



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

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

segunda-feira, 7 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:

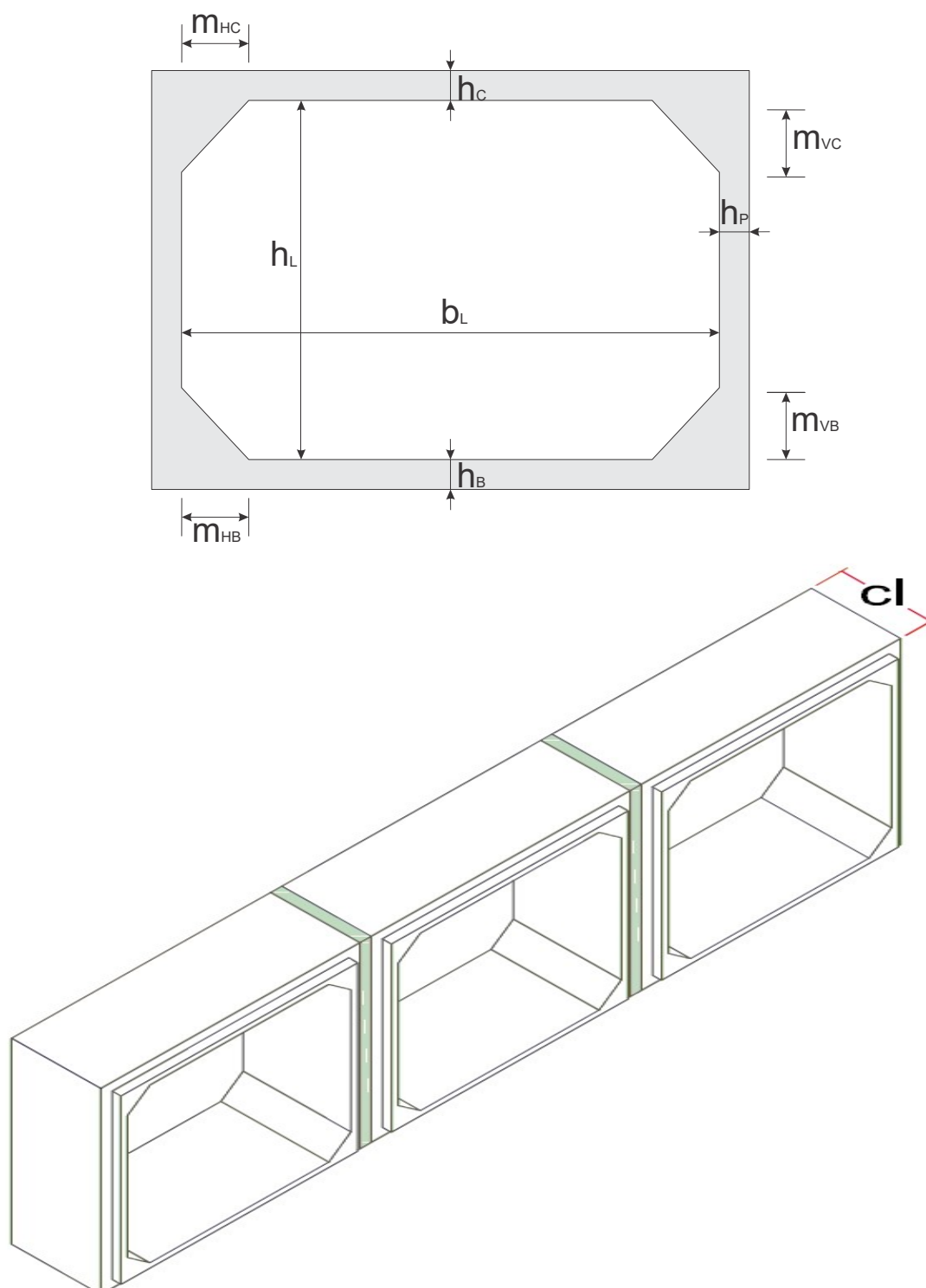
### DADOS DA OBRA



NOME: ADUELA 2,50 X 2,50 M PARA ATERRO DE 1,00 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 ( $b_l$ ).....	: 2.50 m
ALTURA LIVRE ( $h_l$ ).....	: 2.50 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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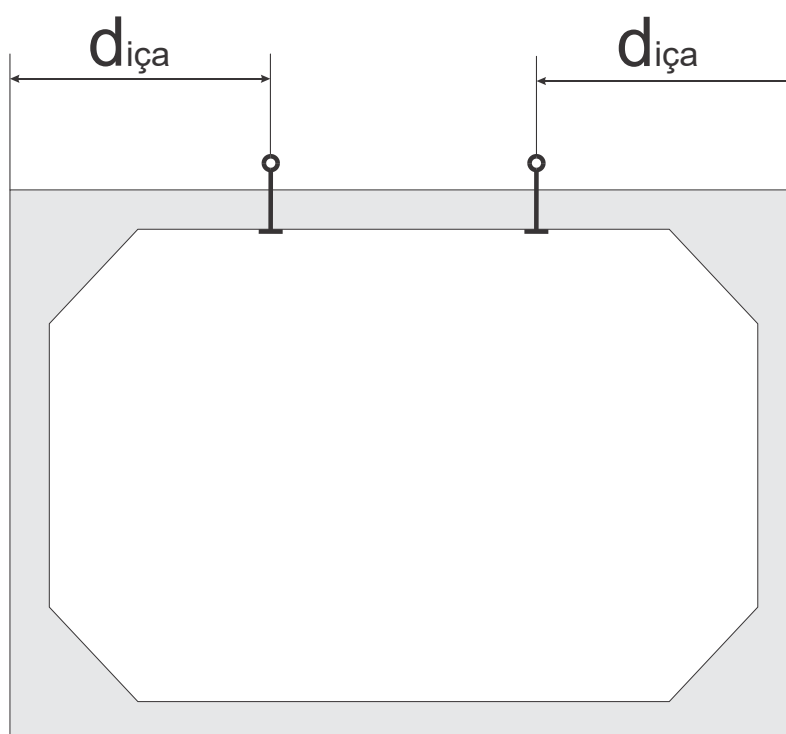
### DADOS DE INSTALAÇÃO

ALTURA DE TERRA.....	: 0.70 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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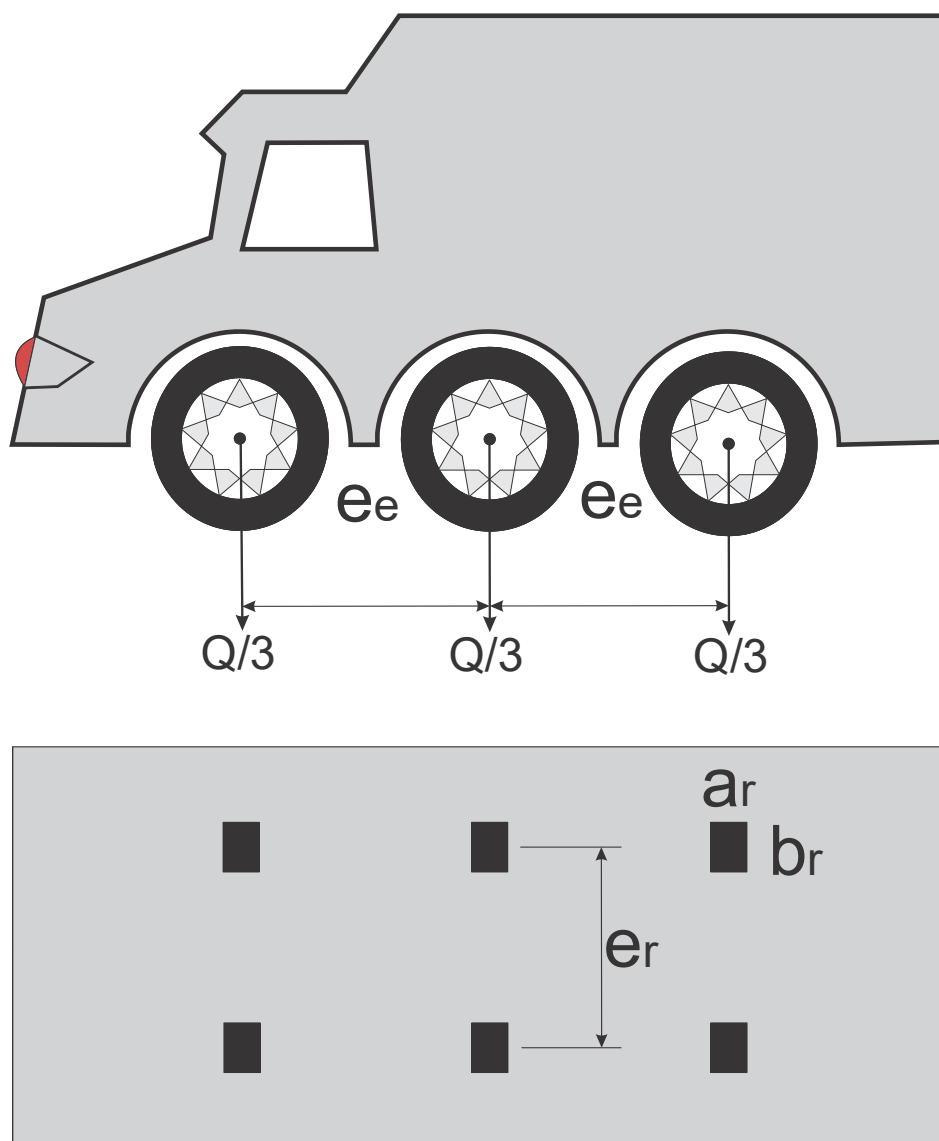
### INFORMAÇÕES DE MANUSEIO

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



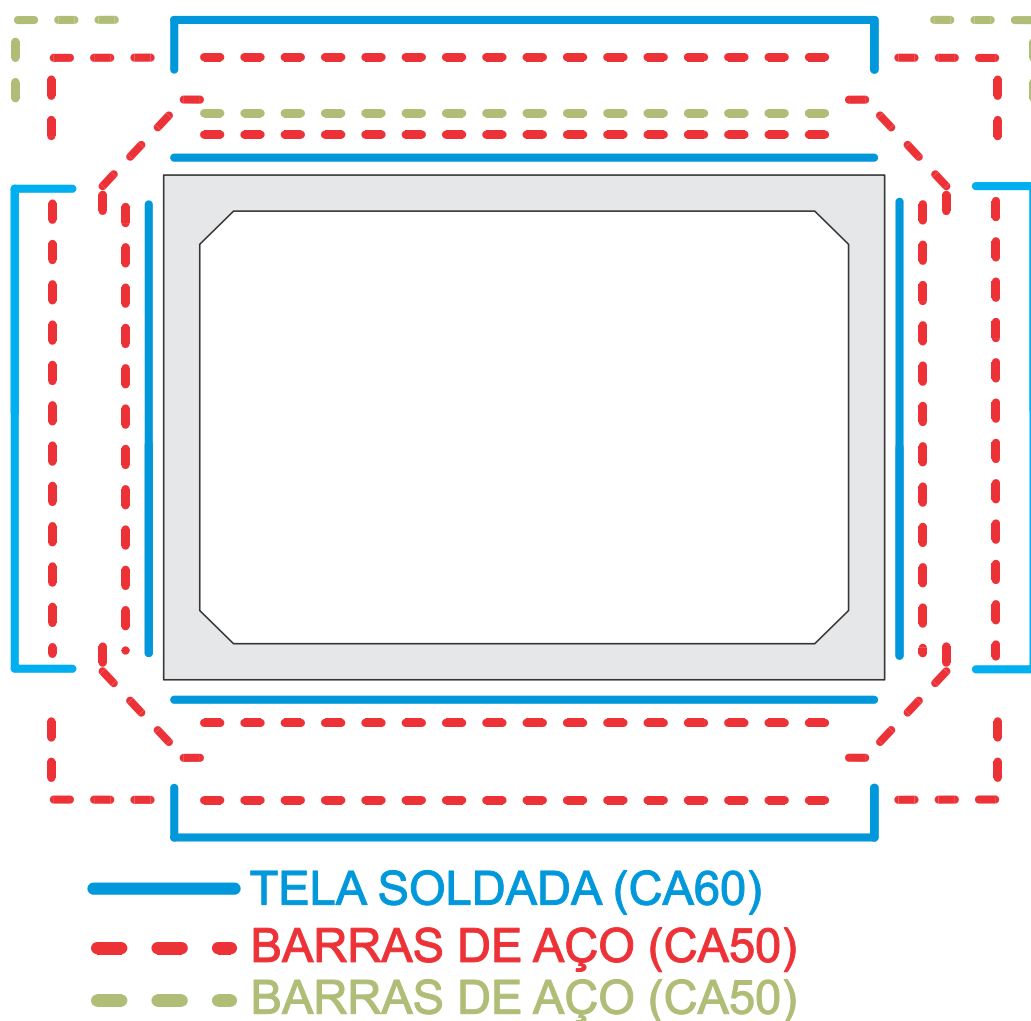
## SOBRECARGA

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.....: 1.30



## 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.....	: 1.30
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:

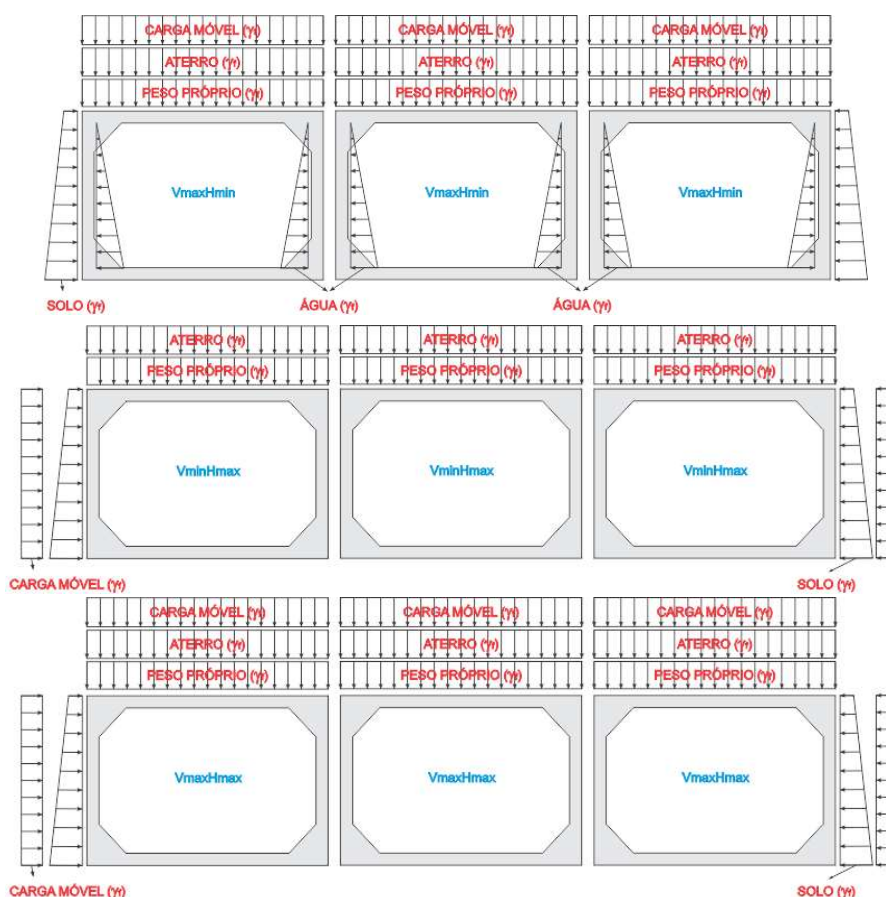
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL V.:	1.50
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.35
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.30
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.00
COEFICIENTE DE PONDERAÇÃO ÁGUA.....	1.20

- VminHmax:

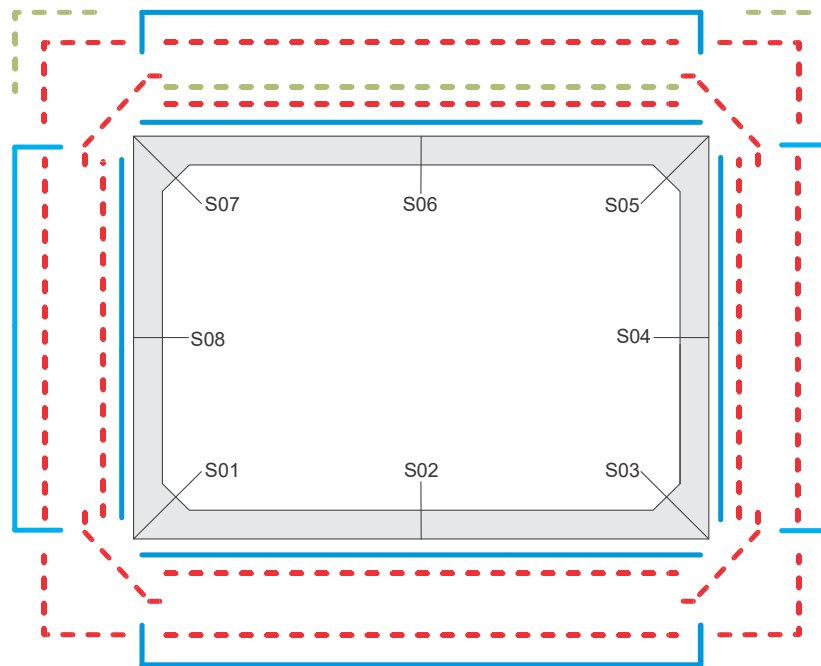
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.00
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.00
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.35
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL H.:	1.50

- 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



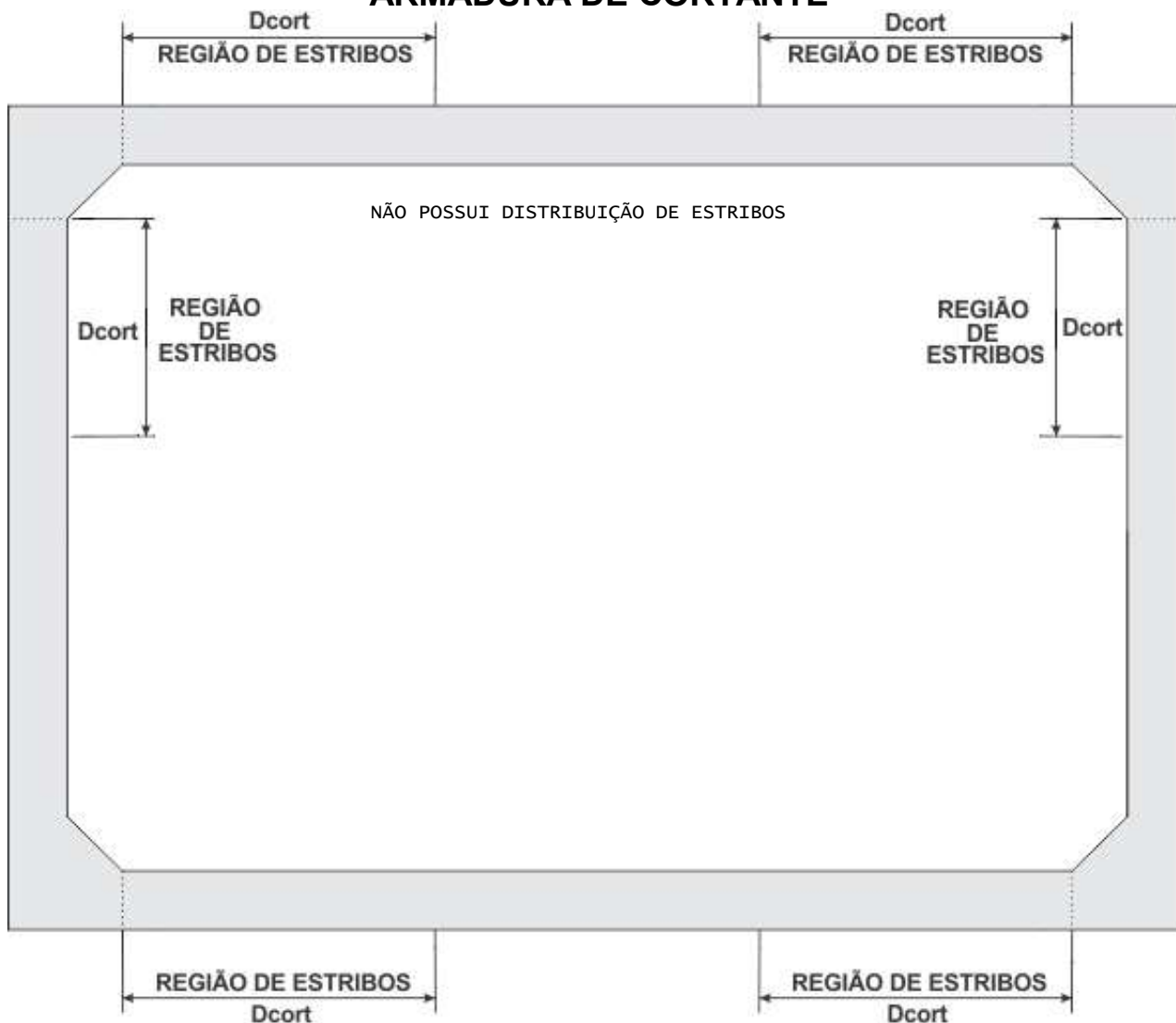
- TELA SOLDADA (CA60) ARMADURA BÁSICA  
 - - - BARRAS DE AÇO (CA50) ARMADURA COMPLEMENTAR  
 - - - BARRAS DE AÇO (CA50) ARMADURA DE FADIGA

OBS.: VALORES POR METRO DE ADUELA.

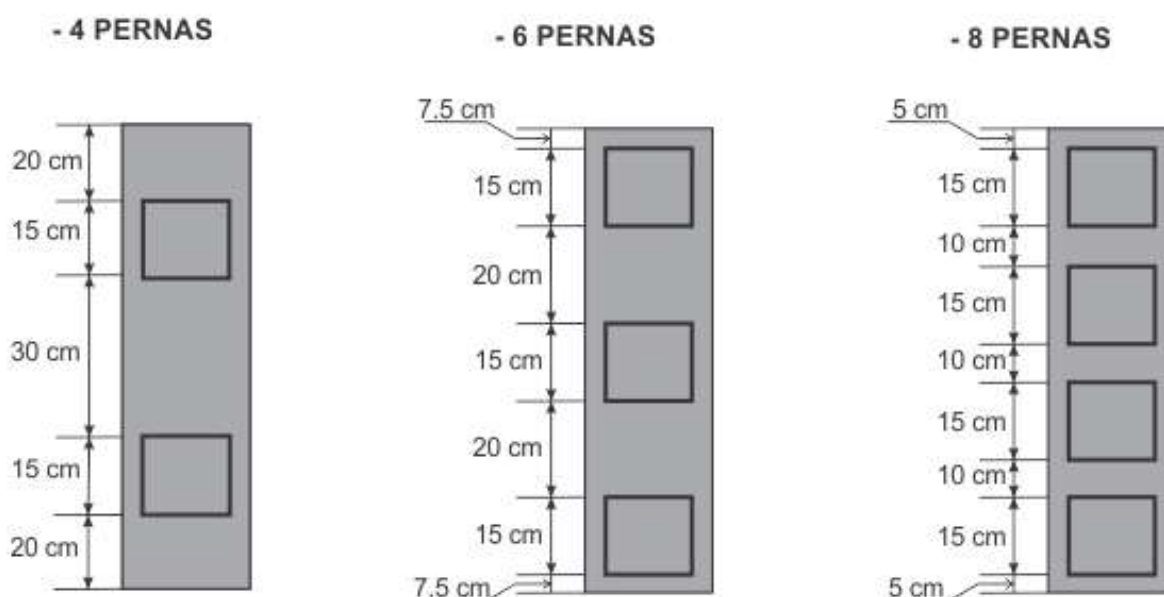
	TELA	ARMADURA COMPLEMENTAR	ARMADURA DE FADIGA
LADO EXTERNO	T-S02: L283	B-S01: 0.22 cm <sup>2</sup> de área acima	B-S05: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 0.61 cm <sup>2</sup> de área acima	B-S07: 0.00 cm <sup>2</sup> de área acima
	T-S06: L283	B-S03: 0.22 cm <sup>2</sup> de área acima	
	T-S08: L283	B-S04: 0.04 cm <sup>2</sup> de área acima B-S05: 0.22 cm <sup>2</sup> de área acima B-S06: 0.61 cm <sup>2</sup> de área acima B-S07: 0.22 cm <sup>2</sup> de área acima B-S08: 0.04 cm <sup>2</sup> de área acima	
LADO INTERNO	T-S02: L335	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: 6 Ø8.00 c/ 31 cm (-8.41%)	
	T-S06: L283	B-S03: 4 Ø6.30 c/ 31 cm ( 0.00%)	
	T-S08: L283	B-S04: 0.61 cm <sup>2</sup> de área acima B-S05: 4 Ø6.30 c/ 31 cm ( 0.00%) B-S06: 4 Ø8.00 c/ 31 cm ( 2.38%) B-S07: 4 Ø6.30 c/ 31 cm ( 0.00%) B-S08: 0.61 cm <sup>2</sup> de área acima	

NOTA: Os valores entre parênteses representam a percentagem de área de aço que a seção apresenta acima (porcentagem positiva) ou a menos (porcentagem 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:

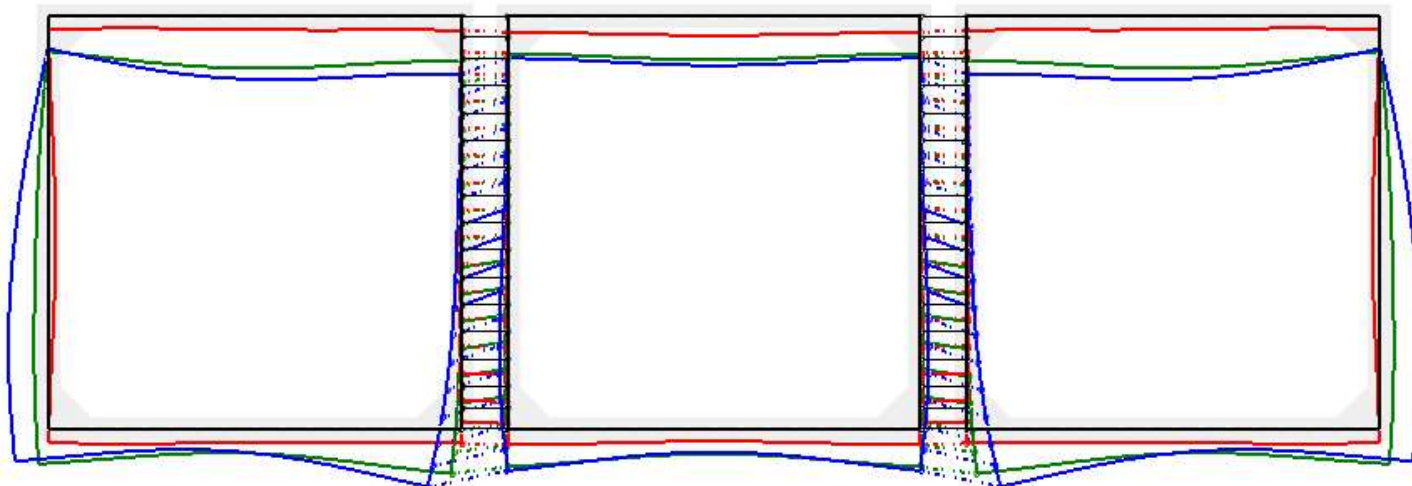
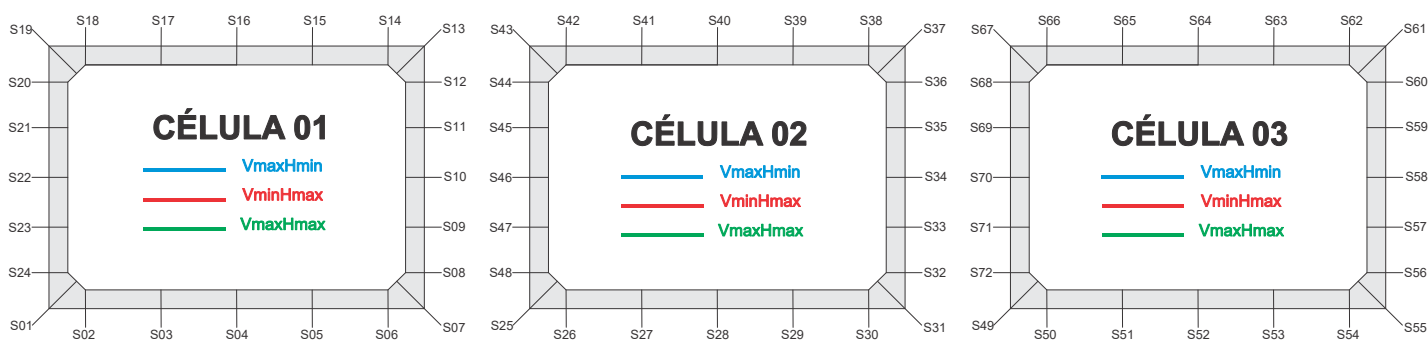


### OBSERVAÇÃO:

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



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#####
#          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	-3.37E-003	-3.29E-003
2	-3.37E-003	-2.89E-003
3	-3.37E-003	-2.20E-003
4	-3.38E-003	-2.18E-003
5	-3.38E-003	-3.15E-003
6	-3.38E-003	-4.89E-003
7	-3.38E-003	-5.86E-003
8	-2.43E-003	-5.87E-003
9	-1.15E-003	-5.88E-003
10	-5.62E-004	-5.89E-003
11	-2.49E-004	-5.91E-003
12	-5.33E-005	-5.92E-003
13	-2.40E-005	-5.93E-003
14	-2.41E-005	-5.94E-003
15	-2.44E-005	-6.30E-003
16	-2.48E-005	-6.46E-003
17	-2.51E-005	-5.79E-003
18	-2.54E-005	-4.27E-003
19	-2.55E-005	-3.34E-003
20	-9.52E-004	-3.33E-003
21	-2.50E-003	-3.32E-003
22	-3.57E-003	-3.31E-003
23	-4.03E-003	-3.30E-003
24	-3.75E-003	-3.29E-003
25	2.43E-006	-4.25E-003
26	2.14E-006	-3.74E-003
27	1.07E-006	-2.77E-003
28	-3.09E-010	-2.34E-003
29	-1.07E-006	-2.77E-003
30	-2.14E-006	-3.74E-003
31	-2.43E-006	-4.25E-003
32	4.71E-004	-4.25E-003
33	8.44E-004	-4.26E-003
34	5.93E-004	-4.27E-003
35	2.45E-004	-4.29E-003
36	6.42E-005	-4.30E-003
37	1.65E-006	-4.30E-003
38	1.37E-006	-4.39E-003
39	2.94E-007	-4.80E-003
40	-7.77E-007	-5.04E-003
41	-1.85E-006	-4.80E-003
42	-2.92E-006	-4.39E-003
43	-3.21E-006	-4.30E-003
44	-6.57E-005	-4.30E-003
45	-2.45E-004	-4.29E-003
46	-5.94E-004	-4.27E-003
47	-8.45E-004	-4.26E-003
48	-4.71E-004	-4.25E-003
49	3.37E-003	-5.86E-003

50	3.37E-003	-4.89E-003
51	3.37E-003	-3.15E-003
52	3.37E-003	-2.18E-003
53	3.37E-003	-2.20E-003
54	3.37E-003	-2.89E-003
55	3.37E-003	-3.29E-003
56	3.75E-003	-3.29E-003
57	4.03E-003	-3.30E-003
58	3.57E-003	-3.31E-003
59	2.50E-003	-3.32E-003
60	9.50E-004	-3.33E-003
61	2.39E-005	-3.34E-003
62	2.38E-005	-4.27E-003
63	2.35E-005	-5.79E-003
64	2.32E-005	-6.46E-003
65	2.29E-005	-6.30E-003
66	2.25E-005	-5.94E-003
67	2.24E-005	-5.93E-003
68	5.18E-005	-5.92E-003
69	2.46E-004	-5.91E-003
70	5.61E-004	-5.89E-003
71	1.15E-003	-5.88E-003
72	2.43E-003	-5.87E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.42E-003
2	1.48E-003
3	8.68E-004
4	-8.74E-004
5	-2.76E-003
6	-3.57E-003
7	-3.50E-003
8	-3.34E-003
9	-1.64E-003
10	-7.51E-004
11	-5.08E-004
12	-1.76E-004
13	-3.72E-005
14	1.65E-004
15	8.04E-004
16	-3.89E-004
17	-2.19E-003
18	-3.38E-003
19	-3.39E-003
20	-3.34E-003
21	-2.53E-003
22	-1.50E-003
23	-2.13E-004
24	1.30E-003
25	1.79E-003
26	1.88E-003
27	1.52E-003
28	8.31E-009
29	-1.52E-003

30	-1.88E-003
31	-1.79E-003
32	-1.62E-003
33	5.86E-005
34	7.15E-004
35	5.14E-004
36	1.96E-004
37	2.72E-004
38	4.23E-004
39	8.22E-004
40	2.24E-007
41	-8.22E-004
42	-4.23E-004
43	-2.72E-004
44	-1.96E-004
45	-5.14E-004
46	-7.13E-004
47	-5.73E-005
48	1.62E-003
49	3.50E-003
50	3.57E-003
51	2.76E-003
52	8.74E-004
53	-8.68E-004
54	-1.48E-003
55	-1.42E-003
56	-1.30E-003
57	2.13E-004
58	1.50E-003
59	2.53E-003
60	3.34E-003
61	3.39E-003
62	3.38E-003
63	2.19E-003
64	3.88E-004
65	-8.04E-004
66	-1.64E-004
67	3.76E-005
68	1.76E-004
69	5.09E-004
70	7.50E-004
71	1.64E-003
72	3.34E-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	4.95E-005	-1.37E-003
2	4.72E-005	-1.49E-003
3	3.85E-005	-1.46E-003
4	2.98E-005	-1.35E-003
5	2.11E-005	-1.38E-003
6	1.25E-005	-1.45E-003
7	1.01E-005	-1.44E-003
8	-1.77E-005	-1.44E-003
9	-7.51E-005	-1.44E-003
10	-9.64E-005	-1.45E-003
11	-7.99E-005	-1.45E-003
12	-2.40E-005	-1.46E-003
13	1.37E-005	-1.46E-003
14	1.54E-005	-1.43E-003
15	2.19E-005	-1.44E-003
16	2.85E-005	-1.40E-003
17	3.50E-005	-1.28E-003
18	4.15E-005	-1.28E-003
19	4.33E-005	-1.40E-003
20	1.80E-004	-1.40E-003
21	5.59E-004	-1.39E-003
22	7.70E-004	-1.39E-003
23	5.76E-004	-1.38E-003
24	1.88E-004	-1.38E-003
25	1.96E-005	-1.63E-003
26	1.72E-005	-1.57E-003
27	8.62E-006	-1.36E-003
28	-3.93E-011	-1.24E-003
29	-8.62E-006	-1.36E-003
30	-1.72E-005	-1.57E-003
31	-1.96E-005	-1.63E-003
32	2.28E-005	-1.63E-003
33	6.97E-005	-1.63E-003
34	9.12E-005	-1.64E-003
35	7.90E-005	-1.64E-003
36	2.75E-005	-1.65E-003
37	-1.49E-005	-1.65E-003
38	-1.32E-005	-1.70E-003
39	-6.58E-006	-1.88E-003
40	-1.66E-010	-1.98E-003
41	6.58E-006	-1.88E-003
42	1.32E-005	-1.70E-003
43	1.49E-005	-1.65E-003
44	-2.75E-005	-1.65E-003
45	-7.83E-005	-1.64E-003
46	-8.99E-005	-1.64E-003
47	-6.92E-005	-1.63E-003
48	-2.29E-005	-1.63E-003
49	-1.01E-005	-1.44E-003

50	-1.25E-005	-1.45E-003
51	-2.12E-005	-1.38E-003
52	-2.98E-005	-1.35E-003
53	-3.85E-005	-1.46E-003
54	-4.72E-005	-1.49E-003
55	-4.95E-005	-1.37E-003
56	-1.88E-004	-1.38E-003
57	-5.76E-004	-1.38E-003
58	-7.70E-004	-1.39E-003
59	-5.60E-004	-1.39E-003
60	-1.80E-004	-1.40E-003
61	-4.33E-005	-1.40E-003
62	-4.15E-005	-1.28E-003
63	-3.50E-005	-1.28E-003
64	-2.85E-005	-1.40E-003
65	-2.20E-005	-1.44E-003
66	-1.54E-005	-1.43E-003
67	-1.37E-005	-1.46E-003
68	2.40E-005	-1.46E-003
69	7.92E-005	-1.45E-003
70	9.51E-005	-1.45E-003
71	7.46E-005	-1.44E-003
72	1.78E-005	-1.44E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	-4.60E-004
2	-3.45E-004
3	2.55E-004
4	1.05E-004
5	-1.75E-004
6	1.29E-005
7	7.95E-005
8	1.20E-004
9	7.64E-005
10	4.68E-006
11	-6.73E-005
12	-1.45E-004
13	-1.25E-004
14	-7.96E-005
15	2.67E-005
16	-1.74E-004
17	-2.18E-004
18	3.61E-004
19	4.60E-004
20	5.47E-004
21	7.00E-004
22	2.38E-005
23	-6.96E-004
24	-5.60E-004
25	1.79E-004
26	2.49E-004
27	4.08E-004
28	-1.20E-008
29	-4.08E-004

30	-2.49E-004
31	-1.79E-004
32	-1.31E-004
33	-6.68E-005
34	-1.21E-005
35	6.19E-005
36	1.39E-004
37	1.72E-004
38	2.26E-004
39	3.46E-004
40	1.85E-008
41	-3.46E-004
42	-2.26E-004
43	-1.72E-004
44	-1.39E-004
45	-5.84E-005
46	1.12E-005
47	6.50E-005
48	1.31E-004
49	-7.96E-005
50	-1.30E-005
51	1.75E-004
52	-1.05E-004
53	-2.55E-004
54	3.45E-004
55	4.60E-004
56	5.60E-004
57	6.96E-004
58	-2.38E-005
59	-7.00E-004
60	-5.47E-004
61	-4.60E-004
62	-3.61E-004
63	2.18E-004
64	1.74E-004
65	-2.67E-005
66	7.96E-005
67	1.25E-004
68	1.45E-004
69	6.38E-005
70	-3.84E-006
71	-7.47E-005
72	-1.20E-004

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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	-9.63E-004	-3.56E-003
2	-9.65E-004	-3.25E-003
3	-9.71E-004	-2.62E-003
4	-9.77E-004	-2.45E-003
5	-9.83E-004	-3.03E-003
6	-9.89E-004	-4.05E-003
7	-9.90E-004	-4.53E-003
8	-5.46E-004	-4.53E-003
9	-1.28E-004	-4.54E-003
10	-8.30E-005	-4.56E-003
11	-9.61E-006	-4.57E-003
12	2.04E-005	-4.58E-003
13	-9.69E-006	-4.59E-003
14	-8.58E-006	-4.65E-003
15	-4.43E-006	-5.08E-003
16	-2.94E-007	-5.34E-003
17	3.85E-006	-4.95E-003
18	7.99E-006	-4.07E-003
19	9.10E-006	-3.61E-003
20	-4.34E-004	-3.60E-003
21	-9.99E-004	-3.59E-003
22	-1.29E-003	-3.58E-003
23	-1.42E-003	-3.57E-003
24	-1.24E-003	-3.56E-003
25	1.41E-005	-3.85E-003
26	1.25E-005	-3.57E-003
27	6.23E-006	-2.88E-003
28	-7.63E-011	-2.54E-003
29	-6.23E-006	-2.88E-003
30	-1.25E-005	-3.56E-003
31	-1.41E-005	-3.85E-003
32	2.38E-004	-3.85E-003
33	3.10E-004	-3.87E-003
34	8.52E-005	-3.88E-003
35	-3.95E-006	-3.89E-003
36	-1.21E-005	-3.90E-003
37	-1.07E-005	-3.91E-003
38	-9.70E-006	-3.94E-003
39	-5.80E-006	-4.26E-003
40	-1.90E-006	-4.47E-003
41	2.00E-006	-4.26E-003
42	5.90E-006	-3.94E-003
43	6.95E-006	-3.91E-003
44	8.39E-006	-3.91E-003
45	8.41E-006	-3.89E-003
46	-8.76E-005	-3.88E-003
47	-3.16E-004	-3.87E-003
48	-2.39E-004	-3.86E-003
49	9.84E-004	-4.52E-003

50	9.83E-004	-4.04E-003
51	9.77E-004	-3.03E-003
52	9.71E-004	-2.45E-003
53	9.65E-004	-2.62E-003
54	9.59E-004	-3.25E-003
55	9.57E-004	-3.56E-003
56	1.23E-003	-3.56E-003
57	1.42E-003	-3.57E-003
58	1.28E-003	-3.58E-003
59	9.94E-004	-3.59E-003
60	4.29E-004	-3.60E-003
61	-1.30E-005	-3.61E-003
62	-1.19E-005	-4.07E-003
63	-7.72E-006	-4.95E-003
64	-3.58E-006	-5.33E-003
65	5.59E-007	-5.07E-003
66	4.70E-006	-4.65E-003
67	5.82E-006	-4.58E-003
68	-2.37E-005	-4.58E-003
69	-8.69E-007	-4.57E-003
70	8.00E-005	-4.55E-003
71	1.28E-004	-4.54E-003
72	5.42E-004	-4.53E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.06E-003
2	1.16E-003
3	9.60E-004
4	-3.89E-004
5	-1.73E-003
6	-1.82E-003
7	-1.69E-003
8	-1.51E-003
9	-2.73E-004
10	-6.40E-005
11	-1.48E-004
12	5.56E-005
13	1.68E-004
14	3.47E-004
15	9.06E-004
16	-6.90E-005
17	-1.35E-003
18	-1.73E-003
19	-1.66E-003
20	-1.55E-003
21	-7.30E-004
22	-4.08E-004
23	-5.79E-005
24	9.21E-004
25	9.92E-004
26	1.13E-003
27	1.18E-003
28	-1.78E-009
29	-1.18E-003

30	-1.12E-003
31	-9.86E-004
32	-8.15E-004
33	3.29E-004
34	3.47E-004
35	7.85E-005
36	-4.28E-005
37	4.34E-005
38	2.02E-004
39	7.13E-004
40	1.91E-006
41	-7.10E-004
42	-2.01E-004
43	-4.27E-005
44	4.27E-005
45	-5.32E-005
46	-3.69E-004
47	-3.23E-004
48	8.21E-004
49	1.68E-003
50	1.81E-003
51	1.73E-003
52	3.89E-004
53	-9.59E-004
54	-1.16E-003
55	-1.06E-003
56	-9.20E-004
57	5.79E-005
58	4.08E-004
59	7.28E-004
60	1.54E-003
61	1.65E-003
62	1.73E-003
63	1.35E-003
64	6.70E-005
65	-9.06E-004
66	-3.46E-004
67	-1.66E-004
68	-5.32E-005
69	1.24E-004
70	8.66E-005
71	2.68E-004
72	1.51E-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	-3.59E-003	-3.39E-003
2	-3.59E-003	-2.94E-003
3	-3.59E-003	-2.15E-003
4	-3.59E-003	-2.08E-003
5	-3.59E-003	-3.09E-003
6	-3.59E-003	-5.02E-003
7	-3.59E-003	-6.14E-003
8	-2.50E-003	-6.15E-003
9	-1.21E-003	-6.18E-003
10	-8.69E-004	-6.21E-003
11	-6.93E-004	-6.23E-003
12	-5.28E-004	-6.26E-003
13	-5.07E-004	-6.27E-003
14	-5.07E-004	-6.30E-003
15	-5.07E-004	-6.65E-003
16	-5.08E-004	-6.75E-003
17	-5.08E-004	-5.98E-003
18	-5.08E-004	-4.40E-003
19	-5.08E-004	-3.44E-003
20	-1.46E-003	-3.44E-003
21	-3.01E-003	-3.43E-003
22	-4.03E-003	-3.42E-003
23	-4.41E-003	-3.41E-003
24	-4.03E-003	-3.40E-003
25	2.28E-006	-4.34E-003
26	2.01E-006	-3.78E-003
27	1.01E-006	-2.72E-003
28	-2.90E-010	-2.25E-003
29	-1.01E-006	-2.72E-003
30	-2.01E-006	-3.86E-003
31	-2.28E-006	-4.50E-003
32	5.97E-004	-4.51E-003
33	8.91E-004	-4.53E-003
34	2.96E-004	-4.55E-003
35	-2.40E-004	-4.58E-003
36	-4.44E-004	-4.60E-003
37	-4.80E-004	-4.61E-003
38	-4.80E-004	-4.68E-003
39	-4.81E-004	-5.04E-003
40	-4.82E-004	-5.21E-003
41	-4.83E-004	-4.92E-003
42	-4.84E-004	-4.49E-003
43	-4.84E-004	-4.40E-003
44	-5.42E-004	-4.40E-003
45	-6.84E-004	-4.38E-003
46	-9.11E-004	-4.37E-003
47	-1.03E-003	-4.36E-003
48	-5.31E-004	-4.35E-003
49	3.60E-003	-6.13E-003

50	3.60E-003	-5.05E-003
51	3.60E-003	-3.14E-003
52	3.60E-003	-2.07E-003
53	3.60E-003	-2.09E-003
54	3.60E-003	-2.92E-003
55	3.60E-003	-3.44E-003
56	4.10E-003	-3.45E-003
57	4.44E-003	-3.47E-003
58	3.80E-003	-3.48E-003
59	2.44E-003	-3.50E-003
60	6.01E-004	-3.52E-003
61	-4.56E-004	-3.53E-003
62	-4.57E-004	-4.58E-003
63	-4.57E-004	-6.24E-003
64	-4.57E-004	-6.91E-003
65	-4.57E-004	-6.68E-003
66	-4.58E-004	-6.24E-003
67	-4.58E-004	-6.19E-003
68	-4.56E-004	-6.19E-003
69	-2.38E-004	-6.18E-003
70	2.57E-004	-6.16E-003
71	1.06E-003	-6.15E-003
72	2.55E-003	-6.13E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.63E-003
2	1.69E-003
3	1.01E-003
4	-8.49E-004
5	-2.95E-003
6	-4.10E-003
7	-4.07E-003
8	-3.82E-003
9	-1.30E-003
10	-2.69E-004
11	-3.93E-004
12	-1.80E-004
13	4.04E-005
14	2.27E-004
15	7.20E-004
16	-5.48E-004
17	-2.35E-003
18	-3.47E-003
19	-3.47E-003
20	-3.41E-003
21	-2.48E-003
22	-1.37E-003
23	-2.96E-005
24	1.50E-003
25	2.00E-003
26	2.10E-003
27	1.65E-003
28	8.72E-006
29	-1.70E-003

30	-2.36E-003
31	-2.29E-003
32	-2.01E-003
33	6.14E-004
34	1.34E-003
35	6.96E-004
36	8.03E-005
37	2.12E-004
38	3.56E-004
39	7.04E-004
40	-1.23E-004
41	-9.03E-004
42	-4.15E-004
43	-2.56E-004
44	-1.79E-004
45	-3.54E-004
46	-4.77E-004
47	1.96E-004
48	1.84E-003
49	3.88E-003
50	3.94E-003
51	3.02E-003
52	9.85E-004
53	-9.70E-004
54	-1.92E-003
55	-1.89E-003
56	-1.71E-003
57	3.58E-004
58	1.99E-003
59	3.12E-003
60	3.82E-003
61	3.86E-003
62	3.82E-003
63	2.30E-003
64	2.98E-004
65	-9.70E-004
66	-2.80E-004
67	-6.76E-005
68	8.16E-005
69	7.16E-004
70	1.14E-003
71	2.06E-003
72	3.72E-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	4.56E-005	-1.37E-003
2	4.33E-005	-1.48E-003
3	3.46E-005	-1.46E-003
4	2.59E-005	-1.35E-003
5	1.73E-005	-1.38E-003
6	8.59E-006	-1.46E-003
7	6.25E-006	-1.44E-003
8	-2.63E-005	-1.45E-003
9	-1.02E-004	-1.46E-003
10	-1.29E-004	-1.46E-003
11	-1.08E-004	-1.47E-003
12	-3.66E-005	-1.48E-003
13	1.13E-005	-1.48E-003
14	1.31E-005	-1.45E-003
15	1.96E-005	-1.45E-003
16	2.61E-005	-1.40E-003
17	3.27E-005	-1.28E-003
18	3.92E-005	-1.28E-003
19	4.09E-005	-1.40E-003
20	1.78E-004	-1.39E-003
21	5.57E-004	-1.39E-003
22	7.67E-004	-1.38E-003
23	5.73E-004	-1.38E-003
24	1.85E-004	-1.37E-003
25	1.96E-005	-1.65E-003
26	1.72E-005	-1.58E-003
27	8.61E-006	-1.36E-003
28	1.78E-011	-1.23E-003
29	-8.61E-006	-1.35E-003
30	-1.72E-005	-1.58E-003
31	-1.96E-005	-1.65E-003
32	3.18E-005	-1.65E-003
33	8.17E-005	-1.66E-003
34	1.07E-004	-1.67E-003
35	9.38E-005	-1.68E-003
36	3.37E-005	-1.69E-003
37	-1.70E-005	-1.69E-003
38	-1.52E-005	-1.76E-003
39	-8.62E-006	-1.95E-003
40	-2.04E-006	-2.05E-003
41	4.54E-006	-1.93E-003
42	1.11E-005	-1.73E-003
43	1.29E-005	-1.67E-003
44	-4.01E-005	-1.67E-003
45	-1.06E-004	-1.66E-003
46	-1.22E-004	-1.66E-003
47	-9.46E-005	-1.65E-003
48	-3.20E-005	-1.65E-003
49	-6.51E-006	-1.42E-003

50	-8.85E-006	-1.44E-003
51	-1.75E-005	-1.38E-003
52	-2.62E-005	-1.36E-003
53	-3.49E-005	-1.48E-003
54	-4.36E-005	-1.47E-003
55	-4.59E-005	-1.34E-003
56	-2.23E-004	-1.34E-003
57	-8.61E-004	-1.35E-003
58	-1.20E-003	-1.36E-003
59	-8.34E-004	-1.37E-003
60	-2.18E-004	-1.38E-003
61	-4.49E-005	-1.39E-003
62	-4.32E-005	-1.25E-003
63	-3.67E-005	-1.22E-003
64	-3.02E-005	-1.34E-003
65	-2.36E-005	-1.40E-003
66	-1.71E-005	-1.40E-003
67	-1.54E-005	-1.44E-003
68	3.02E-005	-1.44E-003
69	9.39E-005	-1.44E-003
70	1.12E-004	-1.43E-003
71	8.82E-005	-1.43E-003
72	2.62E-005	-1.42E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-4.62E-004
2	-3.46E-004
3	2.53E-004
4	1.02E-004
5	-1.78E-004
6	8.33E-006
7	7.49E-005
8	1.55E-004
9	9.99E-005
10	5.08E-006
11	-8.58E-005
12	-1.89E-004
13	-1.50E-004
14	-1.04E-004
15	1.13E-005
16	-1.83E-004
17	-2.21E-004
18	3.60E-004
19	4.59E-004
20	5.46E-004
21	7.00E-004
22	2.37E-005
23	-6.96E-004
24	-5.61E-004
25	2.12E-004
26	2.82E-004
27	4.30E-004
28	6.91E-006
29	-4.23E-004

30	-3.00E-004
31	-2.33E-004
32	-1.45E-004
33	-7.42E-005
34	-1.65E-005
35	7.15E-005
36	1.59E-004
37	2.16E-004
38	2.67E-004
39	3.52E-004
40	-1.85E-005
41	-3.79E-004
42	-2.65E-004
43	-2.10E-004
44	-1.78E-004
45	-7.67E-005
46	1.43E-005
47	8.76E-005
48	1.65E-004
49	-9.77E-005
50	-3.26E-005
51	1.49E-004
52	-1.18E-004
53	-2.34E-004
54	4.29E-004
55	5.50E-004
56	7.65E-004
57	1.22E-003
58	-4.09E-005
59	-1.22E-003
60	-7.35E-004
61	-5.47E-004
62	-4.43E-004
63	1.99E-004
64	1.95E-004
65	1.10E-005
66	1.11E-004
67	1.55E-004
68	1.71E-004
69	7.37E-005
70	-5.84E-006
71	-8.30E-005
72	-1.36E-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	-3.59E-003
2	-1.20E-003	-3.25E-003
3	-1.21E-003	-2.57E-003
4	-1.22E-003	-2.37E-003
5	-1.22E-003	-3.00E-003
6	-1.23E-003	-4.17E-003
7	-1.23E-003	-4.78E-003
8	-6.69E-004	-4.79E-003
9	-2.68E-004	-4.82E-003
10	-3.73E-004	-4.84E-003
11	-3.35E-004	-4.87E-003
12	-2.80E-004	-4.89E-003
13	-2.95E-004	-4.90E-003
14	-2.94E-004	-4.96E-003
15	-2.90E-004	-5.35E-003
16	-2.85E-004	-5.54E-003
17	-2.81E-004	-5.08E-003
18	-2.77E-004	-4.13E-003
19	-2.76E-004	-3.64E-003
20	-7.46E-004	-3.63E-003
21	-1.34E-003	-3.62E-003
22	-1.63E-003	-3.61E-003
23	-1.74E-003	-3.60E-003
24	-1.51E-003	-3.59E-003
25	1.42E-005	-3.94E-003
26	1.25E-005	-3.60E-003
27	6.26E-006	-2.83E-003
28	-1.08E-010	-2.47E-003
29	-6.26E-006	-2.84E-003
30	-1.25E-005	-3.66E-003
31	-1.42E-005	-4.05E-003
32	3.29E-004	-4.06E-003
33	3.21E-004	-4.09E-003
34	-1.24E-004	-4.11E-003
35	-2.99E-004	-4.13E-003
36	-3.11E-004	-4.16E-003
37	-2.94E-004	-4.16E-003
38	-2.93E-004	-4.19E-003
39	-2.89E-004	-4.49E-003
40	-2.85E-004	-4.66E-003
41	-2.82E-004	-4.40E-003
42	-2.78E-004	-4.04E-003
43	-2.77E-004	-3.99E-003
44	-2.92E-004	-3.99E-003
45	-3.15E-004	-3.98E-003
46	-3.77E-004	-3.97E-003
47	-4.94E-004	-3.95E-003
48	-2.94E-004	-3.94E-003
49	1.24E-003	-4.76E-003

50	1.24E-003	-4.19E-003
51	1.23E-003	-3.04E-003
52	1.22E-003	-2.38E-003
53	1.22E-003	-2.54E-003
54	1.21E-003	-3.22E-003
55	1.21E-003	-3.57E-003
56	1.52E-003	-3.58E-003
57	1.58E-003	-3.60E-003
58	1.24E-003	-3.62E-003
59	8.76E-004	-3.64E-003
60	2.44E-004	-3.66E-003
61	-2.95E-004	-3.67E-003
62	-2.94E-004	-4.23E-003
63	-2.90E-004	-5.23E-003
64	-2.86E-004	-5.65E-003
65	-2.82E-004	-5.37E-003
66	-2.77E-004	-4.90E-003
67	-2.76E-004	-4.82E-003
68	-3.23E-004	-4.82E-003
69	-2.97E-004	-4.80E-003
70	-1.28E-004	-4.79E-003
71	9.92E-005	-4.78E-003
72	7.06E-004	-4.76E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.16E-003
2	1.27E-003
3	1.04E-003
4	-3.95E-004
5	-1.90E-003
6	-2.26E-003
7	-2.16E-003
8	-1.86E-003
9	-7.03E-006
10	1.41E-004
11	-1.70E-004
12	-3.03E-005
13	1.58E-004
14	3.29E-004
15	8.01E-004
16	-2.17E-004
17	-1.50E-003
18	-1.84E-003
19	-1.76E-003
20	-1.64E-003
21	-7.55E-004
22	-3.77E-004
23	1.56E-005
24	1.02E-003
25	1.19E-003
26	1.31E-003
27	1.28E-003
28	-3.21E-006
29	-1.33E-003

30	-1.49E-003
31	-1.37E-003
32	-1.07E-003
33	7.34E-004
34	6.65E-004
35	1.54E-004
36	-1.22E-004
37	2.91E-005
38	1.83E-004
39	6.49E-004
40	-8.47E-005
41	-7.97E-004
42	-2.66E-004
43	-1.04E-004
44	-2.29E-005
45	-5.52E-005
46	-2.23E-004
47	-7.24E-005
48	1.02E-003
49	2.00E-003
50	2.13E-003
51	1.93E-003
52	4.81E-004
53	-9.77E-004
54	-1.33E-003
55	-1.24E-003
56	-1.00E-003
57	4.84E-004
58	6.80E-004
59	7.88E-004
60	1.86E-003
61	2.03E-003
62	2.09E-003
63	1.49E-003
64	6.17E-005
65	-9.80E-004
66	-4.12E-004
67	-2.28E-004
68	-1.13E-004
69	2.07E-004
70	3.50E-004
71	6.54E-004
72	1.84E-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	-7.00E-004	-2.39E-003
2	-7.01E-004	-2.17E-003
3	-7.05E-004	-1.72E-003
4	-7.08E-004	-1.61E-003
5	-7.12E-004	-2.02E-003
6	-7.15E-004	-2.74E-003
7	-7.16E-004	-3.08E-003
8	-3.95E-004	-3.09E-003
9	-8.78E-005	-3.10E-003
10	-5.47E-005	-3.10E-003
11	-2.81E-006	-3.11E-003
12	1.48E-005	-3.12E-003
13	-8.91E-006	-3.12E-003
14	-8.41E-006	-3.17E-003
15	-6.52E-006	-3.46E-003
16	-4.64E-006	-3.64E-003
17	-2.75E-006	-3.38E-003
18	-8.71E-007	-2.76E-003
19	-3.63E-007	-2.42E-003
20	-3.29E-004	-2.42E-003
21	-7.74E-004	-2.41E-003
22	-1.00E-003	-2.41E-003
23	-1.08E-003	-2.40E-003
24	-9.08E-004	-2.39E-003
25	8.24E-006	-2.59E-003
26	7.26E-006	-2.39E-003
27	3.63E-006	-1.91E-003
28	-5.26E-011	-1.69E-003
29	-3.63E-006	-1.91E-003
30	-7.26E-006	-2.38E-003
31	-8.24E-006	-2.59E-003
32	1.70E-004	-2.59E-003
33	2.21E-004	-2.60E-003
34	5.63E-005	-2.60E-003
35	-6.99E-006	-2.61E-003
36	-9.61E-006	-2.62E-003
37	-5.24E-006	-2.62E-003
38	-4.78E-006	-2.64E-003
39	-3.08E-006	-2.84E-003
40	-1.37E-006	-2.97E-003
41	3.32E-007	-2.84E-003
42	2.04E-006	-2.64E-003
43	2.50E-006	-2.62E-003
44	6.95E-006	-2.62E-003
45	1.02E-005	-2.61E-003
46	-5.80E-005	-2.61E-003
47	-2.25E-004	-2.60E-003
48	-1.71E-004	-2.59E-003
49	7.12E-004	-3.08E-003

50	7.11E-004	-2.74E-003
51	7.07E-004	-2.02E-003
52	7.04E-004	-1.61E-003
53	7.01E-004	-1.72E-003
54	6.97E-004	-2.17E-003
55	6.96E-004	-2.39E-003
56	9.03E-004	-2.39E-003
57	1.07E-003	-2.40E-003
58	9.98E-004	-2.41E-003
59	7.70E-004	-2.41E-003
60	3.26E-004	-2.42E-003
61	-2.44E-006	-2.42E-003
62	-1.93E-006	-2.76E-003
63	-4.76E-008	-3.38E-003
64	1.84E-006	-3.63E-003
65	3.72E-006	-3.45E-003
66	5.60E-006	-3.17E-003
67	6.11E-006	-3.12E-003
68	-1.72E-005	-3.12E-003
69	-4.77E-006	-3.11E-003
70	5.25E-005	-3.10E-003
71	8.79E-005	-3.09E-003
72	3.92E-004	-3.08E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	7.89E-004
2	8.50E-004
3	6.49E-004
4	-2.87E-004
5	-1.21E-003
6	-1.30E-003
7	-1.22E-003
8	-1.10E-003
9	-2.02E-004
10	-4.52E-005
11	-1.03E-004
12	5.00E-005
13	1.25E-004
14	2.43E-004
15	6.12E-004
16	-3.79E-005
17	-9.23E-004
18	-1.26E-003
19	-1.22E-003
20	-1.16E-003
21	-6.00E-004
22	-2.91E-004
23	3.30E-005
24	7.02E-004
25	6.97E-004
26	7.84E-004
27	7.98E-004
28	-1.29E-009
29	-7.97E-004

30	-7.80E-004
31	-6.93E-004
32	-5.79E-004
33	2.41E-004
34	2.52E-004
35	5.19E-005
36	-4.01E-005
37	1.51E-005
38	1.18E-004
39	4.52E-004
40	1.38E-006
41	-4.49E-004
42	-1.17E-004
43	-1.47E-005
44	4.01E-005
45	-3.36E-005
46	-2.68E-004
47	-2.37E-004
48	5.83E-004
49	1.21E-003
50	1.30E-003
51	1.21E-003
52	2.87E-004
53	-6.48E-004
54	-8.49E-004
55	-7.88E-004
56	-7.01E-004
57	-3.30E-005
58	2.91E-004
59	5.99E-004
60	1.15E-003
61	1.22E-003
62	1.26E-003
63	9.21E-004
64	3.66E-005
65	-6.12E-004
66	-2.42E-004
67	-1.24E-004
68	-4.83E-005
69	8.55E-005
70	6.15E-005
71	1.98E-004
72	1.09E-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	-1.32E-005	-1.52E-003
2	-1.48E-005	-1.52E-003
3	-2.09E-005	-1.38E-003
4	-2.70E-005	-1.27E-003
5	-3.30E-005	-1.37E-003
6	-3.91E-005	-1.55E-003
7	-4.07E-005	-1.59E-003
8	-1.90E-005	-1.59E-003
9	-2.75E-005	-1.60E-003
10	-2.86E-005	-1.60E-003
11	-1.95E-005	-1.61E-003
12	-8.31E-007	-1.61E-003
13	6.13E-006	-1.61E-003
14	7.29E-006	-1.62E-003
15	1.16E-005	-1.71E-003
16	1.59E-005	-1.77E-003
17	2.01E-005	-1.66E-003
18	2.44E-005	-1.54E-003
19	2.56E-005	-1.55E-003
20	4.24E-005	-1.54E-003
21	1.87E-004	-1.54E-003
22	2.82E-004	-1.54E-003
23	1.72E-004	-1.53E-003
24	6.11E-006	-1.52E-003
25	1.37E-005	-1.61E-003
26	1.21E-005	-1.56E-003
27	6.05E-006	-1.36E-003
28	-1.53E-011	-1.25E-003
29	-6.05E-006	-1.36E-003
30	-1.21E-005	-1.56E-003
31	-1.37E-005	-1.61E-003
32	1.96E-005	-1.61E-003
33	2.60E-005	-1.62E-003
34	2.55E-005	-1.62E-003
35	1.87E-005	-1.63E-003
36	4.81E-006	-1.63E-003
37	-9.72E-006	-1.64E-003
38	-8.57E-006	-1.66E-003
39	-4.28E-006	-1.80E-003
40	1.67E-008	-1.89E-003
41	4.31E-006	-1.80E-003
42	8.60E-006	-1.66E-003
43	9.76E-006	-1.64E-003
44	-4.80E-006	-1.63E-003
45	-1.80E-005	-1.63E-003
46	-2.43E-005	-1.62E-003
47	-2.55E-005	-1.62E-003
48	-1.96E-005	-1.61E-003
49	4.08E-005	-1.59E-003

50	3.91E-005	-1.55E-003
51	3.31E-005	-1.37E-003
52	2.70E-005	-1.27E-003
53	2.09E-005	-1.38E-003
54	1.49E-005	-1.52E-003
55	1.33E-005	-1.52E-003
56	-6.07E-006	-1.52E-003
57	-1.72E-004	-1.53E-003
58	-2.82E-004	-1.54E-003
59	-1.87E-004	-1.54E-003
60	-4.24E-005	-1.54E-003
61	-2.56E-005	-1.55E-003
62	-2.44E-005	-1.54E-003
63	-2.01E-005	-1.66E-003
64	-1.58E-005	-1.77E-003
65	-1.15E-005	-1.71E-003
66	-7.26E-006	-1.62E-003
67	-6.11E-006	-1.61E-003
68	8.75E-007	-1.61E-003
69	1.88E-005	-1.61E-003
70	2.75E-005	-1.60E-003
71	2.71E-005	-1.60E-003
72	1.90E-005	-1.59E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-3.49E-005
2	4.84E-005
3	3.39E-004
4	1.15E-005
5	-3.54E-004
6	-1.78E-004
7	-1.08E-004
8	-4.51E-005
9	1.32E-005
10	-8.26E-006
11	-2.59E-005
12	-3.90E-005
13	-8.21E-006
14	4.83E-005
15	2.14E-004
16	-5.46E-005
17	-2.92E-004
18	-3.45E-005
19	3.25E-005
20	9.93E-005
21	3.20E-004
22	-1.01E-005
23	-3.61E-004
24	-1.16E-004
25	1.51E-004
26	2.22E-004
27	3.96E-004
28	-1.24E-008
29	-3.96E-004

30	-2.22E-004
31	-1.51E-004
32	-8.60E-005
33	-2.41E-006
34	5.54E-006
35	2.21E-005
36	3.76E-005
37	7.10E-005
38	1.29E-004
39	2.97E-004
40	-7.36E-009
41	-2.97E-004
42	-1.29E-004
43	-7.10E-005
44	-3.77E-005
45	-1.89E-005
46	-6.29E-006
47	7.94E-007
48	8.59E-005
49	1.08E-004
50	1.78E-004
51	3.54E-004
52	-1.15E-005
53	-3.39E-004
54	-4.84E-005
55	3.49E-005
56	1.16E-004
57	3.61E-004
58	1.01E-005
59	-3.20E-004
60	-9.93E-005
61	-3.25E-005
62	3.45E-005
63	2.92E-004
64	5.46E-005
65	-2.14E-004
66	-4.83E-005
67	8.26E-006
68	3.91E-005
69	2.27E-005
70	9.00E-006
71	-1.16E-005
72	4.51E-005

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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	-6.10E-004	-2.37E-003
2	-6.11E-004	-2.17E-003
3	-6.15E-004	-1.76E-003
4	-6.19E-004	-1.64E-003
5	-6.23E-004	-2.02E-003
6	-6.27E-004	-2.67E-003
7	-6.29E-004	-2.98E-003
8	-3.46E-004	-2.98E-003
9	-8.28E-005	-2.99E-003
10	-5.43E-005	-3.00E-003
11	-7.43E-006	-3.01E-003
12	1.25E-005	-3.02E-003
13	-5.93E-006	-3.02E-003
14	-5.19E-006	-3.06E-003
15	-2.45E-006	-3.33E-003
16	2.87E-007	-3.49E-003
17	3.02E-006	-3.25E-003
18	5.76E-006	-2.69E-003
19	6.50E-006	-2.40E-003
20	-2.71E-004	-2.40E-003
21	-6.21E-004	-2.39E-003
22	-8.00E-004	-2.39E-003
23	-8.93E-004	-2.38E-003
24	-7.84E-004	-2.37E-003
25	9.79E-006	-2.56E-003
26	8.62E-006	-2.37E-003
27	4.31E-006	-1.92E-003
28	-4.92E-011	-1.70E-003
29	-4.31E-006	-1.92E-003
30	-8.62E-006	-2.37E-003
31	-9.79E-006	-2.56E-003
32	1.52E-004	-2.56E-003
33	1.98E-004	-2.57E-003
34	5.56E-005	-2.57E-003
35	-1.14E-006	-2.58E-003
36	-7.18E-006	-2.59E-003
37	-7.07E-006	-2.59E-003
38	-6.37E-006	-2.61E-003
39	-3.79E-006	-2.82E-003
40	-1.20E-006	-2.96E-003
41	1.38E-006	-2.82E-003
42	3.97E-006	-2.61E-003
43	4.66E-006	-2.59E-003
44	4.85E-006	-2.59E-003
45	3.96E-006	-2.58E-003
46	-5.72E-005	-2.58E-003
47	-2.01E-004	-2.57E-003
48	-1.53E-004	-2.56E-003
49	6.25E-004	-2.98E-003

50	6.24E-004	-2.67E-003
51	6.20E-004	-2.02E-003
52	6.16E-004	-1.64E-003
53	6.11E-004	-1.76E-003
54	6.07E-004	-2.17E-003
55	6.06E-004	-2.37E-003
56	7.81E-004	-2.37E-003
57	8.89E-004	-2.38E-003
58	7.97E-004	-2.38E-003
59	6.18E-004	-2.39E-003
60	2.68E-004	-2.40E-003
61	-8.95E-006	-2.40E-003
62	-8.21E-006	-2.69E-003
63	-5.48E-006	-3.25E-003
64	-2.74E-006	-3.49E-003
65	-1.41E-010	-3.33E-003
66	2.74E-006	-3.06E-003
67	3.48E-006	-3.02E-003
68	-1.46E-005	-3.01E-003
69	8.04E-007	-3.01E-003
70	5.24E-005	-3.00E-003
71	8.29E-005	-2.99E-003
72	3.44E-004	-2.98E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	6.73E-004
2	7.43E-004
3	6.31E-004
4	-2.44E-004
5	-1.12E-003
6	-1.16E-003
7	-1.07E-003
8	-9.59E-004
9	-1.72E-004
10	-4.10E-005
11	-9.49E-005
12	3.28E-005
13	1.04E-004
14	2.19E-004
15	5.76E-004
16	-4.55E-005
17	-8.61E-004
18	-1.09E-003
19	-1.04E-003
20	-9.68E-004
21	-4.48E-004
22	-2.62E-004
23	-5.61E-005
24	5.81E-004
25	6.37E-004
26	7.26E-004
27	7.72E-004
28	-1.13E-009
29	-7.71E-004

30	-7.23E-004
31	-6.33E-004
32	-5.21E-004
33	2.07E-004
34	2.20E-004
35	5.10E-005
36	-2.48E-005
37	3.05E-005
38	1.32E-004
39	4.59E-004
40	1.21E-006
41	-4.57E-004
42	-1.32E-004
43	-3.01E-005
44	2.48E-005
45	-3.50E-005
46	-2.33E-004
47	-2.04E-004
48	5.24E-004
49	1.07E-003
50	1.16E-003
51	1.12E-003
52	2.44E-004
53	-6.31E-004
54	-7.43E-004
55	-6.73E-004
56	-5.80E-004
57	5.62E-005
58	2.61E-004
59	4.47E-004
60	9.67E-004
61	1.04E-003
62	1.09E-003
63	8.60E-004
64	4.43E-005
65	-5.76E-004
66	-2.18E-004
67	-1.03E-004
68	-3.13E-005
69	7.98E-005
70	5.52E-005
71	1.69E-004
72	9.55E-004

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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	-3.87E-004	-1.60E-003
2	-3.88E-004	-1.49E-003
3	-3.91E-004	-1.24E-003
4	-3.95E-004	-1.16E-003
5	-3.98E-004	-1.38E-003
6	-4.02E-004	-1.79E-003
7	-4.02E-004	-1.98E-003
8	-2.30E-004	-1.98E-003
9	-4.29E-005	-1.98E-003
10	-2.80E-006	-1.99E-003
11	-1.86E-005	-1.99E-003
12	-1.62E-005	-2.00E-003
13	-2.36E-005	-2.00E-003
14	-2.31E-005	-2.02E-003
15	-2.12E-005	-2.17E-003
16	-1.93E-005	-2.25E-003
17	-1.74E-005	-2.09E-003
18	-1.55E-005	-1.78E-003
19	-1.50E-005	-1.62E-003
20	-1.63E-004	-1.62E-003
21	-3.37E-004	-1.62E-003
22	-4.28E-004	-1.61E-003
23	-5.05E-004	-1.61E-003
24	-4.78E-004	-1.60E-003
25	7.97E-006	-1.75E-003
26	7.02E-006	-1.63E-003
27	3.51E-006	-1.33E-003
28	-2.83E-011	-1.19E-003
29	-3.51E-006	-1.33E-003
30	-7.02E-006	-1.61E-003
31	-7.97E-006	-1.71E-003
32	8.34E-005	-1.71E-003
33	1.07E-004	-1.72E-003
34	2.86E-005	-1.72E-003
35	-7.86E-006	-1.73E-003
36	-2.01E-005	-1.73E-003
37	-2.62E-005	-1.74E-003
38	-2.57E-005	-1.75E-003
39	-2.39E-005	-1.89E-003
40	-2.20E-005	-1.98E-003
41	-2.02E-005	-1.91E-003
42	-1.84E-005	-1.79E-003
43	-1.79E-005	-1.77E-003
44	-2.02E-005	-1.77E-003
45	-3.72E-005	-1.77E-003
46	-1.17E-004	-1.76E-003
47	-1.73E-004	-1.76E-003
48	-1.01E-004	-1.75E-003
49	3.37E-004	-1.94E-003

50	3.36E-004	-1.77E-003
51	3.32E-004	-1.39E-003
52	3.29E-004	-1.17E-003
53	3.25E-004	-1.25E-003
54	3.22E-004	-1.50E-003
55	3.21E-004	-1.60E-003
56	4.10E-004	-1.60E-003
57	4.35E-004	-1.61E-003
58	3.61E-004	-1.61E-003
59	2.76E-004	-1.62E-003
60	1.13E-004	-1.62E-003
61	-2.88E-005	-1.62E-003
62	-2.83E-005	-1.77E-003
63	-2.64E-005	-2.07E-003
64	-2.45E-005	-2.22E-003
65	-2.26E-005	-2.13E-003
66	-2.07E-005	-1.98E-003
67	-2.01E-005	-1.96E-003
68	-2.45E-005	-1.96E-003
69	-6.83E-006	-1.96E-003
70	2.69E-005	-1.95E-003
71	4.67E-005	-1.94E-003
72	1.84E-004	-1.94E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	3.58E-004
2	4.12E-004
3	4.09E-004
4	-1.30E-004
5	-6.89E-004
6	-7.14E-004
7	-6.58E-004
8	-5.88E-004
9	-1.86E-004
10	4.88E-006
11	2.74E-005
12	6.83E-006
13	4.85E-005
14	1.14E-004
15	3.09E-004
16	-5.41E-005
17	-5.10E-004
18	-5.93E-004
19	-5.59E-004
20	-5.13E-004
21	-2.10E-004
22	-1.61E-004
23	-1.03E-004
24	2.93E-004
25	4.26E-004
26	4.84E-004
27	5.09E-004
28	1.73E-006
29	-4.92E-004

30	-4.26E-004
31	-3.63E-004
32	-2.90E-004
33	1.14E-004
34	1.25E-004
35	4.22E-005
36	7.15E-006
37	4.05E-005
38	1.01E-004
39	2.97E-004
40	2.15E-005
41	-2.61E-004
42	-8.52E-005
43	-2.65E-005
44	6.38E-006
45	-1.11E-004
46	-1.61E-004
47	-1.95E-005
48	3.58E-004
49	5.87E-004
50	6.47E-004
51	6.63E-004
52	1.29E-004
53	-4.01E-004
54	-4.04E-004
55	-3.50E-004
56	-2.85E-004
57	1.03E-004
58	1.53E-004
59	1.94E-004
60	4.89E-004
61	5.34E-004
62	5.68E-004
63	4.83E-004
64	3.27E-005
65	-3.18E-004
66	-1.05E-004
67	-3.77E-005
68	3.81E-006
69	5.71E-005
70	3.93E-005
71	9.19E-005
72	5.13E-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	-5.58E-004	-2.10E-003
2	-5.59E-004	-1.92E-003
3	-5.62E-004	-1.55E-003
4	-5.66E-004	-1.45E-003
5	-5.69E-004	-1.78E-003
6	-5.73E-004	-2.37E-003
7	-5.73E-004	-2.65E-003
8	-3.16E-004	-2.65E-003
9	-7.28E-005	-2.66E-003
10	-4.65E-005	-2.67E-003
11	-4.43E-006	-2.68E-003
12	1.15E-005	-2.68E-003
13	-6.49E-006	-2.69E-003
14	-5.98E-006	-2.72E-003
15	-4.08E-006	-2.96E-003
16	-2.19E-006	-3.11E-003
17	-2.94E-007	-2.89E-003
18	1.60E-006	-2.39E-003
19	2.11E-006	-2.13E-003
20	-2.56E-004	-2.12E-003
21	-5.94E-004	-2.12E-003
22	-7.67E-004	-2.11E-003
23	-8.39E-004	-2.11E-003
24	-7.22E-004	-2.10E-003
25	8.13E-006	-2.26E-003
26	7.17E-006	-2.09E-003
27	3.58E-006	-1.70E-003
28	-4.35E-011	-1.50E-003
29	-3.58E-006	-1.70E-003
30	-7.17E-006	-2.09E-003
31	-8.13E-006	-2.26E-003
32	1.37E-004	-2.26E-003
33	1.78E-004	-2.27E-003
34	4.77E-005	-2.28E-003
35	-3.39E-006	-2.28E-003
36	-7.04E-006	-2.29E-003
37	-5.07E-006	-2.29E-003
38	-4.60E-006	-2.31E-003
39	-2.85E-006	-2.48E-003
40	-1.09E-006	-2.59E-003
41	6.59E-007	-2.48E-003
42	2.41E-006	-2.31E-003
43	2.89E-006	-2.29E-003
44	4.91E-006	-2.29E-003
45	5.95E-006	-2.28E-003
46	-4.91E-005	-2.28E-003
47	-1.81E-004	-2.27E-003
48	-1.38E-004	-2.26E-003
49	5.70E-004	-2.65E-003

50	5.69E-004	-2.37E-003
51	5.66E-004	-1.78E-003
52	5.62E-004	-1.45E-003
53	5.59E-004	-1.55E-003
54	5.55E-004	-1.92E-003
55	5.55E-004	-2.10E-003
56	7.18E-004	-2.10E-003
57	8.36E-004	-2.11E-003
58	7.63E-004	-2.11E-003
59	5.91E-004	-2.12E-003
60	2.53E-004	-2.12E-003
61	-4.34E-006	-2.13E-003
62	-3.83E-006	-2.39E-003
63	-1.94E-006	-2.89E-003
64	-4.40E-008	-3.10E-003
65	1.85E-006	-2.96E-003
66	3.75E-006	-2.72E-003
67	4.26E-006	-2.68E-003
68	-1.34E-005	-2.68E-003
69	-1.61E-006	-2.67E-003
70	4.47E-005	-2.67E-003
71	7.29E-005	-2.66E-003
72	3.13E-004	-2.65E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	6.28E-004
2	6.87E-004
3	5.59E-004
4	-2.26E-004
5	-1.00E-003
6	-1.05E-003
7	-9.79E-004
8	-8.78E-004
9	-1.59E-004
10	-3.69E-005
11	-8.41E-005
12	3.55E-005
13	9.77E-005
14	1.96E-004
15	5.04E-004
16	-3.50E-005
17	-7.57E-004
18	-9.98E-004
19	-9.62E-004
20	-9.04E-004
21	-4.44E-004
22	-2.35E-004
23	-1.37E-005
24	5.50E-004
25	5.72E-004
26	6.49E-004
27	6.81E-004
28	-1.03E-009
29	-6.81E-004

30	-6.46E-004
31	-5.69E-004
32	-4.70E-004
33	1.91E-004
34	2.01E-004
35	4.38E-005
36	-2.77E-005
37	1.91E-005
38	1.06E-004
39	3.86E-004
40	1.10E-006
41	-3.84E-004
42	-1.05E-004
43	-1.87E-005
44	2.77E-005
45	-2.92E-005
46	-2.13E-004
47	-1.88E-004
48	4.73E-004
49	9.75E-004
50	1.05E-003
51	1.00E-003
52	2.26E-004
53	-5.58E-004
54	-6.86E-004
55	-6.28E-004
56	-5.49E-004
57	1.37E-005
58	2.35E-004
59	4.44E-004
60	9.02E-004
61	9.60E-004
62	9.97E-004
63	7.56E-004
64	3.39E-005
65	-5.05E-004
66	-1.95E-004
67	-9.67E-005
68	-3.41E-005
69	7.03E-005
70	4.99E-005
71	1.56E-004
72	8.74E-004

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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	-4.38E-005	-1.54E-003
2	-4.53E-005	-1.52E-003
3	-5.10E-005	-1.36E-003
4	-5.66E-005	-1.26E-003
5	-6.23E-005	-1.38E-003
6	-6.80E-005	-1.58E-003
7	-6.95E-005	-1.63E-003
8	-3.23E-005	-1.64E-003
9	-2.27E-005	-1.64E-003
10	-1.88E-005	-1.65E-003
11	-1.20E-005	-1.65E-003
12	1.50E-006	-1.65E-003
13	4.09E-006	-1.66E-003
14	5.11E-006	-1.67E-003
15	8.92E-006	-1.78E-003
16	1.27E-005	-1.84E-003
17	1.65E-005	-1.73E-003
18	2.03E-005	-1.59E-003
19	2.14E-005	-1.56E-003
20	1.25E-005	-1.56E-003
21	1.09E-004	-1.56E-003
22	1.81E-004	-1.55E-003
23	8.53E-005	-1.55E-003
24	-4.38E-005	-1.54E-003
25	1.29E-005	-1.62E-003
26	1.13E-005	-1.57E-003
27	5.66E-006	-1.36E-003
28	-1.35E-011	-1.24E-003
29	-5.66E-006	-1.36E-003
30	-1.13E-005	-1.57E-003
31	-1.29E-005	-1.62E-003
32	2.39E-005	-1.62E-003
33	2.82E-005	-1.63E-003
34	2.05E-005	-1.63E-003
35	1.11E-005	-1.64E-003
36	1.68E-006	-1.64E-003
37	-9.09E-006	-1.64E-003
38	-8.07E-006	-1.66E-003
39	-4.27E-006	-1.80E-003
40	-4.62E-007	-1.89E-003
41	3.34E-006	-1.80E-003
42	7.14E-006	-1.66E-003
43	8.17E-006	-1.64E-003
44	-2.53E-006	-1.64E-003
45	-1.18E-005	-1.64E-003
46	-2.23E-005	-1.63E-003
47	-2.96E-005	-1.63E-003
48	-2.42E-005	-1.62E-003
49	6.81E-005	-1.63E-003

50	6.66E-005	-1.58E-003
51	6.09E-005	-1.38E-003
52	5.53E-005	-1.26E-003
53	4.96E-005	-1.36E-003
54	4.39E-005	-1.52E-003
55	4.24E-005	-1.54E-003
56	4.24E-005	-1.54E-003
57	-8.68E-005	-1.55E-003
58	-1.82E-004	-1.55E-003
59	-1.10E-004	-1.56E-003
60	-1.36E-005	-1.56E-003
61	-2.23E-005	-1.56E-003
62	-2.13E-005	-1.59E-003
63	-1.75E-005	-1.73E-003
64	-1.37E-005	-1.84E-003
65	-9.84E-006	-1.78E-003
66	-6.03E-006	-1.66E-003
67	-5.01E-006	-1.65E-003
68	-2.35E-006	-1.65E-003
69	1.12E-005	-1.65E-003
70	1.93E-005	-1.64E-003
71	2.28E-005	-1.64E-003
72	3.14E-005	-1.63E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	3.39E-005
2	1.12E-004
3	3.51E-004
4	-9.57E-006
5	-3.96E-004
6	-2.35E-004
7	-1.65E-004
8	-9.90E-005
9	-6.90E-006
10	-9.11E-006
11	-1.80E-005
12	-2.42E-005
13	8.54E-006
14	6.70E-005
15	2.41E-004
16	-4.22E-005
17	-3.17E-004
18	-1.20E-004
19	-5.93E-005
20	3.96E-006
21	2.45E-004
22	-1.81E-005
23	-3.05E-004
24	-4.40E-005
25	1.65E-004
26	2.36E-004
27	4.02E-004
28	3.13E-008
29	-4.01E-004

30	-2.35E-004
31	-1.64E-004
32	-9.67E-005
33	1.00E-005
34	1.76E-005
35	1.95E-005
36	2.39E-005
37	5.74E-005
38	1.16E-004
39	2.91E-004
40	4.52E-007
41	-2.90E-004
42	-1.16E-004
43	-5.71E-005
44	-2.37E-005
45	-2.05E-005
46	-1.84E-005
47	-8.06E-006
48	9.81E-005
49	1.63E-004
50	2.33E-004
51	3.96E-004
52	9.54E-006
53	-3.50E-004
54	-1.12E-004
55	-3.37E-005
56	4.42E-005
57	3.05E-004
58	1.79E-005
59	-2.45E-004
60	-4.47E-006
61	5.88E-005
62	1.20E-004
63	3.17E-004
64	4.17E-005
65	-2.41E-004
66	-6.68E-005
67	-8.29E-006
68	2.45E-005
69	1.93E-005
70	1.00E-005
71	4.91E-006
72	9.74E-005

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#####
#          VERIFICAÇÃO DA FISSURAÇÃO (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	-6.07E-004	-2.07E-003
2	-6.08E-004	-1.91E-003
3	-6.12E-004	-1.56E-003
4	-6.16E-004	-1.45E-003
5	-6.20E-004	-1.78E-003
6	-6.24E-004	-2.37E-003
7	-6.25E-004	-2.66E-003
8	-3.58E-004	-2.66E-003
9	-6.17E-005	-2.67E-003
10	1.52E-006	-2.68E-003
11	-2.56E-005	-2.68E-003
12	-2.53E-005	-2.69E-003
13	-3.83E-005	-2.69E-003
14	-3.77E-005	-2.72E-003
15	-3.52E-005	-2.94E-003
16	-3.28E-005	-3.06E-003
17	-3.04E-005	-2.83E-003
18	-2.80E-005	-2.35E-003
19	-2.73E-005	-2.10E-003
20	-2.66E-004	-2.09E-003
21	-5.67E-004	-2.09E-003
22	-7.27E-004	-2.08E-003
23	-8.23E-004	-2.08E-003
24	-7.49E-004	-2.07E-003
25	9.13E-006	-2.30E-003
26	8.05E-006	-2.12E-003
27	4.02E-006	-1.70E-003
28	-4.13E-011	-1.50E-003
29	-4.02E-006	-1.69E-003
30	-8.05E-006	-2.08E-003
31	-9.13E-006	-2.24E-003
32	1.27E-004	-2.24E-003
33	1.63E-004	-2.24E-003
34	3.96E-005	-2.25E-003
35	-1.64E-005	-2.26E-003
36	-3.32E-005	-2.26E-003
37	-4.02E-005	-2.27E-003
38	-3.96E-005	-2.29E-003
39	-3.73E-005	-2.48E-003
40	-3.50E-005	-2.62E-003
41	-3.28E-005	-2.52E-003
42	-3.05E-005	-2.35E-003
43	-2.99E-005	-2.33E-003
44	-3.10E-005	-2.33E-003
45	-5.54E-005	-2.32E-003
46	-1.80E-004	-2.32E-003
47	-2.67E-004	-2.31E-003
48	-1.55E-004	-2.30E-003
49	5.20E-004	-2.60E-003

50	5.19E-004	-2.34E-003
51	5.15E-004	-1.79E-003
52	5.11E-004	-1.47E-003
53	5.07E-004	-1.57E-003
54	5.04E-004	-1.91E-003
55	5.02E-004	-2.07E-003
56	6.41E-004	-2.07E-003
57	7.12E-004	-2.08E-003
58	6.20E-004	-2.08E-003
59	4.70E-004	-2.09E-003
60	1.86E-004	-2.10E-003
61	-4.23E-005	-2.10E-003
62	-4.16E-005	-2.34E-003
63	-3.92E-005	-2.80E-003
64	-3.68E-005	-3.01E-003
65	-3.44E-005	-2.87E-003
66	-3.20E-005	-2.66E-003
67	-3.13E-005	-2.63E-003
68	-3.95E-005	-2.63E-003
69	-1.48E-005	-2.62E-003
70	3.69E-005	-2.61E-003
71	6.79E-005	-2.61E-003
72	2.86E-004	-2.60E-003

-----

DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

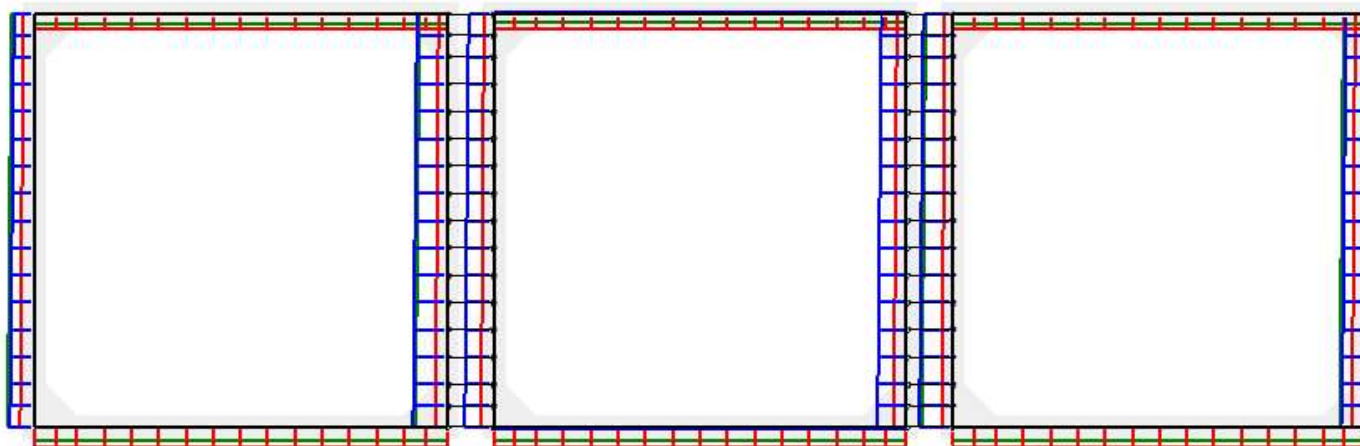
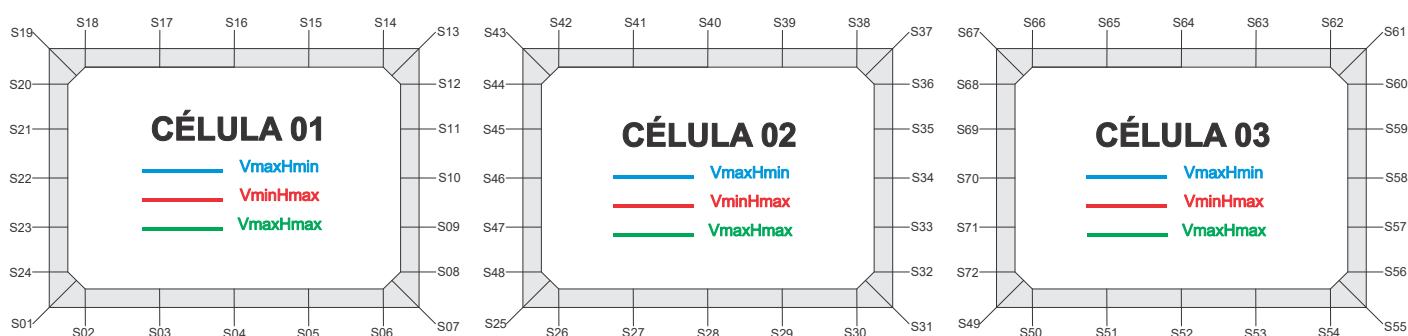
SEÇÃO	ROTAÇÃO (rad)
1	5.52E-004
2	6.17E-004
3	5.50E-004
4	-2.09E-004
5	-9.92E-004
6	-1.08E-003
7	-1.01E-003
8	-9.15E-004
9	-2.96E-004
10	1.01E-005
11	4.86E-005
12	1.78E-005
13	7.89E-005
14	1.74E-004
15	4.56E-004
16	-7.81E-005
17	-7.64E-004
18	-9.38E-004
19	-8.94E-004
20	-8.32E-004
21	-3.88E-004
22	-2.46E-004
23	-8.75E-005
24	4.69E-004
25	6.35E-004
26	7.08E-004
27	7.01E-004
28	2.75E-006
29	-6.73E-004

30	-6.15E-004
31	-5.35E-004
32	-4.36E-004
33	1.79E-004
34	1.96E-004
35	6.22E-005
36	4.56E-006
37	5.22E-005
38	1.40E-004
39	4.24E-004
40	3.41E-005
41	-3.67E-004
42	-1.14E-004
43	-3.00E-005
44	1.70E-005
45	-1.71E-004
46	-2.53E-004
47	-2.96E-005
48	5.44E-004
49	8.94E-004
50	9.71E-004
51	9.52E-004
52	2.06E-004
53	-5.37E-004
54	-6.04E-004
55	-5.40E-004
56	-4.57E-004
57	8.69E-005
58	2.33E-004
59	3.62E-004
60	7.94E-004
61	8.55E-004
62	8.97E-004
63	7.22E-004
64	4.40E-005
65	-4.71E-004
66	-1.59E-004
67	-6.17E-005
68	-8.56E-007
69	8.60E-005
70	6.00E-005
71	1.47E-004
72	7.95E-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	-79.70	-2.42
2	-2.42	-2.42
3	-2.42	-2.42
4	-2.42	-2.42
5	-2.42	-2.42
6	-2.42	-2.42
7	-2.42	-112.18
8	-110.52	-110.52
9	-107.96	-107.96
10	-105.40	-105.40
11	-102.84	-102.84
12	-100.28	-100.28
13	-98.61	2.42
14	2.42	2.42
15	2.42	2.42
16	2.42	2.42
17	2.42	2.42
18	2.42	2.42
19	2.42	-66.13
20	-67.79	-67.79
21	-70.35	-70.35
22	-72.91	-72.91
23	-75.47	-75.47
24	-78.03	-78.03
25	-79.70	-7.98
26	-7.98	-7.98
27	-7.98	-7.98
28	-7.98	-7.98
29	-7.98	-7.98
30	-7.98	-7.98
31	-7.98	-95.94
32	-94.27	-94.27
33	-91.72	-91.72
34	-89.16	-89.16
35	-86.60	-86.60
36	-84.04	-84.04
37	-82.37	7.98
38	7.98	7.98
39	7.98	7.98
40	7.98	7.98
41	7.98	7.98
42	7.98	7.98
43	7.98	-82.37
44	-84.03	-84.03
45	-86.59	-86.59
46	-89.15	-89.15
47	-91.71	-91.71
48	-94.27	-94.27
49	-95.94	-2.41

	50	-2.41	-2.41
	51	-2.41	-2.41
	52	-2.41	-2.41
	53	-2.41	-2.41
	54	-2.41	-2.41
	55	-2.41	-79.69
	56	-78.03	-78.03
	57	-75.47	-75.47
	58	-72.91	-72.91
	59	-70.35	-70.35
	60	-67.79	-67.79
	61	-66.12	2.41
	62	2.41	2.41
	63	2.41	2.41
	64	2.41	2.41
	65	2.41	2.41
	66	2.41	2.41
	67	2.41	-98.62
	68	-100.28	-100.28
	69	-102.84	-102.84
	70	-105.40	-105.40
	71	-107.96	-107.96
	72	-110.52	-110.52

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-46.08	-64.61
2	-64.61	-64.61
3	-64.61	-64.61
4	-64.61	-64.61
5	-64.61	-64.61
6	-64.61	-64.61
7	-64.61	-37.70
8	-36.42	-36.42
9	-34.45	-34.45
10	-32.48	-32.48
11	-30.51	-30.51
12	-28.55	-28.55
13	-27.26	-48.58
14	-48.58	-48.58
15	-48.58	-48.58
16	-48.58	-48.58
17	-48.58	-48.58
18	-48.58	-48.58
19	-48.58	-35.64
20	-36.92	-36.92
21	-38.89	-38.89
22	-40.86	-40.86
23	-42.83	-42.83
24	-44.80	-44.80
25	-46.08	-64.18
26	-64.18	-64.18
27	-64.18	-64.18
28	-64.18	-64.18
29	-64.18	-64.18
30	-64.18	-64.18
31	-64.18	-41.89
32	-40.61	-40.61
33	-38.64	-38.64
34	-36.67	-36.67
35	-34.70	-34.70
36	-32.74	-32.74
37	-31.45	-49.01
38	-49.01	-49.01
39	-49.01	-49.01
40	-49.01	-49.01
41	-49.01	-49.01
42	-49.01	-49.01
43	-49.01	-31.45
44	-32.73	-32.73
45	-34.70	-34.70
46	-36.67	-36.67
47	-38.64	-38.64
48	-40.61	-40.61
49	-41.89	-64.61

	50	-64.61	-64.61
	51	-64.61	-64.61
	52	-64.61	-64.61
	53	-64.61	-64.61
	54	-64.61	-64.61
	55	-64.61	-46.08
	56	-44.80	-44.80
	57	-42.83	-42.83
	58	-40.86	-40.86
	59	-38.89	-38.89
	60	-36.92	-36.92
	61	-35.64	-48.58
	62	-48.58	-48.58
	63	-48.58	-48.58
	64	-48.58	-48.58
	65	-48.58	-48.58
	66	-48.58	-48.58
	67	-48.58	-27.26
	68	-28.55	-28.55
	69	-30.51	-30.51
	70	-32.48	-32.48
	71	-34.45	-34.45
	72	-36.42	-36.42

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-87.66	-44.61
2	-44.61	-44.61
3	-44.61	-44.61
4	-44.61	-44.61
5	-44.61	-44.61
6	-44.61	-44.61
7	-44.61	-104.22
8	-102.55	-102.55
9	-99.99	-99.99
10	-97.43	-97.43
11	-94.88	-94.88
12	-92.32	-92.32
13	-90.65	-30.85
14	-30.85	-30.85
15	-30.85	-30.85
16	-30.85	-30.85
17	-30.85	-30.85
18	-30.85	-30.85
19	-30.85	-74.09
20	-75.75	-75.75
21	-78.31	-78.31
22	-80.87	-80.87
23	-83.43	-83.43
24	-85.99	-85.99
25	-87.66	-46.42
26	-46.42	-46.42
27	-46.42	-46.42
28	-46.42	-46.42
29	-46.42	-46.42
30	-46.42	-46.42
31	-46.42	-95.96
32	-94.29	-94.29
33	-91.73	-91.73
34	-89.17	-89.17
35	-86.61	-86.61
36	-84.05	-84.05
37	-82.39	-29.04
38	-29.04	-29.04
39	-29.04	-29.04
40	-29.04	-29.04
41	-29.04	-29.04
42	-29.04	-29.04
43	-29.04	-82.35
44	-84.02	-84.02
45	-86.58	-86.58
46	-89.13	-89.13
47	-91.69	-91.69
48	-94.25	-94.25
49	-95.92	-44.61

	50	-44.61	-44.61
	51	-44.61	-44.61
	52	-44.61	-44.61
	53	-44.61	-44.61
	54	-44.61	-44.61
	55	-44.61	-87.64
	56	-85.97	-85.97
	57	-83.41	-83.41
	58	-80.85	-80.85
	59	-78.29	-78.29
	60	-75.74	-75.74
	61	-74.07	-30.85
	62	-30.85	-30.85
	63	-30.85	-30.85
	64	-30.85	-30.85
	65	-30.85	-30.85
	66	-30.85	-30.85
	67	-30.85	-90.67
	68	-92.34	-92.34
	69	-94.89	-94.89
	70	-97.45	-97.45
	71	-100.01	-100.01
	72	-102.57	-102.57

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-81.63	-1.62
2	-1.62	-1.62
3	-1.62	-1.62
4	-1.62	-1.62
5	-1.62	-1.62
6	-1.62	-1.62
7	-1.62	-110.25
8	-108.58	-108.58
9	-106.03	-106.03
10	-103.47	-103.47
11	-100.91	-100.91
12	-98.35	-98.35
13	-96.68	1.62
14	1.62	1.62
15	1.62	1.62
16	1.62	1.62
17	1.62	1.62
18	1.62	1.62
19	1.62	-68.06
20	-69.72	-69.72
21	-72.28	-72.28
22	-74.84	-74.84
23	-77.40	-77.40
24	-79.96	-79.96
25	-81.63	-7.49
26	-7.49	-7.49
27	-7.49	-7.49
28	-7.49	-7.49
29	-7.49	-7.49
30	-7.49	-7.49
31	-7.49	-94.70
32	-93.03	-93.03
33	-90.48	-90.48
34	-87.92	-87.92
35	-85.36	-85.36
36	-82.80	-82.80
37	-81.13	7.49
38	7.49	7.49
39	7.49	7.49
40	7.49	7.49
41	7.49	7.49
42	7.49	7.49
43	7.49	-83.61
44	-85.27	-85.27
45	-87.83	-87.83
46	-90.39	-90.39
47	-92.95	-92.95
48	-95.51	-95.51
49	-97.18	-2.29

	50	-2.29	-2.29
	51	-2.29	-2.29
	52	-2.29	-2.29
	53	-2.29	-2.29
	54	-2.29	-2.29
	55	-2.29	-76.36
	56	-74.69	-74.69
	57	-72.13	-72.13
	58	-69.57	-69.57
	59	-67.01	-67.01
	60	-64.46	-64.46
	61	-62.79	2.29
	62	2.29	2.29
	63	2.29	2.29
	64	2.29	2.29
	65	2.29	2.29
	66	2.29	2.29
	67	2.29	-101.95
	68	-103.62	-103.62
	69	-106.17	-106.17
	70	-108.73	-108.73
	71	-111.29	-111.29
	72	-113.85	-113.85

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-46.03	-64.59
2	-64.59	-64.59
3	-64.59	-64.59
4	-64.59	-64.59
5	-64.59	-64.59
6	-64.59	-64.59
7	-64.59	-37.75
8	-36.47	-36.47
9	-34.50	-34.50
10	-32.53	-32.53
11	-30.56	-30.56
12	-28.60	-28.60
13	-27.31	-48.60
14	-48.60	-48.60
15	-48.60	-48.60
16	-48.60	-48.60
17	-48.60	-48.60
18	-48.60	-48.60
19	-48.60	-35.59
20	-36.87	-36.87
21	-38.84	-38.84
22	-40.81	-40.81
23	-42.78	-42.78
24	-44.75	-44.75
25	-46.03	-64.17
26	-64.17	-64.17
27	-64.17	-64.17
28	-64.17	-64.17
29	-64.17	-64.17
30	-64.17	-64.17
31	-64.17	-41.63
32	-40.35	-40.35
33	-38.38	-38.38
34	-36.41	-36.41
35	-34.44	-34.44
36	-32.47	-32.47
37	-31.19	-49.02
38	-49.02	-49.02
39	-49.02	-49.02
40	-49.02	-49.02
41	-49.02	-49.02
42	-49.02	-49.02
43	-49.02	-31.72
44	-33.00	-33.00
45	-34.97	-34.97
46	-36.93	-36.93
47	-38.90	-38.90
48	-40.87	-40.87
49	-42.15	-64.64

	50	-64.64	-64.64
	51	-64.64	-64.64
	52	-64.64	-64.64
	53	-64.64	-64.64
	54	-64.64	-64.64
	55	-64.64	-46.69
	56	-45.41	-45.41
	57	-43.44	-43.44
	58	-41.47	-41.47
	59	-39.50	-39.50
	60	-37.53	-37.53
	61	-36.25	-48.55
	62	-48.55	-48.55
	63	-48.55	-48.55
	64	-48.55	-48.55
	65	-48.55	-48.55
	66	-48.55	-48.55
	67	-48.55	-26.65
	68	-27.94	-27.94
	69	-29.90	-29.90
	70	-31.87	-31.87
	71	-33.84	-33.84
	72	-35.81	-35.81

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-88.79	-44.24
2	-44.24	-44.24
3	-44.24	-44.24
4	-44.24	-44.24
5	-44.24	-44.24
6	-44.24	-44.24
7	-44.24	-103.09
8	-101.42	-101.42
9	-98.86	-98.86
10	-96.30	-96.30
11	-93.74	-93.74
12	-91.18	-91.18
13	-89.52	-31.22
14	-31.22	-31.22
15	-31.22	-31.22
16	-31.22	-31.22
17	-31.22	-31.22
18	-31.22	-31.22
19	-31.22	-75.22
20	-76.89	-76.89
21	-79.45	-79.45
22	-82.01	-82.01
23	-84.57	-84.57
24	-87.13	-87.13
25	-88.79	-46.62
26	-46.62	-46.62
27	-46.62	-46.62
28	-46.62	-46.62
29	-46.62	-46.62
30	-46.62	-46.62
31	-46.62	-95.36
32	-93.70	-93.70
33	-91.14	-91.14
34	-88.58	-88.58
35	-86.02	-86.02
36	-83.46	-83.46
37	-81.79	-28.84
38	-28.84	-28.84
39	-28.84	-28.84
40	-28.84	-28.84
41	-28.84	-28.84
42	-28.84	-28.84
43	-28.84	-82.95
44	-84.61	-84.61
45	-87.17	-87.17
46	-89.73	-89.73
47	-92.29	-92.29
48	-94.85	-94.85
49	-96.51	-45.01

	50	-45.01	-45.01
	51	-45.01	-45.01
	52	-45.01	-45.01
	53	-45.01	-45.01
	54	-45.01	-45.01
	55	-45.01	-85.63
	56	-83.96	-83.96
	57	-81.40	-81.40
	58	-78.84	-78.84
	59	-76.29	-76.29
	60	-73.73	-73.73
	61	-72.06	-30.45
	62	-30.45	-30.45
	63	-30.45	-30.45
	64	-30.45	-30.45
	65	-30.45	-30.45
	66	-30.45	-30.45
	67	-30.45	-92.68
	68	-94.34	-94.34
	69	-96.90	-96.90
	70	-99.46	-99.46
	71	-102.02	-102.02
	72	-104.58	-104.58

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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	-57.06	-25.71
2	-25.71	-25.71
3	-25.71	-25.71
4	-25.71	-25.71
5	-25.71	-25.71
6	-25.71	-25.71
7	-25.71	-69.57
8	-68.29	-68.29
9	-66.32	-66.32
10	-64.35	-64.35
11	-62.38	-62.38
12	-60.41	-60.41
13	-59.13	-14.04
14	-14.04	-14.04
15	-14.04	-14.04
16	-14.04	-14.04
17	-14.04	-14.04
18	-14.04	-14.04
19	-14.04	-46.62
20	-47.91	-47.91
21	-49.87	-49.87
22	-51.84	-51.84
23	-53.81	-53.81
24	-55.78	-55.78
25	-57.06	-27.05
26	-27.05	-27.05
27	-27.05	-27.05
28	-27.05	-27.05
29	-27.05	-27.05
30	-27.05	-27.05
31	-27.05	-63.33
32	-62.05	-62.05
33	-60.08	-60.08
34	-58.11	-58.11
35	-56.14	-56.14
36	-54.17	-54.17
37	-52.89	-12.70
38	-12.70	-12.70
39	-12.70	-12.70
40	-12.70	-12.70
41	-12.70	-12.70
42	-12.70	-12.70
43	-12.70	-52.86
44	-54.14	-54.14
45	-56.11	-56.11
46	-58.08	-58.08
47	-60.05	-60.05
48	-62.02	-62.02
49	-63.30	-25.72

	50	-25.72	-25.72
	51	-25.72	-25.72
	52	-25.72	-25.72
	53	-25.72	-25.72
	54	-25.72	-25.72
	55	-25.72	-57.05
	56	-55.77	-55.77
	57	-53.80	-53.80
	58	-51.83	-51.83
	59	-49.86	-49.86
	60	-47.89	-47.89
	61	-46.61	-14.03
	62	-14.03	-14.03
	63	-14.03	-14.03
	64	-14.03	-14.03
	65	-14.03	-14.03
	66	-14.03	-14.03
	67	-14.03	-59.14
	68	-60.42	-60.42
	69	-62.39	-62.39
	70	-64.36	-64.36
	71	-66.33	-66.33
	72	-68.30	-68.30

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-42.71	-45.14
2	-45.14	-45.14
3	-45.14	-45.14
4	-45.14	-45.14
5	-45.14	-45.14
6	-45.14	-45.14
7	-45.14	-41.07
8	-39.79	-39.79
9	-37.82	-37.82
10	-35.85	-35.85
11	-33.89	-33.89
12	-31.92	-31.92
13	-30.64	-31.93
14	-31.93	-31.93
15	-31.93	-31.93
16	-31.93	-31.93
17	-31.93	-31.93
18	-31.93	-31.93
19	-31.93	-32.27
20	-33.55	-33.55
21	-35.52	-35.52
22	-37.49	-37.49
23	-39.46	-39.46
24	-41.43	-41.43
25	-42.71	-45.09
26	-45.09	-45.09
27	-45.09	-45.09
28	-45.09	-45.09
29	-45.09	-45.09
30	-45.09	-45.09
31	-45.09	-41.89
32	-40.61	-40.61
33	-38.64	-38.64
34	-36.67	-36.67
35	-34.70	-34.70
36	-32.74	-32.74
37	-31.45	-31.97
38	-31.97	-31.97
39	-31.97	-31.97
40	-31.97	-31.97
41	-31.97	-31.97
42	-31.97	-31.97
43	-31.97	-31.45
44	-32.73	-32.73
45	-34.70	-34.70
46	-36.67	-36.67
47	-38.64	-38.64
48	-40.61	-40.61
49	-41.89	-45.14

	50	-45.14	-45.14
	51	-45.14	-45.14
	52	-45.14	-45.14
	53	-45.14	-45.14
	54	-45.14	-45.14
	55	-45.14	-42.71
	56	-41.43	-41.43
	57	-39.46	-39.46
	58	-37.49	-37.49
	59	-35.52	-35.52
	60	-33.55	-33.55
	61	-32.27	-31.93
	62	-31.93	-31.93
	63	-31.93	-31.93
	64	-31.93	-31.93
	65	-31.93	-31.93
	66	-31.93	-31.93
	67	-31.93	-30.64
	68	-31.92	-31.92
	69	-33.89	-33.89
	70	-35.85	-35.85
	71	-37.82	-37.82
	72	-39.79	-39.79

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-58.14	-30.98
2	-30.98	-30.98
3	-30.98	-30.98
4	-30.98	-30.98
5	-30.98	-30.98
6	-30.98	-30.98
7	-30.98	-68.49
8	-67.21	-67.21
9	-65.24	-65.24
10	-63.27	-63.27
11	-61.30	-61.30
12	-59.33	-59.33
13	-58.05	-20.39
14	-20.39	-20.39
15	-20.39	-20.39
16	-20.39	-20.39
17	-20.39	-20.39
18	-20.39	-20.39
19	-20.39	-47.70
20	-48.98	-48.98
21	-50.95	-50.95
22	-52.92	-52.92
23	-54.89	-54.89
24	-56.86	-56.86
25	-58.14	-32.12
26	-32.12	-32.12
27	-32.12	-32.12
28	-32.12	-32.12
29	-32.12	-32.12
30	-32.12	-32.12
31	-32.12	-63.33
32	-62.05	-62.05
33	-60.08	-60.08
34	-58.11	-58.11
35	-56.14	-56.14
36	-54.17	-54.17
37	-52.89	-19.25
38	-19.25	-19.25
39	-19.25	-19.25
40	-19.25	-19.25
41	-19.25	-19.25
42	-19.25	-19.25
43	-19.25	-52.86
44	-54.15	-54.15
45	-56.11	-56.11
46	-58.08	-58.08
47	-60.05	-60.05
48	-62.02	-62.02
49	-63.30	-30.98

	50	-30.98	-30.98
	51	-30.98	-30.98
	52	-30.98	-30.98
	53	-30.98	-30.98
	54	-30.98	-30.98
	55	-30.98	-58.13
	56	-56.85	-56.85
	57	-54.88	-54.88
	58	-52.91	-52.91
	59	-50.94	-50.94
	60	-48.97	-48.97
	61	-47.69	-20.39
	62	-20.39	-20.39
	63	-20.39	-20.39
	64	-20.39	-20.39
	65	-20.39	-20.39
	66	-20.39	-20.39
	67	-20.39	-58.06
	68	-59.35	-59.35
	69	-61.31	-61.31
	70	-63.28	-63.28
	71	-65.25	-65.25
	72	-67.22	-67.22

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-39.43	-25.53
2	-25.53	-25.53
3	-25.53	-25.53
4	-25.53	-25.53
5	-25.53	-25.53
6	-25.53	-25.53
7	-25.53	-44.36
8	-43.08	-43.08
9	-41.11	-41.11
10	-39.14	-39.14
11	-37.17	-37.17
12	-35.20	-35.20
13	-33.92	-14.22
14	-14.22	-14.22
15	-14.22	-14.22
16	-14.22	-14.22
17	-14.22	-14.22
18	-14.22	-14.22
19	-14.22	-28.99
20	-30.27	-30.27
21	-32.24	-32.24
22	-34.21	-34.21
23	-36.18	-36.18
24	-38.14	-38.14
25	-39.43	-26.16
26	-26.16	-26.16
27	-26.16	-26.16
28	-26.16	-26.16
29	-26.16	-26.16
30	-26.16	-26.16
31	-26.16	-42.07
32	-40.79	-40.79
33	-38.82	-38.82
34	-36.85	-36.85
35	-34.88	-34.88
36	-32.91	-32.91
37	-31.63	-13.59
38	-13.59	-13.59
39	-13.59	-13.59
40	-13.59	-13.59
41	-13.59	-13.59
42	-13.59	-13.59
43	-13.59	-31.28
44	-32.56	-32.56
45	-34.53	-34.53
46	-36.50	-36.50
47	-38.46	-38.46
48	-40.43	-40.43
49	-41.71	-25.54

	50	-25.54	-25.54
	51	-25.54	-25.54
	52	-25.54	-25.54
	53	-25.54	-25.54
	54	-25.54	-25.54
	55	-25.54	-39.25
	56	-37.97	-37.97
	57	-36.00	-36.00
	58	-34.03	-34.03
	59	-32.06	-32.06
	60	-30.09	-30.09
	61	-28.81	-14.21
	62	-14.21	-14.21
	63	-14.21	-14.21
	64	-14.21	-14.21
	65	-14.21	-14.21
	66	-14.21	-14.21
	67	-14.21	-34.10
	68	-35.38	-35.38
	69	-37.35	-37.35
	70	-39.32	-39.32
	71	-41.28	-41.28
	72	-43.25	-43.25

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-50.41	-25.63
2	-25.63	-25.63
3	-25.63	-25.63
4	-25.63	-25.63
5	-25.63	-25.63
6	-25.63	-25.63
7	-25.63	-60.15
8	-58.87	-58.87
9	-56.90	-56.90
10	-54.93	-54.93
11	-52.96	-52.96
12	-50.99	-50.99
13	-49.71	-14.12
14	-14.12	-14.12
15	-14.12	-14.12
16	-14.12	-14.12
17	-14.12	-14.12
18	-14.12	-14.12
19	-14.12	-39.97
20	-41.26	-41.26
21	-43.22	-43.22
22	-45.19	-45.19
23	-47.16	-47.16
24	-49.13	-49.13
25	-50.41	-26.69
26	-26.69	-26.69
27	-26.69	-26.69
28	-26.69	-26.69
29	-26.69	-26.69
30	-26.69	-26.69
31	-26.69	-55.29
32	-54.01	-54.01
33	-52.04	-52.04
34	-50.07	-50.07
35	-48.10	-48.10
36	-46.14	-46.14
37	-44.85	-13.06
38	-13.06	-13.06
39	-13.06	-13.06
40	-13.06	-13.06
41	-13.06	-13.06
42	-13.06	-13.06
43	-13.06	-44.83
44	-46.11	-46.11
45	-48.08	-48.08
46	-50.05	-50.05
47	-52.02	-52.02
48	-53.99	-53.99
49	-55.27	-25.63

	50	-25.63	-25.63
	51	-25.63	-25.63
	52	-25.63	-25.63
	53	-25.63	-25.63
	54	-25.63	-25.63
	55	-25.63	-50.40
	56	-49.12	-49.12
	57	-47.15	-47.15
	58	-45.18	-45.18
	59	-43.21	-43.21
	60	-41.24	-41.24
	61	-39.96	-14.12
	62	-14.12	-14.12
	63	-14.12	-14.12
	64	-14.12	-14.12
	65	-14.12	-14.12
	66	-14.12	-14.12
	67	-14.12	-49.72
	68	-51.00	-51.00
	69	-52.97	-52.97
	70	-54.94	-54.94
	71	-56.91	-56.91
	72	-58.88	-58.88

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-42.10	-42.15
2	-42.15	-42.15
3	-42.15	-42.15
4	-42.15	-42.15
5	-42.15	-42.15
6	-42.15	-42.15
7	-42.15	-41.69
8	-40.40	-40.40
9	-38.44	-38.44
10	-36.47	-36.47
11	-34.50	-34.50
12	-32.53	-32.53
13	-31.25	-28.37
14	-28.37	-28.37
15	-28.37	-28.37
16	-28.37	-28.37
17	-28.37	-28.37
18	-28.37	-28.37
19	-28.37	-31.66
20	-32.94	-32.94
21	-34.91	-34.91
22	-36.88	-36.88
23	-38.85	-38.85
24	-40.82	-40.82
25	-42.10	-42.19
26	-42.19	-42.19
27	-42.19	-42.19
28	-42.19	-42.19
29	-42.19	-42.19
30	-42.19	-42.19
31	-42.19	-41.90
32	-40.61	-40.61
33	-38.65	-38.65
34	-36.68	-36.68
35	-34.71	-34.71
36	-32.74	-32.74
37	-31.46	-28.33
38	-28.33	-28.33
39	-28.33	-28.33
40	-28.33	-28.33
41	-28.33	-28.33
42	-28.33	-28.33
43	-28.33	-31.45
44	-32.73	-32.73
45	-34.70	-34.70
46	-36.67	-36.67
47	-38.64	-38.64
48	-40.61	-40.61
49	-41.89	-42.15

	50	-42.15	-42.15
	51	-42.15	-42.15
	52	-42.15	-42.15
	53	-42.15	-42.15
	54	-42.15	-42.15
	55	-42.15	-42.09
	56	-40.81	-40.81
	57	-38.84	-38.84
	58	-36.87	-36.87
	59	-34.91	-34.91
	60	-32.94	-32.94
	61	-31.66	-28.37
	62	-28.37	-28.37
	63	-28.37	-28.37
	64	-28.37	-28.37
	65	-28.37	-28.37
	66	-28.37	-28.37
	67	-28.37	-31.25
	68	-32.53	-32.53
	69	-34.50	-34.50
	70	-36.47	-36.47
	71	-38.44	-38.44
	72	-40.41	-40.41

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

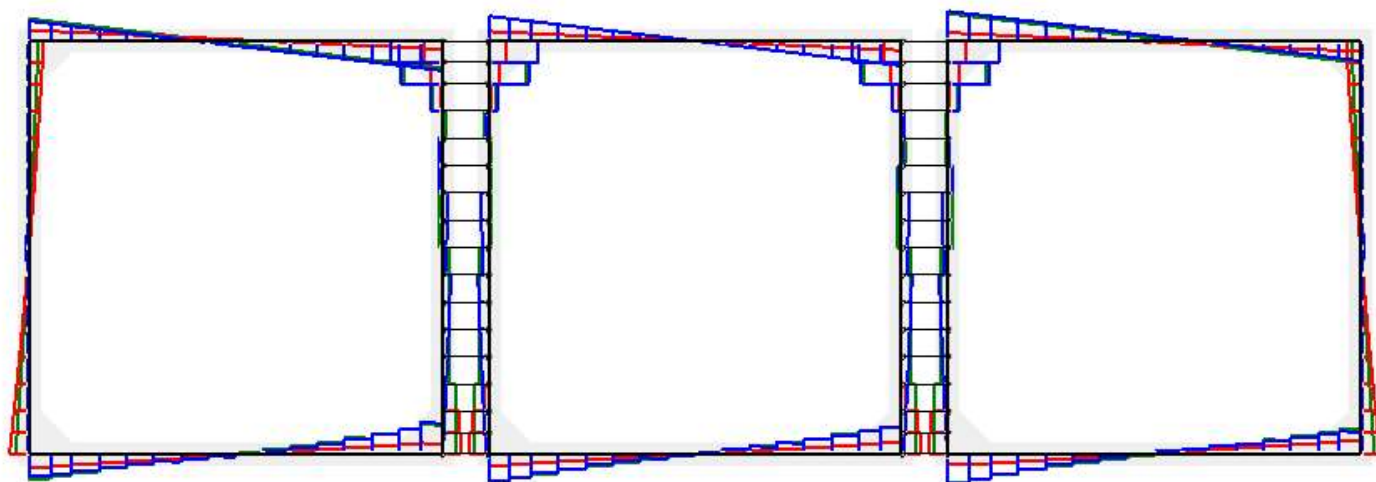
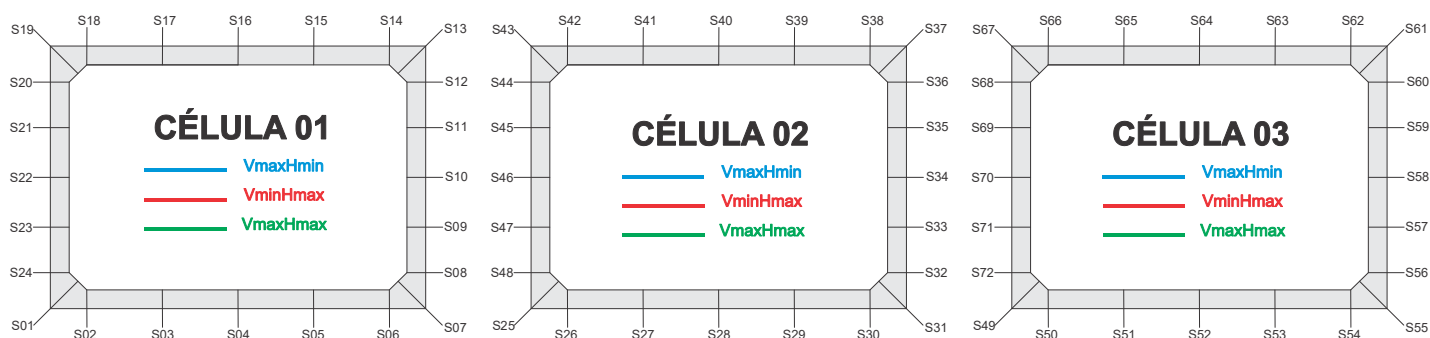
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-51.24	-28.98
2	-28.98	-28.98
3	-28.98	-28.98
4	-28.98	-28.98
5	-28.98	-28.98
6	-28.98	-28.98
7	-28.98	-59.32
8	-58.04	-58.04
9	-56.07	-56.07
10	-54.10	-54.10
11	-52.13	-52.13
12	-50.17	-50.17
13	-48.88	-18.04
14	-18.04	-18.04
15	-18.04	-18.04
16	-18.04	-18.04
17	-18.04	-18.04
18	-18.04	-18.04
19	-18.04	-40.80
20	-42.08	-42.08
21	-44.05	-44.05
22	-46.02	-46.02
23	-47.99	-47.99
24	-49.96	-49.96
25	-51.24	-29.97
26	-29.97	-29.97
27	-29.97	-29.97
28	-29.97	-29.97
29	-29.97	-29.97
30	-29.97	-29.97
31	-29.97	-55.56
32	-54.28	-54.28
33	-52.31	-52.31
34	-50.34	-50.34
35	-48.38	-48.38
36	-46.41	-46.41
37	-45.13	-17.04
38	-17.04	-17.04
39	-17.04	-17.04
40	-17.04	-17.04
41	-17.04	-17.04
42	-17.04	-17.04
43	-17.04	-44.56
44	-45.84	-45.84
45	-47.81	-47.81
46	-49.78	-49.78
47	-51.75	-51.75
48	-53.72	-53.72
49	-55.00	-28.98

	50	-28.98	-28.98
	51	-28.98	-28.98
	52	-28.98	-28.98
	53	-28.98	-28.98
	54	-28.98	-28.98
	55	-28.98	-50.96
	56	-49.68	-49.68
	57	-47.71	-47.71
	58	-45.74	-45.74
	59	-43.77	-43.77
	60	-41.80	-41.80
	61	-40.52	-18.03
	62	-18.03	-18.03
	63	-18.03	-18.03
	64	-18.03	-18.03
	65	-18.03	-18.03
	66	-18.03	-18.03
	67	-18.03	-49.17
	68	-50.45	-50.45
	69	-52.42	-52.42
	70	-54.39	-54.39
	71	-56.35	-56.35
	72	-58.32	-58.32

---

## 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	2.42	-74.04
2	-65.07	-53.77
3	-34.37	-24.73
4	-9.02	0.50
5	20.26	34.02
6	66.19	85.29
7	102.11	-2.42
8	-10.24	-10.24
9	-22.80	-22.80
10	-15.45	-15.45
11	9.21	9.21
12	36.15	138.84
13	168.94	-98.61
14	-81.26	-81.26
15	-48.75	-48.75
16	-16.24	-16.24
17	16.26	16.26
18	48.77	48.77
19	66.13	2.42
20	4.04	4.04
21	6.10	6.10
22	6.79	6.79
23	6.10	6.10
24	4.04	4.04
25	2.42	-88.64
26	-76.56	-61.95
27	-36.23	-24.13
28	-5.12	5.13
29	24.14	36.24
30	61.96	76.57
31	88.64	-7.98
32	-15.81	-15.81
33	-28.36	-28.36
34	-21.45	-21.45
35	8.88	-1.91
36	31.17	133.32
37	163.26	-82.37
38	-65.02	-65.02
39	-32.51	-32.51
40	0.00	0.00
41	32.51	32.51
42	65.01	65.01
43	82.37	-163.38
44	-133.27	-30.58
45	-3.65	-3.65
46	21.02	21.02
47	28.36	28.36
48	15.81	15.81
49	7.98	-102.11

	50	-85.29	-66.19
	51	-34.03	-20.26
	52	-0.50	9.02
	53	24.73	34.36
	54	53.77	65.07
	55	74.04	-2.41
	56	-4.04	-4.04
	57	-6.10	-6.10
	58	-6.79	-6.79
	59	-6.10	-6.10
	60	-4.04	-4.04
	61	-2.41	-66.12
	62	-48.77	-48.77
	63	-16.26	-16.26
	64	16.25	16.25
	65	48.75	48.75
	66	81.26	81.26
	67	98.62	-168.83
	68	-138.88	-36.74
	69	-3.65	-14.45
	70	15.88	15.88
	71	22.80	22.80
	72	10.24	10.24

---

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

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	64.61	-43.72
2	-40.07	-34.26
3	-23.02	-16.62
4	-6.36	-0.46
5	9.35	15.37
6	25.86	31.54
7	35.23	-64.61
8	-55.47	-13.36
9	0.00	0.00
10	0.00	0.00
11	0.00	0.00
12	5.85	34.34
13	59.02	-27.26
14	-20.54	-20.54
15	-8.17	-8.17
16	4.19	4.19
17	16.55	16.55
18	28.92	28.92
19	35.64	-48.58
20	-40.33	-40.33
21	-22.34	-22.34
22	-1.39	-1.39
23	22.51	22.51
24	49.36	49.36
25	64.61	-39.10
26	-34.88	-28.75
27	-17.84	-11.89
28	-2.71	2.71
29	11.89	17.84
30	28.75	34.88
31	39.10	-64.18
32	-55.09	-13.14
33	0.51	0.51
34	0.51	0.51
35	0.51	-1.03
36	6.52	34.75
37	59.37	-31.45
38	-24.73	-24.73
39	-12.36	-12.36
40	0.00	0.00
41	12.36	12.36
42	24.73	24.73
43	31.45	-59.45
44	-34.77	-6.28
45	-0.42	-0.42
46	-0.42	-0.42
47	-0.42	-0.42
48	12.93	55.05
49	64.18	-35.23

	50	-31.54	-25.86
	51	-15.37	-9.35
	52	0.46	6.36
	53	16.62	23.02
	54	34.26	40.07
	55	43.72	-64.61
	56	-49.36	-49.36
	57	-22.51	-22.51
	58	1.39	1.39
	59	22.34	22.34
	60	40.33	40.33
	61	48.58	-35.64
	62	-28.92	-28.92
	63	-16.55	-16.55
	64	-4.19	-4.19
	65	8.17	8.17
	66	20.54	20.54
	67	27.26	-58.95
	68	-34.33	-6.09
	69	1.46	-0.09
	70	-0.09	-0.09
	71	-0.09	-0.09
	72	13.57	55.52

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	44.61	-81.54
2	-71.49	-58.78
3	-35.76	-24.30
4	-5.40	5.30
5	25.98	39.23
6	67.55	83.36
7	96.44	-44.61
8	-44.61	-44.61
9	-26.40	-26.40
10	-26.40	10.80
11	10.80	10.80
12	28.72	127.56
13	167.88	-90.65
14	-73.30	-73.30
15	-40.79	-40.79
16	-8.28	-8.28
17	24.23	24.23
18	56.74	56.74
19	74.09	-30.85
20	-25.35	-25.35
21	-13.35	-13.35
22	0.61	0.61
23	16.55	16.55
24	34.45	34.45
25	44.61	-89.29
26	-78.19	-64.26
27	-38.63	-26.04
28	-5.52	5.59
29	26.11	38.69
30	64.32	78.24
31	89.34	-46.42
32	-46.42	-46.42
33	-28.96	-28.96
34	-28.96	13.71
35	13.71	-11.66
36	29.76	125.80
37	165.44	-82.39
38	-65.04	-65.04
39	-32.53	-32.53
40	-0.02	-0.02
41	32.49	32.49
42	65.00	65.00
43	82.35	-166.08
44	-125.75	-26.92
45	-8.99	-8.99
46	-8.99	28.21
47	28.21	28.21
48	46.42	46.42
49	46.42	-96.46

	50	-83.39	-67.59
	51	-39.27	-26.02
	52	-5.33	5.37
	53	24.27	35.74
	54	58.76	71.47
	55	81.52	-44.61
	56	-34.45	-34.45
	57	-16.55	-16.55
	58	-0.62	-0.62
	59	13.35	13.35
	60	25.35	25.35
	61	30.85	-74.07
	62	-56.72	-56.72
	63	-24.21	-24.21
	64	8.30	8.30
	65	40.81	40.81
	66	73.32	73.32
	67	90.67	-167.24
	68	-127.61	-31.57
	69	9.86	-15.52
	70	-15.52	27.16
	71	27.16	27.16
	72	44.61	44.61

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	1.62	-75.79
2	-66.57	-55.09
3	-35.73	-26.30
4	-11.29	-2.19
5	16.79	30.30
6	62.59	82.18
7	99.70	-1.62
8	-9.45	-9.45
9	-22.00	-22.00
10	-23.37	-23.37
11	7.39	7.39
12	24.99	136.39
13	186.80	-96.68
14	-79.33	-79.33
15	-46.82	-46.82
16	-14.31	-14.31
17	18.20	18.20
18	50.70	50.70
19	68.06	1.62
20	3.25	3.25
21	5.31	5.31
22	5.99	5.99
23	5.31	5.31
24	3.25	3.25
25	1.62	-89.71
26	-77.40	-62.63
27	-37.00	-25.12
28	-6.78	3.09
29	21.41	33.30
30	59.18	74.26
31	86.97	-7.50
32	-15.32	-15.32
33	-27.88	-27.88
34	-26.74	-26.74
35	6.89	-5.12
36	20.83	125.14
37	171.79	-81.13
38	-63.78	-63.78
39	-31.27	-31.27
40	1.24	1.24
41	33.75	33.75
42	66.25	66.25
43	83.61	-180.92
44	-130.52	-19.12
45	-1.52	-1.52
46	29.24	29.24
47	27.88	27.88
48	15.32	15.32
49	7.50	-104.98

	50	-87.42	-67.69
	51	-34.88	-21.14
	52	-1.94	7.13
	53	21.78	30.94
	54	49.79	61.18
	55	70.45	-2.29
	56	-3.92	-3.92
	57	-5.97	-5.97
	58	-6.66	-6.66
	59	-5.97	-5.97
	60	-3.92	-3.92
	61	-2.29	-62.79
	62	-45.44	-45.44
	63	-12.93	-12.93
	64	19.58	19.58
	65	52.09	52.09
	66	84.60	84.60
	67	101.95	-177.00
	68	-130.35	-26.04
	69	-0.09	-12.09
	70	21.53	21.53
	71	22.67	22.67
	72	10.12	10.11

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	64.59	-43.67
2	-40.04	-34.24
3	-23.02	-16.62
4	-6.37	-0.47
5	9.34	15.37
6	25.88	31.56
7	35.27	-64.59
8	-57.12	-10.31
9	0.05	0.05
10	0.05	0.05
11	0.05	0.05
12	3.63	32.46
13	61.48	-27.31
14	-20.59	-20.59
15	-8.22	-8.22
16	4.14	4.14
17	16.50	16.50
18	28.87	28.87
19	35.59	-48.60
20	-40.35	-40.35
21	-22.35	-22.35
22	-1.40	-1.40
23	22.50	22.50
24	49.35	49.35
25	64.59	-39.32
26	-35.05	-28.87
27	-17.93	-12.00
28	-2.89	2.49
29	11.57	17.48
30	28.37	34.52
31	38.80	-64.17
32	-56.29	-10.01
33	0.40	0.40
34	0.40	0.40
35	0.40	-0.65
36	4.09	33.10
37	62.30	-31.19
38	-24.47	-24.47
39	-12.10	-12.10
40	0.26	0.26
41	12.63	12.63
42	24.99	24.99
43	31.72	-61.91
44	-32.88	-4.05
45	-0.47	-0.47
46	-0.47	-0.47
47	-0.47	-0.47
48	9.89	56.70
49	64.17	-34.65

	50	-31.00	-25.36
	51	-14.91	-8.88
	52	1.01	6.97
	53	17.36	23.82
	54	35.08	40.83
	55	44.39	-64.64
	56	-49.40	-49.40
	57	-22.54	-22.54
	58	1.36	1.36
	59	22.30	22.30
	60	40.30	40.30
	61	48.55	-36.25
	62	-29.53	-29.53
	63	-17.16	-17.16
	64	-4.80	-4.80
	65	7.56	7.56
	66	19.93	19.93
	67	26.65	-61.83
	68	-32.63	-3.62
	69	1.11	0.06
	70	0.06	0.06
	71	0.06	0.06
	72	10.48	56.76

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	44.24	-82.63
2	-72.53	-59.82
3	-37.04	-25.80
4	-7.47	2.92
5	23.08	36.20
6	64.83	81.13
7	94.87	-44.24
8	-44.24	-44.24
9	-21.47	-21.47
10	-21.47	9.27
11	9.27	9.27
12	20.11	123.78
13	181.48	-89.52
14	-72.16	-72.16
15	-39.65	-39.65
16	-7.15	-7.15
17	25.36	25.36
18	57.87	57.87
19	75.22	-31.22
20	-25.73	-25.73
21	-13.73	-13.73
22	0.24	0.24
23	16.17	16.17
24	34.07	34.07
25	44.24	-89.75
26	-78.44	-64.40
27	-38.87	-26.48
28	-6.53	4.27
29	24.25	36.68
30	62.48	76.78
31	88.39	-46.62
32	-46.62	-46.62
33	-23.70	-23.70
34	-23.70	11.94
35	11.94	-9.92
36	20.04	119.67
37	175.77	-81.79
38	-64.44	-64.44
39	-31.93	-31.93
40	0.58	0.58
41	33.08	33.08
42	65.59	65.59
43	82.95	-179.10
44	-121.40	-17.72
45	-6.89	-6.89
46	-6.89	23.85
47	23.85	23.85
48	46.62	46.62
49	46.62	-98.07

	50	-84.33	-67.95
	51	-38.98	-25.67
	52	-5.25	5.18
	53	23.39	34.49
	54	56.92	69.48
	55	79.49	-45.01
	56	-34.85	-34.85
	57	-16.95	-16.95
	58	-1.01	-1.01
	59	12.95	12.95
	60	24.95	24.95
	61	30.45	-72.06
	62	-54.71	-54.71
	63	-22.20	-22.20
	64	10.31	10.31
	65	42.82	42.82
	66	75.33	75.33
	67	92.68	-177.38
	68	-121.28	-21.65
	69	8.31	-13.55
	70	-13.55	22.09
	71	22.09	22.09
	72	45.01	45.01

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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	25.71	-52.95
2	-46.40	-37.94
3	-23.00	-15.47
4	-3.33	3.72
5	17.17	26.02
6	44.83	55.53
7	64.27	-25.72
8	-25.72	-25.72
9	-19.34	-19.34
10	-19.34	7.93
11	7.93	7.93
12	19.03	83.67
13	108.02	-59.13
14	-47.96	-47.96
15	-27.10	-27.10
16	-6.25	-6.25
17	14.60	14.60
18	35.45	35.45
19	46.62	-14.04
20	-11.98	-11.98
21	-6.73	-6.73
22	0.27	0.27
23	9.02	9.02
24	19.52	19.52
25	25.71	-58.85
26	-51.58	-42.26
27	-25.42	-17.05
28	-3.67	3.72
29	17.09	25.47
30	42.30	51.62
31	58.89	-27.05
32	-27.05	-27.05
33	-21.22	-21.22
34	-21.22	10.02
35	10.02	-8.33
36	19.76	82.38
37	106.22	-52.89
38	-41.72	-41.72
39	-20.87	-20.87
40	-0.01	-0.01
41	20.84	20.84
42	41.69	41.69
43	52.86	-106.69
44	-82.34	-17.70
45	-6.60	-6.60
46	-6.60	20.67
47	20.67	20.67
48	27.05	27.05
49	27.05	-64.28

	50	-55.55	-44.86
	51	-26.05	-17.20
	52	-3.75	3.31
	53	15.45	22.99
	54	37.92	46.38
	55	52.94	-25.72
	56	-19.52	-19.52
	57	-9.02	-9.02
	58	-0.28	-0.28
	59	6.73	6.73
	60	11.98	11.98
	61	14.03	-46.61
	62	-35.44	-35.44
	63	-14.59	-14.59
	64	6.27	6.27
	65	27.12	27.12
	66	47.97	47.97
	67	59.14	-107.55
	68	-83.71	-21.09
	69	7.00	-11.35
	70	-11.35	19.89
	71	19.89	19.89
	72	25.72	25.72

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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	45.14	-40.09
2	-36.13	-30.18
3	-19.30	-13.27
4	-3.79	1.78
5	11.21	17.23
6	28.15	34.21
7	38.34	-45.14
8	-45.14	-39.93
9	0.10	0.10
10	0.10	0.10
11	0.10	0.10
12	8.59	41.24
13	61.77	-30.64
14	-23.91	-23.91
15	-11.55	-11.55
16	0.82	0.82
17	13.18	13.18
18	25.55	25.55
19	32.27	-31.93
20	-26.67	-26.67
21	-14.86	-14.86
22	-0.75	-0.75
23	15.67	15.67
24	34.40	34.40
25	45.14	-39.12
26	-34.93	-28.83
27	-17.92	-11.96
28	-2.73	2.73
29	11.96	17.92
30	28.83	34.93
31	39.12	-45.09
32	-45.09	-40.10
33	0.23	0.23
34	0.23	0.23
35	0.23	-1.17
36	8.85	41.27
37	61.75	-31.45
38	-24.73	-24.73
39	-12.36	-12.36
40	0.00	0.00
41	12.36	12.36
42	24.73	24.73
43	31.45	-61.82
44	-41.28	-8.63
45	-0.15	-0.15
46	-0.15	-0.15
47	-0.15	-0.15
48	39.88	45.09
49	45.09	-38.34

	50	-34.21	-28.15
	51	-17.23	-11.21
	52	-1.78	3.79
	53	13.27	19.30
	54	30.18	36.13
	55	40.09	-45.14
	56	-34.40	-34.40
	57	-15.67	-15.67
	58	0.75	0.75
	59	14.86	14.86
	60	26.67	26.67
	61	31.93	-32.27
	62	-25.55	-25.55
	63	-13.18	-13.18
	64	-0.82	-0.82
	65	11.55	11.55
	66	23.91	23.91
	67	30.64	-61.70
	68	-41.22	-8.81
	69	1.22	-0.18
	70	-0.18	-0.18
	71	-0.18	-0.18
	72	40.15	45.14

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	30.98	-54.07
2	-47.53	-39.04
3	-23.85	-16.15
4	-3.67	3.52
5	17.12	25.95
6	44.48	54.92
7	63.37	-30.98
8	-30.98	-30.98
9	-16.66	-16.66
10	-16.66	6.81
11	6.81	6.81
12	18.35	81.59
13	107.62	-58.05
14	-46.88	-46.88
15	-26.03	-26.03
16	-5.18	-5.18
17	15.68	15.68
18	36.53	36.53
19	47.70	-20.39
20	-16.89	-16.89
21	-9.02	-9.02
22	0.39	0.39
23	11.34	11.34
24	23.83	23.83
25	30.98	-58.91
26	-51.70	-42.44
27	-25.61	-17.20
28	-3.70	3.75
29	17.24	25.65
30	42.48	51.74
31	58.93	-32.12
32	-32.12	-32.12
33	-18.28	-18.28
34	-18.28	8.66
35	8.66	-7.39
36	19.01	80.49
37	106.07	-52.89
38	-41.72	-41.72
39	-20.86	-20.86
40	-0.01	-0.01
41	20.84	20.84
42	41.69	41.69
43	52.86	-106.48
44	-80.45	-17.21
45	-5.67	-5.67
46	-5.67	17.80
47	17.80	17.80
48	32.12	32.12
49	32.12	-63.38

	50	-54.94	-44.50
	51	-25.98	-17.15
	52	-3.55	3.65
	53	16.13	23.84
	54	39.03	47.52
	55	54.06	-30.98
	56	-23.83	-23.83
	57	-11.34	-11.34
	58	-0.39	-0.39
	59	9.02	9.02
	60	16.89	16.89
	61	20.39	-47.69
	62	-36.52	-36.52
	63	-15.66	-15.66
	64	5.19	5.19
	65	26.04	26.04
	66	46.89	46.89
	67	58.06	-107.21
	68	-81.63	-20.15
	69	6.25	-9.80
	70	-9.80	17.14
	71	17.14	17.14
	72	30.98	30.98

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	25.53	-36.68
2	-32.63	-26.80
3	-16.80	-11.36
4	-3.10	1.97
5	10.83	16.88
6	28.77	35.76
7	40.96	-25.53
8	-25.53	-25.53
9	-4.47	-4.47
10	-4.47	-4.47
11	-4.47	-4.47
12	13.48	46.24
13	61.39	-33.92
14	-27.19	-27.19
15	-14.83	-14.83
16	-2.47	-2.47
17	9.90	9.90
18	22.26	22.26
19	28.99	-14.22
20	-12.16	-12.16
21	-6.91	-6.91
22	0.09	0.09
23	8.84	8.84
24	19.34	19.34
25	25.53	-38.70
26	-34.16	-27.80
27	-16.82	-11.00
28	-2.22	2.97
29	11.74	17.54
30	28.43	34.70
31	39.12	-26.16
32	-26.16	-26.16
33	-9.50	-9.50
34	-9.50	4.50
35	4.50	-3.99
36	11.09	47.40
37	63.22	-31.63
38	-24.90	-24.90
39	-12.54	-12.54
40	-0.18	-0.18
41	12.19	12.19
42	24.55	24.55
43	31.28	-60.76
44	-45.61	-12.85
45	5.10	5.10
46	5.10	5.10
47	5.10	5.10
48	26.16	26.16
49	26.16	-41.20

	50	-36.11	-29.20
	51	-17.36	-11.29
	52	-2.36	2.75
	53	11.08	16.55
	54	26.60	32.45
	55	36.50	-25.54
	56	-19.34	-19.34
	57	-8.84	-8.84
	58	-0.10	-0.10
	59	6.91	6.91
	60	12.16	12.16
	61	14.21	-28.81
	62	-22.08	-22.08
	63	-9.72	-9.72
	64	2.64	2.64
	65	15.01	15.01
	66	27.37	27.37
	67	34.10	-63.84
	68	-48.02	-11.72
	69	3.36	-5.13
	70	-5.13	8.88
	71	8.88	8.88
	72	25.54	25.54

---

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

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	25.63	-46.81
2	-41.18	-33.69
3	-20.58	-13.81
4	-3.10	3.22
5	14.97	22.77
6	38.95	48.23
7	55.59	-25.63
8	-25.63	-25.63
9	-15.30	-15.30
10	-15.30	6.27
11	6.27	6.27
12	15.89	70.12
13	91.32	-49.71
14	-40.21	-40.21
15	-22.54	-22.54
16	-4.87	-4.87
17	12.80	12.80
18	30.47	30.47
19	39.97	-14.12
20	-12.06	-12.06
21	-6.81	-6.81
22	0.19	0.19
23	8.94	8.94
24	19.44	19.44
25	25.63	-51.38
26	-45.17	-36.99
27	-22.36	-14.94
28	-3.27	3.31
29	14.98	22.40
30	37.02	45.20
31	51.41	-26.69
32	-26.69	-26.69
33	-16.79	-16.79
34	-16.79	7.94
35	7.94	-6.68
36	16.47	69.10
37	89.90	-44.85
38	-35.35	-35.35
39	-17.68	-17.68
40	-0.01	-0.01
41	17.66	17.66
42	35.33	35.33
43	44.83	-90.27
44	-69.07	-14.83
45	-5.22	-5.22
46	-5.22	16.35
47	16.35	16.35
48	26.69	26.69
49	26.69	-55.61

	50	-48.24	-38.98
	51	-22.80	-15.00
	52	-3.24	3.08
	53	13.80	20.56
	54	33.68	41.17
	55	46.80	-25.63
	56	-19.44	-19.44
	57	-8.94	-8.94
	58	-0.19	-0.19
	59	6.81	6.81
	60	12.06	12.06
	61	14.12	-39.96
	62	-30.46	-30.46
	63	-12.79	-12.79
	64	4.88	4.88
	65	22.55	22.55
	66	40.22	40.22
	67	49.72	-90.96
	68	-70.15	-17.53
	69	5.63	-8.99
	70	-8.99	15.73
	71	15.73	15.73
	72	25.63	25.63

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	42.15	-39.45
2	-35.45	-29.51
3	-18.74	-12.78
4	-3.47	2.03
5	11.39	17.42
6	28.46	34.63
7	38.88	-42.15
8	-42.15	-42.15
9	-0.18	-0.18
10	-0.18	-0.18
11	-0.18	-0.18
12	9.26	42.42
13	61.98	-31.25
14	-24.52	-24.52
15	-12.16	-12.16
16	0.21	0.21
17	12.57	12.57
18	24.93	24.93
19	31.66	-28.37
20	-23.93	-23.93
21	-13.59	-13.59
22	-0.83	-0.83
23	14.35	14.35
24	31.96	31.96
25	42.15	-39.10
26	-34.90	-28.78
27	-17.87	-11.92
28	-2.71	2.73
29	11.94	17.89
30	28.80	34.91
31	39.11	-42.19
32	-42.19	-42.19
33	-0.31	-0.31
34	-0.31	-0.31
35	0.40	-1.04
36	9.28	42.42
37	61.97	-31.46
38	-24.73	-24.73
39	-12.37	-12.37
40	0.00	0.00
41	12.36	12.36
42	24.72	24.72
43	31.45	-61.94
44	-42.38	-9.22
45	0.22	0.22
46	0.22	0.22
47	0.22	0.22
48	42.19	42.19
49	42.19	-38.88

	50	-34.64	-28.47
	51	-17.43	-11.40
	52	-2.04	3.47
	53	12.78	18.73
	54	29.50	35.45
	55	39.44	-42.15
	56	-31.96	-31.96
	57	-14.35	-14.35
	58	0.83	0.83
	59	13.59	13.59
	60	23.93	23.93
	61	28.37	-31.66
	62	-24.93	-24.93
	63	-12.57	-12.57
	64	-0.20	-0.20
	65	12.16	12.16
	66	24.53	24.53
	67	31.25	-62.01
	68	-42.46	-9.32
	69	1.00	-0.44
	70	0.27	0.27
	71	0.27	0.27
	72	42.15	42.15

---

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

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

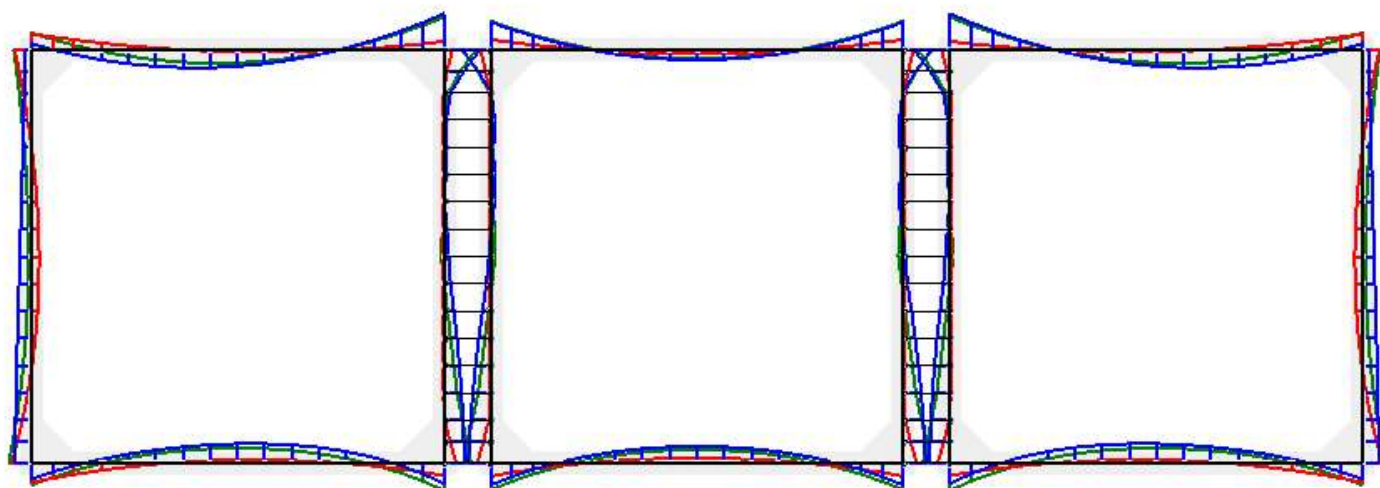
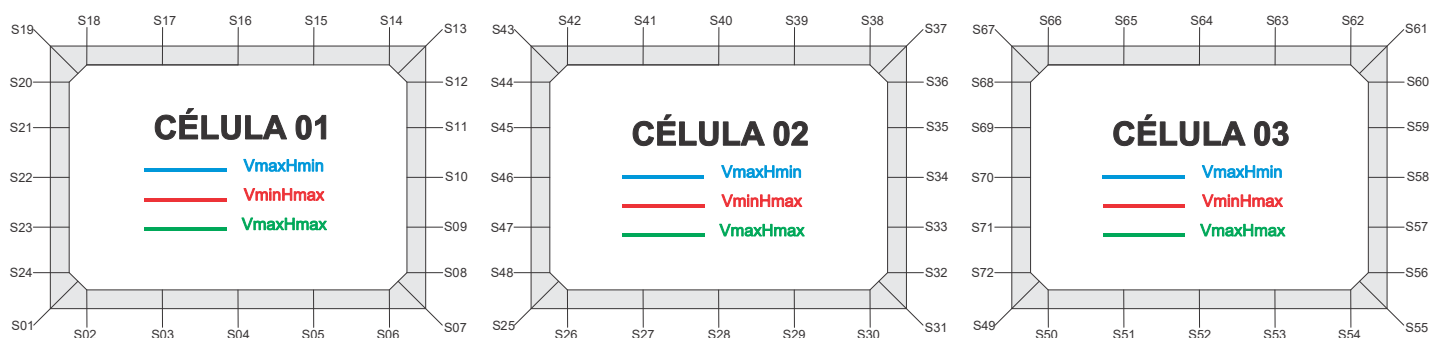
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	28.98	-47.68
2	-42.12	-34.67
3	-21.53	-14.72
4	-3.93	2.42
5	14.18	21.97
6	38.11	47.38
7	54.75	-28.98
8	-28.98	-28.98
9	-7.11	-7.11
10	-7.11	-7.11
11	-7.11	-7.11
12	19.97	66.76
13	87.71	-48.88
14	-39.38	-39.38
15	-21.71	-21.71
16	-4.04	-4.04
17	13.63	13.63
18	31.30	31.30
19	40.80	-18.04
20	-15.07	-15.07
21	-8.19	-8.19
22	0.32	0.32
23	10.44	10.44
24	22.18	22.18
25	28.98	-51.05
26	-44.73	-36.47
27	-21.76	-14.34
28	-2.68	3.88
29	15.51	22.91
30	37.46	45.58
31	51.72	-29.97
32	-29.97	-29.97
33	-15.11	-15.11
34	-15.11	7.13
35	7.13	-6.17
36	16.17	68.60
37	90.63	-45.13
38	-35.62	-35.62
39	-17.95	-17.95
40	-0.28	-0.28
41	17.39	17.39
42	35.06	35.06
43	44.56	-86.71
44	-65.76	-18.98
45	8.11	8.11
46	8.11	8.11
47	8.11	8.11
48	29.97	29.97
49	29.97	-55.14

	50	-47.93	-38.79
	51	-22.73	-14.92
	52	-3.05	3.37
	53	14.29	21.15
	54	34.36	41.83
	55	47.40	-28.98
	56	-22.19	-22.19
	57	-10.45	-10.45
	58	-0.33	-0.33
	59	8.18	8.18
	60	15.07	15.07
	61	18.03	-40.52
	62	-31.01	-31.01
	63	-13.35	-13.35
	64	4.32	4.32
	65	21.99	21.99
	66	39.66	39.66
	67	49.17	-91.62
	68	-69.59	-17.15
	69	5.18	-8.12
	70	-8.12	14.12
	71	14.12	14.12
	72	28.99	28.99

---

## 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	-23.23	23.23
2	4.11	4.11
3	-18.94	-18.94
4	-27.79	-27.79
5	-22.47	-22.47
6	3.61	3.61
7	29.38	29.38
8	27.62	27.62
9	18.81	18.81
10	7.16	7.16
11	2.68	2.68
12	9.85	9.85
13	52.15	-52.15
14	-27.42	-27.42
15	6.71	6.71
16	23.77	23.77
17	23.76	23.76
18	6.69	6.69
19	-9.11	-9.11
20	-10.01	-10.01
21	-12.73	-12.73
22	-16.17	-16.17
23	-19.62	-19.62
24	-22.34	-22.34
25	-23.23	32.04
26	9.32	9.32
27	-16.32	-16.32
28	-23.95	-23.95
29	-16.32	-16.32
30	9.33	9.33
31	32.05	32.05
32	28.76	28.76
33	17.02	17.02
34	2.38	2.38
35	-4.26	-4.26
36	-0.69	-0.69
37	40.07	-40.07
38	-19.81	-19.81
39	5.79	5.79
40	14.33	14.33
41	5.80	5.80
42	-19.80	-19.80
43	-40.07	-40.07
44	0.70	0.70
45	4.96	4.96
46	-2.45	-2.45
47	-17.02	-17.02
48	-28.75	-28.75
49	-32.04	29.38

	50	3.62	3.62
	51	-22.46	-22.46
	52	-27.79	-27.79
	53	-18.94	-18.94
	54	4.11	4.11
	55	23.23	23.23
	56	22.34	22.34
	57	19.61	19.61
	58	16.17	16.17
	59	12.73	12.73
	60	10.01	10.01
	61	9.11	-9.11
	62	6.69	6.69
	63	23.76	23.76
	64	23.77	23.77
	65	6.70	6.70
	66	-27.43	-27.43
	67	-52.16	-52.16
	68	-9.87	-9.87
	69	-3.37	-3.37
	70	-7.09	-7.09
	71	-18.82	-18.82
	72	-27.62	-27.62

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-28.09	28.09
2	16.57	16.57
3	1.54	1.54
4	-4.47	-4.47
5	-2.14	-2.14
6	8.67	8.67
7	17.85	17.85
8	1.34	1.34
9	-1.00	-1.00
10	-1.00	-1.00
11	-1.01	-1.01
12	-0.47	-0.47
13	12.37	-12.37
14	-5.79	-5.79
15	1.74	1.74
16	2.79	2.79
17	-2.66	-2.66
18	-14.59	-14.59
19	-23.47	-23.47
20	-11.23	-11.23
21	5.35	5.35
22	11.71	11.71
23	6.30	6.30
24	-12.44	-12.44
25	-28.09	19.15
26	8.98	8.98
27	-3.22	-3.22
28	-7.04	-7.04
29	-3.22	-3.22
30	8.98	8.98
31	19.15	19.15
32	2.75	2.75
33	0.63	0.63
34	0.90	0.90
35	1.17	1.17
36	1.86	1.86
37	14.80	-14.80
38	-7.07	-7.07
39	2.66	2.66
40	5.91	5.91
41	2.66	2.66
42	-7.07	-7.07
43	-14.80	-14.80
44	-1.84	-1.84
45	-1.08	-1.08
46	-0.86	-0.86
47	-0.64	-0.64
48	-2.75	-2.75
49	-19.15	17.85

	50	8.67	8.67
	51	-2.14	-2.14
	52	-4.47	-4.47
	53	1.54	1.54
	54	16.57	16.57
	55	28.09	28.09
	56	12.44	12.44
	57	-6.30	-6.30
	58	-11.71	-11.71
	59	-5.36	-5.36
	60	11.22	11.22
	61	23.47	-23.47
	62	-14.59	-14.59
	63	-2.66	-2.66
	64	2.79	2.79
	65	1.74	1.74
	66	-5.79	-5.79
	67	-12.37	-12.37
	68	0.46	0.46
	69	0.92	0.92
	70	0.97	0.97
	71	1.01	1.01
	72	-1.33	-1.33

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-31.96	31.96
2	10.92	10.92
3	-13.81	-13.81
4	-21.58	-21.58
5	-13.45	-13.45
6	14.45	14.45
7	39.17	39.17
8	26.90	26.90
9	9.85	9.85
10	-4.01	-4.01
11	1.66	1.66
12	6.12	6.12
13	46.74	-46.74
14	-24.20	-24.20
15	5.75	5.75
16	18.63	18.63
17	14.44	14.44
18	-6.81	-6.81
19	-24.80	-24.80
20	-17.06	-17.06
21	-6.81	-6.81
22	-3.38	-3.38
23	-7.80	-7.80
24	-21.10	-21.10
25	-31.96	38.80
26	15.77	15.77
27	-11.14	-11.14
28	-19.39	-19.39
29	-11.11	-11.11
30	15.84	15.84
31	38.88	38.88
32	26.12	26.12
33	7.86	7.86
34	-7.35	-7.35
35	-0.15	-0.15
36	1.59	1.59
37	41.64	-41.64
38	-21.37	-21.37
39	4.24	4.24
40	12.79	12.79
41	4.26	4.26
42	-21.33	-21.33
43	-41.59	-41.59
44	-1.46	-1.46
45	2.05	2.05
46	6.77	6.77
47	-8.04	-8.04
48	-26.04	-26.04
49	-38.80	39.24

	50	14.51	14.51
	51	-13.41	-13.41
	52	-21.56	-21.56
	53	-13.80	-13.80
	54	10.92	10.92
	55	31.95	31.95
	56	21.09	21.09
	57	7.79	7.79
	58	3.37	3.37
	59	6.80	6.80
	60	17.05	17.05
	61	24.78	-24.78
	62	-6.80	-6.80
	63	14.44	14.44
	64	18.62	18.62
	65	5.73	5.73
	66	-24.23	-24.23
	67	-46.78	-46.78
	68	-6.24	-6.24
	69	-3.55	-3.55
	70	4.60	4.60
	71	-9.66	-9.66
	72	-26.97	-26.97

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-23.16	23.16
2	3.58	3.58
3	-20.15	-20.15
4	-30.01	-30.01
5	-26.31	-26.31
6	-2.17	-2.17
7	22.84	22.84
8	21.29	21.29
9	12.90	12.90
10	1.56	1.56
11	0.48	0.48
12	4.64	4.64
13	49.06	-49.06
14	-24.86	-24.86
15	8.25	8.25
16	24.30	24.30
17	23.28	23.28
18	5.19	5.19
19	-11.14	-11.14
20	-11.81	-11.81
21	-14.12	-14.12
22	-17.15	-17.15
23	-20.17	-20.17
24	-22.48	-22.48
25	-23.16	31.31
26	8.33	8.33
27	-17.68	-17.68
28	-25.99	-25.99
29	-19.62	-19.62
30	4.50	4.50
31	26.67	26.67
32	23.52	23.52
33	12.04	12.04
34	-1.51	-1.51
35	-3.36	-3.36
36	-2.12	-2.12
37	38.69	-38.69
38	-18.76	-18.76
39	6.19	6.19
40	14.07	14.07
41	4.89	4.89
42	-21.36	-21.36
43	-41.97	-41.97
44	0.83	0.83
45	1.92	1.92
46	-2.25	-2.25
47	-16.68	-16.68
48	-28.15	-28.15
49	-31.31	28.84

	50	2.38	2.38
	51	-24.29	-24.29
	52	-30.21	-30.21
	53	-22.63	-22.63
	54	-1.55	-1.55
	55	16.55	16.55
	56	15.69	15.69
	57	13.04	13.04
	58	9.66	9.66
	59	6.28	6.28
	60	3.63	3.63
	61	2.76	-2.76
	62	12.12	12.12
	63	27.44	27.44
	64	25.69	25.69
	65	6.88	6.88
	66	-29.00	-29.00
	67	-54.65	-54.65
	68	-12.41	-12.41
	69	-8.44	-8.44
	70	-7.56	-7.56
	71	-18.37	-18.37
	72	-27.11	-27.11

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-28.07	28.07
2	16.56	16.56
3	1.54	1.54
4	-4.48	-4.48
5	-2.16	-2.16
6	8.66	8.66
7	17.85	17.85
8	1.11	1.11
9	-0.68	-0.68
10	-0.65	-0.65
11	-0.62	-0.62
12	-0.40	-0.40
13	12.52	-12.52
14	-5.93	-5.93
15	1.63	1.63
16	2.71	2.71
17	-2.71	-2.71
18	-14.62	-14.62
19	-23.48	-23.48
20	-11.24	-11.24
21	5.35	5.35
22	11.72	11.72
23	6.31	6.31
24	-12.42	-12.42
25	-28.07	19.08
26	8.86	8.86
27	-3.40	-3.40
28	-7.29	-7.29
29	-3.61	-3.61
30	8.39	8.39
31	18.47	18.47
32	1.91	1.91
33	0.30	0.30
34	0.51	0.51
35	0.72	0.72
36	1.06	1.06
37	14.18	-14.18
38	-6.52	-6.52
39	3.08	3.08
40	6.18	6.18
41	2.80	2.80
42	-7.07	-7.07
43	-14.87	-14.87
44	-1.84	-1.84
45	-1.40	-1.40
46	-1.15	-1.15
47	-0.90	-0.90
48	-2.46	-2.46
49	-19.08	17.49

	50	8.46	8.46
	51	-2.10	-2.10
	52	-4.16	-4.16
	53	2.21	2.21
	54	17.66	17.66
	55	29.38	29.38
	56	13.72	13.72
	57	-5.03	-5.03
	58	-10.47	-10.47
	59	-4.13	-4.13
	60	12.44	12.44
	61	24.67	-24.67
	62	-15.63	-15.63
	63	-3.37	-3.37
	64	2.39	2.39
	65	1.67	1.67
	66	-5.55	-5.55
	67	-11.95	-11.95
	68	1.03	1.03
	69	1.13	1.13
	70	1.09	1.09
	71	1.06	1.06
	72	-0.79	-0.79

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-32.15	32.15
2	10.82	10.82
3	-14.52	-14.52
4	-23.22	-23.22
5	-16.48	-16.48
6	9.89	9.89
7	34.09	34.09
8	21.92	21.92
9	6.67	6.67
10	-4.60	-4.60
11	0.26	0.26
12	2.95	2.95
13	44.93	-44.93
14	-22.69	-22.69
15	6.66	6.66
16	18.94	18.94
17	14.16	14.16
18	-7.69	-7.69
19	-25.99	-25.99
20	-18.14	-18.14
21	-7.70	-7.70
22	-4.07	-4.07
23	-8.30	-8.30
24	-21.40	-21.40
25	-32.15	37.70
26	14.57	14.57
27	-12.43	-12.43
28	-21.05	-21.05
29	-13.62	-13.62
30	12.30	12.30
31	35.01	35.01
32	22.19	22.19
33	5.74	5.74
34	-6.70	-6.70
35	-0.43	-0.43
36	0.07	0.07
37	40.69	-40.69
38	-20.58	-20.58
39	4.72	4.72
40	12.95	12.95
41	4.11	4.11
42	-21.79	-21.79
43	-42.22	-42.22
44	-0.90	-0.90
45	0.54	0.54
46	4.15	4.15
47	-8.37	-8.37
48	-24.88	-24.88
49	-37.70	38.02

	50	12.94	12.94
	51	-14.97	-14.97
	52	-23.01	-23.01
	53	-15.53	-15.53
	54	8.38	8.38
	55	28.86	28.86
	56	17.89	17.89
	57	4.38	4.38
	58	-0.24	-0.24
	59	2.98	2.98
	60	13.01	13.01
	61	20.64	-20.64
	62	-3.21	-3.21
	63	16.98	16.98
	64	20.10	20.10
	65	6.15	6.15
	66	-24.86	-24.86
	67	-47.96	-47.96
	68	-6.90	-6.90
	69	-5.55	-5.55
	70	1.56	1.56
	71	-10.04	-10.04
	72	-25.65	-25.65

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.72	19.72
2	6.06	6.06
3	-9.88	-9.88
4	-14.80	-14.80
5	-9.37	-9.37
6	9.13	9.13
7	25.60	25.60
8	18.53	18.53
9	7.26	7.26
10	-2.89	-2.89
11	1.28	1.28
12	4.29	4.29
13	30.64	-30.64
14	-15.92	-15.92
15	3.78	3.78
16	12.54	12.54
17	10.35	10.35
18	-2.79	-2.79
19	-14.07	-14.07
20	-10.49	-10.49
21	-5.50	-5.50
22	-3.73	-3.73
23	-6.09	-6.09
24	-13.51	-13.51
25	-19.72	25.25
26	10.07	10.07
27	-7.64	-7.64
28	-13.04	-13.04
29	-7.61	-7.61
30	10.12	10.12
31	25.31	25.31
32	17.87	17.87
33	5.72	5.72
34	-5.42	-5.42
35	-0.16	-0.16
36	0.87	0.87
37	26.80	-26.80
38	-13.79	-13.79
39	2.64	2.64
40	8.12	8.12
41	2.65	2.65
42	-13.76	-13.76
43	-26.76	-26.76
44	-0.77	-0.77
45	1.54	1.54
46	5.00	5.00
47	-5.85	-5.85
48	-17.81	-17.81
49	-25.25	25.66

	50	9.18	9.18
	51	-9.34	-9.34
	52	-14.79	-14.79
	53	-9.88	-9.88
	54	6.05	6.05
	55	19.71	19.71
	56	13.50	13.50
	57	6.09	6.09
	58	3.72	3.72
	59	5.49	5.49
	60	10.48	10.48
	61	14.07	-14.07
	62	-2.78	-2.78
	63	10.35	10.35
	64	12.53	12.53
	65	3.77	3.77
	66	-15.94	-15.94
	67	-30.67	-30.67
	68	-4.37	-4.37
	69	-2.64	-2.64
	70	3.31	3.31
	71	-7.12	-7.12
	72	-18.59	-18.59

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-21.69	21.69
2	11.21	11.21
3	-1.76	-1.76
4	-6.23	-6.23
5	-2.83	-2.83
6	9.06	9.06
7	19.04	19.04
8	6.63	6.63
9	-0.33	-0.33
10	-0.27	-0.27
11	-0.22	-0.22
12	0.84	0.84
13	15.01	-15.01
14	-7.51	-7.51
15	1.80	1.80
16	4.62	4.62
17	0.94	0.94
18	-9.22	-9.22
19	-17.17	-17.17
20	-9.10	-9.10
21	1.90	1.90
22	6.10	6.10
23	2.28	2.28
24	-10.77	-10.77
25	-21.69	19.39
26	9.21	9.21
27	-3.04	-3.04
28	-6.88	-6.88
29	-3.04	-3.04
30	9.21	9.21
31	19.39	19.39
32	6.99	6.99
33	0.05	0.05
34	0.17	0.17
35	0.29	0.29
36	1.31	1.31
37	15.48	-15.48
38	-7.75	-7.75
39	1.99	1.99
40	5.23	5.23
41	1.99	1.99
42	-7.75	-7.75
43	-15.48	-15.48
44	-1.30	-1.30
45	-0.21	-0.21
46	-0.14	-0.14
47	-0.06	-0.06
48	-6.99	-6.99
49	-19.39	19.04

	50	9.06	9.06
	51	-2.83	-2.83
	52	-6.23	-6.23
	53	-1.76	-1.76
	54	11.21	11.21
	55	21.69	21.69
	56	10.77	10.77
	57	-2.28	-2.28
	58	-6.10	-6.10
	59	-1.90	-1.90
	60	9.10	9.10
	61	17.17	-17.17
	62	-9.22	-9.22
	63	0.94	0.94
	64	4.62	4.62
	65	1.80	1.80
	66	-7.51	-7.51
	67	-15.01	-15.01
	68	-0.85	-0.85
	69	0.14	0.14
	70	0.24	0.24
	71	0.34	0.34
	72	-6.63	-6.63

---

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

-----

MOMENTO FLETOR NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-21.55	21.55
2	7.58	7.58
3	-8.88	-8.88
4	-14.06	-14.06
5	-8.69	-8.69
6	9.71	9.71
7	25.98	25.98
8	17.46	17.46
9	6.20	6.20
10	-2.54	-2.54
11	1.04	1.04
12	3.88	3.88
13	29.89	-29.89
14	-15.47	-15.47
15	3.67	3.67
16	11.86	11.86
17	9.11	9.11
18	-4.60	-4.60
19	-16.18	-16.18
20	-11.04	-11.04
21	-4.18	-4.18
22	-1.85	-1.85
23	-4.86	-4.86
24	-14.02	-14.02
25	-21.55	25.77
26	10.56	10.56
27	-7.24	-7.24
28	-12.70	-12.70
29	-7.22	-7.22
30	10.60	10.60
31	25.82	25.82
32	16.99	16.99
33	4.97	4.97
34	-4.63	-4.63
35	-0.08	-0.08
36	1.04	1.04
37	26.70	-26.70
38	-13.69	-13.69
39	2.74	2.74
40	8.22	8.22
41	2.75	2.75
42	-13.66	-13.66
43	-26.66	-26.66
44	-0.96	-0.96
45	1.28	1.28
46	4.26	4.26
47	-5.08	-5.08
48	-16.93	-16.93
49	-25.77	26.02

	50	9.75	9.75
	51	-8.66	-8.66
	52	-14.05	-14.05
	53	-8.87	-8.87
	54	7.57	7.57
	55	21.54	21.54
	56	14.02	14.02
	57	4.85	4.85
	58	1.84	1.84
	59	4.17	4.17
	60	11.04	11.04
	61	16.17	-16.17
	62	-4.59	-4.59
	63	9.10	9.10
	64	11.85	11.85
	65	3.66	3.66
	66	-15.49	-15.49
	67	-29.92	-29.92
	68	-3.95	-3.95
	69	-2.23	-2.23
	70	2.92	2.92
	71	-6.08	-6.08
	72	-17.50	-17.50

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-15.80	15.80
2	6.27	6.27
3	-5.14	-5.14
4	-8.92	-8.92
5	-5.59	-5.59
6	6.34	6.34
7	16.89	16.89
8	9.87	9.87
9	3.83	3.83
10	1.49	1.49
11	-0.86	-0.86
12	2.38	2.38
13	17.18	-17.18
14	-8.78	-8.78
15	2.26	2.26
16	6.80	6.80
17	4.84	4.84
18	-3.60	-3.60
19	-10.64	-10.64
20	-7.01	-7.01
21	-1.92	-1.92
22	-0.06	-0.06
23	-2.32	-2.32
24	-9.64	-9.64
25	-15.80	16.87
26	6.85	6.85
27	-4.82	-4.82
28	-8.27	-8.27
29	-4.43	-4.43
30	7.60	7.60
31	17.75	17.75
32	10.55	10.55
33	2.65	2.65
34	-2.34	-2.34
35	0.03	0.03
36	0.75	0.75
37	15.96	-15.96
38	-8.19	-8.19
39	1.64	1.64
40	4.98	4.98
41	1.83	1.83
42	-7.82	-7.82
43	-15.49	-15.49
44	-0.87	-0.87
45	2.04	2.04
46	-0.64	-0.64
47	-3.31	-3.31
48	-9.68	-9.68
49	-16.87	17.66

	50	7.03	7.03
	51	-5.14	-5.14
	52	-8.69	-8.69
	53	-5.08	-5.08
	54	6.22	6.22
	55	15.70	15.70
	56	9.54	9.54
	57	2.22	2.22
	58	-0.05	-0.05
	59	1.81	1.81
	60	6.89	6.89
	61	10.53	-10.53
	62	-3.53	-3.53
	63	4.82	4.82
	64	6.68	6.68
	65	2.04	2.04
	66	-9.08	-9.08
	67	-17.53	-17.53
	68	-2.15	-2.15
	69	-1.10	-1.10
	70	1.59	1.59
	71	-3.06	-3.06
	72	-10.64	-10.64

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-18.20	18.20
2	6.10	6.10
3	-8.09	-8.09
4	-12.52	-12.52
5	-7.79	-7.79
6	8.34	8.34
7	22.61	22.61
8	15.56	15.56
9	5.72	5.72
10	-2.31	-2.31
11	0.99	0.99
12	3.47	3.47
13	25.67	-25.67
14	-13.31	-13.31
15	3.16	3.16
16	10.35	10.35
17	8.27	8.27
18	-3.09	-3.09
19	-12.77	-12.77
20	-9.16	-9.16
21	-4.13	-4.13
22	-2.32	-2.32
23	-4.64	-4.64
24	-12.01	-12.01
25	-18.20	22.37
26	9.10	9.10
27	-6.43	-6.43
28	-11.18	-11.18
29	-6.41	-6.41
30	9.14	9.14
31	22.42	22.42
32	15.08	15.08
33	4.54	4.54
34	-4.28	-4.28
35	-0.11	-0.11
36	0.81	0.81
37	22.67	-22.67
38	-11.64	-11.64
39	2.28	2.28
40	6.92	6.92
41	2.29	2.29
42	-11.62	-11.62
43	-22.64	-22.64
44	-0.73	-0.73
45	1.20	1.20
46	3.94	3.94
47	-4.64	-4.64
48	-15.04	-15.04
49	-22.37	22.65

	50	8.38	8.38
	51	-7.76	-7.76
	52	-12.51	-12.51
	53	-8.09	-8.09
	54	6.10	6.10
	55	18.19	18.19
	56	12.01	12.01
	57	4.63	4.63
	58	2.31	2.31
	59	4.12	4.12
	60	9.15	9.15
	61	12.76	-12.76
	62	-3.08	-3.08
	63	8.27	8.27
	64	10.35	10.35
	65	3.15	3.15
	66	-13.33	-13.33
	67	-25.70	-25.70
	68	-3.54	-3.54
	69	-2.07	-2.07
	70	2.65	2.65
	71	-5.61	-5.61
	72	-15.61	-15.61

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-20.61	20.61
2	10.31	10.31
3	-2.33	-2.33
4	-6.58	-6.58
5	-3.07	-3.07
6	8.94	8.94
7	19.05	19.05
8	7.45	7.45
9	0.02	0.02
10	-0.08	-0.08
11	-0.17	-0.17
12	1.10	1.10
13	15.45	-15.45
14	-7.78	-7.78
15	1.84	1.84
16	4.98	4.98
17	1.63	1.63
18	-8.22	-8.22
19	-16.00	-16.00
20	-8.79	-8.79
21	1.16	1.16
22	5.06	5.06
23	1.62	1.62
24	-10.43	-10.43
25	-20.61	19.26
26	9.09	9.09
27	-3.13	-3.13
28	-6.96	-6.96
29	-3.12	-3.12
30	9.10	9.10
31	19.28	19.28
32	7.68	7.68
33	0.19	0.19
34	0.02	0.02
35	0.11	0.11
36	1.22	1.22
37	15.57	-15.57
38	-7.85	-7.85
39	1.89	1.89
40	5.14	5.14
41	1.89	1.89
42	-7.84	-7.84
43	-15.56	-15.56
44	-1.22	-1.22
45	0.03	0.03
46	-0.09	-0.09
47	-0.20	-0.20
48	-7.66	-7.66
49	-19.26	19.06

	50	8.95	8.95
	51	-3.07	-3.07
	52	-6.58	-6.58
	53	-2.33	-2.33
	54	10.31	10.31
	55	20.61	20.61
	56	10.43	10.43
	57	-1.62	-1.62
	58	-5.06	-5.06
	59	-1.17	-1.17
	60	8.79	8.79
	61	16.00	-16.00
	62	-8.21	-8.21
	63	1.63	1.63
	64	4.98	4.98
	65	1.84	1.84
	66	-7.79	-7.79
	67	-15.46	-15.46
	68	-1.10	-1.10
	69	0.04	0.04
	70	0.14	0.14
	71	0.00	0.00
	72	-7.47	-7.47

---

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

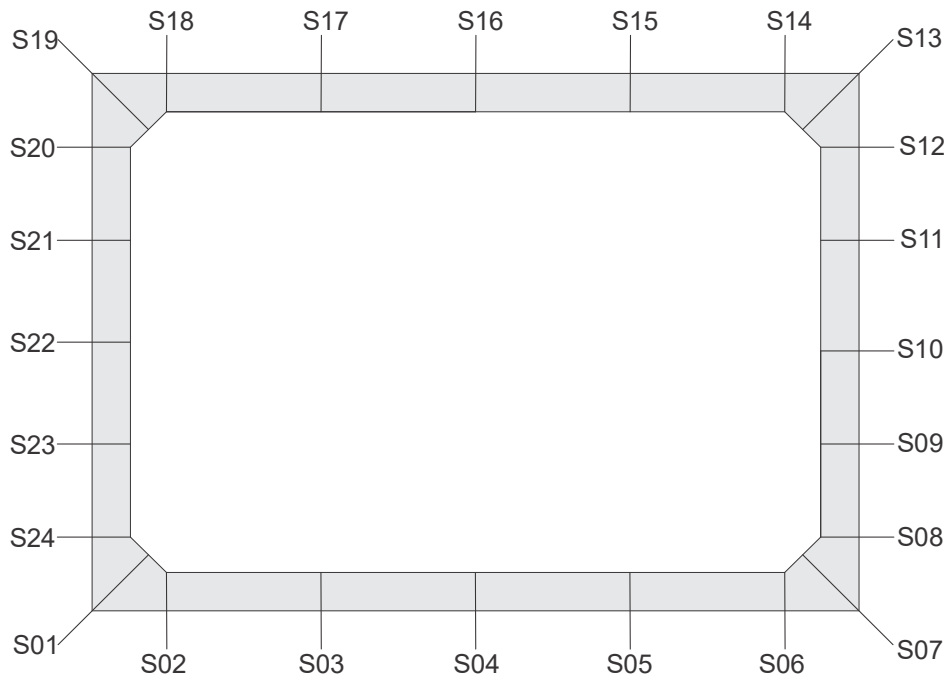
-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.56	19.56
2	7.21	7.21
3	-7.50	-7.50
4	-12.38	-12.38
5	-8.07	-8.07
6	7.63	7.63
7	21.67	21.67
8	13.70	13.70
9	6.14	6.14
10	2.40	2.40
11	-1.33	-1.33
12	3.63	3.63
13	24.87	-24.87
14	-12.73	-12.73
15	3.30	3.30
16	10.06	10.06
17	7.55	7.55
18	-4.24	-4.24
19	-14.16	-14.16
20	-9.59	-9.59
21	-3.42	-3.42
22	-1.28	-1.28
23	-4.04	-4.04
24	-12.53	-12.53
25	-19.56	21.57
26	8.40	8.40
27	-6.83	-6.83
28	-11.27	-11.27
29	-6.20	-6.20
30	9.59	9.59
31	22.97	22.97
32	14.73	14.73
33	4.19	4.19
34	-3.74	-3.74
35	0.01	0.01
36	0.99	0.99
37	22.88	-22.88
38	-11.78	-11.78
39	2.28	2.28
40	7.07	7.07
41	2.58	2.58
42	-11.19	-11.19
43	-22.13	-22.13
44	-1.17	-1.17
45	3.27	3.27
46	-0.99	-0.99
47	-5.25	-5.25
48	-13.33	-13.33
49	-21.57	22.90

	50	8.73	8.73
	51	-7.35	-7.35
	52	-12.02	-12.02
	53	-7.40	-7.40
	54	7.12	7.12
	55	19.39	19.39
	56	12.36	12.36
	57	3.87	3.87
	58	1.11	1.11
	59	3.24	3.24
	60	9.41	9.41
	61	13.97	-13.97
	62	-4.14	-4.14
	63	7.51	7.51
	64	9.87	9.87
	65	2.97	2.97
	66	-13.22	-13.22
	67	-25.43	-25.43
	68	-3.26	-3.26
	69	-1.77	-1.77
	70	2.50	2.50
	71	-4.92	-4.92
	72	-14.93	-14.93

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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	5.47	6.57	1.26	1.26
2	2.98	3.58	2.32	2.79
3	2.32	2.79	3.43	4.12
4	2.32	2.79	5.16	6.19
5	2.32	2.79	4.11	4.93
6	2.58	3.10	2.32	2.79
7	5.47	6.57	1.26	1.26
8	4.47	5.36	2.32	2.79
9	2.79	3.35	2.32	2.79
10	2.32	2.79	2.32	2.79
11	2.32	2.79	2.32	2.79
12	2.32	2.79	2.32	2.79
13	5.47	6.57	1.26	1.26
14	5.18	6.21	2.32	2.79
15	2.32	2.79	2.32	2.79
16	2.32	2.79	4.46	5.35
17	2.32	2.79	4.46	5.35
18	2.70	3.25	2.32	2.79
19	5.47	6.57	1.26	1.26
20	2.41	2.90	2.32	2.79
21	2.32	2.79	2.32	2.79
22	2.32	2.79	2.32	2.79
23	2.79	3.35	2.32	2.79
24	3.27	3.93	2.32	2.79

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	-59.33	3.88	-35.20	2.38	10.18	0.00
13	-58.05	29.89	-14.22	17.18	52.50	0.00
14	-20.39	15.47	-14.22	8.78	99.61	0.00
16	-14.04	12.54	-31.93	4.62	161.37	0.00
18	-20.39	4.60	-14.22	3.60	12.10	0.00
19	-47.70	16.18	-14.22	10.64	15.18	0.00
20	-48.98	11.04	-30.27	7.01	52.13	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	23.08	2.90	2.03	1.56	0.39
2	30.00	23.08	2.90	2.03	1.56	0.39
6	30.00	23.08	2.90	2.03	1.56	0.39
7	30.00	23.08	2.90	2.03	1.56	0.39
13	30.00	23.08	2.90	2.03	1.56	0.39
14	30.00	23.08	2.90	2.03	1.56	0.39
18	30.00	23.08	2.90	2.03	1.56	0.39
19	30.00	23.08	2.90	2.03	1.56	0.39

Seção	As(cm <sup>2</sup> /m)	ro	vsd(kN)	vrd1(kN)	vrd2(kN)	Asw(cm <sup>2</sup> /m/m)
1	6.57	2.12E-003	74.80	191.74	0.00	0.00
2	3.58	3.26E-003	69.75	77.90	0.00	0.00
6	3.10	2.82E-003	77.37	76.79	571.15	0.00
7	6.57	2.12E-003	86.12	185.68	0.00	0.00
13	6.57	2.12E-003	103.51	187.48	0.00	0.00
14	6.21	5.65E-003	49.77	85.78	0.00	0.00
18	3.25	2.95E-003	53.10	78.88	0.00	0.00
19	6.57	2.12E-003	61.77	190.33	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	6.57	-12.82	18.20	6.30	0.011
2	3.58	-25.63	6.10	6.30	0.024
3	4.12	-25.63	8.09	6.30	0.034
4	6.19	-25.63	12.52	6.30	0.040
5	4.93	-25.63	7.79	6.30	0.022
6	3.10	-25.63	8.34	6.30	0.065
7	6.57	-42.89	22.61	6.30	0.014
8	5.36	-58.87	15.56	6.30	0.072
9	3.35	-56.90	5.72	6.30	0.014
10	2.79	-54.93	2.31	6.30	0.000
11	2.79	-52.96	0.99	6.30	0.000
12	2.79	-50.99	3.47	6.30	0.004
13	6.57	-31.91	25.67	6.30	0.020
14	6.21	-14.12	13.31	6.30	0.048
15	2.79	-14.12	3.16	8.00	0.013
16	5.35	-14.12	10.35	8.00	0.049
17	5.35	-14.12	8.27	8.00	0.030
18	3.25	-14.12	3.09	6.30	0.007
19	6.57	-27.05	12.77	6.30	0.004
20	2.90	-41.26	9.16	6.30	0.080
21	2.79	-43.22	4.13	6.30	0.010
22	2.79	-45.19	2.32	6.30	0.001
23	3.35	-47.16	4.64	6.30	0.009
24	3.93	-49.13	12.01	6.30	0.078

VminHmax

Seção	As (cm <sup>2</sup> /m)	Nsd (kN)	Msd (kN.m)	Ø (mm)	w (mm)
1	6.57	-21.08	20.61	6.30	0.014
2	3.58	-42.15	10.31	6.30	0.069
3	4.12	-42.15	2.33	6.30	0.001
4	6.19	-42.15	6.58	6.30	0.008
5	4.93	-42.15	3.07	6.30	0.001
6	3.10	-42.15	8.94	6.30	0.066
7	6.57	-41.92	19.05	6.30	0.009
8	5.36	-40.40	7.45	6.30	0.014
9	3.35	-38.44	0.02	6.30	0.000
10	2.79	-36.47	0.08	6.30	0.000
11	2.79	-34.50	0.17	6.30	0.000
12	2.79	-32.53	1.10	6.30	0.000
13	6.57	-29.81	15.45	6.30	0.006
14	6.21	-28.37	7.78	6.30	0.014
15	2.79	-28.37	1.84	8.00	0.001
16	5.35	-28.37	4.98	8.00	0.008
17	5.35	-28.37	1.63	8.00	0.000
18	3.25	-28.37	8.22	6.30	0.056
19	6.57	-30.02	16.00	6.30	0.007
20	2.90	-32.94	8.79	6.30	0.079
21	2.79	-34.91	1.16	6.30	0.000
22	2.79	-36.88	5.06	6.30	0.021
23	3.35	-38.85	1.62	6.30	0.000
24	3.93	-40.82	10.43	6.30	0.059

## VERIFICAÇÃO DA FISSURAÇÃO (CONT.)

VmaxHmax

Seção	As(cm <sup>2</sup> /m)	Nsd(kN)	Msd(kN.m)	Ø(mm)	w(mm)
1	6.57	-14.49	19.56	6.30	0.013
2	3.58	-28.98	7.21	6.30	0.034
3	4.12	-28.98	7.50	6.30	0.028
4	6.19	-28.98	12.38	6.30	0.038
5	4.93	-28.98	8.07	6.30	0.023
6	3.10	-28.98	7.63	6.30	0.051
7	6.57	-44.15	21.67	6.30	0.012
8	5.36	-58.04	13.70	6.30	0.054
9	3.35	-56.07	6.14	6.30	0.018
10	2.79	-54.10	2.40	6.30	0.000
11	2.79	-52.13	1.33	6.30	0.000
12	2.79	-50.17	3.63	6.30	0.005
13	6.57	-33.46	24.87	6.30	0.019
14	6.21	-18.04	12.73	6.30	0.043
15	2.79	-18.04	3.30	8.00	0.013
16	5.35	-18.04	10.06	8.00	0.045
17	5.35	-18.04	7.55	8.00	0.024
18	3.25	-18.04	4.24	6.30	0.014
19	6.57	-29.42	14.16	6.30	0.005
20	2.90	-42.08	9.59	6.30	0.089
21	2.79	-44.05	3.42	6.30	0.005
22	2.79	-46.02	1.28	6.30	0.000
23	3.35	-47.99	4.04	6.30	0.006
24	3.93	-49.96	12.53	6.30	0.085

NOTA:

\* Seção com aumento na armadura devido à fissuração.