

MEMÓRIA DE CÁLCULO

OBRA:

CONSTRUÇÃO DA EMEF ESTHER DA COSTA SANTOS

ENDEREÇO:

**RUA TRAVESSA PAVÃO, Nº 80, BAIRRO CENTRO, VILA
PAVÃO/ES**

PROPRIETÁRIO:

MUNICÍPIO DE VILA PAVÃO

AUTOR PROJETO:

**CARLOS RAPHAEL MONTEIRO DE LEMOS
ENGENHEIRO CÍVIL
CREA-ES 11840/D**

JANEIRO DE 2022

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1. INTRODUÇÃO

Este presente trabalho visa desenvolver, de acordo com a legislação e as normas vigentes, a memória de cálculo do projeto estrutural-fundação referente à construção da EMEF Esther da Costa Santos, localizada na rua Travessa Pavão, nº80, bairro Centro – Vila Pavão/ES.

2. OBJETIVO

Dimensionamento de elementos estruturais através da análise de esforços.

3. REFERÊNCIAS

O presente trabalho tem como objetivo complementar as pranchas de armação e formas relativas às edificações.

O dimensionamento dos elementos citados fora executado tomando como base as normas que seguem:

- NBR 6118 – Projeto de estruturas de concreto – Procedimentos
- NBR 6120 – Cargas para o cálculo de estruturas de edificações
- NBR 6122 – Projeto e execução de fundações
- NBR 6123 – Força devidas ao vento em edificações
- NBR 8681:2003 - Ações e segurança nas estruturas – Procedimentos.

Documentos técnicos e livros como:

- Resistência do Materiais, V. Feodosiev
- Curso de Concreto Armado, José Milton de Araújo
- Exercícios de fundação – Urbano Rodriguez Alonso
- Fundações – de Rezende Lopes, Francisco; Velloso, Dirceu A.

Além dos softwares de dimensionamento e análise: TQS

4. CARACTERÍSTICAS GERAIS DO PROJETO

- Fck: 30 Mpa
- Módulo de Elasticidade ECS=26GPa
- Fator água-cimento ≤ 0.6 (máximo)
- Aço CA 50 e CA 60
- Es: 26 GPa
- Deformação limite do aço para dimensionamento: 10%.
- Grau de agressividade do Meio Ambiente: II (NBR 6118/2014)
- Limite de abertura de Fissuras ≤ 0.3 mm
- Dimensão máxima do agregado graúdo: 25 mm
- Método para análise de 2° Ordem Global: Gama Z
- Compactação com Proctor normal à 100%

<i>Elemento Estrutural</i>	<i>Cobrimento (cm)</i>
<i>Lajes convencionais (superior / inferior)</i>	2.5 / 2.5
<i>Vigas</i>	3.0
<i>Pilares</i>	3.0
<i>Fundações</i>	3.0

5. MODELO DE CÁLCULO

A análise do comportamento estrutural dos pavimentos foi realizada através de modelos de grelha. Nestes modelos as lajes foram integralmente consideradas, junto com as vigas e os apoios formados pelos pilares existentes.

No modelo de pórtico foram incluídos todos os elementos principais da estrutura, ou seja, pilares e vigas, além da consideração do diafragma rígido formado nos planos de cada pavimento (lajes).

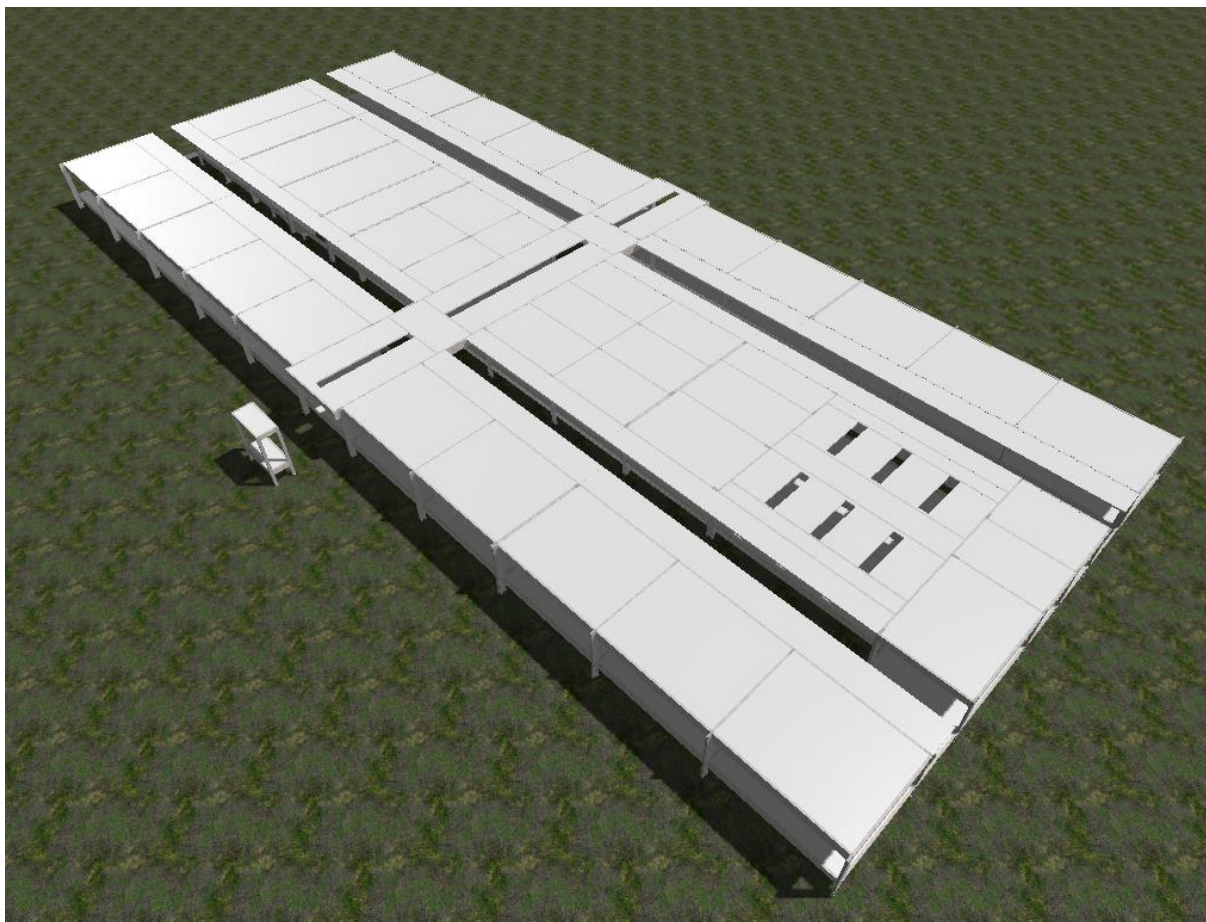


Figura 1 - Perspectiva 3D da edificação

5.1 CONCRETO

Para a edificação foi utilizado concreto com $F_{ck}=30\text{Mpa}$, com módulo de elasticidade = 26.1GPa

	<i>AlfaE</i>	<i>Ecs</i>	<i>Eci</i>	<i>Gc</i>
C30	1	2607159	3067246	0

Relação água-cimento em massa ≤ 0.6 ., de acordo com o item “7.4.2 da NBR 6118:2014, tabela 7.1”.

5.2 AÇO DE ARMADURA

Armaduras CA-50 e CA-60

<i>Tipo de barra</i>	<i>Ecs(GPa)</i>	<i>fyk(MPa)</i>	<i>Massa específica(kg/m3)</i>	<i>n1</i>
CA-50	210	500	7.850	2,25
CA-60	210	600	7.850	1,40

Deformação limite do aço para dimensionamento: 10%.

5.3 CARGAS E COMBINAÇÕES

Cargas e combinações conforme descritas na NBR 6120:

- Cargas Permanentes:
 - Peso Próprio da estrutura
 - Carga de Revestimento: 100kgf/m²
- Cargas Acidentais:
 - Cobertura: 100kgf/m²
- Cargas de Vento:
 - Velocidade básica (m/s): 30,0;
 - Fator topográfico (S1): 1,0;
 - Categoria de rugosidade (S2): II - Terrnos abertos com poucos obstáculos. Árvores, edificações baixas, zonas costeiras, vegetação rala, pradaria;
 - Classe da edificação (S2): A - Maior dimensão horizontal ou vertical < 20m;
 - Fator estatístico (S3): 1,00 - Edificações em geral, Hotéis, residências, comércio e indústria com alta taxa de ocupação.
 - Na tabela que se segue são apresentados os valores de coeficiente de arrasto, área de projeção do edifício e pressão calculada com os fatores apresentados anteriormente:
- Combinações:

No modelo estrutural global foram consideradas as seguintes combinações:

Tipo	Descrição	N. Combinações
ELU1	Verificações de estado limite último - Vigas e lajes	4
ELU2	Verificações de estado limite último - Pilares e fundações	4
ELS	Verificações de estado limite de serviço	4
COMBFLU	Cálculo de fluência (método geral)	2

6. FUNDAÇÃO

Para a fundação da edificação de concreto armado foi utilizado fundação direta (sapatas) apoiada diretamente no solo.

Podemos dizer que são empregados como valores de pressão admissível (Kg/cm²) na prática profissional inconfessada, essencialmente sem distinção de solo, algo como as duas prescrições abaixo, praticamente coincidindo de variação dos dados disponíveis, $4 < N < 16$:

$$\sigma_{adm} \approx \frac{N}{5} \quad \text{ou} \quad \sigma_{adm} \approx \sqrt{N} - 1$$

(MELLO, V.F.B Deformações como Base Fundamental de Escolha de Fundação. Geotecnia. N. 5(12), p. 55-75, 1975)

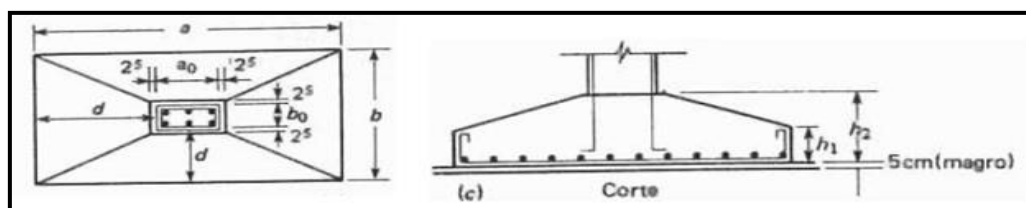
Para pré-dimensionamento das sapatas, utilizamos o livro “EXERCÍCIOS DE FUNDAÇÃO – URBANO E RODRIGUEZ ALONSO”.

$$A = a \times b = P / \sigma_{adm} \text{ solo}$$

$$a = \sqrt{A} ; b = a - (a_0 - b_0)$$

$$h_2 = (a - a_0) / 3 \geq 40'$$

$$h_1 = h_2 / 3 \geq 25$$



Conforme sondagem do terreno, para a estrutura foi utilizado para cálculo da fundação uma tensão de 2,0kgf/cm². Para cálculo das sapatas utilizamos o método simplificado das bielas em blocos rígidos (com um ângulo ótimo entre 45 e 55 graus).

Sapatas

Sapata	Dimensão (cm)		Rodapé (cm)		Altura (cm)	Verificações	Tensão no solo (kgf/cm ²)	
	X	Y	X	Y			Máxima	Média
S1	125	160	25	25	45	ok	1.63	0.87
S2	145	180	25	25	45	ok	1.98	1.54
S4	100	120	25	25	45	ok	1.98	1.54
S5	145	180	25	25	45	ok	1.93	1.43
S6	140	175	25	25	45	ok	1.92	1.44
S7	145	180	25	25	45	ok	1.90	1.28
S8	145	180	25	25	45	ok	2.00	1.30
S9	145	180	25	25	45	ok	1.96	1.51
S11	110	130	25	25	45	ok	1.84	1.60
S12	135	170	25	25	45	ok	1.97	1.57
S13	140	175	25	25	45	ok	1.84	1.48
S14	125	160	25	25	45	ok	1.79	0.90
S15	145	110	25	25	45	ok	1.88	1.52
S16	170	205	25	25	55	ok	2.00	1.79
S18	120	140	25	25	45	ok	1.93	1.68
S19	165	200	25	25	50	ok	2.00	1.74
S20	155	190	25	25	50	ok	2.00	1.81
S21	165	200	25	25	50	ok	1.93	1.62
S22	195	160	25	25	50	ok	1.87	1.65
S23	165	200	25	25	50	ok	2.00	1.79
S25	110	130	25	25	45	ok	1.77	1.49
S26	165	200	25	25	50	ok	2.00	1.74
S27	165	200	25	25	50	ok	1.95	1.70
S28	150	115	25	25	45	ok	1.91	1.54
S29	105	120	25	25	45	ok	1.94	1.74
S30	95	130	25	25	45	ok	1.72	1.07
S31	140	105	25	25	45	ok	1.75	1.30
S32	135	170	25	25	45	ok	1.96	1.58
S34	90	110	25	25	45	ok	1.91	1.81
S35	205	185	25	25	55	ok	1.88	1.66
S36	205	185	25	25	55	ok	1.66	1.26

S37	100	110	25	25	45	ok	1.92	1.44
S39	160	125	25	25	45	ok	1.91	1.52
S40	165	130	25	25	45	ok	1.81	1.61
S41	135	170	25	25	45	ok	1.90	1.67
S42	165	130	25	25	45	ok	1.84	1.72
S44	115	135	25	25	45	ok	1.85	1.76
S45	185	150	25	25	45	ok	1.67	1.51
S46	120	100	25	25	45	ok	1.53	1.41
S47	120	100	25	25	45	ok	1.85	1.13
S48	120	100	25	25	45	ok	1.94	1.36
S49	155	195	25	25	50	ok	1.87	1.58
S50	155	195	25	25	50	ok	1.91	1.44
S51	95	130	25	25	45	ok	1.72	1.12
S52	180	145	25	25	45	ok	1.64	1.59
S53	125	155	25	25	45	ok	1.91	1.70
S55	145	180	25	25	45	ok	1.86	1.77
S57	105	125	25	25	45	ok	1.99	1.84
S58	120	100	25	25	45	ok	1.63	1.43
S59	110	100	25	25	40	ok	1.92	1.40
S60	120	100	25	25	45	ok	1.88	1.63
S61	165	200	25	25	50	ok	1.79	1.55
S62	125	160	25	25	45	ok	1.93	1.59
S63	165	200	25	25	50	ok	1.92	1.82
S64	250	210	25	25	65	ok	1.87	1.40
S65	120	155	25	25	50	ok	1.84	1.22
S66	245	205	25	25	65	ok	1.58	1.53
S67	105	140	25	25	45	ok	1.96	1.52
S68	190	155	25	25	50	ok	1.74	1.48
S70	120	150	25	25	45	ok	1.87	1.83
S71	120	155	25	25	45	ok	2.00	1.48
S72	120	100	25	25	45	ok	2.00	1.04
S73	120	100	25	25	45	ok	1.11	0.65
S74	120	100	25	25	45	ok	1.66	0.93
S75	115	80	25	25	45	ok	1.24	1.00
S76	130	165	25	25	45	ok	2.00	1.68

















































































































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S81	105	140	25	25	45	ok	1.88	1.66
S83	170	135	25	25	45	ok	2.00	1.55
S84	160	125	25	25	45	ok	1.64	1.50
S85	185	150	25	25	45	ok	1.80	1.60
S86	170	135	25	25	45	ok	1.81	1.64

















































































































S88	85	105	25	25	45	ok	1.73	1.41
S89	205	165	25	25	50	ok	1.98	1.73
S90	145	185	25	25	45	ok	1.85	1.60
S91	110	145	25	25	45	ok	1.70	1.10
S92	145	110	25	25	45	ok	1.87	1.54
S93	170	205	25	25	55	ok	2.00	1.78
S95	120	140	25	25	45	ok	1.94	1.60
S96	165	200	25	25	50	ok	1.97	1.72
S97	155	190	25	25	50	ok	2.00	1.79
S98	165	200	25	25	50	ok	1.94	1.64
S99	190	155	25	25	50	ok	1.94	1.69
S100	165	200	25	25	50	ok	1.96	1.77
S102	105	125	25	25	45	ok	1.93	1.72
S103	165	200	25	25	50	ok	2.00	1.73
S104	165	200	25	25	50	ok	2.00	1.69
S105	155	120	25	25	45	ok	1.79	1.41
S106	110	145	25	25	45	ok	1.95	1.07
S107	145	180	25	25	45	ok	1.96	1.55
S109	100	120	25	25	45	ok	1.90	1.47
S110	145	180	25	25	45	ok	1.95	1.45
S111	140	180	25	25	45	ok	1.91	1.42
S112	145	180	25	25	50	ok	1.98	1.30
S113	145	180	25	25	50	ok	1.80	1.32
S114	150	185	25	25	45	ok	1.91	1.45
S116	115	125	25	25	45	ok	1.91	1.52
S117	135	170	25	25	45	ok	1.97	1.59
S118	135	170	25	25	45	ok	2.00	1.59
S119	110	145	25	25	45	ok	2.00	1.12
S120	60	60	25	25	45	ok	1.03	0.92
S121	60	60	25	25	45	ok	1.04	0.94
S122	60	60	25	25	45	ok	1.06	0.95
S123	60	60	25	25	45	ok	1.07	0.97
S1A	120	100	25	25	45	ok	1.96	1.62
S2A	85	65	25	25	45	ok	1.23	0.51
S3A	100	100	25	25	45	ok	1.95	1.75
S4A	100	100	25	25	45	ok	1.43	1.18

























































































































7. PILARES

Abaixo segue relatório de dimensionamento dos pilares:

Pilar	Lances	Seção (cm)	σ (kgf/cm ²)	ν	λ	ρ	Taxa de aço (kgf/m ³)
P1	1 a 3	20X50	0 a 22.8	0.073 a 0.107	14 a 58	0 a 0.47	68.0
P2	1 a 3	20X50	0 a 53.2	0.174 a 0.248	14 a 58	0 a 0.63	79.8
P3	1 a 3	20X50	0 a 17.5	0.061 a 0.082	15 a 58	0 a 0.47	68.0
P4	1 a 3	20X50	0 a 25.5	0.072 a 0.119	14 a 58	0 a 0.63	79.8
P5	1 a 3	20X50	0 a 49.2	0.158 a 0.23	14 a 58	0 a 0.98	108.4
P6	1 a 3	20X50	0 a 47.2	0.152 a 0.22	14 a 58	0 a 0.74	89.9
P7	1 a 3	20X50	0 a 44.9	0.147 a 0.209	14 a 58	0 a 0.47	68.0
P8	1 a 3	20X50	0 a 45.4	0.145 a 0.212	14 a 58	0 a 0.47	68.0
P9	1 a 3	20X50	0 a 52.3	0.17 a 0.244	14 a 58	0 a 0.98	108.4
P10	1 a 3	20X50	0 a 18	0.063 a 0.084	15 a 58	0 a 0.47	68.0
P11	1 a 3	20X50	0 a 24.1	0.065 a 0.113	14 a 58	0 a 0.63	79.8
P12	1 a 3	20X50	0 a 48.2	0.155 a 0.225	14 a 58	0 a 0.63	79.8
P13	1 a 3	20X50	0 a 48.5	0.157 a 0.226	14 a 58	0 a 0.63	79.8
P14	1 a 3	20X50	0 a 23.8	0.077 a 0.111	14 a 58	0 a 0.47	68.0
P15	1 a 3	20X50	0 a 33.6	0.118 a 0.157	14 a 60	0 a 0.63	79.8
P16	1 a 3	20X50	0 a 82.1	0.305 a 0.383	14 a 58	0 a 0.47	69.0
P17	1 a 3	20X50	0 a 26.8	0.105 a 0.125	15 a 58	0 a 0.63	79.8
P18	1 a 3	20X50	0 a 38.6	0.128 a 0.18	14 a 58	0 a 0.47	68.0
P19	1 a 3	20X50	0 a 79.7	0.298 a 0.372	14 a 58	0 a 0.47	68.3
P20	1 a 3	20X50	0 a 71	0.26 a 0.331	14 a 58	0 a 0.47	68.3
P21	1 a 3	20X50	0 a 71.6	0.27 a 0.334	14 a 58	0 a 0.47	68.3
P22	1 a 3	20X50	0 a 69.2	0.267 a 0.323	14 a 58	0 a 0.47	68.3
P23	1 a 3	20X50	0 a 78.1	0.289 a 0.364	14 a 58	0 a 0.47	68.3
P24	1 a 3	20X50	0 a 27.6	0.106 a 0.129	15 a 58	0 a 0.47	68.0
P25	1 a 3	20X50	0 a 36.5	0.121 a 0.17	14 a 58	0 a 0.74	89.9
P26	1 a 3	20X50	0 a 80	0.298 a 0.373	14 a 58	0 a 0.47	68.3
P27	1 a 3	20X50	0 a 73.9	0.271 a 0.345	14 a 58	0 a 0.47	68.3
P28	1 a 3	20X50	0 a 36.4	0.124 a 0.17	14 a 60	0 a 0.98	108.4
P29	1 a 3	20X50	0 a 37.5	0.127 a 0.175	14 a 60	0 a 0.47	68.0
P30	1 a 3	20X50	0 a 18.1	0.05 a 0.084	14 a 60	0 a 0.47	68.0

P31	1 a 3	20X50	0 a 26.4	0.087 a 0.123 	14 a 58 	0 a 0.47 	68.0 
P32	1 a 3	20X50	0 a 48.1	0.174 a 0.224 	14 a 58 	0 a 0.47 	68.0 
P33	1 a 3	20X50	0 a 17.1	0.06 a 0.08 	15 a 58 	0 a 0.47 	68.0 
P34	1 a 3	20X50	0 a 22.3	0.081 a 0.104 	14 a 58 	0 a 0.47 	68.0 
P35	1 a 3	30X50	0 a 55	0.229 a 0.257 	37 a 61 	0 a 1.15 	108.9 
P36	1 a 3	30X50	0 a 41.7	0.177 a 0.194 	14 a 35 	0 a 0.98 	101.6 
P37	1 a 3	20X50	0 a 16.2	0.049 a 0.076 	14 a 58 	0 a 0.47 	68.0 
P38	1 a 3	20X50	0 a 17.7	0.066 a 0.083 	15 a 58 	0 a 0.47 	68.0 
P39	1 a 3	20X50	0 a 40.4	0.15 a 0.189 	14 a 60 	0 a 0.47 	68.0 
P40	1 a 3	20X50	0 a 47.4	0.184 a 0.221 	14 a 58 	0 a 0.47 	68.0 
P41	1 a 3	20X50	0 a 51.9	0.194 a 0.242 	14 a 58 	0 a 0.47 	68.0 
P42	1 a 3	20X50	0 a 49.1	0.185 a 0.229 	14 a 64 	0 a 0.47 	68.0 
P43	1 a 3	20X50	0 a 26.1	0.101 a 0.122 	15 a 58 	0 a 0.47 	68.0 
P44	1 a 3	20X50	0 a 34	0.109 a 0.159 	14 a 58 	0 a 0.47 	68.0 
P45	1 a 3	20X50	0 a 57.5	0.224 a 0.268 	14 a 56 	0 a 0.47 	68.0 
P46	1 a 2	20X40	5 a 7	0.023 a 0.033 	6 a 32 	0.59 a 0.59 	101.1 
P47	1 a 1	20X40	17.9 a 17.9	0.084 a 0.084 	10 a 22 	0.92 a 0.92 	168.6 
P48	1 a 1	20X40	0 a 23.1	0.108 a 0.108 	17 a 35 	0 a 0.59 	91.6 
P49	1 a 3	20X60	0 a 52.1	0.15 a 0.243 	12 a 58 	0 a 0.39 	59.2 
P50	1 a 3	20X60	0 a 47.4	0.149 a 0.221 	12 a 60 	0 a 0.65 	82.5 
P51	1 a 3	20X50	0 a 18.9	0.062 a 0.088 	14 a 60 	0 a 0.47 	68.0 
P52	1 a 3	20X50	0 a 55.9	0.174 a 0.261 	14 a 60 	0 a 0.47 	68.0 
P53	1 a 3	20X50	0 a 37.4	0.116 a 0.175 	14 a 60 	0 a 0.47 	68.0 
P54	1 a 3	20X50	0 a 23.6	0.069 a 0.11 	15 a 60 	0 a 0.98 	108.4 
P55	1 a 3	20X50	0 a 64.1	0.21 a 0.299 	14 a 64 	0 a 0.47 	68.0 
P56	1 a 3	20X50	0 a 22.7	0.075 a 0.106 	15 a 64 	0 a 0.47 	68.0 
P57	1 a 3	20X50	0 a 35.5	0.112 a 0.166 	14 a 64 	0 a 3.93 	337.8 
P58	1 a 2	20X40	4.2 a 6.8	0.019 a 0.032 	6 a 32 	0.59 a 0.59 	101.1 

P59	1 a 1	30X40	17.1 a 17.1	0.08 a 0.08 	10 a 14 	1.01 a 1.01 	206.0 
P60	1 a 1	20X40	0 a 30	0.14 a 0.14 	17 a 35 	0 a 0.59 	91.6 
P61	1 a 3	20X50	0 a 68.3	0.215 a 0.319 	14 a 60 	0 a 0.47 	68.3 
P62	1 a 3	20X50	0 a 42.6	0.14 a 0.199 	14 a 60 	0 a 0.47 	68.0 
P63	1 a 3	20X50	0 a 82.3	0.262 a 0.384 	14 a 64 	0 a 0.47 	68.3 
P64	1 a 3	20X60	0 a 79.5	0.274 a 0.371 	12 a 56 	0 a 0.39 	60.8 
P65	1 a 3	20X50	0 a 30.3	0.1 a 0.141 	14 a 60 	0 a 0.63 	80.1 
P66	1 a 3	20X60	0 a 84.2	0.264 a 0.393 	12 a 56 	0 a 0.39 	60.8 
P67	1 a 3	20X50	0 a 31.7	0.105 a 0.148 	14 a 64 	0 a 0.47 	68.0 
P68	1 a 3	20X50	0 a 58.8	0.193 a 0.275 	14 a 60 	0 a 0.47 	68.3 
P69	1 a 3	20X50	0 a 28.5	0.105 a 0.133 	15 a 58 	0 a 0.47 	68.0 
P70	1 a 3	20X50	0 a 42.6	0.12 a 0.199 	14 a 60 	0 a 0.47 	68.0 
P71	1 a 3	20X50	0 a 39.1	0.13 a 0.183 	14 a 64 	0 a 0.47 	68.0 
P72	1 a 2	20X40	8.2 a 9.2	0.038 a 0.043 	6 a 32 	0.59 a 0.59 	101.1 
P73	1 a 1	20X40	11.8 a 11.8	0.055 a 0.055 	10 a 22 	0.59 a 0.59 	103.4 
P74	1 a 1	20X40	0 a 18.4	0.086 a 0.086 	17 a 35 	0 a 0.59 	91.6 
P75	1 a 3	20X50	0 a 13.4	0.045 a 0.063 	14 a 58 	0 a 0.47 	68.0 
P76	1 a 3	20X50	0 a 49.7	0.183 a 0.232 	14 a 58 	0 a 0.47 	68.0 
P77	1 a 3	20X50	0 a 16.4	0.059 a 0.076 	15 a 58 	0 a 0.47 	68.0 
P78	1 a 3	20X50	0 a 22.6	0.08 a 0.105 	14 a 58 	0 a 0.47 	68.0 
P79	1 a 3	30X50	0 a 51.6	0.232 a 0.241 	14 a 61 	0 a 1.96 	192.6 
P80	1 a 3	30X50	0 a 41.1	0.181 a 0.192 	14 a 35 	0 a 1.96 	192.6 
P81	1 a 3	20X50	0 a 23.6	0.071 a 0.11 	14 a 58 	0 a 0.47 	68.0 
P82	1 a 3	20X50	0 a 18.7	0.07 a 0.087 	15 a 58 	0 a 0.47 	68.0 
P83	1 a 3	20X50	0 a 48.6	0.177 a 0.227 	14 a 60 	0 a 0.47 	68.0 
P84	1 a 3	20X50	0 a 41.8	0.164 a 0.195 	14 a 58 	0 a 0.47 	68.0 
P85	1 a 3	20X50	0 a 62.1	0.236 a 0.29 	14 a 58 	0 a 0.47 	68.0 
P86	1 a 3	20X50	0 a 50.6	0.191 a 0.236 	14 a 60 	0 a 0.47 	68.0 

P87	1 a 3	20X50	0 a 17.2	0.065 a 0.08 	15 a 58 	0 a 0.47 	68.0 
P88	1 a 3	20X50	0 a 19.8	0.067 a 0.093 	14 a 58 	0 a 0.47 	68.0 
P89	1 a 3	20X60	0 a 65.2	0.239 a 0.304 	12 a 56 	0 a 0.39 	59.2 
P90	1 a 3	20X60	0 a 47.4	0.156 a 0.221 	12 a 60 	0 a 0.39 	59.0 
P91	1 a 3	20X50	0 a 24.2	0.068 a 0.113 	14 a 60 	0 a 0.74 	89.9 
P92	1 a 3	20X50	0 a 34	0.117 a 0.159 	14 a 60 	0 a 0.98 	108.4 
P93	1 a 3	20X50	0 a 81.3	0.302 a 0.379 	14 a 58 	0 a 0.47 	69.0 
P94	1 a 3	20X50	0 a 23.8	0.086 a 0.111 	15 a 58 	0 a 0.47 	68.0 
P95	1 a 3	20X50	0 a 39.5	0.137 a 0.184 	14 a 58 	0 a 0.47 	68.0 
P96	1 a 3	20X50	0 a 79	0.295 a 0.369 	14 a 58 	0 a 0.47 	68.3 
P97	1 a 3	20X50	0 a 70.6	0.259 a 0.329 	14 a 58 	0 a 0.47 	68.3 
P98	1 a 3	20X50	0 a 72.2	0.272 a 0.337 	14 a 58 	0 a 0.47 	68.3 
P99	1 a 3	20X50	0 a 66.7	0.255 a 0.311 	14 a 58 	0 a 0.47 	68.3 
P100	1 a 3	20X50	0 a 77.2	0.287 a 0.36 	14 a 58 	0 a 0.47 	68.3 
P101	1 a 3	20X50	0 a 28	0.105 a 0.131 	15 a 58 	0 a 0.47 	68.0 
P102	1 a 3	20X50	0 a 35.5	0.12 a 0.166 	14 a 58 	0 a 0.74 	89.9 
P103	1 a 3	20X50	0 a 79.1	0.294 a 0.369 	14 a 58 	0 a 0.47 	68.3 
P104	1 a 3	20X50	0 a 73.5	0.27 a 0.343 	14 a 58 	0 a 0.47 	68.3 
P105	1 a 3	20X50	0 a 35.8	0.123 a 0.167 	14 a 60 	0 a 0.98 	108.4 
P106	1 a 3	20X50	0 a 23.3	0.074 a 0.109 	14 a 58 	0 a 0.47 	68.0 
P107	1 a 3	20X50	0 a 53.8	0.176 a 0.251 	14 a 58 	0 a 0.74 	89.9 
P108	1 a 3	20X50	0 a 13.2	0.042 a 0.061 	15 a 58 	0 a 0.47 	68.0 
P109	1 a 3	20X50	0 a 28.8	0.086 a 0.135 	14 a 58 	0 a 0.47 	68.0 
P110	1 a 3	20X50	0 a 49.8	0.16 a 0.232 	14 a 58 	0 a 0.98 	108.4 
P111	1 a 3	20X50	0 a 47.7	0.154 a 0.223 	14 a 58 	0 a 0.98 	108.4 
P112	1 a 3	20X50	0 a 45	0.148 a 0.21 	14 a 58 	0 a 0.47 	68.3 
P113	1 a 3	20X50	0 a 46	0.148 a 0.214 	14 a 58 	0 a 0.47 	68.3 
P114	1 a 3	20X50	0 a 53.2	0.173 a 0.248 	14 a 58 	0 a 1.23 	118.7 
P115	1 a 3	20X50	0 a 18.2	0.065 a 0.085 	15 a 58 	0 a 0.63 	79.8 
P116	1 a 3	20X50	0 a 24.8	0.067 a 0.116 	14 a 58 	0 a 0.63 	79.8 

P117	1 a 3	20X50	0 a 49	0.158 a 0.228 	14 a 58 	0 a 0.74 	89.9 
P118	1 a 3	20X50	0 a 48.9	0.158 a 0.228 	14 a 58 	0 a 0.63 	79.8 
P119	1 a 3	20X50	0 a 24	0.078 a 0.112 	14 a 58 	0 a 0.47 	68.0 
P120	1 a 3	15X25	0 a 13.8	0.044 a 0.064 	28 a 82 	0 a 0.84 	107.2 
P121	1 a 3	15X25	0 a 14.1	0.045 a 0.066 	28 a 82 	0 a 0.84 	107.2 
P122	1 a 3	15X25	0 a 14.3	0.046 a 0.067 	28 a 82 	0 a 0.84 	107.2 
P123	1 a 3	15X25	0 a 14.6	0.046 a 0.068 	28 a 82 	0 a 0.84 	107.2 
P1A	1 a 2	20X40	1.1 a 1.5	0.005 a 0.007 	6 a 32 	0.59 a 0.59 	101.1 
P2A	1 a 1	20X40	0 a 3.3	0.015 a 0.015 	17 a 32 	0 a 0.59 	91.6 
P3A	1 a 1	20X20	1.5 a 1.5	0.007 a 0.007 	22 a 43 	0.79 a 0.79 	128.4 
P4A	1 a 1	20X20	5 a 5	0.023 a 0.023 	22 a 22 	0.79 a 0.79 	128.4 

σ : Tensão de Cálculo (Carga Vertical: Combinação 1 TQS PILAR)

v : Força normal adimensional

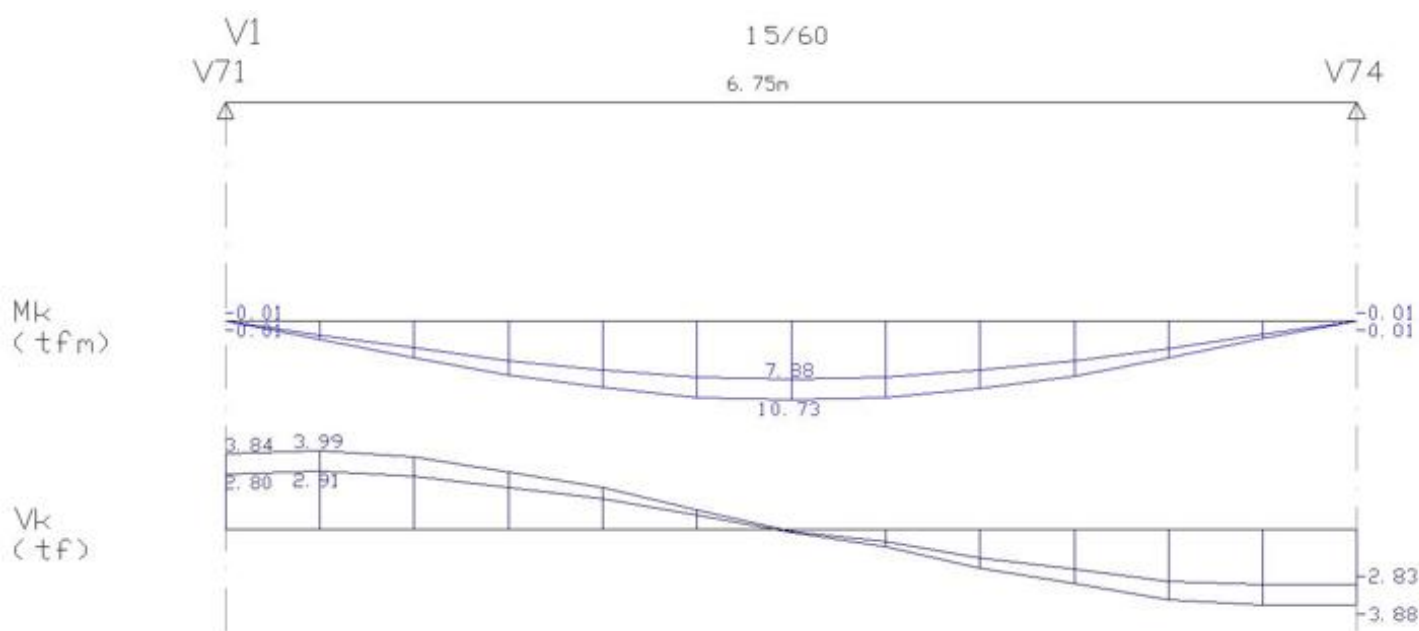
λ : Índice de esbeltez

ρ : Taxa geométrica de armadura

Taxa de aço: Massa de aço por volume de concreto

8. VIGAS

Segue diagramas de momento fletor e esforço cortante e quadro de dimensionamento das vigas da cobertura:



V1

Viga= 1 V1 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----

Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.80 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]

--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -

FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A

| M.[-] = 0.0 tf* m | M.[+] Max= 10.7 tf* m - Abcis.= 337 | M.[-] = 0.0 tf* m

[tf,cm] | AsL= 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 -SRAS- [0 B 6.3mm]

| AsL= 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 -SRAS- [0 B 6.3mm]

| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 2.4 | Grampos Dir.= 3B 8.0mm x/dMx=0.45

[tf,cm] | M[-]Min = 283.3 | M[+]Min = 273.5 | M[-]Min = 283.3

[cm2] | Asapo[+]= 2.12 | Asapo[+]= 2.12 | Asapo[+]= 2.12

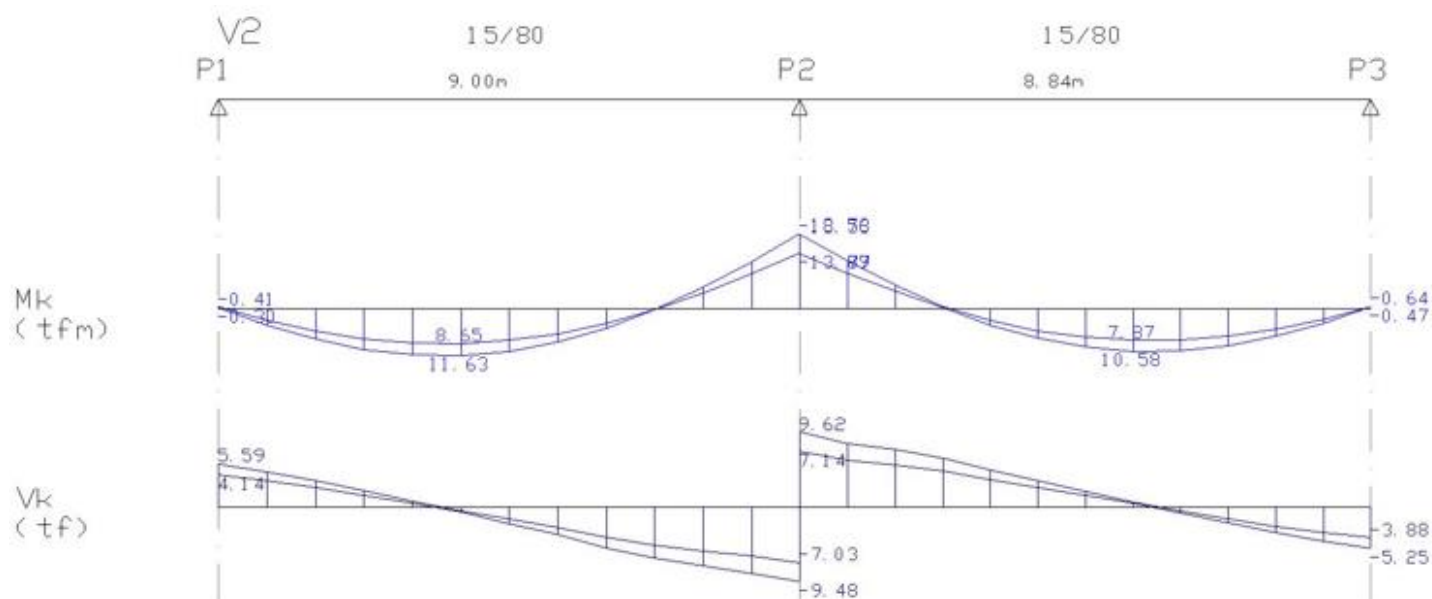
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M

[tf,cm] 0.- 660. 5.58 42.43 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:

1 3.835 2.796 0.15 0.00 2 V71 0.00 0.00 0 0 0 0 0 0

2 3.882 2.831 0.15 0.00 2 V74 0.00 0.00 0 0 0 0 0 0



V2

Viga= 2 V2 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm] M.[-] = 0.4 tf* m | M.[+] Max= 11.6 tf* m - Abcis.= 375 | M.[-] = 18.7 tf* m
[tf,cm] As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 9.44 -SRAS- [3 B 20.0mm]
[tf,cm] AsL= 0.00 ----- x/d =0.06 | As = 5.03 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.26
[tf,cm] Grampos Esq.= 2B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.8 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
[tf,cm] M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
[cm2] Asapo[+]= 1.89 | Asapo[+]= 1.26

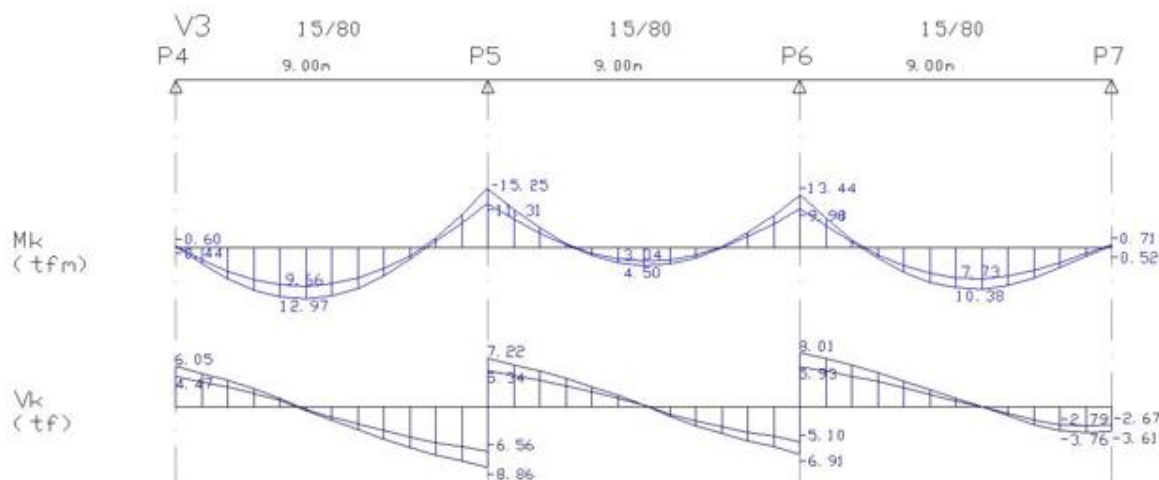
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 13.27 57.79 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 0.81 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm] M.[-] = 18.6 tf* m | M.[+] Max= 10.6 tf* m - Abcis.= 515 | M.[-] = 0.6 tf* m
[tf,cm] As = 9.34 -SRAS- [3 B 20.0mm] | AsL= 0.00 ----- | As = 2.30 -SRAS- [3 B 10.0mm]
[tf,cm] AsL= 0.00 ----- x/d =0.26 | As = 4.57 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.06
[tf,cm] Grampos Dir.= 2B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
[tf,cm] M[-]Min = 1059.5 | M[+]Min = 489.2 | M[-]Min = 522.7
[cm2] Asapo[+]= 1.14 | Asapo[+]= 1.69

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 869. 13.47 57.85 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 5.587 4.130 0.15 0.00 1 P1 0.00 0.00 1 0 0 0 0 0
2 19.103 14.165 0.15 0.00 1 P2 0.00 0.00 2 0 0 0 0 0
3 5.249 3.881 0.15 0.00 1 P3 0.00 0.00 3 0 0 0 0 0



V3

Viga= 3 V3

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.6 tf* m | M.[+] Max= 13.0 tf* m - Abcis.= 375 | M.[-] = 15.2 tf* m |
[tf,cm]| As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 | As = 7.21 -SRAS- [4 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.06 | As = 5.65 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.19 |
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0 | | x/dMx=0.45 |
[tf,cm]| M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7 |
[cm2]| Asapo[+] = 1.95 | | Asapo[+] = 1.41 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 12.41 57.76 1 45. 0.9 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.69 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 15.0 tf* m | M.[+] Max= 4.5 tf* m - Abcis.= 450 | M.[-] = 13.3 tf* m |
[tf,cm]| As = 7.10 -SRAS- [4 B 16.0mm] | AsL= 0.00 | As = 6.15 -SRAS- [3 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.19 | As = 3.02 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.16 |
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | | x/dMx=0.45 |
[tf,cm]| M[-]Min = 941.1 | M[+]Min = 476.8 | M[-]Min = 941.1 |
[cm2]| Asapo[+] = 0.75 | | Asapo[+] = 0.75 |

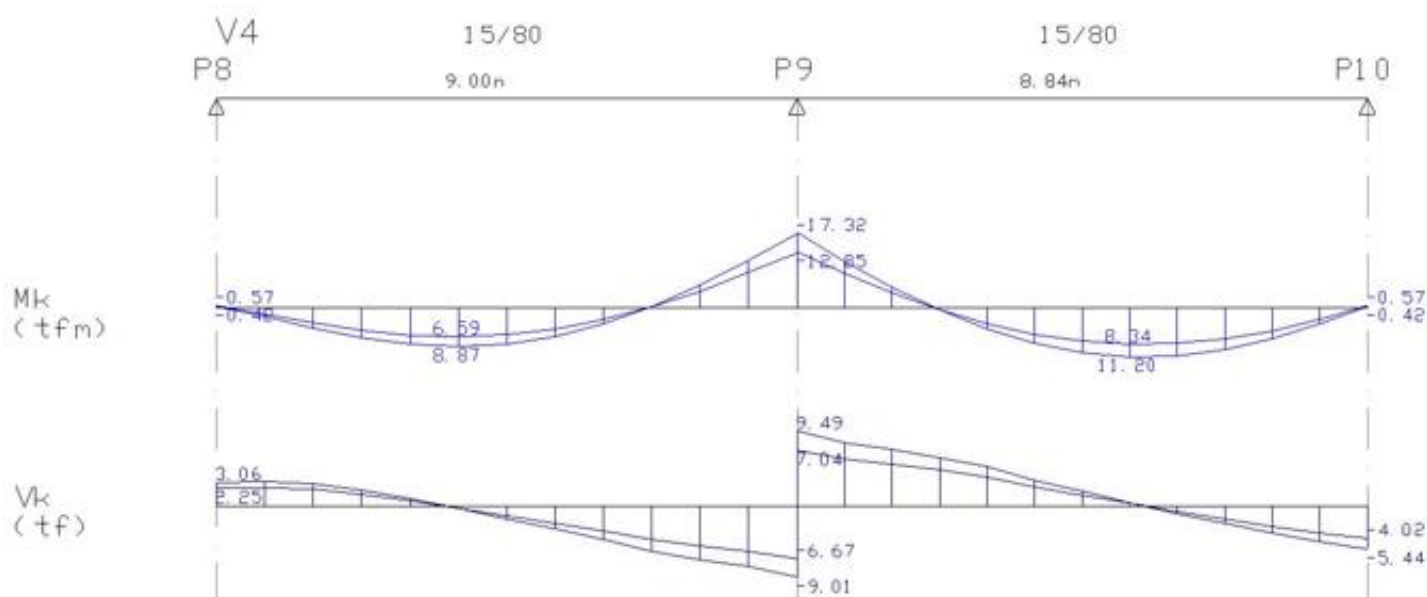
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 10.11 57.85 1 45. 0.1 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 13.4 tf* m | M.[+] Max= 10.4 tf* m - Abcis.= 525 | M.[-] = 0.7 tf* m |
[tf,cm]| As = 6.20 -SRAS- [3 B 16.0mm] | AsL= 0.00 | As = 2.31 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.17 | As = 4.48 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.06 |
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.6 | Grampos Dir.= 1B 6.3mm x/dMx=0.45 |
[tf,cm]| M[-]Min = 1070.7 | M[+]Min = 490.3 | M[-]Min = 525.8 |
[cm2]| Asapo[+] = 1.12 | | Asapo[+] = 1.49 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 11.22 57.85 1 45. 0.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 6.037 4.468 0.15 0.00 1 P4 0.00 0.00 4 0 0 0 0 0
2 16.084 11.899 0.15 0.00 1 P5 0.00 0.00 5 0 0 0 0 0
3 14.923 11.034 0.15 0.00 1 P6 0.00 0.00 6 0 0 0 0 0
4 3.615 2.666 0.15 0.00 1 P7 0.00 0.00 7 0 0 0 0 0



V4

Viga= 4 V4

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 0.6 tf* m | M.[+] Max= 8.9 tf* m - Abcis.= 375 | M.[-] = 17.3 tf* m |
 [tf,cm]| As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 8.63 -SRAS- [3 B 20.0mm] |
 | AsL= 0.00 ----- x/d =0.06 | As = 3.81 -STAS- [2 B 16.0mm] | AsL= 0.00 ----- x/d =0.24 |
 | Grampos Esq.= 2B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.4 | | x/dMx=0.45 |
 [tf,cm]| M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7 |
 [cm2]| Asapo[+]= 1.27 | | Asapo[+]= 0.95 |

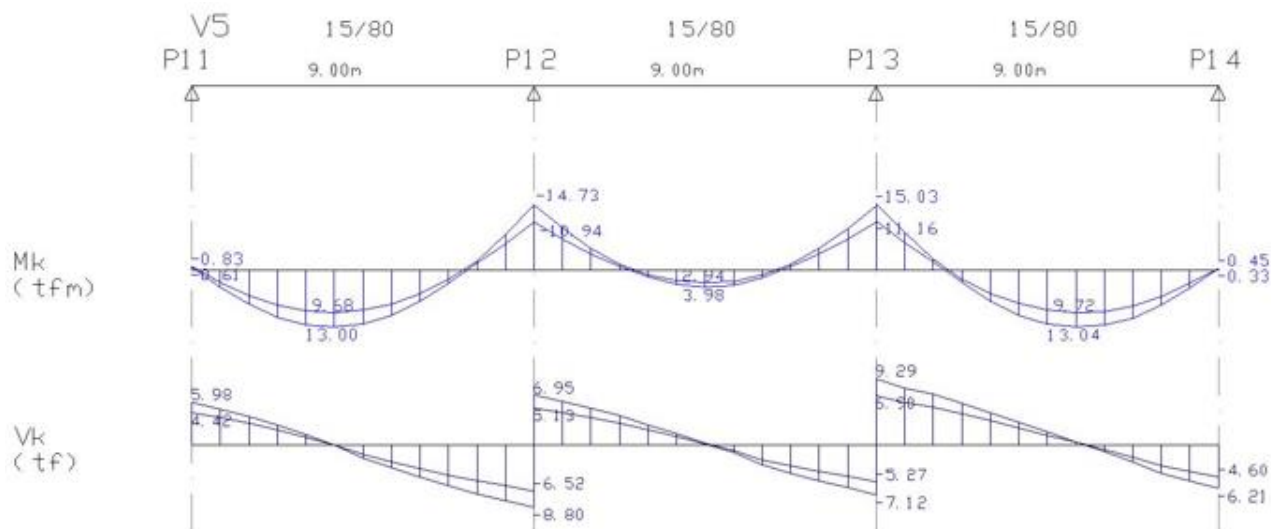
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 885. 12.61 57.85 1 45. 0.9 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 0.81 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 17.3 tf* m | M.[+] Max= 11.2 tf* m - Abcis.= 515 | M.[-] = 0.6 tf* m |
 [tf,cm]| As = 8.64 -SRAS- [3 B 20.0mm] | AsL= 0.00 ----- | As = 2.30 -SRAS- [3 B 10.0mm] |
 | AsL= 0.00 ----- x/d =0.24 | As = 4.84 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.06 |
 | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.8 | Grampos Dir.= 2B 6.3mm x/dMx=0.45 |
 [tf,cm]| M[-]Min = 1059.5 | M[+]Min = 489.2 | M[-]Min = 522.7 |
 [cm2]| Asapo[+]= 1.21 | | Asapo[+]= 1.76 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 869. 13.28 57.79 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 3.058 2.250 0.15 0.00 1 P8 0.00 0.00 8 0 0 0 0 0
 2 18.493 13.710 0.15 0.00 1 P9 0.00 0.00 9 0 0 0 0 0
 3 5.435 4.022 0.15 0.00 1 P10 0.00 0.00 10 0 0 0 0 0



V5

Viga= 5 V5

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A
| M.[-] = 0.8 tf* m | M.[+] Max= 13.0 tf* m - Abcis.= 375 | M.[-] = 14.7 tf* m
[tf,cm] | As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 6.95 -SRAS- [4 B 16.0mm]
| AsL= 0.00 ----- x/d =0.06 | As = 5.66 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.19
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0 | x/dMx=0.45
[tf,cm] | M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
[cm2] | Asapo[+] = 1.92 | Asapo[+] = 1.42

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 12.33 57.77 1 45. 0.8 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.69 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A
| M.[-] = 14.7 tf* m | M.[+] Max= 4.0 tf* m - Abcis.= 450 | M.[-] = 14.6 tf* m
[tf,cm] | As = 6.94 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 6.89 -SRAS- [4 B 16.0mm]
| AsL= 0.00 ----- x/d =0.19 | As = 3.02 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.19
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | x/dMx=0.45
[tf,cm] | M[-]Min = 941.1 | M[+]Min = 476.8 | M[-]Min = 941.1
[cm2] | Asapo[+] = 0.75 | Asapo[+] = 0.75

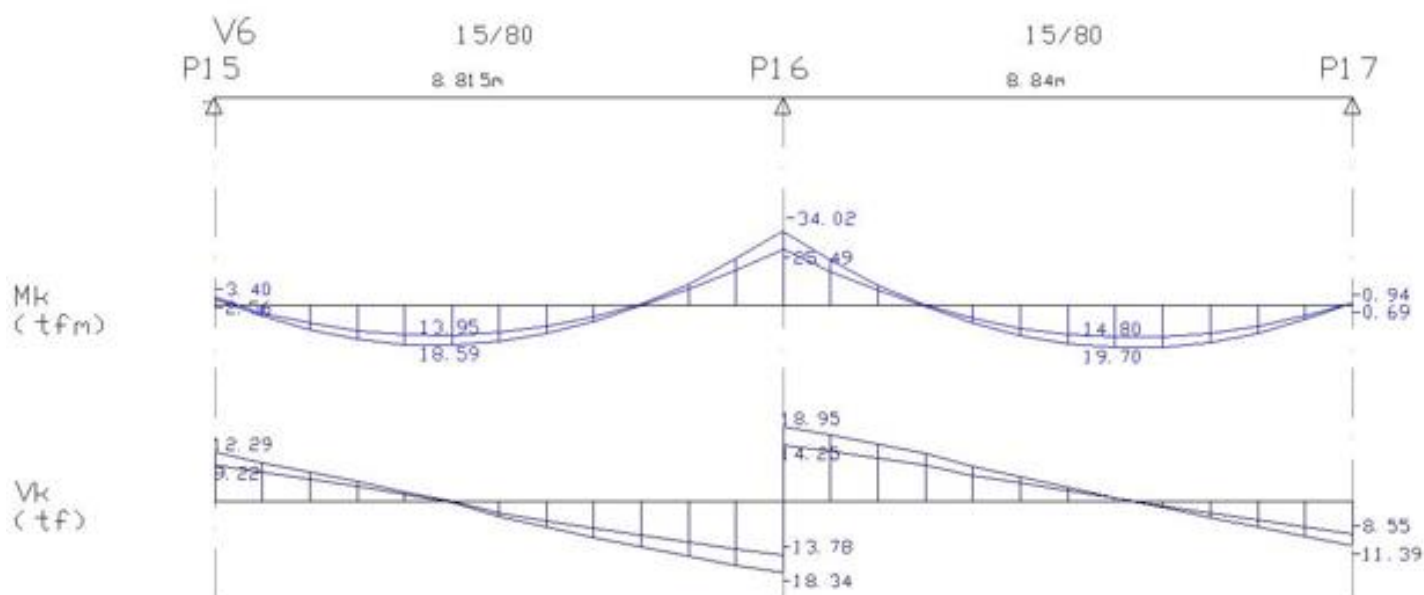
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 9.97 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A
| M.[-] = 15.0 tf* m | M.[+] Max= 13.0 tf* m - Abcis.= 525 | M.[-] = 0.5 tf* m
[tf,cm] | As = 7.10 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 2.31 -SRAS- [3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.19 | As = 5.68 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.06
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | Grampos Dir.= 2B 8.0mm x/dMx=0.45
[tf,cm] | M[-]Min = 1070.7 | M[+]Min = 490.3 | M[-]Min = 525.8
[cm2] | Asapo[+] = 1.42 | Asapo[+] = 2.00

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 13.01 57.75 1 45. 1.1 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 5.967 4.418 0.15 0.00 1 P11 0.00 0.00 11 0 0 0 0
2 15.750 11.653 0.15 0.00 1 P12 0.00 0.00 12 0 0 0 0
3 16.410 12.163 0.15 0.00 1 P13 0.00 0.00 13 0 0 0 0
4 6.205 4.597 0.15 0.00 1 P14 0.00 0.00 14 0 0 0 0



V6

Viga= 6 V6

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 3.4 tf* m | M.[+] Max= 18.6 tf* m - Abcis.= 367 | M.[-] = 34.0 tf* m
 | As = 3.07 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 19.16 -SRAD- [4 B 25.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 8.19 -STAS- [4 B 16.0mm] | AsL= 3.93 ----- x/d =0.45
 | | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | | | x/dMx=0.45
 | % Baric.Armad.= 2 | % Baric.Armad.= 3
 [tf,cm] | M[-]Min = 686.6 | M[+]Min = 528.7 | M[-]Min = 1612.7
 [cm2] | Asapo[+] = 3.17 | | | Asapo[+] = 3.93

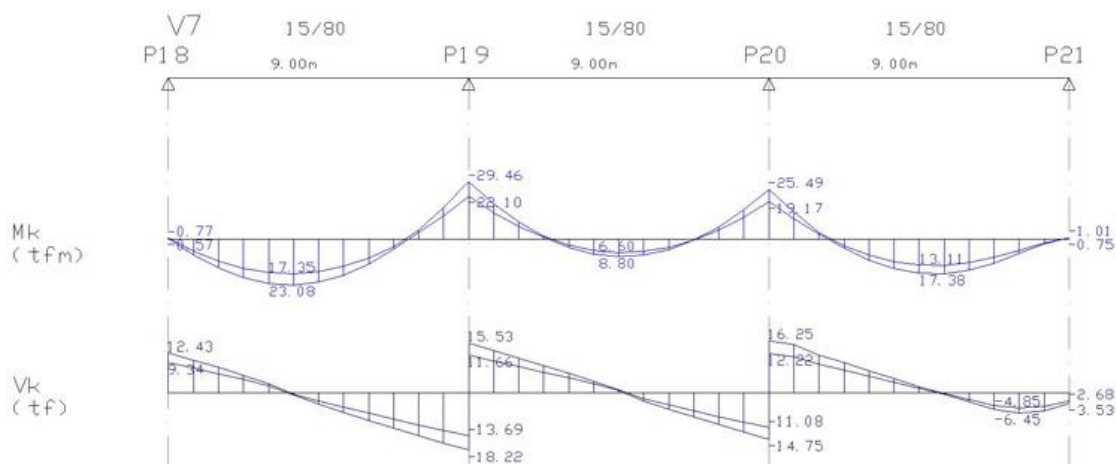
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 170. 17.21 57.62 1 45. 2.5 1.7 2.5 6.3 25.0 2 0.0 0.0
 170.- 510. 10.38 57.37 1 45. 0.2 1.7 1.7 6.3 30.0 2 0.0 0.0
 510.- 680. 18.38 57.64 1 45. 2.9 1.7 2.9 6.3 20.0 2 0.0 0.0
 680.- 850. 25.68 56.60 1 45. 5.5 1.7 5.5 6.3 10.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 1.48 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 33.8 tf* m | M.[+] Max= 19.7 tf* m - Abcis.= 515 | M.[-] = 0.9 tf* m
 | As = 19.04 -SRAD- [4 B 25.0mm] | AsL= 0.00 ----- | As = 3.08 -SRAS- [4 B 10.0mm]
 | AsL= 3.81 ----- x/d =0.45 | As = 8.61 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.08
 | | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | | | Grampos Dir.= 3B 8.0mm x/dMx=0.45
 | ***AsL Compr.*** | % Baric.Armad.= 2
 [tf,cm] | M[-]Min = 1615.5 | M[+]Min = 528.8 | M[-]Min = 687.5
 [cm2] | Asapo[+] = 3.81 | | | Asapo[+] = 2.88

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 174. 26.53 56.62 1 45. 5.8 1.7 5.8 6.3 10.0 2 0.0 0.0
 174.- 348. 18.85 57.59 1 45. 3.1 1.7 3.1 6.3 20.0 2 0.0 0.0
 348.- 869. 15.95 57.50 1 45. 2.1 1.7 2.1 6.3 30.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 12.275 9.211 0.50 0.01 1 P15 0.00 0.00 15 0 0 0 0
 2 37.293 28.024 0.15 0.00 1 P16 0.00 0.00 16 0 0 0 0
 3 11.391 8.552 0.15 0.00 1 P17 0.00 0.00 17 0 0 0 0



V7

Viga= 7 V7

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm]| M.[-] = 0.8 tf* m | M.[+] Max= 23.1 tf* m - Abcis.= 375 | M.[-] = 29.5 tf* m
[tf,cm]| As = 3.10 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 16.85 -SRAD- [4 B 25.0mm]
[tf,cm]| AsL= 0.00 ----- | As = 10.31 -STAS- [5 B 16.0mm] | AsL= 1.61 ----- x/d =0.45
[tf,cm]| Grampos Esq.= 4B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | ***AsL Compr.***
[tf,cm]| % Baric.Armad.= 2 | % Baric.Armad.= 4 | % Baric.Armad.= 11 ***
[tf,cm]| M[-]Min = 693.3 | M[+]Min = 529.8 | M[-]Min = 1633.4
[cm2]| Asapo[+] = 3.44 | Asapo[+] = 2.58

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 177. 17.41 57.47 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0
177.- 531. 9.38 57.16 1 45. 0.0 1.7 1.7 6.3 30.0 2 0.0 0.0
531.- 708. 17.60 57.41 1 45. 2.7 1.7 2.7 6.3 22.0 2 0.0 0.0
708.- 885. 25.51 57.03 1 45. 5.4 1.7 5.4 6.3 10.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.23 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm]| M.[-] = 29.2 tf* m | M.[+] Max= 8.8 tf* m - Abcis.= 450 | M.[-] = 25.4 tf* m
[tf,cm]| As = 16.71 -SRAD- [4 B 25.0mm] | AsL= 0.00 ----- | As = 13.83 -SRAS- [3 B 25.0mm]
[tf,cm]| AsL= 1.47 ----- | As = 4.23 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.39
[tf,cm]| ***AsL Compr.*** | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | x/dMx=0.45
[tf,cm]| % Baric.Armad.= 11 *** | % Baric.Armad.= 1 | % Baric.Armad.= 7
[tf,cm]| M[-]Min = 1423.7 | M[+]Min = 517.6 | M[-]Min = 1423.7
[cm2]| Asapo[+] = 1.47 | Asapo[+] = 1.06

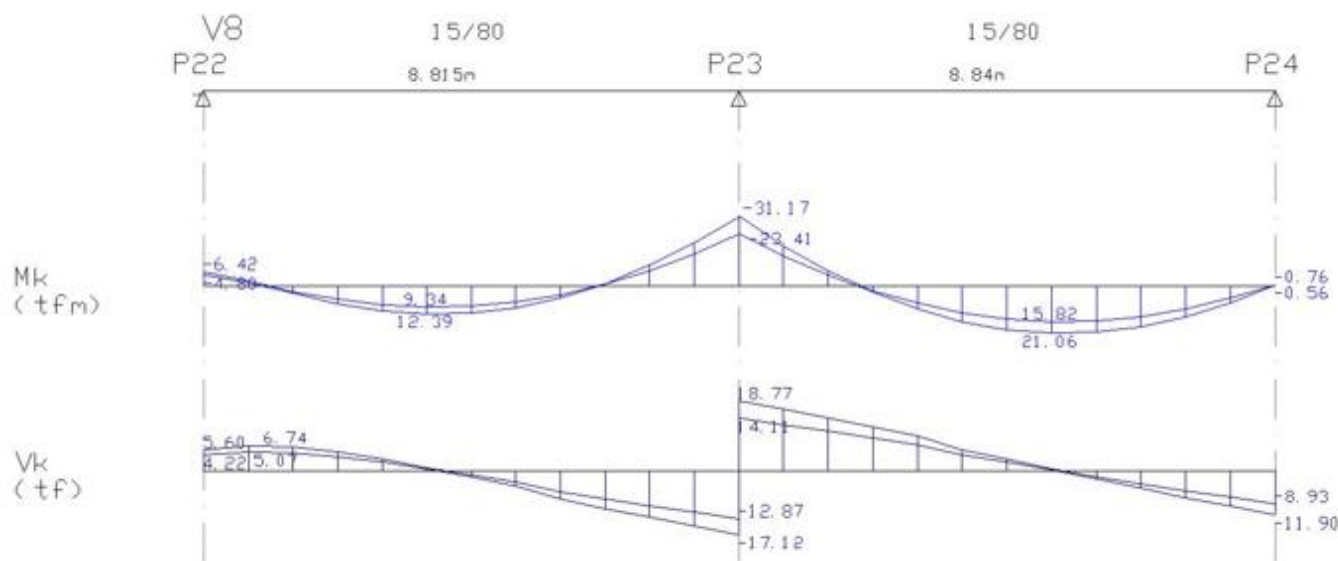
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 177. 21.74 57.06 1 45. 4.1 1.7 4.1 6.3 15.0 2 0.0 0.0
177.- 708. 13.69 57.85 1 45. 1.3 1.7 1.7 6.3 30.0 2 0.0 0.0
708.- 885. 20.65 57.37 1 45. 3.7 1.7 3.7 6.3 15.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm]| M.[-] = 25.5 tf* m | M.[+] Max= 17.4 tf* m - Abcis.= 525 | M.[-] = 1.0 tf* m
[tf,cm]| As = 13.89 -SRAS- [3 B 25.0mm] | AsL= 0.00 ----- | As = 3.10 -SRAS- [4 B 10.0mm]
[tf,cm]| AsL= 0.00 ----- | As = 7.65 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.39
[tf,cm]| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.5 | Grampos Dir.= 3B 8.0mm x/dMx=0.45
[tf,cm]| M[-]Min = 1633.4 | M[+]Min = 529.8 | M[-]Min = 693.3
[cm2]| Asapo[+] = 1.91 | Asapo[+] = 2.55

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 177. 22.75 57.37 1 45. 4.4 1.7 4.4 6.3 12.0 2 0.0 0.0
177.- 885. 14.86 57.74 1 45. 1.7 1.7 1.7 6.3 30.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 12.418 9.331 0.15 0.00 1 P18 0.00 0.00 18 0 0 0 0
2 33.747 25.349 0.15 0.00 1 P19 0.00 0.00 19 0 0 0 0
3 31.001 23.295 0.15 0.00 1 P20 0.00 0.00 20 0 0 0 0
4 3.530 2.681 0.15 0.00 1 P21 0.00 0.00 21 0 0 0 0



V8

Viga= 8 V8 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -		- - - - - D I R E I T A - - - - -	
FLEXAO-	E S Q U E R D A	M E I O D O V A O	D I R E I T A
[tf,cm]	M.[-] = 6.4 tf* m	M.[+] Max= 12.4 tf* m - Abcis.= 367	M.[-] = 31.1 tf* m
	As = 4.51 -SRAS- [4 B 12.5mm]	AsL= 0.00	As = 17.67 -SRAD- [4 B 25.0mm]
	AsL= 0.00	As = 5.37 -STAS- [3 B 16.0mm]	AsL= 2.43
	x/d =0.12	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1	x/d =0.45
	x/dMx=0.45		x/dMx=0.45
	% Baric.Armad.= 2	% Baric.Armad.= 2	***AsL Compr.***
[tf,cm]	M[-]Min = 987.6	M[+]Min = 528.7	% Baric.Armad.= 11 ***
[cm2]	Asapo[+]= 1.34		M[-]Min = 1612.7
			Asapo[+]= 2.54

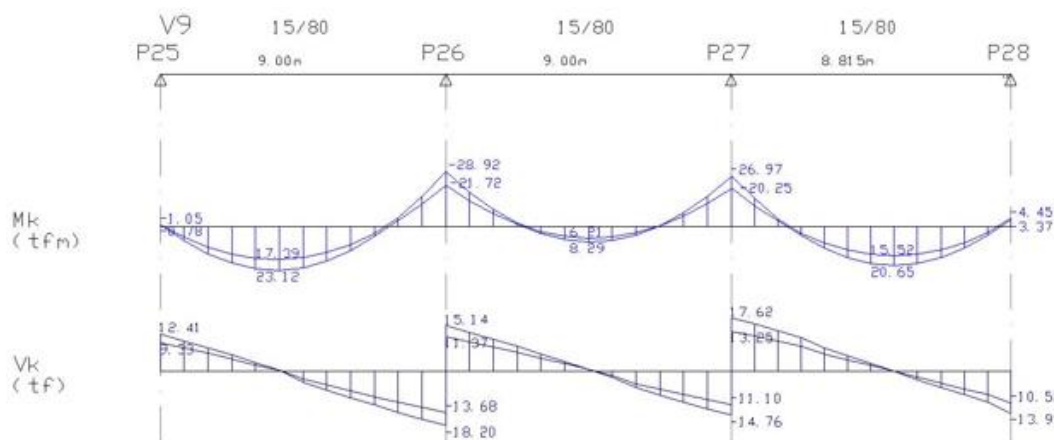
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	510.	9.44	57.84	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	510.-	680.	16.06	57.75	1	45.	2.1	1.7	2.1	6.3	28.0	2	0.0	0.0	
	680.-	850.	23.97	56.88	1	45.	4.9	1.7	4.9	6.3	12.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 1.48 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -		- - - - - D I R E I T A - - - - -	
FLEXAO-	E S Q U E R D A	M E I O D O V A O	D I R E I T A
[tf,cm]	M.[-] = 31.2 tf* m	M.[+] Max= 21.1 tf* m - Abcis.= 515	M.[-] = 0.8 tf* m
	As = 17.72 -SRAD- [4 B 25.0mm]	AsL= 0.00	As = 3.08 -SRAS- [4 B 10.0mm]
	AsL= 2.48	As = 9.21 -STAS- [3 B 20.0mm]	AsL= 0.00
	x/d =0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.9	x/d =0.08
	x/dMx=0.45		x/dMx=0.45
	AsL Compr.		Grampos Dir.= 4B 8.0mm
	% Baric.Armad.= 11 ***	% Baric.Armad.= 2	% Baric.Armad.= 2
[tf,cm]	M[-]Min = 1615.5	M[+]Min = 528.8	M[-]Min = 687.5
[cm2]	Asapo[+]= 2.59		Asapo[+]= 3.07

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	174.	26.28	56.87	1	45.	5.7	1.7	5.7	6.3	10.0	2	0.0	0.0	
	174.-	348.	18.33	57.58	1	45.	2.9	1.7	2.9	6.3	20.0	2	0.0	0.0	
	348.-	695.	8.95	57.34	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	695.-	869.	16.65	57.47	1	45.	2.3	1.7	2.3	6.3	25.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	5.588	4.213	0.50	0.01	1	P22	0.00	0.00	22
2	35.889	26.980	0.15	0.00	1	P23	0.00	0.00	23
3	11.895	8.931	0.15	0.00	1	P24	0.00	0.00	24



V9

Viga= 9 V9

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 1.1 tf* m | M.[+] Max= 23.1 tf* m - Abcis.= 375 | M.[-] = 28.9 tf* m |
As = 3.10 -SRAS- [4 B 10.0mm]	AsL= 0.00 -----	As = 16.57 -SRAD- [4 B 25.0mm]
AsL= 0.00 ----- x/d =0.08	As = 10.33 -STAS- [5 B 16.0mm]	AsL= 1.34 ----- x/d =0.45
Grampos Esq.= 4B 8.0mm x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1	***AsL Compr.*** x/dMx=0.45
% Baric.Armad.= 2	% Baric.Armad.= 4	% Baric.Armad.= 11 ***
[tf,cm]| M[-]Min = 693.3 | M[+]Min = 529.8 | M[-]Min = 1633.4 |
[cm2]| Asapo[+] = 3.44 | Asapo[+] = 2.58 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 177. 17.38 57.47 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0
177.- 531. 9.42 57.15 1 45. 0.0 1.7 1.7 6.3 30.0 2 0.0 0.0
531.- 708. 17.66 57.40 1 45. 2.7 1.7 2.7 6.3 22.0 2 0.0 0.0
708.- 885. 25.49 57.08 1 45. 5.4 1.7 5.4 6.3 10.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.23 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 28.9 tf* m | M.[+] Max= 8.3 tf* m - Abcis.= 450 | M.[-] = 26.5 tf* m |
As = 16.57 -SRAD- [4 B 25.0mm]	AsL= 0.00 -----	As = 14.60 -SRAS- [3 B 25.0mm]
AsL= 1.33 ----- x/d =0.45	As = 4.23 -STAS- [4 B 12.5mm]	AsL= 0.00 ----- x/d =0.41
AsL Compr. x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9	x/dMx=0.45
% Baric.Armad.= 11 ***	% Baric.Armad.= 1	% Baric.Armad.= 7
[tf,cm]| M[-]Min = 1423.7 | M[+]Min = 517.6 | M[-]Min = 1423.7 |
[cm2]| Asapo[+] = 1.44 | Asapo[+] = 1.06 |

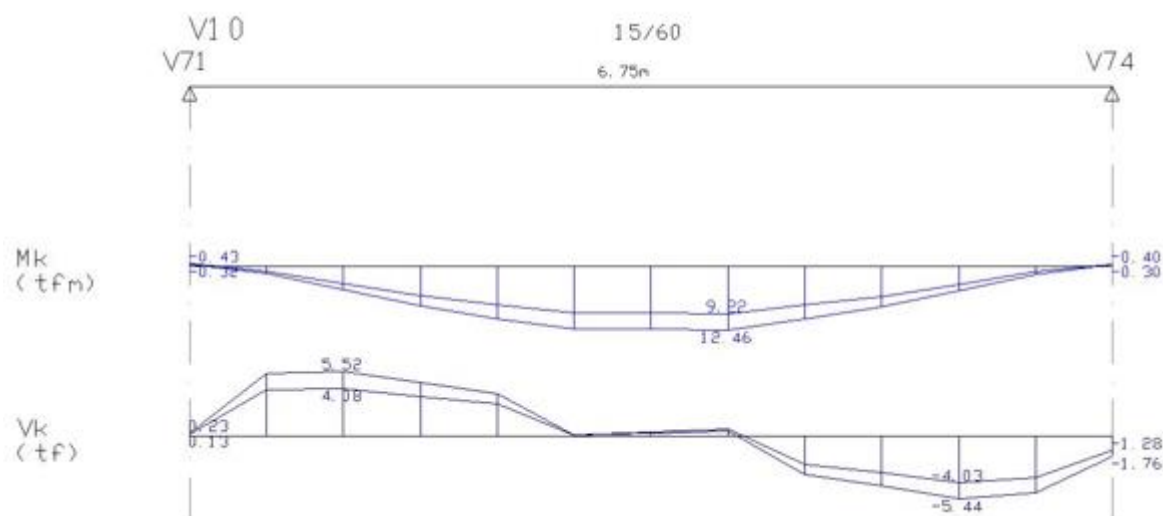
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 177. 21.19 57.08 1 45. 3.9 1.7 3.9 6.3 15.0 2 0.0 0.0
177.- 708. 13.28 57.85 1 45. 1.1 1.7 1.7 6.3 30.0 2 0.0 0.0
708.- 885. 20.67 57.31 1 45. 3.7 1.7 3.7 6.3 15.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 27.0 tf* m | M.[+] Max= 20.6 tf* m - Abcis.= 514 | M.[-] = 4.5 tf* m |
As = 14.90 -SRAS- [3 B 25.0mm]	AsL= 0.00 -----	As = 3.07 -SRAS- [4 B 10.0mm]
AsL= 0.00 ----- x/d =0.42	As = 9.02 -STAS- [3 B 20.0mm]	AsL= 0.00 ----- x/d =0.08
x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.8	x/dMx=0.45
[tf,cm]| M[-]Min = 1612.7 | M[+]Min = 528.7 | M[-]Min = 686.6 |
[cm2]| Asapo[+] = 2.26 | Asapo[+] = 3.73 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 170. 24.66 57.27 1 45. 5.1 1.7 5.1 6.3 12.0 2 0.0 0.0
170.- 340. 17.43 57.53 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0
340.- 680. 8.83 57.37 1 45. 0.0 1.7 1.7 6.3 30.0 2 0.0 0.0
680.- 850. 19.58 57.56 1 45. 3.3 1.7 3.3 6.3 18.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 12.394 9.313 0.15 0.00 1 P25 0.00 0.00 25 0 0 0 0
2 33.341 25.057 0.15 0.00 1 P26 0.00 0.00 26 0 0 0 0
3 32.379 24.346 0.15 0.00 1 P27 0.00 0.00 27 0 0 0 0
4 13.986 10.516 0.50 0.01 1 P28 0.00 0.00 28 0 0 0 0



V10

Viga= 10 V10

Eng.E=Nao /Eng.D=Nao /Repet= 1 /Nand= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----

Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]

--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -

FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |

| M.[-] = 0.4 tf* m | M.[+] Max= 12.5 tf* m - Abcis.= 393 | M.[-] = 0.4 tf* m

[tf,cm] | As = 1.35 -SRAS- [2 B 10.0mm] | AsL= 0.00 ----- | As = 1.35 -SRAS- [2 B 10.0mm]

| AsL= 0.00 ----- x/d =0.04 | As = 8.53 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.04

| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 17.0 | Grampos Dir.= 3B 8.0mm x/dMx=0.45

[tf,cm] | M[-]Min = 195.4 | M.[+]Min = 195.4 | M[-]Min = 195.4

[cm2] | Asapo[+] = 2.84 | Asapo[+] = 2.84

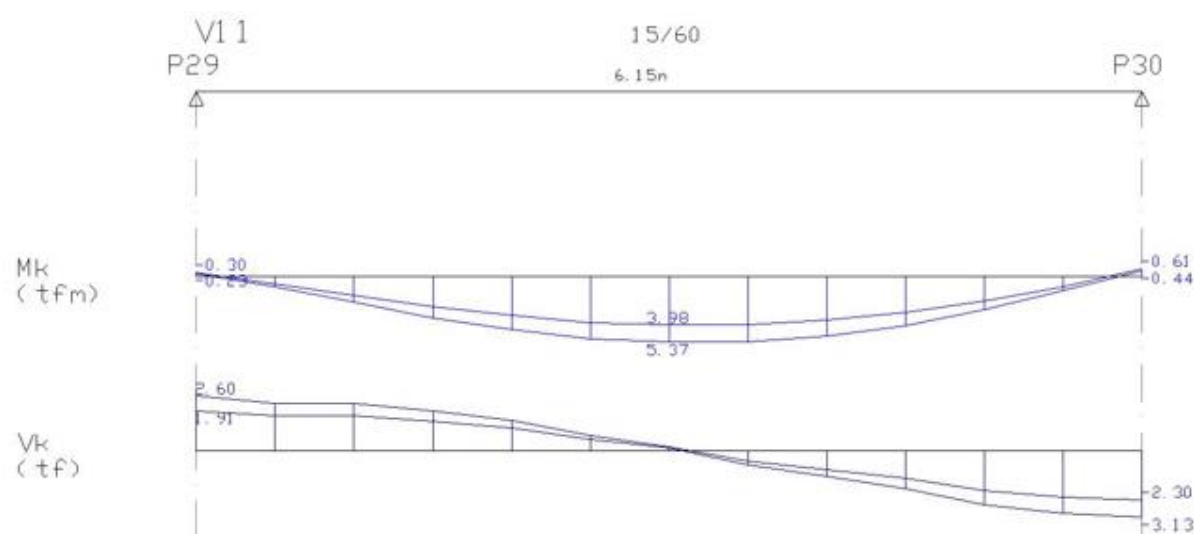
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M

[tf,cm] 0.- 660. 7.72 42.39 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:

1 0.229 0.131 0.15 0.00 2 V71 0.00 0.00 0 0 0 0 0 0

2 1.758 1.276 0.15 0.00 2 V74 0.00 0.00 0 0 0 0 0 0



V11

Viga= 11 V11 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

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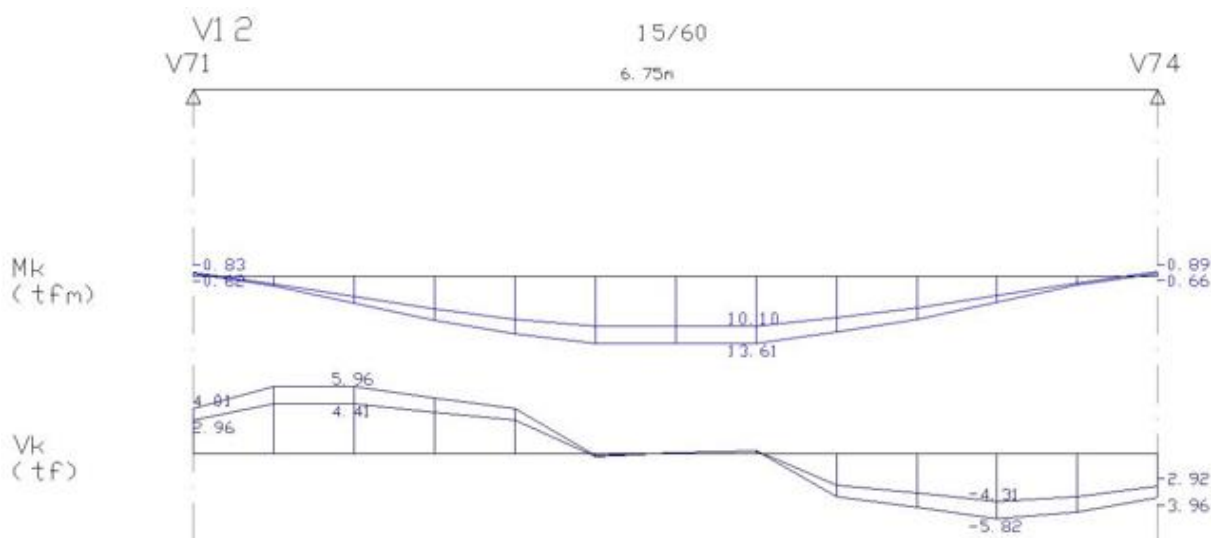
----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 6.15 /B= 0.15 /H= 0.60 /BCs= 0.77 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.3 tf* m | M.[+] Max= 5.4 tf* m - Abcis.= 307 | M.[-] = 0.6 tf* m
[tf,cm] | As = 1.65 -SRAS- [ 3 B 10.0mm] | AsL= 0.00 ----- | As = 1.65 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.06 | As = 3.15 -STAS- [ 4 B 10.0mm ] | AsL= 0.00 ----- x/d =0.06
| Grampos Esq.= 1B 6.3mm x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.2 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
| | | | |
[tf,cm] | M[-]Min = 275.8 | M[+]Min = 271.7 | M[-]Min = 275.8
[cm2 ] | Asapo[+]= 1.05 | | Asapo[+]= 1.05

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 600. 4.38 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 2.601 1.909 0.15 0.00 1 P29 0.00 0.00 29 0 0 0 0 0
2 3.126 2.298 0.15 0.00 1 P30 0.00 0.00 30 0 0 0 0 0

```



V12

Viga= 12 V12 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

```

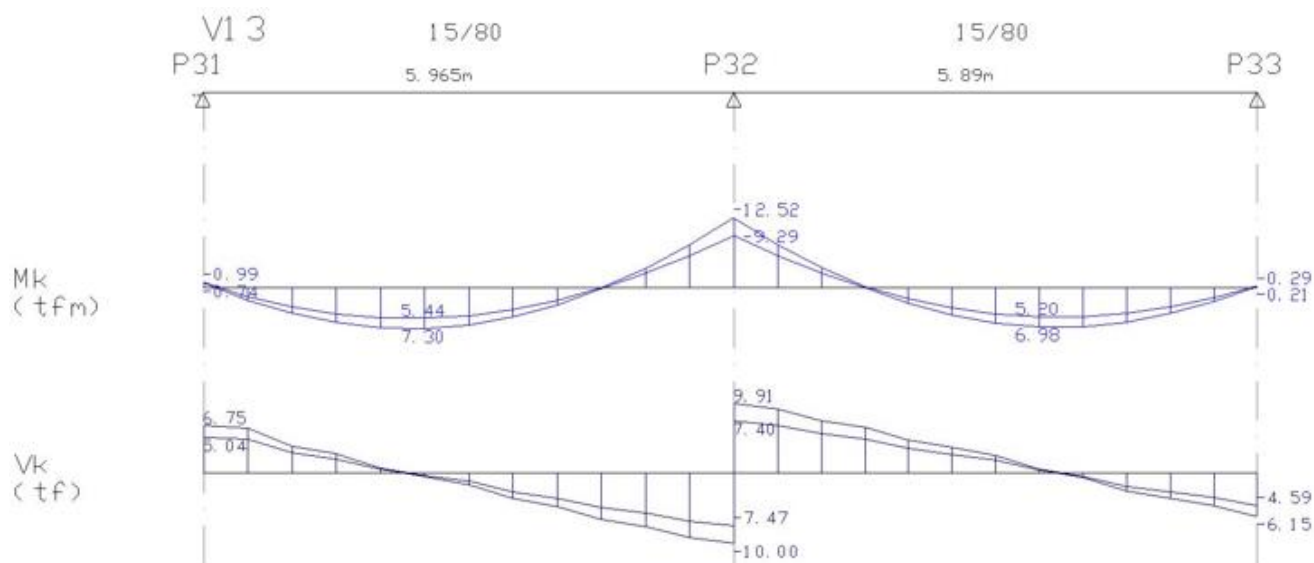
----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.8 tf* m | M.[+] Max= 13.6 tf* m - Abcis.= 393 | M.[-] = 0.9 tf* m
[tf,cm] | As = 1.35 -SRAS- [ 2 B 10.0mm] | AsL= 0.00 ----- | As = 1.35 -SRAS- [ 2 B 10.0mm]
| AsL= 0.00 ----- x/d =0.04 | As = 9.33 -STAS- [ 3 B 20.0mm ] | AsL= 0.00 ----- x/d =0.04
| Grampos Esq.= 4B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 18.6 | Grampos Dir.= 4B 8.0mm x/dMx=0.45
| | | | |
[tf,cm] | M[-]Min = 195.4 | M[+]Min = 195.4 | M[-]Min = 195.4
[cm2 ] | Asapo[+]= 3.11 | | Asapo[+]= 3.11

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 660. 8.34 42.28 1 45. 0.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 4.002 2.957 0.15 0.00 2 V71 0.00 0.00 0 0 0 0 0 0
2 3.960 2.924 0.15 0.00 2 V74 0.00 0.00 0 0 0 0 0 0

```



V13

Viga= 13 V13

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 5.96 /B= 0.15 /H= 0.80 /BCs= 1.04 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 1.0 tf* m | M.[+] Max= 7.3 tf* m - Abcis.= 248 | M.[-] = 12.5 tf* m |
[tf,cm] | As = 2.59 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 5.83 -SRAS- [3 B 16.0mm] |
| AsL= 0.00 ----- | x/d =0.07 | As = 3.81 -STAS- [2 B 16.0mm] | AsL= 0.00 ----- | x/d =0.16 |
| | x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 581.5 | M[+]Min = 506.9 | M[-]Min = 1268.5 |
[cm2] | Asapo[+] = 2.17 | | Asapo[+] = 0.95 |

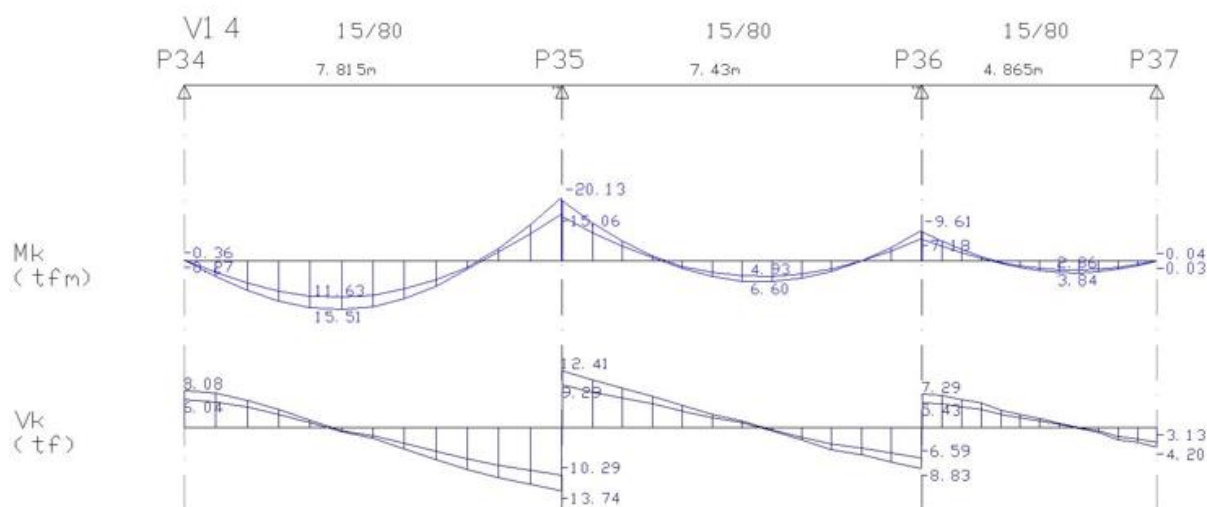
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 565. 13.99 57.85 1 45. 1.4 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 5.89 /B= 0.15 /H= 0.80 /BCs= 1.03 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 12.4 tf* m | M.[+] Max= 7.0 tf* m - Abcis.= 343 | M.[-] = 0.3 tf* m |
[tf,cm] | As = 5.78 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 2.58 -SRAS- [4 B 10.0mm] |
| AsL= 0.00 ----- | x/d =0.15 | As = 3.79 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- | x/d =0.07 |
| | x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | Grampos Dir.= 1B 6.3mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1258.7 | M[+]Min = 506.2 | M[-]Min = 578.7 |
[cm2] | Asapo[+] = 0.95 | | Asapo[+] = 1.98 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 574. 13.87 57.85 1 45. 1.4 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	6.744	5.032	0.50	0.01	1	P31	0.00	0.00	31
	2	19.904	14.870	0.15	0.00	1	P32	0.00	0.00	32
	3	6.154	4.591	0.15	0.00	1	P33	0.00	0.00	33



V14

Viga= 14 V14

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.82 /B= 0.15 /H= 0.80 /BCs= 1.32 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /Flt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.4 tf* m | M.[+] Max= 15.5 tf* m - Abcis.= 326 | M.[-] = 20.1 tf* m
[tf,cm] | As = 2.91 -SRAS- [4 B 10.0mm] | AsL= 0.00 | As = 10.64 -SRAS- [4 B 20.0mm]
| AsL= 0.00 ----- x/d =0.08 | As = 6.82 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.30
| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.5 | x/dMx=0.45
[tf,cm] | M[-]Min = 650.6 | M[+]Min = 522.1 | M[-]Min = 1497.5
[cm2] | Asapo[+] = 2.60 | Asapo[+] = 1.71

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 600. 13.41 57.65 1 45. 1.2 1.7 1.7 6.3 30.0 2 0.0 0.0
600.- 750. 19.23 57.53 1 45. 3.2 1.7 3.2 6.3 18.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 7.43 /B= 0.15 /H= 0.80 /BCs= 1.04 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /Flt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 19.0 tf* m | M.[+] Max= 6.6 tf* m - Abcis.= 434 | M.[-] = 9.6 tf* m
[tf,cm] | As = 9.60 -SRAS- [3 B 20.0mm] | AsL= 0.00 | As = 5.82 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.27 | As = 3.81 -STAS- [2 B 16.0mm] | AsL= 0.00 ----- x/d =0.15
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.8 | x/dMx=0.45
[tf,cm] | M[-]Min = 1265.8 | M[+]Min = 506.7 | M[-]Min = 1265.8
[cm2] | Asapo[+] = 0.95 | Asapo[+] = 0.95

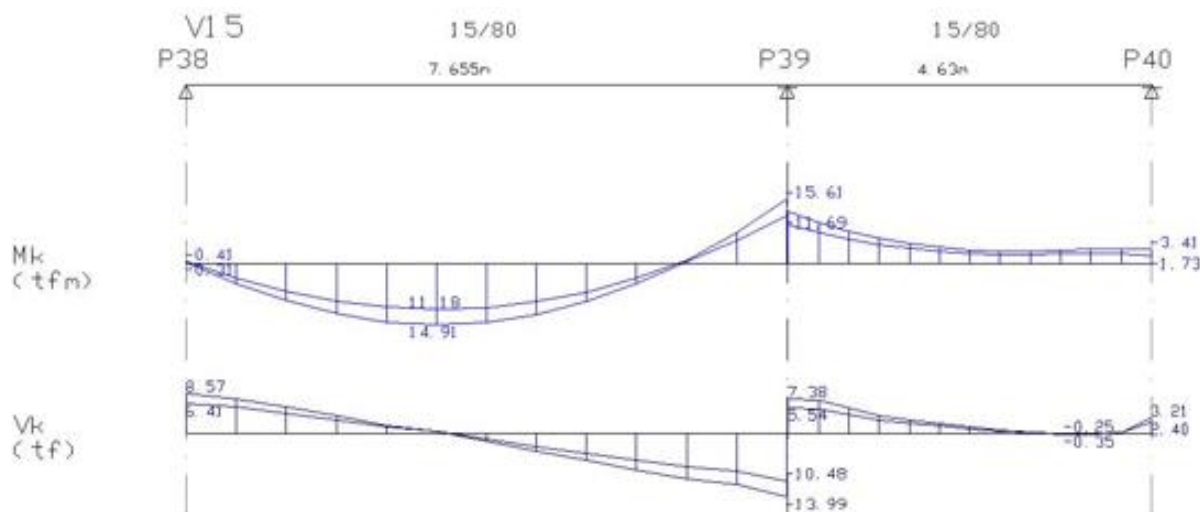
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 174. 17.38 57.56 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0
174.- 695. 12.36 57.85 1 45. 0.8 1.7 1.7 6.3 30.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 4.87 /B= 0.15 /H= 0.80 /BCs= 0.88 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /Flt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 9.1 tf* m | M.[+] Max= 3.8 tf* m - Abcis.= 325 | M.[-] = 0.0 tf* m
[tf,cm] | As = 5.11 -SRAS- [3 B 16.0mm] | AsL= 0.00 | As = 2.37 -SRAS- [3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.14 | As = 3.44 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.06
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.7 | x/dMx=0.45
[tf,cm] | M[-]Min = 1121.5 | M[+]Min = 495.0 | M[-]Min = 540.2
[cm2] | Asapo[+] = 0.86 | Asapo[+] = 1.35

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 455. 10.20 57.85 1 45. 0.1 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:				
	1	8.071	6.036	0.15	0.00	1	P34	0.00	0.00	34	0	0	0	0
	2	25.984	19.455	0.50	0.01	1	P35	0.00	0.00	35	0	0	0	0
	3	16.017	11.944	0.50	0.01	1	P36	0.00	0.00	36	0	0	0	0
	4	4.197	3.134	0.15	0.00	1	P37	0.00	0.00	37	0	0	0	0



V15

Viga= 15 V15

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.66 /B= 0.15 /H= 0.80 /BCs= 1.30 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.4 tf* m | M.[+] Max= 14.9 tf* m - Abcis.= 319 | M.[-] = 15.6 tf* m
 [tf,cm] | As = 2.88 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 7.40 -SRAS- [4 B 16.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 6.42 -STAS- [2 B 20.0mm] | AsL= 0.00 ----- x/d =0.20
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.5 | x/dMx=0.45
 [tf,cm] | M[-]Min = 644.7 | M[+]Min = 521.0 | M[-]Min = 1478.5
 [cm2] | Asapo[+] = 2.76 | Asapo[+] = 1.60

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 551. 11.99 57.59 1 45. 0.7 1.7 1.7 6.3 30.0 2 0.0 0.0
 551.- 734. 19.59 57.56 1 45. 3.3 1.7 3.3 6.3 18.0 2 0.0 0.0

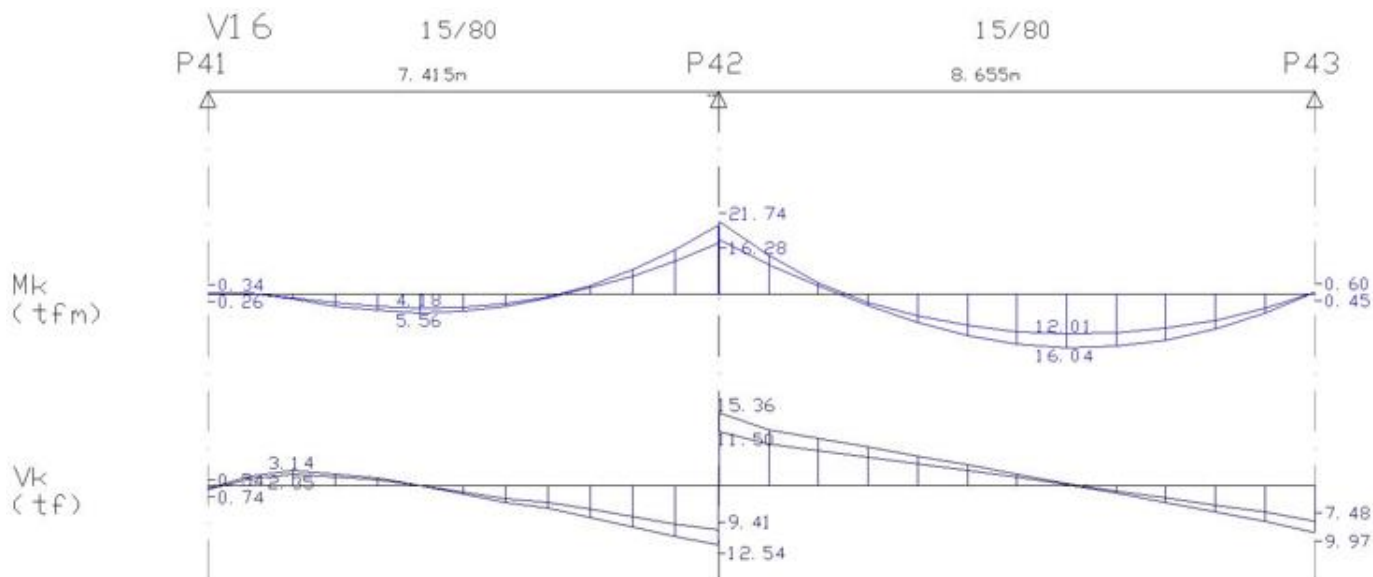
----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 4.63 /B= 0.15 /H= 0.80 /BCs= 0.84 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

* * * * *
 Diagrama M[-] nao usual. Verificar apoios com M[-] Max.
 * * * * *

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 12.7 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 464 | M.[-] = 3.4 tf* m
 [tf,cm] | As = 5.84 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 5.00 -SRAS- [4 B 12.5mm]
 | AsL= 0.00 ----- x/d =0.16 | As = 3.36 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.13
 | x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.7 | x/dMx=0.45
 [tf,cm] | M[-]Min = 1088.9 | M[+]Min = 492.0 | M[-]Min = 1088.9
 [cm2] | Asapo[+] = 0.84 | Asapo[+] = 0.84

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 415. 10.33 57.85 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 8.554 6.401 0.15 0.00 1 P38 0.00 0.00 38 0 0 0 0 0
 2 21.270 15.944 0.50 0.01 1 P39 0.00 0.00 39 0 0 0 0 0
 3 -2.397 -3.214 0.50 0.01 1 P40 0.00 0.00 40 0 0 0 0 0



V16

Viga= 16 V16

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.42 /B= 0.15 /H= 0.80 /BCs= 1.26 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.3 tf* m | M.[+] Max= 5.6 tf* m - Abcis.= 309 | M.[-] = 20.5 tf* m |
[tf,cm] | As = 4.00 -SRAS- [2 B 16.0mm] | AsL= 0.00 ----- | As = 10.85 -SRAS- [4 B 20.0mm] |
| AsL= 0.00 ----- x/d =0.11 | As = 4.30 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.31 |
| Grampos Esq.= 1B 6.3mm x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 0.6 | x/dMx=0.45 |
[tf,cm] | M[-]Min = 896.4 | M[+]Min = 519.2 | M[-]Min = 1449.8 |
[cm2] | Asapo[+] = 1.43 | | Asapo[+] = 1.08 |

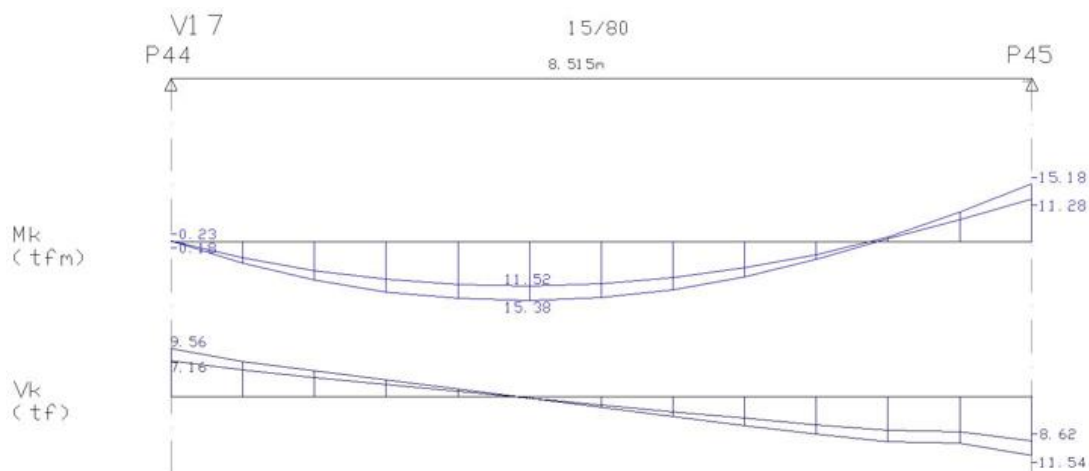
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 533. 8.70 57.85 1 45. 0.0 1.7 1.7 6.3 30.0 2 0.0 0.0
533.- 710. 17.56 57.49 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.65 /B= 0.15 /H= 0.80 /BCs= 1.45 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 21.7 tf* m | M.[+] Max= 16.0 tf* m - Abcis.= 505 | M.[-] = 0.6 tf* m |
[tf,cm] | As = 11.64 -SRAS- [4 B 20.0mm] | AsL= 0.00 ----- | As = 3.05 -SRAS- [4 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.33 | As = 7.05 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.08 |
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.5 | Grampos Dir.= 3B 8.0mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1594.6 | M[+]Min = 527.7 | M[-]Min = 681.2 |
[cm2] | Asapo[+] = 1.76 | | Asapo[+] = 2.95 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 167. 21.51 57.37 1 45. 4.0 1.7 4.0 6.3 15.0 2 0.0 0.0
167.- 834. 13.96 57.65 1 45. 1.4 1.7 1.7 6.3 30.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 -0.535 -0.739 0.15 0.00 1 P41 0.00 0.00 41 0 0 0 0 0
2 27.699 20.750 0.50 0.01 1 P42 0.00 0.00 42 0 0 0 0 0
3 9.973 7.475 0.15 0.00 1 P43 0.00 0.00 43 0 0 0 0 0



V17

Viga= 17 V17

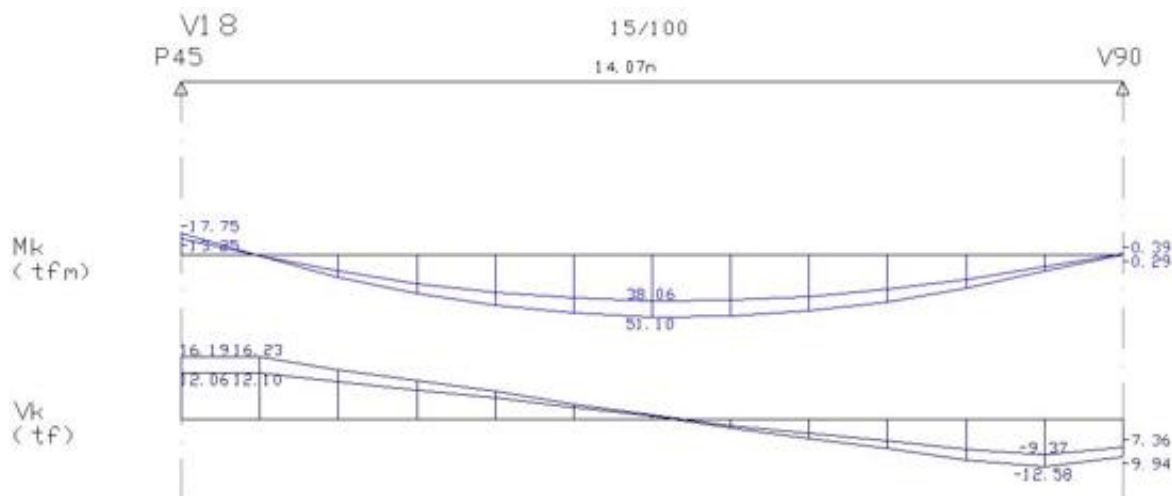
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.52 /B= 0.15 /H= 0.80 /BCs= 1.85 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.2 tf* m | M.[+] Max= 15.4 tf* m - Abcis.= 354 | M.[-] = 15.2 tf* m
[tf,cm] | As = 3.00 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 7.18 -SRAS- [4 B 16.0mm]
| AsL= 0.00 ----- x/d =0.08 | As = 6.75 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.19
| Grampos Esq.= 4B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.1 | x/dMx=0.45
[tf,cm] | M[-]Min = 675.7 | M[+]Min = 542.0 | M[-]Min = 1230.8
[cm2] | Asapo[+]= 3.08 | Asapo[+]= 1.69

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 656. 13.38 57.65 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0
656.- 820. 16.15 57.58 1 45. 2.1 1.7 2.1 5.0 18.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 9.545 7.146 0.15 0.00 1 P44 0.00 0.00 44 0 0 0 0
2 11.539 8.615 0.50 0.01 1 P45 0.00 0.00 45 0 0 0 0



V18

Viga= 18 V18

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

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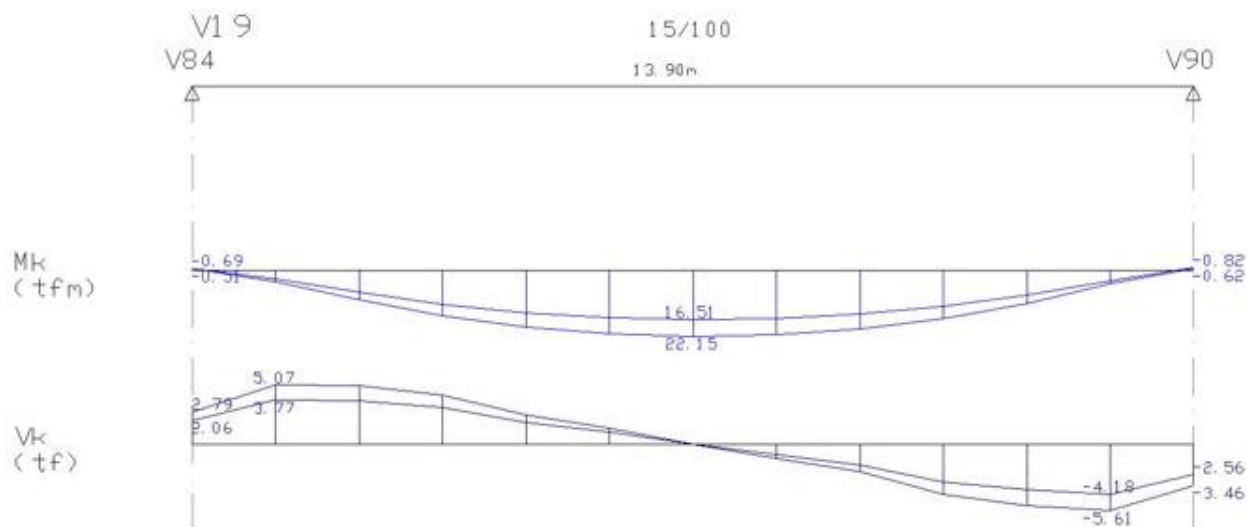
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Vao= 1 /L= 14.07 /B= 0.15 /H= 1.00 /BCs= 2.96 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 17.8 tf* m | M.[+] Max= 51.1 tf* m - Abcis.= 703 | M.[-] = 0.4 tf* m |
[tf,cm]| As = 6.48 -SRAS- [ 2 B 20.0mm] | AsL= 0.00 ----- | As = 4.51 -SRAS- [ 4 B 12.5mm] |
| AsL= 0.00 ----- | x/d =0.14 | As = 17.90 -STAS- [ 4 B 25.0mm ] | AsL= 0.00 ----- | x/d =0.10 |
| | x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 1.8 | Grampos Dir.= 4B 10.0mm x/dMx=0.45 |
[tf,cm]| M[-]Min = 1268.5 | M[+]Min = 888.3 | M[-]Min = 1268.5 |
[cm2 ]| Asapo[+]= 5.97 | | Asapo[+]= 5.97 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 275. 22.72 72.56 1 45. 2.8 1.7 2.8 6.3 22.0 2 0.0 0.0
275.-1375. 17.61 72.32 1 45. 1.4 1.7 1.7 6.3 30.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 16.165 12.048 0.50 0.00 1 P45 0.00 0.00 45 0 0 0 0
2 9.938 7.358 0.15 0.00 2 V90 0.00 0.00 0 0 0 0 0

```



V19

Viga= 19 V19

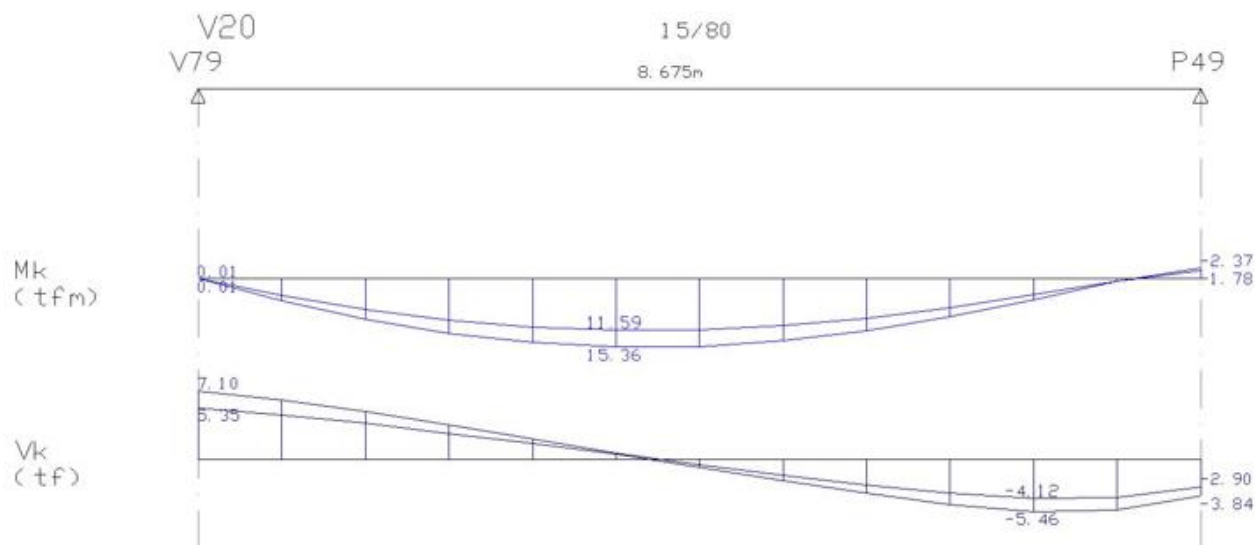
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 13.90 /B= 0.15 /H= 1.00 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.7 tf* m | M.[+] Max= 22.1 tf* m - Abcis.= 695 | M.[-] = 0.8 tf* m
 [tf,cm] | As = 2.25 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.25 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.04 | As = 8.17 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.04
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 4 B 8.0mm] - LN= 16.2 | Grampos Dir.= 3B 8.0mm x/dMx=0.45
 |
 [tf,cm] | M[-]Min = 542.9 | M[+]Min = 542.9 | M[-]Min = 542.9
 [cm2] | Asapo[+] = 2.72 | | Asapo[+] = 2.72

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.-1375. 7.84 73.05 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	2.788	2.059	0.15	0.00	2	V84	0.00	0.00	0 0 0 0 0
2	3.458	2.561	0.15	0.00	2	V90	0.00	0.00	0 0 0 0 0



V20

Viga= 20 V20

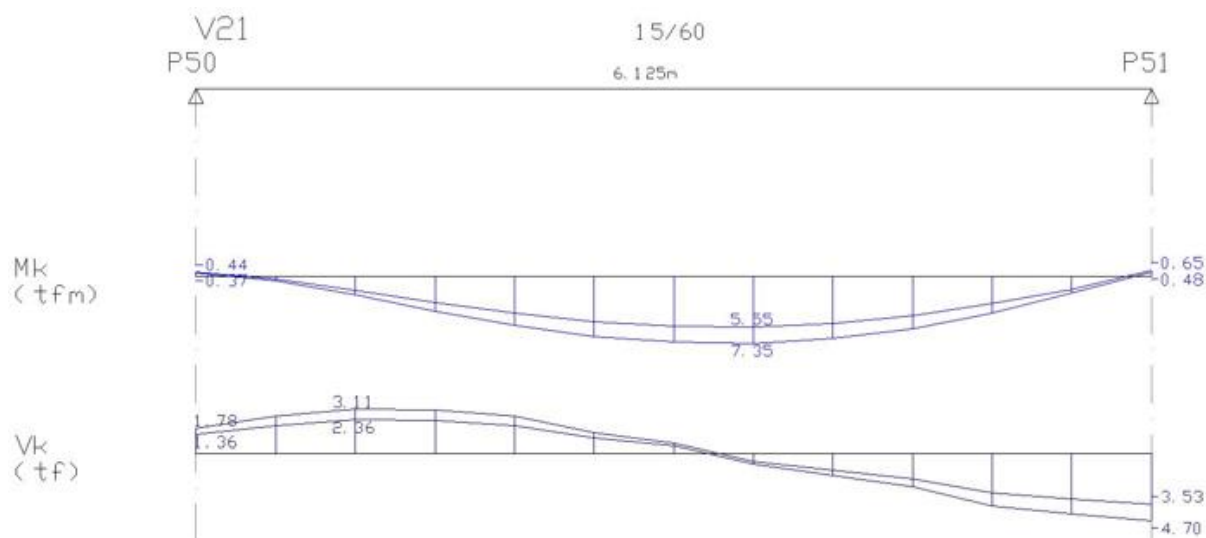
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.68 /B= 0.15 /H= 0.80 /BCs= 1.89 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.0 tf* m | M.[+] Max= 15.4 tf* m - Abcis.= 361 | M.[-] = 2.4 tf* m
 [tf,cm] | As = 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 ----- | As = 3.05 -SRAS- [4 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.00 | As = 6.74 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.08
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 347.4 | M[+]Min = 542.9 | M[-]Min = 681.5
 [cm2] | Asapo[+] = 2.35 | | Asapo[+] = 2.25

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 850. 9.95 57.78 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 7.094 5.341 0.15 0.00 2 V79 0.00 0.00 0 0 0 0 0 0
 2 3.845 2.902 0.20 0.00 1 P49 0.00 0.00 49 0 0 0 0 0 0



V21

Viga= 21 V21

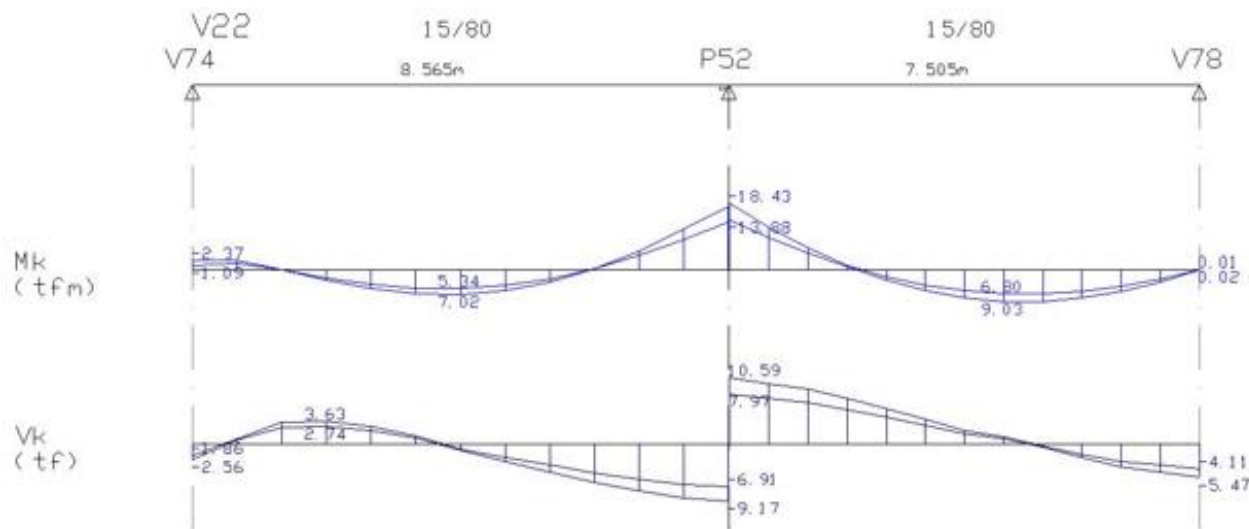
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 6.12 /B= 0.15 /H= 0.60 /BCs= 1.38 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.4 tf* m | M.[+] Max= 7.3 tf* m - Abcis.= 357 | M.[-] = 0.6 tf* m
 [tf,cm] | As = 2.11 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.11 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 4.31 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.08
 | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.9 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 350.0 | M[+]Min = 293.8 | M[-]Min = 350.0
 [cm2] | Asapo[+] = 1.44 | | Asapo[+] = 1.51

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 595. 6.58 42.50 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 1.779 1.357 0.20 0.00 1 P50 0.00 0.00 50 0 0 0 0 0
 2 4.699 3.535 0.15 0.00 1 P51 0.00 0.00 51 0 0 0 0 0



V22

Viga= 22 V22

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.56 /B= 0.15 /H= 0.80 /BCs= 1.43 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

 Diagrama M[-] nao usual. Verificar apoios com M[-] Max.

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)														
E S Q U E R D A					M E I O D O V A O					D I R E I T A				
M.[-] = 2.4 tf* m					M.[+] Max= 7.0 tf* m - Abcis.= 428					M.[-] = 17.6 tf* m				
[tf,cm] As = 5.67 -SRAS- [3 B 16.0mm]					AsL= 0.00 -----					As = 8.79 -SRAS- [3 B 20.0mm]				
AsL= 0.00 ----- x/d =0.15					As = 4.69 -STAS- [4 B 12.5mm]					AsL= 0.00 ----- x/d =0.24				
Grampos Esq.= 2B 6.3mm x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.6					x/dMx=0.45				
[tf,cm] M[-]Min = 1236.1					M[+]Min = 527.1					M[-]Min = 1584.4				
[cm2] Asapo[+]= 1.56										Asapo[+]= 1.17				

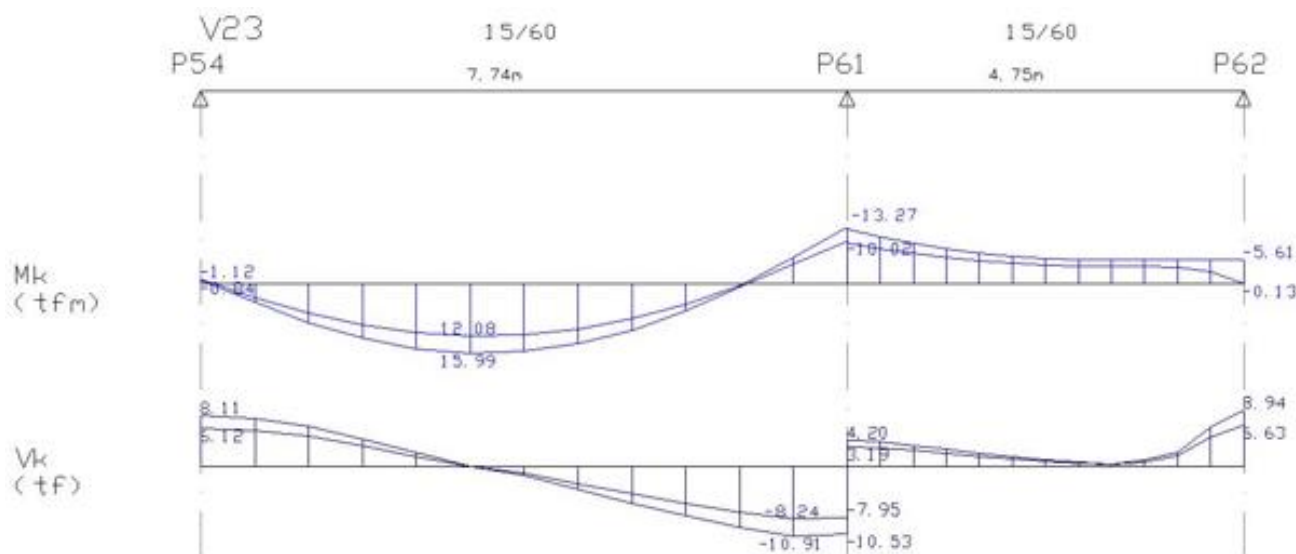
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	825.	12.84	57.85	1	45.	1.0	1.7	1.7	5.0	22.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 7.50 /B= 0.15 /H= 0.80 /BCs= 1.28 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)														
E S Q U E R D A					M E I O D O V A O					D I R E I T A				
M.[-] = 18.4 tf* m					M.[+] Max= 9.0 tf* m - Abcis.= 438					M.[-] = 0.0 tf* m				
[tf,cm] As = 9.27 -SRAS- [3 B 20.0mm]					AsL= 0.00 -----					As = 0.00 -SRAS- [0 B 6.3mm]				
AsL= 0.00 ----- x/d =0.26					As = 4.33 -STAS- [4 B 12.5mm]					AsL= 0.00 ----- x/d =0.00				
x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9					Grampos Dir.= 2B 6.3mm x/dMx=0.45				
[tf,cm] M[-]Min = 1460.6					M[+]Min = 519.9					M[-]Min = 347.4				
[cm2] Asapo[+]= 1.08										Asapo[+]= 1.84				

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	719.	14.83	57.78	1	45.	1.7	1.7	1.7	5.0	22.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	-1.856	-2.554	0.15	0.00	2	V74	0.00	0.00	0 0 0 0 0
2	19.624	14.773	0.50	0.01	1	P52	0.00	0.00	52 0 0 0 0 0
3	5.467	4.108	0.15	0.00	2	V78	0.00	0.00	0 0 0 0 0



V23

Viga= 23 V23

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.74 /B= 0.15 /H= 0.60 /BCs= 1.31 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 1.1 tf* m | M.[+] Max= 16.0 tf* m - Abcis.= 322 | M.[-] = 13.3 tf* m |
[tf,cm]| As = 2.34 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 10.39 -SRAS- [4 B 20.0mm] |
[tf,cm]| AsL= 0.00 ----- x/d =0.08 | As = 9.62 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.42 |
[tf,cm]| Grapos Esq.= 4B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 2.2 | AsL= 0.00 ----- x/dMx=0.45 |
[tf,cm]| % Baric.Armad.= 2 | % Baric.Armad.= 3 | % Baric.Armad.= 11 *** |
[tf,cm]| M[-]Min = 387.2 | M[+]Min = 292.1 | M[-]Min = 863.4 |
[cm2]| Asapo[+]= 3.21 | Asapo[+]= 2.41 | Asapo[+]= 2.41 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 152. 11.36 42.20 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0
152.- 455. 7.58 41.82 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0
455.- 607. 12.16 42.13 1 45. 2.3 1.7 2.3 5.0 15.0 2 0.0 0.0
607.- 759. 15.26 42.29 1 45. 3.7 1.7 3.7 5.0 10.0 2 0.0 0.0

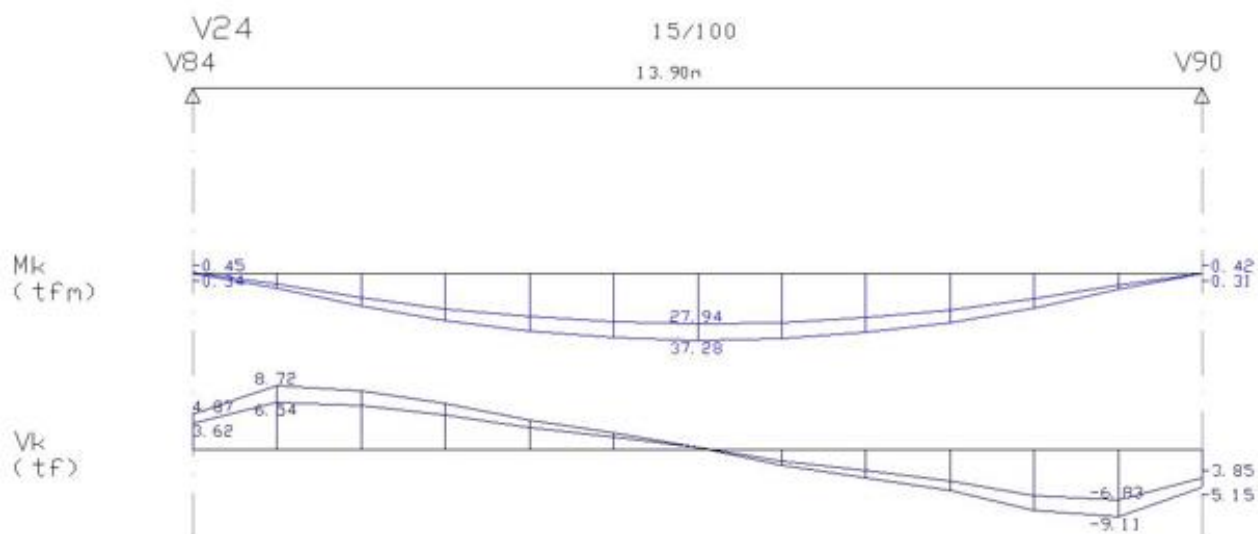
----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 4.75 /B= 0.15 /H= 0.60 /BCs= 0.86 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

* * * * *
Diagrama M[-] nao usual. Verificar apoios com M[-] Max.
* * * * *

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 12.6 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 475 | M.[-] = 5.6 tf* m |
[tf,cm]| As = 9.20 -SRAS- [3 B 20.0mm] | AsL= 0.00 ----- | As = 4.05 -SRAS- [2 B 16.0mm] |
[tf,cm]| AsL= 0.00 ----- x/d =0.36 | As = 2.95 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.15 |
[tf,cm]| x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.6 | x/dMx=0.45 |
[tf,cm]| M[-]Min = 656.1 | M[+]Min = 276.4 | M[-]Min = 656.1 |
[cm2]| Asapo[+]= 0.74 | Asapo[+]= 0.74 | Asapo[+]= 0.74 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 307. 5.88 42.56 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0
307.- 460. 12.51 42.57 1 45. 2.4 1.7 2.4 5.0 15.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 8.101 6.112 0.15 0.00 1 P54 0.00 0.00 54 0 0 0 0
2 14.731 11.146 0.15 0.00 1 P61 0.00 0.00 61 0 0 0 0
3 -6.635 -8.935 0.15 0.00 1 P62 0.00 0.00 62 0 0 0 0



V24

Viga= 24 V24

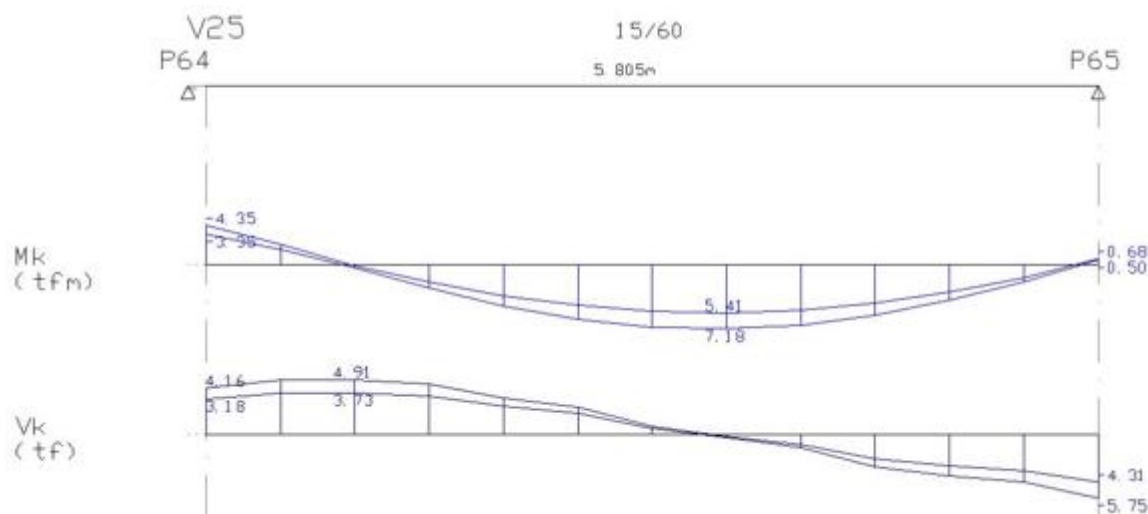
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 13.90 /B= 0.15 /H= 1.00 /BCs= 0.45 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 0.5 tf* m | M.[+] Max= 37.3 tf* m - Abcis.= 695 | M.[-] = 0.4 tf* m |
 [tf,cm] | As = 3.56 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 3.56 -SRAS- [3 B 12.5mm] |
 | AsL= 0.00 ----- x/d =0.07 | As = 13.28 -STAS- [3 B 25.0mm] | AsL= 0.00 ----- x/d =0.07 |
 | Grampos Esq.= 3B 10.0mm x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 8.8 | Grampos Dir.= 3B 10.0mm x/dMx=0.45 |
 [tf,cm] | M[-]Min = 1017.7 | M[+]Min = 683.9 | M[-]Min = 1017.7 |
 [cm2] | Asapo[+]= 4.43 | | Asapo[+]= 4.43 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.-1375. 12.74 72.75 1 45. 0.1 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	4.868	3.620	0.15	0.00	2	V84	0.00	0.00	0	0	0	0	0	0
	2	5.152	3.849	0.15	0.00	2	V90	0.00	0.00	0	0	0	0	0	0



V25

Viga= 25 V25

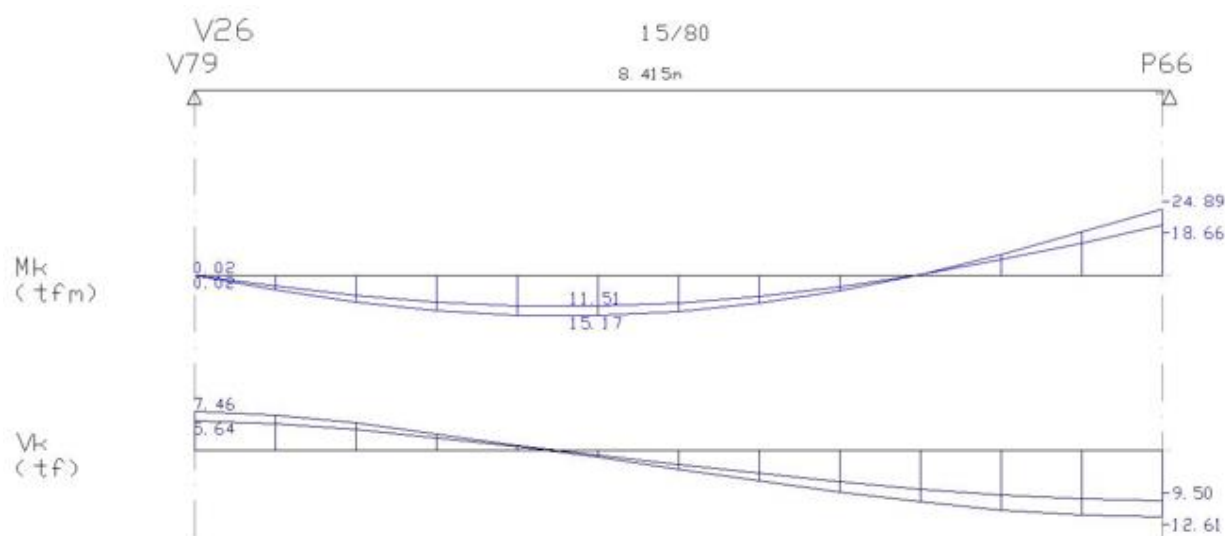
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 5.80 /B= 0.15 /H= 0.60 /BCs= 1.31 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 4.4 tf* m | M.[+] Max= 7.2 tf* m - Abcis.= 338 | M.[-] = 0.7 tf* m |
[tf,cm] | As = 2.91 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 2.06 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.11 | As = 4.22 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.07 |
| | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.0 | Grampos Dir.= 2B 6.3mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 471.2 | M[+]Min = 292.1 | M[-]Min = 342.4 |
[cm2] | Asapo[+] = 1.05 | | Asapo[+] = 1.85 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 555. 8.05 42.55 1 45. 0.4 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	4.150	3.177	0.60	0.12	1	P64	0.00	0.00	64
	2	5.747	4.308	0.15	0.00	1	P65	0.00	0.00	65



V26

Viga= 26 V26

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

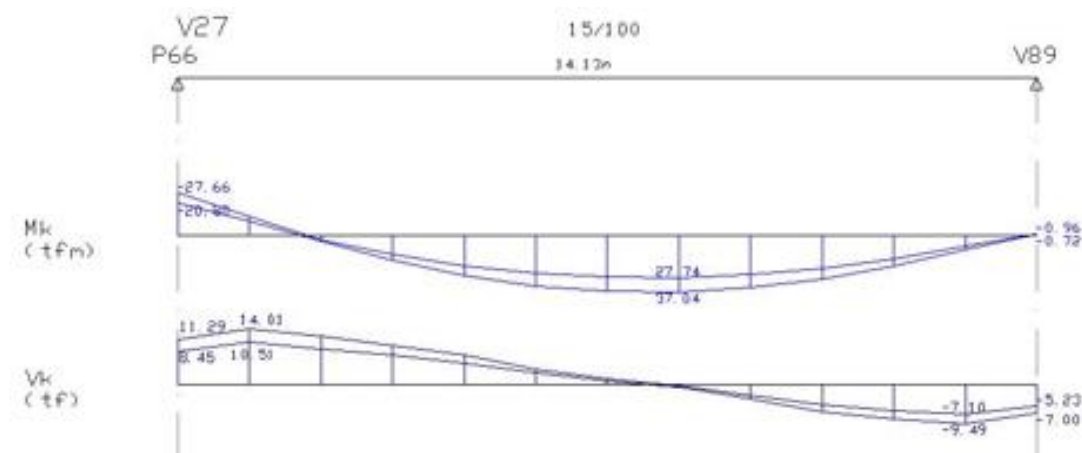
----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.41 /B= 0.15 /H= 0.80 /BCs= 1.83 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.0 tf* m | M.[+] Max= 15.2 tf* m - Abcis.= 350 | M.[-] = 24.9 tf* m
 [tf,cm] | As = 0.00 -SRAS- [0 B 6.3mm] | AsL= 0.00 ----- | As = 13.49 -SRAS- [3 B 25.0mm]
 | AsL= 0.00 ----- x/d =0.00 | As = 6.66 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.38
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.1 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 347.4 | M[+]Min = 541.4 | M[-]Min = 1457.6
 [cm2] | Asapo[+]= 2.64 | | Asapo[+]= 1.66

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus
 [tf,cm] 0.- 648. 14.38 57.72 1 45. 1.5 1.7 1.7 6.3 30.0 2 0.0 0.0
 648.- 810. 17.65 57.37 1 45. 2.7 1.7 2.7 6.3 22.0 2 0.0 0.0

M E N S A G E M

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 7.452 5.630 0.15 0.00 2 V79 0.00 0.00 0 0 0 0 0 0
 2 12.609 9.499 0.60 0.06 1 P66 0.00 0.00 66 0 0 0 0 0 0



V27

Viga= 27 V27

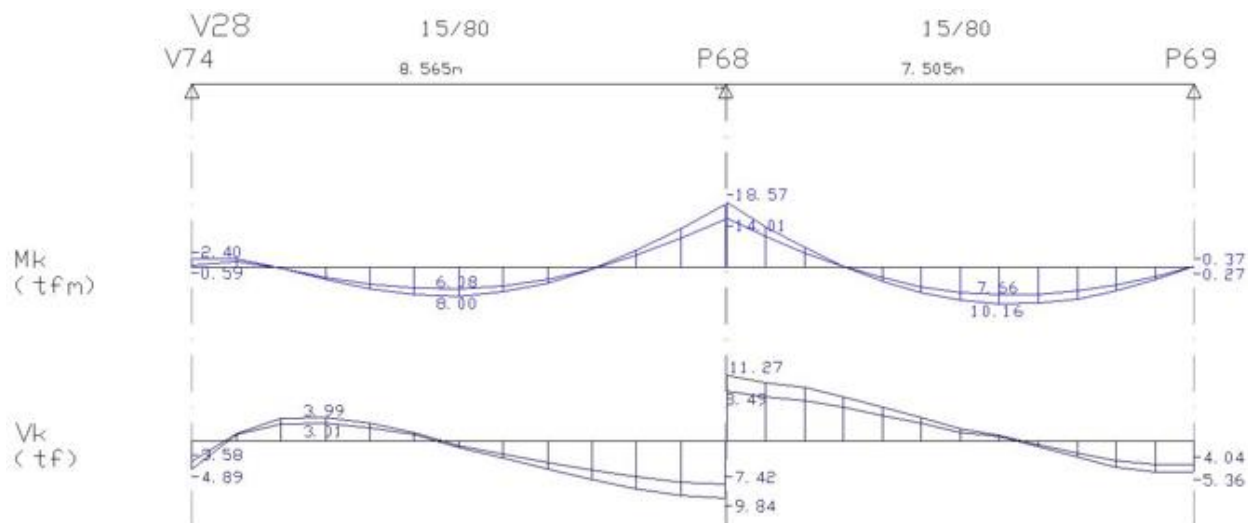
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 14.13 /B= 0.15 /H= 1.00 /BCs= 0.61 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 27.7 tf* m | M.[+] Max= 37.0 tf* m - Abcis.= 824 | M.[-] = 1.0 tf* m |
[tf,cm] | As = 11.05 -SRAS- [4 B 20.0mm] | AsL= 0.00 ----- | As = 4.46 -SRAS- [4 B 12.5mm] |
| AsL= 0.00 ----- x/d =0.25 | As = 13.13 -STAS- [3 B 25.0mm] | AsL= 0.00 ----- x/d =0.09 |
| | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 6.4 | Grupos Dir.= 3B 10.0mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1255.4 | M[+]Min = 725.0 | M[-]Min = 1255.4 |
[cm2] | Asapo[+] = 3.28 | Asapo[+] = 4.38 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 275. 19.61 72.64 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0
275.-1376. 15.07 72.73 1 45. 0.7 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 11.277 8.438 0.60 0.00 1 P66 0.00 0.00 66 0 0 0 0 0
2 7.003 5.233 0.15 0.00 2 V89 0.00 0.00 0 0 0 0 0



V28

Viga= 28 V28

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.56 /B= 0.15 /H= 0.80 /BCs= 1.43 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

 Diagrama M[-] nao usual. Verificar apoios com M[-] Max.

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -														
FLEXAO- E S Q U E R D A					M E I O D O V A O					D I R E I T A				
M.[-] = 2.4 tf* m					M.[+] Max= 8.0 tf* m - Abcis.= 428					M.[-] = 18.0 tf* m				
[tf,cm] As = 4.43 -SRAS- [4 B 12.5mm]					AsL= 0.00 -----					As = 9.02 -SRAS- [3 B 20.0mm]				
AsL= 0.00 ----- x/d =0.12					As = 4.69 -STAS- [4 B 12.5mm]					AsL= 0.00 ----- x/d =0.25				
Grampos Esq.= 2B 6.3mm x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.7					x/dMx=0.45				
[tf,cm] M[-]Min = 972.1					M[+]Min = 527.1					M[-]Min = 1584.4				
[cm2] Asapo[+]= 1.56										Asapo[+]= 1.17				

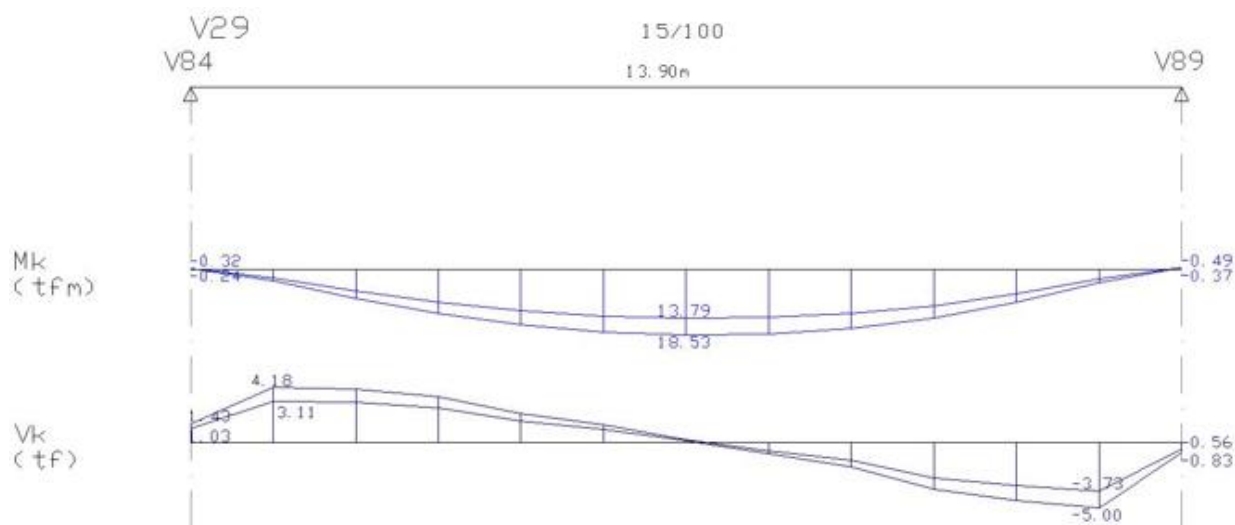
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	825.	13.78	57.85	1	45.	1.3	1.7	1.7	5.0	22.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 7.50 /B= 0.15 /H= 0.80 /BCs= 1.28 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -														
FLEXAO- E S Q U E R D A					M E I O D O V A O					D I R E I T A				
M.[-] = 18.6 tf* m					M.[+] Max= 10.2 tf* m - Abcis.= 438					M.[-] = 0.4 tf* m				
[tf,cm] As = 9.35 -SRAS- [3 B 20.0mm]					AsL= 0.00 -----					As = 2.85 -SRAS- [4 B 10.0mm]				
AsL= 0.00 ----- x/d =0.26					As = 4.37 -STAS- [4 B 12.5mm]					AsL= 0.00 ----- x/d =0.08				
x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.0					Grampos Dir.= 2B 6.3mm x/dMx=0.45				
[tf,cm] M[-]Min = 1460.6					M[+]Min = 519.9					M[-]Min = 639.2				
[cm2] Asapo[+]= 1.09										Asapo[+]= 1.88				

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	180.	15.77	57.56	1	45.	2.0	1.7	2.0	5.0	18.0	2	0.0	0.0	
	180.-	719.	10.05	57.72	1	45.	0.1	1.7	1.7	5.0	22.0	2	0.0	0.0	

REAC. APOIO -	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
	1	-3.575	-4.879	0.15	0.00	2	V74	0.00	0.00	0	0	0	0	0	0
	2	20.959	15.797	0.50	0.01	1	P68	0.00	0.00	68	0	0	0	0	0
	3	5.365	4.045	0.15	0.00	1	P69	0.00	0.00	69	0	0	0	0	0



V29

Viga= 29 V29

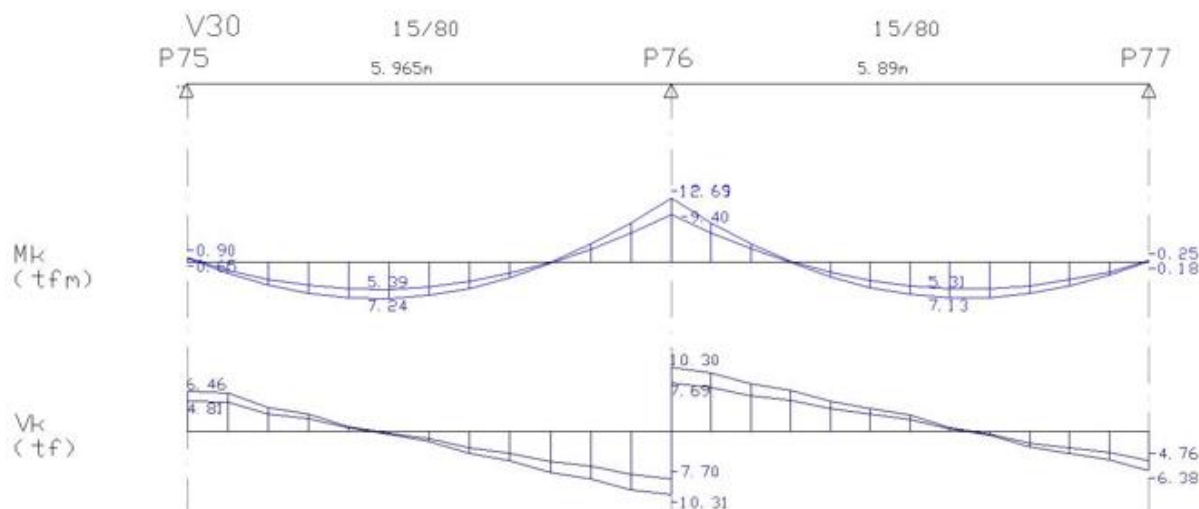
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 13.90 /B= 0.15 /H= 1.00 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm]| M.[-] = 0.3 tf* m | M.[+] Max= 18.5 tf* m - Abcis.= 695 | M.[-] = 0.5 tf* m
 [tf,cm]| As = 2.25 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.25 -SRAS- [3 B 10.0mm]
 [tf,cm]| AsL= 0.00 ----- x/d =0.04 | As = 6.75 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.04
 [tf,cm]| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 13.4 | Grampos Dir.= 3B 8.0mm x/dMx=0.45
 [tf,cm]| M[-]Min = 542.9 | M[+]Min = 542.9 | M[-]Min = 542.9
 [cm2]| Asapo[+]= 2.25 | Asapo[+]= 2.25 | Asapo[+]= 2.25

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.-1375. 6.99 73.06 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	1.431	1.029	0.15	0.00	2	V84	0.00	0.00	0 0 0 0 0
	2	0.830	0.559	0.15	0.00	2	V89	0.00	0.00	0 0 0 0 0



V30

Viga= 30 V30

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 5.96 /B= 0.15 /H= 0.80 /BCs= 1.04 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.9 tf* m | M.[+] Max= 7.2 tf* m - Abcis.= 248 | M.[-] = 12.7 tf* m |
[tf,cm] | As = 2.59 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 5.83 -SRAS- [3 B 16.0mm] |
| AsL= 0.00 ----- | x/d =0.07 | As = 3.81 -STAS- [2 B 16.0mm] | AsL= 0.00 ----- | x/d =0.16 |
| | x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 581.5 | M[+]Min = 506.9 | M[-]Min = 1268.5 |
[cm2] | Asapo[+] = 2.08 | | Asapo[+] = 0.95 |

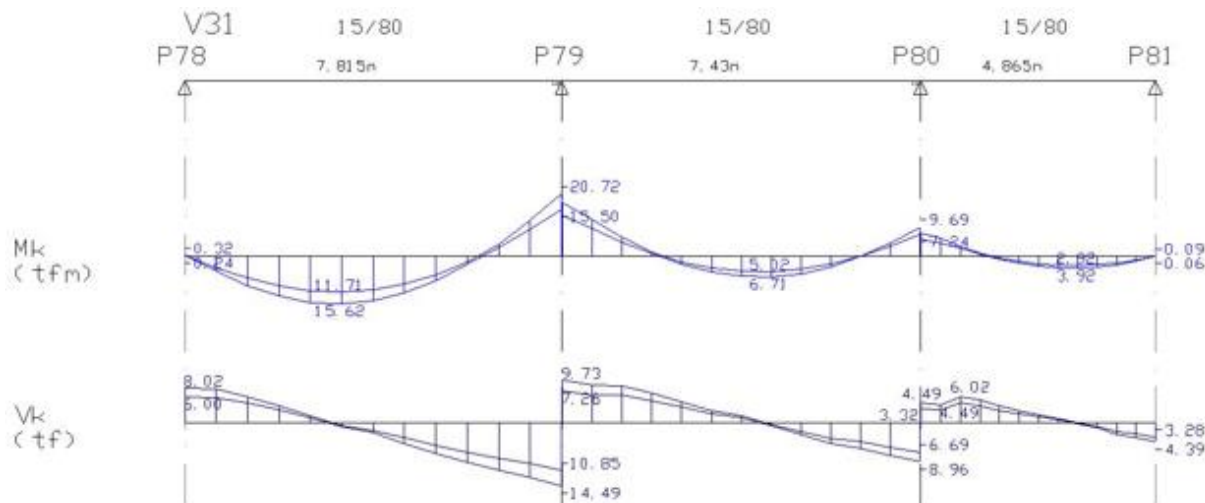
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 565. 14.43 57.85 1 45. 1.6 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 5.89 /B= 0.15 /H= 0.80 /BCs= 1.03 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 12.6 tf* m | M.[+] Max= 7.1 tf* m - Abcis.= 343 | M.[-] = 0.3 tf* m |
[tf,cm] | As = 5.80 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 2.58 -SRAS- [4 B 10.0mm] |
| AsL= 0.00 ----- | x/d =0.15 | As = 3.79 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- | x/d =0.07 |
| | x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | | Grampos Dir.= 2B 6.3mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1258.7 | M[+]Min = 506.2 | M[-]Min = 578.7 |
[cm2] | Asapo[+] = 0.95 | | Asapo[+] = 2.05 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 574. 14.42 57.85 1 45. 1.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	6.450	4.804	0.50	0.01	1	P75	0.00	0.00	75	0 0 0 0 0
2	20.611	15.392	0.15	0.00	1	P76	0.00	0.00	76	0 0 0 0 0
3	6.376	4.758	0.15	0.00	1	P77	0.00	0.00	77	0 0 0 0 0



V31

Viga= 31 V31

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

```

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.82 /B= 0.15 /H= 0.80 /BCs= 1.32 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.3 tf* m | M.[+] Max= 15.6 tf* m - Abcis.= 326 | M.[-] = 20.7 tf* m |
[tf,cm]| As = 2.91 -SRAS- [ 4 B 10.0mm] | AsL= 0.00 ----- | As = 11.00 -SRAS- [ 4 B 20.0mm] |
| AsL= 0.00 ----- | x/d =0.08 | As = 6.87 -STAS- [ 4 B 16.0mm ] | AsL= 0.00 ----- | x/d =0.32 |
| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.6 | | x/dMx=0.45 |
|
[tf,cm]| M[-]Min = 650.6 | M[+]Min = 522.1 | M[-]Min = 1497.5 |
[cm2 ]| Asapo[+] = 2.54 | | Asapo[+] = 1.72 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 600. 13.55 57.65 1 45. 1.3 1.7 1.7 6.3 30.0 2 0.0 0.0
600.- 750. 20.28 57.47 1 45. 3.6 1.7 3.6 6.3 15.0 2 0.0 0.0

```

```

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 7.43 /B= 0.15 /H= 0.80 /BCs= 1.04 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 17.8 tf* m | M.[+] Max= 6.7 tf* m - Abcis.= 434 | M.[-] = 9.7 tf* m |
[tf,cm]| As = 8.92 -SRAS- [ 3 B 20.0mm] | AsL= 0.00 ----- | As = 5.82 -SRAS- [ 3 B 16.0mm] |
| AsL= 0.00 ----- | x/d =0.25 | As = 3.81 -STAS- [ 2 B 16.0mm ] | AsL= 0.00 ----- | x/d =0.15 |
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.8 | | x/dMx=0.45 |
|
[tf,cm]| M[-]Min = 1265.8 | M[+]Min = 506.7 | M[-]Min = 1265.8 |
[cm2 ]| Asapo[+] = 0.95 | | Asapo[+] = 0.95 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 695. 13.62 57.85 1 45. 1.3 1.7 1.7 5.0 22.0 2 0.0 0.0

```

```

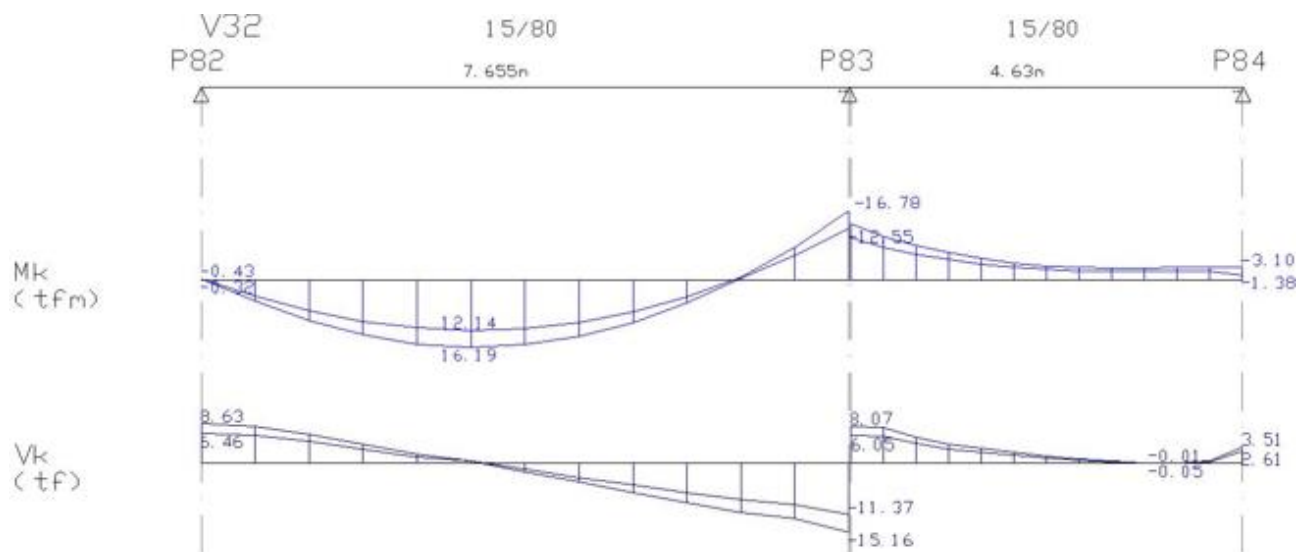
----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 4.87 /B= 0.15 /H= 0.80 /BCs= 0.88 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 7.7 tf* m | M.[+] Max= 3.9 tf* m - Abcis.= 325 | M.[-] = 0.1 tf* m |
[tf,cm]| As = 5.11 -SRAS- [ 3 B 16.0mm] | AsL= 0.00 ----- | As = 2.37 -SRAS- [ 3 B 10.0mm] |
| AsL= 0.00 ----- | x/d =0.14 | As = 3.44 -STAS- [ 3 B 12.5mm ] | AsL= 0.00 ----- | x/d =0.06 |
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.7 | | Grampos Dir.= 1B 6.3mm x/dMx=0.45 |
|
[tf,cm]| M[-]Min = 1121.5 | M[+]Min = 495.0 | M[-]Min = 540.2 |
[cm2 ]| Asapo[+] = 0.86 | | Asapo[+] = 1.41 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 455. 8.42 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

```

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
1	8.007	5.988	0.15	0.00	1	P78	0.00	0.00	78	0	0	0	0	0
2	24.082	18.018	0.50	0.01	1	P79	0.00	0.00	79	0	0	0	0	0
3	13.388	9.966	0.50	0.01	1	P80	0.00	0.00	80	0	0	0	0	0
4	4.390	3.281	0.15	0.00	1	P81	0.00	0.00	81	0	0	0	0	0



V32

Viga= 32 V32

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.66 /B= 0.15 /H= 0.80 /BCs= 1.30 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.4 tf* m | M.[+] Max= 16.2 tf* m - Abcis.= 319 | M.[-] = 16.8 tf* m |
[tf,cm]| As = 2.88 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 8.01 -SRAS- [4 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.08 | As = 7.13 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.22 |
| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.6 | | x/dMx=0.45 |
[tf,cm]| M[-]Min = 644.7 | M[+]Min = 521.0 | M[-]Min = 1478.5 |
[cm2]| Asapo[+] = 2.59 | | Asapo[+] = 1.78 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 551. 12.09 57.56 1 45. 0.8 1.7 6.3 30.0 2 0.0 0.0
551.- 734. 21.23 57.56 1 45. 3.9 1.7 3.9 6.3 15.0 2 0.0 0.0

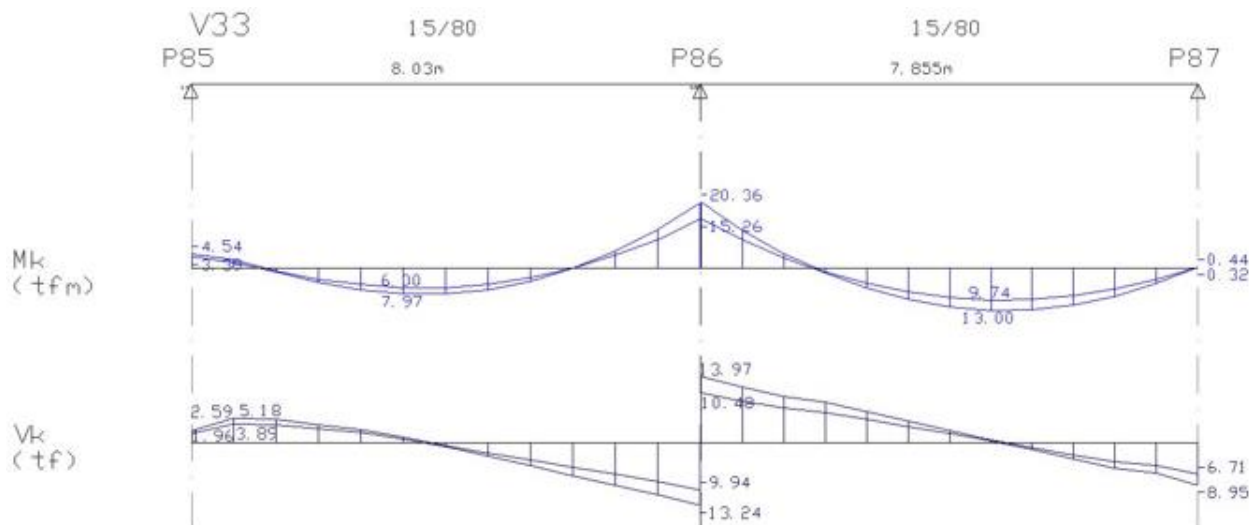
----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 4.63 /B= 0.15 /H= 0.80 /BCs= 0.84 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

Diagrama M[-] nao usual. Verificar apoios com M[-] Max.

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 13.8 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 464 | M.[-] = 3.1 tf* m |
[tf,cm]| As = 6.45 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 5.00 -SRAS- [4 B 12.5mm] |
| AsL= 0.00 ----- x/d =0.17 | As = 3.36 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.13 |
| | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.7 | | x/dMx=0.45 |
[tf,cm]| M[-]Min = 1088.9 | M[+]Min = 492.0 | M[-]Min = 1088.9 |
[cm2]| Asapo[+] = 0.84 | | Asapo[+] = 0.84 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 415. 11.30 57.85 1 45. 0.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	8.623	6.453	0.15	0.00	1	P82	0.00	0.00	82
	2	23.130	17.336	0.50	0.01	1	P83	0.00	0.00	83
	3	-2.615	-3.515	0.50	0.01	1	P84	0.00	0.00	84



V33

Viga= 33 V33

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.03 /B= 0.15 /H= 0.80 /BCs= 1.35 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 4.5 tf* m | M.[+] Max= 8.0 tf* m - Abcis.= 335 | M.[-] = 20.1 tf* m |
[tf,cm] | As = 4.26 -SRAS- [4 B 12.5mm] | AsL= 0.00 ----- | As = 10.62 -SRAS- [4 B 20.0mm] |
| AsL= 0.00 ----- x/d =0.11 | As = 4.51 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.30 |
| | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.8 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 937.2 | M[+]Min = 523.6 | M[-]Min = 1522.7 |
[cm2] | Asapo[+] = 1.13 | | Asapo[+] = 1.13 |

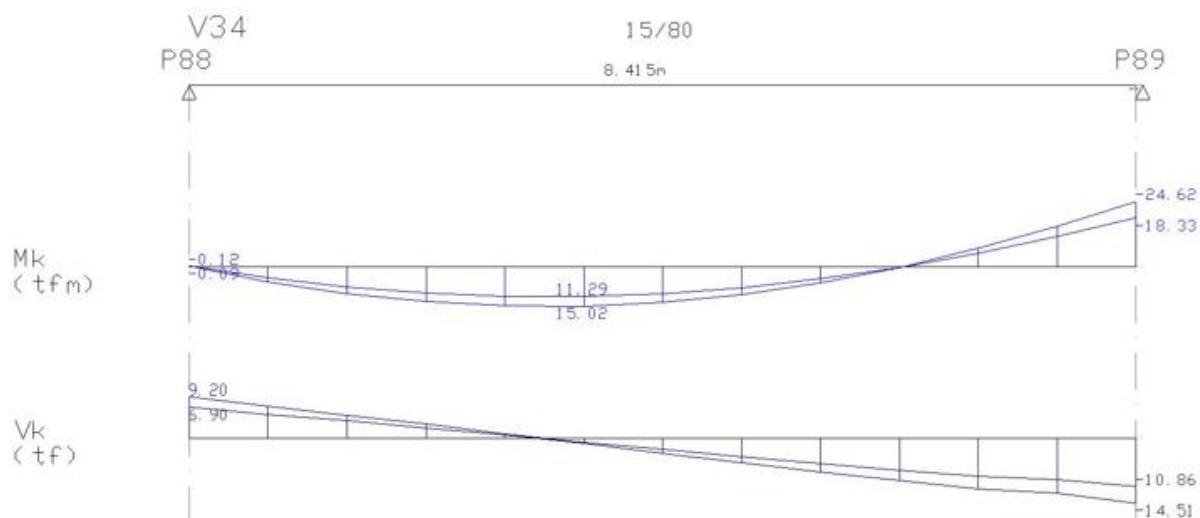
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 604. 10.76 57.85 1 45. 0.3 1.7 1.7 6.3 30.0 2 0.0 0.0
604.- 755. 18.54 57.53 1 45. 3.0 1.7 3.0 6.3 20.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 7.86 /B= 0.15 /H= 0.80 /BCs= 1.33 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 20.4 tf* m | M.[+] Max= 13.0 tf* m - Abcis.= 458 | M.[-] = 0.4 tf* m |
[tf,cm] | As = 10.78 -SRAS- [4 B 20.0mm] | AsL= 0.00 ----- | As = 2.91 -SRAS- [4 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.31 | As = 5.64 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.08 |
| | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.3 | | Grampos Dir.= 3B 8.0mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1502.2 | M[+]Min = 522.4 | M[-]Min = 652.0 |
[cm2] | Asapo[+] = 1.41 | | Asapo[+] = 2.88 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 151. 19.56 57.51 1 45. 3.3 1.7 3.3 6.3 18.0 2 0.0 0.0
151.- 754. 12.53 57.72 1 45. 0.9 1.7 1.7 6.3 30.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	2.590	1.956	0.50	0.01	1	P85	0.00	0.00	85	0 0 0 0 0
2	27.028	20.276	0.50	0.01	1	P86	0.00	0.00	86	0 0 0 0 0
3	8.947	6.708	0.15	0.00	1	P87	0.00	0.00	87	0 0 0 0 0



V34

Viga= 34 V34

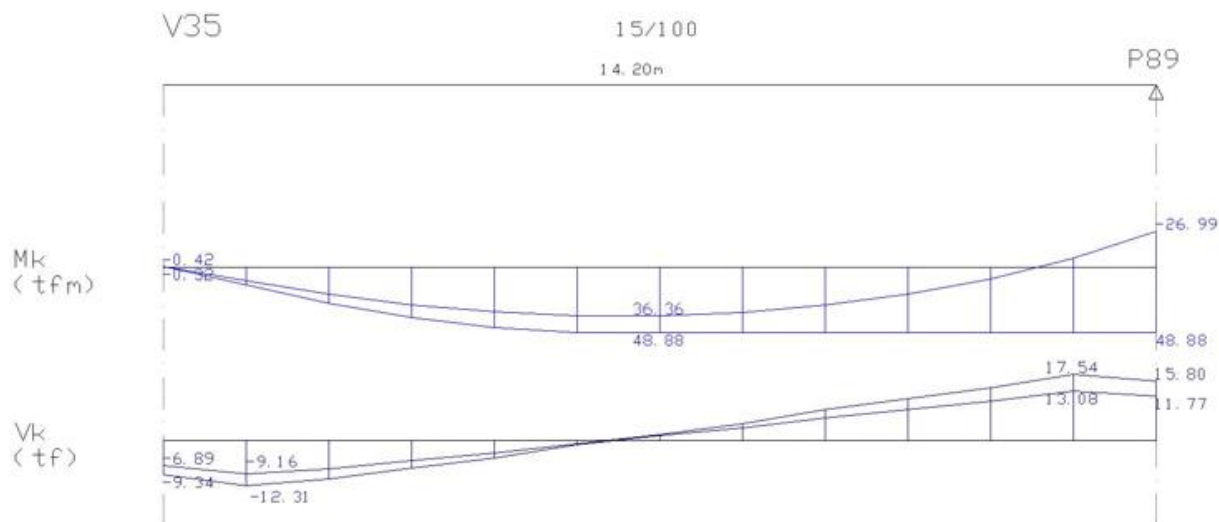
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 8.41 /B= 0.15 /H= 0.80 /BCs= 1.83 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.1 tf* m | M.[+] Max= 15.0 tf* m - Abcis.= 350 | M.[-] = 24.6 tf* m
 [tf,cm] | As = 2.98 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 13.31 -SRAS- [3 B 25.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 6.45 -STAS- [2 B 20.0mm] | AsL= 0.00 ----- x/d =0.38
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.0 | x/dMx=0.45
 [tf,cm] | M[-]Min = 672.1 | M[+]Min = 541.4 | M[-]Min = 1222.0
 [cm2] | Asapo[+]= 2.86 | Asapo[+]= 1.61

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 648. 14.19 57.72 1 45. 1.5 1.7 1.7 6.3 30.0 2 0.0 0.0
 648.- 810. 20.31 57.37 1 45. 3.6 1.7 3.6 6.3 15.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 9.183 6.890 0.15 0.00 1 P88 0.00 0.00 88 0 0 0 0
 2 14.509 10.856 0.60 0.06 1 P89 0.00 0.00 89 0 0 0 0



V35

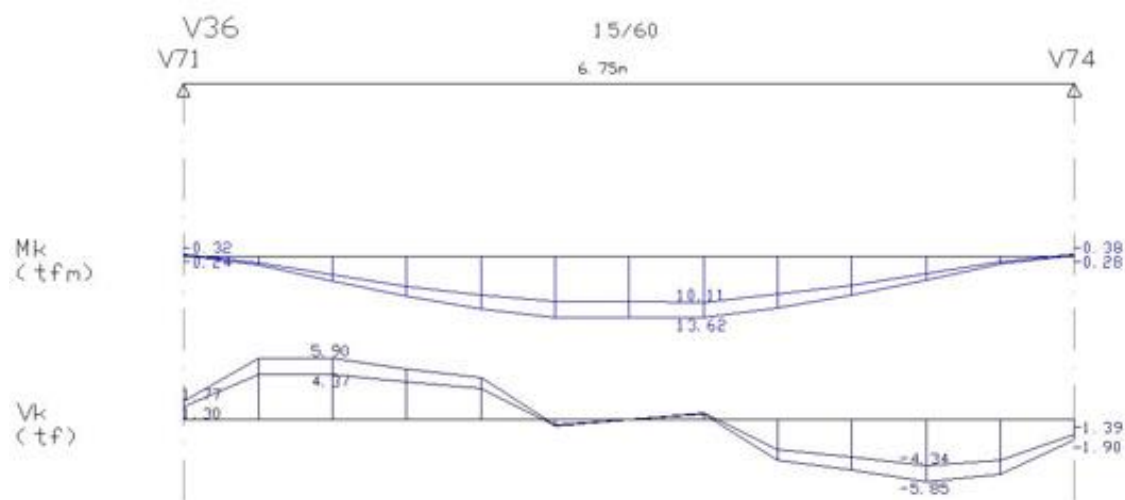
Viga= 35 V35

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1B /L= 14.02 /B= 0.15 /H= 1.00 /BCs= 5.76 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO | M[-]= 26.99 tf* m | As = 26.26 -SRAD- [6 B 25.0mm]
 BAL.ESQ | Grampo ESQ = 1 B 6.3mm x/d =0.45 | AsL= 7.56 -Arm.Lat.= [2 X 4 B 8.0mm]
 [tf,cm] | M[-]Min= 5779.1 - x/dMx =0.45 | ***AsL Compressao*** | % Baric.Armad.=13 ****

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 62. 15.30 72.64 1 45. 0.8 1.7 3.6 6.3 15.0 2 0.0 3.6
 62.-1124. 18.02 72.06 1 45. 1.6 1.7 1.7 6.3 30.0 2 0.0 0.0
 1124.-1390. 24.54 71.10 1 45. 3.4 1.7 3.4 6.3 18.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 15.801 11.770 0.25 0.00 1 P89 0.00 0.00 89 0 0 0 0 0



V36

Viga= 36 V36

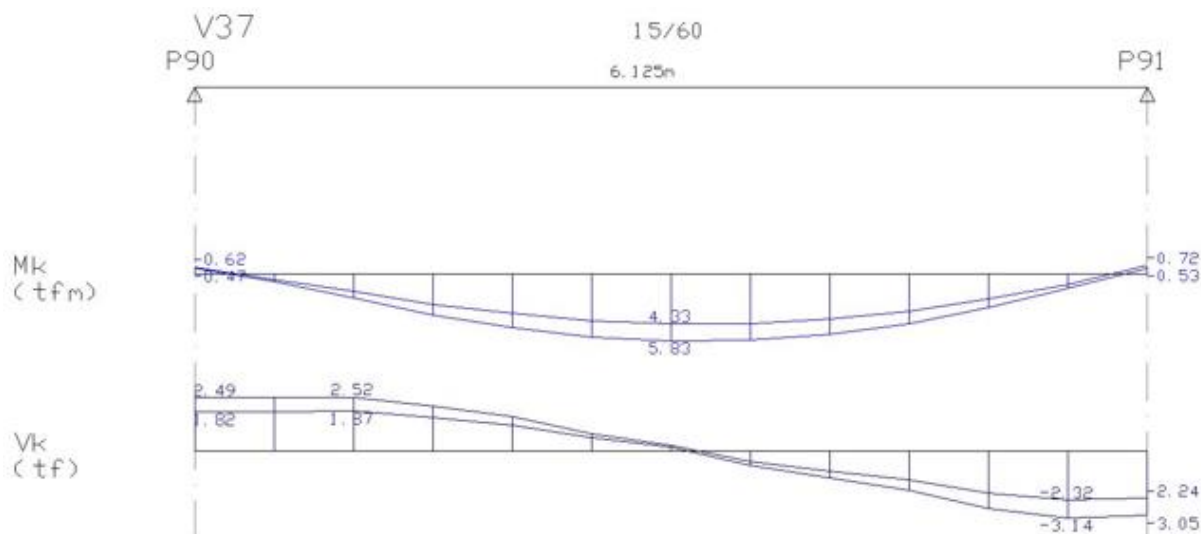
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 0.3 tf* m | M.[+] Max= 13.6 tf* m - Abcis.= 393 | M.[-] = 0.4 tf* m |
 [tf,cm] | As = 1.35 -SRAS- [2 B 10.0mm] | AsL= 0.00 ----- | As = 1.35 -SRAS- [2 B 10.0mm] |
 | AsL= 0.00 ----- x/d =0.04 | As = 9.33 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.04 | |
 | Grampos Esq.= 4B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 18.6 | Grampos Dir.= 4B 8.0mm x/dMx=0.45 |
 | | | | |
 [tf,cm] | M[-]Min = 195.4 | M[+]Min = 195.4 | M[-]Min = 195.4 |
 [cm2] | Asapo[+]= 3.11 | | | Asapo[+]= 3.11 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 660. 8.26 42.28 1 45. 0.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	1.767	1.294	0.15	0.00	2	V71	0.00	0.00	0 0 0 0 0
2	1.902	1.388	0.15	0.00	2	V74	0.00	0.00	0 0 0 0 0

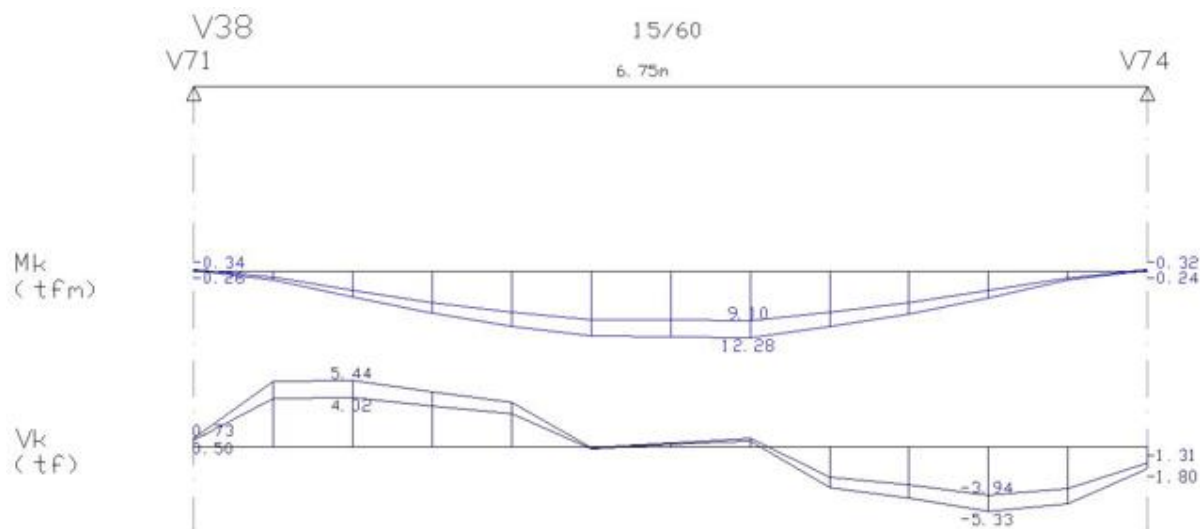


V37

Viga= 37 V37

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

G E O M E T R I A E C A R G A S																			
Vao= 1 /L= 6.12 /B= 0.15 /H= 0.60 /BCs= 0.76 /BCi= 0.00 /TPs= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]																			
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---																			
A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)																			
FLEXAO- E S Q U E R D A				M E I O D O V A O				D I R E I T A											
M.[-] = 0.6 tf* m				M.[+] Max= 5.8 tf* m - Abcis.= 306				M.[-] = 0.7 tf* m											
[tf,cm] As = 1.65 -SRAS- [3 B 10.0mm]				AsL= 0.00 -----				As = 1.65 -SRAS- [3 B 10.0mm]											
AsL= 0.00 -----				As = 3.42 -STAS- [3 B 12.5mm]				AsL= 0.00 -----											
x/d =0.06				Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.3				Grampos Dir.= 1B 6.3mm x/dMx=0.45											
x/dMx=0.45																			
[tf,cm] M[-]Min = 275.5				M[+]Min = 271.6				M[-]Min = 275.5											
[cm2] Asapo[+]= 1.14								Asapo[+]= 1.14											
C I S A L H A M E N T O - M E N S A G E M																			
Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus																			
[tf,cm] 0.- 595. 4.40 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0																			
R E A C . A P O I O -																			
No.		Maximos		Minimos		Largura		DEPEV		Morte		Nome		M.I.Mx		M.I.Mn		Pilares:	
1		2.483		1.822		0.20		0.00		1		P90		0.00		0.00		90 0 0 0 0 0	
2		3.048		2.240		0.15		0.00		1		P91		0.00		0.00		91 0 0 0 0 0	



V38

Viga= 38 V38

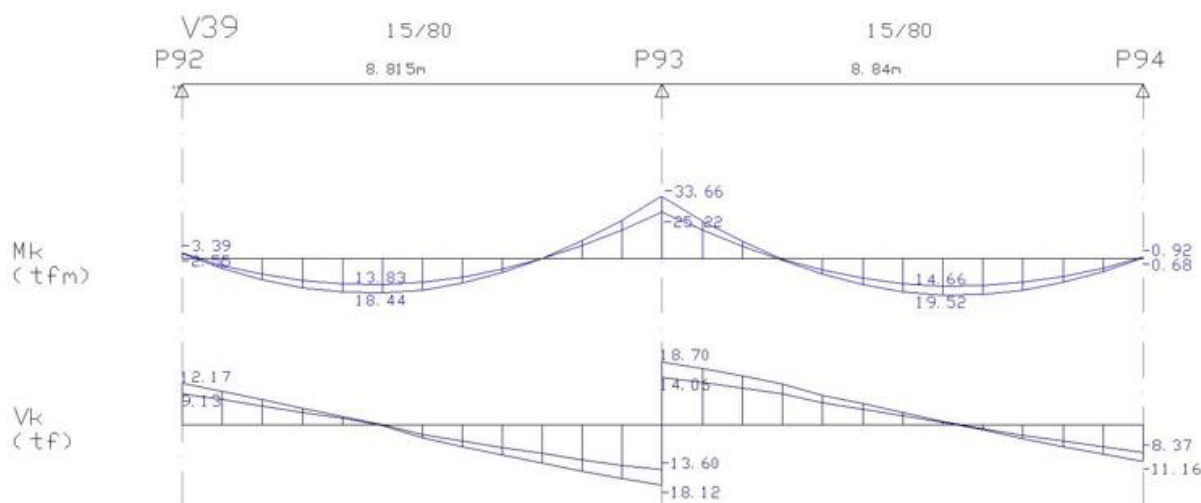
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.15 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.3 tf* m | M.[+] Max= 12.3 tf* m - Abcis.= 393 | M.[-] = 0.3 tf* m
[tf,cm] | As = 1.35 -SRAS- [2 B 10.0mm] | AsL= 0.00 ----- | As = 1.35 -SRAS- [2 B 10.0mm]
| AsL= 0.00 ----- x/d =0.04 | As = 8.39 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.04
| Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 16.7 | Grampos Dir.= 3B 8.0mm x/dMx=0.45
| | | |
[tf,cm] | M[-]Min = 195.4 | M[+]Min = 195.4 | M[-]Min = 195.4
[cm2] | Asapo[+] = 2.80 | | Asapo[+] = 2.80

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 660. 7.61 42.39 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 0.730 0.504 0.15 0.00 2 V71 0.00 0.00 0 0 0 0 0 0
2 1.799 1.306 0.15 0.00 2 V74 0.00 0.00 0 0 0 0 0 0



V39

Viga= 39 V39

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 3.4 tf* m | M.[+] Max= 18.4 tf* m - Abcis.= 367 | M.[-] = 33.7 tf* m
[tf,cm] | As = 3.07 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 18.98 -SRAD- [4 B 25.0mm]
| AsL= 0.00 ----- x/d =0.08 | As = 8.12 -STAS- [4 B 16.0mm] | AsL= 3.74 ----- x/d =0.45
| | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.6 | | x/dMx=0.45
| | | | | |
| % Baric.Armad.= 2 | % Baric.Armad.= 3 | |
[tf,cm] | M[-]Min = 686.6 | M[+]Min = 528.7 | M[-]Min = 1612.7
[cm2] | Asapo[+] = 3.17 | | Asapo[+] = 3.74

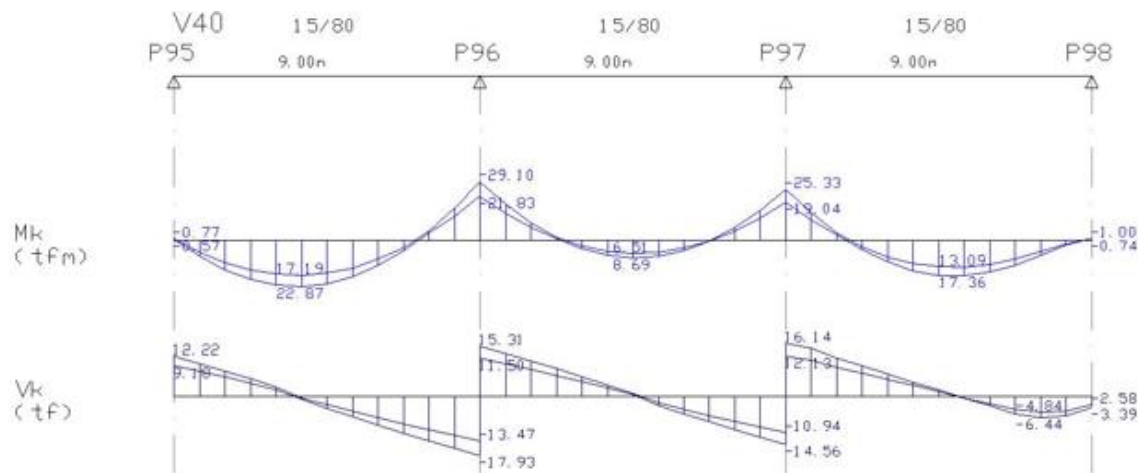
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	170.	17.03	57.62	1	45.	2.4	1.7	2.4	6.3	25.0	2	0.0	0.0	
	170.-	510.	10.29	57.37	1	45.	0.2	1.7	1.7	6.3	30.0	2	0.0	0.0	
	510.-	680.	18.21	57.64	1	45.	2.8	1.7	2.8	6.3	22.0	2	0.0	0.0	
	680.-	850.	25.36	56.63	1	45.	5.4	1.7	5.4	6.3	10.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 1.48 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 33.4 tf* m | M.[+] Max= 19.5 tf* m - Abcis.= 515 | M.[-] = 0.9 tf* m
[tf,cm] | As = 18.87 -SRAD- [4 B 25.0mm] | AsL= 0.00 ----- | As = 3.08 -SRAS- [4 B 10.0mm]
| AsL= 3.63 ----- x/d =0.45 | As = 8.53 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.08
| | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | | Grampos Dir.= 3B 8.0mm x/dMx=0.45
| | | | | |
| ***AsL Compr.*** | | | | | |
| % Baric.Armad.= 11 *** | % Baric.Armad.= 2 | % Baric.Armad.= 2
[tf,cm] | M[-]Min = 1615.5 | M[+]Min = 528.8 | M[-]Min = 687.5
[cm2] | Asapo[+] = 3.63 | | Asapo[+] = 2.85

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	174.	26.18	56.65	1	45.	5.7	1.7	5.7	6.3	10.0	2	0.0	0.0	
	174.-	348.	18.66	57.59	1	45.	3.0	1.7	3.0	6.3	20.0	2	0.0	0.0	
	348.-	869.	15.62	57.51	1	45.	2.0	1.7	2.0	6.3	30.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	12.149	9.114	0.50	0.01	1	P92	0.00	0.00	92
2	36.814	27.657	0.15	0.00	1	P93	0.00	0.00	93
3	11.157	8.372	0.15	0.00	1	P94	0.00	0.00	94



V40

Viga= 40 V40

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)									
FLEXAO- E S Q U E R D A					M E I O D O V A O				
M.[-] = 0.8 tf* m					M.[+] Max= 22.9 tf* m - Abcis.= 375				
As = 3.10 -SRAS- [4 B 10.0mm]					AsL= 0.00 -----				
AsL= 0.00 ----- x/d =0.08					As = 10.22 -STAS- [5 B 16.0mm]				
Grampos Esq.= 4B 8.0mm x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0				
% Baric.Armad.= 2					% Baric.Armad.= 4				
[tf,cm] M[-]Min = 693.3					M[+]Min = 529.8				
[cm2] Asapo[+]= 3.41									

C I S A L H A M E N T O -										M E N S A G E M									
[tf,cm]	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus					
	0.-	177.	17.11	57.47	1	45.	2.5	1.7	2.5	6.3	25.0	2	0.0	0.0					
	177.-	531.	9.30	57.18	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0					
	531.-	708.	17.43	57.41	1	45.	2.6	1.7	2.6	6.3	22.0	2	0.0	0.0					
	708.-	885.	25.10	57.06	1	45.	5.3	1.7	5.3	6.3	10.0	2	0.0	0.0					

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.23 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)									
FLEXAO- E S Q U E R D A					M E I O D O V A O				
M.[-] = 28.9 tf* m					M.[+] Max= 8.7 tf* m - Abcis.= 450				
As = 16.55 -SRAD- [4 B 25.0mm]					AsL= 0.00 -----				
AsL= 1.32 ----- x/d =0.45					As = 4.23 -STAS- [4 B 12.5mm]				
x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9				
AsL Compr.									
% Baric.Armad.= 11 ***					% Baric.Armad.= 1				
[tf,cm] M[-]Min = 1423.7					M[+]Min = 517.6				
[cm2] Asapo[+]= 1.42									

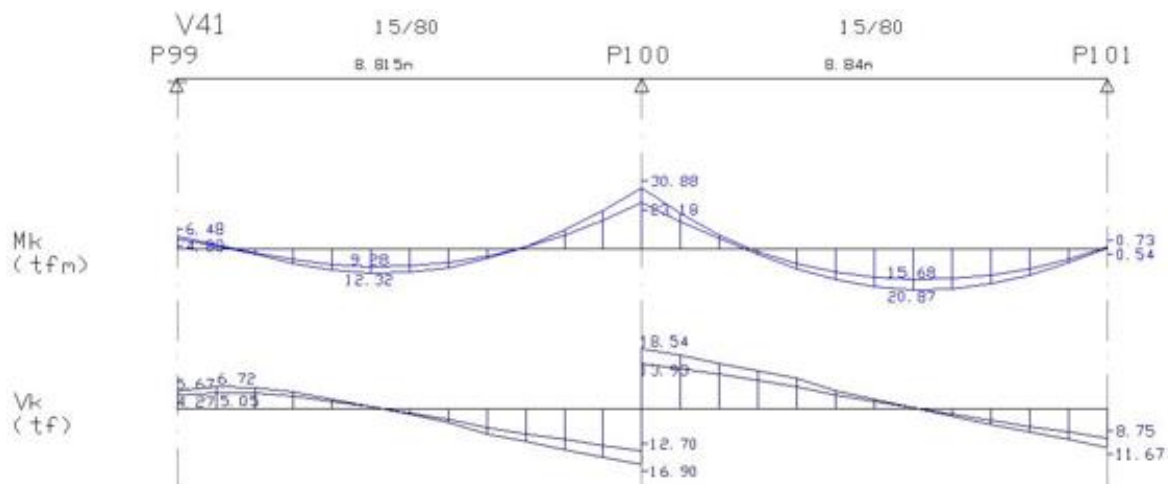
C I S A L H A M E N T O -										M E N S A G E M									
[tf,cm]	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus					
	0.-	177.	21.44	57.09	1	45.	4.0	1.7	4.0	6.3	15.0	2	0.0	0.0					
	177.-	708.	13.55	57.85	1	45.	1.2	1.7	1.7	6.3	30.0	2	0.0	0.0					
	708.-	885.	20.39	57.37	1	45.	3.6	1.7	3.6	6.3	15.0	2	0.0	0.0					

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)									
FLEXAO- E S Q U E R D A					M E I O D O V A O				
M.[-] = 25.3 tf* m					M.[+] Max= 17.4 tf* m - Abcis.= 525				
As = 13.78 -SRAS- [3 B 25.0mm]					AsL= 0.00 -----				
AsL= 0.00 ----- x/d =0.39					As = 7.64 -STAS- [4 B 16.0mm]				
x/dMx=0.45					Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.5				
[tf,cm] M[-]Min = 1633.4					M[+]Min = 529.8				
[cm2] Asapo[+]= 1.91									

C I S A L H A M E N T O -										M E N S A G E M									
[tf,cm]	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus					
	0.-	177.	22.60	57.37	1	45.	4.4	1.7	4.4	6.3	12.0	2	0.0	0.0					
	177.-	885.	14.78	57.74	1	45.	1.7	1.7	1.7	6.3	30.0	2	0.0	0.0					

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	12.207	9.170	0.15	0.00	1	P95	0.00	0.00	95
2	33.246	24.967	0.15	0.00	1	P96	0.00	0.00	96
3	30.707	23.069	0.15	0.00	1	P97	0.00	0.00	97
4	3.392	2.579	0.15	0.00	1	P98	0.00	0.00	98



V41

Viga= 41 V41

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 6.5 tf* m | M.[+] Max= 12.3 tf* m - Abcis.= 367 | M.[-] = 30.8 tf* m
[tf,cm] | As = 4.51 -SRAS- [4 B 12.5mm] | AsL= 0.00 ----- | As = 17.51 -SRAD- [4 B 25.0mm]
| AsL= 0.00 ----- x/d =0.12 | As = 5.34 -STAS- [3 B 16.0mm] | AsL= 2.28 ----- x/d =0.45
| | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | | | x/dMx=0.45
| | | | | | | ***AsL Compr.***
| | | | | | | % Baric.Armad.= 11 ***
[tf,cm] | M[-]Min = 987.6 | M[+]Min = 528.7 | M[-]Min = 1612.7
[cm2] | Asapo[+] = 1.33 | | | Asapo[+] = 2.38

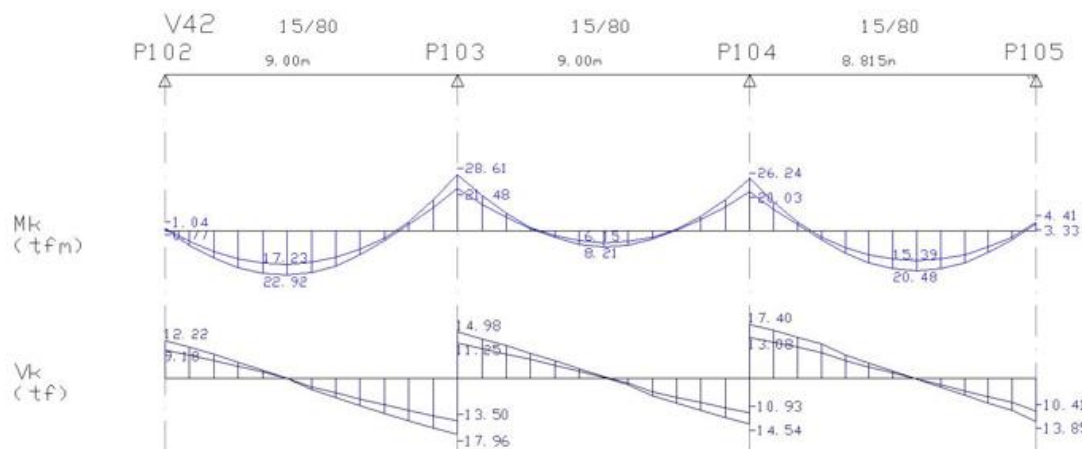
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 680. 15.92 57.84 1 45. 2.0 1.7 2.0 6.3 30.0 2 0.0 0.0
680.- 850. 23.66 56.91 1 45. 4.8 1.7 4.8 6.3 12.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 1.48 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 30.9 tf* m | M.[+] Max= 20.9 tf* m - Abcis.= 515 | M.[-] = 0.7 tf* m
[tf,cm] | As = 17.57 -SRAD- [4 B 25.0mm] | AsL= 0.00 ----- | As = 3.08 -SRAS- [4 B 10.0mm]
| AsL= 2.33 ----- x/d =0.45 | As = 9.12 -STAS- [3 B 20.0mm] | AsL= 0.00 ----- x/d =0.08
| | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.8 | | | Grampos Dir.= 3B 8.0mm x/dMx=0.45
| | | | | | | ***AsL Compr.***
| | | | | | | % Baric.Armad.= 11 ***
[tf,cm] | M[-]Min = 1615.5 | M[+]Min = 528.8 | M[-]Min = 687.5
[cm2] | Asapo[+] = 2.44 | | | Asapo[+] = 3.04

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 174. 25.96 56.89 1 45. 5.6 1.7 5.6 6.3 10.0 2 0.0 0.0
174.- 348. 18.17 57.59 1 45. 2.8 1.7 2.8 6.3 22.0 2 0.0 0.0
348.- 695. 8.88 57.36 1 45. 0.0 1.7 1.7 6.3 30.0 2 0.0 0.0
695.- 869. 16.33 57.47 1 45. 2.2 1.7 2.2 6.3 28.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 5.659 4.265 0.50 0.01 1 P99 0.00 0.00 99 0 0 0 0 0
2 35.441 26.635 0.15 0.00 1 P100 0.00 0.00 100 0 0 0 0 0
3 11.665 8.754 0.15 0.00 1 P101 0.00 0.00 101 0 0 0 0 0



V42

Viga= 42 V42 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.50 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----		----- D I R E I T A -----	
FLEXAO-	E S Q U E R D A	M E I O D O V A O	
[tf,cm]	M.[-] = 1.0 tf* m	M.[+] Max= 22.9 tf* m - Abcis.= 375	M.[-] = 28.6 tf* m
	As = 3.10 -SRAS- [4 B 10.0mm]	AsL= 0.00	As = 16.41 -SRAD- [4 B 25.0mm]
	AsL= 0.00 x/d =0.08	As = 10.24 -STAS- [5 B 16.0mm]	AsL= 1.18 x/d =0.45
	Grampos Esq.= 4B 8.0mm x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0	
	% Baric.Armad.= 2	% Baric.Armad.= 4	***AsL Compr.***
[tf,cm]	M[-]Min = 693.3	M[+]Min = 529.8	% Baric.Armad.= 11 ***
[cm2]	Asapo[+] = 3.41		M[-]Min = 1633.4
			Asapo[+] = 2.56

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	177.	17.11	57.47	1	45.	2.5	1.7	2.5	6.3	25.0	2	0.0	0.0	
	177.-	531.	9.34	57.17	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	531.-	708.	17.49	57.40	1	45.	2.6	1.7	2.6	6.3	22.0	2	0.0	0.0	
	708.-	885.	25.15	57.11	1	45.	5.3	1.7	5.3	6.3	10.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 1.23 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----		----- D I R E I T A -----	
FLEXAO-	E S Q U E R D A	M E I O D O V A O	
[tf,cm]	M.[-] = 28.6 tf* m	M.[+] Max= 8.2 tf* m - Abcis.= 450	M.[-] = 26.2 tf* m
	As = 16.42 -SRAD- [4 B 25.0mm]	AsL= 0.00	As = 14.40 -SRAS- [3 B 25.0mm]
	AsL= 1.18 x/d =0.45	As = 4.23 -STAS- [4 B 12.5mm]	AsL= 0.00 x/d =0.41
	x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9	
	AsL Compr.	% Baric.Armad.= 1	% Baric.Armad.= 7
[tf,cm]	M[-]Min = 1423.7	M[+]Min = 517.6	M[-]Min = 1423.7
[cm2]	Asapo[+] = 1.29		Asapo[+] = 1.06

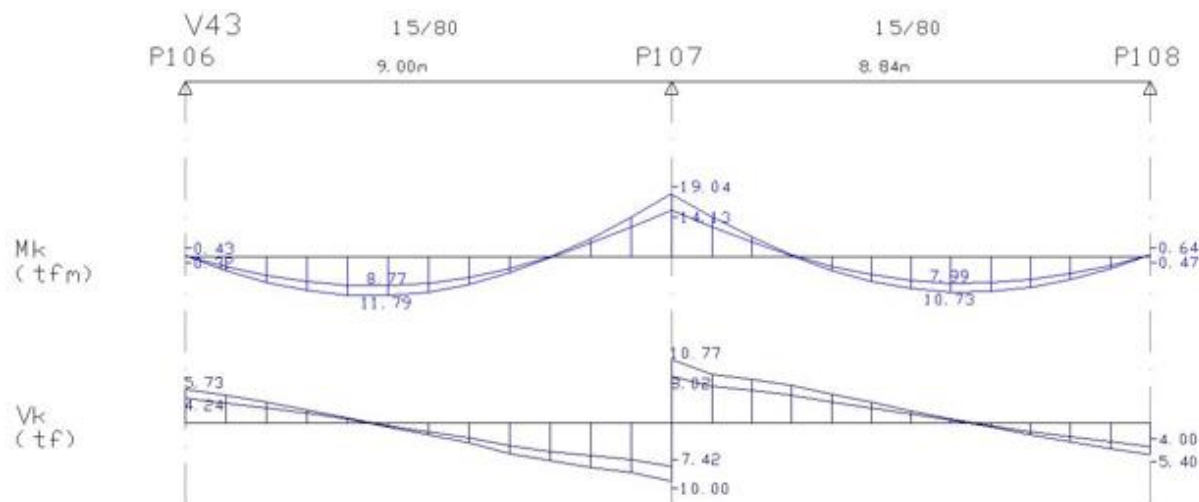
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	177.	20.96	57.11	1	45.	3.8	1.7	3.8	6.3	15.0	2	0.0	0.0	
	177.-	708.	13.15	57.85	1	45.	1.1	1.7	1.7	6.3	30.0	2	0.0	0.0	
	708.-	885.	20.36	57.33	1	45.	3.6	1.7	3.6	6.3	15.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 8.81 /B= 0.15 /H= 0.80 /BCs= 1.47 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----		----- D I R E I T A -----	
FLEXAO-	E S Q U E R D A	M E I O D O V A O	
[tf,cm]	M.[-] = 26.7 tf* m	M.[+] Max= 20.5 tf* m - Abcis.= 514	M.[-] = 4.4 tf* m
	As = 14.70 -SRAS- [3 B 25.0mm]	AsL= 0.00	As = 3.07 -SRAS- [4 B 10.0mm]
	AsL= 0.00 x/d =0.42	As = 8.95 -STAS- [3 B 20.0mm]	AsL= 0.00 x/d =0.08
	x/dMx=0.45	Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.8	
[tf,cm]	M[-]Min = 1612.7	M[+]Min = 528.7	M[-]Min = 686.6
[cm2]	Asapo[+] = 2.24		Asapo[+] = 3.72

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	170.	24.36	57.29	1	45.	5.0	1.7	5.0	6.3	12.0	2	0.0	0.0	
	170.-	340.	17.27	57.55	1	45.	2.5	1.7	2.5	6.3	22.0	2	0.0	0.0	
	340.-	680.	8.76	57.37	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	680.-	850.	19.39	57.58	1	45.	3.2	1.7	3.2	6.3	18.0	2	0.0	0.0	

REAC. APOIO -	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	12.202	9.167	0.15	0.00	1	P102	0.00	0.00	102	0 0 0 0 0
2	32.936	24.746	0.15	0.00	1	P103	0.00	0.00	103	0 0 0 0 0
3	31.941	24.009	0.15	0.00	1	P104	0.00	0.00	104	0 0 0 0 0
4	13.847	10.409	0.50	0.01	1	P105	0.00	0.00	105	0 0 0 0 0



V43

Viga= 43 V43

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.4 tf* m | M.[+] Max= 11.8 tf* m - Abcis.= 375 | M.[-] = 19.0 tf* m
 [tf,cm] | As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 9.62 -SRAS- [3 B 20.0mm]
 | AsL= 0.00 ----- x/d =0.06 | As = 5.13 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.27
 | Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.9 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
 [cm2] | Asapo[+] = 1.90 | Asapo[+] = 1.28

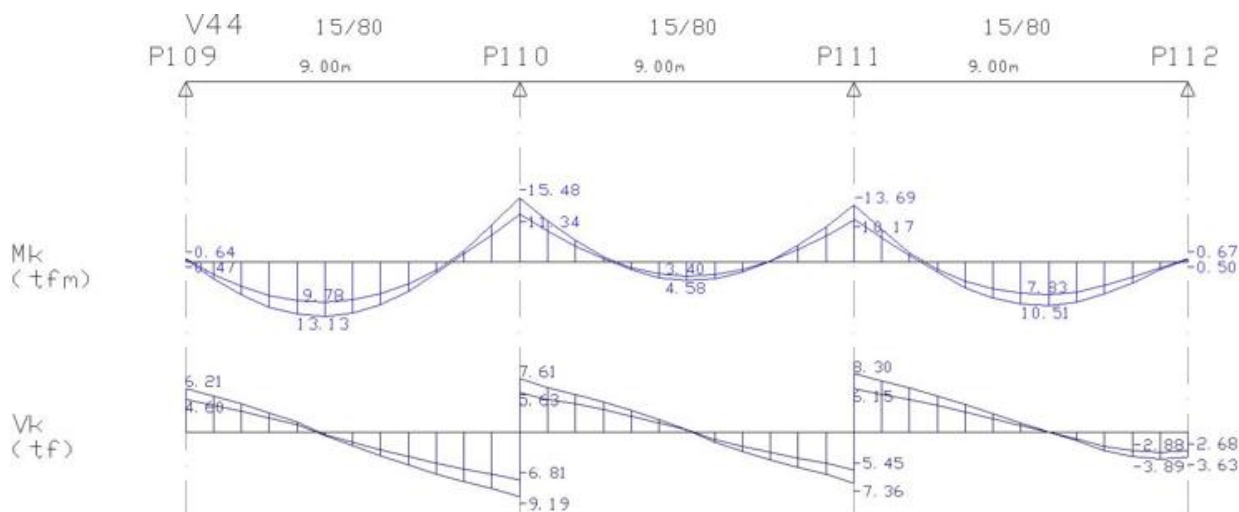
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 885. 14.00 57.78 1 45. 1.4 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 0.81 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 18.9 tf* m | M.[+] Max= 10.7 tf* m - Abcis.= 515 | M.[-] = 0.6 tf* m
 [tf,cm] | As = 9.53 -SRAS- [3 B 20.0mm] | AsL= 0.00 ----- | As = 2.30 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.27 | As = 4.63 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.06
 | Grampos Dir.= 2B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 1059.5 | M[+]Min = 489.2 | M[-]Min = 522.7
 [cm2] | Asapo[+] = 1.16 | Asapo[+] = 1.74

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 869. 15.08 57.85 1 45. 1.8 1.7 1.8 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 5.719 4.231 0.15 0.00 1 P106 0.00 0.00 106 0 0 0 0 0
 2 20.770 15.442 0.15 0.00 1 P107 0.00 0.00 107 0 0 0 0 0
 3 5.399 3.996 0.15 0.00 1 P108 0.00 0.00 108 0 0 0 0 0



V44

Viga= 44 V44

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.6 tf* m | M.[+] Max= 13.1 tf* m - Abcis.= 375 | M.[-] = 15.5 tf* m
[tf,cm] | As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 7.33 -SRAS- [4 B 16.0mm]
| AsL= 0.00 ----- x/d =0.06 | As = 5.72 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.20
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.=2 X 3 B 8.0mm - LN= 2.1 | | x/dMx=0.45
[tf,cm] | M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
[cm2] | Asapo[+] = 2.00 | | Asapo[+] = 1.43

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 12.86 57.75 1 45. 1.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.69 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 15.3 tf* m | M.[+] Max= 4.6 tf* m - Abcis.= 450 | M.[-] = 13.6 tf* m
[tf,cm] | As = 7.23 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 6.39 -SRAS- [2 B 20.0mm]
| AsL= 0.00 ----- x/d =0.19 | As = 3.02 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.17
| | Arm.Lat.=2 X 3 B 8.0mm - LN= 0.9 | | x/dMx=0.45
[tf,cm] | M[-]Min = 941.1 | M[+]Min = 476.8 | M[-]Min = 941.1
[cm2] | Asapo[+] = 0.75 | | Asapo[+] = 0.75

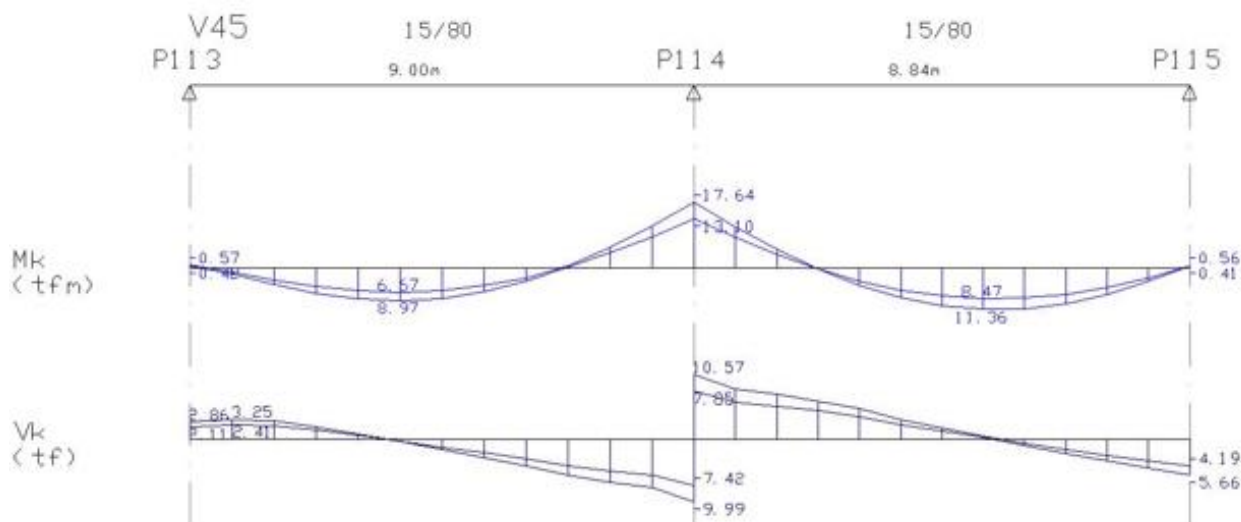
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 10.66 57.85 1 45. 0.3 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 13.7 tf* m | M.[+] Max= 10.5 tf* m - Abcis.= 525 | M.[-] = 0.7 tf* m
[tf,cm] | As = 6.46 -SRAS- [2 B 20.0mm] | AsL= 0.00 ----- | As = 2.31 -SRAS- [3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.17 | As = 4.54 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.06
| | Arm.Lat.=2 X 3 B 8.0mm - LN= 1.6 | | Grampos Dir.= 1B 6.3mm x/dMx=0.45
[tf,cm] | M[-]Min = 1070.7 | M[+]Min = 490.3 | M[-]Min = 525.8
[cm2] | Asapo[+] = 1.13 | | Asapo[+] = 1.51

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 11.62 57.84 1 45. 0.6 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	6.201	4.596	0.15	0.00	1	P109	0.00	0.00	109	0 0 0 0 0
2	16.798	12.439	0.15	0.00	1	P110	0.00	0.00	110	0 0 0 0 0
3	15.667	11.594	0.15	0.00	1	P111	0.00	0.00	111	0 0 0 0 0
4	3.631	2.678	0.15	0.00	1	P112	0.00	0.00	112	0 0 0 0 0



V45

Viga= 45 V45

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

```

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.6 tf* m | M.[+] Max= 9.0 tf* m - Abcis.= 375 | M.[-] = 17.6 tf* m
[tf,cm]| As = 2.31 -SRAS- [ 3 B 10.0mm] | AsL= 0.00 ----- | As = 8.80 -SRAS- [ 3 B 20.0mm]
| AsL= 0.00 ----- x/d =0.06 | As = 3.86 -STAS- [ 2 B 16.0mm ] | AsL= 0.00 ----- x/d =0.25
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.4 | x/dMx=0.45
[tf,cm]| M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
[cm2 ]| Asapo[+]= 1.29 | | Asapo[+]= 0.97

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 13.99 57.85 1 45. 1.4 1.7 1.7 5.0 22.0 2 0.0 0.0

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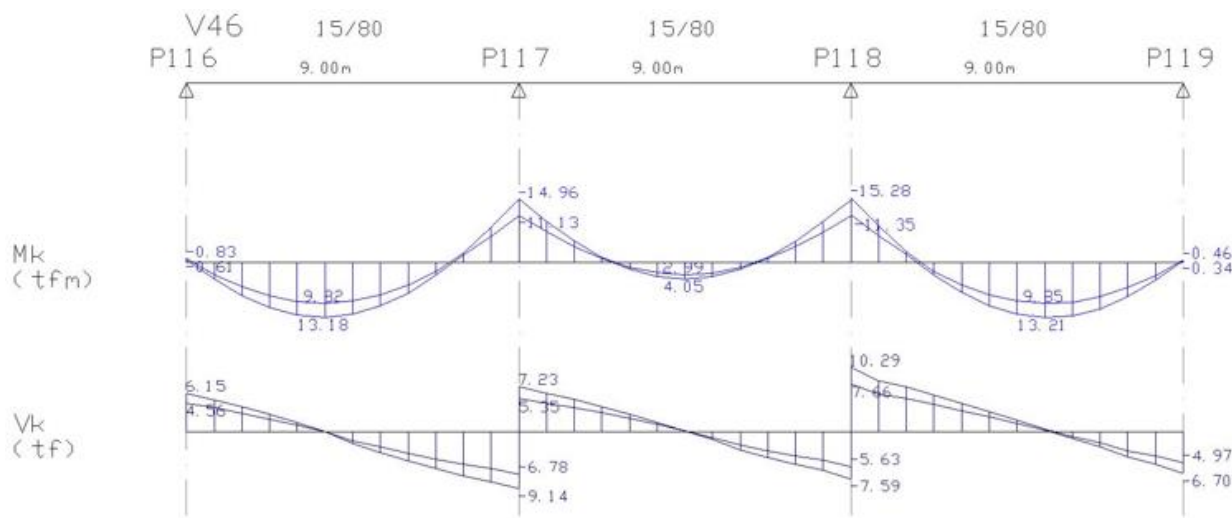
----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.84 /B= 0.15 /H= 0.80 /BCs= 0.81 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 17.6 tf* m | M.[+] Max= 11.4 tf* m - Abcis.= 515 | M.[-] = 0.6 tf* m
[tf,cm]| As = 8.82 -SRAS- [ 3 B 20.0mm] | AsL= 0.00 ----- | As = 2.30 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.25 | As = 4.91 -STAS- [ 4 B 12.5mm ] | AsL= 0.00 ----- x/d =0.06
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.8 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
[tf,cm]| M[-]Min = 1059.5 | M[+]Min = 489.2 | M[-]Min = 522.7
[cm2 ]| Asapo[+]= 1.23 | | Asapo[+]= 1.82

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 869. 14.80 57.79 1 45. 1.7 1.7 1.7 5.0 22.0 2 0.0 0.0

```

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:
	1	2.859	2.105	0.15	0.00	1	P113	0.00	0.00	113	0 0 0 0 0
	2	20.563	15.272	0.15	0.00	1	P114	0.00	0.00	114	0 0 0 0 0
	3	5.661	4.193	0.15	0.00	1	P115	0.00	0.00	115	0 0 0 0 0



V46

Viga= 46 V46

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

```

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.8 tf* m | M.[+] Max= 13.2 tf* m - Abcis.= 375 | M.[-] = 15.0 tf* m
[tf,cm]| As = 2.31 -SRAS- [ 3 B 10.0mm] | AsL= 0.00 ----- | As = 7.08 -SRAS- [ 4 B 16.0mm]
| AsL= 0.00 ----- | As = 5.74 -STAS- [ 3 B 16.0mm ] | AsL= 0.00 ----- | x/d = 0.19
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | | x/dMx=0.45
| | | | |
[tf,cm]| M[-]Min = 525.8 | M[+]Min = 490.3 | M[-]Min = 1070.7
[cm2 ]| Asapo[+] = 1.98 | | Asapo[+] = 1.44

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 12.80 57.76 1 45. 1.0 1.7 1.7 5.0 22.0 2 0.0 0.0

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----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.69 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 15.0 tf* m | M.[+] Max= 4.0 tf* m - Abcis.= 450 | M.[-] = 14.9 tf* m
[tf,cm]| As = 7.07 -SRAS- [ 4 B 16.0mm] | AsL= 0.00 ----- | As = 7.02 -SRAS- [ 4 B 16.0mm]
| AsL= 0.00 ----- | As = 3.02 -STAS- [ 4 B 10.0mm ] | AsL= 0.00 ----- | x/d = 0.19
| | | | |
| Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | | x/dMx=0.45
| | | | |
[tf,cm]| M[-]Min = 941.1 | M[+]Min = 476.8 | M[-]Min = 941.1
[cm2 ]| Asapo[+] = 0.75 | | Asapo[+] = 0.75

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 10.63 57.85 1 45. 0.3 1.7 1.7 5.0 22.0 2 0.0 0.0

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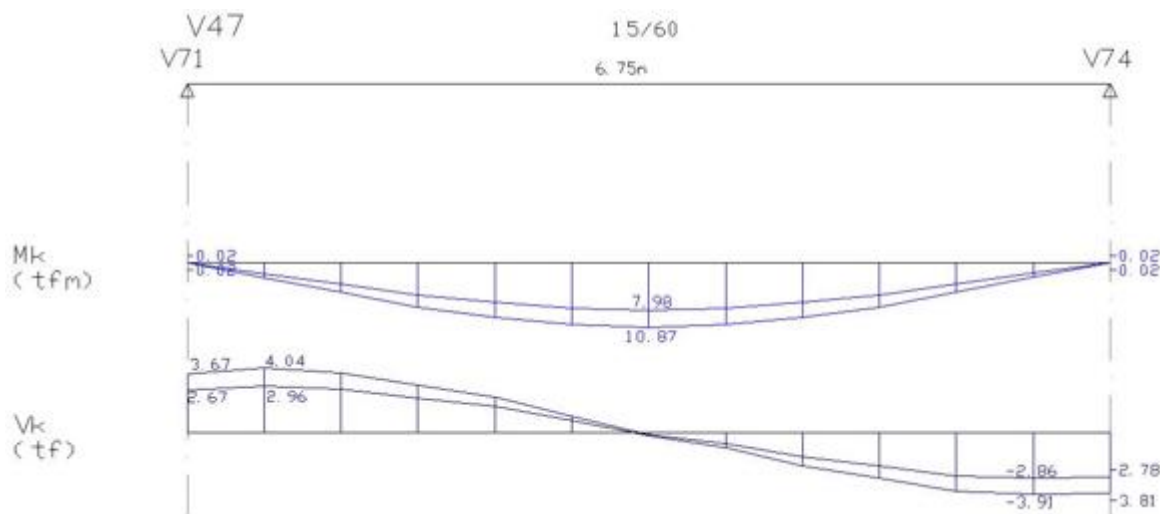
----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 9.00 /B= 0.15 /H= 0.80 /BCs= 0.82 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 15.3 tf* m | M.[+] Max= 13.2 tf* m - Abcis.= 525 | M.[-] = 0.5 tf* m
[tf,cm]| As = 7.23 -SRAS- [ 4 B 16.0mm] | AsL= 0.00 ----- | As = 2.31 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- | As = 5.76 -STAS- [ 3 B 16.0mm ] | AsL= 0.00 ----- | x/d = 0.06
| | | | |
| Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | | Grampos Dir.= 3B 8.0mm x/dMx=0.45
| | | | |
[tf,cm]| M[-]Min = 1070.7 | M[+]Min = 490.3 | M[-]Min = 525.8
[cm2 ]| Asapo[+] = 1.44 | | Asapo[+] = 2.16

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 885. 14.41 57.74 1 45. 1.6 1.7 1.7 5.0 22.0 2 0.0 0.0

```

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:				
	1	6.144	4.554	0.15	0.00	1	P116	0.00	0.00	116	0	0	0	0
	2	16.378	12.130	0.15	0.00	1	P117	0.00	0.00	117	0	0	0	0
	3	17.884	13.289	0.15	0.00	1	P118	0.00	0.00	118	0	0	0	0
	4	6.703	4.974	0.15	0.00	1	P119	0.00	0.00	119	0	0	0	0



V47

Viga= 47 V47

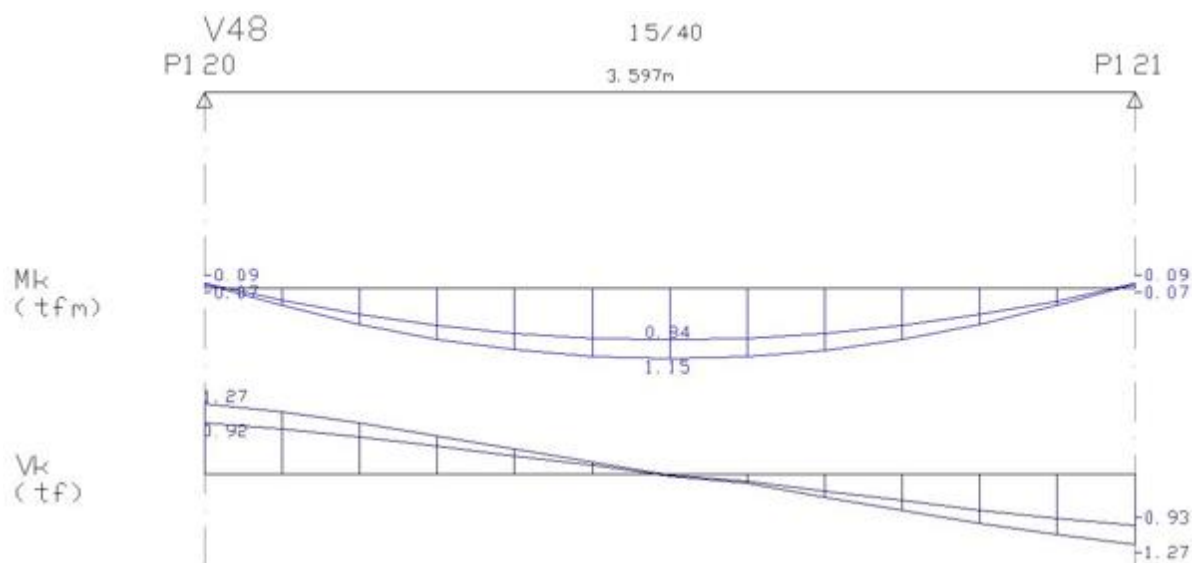
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 6.75 /B= 0.15 /H= 0.60 /BCs= 0.80 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.0 tf* m | M.[+] Max= 10.9 tf* m - Abcis.= 337 | M.[-] = 0.0 tf* m
 [tf,cm] | As = 1.70 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 1.70 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.06 | As = 6.43 -STAS- [2 B 20.0mm] | AsL= 0.00 ----- x/d =0.06
 | Grampos Esq.= 3B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 2.4 | Grampos Dir.= 3B 8.0mm x/dMx=0.45
 [tf,cm] | M[-]Min = 283.3 | M[+]Min = 273.5 | M[-]Min = 283.3
 [cm2] | Asapo[+]= 2.14 | Asapo[+]= 2.14

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 660. 5.65 42.43 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 3.663 2.670 0.15 0.00 2 V71 0.00 0.00 0 0 0 0 0 0
 2 3.815 2.782 0.15 0.00 2 V74 0.00 0.00 0 0 0 0 0 0

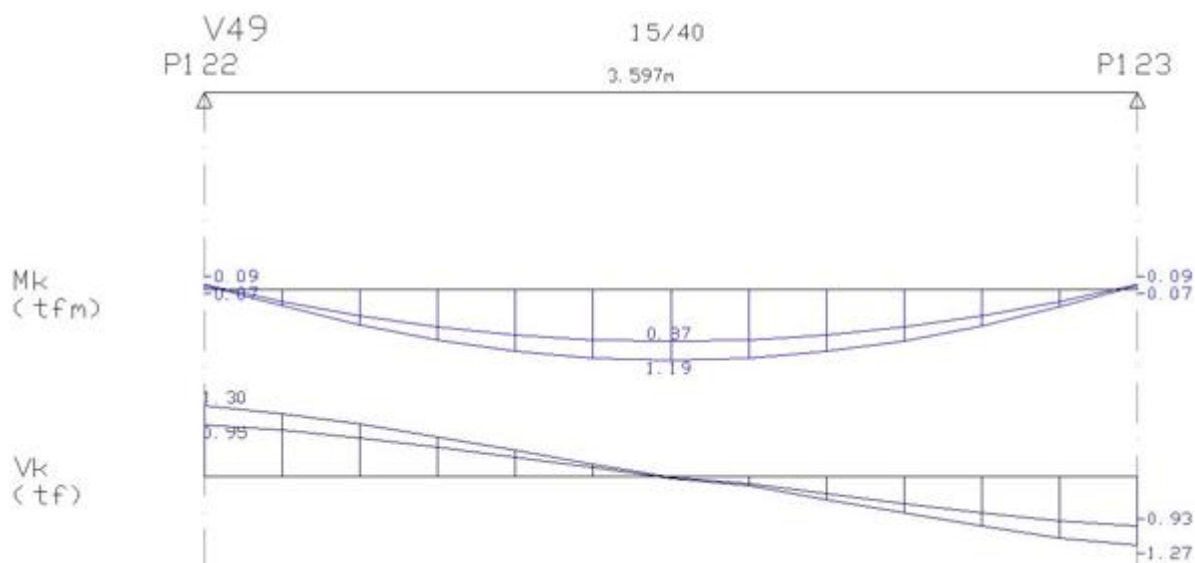


V48

Viga= 48 V48

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----													
Vao= 1 /L= 3.60 /B= 0.15 /H= 0.40 /BCs= 0.51 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.12 /Esp.LI= 0.00 FSp.Ex= 0.20 /FLt.Ex= 0.07 [M]													
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---													
- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -													
FLEXAO- E S Q U E R D A				M E I O D O V A O				D I R E I T A					
M.[-] = 0.1 tf* m				M.[+] Max= 1.1 tf* m - Abcis.= 179				M.[-] = 0.1 tf* m					
[tf,cm] As = 1.02 -SRAS- [2 B 8.0mm]				AsL= 0.00 -----				As = 1.02 -SRAS- [2 B 8.0mm]					
AsL= 0.00 -----				As = 1.55 -STAS- [2 B 10.0mm]				AsL= 0.00 -----					
x/d =0.06				Arm.Lat.=[2 X -- B --- mm] - LN= 0.6				x/d =0.06					
x/dMx=0.45								x/dMx=0.45					
[tf,cm] M[-]Min = 109.7				M[+]Min = 112.9				M[-]Min = 109.7					
[cm2] Asapo[+]= 0.52								Asapo[+]= 0.52					
C I S A L H A M E N T O - M E N S A G E M													
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus													
[tf,cm] 0.- 345. 1.78 27.30 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0													
REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:													
1 1.265 0.923 0.15 0.00 1 P120 0.00 0.00 120 0 0 0 0													
2 1.269 0.925 0.15 0.00 1 P121 0.00 0.00 121 0 0 0 0													



V49

Viga= 49 V49

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 3.60 /B= 0.15 /H= 0.40 /BCs= 0.51 /BCi= 0.00 /Tps= 8 /Esp.LS= 0.12 /Esp.LI= 0.00 FSp.Ex= 0.20 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 0.1 tf* m | M.[+] Max= 1.2 tf* m - Abcis.= 179 | M.[-] = 0.1 tf* m |
 [tf,cm] | As = 1.02 -SRAS- [2 B 8.0mm] | AsL= 0.00 ----- | As = 1.02 -SRAS- [2 B 8.0mm] |
 | AsL= 0.00 ----- x/d =0.06 | As = 1.55 -STAS- [2 B 10.0mm] | AsL= 0.00 ----- x/d =0.06 |
 | | Arm.Lat.= [2 X -- B --- mm] - LN= 0.6 | | x/dMx=0.45 |
 [tf,cm] | M[-]Min = 109.7 | M[+]Min = 112.9 | M[-]Min = 109.7 |
 [cm2] | Asapo[+] = 0.52 | | Asapo[+] = 0.52 |

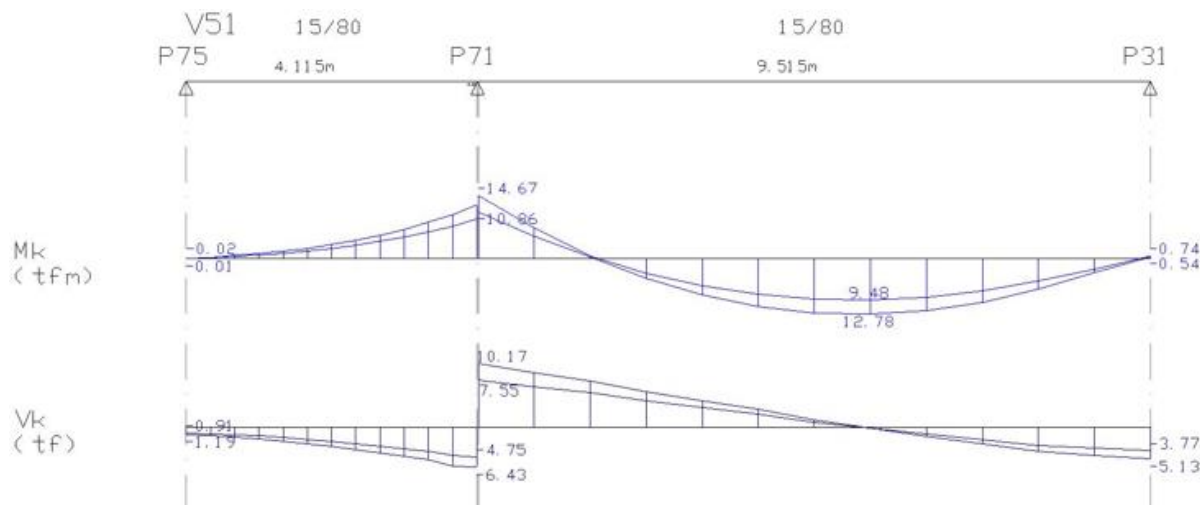
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 345. 1.82 27.30 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0
 REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 1.298 0.949 0.15 0.00 1 P122 0.00 0.00 122 0 0 0 0 0
 2 1.268 0.927 0.15 0.00 1 P123 0.00 0.00 123 0 0 0 0 0



Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

-	-	-	-	-	A R M A D U R	A S	(F L E X A O E	C I S A L H A M E N T O)	-	-	-	-	-
FLEXAO=	E S Q U E R D A					M E I O D O	V A O		D I R E I T A				
[M,[-]	=	1.6 tf* m				M.[+] Max=	9.1 tf* m - Abcis.= 362		M.[-] =	1.2 tf* m			
[tf,cm]	As =	1.73 -SRAS-	[3 B 10.0mm]			AsL=	0.00 -----		As =	1.73 -SRAS-	[3 B 10.0mm]		
	AsL=	0.00 -----	x/d =0.06			As =	5.43 -STAS- [3 B 16.0mm]		AsL=	0.00 -----	x/d =0.06		
			x/dMx=0.45			Arm.Lat.=[2 X 2 B 8.0mm] - LN=	1.8		Grampos Dir.=	2B 8.0mm x/dMx=0.45			
[tf,cm]	M[-]Min =	289.6				M[+]Min =	277.0		M[-]Min =	289.6			
[cm2]	Asapo[+]=	1.81				Asapo[+]=	1.81		Asapo[+]=	1.81			

REAC.	APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:			
1	4.624	3.415	0.50	0.07	1	P106	0.00	0.00	106	0	0	0	0	0
2	3.805	2.794	0.15	0.00	1	P92	0.00	0.00	92	0	0	0	0	0



V51

Viga= 51 V51

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 4.12 /B= 0.15 /H= 0.80 /BCs= 0.46 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 Fsp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 0.0 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 412 | M.[-] = 12.4 tf* m
[tf,cm]| As = 0.35 -SRAS- [2 B 6.3mm] | AsL= 0.00 ----- | As = 5.69 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.00 | As = 2.49 -STAS- [2 B 12.5mm] | AsL= 0.00 ----- x/d =0.15
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.2 | x/dMx=0.45
[tf,cm]| M[-]Min = 702.6 | M[+]Min = 443.4 | M[-]Min = 702.6
[cm2]| Asapo[+] = 0.62 | Asapo[+] = 0.62

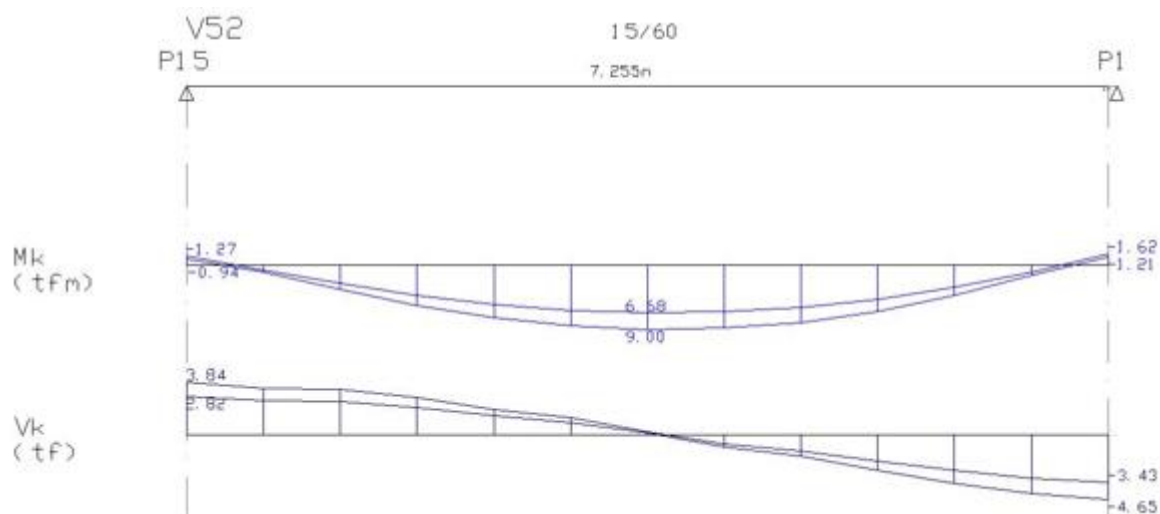
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 380. 9.00 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 9.52 /B= 0.15 /H= 0.80 /BCs= 0.86 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 Fsp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
[tf,cm]| M.[-] = 14.7 tf* m | M.[+] Max= 12.8 tf* m - Abcis.= 555 | M.[-] = 0.7 tf* m
[tf,cm]| As = 6.92 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 2.35 -SRAS- [3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.19 | As = 5.56 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.06
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.9 | Grampos Dir.= 2B 8.0mm x/dMx=0.45
[tf,cm]| M[-]Min = 1106.6 | M[+]Min = 493.6 | M[-]Min = 535.9
[cm2]| Asapo[+] = 1.39 | Asapo[+] = 1.85

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 920. 14.24 57.79 1 45. 1.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	-0.907	-1.192	0.15	0.00	1	P75	0.00	0.00	75
2	16.460	12.203	0.50	0.01	1	P71	0.00	0.00	71
3	5.127	3.772	0.15	0.00	1	P31	0.00	0.00	31



V52

Viga= 52 V52

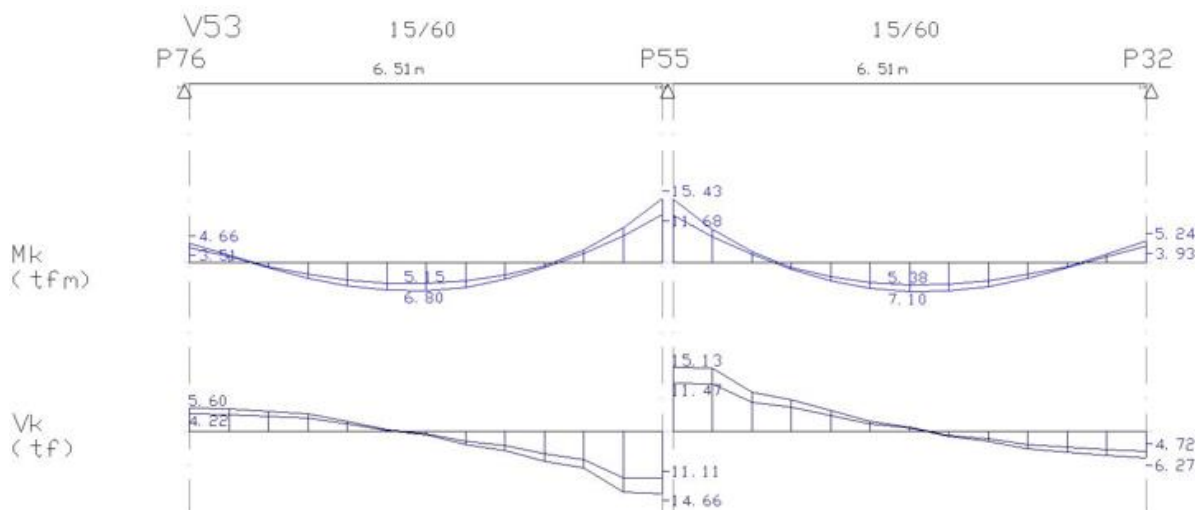
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.25 /B= 0.15 /H= 0.60 /BCs= 0.88 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 1.3 tf* m | M.[+] Max= 9.0 tf* m - Abcis.= 362 | M.[-] = 1.6 tf* m |
[tf,cm] | As = 1.73 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 1.73 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.06 | As = 5.37 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.06 |
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.8 | x/dMx=0.45 |
[tf,cm] | M[-]Min = 289.6 | M[+]Min = 277.0 | M[-]Min = 289.6 |
[cm2] | Asapo[+]= 1.79 | | Asapo[+]= 1.79 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 700. 6.51 42.45 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	3.835	2.816	0.15	0.00	1	P15	0.00	0.00	15
2	4.649	3.434	0.50	0.07	1	P1	0.00	0.00	1



V53

Viga= 53 V53

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 1.13 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -														
FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A														
M.[-] = 4.7 tf* m					M.[+] Max= 6.8 tf* m - Abcis.= 329					M.[-] = 15.4 tf* m				
[tf,cm] As = 3.12 -SRAS- [4 B 10.0mm]					AsL= 0.00 -----					As = 12.14 -SRAD- [4 B 20.0mm]				
AsL= 0.00 -----					As = 3.98 -STAS- [2 B 16.0mm]					AsL= 1.01 -----				
x/d =0.11					Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.1					x/d =0.45				
x/dMx=0.45										x/dMx=0.45				
% Baric.Armad.= 3					% Baric.Armad.= 1					***AsL Compr.***				
[tf,cm] M[-]Min = 503.0					M[+]Min = 286.5					% Baric.Armad.= 11 ***				
[cm2] Asapo[+]= 1.00										M[-]Min = 783.6				
										Asapo[+]= 1.01				

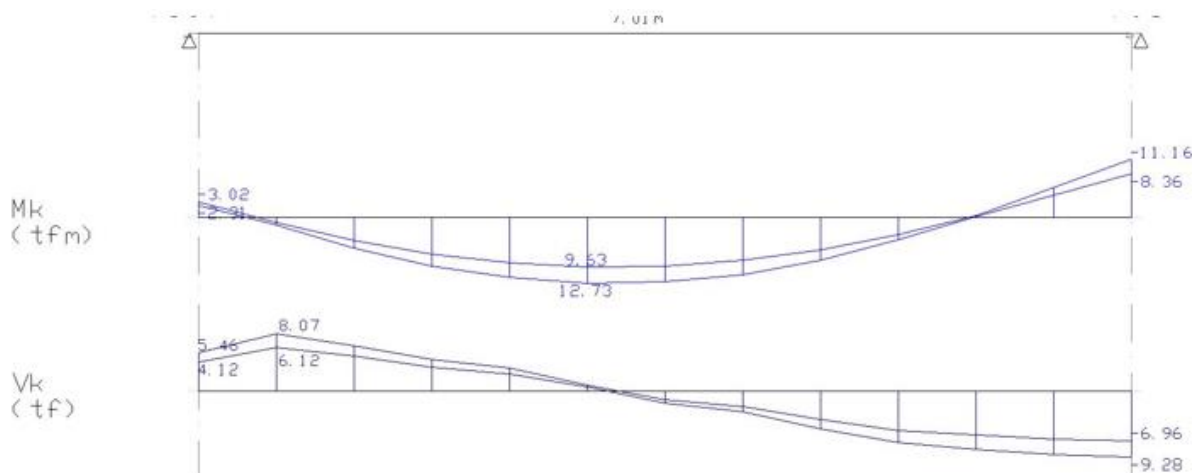
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	461.	8.99	42.56	1	45.	0.8	1.7	1.7	6.3	30.0	2	0.0	0.0	
	461.-	615.	20.53	42.17	1	45.	6.2	1.7	6.2	6.3	10.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 1.13 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -														
FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A														
M.[-] = 15.2 tf* m					M.[+] Max= 7.1 tf* m - Abcis.= 329					M.[-] = 5.2 tf* m				
[tf,cm] As = 11.95 -SRAD- [4 B 20.0mm]					AsL= 0.00 -----					As = 3.22 -SRAS- [3 B 12.5mm]				
AsL= 0.83 -----					As = 4.17 -STAS- [4 B 12.5mm]					AsL= 0.00 -----				
x/d =0.45					Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.1					x/d =0.12				
x/dMx=0.45										x/dMx=0.45				
AsL Compr.														
% Baric.Armad.= 11 ***					% Baric.Armad.= 1					% Baric.Armad.= 2				
[tf,cm] M[-]Min = 783.6					M[+]Min = 286.5					M[-]Min = 503.0				
[cm2] Asapo[+]= 1.04										Asapo[+]= 1.04				

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	154.	21.19	42.20	1	45.	6.5	1.7	6.5	8.0	15.0	2	0.0	0.0	
	154.-	615.	9.48	42.56	1	45.	1.0	1.7	1.7	8.0	30.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	5.595	4.212	0.50	0.07	1	P76	0.00	0.00	76
2	29.363	22.250	0.50	0.07	1	P55	0.00	0.00	55
3	6.274	4.717	0.50	0.07	1	P32	0.00	0.00	32



V54

Viga= 54 V54

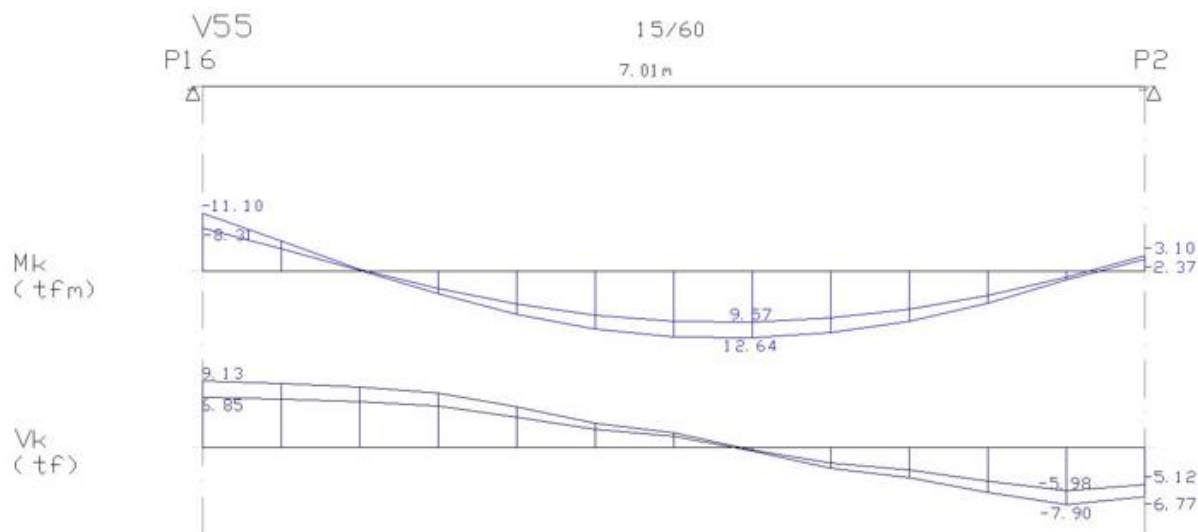
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 3.0 tf* m | M.[+] Max= 12.7 tf* m - Abcis.= 292 | M.[-] = 11.2 tf* m |
 [tf,cm] | As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 7.51 -SRAS- [4 B 16.0mm] |
AsL= 0.00 -----	x/d =0.08	As = 7.70 -STAS- [4 B 16.0mm]		
	x/dMx=0.45	Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.5		x/d =0.28
			x/dMx=0.45	
 [tf,cm] | M[-]Min = 370.5 | M[+]Min = 298.3 | M[-]Min = 650.1 |
 [cm2] | Asapo[+]= 2.57 | | Asapo[+]= 1.93 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 166. 11.27 42.26 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0
 166.- 499. 9.76 42.10 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0
 499.- 665. 12.99 42.31 1 45. 2.7 1.7 2.7 5.0 12.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 5.449 4.112 0.50 0.07 1 P107 0.00 0.00 107 0 0 0 0 0
 2 9.281 6.965 0.50 0.07 1 P93 0.00 0.00 93 0 0 0 0 0



V55

Viga= 55 V55

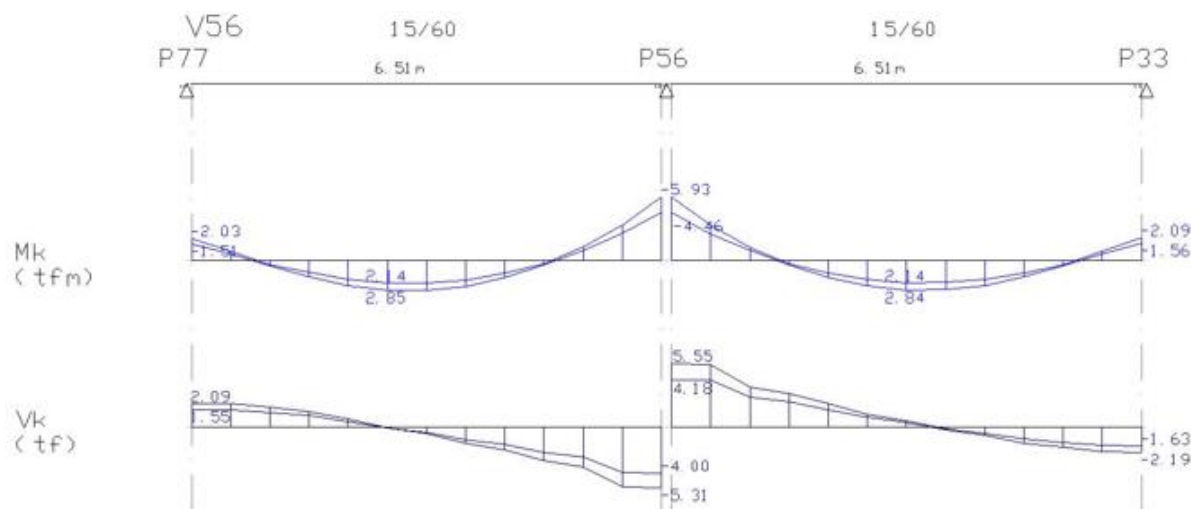
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 11.1 tf* m | M.[+] Max= 12.6 tf* m - Abcis.= 408 | M.[-] = 3.1 tf* m |
[tf,cm] | As = 7.47 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 2.24 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- | As = 7.65 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- | x/d =0.08 |
| | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.5 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 650.1 | M[+]Min = 298.3 | M[-]Min = 370.5 |
[cm2] | Asapo[+]= 1.91 | | Asapo[+]= 2.55 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 166. 12.79 42.31 1 45. 2.6 1.7 2.6 5.0 15.0 2 0.0 0.0
166.- 665. 11.04 42.26 1 45. 1.8 1.7 1.8 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 9.122 6.841 0.50 0.07 1 P16 0.00 0.00 16 0 0 0 0 0
2 6.771 5.123 0.50 0.07 1 P2 0.00 0.00 2 0 0 0 0 0



V56

Viga= 56 V56

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

```

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 0.64 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 2.0 tf* m | M.[+] Max= 2.8 tf* m - Abcis.= 274 | M.[-] = 5.9 tf* m
[tf,cm] | As = 2.17 -SRAS- [ 3 B 10.0mm] | AsL= 0.00 ----- | As = 3.67 -SRAS- [ 3 B 12.5mm]
| AsL= 0.00 ----- | As = 2.45 -STAS- [ 2 B 12.5mm ] | AsL= 0.00 ----- x/d =0.13
| | x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.8 | | x/dMx=0.45
[tf,cm] | M[-]Min = 360.6 | M[+]Min = 264.4 | M[-]Min = 532.5
[cm2 ] | Asapo[+] = 0.61 | | Asapo[+] = 0.61

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 615. 7.44 42.57 1 45. 0.1 1.7 1.7 5.0 22.0 2 0.0 0.0

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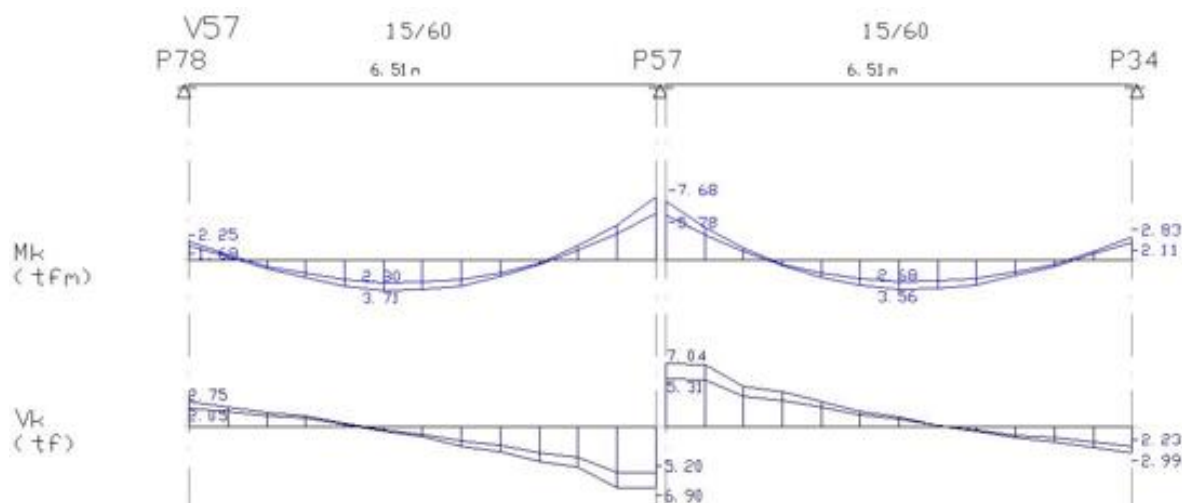
----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 0.64 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 5.9 tf* m | M.[+] Max= 2.8 tf* m - Abcis.= 329 | M.[-] = 2.1 tf* m
[tf,cm] | As = 3.64 -SRAS- [ 3 B 12.5mm] | AsL= 0.00 ----- | As = 2.17 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- | As = 2.45 -STAS- [ 2 B 12.5mm ] | AsL= 0.00 ----- x/d =0.08
| | x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.8 | | x/dMx=0.45
[tf,cm] | M[-]Min = 532.5 | M[+]Min = 264.4 | M[-]Min = 360.6
[cm2 ] | Asapo[+] = 0.61 | | Asapo[+] = 0.61

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 615. 7.77 42.57 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0

```

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
	1	2.091	1.552	0.50	0.07	1	P77	0.00	0.00	77	0	0	0	0	0
	2	10.707	8.065	0.50	0.07	1	P56	0.00	0.00	56	0	0	0	0	0
	3	2.189	1.627	0.50	0.07	1	P33	0.00	0.00	33	0	0	0	0	0



V57

Viga= 57 V57

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 0.64 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 2.3 tf* m | M.[+] Max= 3.7 tf* m - Abcis.= 274 | M.[-] = 7.7 tf* m |
[tf,cm] | As = 2.17 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 4.92 -SRAS- [4 B 12.5mm] |
| AsL= 0.00 ----- x/d =0.08 | As = 2.45 -STAS- [2 B 12.5mm] | AsL= 0.00 ----- x/d =0.18 |
| x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.0 | x/dMx=0.45 |
[tf,cm] | M[-]Min = 360.6 | M[+]Min = 264.4 | M[-]Min = 532.5 |
[cm2] | Asapo[+] = 0.89 | | Asapo[+] = 0.61 |

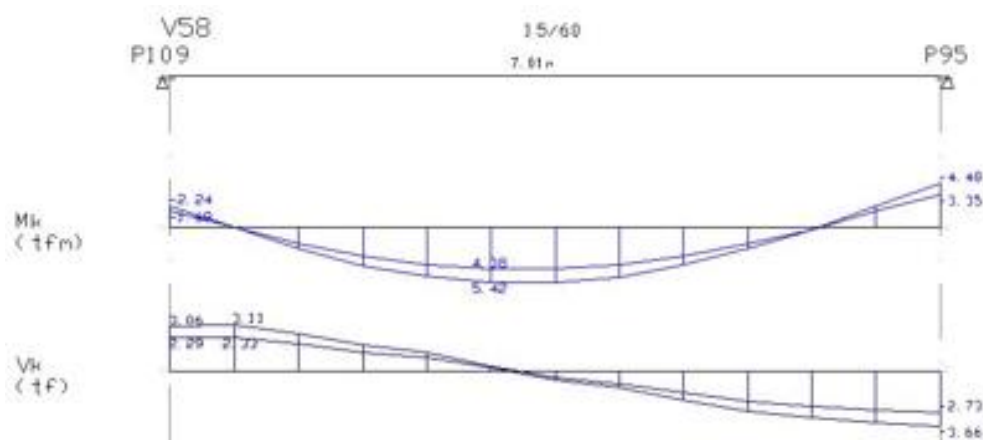
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 615. 9.66 42.57 1 45. 1.1 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 6.51 /B= 0.15 /H= 0.60 /BCs= 0.64 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 7.3 tf* m | M.[+] Max= 3.6 tf* m - Abcis.= 329 | M.[-] = 2.8 tf* m |
[tf,cm] | As = 4.64 -SRAS- [4 B 12.5mm] | AsL= 0.00 ----- | As = 2.17 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.17 | As = 2.45 -STAS- [2 B 12.5mm] | AsL= 0.00 ----- x/d =0.08 |
| x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.0 | x/dMx=0.45 |
[tf,cm] | M[-]Min = 532.5 | M[+]Min = 264.4 | M[-]Min = 360.6 |
[cm2] | Asapo[+] = 0.61 | | Asapo[+] = 0.61 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 615. 9.86 42.57 1 45. 1.2 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	2.746	2.049	0.50	0.07	1	P78	0.00	0.00	78	0	0	0	0	0
	2	13.737	10.349	0.50	0.07	1	P57	0.00	0.00	57	0	0	0	0	0
	3	2.990	2.232	0.50	0.07	1	P34	0.00	0.00	34	0	0	0	0	0



V58

Viga= 58 V58

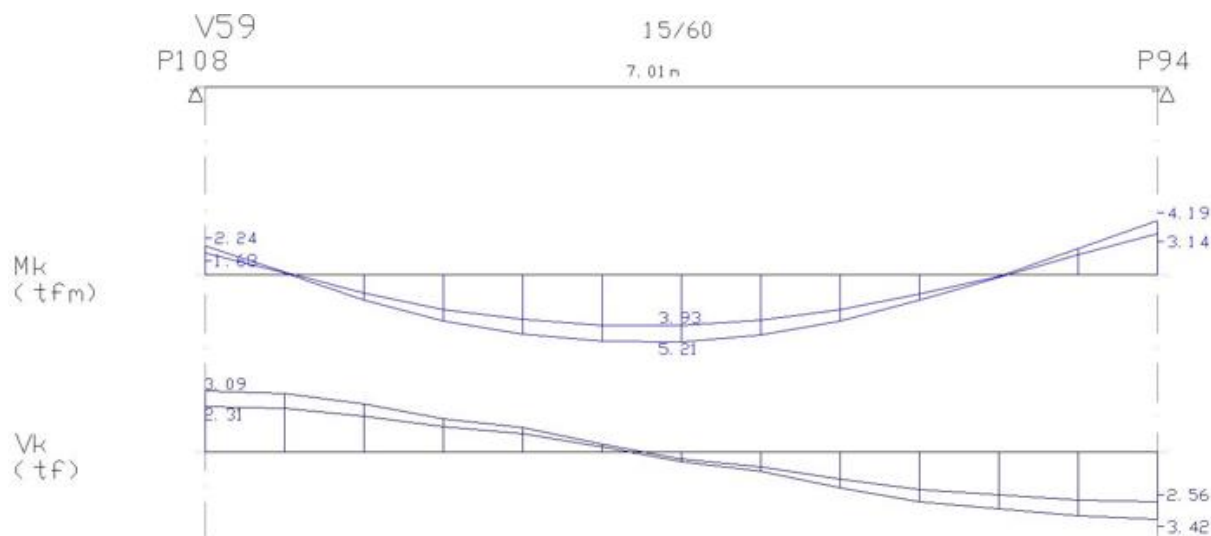
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 2.2 tf* m | M.[+] Max= 5.4 tf* m - Abcis.= 292 | M.[-] = 4.5 tf* m |
 [tf,cm] | As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.76 -SRAS- [4 B 10.0mm] |
 | AsL= 0.00 ----- x/d =0.08 | As = 3.18 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.10 |
 | | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.1 | | x/dMx=0.45 |
 [tf,cm] | M[-]Min = 370.5 | M.[+]Min = 275.9 | M[-]Min = 370.5 |
 [cm2] | Asapo[+]= 1.06 | | Asapo[+]= 0.79 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 665. 5.12 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	3.056	2.284	0.50	0.07	1	P109	0.00	0.00	109
2	3.660	2.731	0.50	0.07	1	P95	0.00	0.00	95



V59

Viga= 59 V59

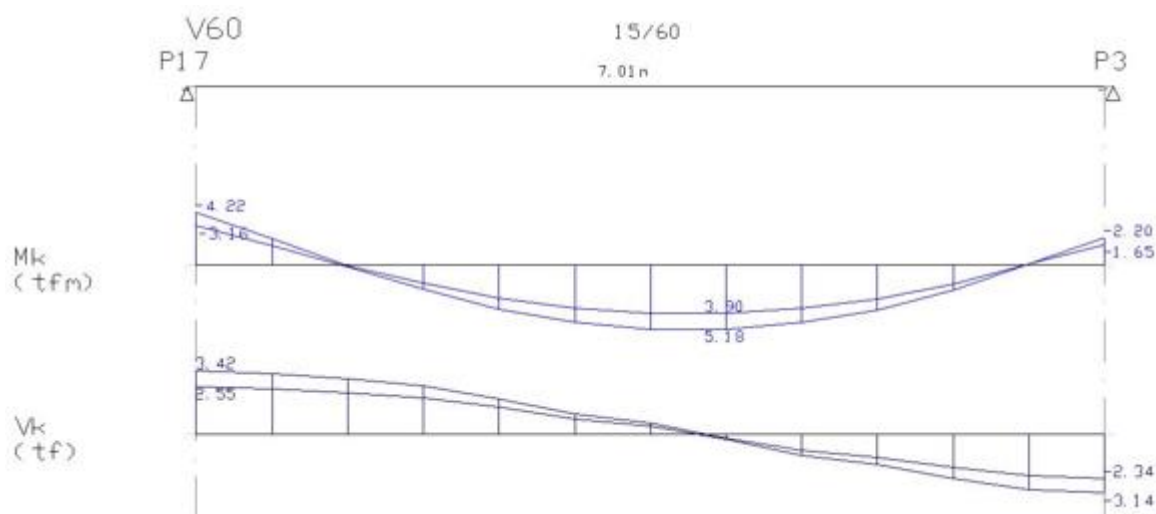
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 2.2 tf* m | M.[+] Max= 5.2 tf* m - Abcis.= 350 | M.[-] = 4.2 tf* m
 | As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.53 -SRAS- [2 B 12.5mm]
 | AsL= 0.00 ----- | As = 3.05 -STAS- [4 B 10.0mm] | AsL= 0.00 -----
 | | x/d =0.08 | | x/d =0.09
 | | x/dMx=0.45 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 370.5
 [cm2] | Asapo[+]= 1.02 | Asapo[+]= 0.76

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 665. 4.79 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 3.088 2.308 0.50 0.07 1 P108 0.00 0.00 108 0 0 0 0 0
 2 3.423 2.556 0.50 0.07 1 P94 0.00 0.00 94 0 0 0 0 0

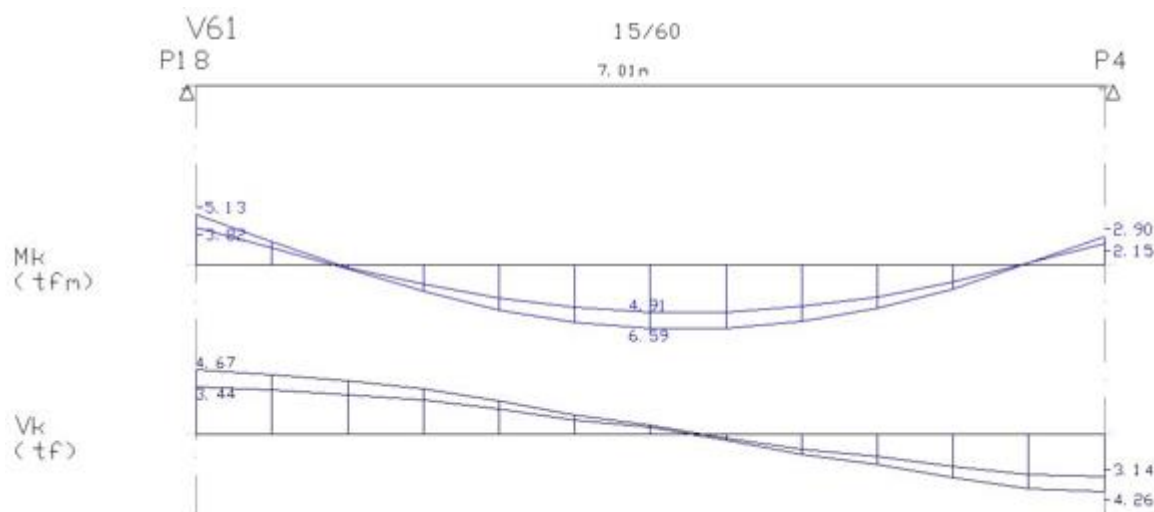


V60

Viga= 60 V60

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

G E O M E T R I A E C A R G A S														
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]														
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---														
A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)														
FLEXAO- E S Q U E R D A					M E I O D O V A O					D I R E I T A				
M.[-] = 4.2 tf* m					M.[+] Max= 5.2 tf* m - Abcis.= 408					M.[-] = 2.2 tf* m				
[tf,cm] As = 2.60 -SRAS- [4 B 10.0mm]					AsL= 0.00					As = 2.24 -SRAS- [3 B 10.0mm]				
AsL= 0.00					As = 3.04 -STAS- [4 B 10.0mm]					AsL= 0.00				
x/d =0.09					Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.1					x/d =0.08				
x/dMx=0.45										x/dMx=0.45				
[tf,cm] M[-]Min = 370.5					M[+]Min = 275.9					M[-]Min = 370.5				
[cm2] Asapo[+]= 0.76										Asapo[+]= 1.01				
C I S A L H A M E N T O -														
Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus					M E N S A G E M									
[tf,cm] 0.- 665. 4.79 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0														
REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:														
1 3.415 2.548 0.50 0.07 1 P17 0.00 0.00 17 0 0 0 0 0														
2 3.136 2.345 0.50 0.07 1 P3 0.00 0.00 3 0 0 0 0 0														



V61

Viga= 61 V61

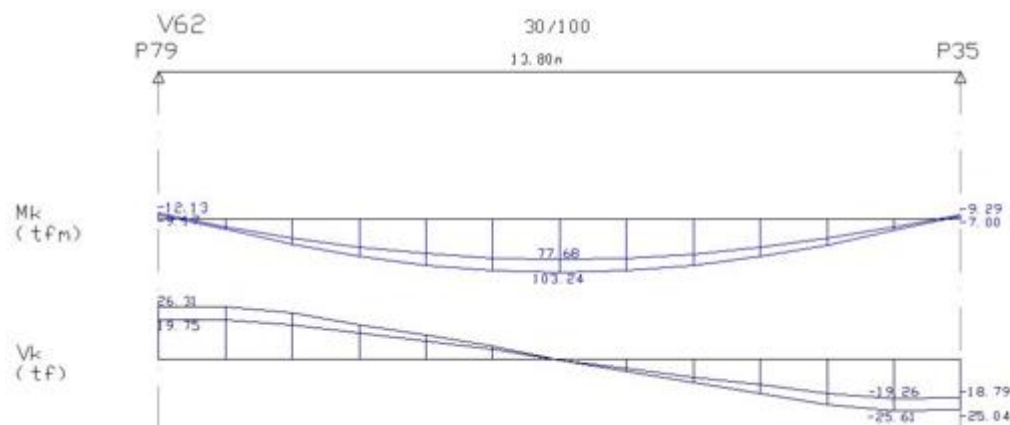
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 5.1 tf* m | M.[+] Max= 6.6 tf* m - Abcis.= 350 | M.[-] = 2.9 tf* m |
[tf,cm]| As = 3.19 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 2.24 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.12 | As = 3.87 -STAS- [2 B 16.0mm] | AsL= 0.00 ----- x/d =0.08 |
| | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.4 | | x/dMx=0.45 |
[tf,cm]| M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 370.5 |
[cm2]| Asapo[+] = 0.97 | | Asapo[+] = 1.37 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 665. 6.54 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 4.663 3.435 0.50 0.07 1 P18 0.00 0.00 18 0 0 0 0 0
2 4.258 3.144 0.50 0.07 1 P4 0.00 0.00 4 0 0 0 0 0



V62

Viga= 62 V62

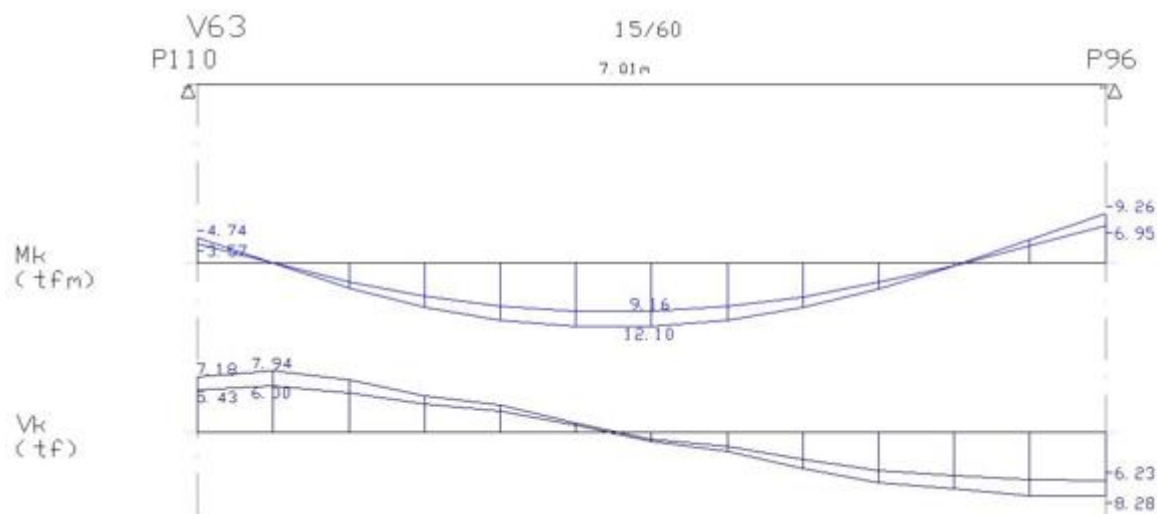
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 13.80 /B= 0.30 /H= 1.00 /BCs= 3.06 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.15 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 12.1 tf* m | M.[+] Max= 103.2 tf* m - Abcis.= 690 | M.[-] = 9.3 tf* m
[tf,cm] | As = 6.31 -SRAS- [2 B 20.0mm] | AsL= 0.00 ----- | As = 6.31 -SRAS- [2 B 20.0mm]
| AsL= 0.00 ----- x/d =0.07 | As = 36.04 -STAS- [8 B 25.0mm] | AsL= 0.00 ----- x/d =0.07
| Grampos Esq.= 2B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 6 B 8.0mm] - LN= 3.5 | Grampos Dir.= 2B 6.3mm x/dMx=0.45
| | | |
[tf,cm] | M[-]Min = 1820.8 | M[+]Min = 1663.9 | M[-]Min = 1820.8
[cm2] | Asapo[+] = 12.01 | | | Asapo[+] = 12.01

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.-1350. 36.83 145.29 1 45. 3.2 3.5 3.5 8.0 28.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	26.272	19.727	0.30	0.00	1	P79	0.00	0.00	79	0	0	0	0	0
	2	25.038	18.795	0.30	0.00	1	P35	0.00	0.00	35	0	0	0	0	0



V63

Viga= 63 V63

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

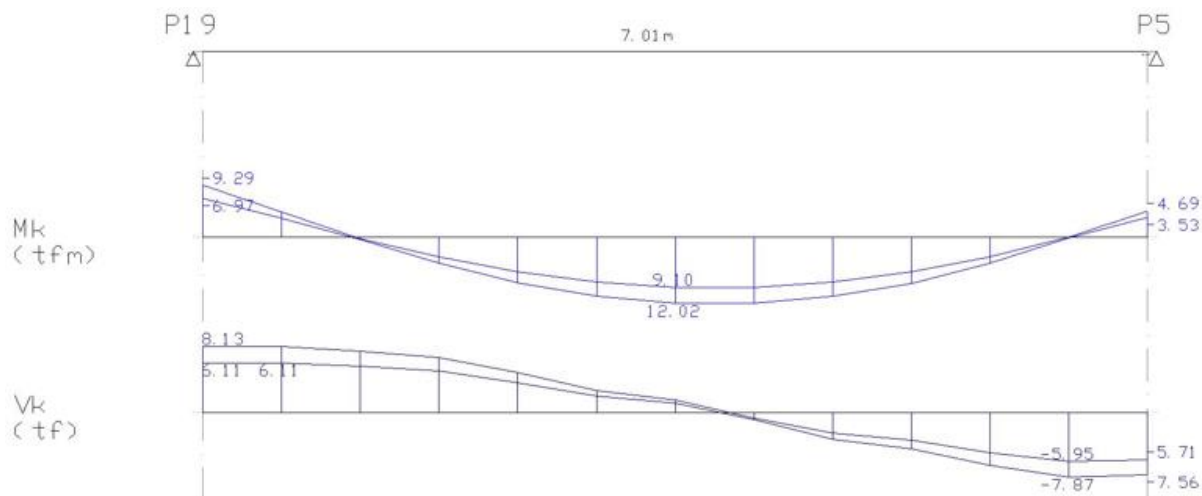
----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 4.7 tf* m | M.[+] Max= 12.1 tf* m - Abcis.= 350 | M.[-] = 9.3 tf* m |
[tf,cm] | As = 2.93 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 5.97 -SRAS- [3 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.11 | As = 7.32 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.22 |
| | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.4 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 370.5 | M[+]Min = 298.3 | M[-]Min = 520.2 |
[cm2] | Asapo[+] = 2.44 | | Asapo[+] = 1.83 |

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus
[tf,cm]	0.-	166.	11.11	42.28	1	45.	1.8	1.7	1.8	5.0	20.0	2	0.0	0.0
	166.-	499.	8.79	42.10	1	45.	0.7	1.7	1.7	5.0	22.0	2	0.0	0.0
	499.-	665.	11.59	42.44	1	45.	2.0	1.7	2.0	5.0	18.0	2	0.0	0.0

M E N S A G E M

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	7.169	5.418	0.50	0.07	1	P110	0.00	0.00	110
2	8.282	6.227	0.50	0.07	1	P96	0.00	0.00	96



V64

Viga= 64 V64

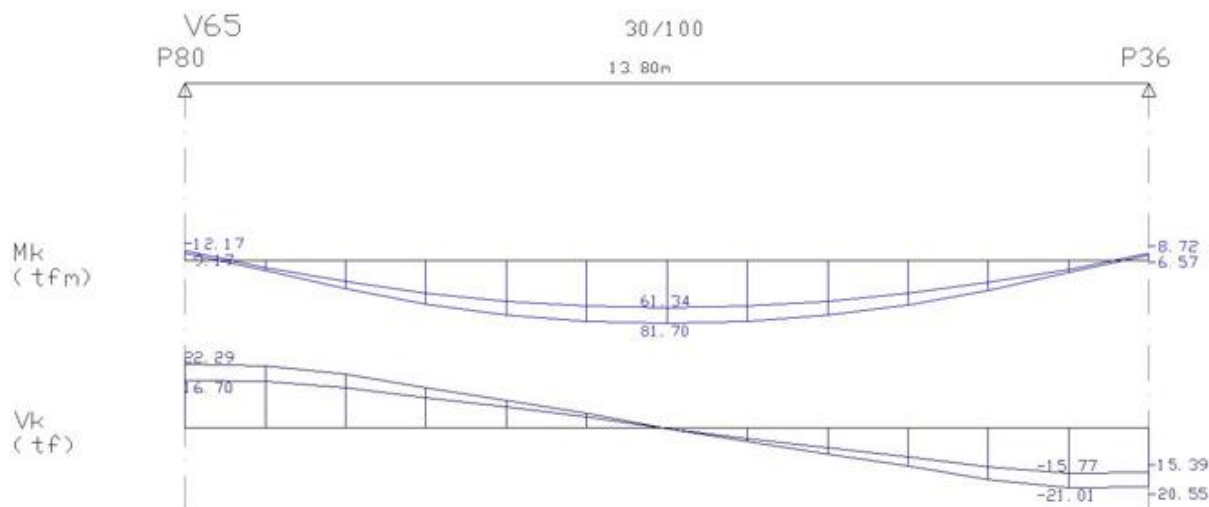
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 9.3 tf* m | M.[+] Max= 12.0 tf* m - Abcis.= 350 | M.[-] = 4.7 tf* m |
 [tf,cm] | As = 5.99 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 2.90 -SRAS- [4 B 10.0mm] |
 | AsL= 0.00 ----- | x/d =0.22 | As = 7.27 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- | x/d =0.11 |
 | | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.4 | | | x/dMx=0.45 |
 [tf,cm] | M[-]Min = 520.2 | M[+]Min = 298.3 | M[-]Min = 370.5 |
 [cm2] | Asapo[+]= 1.82 | | Asapo[+]= 2.44 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 166. 11.38 42.44 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0
 166.- 665. 11.01 42.28 1 45. 1.8 1.7 1.8 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	8.119	6.100	0.50	0.07	1	P19	0.00	0.00	19
	2	7.563	5.713	0.50	0.07	1	P5	0.00	0.00	5



V65

Viga= 65 V65

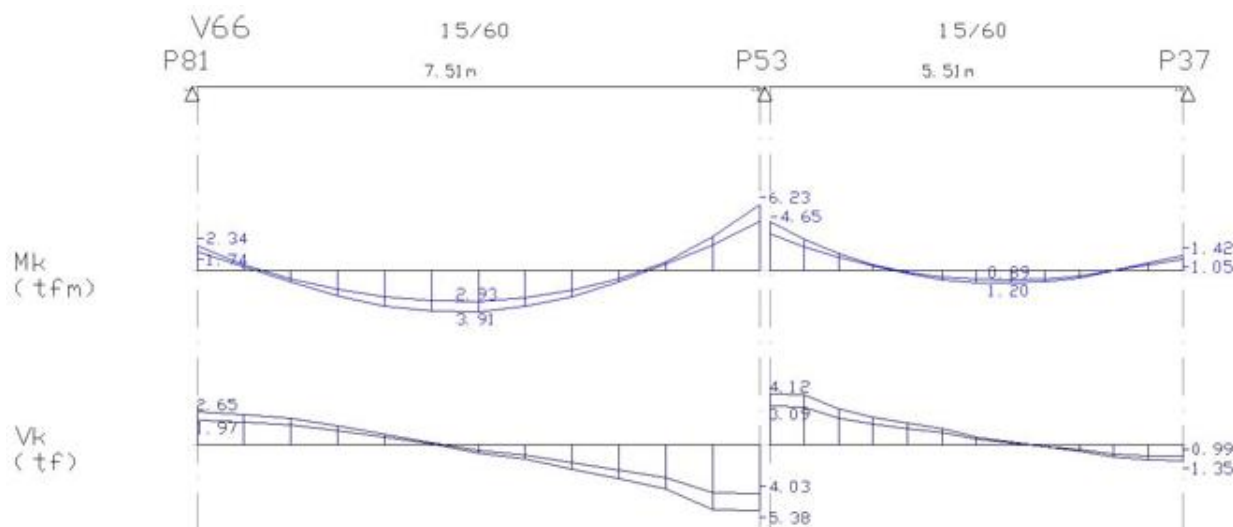
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 13.80 /B= 0.30 /H= 1.00 /BCs= 3.06 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.15 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 [tf,cm]| M.[-] = 12.2 tf* m | M.[+] Max= 81.7 tf* m - Abcis.= 690 | M.[-] = 8.7 tf* m |
 [tf,cm]| As = 6.31 -SRAS- [2 B 20.0mm] | AsL= 0.00 ----- | As = 6.31 -SRAS- [2 B 20.0mm] |
 [tf,cm]| AsL= 0.00 ----- x/d =0.07 | As = 28.12 -STAS- [6 B 25.0mm] | AsL= 0.00 ----- x/d =0.07 |
 [tf,cm]| Grampos Esq.= 4B 10.0mm x/dMx=0.45 | Arm.Lat.= [2 X 6 B 8.0mm] - LN= 2.7 | Grampos Dir.= 4B 10.0mm x/dMx=0.45 |
 [tf,cm]| M[-]Min = 1820.8 | M[+]Min = 1663.9 | M[-]Min = 1820.8 |
 [cm2]| Asapo[+]= 9.37 | Asapo[+]= 9.37 | Asapo[+]= 9.37 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.-1350. 31.21 145.61 1 45. 1.7 3.5 3.5 8.0 28.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 22.264 16.679 0.30 0.00 1 P80 0.00 0.00 80 0 0 0 0 0
 2 20.549 15.387 0.30 0.00 1 P36 0.00 0.00 36 0 0 0 0 0



V66

Viga= 66 V66

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

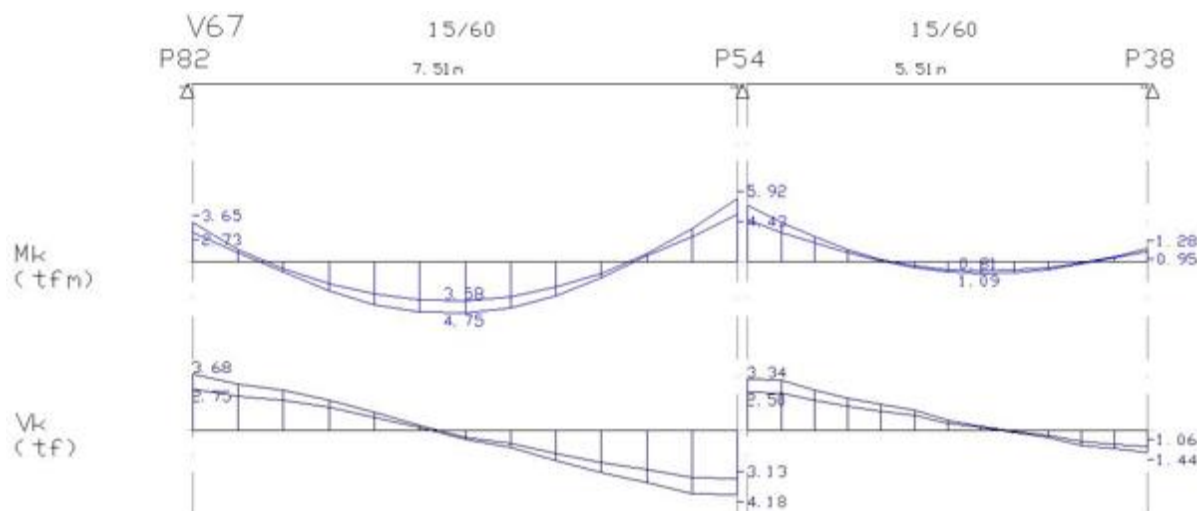
----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.51 /B= 0.15 /H= 0.60 /BCs= 0.71 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 2.3 tf* m | M.[+] Max= 3.9 tf* m - Abcis.= 379 | M.[-] = 6.2 tf* m
 | As = 2.32 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 3.83 -SRAS- [2 B 16.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 2.62 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.14
 | x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.0 | x/dMx=0.45
 [tf,cm] | M[-]Min = 383.5 | M[+]Min = 268.9 | M[-]Min = 575.6
 [cm2] | Asapo[+] = 0.65 | Asapo[+] = 0.65

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 715. 7.53 42.57 1 45. 0.1 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 5.51 /B= 0.15 /H= 0.60 /BCs= 0.56 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 4.7 tf* m | M.[+] Max= 1.2 tf* m - Abcis.= 325 | M.[-] = 1.4 tf* m
 | As = 2.96 -SRAS- [2 B 16.0mm] | AsL= 0.00 ----- | As = 2.03 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.11 | As = 2.28 -STAS- [3 B 10.0mm] | AsL= 0.00 ----- x/d =0.07
 | x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.8 | x/dMx=0.45
 [tf,cm] | M[-]Min = 487.4 | M[+]Min = 259.1 | M[-]Min = 337.1
 [cm2] | Asapo[+] = 0.57 | Asapo[+] = 0.57

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 515. 5.77 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	2.649	1.963	0.50	0.07	1	P81	0.00	0.00	81 0 0 0 0
2	9.366	7.018	0.50	0.07	1	P53	0.00	0.00	53 0 0 0 0
3	1.347	0.987	0.50	0.07	1	P37	0.00	0.00	37 0 0 0 0



V67

Viga= 67 V67

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.51 /B= 0.15 /H= 0.60 /BCs= 0.71 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A
 [tf,cm] | M.[-] = 3.7 tf* m | M.[+] Max= 4.8 tf* m - Abcis.= 379 | M.[-] = 5.9 tf* m
 | As = 2.32 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 3.66 -SRAS- [3 B 12.5mm]
 | AsL= 0.00 ----- | As = 2.79 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.13
 | x/d =0.08 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.2 | x/dMx=0.45
 [tf,cm] | M[-]Min = 383.5 | M[+]Min = 268.9 | M[-]Min = 575.6
 [cm2] | Asapo[+]= 0.70 | Asapo[+]= 0.70

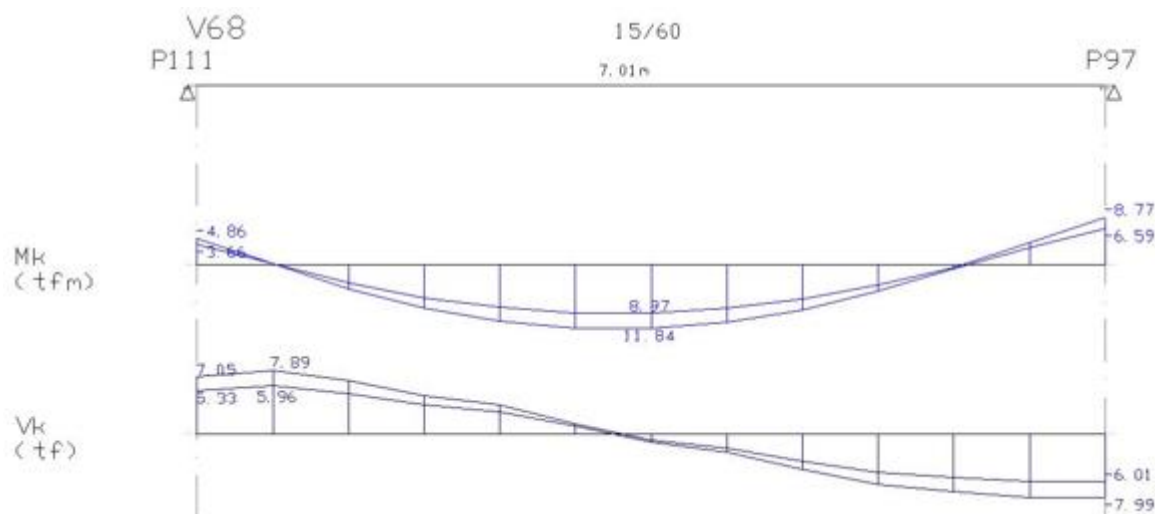
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 715. 5.85 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 5.51 /B= 0.15 /H= 0.60 /BCs= 0.56 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO- E S Q U E R D A M E I O D O V A O D I R E I T A
 [tf,cm] | M.[-] = 5.2 tf* m | M.[+] Max= 1.1 tf* m - Abcis.= 325 | M.[-] = 1.3 tf* m
 | As = 3.20 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 2.03 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- | As = 2.28 -STAS- [3 B 10.0mm] | AsL= 0.00 ----- x/d =0.07
 | x/d =0.12 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.8 | x/dMx=0.45
 [tf,cm] | M[-]Min = 487.4 | M[+]Min = 259.1 | M[-]Min = 337.1
 [cm2] | Asapo[+]= 0.57 | Asapo[+]= 0.57

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 515. 4.68 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
	1	3.670	2.742	0.50	0.07	1	P82	0.00	0.00	82	0	0	0	0	0
	2	7.417	5.546	0.50	0.07	1	P54	0.00	0.00	54	0	0	0	0	0
	3	1.442	1.061	0.50	0.07	1	P38	0.00	0.00	38	0	0	0	0	0



V68

Viga= 68 V68

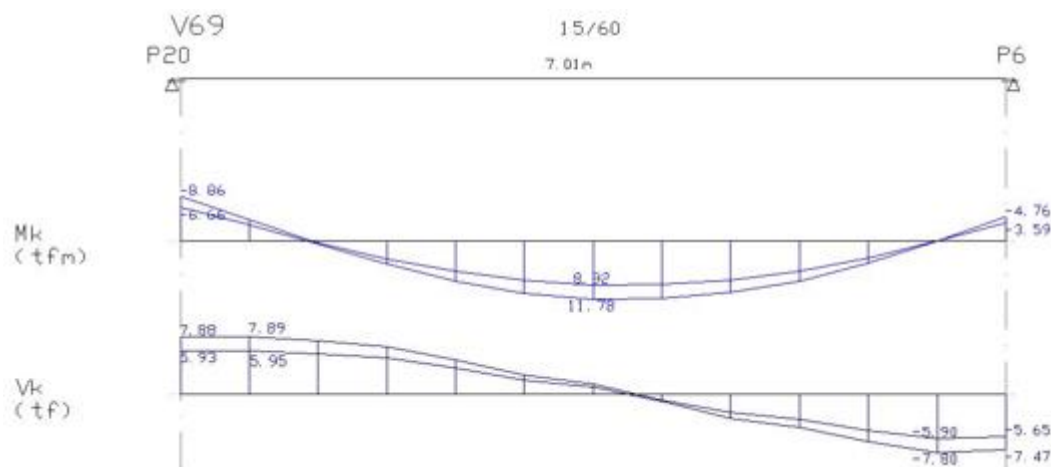
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 4.9 tf* m | M.[+] Max= 11.8 tf* m - Abcis.= 350 | M.[-] = 8.8 tf* m
[tf,cm] | As = 3.23 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 5.62 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.12 | As = 7.16 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.20
| | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.4 | | | x/dMx=0.45
[tf,cm] | M[-]Min = 520.2 | M[+]Min = 298.3 | M[-]Min = 520.2
[cm2] | Asapo[+] = 2.39 | | Asapo[+] = 1.79

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 499. 11.04 42.33 1 45. 1.8 1.7 1.8 5.0 22.0 2 0.0 0.0
499.- 665. 11.18 42.44 1 45. 1.8 1.7 1.8 5.0 20.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
	1	7.044	5.325	0.50	0.07	1	P111	0.00	0.00	111	0	0	0	0	0
	2	7.986	6.010	0.50	0.07	1	P97	0.00	0.00	97	0	0	0	0	0



V69

Viga= 69 V69

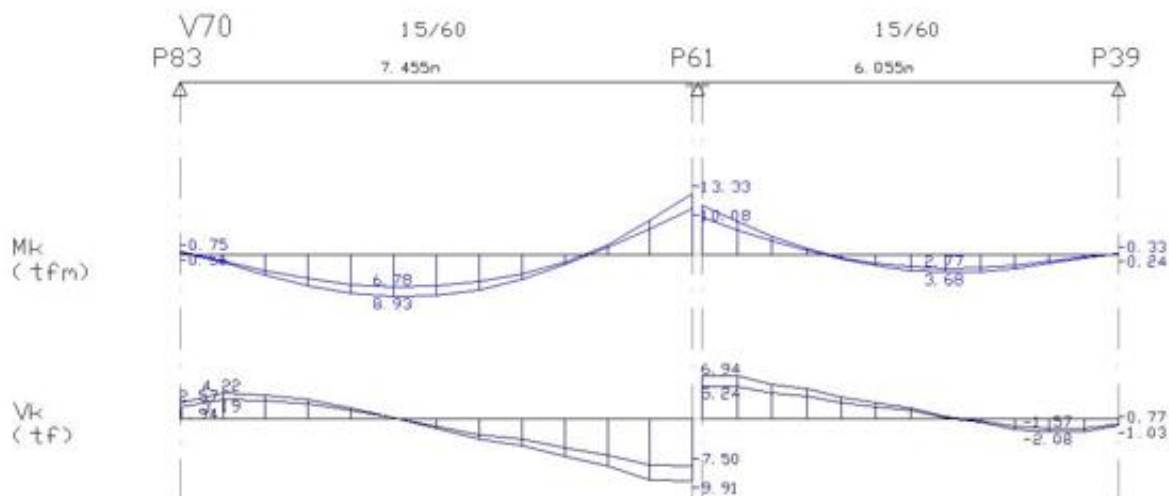
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 8.9 tf* m | M.[+] Max= 11.8 tf* m - Abcis.= 350 | M.[-] = 4.8 tf* m
 [tf,cm] | As = 5.69 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 3.23 -SRAS- [4 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.21 | As = 7.12 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.12
 | | | | | x/dMx=0.45 | | | | | x/dMx=0.45
 [tf,cm] | M[-]Min = 520.2 | M[+]Min = 298.3 | M[-]Min = 520.2
 [cm2] | Asapo[+] = 1.78 | | | Asapo[+] = 2.41

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 665. 11.04 42.44 1 45. 1.7 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	7.872	5.919	0.50	0.07	1	P20	0.00	0.00	20	0	0	0	0	0
	2	7.473	5.647	0.50	0.07	1	P6	0.00	0.00	6	0	0	0	0	0



V70

Viga= 70 V70

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.46 /B= 0.15 /H= 0.60 /BCs= 1.27 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /Flt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.7 tf* m | M.[+] Max= 8.9 tf* m - Abcis.= 313 | M.[-] = 13.3 tf* m
 [tf,cm] | As = 2.31 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 9.46 -SRAS- [5 B 16.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 5.31 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.36
 | Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.2 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 382.3 | M[+]Min = 290.9 | M[-]Min = 845.5
 [cm2] | Asapo[+] = 1.77 | | Asapo[+] = 1.33

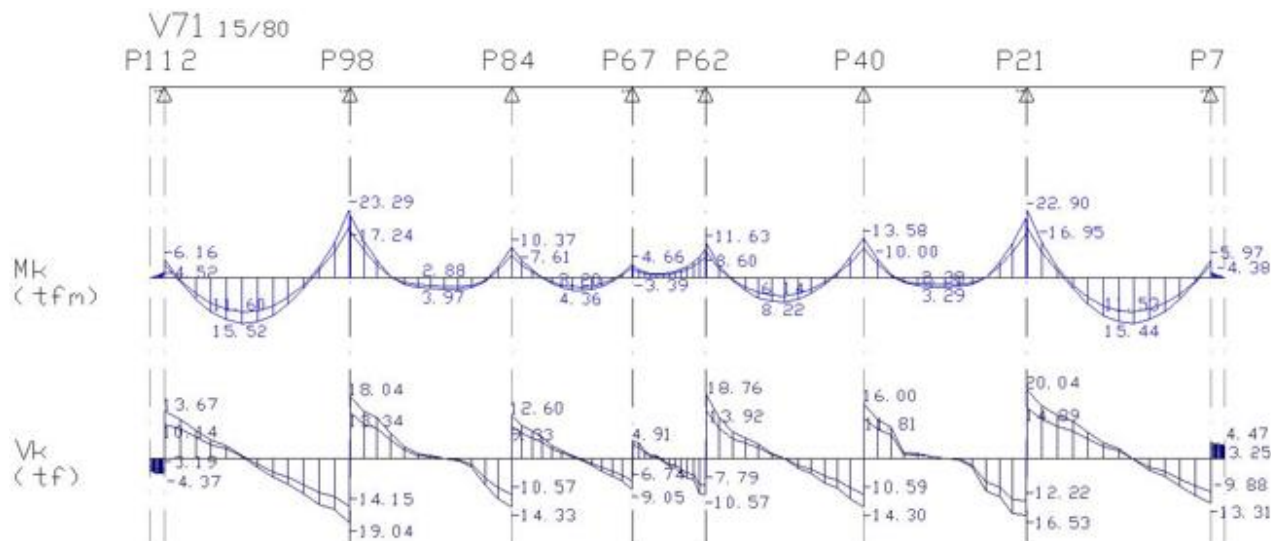
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 540. 7.73 42.44 1 45. 0.2 1.7 1.7 5.0 22.0 2 0.0 0.0
 540.- 720. 13.88 42.29 1 45. 3.1 1.7 3.1 5.0 12.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 6.05 /B= 0.15 /H= 0.60 /BCs= 1.06 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /Flt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 10.7 tf* m | M.[+] Max= 3.7 tf* m - Abcis.= 357 | M.[-] = 0.3 tf* m
 [tf,cm] | As = 7.17 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 2.11 -SRAS- [3 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.27 | As = 3.39 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.08
 | Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.6 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
 [tf,cm] | M[-]Min = 752.3 | M[+]Min = 284.2 | M[-]Min = 350.0
 [cm2] | Asapo[+] = 0.85 | | Asapo[+] = 1.13

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 580. 9.71 42.57 1 45. 1.1 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	2.565	1.940	0.15	0.00	1	P83	0.00	0.00	83	0 0 0 0 0
2	16.605	12.549	0.50	0.07	1	P61	0.00	0.00	61	0 0 0 0 0
3	1.034	0.770	0.15	0.00	1	P39	0.00	0.00	39	0 0 0 0 0



V71

Viga= 71 V71

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1B /L= 0.56 /B= 0.15 /H= 0.80 /BCs= 0.26 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO | M[-]= 3.84 tf* m | As = 2.10 -SRAS- [2 B 16.0mm]
 BAL.ESQ | Grampo ESQ = 2 B 8.0mm x/d =0.06 | AsL= 0.00 -Arm.Lat.= [2 X 3 B 8.0mm]
 [tf,cm] | M[-]Min= 481.7 - x/dMx=0.45 | | % Baric.Armad.= 2

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 30. 6.12 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 7.18 /B= 0.15 /H= 0.80 /BCs= 1.01 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-]= 6.2 tf* m | M.[+] Max= 15.5 tf* m - Abcis.= 299 | M.[-] = 23.3 tf* m
 | As = 5.69 -SRAS- [3 B 16.0mm] | AsL= 0.00 - - - - - | As = 12.64 -SRAS- [4 B 20.0mm]
 | AsL= 0.00 - - - - - x/d =0.15 | As = 6.85 -STAS- [4 B 16.0mm] | AsL= 0.00 - - - - - x/d =0.36
 | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 1239.7 | M[+]Min = 504.7 | M[-]Min = 1239.7
 [cm2] | Asapo[+] = 3.48 | | Asapo[+] = 1.71

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 503. 19.13 57.65 1 45. 3.1 1.7 3.1 8.0 30.0 2 0.0 0.0
 503.- 670. 26.65 57.37 1 45. 5.7 1.7 5.7 8.0 15.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 3 /L= 6.26 /B= 0.15 /H= 0.80 /BCs= 0.53 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 21.1 tf* m | M.[+] Max= 4.0 tf* m - Abcis.= 366 | M.[-] = 10.3 tf* m
 | As = 11.25 -SRAS- [4 B 20.0mm] | AsL= 0.00 - - - - - | As = 4.73 -SRAS- [4 B 12.5mm]
 | AsL= 0.00 - - - - - x/d =0.32 | As = 2.65 -STAS- [4 B 10.0mm] | AsL= 0.00 - - - - - x/d =0.13
 | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 774.2 | M[+]Min = 455.0 | M[-]Min = 774.2
 [cm2] | Asapo[+] = 0.66 | | Asapo[+] = 0.66

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 198. 25.25 57.43 1 45. 5.2 1.7 5.2 8.0 18.0 2 0.0 0.0
198.- 397. 4.00 57.85 1 45. 0.0 1.7 1.7 8.0 30.0 2 0.0 0.0
397.- 595. 20.06 57.71 1 45. 3.5 1.7 3.5 8.0 28.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 4 /L= 4.67 /B= 0.15 /H= 0.80 /BCs= 0.71 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 10.4 tf* m | M.[+] Max= 4.4 tf* m - Abcis.= 272 | M.[-] = 4.7 tf* m
[tf,cm] | As = 4.75 -SRAS- [4 B 12.5mm] | AsL= 0.00 ----- | As = 4.38 -SRAS- [4 B 12.5mm]
| AsL= 0.00 ----- x/d =0.13 | As = 3.06 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.12
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 0.9 | x/dMx=0.45
[tf,cm] | M[-]Min = 960.5 | M[+]Min = 479.0 | M[-]Min = 960.5
[cm2] | Asapo[+]= 0.76 | Asapo[+]= 0.90

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 145. 17.64 57.71 1 45. 2.6 1.7 2.6 6.3 22.0 2 0.0 0.0
145.- 435. 12.67 57.85 1 45. 0.9 1.7 1.7 6.3 30.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 5 /L= 2.83 /B= 0.15 /H= 0.80 /BCs= 0.49 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 4.0 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 284 | M.[-] = 9.6 tf* m
[tf,cm] | As = 3.27 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 4.33 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.09 | As = 2.56 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.12
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.2 | x/dMx=0.45
[tf,cm] | M[-]Min = 735.8 | M[+]Min = 449.0 | M[-]Min = 735.8
[cm2] | Asapo[+]= 0.64 | Asapo[+]= 0.64

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 235. 14.80 57.85 1 45. 1.7 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 6 /L= 6.12 /B= 0.15 /H= 0.80 /BCs= 0.88 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 11.6 tf* m | M.[+] Max= 8.2 tf* m - Abcis.= 306 | M.[-] = 13.6 tf* m
[tf,cm] | As = 5.31 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 6.40 -SRAS- [2 B 20.0mm]
| AsL= 0.00 ----- x/d =0.14 | As = 3.53 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.17
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.2 | x/dMx=0.45
[tf,cm] | M[-]Min = 1125.2 | M[+]Min = 495.3 | M[-]Min = 1125.2
[cm2] | Asapo[+]= 0.88 | Asapo[+]= 0.88

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 193. 26.26 57.71 1 45. 5.5 1.7 5.5 8.0 18.0 2 0.0 0.0
193.- 387. 6.46 57.83 1 45. 0.0 1.7 1.7 8.0 30.0 2 0.0 0.0
387.- 580. 20.02 57.71 1 45. 3.4 1.7 3.4 8.0 28.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 7 /L= 6.32 /B= 0.15 /H= 0.80 /BCs= 0.53 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 13.5 tf* m | M.[+] Max= 3.3 tf* m - Abcis.= 316 | M.[-] = 20.4 tf* m
[tf,cm] | As = 6.34 -SRAS- [2 B 20.0mm] | AsL= 0.00 ----- | As = 10.80 -SRAS- [4 B 20.0mm]
| AsL= 0.00 ----- x/d =0.17 | As = 2.65 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.31
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | x/dMx=0.45

```

[tf,cm] | M[-]Min = 777.4 | M[+]Min = 455.4 | M[-]Min = 777.4
[cm2 ] | Asapo[+]= 0.66 | | Asapo[+]= 0.66

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 200. 22.39 57.71 1 45. 4.2 1.7 4.2 8.0 22.0 2 0.0 0.0
200.- 400. 2.69 57.85 1 45. 0.0 1.7 1.7 8.0 30.0 2 0.0 0.0
400.- 600. 23.14 57.50 1 45. 4.5 1.7 4.5 8.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 8 /L= 7.13 /B= 0.15 /H= 0.80 /BCs= 1.01 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
[tf,cm] | M.[-] = 22.9 tf* m | M.[+] Max= 15.4 tf* m - Abcis.= 416 | M.[-] = 6.0 tf* m
| As = 12.38 -SRAS- [ 4 B 20.0mm] | AsL= 0.00 ----- | As = 5.66 -SRAS- [ 3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.35 | As = 6.81 -STAS- [ 4 B 16.0mm ] | AsL= 0.00 ----- x/d =0.15
| x/dMx=0.45 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.0 | x/dMx=0.45
[tf,cm] | M[-]Min = 1234.4 | M[+]Min = 504.3 | M[-]Min = 1234.4
[cm2 ] | Asapo[+]= 1.70 | | Asapo[+]= 3.29

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 166. 28.05 57.37 1 45. 6.2 1.7 6.2 8.0 15.0 2 0.0 0.0
166.- 665. 18.64 57.65 1 45. 3.0 1.7 3.0 8.0 30.0 2 0.0 0.0

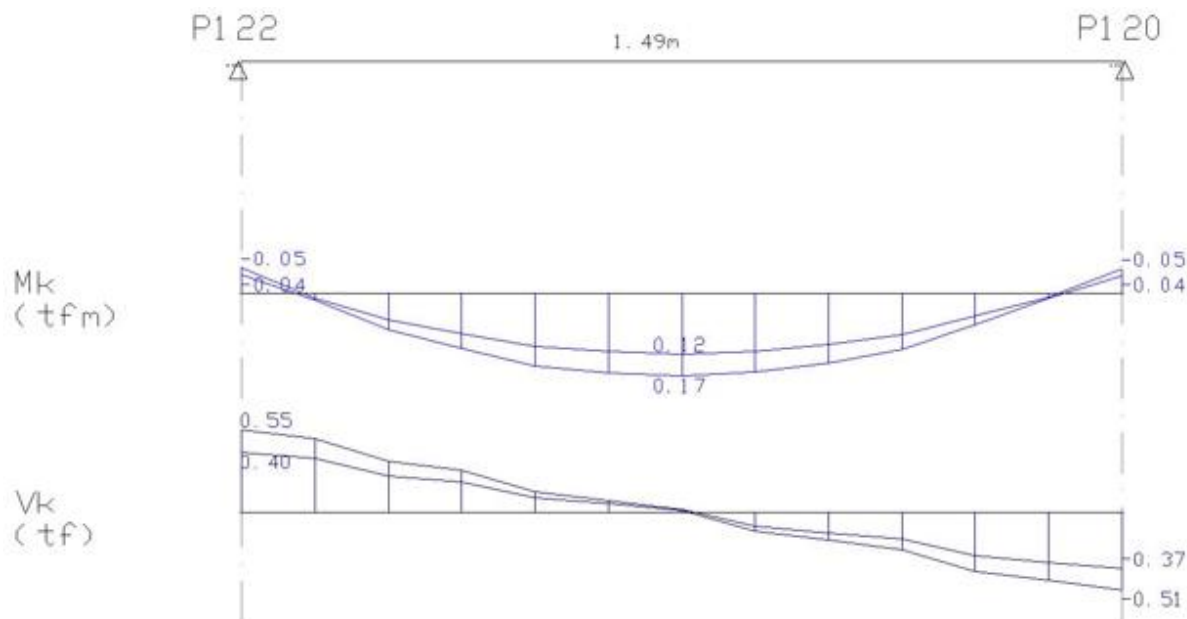
----- G E O M E T R I A E C A R G A S -----
Vao= 9B /L= 0.56 /B= 0.15 /H= 0.80 /BCs= 0.26 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO | M[-]= 3.84 tf* m | As = 2.10 -SRAS- [ 2 B 16.0mm]
BAL.DIR | Grampo DIR = 2 B 8.0mm x/d =0.06 | AsL= 0.00 -Arm.Lat.= [2 X 3 B 8.0mm]
[tf,cm] | M[-]Min= 481.7 - x/dMx =0.45 | | % Baric.Armad.= 2

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 30. 6.25 57.85 1 45. 0.0 1.7 1.8 5.0 22.0 2 0.0 1.8

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 18.022 13.312 0.50 0.01 1 P112 0.00 0.00 112 0 0 0 0
2 36.829 27.306 0.50 0.01 1 P98 0.00 0.00 98 0 0 0 0
3 26.915 19.910 0.15 0.00 1 P84 0.00 0.00 84 0 0 0 0
4 13.889 10.274 0.50 0.01 1 P67 0.00 0.00 67 0 0 0 0
5 29.076 21.524 0.50 0.01 1 P62 0.00 0.00 62 0 0 0 0
6 30.296 22.399 0.15 0.00 1 P40 0.00 0.00 40 0 0 0 0
7 36.301 26.913 0.50 0.01 1 P21 0.00 0.00 21 0 0 0 0
8 17.778 13.129 0.50 0.01 1 P7 0.00 0.00 7 0 0 0 0

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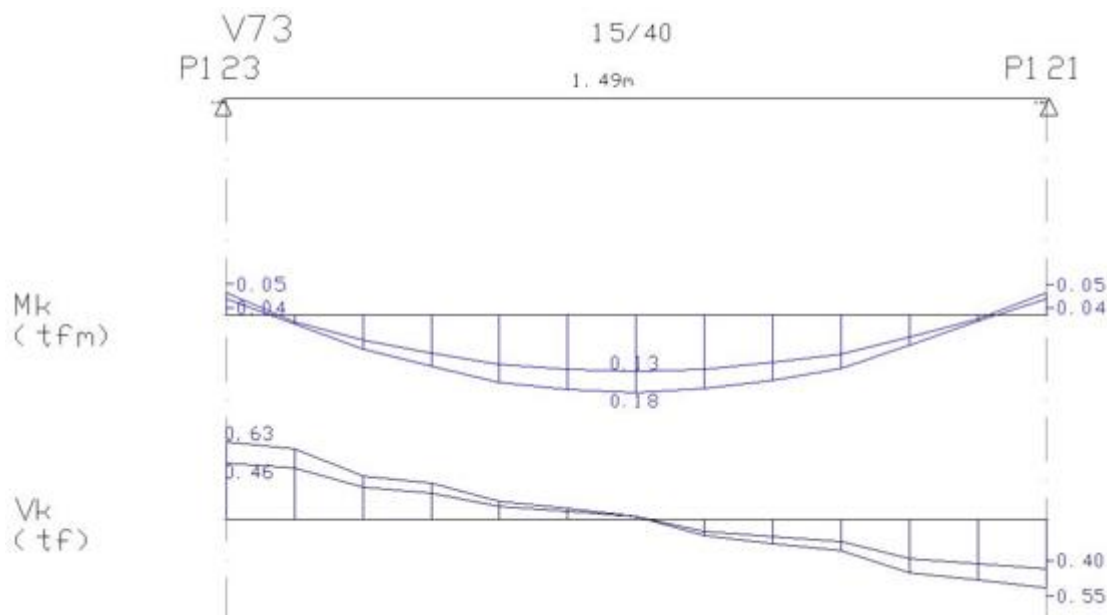


V72

Viga= 72 V72

Eng.E=Nao /Eng.D=Nao /Repet= 1 /Nand= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

G E O M E T R I A E C A R G A S													
Vao= 1 /L= 1.49 /B= 0.15 /H= 0.40 /BCs= 0.30 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.12 /Esp.LI= 0.00 FSp.Ex= 0.20 /FLt.Ex= 0.07 [M]													
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---													
A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)													
FLEXAO- E S Q U E R D A				M E I O D O V A O				D I R E I T A					
M.[+] = 0.1 tf* m				M.[+] Max= 0.2 tf* m - Abcis.= 74				M.[+] = 0.0 tf* m					
[tf,cm] As = 0.94 -SRAS- [2 B 8.0mm]				AsL= 0.00				As = 0.94 -SRAS- [2 B 8.0mm]					
AsL= 0.00				As = 1.17 -STAS- [2 B 10.0mm]				AsL= 0.00					
x/d =0.05				Arm.Lat.= [2 X -- B --- mm] - LN= 0.9				x/d =0.05					
x/dMx=0.45								x/dMx=0.45					
[tf,cm] M[-]Min = 96.5				M[+]Min = 102.1				M[-]Min = 96.5					
[cm2] Asapo[+]= 0.39								Asapo[+]= 0.39					
C I S A L H A M E N T O - M E N S A G E M													
[tf,cm] Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus													
0.- 125. 0.78 27.30 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0													
R E A C . A P O I O -													
No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:													
1 0.554 0.402 0.25 0.01 1 P122 0.00 0.00 122 0 0 0 0 0													
2 0.514 0.372 0.25 0.01 1 P120 0.00 0.00 120 0 0 0 0 0													



V73

Viga= 73 V73

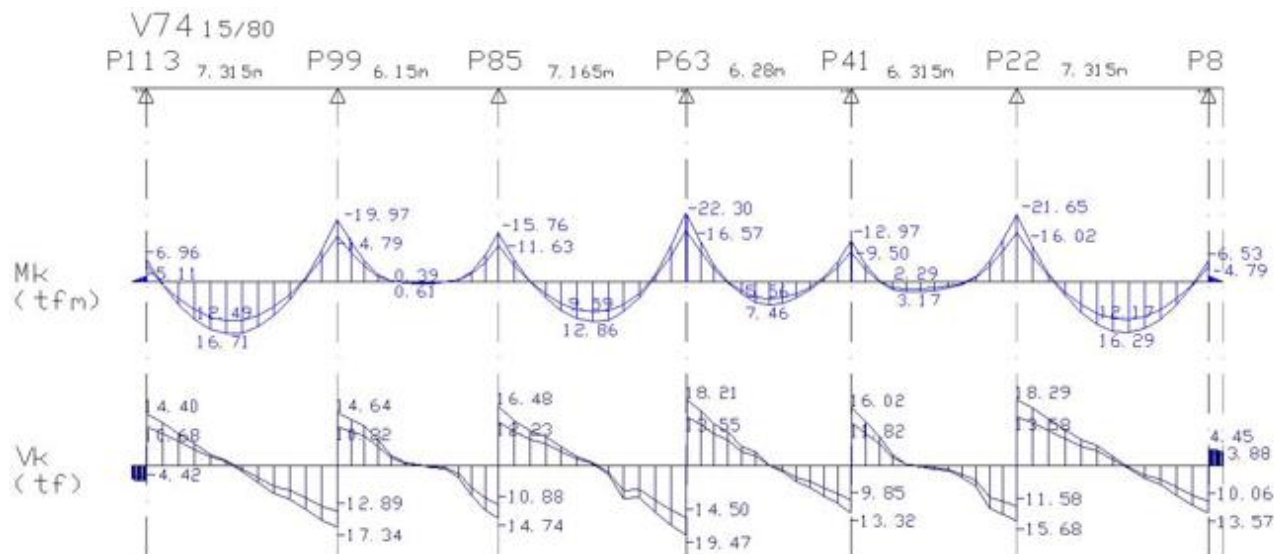
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 1.49 /B= 0.15 /H= 0.40 /BCs= 0.30 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.12 /Esp.LI= 0.00 FSp.Ex= 0.20 /Flt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 0.1 tf* m | M.[+] Max= 0.2 tf* m - Abcis.= 74 | M.[-] = 0.1 tf* m |
 [tf,cm] | As = 0.94 -SRAS- [2 B 8.0mm] | AsL= 0.00 ----- | As = 0.94 -SRAS- [2 B 8.0mm] |
 | AsL= 0.00 ----- x/d =0.05 | As = 1.17 -STAS- [2 B 10.0mm] | AsL= 0.00 ----- x/d =0.05 |
 | | Arm.Lat.=[2 X -- B --- mm] - LN= 0.9 | | x/dMx=0.45 |
 [tf,cm] | M[-]Min = 96.5 | M[+]Min = 102.1 | M[-]Min = 96.5 |
 [cm2] | Asapo[+]= 0.39 | | Asapo[+]= 0.39 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 125. 0.88 27.30 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 0.626 0.457 0.25 0.01 1 P123 0.00 0.00 123 0 0 0 0 0
 2 0.552 0.402 0.25 0.01 1 P121 0.00 0.00 121 0 0 0 0 0



V74

Viga= 74 V74

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1B /L= 0.56 /B= 0.15 /H= 0.80 /BCs= 0.26 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO | M[-]= 3.84 tf* m | As = 2.10 -SRAS- [2 B 16.0mm]
 BAL.ESQ | Grampo ESQ = 2 B 8.0mm x/d =0.06 | AsL= 0.00 -Arm.Lat.= [2 X 3 B 8.0mm]
 [tf,cm] | M[-]Min= 481.7 - x/dMx =0.45 | % Baric.Armad.= 2

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	30.	6.19	57.85	1	45.	0.0	1.7	1.8	5.0	22.0	2	0.0	1.8	

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 7.32 /B= 0.15 /H= 0.80 /BCs= 1.03 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 7.0 tf* m | M.[+] Max= 16.7 tf* m - Abcis.= 304 | M.[-] = 20.0 tf* m
 | As = 5.76 -SRAS- [3 B 16.0mm] | AsL= 0.00 -STAS- [4 B 16.0mm] | As = 9.89 -SRAS- [5 B 16.0mm]
 | AsL= 0.00 -STAS- [4 B 16.0mm] | AsL= 0.00 -STAS- [4 B 16.0mm] | AsL= 0.00 -STAS- [4 B 16.0mm]
 | x/d =0.15 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | x/d =0.27
 | x/dMx=0.45 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 1253.8 | M[+]Min = 505.8 | M[-]Min = 1253.8
 [cm2] | Asapo[+] = 3.89 | | Asapo[+] = 1.84

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	175.	20.17	57.60	1	45.	3.5	1.7	3.5	6.3	15.0	2	0.0	0.0	
	175.-	525.	13.26	57.51	1	45.	1.2	1.7	1.7	6.3	30.0	2	0.0	0.0	
	525.-	700.	24.28	57.54	1	45.	4.9	1.7	4.9	6.3	12.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
 Vao= 3 /L= 6.15 /B= 0.15 /H= 0.80 /BCs= 0.52 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 19.6 tf* m | M.[+] Max= 0.6 tf* m - Abcis.= 307 | M.[-] = 15.5 tf* m
 | As = 9.70 -SRAS- [5 B 16.0mm] | AsL= 0.00 -STAS- [4 B 10.0mm] | As = 7.32 -SRAS- [4 B 16.0mm]
 | AsL= 0.00 -STAS- [4 B 10.0mm] | AsL= 0.00 -STAS- [4 B 10.0mm] | AsL= 0.00 -STAS- [4 B 10.0mm]
 | x/d =0.26 | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | x/d =0.20
 | x/dMx=0.45 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 767.0 | M[+]Min = 453.9 | M[-]Min = 767.0
 [cm2] | Asapo[+] = 0.66 | | Asapo[+] = 0.66

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	200.	20.50	57.56	1	45.	3.6	1.7	3.6	6.3	15.0	2	0.0	0.0	
	200.-	400.	3.71	57.85	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	400.-	600.	20.64	57.56	1	45.	3.7	1.7	3.7	6.3	15.0	2	0.0	0.0	

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----- G E O M E T R I A E C A R G A S -----
Vao= 4 /L= 7.17 /B= 0.15 /H= 0.80 /BCs= 1.01 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 15.8 tf* m | M.[+] Max= 12.9 tf* m - Abcis.= 358 | M.[-] = 22.3 tf* m
[tf,cm]| As = 7.48 -SRAS- [ 4 B 16.0mm] | AsL= 0.00 ----- | As = 12.00 -SRAS- [ 4 B 20.0mm]
| AsL= 0.00 ----- x/d =0.20 | As = 5.59 -STAS- [ 3 B 16.0mm ] | AsL= 0.00 ----- x/d =0.34
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.7 | x/dMx=0.45
|
[tf,cm]| M[-]Min = 1238.1 | M[+]Min = 504.6 | M[-]Min = 1238.1
[cm2 ]| Asapo[+]= 1.40 | | Asapo[+]= 1.40

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 144. 23.08 57.56 1 45. 4.5 1.7 4.5 8.0 22.0 2 0.0 0.0
144.- 523. 13.09 57.65 1 45. 1.1 1.7 1.7 8.0 30.0 2 0.0 1.3
523.- 685. 27.25 57.37 1 45. 5.9 1.7 5.9 8.0 15.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 5 /L= 6.28 /B= 0.15 /H= 0.80 /BCs= 0.90 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 21.4 tf* m | M.[+] Max= 7.5 tf* m - Abcis.= 315 | M.[-] = 13.0 tf* m
[tf,cm]| As = 11.44 -SRAS- [ 4 B 20.0mm] | AsL= 0.00 ----- | As = 5.97 -SRAS- [ 3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.33 | As = 3.50 -STAS- [ 3 B 12.5mm ] | AsL= 0.00 ----- x/d =0.16
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.1 | x/dMx=0.45
|
[tf,cm]| M[-]Min = 1143.3 | M[+]Min = 496.9 | M[-]Min = 1143.3
[cm2 ]| Asapo[+]= 0.87 | | Asapo[+]= 0.87

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 142. 25.49 57.40 1 45. 5.3 1.7 5.3 6.3 10.0 2 0.0 0.0
142.- 406. 12.23 57.85 1 45. 0.8 1.7 1.7 6.3 30.0 2 0.0 0.7
406.- 580. 18.65 57.71 1 45. 3.0 1.7 3.0 6.3 20.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 6 /L= 6.32 /B= 0.15 /H= 0.80 /BCs= 0.53 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 12.6 tf* m | M.[+] Max= 3.2 tf* m - Abcis.= 210 | M.[-] = 21.3 tf* m
[tf,cm]| As = 5.80 -SRAS- [ 3 B 16.0mm] | AsL= 0.00 ----- | As = 11.36 -SRAS- [ 4 B 20.0mm]
| AsL= 0.00 ----- x/d =0.15 | As = 2.65 -STAS- [ 4 B 10.0mm ] | AsL= 0.00 ----- x/d =0.33
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 1.1 | x/dMx=0.45
|
[tf,cm]| M[-]Min = 777.4 | M[+]Min = 455.4 | M[-]Min = 777.4
[cm2 ]| Asapo[+]= 0.66 | | Asapo[+]= 0.66

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 200. 22.43 57.71 1 45. 4.3 1.7 4.3 8.0 22.0 2 0.0 0.0
200.- 400. 5.19 57.85 1 45. 0.0 1.7 1.7 8.0 30.0 2 0.0 0.0
400.- 600. 21.95 57.42 1 45. 4.1 1.7 4.1 8.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 7 /L= 7.32 /B= 0.15 /H= 0.80 /BCs= 1.03 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 21.7 tf* m | M.[+] Max= 16.3 tf* m - Abcis.= 426 | M.[-] = 6.5 tf* m
[tf,cm]| As = 11.59 -SRAS- [ 4 B 20.0mm] | AsL= 0.00 ----- | As = 5.76 -SRAS- [ 3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.33 | As = 7.19 -STAS- [ 4 B 16.0mm ] | AsL= 0.00 ----- x/d =0.15
| x/dMx=0.45 | Arm.Lat.=[2 X 3 B 8.0mm] - LN= 2.1 | x/dMx=0.45
|
[tf,cm]| M[-]Min = 1253.8 | M[+]Min = 505.8 | M[-]Min = 1253.8
[cm2 ]| Asapo[+]= 1.80 | | Asapo[+]= 3.54

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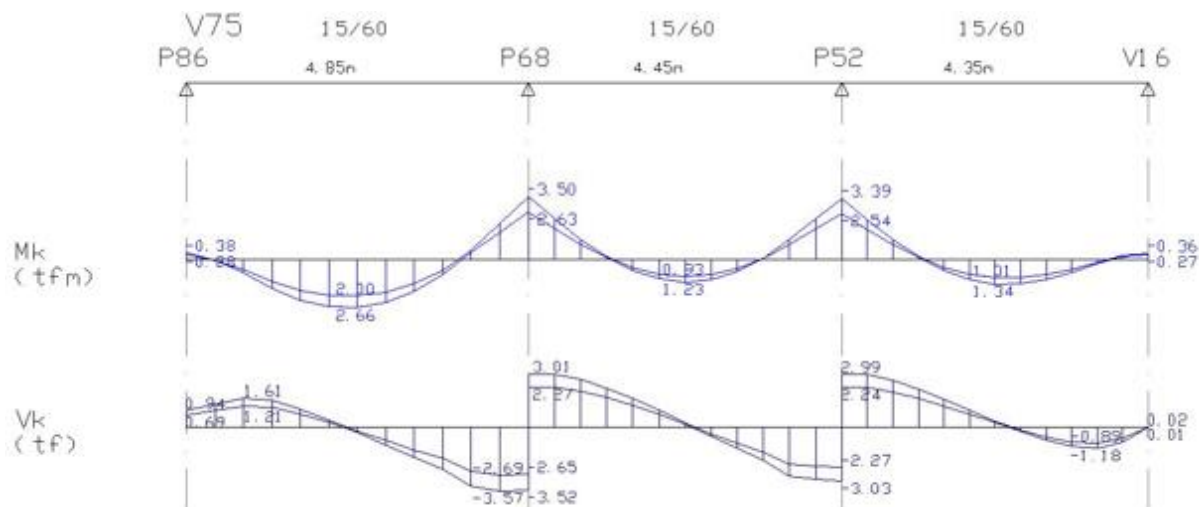
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	175.	25.60	57.38	1	45.	5.4	1.7	5.4	6.3	10.0	2	0.0	0.0	
	175.-	525.	14.07	57.55	1	45.	1.4	1.7	1.7	6.3	30.0	2	0.0	0.0	
	525.-	700.	19.00	57.60	1	45.	3.1	1.7	3.1	6.3	20.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
 Vao= 8B /L= 0.56 /B= 0.15 /H= 0.80 /BCs= 0.26 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO | M[-]= 3.84 tf* m | As = 2.10 -SRAS- [2 B 16.0mm]
 BAL.DIR | Grampo DIR = 2 B 8.0mm x/d =0.06 | AsL= 0.00 -Arm.Lat.= [2 X 3 B 8.0mm]
 [tf,cm] | M[-]Min= 481.7 - x/dMx =0.45 | | % Baric.Armad.= 2

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	30.	6.23	57.85	1	45.	0.0	1.7	1.8	5.0	22.0	2	0.0	1.8	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	18.808	13.892	0.50	0.01	1	P113	0.00	0.00	113 0 0 0 0 0
2	31.988	23.703	0.15	0.00	1	P99	0.00	0.00	99 0 0 0 0 0
3	31.226	23.108	0.15	0.00	1	P85	0.00	0.00	85 0 0 0 0 0
4	37.430	27.868	0.50	0.01	1	P63	0.00	0.00	63 0 0 0 0 0
5	29.126	21.507	0.50	0.01	1	P41	0.00	0.00	41 0 0 0 0 0
6	33.961	25.153	0.15	0.00	1	P22	0.00	0.00	22 0 0 0 0 0
7	18.017	13.300	0.50	0.01	1	P8	0.00	0.00	8 0 0 0 0 0



V75

Viga= 75 V75

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 4.85 /B= 0.15 /H= 0.60 /BCs= 0.88 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 0.4 tf* m | M.[+] Max= 2.7 tf* m - Abcis.= 242 | M.[-] = 3.5 tf* m
[tf,cm]| As = 1.92 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 4.10 -SRAS- [2 B 16.0mm]
| AsL= 0.00 ----- x/d =0.07 | As = 2.99 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.15
| Grampos Esq.= 1B 6.3mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.5 | x/dMx=0.45
[tf,cm]| M[-]Min = 319.6 | M[+]Min = 277.1 | M[-]Min = 663.8
[cm2]| Asapo[+] = 1.00 | | Asapo[+] = 0.75

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 470. 5.00 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 4.45 /B= 0.15 /H= 0.60 /BCs= 0.68 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 3.5 tf* m | M.[+] Max= 1.2 tf* m - Abcis.= 222 | M.[-] = 3.4 tf* m
[tf,cm]| As = 3.42 -SRAS- [2 B 16.0mm] | AsL= 0.00 ----- | As = 3.42 -SRAS- [2 B 16.0mm]
| AsL= 0.00 ----- x/d =0.12 | As = 2.55 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.12
| x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.7 | x/dMx=0.45
[tf,cm]| M[-]Min = 559.0 | M[+]Min = 267.2 | M[-]Min = 559.0
[cm2]| Asapo[+] = 0.64 | | Asapo[+] = 0.64

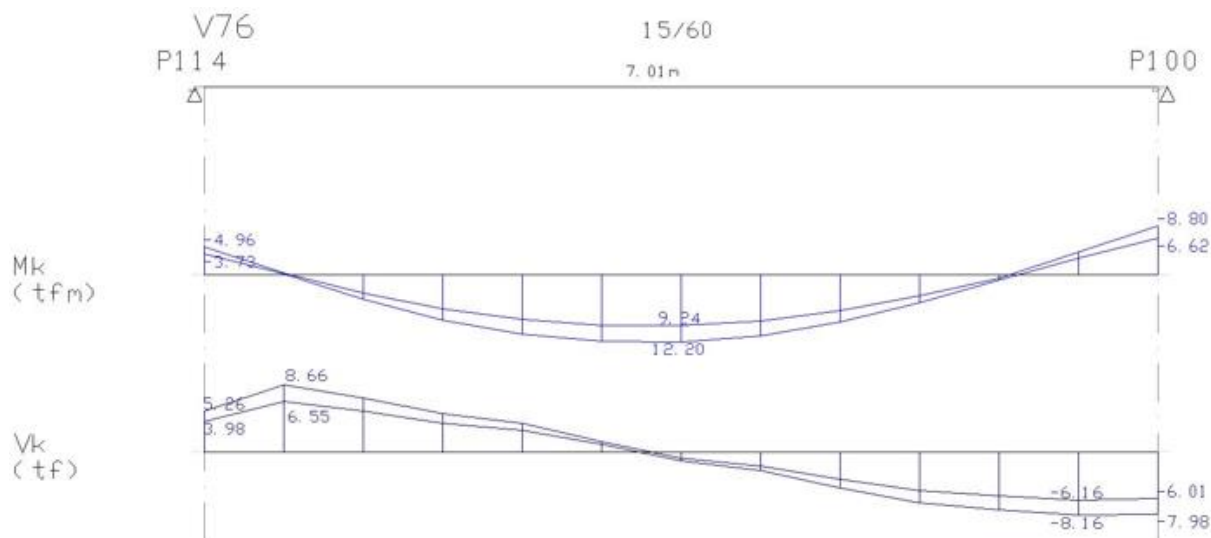
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 430. 4.25 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 4.35 /B= 0.15 /H= 0.60 /BCs= 0.80 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 3.4 tf* m | M.[+] Max= 1.3 tf* m - Abcis.= 217 | M.[-] = 0.4 tf* m
[tf,cm]| As = 3.84 -SRAS- [2 B 16.0mm] | AsL= 0.00 ----- | As = 2.46 -SRAS- [2 B 12.5mm]
| AsL= 0.00 ----- x/d =0.14 | As = 2.82 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.09
| x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.6 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
[tf,cm]| M[-]Min = 624.5 | M[+]Min = 273.6 | M[-]Min = 408.7
[cm2]| Asapo[+] = 0.70 | | Asapo[+] = 0.94

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 420. 4.19 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 0.938 0.694 0.15 0.00 1 P86 0.00 0.00 86 0 0 0 0
2 6.511 4.904 0.15 0.00 1 P68 0.00 0.00 68 0 0 0 0
3 6.027 4.514 0.15 0.00 1 P52 0.00 0.00 52 0 0 0 0
4 -0.007 -0.022 0.15 0.00 2 V16 0.00 0.00 0 0 0 0 0



V76

Viga= 76 V76

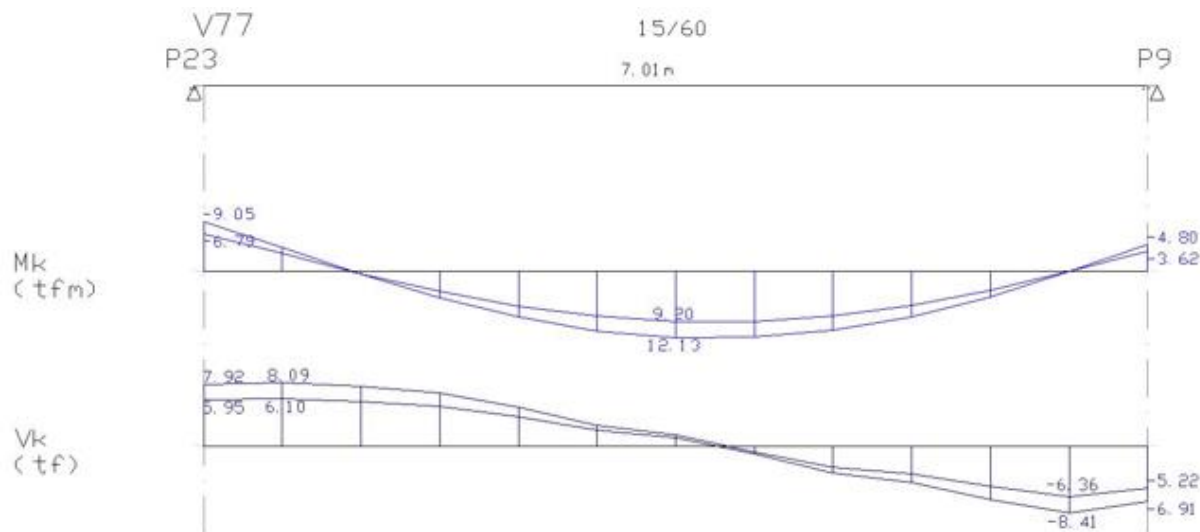
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 5.0 tf* m | M.[+] Max= 12.2 tf* m - Abcis.= 350 | M.[-] = 8.8 tf* m
 | As = 3.23 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 5.65 -SRAS- [3 B 16.0mm]
 | AsL= 0.00 ----- x/d =0.12 | As = 7.38 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.21
 | | | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.4 | | | x/dMx=0.45
 [tf,cm] | M[-]Min = 520.2 | M[+]Min = 298.3 | M[-]Min = 520.2
 [cm2] | Asapo[+]= 2.46 | | Asapo[+]= 1.84

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 166. 12.09 42.30 1 45. 2.2 1.7 2.2 5.0 15.0 2 0.0 0.0
 166.- 499. 8.78 42.10 1 45. 0.7 1.7 1.7 5.0 22.0 2 0.0 0.0
 499.- 665. 11.42 42.44 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 5.249 3.974 0.50 0.07 1 P114 0.00 0.00 114 0 0 0 0
 2 7.981 6.008 0.50 0.07 1 P100 0.00 0.00 100 0 0 0 0



V77

Viga= 77 V77

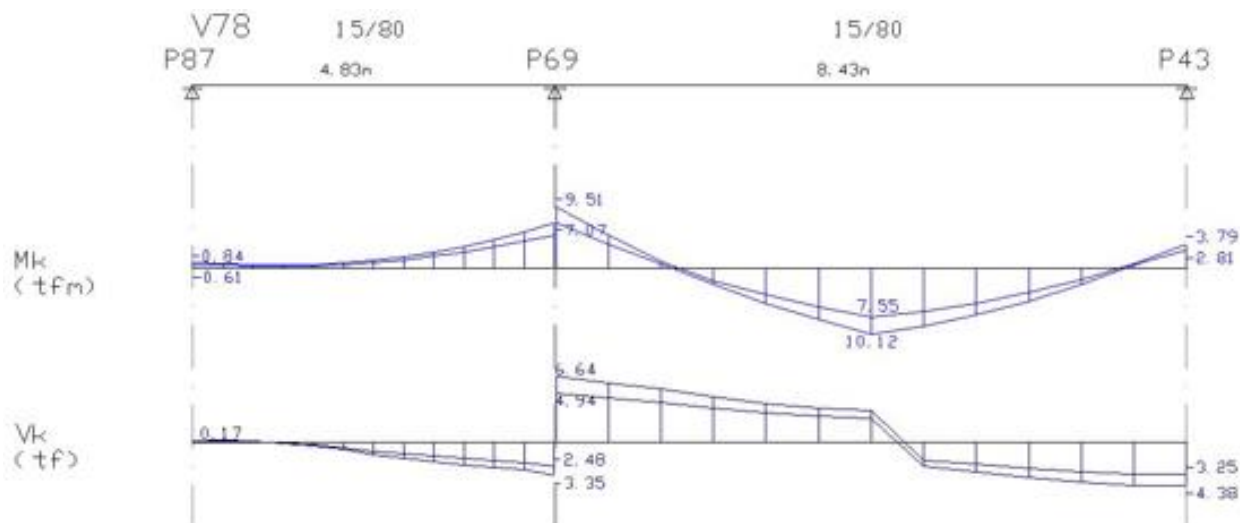
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 9.0 tf* m | M.[+] Max= 12.1 tf* m - Abcis.= 350 | M.[-] = 4.8 tf* m
 [tf,cm] | As = 5.82 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 3.23 -SRAS- [4 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.21 | As = 7.34 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.12
 | | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.4 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 520.2 | M[+]Min = 298.3 | M[-]Min = 520.2
 [cm2] | Asapo[+]= 1.83 | | Asapo[+]= 2.45

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 166. 11.32 42.44 1 45. 1.9 1.7 1.9 5.0 20.0 2 0.0 0.0
 166.- 499. 9.14 42.10 1 45. 0.9 1.7 1.7 5.0 22.0 2 0.0 0.0
 499.- 665. 11.76 42.28 1 45. 2.1 1.7 2.1 5.0 18.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 7.906 5.944 0.50 0.07 1 P23 0.00 0.00 23 0 0 0 0 0
 2 6.907 5.225 0.50 0.07 1 P9 0.00 0.00 9 0 0 0 0 0



V78

Viga= 78 V78

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 4.83 /B= 0.15 /H= 0.80 /BCs= 0.51 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 0.8 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 484 | M.[-] = 7.0 tf* m
 [tf,cm] | As = 3.39 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 3.39 -SRAS- [3 B 12.5mm]
 | AsL= 0.00 ----- x/d =0.09 | As = 2.62 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.09
 | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 759.8 | M[+]Min = 452.8 | M[-]Min = 759.8
 [cm2] | Asapo[+] = 0.65 | | Asapo[+] = 0.65

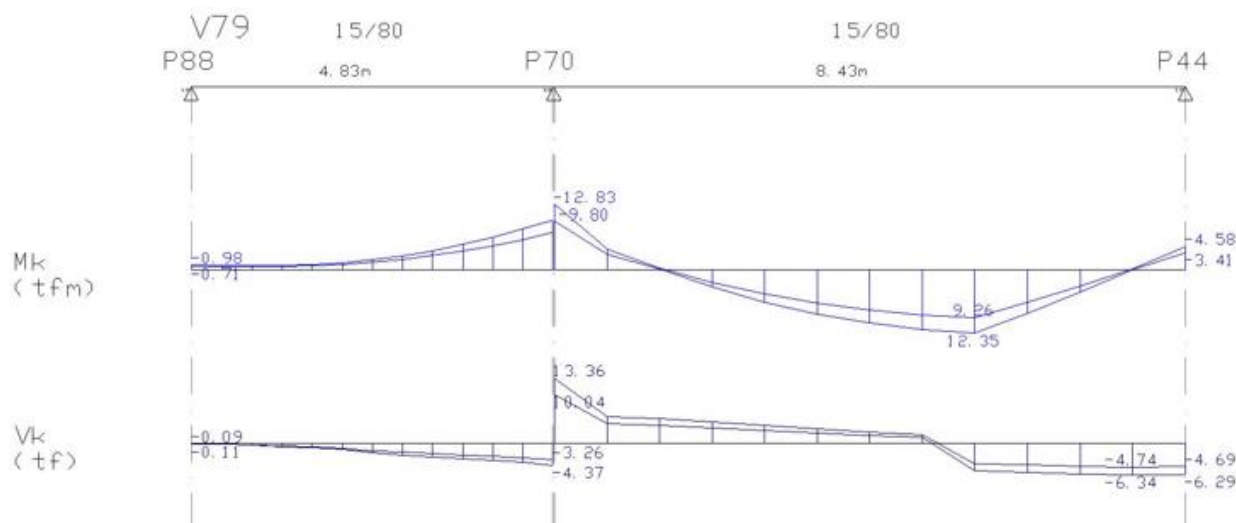
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 435. 4.69 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
 Vao= 2 /L= 8.43 /B= 0.15 /H= 0.80 /BCs= 0.78 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 | M.[-] = 9.5 tf* m | M.[+] Max= 10.1 tf* m - Abcis.= 422 | M.[-] = 3.8 tf* m
 [tf,cm] | As = 4.71 -SRAS- [4 B 12.5mm] | AsL= 0.00 ----- | As = 3.01 -SRAS- [4 B 10.0mm]
 | AsL= 0.00 ----- x/d =0.13 | As = 4.37 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.08
 | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.7 | | x/dMx=0.45
 [tf,cm] | M[-]Min = 1030.4 | M[+]Min = 486.4 | M[-]Min = 673.0
 [cm2] | Asapo[+] = 1.09 | | Asapo[+] = 1.46

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 357. 9.29 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0
 357.- 448. 4.70 57.71 1 45. 0.0 1.7 1.9 5.0 20.0 2 0.0 1.9
 448.- 795. 6.14 57.85 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	0.050	0.005	0.50	0.01	1	P87	0.00	0.00	87
	2	9.900	7.354	0.50	0.01	1	P69	0.00	0.00	69
	3	4.385	3.248	0.50	0.01	1	P43	0.00	0.00	43



V79

Viga= 79 V79

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 4.83 /B= 0.15 /H= 0.80 /BCs= 0.51 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 1.0 tf* m | M.[+] Max= 0.0 tf* m - Abcis.= 484 | M.[-] = 9.8 tf* m
[tf,cm] | As = 3.39 -SRAS- [3 B 12.5mm] | AsL= 0.00 ----- | As = 4.43 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.09 | As = 2.62 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.12
| | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 1.1 | | x/dMx=0.45
[tf,cm] | M[-]Min = 759.8 | M[+]Min = 452.8 | M[-]Min = 759.8
[cm2] | Asapo[+] = 0.65 | | Asapo[+] = 0.65

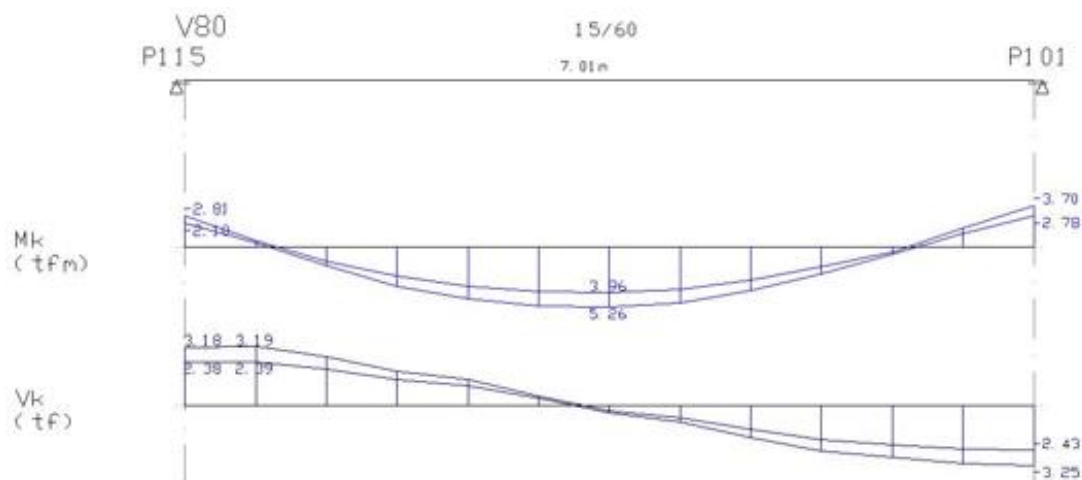
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	435.	6.12	57.85	1	45.	0.0	1.7	1.7	5.0	22.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 8.43 /B= 0.15 /H= 0.80 /BCs= 0.78 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.40 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 12.8 tf* m | M.[+] Max= 12.3 tf* m - Abcis.= 562 | M.[-] = 4.6 tf* m
[tf,cm] | As = 5.90 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 3.01 -SRAS- [4 B 10.0mm]
| AsL= 0.00 ----- x/d =0.16 | As = 5.38 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.08
| | | Arm.Lat.= [2 X 3 B 8.0mm] - LN= 2.1 | | x/dMx=0.45
[tf,cm] | M[-]Min = 1030.4 | M[+]Min = 486.4 | M[-]Min = 673.0
[cm2] | Asapo[+] = 1.35 | | Asapo[+] = 2.03

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	88.	18.71	57.71	1	45.	3.0	1.7	3.0	6.3	20.0	2	0.0	2.6	
	88.-	486.	7.32	57.79	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	
	486.-	578.	7.89	57.64	1	45.	0.0	1.7	2.5	6.3	22.0	2	0.0	2.5	
	578.-	795.	8.88	57.85	1	45.	0.0	1.7	1.7	6.3	30.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	-0.090	-0.105	0.50	0.01	1	P88	0.00	0.00	88 0 0 0 0 0
2	17.553	13.162	0.50	0.01	1	P70	0.00	0.00	70 0 0 0 0 0
3	6.293	4.689	0.50	0.01	1	P44	0.00	0.00	44 0 0 0 0 0



V80

Viga= 80 V80

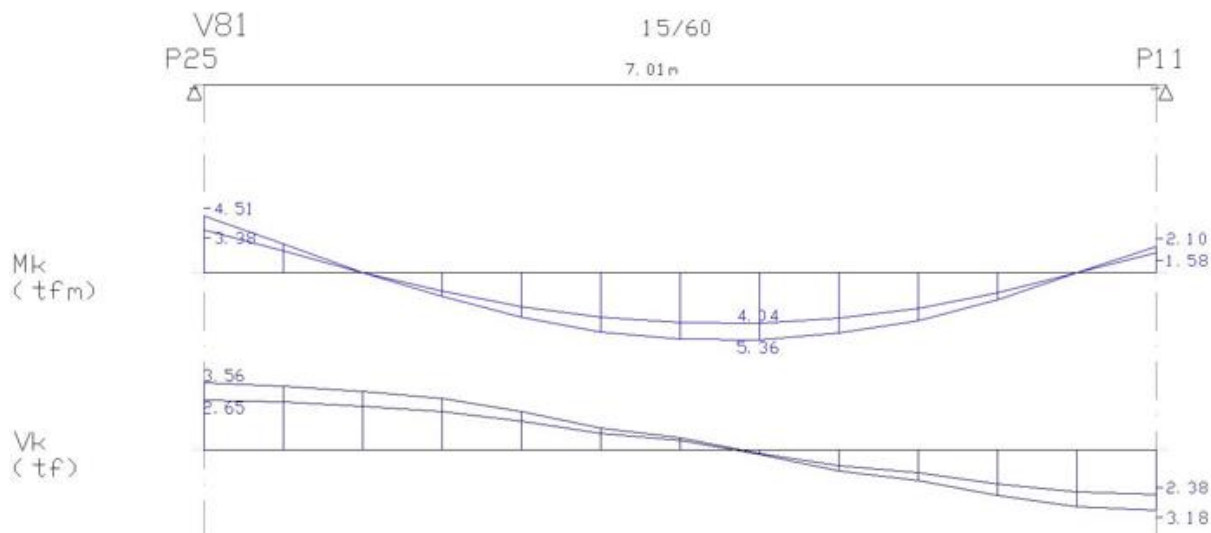
Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 2.8 tf* m | M.[+] Max= 5.3 tf* m - Abcis.= 350 | M.[-] = 3.7 tf* m
[tf,cm] | As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.24 -SRAS- [3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.08 | As = 3.08 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.08
| | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.1 | | x/dMx=0.45
[tf,cm] | M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 370.5
[cm2] | Asapo[+] = 1.03 | | Asapo[+] = 0.77

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 665. 4.55 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:
1	3.179	2.375	0.50	0.07	1	P115	0.00	0.00	115	0 0 0 0 0
2	3.250	2.427	0.50	0.07	1	P101	0.00	0.00	101	0 0 0 0 0



V81

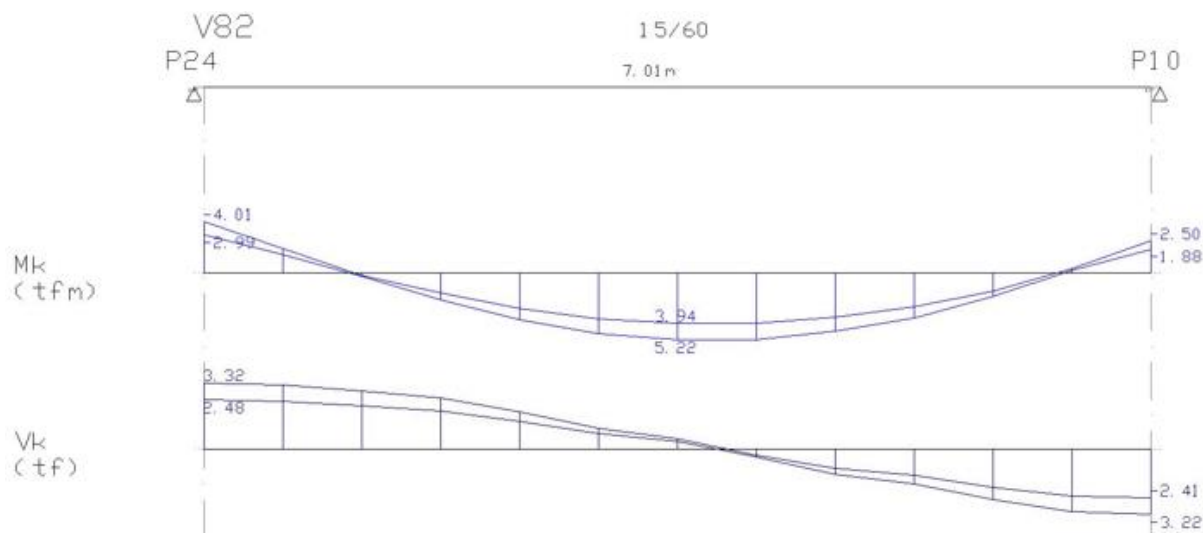
Viga= 81 V81

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /Flt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---
 - - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO- | E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 4.5 tf* m | M.[+] Max= 5.4 tf* m - Abcis.= 408 | M.[-] = 2.1 tf* m |
 [tf,cm] | As = 2.79 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 1.72 -SRAS- [3 B 10.0mm] |
 | AsL= 0.00 ----- x/d =0.10 | As = 3.14 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.06 |
 | | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.1 | | x/dMx=0.45 |
 [tf,cm] | M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 286.6 |
 [cm2] | Asapo[+] = 0.79 | | Asapo[+] = 1.05 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 665. 4.99 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	3.556	2.651	0.50	0.07	1	P25	0.00	0.00	25 0 0 0 0 0
	2	3.184	2.380	0.50	0.07	1	P11	0.00	0.00	11 0 0 0 0 0



V82

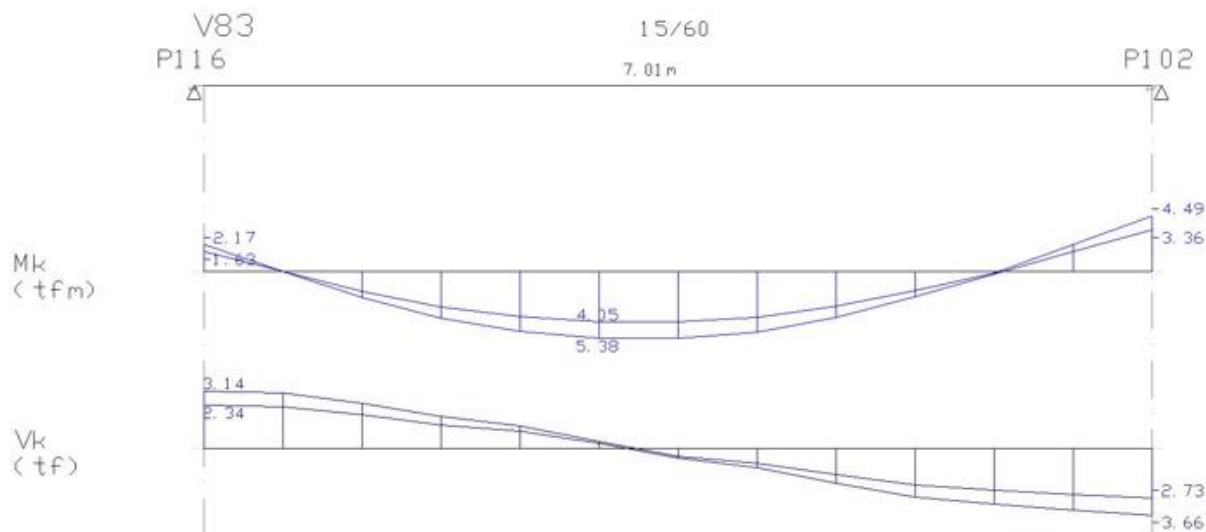
Viga= 82 V82 Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 4.0 tf* m | M.[+] Max= 5.2 tf* m - Abcis.= 350 | M.[-] = 2.5 tf* m |
[tf,cm] | As = 2.42 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.24 -SRAS- [3 B 10.0mm] |
| AsL= 0.00 ----- | x/d =0.09 | As = 3.06 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- | x/d =0.08 |
| | x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.1 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 370.5 |
[cm2] | Asapo[+]= 0.77 | | Asapo[+]= 1.04 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 665. 4.65 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	3.318	2.473	0.50	0.07	1	P24	0.00	0.00	24
	2	3.222	2.410	0.50	0.07	1	P10	0.00	0.00	10



V83

Viga= 83 V83

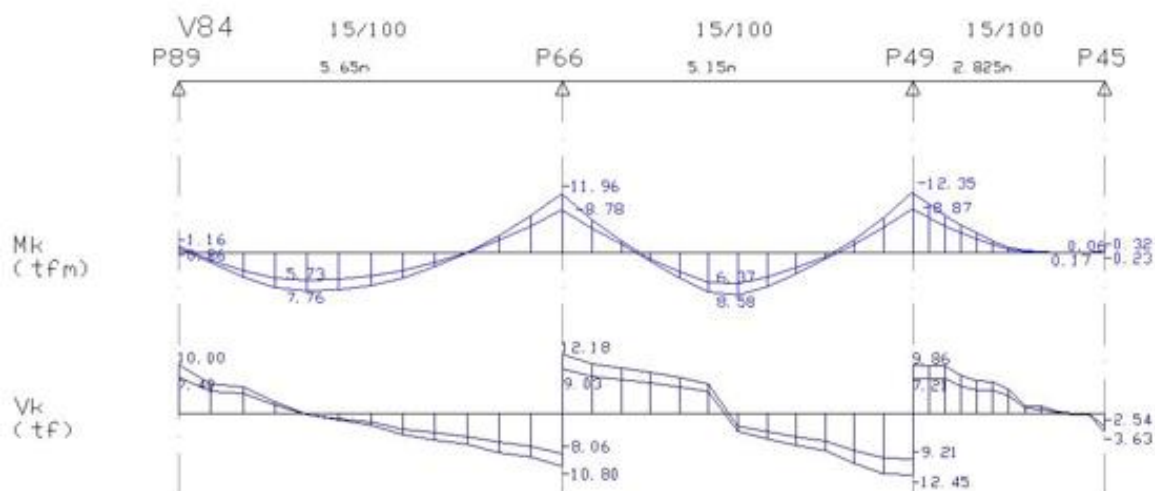
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 0.85 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 2.2 tf* m | M.[+] Max= 5.4 tf* m - Abcis.= 292 | M.[-] = 4.5 tf* m |
[tf,cm]| As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 2.77 -SRAS- [4 B 10.0mm] |
| AsL= 0.00 ----- x/d =0.08 | As = 3.15 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.10 |
| x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.1 | x/dMx=0.45 |
[tf,cm]| M[-]Min = 370.5 | M[+]Min = 275.9 | M[-]Min = 370.5 |
[cm2]| Asapo[+] = 1.05 | Asapo[+] = 0.79 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 665. 5.13 42.57 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 3.132 2.340 0.50 0.07 1 P116 0.00 0.00 116 0 0 0 0 0
2 3.661 2.732 0.50 0.07 1 P102 0.00 0.00 102 0 0 0 0 0



V84

Viga= 84 V84

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 5.65 /B= 0.15 /H= 1.00 /BCs= 1.00 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 1.2 tf* m | M.[+] Max= 7.8 tf* m - Abcis.= 188 | M.[-] = 12.0 tf* m
[tf,cm] | As = 2.96 -SRAS- [4 B 10.0mm] | AsL= 0.00 ----- | As = 6.51 -SRAS- [4 B 16.0mm]
| AsL= 0.00 ----- x/d =0.06 | As = 4.16 -STAS- [4 B 12.5mm] | AsL= 0.00 ----- x/d =0.14
| Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 0.8 | x/dMx=0.45
[tf,cm] | M[-]Min = 845.5 | M[+]Min = 786.4 | M[-]Min = 1791.5
[cm2] | Asapo[+]= 3.22 | Asapo[+]= 1.04

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 545. 15.12 73.12 1 45. 0.7 1.7 1.7 5.0 22.0 2 0.0 0.4

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 5.15 /B= 0.15 /H= 1.00 /BCs= 0.77 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 11.7 tf* m | M.[+] Max= 8.6 tf* m - Abcis.= 257 | M.[-] = 12.3 tf* m
[tf,cm] | As = 5.27 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 5.27 -SRAS- [3 B 16.0mm]
| AsL= 0.00 ----- x/d =0.11 | As = 3.64 -STAS- [3 B 12.5mm] | AsL= 0.00 ----- x/d =0.11
| x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 1.1 | x/dMx=0.45
[tf,cm] | M[-]Min = 1480.5 | M[+]Min = 754.8 | M[-]Min = 1480.5
[cm2] | Asapo[+]= 0.91 | Asapo[+]= 0.91

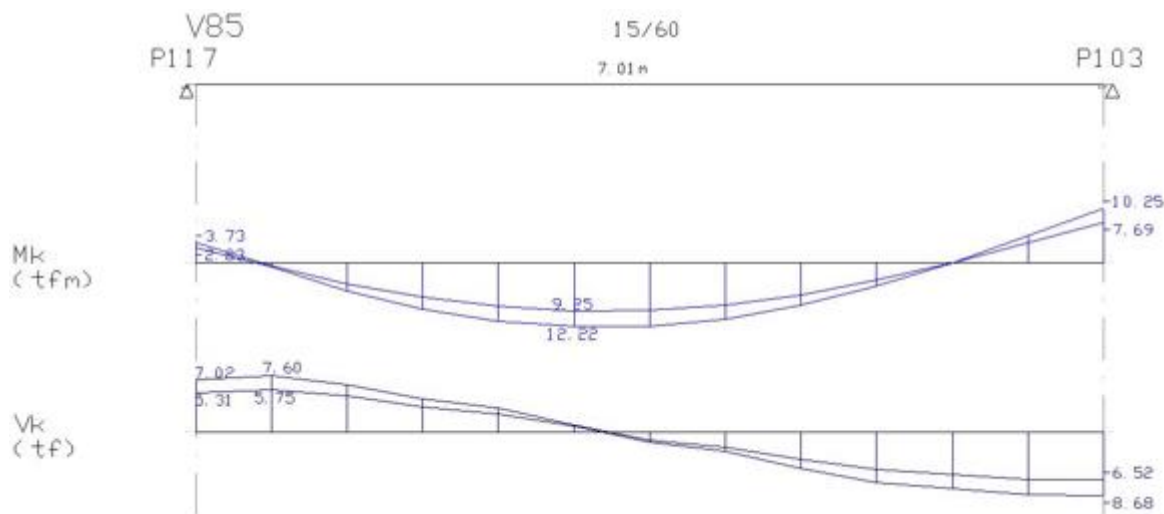
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 475. 17.42 73.12 1 45. 1.3 1.7 1.7 5.0 22.0 2 0.0 1.4

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 2.83 /B= 0.15 /H= 1.00 /BCs= 0.57 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 12.0 tf* m | M.[+] Max= 0.2 tf* m - Abcis.= 235 | M.[-] = 0.3 tf* m
[tf,cm] | As = 4.24 -SRAS- [3 B 16.0mm] | AsL= 0.00 ----- | As = 2.46 -SRAS- [2 B 12.5mm]
| AsL= 0.00 ----- x/d =0.09 | As = 3.20 -STAS- [4 B 10.0mm] | AsL= 0.00 ----- x/d =0.05
| x/dMx=0.45 | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 1.3 | Grampos Dir.= 1B 6.3mm x/dMx=0.45
[tf,cm] | M[-]Min = 1202.4 | M[+]Min = 716.9 | M[-]Min = 696.2
[cm2] | Asapo[+]= 0.80 | Asapo[+]= 1.17

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 245. 13.81 73.12 1 45. 0.4 1.7 1.7 5.0 22.0 2 0.0 0.8

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:					
	1	9.983	7.393	0.20	0.00	1	P89	0.00	0.00	89	0	0	0	0	0
	2	22.987	17.082	0.20	0.00	1	P66	0.00	0.00	66	0	0	0	0	0
	3	22.309	16.417	0.60	0.00	1	P49	0.00	0.00	49	0	0	0	0	0
	4	3.628	2.542	0.15	0.00	1	P45	0.00	0.00	45	0	0	0	0	0



V85

Viga= 85 V85

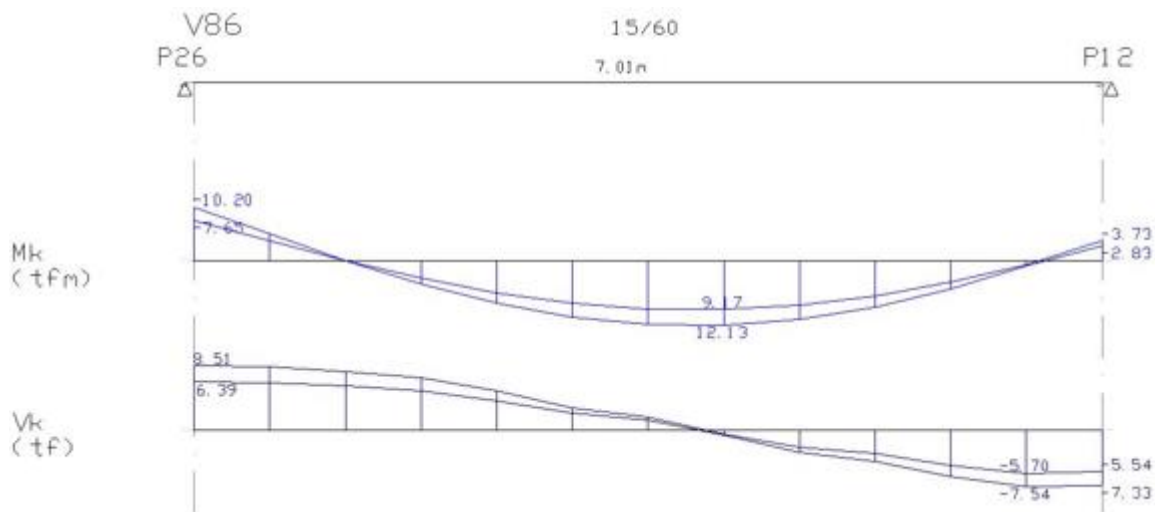
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----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 3.7 tf* m | M.[+] Max= 12.2 tf* m - Abcis.= 292 | M.[-] = 10.2 tf* m |
[tf,cm]| As = 2.25 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 6.82 -SRAS- [4 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.08 | As = 7.39 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.25 |
| x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.4 | x/dMx=0.45 |
[tf,cm]| M[-]Min = 370.5 | M[+]Min = 298.3 | M[-]Min = 520.2 |
[cm2]| Asapo[+]= 2.46 | | Asapo[+]= 1.85 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 499. 10.63 42.28 1 45. 1.6 1.7 1.7 5.0 22.0 2 0.0 0.0
499.- 665. 12.15 42.44 1 45. 2.3 1.7 2.3 5.0 15.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	7.009	5.301	0.50	0.07	1	P117	0.00	0.00	117	0	0	0	0	0
	2	8.682	6.523	0.50	0.07	1	P103	0.00	0.00	103	0	0	0	0	0



V86

Viga= 86 V86

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

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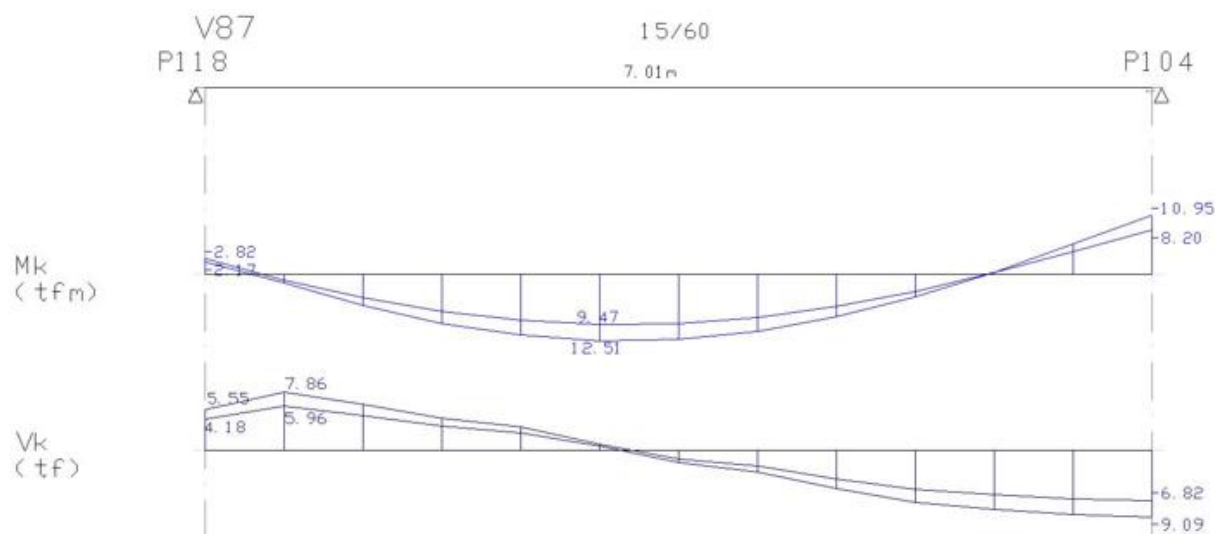
----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial-- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 10.2 tf* m | M.[+] Max= 12.1 tf* m - Abcis.= 408 | M.[-] = 3.7 tf* m
[tf,cm]| As = 6.79 -SRAS- [ 4 B 16.0mm] | AsL= 0.00 ----- | As = 2.25 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- x/d =0.25 | As = 7.33 -STAS- [ 4 B 16.0mm ] | AsL= 0.00 ----- x/d =0.08
| x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.4 | x/dMx=0.45
[tf,cm]| M[-]Min = 650.1 | M[+]Min = 298.3 | M[-]Min = 370.5
[cm2 ]| Asapo[+]= 1.83 | | Asapo[+]= 2.44

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 166. 11.92 42.44 1 45. 2.2 1.7 2.2 5.0 18.0 2 0.0 0.0
166.- 665. 10.55 42.28 1 45. 1.5 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 8.502 6.385 0.50 0.07 1 P26 0.00 0.00 26 0 0 0 0 0
2 7.333 5.545 0.50 0.07 1 P12 0.00 0.00 12 0 0 0 0 0

```



V87

Viga= 87 V87

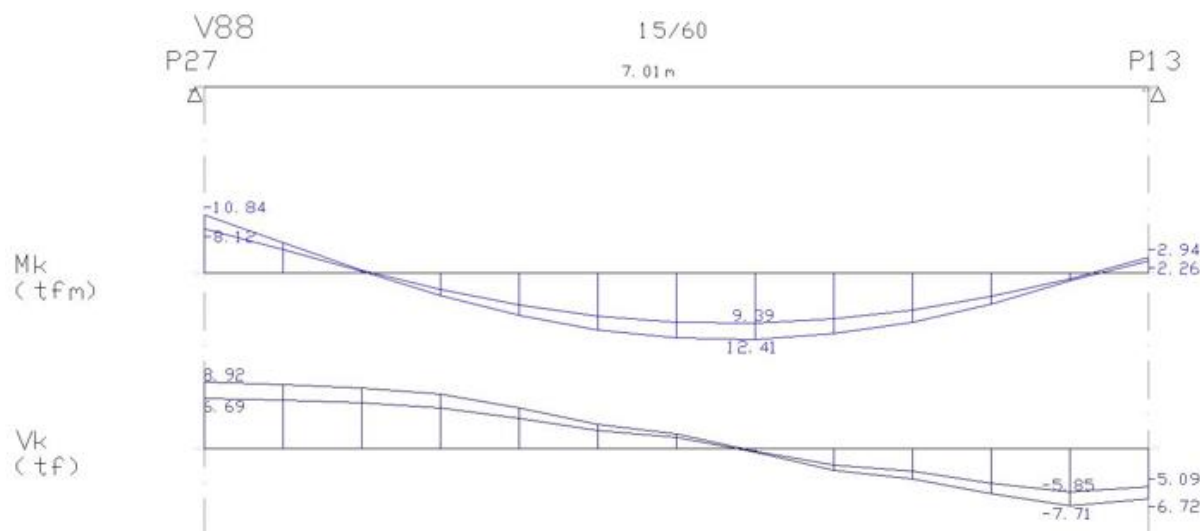
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

----- A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) -----
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
 [tf,cm] | M.[-] = 2.8 tf* m | M.[+] Max= 12.5 tf* m - Abcis.= 292 | M.[-] = 11.0 tf* m
 | As = 2.24 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 7.35 -SRAS- [4 B 16.0mm]
 | AsL= 0.00 ----- x/d =0.08 | As = 7.57 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.27
 | x/dMx=0.45 | Arm.Lat.=[2 X 2 B 8.0mm] - LN= 1.5 | x/dMx=0.45
 [tf,cm] | M[-]Min = 370.5 | M[+]Min = 298.3 | M[-]Min = 650.1
 [cm2] | Asapo[+]= 2.52 | Asapo[+]= 1.89

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 499. 10.97 42.27 1 45. 1.7 1.7 1.7 5.0 22.0 2 0.0 0.0
 499.- 665. 12.72 42.34 1 45. 2.5 1.7 2.5 5.0 15.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
 1 5.540 4.179 0.50 0.07 1 P118 0.00 0.00 118 0 0 0 0 0
 2 9.087 6.818 0.50 0.07 1 P104 0.00 0.00 104 0 0 0 0 0



V88

Viga= 88 V88

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

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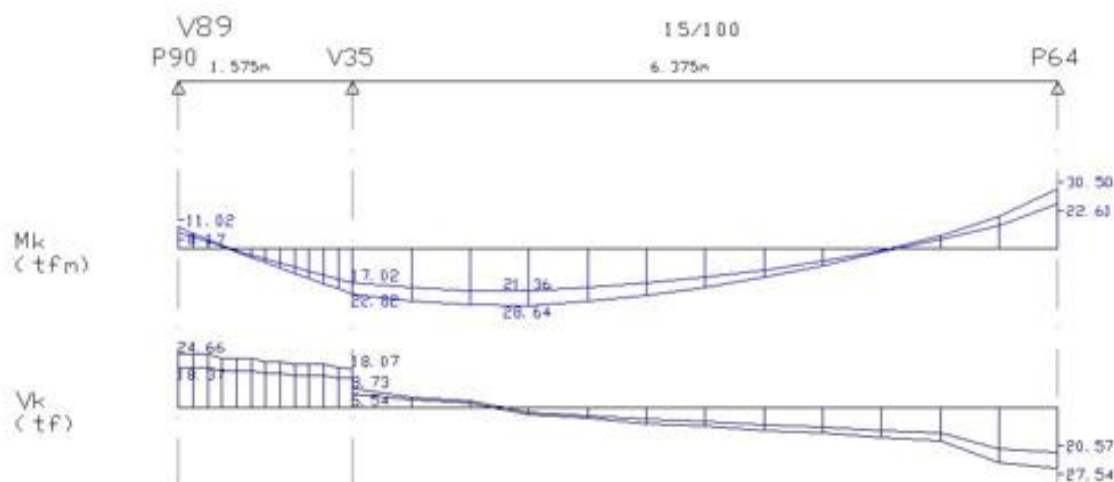
----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 7.01 /B= 0.15 /H= 0.60 /BCs= 1.55 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S ( F L E X A O E C I S A L H A M E N T O ) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A
| M.[-] = 10.8 tf* m | M.[+] Max= 12.4 tf* m - Abcis.= 408 | M.[-] = 2.9 tf* m
[tf,cm]| As = 7.27 -SRAS- [ 4 B 16.0mm] | AsL= 0.00 ----- | As = 2.24 -SRAS- [ 3 B 10.0mm]
| AsL= 0.00 ----- | x/d =0.27 | As = 7.51 -STAS- [ 4 B 16.0mm ] | AsL= 0.00 ----- | x/d =0.08
| | x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.4 | | x/dMx=0.45
[tf,cm]| M[-]Min = 650.1 | M[+]Min = 298.3 | M[-]Min = 370.5
[cm2 ]| Asapo[+]= 1.88 | | Asapo[+]= 2.50

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 166. 12.49 42.36 1 45. 2.4 1.7 2.4 5.0 15.0 2 0.0 0.0
166.- 665. 10.79 42.27 1 45. 1.6 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No. Maximos Minimos Largura DEPEV Morte Nome M.I.Mx M.I.Mn Pilares:
1 8.908 6.679 0.50 0.07 1 P27 0.00 0.00 27 0 0 0 0 0
2 6.722 5.086 0.50 0.07 1 P13 0.00 0.00 13 0 0 0 0 0

```



V89

Viga= 89 V89

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 1.57 /B= 0.15 /H= 1.00 /BCs= 0.27 /BCi= 0.00 /TpS= 5 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /Flt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 11.0 tf* m | M.[+] Max= 22.8 tf* m - Abcis.= 157 | M.[-] = 0.0 tf* m |
[tf,cm] | As = 3.84 -SRAS- [2 B 16.0mm] | AsL= 0.00 ----- | As = 2.53 -SRAS- [2 B 16.0mm] |
| AsL= 0.00 ----- x/d =0.08 | As = 8.15 -STAS- [4 B 16.0mm] | AsL= 0.00 ----- x/d =0.05 |
| | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 9.1 | | x/dMx=0.45 |
[tf,cm] | M[-]Min = 713.6 | M[+]Min = 613.5 | M[-]Min = 734.6 |
[cm2] | Asapo[+]= 6.20 | | Asapo[+]= 8.00 |

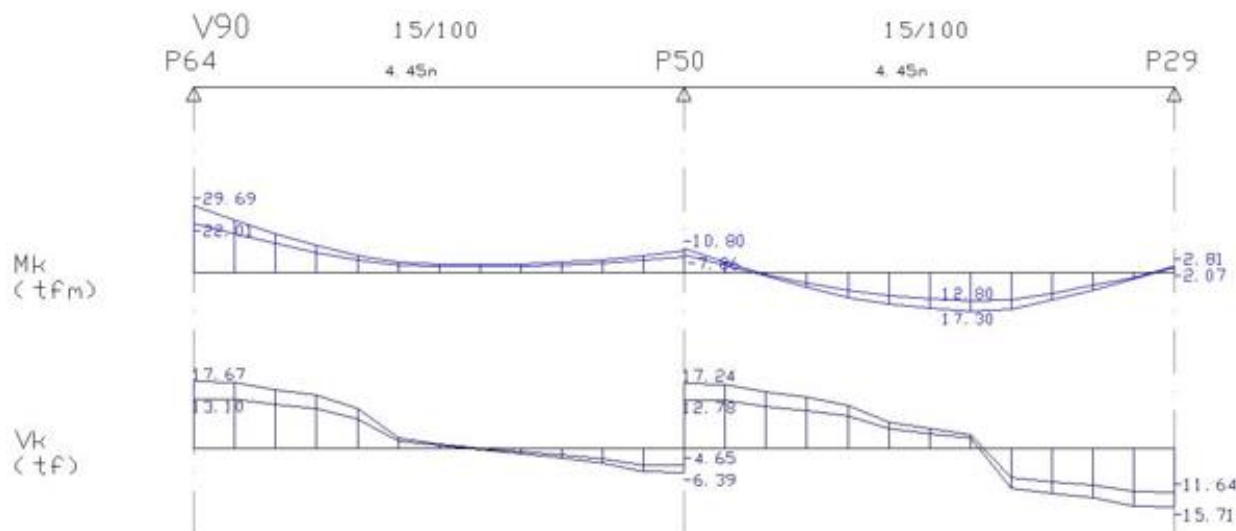
CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 120. 34.52 72.71 1 45. 5.9 1.7 5.9 8.0 15.0 2 0.0 0.0

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 6.38 /B= 0.15 /H= 1.00 /BCs= 1.11 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /Flt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
| M.[-] = 0.0 tf* m | M.[+] Max= 28.6 tf* m - Abcis.= 159 | M.[-] = 30.5 tf* m |
[tf,cm] | As = 7.06 -SRAS- [4 B 16.0mm] | AsL= 0.00 ----- | As = 12.34 -SRAS- [4 B 20.0mm] |
| AsL= 0.00 ----- x/d =0.15 | As = 10.04 -STAS- [5 B 16.0mm] | AsL= 0.00 ----- x/d =0.27 |
| | Arm.Lat.= [2 X 4 B 8.0mm] - LN= 2.7 | | Grampos Dir.= 2B 6.3mm x/dMx=0.45 |
[tf,cm] | M[-]Min = 1932.7 | M[+]Min = 798.1 | M[-]Min = 1507.6 |
[cm2] | Asapo[+]= 11.96 | | Asapo[+]= 2.51 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
[tf,cm] 0.- 507. 20.66 72.93 1 45. 2.2 1.7 2.2 8.0 30.0 2 0.0 0.2
507.- 620. 38.56 72.64 1 45. 7.0 1.7 7.0 8.0 12.0 2 0.0 2.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
	1	24.627	18.343	0.60	0.00	1	P90	0.00	0.00	90
	2	-6.893	-9.341	0.15	0.00	2	V35	0.00	0.00	0
	3	27.545	20.568	0.20	0.00	1	P64	0.00	0.00	64



V90

Viga= 90 V90

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 4.45 /B= 0.15 /H= 1.00 /BCs= 0.82 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)			
FLEXAO-	E S Q U E R D A	M E I O D O V A O	D I R E I T A
[tf,cm]	M.[-] = 29.7 tf* m	M.[+] Max= 0.0 tf* m - Abcis.= 445	M.[-] = 9.7 tf* m
	As = 11.97 -SRAS- [4 B 20.0mm]	AsL= 0.00 -----	As = 5.52 -SRAS- [3 B 16.0mm]
	AsL= 0.00 ----- x/d =0.27	As = 3.75 -STAS- [3 B 12.5mm]	AsL= 0.00 ----- x/d =0.12
	x/dMx=0.45	Arm.Lat.= [2 X 4 B 8.0mm] - LN= 0.9	x/dMx=0.45
[tf,cm]	M[-]Min = 1549.1	M[+]Min = 762.6	M[-]Min = 1549.1
[cm2]	Asapo[+] = 0.94		Asapo[+] = 0.94

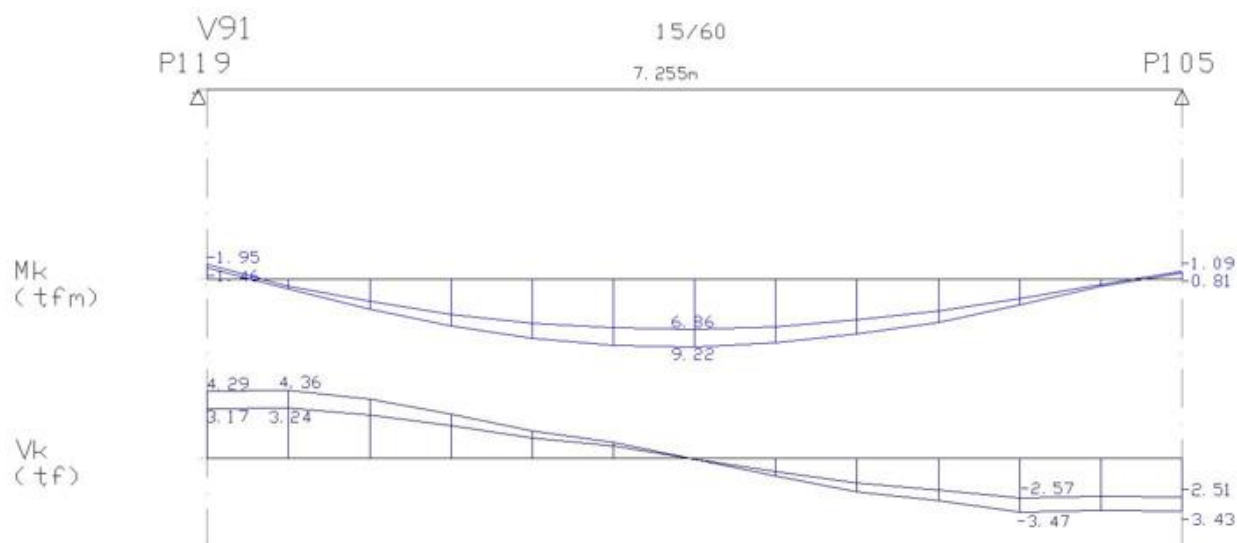
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	100.	24.74	72.64	1	45.	3.3	1.7	3.3	6.3	18.0	2	0.0	0.0	
	100.-	405.	19.95	73.12	1	45.	2.0	1.7	2.0	6.3	30.0	2	0.0	1.5	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 4.45 /B= 0.15 /H= 1.00 /BCs= 0.82 /BCi= 0.00 /TpS= 2 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.50 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)			
FLEXAO-	E S Q U E R D A	M E I O D O V A O	D I R E I T A
[tf,cm]	M.[-] = 10.8 tf* m	M.[+] Max= 17.3 tf* m - Abcis.= 259	M.[-] = 2.8 tf* m
	As = 5.52 -SRAS- [3 B 16.0mm]	AsL= 0.00 -----	As = 2.73 -SRAS- [4 B 10.0mm]
	AsL= 0.00 ----- x/d =0.12	As = 5.94 -STAS- [3 B 16.0mm]	AsL= 0.00 ----- x/d =0.06
	x/dMx=0.45	Arm.Lat.= [2 X 4 B 8.0mm] - LN= 2.2	x/dMx=0.45
[tf,cm]	M[-]Min = 1549.1	M[+]Min = 762.6	M[-]Min = 782.6
[cm2]	Asapo[+] = 2.83		Asapo[+] = 5.06

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	66.	24.14	73.12	1	45.	3.1	1.7	3.1	6.3	20.0	2	0.0	0.0	
	66.-	176.	19.77	72.94	1	45.	2.0	1.7	2.0	6.3	30.0	2	0.0	1.0	
	176.-	308.	16.95	72.94	1	45.	1.2	1.7	2.9	6.3	20.0	2	0.0	2.9	
	308.-	390.	22.00	73.01	1	45.	2.6	1.7	2.6	6.3	22.0	2	0.0	0.0	

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	17.644	13.081	0.20	0.00	1	P64	0.00	0.00	64
2	23.631	17.433	0.60	0.00	1	P50	0.00	0.00	50
3	15.714	11.639	0.50	0.00	1	P29	0.00	0.00	29



V91

Viga= 91 V91

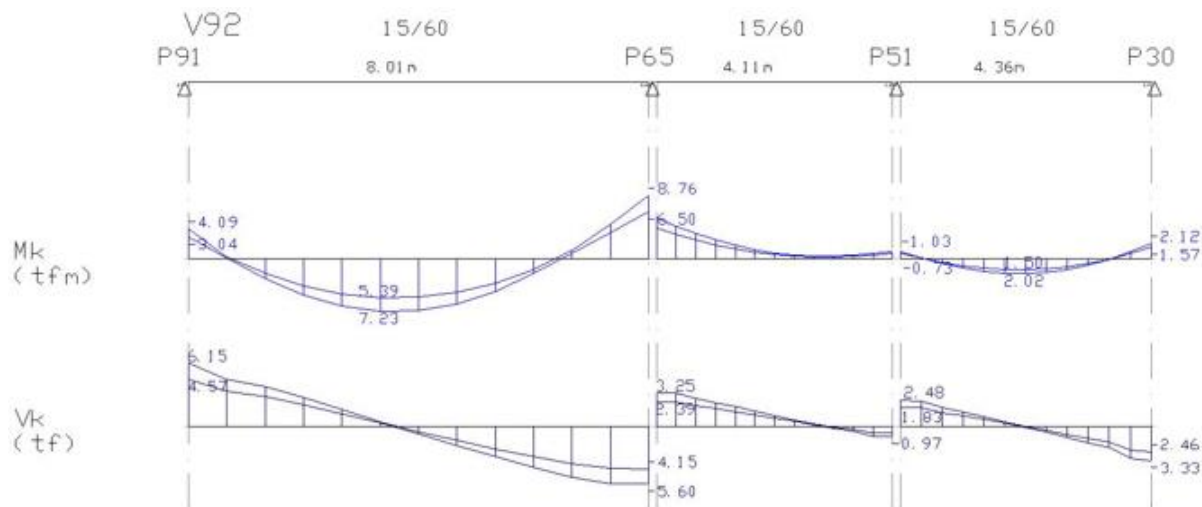
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----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.25 /B= 0.15 /H= 0.60 /BCs= 0.88 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 [tf,cm]| M.[-] = 1.9 tf* m | M.[+] Max= 9.2 tf* m - Abcis.= 362 | M.[-] = 1.1 tf* m |
 [tf,cm]| As = 1.73 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 1.73 -SRAS- [3 B 10.0mm] |
 [tf,cm]| AsL= 0.00 ----- x/d =0.06 | As = 5.51 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.06 |
 [tf,cm]| | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.9 | Grampos Dir.= 2B 8.0mm x/dMx=0.45 |
 [tf,cm]| M[-]Min = 289.6 | M[+]Min = 277.0 | M[-]Min = 289.6 |
 [cm2]| Asapo[+]= 1.84 | Asapo[+]= 1.84 | Asapo[+]= 1.84 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 700. 6.11 42.44 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn		Pilares:				
	1	4.288	3.167	0.50	0.07	1	P119	0.00	0.00	119	0	0	0	0	0
	2	3.427	2.510	0.15	0.00	1	P105	0.00	0.00	105	0	0	0	0	0



V92

Viga= 92 V92

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
Vao= 1 /L= 8.01 /B= 0.15 /H= 0.60 /BCs= 0.75 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)				D I R E I T A			
FLEXAO-	ES Q U E R D A	M E I O D O V A O		D I R E I T A			
[tf,cm]	M.[-] = 4.1 tf* m	M.[+] Max= 7.2 tf* m - Abcis.= 336		M.[-] = 8.8 tf* m			
	As = 2.46 -SRAS- [2 B 12.5mm]	AsL= 0.00		As = 5.62 -SRAS- [3 B 16.0mm]			
	AsL= 0.00	As = 4.27 -STAS- [4 B 12.5mm]		AsL= 0.00			
	x/d =0.09	Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.7		x/d =0.20			
	x/dMx=0.45			x/dMx=0.45			
[tf,cm]	M[-]Min = 394.8	M[+]Min = 271.0		M[-]Min = 596.5			
[cm2]	Asapo[+] = 1.98			Asapo[+] = 1.07			

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	765.	8.61	42.57	1	45.	0.6	1.7	1.7	5.0	22.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 2 /L= 4.11 /B= 0.15 /H= 0.60 /BCs= 0.40 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)				D I R E I T A			
FLEXAO-	ES Q U E R D A	M E I O D O V A O		D I R E I T A			
[tf,cm]	M.[-] = 5.7 tf* m	M.[+] Max= 0.0 tf* m - Abcis.= 425		M.[-] = 1.0 tf* m			
	As = 3.46 -SRAS- [2 B 16.0mm]	AsL= 0.00		As = 2.29 -SRAS- [3 B 10.0mm]			
	AsL= 0.00	As = 1.90 -STAS- [3 B 10.0mm]		AsL= 0.00			
	x/d =0.12	Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.1		x/d =0.08			
	x/dMx=0.45			x/dMx=0.45			
[tf,cm]	M[-]Min = 379.4	M[+]Min = 243.3		M[-]Min = 379.4			
[cm2]	Asapo[+] = 0.48			Asapo[+] = 0.48			

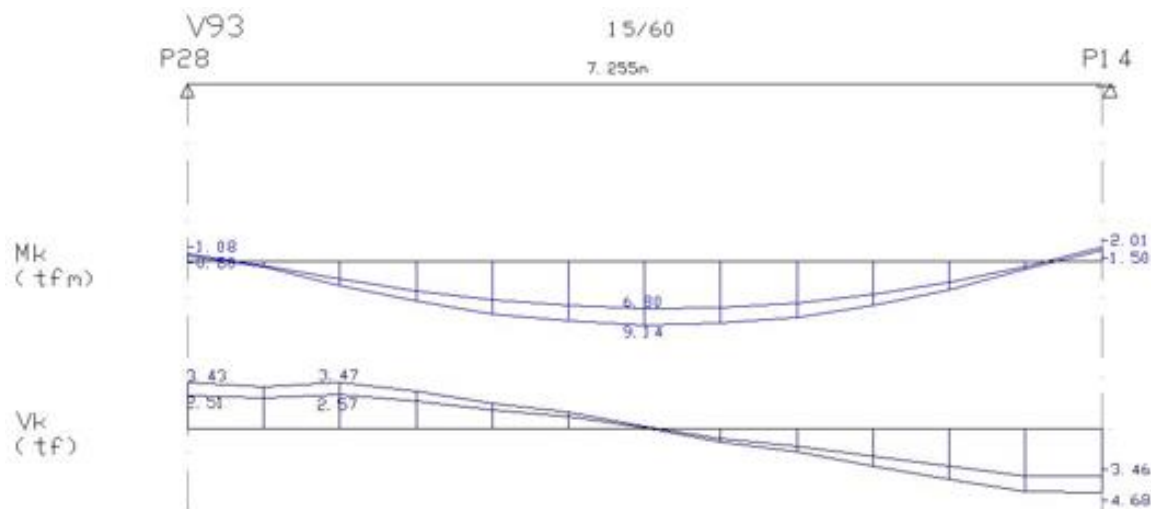
CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	375.	4.54	42.57	1	45.	0.0	1.7	1.7	5.0	22.0	2	0.0	0.0	

----- G E O M E T R I A E C A R G A S -----
Vao= 3 /L= 4.36 /B= 0.15 /H= 0.60 /BCs= 0.48 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
--Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

A R M A D U R A S (F L E X A O E C I S A L H A M E N T O)				D I R E I T A			
FLEXAO-	ES Q U E R D A	M E I O D O V A O		D I R E I T A			
[tf,cm]	M.[-] = 1.0 tf* m	M.[+] Max= 2.0 tf* m - Abcis.= 221		M.[-] = 2.1 tf* m			
	As = 2.67 -SRAS- [4 B 10.0mm]	AsL= 0.00		As = 1.86 -SRAS- [3 B 10.0mm]			
	AsL= 0.00	As = 2.09 -STAS- [3 B 10.0mm]		AsL= 0.00			
	x/d =0.10	Arm.Lat.= [2 X 2 B 8.0mm] - LN= 0.9		x/d =0.07			
	x/dMx=0.45			x/dMx=0.45			
[tf,cm]	M[-]Min = 433.0	M[+]Min = 251.8		M[-]Min = 309.4			
[cm2]	Asapo[+] = 0.70			Asapo[+] = 1.07			

CISALHAMENTO-	Xi	Xf	Vsd	VRd2	MdC	Ang.	Asw[C]	Aswmin	Asw[C+T]	Bit	Esp	NR	AsTrt	AsSus	M E N S A G E M
[tf,cm]	0.-	400.	4.66	42.57	1	45.	0.0	1.7	1.7	5.0	22.0	2	0.0	0.0	

REAC. APOIO	No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	6.142	4.562	0.50	0.07	1	P91	0.00	0.00	91	0 0 0 0
2	8.721	6.438	0.50	0.07	1	P65	0.00	0.00	65	0 0 0 0
3	3.405	2.477	0.50	0.07	1	P51	0.00	0.00	51	0 0 0 0
4	3.330	2.457	0.50	0.07	1	P30	0.00	0.00	30	0 0 0 0



V93

Viga= 93 V93

Eng.E=Nao /Eng.D=Nao /Repet= 1 /NAnd= 1 /Red V Ext=Nao /Fat.Alt=1.00 /Cob/S=3.0 0.0 CM

----- G E O M E T R I A E C A R G A S -----
 Vao= 1 /L= 7.25 /B= 0.15 /H= 0.60 /BCs= 0.88 /BCi= 0.00 /TpS= 8 /Esp.LS= 0.15 /Esp.LI= 0.00 FSp.Ex= 0.30 /FLt.Ex= 0.07 [M]
 --Solicitações provenientes de modelo de grelha e/ou pórtico espacial--- Estrut. Nós FIXOS --- DeltaE=1.00 DeltaD=1.00 ---

- - - - - A R M A D U R A S (F L E X A O E C I S A L H A M E N T O) - - - - -
 FLEXAO-| E S Q U E R D A | M E I O D O V A O | D I R E I T A |
 | M.[-] = 1.1 tf* m | M.[+] Max= 9.1 tf* m - Abcis.= 362 | M.[-] = 2.0 tf* m |
 [tf,cm] | As = 1.73 -SRAS- [3 B 10.0mm] | AsL= 0.00 ----- | As = 1.73 -SRAS- [3 B 10.0mm] |
 | AsL= 0.00 ----- x/d =0.06 | As = 5.46 -STAS- [3 B 16.0mm] | AsL= 0.00 ----- x/d =0.06 | |
 | Grampos Esq.= 2B 8.0mm x/dMx=0.45 | Arm.Lat.= [2 X 2 B 8.0mm] - LN= 1.9 | x/dMx=0.45 |
 | | | | |
 [tf,cm] | M[-]Min = 289.6 | M[+]Min = 277.0 | M[-]Min = 289.6 |
 [cm2] | Asapo[+]= 1.82 | | Asapo[+]= 1.82 |

CISALHAMENTO- Xi Xf Vsd VRd2 MdC Ang. Asw[C] Aswmin Asw[C+T] Bit Esp NR AsTrt AsSus M E N S A G E M
 [tf,cm] 0.- 700. 6.55 42.44 1 45. 0.0 1.7 1.7 5.0 22.0 2 0.0 0.0

REAC. APOIO - No.	Maximos	Minimos	Largura	DEPEV	Morte	Nome	M.I.Mx	M.I.Mn	Pilares:
1	3.421	2.505	0.15	0.00	1	P28	0.00	0.00	28 0 0 0 0
2	4.679	3.461	0.50	0.07	1	P14	0.00	0.00	14 0 0 0 0

9. LAJES

Abaixo segue relatório de dimensionamento das lajes:

Tipo	(R) Retangular (G) Genérica								
P	Cargas verticais na laje, tf								
H	Espessura da laje, cm								
área	Área da laje onde foi distribuída carga, m2								
Trecho	Trecho da laje que recebeu parcela de carga								
Influ	Parcela relativa de carga recebida pelo trecho								
	(E) trecho engastado								
Carga	Parcela total da carga sobre o trecho, tf								
Compr	Comprimento do trecho, cm								
Carga/tr	Carga no trecho, por unidade de comprimento, tf/m								
Laje	1	Tipo G	P=	35.62	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	61.95	18 V6	E .382	13.62	885	1.54
					22 V55	E .252	8.97	700	1.28
					16 V2	.220	7.84	885	.89
					15 V52	.146	5.19	700	.74
Laje	2	Tipo G	P=	34.98	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	60.83	22 V6	E .378	13.22	869	1.52
					19 V60	.149	5.20	700	.74
					17 V2	.217	7.60	869	.87
					16 V55	E .256	8.96	700	1.28
Laje	3	Tipo G	P=	35.62	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	61.95	20 V7	E .382	13.62	885	1.54
					26 V64	E .252	8.97	700	1.28
					24 V3	.220	7.84	885	.89
					157 V61	.146	5.19	700	.74
Laje	4	Tipo G	P=	35.62	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	61.95	26 V7	E .315	11.23	885	1.27
					27 V69	E .252	8.97	700	1.28
					25 V3	.182	6.47	885	.73
					24 V64	E .252	8.96	700	1.28
Laje	5	Tipo G	P=	35.62	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	61.95	27 V7	E .315	11.23	885	1.27
					12 V71	E .252	8.97	700	1.28
					13 V3	.182	6.47	885	.73
					25 V69	E .252	8.96	700	1.28
Laje	6	Tipo G	P=	30.98	Trecho	Influ	Carga	Compr	Carga/tr
H=		15	área=	53.88	11 V10	E .178	5.53	660	.84
					53 V74	E .058	1.79	147	1.21
					54 V74	E .280	8.68	715	1.21
					55 V74	E .023	.70	57	1.21
					56 V1	.102	3.15	660	.48
					14 V71	E .022	.70	57	1.21
					13 V71	E .279	8.65	715	1.21
					12 V71	E .058	1.78	147	1.21

Laje H=	7	Tipo G 15 área=	P= 35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
				54 V8	E .315	11.23	885	1.27
				70 V77	E .252	8.97	700	1.28
				67 V4	.182	6.47	885	.73
				55 V74	E .252	8.96	700	1.28
Laje H=	8	Tipo G 15 área=	P= 34.98 60.83	Trecho	Influ	Carga	Compr	Carga/tr
				70 V8	E .378	13.22	869	1.52
				69 V82	.149	5.20	700	.74
				68 V4	.217	7.60	869	.87
				67 V77	E .256	8.96	700	1.28
Laje H=	9	Tipo G 15 área=	P= 35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
				71 V9	E .382	13.62	885	1.54
				76 V86	E .252	8.97	700	1.28
				73 V5	.220	7.84	885	.89
				72 V81	.146	5.19	700	.74
Laje H=	10	Tipo G 15 área=	P= 35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
				76 V9	E .315	11.23	885	1.27
				77 V88	E .252	8.97	700	1.28
				74 V5	.182	6.47	885	.73
				73 V86	E .252	8.96	700	1.28
Laje H=	11	Tipo G 15 área=	P= 35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
				77 V9	E .382	13.62	885	1.54
				78 V93	.146	5.19	700	.74
				75 V5	.220	7.85	885	.89
				74 V88	E .252	8.96	700	1.28
Laje H=	12	Tipo G 15 área=	P= 22.76 39.58	Trecho	Influ	Carga	Compr	Carga/tr
				198 LIVRE	.000	.00	1799	.00
				199 LIVRE	.000	.00	220	.00
				200 P17	.004	.10	8	1.32
				19 V6	E .491	11.18	884	1.26
				22 V6	E .500	11.38	900	1.26
				18 P15	.005	.11	8	1.40
				197 LIVRE	.000	.00	220	.00
Laje H=	13	Tipo G 15 área=	P= 34.16 59.40	Trecho	Influ	Carga	Compr	Carga/tr
				210 LIVRE	.000	.00	2700	.00
				156 V71	E .014	.47	73	.64
				11 V71	E .028	.95	147	.64
				12 V7	E .316	10.80	893	1.21
				27 V7	E .319	10.89	900	1.21
				26 V7	E .319	10.89	900	1.21
				20 P18	.005	.16	8	2.11
				209 LIVRE	.000	.00	220	.00

Laje H=	14	Tipo G	P=	22.57	Trecho	Influ	Carga	Compr	Carga/tr
		15	área=	39.25	153 LIVRE	.000	.00	1784	.00
					189 LIVRE	.000	.00	220	.00
					190 P24	.004	.10	8	1.31
					69 V8	E .464	10.48	884	1.19
					70 V8	E .469	10.58	893	1.19
					54 V74	E .042	.95	147	.64
					53 V74	E .021	.46	73	.64
Laje H=	15	Tipo G	P=	34.34	Trecho	Influ	Carga	Compr	Carga/tr
		15	área=	59.73	212 LIVRE	.000	.00	2715	.00
					213 LIVRE	.000	.00	220	.00
					214 P28	.004	.15	8	1.99
					78 V9	E .330	11.35	900	1.26
					77 V9	E .330	11.35	900	1.26
					76 V9	E .330	11.35	900	1.26
					71 P25	.005	.16	8	2.12
					211 LIVRE	.000	.00	220	.00
Laje H=	16	Tipo G	P=	12.52	Trecho	Influ	Carga	Compr	Carga/tr
		15	área=	21.78	10 V12	E .425	5.32	660	.81
					52 V74	.015	.18	65	.28
					152 V74	.045	.57	200	.28
					153 V74	.015	.18	65	.28
					53 V10	E .425	5.32	660	.81
					11 V71	.015	.19	65	.29
					156 V71	.046	.57	200	.29
					150 V71	.015	.19	65	.29
Laje H=	17	Tipo G	P=	12.62	Trecho	Influ	Carga	Compr	Carga/tr
		15	área=	21.94	172 P31	.008	.10	8	1.38
					126 V13	E .502	6.34	615	1.03
					129 V13	E .481	6.07	589	1.03
					120 P33	.008	.10	8	1.38
					169 LIVRE	.000	.00	180	.00
					170 LIVRE	.000	.00	1219	.00
					171 LIVRE	.000	.00	180	.00
Laje H=	18	Tipo G	P=	21.01	Trecho	Influ	Carga	Compr	Carga/tr
		15	área=	36.54	188 P34	.005	.10	8	1.27
					139 V14	E .385	8.08	782	1.03
					140 V14	E .366	7.70	745	1.03
					141 V14	E .240	5.04	488	1.03
					138 P37	.005	.10	8	1.27
					185 LIVRE	.000	.00	180	.00
					186 LIVRE	.000	.00	2030	.00
					187 LIVRE	.000	.00	180	.00

Laje H=	19	Tipo G P= 15 área=	12.93 22.48	Trecho	Influ	Carga	Compr	Carga/tr
				176 P38	E .008	.10	8	1.37
				130 V15	E .573	7.40	774	.96
				131 V15	E .346	4.47	468	.96
				9 V71	E .044	.57	107	.53
				10 V71	E .030	.38	73	.53
				150 LIVRE	.000	.00	1249	.00
				175 LIVRE	.000	.00	180	.00
Laje H=	20	Tipo G P= 15 área=	16.65 28.96	Trecho	Influ	Carga	Compr	Carga/tr
				51 V16	E .430	7.16	735	.97
				79 V16	E .057	.95	98	.97
				80 V16	E .450	7.49	769	.97
				81 P43	.007	.11	8	1.48
				179 LIVRE	.000	.00	180	.00
				180 LIVRE	.000	.00	1609	.00
				152 V74	E .023	.38	73	.52
				52 V74	E .034	.56	107	.52
Laje H=	21	Tipo G P= 15 área=	23.39 40.68	Trecho	Influ	Carga	Compr	Carga/tr
				206 P44	.004	.10	8	1.38
				92 V17	E .369	8.62	870	.99
				93 V18	E .586	13.70	1383	.99
				109 V90	E .040	.93	172	.54
				117 P29	.001	.03	8	.46
				204 LIVRE	.000	.00	2260	.00
				205 LIVRE	.000	.00	180	.00
Laje H=	22	Tipo G P= 15 área=	9.25 16.09	Trecho	Influ	Carga	Compr	Carga/tr
				104 V19	E .477	4.41	1375	.32
				116 V90	E .023	.21	117	.18
				109 V18	E .478	4.42	1375	.32
				93 V84	E .022	.21	117	.18
Laje H=	23	Tipo G P= 15 área=	16.22 28.20	Trecho	Influ	Carga	Compr	Carga/tr
				110 V21	E .383	6.21	600	1.04
				107 V92	.146	2.36	470	.50
				108 V11	.222	3.60	600	.60
				117 V90	E .092	1.48	172	.86
				109 V90	E .070	1.14	132	.86
				116 V90	E .088	1.42	165	.86
Laje H=	24	Tipo G P= 15 área=	14.26 24.79	Trecho	Influ	Carga	Compr	Carga/tr
				91 V20	E .431	6.15	855	.72
				103 V84	E .049	.70	166	.43
				104 V84	E .037	.53	124	.43
				93 V17	E .431	6.14	855	.72
				92 V79	.051	.73	290	.25

Laje H=	25	Tipo G P= 15 área=	19.92 34.65	Trecho	Influ	Carga	Compr	Carga/tr
				50 V22	E .371	7.39	825	.90
				87 V75	E .129	2.57	420	.61
				80 V16	E .040	.81	90	.90
				79 V16	E .331	6.59	735	.90
				51 V74	E .129	2.57	420	.61
Laje H=	26	Tipo G P= 15 área=	18.21 31.67	Trecho	Influ	Carga	Compr	Carga/tr
				87 V22	E .389	7.08	754	.94
				85 V78	.082	1.50	420	.36
				81 V16	E .388	7.07	754	.94
				80 V75	E .141	2.56	420	.61
Laje H=	27	Tipo G P= 15 área=	25.53 44.40	Trecho	Influ	Carga	Compr	Carga/tr
				133 V23	E .346	8.84	759	1.17
				135 V70	E .194	4.97	585	.85
				131 V15	E .347	8.85	759	1.17
				130 V67	.113	2.87	585	.49
Laje H=	28	Tipo G P= 15 área=	15.47 26.91	Trecho	Influ	Carga	Compr	Carga/tr
				135 V23	E .195	3.02	460	.66
				8 V71	E .305	4.71	585	.81
				9 V15	E .195	3.01	460	.66
				131 V70	E .305	4.72	585	.81
Laje H=	29	Tipo G P= 15 área=	27.29 47.46	Trecho	Influ	Carga	Compr	Carga/tr
				102 V24	E .423	11.55	1375	.84
				115 V90	E .046	1.27	249	.51
				110 V90	E .031	.84	166	.51
				116 V19	E .423	11.55	1375	.84
				104 V84	E .031	.84	166	.50
				103 V84	E .046	1.26	249	.50
Laje H=	30	Tipo G P= 15 área=	23.35 40.61	Trecho	Influ	Carga	Compr	Carga/tr
				90 V26	E .389	9.08	855	1.06
				101 V84	E .067	1.56	226	.69
				102 V84	E .074	1.73	249	.69
				103 V20	E .389	9.08	855	1.06
				91 V79	.082	1.90	475	.40
Laje H=	31	Tipo G P= 15 área=	14.15 24.60	Trecho	Influ	Carga	Compr	Carga/tr
				114 P64	E .021	.30	35	.86
				111 V25	E .342	4.84	565	.86
				106 V92	.101	1.42	410	.35
				107 V21	E .363	5.14	600	.86
				110 V90	E .105	1.49	249	.60
				115 V90	E .068	.96	161	.60

Laje H=	32	Tipo G P= 15 área=	46.58 81.00	Trecho	Influ	Carga	Compr	Carga/tr
				124 V30	E .140	6.53	600	1.09
				127 V53	E .228	10.64	675	1.58
				128 V53	E .228	10.64	675	1.58
				129 V13	E .140	6.53	600	1.09
				126 V51	.184	8.57	945	.91
				125 V51	.079	3.67	405	.91
Laje H=	33	Tipo G P= 15 área=	44.56 77.49	Trecho	Influ	Carga	Compr	Carga/tr
				127 V30	E .134	5.98	574	1.04
				118 V56	.134	5.97	675	.88
				119 V56	.134	5.97	675	.88
				120 V13	E .134	5.99	574	1.04
				129 V53	E .232	10.32	675	1.53
				128 V53	E .232	10.32	675	1.53
Laje H=	34	Tipo G P= 15 área=	59.00 102.60	Trecho	Influ	Carga	Compr	Carga/tr
				158 V31	E .178	10.49	760	1.38
				143 V62	E .408	24.07	1350	1.78
				140 V14	E .178	10.48	760	1.38
				139 V57	.118	6.98	675	1.03
				122 V57	.118	6.98	675	1.03
Laje H=	35	Tipo G P= 15 área=	55.50 96.53	Trecho	Influ	Carga	Compr	Carga/tr
				143 V31	E .132	7.32	715	1.02
				144 V65	E .369	20.50	1350	1.52
				141 V14	E .132	7.32	715	1.02
				140 V62	E .367	20.36	1350	1.51
Laje H=	36	Tipo G P= 15 área=	18.64 32.42	Trecho	Influ	Carga	Compr	Carga/tr
				86 V28	E .386	7.19	754	.95
				84 V78	.085	1.58	430	.37
				85 V22	E .386	7.19	754	.95
				87 V75	E .144	2.69	430	.62
Laje H=	37	Tipo G P= 15 área=	36.10 62.78	Trecho	Influ	Carga	Compr	Carga/tr
				144 V31	E .109	3.92	465	.84
				136 V66	.165	5.95	775	.77
				137 V66	.122	4.42	575	.77
				138 V14	E .109	3.92	465	.84
				141 V65	E .495	17.89	1350	1.32

Laje H=	38	Tipo G 15 área=	P= 52.69 91.64	Trecho	Influ	Carga	Compr	Carga/tr
				5 V36	E .104	5.48	660	.83
				46 V74	E .027	1.43	107	1.33
				47 V74	E .122	6.43	485	1.33
				48 V74	E .059	3.08	233	1.33
				49 V74	E .053	2.82	213	1.33
				50 V74	E .109	5.77	435	1.33
				51 V74	E .027	1.43	107	1.33
				52 V12	E .104	5.48	660	.83
				10 V71	E .027	1.41	107	1.32
				9 V71	E .150	7.89	600	1.32
				8 V71	E .074	3.91	298	1.32
				7 V71	E .117	6.15	468	1.32
				6 V71	E .027	1.41	107	1.32
Laje H=	39	Tipo G 15 área=	P= 20.40 35.48	Trecho	Influ	Carga	Compr	Carga/tr
				48 V28	E .368	7.51	825	.91
				86 V75	E .132	2.69	430	.62
				87 V22	E .368	7.51	825	.91
				50 V74	E .063	1.28	205	.63
				49 V74	E .069	1.41	225	.63
Laje H=	40	Tipo G 15 área=	P= 17.24 29.97	Trecho	Influ	Carga	Compr	Carga/tr
				101 V27	E .459	7.91	1375	.58
				98 V89	E .011	.19	58	.32
				99 P64	E .001	.02	8	.32
				114 V90	E .029	.50	153	.32
				115 V24	E .459	7.91	1375	.58
				102 V84	E .041	.71	218	.32
Laje H=	41	Tipo G 15 área=	P= 32.73 56.92	Trecho	Influ	Carga	Compr	Carga/tr
				132 V32	E .304	9.94	759	1.31
				134 V70	E .248	8.13	750	1.08
				135 V23	E .304	9.94	759	1.31
				133 V67	.144	4.72	750	.63
Laje H=	42	Tipo G 15 área=	P= 19.84 34.50	Trecho	Influ	Carga	Compr	Carga/tr
				134 V32	E .153	3.04	460	.66
				6 V71	E .213	4.22	460	.92
				7 V71	E .134	2.66	290	.92
				8 V23	E .153	3.03	460	.66
				135 V70	E .347	6.88	750	.92
Laje H=	43	Tipo G 15 área=	P= 27.92 48.56	Trecho	Influ	Carga	Compr	Carga/tr
				100 V29	E .422	11.79	1375	.86
				97 V89	E .078	2.18	423	.51
				98 V27	E .422	11.78	1375	.86
				101 V84	E .078	2.18	423	.51

Laje H=	44	Tipo G 15 área=	P= 22.30 38.78	Trecho	Influ	Carga	Compr	Carga/tr
				47 V33	E .356	7.94	825	.96
				82 V75	E .144	3.21	470	.68
				86 V28	E .356	7.94	825	.96
				48 V74	E .143	3.20	470	.68
Laje H=	45	Tipo G 15 área=	P= 27.29 47.45	Trecho	Influ	Carga	Compr	Carga/tr
				88 V34	E .370	10.10	855	1.18
				94 V84	E .037	1.01	125	.81
				100 V84	E .127	3.48	430	.81
				101 V26	E .370	10.10	855	1.18
				90 V79	.010	.28	60	.47
				89 V79	.085	2.32	495	.47
Laje H=	46	Tipo G 15 área=	P= 20.38 35.44	Trecho	Influ	Carga	Compr	Carga/tr
				82 V33	E .376	7.65	754	1.01
				83 V78	.092	1.87	470	.40
				84 V28	E .376	7.66	754	1.02
				86 V75	E .157	3.20	470	.68
Laje H=	47	Tipo G 15 área=	P= 27.60 48.01	Trecho	Influ	Carga	Compr	Carga/tr
				159 V37	.137	3.78	600	.63
				113 V92	.230	6.36	800	.79
				106 V25	E .233	6.43	565	1.14
				111 P64	E .001	.03	36	.09
				99 V89	E .032	.89	65	1.36
				98 V89	E .216	5.97	438	1.36
				97 V89	E .065	1.80	132	1.36
				96 V89	E .063	1.74	128	1.36
				164 V89	E .022	.61	45	1.36
Laje H=	48	Tipo G 15 área=	P= 9.25 16.09	Trecho	Influ	Carga	Compr	Carga/tr
				94 V35	E .477	4.41	1375	.32
				96 V89	E .023	.21	117	.18
				97 V29	E .478	4.42	1375	.32
				100 V84	E .022	.21	117	.18
Laje H=	49	Tipo G 15 área=	P= 12.62 21.94	Trecho	Influ	Carga	Compr	Carga/tr
				166 LIVRE	.000	.00	1219	.00
				167 LIVRE	.000	.00	180	.00
				168 P77	.008	.10	8	1.37
				118 V30	E .481	6.07	589	1.03
				127 V30	E .502	6.34	615	1.03
				124 P75	.008	.10	8	1.37
				165 LIVRE	.000	.00	180	.00

Laje H=	50	Tipo G 15	P= área=	21.01 36.54	Trecho	Influ	Carga	Compr	Carga/tr
					182 LIVRE	.000	.00	2030	.00
					183 LIVRE	.000	.00	180	.00
					184 P81	.005	.10	8	1.27
					136 V31	E .240	5.04	488	1.03
					144 V31	E .366	7.70	745	1.03
					143 V31	E .385	8.08	782	1.03
					158 P78	.005	.10	8	1.27
					181 LIVRE	.000	.00	180	.00
Laje H=	51	Tipo G 15	P= área=	12.93 22.48	Trecho	Influ	Carga	Compr	Carga/tr
					174 LIVRE	.000	.00	1249	.00
					149 V71	E .030	.38	73	.53
					5 V71	E .044	.57	107	.53
					6 V32	E .346	4.47	468	.96
					134 V32	E .573	7.40	774	.96
					132 P82	.008	.10	8	1.37
					173 LIVRE	.000	.00	180	.00
Laje H=	52	Tipo G 15	P= área=	16.65 28.96	Trecho	Influ	Carga	Compr	Carga/tr
					151 LIVRE	.000	.00	1609	.00
					177 LIVRE	.000	.00	180	.00
					178 P87	.007	.11	8	1.48
					83 V33	E .450	7.49	769	.97
					82 V33	E .487	8.11	833	.97
					47 V74	E .034	.56	107	.52
					46 V74	E .023	.38	73	.52
Laje H=	53	Tipo G 15	P= área=	23.39 40.68	Trecho	Influ	Carga	Compr	Carga/tr
					202 LIVRE	.000	.00	2260	.00
					203 P90	E .014	.32	60	.53
					164 V89	E .027	.64	120	.53
					96 V35	E .586	13.70	1383	.99
					94 V34	E .369	8.62	870	.99
					88 P88	.005	.11	8	1.42
					201 LIVRE	.000	.00	180	.00
Laje H=	54	Tipo G 15	P= área=	12.52 21.78	Trecho	Influ	Carga	Compr	Carga/tr
					4 V38	E .425	5.32	660	.81
					45 V74	.015	.18	65	.28
					154 V74	.045	.57	200	.28
					151 V74	.015	.18	65	.28
					46 V36	E .425	5.32	660	.81
					5 V71	.015	.19	65	.29
					149 V71	.046	.57	200	.29
					155 V71	.015	.19	65	.29

Laje H=	55	Tipo G 15	P= área=	22.76 39.58	Trecho	Influ	Carga	Compr	Carga/tr
					29 V39	E .500	11.38	900	1.26
					30 V39	E .491	11.18	884	1.26
					31 P94	.004	.10	8	1.32
					193 LIVRE	.000	.00	220	.00
					194 LIVRE	.000	.00	1799	.00
					195 LIVRE	.000	.00	220	.00
					196 P92	.005	.11	7	1.40
Laje H=	56	Tipo G 15	P= área=	34.16 59.40	Trecho	Influ	Carga	Compr	Carga/tr
					208 P95	.005	.16	8	2.11
					34 V40	E .319	10.89	900	1.21
					35 V40	E .319	10.89	900	1.21
					36 V40	E .316	10.79	893	1.21
					3 V71	E .028	.96	147	.65
					4 V71	E .014	.47	73	.65
					155 LIVRE	.000	.00	2700	.00
					207 LIVRE	.000	.00	220	.00
Laje H=	57	Tipo G 15	P= área=	22.57 39.25	Trecho	Influ	Carga	Compr	Carga/tr
					44 V41	E .469	10.58	893	1.19
					57 V41	E .464	10.48	884	1.19
					41 P101	.004	.10	8	1.31
					191 LIVRE	.000	.00	220	.00
					192 LIVRE	.000	.00	1784	.00
					154 V74	E .021	.47	73	.64
					45 V74	E .042	.95	147	.64
Laje H=	58	Tipo G 15	P= área=	34.34 59.73	Trecho	Influ	Carga	Compr	Carga/tr
					63 V42	E .330	11.35	900	1.26
					64 V42	E .330	11.35	900	1.26
					65 V42	E .330	11.35	900	1.26
					66 P105	.004	.15	7	1.99
					215 LIVRE	.000	.00	220	.00
					216 LIVRE	.000	.00	2715	.00
					217 LIVRE	.000	.00	220	.00
					218 P102	.005	.16	8	2.12
Laje H=	59	Tipo G 15	P= área=	30.98 53.88	Trecho	Influ	Carga	Compr	Carga/tr
					1 V47	.103	3.19	660	.48
					42 V74	E .023	.70	57	1.21
					43 V74	E .280	8.68	715	1.21
					44 V74	E .058	1.79	147	1.21
					45 V38	E .178	5.52	660	.84
					4 V71	E .057	1.78	147	1.21
					3 V71	E .279	8.63	715	1.21
					2 V71	E .022	.69	58	1.21

Laje H=	60	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					28 V43	.220	7.85	885	.89
					32 V54	E .252	8.96	700	1.28
					30 V39	E .382	13.62	885	1.54
					29 V50	.146	5.19	700	.74
Laje H=	61	Tipo G 15	P= área=	34.98 60.83	Trecho	Influ	Carga	Compr	Carga/tr
					32 V43	.217	7.60	869	.87
					33 V59	.149	5.21	700	.74
					31 V39	E .377	13.20	869	1.52
					30 V54	E .256	8.96	700	1.28
Laje H=	62	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					37 V44	.220	7.85	885	.89
					38 V63	E .252	8.96	700	1.28
					35 V40	E .382	13.62	885	1.54
					34 V58	.146	5.19	700	.74
Laje H=	63	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					38 V44	.182	6.48	885	.73
					39 V68	E .252	8.96	700	1.28
					36 V40	E .315	11.22	885	1.27
					35 V63	E .252	8.96	700	1.28
Laje H=	64	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					39 V44	.182	6.48	885	.73
					2 V71	E .252	8.96	700	1.28
					3 V40	E .315	11.22	885	1.27
					36 V68	E .252	8.96	700	1.28
Laje H=	65	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					43 V45	.182	6.48	885	.73
					58 V76	E .252	8.96	700	1.28
					57 V41	E .315	11.22	885	1.27
					44 V74	E .252	8.96	700	1.28
Laje H=	66	Tipo G 15	P= área=	34.98 60.83	Trecho	Influ	Carga	Compr	Carga/tr
					58 V45	.217	7.60	869	.87
					40 V80	.149	5.21	700	.74
					41 V41	E .377	13.20	869	1.52
					57 V76	E .256	8.96	700	1.28
Laje H=	67	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					59 V46	.220	7.85	885	.89
					60 V85	E .252	8.96	700	1.28
					64 V42	E .382	13.62	885	1.54
					63 V83	.146	5.19	700	.74

Laje H=	68	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					60 V46	.182	6.48	885	.73
					61 V87	E .252	8.96	700	1.28
					65 V42	E .315	11.22	885	1.27
					64 V85	E .252	8.96	700	1.28
Laje H=	69	Tipo G 15	P= área=	35.62 61.95	Trecho	Influ	Carga	Compr	Carga/tr
					61 V46	.220	7.85	885	.89
					62 V91	.146	5.19	700	.74
					66 V42	E .382	13.61	885	1.54
					65 V87	E .252	8.96	700	1.28
Laje H=	70	Tipo R 12 345 X	P= área= 145	2.50 5.00	Trecho	Influ	Carga	Compr	Carga/tr
					147 V49	.395	.99	345	.29
					148 V73	.105	.26	145	.18
					146 V48	.395	.99	345	.29
					145 V72	.105	.26	145	.18

10. CONCLUSÃO

Todos os elementos da estrutura foram calculados para que os esforços solicitantes de cálculo não superam as forças resistentes de cálculo com base nas referidas normas.

Serra, 07 de janeiro de 2022

CARLOS RAPHAEL MONTEIRO DE LEMOS
ENGENHEIRO CÍVIL
CREA-ES 011840/D