



**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:

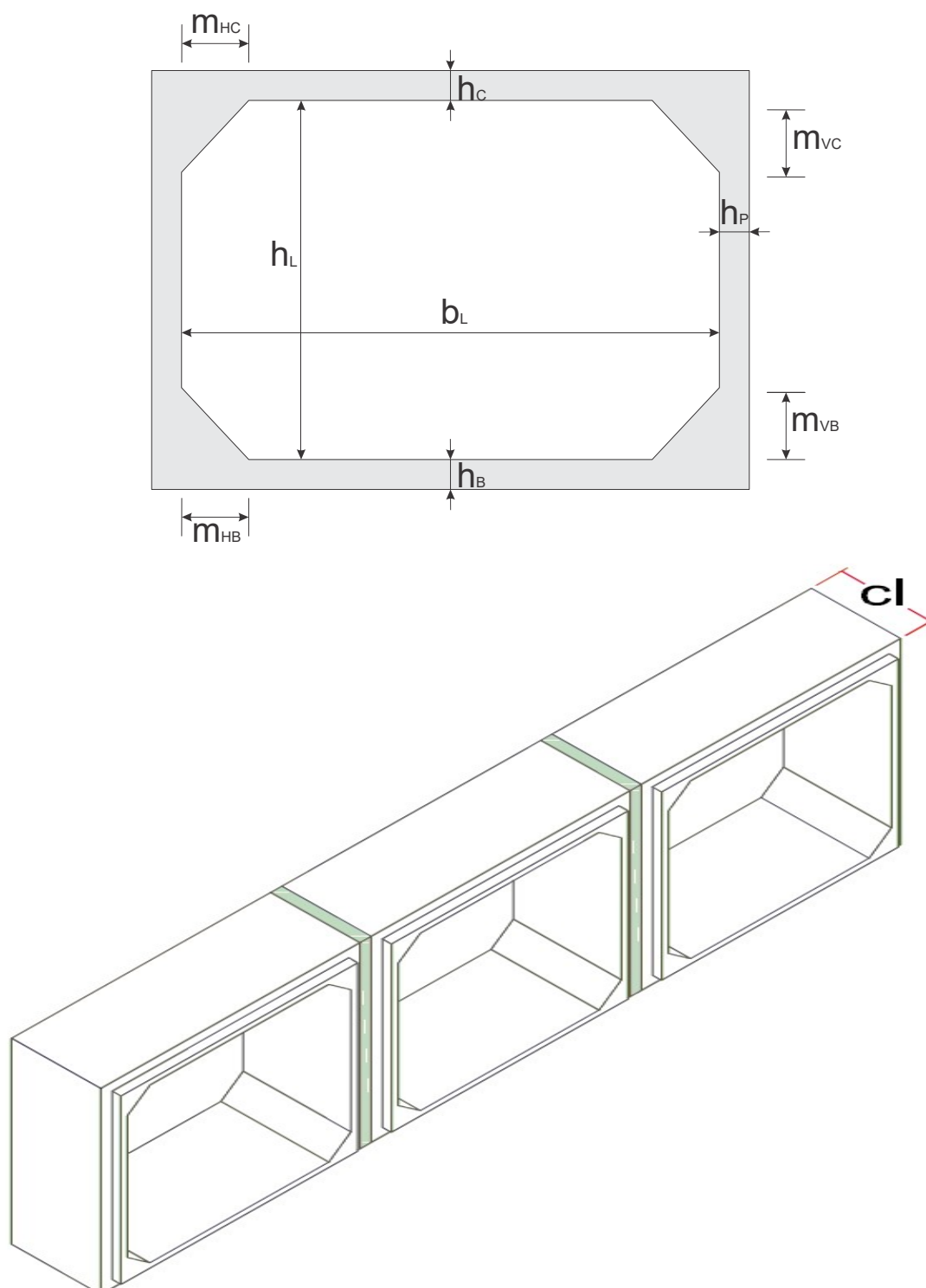
### DADOS DA OBRA



NOME: ADUELA 1,50 X 1,50 M PARA ATERRO DE 5,00 M - LINHA TRIPLA  
ENDEREÇO: ,  
BAIRRO:  
CIDADE:  
ESTADO: Não Informado  
CEP:  
TEL.:  
CEL.:  
E-MAIL:  
SITE:

## GEOMETRIA

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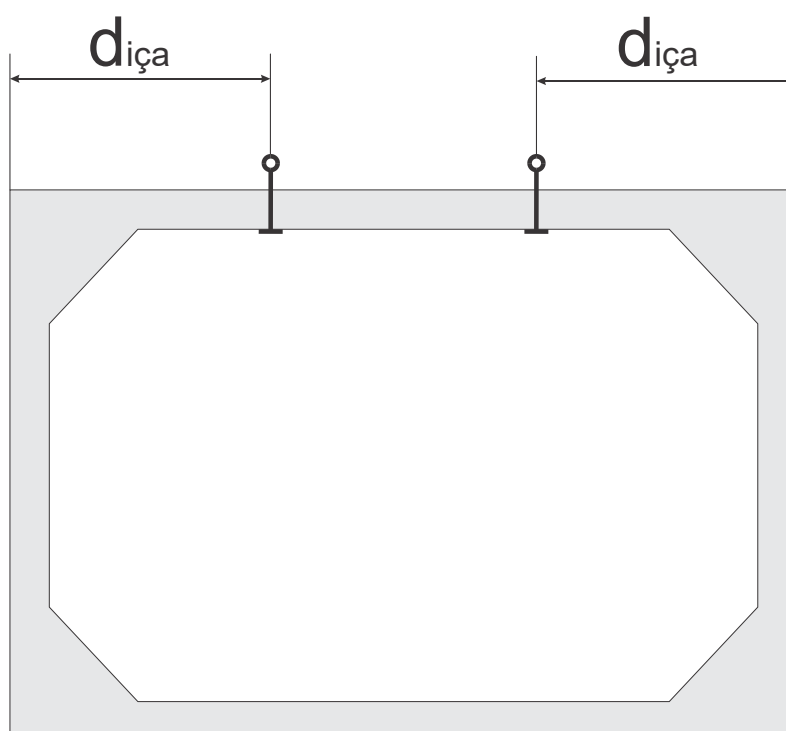
### DADOS DE INSTALAÇÃO

ALTURA DE TERRA.....	: 5.00 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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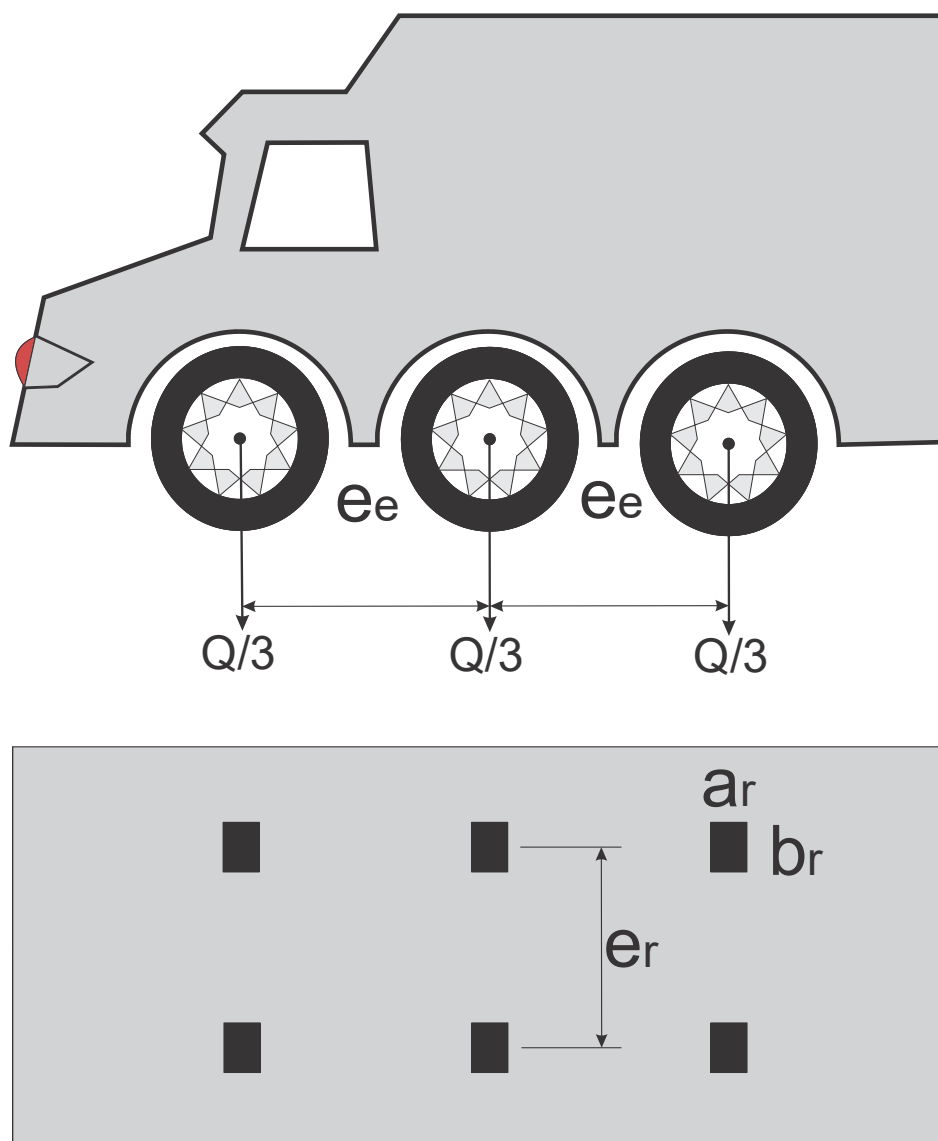
### INFORMAÇÕES DE MANUSEIO

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



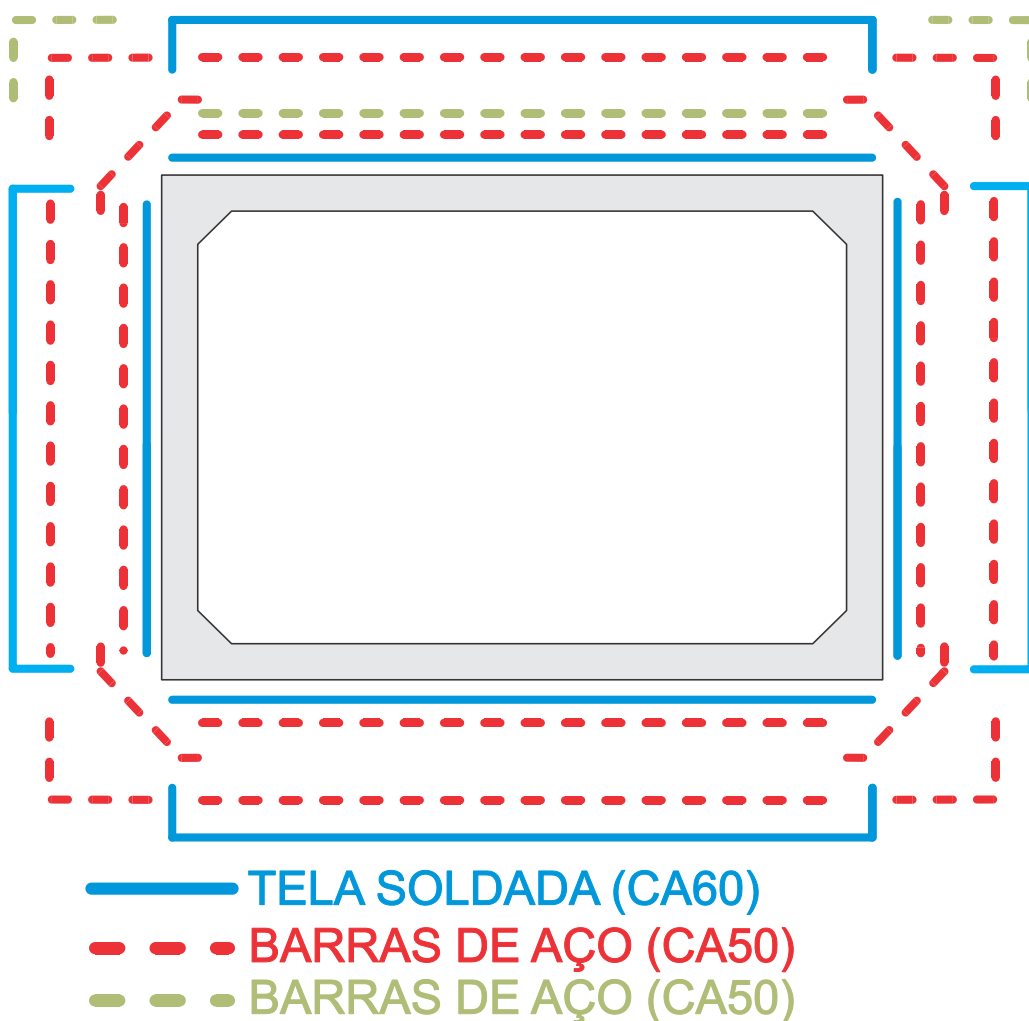
## SOBRECARGA

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.....: 1.00



## PARÂMETROS DA ARMADURA

ABERTURA MÁX. DAS FISSURAS.....	: 0.20 mm
DIMINUIÇÃO DA RIGIDEZ.....	: 1.00
RESISTÊNCIA DA ARMADURA DO COROAMENTO.....	: 190.00 MPa
RESISTÊNCIA DA ARMADURA DA QUINA.....	: 105.00 MPa
COEF. DE PONDERAÇÃO DO CONCRETO.....	: 1.30
COEF. DE PONDERAÇÃO DO AÇO.....	: 1.15
ESPAÇAMENTO MÍN. ENTRE ARMADURAS.....	: 5.00 cm
ESPAÇAMENTO MÁX. ENTRE ARMADURAS.....	: 35.00 cm
COBRIMENTO DAS ARMADURAS.....	: 4.00 cm
TELA PADRÃO INTERNA.....	: L283
TELA PADRÃO EXTERNA.....	: L283
CONSIDERAR ANCOR. DA ARM. INT. P/ CORTANTE..	: SIM



## CRITÉRIOS E CONSTANTES

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

# ELS:

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

# ELU:

- VmaxHmin:

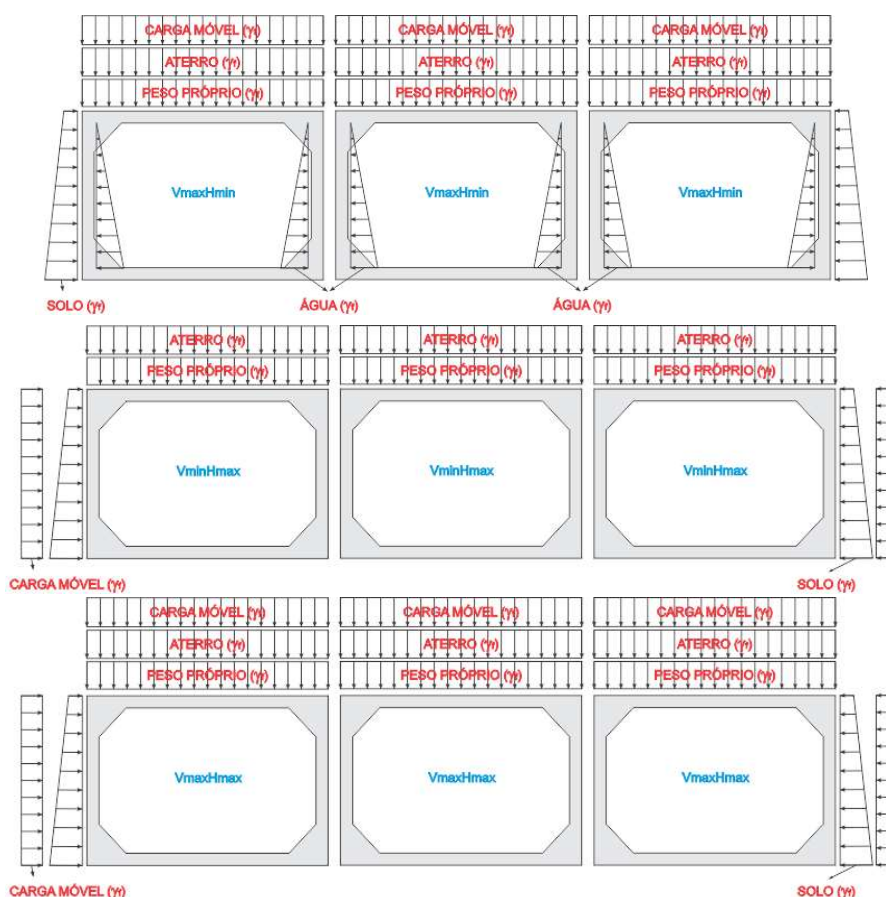
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL V.:	1.50
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.35
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.30
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.00
COEFICIENTE DE PONDERAÇÃO ÁGUA.....	1.20

- VminHmax:

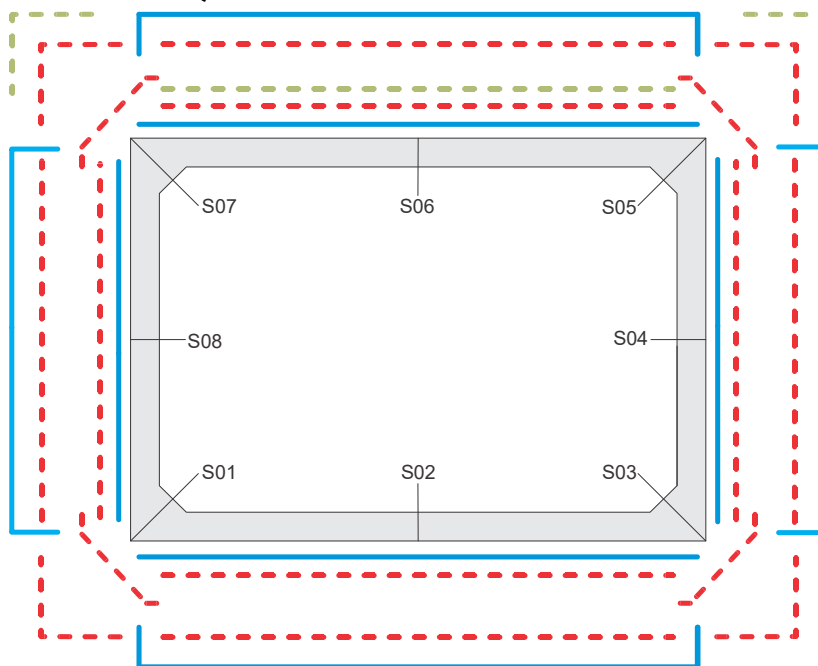
COEFICIENTE DE PONDERAÇÃO ATERRO.....	1.00
COEFICIENTE DE PONDERAÇÃO PESO PRÓPRIO...	1.00
COEFICIENTE DE PONDERAÇÃO SOLO.....	1.35
COEFICIENTE DE PONDERAÇÃO CARGA MÓVEL H.:	1.50

- VmaxHmax:

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



## ESQUEMA P/ DETALHAMENTO



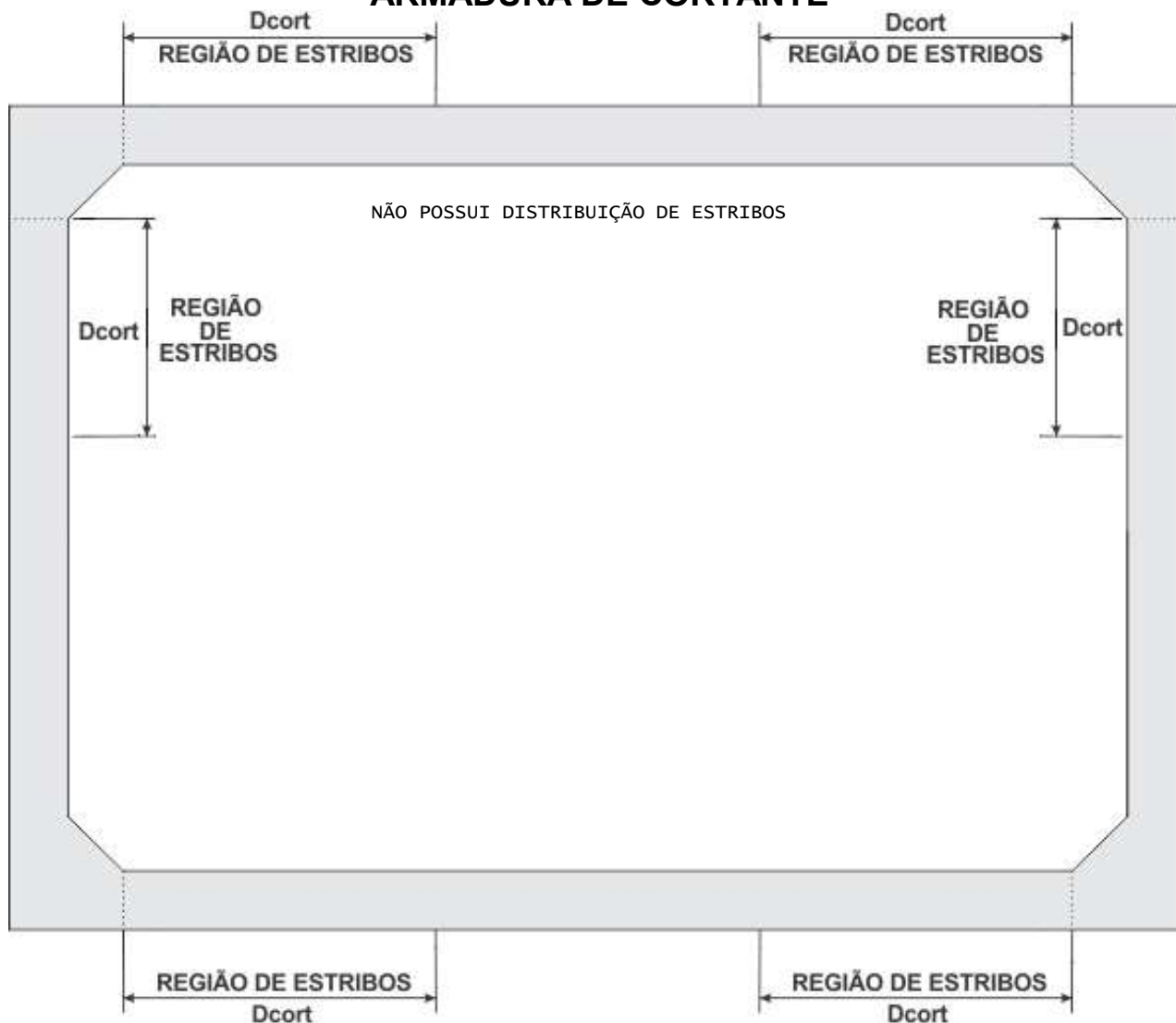
- TELA SOLDADA (CA60) ARMADURA BÁSICA  
 - - - BARRAS DE AÇO (CA50) ARMADURA COMPLEMENTAR  
 - - - BARRAS DE AÇO (CA50) ARMADURA DE FADIGA

OBS.: VALORES POR METRO DE ADUELA.

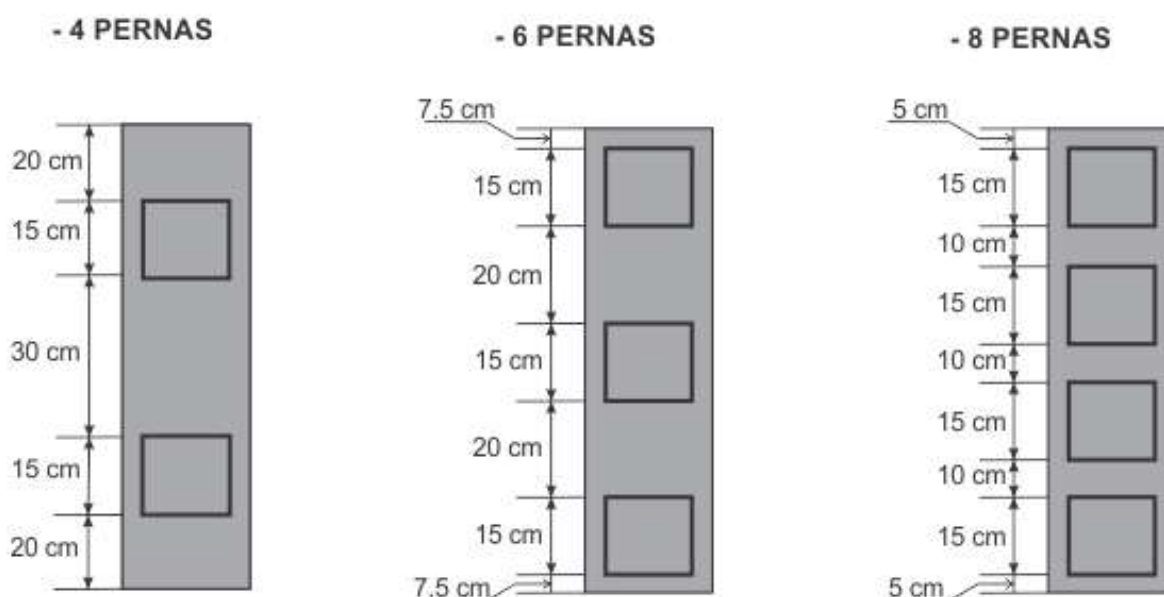
	TELA	ARMADURA COMPLEMENTAR	ARMADURA DE FADIGA
LADO EXTERNO	T-S02: L283	B-S01: 0.22 cm <sup>2</sup> de área acima	B-S05: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 0.61 cm <sup>2</sup> de área acima	B-S07: 0.00 cm <sup>2</sup> de área acima
	T-S06: L283	B-S03: 0.22 cm <sup>2</sup> de área acima	
	T-S08: L283	B-S04: 0.61 cm <sup>2</sup> de área acima B-S05: 0.22 cm <sup>2</sup> de área acima B-S06: 0.61 cm <sup>2</sup> de área acima B-S07: 0.22 cm <sup>2</sup> de área acima B-S08: 0.61 cm <sup>2</sup> de área acima	
LADO INTERNO	T-S02: L283	B-S01: 4 Ø6.30 c/ 31 cm ( 0.00%)	B-S06: 0.00 cm <sup>2</sup> de área acima
	T-S04: L283	B-S02: 5 Ø6.30 c/ 23 cm ( 9.78%)	
	T-S06: L283	B-S03: 4 Ø6.30 c/ 31 cm ( 0.00%)	
	T-S08: L283	B-S04: 0.61 cm <sup>2</sup> de área acima B-S05: 4 Ø6.30 c/ 31 cm ( 0.00%) B-S06: 4 Ø6.30 c/ 31 cm (70.39%) 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 (percentagem positiva) ou a menos (percentagem negativa) em relação ao necessário (calculado) para o tipo de armadura correspondente (armadura complementar ou armadura de fadiga) e não em relação a área total de aço na seção que é o resultado das áreas de tela, armadura complementar e armadura de fadiga. Assim sendo, se uma seção apresenta (X %) de área acima ou abaixo para armadura complementar, esta percentagem é calculada em função da área de armadura complementar necessária e não em relação a área total de aço.

## ARMADURA DE CORTANTE



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

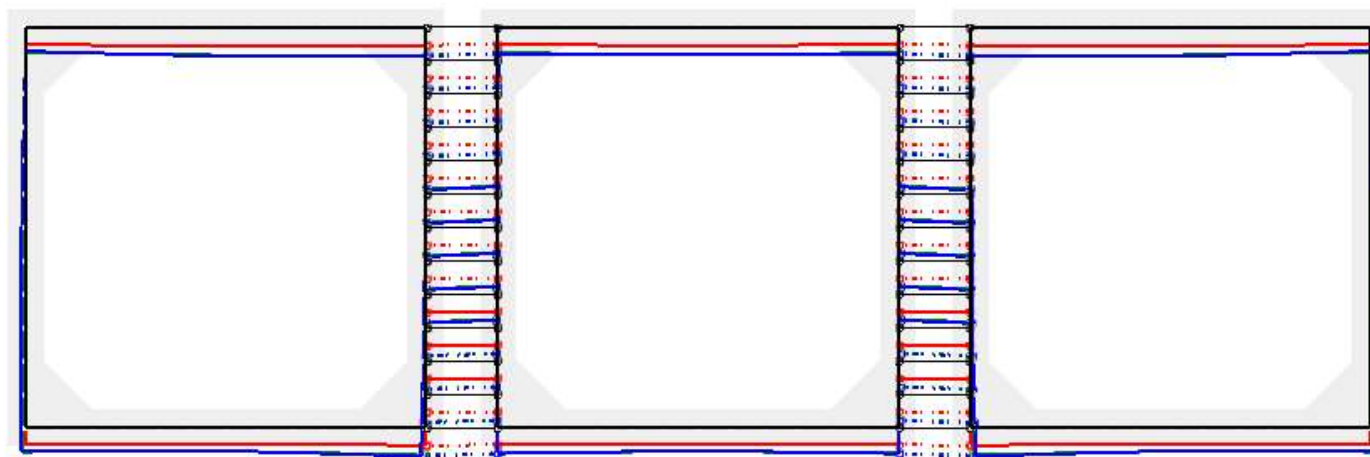
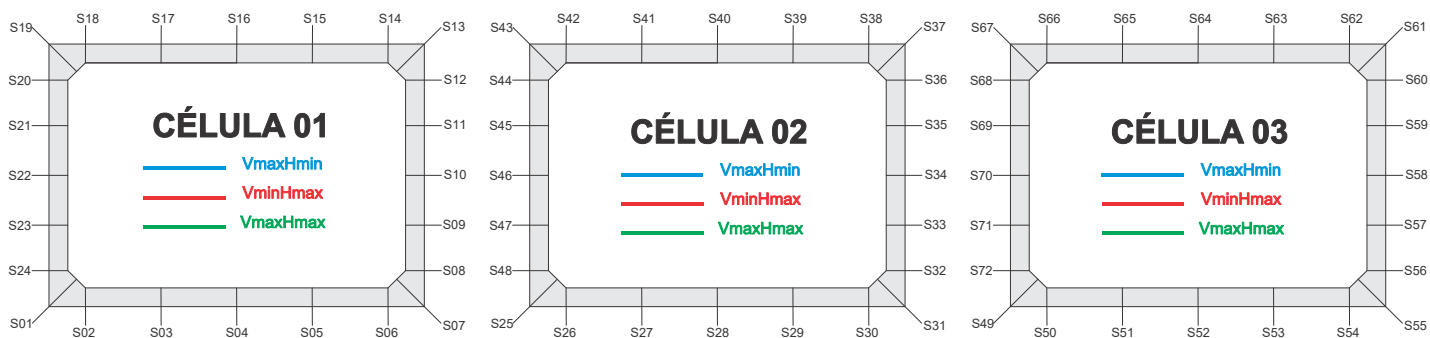


### OBSERVAÇÃO:

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

## DESLOCAMENTOS

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



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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	-1.20E-003	-6.28E-003
2	-1.20E-003	-6.17E-003
3	-1.21E-003	-6.12E-003
4	-1.21E-003	-6.25E-003
5	-1.21E-003	-6.62E-003
6	-1.21E-003	-7.15E-003
7	-1.21E-003	-7.70E-003
8	-6.93E-004	-7.70E-003
9	-3.28E-004	-7.71E-003
10	-1.57E-004	-7.72E-003
11	-8.58E-005	-7.73E-003
12	-1.82E-005	-7.74E-003
13	4.32E-005	-7.75E-003
14	4.40E-005	-7.71E-003
15	4.56E-005	-7.71E-003
16	4.73E-005	-7.60E-003
17	4.89E-005	-7.30E-003
18	5.06E-005	-6.83E-003
19	5.14E-005	-6.32E-003
20	-4.46E-004	-6.32E-003
21	-8.54E-004	-6.31E-003
22	-1.13E-003	-6.30E-003
23	-1.28E-003	-6.29E-003
24	-1.29E-003	-6.29E-003
25	4.38E-006	-6.90E-003
26	3.48E-006	-6.64E-003
27	1.74E-006	-6.39E-003
28	2.33E-010	-6.29E-003
29	-1.74E-006	-6.40E-003
30	-3.48E-006	-6.65E-003
31	-4.38E-006	-6.93E-003
32	2.42E-004	-6.93E-003
33	3.55E-004	-6.94E-003
34	3.13E-004	-6.95E-003
35	2.12E-004	-6.96E-003
36	1.34E-004	-6.97E-003
37	5.24E-005	-6.97E-003
38	5.32E-005	-7.08E-003
39	5.48E-005	-7.21E-003
40	5.64E-005	-7.27E-003
41	5.80E-005	-7.20E-003
42	5.96E-005	-7.06E-003
43	6.04E-005	-6.95E-003
44	-2.74E-005	-6.94E-003
45	-1.30E-004	-6.93E-003
46	-2.63E-004	-6.93E-003
47	-3.28E-004	-6.92E-003
48	-2.30E-004	-6.91E-003
49	1.38E-003	-7.71E-003

50	1.38E-003	-7.16E-003
51	1.38E-003	-6.62E-003
52	1.37E-003	-6.25E-003
53	1.37E-003	-6.11E-003
54	1.37E-003	-6.17E-003
55	1.37E-003	-6.27E-003
56	1.45E-003	-6.27E-003
57	1.44E-003	-6.28E-003
58	1.28E-003	-6.29E-003
59	9.89E-004	-6.30E-003
60	5.69E-004	-6.31E-003
61	6.04E-005	-6.31E-003
62	6.13E-005	-6.83E-003
63	6.29E-005	-7.31E-003
64	6.45E-005	-7.62E-003
65	6.61E-005	-7.73E-003
66	6.78E-005	-7.73E-003
67	6.86E-005	-7.76E-003
68	1.24E-004	-7.75E-003
69	2.06E-004	-7.74E-003
70	2.98E-004	-7.73E-003
71	4.83E-004	-7.72E-003
72	8.55E-004	-7.71E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	3.67E-004
2	3.98E-004
3	-7.33E-005
4	-9.20E-004
5	-1.72E-003
6	-2.03E-003
7	-1.95E-003
8	-1.79E-003
9	-9.18E-004
10	-3.81E-004
11	-2.01E-004
12	-2.68E-004
13	-1.72E-004
14	-5.93E-005
15	-1.16E-004
16	-7.16E-004
17	-1.44E-003
18	-1.87E-003
19	-1.85E-003
20	-1.75E-003
21	-1.23E-003
22	-7.81E-004
23	-3.09E-004
24	2.61E-004
25	9.15E-004
26	9.86E-004
27	7.09E-004
28	-9.10E-006
29	-7.31E-004

30	-1.02E-003
31	-9.55E-004
32	-8.07E-004
33	-7.25E-005
34	3.22E-004
35	3.47E-004
36	2.61E-004
37	3.42E-004
38	4.43E-004
39	4.20E-004
40	-1.87E-005
41	-4.53E-004
42	-4.66E-004
43	-3.62E-004
44	-2.87E-004
45	-4.81E-004
46	-4.21E-004
47	2.47E-006
48	7.63E-004
49	1.97E-003
50	2.05E-003
51	1.73E-003
52	9.30E-004
53	8.49E-005
54	-3.79E-004
55	-3.47E-004
56	-2.39E-004
57	3.40E-004
58	8.18E-004
59	1.27E-003
60	1.79E-003
61	1.89E-003
62	1.91E-003
63	1.47E-003
64	7.35E-004
65	1.19E-004
66	4.19E-005
67	1.52E-004
68	2.52E-004
69	2.94E-004
70	4.43E-004
71	9.57E-004
72	1.81E-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	-3.23E-005	-4.60E-003
2	-3.49E-005	-4.54E-003
3	-3.99E-005	-4.47E-003
4	-4.50E-005	-4.45E-003
5	-5.00E-005	-4.51E-003
6	-5.50E-005	-4.61E-003
7	-5.76E-005	-4.68E-003
8	-8.83E-006	-4.69E-003
9	1.69E-006	-4.69E-003
10	5.29E-006	-4.70E-003
11	9.93E-006	-4.71E-003
12	1.43E-005	-4.71E-003
13	4.65E-006	-4.72E-003
14	6.95E-006	-4.75E-003
15	1.14E-005	-4.81E-003
16	1.59E-005	-4.84E-003
17	2.04E-005	-4.79E-003
18	2.48E-005	-4.70E-003
19	2.71E-005	-4.63E-003
20	-2.61E-005	-4.63E-003
21	-3.55E-005	-4.62E-003
22	-3.42E-005	-4.61E-003
23	-5.49E-005	-4.61E-003
24	-6.59E-005	-4.60E-003
25	1.26E-005	-4.62E-003
26	1.01E-005	-4.57E-003
27	5.03E-006	-4.50E-003
28	8.05E-011	-4.46E-003
29	-5.03E-006	-4.50E-003
30	-1.01E-005	-4.57E-003
31	-1.26E-005	-4.62E-003
32	1.05E-005	-4.62E-003
33	-5.63E-008	-4.63E-003
34	-9.47E-006	-4.64E-003
35	-1.11E-005	-4.64E-003
36	-6.57E-006	-4.65E-003
37	-1.13E-005	-4.65E-003
38	-8.98E-006	-4.67E-003
39	-4.50E-006	-4.73E-003
40	-1.85E-008	-4.76E-003
41	4.46E-006	-4.73E-003
42	8.94E-006	-4.67E-003
43	1.12E-005	-4.65E-003
44	6.57E-006	-4.65E-003
45	1.17E-005	-4.64E-003
46	1.01E-005	-4.64E-003
47	1.21E-007	-4.63E-003
48	-1.05E-005	-4.62E-003
49	5.76E-005	-4.68E-003

50	5.50E-005	-4.61E-003
51	5.00E-005	-4.51E-003
52	4.50E-005	-4.45E-003
53	3.99E-005	-4.47E-003
54	3.49E-005	-4.54E-003
55	3.23E-005	-4.60E-003
56	6.59E-005	-4.60E-003
57	5.49E-005	-4.61E-003
58	3.42E-005	-4.61E-003
59	3.55E-005	-4.62E-003
60	2.61E-005	-4.63E-003
61	-2.71E-005	-4.63E-003
62	-2.48E-005	-4.70E-003
63	-2.04E-005	-4.79E-003
64	-1.59E-005	-4.84E-003
65	-1.14E-005	-4.81E-003
66	-6.95E-006	-4.75E-003
67	-4.65E-006	-4.72E-003
68	-1.43E-005	-4.71E-003
69	-1.06E-005	-4.71E-003
70	-5.94E-006	-4.70E-003
71	-1.76E-006	-4.69E-003
72	8.84E-006	-4.69E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	1.61E-004
2	2.35E-004
3	2.24E-004
4	-7.44E-005
5	-3.54E-004
6	-3.09E-004
7	-2.21E-004
8	-1.26E-004
9	-1.11E-005
10	-1.50E-005
11	-1.87E-005
12	5.66E-006
13	6.86E-005
14	1.53E-004
15	2.19E-004
16	-2.54E-005
17	-2.94E-004
18	-2.99E-004
19	-2.31E-004
20	-1.49E-004
21	2.38E-005
22	-3.46E-005
23	-9.65E-005
24	7.55E-005
25	1.27E-004
26	2.11E-004
27	2.59E-004
28	1.67E-008
29	-2.59E-004

30	-2.11E-004
31	-1.26E-004
32	-3.56E-005
33	5.06E-005
34	1.90E-005
35	-6.28E-006
36	-9.69E-006
37	4.93E-005
38	1.33E-004
39	2.10E-004
40	3.62E-008
41	-2.09E-004
42	-1.33E-004
43	-4.93E-005
44	1.00E-005
45	8.93E-006
46	-2.10E-005
47	-5.19E-005
48	3.57E-005
49	2.21E-004
50	3.08E-004
51	3.54E-004
52	7.44E-005
53	-2.24E-004
54	-2.35E-004
55	-1.61E-004
56	-7.55E-005
57	9.65E-005
58	3.46E-005
59	-2.38E-005
60	1.49E-004
61	2.31E-004
62	2.99E-004
63	2.93E-004
64	2.54E-005
65	-2.19E-004
66	-1.54E-004
67	-6.86E-005
68	-5.99E-006
69	1.60E-005
70	1.70E-005
71	1.24E-005
72	1.26E-004

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-7.75E-004	-6.44E-003
2	-7.77E-004	-6.33E-003
3	-7.80E-004	-6.24E-003
4	-7.83E-004	-6.30E-003
5	-7.87E-004	-6.57E-003
6	-7.90E-004	-6.96E-003
7	-7.92E-004	-7.35E-003
8	-4.36E-004	-7.35E-003
9	-2.09E-004	-7.36E-003
10	-1.12E-004	-7.37E-003
11	-7.18E-005	-7.38E-003
12	-3.67E-005	-7.39E-003
13	-1.63E-005	-7.40E-003
14	-1.48E-005	-7.41E-003
15	-1.19E-005	-7.45E-003
16	-8.94E-006	-7.41E-003
17	-5.99E-006	-7.20E-003
18	-3.04E-006	-6.86E-003
19	-1.53E-006	-6.48E-003
20	-3.53E-004	-6.48E-003
21	-6.22E-004	-6.47E-003
22	-7.91E-004	-6.46E-003
23	-8.82E-004	-6.46E-003
24	-8.72E-004	-6.45E-003
25	8.54E-006	-6.83E-003
26	6.79E-006	-6.63E-003
27	3.40E-006	-6.43E-003
28	1.80E-010	-6.34E-003
29	-3.40E-006	-6.43E-003
30	-6.79E-006	-6.63E-003
31	-8.54E-006	-6.82E-003
32	1.53E-004	-6.82E-003
33	2.00E-004	-6.83E-003
34	1.46E-004	-6.84E-003
35	7.21E-005	-6.85E-003
36	3.12E-005	-6.86E-003
37	-1.59E-005	-6.86E-003
38	-1.44E-005	-6.94E-003
39	-1.14E-005	-7.05E-003
40	-8.48E-006	-7.11E-003
41	-5.53E-006	-7.05E-003
42	-2.59E-006	-6.95E-003
43	-1.08E-006	-6.87E-003
44	-4.68E-005	-6.87E-003
45	-9.54E-005	-6.86E-003
46	-1.69E-004	-6.85E-003
47	-2.13E-004	-6.84E-003
48	-1.59E-004	-6.83E-003
49	7.66E-004	-7.34E-003

50	7.64E-004	-6.96E-003
51	7.61E-004	-6.57E-003
52	7.58E-004	-6.30E-003
53	7.54E-004	-6.24E-003
54	7.51E-004	-6.33E-003
55	7.49E-004	-6.44E-003
56	8.46E-004	-6.45E-003
57	8.56E-004	-6.46E-003
58	7.66E-004	-6.47E-003
59	5.99E-004	-6.47E-003
60	3.33E-004	-6.48E-003
61	-1.58E-005	-6.49E-003
62	-1.43E-005	-6.85E-003
63	-1.13E-005	-7.20E-003
64	-8.36E-006	-7.40E-003
65	-5.42E-006	-7.44E-003
66	-2.47E-006	-7.40E-003
67	-9.56E-007	-7.39E-003
68	2.12E-005	-7.38E-003
69	6.66E-005	-7.37E-003
70	1.08E-004	-7.37E-003
71	1.97E-004	-7.36E-003
72	4.16E-004	-7.35E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	3.98E-004
2	4.49E-004
3	1.07E-004
4	-6.13E-004
5	-1.28E-003
6	-1.46E-003
7	-1.36E-003
8	-1.20E-003
9	-5.31E-004
10	-2.15E-004
11	-1.09E-004
12	-1.20E-004
13	-2.31E-005
14	9.48E-005
15	9.04E-005
16	-4.34E-004
17	-1.06E-003
18	-1.37E-003
19	-1.32E-003
20	-1.22E-003
21	-7.72E-004
22	-4.74E-004
23	-1.73E-004
24	2.89E-004
25	6.70E-004
26	7.58E-004
27	5.98E-004
28	2.88E-006
29	-5.90E-004

30	-7.41E-004
31	-6.51E-004
32	-5.01E-004
33	7.72E-005
34	2.76E-004
35	2.15E-004
36	1.32E-004
37	2.18E-004
38	3.31E-004
39	3.80E-004
40	8.72E-006
41	-3.65E-004
42	-3.22E-004
43	-2.11E-004
44	-1.31E-004
45	-2.49E-004
46	-2.50E-004
47	-4.07E-005
48	5.22E-004
49	1.34E-003
50	1.44E-003
51	1.27E-003
52	6.10E-004
53	-1.07E-004
54	-4.48E-004
55	-3.97E-004
56	-2.88E-004
57	1.71E-004
58	4.69E-004
59	7.64E-004
60	1.21E-003
61	1.31E-003
62	1.36E-003
63	1.05E-003
64	4.25E-004
65	-9.41E-005
66	-9.12E-005
67	2.80E-005
68	1.29E-004
69	1.51E-004
70	1.94E-004
71	4.96E-004
72	1.18E-003

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.43E-003	-6.27E-003
2	-1.43E-003	-6.14E-003
3	-1.43E-003	-6.07E-003
4	-1.43E-003	-6.20E-003
5	-1.43E-003	-6.61E-003
6	-1.44E-003	-7.22E-003
7	-1.44E-003	-7.87E-003
8	-8.15E-004	-7.88E-003
9	-4.20E-004	-7.90E-003
10	-2.88E-004	-7.92E-003
11	-2.67E-004	-7.94E-003
12	-2.05E-004	-7.96E-003
13	-1.28E-004	-7.97E-003
14	-1.28E-004	-7.93E-003
15	-1.26E-004	-7.90E-003
16	-1.24E-004	-7.74E-003
17	-1.22E-004	-7.39E-003
18	-1.21E-004	-6.87E-003
19	-1.20E-004	-6.31E-003
20	-6.62E-004	-6.31E-003
21	-1.10E-003	-6.30E-003
22	-1.39E-003	-6.29E-003
23	-1.54E-003	-6.28E-003
24	-1.54E-003	-6.27E-003
25	4.25E-006	-6.95E-003
26	3.38E-006	-6.65E-003
27	1.69E-006	-6.37E-003
28	-1.26E-010	-6.25E-003
29	-1.69E-006	-6.37E-003
30	-3.38E-006	-6.67E-003
31	-4.25E-006	-7.01E-003
32	2.98E-004	-7.02E-003
33	3.84E-004	-7.04E-003
34	2.37E-004	-7.05E-003
35	4.67E-005	-7.07E-003
36	-4.27E-005	-7.09E-003
37	-1.19E-004	-7.10E-003
38	-1.18E-004	-7.21E-003
39	-1.17E-004	-7.34E-003
40	-1.15E-004	-7.38E-003
41	-1.14E-004	-7.29E-003
42	-1.12E-004	-7.13E-003
43	-1.11E-004	-7.00E-003
44	-2.14E-004	-6.99E-003
45	-3.12E-004	-6.99E-003
46	-4.07E-004	-6.98E-003
47	-4.21E-004	-6.97E-003
48	-2.75E-004	-6.96E-003
49	1.39E-003	-7.84E-003

50	1.39E-003	-7.23E-003
51	1.39E-003	-6.64E-003
52	1.39E-003	-6.22E-003
53	1.39E-003	-6.06E-003
54	1.38E-003	-6.12E-003
55	1.38E-003	-6.25E-003
56	1.49E-003	-6.25E-003
57	1.47E-003	-6.27E-003
58	1.28E-003	-6.29E-003
59	9.49E-004	-6.30E-003
60	4.73E-004	-6.32E-003
61	-1.10E-004	-6.32E-003
62	-1.10E-004	-6.92E-003
63	-1.08E-004	-7.45E-003
64	-1.06E-004	-7.77E-003
65	-1.05E-004	-7.88E-003
66	-1.03E-004	-7.88E-003
67	-1.02E-004	-7.89E-003
68	-5.24E-005	-7.89E-003
69	3.82E-005	-7.88E-003
70	1.59E-004	-7.87E-003
71	3.84E-004	-7.86E-003
72	8.08E-004	-7.85E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	4.40E-004
2	4.70E-004
3	-4.31E-005
4	-9.78E-004
5	-1.91E-003
6	-2.41E-003
7	-2.37E-003
8	-2.11E-003
9	-8.61E-004
10	-1.85E-004
11	-6.91E-005
12	-3.43E-004
13	-1.94E-004
14	-1.00E-004
15	-2.53E-004
16	-9.07E-004
17	-1.65E-003
18	-2.05E-003
19	-2.01E-003
20	-1.91E-003
21	-1.32E-003
22	-8.01E-004
23	-2.79E-004
24	3.29E-004
25	1.07E-003
26	1.14E-003
27	7.96E-004
28	-3.99E-006
29	-8.29E-004

30	-1.25E-003
31	-1.20E-003
32	-9.50E-004
33	2.20E-004
34	7.32E-004
35	5.31E-004
36	2.21E-004
37	3.56E-004
38	4.48E-004
39	3.78E-004
40	-8.72E-005
41	-5.29E-004
42	-5.29E-004
43	-4.20E-004
44	-3.36E-004
45	-3.94E-004
46	-2.47E-004
47	1.91E-004
48	9.26E-004
49	2.19E-003
50	2.26E-003
51	1.93E-003
52	1.07E-003
53	1.30E-004
54	-4.72E-004
55	-4.66E-004
56	-3.12E-004
57	4.26E-004
58	9.57E-004
59	1.44E-003
60	2.05E-003
61	2.18E-003
62	2.17E-003
63	1.59E-003
64	7.52E-004
65	8.71E-005
66	1.03E-005
67	1.26E-004
68	2.36E-004
69	3.73E-004
70	5.68E-004
71	1.13E-003
72	2.02E-003

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-5.63E-005	-4.60E-003
2	-5.89E-005	-4.54E-003
3	-6.39E-005	-4.46E-003
4	-6.89E-005	-4.44E-003
5	-7.39E-005	-4.51E-003
6	-7.89E-005	-4.62E-003
7	-8.15E-005	-4.72E-003
8	-2.00E-005	-4.73E-003
9	-1.86E-005	-4.74E-003
10	-2.04E-005	-4.75E-003
11	-1.43E-005	-4.76E-003
12	1.95E-006	-4.78E-003
13	2.82E-006	-4.78E-003
14	5.13E-006	-4.81E-003
15	9.62E-006	-4.86E-003
16	1.41E-005	-4.88E-003
17	1.86E-005	-4.82E-003
18	2.31E-005	-4.71E-003
19	2.54E-005	-4.63E-003
20	-4.04E-005	-4.62E-003
21	-5.94E-005	-4.62E-003
22	-6.33E-005	-4.61E-003
23	-8.50E-005	-4.61E-003
24	-9.39E-005	-4.60E-003
25	1.26E-005	-4.63E-003
26	1.00E-005	-4.57E-003
27	5.02E-006	-4.49E-003
28	-6.54E-011	-4.45E-003
29	-5.02E-006	-4.49E-003
30	-1.00E-005	-4.58E-003
31	-1.26E-005	-4.64E-003
32	1.88E-005	-4.65E-003
33	-4.56E-006	-4.66E-003
34	-2.26E-005	-4.67E-003
35	-2.66E-005	-4.69E-003
36	-1.44E-005	-4.70E-003
37	-1.23E-005	-4.70E-003
38	-9.99E-006	-4.73E-003
39	-5.51E-006	-4.78E-003
40	-1.02E-006	-4.81E-003
41	3.47E-006	-4.77E-003
42	7.96E-006	-4.70E-003
43	1.03E-005	-4.66E-003
44	-6.16E-006	-4.66E-003
45	-1.20E-005	-4.65E-003
46	-1.80E-005	-4.65E-003
47	-2.31E-005	-4.64E-003
48	-2.16E-005	-4.63E-003
49	8.19E-005	-4.72E-003

50	7.94E-005	-4.63E-003
51	7.43E-005	-4.51E-003
52	6.93E-005	-4.44E-003
53	6.42E-005	-4.46E-003
54	5.92E-005	-4.53E-003
55	5.66E-005	-4.59E-003
56	8.76E-005	-4.60E-003
57	4.10E-005	-4.61E-003
58	-4.73E-006	-4.62E-003
59	1.35E-005	-4.64E-003
60	3.09E-005	-4.65E-003
61	-2.73E-005	-4.65E-003
62	-2.50E-005	-4.74E-003
63	-2.06E-005	-4.84E-003
64	-1.61E-005	-4.89E-003
65	-1.16E-005	-4.85E-003
66	-7.15E-006	-4.79E-003
67	-4.85E-006	-4.75E-003
68	-2.25E-005	-4.74E-003
69	-2.62E-005	-4.74E-003
70	-2.26E-005	-4.73E-003
71	-9.80E-006	-4.73E-003
72	1.72E-005	-4.72E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	1.76E-004
2	2.50E-004
3	2.32E-004
4	-8.30E-005
5	-3.91E-004
6	-3.85E-004
7	-3.05E-004
8	-1.31E-004
9	1.59E-005
10	-5.35E-006
11	-4.16E-005
12	-5.09E-005
13	5.77E-005
14	1.38E-004
15	1.81E-004
16	-7.70E-005
17	-3.49E-004
18	-3.48E-004
19	-2.77E-004
20	-1.93E-004
21	-2.63E-006
22	-4.56E-005
23	-9.42E-005
24	8.90E-005
25	1.67E-004
26	2.49E-004
27	2.80E-004
28	-9.14E-007
29	-2.88E-004

30	-2.73E-004
31	-1.94E-004
32	-2.48E-005
33	8.93E-005
34	4.11E-005
35	-1.33E-005
36	-5.28E-005
37	5.17E-005
38	1.32E-004
39	1.91E-004
40	-3.18E-005
41	-2.49E-004
42	-1.75E-004
43	-9.12E-005
44	-3.43E-005
45	-2.10E-005
46	-2.13E-005
47	-1.43E-005
48	7.70E-005
49	2.79E-004
50	3.65E-004
51	3.98E-004
52	1.01E-004
53	-2.18E-004
54	-2.55E-004
55	-1.87E-004
56	-2.57E-005
57	2.46E-004
58	4.89E-005
59	-1.42E-004
60	1.29E-004
61	2.82E-004
62	3.45E-004
63	3.11E-004
64	2.15E-005
65	-2.38E-004
66	-1.81E-004
67	-9.67E-005
68	-3.67E-005
69	-1.47E-006
70	2.89E-005
71	6.49E-005
72	1.85E-004

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-8.36E-004	-6.45E-003
2	-8.37E-004	-6.31E-003
3	-8.41E-004	-6.20E-003
4	-8.44E-004	-6.26E-003
5	-8.47E-004	-6.55E-003
6	-8.51E-004	-7.01E-003
7	-8.52E-004	-7.48E-003
8	-4.16E-004	-7.49E-003
9	-1.77E-004	-7.51E-003
10	-1.36E-004	-7.53E-003
11	-1.62E-004	-7.55E-003
12	-1.35E-004	-7.57E-003
13	-9.66E-005	-7.58E-003
14	-9.50E-005	-7.58E-003
15	-9.20E-005	-7.60E-003
16	-8.89E-005	-7.52E-003
17	-8.59E-005	-7.27E-003
18	-8.29E-005	-6.89E-003
19	-8.13E-005	-6.49E-003
20	-4.59E-004	-6.49E-003
21	-7.43E-004	-6.48E-003
22	-9.12E-004	-6.47E-003
23	-9.90E-004	-6.46E-003
24	-9.58E-004	-6.46E-003
25	8.38E-006	-6.87E-003
26	6.67E-006	-6.63E-003
27	3.33E-006	-6.40E-003
28	-1.12E-010	-6.30E-003
29	-3.33E-006	-6.41E-003
30	-6.67E-006	-6.65E-003
31	-8.38E-006	-6.91E-003
32	2.11E-004	-6.92E-003
33	2.45E-004	-6.94E-003
34	1.15E-004	-6.96E-003
35	-2.28E-005	-6.97E-003
36	-6.14E-005	-6.99E-003
37	-9.58E-005	-7.00E-003
38	-9.42E-005	-7.07E-003
39	-9.12E-005	-7.17E-003
40	-8.82E-005	-7.21E-003
41	-8.52E-005	-7.13E-003
42	-8.22E-005	-7.00E-003
43	-8.07E-005	-6.91E-003
44	-1.44E-004	-6.91E-003
45	-2.04E-004	-6.90E-003
46	-2.75E-004	-6.89E-003
47	-2.95E-004	-6.88E-003
48	-1.98E-004	-6.87E-003
49	8.22E-004	-7.46E-003

50	8.20E-004	-7.02E-003
51	8.17E-004	-6.58E-003
52	8.13E-004	-6.28E-003
53	8.10E-004	-6.19E-003
54	8.06E-004	-6.29E-003
55	8.05E-004	-6.43E-003
56	9.21E-004	-6.44E-003
57	9.15E-004	-6.45E-003
58	7.96E-004	-6.47E-003
59	6.08E-004	-6.49E-003
60	3.13E-004	-6.50E-003
61	-9.48E-005	-6.51E-003
62	-9.33E-005	-6.94E-003
63	-9.04E-005	-7.33E-003
64	-8.74E-005	-7.55E-003
65	-8.45E-005	-7.58E-003
66	-8.16E-005	-7.53E-003
67	-8.01E-005	-7.51E-003
68	-7.16E-005	-7.50E-003
69	-3.01E-005	-7.49E-003
70	2.35E-005	-7.48E-003
71	1.45E-004	-7.47E-003
72	4.16E-004	-7.46E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	4.91E-004
2	5.41E-004
3	1.55E-004
4	-6.45E-004
5	-1.43E-003
6	-1.76E-003
7	-1.70E-003
8	-1.43E-003
9	-4.26E-004
10	5.04E-005
11	5.99E-005
12	-2.06E-004
13	-5.20E-005
14	5.17E-005
15	-1.94E-005
16	-5.77E-004
17	-1.20E-003
18	-1.48E-003
19	-1.42E-003
20	-1.31E-003
21	-7.97E-004
22	-4.47E-004
23	-1.08E-004
24	3.80E-004
25	8.12E-004
26	8.92E-004
27	6.70E-004
28	-6.36E-006
29	-7.00E-004

30	-9.75E-004
31	-9.07E-004
32	-6.51E-004
33	2.74E-004
34	5.82E-004
35	3.24E-004
36	6.10E-005
37	2.08E-004
38	3.13E-004
39	3.21E-004
40	-7.20E-005
41	-4.49E-004
42	-3.93E-004
43	-2.77E-004
44	-1.92E-004
45	-2.70E-004
46	-2.05E-004
47	9.71E-005
48	6.68E-004
49	1.54E-003
50	1.64E-003
51	1.44E-003
52	7.19E-004
53	-7.86E-005
54	-5.28E-004
55	-4.96E-004
56	-3.25E-004
57	2.81E-004
58	5.60E-004
59	8.30E-004
60	1.39E-003
61	1.55E-003
62	1.57E-003
63	1.15E-003
64	4.44E-004
65	-1.27E-004
66	-1.43E-004
67	-2.25E-005
68	8.19E-005
69	1.69E-004
70	2.70E-004
71	6.63E-004
72	1.38E-003

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-5.96E-004	-4.69E-003
2	-5.97E-004	-4.61E-003
3	-5.99E-004	-4.55E-003
4	-6.02E-004	-4.60E-003
5	-6.04E-004	-4.80E-003
6	-6.07E-004	-5.09E-003
7	-6.08E-004	-5.39E-003
8	-3.37E-004	-5.39E-003
9	-1.63E-004	-5.40E-003
10	-8.72E-005	-5.41E-003
11	-5.67E-005	-5.41E-003
12	-2.98E-005	-5.42E-003
13	-1.29E-005	-5.42E-003
14	-1.18E-005	-5.43E-003
15	-9.80E-006	-5.46E-003
16	-7.78E-006	-5.42E-003
17	-5.76E-006	-5.26E-003
18	-3.73E-006	-5.00E-003
19	-2.69E-006	-4.72E-003
20	-2.69E-004	-4.72E-003
21	-4.74E-004	-4.72E-003
22	-6.04E-004	-4.71E-003
23	-6.74E-004	-4.70E-003
24	-6.67E-004	-4.70E-003
25	5.96E-006	-4.99E-003
26	4.74E-006	-4.84E-003
27	2.37E-006	-4.69E-003
28	1.34E-010	-4.63E-003
29	-2.37E-006	-4.69E-003
30	-4.74E-006	-4.84E-003
31	-5.96E-006	-4.98E-003
32	1.17E-004	-4.99E-003
33	1.55E-004	-4.99E-003
34	1.14E-004	-5.00E-003
35	5.70E-005	-5.01E-003
36	2.47E-005	-5.01E-003
37	-1.18E-005	-5.02E-003
38	-1.07E-005	-5.07E-003
39	-8.70E-006	-5.16E-003
40	-6.68E-006	-5.20E-003
41	-4.67E-006	-5.16E-003
42	-2.65E-006	-5.08E-003
43	-1.61E-006	-5.02E-003
44	-3.70E-005	-5.02E-003
45	-7.53E-005	-5.01E-003
46	-1.32E-004	-5.01E-003
47	-1.65E-004	-5.00E-003
48	-1.21E-004	-4.99E-003
49	5.87E-004	-5.38E-003

50	5.86E-004	-5.09E-003
51	5.84E-004	-4.80E-003
52	5.81E-004	-4.60E-003
53	5.79E-004	-4.55E-003
54	5.77E-004	-4.61E-003
55	5.76E-004	-4.70E-003
56	6.46E-004	-4.70E-003
57	6.53E-004	-4.71E-003
58	5.84E-004	-4.71E-003
59	4.55E-004	-4.72E-003
60	2.53E-004	-4.72E-003
61	-1.09E-005	-4.73E-003
62	-9.90E-006	-5.00E-003
63	-7.88E-006	-5.26E-003
64	-5.86E-006	-5.42E-003
65	-3.84E-006	-5.45E-003
66	-1.82E-006	-5.42E-003
67	-7.80E-007	-5.42E-003
68	1.75E-005	-5.41E-003
69	5.26E-005	-5.41E-003
70	8.43E-005	-5.40E-003
71	1.53E-004	-5.39E-003
72	3.21E-004	-5.38E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.91E-004
2	3.27E-004
3	6.81E-005
4	-4.66E-004
5	-9.63E-004
6	-1.10E-003
7	-1.03E-003
8	-9.14E-004
9	-4.12E-004
10	-1.66E-004
11	-8.28E-005
12	-9.45E-005
13	-2.44E-005
14	6.06E-005
15	5.27E-005
16	-3.34E-004
17	-7.96E-004
18	-1.03E-003
19	-9.98E-004
20	-9.24E-004
21	-5.93E-004
22	-3.64E-004
23	-1.32E-004
24	2.11E-004
25	5.08E-004
26	5.71E-004
27	4.45E-004
28	2.27E-006
29	-4.39E-004

30	-5.58E-004
31	-4.94E-004
32	-3.84E-004
33	5.20E-005
34	2.12E-004
35	1.68E-004
36	1.04E-004
37	1.66E-004
38	2.48E-004
39	2.80E-004
40	6.87E-006
41	-2.68E-004
42	-2.41E-004
43	-1.61E-004
44	-1.03E-004
45	-1.95E-004
46	-1.91E-004
47	-2.33E-005
48	4.01E-004
49	1.02E-003
50	1.09E-003
51	9.56E-004
52	4.64E-004
53	-6.77E-005
54	-3.26E-004
55	-2.90E-004
56	-2.11E-004
57	1.31E-004
58	3.60E-004
59	5.86E-004
60	9.15E-004
61	9.89E-004
62	1.02E-003
63	7.87E-004
64	3.27E-004
65	-5.56E-005
66	-5.78E-005
67	2.84E-005
68	1.02E-004
69	1.16E-004
70	1.49E-004
71	3.85E-004
72	8.97E-004

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-1.80E-004	-4.58E-003
2	-1.81E-004	-4.50E-003
3	-1.85E-004	-4.42E-003
4	-1.89E-004	-4.41E-003
5	-1.92E-004	-4.52E-003
6	-1.96E-004	-4.68E-003
7	-1.98E-004	-4.83E-003
8	-8.05E-005	-4.83E-003
9	-3.03E-005	-4.84E-003
10	-1.20E-005	-4.84E-003
11	-4.59E-007	-4.85E-003
12	7.52E-006	-4.85E-003
13	-6.41E-007	-4.86E-003
14	1.02E-006	-4.89E-003
15	4.26E-006	-4.95E-003
16	7.50E-006	-4.97E-003
17	1.07E-005	-4.89E-003
18	1.40E-005	-4.75E-003
19	1.56E-005	-4.60E-003
20	-1.11E-004	-4.60E-003
21	-1.89E-004	-4.60E-003
22	-2.29E-004	-4.59E-003
23	-2.54E-004	-4.58E-003
24	-2.42E-004	-4.58E-003
25	9.23E-006	-4.66E-003
26	7.34E-006	-4.58E-003
27	3.67E-006	-4.49E-003
28	9.27E-011	-4.44E-003
29	-3.67E-006	-4.49E-003
30	-7.34E-006	-4.58E-003
31	-9.23E-006	-4.65E-003
32	4.24E-005	-4.66E-003
33	3.63E-005	-4.66E-003
34	1.40E-005	-4.67E-003
35	8.96E-007	-4.68E-003
36	4.61E-008	-4.68E-003
37	-8.21E-006	-4.69E-003
38	-6.55E-006	-4.71E-003
39	-3.30E-006	-4.77E-003
40	-6.07E-008	-4.81E-003
41	3.18E-006	-4.77E-003
42	6.42E-006	-4.71E-003
43	8.09E-006	-4.69E-003
44	-1.66E-007	-4.68E-003
45	-1.33E-006	-4.68E-003
46	-1.44E-005	-4.67E-003
47	-3.65E-005	-4.66E-003
48	-4.24E-005	-4.66E-003
49	1.98E-004	-4.83E-003

50	1.96E-004	-4.68E-003
51	1.92E-004	-4.52E-003
52	1.89E-004	-4.41E-003
53	1.85E-004	-4.42E-003
54	1.81E-004	-4.50E-003
55	1.79E-004	-4.58E-003
56	2.42E-004	-4.58E-003
57	2.54E-004	-4.58E-003
58	2.28E-004	-4.59E-003
59	1.88E-004	-4.60E-003
60	1.11E-004	-4.60E-003
61	-1.58E-005	-4.60E-003
62	-1.41E-005	-4.75E-003
63	-1.09E-005	-4.89E-003
64	-7.64E-006	-4.97E-003
65	-4.40E-006	-4.95E-003
66	-1.16E-006	-4.89E-003
67	5.02E-007	-4.86E-003
68	-7.63E-006	-4.85E-003
69	6.80E-007	-4.85E-003
70	1.22E-005	-4.84E-003
71	3.02E-005	-4.84E-003
72	8.04E-005	-4.83E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.63E-004
2	3.16E-004
3	1.93E-004
4	-1.96E-004
5	-5.48E-004
6	-5.57E-004
7	-4.75E-004
8	-3.65E-004
9	-8.41E-005
10	-5.14E-005
11	-3.56E-005
12	-2.28E-006
13	6.51E-005
14	1.51E-004
15	1.98E-004
16	-9.25E-005
17	-4.35E-004
18	-5.43E-004
19	-4.94E-004
20	-4.19E-004
21	-1.86E-004
22	-1.19E-004
23	-5.35E-005
24	1.84E-004
25	2.32E-004
26	3.10E-004
27	3.08E-004
28	2.17E-008
29	-3.08E-004

30	-3.09E-004
31	-2.32E-004
32	-1.31E-004
33	9.21E-005
34	6.75E-005
35	2.44E-005
36	2.99E-006
37	6.24E-005
38	1.45E-004
39	2.16E-004
40	7.67E-008
41	-2.16E-004
42	-1.45E-004
43	-6.24E-005
44	-3.10E-006
45	-2.56E-005
46	-6.66E-005
47	-9.14E-005
48	1.31E-004
49	4.75E-004
50	5.57E-004
51	5.48E-004
52	1.96E-004
53	-1.93E-004
54	-3.16E-004
55	-2.63E-004
56	-1.84E-004
57	5.35E-005
58	1.19E-004
59	1.86E-004
60	4.19E-004
61	4.94E-004
62	5.43E-004
63	4.35E-004
64	9.24E-005
65	-1.98E-004
66	-1.51E-004
67	-6.50E-005
68	2.49E-006
69	3.69E-005
70	5.05E-005
71	8.34E-005
72	3.65E-004

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-5.64E-004	-4.70E-003
2	-5.65E-004	-4.62E-003
3	-5.68E-004	-4.55E-003
4	-5.70E-004	-4.60E-003
5	-5.73E-004	-4.80E-003
6	-5.75E-004	-5.08E-003
7	-5.77E-004	-5.36E-003
8	-3.17E-004	-5.37E-003
9	-1.53E-004	-5.37E-003
10	-8.13E-005	-5.38E-003
11	-5.23E-005	-5.39E-003
12	-2.68E-005	-5.40E-003
13	-1.19E-005	-5.40E-003
14	-1.08E-005	-5.41E-003
15	-8.67E-006	-5.44E-003
16	-6.53E-006	-5.41E-003
17	-4.40E-006	-5.26E-003
18	-2.26E-006	-5.00E-003
19	-1.16E-006	-4.73E-003
20	-2.57E-004	-4.73E-003
21	-4.52E-004	-4.73E-003
22	-5.76E-004	-4.72E-003
23	-6.42E-004	-4.71E-003
24	-6.35E-004	-4.71E-003
25	6.23E-006	-4.98E-003
26	4.96E-006	-4.84E-003
27	2.48E-006	-4.69E-003
28	1.31E-010	-4.63E-003
29	-2.48E-006	-4.69E-003
30	-4.96E-006	-4.84E-003
31	-6.23E-006	-4.98E-003
32	1.12E-004	-4.98E-003
33	1.46E-004	-4.99E-003
34	1.06E-004	-4.99E-003
35	5.25E-005	-5.00E-003
36	2.28E-005	-5.01E-003
37	-1.15E-005	-5.01E-003
38	-1.04E-005	-5.06E-003
39	-8.30E-006	-5.15E-003
40	-6.17E-006	-5.19E-003
41	-4.04E-006	-5.15E-003
42	-1.91E-006	-5.07E-003
43	-8.11E-007	-5.02E-003
44	-3.41E-005	-5.01E-003
45	-6.95E-005	-5.01E-003
46	-1.23E-004	-5.00E-003
47	-1.55E-004	-4.99E-003
48	-1.16E-004	-4.99E-003
49	5.58E-004	-5.36E-003

50	5.57E-004	-5.08E-003
51	5.54E-004	-4.80E-003
52	5.52E-004	-4.60E-003
53	5.49E-004	-4.55E-003
54	5.47E-004	-4.62E-003
55	5.45E-004	-4.71E-003
56	6.16E-004	-4.71E-003
57	6.23E-004	-4.72E-003
58	5.58E-004	-4.72E-003
59	4.36E-004	-4.73E-003
60	2.42E-004	-4.73E-003
61	-1.14E-005	-4.74E-003
62	-1.03E-005	-5.00E-003
63	-8.20E-006	-5.25E-003
64	-6.06E-006	-5.40E-003
65	-3.93E-006	-5.43E-003
66	-1.79E-006	-5.40E-003
67	-6.95E-007	-5.39E-003
68	1.55E-005	-5.39E-003
69	4.85E-005	-5.38E-003
70	7.87E-005	-5.38E-003
71	1.43E-004	-5.37E-003
72	3.03E-004	-5.36E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.90E-004
2	3.28E-004
3	7.89E-005
4	-4.46E-004
5	-9.34E-004
6	-1.06E-003
7	-9.92E-004
8	-8.73E-004
9	-3.86E-004
10	-1.57E-004
11	-7.94E-005
12	-8.72E-005
13	-1.71E-005
14	6.85E-005
15	6.51E-005
16	-3.15E-004
17	-7.70E-004
18	-9.95E-004
19	-9.61E-004
20	-8.86E-004
21	-5.62E-004
22	-3.46E-004
23	-1.26E-004
24	2.11E-004
25	4.88E-004
26	5.52E-004
27	4.36E-004
28	2.10E-006
29	-4.30E-004

30	-5.40E-004
31	-4.75E-004
32	-3.65E-004
33	5.63E-005
34	2.01E-004
35	1.57E-004
36	9.61E-005
37	1.58E-004
38	2.40E-004
39	2.76E-004
40	6.35E-006
41	-2.65E-004
42	-2.34E-004
43	-1.54E-004
44	-9.51E-005
45	-1.81E-004
46	-1.82E-004
47	-2.97E-005
48	3.80E-004
49	9.78E-004
50	1.05E-003
51	9.27E-004
52	4.44E-004
53	-7.85E-005
54	-3.27E-004
55	-2.89E-004
56	-2.10E-004
57	1.25E-004
58	3.42E-004
59	5.56E-004
60	8.78E-004
61	9.53E-004
62	9.86E-004
63	7.62E-004
64	3.09E-004
65	-6.78E-005
66	-6.58E-005
67	2.07E-005
68	9.43E-005
69	1.10E-004
70	1.41E-004
71	3.61E-004
72	8.57E-004

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

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SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-5.29E-004	-4.47E-003
2	-5.30E-004	-4.39E-003
3	-5.32E-004	-4.33E-003
4	-5.35E-004	-4.37E-003
5	-5.37E-004	-4.55E-003
6	-5.40E-004	-4.82E-003
7	-5.41E-004	-5.09E-003
8	-2.97E-004	-5.09E-003
9	-1.43E-004	-5.10E-003
10	-7.61E-005	-5.11E-003
11	-4.88E-005	-5.11E-003
12	-2.49E-005	-5.12E-003
13	-1.11E-005	-5.12E-003
14	-1.01E-005	-5.13E-003
15	-8.08E-006	-5.16E-003
16	-6.06E-006	-5.13E-003
17	-4.04E-006	-4.99E-003
18	-2.02E-006	-4.75E-003
19	-9.83E-007	-4.50E-003
20	-2.41E-004	-4.50E-003
21	-4.25E-004	-4.49E-003
22	-5.41E-004	-4.48E-003
23	-6.03E-004	-4.48E-003
24	-5.96E-004	-4.47E-003
25	5.96E-006	-4.73E-003
26	4.74E-006	-4.60E-003
27	2.37E-006	-4.46E-003
28	1.24E-010	-4.40E-003
29	-2.37E-006	-4.46E-003
30	-4.74E-006	-4.59E-003
31	-5.96E-006	-4.73E-003
32	1.05E-004	-4.73E-003
33	1.37E-004	-4.73E-003
34	9.92E-005	-4.74E-003
35	4.90E-005	-4.75E-003
36	2.12E-005	-4.75E-003
37	-1.08E-005	-4.76E-003
38	-9.79E-006	-4.81E-003
39	-7.77E-006	-4.88E-003
40	-5.75E-006	-4.92E-003
41	-3.74E-006	-4.89E-003
42	-1.72E-006	-4.81E-003
43	-6.83E-007	-4.76E-003
44	-3.18E-005	-4.76E-003
45	-6.48E-005	-4.75E-003
46	-1.15E-004	-4.75E-003
47	-1.46E-004	-4.74E-003
48	-1.09E-004	-4.74E-003
49	5.23E-004	-5.08E-003

50	5.22E-004	-4.82E-003
51	5.20E-004	-4.55E-003
52	5.17E-004	-4.37E-003
53	5.15E-004	-4.33E-003
54	5.13E-004	-4.39E-003
55	5.11E-004	-4.47E-003
56	5.78E-004	-4.47E-003
57	5.86E-004	-4.48E-003
58	5.24E-004	-4.49E-003
59	4.09E-004	-4.49E-003
60	2.27E-004	-4.50E-003
61	-1.08E-005	-4.50E-003
62	-9.72E-006	-4.75E-003
63	-7.70E-006	-4.99E-003
64	-5.68E-006	-5.13E-003
65	-3.66E-006	-5.15E-003
66	-1.64E-006	-5.12E-003
67	-6.03E-007	-5.12E-003
68	1.43E-005	-5.11E-003
69	4.53E-005	-5.11E-003
70	7.36E-005	-5.10E-003
71	1.34E-004	-5.09E-003
72	2.83E-004	-5.09E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.75E-004
2	3.11E-004
3	7.71E-005
4	-4.19E-004
5	-8.79E-004
6	-9.99E-004
7	-9.33E-004
8	-8.20E-004
9	-3.61E-004
10	-1.47E-004
11	-7.46E-005
12	-8.13E-005
13	-1.50E-005
14	6.58E-005
15	6.32E-005
16	-2.95E-004
17	-7.24E-004
18	-9.35E-004
19	-9.04E-004
20	-8.33E-004
21	-5.28E-004
22	-3.25E-004
23	-1.19E-004
24	2.00E-004
25	4.59E-004
26	5.20E-004
27	4.12E-004
28	1.96E-006
29	-4.06E-004

30	-5.09E-004
31	-4.46E-004
32	-3.43E-004
33	5.41E-005
34	1.89E-004
35	1.47E-004
36	8.96E-005
37	1.48E-004
38	2.26E-004
39	2.60E-004
40	5.92E-006
41	-2.50E-004
42	-2.20E-004
43	-1.44E-004
44	-8.87E-005
45	-1.69E-004
46	-1.71E-004
47	-2.93E-005
48	3.57E-004
49	9.19E-004
50	9.86E-004
51	8.73E-004
52	4.17E-004
53	-7.67E-005
54	-3.10E-004
55	-2.75E-004
56	-1.99E-004
57	1.17E-004
58	3.21E-004
59	5.22E-004
60	8.26E-004
61	8.96E-004
62	9.27E-004
63	7.16E-004
64	2.89E-004
65	-6.57E-005
66	-6.34E-005
67	1.84E-005
68	8.79E-005
69	1.03E-004
70	1.32E-004
71	3.38E-004
72	8.05E-004

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

-----

SEÇÃO	DIREÇÃO X (m)	DIREÇÃO Y (m)
1	-5.71E-004	-4.61E-003
2	-5.72E-004	-4.53E-003
3	-5.74E-004	-4.46E-003
4	-5.77E-004	-4.51E-003
5	-5.79E-004	-4.71E-003
6	-5.81E-004	-4.99E-003
7	-5.83E-004	-5.28E-003
8	-3.22E-004	-5.28E-003
9	-1.55E-004	-5.29E-003
10	-8.30E-005	-5.29E-003
11	-5.38E-005	-5.30E-003
12	-2.79E-005	-5.31E-003
13	-1.22E-005	-5.31E-003
14	-1.12E-005	-5.32E-003
15	-9.16E-006	-5.34E-003
16	-7.13E-006	-5.31E-003
17	-5.11E-006	-5.16E-003
18	-3.09E-006	-4.91E-003
19	-2.05E-006	-4.64E-003
20	-2.58E-004	-4.64E-003
21	-4.55E-004	-4.63E-003
22	-5.80E-004	-4.63E-003
23	-6.47E-004	-4.62E-003
24	-6.40E-004	-4.61E-003
25	5.96E-006	-4.89E-003
26	4.74E-006	-4.75E-003
27	2.37E-006	-4.60E-003
28	1.30E-010	-4.54E-003
29	-2.37E-006	-4.60E-003
30	-4.74E-006	-4.75E-003
31	-5.96E-006	-4.89E-003
32	1.13E-004	-4.89E-003
33	1.48E-004	-4.90E-003
34	1.08E-004	-4.90E-003
35	5.40E-005	-4.91E-003
36	2.34E-005	-4.92E-003
37	-1.14E-005	-4.92E-003
38	-1.04E-005	-4.97E-003
39	-8.35E-006	-5.05E-003
40	-6.33E-006	-5.10E-003
41	-4.32E-006	-5.06E-003
42	-2.30E-006	-4.98E-003
43	-1.26E-006	-4.93E-003
44	-3.50E-005	-4.92E-003
45	-7.14E-005	-4.92E-003
46	-1.26E-004	-4.91E-003
47	-1.58E-004	-4.90E-003
48	-1.17E-004	-4.90E-003
49	5.63E-004	-5.27E-003

50	5.62E-004	-4.99E-003
51	5.60E-004	-4.71E-003
52	5.57E-004	-4.51E-003
53	5.55E-004	-4.46E-003
54	5.53E-004	-4.53E-003
55	5.51E-004	-4.61E-003
56	6.21E-004	-4.61E-003
57	6.28E-004	-4.62E-003
58	5.62E-004	-4.63E-003
59	4.38E-004	-4.63E-003
60	2.43E-004	-4.64E-003
61	-1.09E-005	-4.64E-003
62	-9.84E-006	-4.91E-003
63	-7.82E-006	-5.16E-003
64	-5.80E-006	-5.31E-003
65	-3.77E-006	-5.34E-003
66	-1.75E-006	-5.31E-003
67	-7.13E-007	-5.30E-003
68	1.63E-005	-5.30E-003
69	4.99E-005	-5.29E-003
70	8.03E-005	-5.29E-003
71	1.46E-004	-5.28E-003
72	3.07E-004	-5.27E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

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SEÇÃO	ROTAÇÃO (rad)
1	2.85E-004
2	3.21E-004
3	7.15E-005
4	-4.49E-004
5	-9.32E-004
6	-1.06E-003
7	-9.95E-004
8	-8.79E-004
9	-3.93E-004
10	-1.59E-004
11	-7.97E-005
12	-8.95E-005
13	-2.09E-005
14	6.26E-005
15	5.66E-005
16	-3.20E-004
17	-7.69E-004
18	-9.95E-004
19	-9.63E-004
20	-8.90E-004
21	-5.68E-004
22	-3.49E-004
23	-1.27E-004
24	2.07E-004
25	4.90E-004
26	5.52E-004
27	4.33E-004
28	2.15E-006
29	-4.26E-004

30	-5.39E-004
31	-4.76E-004
32	-3.69E-004
33	5.28E-005
34	2.03E-004
35	1.60E-004
36	9.86E-005
37	1.60E-004
38	2.39E-004
39	2.72E-004
40	6.52E-006
41	-2.61E-004
42	-2.33E-004
43	-1.55E-004
44	-9.76E-005
45	-1.85E-004
46	-1.83E-004
47	-2.55E-005
48	3.84E-004
49	9.81E-004
50	1.05E-003
51	9.25E-004
52	4.46E-004
53	-7.11E-005
54	-3.20E-004
55	-2.84E-004
56	-2.07E-004
57	1.26E-004
58	3.45E-004
59	5.62E-004
60	8.82E-004
61	9.54E-004
62	9.86E-004
63	7.60E-004
64	3.13E-004
65	-5.94E-005
66	-5.99E-005
67	2.46E-005
68	9.68E-005
69	1.11E-004
70	1.42E-004
71	3.67E-004
72	8.63E-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	-1.88E-004	-4.57E-003
2	-1.89E-004	-4.49E-003
3	-1.93E-004	-4.41E-003
4	-1.97E-004	-4.41E-003
5	-2.00E-004	-4.52E-003
6	-2.04E-004	-4.69E-003
7	-2.06E-004	-4.83E-003
8	-8.46E-005	-4.84E-003
9	-3.21E-005	-4.84E-003
10	-1.31E-005	-4.85E-003
11	-1.15E-006	-4.86E-003
12	7.07E-006	-4.86E-003
13	-9.18E-007	-4.87E-003
14	7.14E-007	-4.89E-003
15	3.89E-006	-4.95E-003
16	7.06E-006	-4.97E-003
17	1.02E-005	-4.90E-003
18	1.34E-005	-4.75E-003
19	1.50E-005	-4.60E-003
20	-1.16E-004	-4.60E-003
21	-1.96E-004	-4.59E-003
22	-2.39E-004	-4.59E-003
23	-2.64E-004	-4.58E-003
24	-2.52E-004	-4.58E-003
25	9.07E-006	-4.66E-003
26	7.22E-006	-4.58E-003
27	3.61E-006	-4.48E-003
28	9.33E-011	-4.44E-003
29	-3.61E-006	-4.48E-003
30	-7.22E-006	-4.58E-003
31	-9.07E-006	-4.66E-003
32	4.41E-005	-4.66E-003
33	3.84E-005	-4.67E-003
34	1.54E-005	-4.67E-003
35	1.67E-006	-4.68E-003
36	4.63E-007	-4.68E-003
37	-8.07E-006	-4.69E-003
38	-6.43E-006	-4.72E-003
39	-3.25E-006	-4.78E-003
40	-7.21E-008	-4.81E-003
41	3.11E-006	-4.78E-003
42	6.29E-006	-4.72E-003
43	7.92E-006	-4.69E-003
44	-6.05E-007	-4.68E-003
45	-2.18E-006	-4.68E-003
46	-1.59E-005	-4.67E-003
47	-3.86E-005	-4.67E-003
48	-4.42E-005	-4.66E-003
49	2.05E-004	-4.83E-003

50	2.04E-004	-4.69E-003
51	2.00E-004	-4.52E-003
52	1.96E-004	-4.41E-003
53	1.93E-004	-4.41E-003
54	1.89E-004	-4.49E-003
55	1.87E-004	-4.57E-003
56	2.51E-004	-4.58E-003
57	2.64E-004	-4.58E-003
58	2.38E-004	-4.59E-003
59	1.96E-004	-4.59E-003
60	1.15E-004	-4.60E-003
61	-1.52E-005	-4.60E-003
62	-1.36E-005	-4.75E-003
63	-1.04E-005	-4.90E-003
64	-7.23E-006	-4.97E-003
65	-4.05E-006	-4.95E-003
66	-8.80E-007	-4.89E-003
67	7.52E-007	-4.87E-003
68	-7.21E-006	-4.86E-003
69	1.41E-006	-4.86E-003
70	1.34E-005	-4.85E-003
71	3.21E-005	-4.84E-003
72	8.44E-005	-4.84E-003

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DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

SEÇÃO	ROTAÇÃO (rad)
1	2.67E-004
2	3.20E-004
3	1.91E-004
4	-2.03E-004
5	-5.58E-004
6	-5.70E-004
7	-4.88E-004
8	-3.78E-004
9	-8.81E-005
10	-5.33E-005
11	-3.66E-005
12	-3.00E-006
13	6.46E-005
14	1.50E-004
15	1.97E-004
16	-9.64E-005
17	-4.43E-004
18	-5.56E-004
19	-5.08E-004
20	-4.33E-004
21	-1.96E-004
22	-1.23E-004
23	-5.17E-005
24	1.89E-004
25	2.38E-004
26	3.15E-004
27	3.10E-004
28	2.57E-008
29	-3.10E-004

30	-3.15E-004
31	-2.38E-004
32	-1.36E-004
33	9.41E-005
34	7.02E-005
35	2.62E-005
36	3.95E-006
37	6.34E-005
38	1.46E-004
39	2.16E-004
40	9.10E-008
41	-2.16E-004
42	-1.46E-004
43	-6.33E-005
44	-4.09E-006
45	-2.77E-005
46	-6.90E-005
47	-9.33E-005
48	1.36E-004
49	4.88E-004
50	5.70E-004
51	5.58E-004
52	2.03E-004
53	-1.91E-004
54	-3.20E-004
55	-2.67E-004
56	-1.89E-004
57	5.17E-005
58	1.23E-004
59	1.96E-004
60	4.33E-004
61	5.07E-004
62	5.56E-004
63	4.43E-004
64	9.64E-005
65	-1.97E-004
66	-1.50E-004
67	-6.45E-005
68	3.25E-006
69	3.81E-005
70	5.22E-005
71	8.73E-005
72	3.77E-004

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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	-5.51E-004	-4.62E-003
2	-5.52E-004	-4.53E-003
3	-5.55E-004	-4.47E-003
4	-5.57E-004	-4.51E-003
5	-5.59E-004	-4.70E-003
6	-5.62E-004	-4.98E-003
7	-5.63E-004	-5.26E-003
8	-3.10E-004	-5.26E-003
9	-1.49E-004	-5.27E-003
10	-7.94E-005	-5.28E-003
11	-5.10E-005	-5.28E-003
12	-2.61E-005	-5.29E-003
13	-1.16E-005	-5.29E-003
14	-1.05E-005	-5.30E-003
15	-8.45E-006	-5.33E-003
16	-6.36E-006	-5.30E-003
17	-4.26E-006	-5.16E-003
18	-2.17E-006	-4.91E-003
19	-1.09E-006	-4.65E-003
20	-2.51E-004	-4.64E-003
21	-4.42E-004	-4.64E-003
22	-5.63E-004	-4.63E-003
23	-6.28E-004	-4.63E-003
24	-6.20E-004	-4.62E-003
25	6.13E-006	-4.89E-003
26	4.87E-006	-4.75E-003
27	2.44E-006	-4.61E-003
28	1.29E-010	-4.54E-003
29	-2.44E-006	-4.60E-003
30	-4.87E-006	-4.75E-003
31	-6.13E-006	-4.88E-003
32	1.09E-004	-4.89E-003
33	1.42E-004	-4.89E-003
34	1.04E-004	-4.90E-003
35	5.12E-005	-4.91E-003
36	2.22E-005	-4.91E-003
37	-1.13E-005	-4.91E-003
38	-1.02E-005	-4.97E-003
39	-8.10E-006	-5.05E-003
40	-6.01E-006	-5.09E-003
41	-3.93E-006	-5.05E-003
42	-1.84E-006	-4.97E-003
43	-7.63E-007	-4.92E-003
44	-3.32E-005	-4.92E-003
45	-6.77E-005	-4.91E-003
46	-1.20E-004	-4.91E-003
47	-1.52E-004	-4.90E-003
48	-1.13E-004	-4.89E-003
49	5.45E-004	-5.25E-003

50	5.44E-004	-4.98E-003
51	5.41E-004	-4.70E-003
52	5.39E-004	-4.52E-003
53	5.36E-004	-4.47E-003
54	5.34E-004	-4.53E-003
55	5.33E-004	-4.62E-003
56	6.02E-004	-4.62E-003
57	6.09E-004	-4.63E-003
58	5.45E-004	-4.63E-003
59	4.26E-004	-4.64E-003
60	2.37E-004	-4.64E-003
61	-1.12E-005	-4.65E-003
62	-1.01E-005	-4.91E-003
63	-8.01E-006	-5.15E-003
64	-5.92E-006	-5.30E-003
65	-3.83E-006	-5.32E-003
66	-1.74E-006	-5.29E-003
67	-6.61E-007	-5.29E-003
68	1.50E-005	-5.29E-003
69	4.73E-005	-5.28E-003
70	7.68E-005	-5.27E-003
71	1.40E-004	-5.27E-003
72	2.95E-004	-5.26E-003

-----

DESLOCAMENTOS NAS SEÇÕES DE INTERESSE (ROTAÇÃO)

-----

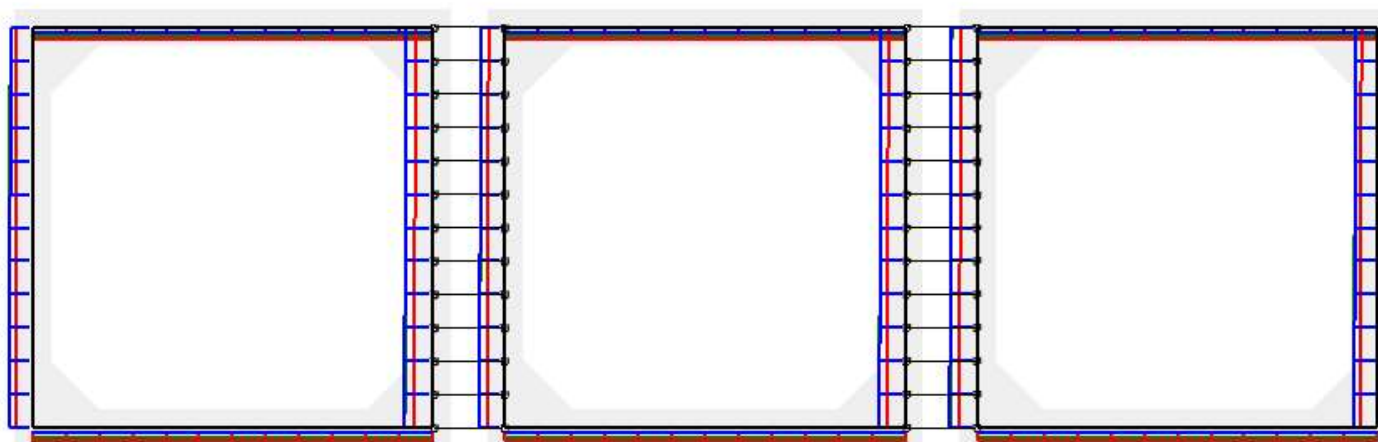
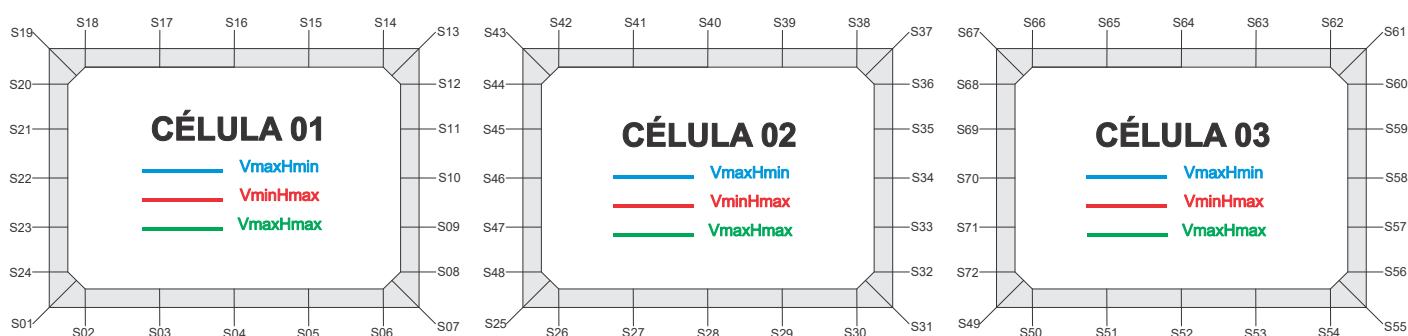
SEÇÃO	ROTAÇÃO (rad)
1	2.85E-004
2	3.22E-004
3	7.82E-005
4	-4.36E-004
5	-9.13E-004
6	-1.04E-003
7	-9.70E-004
8	-8.53E-004
9	-3.77E-004
10	-1.53E-004
11	-7.76E-005
12	-8.50E-005
13	-1.63E-005
14	6.75E-005
15	6.44E-005
16	-3.08E-004
17	-7.53E-004
18	-9.72E-004
19	-9.39E-004
20	-8.66E-004
21	-5.49E-004
22	-3.38E-004
23	-1.23E-004
24	2.07E-004
25	4.77E-004
26	5.40E-004
27	4.27E-004
28	2.05E-006
29	-4.21E-004

30	-5.28E-004
31	-4.64E-004
32	-3.57E-004
33	5.54E-005
34	1.97E-004
35	1.53E-004
36	9.36E-005
37	1.55E-004
38	2.35E-004
39	2.70E-004
40	6.19E-006
41	-2.59E-004
42	-2.29E-004
43	-1.50E-004
44	-9.27E-005
45	-1.77E-004
46	-1.78E-004
47	-2.95E-005
48	3.72E-004
49	9.56E-004
50	1.02E-003
51	9.07E-004
52	4.34E-004
53	-7.78E-005
54	-3.21E-004
55	-2.84E-004
56	-2.06E-004
57	1.22E-004
58	3.34E-004
59	5.44E-004
60	8.59E-004
61	9.31E-004
62	9.64E-004
63	7.44E-004
64	3.02E-004
65	-6.70E-005
66	-6.49E-005
67	1.98E-005
68	9.19E-005
69	1.07E-004
70	1.38E-004
71	3.53E-004
72	8.38E-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	-118.49	-24.08
2	-24.08	-24.08
3	-24.08	-24.08
4	-24.08	-24.08
5	-24.08	-24.08
6	-24.08	-24.08
7	-24.08	-142.70
8	-141.04	-141.04
9	-139.70	-139.70
10	-138.36	-138.36
11	-137.02	-137.02
12	-135.68	-135.68
13	-134.01	-23.44
14	-23.44	-23.44
15	-23.44	-23.44
16	-23.44	-23.44
17	-23.44	-23.44
18	-23.44	-23.44
19	-23.44	-109.79
20	-111.46	-111.46
21	-112.80	-112.80
22	-114.14	-114.14
23	-115.48	-115.48
24	-116.82	-116.82
25	-118.49	-24.76
26	-24.76	-24.76
27	-24.76	-24.76
28	-24.76	-24.76
29	-24.76	-24.76
30	-24.76	-24.76
31	-24.76	-130.25
32	-128.58	-128.58
33	-127.24	-127.24
34	-125.90	-125.90
35	-124.56	-124.56
36	-123.22	-123.22
37	-121.55	-22.76
38	-22.76	-22.76
39	-22.76	-22.76
40	-22.76	-22.76
41	-22.76	-22.76
42	-22.76	-22.76
43	-22.76	-122.25
44	-123.92	-123.92
45	-125.26	-125.26
46	-126.60	-126.60
47	-127.94	-127.94
48	-129.28	-129.28
49	-130.95	-24.36

	50	-24.36	-24.36
	51	-24.36	-24.36
	52	-24.36	-24.36
	53	-24.36	-24.36
	54	-24.36	-24.36
	55	-24.36	-118.84
	56	-117.17	-117.17
	57	-115.83	-115.83
	58	-114.49	-114.49
	59	-113.15	-113.15
	60	-111.81	-111.81
	61	-110.14	-23.16
	62	-23.16	-23.16
	63	-23.16	-23.16
	64	-23.16	-23.16
	65	-23.16	-23.16
	66	-23.16	-23.16
	67	-23.16	-133.66
	68	-135.33	-135.33
	69	-136.67	-136.67
	70	-138.01	-138.01
	71	-139.35	-139.35
	72	-140.69	-140.69

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-87.93	-71.60
2	-71.60	-71.60
3	-71.60	-71.60
4	-71.60	-71.60
5	-71.60	-71.60
6	-71.60	-71.60
7	-71.60	-92.52
8	-91.24	-91.24
9	-90.20	-90.20
10	-89.17	-89.17
11	-88.14	-88.14
12	-87.11	-87.11
13	-85.83	-63.62
14	-63.62	-63.62
15	-63.62	-63.62
16	-63.62	-63.62
17	-63.62	-63.62
18	-63.62	-63.62
19	-63.62	-81.24
20	-82.52	-82.52
21	-83.55	-83.55
22	-84.58	-84.58
23	-85.61	-85.61
24	-86.64	-86.64
25	-87.93	-71.52
26	-71.52	-71.52
27	-71.52	-71.52
28	-71.52	-71.52
29	-71.52	-71.52
30	-71.52	-71.52
31	-71.52	-90.22
32	-88.94	-88.94
33	-87.91	-87.91
34	-86.88	-86.88
35	-85.85	-85.85
36	-84.82	-84.82
37	-83.53	-63.69
38	-63.69	-63.69
39	-63.69	-63.69
40	-63.69	-63.69
41	-63.69	-63.69
42	-63.69	-63.69
43	-63.69	-83.53
44	-84.81	-84.81
45	-85.85	-85.85
46	-86.88	-86.88
47	-87.91	-87.91
48	-88.94	-88.94
49	-90.22	-71.60

	50	-71.60	-71.60
	51	-71.60	-71.60
	52	-71.60	-71.60
	53	-71.60	-71.60
	54	-71.60	-71.60
	55	-71.60	-87.92
	56	-86.64	-86.64
	57	-85.61	-85.61
	58	-84.58	-84.58
	59	-83.55	-83.55
	60	-82.52	-82.52
	61	-81.24	-63.62
	62	-63.62	-63.62
	63	-63.62	-63.62
	64	-63.62	-63.62
	65	-63.62	-63.62
	66	-63.62	-63.62
	67	-63.62	-85.83
	68	-87.11	-87.11
	69	-88.14	-88.14
	70	-89.17	-89.17
	71	-90.21	-90.21
	72	-91.24	-91.24

---

```
#####
#          SOLICITAÇÕES NORMAIS (ELU)          #
#          VmaxHmax                             #
#####
-----
                ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE
-----
| SEÇÃO |          ESQUERDA (kN) |          DIREITA (kN) |
-----
|  1 |          -120.75 |          -48.24 |
|  2 |          -48.24 |          -48.24 |
|  3 |          -48.24 |          -48.24 |
|  4 |          -48.24 |          -48.24 |
|  5 |          -48.24 |          -48.24 |
|  6 |          -48.24 |          -48.24 |
|  7 |          -48.24 |          -140.44 |
|  8 |          -138.77 |          -138.77 |
|  9 |          -137.43 |          -137.43 |
| 10 |          -136.09 |          -136.09 |
| 11 |          -134.75 |          -134.75 |
| 12 |          -133.41 |          -133.41 |
| 13 |          -131.75 |          -41.91 |
| 14 |          -41.91 |          -41.91 |
| 15 |          -41.91 |          -41.91 |
| 16 |          -41.91 |          -41.91 |
| 17 |          -41.91 |          -41.91 |
| 18 |          -41.91 |          -41.91 |
| 19 |          -41.91 |          -112.06 |
| 20 |          -113.72 |          -113.72 |
| 21 |          -115.07 |          -115.07 |
| 22 |          -116.41 |          -116.41 |
| 23 |          -117.75 |          -117.75 |
| 24 |          -119.09 |          -119.09 |
| 25 |          -120.75 |          -48.31 |
| 26 |          -48.31 |          -48.31 |
| 27 |          -48.31 |          -48.31 |
| 28 |          -48.31 |          -48.31 |
| 29 |          -48.31 |          -48.31 |
| 30 |          -48.31 |          -48.31 |
| 31 |          -48.31 |          -130.82 |
| 32 |          -129.15 |          -129.15 |
| 33 |          -127.81 |          -127.81 |
| 34 |          -126.47 |          -126.47 |
| 35 |          -125.13 |          -125.13 |
| 36 |          -123.79 |          -123.79 |
| 37 |          -122.13 |          -41.83 |
| 38 |          -41.83 |          -41.83 |
| 39 |          -41.83 |          -41.83 |
| 40 |          -41.83 |          -41.83 |
| 41 |          -41.83 |          -41.83 |
| 42 |          -41.83 |          -41.83 |
| 43 |          -41.83 |          -121.68 |
| 44 |          -123.34 |          -123.34 |
| 45 |          -124.68 |          -124.68 |
| 46 |          -126.02 |          -126.02 |
| 47 |          -127.37 |          -127.37 |
| 48 |          -128.71 |          -128.71 |
| 49 |          -130.37 |          -48.24 |
```

	50	-48.24	-48.24
	51	-48.24	-48.24
	52	-48.24	-48.24
	53	-48.24	-48.24
	54	-48.24	-48.24
	55	-48.24	-120.53
	56	-118.86	-118.86
	57	-117.52	-117.52
	58	-116.18	-116.18
	59	-114.84	-114.84
	60	-113.50	-113.50
	61	-111.83	-41.90
	62	-41.90	-41.90
	63	-41.90	-41.90
	64	-41.90	-41.90
	65	-41.90	-41.90
	66	-41.90	-41.90
	67	-41.90	-131.97
	68	-133.64	-133.64
	69	-134.98	-134.98
	70	-136.32	-136.32
	71	-137.66	-137.66
	72	-139.00	-139.00

---

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

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-122.47	-22.98
2	-22.98	-22.98
3	-22.98	-22.98
4	-22.98	-22.98
5	-22.98	-22.98
6	-22.98	-22.98
7	-22.98	-138.72
8	-137.05	-137.05
9	-135.71	-135.71
10	-134.37	-134.37
11	-133.03	-133.03
12	-131.69	-131.69
13	-130.02	-24.54
14	-24.54	-24.54
15	-24.54	-24.54
16	-24.54	-24.54
17	-24.54	-24.54
18	-24.54	-24.54
19	-24.54	-113.78
20	-115.45	-115.45
21	-116.79	-116.79
22	-118.13	-118.13
23	-119.47	-119.47
24	-120.81	-120.81
25	-122.47	-24.04
26	-24.04	-24.04
27	-24.04	-24.04
28	-24.04	-24.04
29	-24.04	-24.04
30	-24.04	-24.04
31	-24.04	-128.32
32	-126.65	-126.65
33	-125.31	-125.31
34	-123.97	-123.97
35	-122.63	-122.63
36	-121.29	-121.29
37	-119.63	-23.48
38	-23.48	-23.48
39	-23.48	-23.48
40	-23.48	-23.48
41	-23.48	-23.48
42	-23.48	-23.48
43	-23.48	-124.18
44	-125.84	-125.84
45	-127.18	-127.18
46	-128.53	-128.53
47	-129.87	-129.87
48	-131.21	-131.21
49	-132.87	-24.53

	50	-24.53	-24.53
	51	-24.53	-24.53
	52	-24.53	-24.53
	53	-24.53	-24.53
	54	-24.53	-24.53
	55	-24.53	-114.13
	56	-112.46	-112.46
	57	-111.12	-111.12
	58	-109.78	-109.78
	59	-108.44	-108.44
	60	-107.10	-107.10
	61	-105.44	-22.99
	62	-22.99	-22.99
	63	-22.99	-22.99
	64	-22.99	-22.99
	65	-22.99	-22.99
	66	-22.99	-22.99
	67	-22.99	-138.37
	68	-140.03	-140.03
	69	-141.37	-141.37
	70	-142.71	-142.71
	71	-144.06	-144.06
	72	-145.40	-145.40

---

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

-----

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-88.86	-71.39
2	-71.39	-71.39
3	-71.39	-71.39
4	-71.39	-71.39
5	-71.39	-71.39
6	-71.39	-71.39
7	-71.39	-91.58
8	-90.30	-90.30
9	-89.27	-89.27
10	-88.24	-88.24
11	-87.20	-87.20
12	-86.17	-86.17
13	-84.89	-63.82
14	-63.82	-63.82
15	-63.82	-63.82
16	-63.82	-63.82
17	-63.82	-63.82
18	-63.82	-63.82
19	-63.82	-82.18
20	-83.46	-83.46
21	-84.49	-84.49
22	-85.52	-85.52
23	-86.55	-86.55
24	-87.58	-87.58
25	-88.86	-71.38
26	-71.38	-71.38
27	-71.38	-71.38
28	-71.38	-71.38
29	-71.38	-71.38
30	-71.38	-71.38
31	-71.38	-89.73
32	-88.44	-88.44
33	-87.41	-87.41
34	-86.38	-86.38
35	-85.35	-85.35
36	-84.32	-84.32
37	-83.04	-63.83
38	-63.83	-63.83
39	-63.83	-63.83
40	-63.83	-63.83
41	-63.83	-63.83
42	-63.83	-63.83
43	-63.83	-84.03
44	-85.31	-85.31
45	-86.34	-86.34
46	-87.37	-87.37
47	-88.40	-88.40
48	-89.44	-89.44
49	-90.72	-71.63

	50	-71.63	-71.63
	51	-71.63	-71.63
	52	-71.63	-71.63
	53	-71.63	-71.63
	54	-71.63	-71.63
	55	-71.63	-87.30
	56	-86.01	-86.01
	57	-84.98	-84.98
	58	-83.95	-83.95
	59	-82.92	-82.92
	60	-81.89	-81.89
	61	-80.61	-63.58
	62	-63.58	-63.58
	63	-63.58	-63.58
	64	-63.58	-63.58
	65	-63.58	-63.58
	66	-63.58	-63.58
	67	-63.58	-86.46
	68	-87.74	-87.74
	69	-88.77	-88.77
	70	-89.80	-89.80
	71	-90.83	-90.83
	72	-91.87	-91.87

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-123.99	-47.00
2	-47.00	-47.00
3	-47.00	-47.00
4	-47.00	-47.00
5	-47.00	-47.00
6	-47.00	-47.00
7	-47.00	-137.21
8	-135.54	-135.54
9	-134.20	-134.20
10	-132.86	-132.86
11	-131.52	-131.52
12	-130.18	-130.18
13	-128.51	-43.15
14	-43.15	-43.15
15	-43.15	-43.15
16	-43.15	-43.15
17	-43.15	-43.15
18	-43.15	-43.15
19	-43.15	-115.29
20	-116.96	-116.96
21	-118.30	-118.30
22	-119.64	-119.64
23	-120.98	-120.98
24	-122.32	-122.32
25	-123.99	-47.40
26	-47.40	-47.40
27	-47.40	-47.40
28	-47.40	-47.40
29	-47.40	-47.40
30	-47.40	-47.40
31	-47.40	-129.05
32	-127.38	-127.38
33	-126.04	-126.04
34	-124.70	-124.70
35	-123.36	-123.36
36	-122.02	-122.02
37	-120.35	-42.74
38	-42.74	-42.74
39	-42.74	-42.74
40	-42.74	-42.74
41	-42.74	-42.74
42	-42.74	-42.74
43	-42.74	-123.45
44	-125.12	-125.12
45	-126.46	-126.46
46	-127.80	-127.80
47	-129.14	-129.14
48	-130.48	-130.48
49	-132.15	-48.41

	50	-48.41	-48.41
	51	-48.41	-48.41
	52	-48.41	-48.41
	53	-48.41	-48.41
	54	-48.41	-48.41
	55	-48.41	-117.40
	56	-115.73	-115.73
	57	-114.39	-114.39
	58	-113.05	-113.05
	59	-111.71	-111.71
	60	-110.37	-110.37
	61	-108.70	-41.73
	62	-41.73	-41.73
	63	-41.73	-41.73
	64	-41.73	-41.73
	65	-41.73	-41.73
	66	-41.73	-41.73
	67	-41.73	-135.10
	68	-136.77	-136.77
	69	-138.11	-138.11
	70	-139.45	-139.45
	71	-140.79	-140.79
	72	-142.13	-142.13

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-87.87	-33.62
2	-33.62	-33.62
3	-33.62	-33.62
4	-33.62	-33.62
5	-33.62	-33.62
6	-33.62	-33.62
7	-33.62	-102.49
8	-101.21	-101.21
9	-100.18	-100.18
10	-99.15	-99.15
11	-98.11	-98.11
12	-97.08	-97.08
13	-95.80	-28.75
14	-28.75	-28.75
15	-28.75	-28.75
16	-28.75	-28.75
17	-28.75	-28.75
18	-28.75	-28.75
19	-28.75	-81.18
20	-82.47	-82.47
21	-83.50	-83.50
22	-84.53	-84.53
23	-85.56	-85.56
24	-86.59	-86.59
25	-87.87	-33.69
26	-33.69	-33.69
27	-33.69	-33.69
28	-33.69	-33.69
29	-33.69	-33.69
30	-33.69	-33.69
31	-33.69	-95.36
32	-94.08	-94.08
33	-93.04	-93.04
34	-92.01	-92.01
35	-90.98	-90.98
36	-89.95	-89.95
37	-88.67	-28.68
38	-28.68	-28.68
39	-28.68	-28.68
40	-28.68	-28.68
41	-28.68	-28.68
42	-28.68	-28.68
43	-28.68	-88.32
44	-89.60	-89.60
45	-90.63	-90.63
46	-91.66	-91.66
47	-92.69	-92.69
48	-93.72	-93.72
49	-95.00	-33.62

	50	-33.62	-33.62
	51	-33.62	-33.62
	52	-33.62	-33.62
	53	-33.62	-33.62
	54	-33.62	-33.62
	55	-33.62	-87.69
	56	-86.41	-86.41
	57	-85.38	-85.38
	58	-84.35	-84.35
	59	-83.32	-83.32
	60	-82.29	-82.29
	61	-81.01	-28.75
	62	-28.75	-28.75
	63	-28.75	-28.75
	64	-28.75	-28.75
	65	-28.75	-28.75
	66	-28.75	-28.75
	67	-28.75	-95.98
	68	-97.26	-97.26
	69	-98.29	-98.29
	70	-99.32	-99.32
	71	-100.35	-100.35
	72	-101.38	-101.38

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-85.19	-52.28
2	-52.28	-52.28
3	-52.28	-52.28
4	-52.28	-52.28
5	-52.28	-52.28
6	-52.28	-52.28
7	-52.28	-95.25
8	-93.97	-93.97
9	-92.94	-92.94
10	-91.91	-91.91
11	-90.88	-90.88
12	-89.84	-89.84
13	-88.56	-46.03
14	-46.03	-46.03
15	-46.03	-46.03
16	-46.03	-46.03
17	-46.03	-46.03
18	-46.03	-46.03
19	-46.03	-78.50
20	-79.79	-79.79
21	-80.82	-80.82
22	-81.85	-81.85
23	-82.88	-82.88
24	-83.91	-83.91
25	-85.19	-52.20
26	-52.20	-52.20
27	-52.20	-52.20
28	-52.20	-52.20
29	-52.20	-52.20
30	-52.20	-52.20
31	-52.20	-90.22
32	-88.94	-88.94
33	-87.91	-87.91
34	-86.88	-86.88
35	-85.85	-85.85
36	-84.82	-84.82
37	-83.54	-46.11
38	-46.11	-46.11
39	-46.11	-46.11
40	-46.11	-46.11
41	-46.11	-46.11
42	-46.11	-46.11
43	-46.11	-83.53
44	-84.81	-84.81
45	-85.84	-85.84
46	-86.88	-86.88
47	-87.91	-87.91
48	-88.94	-88.94
49	-90.22	-52.28

	50	-52.28	-52.28
	51	-52.28	-52.28
	52	-52.28	-52.28
	53	-52.28	-52.28
	54	-52.28	-52.28
	55	-52.28	-85.19
	56	-83.91	-83.91
	57	-82.88	-82.88
	58	-81.85	-81.85
	59	-80.81	-80.81
	60	-79.78	-79.78
	61	-78.50	-46.03
	62	-46.03	-46.03
	63	-46.03	-46.03
	64	-46.03	-46.03
	65	-46.03	-46.03
	66	-46.03	-46.03
	67	-46.03	-88.57
	68	-89.85	-89.85
	69	-90.88	-90.88
	70	-91.91	-91.91
	71	-92.94	-92.94
	72	-93.97	-93.97

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-88.02	-35.18
2	-35.18	-35.18
3	-35.18	-35.18
4	-35.18	-35.18
5	-35.18	-35.18
6	-35.18	-35.18
7	-35.18	-102.34
8	-101.06	-101.06
9	-100.03	-100.03
10	-98.99	-98.99
11	-97.96	-97.96
12	-96.93	-96.93
13	-95.65	-30.36
14	-30.36	-30.36
15	-30.36	-30.36
16	-30.36	-30.36
17	-30.36	-30.36
18	-30.36	-30.36
19	-30.36	-81.34
20	-82.62	-82.62
21	-83.65	-83.65
22	-84.68	-84.68
23	-85.71	-85.71
24	-86.74	-86.74
25	-88.02	-35.23
26	-35.23	-35.23
27	-35.23	-35.23
28	-35.23	-35.23
29	-35.23	-35.23
30	-35.23	-35.23
31	-35.23	-95.34
32	-94.06	-94.06
33	-93.03	-93.03
34	-92.00	-92.00
35	-90.97	-90.97
36	-89.94	-89.94
37	-88.66	-30.31
38	-30.31	-30.31
39	-30.31	-30.31
40	-30.31	-30.31
41	-30.31	-30.31
42	-30.31	-30.31
43	-30.31	-88.33
44	-89.61	-89.61
45	-90.64	-90.64
46	-91.67	-91.67
47	-92.70	-92.70
48	-93.74	-93.74
49	-95.02	-35.18

	50	-35.18	-35.18
	51	-35.18	-35.18
	52	-35.18	-35.18
	53	-35.18	-35.18
	54	-35.18	-35.18
	55	-35.18	-87.86
	56	-86.58	-86.58
	57	-85.55	-85.55
	58	-84.52	-84.52
	59	-83.48	-83.48
	60	-82.45	-82.45
	61	-81.17	-30.36
	62	-30.36	-30.36
	63	-30.36	-30.36
	64	-30.36	-30.36
	65	-30.36	-30.36
	66	-30.36	-30.36
	67	-30.36	-95.81
	68	-97.10	-97.10
	69	-98.13	-98.13
	70	-99.16	-99.16
	71	-100.19	-100.19
	72	-101.22	-101.22

---

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

---

ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-83.46	-33.63
2	-33.63	-33.63
3	-33.63	-33.63
4	-33.63	-33.63
5	-33.63	-33.63
6	-33.63	-33.63
7	-33.63	-96.98
8	-95.70	-95.70
9	-94.67	-94.67
10	-93.63	-93.63
11	-92.60	-92.60
12	-91.57	-91.57
13	-90.29	-28.74
14	-28.74	-28.74
15	-28.74	-28.74
16	-28.74	-28.74
17	-28.74	-28.74
18	-28.74	-28.74
19	-28.74	-76.78
20	-78.06	-78.06
21	-79.09	-79.09
22	-80.12	-80.12
23	-81.15	-81.15
24	-82.18	-82.18
25	-83.46	-33.69
26	-33.69	-33.69
27	-33.69	-33.69
28	-33.69	-33.69
29	-33.69	-33.69
30	-33.69	-33.69
31	-33.69	-90.37
32	-89.09	-89.09
33	-88.06	-88.06
34	-87.03	-87.03
35	-86.00	-86.00
36	-84.97	-84.97
37	-83.69	-28.68
38	-28.68	-28.68
39	-28.68	-28.68
40	-28.68	-28.68
41	-28.68	-28.68
42	-28.68	-28.68
43	-28.68	-83.38
44	-84.66	-84.66
45	-85.69	-85.69
46	-86.73	-86.73
47	-87.76	-87.76
48	-88.79	-88.79
49	-90.07	-33.64

	50	-33.64	-33.64
	51	-33.64	-33.64
	52	-33.64	-33.64
	53	-33.64	-33.64
	54	-33.64	-33.64
	55	-33.64	-83.31
	56	-82.03	-82.03
	57	-81.00	-81.00
	58	-79.97	-79.97
	59	-78.94	-78.94
	60	-77.91	-77.91
	61	-76.62	-28.73
	62	-28.73	-28.73
	63	-28.73	-28.73
	64	-28.73	-28.73
	65	-28.73	-28.73
	66	-28.73	-28.73
	67	-28.73	-90.44
	68	-91.72	-91.72
	69	-92.76	-92.76
	70	-93.79	-93.79
	71	-94.82	-94.82
	72	-95.85	-95.85

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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	-86.22	-33.63
2	-33.63	-33.63
3	-33.63	-33.63
4	-33.63	-33.63
5	-33.63	-33.63
6	-33.63	-33.63
7	-33.63	-100.42
8	-99.14	-99.14
9	-98.11	-98.11
10	-97.08	-97.08
11	-96.05	-96.05
12	-95.02	-95.02
13	-93.74	-28.74
14	-28.74	-28.74
15	-28.74	-28.74
16	-28.74	-28.74
17	-28.74	-28.74
18	-28.74	-28.74
19	-28.74	-79.53
20	-80.81	-80.81
21	-81.84	-81.84
22	-82.88	-82.88
23	-83.91	-83.91
24	-84.94	-84.94
25	-86.22	-33.69
26	-33.69	-33.69
27	-33.69	-33.69
28	-33.69	-33.69
29	-33.69	-33.69
30	-33.69	-33.69
31	-33.69	-93.49
32	-92.21	-92.21
33	-91.18	-91.18
34	-90.14	-90.14
35	-89.11	-89.11
36	-88.08	-88.08
37	-86.80	-28.68
38	-28.68	-28.68
39	-28.68	-28.68
40	-28.68	-28.68
41	-28.68	-28.68
42	-28.68	-28.68
43	-28.68	-86.47
44	-87.75	-87.75
45	-88.78	-88.78
46	-89.81	-89.81
47	-90.84	-90.84
48	-91.87	-91.87
49	-93.15	-33.63

	50	-33.63	-33.63
	51	-33.63	-33.63
	52	-33.63	-33.63
	53	-33.63	-33.63
	54	-33.63	-33.63
	55	-33.63	-86.05
	56	-84.77	-84.77
	57	-83.74	-83.74
	58	-82.71	-82.71
	59	-81.68	-81.68
	60	-80.64	-80.64
	61	-79.36	-28.74
	62	-28.74	-28.74
	63	-28.74	-28.74
	64	-28.74	-28.74
	65	-28.74	-28.74
	66	-28.74	-28.74
	67	-28.74	-93.90
	68	-95.18	-95.18
	69	-96.22	-96.22
	70	-97.25	-97.25
	71	-98.28	-98.28
	72	-99.31	-99.31

---

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

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

---

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-85.06	-51.40
2	-51.40	-51.40
3	-51.40	-51.40
4	-51.40	-51.40
5	-51.40	-51.40
6	-51.40	-51.40
7	-51.40	-95.38
8	-94.10	-94.10
9	-93.07	-93.07
10	-92.03	-92.03
11	-91.00	-91.00
12	-89.97	-89.97
13	-88.69	-45.13
14	-45.13	-45.13
15	-45.13	-45.13
16	-45.13	-45.13
17	-45.13	-45.13
18	-45.13	-45.13
19	-45.13	-78.38
20	-79.66	-79.66
21	-80.69	-80.69
22	-81.72	-81.72
23	-82.75	-82.75
24	-83.78	-83.78
25	-85.06	-51.31
26	-51.31	-51.31
27	-51.31	-51.31
28	-51.31	-51.31
29	-51.31	-51.31
30	-51.31	-51.31
31	-51.31	-90.22
32	-88.94	-88.94
33	-87.91	-87.91
34	-86.88	-86.88
35	-85.85	-85.85
36	-84.82	-84.82
37	-83.54	-45.22
38	-45.22	-45.22
39	-45.22	-45.22
40	-45.22	-45.22
41	-45.22	-45.22
42	-45.22	-45.22
43	-45.22	-83.53
44	-84.81	-84.81
45	-85.84	-85.84
46	-86.87	-86.87
47	-87.91	-87.91
48	-88.94	-88.94
49	-90.22	-51.40

	50	-51.40	-51.40
	51	-51.40	-51.40
	52	-51.40	-51.40
	53	-51.40	-51.40
	54	-51.40	-51.40
	55	-51.40	-85.06
	56	-83.78	-83.78
	57	-82.75	-82.75
	58	-81.72	-81.72
	59	-80.69	-80.69
	60	-79.66	-79.66
	61	-78.37	-45.13
	62	-45.13	-45.13
	63	-45.13	-45.13
	64	-45.13	-45.13
	65	-45.13	-45.13
	66	-45.13	-45.13
	67	-45.13	-88.69
	68	-89.97	-89.97
	69	-91.01	-91.01
	70	-92.04	-92.04
	71	-93.07	-93.07
	72	-94.10	-94.10

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

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ESFORÇO NORMAL NAS SEÇÕES DE INTERESSE

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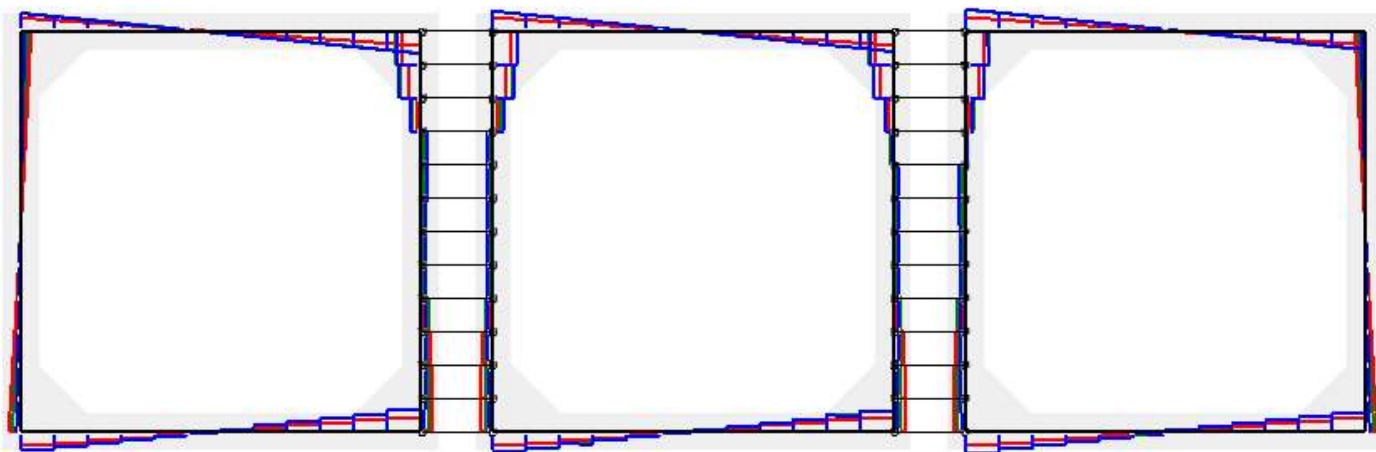
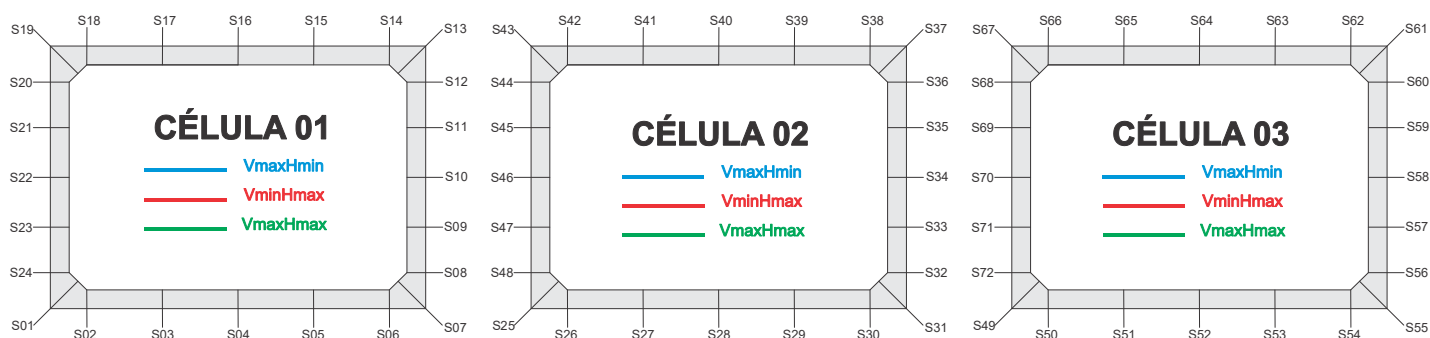
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	-86.31	-34.60
2	-34.60	-34.60
3	-34.60	-34.60
4	-34.60	-34.60
5	-34.60	-34.60
6	-34.60	-34.60
7	-34.60	-100.33
8	-99.05	-99.05
9	-98.02	-98.02
10	-96.98	-96.98
11	-95.95	-95.95
12	-94.92	-94.92
13	-93.64	-29.75
14	-29.75	-29.75
15	-29.75	-29.75
16	-29.75	-29.75
17	-29.75	-29.75
18	-29.75	-29.75
19	-29.75	-79.63
20	-80.91	-80.91
21	-81.94	-81.94
22	-82.97	-82.97
23	-84.00	-84.00
24	-85.03	-85.03
25	-86.31	-34.65
26	-34.65	-34.65
27	-34.65	-34.65
28	-34.65	-34.65
29	-34.65	-34.65
30	-34.65	-34.65
31	-34.65	-93.48
32	-92.20	-92.20
33	-91.17	-91.17
34	-90.14	-90.14
35	-89.11	-89.11
36	-88.07	-88.07
37	-86.79	-29.70
38	-29.70	-29.70
39	-29.70	-29.70
40	-29.70	-29.70
41	-29.70	-29.70
42	-29.70	-29.70
43	-29.70	-86.47
44	-87.76	-87.76
45	-88.79	-88.79
46	-89.82	-89.82
47	-90.85	-90.85
48	-91.88	-91.88
49	-93.16	-34.60

	50	-34.60	-34.60
	51	-34.60	-34.60
	52	-34.60	-34.60
	53	-34.60	-34.60
	54	-34.60	-34.60
	55	-34.60	-86.15
	56	-84.87	-84.87
	57	-83.84	-83.84
	58	-82.81	-82.81
	59	-81.78	-81.78
	60	-80.75	-80.75
	61	-79.47	-29.75
	62	-29.75	-29.75
	63	-29.75	-29.75
	64	-29.75	-29.75
	65	-29.75	-29.75
	66	-29.75	-29.75
	67	-29.75	-93.80
	68	-95.08	-95.08
	69	-96.11	-96.11
	70	-97.14	-97.14
	71	-98.18	-98.18
	72	-99.21	-99.21

---

## ESFORÇO CORTANTE

### NOMENCLATURA DAS SEÇÕES PARA VERSÃO COMPLETA DO RELATÓRIO



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

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ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	24.08	-107.69
2	-87.94	-66.72
3	-46.99	-25.97
4	-6.16	15.32
5	36.00	58.75
6	81.03	105.61
7	129.47	-24.08
8	-28.62	-28.62
9	-32.33	-31.78
10	-34.67	-34.67
11	-36.73	-36.73
12	63.76	127.29
13	142.88	-134.01
14	-93.16	-93.16
15	-52.63	-52.63
16	-12.11	-12.11
17	28.42	28.42
18	68.94	68.94
19	109.79	-23.44
20	-14.69	-14.69
21	-6.28	-6.28
22	1.81	1.81
23	9.56	9.56
24	16.99	16.99
25	24.08	-119.08
26	-97.46	-74.64
27	-53.61	-31.64
28	-11.27	10.36
29	30.74	52.73
30	73.79	96.66
31	118.34	-24.76
32	-29.30	-29.30
33	-33.01	-33.01
34	-35.90	-35.90
35	-37.96	6.71
36	43.68	111.90
37	135.29	-121.55
38	-80.70	-80.70
39	-40.18	-40.18
40	0.35	0.35
41	40.88	40.88
42	81.40	81.40
43	122.25	-142.20
44	-126.61	-63.08
45	37.41	37.41
46	35.35	35.35
47	32.46	33.01
48	29.30	29.30
49	24.76	-129.10

	50	-105.21	-80.61
	51	-58.31	-35.55
	52	-14.87	6.61
	53	26.42	47.44
	54	67.15	88.35
	55	108.06	-24.36
	56	-17.26	-17.26
	57	-9.84	-9.84
	58	-2.08	-2.08
	59	6.00	6.00
	60	14.42	14.42
	61	23.16	-110.14
	62	-69.29	-69.29
	63	-28.77	-28.77
	64	11.76	11.76
	65	52.28	52.28
	66	92.81	92.81
	67	133.66	-135.69
	68	-112.31	-44.08
	69	-7.11	37.56
	70	35.50	35.50
	71	32.61	32.61
	72	28.90	28.90

---

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

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ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	71.60	-80.02
2	-65.58	-49.96
3	-35.50	-20.13
4	-5.87	9.42
5	23.75	39.25
6	53.90	69.76
7	84.47	-71.60
8	-71.60	-60.16
9	-10.82	0.03
10	0.03	0.03
11	0.03	0.03
12	21.52	74.80
13	109.26	-85.83
14	-57.82	-57.82
15	-30.06	-30.06
16	-2.30	-2.30
17	25.47	25.47
18	53.23	53.23
19	81.24	-63.62
20	-43.54	-43.54
21	-22.47	-22.47
22	-0.43	-0.43
23	22.60	22.60
24	46.61	46.61
25	71.60	-82.28
26	-67.75	-52.03
27	-37.46	-22.00
28	-7.66	7.67
29	22.00	37.46
30	52.03	67.75
31	82.28	-71.52
32	-71.52	-60.30
33	-11.20	0.62
34	0.62	0.62
35	0.62	-2.52
36	22.01	75.39
37	109.62	-83.53
38	-55.52	-55.52
39	-27.76	-27.76
40	0.00	0.00
41	27.76	27.76
42	55.52	55.52
43	83.53	-109.33
44	-74.87	-21.59
45	-0.10	-0.10
46	-0.10	-0.10
47	-0.10	10.75
48	60.09	71.52
49	71.52	-84.47

	50	-69.76	-53.90
	51	-39.25	-23.75
	52	-9.42	5.87
	53	20.13	35.50
	54	49.96	65.58
	55	80.02	-71.60
	56	-46.61	-46.61
	57	-22.60	-22.60
	58	0.43	0.43
	59	22.47	22.47
	60	43.54	43.54
	61	63.62	-81.24
	62	-53.23	-53.23
	63	-25.46	-25.46
	64	2.30	2.30
	65	30.06	30.06
	66	57.82	57.82
	67	85.83	-109.54
	68	-75.31	-21.93
	69	2.60	-0.55
	70	-0.55	-0.55
	71	-0.55	11.27
	72	60.38	71.60

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	48.24	-109.68
2	-89.39	-67.65
3	-47.44	-26.01
4	-5.89	15.77
5	36.47	59.05
6	80.94	104.87
7	127.81	-48.24
8	-48.24	-48.24
9	-48.24	-20.24
10	-20.24	-20.24
11	-20.24	-20.24
12	50.90	120.52
13	147.60	-131.75
14	-90.89	-90.89
15	-50.37	-50.37
16	-9.84	-9.84
17	30.68	30.68
18	71.21	71.21
19	112.06	-41.91
20	-28.52	-28.52
21	-14.48	-14.48
22	0.22	0.22
23	15.57	15.57
24	31.58	31.58
25	48.24	-118.64
26	-97.16	-74.36
27	-53.28	-31.17
28	-10.64	11.17
29	31.70	53.80
30	74.87	97.65
31	119.10	-48.31
32	-48.31	-48.31
33	-48.31	-25.25
34	-25.25	-25.25
35	-25.25	12.83
36	45.21	114.69
37	145.09	-122.13
38	-81.28	-81.28
39	-40.75	-40.75
40	-0.22	-0.22
41	40.30	40.30
42	80.83	80.83
43	121.68	-147.52
44	-120.44	-50.82
45	20.32	20.32
46	20.32	20.32
47	20.32	48.31
48	48.31	48.31
49	48.31	-128.05

	50	-105.12	-81.21
	51	-59.32	-36.74
	52	-16.04	5.63
	53	25.75	47.19
	54	67.41	89.16
	55	109.45	-48.24
	56	-31.58	-31.58
	57	-15.58	-15.58
	58	-0.23	-0.23
	59	14.47	14.47
	60	28.51	28.51
	61	41.90	-111.83
	62	-70.98	-70.98
	63	-30.46	-30.46
	64	10.07	10.07
	65	50.59	50.59
	66	91.12	91.12
	67	131.97	-145.16
	68	-114.76	-45.28
	69	-12.90	25.18
	70	25.18	25.18
	71	25.18	48.24
	72	48.24	48.24

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

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ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	22.98	-111.70
2	-92.03	-70.93
3	-51.34	-30.49
4	-10.85	10.48
5	31.04	53.75
6	76.10	100.91
7	125.18	-22.98
8	-27.52	-27.52
9	-31.23	-24.35
10	-27.24	-27.24
11	-29.30	-29.30
12	52.33	114.96
13	145.03	-130.02
14	-89.17	-89.17
15	-48.65	-48.65
16	-8.12	-8.12
17	32.40	32.40
18	72.93	72.93
19	113.78	-24.54
20	-15.79	-15.79
21	-7.38	-7.38
22	0.71	0.71
23	8.46	8.46
24	15.89	15.89
25	22.98	-120.92
26	-99.20	-76.34
27	-55.35	-33.46
28	-13.21	8.29
29	28.55	50.45
30	71.48	94.42
31	116.27	-24.04
32	-28.57	-28.57
33	-32.29	-31.76
34	-34.65	-34.65
35	-36.71	21.88
36	37.52	105.11
37	141.41	-119.63
38	-78.77	-78.77
39	-38.25	-38.25
40	2.28	2.28
41	42.80	42.80
42	83.33	83.33
43	124.18	-143.98
44	-113.90	-51.27
45	30.36	30.36
46	28.29	28.29
47	25.41	32.29
48	28.57	28.57
49	24.04	-133.58

	50	-109.32	-84.47
	51	-62.01	-39.20
	52	-18.54	2.83
	53	22.47	43.29
	54	62.79	83.81
	55	103.39	-24.53
	56	-17.43	-17.43
	57	-10.01	-10.01
	58	-2.25	-2.25
	59	5.83	5.83
	60	14.25	14.25
	61	22.99	-105.44
	62	-64.59	-64.59
	63	-24.06	-24.06
	64	16.47	16.47
	65	56.99	56.99
	66	97.52	97.52
	67	138.37	-140.92
	68	-104.62	-37.03
	69	-21.40	37.20
	70	35.14	35.14
	71	32.25	32.78
	72	29.06	29.06

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	71.39	-80.96
2	-66.53	-50.93
3	-36.50	-21.16
4	-6.93	8.32
5	22.63	38.12
6	52.79	68.68
7	83.47	-71.39
8	-71.39	-60.30
9	-0.73	-0.73
10	-0.73	-0.73
11	-0.73	-0.73
12	15.54	71.73
13	115.39	-84.89
14	-56.88	-56.88
15	-29.12	-29.12
16	-1.36	-1.36
17	26.40	26.40
18	54.16	54.16
19	82.18	-63.82
20	-43.74	-43.74
21	-22.68	-22.68
22	-0.63	-0.63
23	22.40	22.40
24	46.40	46.40
25	71.39	-82.76
26	-68.20	-52.48
27	-37.92	-22.49
28	-8.18	7.11
29	21.41	36.86
30	51.42	67.16
31	81.74	-71.38
32	-71.38	-60.83
33	-0.30	-0.30
34	-0.30	-0.30
35	-0.30	-3.13
36	16.35	72.17
37	115.43	-83.04
38	-55.03	-55.03
39	-27.27	-27.27
40	0.50	0.50
41	28.26	28.26
42	56.02	56.02
43	84.03	-115.40
44	-71.74	-15.55
45	0.72	0.72
46	0.72	0.72
47	0.72	0.72
48	60.29	71.38
49	71.38	-85.04

	50	-70.25	-54.34
	51	-39.66	-24.15
	52	-9.83	5.43
	53	19.65	34.98
	54	49.40	64.98
	55	79.40	-71.63
	56	-46.64	-46.64
	57	-22.64	-22.64
	58	0.39	0.39
	59	22.44	22.44
	60	43.50	43.50
	61	63.58	-80.61
	62	-52.60	-52.60
	63	-24.84	-24.84
	64	2.93	2.93
	65	30.69	30.69
	66	58.45	58.45
	67	86.46	-115.18
	68	-71.92	-16.10
	69	3.38	0.55
	70	0.55	0.55
	71	0.55	0.55
	72	61.08	71.63

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	47.00	-112.90
2	-92.62	-70.94
3	-50.83	-29.52
4	-9.55	11.98
5	32.56	55.09
6	77.01	101.09
7	124.34	-47.00
8	-47.00	-47.00
9	-22.65	-22.65
10	-22.65	-22.65
11	-22.65	-22.65
12	51.79	115.77
13	153.37	-128.51
14	-87.66	-87.66
15	-47.14	-47.14
16	-6.61	-6.61
17	33.92	33.92
18	74.44	74.44
19	115.29	-43.15
20	-29.76	-29.76
21	-15.71	-15.71
22	-1.02	-1.02
23	14.33	14.33
24	30.34	30.34
25	47.00	-120.34
26	-98.80	-76.00
27	-54.97	-32.96
28	-12.54	9.13
29	29.55	51.58
30	72.65	95.51
31	117.17	-47.40
32	-47.40	-47.40
33	-27.40	-27.40
34	-27.40	-27.40
35	-27.40	23.29
36	37.44	107.59
37	151.57	-120.35
38	-79.50	-79.50
39	-38.98	-38.98
40	1.55	1.55
41	42.08	42.08
42	82.60	82.60
43	123.45	-152.96
44	-115.37	-51.39
45	23.05	23.05
46	23.05	23.05
47	23.05	23.05
48	47.40	47.40
49	47.40	-130.98

	50	-107.75	-83.63
	51	-61.62	-39.01
	52	-18.34	3.23
	53	23.22	44.50
	54	64.55	86.15
	55	106.35	-48.41
	56	-31.75	-31.75
	57	-15.75	-15.75
	58	-0.40	-0.40
	59	14.30	14.30
	60	28.34	28.34
	61	41.73	-108.70
	62	-67.85	-67.85
	63	-27.33	-27.33
	64	13.20	13.20
	65	53.72	53.72
	66	94.25	94.25
	67	135.10	-150.55
	68	-106.58	-36.43
	69	-22.27	28.42
	70	28.42	28.42
	71	28.42	28.42
	72	48.41	48.41

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

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	33.62	-79.80
2	-65.09	-49.24
3	-34.57	-18.95
4	-4.33	11.47
5	26.53	43.02
6	58.98	76.49
7	93.23	-33.62
8	-33.62	-33.62
9	-33.62	-15.87
10	-15.87	-15.87
11	-15.87	-15.87
12	37.89	87.90
13	106.63	-95.80
14	-66.14	-66.14
15	-36.72	-36.72
16	-7.31	-7.31
17	22.11	22.11
18	51.52	51.52
19	81.18	-28.75
20	-19.59	-19.59
21	-9.94	-9.94
22	0.21	0.21
23	10.85	10.85
24	21.99	21.99
25	33.62	-86.42
26	-70.79	-54.15
27	-38.81	-22.68
28	-7.74	8.16
29	23.09	39.22
30	54.55	71.18
31	86.79	-33.69
32	-33.69	-33.69
33	-33.69	-19.83
34	-19.83	-19.83
35	-19.83	10.19
36	33.40	83.30
37	104.64	-88.67
38	-59.01	-59.01
39	-29.59	-29.59
40	-0.18	-0.18
41	29.24	29.24
42	58.65	58.65
43	88.32	-106.56
44	-87.83	-37.82
45	15.95	15.95
46	15.95	15.95
47	15.95	33.69
48	33.69	33.69
49	33.69	-93.42

	50	-76.69	-59.19
	51	-43.24	-26.74
	52	-11.68	4.12
	53	18.75	34.38
	54	49.05	64.90
	55	79.62	-33.62
	56	-21.99	-21.99
	57	-10.85	-10.85
	58	-0.21	-0.21
	59	9.94	9.94
	60	19.59	19.59
	61	28.75	-81.01
	62	-51.34	-51.34
	63	-21.93	-21.93
	64	7.49	7.49
	65	36.90	36.90
	66	66.31	66.31
	67	95.98	-104.71
	68	-83.37	-33.47
	69	-10.26	19.76
	70	19.76	19.76
	71	19.76	33.63
	72	33.63	33.62

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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	52.28	-77.33
2	-63.01	-47.56
3	-33.29	-18.10
4	-4.01	11.17
5	25.45	40.99
6	55.78	71.88
7	86.96	-52.28
8	-52.28	-52.28
9	-44.54	-1.64
10	-1.64	-1.64
11	-1.64	-1.64
12	25.07	78.26
13	106.49	-88.56
14	-60.55	-60.55
15	-32.79	-32.79
16	-5.03	-5.03
17	22.73	22.73
18	50.49	50.49
19	78.50	-46.03
20	-31.47	-31.47
21	-16.19	-16.19
22	-0.17	-0.17
23	16.58	16.58
24	34.07	34.07
25	52.28	-82.22
26	-67.62	-51.87
27	-37.32	-21.90
28	-7.63	7.63
29	21.90	37.32
30	51.87	67.62
31	82.22	-52.20
32	-52.20	-52.20
33	-44.19	-1.80
34	-1.80	-1.80
35	-1.80	-0.30
36	24.95	78.10
37	106.45	-83.54
38	-55.52	-55.52
39	-27.76	-27.76
40	0.00	0.00
41	27.76	27.76
42	55.52	55.52
43	83.53	-106.58
44	-78.34	-25.15
45	1.56	1.56
46	1.56	1.56
47	1.56	44.46
48	52.20	52.20
49	52.20	-86.96

	50	-71.88	-55.78
	51	-40.99	-25.45
	52	-11.17	4.00
	53	18.10	33.28
	54	47.55	63.01
	55	77.33	-52.28
	56	-34.07	-34.07
	57	-16.58	-16.58
	58	0.17	0.17
	59	16.19	16.19
	60	31.47	31.47
	61	46.03	-78.50
	62	-50.49	-50.49
	63	-22.73	-22.73
	64	5.03	5.03
	65	32.79	32.79
	66	60.55	60.55
	67	88.57	-106.37
	68	-78.02	-24.87
	69	0.38	1.88
	70	1.88	1.88
	71	1.88	44.27
	72	52.28	52.28

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	35.18	-79.94
2	-65.19	-49.31
3	-34.61	-18.96
4	-4.32	11.50
5	26.56	43.04
6	58.97	76.44
7	93.12	-35.18
8	-35.18	-35.18
9	-35.18	-14.73
10	-14.73	-14.73
11	-14.73	-14.73
12	36.98	87.50
13	107.12	-95.65
14	-65.99	-65.99
15	-36.57	-36.57
16	-7.16	-7.16
17	22.26	22.26
18	51.67	51.67
19	81.34	-30.36
20	-20.66	-20.66
21	-10.47	-10.47
22	0.21	0.21
23	11.38	11.38
24	23.03	23.03
25	35.18	-86.45
26	-70.83	-54.19
27	-38.85	-22.71
28	-7.77	8.15
29	23.09	39.23
30	54.56	71.19
31	86.79	-35.24
32	-35.24	-35.24
33	-35.24	-18.37
34	-18.37	-18.37
35	-18.37	9.34
36	32.84	83.25
37	105.30	-88.66
38	-58.99	-58.99
39	-29.58	-29.58
40	-0.16	-0.16
41	29.25	29.25
42	58.67	58.67
43	88.33	-107.07
44	-87.44	-36.92
45	14.79	14.79
46	14.79	14.79
47	14.79	35.24
48	35.24	35.24
49	35.24	-93.29

	50	-76.63	-59.17
	51	-43.24	-26.76
	52	-11.70	4.13
	53	18.77	34.43
	54	49.14	65.02
	55	79.77	-35.18
	56	-23.04	-23.04
	57	-11.38	-11.38
	58	-0.22	-0.22
	59	10.46	10.46
	60	20.66	20.66
	61	30.36	-81.17
	62	-51.51	-51.51
	63	-22.09	-22.09
	64	7.32	7.32
	65	36.74	36.74
	66	66.15	66.15
	67	95.81	-105.35
	68	-83.31	-32.89
	69	-9.40	18.32
	70	18.32	18.32
	71	18.32	35.18
	72	35.18	35.18

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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	33.63	-75.78
2	-61.83	-46.75
3	-32.83	-17.96
4	-4.10	10.92
5	25.17	40.82
6	55.89	72.47
7	88.23	-33.63
8	-33.63	-33.63
9	-33.63	-13.74
10	-13.74	-13.74
11	-13.74	-13.74
12	34.80	82.56
13	101.16	-90.29
14	-62.28	-62.28
15	-34.52	-34.52
16	-6.76	-6.76
17	21.00	21.00
18	48.77	48.77
19	76.78	-28.74
20	-19.58	-19.58
21	-9.93	-9.93
22	0.22	0.22
23	10.86	10.86
24	22.00	22.00
25	33.63	-81.94
26	-67.17	-51.37
27	-36.85	-21.52
28	-7.38	7.74
29	21.88	37.20
30	51.72	67.51
31	82.25	-33.69
32	-33.69	-33.69
33	-33.69	-17.15
34	-17.15	-17.15
35	-17.15	8.71
36	30.94	78.60
37	99.46	-83.69
38	-55.67	-55.67
39	-27.91	-27.91
40	-0.15	-0.15
41	27.61	27.61
42	55.37	55.37
43	83.38	-101.11
44	-82.51	-34.74
45	13.80	13.80
46	13.80	13.80
47	13.80	33.69
48	33.69	33.69
49	33.69	-88.39

	50	-72.65	-56.08
	51	-41.01	-25.36
	52	-11.10	3.92
	53	17.78	32.66
	54	46.58	61.67
	55	75.63	-33.64
	56	-22.00	-22.00
	57	-10.87	-10.87
	58	-0.22	-0.22
	59	9.92	9.92
	60	19.58	19.58
	61	28.73	-76.62
	62	-48.61	-48.61
	63	-20.85	-20.85
	64	6.91	6.91
	65	34.67	34.67
	66	62.43	62.43
	67	90.44	-99.51
	68	-78.65	-30.99
	69	-8.76	17.09
	70	17.09	17.09
	71	17.09	33.64
	72	33.64	33.64

---

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

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

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	33.63	-78.29
2	-63.87	-48.31
3	-33.92	-18.58
4	-4.24	11.27
5	26.02	42.20
6	57.82	74.98
7	91.36	-33.63
8	-33.63	-33.63
9	-33.63	-15.08
10	-15.08	-15.08
11	-15.08	-15.08
12	36.73	85.90
13	104.58	-93.74
14	-64.69	-64.69
15	-35.90	-35.90
16	-7.10	-7.10
17	21.69	21.69
18	50.49	50.49
19	79.53	-28.74
20	-19.59	-19.59
21	-9.93	-9.93
22	0.21	0.21
23	10.86	10.86
24	21.99	21.99
25	33.63	-84.74
26	-69.44	-53.11
27	-38.07	-22.24
28	-7.61	8.00
29	22.64	38.46
30	53.49	69.80
31	85.09	-33.69
32	-33.69	-33.69
33	-33.69	-18.82
34	-18.82	-18.82
35	-18.82	9.63
36	32.48	81.54
37	102.70	-86.80
38	-57.76	-57.76
39	-28.96	-28.96
40	-0.17	-0.17
41	28.63	28.63
42	57.42	57.42
43	86.47	-104.51
44	-85.84	-36.67
45	15.14	15.14
46	15.14	15.14
47	15.14	33.69
48	33.69	33.69
49	33.69	-91.53

	50	-75.17	-58.02
	51	-42.40	-26.22
	52	-11.47	4.05
	53	18.39	33.73
	54	48.13	63.69
	55	78.12	-33.63
	56	-22.00	-22.00
	57	-10.86	-10.86
	58	-0.22	-0.22
	59	9.93	9.93
	60	19.58	19.58
	61	28.74	-79.36
	62	-50.32	-50.32
	63	-21.52	-21.52
	64	7.27	7.27
	65	36.06	36.06
	66	64.86	64.86
	67	93.90	-102.76
	68	-81.60	-32.54
	69	-9.69	18.76
	70	18.76	18.76
	71	18.76	33.63
	72	33.63	33.63

---

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

-----

ESFORÇOS CORTANTE NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	51.40	-77.20
2	-62.89	-47.45
3	-33.19	-18.02
4	-3.93	11.24
5	25.52	41.07
6	55.86	71.98
7	87.07	-51.40
8	-51.40	-51.40
9	-46.41	-1.74
10	-1.74	-1.74
11	-1.74	-1.74
12	25.26	78.42
13	106.33	-88.69
14	-60.68	-60.68
15	-32.92	-32.92
16	-5.16	-5.16
17	22.60	22.60
18	50.37	50.37
19	78.38	-45.13
20	-30.88	-30.88
21	-15.90	-15.90
22	-0.18	-0.18
23	16.28	16.28
24	33.47	33.47
25	51.40	-82.21
26	-67.61	-51.86
27	-37.31	-21.89
28	-7.63	7.63
29	21.90	37.32
30	51.87	67.61
31	82.22	-51.31
32	-51.31	-51.31
33	-46.01	-1.95
34	-1.95	-1.95
35	-1.95	-0.17
36	25.11	78.22
37	106.27	-83.54
38	-55.53	-55.53
39	-27.76	-27.76
40	0.00	0.00
41	27.76	27.76
42	55.52	55.52
43	83.53	-106.42
44	-78.50	-25.34
45	1.66	1.66
46	1.66	1.66
47	1.66	46.33
48	51.31	51.31
49	51.31	-87.07

	50	-71.98	-55.86
	51	-41.07	-25.53
	52	-11.25	3.92
	53	18.01	33.18
	54	47.45	62.89
	55	77.20	-51.40
	56	-33.47	-33.47
	57	-16.28	-16.28
	58	0.18	0.18
	59	15.90	15.90
	60	30.88	30.88
	61	45.13	-78.37
	62	-50.36	-50.36
	63	-22.60	-22.60
	64	5.16	5.16
	65	32.92	32.92
	66	60.68	60.68
	67	88.69	-106.18
	68	-78.14	-25.02
	69	0.25	2.03
	70	2.03	2.03
	71	2.03	46.09
	72	51.40	51.40

---

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

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

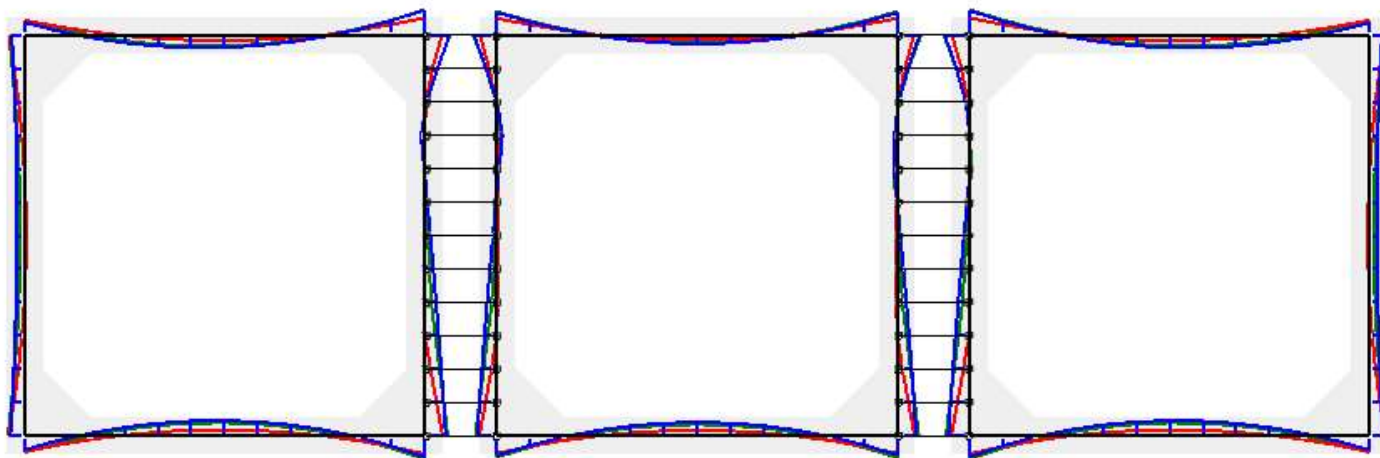
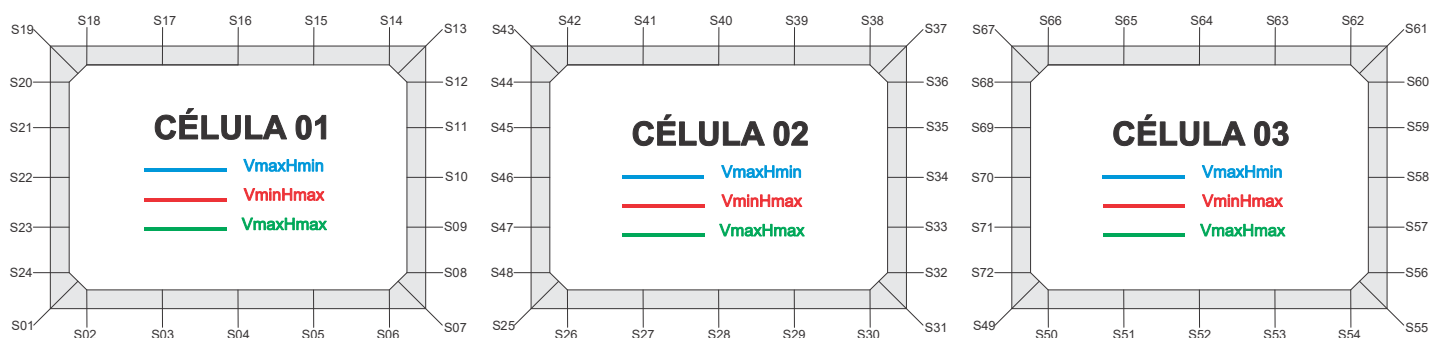
SEÇÃO	ESQUERDA (kN)	DIREITA (kN)
1	34.60	-78.38
2	-63.93	-48.35
3	-33.94	-18.58
4	-4.24	11.28
5	26.04	42.21
6	57.82	74.95
7	91.29	-34.60
8	-34.60	-34.60
9	-34.60	-14.36
10	-14.36	-14.36
11	-14.36	-14.36
12	36.16	85.65
13	104.89	-93.64
14	-64.60	-64.60
15	-35.80	-35.80
16	-7.01	-7.01
17	21.79	21.79
18	50.58	50.58
19	79.63	-29.75
20	-20.25	-20.25
21	-10.26	-10.26
22	0.22	0.22
23	11.19	11.19
24	22.65	22.65
25	34.60	-84.76
26	-69.46	-53.13
27	-38.10	-22.27
28	-7.62	8.00
29	22.64	38.47
30	53.50	69.81
31	85.09	-34.65
32	-34.65	-34.66
33	-34.66	-17.91
34	-17.91	-17.91
35	-17.91	9.10
36	32.12	81.51
37	103.11	-86.79
38	-57.75	-57.75
39	-28.95	-28.95
40	-0.16	-0.16
41	28.64	28.64
42	57.43	57.43
43	86.47	-104.83
44	-85.59	-36.10
45	14.42	14.42
46	14.42	14.42
47	14.42	34.66
48	34.66	34.65
49	34.65	-91.46

	50	-75.13	-58.01
	51	-42.41	-26.23
	52	-11.47	4.05
	53	18.40	33.76
	54	48.18	63.76
	55	78.22	-34.60
	56	-22.65	-22.65
	57	-11.19	-11.19
	58	-0.22	-0.22
	59	10.26	10.26
	60	20.25	20.25
	61	29.75	-79.47
	62	-50.42	-50.42
	63	-21.63	-21.63
	64	7.17	7.17
	65	35.96	35.96
	66	64.76	64.76
	67	93.80	-103.16
	68	-81.56	-32.18
	69	-9.16	17.86
	70	17.86	17.86
	71	17.86	34.60
	72	34.60	34.60

---

## 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	-22.85	22.85
2	-4.05	-4.05
3	-19.68	-19.68
4	-24.10	-24.10
5	-17.05	-17.05
6	2.17	2.17
7	34.50	34.50
8	27.23	27.23
9	18.83	18.83
10	9.68	9.68
11	-0.16	-0.16
12	3.54	3.54
13	40.67	-40.67
14	-9.43	-9.43
15	10.62	10.62
16	19.52	19.52
17	17.28	17.28
18	3.89	3.89
19	-20.69	-20.69
20	-15.45	-15.45
21	-12.57	-12.57
22	-11.97	-11.97
23	-13.54	-13.54
24	-17.20	-17.20
25	-22.85	31.94
26	2.17	2.17
27	-15.47	-15.47
28	-21.37	-21.37
29	-15.72	-15.72
30	1.68	1.68
31	31.24	31.24
32	23.79	23.79
33	15.20	15.20
34	5.71	5.71
35	-4.47	-4.47
36	2.44	2.44
37	36.41	-36.41
38	-8.60	-8.60
39	8.02	8.02
40	13.49	13.49
41	7.83	7.83
42	-8.99	-8.99
43	-36.99	-36.99
44	-0.05	-0.05
45	3.46	3.46
46	-6.56	-6.56
47	-15.90	-15.90
48	-24.49	-24.49
49	-31.94	34.15

	50	1.94	1.94
	51	-17.17	-17.17
	52	-24.10	-24.10
	53	-19.55	-19.55
	54	-3.80	-3.80
	55	23.21	23.21
	56	17.48	17.48
	57	13.74	13.74
	58	12.10	12.10
	59	12.63	12.63
	60	15.43	15.43
	61	20.59	-20.59
	62	4.08	4.08
	63	17.57	17.57
	64	19.91	19.91
	65	11.10	11.10
	66	-8.85	-8.85
	67	-39.99	-39.99
	68	-5.91	-5.91
	69	1.11	1.11
	70	-8.95	-8.95
	71	-18.34	-18.34
	72	-26.81	-26.81

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-26.11	26.11
2	6.09	6.09
3	-5.66	-5.66
4	-9.23	-9.23
5	-4.67	-4.67
6	8.13	8.13
7	29.34	29.34
8	9.65	9.65
9	-0.11	-0.11
10	-0.10	-0.10
11	-0.09	-0.09
12	2.87	2.87
13	28.18	-28.18
14	-8.43	-8.43
15	3.66	3.66
16	8.11	8.11
17	4.92	4.92
18	-5.90	-5.90
19	-24.39	-24.39
20	-9.63	-9.63
21	-0.53	-0.53
22	2.64	2.64
23	-0.39	-0.39
24	-9.88	-9.88
25	-26.11	28.57
26	7.94	7.94
27	-4.36	-4.36
28	-8.44	-8.44
29	-4.36	-4.36
30	7.94	7.94
31	28.57	28.57
32	8.90	8.90
33	-0.93	-0.93
34	-0.76	-0.76
35	-0.59	-0.59
36	2.09	2.09
37	27.53	-27.53
38	-8.41	-8.41
39	3.04	3.04
40	6.86	6.86
41	3.04	3.04
42	-8.41	-8.41
43	-27.53	-27.53
44	-2.20	-2.20
45	0.78	0.78
46	0.81	0.81
47	0.84	0.84
48	-8.90	-8.90
49	-28.57	29.34

	50	8.14	8.14
	51	-4.67	-4.67
	52	-9.23	-9.23
	53	-5.66	-5.66
	54	6.09	6.09
	55	26.11	26.11
	56	9.88	9.88
	57	0.39	0.39
	58	-2.64	-2.64
	59	0.53	0.53
	60	9.63	9.63
	61	24.39	-24.39
	62	-5.90	-5.90
	63	4.92	4.92
	64	8.11	8.11
	65	3.66	3.66
	66	-8.43	-8.43
	67	-28.18	-28.18
	68	-2.76	-2.76
	69	-0.10	-0.10
	70	0.05	0.05
	71	0.20	0.20
	72	-9.65	-9.65

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-26.88	26.88
2	-0.49	-0.49
3	-16.32	-16.32
4	-20.70	-20.70
5	-13.52	-13.52
6	5.73	5.73
7	37.72	37.72
8	24.45	24.45
9	11.19	11.19
10	5.62	5.62
11	0.05	0.05
12	4.27	4.27
13	41.14	-41.14
14	-10.52	-10.52
15	8.90	8.90
16	17.18	17.18
17	14.31	14.31
18	0.30	0.30
19	-24.89	-24.89
20	-15.20	-15.20
21	-9.27	-9.27
22	-7.29	-7.29
23	-9.45	-9.45
24	-15.92	-15.92
25	-26.88	34.94
26	5.27	5.27
27	-12.28	-12.28
28	-18.03	-18.03
29	-12.14	-12.14
30	5.55	5.55
31	35.36	35.36
32	22.07	22.07
33	8.78	8.78
34	1.84	1.84
35	-5.10	-5.10
36	2.88	2.88
37	38.60	-38.60
38	-10.63	-10.63
39	6.15	6.15
40	11.78	11.78
41	6.27	6.27
42	-10.38	-10.38
43	-38.23	-38.23
44	-1.38	-1.38
45	2.81	2.81
46	-2.78	-2.78
47	-8.37	-8.37
48	-21.65	-21.65
49	-34.94	38.06

	50	6.00	6.00
	51	-13.32	-13.32
	52	-20.58	-20.58
	53	-16.26	-16.26
	54	-0.51	-0.51
	55	26.80	26.80
	56	15.84	15.84
	57	9.37	9.37
	58	7.22	7.22
	59	9.19	9.19
	60	15.11	15.11
	61	24.81	-24.81
	62	0.33	0.33
	63	14.27	14.27
	64	17.08	17.08
	65	8.74	8.74
	66	-10.75	-10.75
	67	-41.42	-41.42
	68	-5.68	-5.68
	69	2.32	2.32
	70	-4.61	-4.61
	71	-11.53	-11.53
	72	-24.80	-24.80

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-23.43	23.43
2	-4.59	-4.59
3	-21.40	-21.40
4	-27.08	-27.08
5	-21.37	-21.37
6	-3.52	-3.52
7	27.57	27.57
8	20.61	20.61
9	12.51	12.51
10	5.40	5.40
11	-2.40	-2.40
12	0.75	0.75
13	36.48	-36.48
14	-6.34	-6.34
15	12.61	12.61
16	20.42	20.42
17	17.08	17.08
18	2.60	2.60
19	-23.08	-23.08
20	-17.54	-17.54
21	-14.36	-14.36
22	-13.45	-13.45
23	-14.72	-14.72
24	-18.08	-18.08
25	-23.43	30.96
26	0.70	0.70
27	-17.41	-17.41
28	-23.83	-23.83
29	-18.76	-18.76
30	-2.00	-2.00
31	26.97	26.97
32	19.72	19.72
33	11.33	11.33
34	2.18	2.18
35	-7.65	-7.65
36	0.50	0.50
37	34.38	-34.38
38	-7.10	-7.10
39	8.99	8.99
40	13.94	13.94
41	7.74	7.74
42	-9.60	-9.60
43	-38.13	-38.13
44	-2.69	-2.69
45	0.16	0.16
46	-7.92	-7.92
47	-15.32	-15.32
48	-23.71	-23.71
49	-30.96	35.34

	50	1.94	1.94
	51	-18.20	-18.20
	52	-26.14	-26.14
	53	-22.66	-22.66
	54	-8.08	-8.08
	55	17.67	17.67
	56	11.89	11.89
	57	8.11	8.11
	58	6.42	6.42
	59	6.90	6.90
	60	9.66	9.66
	61	14.77	-14.77
	62	8.61	8.61
	63	20.80	20.80
	64	21.84	21.84
	65	11.74	11.74
	66	-9.50	-9.50
	67	-41.94	-41.94
	68	-8.20	-8.20
	69	-0.18	-0.18
	70	-10.15	-10.15
	71	-19.43	-19.43
	72	-27.95	-27.95

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-26.33	26.33
2	6.05	6.05
3	-5.97	-5.97
4	-9.84	-9.84
5	-5.58	-5.58
6	6.92	6.92
7	27.84	27.84
8	8.21	8.21
9	-0.18	-0.18
10	-0.38	-0.38
11	-0.58	-0.58
12	1.45	1.45
13	27.18	-27.18
14	-7.69	-7.69
15	4.14	4.14
16	8.33	8.33
17	4.88	4.88
18	-6.19	-6.19
19	-24.94	-24.94
20	-10.13	-10.13
21	-0.97	-0.97
22	2.25	2.25
23	-0.72	-0.72
24	-10.15	-10.15
25	-26.33	28.30
26	7.55	7.55
27	-4.88	-4.88
28	-9.10	-9.10
29	-5.18	-5.18
30	6.96	6.96
31	27.43	27.43
32	7.81	7.81
33	-0.60	-0.60
34	-0.68	-0.68
35	-0.77	-0.77
36	1.05	1.05
37	26.85	-26.85
38	-7.86	-7.86
39	3.45	3.45
40	7.13	7.13
41	3.18	3.18
42	-8.41	-8.41
43	-27.66	-27.66
44	-1.93	-1.93
45	0.11	0.11
46	-0.09	-0.09
47	-0.29	-0.29
48	-8.67	-8.67
49	-28.30	29.21

	50	7.86	7.86
	51	-5.07	-5.07
	52	-9.74	-9.74
	53	-6.29	-6.29
	54	5.31	5.31
	55	25.16	25.16
	56	8.92	8.92
	57	-0.58	-0.58
	58	-3.62	-3.62
	59	-0.46	-0.46
	60	8.63	8.63
	61	23.38	-23.38
	62	-5.06	-5.06
	63	5.58	5.58
	64	8.60	8.60
	65	3.97	3.97
	66	-8.28	-8.28
	67	-28.21	-28.21
	68	-2.48	-2.48
	69	-0.73	-0.73
	70	-0.89	-0.89
	71	-1.04	-1.04
	72	-9.51	-9.51

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-27.06	27.06
2	-1.20	-1.20
3	-17.94	-17.94
4	-23.32	-23.32
5	-17.19	-17.19
6	0.97	0.97
7	31.97	31.97
8	19.04	19.04
9	9.47	9.47
10	3.24	3.24
11	-2.99	-2.99
12	1.02	1.02
13	38.03	-38.03
14	-8.30	-8.30
15	10.23	10.23
16	17.62	17.62
17	13.87	13.87
18	-1.03	-1.03
19	-27.12	-27.12
20	-17.08	-17.08
21	-10.81	-10.81
22	-8.50	-8.50
23	-10.31	-10.31
24	-16.44	-16.44
25	-27.06	33.95
26	3.82	3.82
27	-14.19	-14.19
28	-20.45	-20.45
29	-15.13	-15.13
30	1.95	1.95
31	31.19	31.19
32	18.16	18.16
33	7.87	7.87
34	0.34	0.34
35	-7.20	-7.20
36	1.15	1.15
37	36.79	-36.79
38	-9.31	-9.31
39	6.99	6.99
40	12.13	12.13
41	6.13	6.13
42	-11.01	-11.01
43	-39.34	-39.34
44	-2.45	-2.45
45	1.45	1.45
46	-4.89	-4.89
47	-11.23	-11.23
48	-20.91	-20.91
49	-33.95	38.28

	50	5.46	5.46
	51	-14.51	-14.51
	52	-22.40	-22.40
	53	-18.76	-18.76
	54	-3.77	-3.77
	55	22.70	22.70
	56	11.69	11.69
	57	5.18	5.18
	58	2.97	2.97
	59	4.90	4.90
	60	10.77	10.77
	61	20.42	-20.42
	62	3.85	3.85
	63	16.94	16.94
	64	18.88	18.88
	65	9.68	9.68
	66	-10.67	-10.67
	67	-42.20	-42.20
	68	-6.85	-6.85
	69	1.22	1.22
	70	-6.59	-6.59
	71	-14.41	-14.41
	72	-24.97	-24.97

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.31	19.31
2	-0.61	-0.61
3	-12.14	-12.14
4	-15.34	-15.34
5	-10.11	-10.11
6	3.91	3.91
7	27.25	27.25
8	18.00	18.00
9	8.76	8.76
10	4.39	4.39
11	0.02	0.02
12	3.05	3.05
13	29.80	-29.80
14	-7.53	-7.53
15	6.61	6.61
16	12.66	12.66
17	10.63	10.63
18	0.51	0.51
19	-17.74	-17.74
20	-11.08	-11.08
21	-7.01	-7.01
22	-5.66	-5.66
23	-7.17	-7.17
24	-11.67	-11.67
25	-19.31	25.20
26	3.58	3.58
27	-9.20	-9.20
28	-13.38	-13.38
29	-9.08	-9.08
30	3.81	3.81
31	25.53	25.53
32	16.27	16.27
33	7.00	7.00
34	1.55	1.55
35	-3.91	-3.91
36	2.09	2.09
37	27.93	-27.93
38	-7.62	-7.62
39	4.56	4.56
40	8.65	8.65
41	4.66	4.66
42	-7.43	-7.43
43	-27.64	-27.64
44	-0.91	-0.91
45	2.10	2.10
46	-2.28	-2.28
47	-6.67	-6.67
48	-15.94	-15.94
49	-25.20	27.52

	50	4.13	4.13
	51	-9.95	-9.95
	52	-15.24	-15.24
	53	-12.09	-12.09
	54	-0.62	-0.62
	55	19.25	19.25
	56	11.61	11.61
	57	7.11	7.11
	58	5.60	5.60
	59	6.95	6.95
	60	11.02	11.02
	61	17.68	-17.68
	62	0.52	0.52
	63	10.60	10.60
	64	12.58	12.58
	65	6.48	6.48
	66	-7.71	-7.71
	67	-30.03	-30.03
	68	-4.17	-4.17
	69	1.84	1.84
	70	-3.59	-3.59
	71	-9.02	-9.02
	72	-18.27	-18.27

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-22.06	22.06
2	2.76	2.76
3	-8.36	-8.36
4	-11.40	-11.40
5	-6.36	-6.36
6	6.95	6.95
7	28.79	28.79
8	14.41	14.41
9	1.10	1.10
10	0.65	0.65
11	0.20	0.20
12	3.42	3.42
13	28.82	-28.82
14	-8.32	-8.32
15	4.52	4.52
16	9.72	9.72
17	7.28	7.28
18	-2.78	-2.78
19	-20.52	-20.52
20	-9.85	-9.85
21	-3.28	-3.28
22	-1.01	-1.01
23	-3.25	-3.25
24	-10.20	-10.20
25	-22.06	27.19
26	6.59	6.59
27	-5.67	-5.67
28	-9.73	-9.73
29	-5.67	-5.67
30	6.60	6.60
31	27.20	27.20
32	12.84	12.84
33	-0.41	-0.41
34	-0.90	-0.90
35	-1.40	-1.40
36	1.99	1.99
37	27.37	-27.37
38	-8.25	-8.25
39	3.20	3.20
40	7.02	7.02
41	3.21	3.21
42	-8.25	-8.25
43	-27.37	-27.37
44	-1.94	-1.94
45	1.30	1.30
46	0.88	0.88
47	0.45	0.45
48	-12.84	-12.84
49	-27.19	28.79

	50	6.95	6.95
	51	-6.36	-6.36
	52	-11.39	-11.39
	53	-8.35	-8.35
	54	2.76	2.76
	55	22.06	22.06
	56	10.20	10.20
	57	3.25	3.25
	58	1.01	1.01
	59	3.28	3.28
	60	9.85	9.85
	61	20.52	-20.52
	62	-2.78	-2.78
	63	7.28	7.28
	64	9.72	9.72
	65	4.52	4.52
	66	-8.32	-8.32
	67	-28.82	-28.82
	68	-3.47	-3.47
	69	-0.10	-0.10
	70	-0.62	-0.62
	71	-1.14	-1.14
	72	-14.41	-14.41

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.61	19.61
2	-0.35	-0.35
3	-11.89	-11.89
4	-15.09	-15.09
5	-9.85	-9.85
6	4.17	4.17
7	27.49	27.49
8	17.81	17.81
9	8.14	8.14
10	4.09	4.09
11	0.04	0.04
12	3.10	3.10
13	29.86	-29.86
14	-7.63	-7.63
15	6.47	6.47
16	12.48	12.48
17	10.40	10.40
18	0.24	0.24
19	-18.05	-18.05
20	-11.02	-11.02
21	-6.73	-6.73
22	-5.31	-5.31
23	-6.89	-6.89
24	-11.61	-11.61
25	-19.61	25.47
26	3.84	3.84
27	-8.95	-8.95
28	-13.14	-13.14
29	-8.85	-8.85
30	4.05	4.05
31	25.77	25.77
32	16.08	16.08
33	6.39	6.39
34	1.34	1.34
35	-3.71	-3.71
36	2.09	2.09
37	28.01	-28.01
38	-7.71	-7.71
39	4.47	4.47
40	8.56	8.56
41	4.56	4.56
42	-7.53	-7.53
43	-27.74	-27.74
44	-1.00	-1.00
45	2.04	2.04
46	-2.02	-2.02
47	-6.09	-6.09
48	-15.78	-15.78
49	-25.47	27.74

	50	4.37	4.37
	51	-9.71	-9.71
	52	-14.99	-14.99
	53	-11.85	-11.85
	54	-0.36	-0.36
	55	19.55	19.55
	56	11.56	11.56
	57	6.84	6.84
	58	5.25	5.25
	59	6.67	6.67
	60	10.96	10.96
	61	17.99	-17.99
	62	0.25	0.25
	63	10.37	10.37
	64	12.41	12.41
	65	6.35	6.35
	66	-7.80	-7.80
	67	-30.07	-30.07
	68	-4.13	-4.13
	69	1.69	1.69
	70	-3.35	-3.35
	71	-8.39	-8.39
	72	-18.06	-18.06

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-18.64	18.64
2	-0.28	-0.28
3	-11.22	-11.22
4	-14.26	-14.26
5	-9.29	-9.29
6	4.00	4.00
7	26.10	26.10
8	16.85	16.85
9	7.60	7.60
10	3.82	3.82
11	0.04	0.04
12	2.94	2.94
13	28.20	-28.20
14	-7.22	-7.22
15	6.09	6.09
16	11.76	11.76
17	9.80	9.80
18	0.21	0.21
19	-17.05	-17.05
20	-10.40	-10.40
21	-6.33	-6.33
22	-4.98	-4.98
23	-6.49	-6.49
24	-11.00	-11.00
25	-18.64	24.19
26	3.69	3.69
27	-8.44	-8.44
28	-12.41	-12.41
29	-8.34	-8.34
30	3.88	3.88
31	24.48	24.48
32	15.21	15.21
33	5.95	5.95
34	1.23	1.23
35	-3.48	-3.48
36	1.97	1.97
37	26.45	-26.45
38	-7.29	-7.29
39	4.20	4.20
40	8.06	8.06
41	4.29	4.29
42	-7.12	-7.12
43	-26.20	-26.20
44	-0.95	-0.95
45	1.93	1.93
46	-1.87	-1.87
47	-5.66	-5.66
48	-14.93	-14.93
49	-24.19	26.33

	50	4.19	4.19
	51	-9.16	-9.16
	52	-14.17	-14.17
	53	-11.19	-11.19
	54	-0.29	-0.29
	55	18.59	18.59
	56	10.95	10.95
	57	6.44	6.44
	58	4.93	4.93
	59	6.27	6.27
	60	10.34	10.34
	61	16.99	-16.99
	62	0.23	0.23
	63	9.78	9.78
	64	11.69	11.69
	65	5.98	5.98
	66	-7.37	-7.37
	67	-28.40	-28.40
	68	-3.90	-3.90
	69	1.57	1.57
	70	-3.13	-3.13
	71	-7.83	-7.83
	72	-17.08	-17.08

---

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

-----

MOMENTO FLETOR NAS SEÇÕES DE INTERESSE

-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.06	19.06
2	-0.49	-0.49
3	-11.79	-11.79
4	-14.93	-14.93
5	-9.81	-9.81
6	3.95	3.95
7	26.82	26.82
8	17.57	17.57
9	8.32	8.32
10	4.18	4.18
11	0.03	0.03
12	3.01	3.01
13	29.20	-29.20
14	-7.42	-7.42
15	6.41	6.41
16	12.33	12.33
17	10.32	10.32
18	0.40	0.40
19	-17.48	-17.48
20	-10.83	-10.83
21	-6.75	-6.75
22	-5.41	-5.41
23	-6.92	-6.92
24	-11.42	-11.42
25	-19.06	24.82
26	3.62	3.62
27	-8.91	-8.91
28	-13.02	-13.02
29	-8.81	-8.81
30	3.84	3.84
31	25.14	25.14
32	15.87	15.87
33	6.61	6.61
34	1.43	1.43
35	-3.75	-3.75
36	2.04	2.04
37	27.38	-27.38
38	-7.50	-7.50
39	4.43	4.43
40	8.43	8.43
41	4.52	4.52
42	-7.31	-7.31
43	-27.10	-27.10
44	-0.93	-0.93
45	2.03	2.03
46	-2.13	-2.13
47	-6.29	-6.29
48	-15.56	-15.56
49	-24.82	27.07

	50	4.15	4.15
	51	-9.66	-9.66
	52	-14.84	-14.84
	53	-11.75	-11.75
	54	-0.50	-0.50
	55	19.00	19.00
	56	11.37	11.37
	57	6.86	6.86
	58	5.35	5.35
	59	6.69	6.69
	60	10.76	10.76
	61	17.42	-17.42
	62	0.41	0.41
	63	10.29	10.29
	64	12.25	12.25
	65	6.29	6.29
	66	-7.59	-7.59
	67	-29.42	-29.42
	68	-4.07	-4.07
	69	1.74	1.74
	70	-3.42	-3.42
	71	-8.58	-8.58
	72	-17.83	-17.83

---

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

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

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-21.86	21.86
2	2.60	2.60
3	-8.49	-8.49
4	-11.50	-11.50
5	-6.45	-6.45
6	6.88	6.88
7	28.75	28.75
8	14.61	14.61
9	1.17	1.17
10	0.69	0.69
11	0.21	0.21
12	3.44	3.44
13	28.84	-28.84
14	-8.31	-8.31
15	4.56	4.56
16	9.80	9.80
17	7.40	7.40
18	-2.63	-2.63
19	-20.34	-20.34
20	-9.87	-9.87
21	-3.42	-3.42
22	-1.19	-1.19
23	-3.39	-3.39
24	-10.21	-10.21
25	-21.86	27.12
26	6.52	6.52
27	-5.74	-5.74
28	-9.80	-9.80
29	-5.74	-5.74
30	6.52	6.52
31	27.12	27.12
32	13.01	13.01
33	-0.37	-0.37
34	-0.90	-0.90
35	-1.44	-1.44
36	1.99	1.99
37	27.36	-27.36
38	-8.24	-8.24
39	3.22	3.22
40	7.03	7.03
41	3.22	3.22
42	-8.23	-8.23
43	-27.35	-27.35
44	-1.93	-1.93
45	1.33	1.33
46	0.87	0.87
47	0.42	0.42
48	-13.01	-13.01
49	-27.12	28.75

	50	6.88	6.88
	51	-6.45	-6.45
	52	-11.50	-11.50
	53	-8.49	-8.49
	54	2.60	2.60
	55	21.86	21.86
	56	10.21	10.21
	57	3.39	3.39
	58	1.19	1.19
	59	3.42	3.42
	60	9.87	9.87
	61	20.33	-20.33
	62	-2.63	-2.63
	63	7.40	7.40
	64	9.80	9.80
	65	4.56	4.56
	66	-8.31	-8.31
	67	-28.85	-28.85
	68	-3.50	-3.50
	69	-0.10	-0.10
	70	-0.66	-0.66
	71	-1.21	-1.21
	72	-14.62	-14.62

---

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

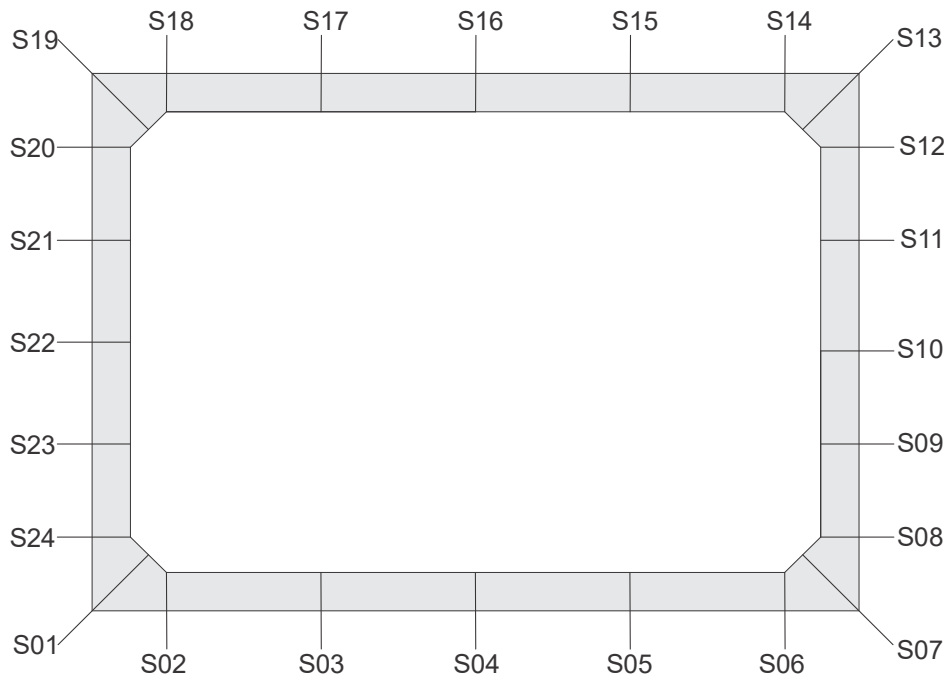
-----  
MOMENTO FLETOR NAS SEÇÕES DE INTERESSE  
-----

SEÇÃO	ESQUERDA (kN.m)	DIREITA (kN.m)
1	-19.24	19.24
2	-0.32	-0.32
3	-11.64	-11.64
4	-14.78	-14.78
5	-9.64	-9.64
6	4.11	4.11
7	26.97	26.97
8	17.45	17.45
9	7.94	7.94
10	3.99	3.99
11	0.04	0.04
12	3.04	3.04
13	29.24	-29.24
14	-7.48	-7.48
15	6.32	6.32
16	12.21	12.21
17	10.18	10.18
18	0.23	0.23
19	-17.67	-17.67
20	-10.79	-10.79
21	-6.58	-6.58
22	-5.19	-5.19
23	-6.74	-6.74
24	-11.38	-11.38
25	-19.24	24.99
26	3.78	3.78
27	-8.76	-8.76
28	-12.87	-12.87
29	-8.66	-8.66
30	3.99	3.99
31	25.29	25.29
32	15.76	15.76
33	6.23	6.23
34	1.30	1.30
35	-3.63	-3.63
36	2.04	2.04
37	27.43	-27.43
38	-7.55	-7.55
39	4.37	4.37
40	8.37	8.37
41	4.46	4.46
42	-7.38	-7.38
43	-27.17	-27.17
44	-0.98	-0.98
45	2.00	2.00
46	-1.96	-1.96
47	-5.93	-5.93
48	-15.46	-15.46
49	-24.99	27.21

	50	4.31	4.31
	51	-9.50	-9.50
	52	-14.69	-14.69
	53	-11.60	-11.60
	54	-0.33	-0.33
	55	19.19	19.19
	56	11.33	11.33
	57	6.69	6.69
	58	5.13	5.13
	59	6.52	6.52
	60	10.73	10.73
	61	17.62	-17.62
	62	0.24	0.24
	63	10.15	10.15
	64	12.14	12.14
	65	6.21	6.21
	66	-7.64	-7.64
	67	-29.44	-29.44
	68	-4.04	-4.04
	69	1.64	1.64
	70	-3.27	-3.27
	71	-8.18	-8.18
	72	-17.70	-17.70

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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	3.16	3.79
4	2.32	2.79	4.01	4.82
5	2.32	2.79	2.66	3.19
6	2.32	2.79	2.32	2.79
7	5.47	6.57	1.26	1.26
8	3.34	4.01	2.32	2.79
9	2.32	2.79	2.32	2.79
10	2.32	2.79	2.32	2.79
11	2.32	2.79	2.32	2.79
12	2.32	2.79	2.32	2.79
13	5.47	6.57	1.26	1.26
14	2.32	2.79	2.32	2.79
15	2.32	2.79	2.32	2.79
16	2.32	2.79	3.14	3.77
17	2.32	2.79	2.71	3.26
18	2.32	2.79	2.32	2.79
19	5.47	6.57	1.26	1.26
20	2.32	2.79	2.32	2.79
21	2.32	2.79	2.32	2.79
22	2.32	2.79	2.32	2.79
23	2.32	2.79	2.32	2.79
24	2.32	2.79	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	-96.93	3.10	-91.57	2.94	-0.37	0.00
13	-95.65	29.86	-28.74	28.20	-25.75	0.00
14	-30.36	7.63	-28.74	7.22	5.49	0.00
16	-28.75	12.66	-46.03	9.72	94.99	0.00
18	-30.36	0.24	-28.74	0.21	-0.04	0.00
19	-81.34	18.05	-28.74	17.05	-22.07	0.00
20	-82.62	11.02	-78.06	10.40	7.21	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	97.19	190.84	0.00	0.00
2	2.79	2.53E-003	87.05	75.31	571.15	0.00
6	2.79	2.53E-003	94.47	75.31	571.15	0.00
7	6.57	2.12E-003	106.51	181.89	0.00	0.00
13	6.57	2.12E-003	103.62	183.05	0.00	0.00
14	2.79	2.53E-003	71.52	76.14	0.00	0.00
18	2.79	2.53E-003	63.21	76.14	0.00	0.00
19	6.57	2.12E-003	83.63	185.01	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	-31.04	19.06	6.30	0.010
2	2.79	-33.63	0.49	6.30	0.000
3	3.79	-33.63	11.79	6.30	0.089
4	4.82	-33.63	14.93	6.30	0.092
5	3.19	-33.63	9.81	6.30	0.083
6	2.79	-33.63	3.95	6.30	0.011
7	6.57	-67.02	26.82	6.30	0.017
8	4.01	-99.14	17.57	6.30	0.140
9	2.79	-98.11	8.32	6.30	0.035
10	2.79	-97.08	4.18	6.30	0.001
11	2.79	-96.05	0.03	6.30	0.000
12	2.79	-95.02	3.01	6.30	0.000
13	6.57	-61.24	29.20	6.30	0.022
14	2.79	-28.74	7.42	6.30	0.060
15	2.79	-28.74	6.41	6.30	0.043
16	3.77	-28.74	12.33	6.30	0.102
17	3.26	-28.74	10.32	6.30	0.092
18	2.79	-28.74	0.40	6.30	0.000
19	6.57	-54.14	17.48	6.30	0.006
20	2.79	-80.81	10.83	6.30	0.093
21	2.79	-81.84	6.75	6.30	0.022
22	2.79	-82.88	5.41	6.30	0.009
23	2.79	-83.91	6.92	6.30	0.023
24	2.79	-84.94	11.42	6.30	0.104

VminHmax

Seção	As (cm <sup>2</sup> /m)	Nsd (kN)	Msd (kN.m)	Ø (mm)	w (mm)
1	6.57	-26.59	21.86	6.30	0.015
2	2.79	-51.40	2.60	6.30	0.001
3	3.79	-51.40	8.49	6.30	0.035
4	4.82	-51.40	11.50	6.30	0.046
5	3.19	-51.40	6.45	6.30	0.024
6	2.79	-51.40	6.88	6.30	0.038
7	6.57	-73.39	28.75	6.30	0.019
8	4.01	-94.10	14.61	6.30	0.090
9	2.79	-93.07	1.17	6.30	0.000
10	2.79	-92.03	0.69	6.30	0.000
11	2.79	-91.00	0.21	6.30	0.000
12	2.79	-89.97	3.44	6.30	0.000
13	6.57	-66.91	28.84	6.30	0.021
14	2.79	-45.13	8.31	6.30	0.066
15	2.79	-45.13	4.56	6.30	0.013
16	3.77	-45.13	9.80	6.30	0.054
17	3.26	-45.13	7.40	6.30	0.036
18	2.79	-45.13	2.63	6.30	0.002
19	6.57	-61.75	20.34	6.30	0.009
20	2.79	-79.66	9.87	6.30	0.073
21	2.79	-80.69	3.42	6.30	0.001
22	2.79	-81.72	1.19	6.30	0.000
23	2.79	-82.75	3.39	6.30	0.000
24	2.79	-83.78	10.21	6.30	0.078

## VERIFICAÇÃO DA FISSURAÇÃO (CONT.)

VmaxHmax

Seção	As(cm <sup>2</sup> /m)	Nsd(kN)	Msd(kN.m)	Ø(mm)	w(mm)
1	6.57	-30.81	19.24	6.30	0.011
2	2.79	-34.60	0.32	6.30	0.000
3	3.79	-34.60	11.64	6.30	0.085
4	4.82	-34.60	14.78	6.30	0.090
5	3.19	-34.60	9.64	6.30	0.079
6	2.79	-34.60	4.11	6.30	0.012
7	6.57	-67.46	26.97	6.30	0.017
8	4.01	-99.05	17.45	6.30	0.138
9	2.79	-98.02	7.94	6.30	0.030
10	2.79	-96.98	3.99	6.30	0.001
11	2.79	-95.95	0.04	6.30	0.000
12	2.79	-94.92	3.04	6.30	0.000
13	6.57	-61.70	29.24	6.30	0.022
14	2.79	-29.75	7.48	6.30	0.060
15	2.79	-29.75	6.32	6.30	0.041
16	3.77	-29.75	12.21	6.30	0.099
17	3.26	-29.75	10.18	6.30	0.089
18	2.79	-29.75	0.23	6.30	0.000
19	6.57	-54.69	17.67	6.30	0.006
20	2.79	-80.91	10.79	6.30	0.093
21	2.79	-81.94	6.58	6.30	0.020
22	2.79	-82.97	5.19	6.30	0.008
23	2.79	-84.00	6.74	6.30	0.021
24	2.79	-85.03	11.38	6.30	0.103

NOTA:

\* Seção com aumento na armadura devido à fissuração.