	1.20E-004	-2.83E-003
23	5.52E-005	-2.83E-003
24	-3.01E-005	-2.82E-003
25	1.60E-005	-2.88E-003
26	1.36E-005	-2.82E-003
27	6.79E-006	-2.67E-003
28	3.97E-011	-2.58E-003
29	-6.79E-006	-2.67E-003
30	-1.36E-005	-2.82E-003
31	-1.60E-005	-2.88E-003
32	1.78E-005	-2.88E-003
33	1.11E-005	-2.89E-003
34	4.74E-006	-2.90E-003
35	9.42E-007	-2.90E-003
36	-2.20E-006	-2.91E-003
37	-1.30E-005	-2.91E-003
38	-1.10E-005	-2.94E-003
39	-5.50E-006	-3.06E-003
40	2.80E-008	-3.13E-003
41	5.56E-006	-3.06E-003
42	1.11E-005	-2.94E-003
43	1.30E-005	-2.91E-003
44	2.16E-006	-2.91E-003
45	1.71E-006	-2.90E-003
46	-1.29E-006	-2.90E-003
47	-1.01E-005	-2.89E-003
48	-1.78E-005	-2.88E-003
49	5.51E-005	-2.91E-003

50	5.27E-005	-2.85E-003
51	4.59E-005	-2.69E-003
52	3.91E-005	-2.59E-003
53	3.23E-005	-2.66E-003
54	2.55E-005	-2.79E-003
55	2.31E-005	-2.82E-003
56	3.01E-005	-2.82E-003
57	-5.52E-005	-2.83E-003
58	-1.20E-004	-2.83E-003
59	-7.16E-005	-2.84E-003
60	-1.08E-005	-2.85E-003
61	-3.35E-005	-2.85E-003
62	-3.15E-005	-2.89E-003
63	-2.60E-005	-3.03E-003
64	-2.04E-005	-3.12E-003
65	-1.49E-005	-3.07E-003
66	-9.38E-006	-2.96E-003
67	-7.42E-006	-2.94E-003
68	-8.54E-006	-2.94E-003
69	1.52E-006	-2.94E-003
70	9.44E-006	-2.93E-003
71	1.34E-005	-2.92E-003
72	1.56E-005	-2.92E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	6.92E-005
2	1.66E-004
3	3.42E-004
4	-3.26E-005
5	-4.20E-004
6	-2.76E-004
7	-1.84E-004
8	-9.67E-005
9	6.38E-006
10	-1.35E-005
11	-2.94E-005
12	-1.81E-005
13	3.28E-005
14	1.19E-004
15	2.82E-004
16	-4.44E-005
17	-3.71E-004
18	-2.09E-004
19	-1.22E-004
20	-3.15E-005
21	2.18E-004
22	-1.74E-005
23	-2.70E-004
24	-2.93E-005
25	1.64E-004
26	2.56E-004
27	3.98E-004
28	-1.23E-007
29	-3.98E-004

30	-2.56E-004
31	-1.64E-004
32	-7.57E-005
33	2.45E-005
34	9.99E-006
35	1.17E-005
36	1.64E-005
37	6.77E-005
38	1.54E-004
39	3.21E-004
40	1.16E-008
41	-3.22E-004
42	-1.55E-004
43	-6.80E-005
44	-1.67E-005
45	-1.69E-006
46	-1.40E-005
47	-3.05E-005
48	7.57E-005
49	1.84E-004
50	2.76E-004
51	4.20E-004
52	3.27E-005
53	-3.42E-004
54	-1.66E-004
55	-6.91E-005
56	2.95E-005
57	2.70E-004
58	1.74E-005
59	-2.18E-004
60	3.13E-005
61	1.22E-004
62	2.09E-004
63	3.71E-004
64	4.44E-005
65	-2.81E-004
66	-1.19E-004
67	-3.24E-005
68	1.86E-005
69	1.94E-005
70	1.75E-005
71	-4.83E-007
72	9.65E-005

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#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VmaxHmax                             #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-9.96E-004	-4.32E-003
2	-9.98E-004	-4.11E-003
3	-1.00E-003	-3.81E-003
4	-1.01E-003	-3.81E-003
5	-1.01E-003	-4.26E-003
6	-1.02E-003	-4.99E-003
7	-1.02E-003	-5.46E-003
8	-5.74E-004	-5.47E-003
9	-1.76E-004	-5.48E-003
10	-5.22E-005	-5.49E-003
11	-4.78E-005	-5.50E-003
12	-2.60E-005	-5.51E-003
13	-2.20E-005	-5.52E-003
14	-2.07E-005	-5.55E-003
15	-1.72E-005	-5.72E-003
16	-1.36E-005	-5.75E-003
17	-1.01E-005	-5.42E-003
18	-6.51E-006	-4.81E-003
19	-5.26E-006	-4.36E-003
20	-4.27E-004	-4.36E-003
21	-8.73E-004	-4.35E-003
22	-1.13E-003	-4.34E-003
23	-1.26E-003	-4.33E-003
24	-1.18E-003	-4.32E-003
25	1.13E-005	-4.79E-003
26	9.59E-006	-4.51E-003
27	4.79E-006	-4.07E-003
28	6.32E-011	-3.87E-003
29	-4.79E-006	-4.07E-003
30	-9.59E-006	-4.50E-003
31	-1.13E-005	-4.76E-003
32	2.18E-004	-4.76E-003
33	3.19E-004	-4.77E-003
34	1.98E-004	-4.78E-003
35	5.12E-005	-4.79E-003
36	6.28E-006	-4.80E-003
37	-2.40E-005	-4.81E-003
38	-2.28E-005	-4.87E-003
39	-1.94E-005	-5.08E-003
40	-1.60E-005	-5.21E-003
41	-1.26E-005	-5.09E-003
42	-9.15E-006	-4.89E-003
43	-7.94E-006	-4.84E-003
44	-3.44E-005	-4.83E-003
45	-1.02E-004	-4.82E-003
46	-2.58E-004	-4.81E-003
47	-3.56E-004	-4.80E-003
48	-2.30E-004	-4.79E-003
49	9.71E-004	-5.44E-003

50	9.69E-004	-4.97E-003
51	9.64E-004	-4.26E-003
52	9.60E-004	-3.82E-003
53	9.55E-004	-3.81E-003
54	9.50E-004	-4.11E-003
55	9.49E-004	-4.32E-003
56	1.13E-003	-4.33E-003
57	1.21E-003	-4.34E-003
58	1.08E-003	-4.35E-003
59	8.30E-004	-4.35E-003
60	3.90E-004	-4.36E-003
61	-2.63E-005	-4.37E-003
62	-2.51E-005	-4.80E-003
63	-2.15E-005	-5.41E-003
64	-1.80E-005	-5.73E-003
65	-1.44E-005	-5.69E-003
66	-1.09E-005	-5.52E-003
67	-9.62E-006	-5.49E-003
68	-4.20E-006	-5.49E-003
69	4.62E-005	-5.48E-003
70	6.47E-005	-5.47E-003
71	1.67E-004	-5.45E-003
72	5.40E-004	-5.44E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	7.26E-004
2	8.06E-004
3	5.00E-004
4	-5.69E-004
5	-1.61E-003
6	-1.79E-003
7	-1.68E-003
8	-1.52E-003
9	-5.84E-004
10	-9.83E-005
11	1.42E-005
12	-6.41E-005
13	3.98E-005
14	1.91E-004
15	4.22E-004
16	-3.32E-004
17	-1.28E-003
18	-1.64E-003
19	-1.58E-003
20	-1.47E-003
21	-8.32E-004
22	-4.86E-004
23	-1.22E-004
24	6.01E-004
25	9.41E-004
26	1.05E-003
27	9.36E-004
28	5.10E-006
29	-9.18E-004

30	-1.01E-003
31	-8.98E-004
32	-7.40E-004
33	1.11E-004
34	4.14E-004
35	2.38E-004
36	7.33E-005
37	1.57E-004
38	2.96E-004
39	5.54E-004
40	1.74E-005
41	-5.23E-004
42	-2.80E-004
43	-1.42E-004
44	-5.99E-005
45	-3.31E-004
46	-3.84E-004
47	-3.78E-005
48	7.86E-004
49	1.64E-003
50	1.75E-003
51	1.59E-003
52	5.64E-004
53	-4.97E-004
54	-8.02E-004
55	-7.22E-004
56	-5.97E-004
57	1.20E-004
58	4.79E-004
59	8.19E-004
60	1.45E-003
61	1.56E-003
62	1.62E-003
63	1.26E-003
64	3.14E-004
65	-4.32E-004
66	-1.88E-004
67	-3.50E-005
68	6.96E-005
69	9.18E-005
70	7.59E-005
71	5.12E-004
72	1.47E-003

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#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmin                                #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.90E-003	-4.21E-003
2	-1.90E-003	-3.90E-003
3	-1.91E-003	-3.54E-003
4	-1.91E-003	-3.61E-003
5	-1.91E-003	-4.29E-003
6	-1.91E-003	-5.46E-003
7	-1.91E-003	-6.33E-003
8	-1.08E-003	-6.34E-003
9	-3.35E-004	-6.36E-003
10	-1.99E-004	-6.38E-003
11	-3.18E-004	-6.41E-003
12	-2.91E-004	-6.43E-003
13	-2.40E-004	-6.44E-003
14	-2.40E-004	-6.43E-003
15	-2.38E-004	-6.52E-003
16	-2.37E-004	-6.42E-003
17	-2.36E-004	-5.87E-003
18	-2.34E-004	-4.94E-003
19	-2.34E-004	-4.25E-003
20	-9.13E-004	-4.25E-003
21	-1.71E-003	-4.24E-003
22	-2.20E-003	-4.23E-003
23	-2.37E-003	-4.22E-003
24	-2.19E-003	-4.21E-003
25	4.02E-006	-5.02E-003
26	3.41E-006	-4.58E-003
27	1.71E-006	-3.98E-003
28	1.09E-010	-3.72E-003
29	-1.71E-006	-3.99E-003
30	-3.41E-006	-4.63E-003
31	-4.02E-006	-5.10E-003
32	4.32E-004	-5.11E-003
33	5.82E-004	-5.13E-003
34	2.29E-004	-5.16E-003
35	-7.44E-005	-5.18E-003
36	-1.81E-004	-5.20E-003
37	-2.28E-004	-5.20E-003
38	-2.28E-004	-5.29E-003
39	-2.27E-004	-5.51E-003
40	-2.26E-004	-5.61E-003
41	-2.25E-004	-5.44E-003
42	-2.24E-004	-5.17E-003
43	-2.23E-004	-5.07E-003
44	-2.98E-004	-5.06E-003
45	-4.40E-004	-5.05E-003
46	-6.54E-004	-5.04E-003
47	-7.10E-004	-5.03E-003
48	-4.01E-004	-5.02E-003
49	2.05E-003	-6.25E-003

50	2.05E-003	-5.47E-003
51	2.05E-003	-4.35E-003
52	2.04E-003	-3.64E-003
53	2.04E-003	-3.51E-003
54	2.04E-003	-3.85E-003
55	2.04E-003	-4.17E-003
56	2.33E-003	-4.17E-003
57	2.44E-003	-4.19E-003
58	2.11E-003	-4.21E-003
59	1.47E-003	-4.23E-003
60	5.46E-004	-4.24E-003
61	-2.16E-004	-4.25E-003
62	-2.15E-004	-5.02E-003
63	-2.14E-004	-5.99E-003
64	-2.13E-004	-6.48E-003
65	-2.12E-004	-6.49E-003
66	-2.11E-004	-6.33E-003
67	-2.10E-004	-6.31E-003
68	-1.92E-004	-6.31E-003
69	-7.05E-005	-6.30E-003
70	1.45E-004	-6.28E-003
71	5.12E-004	-6.27E-003
72	1.29E-003	-6.26E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.08E-003
2	1.13E-003
3	4.97E-004
4	-9.36E-004
5	-2.43E-003
6	-3.18E-003
7	-3.13E-003
8	-2.88E-003
9	-9.69E-004
10	1.44E-004
11	2.67E-004
12	-2.69E-004
13	-8.39E-005
14	5.70E-005
15	1.54E-004
16	-7.73E-004
17	-1.93E-003
18	-2.54E-003
19	-2.51E-003
20	-2.41E-003
21	-1.60E-003
22	-8.36E-004
23	-1.60E-005
24	9.63E-004
25	1.53E-003
26	1.62E-003
27	1.22E-003
28	-6.06E-006
29	-1.26E-003

30	-1.76E-003
31	-1.69E-003
32	-1.42E-003
33	4.74E-004
34	1.05E-003
35	4.41E-004
36	1.20E-004
37	2.51E-004
38	3.77E-004
39	5.26E-004
40	-8.89E-005
41	-6.79E-004
42	-4.54E-004
43	-3.17E-004
44	-2.33E-004
45	-5.34E-004
46	-4.32E-004
47	2.39E-004
48	1.38E-003
49	2.83E-003
50	2.91E-003
51	2.43E-003
52	1.06E-003
53	-3.81E-004
54	-1.15E-003
55	-1.12E-003
56	-9.51E-004
57	3.36E-004
58	1.24E-003
59	1.95E-003
60	2.71E-003
61	2.81E-003
62	2.80E-003
63	1.89E-003
64	5.66E-004
65	-3.81E-004
66	-1.60E-004
67	4.10E-006
68	1.24E-004
69	4.64E-004
70	6.20E-004
71	1.33E-003
72	2.65E-003

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#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VminHmax                                #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-4.81E-005	-2.82E-003
2	-5.05E-005	-2.78E-003
3	-5.73E-005	-2.65E-003
4	-6.41E-005	-2.58E-003
5	-7.08E-005	-2.68E-003
6	-7.76E-005	-2.87E-003
7	-8.00E-005	-2.95E-003
8	-2.83E-005	-2.96E-003
9	-4.95E-005	-2.97E-003
10	-5.72E-005	-2.99E-003
11	-4.25E-005	-3.00E-003
12	-1.38E-005	-3.01E-003
13	-5.20E-006	-3.02E-003
14	-3.24E-006	-3.03E-003
15	2.30E-006	-3.13E-003
16	7.84E-006	-3.17E-003
17	1.34E-005	-3.06E-003
18	1.89E-005	-2.90E-003
19	2.09E-005	-2.85E-003
20	-1.06E-005	-2.85E-003
21	4.09E-005	-2.84E-003
22	8.58E-005	-2.83E-003
23	2.15E-005	-2.83E-003
24	-5.93E-005	-2.82E-003
25	1.60E-005	-2.90E-003
26	1.36E-005	-2.83E-003
27	6.79E-006	-2.66E-003
28	-1.84E-011	-2.56E-003
29	-6.79E-006	-2.66E-003
30	-1.36E-005	-2.84E-003
31	-1.60E-005	-2.92E-003
32	2.97E-005	-2.92E-003
33	-4.01E-007	-2.93E-003
34	-1.74E-005	-2.95E-003
35	-2.13E-005	-2.96E-003
36	-1.81E-005	-2.97E-003
37	-2.50E-005	-2.98E-003
38	-2.30E-005	-3.01E-003
39	-1.75E-005	-3.13E-003
40	-1.19E-005	-3.19E-003
41	-6.40E-006	-3.11E-003
42	-8.67E-007	-2.97E-003
43	1.09E-006	-2.93E-003
44	-2.05E-005	-2.93E-003
45	-3.51E-005	-2.92E-003
46	-4.08E-005	-2.92E-003
47	-4.10E-005	-2.91E-003
48	-3.09E-005	-2.90E-003
49	8.01E-005	-2.95E-003

50	7.77E-005	-2.87E-003
51	7.09E-005	-2.69E-003
52	6.41E-005	-2.58E-003
53	5.73E-005	-2.65E-003
54	5.05E-005	-2.78E-003
55	4.81E-005	-2.81E-003
56	4.52E-005	-2.81E-003
57	-1.43E-004	-2.83E-003
58	-2.78E-004	-2.84E-003
59	-1.70E-004	-2.85E-003
60	-2.32E-005	-2.87E-003
61	-4.47E-005	-2.87E-003
62	-4.28E-005	-2.92E-003
63	-3.73E-005	-3.07E-003
64	-3.17E-005	-3.17E-003
65	-2.62E-005	-3.11E-003
66	-2.07E-005	-3.00E-003
67	-1.87E-005	-2.98E-003
68	-2.45E-005	-2.98E-003
69	-2.08E-005	-2.97E-003
70	-1.00E-005	-2.96E-003
71	5.60E-006	-2.96E-003
72	2.71E-005	-2.95E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	8.47E-005
2	1.81E-004
3	3.53E-004
4	-3.80E-005
5	-4.53E-004
6	-3.52E-004
7	-2.65E-004
8	-1.01E-004
9	5.29E-005
10	-1.17E-005
11	-5.88E-005
12	-6.87E-005
13	2.09E-005
14	1.05E-004
15	2.50E-004
16	-8.57E-005
17	-4.13E-004
18	-2.43E-004
19	-1.55E-004
20	-6.25E-005
21	2.02E-004
22	-2.07E-005
23	-2.63E-004
24	-1.45E-005
25	2.11E-004
26	3.01E-004
27	4.23E-004
28	4.54E-007
29	-4.30E-004

30	-3.31E-004
31	-2.43E-004
32	-7.84E-005
33	7.24E-005
34	1.93E-005
35	7.07E-006
36	-1.32E-005
37	7.76E-005
38	1.62E-004
39	3.08E-004
40	-2.82E-005
41	-3.58E-004
42	-1.93E-004
43	-1.06E-004
44	-5.75E-005
45	-2.33E-005
46	-6.17E-006
47	3.65E-006
48	1.24E-004
49	2.33E-004
50	3.23E-004
51	4.51E-004
52	5.01E-005
53	-3.36E-004
54	-1.71E-004
55	-7.59E-005
56	1.18E-004
57	5.68E-004
58	2.84E-005
59	-4.80E-004
60	-2.11E-005
61	1.57E-004
62	2.41E-004
63	3.85E-004
64	4.54E-005
65	-2.91E-004
66	-1.34E-004
67	-4.82E-005
68	-4.65E-007
69	1.46E-005
70	3.60E-005
71	3.93E-005
72	1.47E-004

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#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmax                                #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.20E-003	-4.31E-003
2	-1.21E-003	-4.08E-003
3	-1.21E-003	-3.75E-003
4	-1.22E-003	-3.75E-003
5	-1.22E-003	-4.25E-003
6	-1.22E-003	-5.09E-003
7	-1.23E-003	-5.68E-003
8	-6.77E-004	-5.69E-003
9	-2.51E-004	-5.71E-003
10	-1.91E-004	-5.74E-003
11	-2.53E-004	-5.76E-003
12	-2.24E-004	-5.78E-003
13	-1.99E-004	-5.79E-003
14	-1.98E-004	-5.81E-003
15	-1.94E-004	-5.94E-003
16	-1.91E-004	-5.92E-003
17	-1.87E-004	-5.52E-003
18	-1.83E-004	-4.84E-003
19	-1.82E-004	-4.36E-003
20	-6.39E-004	-4.35E-003
21	-1.12E-003	-4.34E-003
22	-1.39E-003	-4.33E-003
23	-1.51E-003	-4.32E-003
24	-1.41E-003	-4.31E-003
25	1.13E-005	-4.83E-003
26	9.61E-006	-4.52E-003
27	4.81E-006	-4.04E-003
28	4.55E-011	-3.82E-003
29	-4.81E-006	-4.05E-003
30	-9.61E-006	-4.56E-003
31	-1.13E-005	-4.91E-003
32	2.92E-004	-4.91E-003
33	3.63E-004	-4.94E-003
34	1.19E-004	-4.96E-003
35	-1.26E-004	-4.98E-003
36	-1.79E-004	-5.00E-003
37	-2.00E-004	-5.00E-003
38	-1.99E-004	-5.06E-003
39	-1.95E-004	-5.26E-003
40	-1.92E-004	-5.35E-003
41	-1.89E-004	-5.20E-003
42	-1.85E-004	-4.96E-003
43	-1.84E-004	-4.88E-003
44	-2.33E-004	-4.88E-003
45	-3.12E-004	-4.87E-003
46	-4.29E-004	-4.86E-003
47	-4.60E-004	-4.85E-003
48	-2.69E-004	-4.84E-003
49	1.19E-003	-5.64E-003

50	1.19E-003	-5.10E-003
51	1.18E-003	-4.29E-003
52	1.18E-003	-3.77E-003
53	1.17E-003	-3.74E-003
54	1.17E-003	-4.05E-003
55	1.17E-003	-4.28E-003
56	1.37E-003	-4.29E-003
57	1.38E-003	-4.31E-003
58	1.14E-003	-4.33E-003
59	8.18E-004	-4.35E-003
60	3.07E-004	-4.37E-003
61	-2.01E-004	-4.37E-003
62	-2.00E-004	-4.90E-003
63	-1.96E-004	-5.61E-003
64	-1.93E-004	-5.97E-003
65	-1.89E-004	-5.92E-003
66	-1.86E-004	-5.74E-003
67	-1.84E-004	-5.70E-003
68	-1.90E-004	-5.69E-003
69	-1.30E-004	-5.68E-003
70	-3.58E-005	-5.67E-003
71	1.84E-004	-5.66E-003
72	6.79E-004	-5.65E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	7.99E-004
2	8.80E-004
3	5.41E-004
4	-6.10E-004
5	-1.80E-003
6	-2.20E-003
7	-2.11E-003
8	-1.84E-003
9	-4.96E-004
10	9.80E-005
11	1.15E-004
12	-1.69E-004
13	3.38E-006
14	1.44E-004
15	2.95E-004
16	-5.01E-004
17	-1.46E-003
18	-1.78E-003
19	-1.71E-003
20	-1.59E-003
21	-8.89E-004
22	-4.88E-004
23	-8.12E-005
24	6.72E-004
25	1.08E-003
26	1.19E-003
27	1.01E-003
28	-6.09E-006
29	-1.05E-003

30	-1.31E-003
31	-1.22E-003
32	-9.44E-004
33	3.55E-004
34	7.37E-004
35	3.66E-004
36	1.97E-005
37	1.60E-004
38	2.92E-004
39	4.91E-004
40	-7.87E-005
41	-6.28E-004
42	-3.67E-004
43	-2.26E-004
44	-1.43E-004
45	-2.88E-004
46	-2.41E-004
47	1.37E-004
48	9.32E-004
49	1.92E-003
50	2.03E-003
51	1.81E-003
52	6.98E-004
53	-4.63E-004
54	-8.98E-004
55	-8.35E-004
56	-6.25E-004
57	4.11E-004
58	7.08E-004
59	9.48E-004
60	1.75E-003
61	1.92E-003
62	1.95E-003
63	1.42E-003
64	3.50E-004
65	-4.63E-004
66	-2.30E-004
67	-7.40E-005
68	3.23E-005
69	1.99E-004
70	3.34E-004
71	8.27E-004
72	1.76E-003

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#####
#                VERIFICAÇÃO DA FADIGA (ELS)                #
#                VmaxHmin                                    #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-7.55E-004	-3.09E-003
2	-7.56E-004	-2.93E-003
3	-7.60E-004	-2.72E-003
4	-7.63E-004	-2.72E-003
5	-7.66E-004	-3.06E-003
6	-7.69E-004	-3.60E-003
7	-7.70E-004	-3.95E-003
8	-4.36E-004	-3.96E-003
9	-1.33E-004	-3.96E-003
10	-3.95E-005	-3.97E-003
11	-3.69E-005	-3.98E-003
12	-2.10E-005	-3.99E-003
13	-1.75E-005	-3.99E-003
14	-1.67E-005	-4.01E-003
15	-1.44E-005	-4.13E-003
16	-1.22E-005	-4.15E-003
17	-9.96E-006	-3.91E-003
18	-7.72E-006	-3.45E-003
19	-6.93E-006	-3.12E-003
20	-3.24E-004	-3.12E-003
21	-6.66E-004	-3.11E-003
22	-8.66E-004	-3.11E-003
23	-9.58E-004	-3.10E-003
24	-8.94E-004	-3.09E-003
25	7.54E-006	-3.44E-003
26	6.41E-006	-3.24E-003
27	3.20E-006	-2.92E-003
28	4.52E-011	-2.77E-003
29	-3.20E-006	-2.91E-003
30	-6.41E-006	-3.23E-003
31	-7.54E-006	-3.42E-003
32	1.64E-004	-3.42E-003
33	2.42E-004	-3.43E-003
34	1.51E-004	-3.44E-003
35	3.95E-005	-3.45E-003
36	5.17E-006	-3.45E-003
37	-1.74E-005	-3.46E-003
38	-1.66E-005	-3.50E-003
39	-1.45E-005	-3.65E-003
40	-1.23E-005	-3.74E-003
41	-1.02E-005	-3.66E-003
42	-8.05E-006	-3.52E-003
43	-7.30E-006	-3.48E-003
44	-2.68E-005	-3.48E-003
45	-7.84E-005	-3.47E-003
46	-1.97E-004	-3.46E-003
47	-2.71E-004	-3.45E-003
48	-1.74E-004	-3.45E-003
49	7.33E-004	-3.93E-003

50	7.32E-004	-3.59E-003
51	7.29E-004	-3.06E-003
52	7.26E-004	-2.73E-003
53	7.23E-004	-2.72E-003
54	7.20E-004	-2.94E-003
55	7.19E-004	-3.09E-003
56	8.57E-004	-3.10E-003
57	9.21E-004	-3.10E-003
58	8.30E-004	-3.11E-003
59	6.33E-004	-3.12E-003
60	2.96E-004	-3.12E-003
61	-1.74E-005	-3.13E-003
62	-1.66E-005	-3.45E-003
63	-1.44E-005	-3.90E-003
64	-1.22E-005	-4.14E-003
65	-9.92E-006	-4.11E-003
66	-7.68E-006	-3.99E-003
67	-6.89E-006	-3.97E-003
68	-2.25E-006	-3.97E-003
69	3.57E-005	-3.96E-003
70	4.91E-005	-3.95E-003
71	1.27E-004	-3.95E-003
72	4.09E-004	-3.94E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	5.42E-004
2	5.97E-004
3	3.55E-004
4	-4.29E-004
5	-1.19E-003
6	-1.34E-003
7	-1.26E-003
8	-1.15E-003
9	-4.44E-004
10	-7.34E-005
11	1.30E-005
12	-4.86E-005
13	2.60E-005
14	1.34E-004
15	2.95E-004
16	-2.50E-004
17	-9.43E-004
18	-1.22E-003
19	-1.18E-003
20	-1.11E-003
21	-6.46E-004
22	-3.67E-004
23	-7.52E-005
24	4.54E-004
25	7.04E-004
26	7.80E-004
27	6.83E-004
28	3.93E-006
29	-6.69E-004

30	-7.49E-004
31	-6.71E-004
32	-5.58E-004
33	8.12E-005
34	3.14E-004
35	1.81E-004
36	5.57E-005
37	1.15E-004
38	2.13E-004
39	3.95E-004
40	1.35E-005
41	-3.71E-004
42	-2.01E-004
43	-1.04E-004
44	-4.54E-005
45	-2.53E-004
46	-2.91E-004
47	-2.50E-005
48	5.93E-004
49	1.23E-003
50	1.31E-003
51	1.18E-003
52	4.25E-004
53	-3.53E-004
54	-5.94E-004
55	-5.39E-004
56	-4.52E-004
57	7.39E-005
58	3.62E-004
59	6.36E-004
60	1.10E-003
61	1.17E-003
62	1.21E-003
63	9.27E-004
64	2.37E-004
65	-3.02E-004
66	-1.31E-004
67	-2.23E-005
68	5.28E-005
69	6.88E-005
70	5.61E-005
71	3.89E-004
72	1.11E-003

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#####
#                VERIFICAÇÃO DA FADIGA (ELS)                #
#                VminHmax                                    #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-2.52E-004	-2.82E-003
2	-2.54E-004	-2.73E-003
3	-2.58E-004	-2.57E-003
4	-2.63E-004	-2.52E-003
5	-2.68E-004	-2.70E-003
6	-2.73E-004	-2.99E-003
7	-2.75E-004	-3.15E-003
8	-1.39E-004	-3.15E-003
9	-4.32E-005	-3.16E-003
10	-1.17E-005	-3.16E-003
11	-5.15E-006	-3.17E-003
12	4.00E-006	-3.18E-003
13	-5.47E-007	-3.18E-003
14	8.27E-007	-3.20E-003
15	4.71E-006	-3.32E-003
16	8.60E-006	-3.37E-003
17	1.25E-005	-3.24E-003
18	1.64E-005	-2.99E-003
19	1.78E-005	-2.85E-003
20	-1.12E-004	-2.85E-003
21	-2.02E-004	-2.84E-003
22	-2.44E-004	-2.83E-003
23	-3.06E-004	-2.83E-003
24	-3.17E-004	-2.82E-003
25	1.17E-005	-2.95E-003
26	9.92E-006	-2.85E-003
27	4.96E-006	-2.65E-003
28	4.03E-011	-2.55E-003
29	-4.96E-006	-2.65E-003
30	-9.92E-006	-2.85E-003
31	-1.17E-005	-2.94E-003
32	6.20E-005	-2.94E-003
33	7.48E-005	-2.95E-003
34	4.04E-005	-2.96E-003
35	5.66E-006	-2.96E-003
36	-2.01E-006	-2.97E-003
37	-1.15E-005	-2.97E-003
38	-1.01E-005	-3.00E-003
39	-6.23E-006	-3.12E-003
40	-2.38E-006	-3.19E-003
41	1.47E-006	-3.12E-003
42	5.33E-006	-3.00E-003
43	6.69E-006	-2.98E-003
44	-2.17E-006	-2.97E-003
45	-1.32E-005	-2.97E-003
46	-4.94E-005	-2.96E-003
47	-8.03E-005	-2.95E-003
48	-6.38E-005	-2.95E-003
49	2.68E-004	-3.14E-003

50	2.66E-004	-2.99E-003
51	2.61E-004	-2.70E-003
52	2.56E-004	-2.53E-003
53	2.51E-004	-2.57E-003
54	2.46E-004	-2.73E-003
55	2.45E-004	-2.82E-003
56	3.10E-004	-2.82E-003
57	2.99E-004	-2.83E-003
58	2.37E-004	-2.83E-003
59	1.96E-004	-2.84E-003
60	1.06E-004	-2.85E-003
61	-2.24E-005	-2.85E-003
62	-2.11E-005	-2.99E-003
63	-1.72E-005	-3.24E-003
64	-1.33E-005	-3.37E-003
65	-9.41E-006	-3.31E-003
66	-5.53E-006	-3.20E-003
67	-4.15E-006	-3.18E-003
68	-8.50E-006	-3.17E-003
69	4.92E-006	-3.17E-003
70	1.36E-005	-3.16E-003
71	4.19E-005	-3.15E-003
72	1.34E-004	-3.15E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.77E-004
2	3.51E-004
3	3.45E-004
4	-1.69E-004
5	-6.71E-004
6	-6.22E-004
7	-5.37E-004
8	-4.38E-004
9	-1.36E-004
10	-3.45E-005
11	-1.12E-005
12	-1.02E-005
13	4.78E-005
14	1.39E-004
15	3.01E-004
16	-8.85E-005
17	-5.40E-004
18	-5.67E-004
19	-5.04E-004
20	-4.26E-004
21	-1.09E-004
22	-1.29E-004
23	-1.52E-004
24	1.88E-004
25	3.17E-004
26	4.01E-004
27	4.67E-004
28	7.59E-007
29	-4.64E-004

30	-3.95E-004
31	-3.10E-004
32	-2.13E-004
33	5.33E-005
34	1.03E-004
35	5.47E-005
36	1.15E-005
37	6.30E-005
38	1.50E-004
39	3.21E-004
40	2.60E-006
41	-3.16E-004
42	-1.48E-004
43	-6.09E-005
44	-9.51E-006
45	-6.85E-005
46	-9.82E-005
47	-4.24E-005
48	2.20E-004
49	5.30E-004
50	6.16E-004
51	6.68E-004
52	1.69E-004
53	-3.45E-004
54	-3.50E-004
55	-2.76E-004
56	-1.88E-004
57	1.52E-004
58	1.28E-004
59	1.07E-004
60	4.23E-004
61	5.02E-004
62	5.64E-004
63	5.37E-004
64	8.59E-005
65	-3.02E-004
66	-1.38E-004
67	-4.70E-005
68	1.10E-005
69	2.70E-005
70	3.12E-005
71	1.26E-004
72	4.30E-004

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#####
#                VERIFICAÇÃO DA FADIGA (ELS)                #
#                VmaxHmax                                    #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-7.06E-004	-3.10E-003
2	-7.07E-004	-2.95E-003
3	-7.10E-004	-2.73E-003
4	-7.14E-004	-2.73E-003
5	-7.17E-004	-3.05E-003
6	-7.20E-004	-3.57E-003
7	-7.22E-004	-3.91E-003
8	-4.07E-004	-3.91E-003
9	-1.25E-004	-3.92E-003
10	-3.72E-005	-3.93E-003
11	-3.40E-005	-3.93E-003
12	-1.85E-005	-3.94E-003
13	-1.55E-005	-3.95E-003
14	-1.46E-005	-3.97E-003
15	-1.21E-005	-4.09E-003
16	-9.60E-006	-4.11E-003
17	-7.08E-006	-3.88E-003
18	-4.57E-006	-3.44E-003
19	-3.68E-006	-3.13E-003
20	-3.02E-004	-3.13E-003
21	-6.17E-004	-3.12E-003
22	-8.01E-004	-3.11E-003
23	-8.92E-004	-3.11E-003
24	-8.37E-004	-3.10E-003
25	8.12E-006	-3.43E-003
26	6.90E-006	-3.23E-003
27	3.45E-006	-2.92E-003
28	4.52E-011	-2.78E-003
29	-3.45E-006	-2.92E-003
30	-6.90E-006	-3.22E-003
31	-8.12E-006	-3.41E-003
32	1.54E-004	-3.41E-003
33	2.26E-004	-3.42E-003
34	1.40E-004	-3.43E-003
35	3.64E-005	-3.43E-003
36	4.50E-006	-3.44E-003
37	-1.70E-005	-3.44E-003
38	-1.62E-005	-3.49E-003
39	-1.37E-005	-3.63E-003
40	-1.13E-005	-3.73E-003
41	-8.89E-006	-3.64E-003
42	-6.47E-006	-3.50E-003
43	-5.61E-006	-3.46E-003
44	-2.44E-005	-3.46E-003
45	-7.21E-005	-3.45E-003
46	-1.83E-004	-3.45E-003
47	-2.52E-004	-3.44E-003
48	-1.63E-004	-3.43E-003
49	6.88E-004	-3.89E-003

50	6.87E-004	-3.56E-003
51	6.83E-004	-3.05E-003
52	6.80E-004	-2.74E-003
53	6.77E-004	-2.74E-003
54	6.73E-004	-2.95E-003
55	6.72E-004	-3.10E-003
56	8.03E-004	-3.10E-003
57	8.58E-004	-3.11E-003
58	7.68E-004	-3.12E-003
59	5.87E-004	-3.12E-003
60	2.76E-004	-3.13E-003
61	-1.87E-005	-3.13E-003
62	-1.78E-005	-3.44E-003
63	-1.53E-005	-3.87E-003
64	-1.27E-005	-4.10E-003
65	-1.02E-005	-4.07E-003
66	-7.71E-006	-3.95E-003
67	-6.82E-006	-3.93E-003
68	-2.92E-006	-3.93E-003
69	3.29E-005	-3.92E-003
70	4.60E-005	-3.91E-003
71	1.19E-004	-3.90E-003
72	3.82E-004	-3.89E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	5.16E-004
2	5.74E-004
3	3.58E-004
4	-4.03E-004
5	-1.15E-003
6	-1.27E-003
7	-1.19E-003
8	-1.08E-003
9	-4.13E-004
10	-6.98E-005
11	9.78E-006
12	-4.56E-005
13	2.79E-005
14	1.35E-004
15	2.99E-004
16	-2.35E-004
17	-9.07E-004
18	-1.16E-003
19	-1.12E-003
20	-1.04E-003
21	-5.89E-004
22	-3.46E-004
23	-8.86E-005
24	4.27E-004
25	6.68E-004
26	7.46E-004
27	6.67E-004
28	3.61E-006
29	-6.54E-004

30	-7.18E-004
31	-6.38E-004
32	-5.25E-004
33	7.86E-005
34	2.93E-004
35	1.69E-004
36	5.21E-005
37	1.11E-004
38	2.10E-004
39	3.92E-004
40	1.23E-005
41	-3.71E-004
42	-1.98E-004
43	-1.01E-004
44	-4.26E-005
45	-2.35E-004
46	-2.72E-004
47	-2.71E-005
48	5.58E-004
49	1.16E-003
50	1.24E-003
51	1.13E-003
52	3.99E-004
53	-3.57E-004
54	-5.71E-004
55	-5.14E-004
56	-4.24E-004
57	8.74E-005
58	3.41E-004
59	5.80E-004
60	1.03E-003
61	1.10E-003
62	1.15E-003
63	8.92E-004
64	2.22E-004
65	-3.05E-004
66	-1.33E-004
67	-2.45E-005
68	4.95E-005
69	6.52E-005
70	5.39E-005
71	3.63E-004
72	1.04E-003

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#####
#                VERIFICAÇÃO DA FADIGA (ELS)                #
#                VminHmin                                    #
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 DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y  
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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-6.05E-004	-2.77E-003
2	-6.06E-004	-2.64E-003
3	-6.09E-004	-2.45E-003
4	-6.12E-004	-2.45E-003
5	-6.15E-004	-2.73E-003
6	-6.18E-004	-3.18E-003
7	-6.20E-004	-3.47E-003
8	-3.48E-004	-3.47E-003
9	-1.07E-004	-3.48E-003
10	-3.19E-005	-3.49E-003
11	-2.88E-005	-3.49E-003
12	-1.54E-005	-3.50E-003
13	-1.32E-005	-3.50E-003
14	-1.24E-005	-3.52E-003
15	-1.01E-005	-3.63E-003
16	-7.88E-006	-3.65E-003
17	-5.64E-006	-3.45E-003
18	-3.39E-006	-3.07E-003
19	-2.60E-006	-2.80E-003
20	-2.59E-004	-2.80E-003
21	-5.29E-004	-2.79E-003
22	-6.85E-004	-2.79E-003
23	-7.65E-004	-2.78E-003
24	-7.19E-004	-2.78E-003
25	7.48E-006	-3.06E-003
26	6.36E-006	-2.89E-003
27	3.18E-006	-2.62E-003
28	4.06E-011	-2.49E-003
29	-3.18E-006	-2.61E-003
30	-6.36E-006	-2.88E-003
31	-7.48E-006	-3.04E-003
32	1.33E-004	-3.04E-003
33	1.93E-004	-3.05E-003
34	1.20E-004	-3.06E-003
35	3.09E-005	-3.06E-003
36	3.73E-006	-3.07E-003
37	-1.47E-005	-3.07E-003
38	-1.40E-005	-3.11E-003
39	-1.18E-005	-3.24E-003
40	-9.62E-006	-3.32E-003
41	-7.46E-006	-3.25E-003
42	-5.29E-006	-3.12E-003
43	-4.53E-006	-3.09E-003
44	-2.06E-005	-3.09E-003
45	-6.12E-005	-3.08E-003
46	-1.56E-004	-3.07E-003
47	-2.16E-004	-3.07E-003
48	-1.40E-004	-3.06E-003
49	5.91E-004	-3.45E-003

50	5.90E-004	-3.17E-003
51	5.87E-004	-2.73E-003
52	5.84E-004	-2.45E-003
53	5.81E-004	-2.46E-003
54	5.77E-004	-2.65E-003
55	5.76E-004	-2.78E-003
56	6.90E-004	-2.78E-003
57	7.36E-004	-2.78E-003
58	6.57E-004	-2.79E-003
59	5.03E-004	-2.80E-003
60	2.37E-004	-2.80E-003
61	-1.64E-005	-2.80E-003
62	-1.56E-005	-3.07E-003
63	-1.34E-005	-3.44E-003
64	-1.11E-005	-3.64E-003
65	-8.87E-006	-3.61E-003
66	-6.63E-006	-3.51E-003
67	-5.83E-006	-3.49E-003
68	-2.76E-006	-3.48E-003
69	2.79E-005	-3.48E-003
70	3.94E-005	-3.47E-003
71	1.02E-004	-3.46E-003
72	3.28E-004	-3.46E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	4.50E-004
2	5.03E-004
3	3.21E-004
4	-3.46E-004
5	-9.97E-004
6	-1.10E-003
7	-1.03E-003
8	-9.26E-004
9	-3.53E-004
10	-6.04E-005
11	7.69E-006
12	-3.87E-005
13	2.55E-005
14	1.19E-004
15	2.63E-004
16	-2.01E-004
17	-7.84E-004
18	-9.99E-004
19	-9.60E-004
20	-8.93E-004
21	-5.01E-004
22	-2.98E-004
23	-8.19E-005
24	3.70E-004
25	5.78E-004
26	6.48E-004
27	5.85E-004
28	3.07E-006
29	-5.74E-004

30	-6.24E-004
31	-5.52E-004
32	-4.52E-004
33	6.88E-005
34	2.51E-004
35	1.44E-004
36	4.42E-005
37	9.58E-005
38	1.82E-004
39	3.42E-004
40	1.05E-005
41	-3.24E-004
42	-1.72E-004
43	-8.70E-005
44	-3.61E-005
45	-2.00E-004
46	-2.33E-004
47	-2.50E-005
48	4.80E-004
49	1.00E-003
50	1.07E-003
51	9.85E-004
52	3.43E-004
53	-3.20E-004
54	-5.00E-004
55	-4.48E-004
56	-3.68E-004
57	8.08E-005
58	2.94E-004
59	4.94E-004
60	8.82E-004
61	9.48E-004
62	9.87E-004
63	7.71E-004
64	1.90E-004
65	-2.69E-004
66	-1.17E-004
67	-2.26E-005
68	4.19E-005
69	5.61E-005
70	4.69E-005
71	3.11E-004
72	8.96E-004

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#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmin          #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-6.99E-004	-2.97E-003
2	-7.00E-004	-2.83E-003
3	-7.03E-004	-2.62E-003
4	-7.06E-004	-2.62E-003
5	-7.09E-004	-2.93E-003
6	-7.12E-004	-3.44E-003
7	-7.14E-004	-3.77E-003
8	-4.03E-004	-3.77E-003
9	-1.24E-004	-3.78E-003
10	-3.66E-005	-3.79E-003
11	-3.39E-005	-3.80E-003
12	-1.89E-005	-3.81E-003
13	-1.58E-005	-3.81E-003
14	-1.51E-005	-3.83E-003
15	-1.28E-005	-3.94E-003
16	-1.06E-005	-3.96E-003
17	-8.34E-006	-3.74E-003
18	-6.10E-006	-3.31E-003
19	-5.31E-006	-3.00E-003
20	-3.00E-004	-3.00E-003
21	-6.15E-004	-2.99E-003
22	-7.98E-004	-2.99E-003
23	-8.86E-004	-2.98E-003
24	-8.29E-004	-2.97E-003
25	7.52E-006	-3.30E-003
26	6.39E-006	-3.11E-003
27	3.20E-006	-2.80E-003
28	4.38E-011	-2.67E-003
29	-3.19E-006	-2.80E-003
30	-6.39E-006	-3.10E-003
31	-7.52E-006	-3.28E-003
32	1.52E-004	-3.28E-003
33	2.24E-004	-3.29E-003
34	1.39E-004	-3.30E-003
35	3.63E-005	-3.30E-003
36	4.63E-006	-3.31E-003
37	-1.64E-005	-3.31E-003
38	-1.56E-005	-3.35E-003
39	-1.35E-005	-3.50E-003
40	-1.13E-005	-3.58E-003
41	-9.17E-006	-3.51E-003
42	-7.02E-006	-3.37E-003
43	-6.26E-006	-3.33E-003
44	-2.45E-005	-3.33E-003
45	-7.19E-005	-3.32E-003
46	-1.82E-004	-3.32E-003
47	-2.50E-004	-3.31E-003
48	-1.61E-004	-3.30E-003
49	6.80E-004	-3.75E-003

50	6.79E-004	-3.43E-003
51	6.76E-004	-2.93E-003
52	6.73E-004	-2.62E-003
53	6.70E-004	-2.62E-003
54	6.66E-004	-2.83E-003
55	6.65E-004	-2.97E-003
56	7.95E-004	-2.98E-003
57	8.51E-004	-2.98E-003
58	7.65E-004	-2.99E-003
59	5.84E-004	-3.00E-003
60	2.74E-004	-3.00E-003
61	-1.70E-005	-3.01E-003
62	-1.62E-005	-3.31E-003
63	-1.40E-005	-3.73E-003
64	-1.18E-005	-3.95E-003
65	-9.52E-006	-3.92E-003
66	-7.29E-006	-3.81E-003
67	-6.49E-006	-3.79E-003
68	-2.44E-006	-3.79E-003
69	3.27E-005	-3.78E-003
70	4.55E-005	-3.77E-003
71	1.17E-004	-3.77E-003
72	3.79E-004	-3.76E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	5.08E-004
2	5.62E-004
3	3.42E-004
4	-3.98E-004
5	-1.12E-003
6	-1.25E-003
7	-1.18E-003
8	-1.06E-003
9	-4.10E-004
10	-6.85E-005
11	1.10E-005
12	-4.49E-005
13	2.58E-005
14	1.28E-004
15	2.83E-004
16	-2.32E-004
17	-8.83E-004
18	-1.14E-003
19	-1.10E-003
20	-1.03E-003
21	-5.92E-004
22	-3.41E-004
23	-7.77E-005
24	4.23E-004
25	6.57E-004
26	7.30E-004
27	6.46E-004
28	3.61E-006
29	-6.34E-004

30	-7.02E-004
31	-6.26E-004
32	-5.18E-004
33	7.65E-005
34	2.90E-004
35	1.67E-004
36	5.14E-005
37	1.08E-004
38	2.02E-004
39	3.75E-004
40	1.23E-005
41	-3.53E-004
42	-1.90E-004
43	-9.74E-005
44	-4.19E-005
45	-2.33E-004
46	-2.70E-004
47	-2.50E-005
48	5.51E-004
49	1.14E-003
50	1.22E-003
51	1.11E-003
52	3.94E-004
53	-3.40E-004
54	-5.59E-004
55	-5.05E-004
56	-4.20E-004
57	7.65E-005
58	3.36E-004
59	5.83E-004
60	1.02E-003
61	1.09E-003
62	1.13E-003
63	8.68E-004
64	2.19E-004
65	-2.90E-004
66	-1.26E-004
67	-2.24E-005
68	4.87E-005
69	6.40E-005
70	5.26E-005
71	3.60E-004
72	1.03E-003

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#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VminHmax          #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-2.80E-004	-2.81E-003
2	-2.81E-004	-2.73E-003
3	-2.86E-004	-2.56E-003
4	-2.91E-004	-2.52E-003
5	-2.96E-004	-2.70E-003
6	-3.01E-004	-3.00E-003
7	-3.02E-004	-3.17E-003
8	-1.56E-004	-3.18E-003
9	-4.80E-005	-3.18E-003
10	-1.30E-005	-3.19E-003
11	-6.77E-006	-3.20E-003
12	2.55E-006	-3.20E-003
13	-1.64E-006	-3.21E-003
14	-3.17E-007	-3.23E-003
15	3.41E-006	-3.34E-003
16	7.14E-006	-3.39E-003
17	1.09E-005	-3.26E-003
18	1.46E-005	-3.00E-003
19	1.59E-005	-2.84E-003
20	-1.24E-004	-2.84E-003
21	-2.30E-004	-2.84E-003
22	-2.81E-004	-2.83E-003
23	-3.43E-004	-2.82E-003
24	-3.49E-004	-2.82E-003
25	1.14E-005	-2.95E-003
26	9.64E-006	-2.85E-003
27	4.82E-006	-2.65E-003
28	4.03E-011	-2.54E-003
29	-4.82E-006	-2.64E-003
30	-9.64E-006	-2.85E-003
31	-1.13E-005	-2.95E-003
32	6.75E-005	-2.95E-003
33	8.39E-005	-2.96E-003
34	4.63E-005	-2.97E-003
35	7.41E-006	-2.97E-003
36	-1.63E-006	-2.98E-003
37	-1.16E-005	-2.98E-003
38	-1.03E-005	-3.01E-003
39	-6.64E-006	-3.13E-003
40	-2.95E-006	-3.20E-003
41	7.42E-007	-3.13E-003
42	4.43E-006	-3.01E-003
43	5.74E-006	-2.99E-003
44	-3.55E-006	-2.98E-003
45	-1.67E-005	-2.98E-003
46	-5.75E-005	-2.97E-003
47	-9.08E-005	-2.96E-003
48	-6.97E-005	-2.96E-003
49	2.93E-004	-3.17E-003

50	2.92E-004	-3.00E-003
51	2.87E-004	-2.70E-003
52	2.82E-004	-2.52E-003
53	2.77E-004	-2.56E-003
54	2.73E-004	-2.73E-003
55	2.71E-004	-2.82E-003
56	3.41E-004	-2.82E-003
57	3.34E-004	-2.82E-003
58	2.72E-004	-2.83E-003
59	2.22E-004	-2.84E-003
60	1.18E-004	-2.84E-003
61	-2.17E-005	-2.85E-003
62	-2.04E-005	-3.00E-003
63	-1.67E-005	-3.25E-003
64	-1.30E-005	-3.39E-003
65	-9.24E-006	-3.34E-003
66	-5.51E-006	-3.22E-003
67	-4.19E-006	-3.20E-003
68	-8.12E-006	-3.20E-003
69	6.48E-006	-3.19E-003
70	1.53E-005	-3.18E-003
71	4.64E-005	-3.18E-003
72	1.49E-004	-3.17E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.91E-004
2	3.63E-004
3	3.43E-004
4	-1.84E-004
5	-6.98E-004
6	-6.61E-004
7	-5.77E-004
8	-4.77E-004
9	-1.54E-004
10	-3.66E-005
11	-9.46E-006
12	-1.19E-005
13	4.67E-005
14	1.38E-004
15	2.99E-004
16	-9.71E-005
17	-5.61E-004
18	-6.03E-004
19	-5.43E-004
20	-4.66E-004
21	-1.41E-004
22	-1.41E-004
23	-1.44E-004
24	2.04E-004
25	3.37E-004
26	4.20E-004
27	4.76E-004
28	9.41E-007
29	-4.73E-004

30	-4.12E-004
31	-3.29E-004
32	-2.32E-004
33	5.47E-005
34	1.14E-004
35	6.15E-005
36	1.36E-005
37	6.51E-005
38	1.52E-004
39	3.22E-004
40	3.22E-006
41	-3.17E-004
42	-1.49E-004
43	-6.24E-005
44	-1.11E-005
45	-7.87E-005
46	-1.09E-004
47	-4.13E-005
48	2.40E-004
49	5.68E-004
50	6.53E-004
51	6.94E-004
52	1.83E-004
53	-3.43E-004
54	-3.63E-004
55	-2.91E-004
56	-2.03E-004
57	1.44E-004
58	1.40E-004
59	1.39E-004
60	4.62E-004
61	5.40E-004
62	6.00E-004
63	5.57E-004
64	9.39E-005
65	-3.00E-004
66	-1.37E-004
67	-4.58E-005
68	1.29E-005
69	2.90E-005
70	3.24E-005
71	1.40E-004
72	4.68E-004

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#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmax                                  #
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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE NAS DIR. X E Y

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-6.68E-004	-2.98E-003
2	-6.69E-004	-2.83E-003
3	-6.72E-004	-2.63E-003
4	-6.76E-004	-2.63E-003
5	-6.79E-004	-2.93E-003
6	-6.82E-004	-3.42E-003
7	-6.83E-004	-3.74E-003
8	-3.85E-004	-3.75E-003
9	-1.18E-004	-3.75E-003
10	-3.52E-005	-3.76E-003
11	-3.21E-005	-3.77E-003
12	-1.73E-005	-3.78E-003
13	-1.46E-005	-3.78E-003
14	-1.38E-005	-3.80E-003
15	-1.14E-005	-3.91E-003
16	-8.95E-006	-3.94E-003
17	-6.54E-006	-3.72E-003
18	-4.13E-006	-3.30E-003
19	-3.27E-006	-3.01E-003
20	-2.86E-004	-3.00E-003
21	-5.84E-004	-3.00E-003
22	-7.58E-004	-2.99E-003
23	-8.45E-004	-2.99E-003
24	-7.93E-004	-2.98E-003
25	7.88E-006	-3.29E-003
26	6.70E-006	-3.10E-003
27	3.35E-006	-2.81E-003
28	4.37E-011	-2.67E-003
29	-3.35E-006	-2.80E-003
30	-6.70E-006	-3.09E-003
31	-7.88E-006	-3.27E-003
32	1.46E-004	-3.27E-003
33	2.14E-004	-3.28E-003
34	1.32E-004	-3.29E-003
35	3.43E-005	-3.29E-003
36	4.21E-006	-3.30E-003
37	-1.62E-005	-3.30E-003
38	-1.53E-005	-3.34E-003
39	-1.30E-005	-3.49E-003
40	-1.07E-005	-3.57E-003
41	-8.35E-006	-3.49E-003
42	-6.03E-006	-3.36E-003
43	-5.20E-006	-3.32E-003
44	-2.30E-005	-3.32E-003
45	-6.80E-005	-3.31E-003
46	-1.73E-004	-3.31E-003
47	-2.39E-004	-3.30E-003
48	-1.54E-004	-3.29E-003
49	6.52E-004	-3.73E-003

50	6.50E-004	-3.41E-003
51	6.47E-004	-2.93E-003
52	6.44E-004	-2.63E-003
53	6.41E-004	-2.63E-003
54	6.37E-004	-2.84E-003
55	6.36E-004	-2.98E-003
56	7.61E-004	-2.98E-003
57	8.12E-004	-2.99E-003
58	7.26E-004	-2.99E-003
59	5.55E-004	-3.00E-003
60	2.61E-004	-3.01E-003
61	-1.78E-005	-3.01E-003
62	-1.70E-005	-3.30E-003
63	-1.45E-005	-3.71E-003
64	-1.21E-005	-3.93E-003
65	-9.72E-006	-3.90E-003
66	-7.30E-006	-3.78E-003
67	-6.45E-006	-3.76E-003
68	-2.86E-006	-3.76E-003
69	3.10E-005	-3.75E-003
70	4.35E-005	-3.74E-003
71	1.12E-004	-3.74E-003
72	3.62E-004	-3.73E-003

-----

DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

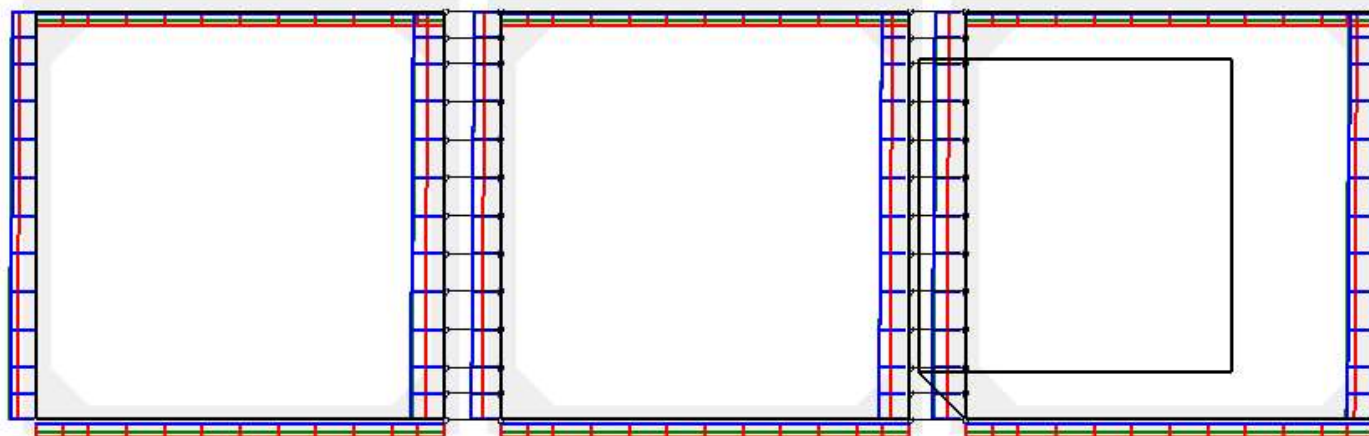
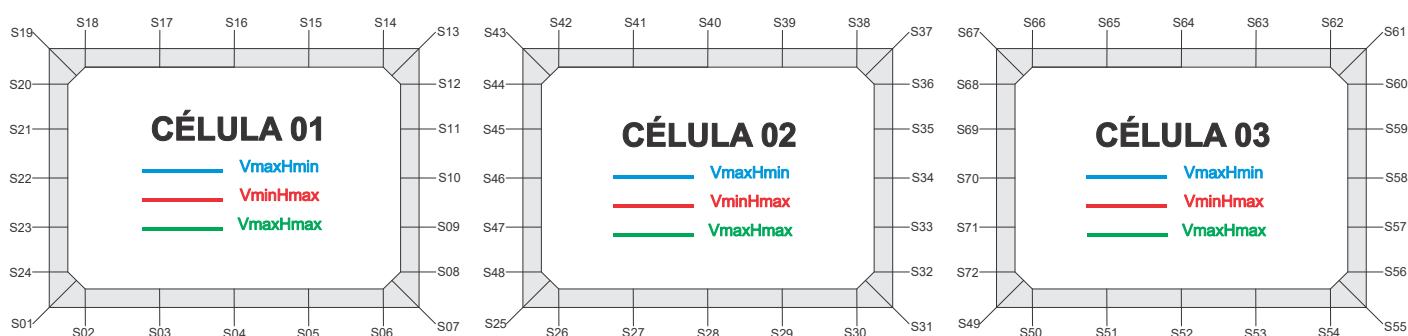
SEÇÃO	ROTAÇÃO (rad)
1	4.91E-004
2	5.47E-004
3	3.45E-004
4	-3.81E-004
5	-1.09E-003
6	-1.21E-003
7	-1.13E-003
8	-1.02E-003
9	-3.91E-004
10	-6.63E-005
11	9.00E-006
12	-4.30E-005
13	2.70E-005
14	1.29E-004
15	2.85E-004
16	-2.22E-004
17	-8.61E-004
18	-1.10E-003
19	-1.06E-003
20	-9.85E-004
21	-5.56E-004
22	-3.28E-004
23	-8.61E-005
24	4.05E-004
25	6.34E-004
26	7.09E-004
27	6.36E-004
28	3.41E-006
29	-6.24E-004

30	-6.83E-004
31	-6.06E-004
32	-4.97E-004
33	7.49E-005
34	2.77E-004
35	1.59E-004
36	4.91E-005
37	1.05E-004
38	1.99E-004
39	3.73E-004
40	1.17E-005
41	-3.53E-004
42	-1.88E-004
43	-9.57E-005
44	-4.02E-005
45	-2.22E-004
46	-2.58E-004
47	-2.63E-005
48	5.28E-004
49	1.10E-003
50	1.18E-003
51	1.08E-003
52	3.78E-004
53	-3.43E-004
54	-5.45E-004
55	-4.89E-004
56	-4.03E-004
57	8.49E-005
58	3.23E-004
59	5.48E-004
60	9.73E-004
61	1.04E-003
62	1.09E-003
63	8.47E-004
64	2.10E-004
65	-2.92E-004
66	-1.27E-004
67	-2.38E-005
68	4.66E-005
69	6.18E-005
70	5.13E-005
71	3.43E-004
72	9.87E-004

---

## ESFORÇO NORMAL

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



```
#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VmaxHmin                             #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-94.91	-15.19
2	-15.19	-15.19
3	-15.19	-15.19
4	-15.19	-15.19
5	-15.19	-15.19
6	-15.19	-15.19
7	-15.19	-122.47
8	-120.80	-120.80
9	-118.85	-118.85
10	-116.90	-116.90
11	-114.95	-114.95
12	-113.00	-113.00
13	-111.34	-11.26
14	-11.26	-11.26
15	-11.26	-11.26
16	-11.26	-11.26
17	-11.26	-11.26
18	-11.26	-11.26
19	-11.26	-83.78
20	-85.44	-85.44
21	-87.39	-87.39
22	-89.34	-89.34
23	-91.29	-91.29
24	-93.24	-93.24
25	-94.91	-18.42
26	-18.42	-18.42
27	-18.42	-18.42
28	-18.42	-18.42
29	-18.42	-18.42
30	-18.42	-18.42
31	-18.42	-108.72
32	-107.05	-107.05
33	-105.10	-105.10
34	-103.15	-103.15
35	-101.20	-101.20
36	-99.25	-99.25
37	-97.58	-8.02
38	-8.02	-8.02
39	-8.02	-8.02
40	-8.02	-8.02
41	-8.02	-8.02
42	-8.02	-8.02
43	-8.02	-97.53
44	-99.19	-99.19
45	-101.14	-101.14
46	-103.09	-103.09
47	-105.04	-105.04
48	-106.99	-106.99
49	-108.66	-15.18

	50	-15.18	-15.18
	51	-15.18	-15.18
	52	-15.18	-15.18
	53	-15.18	-15.18
	54	-15.18	-15.18
	55	-15.18	-94.88
	56	-93.21	-93.21
	57	-91.26	-91.26
	58	-89.31	-89.31
	59	-87.36	-87.36
	60	-85.41	-85.41
	61	-83.75	-11.27
	62	-11.27	-11.27
	63	-11.27	-11.27
	64	-11.27	-11.27
	65	-11.27	-11.27
	66	-11.27	-11.27
	67	-11.27	-111.37
	68	-113.03	-113.03
	69	-114.98	-114.98
	70	-116.93	-116.93
	71	-118.88	-118.88
	72	-120.83	-120.83

---

```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VminHmax #
#####
```

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-68.95	-66.39
2	-66.39	-66.39
3	-66.39	-66.39
4	-66.39	-66.39
5	-66.39	-66.39
6	-66.39	-66.39
7	-66.39	-68.97
8	-67.69	-67.69
9	-66.19	-66.19
10	-64.69	-64.69
11	-63.19	-63.19
12	-61.69	-61.69
13	-60.40	-54.07
14	-54.07	-54.07
15	-54.07	-54.07
16	-54.07	-54.07
17	-54.07	-54.07
18	-54.07	-54.07
19	-54.07	-60.39
20	-61.67	-61.67
21	-63.17	-63.17
22	-64.67	-64.67
23	-66.17	-66.17
24	-67.67	-67.67
25	-68.95	-66.38
26	-66.38	-66.38
27	-66.38	-66.38
28	-66.38	-66.38
29	-66.38	-66.38
30	-66.38	-66.38
31	-66.38	-68.96
32	-67.68	-67.68
33	-66.18	-66.18
34	-64.68	-64.68
35	-63.18	-63.18
36	-61.68	-61.68
37	-60.40	-54.08
38	-54.08	-54.08
39	-54.08	-54.08
40	-54.08	-54.08
41	-54.08	-54.08
42	-54.08	-54.08
43	-54.08	-60.39
44	-61.67	-61.67
45	-63.17	-63.17
46	-64.67	-64.67
47	-66.17	-66.17
48	-67.67	-67.67
49	-68.96	-66.39

	50	-66.39	-66.39
	51	-66.39	-66.39
	52	-66.39	-66.39
	53	-66.39	-66.39
	54	-66.39	-66.39
	55	-66.39	-68.95
	56	-67.67	-67.67
	57	-66.17	-66.17
	58	-64.67	-64.67
	59	-63.17	-63.17
	60	-61.67	-61.67
	61	-60.38	-54.07
	62	-54.07	-54.07
	63	-54.07	-54.07
	64	-54.07	-54.07
	65	-54.07	-54.07
	66	-54.07	-54.07
	67	-54.07	-60.41
	68	-61.69	-61.69
	69	-63.19	-63.19
	70	-64.69	-64.69
	71	-66.19	-66.19
	72	-67.69	-67.69

---

```
#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VmaxHmax                            #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-99.71	-45.62
2	-45.62	-45.62
3	-45.62	-45.62
4	-45.62	-45.62
5	-45.62	-45.62
6	-45.62	-45.62
7	-45.62	-117.67
8	-116.00	-116.00
9	-114.05	-114.05
10	-112.10	-112.10
11	-110.15	-110.15
12	-108.20	-108.20
13	-106.54	-34.68
14	-34.68	-34.68
15	-34.68	-34.68
16	-34.68	-34.68
17	-34.68	-34.68
18	-34.68	-34.68
19	-34.68	-88.58
20	-90.24	-90.24
21	-92.19	-92.19
22	-94.14	-94.14
23	-96.09	-96.09
24	-98.04	-98.04
25	-99.71	-46.86
26	-46.86	-46.86
27	-46.86	-46.86
28	-46.86	-46.86
29	-46.86	-46.86
30	-46.86	-46.86
31	-46.86	-108.90
32	-107.23	-107.23
33	-105.28	-105.28
34	-103.33	-103.33
35	-101.38	-101.38
36	-99.43	-99.43
37	-97.77	-33.44
38	-33.44	-33.44
39	-33.44	-33.44
40	-33.44	-33.44
41	-33.44	-33.44
42	-33.44	-33.44
43	-33.44	-97.35
44	-99.01	-99.01
45	-100.96	-100.96
46	-102.91	-102.91
47	-104.86	-104.86
48	-106.81	-106.81
49	-108.48	-45.63

50	-45.63	-45.63
51	-45.63	-45.63
52	-45.63	-45.63
53	-45.63	-45.63
54	-45.63	-45.63
55	-45.63	-99.50
56	-97.83	-97.83
57	-95.88	-95.88
58	-93.93	-93.93
59	-91.98	-91.98
60	-90.03	-90.03
61	-88.37	-34.67
62	-34.67	-34.67
63	-34.67	-34.67
64	-34.67	-34.67
65	-34.67	-34.67
66	-34.67	-34.67
67	-34.67	-106.75
68	-108.41	-108.41
69	-110.36	-110.36
70	-112.31	-112.31
71	-114.26	-114.26
72	-116.21	-116.21

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmin                                #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-97.95	-13.30
2	-13.30	-13.30
3	-13.30	-13.30
4	-13.30	-13.30
5	-13.30	-13.30
6	-13.30	-13.30
7	-13.30	-119.42
8	-117.76	-117.76
9	-115.81	-115.81
10	-113.86	-113.86
11	-111.91	-111.91
12	-109.96	-109.96
13	-108.29	-13.14
14	-13.14	-13.14
15	-13.14	-13.14
16	-13.14	-13.14
17	-13.14	-13.14
18	-13.14	-13.14
19	-13.14	-86.82
20	-88.49	-88.49
21	-90.44	-90.44
22	-92.39	-92.39
23	-94.34	-94.34
24	-96.29	-96.29
25	-97.95	-16.68
26	-16.68	-16.68
27	-16.68	-16.68
28	-16.68	-16.68
29	-16.68	-16.68
30	-16.68	-16.68
31	-16.68	-107.54
32	-105.87	-105.87
33	-103.92	-103.92
34	-101.97	-101.97
35	-100.02	-100.02
36	-98.07	-98.07
37	-96.41	-9.76
38	-9.76	-9.76
39	-9.76	-9.76
40	-9.76	-9.76
41	-9.76	-9.76
42	-9.76	-9.76
43	-9.76	-98.71
44	-100.37	-100.37
45	-102.32	-102.32
46	-104.27	-104.27
47	-106.22	-106.22
48	-108.17	-108.17
49	-109.84	-14.82

	50	-14.82	-14.82
	51	-14.82	-14.82
	52	-14.82	-14.82
	53	-14.82	-14.82
	54	-14.82	-14.82
	55	-14.82	-91.40
	56	-89.73	-89.73
	57	-87.78	-87.78
	58	-85.83	-85.83
	59	-83.88	-83.88
	60	-81.93	-81.93
	61	-80.27	-11.62
	62	-11.62	-11.62
	63	-11.62	-11.62
	64	-11.62	-11.62
	65	-11.62	-11.62
	66	-11.62	-11.62
	67	-11.62	-114.85
	68	-116.51	-116.51
	69	-118.46	-118.46
	70	-120.41	-120.41
	71	-122.36	-122.36
	72	-124.31	-124.31

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```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VminHmax                                #
#####
```

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-69.34	-66.28
2	-66.28	-66.28
3	-66.28	-66.28
4	-66.28	-66.28
5	-66.28	-66.28
6	-66.28	-66.28
7	-66.28	-68.58
8	-67.30	-67.30
9	-65.80	-65.80
10	-64.30	-64.30
11	-62.80	-62.80
12	-61.30	-61.30
13	-60.02	-54.18
14	-54.18	-54.18
15	-54.18	-54.18
16	-54.18	-54.18
17	-54.18	-54.18
18	-54.18	-54.18
19	-54.18	-60.78
20	-62.06	-62.06
21	-63.56	-63.56
22	-65.06	-65.06
23	-66.56	-66.56
24	-68.06	-68.06
25	-69.34	-66.35
26	-66.35	-66.35
27	-66.35	-66.35
28	-66.35	-66.35
29	-66.35	-66.35
30	-66.35	-66.35
31	-66.35	-68.67
32	-67.39	-67.39
33	-65.89	-65.89
34	-64.39	-64.39
35	-62.89	-62.89
36	-61.39	-61.39
37	-60.11	-54.11
38	-54.11	-54.11
39	-54.11	-54.11
40	-54.11	-54.11
41	-54.11	-54.11
42	-54.11	-54.11
43	-54.11	-60.68
44	-61.97	-61.97
45	-63.47	-63.47
46	-64.97	-64.97
47	-66.47	-66.47
48	-67.97	-67.97
49	-69.25	-66.45

	50	-66.45	-66.45
	51	-66.45	-66.45
	52	-66.45	-66.45
	53	-66.45	-66.45
	54	-66.45	-66.45
	55	-66.45	-68.78
	56	-67.50	-67.50
	57	-66.00	-66.00
	58	-64.50	-64.50
	59	-63.00	-63.00
	60	-61.50	-61.50
	61	-60.22	-54.00
	62	-54.00	-54.00
	63	-54.00	-54.00
	64	-54.00	-54.00
	65	-54.00	-54.00
	66	-54.00	-54.00
	67	-54.00	-60.58
	68	-61.86	-61.86
	69	-63.36	-63.36
	70	-64.86	-64.86
	71	-66.36	-66.36
	72	-67.86	-67.86

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmax                                #
#####
```

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-101.47	-45.07
2	-45.07	-45.07
3	-45.07	-45.07
4	-45.07	-45.07
5	-45.07	-45.07
6	-45.07	-45.07
7	-45.07	-115.91
8	-114.24	-114.24
9	-112.29	-112.29
10	-110.34	-110.34
11	-108.39	-108.39
12	-106.44	-106.44
13	-104.78	-35.23
14	-35.23	-35.23
15	-35.23	-35.23
16	-35.23	-35.23
17	-35.23	-35.23
18	-35.23	-35.23
19	-35.23	-90.34
20	-92.00	-92.00
21	-93.95	-93.95
22	-95.90	-95.90
23	-97.85	-97.85
24	-99.80	-99.80
25	-101.47	-46.99
26	-46.99	-46.99
27	-46.99	-46.99
28	-46.99	-46.99
29	-46.99	-46.99
30	-46.99	-46.99
31	-46.99	-107.74
32	-106.07	-106.07
33	-104.12	-104.12
34	-102.17	-102.17
35	-100.22	-100.22
36	-98.27	-98.27
37	-96.61	-33.32
38	-33.32	-33.32
39	-33.32	-33.32
40	-33.32	-33.32
41	-33.32	-33.32
42	-33.32	-33.32
43	-33.32	-98.50
44	-100.17	-100.17
45	-102.12	-102.12
46	-104.07	-104.07
47	-106.02	-106.02
48	-107.97	-107.97
49	-109.64	-46.11

	50	-46.11	-46.11
	51	-46.11	-46.11
	52	-46.11	-46.11
	53	-46.11	-46.11
	54	-46.11	-46.11
	55	-46.11	-96.95
	56	-95.29	-95.29
	57	-93.34	-93.34
	58	-91.39	-91.39
	59	-89.44	-89.44
	60	-87.49	-87.49
	61	-85.82	-34.19
	62	-34.19	-34.19
	63	-34.19	-34.19
	64	-34.19	-34.19
	65	-34.19	-34.19
	66	-34.19	-34.19
	67	-34.19	-109.29
	68	-110.96	-110.96
	69	-112.91	-112.91
	70	-114.86	-114.86
	71	-116.81	-116.81
	72	-118.76	-118.76

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```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmin                             #
#####
```

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-70.85	-30.39
2	-30.39	-30.39
3	-30.39	-30.39
4	-30.39	-30.39
5	-30.39	-30.39
6	-30.39	-30.39
7	-30.39	-84.38
8	-83.10	-83.10
9	-81.60	-81.60
10	-80.10	-80.10
11	-78.60	-78.60
12	-77.10	-77.10
13	-75.82	-21.86
14	-21.86	-21.86
15	-21.86	-21.86
16	-21.86	-21.86
17	-21.86	-21.86
18	-21.86	-21.86
19	-21.86	-62.29
20	-63.57	-63.57
21	-65.07	-65.07
22	-66.57	-66.57
23	-68.07	-68.07
24	-69.57	-69.57
25	-70.85	-31.33
26	-31.33	-31.33
27	-31.33	-31.33
28	-31.33	-31.33
29	-31.33	-31.33
30	-31.33	-31.33
31	-31.33	-77.78
32	-76.50	-76.50
33	-75.00	-75.00
34	-73.50	-73.50
35	-72.00	-72.00
36	-70.50	-70.50
37	-69.22	-20.91
38	-20.91	-20.91
39	-20.91	-20.91
40	-20.91	-20.91
41	-20.91	-20.91
42	-20.91	-20.91
43	-20.91	-68.89
44	-70.18	-70.18
45	-71.68	-71.68
46	-73.18	-73.18
47	-74.68	-74.68
48	-76.18	-76.18
49	-77.46	-30.40

	50	-30.40	-30.40
	51	-30.40	-30.40
	52	-30.40	-30.40
	53	-30.40	-30.40
	54	-30.40	-30.40
	55	-30.40	-70.69
	56	-69.41	-69.41
	57	-67.91	-67.91
	58	-66.41	-66.41
	59	-64.91	-64.91
	60	-63.41	-63.41
	61	-62.13	-21.85
	62	-21.85	-21.85
	63	-21.85	-21.85
	64	-21.85	-21.85
	65	-21.85	-21.85
	66	-21.85	-21.85
	67	-21.85	-75.98
	68	-77.26	-77.26
	69	-78.76	-78.76
	70	-80.26	-80.26
	71	-81.76	-81.76
	72	-83.26	-83.26

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VminHmax                             #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-66.08	-48.18
2	-48.18	-48.18
3	-48.18	-48.18
4	-48.18	-48.18
5	-48.18	-48.18
6	-48.18	-48.18
7	-48.18	-71.83
8	-70.55	-70.55
9	-69.05	-69.05
10	-67.55	-67.55
11	-66.05	-66.05
12	-64.55	-64.55
13	-63.27	-38.01
14	-38.01	-38.01
15	-38.01	-38.01
16	-38.01	-38.01
17	-38.01	-38.01
18	-38.01	-38.01
19	-38.01	-57.52
20	-58.80	-58.80
21	-60.30	-60.30
22	-61.80	-61.80
23	-63.30	-63.30
24	-64.80	-64.80
25	-66.08	-48.51
26	-48.51	-48.51
27	-48.51	-48.51
28	-48.51	-48.51
29	-48.51	-48.51
30	-48.51	-48.51
31	-48.51	-68.99
32	-67.71	-67.71
33	-66.21	-66.21
34	-64.71	-64.71
35	-63.21	-63.21
36	-61.71	-61.71
37	-60.43	-37.68
38	-37.68	-37.68
39	-37.68	-37.68
40	-37.68	-37.68
41	-37.68	-37.68
42	-37.68	-37.68
43	-37.68	-60.37
44	-61.65	-61.65
45	-63.15	-63.15
46	-64.65	-64.65
47	-66.15	-66.15
48	-67.65	-67.65
49	-68.93	-48.18

	50	-48.18	-48.18
	51	-48.18	-48.18
	52	-48.18	-48.18
	53	-48.18	-48.18
	54	-48.18	-48.18
	55	-48.18	-66.05
	56	-64.77	-64.77
	57	-63.27	-63.27
	58	-61.77	-61.77
	59	-60.27	-60.27
	60	-58.77	-58.77
	61	-57.49	-38.00
	62	-38.00	-38.00
	63	-38.00	-38.00
	64	-38.00	-38.00
	65	-38.00	-38.00
	66	-38.00	-38.00
	67	-38.00	-63.30
	68	-64.58	-64.58
	69	-66.08	-66.08
	70	-67.58	-67.58
	71	-69.08	-69.08
	72	-70.58	-70.58

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmax                             #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-71.27	-32.86
2	-32.86	-32.86
3	-32.86	-32.86
4	-32.86	-32.86
5	-32.86	-32.86
6	-32.86	-32.86
7	-32.86	-83.97
8	-82.69	-82.69
9	-81.19	-81.19
10	-79.69	-79.69
11	-78.19	-78.19
12	-76.69	-76.69
13	-75.41	-24.60
14	-24.60	-24.60
15	-24.60	-24.60
16	-24.60	-24.60
17	-24.60	-24.60
18	-24.60	-24.60
19	-24.60	-62.70
20	-63.98	-63.98
21	-65.48	-65.48
22	-66.98	-66.98
23	-68.48	-68.48
24	-69.98	-69.98
25	-71.27	-33.74
26	-33.74	-33.74
27	-33.74	-33.74
28	-33.74	-33.74
29	-33.74	-33.74
30	-33.74	-33.74
31	-33.74	-77.77
32	-76.48	-76.48
33	-74.98	-74.98
34	-73.48	-73.48
35	-71.98	-71.98
36	-70.48	-70.48
37	-69.20	-23.71
38	-23.71	-23.71
39	-23.71	-23.71
40	-23.71	-23.71
41	-23.71	-23.71
42	-23.71	-23.71
43	-23.71	-68.91
44	-70.19	-70.19
45	-71.69	-71.69
46	-73.19	-73.19
47	-74.69	-74.69
48	-76.19	-76.19
49	-77.47	-32.87

	50	-32.87	-32.87
	51	-32.87	-32.87
	52	-32.87	-32.87
	53	-32.87	-32.87
	54	-32.87	-32.87
	55	-32.87	-71.12
	56	-69.84	-69.84
	57	-68.34	-68.34
	58	-66.84	-66.84
	59	-65.34	-65.34
	60	-63.84	-63.84
	61	-62.56	-24.59
	62	-24.59	-24.59
	63	-24.59	-24.59
	64	-24.59	-24.59
	65	-24.59	-24.59
	66	-24.59	-24.59
	67	-24.59	-75.55
	68	-76.84	-76.84
	69	-78.34	-78.34
	70	-79.84	-79.84
	71	-81.34	-81.34
	72	-82.84	-82.84

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VminHmin                             #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-63.48	-30.32
2	-30.32	-30.32
3	-30.32	-30.32
4	-30.32	-30.32
5	-30.32	-30.32
6	-30.32	-30.32
7	-30.32	-74.43
8	-73.15	-73.15
9	-71.65	-71.65
10	-70.15	-70.15
11	-68.65	-68.65
12	-67.15	-67.15
13	-65.87	-21.93
14	-21.93	-21.93
15	-21.93	-21.93
16	-21.93	-21.93
17	-21.93	-21.93
18	-21.93	-21.93
19	-21.93	-54.92
20	-56.20	-56.20
21	-57.70	-57.70
22	-59.20	-59.20
23	-60.70	-60.70
24	-62.20	-62.20
25	-63.48	-31.08
26	-31.08	-31.08
27	-31.08	-31.08
28	-31.08	-31.08
29	-31.08	-31.08
30	-31.08	-31.08
31	-31.08	-69.08
32	-67.80	-67.80
33	-66.30	-66.30
34	-64.80	-64.80
35	-63.30	-63.30
36	-61.80	-61.80
37	-60.52	-21.17
38	-21.17	-21.17
39	-21.17	-21.17
40	-21.17	-21.17
41	-21.17	-21.17
42	-21.17	-21.17
43	-21.17	-60.27
44	-61.55	-61.55
45	-63.05	-63.05
46	-64.55	-64.55
47	-66.05	-66.05
48	-67.55	-67.55
49	-68.83	-30.33

	50	-30.33	-30.33
	51	-30.33	-30.33
	52	-30.33	-30.33
	53	-30.33	-30.33
	54	-30.33	-30.33
	55	-30.33	-63.36
	56	-62.08	-62.08
	57	-60.58	-60.58
	58	-59.08	-59.08
	59	-57.58	-57.58
	60	-56.08	-56.08
	61	-54.80	-21.92
	62	-21.92	-21.92
	63	-21.92	-21.92
	64	-21.92	-21.92
	65	-21.92	-21.92
	66	-21.92	-21.92
	67	-21.92	-66.00
	68	-67.28	-67.28
	69	-68.78	-68.78
	70	-70.28	-70.28
	71	-71.78	-71.78
	72	-73.28	-73.28

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```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmin                                  #
#####
```

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-68.09	-30.36
2	-30.36	-30.36
3	-30.36	-30.36
4	-30.36	-30.36
5	-30.36	-30.36
6	-30.36	-30.36
7	-30.36	-80.65
8	-79.37	-79.37
9	-77.87	-77.87
10	-76.37	-76.37
11	-74.87	-74.87
12	-73.37	-73.37
13	-72.09	-21.88
14	-21.88	-21.88
15	-21.88	-21.88
16	-21.88	-21.88
17	-21.88	-21.88
18	-21.88	-21.88
19	-21.88	-59.53
20	-60.81	-60.81
21	-62.31	-62.31
22	-63.81	-63.81
23	-65.31	-65.31
24	-66.81	-66.81
25	-68.09	-31.24
26	-31.24	-31.24
27	-31.24	-31.24
28	-31.24	-31.24
29	-31.24	-31.24
30	-31.24	-31.24
31	-31.24	-74.52
32	-73.24	-73.24
33	-71.74	-71.74
34	-70.24	-70.24
35	-68.74	-68.74
36	-67.24	-67.24
37	-65.96	-21.01
38	-21.01	-21.01
39	-21.01	-21.01
40	-21.01	-21.01
41	-21.01	-21.01
42	-21.01	-21.01
43	-21.01	-65.66
44	-66.94	-66.94
45	-68.44	-68.44
46	-69.94	-69.94
47	-71.44	-71.44
48	-72.94	-72.94
49	-74.22	-30.37

50	-30.37	-30.37
51	-30.37	-30.37
52	-30.37	-30.37
53	-30.37	-30.37
54	-30.37	-30.37
55	-30.37	-67.94
56	-66.66	-66.66
57	-65.16	-65.16
58	-63.66	-63.66
59	-62.16	-62.16
60	-60.66	-60.66
61	-59.38	-21.87
62	-21.87	-21.87
63	-21.87	-21.87
64	-21.87	-21.87
65	-21.87	-21.87
66	-21.87	-21.87
67	-21.87	-72.24
68	-73.52	-73.52
69	-75.02	-75.02
70	-76.52	-76.52
71	-78.02	-78.02
72	-79.52	-79.52

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VminHmax                                  #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-65.85	-46.79
2	-46.79	-46.79
3	-46.79	-46.79
4	-46.79	-46.79
5	-46.79	-46.79
6	-46.79	-46.79
7	-46.79	-72.07
8	-70.78	-70.78
9	-69.28	-69.28
10	-67.78	-67.78
11	-66.28	-66.28
12	-64.78	-64.78
13	-63.50	-36.47
14	-36.47	-36.47
15	-36.47	-36.47
16	-36.47	-36.47
17	-36.47	-36.47
18	-36.47	-36.47
19	-36.47	-57.29
20	-58.57	-58.57
21	-60.07	-60.07
22	-61.57	-61.57
23	-63.07	-63.07
24	-64.57	-64.57
25	-65.85	-47.15
26	-47.15	-47.15
27	-47.15	-47.15
28	-47.15	-47.15
29	-47.15	-47.15
30	-47.15	-47.15
31	-47.15	-69.00
32	-67.72	-67.72
33	-66.22	-66.22
34	-64.72	-64.72
35	-63.22	-63.22
36	-61.72	-61.72
37	-60.43	-36.11
38	-36.11	-36.11
39	-36.11	-36.11
40	-36.11	-36.11
41	-36.11	-36.11
42	-36.11	-36.11
43	-36.11	-60.36
44	-61.64	-61.64
45	-63.14	-63.14
46	-64.64	-64.64
47	-66.14	-66.14
48	-67.64	-67.64
49	-68.92	-46.79

	50	-46.79	-46.79
	51	-46.79	-46.79
	52	-46.79	-46.79
	53	-46.79	-46.79
	54	-46.79	-46.79
	55	-46.79	-65.81
	56	-64.53	-64.53
	57	-63.03	-63.03
	58	-61.53	-61.53
	59	-60.03	-60.03
	60	-58.53	-58.53
	61	-57.25	-36.46
	62	-36.46	-36.46
	63	-36.46	-36.46
	64	-36.46	-36.46
	65	-36.46	-36.46
	66	-36.46	-36.46
	67	-36.46	-63.54
	68	-64.82	-64.82
	69	-66.32	-66.32
	70	-67.82	-67.82
	71	-69.32	-69.32
	72	-70.82	-70.82

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmax                                  #
#####
```

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

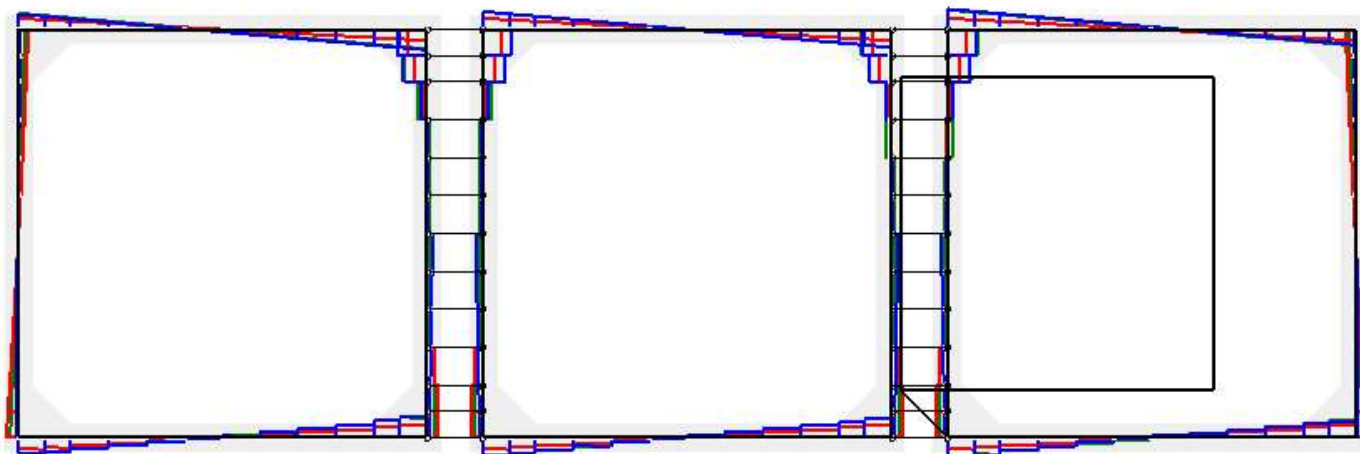
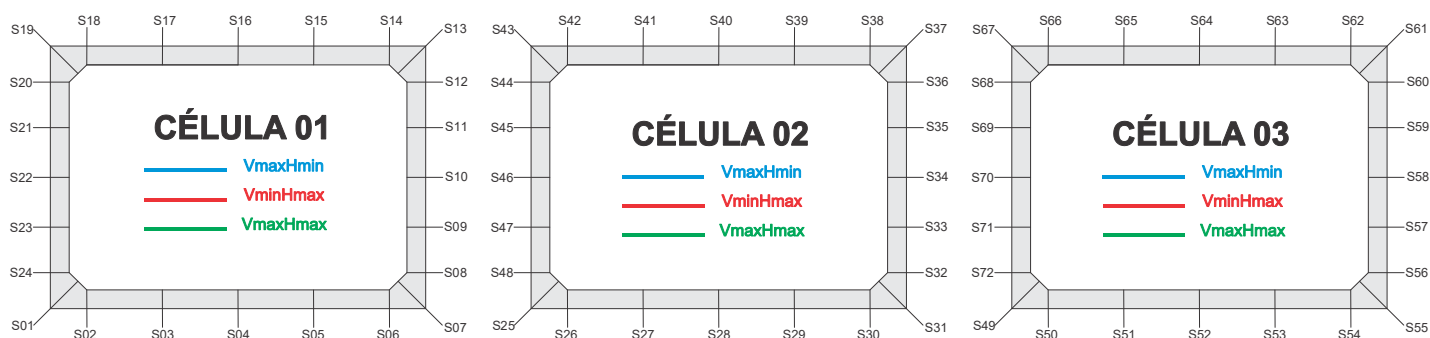
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-68.35	-31.91
2	-31.91	-31.91
3	-31.91	-31.91
4	-31.91	-31.91
5	-31.91	-31.91
6	-31.91	-31.91
7	-31.91	-80.39
8	-79.11	-79.11
9	-77.61	-77.61
10	-76.11	-76.11
11	-74.61	-74.61
12	-73.11	-73.11
13	-71.83	-23.60
14	-23.60	-23.60
15	-23.60	-23.60
16	-23.60	-23.60
17	-23.60	-23.60
18	-23.60	-23.60
19	-23.60	-59.78
20	-61.07	-61.07
21	-62.57	-62.57
22	-64.07	-64.07
23	-65.57	-65.57
24	-67.07	-67.07
25	-68.35	-32.75
26	-32.75	-32.75
27	-32.75	-32.75
28	-32.75	-32.75
29	-32.75	-32.75
30	-32.75	-32.75
31	-32.75	-74.51
32	-73.23	-73.23
33	-71.73	-71.73
34	-70.23	-70.23
35	-68.73	-68.73
36	-67.23	-67.23
37	-65.95	-22.76
38	-22.76	-22.76
39	-22.76	-22.76
40	-22.76	-22.76
41	-22.76	-22.76
42	-22.76	-22.76
43	-22.76	-65.67
44	-66.95	-66.95
45	-68.45	-68.45
46	-69.95	-69.95
47	-71.45	-71.45
48	-72.95	-72.95
49	-74.23	-31.92

	50	-31.92	-31.92
	51	-31.92	-31.92
	52	-31.92	-31.92
	53	-31.92	-31.92
	54	-31.92	-31.92
	55	-31.92	-68.21
	56	-66.93	-66.93
	57	-65.43	-65.43
	58	-63.93	-63.93
	59	-62.43	-62.43
	60	-60.93	-60.93
	61	-59.65	-23.58
	62	-23.58	-23.58
	63	-23.58	-23.58
	64	-23.58	-23.58
	65	-23.58	-23.58
	66	-23.58	-23.58
	67	-23.58	-71.97
	68	-73.25	-73.25
	69	-74.75	-74.75
	70	-76.25	-76.25
	71	-77.75	-77.75
	72	-79.25	-79.25

---

## ESFORÇO CORTANTE

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VmaxHmin #
#####
```

-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	15.19	-87.96
2	-76.10	-59.95
3	-43.55	-25.71
4	-9.82	8.67
5	26.56	48.40
6	70.79	93.64
7	111.88	-15.19
8	-21.37	-21.37
9	-28.85	-28.85
10	-34.54	-4.44
11	-8.35	-8.35
12	30.04	124.52
13	158.66	-111.34
14	-86.14	-86.14
15	-49.96	-49.96
16	-13.78	-13.78
17	22.40	22.40
18	58.58	58.58
19	83.78	-11.26
20	-6.65	-6.65
21	-0.59	-0.59
22	4.71	4.71
23	9.25	9.25
24	13.03	13.03
25	15.19	-100.19
26	-85.52	-66.28
27	-46.84	-26.73
28	-9.42	9.53
29	26.83	46.94
30	66.37	85.60
31	100.25	-18.42
32	-24.60	-24.60
33	-32.08	-32.08
34	-37.78	-10.53
35	-14.43	-2.26
36	23.30	120.44
37	155.83	-97.58
38	-72.39	-72.39
39	-36.21	-36.21
40	-0.03	-0.03
41	36.15	36.15
42	72.33	72.33
43	97.53	-155.43
44	-121.29	-26.81
45	11.58	11.58
46	7.67	37.78
47	32.08	32.08
48	24.60	24.60
49	18.42	-111.91

	50	-93.68	-70.84
	51	-48.45	-26.62
	52	-8.73	9.76
	53	25.66	43.51
	54	59.91	76.06
	55	87.93	-15.18
	56	-13.02	-13.02
	57	-9.23	-9.23
	58	-4.69	-4.69
	59	0.61	0.61
	60	6.66	6.66
	61	11.27	-83.75
	62	-58.55	-58.55
	63	-22.37	-22.37
	64	13.81	13.81
	65	49.99	49.99
	66	86.17	86.17
	67	111.37	-159.08
	68	-123.69	-26.55
	69	-0.99	11.19
	70	7.28	34.53
	71	28.84	28.84
	72	21.36	21.36

---

```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VminHmax #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	66.39	-64.11
2	-55.74	-43.99
3	-31.83	-18.54
4	-7.03	5.90
5	17.49	30.91
6	43.29	55.32
7	63.96	-66.39
8	-66.39	-46.36
9	0.18	0.18
10	0.18	0.18
11	0.18	0.18
12	8.66	66.57
13	103.51	-60.40
14	-44.77	-44.77
15	-22.39	-22.39
16	-0.01	-0.01
17	22.37	22.37
18	44.75	44.75
19	60.39	-54.07
20	-41.83	-41.83
21	-22.38	-22.38
22	-0.96	-0.96
23	22.44	22.44
24	47.81	47.81
25	66.39	-64.00
26	-55.47	-43.55
27	-31.29	-17.95
28	-6.44	6.45
29	17.96	31.29
30	43.56	55.47
31	64.01	-66.38
32	-66.38	-47.31
33	0.75	0.75
34	0.75	0.75
35	0.75	-4.34
36	11.13	67.17
37	103.33	-60.40
38	-44.76	-44.76
39	-22.38	-22.38
40	0.00	0.00
41	22.38	22.38
42	44.76	44.76
43	60.39	-103.52
44	-66.57	-8.67
45	-0.19	-0.19
46	-0.19	-0.19
47	-0.19	-0.19
48	46.35	66.38
49	66.38	-63.96

	50	-55.32	-43.29
	51	-30.92	-17.49
	52	-5.91	7.03
	53	18.54	31.83
	54	43.98	55.74
	55	64.10	-66.39
	56	-47.81	-47.81
	57	-22.44	-22.44
	58	0.96	0.96
	59	22.38	22.38
	60	41.83	41.83
	61	54.07	-60.38
	62	-44.75	-44.75
	63	-22.37	-22.37
	64	0.01	0.01
	65	22.39	22.39
	66	44.77	44.77
	67	60.41	-103.32
	68	-67.17	-11.12
	69	4.35	-0.74
	70	-0.74	-0.74
	71	-0.74	-0.74
	72	47.32	66.39

---

```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VmaxHmax #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	45.62	-92.28
2	-79.46	-62.12
3	-44.36	-25.32
4	-8.49	10.56
5	28.52	49.82
6	70.94	91.97
7	108.28	-45.62
8	-45.62	-45.62
9	-17.08	-17.08
10	-17.08	-17.08
11	-17.08	-17.08
12	49.59	123.38
13	158.63	-106.54
14	-81.34	-81.34
15	-45.16	-45.16
16	-8.98	-8.98
17	27.20	27.20
18	63.38	63.38
19	88.58	-34.68
20	-26.53	-26.53
21	-13.56	-13.56
22	0.72	0.72
23	16.32	16.32
24	33.23	33.23
25	45.62	-100.25
26	-85.92	-66.88
27	-47.39	-27.02
28	-9.34	10.03
29	27.70	48.05
30	67.49	86.46
31	100.72	-46.86
32	-46.86	-46.86
33	-21.97	-21.97
34	-21.97	-21.97
35	-21.97	22.25
36	25.26	117.95
37	161.05	-97.77
38	-72.57	-72.57
39	-36.39	-36.39
40	-0.21	-0.21
41	35.97	35.97
42	72.15	72.15
43	97.35	-157.38
44	-122.14	-48.35
45	18.33	18.33
46	18.33	18.33
47	18.33	18.33
48	46.86	46.86
49	46.86	-108.53

	50	-92.28	-71.30
	51	-50.20	-28.90
	52	-10.92	8.16
	53	25.02	44.09
	54	61.88	79.23
	55	92.07	-45.63
	56	-33.25	-33.25
	57	-16.33	-16.33
	58	-0.74	-0.74
	59	13.55	13.55
	60	26.51	26.51
	61	34.67	-88.37
	62	-63.17	-63.17
	63	-26.99	-26.99
	64	9.19	9.19
	65	45.37	45.37
	66	81.55	81.55
	67	106.75	-162.28
	68	-119.18	-26.49
	69	-23.48	20.74
	70	20.74	20.74
	71	20.74	20.74
	72	45.63	45.63

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```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmin                                 #
#####
```

-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	13.30	-90.72
2	-78.45	-61.99
3	-45.51	-27.83
4	-12.27	5.78
5	23.21	44.68
6	66.92	89.95
7	108.55	-13.30
8	-19.48	-19.48
9	-17.13	-17.13
10	-22.83	-22.82
11	-26.73	-26.73
12	63.05	121.62
13	162.75	-108.29
14	-83.10	-83.10
15	-46.92	-46.92
16	-10.74	-10.74
17	25.44	25.44
18	61.62	61.62
19	86.82	-13.14
20	-8.54	-8.54
21	-2.48	-2.48
22	2.82	2.82
23	7.36	7.36
24	11.14	11.14
25	13.30	-101.21
26	-86.36	-67.02
27	-47.67	-27.79
28	-10.82	7.78
29	24.77	44.70
30	64.16	83.69
31	98.76	-16.69
32	-22.86	-22.87
33	-30.34	-30.34
34	-36.04	-36.04
35	29.92	-4.50
36	12.99	115.02
37	167.52	-96.41
38	-71.21	-71.21
39	-35.03	-35.03
40	1.15	1.15
41	37.33	37.33
42	73.51	73.51
43	98.71	-159.37
44	-118.24	-59.67
45	30.12	30.12
46	26.21	26.21
47	20.52	20.52
48	22.86	22.86
49	16.69	-115.23

	50	-96.74	-73.68
	51	-51.22	-29.46
	52	-11.78	6.42
	53	21.99	39.57
	54	55.84	72.11
	55	84.23	-14.82
	56	-12.67	-12.67
	57	-8.88	-8.88
	58	-4.34	-4.34
	59	0.96	0.96
	60	7.01	7.01
	61	11.62	-80.27
	62	-55.07	-55.07
	63	-18.89	-18.89
	64	17.29	17.29
	65	53.47	53.47
	66	89.65	89.65
	67	114.85	-169.38
	68	-116.88	-14.85
	69	2.64	-31.78
	70	34.18	34.18
	71	28.48	28.48
	72	21.01	21.01

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#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmínHmax                                #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	66.28	-64.50
2	-56.14	-44.40
3	-32.28	-19.03
4	-7.57	5.31
5	16.84	30.26
6	42.66	54.76
7	63.50	-66.28
8	-66.28	-42.90
9	0.40	0.40
10	0.40	0.40
11	0.40	0.40
12	4.02	63.73
13	109.79	-60.02
14	-44.38	-44.38
15	-22.00	-22.00
16	0.38	0.38
17	22.76	22.76
18	45.14	45.14
19	60.78	-54.18
20	-41.94	-41.94
21	-22.49	-22.49
22	-1.06	-1.06
23	22.33	22.33
24	47.70	47.70
25	66.28	-64.26
26	-55.68	-43.74
27	-31.49	-18.20
28	-6.76	6.07
29	17.51	30.81
30	43.07	55.04
31	63.66	-66.35
32	-66.35	-43.90
33	0.93	0.93
34	0.93	0.93
35	0.93	-4.00
36	6.80	64.02
37	109.25	-60.11
38	-44.47	-44.47
39	-22.09	-22.09
40	0.29	0.29
41	22.67	22.67
42	45.05	45.05
43	60.68	-109.72
44	-63.66	-3.95
45	-0.33	-0.33
46	-0.33	-0.33
47	-0.33	-0.33
48	42.97	66.35
49	66.35	-64.08

	50	-55.35	-43.24
	51	-30.81	-17.36
	52	-5.79	7.11
	53	18.58	31.81
	54	43.91	55.62
	55	63.95	-66.45
	56	-47.87	-47.87
	57	-22.51	-22.51
	58	0.89	0.89
	59	22.31	22.31
	60	41.77	41.77
	61	54.00	-60.22
	62	-44.58	-44.58
	63	-22.20	-22.20
	64	0.18	0.18
	65	22.56	22.56
	66	44.94	44.94
	67	60.58	-109.14
	68	-63.91	-6.70
	69	4.11	-0.83
	70	-0.83	-0.83
	71	-0.83	-0.83
	72	44.01	66.45

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#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmax                                #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	45.07	-94.06
2	-81.30	-64.09
3	-46.54	-27.77
4	-11.24	7.54
5	25.29	46.53
6	67.82	89.29
7	106.14	-45.08
8	-45.08	-45.08
9	-13.23	-13.23
10	-13.23	-13.23
11	-13.23	-13.23
12	37.48	115.82
13	169.69	-104.78
14	-79.58	-79.58
15	-43.40	-43.40
16	-7.22	-7.22
17	28.96	28.96
18	65.14	65.14
19	90.34	-35.23
20	-27.07	-27.07
21	-14.10	-14.10
22	0.18	0.18
23	15.78	15.78
24	32.69	32.69
25	45.07	-101.33
26	-86.91	-67.85
27	-48.45	-28.27
28	-10.82	8.29
29	25.74	45.97
30	65.46	84.70
31	99.31	-46.99
32	-46.99	-46.99
33	-17.27	-17.27
34	-17.27	-17.27
35	-17.27	19.82
36	14.13	111.04
37	170.30	-96.61
38	-71.41	-71.41
39	-35.23	-35.23
40	0.95	0.95
41	37.13	37.13
42	73.31	73.31
43	98.50	-167.78
44	-113.90	-35.57
45	15.14	15.14
46	15.14	15.14
47	15.14	15.14
48	46.99	46.99
49	46.99	-110.72

	50	-93.91	-72.40
	51	-50.94	-29.50
	52	-11.58	7.27
	53	23.80	42.48
	54	59.87	76.93
	55	89.59	-46.11
	56	-33.73	-33.73
	57	-16.82	-16.82
	58	-1.22	-1.22
	59	13.06	13.06
	60	26.03	26.03
	61	34.19	-85.82
	62	-60.63	-60.63
	63	-24.45	-24.45
	64	11.73	11.73
	65	47.91	47.91
	66	84.09	84.09
	67	109.29	-171.17
	68	-111.91	-15.01
	69	-20.69	16.39
	70	16.39	16.39
	71	16.39	16.39
	72	46.12	46.12

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```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmin                             #
#####
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-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	30.39	-65.54
2	-56.46	-44.08
3	-31.52	-17.93
4	-6.03	7.58
5	20.34	35.62
6	50.72	65.88
7	77.59	-30.39
8	-30.39	-30.39
9	-13.03	-13.03
10	-13.03	-13.03
11	-13.03	-13.03
12	36.99	88.07
13	111.71	-75.82
14	-57.97	-57.97
15	-32.37	-32.37
16	-6.76	-6.76
17	18.84	18.84
18	44.44	44.44
19	62.29	-21.86
20	-16.83	-16.83
21	-8.65	-8.65
22	0.56	0.56
23	10.79	10.79
24	22.05	22.05
25	30.39	-71.54
26	-61.33	-47.66
27	-33.79	-19.21
28	-6.66	7.19
29	19.73	34.30
30	48.13	61.74
31	71.90	-31.33
32	-31.33	-31.33
33	-16.78	-16.78
34	-16.78	-16.78
35	-16.78	17.32
36	18.25	83.89
37	113.59	-69.22
38	-51.36	-51.36
39	-25.76	-25.76
40	-0.16	-0.16
41	25.44	25.44
42	51.04	51.04
43	68.89	-110.77
44	-87.12	-36.04
45	13.97	13.97
46	13.97	13.97
47	13.97	13.97
48	31.33	31.33
49	31.33	-77.78

	50	-66.12	-50.99
	51	-35.92	-20.63
	52	-7.86	5.78
	53	17.70	31.31
	54	43.89	56.28
	55	65.38	-30.40
	56	-22.06	-22.06
	57	-10.80	-10.80
	58	-0.57	-0.57
	59	8.64	8.64
	60	16.82	16.82
	61	21.85	-62.13
	62	-44.28	-44.28
	63	-18.68	-18.68
	64	6.92	6.92
	65	32.53	32.53
	66	58.13	58.13
	67	75.98	-114.52
	68	-84.82	-19.18
	69	-18.25	15.85
	70	15.85	15.85
	71	15.85	15.85
	72	30.40	30.40

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#####
# VERIFICAÇÃO DA FADIGA (ELS) #
# VminHmax #
#####
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-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	48.18	-61.24
2	-52.97	-41.44
3	-29.69	-16.85
4	-5.75	6.87
5	18.31	31.81
6	44.55	57.15
7	66.43	-48.18
8	-48.18	-48.18
9	-3.59	-3.59
10	-3.59	-3.59
11	-3.59	-3.59
12	16.96	71.56
13	102.03	-63.27
14	-47.64	-47.64
15	-25.26	-25.26
16	-2.88	-2.88
17	19.50	19.50
18	41.88	41.88
19	57.52	-38.01
20	-29.37	-29.37
21	-15.56	-15.56
22	-0.27	-0.27
23	16.51	16.51
24	34.77	34.77
25	48.18	-63.87
26	-55.18	-43.16
27	-30.91	-17.67
28	-6.31	6.41
29	17.78	31.01
30	43.25	55.26
31	63.93	-48.51
32	-48.51	-48.51
33	-4.46	-4.46
34	-4.46	-4.46
35	-4.46	2.12
36	13.20	70.61
37	102.25	-60.43
38	-44.79	-44.79
39	-22.41	-22.41
40	-0.03	-0.03
41	22.35	22.35
42	44.73	44.73
43	60.37	-101.70
44	-71.24	-16.63
45	3.91	3.91
46	3.91	3.91
47	3.91	3.91
48	48.51	48.51
49	48.51	-66.46

	50	-57.20	-44.60
	51	-31.87	-18.36
	52	-6.92	5.70
	53	16.81	29.65
	54	41.40	52.94
	55	61.21	-48.18
	56	-34.77	-34.77
	57	-16.51	-16.51
	58	0.26	0.26
	59	15.56	15.56
	60	29.37	29.37
	61	38.00	-57.49
	62	-41.85	-41.85
	63	-19.47	-19.47
	64	2.91	2.91
	65	25.29	25.29
	66	47.67	47.67
	67	63.30	-102.57
	68	-70.94	-13.52
	69	-2.45	4.13
	70	4.13	4.13
	71	4.13	4.13
	72	48.18	48.18

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```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmax                             #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	32.86	-65.94
2	-56.83	-44.39
3	-31.75	-18.08
4	-6.10	7.56
5	20.34	35.61
6	50.63	65.68
7	77.26	-32.86
8	-32.86	-32.86
9	-12.08	-12.08
10	-12.08	-12.08
11	-12.08	-12.08
12	35.09	87.31
13	112.27	-75.41
14	-57.56	-57.56
15	-31.95	-31.95
16	-6.35	-6.35
17	19.25	19.25
18	44.85	44.85
19	62.70	-24.60
20	-18.84	-18.84
21	-9.63	-9.63
22	0.56	0.56
23	11.75	11.75
24	23.92	23.92
25	32.86	-71.58
26	-61.40	-47.76
27	-33.89	-19.28
28	-6.70	7.19
29	19.76	34.35
30	48.19	61.78
31	71.91	-33.75
32	-33.75	-33.75
33	-15.54	-15.54
34	-15.54	-15.54
35	-15.54	15.74
36	17.87	83.46
37	113.98	-69.20
38	-51.35	-51.35
39	-25.75	-25.75
40	-0.15	-0.15
41	25.45	25.45
42	51.06	51.06
43	68.91	-111.39
44	-86.43	-34.21
45	12.97	12.97
46	12.97	12.97
47	12.97	12.97
48	33.75	33.75
49	33.75	-77.43

	50	-65.90	-50.88
	51	-35.88	-20.61
	52	-7.82	5.87
	53	17.87	31.55
	54	44.22	56.67
	55	65.79	-32.87
	56	-23.93	-23.93
	57	-11.76	-11.76
	58	-0.57	-0.57
	59	9.62	9.62
	60	18.83	18.83
	61	24.59	-62.56
	62	-44.70	-44.70
	63	-19.10	-19.10
	64	6.50	6.50
	65	32.10	32.10
	66	57.70	57.70
	67	75.55	-114.85
	68	-84.34	-18.75
	69	-16.62	14.67
	70	14.67	14.67
	71	14.67	14.67
	72	32.87	32.87

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```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VminHmin                             #
#####
```

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	30.32	-58.72
2	-50.68	-39.53
3	-28.34	-16.07
4	-5.48	6.78
5	18.06	31.70
6	44.93	58.33
7	68.47	-30.32
8	-30.32	-30.32
9	-10.31	-10.31
10	-10.31	-10.31
11	-10.31	-10.31
12	30.20	76.21
13	98.29	-65.87
14	-50.24	-50.24
15	-27.86	-27.86
16	-5.48	-5.48
17	16.90	16.90
18	39.28	39.28
19	54.92	-21.93
20	-16.90	-16.90
21	-8.72	-8.72
22	0.49	0.49
23	10.72	10.72
24	21.98	21.98
25	30.32	-63.58
26	-54.64	-42.45
27	-30.21	-17.13
28	-6.02	6.43
29	17.54	30.60
30	42.81	54.96
31	63.86	-31.08
32	-31.08	-31.08
33	-13.26	-13.26
34	-13.26	-13.26
35	-13.26	13.34
36	15.55	72.93
37	99.73	-60.52
38	-44.89	-44.89
39	-22.51	-22.51
40	-0.13	-0.13
41	22.25	22.25
42	44.63	44.63
43	60.27	-97.53
44	-75.45	-29.44
45	11.07	11.07
46	11.07	11.07
47	11.07	11.07
48	31.08	31.08
49	31.08	-68.62

	50	-58.51	-45.15
	51	-31.93	-18.29
	52	-6.99	5.28
	53	15.89	28.17
	54	39.38	50.54
	55	58.59	-30.33
	56	-21.99	-21.99
	57	-10.73	-10.73
	58	-0.50	-0.50
	59	8.71	8.71
	60	16.89	16.89
	61	21.92	-54.80
	62	-39.16	-39.16
	63	-16.78	-16.78
	64	5.60	5.60
	65	27.98	27.98
	66	50.36	50.36
	67	66.00	-100.49
	68	-73.68	-16.30
	69	-14.09	12.51
	70	12.51	12.51
	71	12.51	12.51
	72	30.33	30.33

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmin                                   #
#####
```

-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	30.36	-62.98
2	-54.29	-42.37
3	-30.32	-17.23
4	-5.82	7.28
5	19.48	34.15
6	48.55	63.05
7	74.17	-30.36
8	-30.36	-30.36
9	-12.01	-12.01
10	-12.01	-12.01
11	-12.01	-12.01
12	34.44	83.62
13	106.68	-72.09
14	-55.07	-55.07
15	-30.67	-30.67
16	-6.28	-6.28
17	18.11	18.11
18	42.51	42.51
19	59.53	-21.88
20	-16.86	-16.86
21	-8.68	-8.68
22	0.53	0.53
23	10.76	10.76
24	22.02	22.02
25	30.36	-68.55
26	-58.82	-45.71
27	-32.45	-18.43
28	-6.42	6.91
29	18.91	32.91
30	46.13	59.20
31	68.88	-31.24
32	-31.24	-31.24
33	-15.46	-15.46
34	-15.46	-15.46
35	-15.46	15.82
36	17.24	79.78
37	108.39	-65.96
38	-48.93	-48.93
39	-24.54	-24.54
40	-0.15	-0.15
41	24.25	24.25
42	48.64	48.64
43	65.66	-105.80
44	-82.74	-33.57
45	12.88	12.88
46	12.88	12.88
47	12.88	12.88
48	31.24	31.24
49	31.24	-74.35

	50	-63.27	-48.80
	51	-34.42	-19.75
	52	-7.53	5.59
	53	17.02	30.13
	54	42.20	54.13
	55	62.83	-30.37
	56	-22.03	-22.03
	57	-10.77	-10.77
	58	-0.54	-0.54
	59	8.67	8.67
	60	16.85	16.85
	61	21.87	-59.38
	62	-42.36	-42.36
	63	-17.97	-17.97
	64	6.43	6.43
	65	30.82	30.82
	66	55.22	55.22
	67	72.24	-109.26
	68	-80.64	-18.10
	69	-16.69	14.60
	70	14.60	14.60
	71	14.60	14.60
	72	30.37	30.37

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VminHmax                                  #
#####
```

-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	46.79	-61.01
2	-52.76	-41.26
3	-29.56	-16.77
4	-5.71	6.88
5	18.30	31.82
6	44.60	57.27
7	66.61	-46.79
8	-46.79	-46.79
9	-4.12	-4.12
10	-4.12	-4.12
11	-4.12	-4.12
12	18.02	71.98
13	101.71	-63.50
14	-47.87	-47.87
15	-25.49	-25.49
16	-3.11	-3.11
17	19.27	19.27
18	41.65	41.65
19	57.29	-36.47
20	-28.24	-28.24
21	-15.01	-15.01
22	-0.27	-0.27
23	15.97	15.97
24	33.72	33.72
25	46.79	-63.84
26	-55.14	-43.11
27	-30.86	-17.63
28	-6.29	6.42
29	17.76	30.98
30	43.22	55.24
31	63.93	-47.15
32	-47.15	-47.15
33	-5.15	-5.15
34	-5.15	-5.15
35	-5.15	3.01
36	13.41	70.85
37	102.03	-60.43
38	-44.80	-44.80
39	-22.42	-22.42
40	-0.04	-0.04
41	22.34	22.34
42	44.72	44.72
43	60.36	-101.35
44	-71.62	-17.66
45	4.48	4.48
46	4.48	4.48
47	4.48	4.48
48	47.15	47.15
49	47.15	-66.66

	50	-57.33	-44.66
	51	-31.89	-18.37
	52	-6.95	5.65
	53	16.71	29.51
	54	41.22	52.72
	55	60.97	-46.79
	56	-33.72	-33.72
	57	-15.97	-15.97
	58	0.27	0.27
	59	15.00	15.00
	60	28.24	28.24
	61	36.46	-57.25
	62	-41.61	-41.61
	63	-19.23	-19.23
	64	3.15	3.15
	65	25.53	25.53
	66	47.91	47.91
	67	63.54	-102.39
	68	-71.21	-13.76
	69	-3.36	4.80
	70	4.80	4.80
	71	4.80	4.80
	72	46.79	46.79

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmax                                   #
#####
```

-----  
 ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE  
 -----

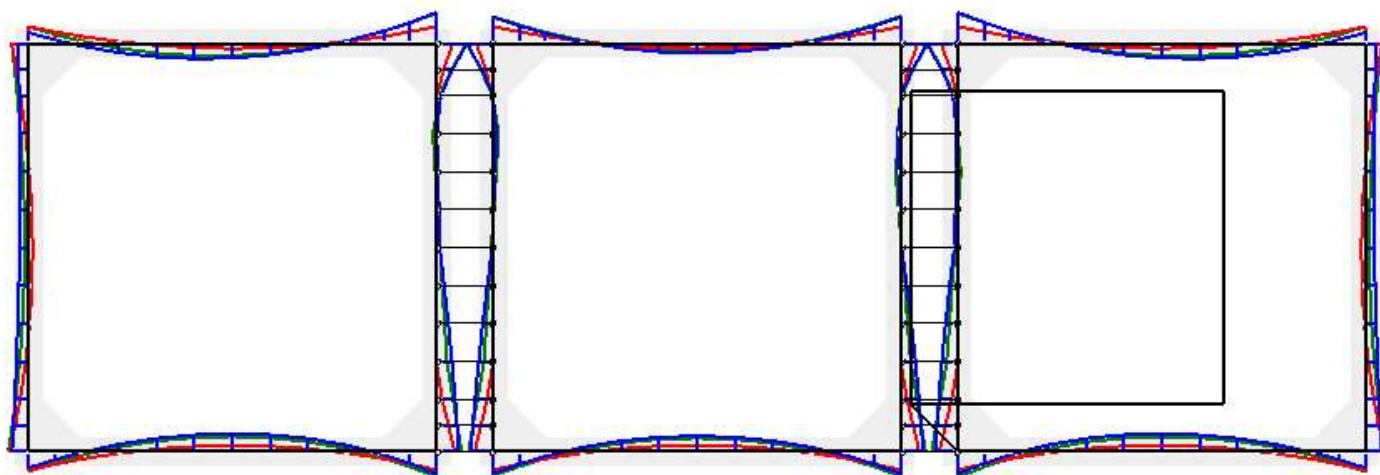
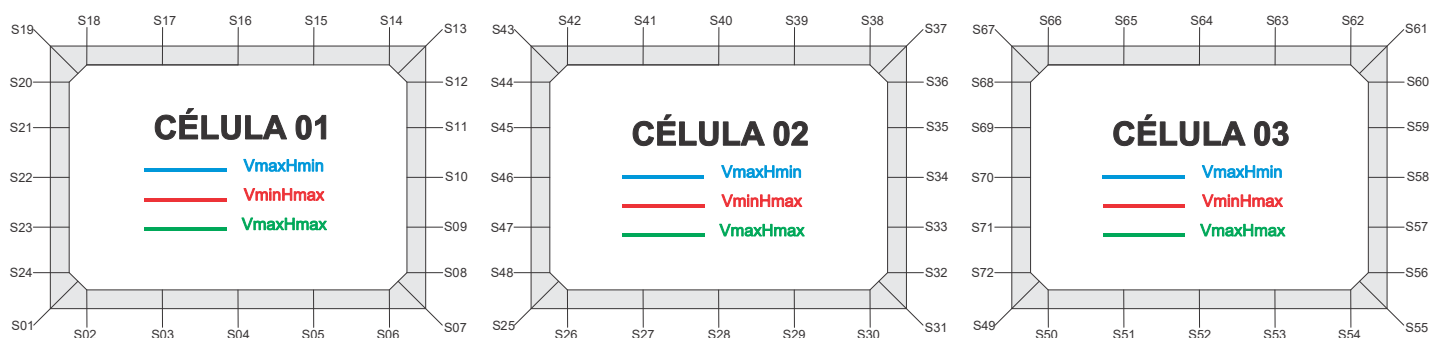
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	31.91	-63.23
2	-54.52	-42.57
3	-30.47	-17.32
4	-5.87	7.27
5	19.48	34.14
6	48.49	62.92
7	73.96	-31.91
8	-31.91	-31.91
9	-11.42	-11.42
10	-11.42	-11.42
11	-11.42	-11.42
12	33.25	83.15
13	107.03	-71.83
14	-54.81	-54.81
15	-30.42	-30.42
16	-6.02	-6.02
17	18.37	18.37
18	42.76	42.76
19	59.78	-23.60
20	-18.11	-18.11
21	-9.29	-9.29
22	0.53	0.53
23	11.36	11.36
24	23.19	23.19
25	31.91	-68.58
26	-58.86	-45.77
27	-32.51	-18.48
28	-6.44	6.91
29	18.93	32.95
30	46.17	59.22
31	68.89	-32.75
32	-32.75	-32.75
33	-14.69	-14.69
34	-14.69	-14.69
35	-14.69	14.84
36	17.00	79.51
37	108.64	-65.95
38	-48.93	-48.93
39	-24.53	-24.53
40	-0.14	-0.14
41	24.25	24.25
42	48.65	48.65
43	65.67	-106.19
44	-82.31	-32.42
45	12.26	12.26
46	12.26	12.26
47	12.26	12.26
48	32.75	32.75
49	32.75	-74.13

	50	-63.13	-48.73
	51	-34.40	-19.74
	52	-7.51	5.65
	53	17.12	30.29
	54	42.40	54.37
	55	63.09	-31.92
	56	-23.20	-23.20
	57	-11.37	-11.37
	58	-0.55	-0.55
	59	9.28	9.28
	60	18.10	18.10
	61	23.58	-59.65
	62	-42.63	-42.63
	63	-18.23	-18.23
	64	6.16	6.16
	65	30.56	30.56
	66	54.95	54.95
	67	71.97	-109.47
	68	-80.34	-17.83
	69	-15.67	13.86
	70	13.86	13.86
	71	13.86	13.86
	72	31.92	31.92

---

## MOMENTO FLETOR

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VmaxHmin #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-24.14	24.14
2	1.58	1.58
3	-19.12	-19.12
4	-26.23	-26.23
5	-19.18	-19.18
6	4.66	4.66
7	32.92	32.92
8	27.87	27.87
9	17.77	17.77
10	5.03	5.03
11	2.41	2.41
12	6.69	6.69
13	45.61	-45.61
14	-18.46	-18.46
15	8.76	8.76
16	21.51	21.51
17	19.79	19.79
18	3.59	3.59
19	-15.98	-15.98
20	-13.53	-13.53
21	-12.10	-12.10
22	-12.95	-12.95
23	-15.77	-15.77
24	-20.25	-20.25
25	-24.14	32.55
26	7.02	7.02
27	-15.61	-15.61
28	-22.84	-22.84
29	-15.57	-15.57
30	7.10	7.10
31	32.65	32.65
32	26.72	26.72
33	15.32	15.32
34	1.29	1.29
35	-3.76	-3.76
36	0.39	0.39
37	38.35	-38.35
38	-14.98	-14.98
39	6.74	6.74
40	13.98	13.98
41	6.76	6.76
42	-14.94	-14.94
43	-38.29	-38.29
44	-0.26	-0.26
45	2.72	2.72
46	-1.19	-1.19
47	-15.22	-15.22
48	-26.62	-26.62
49	-32.55	32.99

	50	4.72	4.72
	51	-19.14	-19.14
	52	-26.21	-26.21
	53	-19.13	-19.13
	54	1.56	1.56
	55	24.11	24.11
	56	20.22	20.22
	57	15.75	15.75
	58	12.94	12.94
	59	12.09	12.09
	60	13.52	13.52
	61	15.98	-15.98
	62	3.59	3.59
	63	19.77	19.77
	64	21.48	21.48
	65	8.72	8.72
	66	-18.51	-18.51
	67	-45.67	-45.67
	68	-6.81	-6.81
	69	-1.36	-1.36
	70	-5.11	-5.11
	71	-17.85	-17.85
	72	-27.94	-27.94

---

```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VminHmax #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-27.93	27.93
2	11.45	11.45
3	-3.71	-3.71
4	-8.83	-8.83
5	-4.15	-4.15
6	10.69	10.69
7	27.09	27.09
8	8.83	8.83
9	-0.40	-0.40
10	-0.33	-0.33
11	-0.25	-0.25
12	1.52	1.52
13	24.90	-24.90
14	-10.44	-10.44
15	2.99	2.99
16	7.47	7.47
17	3.00	3.00
18	-10.43	-10.43
19	-24.88	-24.88
20	-11.68	-11.68
21	1.23	1.23
22	5.97	5.97
23	1.73	1.73
24	-12.25	-12.25
25	-27.93	27.15
26	10.72	10.72
27	-4.25	-4.25
28	-9.13	-9.13
29	-4.25	-4.25
30	10.72	10.72
31	27.15	27.15
32	8.90	8.90
33	-0.42	-0.42
34	-0.12	-0.12
35	0.18	0.18
36	1.54	1.54
37	24.98	-24.98
38	-10.52	-10.52
39	2.91	2.91
40	7.39	7.39
41	2.91	2.91
42	-10.52	-10.52
43	-24.97	-24.97
44	-1.59	-1.59
45	0.19	0.19
46	0.26	0.26
47	0.34	0.34
48	-8.89	-8.89
49	-27.15	27.10

	50	10.69	10.69
	51	-4.15	-4.15
	52	-8.83	-8.83
	53	-3.71	-3.71
	54	11.45	11.45
	55	27.93	27.93
	56	12.25	12.25
	57	-1.74	-1.74
	58	-5.97	-5.97
	59	-1.23	-1.23
	60	11.67	11.67
	61	24.88	-24.88
	62	-10.43	-10.43
	63	3.00	3.00
	64	7.47	7.47
	65	2.99	2.99
	66	-10.45	-10.45
	67	-24.91	-24.91
	68	-1.47	-1.47
	69	-0.11	-0.11
	70	0.18	0.18
	71	0.48	0.48
	72	-8.84	-8.84

---

```
#####
# SOLICITAÇÕES NORMAIS (ELU) #
# VmaxHmax #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-29.57	29.57
2	5.95	5.95
3	-15.34	-15.34
4	-22.11	-22.11
5	-14.29	-14.29
6	9.86	9.86
7	37.40	37.40
8	24.85	24.85
9	12.31	12.31
10	5.48	5.48
11	-1.35	-1.35
12	5.15	5.15
13	43.92	-43.92
14	-18.09	-18.09
15	7.21	7.21
16	18.04	18.04
17	14.39	14.39
18	-3.72	-3.72
19	-24.62	-24.62
20	-16.18	-16.18
21	-8.12	-8.12
22	-5.51	-5.51
23	-8.88	-8.88
24	-18.74	-18.74
25	-29.57	35.94
26	10.35	10.35
27	-12.51	-12.51
28	-19.78	-19.78
29	-12.24	-12.24
30	10.87	10.87
31	36.61	36.61
32	23.72	23.72
33	9.95	9.95
34	1.17	1.17
35	-7.62	-7.62
36	1.88	1.88
37	40.24	-40.24
38	-16.82	-16.82
39	4.97	4.97
40	12.29	12.29
41	5.13	5.13
42	-16.49	-16.49
43	-39.80	-39.80
44	-1.36	-1.36
45	4.64	4.64
46	-2.69	-2.69
47	-10.02	-10.02
48	-23.06	-23.06
49	-35.94	37.98

	50	10.36	10.36
	51	-13.94	-13.94
	52	-21.90	-21.90
	53	-15.26	-15.26
	54	5.93	5.93
	55	29.48	29.48
	56	18.65	18.65
	57	8.78	8.78
	58	5.41	5.41
	59	8.01	8.01
	60	16.07	16.07
	61	24.50	-24.50
	62	-3.66	-3.66
	63	14.37	14.37
	64	17.93	17.93
	65	7.02	7.02
	66	-18.36	-18.36
	67	-44.25	-44.25
	68	-5.56	-5.56
	69	4.44	4.44
	70	-3.86	-3.86
	71	-12.15	-12.15
	72	-25.43	-25.43

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmin                                 #
#####
```

-----

MOMENTO FLETOR NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-23.31	23.31
2	0.05	0.05
3	-21.45	-21.45
4	-29.47	-29.47
5	-23.67	-23.67
6	-1.35	-1.35
7	25.94	25.94
8	21.41	21.41
9	14.03	14.03
10	5.98	5.98
11	-3.99	-3.99
12	3.21	3.21
13	42.30	-42.30
14	-15.98	-15.98
15	10.02	10.02
16	21.55	21.55
17	18.61	18.61
18	1.20	1.20
19	-19.21	-19.21
20	-16.24	-16.24
21	-14.06	-14.06
22	-14.15	-14.15
23	-16.22	-16.22
24	-19.94	-19.94
25	-23.31	31.00
26	5.21	5.21
27	-17.73	-17.73
28	-25.45	-25.45
29	-18.94	-18.94
30	2.83	2.83
31	27.92	27.92
32	22.46	22.46
33	11.76	11.76
34	-1.58	-1.58
35	-2.86	-2.86
36	-1.22	-1.22
37	37.61	-37.61
38	-14.56	-14.56
39	6.68	6.68
40	13.46	13.46
41	5.76	5.76
42	-16.41	-16.41
43	-40.09	-40.09
44	-1.93	-1.93
45	3.92	3.92
46	-7.41	-7.41
47	-16.81	-16.81
48	-25.55	-25.55
49	-31.00	33.99

	50	4.84	4.84
	51	-20.14	-20.14
	52	-28.39	-28.39
	53	-22.70	-22.70
	54	-3.62	-3.62
	55	17.88	17.88
	56	14.09	14.09
	57	9.75	9.75
	58	7.08	7.08
	59	6.38	6.38
	60	7.95	7.95
	61	10.50	-10.50
	62	8.11	8.11
	63	22.90	22.90
	64	23.22	23.22
	65	9.07	9.07
	66	-19.56	-19.56
	67	-47.68	-47.68
	68	-8.34	-8.34
	69	-5.95	-5.95
	70	-6.49	-6.49
	71	-19.08	-19.08
	72	-29.04	-29.04

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VminHmax                                #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-28.02	28.02
2	11.43	11.43
3	-3.90	-3.90
4	-9.22	-9.22
5	-4.79	-4.79
6	9.79	9.79
7	26.05	26.05
8	7.83	7.83
9	-0.67	-0.67
10	-0.51	-0.51
11	-0.35	-0.35
12	0.53	0.53
13	24.39	-24.39
14	-10.04	-10.04
15	3.24	3.24
16	7.56	7.56
17	2.93	2.93
18	-10.65	-10.65
19	-25.21	-25.21
20	-11.97	-11.97
21	0.98	0.98
22	5.76	5.76
23	1.57	1.57
24	-12.37	-12.37
25	-28.02	26.89
26	10.39	10.39
27	-4.65	-4.65
28	-9.65	-9.65
29	-4.93	-4.93
30	9.84	9.84
31	26.17	26.17
32	7.92	7.92
33	-0.67	-0.67
34	-0.30	-0.30
35	0.07	0.07
36	0.63	0.63
37	24.46	-24.46
38	-10.08	-10.08
39	3.23	3.23
40	7.60	7.60
41	3.00	3.00
42	-10.54	-10.54
43	-25.08	-25.08
44	-1.24	-1.24
45	-0.38	-0.38
46	-0.25	-0.25
47	-0.11	-0.11
48	-8.64	-8.64
49	-26.89	26.81

	50	10.39	10.39
	51	-4.42	-4.42
	52	-9.05	-9.05
	53	-3.92	-3.92
	54	11.23	11.23
	55	27.67	27.67
	56	11.97	11.97
	57	-2.04	-2.04
	58	-6.30	-6.30
	59	-1.59	-1.59
	60	11.29	11.29
	61	24.48	-24.48
	62	-10.07	-10.07
	63	3.28	3.28
	64	7.69	7.69
	65	3.14	3.14
	66	-10.36	-10.36
	67	-24.87	-24.87
	68	-1.07	-1.07
	69	-0.56	-0.56
	70	-0.23	-0.23
	71	0.10	0.10
	72	-8.53	-8.53

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmax                                #
#####
```

-----

MOMENTO FLETOR NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-29.88	29.88
2	5.77	5.77
3	-16.36	-16.36
4	-24.16	-24.16
5	-17.59	-17.59
6	5.28	5.28
7	32.15	32.15
8	19.75	19.75
9	8.09	8.09
10	2.80	2.80
11	-2.49	-2.49
12	2.36	2.36
13	41.62	-41.62
14	-16.27	-16.27
15	8.33	8.33
16	18.45	18.45
17	14.10	14.10
18	-4.72	-4.72
19	-26.09	-26.09
20	-17.51	-17.51
21	-9.23	-9.23
22	-6.41	-6.41
23	-9.55	-9.55
24	-19.20	-19.20
25	-29.88	35.30
26	9.42	9.42
27	-13.84	-13.84
28	-21.66	-21.66
29	-14.86	-14.86
30	7.43	7.43
31	32.73	32.73
32	19.81	19.81
33	6.96	6.96
34	0.05	0.05
35	-6.85	-6.85
36	-0.06	-0.06
37	38.62	-38.62
38	-15.52	-15.52
39	5.81	5.81
40	12.67	12.67
41	5.05	5.05
42	-17.03	-17.03
43	-40.66	-40.66
44	-1.93	-1.93
45	2.16	2.16
46	-3.90	-3.90
47	-9.95	-9.95
48	-22.38	-22.38
49	-35.30	37.50

	50	9.36	9.36
	51	-15.31	-15.31
	52	-23.53	-23.53
	53	-17.31	-17.31
	54	3.16	3.16
	55	26.05	26.05
	56	15.09	15.09
	57	5.03	5.03
	58	1.46	1.46
	59	3.88	3.88
	60	11.74	11.74
	61	20.03	-20.03
	62	0.10	0.10
	63	17.12	17.12
	64	19.66	19.66
	65	7.73	7.73
	66	-18.67	-18.67
	67	-45.26	-45.26
	68	-6.34	-6.34
	69	0.80	0.80
	70	-5.75	-5.75
	71	-12.31	-12.31
	72	-24.81	-24.81

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmin                             #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-20.55	20.55
2	3.77	3.77
3	-11.35	-11.35
4	-16.14	-16.14
5	-10.56	-10.56
6	6.71	6.71
7	26.44	26.44
8	18.08	18.08
9	9.40	9.40
10	4.19	4.19
11	-1.02	-1.02
12	3.77	3.77
13	31.24	-31.24
14	-12.84	-12.84
15	5.22	5.22
16	13.05	13.05
17	10.64	10.64
18	-2.02	-2.02
19	-16.70	-16.70
20	-11.36	-11.36
21	-6.23	-6.23
22	-4.58	-4.58
23	-6.82	-6.82
24	-13.35	-13.35
25	-20.55	25.35
26	7.08	7.08
27	-9.21	-9.21
28	-14.38	-14.38
29	-9.00	-9.00
30	7.49	7.49
31	25.86	25.86
32	17.25	17.25
33	7.62	7.62
34	0.91	0.91
35	-5.80	-5.80
36	1.31	1.31
37	28.47	-28.47
38	-11.89	-11.89
39	3.54	3.54
40	8.72	8.72
41	3.67	3.67
42	-11.63	-11.63
43	-28.12	-28.12
44	-0.91	-0.91
45	3.50	3.50
46	-2.09	-2.09
47	-7.67	-7.67
48	-16.74	-16.74
49	-25.35	26.89

	50	7.10	7.10
	51	-10.28	-10.28
	52	-15.98	-15.98
	53	-11.29	-11.29
	54	3.75	3.75
	55	20.48	20.48
	56	13.28	13.28
	57	6.74	6.74
	58	4.50	4.50
	59	6.15	6.15
	60	11.28	11.28
	61	16.60	-16.60
	62	-1.97	-1.97
	63	10.62	10.62
	64	12.97	12.97
	65	5.08	5.08
	66	-13.05	-13.05
	67	-31.49	-31.49
	68	-4.08	-4.08
	69	3.40	3.40
	70	-2.94	-2.94
	71	-9.28	-9.28
	72	-18.53	-18.53

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VminHmax                             #
#####
```

-----

MOMENTO FLETOR NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-23.34	23.34
2	7.63	7.63
3	-6.59	-6.59
4	-11.12	-11.12
5	-6.08	-6.08
6	9.19	9.19
7	26.18	26.18
8	12.93	12.93
9	2.58	2.58
10	1.14	1.14
11	-0.29	-0.29
12	2.38	2.38
13	26.25	-26.25
14	-11.00	-11.00
15	3.58	3.58
16	9.20	9.20
17	5.88	5.88
18	-6.40	-6.40
19	-20.07	-20.07
20	-10.79	-10.79
21	-1.75	-1.75
22	1.46	1.46
23	-1.74	-1.74
24	-11.95	-11.95
25	-23.34	25.63
26	9.26	9.26
27	-5.55	-5.55
28	-10.35	-10.35
29	-5.51	-5.51
30	9.34	9.34
31	25.73	25.73
32	12.39	12.39
33	1.80	1.80
34	0.01	0.01
35	-1.77	-1.77
36	1.29	1.29
37	25.06	-25.06
38	-10.59	-10.59
39	2.85	2.85
40	7.33	7.33
41	2.87	2.87
42	-10.55	-10.55
43	-25.00	-25.00
44	-1.22	-1.22
45	1.33	1.33
46	-0.24	-0.24
47	-1.81	-1.81
48	-12.29	-12.29
49	-25.63	26.27

	50	9.27	9.27
	51	-6.03	-6.03
	52	-11.09	-11.09
	53	-6.58	-6.58
	54	7.63	7.63
	55	23.32	23.32
	56	11.93	11.93
	57	1.73	1.73
	58	-1.47	-1.47
	59	1.74	1.74
	60	10.77	10.77
	61	20.05	-20.05
	62	-6.39	-6.39
	63	5.87	5.87
	64	9.19	9.19
	65	3.55	3.55
	66	-11.04	-11.04
	67	-26.30	-26.30
	68	-2.44	-2.44
	69	0.75	0.75
	70	-0.90	-0.90
	71	-2.56	-2.56
	72	-13.02	-13.02

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VmaxHmax                             #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-21.20	21.20
2	4.32	4.32
3	-10.91	-10.91
4	-15.75	-15.75
5	-10.17	-10.17
6	7.08	7.08
7	26.73	26.73
8	17.70	17.70
9	8.71	8.71
10	3.88	3.88
11	-0.96	-0.96
12	3.64	3.64
13	31.09	-31.09
14	-12.80	-12.80
15	5.10	5.10
16	12.76	12.76
17	10.18	10.18
18	-2.64	-2.64
19	-17.43	-17.43
20	-11.45	-11.45
21	-5.72	-5.72
22	-3.87	-3.87
23	-6.30	-6.30
24	-13.40	-13.40
25	-21.20	25.71
26	7.43	7.43
27	-8.90	-8.90
28	-14.10	-14.10
29	-8.71	-8.71
30	7.80	7.80
31	26.18	26.18
32	16.90	16.90
33	7.04	7.04
34	0.83	0.83
35	-5.39	-5.39
36	1.33	1.33
37	28.48	-28.48
38	-11.90	-11.90
39	3.52	3.52
40	8.70	8.70
41	3.63	3.63
42	-11.67	-11.67
43	-28.16	-28.16
44	-0.96	-0.96
45	3.28	3.28
46	-1.90	-1.90
47	-7.09	-7.09
48	-16.43	-16.43
49	-25.71	27.14

	50	7.44	7.44
	51	-9.92	-9.92
	52	-15.60	-15.60
	53	-10.85	-10.85
	54	4.30	4.30
	55	21.14	21.14
	56	13.34	13.34
	57	6.23	6.23
	58	3.80	3.80
	59	5.64	5.64
	60	11.37	11.37
	61	17.35	-17.35
	62	-2.60	-2.60
	63	10.16	10.16
	64	12.68	12.68
	65	4.96	4.96
	66	-13.00	-13.00
	67	-31.32	-31.32
	68	-3.93	-3.93
	69	3.14	3.14
	70	-2.73	-2.73
	71	-8.60	-8.60
	72	-18.10	-18.10

---

```
#####
#          VERIFICAÇÃO DA FADIGA (ELS)          #
#          VminHmin                             #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.09	19.09
2	4.05	4.05
3	-9.52	-9.52
4	-13.83	-13.83
5	-8.87	-8.87
6	6.46	6.46
7	23.90	23.90
8	15.56	15.56
9	7.43	7.43
10	3.31	3.31
11	-0.81	-0.81
12	3.16	3.16
13	27.16	-27.16
14	-11.19	-11.19
15	4.42	4.42
16	11.09	11.09
17	8.80	8.80
18	-2.43	-2.43
19	-15.39	-15.39
20	-10.04	-10.04
21	-4.88	-4.88
22	-3.20	-3.20
23	-5.41	-5.41
24	-11.91	-11.91
25	-19.09	23.01
26	6.76	6.76
27	-7.77	-7.77
28	-12.40	-12.40
29	-7.61	-7.61
30	7.07	7.07
31	23.41	23.41
32	14.86	14.86
33	6.00	6.00
34	0.69	0.69
35	-4.61	-4.61
36	1.17	1.17
37	24.91	-24.91
38	-10.41	-10.41
39	3.07	3.07
40	7.59	7.59
41	3.17	3.17
42	-10.21	-10.21
43	-24.64	-24.64
44	-0.85	-0.85
45	2.82	2.82
46	-1.61	-1.61
47	-6.03	-6.03
48	-14.46	-14.46
49	-23.01	24.24

	50	6.76	6.76
	51	-8.65	-8.65
	52	-13.71	-13.71
	53	-9.48	-9.48
	54	4.03	4.03
	55	19.04	19.04
	56	11.86	11.86
	57	5.35	5.35
	58	3.14	3.14
	59	4.81	4.81
	60	9.97	9.97
	61	15.32	-15.32
	62	-2.40	-2.40
	63	8.79	8.79
	64	11.03	11.03
	65	4.31	4.31
	66	-11.36	-11.36
	67	-27.36	-27.36
	68	-3.41	-3.41
	69	2.67	2.67
	70	-2.33	-2.33
	71	-7.34	-7.34
	72	-15.90	-15.90

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmin                                  #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-20.00	20.00
2	3.88	3.88
3	-10.66	-10.66
4	-15.27	-15.27
5	-9.92	-9.92
6	6.62	6.62
7	25.49	25.49
8	17.14	17.14
9	8.66	8.66
10	3.86	3.86
11	-0.94	-0.94
12	3.54	3.54
13	29.71	-29.71
14	-12.22	-12.22
15	4.92	4.92
16	12.32	12.32
17	9.95	9.95
18	-2.17	-2.17
19	-16.20	-16.20
20	-10.87	-10.87
21	-5.73	-5.73
22	-4.06	-4.06
23	-6.29	-6.29
24	-12.81	-12.81
25	-20.00	24.47
26	6.96	6.96
27	-8.67	-8.67
28	-13.64	-13.64
29	-8.48	-8.48
30	7.33	7.33
31	24.94	24.94
32	16.35	16.35
33	7.01	7.01
34	0.83	0.83
35	-5.35	-5.35
36	1.26	1.26
37	27.13	-27.13
38	-11.33	-11.33
39	3.36	3.36
40	8.30	8.30
41	3.48	3.48
42	-11.10	-11.10
43	-26.81	-26.81
44	-0.89	-0.89
45	3.25	3.25
46	-1.91	-1.91
47	-7.06	-7.06
48	-15.88	-15.88
49	-24.47	25.90

	50	6.97	6.97
	51	-9.67	-9.67
	52	-15.13	-15.13
	53	-10.61	-10.61
	54	3.86	3.86
	55	19.94	19.94
	56	12.75	12.75
	57	6.22	6.22
	58	3.99	3.99
	59	5.65	5.65
	60	10.79	10.79
	61	16.12	-16.12
	62	-2.13	-2.13
	63	9.93	9.93
	64	12.24	12.24
	65	4.79	4.79
	66	-12.42	-12.42
	67	-29.94	-29.94
	68	-3.83	-3.83
	69	3.13	3.13
	70	-2.71	-2.71
	71	-8.55	-8.55
	72	-17.54	-17.54

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VminHmax                                   #
#####
```

-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-22.97	22.97
2	7.32	7.32
3	-6.84	-6.84
4	-11.34	-11.34
5	-6.30	-6.30
6	8.98	8.98
7	26.02	26.02
8	13.15	13.15
9	2.97	2.97
10	1.32	1.32
11	-0.33	-0.33
12	2.45	2.45
13	26.34	-26.34
14	-11.02	-11.02
15	3.65	3.65
16	9.37	9.37
17	6.13	6.13
18	-6.05	-6.05
19	-19.66	-19.66
20	-10.74	-10.74
21	-2.04	-2.04
22	1.06	1.06
23	-2.03	-2.03
24	-11.92	-11.92
25	-22.97	25.43
26	9.07	9.07
27	-5.73	-5.73
28	-10.51	-10.51
29	-5.68	-5.68
30	9.16	9.16
31	25.55	25.55
32	12.58	12.58
33	2.12	2.12
34	0.06	0.06
35	-2.00	-2.00
36	1.28	1.28
37	25.05	-25.05
38	-10.58	-10.58
39	2.86	2.86
40	7.35	7.35
41	2.89	2.89
42	-10.52	-10.52
43	-24.97	-24.97
44	-1.19	-1.19
45	1.45	1.45
46	-0.34	-0.34
47	-2.13	-2.13
48	-12.46	-12.46
49	-25.43	26.12

	50	9.08	9.08
	51	-6.24	-6.24
	52	-11.30	-11.30
	53	-6.83	-6.83
	54	7.32	7.32
	55	22.95	22.95
	56	11.90	11.90
	57	2.01	2.01
	58	-1.08	-1.08
	59	2.02	2.02
	60	10.72	10.72
	61	19.64	-19.64
	62	-6.04	-6.04
	63	6.13	6.13
	64	9.35	9.35
	65	3.61	3.61
	66	-11.07	-11.07
	67	-26.40	-26.40
	68	-2.53	-2.53
	69	0.90	0.90
	70	-1.02	-1.02
	71	-2.94	-2.94
	72	-13.26	-13.26

---

```
#####
#          VERIFICAÇÃO DA FISSURAÇÃO (ELS)          #
#          VmaxHmax                                   #
#####
```

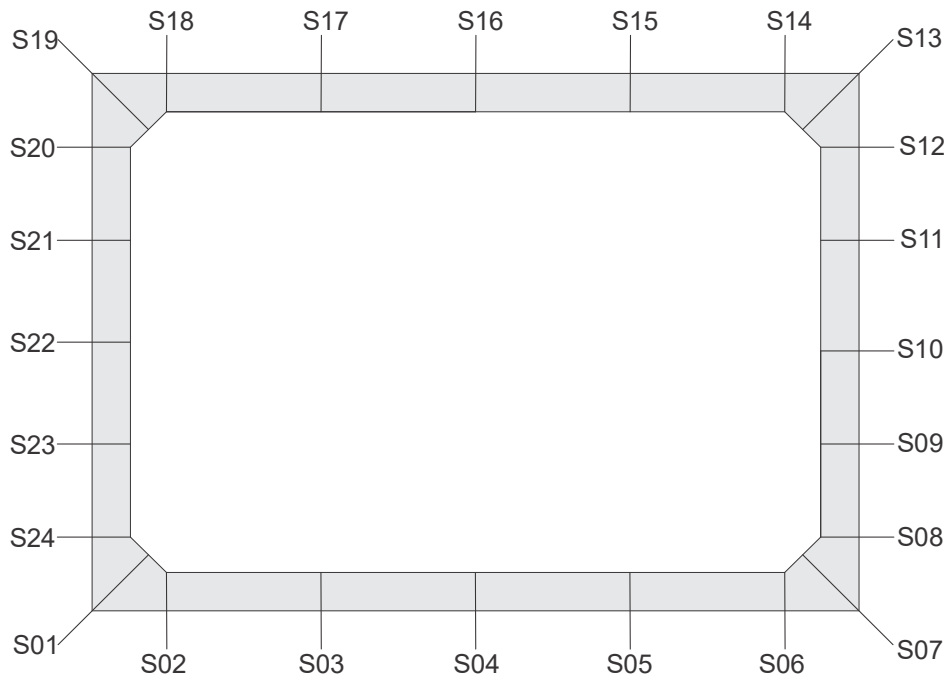
-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-20.41	20.41
2	4.22	4.22
3	-10.39	-10.39
4	-15.03	-15.03
5	-9.68	-9.68
6	6.85	6.85
7	25.67	25.67
8	16.90	16.90
9	8.23	8.23
10	3.66	3.66
11	-0.90	-0.90
12	3.46	3.46
13	29.61	-29.61
14	-12.20	-12.20
15	4.85	4.85
16	12.13	12.13
17	9.66	9.66
18	-2.56	-2.56
19	-16.66	-16.66
20	-10.92	-10.92
21	-5.40	-5.40
22	-3.62	-3.62
23	-5.97	-5.97
24	-12.84	-12.84
25	-20.41	24.70
26	7.18	7.18
27	-8.48	-8.48
28	-13.46	-13.46
29	-8.30	-8.30
30	7.53	7.53
31	25.14	25.14
32	16.14	16.14
33	6.65	6.65
34	0.78	0.78
35	-5.10	-5.10
36	1.27	1.27
37	27.14	-27.14
38	-11.34	-11.34
39	3.35	3.35
40	8.28	8.28
41	3.46	3.46
42	-11.12	-11.12
43	-26.84	-26.84
44	-0.92	-0.92
45	3.11	3.11
46	-1.79	-1.79
47	-6.69	-6.69
48	-15.69	-15.69
49	-24.70	26.06

	50	7.18	7.18
	51	-9.44	-9.44
	52	-14.89	-14.89
	53	-10.34	-10.34
	54	4.20	4.20
	55	20.35	20.35
	56	12.78	12.78
	57	5.90	5.90
	58	3.55	3.55
	59	5.33	5.33
	60	10.84	10.84
	61	16.58	-16.58
	62	-2.52	-2.52
	63	9.65	9.65
	64	12.06	12.06
	65	4.72	4.72
	66	-12.38	-12.38
	67	-29.83	-29.83
	68	-3.74	-3.74
	69	2.96	2.96
	70	-2.58	-2.58
	71	-8.12	-8.12
	72	-17.28	-17.28

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## ARMADURAS P/ SOLICITAÇÕES NORMAIS



Seção	As-CA60ext(cm <sup>2</sup> /m)	As-CA50ext(cm <sup>2</sup> /m)	As-CA60int(cm <sup>2</sup> /m)	As-CA50int(cm <sup>2</sup> /m)
1	5.08	6.10	1.26	1.26
2	2.16	2.59	2.16	2.59
3	2.16	2.59	3.23	3.88
4	2.16	2.59	4.62	5.55
5	2.16	2.59	3.25	3.89
6	2.16	2.59	2.16	2.59
7	5.08	6.10	1.26	1.26
8	3.95	4.73	2.16	2.59
9	2.16	2.59	2.16	2.59
10	2.16	2.59	2.16	2.59
11	2.16	2.59	2.16	2.59
12	2.16	2.59	2.16	2.59
13	5.08	6.10	1.26	1.26
14	3.18	3.82	2.16	2.59
15	2.16	2.59	2.16	2.59
16	2.16	2.59	3.77	4.53
17	2.16	2.59	3.44	4.12
18	2.16	2.59	2.16	2.59
19	5.08	6.10	1.26	1.26
20	2.16	2.59	2.16	2.59
21	2.16	2.59	2.16	2.59
22	2.16	2.59	2.16	2.59
23	2.16	2.59	2.16	2.59
24	2.45	2.93	2.16	2.59

**NOTA:** A tabela acima mostra as áreas de aço calculadas para parte interna e externa das seções de interesse. Estas áreas são mostradas para o caso de se utilizar apenas aço do tipo CA60 (As-CA60ext e As-CA60int) e os correspondentes valores para o caso de se utilizar apenas aço do tipo CA50 (As-CA50ext e As-CA50int). Possibilitando os cálculos para o uso combinado dos tipos de aço: CA60 contido nas telas soldadas e o CA50 presentes nas barras.

**VERIFICAÇÃO DA FADIGA**

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Seção	Nsdmax(kN)	Msdmax(kN.m)	Nsdmin(kN)	Msdmin(kN.m)	DSs(MPa)	Asad(cm <sup>2</sup> /m)
12	-76.69	3.64	-67.15	3.16	2.46	0.00
13	-75.41	31.09	-21.93	27.16	-5.45	0.00
14	-24.60	12.80	-21.93	11.19	25.14	0.00
16	-21.86	13.05	-38.01	9.20	98.38	0.00
18	-24.60	2.64	-21.93	2.43	1.90	0.00
19	-62.70	17.43	-21.93	15.39	-10.27	0.00
20	-63.98	11.45	-56.20	10.04	18.88	0.00

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## VERIFICAÇÃO DA CORTANTE

Seção	fck(MPa)	fcd(MPa)	fctm(MPa)	fctk,inf(MPa)	fctd(MPa)	Trd(MPa)
1	30.00	21.43	2.90	2.03	1.45	0.36
2	30.00	21.43	2.90	2.03	1.45	0.36
6	30.00	21.43	2.90	2.03	1.45	0.36
7	30.00	21.43	2.90	2.03	1.45	0.36
13	30.00	21.43	2.90	2.03	1.45	0.36
14	30.00	21.43	2.90	2.03	1.45	0.36
18	30.00	21.43	2.90	2.03	1.45	0.36
19	30.00	21.43	2.90	2.03	1.45	0.36

Seção	As(cm <sup>2</sup> /m)	ro	vsd(kN)	vrd1(kN)	vrd2(kN)	Asw(cm <sup>2</sup> /m/m)
1	6.10	1.97E-003	84.17	176.33	0.00	0.00
2	2.59	2.35E-003	77.79	69.50	530.36	0.00
6	2.59	2.35E-003	84.84	69.50	530.36	0.00
7	6.10	1.97E-003	94.14	169.27	0.00	0.00
13	6.10	1.97E-003	102.58	170.75	0.00	0.00
14	3.82	3.47E-003	59.28	73.49	0.00	0.00
18	2.59	2.35E-003	58.21	70.83	0.00	0.00
19	6.10	1.97E-003	70.81	173.14	0.00	0.00

**OBSERVAÇÃO:** A verificação da resistência à força cortante é feita a uma distância  $d/2$  das seções das mísulas.

## VERIFICAÇÃO DA FISSURAÇÃO

VmaxHmin

Seção	As (cm <sup>2</sup> /m)	Nsd (kN)	Msd (kN.m)	Ø (mm)	w (mm)
1	6.10	-30.82	20.00	6.30	0.014
2	2.59	-30.36	3.88	6.30	0.013
3	3.88	-30.36	10.66	6.30	0.069
4	5.55	-30.36	15.27	6.30	0.074
5	3.89	-30.36	9.92	6.30	0.058
6	2.59	-30.36	6.62	6.30	0.052
7	6.10	-55.51	25.49	6.30	0.019
8	4.73	-79.37	17.14	6.30	0.104
9	2.59	-77.87	8.66	6.30	0.060
10	2.59	-76.37	3.86	6.30	0.002
11	2.59	-74.87	0.94	6.30	0.000
12	2.59	-73.37	3.54	6.30	0.002
13	6.10	-46.99	29.71	6.30	0.030
14	3.82	-21.88	12.22	6.30	0.102
15	2.59	-21.88	4.92	6.30	0.029
16	4.53	-21.88	12.32	6.30	0.074
17	4.12	-21.88	9.95	6.30	0.056
18	2.59	-21.88	2.17	6.30	0.003
19	6.10	-40.71	16.20	6.30	0.007
20	2.59	-60.81	10.87	6.30	0.129
21	2.59	-62.31	5.73	6.30	0.021
22	2.59	-63.81	4.06	6.30	0.006
23	2.59	-65.31	6.29	6.30	0.027
24	2.93	-66.81	12.81	6.30	0.144

VminHmax

Seção	As (cm <sup>2</sup> /m)	Nsd (kN)	Msd (kN.m)	Ø (mm)	w (mm)
1	6.10	-27.47	22.97	6.30	0.019
2	2.59	-46.79	7.32	6.30	0.055
3	3.88	-46.79	6.84	6.30	0.020
4	5.55	-46.79	11.34	6.30	0.035
5	3.89	-46.79	6.30	6.30	0.016
6	2.59	-46.79	8.98	6.30	0.091
7	6.10	-59.43	26.02	6.30	0.020
8	4.73	-70.78	13.15	6.30	0.058
9	2.59	-69.28	2.97	6.30	0.001
10	2.59	-67.78	1.32	6.30	0.000
11	2.59	-66.28	0.33	6.30	0.000
12	2.59	-64.78	2.45	6.30	0.000
13	6.10	-49.98	26.34	6.30	0.022
14	3.82	-36.47	11.02	6.30	0.074
15	2.59	-36.47	3.65	6.30	0.010
16	4.53	-36.47	9.37	6.30	0.036
17	4.12	-36.47	6.13	6.30	0.016
18	2.59	-36.47	6.05	6.30	0.039
19	6.10	-46.88	19.66	6.30	0.011
20	2.59	-58.57	10.74	6.30	0.128
21	2.59	-60.07	2.04	6.30	0.000
22	2.59	-61.57	1.06	6.30	0.000
23	2.59	-63.07	2.03	6.30	0.000
24	2.93	-64.57	11.92	6.30	0.123

## VERIFICAÇÃO DA FISSURAÇÃO (CONT.)

VmaxHmax

Seção	As(cm <sup>2</sup> /m)	Nsd(kN)	Msd(kN.m)	Ø(mm)	w(mm)
1	6.10	-30.72	20.41	6.30	0.014
2	2.59	-31.91	4.22	6.30	0.016
3	3.88	-31.91	10.39	6.30	0.065
4	5.55	-31.91	15.03	6.30	0.071
5	3.89	-31.91	9.68	6.30	0.055
6	2.59	-31.91	6.85	6.30	0.056
7	6.10	-56.15	25.67	6.30	0.019
8	4.73	-79.11	16.90	6.30	0.101
9	2.59	-77.61	8.23	6.30	0.052
10	2.59	-76.11	3.66	6.30	0.002
11	2.59	-74.61	0.90	6.30	0.000
12	2.59	-73.11	3.46	6.30	0.001
13	6.10	-47.71	29.61	6.30	0.029
14	3.82	-23.60	12.20	6.30	0.100
15	2.59	-23.60	4.85	6.30	0.027
16	4.53	-23.60	12.13	6.30	0.070
17	4.12	-23.60	9.66	6.30	0.052
18	2.59	-23.60	2.56	6.30	0.005
19	6.10	-41.69	16.66	6.30	0.008
20	2.59	-61.07	10.92	6.30	0.130
21	2.59	-62.57	5.40	6.30	0.018
22	2.59	-64.07	3.62	6.30	0.003
23	2.59	-65.57	5.97	6.30	0.023
24	2.93	-67.07	12.84	6.30	0.145

NOTA:

\* Seção com aumento na armadura devido à fissuração.