



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

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

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



ASSOCIAÇÃO BRASILEIRA  
DOS FABRICANTES DE  
TUBOS DE CONCRETO

### DADOS DO FABRICANTE



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

### DADOS DO CLIENTE



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

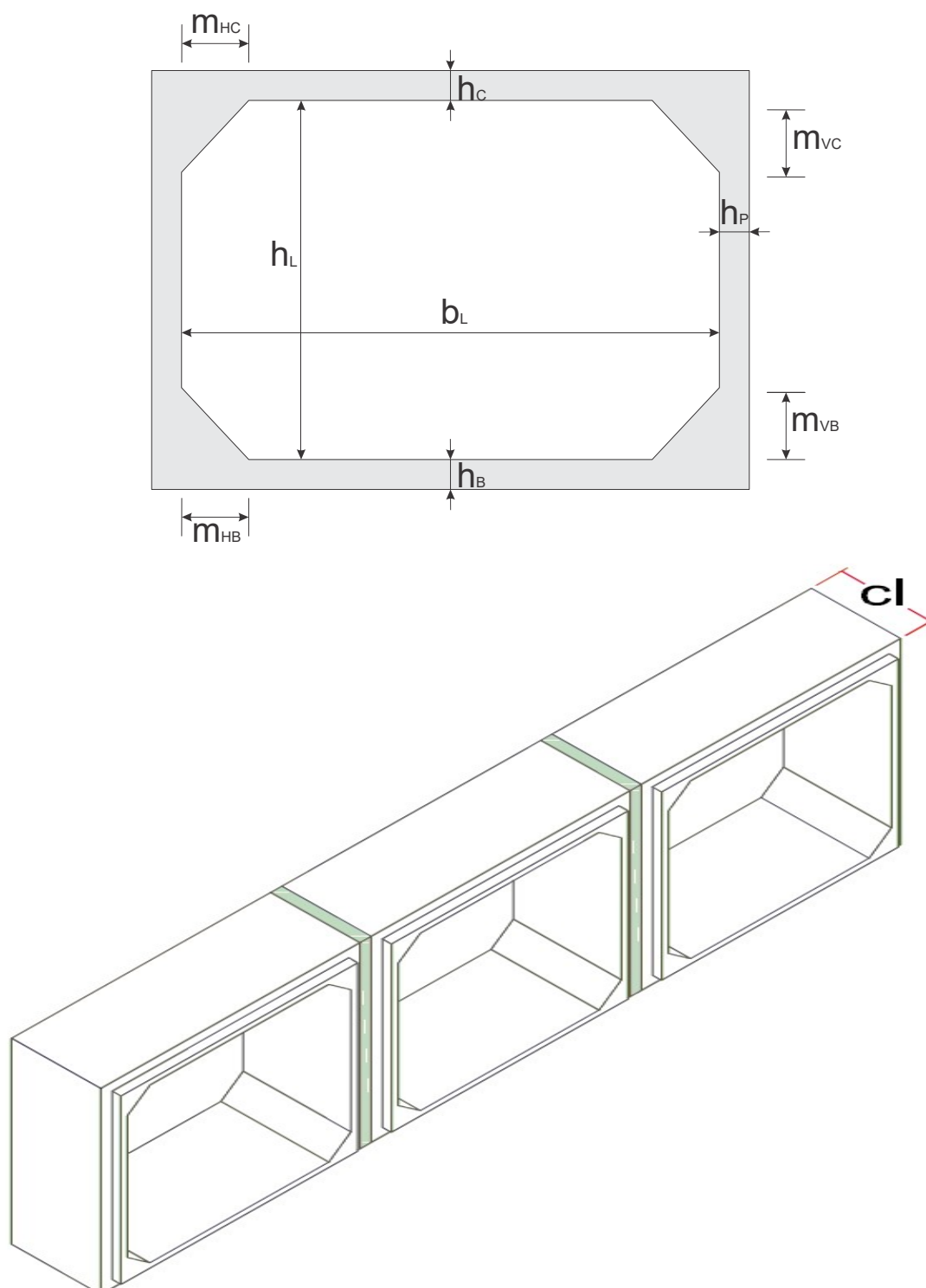
### DADOS DA OBRA



NOME: ADUELA 1,50 X 1,50 M PARA ATERRO DE 0,50 M - LINHA TRIPLA  
ENDEREÇO: ,  
BAIRRO:  
CIDADE:  
ESTADO: Não Informado  
CEP:  
TEL.:  
CEL.:  
E-MAIL:  
SITE:

## GEOMETRIA

SEÇÃO CONSTANTE.....	: SIM
FINALIDADE.....	: ÁGUAS PLUVIAIS
COMPRIMENTO ( $c_l$ ).....	: 1.00 m
LARGURA LIVRE ( $b_l$ ).....	: 1.50 m
ALTURA LIVRE ( $h_l$ ).....	: 1.50 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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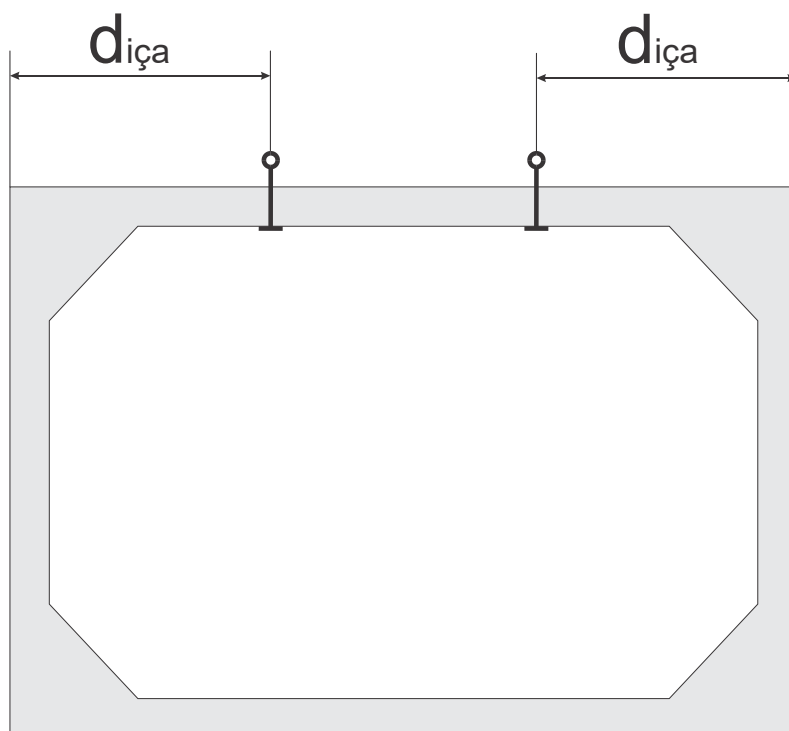
### DADOS DE INSTALAÇÃO

ALTURA DE TERRA.....	: 0.20 m
ESPESSURA DO PAVIMENTO.....	: 0.30 m
EFEITO DO ARQUEAMENTO.....	: NÃO CONSIDERADO
TIPO DE INSTALAÇÃO.....	: ---
LARGURA DA VALA.....	: ---
0.80 x Ka x COEFICIENTE DE ATRITO.....	: 0.15
RAZÃO DE RECALQUE.....	: ---

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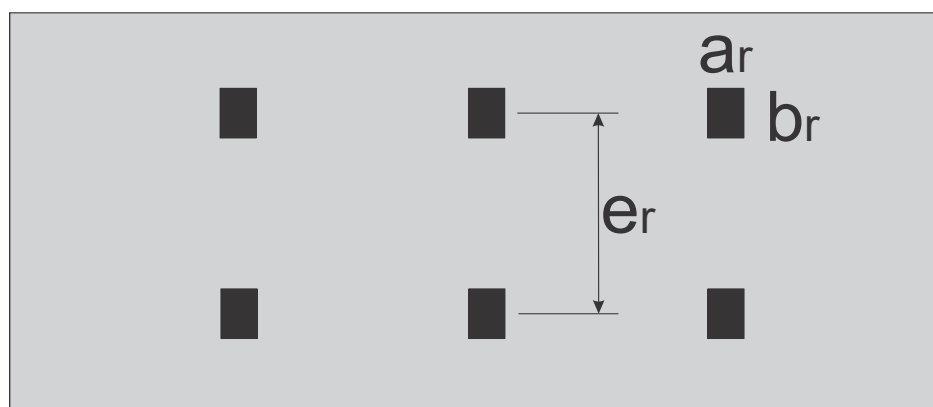
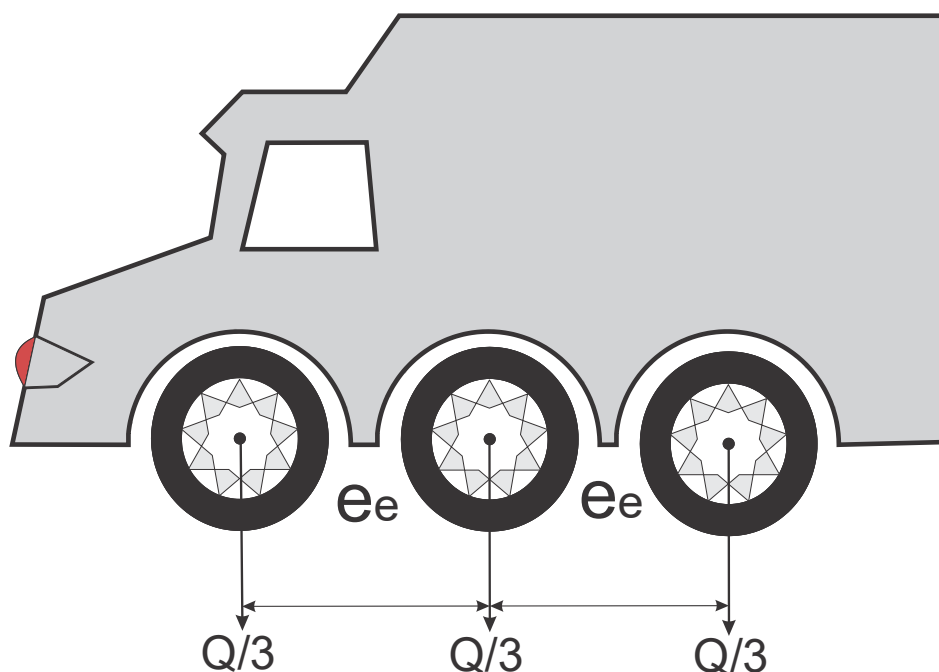
### INFORMAÇÕES DE MANUSEIO

RESISTÊNCIA DO CONCRETO (fcj).....	: 20.00 MPa
COEFICIENTE DE IMPACTO.....	: 1.20
DISTÂNCIA DE IÇAMENTO.....	: 50.00 cm



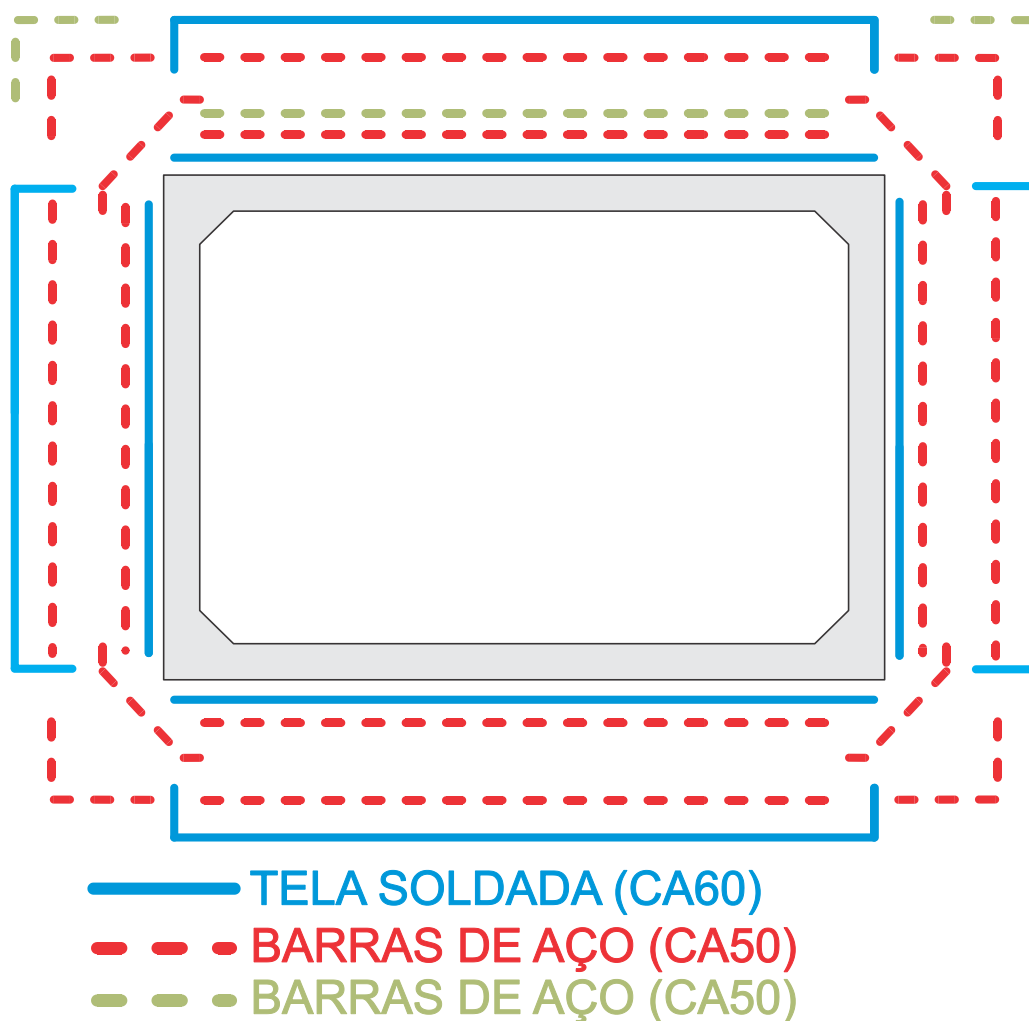
## SOBRECARGA

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.....: 1.58



## 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:

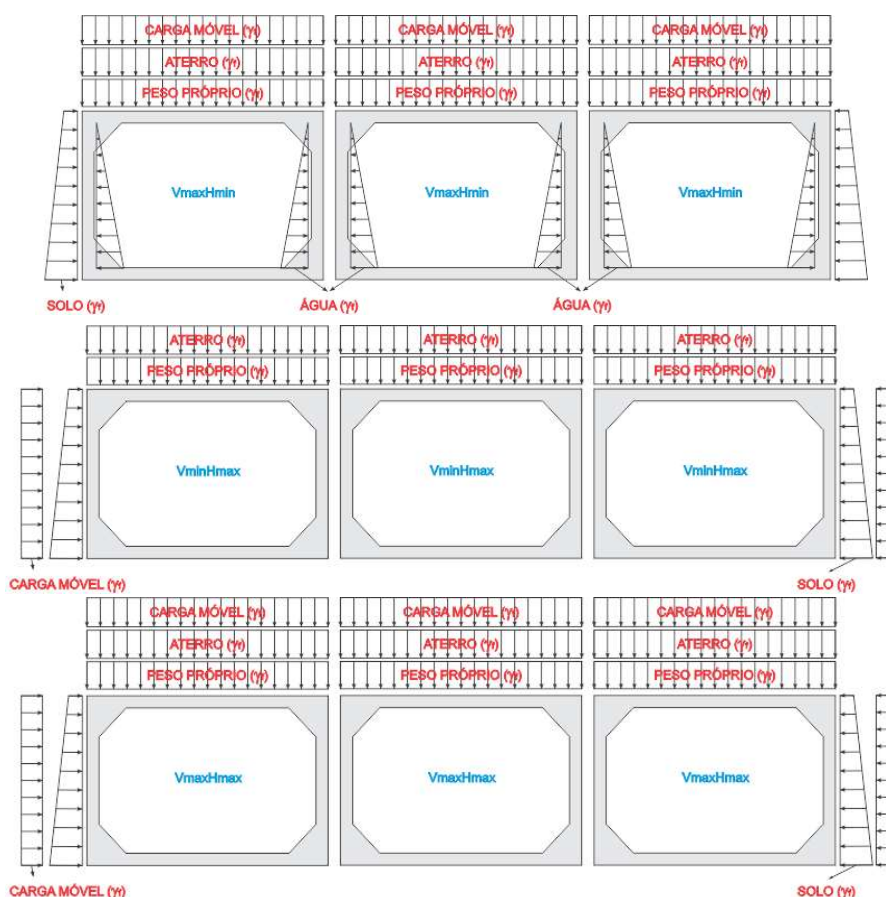
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL V.:	1.50
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.35
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.30
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.00
COEFICIENTE DE PONDERAÇÃO ÁGUA.....	1.20

- VminHmax:

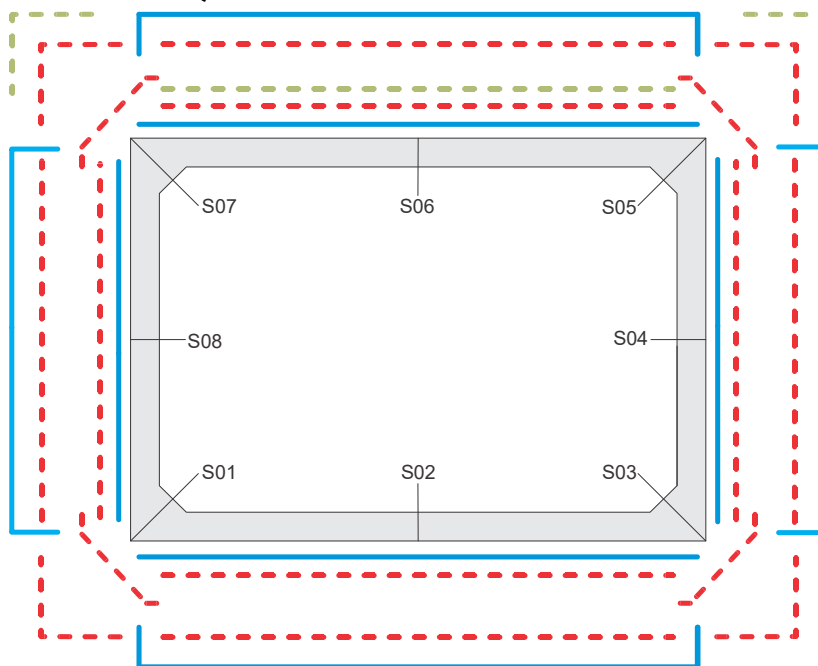
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.00
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.00
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.35
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL H.:	1.50

- 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



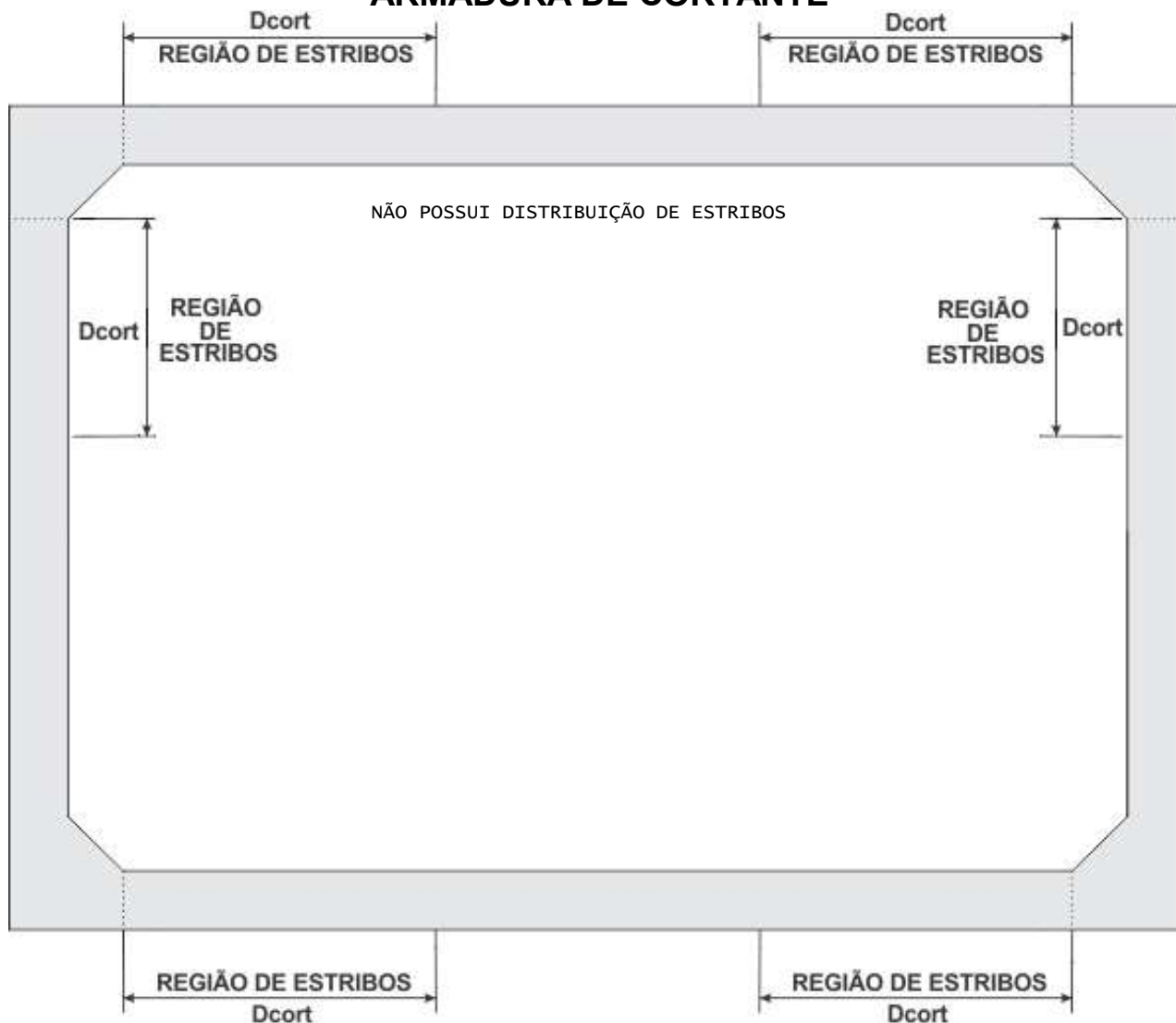
- TELA SOLDADA (CA60) ARMADURA BÁSICA  
 - - - BARRAS DE AÇO (CA50) ARMADURA COMPLEMENTAR  
 - - - BARRAS DE AÇO (CA50) ARMADURA DE FADIGA

OBS.: VALORES POR METRO DE ADUELA.

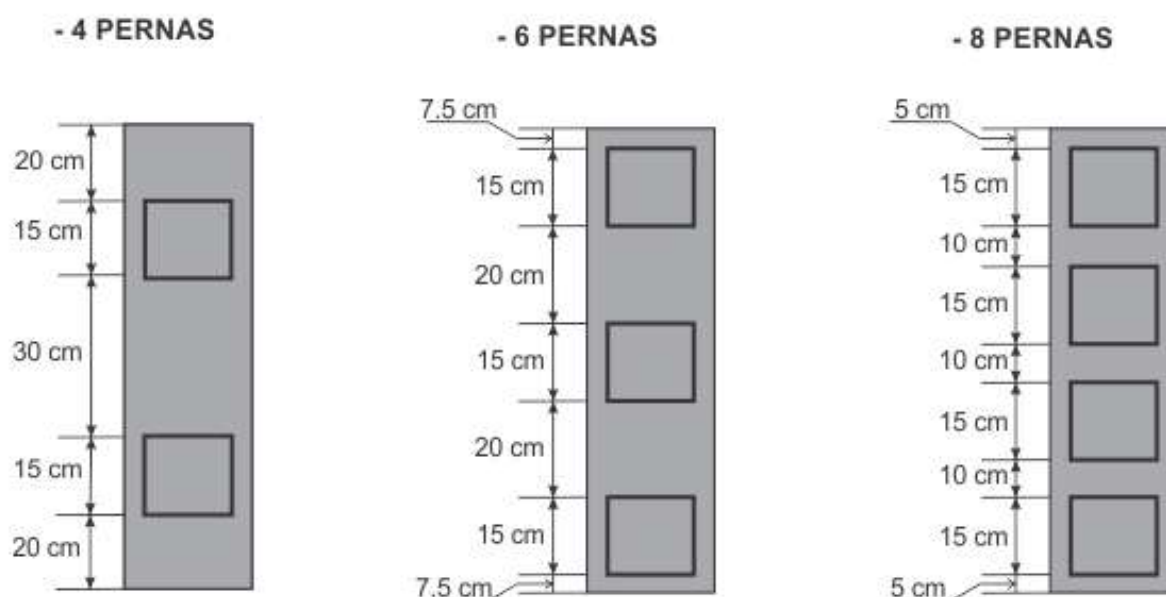
	TELA	ARMADURA COMPLEMENTAR	ARMADURA DE FADIGA
LADO EXTERNO	T-S02: L283	B-S01: 0.22 cm <sup>2</sup> de área acima	B-S05: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 0.61 cm <sup>2</sup> de área acima	B-S07: 0.00 cm <sup>2</sup> de área acima
	T-S06: L283	B-S03: 0.22 cm <sup>2</sup> de área acima	
	T-S08: L283	B-S04: 4 Ø6.30 c/ 31 cm (71.18%) 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: 4 Ø6.30 c/ 31 cm (71.18%)	
LADO INTERNO	T-S02: L283	B-S01: 4 Ø6.30 c/ 31 cm ( 0.00%)	B-S06: 4 Ø6.30 c/ 31 cm (27.37%)
	T-S04: L283	B-S02: 7 Ø6.30 c/ 15 cm ( 0.43%)	
	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: 6 Ø6.30 c/ 18 cm ( 3.05%) 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:

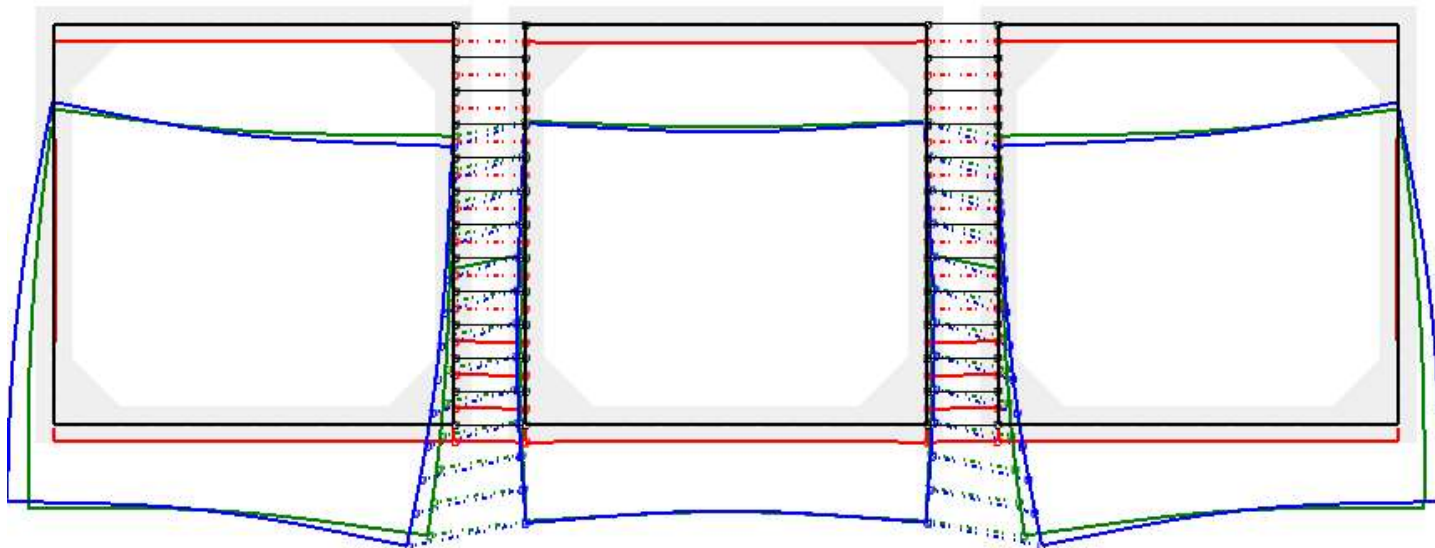
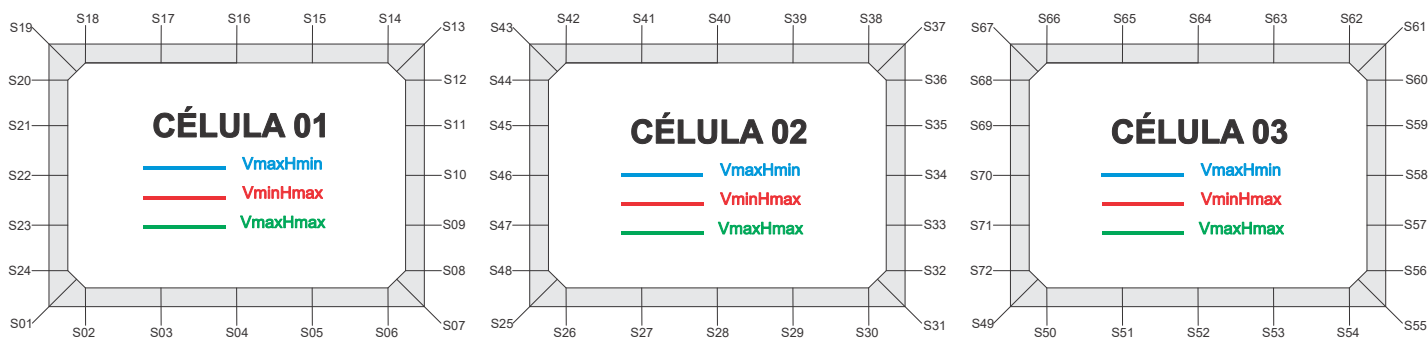


### OBSERVAÇÃO:

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	-2.92E-003	-4.84E-003
2	-2.92E-003	-4.93E-003
3	-2.92E-003	-5.07E-003
4	-2.92E-003	-5.41E-003
5	-2.92E-003	-5.99E-003
6	-2.92E-003	-6.78E-003
7	-2.92E-003	-7.63E-003
8	-2.09E-003	-7.63E-003
9	-1.39E-003	-7.64E-003
10	-8.72E-004	-7.65E-003
11	-5.13E-004	-7.66E-003
12	-2.70E-004	-7.67E-003
13	-8.47E-005	-7.67E-003
14	-8.48E-005	-7.51E-003
15	-8.49E-005	-7.33E-003
16	-8.51E-005	-7.01E-003
17	-8.52E-005	-6.46E-003
18	-8.54E-005	-5.70E-003
19	-8.54E-005	-4.87E-003
20	-9.06E-004	-4.87E-003
21	-1.64E-003	-4.86E-003
22	-2.20E-003	-4.86E-003
23	-2.60E-003	-4.85E-003
24	-2.82E-003	-4.84E-003
25	9.12E-007	-6.20E-003
26	7.25E-007	-5.85E-003
27	3.63E-007	-5.56E-003
28	-2.36E-011	-5.44E-003
29	-3.63E-007	-5.55E-003
30	-7.25E-007	-5.84E-003
31	-9.12E-007	-6.17E-003
32	3.09E-004	-6.17E-003
33	4.95E-004	-6.18E-003
34	4.99E-004	-6.19E-003
35	3.62E-004	-6.19E-003
36	1.53E-004	-6.20E-003
37	-6.73E-005	-6.20E-003
38	-6.74E-005	-6.44E-003
39	-6.78E-005	-6.67E-003
40	-6.81E-005	-6.76E-003
41	-6.85E-005	-6.68E-003
42	-6.89E-005	-6.46E-003
43	-6.90E-005	-6.23E-003
44	-2.83E-004	-6.23E-003
45	-4.63E-004	-6.22E-003
46	-5.61E-004	-6.21E-003
47	-5.28E-004	-6.21E-003
48	-3.23E-004	-6.20E-003
49	2.72E-003	-7.61E-003

50	2.72E-003	-6.77E-003
51	2.72E-003	-5.99E-003
52	2.72E-003	-5.41E-003
53	2.72E-003	-5.08E-003
54	2.72E-003	-4.94E-003
55	2.72E-003	-4.85E-003
56	2.62E-003	-4.86E-003
57	2.41E-003	-4.86E-003
58	2.03E-003	-4.87E-003
59	1.47E-003	-4.88E-003
60	7.57E-004	-4.88E-003
61	-4.98E-005	-4.89E-003
62	-4.99E-005	-5.71E-003
63	-5.00E-005	-6.45E-003
64	-5.01E-005	-6.99E-003
65	-5.02E-005	-7.31E-003
66	-5.03E-005	-7.49E-003
67	-5.04E-005	-7.66E-003
68	1.41E-004	-7.65E-003
69	3.69E-004	-7.64E-003
70	7.04E-004	-7.64E-003
71	1.20E-003	-7.63E-003
72	1.90E-003	-7.62E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-3.47E-004
2	-3.26E-004
3	-8.05E-004
4	-1.67E-003
5	-2.56E-003
6	-3.09E-003
7	-3.06E-003
8	-2.94E-003
9	-2.21E-003
10	-1.57E-003
11	-1.07E-003
12	-7.19E-004
13	-6.28E-004
14	-5.76E-004
15	-8.12E-004
16	-1.56E-003
17	-2.43E-003
18	-3.02E-003
19	-3.01E-003
20	-2.93E-003
21	-2.36E-003
22	-1.76E-003
23	-1.12E-003
24	-4.50E-004
25	1.22E-003
26	1.25E-003
27	8.17E-004
28	1.07E-005
29	-7.89E-004

30	-1.21E-003
31	-1.17E-003
32	-1.05E-003
33	-3.23E-004
34	2.69E-004
35	6.93E-004
36	7.77E-004
37	8.36E-004
38	8.80E-004
39	6.51E-004
40	2.29E-005
41	-6.10E-004
42	-8.54E-004
43	-8.11E-004
44	-7.46E-004
45	-5.37E-004
46	-1.47E-004
47	4.11E-004
48	1.11E-003
49	3.04E-003
50	3.06E-003
51	2.54E-003
52	1.66E-003
53	7.92E-004
54	3.04E-004
55	3.24E-004
56	4.24E-004
57	1.09E-003
58	1.72E-003
59	2.31E-003
60	2.88E-003
61	2.96E-003
62	2.97E-003
63	2.39E-003
64	1.54E-003
65	8.10E-004
66	5.99E-004
67	6.54E-004
68	7.39E-004
69	9.65E-004
70	1.49E-003
71	2.15E-003
72	2.92E-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	1.89E-005	-1.07E-003
2	1.77E-005	-1.09E-003
3	1.54E-005	-1.09E-003
4	1.30E-005	-1.08E-003
5	1.07E-005	-1.07E-003
6	8.31E-006	-1.07E-003
7	7.10E-006	-1.06E-003
8	-4.17E-006	-1.06E-003
9	-1.34E-005	-1.06E-003
10	-1.66E-005	-1.06E-003
11	-1.38E-005	-1.07E-003
12	-5.25E-006	-1.07E-003
13	6.15E-006	-1.07E-003
14	6.96E-006	-1.06E-003
15	8.86E-006	-1.05E-003
16	1.08E-005	-1.04E-003
17	1.27E-005	-1.03E-003
18	1.46E-005	-1.05E-003
19	1.54E-005	-1.08E-003
20	5.13E-005	-1.08E-003
21	9.03E-005	-1.07E-003
22	1.07E-004	-1.07E-003
23	8.87E-005	-1.07E-003
24	5.05E-005	-1.07E-003
25	5.91E-006	-1.11E-003
26	4.70E-006	-1.09E-003
27	2.35E-006	-1.07E-003
28	-1.10E-011	-1.06E-003
29	-2.35E-006	-1.07E-003
30	-4.70E-006	-1.09E-003
31	-5.91E-006	-1.11E-003
32	5.58E-006	-1.11E-003
33	1.29E-005	-1.11E-003
34	1.57E-005	-1.11E-003
35	1.34E-005	-1.11E-003
36	6.08E-006	-1.11E-003
37	-4.62E-006	-1.11E-003
38	-3.80E-006	-1.12E-003
39	-1.90E-006	-1.14E-003
40	-3.77E-009	-1.14E-003
41	1.90E-006	-1.14E-003
42	3.80E-006	-1.12E-003
43	4.61E-006	-1.11E-003
44	-6.08E-006	-1.11E-003
45	-1.32E-005	-1.11E-003
46	-1.54E-005	-1.11E-003
47	-1.28E-005	-1.11E-003
48	-5.59E-006	-1.11E-003
49	-7.09E-006	-1.06E-003

50	-8.30E-006	-1.07E-003
51	-1.07E-005	-1.07E-003
52	-1.30E-005	-1.08E-003
53	-1.54E-005	-1.09E-003
54	-1.77E-005	-1.09E-003
55	-1.89E-005	-1.07E-003
56	-5.05E-005	-1.07E-003
57	-8.87E-005	-1.07E-003
58	-1.07E-004	-1.07E-003
59	-9.03E-005	-1.07E-003
60	-5.13E-005	-1.08E-003
61	-1.54E-005	-1.08E-003
62	-1.46E-005	-1.05E-003
63	-1.27E-005	-1.03E-003
64	-1.08E-005	-1.04E-003
65	-8.86E-006	-1.05E-003
66	-6.96E-006	-1.06E-003
67	-6.14E-006	-1.07E-003
68	5.25E-006	-1.07E-003
69	1.36E-005	-1.07E-003
70	1.63E-005	-1.06E-003
71	1.33E-005	-1.06E-003
72	4.17E-006	-1.06E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-1.02E-004
2	-6.58E-005
3	3.66E-005
4	4.13E-005
5	1.49E-005
6	2.31E-005
7	3.67E-005
8	4.30E-005
9	2.27E-005
10	6.47E-007
11	-2.08E-005
12	-4.14E-005
13	-3.97E-005
14	-3.53E-005
15	-2.93E-005
16	-3.18E-005
17	-1.37E-006
18	1.03E-004
19	1.20E-004
20	1.41E-004
21	1.18E-004
22	-3.29E-006
23	-1.21E-004
24	-1.29E-004
25	4.82E-005
26	6.47E-005
27	6.48E-005
28	1.97E-009
29	-6.48E-005

30	-6.46E-005
31	-4.82E-005
32	-3.63E-005
33	-1.84E-005
34	-1.35E-006
35	1.78E-005
36	3.55E-005
37	4.28E-005
38	4.91E-005
39	4.52E-005
40	7.27E-009
41	-4.52E-005
42	-4.91E-005
43	-4.28E-005
44	-3.54E-005
45	-1.67E-005
46	8.74E-007
47	1.77E-005
48	3.63E-005
49	-3.67E-005
50	-2.31E-005
51	-1.49E-005
52	-4.13E-005
53	-3.66E-005
54	6.58E-005
55	1.02E-004
56	1.29E-004
57	1.21E-004
58	3.28E-006
59	-1.18E-004
60	-1.41E-004
61	-1.20E-004
62	-1.03E-004
63	1.36E-006
64	3.18E-005
65	2.93E-005
66	3.53E-005
67	3.97E-005
68	4.13E-005
69	1.97E-005
70	-1.65E-007
71	-2.20E-005
72	-4.30E-005

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.60E-003	-5.29E-003
2	-1.60E-003	-5.27E-003
3	-1.60E-003	-5.28E-003
4	-1.60E-003	-5.46E-003
5	-1.60E-003	-5.86E-003
6	-1.60E-003	-6.41E-003
7	-1.61E-003	-6.98E-003
8	-1.06E-003	-6.98E-003
9	-6.32E-004	-6.99E-003
10	-3.73E-004	-7.00E-003
11	-2.15E-004	-7.01E-003
12	-9.82E-005	-7.02E-003
13	-7.74E-006	-7.02E-003
14	-7.20E-006	-6.95E-003
15	-5.93E-006	-6.90E-003
16	-4.67E-006	-6.74E-003
17	-3.40E-006	-6.39E-003
18	-2.13E-006	-5.88E-003
19	-1.59E-006	-5.33E-003
20	-5.43E-004	-5.32E-003
21	-9.97E-004	-5.32E-003
22	-1.32E-003	-5.31E-003
23	-1.53E-003	-5.30E-003
24	-1.61E-003	-5.30E-003
25	4.16E-006	-6.08E-003
26	3.31E-006	-5.82E-003
27	1.65E-006	-5.59E-003
28	-4.94E-011	-5.50E-003
29	-1.65E-006	-5.59E-003
30	-3.31E-006	-5.82E-003
31	-4.16E-006	-6.08E-003
32	2.27E-004	-6.08E-003
33	3.45E-004	-6.09E-003
34	3.22E-004	-6.10E-003
35	2.26E-004	-6.11E-003
36	1.18E-004	-6.11E-003
37	2.18E-006	-6.12E-003
38	2.68E-006	-6.25E-003
39	3.86E-006	-6.40E-003
40	5.04E-006	-6.47E-003
41	6.22E-006	-6.40E-003
42	7.40E-006	-6.25E-003
43	7.90E-006	-6.11E-003
44	-1.09E-004	-6.11E-003
45	-2.18E-004	-6.10E-003
46	-3.17E-004	-6.10E-003
47	-3.42E-004	-6.09E-003
48	-2.26E-004	-6.08E-003
49	1.62E-003	-6.98E-003

50	1.62E-003	-6.41E-003
51	1.62E-003	-5.86E-003
52	1.62E-003	-5.46E-003
53	1.62E-003	-5.28E-003
54	1.61E-003	-5.27E-003
55	1.61E-003	-5.29E-003
56	1.62E-003	-5.30E-003
57	1.54E-003	-5.30E-003
58	1.34E-003	-5.31E-003
59	1.01E-003	-5.32E-003
60	5.54E-004	-5.32E-003
61	1.16E-005	-5.33E-003
62	1.21E-005	-5.88E-003
63	1.34E-005	-6.39E-003
64	1.47E-005	-6.74E-003
65	1.59E-005	-6.90E-003
66	1.72E-005	-6.96E-003
67	1.77E-005	-7.02E-003
68	1.08E-004	-7.02E-003
69	2.25E-004	-7.01E-003
70	3.85E-004	-7.00E-003
71	6.46E-004	-6.99E-003
72	1.07E-003	-6.98E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	7.80E-005
2	1.07E-004
3	-2.99E-004
4	-1.05E-003
5	-1.78E-003
6	-2.11E-003
7	-2.05E-003
8	-1.92E-003
9	-1.20E-003
10	-7.21E-004
11	-4.67E-004
12	-3.73E-004
13	-2.82E-004
14	-2.18E-004
15	-3.08E-004
16	-9.01E-004
17	-1.60E-003
18	-2.02E-003
19	-2.00E-003
20	-1.91E-003
21	-1.41E-003
22	-9.71E-004
23	-5.30E-004
24	-1.65E-005
25	8.86E-004
26	9.41E-004
27	6.60E-004
28	-7.92E-007
29	-6.62E-004

30	-9.45E-004
31	-8.90E-004
32	-7.65E-004
33	-1.33E-004
34	2.56E-004
35	4.03E-004
36	3.89E-004
37	4.61E-004
38	5.18E-004
39	4.55E-004
40	-1.69E-006
41	-4.58E-004
42	-5.20E-004
43	-4.63E-004
44	-3.91E-004
45	-4.14E-004
46	-2.65E-004
47	1.27E-004
48	7.61E-004
49	2.05E-003
50	2.11E-003
51	1.79E-003
52	1.05E-003
53	3.00E-004
54	-1.05E-004
55	-7.62E-005
56	1.84E-005
57	5.33E-004
58	9.74E-004
59	1.41E-003
60	1.92E-003
61	2.01E-003
62	2.03E-003
63	1.61E-003
64	9.03E-004
65	3.08E-004
66	2.17E-004
67	2.80E-004
68	3.71E-004
69	4.75E-004
70	7.26E-004
71	1.21E-003
72	1.92E-003

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

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-2.97E-003	-6.50E-003
2	-2.97E-003	-5.91E-003
3	-2.97E-003	-5.39E-003
4	-2.97E-003	-5.07E-003
5	-2.97E-003	-5.01E-003
6	-2.97E-003	-5.17E-003
7	-2.97E-003	-5.40E-003
8	-2.75E-003	-5.41E-003
9	-2.70E-003	-5.42E-003
10	-2.87E-003	-5.43E-003
11	-3.21E-003	-5.45E-003
12	-3.64E-003	-5.46E-003
13	-4.10E-003	-5.47E-003
14	-4.10E-003	-5.96E-003
15	-4.10E-003	-6.44E-003
16	-4.10E-003	-6.76E-003
17	-4.10E-003	-6.85E-003
18	-4.10E-003	-6.73E-003
19	-4.10E-003	-6.54E-003
20	-4.28E-003	-6.54E-003
21	-4.36E-003	-6.53E-003
22	-4.27E-003	-6.52E-003
23	-4.00E-003	-6.51E-003
24	-3.54E-003	-6.50E-003
25	7.62E-007	-7.85E-003
26	6.06E-007	-6.83E-003
27	3.03E-007	-5.87E-003
28	-4.97E-010	-5.10E-003
29	-3.04E-007	-4.57E-003
30	-6.07E-007	-4.22E-003
31	-7.63E-007	-3.93E-003
32	-3.14E-004	-3.94E-003
33	-7.89E-004	-3.95E-003
34	-1.49E-003	-3.96E-003
35	-2.34E-003	-3.97E-003
36	-3.22E-003	-3.99E-003
37	-4.09E-003	-3.99E-003
38	-4.09E-003	-4.88E-003
39	-4.09E-003	-5.75E-003
40	-4.09E-003	-6.49E-003
41	-4.09E-003	-7.05E-003
42	-4.09E-003	-7.48E-003
43	-4.09E-003	-7.90E-003
44	-3.65E-003	-7.89E-003
45	-3.17E-003	-7.88E-003
46	-2.59E-003	-7.88E-003
47	-1.89E-003	-7.87E-003
48	-1.00E-003	-7.86E-003
49	2.77E-003	-9.32E-003

50	2.77E-003	-7.79E-003
51	2.77E-003	-6.32E-003
52	2.77E-003	-5.07E-003
53	2.77E-003	-4.08E-003
54	2.77E-003	-3.29E-003
55	2.77E-003	-2.57E-003
56	2.03E-003	-2.57E-003
57	1.17E-003	-2.58E-003
58	1.06E-004	-2.59E-003
59	-1.14E-003	-2.60E-003
60	-2.56E-003	-2.61E-003
61	-4.07E-003	-2.62E-003
62	-4.07E-003	-4.14E-003
63	-4.07E-003	-5.57E-003
64	-4.07E-003	-6.77E-003
65	-4.07E-003	-7.74E-003
66	-4.07E-003	-8.55E-003
67	-4.07E-003	-9.37E-003
68	-3.23E-003	-9.36E-003
69	-2.33E-003	-9.35E-003
70	-1.32E-003	-9.34E-003
71	-1.32E-004	-9.34E-003
72	1.25E-003	-9.33E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.12E-003
2	2.14E-003
3	1.60E-003
4	6.87E-004
5	-2.37E-004
6	-8.30E-004
7	-8.32E-004
8	-6.81E-004
9	2.39E-004
10	9.67E-004
11	1.44E-003
12	1.65E-003
13	1.76E-003
14	1.83E-003
15	1.54E-003
16	7.66E-004
17	-1.09E-004
18	-6.88E-004
19	-6.86E-004
20	-5.98E-004
21	1.78E-005
22	6.59E-004
23	1.33E-003
24	2.02E-003
25	3.69E-003
26	3.72E-003
27	3.21E-003
28	2.36E-003
29	1.53E-003

30	1.06E-003
31	1.07E-003
32	1.24E-003
33	2.18E-003
34	2.87E-003
35	3.24E-003
36	3.12E-003
37	3.20E-003
38	3.25E-003
39	3.00E-003
40	2.35E-003
41	1.72E-003
42	1.50E-003
43	1.56E-003
44	1.64E-003
45	1.89E-003
46	2.30E-003
47	2.87E-003
48	3.58E-003
49	5.56E-003
50	5.58E-003
51	5.00E-003
52	4.07E-003
53	3.18E-003
54	2.64E-003
55	2.63E-003
56	2.75E-003
57	3.51E-003
58	4.22E-003
59	4.86E-003
60	5.44E-003
61	5.52E-003
62	5.50E-003
63	4.83E-003
64	3.92E-003
65	3.15E-003
66	2.92E-003
67	3.01E-003
68	3.11E-003
69	3.44E-003
70	3.98E-003
71	4.66E-003
72	5.43E-003

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

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	1.88E-005	-1.07E-003
2	1.76E-005	-1.09E-003
3	1.53E-005	-1.09E-003
4	1.29E-005	-1.08E-003
5	1.06E-005	-1.08E-003
6	8.21E-006	-1.07E-003
7	7.00E-006	-1.06E-003
8	-6.74E-006	-1.06E-003
9	-1.84E-005	-1.06E-003
10	-2.25E-005	-1.07E-003
11	-1.91E-005	-1.07E-003
12	-8.58E-006	-1.07E-003
13	5.42E-006	-1.07E-003
14	6.39E-006	-1.06E-003
15	8.29E-006	-1.05E-003
16	1.02E-005	-1.04E-003
17	1.21E-005	-1.03E-003
18	1.40E-005	-1.04E-003
19	1.49E-005	-1.07E-003
20	5.24E-005	-1.07E-003
21	9.23E-005	-1.07E-003
22	1.09E-004	-1.07E-003
23	9.06E-005	-1.07E-003
24	5.15E-005	-1.07E-003
25	5.91E-006	-1.11E-003
26	4.70E-006	-1.09E-003
27	2.35E-006	-1.07E-003
28	-1.43E-011	-1.06E-003
29	-2.35E-006	-1.07E-003
30	-4.70E-006	-1.09E-003
31	-5.91E-006	-1.11E-003
32	7.51E-006	-1.11E-003
33	1.56E-005	-1.11E-003
34	1.87E-005	-1.11E-003
35	1.59E-005	-1.12E-003
36	7.06E-006	-1.12E-003
37	-5.67E-006	-1.12E-003
38	-4.69E-006	-1.13E-003
39	-2.79E-006	-1.15E-003
40	-8.96E-007	-1.16E-003
41	1.00E-006	-1.15E-003
42	2.90E-006	-1.13E-003
43	3.88E-006	-1.12E-003
44	-9.38E-006	-1.11E-003
45	-1.84E-005	-1.11E-003
46	-2.11E-005	-1.11E-003
47	-1.76E-005	-1.11E-003
48	-8.18E-006	-1.11E-003
49	-7.00E-006	-1.06E-003

50	-8.21E-006	-1.07E-003
51	-1.06E-005	-1.08E-003
52	-1.29E-005	-1.08E-003
53	-1.53E-005	-1.10E-003
54	-1.76E-005	-1.09E-003
55	-1.88E-005	-1.06E-003
56	-6.01E-005	-1.07E-003
57	-1.21E-004	-1.07E-003
58	-1.53E-004	-1.07E-003
59	-1.26E-004	-1.07E-003
60	-6.52E-005	-1.08E-003
61	-1.67E-005	-1.08E-003
62	-1.58E-005	-1.04E-003
63	-1.39E-005	-1.02E-003
64	-1.20E-005	-1.03E-003
65	-1.01E-005	-1.04E-003
66	-8.18E-006	-1.05E-003
67	-7.20E-006	-1.06E-003
68	6.27E-006	-1.06E-003
69	1.61E-005	-1.06E-003
70	1.94E-005	-1.06E-003
71	1.62E-005	-1.06E-003
72	6.08E-006	-1.06E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-1.06E-004
2	-6.98E-005
3	3.32E-005
4	3.94E-005
5	1.53E-005
6	2.69E-005
7	4.11E-005
8	5.44E-005
9	2.87E-005
10	1.14E-006
11	-2.54E-005
12	-5.15E-005
13	-4.71E-005
14	-3.98E-005
15	-3.29E-005
16	-3.54E-005
17	-6.10E-006
18	9.63E-005
19	1.26E-004
20	1.46E-004
21	1.20E-004
22	-3.64E-006
23	-1.24E-004
24	-1.33E-004
25	5.76E-005
26	7.40E-005
27	7.20E-005
28	3.35E-006
29	-6.73E-005

30	-7.51E-005
31	-6.02E-005
32	-4.01E-005
33	-2.07E-005
34	-1.12E-006
35	2.20E-005
36	4.15E-005
37	5.28E-005
38	6.10E-005
39	4.77E-005
40	-4.68E-006
41	-5.50E-005
42	-6.19E-005
43	-5.22E-005
44	-4.46E-005
45	-2.11E-005
46	1.64E-006
47	2.35E-005
48	4.58E-005
49	-4.38E-005
50	-3.08E-005
51	-2.30E-005
52	-4.56E-005
53	-3.25E-005
54	8.29E-005
55	1.21E-004
56	1.81E-004
57	2.06E-004
58	9.81E-006
59	-1.93E-004
60	-2.00E-004
61	-1.53E-004
62	-1.21E-004
63	-3.46E-006
64	3.51E-005
65	3.63E-005
66	4.14E-005
67	4.77E-005
68	4.83E-005
69	2.35E-005
70	5.63E-007
71	-2.41E-005
72	-4.88E-005

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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	-1.41E-003	-7.04E-003
2	-1.41E-003	-6.30E-003
3	-1.41E-003	-5.62E-003
4	-1.41E-003	-5.12E-003
5	-1.41E-003	-4.85E-003
6	-1.41E-003	-4.74E-003
7	-1.41E-003	-4.66E-003
8	-1.52E-003	-4.67E-003
9	-1.81E-003	-4.68E-003
10	-2.30E-003	-4.69E-003
11	-2.89E-003	-4.71E-003
12	-3.46E-003	-4.72E-003
13	-4.03E-003	-4.73E-003
14	-4.03E-003	-5.33E-003
15	-4.03E-003	-5.94E-003
16	-4.03E-003	-6.45E-003
17	-4.02E-003	-6.78E-003
18	-4.02E-003	-6.94E-003
19	-4.02E-003	-7.07E-003
20	-3.88E-003	-7.07E-003
21	-3.64E-003	-7.06E-003
22	-3.26E-003	-7.05E-003
23	-2.76E-003	-7.05E-003
24	-2.13E-003	-7.04E-003
25	3.92E-006	-7.72E-003
26	3.12E-006	-6.80E-003
27	1.56E-006	-5.90E-003
28	-3.94E-010	-5.16E-003
29	-1.56E-006	-4.62E-003
30	-3.12E-006	-4.22E-003
31	-3.92E-006	-3.84E-003
32	-4.11E-004	-3.84E-003
33	-9.79E-004	-3.86E-003
34	-1.73E-003	-3.87E-003
35	-2.53E-003	-3.88E-003
36	-3.28E-003	-3.89E-003
37	-4.02E-003	-3.90E-003
38	-4.02E-003	-4.67E-003
39	-4.02E-003	-5.46E-003
40	-4.02E-003	-6.17E-003
41	-4.02E-003	-6.74E-003
42	-4.01E-003	-7.24E-003
43	-4.01E-003	-7.76E-003
44	-3.47E-003	-7.76E-003
45	-2.92E-003	-7.75E-003
46	-2.34E-003	-7.74E-003
47	-1.69E-003	-7.73E-003
48	-8.99E-004	-7.72E-003
49	1.48E-003	-8.60E-003

50	1.48E-003	-7.37E-003
51	1.48E-003	-6.17E-003
52	1.48E-003	-5.13E-003
53	1.48E-003	-4.31E-003
54	1.48E-003	-3.66E-003
55	1.47E-003	-3.06E-003
56	8.55E-004	-3.07E-003
57	1.31E-004	-3.08E-003
58	-7.27E-004	-3.09E-003
59	-1.70E-003	-3.10E-003
60	-2.81E-003	-3.11E-003
61	-4.01E-003	-3.11E-003
62	-4.01E-003	-4.33E-003
63	-4.01E-003	-5.50E-003
64	-4.01E-003	-6.49E-003
65	-4.01E-003	-7.28E-003
66	-4.01E-003	-7.96E-003
67	-4.01E-003	-8.65E-003
68	-3.29E-003	-8.64E-003
69	-2.53E-003	-8.63E-003
70	-1.72E-003	-8.62E-003
71	-8.07E-004	-8.61E-003
72	2.75E-004	-8.60E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.66E-003
2	2.68E-003
3	2.19E-003
4	1.39E-003
5	6.37E-004
6	2.76E-004
7	3.14E-004
8	5.14E-004
9	1.49E-003
10	2.04E-003
11	2.17E-003
12	2.00E-003
13	2.13E-003
14	2.23E-003
15	2.13E-003
16	1.54E-003
17	8.50E-004
18	4.60E-004
19	4.90E-004
20	5.88E-004
21	1.13E-003
22	1.60E-003
23	2.05E-003
24	2.56E-003
25	3.33E-003
26	3.38E-003
27	3.03E-003
28	2.33E-003
29	1.66E-003

30	1.36E-003
31	1.40E-003
32	1.59E-003
33	2.47E-003
34	2.89E-003
35	2.86E-003
36	2.65E-003
37	2.76E-003
38	2.84E-003
39	2.79E-003
40	2.34E-003
41	1.89E-003
42	1.84E-003
43	1.93E-003
44	2.01E-003
45	2.02E-003
46	2.19E-003
47	2.59E-003
48	3.21E-003
49	4.45E-003
50	4.50E-003
51	4.13E-003
52	3.37E-003
53	2.62E-003
54	2.19E-003
55	2.20E-003
56	2.33E-003
57	2.90E-003
58	3.33E-003
59	3.76E-003
60	4.32E-003
61	4.43E-003
62	4.44E-003
63	3.96E-003
64	3.21E-003
65	2.58E-003
66	2.46E-003
67	2.56E-003
68	2.65E-003
69	2.83E-003
70	3.10E-003
71	3.59E-003
72	4.31E-003

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

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.21E-003	-3.03E-003
2	-1.21E-003	-3.04E-003
3	-1.21E-003	-3.07E-003
4	-1.21E-003	-3.21E-003
5	-1.21E-003	-3.48E-003
6	-1.21E-003	-3.84E-003
7	-1.21E-003	-4.23E-003
8	-8.35E-004	-4.23E-003
9	-5.32E-004	-4.24E-003
10	-3.27E-004	-4.24E-003
11	-1.91E-004	-4.25E-003
12	-9.58E-005	-4.25E-003
13	-2.36E-005	-4.26E-003
14	-2.34E-005	-4.20E-003
15	-2.31E-005	-4.14E-003
16	-2.28E-005	-4.01E-003
17	-2.25E-005	-3.77E-003
18	-2.22E-005	-3.42E-003
19	-2.20E-005	-3.05E-003
20	-3.92E-004	-3.05E-003
21	-7.12E-004	-3.04E-003
22	-9.51E-004	-3.04E-003
23	-1.11E-003	-3.03E-003
24	-1.19E-003	-3.03E-003
25	2.02E-006	-3.60E-003
26	1.61E-006	-3.44E-003
27	8.03E-007	-3.29E-003
28	-2.37E-011	-3.23E-003
29	-8.03E-007	-3.29E-003
30	-1.61E-006	-3.43E-003
31	-2.02E-006	-3.59E-003
32	1.46E-004	-3.60E-003
33	2.28E-004	-3.60E-003
34	2.20E-004	-3.60E-003
35	1.57E-004	-3.61E-003
36	7.35E-005	-3.61E-003
37	-1.58E-005	-3.62E-003
38	-1.57E-005	-3.72E-003
39	-1.55E-005	-3.82E-003
40	-1.52E-005	-3.86E-003
41	-1.50E-005	-3.82E-003
42	-1.47E-005	-3.72E-003
43	-1.46E-005	-3.62E-003
44	-1.02E-004	-3.62E-003
45	-1.80E-004	-3.62E-003
46	-2.34E-004	-3.61E-003
47	-2.35E-004	-3.61E-003
48	-1.49E-004	-3.60E-003
49	1.16E-003	-4.23E-003

50	1.16E-003	-3.84E-003
51	1.16E-003	-3.48E-003
52	1.16E-003	-3.21E-003
53	1.16E-003	-3.07E-003
54	1.16E-003	-3.04E-003
55	1.16E-003	-3.03E-003
56	1.14E-003	-3.03E-003
57	1.07E-003	-3.04E-003
58	9.11E-004	-3.04E-003
59	6.75E-004	-3.04E-003
60	3.59E-004	-3.05E-003
61	-8.18E-006	-3.05E-003
62	-8.04E-006	-3.42E-003
63	-7.72E-006	-3.77E-003
64	-7.39E-006	-4.01E-003
65	-7.06E-006	-4.13E-003
66	-6.73E-006	-4.19E-003
67	-6.59E-006	-4.25E-003
68	6.72E-005	-4.25E-003
69	1.59E-004	-4.25E-003
70	2.89E-004	-4.24E-003
71	4.90E-004	-4.24E-003
72	7.91E-004	-4.23E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-4.95E-005
2	-3.32E-005
3	-2.79E-004
4	-7.35E-004
5	-1.19E-003
6	-1.42E-003
7	-1.39E-003
8	-1.32E-003
9	-9.07E-004
10	-6.03E-004
11	-4.04E-004
12	-2.88E-004
13	-2.37E-004
14	-2.04E-004
15	-2.88E-004
16	-6.59E-004
17	-1.09E-003
18	-1.37E-003
19	-1.36E-003
20	-1.32E-003
21	-1.01E-003
22	-7.27E-004
23	-4.34E-004
24	-1.06E-004
25	5.78E-004
26	6.06E-004
27	4.14E-004
28	2.39E-006
29	-4.08E-004

30	-5.96E-004
31	-5.68E-004
32	-4.96E-004
33	-1.15E-004
34	1.47E-004
35	2.93E-004
36	3.08E-004
37	3.46E-004
38	3.75E-004
39	3.01E-004
40	5.11E-006
41	-2.92E-004
42	-3.69E-004
43	-3.40E-004
44	-3.01E-004
45	-2.58E-004
46	-1.20E-004
47	1.35E-004
48	5.08E-004
49	1.39E-003
50	1.41E-003
51	1.19E-003
52	7.33E-004
53	2.76E-004
54	2.83E-005
55	4.41E-005
56	1.01E-004
57	4.26E-004
58	7.17E-004
59	1.00E-003
60	1.30E-003
61	1.35E-003
62	1.36E-003
63	1.09E-003
64	6.54E-004
65	2.87E-004
66	2.09E-004
67	2.43E-004
68	2.93E-004
69	3.80E-004
70	5.85E-004
71	8.96E-004
72	1.31E-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	9.87E-006	-1.09E-003
2	9.07E-006	-1.09E-003
3	7.51E-006	-1.08E-003
4	5.95E-006	-1.07E-003
5	4.40E-006	-1.07E-003
6	2.84E-006	-1.08E-003
7	2.04E-006	-1.08E-003
8	4.39E-007	-1.09E-003
9	-2.92E-006	-1.09E-003
10	-4.12E-006	-1.09E-003
11	-3.02E-006	-1.09E-003
12	5.50E-008	-1.09E-003
13	2.76E-006	-1.09E-003
14	3.26E-006	-1.09E-003
15	4.40E-006	-1.09E-003
16	5.55E-006	-1.09E-003
17	6.70E-006	-1.09E-003
18	7.85E-006	-1.09E-003
19	8.34E-006	-1.10E-003
20	1.95E-005	-1.09E-003
21	3.51E-005	-1.09E-003
22	4.18E-005	-1.09E-003
23	3.22E-005	-1.09E-003
24	1.67E-005	-1.09E-003
25	3.92E-006	-1.10E-003
26	3.12E-006	-1.09E-003
27	1.56E-006	-1.07E-003
28	-1.20E-011	-1.06E-003
29	-1.56E-006	-1.07E-003
30	-3.12E-006	-1.09E-003
31	-3.92E-006	-1.10E-003
32	1.19E-006	-1.10E-003
33	2.70E-006	-1.10E-003
34	3.25E-006	-1.10E-003
35	2.75E-006	-1.10E-003
36	9.84E-007	-1.10E-003
37	-2.78E-006	-1.10E-003
38	-2.29E-006	-1.11E-003
39	-1.15E-006	-1.12E-003
40	-8.42E-010	-1.12E-003
41	1.15E-006	-1.12E-003
42	2.29E-006	-1.11E-003
43	2.78E-006	-1.10E-003
44	-9.80E-007	-1.10E-003
45	-2.57E-006	-1.10E-003
46	-3.03E-006	-1.10E-003
47	-2.63E-006	-1.10E-003
48	-1.19E-006	-1.10E-003
49	-2.03E-006	-1.08E-003

50	-2.83E-006	-1.08E-003
51	-4.39E-006	-1.07E-003
52	-5.95E-006	-1.07E-003
53	-7.50E-006	-1.08E-003
54	-9.06E-006	-1.09E-003
55	-9.86E-006	-1.09E-003
56	-1.67E-005	-1.09E-003
57	-3.22E-005	-1.09E-003
58	-4.18E-005	-1.09E-003
59	-3.51E-005	-1.09E-003
60	-1.95E-005	-1.09E-003
61	-8.33E-006	-1.10E-003
62	-7.84E-006	-1.09E-003
63	-6.69E-006	-1.09E-003
64	-5.54E-006	-1.09E-003
65	-4.40E-006	-1.09E-003
66	-3.25E-006	-1.09E-003
67	-2.76E-006	-1.09E-003
68	-5.24E-008	-1.09E-003
69	2.85E-006	-1.09E-003
70	3.91E-006	-1.09E-003
71	2.86E-006	-1.09E-003
72	-4.32E-007	-1.09E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	-1.45E-005
2	9.08E-006
3	4.87E-005
4	1.38E-005
5	-3.03E-005
6	-1.81E-005
7	-9.71E-007
8	1.15E-005
9	8.71E-006
10	6.56E-008
11	-7.91E-006
12	-1.26E-005
13	-6.00E-006
14	6.79E-007
15	1.23E-005
16	-7.67E-006
17	-1.79E-005
18	2.28E-005
19	3.33E-005
20	4.83E-005
21	5.05E-005
22	-6.01E-006
23	-5.79E-005
24	-3.63E-005
25	2.60E-005
26	4.41E-005
27	5.46E-005
28	1.54E-010
29	-5.46E-005

30	-4.41E-005
31	-2.60E-005
32	-1.18E-005
33	-3.41E-006
34	-3.16E-007
35	4.19E-006
36	9.99E-006
37	1.82E-005
38	2.53E-005
39	3.33E-005
40	3.68E-010
41	-3.33E-005
42	-2.53E-005
43	-1.82E-005
44	-9.91E-006
45	-3.43E-006
46	-3.13E-008
47	2.88E-006
48	1.18E-005
49	9.70E-007
50	1.81E-005
51	3.03E-005
52	-1.38E-005
53	-4.87E-005
54	-9.08E-006
55	1.45E-005
56	3.63E-005
57	5.79E-005
58	6.01E-006
59	-5.05E-005
60	-4.83E-005
61	-3.33E-005
62	-2.28E-005
63	1.79E-005
64	7.67E-006
65	-1.23E-005
66	-6.78E-007
67	6.00E-006
68	1.25E-005
69	7.15E-006
70	2.82E-007
71	-8.18E-006
72	-1.15E-005

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

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-7.67E-004	-3.18E-003
2	-7.68E-004	-3.15E-003
3	-7.69E-004	-3.14E-003
4	-7.70E-004	-3.23E-003
5	-7.71E-004	-3.43E-003
6	-7.72E-004	-3.72E-003
7	-7.73E-004	-4.03E-003
8	-4.85E-004	-4.03E-003
9	-2.72E-004	-4.03E-003
10	-1.53E-004	-4.04E-003
11	-8.66E-005	-4.04E-003
12	-3.48E-005	-4.05E-003
13	6.57E-006	-4.05E-003
14	6.91E-006	-4.02E-003
15	7.69E-006	-4.00E-003
16	8.47E-006	-3.93E-003
17	9.25E-006	-3.75E-003
18	1.00E-005	-3.49E-003
19	1.04E-005	-3.20E-003
20	-2.71E-004	-3.20E-003
21	-5.03E-004	-3.19E-003
22	-6.66E-004	-3.19E-003
23	-7.63E-004	-3.19E-003
24	-7.90E-004	-3.18E-003
25	2.66E-006	-3.56E-003
26	2.11E-006	-3.43E-003
27	1.06E-006	-3.30E-003
28	-3.25E-011	-3.25E-003
29	-1.06E-006	-3.30E-003
30	-2.11E-006	-3.43E-003
31	-2.66E-006	-3.57E-003
32	1.24E-004	-3.57E-003
33	1.85E-004	-3.58E-003
34	1.69E-004	-3.58E-003
35	1.17E-004	-3.59E-003
36	6.63E-005	-3.59E-003
37	1.19E-005	-3.59E-003
38	1.23E-005	-3.66E-003
39	1.30E-005	-3.73E-003
40	1.37E-005	-3.77E-003
41	1.45E-005	-3.73E-003
42	1.52E-005	-3.65E-003
43	1.56E-005	-3.59E-003
44	-4.03E-005	-3.58E-003
45	-9.66E-005	-3.58E-003
46	-1.56E-004	-3.58E-003
47	-1.78E-004	-3.57E-003
48	-1.21E-004	-3.57E-003
49	8.14E-004	-4.03E-003

50	8.13E-004	-3.73E-003
51	8.12E-004	-3.43E-003
52	8.11E-004	-3.23E-003
53	8.10E-004	-3.14E-003
54	8.09E-004	-3.15E-003
55	8.08E-004	-3.18E-003
56	8.30E-004	-3.18E-003
57	8.01E-004	-3.18E-003
58	7.01E-004	-3.19E-003
59	5.36E-004	-3.19E-003
60	3.01E-004	-3.19E-003
61	1.69E-005	-3.20E-003
62	1.72E-005	-3.49E-003
63	1.80E-005	-3.76E-003
64	1.88E-005	-3.93E-003
65	1.96E-005	-4.01E-003
66	2.04E-005	-4.03E-003
67	2.07E-005	-4.05E-003
68	6.07E-005	-4.05E-003
69	1.15E-004	-4.05E-003
70	1.86E-004	-4.04E-003
71	3.09E-004	-4.04E-003
72	5.25E-004	-4.03E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.05E-004
2	1.22E-004
3	-1.09E-004
4	-5.38E-004
5	-9.48E-004
6	-1.11E-003
7	-1.08E-003
8	-9.97E-004
9	-5.80E-004
10	-3.12E-004
11	-1.93E-004
12	-1.75E-004
13	-1.24E-004
14	-8.66E-005
15	-1.23E-004
16	-4.44E-004
17	-8.28E-004
18	-1.05E-003
19	-1.04E-003
20	-9.91E-004
21	-7.11E-004
22	-4.73E-004
23	-2.34E-004
24	5.08E-005
25	4.80E-004
26	5.15E-004
27	3.68E-004
28	-2.16E-006
29	-3.73E-004

30	-5.24E-004
31	-4.90E-004
32	-4.16E-004
33	-5.57E-005
34	1.50E-004
35	2.01E-004
36	1.79E-004
37	2.21E-004
38	2.54E-004
39	2.35E-004
40	-4.61E-006
41	-2.43E-004
42	-2.59E-004
43	-2.26E-004
44	-1.85E-004
45	-2.32E-004
46	-1.75E-004
47	3.79E-005
48	4.05E-004
49	1.08E-003
50	1.12E-003
51	9.51E-004
52	5.40E-004
53	1.12E-004
54	-1.18E-004
55	-1.00E-004
56	-4.55E-005
57	2.42E-004
58	4.82E-004
59	7.21E-004
60	1.00E-003
61	1.05E-003
62	1.06E-003
63	8.36E-004
64	4.48E-004
65	1.23E-004
66	8.20E-005
67	1.19E-004
68	1.71E-004
69	2.15E-004
70	3.27E-004
71	5.90E-004
72	1.00E-003

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-4.90E-005	-1.09E-003
2	-4.94E-005	-1.07E-003
3	-5.01E-005	-1.05E-003
4	-5.08E-005	-1.05E-003
5	-5.15E-005	-1.08E-003
6	-5.22E-005	-1.11E-003
7	-5.26E-005	-1.15E-003
8	-2.39E-005	-1.15E-003
9	-1.03E-005	-1.15E-003
10	-5.14E-006	-1.15E-003
11	-2.25E-006	-1.15E-003
12	-3.04E-007	-1.15E-003
13	-9.45E-007	-1.15E-003
14	-8.03E-007	-1.16E-003
15	-4.70E-007	-1.16E-003
16	-1.37E-007	-1.16E-003
17	1.96E-007	-1.15E-003
18	5.29E-007	-1.12E-003
19	6.72E-007	-1.09E-003
20	-2.68E-005	-1.09E-003
21	-4.69E-005	-1.09E-003
22	-5.98E-005	-1.09E-003
23	-6.72E-005	-1.09E-003
24	-6.40E-005	-1.09E-003
25	1.79E-006	-1.11E-003
26	1.42E-006	-1.09E-003
27	7.12E-007	-1.07E-003
28	-1.29E-011	-1.06E-003
29	-7.12E-007	-1.07E-003
30	-1.42E-006	-1.09E-003
31	-1.79E-006	-1.11E-003
32	1.14E-005	-1.11E-003
33	1.13E-005	-1.11E-003
34	6.14E-006	-1.11E-003
35	2.26E-006	-1.11E-003
36	1.02E-006	-1.11E-003
37	-1.03E-006	-1.11E-003
38	-8.84E-007	-1.12E-003
39	-5.51E-007	-1.13E-003
40	-2.19E-007	-1.13E-003
41	1.13E-007	-1.13E-003
42	4.45E-007	-1.12E-003
43	5.88E-007	-1.11E-003
44	-1.42E-006	-1.11E-003
45	-2.86E-006	-1.11E-003
46	-6.74E-006	-1.11E-003
47	-1.17E-005	-1.11E-003
48	-1.16E-005	-1.11E-003
49	5.19E-005	-1.15E-003

50	5.16E-005	-1.11E-003
51	5.09E-005	-1.08E-003
52	5.02E-005	-1.05E-003
53	4.94E-005	-1.05E-003
54	4.87E-005	-1.07E-003
55	4.84E-005	-1.09E-003
56	6.33E-005	-1.09E-003
57	6.65E-005	-1.09E-003
58	5.91E-005	-1.09E-003
59	4.63E-005	-1.09E-003
60	2.63E-005	-1.09E-003
61	-1.12E-006	-1.09E-003
62	-9.76E-007	-1.12E-003
63	-6.43E-007	-1.15E-003
64	-3.11E-007	-1.16E-003
65	2.25E-008	-1.16E-003
66	3.55E-007	-1.16E-003
67	4.98E-007	-1.15E-003
68	-9.75E-008	-1.15E-003
69	2.12E-006	-1.15E-003
70	5.05E-006	-1.15E-003
71	9.98E-006	-1.15E-003
72	2.34E-005	-1.15E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	6.15E-005
2	7.22E-005
3	4.16E-005
4	-4.53E-005
5	-1.24E-004
6	-1.31E-004
7	-1.15E-004
8	-9.12E-005
9	-2.49E-005
10	-1.37E-005
11	-8.32E-006
12	-2.68E-006
13	7.76E-006
14	1.57E-005
15	2.22E-005
16	-2.37E-005
17	-8.07E-005
18	-1.08E-004
19	-1.04E-004
20	-9.41E-005
21	-5.70E-005
22	-3.77E-005
23	-1.31E-005
24	4.47E-005
25	5.79E-005
26	7.36E-005
27	6.92E-005
28	6.91E-008
29	-6.90E-005

30	-7.32E-005
31	-5.74E-005
32	-3.58E-005
33	1.89E-005
34	1.77E-005
35	9.26E-006
36	3.47E-006
37	1.22E-005
38	1.96E-005
39	3.06E-005
40	2.21E-007
41	-3.02E-005
42	-1.94E-005
43	-1.20E-005
44	-3.43E-006
45	-1.01E-005
46	-1.70E-005
47	-1.80E-005
48	3.63E-005
49	1.14E-004
50	1.31E-004
51	1.24E-004
52	4.52E-005
53	-4.16E-005
54	-7.21E-005
55	-6.15E-005
56	-4.47E-005
57	1.31E-005
58	3.75E-005
59	5.68E-005
60	9.38E-005
61	1.04E-004
62	1.07E-004
63	8.04E-005
64	2.35E-005
65	-2.23E-005
66	-1.56E-005
67	-7.63E-006
68	2.94E-006
69	9.41E-006
70	1.31E-005
71	2.40E-005
72	9.06E-005

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-6.34E-004	-2.35E-003
2	-6.35E-004	-2.33E-003
3	-6.35E-004	-2.33E-003
4	-6.36E-004	-2.40E-003
5	-6.37E-004	-2.56E-003
6	-6.37E-004	-2.79E-003
7	-6.38E-004	-3.02E-003
8	-4.13E-004	-3.03E-003
9	-2.42E-004	-3.03E-003
10	-1.40E-004	-3.03E-003
11	-8.07E-005	-3.04E-003
12	-3.58E-005	-3.04E-003
13	-2.97E-007	-3.04E-003
14	-1.48E-007	-3.02E-003
15	1.99E-007	-2.99E-003
16	5.47E-007	-2.93E-003
17	8.94E-007	-2.79E-003
18	1.24E-006	-2.59E-003
19	1.39E-006	-2.36E-003
20	-2.18E-004	-2.36E-003
21	-4.03E-004	-2.36E-003
22	-5.35E-004	-2.36E-003
23	-6.17E-004	-2.35E-003
24	-6.45E-004	-2.35E-003
25	1.84E-006	-2.66E-003
26	1.46E-006	-2.55E-003
27	7.32E-007	-2.46E-003
28	-2.28E-011	-2.42E-003
29	-7.32E-007	-2.46E-003
30	-1.46E-006	-2.56E-003
31	-1.84E-006	-2.66E-003
32	9.45E-005	-2.66E-003
33	1.43E-004	-2.67E-003
34	1.32E-004	-2.67E-003
35	9.25E-005	-2.67E-003
36	5.00E-005	-2.68E-003
37	4.62E-006	-2.68E-003
38	4.75E-006	-2.73E-003
39	5.06E-006	-2.79E-003
40	5.38E-006	-2.81E-003
41	5.69E-006	-2.79E-003
42	6.00E-006	-2.73E-003
43	6.14E-006	-2.68E-003
44	-3.98E-005	-2.67E-003
45	-8.46E-005	-2.67E-003
46	-1.27E-004	-2.67E-003
47	-1.40E-004	-2.66E-003
48	-9.34E-005	-2.66E-003
49	6.54E-004	-3.03E-003

50	6.53E-004	-2.79E-003
51	6.53E-004	-2.56E-003
52	6.52E-004	-2.40E-003
53	6.51E-004	-2.33E-003
54	6.51E-004	-2.33E-003
55	6.50E-004	-2.35E-003
56	6.60E-004	-2.35E-003
57	6.32E-004	-2.35E-003
58	5.49E-004	-2.35E-003
59	4.16E-004	-2.36E-003
60	2.30E-004	-2.36E-003
61	9.28E-006	-2.36E-003
62	9.43E-006	-2.59E-003
63	9.78E-006	-2.79E-003
64	1.01E-005	-2.93E-003
65	1.05E-005	-3.00E-003
66	1.08E-005	-3.02E-003
67	1.10E-005	-3.04E-003
68	4.60E-005	-3.04E-003
69	9.20E-005	-3.04E-003
70	1.54E-004	-3.03E-003
71	2.56E-004	-3.03E-003
72	4.28E-004	-3.03E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	5.41E-005
2	6.65E-005
3	-1.06E-004
4	-4.25E-004
5	-7.33E-004
6	-8.66E-004
7	-8.41E-004
8	-7.83E-004
9	-4.78E-004
10	-2.76E-004
11	-1.76E-004
12	-1.47E-004
13	-1.11E-004
14	-8.56E-005
15	-1.22E-004
16	-3.59E-004
17	-6.43E-004
18	-8.18E-004
19	-8.12E-004
20	-7.77E-004
21	-5.74E-004
22	-3.90E-004
23	-2.04E-004
24	1.39E-005
25	3.68E-004
26	3.93E-004
27	2.77E-004
28	-8.45E-007
29	-2.79E-004

30	-3.96E-004
31	-3.72E-004
32	-3.19E-004
33	-5.09E-005
34	1.09E-004
35	1.62E-004
36	1.52E-004
37	1.80E-004
38	2.03E-004
39	1.77E-004
40	-1.81E-006
41	-1.81E-004
42	-2.05E-004
43	-1.82E-004
44	-1.54E-004
45	-1.75E-004
46	-1.19E-004
47	4.40E-005
48	3.14E-004
49	8.43E-004
50	8.68E-004
51	7.34E-004
52	4.26E-004
53	1.07E-004
54	-6.48E-005
55	-5.22E-005
56	-1.19E-005
57	2.07E-004
58	3.94E-004
59	5.78E-004
60	7.81E-004
61	8.16E-004
62	8.22E-004
63	6.46E-004
64	3.61E-004
65	1.22E-004
66	8.38E-005
67	1.09E-004
68	1.45E-004
69	1.84E-004
70	2.82E-004
71	4.82E-004
72	7.85E-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	6.53E-006	-1.09E-003
2	5.83E-006	-1.09E-003
3	4.47E-006	-1.08E-003
4	3.12E-006	-1.07E-003
5	1.76E-006	-1.07E-003
6	3.98E-007	-1.09E-003
7	-3.01E-007	-1.09E-003
8	1.29E-006	-1.09E-003
9	-3.67E-007	-1.09E-003
10	-9.88E-007	-1.09E-003
11	-3.25E-007	-1.10E-003
12	1.32E-006	-1.10E-003
13	1.75E-006	-1.10E-003
14	2.15E-006	-1.10E-003
15	3.06E-006	-1.10E-003
16	3.98E-006	-1.11E-003
17	4.90E-006	-1.10E-003
18	5.82E-006	-1.10E-003
19	6.22E-006	-1.10E-003
20	9.98E-006	-1.10E-003
21	1.89E-005	-1.10E-003
22	2.30E-005	-1.10E-003
23	1.60E-005	-1.10E-003
24	6.76E-006	-1.09E-003
25	3.42E-006	-1.10E-003
26	2.72E-006	-1.09E-003
27	1.36E-006	-1.07E-003
28	-1.24E-011	-1.07E-003
29	-1.36E-006	-1.07E-003
30	-2.72E-006	-1.09E-003
31	-3.42E-006	-1.10E-003
32	4.07E-007	-1.10E-003
33	3.30E-007	-1.10E-003
34	1.95E-007	-1.10E-003
35	8.90E-008	-1.10E-003
36	-2.30E-007	-1.10E-003
37	-2.23E-006	-1.10E-003
38	-1.84E-006	-1.11E-003
39	-9.20E-007	-1.11E-003
40	-1.85E-009	-1.12E-003
41	9.16E-007	-1.11E-003
42	1.83E-006	-1.11E-003
43	2.23E-006	-1.10E-003
44	2.32E-007	-1.10E-003
45	5.95E-008	-1.10E-003
46	-2.71E-008	-1.10E-003
47	-2.82E-007	-1.10E-003
48	-4.09E-007	-1.10E-003
49	3.04E-007	-1.09E-003

50	-3.95E-007	-1.09E-003
51	-1.75E-006	-1.07E-003
52	-3.11E-006	-1.07E-003
53	-4.47E-006	-1.08E-003
54	-5.83E-006	-1.09E-003
55	-6.53E-006	-1.09E-003
56	-6.75E-006	-1.09E-003
57	-1.60E-005	-1.10E-003
58	-2.30E-005	-1.10E-003
59	-1.89E-005	-1.10E-003
60	-9.97E-006	-1.10E-003
61	-6.21E-006	-1.10E-003
62	-5.82E-006	-1.10E-003
63	-4.90E-006	-1.10E-003
64	-3.98E-006	-1.11E-003
65	-3.06E-006	-1.10E-003
66	-2.14E-006	-1.10E-003
67	-1.75E-006	-1.10E-003
68	-1.32E-006	-1.10E-003
69	1.79E-007	-1.10E-003
70	8.22E-007	-1.09E-003
71	3.22E-007	-1.09E-003
72	-1.28E-006	-1.09E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	8.59E-006
2	2.88E-005
3	5.12E-005
4	5.08E-006
5	-4.42E-005
6	-3.15E-005
7	-1.36E-005
8	1.55E-006
9	4.77E-006
10	-1.68E-007
11	-4.56E-006
12	-5.12E-006
13	2.84E-006
14	1.01E-005
15	2.27E-005
16	-2.49E-006
17	-2.43E-005
18	-1.33E-006
19	7.28E-006
20	2.09E-005
21	3.19E-005
22	-5.84E-006
23	-4.00E-005
24	-1.17E-005
25	2.20E-005
26	4.03E-005
27	5.27E-005
28	1.17E-009
29	-5.27E-005

30	-4.03E-005
31	-2.20E-005
32	-6.18E-006
33	9.62E-007
34	2.29E-007
35	7.55E-007
36	3.45E-006
37	1.19E-005
38	1.93E-005
39	3.03E-005
40	2.78E-009
41	-3.03E-005
42	-1.93E-005
43	-1.19E-005
44	-3.38E-006
45	-1.34E-007
46	-5.58E-007
47	-1.36E-006
48	6.18E-006
49	1.36E-005
50	3.15E-005
51	4.42E-005
52	-5.08E-006
53	-5.12E-005
54	-2.88E-005
55	-8.59E-006
56	1.17E-005
57	4.00E-005
58	5.83E-006
59	-3.19E-005
60	-2.09E-005
61	-7.28E-006
62	1.33E-006
63	2.43E-005
64	2.49E-006
65	-2.27E-005
66	-1.01E-005
67	-2.84E-006
68	5.05E-006
69	3.94E-006
70	4.99E-007
71	-4.38E-006
72	-1.55E-006

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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	-4.01E-004	-2.43E-003
2	-4.02E-004	-2.39E-003
3	-4.02E-004	-2.37E-003
4	-4.03E-004	-2.41E-003
5	-4.04E-004	-2.54E-003
6	-4.05E-004	-2.72E-003
7	-4.06E-004	-2.91E-003
8	-2.30E-004	-2.91E-003
9	-1.10E-004	-2.91E-003
10	-5.53E-005	-2.92E-003
11	-3.29E-005	-2.92E-003
12	-1.21E-005	-2.92E-003
13	5.17E-006	-2.92E-003
14	5.44E-006	-2.92E-003
15	6.07E-006	-2.92E-003
16	6.70E-006	-2.88E-003
17	7.33E-006	-2.78E-003
18	7.96E-006	-2.62E-003
19	8.23E-006	-2.45E-003
20	-1.61E-004	-2.45E-003
21	-2.97E-004	-2.44E-003
22	-3.86E-004	-2.44E-003
23	-4.34E-004	-2.44E-003
24	-4.35E-004	-2.43E-003
25	2.25E-006	-2.64E-003
26	1.79E-006	-2.55E-003
27	8.97E-007	-2.46E-003
28	-2.72E-011	-2.43E-003
29	-8.97E-007	-2.46E-003
30	-1.79E-006	-2.55E-003
31	-2.26E-006	-2.64E-003
32	7.92E-005	-2.65E-003
33	1.13E-004	-2.65E-003
34	9.44E-005	-2.65E-003
35	5.91E-005	-2.66E-003
36	3.47E-005	-2.66E-003
37	8.51E-006	-2.66E-003
38	8.78E-006	-2.69E-003
39	9.40E-006	-2.74E-003
40	1.00E-005	-2.76E-003
41	1.06E-005	-2.74E-003
42	1.13E-005	-2.69E-003
43	1.15E-005	-2.66E-003
44	-1.56E-005	-2.66E-003
45	-4.67E-005	-2.65E-003
46	-8.86E-005	-2.65E-003
47	-1.10E-004	-2.65E-003
48	-7.79E-005	-2.64E-003
49	4.35E-004	-2.91E-003

50	4.35E-004	-2.72E-003
51	4.34E-004	-2.54E-003
52	4.33E-004	-2.41E-003
53	4.32E-004	-2.37E-003
54	4.31E-004	-2.39E-003
55	4.31E-004	-2.43E-003
56	4.63E-004	-2.43E-003
57	4.61E-004	-2.44E-003
58	4.11E-004	-2.44E-003
59	3.20E-004	-2.44E-003
60	1.82E-004	-2.44E-003
61	1.16E-005	-2.45E-003
62	1.18E-005	-2.62E-003
63	1.25E-005	-2.78E-003
64	1.31E-005	-2.89E-003
65	1.37E-005	-2.92E-003
66	1.43E-005	-2.92E-003
67	1.46E-005	-2.93E-003
68	3.11E-005	-2.92E-003
69	5.67E-005	-2.92E-003
70	8.38E-005	-2.92E-003
71	1.40E-004	-2.91E-003
72	2.60E-004	-2.91E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

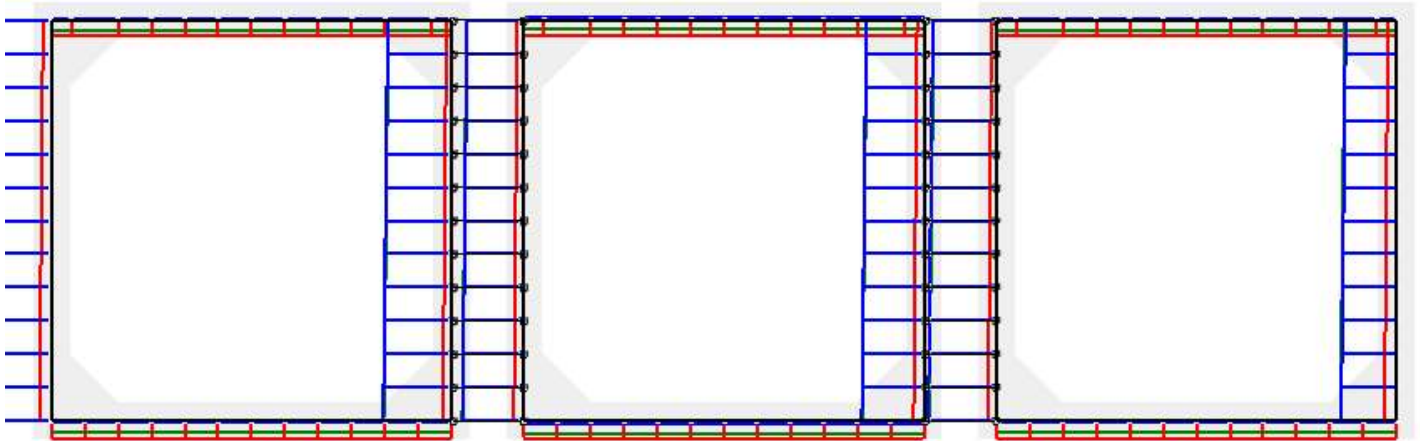
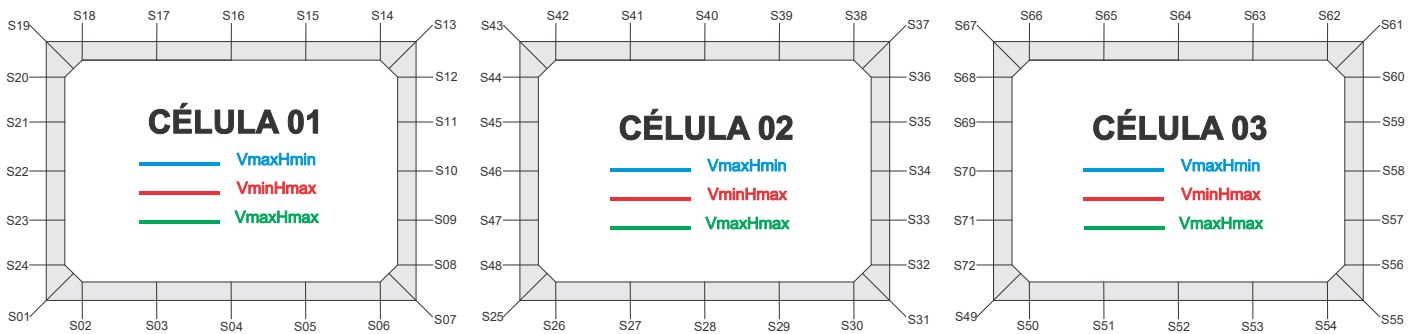
SEÇÃO	ROTAÇÃO (rad)
1	1.38E-004
2	1.51E-004
3	-1.03E-005
4	-3.12E-004
5	-5.94E-004
6	-6.92E-004
7	-6.61E-004
8	-6.00E-004
9	-2.98E-004
10	-1.20E-004
11	-6.22E-005
12	-7.96E-005
13	-4.39E-005
14	-1.70E-005
15	-2.80E-005
16	-2.38E-004
17	-4.93E-004
18	-6.39E-004
19	-6.29E-004
20	-5.93E-004
21	-4.04E-004
22	-2.49E-004
23	-9.47E-005
24	9.89E-005
25	3.14E-004
26	3.42E-004
27	2.52E-004
28	-1.28E-006
29	-2.55E-004

30	-3.46E-004
31	-3.19E-004
32	-2.63E-004
33	-5.85E-006
34	1.20E-004
35	1.15E-004
36	8.10E-005
37	1.12E-004
38	1.37E-004
39	1.44E-004
40	-2.12E-006
41	-1.48E-004
42	-1.40E-004
43	-1.15E-004
44	-8.61E-005
45	-1.49E-004
46	-1.36E-004
47	-1.47E-006
48	2.59E-004
49	6.62E-004
50	6.92E-004
51	5.94E-004
52	3.13E-004
53	1.28E-005
54	-1.47E-004
55	-1.33E-004
56	-9.42E-005
57	1.01E-004
58	2.56E-004
59	4.11E-004
60	6.00E-004
61	6.36E-004
62	6.45E-004
63	4.97E-004
64	2.40E-004
65	2.77E-005
66	1.39E-005
67	4.06E-005
68	7.83E-005
69	8.98E-005
70	1.29E-004
71	2.99E-004
72	6.00E-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	-102.30	-1.97
2	-1.97	-1.97
3	-1.97	-1.97
4	-1.97	-1.97
5	-1.97	-1.97
6	-1.97	-1.97
7	-1.97	-125.30
8	-123.64	-123.64
9	-122.30	-122.30
10	-120.96	-120.96
11	-119.62	-119.62
12	-118.27	-118.27
13	-116.61	1.97
14	1.97	1.97
15	1.97	1.97
16	1.97	1.97
17	1.97	1.97
18	1.97	1.97
19	1.97	-93.61
20	-95.28	-95.28
21	-96.62	-96.62
22	-97.96	-97.96
23	-99.30	-99.30
24	-100.64	-100.64
25	-102.30	-5.16
26	-5.16	-5.16
27	-5.16	-5.16
28	-5.16	-5.16
29	-5.16	-5.16
30	-5.16	-5.16
31	-5.16	-114.26
32	-112.59	-112.59
33	-111.25	-111.25
34	-109.91	-109.91
35	-108.57	-108.57
36	-107.23	-107.23
37	-105.57	5.16
38	5.16	5.16
39	5.16	5.16
40	5.16	5.16
41	5.16	5.16
42	5.16	5.16
43	5.16	-104.65
44	-106.32	-106.32
45	-107.66	-107.66
46	-109.00	-109.00
47	-110.34	-110.34
48	-111.68	-111.68
49	-113.35	-1.63

	50	-1.63	-1.63
	51	-1.63	-1.63
	52	-1.63	-1.63
	53	-1.63	-1.63
	54	-1.63	-1.63
	55	-1.63	-101.85
	56	-100.18	-100.18
	57	-98.84	-98.84
	58	-97.50	-97.50
	59	-96.16	-96.16
	60	-94.82	-94.82
	61	-93.15	1.63
	62	1.63	1.63
	63	1.63	1.63
	64	1.63	1.63
	65	1.63	1.63
	66	1.63	1.63
	67	1.63	-117.06
	68	-118.73	-118.73
	69	-120.07	-120.07
	70	-121.41	-121.41
	71	-122.75	-122.75
	72	-124.09	-124.09

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-22.13	-33.42
2	-33.42	-33.42
3	-33.42	-33.42
4	-33.42	-33.42
5	-33.42	-33.42
6	-33.42	-33.42
7	-33.42	-15.76
8	-14.47	-14.47
9	-13.44	-13.44
10	-12.41	-12.41
11	-11.38	-11.38
12	-10.35	-10.35
13	-9.07	-27.00
14	-27.00	-27.00
15	-27.00	-27.00
16	-27.00	-27.00
17	-27.00	-27.00
18	-27.00	-27.00
19	-27.00	-15.44
20	-16.72	-16.72
21	-17.75	-17.75
22	-18.78	-18.78
23	-19.81	-19.81
24	-20.85	-20.85
25	-22.13	-33.40
26	-33.40	-33.40
27	-33.40	-33.40
28	-33.40	-33.40
29	-33.40	-33.40
30	-33.40	-33.40
31	-33.40	-18.94
32	-17.66	-17.66
33	-16.63	-16.63
34	-15.60	-15.60
35	-14.57	-14.57
36	-13.54	-13.54
37	-12.25	-27.02
38	-27.02	-27.02
39	-27.02	-27.02
40	-27.02	-27.02
41	-27.02	-27.02
42	-27.02	-27.02
43	-27.02	-12.25
44	-13.53	-13.53
45	-14.57	-14.57
46	-15.60	-15.60
47	-16.63	-16.63
48	-17.66	-17.66
49	-18.94	-33.42

	50	-33.42	-33.42
	51	-33.42	-33.42
	52	-33.42	-33.42
	53	-33.42	-33.42
	54	-33.42	-33.42
	55	-33.42	-22.13
	56	-20.85	-20.85
	57	-19.81	-19.81
	58	-18.78	-18.78
	59	-17.75	-17.75
	60	-16.72	-16.72
	61	-15.44	-27.00
	62	-27.00	-27.00
	63	-27.00	-27.00
	64	-27.00	-27.00
	65	-27.00	-27.00
	66	-27.00	-27.00
	67	-27.00	-9.07
	68	-10.35	-10.35
	69	-11.38	-11.38
	70	-12.41	-12.41
	71	-13.44	-13.44
	72	-14.47	-14.47

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-103.13	-22.26
2	-22.26	-22.26
3	-22.26	-22.26
4	-22.26	-22.26
5	-22.26	-22.26
6	-22.26	-22.26
7	-22.26	-124.47
8	-122.81	-122.81
9	-121.47	-121.47
10	-120.13	-120.13
11	-118.79	-118.79
12	-117.45	-117.45
13	-115.78	-18.02
14	-18.02	-18.02
15	-18.02	-18.02
16	-18.02	-18.02
17	-18.02	-18.02
18	-18.02	-18.02
19	-18.02	-94.44
20	-96.10	-96.10
21	-97.45	-97.45
22	-98.79	-98.79
23	-100.13	-100.13
24	-101.47	-101.47
25	-103.13	-23.52
26	-23.52	-23.52
27	-23.52	-23.52
28	-23.52	-23.52
29	-23.52	-23.52
30	-23.52	-23.52
31	-23.52	-113.77
32	-112.10	-112.10
33	-110.76	-110.76
34	-109.42	-109.42
35	-108.08	-108.08
36	-106.74	-106.74
37	-105.08	-16.76
38	-16.76	-16.76
39	-16.76	-16.76
40	-16.76	-16.76
41	-16.76	-16.76
42	-16.76	-16.76
43	-16.76	-105.14
44	-106.81	-106.81
45	-108.15	-108.15
46	-109.49	-109.49
47	-110.83	-110.83
48	-112.17	-112.17
49	-113.84	-22.28

	50	-22.28	-22.28
	51	-22.28	-22.28
	52	-22.28	-22.28
	53	-22.28	-22.28
	54	-22.28	-22.28
	55	-22.28	-103.17
	56	-101.50	-101.50
	57	-100.16	-100.16
	58	-98.82	-98.82
	59	-97.48	-97.48
	60	-96.14	-96.14
	61	-94.47	-18.00
	62	-18.00	-18.00
	63	-18.00	-18.00
	64	-18.00	-18.00
	65	-18.00	-18.00
	66	-18.00	-18.00
	67	-18.00	-115.75
	68	-117.41	-117.41
	69	-118.75	-118.75
	70	-120.09	-120.09
	71	-121.43	-121.43
	72	-122.77	-122.77

---

```
#####
#          SOLICITAÇÕES TANGENCIAIS (ELU)          #
#          VmaxHmin                                #
#####
-----
                ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE
-----
| SEÇÃO|          ESQUERDA (kN)|          DIREITA (kN)|
-----
|  1|          -114.09|          -1.14|
|  2|           -1.14|           -1.14|
|  3|           -1.14|           -1.14|
|  4|           -1.14|           -1.14|
|  5|           -1.14|           -1.14|
|  6|           -1.14|           -1.14|
|  7|           -1.14|          -100.24|
|  8|          -98.57|          -98.57|
|  9|          -97.23|          -97.23|
| 10|          -95.89|          -95.89|
| 11|          -94.55|          -94.55|
| 12|          -93.21|          -93.21|
| 13|          -91.55|           1.14|
| 14|           1.14|           1.14|
| 15|           1.14|           1.14|
| 16|           1.14|           1.14|
| 17|           1.14|           1.14|
| 18|           1.14|           1.14|
| 19|           1.14|          -105.39|
| 20|          -107.06|          -107.06|
| 21|          -108.40|          -108.40|
| 22|          -109.74|          -109.74|
| 23|          -111.08|          -111.08|
| 24|          -112.42|          -112.42|
| 25|          -114.09|           -4.31|
| 26|           -4.31|           -4.31|
| 27|           -4.31|           -4.31|
| 28|           -4.31|           -4.31|
| 29|           -4.31|           -4.31|
| 30|           -4.31|           -4.31|
| 31|           -4.31|          -89.79|
| 32|          -88.13|          -88.13|
| 33|          -86.79|          -86.79|
| 34|          -85.45|          -85.45|
| 35|          -84.11|          -84.11|
| 36|          -82.76|          -82.76|
| 37|          -81.10|           4.31|
| 38|           4.31|           4.31|
| 39|           4.31|           4.31|
| 40|           4.31|           4.31|
| 41|           4.31|           4.31|
| 42|           4.31|           4.31|
| 43|           4.31|          -115.84|
| 44|          -117.50|          -117.50|
| 45|          -118.85|          -118.85|
| 46|          -120.19|          -120.19|
| 47|          -121.53|          -121.53|
| 48|          -122.87|          -122.87|
| 49|          -124.53|           -1.52|
```

	50	-1.52	-1.52
	51	-1.52	-1.52
	52	-1.52	-1.52
	53	-1.52	-1.52
	54	-1.52	-1.52
	55	-1.52	-76.55
	56	-74.88	-74.88
	57	-73.54	-73.54
	58	-72.20	-72.20
	59	-70.86	-70.86
	60	-69.52	-69.52
	61	-67.85	1.52
	62	1.52	1.52
	63	1.52	1.52
	64	1.52	1.52
	65	1.52	1.52
	66	1.52	1.52
	67	1.52	-129.09
	68	-130.75	-130.75
	69	-132.09	-132.09
	70	-133.43	-133.43
	71	-134.77	-134.77
	72	-136.11	-136.11

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-22.03	-33.46
2	-33.46	-33.46
3	-33.46	-33.46
4	-33.46	-33.46
5	-33.46	-33.46
6	-33.46	-33.46
7	-33.46	-15.85
8	-14.57	-14.57
9	-13.54	-13.54
10	-12.51	-12.51
11	-11.48	-11.48
12	-10.45	-10.45
13	-9.17	-26.96
14	-26.96	-26.96
15	-26.96	-26.96
16	-26.96	-26.96
17	-26.96	-26.96
18	-26.96	-26.96
19	-26.96	-15.34
20	-16.62	-16.62
21	-17.65	-17.65
22	-18.68	-18.68
23	-19.72	-19.72
24	-20.75	-20.75
25	-22.03	-33.42
26	-33.42	-33.42
27	-33.42	-33.42
28	-33.42	-33.42
29	-33.42	-33.42
30	-33.42	-33.42
31	-33.42	-18.74
32	-17.45	-17.45
33	-16.42	-16.42
34	-15.39	-15.39
35	-14.36	-14.36
36	-13.33	-13.33
37	-12.05	-27.00
38	-27.00	-27.00
39	-27.00	-27.00
40	-27.00	-27.00
41	-27.00	-27.00
42	-27.00	-27.00
43	-27.00	-12.46
44	-13.74	-13.74
45	-14.77	-14.77
46	-15.80	-15.80
47	-16.83	-16.83
48	-17.87	-17.87
49	-19.15	-33.43

	50	-33.43	-33.43
	51	-33.43	-33.43
	52	-33.43	-33.43
	53	-33.43	-33.43
	54	-33.43	-33.43
	55	-33.43	-22.57
	56	-21.29	-21.29
	57	-20.25	-20.25
	58	-19.22	-19.22
	59	-18.19	-18.19
	60	-17.16	-17.16
	61	-15.88	-26.99
	62	-26.99	-26.99
	63	-26.99	-26.99
	64	-26.99	-26.99
	65	-26.99	-26.99
	66	-26.99	-26.99
	67	-26.99	-8.63
	68	-9.91	-9.91
	69	-10.94	-10.94
	70	-11.97	-11.97
	71	-13.00	-13.00
	72	-14.03	-14.03

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-114.19	-20.81
2	-20.81	-20.81
3	-20.81	-20.81
4	-20.81	-20.81
5	-20.81	-20.81
6	-20.81	-20.81
7	-20.81	-100.14
8	-98.47	-98.47
9	-97.13	-97.13
10	-95.79	-95.79
11	-94.45	-94.45
12	-93.11	-93.11
13	-91.44	-19.47
14	-19.47	-19.47
15	-19.47	-19.47
16	-19.47	-19.47
17	-19.47	-19.47
18	-19.47	-19.47
19	-19.47	-105.50
20	-107.16	-107.16
21	-108.50	-108.50
22	-109.84	-109.84
23	-111.18	-111.18
24	-112.52	-112.52
25	-114.19	-22.19
26	-22.19	-22.19
27	-22.19	-22.19
28	-22.19	-22.19
29	-22.19	-22.19
30	-22.19	-22.19
31	-22.19	-90.67
32	-89.00	-89.00
33	-87.66	-87.66
34	-86.32	-86.32
35	-84.98	-84.98
36	-83.64	-83.64
37	-81.97	-18.09
38	-18.09	-18.09
39	-18.09	-18.09
40	-18.09	-18.09
41	-18.09	-18.09
42	-18.09	-18.09
43	-18.09	-114.96
44	-116.63	-116.63
45	-117.97	-117.97
46	-119.31	-119.31
47	-120.65	-120.65
48	-121.99	-121.99
49	-123.66	-22.16

	50	-22.16	-22.16
	51	-22.16	-22.16
	52	-22.16	-22.16
	53	-22.16	-22.16
	54	-22.16	-22.16
	55	-22.16	-79.27
	56	-77.61	-77.61
	57	-76.27	-76.27
	58	-74.93	-74.93
	59	-73.59	-73.59
	60	-72.24	-72.24
	61	-70.58	-18.12
	62	-18.12	-18.12
	63	-18.12	-18.12
	64	-18.12	-18.12
	65	-18.12	-18.12
	66	-18.12	-18.12
	67	-18.12	-126.36
	68	-128.02	-128.02
	69	-129.37	-129.37
	70	-130.71	-130.71
	71	-132.05	-132.05
	72	-133.39	-133.39

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-60.00	-10.27
2	-10.27	-10.27
3	-10.27	-10.27
4	-10.27	-10.27
5	-10.27	-10.27
6	-10.27	-10.27
7	-10.27	-72.53
8	-71.25	-71.25
9	-70.22	-70.22
10	-69.19	-69.19
11	-68.15	-68.15
12	-67.12	-67.12
13	-65.84	-4.58
14	-4.58	-4.58
15	-4.58	-4.58
16	-4.58	-4.58
17	-4.58	-4.58
18	-4.58	-4.58
19	-4.58	-53.32
20	-54.60	-54.60
21	-55.63	-55.63
22	-56.66	-56.66
23	-57.69	-57.69
24	-58.72	-58.72
25	-60.00	-11.42
26	-11.42	-11.42
27	-11.42	-11.42
28	-11.42	-11.42
29	-11.42	-11.42
30	-11.42	-11.42
31	-11.42	-66.37
32	-65.09	-65.09
33	-64.06	-64.06
34	-63.02	-63.02
35	-61.99	-61.99
36	-60.96	-60.96
37	-59.68	-3.43
38	-3.43	-3.43
39	-3.43	-3.43
40	-3.43	-3.43
41	-3.43	-3.43
42	-3.43	-3.43
43	-3.43	-59.48
44	-60.76	-60.76
45	-61.79	-61.79
46	-62.82	-62.82
47	-63.85	-63.85
48	-64.88	-64.88
49	-66.16	-10.20

	50	-10.20	-10.20
	51	-10.20	-10.20
	52	-10.20	-10.20
	53	-10.20	-10.20
	54	-10.20	-10.20
	55	-10.20	-59.90
	56	-58.62	-58.62
	57	-57.59	-57.59
	58	-56.56	-56.56
	59	-55.53	-55.53
	60	-54.50	-54.50
	61	-53.21	-4.65
	62	-4.65	-4.65
	63	-4.65	-4.65
	64	-4.65	-4.65
	65	-4.65	-4.65
	66	-4.65	-4.65
	67	-4.65	-65.94
	68	-67.22	-67.22
	69	-68.26	-68.26
	70	-69.29	-69.29
	71	-70.32	-70.32
	72	-71.35	-71.35

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-19.88	-22.14
2	-22.14	-22.14
3	-22.14	-22.14
4	-22.14	-22.14
5	-22.14	-22.14
6	-22.14	-22.14
7	-22.14	-18.00
8	-16.72	-16.72
9	-15.69	-15.69
10	-14.66	-14.66
11	-13.63	-13.63
12	-12.59	-12.59
13	-11.31	-16.32
14	-16.32	-16.32
15	-16.32	-16.32
16	-16.32	-16.32
17	-16.32	-16.32
18	-16.32	-16.32
19	-16.32	-13.19
20	-14.48	-14.48
21	-15.51	-15.51
22	-16.54	-16.54
23	-17.57	-17.57
24	-18.60	-18.60
25	-19.88	-22.16
26	-22.16	-22.16
27	-22.16	-22.16
28	-22.16	-22.16
29	-22.16	-22.16
30	-22.16	-22.16
31	-22.16	-18.94
32	-17.66	-17.66
33	-16.63	-16.63
34	-15.60	-15.60
35	-14.57	-14.57
36	-13.54	-13.54
37	-12.25	-16.30
38	-16.30	-16.30
39	-16.30	-16.30
40	-16.30	-16.30
41	-16.30	-16.30
42	-16.30	-16.30
43	-16.30	-12.25
44	-13.53	-13.53
45	-14.57	-14.57
46	-15.60	-15.60
47	-16.63	-16.63
48	-17.66	-17.66
49	-18.94	-22.14

	50	-22.14	-22.14
	51	-22.14	-22.14
	52	-22.14	-22.14
	53	-22.14	-22.14
	54	-22.14	-22.14
	55	-22.14	-19.88
	56	-18.60	-18.60
	57	-17.57	-17.57
	58	-16.54	-16.54
	59	-15.51	-15.51
	60	-14.48	-14.48
	61	-13.19	-16.32
	62	-16.32	-16.32
	63	-16.32	-16.32
	64	-16.32	-16.32
	65	-16.32	-16.32
	66	-16.32	-16.32
	67	-16.32	-11.31
	68	-12.59	-12.59
	69	-13.63	-13.63
	70	-14.66	-14.66
	71	-15.69	-15.69
	72	-16.72	-16.72

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-60.12	-14.51
2	-14.51	-14.51
3	-14.51	-14.51
4	-14.51	-14.51
5	-14.51	-14.51
6	-14.51	-14.51
7	-14.51	-72.42
8	-71.13	-71.13
9	-70.10	-70.10
10	-69.07	-69.07
11	-68.04	-68.04
12	-67.01	-67.01
13	-65.73	-11.13
14	-11.13	-11.13
15	-11.13	-11.13
16	-11.13	-11.13
17	-11.13	-11.13
18	-11.13	-11.13
19	-11.13	-53.43
20	-54.71	-54.71
21	-55.74	-55.74
22	-56.77	-56.77
23	-57.80	-57.80
24	-58.84	-58.84
25	-60.12	-15.03
26	-15.03	-15.03
27	-15.03	-15.03
28	-15.03	-15.03
29	-15.03	-15.03
30	-15.03	-15.03
31	-15.03	-66.17
32	-64.89	-64.89
33	-63.86	-63.86
34	-62.83	-62.83
35	-61.80	-61.80
36	-60.77	-60.77
37	-59.49	-10.62
38	-10.62	-10.62
39	-10.62	-10.62
40	-10.62	-10.62
41	-10.62	-10.62
42	-10.62	-10.62
43	-10.62	-59.67
44	-60.95	-60.95
45	-61.98	-61.98
46	-63.01	-63.01
47	-64.05	-64.05
48	-65.08	-65.08
49	-66.36	-14.58

	50	-14.58	-14.58
	51	-14.58	-14.58
	52	-14.58	-14.58
	53	-14.58	-14.58
	54	-14.58	-14.58
	55	-14.58	-60.21
	56	-58.93	-58.93
	57	-57.90	-57.90
	58	-56.87	-56.87
	59	-55.83	-55.83
	60	-54.80	-54.80
	61	-53.52	-11.06
	62	-11.06	-11.06
	63	-11.06	-11.06
	64	-11.06	-11.06
	65	-11.06	-11.06
	66	-11.06	-11.06
	67	-11.06	-65.64
	68	-66.92	-66.92
	69	-67.95	-67.95
	70	-68.98	-68.98
	71	-70.01	-70.01
	72	-71.04	-71.04

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-17.86	-10.11
2	-10.11	-10.11
3	-10.11	-10.11
4	-10.11	-10.11
5	-10.11	-10.11
6	-10.11	-10.11
7	-10.11	-20.02
8	-18.74	-18.74
9	-17.71	-17.71
10	-16.68	-16.68
11	-15.65	-15.65
12	-14.61	-14.61
13	-13.33	-4.74
14	-4.74	-4.74
15	-4.74	-4.74
16	-4.74	-4.74
17	-4.74	-4.74
18	-4.74	-4.74
19	-4.74	-11.17
20	-12.46	-12.46
21	-13.49	-13.49
22	-14.52	-14.52
23	-15.55	-15.55
24	-16.58	-16.58
25	-17.86	-10.12
26	-10.12	-10.12
27	-10.12	-10.12
28	-10.12	-10.12
29	-10.12	-10.12
30	-10.12	-10.12
31	-10.12	-18.95
32	-17.67	-17.67
33	-16.63	-16.63
34	-15.60	-15.60
35	-14.57	-14.57
36	-13.54	-13.54
37	-12.26	-4.73
38	-4.73	-4.73
39	-4.73	-4.73
40	-4.73	-4.73
41	-4.73	-4.73
42	-4.73	-4.73
43	-4.73	-12.25
44	-13.53	-13.53
45	-14.56	-14.56
46	-15.59	-15.59
47	-16.62	-16.62
48	-17.65	-17.65
49	-18.94	-10.12

	50	-10.12	-10.12
	51	-10.12	-10.12
	52	-10.12	-10.12
	53	-10.12	-10.12
	54	-10.12	-10.12
	55	-10.12	-17.86
	56	-16.57	-16.57
	57	-15.54	-15.54
	58	-14.51	-14.51
	59	-13.48	-13.48
	60	-12.45	-12.45
	61	-11.17	-4.73
	62	-4.73	-4.73
	63	-4.73	-4.73
	64	-4.73	-4.73
	65	-4.73	-4.73
	66	-4.73	-4.73
	67	-4.73	-13.34
	68	-14.62	-14.62
	69	-15.65	-15.65
	70	-16.68	-16.68
	71	-17.71	-17.71
	72	-18.75	-18.75

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

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-44.01	-9.91
2	-9.91	-9.91
3	-9.91	-9.91
4	-9.91	-9.91
5	-9.91	-9.91
6	-9.91	-9.91
7	-9.91	-53.03
8	-51.75	-51.75
9	-50.72	-50.72
10	-49.68	-49.68
11	-48.65	-48.65
12	-47.62	-47.62
13	-46.34	-4.94
14	-4.94	-4.94
15	-4.94	-4.94
16	-4.94	-4.94
17	-4.94	-4.94
18	-4.94	-4.94
19	-4.94	-37.32
20	-38.60	-38.60
21	-39.64	-39.64
22	-40.67	-40.67
23	-41.70	-41.70
24	-42.73	-42.73
25	-44.01	-10.40
26	-10.40	-10.40
27	-10.40	-10.40
28	-10.40	-10.40
29	-10.40	-10.40
30	-10.40	-10.40
31	-10.40	-48.48
32	-47.20	-47.20
33	-46.17	-46.17
34	-45.14	-45.14
35	-44.11	-44.11
36	-43.08	-43.08
37	-41.80	-4.45
38	-4.45	-4.45
39	-4.45	-4.45
40	-4.45	-4.45
41	-4.45	-4.45
42	-4.45	-4.45
43	-4.45	-41.87
44	-43.15	-43.15
45	-44.18	-44.18
46	-45.21	-45.21
47	-46.24	-46.24
48	-47.27	-47.27
49	-48.56	-9.94

	50	-9.94	-9.94
	51	-9.94	-9.94
	52	-9.94	-9.94
	53	-9.94	-9.94
	54	-9.94	-9.94
	55	-9.94	-44.05
	56	-42.77	-42.77
	57	-41.73	-41.73
	58	-40.70	-40.70
	59	-39.67	-39.67
	60	-38.64	-38.64
	61	-37.36	-4.91
	62	-4.91	-4.91
	63	-4.91	-4.91
	64	-4.91	-4.91
	65	-4.91	-4.91
	66	-4.91	-4.91
	67	-4.91	-46.30
	68	-47.59	-47.59
	69	-48.62	-48.62
	70	-49.65	-49.65
	71	-50.68	-50.68
	72	-51.71	-51.71

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-19.27	-19.32
2	-19.32	-19.32
3	-19.32	-19.32
4	-19.32	-19.32
5	-19.32	-19.32
6	-19.32	-19.32
7	-19.32	-18.61
8	-17.33	-17.33
9	-16.30	-16.30
10	-15.26	-15.26
11	-14.23	-14.23
12	-13.20	-13.20
13	-11.92	-13.07
14	-13.07	-13.07
15	-13.07	-13.07
16	-13.07	-13.07
17	-13.07	-13.07
18	-13.07	-13.07
19	-13.07	-12.59
20	-13.87	-13.87
21	-14.90	-14.90
22	-15.93	-15.93
23	-16.96	-16.96
24	-17.99	-17.99
25	-19.27	-19.34
26	-19.34	-19.34
27	-19.34	-19.34
28	-19.34	-19.34
29	-19.34	-19.34
30	-19.34	-19.34
31	-19.34	-18.94
32	-17.66	-17.66
33	-16.63	-16.63
34	-15.60	-15.60
35	-14.57	-14.57
36	-13.54	-13.54
37	-12.25	-13.05
38	-13.05	-13.05
39	-13.05	-13.05
40	-13.05	-13.05
41	-13.05	-13.05
42	-13.05	-13.05
43	-13.05	-12.25
44	-13.53	-13.53
45	-14.57	-14.57
46	-15.60	-15.60
47	-16.63	-16.63
48	-17.66	-17.66
49	-18.94	-19.32

	50	-19.32	-19.32
	51	-19.32	-19.32
	52	-19.32	-19.32
	53	-19.32	-19.32
	54	-19.32	-19.32
	55	-19.32	-19.27
	56	-17.99	-17.99
	57	-16.96	-16.96
	58	-15.93	-15.93
	59	-14.90	-14.90
	60	-13.87	-13.87
	61	-12.59	-13.07
	62	-13.07	-13.07
	63	-13.07	-13.07
	64	-13.07	-13.07
	65	-13.07	-13.07
	66	-13.07	-13.07
	67	-13.07	-11.92
	68	-13.20	-13.20
	69	-14.23	-14.23
	70	-15.26	-15.26
	71	-16.30	-16.30
	72	-17.33	-17.33

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

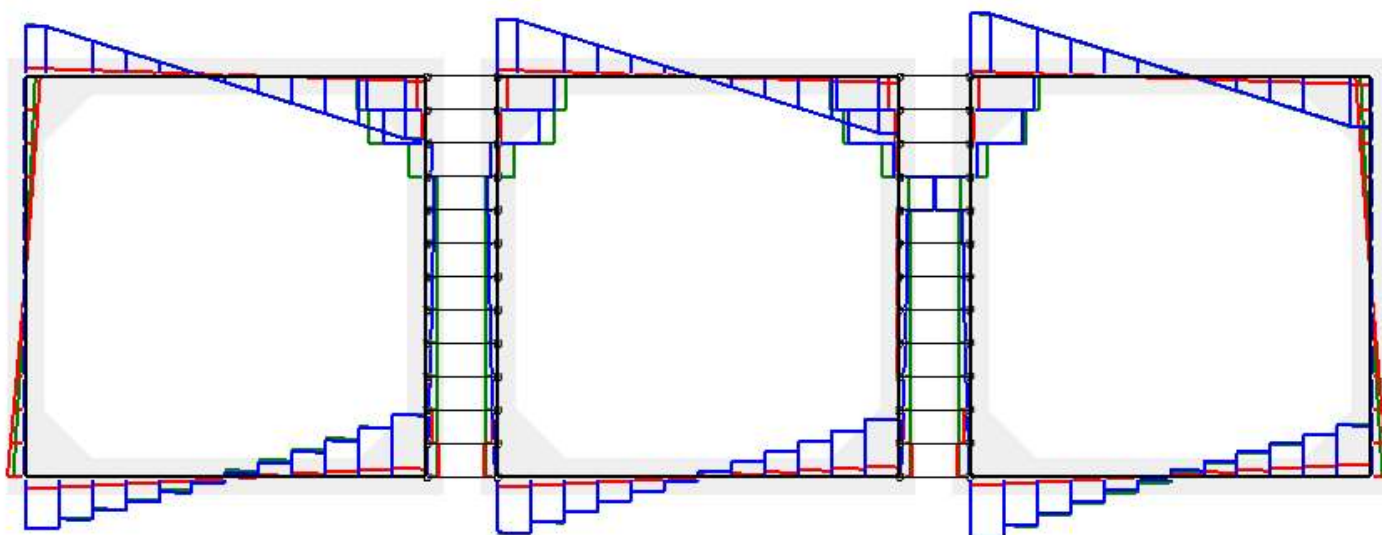
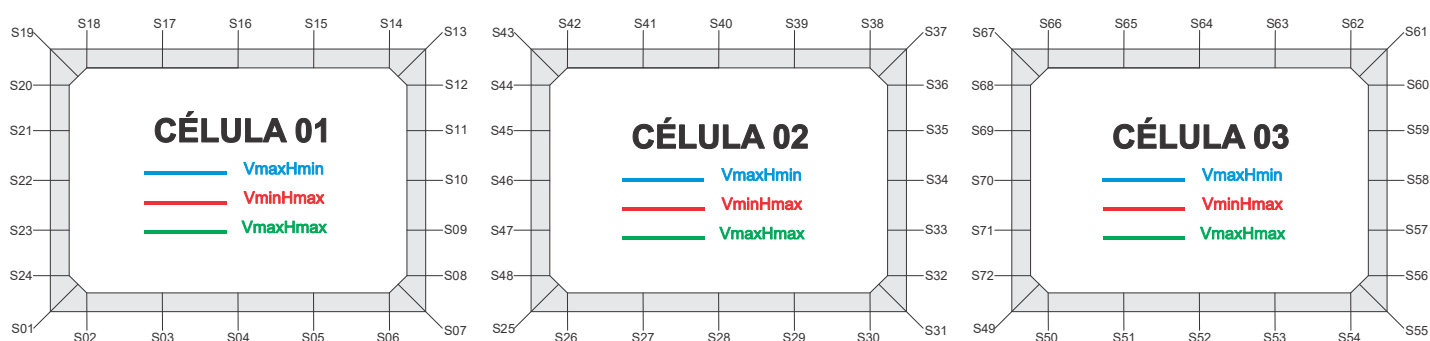
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-44.17	-12.64
2	-12.64	-12.64
3	-12.64	-12.64
4	-12.64	-12.64
5	-12.64	-12.64
6	-12.64	-12.64
7	-12.64	-52.87
8	-51.59	-51.59
9	-50.56	-50.56
10	-49.53	-49.53
11	-48.50	-48.50
12	-47.46	-47.46
13	-46.18	-8.96
14	-8.96	-8.96
15	-8.96	-8.96
16	-8.96	-8.96
17	-8.96	-8.96
18	-8.96	-8.96
19	-8.96	-37.48
20	-38.76	-38.76
21	-39.79	-39.79
22	-40.82	-40.82
23	-41.86	-41.86
24	-42.89	-42.89
25	-44.17	-12.75
26	-12.75	-12.75
27	-12.75	-12.75
28	-12.75	-12.75
29	-12.75	-12.75
30	-12.75	-12.75
31	-12.75	-48.49
32	-47.21	-47.21
33	-46.18	-46.18
34	-45.15	-45.15
35	-44.12	-44.12
36	-43.08	-43.08
37	-41.80	-8.84
38	-8.84	-8.84
39	-8.84	-8.84
40	-8.84	-8.84
41	-8.84	-8.84
42	-8.84	-8.84
43	-8.84	-41.86
44	-43.14	-43.14
45	-44.17	-44.17
46	-45.20	-45.20
47	-46.24	-46.24
48	-47.27	-47.27
49	-48.55	-12.70

	50	-12.70	-12.70
	51	-12.70	-12.70
	52	-12.70	-12.70
	53	-12.70	-12.70
	54	-12.70	-12.70
	55	-12.70	-44.20
	56	-42.92	-42.92
	57	-41.88	-41.88
	58	-40.85	-40.85
	59	-39.82	-39.82
	60	-38.79	-38.79
	61	-37.51	-8.90
	62	-8.90	-8.90
	63	-8.90	-8.90
	64	-8.90	-8.90
	65	-8.90	-8.90
	66	-8.90	-8.90
	67	-8.90	-46.15
	68	-47.44	-47.44
	69	-48.47	-48.47
	70	-49.50	-49.50
	71	-50.53	-50.53
	72	-51.56	-51.56

---

## 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	1.97	-93.99
2	-78.86	-61.91
3	-46.12	-28.68
4	-12.12	6.47
5	24.62	45.22
6	65.77	89.08
7	112.19	-1.97
8	-6.51	-6.51
9	-10.22	-10.22
10	-13.11	-13.11
11	-15.17	-15.17
12	-11.31	78.10
13	106.86	-116.61
14	-87.87	-87.87
15	-49.69	-49.69
16	-11.50	-11.50
17	26.69	26.69
18	64.88	64.88
19	93.61	1.97
20	2.79	2.79
21	3.29	3.29
22	3.45	3.45
23	3.29	3.29
24	2.79	2.79
25	1.97	-102.70
26	-83.65	-63.53
27	-45.32	-26.22
28	-8.76	9.93
29	27.37	46.45
30	64.63	84.69
31	103.66	-5.16
32	-9.70	-9.70
33	-13.41	-13.41
34	-16.30	-16.30
35	-18.36	-66.76
36	7.95	91.77
37	111.66	-105.57
38	-76.83	-76.83
39	-38.64	-38.64
40	-0.46	-0.46
41	37.73	37.73
42	75.92	75.92
43	104.65	-103.66
44	-74.91	14.50
45	18.36	18.36
46	16.30	16.30
47	13.41	13.41
48	9.70	9.70
49	5.16	-112.67

	50	-89.60	-66.32
	51	-45.79	-25.20
	52	-7.06	11.53
	53	28.11	45.56
	54	61.37	78.34
	55	93.51	-1.63
	56	-2.46	-2.46
	57	-2.95	-2.95
	58	-3.12	-3.12
	59	-2.95	-2.95
	60	-2.46	-2.46
	61	-1.63	-93.15
	62	-64.42	-64.42
	63	-26.23	-26.23
	64	11.96	11.96
	65	50.14	50.14
	66	88.33	88.33
	67	117.06	-115.19
	68	-95.30	-11.48
	69	63.23	14.84
	70	12.77	12.77
	71	9.88	9.88
	72	6.17	6.17

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	33.42	-20.29
2	-17.85	-14.09
3	-11.35	-7.59
4	-4.88	-1.16
5	1.51	5.21
6	7.86	11.54
7	13.93	-25.17
8	-11.70	-1.88
9	0.06	0.06
10	0.06	0.06
11	0.06	0.06
12	0.25	5.97
13	16.34	-9.07
14	-4.82	-4.82
15	-0.82	-0.82
16	3.19	3.19
17	7.19	7.19
18	11.19	11.19
19	15.44	-27.00
20	-18.58	-18.58
21	-9.50	-9.50
22	0.24	0.24
23	10.64	10.64
24	21.70	21.70
25	33.42	-17.04
26	-14.55	-10.80
27	-8.12	-4.44
28	-1.82	1.82
29	4.44	8.12
30	10.80	14.55
31	17.04	-25.18
32	-11.75	-2.00
33	0.20	0.20
34	0.20	0.20
35	0.20	-0.79
36	0.43	6.17
37	16.45	-12.25
38	-8.00	-8.00
39	-4.00	-4.00
40	0.00	0.00
41	4.00	4.00
42	8.00	8.00
43	12.25	-16.35
44	-5.99	-0.26
45	-0.08	-0.08
46	-0.08	-0.08
47	-0.08	-0.08
48	1.87	11.68
49	25.16	-13.93

	50	-11.54	-7.86
	51	-5.21	-1.51
	52	1.16	4.88
	53	7.59	11.35
	54	14.09	17.85
	55	20.29	-33.42
	56	-21.70	-21.70
	57	-10.64	-10.64
	58	-0.24	-0.24
	59	9.50	9.50
	60	18.58	18.58
	61	27.00	-15.44
	62	-11.19	-11.19
	63	-7.19	-7.19
	64	-3.19	-3.19
	65	0.82	0.82
	66	4.82	4.82
	67	9.07	-16.43
	68	-6.16	-0.41
	69	0.80	-0.19
	70	-0.19	-0.19
	71	-0.19	-0.19
	72	2.01	11.76

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	22.26	-94.04
2	-77.55	-59.45
3	-42.71	-24.56
4	-7.53	11.25
5	29.28	49.41
6	69.11	91.13
7	112.48	-22.26
8	-22.26	-22.26
9	-22.26	-22.26
10	-22.26	-22.26
11	-22.26	-22.26
12	32.01	103.61
13	126.36	-115.78
14	-87.05	-87.05
15	-48.86	-48.86
16	-10.67	-10.67
17	27.52	27.52
18	65.70	65.70
19	94.44	-18.02
20	-12.41	-12.41
21	-6.36	-6.36
22	0.14	0.14
23	7.07	7.07
24	14.44	14.44
25	22.26	-103.39
26	-84.60	-64.58
27	-46.34	-27.12
28	-9.49	9.40
29	27.04	46.26
30	64.50	84.52
31	103.32	-23.52
32	-23.52	-23.52
33	-23.52	-23.52
34	-23.52	-23.52
35	-23.52	-19.94
36	29.09	101.10
37	124.51	-105.08
38	-76.34	-76.34
39	-38.15	-38.15
40	0.03	0.03
41	38.22	38.22
42	76.41	76.41
43	105.14	-125.10
44	-102.35	-30.75
45	23.52	23.52
46	23.52	23.52
47	23.52	23.52
48	23.52	23.52
49	23.52	-112.44

	50	-91.09	-69.07
	51	-49.37	-29.24
	52	-11.21	7.57
	53	24.60	42.75
	54	59.49	77.59
	55	94.07	-22.28
	56	-14.47	-14.47
	57	-7.09	-7.09
	58	-0.16	-0.16
	59	6.33	6.33
	60	12.39	12.39
	61	18.00	-94.47
	62	-65.74	-65.74
	63	-27.55	-27.55
	64	10.64	10.64
	65	48.82	48.82
	66	87.01	87.01
	67	115.75	-125.75
	68	-102.34	-30.32
	69	18.70	22.28
	70	22.28	22.28
	71	22.28	22.28
	72	22.28	22.28

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#####
# SOLICITAÇÕES TANGENCIAIS (ELU) #
# VmaxHmin #
#####
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ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	1.14	-102.91
2	-83.24	-62.92
3	-44.90	-26.39
4	-9.87	7.54
5	23.41	40.63
6	56.71	74.47
7	90.96	-1.14
8	-5.68	-5.68
9	-9.39	-9.39
10	-12.28	-12.28
11	-14.34	-14.34
12	-5.74	75.40
13	107.79	-91.55
14	-85.87	-85.87
15	-47.68	-47.68
16	-9.50	-9.50
17	28.69	28.69
18	66.88	66.88
19	105.39	1.14
20	1.96	1.96
21	2.46	2.46
22	2.62	2.62
23	2.46	2.46
24	1.96	1.96
25	1.14	-111.03
26	-87.45	-63.96
27	-43.53	-23.36
28	-5.95	11.57
29	26.75	42.45
30	56.17	70.68
31	83.04	-4.31
32	-8.85	-8.85
33	-12.56	-12.56
34	-15.45	-15.45
35	-17.51	-43.80
36	10.34	79.90
37	104.34	-81.10
38	-75.42	-75.42
39	-37.24	-37.24
40	0.95	0.95
41	39.14	39.14
42	77.33	77.33
43	115.84	-104.61
44	-72.23	8.91
45	17.52	17.52
46	15.45	15.45
47	12.56	12.56
48	8.85	8.85
49	4.31	-121.76

	50	-94.02	-67.25
	51	-44.41	-22.68
	52	-4.56	12.87
	53	27.15	41.16
	54	52.42	63.73
	55	72.13	-1.52
	56	-2.34	-2.34
	57	-2.84	-2.84
	58	-3.00	-3.00
	59	-2.84	-2.84
	60	-2.34	-2.34
	61	-1.52	-67.85
	62	-62.18	-62.18
	63	-23.99	-23.99
	64	14.20	14.20
	65	52.39	52.39
	66	90.57	90.57
	67	129.09	-107.13
	68	-82.69	-13.13
	69	41.00	14.72
	70	12.66	12.66
	71	9.77	9.77
	72	6.06	6.06

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	33.46	-20.19
2	-17.76	-14.00
3	-11.27	-7.50
4	-4.79	-1.07
5	1.61	5.30
6	7.96	11.64
7	14.03	-25.93
8	-11.08	-1.05
9	0.05	0.05
10	0.05	0.05
11	0.05	0.05
12	-0.18	5.36
13	16.30	-9.17
14	-4.92	-4.92
15	-0.91	-0.91
16	3.09	3.09
17	7.09	7.09
18	11.09	11.09
19	15.34	-26.96
20	-18.54	-18.54
21	-9.46	-9.46
22	0.28	0.28
23	10.68	10.68
24	21.74	21.74
25	33.46	-17.24
26	-14.73	-10.98
27	-8.30	-4.62
28	-2.01	1.63
29	4.24	7.91
30	10.59	14.33
31	16.83	-25.86
32	-11.07	-1.16
33	0.17	0.17
34	0.17	0.17
35	0.17	-0.72
36	0.08	5.56
37	16.41	-12.05
38	-7.80	-7.80
39	-3.80	-3.80
40	0.21	0.21
41	4.21	4.21
42	8.21	8.21
43	12.46	-16.34
44	-5.40	0.14
45	-0.09	-0.09
46	-0.09	-0.09
47	-0.09	-0.09
48	1.01	11.03
49	25.89	-13.50

	50	-11.12	-7.44
	51	-4.79	-1.09
	52	1.58	5.31
	53	8.03	11.80
	54	14.55	18.31
	55	20.74	-33.43
	56	-21.71	-21.71
	57	-10.65	-10.65
	58	-0.25	-0.25
	59	9.49	9.49
	60	18.57	18.57
	61	26.99	-15.88
	62	-11.63	-11.63
	63	-7.63	-7.63
	64	-3.63	-3.63
	65	0.38	0.38
	66	4.38	4.38
	67	8.63	-16.41
	68	-5.55	-0.07
	69	0.72	-0.17
	70	-0.17	-0.17
	71	-0.17	-0.17
	72	1.16	11.08

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	20.81	-102.10
2	-80.84	-59.18
3	-40.10	-20.78
4	-3.75	13.86
5	29.58	46.25
6	61.35	77.64
7	92.13	-20.81
8	-20.82	-20.82
9	-20.82	-20.82
10	-20.82	-20.82
11	-20.82	-20.82
12	36.42	97.56
13	126.90	-91.44
14	-85.77	-85.77
15	-47.58	-47.58
16	-9.39	-9.39
17	28.80	28.80
18	66.98	66.98
19	105.50	-19.47
20	-13.85	-13.85
21	-7.80	-7.80
22	-1.31	-1.31
23	5.63	5.63
24	13.00	13.00
25	20.81	-110.39
26	-87.10	-63.74
27	-43.30	-23.02
28	-5.42	12.33
29	27.72	43.60
30	57.40	71.89
31	84.07	-22.19
32	-22.19	-22.19
33	-22.19	-22.19
34	-22.19	-22.19
35	-22.19	-1.31
36	25.86	90.03
37	122.20	-81.97
38	-76.30	-76.30
39	-38.11	-38.11
40	0.08	0.08
41	38.26	38.26
42	76.45	76.45
43	114.96	-125.52
44	-96.19	-35.05
45	22.19	22.19
46	22.19	22.19
47	22.19	22.19
48	22.19	22.19
49	22.19	-120.27

	50	-94.48	-69.15
	51	-47.27	-26.07
	52	-8.07	9.57
	53	24.38	39.21
	54	51.53	64.12
	55	74.01	-22.16
	56	-14.35	-14.35
	57	-6.97	-6.97
	58	-0.04	-0.04
	59	6.45	6.45
	60	12.51	12.51
	61	18.12	-70.58
	62	-64.90	-64.90
	63	-26.72	-26.72
	64	11.47	11.47
	65	49.66	49.66
	66	87.85	87.85
	67	126.36	-122.23
	68	-90.06	-25.89
	69	1.28	22.16
	70	22.16	22.16
	71	22.16	22.16
	72	22.16	22.16

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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	10.27	-54.80
2	-45.65	-35.21
3	-25.77	-15.20
4	-5.49	5.55
5	15.96	27.91
6	39.44	52.65
7	65.26	-10.28
8	-10.28	-10.28
9	-10.28	-10.28
10	-10.28	-10.28
11	-10.28	-10.28
12	7.73	52.37
13	66.52	-65.84
14	-49.29	-49.29
15	-27.78	-27.78
16	-6.26	-6.26
17	15.25	15.25
18	36.77	36.77
19	53.32	-4.58
20	-3.34	-3.34
21	-1.61	-1.61
22	0.62	0.62
23	3.34	3.34
24	6.56	6.56
25	10.27	-59.98
26	-49.16	-37.35
27	-26.84	-15.54
28	-5.42	5.68
29	15.80	27.10
30	37.59	49.39
31	60.19	-11.42
32	-11.42	-11.42
33	-11.42	-11.42
34	-11.43	-11.43
35	-11.43	-22.23
36	11.60	54.99
37	67.16	-59.68
38	-43.13	-43.13
39	-21.62	-21.62
40	-0.10	-0.10
41	21.41	21.41
42	42.93	42.93
43	59.48	-65.37
44	-51.22	-6.58
45	11.43	11.43
46	11.43	11.43
47	11.43	11.42
48	11.42	11.42
49	11.42	-65.36

	50	-52.77	-39.56
	51	-28.04	-16.09
	52	-5.68	5.36
	53	15.07	25.64
	54	35.09	45.54
	55	54.69	-10.20
	56	-6.49	-6.49
	57	-3.27	-3.27
	58	-0.55	-0.55
	59	1.68	1.68
	60	3.41	3.41
	61	4.65	-53.21
	62	-36.66	-36.66
	63	-15.15	-15.15
	64	6.36	6.36
	65	27.88	27.88
	66	49.39	49.39
	67	65.94	-68.38
	68	-56.21	-12.82
	69	21.01	10.20
	70	10.20	10.20
	71	10.20	10.20
	72	10.20	10.20

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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	22.14	-18.01
2	-15.54	-11.79
3	-9.09	-5.38
4	-2.72	0.96
5	3.61	7.30
6	9.97	13.69
7	16.14	-22.14
8	-16.28	-4.98
9	0.06	0.06
10	0.06	0.06
11	0.06	0.06
12	2.08	9.25
13	16.45	-11.31
14	-7.06	-7.06
15	-3.06	-3.06
16	0.94	0.94
17	4.94	4.94
18	8.94	8.94
19	13.19	-16.32
20	-11.31	-11.31
21	-5.74	-5.74
22	0.39	0.39
23	7.08	7.08
24	14.33	14.33
25	22.14	-17.05
26	-14.58	-10.83
27	-8.15	-4.46
28	-1.83	1.83
29	4.46	8.15
30	10.83	14.58
31	17.05	-22.16
32	-16.35	-5.09
33	0.14	0.14
34	0.14	0.14
35	0.14	-0.58
36	2.18	9.36
37	16.50	-12.25
38	-8.00	-8.00
39	-4.00	-4.00
40	0.00	0.00
41	4.00	4.00
42	8.00	8.00
43	12.25	-16.43
44	-9.23	-2.06
45	-0.05	-0.05
46	-0.05	-0.05
47	-0.05	-0.05
48	5.00	16.29
49	22.16	-16.14

	50	-13.69	-9.97
	51	-7.30	-3.61
	52	-0.96	2.72
	53	5.38	9.09
	54	11.79	15.54
	55	18.01	-22.14
	56	-14.33	-14.33
	57	-7.08	-7.08
	58	-0.39	-0.39
	59	5.74	5.74
	60	11.31	11.31
	61	16.32	-13.19
	62	-8.94	-8.94
	63	-4.94	-4.94
	64	-0.94	-0.94
	65	3.06	3.06
	66	7.06	7.06
	67	11.31	-16.52
	68	-9.38	-2.20
	69	0.56	-0.16
	70	-0.16	-0.16
	71	-0.16	-0.16
	72	5.07	16.33

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	14.51	-54.65
2	-45.06	-34.24
3	-24.50	-13.71
4	-3.85	7.24
5	17.60	29.40
6	40.65	53.45
7	65.49	-14.51
8	-14.51	-14.51
9	-14.51	-14.51
10	-14.51	-14.51
11	-14.51	-14.51
12	24.27	62.11
13	73.35	-65.73
14	-49.18	-49.18
15	-27.66	-27.66
16	-6.15	-6.15
17	15.37	15.37
18	36.88	36.88
19	53.43	-11.13
20	-7.79	-7.79
21	-4.07	-4.07
22	0.01	0.01
23	4.47	4.47
24	9.31	9.31
25	14.51	-60.23
26	-49.49	-37.71
27	-27.20	-15.87
28	-5.70	5.46
29	15.63	26.97
30	37.49	49.28
31	60.04	-15.03
32	-15.03	-15.03
33	-15.03	-15.03
34	-15.03	-15.03
35	-15.03	-5.26
36	19.23	58.20
37	71.22	-59.49
38	-42.94	-42.94
39	-21.42	-21.42
40	0.09	0.09
41	21.61	21.61
42	43.12	43.12
43	59.67	-72.83
44	-61.60	-23.76
45	15.03	15.03
46	15.03	15.03
47	15.03	15.03
48	15.03	15.03
49	15.03	-65.40

	50	-53.34	-40.54
	51	-29.28	-17.48
	52	-7.12	3.97
	53	13.82	24.61
	54	34.35	45.16
	55	54.75	-14.58
	56	-9.37	-9.37
	57	-4.54	-4.54
	58	-0.08	-0.08
	59	4.01	4.01
	60	7.72	7.72
	61	11.06	-53.52
	62	-36.97	-36.97
	63	-15.46	-15.46
	64	6.06	6.06
	65	27.57	27.57
	66	49.09	49.09
	67	65.64	-71.67
	68	-58.64	-19.67
	69	4.82	14.58
	70	14.58	14.58
	71	14.58	14.58
	72	14.58	14.58

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

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	10.11	-15.99
2	-13.56	-9.88
3	-7.27	-3.65
4	-1.07	2.55
5	5.17	8.87
6	11.61	15.44
7	18.05	-10.11
8	-10.12	-10.12
9	-10.12	-0.57
10	-0.57	-0.57
11	-0.57	-0.57
12	4.21	11.96
13	15.35	-13.33
14	-9.08	-9.08
15	-5.08	-5.08
16	-1.08	-1.08
17	2.92	2.92
18	6.92	6.92
19	11.17	-4.74
20	-3.50	-3.50
21	-1.77	-1.77
22	0.46	0.46
23	3.18	3.18
24	6.40	6.40
25	10.11	-17.03
26	-14.53	-10.78
27	-8.10	-4.43
28	-1.81	1.83
29	4.44	8.12
30	10.79	14.54
31	17.04	-10.12
32	-10.12	-10.12
33	-10.12	-0.71
34	-0.71	-0.71
35	-0.71	0.29
36	4.05	11.81
37	15.28	-12.26
38	-8.01	-8.01
39	-4.01	-4.01
40	-0.01	-0.01
41	4.00	4.00
42	8.00	8.00
43	12.25	-15.34
44	-11.95	-4.20
45	0.58	0.58
46	0.58	0.58
47	0.58	10.12
48	10.12	10.12
49	10.12	-18.05

	50	-15.44	-11.61
	51	-8.88	-5.18
	52	-2.56	1.06
	53	3.64	7.26
	54	9.87	13.55
	55	15.98	-10.12
	56	-6.40	-6.40
	57	-3.19	-3.19
	58	-0.46	-0.46
	59	1.76	1.76
	60	3.50	3.50
	61	4.73	-11.17
	62	-6.92	-6.92
	63	-2.92	-2.92
	64	1.09	1.09
	65	5.09	5.09
	66	9.09	9.09
	67	13.34	-15.29
	68	-11.81	-4.06
	69	-0.30	0.70
	70	0.70	0.70
	71	0.70	10.12
	72	10.12	10.12

---

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

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	9.91	-39.98
2	-33.21	-25.20
3	-18.24	-10.23
4	-3.16	5.09
5	12.56	21.37
6	29.53	39.11
7	47.83	-9.91
8	-9.91	-9.91
9	-9.91	-9.91
10	-9.91	-9.91
11	-9.91	-9.91
12	14.50	41.85
13	49.48	-46.34
14	-34.40	-34.40
15	-19.46	-19.46
16	-4.51	-4.51
17	10.44	10.44
18	25.39	25.39
19	37.32	-4.94
20	-3.70	-3.70
21	-1.97	-1.97
22	0.26	0.26
23	2.98	2.98
24	6.20	6.20
25	9.91	-43.98
26	-36.30	-27.52
27	-19.96	-11.51
28	-4.20	4.11
29	11.42	19.87
30	27.44	36.22
31	43.91	-10.40
32	-10.40	-10.40
33	-10.40	-10.40
34	-10.40	-10.40
35	-10.40	-6.59
36	12.24	40.03
37	48.35	-41.80
38	-29.86	-29.86
39	-14.91	-14.91
40	0.04	0.04
41	14.98	14.98
42	29.93	29.93
43	41.87	-48.98
44	-41.36	-14.01
45	10.40	10.40
46	10.40	10.40
47	10.40	10.40
48	10.40	10.40
49	10.40	-47.79

	50	-39.07	-29.48
	51	-21.33	-12.51
	52	-5.05	3.21
	53	10.28	18.29
	54	25.25	33.25
	55	40.01	-9.94
	56	-6.23	-6.23
	57	-3.01	-3.01
	58	-0.29	-0.29
	59	1.94	1.94
	60	3.67	3.67
	61	4.91	-37.36
	62	-25.42	-25.42
	63	-10.47	-10.47
	64	4.47	4.47
	65	19.42	19.42
	66	34.37	34.37
	67	46.30	-48.82
	68	-40.49	-12.70
	69	6.12	9.94
	70	9.94	9.94
	71	9.94	9.94
	72	9.94	9.94

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	19.32	-17.39
2	-14.92	-11.18
3	-8.49	-4.79
4	-2.14	1.52
5	4.17	7.86
6	10.54	14.27
7	16.73	-19.32
8	-18.46	-6.71
9	0.05	0.05
10	0.05	0.05
11	0.05	0.05
12	2.61	10.14
13	16.37	-11.92
14	-7.67	-7.67
15	-3.67	-3.67
16	0.33	0.33
17	4.33	4.33
18	8.34	8.34
19	12.59	-13.07
20	-9.24	-9.24
21	-4.79	-4.79
22	0.30	0.30
23	6.01	6.01
24	12.35	12.35
25	19.32	-17.06
26	-14.58	-10.84
27	-8.16	-4.47
28	-1.83	1.83
29	4.47	8.16
30	10.84	14.58
31	17.06	-19.34
32	-18.51	-6.79
33	0.06	0.12
34	0.12	0.12
35	0.12	-0.50
36	2.69	10.24
37	16.41	-12.25
38	-8.00	-8.00
39	-4.00	-4.00
40	0.00	0.00
41	4.00	4.00
42	8.00	8.00
43	12.25	-16.35
44	-10.13	-2.59
45	-0.04	-0.04
46	-0.04	-0.04
47	-0.04	-0.04
48	6.72	18.47
49	19.34	-16.73

	50	-14.27	-10.54
	51	-7.86	-4.17
	52	-1.52	2.14
	53	4.79	8.49
	54	11.18	14.92
	55	17.39	-19.32
	56	-12.35	-12.35
	57	-6.01	-6.01
	58	-0.30	-0.30
	59	4.79	4.79
	60	9.24	9.24
	61	13.07	-12.59
	62	-8.34	-8.34
	63	-4.33	-4.33
	64	-0.33	-0.33
	65	3.67	3.67
	66	7.67	7.67
	67	11.92	-16.42
	68	-10.25	-2.71
	69	0.48	-0.14
	70	-0.14	-0.14
	71	-0.14	-0.08
	72	6.78	18.49

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

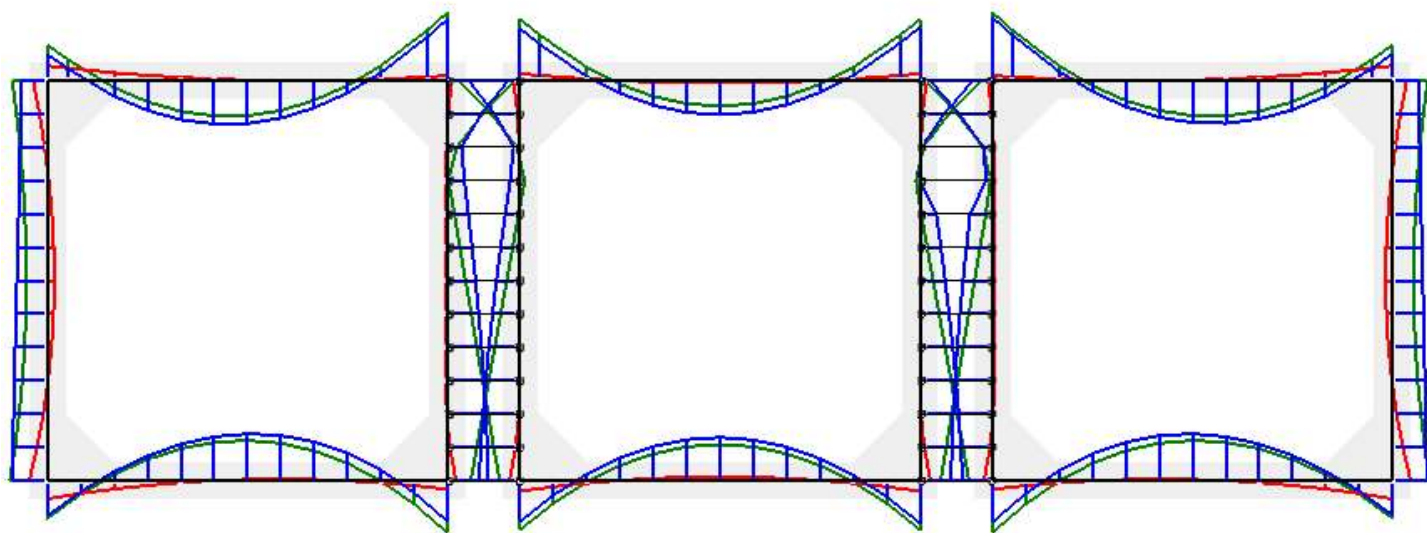
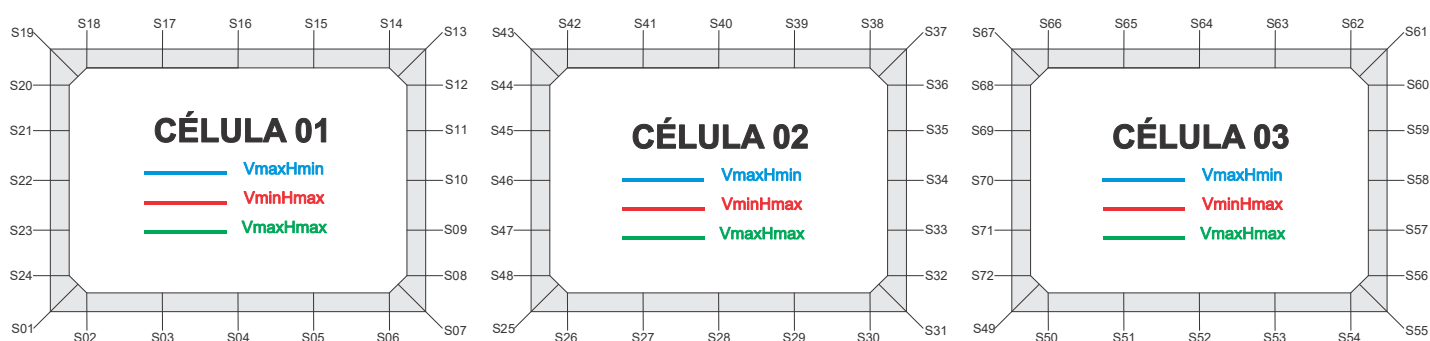
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	12.64	-39.99
2	-32.97	-24.75
3	-17.61	-9.47
4	-2.33	5.96
5	13.40	22.13
6	30.12	39.48
7	47.87	-12.64
8	-12.64	-12.64
9	-12.64	-11.56
10	-11.56	-11.56
11	-11.56	-11.56
12	22.29	46.40
13	52.98	-46.18
14	-34.25	-34.25
15	-19.30	-19.30
16	-4.35	-4.35
17	10.60	10.60
18	25.54	25.54
19	37.48	-8.96
20	-6.40	-6.40
21	-3.43	-3.43
22	-0.04	-0.04
23	3.77	3.77
24	7.99	7.99
25	12.64	-44.01
26	-36.36	-27.60
27	-20.02	-11.56
28	-4.21	4.13
29	11.47	19.94
30	27.52	36.29
31	43.95	-12.75
32	-12.75	-12.75
33	-12.75	-12.75
34	-12.75	-12.75
35	-12.75	4.04
36	17.03	42.09
37	50.95	-41.80
38	-29.86	-29.86
39	-14.92	-14.92
40	0.03	0.03
41	14.98	14.98
42	29.92	29.92
43	41.86	-52.87
44	-46.29	-22.17
45	11.67	11.67
46	11.67	11.67
47	11.67	12.75
48	12.75	12.75
49	12.75	-47.84

	50	-39.44	-30.09
	51	-22.09	-13.36
	52	-5.92	2.37
	53	9.52	17.66
	54	24.79	33.01
	55	40.02	-12.70
	56	-8.05	-8.05
	57	-3.82	-3.82
	58	-0.02	-0.02
	59	3.37	3.37
	60	6.34	6.34
	61	8.90	-37.51
	62	-25.57	-25.57
	63	-10.62	-10.62
	64	4.32	4.32
	65	19.27	19.27
	66	34.22	34.22
	67	46.15	-51.00
	68	-42.15	-17.09
	69	-4.09	12.70
	70	12.70	12.70
	71	12.70	12.70
	72	12.70	12.70

---

## 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	-18.99	18.99
2	-4.77	-4.77
3	-19.63	-19.63
4	-25.24	-25.24
5	-20.96	-20.96
6	-5.70	-5.70
7	21.98	21.98
8	20.79	20.79
9	18.47	18.47
10	15.25	15.25
11	11.34	11.34
12	7.68	7.68
13	33.09	-33.09
14	-4.03	-4.03
15	14.88	14.88
16	23.30	23.30
17	21.21	21.21
18	8.62	8.62
19	-14.12	-14.12
20	-14.78	-14.78
21	-15.62	-15.62
22	-16.56	-16.56
23	-17.49	-17.49
24	-18.33	-18.33
25	-18.99	22.12
26	-3.51	-3.51
27	-18.47	-18.47
28	-23.28	-23.28
29	-18.16	-18.16
30	-2.88	-2.88
31	23.02	23.02
32	20.95	20.95
33	17.76	17.76
34	13.65	13.65
35	8.87	8.87
36	0.76	0.76
37	28.72	-28.72
38	-2.69	-2.69
39	13.18	13.18
40	18.56	18.56
41	13.43	13.43
42	-2.19	-2.19
43	-27.97	-27.97
44	-3.43	-3.43
45	-7.97	-7.97
46	-12.75	-12.75
47	-16.86	-16.86
48	-20.06	-20.06
49	-22.12	22.43

	50	-5.38	-5.38
	51	-20.79	-20.79
	52	-25.23	-25.23
	53	-19.78	-19.78
	54	-5.08	-5.08
	55	18.55	18.55
	56	17.98	17.98
	57	17.23	17.23
	58	16.39	16.39
	59	15.55	15.55
	60	14.80	14.80
	61	14.23	-14.23
	62	8.38	8.38
	63	20.85	20.85
	64	22.81	22.81
	65	14.27	14.27
	66	-4.77	-4.77
	67	-33.95	-33.95
	68	-5.03	-5.03
	69	-12.17	-12.17
	70	-15.98	-15.98
	71	-19.12	-19.12
	72	-21.34	-21.34

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-9.83	9.83
2	4.59	4.59
3	1.09	1.09
4	-0.63	-0.63
5	-0.58	-0.58
6	1.22	1.22
7	4.72	4.72
8	-0.35	-0.35
9	-0.60	-0.60
10	-0.58	-0.58
11	-0.56	-0.56
12	-0.52	-0.52
13	2.55	-2.55
14	-0.64	-0.64
15	0.14	0.14
16	-0.19	-0.19
17	-1.62	-1.62
18	-4.14	-4.14
19	-7.80	-7.80
20	-1.52	-1.52
21	2.36	2.36
22	3.65	3.65
23	2.17	2.17
24	-2.27	-2.27
25	-9.83	5.75
26	1.41	1.41
27	-1.19	-1.19
28	-2.06	-2.06
29	-1.19	-1.19
30	1.41	1.41
31	5.75	5.75
32	0.67	0.67
33	0.43	0.43
34	0.48	0.48
35	0.54	0.54
36	0.49	0.49
37	3.60	-3.60
38	-0.81	-0.81
39	0.84	0.84
40	1.39	1.39
41	0.84	0.84
42	-0.81	-0.81
43	-3.60	-3.60
44	-0.53	-0.53
45	-0.48	-0.48
46	-0.46	-0.46
47	-0.44	-0.44
48	-0.69	-0.69
49	-5.75	4.72

	50	1.22	1.22
	51	-0.58	-0.58
	52	-0.63	-0.63
	53	1.09	1.09
	54	4.59	4.59
	55	9.83	9.83
	56	2.27	2.27
	57	-2.17	-2.17
	58	-3.65	-3.65
	59	-2.36	-2.36
	60	1.52	1.52
	61	7.80	-7.80
	62	-4.14	-4.14
	63	-1.62	-1.62
	64	-0.19	-0.19
	65	0.14	0.14
	66	-0.64	-0.64
	67	-2.55	-2.55
	68	0.56	0.56
	69	0.51	0.51
	70	0.56	0.56
	71	0.61	0.61
	72	0.36	0.36

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-20.38	20.38
2	-3.22	-3.22
3	-17.26	-17.26
4	-21.67	-21.67
5	-16.10	-16.10
6	0.20	0.20
7	28.19	28.19
8	22.07	22.07
9	15.95	15.95
10	9.83	9.83
11	3.71	3.71
12	5.05	5.05
13	36.67	-36.67
14	-7.84	-7.84
15	10.85	10.85
16	19.03	19.03
17	16.72	16.72
18	3.90	3.90
19	-19.06	-19.06
20	-14.87	-14.87
21	-12.28	-12.28
22	-11.41	-11.41
23	-12.39	-12.39
24	-15.34	-15.34
25	-20.38	26.62
26	0.77	0.77
27	-14.48	-14.48
28	-19.52	-19.52
29	-14.51	-14.51
30	0.72	0.72
31	26.55	26.55
32	20.08	20.08
33	13.61	13.61
34	7.15	7.15
35	0.68	0.68
36	1.94	1.94
37	32.96	-32.96
38	-7.07	-7.07
39	8.68	8.68
40	13.92	13.92
41	8.66	8.66
42	-7.10	-7.10
43	-33.01	-33.01
44	-1.74	-1.74
45	-0.74	-0.74
46	-7.21	-7.21
47	-13.68	-13.68
48	-20.15	-20.15
49	-26.62	28.16

	50	0.17	0.17
	51	-16.11	-16.11
	52	-21.67	-21.67
	53	-17.25	-17.25
	54	-3.19	-3.19
	55	20.41	20.41
	56	15.37	15.37
	57	12.41	12.41
	58	11.42	11.42
	59	12.28	12.28
	60	14.87	14.87
	61	19.06	-19.06
	62	3.92	3.92
	63	16.75	16.75
	64	19.07	19.07
	65	10.89	10.89
	66	-7.78	-7.78
	67	-36.61	-36.61
	68	-5.24	-5.24
	69	-3.65	-3.65
	70	-9.77	-9.77
	71	-15.90	-15.90
	72	-22.03	-22.03

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.21	19.21
2	-6.39	-6.39
3	-21.22	-21.22
4	-26.20	-26.20
5	-21.95	-21.95
6	-8.56	-8.56
7	14.18	14.18
8	13.23	13.23
9	11.14	11.14
10	8.14	8.14
11	4.46	4.46
12	1.68	1.68
13	26.85	-26.85
14	-2.46	-2.46
15	15.91	15.91
16	23.77	23.77
17	21.13	21.13
18	7.99	7.99
19	-15.70	-15.70
20	-16.13	-16.13
21	-16.75	-16.75
22	-17.45	-17.45
23	-18.16	-18.16
24	-18.77	-18.77
25	-19.21	21.96
26	-5.33	-5.33
27	-20.11	-20.11
28	-24.14	-24.14
29	-18.87	-18.87
30	-5.31	-5.31
31	15.82	15.82
32	14.00	14.00
33	11.03	11.03
34	7.16	7.16
35	2.61	2.61
36	-2.01	-2.01
37	23.30	-23.30
38	-1.78	-1.78
39	13.71	13.71
40	18.70	18.70
41	13.19	13.19
42	-2.83	-2.83
43	-29.39	-29.39
44	-5.09	-5.09
45	-8.74	-8.74
46	-13.30	-13.30
47	-17.17	-17.17
48	-20.13	-20.13
49	-21.96	22.76

	50	-6.91	-6.91
	51	-22.26	-22.26
	52	-26.01	-26.01
	53	-20.51	-20.51
	54	-7.64	-7.64
	55	11.04	11.04
	56	10.50	10.50
	57	9.78	9.78
	58	8.97	8.97
	59	8.16	8.16
	60	7.44	7.44
	61	6.90	-6.90
	62	10.98	10.98
	63	22.82	22.82
	64	24.17	24.17
	65	15.02	15.02
	66	-4.64	-4.64
	67	-34.84	-34.84
	68	-8.76	-8.76
	69	-12.61	-12.61
	70	-16.40	-16.40
	71	-19.50	-19.50
	72	-21.70	-21.70

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-9.81	9.81
2	4.59	4.59
3	1.12	1.12
4	-0.57	-0.57
5	-0.50	-0.50
6	1.32	1.32
7	4.85	4.85
8	-0.24	-0.24
9	-0.37	-0.37
10	-0.36	-0.36
11	-0.35	-0.35
12	-0.36	-0.36
13	2.61	-2.61
14	-0.68	-0.68
15	0.13	0.13
16	-0.17	-0.17
17	-1.57	-1.57
18	-4.07	-4.07
19	-7.71	-7.71
20	-1.44	-1.44
21	2.43	2.43
22	3.70	3.70
23	2.21	2.21
24	-2.23	-2.23
25	-9.81	5.77
26	1.38	1.38
27	-1.27	-1.27
28	-2.19	-2.19
29	-1.38	-1.38
30	1.17	1.17
31	5.45	5.45
32	0.37	0.37
33	0.24	0.24
34	0.28	0.28
35	0.33	0.33
36	0.24	0.24
37	3.26	-3.26
38	-0.53	-0.53
39	1.06	1.06
40	1.55	1.55
41	0.95	0.95
42	-0.76	-0.76
43	-3.60	-3.60
44	-0.61	-0.61
45	-0.62	-0.62
46	-0.60	-0.60
47	-0.57	-0.57
48	-0.70	-0.70
49	-5.77	4.54

	50	1.15	1.15
	51	-0.53	-0.53
	52	-0.46	-0.46
	53	1.37	1.37
	54	5.00	5.00
	55	10.36	10.36
	56	2.80	2.80
	57	-1.64	-1.64
	58	-3.12	-3.12
	59	-1.83	-1.83
	60	2.04	2.04
	61	8.32	-8.32
	62	-4.54	-4.54
	63	-1.89	-1.89
	64	-0.35	-0.35
	65	0.10	0.10
	66	-0.55	-0.55
	67	-2.34	-2.34
	68	0.68	0.68
	69	0.59	0.59
	70	0.63	0.63
	71	0.68	0.68
	72	0.54	0.54

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.72	19.72
2	-5.44	-5.44
3	-19.09	-19.09
4	-22.46	-22.46
5	-16.49	-16.49
6	-1.69	-1.69
7	21.65	21.65
8	15.93	15.93
9	10.20	10.20
10	4.48	4.48
11	-1.25	-1.25
12	0.90	0.90
13	31.76	-31.76
14	-7.40	-7.40
15	10.94	10.94
16	18.77	18.77
17	16.10	16.10
18	2.93	2.93
19	-20.78	-20.78
20	-16.19	-16.19
21	-13.20	-13.20
22	-11.94	-11.94
23	-12.53	-12.53
24	-15.08	-15.08
25	-19.72	25.83
26	-1.33	-1.33
27	-16.05	-16.05
28	-19.96	-19.96
29	-14.45	-14.45
30	-0.57	-0.57
31	20.88	20.88
32	14.78	14.78
33	8.68	8.68
34	2.58	2.58
35	-3.53	-3.53
36	-0.15	-0.15
37	29.03	-29.03
38	-7.27	-7.27
39	8.46	8.46
40	13.69	13.69
41	8.42	8.42
42	-7.35	-7.35
43	-33.67	-33.67
44	-3.19	-3.19
45	-1.42	-1.42
46	-7.52	-7.52
47	-13.62	-13.62
48	-19.72	-19.72
49	-25.83	28.38

	50	-1.15	-1.15
	51	-17.16	-17.16
	52	-21.85	-21.85
	53	-17.18	-17.18
	54	-4.71	-4.71
	55	14.29	14.29
	56	9.28	9.28
	57	6.36	6.36
	58	5.40	5.40
	59	6.29	6.29
	60	8.91	8.91
	61	13.13	-13.13
	62	5.50	5.50
	63	18.10	18.10
	64	20.19	20.19
	65	11.79	11.79
	66	-7.12	-7.12
	67	-36.57	-36.57
	68	-7.38	-7.38
	69	-4.00	-4.00
	70	-10.10	-10.10
	71	-16.19	-16.19
	72	-22.28	-22.28

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-11.80	11.80
2	-2.02	-2.02
3	-10.40	-10.40
4	-13.25	-13.25
5	-10.29	-10.29
6	-1.03	-1.03
7	15.18	15.18
8	12.36	12.36
9	9.53	9.53
10	6.71	6.71
11	3.88	3.88
12	3.53	3.53
13	19.88	-19.88
14	-3.54	-3.54
15	7.05	7.05
16	11.74	11.74
17	10.50	10.50
18	3.35	3.35
19	-9.54	-9.54
20	-8.44	-8.44
21	-7.75	-7.75
22	-7.61	-7.61
23	-8.14	-8.14
24	-9.49	-9.49
25	-11.80	14.66
26	-0.34	-0.34
27	-9.17	-9.17
28	-12.05	-12.05
29	-9.10	-9.10
30	-0.20	-0.20
31	14.86	14.86
32	11.72	11.72
33	8.58	8.58
34	5.44	5.44
35	2.30	2.30
36	0.83	0.83
37	17.63	-17.63
38	-2.99	-2.99
39	5.91	5.91
40	8.90	8.90
41	5.97	5.97
42	-2.88	-2.88
43	-17.46	-17.46
44	-1.43	-1.43
45	-2.10	-2.10
46	-5.24	-5.24
47	-8.38	-8.38
48	-11.52	-11.52
49	-14.66	15.29

	50	-0.96	-0.96
	51	-10.25	-10.25
	52	-13.25	-13.25
	53	-10.44	-10.44
	54	-2.08	-2.08
	55	11.70	11.70
	56	9.41	9.41
	57	8.08	8.08
	58	7.57	7.57
	59	7.74	7.74
	60	8.45	8.45
	61	9.57	-9.57
	62	3.29	3.29
	63	10.42	10.42
	64	11.63	11.63
	65	6.92	6.92
	66	-3.71	-3.71
	67	-20.07	-20.07
	68	-2.94	-2.94
	69	-4.06	-4.06
	70	-6.87	-6.87
	71	-9.67	-9.67
	72	-12.48	-12.48

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-7.21	7.21
2	2.60	2.60
3	-0.27	-0.27
4	-1.39	-1.39
5	-0.76	-0.76
6	1.62	1.62
7	5.72	5.72
8	0.44	0.44
9	-0.24	-0.24
10	-0.22	-0.22
11	-0.20	-0.20
12	0.09	0.09
13	3.62	-3.62
14	-1.10	-1.10
15	0.29	0.29
16	0.59	0.59
17	-0.22	-0.22
18	-2.13	-2.13
19	-5.18	-5.18
20	-1.36	-1.36
21	0.99	0.99
22	1.74	1.74
23	0.72	0.72
24	-2.21	-2.21
25	-7.21	6.04
26	1.69	1.69
27	-0.92	-0.92
28	-1.79	-1.79
29	-0.92	-0.92
30	1.69	1.69
31	6.04	6.04
32	0.74	0.74
33	0.06	0.06
34	0.10	0.10
35	0.14	0.14
36	0.36	0.36
37	3.91	-3.91
38	-1.13	-1.13
39	0.52	0.52
40	1.07	1.07
41	0.52	0.52
42	-1.13	-1.13
43	-3.91	-3.91
44	-0.39	-0.39
45	-0.10	-0.10
46	-0.08	-0.08
47	-0.07	-0.07
48	-0.75	-0.75
49	-6.04	5.72

	50	1.62	1.62
	51	-0.76	-0.76
	52	-1.39	-1.39
	53	-0.27	-0.27
	54	2.60	2.60
	55	7.21	7.21
	56	2.21	2.21
	57	-0.72	-0.72
	58	-1.74	-1.74
	59	-0.99	-0.99
	60	1.36	1.36
	61	5.18	-5.18
	62	-2.13	-2.13
	63	-0.22	-0.22
	64	0.59	0.59
	65	0.29	0.29
	66	-1.10	-1.10
	67	-3.62	-3.62
	68	-0.06	-0.06
	69	0.16	0.16
	70	0.20	0.20
	71	0.25	0.25
	72	-0.43	-0.43

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-11.92	11.92
2	-1.79	-1.79
3	-9.86	-9.86
4	-12.28	-12.28
5	-8.86	-8.86
6	0.77	0.77
7	17.12	17.12
8	13.13	13.13
9	9.14	9.14
10	5.15	5.15
11	1.16	1.16
12	2.50	2.50
13	21.12	-21.12
14	-4.82	-4.82
15	5.75	5.75
16	10.40	10.40
17	9.13	9.13
18	1.95	1.95
19	-10.98	-10.98
20	-8.37	-8.37
21	-6.73	-6.73
22	-6.16	-6.16
23	-6.77	-6.77
24	-8.66	-8.66
25	-11.92	16.00
26	0.91	0.91
27	-8.01	-8.01
28	-10.98	-10.98
29	-8.08	-8.08
30	0.79	0.79
31	15.82	15.82
32	11.69	11.69
33	7.55	7.55
34	3.42	3.42
35	-0.71	-0.71
36	1.21	1.21
37	19.00	-19.00
38	-4.42	-4.42
39	4.43	4.43
40	7.37	7.37
41	4.38	4.38
42	-4.52	-4.52
43	-19.15	-19.15
44	-0.67	-0.67
45	0.53	0.53
46	-3.60	-3.60
47	-7.73	-7.73
48	-11.87	-11.87
49	-16.00	17.03

	50	0.70	0.70
	51	-8.90	-8.90
	52	-12.28	-12.28
	53	-9.83	-9.83
	54	-1.73	-1.73
	55	12.01	12.01
	56	8.73	8.73
	57	6.82	6.82
	58	6.19	6.19
	59	6.74	6.74
	60	8.36	8.36
	61	10.95	-10.95
	62	1.99	1.99
	63	9.20	9.20
	64	10.49	10.49
	65	5.87	5.87
	66	-4.67	-4.67
	67	-20.95	-20.95
	68	-3.03	-3.03
	69	-0.99	-0.99
	70	-5.00	-5.00
	71	-9.01	-9.01
	72	-13.02	-13.02

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-4.53	4.53
2	0.47	0.47
3	-1.89	-1.89
4	-2.54	-2.54
5	-1.48	-1.48
6	1.34	1.34
7	5.94	5.94
8	3.16	3.16
9	0.38	0.38
10	0.22	0.22
11	0.06	0.06
12	0.56	0.56
13	4.32	-4.32
14	-1.24	-1.24
15	0.71	0.71
16	1.56	1.56
17	1.30	1.30
18	-0.05	-0.05
19	-2.54	-2.54
20	-1.40	-1.40
21	-0.66	-0.66
22	-0.47	-0.47
23	-0.96	-0.96
24	-2.27	-2.27
25	-4.53	5.62
26	1.28	1.28
27	-1.31	-1.31
28	-2.17	-2.17
29	-1.31	-1.31
30	1.29	1.29
31	5.63	5.63
32	2.85	2.85
33	0.07	0.07
34	-0.13	-0.13
35	-0.32	-0.32
36	0.27	0.27
37	4.00	-4.00
38	-1.21	-1.21
39	0.44	0.44
40	0.99	0.99
41	0.45	0.45
42	-1.20	-1.20
43	-3.99	-3.99
44	-0.23	-0.23
45	0.26	0.26
46	0.10	0.10
47	-0.05	-0.05
48	-2.84	-2.84
49	-5.62	5.95

	50	1.34	1.34
	51	-1.47	-1.47
	52	-2.54	-2.54
	53	-1.89	-1.89
	54	0.46	0.46
	55	4.53	4.53
	56	2.27	2.27
	57	0.96	0.96
	58	0.47	0.47
	59	0.66	0.66
	60	1.39	1.39
	61	2.54	-2.54
	62	-0.05	-0.05
	63	1.30	1.30
	64	1.55	1.55
	65	0.70	0.70
	66	-1.24	-1.24
	67	-4.33	-4.33
	68	-0.60	-0.60
	69	0.00	0.00
	70	-0.19	-0.19
	71	-0.39	-0.39
	72	-3.17	-3.17

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-8.71	8.71
2	-1.36	-1.36
3	-7.33	-7.33
4	-9.17	-9.17
5	-6.74	-6.74
6	0.25	0.25
7	12.21	12.21
8	9.48	9.48
9	6.76	6.76
10	4.03	4.03
11	1.30	1.30
12	1.94	1.94
13	14.49	-14.49
14	-3.08	-3.08
15	4.33	4.33
16	7.62	7.62
17	6.81	6.81
18	1.88	1.88
19	-7.05	-7.05
20	-5.85	-5.85
21	-5.06	-5.06
22	-4.82	-4.82
23	-5.25	-5.25
24	-6.50	-6.50
25	-8.71	11.50
26	0.46	0.46
27	-6.07	-6.07
28	-8.23	-8.23
29	-6.09	-6.09
30	0.41	0.41
31	11.43	11.43
32	8.57	8.57
33	5.71	5.71
34	2.84	2.84
35	-0.02	-0.02
36	0.76	0.76
37	12.91	-12.91
38	-2.74	-2.74
39	3.41	3.41
40	5.46	5.46
41	3.39	3.39
42	-2.78	-2.78
43	-12.97	-12.97
44	-0.55	-0.55
45	-0.05	-0.05
46	-2.92	-2.92
47	-5.78	-5.78
48	-8.64	-8.64
49	-11.50	12.17

	50	0.23	0.23
	51	-6.76	-6.76
	52	-9.17	-9.17
	53	-7.32	-7.32
	54	-1.33	-1.33
	55	8.74	8.74
	56	6.53	6.53
	57	5.27	5.27
	58	4.83	4.83
	59	5.07	5.07
	60	5.85	5.85
	61	7.04	-7.04
	62	1.90	1.90
	63	6.84	6.84
	64	7.66	7.66
	65	4.38	4.38
	66	-3.02	-3.02
	67	-14.42	-14.42
	68	-2.14	-2.14
	69	-1.24	-1.24
	70	-3.97	-3.97
	71	-6.71	-6.71
	72	-9.44	-9.44

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-6.50	6.50
2	2.05	2.05
3	-0.65	-0.65
4	-1.60	-1.60
5	-0.82	-0.82
6	1.71	1.71
7	5.97	5.97
8	0.78	0.78
9	-0.14	-0.14
10	-0.12	-0.12
11	-0.11	-0.11
12	0.26	0.26
13	3.90	-3.90
14	-1.21	-1.21
15	0.35	0.35
16	0.81	0.81
17	0.17	0.17
18	-1.57	-1.57
19	-4.45	-4.45
20	-1.37	-1.37
21	0.57	0.57
22	1.21	1.21
23	0.35	0.35
24	-2.16	-2.16
25	-6.50	6.09
26	1.74	1.74
27	-0.87	-0.87
28	-1.74	-1.74
29	-0.87	-0.87
30	1.74	1.74
31	6.09	6.09
32	0.89	0.89
33	-0.04	-0.04
34	0.00	0.00
35	0.03	0.03
36	0.33	0.33
37	4.00	-4.00
38	-1.21	-1.21
39	0.44	0.44
40	0.99	0.99
41	0.44	0.44
42	-1.21	-1.21
43	-4.00	-4.00
44	-0.35	-0.35
45	0.01	0.01
46	0.02	0.02
47	0.03	0.03
48	-0.89	-0.89
49	-6.09	5.97

	50	1.71	1.71
	51	-0.82	-0.82
	52	-1.60	-1.60
	53	-0.65	-0.65
	54	2.05	2.05
	55	6.50	6.50
	56	2.16	2.16
	57	-0.35	-0.35
	58	-1.21	-1.21
	59	-0.57	-0.57
	60	1.37	1.37
	61	4.45	-4.45
	62	-1.57	-1.57
	63	0.17	0.17
	64	0.81	0.81
	65	0.35	0.35
	66	-1.21	-1.21
	67	-3.90	-3.90
	68	-0.23	-0.23
	69	0.07	0.07
	70	0.11	0.11
	71	0.15	0.15
	72	-0.77	-0.77

---

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

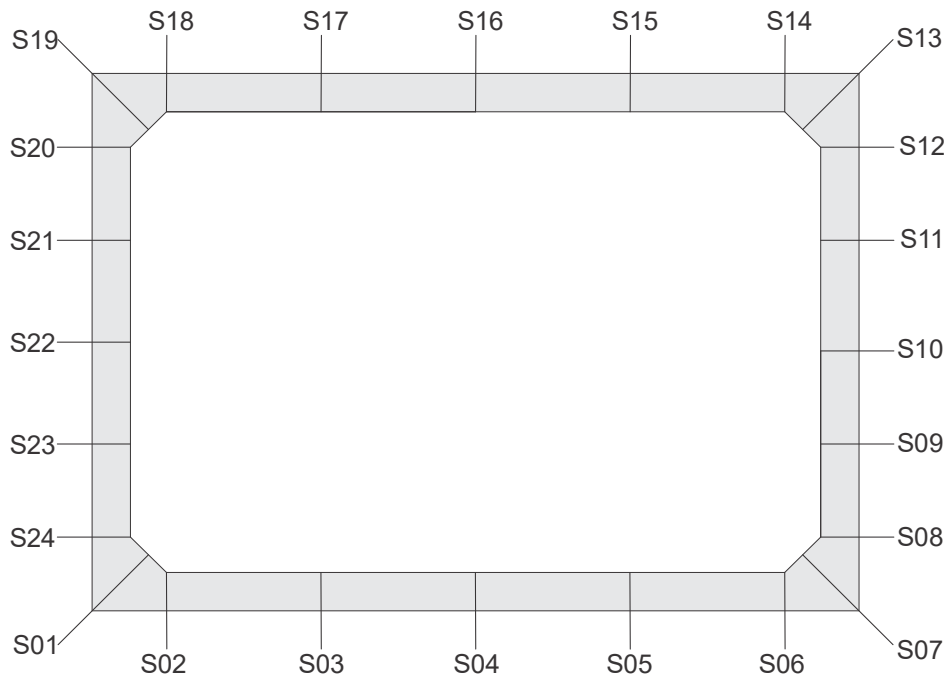
-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-8.89	8.89
2	-1.14	-1.14
3	-6.97	-6.97
4	-8.59	-8.59
5	-5.93	-5.93
6	1.26	1.26
7	13.27	13.27
8	9.79	9.79
9	6.32	6.32
10	3.14	3.14
11	-0.04	-0.04
12	1.44	1.44
13	15.10	-15.10
14	-3.73	-3.73
15	3.63	3.63
16	6.88	6.88
17	6.03	6.03
18	1.06	1.06
19	-7.92	-7.92
20	-5.80	-5.80
21	-4.44	-4.44
22	-3.95	-3.95
23	-4.46	-4.46
24	-6.06	-6.06
25	-8.89	12.19
26	1.14	1.14
27	-5.41	-5.41
28	-7.57	-7.57
29	-5.43	-5.43
30	1.10	1.10
31	12.13	12.13
32	8.62	8.62
33	5.11	5.11
34	1.61	1.61
35	-1.90	-1.90
36	1.00	1.00
37	13.79	-13.79
38	-3.62	-3.62
39	2.54	2.54
40	4.58	4.58
41	2.52	2.52
42	-3.65	-3.65
43	-13.84	-13.84
44	-0.20	-0.20
45	1.24	1.24
46	-1.97	-1.97
47	-5.18	-5.18
48	-8.69	-8.69
49	-12.19	13.27

	50	1.26	1.26
	51	-5.91	-5.91
	52	-8.56	-8.56
	53	-6.93	-6.93
	54	-1.09	-1.09
	55	8.95	8.95
	56	6.11	6.11
	57	4.48	4.48
	58	3.96	3.96
	59	4.44	4.44
	60	5.78	5.78
	61	7.89	-7.89
	62	1.10	1.10
	63	6.08	6.08
	64	6.95	6.95
	65	3.70	3.70
	66	-3.65	-3.65
	67	-15.02	-15.02
	68	-2.21	-2.21
	69	0.70	0.70
	70	-2.79	-2.79
	71	-6.28	-6.28
	72	-9.77	-9.77

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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	2.32	2.79	2.32	2.79
3	2.32	2.79	3.57	4.29
4	2.32	2.79	4.66	5.59
5	2.32	2.79	3.83	4.60
6	2.32	2.79	2.32	2.79
7	5.47	6.57	1.26	1.26
8	3.80	4.56	2.32	2.79
9	3.13	3.76	2.32	2.79
10	2.54	3.05	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	2.32	2.79	2.32	2.79
15	2.32	2.79	2.75	3.30
16	2.32	2.79	4.36	5.23
17	2.32	2.79	3.95	4.74
18	2.32	2.79	2.32	2.79
19	5.47	6.57	1.26	1.26
20	2.39	2.87	2.32	2.79
21	2.51	3.01	2.32	2.79
22	2.67	3.20	2.32	2.79
23	2.82	3.39	2.32	2.79
24	2.96	3.56	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	-67.01	2.50	-14.61	0.56	1.80	0.00
13	-65.73	21.12	-4.74	4.32	67.74	0.00
14	-11.13	4.82	-4.74	1.24	51.66	0.00
16	-4.58	11.74	-16.32	0.59	223.26	0.92
18	-11.13	1.95	-4.74	0.05	6.17	0.00
19	-53.43	10.98	-4.74	2.54	24.38	0.00
20	-54.71	8.37	-12.46	1.40	84.68	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	87.67	195.88	0.00	0.00
2	2.79	2.53E-003	77.83	79.48	0.00	0.00
6	2.79	2.53E-003	73.65	79.48	0.00	0.00
7	6.57	2.12E-003	80.90	187.01	0.00	0.00
13	6.57	2.12E-003	95.10	188.16	0.00	0.00
14	2.79	2.53E-003	74.59	80.20	0.00	0.00
18	2.79	2.53E-003	56.39	80.20	0.00	0.00
19	6.57	2.12E-003	75.65	186.31	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	-6.87	8.71	6.30	0.003
2	2.79	-9.91	1.36	6.30	0.001
3	4.29	-9.91	7.33	6.30	0.030
4	5.59	-9.91	9.17	6.30	0.028
5	4.60	-9.91	6.74	6.30	0.022
6	2.79	-9.91	0.25	6.30	0.000
7	6.57	-31.47	12.21	6.30	0.003
8	4.56	-51.75	9.48	6.30	0.032
9	3.76	-50.72	6.76	6.30	0.020
10	3.05	-49.68	4.03	6.30	0.006
11	2.79	-48.65	1.30	6.30	0.000
12	2.79	-47.62	1.94	6.30	0.000
13	6.57	-25.64	14.49	6.30	0.006
14	2.79	-4.94	3.08	6.30	0.012
15	3.30	-4.94	4.33	6.30	0.018
16	5.23	-4.94	7.62	6.30	0.023
17	4.74	-4.94	6.81	6.30	0.022
18	2.79	-4.94	1.88	6.30	0.004
19	6.57	-21.13	7.05	6.30	0.001
20	2.87	-38.60	5.85	6.30	0.028
21	3.01	-39.64	5.06	6.30	0.017
22	3.20	-40.67	4.82	6.30	0.013
23	3.39	-41.70	5.25	6.30	0.014
24	3.56	-42.73	6.50	6.30	0.022

VminHmax

Seção	As (cm <sup>2</sup> /m)	Nsd (kN)	Msd (kN.m)	Ø (mm)	w (mm)
1	6.57	-9.35	6.50	6.30	0.001
2	2.79	-19.32	2.05	6.30	0.003
3	4.29	-19.32	0.65	6.30	0.000
4	5.59	-19.32	1.60	6.30	0.000
5	4.60	-19.32	0.82	6.30	0.000
6	2.79	-19.32	1.71	6.30	0.002
7	6.57	-18.96	5.97	6.30	0.001
8	4.56	-17.33	0.78	6.30	0.000
9	3.76	-16.30	0.14	6.30	0.000
10	3.05	-15.26	0.12	6.30	0.000
11	2.79	-14.23	0.11	6.30	0.000
12	2.79	-13.20	0.26	6.30	0.000
13	6.57	-12.50	3.90	6.30	0.000
14	2.79	-13.07	1.21	6.30	0.001
15	3.30	-13.07	0.35	6.30	0.000
16	5.23	-13.07	0.81	6.30	0.000
17	4.74	-13.07	0.17	6.30	0.000
18	2.79	-13.07	1.57	6.30	0.002
19	6.57	-12.83	4.45	6.30	0.000
20	2.87	-13.87	1.37	6.30	0.001
21	3.01	-14.90	0.57	6.30	0.000
22	3.20	-15.93	1.21	6.30	0.000
23	3.39	-16.96	0.35	6.30	0.000
24	3.56	-17.99	2.16	6.30	0.002

## VERIFICAÇÃO DA FISSURAÇÃO (CONT.)

VmaxHmax

Seção	As(cm <sup>2</sup> /m)	Nsd(kN)	Msd(kN.m)	Ø(mm)	w(mm)
1	6.57	-14.72	8.89	6.30	0.002
2	2.79	-12.64	1.14	6.30	0.001
3	4.29	-12.64	6.97	6.30	0.026
4	5.59	-12.64	8.59	6.30	0.024
5	4.60	-12.64	5.93	6.30	0.016
6	2.79	-12.64	1.26	6.30	0.001
7	6.57	-32.75	13.27	6.30	0.004
8	4.56	-51.59	9.79	6.30	0.035
9	3.76	-50.56	6.32	6.30	0.017
10	3.05	-49.53	3.14	6.30	0.002
11	2.79	-48.50	0.04	6.30	0.000
12	2.79	-47.46	1.44	6.30	0.000
13	6.57	-27.57	15.10	6.30	0.006
14	2.79	-8.96	3.73	6.30	0.017
15	3.30	-8.96	3.63	6.30	0.011
16	5.23	-8.96	6.88	6.30	0.018
17	4.74	-8.96	6.03	6.30	0.016
18	2.79	-8.96	1.06	6.30	0.001
19	6.57	-23.22	7.92	6.30	0.001
20	2.87	-38.76	5.80	6.30	0.027
21	3.01	-39.79	4.44	6.30	0.012
22	3.20	-40.82	3.95	6.30	0.007
23	3.39	-41.86	4.46	6.30	0.009
24	3.56	-42.89	6.06	6.30	0.019

NOTA:

\* Seção com aumento na armadura devido à fissuração.