DER DF

GDF
É tempo de ação.

Produto 10.2

Projeto Executivo de Obra de Arte Especial - R00

Projetos Básicos e Executivos de Engenharia, da Implantação e Adequação do Sistema Viário de Acesso ao Setor Noroeste, na Rodovia DF-003 (EPIA) e Via STN (Setor Terminal Norte), incluindo as Interligações com as Vias W9 e W7 (SHCNW - Trecho 1) e ao TAN (Terminal Asa Norte - BRT Norte)

AeT Arquitetura Planejamento e Transportes Ltda

Sumário

EQUIPE TÉCNICA RESPONSÁVEL PELA ELABORAÇÃO DOS PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA PARA IMPLANTAÇÃO E ADEQUAÇÃO DO SISTEMA VIÁRIO DE ACESSO AO NOROESTE, NA RODOVIA DF-003 (EPIA) E VIA STN E AO TAN

<u>COORDENAÇÃO TÉCNICA e EXECUÇÃO:</u>

PAULO CAVALCANTI DE ALBUQUERQUE Arquiteto e Urbanista – CAU: A80095-3	PAULO CAVALCANTI DE ALBUQUERQUE:35727578434	Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Dados: 2022.02.17 16:09:47 -03'00'
ANA CECÍLIA PARISI Arquiteta e Urbanista – CAU: A80096-1	ANA CECILIA PARISI:30807379115	Assinado de forma digital por ANA CECILIA PARISI:30807379115 Dados: 2022.02.17 16:11:15 -03'00'
THIAGO PEIXOTO NOVAIS Engenheiro Civil – CREA 147293/D-MG	THIAGO PEIXOTO NOVAIS:10154861693	Assinado de forma digital por THIAGO PEIXOTO NOVAIS:10154861693 Dados: 2022.02.17 15:59:39 -03'00'
RENATO GRILLO ELY Engenheiro Civil – CREA 13611/D-RS	RENATO GRILLO ELY:27878945004	Assinado de forma digital por RENATO GRILLO ELY:27878945004 Dados: 2022.02.17 15:58:04 -03'00'
JORDAN PAULO MEROS Arquiteto e Urbanista – CAU: A55153-8	JORDAN PAULO MEROS:04430217912	Assinado de forma digital por JORDAN PAULO MEROS:04430217912 DN: c=BR, o=ICP-Brasil, ou=VideoConferencia, ou=07594418000113, ou=Secretaria da Receita Federal do Brasil - RFB, ou=RFB e-CPF A1, ou=(em branco), cn=JORDAN PAULO MEROS:04430217912 Dados: 2022.02.17 16:26:40 -03'00'
GERALDO AUGUSTO NOVAIS Engenheiro Civil - CREA 30616/D-MG	GERALDO AUGUSTO NOVAIS:27445682600	Assinado de forma digital por GERALDO AUGUSTO NOVAIS:27445682600 Dados: 2022.02.17 16:02:55 -03'00'
HERMES BUENO PROCOPIO Engenheiro Civil - CREA 12206/D-GO	HERMES BUENO PROCOPIO:95570500120	Assinado de forma digital por HERMES BUENO PROCOPIO:95570500120 DN: c=BR, o=ICP-Brasil, ou=AC CERTIFICA MINAS v5, ou=37551746000101, ou=Videoconferencia, ou=Certificado PF A1, cn=HERMES BUENO PROCOPIO:95570500120 Dados: 2022.02.17 15:43:20 -03'00'
HÉRBIO HENRIQUE LOPES Engenheiro Civil - CREA 20918/D-GO	HERBIO HENRIQUE LOPES:02360490117	Assinado de forma digital por HERBIO HENRIQUE LOPES:02360490117 DN: c=BR, o=ICP-Brasil, ou=AC CERTIFICA MINAS v5, ou=37551746000101, ou=Videoconferencia, ou=Certificado PF A1, cn=HERBIO HENRIQUE LOPES:02360490117 Dados: 2022.02.17 15:43:52 -03'00'

APRESENTAÇÃO

O Departamento de Estradas de Rodagem do Distrito Federal, sob a coordenação da Superintendência Técnica, firmou com a **AeT Arquitetura Planejamento e Transportes Ltda o Contrato nº 005/2021** que tem por objetivo contratação de empresa especializada para Elaboração de Projetos Básico e Executivo de Engenharia para Implantação e Adequação do Sistema Viário de Acesso ao Noroeste, na Rodovia DF-003 (EPIA), via STN e ao TAN (Terminal Asa Norte).

O presente relatório corresponde ao **Produto 10.2 – Projeto Executivo de OAE**, na sua primeira versão.

1 Localização

A área do estudo em foco corresponde a conjunção da Estrada Parque Industria e Abastecimento – EPIA e a Via do Setor Terminal Norte, cuja demanda de tráfego sofre a influência das viagens produzidas no SMHLN e quadras da W3 Norte, além dos setores adjacentes: SHCNW e STN.

Figura 1 – Circulação de Tráfego Urbano no SHCNW e STN

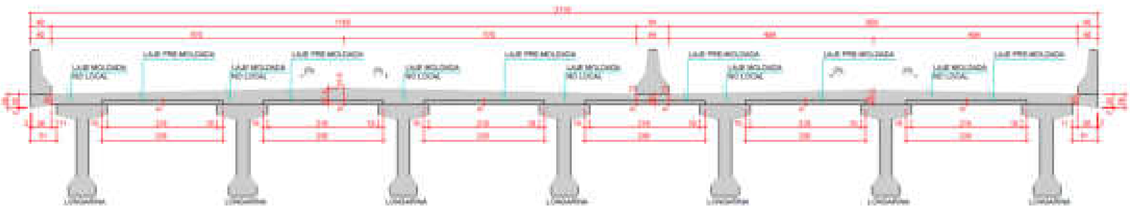
2 Introdução

A AeT Arquitetura Planejamento e Transportes submete ao Departamento de Estradas de Rodagem do Distrito Federal – DER/DF, para apreciação, o **Projeto Executivo de Obra de Arte Especial** para elaboração do Implantação e Adequação do Sistema Viário de Acesso ao Noroeste, na Rodovia DF-003 (EPIA) e Via STN (Setor Terminal Norte), incluindo as Interligações com as Vias W9 e W7 (SHCNW – Trecho 01) e ao TAN (Terminal Asa Norte).

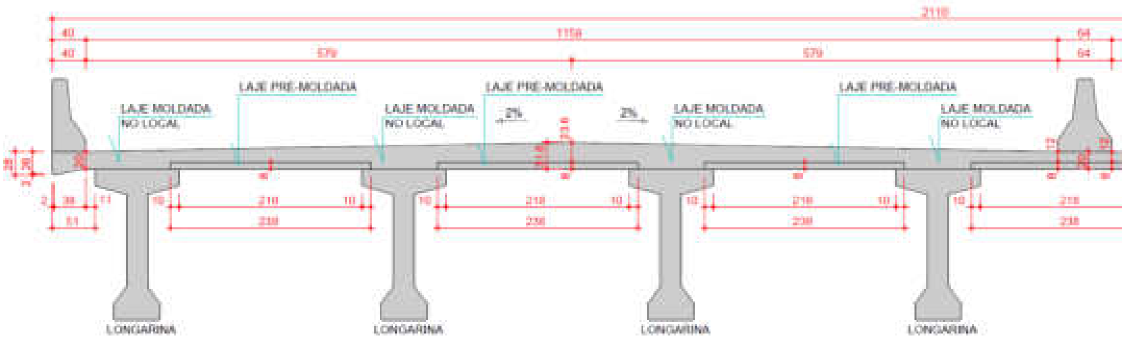
3 Projeto Estrutural

3.1 Memorial Descritivo

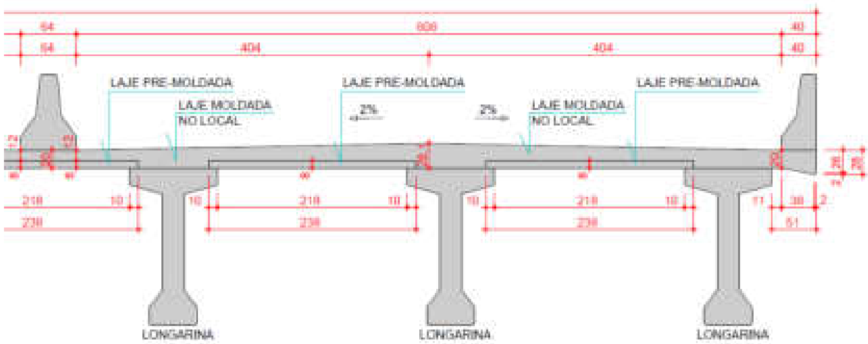
Trata-se de uma obra de arte rodoviária de viaduto dos eixos 01 e 04, sobre os eixos 01, 02 e 03, que será responsável pela ligação STN-EPIA, no Setor Noroeste em Brasília, em concreto armado com dois sentidos de tráfego. O viaduto em concreto armado contém dois eixos que juntos contemplam um grupo com cinco faixas de rodagem de 3,5 m, quatro acostamentos de 0,54 m, duas barreiras nas extremidades de 0,40 m e uma barreira de divisão dos eixos com 0,64 m rígidos de concreto padrão ABNT que totalizam uma largura constante de 21,10 m.



Para a pista do eixo 01 a largura é composta de três faixas de rodagem de 3,5 m, dois acostamentos de 0,54 m, uma barreira na extremidade de 0,40 m que totalizam uma largura constante de 11,98 m.



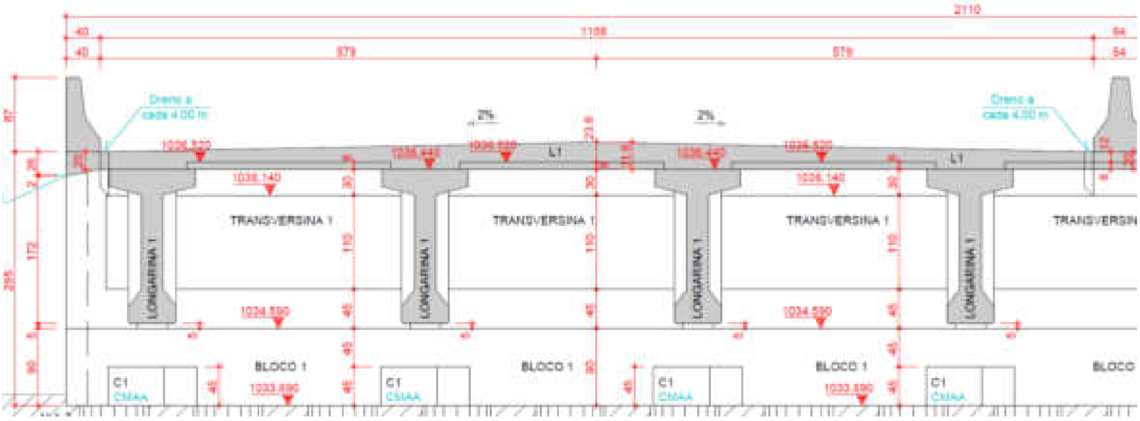
Para a pista do eixo 04 a largura é composta de duas faixas de rodagem de 3,5 m, dois acostamentos de 0,54 m, uma barreira na extremidade de 0,40 m que totalizam uma largura constante de 8,48 m.



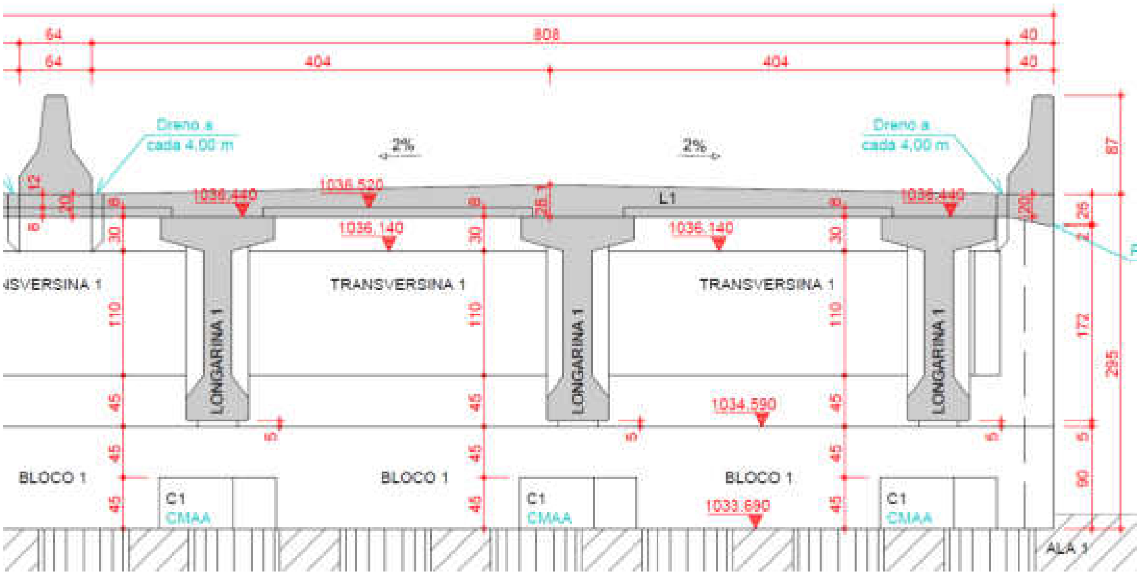
A obra é longitudinalmente e transversalmente plana com extensão de 89,15 m, e inclinação

2,0% do centro da pista de cada eixo para as bordas na face superior do tabuleiro para escoamento das águas pluviais.

Pista Eixo 01:



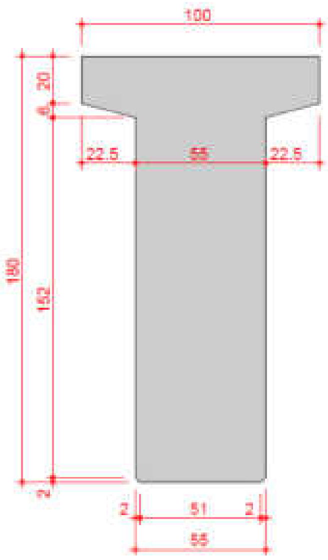
Pista Eixo 04:



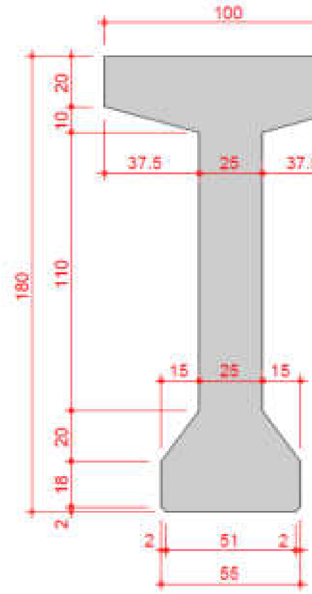
O viaduto é constituído pela superestrutura em grelha longitudinalmente contínua com o primeiro vão de aproximadamente 25,8 m, o segundo com 25,4 m e o terceiro com 36,4 m por conta das larguras dos eixos inferiores, mantendo a altura das longarinas de 1,80 m. As longarinas são isostáticas autoportantes de inércia variável e apoiam diretamente sobre as travessas. Os dois primeiros vãos do viaduto são compostos de sete longarinas espaçadas em 2,18 m com marquises de 0,51 m nas extremidades do tabuleiro. No vão de 36,4 m, que é o maior, existem treze longarinas espaçadas em 1,00 m com marquises de 0,51 m nas extremidades do tabuleiro.

As longarinas são em concreto protendido de seção “T” com largura variável e altura fixa de 180,0 cm, produzidas totalmente no local de utilização final da obra de arte.

A largura da seção das longarinas no início e fim das peças são mais largas para a ancoragem das placas de protensão conforme imagem abaixo:

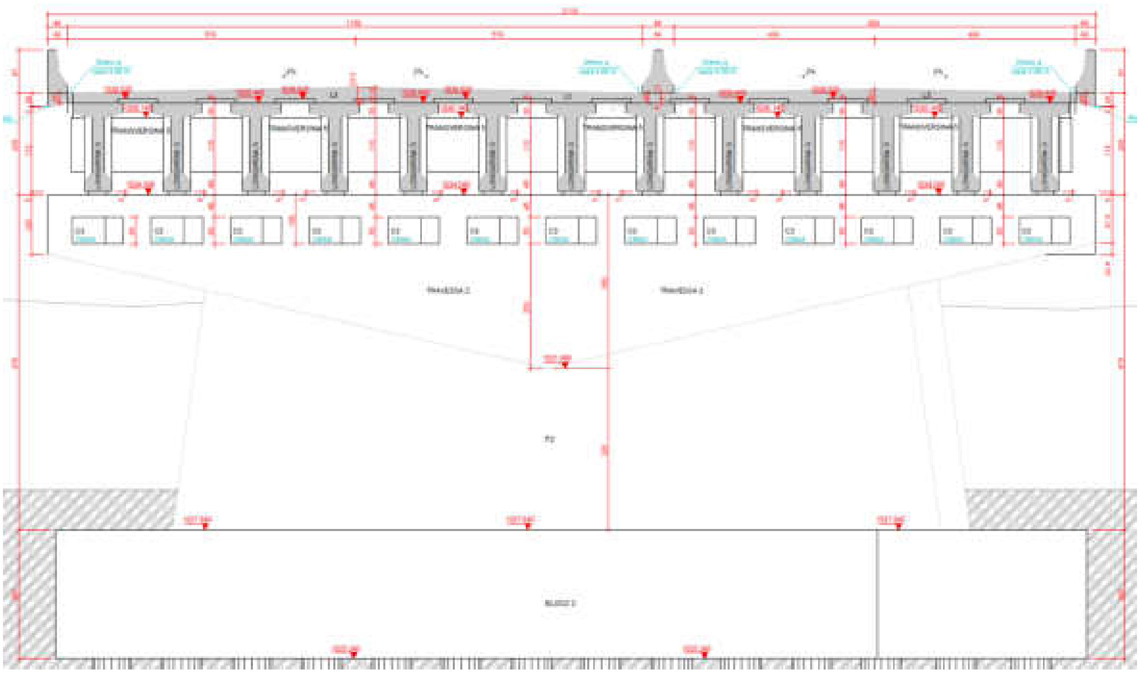


Após 200,0 cm de extensão no início e fim das longarinas, a seção varia para o formato “I” conforme a seguinte imagem abaixo:

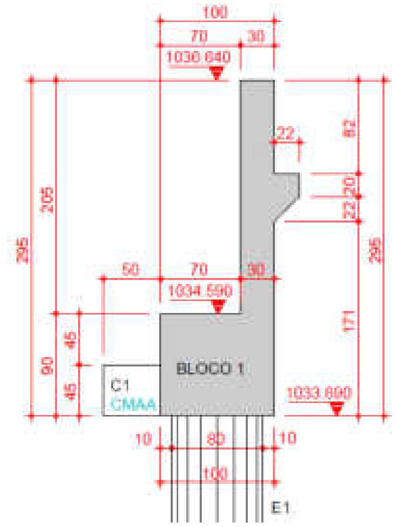


As longarinas são pré-tensionadas, produzidas no canteiro da obra e lançadas em suas posições definitivas por guindaste de grande capacidade. As ligações das longarinas com as travessas e blocos são articuladas com aparelho de apoio fretado.

As travessas são em concreto armado moldado no local com 130,0 cm de largura constante e altura variável. Devido aos aparelhos de apoio precisarem de manutenção e/ou troca, as travessas já foram preparadas com consoles para suportar o apoio do equipamento de manutenção

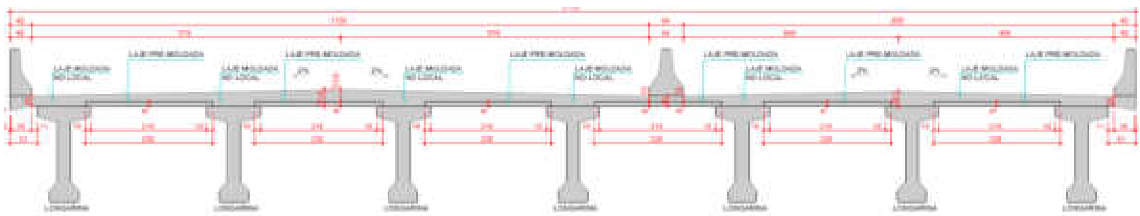


Nas entradas da obra de artes as travessas são os próprios blocos de fundação para apoiar as longarinas. Os blocos da entrada/saída da obra de arte são em concreto armado moldado no local com seção “L” de 100,0 cm de largura por 90,0 cm de altura no trecho inferior da peça e largura de 30,0 cm por 205,0 cm de altura no trecho superior da peça.



As transversinas também são em concreto armado moldado no local, sempre nas pontas das longarinas com seção retangular constante de 30,0 cm de largura e 110,0 cm de altura.

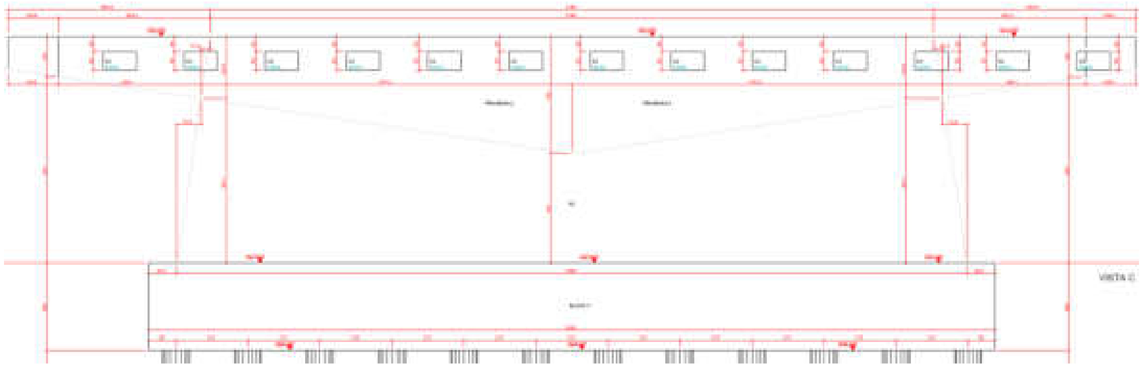
As lajes do tabuleiro do viaduto têm a espessura variável para caimento das águas pluviais, com espessura máxima de 31,6 cm no trecho do eixo 01, e espessura máxima de 28,1 cm no trecho do eixo 02.



Entre as longarinas existirão lajes pré-moldadas de 9,0 cm produzidas no canteiro de obras no local da obra, afim de servirem de formas para o concreto da laje do tabuleiro.

As lajes de transição são em concreto armado com uma espessura constante de 30,0 cm que apoiam sobre os blocos de entrada/saída e sobre o solo aterrado contido na projeção da ala.

A meso-estrutura da obra de arte do viaduto é em concreto armado moldado no local e constituída por dois pilares de seção variável, engastados nas fundações e com travessas responsáveis por apoiar as longarinas já citadas anteriormente.



A infraestrutura do viaduto é composta por quatro blocos sobre estacas em concreto armado do tipo hélice contínua, com diâmetros de 80,0 cm.

O primeiro bloco tem a dimensão de 100,0 x 3216,0 cm com altura de 90,0 cm e estacas com 19,0 m de profundidade, o segundo com seção de 560,0 x 2525,0 cm com altura de 260,0 cm e estacas com 10,0 m de profundidade, o terceiro com seção de 560,0 x 2525,0 cm com altura de 260,0 cm e estacas com 11,0 m de profundidade, e o último com seção de 100,0 x 3216,0 cm com altura de 90,0 cm e estacas com 13,0 m de profundidade,

A drenagem das águas pluviais das pistas do viaduto se dá por tubos de 100,0 mm espaçados a cada 4,0 m, localizados nas pranchas de corte transversais nos extremos das pistas do tabuleiro e espaçados longitudinalmente, que são fixados com chumbadores de expansão na laje do tabuleiro.

3.2 Normas Adotadas

Na análise, dimensionamento e detalhamento dos elementos estruturais desta obra de arte especial foram utilizadas as prescrições indicadas pelas seguintes normas:

- NBR7187:2003 - Projeto e execução de pontes de concreto armado e protendido;
- NBR6118:2014 - Projeto de estruturas de concreto - Procedimentos;
- NBR7188:2013 - Carga móvel em ponte rodoviária e passarela de pedestres;
- NBR6120:1980 - Cargas para o cálculo de estruturas de edificações - Procedimentos;
- NBR6123:1988 - Forças devidas ao vento em edificações – Procedimentos;
- NBR8681:2003 - Ações e segurança nas estruturas – Procedimentos;
- NBR12655:2015 - Concreto de cimento Portland - Preparo, controle, recebimento e aceitação – Procedimento

3.3 Carga Móvel de Projeto

Veículo tipo rodoviário de Classe 45 Tf

Carga de multidão (distribuída): 500 Kgf/m²

3.4 Software Utilizado

Para a análise estrutural e dimensionamento e detalhamento estrutural foi utilizado o sistema TQS na versão V22.10.1.

4 Memoria Justificativa

4.1 Superestrutura

A superestrutura é constituída por longarinas pré-moldadas, lajes pré-moldadas e lajes moldadas no local. O uso de elementos pré-moldados facilita a construção e redução do prazo da obra, possibilitando assim a entrega antecipada do viaduto. Dentre as vantagens das longarinas pré-moldadas e protendidas pode-se citar:

1- Melhor controle e qualidade na fabricação das longarinas comparado a longarinas moldadas no local;
2- Possibilidade de fabricação das longarinas juntamente com a infraestrutura e a mesoestrutura, reduzindo o tempo de execução obra;
3- Montagem da superestrutura sem a necessidade de escoramento;
4- Menor tempo de interdição das pistas;
5- Pelo vão e altura das longarinas optou-se por utilizar um elemento protendido.

Como maior vantagem para utilização das lajes pré-moldadas está a não utilização de formas e escoramento.

4.2 Mesoestrutura

A mesoestrutura é composta por pilares, travessas, alas e laje de aproximação. Os encontros são constituídos por uma travessa em “I” e alas para confinamento do solo. A laje de aproximação evita que o solo nos encontros da ponte afunde provocando um “degrau” nesses encontros.

A solução de pilares e travessas se mostra mais adequada para pontes com vigas pré-moldadas devido a facilidade de execução e eficiência.

As eventuais substituições dos aparelhos de apoio serão feitas através da instalação de macacos hidráulicos sobre os consoles, levantando assim todas as longarinas simultaneamente.

4.3 Infraestrutura

A infraestrutura é composta por blocos sobre estacas do tipo hélice contínua. Optou-se por esse tipo de estaca devido à baixa resistência do solo nas camadas superficiais e o nível de água ser muito elevado.

O uso de fundações diretas é difícil uma vez que o nível de água é muito elevado e a resistência do solo nas camadas superficiais é muito baixa. E por fim o uso de tubulões de ar comprimido não são aconselhados uma vez que não apresentam segurança durante o processo executivo.

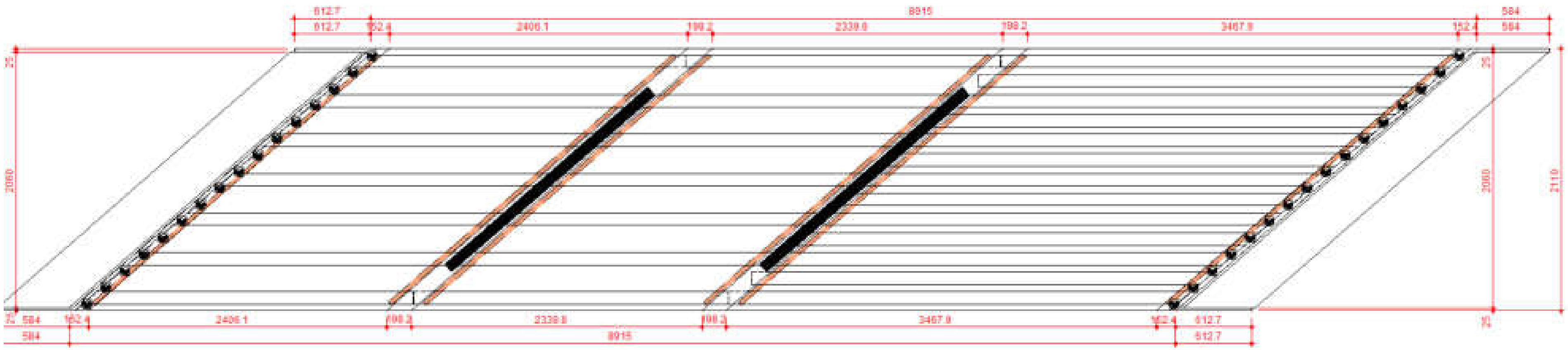
5 Descrição Da Obra De Arte Especial

O projeto de obra de arte especial é constituído por 4 níveis: 2 níveis fundação, 1 nível travessa e 1 nível tabuleiro. A seguir é apresentado um quadro com detalhes de cada um destes níveis.

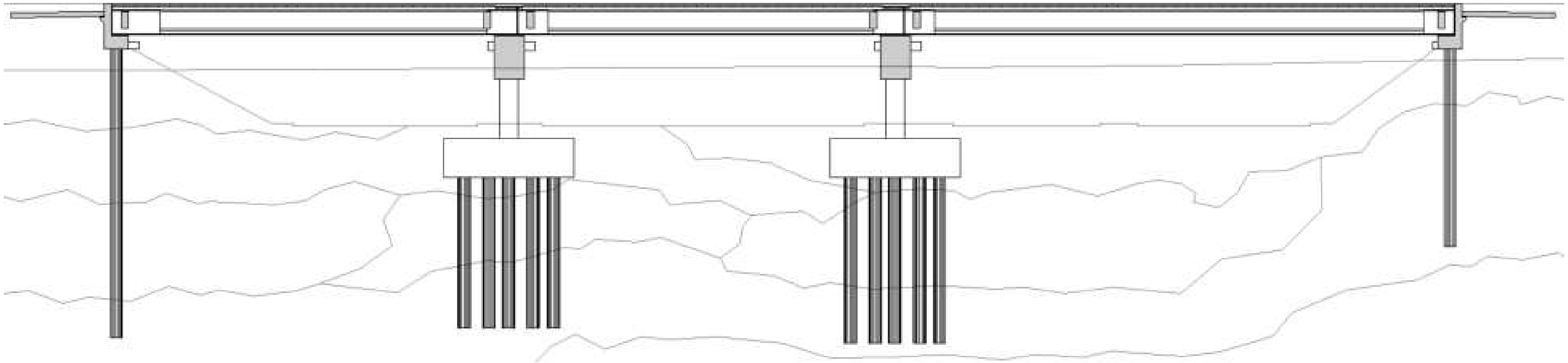
Pavimentos	*Piso a piso (m)*	*Cota (m)*	*Área (m²)*
Tabuleiro	2.05	1036.640	1048.61
Travessa	0.90	1034.590	357.29
Fundação_1	5.85	1033.690	34.42
Fundação	0.00	1027.840	282.80
Total	---	---	1723.12

A altura total da obra de arte especial é de 8.8 m.

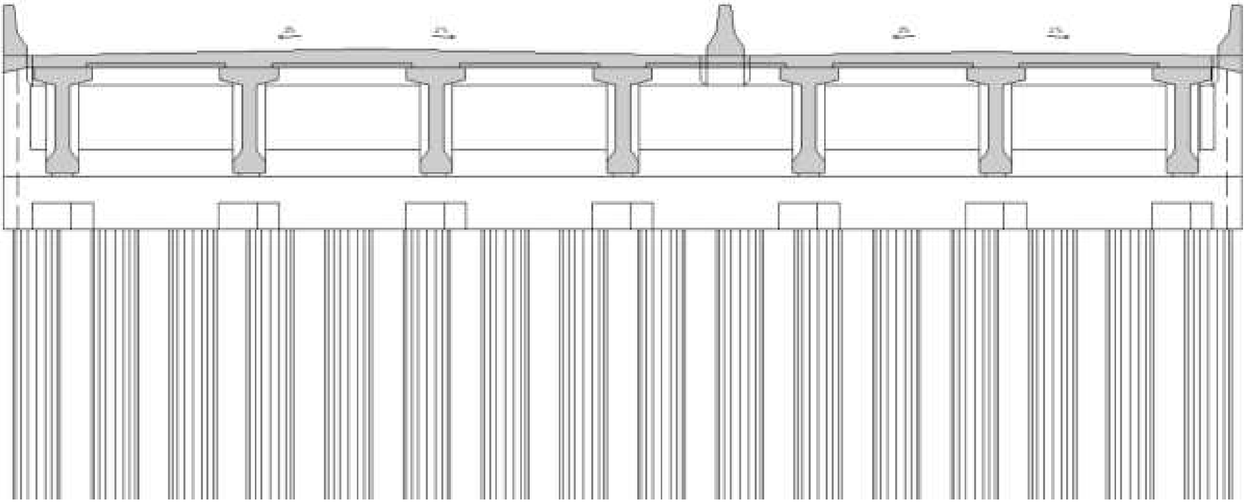
5.1 Planta de formas



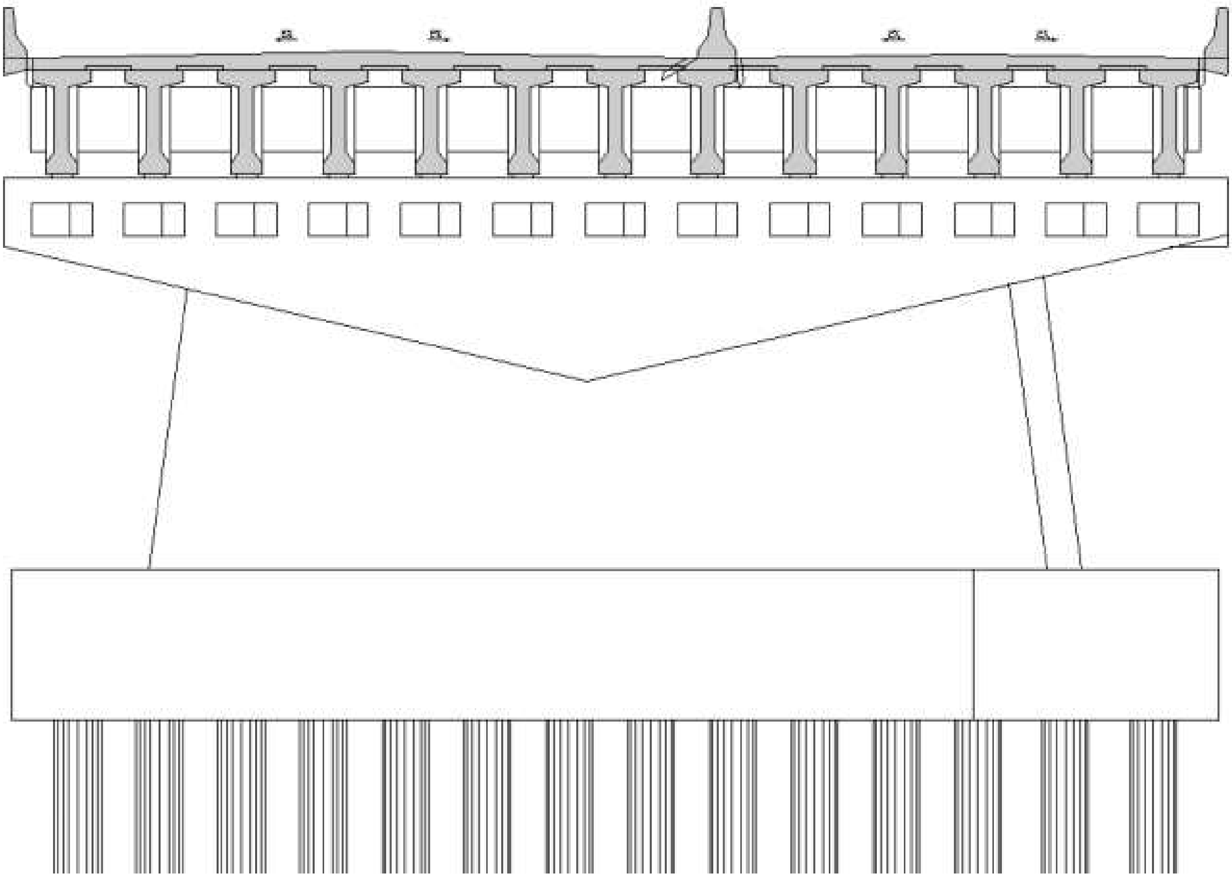
5.2 Corte longitudinal



5.3 Cortes transversais



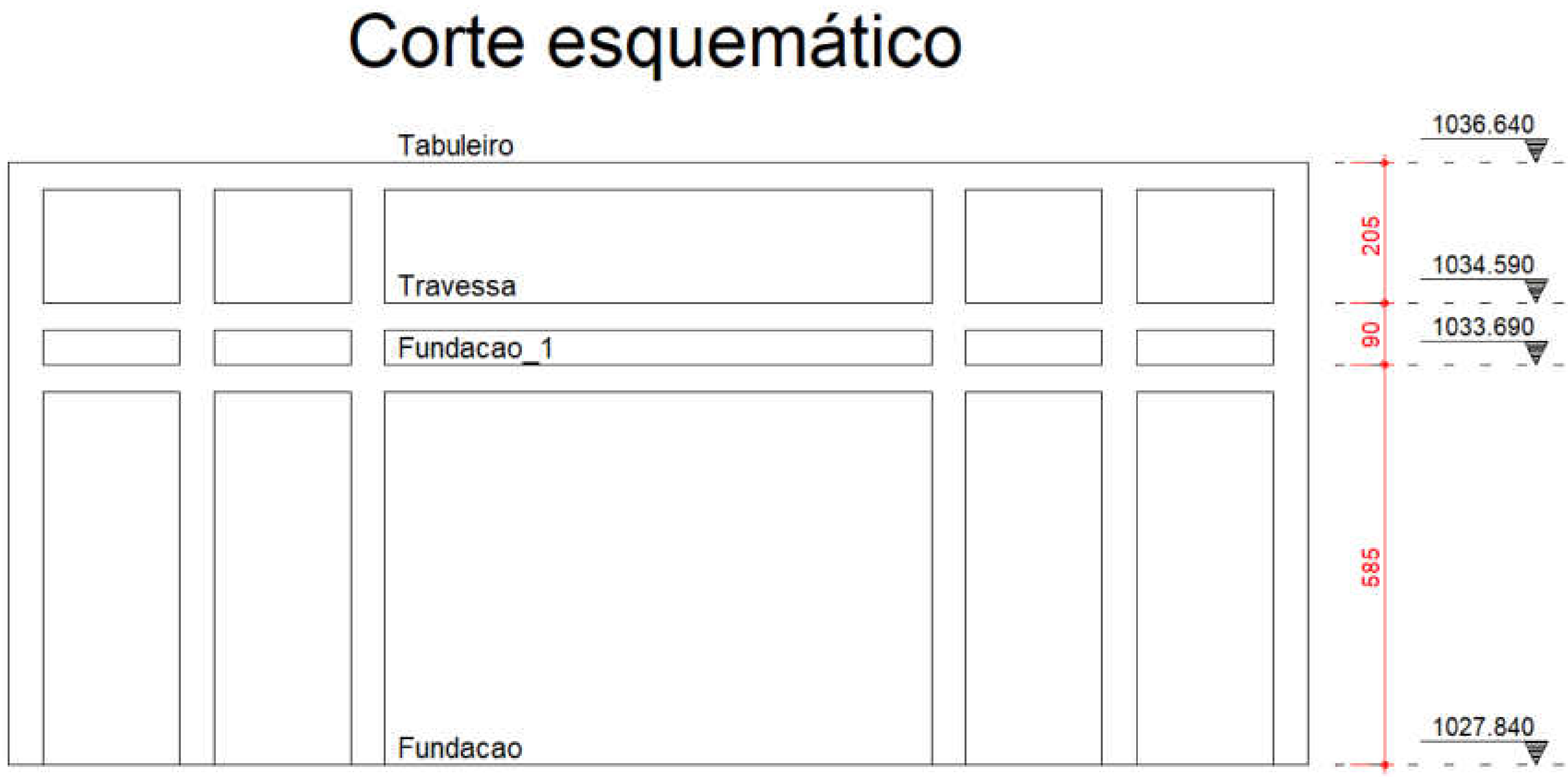
Seção transversal pórticos externos



Seção transversal pórticos internos

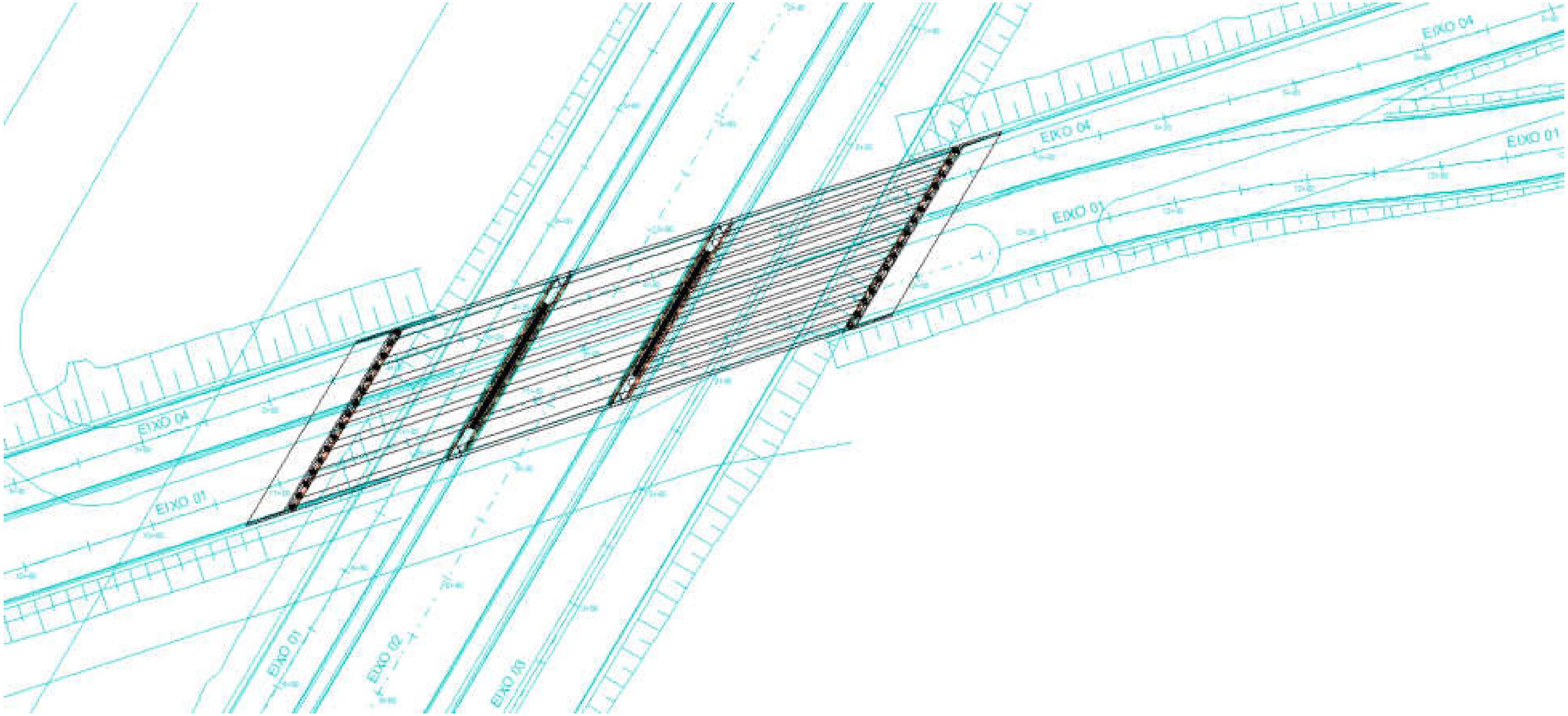
5.4 Corte esquemático

A seguir é apresentado um corte esquemático da obra de arte especial. Nele é possível visualizar as distancias entre pavimentos, cotas e nomenclaturas utilizadas:



5.5 Localização

Ligação stn-epia, setor noroeste - brasília - df.



6 Normas Em Uso

Na análise, dimensionamento e detalhamento dos elementos estruturais desta obra de arte especial foram utilizadas as prescrições indicadas pelas seguintes normas:

- Nbr7187:2003 - projeto de pontes de concreto armado e de concreto protendido - procedimento;
- Nbr7188:2013 - carga móvel em ponte rodoviária e passarela de pedestres;
- Nbr6118:2014 - projeto de estruturas de concreto - procedimentos;
- Nbr6120:2019 - cargas para o cálculo de estruturas de edificações - procedimentos;
- Nbr6122:2019 - projeto e execução de fundações;
- Nbr6123:1988 - forças devidas ao vento em edificações – procedimentos;
- Nbr8681:2003 - ações e segurança nas estruturas – procedimentos;
- Nbr12655:2015 - concreto de cimento portland - preparo, controle, recebimento e aceitação - procedimento.

7 Software Utilizado

Para a análise estrutural e dimensionamento e detalhamento estrutural foi utilizado o sistema tqs na versão v22.10.1.

8 Materiais

8.1 Concreto

A seguir são apresentados os valores de fck utilizados para cada um dos elementos estruturais, para cada um dos pavimentos:

Pavimento	*Lajes (mpa)*	*Vigas (mpa)*	*Fundações (mpa)*
Tabuleiro	45	45	30
Travessa	45	45	30
Fundação_1	45	45	45
Fundação	30	30	30

Piso	*Pavimento*	*Fck do pilar (mpa)*
11	Tabuleiro	45
10	Travessa	45
9	Fundação_1	45
0	Fundação	45

8.2 Fck de elementos pré-moldados

Abaixo são apresentados os fck dos elementos pré-moldados em fase de serviço

Elemento pré-moldado	*Fck (mpa)*
Viga	45
Laje	45

8.3 Fck de elementos pré-moldados em situações de saque/levantamento

Abaixo são apresentados os fck dos elementos pré-moldados nas situações de saque/levantamento

Elemento/fase	*fck (mpa)*
Viga/saque	35
Laje/saque	30
Viga/levantamento	35
Laje/levantamento	30

8.4 Módulo de elasticidade

O módulo de elasticidade utilizado para cada um dos concretos utilizados é listado a seguir:

	Ecs (mpa)	*Eci (mpa)*
C30	26838	30672
C35	29403	33130
C45	34279	37566

8.5 Aço de armadura passiva

Foram utilizadas as seguintes características para o aço estrutural utilizado no projeto:

Tipo de barra	*Es (mpa)*	*Fyk (mpa)*	*Massa específica (kgf/m³)*
Ca-50	210000	500	7850
Ca-60	210000	600	7850

8.6 Aço de armadura ativa

Foram utilizadas as seguintes características para o aço estrutural utilizado no projeto:

Tipo de barra	*Ep (mpa)*	*Fpyk (mpa)*	*Fptk (mpa)*	*Massa específica (kgf/m)*
Cp190 rb - 12,7	196000	1750	1900	0.890

9 Parâmetro De Durabilidade

9.1 Classe de agressividade

Para o dimensionamento e detalhamento dos elementos estruturais foi considerada a seguinte classe de agressividade ambiental no projeto: **ii - moderada**.

9.2 Cobrimentos gerais

A definição dos cobrimentos foi feita com base na classe de agressividade ambiental definida anteriormente.

Foi considerado que durante a execução da obra de arte especial será feito um rígido controle de qualidade e tolerância de medidas. Deste modo, cabe ao executor da obra a obediência do item 7.4.7.4 da nbr6118.

A seguir são apresentados os valores de cobrimento utilizados para os diversos elementos estruturais existentes no projeto:

Elemento estrutural	***Cobrimento (cm)***
Lajes	2.0
Vigas	2.5
Pilares	2.5
Fundações	5.0

9.3 Cobrimentos específicos para elementos pré-moldados

A seguir são apresentados os valores de cobrimentos específicos para elementos pré-moldados. Caso os valores apresentados sejam zero (0), o valor geral foi utilizado:

Elemento	***Cobrimento***
Viga (cm)	2.5
Laje (cm)	2.0

10 Ações

10.1 Carregamentos nos pavimentos

Outros carregamentos considerados nos modelos dos pavimentos são apresentados a seguir:

Pavimento	*Temperatura*	*Retração*	*Protensão*	*Dinâmica*
Tabuleiro	Sim	Sim	Sim	Sim
Travessa	Sim	Sim	Não	Sim
Fundação_1	Sim	Sim	Não	Sim
Fundação	Sim	Sim	Não	Sim

10.2 Cargas permanentes

As cargas permanentes utilizadas estão listadas a seguir:

1- Foi utilizada uma carga permanente de 100 kgf/m² para execução da pavimentação em cbuq sobre o viaduto, para essa carga a espessura média máxima da pavimentação deverá ser de 4.17 cm e peso especifico de 2400 kgf/m³.
2- Para os guarda-rodas externos foi considerado uma carga de 700 kgf/m na projeção dos guarda-rodas.
3- Para o guarda-rodas interno foi considerado uma carga de 1000 kgf/m na projeção do guarda-rodas.
4- Para os dispositivos de sinalização foi considerado uma carga de 50 kgf/m na projeção dos guarda-rodas.
5- Foi utilizada uma carga permanente de 200 kgf/m² para um eventual recapeamento em cbuq sobre o viaduto, para essa carga a espessura média máxima do recapeamento deverá ser de 8.33 cm e peso especifico de 2400 kgf/m³.

10.3 Cargas acidentais

As cargas móveis compõem-se de um veículo tipo e de cargas uniformemente distribuídas sobre o tabuleiro de acordo com a classe da ponte. As cargas móveis foram adotadas para o trem tipo classe 45, de acordo com a nbr 7188/2013.

A carga de multidão foi admitida na área do veículo tipo, logo a carga do veículo tipo foi reduzida em 9 tf.

Carga veículo tipo – (área veículo tipo * carga multidão)

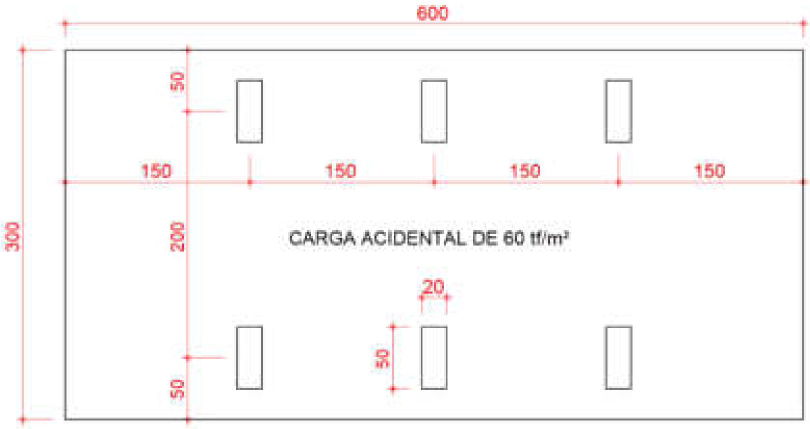
45 tf – (6,0 m * 3,0 m * 0.5 tf) = 36 tf

$$Veículo = \frac{36}{6} = 6.0\ tf$$

Considerando as rodas de 20x50 cm, temos:

$$Veículo = \frac{6}{0.5 * 0.2} = 60\ tf/m^2$$

Carregamento de multidão de 0.5 tf/m².



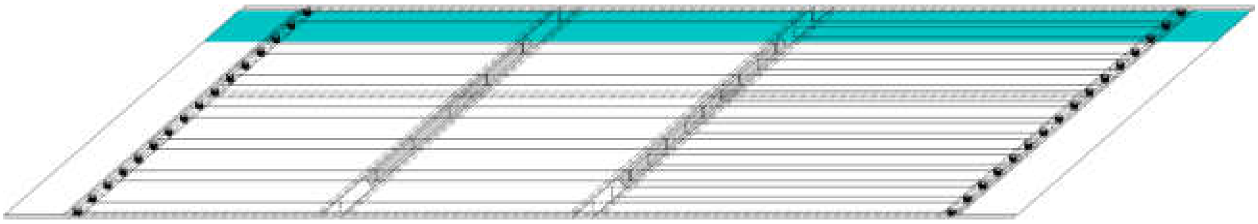
10.4 Hipóteses e considerações para cargas móveis

- Para cargas de multidão:

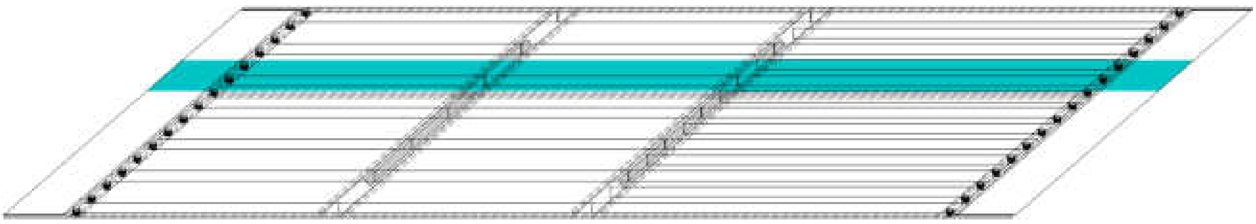
consideradas em todo tabuleiro.

- Para cargas de trem-tipo (as posições estão descritas nas imagens a seguir):

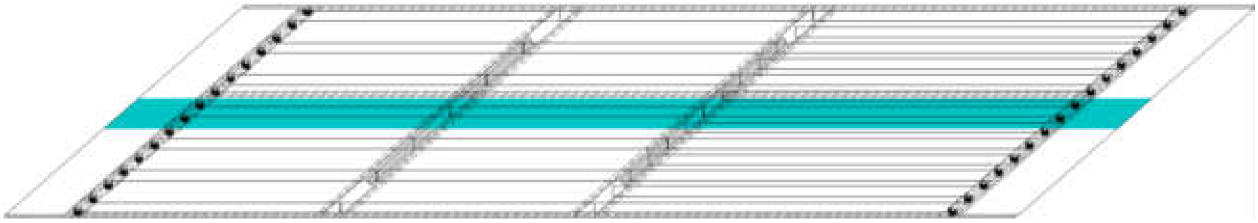
Foram consideradas 11 posições para trem-tipo ao longo de cada linha hachurada na ponte. Para cada linha de cargas, os trem-tipo estão distribuídos da seguinte forma: 01 trem-tipo no centro da laje de aproximação, 01 trem-tipo de cada lado de cada travessa e 01 trem-tipo no centro de cada vão.



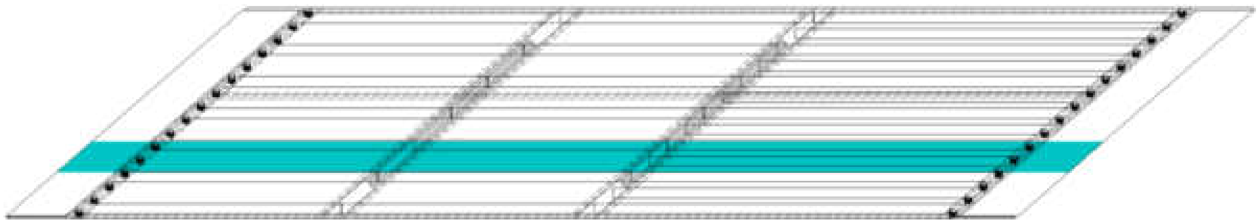
1º linha de trem-tipo



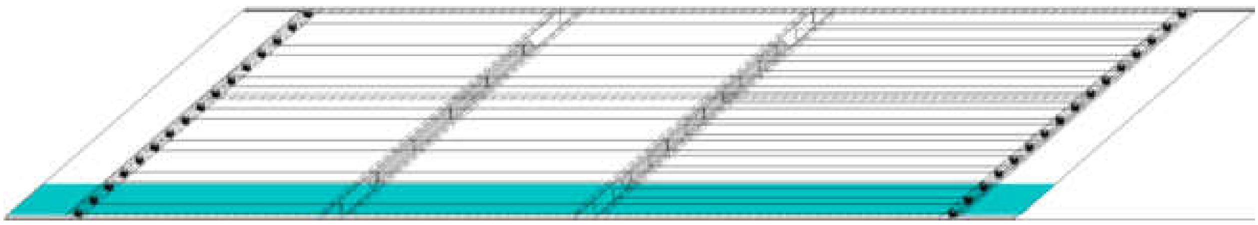
2º linha de trem-tipo



3º linha de trem-tipo



4º linha de trem-tipo

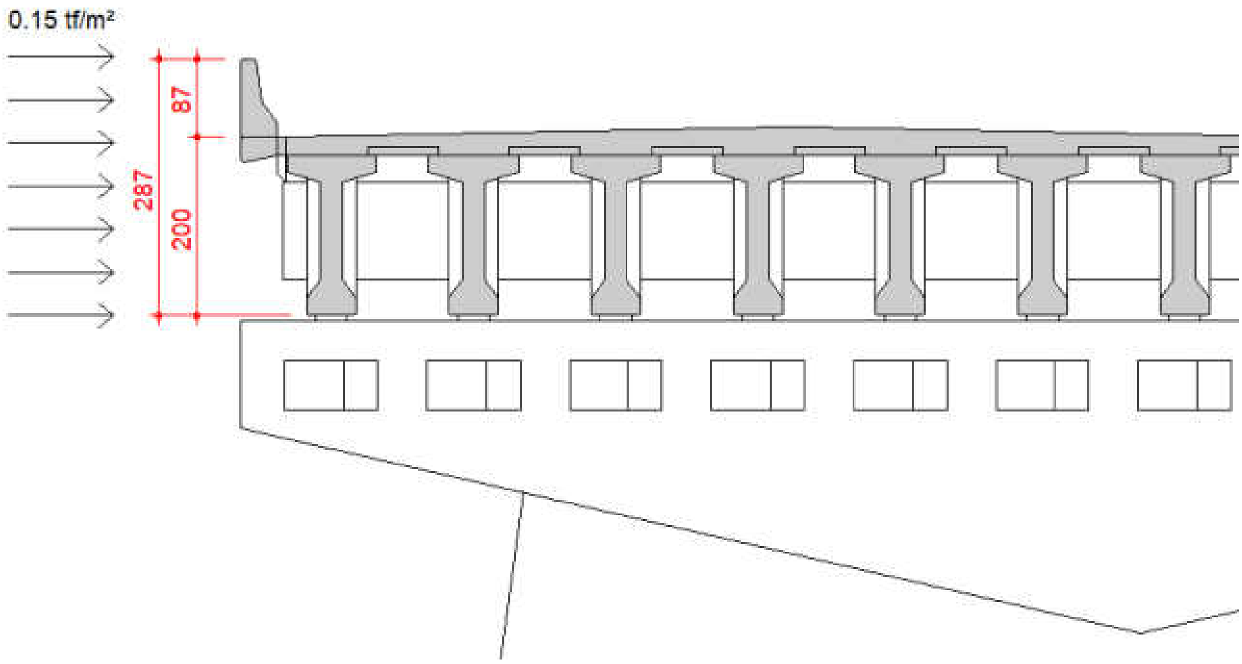


5º linha de trem-tipo

10.5 Vento

Abaixo temos as hipóteses de cálculo para os efeitos de vento:

10.5.1 Ponte descarregada



Ftv= carga*barreira vento *comprimento do trecho

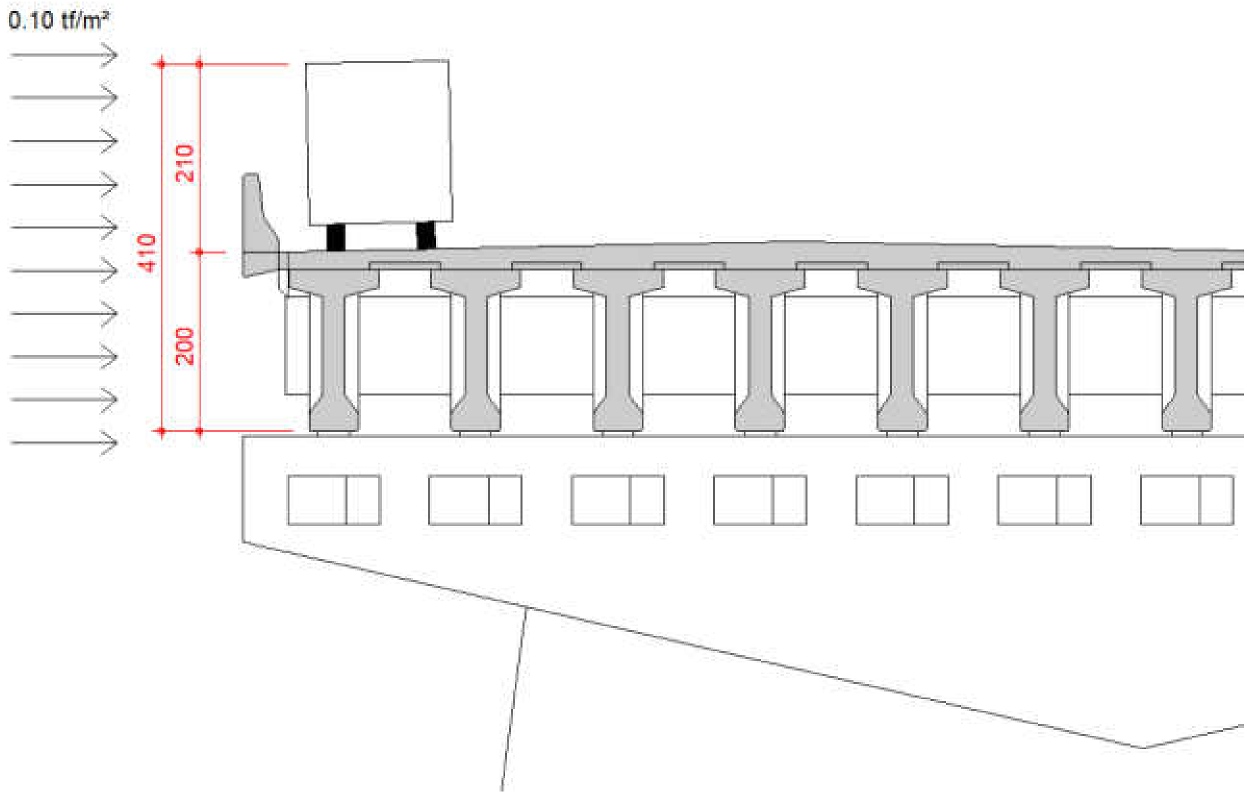
- Pórtico 1:
  - Ftv= 0.15*2.87*12.91 = 5.56 tf

- Pórtico 2:
  - Ftv= 0.15*2.87*25.60 = 11.02 tf

- Pórtico 3:
  - Ftv= 0.15*2.87*30.91 = 13.31 tf

- Pórtico 4:
  - Ftv= 0.15*2.87*18.22 = 7.85 tf

10.5.2 Ponte carregada



Flv= carga*barreira vento com veículo*comprimento do trecho

- Pórtico 1:
  - Ftv= 0.10*4.10*12.91 = 5.30 tf

- Pórtico 2:
  - Ftv= 0.10*4.10*25.60 = 10.50 tf

- Pórtico 3:
  - Ftv= 0.10*4.10*30.91 = 12.68 tf

- Pórtico 4:
  - Ftv= 0.10*4.10*18.22 = 7.47 tf

10.6 Efeito de temperatura

Foi considerado em toda ponte as seguintes variações de temperatura:

Variação transversal: +/- 5º

Variação axial: +/- 10º

Obs.: para o cálculo da deformação por fluência as tensões nos elementos estruturais não são suficientes para gerar deformações consideráveis, por isso não foram considerados os deslocamentos dos apoios".

10.7 Frenagem e aceleração

Segundo a nbr 7188/2013 os esforços devido frenagem e aceleração são calculados pela seguinte formula:

Hf=0.25*largura ponte*comprimento ponte*cnf > 135.0 kn

Hf=0.25*19.66*89.15*1

Hf=438.18 kn é maior que 135.0 kn, logo usaremos 438.18 kn

Hf= 43.82 tf

Carga por pórtico = 43.82 / 4 = 10.96 tf

10.8 Colisão em pilares

Segundo a nbr 7188/2013 todos os pilares próximos a rodovias devem ser protegidos por dispositivos de contenção apropriados. E como medida mitigadora de eventuais impactos, os pilares devem ser verificados para uma carga horizontal de 100 tf na direção do tráfego, e 50 tf perpendicular ao tráfego, não concomitantes entre si, aplicadas a uma altura de 1.25 metros do terreno ou pavimento. Logo foram utilizas tais cargas para o dimensionamento de todos os pilares da obra de arte especial.

10.9 Colisão ao nível do tabuleiro

Segundo a nbr 7188/2013 é aplicada uma ação em um comprimento de 50 cm, no topo do elemento, admitindo-se distribuição espacial a 45º. Foi aplicada uma carga concentrada de 10 tf na direção do tráfego de cada pista abaixo do viaduto.

10.10 Peso de solo

Foi considerado 50 cm de solo sobre as lajes de aproximação, resultando em uma carga distribuída por área de 0.9 tf/m².

$Q=1800*0.5 \Rightarrow q = 0.9$ tf/m²

10.11 Empuxo de solo

Nos encontros foram considerados os empuxos devido ao solo contido entre as alas e o bloco em “I”.

10.12 Coeficientes adicionais

Os coeficientes adicionais são usados para majorar todas as cargas moveis da obra de arte de acordo com o vão adotado.

- Para o vão 1 de 25.81 metros, temos:

Foram considerados os seguintes coeficientes: coeficiente de impacto vertical, coeficiente de número de faixas e o coeficiente de impacto adicional.

- O coeficiente de impacto vertical (civ) será de 1.280
- O coeficiente de número de faixas (cnf) será de 1.000
- O coeficiente de impacto adicional (cia) será de 1.250

O coeficiente de impacto adicional aplica-se somente as regiões até 5.00 metros distantes de juntas de dilatação e extremidades da obra de arte. Como não temos juntas de dilatação o coeficiente de impacto adicional será aplicado somente as extremidades da obra de arte.

Para as regiões até 5.00 metros distantes das extremidades da obra de arte o coeficiente final será: civ*cnf*cia

1.280*1.00*1.25 = 1.600

Para o restante da obra de arte será: civ*cnf

1.280*1.00 = 1.280

- Para o vão 2 de 25.38 metros, temos:

Foram considerados os seguintes coeficientes: coeficiente de impacto vertical, coeficiente de número de faixas e o coeficiente de impacto adicional.

- O coeficiente de impacto vertical (civ) será de 1.282
- O coeficiente de número de faixas (cnf) será de 1.000
- O coeficiente de impacto adicional (cia) será de 1.250

O coeficiente de impacto adicional aplica-se somente as regiões até 5.00 metros distantes de juntas de dilatação e extremidades da obra de arte. Como não temos juntas de dilatação o coeficiente de impacto adicional será aplicado somente as extremidades da obra de arte.

Para as regiões até 5.00 metros distantes das extremidades da obra de arte o coeficiente final será: civ*cnf*cia

1.282*1.00*1.25 = 1.603

Para o restante da obra de arte será: civ*cnf

1.282*1.00 = 1.282

- Para o vão 3 de 36.43 metros, temos:

Foram considerados os seguintes coeficientes: coeficiente de impacto vertical, coeficiente de número de faixas e o coeficiente de impacto adicional.

- O coeficiente de impacto vertical (civ) será de 1.246
- O coeficiente de número de faixas (cnf) será de 1.00
- O coeficiente de impacto adicional (cia) será de 1.250

O coeficiente de impacto adicional aplica-se somente as regiões até 5.00 metros distantes de juntas de dilatação e extremidades da obra de arte. Como não temos juntas de dilatação o coeficiente de impacto adicional será aplicado somente as extremidades da obra de arte.

Para as regiões até 5.00 metros distantes das extremidades da obra de arte o coeficiente final será: civ*cnf*cia

1.246*1.00*1.25 = 1.558

Para o restante da obra de arte será: civ*cnf

1.246*1.00 = 1.246

11 Combinações

11.1 Resumo de combinações no modelo global

No modelo estrutural global foram consideradas as seguintes combinações:

Tipo	Descrição	N. Combinações
Elu1	Verificações de estado limite último - vigas e lajes	39602
Elu2	Verificações de estado limite último - pilares e fundações	39602
Fogo	Verificações em situação de incêndio	3300
Els	Verificações de estado limite de serviço	17600
Combflu	Cálculo de fluência (método geral)	3300
Atopro	Ato da protensão	2
Cqperm	Combinações quase permanentes	2200
Cfreq	Combinações frequentes	15400
Crara	Combinações raras	26400

11.2 Lista de combinações no modelo global

No modelo estrutural global foram consideradas as seguintes combinações:

```
---------------------------------------------------------------------------
Listagem de casos e combinações padrão
Edifício: 1470-car-aet_viaduto_noroeste_3d
Regras de combinações: [combpre.dat]
01/12/2021 08:17:50
---------------------------------------------------------------------------

Casos de carregamento simples
----------------------------

Sufixo "_r"  carga acidental reduzida
Sufixo "_v"  vigas de transição c/inércia normal
Sufixo "_e"  engastado, com caso correspondente articulado

Num prefixo  título
  1 todas    todas permanentes e acidentais dos pavimentos
  2 pp       peso próprio - articulado
  3 perm     cargas permanentes
  4 acid     cargas acidentais
```

```
 5 adia1    trem tipo (1)
 6 adia2    trem tipo (2)
 7 adia3    trem tipo (3)
 8 adia4    trem tipo (4)
 9 adia5    trem tipo (5)
10 adia6    trem tipo (6)
11 adia7    trem tipo (7)
12 adia8    trem tipo (8)
13 adia9    trem tipo (9)
14 adia10   trem tipo (10)
15 adia11   trem tipo (11)
16 adia12   trem tipo (12)
17 adia13   trem tipo (13)
18 adia14   trem tipo (14)
19 adia15   trem tipo (15)
20 adia16   trem tipo (16)
21 adia17   trem tipo (17)
22 adia18   trem tipo (18)
23 adia19   trem tipo (19)
24 adia20   trem tipo (20)
25 adia21   trem tipo (21)
26 adia22   trem tipo (22)
27 adia23   trem tipo (23)
28 adia24   trem tipo (24)
29 adia25   trem tipo (25)
30 adia26   trem tipo (26)
31 adia27   trem tipo (27)
32 adia28   trem tipo (28)
33 adia29   trem tipo (29)
34 adia30   trem tipo (30)
35 adia31   trem tipo (31)
36 adia32   trem tipo (32)
37 adia33   trem tipo (33)
38 adia34   trem tipo (34)
39 adia35   trem tipo (35)
40 adia36   trem tipo (36)
41 adia37   trem tipo (37)
42 adia38   trem tipo (38)
43 adia39   trem tipo (39)
44 adia40   trem tipo (40)
45 adia41   trem tipo (41)
```

```
 46 adia42   trem tipo (42)
 47 adia43   trem tipo (43)
 48 adia44   trem tipo (44)
 49 adia45   trem tipo (45)
 50 adia46   trem tipo (46)
 51 adia47   trem tipo (47)
 52 adia48   trem tipo (48)
 53 adia49   trem tipo (49)
 54 adia50   trem tipo (50)
 55 adia51   trem tipo (51)
 56 adia52   trem tipo (52)
 57 adia53   trem tipo (53)
 58 adia54   trem tipo (54)
 59 adia55   trem tipo (55)
 60 adib1    colisao (1)
 61 adib2    colisao (2)
 62 adib3    colisao (3)
 63 adib4    colisao (4)
 64 adib5    colisao (5)
 65 adib6    colisao (6)
 66 adib7    colisao (7)
 67 adib8    colisao (8)
 68 adib9    colisao (9)
 69 adib10   colisao (10)
 70 adic     fren_acel
 71 temp1    temperatura (1)
 72 temp2    temperatura (2)
 73 vent1    vento (1) 90°
 74 vent2    vento (2) 270°
 75 todas_v  todas permanentes e acidentais dos pavimentos - vtn
 76 pp_v     peso próprio - vtn
 77 perm_v   cargas permanentes - vtn
 78 acid_v   cargas acidentais - vtn

Dados por caso de carregamento
------------------------------

Num     número do caso, referenciado na listagem de combinações
Prefixo usado para montar os títulos das combinações
Tipo    tipo de carga quanto à sua permanência
        tod     cargas permanentes e variáveis lançadas nas grelhas
```

	per	permanentes
	var	variáveis normais
	varb	variáveis excepcionais 1
	varc	variáveis excepcionais 2
Vtn	caso com vigas de transição com inércia normal. Nos outros casos, as vigas de transição são enrijecidas conforme critérios.	
Acr	caso de carga acidental reduzida nos pisos	
Gamaf	ponderador de ações desfavorável	
Gamafd	ponderador de ações favorável	
Psi0	fator de redução de combinação para o estado limite último	
Psi1	fator de redução de combin frequente p/estado limite de serviço	
Psi2	fator de redução de combin quase permanente p/estado limite de serviço	
For	número do caso correspondente na planta de formas/grelha	
Usu	marcado se o caso foi lançado pelo usuário	
Art	marcado se barras articuladas	

Num	prefixo	tipo	vtn	acr	gamaf	gamafd	psi0	psi1	psi2	for	usu	art
1	todas	tod			1.40					1		
2	pp	per			1.35					2		x
3	perm	per			1.40					3		
4	acid	var			1.50		0.70	0.50	0.30	4		
5	adia1	var	x		1.50		0.70	0.50	0.30	5	x	
6	adia2	var	x		1.50		0.70	0.50	0.30	6	x	
7	adia3	var	x		1.50		0.70	0.50	0.30	7	x	
8	adia4	var	x		1.50		0.70	0.50	0.30	8	x	
9	adia5	var	x		1.50		0.70	0.50	0.30	9	x	
10	adia6	var	x		1.50		0.70	0.50	0.30	10	x	
11	adia7	var	x		1.50		0.70	0.50	0.30	11	x	
12	adia8	var	x		1.50		0.70	0.50	0.30	12	x	
13	adia9	var	x		1.50		0.70	0.50	0.30	13	x	
14	adia10	var	x		1.50		0.70	0.50	0.30	14	x	
15	adia11	var	x		1.50		0.70	0.50	0.30	15	x	
16	adia12	var	x		1.50		0.70	0.50	0.30	16	x	
17	adia13	var	x		1.50		0.70	0.50	0.30	17	x	
18	adia14	var	x		1.50		0.70	0.50	0.30	18	x	
19	adia15	var	x		1.50		0.70	0.50	0.30	19	x	
20	adia16	var	x		1.50		0.70	0.50	0.30	20	x	
21	adia17	var	x		1.50		0.70	0.50	0.30	21	x	
22	adia18	var	x		1.50		0.70	0.50	0.30	22	x	
23	adia19	var	x		1.50		0.70	0.50	0.30	23	x	
24	adia20	var	x		1.50		0.70	0.50	0.30	24	x	

25	adia21	var	x	1.50	0.70	0.50	0.30	25	x
26	adia22	var	x	1.50	0.70	0.50	0.30	26	x
27	adia23	var	x	1.50	0.70	0.50	0.30	27	x
28	adia24	var	x	1.50	0.70	0.50	0.30	28	x
29	adia25	var	x	1.50	0.70	0.50	0.30	29	x
30	adia26	var	x	1.50	0.70	0.50	0.30	30	x
31	adia27	var	x	1.50	0.70	0.50	0.30	31	x
32	adia28	var	x	1.50	0.70	0.50	0.30	32	x
33	adia29	var	x	1.50	0.70	0.50	0.30	33	x
34	adia30	var	x	1.50	0.70	0.50	0.30	34	x
35	adia31	var	x	1.50	0.70	0.50	0.30	35	x
36	adia32	var	x	1.50	0.70	0.50	0.30	36	x
37	adia33	var	x	1.50	0.70	0.50	0.30	37	x
38	adia34	var	x	1.50	0.70	0.50	0.30	38	x
39	adia35	var	x	1.50	0.70	0.50	0.30	39	x
40	adia36	var	x	1.50	0.70	0.50	0.30	40	x
41	adia37	var	x	1.50	0.70	0.50	0.30	41	x
42	adia38	var	x	1.50	0.70	0.50	0.30	42	x
43	adia39	var	x	1.50	0.70	0.50	0.30	43	x
44	adia40	var	x	1.50	0.70	0.50	0.30	44	x
45	adia41	var	x	1.50	0.70	0.50	0.30	45	x
46	adia42	var	x	1.50	0.70	0.50	0.30	46	x
47	adia43	var	x	1.50	0.70	0.50	0.30	47	x
48	adia44	var	x	1.50	0.70	0.50	0.30	48	x
49	adia45	var	x	1.50	0.70	0.50	0.30	49	x
50	adia46	var	x	1.50	0.70	0.50	0.30	50	x
51	adia47	var	x	1.50	0.70	0.50	0.30	51	x
52	adia48	var	x	1.50	0.70	0.50	0.30	52	x
53	adia49	var	x	1.50	0.70	0.50	0.30	53	x
54	adia50	var	x	1.50	0.70	0.50	0.30	54	x
55	adia51	var	x	1.50	0.70	0.50	0.30	55	x
56	adia52	var	x	1.50	0.70	0.50	0.30	56	x
57	adia53	var	x	1.50	0.70	0.50	0.30	57	x
58	adia54	var	x	1.50	0.70	0.50	0.30	58	x
59	adia55	var	x	1.50	0.70	0.50	0.30	59	x
60	adib1	var	x	1.50	0.70	0.50	0.30	60	x
61	adib2	var	x	1.50	0.70	0.50	0.30	61	x
62	adib3	var	x	1.50	0.70	0.50	0.30	62	x
63	adib4	var	x	1.50	0.70	0.50	0.30	63	x
64	adib5	var	x	1.50	0.70	0.50	0.30	64	x
65	adib6	var	x	1.50	0.70	0.50	0.30	65	x

66	adib7	var	x	1.50		0.70	0.50	0.30	66	x	
67	adib8	var	x	1.50		0.70	0.50	0.30	67	x	
68	adib9	var	x	1.50		0.70	0.50	0.30	68	x	
69	adib10	var	x	1.50		0.70	0.50	0.30	69	x	
70	adic	var	x	1.50		0.70	0.50	0.30	70	x	
71	temp1	var	x	1.20	0.00	0.60	0.50	0.30	71		
72	temp2	var	x	1.20	0.00	0.60	0.50	0.30	72		
73	vent1	var	x	1.40		0.60	0.30	0.00			
74	vent2	var	x	1.40		0.60	0.30	0.00			
75	todas_v	tod	x	1.40					1		
76	pp_v	per	x	1.35					2		x
77	perm_v	per	x	1.40					3		
78	acid_v	var	x	1.50		0.70	0.50	0.30	4		

Num	prefixo	v0	s1	s2	s3	ca	ang	coti
73	vent1	45	1.10	i	1.10	1.50	90.0	
74	vent2	45	1.10	i	1.10	1.50	270.0	

```
Grupos de combinação [combpre.dat]
---------------------

Grupo elu1      "verificações de estado limite último - vigas e lajes"
   permacid     "permanentes, acidentais"
   acidcomb     "todas as acidentais combinadas"

Grupo elu2      "verificações de estado limite último - pilares e fundações"
   permacid     "permanentes, acidentais"
   acidcomb     "todas as acidentais combinadas"

Grupo fogo      "verificações em situação de incêndio"
   permvar      "todas permanentes e variáveis ponderadas"

Grupo els       "verificações de estado limite de serviço"
   cfreq        "combinações frequentes"
   cqperav      "combinações quase permanentes"

Grupo combflu   "cálculo de fluência (método geral)"
   combflu      "combinação para cálculo da fluência (método geral)"

Grupo atopro    "ato da protensão"
```

```
   atopro       "ato da protensão"

Grupo cqperm    "combinações quase permanentes"
   cqperm       "combinações quase permanentes"

Grupo cfreq     "combinações frequentes"
   cfreq        "combinações frequentes"

Grupo crara     "combinações raras"
   crara        "combinações raras"
```

12 Modelo Estrutural

12.1 Explicações

Na análise estrutural da obra de arte especial foi utilizado o 'modelo 6' do sistema tqs. Este modelo consiste em um único modelo de cálculo.

A obra de arte especial será modelada por um pórtico espacial único, composto por elementos que simularão as vigas, os pilares e as lajes da estrutura. Desta forma, além das vigas e pilares, as lajes passarão a resistir parte dos esforços gerados pelas cargas horizontais, situação está não flagrada em outros modelos do sistema tqs.

Os efeitos oriundos das ações verticais e horizontais nas vigas, pilares e lajes serão calculados com o pórtico espacial único.

12.2 Modelo estrutural dos pavimentos

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

A seguir são apresentados o tipo de modelo estrutural utilizado em cada um dos pavimentos:

Pavimento	***Descrição do modelo***	***Modelo estrutural***
Tabuleiro	Modelo de lajes planas	Pórtico (6 graus de liberdade)
Travessa	Modelo de lajes planas	Pórtico (6 graus de liberdade)
Fundação_1	Modelo de lajes planas	Pórtico (6 graus de liberdade)
Fundação	Modelo de lajes planas	Pórtico (6 graus de liberdade)

Para a avaliação das deformações dos níveis em serviço, também foram realizadas análises considerando a não linearidade física, onde através de incrementos de carga, as inércias reais das seções são estimadas considerando as armaduras de projeto e a fissuração nos estádios i, ii ou iii.

Os esforços obtidos dos modelos estruturais dos pavimentos foram utilizados para o dimensionamento das lajes à flexão e cisalhamento.

Nestes modelos foi utilizado o módulo de elasticidade secante do concreto. A seguir são apresentados os valores utilizados para cada um dos pavimentos:

Pavimento	***Módulo de elasticidade adotado (mpa)***
Tabuleiro	34279
Travessa	34279

Fundação_1	34279
Fundação	26838

12.3 Modelo estrutural global

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). A rigidez à flexão das lajes foi desprezada na análise de esforços horizontais.

Os pórticos espaciais foram modelados com todos os pavimentos da obra de arte especial, para a avaliação dos efeitos das ações horizontais e os efeitos de redistribuição de esforços em toda a estrutura devido aos carregamentos verticais.

As cargas verticais atuantes nas vigas e pilares do pórtico foram extraídas de modelos de grelha de cada um dos pavimentos.

Foram utilizados dois modelos de pórtico espacial em cada etapa construtiva: um específico para análises de estado limite último - elu e outro para o estado limite de serviço - els. As características de cada um destes modelos são apresentadas a seguir.

12.4 Critérios de projeto

A seguir são apresentadas algumas considerações de projeto utilizadas para a análise estrutura da obra de arte especial em questão:

- Flexibilização das ligações viga/pilar : sim;
- Modelo enrijecido para viga de transição: sim
- Método para análise de 2ª. Ordem global: gamaz
- Análise por efeito incremental: não

12.5 Modelo ELU

O modelo ELU foi utilizado para obtenção dos esforços necessários para o dimensionamento e detalhamento dos elementos estruturais.

Nos elementos de concreto moldados no local foram utilizados os coeficientes de não linearidade física conforme apresentados na tabela a seguir:

Elemento estrutural moldado no local	*Coef. Nlf*
Pilares	0.80
Vigas	0.40
Lajes	0.30

Nos elementos de concreto pré-moldado foram utilizados os coeficientes de não linearidade física conforme apresentados na tabela a seguir:

Elemento estrutural pré-moldado	Coef. NIf
Vigas protendidas	0.80
Lajes	0.25

O módulo de elasticidade utilizado no modelo foi o secante, de acordo com o fck do elemento estrutural.

12.6 Modelo ELS

O modelo ELS foi utilizado para análise de deslocamento da obra de arte especial. Neste modelo a inércia utilizada para os elementos estruturais foi a bruta.

12.7 Deformação excessiva

Foi verificado conforme seção 13, item 13.3 da nbr 6118:2014.

12.8 Abertura de fissuras

Foi verificado conforme seção 13, item 13.4 da nbr 6118:2014.

12.9 Verificação quanto a fadiga

Foi verificado conforme seção 23, itens 23.5.3, 23.5.4 e 23.5.5 da nbr 6118:2014.

12.10 Consideração das fundações

Todas as fundações foram consideradas rigidamente conectadas à base.

12.11 Esforços de cálculo

Os esforços obtidos na análise de pórtico foram utilizados para o dimensionamento dos elementos estruturais.

No dimensionamento das armaduras das vigas é utilizada uma envoltória de esforços solicitantes de todas as combinações pertencentes ao grupo elu1. Para o dimensionamento de armaduras dos pilares são utilizadas todas as hipóteses de solicitações (combinações do grupo elu2).

13 Parâmetros Qualitativos

13.1 Padronização de elementos

A seguir são apresentados os elementos e suas variações para cada um dos pavimentos.

Pavimentos	*Pilares*	*Vigas*	*Lajes*
Tabuleiro	2 / 1	33 / 4	5 / 2
Travessa	2 / 1	6 / 2	2 / 1
Fundação_1	2 / 1	0 / 0	0 / 0
Fundação	2 / 1	0 / 0	0 / 0

Na tabela anterior são apresentados os números de elementos do pavimento e o número de variações (seções ou espessuras diferentes).

13.2 Densidade de pilares e vãos médios

A seguir é apresentada a densidade de pilares e vãos médios das vigas e lajes.

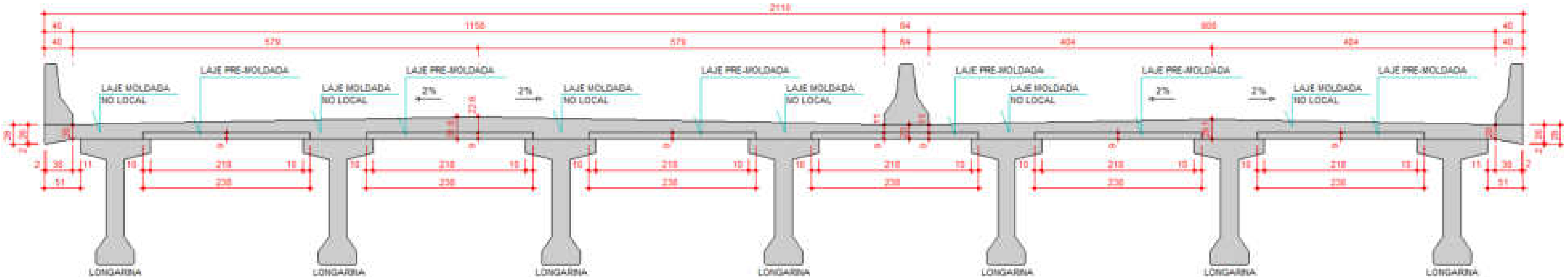
Pavimentos	*Densidade de pilares (m²)*	*Vigas (m)*	*Lajes (m)*
Tabuleiro	940.53	22.62	3.18
Travessa	203.22	5.28	4.52
Fundação_1	1.9	0.0	0.0
Fundação	0.0	0.0	0.0

A densidade de pilares é a razão da área do pavimento pelo número de pilares existentes neste pavimento.

14 Memorial De Cálculo De Lajes

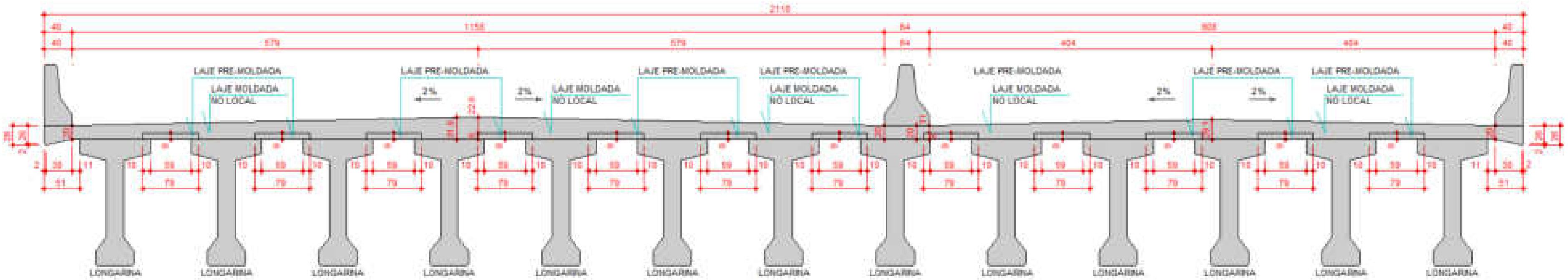
14.1 Geometria

14.1.1 L1 / I2



Todas as lajes possuem 6 vãos de 318 cm e 2 balanços de 101 cm, todos com continuidade e altura variando de 20 cm a 31.6 cm.

14.1.2 L3

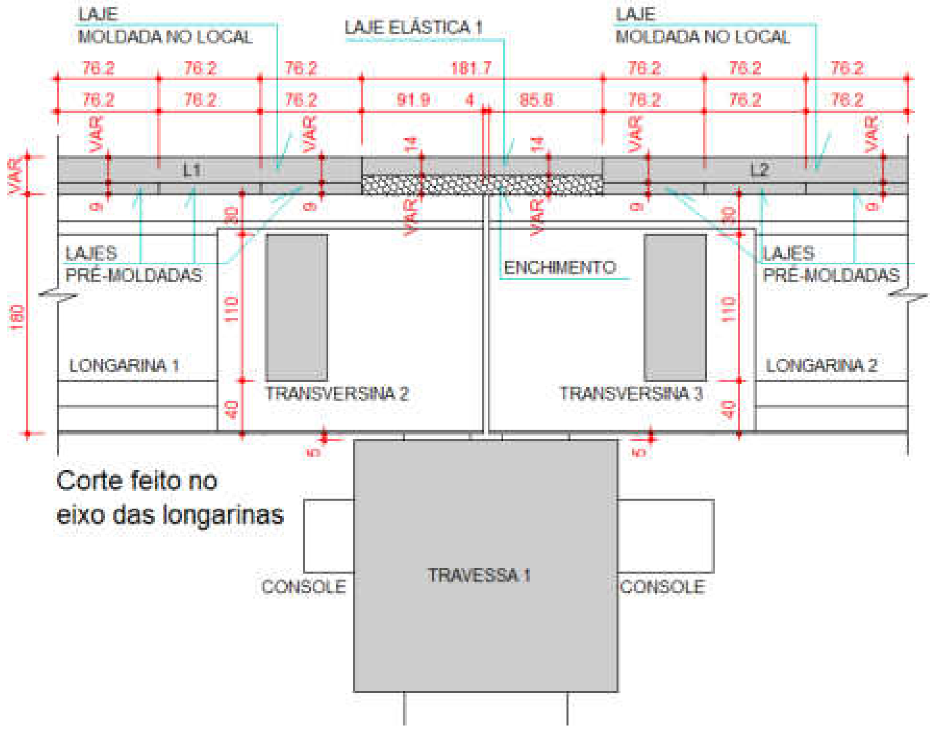


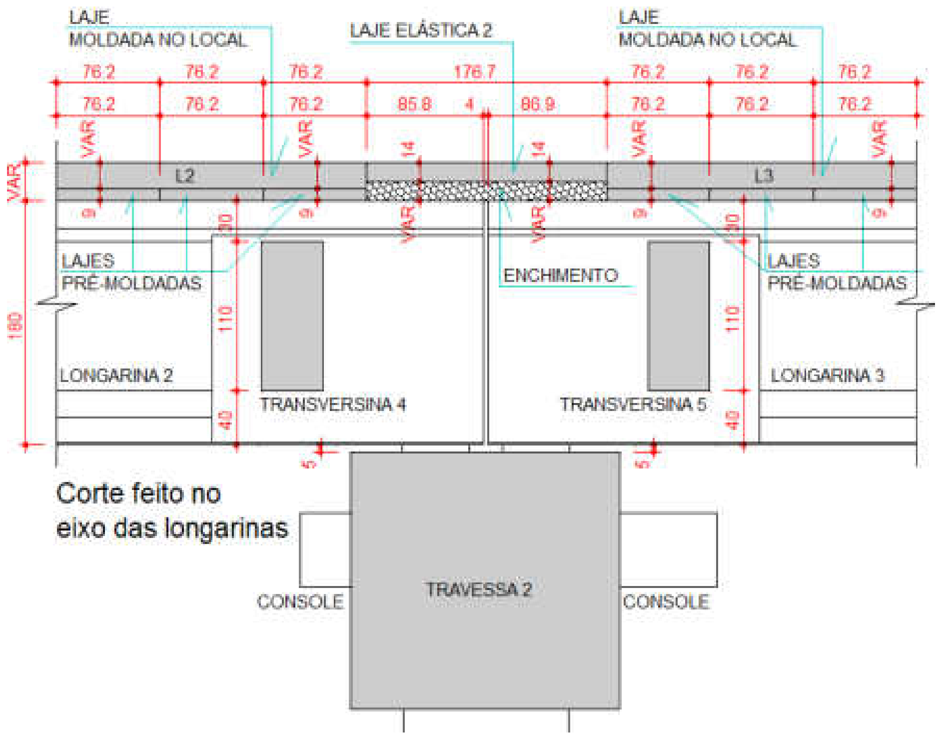
A laje possui 12 vãos de 159 cm e 2 balanços de 101 cm, todos com continuidade e altura variando de 20 cm a 31.6 cm.

14.1.3 La1=la2

Todas as lajes possuem um vão de 400 cm com os apoios articulados e altura de 30 cm.

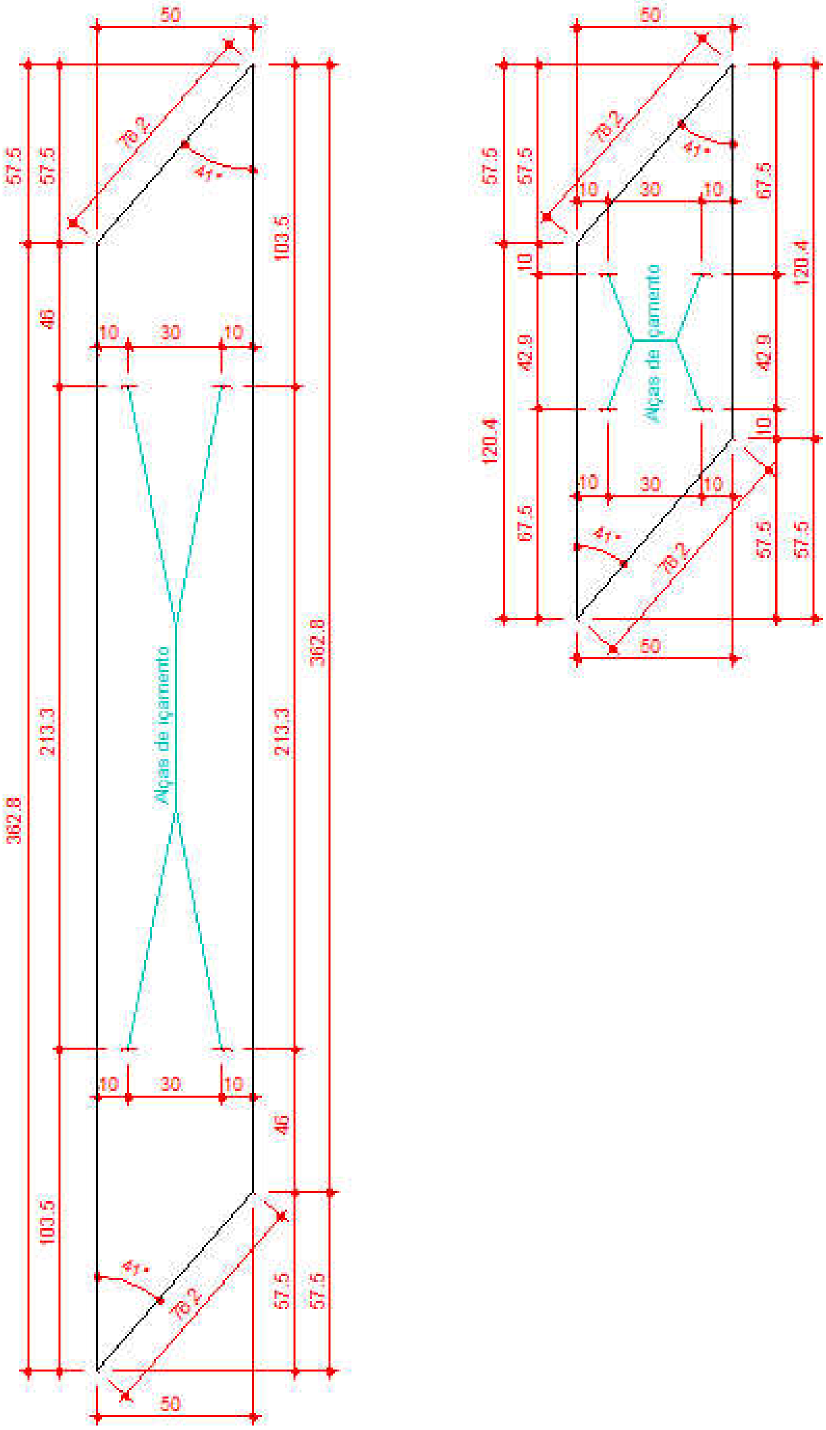
14.1.4 Laje elástica 1 / laje elástica 2





As lajes elásticas possuem 14 cm de altura e 181.7 cm e 176.7 cm de comprimento, sobre os dois pórticos internos.

14.1.5 Lp1 / lp2



As lajes pré-moldadas são bi apoiadas e articuladas com vãos de 347.5 cm e 105.2 cm, todas com altura de 9 cm.

Lp1 - 384 peças de 50x362.8 cm. / lp2 - 564 peças de 50x120.4 cm.

14.2 Esforços

Todos os esforços são de cálculo.

14.2.1 L1 / l2

Momento positivo principal máximo = 4.429 tf.m/m

Momento positivo secundário máximo = 5.143 tf.m/m

Momento negativo principal máximo = -5.670 tf.m/m

Momento negativo secundário máximo = -6.550 tf.m/m

14.2.2 L3

Momento positivo principal máximo = 4.286 tf.m/m

Momento positivo secundário máximo = 5.429 tf.m/m

Momento negativo principal máximo = -5.448 tf.m/m

Momento negativo secundário máximo = -6.919 tf.m/m

14.2.3 Laje elástica 1 / laje elástica 2

Momento positivo principal máximo = 5.923 tf.m/m

Momento positivo secundário máximo = 3.715 tf.m/m

Momento negativo principal máximo = -5.715 tf.m/m

Momento negativo secundário máximo = -4.270 tf.m/m

14.2.4 La1 / la2

Momento positivo principal máximo = 20.286 tf.m/m

Momento positivo secundário máximo = 7.143 tf.m/m

Momento negativo principal máximo = -12.286 tf.m/m

Momento negativo secundário máximo = -13.715 tf.m/m

14.2.5 Lp1

Para etapa de saque e içamento:

Momento positivo principal máximo = 0.120 tf.m/m

Momento positivo secundário máximo = 0.000 tf.m/m

Momento negativo principal máximo = -0.160 tf.m/m

Momento negativo secundário máximo = -0.000 tf.m/m

Para etapa de utilização:

Momento positivo principal máximo = 1.950 tf.m/m

Momento positivo secundário máximo = 0.000 tf.m/m

Momento negativo principal máximo = -0.000 tf.m/m

Momento negativo secundário máximo = -0.000 tf.m/m

14.2.6 Lp2

Para etapa de saque e içamento:

Momento positivo principal máximo = 0.000 tf.m/m

Momento positivo secundário máximo = 0.000 tf.m/m

Momento negativo principal máximo = -0.090 tf.m/m

Momento negativo secundário máximo = -0.000 tf.m/m

Para etapa de utilização:

Momento positivo principal máximo = 0.200 tf.m/m

Momento positivo secundário máximo = 0.000 tf.m/m

Momento negativo principal máximo = -0.000 tf.m/m

Momento negativo secundário máximo = -0.000 tf.m/m

14.3 Detalhamento

14.3.1 L1 / l2

Todas as lajes possuem altura variável, a seguir está indicada a altura na seção mais solicitada. Como as armaduras de distribuição positivas ficam acima das lajes pré-moldadas foi considerada uma altura útil de 10 cm no cálculo.

Área de aço principal positiva = 6.58 cm² = ø 10.0 c/10.0 cm - h = 20 cm

Área de aço secundária positiva = 12.25 cm² = ø 12.5 c/10.0 cm - h = 20 cm

Área de aço principal negativa = 7.98 cm² = ø 12.5 c/14.0 cm - h = 21 cm

Área de aço secundária negativa = 9.26 cm² = ø 12.5 c/12.5 cm - h = 21 cm

14.3.2 L3

Todas as lajes possuem altura variável, a seguir está indicada a altura na seção mais solicitada. Como as armaduras de distribuição positivas ficam acima das lajes pré-moldadas foi considerada uma altura útil de 10 cm no cálculo.

Área de aço principal positiva = 5.97 cm² = ø 10.0 c/12.5 cm - h = 21 cm

Área de aço secundária positiva = 6.71 cm² = ø 10.0 c/11.0 cm - h = 29 cm

Área de aço principal negativa = 7.64 cm² = ø 12.5 c/14.0 cm - h = 21 cm

Área de aço secundária negativa = 9.81 cm² = ø 12.5 c/12.5 cm - h = 21 cm

14.3.3 Laje elástica 1 / laje elástica 2

Todas as lajes possuem 14 cm de altura.

Área de aço principal positiva = 15.55 cm² = ø 16.0 c/12.5 cm

Área de aço secundária positiva = 9.22 cm² = ø 12.5 c/12.5 cm

Área de aço principal negativa = 14.91 cm² = ø 16.0 c/12.5 cm

Área de aço secundária negativa = 10.74 cm² = ø 12.5 c/11.0 cm

14.3.4 La1 / la2

Todas as lajes possuem 30 cm de altura.

Área de aço principal positiva = 19.93 cm² = ø 16.0 c/10.0 cm

Área de aço secundária positiva = 6.72 cm² = ø 10.0 c/11.0 cm

Área de aço principal negativa = 11.74 cm² = ø 12.5 c/10.0 cm

Área de aço secundária negativa = 13.17 cm² = ø 16.0 c/14.0 cm

14.3.5 Lp1

Todas as lajes possuem 9 cm de altura.

Área de aço principal positiva = 8.41 cm² = ø 12.5 c/14.0 cm

Área de aço secundária positiva = 1.69 cm² = ø 6.3 c/15.0 cm

Os esforços negativos são quase nulos, logo as armaduras positivas já são suficientes.

As treliças tr 16745 são para solidarização das lajes pré-moldadas com as lajes moldadas no local, logo são de extrema importância para o conjunto.

14.3.6 Lp2

Todas as lajes possuem 9 cm de altura.

Área de aço principal positiva = 2.10 cm² = ø 6.3 c/14.0 cm

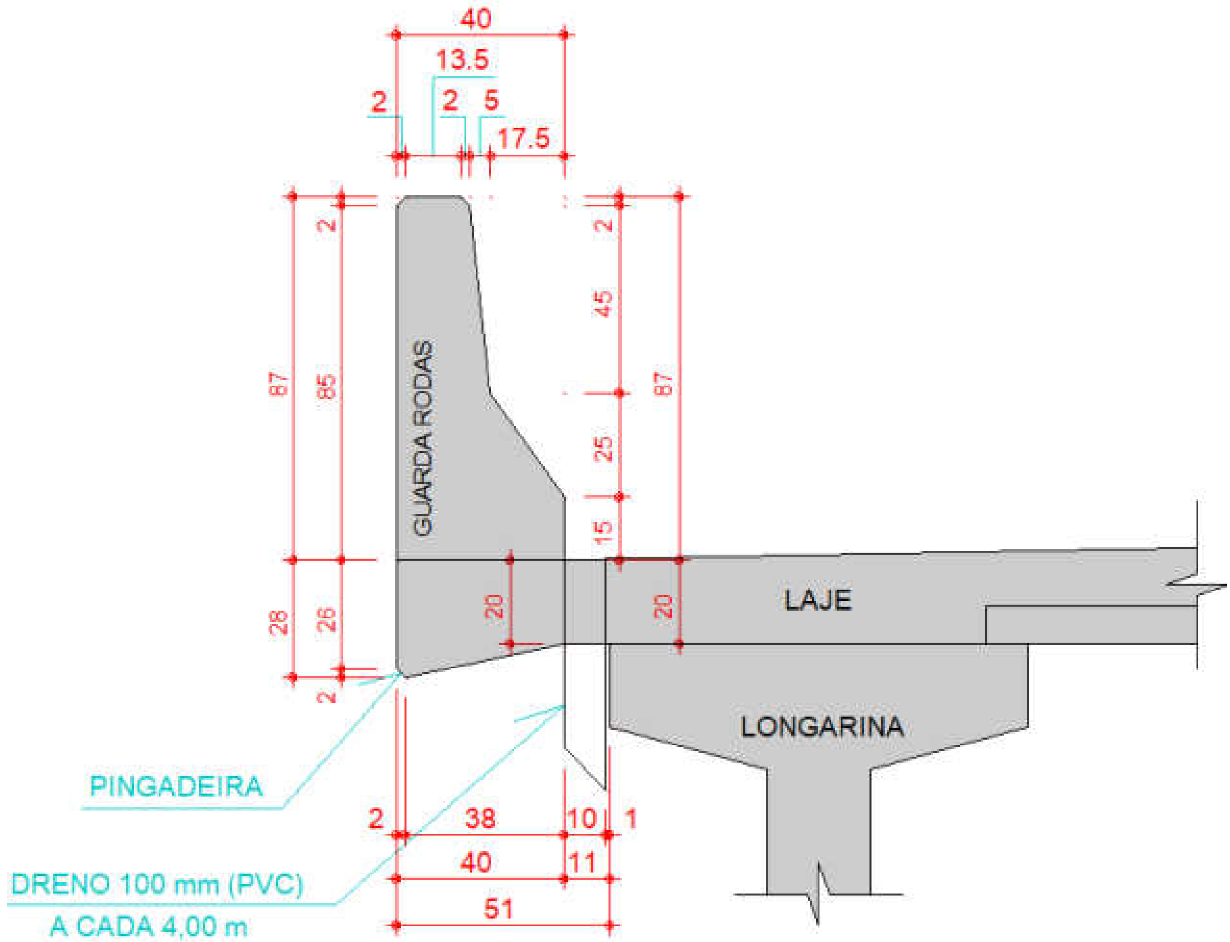
Área de aço secundária positiva = 1.05 cm² = ø 6.3 c/25.0 cm

As armaduras das lajes pré-moldadas são inferiores as armaduras positivas principais das lajes do tabuleiro, logo serão usadas as armaduras das lajes do tabuleiro.

Os esforços negativos são quase nulos, logo as armaduras positivas já são suficientes.

As treliças tr 16745 são para solidarização das lajes pré-moldadas com as lajes moldadas no local, logo são de extrema importância para o conjunto.

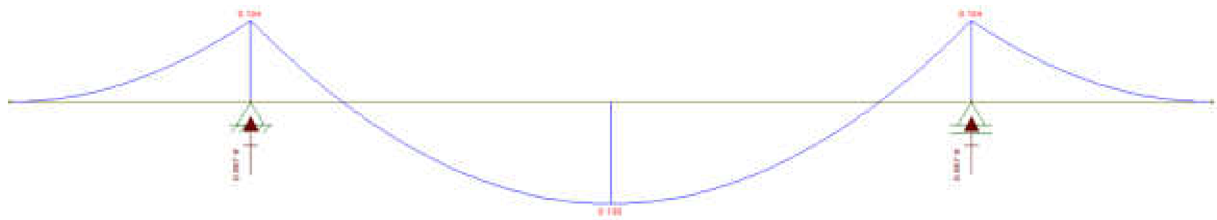
15 Guarda Rodas



Para o cálculo dos esforços de utilização do guarda-rodas foi adotada uma força horizontal p=6 tf/m aplicada no topo do guarda rodas conforme a nbr 7187. Essa força resulta no momento de 5.22 tf.m/m.

Logo temos uma armadura de ø 10.0 c/15.0 para estribos.

Para saque e içamento os momentos negativos são de 0.104 tf.m e o momento positivo é de 0.130 tf.m



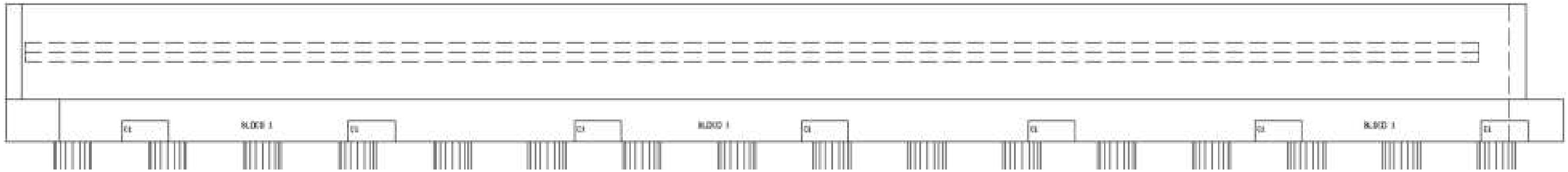
Como a armadura mínima é superior à armadura devido ao esforço, usamos armadura mínima tanto para positiva quanto para negativa.

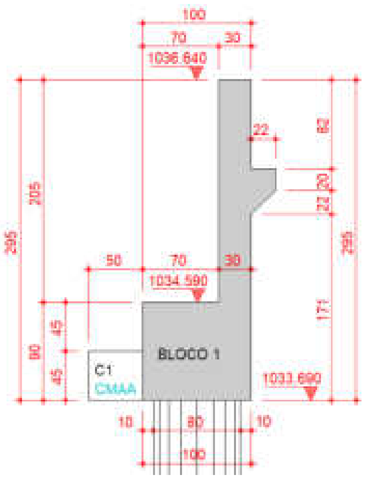
16 Memorial De Cálculo Das Vigas

16.1 Geometria

16.1.1 Bloco 1

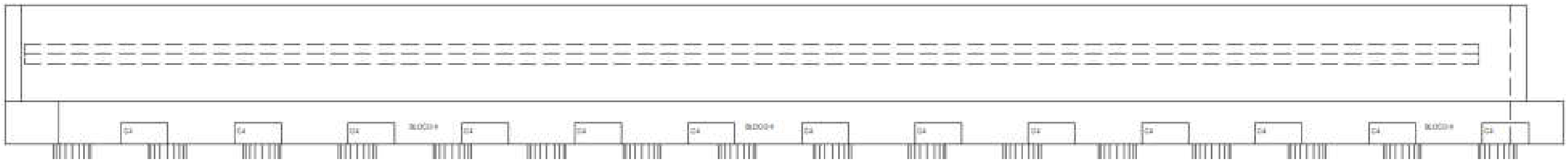
Bloco composto por 15 vãos de 203 cm e dois balanços de 85.6 cm, totalizando 3216.2 cm de comprimento, apoiada sobre 16 estacas e1 do tipo hélice contínua de 80 cm de diâmetro. O bloco possui seção em "I", 7 consoles c1 para troca dos aparelhos de apoio e um console linear para apoio da laje de aproximação.

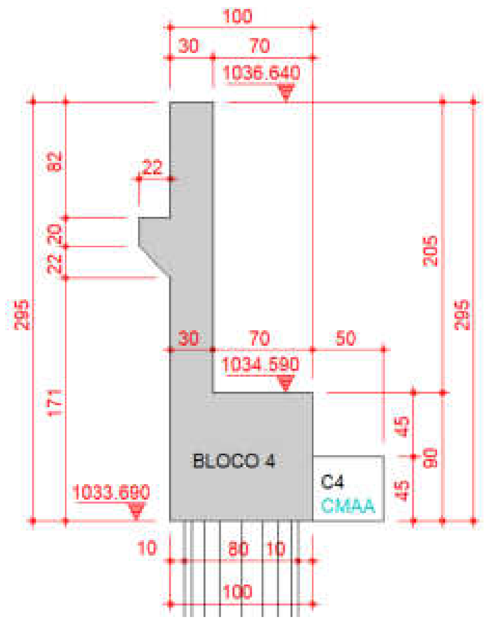




16.1.2 Bloco 4

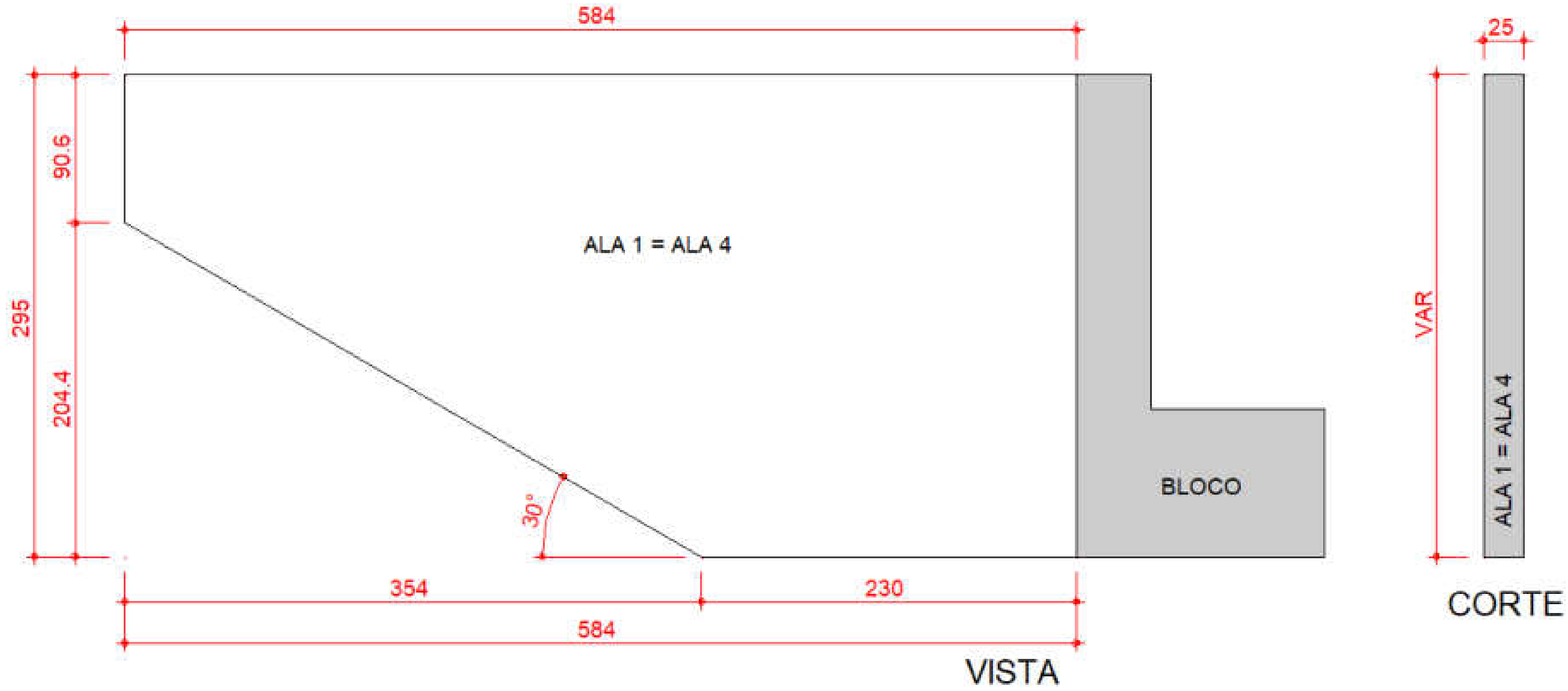
Bloco composto por 15 vãos de 203 cm e dois balanços de 85.6 cm, totalizando 3216.2 cm de comprimento, apoiada sobre 16 estacas e4 do tipo hélice contínua de 80 cm de diâmetro. O bloco possui seção em “I”, 13 consoles c4 para troca dos aparelhos de apoio e um console linear para apoio da laje de aproximação.





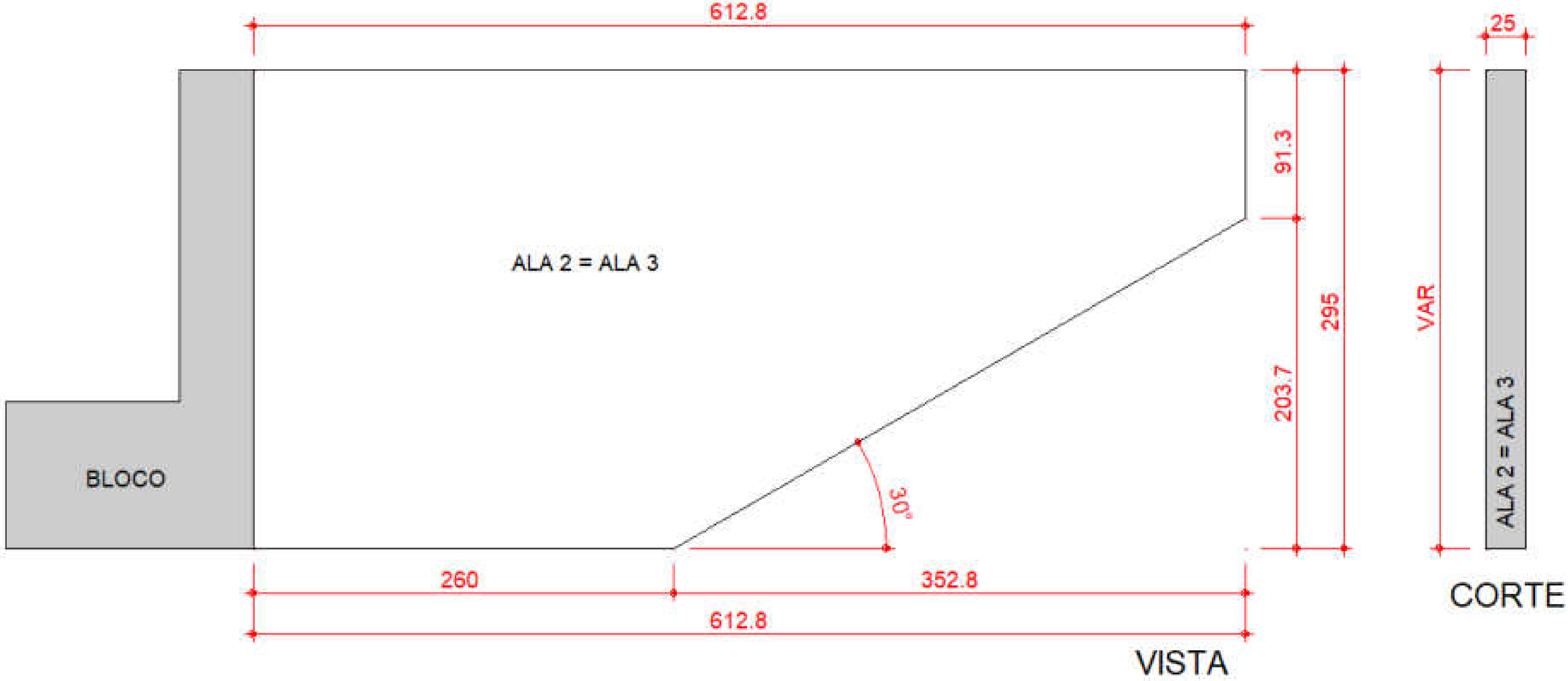
16.1.3 Ala 1 = ala 4

As alas 1 e 4 são vigas engastadas nos blocos em “I” com 584 cm de comprimento para contenção do solo nos encontros do viaduto, possuem 25 cm de base e altura variando de 295 cm até 90.6 cm.



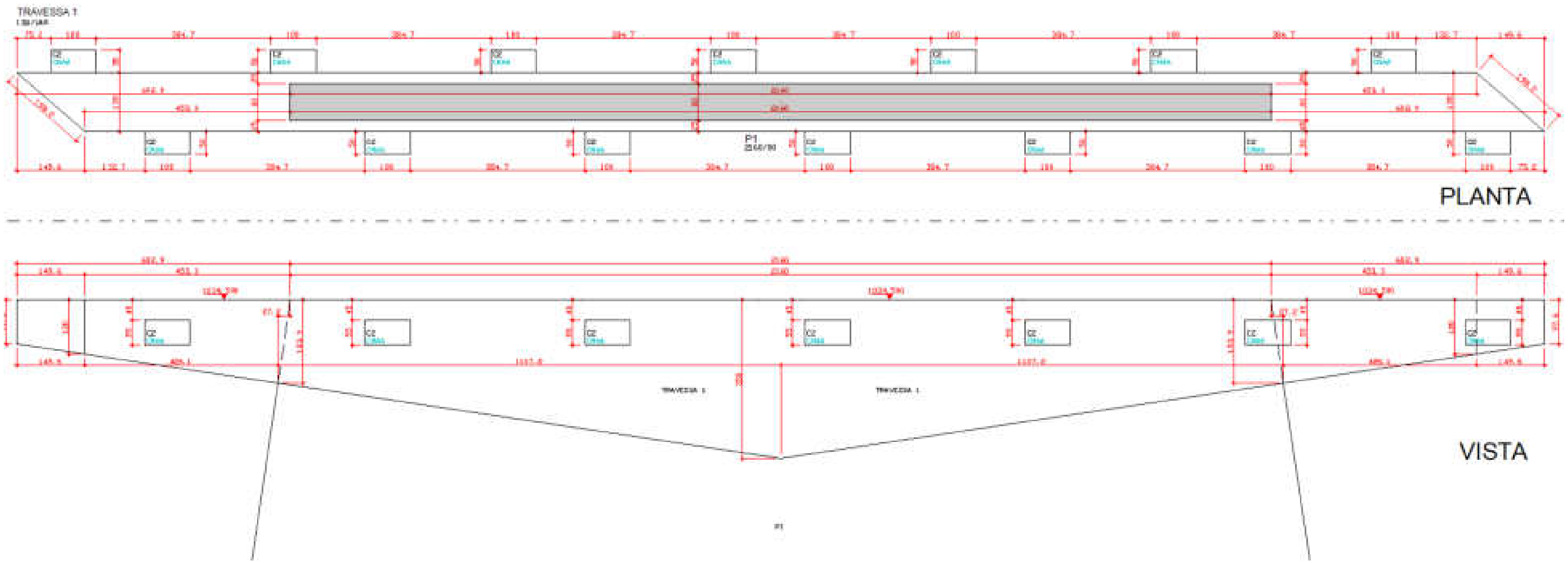
16.1.4 Ala 2 = ala 3

As alas 2 e 3 são vigas engastadas nos blocos em “I” com 612.8 cm de comprimento para contenção do solo nos encontros do viaduto, possuem 25 cm de base e altura variando de 295 cm até 91.3 cm.



16.1.5 Travessa 1

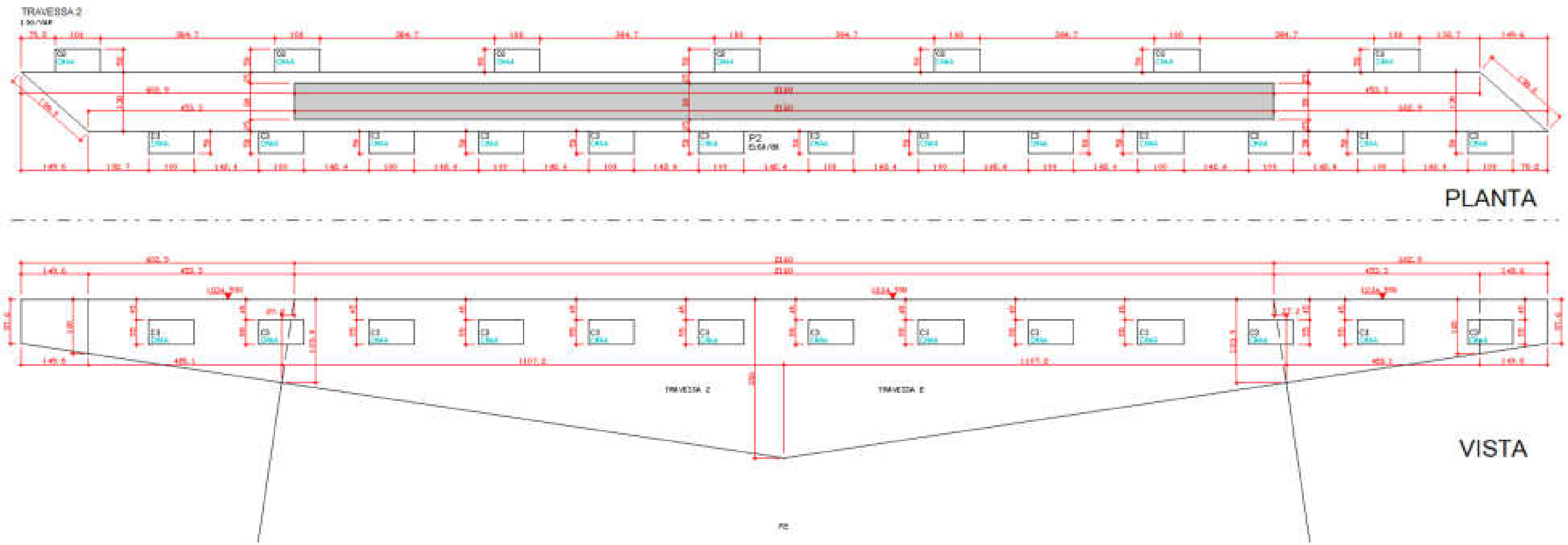
Travessa composta por dois balanços de 602.9 cm e 3216.2 cm de comprimento, apoiada sobre um pilar retangular com seção de 2160x80 cm. A travessa possui seção com base de 130 cm, altura variando de 97.6 cm até 350 cm e 14 consoles c2 para troca dos aparelhos de apoio.



16.1.6 Travessa 2

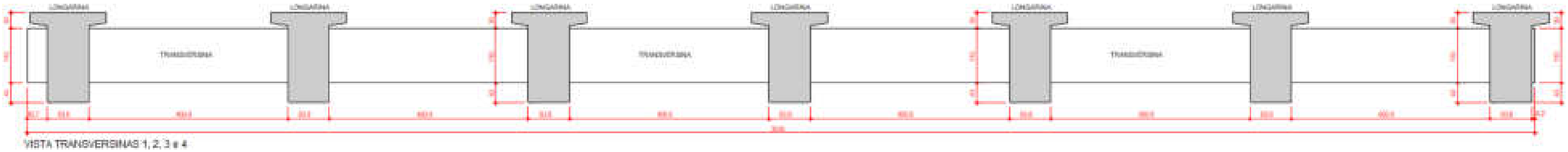
Travessa composta por dois balanços de 602.9 cm e 3216.2 cm de comprimento, apoiada sobre um pilar retangular com seção de 2160x80 cm.

A travessa possui seção com base de 130 cm, altura variando de 97.6 cm até 350 cm, 7 consoles c2 e 13 consoles c3 para troca dos aparelhos de apoio.



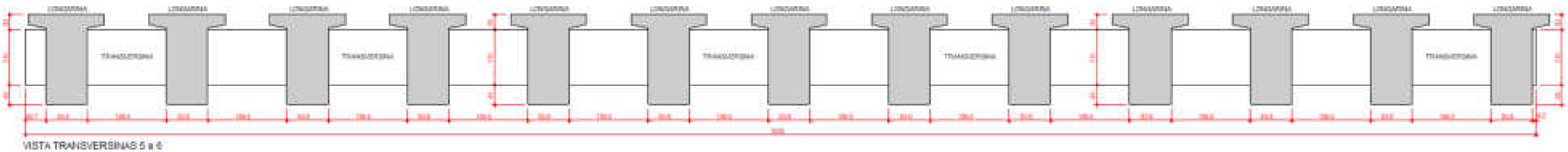
16.1.7 Transversinas 1, 2, 3 e 4

As transversinas são vigas retangulares de 30x110 cm, com 6 vãos de 484.7 cm e 2 balanços de 65.4 cm, comprimento de 3039 cm, localizadas sobre as travessas e blocos.



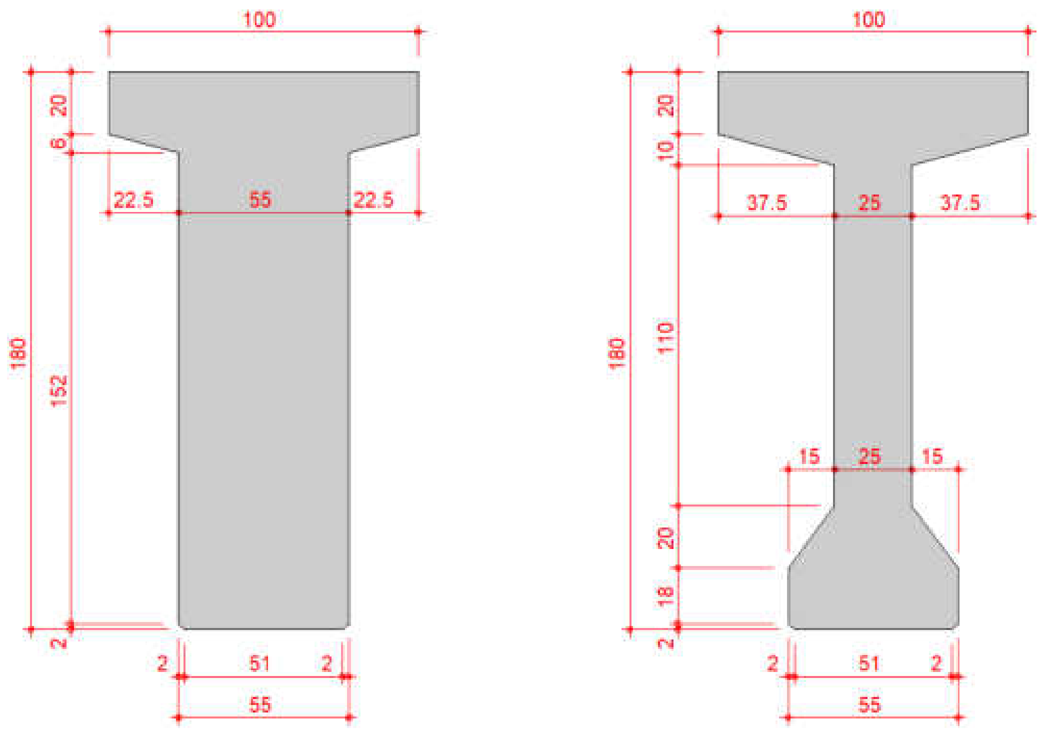
16.1.8 Transversinas 5 e 6

As transversinas são vigas retangulares de 30x110 cm, com 12 vãos de 242.4 cm e 2 balanços de 65.1 cm, comprimento de 3039 cm, localizadas sobre as travessas e blocos.



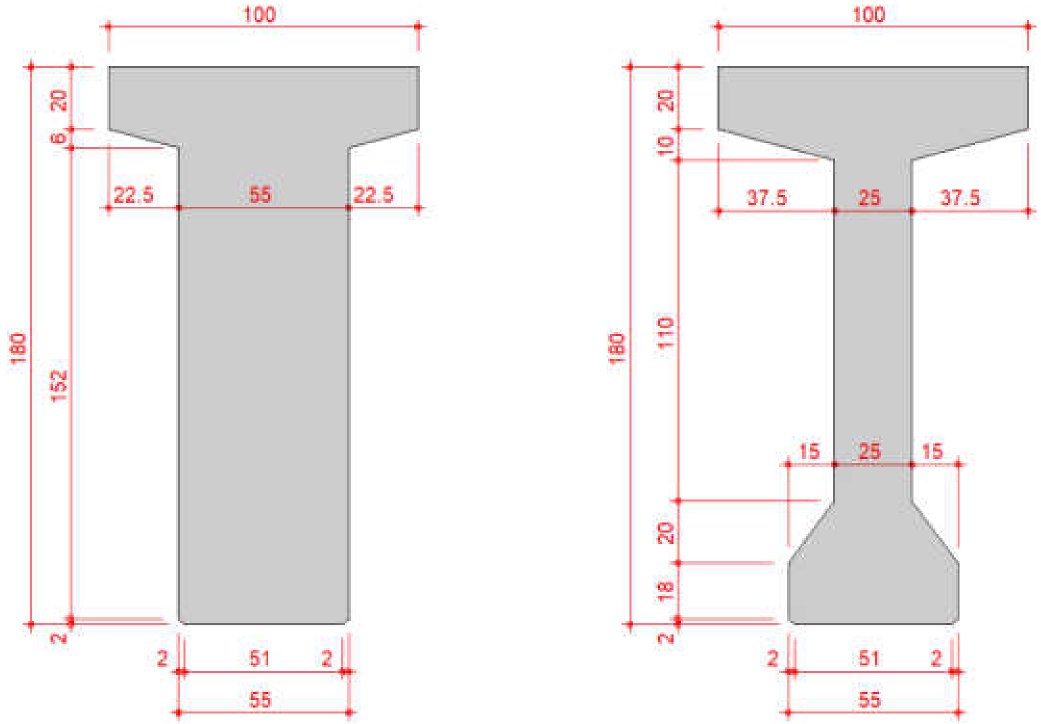
16.1.9 Longarina 1

Vigas com 26.068 m de comprimento e seção variável. As extremidades são em seção do tipo “t” com 4.575 m e o meio em seção do tipo “i” com 21.493 cm.



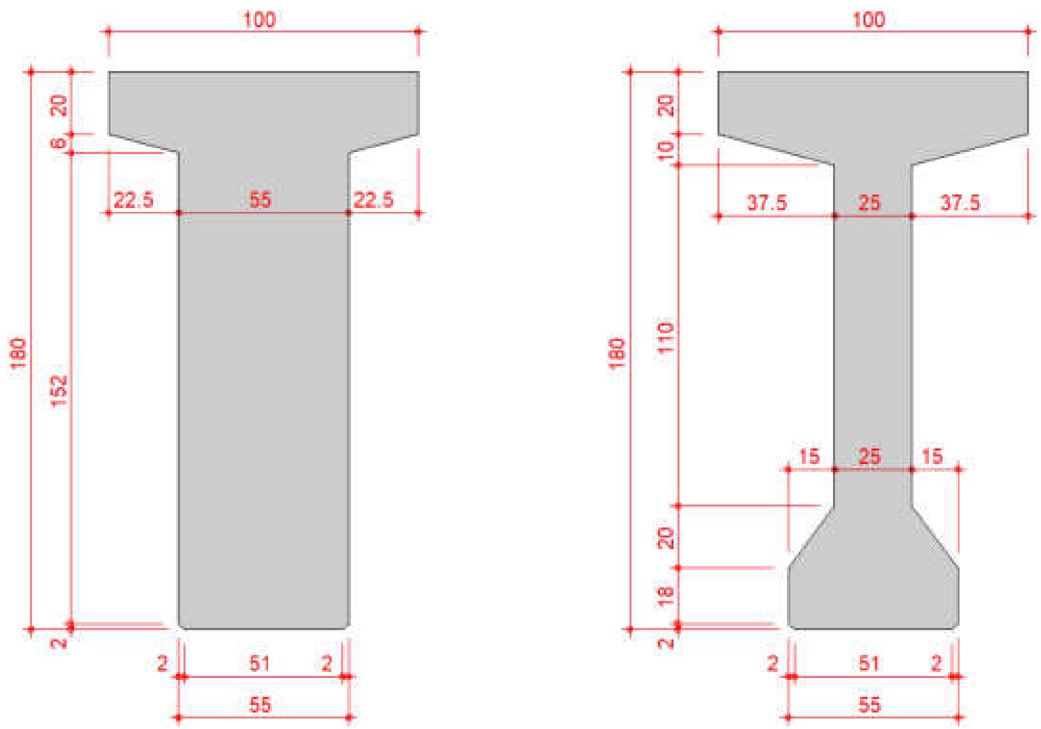
16.1.10 Longarina 2

Vigas com 25.34 m de comprimento e seção variável. As extremidades são em seção do tipo “t” com 4.00 m e o meio em seção do tipo “i” com 21.34 cm.



16.1.11 Longarina 3

Vigas com 36.687 m de comprimento e seção variável. As extremidades são em seção do tipo “t” com 4.575 m e o meio em seção do tipo “i” com 32.112 cm.


100
20
6
22.5
55
22.5
180
152
2
2
51
2
55
100
20
10
37.5
25
37.5
180
110
15
25
15
20
18
2
2
51
2
55

16.2 Envoltórias dos esforços

Esforços de cálculo

16.2.1 Legenda

Q mn. – cortante mínimo / m mn. – momento mínimo / q mx. Cortante máximo / m mx. – momento máximo / mt mx. – momento torsor máximo

16.3 Etapa de troca do aparelho de apoio

16.3.1 Bloco 1

```
        viga =   201 - bloco 1
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
```

vao	comprim.	Largura	altura	b colab.s.	b colab.i.	tipo secao	esp.lj.s.	esp.lj.i.	fc sp eixo	fc lt eixo
1b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
2	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
3	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
4	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
5	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
6	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
7	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
8	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
9	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
10	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
11	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
12	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500

13	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
14	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
15	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
16	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
17b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	-24.134	-24.271	-24.408	-24.544	-24.681	-24.817	-24.954	-25.091	-25.227	-25.364	-25.501	-25.637	-25.774
Q mn. Vao= 2	33.242	32.792	32.342	31.891	32.580	32.130	31.680	31.294	30.844	31.453	-60.700	-61.150	-61.601
Q mn. Vao= 3	8.551	8.100	9.196	8.746	8.295	7.578	7.128	6.329	5.879	5.428	6.201	5.751	5.301
Q mn. Vao= 4	2.607	2.157	1.707	2.803	2.352	1.628	1.178	0.727	0.046	-0.404	0.899	0.449	-0.002
Q mn. Vao= 5	-9.359	-9.809	-10.259	-9.257	-9.708	-10.158	-10.933	-11.383	-12.061	-12.511	-12.940	-11.577	-12.027
Q mn. Vao= 6	9.021	8.571	8.120	7.670	8.258	7.807	7.032	6.582	6.132	6.051	5.601	5.151	4.700
Q mn. Vao= 7	32.981	32.530	32.080	31.630	31.738	31.288	30.838	-57.069	-57.519	-56.906	-57.357	-57.807	-58.257
Q mn. Vao= 8	7.985	7.535	8.902	8.451	8.001	7.287	6.837	6.019	5.569	5.119	6.037	5.587	5.136
Q mn. Vao= 9	9.174	8.724	8.274	9.558	9.107	8.425	7.974	7.524	6.872	6.421	7.817	7.366	6.916
Q mn. Vao=10	-4.288	-4.738	-5.188	-4.121	-4.571	-5.022	-5.786	-6.236	-6.905	-7.355	-7.784	-6.380	-6.831
Q mn. Vao=11	12.386	11.936	11.485	11.035	11.656	11.206	10.450	9.999	9.549	9.485	9.034	8.584	8.134
Q mn. Vao=12	56.777	56.327	55.877	55.427	-40.678	-41.128	-41.579	-42.251	-42.702	-42.165	-42.615	-43.066	-43.516
Q mn. Vao=13	5.930	5.480	6.744	6.294	5.844	5.079	4.629	3.771	3.321	2.871	3.785	3.335	2.884
Q mn. Vao=14	23.359	22.908	22.458	23.787	23.336	22.651	22.201	21.750	21.159	-64.215	-62.561	-63.011	-63.461
Q mn. Vao=15	2.087	1.636	1.186	2.642	2.192	1.741	1.297	0.847	0.528	0.078	-0.351	1.325	0.874
Q mn. Vao=16	11.511	11.061	10.610	10.160	11.813	11.362	12.330	11.880	11.429	6.355	5.905	5.455	5.004
Q mn. Vao=17b	17.267	17.130	18.159	18.023	17.886	17.749	17.613	17.476	17.339	17.203	17.066	16.929	16.793

M mn. Vao= 1b	-42.728	-43.816	-44.911	-46.013	-47.120	-48.233	-49.353	-50.479	-51.611	-52.749	-53.893	-55.044	-56.200
M mn. Vao= 2	-31.448	-26.553	-21.724	-16.963	-12.236	-7.440	-2.710	1.954	6.559	11.156	10.262	1.232	-7.867
M mn. Vao= 3	-10.741	-9.506	-8.305	-6.975	-5.711	-4.535	-3.445	-2.443	-1.538	-0.700	0.236	1.122	1.942

M mn. Vao= 4	-2.994	-2.641	-2.354	-1.982	-1.600	-1.285	-1.077	-0.936	-0.899	-0.926	-0.899	-0.799	-0.766
M mn. Vao= 5	10.820	9.400	7.913	6.405	5.000	3.528	1.961	0.307	-1.435	-3.256	-5.143	-6.832	-8.581
M mn. Vao= 6	-9.756	-8.452	-7.214	-6.044	-4.823	-3.632	-2.522	-1.513	-0.570	0.346	1.210	2.007	2.738
M mn. Vao= 7	-4.360	0.499	5.289	10.011	14.694	19.366	23.971	22.282	13.794	5.291	-3.176	-11.712	-20.315
M mn. Vao= 8	-12.302	-11.151	-10.028	-8.741	-7.520	-6.387	-5.340	-4.383	-3.523	-2.730	-1.823	-0.961	-0.167
M mn. Vao= 9	-4.984	-3.656	-2.395	-1.033	0.351	1.669	2.884	4.033	5.079	6.064	7.109	8.235	9.293
M mn. Vao=10	2.092	1.423	0.687	-0.064	-0.708	-1.419	-2.228	-3.120	-4.097	-5.154	-6.278	-7.196	-8.176
M mn. Vao=11	-12.081	-10.278	-8.542	-6.872	-5.150	-3.455	-1.840	-0.324	1.125	2.550	3.923	5.229	6.468
M mn. Vao=12	2.237	10.621	18.938	27.188	27.491	21.429	15.301	9.078	2.783	-3.524	-9.808	-16.159	-22.577
M mn. Vao=13	-11.484	-10.638	-9.821	-8.854	-7.954	-7.145	-6.425	-5.797	-5.270	-4.811	-4.235	-3.707	-3.246
M mn. Vao=14	-8.972	-5.542	-2.179	1.292	4.786	8.216	11.541	14.799	17.959	17.976	8.573	-0.735	-10.110
M mn. Vao=15	-5.820	-5.544	-5.335	-5.134	-4.776	-4.484	-4.259	-4.100	-4.010	-3.965	-3.987	-3.775	-3.612
M mn. Vao=16	-6.204	-4.531	-2.924	-1.385	0.282	2.000	3.686	5.481	7.209	8.200	9.108	9.951	10.726
M mn. Vao=17b	33.292	34.065	34.883	35.697	36.504	37.306	38.101	38.891	39.674	40.451	41.221	41.986	42.744
Q mx. Vao= 1b	-24.134	-24.271	-24.407	-24.544	-24.681	-24.817	-24.954	-25.091	-25.227	-25.364	-25.501	-25.637	-25.774
Q mx. Vao= 2	33.245	32.794	32.344	31.894	32.583	32.132	31.682	31.296	30.846	31.456	-60.688	-61.138	-61.589
Q mx. Vao= 3	8.552	8.101	9.197	8.747	8.296	7.579	7.129	6.330	5.880	5.429	6.202	5.752	5.301
Q mx. Vao= 4	2.608	2.157	1.707	2.803	2.353	1.629	1.178	0.728	0.046	-0.404	0.899	0.449	-0.001
Q mx. Vao= 5	-9.355	-9.805	-10.256	-9.254	-9.704	-10.155	-10.929	-11.380	-12.058	-12.508	-12.937	-11.573	-12.024
Q mx. Vao= 6	9.022	8.572	8.121	7.671	8.259	7.808	7.033	6.583	6.133	6.052	5.602	5.152	4.701
Q mx. Vao= 7	33.001	32.551	32.101	31.650	31.759	31.309	30.858	-57.034	-57.484	-56.871	-57.321	-57.772	-58.222
Q mx. Vao= 8	7.990	7.540	8.907	8.457	8.006	7.292	6.842	6.025	5.574	5.124	6.042	5.592	5.142
Q mx. Vao= 9	9.180	8.729	8.279	9.563	9.113	8.430	7.980	7.529	6.877	6.427	7.822	7.372	6.922
Q mx. Vao=10	-4.287	-4.738	-5.188	-4.121	-4.571	-5.022	-5.785	-6.236	-6.905	-7.355	-7.784	-6.380	-6.831
Q mx. Vao=11	12.388	11.938	11.488	11.037	11.659	11.208	10.452	10.002	9.551	9.487	9.037	8.586	8.136
Q mx. Vao=12	56.799	56.348	55.898	55.448	-40.664	-41.114	-41.564	-42.237	-42.687	-42.151	-42.601	-43.051	-43.501
Q mx. Vao=13	5.933	5.483	6.747	6.297	5.847	5.082	4.632	3.774	3.324	2.873	3.788	3.337	2.887

Q mx. Vao=14	23.360	22.909	22.459	23.788	23.338	22.652	22.202	21.751	21.160	-64.213	-62.559	-63.009	-63.459
Q mx. Vao=15	2.087	1.637	1.186	2.642	2.192	1.742	1.297	0.847	0.528	0.078	-0.351	1.325	0.875
Q mx. Vao=16	11.511	11.061	10.611	10.160	11.813	11.362	12.330	11.880	11.429	6.355	5.905	5.455	5.004
Q mx. Vao=17b	17.267	17.130	18.159	18.023	17.886	17.749	17.613	17.476	17.339	17.203	17.066	16.929	16.793
M mx. Vao= 1b	-42.728	-43.816	-44.911	-46.013	-47.120	-48.233	-49.353	-50.479	-51.611	-52.749	-53.893	-55.044	-56.200
M mx. Vao= 2	-31.447	-26.552	-21.724	-16.963	-12.235	-7.439	-2.708	1.955	6.561	11.158	10.264	1.232	-7.865
M mx. Vao= 3	-10.739	-9.505	-8.304	-6.974	-5.710	-4.535	-3.445	-2.443	-1.538	-0.699	0.236	1.123	1.942
M mx. Vao= 4	-2.993	-2.640	-2.354	-1.981	-1.599	-1.284	-1.076	-0.935	-0.898	-0.925	-0.898	-0.798	-0.765
M mx. Vao= 5	10.825	9.404	7.916	6.408	5.003	3.530	1.963	0.309	-1.434	-3.255	-5.143	-6.831	-8.580
M mx. Vao= 6	-9.754	-8.450	-7.213	-6.042	-4.822	-3.631	-2.521	-1.512	-0.569	0.347	1.210	2.007	2.738
M mx. Vao= 7	-4.356	0.500	5.291	10.016	14.703	19.378	23.986	22.296	13.802	5.294	-3.174	-11.705	-20.303
M mx. Vao= 8	-12.295	-11.145	-10.022	-8.736	-7.516	-6.384	-5.338	-4.382	-3.523	-2.730	-1.822	-0.960	-0.164
M mx. Vao= 9	-4.980	-3.653	-2.393	-1.031	0.352	1.669	2.885	4.035	5.081	6.067	7.113	8.239	9.299
M mx. Vao=10	2.092	1.423	0.687	-0.064	-0.708	-1.419	-2.228	-3.119	-4.097	-5.154	-6.278	-7.196	-8.176
M mx. Vao=11	-12.079	-10.276	-8.540	-6.870	-5.148	-3.454	-1.840	-0.324	1.125	2.550	3.924	5.230	6.469
M mx. Vao=12	2.237	10.624	18.944	27.197	27.500	21.437	15.306	9.081	2.784	-3.523	-9.805	-16.154	-22.569
M mx. Vao=13	-11.480	-10.635	-9.818	-8.851	-7.951	-7.143	-6.424	-5.796	-5.270	-4.811	-4.235	-3.707	-3.245
M mx. Vao=14	-8.971	-5.541	-2.178	1.293	4.786	8.216	11.541	14.799	17.960	17.976	8.573	-0.735	-10.110
M mx. Vao=15	-5.820	-5.544	-5.334	-5.134	-4.776	-4.484	-4.258	-4.100	-4.010	-3.965	-3.987	-3.775	-3.612
M mx. Vao=16	-6.204	-4.531	-2.924	-1.384	0.282	2.000	3.686	5.481	7.209	8.200	9.109	9.951	10.726
M mx. Vao=17b	33.292	34.065	34.883	35.697	36.504	37.306	38.101	38.891	39.674	40.451	41.221	41.986	42.744
Mt mx.vao= 1b	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179	-37.179
Mt mx.vao= 2	-32.677	-32.677	-32.677	-32.677	-32.678	-32.678	-32.678	-32.678	-32.678	-32.678	35.831	35.831	35.831
Mt mx.vao= 3	3.284	3.284	3.283	3.283	3.283	3.283	3.283	3.283	3.283	3.283	3.283	3.283	3.283
Mt mx.vao= 4	-12.689	-12.689	-12.689	-12.688	-12.688	-12.688	-12.688	-12.688	-12.688	-12.688	-12.688	-12.688	-12.688
Mt mx.vao= 5	10.954	10.954	10.954	10.954	10.954	10.954	10.954	10.954	10.953	10.953	10.953	10.953	10.953

Mt mx.vao= 6	-5.355	-5.355	-5.355	-5.355	-5.355	-5.355	-5.354	-5.354	-5.354	-5.355	-5.355	-5.355	-5.355
Mt mx.vao= 7	-31.997	-31.997	-31.997	-31.997	-31.996	-31.996	-31.996	33.183	33.183	33.185	33.185	33.185	33.185
Mt mx.vao= 8	3.827	3.827	3.826	3.826	3.826	3.826	3.826	3.827	3.827	3.827	3.826	3.826	3.826
Mt mx.vao= 9	-14.041	-14.041	-14.041	-14.041	-14.041	-14.040	-14.040	-14.040	-14.041	-14.041	-14.039	-14.039	-14.039
Mt mx.vao=10	12.199	12.199	12.199	12.199	12.199	12.199	12.199	12.199	12.199	12.199	12.199	12.198	12.198
Mt mx.vao=11	-7.068	-7.068	-7.068	-7.068	-7.069	-7.069	-7.068	-7.068	-7.068	-7.068	-7.068	-7.068	-7.068
Mt mx.vao=12	-43.819	-43.819	-43.819	-43.819	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125	28.125
Mt mx.vao=13	3.286	3.286	3.285	3.285	3.285	3.285	3.285	3.286	3.286	3.286	3.285	3.285	3.285
Mt mx.vao=14	-19.335	-19.335	-19.335	-19.335	-19.335	-19.334	-19.334	-19.334	-19.339	44.086	44.084	44.084	44.084
Mt mx.vao=15	11.108	11.108	11.108	11.109	11.109	11.109	11.108	11.108	11.109	11.109	11.109	11.107	11.107
Mt mx.vao=16	-8.877	-8.877	-8.877	-8.877	-8.877	-8.877	-8.877	-8.877	-8.877	-11.925	-11.925	-11.925	-11.925
Mt mx.vao=17b	37.168	37.168	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	59.019	59.016	0.79	0.13	1.	E1-p	0.00	0.00	0.00	0.00	0.00	0	216.	0.	0.	0.	0.	0.
2	70.152	70.139	0.79	0.13	1.	E1-o	0.00	0.00	0.00	0.00	0.00	0	215.	0.	0.	0.	0.	0.
3	-2.693	-2.694	0.79	0.13	1.	E1-n	0.00	0.00	0.00	0.00	0.00	0	214.	0.	0.	0.	0.	0.
4	-9.354	-9.357	0.79	0.13	1.	E1-m	0.00	0.00	0.00	0.00	0.00	0	213.	0.	0.	0.	0.	0.
5	21.048	21.046	0.79	0.13	1.	E1-l	0.00	0.00	0.00	0.00	0.00	0	212.	0.	0.	0.	0.	0.
6	28.300	28.280	0.79	0.13	1.	E1-k	0.00	0.00	0.00	0.00	0.00	0	211.	0.	0.	0.	0.	0.
7	66.247	66.207	0.79	0.13	1.	E1-j	0.00	0.00	0.00	0.00	0.00	0	210.	0.	0.	0.	0.	0.
8	4.043	4.033	0.79	0.13	1.	E1-i	0.00	0.00	0.00	0.00	0.00	0	209.	0.	0.	0.	0.	0.
9	-11.204	-11.210	0.79	0.13	1.	E1-h	0.00	0.00	0.00	0.00	0.00	0	208.	0.	0.	0.	0.	0.
10	19.219	19.217	0.79	0.13	1.	E1-g	0.00	0.00	0.00	0.00	0.00	0	207.	0.	0.	0.	0.	0.
11	48.662	48.644	0.79	0.13	1.	E1-f	0.00	0.00	0.00	0.00	0.00	0	206.	0.	0.	0.	0.	0.
12	49.449	49.432	0.79	0.13	1.	E1-e	0.00	0.00	0.00	0.00	0.00	0	205.	0.	0.	0.	0.	0.
13	20.476	20.471	0.79	0.13	1.	E1-d	0.00	0.00	0.00	0.00	0.00	0	204.	0.	0.	0.	0.	0.
14	65.548	65.546	0.79	0.13	1.	E1-c	0.00	0.00	0.00	0.00	0.00	0	203.	0.	0.	0.	0.	0.

15	10.637	10.637	0.79	0.13	1.	E1-b	0.00	0.00	0.00	0.00	0.00	0	202.	0.	0.	0.	0.	0.
16	12.263	12.263	0.79	0.13	1.	E1-a	0.00	0.00	0.00	0.00	0.00	0	201.	0.	0.	0.	0.	0.

16.3.2 Bloco 4

viga = 204 - bloco 4

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.	b colab.i.	tipo secao	esp.lj.s.	esp.lj.i.	fc sp eixo	fc lt eixo
1b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
2	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
3	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
4	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
5	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
6	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
7	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
8	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
9	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
10	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
11	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
12	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
13	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
14	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
15	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
16	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
17b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	-16.793	-16.930	-17.066	-17.203	-17.340	-17.476	-17.613	-17.750	-17.886	-18.023	-18.160	-18.270	-17.223
Q mn. Vao= 2	-8.724	-9.174	-9.625	-10.075	-10.496	-15.855	-16.305	-15.255	-15.705	-13.862	-14.313	-14.763	-15.213
Q mn. Vao= 3	-10.460	-10.910	-11.360	-9.376	-9.827	-10.025	-10.475	-10.817	-11.267	-11.718	-10.023	-10.474	-10.924
Q mn. Vao= 4	59.532	59.082	58.632	60.547	-27.314	-27.801	-28.251	-28.702	-29.278	-29.728	-28.069	-28.520	-28.970
Q mn. Vao= 5	45.146	44.696	44.245	43.799	45.046	44.596	-37.548	-37.998	-38.575	-39.026	-39.476	-37.860	-38.310
Q mn. Vao= 6	27.250	26.800	26.349	25.899	26.670	26.220	25.641	25.190	24.740	-58.053	-58.504	-58.954	-59.404
Q mn. Vao= 7	14.012	13.561	13.111	12.661	12.239	12.341	11.891	11.275	10.824	11.766	11.315	10.865	10.415
Q mn. Vao= 8	1.899	1.449	0.998	2.838	2.388	1.869	1.419	0.770	0.320	-0.130	1.209	0.759	0.308
Q mn. Vao= 9	-9.889	-10.339	-10.789	-9.099	-9.549	-10.093	-10.543	-10.994	-11.555	-12.005	-10.349	-10.799	-11.250
Q mn. Vao=10	66.039	65.589	65.138	-25.706	-24.396	-24.847	-25.485	-25.935	-26.493	-26.944	-27.394	-25.690	-26.140
Q mn. Vao=11	42.175	41.725	41.275	40.824	41.673	41.222	-37.713	-38.163	-38.613	-38.307	-38.757	-39.208	-39.658
Q mn. Vao=12	29.191	28.741	28.290	27.840	27.418	27.548	27.097	26.509	26.058	-54.172	-54.622	-55.072	-55.523
Q mn. Vao=13	10.242	9.792	9.341	11.086	10.635	10.079	9.628	8.951	8.501	8.050	9.304	8.854	8.404
Q mn. Vao=14	6.048	5.598	5.147	6.726	6.276	5.701	5.250	4.800	4.201	3.750	5.202	4.752	4.301
Q mn. Vao=15	0.095	-0.355	-0.805	-1.252	-0.183	-0.633	-1.332	-1.782	-2.429	-2.880	-3.330	-2.101	-2.551
Q mn. Vao=16	72.423	71.973	71.522	-32.525	-31.822	-32.272	-32.624	-33.074	-33.525	-32.814	-33.264	-33.715	-34.165
Q mn. Vao=17b	25.791	25.655	25.518	25.381	25.245	25.108	24.971	24.835	24.698	24.561	24.425	24.288	24.151
M mn. Vao= 1b	42.751	41.993	41.228	40.457	39.680	38.897	38.108	37.313	36.511	35.703	34.889	34.070	33.260
M mn. Vao= 2	12.970	11.646	10.255	8.798	7.274	4.944	2.560	0.293	-2.002	-4.235	-6.324	-8.479	-10.701
M mn. Vao= 3	5.664	4.085	2.440	1.102	-0.316	-1.764	-3.278	-4.856	-6.487	-8.189	-9.701	-11.220	-12.806
M mn. Vao= 4	-10.960	-2.165	6.561	15.423	14.567	10.492	6.345	2.131	-2.169	-6.535	-10.866	-15.060	-19.321
M mn. Vao= 5	-19.718	-13.052	-6.459	0.067	6.804	13.449	18.798	13.208	7.527	1.784	-4.026	-9.632	-15.279
M mn. Vao= 6	-15.707	-11.698	-7.758	-3.885	0.037	3.958	7.805	11.573	15.274	13.510	4.883	-3.811	-12.584
M mn. Vao= 7	-12.471	-10.427	-8.449	-6.538	-4.694	-2.814	-1.017	0.693	2.332	3.957	5.668	7.313	8.891
M mn. Vao= 8	-3.021	-2.772	-2.590	-2.131	-1.743	-1.419	-1.175	-1.011	-0.929	-0.915	-0.756	-0.610	-0.531
M mn. Vao= 9	7.548	6.049	4.483	3.024	1.642	0.199	-1.330	-2.926	-4.608	-6.353	-8.062	-9.629	-11.263

M mn. Vao=10	-9.688	0.087	9.777	17.007	13.515	9.871	6.149	2.343	-1.544	-5.499	-9.521	-13.331	-17.173
M mn. Vao=11	-15.024	-8.795	-2.642	3.443	9.580	15.725	15.767	10.153	4.471	-1.196	-6.899	-12.674	-18.520
M mn. Vao=12	-16.237	-11.942	-7.715	-3.554	0.540	4.672	8.723	12.689	16.586	10.067	2.012	-6.113	-14.311
M mn. Vao=13	-11.622	-10.135	-8.716	-7.033	-5.422	-3.878	-2.416	-1.037	0.256	1.483	2.843	4.189	5.468
M mn. Vao=14	-9.565	-8.698	-7.898	-7.001	-6.034	-5.131	-4.319	-3.574	-2.921	-2.332	-1.718	-0.981	-0.310
M mn. Vao=15	-2.067	-2.082	-2.164	-2.312	-2.282	-2.338	-2.483	-2.709	-3.018	-3.411	-3.872	-4.185	-4.530
M mn. Vao=16	-8.666	2.037	12.674	14.126	9.373	4.624	-0.172	-5.039	-9.973	-14.830	-19.726	-24.689	-29.720
M mn. Vao=17b	-56.211	-55.053	-53.902	-52.757	-51.618	-50.486	-49.359	-48.239	-47.124	-46.016	-44.914	-43.818	-42.729

Q mx. Vao= 1b	-16.793	-16.930	-17.066	-17.203	-17.340	-17.476	-17.613	-17.750	-17.886	-18.023	-18.160	-18.270	-17.223
Q mx. Vao= 2	-8.704	-9.154	-9.605	-10.055	-10.476	-15.835	-16.285	-15.235	-15.685	-13.842	-14.293	-14.743	-15.193
Q mx. Vao= 3	-10.423	-10.873	-11.324	-9.340	-9.791	-9.989	-10.439	-10.781	-11.231	-11.681	-9.987	-10.438	-10.888
Q mx. Vao= 4	59.648	59.198	58.747	60.663	-27.261	-27.748	-28.199	-28.649	-29.225	-29.675	-28.017	-28.467	-28.917
Q mx. Vao= 5	45.203	44.753	44.303	43.856	45.104	44.653	-37.484	-37.934	-38.511	-38.962	-39.412	-37.796	-38.246
Q mx. Vao= 6	27.277	26.826	26.376	25.926	26.697	26.247	25.668	25.217	24.767	-57.963	-58.413	-58.863	-59.313
Q mx. Vao= 7	14.015	13.565	13.115	12.664	12.243	12.345	11.895	11.278	10.828	11.769	11.319	10.869	10.418
Q mx. Vao= 8	1.902	1.452	1.001	2.841	2.391	1.873	1.422	0.774	0.323	-0.127	1.212	0.762	0.312
Q mx. Vao= 9	-9.886	-10.336	-10.786	-9.096	-9.547	-10.090	-10.541	-10.991	-11.552	-12.002	-10.346	-10.797	-11.247
Q mx. Vao=10	66.189	65.738	65.288	-25.666	-24.357	-24.807	-25.445	-25.896	-26.454	-26.904	-27.354	-25.650	-26.101
Q mx. Vao=11	42.244	41.793	41.343	40.893	41.741	41.291	-37.650	-38.100	-38.550	-38.244	-38.695	-39.145	-39.595
Q mx. Vao=12	29.211	28.760	28.310	27.860	27.438	27.568	27.117	26.529	26.078	-54.107	-54.557	-55.007	-55.458
Q mx. Vao=13	10.252	9.802	9.352	11.096	10.646	10.089	9.639	8.962	8.511	8.061	9.315	8.865	8.414
Q mx. Vao=14	6.072	5.622	5.172	6.751	6.301	5.725	5.275	4.824	4.225	3.775	5.227	4.776	4.326
Q mx. Vao=15	0.126	-0.324	-0.775	-1.221	-0.153	-0.603	-1.301	-1.752	-2.399	-2.850	-3.300	-2.071	-2.521
Q mx. Vao=16	72.470	72.019	71.569	-32.509	-31.806	-32.256	-32.608	-33.058	-33.509	-32.798	-33.248	-33.699	-34.149
Q mx. Vao=17b	25.791	25.655	25.518	25.381	25.245	25.108	24.971	24.835	24.698	24.561	24.425	24.288	24.151

M mx. Vao= 1b	42.751	41.993	41.228	40.457	39.680	38.897	38.108	37.313	36.511	35.703	34.889	34.070	33.260

M mx. Vao= 2	12.982	11.655	10.261	8.801	7.274	4.946	2.565	0.301	-1.991	-4.221	-6.306	-8.458	-10.678
M mx. Vao= 3	5.709	4.125	2.474	1.131	-0.293	-1.745	-3.265	-4.848	-6.485	-8.186	-9.692	-11.206	-12.787
M mx. Vao= 4	-10.957	-2.150	6.592	15.471	14.614	10.531	6.376	2.154	-2.154	-6.527	-10.866	-15.052	-19.306
M mx. Vao= 5	-19.712	-13.049	-6.448	0.087	6.832	13.485	18.842	13.242	7.551	1.799	-4.020	-9.629	-15.265
M mx. Vao= 6	-15.704	-11.697	-7.753	-3.876	0.050	3.974	7.826	11.598	15.303	13.535	4.895	-3.809	-12.569
M mx. Vao= 7	-12.463	-10.419	-8.442	-6.532	-4.688	-2.808	-1.012	0.697	2.335	3.960	5.671	7.315	8.893
M mx. Vao= 8	-3.016	-2.768	-2.586	-2.128	-1.740	-1.417	-1.173	-1.009	-0.928	-0.914	-0.756	-0.610	-0.530
M mx. Vao= 9	7.560	6.060	4.494	3.035	1.652	0.209	-1.321	-2.917	-4.599	-6.345	-8.054	-9.622	-11.256
M mx. Vao=10	-9.670	0.091	9.804	17.051	13.553	9.903	6.175	2.363	-1.529	-5.491	-9.518	-13.328	-17.164
M mx. Vao=11	-15.014	-8.795	-2.632	3.463	9.610	15.765	15.808	10.184	4.493	-1.183	-6.895	-12.668	-18.505
M mx. Vao=12	-16.237	-11.939	-7.709	-3.545	0.552	4.687	8.740	12.710	16.610	10.083	2.018	-6.110	-14.298
M mx. Vao=13	-11.613	-10.128	-8.710	-7.029	-5.419	-3.877	-2.415	-1.035	0.260	1.489	2.850	4.197	5.478
M mx. Vao=14	-9.547	-8.684	-7.888	-6.995	-6.031	-5.131	-4.315	-3.567	-2.910	-2.317	-1.700	-0.958	-0.283
M mx. Vao=15	-2.033	-2.052	-2.138	-2.291	-2.266	-2.326	-2.476	-2.706	-3.016	-3.405	-3.861	-4.170	-4.510
M mx. Vao=16	-8.663	2.047	12.690	14.144	9.388	4.637	-0.161	-5.031	-9.967	-14.826	-19.724	-24.688	-29.717
M mx. Vao=17b	-56.211	-55.053	-53.902	-52.757	-51.618	-50.486	-49.359	-48.239	-47.124	-46.016	-44.914	-43.818	-42.729

Mt mx.vao= 1b	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.203
Mt mx.vao= 2	-5.727	-5.727	-5.727	-5.727	-5.727	-2.524	-2.524	-2.524	-2.524	-2.524	-2.524	-2.524	-2.524
Mt mx.vao= 3	-0.426	-0.426	-0.426	-0.425	-0.425	-0.425	-0.425	-0.426	-0.426	-0.426	-0.425	-0.425	-0.425
Mt mx.vao= 4	48.721	48.721	48.721	48.718	-16.652	-16.656	-16.656	-16.656	-16.656	-16.656	-16.657	-16.657	-16.657
Mt mx.vao= 5	32.184	32.184	32.184	32.184	32.184	32.184	-28.686	-28.686	-28.689	-28.689	-28.689	-28.691	-28.691
Mt mx.vao= 6	19.725	19.725	19.725	19.725	19.725	19.725	19.727	19.727	19.727	-42.356	-42.356	-42.356	-42.356
Mt mx.vao= 7	5.643	5.643	5.643	5.643	5.643	5.643	5.643	5.643	5.643	5.642	5.642	5.642	5.642
Mt mx.vao= 8	1.626	1.626	1.626	1.625	1.625	1.626	1.626	1.626	1.626	1.626	1.626	1.626	1.626
Mt mx.vao= 9	-4.065	-4.065	-4.065	-4.065	-4.065	-4.065	-4.065	-4.065	-4.066	-4.066	-4.066	-4.066	-4.066
Mt mx.vao=10	48.346	48.346	48.346	-19.347	-19.290	-19.290	-19.290	-19.290	-19.290	-19.290	-19.290	-19.293	-19.293
Mt mx.vao=11	29.844	29.844	29.844	29.844	29.844	29.844	-28.710	-28.710	-28.710	-28.710	-28.710	-28.710	-28.710

Mt mx.vao=12	18.329	18.329	18.329	18.329	18.329	18.329	18.329	18.328	18.328	-42.275	-42.275	-42.275	-42.275
Mt mx.vao=13	3.315	3.315	3.315	3.312	3.312	3.313	3.313	3.313	3.313	3.313	3.313	3.313	3.313
Mt mx.vao=14	-2.163	-2.163	-2.163	-2.163	-2.163	-2.162	-2.162	-2.162	-2.163	-2.163	-2.163	-2.163	-2.163
Mt mx.vao=15	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.171	-12.172	-12.172
Mt mx.vao=16	35.418	35.418	35.418	-42.059	-42.061	-42.061	-42.061	-42.061	-42.061	-42.062	-42.062	-42.062	-42.062
Mt mx.vao=17b	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180	-37.180

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	8.519	8.499	0.79	0.13	1.	E4-p	0.00	0.00	0.00	0.00	0.00	0	304.	0.	0.	0.	0.	0.
2	4.790	4.734	0.79	0.13	1.	E4-o	0.00	0.00	0.00	0.00	0.00	0	303.	0.	0.	0.	0.	0.
3	70.536	70.456	0.79	0.13	1.	E4-n	0.00	0.00	0.00	0.00	0.00	0	302.	0.	0.	0.	0.	0.
4	74.121	74.116	0.79	0.13	1.	E4-m	0.00	0.00	0.00	0.00	0.00	0	301.	0.	0.	0.	0.	0.
5	65.560	65.523	0.79	0.13	1.	E4-l	0.00	0.00	0.00	0.00	0.00	0	300.	0.	0.	0.	0.	0.
6	73.420	73.325	0.79	0.13	1.	E4-k	0.00	0.00	0.00	0.00	0.00	0	299.	0.	0.	0.	0.	0.
7	-8.513	-8.519	0.79	0.13	1.	E4-j	0.00	0.00	0.00	0.00	0.00	0	298.	0.	0.	0.	0.	0.
8	-10.194	-10.200	0.79	0.13	1.	E4-i	0.00	0.00	0.00	0.00	0.00	0	297.	0.	0.	0.	0.	0.
9	77.436	77.289	0.79	0.13	1.	E4-h	0.00	0.00	0.00	0.00	0.00	0	296.	0.	0.	0.	0.	0.
10	68.344	68.315	0.79	0.13	1.	E4-g	0.00	0.00	0.00	0.00	0.00	0	295.	0.	0.	0.	0.	0.
11	68.849	68.806	0.79	0.13	1.	E4-f	0.00	0.00	0.00	0.00	0.00	0	294.	0.	0.	0.	0.	0.
12	65.775	65.700	0.79	0.13	1.	E4-e	0.00	0.00	0.00	0.00	0.00	0	293.	0.	0.	0.	0.	0.
13	-2.331	-2.366	0.79	0.13	1.	E4-d	0.00	0.00	0.00	0.00	0.00	0	292.	0.	0.	0.	0.	0.
14	-4.176	-4.231	0.79	0.13	1.	E4-c	0.00	0.00	0.00	0.00	0.00	0	291.	0.	0.	0.	0.	0.
15	74.991	74.974	0.79	0.13	1.	E4-b	0.00	0.00	0.00	0.00	0.00	0	290.	0.	0.	0.	0.	0.
16	59.956	59.940	0.79	0.13	1.	E4-a	0.00	0.00	0.00	0.00	0.00	0	289.	0.	0.	0.	0.	0.

16.3.3 Ala 1

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        viga =   101 - ala 1
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       6.109     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125
    2        1.274     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -1.399    -2.799    -4.198    -5.598    -6.997    -8.396    -9.796   -11.195   -12.595   -13.994   -15.393   -16.793
Q mn. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

M mn. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.293    -9.833   -14.160   -19.273   -25.173   -31.860   -39.333   -47.593   -56.639
M mn. Vao= 2     -0.344    -0.315    -0.287    -0.258    -0.229    -0.201    -0.172    -0.143    -0.115    -0.086    -0.057    -0.029    -0.000

Q mx. Vao= 1b     0.000    -1.399    -2.799    -4.198    -5.598    -6.997    -8.396    -9.796   -11.195   -12.595   -13.994   -15.393   -16.793
Q mx. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

M mx. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.293    -9.833   -14.160   -19.273   -25.173   -31.860   -39.333   -47.593   -56.639
M mx. Vao= 2     -0.343    -0.315    -0.286    -0.258    -0.229    -0.200    -0.172    -0.143    -0.114    -0.086    -0.057    -0.029     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793     0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
         2    0.000   0.000     0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
```

16.3.4 Ala 2

```
        viga =   102 - ala 2
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      6.109     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125
    2       1.274     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000     1.399     2.799     4.198     5.598     6.997     8.396     9.796    11.195    12.595    13.994    15.394    16.793
Q mn. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

M mn. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.293    -9.834   -14.160   -19.274   -25.174   -31.861   -39.334   -47.594   -56.641
M mn. Vao= 2     -0.344    -0.315    -0.287    -0.258    -0.229    -0.201    -0.172    -0.143    -0.115    -0.086    -0.057    -0.029    -0.000

Q mx. Vao= 1b     0.000     1.399     2.799     4.198     5.598     6.997     8.396     9.796    11.195    12.595    13.994    15.394    16.793
Q mx. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

M mx. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.293    -9.834   -14.160   -19.274   -25.174   -31.861   -39.334   -47.594   -56.641
M mx. Vao= 2     -0.343    -0.315    -0.286    -0.258    -0.229    -0.200    -0.172    -0.143    -0.114    -0.086    -0.057    -0.029     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793     0.25     0.00     2. Bloco 4_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
         2    0.000   0.000     0.25     0.00     2. Bloco 4_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
```

16.3.5 Ala 3

```
        viga =   103 - ala 3
----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      6.109     0.250     var.      0.000      0.000      1.000      0.000      0.000      1.475      0.125
    2       1.274     0.250     var.      0.000      0.000      1.000      0.000      0.000      1.475      0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -1.399   -2.799   -4.198   -5.598   -6.997   -8.396   -9.796  -11.195  -12.595  -13.994  -15.393  -16.793
Q mn. Vao= 2      0.000     0.000    0.000    0.000    0.000    0.000    0.000   -0.000   -0.000   -0.000   -0.000   -0.000   -0.000

M mn. Vao= 1b     0.000    -0.393   -1.573   -3.540   -6.293   -9.833  -14.160  -19.273  -25.173  -31.860  -39.333  -47.593  -56.639
M mn. Vao= 2     -0.344    -0.315   -0.287   -0.258   -0.229   -0.201   -0.172   -0.143   -0.115   -0.086   -0.057   -0.029   -0.000

Q mx. Vao= 1b     0.000    -1.399   -2.799   -4.198   -5.598   -6.997   -8.396   -9.796  -11.195  -12.595  -13.994  -15.393  -16.793
Q mx. Vao= 2      0.000     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

M mx. Vao= 1b     0.000    -0.393   -1.573   -3.540   -6.293   -9.833  -14.160  -19.273  -25.173  -31.860  -39.333  -47.593  -56.639
M mx. Vao= 2     -0.343    -0.315   -0.286   -0.258   -0.229   -0.200   -0.172   -0.143   -0.114   -0.086   -0.057   -0.029    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793     0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
         2    0.000   0.000     0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
```

16.3.6 Ala 4

```
        viga =   104 - ala 4
----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      6.109     0.250     var.      0.000      0.000      1.000      0.000      0.000      1.475      0.125
    2       1.274     0.250     var.      0.000      0.000      1.000      0.000      0.000      1.475      0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000     1.399     2.799     4.198     5.598     6.997     8.397     9.796    11.195    12.595    13.994    15.394    16.793
Q mn. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

M mn. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.294    -9.834   -14.161   -19.274   -25.175   -31.862   -39.335   -47.596   -56.643
M mn. Vao= 2     -0.344    -0.315    -0.287    -0.258    -0.229    -0.201    -0.172    -0.143    -0.115    -0.086    -0.057    -0.029    -0.000

Q mx. Vao= 1b     0.000     1.399     2.799     4.198     5.598     6.997     8.397     9.796    11.195    12.595    13.994    15.394    16.793
Q mx. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

M mx. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.294    -9.834   -14.161   -19.274   -25.175   -31.862   -39.335   -47.596   -56.643
M mx. Vao= 2     -0.343    -0.315    -0.286    -0.258    -0.229    -0.200    -0.172    -0.143    -0.114    -0.086    -0.057    -0.029     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793     0.25     0.00     2. Bloco 4_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
         2    0.000   0.000     0.25     0.00     2. Bloco 4_   0.00    0.00    0.00    0.00    0.00      0   0.    0.    0.    0.    0.    0.
```

16.3.7 Travessa 1

```
         viga =     1 - travessa 1
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      5.411     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650
    2b      5.411     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650

                           esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    -2.215  -49.408  -52.013  -54.727  -57.598 -191.630 -194.789 -198.096 -201.522 -205.128 -208.646 -212.359
Q mn. Vao= 2b    0.000     2.215   37.056   39.661   42.374   45.246  185.634  188.793  192.099  195.525  199.131  202.681  206.394

M mn. Vao= 1b    0.000    -0.518  -21.317  -45.031  -69.965  -96.223 -154.203 -244.526 -336.346 -429.755 -524.803 -621.520 -719.928
M mn. Vao= 2b    0.000    -0.518  -16.063  -34.057  -53.279  -73.821 -127.527 -215.056 -304.072 -394.686 -486.928 -580.872 -676.500

Q mx. Vao= 1b    0.000    -2.215  -49.319  -51.925  -54.638  -57.510 -191.611 -194.770 -198.077 -201.503 -205.109 -208.627 -212.340
Q mx. Vao= 2b    0.000     2.215   37.183   39.788   42.502   45.373  185.647  188.806  192.112  195.538  199.144  202.694  206.407

M mx. Vao= 1b    0.000    -0.518  -21.279  -44.951  -69.845  -96.061 -154.024 -244.357 -336.186 -429.603 -524.660 -621.386 -719.803
M mx. Vao= 2b    0.000    -0.518  -16.009  -33.943  -53.105  -73.588 -127.267 -214.802 -303.824 -394.444 -486.691 -580.642 -676.276

Mt mx.vao= 1b    0.000     0.000  -39.412  -39.409  -39.413  -39.413   77.810   77.810   77.808   77.808   77.740   77.875   77.875
Mt mx.vao= 2b    0.000     0.000  -28.422  -28.422  -28.422  -28.422   94.510   94.510   94.533   94.533   94.534   94.537   94.537

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  212.359 212.340    0.25     0.00    1. P1-i      0.00   0.00   0.00   0.00   0.00     0   9.   0.   0.   0.   0.   0.
         2  206.407 206.394    0.25     0.00    1. P1-a      0.00   0.00   0.00   0.00   0.00     0   1.   0.   0.   0.   0.   0.
```

16.3.8 Travessa 2

```
         viga =     2 - travessa 2
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      5.411     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650
    2b      2.140     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650

                           esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -2.215    6.196    3.590    0.877   -1.995 -171.758 -174.917 -178.223 -181.649 -185.256 -350.579 -353.184
Q mn. Vao= 2b    0.000    2.215   85.949   88.553   91.267   94.139  199.153  297.205  300.511  303.937  307.543  311.008  314.722

M mn. Vao= 1b    0.000   -0.518    2.567    4.857    5.915    5.653  -34.628 -115.669 -198.196 -282.322 -368.082 -479.128 -643.519
M mn. Vao= 2b    0.000   -0.518  -37.035  -77.866 -119.912 -163.285 -231.642 -358.107 -497.813 -639.113 -782.052 -926.673-1072.979

Q mx. Vao= 1b    0.000   -2.215    6.376    3.770    1.057   -1.815 -171.654 -174.813 -178.119 -181.544 -185.152 -350.310 -352.915
Q mx. Vao= 2b    0.000    2.215   86.015   88.620   91.334   94.205  199.175  297.272  300.578  304.003  307.610  311.075  314.788

M mx. Vao= 1b    0.000   -0.518    2.644    5.019    6.160    5.983  -34.232 -115.224 -197.703 -281.780 -367.491 -478.543 -643.060
M mx. Vao= 2b    0.000   -0.518  -37.006  -77.806 -119.821 -163.163 -231.499 -357.984 -497.722 -639.053 -782.023 -926.671-1072.946

Mt mx.vao= 1b    0.000    0.000   10.727   10.727   10.728   10.728  159.961  159.961  159.970  159.970  159.960  305.219  305.219
Mt mx.vao= 2b    0.000    0.000  -72.311  -72.306  -72.315  -72.315   18.779  -65.935  -65.965  -65.965  -65.855  -65.848  -65.848
```

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	353.184	352.915	0.25	0.00	1.	P2-i	0.00	0.00	0.00	0.00	0.00	0	18.	0.	0.	0.	0.	0.
2	314.788	314.722	0.25	0.00	1.	P2-a	0.00	0.00	0.00	0.00	0.00	0	10.	0.	0.	0.	0.	0.

16.3.9 Transversina 1

viga = 101 - transversina 1

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	-10.622	0.390	-0.084	2.488	2.260	1.854	1.343	0.759	0.129	-0.515	-0.534	-5.020	-8.772
Q mn. Vao= 2	4.843	3.916	1.759	2.171	1.773	1.124	0.379	-0.442	-1.321	-2.226	-3.030	-6.105	-9.018
Q mn. Vao= 3	6.045	4.765	2.344	1.983	1.241	-0.025	-0.955	-1.920	-2.914	-3.899	-4.756	-5.670	-3.632
Q mn. Vao= 4	8.937	6.231	5.355	4.763	4.036	3.234	1.377	-0.693	-2.067	-3.217	-3.965	-4.443	-10.583
Q mn. Vao= 5	4.620	2.449	2.645	2.592	2.256	1.750	1.131	0.124	-0.672	-1.450	-2.038	-2.531	-6.749
Q mn. Vao= 6	2.500	4.112	2.671	2.313	1.735	1.060	0.319	-0.466	-1.647	-2.403	-2.870	-3.374	0.326

M mn. Vao= 1	-1.214	-2.474	-2.417	-1.513	-0.568	0.268	0.918	1.335	1.490	1.371	1.049	0.285	-2.382
M mn. Vao= 2	-2.404	-0.633	0.405	1.324	2.182	2.803	3.129	3.117	2.736	1.966	0.837	-0.736	-3.568

M mn. Vao= 3	-3.575	-1.352	0.064	0.964	1.598	1.870	1.738	1.187	0.208	-1.202	-3.002	-5.192	-8.034
M mn. Vao= 4	-7.805	-4.511	-2.122	-0.047	1.741	3.190	4.207	4.479	3.959	2.872	1.378	-0.352	-4.275
M mn. Vao= 5	-4.822	-3.149	-2.164	-1.105	-0.109	0.707	1.275	1.535	1.459	1.042	0.327	-0.610	-2.870
M mn. Vao= 6	-2.919	-1.264	-0.160	0.848	1.677	2.240	2.496	2.418	1.966	1.169	0.091	-1.176	-1.584
Q mx. Vao= 1	-10.616	0.398	-0.075	2.497	2.268	1.863	1.351	0.768	0.137	-0.506	-0.526	-5.010	-8.765
Q mx. Vao= 2	4.864	3.934	1.777	2.190	1.793	1.144	0.399	-0.422	-1.301	-2.206	-3.010	-6.082	-8.987
Q mx. Vao= 3	6.066	4.786	2.366	2.007	1.266	0.000	-0.929	-1.894	-2.887	-3.873	-4.729	-5.643	-3.594
Q mx. Vao= 4	8.957	6.251	5.376	4.785	4.058	3.257	1.400	-0.670	-2.044	-3.194	-3.942	-4.420	-10.559
Q mx. Vao= 5	4.628	2.456	2.652	2.599	2.263	1.757	1.138	0.131	-0.664	-1.443	-2.031	-2.523	-6.744
Q mx. Vao= 6	2.503	4.113	2.673	2.315	1.737	1.063	0.321	-0.464	-1.644	-2.401	-2.868	-3.371	0.328
M mx. Vao= 1	-1.214	-2.471	-2.411	-1.503	-0.555	0.285	0.938	1.358	1.517	1.401	1.083	0.322	-2.341
M mx. Vao= 2	-2.362	-0.599	0.431	1.342	2.192	2.805	3.134	3.131	2.758	1.996	0.876	-0.689	-3.511
M mx. Vao= 3	-3.518	-1.303	0.104	0.994	1.618	1.880	1.738	1.197	0.230	-1.169	-2.959	-5.138	-7.968
M mx. Vao= 4	-7.738	-4.452	-2.072	-0.005	1.775	3.214	4.222	4.485	3.963	2.885	1.400	-0.320	-4.234
M mx. Vao= 5	-4.780	-3.111	-2.129	-1.072	-0.080	0.734	1.299	1.556	1.478	1.057	0.339	-0.601	-2.863
M mx. Vao= 6	-2.911	-1.257	-0.153	0.854	1.682	2.244	2.499	2.420	1.967	1.169	0.093	-1.174	-1.582

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-10.616	-10.622	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	13.636	13.608	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	15.084	15.031	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	12.589	12.532	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	15.210	15.179	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	9.252	9.244	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	-0.326	-0.328	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.10 Transversina 2

```
        viga =   102 - transversina 2
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    2       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    3       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    4       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    5       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    6       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150

                           esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1   -48.800  -14.709   -4.500   -1.703    0.404    0.453   -0.030   -0.600   -1.285   -1.720    1.424   -9.414   -8.205
Q mn. Vao= 2    -4.933    0.992    5.667    7.330   10.044    9.429    8.744    8.019    7.172    6.321    9.311   -3.895   -0.016
Q mn. Vao= 3   -13.413   -7.543   -2.643   -1.302    0.698    1.160    0.730    0.268   -0.310   -0.882   -1.079   -6.838   -9.029
Q mn. Vao= 4    -6.160   -0.712    2.398    4.238    5.767    5.664    3.866    1.534    0.090   -1.058   -1.822   -0.644  -25.842
Q mn. Vao= 5   -11.349   -4.513   -2.125    0.119    1.105    1.066    0.506   -0.841   -1.937   -2.801   -3.646   -2.047  -10.917
Q mn. Vao= 6   -27.660    2.428    4.040    6.051    7.417    7.175    6.610    5.995    4.693    3.909    3.445    0.586   -6.748

M mn. Vao= 1    -1.593  -11.594  -14.027  -15.334  -15.836  -15.669  -15.570  -15.695  -16.097  -16.807  -17.370  -18.183  -21.774
M mn. Vao= 2   -22.143  -22.739  -20.960  -18.024  -14.018  -10.062   -6.375   -2.988    0.055    2.730    5.124    7.883    6.760
M mn. Vao= 3     6.333    1.954    0.061   -0.572   -0.332    0.194    0.581    0.788    0.781    0.532    0.155    0.613   -2.363
M mn. Vao= 4    -2.831   -4.667   -4.402   -2.970   -0.755    1.617    3.617    4.853    5.218    5.012    4.400    4.059    0.488
M mn. Vao= 5     0.115   -4.029   -5.580   -6.020   -5.705   -5.216   -4.905   -4.951   -5.447   -6.388   -7.701   -8.753  -12.342
```

M mn. Vao= 6	-12.790	-15.895	-14.856	-12.978	-10.270	-7.301	-4.517	-1.987	0.189	1.962	3.443	4.230	2.509
Q mx. Vao= 1	-48.795	-14.708	-4.498	-1.702	0.405	0.454	-0.029	-0.599	-1.284	-1.720	1.425	-9.414	-8.205
Q mx. Vao= 2	-4.930	0.996	5.669	7.332	10.045	9.430	8.744	8.019	7.173	6.322	9.312	-3.893	-0.015
Q mx. Vao= 3	-13.409	-7.540	-2.640	-1.300	0.700	1.163	0.732	0.270	-0.308	-0.879	-1.077	-6.836	-9.027
Q mx. Vao= 4	-6.157	-0.710	2.401	4.240	5.769	5.667	3.868	1.536	0.092	-1.056	-1.821	-0.643	-25.819
Q mx. Vao= 5	-11.336	-4.500	-2.111	0.132	1.119	1.080	0.519	-0.828	-1.925	-2.791	-3.637	-2.041	-10.911
Q mx. Vao= 6	-27.606	2.433	4.048	6.062	7.427	7.184	6.620	6.005	4.702	3.918	3.454	0.592	-6.745
M mx. Vao= 1	-1.593	-11.593	-14.027	-15.333	-15.836	-15.668	-15.570	-15.694	-16.096	-16.805	-17.368	-18.181	-21.772
M mx. Vao= 2	-22.141	-22.735	-20.955	-18.018	-14.012	-10.054	-6.367	-2.981	0.063	2.738	5.132	7.891	6.768
M mx. Vao= 3	6.341	1.960	0.066	-0.567	-0.328	0.197	0.583	0.789	0.782	0.532	0.157	0.616	-2.360
M mx. Vao= 4	-2.828	-4.662	-4.396	-2.963	-0.748	1.625	3.626	4.863	5.229	5.024	4.412	4.071	0.501
M mx. Vao= 5	0.127	-4.022	-5.578	-6.017	-5.696	-5.202	-4.885	-4.926	-5.418	-6.354	-7.662	-8.712	-12.298
M mx. Vao= 6	-12.747	-15.859	-14.821	-12.948	-10.244	-7.279	-4.498	-1.972	0.199	1.968	3.446	4.230	2.511

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-48.795	-48.800	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	3.275	3.272	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	-13.393	-13.397	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	2.870	2.869	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	14.493	14.483	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	-16.688	-16.749	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	6.748	6.745	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.11 Transversina 3

viga = 103 - transversina 3

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	21.627	4.240	-5.959	-5.603	-6.318	-7.001	-7.485	-7.831	-7.931	-7.104	-2.338	1.995	7.506
Q mn. Vao= 2	14.063	8.701	0.644	2.244	1.855	1.092	0.471	-0.061	-0.376	0.179	2.212	9.609	17.670
Q mn. Vao= 3	10.193	4.909	-3.362	-2.484	-3.045	-4.538	-5.334	-6.000	-6.402	-5.836	-3.364	-0.617	26.101
Q mn. Vao= 4	9.557	3.315	3.661	3.112	2.112	0.963	-1.209	-3.172	-3.772	-3.081	-1.241	1.952	5.137
Q mn. Vao= 5	0.341	-5.705	-4.940	-4.642	-5.018	-5.657	-6.310	-6.750	-6.759	-5.579	-2.620	-0.131	6.810
Q mn. Vao= 6	-1.236	4.468	1.026	1.392	0.996	0.392	-0.254	-0.802	-0.293	1.862	2.948	5.870	19.766
M mn. Vao= 1	3.472	7.520	5.972	3.777	1.402	-1.275	-4.205	-7.302	-10.462	-13.323	-15.009	-15.504	-13.802
M mn. Vao= 2	-13.412	-8.897	-7.549	-6.691	-5.746	-5.113	-4.788	-4.709	-4.797	-4.749	-3.906	-1.806	2.947
M mn. Vao= 3	3.350	6.574	6.752	5.688	4.569	3.041	1.087	-1.192	-3.703	-6.141	-7.728	-8.046	-4.335
M mn. Vao= 4	-3.551	-0.424	0.977	2.354	3.374	3.911	3.876	3.110	1.703	0.294	-0.491	0.009	2.009
M mn. Vao= 5	3.280	3.005	0.762	-1.191	-3.138	-5.307	-7.752	-10.429	-13.223	-15.837	-17.543	-17.966	-15.862
M mn. Vao= 6	-15.247	-13.633	-13.839	-13.416	-12.935	-12.659	-12.650	-12.883	-13.263	-13.267	-12.393	-10.615	-4.715

Q mx. Vao= 1	21.630	4.246	-5.951	-5.594	-6.309	-6.992	-7.476	-7.822	-7.922	-7.094	-2.330	2.003	7.507
Q mx. Vao= 2	14.075	8.711	0.651	2.252	1.865	1.102	0.480	-0.051	-0.366	0.189	2.222	9.618	17.676
Q mx. Vao= 3	10.197	4.911	-3.360	-2.483	-3.044	-4.537	-5.334	-5.999	-6.402	-5.836	-3.363	-0.617	26.101
Q mx. Vao= 4	9.558	3.316	3.662	3.113	2.113	0.964	-1.207	-3.170	-3.770	-3.080	-1.240	1.954	5.140
Q mx. Vao= 5	0.342	-5.704	-4.939	-4.641	-5.016	-5.656	-6.308	-6.749	-6.758	-5.577	-2.618	-0.130	6.815
Q mx. Vao= 6	-1.222	4.472	1.028	1.394	0.998	0.393	-0.252	-0.800	-0.292	1.863	2.952	5.875	19.768

M mx. Vao= 1	3.474	7.521	5.974	3.783	1.411	-1.262	-4.189	-7.282	-10.438	-13.295	-14.976	-15.469	-13.764
M mx. Vao= 2	-13.375	-8.864	-7.519	-6.664	-5.723	-5.093	-4.773	-4.697	-4.790	-4.746	-3.906	-1.802	2.955
M mx. Vao= 3	3.358	6.580	6.758	5.693	4.573	3.046	1.091	-1.188	-3.700	-6.138	-7.725	-8.044	-4.332
M mx. Vao= 4	-3.549	-0.422	0.979	2.355	3.375	3.911	3.876	3.111	1.704	0.296	-0.489	0.011	2.012
M mx. Vao= 5	3.284	3.010	0.766	-1.186	-3.132	-5.301	-7.745	-10.422	-13.216	-15.830	-17.536	-17.958	-15.853
M mx. Vao= 6	-15.237	-13.626	-13.832	-13.410	-12.930	-12.656	-12.647	-12.880	-13.261	-13.265	-12.392	-10.614	-4.713

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	21.630	21.627	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	6.569	6.557	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	-7.473	-7.483	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	-16.543	-16.543	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	-4.796	-4.797	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	-8.032	-8.050	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	-19.766	-19.768	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.12 Transversina 4

viga = 104 - transversina 4

```
eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
 1        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
 2        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
 3        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
 4        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
 5        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
 6        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150

                          esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1   -46.019  -24.007  -12.450   -8.813   -4.283   -2.060   -0.220    4.183    8.297   12.879   17.375   16.104    2.052
Q mn. Vao= 2   -22.108   -7.430   -3.087    1.544    3.726    3.794    5.648    9.216   12.152   16.021   19.172   21.877  -24.311
Q mn. Vao= 3   -27.541  -15.811  -11.891   -8.577   -5.811   -5.287   -4.800    2.447    5.933   10.754   14.385   16.667    8.498
Q mn. Vao= 4   -68.813  -12.973   -8.686   -2.677   -0.910   -1.077   -0.743    1.099   11.278   17.051   18.768   19.584   11.973
Q mn. Vao= 5   -52.973  -29.133  -15.407  -10.515   -8.702   -8.490   -7.612   -4.386    0.374   10.239   14.074    3.601   -5.099
Q mn. Vao= 6   -25.943  -14.555   -6.530    1.761    3.116    3.322    4.336    7.470   11.143   14.387   20.777    2.550  -30.586

M mn. Vao= 1    -4.276  -18.730  -25.615  -29.504  -31.361  -32.367  -33.061  -32.497  -29.934  -25.285  -18.530  -10.813   -5.510
M mn. Vao= 2    -6.630  -13.604  -15.779  -15.832  -14.472  -12.852  -11.166   -8.583   -4.418    1.366    8.755   17.433   21.672
M mn. Vao= 3    20.650   10.428    4.544    0.397   -2.332   -4.459   -6.360   -7.073   -5.751   -2.538    2.643    9.113   13.218
M mn. Vao= 4    11.998    3.305   -1.634   -4.292   -5.003   -5.384   -5.696   -5.214   -2.249    2.964   10.152   17.916   23.754
M mn. Vao= 5    22.554    8.999    1.240   -4.578   -8.568  -12.034  -15.240  -17.341  -17.399  -15.133  -10.591   -6.662   -7.115
M mn. Vao= 6    -7.774  -15.099  -18.294  -19.268  -18.459  -17.187  -15.663  -13.147   -9.003   -3.262    4.382   10.645    6.084

Q mx. Vao= 1   -46.010  -24.006  -12.448   -8.813   -4.281   -2.055   -0.214    4.192    8.307   12.891   17.389   16.119    2.052
Q mx. Vao= 2   -22.101   -7.426   -3.081    1.546    3.731    3.801    5.655    9.222   12.158   16.027   19.177   21.882  -24.304
Q mx. Vao= 3   -27.540  -15.811  -11.891   -8.576   -5.811   -5.286   -4.799    2.447    5.934   10.754   14.385   16.667    8.498
Q mx. Vao= 4   -24.808  -12.972   -8.684   -2.676   -0.910   -1.077   -0.742    1.100   11.279   17.054   18.771   19.586   11.975
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Q mx. Vao= 5	-32.964	-29.129	-15.404	-10.510	-8.697	-8.485	-7.607	-4.380	0.379	10.245	14.079	3.610	-5.089
Q mx. Vao= 6	-25.940	-14.546	-6.520	1.771	3.125	3.330	4.344	7.477	11.149	14.392	20.780	2.551	-30.577
M mx. Vao= 1	-4.274	-18.725	-25.611	-29.499	-31.357	-32.364	-33.061	-32.494	-29.928	-25.274	-18.513	-10.792	-5.484
M mx. Vao= 2	-6.605	-13.581	-15.758	-15.812	-14.454	-12.836	-11.153	-8.573	-4.410	1.372	8.758	17.435	21.672
M mx. Vao= 3	20.650	10.429	4.544	0.397	-2.332	-4.458	-6.359	-7.072	-5.750	-2.537	2.645	9.114	13.219
M mx. Vao= 4	11.999	3.306	-1.633	-4.289	-5.001	-5.381	-5.693	-5.211	-2.246	2.966	10.153	17.917	23.755
M mx. Vao= 5	22.556	9.002	1.246	-4.571	-8.559	-12.024	-15.228	-17.326	-17.382	-15.114	-10.569	-6.637	-7.086
M mx. Vao= 6	-7.745	-15.073	-18.272	-19.250	-18.446	-17.177	-15.656	-13.144	-9.002	-3.261	4.384	10.649	6.085

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-46.010	-46.019	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	-24.154	-24.160	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	-3.229	-3.238	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	-77.306	-77.310	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	-64.939	-64.946	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	-20.842	-20.854	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	30.586	30.577	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.13 Transversina 5

viga = 105 - transversina 5

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eng esq=nao   eng dir=nao   repet.= 1   andar= 1   red v ext=nao   fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

3	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
7	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
8	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
9	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
10	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
11	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
12	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	25.995	25.770	-12.437	-36.170	-36.395	-28.844	-29.068	-24.195	-24.419	-21.178	-15.024	-15.249	10.621
Q mn. Vao= 2	-1.570	-1.795	10.659	10.437	12.235	16.226	16.001	20.618	20.393	24.314	37.549	37.325	42.879
Q mn. Vao= 3	3.779	3.554	-15.349	-15.574	-10.064	-8.102	-8.327	-3.239	-3.464	-0.697	-0.922	6.114	15.957
Q mn. Vao= 4	-11.614	-11.839	-8.438	-8.663	-6.364	-6.585	-3.012	2.664	2.439	7.074	6.849	21.213	38.300
Q mn. Vao= 5	3.487	3.263	-10.858	-11.083	-7.121	-7.346	-4.562	0.940	0.715	3.411	3.186	11.248	11.023
Q mn. Vao= 6	-18.418	-8.787	-6.885	-7.110	-6.844	-7.069	-2.864	-3.083	0.975	4.879	4.654	22.160	21.935
Q mn. Vao= 7	40.383	0.854	-12.522	-12.747	-9.187	-9.412	-5.184	-5.409	-1.611	2.332	2.107	13.560	13.335
Q mn. Vao= 8	-14.116	-6.711	-6.936	-5.744	-5.291	-5.516	-1.183	-1.408	2.449	2.231	7.216	19.109	18.884
Q mn. Vao= 9	11.300	4.577	4.352	-14.593	-9.079	-9.304	-5.149	-5.374	-1.948	-2.173	1.899	12.740	12.515
Q mn. Vao=10	-26.799	-20.879	-21.103	-20.200	-20.425	-19.241	-14.551	-14.776	-11.850	-12.075	-2.365	-2.583	7.817
Q mn. Vao=11	16.104	11.842	11.617	-5.634	-5.859	0.290	4.510	4.285	7.024	6.799	10.673	10.448	20.089
Q mn. Vao=12	-11.143	-8.876	-9.101	-8.407	-8.632	-6.356	-6.581	-1.050	1.340	1.115	21.885	21.660	35.443
M mn. Vao= 1	3.586	8.813	7.290	4.072	-3.255	-9.974	-15.823	-21.065	-25.974	-30.290	-34.312	-37.369	-37.937
M mn. Vao= 2	-36.869	-37.172	-35.578	-33.407	-30.876	-28.191	-24.926	-21.228	-17.087	-12.315	-7.202	0.359	9.194
M mn. Vao= 3	9.795	10.557	8.976	5.883	3.796	1.811	0.183	-1.096	-1.740	-2.033	-2.187	-0.992	0.700

M mn. Vao= 4	1.557	-0.804	-2.849	-4.567	-5.951	-7.250	-7.846	-8.177	-7.652	-6.633	-5.217	-1.431	3.448
M mn. Vao= 5	3.957	4.639	4.310	2.095	0.380	-1.081	-2.081	-2.900	-2.732	-2.365	-1.699	0.098	2.347
M mn. Vao= 6	3.799	2.020	0.348	-1.063	-2.482	-3.885	-4.700	-5.301	-5.100	-4.675	-3.713	-0.784	3.669
M mn. Vao= 7	4.790	6.389	6.323	3.772	1.458	-0.419	-1.821	-2.890	-3.316	-3.523	-3.073	-1.633	1.083
M mn. Vao= 8	3.073	1.332	-0.045	-1.173	-2.341	-3.432	-4.161	-4.422	-4.137	-3.666	-2.149	0.025	3.862
M mn. Vao= 9	4.755	6.282	7.188	4.935	2.094	0.239	-1.381	-2.443	-3.117	-3.534	-3.210	-2.455	0.095
M mn. Vao=10	1.581	-3.275	-7.515	-11.631	-15.733	-19.624	-23.342	-26.303	-29.013	-31.429	-32.349	-32.850	-31.177
M mn. Vao=11	-30.444	-27.457	-25.081	-24.689	-25.841	-25.961	-25.876	-24.988	-23.951	-22.555	-20.668	-18.535	-14.625
M mn. Vao=12	-13.388	-15.544	-17.355	-19.137	-20.853	-22.290	-23.591	-23.834	-23.922	-23.669	-21.296	-16.894	-3.616
Q mx. Vao= 1	26.071	25.846	-12.353	-36.074	-36.299	-28.751	-28.976	-24.104	-24.329	-21.090	-14.937	-15.162	10.698
Q mx. Vao= 2	-1.384	-1.608	10.861	10.640	12.440	16.434	16.209	20.822	20.597	24.513	37.753	37.528	56.092
Q mx. Vao= 3	3.887	3.662	-15.201	-15.426	-9.912	-7.945	-8.170	-3.078	-3.303	-0.534	-0.759	6.278	16.120
Q mx. Vao= 4	-11.578	-11.803	-8.398	-8.623	-6.321	-6.541	-2.968	2.709	2.484	7.121	6.896	21.257	56.304
Q mx. Vao= 5	3.492	3.267	-10.856	-11.081	-7.119	-7.344	-4.561	0.940	0.715	3.411	3.186	11.248	11.023
Q mx. Vao= 6	-18.364	-8.779	-6.876	-7.101	-6.833	-7.058	-2.853	-3.073	0.985	4.888	4.663	22.168	21.943
Q mx. Vao= 7	40.383	0.860	-12.517	-12.742	-9.182	-9.406	-5.177	-5.402	-1.604	2.340	2.115	13.570	13.345
Q mx. Vao= 8	-14.108	-6.704	-6.929	-5.735	-5.281	-5.506	-1.173	-1.398	2.457	2.239	7.225	19.118	18.893
Q mx. Vao= 9	11.317	4.597	4.372	-14.574	-9.059	-9.284	-5.129	-5.354	-1.927	-2.152	1.920	12.762	12.538
Q mx. Vao=10	-26.795	-20.876	-21.101	-20.198	-20.423	-19.241	-14.551	-14.776	-11.850	-12.074	-2.365	-2.582	7.820
Q mx. Vao=11	16.133	11.878	11.653	-5.592	-5.817	0.331	4.551	4.326	7.065	6.840	10.713	10.488	20.127
Q mx. Vao=12	-11.123	-8.852	-9.077	-8.381	-8.606	-6.329	-6.554	-1.023	1.366	1.141	21.910	21.685	78.465
M mx. Vao= 1	3.586	8.828	7.322	4.122	-3.187	-9.887	-15.717	-20.941	-25.832	-30.130	-34.134	-37.173	-37.725
M mx. Vao= 2	-36.657	-36.997	-35.444	-33.314	-30.824	-28.180	-24.895	-21.156	-16.973	-12.160	-7.007	0.595	9.472
M mx. Vao= 3	10.073	10.813	9.206	6.083	3.965	1.949	0.290	-1.021	-1.698	-2.023	-2.163	-0.936	0.789
M mx. Vao= 4	1.647	-0.722	-2.774	-4.501	-5.893	-7.201	-7.805	-8.145	-7.630	-6.620	-5.214	-1.426	3.461
M mx. Vao= 5	3.970	4.651	4.322	2.106	0.390	-1.071	-2.071	-2.890	-2.723	-2.355	-1.689	0.108	2.357

M mx. Vao= 6	3.809	2.029	0.355	-1.058	-2.479	-3.884	-4.699	-5.298	-5.095	-4.668	-3.704	-0.773	3.681
M mx. Vao= 7	4.802	6.400	6.333	3.781	1.466	-0.412	-1.816	-2.885	-3.313	-3.521	-3.073	-1.632	1.086
M mx. Vao= 8	3.078	1.334	-0.044	-1.173	-2.338	-3.428	-4.154	-4.414	-4.127	-3.654	-2.135	0.041	3.879
M mx. Vao= 9	4.772	6.295	7.197	4.941	2.096	0.242	-1.374	-2.432	-3.102	-3.514	-3.186	-2.428	0.127
M mx. Vao=10	1.613	-3.242	-7.481	-11.597	-15.699	-19.589	-23.307	-26.269	-28.978	-31.394	-32.315	-32.815	-31.142
M mx. Vao=11	-30.409	-27.428	-25.059	-24.675	-25.836	-25.957	-25.864	-24.968	-23.922	-22.518	-20.623	-18.482	-14.564
M mx. Vao=12	-13.327	-15.488	-17.304	-19.091	-20.812	-22.254	-23.560	-23.809	-23.902	-23.654	-21.287	-16.889	-3.616

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	26.071	25.995	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	-12.005	-12.267	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	-51.992	-52.313	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	-27.535	-27.734	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	-52.812	-52.812	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	-29.387	-29.441	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	18.448	18.441	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
8	-27.443	-27.461	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
9	-7.567	-7.593	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
10	-39.315	-39.333	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
11	8.316	8.284	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
12	-31.212	-31.270	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
13	-78.443	-78.465	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.14 Transversina 6

viga = 106 - transversina 6

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao comprim. Largura altura b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo

1	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
7	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
8	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
9	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
10	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
11	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
12	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	-21.920	-22.145	9.171	8.952	7.002	5.990	5.765	5.516	5.291	3.733	3.592	3.367	0.311
Q mn. Vao= 2	-3.015	-3.239	1.007	0.782	-0.621	-1.493	-1.718	-2.253	-2.478	-3.625	-3.850	-4.562	-5.429
Q mn. Vao= 3	1.456	1.231	3.114	2.889	1.832	1.614	0.924	0.371	0.146	-0.804	-1.029	-1.801	1.138
Q mn. Vao= 4	1.143	0.918	1.051	0.826	0.255	0.030	-0.401	-0.699	-0.924	-1.458	-1.683	-2.588	-2.813
Q mn. Vao= 5	3.413	2.398	1.017	0.792	0.587	0.362	0.008	-0.208	-0.402	-0.788	-1.013	-1.580	-1.805
Q mn. Vao= 6	8.209	1.131	-0.338	-0.563	-0.705	-0.930	-1.228	-1.452	-1.198	-2.068	-2.293	-2.689	-2.914
Q mn. Vao= 7	5.993	2.340	2.115	1.204	0.890	0.665	0.105	-0.120	-0.188	-0.403	-1.626	-2.846	-3.071
Q mn. Vao= 8	3.619	2.441	2.216	2.253	1.802	1.577	1.189	0.964	0.861	0.636	-1.075	-1.450	-1.675
Q mn. Vao= 9	1.130	-0.186	-0.410	0.332	0.107	-0.251	-0.455	-0.680	-0.792	-1.017	-1.473	-1.687	-1.758
Q mn. Vao=10	5.095	2.087	1.862	0.545	0.321	0.593	0.701	0.476	1.202	0.977	0.588	0.363	1.196
Q mn. Vao=11	4.982	-0.119	-0.343	-2.952	-3.177	-2.321	-2.546	-2.197	-0.602	-0.827	-1.585	-1.810	-1.714
Q mn. Vao=12	5.490	-0.302	-0.526	-3.924	-4.149	-3.226	-3.451	-3.184	-0.117	-0.341	0.535	0.310	14.854

M mn. Vao= 1	-2.803	-7.252	-6.920	-5.091	-3.667	-2.312	-1.125	0.028	1.120	1.955	2.689	3.392	3.843
M mn. Vao= 2	3.781	3.167	3.067	3.265	3.201	3.053	2.740	2.349	1.871	1.225	0.470	-0.425	-1.399
M mn. Vao= 3	-1.418	-1.134	-0.689	-0.073	0.370	0.728	0.948	1.106	1.169	1.105	0.920	0.598	0.277
M mn. Vao= 4	0.274	0.491	0.688	0.887	0.992	1.021	0.968	0.862	0.698	0.464	0.147	-0.309	-0.855
M mn. Vao= 5	-0.677	-0.156	0.262	0.455	0.606	0.712	0.753	0.742	0.685	0.571	0.389	0.125	-0.217
M mn. Vao= 6	-0.206	0.269	0.450	0.359	0.231	0.066	-0.154	-0.424	-0.654	-0.937	-1.377	-1.881	-2.447
M mn. Vao= 7	-2.481	-1.768	-1.299	-1.008	-0.771	-0.595	-0.510	-0.511	-0.535	-0.596	-0.906	-1.323	-1.920
M mn. Vao= 8	-1.955	-1.348	-0.862	-0.379	0.064	0.419	0.718	0.949	1.150	1.309	1.147	0.900	0.584
M mn. Vao= 9	0.537	0.646	0.595	0.638	0.691	0.673	0.602	0.488	0.340	0.157	-0.105	-0.425	-0.752
M mn. Vao=10	-0.725	0.112	0.517	0.751	0.844	0.978	1.087	1.211	1.361	1.586	1.744	1.840	2.088
M mn. Vao=11	2.119	2.926	2.880	2.579	1.960	1.453	0.961	0.533	0.152	0.008	-0.239	-0.582	-0.920
M mn. Vao=12	-0.866	0.179	0.106	-0.207	-1.012	-1.726	-2.390	-3.025	-3.615	-3.651	-3.640	-3.545	-1.546
Q mx. Vao= 1	-21.875	-22.099	9.212	8.993	7.043	6.031	5.806	5.556	5.331	3.771	3.629	3.404	0.342
Q mx. Vao= 2	-2.929	-3.154	1.093	0.868	-0.536	-1.409	-1.634	-2.172	-2.397	-3.548	-3.773	-4.493	-5.396
Q mx. Vao= 3	1.516	1.292	3.166	2.941	1.885	1.668	0.978	0.424	0.199	-0.752	-0.977	-1.751	1.145
Q mx. Vao= 4	1.187	0.962	1.097	0.872	0.300	0.075	-0.357	-0.657	-0.882	-1.416	-1.641	-2.545	-2.770
Q mx. Vao= 5	3.466	2.450	1.069	0.844	0.638	0.413	0.058	-0.158	-0.354	-0.741	-0.966	-1.534	-1.758
Q mx. Vao= 6	8.210	1.153	-0.311	-0.536	-0.680	-0.905	-1.202	-1.427	-1.173	-2.044	-2.269	-2.663	-2.888
Q mx. Vao= 7	6.087	2.438	2.213	1.298	0.985	0.760	0.198	-0.026	-0.094	-0.310	-1.536	-2.755	-2.980
Q mx. Vao= 8	3.701	2.515	2.290	2.322	1.871	1.646	1.257	1.032	0.929	0.704	-1.009	-1.385	-1.610
Q mx. Vao= 9	1.182	-0.140	-0.365	0.375	0.150	-0.208	-0.413	-0.638	-0.752	-0.977	-1.434	-1.648	-1.718
Q mx. Vao=10	5.131	2.118	1.893	0.573	0.348	0.621	0.729	0.504	1.228	1.003	0.613	0.388	1.218
Q mx. Vao=11	5.024	-0.073	-0.298	-2.903	-3.128	-2.273	-2.498	-2.150	-0.559	-0.784	-1.537	-1.762	-1.661
Q mx. Vao=12	5.546	-0.247	-0.472	-3.873	-4.098	-3.174	-3.399	-3.133	-0.066	-0.291	0.583	0.358	14.900
M mx. Vao= 1	-2.802	-7.243	-6.902	-5.065	-3.633	-2.269	-1.074	0.087	1.187	2.030	2.772	3.482	3.940

M mx. Vao= 2	3.878	3.247	3.130	3.310	3.229	3.064	2.746	2.372	1.911	1.279	0.540	-0.341	-1.302
M mx. Vao= 3	-1.321	-1.050	-0.616	-0.010	0.422	0.769	0.978	1.126	1.178	1.107	0.932	0.621	0.308
M mx. Vao= 4	0.306	0.514	0.702	0.892	0.997	1.034	0.990	0.894	0.739	0.512	0.203	-0.244	-0.781
M mx. Vao= 5	-0.603	-0.092	0.315	0.498	0.639	0.734	0.765	0.744	0.693	0.588	0.416	0.161	-0.171
M mx. Vao= 6	-0.160	0.319	0.504	0.419	0.296	0.136	-0.079	-0.344	-0.569	-0.847	-1.282	-1.782	-2.342
M mx. Vao= 7	-2.376	-1.683	-1.233	-0.961	-0.744	-0.587	-0.499	-0.482	-0.487	-0.529	-0.821	-1.219	-1.798
M mx. Vao= 8	-1.833	-1.242	-0.772	-0.303	0.127	0.468	0.753	0.970	1.158	1.315	1.166	0.932	0.630
M mx. Vao= 9	0.582	0.682	0.622	0.655	0.700	0.673	0.611	0.504	0.365	0.191	-0.064	-0.376	-0.695
M mx. Vao=10	-0.668	0.162	0.561	0.789	0.877	1.005	1.108	1.227	1.371	1.591	1.744	1.845	2.097
M mx. Vao=11	2.129	2.945	2.907	2.616	2.007	1.510	1.028	0.610	0.238	0.102	-0.135	-0.469	-0.796
M mx. Vao=12	-0.742	0.291	0.208	-0.116	-0.931	-1.656	-2.330	-2.975	-3.576	-3.622	-3.621	-3.535	-1.546

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-21.875	-21.920	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	-3.240	-3.356	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	6.946	6.851	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	0.043	0.005	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	6.279	6.183	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	10.015	9.968	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	9.001	8.881	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
8	6.772	6.599	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
9	2.858	2.740	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
10	6.889	6.813	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
11	3.806	3.787	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
12	7.260	7.151	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
13	-14.854	-14.900	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.3.15 Longarina 1-a

```
        viga =     1 - longarina 1-a
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      23.300     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                             esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -4.154   -4.490   -4.825    0.293   -4.615   -4.950   -5.702   -6.038   -6.351  -11.649  -11.985  -12.320
Q mn. Vao= 2    75.381   63.348   49.746   35.433   22.259    8.885   -3.724  -17.048  -31.092  -43.353  -56.119  -68.788  -75.674
Q mn. Vao= 3b   35.017   34.628   63.810   63.422   63.033   55.900   62.759   57.882   57.493   57.104   97.933   97.568    0.000

M mn. Vao= 1b    0.000   -0.179   -0.599   -1.051   -1.162   -1.156   -1.620   -1.574   -2.144   -4.104   -5.264   -6.411   -7.591
M mn. Vao= 2    -7.621  127.452  236.593  319.497  375.942  406.359  411.081  390.050  343.522  271.885  175.522   54.435  -89.223
M mn. Vao= 3b  -85.278  -81.345  -75.878  -68.707  -61.580  -53.169  -45.439  -39.341  -32.838  -26.380  -14.168   -3.154    0.000

Q mx. Vao= 1b    0.000   -4.153   -4.488   -4.824    0.296   -4.612   -4.947   -5.698   -6.033   -6.347  -11.645  -11.981  -12.317
Q mx. Vao= 2    75.382   63.352   49.749   35.436   22.263    8.890   -3.717  -17.041  -31.083  -43.342  -56.106  -68.775  -75.660
Q mx. Vao= 3b   35.153   34.764   63.933   63.544   63.155   56.019   62.883   57.995   57.606   57.217   98.095   97.730    0.000

M mx. Vao= 1b    0.000   -0.179   -0.598   -1.051   -1.162   -1.156   -1.620   -1.574   -2.143   -4.101   -5.260   -6.407   -7.587
M mx. Vao= 2    -7.617  127.453  236.601  319.512  375.965  406.390  411.123  390.105  343.593  271.974  175.634   54.573  -89.061
M mx. Vao= 3b  -85.115  -81.197  -75.744  -68.587  -61.474  -53.075  -45.358  -39.273  -32.783  -26.337  -14.145   -3.149    0.000

Mt mx.vao= 1b    0.000    0.087    0.087    0.087    0.079    0.213    0.213   -0.306   -0.306    0.541    0.206    0.206    0.206
```

```
Mt mx.vao= 2      0.002     0.080     0.089     0.086     0.089     0.089     0.083     0.074     0.055     0.039     0.018    -0.021    -0.055
Mt mx.vao= 3b    -0.032    -0.032     0.201     0.201     0.201    -1.224    -0.412     0.118     0.118     0.118     2.403     2.403     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   87.701  87.699    0.25    0.00    1. Ap1       0.00   0.00   0.00   0.00   0.00     0 801.   0.   0.   0.   0.   0.
         2  110.827 110.677    0.25    0.00    1. Ap2       0.00   0.00   0.00   0.00   0.00     0 802.   0.   0.   0.   0.   0.
```

16.3.16 Longarina 1-b

```
         viga =     2 - longarina 1-b
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      23.300     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                              esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    -0.244    -0.955    -1.312    -1.670    -3.673     0.528     0.171    -0.187    -0.544   -13.823   -14.180   -14.538   -14.895
Q mn. Vao= 2     76.301    58.035    45.468    34.092    22.633    11.174     0.292   -11.005   -22.671   -33.392   -44.593   -55.895   -63.788
Q mn. Vao= 3b     6.226     5.812     0.789     0.375    -0.039    -3.345    -3.759    -8.408    -8.822   -10.392   -10.806   -11.194     0.000

M mn. Vao= 1b    -0.016    -0.318    -0.428    -0.572    -0.814    -0.747    -0.713    -0.714    -0.750    -1.749    -3.109    -4.503    -5.932
M mn. Vao= 2     -6.962   117.433   217.919   295.516   350.510   383.262   393.992   382.829   350.008   295.770   219.961   122.331     4.814
M mn. Vao= 3b     4.123     4.813     5.183     5.260     5.290     6.025     5.636     4.886     3.926     2.849     1.669     0.442     0.000

Q mx. Vao= 1b    -0.244    -0.955    -1.312    -1.669    -3.672     0.531     0.174    -0.183    -0.541   -13.817   -14.175   -14.532   -14.889
```

```
Q mx. Vao= 2    76.322   58.037   45.468   34.092   22.633   11.175    0.293  -11.001  -22.666  -33.383  -44.581  -55.880  -63.764
Q mx. Vao= 3b    6.339    5.925    0.893    0.479    0.065   -3.256   -3.670   -8.323   -8.737  -10.284  -10.698  -11.086    0.000

M mx. Vao= 1b   -0.015   -0.318   -0.428   -0.572   -0.814   -0.747   -0.713   -0.713   -0.748   -1.747   -3.106   -4.499   -5.927
M mx. Vao= 2    -6.960  117.441  217.928  295.524  350.518  383.271  394.004  382.846  350.034  295.809  220.020  122.416    4.936
M mx. Vao= 3b    4.247    4.924    5.281    5.346    5.365    6.092    5.693    4.934    3.965    2.875    1.683    0.444    0.000

Mt mx.vao= 1b   -0.040    0.143    0.143    0.143    0.046   -0.002   -0.002   -0.002   -0.002   -0.046   -0.046   -0.046   -0.046
Mt mx.vao= 2    -0.007    0.018    0.044    0.059    0.076    0.088    0.090    0.092    0.083    0.071    0.062    0.049    0.038
Mt mx.vao= 3b    0.007    0.007   -0.005   -0.005   -0.005   -0.470   -0.470   -0.529   -0.529   -0.528   -0.528   -0.528    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   91.211   91.196    0.25     0.00     1. Ap9        0.00   0.00   0.00   0.00   0.00      0 809.   0.    0.    0.    0.    0.
         2   70.128   69.990    0.25     0.00     1. Ap10       0.00   0.00   0.00   0.00   0.00      0 810.   0.    0.    0.    0.    0.
```

16.3.17 Longarina 1-c

```
         viga =      3 - longarina 1-c
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.165      1.000      1.800      1.233      0.000      5.000      0.000      0.000      0.900      0.500
    2       23.300      1.000      1.800      2.398      0.000      5.000      0.000      0.000      0.900      0.500
    3b       1.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                               esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.005   -1.344   -1.683   -2.023    2.114    1.775    1.435    1.096    0.756  -16.145  -16.485  -16.824  -17.164
```

```
Q mn. Vao= 2     77.989    63.813    50.098    37.517    24.322    11.688    -0.998   -14.845   -27.579   -39.771   -52.627   -64.800   -73.307
Q mn. Vao= 3b    22.322    21.929    22.468    22.074    39.327    24.450    24.056    17.944    21.775    21.381    20.987    20.618     0.000

M mn. Vao= 1b    -0.016    -0.598    -0.745    -0.925    -1.143    -0.954    -0.798    -0.675    -0.585    -1.471    -3.054    -4.671    -6.321
M mn. Vao= 2     -6.321   131.896   243.275   328.674   388.642   423.498   433.335   418.264   378.347   313.650   224.234   109.110   -27.938
M mn. Vao= 3b   -27.916   -25.426   -22.885   -20.379   -17.555   -14.510   -11.782    -9.634    -7.326    -4.898    -2.514    -0.175     0.000

Q mx. Vao= 1b     0.005    -1.343    -1.683    -2.023     2.116     1.776     1.436     1.097     0.757   -16.113   -16.452   -16.792   -17.131
Q mx. Vao= 2     77.994    63.816    50.100    37.519    24.323    11.689    -0.997   -14.844   -27.579   -39.770   -52.625   -64.796   -73.300
Q mx. Vao= 3b    22.338    21.944    22.482    22.088    39.339    24.451    24.057    17.945    21.777    21.383    20.990    20.620     0.000

M mx. Vao= 1b    -0.016    -0.598    -0.745    -0.925    -1.143    -0.954    -0.798    -0.675    -0.585    -1.467    -3.048    -4.662    -6.309
M mx. Vao= 2     -6.309   131.900   243.275   328.678   388.649   423.508   433.347   418.278   378.361   313.664   224.245   109.116   -27.933
M mx. Vao= 3b   -27.912   -25.423   -22.884   -20.378   -17.554   -14.509   -11.781    -9.633    -7.325    -4.897    -2.514    -0.175     0.000

Mt mx.vao= 1b     0.011     0.429     0.429     0.429     0.030     0.030     0.030     0.030     0.030    -0.033    -0.033    -0.033    -0.033
Mt mx.vao= 2     -0.033     0.010     0.034     0.060     0.071     0.073     0.089     0.102     0.086     0.089     0.069     0.053     0.005
Mt mx.vao= 3b     0.008     0.008    -0.029    -0.029    -0.112    -0.369    -0.369    -0.341     0.005     0.005     0.005     0.005     0.000

R.apoio-no. Maximos minimos largura   depev morte    nome    m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1    95.158   95.120     0.25     0.00     1. Ap17       0.00    0.00    0.00    0.00    0.00      0 817.    0.    0.    0.    0.    0.
         2    95.645   95.622     0.25     0.00     1. Ap18       0.00    0.00    0.00    0.00    0.00      0 818.    0.    0.    0.    0.    0.
```

16.3.18 Longarina 1-d

```
         viga =     4 - longarina 1-d
-----------------------------------------------------------------------------------------------------------------------------------
```

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.165	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	23.300	1.000	1.800	2.398	0.000	8.000	0.000	0.000	0.900	0.500
3b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	-0.073	-1.165	-1.506	-0.847	0.461	0.120	-0.221	-0.562	-7.955	-20.876	-21.217	-21.558	-21.899
Q mn. Vao= 2	73.501	63.699	51.055	38.487	25.850	12.200	-1.660	-13.627	-26.687	-39.340	-52.598	-67.680	-78.730
Q mn. Vao= 3b	32.657	32.262	30.719	30.324	31.192	27.927	27.532	24.857	22.142	21.747	21.352	20.981	0.000
M mn. Vao= 1b	-0.012	-0.391	-0.520	-0.812	-0.843	-0.815	-0.820	-0.858	-1.480	-3.700	-5.743	-7.820	-9.929
M mn. Vao= 2	-9.929	123.589	235.081	321.513	382.926	419.147	430.170	416.102	376.915	312.346	222.281	105.938	-36.910
M mn. Vao= 3b	-37.154	-33.502	-29.875	-26.441	-22.931	-19.554	-16.434	-13.470	-10.932	-8.462	-6.038	-3.657	0.000
Q mx. Vao= 1b	-0.073	-1.165	-1.506	-0.844	0.465	0.124	-0.217	-0.558	-7.946	-20.827	-21.168	-21.509	-21.850
Q mx. Vao= 2	73.512	63.705	51.058	38.489	25.850	12.200	-1.659	-13.627	-26.686	-39.339	-52.597	-67.679	-78.729
Q mx. Vao= 3b	32.661	32.266	30.722	30.327	31.196	27.932	27.537	24.861	22.147	21.752	21.357	20.986	0.000
M mx. Vao= 1b	-0.011	-0.390	-0.520	-0.811	-0.843	-0.815	-0.819	-0.857	-1.478	-3.697	-5.736	-7.808	-9.912
M mx. Vao= 2	-9.912	123.589	235.089	321.526	382.941	419.163	430.186	416.116	376.927	312.356	222.290	105.946	-36.904
M mx. Vao= 3b	-37.148	-33.496	-29.869	-26.436	-22.926	-19.551	-16.431	-13.467	-10.929	-8.461	-6.036	-3.656	0.000
Mt mx.vao= 1b	-0.009	0.255	0.255	0.047	0.033	0.033	0.033	0.033	-0.021	0.009	0.009	0.009	0.009
Mt mx.vao= 2	0.009	0.059	0.082	0.077	0.100	0.116	0.074	0.076	0.073	0.045	0.028	-0.002	-0.043
Mt mx.vao= 3b	0.014	0.014	-0.078	-0.078	-0.083	-0.553	-0.553	-0.641	-0.697	-0.697	-0.697	-0.697	0.000

R.apoio-no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilars espesi espess %rdmo pilares:

```
 1    95.411   95.351     0.25     0.00     1. Ap25       0.00    0.00    0.00    0.00    0.00      0 825.    0.    0.    0.    0.    0.
 2   111.390  111.387     0.25     0.00     1. Ap26       0.00    0.00    0.00    0.00    0.00      0 826.    0.    0.    0.    0.    0.
```

16.3.19 Longarina 1-e

```
         viga =      5 - longarina 1-e
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       23.300     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    -0.038    -1.241    -0.335    -0.698    -0.565    -0.928    -1.290    -0.239    -0.602   -16.039   -16.402   -16.765   -17.128
Q mn. Vao= 2     68.946    58.945    47.131    35.137    23.097    10.407    -1.778   -13.054   -24.927   -36.075   -47.768   -60.668   -73.758
Q mn. Vao= 3b     4.428     4.008    30.043    16.336    15.916    28.888    28.468    22.593    22.173    21.752    21.332     9.292     0.000

M mn. Vao= 1b    -0.008    -0.342    -0.638    -0.688    -0.753    -0.825    -0.933    -1.023    -1.064    -2.514    -4.089    -5.699    -7.344
M mn. Vao= 2     -7.344   117.276   220.142   299.235   354.405   386.117   394.835   380.478   343.290   283.537   201.332    95.887   -32.501
M mn. Vao= 3b   -29.378   -28.904   -26.712   -24.001   -22.186   -18.678   -15.451   -12.538   -10.019    -7.547    -5.122    -1.416     0.000

Q mx. Vao= 1b    -0.037    -1.240    -0.332    -0.695    -0.560    -0.923    -1.286    -0.230    -0.592   -15.996   -16.359   -16.721   -17.084
Q mx. Vao= 2     68.959    58.950    47.133    35.138    23.098    10.409    -1.776   -13.052   -24.925   -36.074   -47.767   -60.667   -73.756
Q mx. Vao= 3b     4.429     4.009    30.053    16.342    15.922    28.898    28.478    22.602    22.182    21.761    21.341     9.297     0.000

M mx. Vao= 1b    -0.008    -0.341    -0.637    -0.687    -0.753    -0.825    -0.933    -1.022    -1.062    -2.512    -4.083    -5.688    -7.329
```

```
M mx. Vao= 2    -7.329  117.277  220.150  299.246  354.414  386.124  394.838  380.479  343.295  283.544  201.342   95.898  -32.489
M mx. Vao= 3b  -29.367  -28.893  -26.701  -23.992  -22.178  -18.671  -15.444  -12.533  -10.014   -7.544   -5.120   -1.415    0.000

Mt mx.vao= 1b   -0.004    0.234    0.014    0.014    0.016    0.016    0.016    0.000    0.000   -0.003   -0.003   -0.003   -0.003
Mt mx.vao= 2    -0.003    0.036    0.062    0.067    0.085    0.085    0.077    0.081    0.079    0.057    0.042    0.017   -0.009
Mt mx.vao= 3b   -0.010   -0.010   -0.142   -0.087   -0.087   -0.469   -0.469   -0.610   -0.610   -0.610   -0.610    1.198    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo        pilares:
         1   86.087  86.030    0.25    0.00    1. Ap33       0.00   0.00   0.00   0.00   0.00     0 833.   0.   0.   0.   0.   0.
         2   78.186  78.185    0.25    0.00    1. Ap34       0.00   0.00   0.00   0.00   0.00     0 834.   0.   0.   0.   0.   0.
```

16.3.20 Longarina 1-f

```
         viga =     6 - longarina 1-f
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      23.300     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.140   -1.064    0.781    0.424    0.722    0.365    2.776    2.419    2.061  -11.931  -12.289  -23.672  -24.029
Q mn. Vao= 2    71.604   59.483   47.474   35.701   22.932   10.729   -1.030  -13.539  -24.940  -38.180  -52.182  -66.237  -76.864
Q mn. Vao= 3b   31.601   31.187   72.127   39.269   38.855   35.169   34.755   28.205   27.791   27.377   26.963   58.482    0.000

M mn. Vao= 1b    0.000   -0.313   -0.459   -0.401   -0.351   -0.298   -0.248    0.004    0.221   -0.820   -1.996   -3.651   -5.967
```

M mn. Vao= 2	-4.519	122.666	226.504	307.046	364.298	398.183	408.416	394.936	357.360	295.155	207.980	94.195	-46.530
M mn. Vao= 3b	-45.403	-41.867	-35.791	-31.709	-27.310	-23.127	-19.190	-15.805	-12.651	-9.543	-6.482	0.001	0.000
Q mx. Vao= 1b	0.141	-1.064	0.782	0.425	0.726	0.368	2.776	2.419	2.062	-11.903	-12.261	-23.665	-24.022
Q mx. Vao= 2	71.613	59.488	47.477	35.702	22.933	10.729	-1.029	-13.537	-24.938	-38.176	-52.177	-66.232	-76.859
Q mx. Vao= 3b	31.637	31.223	72.171	39.312	38.898	35.209	34.795	28.246	27.832	27.418	27.004	58.566	0.000
M mx. Vao= 1b	0.000	-0.313	-0.459	-0.400	-0.351	-0.298	-0.248	0.004	0.222	-0.818	-1.991	-3.644	-5.959
M mx. Vao= 2	-4.508	122.668	226.514	307.060	364.313	398.199	408.433	394.955	357.383	295.184	208.017	94.242	-46.473
M mx. Vao= 3b	-45.347	-41.815	-35.744	-31.667	-27.272	-23.094	-19.161	-15.781	-12.631	-9.528	-6.471	0.002	0.000
Mt mx.vao= 1b	0.030	0.281	0.012	0.012	0.014	0.014	-0.013	-0.013	-0.013	-0.015	-0.015	-0.010	-0.010
Mt mx.vao= 2	-0.030	0.006	0.026	0.049	0.072	0.072	0.091	0.079	0.065	0.066	0.062	0.034	-0.026
Mt mx.vao= 3b	-0.012	-0.012	-0.069	-0.112	-0.112	-0.447	-0.447	-0.460	-0.460	-0.460	-0.460	0.123	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	95.643	95.627	0.25	0.00	1.	Ap41	0.00	0.00	0.00	0.00	0.00	0	841.	0.	0.	0.	0.	0.
2	108.500	108.460	0.25	0.00	1.	Ap42	0.00	0.00	0.00	0.00	0.00	0	842.	0.	0.	0.	0.	0.

16.3.21 Longarina 1-g

viga = 7 - longarina 1-g

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.165	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	23.300	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

3b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.400	-0.878	-1.214	-1.549	-0.591	-0.926	-5.507	-5.315	-5.651	4.629	-15.477	-15.813	-16.148
Q mn. Vao= 2	80.496	65.103	52.469	40.774	27.518	14.956	2.697	-10.397	-23.165	-36.800	-50.242	-63.469	-74.432
Q mn. Vao= 3b	-30.898	-31.287	-42.540	-42.929	-43.318	5.093	-34.686	-31.103	-31.492	-31.881	-30.743	-31.108	0.000
M mn. Vao= 1b	-0.031	-1.269	-1.370	-1.504	-1.618	-1.692	-2.143	-3.336	-3.868	-2.551	-2.403	-3.922	-5.474
M mn. Vao= 2	-4.162	134.439	248.068	337.847	403.655	445.446	462.690	454.819	421.753	363.311	279.224	169.404	34.452
M mn. Vao= 3b	33.211	29.714	27.361	22.563	17.720	19.476	17.784	14.527	11.015	7.459	3.973	0.508	0.000
Q mx. Vao= 1b	0.400	-0.878	-1.214	-1.549	-0.590	-0.926	-5.507	-5.315	-5.650	4.636	-15.468	-15.804	-16.139
Q mx. Vao= 2	80.502	65.108	52.474	40.779	27.522	14.960	2.701	-10.393	-23.160	-36.795	-50.236	-63.463	-74.425
Q mx. Vao= 3b	-30.886	-31.275	-42.460	-42.849	-43.238	5.169	-34.595	-31.022	-31.411	-31.800	-30.605	-30.970	0.000
M mx. Vao= 1b	-0.031	-1.269	-1.370	-1.504	-1.618	-1.692	-2.143	-3.336	-3.868	-2.551	-2.402	-3.920	-5.470
M mx. Vao= 2	-4.159	134.447	248.086	337.873	403.689	445.487	462.739	454.876	421.818	363.385	279.309	169.501	34.561
M mx. Vao= 3b	33.312	29.814	27.453	22.645	17.794	19.542	17.840	14.573	11.052	7.487	3.989	0.508	0.000
Mt mx.vao= 1b	0.115	0.476	0.476	0.476	0.085	0.085	0.126	0.740	0.740	-0.066	-0.082	-0.082	-0.082
Mt mx.vao= 2	-0.064	-0.017	-0.008	0.011	0.035	0.050	0.065	0.074	0.075	0.082	0.078	0.068	0.102
Mt mx.vao= 3b	0.022	0.022	0.322	0.322	0.322	-0.781	-0.344	-0.580	-0.580	-0.580	-0.581	-0.581	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	96.650	96.635	0.25	0.00	1.	Ap49	0.00	0.00	0.00	0.00	0.00	0	849.	0.	0.	0.	0.	0.
2	43.546	43.527	0.25	0.00	1.	Ap50	0.00	0.00	0.00	0.00	0.00	0	850.	0.	0.	0.	0.	0.

16.3.22 Longarina 2-a

```
        viga =     8 - longarina 2-a
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      22.640     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.356   42.793   42.404   38.482   38.093   29.565   29.176   28.787   22.738   39.504   39.116   38.727
Q mn. Vao= 2   106.824   57.453   45.297   32.479   20.306    6.474   -6.228  -18.230  -30.774  -42.485  -54.969  -67.585  150.208
Q mn. Vao= 3b   33.620   33.232   32.843   73.713   83.783   52.810   52.421   51.962   51.573  102.469  102.080    0.389    0.000

M mn. Vao= 1b    0.000   -0.022    4.785    9.577   13.828   18.135   21.344   24.649   27.909   29.601   33.676   38.098   42.477
M mn. Vao= 2    36.961  162.057  258.263  330.675  379.472  404.310  405.480  383.130  337.553  268.807  177.434   61.941  -44.218
M mn. Vao= 3b  -73.788  -70.024  -66.303  -58.855  -53.436  -42.845  -36.922  -30.765  -24.937  -15.450   -3.938   -0.022    0.000

Q mx. Vao= 1b    0.000   -0.356   42.944   42.556   38.592   38.203   29.681   29.292   28.904   22.843   39.621   39.232   38.843
Q mx. Vao= 2   106.880   57.463   45.307   32.488   20.314    6.482   -6.220  -18.223  -30.766  -42.477  -54.961  -67.576  150.232
Q mx. Vao= 3b   33.654   33.265   32.876   73.737   83.806   52.843   52.454   51.994   51.605  102.521  102.132    0.389    0.000

M mx. Vao= 1b    0.000   -0.022    4.807    9.616   13.883   18.203   21.425   24.742   28.016   29.719   33.806   38.242   42.633
M mx. Vao= 2    37.108  162.192  258.379  330.773  379.554  404.376  405.531  383.167  337.576  268.815  177.441   61.965  -44.182
M mx. Vao= 3b  -73.747  -69.987  -66.270  -58.824  -53.409  -42.821  -36.901  -30.748  -24.924  -15.443   -3.937   -0.022    0.000

Mt mx.vao= 1b    0.000    0.000   -0.538   -0.538   -0.348   -0.348   -0.559   -0.559   -0.559    0.326    0.162    0.162    0.162
```

```
Mt mx.vao= 2      0.027     0.074     0.073     0.077     0.074     0.070     0.064     0.052     0.038     0.023     0.003    -0.024     0.005
Mt mx.vao= 3b     0.127     0.127     0.127    -0.723     2.393    -1.562    -1.562    -1.128    -1.128    -0.475    -0.475     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   68.097  68.037    0.25    0.00    1. Ap3        0.00   0.00   0.00   0.00   0.00      0 803.   0.   0.   0.   0.   0.
         2 -116.578-116.588    0.25    0.00    1. Ap4        0.00   0.00   0.00   0.00   0.00      0 804.   0.   0.   0.   0.   0.
```

16.3.23 Longarina 2-b

```
         viga =     9 - longarina 2-b
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      22.640     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000   -38.757   -39.171   -39.585   -28.483   -38.833   -39.247   -39.661   -40.076   -40.797   -41.212   -41.626   -42.040
Q mn. Vao= 2     76.676    64.782    52.063    38.198    26.142    13.654     1.379   -10.249   -22.282   -33.886   -46.286   -57.956   -67.857
Q mn. Vao= 3b    -1.932    -2.346    -9.762   -10.176   -10.590     9.850    -0.799    -1.213    -1.627   -11.442     0.828     0.414     0.000

M mn. Vao= 1b     0.000    -4.462    -8.845   -13.275   -17.206   -20.788   -25.180   -29.619   -34.104   -38.456   -43.069   -47.729   -52.435
M mn. Vao= 2    -52.435    81.440   190.795   275.548   336.622   374.280   388.994   380.972   350.527   297.697   222.127   123.444     3.944
M mn. Vao= 3b     2.900     2.665     1.839     0.723    -0.439     1.056     1.522     1.412     1.256     0.148    -0.093    -0.023     0.000

Q mx. Vao= 1b     0.000   -38.651   -39.065   -39.479   -28.405   -38.741   -39.155   -39.569   -39.983   -40.713   -41.127   -41.542   -41.956
```

```
Q mx. Vao= 2     76.690   64.794   52.076   38.209   26.150   13.661    1.385  -10.244  -22.277  -33.882  -46.282  -57.951  -67.804
Q mx. Vao= 3b    -1.882   -2.296   -9.710  -10.124  -10.538    9.889   -0.767   -1.181   -1.595  -11.389    0.828    0.414    0.000

M mx. Vao= 1b     0.000   -4.451   -8.823  -13.241  -17.161  -20.734  -25.115  -29.544  -34.018  -38.362  -42.966  -47.616  -52.312
M mx. Vao= 2    -52.312   81.538  190.869  275.601  336.656  374.299  389.001  380.977  350.540  297.719  222.156  123.483    3.985
M mx. Vao= 3b     2.949    2.708    1.877    0.755   -0.413    1.078    1.539    1.426    1.266    0.152   -0.093   -0.023    0.000

Mt mx.vao= 1b     0.000   -1.314   -1.314   -1.314   -0.991   -0.638   -0.638   -0.638   -0.638   -0.031   -0.031   -0.031   -0.031
Mt mx.vao= 2     -0.031    0.014    0.036    0.056    0.060    0.077    0.082    0.078    0.074    0.065    0.061    0.050   -0.009
Mt mx.vao= 3b    -0.025   -0.025   -0.100   -0.100   -0.100   -0.692   -0.768   -0.768   -0.768   -0.689    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  118.729 118.632    0.25    0.00     1. Ap11       0.00   0.00   0.00   0.00   0.00     0 811.   0.    0.    0.    0.    0.
         2   65.925  65.922    0.25    0.00     1. Ap12       0.00   0.00   0.00   0.00   0.00     0 812.   0.    0.    0.    0.    0.
```

16.3.24 Longarina 2-c

```
         viga =    10 - longarina 2-c
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350      1.000     1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       22.640      1.000     1.800      2.358      0.000      5.000      0.000      0.000      0.900      0.500
    3b       1.350      1.000     1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                                   esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000   -0.394   -0.787   -1.181   -9.113   -9.506   -9.900  -10.294  -10.687   -6.459   -6.852   -7.246   -7.639
```

```
Q mn. Vao= 2     77.462    63.208    49.946    37.132    25.529    12.807     0.440   -11.594   -23.576   -35.511   -47.657   -59.842  -108.950
Q mn. Vao= 3b   -47.155   -47.548   -47.942   -48.335   -48.729    -7.755    -8.148    -8.542    -8.935   -39.486     0.787     0.394     0.000

M mn. Vao= 1b     0.000    -0.022    -0.089    -0.199    -1.352    -2.399    -3.491    -4.627    -5.807    -7.813    -8.562    -9.355   -10.192
M mn. Vao= 2    -10.192   123.228   230.476   313.013   372.338   408.672   422.036   412.212   379.665   324.216   246.021   144.282    18.888
M mn. Vao= 3b    25.172    19.848    14.479     9.066     3.609     6.137     5.245     4.310     3.329    -0.464    -0.089    -0.022     0.000

Q mx. Vao= 1b     0.000    -0.394    -0.787    -1.181    -9.110    -9.503    -9.897   -10.290   -10.684    -6.457    -6.851    -7.244    -7.638
Q mx. Vao= 2     77.463    63.209    49.947    37.133    25.529    12.808     0.442   -11.592   -23.573   -35.508   -47.653   -59.838  -108.906
Q mx. Vao= 3b   -47.131   -47.525   -47.918   -48.312   -48.705    -7.728    -8.122    -8.515    -8.909   -39.426     0.787     0.394     0.000

M mx. Vao= 1b     0.000    -0.022    -0.089    -0.199    -1.352    -2.399    -3.490    -4.625    -5.805    -7.811    -8.559    -9.352   -10.189
M mx. Vao= 2    -10.189   123.231   230.482   313.019   372.345   408.679   422.041   412.214   379.668   324.224   246.035   144.304    18.911
M mx. Vao= 3b    25.202    19.875    14.504     9.088     3.628     6.153     5.258     4.320     3.336    -0.463    -0.089    -0.022     0.000

Mt mx.vao= 1b     0.000     0.000     0.000     0.000    -0.552    -0.552    -0.552    -0.552    -0.552    -0.061    -0.061    -0.061    -0.061
Mt mx.vao= 2     -0.061     0.006     0.021     0.049     0.077     0.084     0.082     0.099     0.084     0.095     0.077     0.089    -0.024
Mt mx.vao= 3b    -0.009    -0.009    -0.009    -0.009    -0.009    -0.689    -0.689    -0.689    -0.689    -0.557     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte    nome    m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
         1   85.102  85.101     0.25     0.00     1. Ap19       0.00    0.00    0.00    0.00    0.00      0 819.    0.    0.    0.    0.    0.
         2   61.795  61.775     0.25     0.00     1. Ap20       0.00    0.00    0.00    0.00    0.00      0 820.    0.    0.    0.    0.    0.
```

16.3.25 Longarina 2-d

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         viga =     11 - longarina 2-d
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  eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
  vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
   1b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
   2      22.640     1.000     1.800     2.358     0.000     8.000     0.000     0.000     0.900     0.500
   3b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                          esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.395   -0.790   -1.185   -6.131   -6.527   -6.922   -7.317  -27.722  -11.575  -11.970  -12.365  -12.760
Q mn. Vao= 2    72.562   64.724   51.816   39.562   26.877   14.643    1.818  -10.267  -23.178  -35.280  -48.571  -61.538 -108.549
Q mn. Vao= 3b  -36.742  -37.137  -37.532  -37.927  -38.322  -12.337  -12.732  -13.127  -13.522    1.185    0.790    0.395    0.000

M mn. Vao= 1b    0.000   -0.022   -0.089   -0.200   -0.970   -1.682   -2.439   -3.240   -5.592   -7.489   -8.814  -10.182  -11.596
M mn. Vao= 2   -11.596  119.052  229.590  315.839  378.413  417.274  432.520  424.139  392.126  336.428  256.761  152.084   18.079
M mn. Vao= 3b   22.873   18.719   14.521   10.278    5.991    7.156    5.748    4.295    2.798   -0.200   -0.089   -0.022    0.000

Q mx. Vao= 1b    0.000   -0.395   -0.790   -1.185   -6.127   -6.522   -6.917   -7.313  -27.718  -11.571  -11.966  -12.361  -12.756
Q mx. Vao= 2    72.563   64.726   51.817   39.563   26.878   14.644    1.819  -10.267  -23.178  -35.279  -48.570  -61.538 -108.528
Q mx. Vao= 3b  -36.725  -37.120  -37.516  -37.911  -38.306  -12.320  -12.715  -13.110  -13.506    1.185    0.790    0.395    0.000

M mx. Vao= 1b    0.000   -0.022   -0.089   -0.200   -0.969   -1.681   -2.437   -3.237   -5.589   -7.486   -8.810  -10.178  -11.591
M mx. Vao= 2   -11.591  119.060  229.601  315.853  378.429  417.293  432.540  424.160  392.148  336.449  256.781  152.103   18.094
M mx. Vao= 3b   22.891   18.735   14.535   10.291    6.002    7.165    5.755    4.300    2.801   -0.200   -0.089   -0.022    0.000

Mt mx.vao= 1b    0.000    0.000    0.000    0.000   -0.573   -0.573   -0.573   -0.573   -0.481    0.002    0.002    0.002    0.002
Mt mx.vao= 2     0.002    0.064    0.065    0.082    0.077    0.093    0.106    0.086    0.084    0.059    0.044    0.024   -0.019
Mt mx.vao= 3b   -0.111   -0.111   -0.111   -0.111   -0.111   -0.911   -0.911   -0.911   -0.911    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
```

1	85.322	85.320	0.25	0.00	1.	Ap27	0.00	0.00	0.00	0.00	0.00	0	827.	0.	0.	0.	0.	0.
2	71.807	71.803	0.25	0.00	1.	Ap28	0.00	0.00	0.00	0.00	0.00	0	828.	0.	0.	0.	0.	0.

16.3.26 Longarina 2-e

viga = 12 - longarina 2-e

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	22.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.420	-0.841	1.889	-4.263	-4.683	-5.103	-13.132	-13.552	-6.494	-6.915	7.857	7.436
Q mn. Vao= 2	64.873	58.512	47.048	35.203	23.652	12.436	0.300	-10.028	-21.884	-32.096	-43.807	-56.355	-90.849
Q mn. Vao= 3b	-36.366	-36.787	-37.207	-37.627	-2.463	0.344	-0.077	-0.497	-8.694	-8.550	-8.970	-9.391	0.000
M mn. Vao= 1b	0.000	-0.024	-0.095	-0.519	-0.782	-1.286	-1.836	-2.634	-4.135	-5.066	-5.820	-6.218	-5.357
M mn. Vao= 2	-6.985	111.901	211.649	288.789	343.773	376.961	388.769	379.383	348.963	297.837	225.902	131.690	14.101
M mn. Vao= 3b	18.154	14.044	9.886	5.682	2.759	3.474	3.494	3.467	2.749	1.671	0.691	-0.336	0.000
Q mx. Vao= 1b	0.000	-0.420	-0.841	1.909	-4.255	-4.676	-5.096	-13.127	-13.547	-6.489	-6.909	7.858	7.437
Q mx. Vao= 2	64.876	58.513	47.049	35.204	23.652	12.437	0.302	-10.025	-21.880	-32.090	-43.800	-56.347	-90.749
Q mx. Vao= 3b	-36.324	-36.745	-37.165	-37.585	-2.425	0.391	-0.030	-0.450	-8.646	-8.499	-8.920	-9.340	0.000
M mx. Vao= 1b	0.000	-0.024	-0.095	-0.518	-0.780	-1.282	-1.832	-2.629	-4.129	-5.061	-5.816	-6.214	-5.354

M mx. Vao= 2	-6.982	111.901	211.651	288.794	343.778	376.966	388.772	379.385	348.973	297.856	225.934	131.738	14.148
M mx. Vao= 3b	18.217	14.102	9.940	5.730	2.803	3.512	3.527	3.495	2.772	1.688	0.703	-0.330	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	-0.527	-0.509	-0.509	-0.509	-0.419	-0.419	-0.064	-0.064	-0.009	-0.009
Mt mx.vao= 2	-0.027	0.044	0.057	0.079	0.077	0.094	0.103	0.089	0.083	0.060	0.043	0.018	-0.021
Mt mx.vao= 3b	-0.055	-0.055	-0.055	-0.055	-0.097	-0.911	-0.911	-0.911	-1.416	-1.310	-1.310	-1.310	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo		pilares:				
1	57.439	57.437	0.25	0.00	1.	Ap35	0.00	0.00	0.00	0.00	0.00	0	835.	0.	0.	0.	0.	0.
2	54.483	54.424	0.25	0.00	1.	Ap36	0.00	0.00	0.00	0.00	0.00	0	836.	0.	0.	0.	0.	0.

16.3.27 Longarina 2-f

viga = 13 - longarina 2-f

----

eng esq=nao   eng dir=nao   repet.= 1   andar= 1   red v ext=nao   fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	22.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.414	-0.797	9.043	2.312	1.898	1.484	-3.358	-3.772	-10.755	-11.169	-10.078	-10.492
Q mn. Vao= 2	67.593	58.717	47.061	35.165	23.451	11.459	1.509	-12.852	-25.902	-39.136	-52.882	-67.003	54.935
Q mn. Vao= 3b	22.377	21.963	21.549	21.135	28.563	52.303	51.889	51.475	32.520	46.579	46.165	45.751	0.000
M mn. Vao= 1b	0.000	-0.023	-0.093	0.713	1.277	1.514	1.704	1.429	1.027	-0.348	-1.581	-2.717	-3.874

M mn. Vao= 2	-3.363	117.591	217.666	295.267	350.643	383.758	394.207	381.517	345.163	284.428	198.984	86.879	-33.506
M mn. Vao= 3b	-51.619	-49.115	-46.658	-44.248	-41.158	-34.442	-28.568	-22.741	-19.144	-13.846	-8.613	-3.427	0.000
Q mx. Vao= 1b	0.000	-0.414	-0.797	9.112	2.354	1.940	1.526	-3.309	-3.723	-10.694	-11.108	-10.018	-10.432
Q mx. Vao= 2	67.607	58.726	47.068	35.171	23.456	11.465	1.515	-12.844	-25.893	-39.124	-52.868	-66.989	54.946
Q mx. Vao= 3b	22.462	22.048	21.634	21.220	28.674	52.420	52.006	51.592	32.619	46.719	46.305	45.890	0.000
M mx. Vao= 1b	0.000	-0.023	-0.093	0.722	1.293	1.534	1.729	1.459	1.063	-0.305	-1.532	-2.660	-3.810
M mx. Vao= 2	-3.300	117.634	217.694	295.284	350.650	383.760	394.219	381.542	345.204	284.489	199.069	86.991	-33.384
M mx. Vao= 3b	-51.474	-48.980	-46.532	-44.131	-41.053	-34.351	-28.490	-22.676	-19.090	-13.808	-8.591	-3.420	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	-0.401	-0.451	-0.451	-0.451	-0.396	-0.396	-0.019	-0.019	-0.026	-0.026
Mt mx.vao= 2	-0.020	0.025	0.043	0.048	0.070	0.070	0.065	0.076	0.014	0.085	0.059	0.054	0.035
Mt mx.vao= 3b	-0.106	-0.106	-0.106	-0.106	-0.239	-1.032	-1.032	-1.032	-1.523	-1.891	-1.891	-1.891	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	78.099	78.025	0.25	0.00	1.	Ap43	0.00	0.00	0.00	0.00	0.00	0	843.	0.	0.	0.	0.	0.
2	-32.484	-32.558	0.25	0.00	1.	Ap44	0.00	0.00	0.00	0.00	0.00	0	844.	0.	0.	0.	0.	0.

16.3.28 Longarina 2-g

viga = 14 - longarina 2-g

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	22.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

3b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.389	-98.976	-99.365	-56.547	-56.936	-60.128	-60.517	-60.906	-74.936	-53.235	-53.624	-54.012
Q mn. Vao= 2	72.493	69.191	57.134	44.865	32.960	20.350	7.734	-5.389	-18.472	-30.730	-43.548	-55.782	-218.821
Q mn. Vao= 3b	-81.672	-82.061	-82.450	-70.169	-91.807	-46.179	-46.567	-63.082	-63.471	-69.975	-70.363	0.389	0.000
M mn. Vao= 1b	0.000	-0.022	-8.392	-19.549	-27.100	-33.484	-39.997	-46.783	-53.613	-62.729	-70.113	-76.124	-82.179
M mn. Vao= 2	-81.575	58.951	177.703	273.302	346.039	395.371	421.448	423.887	402.396	356.713	287.296	194.047	55.414
M mn. Vao= 3b	77.197	68.005	58.770	50.391	39.290	37.197	31.997	26.304	19.202	12.079	4.208	-0.022	0.000
Q mx. Vao= 1b	0.000	-0.389	-98.846	-99.235	-56.463	-56.852	-60.045	-60.434	-60.823	-74.855	-53.144	-53.533	-53.922
Q mx. Vao= 2	72.511	69.206	57.150	44.879	32.974	20.363	7.748	-5.376	-18.459	-30.716	-43.533	-55.767	-218.382
Q mx. Vao= 3b	-81.507	-81.896	-82.284	-70.015	-91.642	-46.022	-46.411	-62.931	-63.320	-69.762	-70.150	0.389	0.000
M mx. Vao= 1b	0.000	-0.022	-8.382	-19.524	-27.064	-33.437	-39.941	-46.718	-53.539	-62.646	-70.021	-76.022	-82.066
M mx. Vao= 2	-81.462	59.034	177.756	273.327	346.040	395.397	421.499	423.962	402.495	356.838	287.447	194.226	55.562
M mx. Vao= 3b	77.407	68.197	58.944	50.547	39.427	37.318	32.101	26.390	19.272	12.123	4.229	-0.022	0.000
Mt mx.vao= 1b	0.000	0.000	-0.315	-0.315	-0.581	-0.581	-0.525	-0.525	-0.525	-0.046	-0.137	-0.137	-0.137
Mt mx.vao= 2	0.024	-0.025	-0.007	0.015	0.035	0.049	0.047	0.067	0.071	0.071	0.061	0.053	-0.056
Mt mx.vao= 3b	0.014	0.014	0.014	0.102	1.898	-1.095	-1.095	-0.634	-0.634	-1.108	-1.108	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	126.523	126.415	0.25	0.00	1.	Ap51	0.00	0.00	0.00	0.00	0.00	0	851.	0.	0.	0.	0.	0.
2	137.149	136.875	0.25	0.00	1.	Ap52	0.00	0.00	0.00	0.00	0.00	0	852.	0.	0.	0.	0.	0.

16.3.29 Longarina 3-a

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        viga =    15 - longarina 3-a
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000  -21.686  -22.075    9.835    9.447    9.058   13.068  -48.515  -48.904   29.152   28.763   23.179   22.790
Q mn. Vao= 2    90.020   75.498   59.269   43.206   28.244   13.704   -1.144  -15.803  -30.029  -44.322  -58.120  -71.794  -93.742
Q mn. Vao= 3b   18.409   18.073   17.738   -8.609   -8.927    5.619    3.934    3.626    0.223    1.314    0.979    0.643   -0.417

M mn. Vao= 1b    0.000   -0.175   -2.636   -1.901   -0.816    0.225    1.008   -3.848   -9.328   -8.841   -5.583   -6.711   -4.125
M mn. Vao= 2    -4.408  232.972  422.718  567.075  667.680  726.406  743.423  719.448  655.089  550.282  405.926  222.208   -3.028
M mn. Vao= 3b   -4.853   -3.078   -1.334   -1.796   -2.643   -3.150   -1.821   -1.455   -1.482   -1.396   -1.285   -1.206   -0.026

Q mx. Vao= 1b    0.000  -21.634  -22.023    9.868    9.479    9.090   13.104  -48.479  -48.868   29.209   28.821   23.236   22.847
Q mx. Vao= 2    90.026   75.503   59.272   43.208   28.245   13.704   -1.144  -15.802  -30.028  -44.321  -58.117  -71.786  -93.730
Q mx. Vao= 3b   18.460   18.124   17.788   -8.563   -8.880    5.620    3.935    3.627    0.223    1.314    0.979    0.643   -0.417

M mx. Vao= 1b    0.000   -0.172   -2.628   -1.889   -0.800    0.244    1.031   -3.821   -9.297   -8.803   -5.538   -6.659   -4.067
M mx. Vao= 2    -4.350  233.014  422.750  567.100  667.702  726.427  743.445  719.472  655.116  550.309  405.949  222.216   -3.009
M mx. Vao= 3b   -4.834   -3.064   -1.325   -1.791   -2.643   -3.150   -1.821   -1.455   -1.482   -1.396   -1.285   -1.206   -0.026

Mt mx.vao= 1b    0.000   -0.765   -0.765   -1.032   -1.032   -1.032   -0.604   -1.289   -1.289    0.985    0.985    0.080    0.080
```

Mt mx.vao= 2	0.384	0.190	0.191	0.173	0.156	0.137	0.102	0.071	0.033	-0.009	-0.049	-0.090	-0.130
Mt mx.vao= 3b	-0.112	-0.112	-0.112	-0.113	-0.113	0.924	0.148	0.148	0.095	0.478	0.478	0.478	0.115

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	67.236	67.173	0.25	0.00	1.	Ap5	0.00	0.00	0.00	0.00	0.00	0	805.	0.	0.	0.	0.	0.
2	112.202	112.139	0.25	0.00	1.	Ap6	0.00	0.00	0.00	0.00	0.00	0	806.	0.	0.	0.	0.	0.

16.3.30 Longarina 3-b

viga = 16 - longarina 3-b

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	33.920	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	1.165	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-61.651	-33.363	-33.764	-34.165	-34.567	-48.674	-49.076	-49.477	-18.666	-19.057	-16.428	-16.829
Q mn. Vao= 2	75.892	65.817	55.859	43.585	30.583	16.745	2.316	-11.427	-25.248	-38.878	-52.476	-66.028	-84.609
Q mn. Vao= 3b	11.897	11.551	2.250	1.904	1.577	-5.948	-6.294	-1.545	-1.891	-1.426	-1.772	-2.119	0.145
M mn. Vao= 1b	0.000	-3.486	-10.252	-14.028	-17.849	-21.715	-25.656	-31.154	-36.698	-39.742	-41.864	-43.618	-45.488
M mn. Vao= 2	-45.625	154.395	326.348	466.400	570.191	635.495	661.441	648.491	596.673	506.246	377.428	210.167	1.799
M mn. Vao= 3b	0.447	1.595	2.505	2.717	2.891	2.223	1.630	1.245	1.079	0.927	0.772	0.583	0.012
Q mx. Vao= 1b	0.000	-61.635	-33.354	-33.756	-34.157	-34.559	-48.662	-49.063	-49.464	-18.596	-18.986	-16.355	-16.757

```
Q mx. Vao= 2     75.905   65.824   55.862   43.585   30.583   16.746    2.318  -11.425  -25.247  -38.878  -52.473  -66.020  -84.588
Q mx. Vao= 3b    11.998   11.652    2.352    2.005    1.678   -5.939   -6.286   -1.539   -1.886   -1.424   -1.770   -2.116    0.146

M mx. Vao= 1b     0.000   -3.485  -10.250  -14.025  -17.845  -21.710  -25.649  -31.146  -36.688  -39.724  -41.839  -43.583  -45.446
M mx. Vao= 2    -45.583  154.410  326.350  466.402  570.194  635.495  661.445  648.500  596.687  506.261  377.440  210.169    1.835
M mx. Vao= 3b     0.483    1.621    2.521    2.723    2.895    2.225    1.631    1.246    1.079    0.927    0.772    0.584    0.012

Mt mx.vao= 1b     0.000    0.360   -0.530   -0.530   -0.530   -0.530   -0.726   -0.726   -0.726    0.048    0.048    0.013    0.013
Mt mx.vao= 2      0.108    0.096    0.128    0.163    0.158    0.144    0.119    0.094    0.063    0.032   -0.009   -0.050   -0.104
Mt mx.vao= 3b    -0.033   -0.033   -0.045   -0.045   -0.045   -0.045   -0.045   -0.025   -0.025   -0.159   -0.159   -0.159   -0.038

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
         1    92.735   92.649     0.25     0.00     1. Ap7         0.00    0.00    0.00    0.00    0.00      0 807.    0.    0.    0.    0.    0.
         2    96.607   96.485     0.25     0.00     1. Ap8         0.00    0.00    0.00    0.00    0.00      0 808.    0.    0.    0.    0.    0.
```

16.3.31 Longarina 3-c

```
         viga =    17 - longarina 3-c
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       33.920      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    3b       1.165      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                               esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000  -88.072  -41.449  -41.864  -42.278  -42.692  -55.601  -56.015  -56.429  -65.130  -62.538  -61.525  -61.939
```

Q mn. Vao= 2	79.671	67.843	52.809	38.988	26.690	14.408	2.012	-10.424	-23.107	-35.933	-48.634	-61.247	-76.689
Q mn. Vao= 3b	32.223	31.866	0.775	0.418	0.080	-4.083	-4.440	-0.616	-0.973	-0.876	-1.233	-1.581	0.115
M mn. Vao= 1b	0.000	-4.499	-12.028	-16.715	-21.448	-26.227	-31.906	-38.185	-44.510	-52.267	-59.685	-66.925	-73.868
M mn. Vao= 2	-74.048	139.954	309.483	438.242	530.555	588.206	611.358	599.516	552.079	468.680	349.206	193.836	1.342
M mn. Vao= 3b	-2.656	0.455	1.777	1.837	1.863	1.425	1.012	0.906	0.829	0.745	0.643	0.507	0.005
Q mx. Vao= 1b	0.000	-88.008	-41.416	-41.830	-42.244	-42.658	-55.565	-55.979	-56.393	-65.126	-62.534	-61.515	-61.929
Q mx. Vao= 2	79.684	67.843	52.811	38.991	26.692	14.409	2.013	-10.424	-23.106	-35.932	-48.633	-61.247	-76.684
Q mx. Vao= 3b	32.251	31.894	0.802	0.445	0.107	-4.076	-4.433	-0.611	-0.969	-0.872	-1.229	-1.577	0.115
M mx. Vao= 1b	0.000	-4.495	-12.019	-16.701	-21.431	-26.206	-31.882	-38.156	-44.477	-52.234	-59.651	-66.892	-73.837
M mx. Vao= 2	-74.017	139.994	309.520	438.272	530.578	588.222	611.371	599.527	552.091	468.695	349.224	193.855	1.356
M mx. Vao= 3b	-2.649	0.465	1.786	1.844	1.867	1.428	1.015	0.908	0.831	0.746	0.644	0.507	0.005
Mt mx.vao= 1b	0.000	0.191	-0.721	-0.721	-0.721	-0.721	-0.686	-0.686	-0.686	-0.091	-0.312	-0.004	-0.004
Mt mx.vao= 2	0.015	0.063	0.091	0.118	0.131	0.117	0.129	0.114	0.093	0.066	0.032	-0.009	-0.064
Mt mx.vao= 3b	-0.007	-0.007	-0.035	-0.035	-0.035	-0.032	-0.032	-0.018	-0.018	-0.096	-0.096	-0.096	-0.026

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo		pilares:				
1	141.624	141.601	0.25	0.00	1.	Ap13	0.00	0.00	0.00	0.00	0.00	0	813.	0.	0.	0.	0.	0.
2	108.940	108.907	0.25	0.00	1.	Ap14	0.00	0.00	0.00	0.00	0.00	0	814.	0.	0.	0.	0.	0.

16.3.32 Longarina 3-d

viga = 18 - longarina 3-d

```
eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
 1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 2       33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 3b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                         esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000 -119.625  -37.567  -37.973  -38.379  -38.785  -54.197  -54.603  -55.009  -16.094  -17.625  -17.987  -18.393
Q mn. Vao= 2    71.209   60.884   50.381   39.229   26.620   14.552    0.929  -11.392  -23.479  -35.455  -47.447  -59.406  -72.251
Q mn. Vao= 3b    8.226    7.876    7.525    7.175    6.844   -0.346    1.391    1.041    0.690    0.390    0.039    0.230    0.045

M mn. Vao= 1b    0.000   -5.891  -11.791  -16.040  -20.335  -24.675  -29.532  -35.652  -41.817  -44.708  -46.621  -48.630  -50.677
M mn. Vao= 2   -50.316  138.661  296.497  423.314  516.077  573.398  595.045  581.274  532.744  449.990  333.156  182.345   -2.991
M mn. Vao= 3b   -2.991   -2.203   -1.449   -0.728   -0.044   -0.132   -0.146   -0.028    0.056    0.110    0.130    0.083    0.001

Q mx. Vao= 1b    0.000 -119.615  -37.564  -37.970  -38.377  -38.783  -54.192  -54.598  -55.004  -16.081  -17.609  -17.966  -18.372
Q mx. Vao= 2    71.218   60.888   50.383   39.230   26.620   14.553    0.931  -11.390  -23.477  -35.453  -47.447  -59.401  -72.236
Q mx. Vao= 3b    8.296    7.945    7.595    7.244    6.913   -0.339    1.395    1.044    0.694    0.392    0.041    0.230    0.045

M mx. Vao= 1b    0.000   -5.891  -11.790  -16.039  -20.333  -24.674  -29.530  -35.649  -41.814  -44.706  -46.621  -48.628  -50.672
M mx. Vao= 2   -50.312  138.672  296.516  423.337  516.101  573.420  595.064  581.288  532.751  449.990  333.162  182.346   -2.967
M mx. Vao= 3b   -2.967   -2.185   -1.438   -0.724   -0.042   -0.131   -0.146   -0.028    0.056    0.110    0.131    0.083    0.001

Mt mx.vao= 1b    0.000    0.200   -0.756   -0.756   -0.756   -0.756   -1.002   -1.002   -1.002   -0.007   -0.004    0.005    0.005
Mt mx.vao= 2    -0.007    0.028    0.070    0.087    0.107    0.143    0.127    0.131    0.120    0.085    0.061    0.031   -0.013
Mt mx.vao= 3b   -0.013   -0.013   -0.013   -0.013   -0.013   -0.012   -0.012   -0.012   -0.012   -0.022   -0.022   -0.088   -0.010

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
```

```
1    89.611  89.581     0.25     0.00     1. Ap15        0.00    0.00    0.00    0.00    0.00      0 815.    0.    0.    0.    0.    0.
2    80.546  80.462     0.25     0.00     1. Ap16        0.00    0.00    0.00    0.00    0.00      0 816.    0.    0.    0.    0.    0.
```

16.3.33 Longarina 3-e

```
         viga =    19 - longarina 3-e
---------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      33.920     1.000     1.800     3.035     0.000     5.000     0.000     0.000     0.900     0.500
    3b      1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000  -50.802  -51.195  -51.589  -51.982  -52.343  -61.877  -62.270  -62.664  -55.490  -57.191  -42.307  -42.701
Q mn. Vao= 2  -434.599   66.779   53.230   39.928   26.295   13.930    0.730  -11.833  -24.196  -36.368  -48.442  -59.780  -70.404
Q mn. Vao= 3b    7.820    7.481    7.141    6.802    6.480    3.376    2.887    2.547    2.208    1.741    1.401    0.675    0.043

M mn. Vao= 1b    0.000   -9.538  -15.276  -21.057  -26.883  -32.753  -39.502  -46.485  -53.512  -60.327  -66.779  -71.867  -76.649
M mn. Vao= 2   -11.019  130.443  299.606  430.452  523.826  580.755  601.811  587.148  537.010  451.805  332.148  179.379   -4.512
M mn. Vao= 3b   -4.512   -3.759   -3.038   -2.350   -1.698   -1.325   -1.018   -0.754   -0.524   -0.333   -0.181   -0.084   -0.003

Q mx. Vao= 1b    0.000  -50.773  -51.167  -51.561  -51.954  -52.315  -61.850  -62.244  -62.637  -55.438  -57.136  -42.252  -42.645
Q mx. Vao= 2  -434.276   66.786   53.234   39.930   26.295   13.931    0.731  -11.832  -24.194  -36.368  -48.440  -59.771  -70.384
Q mx. Vao= 3b    7.932    7.593    7.253    6.913    6.592    3.382    2.888    2.548    2.209    1.742    1.402    0.675    0.043

M mx. Vao= 1b    0.000   -9.533  -15.267  -21.046  -26.868  -32.735  -39.481  -46.461  -53.485  -60.294  -66.740  -71.821  -76.597
```

```
M mx. Vao= 2   -11.011  130.468  299.617  430.457  523.829  580.758  601.815  587.154  537.020  451.819  332.161  179.381   -4.471
M mx. Vao= 3b   -4.471   -3.728   -3.018   -2.341   -1.696   -1.325   -1.018   -0.754   -0.523   -0.333   -0.180   -0.084   -0.003

Mt mx.vao= 1b    0.000   -1.035   -1.035   -1.035   -1.035   -1.035   -0.861   -0.861   -0.861   -0.182   -0.248   -0.063   -0.063
Mt mx.vao= 2    -0.047    0.006    0.047    0.069    0.112    0.136    0.125    0.134    0.132    0.102    0.086    0.060    0.020
Mt mx.vao= 3b    0.020    0.020    0.020    0.020    0.020   -0.005   -0.001   -0.001   -0.001    0.029    0.029    0.037   -0.008

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1 -391.631-391.898     0.25     0.00     1. Ap21       0.00   0.00   0.00   0.00   0.00      0 821.   0.   0.   0.   0.   0.
         2   78.336  78.204     0.25     0.00     1. Ap22       0.00   0.00   0.00   0.00   0.00      0 822.   0.   0.   0.   0.   0.
```

16.3.34 Longarina 3-f

```
         viga =    20 - longarina 3-f
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       33.920     1.000     1.800     5.070     0.000     2.000     0.000     0.000     0.900     0.500
    3b       1.165     1.000     1.800     1.233     0.000     8.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000  -43.054  -43.603  -44.153  -44.702  -45.376  -64.307  -64.857  -65.406  -39.046  -39.596  -39.872  -40.422
Q mn. Vao= 2    81.894   66.063   52.710   39.894   27.058   14.231    1.677  -10.941  -23.524  -36.122  -48.950  -62.260  -77.354
Q mn. Vao= 3b   13.457   12.983   12.508   12.034   11.586    4.476    3.855    3.381    2.907    2.459    1.896    1.422    0.080

M mn. Vao= 1b    0.000   -9.697  -14.571  -19.508  -24.506  -29.541  -35.598  -42.863  -50.191  -56.003  -60.426  -64.892  -69.407
```

```
M mn. Vao= 2    -69.451  139.104  306.869  437.588  531.987  590.281  612.657  599.350  550.537  466.214  346.031  188.983   -7.333
M mn. Vao= 3b    -7.333   -6.034   -4.781   -3.574   -2.417   -1.964   -1.552   -1.201   -0.895   -0.634   -0.369   -0.208   -0.006

Q mx. Vao= 1b     0.000  -43.048  -43.597  -44.147  -44.696  -45.370  -64.298  -64.847  -65.397  -39.036  -39.586  -39.862  -40.412
Q mx. Vao= 2     81.898   66.066   52.710   39.895   27.060   14.233    1.680  -10.938  -23.522  -36.121  -48.946  -62.248  -77.327
Q mx. Vao= 3b    13.619   13.145   12.671   12.196   11.748    4.487    3.861    3.386    2.912    2.462    1.896    1.422    0.080

M mx. Vao= 1b     0.000   -9.696  -14.569  -19.505  -24.502  -29.537  -35.593  -42.857  -50.184  -55.997  -60.421  -64.888  -69.404
M mx. Vao= 2    -69.448  139.117  306.885  437.604  531.999  590.287  612.658  599.358  550.553  466.235  346.048  188.988   -7.275
M mx. Vao= 3b    -7.275   -5.991   -4.754   -3.562   -2.413   -1.963   -1.551   -1.200   -0.894   -0.634   -0.368   -0.207   -0.006

Mt mx.vao= 1b     0.000   -1.004   -1.004   -1.004   -1.004   -0.965   -1.320   -1.320   -1.320   -0.006   -0.006    0.002    0.002
Mt mx.vao= 2      0.007    0.020    0.058    0.090    0.109    0.121    0.131    0.128    0.119    0.105    0.081    0.049    0.017
Mt mx.vao= 3b     0.017    0.017    0.017    0.017    0.017   -0.003    0.014    0.014    0.014    0.055    0.115    0.115   -0.013

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  122.319 122.306    0.25    0.00    1. Ap23       0.00   0.00   0.00   0.00   0.00      0 823.   0.   0.   0.   0.   0.

         2   90.973  90.783    0.25    0.00    1. Ap24       0.00   0.00   0.00   0.00   0.00      0 824.   0.   0.   0.   0.   0.
```

16.3.35 Longarina 3-g

```
         viga =    21 - longarina 3-g
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       33.920     1.000     1.800     3.035     0.000     8.000     0.000     0.000     0.900     0.500
```

3b	1.165	1.000	1.800	1.233	0.000	8.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-54.506	-54.901	-55.296	-55.691	-59.196	-68.739	-69.134	-69.530	-50.659	-51.055	-49.206	-49.601
Q mn. Vao= 2	75.566	67.648	54.381	40.929	27.771	14.624	2.122	-10.557	-23.187	-36.187	-48.636	-61.251	-75.227
Q mn. Vao= 3b	10.635	10.294	9.953	9.612	9.290	1.885	1.544	1.203	0.862	0.743	0.837	0.496	0.013
M mn. Vao= 1b	0.000	-11.953	-18.107	-24.306	-30.549	-37.023	-44.545	-52.300	-60.100	-68.260	-73.982	-79.551	-85.108
M mn. Vao= 2	-85.168	122.710	294.654	428.883	525.625	585.386	608.712	596.089	547.660	463.432	343.400	187.552	-4.668
M mn. Vao= 3b	-4.668	-3.640	-2.645	-1.684	-0.756	-0.691	-0.524	-0.390	-0.290	-0.210	-0.123	-0.059	-0.001
Q mx. Vao= 1b	0.000	-54.488	-54.883	-55.278	-55.673	-59.179	-68.721	-69.116	-69.512	-50.626	-51.021	-49.173	-49.568
Q mx. Vao= 2	75.573	67.651	54.381	40.929	27.771	14.625	2.122	-10.556	-23.187	-36.185	-48.632	-61.243	-75.208
Q mx. Vao= 3b	10.759	10.418	10.077	9.736	9.414	1.890	1.549	1.208	0.867	0.744	0.838	0.497	0.013
M mx. Vao= 1b	0.000	-11.950	-18.102	-24.298	-30.539	-37.011	-44.531	-52.285	-60.083	-68.239	-73.957	-79.522	-85.076
M mx. Vao= 2	-85.135	122.730	294.669	428.896	525.639	585.401	608.728	596.106	547.676	463.446	343.405	187.565	-4.621
M mx. Vao= 3b	-4.621	-3.605	-2.622	-1.673	-0.755	-0.690	-0.524	-0.390	-0.290	-0.210	-0.123	-0.058	-0.001
Mt mx.vao= 1b	0.000	-1.135	-1.135	-1.135	-1.135	-1.067	-0.912	-0.912	-0.912	-0.032	-0.032	0.004	0.004
Mt mx.vao= 2	0.015	0.045	0.038	0.105	0.115	0.118	0.137	0.126	0.105	0.098	0.064	0.026	-0.008
Mt mx.vao= 3b	-0.008	-0.008	-0.008	-0.008	-0.008	-0.005	-0.005	-0.005	-0.005	0.018	0.030	0.030	-0.002

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	125.174	125.134	0.25	0.00	1.	Ap29	0.00	0.00	0.00	0.00	0.00	0	829.	0.	0.	0.	0.	0.
2	85.987	85.844	0.25	0.00	1.	Ap30	0.00	0.00	0.00	0.00	0.00	0	830.	0.	0.	0.	0.	0.

16.3.36 Longarina 3-h

```
        viga =    22 - longarina 3-h
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000  -46.843  -47.251  -47.659  -48.059  -32.797  -54.729  -55.137  -55.545  -28.492  -28.900  -28.671  -29.079
Q mn. Vao= 2    73.948   61.515   50.507   38.837   26.983   14.519    2.347  -10.048  -22.572  -35.654  -47.635  -59.688  -72.915
Q mn. Vao= 3b    7.676    7.324    6.972    6.621    6.288    1.781    1.429    1.078    0.726    0.508    0.831    0.479    0.029

M mn. Vao= 1b    0.000   -3.475   -8.767  -14.106  -19.491  -23.801  -28.437  -34.617  -40.842  -45.095  -48.323  -51.537  -54.785
M mn. Vao= 2   -54.858  136.948  295.216  420.993  513.494  571.757  595.094  583.281  536.090  453.525  335.859  183.646   -3.234
M mn. Vao= 3b   -3.234   -2.504   -1.809   -1.149   -0.523   -0.620   -0.464   -0.342   -0.253   -0.192   -0.092   -0.028   -0.001

Q mx. Vao= 1b    0.000  -46.841  -47.249  -47.657  -48.057  -32.795  -54.726  -55.134  -55.541  -28.486  -28.893  -28.664  -29.072
Q mx. Vao= 2    73.954   61.517   50.507   38.838   26.984   14.519    2.348  -10.046  -22.571  -35.652  -47.635  -59.683  -72.899
Q mx. Vao= 3b    7.697    7.345    6.993    6.641    6.309    1.787    1.436    1.084    0.732    0.513    0.832    0.480    0.029

M mx. Vao= 1b    0.000   -3.474   -8.767  -14.105  -19.490  -23.800  -28.435  -34.615  -40.840  -45.093  -48.321  -51.536  -54.785
M mx. Vao= 2   -54.858  136.960  295.231  421.007  513.506  571.768  595.106  583.295  536.109  453.550  335.888  183.669   -3.231
M mx. Vao= 3b   -3.231   -2.503   -1.808   -1.146   -0.519   -0.618   -0.462   -0.340   -0.253   -0.191   -0.092   -0.028   -0.001

Mt mx.vao= 1b    0.000    0.483    0.483    0.483    0.483   -0.372   -0.960   -0.960   -0.960   -0.004   -0.004    0.001    0.001
```

```
Mt mx.vao= 2      0.014     0.036     0.042     0.102     0.116     0.120     0.137     0.127     0.107     0.098     0.065     0.028    -0.007
Mt mx.vao= 3b    -0.007    -0.007    -0.007    -0.007    -0.007    -0.006    -0.006    -0.006    -0.006    -0.012     0.002     0.002    -0.006

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  103.033 103.020     0.25     0.00     1. Ap31       0.00    0.00    0.00    0.00    0.00      0 831.   0.    0.    0.    0.    0.
         2   80.612  80.575     0.25     0.00     1. Ap32       0.00    0.00    0.00    0.00    0.00      0 832.   0.    0.    0.    0.    0.
```

16.3.37 Longarina 3-i

```
         viga =    23 - longarina 3-i
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000   -55.216   -55.636   -56.056   -42.991   -43.411   -57.332   -57.753   -90.789   -38.391   -38.811   -38.452   -38.872
Q mn. Vao= 2     74.134    63.637    49.759    38.031    25.786    13.693     1.885   -10.048   -22.135   -35.477   -46.845   -59.449   -72.681
Q mn. Vao= 3b    10.367    10.004     9.641     9.278     8.936     2.217     1.854     1.491     1.129     1.277     0.914     0.551     0.027

M mn. Vao= 1b     0.000    -3.740    -9.976   -16.258   -22.807   -27.667   -33.447   -39.921   -47.183   -51.706   -56.048   -60.417   -64.766
M mn. Vao= 2    -64.782   133.912   295.545   420.517   510.045   565.233   586.491   574.056   527.593   446.767   331.403   181.332    -4.538
M mn. Vao= 3b    -4.538    -3.540    -2.577    -1.649    -0.758    -0.793    -0.595    -0.432    -0.305    -0.208    -0.101    -0.030    -0.001

Q mx. Vao= 1b     0.000   -55.165   -55.586   -56.006   -42.949   -43.370   -57.290   -57.710   -90.783   -38.384   -38.805   -38.444   -38.865
```

Q mx. Vao= 2	74.140	63.643	49.762	38.032	25.787	13.694	1.886	-10.047	-22.134	-35.475	-46.844	-59.443	-72.660
Q mx. Vao= 3b	10.462	10.099	9.737	9.374	9.031	2.221	1.858	1.496	1.133	1.277	0.914	0.552	0.027
M mx. Vao= 1b	0.000	-3.737	-9.967	-16.244	-22.787	-27.642	-33.418	-39.886	-47.145	-51.669	-56.011	-60.382	-64.731
M mx. Vao= 2	-64.747	133.930	295.549	420.518	510.046	565.234	586.496	574.062	527.598	446.768	331.408	181.332	-4.502
M mx. Vao= 3b	-4.502	-3.513	-2.560	-1.641	-0.757	-0.792	-0.595	-0.432	-0.304	-0.207	-0.101	-0.029	-0.001
Mt mx.vao= 1b	0.000	0.476	0.476	0.476	-0.441	-0.441	-0.569	-0.569	-0.567	-0.055	-0.055	0.006	0.006
Mt mx.vao= 2	-0.007	0.031	0.061	0.099	0.109	0.118	0.137	0.131	0.111	0.105	0.073	0.029	-0.003
Mt mx.vao= 3b	-0.003	-0.003	-0.003	-0.003	-0.003	-0.005	-0.005	-0.005	-0.005	0.003	0.003	0.003	-0.005

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	113.007	113.005	0.25	0.00	1.	Ap37	0.00	0.00	0.00	0.00	0.00	0	837.	0.	0.	0.	0.	0.
2	83.143	83.027	0.25	0.00	1.	Ap38	0.00	0.00	0.00	0.00	0.00	0	838.	0.	0.	0.	0.	0.

16.3.38 Longarina 3-j

viga = 24 - longarina 3-j

---

eng esq=nao   eng dir=nao   repet.= 1   andar= 1   red v ext=nao   fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	33.920	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	1.165	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-44.528	-44.955	-45.381	-32.910	-33.336	-50.780	-51.207	-51.634	-24.526	-24.953	-29.105	-29.532

Q mn. Vao= 2	81.923	61.640	48.877	36.378	24.660	13.048	1.450	-10.564	-22.488	-34.808	-47.148	-59.535	-71.804
Q mn. Vao= 3b	9.759	9.391	9.022	8.654	4.196	3.801	3.433	3.065	2.697	1.460	1.092	0.724	0.081
M mn. Vao= 1b	0.000	-3.091	-8.124	-13.206	-18.077	-21.803	-26.150	-31.887	-37.672	-40.802	-43.585	-46.886	-50.184
M mn. Vao= 2	-49.896	148.085	303.878	424.234	511.004	564.767	585.591	573.070	526.767	446.183	330.963	180.749	-5.185
M mn. Vao= 3b	-5.185	-4.246	-3.342	-2.475	-1.789	-1.398	-1.046	-0.730	-0.450	-0.290	-0.166	-0.078	-0.004
Q mx. Vao= 1b	0.000	-44.527	-44.953	-45.380	-32.907	-33.334	-50.775	-51.201	-51.628	-24.322	-24.748	-28.885	-29.311
Q mx. Vao= 2	81.972	61.655	48.879	36.380	24.662	13.048	1.451	-10.564	-22.487	-34.807	-47.148	-59.527	-71.782
Q mx. Vao= 3b	9.859	9.491	9.123	8.755	4.236	3.804	3.436	3.068	2.700	1.461	1.093	0.725	0.081
M mx. Vao= 1b	0.000	-3.091	-8.124	-13.206	-18.076	-21.803	-26.149	-31.885	-37.669	-40.777	-43.537	-46.813	-50.087
M mx. Vao= 2	-49.801	148.098	303.884	424.238	511.005	564.770	585.594	573.073	526.771	446.191	330.974	180.752	-5.147
M mx. Vao= 3b	-5.147	-4.217	-3.323	-2.465	-1.787	-1.396	-1.045	-0.729	-0.450	-0.289	-0.165	-0.077	-0.004
Mt mx.vao= 1b	0.000	0.527	0.527	0.527	-0.326	-0.326	-0.927	-0.927	-0.927	-0.075	-0.075	0.012	0.012
Mt mx.vao= 2	-0.025	0.022	0.063	0.090	0.113	0.128	0.126	0.127	0.121	0.081	0.081	0.050	0.008
Mt mx.vao= 3b	0.008	0.008	0.008	0.008	-0.003	-0.002	-0.002	-0.002	-0.002	0.018	0.018	0.018	-0.015

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	111.504	111.234	0.25	0.00	1.	Ap39	0.00	0.00	0.00	0.00	0.00	0	839.	0.	0.	0.	0.	0.
2	81.663	81.541	0.25	0.00	1.	Ap40	0.00	0.00	0.00	0.00	0.00	0	840.	0.	0.	0.	0.	0.

16.3.39 Longarina 3-k

viga = 25 - longarina 3-k

```
eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
 1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 2       33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 3b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                         esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    0.311   -0.103   -0.517    2.198    1.784   -6.525   -6.939  -22.363   29.214   28.800   31.263   30.849
Q mn. Vao= 2    63.581   54.490   46.285   35.929   24.553   12.570    1.039  -11.299  -23.251  -35.282  -48.074  -61.383  -54.076
Q mn. Vao= 3b   14.146   13.788   13.431   13.074   12.576    5.339    4.982    4.624    4.267    1.604    1.247    0.889    0.197

M mn. Vao= 1b    0.000    0.378    0.390    0.355    0.386    0.610    0.195   -0.562   -2.653    0.352    3.615    6.995   10.489
M mn. Vao= 2    11.192  178.018  320.955  437.679  523.928  577.274  596.855  582.472  534.518  453.197  336.896  183.303   -5.082
M mn. Vao= 3b   -7.743   -6.374   -5.040   -3.741   -2.513   -1.996   -1.494   -1.027   -0.594   -0.426   -0.287   -0.184   -0.010

Q mx. Vao= 1b    0.000    0.457    0.043   -0.371    2.316    1.901   -6.399   -6.813  -22.259   29.639   29.225   31.756   31.342
Q mx. Vao= 2    63.696   54.543   46.304   35.931   24.556   12.574    1.042  -11.295  -23.246  -35.278  -48.073  -61.374  -53.988
Q mx. Vao= 3b   14.275   13.918   13.560   13.203   12.661    5.349    4.991    4.634    4.277    1.605    1.247    0.890    0.198

M mx. Vao= 1b    0.000    0.388    0.416    0.398    0.443    0.681    0.279   -0.464   -2.543    0.510    3.821    7.255   10.805
M mx. Vao= 2    11.505  178.098  320.972  437.722  523.970  577.306  596.878  582.483  534.518  453.209  336.917  183.314   -5.031
M mx. Vao= 3b   -7.699   -6.343   -5.022   -3.736   -2.509   -1.993   -1.492   -1.026   -0.594   -0.425   -0.287   -0.183   -0.010

Mt mx.vao= 1b    0.000   -0.509   -0.509   -0.509   -0.807   -0.807   -0.805   -0.805   -0.689   -0.125   -0.125   -0.007   -0.007
Mt mx.vao= 2     0.003    0.001    0.047    0.074    0.105    0.128    0.124    0.133    0.132    0.119    0.100    0.074    0.003
Mt mx.vao= 3b    0.036    0.036    0.036    0.036    0.017    0.008    0.008    0.008    0.008    0.057    0.057    0.057   -0.034

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
```

1	32.847	32.239	0.25	0.00	1.	Ap45	0.00	0.00	0.00	0.00	0.00	0	845.	0.	0.	0.	0.	0.
2	68.351	68.133	0.25	0.00	1.	Ap46	0.00	0.00	0.00	0.00	0.00	0	846.	0.	0.	0.	0.	0.

16.3.40 Longarina 3-l

viga = 26 - longarina 3-l

----

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao comprim. Largura altura b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo

1b	1.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	33.920	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	1.165	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-50.832	-51.233	-36.746	-37.148	-37.549	-43.170	-70.217	-70.618	-59.006	-59.407	-71.953	-72.354
Q mn. Vao= 2	88.629	69.769	55.443	41.121	27.505	14.005	0.737	-13.304	-26.978	-40.442	-51.987	-61.649	-64.584
Q mn. Vao= 3b	3.214	2.868	2.521	2.193	4.551	7.541	7.194	6.848	2.509	1.760	1.413	1.067	0.252
M mn. Vao= 1b	0.000	-3.320	-9.061	-15.189	-19.346	-23.547	-27.926	-33.307	-41.229	-48.495	-55.155	-63.093	-71.211
M mn. Vao= 2	-70.947	150.761	327.601	463.983	561.240	620.093	640.615	622.477	565.653	471.279	341.568	181.406	-3.786
M mn. Vao= 3b	-4.723	-4.416	-4.142	-3.901	-3.449	-2.641	-1.926	-1.244	-0.715	-0.513	-0.358	-0.238	-0.014
Q mx. Vao= 1b	0.000	-50.806	-51.208	-36.730	-37.131	-37.533	-43.151	-70.191	-70.593	-58.718	-59.119	-71.631	-72.032
Q mx. Vao= 2	88.691	69.800	55.449	41.127	27.513	14.010	0.739	-13.304	-26.977	-40.440	-51.982	-61.638	-64.555
Q mx. Vao= 3b	3.343	2.996	2.650	2.321	4.666	7.542	7.196	6.849	2.510	1.760	1.414	1.068	0.253
M mx. Vao= 1b	0.000	-3.318	-9.056	-15.181	-19.336	-23.536	-27.913	-33.291	-41.211	-48.444	-55.072	-62.975	-71.056

```
M mx. Vao= 2   -70.794  150.778  327.631  464.009  561.246  620.105  640.638  622.504  565.680  471.302  341.583  181.411   -3.737
M mx. Vao= 3b   -4.675   -4.380   -4.118   -3.890   -3.449   -2.640   -1.925   -1.243   -0.714   -0.512   -0.358   -0.237   -0.014

Mt mx.vao= 1b    0.000    0.540    0.540   -0.464   -0.464   -0.464   -0.720   -0.856   -0.856    0.024    0.024    0.043    0.043
Mt mx.vao= 2    -0.007   -0.007    0.022    0.050    0.081    0.116    0.123    0.143    0.156    0.157    0.151    0.114    0.029
Mt mx.vao= 3b    0.093    0.093    0.093    0.093    0.060    0.014    0.014    0.014    0.007    0.075    0.075    0.075   -0.043

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  161.045 160.662    0.25     0.00     1. Ap47       0.00   0.00   0.00   0.00   0.00      0 847.   0.   0.   0.   0.   0.

         2   67.927  67.770    0.25     0.00     1. Ap48       0.00   0.00   0.00   0.00   0.00      0 848.   0.   0.   0.   0.   0.
```

16.3.41 Longarina 3-m

```
         viga =    27 - longarina 3-m
-------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       1.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       33.920     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       1.165     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000 -170.149 -170.538  -99.251  -99.640 -100.028 -108.403  -99.980 -100.369 -126.753 -127.142  -94.585  -94.974
Q mn. Vao= 2    93.373   80.768   66.768   51.760   36.931   21.797    6.070   -9.305  -25.825  -42.253  -59.226  -77.162  -91.072
Q mn. Vao= 3b   16.871   16.535   16.200    3.149    2.832   24.396   23.107   22.771   -3.086    2.636    2.301    1.965    0.233

M mn. Vao= 1b    0.000  -14.036  -33.199  -50.962  -62.150  -73.381  -84.108  -96.670 -107.940 -124.909 -139.190 -146.096 -156.759
```

```
M mn. Vao= 2  -156.229   92.594  301.161  468.535  593.767  676.166  714.899  709.880  660.157  564.897  422.491  230.078  -13.501
M mn. Vao= 3b  -14.064  -12.438  -10.845   -9.391   -9.098   -4.356   -3.239   -1.012   -0.868   -1.011   -0.772   -0.564   -0.018

Q mx. Vao= 1b    0.000 -169.923 -170.312  -99.088  -99.477  -99.866 -108.227  -99.811 -100.200 -126.660 -127.048  -94.534  -94.923
Q mx. Vao= 2    93.374   80.775   66.780   51.774   36.944   21.806    6.076   -9.301  -25.824  -42.253  -59.226  -77.160  -91.067
Q mx. Vao= 3b   16.913   16.577   16.242    3.192    2.875   24.398   23.108   22.773   -3.084    2.637    2.301    1.966    0.233

M mx. Vao= 1b    0.000  -14.019  -33.157  -50.895  -62.064  -73.277  -83.985  -96.528 -107.778 -124.736 -139.007 -145.905 -156.562
M mx. Vao= 2  -156.028   92.785  301.322  468.658  593.851  676.220  714.931  709.899  660.169  564.904  422.498  230.086  -13.485
M mx. Vao= 3b  -14.048  -12.426  -10.837   -9.387   -9.097   -4.356   -3.239   -1.011   -0.867   -1.011   -0.772   -0.564   -0.018

Mt mx.vao= 1b    0.000    4.022    4.022    0.059    0.059    0.059   -1.023   -2.051   -2.051    0.273    0.273   -0.061   -0.061
Mt mx.vao= 2    -0.088   -0.065   -0.010    0.026    0.057    0.086    0.121    0.148    0.170    0.193    0.202    0.204    0.047
Mt mx.vao= 3b    0.554    0.554    0.554    1.123    1.123   -0.574    0.518    0.518    0.024    0.325    0.325    0.325   -0.031

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  188.347 188.296    0.25    0.00    1. Ap53       0.00   0.00   0.00   0.00   0.00     0 853.   0.   0.   0.   0.   0.

         2  107.984 107.938    0.25    0.00    1. Ap54       0.00   0.00   0.00   0.00   0.00     0 854.   0.   0.   0.   0.   0.
```

16.4 Etapa de utilização

16.4.1 Bloco 1

```
         viga =   201 - bloco 1
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
```

1b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
2	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
3	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
4	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
5	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
6	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
7	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
8	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
9	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
10	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
11	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
12	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
13	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
14	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
15	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
16	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
17b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	-54.102	-54.239	-54.376	-54.512	-54.649	-54.786	-54.922	-55.059	-55.196	-55.332	-55.469	-55.606	-55.742
Q mn. Vao= 2	51.249	50.799	50.349	49.899	51.231	50.781	-93.590	-94.045	-94.495	-93.873	-95.850	-96.300	-96.750
Q mn. Vao= 3	11.574	11.124	12.507	12.057	11.607	10.633	10.182	9.128	8.678	8.228	9.077	8.627	8.177
Q mn. Vao= 4	17.276	16.825	16.375	19.121	18.670	17.738	17.287	16.837	15.943	15.493	16.824	16.374	15.924
Q mn. Vao= 5	-22.877	-23.328	-23.778	-21.943	-22.393	-22.844	-23.954	-24.404	-25.355	-25.806	-26.235	-24.410	-24.860
Q mn. Vao= 6	19.193	18.743	18.293	17.842	18.612	18.161	17.152	16.701	16.251	16.054	15.604	15.153	14.703
Q mn. Vao= 7	57.785	57.334	56.908	-79.432	-79.366	-79.817	-80.267	-82.800	-83.250	-82.561	-83.012	-83.462	-83.912
Q mn. Vao= 8	1.934	1.483	3.043	2.593	2.142	1.189	0.739	-0.341	-0.791	-1.241	-0.208	-0.658	-1.109
Q mn. Vao= 9	49.214	48.763	48.313	50.375	49.925	49.077	48.626	48.176	-114.385	-114.835	-113.309	-113.760	-114.210

Q mn. Vao=10	-13.847	-14.298	-14.748	-13.521	-13.971	-14.422	-15.536	-15.987	-16.948	-17.398	-17.827	-16.028	-16.478
Q mn. Vao=11	30.689	30.239	29.789	29.338	29.994	29.544	28.548	28.098	27.647	27.453	27.003	26.552	26.102
Q mn. Vao=12	-60.722	-61.172	-61.623	-62.073	-63.558	-64.009	-64.459	-65.488	-65.938	-65.333	-65.783	-66.234	-66.684
Q mn. Vao=13	2.338	1.888	3.287	2.837	2.387	1.364	0.913	-0.223	-0.674	-1.124	-0.133	-0.583	-1.034
Q mn. Vao=14	69.342	68.892	68.442	70.435	69.984	-58.813	-59.264	-59.714	-60.606	-62.575	-60.438	-60.888	-61.338
Q mn. Vao=15	-8.805	-9.255	-9.706	-3.881	-4.331	-4.781	-4.719	-5.169	-5.473	-5.923	-6.352	-4.172	-4.622
Q mn. Vao=16	38.094	37.643	37.193	36.743	41.777	41.327	42.674	42.224	41.773	32.929	-124.555	-125.005	-125.455
Q mn. Vao=17b	13.410	13.273	18.159	18.023	17.886	17.749	17.613	17.476	17.339	17.203	17.066	16.929	16.793

M mn. Vao= 1b	-42.725	-45.125	-47.569	-50.018	-52.474	-54.936	-57.404	-59.878	-62.358	-64.844	-67.337	-69.835	-72.340
M mn. Vao= 2	-47.067	-39.502	-32.005	-24.574	-17.108	-9.048	-17.487	-26.089	-34.680	-43.342	-53.689	-67.459	-81.296
M mn. Vao= 3	-77.072	-72.097	-67.145	-62.038	-56.998	-52.074	-47.252	-42.536	-37.945	-33.421	-29.037	-25.030	-21.090
M mn. Vao= 4	-23.691	-17.424	-11.223	-4.900	0.656	3.479	6.091	8.622	11.019	13.349	15.738	18.203	20.597
M mn. Vao= 5	-6.592	-6.543	-6.655	-6.906	-8.102	-11.455	-14.942	-18.527	-22.217	-26.010	-29.869	-33.463	-37.115
M mn. Vao= 6	-42.835	-35.146	-27.523	-19.967	-12.338	-4.960	-1.445	1.727	4.169	6.566	8.913	11.192	13.406
M mn. Vao= 7	10.559	22.246	33.867	27.577	22.282	16.964	11.579	5.717	-0.507	-8.763	-17.214	-28.279	-40.478
M mn. Vao= 8	-39.882	-37.962	-36.059	-33.946	-31.900	-29.969	-28.412	-27.356	-26.424	-25.559	-24.542	-23.566	-22.657
M mn. Vao= 9	-26.761	-15.556	-4.418	4.216	11.943	19.590	27.160	34.450	27.463	16.267	5.131	-9.584	-26.482
M mn. Vao=10	-17.862	-19.023	-20.409	-21.978	-23.423	-24.934	-26.581	-28.325	-30.372	-32.918	-35.530	-37.883	-40.292
M mn. Vao=11	-43.332	-33.037	-22.809	-12.647	-5.464	0.400	4.795	8.994	13.126	17.212	21.249	25.219	29.122
M mn. Vao=12	25.426	22.113	18.733	15.286	11.670	7.861	3.986	-0.214	-5.411	-13.142	-22.860	-32.646	-42.498
M mn. Vao=13	-40.591	-38.106	-35.640	-32.985	-30.398	-27.932	-25.570	-23.318	-21.200	-19.148	-16.945	-14.787	-12.695
M mn. Vao=14	-21.195	-5.973	6.724	18.162	29.594	26.959	21.255	15.484	9.600	3.578	-3.777	-11.783	-19.877
M mn. Vao=15	-17.836	-18.101	-18.432	-18.756	-18.861	-19.348	-19.950	-20.625	-21.378	-22.173	-23.035	-23.548	-24.109
M mn. Vao=16	-26.505	-17.865	-9.291	-1.788	4.612	11.522	18.240	24.533	30.760	36.086	32.969	21.976	8.323
M mn. Vao=17b	33.295	34.066	34.883	35.697	36.504	37.306	38.101	38.891	39.674	40.451	41.221	41.986	42.744

Q mx. Vao= 1b	-26.365	-26.501	-26.638	-26.775	-26.911	-27.048	-27.185	-27.321	-27.458	-27.594	-27.731	-27.868	-28.004

Q mx. Vao= 2	102.409	101.959	101.509	101.058	102.044	101.594	-37.751	-36.913	-37.363	-36.091	-38.063	-38.513	-38.964
Q mx. Vao= 3	33.989	33.539	34.717	34.266	33.816	32.852	32.401	31.351	30.901	30.451	31.314	30.864	30.414
Q mx. Vao= 4	42.500	42.050	41.600	43.018	42.567	41.559	41.108	40.658	39.689	39.238	40.846	40.396	39.946
Q mx. Vao= 5	1.071	0.621	0.170	1.212	0.762	0.311	-0.749	-1.199	-2.107	-2.557	-2.986	-0.715	-1.165
Q mx. Vao= 6	52.091	51.641	51.191	50.740	51.521	51.071	50.012	49.561	49.111	48.973	48.522	48.072	47.622
Q mx. Vao= 7	117.432	116.982	116.555	-35.679	-35.651	-36.101	-36.552	-39.014	-39.464	-38.877	-39.327	-39.777	-40.227
Q mx. Vao= 8	13.610	13.160	14.715	14.265	13.815	12.874	12.423	11.362	10.911	10.461	11.505	11.055	10.604
Q mx. Vao= 9	80.862	80.411	79.961	81.465	81.015	80.145	79.695	79.244	-69.321	-69.771	-68.297	-68.747	-69.197
Q mx. Vao=10	4.876	4.426	3.975	5.026	4.576	4.125	3.053	2.603	1.683	1.232	0.804	2.417	1.967
Q mx. Vao=11	69.668	69.218	68.768	68.317	69.087	68.637	67.585	67.134	66.684	66.537	66.087	65.636	65.186
Q mx. Vao=12	-22.124	-22.574	-23.024	-23.475	-25.031	-25.481	-25.931	-26.907	-27.357	-26.849	-27.299	-27.750	-28.200
Q mx. Vao=13	17.128	16.678	18.643	18.193	17.742	16.717	16.267	14.978	14.528	14.077	15.308	14.857	14.407
Q mx. Vao=14	102.899	102.448	101.998	103.761	103.310	-38.251	-38.701	-39.152	-39.966	-41.936	-34.872	-35.323	-35.773
Q mx. Vao=15	2.315	1.865	1.414	3.145	2.695	2.244	1.671	1.221	0.843	0.393	-0.036	8.757	8.307
Q mx. Vao=16	69.682	69.232	68.781	68.331	70.534	70.084	71.438	70.988	70.537	64.098	-63.618	-64.068	-64.518
Q mx. Vao=17b	17.199	17.062	18.159	18.023	17.886	17.749	17.613	17.476	17.339	17.203	17.066	16.929	16.793

M mx. Vao= 1b	-42.687	-43.913	-45.108	-46.310	-47.518	-48.731	-49.951	-51.178	-52.410	-53.648	-54.893	-56.144	-57.400
M mx. Vao= 2	-32.685	-20.972	-5.890	9.125	24.117	39.211	28.762	17.929	7.039	-3.853	-9.851	-16.047	-22.310
M mx. Vao= 3	-17.533	-15.815	-14.125	-12.277	-10.419	-8.668	-7.012	-5.458	-3.969	-2.119	-0.215	1.638	3.424
M mx. Vao= 4	-10.060	-7.505	-4.811	-1.871	1.725	7.771	13.840	19.901	25.819	31.670	37.592	43.614	49.569
M mx. Vao= 5	6.437	3.012	-0.333	-3.558	-5.450	-5.478	-5.633	-5.854	-6.131	-6.507	-6.950	-7.155	-7.421
M mx. Vao= 6	-17.178	-14.351	-11.591	-8.897	-6.144	-3.191	3.281	10.161	17.475	24.751	31.978	39.138	46.232
M mx. Vao= 7	55.042	68.584	82.059	68.770	56.991	45.192	33.326	21.214	9.331	-1.008	-10.419	-17.349	-23.279
M mx. Vao= 8	-12.531	-11.906	-11.303	-10.440	-9.300	-8.517	-7.933	-7.585	-7.505	-7.492	-7.181	-6.295	-5.476
M mx. Vao= 9	-13.197	-5.101	3.051	13.232	25.029	36.751	48.555	60.337	50.849	35.211	19.762	7.272	-3.490
M mx. Vao=10	-8.773	-8.931	-9.155	-9.099	-8.871	-8.710	-8.679	-8.724	-8.859	-9.094	-9.392	-9.458	-9.577
M mx. Vao=11	-21.730	-17.214	-12.764	-8.381	-1.172	8.182	17.912	27.898	37.817	47.697	57.528	67.292	76.990

M mx. Vao=12	71.635	62.600	53.498	44.329	34.995	25.539	16.017	6.521	-1.917	-7.887	-11.901	-15.981	-20.128
M mx. Vao=13	-10.627	-10.313	-9.931	-9.367	-8.869	-8.489	-8.210	-8.037	-7.972	-7.894	-7.691	-7.534	-7.384
M mx. Vao=14	-1.979	9.245	22.350	36.550	50.784	46.129	37.376	28.557	19.613	10.530	2.583	-3.778	-9.932
M mx. Vao=15	-4.567	-5.467	-6.433	-7.268	-7.188	-7.111	-7.113	-7.187	-7.318	-7.483	-7.714	-7.384	-6.277
M mx. Vao=16	-15.459	-7.768	-0.145	7.412	17.111	27.534	37.939	48.497	58.988	68.545	64.381	47.898	34.405
M mx. Vao=17b	33.504	34.104	34.883	35.697	36.504	37.306	38.101	38.891	39.674	40.451	41.221	41.986	42.744
Mt mx.vao= 1b	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222	-37.222
Mt mx.vao= 2	-24.600	-24.600	-24.600	-24.600	-24.594	-24.594	-5.896	-5.895	-5.895	-5.895	-5.135	-5.135	-5.135
Mt mx.vao= 3	-5.972	-5.972	-5.975	-5.975	-5.975	-5.975	-5.975	-5.973	-5.973	-5.973	-5.974	-5.974	-5.974
Mt mx.vao= 4	-8.217	-8.217	-8.217	-8.216	-8.216	-8.215	-8.215	-8.215	-8.217	-8.217	-8.213	-8.213	-8.213
Mt mx.vao= 5	3.103	3.103	3.103	3.103	3.103	3.103	3.104	3.104	3.103	3.103	3.103	3.102	3.102
Mt mx.vao= 6	-5.613	-5.613	-5.613	-5.613	-5.614	-5.614	-5.614	-5.614	-5.614	-5.611	-5.611	-5.611	-5.611
Mt mx.vao= 7	-20.028	-20.028	-20.028	7.750	7.754	7.754	7.754	8.514	8.514	8.514	8.514	8.514	8.514
Mt mx.vao= 8	-2.238	-2.238	-2.240	-2.240	-2.240	-2.240	-2.240	-2.238	-2.238	-2.238	-2.240	-2.240	-2.240
Mt mx.vao= 9	-13.458	-13.458	-13.458	-13.458	-13.458	-13.453	-13.453	-13.453	16.974	16.974	16.978	16.978	16.978
Mt mx.vao=10	4.160	4.160	4.160	4.162	4.162	4.162	4.160	4.160	4.160	4.160	4.160	4.160	4.160
Mt mx.vao=11	-4.779	-4.779	-4.779	-4.779	-4.780	-4.780	-4.783	-4.783	-4.783	-4.774	-4.774	-4.774	-4.774
Mt mx.vao=12	7.077	7.077	7.077	7.077	7.838	7.838	7.838	7.838	7.838	7.838	7.838	7.838	7.838
Mt mx.vao=13	5.016	5.016	5.014	5.014	5.014	5.014	5.014	5.016	5.016	5.016	5.014	5.014	5.014
Mt mx.vao=14	-10.340	-10.340	-10.340	-10.346	-10.346	15.813	15.813	15.813	15.808	16.570	16.570	16.570	16.570
Mt mx.vao=15	8.653	8.653	8.653	8.658	8.658	8.658	8.654	8.654	8.658	8.658	8.658	8.648	8.648
Mt mx.vao=16	6.511	6.511	6.511	6.511	6.512	6.512	6.507	6.507	6.507	-6.902	23.110	23.110	23.110
Mt mx.vao=17b	37.168	37.168	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161	37.161

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo		pilares:				
1	130.994	80.399	0.79	0.13	1.	E1-p	0.00	0.00	0.00	0.00	0.00	0	216.	0.	0.	0.	0.	0.
2	130.740	54.284	0.79	0.13	1.	E1-o	0.00	0.00	0.00	0.00	0.00	0	215.	0.	0.	0.	0.	0.

3	16.147	6.837	0.79	0.13	1.	E1-n	0.00	0.00	0.00	0.00	0.00	0	214.	0.	0.	0.	0.	0.
4	-15.615	-62.215	0.79	0.13	0.	E1-m	0.00	0.00	0.00	0.00	0.00	0	213.	0.	0.	0.	0.	0.
5	76.951	20.359	0.79	0.13	1.	E1-l	0.00	0.00	0.00	0.00	0.00	0	212.	0.	0.	0.	0.	0.
6	96.794	17.195	0.79	0.13	1.	E1-k	0.00	0.00	0.00	0.00	0.00	0	211.	0.	0.	0.	0.	0.
7	97.087	44.667	0.79	0.13	1.	E1-j	0.00	0.00	0.00	0.00	0.00	0	210.	0.	0.	0.	0.	0.
8	76.912	44.234	0.79	0.13	1.	E1-i	0.00	0.00	0.00	0.00	0.00	0	209.	0.	0.	0.	0.	0.
9	119.086	55.900	0.79	0.13	1.	E1-h	0.00	0.00	0.00	0.00	0.00	0	208.	0.	0.	0.	0.	0.
10	86.146	30.877	0.79	0.13	1.	E1-g	0.00	0.00	0.00	0.00	0.00	0	207.	0.	0.	0.	0.	0.
11	-48.226	-125.908	0.79	0.13	0.	E1-f	0.00	0.00	0.00	0.00	0.00	0	206.	0.	0.	0.	0.	0.
12	83.674	30.538	0.79	0.13	1.	E1-e	0.00	0.00	0.00	0.00	0.00	0	205.	0.	0.	0.	0.	0.
13	102.659	56.074	0.79	0.13	1.	E1-d	0.00	0.00	0.00	0.00	0.00	0	204.	0.	0.	0.	0.	0.
14	59.780	29.928	0.79	0.13	1.	E1-c	0.00	0.00	0.00	0.00	0.00	0	203.	0.	0.	0.	0.	0.
15	74.304	29.787	0.79	0.13	1.	E1-b	0.00	0.00	0.00	0.00	0.00	0	202.	0.	0.	0.	0.	0.
16	142.622	81.539	0.79	0.13	1.	E1-a	0.00	0.00	0.00	0.00	0.00	0	201.	0.	0.	0.	0.	0.

16.4.2 Bloco 4

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        viga =    204 - bloco 4
-------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.981     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
    2        1.779     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
    3        1.779     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
    4        1.779     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
    5        1.779     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
    6        1.779     var.      Var.      0.000      0.000      1.000      0.000      0.000      0.450      0.500
```

7	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
8	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
9	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
10	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
11	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
12	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
13	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
14	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
15	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
16	1.779	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500
17b	0.981	var.	Var.	0.000	0.000	1.000	0.000	0.000	0.450	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	-16.793	-16.930	-17.066	-17.203	-17.340	-17.476	-17.613	-17.750	-17.886	-18.023	-18.160	-18.270	-17.213
Q mn. Vao= 2	83.694	83.244	82.794	-64.160	-64.581	-71.055	-71.505	-70.162	-70.612	-68.416	-68.866	-69.317	-69.767
Q mn. Vao= 3	32.102	31.651	31.201	39.811	39.361	39.014	-69.569	-70.097	-70.548	-70.998	-68.980	-69.431	-69.881
Q mn. Vao= 4	30.719	30.269	29.819	37.146	35.177	34.805	34.354	33.904	-87.149	-87.599	-85.829	-86.279	-86.729
Q mn. Vao= 5	20.833	20.382	19.932	19.485	21.284	20.833	18.120	17.669	16.789	16.338	15.888	17.437	16.987
Q mn. Vao= 6	4.070	3.620	3.169	2.719	4.142	3.692	2.809	2.358	1.908	0.720	0.270	-0.181	-0.631
Q mn. Vao= 7	-8.067	-8.517	-8.968	-9.418	-9.839	-9.958	-10.409	-11.639	-12.090	-11.028	-11.478	-11.929	-12.379
Q mn. Vao= 8	73.308	72.858	72.408	-32.034	-32.484	-33.376	-33.827	-34.890	-35.340	-35.791	-34.491	-34.941	-35.391
Q mn. Vao= 9	61.020	60.570	60.120	62.170	61.720	-60.466	-60.916	-61.367	-62.228	-62.678	-61.108	-61.558	-62.008
Q mn. Vao=10	45.737	45.287	44.836	42.869	43.978	43.528	42.563	42.113	-83.175	-83.626	-84.076	-82.212	-82.662
Q mn. Vao=11	21.468	21.017	20.567	20.117	22.029	21.579	19.131	18.681	18.230	18.323	17.873	-113.492	-113.942
Q mn. Vao=12	4.306	3.856	3.405	2.955	2.534	2.397	1.946	0.982	0.532	-0.233	-0.683	-1.133	-1.584
Q mn. Vao=13	-22.398	-22.848	-23.299	-21.340	-21.790	-22.693	-23.144	-24.220	-24.670	-25.120	-23.950	-24.400	-24.850
Q mn. Vao=14	-26.672	-27.122	-27.573	-26.027	-26.478	-27.408	-27.858	-28.308	-29.321	-29.772	-28.660	-29.111	-29.561
Q mn. Vao=15	70.875	70.425	69.975	69.528	70.067	-37.899	-38.909	-39.359	-40.282	-40.732	-41.182	-39.888	-40.338

Q mn. Vao=16	65.406	64.956	64.506	62.532	63.413	62.963	62.429	61.989	-94.038	-93.212	-93.662	-94.112	-94.563
Q mn. Vao=17b	28.145	28.008	27.871	27.735	27.598	27.461	27.325	27.188	27.051	26.915	26.778	26.641	26.505
M mn. Vao= 1b	42.751	41.993	41.228	40.457	39.680	38.897	38.108	37.313	36.511	35.703	34.889	34.070	33.260
M mn. Vao= 2	10.148	23.262	35.732	39.016	32.462	24.969	17.429	9.653	1.587	-6.536	-16.214	-25.959	-35.771
M mn. Vao= 3	-21.455	-12.389	-3.390	4.947	12.753	20.390	15.797	8.638	-0.132	-9.539	-19.752	-30.012	-40.339
M mn. Vao= 4	-36.799	-30.512	-24.291	-17.923	-11.622	-5.474	0.192	5.357	7.503	-3.263	-14.570	-26.589	-39.413
M mn. Vao= 5	-43.401	-37.431	-31.528	-25.691	-19.650	-13.698	-8.306	-3.260	1.492	5.912	9.656	12.287	14.839
M mn. Vao= 6	-7.453	-6.405	-5.424	-4.562	-3.743	-2.931	-2.198	-1.599	-1.192	-0.835	-0.622	-0.517	-0.577
M mn. Vao= 7	2.180	1.109	-0.030	-1.235	-2.528	-3.881	-5.319	-6.886	-8.541	-10.219	-11.816	-13.479	-15.210
M mn. Vao= 8	-9.028	3.672	14.814	13.452	10.114	6.691	3.168	-1.033	-6.207	-11.446	-16.568	-21.704	-26.913
M mn. Vao= 9	-24.886	-12.406	-0.248	9.024	18.444	23.798	16.917	9.969	2.947	-4.222	-12.836	-21.674	-30.691
M mn. Vao=10	-27.725	-19.515	-11.453	-3.479	4.338	10.829	17.210	23.492	19.659	8.849	-2.029	-13.121	-25.047
M mn. Vao=11	-22.154	-17.827	-13.568	-9.710	-5.934	-2.209	1.147	4.264	7.314	10.168	12.940	1.155	-13.903
M mn. Vao=12	-18.793	-17.750	-16.774	-15.864	-15.021	-14.171	-13.406	-12.781	-12.612	-12.616	-12.513	-12.513	-12.641
M mn. Vao=13	-11.471	-14.734	-18.064	-20.902	-23.836	-26.895	-30.293	-33.786	-37.410	-41.101	-44.662	-48.233	-51.870
M mn. Vao=14	-25.391	-29.278	-33.232	-37.081	-40.857	-44.704	-48.690	-52.743	-56.935	-61.204	-65.455	-69.579	-73.771
M mn. Vao=15	-82.140	-67.307	-52.540	-38.327	-26.020	-24.935	-29.082	-33.330	-37.662	-42.106	-46.617	-50.977	-55.381
M mn. Vao=16	-75.500	-63.160	-50.886	-38.811	-26.723	-14.641	-2.548	9.569	1.952	-4.841	-11.618	-20.020	-30.765
M mn. Vao=17b	-72.050	-69.569	-67.095	-64.627	-62.165	-59.710	-57.260	-54.817	-52.380	-49.949	-47.524	-45.105	-42.728
Q mx. Vao= 1b	-16.793	-16.930	-17.066	-17.203	-17.340	-17.476	-17.613	-17.750	-17.886	-18.023	-18.160	-18.270	-13.522
Q mx. Vao= 2	125.121	124.671	124.221	-40.914	-41.335	-50.633	-51.084	-49.744	-50.194	-44.763	-45.213	-45.663	-46.114
Q mx. Vao= 3	62.442	61.991	61.541	64.044	63.594	63.327	-46.637	-46.520	-46.970	-47.420	-41.659	-42.109	-42.559
Q mx. Vao= 4	46.281	45.830	45.380	47.542	45.573	44.733	44.282	43.832	-69.879	-70.330	-68.541	-68.991	-69.441
Q mx. Vao= 5	40.494	40.044	39.593	39.147	40.367	39.917	37.253	36.802	35.793	35.342	34.892	36.601	36.150
Q mx. Vao= 6	7.292	6.842	6.391	5.941	6.572	6.121	5.155	4.705	4.254	2.800	2.349	1.899	1.449
Q mx. Vao= 7	-5.194	-5.644	-6.094	-6.545	-6.966	-7.584	-8.035	-9.003	-9.454	-8.747	-9.197	-9.648	-10.098

Q mx. Vao= 8	96.719	96.269	95.818	-22.292	-22.742	-23.349	-23.800	-24.967	-25.417	-25.868	-23.885	-24.335	-24.786
Q mx. Vao= 9	84.413	83.962	83.512	85.084	84.633	-44.951	-45.401	-45.851	-46.717	-47.167	-44.138	-44.589	-45.039
Q mx. Vao=10	57.579	57.129	56.679	54.711	55.982	55.531	54.467	54.017	-69.445	-69.895	-70.345	-68.716	-69.167
Q mx. Vao=11	29.409	28.958	28.508	28.058	28.810	28.360	25.859	25.408	24.958	25.080	24.630	-84.353	-84.804
Q mx. Vao=12	11.379	10.929	10.479	10.028	9.607	9.468	9.018	8.062	7.612	6.854	6.403	5.953	5.503
Q mx. Vao=13	-8.438	-8.888	-9.338	-6.432	-6.883	-7.775	-8.225	-9.341	-9.791	-10.241	-7.117	-7.567	-8.018
Q mx. Vao=14	-17.318	-17.768	-18.218	-16.537	-16.987	-18.184	-18.634	-19.085	-20.027	-20.477	-17.104	-17.554	-18.004
Q mx. Vao=15	100.282	99.831	99.381	98.934	99.934	-21.920	-22.957	-23.407	-24.383	-24.834	-25.284	-23.782	-24.232
Q mx. Vao=16	103.677	103.227	102.777	100.800	101.306	100.855	100.326	99.886	-49.927	-45.492	-45.943	-46.393	-46.843
Q mx. Vao=17b	55.197	55.060	54.923	54.787	54.650	54.513	54.377	54.240	54.103	53.967	53.830	53.693	53.557

M mx. Vao= 1b	42.751	41.993	41.228	40.457	39.680	38.897	38.108	37.313	36.511	35.703	34.889	34.070	33.463
M mx. Vao= 2	35.935	52.732	70.614	75.463	65.918	55.529	45.177	34.998	24.805	16.041	7.872	0.096	-7.525
M mx. Vao= 3	-4.028	0.805	7.226	14.125	21.388	29.007	21.782	11.430	2.709	-4.481	-10.815	-17.024	-23.300
M mx. Vao= 4	-18.201	-13.483	-8.832	-3.659	2.869	9.400	15.870	22.402	25.464	12.616	-0.105	-10.609	-20.902
M mx. Vao= 5	-18.993	-15.825	-12.724	-9.690	-6.480	-3.340	-0.170	3.277	6.627	9.869	13.583	18.868	24.261
M mx. Vao= 6	-5.076	-4.506	-4.003	-3.407	-2.639	-1.881	-1.176	-0.577	-0.045	0.367	0.620	0.895	1.143
M mx. Vao= 7	5.445	4.325	3.139	2.179	1.175	0.019	-1.225	-2.715	-4.327	-5.923	-7.270	-8.683	-10.156
M mx. Vao= 8	-5.391	7.151	21.069	18.782	14.000	9.121	4.140	-0.131	-3.966	-7.817	-11.553	-15.142	-18.783
M mx. Vao= 9	-15.944	-6.931	2.162	14.452	26.910	34.032	25.035	15.971	6.788	-2.342	-9.409	-16.341	-23.339
M mx. Vao=10	-20.960	-13.934	-6.946	0.043	7.441	15.291	23.439	31.481	27.543	15.342	3.110	-7.583	-17.858
M mx. Vao=11	-16.482	-13.265	-9.992	-6.786	-3.377	0.749	4.682	8.381	12.013	15.631	19.214	3.720	-10.135
M mx. Vao=12	-8.190	-7.076	-6.025	-5.036	-4.114	-3.193	-2.347	-1.547	-0.788	0.156	1.139	2.055	2.904
M mx. Vao=13	5.456	3.969	2.415	1.126	-0.237	-1.695	-3.249	-4.781	-6.203	-7.688	-8.804	-9.892	-11.047
M mx. Vao=14	13.587	10.542	7.464	4.583	1.763	-1.126	-4.079	-6.886	-9.864	-12.904	-15.835	-18.404	-21.040
M mx. Vao=15	-28.522	-18.038	-7.621	3.082	15.886	16.759	11.136	5.411	-0.271	-5.846	-11.023	-16.023	-21.021
M mx. Vao=16	-38.548	-28.885	-19.289	-9.302	4.119	17.526	30.872	44.144	29.894	16.084	2.233	-11.686	-20.279
M mx. Vao=17b	-57.479	-56.216	-54.959	-53.708	-52.463	-51.224	-49.992	-48.766	-47.546	-46.332	-45.124	-43.922	-42.691

Mt mx.vao= 1b	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.158	37.203
Mt mx.vao= 2	27.176	27.176	27.176	-5.325	-5.325	7.883	7.883	7.882	7.882	7.881	7.881	7.881	7.881
Mt mx.vao= 3	17.459	17.459	17.459	17.462	17.462	17.459	-3.266	-3.262	-3.262	-3.262	-3.262	-3.262	-3.262
Mt mx.vao= 4	15.078	15.078	15.078	15.080	14.320	14.317	14.317	14.317	-8.946	-8.946	-8.945	-8.945	-8.945
Mt mx.vao= 5	8.928	8.928	8.928	8.928	8.931	8.931	8.171	8.171	8.170	8.170	8.170	8.173	8.173
Mt mx.vao= 6	4.638	4.638	4.638	4.638	4.638	4.638	4.638	4.638	4.638	3.879	3.879	3.879	3.879
Mt mx.vao= 7	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496	-1.496
Mt mx.vao= 8	17.624	17.624	17.624	-4.497	-4.497	-4.499	-4.499	-4.499	-4.499	-4.499	-4.498	-4.498	-4.498
Mt mx.vao= 9	13.775	13.775	13.775	13.775	13.775	-9.383	-9.383	-9.383	-9.380	-9.380	-9.381	-9.381	-9.381
Mt mx.vao=10	9.134	9.134	9.134	8.387	8.379	8.379	8.378	8.378	-13.951	-13.951	-13.951	-13.951	-13.951
Mt mx.vao=11	5.737	5.737	5.737	5.737	5.737	5.737	4.979	4.979	4.979	4.982	4.982	-17.480	-17.480
Mt mx.vao=12	-2.056	-2.056	-2.056	-2.056	-2.056	-2.058	-2.058	-2.058	-2.058	-2.816	-2.816	-2.816	-2.816
Mt mx.vao=13	-4.042	-4.042	-4.042	-4.049	-4.049	-4.039	-4.039	-4.045	-4.045	-4.045	-4.042	-4.042	-4.042
Mt mx.vao=14	-6.055	-6.055	-6.055	-6.055	-6.055	-6.055	-6.055	-6.055	-6.056	-6.056	-6.058	-6.058	-6.058
Mt mx.vao=15	8.472	8.472	8.472	8.472	8.472	-14.472	-14.471	-14.471	-14.472	-14.472	-14.472	-14.474	-14.474
Mt mx.vao=16	-7.284	-7.284	-7.284	-8.044	-8.040	-8.040	-8.037	-8.037	-28.946	-28.938	-28.938	-28.938	-28.938
Mt mx.vao=17b	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221	-37.221

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	142.305	100.731	0.79	0.13	1.	E4-p	0.00	0.00	0.00	0.00	0.00	0	304.	0.	0.	0.	0.	0.
2	127.788	81.573	0.79	0.13	1.	E4-o	0.00	0.00	0.00	0.00	0.00	0	303.	0.	0.	0.	0.	0.
3	112.519	74.610	0.79	0.13	1.	E4-n	0.00	0.00	0.00	0.00	0.00	0	302.	0.	0.	0.	0.	0.
4	127.223	90.274	0.79	0.13	1.	E4-m	0.00	0.00	0.00	0.00	0.00	0	301.	0.	0.	0.	0.	0.
5	-10.555	-29.808	0.79	0.13	0.	E4-l	0.00	0.00	0.00	0.00	0.00	0	300.	0.	0.	0.	0.	0.
6	-5.875	-8.777	0.79	0.13	0.	E4-k	0.00	0.00	0.00	0.00	0.00	0	299.	0.	0.	0.	0.	0.
7	107.901	84.184	0.79	0.13	1.	E4-j	0.00	0.00	0.00	0.00	0.00	0	298.	0.	0.	0.	0.	0.
8	118.931	86.915	0.79	0.13	1.	E4-i	0.00	0.00	0.00	0.00	0.00	0	297.	0.	0.	0.	0.	0.

9	118.888	91.551	0.79	0.13	1.	E4-h	0.00	0.00	0.00	0.00	0.00	0	296.	0.	0.	0.	0.	0.
10	108.280	91.799	0.79	0.13	1.	E4-g	0.00	0.00	0.00	0.00	0.00	0	295.	0.	0.	0.	0.	0.
11	124.978	89.764	0.79	0.13	1.	E4-f	0.00	0.00	0.00	0.00	0.00	0	294.	0.	0.	0.	0.	0.
12	-10.916	-23.875	0.79	0.13	0.	E4-e	0.00	0.00	0.00	0.00	0.00	0	293.	0.	0.	0.	0.	0.
13	-0.464	-11.074	0.79	0.13	0.	E4-d	0.00	0.00	0.00	0.00	0.00	0	292.	0.	0.	0.	0.	0.
14	128.779	88.945	0.79	0.13	1.	E4-c	0.00	0.00	0.00	0.00	0.00	0	291.	0.	0.	0.	0.	0.
15	133.099	99.344	0.79	0.13	1.	E4-b	0.00	0.00	0.00	0.00	0.00	0	290.	0.	0.	0.	0.	0.
16	123.319	89.150	0.79	0.13	1.	E4-a	0.00	0.00	0.00	0.00	0.00	0	289.	0.	0.	0.	0.	0.

16.4.3 Ala 1

```
         viga =   101 - ala 1
-------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       6.109      0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125
    2        1.274      0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -1.399    -2.799    -4.198    -5.598    -6.997    -8.396    -9.796   -11.195   -12.595   -13.994   -15.393   -16.793
Q mn. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

M mn. Vao= 1b     0.000    -0.393    -1.573    -3.540    -6.293    -9.833   -14.160   -19.273   -25.173   -31.860   -39.333   -47.593   -56.639
M mn. Vao= 2     -0.344    -0.315    -0.287    -0.258    -0.229    -0.201    -0.172    -0.143    -0.115    -0.086    -0.057    -0.029    -0.000

Q mx. Vao= 1b     0.000    -1.399    -2.799    -4.198    -5.598    -6.997    -8.396    -9.796   -11.195   -12.595   -13.994   -15.393   -16.793
Q mx. Vao= 2      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

```
M mx. Vao= 1b     0.000    -0.393   -1.573   -3.540   -6.293   -9.833  -14.160  -19.273  -25.173  -31.860  -39.333  -47.593  -56.639
M mx. Vao= 2     -0.343    -0.315   -0.286   -0.258   -0.229   -0.200   -0.172   -0.143   -0.114   -0.086   -0.057   -0.029    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793    0.25    0.00   2. Bloco 1_   0.00   0.00   0.00   0.00   0.00     0  0.   0.   0.   0.   0.   0.

         2    0.000   0.000    0.25    0.00   2. Bloco 1_   0.00   0.00   0.00   0.00   0.00     0  0.   0.   0.   0.   0.   0.
```

16.4.4 Ala 2

```
         viga =   102 - ala 2
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      6.109      0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125
    2       1.274      0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000     1.399    2.799    4.198    5.598    6.997    8.396    9.796   11.195   12.595   13.994   15.394   16.793
Q mn. Vao= 2      0.000     0.000    0.000    0.000    0.000    0.000    0.000   -0.000   -0.000   -0.000   -0.000   -0.000   -0.000

M mn. Vao= 1b     0.000    -0.393   -1.573   -3.540   -6.293   -9.834  -14.160  -19.274  -25.174  -31.861  -39.334  -47.594  -56.641
M mn. Vao= 2     -0.344    -0.315   -0.287   -0.258   -0.229   -0.201   -0.172   -0.143   -0.115   -0.086   -0.057   -0.029   -0.000

Q mx. Vao= 1b     0.000     1.399    2.799    4.198    5.598    6.997    8.396    9.796   11.195   12.595   13.994   15.394   16.793
Q mx. Vao= 2      0.000     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
```

```
M mx. Vao= 1b    0.000   -0.393   -1.573   -3.540   -6.293   -9.834  -14.160  -19.274  -25.174  -31.861  -39.334  -47.594  -56.641
M mx. Vao= 2    -0.343   -0.315   -0.286   -0.258   -0.229   -0.200   -0.172   -0.143   -0.114   -0.086   -0.057   -0.029    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1   16.793  16.793    0.25    0.00    2. Bloco 4_   0.00   0.00   0.00   0.00   0.00     0  0.   0.   0.   0.   0.   0.
         2    0.000   0.000    0.25    0.00    2. Bloco 4_   0.00   0.00   0.00   0.00   0.00     0  0.   0.   0.   0.   0.   0.
```

16.4.5 Ala 3

```
         viga =   103 - ala 3
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      6.109     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125
    2       1.274     0.250     var.      0.000     0.000     1.000     0.000     0.000     1.475     0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -1.399   -2.799   -4.198   -5.598   -6.997   -8.396   -9.796  -11.195  -12.595  -13.994  -15.393  -16.793
Q mn. Vao= 2     0.000    0.000    0.000    0.000    0.000    0.000    0.000   -0.000   -0.000   -0.000   -0.000   -0.000   -0.000

M mn. Vao= 1b    0.000   -0.393   -1.573   -3.540   -6.293   -9.833  -14.160  -19.273  -25.173  -31.860  -39.333  -47.593  -56.639
M mn. Vao= 2    -0.344   -0.315   -0.287   -0.258   -0.229   -0.201   -0.172   -0.143   -0.115   -0.086   -0.057   -0.029   -0.000

Q mx. Vao= 1b    0.000   -1.399   -2.799   -4.198   -5.598   -6.997   -8.396   -9.796  -11.195  -12.595  -13.994  -15.393  -16.793
Q mx. Vao= 2     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

M mx. Vao= 1b    0.000   -0.393   -1.573   -3.540   -6.293   -9.833  -14.160  -19.273  -25.173  -31.860  -39.333  -47.593  -56.639
```

```
M mx. Vao= 2    -0.343   -0.315   -0.286   -0.258   -0.229   -0.200   -0.172   -0.143   -0.114   -0.086   -0.057   -0.029    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
         1    16.793  16.793    0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00     0   0.    0.    0.    0.    0.    0.
         2     0.000   0.000    0.25     0.00     2. Bloco 1_   0.00    0.00    0.00    0.00    0.00     0   0.    0.    0.    0.    0.    0.
```

16.4.6 Ala 4

```
         viga =   104 - ala 4
-------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       6.109     0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125
    2        1.274     0.250     var.       0.000      0.000      1.000      0.000      0.000      1.475      0.125

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    1.399    2.799    4.198    5.598    6.997    8.397    9.796   11.195   12.595   13.994   15.394   16.793
Q mn. Vao= 2      0.000    0.000    0.000    0.000    0.000    0.000    0.000   -0.000   -0.000   -0.000   -0.000   -0.000   -0.000

M mn. Vao= 1b     0.000   -0.393   -1.573   -3.540   -6.294   -9.834  -14.161  -19.274  -25.175  -31.862  -39.335  -47.596  -56.643
M mn. Vao= 2     -0.344   -0.315   -0.287   -0.258   -0.229   -0.201   -0.172   -0.143   -0.115   -0.086   -0.057   -0.029   -0.000

Q mx. Vao= 1b     0.000    1.399    2.799    4.198    5.598    6.997    8.397    9.796   11.195   12.595   13.994   15.394   16.793
Q mx. Vao= 2      0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

M mx. Vao= 1b     0.000   -0.393   -1.573   -3.540   -6.294   -9.834  -14.161  -19.274  -25.175  -31.862  -39.335  -47.596  -56.643
M mx. Vao= 2     -0.343   -0.315   -0.286   -0.258   -0.229   -0.200   -0.172   -0.143   -0.114   -0.086   -0.057   -0.029    0.000
```

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	16.793	16.793	0.25	0.00	2.	Bloco 4_	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	0.000	0.000	0.25	0.00	2.	Bloco 4_	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.7 Travessa 1

viga = 1 - travessa 1

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.	b colab.i.	tipo secao	esp.lj.s.	esp.lj.i.	fc sp eixo	fc lt eixo
1b	5.411	1.300	var.	0.000	0.000	1.000	0.000	0.000	0.540	0.650
2b	2.140	1.300	var.	0.000	0.000	1.000	0.000	0.000	0.540	0.650

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-2.215	-6.925	-164.346	-275.503	-278.375	-283.522	-286.681	-289.988	-293.413	-297.018	-300.731	-304.443
Q mn. Vao= 2b	0.000	2.215	6.925	102.008	211.550	214.422	219.570	222.729	226.035	229.460	233.066	236.780	240.492
M mn. Vao= 1b	0.000	-0.518	-3.069	-28.936	-111.745	-239.372	-370.076	-503.357	-638.135	-774.501	-912.493	-1052.216	-1193.671
M mn. Vao= 2b	0.000	-0.518	-3.069	-28.915	-111.769	-240.196	-371.204	-505.103	-640.499	-777.482	-916.093	-1056.431	-1198.505
Q mx. Vao= 1b	0.000	-2.215	-6.925	-104.986	-210.132	-213.004	-218.151	-221.310	-224.617	-228.042	-231.647	-235.360	-239.073
Q mx. Vao= 2b	0.000	2.215	6.925	164.254	276.820	279.691	284.840	287.998	291.304	294.729	298.335	302.049	305.762
M mx. Vao= 1b	0.000	-0.518	-3.069	-20.493	-75.444	-174.350	-275.105	-377.827	-482.044	-587.850	-695.284	-804.444	-915.339
M mx. Vao= 2b	0.000	-0.518	-3.069	-20.065	-73.845	-173.415	-274.835	-378.221	-483.103	-589.573	-697.671	-807.496	-919.057

```
Mt mx.vao= 1b    0.000    0.000   -1.228  -38.820  -13.460  -13.460   13.010   13.010   13.006   13.006   12.897   13.108   13.108
Mt mx.vao= 2b    0.000    0.000   -1.228  -38.776   13.885   13.885   15.138   15.138   15.185   15.185   15.187   15.191   15.191
```

```
R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  304.443 239.073    0.25    0.00     0. P1-i       0.00   0.00   0.00   0.00   0.00      0   9.   0.   0.   0.   0.   0.
         2  305.762 240.492    0.25    0.00     0. P1-a       0.00   0.00   0.00   0.00   0.00      0   1.   0.   0.   0.   0.   0.
```

16.4.8 Travessa 2

```
         viga =     2 - travessa 2-a
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      5.411     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650
    2b      2.140     1.300     var.      0.000      0.000      1.000      0.000      0.000      0.540      0.650

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -2.215   -6.924 -147.309 -290.032 -292.903 -298.051 -301.210 -304.516 -443.214 -446.826 -452.330 -454.936
Q mn. Vao= 2b    0.000    2.215    6.925  104.459  212.374  215.246  220.390  225.687  228.993  359.972  363.578  367.294  371.007

M mn. Vao= 1b    0.000   -0.518   -3.068  -26.519 -102.883 -236.959 -375.066 -515.140 -656.709 -795.691 -996.494-1199.308-1404.155
M mn. Vao= 2b    0.000   -0.518   -3.069  -30.572 -118.641 -253.758 -390.941 -530.822 -672.460 -879.789-1081.882-1285.696-1491.248

Q mx. Vao= 1b    0.000   -2.215   -6.924  -71.530 -200.235 -203.107 -208.254 -211.413 -214.719 -361.383 -364.994 -370.499 -373.104
Q mx. Vao= 2b    0.000    2.215    6.925  175.852  291.731  294.602  299.745  305.043  308.349  439.092  442.698  446.415  450.128
```

```
M mx. Vao= 1b    0.000   -0.518   -3.068  -15.736  -57.475 -151.807 -247.937 -346.032 -445.621 -541.511 -715.294 -891.090-1068.918
M mx. Vao= 2b    0.000   -0.518   -3.069  -20.418  -76.550 -176.505 -278.309 -382.816 -489.081 -670.115 -844.370-1019.419-1195.797

Mt mx.vao= 1b    0.000    0.000   -1.227  -34.681   22.848   22.848   24.051   24.051   24.091   67.854   67.895   69.136   69.136
Mt mx.vao= 2b    0.000    0.000   -1.228  -41.587  -16.715  -16.715  -15.437  -16.731  -16.830  -47.290  -47.189  -47.180  -47.180

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  454.936 373.104    0.25    0.00    0. P2-i       0.00   0.00   0.00   0.00   0.00     0  18.   0.   0.   0.   0.   0.
         2  450.128 371.007    0.25    0.00    0. P2-a       0.00   0.00   0.00   0.00   0.00     0  10.   0.   0.   0.   0.   0.
```

16.4.9 Transversina 1

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         viga =   101 - transversina 1
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    2        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    3        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    4        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    5        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    6        3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1   -16.479    0.752   -1.248    1.308    0.861    0.237   -0.526   -1.365   -4.075   -7.874   -6.872  -23.131  -38.121
Q mn. Vao= 2     2.698    5.917    2.470    2.978    2.376    1.583    0.609   -1.175   -3.639   -6.147   -7.483  -27.002  -34.886
```

Q mn. Vao= 3	4.626	5.453	1.431	1.550	0.915	-0.276	-1.433	-2.900	-4.670	-6.782	-8.728	-9.883	-39.805
Q mn. Vao= 4	10.396	3.593	3.753	3.326	2.596	1.801	-1.471	-4.780	-6.752	-8.300	-8.976	-10.624	-13.842
Q mn. Vao= 5	3.015	0.942	1.930	1.849	1.434	0.823	0.071	-1.283	-3.272	-5.674	-7.816	-12.375	-19.717
Q mn. Vao= 6	-64.714	-0.262	3.807	3.379	2.692	1.890	0.990	0.021	-4.038	-6.378	-6.843	-6.453	-4.123
M mn. Vao= 1	-2.952	-3.363	-3.146	-2.609	-2.156	-1.915	-1.968	-2.372	-3.164	-4.358	-5.877	-7.879	-13.953
M mn. Vao= 2	-14.108	-12.038	-9.680	-7.347	-5.040	-3.004	-1.301	0.008	0.887	1.121	-0.061	-1.855	-10.317
M mn. Vao= 3	-10.371	-8.203	-6.387	-4.937	-3.482	-2.242	-1.347	-0.847	-0.927	-2.693	-5.985	-9.882	-18.077
M mn. Vao= 4	-17.746	-5.066	-2.792	-0.617	0.940	1.931	2.465	2.095	0.847	-1.044	-3.417	-6.287	-9.936
M mn. Vao= 5	-10.003	-8.138	-6.823	-5.213	-3.669	-2.341	-1.314	-0.700	-0.786	-1.895	-3.386	-5.256	-7.715
M mn. Vao= 6	-8.227	-11.223	-9.990	-8.135	-6.163	-4.329	-2.762	-1.546	-0.777	-0.432	-0.457	-1.223	-2.523
Q mx. Vao= 1	-10.294	16.682	1.816	7.315	6.232	4.673	2.957	-0.057	-0.979	-1.899	-1.979	-6.480	-10.731
Q mx. Vao= 2	22.270	18.517	8.298	9.034	5.957	4.576	3.711	2.771	1.758	0.715	-0.170	-5.674	-10.799
Q mx. Vao= 3	9.082	7.555	3.021	3.662	3.357	2.517	1.651	0.701	-0.319	-1.346	-2.183	-3.129	-12.479
Q mx. Vao= 4	43.390	8.808	11.669	10.816	8.829	5.792	1.867	-0.320	-1.825	-3.134	-4.014	-5.080	-6.933
Q mx. Vao= 5	24.847	3.643	5.952	5.915	5.280	4.565	3.647	0.908	-0.085	-1.073	-1.800	-2.796	-4.268
Q mx. Vao= 6	7.627	9.629	6.489	5.968	5.056	4.277	3.580	2.743	1.280	0.323	-0.277	-0.953	2.011
M mx. Vao= 1	-1.405	0.295	1.426	3.907	6.818	9.115	10.641	10.936	9.602	6.545	2.759	-1.825	-5.855
M mx. Vao= 2	-5.889	-2.994	1.059	4.753	7.931	10.048	11.108	11.125	10.041	7.994	5.226	2.176	-1.921
M mx. Vao= 3	-1.942	0.473	1.814	2.478	2.972	3.142	2.924	2.291	1.417	0.260	-1.278	-3.105	-5.696
M mx. Vao= 4	-5.662	-2.034	0.661	5.194	9.005	11.552	12.398	11.429	9.204	6.179	2.683	-0.021	-2.803
M mx. Vao= 5	-3.655	-0.629	1.100	3.524	5.816	7.799	9.375	10.252	9.827	8.065	5.261	0.910	-3.820
M mx. Vao= 6	-4.062	-1.422	-0.003	1.579	3.833	5.642	6.863	7.293	6.612	4.737	2.505	1.066	-0.524

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-10.294	-16.479	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

2	40.819	18.688	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	39.775	17.262	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	83.195	24.891	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	34.254	10.798	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	13.926	-45.230	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	4.123	-2.011	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.10 Transversina 2

viga = 102 - transversina 2

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	-15.267	-4.783	-6.632	-7.177	-7.367	-7.654	-8.362	-9.278	-10.037	-10.157	-8.991	-12.058	-5.581
Q mn. Vao= 2	7.282	5.533	4.049	3.305	1.877	-1.429	-2.757	-3.772	-4.724	-5.601	-5.552	-8.017	-6.556
Q mn. Vao= 3	1.851	2.630	1.096	0.178	-0.625	-2.006	-2.917	-3.759	-4.902	-8.874	-13.410	-8.967	-0.648
Q mn. Vao= 4	4.544	4.352	4.143	3.497	2.520	1.373	-0.965	-3.180	-4.869	-6.322	-7.100	-6.737	12.533
Q mn. Vao= 5	-4.154	-4.003	-5.216	-5.678	-6.459	-7.328	-8.200	-9.332	-9.972	-10.916	-11.567	-10.983	-15.790
Q mn. Vao= 6	-0.580	5.328	4.935	4.498	3.631	2.686	1.761	-0.162	-6.903	-6.463	-5.054	-0.843	-0.296

M mn. Vao= 1	-0.980	-2.326	-4.468	-7.172	-10.128	-13.160	-16.346	-19.737	-23.287	-26.883	-30.262	-33.455	-36.293
M mn. Vao= 2	-36.164	-30.120	-25.227	-20.796	-16.683	-12.941	-9.583	-6.638	-4.979	-3.839	-4.243	-5.089	-6.946
M mn. Vao= 3	-6.990	-5.040	-3.251	-1.963	-1.042	-0.535	-0.399	-0.611	-1.139	-2.795	-4.765	-8.561	-10.464
M mn. Vao= 4	-10.056	-6.299	-2.688	0.622	2.448	3.136	3.218	2.513	1.020	-0.870	-2.940	-4.693	-5.630
M mn. Vao= 5	-5.552	-4.171	-2.950	-2.874	-5.319	-8.137	-11.331	-14.891	-18.769	-22.868	-27.017	-30.614	-34.105
M mn. Vao= 6	-33.948	-27.473	-23.636	-20.020	-16.854	-14.070	-11.682	-9.681	-8.055	-6.715	-5.536	-4.989	-1.707
Q mx. Vao= 1	-2.920	3.085	0.890	0.424	-0.212	-0.916	-1.760	-2.588	-3.386	-4.120	-3.342	-3.284	7.835
Q mx. Vao= 2	28.330	21.718	16.891	15.335	9.701	8.757	7.774	6.816	5.844	4.955	4.725	2.081	5.605
Q mx. Vao= 3	8.411	8.608	5.527	4.883	3.785	1.040	-0.175	-0.949	-1.657	-2.231	-2.536	-2.984	17.345
Q mx. Vao= 4	9.428	9.022	8.779	7.766	6.720	5.190	2.130	-0.203	-1.510	-2.468	-3.142	-2.874	77.697
Q mx. Vao= 5	5.990	5.941	4.604	3.682	2.194	0.628	-0.838	-2.193	-3.013	-3.825	-4.515	-3.678	-5.666
Q mx. Vao= 6	44.850	15.282	14.748	13.307	11.208	9.286	6.846	4.817	3.567	3.023	2.895	4.775	11.095
M mx. Vao= 1	-0.050	-0.979	-0.490	-0.127	-0.149	-0.438	-1.069	-1.968	-3.213	-4.768	-6.464	-8.196	-9.883
M mx. Vao= 2	-9.828	-5.898	-0.322	4.131	6.694	7.059	6.246	4.919	3.171	1.036	0.607	1.618	2.473
M mx. Vao= 3	2.432	3.363	4.097	5.448	6.532	6.891	6.526	5.527	3.883	1.399	-1.896	-2.862	-3.817
M mx. Vao= 4	-3.781	-1.989	0.119	2.342	4.649	6.907	8.223	8.413	7.474	6.494	5.344	4.184	2.727
M mx. Vao= 5	2.844	1.129	0.742	1.433	2.590	3.060	2.814	1.744	-0.101	-2.643	-5.367	-6.984	-10.807
M mx. Vao= 6	-10.811	-8.364	-6.238	-3.433	0.364	3.239	5.094	5.332	3.364	0.614	-0.253	-0.429	-0.406

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-2.920	-15.267	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	21.196	9.830	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	11.133	-1.174	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	8.123	-9.276	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	-9.280	-76.261	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

6	53.782	11.945	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	0.296	-11.095	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.11 Transversina 3

viga = 103 - transversina 3

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	3.983	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	-16.690	-3.053	-4.705	-3.720	-4.284	-5.069	-5.909	-7.860	-10.001	-11.850	-14.007	-15.035	-18.980
Q mn. Vao= 2	2.799	5.706	3.601	3.877	3.162	2.368	1.506	0.369	-1.182	-2.662	-4.040	-4.968	-15.094
Q mn. Vao= 3	-3.621	0.511	-0.161	-0.195	-0.684	-1.863	-2.761	-3.713	-4.915	-6.329	-7.446	-7.651	-36.502
Q mn. Vao= 4	5.984	4.400	4.476	4.012	3.275	2.304	-0.369	-3.936	-6.092	-7.593	-8.664	-9.505	-10.380
Q mn. Vao= 5	-5.126	-5.932	-5.312	-5.440	-5.975	-6.639	-7.396	-8.518	-9.331	-12.690	-15.054	-15.739	-17.521
Q mn. Vao= 6	-25.818	-0.069	4.010	3.764	3.210	2.459	1.624	0.789	-0.299	-1.505	-2.539	-2.803	-3.156
M mn. Vao= 1	-1.929	-4.881	-5.239	-6.317	-7.917	-9.761	-11.912	-14.394	-17.207	-20.320	-23.813	-27.577	-33.353
M mn. Vao= 2	-33.396	-30.579	-27.116	-23.278	-19.226	-15.274	-11.543	-8.080	-4.898	-1.981	-1.010	-1.806	-3.727
M mn. Vao= 3	-3.962	-4.017	-3.309	-2.493	-1.599	-0.898	-0.504	-0.453	-0.760	-2.109	-4.953	-7.974	-12.958

M mn. Vao= 4	-13.326	-8.238	-2.901	-0.237	1.990	3.061	3.586	3.291	2.140	0.436	-1.729	-4.246	-6.986
M mn. Vao= 5	-7.458	-7.086	-6.647	-6.656	-7.903	-9.499	-12.372	-15.582	-19.117	-22.966	-27.116	-31.347	-35.737
M mn. Vao= 6	-35.710	-32.510	-29.115	-25.833	-22.391	-18.964	-15.690	-12.622	-9.752	-7.053	-4.638	-3.119	-3.823
Q mx. Vao= 1	-1.255	1.088	2.859	6.524	5.344	1.597	-1.666	-2.479	-3.290	-4.040	-4.922	-5.331	-2.426
Q mx. Vao= 2	12.984	12.786	10.663	11.007	10.035	9.533	8.919	8.245	7.588	6.971	6.314	5.855	0.400
Q mx. Vao= 3	4.643	4.475	2.694	2.710	2.070	1.267	0.481	-0.355	-1.188	-2.038	-2.605	-2.319	-4.552
Q mx. Vao= 4	12.262	13.858	14.979	13.013	9.037	6.072	2.746	0.385	-0.981	-2.141	-3.100	-3.907	-4.649
Q mx. Vao= 5	5.389	4.595	5.233	5.125	4.734	4.034	3.182	0.540	-1.358	-2.107	-2.831	-2.774	-3.191
Q mx. Vao= 6	-0.569	10.778	10.574	10.524	10.021	9.226	8.214	7.381	6.956	6.323	5.527	4.937	4.445
M mx. Vao= 1	-0.516	-0.427	-0.389	-0.241	1.993	3.623	3.577	2.142	-0.350	-3.749	-6.598	-8.706	-10.932
M mx. Vao= 2	-10.865	-7.275	-5.221	-2.518	0.206	2.227	3.478	3.979	3.771	2.892	2.292	3.067	4.767
M mx. Vao= 3	4.653	4.937	5.123	5.085	4.905	4.410	3.647	2.510	0.861	-0.628	-2.088	-3.276	-4.477
M mx. Vao= 4	-4.493	-2.208	-0.069	3.605	7.371	10.106	11.541	11.607	10.303	8.162	5.805	4.335	2.532
M mx. Vao= 5	2.101	0.025	-1.713	-1.428	0.565	2.319	3.731	4.652	4.475	2.429	-1.127	-5.411	-8.529
M mx. Vao= 6	-8.452	-6.923	-5.386	-3.783	-2.351	-1.210	-0.413	0.062	0.222	0.025	-0.494	-1.253	-0.581

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-1.255	-16.690	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	23.497	11.589	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	13.533	0.061	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	48.763	12.512	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	12.373	-0.419	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	5.167	-36.297	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	3.156	-4.445	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.12 Transversina 4

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        viga =   104 - transversina 4
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    2       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    3       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    4       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    5       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    6       3.983     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150

                          esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1    -3.879  -12.671  -14.584  -13.745  -14.331  -13.605  -13.920  -13.083  -12.064  -12.551  -10.545   -4.796    4.092
Q mn. Vao= 2     3.924    3.774    3.808    3.289    2.347    0.576   -2.386   -2.687   -3.084   -3.659   -3.567   -3.019    0.599
Q mn. Vao= 3    -1.012   -1.105   -1.003   -1.540   -2.377   -3.046   -3.883   -4.679   -6.196   -8.963   -9.618   -6.355   -3.993
Q mn. Vao= 4    24.764    1.095    2.006    1.763    0.810   -0.251   -1.379   -3.123   -2.600   -1.824   -1.579   -1.381   -4.154
Q mn. Vao= 5    -2.633   -8.173   -7.466   -7.675   -8.284   -8.981   -9.634   -9.986  -10.176  -10.685   -9.852  -12.718  -13.413
Q mn. Vao= 6     2.934    5.136    4.363    3.743    3.231    2.462    1.599   -1.112   -4.234   -5.753   -0.760   -0.452   -0.144

M mn. Vao= 1    -2.329   -2.506   -7.707  -13.177  -18.778  -24.035  -29.282  -34.344  -39.112  -44.043  -48.326  -51.364  -51.108
M mn. Vao= 2   -50.796  -44.628  -38.386  -32.188  -26.375  -20.956  -15.982  -11.359   -7.225   -4.239   -3.558   -3.284   -4.131
M mn. Vao= 3    -4.379   -3.513   -2.580   -1.686   -1.102   -0.827   -0.881   -1.180   -1.501   -2.539   -4.484   -7.441   -9.005
M mn. Vao= 4    -8.662   -4.145   -1.945   -0.096    1.101    1.379    0.975   -0.027   -1.148   -2.143   -2.771   -2.924   -2.735
M mn. Vao= 5    -2.508   -1.470   -1.657   -2.886   -6.092   -9.571  -13.338  -17.291  -21.326  -25.392  -29.075  -32.508  -35.710
M mn. Vao= 6   -35.649  -30.407  -27.107  -23.888  -20.885  -18.225  -15.867  -13.666  -11.479   -9.539   -8.298   -6.670   -1.632
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Q mx. Vao= 1	5.233	0.582	-0.933	-1.114	-1.785	-2.046	-2.596	-2.651	-2.625	-3.301	-2.746	0.183	45.562
Q mx. Vao= 2	21.162	20.343	19.637	17.643	13.969	13.220	11.711	11.187	10.613	9.746	9.573	10.071	22.629
Q mx. Vao= 3	4.609	4.385	4.373	3.686	2.501	1.104	-0.398	-0.582	-0.949	-1.017	-0.651	0.506	-0.776
Q mx. Vao= 4	43.443	5.707	6.269	5.593	4.254	3.123	1.922	0.106	0.418	0.910	1.065	1.744	2.245
Q mx. Vao= 5	19.036	2.405	2.535	1.837	0.481	-1.003	-2.084	-2.508	-2.821	-3.227	-2.615	-4.784	-2.697
Q mx. Vao= 6	20.208	13.416	12.316	10.698	9.136	7.185	5.774	5.569	5.541	4.627	6.422	6.571	20.770

M mx. Vao= 1	0.257	-1.330	-1.801	-2.304	-2.982	-3.684	-4.614	-5.698	-6.764	-7.983	-9.117	-9.864	-10.333
M mx. Vao= 2	-10.333	-7.278	-2.519	1.525	4.014	4.528	3.849	2.793	1.616	0.254	1.792	5.124	7.963
M mx. Vao= 3	7.714	7.326	6.920	7.015	7.355	7.117	6.072	4.344	2.235	-0.288	-1.238	-1.411	-1.704
M mx. Vao= 4	-1.621	-0.470	0.337	1.540	2.748	3.885	4.723	5.027	5.176	5.368	5.752	6.235	6.219
M mx. Vao= 5	6.253	3.438	1.812	1.572	2.102	2.002	1.238	-0.104	-1.967	-4.440	-6.965	-8.701	-11.549
M mx. Vao= 6	-11.605	-9.435	-7.552	-5.040	-2.080	0.046	1.177	1.157	-0.218	-0.887	-0.525	-0.080	-0.176

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	5.233	-3.879	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	2.310	-24.400	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	1.033	-20.141	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	86.938	26.794	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	18.578	-1.853	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	26.243	11.437	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	0.144	-20.770	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.13 Transversina 5

viga =   105 - transversina 5

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.	b colab.i.	tipo secao	esp.lj.s.	esp.lj.i.	fc sp eixo	fc lt eixo
1	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
2	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
3	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
4	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
5	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
6	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
7	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
8	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
9	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
10	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
11	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150
12	1.559	0.300	1.100	0.000	0.000	1.000	0.000	0.000	0.550	0.150

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1	-38.815	-39.040	-28.724	-34.405	-34.629	-31.897	-32.122	-30.843	-31.068	-29.749	-25.719	-25.943	-16.386
Q mn. Vao= 2	-3.780	-4.005	-2.419	-2.641	-2.489	-2.621	-2.845	-2.060	-2.285	-1.507	-0.590	-0.815	-0.914
Q mn. Vao= 3	7.022	6.797	1.801	1.576	2.825	2.213	1.988	2.289	2.064	1.744	1.519	4.666	5.343
Q mn. Vao= 4	-4.857	-5.082	-1.974	-2.199	-1.341	-1.562	-1.668	-1.753	-1.978	-2.089	-2.314	-1.446	11.520
Q mn. Vao= 5	4.482	4.257	-1.314	-1.539	-1.049	-1.274	-1.719	-1.470	-1.695	-3.473	-3.698	2.330	2.105
Q mn. Vao= 6	-44.413	-1.129	-0.469	-0.694	-0.992	-1.217	-1.574	-1.793	-2.477	-2.331	-2.556	-1.787	-2.012
Q mn. Vao= 7	-2.389	3.826	-1.087	-1.312	-0.783	-1.008	-1.108	-1.333	-2.774	-4.466	-4.691	0.104	-0.121
Q mn. Vao= 8	-18.584	-2.109	-2.334	-1.124	-1.278	-1.503	-1.590	-1.815	-1.884	-2.102	-1.446	-1.169	-1.394
Q mn. Vao= 9	1.863	-0.554	-0.779	-5.251	-4.644	-4.869	-5.013	-5.238	-5.002	-5.227	-5.034	-5.700	-5.924
Q mn. Vao=10	-9.301	-8.137	-8.362	-8.247	-8.472	-8.423	-8.524	-8.749	-9.688	-9.913	-10.884	-11.101	-11.873
Q mn. Vao=11	-13.415	-7.974	-8.199	-13.847	-14.072	-12.469	-12.222	-12.447	-11.480	-11.705	-12.364	-12.589	-14.244
Q mn. Vao=12	-2.066	-0.299	-0.524	-0.398	-0.623	-0.663	-0.888	-0.846	0.161	-0.064	-0.266	-0.491	25.605

M mn. Vao= 1	-1.149	-9.011	-15.057	-20.974	-27.510	-33.736	-39.504	-45.105	-51.090	-57.118	-62.964	-68.181	-72.510
M mn. Vao= 2	-72.416	-69.496	-65.853	-61.997	-57.894	-53.808	-49.636	-45.413	-41.104	-36.824	-32.550	-27.914	-23.902
M mn. Vao= 3	-23.996	-21.921	-20.063	-18.334	-16.308	-14.270	-12.171	-10.060	-7.885	-5.732	-4.029	-2.689	-1.586
M mn. Vao= 4	-1.622	-1.541	-1.780	-1.895	-1.870	-1.823	-1.663	-1.517	-1.328	-1.372	-1.810	-2.118	-2.056
M mn. Vao= 5	-1.895	-0.732	0.010	0.006	0.048	-0.084	-0.337	-0.628	-0.846	-1.261	-1.938	-0.983	-0.535
M mn. Vao= 6	-0.574	-0.871	-0.916	-0.911	-0.941	-0.998	-1.056	-1.195	-1.356	-1.512	-1.989	-2.421	-2.804
M mn. Vao= 7	-2.550	-1.174	0.465	0.349	0.190	0.076	-0.132	-0.370	-0.559	-0.784	-1.099	-0.778	0.377
M mn. Vao= 8	0.621	-0.545	-0.933	-0.948	-0.988	-0.980	-0.964	-0.928	-0.903	-0.906	-0.873	-1.163	-1.422
M mn. Vao= 9	-1.171	-0.733	-0.380	-0.605	-1.317	-1.891	-2.497	-3.276	-4.308	-5.340	-6.351	-7.405	-8.579
M mn. Vao=10	-8.424	-7.403	-7.539	-8.710	-10.361	-12.011	-13.699	-15.415	-17.192	-19.020	-20.700	-22.355	-23.879
M mn. Vao=11	-23.820	-25.476	-27.109	-29.381	-32.151	-34.660	-37.160	-39.613	-42.042	-44.338	-46.754	-49.243	-52.031
M mn. Vao=12	-52.126	-49.981	-46.566	-42.979	-39.125	-35.177	-31.370	-27.681	-23.932	-19.847	-15.917	-12.118	-3.022

Q mx. Vao= 1	-3.695	-3.920	-1.154	-4.200	-4.425	-2.977	-3.202	-2.569	-2.794	-2.352	1.162	0.937	3.879
Q mx. Vao= 2	15.782	15.557	19.203	18.982	20.240	20.766	20.541	21.449	21.225	21.221	23.068	22.843	20.526
Q mx. Vao= 3	13.960	13.735	8.834	8.609	10.192	10.508	10.283	10.880	10.655	10.673	10.448	13.149	13.736
Q mx. Vao= 4	0.979	0.754	1.065	0.840	0.620	0.399	0.700	1.045	0.820	0.963	0.738	1.585	29.107
Q mx. Vao= 5	6.299	6.074	0.093	-0.132	0.307	0.082	-0.315	0.030	-0.195	-1.842	-2.067	9.325	9.101
Q mx. Vao= 6	1.527	0.458	0.282	0.057	-0.173	-0.398	-0.254	-0.473	-0.644	-0.064	-0.289	0.481	0.256
Q mx. Vao= 7	14.307	8.629	4.060	3.835	4.368	4.143	0.289	0.064	-0.405	-0.829	-1.054	7.141	6.916
Q mx. Vao= 8	-2.760	1.020	0.795	0.653	0.476	0.251	0.652	0.427	0.456	0.238	1.166	1.631	1.406
Q mx. Vao= 9	4.801	2.404	2.179	-1.572	-0.982	-1.207	-1.251	-1.476	-1.289	-1.514	-1.520	-2.001	-2.226
Q mx. Vao=10	4.753	6.704	6.479	4.829	4.604	0.857	-0.517	-0.742	-1.148	-1.373	-1.044	-1.262	-0.844
Q mx. Vao=11	4.380	4.557	4.332	0.872	0.647	1.886	2.243	2.018	2.209	1.984	2.335	2.110	2.562
Q mx. Vao=12	11.310	18.441	18.216	20.676	20.451	21.345	21.120	20.903	22.144	21.919	20.347	20.122	36.564

M mx. Vao= 1	-0.309	-1.112	-1.440	-1.807	-2.750	-3.524	-4.148	-4.708	-5.249	-5.719	-6.126	-6.246	-6.056

M mx. Vao= 2	-5.988	-6.755	-7.304	-7.815	-8.265	-8.660	-9.072	-9.435	-9.744	-9.995	-10.256	-10.338	-10.482
M mx. Vao= 3	-10.445	-8.131	-6.971	-6.629	-6.064	-5.365	-4.675	-4.022	-3.385	-2.851	-1.981	0.078	2.190
M mx. Vao= 4	1.980	1.441	1.258	1.144	0.988	0.787	0.553	0.277	-0.029	-0.352	-0.492	-0.507	0.074
M mx. Vao= 5	0.249	1.215	1.744	1.497	1.277	1.045	0.724	0.361	0.129	-0.185	-0.627	-0.200	1.035
M mx. Vao= 6	0.988	0.611	0.583	0.494	0.339	0.119	-0.171	-0.312	-0.509	-0.699	-0.793	-0.802	-0.760
M mx. Vao= 7	-0.301	0.969	1.780	1.573	2.091	2.950	3.315	3.351	2.859	2.242	1.338	0.857	2.069
M mx. Vao= 8	2.328	1.793	1.570	1.366	1.145	1.111	1.137	1.144	1.103	1.023	1.114	1.194	1.319
M mx. Vao= 9	1.662	1.806	1.672	0.806	0.344	0.042	-0.305	-0.688	-1.087	-1.502	-1.905	-2.350	-2.892
M mx. Vao=10	-2.756	-4.232	-5.529	-4.859	-3.907	-3.691	-3.678	-4.100	-4.672	-5.389	-6.352	-7.417	-7.627
M mx. Vao=11	-7.580	-6.900	-6.176	-5.863	-5.877	-5.751	-5.637	-5.510	-5.405	-5.281	-5.192	-4.999	-4.473
M mx. Vao=12	-4.438	-4.642	-4.725	-4.826	-4.929	-5.056	-5.213	-5.365	-5.506	-5.496	-5.528	-5.578	-0.947

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-3.695	-38.815	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	30.959	-6.795	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	9.133	-6.566	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	-4.699	-16.631	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	-6.650	-23.653	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	-1.745	-51.244	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	14.311	-0.481	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
8	-8.363	-18.793	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
9	5.625	1.808	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
10	10.678	-6.509	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
11	6.325	-1.542	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
12	24.957	-3.637	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
13	-25.605	-56.564	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.14 Transversina 6

```
        viga =   106 - transversina 6
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
     1       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     2       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     3       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     4       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     5       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     6       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     7       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     8       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
     9       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    10       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    11       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150
    12       1.559     0.300     1.100     0.000     0.000     1.000     0.000     0.000     0.550     0.150

                              esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1   -27.567  -27.792    1.899    1.680    1.372    1.056    0.831    0.698    0.473   -0.094   -0.622   -0.847   -4.532
Q mn. Vao= 2    -1.166   -1.391   -0.744   -0.969   -1.428   -1.624   -1.849   -1.885   -2.110   -2.357   -2.582   -3.589   -5.796
Q mn. Vao= 3     1.721    1.496    2.306    2.081    1.519    1.301    0.768    0.059   -0.166   -0.404   -0.629  -21.057  -48.870
Q mn. Vao= 4     0.079   -0.146    0.732    0.507    0.027   -0.198   -0.595   -0.947   -1.172   -1.625   -1.850   -3.556   -3.781
Q mn. Vao= 5    -0.937   -1.419   -0.751   -0.976   -1.261   -1.486   -1.605   -1.822   -1.665   -1.761   -1.986   -3.160   -3.385
Q mn. Vao= 6    -1.590    0.748    1.031    0.806    0.365    0.140   -1.279   -1.504   -2.898   -1.872   -2.097  -16.194  -16.419
Q mn. Vao= 7    -2.111    2.173    1.948    1.519    1.081    0.856    0.316    0.091   -0.319   -0.535   -1.025   -2.817   -3.042
Q mn. Vao= 8    -2.043   -0.039   -0.264   -0.634   -1.002   -1.227   -1.612   -1.837   -2.229   -2.454   -3.512   -4.871   -5.095
```

Q mn. Vao= 9	0.724	1.546	1.321	-0.370	-0.594	0.012	-0.423	-0.648	-0.974	-1.199	-7.570	-7.785	-10.887
Q mn. Vao=10	0.106	0.075	-0.150	-0.953	-1.178	-1.422	-1.745	-1.970	-2.036	-2.261	-2.947	-3.172	-3.628
Q mn. Vao=11	0.483	-0.356	-0.581	-1.802	-2.027	-2.082	-2.307	-2.536	-2.347	-2.572	-3.544	-3.769	-4.769
Q mn. Vao=12	-6.535	-6.891	-7.116	-5.559	-5.784	-6.071	-6.296	-4.523	-0.393	-0.618	2.386	2.161	22.646
M mn. Vao= 1	-5.029	-10.620	-11.303	-10.459	-9.164	-7.875	-6.579	-5.309	-4.080	-2.986	-2.804	-2.938	-3.376
M mn. Vao= 2	-3.444	-3.044	-2.610	-2.261	-2.467	-2.720	-3.023	-3.356	-3.719	-4.043	-4.376	-4.519	-3.741
M mn. Vao= 3	-3.480	-2.943	-2.382	-1.773	-1.269	-0.832	-0.504	-0.257	-0.092	0.014	0.010	-0.261	-5.432
M mn. Vao= 4	-5.578	-4.776	-3.960	-3.145	-2.380	-1.664	-1.081	-0.568	-0.581	-0.793	-1.013	-1.405	-1.958
M mn. Vao= 5	-1.990	-1.600	-1.372	-1.498	-1.685	-1.922	-2.188	-2.496	-2.766	-3.013	-3.136	-3.034	-2.783
M mn. Vao= 6	-2.665	-1.356	-1.114	-0.815	-0.579	-0.423	-0.336	-0.312	-0.412	-0.583	-0.770	-1.082	-3.749
M mn. Vao= 7	-3.928	-3.033	-1.619	-0.619	0.152	0.400	0.574	0.674	0.710	0.629	0.476	0.203	-0.283
M mn. Vao= 8	-0.300	0.024	0.360	0.559	0.695	0.750	0.708	0.448	0.038	-0.435	-1.107	-1.874	-2.840
M mn. Vao= 9	-2.854	-2.480	-2.051	-1.717	-1.447	-1.254	-1.117	-1.087	-1.185	-1.329	-1.602	-2.683	-4.844
M mn. Vao=10	-4.811	-2.817	-1.950	-1.864	-2.079	-2.335	-2.638	-2.993	-3.374	-3.763	-4.255	-4.867	-5.542
M mn. Vao=11	-5.534	-4.492	-3.694	-3.155	-3.274	-3.584	-4.028	-4.517	-5.033	-5.530	-6.153	-6.891	-7.791
M mn. Vao=12	-7.788	-7.305	-6.980	-7.411	-8.486	-9.593	-10.758	-11.626	-12.381	-12.391	-11.794	-10.192	-2.833
Q mx. Vao= 1	-8.116	-8.341	4.292	4.073	6.362	6.610	6.385	6.287	6.062	5.364	5.012	4.787	3.027
Q mx. Vao= 2	2.093	1.868	2.297	2.072	1.261	0.727	0.502	0.022	-0.203	-0.407	-0.632	-0.784	20.434
Q mx. Vao= 3	10.535	10.310	7.882	7.657	4.868	4.650	1.529	1.024	0.799	0.429	0.205	-1.190	-0.629
Q mx. Vao= 4	4.082	3.857	4.411	4.186	3.915	3.690	2.971	2.354	2.129	1.617	1.392	-0.536	-0.760
Q mx. Vao= 5	2.371	1.801	2.262	2.037	1.391	1.166	0.597	0.381	0.059	-0.013	-0.238	1.403	1.178
Q mx. Vao= 6	38.400	6.762	3.255	3.030	0.949	0.724	0.291	0.066	-0.270	-0.427	-0.652	-1.795	-2.020
Q mx. Vao= 7	3.214	7.226	7.001	4.895	3.948	3.723	1.861	1.637	0.670	0.454	-0.290	-1.652	-1.877
Q mx. Vao= 8	1.812	1.794	1.569	0.809	0.439	0.214	-0.284	-0.509	-0.842	-1.067	-2.327	-3.468	-3.693
Q mx. Vao= 9	2.298	5.967	5.743	1.451	1.226	0.832	0.405	0.180	0.539	0.314	-1.242	-1.456	-2.336
Q mx. Vao=10	11.753	5.958	5.733	1.554	1.329	0.639	-0.185	-0.410	-0.512	-0.737	-1.527	-1.752	-2.248

Q mx. Vao=11	5.489	4.061	3.836	2.325	2.100	1.882	1.657	1.043	0.585	0.360	-1.318	-1.543	-2.169
Q mx. Vao=12	2.528	1.720	1.495	0.231	0.006	0.295	0.070	0.293	1.340	1.115	8.042	7.818	51.333
M mx. Vao= 1	-1.580	-3.253	-3.320	-2.843	-2.441	-2.080	-1.785	-1.526	-1.313	-1.179	-1.102	-0.483	0.349
M mx. Vao= 2	0.326	0.307	0.325	0.350	0.243	0.079	-0.174	-0.490	-0.746	-0.837	-0.967	-1.310	-1.641
M mx. Vao= 3	-1.605	-1.233	0.567	2.111	3.240	4.178	4.456	4.663	4.672	4.624	4.532	0.984	-0.148
M mx. Vao= 4	-0.141	0.003	0.181	0.500	0.712	0.841	0.853	0.797	0.671	0.583	0.825	0.840	0.709
M mx. Vao= 5	0.592	0.645	0.693	0.841	0.904	0.878	0.767	0.597	0.331	0.182	0.043	-0.193	-0.555
M mx. Vao= 6	-0.562	0.759	2.036	2.671	3.134	3.235	3.150	2.881	2.362	1.774	1.384	0.133	-0.322
M mx. Vao= 7	-0.333	0.191	0.669	1.098	1.470	1.748	1.941	2.214	2.401	2.513	2.465	2.273	1.805
M mx. Vao= 8	1.767	1.590	1.559	1.456	1.311	1.318	1.260	1.121	0.976	0.783	0.352	-0.175	-0.898
M mx. Vao= 9	-0.909	-0.579	0.108	0.410	0.313	0.385	0.377	0.269	0.235	0.305	-0.650	-1.060	-1.592
M mx. Vao=10	-1.598	-1.588	-1.363	-0.827	-0.535	-0.379	-0.303	-0.424	-0.617	-0.893	-1.316	-1.792	-2.408
M mx. Vao=11	-2.408	-2.299	-2.249	-2.111	-2.061	-2.048	-1.850	-1.617	-1.444	-1.349	-1.482	-1.822	-2.565
M mx. Vao=12	-2.549	-3.524	-3.582	-3.734	-4.038	-4.333	-4.638	-4.909	-5.185	-5.282	-5.178	-4.719	-1.548

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	-8.116	-27.567	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
2	6.625	-3.011	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
3	8.443	-10.047	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
4	126.708	0.951	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
5	6.152	1.466	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
6	67.302	0.907	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
7	14.379	4.782	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
8	3.855	0.386	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
9	7.166	5.043	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
10	22.390	2.818	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
11	8.948	2.731	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

12	7.255	-2.291	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.
13	-22.646	-51.333	1.52	0.43	2.	Longarin	0.00	0.00	0.00	0.00	0.00	0	0.	0.	0.	0.	0.	0.

16.4.15 Longarina 1-a

viga = 1 - longarina 1-a

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.	b colab.i.	tipo secao	esp.lj.s.	esp.lj.i.	fc sp eixo	fc lt eixo
1b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	25.200	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.103	-0.206	-0.308	-0.404	-4.398	-4.501	-4.603	-4.706	-4.809	-4.912	-5.015	-5.117
Q mn. Vao= 2	105.569	85.490	64.531	45.602	28.684	11.475	-6.883	-44.873	-61.172	-78.848	-95.668	-118.620	-183.144
Q mn. Vao= 3b	1.445	1.325	1.204	1.084	0.963	0.843	0.722	0.602	0.482	0.361	0.241	0.120	0.000
M mn. Vao= 1b	0.000	-0.001	-0.005	-0.010	-0.018	-0.988	-1.055	-1.125	-1.197	-1.271	-1.348	-1.426	-1.509
M mn. Vao= 2	-1.968	200.231	362.094	487.465	577.768	632.560	649.872	629.076	573.184	482.912	357.024	194.677	-11.196
M mn. Vao= 3b	-0.271	-0.227	-0.188	-0.152	-0.120	-0.092	-0.068	-0.047	-0.030	-0.017	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.095	-0.190	-0.285	-0.372	-1.802	-1.897	-1.992	-2.087	-2.182	-2.277	-2.371	-2.466
Q mx. Vao= 2	172.726	117.333	99.759	81.466	64.738	34.477	7.702	-10.327	-26.751	-44.101	-68.105	-85.333	-110.194
Q mx. Vao= 3b	1.546	1.417	1.288	1.159	1.030	0.902	0.773	0.644	0.515	0.386	0.258	0.129	0.000
M mx. Vao= 1b	0.000	-0.001	-0.004	-0.009	-0.017	-0.630	-0.708	-0.788	-0.870	-0.954	-1.041	-1.129	-1.220

```
M mx. Vao= 2    -1.252  295.976  495.769  686.701  840.910  954.209  981.564  918.606  806.614  658.904  506.347  293.363   -2.510
M mx. Vao= 3b   -0.253   -0.212   -0.176   -0.142   -0.112   -0.086   -0.063   -0.044   -0.028   -0.016   -0.007   -0.002    0.000

Mt mx.vao= 1b    0.000    0.000    0.000    0.000    0.000    0.561    0.561    0.561    0.561    0.561    0.561    0.561    0.561
Mt mx.vao= 2     1.114    0.050    0.044    0.037    0.045    0.047    0.041    0.035    0.033    0.056    0.036   -0.048    0.098
Mt mx.vao= 3b    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  175.192 109.876    0.33     0.00     1. Ap1        0.00   0.00   0.00   0.00   0.00      0 801.   0.    0.    0.    0.    0.
         2  184.589 111.639    0.50     0.00     1. Ap2        0.00   0.00   0.00   0.00   0.00      0 802.   0.    0.    0.    0.    0.
```

16.4.16 Longarina 1-b

```
         viga =     2 - longarina 1-b
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura     altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.265     1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       25.200     1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    3b       0.350     1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.108   -0.216   -0.323   -0.423  -10.582  -10.682  -10.782  -10.882  -10.981  -11.081  -11.181  -11.281
Q mn. Vao= 2   110.952   84.974   68.780   50.302   30.541   13.702  -10.948  -29.287  -45.961  -66.321  -88.948 -112.923 -151.404
Q mn. Vao= 3b    1.523    1.396    1.269    1.142    1.016    0.889    0.762    0.635    0.508    0.381    0.254    0.127    0.000

M mn. Vao= 1b    0.000   -0.001   -0.005   -0.011   -0.019   -3.791   -4.026   -4.263   -4.502   -4.744   -4.987   -5.233   -5.481
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M mn. Vao= 2     -5.801  199.601  361.728  488.011  579.168  634.262  651.209  632.843  579.863  491.161  365.220  202.167   -1.033
M mn. Vao= 3b    -0.284   -0.239   -0.197   -0.160   -0.126   -0.097   -0.071   -0.049   -0.032   -0.018   -0.008   -0.002    0.000

Q mx. Vao= 1b     0.000   -0.100   -0.200   -0.299   -0.392   -2.379   -2.478   -2.578   -2.678   -2.778   -2.878   -2.978   -3.077
Q mx. Vao= 2    148.570  110.215   90.966   70.061   51.366   24.625    7.801  -10.901  -27.742  -50.770  -69.456  -85.541 -112.384
Q mx. Vao= 3b     1.624    1.489    1.353    1.218    1.083    0.947    0.812    0.677    0.541    0.406    0.271    0.135    0.000

M mx. Vao= 1b     0.000   -0.001   -0.004   -0.010   -0.018   -0.520   -0.577   -0.637   -0.700   -0.761   -0.823   -0.888   -0.955
M mx. Vao= 2     -0.993  257.086  469.177  638.450  765.750  838.360  850.495  813.108  735.232  633.667  479.977  265.642   -0.389
M mx. Vao= 3b    -0.267   -0.224   -0.185   -0.150   -0.118   -0.091   -0.067   -0.046   -0.030   -0.017   -0.007   -0.002    0.000

Mt mx.vao= 1b     0.000    0.000    0.000    0.000    0.000    2.118    2.118    2.118    2.118    2.118    2.118    2.118    2.118
Mt mx.vao= 2      2.000    0.050    0.064   -0.029   -0.063    0.038    0.096    0.047    0.032    0.028    0.061    0.082    0.030
Mt mx.vao= 3b     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  157.821 114.090    0.33    0.00    1. Ap9        0.00   0.00   0.00   0.00   0.00     0 809.   0.   0.   0.   0.   0.

         2  153.028 113.908    0.50    0.00    1. Ap10       0.00   0.00   0.00   0.00   0.00     0 810.   0.   0.   0.   0.   0.
```

16.4.17 Longarina 1-c

```
         viga =      3 - longarina 1-c
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.265      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       25.200      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
```

```
    3b       0.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    -0.104   -0.208   -0.311   -0.407   -5.977   -6.073   -6.168   -6.264   -6.360   -6.456   -6.552   -6.648
Q mn. Vao= 2   121.424    93.884   75.367   47.521   29.156   10.676   -8.687  -28.036  -61.623  -79.751 -100.875 -119.190 -150.417
Q mn. Vao= 3b    1.460     1.338    1.216    1.095    0.973    0.851    0.730    0.608    0.487    0.365    0.243    0.122    0.000

M mn. Vao= 1b    0.000    -0.001   -0.005   -0.010   -0.018   -1.944   -2.077   -2.212   -2.350   -2.489   -2.631   -2.774   -2.920
M mn. Vao= 2    -2.746   222.562  400.489  536.727  632.712  690.237  709.762  689.431  626.308  524.519  384.939  207.936   -3.409
M mn. Vao= 3b   -0.273    -0.229   -0.190   -0.154   -0.121   -0.093   -0.068   -0.047   -0.030   -0.017   -0.008   -0.002    0.000

Q mx. Vao= 1b    0.000    -0.096   -0.192   -0.287   -0.376   -2.824   -2.920   -3.016   -3.112   -3.208   -3.303   -3.399   -3.495
Q mx. Vao= 2   170.423   133.580   96.983   74.537   56.412   38.209    5.410  -16.693  -36.445  -54.972  -74.995  -91.725 -107.022
Q mx. Vao= 3b    1.560     1.430    1.300    1.170    1.040    0.910    0.780    0.650    0.520    0.390    0.260    0.130    0.000

M mx. Vao= 1b    0.000    -0.001   -0.004   -0.010   -0.017   -0.701   -0.764   -0.830   -0.898   -0.967   -1.039   -1.113   -1.189
M mx. Vao= 2    -1.208   307.034  541.376  696.741  814.499  906.820  954.020  930.830  837.155  692.533  503.867  271.676   -0.733
M mx. Vao= 3b   -0.255    -0.215   -0.177   -0.144   -0.114   -0.087   -0.064   -0.044   -0.028   -0.016   -0.007   -0.002    0.000

Mt mx.vao= 1b    0.000     0.000    0.000    0.000    0.000    1.250    1.250    1.250    1.250    1.250    1.250    1.250    1.250
Mt mx.vao= 2     1.408    -0.020    0.030   -0.022    0.006    0.048    0.068    0.028    0.029    0.030    0.086    0.034    0.009
Mt mx.vao= 3b    0.000     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  173.941 125.245    0.33    0.00    1. Ap17      0.00   0.00   0.00   0.00   0.00      0 817.   0.   0.   0.   0.   0.

         2  151.977 108.481    0.50    0.00    1. Ap18      0.00   0.00   0.00   0.00   0.00      0 818.   0.   0.   0.   0.   0.
```

16.4.18 Longarina 1-d

```
        viga =     4 - longarina 1-d
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      25.200     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.104   -0.208   -0.312   -0.408   -2.698   -2.802   -2.906   -3.010   -3.114   -3.218   -3.322   -3.426
Q mn. Vao= 2   120.009   93.423   71.409   49.851   30.519   13.422   -6.013  -42.292  -62.720  -80.258 -100.129 -122.325 -167.084
Q mn. Vao= 3b   18.768   18.646   18.524   18.402   18.280   18.158   18.035   17.913   17.791   17.669   17.584    0.122    0.000

M mn. Vao= 1b    0.000   -0.001   -0.005   -0.010   -0.018   -0.512   -0.573   -0.636   -0.701   -0.769   -0.839   -0.911   -0.986
M mn. Vao= 2    -1.031  217.973  397.029  535.560  634.408  693.737  713.519  694.064  635.132  536.440  397.893  219.688   -1.092
M mn. Vao= 3b   -7.099   -6.372   -5.648   -4.929   -4.213   -3.501   -2.792   -2.088   -1.387   -0.690   -0.010   -0.002    0.000

Q mx. Vao= 1b    0.000   -0.096   -0.192   -0.288   -0.377   -1.784   -1.881   -1.977   -2.073   -2.169   -2.265   -2.361   -2.457
Q mx. Vao= 2   189.274  124.793  100.320   82.064   63.329   44.203    6.135  -11.536  -30.945  -48.940  -75.477  -93.155 -114.474
Q mx. Vao= 3b   25.002   24.872   24.741   24.611   24.480   24.350   24.220   24.089   23.959   23.828   23.737    0.130    0.000

M mx. Vao= 1b    0.000   -0.001   -0.004   -0.010   -0.017   -0.402   -0.451   -0.496   -0.541   -0.588   -0.637   -0.688   -0.741
M mx. Vao= 2    -0.766  305.931  523.393  701.968  849.116  960.084 1000.091  950.245  843.314  697.840  523.827  305.233   -0.592
M mx. Vao= 3b   -5.301   -4.755   -4.213   -3.675   -3.140   -2.608   -2.080   -1.556   -1.035   -0.518    0.005   -0.002    0.000

Mt mx.vao= 1b    0.000    0.000    0.000    0.000    0.000    0.279    0.279    0.279    0.279    0.279    0.279    0.279    0.279
```

Mt mx.vao= 2	0.266	0.039	0.046	0.032	0.022	0.021	0.015	0.019	0.015	0.017	0.032	0.018	-0.056
Mt mx.vao= 3b	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	-0.109	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo		pilares:				
1	191.752	122.775	0.33	0.00	1.	Ap25	0.00	0.00	0.00	0.00	0.00	0	825.	0.	0.	0.	0.	0.
2	187.545	133.242	0.50	0.00	1.	Ap26	0.00	0.00	0.00	0.00	0.00	0	826.	0.	0.	0.	0.	0.

16.4.19 Longarina 1-e

viga = 5 - longarina 1-e

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	25.200	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.109	-0.218	-0.327	-0.428	-18.054	-18.155	-18.256	-18.325	-47.549	-47.650	-47.751	-47.852
Q mn. Vao= 2	113.782	87.281	68.538	49.949	31.144	14.545	-19.408	-36.302	-53.943	-71.118	-92.775	-119.167	-101.227
Q mn. Vao= 3b	1.543	1.414	1.286	1.157	1.029	0.900	0.771	0.643	0.514	0.386	0.257	0.129	0.000
M mn. Vao= 1b	0.000	-0.001	-0.005	-0.011	-0.019	-4.315	-4.715	-5.117	-5.521	-9.254	-10.305	-11.359	-12.414
M mn. Vao= 2	-8.350	203.979	369.708	498.280	589.979	642.352	655.791	633.389	576.418	485.080	357.833	194.206	0.273
M mn. Vao= 3b	-0.288	-0.242	-0.200	-0.162	-0.128	-0.098	-0.072	-0.050	-0.032	-0.018	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.101	-0.202	-0.303	-0.397	-3.015	-3.116	-3.217	-3.286	-7.547	-7.648	-7.749	-7.850

Q mx. Vao= 2	171.414	116.986	95.946	76.730	57.457	26.569	6.325	-10.501	-28.134	-44.820	-69.103	-85.355	-67.863
Q mx. Vao= 3b	1.644	1.507	1.370	1.233	1.096	0.959	0.822	0.685	0.548	0.411	0.274	0.137	0.000
M mx. Vao= 1b	0.000	-0.001	-0.004	-0.010	-0.018	-0.625	-0.692	-0.762	-0.834	-1.375	-1.543	-1.713	-1.885
M mx. Vao= 2	-1.215	274.096	494.668	675.047	811.890	894.839	906.534	856.659	766.037	650.368	497.385	274.856	0.496
M mx. Vao= 3b	-0.270	-0.227	-0.188	-0.152	-0.120	-0.092	-0.068	-0.047	-0.030	-0.017	-0.007	-0.002	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	3.034	3.034	3.034	3.034	0.147	0.147	0.147	0.147
Mt mx.vao= 2	0.073	0.021	0.049	0.021	0.020	0.021	0.032	0.031	0.021	0.019	0.025	0.017	0.000
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	219.266	121.632	0.33	0.00	1.	Ap33	0.00	0.00	0.00	0.00	0.00	0	833.	0.	0.	0.	0.	0.
2	102.870	69.405	0.50	0.00	1.	Ap34	0.00	0.00	0.00	0.00	0.00	0	834.	0.	0.	0.	0.	0.

16.4.20 Longarina 1-f

viga = 6 - longarina 1-f

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao comprim. Largura altura b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo

1b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	25.200	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.108	-0.216	-0.323	-0.423	-7.477	-7.576	-7.676	-7.776	-7.876	-7.976	-8.076	-8.175

Q mn. Vao= 2	114.353	89.456	71.198	49.341	29.743	13.465	-5.726	-23.930	-50.567	-72.800	-93.654	-117.083	-163.388
Q mn. Vao= 3b	1.523	1.396	1.269	1.142	1.016	0.889	0.762	0.635	0.508	0.381	0.254	0.127	0.000
M mn. Vao= 1b	0.000	-0.001	-0.005	-0.011	-0.019	-2.931	-3.097	-3.266	-3.436	-3.609	-3.784	-3.961	-4.141
M mn. Vao= 2	-3.287	209.582	378.914	509.810	602.293	658.479	678.673	662.092	605.367	510.869	379.484	210.829	-0.367
M mn. Vao= 3b	-0.284	-0.239	-0.197	-0.160	-0.126	-0.097	-0.071	-0.049	-0.032	-0.018	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.100	-0.200	-0.299	-0.392	-2.077	-2.177	-2.276	-2.376	-2.476	-2.576	-2.676	-2.776
Q mx. Vao= 2	153.077	121.318	91.515	71.305	50.086	33.110	12.935	-13.694	-31.373	-53.106	-71.087	-89.128	-115.560
Q mx. Vao= 3b	1.624	1.489	1.353	1.218	1.083	0.947	0.812	0.677	0.541	0.406	0.271	0.135	0.000
M mx. Vao= 1b	0.000	-0.001	-0.004	-0.010	-0.018	-0.549	-0.597	-0.646	-0.698	-0.752	-0.808	-0.867	-0.927
M mx. Vao= 2	-0.447	278.139	503.537	663.367	771.226	856.326	898.509	885.439	808.397	678.805	504.058	282.425	-0.171
M mx. Vao= 3b	-0.267	-0.224	-0.185	-0.150	-0.118	-0.091	-0.067	-0.046	-0.030	-0.017	-0.007	-0.002	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.130	0.054	0.039	-0.034	0.020	0.037	0.082	0.029	-0.048	0.018	0.044	0.020	-0.029
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	156.291	117.165	0.33	0.00	1.	Ap41	0.00	0.00	0.00	0.00	0.00	0	841.	0.	0.	0.	0.	0.
2	165.012	117.083	0.50	0.00	1.	Ap42	0.00	0.00	0.00	0.00	0.00	0	842.	0.	0.	0.	0.	0.

16.4.21 Longarina 1-g

viga = 7 - longarina 1-g

```
  eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
  vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
   1b      0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
   2      25.200     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
   3b      0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                         esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.784     0.689   -24.956   -25.058   -25.154    13.222    13.127    13.032    12.937    12.842    12.747    12.652    12.557
Q mn. Vao= 2    113.341    85.369    68.305    42.096    25.763     9.023    -7.589   -43.546   -63.366   -81.099   -97.938  -115.836  -151.304
Q mn. Vao= 3b     1.445     1.325     1.204     1.084     0.963     0.843     0.722     0.602     0.482     0.361     0.241     0.120     0.000

M mn. Vao= 1b     0.007     0.023    -0.386    -0.938    -1.492    -1.002    -0.695    -0.389    -0.086     0.209     0.491     0.772     1.050
M mn. Vao= 2     -4.175   202.373   364.915   489.870   578.493   632.502   651.075   632.633   576.226   484.838   358.596   196.880    -0.310
M mn. Vao= 3b    -0.271    -0.227    -0.188    -0.152    -0.120    -0.092    -0.068    -0.047    -0.030    -0.017    -0.008    -0.002     0.000

Q mx. Vao= 1b     0.994     0.900   -22.563   -22.658   -22.746    14.562    14.459    14.356    14.253    14.151    14.048    13.945    13.842
Q mx. Vao= 2    181.508   121.858    96.303    77.964    61.419    43.950     7.131   -12.762   -29.272   -46.817   -64.500   -85.543   -97.787
Q mx. Vao= 3b     1.546     1.417     1.288     1.159     1.030     0.902     0.773     0.644     0.515     0.386     0.258     0.129     0.000

M mx. Vao= 1b     0.031     0.052    -0.341    -0.841    -1.342    -0.860    -0.551    -0.244     0.061     0.364     0.664     0.963     1.259
M mx. Vao= 2     -3.739   312.424   526.568   667.110   814.327   926.021   979.396   941.143   825.956   673.919   485.519   282.892     0.374
M mx. Vao= 3b    -0.253    -0.212    -0.176    -0.142    -0.112    -0.086    -0.063    -0.044    -0.028    -0.016    -0.007    -0.002     0.000

Mt mx.vao= 1b     0.199     0.199     0.137     0.137     0.137     0.032     0.032     0.032     0.032     0.032     0.032     0.032     0.032
Mt mx.vao= 2      0.599    -0.047     0.044     0.025    -0.016     0.021     0.019     0.057     0.016    -0.016    -0.056    -0.029    -0.065
Mt mx.vao= 3b     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  168.135 100.779    0.33    0.00    1. Ap49       0.00   0.00   0.00   0.00   0.00     0 849.   0.    0.    0.    0.    0.
         2  152.749  99.232    0.50    0.00    1. Ap50       0.00   0.00   0.00   0.00   0.00     0 850.   0.    0.    0.    0.    0.
```

16.4.22 Longarina 2-a

viga = 8 - longarina 2-a

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	24.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.129	-0.258	-0.386	-13.161	-13.290	-13.419	-13.547	-13.676	-13.805	-13.934	-14.063	-14.191
Q mn. Vao= 2	95.365	82.779	64.273	44.694	27.432	11.113	-9.637	-43.773	-60.104	-77.486	-94.061	-117.448	-153.870
Q mn. Vao= 3b	1.445	1.324	1.204	1.084	0.963	0.843	0.722	0.602	0.482	0.361	0.241	0.120	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.017	-0.433	-0.815	-1.204	-1.597	-1.994	-2.395	-2.799	-3.208	-3.620
M mn. Vao= 2	-3.620	183.837	335.021	452.969	538.445	590.741	607.400	588.459	536.800	452.528	334.762	181.935	-3.908
M mn. Vao= 3b	-0.270	-0.227	-0.188	-0.152	-0.120	-0.092	-0.068	-0.047	-0.030	-0.017	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.120	-0.241	-0.361	-2.752	-2.872	-2.992	-3.113	-3.233	-3.354	-3.474	-3.594	-3.715
Q mx. Vao= 2	155.050	115.657	97.046	80.528	63.006	35.839	6.335	-9.006	-25.025	-41.974	-65.608	-82.708	-102.081
Q mx. Vao= 3b	1.546	1.417	1.288	1.159	1.030	0.902	0.773	0.644	0.515	0.386	0.258	0.129	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.016	0.452	0.370	0.284	0.195	0.102	0.006	-0.093	-0.196	-0.303
M mx. Vao= 2	-0.303	270.620	465.040	646.940	794.296	903.998	934.761	878.731	770.848	628.796	481.782	278.032	-1.745
M mx. Vao= 3b	-0.253	-0.212	-0.176	-0.142	-0.112	-0.086	-0.063	-0.044	-0.028	-0.016	-0.007	-0.002	0.000

Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266	0.266
Mt mx.vao= 2	0.266	0.033	-0.029	0.019	0.022	0.025	0.027	0.022	0.016	0.033	0.044	-0.051	-0.217
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	166.096	100.530	0.50	0.00	1.	Ap3	0.00	0.00	0.00	0.00	0.00	0	803.	0.	0.	0.	0.	0.
2	155.315	103.526	0.50	0.00	1.	Ap4	0.00	0.00	0.00	0.00	0.00	0	804.	0.	0.	0.	0.	0.

16.4.23 Longarina 2-b

viga = 9 - longarina 2-b

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	24.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.135	-9.530	-9.666	-9.801	-9.936	-10.072	-10.207	-10.342	-10.478	-10.613	-10.748	-10.884
Q mn. Vao= 2	107.286	83.827	68.091	50.900	31.173	14.035	-12.545	-29.680	-48.541	-68.127	-88.734	-115.244	-152.653
Q mn. Vao= 3b	1.523	1.396	1.269	1.143	1.016	0.889	0.762	0.635	0.508	0.381	0.254	0.127	0.000

M mn. Vao= 1b	0.000	-0.002	-0.375	-0.655	-0.939	-1.227	-1.519	-1.814	-2.114	-2.418	-2.725	-3.037	-3.352
M mn. Vao= 2	-1.664	191.916	348.464	471.322	560.170	613.915	630.752	613.363	562.183	476.134	353.745	195.210	-1.138
M mn. Vao= 3b	-0.284	-0.239	-0.197	-0.160	-0.126	-0.097	-0.071	-0.049	-0.032	-0.018	-0.008	-0.002	0.000

```
Q mx. Vao= 1b    0.000   -0.127   -6.071   -6.198   -6.325   -6.452   -6.578   -6.705   -6.832   -6.959   -7.086   -7.213   -7.340
Q mx. Vao= 2   153.710  112.099   92.178   72.245   50.670   24.428    5.709  -10.844  -28.711  -50.529  -68.086  -85.430 -110.758
Q mx. Vao= 3b    1.624    1.489    1.353    1.218    1.083    0.947    0.812    0.677    0.541    0.406    0.271    0.135    0.000

M mx. Vao= 1b    0.000   -0.002   -0.232   -0.411   -0.594   -0.780   -0.970   -1.164   -1.362   -1.563   -1.767   -1.976   -2.188
M mx. Vao= 2    -1.103  261.305  471.405  639.168  764.997  838.166  851.476  813.499  734.870  630.640  476.833  263.365   -0.763
M mx. Vao= 3b   -0.267   -0.224   -0.185   -0.150   -0.118   -0.091   -0.067   -0.046   -0.030   -0.017   -0.007   -0.002    0.000

Mt mx.vao= 1b    0.000    0.000   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130   -0.130
Mt mx.vao= 2    -0.219    0.032    0.058   -0.024   -0.063    0.028    0.089    0.047   -0.034   -0.028    0.059    0.070   -0.217
Mt mx.vao= 3b    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  163.876 115.332    0.50    0.00    1. Ap11       0.00   0.00   0.00   0.00   0.00      0 811.   0.   0.   0.   0.   0.
         2  154.277 112.282    0.50    0.00    1. Ap12       0.00   0.00   0.00   0.00   0.00      0 812.   0.   0.   0.   0.   0.
```

16.4.24 Longarina 2-c

```
         viga =    10 - longarina 2-c
----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       24.640      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    3b       0.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
```

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.130	-0.260	-0.390	-0.520	-0.650	-0.780	-0.910	-1.040	-1.170	-1.300	-1.430	-1.560
Q mn. Vao= 2	102.718	89.076	71.569	46.174	28.021	10.687	-8.273	-26.522	-60.978	-79.356	-99.886	-117.346	-138.480
Q mn. Vao= 3b	1.460	1.338	1.216	1.095	0.973	0.851	0.730	0.608	0.487	0.365	0.243	0.122	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.017	-0.030	-0.047	-0.068	-0.093	-0.121	-0.154	-0.190	-0.229	-0.273
M mn. Vao= 2	-0.390	200.794	365.867	492.834	582.531	636.700	655.137	636.986	579.841	484.761	354.128	188.848	-2.951
M mn. Vao= 3b	-0.273	-0.229	-0.190	-0.154	-0.121	-0.093	-0.068	-0.047	-0.030	-0.017	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.122	-0.243	-0.365	-0.487	-0.608	-0.730	-0.851	-0.973	-1.095	-1.216	-1.338	-1.460
Q mx. Vao= 2	149.135	122.729	95.590	72.716	54.886	37.788	16.618	-15.448	-34.619	-52.537	-72.147	-87.544	-93.563
Q mx. Vao= 3b	1.560	1.430	1.300	1.170	1.040	0.910	0.780	0.650	0.520	0.390	0.260	0.130	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.016	-0.028	-0.044	-0.064	-0.087	-0.114	-0.144	-0.177	-0.215	-0.255
M mx. Vao= 2	-0.255	278.522	501.540	656.228	772.330	861.187	908.183	890.145	801.781	661.986	479.986	256.559	-0.255
M mx. Vao= 3b	-0.255	-0.215	-0.177	-0.144	-0.114	-0.087	-0.064	-0.044	-0.028	-0.016	-0.007	-0.002	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.092	-0.027	0.040	-0.026	0.023	0.032	0.040	0.028	0.027	0.029	0.081	0.024	0.000
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	150.696	104.177	0.50	0.00	1.	Ap19	0.00	0.00	0.00	0.00	0.00	0	819.	0.	0.	0.	0.	0.
2	140.041	95.023	0.50	0.00	1.	Ap20	0.00	0.00	0.00	0.00	0.00	0	820.	0.	0.	0.	0.	0.

16.4.25 Longarina 2-d

```
        viga =    11 - longarina 2-d
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    2       24.640      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500
    3b       0.350      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                              esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -0.130    -0.261    -0.391    -0.522    -0.652    -0.783    -0.913    -1.044    -1.174    -1.304    -1.435    -1.565
Q mn. Vao= 2    112.666    90.262    74.843    48.729    30.915    11.740    -5.966   -39.751   -62.856   -80.308   -99.922  -121.063  -161.658
Q mn. Vao= 3b     1.465     1.342     1.220     1.098     0.976     0.854     0.732     0.610     0.488     0.366     0.244     0.122     0.000

M mn. Vao= 1b     0.000    -0.002    -0.008    -0.017    -0.030    -0.048    -0.068    -0.093    -0.122    -0.154    -0.190    -0.230    -0.274
M mn. Vao= 2     -0.274   205.366   375.331   508.351   603.545   660.951   680.561   662.512   606.458   512.493   379.881   208.805    -0.274
M mn. Vao= 3b    -0.274    -0.230    -0.190    -0.154    -0.122    -0.093    -0.068    -0.048    -0.030    -0.017    -0.008    -0.002     0.000

Q mx. Vao= 1b     0.000    -0.122    -0.244    -0.366    -0.488    -0.610    -0.732    -0.854    -0.976    -1.098    -1.220    -1.342    -1.465
Q mx. Vao= 2    164.548   119.191   100.445    81.280    63.982    41.481     6.231   -10.649   -29.813   -47.633   -74.408   -91.740  -109.928
Q mx. Vao= 3b     1.565     1.435     1.304     1.174     1.044     0.913     0.783     0.652     0.522     0.391     0.261     0.130     0.000

M mx. Vao= 1b     0.000    -0.002    -0.007    -0.016    -0.028    -0.044    -0.064    -0.087    -0.114    -0.144    -0.178    -0.215    -0.256
M mx. Vao= 2     -0.256   285.195   495.822   670.723   813.733   925.848   970.871   927.931   817.479   676.009   503.114   292.510    -0.256
M mx. Vao= 3b    -0.256    -0.215    -0.178    -0.144    -0.114    -0.087    -0.064    -0.044    -0.028    -0.016    -0.007    -0.002     0.000

Mt mx.vao= 1b     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

```
Mt mx.vao= 2      0.000     0.018     0.072     0.022     0.022     0.023     0.034     0.022     0.015     0.019     0.033    -0.015     0.000
Mt mx.vao= 3b     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  166.013 114.130    0.50    0.00    1. Ap27       0.00   0.00   0.00   0.00   0.00      0 827.   0.    0.    0.    0.    0.
         2  163.123 111.392    0.50    0.00    1. Ap28       0.00   0.00   0.00   0.00   0.00      0 828.   0.    0.    0.    0.    0.
```

16.4.26 Longarina 2-e

```
         viga =    12 - longarina 2-e
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       24.640     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -0.137    -0.274    -0.411    -0.548    -0.685    -0.822    -0.959    -1.096    -1.233    -1.370    -1.507    -1.644
Q mn. Vao= 2     94.188    82.601    67.053    48.009    30.705    12.671   -19.887   -38.072   -54.038   -70.675   -92.310  -117.938 -138.059
Q mn. Vao= 3b    11.033    10.904    10.776    10.647    10.518    10.390    10.261    10.133    10.004     9.876     9.747     9.618     0.000

M mn. Vao= 1b     0.000    -0.002    -0.008    -0.018    -0.032    -0.050    -0.072    -0.098    -0.128    -0.162    -0.200    -0.242    -0.288
M mn. Vao= 2     -2.966   183.466   337.671   458.473   545.080   594.080   606.753   585.621   532.020   446.254   326.954   173.008    -5.943
M mn. Vao= 3b    -7.546    -6.901    -6.261    -5.624    -4.990    -4.361    -3.735    -3.113    -2.494    -1.880    -1.269    -0.662     0.000

Q mx. Vao= 1b     0.000    -0.129    -0.257    -0.386    -0.514    -0.643    -0.771    -0.900    -1.029    -1.157    -1.286    -1.414    -1.543
```

```
Q mx. Vao= 2    141.309  113.654   95.758   75.753   58.050   24.581    6.347  -10.718  -26.587  -43.181  -66.641  -82.332  -85.578
Q mx. Vao= 3b    22.164   22.036   21.907   21.779   21.650   21.522   21.393   21.264   21.136   21.007   20.879   20.750    0.000

M mx. Vao= 1b     0.000   -0.002   -0.007   -0.017   -0.030   -0.047   -0.068   -0.092   -0.120   -0.152   -0.188   -0.227   -0.270
M mx. Vao= 2     -0.270  254.537  467.929  641.609  774.125  856.382  870.901  821.784  733.239  622.378  472.669  257.182   -2.787
M mx. Vao= 3b    -3.622   -3.302   -2.986   -2.673   -2.365   -2.060   -1.759   -1.461   -1.168   -0.878   -0.592   -0.309    0.000

Mt mx.vao= 1b     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
Mt mx.vao= 2      0.000    0.009    0.045    0.018    0.020    0.023    0.042    0.029    0.023    0.020    0.033    0.015   -0.331
Mt mx.vao= 3b    -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212   -0.212    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  142.953  95.731    0.50    0.00     1. Ap35       0.00   0.00   0.00   0.00   0.00     0 835.   0.   0.   0.   0.   0.

         2  154.501  99.221    0.50    0.00     1. Ap36       0.00   0.00   0.00   0.00   0.00     0 836.   0.   0.   0.   0.   0.
```

16.4.27 Longarina 2-f

```
         viga =    13 - longarina 2-f
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       24.640     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                                          esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000   -0.135   -0.271   -0.406   -0.541   -0.677   -0.812   -0.947   -1.083   -1.218   -1.353   -1.489   -1.624
```

Q mn. Vao= 2	116.544	88.334	70.695	52.956	30.874	12.508	-5.172	-24.375	-50.498	-74.270	-95.806	-118.748	-165.832
Q mn. Vao= 3b	3.485	3.359	3.232	3.105	2.978	2.851	2.724	2.597	2.470	2.343	0.254	0.127	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.018	-0.032	-0.049	-0.071	-0.097	-0.126	-0.160	-0.197	-0.239	-0.284
M mn. Vao= 2	-1.896	202.475	366.290	493.552	583.842	638.097	657.283	640.658	585.261	493.579	366.157	202.790	-0.777
M mn. Vao= 3b	-9.140	-8.142	-7.149	-6.159	-5.173	-4.191	-3.212	-2.237	-1.266	-0.298	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.127	-0.254	-0.381	-0.508	-0.635	-0.762	-0.889	-1.016	-1.142	-1.269	-1.396	-1.523
Q mx. Vao= 2	160.294	119.617	92.642	71.951	51.804	31.379	14.866	-13.598	-31.363	-52.784	-70.798	-87.592	-110.457
Q mx. Vao= 3b	34.253	34.126	33.999	33.872	33.745	33.618	33.491	33.364	33.237	33.110	0.271	0.135	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.017	-0.030	-0.046	-0.067	-0.091	-0.118	-0.150	-0.185	-0.224	-0.267
M mx. Vao= 2	-1.006	274.618	495.974	657.348	770.739	854.249	895.143	883.615	809.686	680.719	506.688	285.599	1.849
M mx. Vao= 3b	-0.769	-0.669	-0.573	-0.481	-0.392	-0.307	-0.226	-0.148	-0.074	-0.004	-0.007	-0.002	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.182	0.055	0.048	-0.022	-0.021	0.034	0.055	0.029	-0.046	0.020	0.040	0.018	-0.184
Mt mx.vao= 3b	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	161.918	118.067	0.50	0.00	1.	Ap43	0.00	0.00	0.00	0.00	0.00	0	843.	0.	0.	0.	0.	0.
2	190.711	131.227	0.50	0.00	1.	Ap44	0.00	0.00	0.00	0.00	0.00	0	844.	0.	0.	0.	0.	0.

16.4.28 Longarina 2-g

viga = 14 - longarina 2-g

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	24.640	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.129	-0.258	-0.386	-0.515	-0.644	-0.773	-0.902	-1.030	-1.159	-1.288	-1.417	-1.546
Q mn. Vao= 2	148.053	82.592	65.388	41.259	24.286	8.415	-7.392	-34.768	-62.538	-79.929	-96.290	-114.409	-182.567
Q mn. Vao= 3b	1.445	1.325	1.204	1.084	0.963	0.843	0.722	0.602	0.482	0.361	0.241	0.120	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.017	-0.030	-0.047	-0.068	-0.092	-0.120	-0.152	-0.188	-0.227	-0.270
M mn. Vao= 2	-25.317	182.708	334.589	451.752	535.207	585.738	603.539	586.662	534.597	449.368	332.006	181.805	-10.448
M mn. Vao= 3b	-0.271	-0.227	-0.188	-0.152	-0.120	-0.092	-0.068	-0.047	-0.030	-0.017	-0.008	-0.002	0.000
Q mx. Vao= 1b	0.000	-0.120	-0.241	-0.361	-0.482	-0.602	-0.722	-0.843	-0.963	-1.084	-1.204	-1.324	-1.445
Q mx. Vao= 2	236.798	121.403	93.866	77.408	59.895	43.622	7.853	-11.052	-27.175	-44.039	-62.355	-81.900	22.487
Q mx. Vao= 3b	1.546	1.417	1.288	1.159	1.030	0.902	0.773	0.644	0.515	0.386	0.258	0.129	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.016	-0.028	-0.044	-0.063	-0.086	-0.112	-0.142	-0.176	-0.212	-0.253
M mx. Vao= 2	-12.638	282.578	487.445	629.054	770.292	877.370	932.567	901.301	791.742	645.013	464.110	270.590	27.914
M mx. Vao= 3b	-0.253	-0.212	-0.176	-0.142	-0.112	-0.086	-0.063	-0.044	-0.028	-0.016	-0.007	-0.002	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.050	-0.099	0.048	0.037	0.014	-0.020	-0.037	0.015	0.018	-0.019	-0.056	-0.038	0.036
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R.apoio-no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilars espesi espess %rdmo pilares:

1	238.243	149.497	0.50	0.00	1.	Ap51	0.00	0.00	0.00	0.00	0.00	0	851.	0.	0.	0.	0.	0.
2	184.011	-21.042	0.50	0.00	1.	Ap52	0.00	0.00	0.00	0.00	0.00	0	852.	0.	0.	0.	0.	0.

16.4.29 Longarina 3-a

viga = 15 - longarina 3-a

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.128	-0.256	-16.512	-16.640	-16.768	-16.896	-17.024	-17.152	-17.280	-17.408	-17.536	-17.664
Q mn. Vao= 2	71.608	99.513	77.913	57.612	38.116	17.347	-5.678	-41.999	-61.968	-81.670	-101.406	-129.479	-190.423
Q mn. Vao= 3b	-13.817	-13.919	-14.021	-14.123	-14.225	-14.328	-14.430	-14.532	-14.634	22.021	21.926	21.864	-1.046
M mn. Vao= 1b	0.000	-0.002	-0.007	-0.343	-0.826	-1.313	-1.804	-2.299	-2.797	-3.299	-3.805	-4.315	-4.828
M mn. Vao= 2	-2.002	316.708	584.508	793.885	944.309	1035.998	1069.100	1043.611	959.204	814.616	609.195	340.834	-3.935
M mn. Vao= 3b	1.048	0.773	0.497	0.218	-0.070	-0.370	-0.671	-0.975	-1.282	-0.916	-0.375	0.153	0.010
Q mx. Vao= 1b	0.000	-0.120	-0.240	21.726	21.598	21.470	21.343	21.215	21.093	20.973	20.853	20.733	20.613
Q mx. Vao= 2	113.362	126.585	103.654	83.006	63.635	43.144	5.648	-13.755	-33.227	-53.029	-73.482	-101.533	-132.809
Q mx. Vao= 3b	-12.378	-12.472	-12.567	-12.661	-12.755	-12.850	-12.944	-13.039	-13.133	24.526	24.424	24.357	-0.788
M mx. Vao= 1b	0.000	-0.002	-0.007	0.493	1.119	1.747	2.371	2.992	3.608	4.222	4.831	5.437	6.039

M mx. Vao= 2	2.213	416.833	749.663	1025.409	1237.511	1395.516	1460.314	1382.775	1228.808	1022.342	764.919	473.517	-3.659
M mx. Vao= 3b	1.302	1.005	0.706	0.405	0.102	-0.203	-0.511	-0.820	-1.132	-0.813	-0.328	0.165	0.039
Mt mx.vao= 1b	0.000	0.000	0.000	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
Mt mx.vao= 2	0.000	0.070	0.066	0.059	0.059	0.119	-0.030	-0.071	-0.036	-0.041	-0.050	-0.110	0.926
Mt mx.vao= 3b	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.136	0.136	0.136	0.204

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	127.103	50.994	0.50	0.00	1.	Ap5	0.00	0.00	0.00	0.00	0.00	0	805.	0.	0.	0.	0.	0.
2	177.029	120.423	0.33	0.00	1.	Ap6	0.00	0.00	0.00	0.00	0.00	0	806.	0.	0.	0.	0.	0.

16.4.30 Longarina 3-b

viga = 16 - longarina 3-b

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.131	-0.262	-0.394	-0.525	-0.656	-0.787	-0.875	-1.096	-1.227	-1.358	-1.489	-1.621
Q mn. Vao= 2	92.942	78.321	59.522	47.245	30.867	14.278	-2.675	-20.653	-44.560	-62.716	-81.042	-99.739	-122.863
Q mn. Vao= 3b	1.685	1.588	1.491	1.394	1.297	1.200	1.103	1.006	0.909	0.291	0.194	0.097	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.017	-0.031	-0.048	-0.069	-0.094	-0.124	-0.158	-0.196	-0.237	-0.283

M mn. Vao= 2	-3.409	255.669	469.779	642.267	769.733	849.415	879.329	858.418	786.256	663.214	490.421	269.377	-3.064
M mn. Vao= 3b	-3.062	-2.790	-2.521	-2.254	-1.989	-1.727	-1.466	-1.208	-0.951	-0.010	-0.005	-0.001	0.000
Q mx. Vao= 1b	0.000	-0.123	-0.246	-0.369	-0.492	-0.615	-0.738	-0.821	-1.021	-1.144	-1.267	-1.390	-1.513
Q mx. Vao= 2	159.250	96.543	78.568	61.379	43.803	27.695	2.753	-15.060	-32.670	-49.628	-65.993	-81.074	-100.083
Q mx. Vao= 3b	12.378	12.281	12.184	12.087	11.990	11.894	11.797	11.700	11.603	0.314	0.209	0.105	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.016	-0.029	-0.045	-0.065	-0.088	-0.116	-0.148	-0.183	-0.222	-0.264
M mx. Vao= 2	-1.457	360.532	611.293	808.788	963.043	1062.643	1109.181	1078.102	970.482	810.623	595.859	326.780	-0.321
M mx. Vao= 3b	-0.171	-0.134	-0.099	-0.065	-0.035	-0.006	0.021	0.046	0.068	-0.010	-0.004	-0.001	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.039	0.023	0.032	0.038	0.029	0.025	0.028	0.020	0.014	-0.012	-0.027	-0.037	-0.011
Mt mx.vao= 3b	0.738	0.738	0.738	0.738	0.738	0.738	0.738	0.738	0.738	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:
1	160.869	94.455	0.50	0.00	1.	Ap7	0.00	0.00	0.00	0.00	0.00	0	807. 0. 0. 0. 0. 0.
2	126.217	101.772	0.33	0.00	1.	Ap8	0.00	0.00	0.00	0.00	0.00	0	808. 0. 0. 0. 0. 0.

16.4.31 Longarina 3-c

viga = 17 - longarina 3-c

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eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.134	-0.269	-11.565	-11.699	-11.834	-11.968	-12.102	-12.237	-12.371	-12.506	-12.640	-12.775
Q mn. Vao= 2	68.174	79.458	62.441	45.652	29.365	13.723	-10.109	-24.284	-39.499	-55.998	-72.545	-96.430	-117.042
Q mn. Vao= 3b	1.226	1.126	1.027	0.928	0.828	0.729	0.630	0.530	0.735	0.298	0.199	0.099	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.298	-0.637	-0.980	-1.328	-1.679	-2.034	-2.392	-2.755	-3.122	-3.493
M mn. Vao= 2	-1.128	263.527	475.792	637.295	750.070	815.931	835.947	810.690	740.441	625.145	464.479	257.404	-0.328
M mn. Vao= 3b	-0.347	-0.309	-0.274	-0.241	-0.211	-0.183	-0.157	-0.133	-0.147	-0.011	-0.005	-0.001	0.000
Q mx. Vao= 1b	0.000	-0.126	-0.253	-5.130	-5.256	-5.383	-5.509	-5.635	-5.762	-5.888	-6.014	-6.141	-6.267
Q mx. Vao= 2	85.376	92.840	75.282	57.558	40.224	19.484	1.140	-13.764	-28.165	-42.455	-60.384	-77.740	-95.879
Q mx. Vao= 3b	1.757	1.650	1.543	1.436	1.328	1.221	1.114	1.007	1.359	0.321	0.214	0.107	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.135	-0.286	-0.441	-0.600	-0.763	-0.929	-1.099	-1.272	-1.450	-1.631
M mx. Vao= 2	-0.651	304.724	555.776	753.892	899.684	992.345	1012.832	967.761	874.091	731.483	560.472	317.036	-0.224
M mx. Vao= 3b	-0.125	-0.099	-0.075	-0.053	-0.034	-0.017	-0.002	0.011	0.031	-0.010	-0.004	-0.001	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
Mt mx.vao= 2	0.000	0.030	0.021	0.022	0.020	0.020	0.048	0.022	0.021	0.019	0.016	0.039	-0.019
Mt mx.vao= 3b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.114	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	96.168	77.810	0.50	0.00	1.	Ap13	0.00	0.00	0.00	0.00	0.00	0	813.	0.	0.	0.	0.	0.
2	118.652	97.304	0.33	0.00	1.	Ap14	0.00	0.00	0.00	0.00	0.00	0	814.	0.	0.	0.	0.	0.

16.4.32 Longarina 3-d

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         viga =    18 - longarina 3-d
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   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.132   -0.265   -0.397   -0.530   -0.662   -0.795   -0.927   -1.059   -1.192   -1.324   -1.457   -1.589
Q mn. Vao= 2    81.056   77.351   62.164   46.292   30.097   13.971   -2.529  -25.784  -41.813  -58.450  -75.354  -93.429 -130.968
Q mn. Vao= 3b    2.862    2.765    2.667    2.569    2.471    2.373    2.285    1.045    0.947    0.293    0.196    0.098    0.000

M mn. Vao= 1b    0.000   -0.002   -0.008   -0.017   -0.031   -0.048   -0.070   -0.095   -0.124   -0.156   -0.193   -0.234   -0.278
M mn. Vao= 2     0.186  250.256  459.106  623.353  742.159  814.636  839.722  817.781  748.891  632.959  470.001  259.443   -0.543
M mn. Vao= 3b   -1.151   -1.015   -0.880   -0.748   -0.617   -0.489   -0.363   -0.218   -0.186   -0.010   -0.005   -0.001    0.000

Q mx. Vao= 1b    0.000   -0.124   -0.249   -0.373   -0.497   -0.621   -0.746   -0.870   -0.994   -1.119   -1.243   -1.367   -1.491
Q mx. Vao= 2   112.124   93.048   75.822   58.771   42.289   26.343    2.635  -12.738  -28.282  -44.245  -60.179  -79.004  -96.520
Q mx. Vao= 3b    6.241    6.143    6.046    5.948    5.850    5.752    5.664    1.559    1.453    0.317    0.211    0.106    0.000

M mx. Vao= 1b    0.000   -0.002   -0.007   -0.016   -0.029   -0.045   -0.065   -0.089   -0.116   -0.147   -0.181   -0.219   -0.261
M mx. Vao= 2     0.918  311.745  557.134  757.948  907.515 1005.357 1042.873 1003.521  905.585  756.418  556.563  322.858   -0.295
M mx. Vao= 3b   -0.478   -0.416   -0.356   -0.298   -0.242   -0.189   -0.137   -0.084   -0.062   -0.010   -0.004   -0.001    0.000

Mt mx.vao= 1b    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
```

```
Mt mx.vao= 2    -0.009     0.005     0.013     0.015     0.021     0.034     0.020     0.021     0.018     0.021     0.025     0.016     0.048
Mt mx.vao= 3b    0.005     0.005     0.005     0.005     0.005     0.005     0.005     0.145     0.145     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
         1  113.713  82.547     0.50    0.00    1. Ap15       0.00   0.00   0.00   0.00   0.00     0 815.   0.    0.    0.    0.    0.
         2  137.209  99.873     0.33    0.00    1. Ap16       0.00   0.00   0.00   0.00   0.00     0 816.   0.    0.    0.    0.    0.
```

16.4.33 Longarina 3-e

```
         viga =    19 - longarina 3-e
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura     altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    -0.129    -0.258   -77.201     2.988     2.867     2.746     2.625     2.504     2.383     2.262     2.141     2.020
Q mn. Vao= 2    67.721    81.855    58.262    43.728    28.306    12.717    -3.369   -21.441   -46.843   -62.033   -78.815   -96.647 -130.871
Q mn. Vao= 3b    2.724     2.629     2.533     2.438     2.343     1.478     1.383     1.288     1.192     0.286     0.191     0.095     0.000

M mn. Vao= 1b    0.000    -0.002    -0.008    -1.508    -1.513    -1.401    -1.293    -1.188    -1.087    -1.000    -0.921    -0.846    -0.779
M mn. Vao= 2    -2.256   265.822   485.282   655.584   776.510   848.144   870.788   844.711   770.420   648.255   479.052   263.381    -4.745
M mn. Vao= 3b   -6.343    -5.792    -5.243    -4.697    -4.152    -2.636    -2.404    -2.174    -1.945    -0.010    -0.005    -0.001     0.000

Q mx. Vao= 1b    0.000    -0.121    -0.242   -59.692     5.195     5.066     4.937     4.808     4.678     4.549     4.420     4.291     4.162
```

Q mx. Vao= 2	86.000	98.347	77.747	60.697	43.904	28.660	13.957	-15.719	-32.457	-48.363	-64.227	-80.212	-100.060
Q mx. Vao= 3b	24.996	24.901	24.805	24.710	24.615	10.581	10.486	10.391	10.295	0.309	0.206	0.103	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-1.189	-1.169	-1.043	-0.921	-0.798	-0.668	-0.541	-0.418	-0.298	-0.182
M mx. Vao= 2	-1.805	335.075	590.759	766.672	921.928	1026.153	1080.039	1055.570	947.191	786.984	576.516	316.533	-0.428
M mx. Vao= 3b	-0.526	-0.467	-0.410	-0.355	-0.302	-0.203	-0.172	-0.139	-0.107	-0.009	-0.004	-0.001	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	-0.039	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
Mt mx.vao= 2	0.000	-0.007	0.011	0.014	0.021	0.020	0.021	0.025	0.028	0.032	0.023	0.023	0.197
Mt mx.vao= 3b	0.146	0.146	0.146	0.146	0.146	1.528	1.528	1.528	1.528	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	82.287	65.513	0.50	0.00	1.	Ap21	0.00	0.00	0.00	0.00	0.00	0	821.	0.	0.	0.	0.	0.
2	155.865	102.787	0.33	0.00	1.	Ap22	0.00	0.00	0.00	0.00	0.00	0	822.	0.	0.	0.	0.	0.

16.4.34 Longarina 3-f

viga = 20 - longarina 3-f

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.170	-0.316	-25.690	-25.835	-25.962	-26.089	-26.216	-26.342	-26.469	-26.596	-26.722	-26.849

```
Q mn. Vao= 2     97.316   87.145   68.948   51.010   33.471   16.253   -9.110  -26.447  -42.807  -61.017  -79.727 -105.480 -132.031
Q mn. Vao= 3b     2.633    2.540    2.446    2.353    2.259    2.166    2.072    1.979    1.868    0.378    0.252    0.126    0.000

M mn. Vao= 1b     0.000   -0.002   -0.010   -1.097   -1.849   -2.604   -3.363   -4.126   -4.892   -5.662   -6.436   -7.214   -7.995
M mn. Vao= 2     -2.750  284.465  518.169  698.280  826.219  902.592  928.057  903.172  827.777  701.300  522.721  290.073   -0.675
M mn. Vao= 3b    -0.654   -0.587   -0.522   -0.460   -0.400   -0.342   -0.286   -0.233   -0.182   -0.013   -0.006   -0.001    0.000

Q mx. Vao= 1b     0.000   -0.161   -0.301  -21.219  -21.356  -21.475  -21.594  -21.712  -21.831  -21.949  -22.068  -22.186  -22.305
Q mx. Vao= 2    120.747  101.428   81.748   62.620   44.428   25.546    2.784  -13.605  -29.852  -46.230  -63.633  -87.546 -108.990
Q mx. Vao= 3b     3.074    2.973    2.872    2.771    2.669    2.568    2.467    2.366    2.247    0.401    0.267    0.134    0.000

M mx. Vao= 1b     0.000   -0.002   -0.009   -0.905   -1.526   -2.151   -2.779   -3.411   -4.046   -4.684   -5.326   -5.971   -6.620
M mx. Vao= 2     -1.233  329.907  602.733  817.894  976.948 1081.059 1109.832 1062.270  961.426  806.565  623.928  357.210   -0.542
M mx. Vao= 3b    -0.520   -0.463   -0.408   -0.355   -0.304   -0.255   -0.208   -0.164   -0.121   -0.013   -0.006   -0.001    0.000

Mt mx.vao= 1b     0.000    0.000    0.000   -0.227   -0.227   -0.227   -0.227   -0.227   -0.227   -0.227   -0.227   -0.227   -0.227
Mt mx.vao= 2     -0.074    0.055    0.019    0.023    0.024    0.025    0.084    0.030    0.026    0.025   -0.073    0.021    0.106
Mt mx.vao= 3b     0.117    0.117    0.117    0.117    0.117    0.117    0.117    0.117    0.117    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  146.905 120.620    0.50    0.00   1. Ap23      0.00   0.00   0.00   0.00   0.00     0 823.   0.   0.   0.   0.   0.
         2  135.072 111.700    0.33    0.00   1. Ap24      0.00   0.00   0.00   0.00   0.00     0 824.   0.   0.   0.   0.   0.
```

16.4.35 Longarina 3-g

```
         viga =    21 - longarina 3-g
-----------------------------------------------------------------------------------------------------------------------------------
```

```
eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
 1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 2       35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
 3b       0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                         esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    -0.086  -35.375     7.829     7.708     7.586     7.465     7.344     7.222     7.101     6.979     6.858     6.736
Q mn. Vao= 2    70.222    82.951   65.336    48.800    32.075    15.437    -1.724   -29.437   -46.329   -62.612   -80.729   -98.945 -142.649
Q mn. Vao= 3b    1.948     1.853    1.757     1.661     1.566     1.470     1.374     1.279     1.183     0.287     0.191     0.096     0.000

M mn. Vao= 1b    0.000    -0.002   -1.763    -2.264    -1.992    -1.724    -1.460    -1.199    -0.943    -0.690    -0.443    -0.198     0.014
M mn. Vao= 2    -2.876   267.180  491.678   668.311   795.914   873.709   901.133   877.924   803.960   679.331   504.265   278.788    -0.464
M mn. Vao= 3b   -0.465    -0.416   -0.370    -0.326    -0.283    -0.244    -0.206    -0.171    -0.138    -0.010    -0.005    -0.001     0.000

Q mx. Vao= 1b    0.000    -0.080  -29.222     9.384     9.254     9.124     8.995     8.865     8.736     8.606     8.477     8.347     8.217
Q mx. Vao= 2    89.302    97.392   80.793    63.637    47.114    31.006     2.919   -13.590   -30.888   -47.497   -64.928   -84.297 -105.269
Q mx. Vao= 3b    2.412     2.308    2.205     2.101     1.998     1.895     1.791     1.688     1.584     0.310     0.207     0.103     0.000

M mx. Vao= 1b    0.000    -0.002   -1.458    -1.873    -1.646    -1.423    -1.198    -0.973    -0.752    -0.533    -0.318    -0.106     0.115
M mx. Vao= 2    -2.375   326.758  577.079   792.271   955.663  1066.515  1115.354  1074.214   966.765   805.893   591.930   343.591    -0.353
M mx. Vao= 3b   -0.349    -0.307   -0.267    -0.230    -0.194    -0.160    -0.129    -0.100    -0.073    -0.010    -0.004    -0.001     0.000

Mt mx.vao= 1b    0.000     0.000   -0.410    -0.083    -0.083    -0.083    -0.083    -0.083    -0.083    -0.083    -0.083    -0.083    -0.083
Mt mx.vao= 2     0.000     0.030    0.018     0.025     0.022     0.025     0.023     0.021     0.018     0.014     0.009     0.021     0.136
Mt mx.vao= 3b    0.101     0.101    0.101     0.101     0.101     0.101     0.101     0.101     0.101     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
```

1	82.169	62.991	0.50	0.00	1. Ap29	0.00	0.00	0.00	0.00	0.00	0	829.	0.	0.	0.	0.	0.
2	144.668	107.281	0.33	0.00	1. Ap30	0.00	0.00	0.00	0.00	0.00	0	830.	0.	0.	0.	0.	0.

16.4.36 Longarina 3-h

```
        viga =    22 - longarina 3-h
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao    comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b      0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2      35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b      0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000    -0.133    -0.266    -0.398    -0.531    -0.664    -0.797    -0.930    -1.063    -1.195    -1.328    -1.461    -1.594
Q mn. Vao= 2    88.286    81.181    65.116    44.201    29.188    13.783    -2.207   -20.098   -43.577   -59.693   -77.143   -95.008  -124.371
Q mn. Vao= 3b    2.059     1.961     1.863     1.765     1.666     1.568     1.470     1.372     1.274     0.294     0.196     0.098     0.000

M mn. Vao= 1b    0.000    -0.002    -0.008    -0.017    -0.031    -0.048    -0.070    -0.095    -0.124    -0.157    -0.194    -0.234    -0.279
M mn. Vao= 2     0.091   265.267   483.555   653.146   774.215   846.886   871.162   847.089   774.601   653.760   484.335   267.035    -2.485
M mn. Vao= 3b   -2.304    -2.149    -1.996    -1.846    -1.698    -1.552    -1.408    -1.267    -1.127    -0.011    -0.005    -0.001     0.000

Q mx. Vao= 1b    0.000    -0.125    -0.249    -0.374    -0.499    -0.623    -0.748    -0.873    -0.998    -1.122    -1.247    -1.372    -1.496
Q mx. Vao= 2   112.672    97.819    75.914    58.261    41.345    25.812    10.651   -15.401   -32.161   -48.253   -64.746   -80.950   -99.829
Q mx. Vao= 3b    7.057     6.959     6.861     6.763     6.665     6.567     6.468     6.370     6.272     0.318     0.212     0.106     0.000

M mx. Vao= 1b    0.000    -0.002    -0.007    -0.016    -0.029    -0.045    -0.065    -0.089    -0.116    -0.147    -0.182    -0.220    -0.262
```

```
M mx. Vao= 2      1.350   323.473   575.707   753.863   902.487  1000.042 1047.198 1026.156   926.153   772.861   568.597   312.396    -0.375
M mx. Vao= 3b    -0.372    -0.326    -0.283    -0.241    -0.202    -0.164    -0.129    -0.096    -0.065    -0.010    -0.004    -0.001     0.000

Mt mx.vao= 1b     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
Mt mx.vao= 2     -0.015     0.028     0.021     0.023     0.024     0.028     0.061     0.024     0.023     0.020     0.016     0.028     0.663
Mt mx.vao= 3b     0.754     0.754     0.754     0.754     0.754     0.754     0.754     0.754     0.754     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome    m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  114.266  89.782     0.50     0.00     1. Ap31       0.00   0.00   0.00   0.00   0.00      0 831.   0.   0.   0.   0.   0.
         2  130.158 101.899     0.33     0.00     1. Ap32       0.00   0.00   0.00   0.00   0.00      0 832.   0.   0.   0.   0.   0.
```

16.4.37 Longarina 3-i

```
         viga =    23 - longarina 3-i
------------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao     eng dir=nao     repet.= 1     andar= 1     red v ext=nao     fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -0.136    -0.272     2.523     2.395     2.267     2.139     2.011     1.883     1.755     1.627     1.499     1.371
Q mn. Vao= 2     68.752    79.183    63.588    47.228    31.388    14.921    -3.205   -27.725   -42.217   -58.191   -75.225   -98.794  -128.063
Q mn. Vao= 3b     2.102     2.001     1.901     1.800     1.700     1.599     1.498     1.398     1.297     0.302     0.201     0.101     0.000

M mn. Vao= 1b     0.000    -0.002    -0.008    -0.112    -0.041     0.027     0.091     0.152     0.209     0.262     0.311     0.357     0.399
```

M mn. Vao= 2	-0.259	264.663	479.104	646.210	766.096	838.674	863.946	841.744	771.624	653.091	485.569	268.946	-0.516
M mn. Vao= 3b	-0.518	-0.461	-0.406	-0.354	-0.304	-0.257	-0.212	-0.169	-0.129	-0.011	-0.005	-0.001	0.000
Q mx. Vao= 1b	0.000	-0.128	-0.256	21.126	20.999	20.871	20.743	20.615	20.487	20.359	20.231	20.103	19.975
Q mx. Vao= 2	84.126	94.344	77.094	59.747	44.117	30.800	2.792	-12.258	-27.289	-41.730	-55.389	-81.130	-99.843
Q mx. Vao= 3b	2.636	2.528	2.419	2.311	2.203	2.094	1.986	1.878	1.769	0.325	0.217	0.108	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	0.384	0.998	1.609	2.216	2.819	3.418	4.014	4.606	5.194	5.779
M mx. Vao= 2	2.352	313.859	565.234	769.234	922.836	1027.898	1056.694	1005.295	904.697	756.162	589.350	344.707	-0.360
M mx. Vao= 3b	-0.361	-0.316	-0.273	-0.232	-0.193	-0.157	-0.122	-0.090	-0.061	-0.010	-0.004	-0.001	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044
Mt mx.vao= 2	0.000	0.016	0.018	0.020	0.021	0.021	0.022	0.022	0.021	0.019	0.015	0.013	0.079
Mt mx.vao= 3b	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:				
1	75.961	50.132	0.50	0.00	1.	Ap37	0.00	0.00	0.00	0.00	0.00	0	837.	0.	0.	0.	0. 0.
2	130.623	102.106	0.33	0.00	1.	Ap38	0.00	0.00	0.00	0.00	0.00	0	838.	0.	0.	0.	0. 0.

16.4.38 Longarina 3-j

viga = 24 - longarina 3-j

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

```
    3b       0.265      1.000      1.800      0.000      0.000      1.000      0.000      0.000      0.900      0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b     0.000    -0.138    -0.275    -0.413    -0.551    -0.689    -0.826    -0.964    -1.102    -1.240    -1.377    -1.515    -1.653
Q mn. Vao= 2     80.488    80.229    62.225    45.933    30.187    14.128    -1.650   -25.963   -42.331   -59.120   -77.030   -95.527  -131.862
Q mn. Vao= 3b     2.175     2.073     1.971     1.869     1.767     1.666     1.564     1.462     1.360     0.306     0.204     0.102     0.000

M mn. Vao= 1b     0.000    -0.002    -0.008    -0.018    -0.032    -0.050    -0.072    -0.098    -0.129    -0.163    -0.201    -0.243    -0.289
M mn. Vao= 2     -0.966   253.330   470.582   641.954   766.093   841.659   867.773   844.934   773.922   654.636   486.869   269.589    -0.562
M mn. Vao= 3b    -0.750    -0.678    -0.609    -0.541    -0.476    -0.413    -0.353    -0.294    -0.238    -0.011    -0.005    -0.001     0.000

Q mx. Vao= 1b     0.000    -0.130    -0.259    -0.389    -0.518    -0.648    -0.778    -0.907    -1.037    -1.166    -1.296    -1.426    -1.555
Q mx. Vao= 2    113.119    93.605    77.032    60.264    43.899    27.635     2.980   -13.155   -30.013   -46.433   -63.950   -81.475  -100.522
Q mx. Vao= 3b     3.308     3.206     3.104     3.002     2.900     2.798     2.697     2.595     2.493     0.329     0.219     0.110     0.000

M mx. Vao= 1b     0.000    -0.002    -0.008    -0.017    -0.030    -0.047    -0.068    -0.093    -0.121    -0.153    -0.189    -0.229    -0.272
M mx. Vao= 2     -0.624   318.188   556.593   759.008   911.195  1012.263  1056.995  1022.465   924.546   773.839   570.529   323.367    -0.375
M mx. Vao= 3b    -0.377    -0.330    -0.286    -0.243    -0.203    -0.165    -0.130    -0.096    -0.065    -0.010    -0.004    -0.001     0.000

Mt mx.vao= 1b     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
Mt mx.vao= 2     -0.035     0.011     0.025     0.019     0.021     0.022     0.021     0.036     0.020     0.018     0.014     0.013     0.309
Mt mx.vao= 3b     0.181     0.181     0.181     0.181     0.181     0.181     0.181     0.181     0.181     0.000     0.000     0.000     0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo          pilares:
         1  114.772  82.043     0.50     0.00    1. Ap39       0.00    0.00    0.00    0.00    0.00      0 839.    0.    0.    0.    0.    0.

         2  135.160 102.865     0.33     0.00    1. Ap40       0.00    0.00    0.00    0.00    0.00      0 840.    0.    0.    0.    0.    0.
```

16.4.39 Longarina 3-k

```
        viga =    25 - longarina 3-k
-----------------------------------------------------------------------------------------------------------------------------------
   eng esq=nao      eng dir=nao      repet.= 1      andar= 1      red v ext=nao      fat carga min=1.00
   vao     comprim.  Largura    altura  b colab.s.b colab.i.tipo secao esp.lj.s. esp.lj.i.fc sp eixofc lt eixo
    1b       0.350     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    2       35.820     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500
    3b       0.265     1.000     1.800     0.000     0.000     1.000     0.000     0.000     0.900     0.500

                            esforcos provenientes de grelha/portico espacial
Q mn. Vao= 1b    0.000   -0.134   -0.269  -44.605  -44.731  -44.858  -44.984  -45.110  -45.237  -45.363  -45.489  -45.616  -45.742
Q mn. Vao= 2    64.493   79.128   63.096   43.906   29.253   13.814   -1.603  -18.823  -40.671  -57.819  -76.574  -95.745 -125.647
Q mn. Vao= 3b    2.229    2.129    2.030    1.931    1.831    1.732    1.632    1.533    1.434    0.298    0.199    0.099    0.000

M mn. Vao= 1b    0.000   -0.002   -0.008   -1.167   -2.470   -3.776   -5.086   -6.400   -7.718   -9.039  -10.364  -11.693  -13.025
M mn. Vao= 2    -3.298  260.567  473.357  637.653  755.190  826.590  852.065  831.465  764.183  649.196  484.775  269.064   -1.360
M mn. Vao= 3b   -1.258   -1.167   -1.079   -0.993   -0.910   -0.828   -0.749   -0.672   -0.597   -0.011   -0.005   -0.001    0.000

Q mx. Vao= 1b    0.000   -0.126   -0.253  -16.845  -16.972  -17.098  -17.224  -17.351  -17.477  -17.603  -17.730  -17.856  -17.982
Q mx. Vao= 2    83.031   97.677   75.158   56.850   39.744   23.905    9.536  -13.712  -29.771  -46.477  -63.679  -81.029 -101.782
Q mx. Vao= 3b    4.138    4.039    3.939    3.840    3.741    3.641    3.542    3.442    3.343    0.321    0.214    0.107    0.000

M mx. Vao= 1b    0.000   -0.002   -0.007   -0.463   -0.956   -1.453   -1.953   -2.458   -2.965   -3.477   -3.992   -4.511   -5.034
M mx. Vao= 2    -1.027  316.027  568.321  750.010  894.118  987.041 1030.002 1012.135  920.293  773.385  572.801  316.032   -0.404
M mx. Vao= 3b   -0.412   -0.362   -0.314   -0.268   -0.225   -0.184   -0.145   -0.108   -0.073   -0.010   -0.004   -0.001    0.000

Mt mx.vao= 1b    0.000    0.000    0.000    0.152    0.152    0.152    0.152    0.152    0.152    0.152    0.152    0.152    0.152
```

Mt mx.vao= 2	0.000	0.035	0.020	0.023	0.027	0.029	0.044	0.030	0.025	0.025	0.023	0.022	0.279
Mt mx.vao= 3b	0.331	0.331	0.331	0.331	0.331	0.331	0.331	0.331	0.331	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	120.845	85.059	0.50	0.00	1.	Ap45	0.00	0.00	0.00	0.00	0.00	0	845.	0.	0.	0.	0.	0.
2	129.497	104.011	0.33	0.00	1.	Ap46	0.00	0.00	0.00	0.00	0.00	0	846.	0.	0.	0.	0.	0.

16.4.40 Longarina 3-I

viga = 26 - longarina 3-l

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.131	-0.262	-0.394	-0.525	-0.656	-0.787	-0.918	-1.050	-1.181	-1.312	-1.488	-1.619
Q mn. Vao= 2	96.273	81.309	66.369	48.927	31.880	13.336	-5.276	-29.757	-46.018	-62.618	-78.184	-94.404	-118.603
Q mn. Vao= 3b	2.202	2.105	2.008	1.911	1.814	1.717	1.620	1.524	1.427	0.291	0.194	0.097	0.000
M mn. Vao= 1b	0.000	-0.002	-0.008	-0.017	-0.031	-0.048	-0.069	-0.094	-0.122	-0.155	-0.191	-0.232	-0.277
M mn. Vao= 2	-3.244	264.598	485.020	658.740	783.289	856.983	879.188	850.150	771.011	643.885	471.951	258.285	-0.587
M mn. Vao= 3b	-0.590	-0.530	-0.473	-0.418	-0.365	-0.315	-0.267	-0.221	-0.177	-0.010	-0.005	-0.001	0.000
Q mx. Vao= 1b	0.000	-0.123	-0.246	-0.369	-0.492	-0.615	-0.738	-0.861	-0.985	-1.108	-1.231	-1.391	-1.514

Q mx. Vao= 2	166.911	98.410	79.670	60.957	42.809	27.859	0.627	-16.619	-33.048	-47.888	-58.567	-78.415	-94.707
Q mx. Vao= 3b	2.754	2.649	2.544	2.440	2.335	2.230	2.126	2.021	1.917	0.314	0.209	0.105	0.000
M mx. Vao= 1b	0.000	-0.002	-0.007	-0.016	-0.029	-0.045	-0.065	-0.088	-0.115	-0.145	-0.179	-0.218	-0.260
M mx. Vao= 2	-1.465	352.979	618.439	826.390	976.810	1072.309	1095.905	1039.775	929.085	766.651	563.404	324.638	-0.420
M mx. Vao= 3b	-0.417	-0.369	-0.323	-0.280	-0.238	-0.199	-0.162	-0.127	-0.094	-0.010	-0.004	-0.001	0.000
Mt mx.vao= 1b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mt mx.vao= 2	-0.085	-0.018	0.022	0.027	0.034	0.045	0.036	0.046	0.046	0.050	0.050	0.030	0.103
Mt mx.vao= 3b	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.000	0.000	0.000	0.000

R.apoio-no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilars	espesi	espess	%rdmo	pilares:					
1	168.531	97.788	0.50	0.00	1.	Ap47	0.00	0.00	0.00	0.00	0.00	0	847.	0.	0.	0.	0.	0.
2	121.256	96.909	0.33	0.00	1.	Ap48	0.00	0.00	0.00	0.00	0.00	0	848.	0.	0.	0.	0.	0.

16.4.41 Longarina 3-m

viga = 27 - longarina 3-m

---

eng esq=nao eng dir=nao repet.= 1 andar= 1 red v ext=nao fat carga min=1.00

vao	comprim.	Largura	altura	b colab.s.b	colab.i.tipo	secao	esp.lj.s.	esp.lj.i.fc	sp eixofc	lt eixo
1b	0.350	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
2	35.820	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500
3b	0.265	1.000	1.800	0.000	0.000	1.000	0.000	0.000	0.900	0.500

esforcos provenientes de grelha/portico espacial

Q mn. Vao= 1b	0.000	-0.128	-0.256	-206.143	-206.271	-206.399	-206.527	-206.655	-206.783	-206.911	-207.039	-207.167	-207.295

```
Q mn. Vao= 2     58.085   98.144   74.530   55.225   36.377   16.165   -3.337  -41.667  -62.743  -83.124 -104.068 -127.766 -179.975
Q mn. Vao= 3b    -1.611   -1.705   -1.800   -1.894   -1.988   -2.083   -2.177   -2.272   -2.366    0.283    0.189    0.094    0.000

M mn. Vao= 1b     0.000   -0.002   -0.007   -5.457  -11.471  -17.489  -23.511  -29.537  -35.566  -41.599  -47.636  -53.676  -59.720
M mn. Vao= 2    -11.564  290.749  556.800  766.877  920.098 1015.967 1053.751 1031.724  949.486  806.764  602.178  333.510   -1.125
M mn. Vao= 3b    -0.553   -0.509   -0.467   -0.427   -0.390   -0.354   -0.321   -0.352   -0.402   -0.010   -0.005   -0.001    0.000

Q mx. Vao= 1b     0.000   -0.120   -0.240  -70.396  -70.515  -70.635  -70.755  -70.875  -70.995  -71.114  -71.234  -71.354  -71.474
Q mx. Vao= 2    108.959  126.213  102.002   81.854   63.605   43.917    9.592  -14.233  -34.412  -55.296  -77.226 -101.064 -124.165
Q mx. Vao= 3b     2.056    1.954    1.852    1.750    1.648    1.546    1.443    1.341    1.239    0.306    0.204    0.102    0.000

M mx. Vao= 1b     0.000   -0.002   -0.007   -1.882   -3.937   -5.995   -8.057  -10.122  -12.191  -14.264  -16.340  -18.419  -20.502
M mx. Vao= 2     -4.064  434.220  739.958 1007.076 1215.449 1368.929 1455.038 1405.963 1249.249 1036.612  761.524  432.243   -0.697
M mx. Vao= 3b    -0.037   -0.074   -0.112   -0.153   -0.196   -0.241   -0.223   -0.201   -0.181   -0.009   -0.004   -0.001    0.000

Mt mx.vao= 1b     0.000    0.000    0.000    0.783    0.783    0.783    0.783    0.783    0.783    0.783    0.783    0.783    0.783
Mt mx.vao= 2      0.000   -0.113    0.089    0.035    0.032   -0.040    0.048    0.161    0.090    0.080    0.087    0.130    1.870
Mt mx.vao= 3b     0.244    0.244    0.244    0.244    0.244    0.244    0.244    0.244    0.244    0.000    0.000    0.000    0.000

R.apoio-no. Maximos minimos largura   depev morte   nome   m.i.mx m.i.mn pilars espesi espess %rdmo         pilares:
         1  274.602 155.944    0.50     0.00    1. Ap53       0.00   0.00   0.00   0.00   0.00      0 853.   0.   0.   0.   0.   0.
         2  178.364 125.874    0.33     0.00    1. Ap54       0.00   0.00   0.00   0.00   0.00      0 854.   0.   0.   0.   0.   0.
```

16.5 Detalhamento - relatório geral de vigas

A seguir são apresentados os dados e resultados do cálculo/dimensionamento das vigas:

16.6 Relatório geral de vigas

16.6.1 Legenda

G e o m e t r i a

Eng.e : engastamento a esquerda / eng.d : engastamento a direita / repet : repeticoes

Nand : n.de andares / red v ext : reducao de cortante no extremo / fat.alt : fator de alternancia de cargas

Cob : cobrimento / tps : tipo da secao / bcs : mesa colaborante superior

Bci : mesa colaborante inferior / esp.ls : espessura laje superior / esp.li : espessura laje infetior

Fsp.ex : distancia face superior eixo / flt.ex : distancia face lateral ao eixo / cob/s : cobrim/cobr.superior adicional

C a r g a s

Mesq : momento adicional a esquerda / mdir : momento adicional a direita / q : cortante adicional (valor unico)

A r m a d u r a s - f l e x a o

Sras : secao retangular armad.simples / srad : secao retangular armad.dupla / stas : secao te armadura simples

Stad : secao te armadura dupla / x/d : profund. Relativa da linha neutra / x/dmx : profund. Relativa da ln maxima

Asl : armadura de compressao / bit.de fiss.: bitola de fissuracao / asapo : armadura e/d que chega no extremo

A r m a d u r a s - c i s a l h a m e n t o

Mdc : modelo de calculo (i ou ii) / ang. : angulo da biela de compressao / aswmin : armad.transv.minima-cisalhamento

Asw[c+t]: arm.tran.calculada cisalh+torcao / bit : bitola selecionada / esp : espacamento selecionado

Nr : numero de ramos do estribo / astrt : armadura transversal de tirante / assus : armadura transversal-suspensao

A r m a d u r a s - t o r c a o

%dt : % limite de trd2 para desprezar o m de torcao (tsd) / he : espessura do nucleo de torcao

B-nuc : largura do nucleo / h-nuc : altura do nucleo

Asw-1r : armadura de torcao calculada para 1 ramo de estribo / aswmnnr : armad.transv.minima-torcao p/nr estribos selecionado

Asl-b : armadura longitudinal de torcao no lado b / asl-h : armadura longitudinal de torcao no lado h

Comdia : valor da compressao diagonal (cisalhamento+torcao) / adpla : capacida/ adaptacao plastica no vao - s[sim] n[nao]

R e a c o e s d e a p o i o

Depev : distancia do eixo do pilar ao eixo efetivo de apoio -viga / morte : codigo se pilar morre / segue / vigas

M.i.mx : momento imposto maximo / m.i.mn : momento imposto minimo

16.7 Etapa de troca do aparelho de apoio

16.7.1 Ala 1

Viga= 101 ala 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [6 b 16.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 15 b 8.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 8.0 25.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 1

16.7.2 Ala 2

Viga= 102 ala 2 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 4

16.7.3 Ala 3

Viga= 103 ala 3 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 1

16.7.4 Ala 4

Viga= 104 ala 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 4

16.7.5 Bloco 1

Viga= 201 bloco 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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[-]= 59.37 tf* m | as = 22.58 -sras- [7 b 20.0mm]

Bal.esq | x/d =0.04 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 26.02 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.18 157.96 5 23.7 76.3 66.3 8.4 27.3 3.6 6.4 5.6 0.28 n

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 2 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 45.4 tf* m | m.[+] max= 15.1 tf* m - abcis.= 152 | m.[-] = 14.2 tf* m

[tf,cm]| as = 22.58 -sras- [7 b 20.0mm] | asl= 0.00 ------ | as = 20.41 -sras- [10 b 16.0mm]

| asl= 0.00 ------ x/d =0.04 | as = 20.41 -sras- [7 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 13.74 | | asapo[+]= 10.13

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.- 124. 63.13 608.45 1 45. 0.0 15.2 43.2 12.5 10.0 4 0.0 11.5

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm]   0.- 124. 34.91 157.96   5 23.7 76.3 66.3   7.9   27.3   3.6   6.1   5.3   0.32   n

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 3 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   2.2 tf* m - abcis.= 202 | m.[-] =   0.0 tf* m

[tf,cm]| as = 14.36 -sras-   [7 b 16.0mm] | asl=   0.00   ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 14.36   -sras- [7 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124.   8.05 608.45   1 45.   0.0   15.2   15.2 8.0 12.5 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   3.03 157.96   5 23.7 76.3 66.3   0.0   0.0   0.0   0.0   0.0   0.03   n

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 4 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   3.2 tf* m | m.[+] max=   0.0 tf* m - abcis.= 202 | m.[-] =   1.7 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 2.46 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 13.17 157.96 5 23.7 76.3 66.3 3.0 27.3 3.6 2.7 2.4 0.09 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 5 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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= 11.0 tf* m - abcis.= 0 | m.[-] = 8.7 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 5.71 | | asapo[+]= 3.59

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.- 124. 11.50 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 11.78 157.96 5 23.7 76.3 66.3 2.7 27.3 3.6 2.7 2.4 0.09 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 6 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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= 2.9 tf* m - abcis.= 202 | m.[-] = 0.0 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124.   8.51 608.45   1 45.   0.0   15.2   15.2 8.0 12.5 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   4.92 157.96   5 23.7 76.3 66.3   0.0   0.0   0.0   0.0   0.0   0.05   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 7 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   8.8 tf* m | m.[+] max=   26.5 tf* m - abcis.= 101 | m.[-] =   25.2 tf* m

[tf,cm]| as = 20.39 -sras-   [10 b 16.0mm] | asl=   0.00   ------ | as = 20.39 -sras- [10 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 20.39   -sras- [7 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 13.18 | | asapo[+]= 13.18

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.- 124. 58.94 608.45   1 45.   0.0   15.2   42.8 12.5 10.0 4   0.0 11.2

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 34.76 157.96   5 23.7 76.3 66.3   7.9   27.3   3.6   6.0   5.2   0.32   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 8 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   0.3 tf* m - abcis.= 202 | m.[-] =   0.0 tf* m

[tf,cm]| as = 14.36 -sras-   [7 b 16.0mm] | asl=   0.00   ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 14.36   -sras- [7 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124.   7.42 608.45   1 45.   0.0   15.2   15.2 8.0 12.5 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   4.50 157.96   5 23.7 76.3 66.3   0.0   0.0   0.0   0.0   0.0   0.04   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 9 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =    5.3 tf* m          | m.[+] max=    8.5 tf* m - abcis.= 202   | m.[-] =    0.0  tf* m

[tf,cm]| as =  17.10  -sras-  [ 9 b 16.0mm]   | asl=   0.00   ------            | as =  17.10  -sras- [ 9 b 16.0mm]

     | asl=   0.00  ------     x/d  =0.03   | as =  17.10   -sras-  [ 6 b 20.0mm ]    | asl=   0.00  ------    x/d  =0.03

     |                x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9     |                x/dmx=0.45

     |                   |                    |

[tf,cm]| m[-]min =  5292.0            | m[+]min =  5292.0             | m[-]min =  5292.0

[cm2  ]| asapo[+]=  3.59              |                     | asapo[+]=  5.03


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.- 124.   8.55 608.45   1  45.    0.0   15.2     27.3 10.0 10.0  4   0.0   0.0


T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m

[tf,cm]       0.- 124.  12.77 157.96   5 23.7  76.3  66.3    2.9    27.3    3.6   2.7   2.4   0.09   n


------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   ------------------------------

Vao=10  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   0.9 tf* m - abcis.=  0  | m.[-] =   6.9 tf* m

[tf,cm]| as =  17.10 -sras-  [ 9 b 16.0mm]  | asl=  0.00  ------           | as =  17.10 -sras- [ 9 b 16.0mm]

      | asl=  0.00 ------   x/d =0.03  | as =  17.10  -sras-  [ 6 b 20.0mm ]   | asl=  0.00 ------   x/d =0.03

      |              x/dmx=0.45  | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9   |              x/dmx=0.45

      |                       |                       |

[tf,cm]| m[-]min =  5292.0            | m[+]min =  5292.0              | m[-]min =  5292.0

[cm2  ]| asapo[+]=  3.59              |                       | asapo[+]=  3.59


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.- 124.   5.68 608.45   1  45.   0.0   15.2    27.3 10.0 10.0  4   0.0   0.0


T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m

[tf,cm]      0.- 124.  11.35 157.96   5 23.7  76.3  66.3    2.6    27.3    3.6   2.7   2.4   0.08   n
```

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=11 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 11.9 tf* m | m.[+] max= 6.5 tf* m - abcis.= 202 | m.[-] = 0.0 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 11.43 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 7.08 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.06 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=12 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =    5.8 tf* m         | m.[+] max=   30.1 tf* m - abcis.=  67   | m.[-] =   24.7  tf* m
[tf,cm]| as =  21.97  -sras-  [ 11 b 16.0mm]   | asl=   0.00  ------              | as =  21.97  -sras- [ 11 b 16.0mm]
      | asl=   0.00  ------     x/d  =0.03   | as =  21.97   -sras-  [  7 b 20.0mm ]    | asl=   0.00  ------    x/d  =0.03
      |                   x/dmx=0.45   | arm.lat.=[2 x  4 b 16.0mm] - ln=  2.9    |                  x/dmx=0.45
      |                          |                             |
[tf,cm]| m[-]min =  5292.0                | m[+]min =  5292.0                | m[-]min =  5292.0
[cm2  ]| asapo[+]= 15.73                  |                             | asapo[+]= 14.69
```

```
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.- 124.  59.79 608.45   1  45.    0.0   15.2     51.9 16.0 15.0  4   0.0  12.0
```

```
T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m
[tf,cm]        0.- 124.  43.87 157.96   5 23.7  76.3  66.3   10.0    27.3     3.6   7.6   6.6   0.38   n

-------------------------------  g  e  o  m  e  t  r  i  a      e      c  a  r  g  a  s   -------------------------------
Vao=13  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =      9.9 tf* m                 | m.[+] max=      0.0 tf* m - abcis.= 202    | m.[-] =      3.1  tf* m
[tf,cm]| as =  14.36  -sras-   [  7 b 16.0mm]    | asl=   0.00   ------                      | as =  14.36  -sras- [  7 b 16.0mm]
      | asl=   0.00  ------       x/d  =0.03    | as =  14.36   -sras-  [  7 b 16.0mm ]      | asl=   0.00  ------     x/d  =0.03
      |                        x/dmx=0.45    | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9      |                       x/dmx=0.45
      |                                  |                                 |
[tf,cm]| m[-]min =  5292.0                    | m[+]min =  5292.0                      | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.59                      |                                 | asapo[+]=  3.59
```

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.- 124. 5.23 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 2.71 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.03 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=14 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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= 21.4 tf* m - abcis.= 135 | m.[-] = 17.2 tf* m

[tf,cm]| as = 22.27 -sras- [11 b 16.0mm] | asl= 0.00 ------ | as = 22.27 -sras- [11 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 22.27 -sras- [7 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 13.05 | | asapo[+]= 13.67

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.- 124. 67.31 608.45 1 45. 0.0 15.2 52.6 16.0 15.0 4 0.0 11.1

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 45.60 157.96 5 23.7 76.3 66.3 10.4 27.3 3.6 7.9 6.9 0.40 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=15 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 5.4 tf* m | m.[+] max= 0.0 tf* m - abcis.= 202 | m.[-] = 2.8 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124.   2.43 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 11.67 157.96   5 23.7 76.3 66.3   2.7   27.3   3.6   2.7   2.4   0.08   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=16 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   10.5 tf* m - abcis.= 203 | m.[-] =   45.4 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 20.80 -sras- [10 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 4.46 | | asapo[+]= 5.38

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.- 124. 11.35 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   9.93 157.96   5 23.7 76.3 66.3   2.3   27.3   3.6   2.7   2.4   0.08   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=17b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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[-]=   45.36 tf* m | as = 20.80   -sras-   [10 b 16.0mm]

Bal.dir | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 17.87 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.16 157.96 5 23.7 76.3 66.3 8.4 27.3 3.6 6.4 5.6 0.26 n

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	59.402	59.401	0.79	0.00	1	e1-p	0.00	0.00	216	0	0	0	0	0
2	71.160	71.156	0.79	0.00	1	e1-o	0.00	0.00	215	0	0	0	0	0
3	-1.619	-1.619	0.79	0.00	1	e1-n	0.00	0.00	214	0	0	0	0	0
4	-6.953	-6.953	0.79	0.00	1	e1-m	0.00	0.00	213	0	0	0	0	0
5	19.702	19.702	0.79	0.00	1	e1-l	0.00	0.00	212	0	0	0	0	0
6	32.617	32.615	0.79	0.00	1	e1-k	0.00	0.00	211	0	0	0	0	0
7	66.066	66.062	0.79	0.00	1	e1-j	0.00	0.00	210	0	0	0	0	0
8	4.805	4.805	0.79	0.00	1	e1-i	0.00	0.00	209	0	0	0	0	0

9	-7.369	-7.369	0.79	0.00	1	e1-h	0.00	0.00	208	0	0	0	0	0
10	16.776	16.775	0.79	0.00	1	e1-g	0.00	0.00	207	0	0	0	0	0
11	53.375	53.373	0.79	0.00	1	e1-f	0.00	0.00	206	0	0	0	0	0
12	47.106	47.105	0.79	0.00	1	e1-e	0.00	0.00	205	0	0	0	0	0
13	24.360	24.360	0.79	0.00	1	e1-d	0.00	0.00	204	0	0	0	0	0
14	69.150	69.149	0.79	0.00	1	e1-c	0.00	0.00	203	0	0	0	0	0
15	10.447	10.447	0.79	0.00	1	e1-b	0.00	0.00	202	0	0	0	0	0
16	14.006	14.006	0.79	0.00	1	e1-a	0.00	0.00	201	0	0	0	0	0

16.7.6 Bloco 4

Viga= 204 bloco 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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[-]= 45.36 tf* m | as = 20.80 -sras- [10 b 16.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 17.88 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.16 157.96 5 23.7 76.3 66.3 8.4 27.3 3.6 6.4 5.6 0.26 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 2 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 45.4 tf* m | m.[+] max= 12.0 tf* m - abcis.= 0 | m.[-] = 9.8 tf* m

[tf,cm]| as = 20.80 -sras- [10 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 13.89 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 2.50 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.04 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 3 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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=   8.6 tf* m - abcis.=   0 | m.[-] =   13.5 tf* m

[tf,cm]| as = 14.36 -sras-   [7 b 16.0mm] | asl=   0.00   ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 14.36   -sras- [7 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 11.82 608.45   1 45.   0.0   15.2   15.2 8.0 12.5 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   0.64 157.96   5 23.7 76.3 66.3   0.0   0.0   0.0   0.0   0.0   0.02   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 4 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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= 18.5 tf* m - abcis.= 67 | m.[-] = 21.2 tf* m

[tf,cm]| as = 23.13 -sras- [12 b 16.0mm] | asl= 0.00 ------ | as = 23.13 -sras- [12 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 23.17 -sras- [5 b 25.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 13.75 | | asapo[+]= 12.98

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.- 124. 62.75 608.45 1 45. 0.0 15.2 57.2 16.0 12.5 4 0.0 11.3

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 50.54 157.96 5 23.7 76.3 66.3 11.5 27.3 3.6 8.8 7.6 0.42 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 5 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =   23.5 tf* m         | m.[+] max=   22.7 tf* m - abcis.= 101  | m.[-] =   19.7  tf* m
[tf,cm]| as =  20.38  -sras-  [ 10 b 16.0mm]  | asl=  0.00  ------           | as =  20.38  -sras- [ 10 b 16.0mm]
       | asl=  0.00  ------   x/d  =0.03  | as =  20.38  -sras-  [ 7 b 20.0mm ]  | asl=  0.00  ------  x/d  =0.03
       |                x/dmx=0.45   | arm.lat.=[2 x  4 b 16.0mm] - ln=  2.9   |             x/dmx=0.45
       |                       |                       |
[tf,cm]| m[-]min =  5292.0           | m[+]min =  5292.0              | m[-]min =  5292.0
[cm2  ]| asapo[+]= 12.15            |                       | asapo[+]= 12.15

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.- 124.  47.60 608.45   1  45.   0.0   15.2    42.3 12.5 10.0  4   0.0  10.8

T o r c a o-  xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla    m e n s a g e m
[tf,cm]      0.- 124.  34.70 157.96   5 23.7  76.3  66.3   7.9   27.3    3.6   6.0   5.2   0.30   n
```

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao= 6 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] = 18.2 tf* m | m.[+] max= 20.0 tf* m - abcis.= 135 | m.[-] = 19.3 tf* m

[tf,cm]| as = 22.19 -sras- [11 b 16.0mm] | asl= 0.00 ------ | as = 22.19 -sras- [11 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 22.19 -sras- [7 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 12.49 | | asapo[+]= 13.21

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.- 124. 64.42 608.45 1 45. 0.0 15.2 52.2 16.0 15.0 4 0.0 11.1

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm]   0.- 124. 45.17 157.96   5 23.7 76.3 66.3   10.3   27.3   3.6   7.8   6.8   0.39   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 7 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   12.3 tf* m | m.[+] max=   8.9 tf* m - abcis.= 202 | m.[-] =   0.0 tf* m

[tf,cm]| as = 14.36 -sras-   [7 b 16.0mm] | asl=   0.00   ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 14.36   -sras- [7 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 12.76 608.45   1 45.   0.0   15.2   15.2 8.0 12.5 4   0.0   0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 5.16 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.05 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 8 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 3.6 tf* m | m.[+] max= 0.0 tf* m - abcis.= 202 | m.[-] = 1.2 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 2.83 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 1.05 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.01 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 9 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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= 7.5 tf* m - abcis.= 0 | m.[-] = 10.7 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 10.59 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 4.57 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.05 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=10 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 16.4 tf* m | m.[+] max= 17.5 tf* m - abcis.= 50 | m.[-] = 18.3 tf* m

[tf,cm]| as = 22.71 -sras- [11 b 16.0mm] | asl= 0.00 ------ | as = 22.71 -sras- [11 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 22.75 -sras- [5 b 25.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 13.06 | | asapo[+]= 12.18

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.- 124. 67.62 608.45   1 45.   0.0   15.2   55.1 16.0 12.5 4   0.0 11.4

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 48.13 157.96   5 23.7 76.3 66.3   10.9   27.3   3.6   8.3   7.3   0.42   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=11 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   18.4 tf* m | m.[+] max=   18.2 tf* m - abcis.= 101 | m.[-] =   21.5 tf* m

[tf,cm]| as = 19.70 -sras-   [10 b 16.0mm] | asl=   0.00   ------ | as = 19.70 -sras- [10 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 19.74   -sras- [4 b 25.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 10 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 10.25 | | asapo[+]= 10.25

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.- 124. 43.13 608.45   1 45.   0.0   15.2   37.8 12.5 12.5 4   0.0   9.9

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 30.78 157.96   5 23.7 76.3 66.3   7.0   27.3   3.6   5.3   4.6   0.27   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=12 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   18.8 tf* m | m.[+] max=   19.9 tf* m - abcis.= 135 | m.[-] =   20.6 tf* m

[tf,cm]| as = 22.08 -sras-   [11 b 16.0mm] | asl=   0.00   ------ | as = 22.08 -sras- [11 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 22.08   -sras- [7 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 4 b 16.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 12.63 | | asapo[+]= 13.09

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.- 124. 60.72 608.45   1 45.   0.0   15.2   51.4 16.0 15.0 4   0.0 11.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 44.54 157.96   5 23.7 76.3 66.3   10.1   27.3   3.6   7.7   6.7   0.38   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=13 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] = 11.8 tf* m | m.[+] max= 6.5 tf* m - abcis.= 202 | m.[-] = 0.0 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 10.69 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 3.56 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.04 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=14 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =   10.3 tf* m        | m.[+] max=   0.5 tf* m - abcis.= 202   | m.[-] =   0.0 tf* m
[tf,cm]| as =  14.36 -sras-  [ 7 b 16.0mm]   | asl=  0.00  ------             | as =  14.36 -sras- [ 7 b 16.0mm]
       | asl=  0.00 ------    x/d =0.03   | as =  14.36  -sras-  [ 7 b 16.0mm ]    | asl=  0.00 ------   x/d =0.03
       |                 x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9    |                x/dmx=0.45
       |                          |                          |
[tf,cm]| m[-]min =  5292.0             | m[+]min =  5292.0              | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.59              |                          | asapo[+]=  3.59

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.- 124.   6.51 608.45  1  45.   0.0   15.2    15.2  8.0 12.5  4   0.0   0.0

T o r c a o-  xi   xf   tsd  trd2 %dt  he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m
[tf,cm]       0.- 124.   2.29 157.96  5 23.7  76.3  66.3   0.0   0.0    0.0  0.0   0.0  0.03  n
```

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=15 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 1.4 tf* m | m.[+] max= 0.0 tf* m - abcis.= 202 | m.[-] = 4.5 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 3.19 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

```
[tf,cm]      0.- 124.  12.42 157.96   5 23.7  76.3  66.3    2.8    27.3     3.6   2.7   2.4   0.08   n

------------------------------- g e o m e t r i a    e    c a r g a s  -------------------------------

Vao=16  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =     16.3 tf* m               | m.[+] max=     18.1 tf* m - abcis.=  50    | m.[-] =     45.4  tf* m

[tf,cm]| as =  21.83  -sras-   [ 11 b 16.0mm]    | asl=   0.00   ------                  | as =  22.59  -sras- [  7 b 20.0mm]

      | asl=   0.00  ------      x/d  =0.03    | as =  21.83   -sras-  [  7 b 20.0mm ]      | asl=   0.00  ------     x/d  =0.04

      |                     x/dmx=0.45    | arm.lat.=[2 x  4 b 16.0mm] - ln=  2.9      |                    x/dmx=0.45

      |                              |                              |

[tf,cm]| m[-]min =  5292.0                   | m[+]min =  5292.0                    | m[-]min =  5292.0

[cm2  ]| asapo[+]= 12.35                       |                                  | asapo[+]= 15.40

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.- 124.  73.91 608.45   1  45.    0.0   15.2     52.1 16.0 15.0  4   0.0  13.0
```

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 43.05 157.96   5 23.7 76.3 66.3   9.8   27.3   3.6   7.5   6.5   0.39   n

------------------------------ g e o m e t r i a   e   c a r g a s -------------------------------

Vao=17b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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[-]=   59.38 tf* m | as = 22.59   -sras-   [7 b 20.0mm]

Bal.dir | x/d =0.04 | asl=   0.00   -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0   - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 26.04 608.45   1 45.   0.0   15.2   39.0 12.5 12.5 4   0.0   5.2

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 46. 37.18 157.96   5 23.7 76.3 66.3   8.4   27.3   3.6   6.4   5.6   0.28   n

Reac. Apoio - no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilares:					
1	11.724	11.718	0.79	0.00	1	e4-p	0.00	0.00	304	0	0	0	0	0
2	2.632	2.615	0.79	0.00	1	e4-o	0.00	0.00	303	0	0	0	0	0
3	74.464	74.437	0.79	0.00	1	e4-n	0.00	0.00	302	0	0	0	0	0
4	77.634	77.632	0.79	0.00	1	e4-m	0.00	0.00	301	0	0	0	0	0
5	71.658	71.647	0.79	0.00	1	e4-l	0.00	0.00	300	0	0	0	0	0
6	77.177	77.157	0.79	0.00	1	e4-k	0.00	0.00	299	0	0	0	0	0
7	-6.421	-6.422	0.79	0.00	1	e4-j	0.00	0.00	298	0	0	0	0	0
8	-7.741	-7.742	0.79	0.00	1	e4-i	0.00	0.00	297	0	0	0	0	0
9	77.625	77.591	0.79	0.00	1	e4-h	0.00	0.00	296	0	0	0	0	0
10	69.613	69.587	0.79	0.00	1	e4-g	0.00	0.00	295	0	0	0	0	0
11	72.229	72.219	0.79	0.00	1	e4-f	0.00	0.00	294	0	0	0	0	0
12	70.711	70.678	0.79	0.00	1	e4-e	0.00	0.00	293	0	0	0	0	0
13	-1.008	-1.014	0.79	0.00	1	e4-d	0.00	0.00	292	0	0	0	0	0
14	-3.798	-3.802	0.79	0.00	1	e4-c	0.00	0.00	291	0	0	0	0	0
15	76.942	76.938	0.79	0.00	1	e4-b	0.00	0.00	290	0	0	0	0	0
16	60.522	60.521	0.79	0.00	1	e4-a	0.00	0.00	289	0	0	0	0	0

16.7.7 Travessa 1

Viga= 1 travessa 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 5.41 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.54 /flt.ex= 0.65 [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[-]= 781.78 tf* m | as = 103.23 -sras- [22 b 25.0mm]

Bal.esq | x/d =0.09 | asl= 0.00 -arm.lat.=[2 x 7 b 16.0mm]

[tf,cm] | m[-]min= 3416.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 529. 203.32 1665.24 1 45. 0.0 19.7 19.9 16.0 10.0 4 0.0 0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 529. 118.49 693.63   5 38.4 91.6 149.6   19.7   19.7   4.5 9.11 14.9   0.60   n

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao= 2b /l= 5.41 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.54 /flt.ex= 0.65   [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[-]=   770.60 tf* m | as = 101.7   -sras-   [21 b 25.0mm]

Bal.esq | x/d =0.09 | asl=   0.00   -arm.lat.=[2 x 6 b 16.0mm]

[tf,cm] | m[-]min= 3416.0   - x/dmx =0.45 | | % baric.armad.= 1

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.- 529. 197.90 1665.2 1 45.   0.00   19.7   19.74 16.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 529. 104.89 693.6   5 38.4 91.6 149.6   9.87   19.7   4.5 8.07 13.17   0.55   n

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	203.317	203.315	0.25	0.00	1	p1-i	0.00	0.00	9	0	0	0	0	0
2	197.902	197.893	0.25	0.00	1	p1-a	0.00	0.00	1	0	0	0	0	0

16.7.8 Travessa 2

Viga= 2 travessa 2 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 5.41 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.54 /flt.ex= 0.65 [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[-]= 822.41 tf* m | as = 108.81 -sras- [23 b 25.0mm]

Bal.esq | x/d =0.09 | asl= 0.00 -arm.lat.=[2 x 15 b 16.0mm]

[tf,cm] | m[-]min= 3416.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 529. 289.21 1665.24 1 45. 3.2 19.7 43.5 16.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 529. 239.75 693.63 5 38.4 91.6 149.6 20.1 19.7 4.5 18.4 30.1 1.09 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 2b /l= 5.41 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.54 /flt.ex= 0.65 [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[-]= 1007.97 tf* m | as = 134.58 -sras- [28 b 25.0mm]

Bal.esq | x/d =0.11 | asl= 0.00 -arm.lat.=[2 x 9 b 16.0mm]

[tf,cm] | m[-]min= 3416.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 529. 261.01 1665.24 1 45.   0.00   19.7   45.7 16.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 529. 112.29 693.63   5 38.4 91.6 149.6   11.4   19.7   4.5 10.5 17.1   0.64   n

Reac. Apoio - no.   Maximos   minimos   largura   depev morte   nome   m.i.mx m.i.mn   pilares:

1   289.211   289.209   0.25   0.00   1   p2-i   0.00   0.00   18   0   0   0   0   0

1   261.014   260.704   0.25   0.00   1   p2-a   0.00   0.00   10   0   0   0   0   0

16.7.9 Transversina 1

Viga= 101 transversina 1   eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 2.4 tf* m | m.[+] max= 1.5 tf* m - abcis.= 323 | m.[-] = 1.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 10.19 225.23 1 45. 0.0 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.5 tf* m | m.[+] max= 2.4 tf* m - abcis.= 282 | m.[-] = 1.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 11.00 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   2.0 tf* m | m.[+] max=   0.1 tf* m - abcis.= 242 | m.[-] =   5.6 tf* m

[tf,cm]| as =   5.22 -sras- [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332.   2.65 225.23   1 45.   0.0   4.6   4.6 8.0 20.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   5.4 tf* m | m.[+] max=   4.2 tf* m - abcis.= 282 | m.[-] =   3.1 tf* m

```
[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                     | as =   5.22  -sras- [  3 b 16.0mm]

       | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]      | asl=   0.00  ------     x/d  =0.03

       |                       x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                        x/dmx=0.45

       |                                |                                 |

[tf,cm]| m[-]min =  2371.6                     | m[+]min =  2371.6                      | m[-]min =  2371.6

[cm2  ]| asapo[+]=  1.30                       |                                   | asapo[+]=  1.30


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.- 332.   9.18 225.23   1  45.    0.0    4.6      4.6  8.0 20.0  2   0.0   0.0


-------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   -------------------------------

Vao= 5  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      3.5 tf* m                | m.[+] max=      0.9 tf* m - abcis.= 282    | m.[-] =      2.8  tf* m

[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                     | as =   5.22  -sras- [  3 b 16.0mm]
```

```
     | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]      | asl=   0.00  ------      x/d  =0.03
     |                      x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                       x/dmx=0.45
     |                             |                              |
[tf,cm]| m[-]min =  2371.6                    | m[+]min =  2371.6                      | m[-]min =  2371.6
[cm2  ]| asapo[+]=  1.30                      |                                 | asapo[+]=  1.30

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.- 332.   6.12 225.23   1  45.    0.0    4.6      4.6  8.0 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=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      2.8 tf* m                 | m.[+] max=      2.2 tf* m - abcis.= 282    | m.[-] =      0.2  tf* m
[tf,cm]| as =    5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                      | as =   5.22  -sras- [  3 b 16.0mm]
     | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]      | asl=   0.00  ------      x/d  =0.03
```

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | 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.- 332. 2.25 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	-10.177	-10.177	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	11.499	11.498	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	13.555	13.554	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	8.336	8.334	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	12.604	12.602	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	8.230	8.229	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	1.644	1.641	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.7.10 Transversina 2

Viga= 102 transversina 2 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 0.7 tf* m - abcis.= 40 | m.[-] = 37.9 tf* m

[tf,cm]| as = 0.00 -sras- [0 b 8.0mm] | asl= 0.00 ------ | as = 8.41 -sras- [3 b 20.0mm]

| asl= 0.00 ------ x/d =0.00 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.05

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.74 | | asapo[+]= 1.30

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.- 332. 10.91 225.23 1 45. 0.0 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 37.7 tf* m | m.[+] max= 5.5 tf* m - abcis.= 484 | m.[-] = 0.0 tf* m

[tf,cm]| as = 8.36 -sras- [3 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.05 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 19.84 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

```
------------------------------- g e o m e t r i a    e    c a r g a s  -------------------------------

Vao= 3  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      0.0 tf* m                | m.[+] max=      8.2 tf* m - abcis.=  80    | m.[-] =      7.8  tf* m

[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                    | as =   5.22  -sras- [  3 b 16.0mm]

      | asl=   0.00  ------      x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]     | asl=   0.00  ------     x/d  =0.03

      |                       x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                      x/dmx=0.45

      |                                  |                                     |

[tf,cm]| m[-]min =  2371.6                    | m[+]min =  2371.6                       | m[-]min =  2371.6

[cm2  ]| asapo[+]=  2.95                      |                                     | asapo[+]=  1.30

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.- 332.   8.01 225.23   1  45.    0.0    4.6      4.6  8.0 20.0  2   0.0   0.0
```

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   7.5 tf* m        | m.[+] max=  5.1 tf* m - abcis.= 242  | m.[-] =  1.2 tf* m
[tf,cm]| as =  5.22 -sras- [ 3 b 16.0mm]  | asl=  0.00  ------      | as =  5.22 -sras- [ 3 b 16.0mm]
       | asl=  0.00 ------  x/d =0.03   | as =  5.22  -sras- [ 3 b 16.0mm ]  | asl=  0.00 ------  x/d =0.03
       |              x/dmx=0.45  | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5  |              x/dmx=0.45
       |                          |                          |
[tf,cm]| m[-]min =  2371.6        | m[+]min =  2371.6        | m[-]min =  2371.6
[cm2 ]| asapo[+]=  1.30           |                          | 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.- 332.  33.17 225.23  1  45.   0.0   4.6    4.6  8.0 20.0  2   0.0   0.0
```

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.0 tf* m | m.[+] max= 0.1 tf* m - abcis.= 40 | m.[-] = 25.7 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.67 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.04

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 8.38 225.23 1 45. 0.0 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 25.6 tf* m | m.[+] max= 0.0 tf* m - abcis.= 484 | m.[-] = 3.5 tf* m

[tf,cm]| as = 5.63 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.04 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 18.05 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 6.719 6.716 1.52 0.00 2 longarin 0.00 0.00 0 0 0 0 0 0

2 16.420 16.396 1.52 0.00 2 longarin 0.00 0.00 0 0 0 0 0 0

3	-3.860	-3.884	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	5.553	5.539	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	-29.670	-29.694	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	24.650	24.588	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	-11.802	-11.805	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.7.11 Transversina 3

Viga= 103 transversina 3 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.9 tf* m | m.[+] max= 0.0 tf* m - abcis.= 484 | m.[-] = 23.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 26.27 225.23   1 45.   0.0   4.6   4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   23.3 tf* m | m.[+] max=   4.0 tf* m - abcis.= 444 | m.[-] =   0.0 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 3.23

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.- 332. 10.98 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.2 tf* m | m.[+] max= 2.3 tf* m - abcis.= 0 | m.[-] = 8.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

```
      |                         |                          |
[tf,cm]| m[-]min =  2371.6            | m[+]min =  2371.6              | m[-]min =  2371.6
[cm2  ]| asapo[+]=  1.74              |                          | asapo[+]=  1.30

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.- 332.  20.02 225.23   1  45.    0.0    4.6      4.6  8.0 20.0  2   0.0   0.0

------------------------------  g e o m e t r i a     e     c a r g a s   ------------------------------
Vao= 4  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      8.4 tf* m               | m.[+] max=      8.7 tf* m - abcis.= 323    | m.[-] =      0.0  tf* m
[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                    | as =   5.22  -sras- [  3 b 16.0mm]
      | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]     | asl=   0.00  ------     x/d  =0.03
      |                      x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                      x/dmx=0.45
      |                         |                          |
```

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 2.68

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.- 332. 8.30 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 1.7 tf* m - abcis.= 0 | m.[-] = 35.3 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 7.82 -sras- [4 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.05

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 15.24 225.23 1 45. 0.0 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 35.6 tf* m | m.[+] max= 0.4 tf* m - abcis.= 444 | m.[-] = 0.0 tf* m

[tf,cm]| as = 7.89 -sras- [4 b 16.0mm] | asl= 0.00 ------ | as = 0.00 -sras- [0 b 8.0mm]

| asl= 0.00 ------ x/d =0.05 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.00

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 31.11 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	-26.221	-26.236	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	16.482	16.480	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	3.969	3.967	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	26.364	26.351	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	2.584	2.564	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	-15.857	-15.873	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	2.174	2.173	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.7.12 Transversina 4

Viga= 104 transversina 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 0.7 tf* m - abcis.= 0 | m.[-] = 68.8 tf* m

[tf,cm]| as = 0.00 -sras- [0 b 8.0mm] | asl= 0.00 ------ | as = 15.54 -sras- [5 b 20.0mm]

| asl= 0.00 ------ x/d =0.00 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.10

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 45.85 225.23 1 45. 2.4 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 68.3 tf* m | m.[+] max= 8.9 tf* m - abcis.= 484 | m.[-] = 0.0 tf* m

[tf,cm]| as = 15.42 -sras- [5 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.10 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.95

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.- 332. 38.59 225.23 1 45. 0.6 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    0.0 tf* m         | m.[+] max=   12.1 tf* m - abcis.= 121   | m.[-] =   18.0 tf* m

[tf,cm]| as =  5.22 -sras- [ 3 b 16.0mm]  | asl=  0.00  ------             | as =  5.22 -sras- [ 3 b 16.0mm]

       | asl=  0.00 ------    x/d =0.03   | as =  5.22  -sras- [ 3 b 16.0mm ]   | asl=  0.00 ------   x/d =0.03

       |                 x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5    |              x/dmx=0.45

       |                        |                        |

[tf,cm]| m[-]min =  2371.6             | m[+]min =  2371.6              | m[-]min =  2371.6

[cm2  ]| asapo[+]=  3.95               |                        | asapo[+]=  1.30


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.- 332.  13.68 225.23  1  45.   0.0   4.6    4.6  8.0 20.0  2   0.0   0.0


------------------------------  g e o m e t r i a   e   c a r g a s  ------------------------------

Vao= 4  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 17.5 tf* m | m.[+] max= 9.2 tf* m - abcis.= 282 | m.[-] = 6.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | 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.- 332. 55.39 225.23 1 45. 4.7 4.6 4.7 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 6.0 tf* m | m.[+] max= 0.0 tf* m - abcis.= 484 | m.[-] = 37.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 8.41 -sras- [3 b 20.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.05

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 17.08 225.23 1 45. 0.0 4.6 4.6 8.0 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= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 37.7 tf* m | m.[+] max= 0.0 tf* m - abcis.= 484 | m.[-] = 7.8 tf* m

[tf,cm]| as = 8.36 -sras- [3 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.05 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 23.10 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	1.587	1.584	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	-17.052	-17.088	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	-32.293	-32.326	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	67.926	67.910	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	25.626	25.624	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	33.984	33.965	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

7 -22.721 -22.741 1.52 0.00 2 longarin 0.00 0.00 0 0 0 0 0 0

16.7.13 Transversina 5

Viga= 105 transversina 5 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 2.4 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 53.4 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 11.95 -sras- [6 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.07

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 46.48 225.23 1 45. 2.5 4.6 4.6 8.0 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= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 53.7 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 44.6 tf* m

[tf,cm]| as = 12.04 -sras- [6 b 16.0mm] | asl= 0.00 ------ | as = 9.92 -sras- [5 b 16.0mm]

| asl= 0.00 ------ x/d =0.08 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.06

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 7.95 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 44.6 tf* m | m.[+] max= 13.6 tf* m - abcis.= 242 | m.[-] = 0.0 tf* m

[tf,cm]| as = 9.93 -sras- [5 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.06 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 2.98

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.- 90. 28.27 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 4 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 12.7 tf* m - abcis.= 0 | m.[-] = 18.7 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.77 | | 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.- 90. 30.36 225.23   1 45.   0.0   4.6   4.6 8.0 20.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 5 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   18.9 tf* m | m.[+] max=   11.1 tf* m - abcis.= 242 | m.[-] =   0.0 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.41 | | asapo[+]= 2.43

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.- 90. 15.93 225.23   1 45.   0.0   4.6   4.6 8.0 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= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 10.4 tf* m - abcis.= 0 | m.[-] = 12.8 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.28 | | asapo[+]= 1.50

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.- 90. 30.36 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 7 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 13.2 tf* m | m.[+] max= 7.8 tf* m - abcis.= 242 | m.[-] = 0.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.70

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.- 90. 12.85 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 8 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 7.0 tf* m - abcis.= 0 | m.[-] = 9.3 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.53 | | asapo[+]= 1.30

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.- 90. 17.02 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 9 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    9.7 tf* m          | m.[+] max=   12.2 tf* m - abcis.= 242   | m.[-] =    0.0  tf* m
[tf,cm]| as =  5.22  -sras-  [ 3 b 16.0mm]   | asl=  0.00  ------            | as =  5.22  -sras- [ 3 b 16.0mm]
       | asl=  0.00  ------    x/d  =0.03   | as =  5.22  -sras-  [ 3 b 16.0mm ]   | asl=  0.00  ------   x/d  =0.03
       |                x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5    |                x/dmx=0.45
       |                       |                         |
[tf,cm]| m[-]min =  2371.6             | m[+]min =  2371.6               | m[-]min =  2371.6
[cm2  ]| asapo[+]=  2.11               |                         | asapo[+]=  2.67

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.-  90.  13.49 225.23   1  45.    0.0    4.6      4.6  8.0 20.0  2   0.0   0.0
```

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao=10 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 11.6 tf* m - abcis.= 0 | m.[-] = 76.1 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 17.28 -sras- [6 b 20.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.11

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.54 | | asapo[+]= 1.30

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.- 90. 46.58 225.23 1 45. 2.6 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=11 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =     76.5 tf* m              | m.[+] max=     4.2 tf* m - abcis.= 242   | m.[-] =      0.0  tf* m

[tf,cm]| as =  17.38  -sras-  [  6 b 20.0mm]   | asl=   0.00   ------                   | as =   5.22  -sras- [  3 b 16.0mm]

      | asl=   0.00  ------      x/d  =0.11   | as =   5.22   -sras-  [  3 b 16.0mm ]     | asl=   0.00  ------    x/d  =0.03

      |                     x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                    x/dmx=0.45

      |                               |                               |

[tf,cm]| m[-]min =  2371.6                  | m[+]min =  2371.6                   | m[-]min =  2371.6

[cm2  ]| asapo[+]=  1.30                    |                                 | asapo[+]=  1.30


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.-  90.  38.63 225.23   1  45.    0.6    4.6      4.6  8.0 20.0  2   0.0   0.0


------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   ------------------------------

Vao=12  /l=  2.42 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      0.0 tf* m            | m.[+] max=     4.3 tf* m - abcis.=  40   | m.[-] =      1.5  tf* m
[tf,cm]| as =   5.22  -sras-  [  3 b 16.0mm]   | asl=   0.00   ------                 | as =   5.22  -sras- [  3 b 16.0mm]
       | asl=   0.00  ------      x/d  =0.03   | as =   5.22   -sras-  [  3 b 16.0mm ]    | asl=   0.00  ------     x/d  =0.03
       |                     x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                     x/dmx=0.45
       |                                   |                                 |
[tf,cm]| m[-]min =  2371.6                 | m[+]min =  2371.6                | m[-]min =  2371.6
[cm2  ]| asapo[+]=  2.11                   |                                 | 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.-  90.   5.72 225.23   1  45.    0.0    4.6      4.6  8.0 20.0  2   0.0   0.0

Reac. Apoio - no.   Maximos   minimos   largura    depev  morte    nome     m.i.mx m.i.mn         pilares:
             1   -46.399   -46.419     1.52     0.00     2   longarin   0.00   0.00     0     0     0     0     0     0
             2    35.703    35.638     1.52     0.00     2   longarin   0.00   0.00     0     0     0     0     0     0
             3    19.931    19.893     1.52     0.00     2   longarin   0.00   0.00     0     0     0     0     0     0
             4   -25.684   -25.695     1.52     0.00     2   longarin   0.00   0.00     0     0     0     0     0     0
             5    43.000    42.933     1.52     0.00     2   longarin   0.00   0.00     0     0     0     0     0     0
```

6	-36.316	-36.360	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	11.041	10.989	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
8	2.219	2.117	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
9	19.779	19.556	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
10	-26.128	-26.499	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
11	69.021	68.560	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
12	-18.521	-18.811	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
13	-5.242	-5.319	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.7.14 Transversina 6

Viga= 106 transversina 6 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.8 tf* m | m.[+] max= 2.4 tf* m - abcis.= 242 | m.[-] = 0.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 11.33 225.23 1 45. 0.0 4.6 4.6 8.0 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= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 2.4 tf* m - abcis.= 0 | m.[-] = 1.8 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 4.87 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.8 tf* m | m.[+] max= 0.6 tf* m - abcis.= 181 | m.[-] = 0.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 2.33

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.- 90. 9.98 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 4 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 0.5 tf* m - abcis.= 101 | m.[-] = 1.3 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.74 | | asapo[+]= 1.30

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.- 90.   2.42 225.23   1 45.   0.0   4.6   4.6 8.0 20.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 5 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   1.4 tf* m | m.[+] max=   0.9 tf* m - abcis.= 202 | m.[-] =   0.0 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90.   1.93 225.23   1 45.   0.0   4.6   4.6 8.0 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= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   0.0 tf* m | m.[+] max=   0.6 tf* m - abcis.=   0 | m.[-] =   1.8 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 2.46 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 7 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.8 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 1.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 1.78 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 8 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.0 tf* m | m.[+] max= 1.6 tf* m - abcis.= 202 | m.[-] = 0.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 1.70 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 9 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 1.5 tf* m - abcis.= 0 | m.[-] = 2.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 2.01 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=10 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.9 tf* m | m.[+] max= 2.2 tf* m - abcis.= 242 | m.[-] = 0.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 5.73 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=11 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.0 tf* m | m.[+] max= 2.6 tf* m - abcis.= 20 | m.[-] = 1.7 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 2.87 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=12 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.6 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 4.1 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 15.02 225.23 1 45. 0.0 4.6 4.6 8.0 20.0 2 0.0 0.0

Reac. Apoio - no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilares:					
1	-11.289	-11.312	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	-0.801	-0.840	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	6.852	6.820	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	10.431	10.431	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	4.352	4.333	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	-1.324	-1.346	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	4.235	4.228	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
8	1.740	1.707	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
9	-0.928	-0.985	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
10	7.743	7.698	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
11	1.716	1.690	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
12	5.234	5.230	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
13	-15.017	-15.018	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8 Etapa de utilização

16.8.1 Ala 1

Viga= 101 ala 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 1

16.8.2 Ala 2

Viga= 102 ala 2 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 4

16.8.3 Ala 3

Viga= 103 ala 3 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 1

16.8.4 Ala 4

Viga= 104 ala 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 6.11 /b= 0.25 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 1.48 /flt.ex= 0.12 [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[-]= 121.83 tf* m | as = 11.39 -sras- [4 b 20.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 34 b 16.0mm]

[tf,cm] | m[-]min=14214.1 - x/dmx =0.45 | | % baric.armad.= 0

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.- 598. 16.79 516.83 1 45. 0.0 3.8 3.8 10.0 16.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 16.793 16.793 0.25 0.00 2 bloco 4

16.8.5 Bloco 1

Viga= 201 bloco 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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[-]= 79.54 tf* m | as = 28.19 -sras- [9 b 20.0mm]

Bal.esq | x/d =0.05 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 56.40 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.22 157.96 5 23.7 76.3 66.3 8.5 27.3 3.6 6.5 5.6 0.33 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 2 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 69.5 tf* m | m.[+] max= 39.7 tf* m - abcis.= 84 | m.[-] = 29.0 tf* m

[tf,cm]| as = 28.19 -sras- [9 b 20.0mm] | asl= 0.00 ------ | as = 17.99 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.05 | as = 17.99 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 31.36 | | asapo[+]= 14.38

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.- 124. 120.56 608.45 1 45. 6.9 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm]   0.- 124. 20.91 157.96   5 23.7 76.3 66.3   4.8   27.3   3.6   3.6   3.2   0.33   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 3 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   22.5 tf* m | m.[+] max=   0.3 tf* m - abcis.= 135 | m.[-] =   14.6 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 13.81 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   8.22 157.96   5 23.7 76.3 66.3   1.9   27.3   3.6   2.7   2.4   0.07   n

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao= 4 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   22.8 tf* m | m.[+] max=   48.2 tf* m - abcis.= 202 | m.[-] =   0.0 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 8.75 | | asapo[+]= 15.82

```
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.- 124.  37.34 608.45   1  45.    0.0   15.2     27.3 10.0 10.0  4   0.0   0.0


T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m

[tf,cm]        0.- 124.   8.16 157.96   5 23.7  76.3  66.3    1.9    27.3    3.6   2.7   2.4   0.11   n


-------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   -------------------------------

Vao= 5  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=      7.0 tf* m - abcis.=   0    | m.[-] =     22.4  tf* m

[tf,cm]| as =  14.36  -sras-   [  7 b 16.0mm]    | asl=   0.00   ------                     | as =  14.36  -sras- [  7 b 16.0mm]

       | asl=   0.00  ------       x/d  =0.03    | as =  14.36   -sras-  [  7 b 16.0mm ]      | asl=   0.00  ------     x/d  =0.03

       |                        x/dmx=0.45    | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9      |                       x/dmx=0.45

       |                                |                                |

[tf,cm]| m[-]min =  5292.0                    | m[+]min =  5292.0                     | m[-]min =  5292.0
```

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 16.41 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 6.88 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.07 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 6 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 23.5 tf* m | m.[+] max= 5.8 tf* m - abcis.= 202 | m.[-] = 9.6 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 4.30

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.- 124. 22.99 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 10.11 157.96   5 23.7 76.3 66.3   2.3   27.3   3.6   2.7   2.4   0.10   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 7 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   28.0 tf* m | m.[+] max=   44.5 tf* m - abcis.= 50 | m.[-] =   26.7 tf* m

[tf,cm]| as = 17.13 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.13 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.13   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 37.35 | | asapo[+]= 11.53

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.- 124. 147.31 608.45   1 45.   14.9   15.2   29.4 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 15.97 157.96   5 23.7 76.3 66.3   3.6   27.3   3.6   2.8   2.4   0.34   n

------------------------------- g e o m e t r i a   e   c a r g a s   -------------------------------

Vao= 8 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =     22.8 tf* m             | m.[+] max=     0.3 tf* m - abcis.=  84    | m.[-] =     19.0  tf* m
[tf,cm]| as =  17.10  -sras-   [  9 b 16.0mm]    | asl=   0.00   ------                  | as =  17.10  -sras- [  9 b 16.0mm]
     | asl=   0.00  ------      x/d  =0.03    | as =  17.10   -sras-  [  6 b 20.0mm ]     | asl=   0.00  ------     x/d  =0.03
     |                    x/dmx=0.45    | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9      |                      x/dmx=0.45
     |                          |                          |
[tf,cm]| m[-]min =  5292.0                | m[+]min =  5292.0                  | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.59                  |                              | asapo[+]=  3.59

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.- 124.  20.52 608.45   1  45.    0.0    15.2     27.3 10.0 10.0  4   0.0   0.0

T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m
[tf,cm]        0.- 124.  11.33 157.96   5 23.7  76.3  66.3    2.6    27.3    3.6   2.7   2.4   0.11   n

------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   ------------------------------
Vao= 9  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =    34.4 tf* m           | m.[+] max=    66.2 tf* m - abcis.= 118   | m.[-] =    38.4  tf* m

[tf,cm]| as =  17.10  -sras-  [ 9 b 16.0mm]   | asl=   0.00   ------                 | as =  17.10  -sras- [ 9 b 16.0mm]

      | asl=   0.00  ------      x/d  =0.03   | as =  20.76   -sras-  [ 7 b 20.0mm ]    | asl=   0.00  ------    x/d  =0.03

      |                   x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  3.6     |                   x/dmx=0.45

      |                               |                               |

[tf,cm]| m[-]min =  5292.0                  | m[+]min =  5292.0                   | m[-]min =  5292.0

[cm2  ]| asapo[+]= 20.79                    |                                  | asapo[+]= 20.79


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.- 124. 115.11 608.45   1  45.    5.3   15.2     27.3 10.0 10.0  4   0.0   0.0


T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m

[tf,cm]       0.- 124.  15.07 157.96   5 23.7  76.3  66.3    3.4    27.3     3.6   2.7   2.4   0.28   n


------------------------------  g e o m e t r i a     e     c a r g a s   ------------------------------

Vao=10  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =    16.6 tf* m           | m.[+] max=    0.0 tf* m - abcis.= 202   | m.[-] =    24.3  tf* m
[tf,cm]| as =  17.10  -sras-  [ 9 b 16.0mm]   | asl=  0.00  ------               | as =  17.10  -sras- [  9 b 16.0mm]
       | asl=  0.00  ------     x/d  =0.03   | as =  17.10  -sras-  [  6 b 20.0mm ]    | asl=  0.00  ------    x/d  =0.03
       |                    x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9     |                  x/dmx=0.45
       |                        |                          |
[tf,cm]| m[-]min =  5292.0                | m[+]min =  5292.0                | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.59                 |                           | asapo[+]=  3.59

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.- 124.  16.09 608.45   1  45.    0.0   15.2     27.3 10.0 10.0  4   0.0   0.0

T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m
[tf,cm]        0.- 124.  14.01 157.96   5 23.7  76.3  66.3    3.2    27.3     3.6   2.7   2.4   0.12   n
```

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=11 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =   26.6 tf* m      | m.[+] max=   30.2 tf* m - abcis.= 202   | m.[-] =    0.0  tf* m
[tf,cm]| as =  17.10  -sras-  [ 9 b 16.0mm]   | asl=  0.00  ------        | as =  17.10  -sras- [ 9 b 16.0mm]
       | asl=  0.00  ------    x/d  =0.03   | as =  17.10  -sras-  [ 6 b 20.0mm ]   | asl=  0.00  ------   x/d  =0.03
       |                 x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9    |               x/dmx=0.45
       |                    |                    |
[tf,cm]| m[-]min =  5292.0           | m[+]min =  5292.0            | m[-]min =  5292.0
[cm2  ]| asapo[+]=  6.51              |                    | asapo[+]= 10.89

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.- 124.  37.37 608.45   1  45.    0.0    15.2     27.3 10.0 10.0  4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m
```

```
[tf,cm]       0.- 124.  11.32 157.96   5 23.7  76.3  66.3    2.6    27.3     3.6   2.7   2.4   0.13   n


------------------------------  g e o m e t r i a     e     c a r g a s   ------------------------------

Vao=12  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=     24.7 tf* m - abcis.=   0    | m.[-] =     24.8  tf* m

[tf,cm]| as =  17.10  -sras-   [  9 b 16.0mm]    | asl=   0.00   ------                       | as =  17.10  -sras- [  9 b 16.0mm]

      | asl=   0.00  ------       x/d  =0.03    | as =  17.10   -sras-  [  6 b 20.0mm ]      | asl=   0.00  ------     x/d  =0.03

      |                       x/dmx=0.45    | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9      |                      x/dmx=0.45

      |                                  |                                    |

[tf,cm]| m[-]min =  5292.0                      | m[+]min =  5292.0                       | m[-]min =  5292.0

[cm2  ]| asapo[+]=  9.39                         |                                    | asapo[+]=  5.36


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.- 124.  31.00 608.45   1  45.    0.0   15.2     27.3 10.0 10.0  4   0.0   0.0
```

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 11.21 157.96   5 23.7 76.3 66.3   2.5   27.3   3.6   2.7   2.4   0.12   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=13 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   24.1 tf* m | m.[+] max=   0.0 tf* m - abcis.= 202 | m.[-] =   12.9 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 17.72 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 11.75 157.96 5 23.7 76.3 66.3 2.7 27.3 3.6 2.7 2.4 0.10 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=14 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 33.3 tf* m | m.[+] max= 49.9 tf* m - abcis.= 84 | m.[-] = 25.8 tf* m

[tf,cm]| as = 17.40 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.40 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.40 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 16.60 | | asapo[+]= 16.60

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.- 124. 105.46 608.45 1 45. 2.4 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 17.53 157.96 5 23.7 76.3 66.3 4.0 27.3 3.6 3.0 2.6 0.28 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=15 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 18.1 tf* m | m.[+] max= 0.0 tf* m - abcis.= 202 | m.[-] = 23.7 tf* m

[tf,cm]| as = 17.77 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.77 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.77 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 14.81 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 19.65 157.96   5 23.7 76.3 66.3   4.5   27.3   3.6   3.4   3.0   0.15   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=16 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   73.0 tf* m - abcis.= 152 | m.[-] =   45.4 tf* m

[tf,cm]| as = 17.46 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 20.80 -sras- [10 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 23.06   -sras- [5 b 25.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 4.0 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 18.19 | | asapo[+]= 41.06

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.- 124. 128.34 608.45   1 45.   9.3   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 17.87 157.96   5 23.7 76.3 66.3   4.1   27.3   3.6   3.1   2.7   0.32   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=17b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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[-]=   45.36 tf* m | as = 20.80   -sras-   [10 b 16.0mm]

Bal.dir | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 18.81 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.16 157.96 5 23.7 76.3 66.3 8.4 27.3 3.6 6.4 5.6 0.27 n

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	149.929	114.103	0.79	0.00	1	e1-p	0.00	0.00	216	0	0	0	0	0
2	71.158	28.804	0.79	0.00	1	e1-o	0.00	0.00	215	0	0	0	0	0
3	42.451	19.969	0.79	0.00	1	e1-n	0.00	0.00	214	0	0	0	0	0
4	-6.924	-45.612	0.79	0.00	0	e1-m	0.00	0.00	213	0	0	0	0	0
5	39.038	3.219	0.79	0.00	1	e1-l	0.00	0.00	212	0	0	0	0	0
6	157.060	78.396	0.79	0.00	1	e1-k	0.00	0.00	211	0	0	0	0	0
7	60.387	28.803	0.79	0.00	1	e1-j	0.00	0.00	210	0	0	0	0	0
8	91.136	62.096	0.79	0.00	1	e1-i	0.00	0.00	209	0	0	0	0	0

9	128.941	75.836	0.79	0.00	1	e1-h	0.00	0.00	208	0	0	0	0	0
10	53.457	13.722	0.79	0.00	1	e1-g	0.00	0.00	207	0	0	0	0	0
11	11.906	-38.792	0.79	0.00	0	e1-f	0.00	0.00	206	0	0	0	0	0
12	48.486	14.515	0.79	0.00	1	e1-e	0.00	0.00	205	0	0	0	0	0
13	117.513	69.463	0.79	0.00	1	e1-d	0.00	0.00	204	0	0	0	0	0
14	70.537	48.222	0.79	0.00	1	e1-c	0.00	0.00	203	0	0	0	0	0
15	81.276	46.581	0.79	0.00	1	e1-b	0.00	0.00	202	0	0	0	0	0
16	147.155	82.847	0.79	0.00	1	e1-a	0.00	0.00	201	0	0	0	0	0

16.8.6 Bloco 4

Viga= 204 bloco 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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[-]= 45.36 tf* m | as = 20.81 -sras- [10 b 16.0mm]

Bal.esq | x/d =0.03 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 18.81 608.45 1 45. 0.0 15.2 39.0 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.16 157.96 5 23.7 76.3 66.3 8.4 27.3 3.6 6.4 5.6 0.27 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 2 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 45.4 tf* m | m.[+] max= 78.3 tf* m - abcis.= 50 | m.[-] = 39.2 tf* m

[tf,cm]| as = 20.81 -sras- [10 b 16.0mm] | asl= 0.00 ------ | as = 17.68 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 24.79   -sras- [5 b 25.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 4.3 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 40.43 | | asapo[+]= 20.21

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.- 124. 126.96 608.45   1 45.   8.8   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 19.16 157.96   5 23.7 76.3 66.3   4.4   27.3   3.6   3.3   2.9   0.33   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 3 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] = 25.9 tf* m | m.[+] max= 33.4 tf* m - abcis.= 84 | m.[-] = 44.2 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 11.79 | | asapo[+]= 11.79

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.- 124. 71.18 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 15.46 157.96 5 23.7 76.3 66.3 3.5 27.3 3.6 2.7 2.4 0.21 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 4 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 37.2 tf* m | m.[+] max= 26.9 tf* m - abcis.= 118 | m.[-] = 44.8 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 10.01 | | asapo[+]= 10.01

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.- 124. 87.37 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 13.78 157.96 5 23.7 76.3 66.3 3.1 27.3 3.6 2.7 2.4 0.23 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =    40.6 tf* m        | m.[+] max=    16.9 tf* m - abcis.= 202   | m.[-] =     0.0  tf* m

[tf,cm]| as =  17.10  -sras-  [  9 b 16.0mm]   | asl=   0.00   ------          | as =  17.10  -sras- [  9 b 16.0mm]

       | asl=   0.00  ------    x/d  =0.03   | as =  17.10   -sras-  [  6 b 20.0mm ]    | asl=   0.00  ------    x/d  =0.03

       |              x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9     |              x/dmx=0.45

       |                    |                    |

[tf,cm]| m[-]min =  5292.0          | m[+]min =  5292.0          | m[-]min =  5292.0

[cm2  ]| asapo[+]=  4.19            |                    | asapo[+]=  7.29

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.- 124.  35.99 608.45   1  45.    0.0   15.2     27.3 10.0 10.0  4   0.0   0.0

T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m

[tf,cm]      0.- 124.  13.05 157.96   5 23.7  76.3  66.3    3.0    27.3     3.6   2.7   2.4   0.14   n
```

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 6 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] =    19.4 tf* m            | m.[+] max=    2.2 tf* m - abcis.= 202   | m.[-] =     1.1  tf* m
[tf,cm]| as =  17.10  -sras-  [ 9 b 16.0mm]   | asl=   0.00   ------            | as =  17.10  -sras- [ 9 b 16.0mm]
       | asl=   0.00  ------    x/d  =0.03   | as =  17.10  -sras-  [ 6 b 20.0mm ]   | asl=   0.00  ------   x/d  =0.03
       |                   x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9   |                  x/dmx=0.45
       |                              |                              |
[tf,cm]| m[-]min =  5292.0               | m[+]min =  5292.0                 | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.59                 |                               | asapo[+]=  4.79

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.- 124.  17.06 608.45   1  45.    0.0    15.2     27.3 10.0 10.0  4   0.0   0.0

T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m
```

[tf,cm]   0.- 124. 10.15 157.96   5 23.7 76.3 66.3   2.3   27.3   3.6   2.7   2.4   0.09   n

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao= 7 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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=   5.4 tf* m - abcis.=   0 | m.[-] =   17.8 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 4.79 | | asapo[+]= 3.59

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.- 124. 21.83 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124.   9.06 157.96   5 23.7 76.3 66.3   2.1   27.3   3.6   2.7   2.4   0.09   n

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 8 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   22.9 tf* m | m.[+] max=   23.8 tf* m - abcis.= 50 | m.[-] =   30.6 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 9.16 | | asapo[+]= 6.97

```
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.- 124. 107.15 608.45   1  45.    2.9   15.2     27.3 10.0 10.0  4   0.0   0.0


T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m

[tf,cm]       0.- 124.  11.62 157.96   5 23.7  76.3  66.3    2.6    27.3     3.6   2.7   2.4   0.25   n


------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   ------------------------------

Vao= 9  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =     34.6 tf* m                | m.[+] max=     39.7 tf* m - abcis.=  84    | m.[-] =     33.9  tf* m

[tf,cm]| as =  17.10  -sras-   [  9 b 16.0mm]    | asl=   0.00   ------                    | as =  17.10  -sras- [  9 b 16.0mm]

      | asl=   0.00  ------       x/d  =0.03    | as =  17.10   -sras-  [  6 b 20.0mm ]      | asl=   0.00  ------      x/d  =0.03

      |                       x/dmx=0.45    | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9      |                      x/dmx=0.45

      |                                  |                                |

[tf,cm]| m[-]min =  5292.0                   | m[+]min =  5292.0                    | m[-]min =  5292.0
```

[cm2]| asapo[+]= 13.51 | | asapo[+]= 13.51

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.- 124. 90.45 608.45 1 45. 0.0 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 14.34 157.96 5 23.7 76.3 66.3 3.3 27.3 3.6 2.7 2.4 0.24 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=10 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 30.6 tf* m | m.[+] max= 31.2 tf* m - abcis.= 118 | m.[-] = 29.4 tf* m

[tf,cm]| as = 17.10 -sras- [9 b 16.0mm] | asl= 0.00 ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 11.17 | | asapo[+]= 11.17

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.- 124. 76.81 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 13.71 157.96   5 23.7 76.3 66.3   3.1   27.3   3.6   2.7   2.4   0.21   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=11 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   24.0 tf* m | m.[+] max=   19.8 tf* m - abcis.= 152 | m.[-] =   25.2 tf* m

[tf,cm]| as = 17.10 -sras-   [9 b 16.0mm] | asl=   0.00   ------ | as = 17.10 -sras- [9 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as = 17.10   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 6.29 | | asapo[+]= 8.09

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.- 124. 113.20 608.45   1 45.   4.7   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 124. 12.15 157.96   5 23.7 76.3 66.3   2.8   27.3   3.6   2.7   2.4   0.26   n

------------------------------- g e o m e t r i a   e   c a r g a s   -------------------------------

Vao=12 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] = 17.9 tf* m | m.[+] max= 2.8 tf* m - abcis.= 202 | m.[-] = 10.5 tf* m

[tf,cm]| as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ | as = 14.36 -sras- [7 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 14.36 -sras- [7 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 3.59 | | asapo[+]= 3.59

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.- 124. 9.61 608.45 1 45. 0.0 15.2 15.2 8.0 12.5 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 3.40 157.96 5 23.7 76.3 66.3 0.0 0.0 0.0 0.0 0.0 0.04 n

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=13 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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=   5.7 tf* m - abcis.=  0   | m.[-] =   49.7  tf* m

[tf,cm]| as =  14.36  -sras-  [ 7 b 16.0mm]   | asl=   0.00   ------              | as =  14.36  -sras- [ 7 b 16.0mm]

       | asl=   0.00  ------      x/d  =0.03   | as =  14.36   -sras-  [ 7 b 16.0mm ]    | asl=   0.00  ------    x/d  =0.03

       |                  x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9    |                  x/dmx=0.45

       |                          |                          |

[tf,cm]| m[-]min =  5292.0                | m[+]min =  5292.0                | m[-]min =  5292.0

[cm2  ]| asapo[+]=  3.59                  |                            | asapo[+]=  3.59


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.- 124.  23.20 608.45   1  45.    0.0   15.2     15.2  8.0 12.5  4   0.0   0.0


T o r c a o-   xi    xf    tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla      m e n s a g e m

[tf,cm]       0.- 124.   2.70 157.96   5 23.7  76.3  66.3    0.0     0.0     0.0   0.0   0.0   0.06   n


------------------------------  g e o m e t r i a    e    c a r g a s   ------------------------------

Vao=14  /l=  2.03 /b= 1.00 /h=  0.90  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   15.7 tf* m        | m.[+] max=   14.5 tf* m - abcis.=  0   | m.[-] =   64.6 tf* m
[tf,cm]| as =  14.36 -sras-  [ 7 b 16.0mm]   | asl=  0.00  ------          | as =  17.59 -sras- [ 6 b 20.0mm]
      | asl=  0.00  ------    x/d =0.03   | as =  14.36  -sras-  [ 7 b 16.0mm ]    | asl=  0.00  ------   x/d =0.04
      |             x/dmx=0.45   | arm.lat.=[2 x  9 b  8.0mm] - ln=  2.9    |             x/dmx=0.45
      |                    |                    |
[tf,cm]| m[-]min =  5292.0          | m[+]min =  5292.0            | m[-]min =  5292.0
[cm2  ]| asapo[+]=  3.90           |                    | asapo[+]=  3.59

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.- 124.  26.99 608.45   1  45.   0.0   15.2    15.2  8.0 12.5  4   0.0   0.0

T o r c a o-  xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr  asl-mn asl-b asl-h comdia adpla     m e n s a g e m
[tf,cm]      0.- 124.   4.89 157.96   5 23.7  76.3  66.3   0.0    0.0    0.0   0.0   0.0   0.08   n
```

------------------------------- g e o m e t r i a   e   c a r g a s -------------------------------

Vao=15 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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.[-] = 80.4 tf* m | m.[+] max= 26.5 tf* m - abcis.= 84 | m.[-] = 54.7 tf* m

[tf,cm]| as = 24.71 -sras- [8 b 20.0mm] | asl= 0.00 ------ | as = 17.59 -sras- [6 b 20.0mm]

| asl= 0.00 ------ x/d =0.05 | as = 17.10 -sras- [6 b 20.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 9.90 | | asapo[+]= 9.90

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.- 124. 103.21 608.45 1 45. 1.8 15.2 27.3 10.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm]   0.- 124. 13.94 157.96   5 23.7 76.3 66.3   3.2   27.3   3.6   2.7   2.4   0.26   n

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao=16 /l= 2.03 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50   [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.[-] =   77.4 tf* m | m.[+] max=   40.9 tf* m - abcis.= 118 | m.[-] =   45.4 tf* m

[tf,cm]| as = 25.84 -sras-   [8 b 20.0mm] | asl=   0.00   ------ | as = 28.03 -sras- [9 b 20.0mm]

| asl=   0.00 ------   x/d =0.05 | as = 19.07   -sras- [6 b 20.0mm] | asl=   0.00 ------   x/d =0.05

| x/dmx=0.45 | arm.lat.=[2 x 9 b 8.0mm] - ln= 2.9 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 5292.0 | m[+]min = 5292.0 | m[-]min = 5292.0

[cm2]| asapo[+]= 15.79 | | asapo[+]= 25.83

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.- 124. 91.90 608.45   1 45.   0.0   15.2   27.3 10.0 10.0 4   0.0   0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 124. 27.13 157.96 5 23.7 76.3 66.3 6.2 27.3 3.6 4.7 4.1 0.32 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=17b /l= 0.86 /b= 1.00 /h= 0.90 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.45 /flt.ex= 0.50 [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[-]= 78.97 tf* m | as = 28.03 -sras- [9 b 20.0mm]

Bal.dir | x/d =0.05 | asl= 0.00 -arm.lat.=[2 x 4 b 16.0mm]

[tf,cm] | m[-]min= 5292.0 - x/dmx =0.45 | | % baric.armad.= 1

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.- 46. 55.53 608.45 1 45. 0.0 15.2 39.1 12.5 12.5 4 0.0 5.2

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 46. 37.22 157.96 5 23.7 76.3 66.3 8.5 27.3 3.6 6.5 5.6 0.33 n

Reac. Apoio - no.	Maximos	minimos	largura	depev	morte	nome	m.i.mx	m.i.mn	pilares:				
1	145.601	100.443	0.79	0.00	1	e4-p	0.00	0.00	304	0	0	0	0	0
2	127.372	89.283	0.79	0.00	1	e4-o	0.00	0.00	303	0	0	0	0	0
3	113.348	76.648	0.79	0.00	1	e4-n	0.00	0.00	302	0	0	0	0	0
4	123.362	91.029	0.79	0.00	1	e4-m	0.00	0.00	301	0	0	0	0	0
5	7.821	-3.684	0.79	0.00	0	e4-l	0.00	0.00	300	0	0	0	0	0
6	8.768	-8.350	0.79	0.00	0	e4-k	0.00	0.00	299	0	0	0	0	0
7	122.354	99.345	0.79	0.00	1	e4-j	0.00	0.00	298	0	0	0	0	0
8	130.546	98.868	0.79	0.00	1	e4-i	0.00	0.00	297	0	0	0	0	0
9	119.223	93.538	0.79	0.00	1	e4-h	0.00	0.00	296	0	0	0	0	0
10	101.649	86.715	0.79	0.00	1	e4-g	0.00	0.00	295	0	0	0	0	0
11	122.809	87.673	0.79	0.00	1	e4-f	0.00	0.00	294	0	0	0	0	0
12	-9.657	-22.166	0.79	0.00	0	e4-e	0.00	0.00	293	0	0	0	0	0
13	0.921	-7.602	0.79	0.00	0	e4-d	0.00	0.00	292	0	0	0	0	0
14	128.885	88.795	0.79	0.00	1	e4-c	0.00	0.00	291	0	0	0	0	0
15	132.367	97.294	0.79	0.00	1	e4-b	0.00	0.00	290	0	0	0	0	0
16	120.813	88.426	0.79	0.00	1	e4-a	0.00	0.00	289	0	0	0	0	0

16.8.7 Travessa 1

Viga= 1 travessa 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1b /l= 4.63 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.64 /flt.ex= 0.65 [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[-]= 1410.55 tf* m | as = 192.27 -sras- [40 b 25.0mm]

Bal.esq | x/d =0.16 | asl= 0.00 -arm.lat.=[2 x 12 b 10.0mm]

[tf,cm] | m[-]min=3416.00 - x/dmx =0.45 | | % baric.armad.= 1

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.- 450. 301.7 1665.2 1 45. 5.0 19.7 44.5 16.0 10.0 4 0.0 0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 450. 13.61 693.63   5 38.4 91.6 149.6   0.0   0.0   0.0   0.0   0.0   0.31   n

------------------------------- g e o m e t r i a   e   c a r g a s   -------------------------------

Vao= 2b /l= 4.63 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.64 /flt.ex= 0.65   [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[-]= 1407.33 tf* m | as = 191.80   -sras-   [40 b 25.0mm]

Bal.esq | grampo esq =10 b 10.0mm x/d =0.16 | asl=   0.00   -arm.lat.=[2 x 12 b 10.0mm]

[tf,cm] | m[-]min=3416.00   - x/dmx =0.45 | | % baric.armad.= 1

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.- 450. 300.6 1665.2   1 45.   4.8   19.7   44.2 16.0 10.0 4   0.0   0.0

T o r c a o-   xi   xf   tsd   trd2 %dt   he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla   m e n s a g e m

[tf,cm]   0.- 450. 37.67 393.11   5 38.4 91.6 149.6   9.9   19.7   4.9   5.3   8.7   0.34   n

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 301.702 232.862 0.25 0.00 0 p1-i 0.00 0.00 9 0 0 0 0 0

2 300.633 231.887 0.25 0.00 0 p1-a 0.00 0.00 1 0 0 0 0 0

16.8.8 Travessa 2

Viga= 2 travessa 2 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 1b /l= 4.63 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.64 /flt.ex= 0.65 [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[-]= 1630.38 tf* m | as = 224.90 -srad- [46 b 25.0mm]

Bal.esq | x/d =0.20 | asl= 41.66 -arm.lat.=[2 x 8 b 12.5mm]

[tf,cm] | m[-]min=3416.00 - x/dmx =0.45 |

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.- 450. 437.1 1665.2 1 45. 24.2 19.7 63.7 16.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 450. 66.46 693.63 5 38.4 91.6 149.6 9.9 19.7 4.9 5.3 8.7 0.33 n

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 2b /l= 4.63 /b= 1.30 /h= var. /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.64 /flt.ex= 0.65 [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[-]= 1653.28 tf* m | as = 228.35 -srad- [47 b 25.0mm]

Bal.esq | grampo esq =12 b 10.0mm x/d =0.19 | asl= 8.73 -arm.lat.=[2 x 12 b 10.0mm]

[tf,cm] | m[-]min=3416.00 - x/dmx =0.45 |

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.- 450. 420.9 1665.2 1 45. 21.9 19.7 61.4 16.0 10.0 4 0.0 0.0

T o r c a o- xi xf tsd trd2 %dt he b-nuc h-nuc asw-1r aswmnnr asl-mn asl-b asl-h comdia adpla m e n s a g e m

[tf,cm] 0.- 450. 43.17 693.63 5 38.4 91.6 149.6 9.9 19.7 4.9 5.3 8.7 0.35 n

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1 437.097 361.813 0.25 0.00 0 p2-i 0.00 0.00 18 0 0 0 0 0

2 420.948 342.610 0.25 0.00 0 p2-a 0.00 0.00 10 0 0 0 0 0

16.8.9 Transversina 1

Viga= 101 transversina 1 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.2 tf* m | m.[+] max= 10.6 tf* m - abcis.= 282 | m.[-] = 14.4 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.74 | | asapo[+]= 2.17

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.- 332. 39.23 225.23 1 45. 0.8 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 2 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 14.5 tf* m | m.[+] max= 12.5 tf* m - abcis.= 242 | m.[-] = 10.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.33 | | asapo[+]= 2.57

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.- 332. 35.03 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 10.6 tf* m | m.[+] max= 3.8 tf* m - abcis.= 201 | m.[-] = 16.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 30.70 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 16.5 tf* m | m.[+] max= 14.3 tf* m - abcis.= 242 | m.[-] = 8.2 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.72 | | 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.- 332. 46.05 225.23 1 45. 2.4 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   9.8 tf* m | m.[+] max=   11.8 tf* m - abcis.= 282 | m.[-] =   8.3 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.01 | | 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.- 332. 26.46 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 6 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   12.7 tf* m | m.[+] max=   6.2 tf* m - abcis.= 282 | m.[-] =   6.7 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | 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.- 332. 19.61 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

Reac. Apoio - no.   Maximos   minimos   largura   depev morte   nome   m.i.mx m.i.mn   pilares:

1	-10.390	-15.842	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	40.424	17.045	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	39.111	15.137	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	72.231	11.333	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	34.191	8.772	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	19.780	-53.276	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	9.404	-19.612	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.10 Transversina 2

```
Viga=  102  transversina 2              eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    2.3 tf* m           | m.[+] max=    0.9 tf* m - abcis.=  0   | m.[-] =    57.1  tf* m

[tf,cm]| as =   5.22  -sras-  [ 3 b 16.0mm]   | asl=   0.00   ------              | as =  12.82  -sras- [  4 b 20.0mm]

      | asl=   0.00  ------     x/d  =0.03   | as =   5.22   -sras-  [  3 b 16.0mm ]     | asl=   0.00  ------     x/d  =0.08

      |                  x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                  x/dmx=0.45

      |                          |                          |

[tf,cm]| m[-]min =  2371.6               | m[+]min =  2371.6                | m[-]min =  2371.6

[cm2  ]| asapo[+]=  2.97                 |                          | asapo[+]=  1.30
```

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.- 332. 52.53 225.23 1 45. 4.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 2 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 57.1 tf* m | m.[+] max= 6.1 tf* m - abcis.= 484 | m.[-] = 5.8 tf* m

[tf,cm]| as = 12.82 -sras- [4 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.08 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | 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.- 332. 30.87 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 5.9 tf* m | m.[+] max= 8.9 tf* m - abcis.= 201 | m.[-] = 9.4 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.22 | | asapo[+]= 1.59

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.- 332. 14.53 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 9.6 tf* m | m.[+] max= 11.0 tf* m - abcis.= 323 | m.[-] = 4.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.31 | | asapo[+]= 11.68

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.- 332. 9.53 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 4.8 tf* m | m.[+] max= 8.3 tf* m - abcis.= 0 | m.[-] = 54.3 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 12.17 -sras- [6 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.08

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.80 | | asapo[+]= 1.30

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.- 332. 26.57 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

```
------------------------------ g e o m e t r i a   e   c a r g a s  ------------------------------

Vao= 6  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    54.4 tf* m          | m.[+] max=     3.4 tf* m - abcis.= 444   | m.[-] =     1.0  tf* m

[tf,cm]| as =  12.19  -sras-  [ 6 b 16.0mm]   | asl=   0.00   ------              | as =   5.22  -sras- [  3 b 16.0mm]

      | asl=   0.00  ------    x/d  =0.08   | as =   5.22   -sras-  [  3 b 16.0mm ]    | asl=   0.00  ------    x/d  =0.03

      |                    x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                   x/dmx=0.45

      |                           |                           |

[tf,cm]| m[-]min =  2371.6                | m[+]min =  2371.6                  | m[-]min =  2371.6

[cm2  ]| asapo[+]=  1.30                  |                            | asapo[+]=  2.94


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.- 332.  47.69 225.23   1  45.    2.8    4.6      4.6  8.0 14.0  2   0.0   0.0


Reac. Apoio - no.   Maximos   minimos   largura    depev  morte    nome     m.i.mx m.i.mn         pilares:
```

1	12.873	-52.462	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	31.231	7.192	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	12.649	-10.977	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	18.616	-2.123	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	41.981	-72.078	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	62.993	3.164	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	11.557	-6.692	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.11 Transversina 3

Viga= 103 transversina 3 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   0.3 tf* m | m.[+] max=   4.4 tf* m - abcis.= 40 | m.[-] =   53.9 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as = 12.07 -sras- [6 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.08

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.69 | | asapo[+]= 1.30

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.- 332. 19.23 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 2 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   53.6 tf* m | m.[+] max=   10.7 tf* m - abcis.= 484 | m.[-] =   3.5 tf* m

[tf,cm]| as = 12.01 -sras-   [6 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.08 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 2.34

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.- 332. 26.32 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   3.5 tf* m | m.[+] max=   10.5 tf* m - abcis.=   0 | m.[-] =   11.8 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.29 | | asapo[+]= 1.30

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.- 332. 19.78 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   11.8 tf* m | m.[+] max=   14.8 tf* m - abcis.= 242 | m.[-] =   6.0 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.73 | | asapo[+]= 3.99

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.- 332. 19.05 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 6.8 tf* m | m.[+] max= 6.5 tf* m - abcis.= 0 | m.[-] = 57.3 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 12.86 -sras- [4 b 20.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.08

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.41 | | asapo[+]= 1.30

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.- 332. 20.05 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 6 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 56.7 tf* m | m.[+] max= 2.6 tf* m - abcis.= 484 | m.[-] = 7.4 tf* m

[tf,cm]| as = 12.71 -sras- [4 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.08 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 332. 53.85 225.23 1 45. 4.3 4.6 4.6 8.0 14.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	13.949	-7.737	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	32.114	12.342	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	15.514	-7.581	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	35.499	-3.001	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	13.022	-5.497	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	28.674	-40.741	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	0.718	-9.237	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.12 Transversina 4

Viga= 104 transversina 4 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 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= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.6 tf* m | m.[+] max= 4.0 tf* m - abcis.= 0 | m.[-] = 102.4 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 23.87 -sras- [5 b 25.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.15

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.88 | | asapo[+]= 1.30

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.- 332. 45.26 225.23 1 45. 2.2 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 2 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 103.0 tf* m | m.[+] max= 20.2 tf* m - abcis.= 484 | m.[-] = 0.0 tf* m

[tf,cm]| as = 24.02 -sras- [5 b 25.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.15 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 4.45

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.- 332. 52.74 225.23 1 45. 4.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 3 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 2.8 tf* m | m.[+] max= 19.2 tf* m - abcis.= 0 | m.[-] = 8.6 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 4.21 | | 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.- 332. 10.56 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 4 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 8.5 tf* m | m.[+] max= 14.1 tf* m - abcis.= 484 | m.[-] = 0.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 3.08

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.- 332. 62.35 225.23 1 45. 6.4 4.6 6.4 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 4.85 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    0.5 tf* m        | m.[+] max=   14.0 tf* m - abcis.=  0   | m.[-] =   61.8  tf* m

[tf,cm]| as =  5.22  -sras-  [ 3 b 16.0mm]   | asl=  0.00  ------        | as =  13.90  -sras- [ 5 b 20.0mm]

      | asl=  0.00  ------   x/d  =0.03   | as =  5.22  -sras-  [ 3 b 16.0mm ]    | asl=  0.00  ------   x/d  =0.09

      |              x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5    |             x/dmx=0.45

      |                      |                      |

[tf,cm]| m[-]min =  2371.6          | m[+]min =  2371.6           | m[-]min =  2371.6

[cm2  ]| asapo[+]=  3.07            |                      | asapo[+]=  1.30


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.- 332.  27.01 225.23  1  45.   0.0   4.6    4.6  8.0 14.0  2   0.0   0.0


------------------------------ g e o m e t r i a   e   c a r g a s  ------------------------------

Vao= 6  /l=  4.85 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 61.9 tf* m | m.[+] max= 4.2 tf* m - abcis.= 444 | m.[-] = 0.4 tf* m

[tf,cm]| as = 13.93 -sras- [5 b 20.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.09 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 3.70

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.- 332. 23.09 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	16.857	-19.188	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	17.009	-21.434	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	-5.445	-61.294	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	70.275	3.365	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

5	12.830	-13.868	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	37.163	14.054	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	14.208	-13.876	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.13 Transversina 5

Viga= 105 transversina 5 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 1.4 tf* m | m.[+] max= 3.2 tf* m - abcis.= 60 | m.[-] = 70.0 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 15.83 -sras- [5 b 20.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.10

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 2.22 | | asapo[+]= 1.30

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.- 90. 36.88 225.23   1 45.   0.2   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 2 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   69.6 tf* m | m.[+] max=   0.0 tf* m - abcis.= 242 | m.[-] =   106.2 tf* m

[tf,cm]| as = 15.75 -sras-   [5 b 20.0mm] | asl=   0.00   ------ | as = 24.81 -sras- [5 b 25.0mm]

| asl=   0.00 ------   x/d =0.10 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.16

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 28.01 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao= 3 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   106.1 tf* m | m.[+] max=   18.0 tf* m - abcis.= 242 | m.[-] =   0.4 tf* m

[tf,cm]| as = 24.78 -sras- [5 b 25.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.16 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 3.94

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.- 90. 62.25 225.23 1 45. 6.3 4.6 6.3 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 4 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.3 tf* m | m.[+] max= 17.4 tf* m - abcis.= 0 | m.[-] = 4.7 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.81 | | 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.- 90. 62.25 225.23 1 45. 6.3 4.6 6.3 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 5 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.8 tf* m | m.[+] max= 3.5 tf* m - abcis.= 40 | m.[-] = 3.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.25 | | asapo[+]= 1.30

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.- 90. 11.99 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 6 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   2.8 tf* m          | m.[+] max=   1.3 tf* m - abcis.= 80   | m.[-] =   1.8 tf* m
[tf,cm]| as =  5.22 -sras- [ 3 b 16.0mm]  | asl=  0.00  ------          | as =  5.22 -sras- [ 3 b 16.0mm]
       | asl=  0.00 ------   x/d =0.03  | as =  5.22  -sras- [ 3 b 16.0mm ]   | asl=  0.00 ------   x/d =0.03
       |                x/dmx=0.45  | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5   |              x/dmx=0.45
       |                      |                       |
[tf,cm]| m[-]min = 2371.6            | m[+]min = 2371.6             | m[-]min = 2371.6
[cm2 ]| asapo[+]= 1.30               |                       | asapo[+]= 1.30
```

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.- 90. 61.41 225.23 1 45. 6.6 4.6 8.3 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 7 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.7 tf* m | m.[+] max= 5.4 tf* m - abcis.= 40 | m.[-] = 2.7 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 8.14 | | asapo[+]= 1.30

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.- 90. 33.21 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 8 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    0.6 tf* m          | m.[+] max=    4.5 tf* m - abcis.=  0   | m.[-] =    3.0  tf* m
[tf,cm]| as =   5.22  -sras-  [ 3 b 16.0mm]   | asl=   0.00  ------            | as =   5.22  -sras- [ 3 b 16.0mm]
      | asl=   0.00  ------    x/d  =0.03   | as =   5.22   -sras-  [ 3 b 16.0mm ]    | asl=   0.00  ------    x/d  =0.03
      |                   x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                   x/dmx=0.45
      |                         |                             |
[tf,cm]| m[-]min =  2371.6              | m[+]min =  2371.6                 | m[-]min =  2371.6
[cm2  ]| asapo[+]=  1.74                |                             | asapo[+]=  1.30

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.-  90.  20.71 225.23   1  45.    0.0    4.6      4.6  8.0 14.0  2   0.0   0.0
```

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 9 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 2.7 tf* m | m.[+] max= 4.1 tf* m - abcis.= 20 | m.[-] = 9.6 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 3.98 | | asapo[+]= 2.11

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.- 90. 13.02 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=10 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 9.4 tf* m | m.[+] max= 1.6 tf* m - abcis.= 0 | m.[-] = 77.5 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 17.62 -sras- [6 b 20.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.11

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 34.41 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=11 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 77.4 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 41.1 tf* m

[tf,cm]| as = 17.59 -sras- [6 b 20.0mm] | asl= 0.00 ------ | as = 9.14 -sras- [3 b 20.0mm]

| asl= 0.00 ------ x/d =0.11 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.06

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 25.89 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=12 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =    41.0 tf* m             | m.[+] max=    0.0 tf* m - abcis.= 242   | m.[-] =    4.8  tf* m

[tf,cm]| as =   9.12  -sras-  [ 3 b 20.0mm]   | asl=   0.00   ------               | as =   5.22  -sras- [ 3 b 16.0mm]

      | asl=   0.00  ------     x/d  =0.06   | as =   5.22   -sras-  [ 3 b 16.0mm ]    | asl=   0.00  ------    x/d  =0.03

      |                  x/dmx=0.45   | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5     |                  x/dmx=0.45

      |                        |                          |

[tf,cm]| m[-]min =  2371.6                | m[+]min =  2371.6                  | m[-]min =  2371.6

[cm2  ]| asapo[+]=  1.30                  |                           | asapo[+]=  1.30


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.-  90.  60.69 225.23   1  45.    6.0    4.6      9.4  8.0 14.0  2   0.0   0.0


Reac. Apoio - no.   Maximos   minimos   largura    depev  morte    nome     m.i.mx m.i.mn        pilares:

           1     9.116   -36.435      1.52      0.00      2   longarin   0.00   0.00     0     0     0     0     0     0

           2    -7.186   -40.202      1.52      0.00      2   longarin   0.00   0.00     0     0     0     0     0     0

           3    56.622     9.625      1.52      0.00      2   longarin   0.00   0.00     0     0     0     0     0     0
```

4	-17.197	-83.405	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	-28.967	-101.094	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	63.471	-77.512	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	30.130	3.543	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
8	-5.400	-27.813	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
9	12.934	1.478	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
10	6.899	-30.803	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
11	52.827	15.924	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
12	-0.520	-14.803	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
13	-38.409	-74.687	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.14 Transversina 6

Viga= 106 transversina 6 eng.e=nao /eng.d=nao /repet= 1 /nand= 1 /red v ext=nao /fat.alt=1.00 /cob/s=2.5 0.0 cm

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao= 1 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 16.4 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 9.4 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 41.98 225.23 1 45. 1.4 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 2 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      9.9 tf* m                 | m.[+] max=      0.0 tf* m - abcis.= 242    | m.[-] =      6.0  tf* m

[tf,cm]| as =    5.22  -sras-   [  3 b 16.0mm]    | asl=    0.00    ------                       | as =    5.22  -sras- [  3 b 16.0mm]

      | asl=    0.00  ------       x/d  =0.03    | as =    5.22   -sras-  [  3 b 16.0mm ]      | asl=    0.00  ------     x/d  =0.03

      |                        x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                        x/dmx=0.45

      |                                  |                                   |

[tf,cm]| m[-]min =  2371.6                      | m[+]min =  2371.6                        | m[-]min =  2371.6

[cm2  ]| asapo[+]=  1.30                         |                                   | asapo[+]=  1.30


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.-  90.  32.38 225.23   1  45.    0.0    4.6      4.6  8.0 14.0  2   0.0   0.0


------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s   ------------------------------

Vao= 3  /l=  2.42 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      6.3 tf* m                | m.[+] max=      4.4 tf* m - abcis.= 161    | m.[-] =      6.5  tf* m
[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                    | as =   5.22  -sras- [  3 b 16.0mm]
       | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]      | asl=   0.00  ------     x/d  =0.03
       |                         x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                      x/dmx=0.45
       |                                  |                                   |
[tf,cm]| m[-]min =  2371.6                     | m[+]min =  2371.6                        | m[-]min =  2371.6
[cm2  ]| asapo[+]=  1.30                       |                                    | asapo[+]=  1.30

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.-  90.  60.01 225.23   1  45.    6.04    4.6     6.04  8.0 14.0  2   0.0   0.0

------------------------------  g  e  o  m  e  t  r  i  a     e     c  a  r  g  a  s    ------------------------------
Vao= 4  /l=  2.42 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 6.6 tf* m | m.[+] max= 2.3 tf* m - abcis.= 202 | m.[-] = 2.8 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.63

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.- 90. 6.16 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 5 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 3.2 tf* m | m.[+] max= 1.3 tf* m - abcis.= 80 | m.[-] = 3.7 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90.   4.75 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s   ------------------------------

Vao= 6 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   3.1 tf* m | m.[+] max=   3.7 tf* m - abcis.= 121 | m.[-] =   2.7 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 3.96

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.- 90. 59.59 225.23   1 45.   5.8   4.6   5.8 8.0 14.0 2   0.0   0.0

------------------------------- g e o m e t r i a   e   c a r g a s   -------------------------------

Vao= 7 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   2.9 tf* m | m.[+] max=   4.9 tf* m - abcis.= 181 | m.[-] =   0.4 tf* m

[tf,cm]| as =   5.22 -sras-   [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.58 | | asapo[+]= 1.95

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.- 90. 6.04 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao= 8 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 0.4 tf* m | m.[+] max= 3.4 tf* m - abcis.= 0 | m.[-] = 4.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

```
      |                              |                                |
[tf,cm]| m[-]min =  2371.6                 | m[+]min =  2371.6                   | m[-]min =  2371.6
[cm2  ]| asapo[+]=  1.74                   |                                | asapo[+]=  1.30

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.-  90.   7.59 225.23   1  45.    0.0    4.6      4.6  8.0 14.0  2   0.0   0.0

-------------------------------  g e o m e t r i a     e     c a r g a s   -------------------------------
Vao= 9  /l=  2.42 /b= 0.30 /h=  1.10  /bcs= 0.00 /bci= 0.00 /tps=  1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =      4.9 tf* m                 | m.[+] max=      0.2 tf* m - abcis.= 101    | m.[-] =      4.9  tf* m
[tf,cm]| as =   5.22  -sras-   [  3 b 16.0mm]    | asl=   0.00   ------                     | as =   5.22  -sras- [  3 b 16.0mm]
      | asl=   0.00  ------       x/d  =0.03    | as =   5.22   -sras-  [  3 b 16.0mm ]      | asl=   0.00  ------      x/d  =0.03
      |                       x/dmx=0.45    | arm.lat.=[2 x  7 b  8.0mm] - ln=  3.5      |                       x/dmx=0.45
      |                              |                                |
```

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 10.66 225.23   1 45.   0.0   4.6   4.6 8.0 14.0 2   0.0   0.0

------------------------------ g e o m e t r i a   e   c a r g a s ------------------------------

Vao=10 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] =   4.9 tf* m | m.[+] max=   0.0 tf* m - abcis.= 242 | m.[-] =   6.8 tf* m

[tf,cm]| as =   5.22 -sras- [3 b 16.0mm] | asl=   0.00   ------ | as =   5.22 -sras- [3 b 16.0mm]

| asl=   0.00 ------   x/d =0.03 | as =   5.22   -sras- [3 b 16.0mm] | asl=   0.00 ------   x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 12.78 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------ g e o m e t r i a e c a r g a s ------------------------------

Vao=11 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 6.8 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 7.9 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 6.65 225.23 1 45. 0.0 4.6 4.6 8.0 14.0 2 0.0 0.0

------------------------------- g e o m e t r i a e c a r g a s -------------------------------

Vao=12 /l= 2.42 /b= 0.30 /h= 1.10 /bcs= 0.00 /bci= 0.00 /tps= 1 /esp.ls= 0.00 /esp.li= 0.00 fsp.ex= 0.55 /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.[-] = 7.9 tf* m | m.[+] max= 0.0 tf* m - abcis.= 242 | m.[-] = 12.6 tf* m

[tf,cm]| as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ | as = 5.22 -sras- [3 b 16.0mm]

| asl= 0.00 ------ x/d =0.03 | as = 5.22 -sras- [3 b 16.0mm] | asl= 0.00 ------ x/d =0.03

| x/dmx=0.45 | arm.lat.=[2 x 7 b 8.0mm] - ln= 3.5 | x/dmx=0.45

| | |

[tf,cm]| m[-]min = 2371.6 | m[+]min = 2371.6 | m[-]min = 2371.6

[cm2]| asapo[+]= 1.30 | | asapo[+]= 1.30

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.- 90. 53.24 225.23 1 45. 4.2 4.6 4.6 8.0 14.0 2 0.0 0.0

Reac. Apoio - no. Maximos minimos largura depev morte nome m.i.mx m.i.mn pilares:

1	-15.219	-41.922	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
2	28.133	6.963	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
3	36.980	-2.145	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
4	143.000	-5.812	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
5	8.117	1.561	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
6	68.326	-5.841	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
7	14.951	2.543	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
8	3.430	-3.528	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
9	7.857	3.049	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
10	22.911	2.452	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
11	8.033	3.045	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
12	8.401	1.100	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0
13	-23.228	-53.238	1.52	0.00	2	longarin	0.00	0.00	0	0	0	0	0	0

16.8.15 Longarina 1

Para o detalhamento das longarinas foi utilizado os esforços da longarina mais solicitada.

A seguir são apresentados os dados e resultados do cálculo/dimensionamento das longarinas pré-moldadas:

Longarina 1

dados

número de peças do grupo: 7

comprimento da peça (cm): 2606.8

volume unitário | total (m3): 20.63 | 144.40

peso unitário | total (tf): 51.57 | 361.00

protensão

número de armaduras na peça: 30

força total na peça (tf): 360.00

peso de armadura na peça (kgf): 737.0

nível de protensão: ii - limitada

Armadura passiva

armadura superior nec | detalhada (cm2) | situação: 13.98 | 16.08 |ok

armadura inferior nec | detalhada (cm2) | situação: 48.31 | 49.09 |ok

fissuração

abertura de fissura máxima| limite (mm) | situação: 0.04 | 0.20 |ok

cisalhamento

faixa	montagem (cm2/m)		fasefinal (cm2/m)		
	asw,nec	asw,det	asw,nec	asw,det	situação
1	4.25	15.34	14.78	15.34	ok
2	4.25	12.57	12.03	12.57	ok
3	4.25	7.85	4.38	7.85	ok
4	4.25	12.57	12.03	12.57	ok

5	4.25	15.34	14.78	15.34	ok

apoios / dentes gerber

no início da peça: apoio sem recorte

- tirantes: as,nec =42.17cm2 | as,det =44.18cm2

- costuras: as,nec = 6.99cm2 | as,det = 8.04cm2

- estribos: as,nec = 5.72cm2 | as,det = 7.36cm2

no fim da peça: apoio sem recorte

- tirantes: as,nec =42.17cm2 | as,det =44.18cm2

- costuras: as,nec = 6.99cm2 | as,det = 8.04cm2

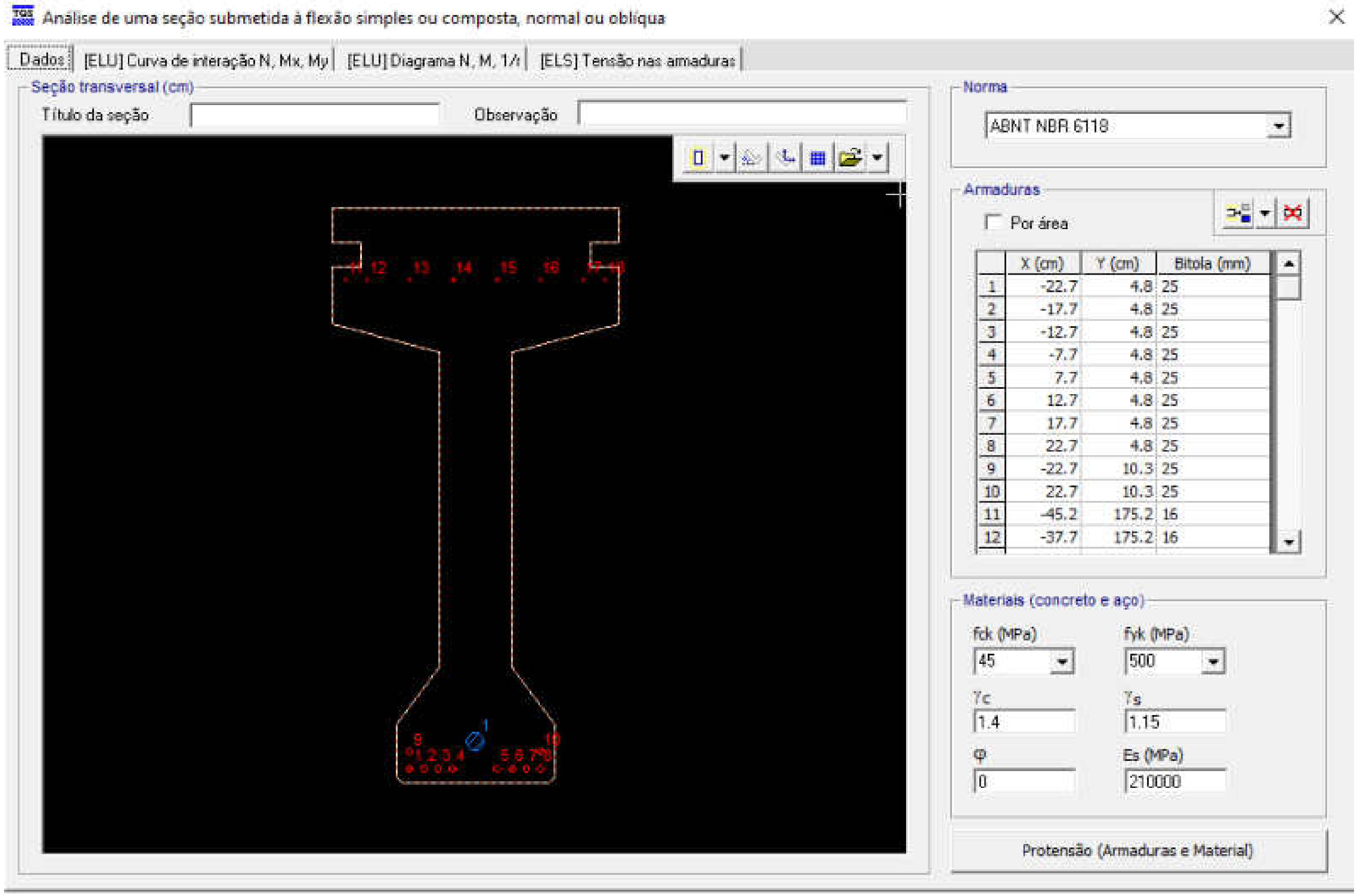
- estribos: as,nec = 5.72cm2 | as,det = 7.36cm2

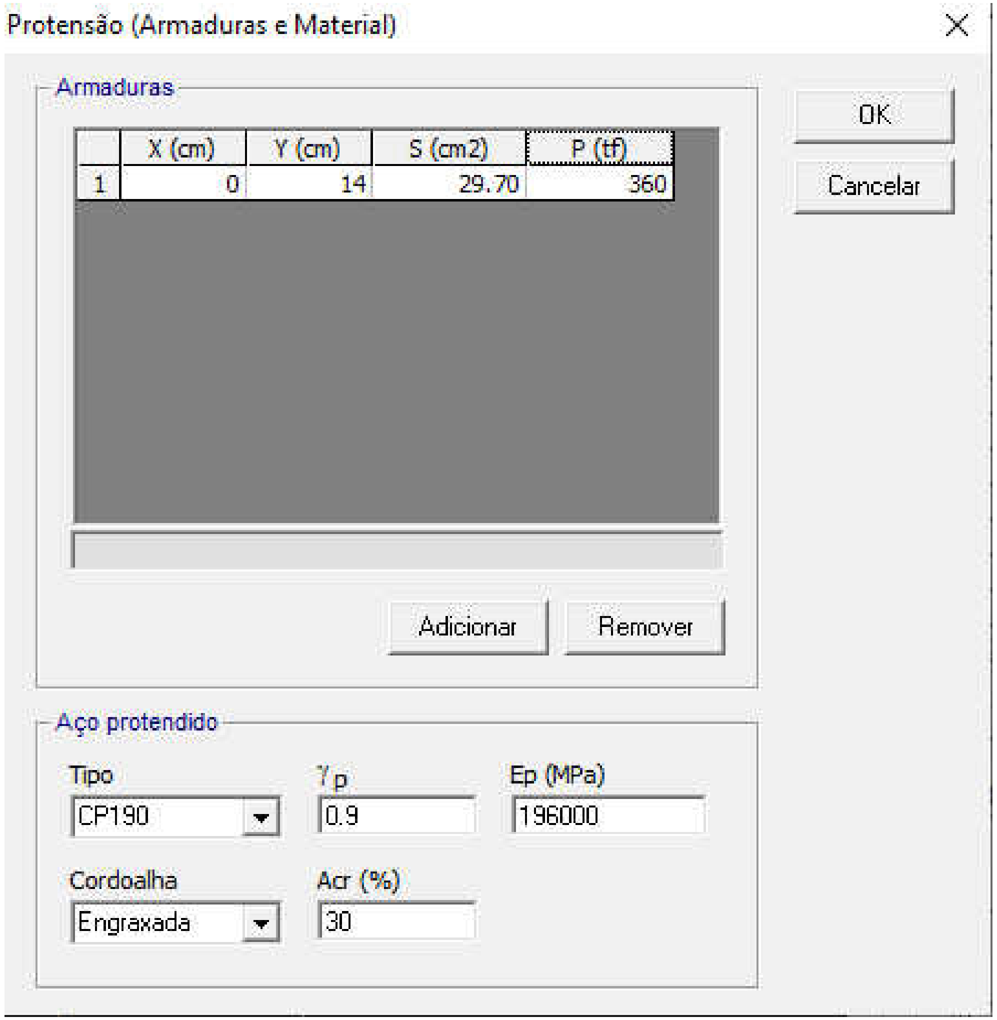
16.8.16 Armadura passiva

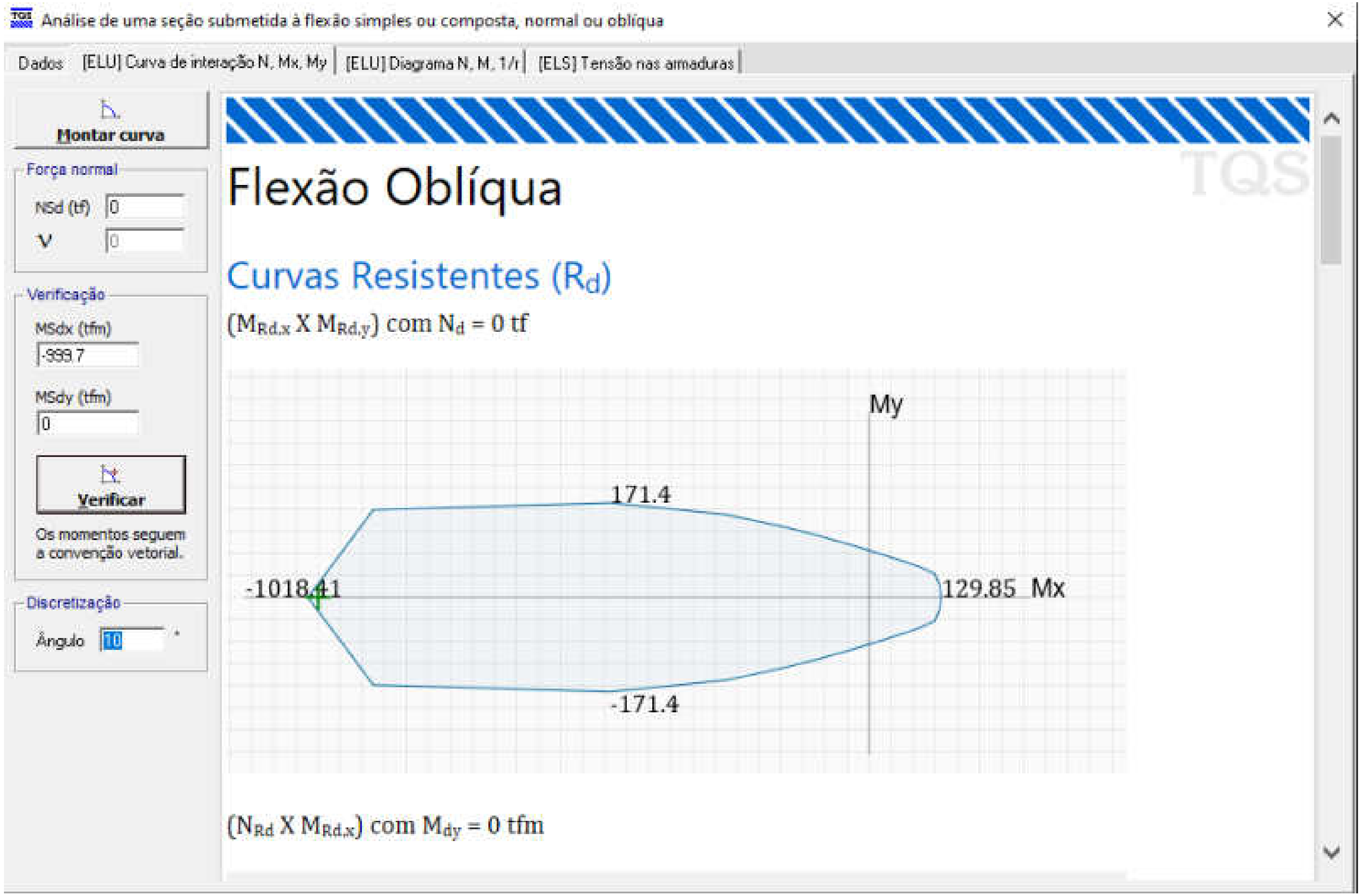
O cálculo da armadura passiva foi feito utilizando a calculadora de flexão composta oblíqua do tqs.

A seguir temos todas as informações necessárias para o cálculo: a seção utilizada, o concreto e as armaduras, ativas e passivas.

- Armadura positiva: 10 barras de 25 mm;
- Armadura negativa: 8 barras de 16 mm;
- Protensão: 30 cordoalhas de 12.7 mm não aderente – aço cp190 rb-ep / arcelormittal ou similar.


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Seção transversal (cm)
Título da seção
Observação
Norma
ABNT NBR 6118
Armaduras
Por área
X (cm) Y (cm) Bitola (mm)
1 -22.7 4.8 25
2 -17.7 4.8 25
3 -12.7 4.8 25
4 -7.7 4.8 25
5 7.7 4.8 25
6 12.7 4.8 25
7 17.7 4.8 25
8 22.7 4.8 25
9 -22.7 10.3 25
10 22.7 10.3 25
11 -45.2 175.2 16
12 -37.7 175.2 16
Materiais (concreto e aço)
fck (MPa)
45
fyk (MPa)
500
γc
1.4
γs
1.15
φ
0
Es (MPa)
210000
Protensão (Armaduras e Material)


Protensão (Armaduras e Material)
Armaduras
X (cm) | Y (cm) | S (cm2) | P (tf)
1 | 0 | 14 | 29.70 | 360
OK
Cancelar
Adicionar
Remover
Aço protendido
Tipo
CP190
γ p
0.9
Ep (MPa)
196000
Cordoalha
Engraxada
Acr (%)
30


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 0
ν 0
Verificação
MSdx (tfm) -999.7
MSdy (tfm) 0
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
TQS
Flexão Oblíqua
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 0 tf
My
171.4
-1018.41
129.85
Mx
-171.4
(NRd X MRd,x) com Mdy = 0 tfm

16.8.17 Protensão

Tabuleiro
Longarina 1

Quinta-feira, 13 de janeiro de 2022

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- strength_1_max_ll
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legend

A. Design parameters and load combinations

A.1 project design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	300.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Aci-318 (1999)

A.2 load combinations

Strength load combinations
1. 1.4 sw + 1.7 ll + 1.4 sdl + 1.7 x + 1 hyp

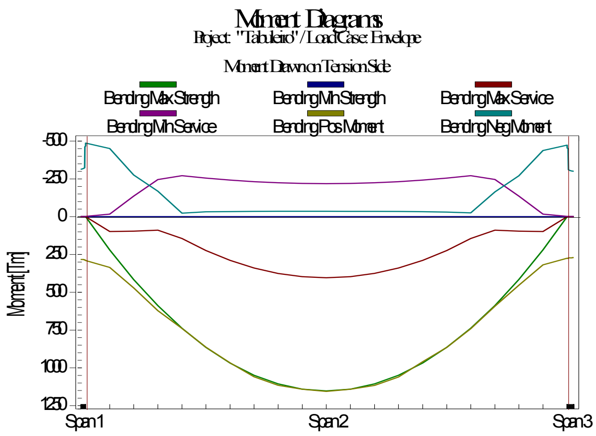
Service load combinations
sustained load
1. 1 sw + 1 ll + 1 sdl + 1 x + 1 pt

Initial load combinations
1 sw + 1.15 pt

B. Design strip report: longarina 1

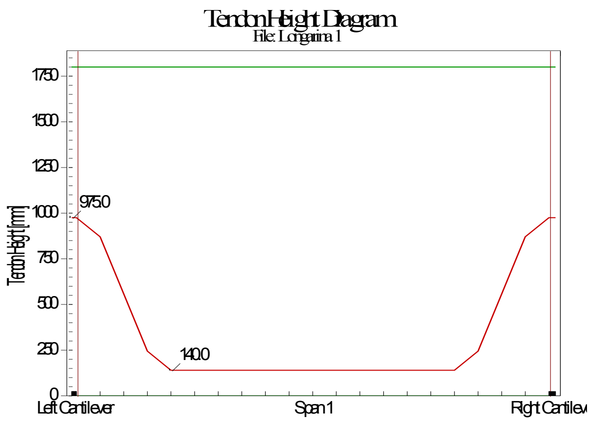
B.3 design moment

Load combination: envelope



Design moment
(moment is drawn on tension side)

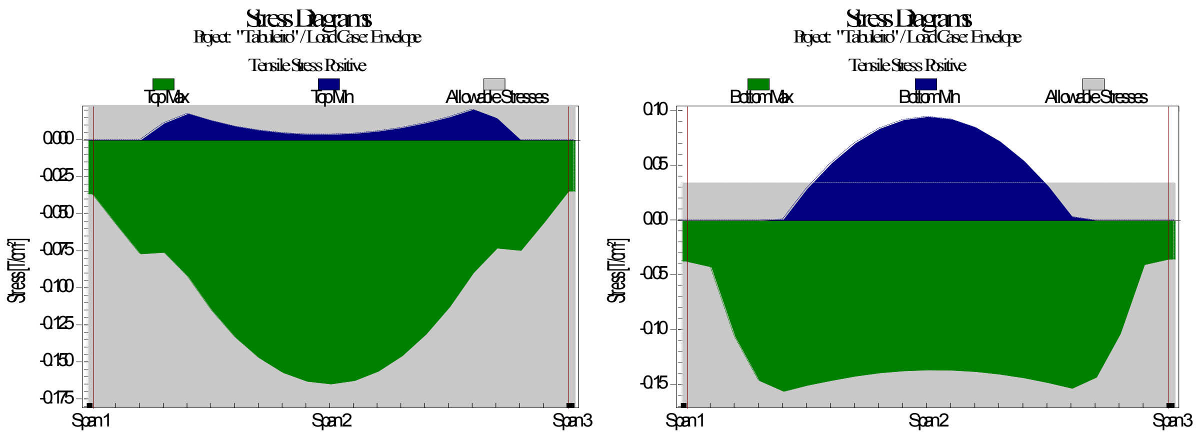
B.4 tendon profile



Post-tensioning
Profile

B.5 stress check results / code check

Load combination: envelope



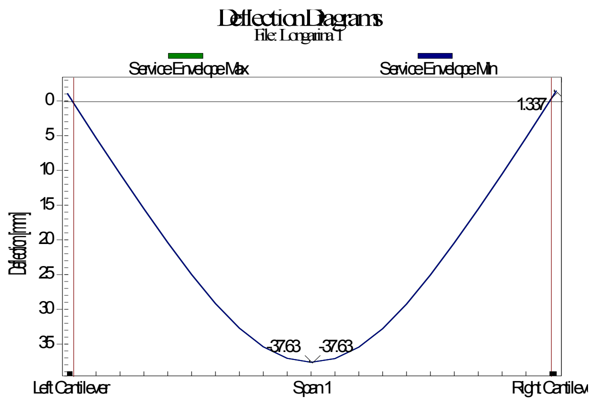
Service combination stresses
(tension stress positive)

B.6 rebar report

total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.21	32	3	5.10	22.72
1	2	Top	20.16	32	3	5.12	22.72
1	3	Bot	3.48	46	3	18.24	32.66
1	4	Bot	6.00	46	3	13.20	32.66

B.8 deflection



Deflection

B.9 quantities

Concrete
total volume of concrete = 20.28 m3
area covered = 25.81 m2

Mild steel
total weight of rebar = 1017.32 kg

average rebar usage = 39.42 kg/m2, 50.17 kg/m3

Prestressing material
Total weight of tendon = 625.1 kg
Average tendon usage = 24.22 kg/m2, 30.83 kg/m3

1 - user specified general analysis and design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	300.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Aci-318 (1999)

2 - input geometry

2.1 principal span data of uniform spans

Span	Form	Length	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
		M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
C	2	0.26	55.00	180.00	100.00	25.00			180.00	0.50	0.50
C	2	0.35	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.2 detailed data for nonuniform spans

Span	Seg.	Form	Left dist.	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
			M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
1	1	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	2	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	3	2	1.74	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	4	3	1.74	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	5	3	23.55	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	6	2	23.55	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	7	2	25.20	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.7 support width and column data

Joint	Support width	Length lc	B(dia.) Lc	D lc	% lc	Cbc lc	Length uc	B(dia.) Uc	D uc	% uc	Cbc uc
	Cm	M	Cm	Cm			M	Cm	Cm		
1	0.0	0.0	0.0	0.0	100	(1)					
2	0.0	0.0	0.0	0.0	100	(1)					

3 - input applied loading

3.1 loading as appears in user's input screen

Span	Class	Type	W	P1	P2	A	B	C	F	M
			T/m2	T/m	T/m	M	M	M	T	T-m
Cant	Ll	L		5.404		0.000	0.260			
Cant	D	L		2.733		0.000	0.260			
Cant	Sdl	L		1.773		0.000	0.260			
1	Ll	L		5.404		0.000	25.200			
1	D	L		2.733		0.000	1.740			
1	D	L		1.818		1.740	23.550			
1	D	L		2.733		23.550	25.200			
1	Sdl	L		1.773		0.000	25.200			
Cant	Ll	L		5.404		0.000	0.350			
Cant	D	L		2.733		0.000	0.350			
Cant	Sdl	L		1.773		0.000	0.350			

3.2 compiled loads

Span	Class	Type	P1	P2	F	M	A	B	C	Reduction factor
			T/m	T/m	T	T-m	M	M	M	%
Cl	Ll	P	5.404				0.000	0.260		0.000
Cl	Sw	P	2.733				0.000	0.260		
Cl	Sdl	P	1.773				0.000	0.260		
1	Ll	P	5.404				0.000	25.200		0.000
1	Sw	P	2.733				0.000	1.740		
1	Sw	P	1.818				1.740	23.550		
1	Sw	P	2.733				23.550	25.200		
1	Sdl	P	1.773				0.000	25.200		
Cr	Ll	P	5.404				0.000	0.350		0.000
Cr	Sw	P	2.733				0.000	0.350		
Cr	Sdl	P	1.773				0.000	0.350		

4 - calculated section properties

4.1 section properties of uniform spans and cantilevers

Span	Area	I	Yb	Yt
	Cm2	Cm4	Cm	Cm
Cant	11025.00	0.33e+08	97.91	82.09
1	---	---	---	---
Cant	11025.00	0.33e+08	97.91	82.09

4.2 section properties for non-uniform spans

Span	Segment	Area	I	Yb	Yt
		Cm2	Cm4	Cm	Cm
1	1	11025.00	0.33e+08	97.91	82.09
1	2	11025.00	0.33e+08	97.91	82.09
1	3	11025.00	0.33e+08	97.91	82.09
1	4	7275.00	0.28e+08	100.70	79.30
1	5	7275.00	0.28e+08	100.70	79.30
1	6	11025.00	0.33e+08	97.91	82.09
1	7	11025.00	0.33e+08	97.91	82.09

5 - moments, shears and reactions

5.1 span moments and shears (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right	shear left	shear right
		T-m	T-m	T-m	T	T
Cant	Sw	-----	-----	-0.09	-----	0.71
1	Sw	-0.09	145.50	-0.16	-24.49	24.42
Cant	Sw	-0.17	-----	-----	-0.96	-----
Cant	Sdl	-----	-----	-0.06	-----	0.46
1	Sdl	-0.06	140.66	-0.10	-22.34	22.34
Cant	Sdl	-0.11	-----	-----	-0.62	-----
Cant	Xl	-----	-----	0.00	-----	0.00
1	Xl	0.00	0.00	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----	0.00	-----

5.2 reactions and column moments (excluding live load)

Joint	Load case	Reaction	Moment lower column	Moment upper column
		T	T-m	T-m
1	Sw	25.20	0.00	0.00
2	Sw	25.38	0.00	0.00
1	Sdl	22.80	0.00	0.00
2	Sdl	22.96	0.00	0.00
1	Xl	0.00	0.00	0.00
2	Xl	0.00	0.00	0.00

5.3 span moments and shears (live load)

Span	moment left max	moment left min	Moment midspan max	Moment midspan min	Moment right max	Moment right min	shear left	shear right
	T-m	T-m	T-m	T-m	T-m	T-m	T	T
Cl	-----	-----	-----	-----	-0.18	-----	-----	1.41
1	-0.18	-0.18	428.72	428.72	-0.32	-0.32	-68.09	68.10
Cr	-0.33	-----	-----	-----	-----	-----	-1.89	-----

5.4 reactions and column moments (live load)

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	69.49	69.49	0.00	0.00	0.00	0.00
2	69.99	69.99	0.00	0.00	0.00	0.00

6 - moments reduced to face of support

6.1 reduced moments at face of support (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right
		T-m	T-m	T-m
Cant	Sw	-----	-----	-0.09
1	Sw	-0.09	145.50	-0.16
Cant	Sw	-0.17	-----	-----
Cant	Sdl	-----	-----	-0.06
1	Sdl	-0.06	140.70	-0.10
Cant	Sdl	-0.11	-----	-----
Cant	Xl	-----	-----	0.00
1	Xl	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----

6.2 reduced moments at face of support (live load)

Span	Moment left	Moment left	Moment	Moment	Moment	Moment

	max	min	midspan max	midspan min	right max	right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.18	-----
1	-0.18	-0.18	428.70	428.70	-0.32	-0.32
Cr	-0.33	-----	-----	-----	-----	-----

7 - selected post-tensioning forces and tendon profiles

7.1 tendon profile

Tendon a

Span	Type	X1/l	X2/l	X3/l	A/l
Cl	3	---	---	0.100	---
1	5	0.200	0.200	---	---
Cr	3	0.100	---	---	---

7.2 selected post-tensioning forces and tendon drape

Tendon a

Span	Force	Cgs left	Cgs c1	Cgs c2	Cgs right	P/a	Wbal	Wbal (%dl)
	T	Cm	Cm	Cm	Cm	Kg/cm2	T/-	
Cl	350.280	97.50	---	---	97.50	31.78	0.000	0
1	366.450	97.50	14.00	14.00	97.50	49.87	9.541	26
Cr	332.673	97.50	---	---	97.50	30.19	0.000	0

All tendons

Span	Force	Total p/a	Total wbal (%dl)
	T	Kg/cm2	
Cl	350.28	31.78	0
1	366.45	49.87	26
Cr	332.673	30.19	0

approximate weight of strand: 625.1 kg

7.3 tendon extents and stressing conditions

Type	Num	Force	Left end	Right end	From	To	Extension
A	30	12.00	Dead	Live	Cl	Cr	---

7.4 required minimum post-tensioning forces

	based on stress conditions			based on minimum p/a		
Type	Left	Center	Right	Left	Center	Right
	T	T	T	T	T	T
Cl	-----	-----	0.00	-----	-----	104.74
1	0.00	500.66	0.00	104.74	69.11	104.74
Cr	0.00	-----	-----	104.74	-----	-----

7.5 service stresses (tension shown positive)

Envelope of service 1

Span	Left top	Left bottom	Center top	Center bottom	Right top	Right bottom
	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
Cl	-----	-----	-----	-----	-31.34	-32.31
1	-31.55	-32.51	-164.50	94.55	-30.12	-31.19
Cr	-29.71	-30.79	-----	-----	-----	-----

7.6 post-tensioning balance moments, shears and reactions

Span moments and shears

Span	Moment left	Moment center	Moment right	Shear left	Shear right
	T-m	T-m	T-m	T	T
Cl	-----	-----	-1.43	-----	0.00
1	-1.43	-314.70	-1.37	0.00	0.00

Cr	-1.36	-----	-----	0.00	-----

Reactions and column moments

Joint	Reaction	Moment lower column	Moment upper column
	T	T-m	T-m
1	0.002	0.000	0.000
2	-0.002	0.000	0.000

Note: moments are reported at centerline

8 - factored moments and reactions envelope

8.1 factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.52	-----
1	-0.52	-0.52	1129.47	1129.47	-0.91	-0.91
Cr	-0.95	-----	-----	-----	-----	-----

8.2 reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	185.34	185.34	0.00	0.00	0.00	0.00
2	186.66	186.66	0.00	0.00	0.00	0.00

8.3 secondary moments

Span	Left	Midspan	Right
	T-m	T-m	T-m
1	0.00	0.00	0.00

8.4 factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.16	-0.16	-0.53	-0.53	0.00	0.00
1	-0.53	-0.53	1140.76	1140.76	-0.92	-0.92	0.00	0.00
Cr	-0.96	-0.96	-0.24	-0.24	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

10 - mild steel - no redistribution

10.1 required rebar

10.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.22	0.26	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	3.78	22.56	0.00	22.56	0.00	0.00
1	Top	21.42	25.20	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.05	19.80	0.00	19.80	0.00	0.00
1	Bot	5.04	20.16	64.96	64.96	13.67	0.00	0.00

10.2 provided rebar

10.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.21	32	3	5.10	22.72
1	2	Top	20.16	32	3	5.12	22.72
1	3	Bot	3.48	46	3	18.24	32.66
1	4	Bot	6.00	46	3	13.20	32.66

10.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.21	32	3	0.05
1	1	Top	0.00	32	3	5.05
1	2	Top	20.16	32	3	5.04
Cr	2	Top	0.00	32	3	0.08
1	3	Bot	3.48	46	3	18.24
1	4	Bot	6.00	46	3	13.20

11 - mild steel - redistributed

11.1 required rebar

11.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.22	0.26	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	3.78	22.56	0.00	22.56	0.00	0.00
1	Top	21.42	25.20	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.05	19.80	0.00	19.80	0.00	0.00
1	Bot	5.04	20.16	66.95	66.95	13.67	0.00	0.00

11.2 provided rebar

11.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.21	32	3	5.10	22.72
1	2	Top	20.16	32	3	5.12	22.72
1	3	Bot	3.48	48	3	18.24	34.08
1	4	Bot	6.00	47	3	13.20	33.37

11.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.21	32	3	0.05
1	1	Top	0.00	32	3	5.05
1	2	Top	20.16	32	3	5.04
Cr	2	Top	0.00	32	3	0.08
1	3	Bot	3.48	48	3	18.24
1	4	Bot	6.00	47	3	13.20

12 - shear reinforcement

12.1 shear calculation envelope

Cl

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	0.00	-0.00	0.00	0.000	0.00

0.05	0.01	144.00	0.20	-0.00	0.00	0.000	0.00
0.10	0.03	144.00	0.41	-0.01	0.00	0.000	0.00
0.15	0.04	144.00	0.61	-0.01	0.00	0.000	0.00
0.20	0.05	144.00	0.80	-0.02	0.00	0.000	0.00
0.25	0.07	144.00	1.01	-0.03	0.01	0.000	0.00
0.30	0.08	144.00	1.20	-0.05	0.01	0.000	0.00
0.35	0.09	144.00	1.41	-0.07	0.01	0.000	0.00
0.40	0.10	144.00	1.60	-0.09	0.01	0.000	0.00
0.45	0.12	144.00	1.81	-0.11	0.01	0.000	0.00
0.50	0.13	144.00	2.02	-0.13	0.01	0.000	0.00
0.55	0.14	144.00	2.20	-0.16	0.01	0.000	0.00
0.60	0.16	144.00	2.42	-0.19	0.01	0.000	0.00
0.65	0.17	144.00	2.61	-0.23	0.01	0.000	0.00
0.70	0.18	144.00	2.81	-0.26	0.01	0.000	0.00
0.75	0.20	144.00	3.02	-0.30	0.02	0.000	0.00
0.80	0.21	144.00	3.22	-0.34	0.02	0.000	0.00
0.85	0.22	144.00	3.41	-0.39	0.02	0.000	0.00
0.90	0.23	144.00	3.61	-0.43	0.02	0.000	0.00
0.95	0.25	144.00	3.83	-0.48	0.02	0.000	0.00
1.00	0.26	144.00	4.03	-0.53	0.02	0.000	0.00

Span 1

X/I	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-181.35	-0.53	0.96	1.618	60.00
0.05	1.26	144.00	-161.77	219.98	0.85	1.646	60.00
0.10	2.52	144.00	-143.22	415.70	1.92	11.900	11.25
0.15	3.78	155.60	-125.38	588.38	1.93	9.705	13.80
0.20	5.04	166.00	-107.44	737.92	2.00	8.082	16.57
0.25	6.30	166.00	-89.52	864.63	2.15	7.207	18.59
0.30	7.56	166.00	-71.60	968.09	1.80	4.817	27.81
0.35	8.82	166.00	-53.70	1048.93	1.35	2.117	60.00
0.40	10.08	166.00	-35.79	1106.01	0.90	1.807	60.00
0.45	11.34	166.00	-17.87	1140.67	0.45	0.000	0.00
0.50	12.60	166.00	0.03	1151.89	0.00	0.000	0.00
0.55	13.86	166.00	17.93	1140.67	0.45	0.000	0.00
0.60	15.12	166.00	35.84	1106.01	0.90	1.807	60.00
0.65	16.38	166.00	53.74	1048.93	1.36	2.124	60.00
0.70	17.64	166.00	71.66	967.99	1.81	4.826	27.76
0.75	18.90	166.00	89.57	864.22	2.15	7.210	18.58
0.80	20.16	166.00	107.44	737.72	2.00	8.085	16.57
0.85	21.42	155.60	125.38	587.97	1.93	9.701	13.81
0.90	22.68	144.00	143.32	415.19	1.91	11.890	11.26
0.95	23.94	144.00	161.67	219.47	0.85	1.548	60.00
1.00	25.20	144.00	181.24	-0.93	0.96	1.528	60.00

Cr

X/I	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-5.42	-0.97	0.03	0.000	0.00
0.05	0.02	144.00	-5.16	-0.87	0.03	0.000	0.00
0.10	0.04	144.00	-4.88	-0.78	0.03	0.000	0.00
0.15	0.05	144.00	-4.61	-0.70	0.02	0.000	0.00
0.20	0.07	144.00	-4.34	-0.62	0.02	0.000	0.00
0.25	0.09	144.00	-4.08	-0.54	0.02	0.000	0.00
0.30	0.11	144.00	-3.78	-0.47	0.02	0.000	0.00
0.35	0.12	144.00	-3.52	-0.41	0.02	0.000	0.00
0.40	0.14	144.00	-3.24	-0.35	0.02	0.000	0.00
0.45	0.16	144.00	-2.99	-0.29	0.02	0.000	0.00
0.50	0.17	144.00	-2.72	-0.24	0.01	0.000	0.00
0.55	0.19	144.00	-2.44	-0.20	0.01	0.000	0.00

0.60	0.21	144.00	-2.17	-0.15	0.01	0.000	0.00
0.65	0.23	144.00	-1.89	-0.12	0.01	0.000	0.00
0.70	0.25	144.00	-1.64	-0.09	0.01	0.000	0.00
0.75	0.26	144.00	-1.36	-0.06	0.01	0.000	0.00
0.80	0.28	144.00	-1.08	-0.04	0.01	0.000	0.00
0.85	0.30	144.00	-0.80	-0.02	0.00	0.000	0.00
0.90	0.32	144.00	-0.55	-0.01	0.00	0.000	0.00
0.95	0.33	144.00	-0.27	-0.00	0.00	0.000	0.00
1.00	0.35	144.00	0.00	-0.00	0.00	0.000	0.00

Note: "vu" is related to the load combination which produces the maximum "ratio"
Note: sections with **** have exceeded the maximum allowable shear stress.

14 - deflections

14.1 maximum span deflections

Span	Sw	Sw+pt	Sw+pt+sdl	Sw+pt+sdl+creep	Ll	X	Total
	Cm	Cm	Cm	Cm	Cm	Cm	Cm
Cl	0.0	0.1	0.0	0.1(387)	-0.1(196)	0.0(*****)	-0.1(397)
1	1.1	-1.6	-0.5	-1.6(1556)	4.3(585)	0.0(*****)	2.7(939)
Cr	0.0	0.1	0.0	0.1(386)	-0.2(195)	0.0(*****)	-0.1(396)

Note: deflections are calculated using effective moment of inertia of cracked sections.

15 - friction, elongation and long term losses

15.1 input parameters

Parameter	Value	Parameter	Value
Type of strand	Low relaxation	Coefficient of angular friction (meu)	0.07000 1/rad
Age of concrete at stressing	5 days	Coefficient of wobble friction (k)	0.00350 rad/m
Ec at stressing	265.92 t/cm2	Ratio of jacking stress	0.77
Average relative humidity	70.00 percent	Anchor set	10.00 mm
Volume to surface ratio of members	8.00 cm	Tendon_a stressing method	Right side
Es of strand	1960.00 t/cm2		

15.2 long-term losses

Tendon	Span	Left	Center	Right
		T/cm2	T/cm2	T/cm2
Tendon_a	Cl	1.07	1.07	1.07
Tendon_a	1	1.09	1.11	1.03
Tendon_a	Cr	1.03	1.03	1.03

15.3 calculated stresses after friction and long-term losses

Tendon	Span	Stress left fl only	Stress center fl only	Stress right fl only	Stress left fl+ltl	Stress center fl+ltl	Stress right fl+ltl
		T/cm2	T/cm2	T/cm2	T/cm2	T/cm2	T/cm2
Tendon_a	Cl	12.80	12.81	12.90	11.74	11.74	11.81
Tendon_a	1	12.90	13.37	12.24	11.81	12.26	11.21
Tendon_a	Cr	12.24	12.23	12.22	11.21	11.20	11.19

15.6 summary

Tendon	Force	Ext. Left	Start span	End span	Ext. Right	Elong. Left	Elong right	Anchor left	Anchor right	Max stress ratio
	T					Cm	Cm			
Tendon_a	11.56	0.00	Cl	3	0.00	0.00	17.43	0.66	0.63	0.70

21 - tendon heights

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cl			
0.00	0.000	975.00	979.08	979.08
0.05	0.013	975.00	981.01	981.01
0.10	0.026	975.00	986.79	986.79
0.15	0.039	975.00	996.43	996.43
0.20	0.052	975.00	1009.92	1009.92
0.25	0.065	975.00	1027.26	1027.26
0.30	0.078	975.00	1048.46	1048.46
0.35	0.091	975.00	1073.52	1073.52
0.40	0.104	975.00	1102.43	1102.43
0.45	0.117	975.00	1135.19	1135.19
0.50	0.130	975.00	1171.81	1171.81
0.55	0.143	975.00	1212.28	1212.28
0.60	0.156	975.00	1256.61	1256.61
0.65	0.169	975.00	1304.79	1304.79
0.70	0.182	975.00	1356.83	1356.83
0.75	0.195	975.00	1412.72	1412.72
0.80	0.208	975.00	1472.47	1472.47
0.85	0.221	975.00	1536.07	1536.07
0.90	0.234	975.00	1603.53	1603.53
0.95	0.247	975.00	1674.84	1674.84
1.00	0.260	975.00	1750.00	1750.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Span 1			
0.00	0.000	975.00	1750.00	1750.00
0.05	1.260	870.63	1665.00	1665.00
0.10	2.520	557.50	1409.99	1409.99
0.15	3.780	244.38	1091.23	1091.23
0.20	5.040	140.00	814.98	814.98
0.25	6.300	140.00	581.22	581.22
0.30	7.560	140.00	389.97	389.97
0.35	8.820	140.00	241.21	241.21
0.40	10.080	140.00	134.96	134.96
0.45	11.340	140.00	71.21	71.21
0.50	12.600	140.00	49.96	49.96
0.55	13.860	140.00	71.21	71.21
0.60	15.120	140.00	134.96	134.96
0.65	16.380	140.00	241.21	241.21
0.70	17.640	140.00	389.97	389.97
0.75	18.900	140.00	581.22	581.22
0.80	20.160	140.00	814.98	814.98
0.85	21.420	244.38	1091.23	1091.23
0.90	22.680	557.50	1409.99	1409.99
0.95	23.940	870.63	1665.00	1665.00
1.00	25.200	975.00	1750.00	1750.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cr			
0.00	0.000	975.00	1750.00	1750.00
0.05	0.018	975.00	1674.84	1674.84
0.10	0.035	975.00	1603.53	1603.53
0.15	0.053	975.00	1536.07	1536.07
0.20	0.070	975.00	1472.47	1472.47
0.25	0.087	975.00	1412.72	1412.72
0.30	0.105	975.00	1356.83	1356.83
0.35	0.122	975.00	1304.79	1304.79
0.40	0.140	975.00	1256.61	1256.61
0.45	0.157	975.00	1212.28	1212.28
0.50	0.175	975.00	1171.81	1171.81
0.55	0.193	975.00	1135.19	1135.19
0.60	0.210	975.00	1102.43	1102.43
0.65	0.227	975.00	1073.52	1073.52
0.70	0.245	975.00	1048.46	1048.46
0.75	0.262	975.00	1027.26	1027.26
0.80	0.280	975.00	1009.92	1009.92
0.85	0.298	975.00	996.43	996.43
0.90	0.315	975.00	986.79	986.79
0.95	0.332	975.00	981.01	981.01
1.00	0.350	975.00	979.08	979.08

22 - post-tensioning balanced loading

Span	Type	W	F	M	A	B
		T/m	T	T-m	M	M
1	3	47.704			0.00	2.52
1	3	47.704			22.68	25.20
1	3	-47.704			2.52	5.04
1	3	-47.704			20.16	22.68
1	4			10.35	1.74	
1	4			-10.35	23.55	
Cl	4			1.43	0.26	
Cr	4			-1.36	0.35	

23 - detailed moments

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.43	0.00
0.05	0.01	0.00	0.00	0.00	0.00	0.00	-1.43	0.00
0.10	0.03	0.00	0.00	0.00	0.00	0.00	-1.43	0.00
0.15	0.04	0.00	0.00	0.00	0.00	0.00	-1.43	0.00
0.20	0.05	0.00	0.00	0.00	-0.01	-0.01	-1.43	0.00
0.25	0.06	-0.01	0.00	0.00	-0.01	-0.01	-1.43	0.00
0.30	0.08	-0.01	-0.01	0.00	-0.02	-0.02	-1.43	0.00
0.35	0.09	-0.01	-0.01	0.00	-0.02	-0.02	-1.43	0.00
0.40	0.10	-0.01	-0.01	0.00	-0.03	-0.03	-1.43	0.00
0.45	0.12	-0.02	-0.01	0.00	-0.04	-0.04	-1.43	0.00
0.50	0.13	-0.02	-0.01	0.00	-0.05	-0.05	-1.43	0.00
0.55	0.14	-0.03	-0.02	0.00	-0.06	-0.06	-1.43	0.00
0.60	0.16	-0.03	-0.02	0.00	-0.07	-0.07	-1.43	0.00
0.65	0.17	-0.04	-0.03	0.00	-0.08	-0.08	-1.43	0.00
0.70	0.18	-0.05	-0.03	0.00	-0.09	-0.09	-1.43	0.00
0.75	0.20	-0.05	-0.03	0.00	-0.10	-0.10	-1.43	0.00

0.80	0.21	-0.06	-0.04	0.00	-0.12	-0.12	-1.43	0.00
0.85	0.22	-0.07	-0.04	0.00	-0.13	-0.13	-1.43	0.00
0.90	0.23	-0.07	-0.05	0.00	-0.15	-0.15	-1.43	0.00
0.95	0.25	-0.08	-0.05	0.00	-0.16	-0.16	-1.43	0.00
1.00	0.26	-0.09	-0.06	0.00	-0.18	-0.18	-1.43	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.09	-0.06	0.00	-0.18	-0.18	-1.43	0.00
0.05	1.26	28.60	26.68	0.00	81.32	81.32	-39.29	0.00
0.10	2.52	53.22	50.60	0.00	154.23	154.23	-163.24	0.00
0.15	3.78	74.86	71.71	0.00	218.57	218.57	-276.84	0.00
0.20	5.04	93.61	90.00	0.00	274.33	274.33	-314.71	0.00
0.25	6.30	109.48	105.48	0.00	321.51	321.51	-314.71	0.00
0.30	7.56	122.45	118.15	0.00	360.11	360.11	-314.70	0.00
0.35	8.82	132.54	128.00	0.00	390.13	390.13	-314.70	0.00
0.40	10.08	139.75	135.03	0.00	411.57	411.57	-314.70	0.00
0.45	11.34	144.07	139.25	0.00	424.44	424.44	-314.69	0.00
0.50	12.60	145.50	140.66	0.00	428.72	428.72	-314.69	0.00
0.55	13.86	144.05	139.25	0.00	424.42	424.42	-314.69	0.00
0.60	15.12	139.71	135.02	0.00	411.55	411.55	-314.69	0.00
0.65	16.38	132.48	127.99	0.00	390.09	390.09	-314.68	0.00
0.70	17.64	122.37	118.13	0.00	360.06	360.06	-314.68	0.00
0.75	18.90	109.37	105.46	0.00	321.44	321.44	-314.68	0.00
0.80	20.16	93.49	89.98	0.00	274.25	274.25	-314.67	0.00
0.85	21.42	74.71	71.68	0.00	218.48	218.48	-276.80	0.00
0.90	22.68	53.06	50.57	0.00	154.13	154.13	-163.20	0.00
0.95	23.94	28.44	26.64	0.00	81.19	81.19	-39.24	0.00
1.00	25.20	-0.16	-0.10	0.00	-0.32	-0.32	-1.37	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.17	-0.11	0.00	-0.33	-0.33	-1.36	0.00
0.05	0.02	-0.15	-0.10	0.00	-0.30	-0.30	-1.36	0.00
0.10	0.04	-0.14	-0.09	0.00	-0.27	-0.27	-1.36	0.00
0.15	0.05	-0.12	-0.08	0.00	-0.24	-0.24	-1.36	0.00
0.20	0.07	-0.11	-0.07	0.00	-0.21	-0.21	-1.36	0.00
0.25	0.09	-0.09	-0.06	0.00	-0.19	-0.19	-1.36	0.00
0.30	0.11	-0.08	-0.05	0.00	-0.16	-0.16	-1.36	0.00
0.35	0.12	-0.07	-0.05	0.00	-0.14	-0.14	-1.36	0.00
0.40	0.14	-0.06	-0.04	0.00	-0.12	-0.12	-1.36	0.00
0.45	0.16	-0.05	-0.03	0.00	-0.10	-0.10	-1.36	0.00
0.50	0.18	-0.04	-0.03	0.00	-0.08	-0.08	-1.36	0.00
0.55	0.19	-0.03	-0.02	0.00	-0.07	-0.07	-1.36	0.00
0.60	0.21	-0.03	-0.02	0.00	-0.05	-0.05	-1.36	0.00
0.65	0.23	-0.02	-0.01	0.00	-0.04	-0.04	-1.36	0.00
0.70	0.25	-0.02	-0.01	0.00	-0.03	-0.03	-1.36	0.00
0.75	0.26	-0.01	-0.01	0.00	-0.02	-0.02	-1.36	0.00
0.80	0.28	-0.01	0.00	0.00	-0.01	-0.01	-1.36	0.00
0.85	0.30	0.00	0.00	0.00	-0.01	-0.01	-1.36	0.00
0.90	0.32	0.00	0.00	0.00	0.00	0.00	-1.36	0.00
0.95	0.33	0.00	0.00	0.00	0.00	0.00	-1.36	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	-1.36	0.00

24 - detailed shears

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary

	M	T	T	T	T	T	T	T
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.01	0.04	0.02	0.00	0.07	0.00	0.00	0.00
0.10	0.03	0.07	0.05	0.00	0.14	0.00	0.00	0.00
0.15	0.04	0.11	0.07	0.00	0.21	0.00	0.00	0.00
0.20	0.05	0.14	0.09	0.00	0.28	0.00	0.00	0.00
0.25	0.06	0.18	0.12	0.00	0.35	0.00	0.00	0.00
0.30	0.08	0.21	0.14	0.00	0.42	0.00	0.00	0.00
0.35	0.09	0.25	0.16	0.00	0.49	0.00	0.00	0.00
0.40	0.10	0.28	0.18	0.00	0.56	0.00	0.00	0.00
0.45	0.12	0.32	0.21	0.00	0.63	0.00	0.00	0.00
0.50	0.13	0.36	0.23	0.00	0.70	0.00	0.00	0.00
0.55	0.14	0.39	0.25	0.00	0.77	0.00	0.00	0.00
0.60	0.16	0.43	0.28	0.00	0.84	0.00	0.00	0.00
0.65	0.17	0.46	0.30	0.00	0.91	0.00	0.00	0.00
0.70	0.18	0.50	0.32	0.00	0.98	0.00	0.00	0.00
0.75	0.20	0.53	0.35	0.00	1.05	0.00	0.00	0.00
0.80	0.21	0.57	0.37	0.00	1.12	0.00	0.00	0.00
0.85	0.22	0.60	0.39	0.00	1.19	0.00	0.00	0.00
0.90	0.23	0.64	0.41	0.00	1.26	0.00	0.00	0.00
0.95	0.25	0.68	0.44	0.00	1.33	0.00	0.00	0.00
1.00	0.26	0.71	0.46	0.00	1.40	0.00	0.00	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-24.49	-22.34	0.00	0.00	-68.08	0.00	0.00
0.05	1.26	-21.05	-20.10	0.00	0.00	-61.28	60.10	0.00
0.10	2.52	-18.32	-17.87	0.00	0.00	-54.47	120.21	0.00
0.15	3.78	-16.03	-15.64	0.00	0.00	-47.66	60.10	0.00
0.20	5.04	-13.74	-13.40	0.00	0.00	-40.85	0.00	0.00
0.25	6.30	-11.44	-11.17	0.00	0.00	-34.04	0.00	0.00
0.30	7.56	-9.15	-8.93	0.00	0.00	-27.23	0.00	0.00
0.35	8.82	-6.86	-6.70	0.00	0.00	-20.42	0.00	0.00
0.40	10.08	-4.57	-4.47	0.00	0.00	-13.61	0.00	0.00
0.45	11.34	-2.28	-2.23	0.00	0.00	-6.80	0.00	0.00
0.50	12.60	0.01	0.00	0.00	0.01	0.00	0.00	0.00
0.55	13.86	2.30	2.24	0.00	6.81	0.00	0.00	0.00
0.60	15.12	4.59	4.47	0.00	13.62	0.00	0.00	0.00
0.65	16.38	6.88	6.70	0.00	20.43	0.00	0.00	0.00
0.70	17.64	9.17	8.94	0.00	27.24	0.00	0.00	0.00
0.75	18.90	11.46	11.17	0.00	34.05	0.00	0.00	0.00
0.80	20.16	13.75	13.41	0.00	40.86	0.00	0.00	0.00
0.85	21.42	16.04	15.64	0.00	47.67	0.00	-60.11	0.00
0.90	22.68	18.33	17.87	0.00	54.48	0.00	-120.22	0.00
0.95	23.94	20.98	20.11	0.00	61.29	0.00	-60.11	0.00
1.00	25.20	24.42	22.34	0.00	68.10	0.00	0.00	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-0.96	-0.62	0.00	0.00	-1.89	0.00	0.00
0.05	0.02	-0.91	-0.59	0.00	0.00	-1.80	0.00	0.00
0.10	0.04	-0.86	-0.56	0.00	0.00	-1.70	0.00	0.00
0.15	0.05	-0.81	-0.53	0.00	0.00	-1.61	0.00	0.00
0.20	0.07	-0.77	-0.50	0.00	0.00	-1.51	0.00	0.00
0.25	0.09	-0.72	-0.47	0.00	0.00	-1.42	0.00	0.00
0.30	0.11	-0.67	-0.43	0.00	0.00	-1.32	0.00	0.00
0.35	0.12	-0.62	-0.40	0.00	0.00	-1.23	0.00	0.00
0.40	0.14	-0.57	-0.37	0.00	0.00	-1.13	0.00	0.00
0.45	0.16	-0.53	-0.34	0.00	0.00	-1.04	0.00	0.00

0.50	0.18	-0.48	-0.31	0.00	0.00	-0.95	0.00	0.00
0.55	0.19	-0.43	-0.28	0.00	0.00	-0.85	0.00	0.00
0.60	0.21	-0.38	-0.25	0.00	0.00	-0.76	0.00	0.00
0.65	0.23	-0.33	-0.22	0.00	0.00	-0.66	0.00	0.00
0.70	0.25	-0.29	-0.19	0.00	0.00	-0.57	0.00	0.00
0.75	0.26	-0.24	-0.16	0.00	0.00	-0.47	0.00	0.00
0.80	0.28	-0.19	-0.12	0.00	0.00	-0.38	0.00	0.00
0.85	0.30	-0.14	-0.09	0.00	0.00	-0.28	0.00	0.00
0.90	0.32	-0.10	-0.06	0.00	0.00	-0.19	0.00	0.00
0.95	0.33	-0.05	-0.03	0.00	0.00	-0.09	0.00	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00

25 - factored moments and reactions

Load combination: 1.40sw + 1.70ll + 1.40sdl + 1.70xl + 1.00sec

Factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.52	-----
1	-0.52	-0.52	1129.45	1129.45	-0.91	-0.91
Cr	-0.95	-----	-----	-----	-----	-----

Reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	185.34	185.34	0.00	0.00	0.00	0.00
2	186.66	186.66	0.00	0.00	0.00	0.00

Factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.16	-0.16	-0.53	-0.53	0.00	0.00
1	-0.53	-0.53	1140.76	1140.76	-0.92	-0.92	0.00	0.00
Cr	-0.96	-0.96	-0.24	-0.24	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

27 - detailed stresses

Cl

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.05	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.10	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.15	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.20	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.25	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.30	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.35	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.40	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.45	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.50	0.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.55	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2

0.60	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.65	0.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.70	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.75	0.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.80	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.85	0.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.90	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
0.95	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.4	-32.2
1.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-31.6	-32.4

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.05	0.01	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.10	0.03	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.15	0.04	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.20	0.05	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.25	0.06	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.30	0.08	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.35	0.09	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.40	0.10	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.45	0.12	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.50	0.13	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.55	0.14	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.60	0.16	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.65	0.17	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.2
0.70	0.18	-----	-36.1	-----	-37.0	-----	-31.4	-----	-32.3
0.75	0.20	-----	-36.1	-----	-37.1	-----	-31.4	-----	-32.3
0.80	0.21	-----	-36.1	-----	-37.1	-----	-31.4	-----	-32.3
0.85	0.22	-----	-36.1	-----	-37.1	-----	-31.4	-----	-32.3
0.90	0.23	-----	-36.1	-----	-37.1	-----	-31.4	-----	-32.3
0.95	0.25	-----	-36.1	-----	-37.1	-----	-31.4	-----	-32.3
1.00	0.26	-----	-36.4	-----	-37.3	-----	-31.5	-----	-32.5

Span 1

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-31.6	-32.4
0.05	1.26	-7.1	8.5	-6.7	8.0	0.0	0.0	-20.3	-20.3	24.2	24.2	-22.7	-44.2
0.10	2.52	-15.2	19.3	-14.4	18.3	0.0	0.0	-44.0	-44.0	55.9	55.9	-3.0	-108.7
0.15	3.78	-21.3	27.1	-20.5	26.0	0.0	0.0	-62.3	-62.3	79.2	79.2	28.6	-150.6
0.20	5.04	-26.7	33.9	-25.7	32.6	0.0	0.0	-78.2	-78.2	99.3	99.3	38.8	-164.9
0.25	6.30	-31.2	39.6	-30.1	38.2	0.0	0.0	-91.7	-91.7	116.4	116.4	38.6	-165.2
0.30	7.56	-34.9	44.3	-33.7	42.8	0.0	0.0	-102.7	-102.7	130.4	130.4	38.4	-165.3
0.35	8.82	-37.8	48.0	-36.5	46.4	0.0	0.0	-111.3	-111.3	141.3	141.3	38.6	-165.1
0.40	10.08	-39.9	50.6	-38.5	48.9	0.0	0.0	-117.4	-117.4	149.0	149.0	38.9	-164.8
0.45	11.34	-41.1	52.2	-39.7	50.4	0.0	0.0	-121.0	-121.0	153.7	153.7	39.1	-164.6
0.50	12.60	-41.5	52.7	-40.1	50.9	0.0	0.0	-122.3	-122.3	155.3	155.3	39.4	-164.3
0.55	13.86	-41.1	52.2	-39.7	50.4	0.0	0.0	-121.0	-121.0	153.7	153.7	39.6	-164.1
0.60	15.12	-39.8	50.6	-38.5	48.9	0.0	0.0	-117.4	-117.4	149.0	149.0	39.9	-163.8
0.65	16.38	-37.8	48.0	-36.5	46.4	0.0	0.0	-111.3	-111.3	141.3	141.3	40.1	-163.6
0.70	17.64	-34.9	44.3	-33.7	42.8	0.0	0.0	-102.7	-102.7	130.4	130.4	40.4	-163.3
0.75	18.90	-31.2	39.6	-30.1	38.2	0.0	0.0	-91.7	-91.7	116.4	116.4	40.6	-163.1
0.80	20.16	-26.7	33.9	-25.7	32.6	0.0	0.0	-78.2	-78.2	99.3	99.3	41.2	-162.5
0.85	21.42	-21.3	27.1	-20.4	26.0	0.0	0.0	-62.3	-62.3	79.1	79.1	31.4	-147.8
0.90	22.68	-15.1	19.2	-14.4	18.3	0.0	0.0	-44.0	-44.0	55.8	55.8	-0.8	-106.4
0.95	23.94	-7.1	8.5	-6.7	7.9	0.0	0.0	-20.3	-20.3	24.2	24.2	-20.8	-42.3
1.00	25.20	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-36.4	-----	-37.3	-----	-31.5	-----	-32.5
0.05	1.26	-----	-33.3	-----	-42.4	-----	-56.8	-----	-3.5
0.10	2.52	-----	-18.6	-----	-105.7	-----	-76.6	-----	-15.2
0.15	3.78	11.5	-----	-----	-146.1	-----	-75.6	-----	-18.4
0.20	5.04	17.9	-----	-----	-155.8	-----	-91.8	0.9	-----
0.25	6.30	13.1	-----	-----	-150.3	-----	-114.4	29.1	-----
0.30	7.56	9.2	-----	-----	-145.8	-----	-132.9	52.2	-----
0.35	8.82	6.6	-----	-----	-141.8	-----	-146.9	70.6	-----
0.40	10.08	4.9	-----	-----	-139.0	-----	-156.9	83.7	-----
0.45	11.34	3.9	-----	-----	-137.1	-----	-162.7	91.7	-----
0.50	12.60	3.8	-----	-----	-136.3	-----	-164.5	94.6	-----
0.55	13.86	4.5	-----	-----	-136.5	-----	-162.2	92.2	-----
0.60	15.12	6.0	-----	-----	-137.8	-----	-155.8	84.7	-----
0.65	16.38	8.4	-----	-----	-140.1	-----	-145.4	72.0	-----
0.70	17.64	11.5	-----	-----	-143.5	-----	-130.9	54.2	-----
0.75	18.90	15.5	-----	-----	-147.9	-----	-112.3	31.1	-----
0.80	20.16	20.7	-----	-----	-153.0	-----	-89.3	3.3	-----
0.85	21.42	14.7	-----	-----	-142.9	-----	-72.7	-----	-15.7
0.90	22.68	-----	-16.0	-----	-103.2	-----	-74.3	-----	-13.1
0.95	23.94	-----	-31.0	-----	-40.2	-----	-54.9	-----	-1.7
1.00	25.20	-----	-34.3	-----	-35.2	-----	-29.7	-----	-30.8

Cr

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6
0.05	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6
0.10	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6
0.15	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6
0.20	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.9	-30.6
0.25	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-29.8	-30.6
0.30	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.35	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.40	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.45	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.50	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.55	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.60	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.65	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.70	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.75	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.80	0.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.85	0.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.90	0.32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
0.95	0.33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6
1.00	0.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.8	-30.6

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-34.3	-----	-35.2	-----	-29.7	-----	-30.8
0.05	0.02	-----	-34.3	-----	-35.2	-----	-29.7	-----	-30.8
0.10	0.04	-----	-34.3	-----	-35.2	-----	-29.7	-----	-30.7
0.15	0.05	-----	-34.3	-----	-35.2	-----	-29.7	-----	-30.7
0.20	0.07	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.7
0.25	0.09	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.7

0.30	0.11	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.7
0.35	0.12	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.7
0.40	0.14	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.45	0.16	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.50	0.18	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.55	0.19	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.60	0.21	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.65	0.23	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.70	0.25	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.75	0.26	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.80	0.28	-----	-34.3	-----	-35.2	-----	-29.8	-----	-30.6
0.85	0.30	-----	-34.3	-----	-35.1	-----	-29.8	-----	-30.6
0.90	0.32	-----	-34.3	-----	-35.1	-----	-29.8	-----	-30.6
0.95	0.33	-----	-34.3	-----	-35.1	-----	-29.8	-----	-30.6
1.00	0.35	-----	-34.3	-----	-35.1	-----	-29.8	-----	-30.6

28 - required post-tensioning

note: required post-tensioning force based on stress conditions

X/l	X	Pt	X	Pt	X	Pt
	M	T	M	T	M	T
	Cl		Span 1		Cr	
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.01	0.00	1.26	51.38	0.02	0.00
0.10	0.03	0.00	2.52	196.00	0.04	0.00
0.15	0.04	0.00	3.78	238.16	0.05	0.00
0.20	0.05	0.00	5.04	295.51	0.07	0.00
0.25	0.06	0.00	6.30	360.61	0.09	0.00
0.30	0.08	0.00	7.56	413.99	0.11	0.00
0.35	0.09	0.00	8.82	453.38	0.12	0.00
0.40	0.10	0.00	10.08	480.88	0.14	0.00
0.45	0.12	0.00	11.34	496.61	0.16	0.00
0.50	0.13	0.00	12.60	500.66	0.17	0.00
0.55	0.14	0.00	13.86	493.18	0.19	0.00
0.60	0.16	0.00	15.12	474.27	0.21	0.00
0.65	0.17	0.00	16.38	444.05	0.23	0.00
0.70	0.18	0.00	17.64	402.66	0.25	0.00
0.75	0.20	0.00	18.90	350.20	0.26	0.00
0.80	0.21	0.00	20.16	285.43	0.28	0.00
0.85	0.22	0.00	21.42	228.99	0.30	0.00
0.90	0.23	0.00	22.68	190.80	0.31	0.00
0.95	0.25	0.00	23.94	49.82	0.33	0.00
1.00	0.26	0.00	25.20	0.00	0.35	0.00

29 - detailed rebar

Cl

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.09	0.00	0.00	0.00	0.00	0.00	0.00

0.40	0.10	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.12	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.13	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.18	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.20	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.21	0.00	0.00	0.00	0.00	0.00	0.00
0.85	0.22	0.00	0.00	19.80	0.00	19.80	0.00
0.90	0.23	0.00	0.00	19.80	0.00	19.80	0.00
0.95	0.25	0.00	0.00	19.80	0.00	19.80	0.00
1.00	0.26	0.00	0.00	19.80	0.00	19.80	0.00

Span 1

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	22.56	0.00	22.56	0.00
0.05	1.26	0.00	0.00	22.56	0.00	22.56	0.00
0.10	2.52	0.00	0.00	15.43	0.00	15.43	0.00
0.15	3.78	0.00	0.00	15.43	0.00	15.43	0.00
0.20	5.04	0.00	9.21	0.00	0.00	0.00	9.21
0.25	6.30	0.00	25.86	0.00	0.00	0.00	25.86
0.30	7.56	0.00	39.99	0.00	0.00	0.00	39.99
0.35	8.82	0.00	52.84	0.00	13.67	0.00	52.84
0.40	10.08	0.00	61.26	0.00	13.67	0.00	61.26
0.45	11.34	0.00	64.77	0.00	13.67	0.00	64.77
0.50	12.60	0.00	66.95	0.00	13.67	0.00	66.95
0.55	13.86	0.00	65.53	0.00	13.67	0.00	65.53
0.60	15.12	0.00	62.80	0.00	13.67	0.00	62.80
0.65	16.38	0.00	55.14	0.00	13.67	0.00	55.14
0.70	17.64	0.00	41.59	0.00	0.00	0.00	41.59
0.75	18.90	0.00	29.07	0.00	0.00	0.00	29.07
0.80	20.16	0.00	12.95	0.00	0.00	0.00	12.95
0.85	21.42	0.00	0.00	15.43	0.00	15.43	0.00
0.90	22.68	0.00	0.00	15.43	0.00	15.43	0.00
0.95	23.94	0.00	0.00	22.56	0.00	22.56	0.00
1.00	25.20	0.00	0.00	22.56	0.00	22.56	0.00

Cr

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	19.80	0.00	19.80	0.00
0.05	0.02	0.00	0.00	19.80	0.00	19.80	0.00
0.10	0.04	0.00	0.00	19.80	0.00	19.80	0.00
0.15	0.05	0.00	0.00	19.80	0.00	19.80	0.00
0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.09	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00
0.40	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.19	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.21	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.23	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.25	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.26	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.28	0.00	0.00	0.00	0.00	0.00	0.00

0.85	0.30	0.00	0.00	0.00	0.00	0.00	0.00
0.90	0.32	0.00	0.00	0.00	0.00	0.00	0.00
0.95	0.33	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00

Note: reinforcement requirements for initial condition are included in service block. Reinforcement requirements for ubc combination, if selected, are included in analysis block.

31 - detailed friction and longterm stress losses

Tendon_a

X/l	X	Initial stress	Longterm loss	Final stress	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2	M	T/cm2	T/cm2	T/cm2
	Cl				Span 1			
0.00	0.00	12.80	1.07	11.74	0.00	12.90	1.09	11.81
0.05	0.01	12.80	1.07	11.74	1.26	13.10	1.09	12.01
0.10	0.03	12.80	1.07	11.74	2.52	13.16	1.10	12.06
0.15	0.04	12.80	1.07	11.74	3.78	13.36	1.11	12.26
0.20	0.05	12.80	1.07	11.74	5.04	13.51	1.12	12.39
0.25	0.07	12.81	1.07	11.74	6.30	13.56	1.12	12.45
0.30	0.08	12.81	1.07	11.74	7.56	13.62	1.12	12.50
0.35	0.09	12.81	1.07	11.74	8.82	13.56	1.12	12.44
0.40	0.10	12.81	1.07	11.74	10.08	13.50	1.11	12.38
0.45	0.12	12.81	1.07	11.74	11.34	13.44	1.11	12.32
0.50	0.13	12.81	1.07	11.74	12.60	13.37	1.11	12.26
0.55	0.14	12.81	1.07	11.74	13.86	13.31	1.10	12.20
0.60	0.16	12.81	1.07	11.74	15.12	13.25	1.09	12.16
0.65	0.17	12.81	1.07	11.74	16.38	13.19	1.09	12.10
0.70	0.18	12.81	1.07	11.74	17.64	13.13	1.09	12.04
0.75	0.20	12.81	1.07	11.75	18.90	13.06	1.08	11.99
0.80	0.21	12.81	1.07	11.75	20.16	12.92	1.07	11.83
0.85	0.22	12.81	1.07	11.75	21.42	12.69	1.06	11.62
0.90	0.23	12.81	1.07	11.75	22.68	12.63	1.05	11.57
0.95	0.25	12.81	1.07	11.75	23.94	12.40	1.03	11.36
1.00	0.26	12.90	1.07	11.81	25.20	12.24	1.03	11.21

X/l	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2
	Cr			
0.00	0.00	12.24	1.03	11.21
0.05	0.02	12.24	1.03	11.21
0.10	0.04	12.24	1.03	11.21
0.15	0.05	12.23	1.03	11.21
0.20	0.07	12.23	1.03	11.21
0.25	0.09	12.23	1.03	11.20
0.30	0.11	12.23	1.03	11.20
0.35	0.12	12.23	1.03	11.20
0.40	0.14	12.23	1.03	11.20
0.45	0.16	12.23	1.03	11.20
0.50	0.17	12.23	1.03	11.20
0.55	0.19	12.23	1.03	11.20
0.60	0.21	12.23	1.03	11.20
0.65	0.23	12.23	1.03	11.20
0.70	0.25	12.22	1.03	11.20
0.75	0.26	12.22	1.03	11.20
0.80	0.28	12.22	1.03	11.19
0.85	0.30	12.22	1.03	11.19
0.90	0.32	12.22	1.03	11.19
0.95	0.33	12.22	1.03	11.19

1.00	0.35	12.22	1.03	11.19

34 demand moment and moment capacity

34.2 - based on designed values

CI

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	0.00	277.80	-308.30	0.00	0.00
0.05	0.01	0.00	0.00	277.79	-308.36	0.00	0.00
0.10	0.03	0.00	-0.01	277.77	-308.50	0.00	0.00
0.15	0.04	0.00	-0.01	277.76	-308.72	0.00	0.00
0.20	0.05	0.00	-0.02	277.74	-309.01	0.00	0.00
0.25	0.07	0.00	-0.03	277.73	-309.40	0.00	0.00
0.30	0.08	0.00	-0.05	277.71	-309.68	0.00	0.00
0.35	0.09	0.00	-0.06	277.69	-310.02	0.00	0.00
0.40	0.10	0.00	-0.08	277.68	-310.66	0.00	0.00
0.45	0.12	0.00	-0.11	277.66	-311.21	0.00	0.00
0.50	0.13	0.00	-0.13	277.65	-311.81	0.00	0.00
0.55	0.14	0.00	-0.16	277.63	-312.68	0.00	0.00
0.60	0.16	0.00	-0.19	277.62	-313.44	0.00	0.00
0.65	0.17	0.00	-0.22	279.70	-314.11	0.00	0.00
0.70	0.18	0.00	-0.25	279.68	-315.24	0.00	0.00
0.75	0.20	0.00	-0.29	279.66	-316.09	0.00	0.00
0.80	0.21	0.00	-0.33	279.65	-317.18	0.00	0.00
0.85	0.22	0.00	-0.37	282.20	-454.00	0.00	0.00
0.90	0.23	0.00	-0.42	282.18	-455.44	0.00	0.00
0.95	0.25	0.00	-0.47	282.22	-456.66	0.00	0.00
1.00	0.26	0.00	-0.52	283.92	-459.03	0.00	0.00
1.00	0.26	0.00	-0.52	283.92	-459.04	0.00	0.00

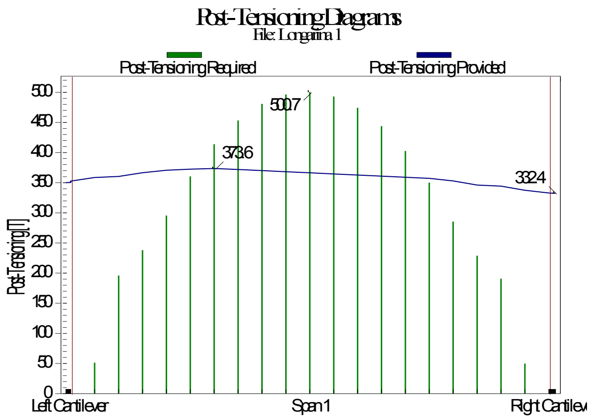
Span 1

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.52	284.50	-477.86	0.00	0.00
0.00	0.00	0.00	-0.52	284.50	-477.86	0.00	0.00
0.05	1.26	213.65	0.00	329.31	-441.97	0.65	0.00
0.10	2.52	403.74	0.00	461.81	-270.48	0.87	0.00
0.15	3.78	571.52	0.00	609.59	-165.35	0.94	0.00
0.20	5.04	716.72	0.00	724.72	-23.16	0.99	0.00
0.25	6.30	839.76	0.00	846.84	-31.96	0.99	0.00
0.30	7.56	940.29	0.00	948.84	-32.99	0.99	0.00
0.35	8.82	1018.42	0.00	1038.88	-34.47	0.98	0.00
0.40	10.08	1074.47	0.00	1093.87	-34.90	0.98	0.00
0.45	11.34	1107.96	0.00	1119.86	-34.95	0.99	0.00
0.50	12.60	1119.09	0.00	1133.84	-34.92	0.99	0.00
0.55	13.86	1107.96	0.00	1120.20	-34.71	0.99	0.00
0.60	15.12	1074.17	0.00	1094.55	-34.44	0.98	0.00
0.65	16.38	1018.42	0.00	1039.90	-33.89	0.98	0.00
0.70	17.64	940.15	0.00	941.37	-32.44	1.00	0.00
0.75	18.90	839.45	0.00	848.26	-30.08	0.99	0.00
0.80	20.16	716.52	0.00	726.38	-24.52	0.99	0.00
0.85	21.42	571.10	0.00	580.38	-160.71	0.98	0.00
0.90	22.68	403.31	0.00	444.63	-265.29	0.91	0.00
0.95	23.94	213.16	0.00	312.79	-429.47	0.68	0.00
1.00	25.20	0.00	-0.90	269.68	-464.13	0.00	0.00
1.00	25.20	0.00	-0.90	269.68	-464.13	0.00	0.00

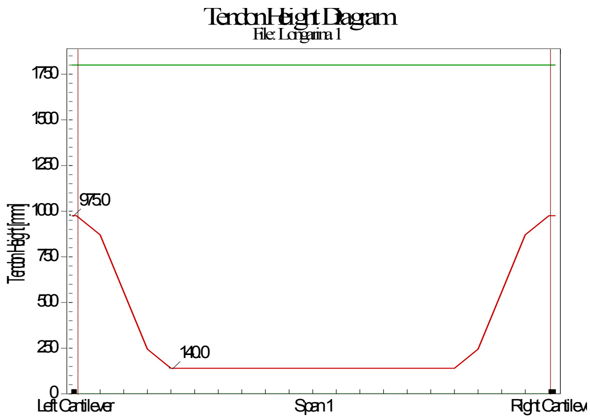
Cr

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.94	270.42	-445.60	0.00	0.00
0.00	0.00	0.00	-0.94	270.42	-445.60	0.00	0.00
0.05	0.02	0.00	-0.85	270.49	-444.29	0.00	0.00
0.10	0.04	0.00	-0.76	270.52	-443.17	0.00	0.00
0.15	0.05	0.00	-0.68	270.59	-441.75	0.00	0.00
0.20	0.07	0.00	-0.60	267.13	-304.18	0.00	0.00
0.25	0.09	0.00	-0.53	267.15	-303.03	0.00	0.00
0.30	0.11	0.00	-0.46	267.18	-301.99	0.00	0.00
0.35	0.12	0.00	-0.40	267.20	-301.06	0.00	0.00
0.40	0.14	0.00	-0.34	267.23	-300.22	0.00	0.00
0.45	0.16	0.00	-0.28	267.25	-299.39	0.00	0.00
0.50	0.18	0.00	-0.24	267.28	-298.87	0.00	0.00
0.55	0.19	0.00	-0.19	267.30	-298.07	0.00	0.00
0.60	0.21	0.00	-0.15	267.33	-297.53	0.00	0.00
0.65	0.23	0.00	-0.12	267.35	-297.06	0.00	0.00
0.70	0.25	0.00	-0.08	267.37	-296.47	0.00	0.00
0.75	0.26	0.00	-0.06	267.40	-296.00	0.00	0.00
0.80	0.28	0.00	-0.04	265.26	-295.79	0.00	0.00
0.85	0.30	0.00	-0.02	265.28	-295.48	0.00	0.00
0.90	0.32	0.00	-0.01	265.31	-295.42	0.00	0.00
0.95	0.33	0.00	0.00	265.33	-295.27	0.00	0.00
1.00	0.35	0.00	0.00	265.36	-295.21	0.00	0.00

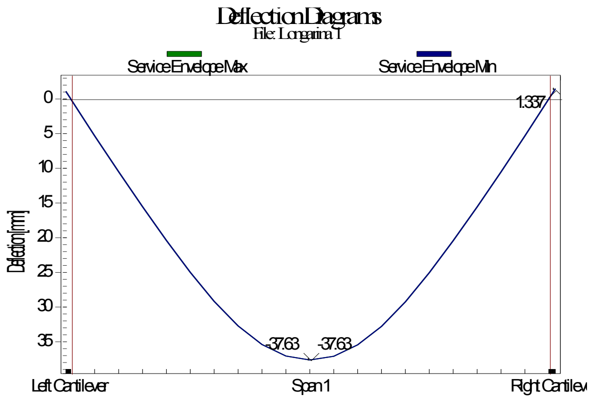
Note: capacity is calculated with the rebar and pt required for the design, including user defined base reinforcement



Post-tensioning
Required and provided

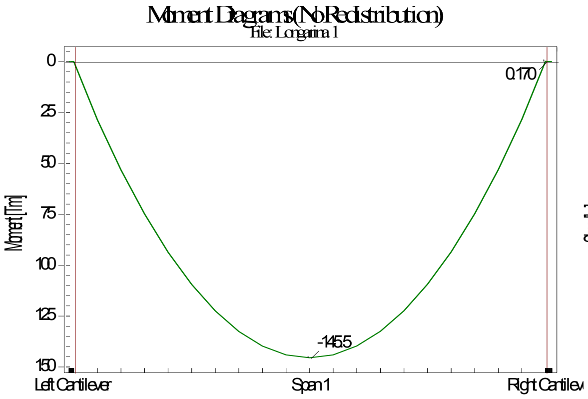


Post-tensioning
Profile

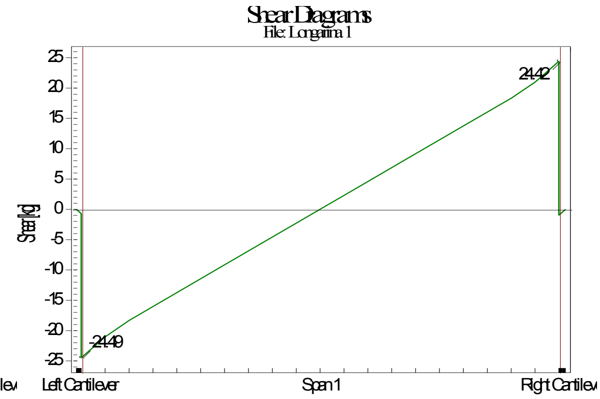


Deflection

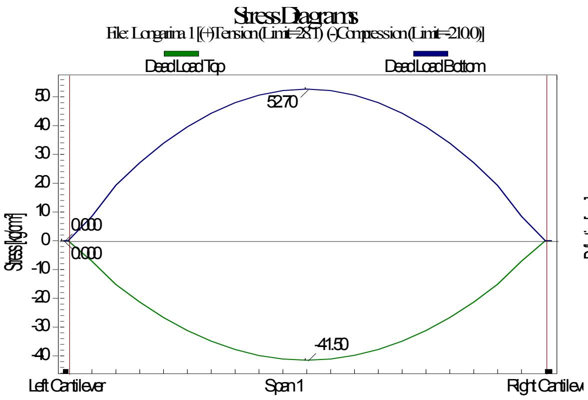
Load case: selfweight



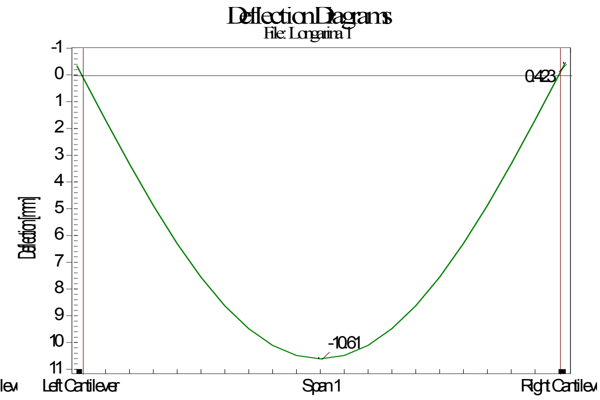
Moment



shear

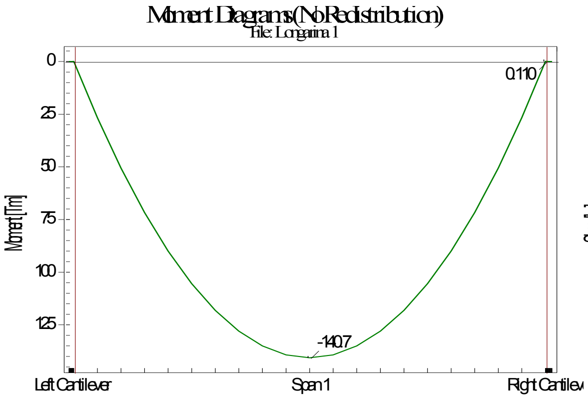


Stress

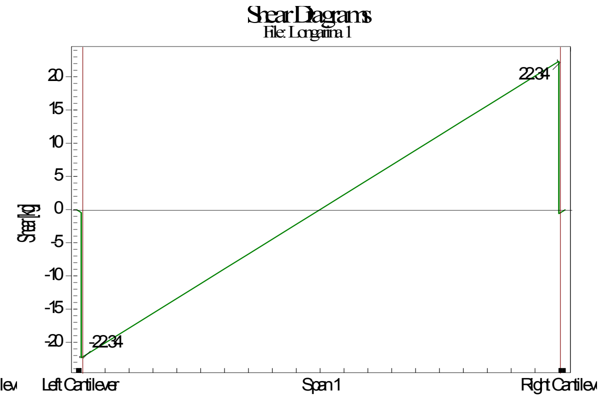


deflection

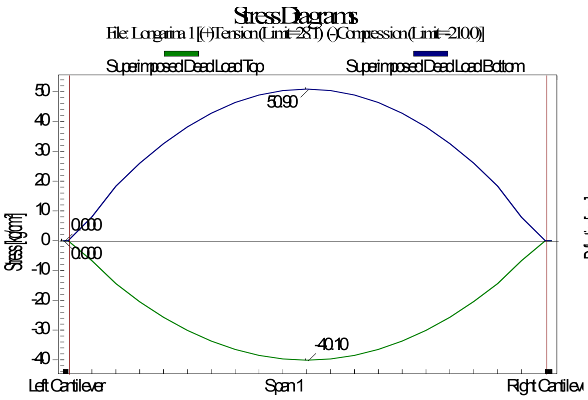
Load case: super imposed dead load



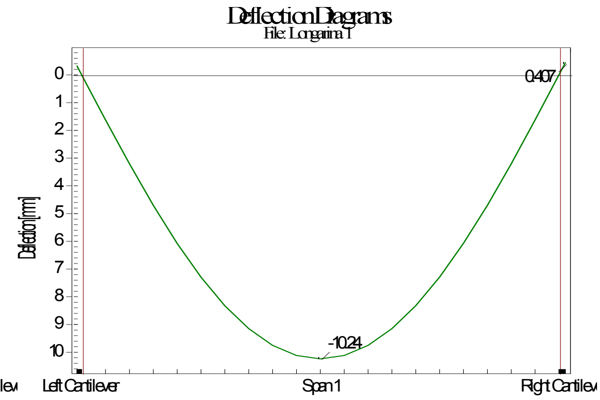
Moment



shear

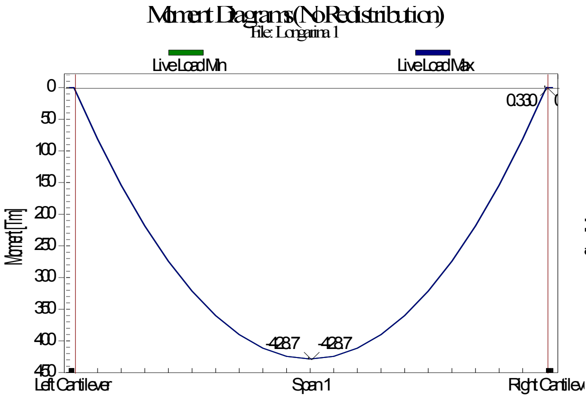


Stress

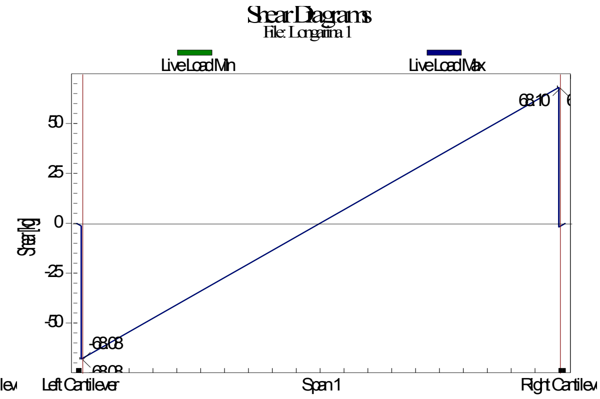


deflection

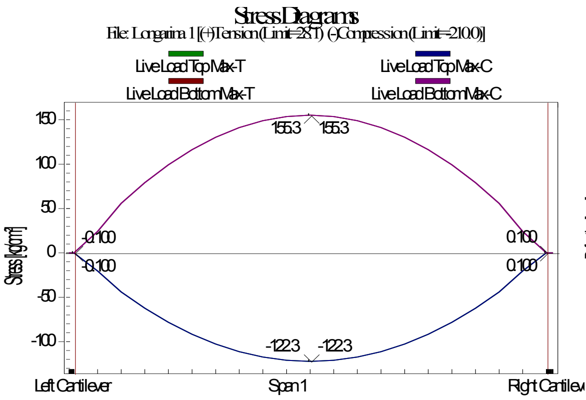
Load case: live load



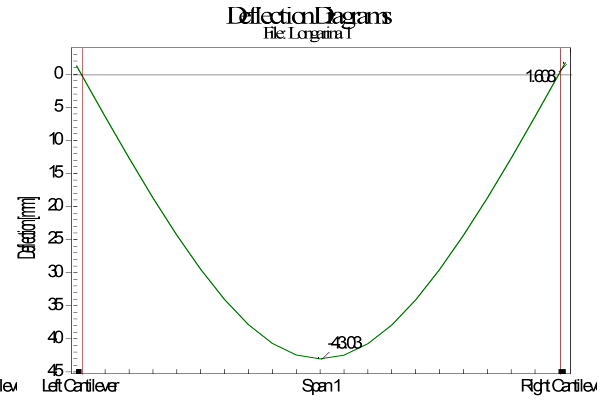
Moment



shear

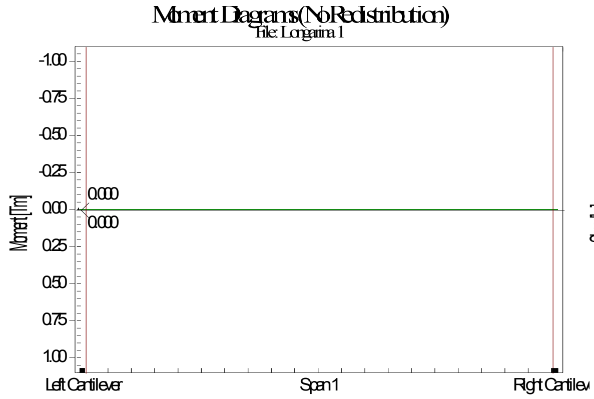


Stress

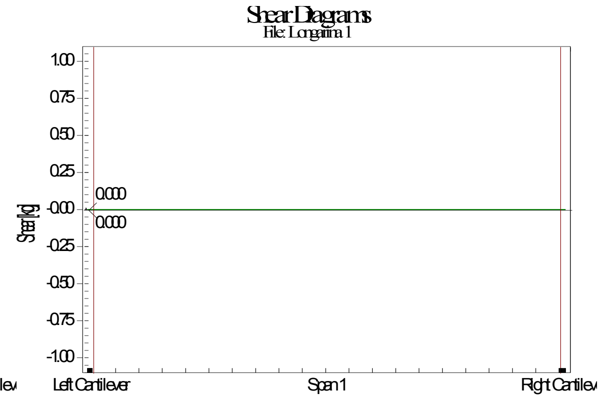


deflection

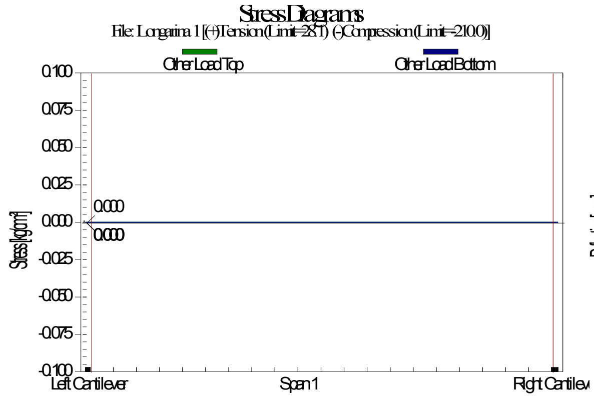
Load case: other load



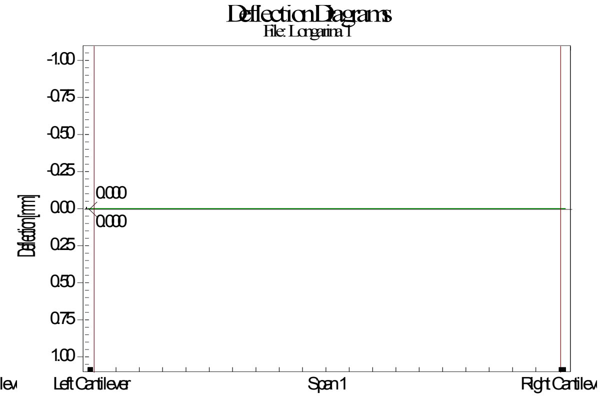
Moment



shear

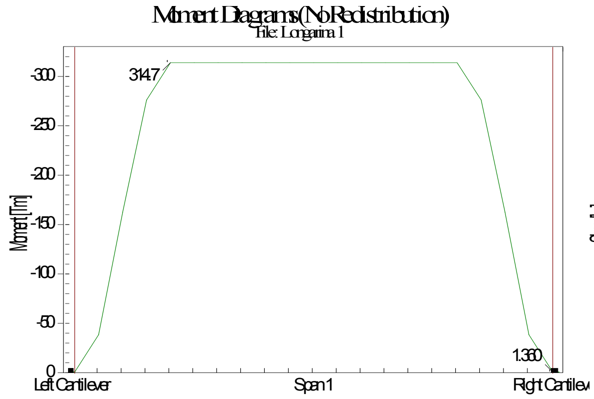


Stress

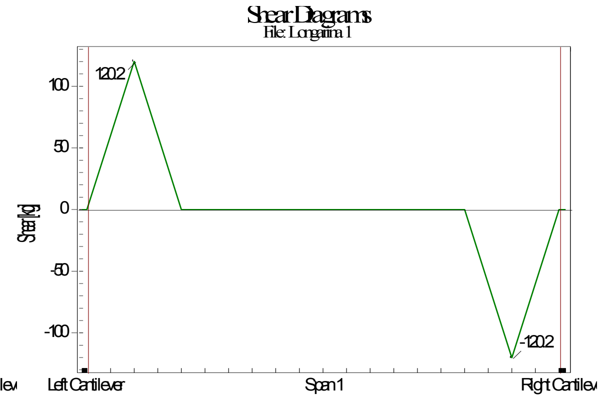


deflection

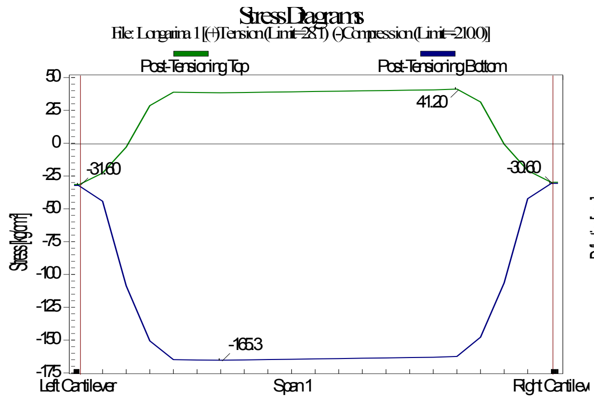
Load case: prestressing load



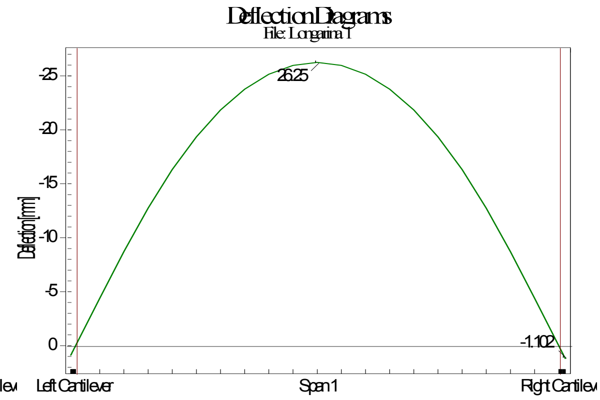
Moment



shear

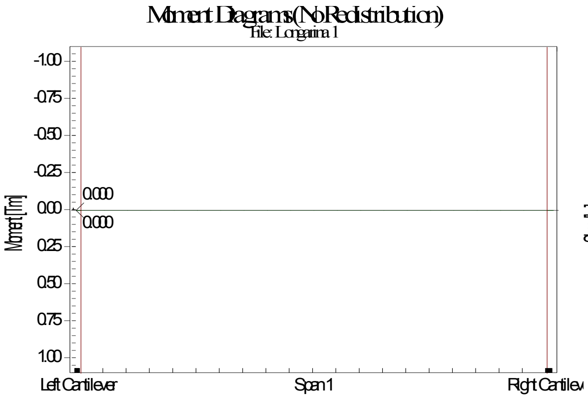


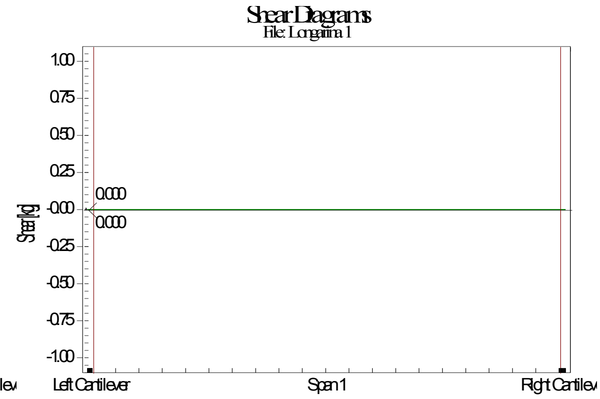
Stress



deflection

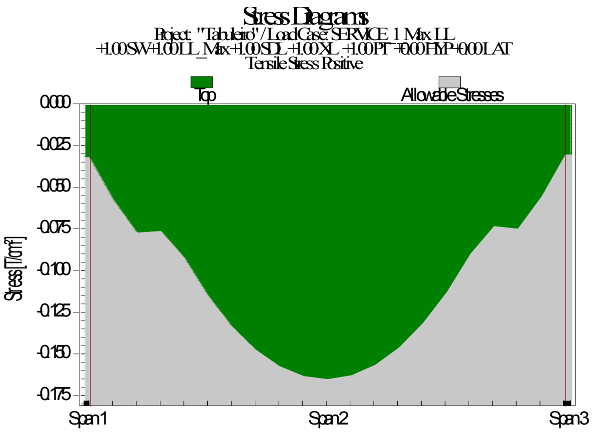
Load case: hyper static load

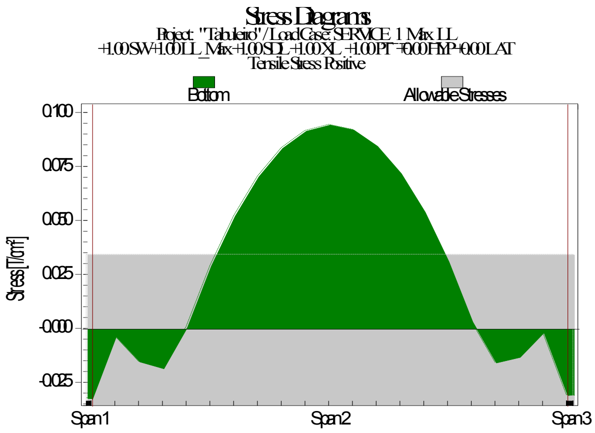




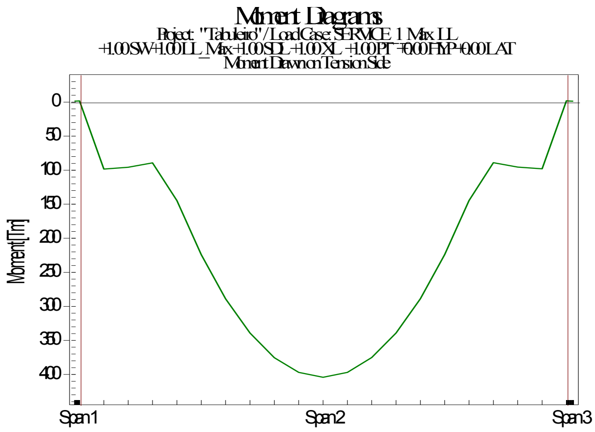
Moment **shear**

Load combination: service_1_max_II

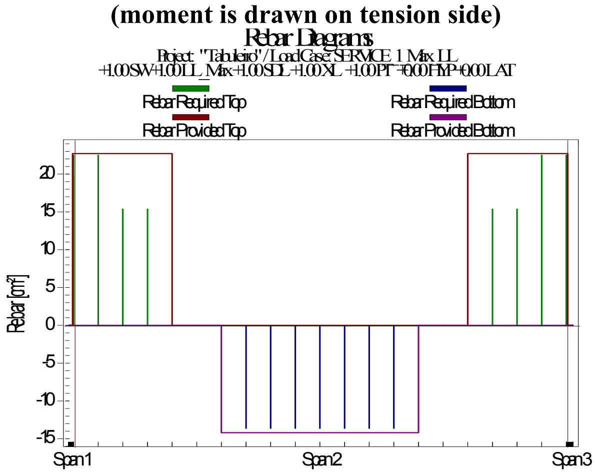




Service combination stresses
(tension stress positive)

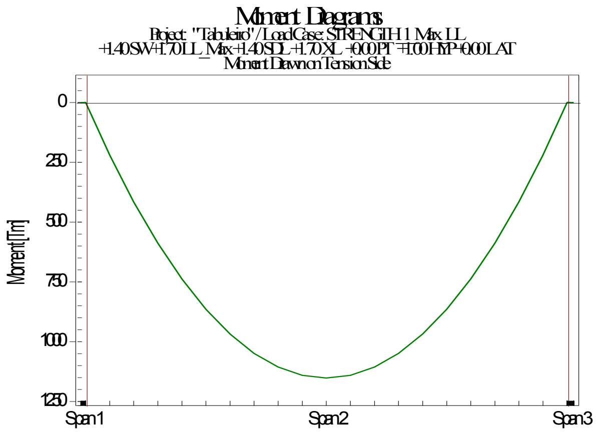


Design moment
(moment is drawn on tension side)

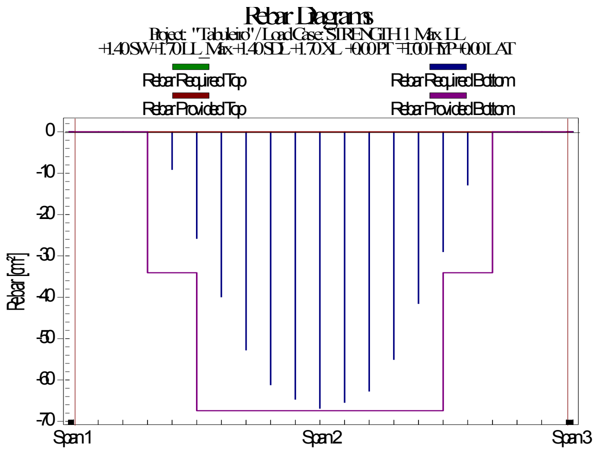


Reinforcement
Required and provided

Load combination: strength_1_max_II

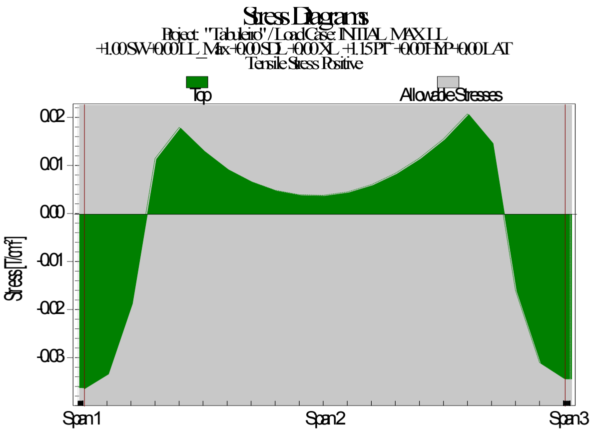


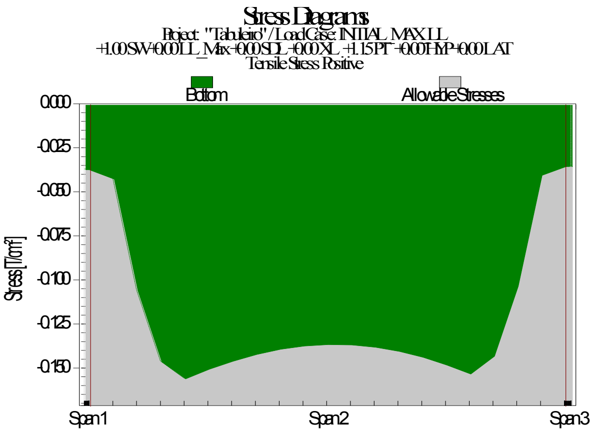
Design moment
(moment is drawn on tension side)



Reinforcement
Required and provided

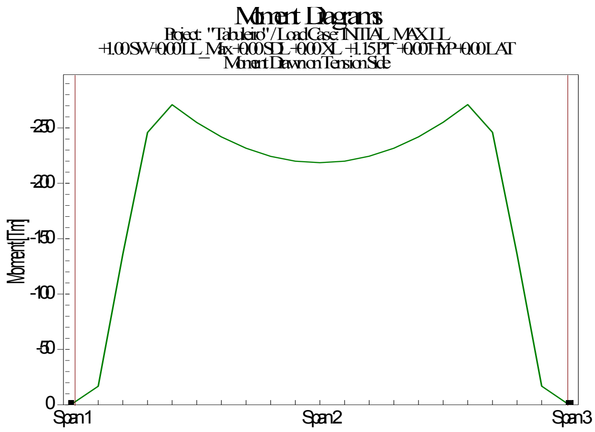
Load combination: initial_max_ll





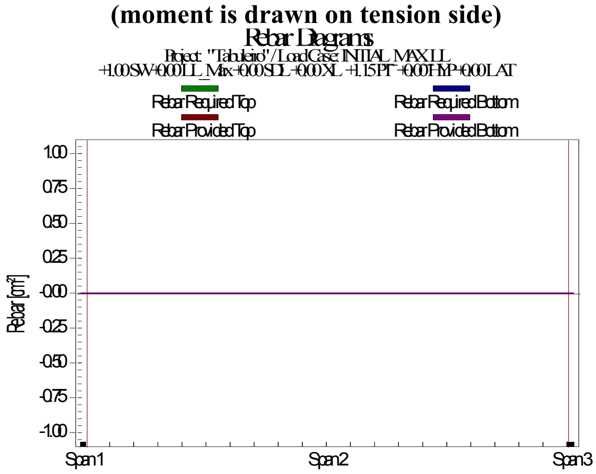
Service combination stresses

(tension stress positive)



Design moment

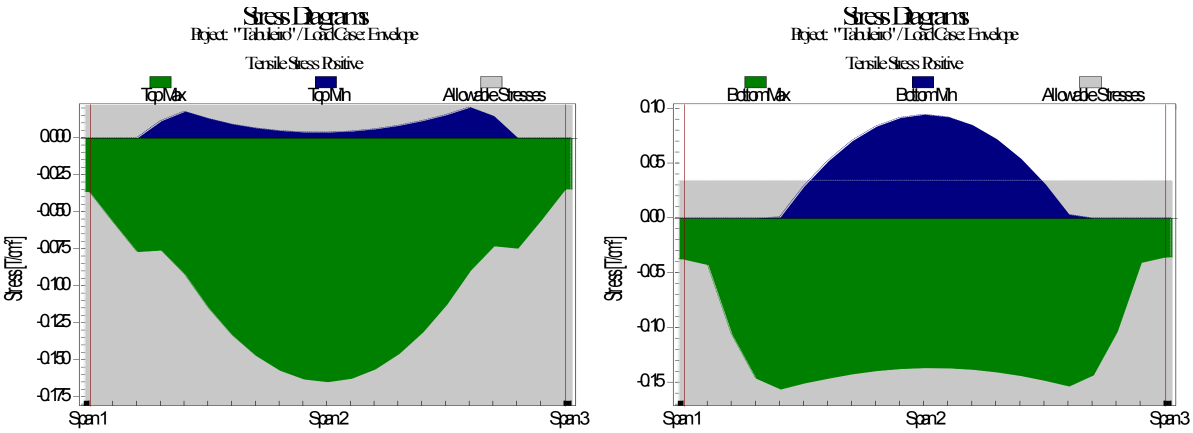
(moment is drawn on tension side)



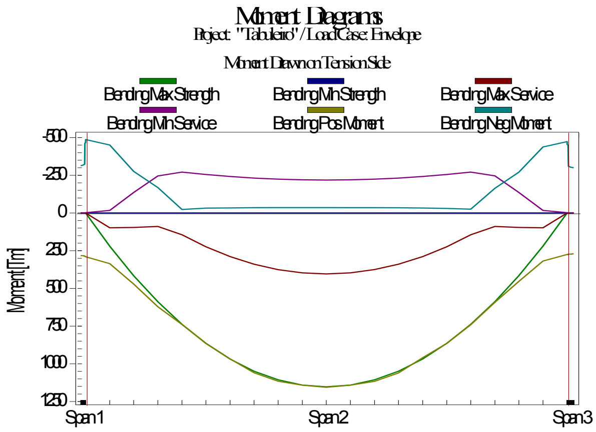
Reinforcement

Required and provided

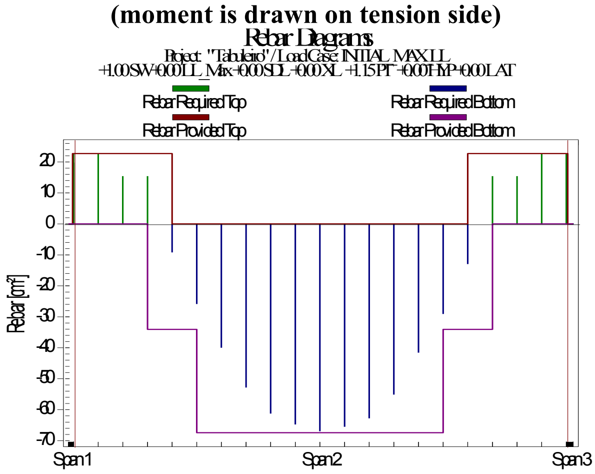
Load combination: envelope



Service combination stresses
(tension stress positive)



Design moment
(moment is drawn on tension side)



Reinforcement
Required and provided

Legend (2.2):

Span	c = cantilever
Seg.	Segment number
Form	1 = rectangular, 2 = t or inverted l, 3 = i, 4 = extended t or l section
Rh	elevation of top surface
Tf	top flange
Mf	middle flange
Bf	bottom flange

Legend (2.7):
The column boundary condition (cbc):

Fixed at both	1
Hinged at near end, fixed at far end	2
Fixed at near end, hinged at far end	3
Fixed at near end, roller with rotational fixity at far end	4
Lc	lower column
Uc	upper column

Legend (3.1):

Class: sw: selfweight, ll: live load, sdl: superimposed dead load, x: other loading
Type: u: uniform, p: partial uniform, l: line load, m: applied moment
c: concentrated load, r: triangle, v: variable, t: trapezoidal

Legend (4.1, 4.2):
Yb: distance from centroid to bottom fiber
Yt: distance from centroid to top fiber
I: gross moment of inertia

Legend (7.1):
Type
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon
4 = straight tendon
5 = extended reversed parabola

Legend (7.2):
Cgs c1: cgs of left middle point of tendon for type 5 profile
Cgs c2: cgs of right middle point of tendon for type 5 profile or middle point of other types

Legend (7.3):
From: starting span of tendon
To: end span of tendon
Extension: extension of the tendon after last span into the next span normalized to then span length

Legend (10.1, 11.1):
From: beginning of rebar measured from left support of the span
To: end of rebar measured from left support of the span
As required: envelope of minimum and ultimate rebar
Ultimate: required rebar for ultimate load combinations
Minimum: required minimum rebar

Legend (10.2, 11_2):
Id: id number of the bar as shown on graph
From: beginning of rebar measured from left support of the span
Quantity: number of bars
Size: bar number
Length: total length of the bar
Area: area of reinforcement

Legend (12):
D: effective depth of section for shear rebar calculation
Vu: ultimate shear
Ratio: ratio of ultimate to allowable shear stress

Req.: required shear reinforcement per unit length
Spacing: spacing between shear rebar

Legend (15.3):
Fl: friction loss
Ltl: long term loss

Legend (22):
Type
1 = uniform 2 = concentrated
3 = partial uniform 4 = applied moment

16.8.18 Longarina 2

Para o detalhamento das longarinas foi utilizado os esforços da longarina mais solicitada.

A seguir são apresentados os dados e resultados do cálculo/dimensionamento das longarinas pré-moldadas:

Longarina 2

dados

número de peças do grupo: 7

comprimento da peça (cm): 2534.0

volume unitário | total (m3): 19.889 | 139.223

peso unitário | total (tf): 49.722 | 348.054

protensão

número de armaduras na peça: 28

força total na peça (tf): 336.28

peso de armadura na peça (kgf): 661.0

nível de protensão: ii - limitada

Armadura passiva

armadura superior nec | detalhada (cm2) | situação: 15.09 | 16.08 |ok

armadura inferior nec | detalhada (cm2) | situação: 47.48 | 49.09 |ok

fissuração

abertura de fissura máxima| limite (mm) | situação: 0.04 | 0.20 |ok

cisalhamento

faixa	montagem (cm2/m)		fasefinal (cm2/m)		
	asw,nec	asw,det	asw,nec	asw,det	situação
1	4.25	12.57	11.71	12.57	ok
2	4.25	12.57	11.06	12.57	ok
3	4.25	7.85	3.96	7.85	ok
4	4.25	12.57	11.06	12.57	ok

5	4.25	12.57	11.71	12.57	ok

apoios / dentes gerber

no início da peça: apoio sem recorte

- tirantes: as,nec =42.48cm2 | as,det =44.18cm2

- costuras: as,nec = 7.37cm2 | as,det = 8.04cm2

- estribos: as,nec = 5.18cm2 | as,det = 7.36cm2

no fim da peça: apoio sem recorte

- tirantes: as,nec =42.48cm2 | as,det =44.18cm2

- costuras: as,nec = 7.37cm2 | as,det = 8.04cm2

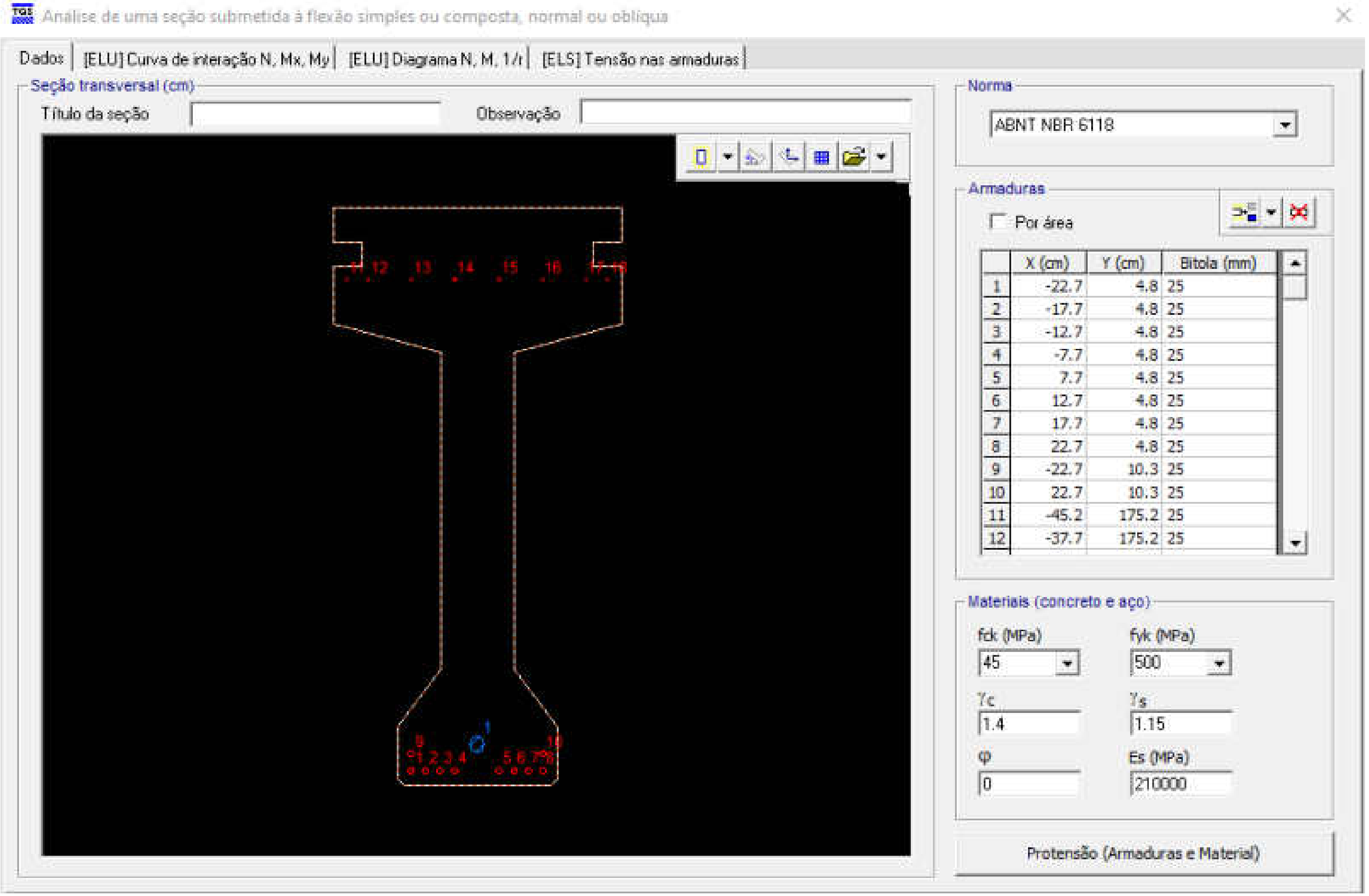
- estribos: as,nec = 5.18cm2 | as,det = 7.36cm2

16.8.19 Armadura passiva

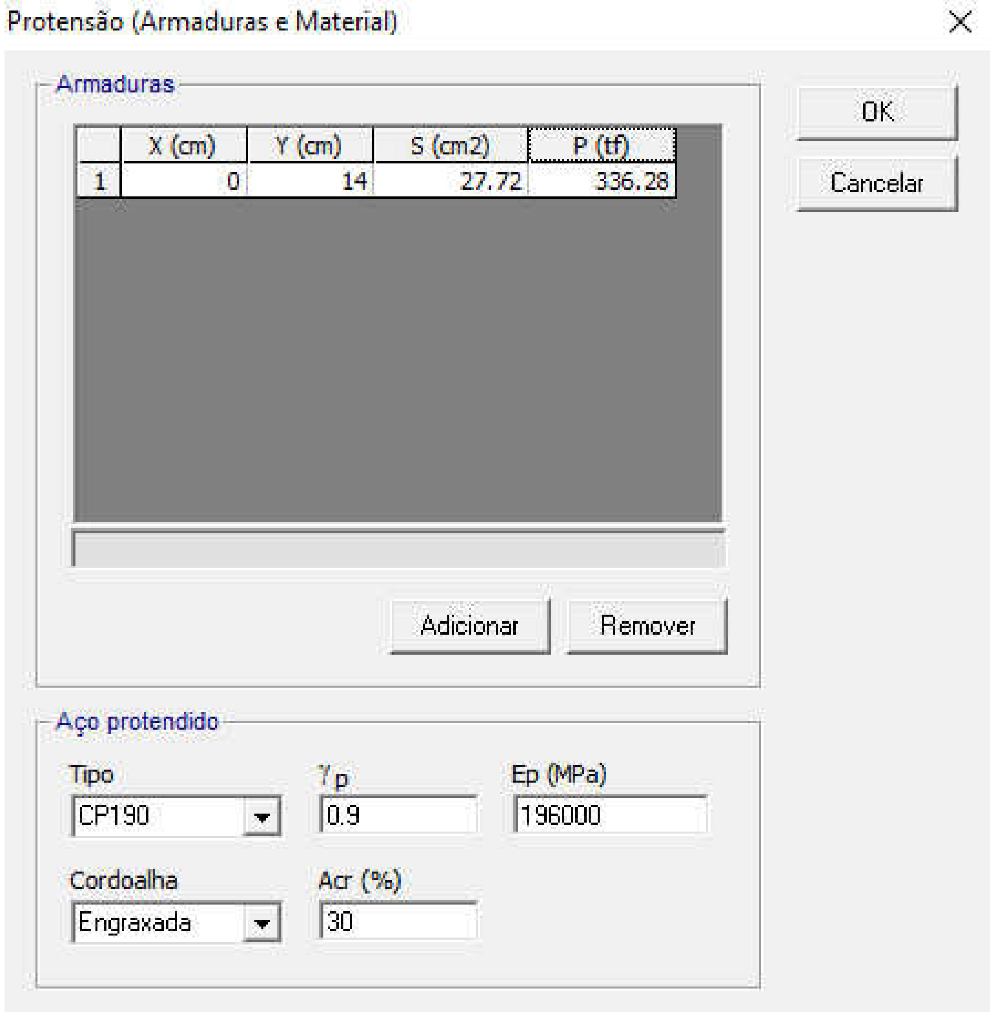
O cálculo da armadura passiva foi feito utilizando a calculadora de flexão composta oblíqua do tqs.

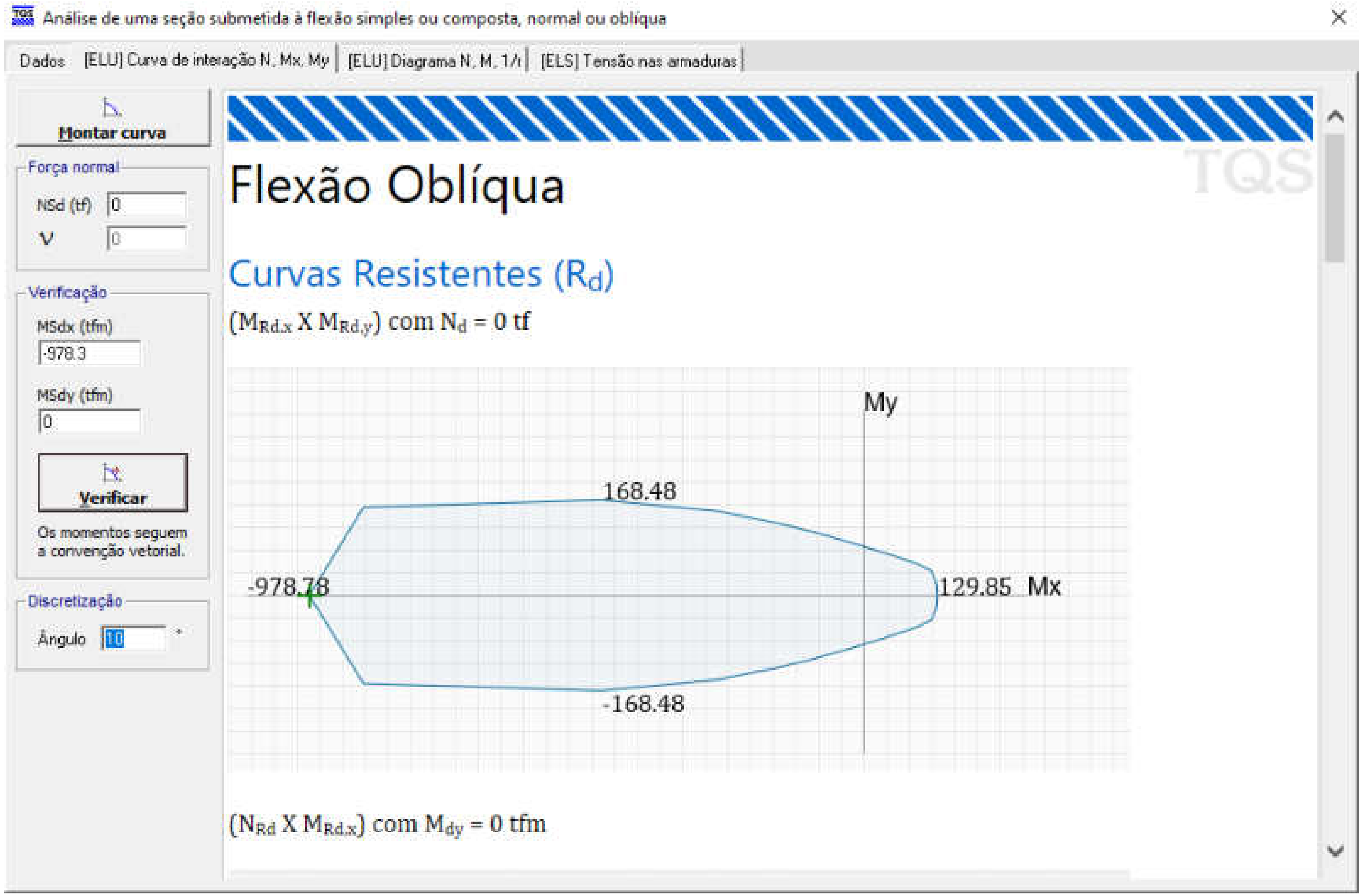
A seguir temos todas as informações necessárias para o cálculo: a seção utilizada, o concreto e as armaduras, ativas e passivas.

- Armadura positiva: 10 barras de 25 mm;
- Armadura negativa: 8 barras de 16 mm;
- Protensão: 28 cordoalhas de 12.7 mm não aderente – aço cp190 rb-ep / arcelormittal ou similar.



	X (cm)	Y (cm)	Bitola (mm)
1	-22.7	4.8	25
2	-17.7	4.8	25
3	-12.7	4.8	25
4	-7.7	4.8	25
5	7.7	4.8	25
6	12.7	4.8	25
7	17.7	4.8	25
8	22.7	4.8	25
9	-22.7	10.3	25
10	22.7	10.3	25
11	-45.2	175.2	25
12	-37.7	175.2	25


Protensão (Armaduras e Material)
Armaduras
X (cm)
Y (cm)
S (cm2)
P (tf)
1
0
14
27.72
336.28
OK
Cancelar
Adicionar
Remover
Aço protendido
Tipo
CP190
γp
0.9
Ep (MPa)
196000
Cordoalha
Engraxada
Acr (%)
30


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 0
ν 0
Verificação
MSdx (tfm) -978.3
MSdy (tfm) 0
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
TQS
Flexão Oblíqua
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 0 tf
My
168.48
-978.78
129.85
Mx
-168.48
(NRd X MRd,x) com Mdy = 0 tfm

16.8.20 Protensão

Tabuleiro
Longarina 2

Quinta-feira, 13 de janeiro de 2022

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graphical reports

pt-force

pt-profile

deflection

load cases

- selfweight
- super imposed dead
- live
- other
- prestressing
- hyper-static

load combinations

- service_1_max_ll
- strength_1_max_ll
- initial_max_ll
- envelope

legend

A. Design parameters and load combinations

A.1 project design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	300.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Aci-318 (1999)

A.2 load combinations

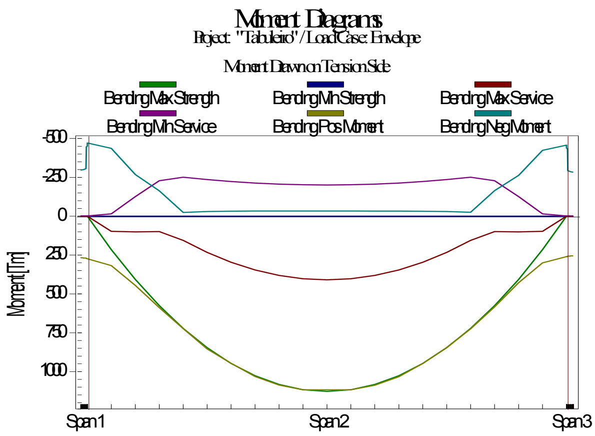
Strength load combinations
1. 1.4 sw + 1.7 ll + 1.4 sdl + 1.7 x + 1 hyp

Service load combinations
sustained load
1. 1 sw + 1 ll + 1 sdl + 1 x + 1 pt

Initial load combinations
1 sw + 1.15 pt

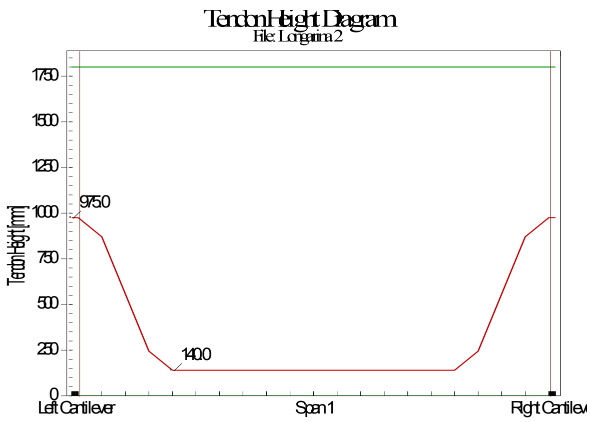
B. Design strip report: longarina 2
B.3 design moment

Load combination: envelope



Design moment
(moment is drawn on tension side)

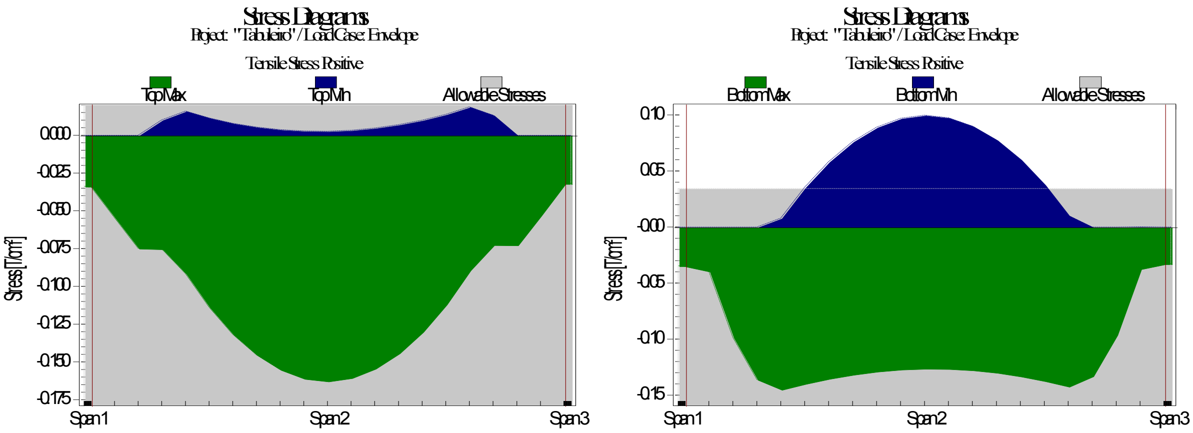
B.4 tendon profile



Post-tensioning
Profile

B.5 stress check results / code check

Load combination: envelope



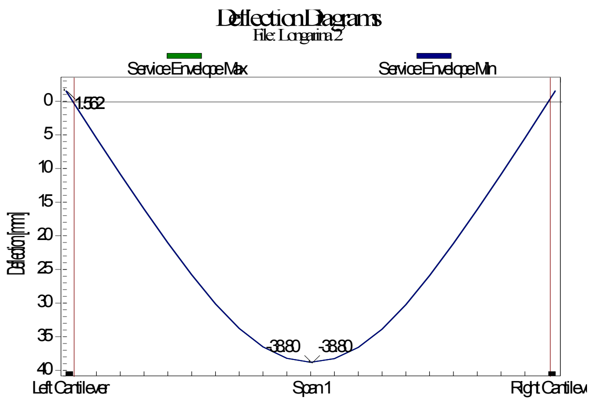
Service combination stresses
(tension stress positive)

B.6 rebar report

total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.28	32	3	5.00	22.72
1	2	Top	19.71	32	3	5.00	22.72
1	3	Bot	3.40	47	3	19.08	33.37
1	4	Bot	5.86	47	3	12.92	33.37

B.8 deflection



Deflection

B.9 quantities

Concrete
total volume of concrete = 19.93 m3
area covered = 25.34 m2

Mild steel
total weight of rebar = 1028.55 kg

average rebar usage = 40.59 kg/m2, 51.60 kg/m3

Prestressing material
Total weight of tendon = 573.2 kg
Average tendon usage = 22.62 kg/m2, 28.75 kg/m3

1 - user specified general analysis and design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	300.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Aci-318 (1999)

2 - input geometry

2.1 principal span data of uniform spans

Span	Form	Length	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
		M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
C	2	0.35	55.00	180.00	100.00	25.00			180.00	0.50	0.50
C	2	0.35	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.2 detailed data for nonuniform spans

Span	Seg.	Form	Left dist.	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
			M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
1	1	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	2	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	3	2	1.65	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	4	3	1.65	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	5	3	22.99	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	6	2	22.99	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	7	2	24.64	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.7 support width and column data

Joint	Support width	Length lc	B(dia.) Lc	D lc	% lc	Cbc lc	Length uc	B(dia.) Uc	D uc	% uc	Cbc uc
	Cm	M	Cm	Cm			M	Cm	Cm		
1	0.0	0.0	0.0	0.0	100	(1)					
2	0.0	0.0	0.0	0.0	100	(1)					

3 - input applied loading

3.1 loading as appears in user's input screen

Span	Class	Type	W	P1	P2	A	B	C	F	M
			T/m2	T/m	T/m	M	M	M	T	T-m
Cant	Ll	L		5.556		0.000	0.350			
Cant	D	L		2.733		0.000	0.350			
Cant	Sdl	L		1.834		0.000	0.350			
1	Ll	L		5.556		0.000	24.640			
1	D	L		2.733		0.000	1.650			
1	D	L		1.818		1.650	22.990			
1	D	L		2.733		22.990	24.640			
1	Sdl	L		1.834		0.000	24.640			
Cant	Ll	L		5.556		0.000	0.350			
Cant	D	L		2.733		0.000	0.350			
Cant	Sdl	L		1.834		0.000	0.350			

3.2 compiled loads

Span	Class	Type	P1	P2	F	M	A	B	C	Reduction factor
			T/m	T/m	T	T-m	M	M	M	%
Cl	Ll	P	5.556				0.000	0.350		0.000
Cl	Sw	P	2.733				0.000	0.350		
Cl	Sdl	P	1.834				0.000	0.350		
1	Ll	P	5.556				0.000	24.640		0.000
1	Sw	P	2.733				0.000	1.650		
1	Sw	P	1.818				1.650	22.990		
1	Sw	P	2.733				22.990	24.640		
1	Sdl	P	1.834				0.000	24.640		
Cr	Ll	P	5.556				0.000	0.350		0.000
Cr	Sw	P	2.733				0.000	0.350		
Cr	Sdl	P	1.834				0.000	0.350		

4 - calculated section properties

4.1 section properties of uniform spans and cantilevers

Span	Area	I	Yb	Yt
	Cm2	Cm4	Cm	Cm
Cant	11025.00	0.33e+08	97.91	82.09
1	---	---	---	---
Cant	11025.00	0.33e+08	97.91	82.09

4.2 section properties for non-uniform spans

Span	Segment	Area	I	Yb	Yt
		Cm2	Cm4	Cm	Cm
1	1	11025.00	0.33e+08	97.91	82.09
1	2	11025.00	0.33e+08	97.91	82.09
1	3	11025.00	0.33e+08	97.91	82.09
1	4	7275.00	0.28e+08	100.70	79.30
1	5	7275.00	0.28e+08	100.70	79.30
1	6	11025.00	0.33e+08	97.91	82.09
1	7	11025.00	0.33e+08	97.91	82.09

5 - moments, shears and reactions

5.1 span moments and shears (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right	shear left	shear right
		T-m	T-m	T-m	T	T
Cant	Sw	-----	-----	-0.17	-----	0.96
1	Sw	-0.17	139.05	-0.17	-23.91	23.91
Cant	Sw	-0.17	-----	-----	-0.96	-----
Cant	Sdl	-----	-----	-0.11	-----	0.64
1	Sdl	-0.11	139.07	-0.11	-22.59	22.59
Cant	Sdl	-0.11	-----	-----	-0.64	-----
Cant	Xl	-----	-----	0.00	-----	0.00
1	Xl	0.00	0.00	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----	0.00	-----

5.2 reactions and column moments (excluding live load)

Joint	Load case	Reaction	Moment lower column	Moment upper column
		T	T-m	T-m
1	Sw	24.86	0.00	0.00
2	Sw	24.86	0.00	0.00
1	Sdl	23.24	0.00	0.00
2	Sdl	23.24	0.00	0.00
1	Xl	0.00	0.00	0.00
2	Xl	0.00	0.00	0.00

5.3 span moments and shears (live load)

Span	moment left max	moment left min	Moment midspan max	Moment midspan min	Moment right max	Moment right min	shear left	shear right
	T-m	T-m	T-m	T-m	T-m	T-m	T	T
Cl	-----	-----	-----	-----	-0.34	-----	-----	1.94
1	-0.34	-0.34	421.31	421.31	-0.34	-0.34	-68.45	68.45
Cr	-0.34	-----	-----	-----	-----	-----	-1.94	-----

5.4 reactions and column moments (live load)

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	70.39	70.39	0.00	0.00	0.00	0.00
2	70.39	70.39	0.00	0.00	0.00	0.00

6 - moments reduced to face of support

6.1 reduced moments at face of support (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right
		T-m	T-m	T-m
Cant	Sw	-----	-----	-0.17
1	Sw	-0.17	139.00	-0.17
Cant	Sw	-0.17	-----	-----
Cant	Sdl	-----	-----	-0.11
1	Sdl	-0.11	139.10	-0.11
Cant	Sdl	-0.11	-----	-----
Cant	Xl	-----	-----	0.00
1	Xl	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----

6.2 reduced moments at face of support (live load)

Span	Moment left	Moment left	Moment	Moment	Moment	Moment

	max	min	midspan max	midspan min	right max	right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.34	-----
1	-0.34	-0.34	421.30	421.30	-0.34	-0.34
Cr	-0.34	-----	-----	-----	-----	-----

7 - selected post-tensioning forces and tendon profiles

7.1 tendon profile

Tendon a

Span	Type	X1/l	X2/l	X3/l	A/l
Cl	3	---	---	0.100	---
1	5	0.200	0.200	---	---
Cr	3	0.100	---	---	---

7.2 selected post-tensioning forces and tendon drape

Tendon a

Span	Force	Cgs left	Cgs c1	Cgs c2	Cgs right	P/a	Wbal	Wbal (%dl)
	T	Cm	Cm	Cm	Cm	Kg/cm2	T/-	
Cl	327.913	97.50	---	---	97.50	29.76	0.000	0
1	342.228	97.50	14.00	14.00	97.50	46.58	9.322	25
Cr	310.795	97.50	---	---	97.50	28.21	0.000	0

All tendons

Span	Force	Total p/a	Total wbal (%dl)
	T	Kg/cm2	
Cl	327.913	29.76	0
1	342.228	46.58	25
Cr	310.795	28.21	0

approximate weight of strand: 573.2 kg

7.3 tendon extents and stressing conditions

Type	Num	Force	Left end	Right end	From	To	Extension
A	28	12.01	Dead	Live	Cl	Cr	---

7.4 required minimum post-tensioning forces

	based on stress conditions			based on minimum p/a		
Type	Left	Center	Right	Left	Center	Right
	T	T	T	T	T	T
Cl	-----	-----	0.00	-----	-----	104.74
1	0.00	488.09	0.00	104.74	69.11	104.74
Cr	0.00	-----	-----	104.74	-----	-----

7.5 service stresses (tension shown positive)

Envelope of service 1

Span	Left top	Left bottom	Center top	Center bottom	Right top	Right bottom
	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
Cl	-----	-----	-----	-----	-29.27	-30.34
1	-29.46	-30.54	-162.68	99.79	-28.12	-29.16
Cr	-27.74	-28.78	-----	-----	-----	-----

7.6 post-tensioning balance moments, shears and reactions

Span moments and shears

Span	Moment left	Moment center	Moment right	Shear left	Shear right
	T-m	T-m	T-m	T	T
Cl	-----	-----	-1.34	-----	0.00
1	-1.34	-294.00	-1.26	0.00	0.00

Cr	-1.27	-----	-----	0.00	-----

Reactions and column moments

Joint	Reaction	Moment lower column	Moment upper column
	T	T-m	T-m
1	0.003	0.000	0.000
2	-0.003	0.000	0.000

Note: moments are reported at centerline

8 - factored moments and reactions envelope

8.1 factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.97	-----
1	-0.98	-0.98	1105.55	1105.55	-0.98	-0.98
Cr	-0.97	-----	-----	-----	-----	-----

8.2 reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	187.01	187.01	0.00	0.00	0.00	0.00
2	187.00	187.00	0.00	0.00	0.00	0.00

8.3 secondary moments

Span	Left	Midspan	Right
	T-m	T-m	T-m
1	0.00	0.00	0.00

8.4 factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.30	-0.30	-0.98	-0.98	0.00	0.00
1	-0.99	-0.99	1116.75	1116.75	-0.99	-0.99	0.00	0.00
Cr	-0.98	-0.98	-0.24	-0.24	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

10 - mild steel - no redistribution

10.1 required rebar

10.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.30	0.35	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	3.70	22.56	0.00	22.56	0.00	0.00
1	Top	20.94	24.64	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.05	19.80	0.00	19.80	0.00	0.00
1	Bot	4.93	20.94	66.54	66.54	13.67	0.00	0.00

10.2 provided rebar

10.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.28	32	3	5.00	22.72
1	2	Top	19.71	32	3	5.00	22.72
1	3	Bot	3.40	47	3	19.08	33.37
1	4	Bot	5.86	47	3	12.92	33.37

10.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.28	32	3	0.07
1	1	Top	0.00	32	3	4.93
1	2	Top	19.71	32	3	4.93
Cr	2	Top	0.00	32	3	0.07
1	3	Bot	3.40	47	3	19.08
1	4	Bot	5.86	47	3	12.92

11 - mild steel - redistributed

11.1 required rebar

11.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.30	0.35	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	3.70	22.56	0.00	22.56	0.00	0.00
1	Top	20.94	24.64	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.05	19.80	0.00	19.80	0.00	0.00
1	Bot	4.93	20.94	66.92	66.92	13.67	0.00	0.00

11.2 provided rebar

11.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.28	32	3	5.00	22.72
1	2	Top	19.71	32	3	5.00	22.72
1	3	Bot	3.40	48	3	19.08	34.08
1	4	Bot	5.86	47	3	12.92	33.37

11.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.28	32	3	0.07
1	1	Top	0.00	32	3	4.93
1	2	Top	19.71	32	3	4.93
Cr	2	Top	0.00	32	3	0.07
1	3	Bot	3.40	48	3	19.08
1	4	Bot	5.86	47	3	12.92

12 - shear reinforcement

12.1 shear calculation envelope
Cl

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	0.00	-0.00	0.00	0.000	0.00

0.05	0.02	144.00	0.28	-0.00	0.00	0.000	0.00
0.10	0.04	144.00	0.55	-0.01	0.00	0.000	0.00
0.15	0.05	144.00	0.83	-0.02	0.00	0.000	0.00
0.20	0.07	144.00	1.11	-0.04	0.01	0.000	0.00
0.25	0.09	144.00	1.39	-0.06	0.01	0.000	0.00
0.30	0.11	144.00	1.66	-0.09	0.01	0.000	0.00
0.35	0.12	144.00	1.93	-0.12	0.01	0.000	0.00
0.40	0.14	144.00	2.22	-0.16	0.01	0.000	0.00
0.45	0.16	144.00	2.50	-0.20	0.01	0.000	0.00
0.50	0.17	144.00	2.77	-0.25	0.01	0.000	0.00
0.55	0.19	144.00	3.05	-0.30	0.02	0.000	0.00
0.60	0.21	144.00	3.33	-0.36	0.02	0.000	0.00
0.65	0.23	144.00	3.60	-0.42	0.02	0.000	0.00
0.70	0.25	144.00	3.88	-0.48	0.02	0.000	0.00
0.75	0.26	144.00	4.16	-0.56	0.02	0.000	0.00
0.80	0.28	144.00	4.44	-0.63	0.02	0.000	0.00
0.85	0.30	144.00	4.71	-0.71	0.02	0.000	0.00
0.90	0.32	144.00	4.99	-0.80	0.03	0.000	0.00
0.95	0.33	144.00	5.27	-0.89	0.03	0.000	0.00
1.00	0.35	144.00	5.54	-0.99	0.03	0.000	0.00

Span 1

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-181.45	-1.00	0.96	1.515	60.00
0.05	1.23	144.00	-161.98	214.78	0.86	1.542	60.00
0.10	2.46	144.00	-143.53	406.42	1.88	11.670	11.48
0.15	3.70	155.60	-125.59	575.54	1.89	9.530	14.06
0.20	4.93	166.00	-107.65	722.02	1.96	7.960	16.83
0.25	6.16	166.00	-89.67	846.18	2.11	7.125	18.80
0.30	7.39	166.00	-71.74	947.40	1.81	4.838	27.69
0.35	8.62	166.00	-53.80	1026.50	1.36	2.132	60.00
0.40	9.86	166.00	-35.87	1082.57	0.90	1.807	60.00
0.45	11.09	166.00	-17.93	1116.21	0.45	0.000	0.00
0.50	12.32	166.00	0.00	1127.42	0.00	0.000	0.00
0.55	13.55	166.00	17.93	1116.21	0.45	0.000	0.00
0.60	14.78	166.00	35.87	1082.57	0.90	1.807	60.00
0.65	16.02	166.00	53.80	1026.50	1.36	2.132	60.00
0.70	17.25	166.00	71.74	947.40	1.81	4.838	27.69
0.75	18.48	166.00	89.67	846.18	2.11	7.125	18.80
0.80	19.71	166.00	107.65	722.02	1.96	7.960	16.83
0.85	20.94	155.60	125.59	575.54	1.89	9.530	14.06
0.90	22.18	144.00	143.53	406.42	1.88	11.670	11.48
0.95	23.41	144.00	161.98	214.78	0.86	1.447	60.00
1.00	24.64	144.00	181.45	-1.00	0.96	1.427	60.00

Cr

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-5.54	-0.99	0.03	0.000	0.00
0.05	0.02	144.00	-5.27	-0.89	0.03	0.000	0.00
0.10	0.04	144.00	-4.99	-0.80	0.03	0.000	0.00
0.15	0.05	144.00	-4.71	-0.71	0.02	0.000	0.00
0.20	0.07	144.00	-4.44	-0.63	0.02	0.000	0.00
0.25	0.09	144.00	-4.16	-0.56	0.02	0.000	0.00
0.30	0.11	144.00	-3.88	-0.48	0.02	0.000	0.00
0.35	0.12	144.00	-3.60	-0.42	0.02	0.000	0.00
0.40	0.14	144.00	-3.33	-0.36	0.02	0.000	0.00
0.45	0.16	144.00	-3.05	-0.30	0.02	0.000	0.00
0.50	0.17	144.00	-2.77	-0.25	0.01	0.000	0.00
0.55	0.19	144.00	-2.50	-0.20	0.01	0.000	0.00

0.60	0.21	144.00	-2.22	-0.16	0.01	0.000	0.00
0.65	0.23	144.00	-1.93	-0.12	0.01	0.000	0.00
0.70	0.25	144.00	-1.66	-0.09	0.01	0.000	0.00
0.75	0.26	144.00	-1.39	-0.06	0.01	0.000	0.00
0.80	0.28	144.00	-1.11	-0.04	0.01	0.000	0.00
0.85	0.30	144.00	-0.83	-0.02	0.00	0.000	0.00
0.90	0.32	144.00	-0.55	-0.01	0.00	0.000	0.00
0.95	0.33	144.00	-0.28	-0.00	0.00	0.000	0.00
1.00	0.35	144.00	0.00	-0.00	0.00	0.000	0.00

Note: "vu" is related to the load combination which produces the maximum "ratio"
Note: sections with **** have exceeded the maximum allowable shear stress.

14 - deflections

14.1 maximum span deflections

Span	Sw	Sw+pt	Sw+pt+sdl	Sw+pt+sdl+creep	Ll	X	Total
	Cm	Cm	Cm	Cm	Cm	Cm	Cm
Cl	0.0	0.1	0.0	0.1(483)	-0.2(194)	0.0(*****)	-0.1(324)
1	1.0	-1.4	-0.4	-1.2(2017)	4.3(574)	0.0(*****)	3.1(803)
Cr	0.0	0.1	0.0	0.1(483)	-0.2(193)	0.0(*****)	-0.1(322)

Note: deflections are calculated using effective moment of inertia of cracked sections.

15 - friction, elongation and long term losses

15.1 input parameters

Parameter	Value	Parameter	Value
Type of strand	Low relaxation	Coefficient of angular friction (meu)	0.07000 1/rad
Age of concrete at stressing	5 days	Coefficient of wobble friction (k)	0.00350 rad/m
Ec at stressing	265.92 t/cm2	Ratio of jacking stress	0.77
Average relative humidity	70.00 percent	Anchor set	10.00 mm
Volume to surface ratio of members	8.00 cm	Tendon_a stressing method	Right side
Es of strand	1960.00 t/cm2		

15.2 long-term losses

Tendon	Span	Left	Center	Right
		T/cm2	T/cm2	T/cm2
Tendon_a	Cl	1.03	1.03	1.03
Tendon_a	1	1.05	1.07	1.00
Tendon_a	Cr	0.99	0.99	0.99

15.3 calculated stresses after friction and long-term losses

Tendon	Span	Stress left fl only	Stress center fl only	Stress right fl only	Stress left fl+ltl	Stress center fl+ltl	Stress right fl+ltl
		T/cm2	T/cm2	T/cm2	T/cm2	T/cm2	T/cm2
Tendon_a	Cl	12.80	12.81	12.90	11.78	11.78	11.86
Tendon_a	1	12.90	13.35	12.22	11.86	12.28	11.23
Tendon_a	Cr	12.22	12.21	12.20	11.23	11.22	11.21

15.6 summary

Tendon	Force	Ext. Left	Start span	End span	Ext. Right	Elong. Left	Elong right	Anchor left	Anchor right	Max stress ratio
	T					Cm	Cm			
Tendon_a	11.59	0.00	Cl	3	0.00	0.00	17.10	0.66	0.63	0.70

21 - tendon heights

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cl			
0.00	0.000	975.00	979.08	979.08
0.05	0.018	975.00	981.01	981.01
0.10	0.035	975.00	986.79	986.79
0.15	0.053	975.00	996.43	996.43
0.20	0.070	975.00	1009.92	1009.92
0.25	0.087	975.00	1027.26	1027.26
0.30	0.105	975.00	1048.46	1048.46
0.35	0.122	975.00	1073.52	1073.52
0.40	0.140	975.00	1102.43	1102.43
0.45	0.157	975.00	1135.19	1135.19
0.50	0.175	975.00	1171.81	1171.81
0.55	0.193	975.00	1212.28	1212.28
0.60	0.210	975.00	1256.61	1256.61
0.65	0.227	975.00	1304.79	1304.79
0.70	0.245	975.00	1356.83	1356.83
0.75	0.262	975.00	1412.72	1412.72
0.80	0.280	975.00	1472.47	1472.47
0.85	0.298	975.00	1536.07	1536.07
0.90	0.315	975.00	1603.53	1603.53
0.95	0.332	975.00	1674.84	1674.84
1.00	0.350	975.00	1750.00	1750.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Span 1			
0.00	0.000	975.00	1750.00	1750.00
0.05	1.232	870.63	1665.00	1665.00
0.10	2.464	557.50	1409.99	1409.99
0.15	3.696	244.38	1091.23	1091.23
0.20	4.928	140.00	814.98	814.98
0.25	6.160	140.00	581.22	581.22
0.30	7.392	140.00	389.97	389.97
0.35	8.624	140.00	241.21	241.21
0.40	9.856	140.00	134.96	134.96
0.45	11.088	140.00	71.21	71.21
0.50	12.320	140.00	49.96	49.96
0.55	13.552	140.00	71.21	71.21
0.60	14.784	140.00	134.96	134.96
0.65	16.016	140.00	241.21	241.21
0.70	17.248	140.00	389.97	389.97
0.75	18.480	140.00	581.22	581.22
0.80	19.712	140.00	814.98	814.98
0.85	20.944	244.38	1091.23	1091.23
0.90	22.176	557.50	1409.99	1409.99
0.95	23.408	870.63	1665.00	1665.00
1.00	24.640	975.00	1750.00	1750.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cr			
0.00	0.000	975.00	1750.00	1750.00
0.05	0.018	975.00	1674.84	1674.84
0.10	0.035	975.00	1603.53	1603.53
0.15	0.053	975.00	1536.07	1536.07
0.20	0.070	975.00	1472.47	1472.47
0.25	0.087	975.00	1412.72	1412.72
0.30	0.105	975.00	1356.83	1356.83
0.35	0.122	975.00	1304.79	1304.79
0.40	0.140	975.00	1256.61	1256.61
0.45	0.157	975.00	1212.28	1212.28
0.50	0.175	975.00	1171.81	1171.81
0.55	0.193	975.00	1135.19	1135.19
0.60	0.210	975.00	1102.43	1102.43
0.65	0.227	975.00	1073.52	1073.52
0.70	0.245	975.00	1048.46	1048.46
0.75	0.262	975.00	1027.26	1027.26
0.80	0.280	975.00	1009.92	1009.92
0.85	0.298	975.00	996.43	996.43
0.90	0.315	975.00	986.79	986.79
0.95	0.332	975.00	981.01	981.01
1.00	0.350	975.00	979.08	979.08

22 - post-tensioning balanced loading

Span	Type	W	F	M	A	B
		T/m	T	T-m	M	M
1	3	46.610			0.00	2.46
1	3	46.610			22.18	24.64
1	3	-46.610			2.46	4.93
1	3	-46.610			19.71	22.18
1	4			9.69	1.65	
1	4			-9.69	22.99	
Cl	4			1.34	0.35	
Cr	4			-1.27	0.35	

23 - detailed moments

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.34	0.00
0.05	0.02	0.00	0.00	0.00	0.00	0.00	-1.34	0.00
0.10	0.04	0.00	0.00	0.00	0.00	0.00	-1.34	0.00
0.15	0.05	0.00	0.00	0.00	-0.01	-0.01	-1.34	0.00
0.20	0.07	-0.01	0.00	0.00	-0.01	-0.01	-1.34	0.00
0.25	0.09	-0.01	-0.01	0.00	-0.02	-0.02	-1.34	0.00
0.30	0.11	-0.02	-0.01	0.00	-0.03	-0.03	-1.34	0.00
0.35	0.12	-0.02	-0.01	0.00	-0.04	-0.04	-1.34	0.00
0.40	0.14	-0.03	-0.02	0.00	-0.05	-0.05	-1.34	0.00
0.45	0.16	-0.03	-0.02	0.00	-0.07	-0.07	-1.34	0.00
0.50	0.18	-0.04	-0.03	0.00	-0.09	-0.09	-1.34	0.00
0.55	0.19	-0.05	-0.03	0.00	-0.10	-0.10	-1.34	0.00
0.60	0.21	-0.06	-0.04	0.00	-0.12	-0.12	-1.34	0.00
0.65	0.23	-0.07	-0.05	0.00	-0.14	-0.14	-1.34	0.00
0.70	0.25	-0.08	-0.06	0.00	-0.17	-0.17	-1.34	0.00
0.75	0.26	-0.09	-0.06	0.00	-0.19	-0.19	-1.34	0.00

0.80	0.28	-0.11	-0.07	0.00	-0.22	-0.22	-1.34	0.00
0.85	0.30	-0.12	-0.08	0.00	-0.25	-0.25	-1.34	0.00
0.90	0.32	-0.14	-0.09	0.00	-0.28	-0.28	-1.34	0.00
0.95	0.33	-0.15	-0.10	0.00	-0.31	-0.31	-1.34	0.00
1.00	0.35	-0.17	-0.11	0.00	-0.34	-0.34	-1.34	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.17	-0.11	0.00	-0.34	-0.34	-1.34	0.00
0.05	1.23	27.21	26.33	0.00	79.77	79.77	-36.70	0.00
0.10	2.46	50.75	49.99	0.00	151.45	151.45	-152.51	0.00
0.15	3.70	71.44	70.87	0.00	214.70	214.70	-258.63	0.00
0.20	4.93	89.38	88.96	0.00	269.51	269.51	-294.00	0.00
0.25	6.16	104.55	104.27	0.00	315.89	315.89	-293.99	0.00
0.30	7.39	116.97	116.80	0.00	353.84	353.84	-293.99	0.00
0.35	8.62	126.63	126.54	0.00	383.36	383.36	-293.98	0.00
0.40	9.86	133.53	133.50	0.00	404.44	404.44	-293.98	0.00
0.45	11.09	137.67	137.68	0.00	417.09	417.09	-293.98	0.00
0.50	12.32	139.05	139.07	0.00	421.31	421.31	-293.97	0.00
0.55	13.55	137.67	137.68	0.00	417.09	417.09	-293.97	0.00
0.60	14.78	133.53	133.50	0.00	404.44	404.44	-293.97	0.00
0.65	16.02	126.63	126.54	0.00	383.36	383.36	-293.96	0.00
0.70	17.25	116.97	116.80	0.00	353.84	353.84	-293.96	0.00
0.75	18.48	104.55	104.27	0.00	315.89	315.89	-293.96	0.00
0.80	19.71	89.38	88.96	0.00	269.51	269.51	-293.95	0.00
0.85	20.94	71.44	70.87	0.00	214.70	214.70	-258.58	0.00
0.90	22.18	50.75	49.99	0.00	151.45	151.45	-152.46	0.00
0.95	23.41	27.21	26.33	0.00	79.77	79.77	-36.64	0.00
1.00	24.64	-0.17	-0.11	0.00	-0.34	-0.34	-1.27	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.17	-0.11	0.00	-0.34	-0.34	-1.27	0.00
0.05	0.02	-0.15	-0.10	0.00	-0.31	-0.31	-1.27	0.00
0.10	0.04	-0.14	-0.09	0.00	-0.28	-0.28	-1.27	0.00
0.15	0.05	-0.12	-0.08	0.00	-0.25	-0.25	-1.27	0.00
0.20	0.07	-0.11	-0.07	0.00	-0.22	-0.22	-1.27	0.00
0.25	0.09	-0.09	-0.06	0.00	-0.19	-0.19	-1.27	0.00
0.30	0.11	-0.08	-0.06	0.00	-0.17	-0.17	-1.27	0.00
0.35	0.12	-0.07	-0.05	0.00	-0.14	-0.14	-1.27	0.00
0.40	0.14	-0.06	-0.04	0.00	-0.12	-0.12	-1.27	0.00
0.45	0.16	-0.05	-0.03	0.00	-0.10	-0.10	-1.27	0.00
0.50	0.18	-0.04	-0.03	0.00	-0.09	-0.09	-1.27	0.00
0.55	0.19	-0.03	-0.02	0.00	-0.07	-0.07	-1.27	0.00
0.60	0.21	-0.03	-0.02	0.00	-0.05	-0.05	-1.27	0.00
0.65	0.23	-0.02	-0.01	0.00	-0.04	-0.04	-1.27	0.00
0.70	0.25	-0.02	-0.01	0.00	-0.03	-0.03	-1.27	0.00
0.75	0.26	-0.01	-0.01	0.00	-0.02	-0.02	-1.27	0.00
0.80	0.28	-0.01	0.00	0.00	-0.01	-0.01	-1.27	0.00
0.85	0.30	0.00	0.00	0.00	-0.01	-0.01	-1.27	0.00
0.90	0.32	0.00	0.00	0.00	0.00	0.00	-1.27	0.00
0.95	0.33	0.00	0.00	0.00	0.00	0.00	-1.27	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	-1.27	0.00

24 - detailed shears

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary

	M	T	T	T	T	T	T	T
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.05	0.03	0.00	0.10	0.00	0.00	0.00
0.10	0.04	0.10	0.06	0.00	0.19	0.00	0.00	0.00
0.15	0.05	0.14	0.10	0.00	0.29	0.00	0.00	0.00
0.20	0.07	0.19	0.13	0.00	0.39	0.00	0.00	0.00
0.25	0.09	0.24	0.16	0.00	0.49	0.00	0.00	0.00
0.30	0.11	0.29	0.19	0.00	0.58	0.00	0.00	0.00
0.35	0.12	0.33	0.22	0.00	0.68	0.00	0.00	0.00
0.40	0.14	0.38	0.26	0.00	0.78	0.00	0.00	0.00
0.45	0.16	0.43	0.29	0.00	0.88	0.00	0.00	0.00
0.50	0.18	0.48	0.32	0.00	0.97	0.00	0.00	0.00
0.55	0.19	0.53	0.35	0.00	1.07	0.00	0.00	0.00
0.60	0.21	0.57	0.39	0.00	1.17	0.00	0.00	0.00
0.65	0.23	0.62	0.42	0.00	1.26	0.00	0.00	0.00
0.70	0.25	0.67	0.45	0.00	1.36	0.00	0.00	0.00
0.75	0.26	0.72	0.48	0.00	1.46	0.00	0.00	0.00
0.80	0.28	0.77	0.51	0.00	1.56	0.00	0.00	0.00
0.85	0.30	0.81	0.55	0.00	1.65	0.00	0.00	0.00
0.90	0.32	0.86	0.58	0.00	1.75	0.00	0.00	0.00
0.95	0.33	0.91	0.61	0.00	1.85	0.00	0.00	0.00
1.00	0.35	0.96	0.64	0.00	1.94	0.00	0.00	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-23.91	-22.59	0.00	0.00	-68.45	0.00	0.00
0.05	1.23	-20.54	-20.33	0.00	0.00	-61.60	57.42	0.00
0.10	2.46	-17.92	-18.08	0.00	0.00	-54.76	114.84	0.00
0.15	3.70	-15.68	-15.82	0.00	0.00	-47.92	57.42	0.00
0.20	4.93	-13.44	-13.56	0.00	0.00	-41.07	0.00	0.00
0.25	6.16	-11.20	-11.30	0.00	0.00	-34.22	0.00	0.00
0.30	7.39	-8.96	-9.04	0.00	0.00	-27.38	0.00	0.00
0.35	8.62	-6.72	-6.78	0.00	0.00	-20.53	0.00	0.00
0.40	9.86	-4.48	-4.52	0.00	0.00	-13.69	0.00	0.00
0.45	11.09	-2.24	-2.26	0.00	0.00	-6.84	0.00	0.00
0.50	12.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	13.55	2.24	2.26	0.00	6.84	0.00	0.00	0.00
0.60	14.78	4.48	4.52	0.00	13.69	0.00	0.00	0.00
0.65	16.02	6.72	6.78	0.00	20.53	0.00	0.00	0.00
0.70	17.25	8.96	9.04	0.00	27.38	0.00	0.00	0.00
0.75	18.48	11.20	11.30	0.00	34.22	0.00	0.00	0.00
0.80	19.71	13.44	13.56	0.00	41.07	0.00	0.00	0.00
0.85	20.94	15.68	15.82	0.00	47.92	0.00	-57.43	0.00
0.90	22.18	17.92	18.08	0.00	54.76	0.00	-114.85	0.00
0.95	23.41	20.54	20.33	0.00	61.60	0.00	-57.43	0.00
1.00	24.64	23.91	22.59	0.00	68.45	0.00	0.00	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-0.96	-0.64	0.00	0.00	-1.94	0.00	0.00
0.05	0.02	-0.91	-0.61	0.00	0.00	-1.85	0.00	0.00
0.10	0.04	-0.86	-0.58	0.00	0.00	-1.75	0.00	0.00
0.15	0.05	-0.81	-0.55	0.00	0.00	-1.65	0.00	0.00
0.20	0.07	-0.77	-0.51	0.00	0.00	-1.56	0.00	0.00
0.25	0.09	-0.72	-0.48	0.00	0.00	-1.46	0.00	0.00
0.30	0.11	-0.67	-0.45	0.00	0.00	-1.36	0.00	0.00
0.35	0.12	-0.62	-0.42	0.00	0.00	-1.26	0.00	0.00
0.40	0.14	-0.57	-0.39	0.00	0.00	-1.17	0.00	0.00
0.45	0.16	-0.53	-0.35	0.00	0.00	-1.07	0.00	0.00

0.50	0.18	-0.48	-0.32	0.00	0.00	-0.97	0.00	0.00
0.55	0.19	-0.43	-0.29	0.00	0.00	-0.88	0.00	0.00
0.60	0.21	-0.38	-0.26	0.00	0.00	-0.78	0.00	0.00
0.65	0.23	-0.33	-0.22	0.00	0.00	-0.68	0.00	0.00
0.70	0.25	-0.29	-0.19	0.00	0.00	-0.58	0.00	0.00
0.75	0.26	-0.24	-0.16	0.00	0.00	-0.49	0.00	0.00
0.80	0.28	-0.19	-0.13	0.00	0.00	-0.39	0.00	0.00
0.85	0.30	-0.14	-0.10	0.00	0.00	-0.29	0.00	0.00
0.90	0.32	-0.10	-0.06	0.00	0.00	-0.19	0.00	0.00
0.95	0.33	-0.05	-0.03	0.00	0.00	-0.10	0.00	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00

25 - factored moments and reactions

Load combination: 1.40sw + 1.70ll + 1.40sdl + 1.70xl + 1.00sec

Factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.97	-----
1	-0.98	-0.98	1105.59	1105.59	-0.98	-0.98
Cr	-0.97	-----	-----	-----	-----	-----

Reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	187.01	187.01	0.00	0.00	0.00	0.00
2	187.00	187.00	0.00	0.00	0.00	0.00

Factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.30	-0.30	-0.98	-0.98	0.00	0.00
1	-0.99	-0.99	1116.75	1116.75	-0.99	-0.99	0.00	0.00
Cr	-0.98	-0.98	-0.24	-0.24	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

27 - detailed stresses

Cl

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.05	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.10	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.15	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.20	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.25	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.30	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.35	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.40	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.45	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.50	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.55	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1

0.60	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.65	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.70	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-29.4	-30.1
0.75	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-29.4	-30.2
0.80	0.28	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.4	-30.2
0.85	0.30	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.4	-30.2
0.90	0.32	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.4	-30.2
0.95	0.33	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.4	-30.2
1.00	0.35	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.6	-30.4

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-33.8	-----	-34.6	-----	-29.4	-----	-30.1
0.05	0.02	-----	-33.8	-----	-34.6	-----	-29.4	-----	-30.1
0.10	0.04	-----	-33.8	-----	-34.6	-----	-29.4	-----	-30.1
0.15	0.05	-----	-33.8	-----	-34.6	-----	-29.4	-----	-30.1
0.20	0.07	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.1
0.25	0.09	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.1
0.30	0.11	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.35	0.12	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.40	0.14	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.45	0.16	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.50	0.18	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.55	0.19	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.60	0.21	-----	-33.8	-----	-34.7	-----	-29.4	-----	-30.2
0.65	0.23	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.2
0.70	0.25	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.2
0.75	0.26	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.3
0.80	0.28	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.3
0.85	0.30	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.3
0.90	0.32	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.3
0.95	0.33	-----	-33.8	-----	-34.7	-----	-29.3	-----	-30.3
1.00	0.35	-----	-34.0	-----	-35.0	-----	-29.5	-----	-30.5

Span 1

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-29.6	-30.4
0.05	1.23	-6.8	8.1	-6.6	7.8	0.0	0.0	-19.9	-19.9	23.8	23.8	-21.3	-41.4
0.10	2.46	-14.5	18.4	-14.3	18.1	0.0	0.0	-43.2	-43.2	54.8	54.8	-2.9	-101.6
0.15	3.70	-20.4	25.9	-20.2	25.7	0.0	0.0	-61.2	-61.2	77.8	77.8	26.6	-140.9
0.20	4.93	-25.5	32.4	-25.4	32.2	0.0	0.0	-76.9	-76.9	97.6	97.6	36.1	-154.2
0.25	6.16	-29.8	37.9	-29.7	37.8	0.0	0.0	-90.1	-90.1	114.4	114.4	35.9	-154.4
0.30	7.39	-33.4	42.4	-33.3	42.3	0.0	0.0	-100.9	-100.9	128.1	128.1	35.9	-154.4
0.35	8.62	-36.1	45.9	-36.1	45.8	0.0	0.0	-109.3	-109.3	138.8	138.8	36.1	-154.2
0.40	9.86	-38.1	48.4	-38.1	48.3	0.0	0.0	-115.3	-115.3	146.5	146.5	36.3	-154.0
0.45	11.09	-39.3	49.9	-39.3	49.9	0.0	0.0	-119.0	-119.0	151.0	151.0	36.6	-153.7
0.50	12.32	-39.7	50.4	-39.7	50.4	0.0	0.0	-120.2	-120.2	152.6	152.6	36.8	-153.5
0.55	13.55	-39.3	49.9	-39.3	49.9	0.0	0.0	-119.0	-119.0	151.0	151.0	37.0	-153.3
0.60	14.78	-38.1	48.4	-38.1	48.3	0.0	0.0	-115.3	-115.3	146.5	146.5	37.3	-153.0
0.65	16.02	-36.1	45.9	-36.1	45.8	0.0	0.0	-109.3	-109.3	138.8	138.8	37.5	-152.8
0.70	17.25	-33.4	42.4	-33.3	42.3	0.0	0.0	-100.9	-100.9	128.1	128.1	37.7	-152.6
0.75	18.48	-29.8	37.9	-29.7	37.8	0.0	0.0	-90.1	-90.1	114.4	114.4	37.9	-152.3
0.80	19.71	-25.5	32.4	-25.4	32.2	0.0	0.0	-76.9	-76.9	97.6	97.6	38.5	-151.8
0.85	20.94	-20.4	25.9	-20.2	25.7	0.0	0.0	-61.2	-61.2	77.8	77.8	29.3	-138.1
0.90	22.18	-14.5	18.4	-14.3	18.1	0.0	0.0	-43.2	-43.2	54.8	54.8	-0.7	-99.4
0.95	23.41	-6.8	8.1	-6.6	7.8	0.0	0.0	-19.9	-19.9	23.8	23.8	-19.4	-39.5
1.00	24.64	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-34.0	-----	-35.0	-----	-29.5	-----	-30.5
0.05	1.23	-----	-31.3	-----	-39.5	-----	-54.6	-----	-1.7
0.10	2.46	-----	-17.8	-----	-98.5	-----	-74.8	-----	-10.3
0.15	3.70	10.2	-----	-----	-136.1	-----	-75.3	-----	-11.6
0.20	4.93	16.1	-----	-----	-144.9	-----	-91.6	8.0	-----
0.25	6.16	11.5	-----	-----	-139.7	-----	-113.7	35.6	-----
0.30	7.39	7.9	-----	-----	-135.2	-----	-131.7	58.4	-----
0.35	8.62	5.4	-----	-----	-131.5	-----	-145.4	76.3	-----
0.40	9.86	3.7	-----	-----	-128.7	-----	-155.2	89.2	-----
0.45	11.09	2.8	-----	-----	-126.9	-----	-160.9	97.0	-----
0.50	12.32	2.7	-----	-----	-126.2	-----	-162.7	99.8	-----
0.55	13.55	3.3	-----	-----	-126.4	-----	-160.5	97.5	-----
0.60	14.78	4.8	-----	-----	-127.6	-----	-154.2	90.1	-----
0.65	16.02	7.0	-----	-----	-129.9	-----	-144.1	77.7	-----
0.70	17.25	10.0	-----	-----	-133.1	-----	-129.9	60.2	-----
0.75	18.48	13.8	-----	-----	-137.3	-----	-111.7	37.7	-----
0.80	19.71	18.8	-----	-----	-142.2	-----	-89.2	10.4	-----
0.85	20.94	13.3	-----	-----	-133.0	-----	-72.5	-----	-8.8
0.90	22.18	-----	-15.3	-----	-96.0	-----	-72.7	-----	-8.1
0.95	23.41	-----	-29.2	-----	-37.3	-----	-52.7	0.2	-----
1.00	24.64	-----	-32.0	-----	-32.9	-----	-27.7	-----	-28.8

Cr

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6
0.05	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6
0.10	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6
0.15	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6
0.20	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-27.9	-28.6
0.25	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-27.9	-28.6
0.30	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.35	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.40	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.45	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.50	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.55	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.60	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.65	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.70	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.75	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.80	0.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.85	0.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.6
0.90	0.32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.5
0.95	0.33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.9	-28.5
1.00	0.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-27.8	-28.5

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-32.0	-----	-32.9	-----	-27.7	-----	-28.8
0.05	0.02	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.8
0.10	0.04	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7
0.15	0.05	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7
0.20	0.07	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7
0.25	0.09	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7

0.30	0.11	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7
0.35	0.12	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.7
0.40	0.14	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.45	0.16	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.50	0.18	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.55	0.19	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.60	0.21	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.65	0.23	-----	-32.0	-----	-32.9	-----	-27.8	-----	-28.6
0.70	0.25	-----	-32.0	-----	-32.8	-----	-27.8	-----	-28.6
0.75	0.26	-----	-32.0	-----	-32.8	-----	-27.9	-----	-28.6
0.80	0.28	-----	-32.0	-----	-32.8	-----	-27.9	-----	-28.6
0.85	0.30	-----	-32.0	-----	-32.8	-----	-27.9	-----	-28.6
0.90	0.32	-----	-32.0	-----	-32.8	-----	-27.9	-----	-28.6
0.95	0.33	-----	-32.0	-----	-32.8	-----	-27.9	-----	-28.5
1.00	0.35	-----	-32.0	-----	-32.8	-----	-27.8	-----	-28.5

28 - required post-tensioning

note: required post-tensioning force based on stress conditions

X/l	X	Pt	X	Pt	X	Pt
	M	T	M	T	M	T
	Cl		Span 1		Cr	
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.00	1.23	43.49	0.02	0.00
0.10	0.04	0.00	2.46	189.18	0.04	0.00
0.15	0.05	0.00	3.70	231.38	0.05	0.00
0.20	0.07	0.00	4.93	287.79	0.07	0.00
0.25	0.09	0.00	6.16	351.58	0.09	0.00
0.30	0.11	0.00	7.39	403.07	0.11	0.00
0.35	0.12	0.00	8.62	441.66	0.12	0.00
0.40	0.14	0.00	9.86	468.61	0.14	0.00
0.45	0.16	0.00	11.09	484.06	0.16	0.00
0.50	0.17	0.00	12.32	488.09	0.17	0.00
0.55	0.19	0.00	13.55	480.82	0.19	0.00
0.60	0.21	0.00	14.78	462.37	0.21	0.00
0.65	0.23	0.00	16.02	432.86	0.23	0.00
0.70	0.25	0.00	17.25	392.40	0.25	0.00
0.75	0.26	0.00	18.48	341.10	0.26	0.00
0.80	0.28	0.00	19.71	277.73	0.28	0.00
0.85	0.30	0.00	20.94	222.33	0.30	0.00
0.90	0.31	0.00	22.18	184.31	0.31	0.00
0.95	0.33	0.00	23.41	42.77	0.33	0.00
1.00	0.35	0.00	24.64	---	0.35	0.00

29 - detailed rebar

Cl

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.09	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00

0.40	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.19	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.21	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.23	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.25	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.26	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.28	0.00	0.00	0.00	0.00	0.00	0.00
0.85	0.30	0.00	0.00	19.80	0.00	19.80	0.00
0.90	0.32	0.00	0.00	19.80	0.00	19.80	0.00
0.95	0.33	0.00	0.00	19.80	0.00	19.80	0.00
1.00	0.35	0.00	0.00	19.80	0.00	19.80	0.00

Span 1

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	22.56	0.00	22.56	0.00
0.05	1.23	0.00	0.00	22.56	0.00	22.56	0.00
0.10	2.46	0.00	0.00	15.43	0.00	15.43	0.00
0.15	3.70	0.00	0.00	15.43	0.00	15.43	0.00
0.20	4.93	0.00	11.37	0.00	0.00	0.00	11.37
0.25	6.16	0.00	29.10	0.00	0.00	0.00	29.10
0.30	7.39	0.00	41.79	0.00	0.00	0.00	41.79
0.35	8.62	0.00	54.41	0.00	13.67	0.00	54.41
0.40	9.86	0.00	62.24	0.00	13.67	0.00	62.24
0.45	11.09	0.00	66.22	0.00	13.67	0.00	66.22
0.50	12.32	0.00	66.38	0.00	13.67	0.00	66.38
0.55	13.55	0.00	66.92	0.00	13.67	0.00	66.92
0.60	14.78	0.00	63.64	0.00	13.67	0.00	63.64
0.65	16.02	0.00	56.51	0.00	13.67	0.00	56.51
0.70	17.25	0.00	44.59	0.00	0.00	0.00	44.59
0.75	18.48	0.00	30.78	0.00	0.00	0.00	30.78
0.80	19.71	0.00	15.04	0.00	0.00	0.00	15.04
0.85	20.94	0.00	3.11	15.43	0.00	15.43	3.11
0.90	22.18	0.00	0.00	15.43	0.00	15.43	0.00
0.95	23.41	0.00	0.00	22.56	0.00	22.56	0.00
1.00	24.64	0.00	0.00	22.56	0.00	22.56	0.00

Cr

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	19.80	0.00	19.80	0.00
0.05	0.02	0.00	0.00	19.80	0.00	19.80	0.00
0.10	0.04	0.00	0.00	19.80	0.00	19.80	0.00
0.15	0.05	0.00	0.00	19.80	0.00	19.80	0.00
0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.09	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00
0.40	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.19	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.21	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.23	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.25	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.26	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.28	0.00	0.00	0.00	0.00	0.00	0.00

0.85	0.30	0.00	0.00	0.00	0.00	0.00	0.00
0.90	0.32	0.00	0.00	0.00	0.00	0.00	0.00
0.95	0.33	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00

Note: reinforcement requirements for initial condition are included in service block. Reinforcement requirements for ubc combination, if selected, are included in analysis block.

31 - detailed friction and longterm stress losses

Tendon_a

X/l	X	Initial stress	Longterm loss	Final stress	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2	M	T/cm2	T/cm2	T/cm2
	Cl				Span 1			
0.00	0.00	12.80	1.03	11.78	0.00	12.90	1.05	11.86
0.05	0.02	12.81	1.03	11.78	1.23	13.11	1.05	12.05
0.10	0.04	12.81	1.03	11.78	2.46	13.16	1.06	12.11
0.15	0.05	12.81	1.03	11.78	3.70	13.37	1.08	12.30
0.20	0.07	12.81	1.03	11.78	4.93	13.52	1.08	12.43
0.25	0.09	12.81	1.03	11.78	6.16	13.57	1.08	12.49
0.30	0.11	12.81	1.03	11.78	7.39	13.59	1.08	12.51
0.35	0.12	12.81	1.03	11.78	8.62	13.53	1.08	12.45
0.40	0.14	12.81	1.03	11.78	9.86	13.47	1.08	12.39
0.45	0.16	12.81	1.03	11.78	11.09	13.40	1.07	12.34
0.50	0.17	12.81	1.03	11.78	12.32	13.35	1.07	12.28
0.55	0.19	12.81	1.03	11.78	13.55	13.29	1.06	12.22
0.60	0.21	12.81	1.03	11.78	14.78	13.23	1.05	12.17
0.65	0.23	12.81	1.03	11.79	16.02	13.17	1.05	12.11
0.70	0.25	12.82	1.03	11.79	17.25	13.11	1.05	12.06
0.75	0.26	12.82	1.03	11.79	18.48	13.05	1.04	12.01
0.80	0.28	12.82	1.03	11.79	19.71	12.91	1.03	11.87
0.85	0.30	12.82	1.03	11.79	20.94	12.67	1.02	11.66
0.90	0.32	12.82	1.03	11.79	22.18	12.61	1.01	11.59
0.95	0.33	12.82	1.03	11.79	23.41	12.38	1.00	11.37
1.00	0.35	12.90	1.03	11.86	24.64	12.22	1.00	11.23

X/l	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2
	Cr			
0.00	0.00	12.22	0.99	11.23
0.05	0.02	12.22	0.99	11.23
0.10	0.04	12.22	0.99	11.22
0.15	0.05	12.22	0.99	11.22
0.20	0.07	12.22	0.99	11.22
0.25	0.09	12.21	0.99	11.22
0.30	0.11	12.21	0.99	11.22
0.35	0.12	12.21	0.99	11.22
0.40	0.14	12.21	0.99	11.22
0.45	0.16	12.21	0.99	11.22
0.50	0.17	12.21	0.99	11.22
0.55	0.19	12.21	0.99	11.22
0.60	0.21	12.21	0.99	11.22
0.65	0.23	12.21	0.99	11.22
0.70	0.25	12.21	0.99	11.21
0.75	0.26	12.21	0.99	11.21
0.80	0.28	12.20	0.99	11.21
0.85	0.30	12.20	0.99	11.21
0.90	0.32	12.20	0.99	11.21
0.95	0.33	12.20	0.99	11.21

1.00	0.35	12.20	0.99	11.21

34 demand moment and moment capacity

34.2 - based on designed values

Cl

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	0.00	262.75	-291.56	0.00	0.00
0.05	0.02	0.00	0.00	262.74	-291.62	0.00	0.00
0.10	0.04	0.00	-0.01	262.72	-291.76	0.00	0.00
0.15	0.05	0.00	-0.02	262.70	-291.99	0.00	0.00
0.20	0.07	0.00	-0.04	262.68	-292.12	0.00	0.00
0.25	0.09	0.00	-0.06	262.66	-292.48	0.00	0.00
0.30	0.11	0.00	-0.09	262.64	-292.95	0.00	0.00
0.35	0.12	0.00	-0.12	262.62	-293.37	0.00	0.00
0.40	0.14	0.00	-0.15	264.39	-293.90	0.00	0.00
0.45	0.16	0.00	-0.19	264.37	-294.44	0.00	0.00
0.50	0.18	0.00	-0.24	264.35	-295.23	0.00	0.00
0.55	0.19	0.00	-0.29	264.33	-295.94	0.00	0.00
0.60	0.21	0.00	-0.35	264.31	-296.72	0.00	0.00
0.65	0.23	0.00	-0.41	264.29	-297.62	0.00	0.00
0.70	0.25	0.00	-0.47	264.27	-298.56	0.00	0.00
0.75	0.26	0.00	-0.54	264.25	-299.41	0.00	0.00
0.80	0.28	0.00	-0.62	264.23	-300.56	0.00	0.00
0.85	0.30	0.00	-0.69	266.78	-438.52	0.00	0.00
0.90	0.32	0.00	-0.78	266.78	-439.75	0.00	0.00
0.95	0.33	0.00	-0.87	266.72	-440.98	0.00	0.00
1.00	0.35	0.00	-0.96	268.68	-443.64	0.00	0.00
1.00	0.35	0.00	-0.96	268.68	-443.64	0.00	0.00

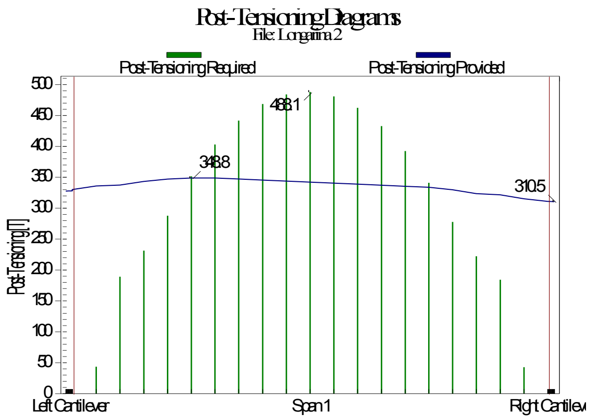
Span 1

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.97	268.61	-462.16	0.00	0.00
0.00	0.00	0.00	-0.97	268.61	-462.16	0.00	0.00
0.05	1.23	208.63	0.00	311.44	-428.54	0.67	0.00
0.10	2.46	394.75	0.00	436.62	-263.05	0.90	0.00
0.15	3.70	559.04	0.00	577.21	-160.17	0.97	0.00
0.20	4.93	701.32	0.00	709.29	-24.00	0.99	0.00
0.25	6.16	821.87	0.00	837.60	-29.75	0.98	0.00
0.30	7.39	920.24	0.00	928.17	-31.88	0.99	0.00
0.35	8.62	996.87	0.00	1012.29	-32.84	0.98	0.00
0.40	9.86	1051.53	0.00	1065.91	-33.03	0.99	0.00
0.45	11.09	1084.57	0.00	1096.06	-33.07	0.99	0.00
0.50	12.32	1095.53	0.00	1096.13	-32.94	1.00	0.00
0.55	13.55	1084.57	0.00	1096.37	-32.81	0.99	0.00
0.60	14.78	1051.53	0.00	1066.53	-32.57	0.99	0.00
0.65	16.02	996.87	0.00	1013.22	-32.19	0.98	0.00
0.70	17.25	920.24	0.00	929.41	-31.32	0.99	0.00
0.75	18.48	821.87	0.00	828.49	-29.49	0.99	0.00
0.80	19.71	701.32	0.00	710.91	-24.75	0.99	0.00
0.85	20.94	559.04	0.00	572.66	-161.36	0.98	0.00
0.90	22.18	394.75	0.00	419.67	-257.87	0.94	0.00
0.95	23.41	208.63	0.00	294.60	-416.07	0.71	0.00
1.00	24.64	0.00	-0.97	255.08	-448.82	0.00	0.00
1.00	24.64	0.00	-0.97	255.08	-448.82	0.00	0.00

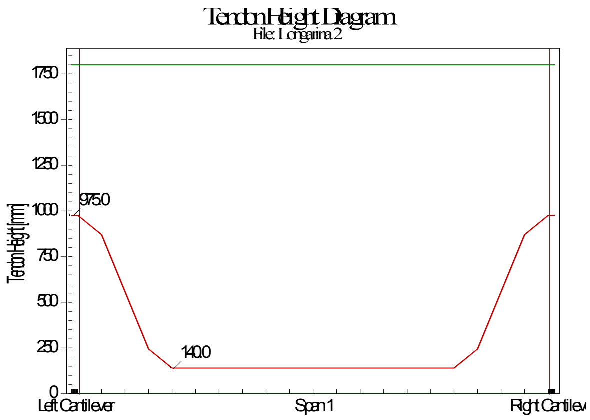
Cr

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.96	254.71	-429.84	0.00	0.00
0.00	0.00	0.00	-0.96	254.71	-429.84	0.00	0.00
0.05	0.02	0.00	-0.87	254.90	-428.77	0.00	0.00
0.10	0.04	0.00	-0.78	254.86	-427.51	0.00	0.00
0.15	0.05	0.00	-0.69	254.90	-426.43	0.00	0.00
0.20	0.07	0.00	-0.62	251.64	-287.60	0.00	0.00
0.25	0.09	0.00	-0.54	251.68	-286.64	0.00	0.00
0.30	0.11	0.00	-0.47	251.71	-285.57	0.00	0.00
0.35	0.12	0.00	-0.41	251.73	-284.59	0.00	0.00
0.40	0.14	0.00	-0.35	251.75	-283.87	0.00	0.00
0.45	0.16	0.00	-0.29	251.78	-282.91	0.00	0.00
0.50	0.18	0.00	-0.24	251.80	-282.31	0.00	0.00
0.55	0.19	0.00	-0.19	251.82	-281.60	0.00	0.00
0.60	0.21	0.00	-0.15	250.48	-280.88	0.00	0.00
0.65	0.23	0.00	-0.12	250.51	-280.43	0.00	0.00
0.70	0.25	0.00	-0.09	250.53	-280.02	0.00	0.00
0.75	0.26	0.00	-0.06	250.55	-279.55	0.00	0.00
0.80	0.28	0.00	-0.04	250.58	-279.16	0.00	0.00
0.85	0.30	0.00	-0.02	250.60	-279.01	0.00	0.00
0.90	0.32	0.00	-0.01	250.62	-278.78	0.00	0.00
0.95	0.33	0.00	0.00	250.65	-278.63	0.00	0.00
1.00	0.35	0.00	0.00	250.67	-278.57	0.00	0.00

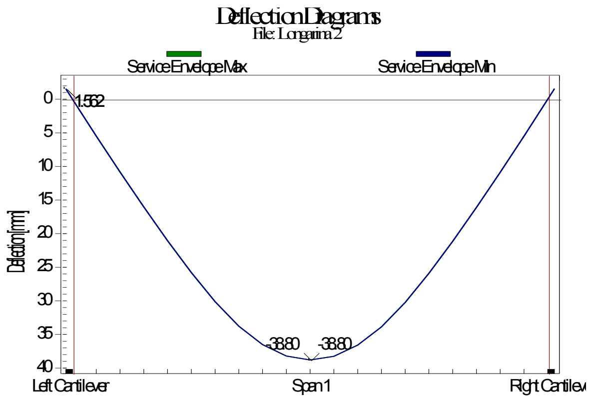
Note: capacity is calculated with the rebar and pt required for the design, including user defined base reinforcement



Post-tensioning
Required and provided

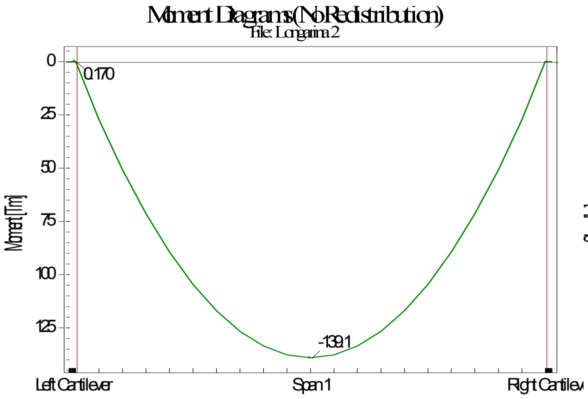


Post-tensioning
Profile

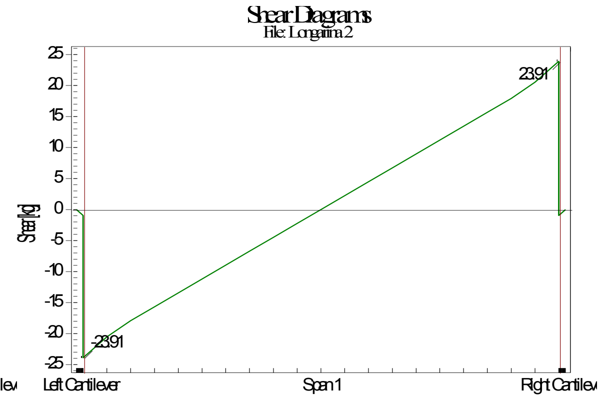


Deflection

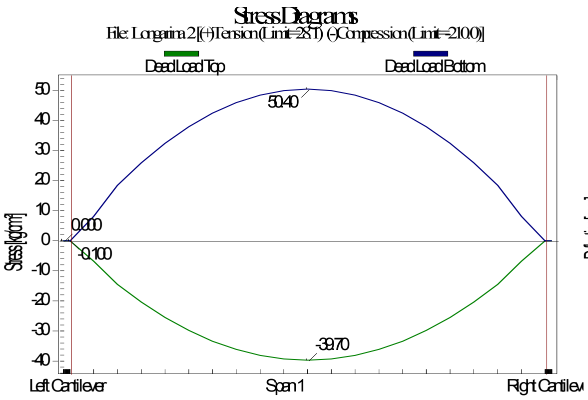
Load case: selfweight



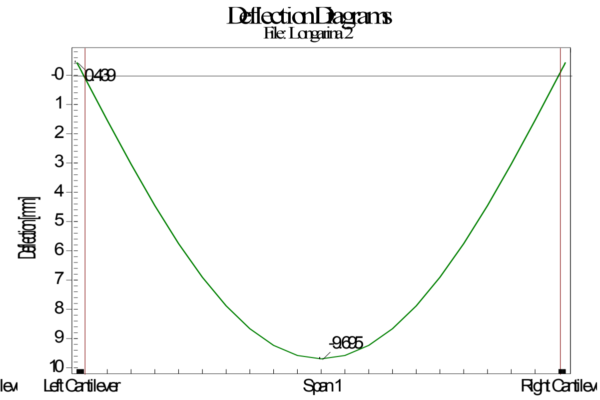
Moment



shear

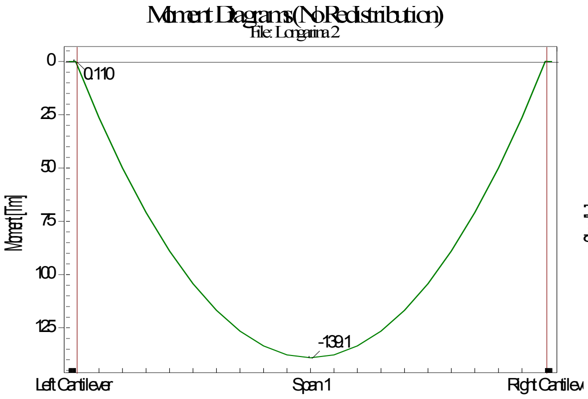


Stress

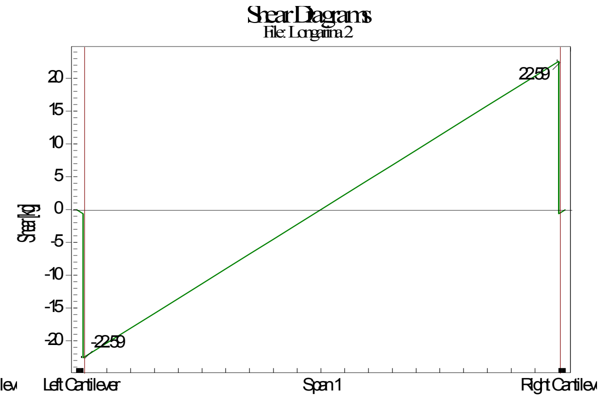


deflection

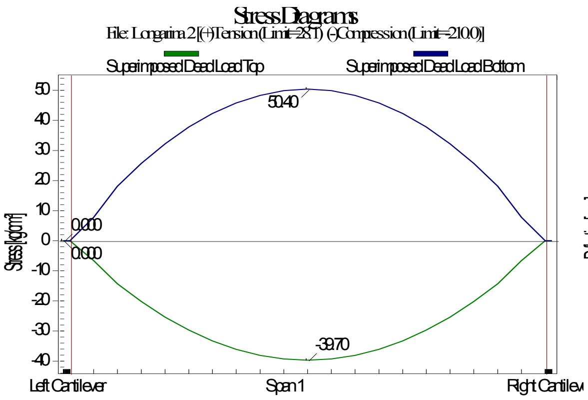
Load case: super imposed dead load



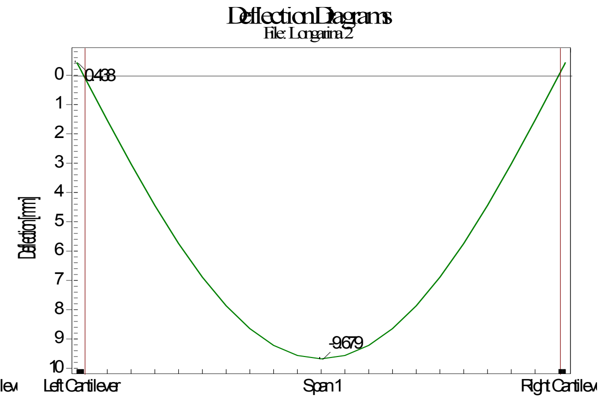
Moment



shear

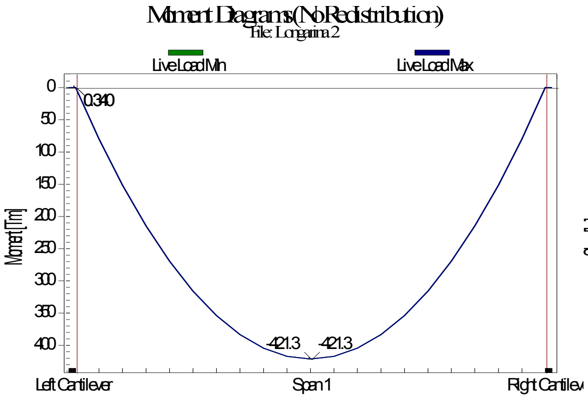


Stress

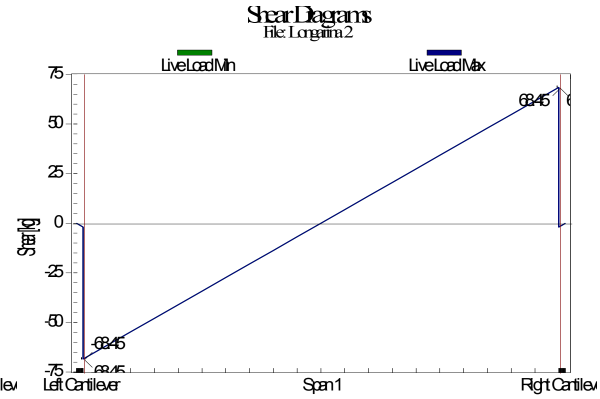


deflection

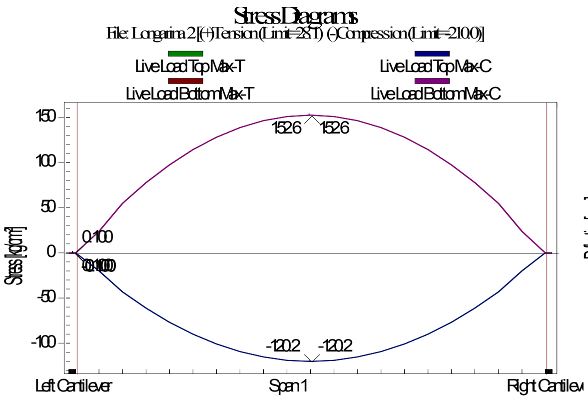
Load case: live load



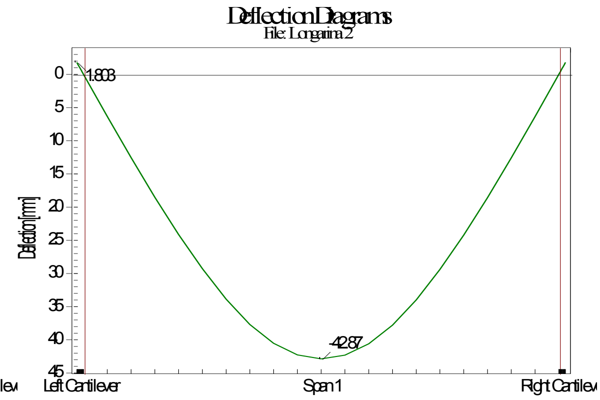
Moment



shear

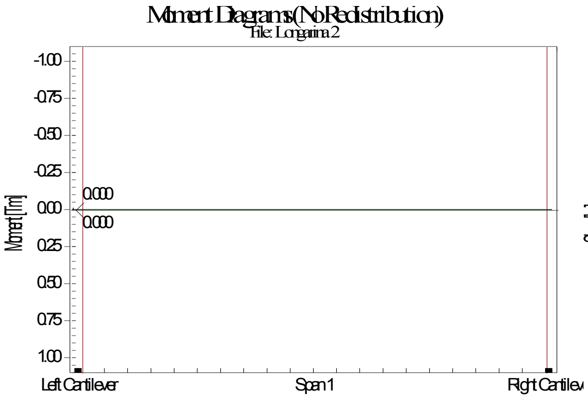


Stress

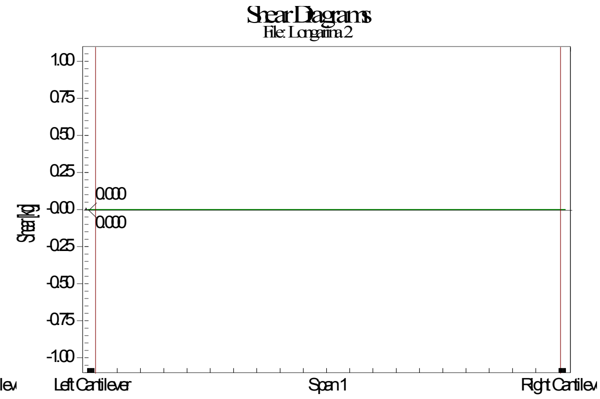


deflection

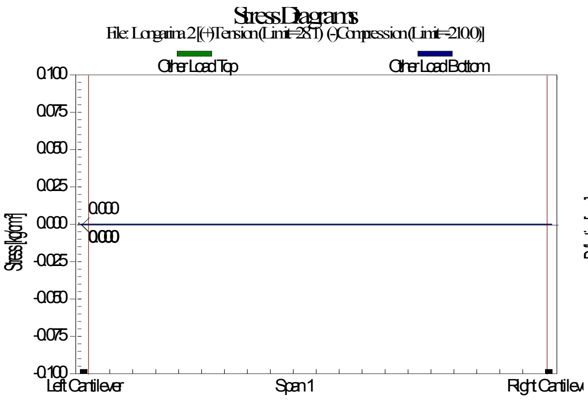
Load case: other load



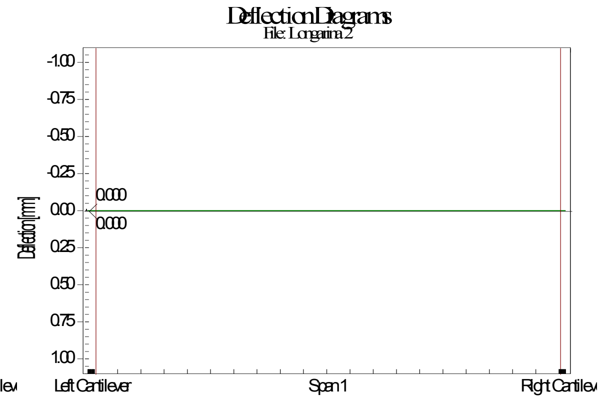
Moment



shear

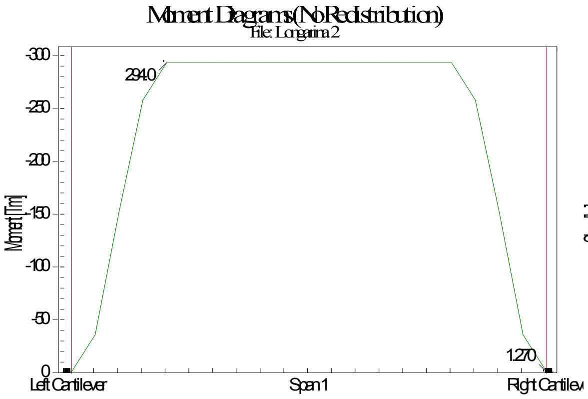


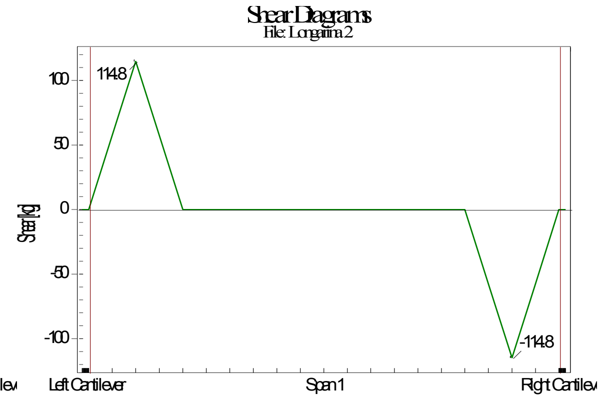
Stress



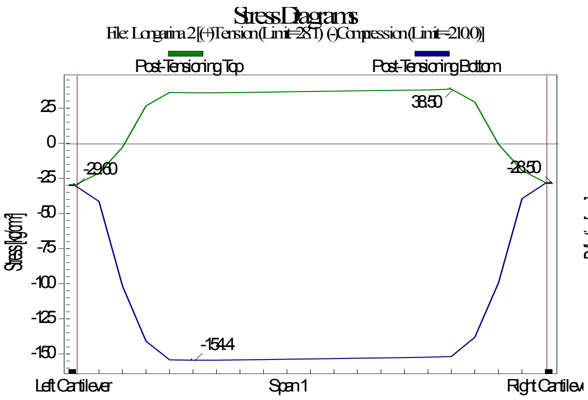
deflection

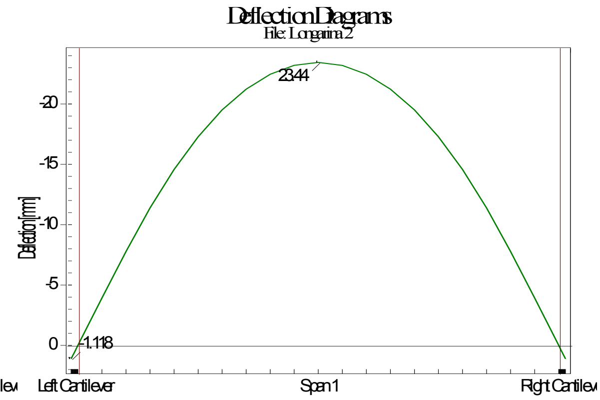
Load case: prestressing load





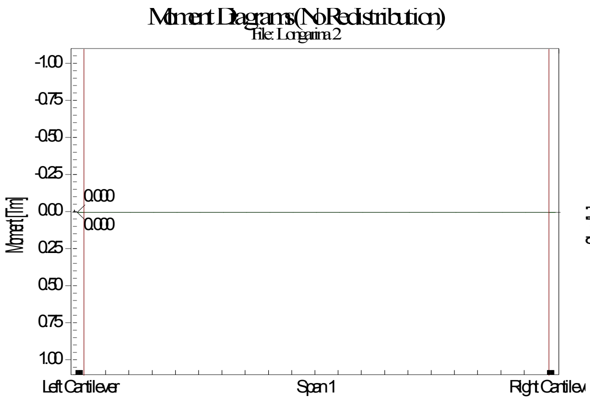
Moment **shear**



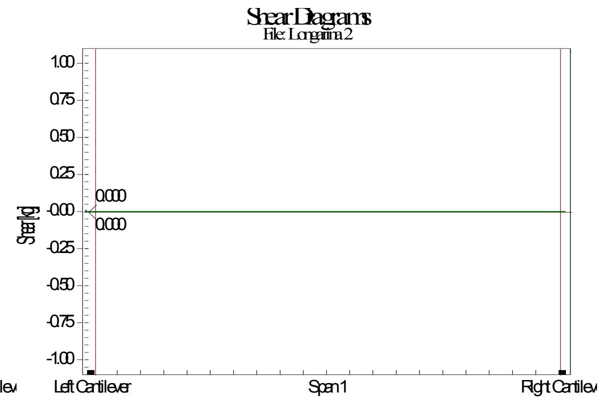


Stress **deflection**

Load case: hyper static load

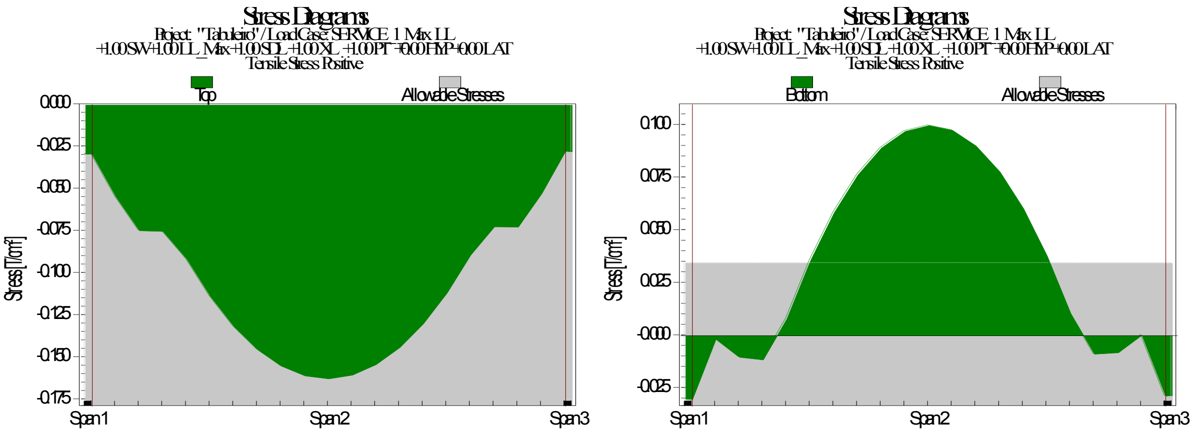


Moment

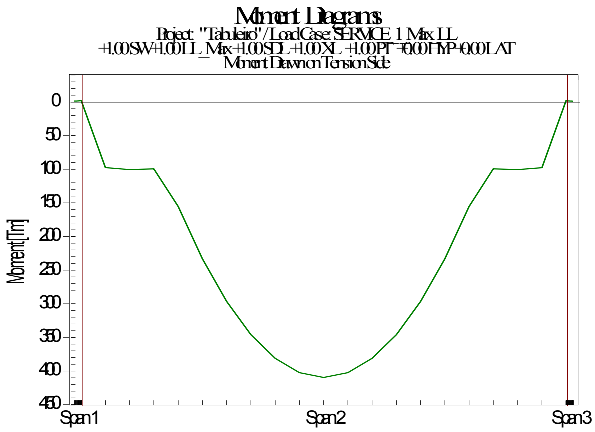


shear

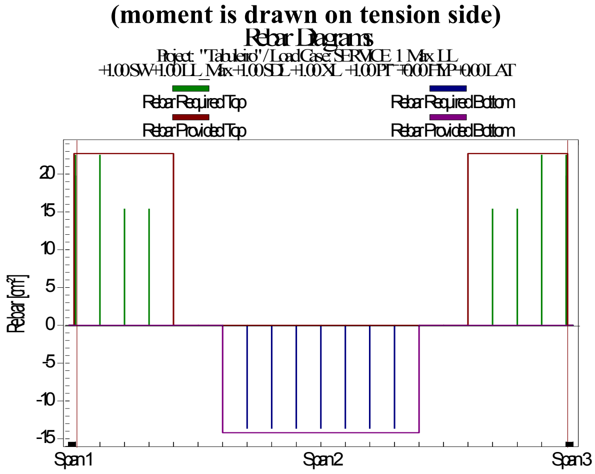
Load combination: service_1_max_II



Service combination stresses
(tension stress positive)

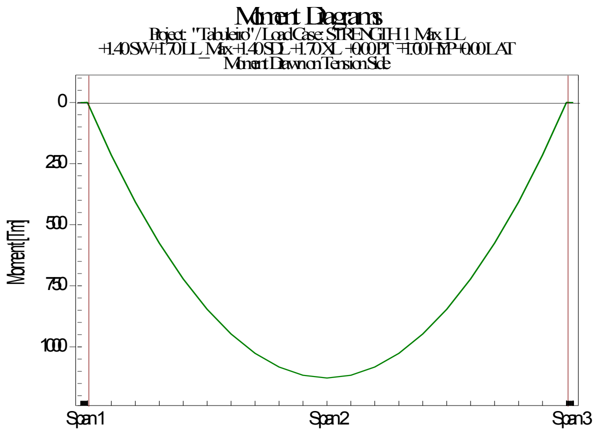


Design moment
(moment is drawn on tension side)



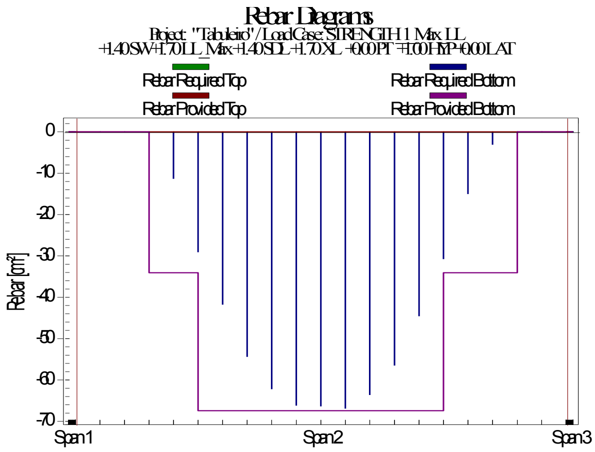
Reinforcement
Required and provided

Load combination: strength_1_max_II



Design moment

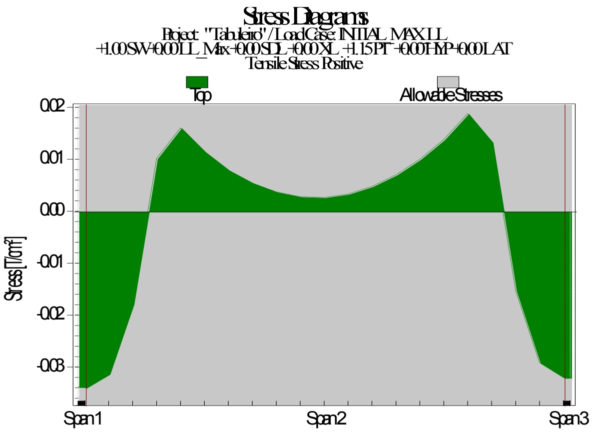
(moment is drawn on tension side)

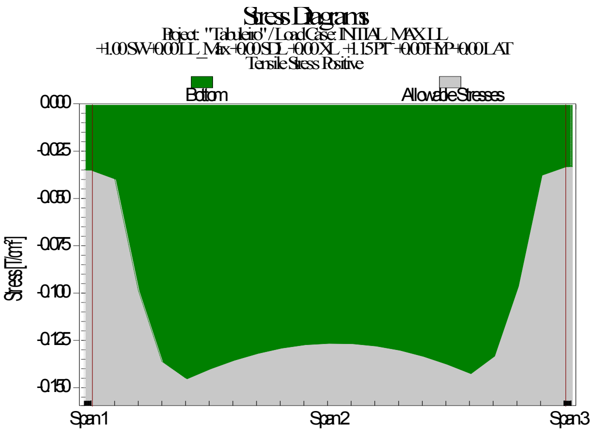


Reinforcement

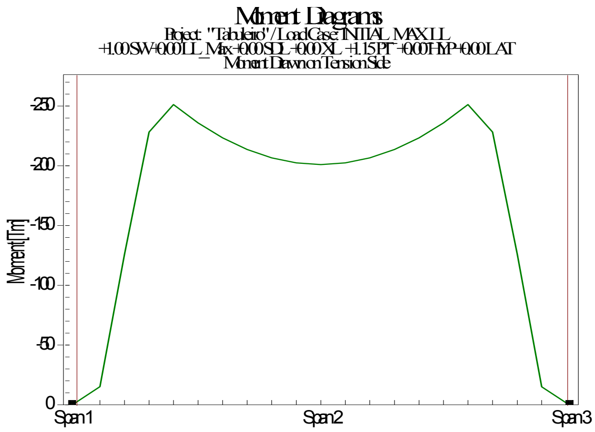
Required and provided

Load combination: initial_max_ll

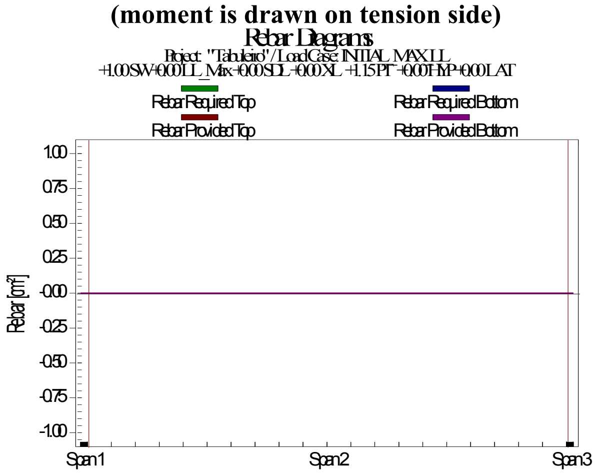




Service combination stresses
(tension stress positive)

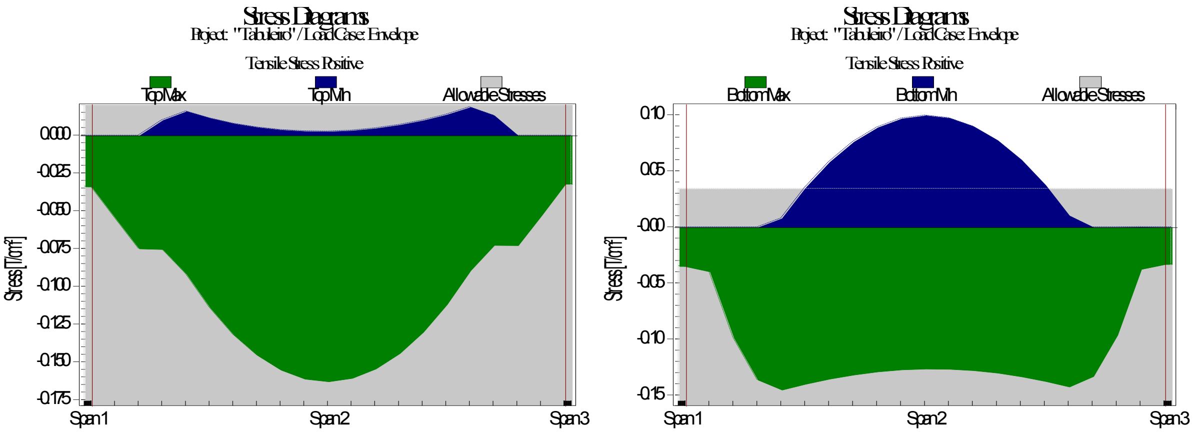


Design moment
(moment is drawn on tension side)

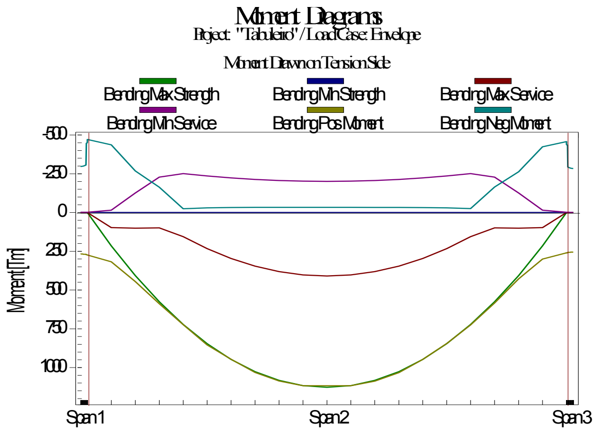


Reinforcement
Required and provided

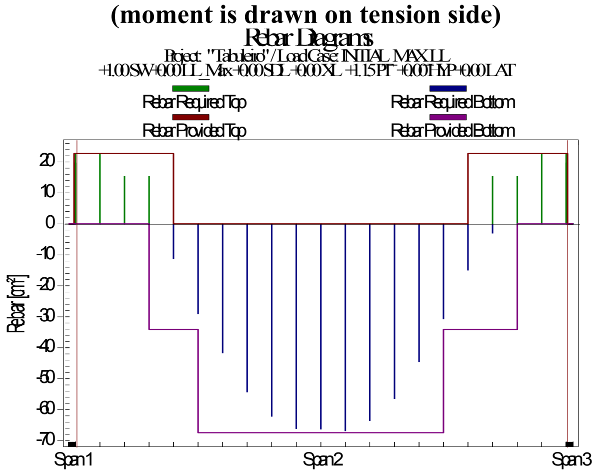
Load combination: envelope



Service combination stresses
(tension stress positive)



Design moment
(moment is drawn on tension side)



Reinforcement
Required and provided

Legend (2.2):

Span	c = cantilever
Seg.	Segment number
Form	1 = rectangular, 2 = t or inverted l, 3 = i, 4 = extended t or l section
Rh	elevation of top surface
Tf	top flange
Mf	middle flange
Bf	bottom flange

Legend (2.7):
The column boundary condition (cbc):

Fixed at both	1
Hinged at near end, fixed at far end	2
Fixed at near end, hinged at far end	3
Fixed at near end, roller with rotational fixity at far end	4

Lc	lower column
Uc	upper column

Legend (3.1):

Class:	sw: selfweight, ll: live load, sdl: superimposed dead load, x: other loading
Type:	u: uniform, p: partial uniform, l: line load, m: applied moment
	c: concentrated load, r: triangle, v: variable, t: trapezoidal

Legend (4.1, 4.2):
Yb: distance from centroid to bottom fiber
Yt: distance from centroid to top fiber
I: gross moment of inertia

Legend (7.1):
Type
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon
4 = straight tendon
5 = extended reversed parabola

Legend (7.2):
Cgs c1: cgs of left middle point of tendon for type 5 profile
Cgs c2: cgs of right middle point of tendon for type 5 profile or middle point of other types

Legend (7.3):
From: starting span of tendon
To: end span of tendon
Extension: extension of the tendon after last span into the next span normalized to then span length

Legend (10.1, 11.1):
From: beginning of rebar measured from left support of the span
To: end of rebar measured from left support of the span
As required: envelope of minimum and ultimate rebar
Ultimate: required rebar for ultimate load combinations
Minimum: required minimum rebar

Legend (10.2, 11_2):
Id: id number of the bar as shown on graph
From: beginning of rebar measured from left support of the span
Quantity: number of bars
Size: bar number
Length: total length of the bar
Area: area of reinforcement

Legend (12):
D: effective depth of section for shear rebar calculation
Vu: ultimate shear
Ratio: ratio of ultimate to allowable shear stress

Req.: required shear reinforcement per unit length
Spacing: spacing between shear rebar

Legend (15.3):
Fl: friction loss
Ltl: long term loss

Legend (22):
Type
1 = uniform 2 = concentrated
3 = partial uniform 4 = applied moment

16.8.21 Longarina 3

Para o detalhamento das longarinas foi utilizado os esforços da longarina mais solicitada.

A seguir são apresentados os dados e resultados do cálculo/dimensionamento das longarinas pré-moldadas:

Longarina 3

dados

número de peças do grupo: 13

comprimento da peça (cm): 3668.70

volume unitário | total (m3): 28.350 | 368.550

peso unitário | total (tf): 70.874 | 921.362

protensão

número de armaduras na peça: 48

força total na peça (tf): 568.32

peso de armadura na peça (kgf): 1632.0

nível de protensão: ii - limitada

Armadura passiva

armadura superior nec | detalhada (cm2) | situação: 15.76 | 16.08 |ok

armadura inferior nec | detalhada (cm2) | situação: 66.14 | 68.72 |ok

fissuração

abertura de fissura máxima| limite (mm) | situação: 0.04 | 0.20 |ok

cisalhamento

faixa	montagem (cm2/m)		fasefinal (cm2/m)		
	asw,nec	asw,det	asw,nec	asw,det	situação
1	4.25	20.45	19.14	20.45	ok
2	4.25	16.36	15.76	16.36	ok
3	4.25	7.85	3.96	7.85	ok
4	4.25	16.36	15.76	16.36	ok

5	4.25	20.45	19.14	20.45	ok

apoios / dentes gerber

no início da peça: apoio sem recorte

- tirantes: as,nec =43.09cm2 | as,det =44.18cm2

- costuras: as,nec = 7.53cm2 | as,det = 8.04cm2

- estribos: as,nec = 5.21cm2 | as,det = 7.36cm2

no fim da peça: apoio sem recorte

- tirantes: as,nec =43.09cm2 | as,det =44.18cm2

- costuras: as,nec = 7.53cm2 | as,det = 8.04cm2

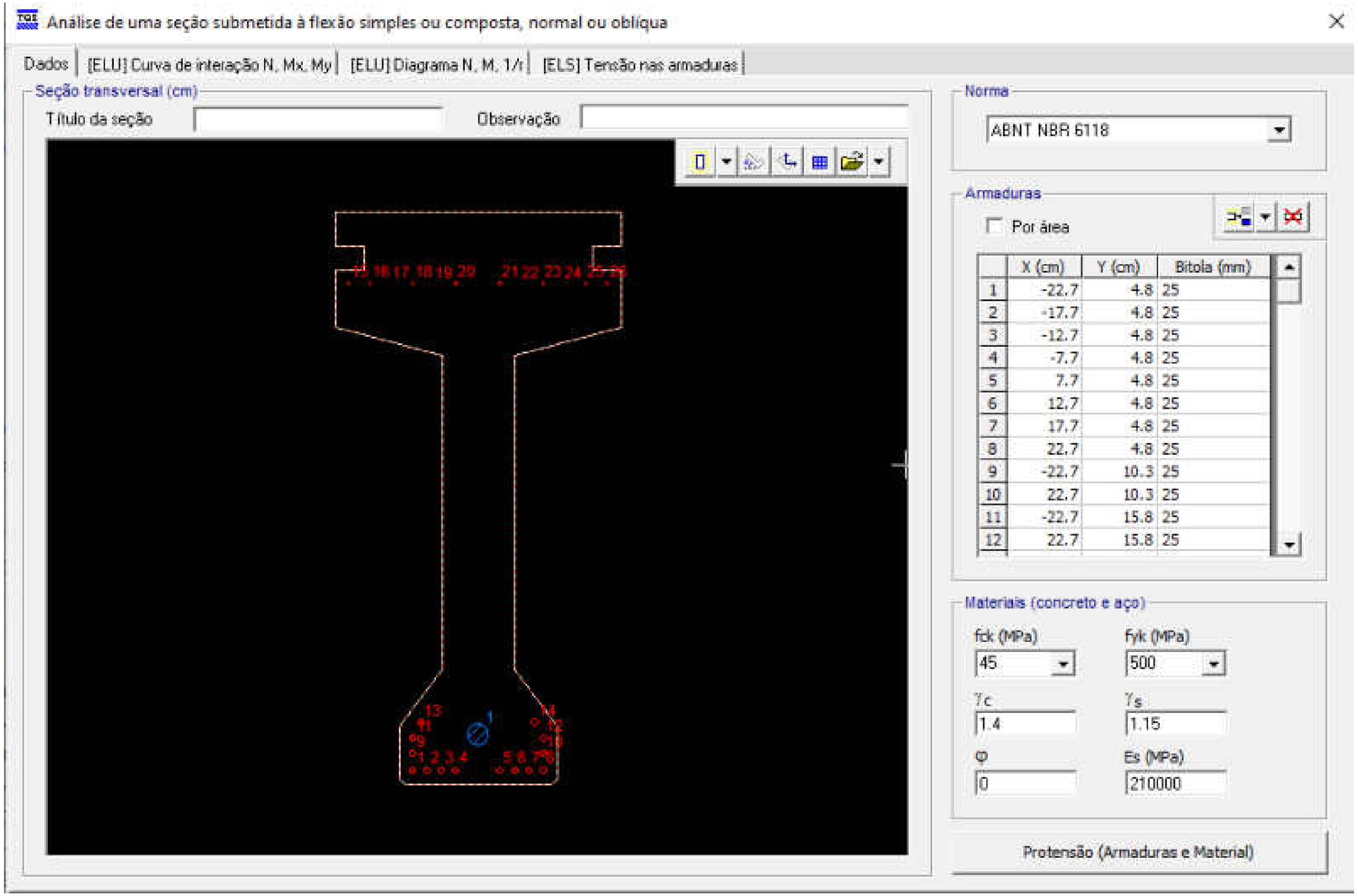
- estribos: as,nec = 5.21cm2 | as,det = 7.36cm2

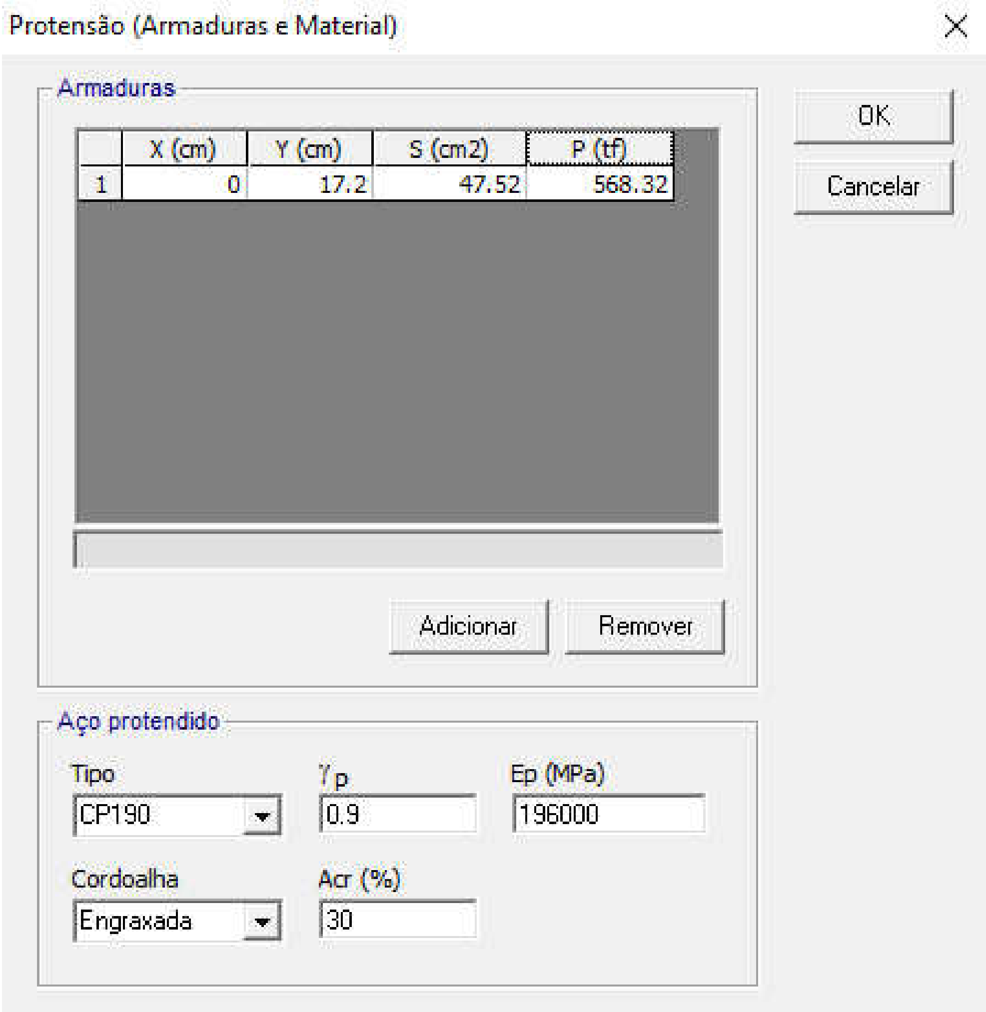
16.8.22 Armadura passiva

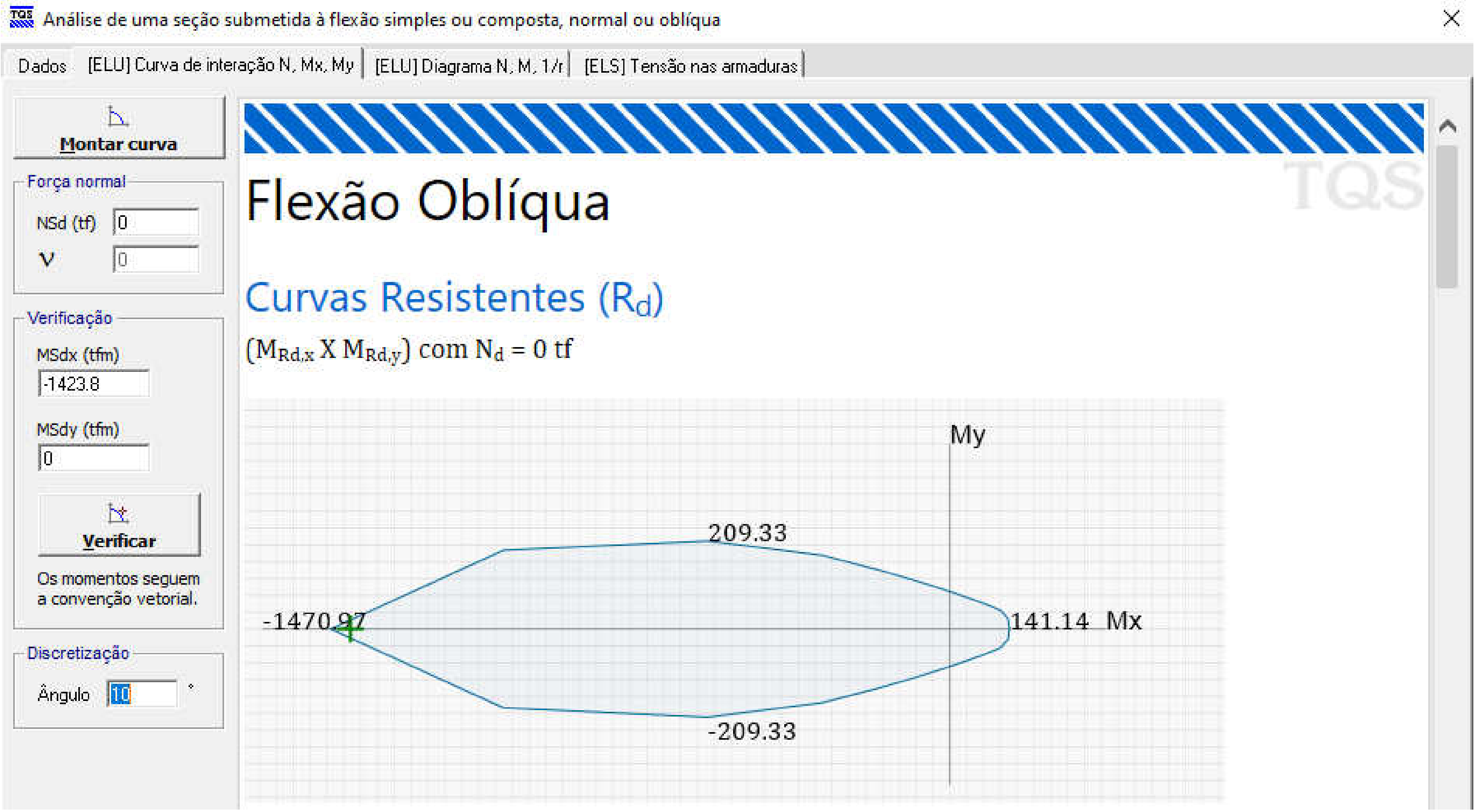
O cálculo da armadura passiva foi feito utilizando a calculadora de flexão composta oblíqua do tqs.

A seguir temos todas as informações necessárias para o cálculo: a seção utilizada, o concreto e as armaduras, ativas e passivas.

- Armadura positiva: 14 barras de 25 mm;
- Armadura negativa: 8 barras de 16 mm;
- Protensão: 48 cordoalhas de 12.7 mm não aderente – aço cp190 rb-ep / arcelormittal ou similar.


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Seção transversal (cm)
Título da seção
Observação
Norma
ABNT NBR 6118
Armaduras
Por área
X (cm) Y (cm) Bitola (mm)
1 -22.7 4.8 25
2 -17.7 4.8 25
3 -12.7 4.8 25
4 -7.7 4.8 25
5 7.7 4.8 25
6 12.7 4.8 25
7 17.7 4.8 25
8 22.7 4.8 25
9 -22.7 10.3 25
10 22.7 10.3 25
11 -22.7 15.8 25
12 22.7 15.8 25
Materiais (concreto e aço)
fck (MPa)
45
fyk (MPa)
500
γc
1.4
γs
1.15
φ
0
Es (MPa)
210000
Protensão (Armaduras e Material)


Protensão (Armaduras e Material)
Armaduras
X (cm)
Y (cm)
S (cm2)
P (tf)
1
0
17.2
47.52
568.32
Adicionar
Remover
OK
Cancelar
Aço protendido
Tipo
CP190
γp
0.9
Ep (MPa)
196000
Cordoalha
Engraxada
Acr (%)
30


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 0
ν 0
Verificação
MSdx (tfm) -1423.8
MSdy (tfm) 0
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Flexão Oblíqua
TQS
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 0 tf
My
209.33
-1470.97
141.14
Mx
-209.33

16.8.23 Protensão

Tabuleiro
Longarina 3

Quarta-feira, 1 de dezembro de 2021

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10.2.1 - total strip provided rebar
10.2.2 - total strip steel disposition

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11.1.1 - total strip required rebar
11.2 - provided rebar
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pt-profile

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- live
- other
- prestressing
- hyper-static

load combinations
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- strength_1_max_ll
- initial_max_ll
- envelope

legend

A. Design parameters and load combinations

A.1 project design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	350.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Nbr-6118 (2014)

A.2 load combinations

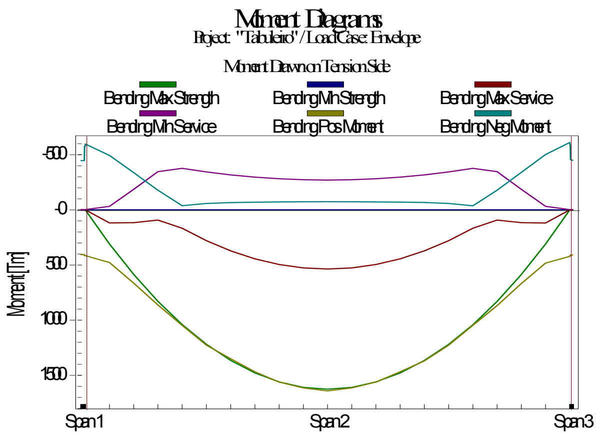
Strength load combinations
1. 1.4 sw + 1.7 ll + 1.4 sdl + 1.7 x + 1 hyp

Service load combinations
sustained load
1. 1 sw + 1 ll + 1 sdl + 1 x + 1 pt

Initial load combinations
1 sw + 1.15 pt

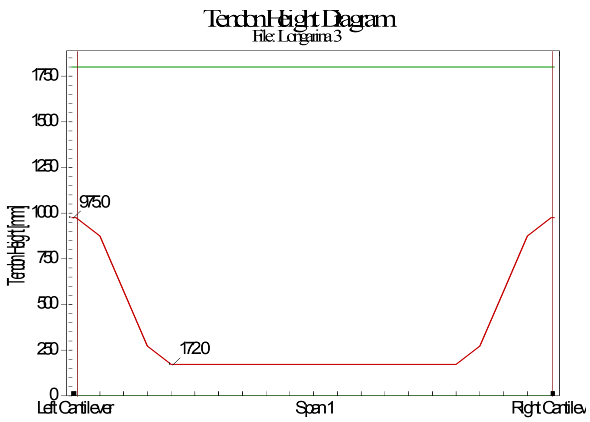
B. Design strip report: longarina 3
B.3 design moment

Load combination: envelope



Design moment
(moment is drawn on tension side)

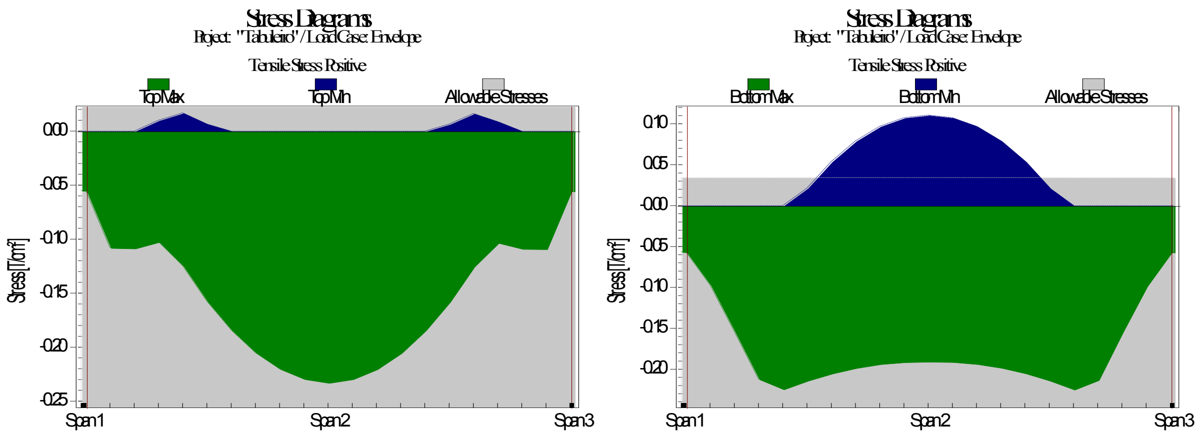
B.4 tendon profile



Post-tensioning Profile

B.5 stress check results / code check

Load combination: envelope



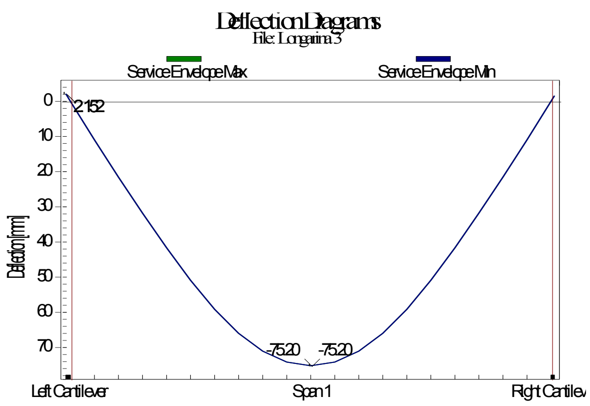
Service combination stresses
(tension stress positive)

B.6 rebar report

total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.28	32	3	7.24	22.72
1	2	Top	28.66	32	3	7.22	22.72
1	3	Bot	5.07	74	3	25.68	52.54
1	4	Bot	8.66	73	3	18.52	51.83

B.8 deflection



Deflection

B.9 quantities

Concrete
total volume of concrete = 28.00 m3
area covered = 36.43 m2

Mild steel
total weight of rebar = 2147.19 kg
average rebar usage = 58.94 kg/m2, 76.68 kg/m3

Prestressing material
Total weight of tendon = 1396.4 kg
Average tendon usage = 38.33 kg/m2, 49.87 kg/m3

1 - user specified general analysis and design parameters

Parameter	Value	Parameter	Value
Concrete		Minimum cover at top	3.50 cm
F'c for beams/slabs	450.00 kg/cm 2	Minimum cover at bottom	3.50 cm
F'ci for beams/slabs	350.00 kg/cm 2	Post-tensioning	
Ec for beams/slabs	325.70 t/cm 2	System	Unbonded
Creep factor	2.00	Fpu	19.50 t/cm 2
Concrete weight	Normal	Fse	12.70 t/cm 2
Tension stress limits / (f'c)1/2		Strand area	0.990 cm 2
At top	1.620	Min cgs from top	5.00 cm
At bottom	1.620	Min cgs from bot for interior spans	5.00 cm
Compression stress limits / f'c		Min cgs from bot for exterior spans	5.00 cm
At all locations	0.600	Min average precompression	9.50 kg/cm 2
Tension stress limits (initial) / (f'c)1/2		Max spacing / slab depth	8.00
At top	1.620	Analysis and design options	
At bottom	1.620	Structural system	Beam
Compression stress limits (initial) / f'c		Moment of inertia over support is	Increased
At all locations	0.700	Moments reduced to face of support	No
Reinforcement		Moment redistribution	Yes
Fy (main bars)	5.00 t/cm 2	Effective flange width consideration	No
Fy (shear reinforcement)	4.70 t/cm 2	Design code selected	Aci-318 (1999)

2 - input geometry

2.1 principal span data of uniform spans

Span	Form	Length	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
		M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
C	2	0.35	55.00	180.00	100.00	25.00			180.00	0.50	0.50
C	2	0.26	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.2 detailed data for nonuniform spans

Span	Seg.	Form	Left dist.	Width	Depth	Tf width	Tf thick.	Bf/mf width	Bf/mf thick.	Rh	Right mult.	Left mult.
			M	Cm	Cm	Cm	Cm	Cm	Cm	Cm		
1	1	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	2	2	0.00	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	3	2	1.65	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	4	3	1.65	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	5	3	34.08	25.00	180.00	100.00	25.00	55.00	30.00	180.00	0.50	0.50
1	6	2	34.08	55.00	180.00	100.00	25.00			180.00	0.50	0.50
1	7	2	35.82	55.00	180.00	100.00	25.00			180.00	0.50	0.50

2.7 support width and column data

Joint	Support width	Length lc	B(dia.) Lc	D lc	% lc	Cbc lc	Length uc	B(dia.) Uc	D uc	% uc	Cbc uc
	Cm	M	Cm	Cm			M	Cm	Cm		
1	0.0	0.0	0.0	0.0	100	(1)					
2	0.0	0.0	0.0	0.0	100	(1)					

3 - input applied loading

3.1 loading as appears in user's input screen

Span	Class	Type	W	P1	P2	A	B	C	F	M
			T/m2	T/m	T/m	M	M	M	T	T-m
Cant	Ll	L		3.478		0.000	0.350			
Cant	D	L		2.733		0.000	0.350			
Cant	Sdl	L		1.045		0.000	0.350			
1	Ll	L		3.478		0.000	35.820			
1	D	L		2.733		0.000	1.650			
1	D	L		1.818		1.650	34.080			
1	D	L		2.733		34.080	35.820			
1	Sdl	L		1.045		0.000	35.820			
Cant	Ll	L		3.478		0.000	0.260			
Cant	D	L		2.733		0.000	0.260			
Cant	Sdl	L		1.045		0.000	0.260			

3.2 compiled loads

Span	Class	Type	P1	P2	F	M	A	B	C	Reduction factor
			T/m	T/m	T	T-m	M	M	M	%
Cl	Ll	P	3.478				0.000	0.350		0.000
Cl	Sw	P	2.733				0.000	0.350		
Cl	Sdl	P	1.045				0.000	0.350		
1	Ll	P	3.478				0.000	35.820		0.000
1	Sw	P	2.733				0.000	1.650		
1	Sw	P	1.818				1.650	34.080		
1	Sw	P	2.733				34.080	35.820		
1	Sdl	P	1.045				0.000	35.820		
Cr	Ll	P	3.478				0.000	0.260		0.000
Cr	Sw	P	2.733				0.000	0.260		
Cr	Sdl	P	1.045				0.000	0.260		

4 - calculated section properties

4.1 section properties of uniform spans and cantilevers

Span	Area	I	Yb	Yt
	Cm2	Cm4	Cm	Cm
Cant	11025.00	0.33e+08	97.91	82.09
1	---	---	---	---
Cant	11025.00	0.33e+08	97.91	82.09

4.2 section properties for non-uniform spans

Span	Segment	Area	I	Yb	Yt
		Cm2	Cm4	Cm	Cm
1	1	11025.00	0.33e+08	97.91	82.09
1	2	11025.00	0.33e+08	97.91	82.09
1	3	11025.00	0.33e+08	97.91	82.09
1	4	7275.00	0.28e+08	100.70	79.30
1	5	7275.00	0.28e+08	100.70	79.30
1	6	11025.00	0.33e+08	97.91	82.09
1	7	11025.00	0.33e+08	97.91	82.09

5 - moments, shears and reactions

5.1 span moments and shears (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right	shear left	shear right
		T-m	T-m	T-m	T	T
Cant	Sw	-----	-----	-0.17	-----	0.96
1	Sw	-0.16	292.77	-0.08	-34.08	34.15
Cant	Sw	-0.09	-----	-----	-0.71	-----
Cant	Sdl	-----	-----	-0.06	-----	0.37
1	Sdl	-0.06	167.56	-0.03	-18.72	18.72
Cant	Sdl	-0.04	-----	-----	-0.27	-----
Cant	Xl	-----	-----	0.00	-----	0.00
1	Xl	0.00	0.00	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----	0.00	-----

5.2 reactions and column moments (excluding live load)

Joint	Load case	Reaction	Moment lower column	Moment upper column
		T	T-m	T-m
1	Sw	35.03	0.00	0.00
2	Sw	34.86	0.00	0.00
1	Sdl	19.08	0.00	0.00
2	Sdl	18.99	0.00	0.00
1	Xl	0.00	0.00	0.00
2	Xl	0.00	0.00	0.00

5.3 span moments and shears (live load)

Span	moment left max	moment left min	Moment midspan max	Moment midspan min	Moment right max	Moment right min	shear left	shear right
	T-m	T-m	T-m	T-m	T-m	T-m	T	T
Cl	-----	-----	-----	-----	-0.21	-----	-----	1.22
1	-0.21	-0.21	557.66	557.66	-0.10	-0.10	-62.29	62.29
Cr	-0.12	-----	-----	-----	-----	-----	-0.90	-----

5.4 reactions and column moments (live load)

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	63.51	63.51	0.00	0.00	0.00	0.00
2	63.19	63.19	0.00	0.00	0.00	0.00

6 - moments reduced to face of support

6.1 reduced moments at face of support (excluding live load)

Span	Load case	moment left	Moment midspan	Moment right
		T-m	T-m	T-m
Cant	Sw	-----	-----	-0.17
1	Sw	-0.16	292.80	-0.08
Cant	Sw	-0.09	-----	-----
Cant	Sdl	-----	-----	-0.06
1	Sdl	-0.06	167.60	-0.03
Cant	Sdl	-0.04	-----	-----
Cant	Xl	-----	-----	0.00
1	Xl	0.00	0.00	0.00
Cant	Xl	0.00	-----	-----

6.2 reduced moments at face of support (live load)

Span	Moment left max	Moment left min	Moment midspan	Moment midspan min	Moment right max	Moment right min

			max			
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.21	-----
1	-0.21	-0.21	557.70	557.70	-0.10	-0.10
Cr	-0.12	-----	-----	-----	-----	-----

7 - selected post-tensioning forces and tendon profiles

7.1 tendon profile

Tendon a

Span	Type	X1/l	X2/l	X3/l	A/l
Cl	3	---	---	0.100	---
1	5	0.200	0.200	---	---
Cr	3	0.100	---	---	---

7.2 selected post-tensioning forces and tendon drape

Tendon a

Span	Force	Cgs left	Cgs c1	Cgs c2	Cgs right	P/a	Wbal	Wbal (%dl)
	T	Cm	Cm	Cm	Cm	Kg/cm2	T/-	
Cl	533.540	97.50	---	---	97.50	48.43	0.000	0
1	592.435	97.50	17.20	17.20	97.50	80.31	7.314	25
Cr	538.273	97.50	---	---	97.50	48.84	0.000	0

All tendons

Span	Force	Total p/a	Total wbal (%dl)
	T	Kg/cm2	
Cl	533.54	48.43	0
1	592.435	80.31	25
Cr	538.273	48.84	0

approximate weight of strand: 1396.4 kg

7.3 tendon extents and stressing conditions

Type	Num	Force	Left end	Right end	From	To	Extension
A	48	11.84	Live	Dead	Cl	Cr	---

7.4 required minimum post-tensioning forces

	based on stress conditions			based on minimum p/a		
Type	Left	Center	Right	Left	Center	Right
	T	T	T	T	T	T
Cl	-----	-----	0.00	-----	-----	104.74
1	0.00	768.05	0.00	104.74	69.11	104.74
Cr	0.00	-----	-----	104.74	-----	-----

7.5 service stresses (tension shown positive)

Envelope of service 1

Span	Left top	Left bottom	Center top	Center bottom	Right top	Right bottom
	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
Cl	-----	-----	-----	-----	-47.78	-49.21
1	-47.78	-49.22	-232.82	110.79	-49.23	-50.56
Cr	-48.45	-49.79	-----	-----	-----	-----

7.6 post-tensioning balance moments, shears and reactions

Span moments and shears

Span	Moment left	Moment center	Moment right	Shear left	Shear right
	T-m	T-m	T-m	T	T
Cl	-----	-----	-2.18	-----	0.00
1	-2.18	-487.20	-2.22	0.00	0.00
Cr	-2.20	-----	-----	0.00	-----

Reactions and column moments

Joint	Reaction	Moment lower column	Moment upper column
	T	T-m	T-m
1	-0.001	0.000	0.000
2	0.001	0.000	0.000

Note: moments are reported at centerline

8 - factored moments and reactions envelope

8.1 factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.69	-----
1	-0.67	-0.67	1592.65	1592.65	-0.31	-0.31
Cr	-0.38	-----	-----	-----	-----	-----

8.2 reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	183.72	183.72	0.00	0.00	0.00	0.00
2	182.81	182.81	0.00	0.00	0.00	0.00

8.3 secondary moments

Span	Left	Midspan	Right
	T-m	T-m	T-m
1	0.00	0.00	0.00

8.4 factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.21	-0.21	-0.69	-0.69	0.00	0.00
1	-0.68	-0.68	1608.58	1608.58	-0.32	-0.32	0.00	0.00
Cr	-0.38	-0.38	-0.10	-0.10	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

10 - mild steel - no redistribution

10.1 required rebar

10.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.30	0.35	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	5.37	22.56	0.00	22.56	0.00	0.00
1	Top	30.45	35.82	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.04	19.80	0.00	19.80	0.00	0.00
1	Bot	7.16	28.66	103.80	103.80	13.67	0.00	0.00

10.2 provided rebar

10.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area

			M			M	Cm2
Cl	1	Top	0.28	32	3	7.24	22.72
1	2	Top	28.66	32	3	7.22	22.72
1	3	Bot	5.07	74	3	25.68	52.54
1	4	Bot	8.66	73	3	18.52	51.83

10.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.28	32	3	0.07
1	1	Top	0.00	32	3	7.17
1	2	Top	28.66	32	3	7.16
Cr	2	Top	0.00	32	3	0.06
1	3	Bot	5.07	74	3	25.68
1	4	Bot	8.66	73	3	18.52

11 - mild steel - redistributed

11.1 required rebar

11.1.1 total strip required rebar

Span	Location	From	To	As required	Ultimate	Minimum	Initial	Ubc
		M	M	Cm2	Cm2	Cm2	Cm2	Cm2
Cl	Top	0.30	0.35	19.80	0.00	19.80	0.00	0.00
1	Top	0.00	5.37	22.56	0.00	22.56	0.00	0.00
1	Top	30.45	35.82	22.56	0.00	22.56	0.00	0.00
Cr	Top	0.00	0.04	19.80	0.00	19.80	0.00	0.00
1	Bot	7.16	28.66	108.10	108.10	13.67	0.00	0.00

11.2 provided rebar

11.2.1 total strip provided rebar

Span	Id	Location	From	Quantity	Size	Length	Area
			M			M	Cm2
Cl	1	Top	0.28	32	3	7.24	22.72
1	2	Top	28.66	32	3	7.22	22.72
1	3	Bot	5.07	77	3	25.68	54.67
1	4	Bot	8.66	76	3	18.52	53.96

11.2.2 total strip steel disposition

Span	Id	Location	From	Quantity	Size	Length
			M			M
Cl	1	Top	0.28	32	3	0.07
1	1	Top	0.00	32	3	7.17
1	2	Top	28.66	32	3	7.16
Cr	2	Top	0.00	32	3	0.06
1	3	Bot	5.07	77	3	25.68
1	4	Bot	8.66	76	3	18.52

12 - shear reinforcement

12.1 shear calculation envelope

Cl

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	0.00	-0.00	0.00	0.000	0.00
0.05	0.02	144.00	0.20	-0.00	0.00	0.000	0.00
0.10	0.04	144.00	0.40	-0.01	0.00	0.000	0.00
0.15	0.05	144.00	0.57	-0.02	0.00	0.000	0.00
0.20	0.07	144.00	0.77	-0.03	0.00	0.000	0.00
0.25	0.09	144.00	0.97	-0.04	0.01	0.000	0.00
0.30	0.11	144.00	1.19	-0.06	0.01	0.000	0.00
0.35	0.12	144.00	1.38	-0.09	0.01	0.000	0.00
0.40	0.14	144.00	1.57	-0.11	0.01	0.000	0.00
0.45	0.16	144.00	1.76	-0.14	0.01	0.000	0.00
0.50	0.17	144.00	1.96	-0.18	0.01	0.000	0.00
0.55	0.19	144.00	2.16	-0.21	0.01	0.000	0.00
0.60	0.21	144.00	2.35	-0.25	0.01	0.000	0.00
0.65	0.23	144.00	2.55	-0.30	0.01	0.000	0.00
0.70	0.25	144.00	2.75	-0.34	0.01	0.000	0.00
0.75	0.26	144.00	2.93	-0.39	0.02	0.000	0.00
0.80	0.28	144.00	3.13	-0.45	0.02	0.000	0.00
0.85	0.30	144.00	3.32	-0.51	0.02	0.000	0.00
0.90	0.32	144.00	3.54	-0.57	0.02	0.000	0.00
0.95	0.33	144.00	3.74	-0.63	0.02	0.000	0.00
1.00	0.35	144.00	3.92	-0.70	0.02	0.000	0.00

Span 1

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-179.82	-0.69	0.95	2.450	54.67
0.05	1.79	144.00	-159.94	309.58	1.94	13.490	9.93
0.10	3.58	144.00	-142.20	585.52	2.58	15.130	8.86
0.15	5.37	152.80	-124.36	828.95	2.62	12.590	10.64
0.20	7.16	162.80	-106.63	1039.76	2.66	10.230	13.09
0.25	8.96	162.80	-88.87	1218.14	2.29	7.683	17.44
0.30	10.75	162.80	-71.09	1364.93	1.83	4.950	27.06
0.35	12.54	162.80	-53.32	1478.08	1.37	2.218	60.00
0.40	14.33	162.80	-35.55	1559.63	0.91	1.807	60.00
0.45	16.12	162.80	-17.78	1608.56	0.46	0.000	0.00
0.50	17.91	162.80	-0.01	1624.87	0.00	0.000	0.00
0.55	19.70	162.80	17.76	1608.56	0.46	0.000	0.00
0.60	21.49	162.80	35.51	1559.63	0.91	1.807	60.00
0.65	23.28	162.80	53.27	1479.10	1.37	2.211	60.00
0.70	25.07	162.80	71.06	1364.93	1.83	4.946	27.09
0.75	26.87	162.80	88.82	1219.16	2.28	7.676	17.45
0.80	28.66	162.80	106.63	1040.77	2.66	10.230	13.09
0.85	30.45	152.80	124.36	829.46	2.62	12.590	10.64
0.90	32.24	144.00	142.10	586.03	2.58	15.130	8.86
0.95	34.03	144.00	159.94	309.99	1.95	13.510	9.91
1.00	35.82	144.00	179.92	-0.32	0.95	2.482	53.97

Cr

X/l	X	D	Vu	Mu	Ratio	Req.	Spacing
	M	Cm	T	Tm		Cm2	Cm
0.00	0.00	144.00	-2.91	-0.39	0.02	0.000	0.00
0.05	0.01	144.00	-2.78	-0.35	0.01	0.000	0.00
0.10	0.03	144.00	-2.61	-0.31	0.01	0.000	0.00
0.15	0.04	144.00	-2.47	-0.28	0.01	0.000	0.00
0.20	0.05	144.00	-2.33	-0.25	0.01	0.000	0.00
0.25	0.07	144.00	-2.18	-0.22	0.01	0.000	0.00
0.30	0.08	144.00	-2.04	-0.19	0.01	0.000	0.00
0.35	0.09	144.00	-1.90	-0.16	0.01	0.000	0.00

0.40	0.10	144.00	-1.74	-0.14	0.01	0.000	0.00
0.45	0.12	144.00	-1.61	-0.12	0.01	0.000	0.00
0.50	0.13	144.00	-1.46	-0.10	0.01	0.000	0.00
0.55	0.14	144.00	-1.31	-0.08	0.01	0.000	0.00
0.60	0.16	144.00	-1.16	-0.06	0.01	0.000	0.00
0.65	0.17	144.00	-1.03	-0.05	0.01	0.000	0.00
0.70	0.18	144.00	-0.87	-0.03	0.00	0.000	0.00
0.75	0.20	144.00	-0.74	-0.02	0.00	0.000	0.00
0.80	0.21	144.00	-0.57	-0.02	0.00	0.000	0.00
0.85	0.22	144.00	-0.45	-0.01	0.00	0.000	0.00
0.90	0.23	144.00	-0.29	-0.00	0.00	0.000	0.00
0.95	0.25	144.00	-0.16	-0.00	0.00	0.000	0.00
1.00	0.26	144.00	0.00	-0.00	0.00	0.000	0.00

Note: "vu" is related to the load combination which produces the maximum "ratio"
Note: sections with **** have exceeded the maximum allowable shear stress.

14 - deflections

14.1 maximum span deflections

Span	Sw	Sw+pt	Sw+pt+sdl	Sw+pt+sdl+creep	Ll	X	Total
	Cm	Cm	Cm	Cm	Cm	Cm	Cm
Cl	-0.1	0.1	0.1	0.2(195)	-0.3(127)	0.0(*****)	-0.1(365)
1	4.3	-3.9	-1.4	-4.3(828)	9.0(399)	0.0(*****)	4.6(772)
Cr	-0.1	0.1	0.0	0.1(195)	-0.2(127)	0.0(*****)	-0.1(364)

Note: deflections are calculated using effective moment of inertia of cracked sections.

15 - friction, elongation and long term losses

15.1 input parameters

Parameter	Value	Parameter	Value
Type of strand	Low relaxation	Coefficient of angular friction (meu)	0.07000 1/rad
Age of concrete at stressing	5 days	Coefficient of wobble friction (k)	0.00350 rad/m
Ec at stressing	287.23 t/cm2	Ratio of jacking stress	0.77
Average relative humidity	70.00 percent	Anchor set	10.00 mm
Volume to surface ratio of members	8.00 cm	Tendon_a stressing method	Left side
Es of strand	1960.00 t/cm2		

15.2 long-term losses

Tendon	Span	Left	Center	Right
		T/cm2	T/cm2	T/cm2
Tendon_a	Cl	1.38	1.38	1.38
Tendon_a	1	1.38	1.45	1.38
Tendon_a	Cr	1.38	1.38	1.38

15.3 calculated stresses after friction and long-term losses

Tendon	Span	Stress left fl only	Stress center fl only	Stress right fl only	Stress left fl+ltl	Stress center fl+ltl	Stress right fl+ltl
		T/cm2	T/cm2	T/cm2	T/cm2	T/cm2	T/cm2
Tendon_a	Cl	12.51	12.52	12.53	11.14	11.14	11.15
Tendon_a	1	12.53	13.76	12.67	11.15	12.30	11.29
Tendon_a	Cr	12.67	12.62	12.61	11.29	11.24	11.23

15.6 summary

Tendon	Force	Ext. Left	Start span	End span	Ext. Right	Elong. Left	Elong right	Anchor left	Anchor right	Max stress ratio
	T					Cm	Cm			
Tendon_a	11.30	0.00	Cl	3	0.00	24.71	-0.00	0.64	0.65	0.71

21 - tendon heights

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cl			
0.00	0.000	975.00	1007.00	1007.00
0.05	0.018	975.00	1007.02	1007.02
0.10	0.035	975.00	1007.08	1007.08
0.15	0.053	975.00	1007.18	1007.18
0.20	0.070	975.00	1007.32	1007.32
0.25	0.087	975.00	1007.50	1007.50
0.30	0.105	975.00	1007.72	1007.72
0.35	0.122	975.00	1007.98	1007.98
0.40	0.140	975.00	1008.28	1008.28
0.45	0.157	975.00	1008.62	1008.62
0.50	0.175	975.00	1009.00	1009.00
0.55	0.193	975.00	1009.42	1009.42
0.60	0.210	975.00	1009.88	1009.88
0.65	0.227	975.00	1010.38	1010.38
0.70	0.245	975.00	1010.92	1010.92
0.75	0.262	975.00	1011.50	1011.50
0.80	0.280	975.00	1012.12	1012.12
0.85	0.298	975.00	1012.78	1012.78
0.90	0.315	975.00	1013.48	1013.48
0.95	0.332	975.00	1014.22	1014.22
1.00	0.350	975.00	1015.00	1015.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Span 1			
0.00	0.000	975.00	1015.00	1015.00
0.05	1.791	874.63	966.75	966.75
0.10	3.582	573.50	821.99	821.99
0.15	5.373	272.38	641.05	641.05
0.20	7.164	172.00	484.23	484.23
0.25	8.955	172.00	351.53	351.53
0.30	10.746	172.00	242.97	242.97
0.35	12.537	172.00	158.53	158.53
0.40	14.328	172.00	98.21	98.21
0.45	16.119	172.00	62.02	62.02
0.50	17.910	172.00	49.96	49.96
0.55	19.701	172.00	71.21	71.21
0.60	21.492	172.00	134.96	134.96
0.65	23.283	172.00	241.21	241.21
0.70	25.074	172.00	389.97	389.97
0.75	26.865	172.00	581.22	581.22
0.80	28.656	172.00	814.98	814.98
0.85	30.447	272.38	1091.23	1091.23
0.90	32.238	573.50	1409.99	1409.99
0.95	34.029	874.63	1665.00	1665.00
1.00	35.820	975.00	1750.00	1750.00

X/l	X	Cgs a	Cgs b	Cgs c
	M	Mm	Mm	Mm
	Cr			
0.00	0.000	975.00	1750.00	1750.00
0.05	0.013	975.00	1674.84	1674.84
0.10	0.026	975.00	1603.53	1603.53
0.15	0.039	975.00	1536.07	1536.07
0.20	0.052	975.00	1472.47	1472.47
0.25	0.065	975.00	1412.72	1412.72
0.30	0.078	975.00	1356.83	1356.83
0.35	0.091	975.00	1304.79	1304.79
0.40	0.104	975.00	1256.61	1256.61
0.45	0.117	975.00	1212.28	1212.28
0.50	0.130	975.00	1171.81	1171.81
0.55	0.143	975.00	1135.19	1135.19
0.60	0.156	975.00	1102.43	1102.43
0.65	0.169	975.00	1073.52	1073.52
0.70	0.182	975.00	1048.46	1048.46
0.75	0.195	975.00	1027.26	1027.26
0.80	0.208	975.00	1009.92	1009.92
0.85	0.221	975.00	996.43	996.43
0.90	0.234	975.00	986.79	986.79
0.95	0.247	975.00	981.01	981.01
1.00	0.260	975.00	979.08	979.08

22 - post-tensioning balanced loading

Span	Type	W	F	M	A	B
		T/m	T	T-m	M	M
1	3	36.568			0.00	3.58
1	3	36.568			32.24	35.82
1	3	-36.568			3.58	7.16
1	3	-36.568			28.66	32.24
1	4			15.77	1.65	
1	4			-15.77	34.08	
Cl	4			2.18	0.35	
Cr	4			-2.20	0.26	

23 - detailed moments

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.18	0.00
0.05	0.02	0.00	0.00	0.00	0.00	0.00	-2.18	0.00
0.10	0.04	0.00	0.00	0.00	0.00	0.00	-2.18	0.00
0.15	0.05	0.00	0.00	0.00	0.00	0.00	-2.18	0.00
0.20	0.07	-0.01	0.00	0.00	-0.01	-0.01	-2.18	0.00
0.25	0.09	-0.01	0.00	0.00	-0.01	-0.01	-2.18	0.00
0.30	0.11	-0.02	-0.01	0.00	-0.02	-0.02	-2.18	0.00
0.35	0.12	-0.02	-0.01	0.00	-0.03	-0.03	-2.18	0.00
0.40	0.14	-0.03	-0.01	0.00	-0.03	-0.03	-2.18	0.00
0.45	0.16	-0.03	-0.01	0.00	-0.04	-0.04	-2.18	0.00
0.50	0.18	-0.04	-0.02	0.00	-0.05	-0.05	-2.18	0.00
0.55	0.19	-0.05	-0.02	0.00	-0.06	-0.06	-2.18	0.00
0.60	0.21	-0.06	-0.02	0.00	-0.08	-0.08	-2.18	0.00
0.65	0.23	-0.07	-0.03	0.00	-0.09	-0.09	-2.18	0.00
0.70	0.25	-0.08	-0.03	0.00	-0.10	-0.10	-2.18	0.00
0.75	0.26	-0.09	-0.04	0.00	-0.12	-0.12	-2.18	0.00

0.80	0.28	-0.11	-0.04	0.00	-0.14	-0.14	-2.18	0.00
0.85	0.30	-0.12	-0.05	0.00	-0.15	-0.15	-2.18	0.00
0.90	0.32	-0.14	-0.05	0.00	-0.17	-0.17	-2.18	0.00
0.95	0.33	-0.15	-0.06	0.00	-0.19	-0.19	-2.18	0.00
1.00	0.35	-0.17	-0.06	0.00	-0.21	-0.21	-2.18	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.16	-0.06	0.00	-0.21	-0.21	-2.18	0.00
0.05	1.79	56.49	31.78	0.00	105.78	105.78	-76.61	0.00
0.10	3.58	106.07	60.28	0.00	200.62	200.62	-252.56	0.00
0.15	5.37	149.82	85.42	0.00	284.29	284.29	-428.51	0.00
0.20	7.16	187.74	107.21	0.00	356.82	356.82	-487.16	0.00
0.25	8.95	219.82	125.65	0.00	418.18	418.18	-487.16	0.00
0.30	10.75	246.07	140.73	0.00	468.39	468.39	-487.16	0.00
0.35	12.54	266.50	152.47	0.00	507.44	507.44	-487.17	0.00
0.40	14.33	281.09	160.85	0.00	535.34	535.34	-487.17	0.00
0.45	16.12	289.84	165.88	0.00	552.08	552.08	-487.17	0.00
0.50	17.91	292.77	167.56	0.00	557.66	557.66	-487.17	0.00
0.55	19.70	289.87	165.88	0.00	552.09	552.09	-487.17	0.00
0.60	21.49	281.13	160.86	0.00	535.36	535.36	-487.18	0.00
0.65	23.28	266.56	152.48	0.00	507.48	507.48	-487.18	0.00
0.70	25.07	246.16	140.75	0.00	468.44	468.44	-487.18	0.00
0.75	26.87	219.93	125.66	0.00	418.24	418.24	-487.18	0.00
0.80	28.66	187.87	107.23	0.00	356.88	356.88	-487.18	0.00
0.85	30.45	149.98	85.44	0.00	284.37	284.37	-428.54	0.00
0.90	32.24	106.25	60.31	0.00	200.71	200.71	-252.59	0.00
0.95	34.03	56.69	31.81	0.00	105.88	105.88	-76.64	0.00
1.00	35.82	-0.08	-0.03	0.00	-0.10	-0.10	-2.22	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T-m	T-m	T-m	T-m	T-m	T-m	T-m
0.00	0.00	-0.09	-0.04	0.00	-0.12	-0.12	-2.20	0.00
0.05	0.01	-0.08	-0.03	0.00	-0.11	-0.11	-2.20	0.00
0.10	0.03	-0.07	-0.03	0.00	-0.10	-0.10	-2.20	0.00
0.15	0.04	-0.07	-0.03	0.00	-0.08	-0.08	-2.20	0.00
0.20	0.05	-0.06	-0.02	0.00	-0.08	-0.08	-2.20	0.00
0.25	0.06	-0.05	-0.02	0.00	-0.07	-0.07	-2.20	0.00
0.30	0.08	-0.05	-0.02	0.00	-0.06	-0.06	-2.20	0.00
0.35	0.09	-0.04	-0.01	0.00	-0.05	-0.05	-2.20	0.00
0.40	0.10	-0.03	-0.01	0.00	-0.04	-0.04	-2.20	0.00
0.45	0.12	-0.03	-0.01	0.00	-0.04	-0.04	-2.20	0.00
0.50	0.13	-0.02	-0.01	0.00	-0.03	-0.03	-2.20	0.00
0.55	0.14	-0.02	-0.01	0.00	-0.02	-0.02	-2.20	0.00
0.60	0.16	-0.01	-0.01	0.00	-0.02	-0.02	-2.20	0.00
0.65	0.17	-0.01	0.00	0.00	-0.01	-0.01	-2.20	0.00
0.70	0.18	-0.01	0.00	0.00	-0.01	-0.01	-2.20	0.00
0.75	0.20	-0.01	0.00	0.00	-0.01	-0.01	-2.20	0.00
0.80	0.21	0.00	0.00	0.00	0.00	0.00	-2.20	0.00
0.85	0.22	0.00	0.00	0.00	0.00	0.00	-2.20	0.00
0.90	0.23	0.00	0.00	0.00	0.00	0.00	-2.20	0.00
0.95	0.25	0.00	0.00	0.00	0.00	0.00	-2.20	0.00
1.00	0.26	0.00	0.00	0.00	0.00	0.00	-2.20	0.00

24 - detailed shears

Cl

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary

	M	T	T	T	T	T	T	T
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.05	0.02	0.00	0.06	0.00	0.00	0.00
0.10	0.04	0.10	0.04	0.00	0.12	0.00	0.00	0.00
0.15	0.05	0.14	0.05	0.00	0.18	0.00	0.00	0.00
0.20	0.07	0.19	0.07	0.00	0.24	0.00	0.00	0.00
0.25	0.09	0.24	0.09	0.00	0.30	0.00	0.00	0.00
0.30	0.11	0.29	0.11	0.00	0.37	0.00	0.00	0.00
0.35	0.12	0.33	0.13	0.00	0.43	0.00	0.00	0.00
0.40	0.14	0.38	0.15	0.00	0.49	0.00	0.00	0.00
0.45	0.16	0.43	0.16	0.00	0.55	0.00	0.00	0.00
0.50	0.18	0.48	0.18	0.00	0.61	0.00	0.00	0.00
0.55	0.19	0.53	0.20	0.00	0.67	0.00	0.00	0.00
0.60	0.21	0.57	0.22	0.00	0.73	0.00	0.00	0.00
0.65	0.23	0.62	0.24	0.00	0.79	0.00	0.00	0.00
0.70	0.25	0.67	0.26	0.00	0.85	0.00	0.00	0.00
0.75	0.26	0.72	0.27	0.00	0.91	0.00	0.00	0.00
0.80	0.28	0.77	0.29	0.00	0.97	0.00	0.00	0.00
0.85	0.30	0.81	0.31	0.00	1.03	0.00	0.00	0.00
0.90	0.32	0.86	0.33	0.00	1.10	0.00	0.00	0.00
0.95	0.33	0.91	0.35	0.00	1.16	0.00	0.00	0.00
1.00	0.35	0.96	0.37	0.00	1.22	0.00	0.00	0.00

Span 1

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-34.08	-18.72	0.00	0.00	-62.29	0.00	0.00
0.05	1.79	-29.31	-16.84	0.00	0.00	-56.06	65.50	0.00
0.10	3.58	-26.06	-14.97	0.00	0.00	-49.84	130.99	0.00
0.15	5.37	-22.80	-13.10	0.00	0.00	-43.61	65.50	0.00
0.20	7.16	-19.54	-11.23	0.00	0.00	-37.38	0.00	0.00
0.25	8.95	-16.29	-9.36	0.00	0.00	-31.15	0.00	0.00
0.30	10.75	-13.03	-7.49	0.00	0.00	-24.92	0.00	0.00
0.35	12.54	-9.77	-5.62	0.00	0.00	-18.69	0.00	0.00
0.40	14.33	-6.52	-3.74	0.00	0.00	-12.46	0.00	0.00
0.45	16.12	-3.26	-1.87	0.00	0.00	-6.23	0.00	0.00
0.50	17.91	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.55	19.70	3.25	1.87	0.00	6.23	0.00	0.00	0.00
0.60	21.49	6.51	3.74	0.00	12.45	0.00	0.00	0.00
0.65	23.28	9.76	5.61	0.00	18.68	0.00	0.00	0.00
0.70	25.07	13.02	7.49	0.00	24.91	0.00	0.00	0.00
0.75	26.87	16.27	9.36	0.00	31.14	0.00	0.00	0.00
0.80	28.66	19.53	11.23	0.00	37.37	0.00	0.00	0.00
0.85	30.45	22.79	13.10	0.00	43.60	0.00	-65.49	0.00
0.90	32.24	26.04	14.97	0.00	49.83	0.00	-130.99	0.00
0.95	34.03	29.30	16.84	0.00	56.06	0.00	-65.49	0.00
1.00	35.82	34.15	18.72	0.00	62.29	0.00	0.00	0.00

Cr

X/l	X	Sw	Sdl	Xl	Ll min	Ll max	Pt	Secondary
	M	T	T	T	T	T	T	T
0.00	0.00	-0.71	-0.27	0.00	0.00	-0.90	0.00	0.00
0.05	0.01	-0.68	-0.26	0.00	0.00	-0.86	0.00	0.00
0.10	0.03	-0.64	-0.24	0.00	0.00	-0.81	0.00	0.00
0.15	0.04	-0.60	-0.23	0.00	0.00	-0.77	0.00	0.00
0.20	0.05	-0.57	-0.22	0.00	0.00	-0.72	0.00	0.00
0.25	0.06	-0.53	-0.20	0.00	0.00	-0.68	0.00	0.00
0.30	0.08	-0.50	-0.19	0.00	0.00	-0.63	0.00	0.00
0.35	0.09	-0.46	-0.18	0.00	0.00	-0.59	0.00	0.00
0.40	0.10	-0.43	-0.16	0.00	0.00	-0.54	0.00	0.00
0.45	0.12	-0.39	-0.15	0.00	0.00	-0.50	0.00	0.00

0.50	0.13	-0.36	-0.14	0.00	0.00	-0.45	0.00	0.00
0.55	0.14	-0.32	-0.12	0.00	0.00	-0.41	0.00	0.00
0.60	0.16	-0.28	-0.11	0.00	0.00	-0.36	0.00	0.00
0.65	0.17	-0.25	-0.10	0.00	0.00	-0.32	0.00	0.00
0.70	0.18	-0.21	-0.08	0.00	0.00	-0.27	0.00	0.00
0.75	0.20	-0.18	-0.07	0.00	0.00	-0.23	0.00	0.00
0.80	0.21	-0.14	-0.05	0.00	0.00	-0.18	0.00	0.00
0.85	0.22	-0.11	-0.04	0.00	0.00	-0.14	0.00	0.00
0.90	0.23	-0.07	-0.03	0.00	0.00	-0.09	0.00	0.00
0.95	0.25	-0.04	-0.01	0.00	0.00	-0.05	0.00	0.00
1.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00

25 - factored moments and reactions

Load combination: 1.40sw + 1.70ll + 1.40sdl + 1.70xl + 1.00sec

Factored design moments (not redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min
	T-m	T-m	T-m	T-m	T-m	T-m
Cl	-----	-----	-----	-----	-0.69	-----
1	-0.67	-0.67	1592.48	1592.48	-0.31	-0.31
Cr	-0.38	-----	-----	-----	-----	-----

Reactions and column moments

Joint	Reaction max	Reaction min	Moment lower column max	Moment lower column min	Moment upper column max	Moment upper column min
	T	T	T-m	T-m	T-m	T-m
1	183.72	183.72	0.00	0.00	0.00	0.00
2	182.81	182.81	0.00	0.00	0.00	0.00

Factored design moments (redistributed)

Span	Left max	Left min	middle max	middle min	Right max	Right min	Redist. Coef. Left	Redist. Coef right
	T-m	T-m	T-m	T-m	T-m	T-m		
Cl	-0.00	-0.00	-0.21	-0.21	-0.69	-0.69	0.00	0.00
1	-0.68	-0.68	1608.58	1608.58	-0.32	-0.32	0.00	0.00
Cr	-0.38	-0.38	-0.10	-0.10	-0.00	-0.00	0.00	0.00

Note: moments are reported at centerline

27 - detailed stresses

Cl

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.05	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.10	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.15	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.20	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.25	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.30	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.35	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.40	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.45	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.50	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.8	-49.0
0.55	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.0

0.60	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.65	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.70	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.75	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.80	0.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.85	0.30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-47.9	-49.1
0.90	0.32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-47.9	-49.1
0.95	0.33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-47.9	-49.1
1.00	0.35	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-47.9	-49.1

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.05	0.02	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.10	0.04	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.15	0.05	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.20	0.07	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.25	0.09	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.30	0.11	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.35	0.12	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.0
0.40	0.14	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.45	0.16	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.50	0.18	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.55	0.19	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.60	0.21	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.65	0.23	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.70	0.25	-----	-55.0	-----	-56.4	-----	-47.8	-----	-49.1
0.75	0.26	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.1
0.80	0.28	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2
0.85	0.30	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2
0.90	0.32	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2
0.95	0.33	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2
1.00	0.35	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2

Span 1

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1	-47.9	-49.1
0.05	1.79	-16.1	20.5	-9.1	11.5	0.0	0.0	-30.2	-30.2	38.3	38.3	-52.5	-102.1
0.10	3.58	-30.3	38.4	-17.2	21.8	0.0	0.0	-57.2	-57.2	72.7	72.7	-3.7	-167.2
0.15	5.37	-42.7	54.3	-24.4	30.9	0.0	0.0	-81.1	-81.1	103.0	103.0	45.9	-231.5
0.20	7.16	-53.5	68.0	-30.6	38.8	0.0	0.0	-101.8	-101.8	129.2	129.2	61.3	-254.1
0.25	8.95	-62.7	79.6	-35.8	45.5	0.0	0.0	-119.3	-119.3	151.4	151.4	60.3	-255.0
0.30	10.75	-70.2	89.1	-40.1	51.0	0.0	0.0	-133.6	-133.6	169.6	169.6	59.7	-255.6
0.35	12.54	-76.0	96.5	-43.5	55.2	0.0	0.0	-144.7	-144.7	183.8	183.8	59.2	-256.2
0.40	14.33	-80.2	101.8	-45.9	58.3	0.0	0.0	-152.7	-152.7	193.9	193.9	58.6	-256.8
0.45	16.12	-82.7	105.0	-47.3	60.1	0.0	0.0	-157.5	-157.5	199.9	199.9	58.0	-257.3
0.50	17.91	-83.5	106.0	-47.8	60.7	0.0	0.0	-159.0	-159.0	202.0	202.0	57.5	-257.9
0.55	19.70	-82.7	105.0	-47.3	60.1	0.0	0.0	-157.5	-157.5	199.9	199.9	58.1	-257.3
0.60	21.49	-80.2	101.8	-45.9	58.3	0.0	0.0	-152.7	-152.7	193.9	193.9	58.6	-256.7
0.65	23.28	-76.0	96.5	-43.5	55.2	0.0	0.0	-144.7	-144.7	183.8	183.8	59.2	-256.2
0.70	25.07	-70.2	89.1	-40.1	51.0	0.0	0.0	-133.6	-133.6	169.6	169.6	59.7	-255.6
0.75	26.87	-62.7	79.6	-35.8	45.5	0.0	0.0	-119.3	-119.3	151.5	151.5	60.3	-255.1
0.80	28.66	-53.6	68.0	-30.6	38.8	0.0	0.0	-101.8	-101.8	129.2	129.2	60.8	-254.5
0.85	30.45	-42.8	54.3	-24.4	30.9	0.0	0.0	-81.1	-81.1	103.0	103.0	45.0	-232.4
0.90	32.24	-30.3	38.5	-17.2	21.8	0.0	0.0	-57.2	-57.2	72.7	72.7	-4.0	-167.5
0.95	34.03	-16.2	20.5	-9.1	11.5	0.0	0.0	-30.2	-30.2	38.3	38.3	-53.7	-103.3
1.00	35.82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.5	-49.7

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-55.0	-----	-56.5	-----	-47.8	-----	-49.2
0.05	1.79	-----	-76.5	-----	-97.0	-----	-107.9	-----	-31.9
0.10	3.58	-----	-34.5	-----	-153.9	-----	-108.4	-----	-34.3
0.15	5.37	10.0	-----	-----	-212.0	-----	-102.3	-----	-43.4
0.20	7.16	16.9	-----	-----	-224.2	-----	-124.6	-----	-18.0
0.25	8.95	6.7	-----	-----	-213.7	-----	-157.5	21.5	-----
0.30	10.75	-----	-1.5	-----	-204.8	-----	-184.1	54.1	-----
0.35	12.54	-----	-8.0	-----	-198.1	-----	-205.0	79.3	-----
0.40	14.33	-----	-12.8	-----	-193.5	-----	-220.1	97.1	-----
0.45	16.12	-----	-15.9	-----	-191.0	-----	-229.4	107.6	-----
0.50	17.91	-----	-17.4	-----	-190.5	-----	-232.8	110.8	-----
0.55	19.70	-----	-15.9	-----	-190.9	-----	-229.4	107.7	-----
0.60	21.49	-----	-12.8	-----	-193.4	-----	-220.1	97.2	-----
0.65	23.28	-----	-8.0	-----	-198.1	-----	-205.1	79.3	-----
0.70	25.07	-----	-1.5	-----	-204.8	-----	-184.2	54.1	-----
0.75	26.87	6.6	-----	-----	-213.7	-----	-157.6	21.5	-----
0.80	28.66	16.4	-----	-----	-224.7	-----	-125.1	-----	-18.4
0.85	30.45	9.0	-----	-----	-213.0	-----	-103.3	-----	-44.2
0.90	32.24	-----	-34.9	-----	-154.2	-----	-108.8	-----	-34.5
0.95	34.03	-----	-77.9	-----	-98.2	-----	-109.1	-----	-32.9
1.00	35.82	-----	-55.8	-----	-57.2	-----	-48.5	-----	-49.8

Cr

X/l	X	Sw top	Sw bot	Sdl top	Sdl bot	Xl top	Xl bot	Ll top max-t	Ll top max-c	Ll bot max-t	Ll bot max-c	Pt top	Pt bot
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.5	-49.7
0.05	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.10	0.03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.15	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.20	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.25	0.06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.30	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.35	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.40	0.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.45	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.50	0.13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.55	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.60	0.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.65	0.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.70	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.75	0.20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.80	0.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.85	0.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.90	0.23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
0.95	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.3	-49.5
1.00	0.26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-48.2	-49.5

X/l	X	Initial top max-t	Initial top max-c	Initial bot max-t	Initial bot max-c	Env-1 top max-t	Env-1 top max-c	Env-1 bot max-t	Env-1 bot max-c
	M	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2	Kg/cm2
0.00	0.00	-----	-55.8	-----	-57.2	-----	-48.5	-----	-49.8
0.05	0.01	-----	-55.5	-----	-56.9	-----	-48.2	-----	-49.6
0.10	0.03	-----	-55.5	-----	-56.9	-----	-48.2	-----	-49.6
0.15	0.04	-----	-55.5	-----	-56.9	-----	-48.2	-----	-49.5
0.20	0.05	-----	-55.5	-----	-56.9	-----	-48.2	-----	-49.5
0.25	0.06	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5

0.30	0.08	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.35	0.09	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.40	0.10	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.45	0.12	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.50	0.13	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.55	0.14	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.60	0.16	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.65	0.17	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.70	0.18	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.75	0.20	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.80	0.21	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.85	0.22	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.90	0.23	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
0.95	0.25	-----	-55.5	-----	-56.9	-----	-48.3	-----	-49.5
1.00	0.26	-----	-55.5	-----	-56.9	-----	-48.2	-----	-49.5

28 - required post-tensioning

note: required post-tensioning force based on stress conditions

X/l	X	Pt	X	Pt	X	Pt
	M	T	M	T	M	T
	Cl		Span 1		Cr	
0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.00	1.79	190.27	0.01	0.00
0.10	0.04	0.00	3.58	324.70	0.03	0.00
0.15	0.05	0.00	5.37	368.88	0.04	0.00
0.20	0.07	0.00	7.16	448.43	0.05	0.00
0.25	0.09	0.00	8.95	543.08	0.06	0.00
0.30	0.11	0.00	10.75	620.56	0.08	0.00
0.35	0.12	0.00	12.54	682.09	0.09	0.00
0.40	0.14	0.00	14.33	727.38	0.10	0.00
0.45	0.16	0.00	16.12	756.19	0.12	0.00
0.50	0.17	0.00	17.91	768.05	0.13	0.00
0.55	0.19	0.00	19.70	755.97	0.14	0.00
0.60	0.21	0.00	21.49	727.29	0.16	0.00
0.65	0.23	0.00	23.28	682.14	0.17	0.00
0.70	0.25	0.00	25.07	620.78	0.18	0.00
0.75	0.26	0.00	26.86	543.46	0.20	0.00
0.80	0.28	0.00	28.66	450.42	0.21	0.00
0.85	0.30	0.00	30.45	372.00	0.22	0.00
0.90	0.31	0.00	32.24	325.76	0.23	0.00
0.95	0.33	0.00	34.03	191.68	0.25	0.00
1.00	0.35	0.00	35.82	0.00	0.26	0.00

29 - detailed rebar

Cl

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00
0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.09	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.11	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00

0.40	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.19	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.21	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.23	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.25	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.26	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.28	0.00	0.00	0.00	0.00	0.00	0.00
0.85	0.30	0.00	0.00	19.80	0.00	19.80	0.00
0.90	0.32	0.00	0.00	19.80	0.00	19.80	0.00
0.95	0.33	0.00	0.00	19.80	0.00	19.80	0.00
1.00	0.35	0.00	0.00	19.80	0.00	19.80	0.00

Span 1

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	22.56	0.00	22.56	0.00
0.05	1.79	0.00	0.00	15.43	0.00	15.43	0.00
0.10	3.58	0.00	0.00	15.43	0.00	15.43	0.00
0.15	5.37	0.00	0.00	15.43	0.00	15.43	0.00
0.20	7.16	0.00	16.22	0.00	0.00	0.00	16.22
0.25	8.96	0.00	50.36	0.00	0.00	0.00	50.36
0.30	10.75	0.00	67.60	0.00	0.00	0.00	67.60
0.35	12.54	0.00	83.73	0.00	13.67	0.00	83.73
0.40	14.33	0.00	96.89	0.00	13.67	0.00	96.89
0.45	16.12	0.00	104.70	0.00	13.67	0.00	104.70
0.50	17.91	0.00	108.10	0.00	13.67	0.00	108.10
0.55	19.70	0.00	104.70	0.00	13.67	0.00	104.70
0.60	21.49	0.00	97.00	0.00	13.67	0.00	97.00
0.65	23.28	0.00	83.77	0.00	13.67	0.00	83.77
0.70	25.07	0.00	70.46	0.00	0.00	0.00	70.46
0.75	26.87	0.00	50.28	0.00	0.00	0.00	50.28
0.80	28.66	0.00	15.52	0.00	0.00	0.00	15.52
0.85	30.45	0.00	0.00	15.43	0.00	15.43	0.00
0.90	32.24	0.00	0.00	15.43	0.00	15.43	0.00
0.95	34.03	0.00	0.00	15.43	0.00	15.43	0.00
1.00	35.82	0.00	0.00	22.56	0.00	22.56	0.00

Cr

X/l	X	Analysis top	Analysis bot	Minimum top	Minimum bot	Selected top	Selected bot
	M	Cm2	Cm2	Cm2	Cm2	Cm2	Cm2
0.00	0.00	0.00	0.00	19.80	0.00	19.80	0.00
0.05	0.01	0.00	0.00	19.80	0.00	19.80	0.00
0.10	0.03	0.00	0.00	19.80	0.00	19.80	0.00
0.15	0.04	0.00	0.00	19.80	0.00	19.80	0.00
0.20	0.05	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.07	0.00	0.00	0.00	0.00	0.00	0.00
0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.09	0.00	0.00	0.00	0.00	0.00	0.00
0.40	0.10	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.12	0.00	0.00	0.00	0.00	0.00	0.00
0.50	0.13	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.14	0.00	0.00	0.00	0.00	0.00	0.00
0.60	0.16	0.00	0.00	0.00	0.00	0.00	0.00
0.65	0.17	0.00	0.00	0.00	0.00	0.00	0.00
0.70	0.18	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.20	0.00	0.00	0.00	0.00	0.00	0.00
0.80	0.21	0.00	0.00	0.00	0.00	0.00	0.00

0.85	0.22	0.00	0.00	0.00	0.00	0.00	0.00
0.90	0.23	0.00	0.00	0.00	0.00	0.00	0.00
0.95	0.25	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00

Note: reinforcement requirements for initial condition are included in service block. Reinforcement requirements for ubc combination, if selected, are included in analysis block.

31 - detailed friction and longterm stress losses

Tendon_a

X/l	X	Initial stress	Longterm loss	Final stress	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2	M	T/cm2	T/cm2	T/cm2
	Cl				Span 1			
0.00	0.00	12.51	1.38	11.14	0.00	12.53	1.38	11.15
0.05	0.02	12.52	1.38	11.14	1.79	12.68	1.39	11.29
0.10	0.04	12.52	1.38	11.14	3.58	12.90	1.40	11.49
0.15	0.05	12.52	1.38	11.14	5.37	12.99	1.41	11.58
0.20	0.07	12.52	1.38	11.14	7.16	13.19	1.42	11.77
0.25	0.09	12.52	1.38	11.14	8.96	13.33	1.43	11.91
0.30	0.11	12.52	1.38	11.14	10.75	13.43	1.43	12.00
0.35	0.12	12.52	1.38	11.14	12.54	13.51	1.44	12.07
0.40	0.14	12.52	1.38	11.14	14.33	13.60	1.45	12.16
0.45	0.16	12.52	1.38	11.14	16.12	13.68	1.45	12.23
0.50	0.17	12.52	1.38	11.14	17.91	13.76	1.45	12.30
0.55	0.19	12.52	1.38	11.15	19.70	13.67	1.45	12.22
0.60	0.21	12.53	1.38	11.15	21.49	13.59	1.44	12.15
0.65	0.23	12.53	1.38	11.15	23.28	13.51	1.43	12.06
0.70	0.25	12.53	1.38	11.15	25.07	13.41	1.43	11.99
0.75	0.26	12.53	1.38	11.15	26.86	13.33	1.42	11.91
0.80	0.28	12.53	1.38	11.15	28.66	13.25	1.41	11.83
0.85	0.30	12.53	1.38	11.15	30.45	13.12	1.41	11.70
0.90	0.32	12.53	1.38	11.15	32.24	12.94	1.39	11.53
0.95	0.33	12.53	1.38	11.15	34.03	12.85	1.38	11.46
1.00	0.35	12.53	1.38	11.15	35.82	12.67	1.38	11.29

X/l	X	Initial stress	Longterm loss	Final stress
	M	T/cm2	T/cm2	T/cm2
	Cr			
0.00	0.00	12.67	1.38	11.29
0.05	0.01	12.62	1.38	11.24
0.10	0.03	12.62	1.38	11.24
0.15	0.04	12.62	1.38	11.24
0.20	0.05	12.62	1.38	11.24
0.25	0.07	12.62	1.38	11.24
0.30	0.08	12.62	1.38	11.24
0.35	0.09	12.62	1.38	11.24
0.40	0.10	12.62	1.38	11.24
0.45	0.12	12.62	1.38	11.24
0.50	0.13	12.62	1.38	11.24
0.55	0.14	12.62	1.38	11.24
0.60	0.16	12.62	1.38	11.24
0.65	0.17	12.61	1.38	11.24
0.70	0.18	12.61	1.38	11.23
0.75	0.20	12.61	1.38	11.23
0.80	0.21	12.61	1.38	11.23
0.85	0.22	12.61	1.38	11.23
0.90	0.23	12.61	1.38	11.23
0.95	0.25	12.61	1.38	11.23

1.00	0.26	12.61	1.38	11.23

34 demand moment and moment capacity

34.2 - based on designed values

CI

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	0.00	397.91	-437.68	0.00	0.00
0.05	0.02	0.00	0.00	397.87	-437.72	0.00	0.00
0.10	0.04	0.00	-0.01	397.83	-437.76	0.00	0.00
0.15	0.05	0.00	-0.02	397.79	-437.80	0.00	0.00
0.20	0.07	0.00	-0.03	397.86	-437.84	0.00	0.00
0.25	0.09	0.00	-0.04	397.82	-437.88	0.00	0.00
0.30	0.11	0.00	-0.06	397.78	-437.93	0.00	0.00
0.35	0.12	0.00	-0.08	397.74	-437.97	0.00	0.00
0.40	0.14	0.00	-0.11	397.70	-438.02	0.00	0.00
0.45	0.16	0.00	-0.14	397.66	-438.07	0.00	0.00
0.50	0.18	0.00	-0.17	397.62	-437.68	0.00	0.00
0.55	0.19	0.00	-0.21	397.58	-437.71	0.00	0.00
0.60	0.21	0.00	-0.24	397.54	-437.76	0.00	0.00
0.65	0.23	0.00	-0.29	397.50	-437.81	0.00	0.00
0.70	0.25	0.00	-0.33	397.46	-437.87	0.00	0.00
0.75	0.26	0.00	-0.38	397.42	-437.92	0.00	0.00
0.80	0.28	0.00	-0.43	397.38	-437.97	0.00	0.00
0.85	0.30	0.00	-0.49	407.56	-566.85	0.00	0.00
0.90	0.32	0.00	-0.55	407.52	-566.90	0.00	0.00
0.95	0.33	0.00	-0.61	407.48	-566.96	0.00	0.00
1.00	0.35	0.00	-0.68	407.44	-567.01	0.00	0.00
1.00	0.35	0.00	-0.68	407.44	-567.01	0.00	0.00

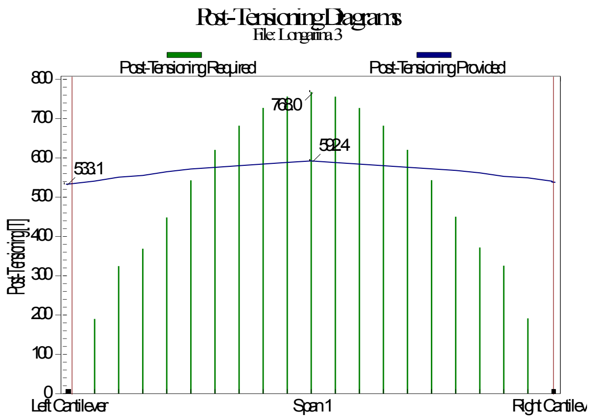
Span 1

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.67	407.26	-585.05	0.00	0.00
0.00	0.00	0.00	-0.67	407.26	-585.05	0.00	0.00
0.05	1.79	300.65	0.00	468.19	-483.93	0.64	0.00
0.10	3.58	568.68	0.00	651.49	-331.20	0.87	0.00
0.15	5.37	805.15	0.00	845.21	-174.46	0.95	0.00
0.20	7.16	1010.05	0.00	1026.62	-36.66	0.98	0.00
0.25	8.96	1183.66	0.00	1203.26	-57.06	0.98	0.00
0.30	10.75	1325.51	0.00	1323.84	-64.60	1.00	0.00
0.35	12.54	1435.86	0.00	1440.07	-68.41	1.00	0.00
0.40	14.33	1514.76	0.00	1531.13	-70.62	0.99	0.00
0.45	16.12	1562.06	0.00	1583.38	-71.75	0.99	0.00
0.50	17.91	1578.01	0.00	1608.73	-72.40	0.98	0.00
0.55	19.70	1562.20	0.00	1583.42	-71.74	0.99	0.00
0.60	21.49	1514.93	0.00	1531.20	-70.58	0.99	0.00
0.65	23.28	1436.17	0.00	1440.09	-68.52	1.00	0.00
0.70	25.07	1325.78	0.00	1343.09	-65.48	0.99	0.00
0.75	26.87	1183.80	0.00	1203.22	-57.13	0.98	0.00
0.80	28.66	1010.50	0.00	1026.21	-35.82	0.98	0.00
0.85	30.45	805.62	0.00	851.35	-174.69	0.95	0.00
0.90	32.24	569.16	0.00	655.60	-333.66	0.87	0.00
0.95	34.03	301.14	0.00	473.30	-492.31	0.64	0.00
1.00	35.82	0.00	-0.31	413.26	-599.68	0.00	0.00
1.00	35.82	0.00	-0.31	413.26	-599.68	0.00	0.00

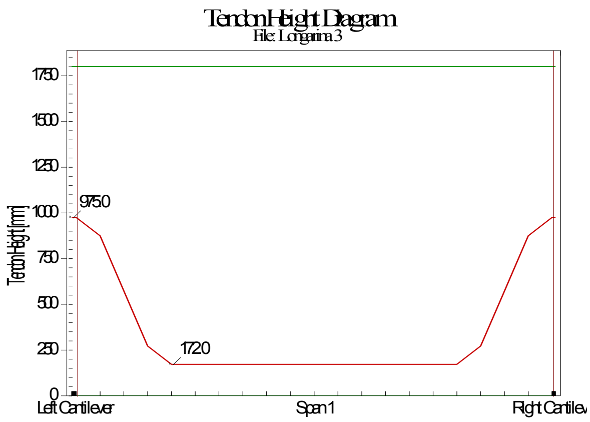
Cr

X/l	X	Demand moment pos	Demand moment neg	Moment capacity pos	Moment capacity neg	Demand/capacity pos	Demand/capacity neg
	M	T-m	T-m	T-m	T-m		
0.00	0.00	0.00	-0.38	410.69	-581.81	0.00	0.00
0.00	0.00	0.00	-0.38	410.69	-581.81	0.00	0.00
0.05	0.01	0.00	-0.34	410.20	-579.43	0.00	0.00
0.10	0.03	0.00	-0.30	410.35	-578.41	0.00	0.00
0.15	0.04	0.00	-0.27	410.25	-577.64	0.00	0.00
0.20	0.05	0.00	-0.24	400.88	-448.59	0.00	0.00
0.25	0.07	0.00	-0.21	400.91	-447.64	0.00	0.00
0.30	0.08	0.00	-0.18	400.93	-446.42	0.00	0.00
0.35	0.09	0.00	-0.16	400.96	-445.78	0.00	0.00
0.40	0.10	0.00	-0.14	400.98	-444.74	0.00	0.00
0.45	0.12	0.00	-0.11	401.01	-444.31	0.00	0.00
0.50	0.13	0.00	-0.09	401.03	-443.42	0.00	0.00
0.55	0.14	0.00	-0.08	401.06	-442.88	0.00	0.00
0.60	0.16	0.00	-0.06	401.08	-442.22	0.00	0.00
0.65	0.17	0.00	-0.05	401.11	-442.04	0.00	0.00
0.70	0.18	0.00	-0.03	401.13	-441.48	0.00	0.00
0.75	0.20	0.00	-0.02	401.15	-441.44	0.00	0.00
0.80	0.21	0.00	-0.02	401.18	-441.05	0.00	0.00
0.85	0.22	0.00	-0.01	401.20	-440.75	0.00	0.00
0.90	0.23	0.00	0.00	401.23	-440.52	0.00	0.00
0.95	0.25	0.00	0.00	401.25	-440.37	0.00	0.00
1.00	0.26	0.00	0.00	401.28	-440.31	0.00	0.00

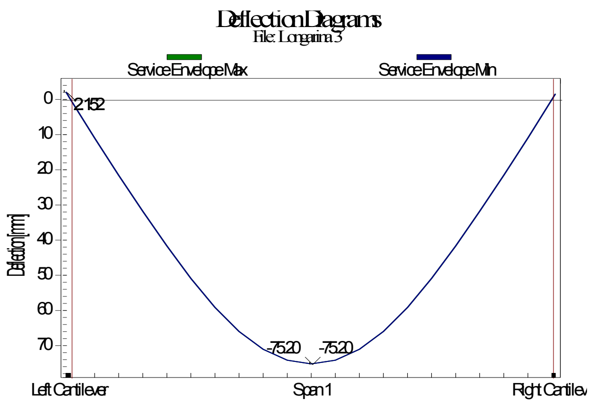
Note: capacity is calculated with the rebar and pt required for the design, including user defined base reinforcement



Post-tensioning
Required and provided

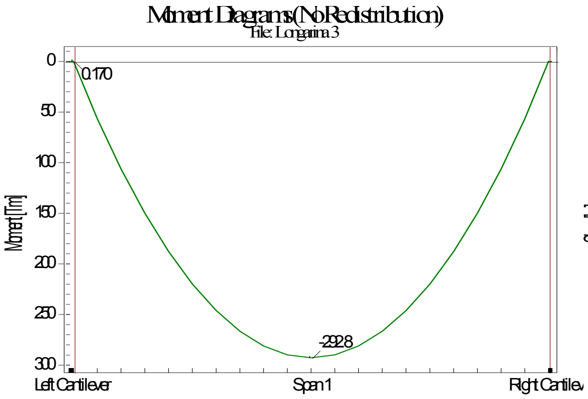


Post-tensioning
Profile

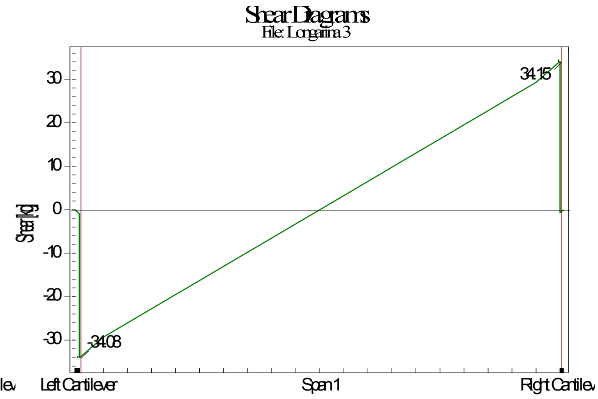


Deflection

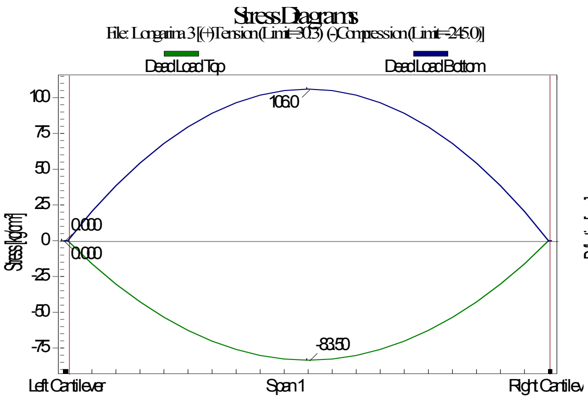
Load case: selfweight



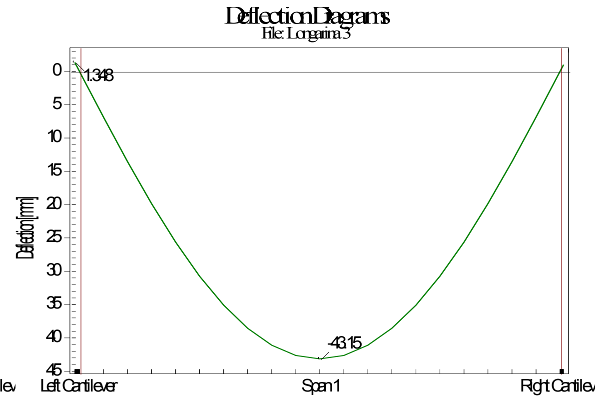
Moment



shear

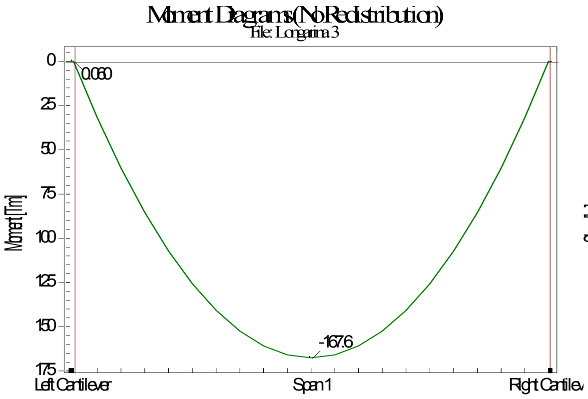


Stress

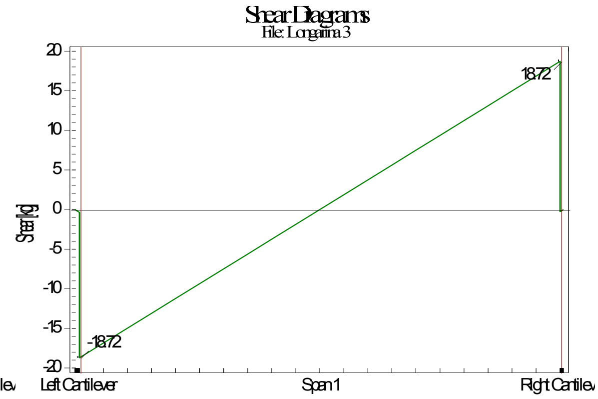


deflection

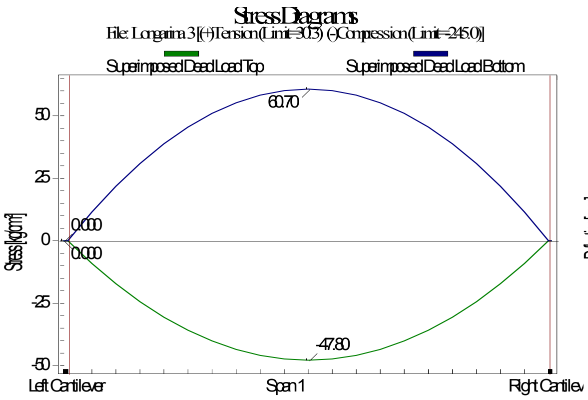
Load case: super imposed dead load



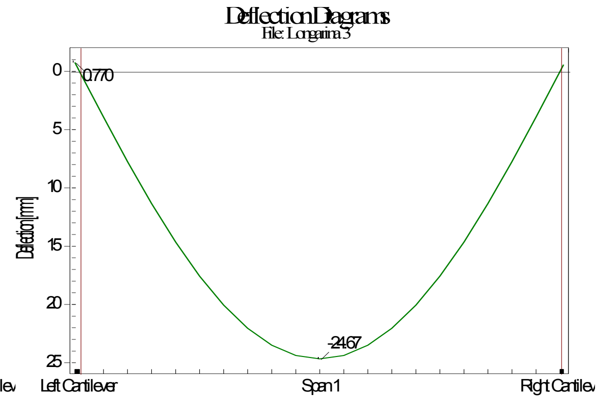
Moment



shear

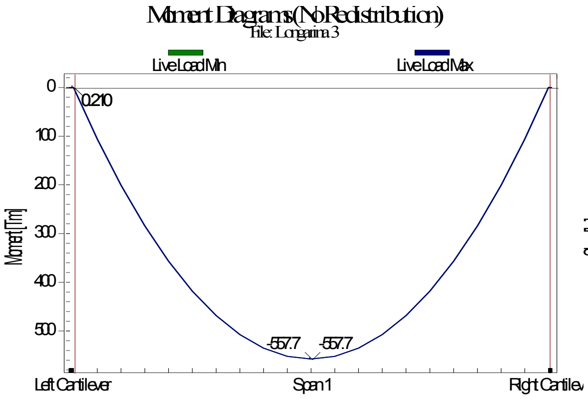


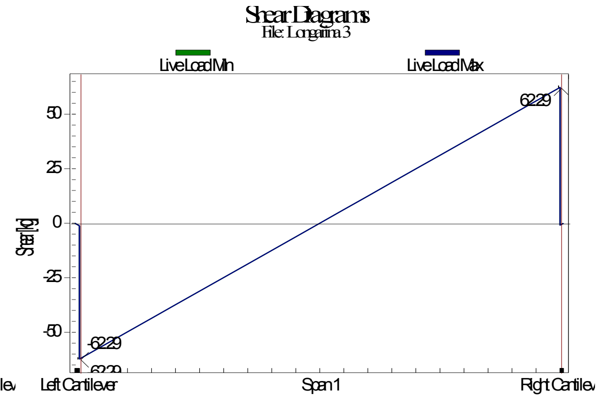
Stress



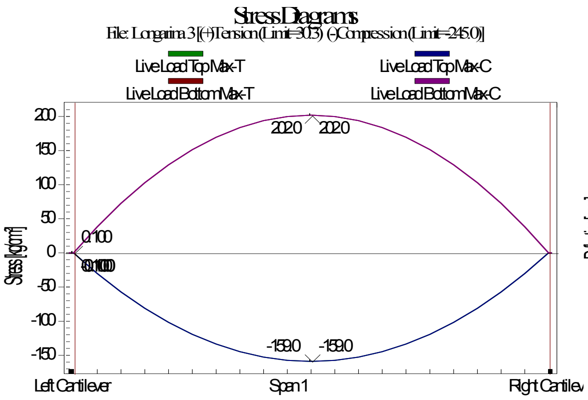
deflection

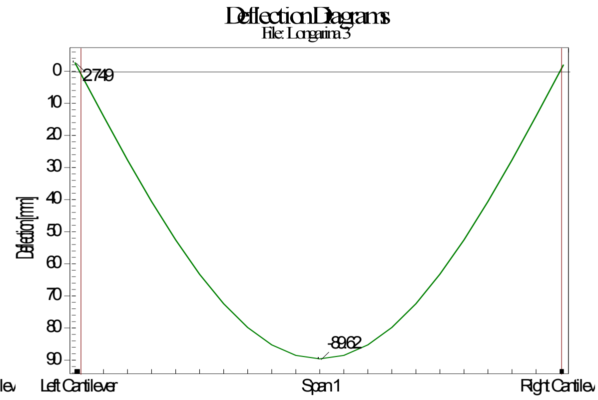
Load case: live load





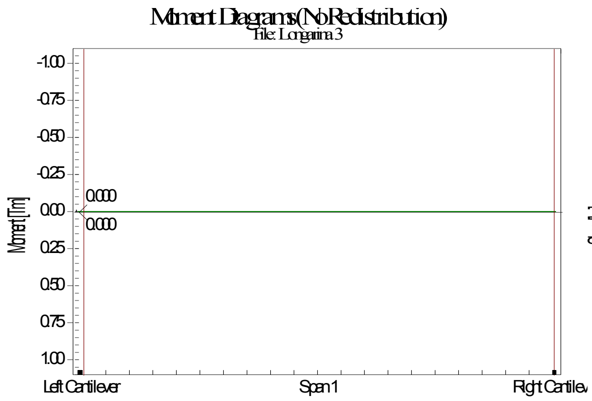
Moment **shear**



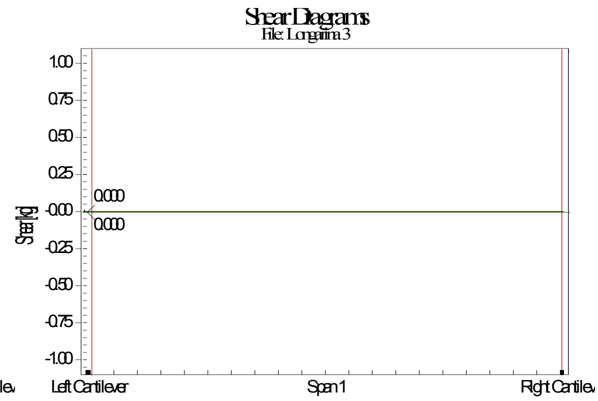


Stress **deflection**

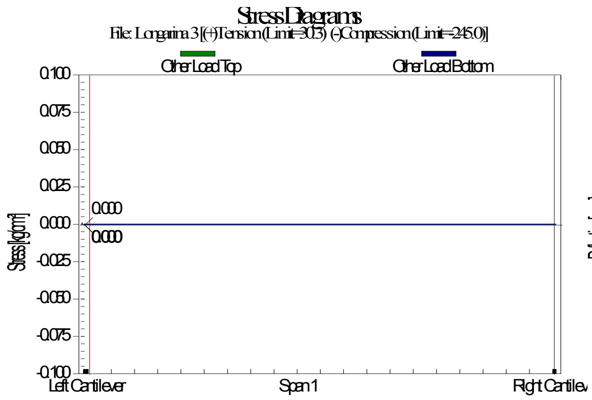
Load case: other load



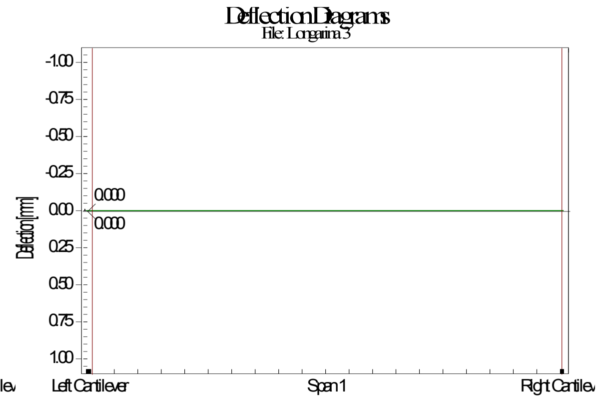
Moment



shear

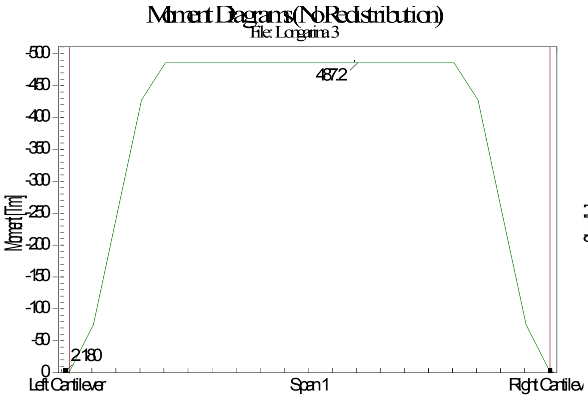


Stress

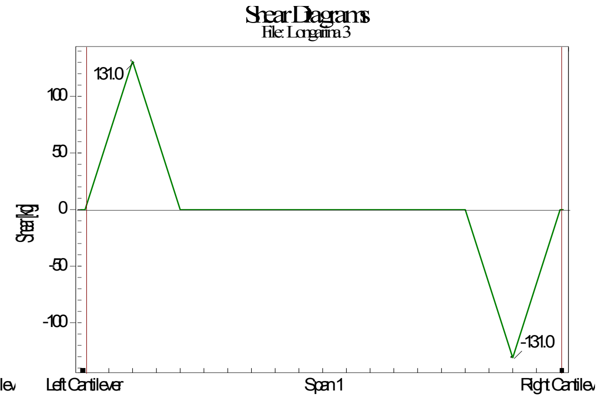


deflection

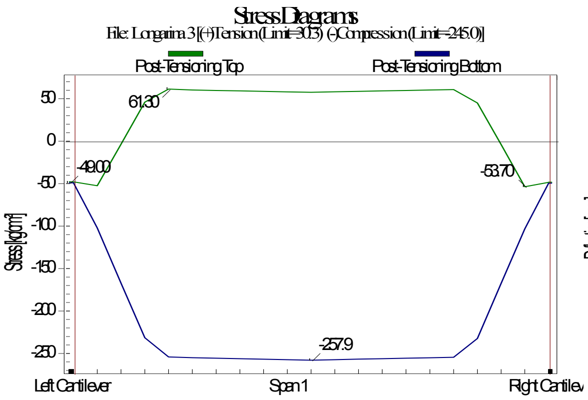
Load case: prestressing load



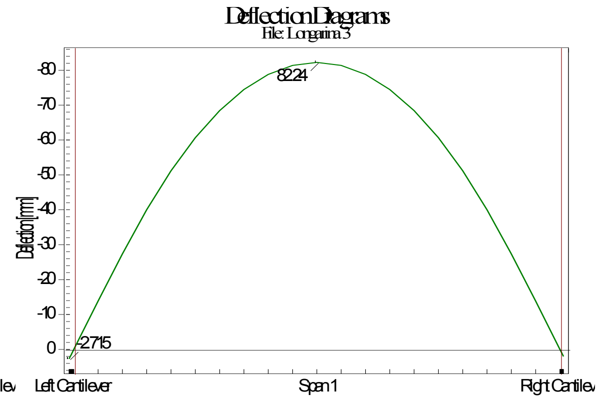
Moment



shear

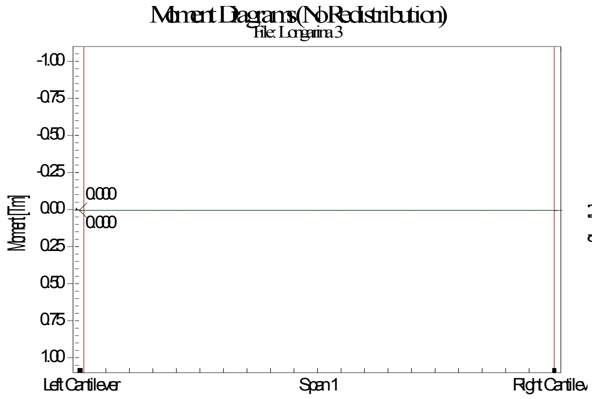


Stress

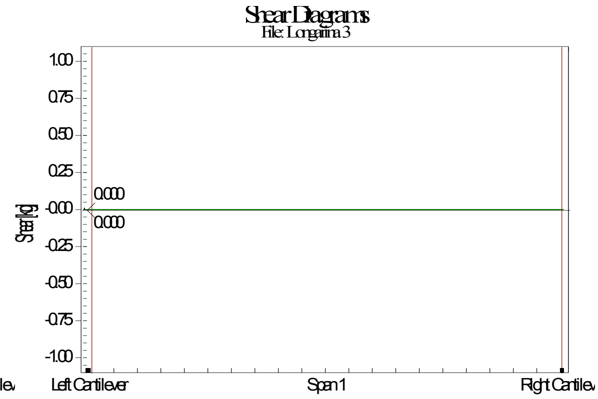


deflection

Load case: hyper static load

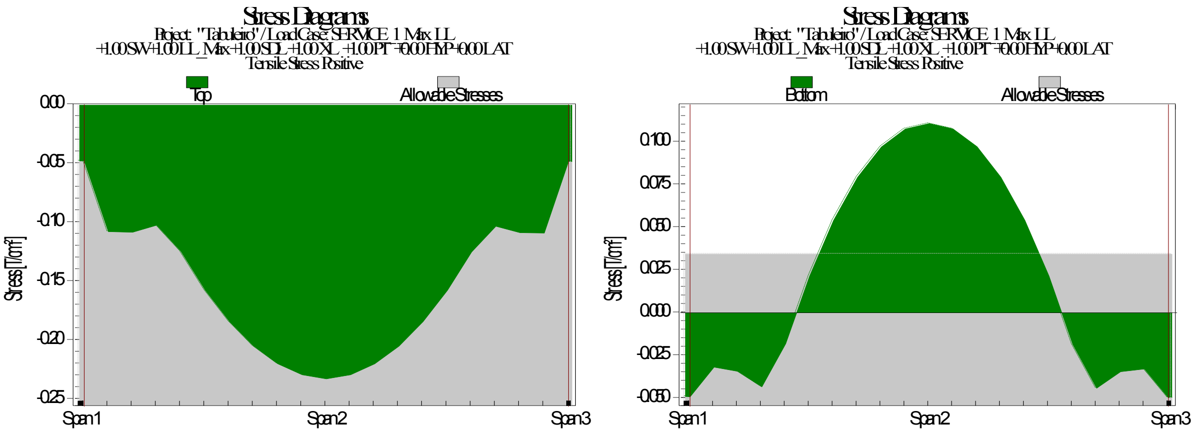


Moment

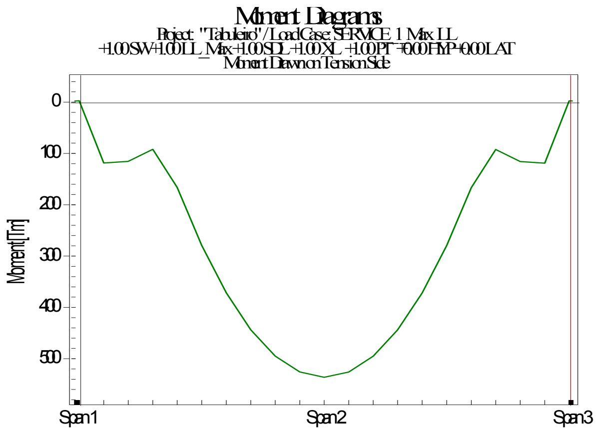


shear

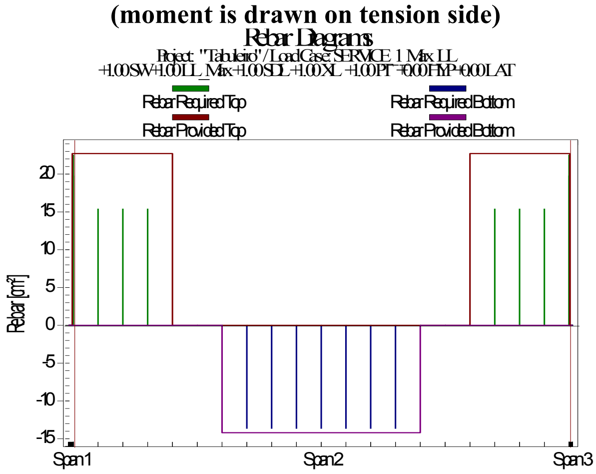
Load combination: service_1_max_II



Service combination stresses
(tension stress positive)

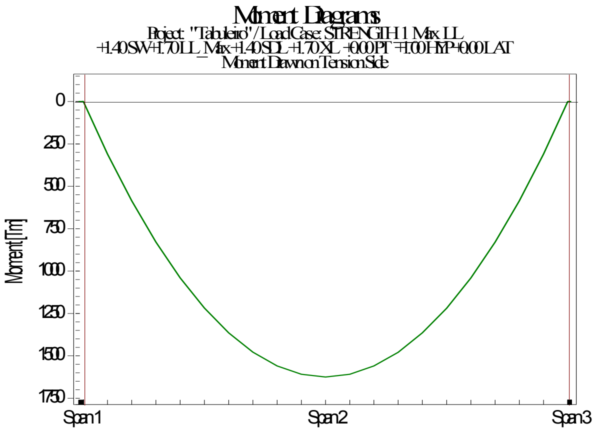


Design moment
(moment is drawn on tension side)

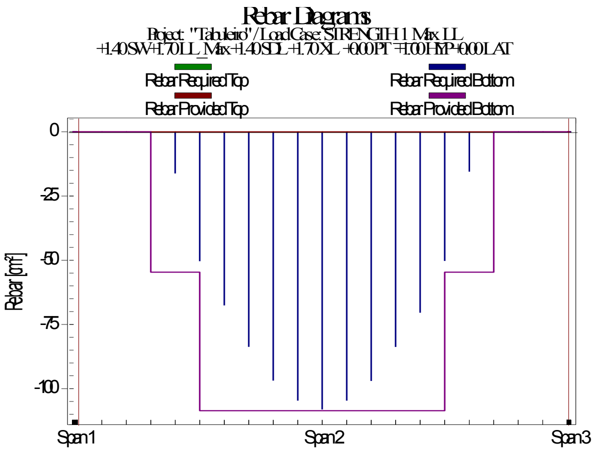


Reinforcement
Required and provided

Load combination: strength_1_max_II

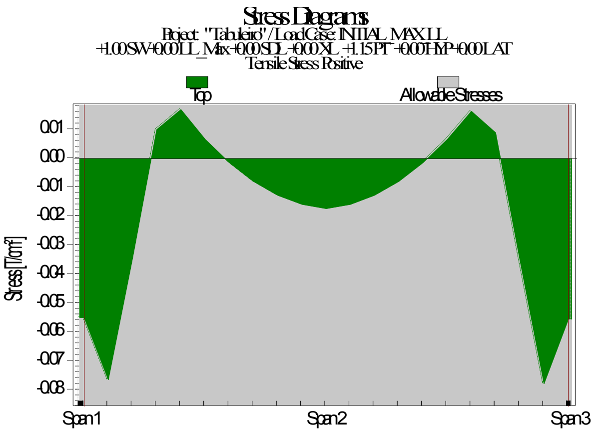


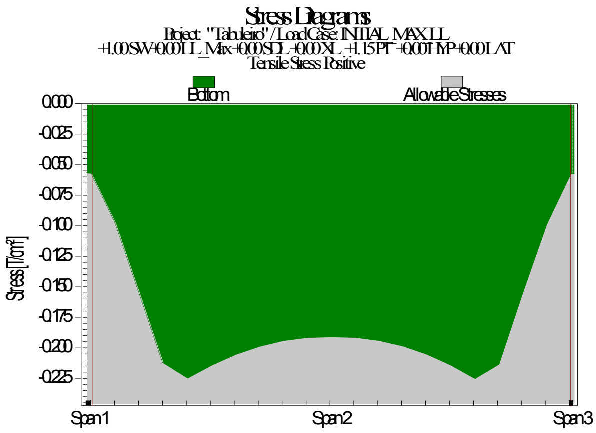
Design moment
(moment is drawn on tension side)



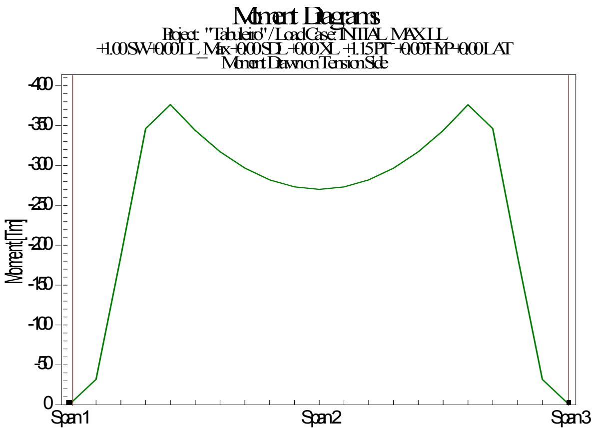
Reinforcement
Required and provided

Load combination: initial_max_ll

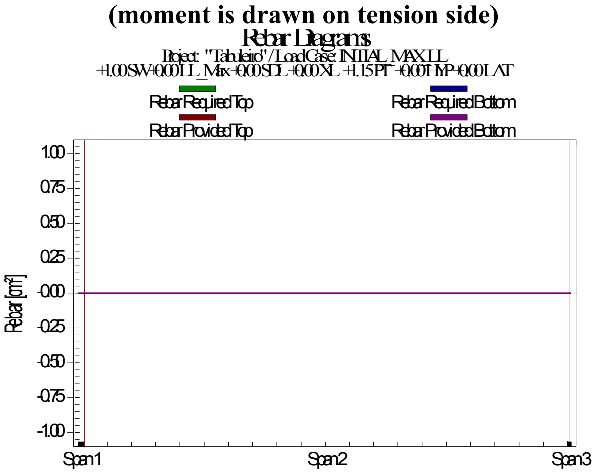




Service combination stresses
(tension stress positive)

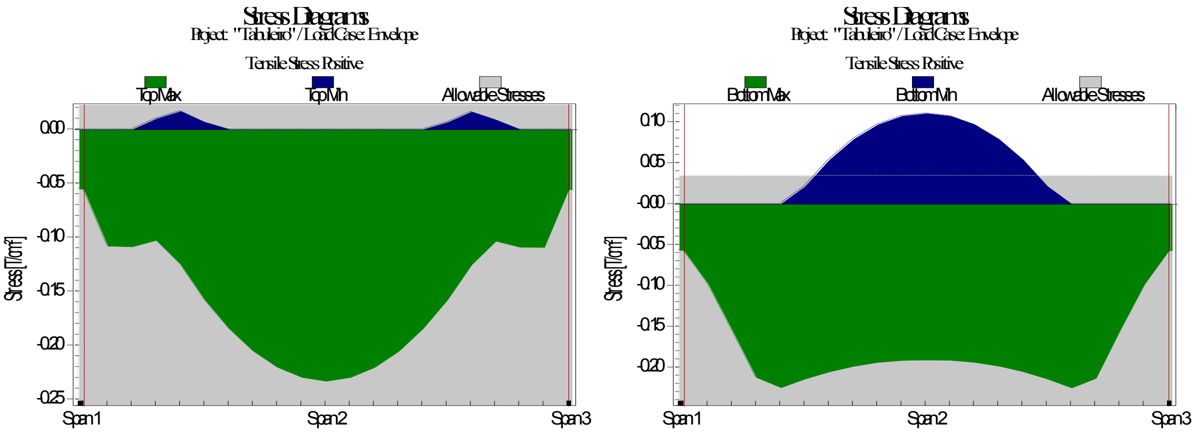


Design moment
(moment is drawn on tension side)

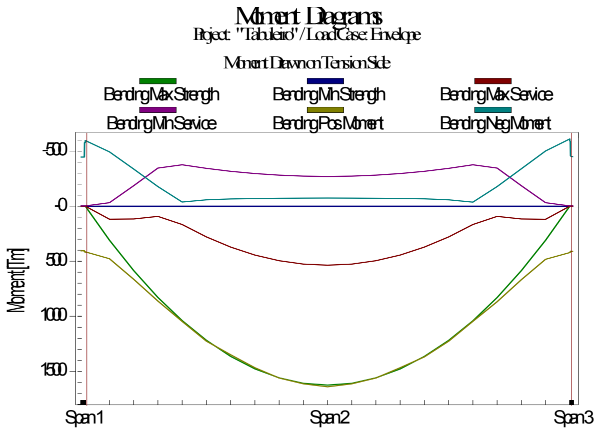


Reinforcement
Required and provided

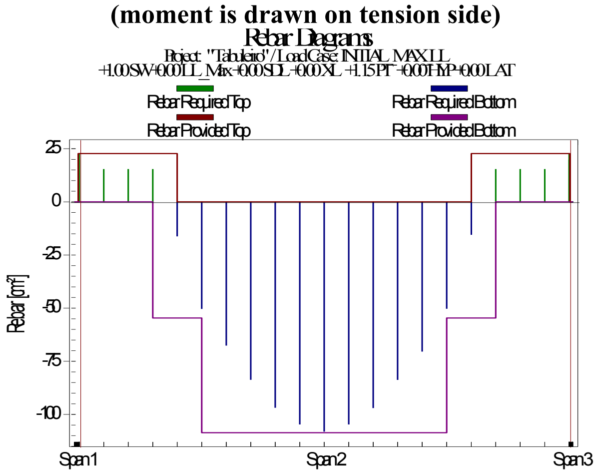
Load combination: envelope



Service combination stresses
(tension stress positive)



Design moment
(moment is drawn on tension side)



Reinforcement
Required and provided

Legend (2.2):
Span c = cantilever
Seg. Segment number
Form 1 = rectangular, 2 = t or inverted l, 3 = i, 4 = extended t or l section
Rh elevation of top surface
Tf top flange
Mf middle flange
Bf bottom flange

Legend (2.7):
The column boundary condition (cbc):
Fixed at both 1
Hinged at near end, fixed at far end 2
Fixed at near end, hinged at far end 3
Fixed at near end, roller with rotational fixity at far end 4
Lc lower column
Uc upper column

Legend (3.1):
Class: sw: selfweight, ll: live load, sdl: superimposed dead load, x: other loading
Type: u: uniform, p: partial uniform, l: line load, m: applied moment
c: concentrated load, r: triangle, v: variable, t: trapezoidal

Legend (4.1, 4.2):
Yb: distance from centroid to bottom fiber
Yt: distance from centroid to top fiber
I: gross moment of inertia

Legend (7.1):
Type
1 = reversed parabola
2 = simple parabola with straight portion over support
3 = harped tendon
4 = straight tendon
5 = extended reversed parabola

Legend (7.2):
Cgs c1: cgs of left middle point of tendon for type 5 profile
Cgs c2: cgs of right middle point of tendon for type 5 profile or middle point of other types

Legend (7.3):
From: starting span of tendon
To: end span of tendon
Extension: extension of the tendon after last span into the next span normalized to then span length

Legend (10.1, 11.1):
From: beginning of rebar measured from left support of the span
To: end of rebar measured from left support of the span
As required: envelope of minimum and ultimate rebar
Ultimate: required rebar for ultimate load combinations
Minimum: required minimum rebar

Legend (10.2, 11_2):
Id: id number of the bar as shown on graph
From: beginning of rebar measured from left support of the span
Quantity: number of bars
Size: bar number
Length: total length of the bar
Area: area of reinforcement

Legend (12):
D: effective depth of section for shear rebar calculation
Vu: ultimate shear
Ratio: ratio of ultimate to allowable shear stress

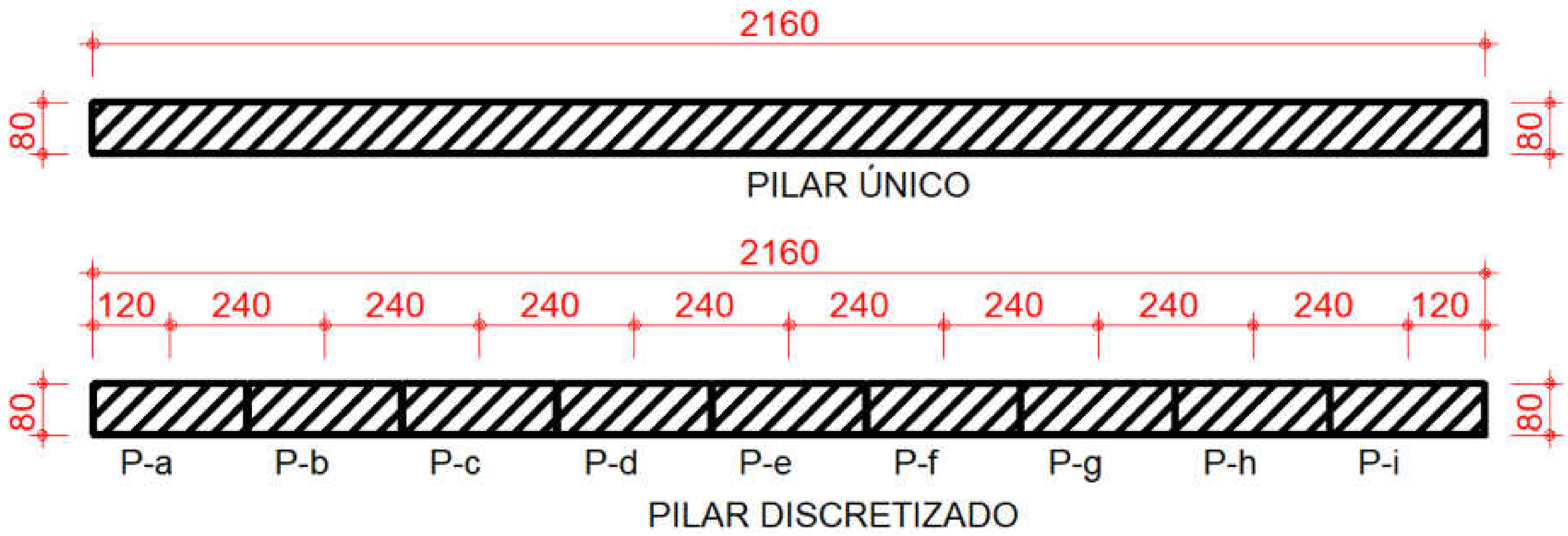
Req.: required shear reinforcement per unit length
Spacing: spacing between shear rebar

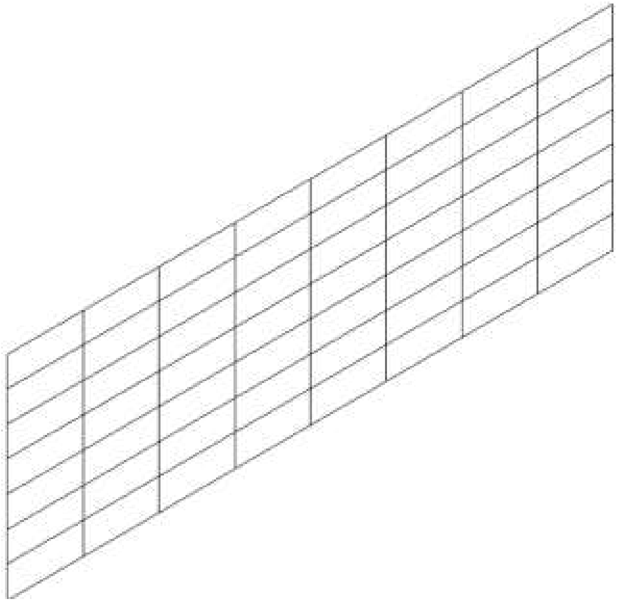
Legend (15.3):
Fl: friction loss
Ltl: long term loss

Legend (22):
Type
1 = uniform 2 = concentrated
3 = partial uniform 4 = applied moment

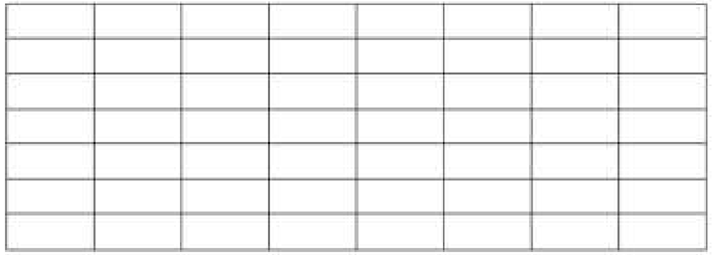
17 Memorial De Cálculo Dos Pilares

Para análise e detalhamento os pilares foram discretizados em 9 laminas e ligados por barras horizontais formando assim uma grelha. O pilar de 2160x80 cm foi separado em 9 pilares de 239x80 cm como mostra o detalhe abaixo:





Perspectiva da grelha no modelo



vista da grelha no modelo

A seguir são apresentados os dados e resultados do cálculo/dimensionamento dos pilares:

17.1 Etapa de troca do aparelho de apoio

17.2 Montagem de carregamentos de pilares

17.2.1 Legenda

nota a

Os valores apresentados equivalem a carregamentos de esforços finais de cálculo para o dimensionamento após a envoltória.

legenda

Fdzt = forca normal de calculo para dimensionamento de armaduras na secao

Mdxt = momento de calculo p/dimensionamento de armaduras na secao, momento x

Mdyt = momento de calculo p/dimensionamento de armaduras na secao, momento y

Carr = número do carregamento na envoltória

Comb = número da combinação de origem do carregamento

17.2.2 P1-a

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	419.4	419.4	419.4	419.4	419.4
Mdxt	-5900.0	-7591.5	-5811.6	-5899.3	-5810.7
Mdyt	260.2	-461.1	-842.4	260.3	-842.5
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	417.9	417.9	417.9	417.9	417.9
Mdxt	-6072.8	-7793.4	-5889.6	-6072.2	-7792.8
Mdyt	2203.1	1206.5	-545.8	2203.2	1206.6
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	424.7	424.7	424.7	424.7
Mdxt	-6346.9	-8126.3	-6346.7	-8126.1
Mdyt	4300.8	2677.7	4301.1	2677.9
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	432.4	432.4	432.4	432.4
Mdxt	-6691.5	-8541.9	-6691.5	-8541.9
Mdyt	8895.5	6188.1	8896.0	6188.4
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	439.7	439.7
Mdxt	-7115.2	-9047.0
Mdyt	18025.7	13512.0
Comb	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	444.4	444.4

Mdxt	-7606.2	-9621.6
Mdyt	33961.6	26854.7
Comb	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	443.3	443.3
Mdxt	-8107.9	-10191.6
Mdyt	57183.2	47494.1
Comb	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	432.1	432.1
Mdxt	-8475.0	-10580.6
Mdyt	81166.5	71788.6

Comb	(112)	(112)

17.2.3 P1-b

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6
Fdzt	129.7	129.7	129.7	129.7	129.7	129.7
Mdxt	-3239.8	-4200.1	-3254.4	-3239.1	-4199.3	-3253.7
Mdyt	1085.1	440.2	-727.7	1085.1	440.2	-727.7
Comb	(1)	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	125.8	125.8	125.8	125.8
Mdxt	-3165.1	-4128.8	-3164.4	-4128.0
Mdyt	4321.9	2910.2	4322.0	2910.2

Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	109.1	109.1	109.1	109.1
Mdxt	-2942.4	-3852.5	-2941.7	-3851.7
Mdyt	6693.7	4999.8	6693.9	5000.0
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	89.4	89.4	89.4	89.4
Mdxt	-2615.6	-3473.6	-2614.9	-3472.9
Mdyt	9683.3	7819.5	9683.8	7819.9
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	66.7	66.7	66.7	66.7
Mdxt	-2147.4	-2958.6	-2146.7	-2957.8
Mdyt	12099.7	10672.3	12100.2	10672.8
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	42.3	42.3	42.3	42.3
Mdxt	-2281.1	-1955.3	-2280.2	-1954.5
Mdyt	11705.7	11890.8	11706.3	11891.6
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	19.0	19.0	19.0	19.0
Mdxt	-1448.4	-1325.5	-1447.8	-1324.9
Mdyt	9640.6	12477.6	9641.1	12478.3
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	2.0	2.0	2.0	2.0
Mdxt	-29.2	-597.9	-29.1	-597.5
Mdyt	-3864.1	7771.3	-3864.6	7771.8
Comb	(1)	(1)	(112)	(112)

17.2.4 P1-c

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	146.3	146.3	146.3	146.3	146.3
Mdxt	-2640.0	-3477.2	-2791.4	-2639.3	-3476.5
Mdyt	918.9	389.1	-457.7	919.0	389.2
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	143.4	143.4	143.4	143.4
Mdxt	-2318.9	-3259.7	-2318.1	-3258.8
Mdyt	3239.0	2238.5	3239.2	2238.7
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	139.1	139.1	139.1	139.1

Mdxt	-1975.2	-2869.8	-1974.4	-2868.9
Mdyt	4577.4	3747.8	4577.6	3748.0
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	136.2	136.2	136.2	136.2
Mdxt	-1627.3	-2472.9	-1626.4	-2471.9
Mdyt	5303.6	4855.4	5303.9	4855.7
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	135.5	135.5	135.5	135.5
Mdxt	-2071.8	-1622.1	-2070.6	-1621.2
Mdyt	5271.2	5602.9	5271.6	5603.2

Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	138.1	138.1	138.1	138.1
Mdxt	-1697.8	-1317.6	-1696.2	-1316.4
Mdyt	4727.3	5870.6	4727.9	5871.1
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	144.8	144.8	144.8
Mdxt	1374.8	-1101.1	-1099.5
Mdyt	2997.8	4717.8	4719.0
Comb	(112)	(1)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	155.4	155.4	155.4	155.4
Mdxt	1101.0	1474.4	1129.7	1104.3
Mdyt	-1377.6	1024.7	2524.9	-1374.3
Comb	(1)	(112)	(112)	(112)

17.2.5 P1-d

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	91.4	91.4	91.4	91.4	91.4
Mdxt	-1563.1	-2251.4	-1677.6	-1562.2	-2250.5
Mdyt	404.7	195.4	-151.0	404.7	195.5
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	87.8	87.8	87.8	87.8
Mdxt	-1311.4	-2061.0	-1310.5	-2060.1
Mdyt	1403.8	972.1	1403.9	972.2
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	76.6	76.6	76.6	76.6
Mdxt	-1021.2	-1660.4	-1020.2	-1659.3
Mdyt	1992.8	1676.4	1993.0	1676.5
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	65.2	65.2	65.2	65.2
Mdxt	-769.7	-1281.9	-768.6	-1280.6
Mdyt	2134.0	2075.9	2134.4	2076.1
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	53.6	53.6	53.6	53.6
Mdxt	-949.9	-679.0	-948.4	-677.8
Mdyt	2138.1	2471.8	2138.5	2472.1
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	41.9	41.9	41.9	41.9

Mdxt	-679.6	-478.5	-678.1	-477.3	
Mdyt	1668.4	2315.6	1668.9	2316.0	
Comb	(1)	(1)	(112)	(112)	

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	29.6	29.6	29.6	29.6	29.6
Mdxt	-281.7	-459.0	-321.5	-457.7	-320.5
Mdyt	-441.3	781.3	1582.4	781.7	1582.8
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	15.9	15.9	15.9	15.9
Mdxt	-126.0	-243.7	-173.1	-172.6
Mdyt	-991.1	-398.0	573.9	574.2

Comb	(1)	(1)	(1)	(112)

17.2.6 P1-e

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	153.4	153.4	153.4
Mdxt	-1107.0	-1447.6	-1087.8
Mdyt	-89.4	-57.6	-97.1
Comb	(1)	(1)	(1)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	150.9	150.9	150.9
Mdxt	-1126.2	-1475.4	-1089.6
Mdyt	160.9	-77.2	-162.0

Comb (1) (1) (1)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	149.8	149.8	149.8	149.8
Mdxt	-1149.5	-1508.0	-1118.6	-1148.7
Mdyt	186.9	-94.9	-201.8	187.0
Comb	(1)	(1)	(1)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	150.6	150.6	150.6	150.6
Mdxt	-1182.3	-1552.2	-1155.6	-1181.4
Mdyt	190.0	-96.8	-206.2	190.1
Comb	(1)	(1)	(1)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	153.8	153.8	153.8	153.8
Mdxt	-1236.0	-1623.8	-1205.1	-1235.0
Mdyt	181.3	-99.0	-211.0	181.4
Comb	(1)	(1)	(1)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	159.6	159.6
Mdxt	-1328.0	-1745.9
Mdyt	-242.2	-163.2
Comb	(1)	(1)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	168.0	168.0
Mdxt	-1472.2	-1936.2
Mdyt	-380.8	-271.0
Comb	(1)	(1)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	178.9	178.9
Mdxt	-1648.0	-2166.6
Mdyt	-580.5	-447.0
Comb	(1)	(1)

17.2.7 P1-f

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	89.4	89.4	89.4	89.4	89.4
Mdxt	1566.7	2297.9	1728.8	1566.8	2297.9
Mdyt	-422.5	-219.8	116.1	-422.5	-219.8
Comb	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	85.9	85.9
Mdxt	1220.9	2047.9
Mdyt	-1383.4	-971.7
Comb	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	74.8	74.8

Mdxt	843.0	1536.7
Mdyt	-1989.3	-1703.5
Comb	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	63.5	63.5	63.5	63.5
Mdxt	753.6	1048.0	1048.4	753.9
Mdyt	-2165.7	-2124.2	-2124.2	-2165.5
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	52.2	52.2	52.2
Mdxt	-767.8	431.1	431.5
Mdyt	-2209.7	-2592.7	-2592.4

Comb (1) (1) (112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	40.8	40.8
Mdxt	-676.9	-441.0
Mdyt	-1729.7	-2445.0
Comb	(1)	(1)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	28.8	28.8	28.8	28.8
Mdxt	-315.6	-529.5	-380.9	-529.0
Mdyt	562.1	-797.9	-1690.9	-798.1
Comb	(1)	(1)	(1)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	15.5	15.5	15.5	15.5
Mdxt	123.1	-288.6	-213.8	123.2
Mdyt	1181.6	474.1	-620.7	1180.9
Comb	(1)	(1)	(1)	(112)

17.2.8 P1-g

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	138.6	138.6	138.6	138.6	138.6
Mdxt	2847.0	3727.0	3035.6	2846.6	3035.3
Mdyt	-932.2	-415.1	409.7	-932.2	409.9
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	135.7	135.7	135.7	135.7
Mdxt	2450.9	3465.7	2450.7	3465.5
Mdyt	-3229.1	-2241.5	-3229.3	-2241.6
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	130.7	130.7	130.7	130.7
Mdxt	2024.1	2989.9	2024.0	2989.8
Mdyt	-4590.5	-3768.9	-4590.8	-3769.1
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	127.1	127.1
Mdxt	1588.4	2499.9
Mdyt	-5334.0	-4897.9
Comb	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	125.6	125.6
Mdxt	1996.5	1576.5
Mdyt	-5333.1	-5674.1
Comb	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	127.2	127.2	127.2

Mdxt	-932.7	1509.0	1181.1
Mdyt	-3216.1	-4798.5	-5954.0
Comb	(112)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	132.7	132.7
Mdxt	-1532.5	-976.3
Mdyt	-3084.2	-4813.0
Comb	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	142.0	142.0	142.0
Mdxt	-1252.8	-1647.6	-1237.4
Mdyt	1222.6	-1141.0	-2649.3

Comb	(112)	(112)	(112)

17.2.9 P1-h

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	130.7	130.7	130.7
Mdxt	3791.2	4796.1	3782.4
Mdyt	-1142.5	-463.2	704.5
Comb	(1)	(1)	(1)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	126.8	126.8
Mdxt	3759.4	4742.6
Mdyt	-4430.1	-2995.7

Comb	(1)	(1)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	110.0	110.0	110.0	110.0
Mdxt	3559.1	4503.4	3557.8	4502.1
Mdyt	-6814.2	-5093.4	-6814.2	-5093.5
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	90.2	90.2	90.2	90.2
Mdxt	3218.2	4136.6	3217.0	4135.3
Mdyt	-9825.0	-7925.7	-9825.2	-7925.9
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	67.3	67.3	67.3	67.3
Mdxt	2680.7	3591.2	2679.6	3590.0
Mdyt	-12268.7	-10798.7	-12268.9	-10798.9
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	42.7	42.7	42.7	42.7
Mdxt	2823.5	2486.8	2822.4	2485.7
Mdyt	-11829.2	-11970.5	-11829.5	-11971.0
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	19.3	19.3	19.3	19.3
Mdxt	1832.3	1718.1	1831.6	1717.2
Mdyt	-9767.4	-12568.1	-9767.5	-12568.5
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	2.1	2.1	2.1
Mdxt	36.0	792.0	791.6
Mdyt	3747.7	-7843.2	-7843.4
Comb	(112)	(1)	(112)

17.2.10 P1-i

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	433.5	433.5	433.5	433.5	433.5
Mdxt	6868.4	8749.7	6701.9	8747.2	6699.9
Mdyt	-324.5	416.6	807.9	416.7	808.0
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	432.1	432.1	432.1	432.0
Mdxt	7199.8	9130.0	6858.3	6856.2
Mdyt	-2308.5	-1289.1	506.3	506.3
Comb	(1)	(1)	(1)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	439.2	439.2

Mdxt	7646.8	9657.4
Mdyt	-4428.8	-2777.6
Comb	(1)	(1)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	447.2	447.2	447.2	447.2
Mdxt	8183.5	10286.2	8180.7	10283.0
Mdyt	-9051.1	-6309.3	-9051.2	-6309.4
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	454.9	454.9	454.9	454.9
Mdxt	8822.7	11026.8	8819.4	11023.1
Mdyt	-18215.8	-13661.8	-18216.4	-13662.2

Comb (1) (1) (112) (112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	460.1	460.1	460.1	460.1
Mdxt	9550.3	11855.3	9546.6	11851.2
Mdyt	-34191.3	-27039.5	-34192.6	-27040.5
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	459.4	459.4	459.4	459.4
Mdxt	10291.7	12677.1	10287.6	12672.5
Mdyt	-57447.6	-47713.2	-57450.1	-47715.2
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	448.8	448.8	448.8	448.8
Mdxt	10851.3	13261.8	10846.8	13256.9
Mdyt	-81461.8	-72038.6	-81465.6	-72041.9
Comb	(1)	(1)	(112)	(112)

17.2.11 P2-a

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	557.8	557.8	557.8
Mdxt	-7606.6	-9811.0	-7440.1
Mdyt	418.0	-528.9	-1027.9
Comb	(1)	(1)	(1)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	556.7	556.7	556.7	556.6
Mdxt	-7937.9	-10202.7	-7599.0	-7593.1
Mdyt	2944.0	1644.6	-647.7	-647.8
Comb	(1)	(1)	(1)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	567.2	567.2	567.1	567.1
Mdxt	-8395.9	-10758.4	-8390.1	-10751.4
Mdyt	5655.7	3551.0	5656.2	3551.6
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	579.0	579.0	578.8	578.8
Mdxt	-8935.3	-11408.9	-8930.3	-11402.8
Mdyt	11546.5	8054.4	11549.4	8057.2
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	590.3	590.3	590.1	590.1
Mdxt	-9583.0	-12181.2	-9579.9	-12177.3
Mdyt	23183.6	17397.8	23189.2	17403.4
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	598.2	598.2

Mdxt	-10363.3	-13094.4
Mdyt	43394.3	34342.5
Comb	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	598.9	598.9
Mdxt	-11252.2	-14107.2
Mdyt	72687.3	60419.3
Comb	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	586.8	586.8
Mdxt	-12018.6	-14939.6
Mdyt	102790.5	90979.5

Comb	(112)	(112)

17.2.12 P2-b

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6
Fdzt	171.9	171.9	171.9	172.1	172.1	172.1
Mdxt	-3911.4	-4813.6	-3914.8	-3910.0	-4812.8	-3913.6
Mdyt	1454.6	590.0	-894.2	1455.6	590.4	-894.7
Comb	(1)	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	167.7	167.7	167.9	167.9
Mdxt	-3865.3	-4764.0	-3863.4	-4763.0
Mdyt	5619.0	3800.6	5620.9	3802.1

Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	148.1	148.1	148.3	148.3
Mdxt	-3675.6	-4532.6	-3673.3	-4531.6
Mdyt	8617.2	6440.4	8618.8	6442.2
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	124.6	124.6	124.8	124.8
Mdxt	-3365.7	-4208.8	-3361.8	-4207.3
Mdyt	12402.5	9998.5	12404.6	10000.5
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	97.3	97.3	97.6	97.6
Mdxt	-2807.8	-3724.1	-2799.6	-3720.8
Mdyt	15543.1	13649.6	15548.2	13653.7
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	67.9	67.9	68.2	68.2
Mdxt	-2601.5	-2948.9	-2941.1	-2593.7
Mdyt	15139.0	15087.5	15096.6	15145.5
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	40.4	40.0	40.0	40.4	40.4
Mdxt	407.3	-1707.8	-1598.2	-1690.6	-1581.8
Mdyt	8226.1	12981.2	16203.1	13002.5	16218.8
Comb	(112)	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6
Fdzt	20.4	20.4	20.4	20.8	20.8	20.8
Mdxt	1912.7	2071.8	246.3	1964.7	2127.5	283.1
Mdyt	-2509.5	5626.0	11040.0	-2457.6	5667.6	11074.6
Comb	(1)	(1)	(1)	(112)	(112)	(112)

17.2.13 P2-c

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	178.0	178.0	178.0	177.9	177.9
Mdxt	-3160.0	-4218.2	-3389.8	-3155.5	-4213.4
Mdyt	1161.5	518.3	-509.8	1161.6	518.6
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	174.9	174.9	174.9	174.9
Mdxt	-2668.8	-3899.5	-2663.1	-3894.0
Mdyt	4055.8	2814.3	4056.6	2814.9
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	169.2	169.2	169.1	169.1

Mdxt	-2111.4	-3294.9	-2104.1	-3287.8
Mdyt	5880.0	4836.1	5882.4	4837.7
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	165.0	165.0	164.9	164.9
Mdxt	-1555.4	-2635.8	-1546.9	-2626.6
Mdyt	6917.4	6371.2	6921.6	6374.7
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	163.2	163.2	163.1	163.1
Mdxt	-1979.1	-1540.5	-1967.9	-1531.8
Mdyt	6971.9	7493.0	6976.2	7497.0

Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	165.1	165.1	165.0	165.0
Mdxt	-1846.7	-1197.8	-1841.4	-1189.3
Mdyt	6026.1	7807.7	6029.3	7812.3
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	171.3	171.5	171.5	171.3	171.3
Mdxt	-2625.9	-3348.2	-1442.7	-3354.8	-1438.5
Mdyt	-1686.2	2843.3	5775.5	2840.2	5776.6
Comb	(112)	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	181.7	181.7	181.9	181.7
Mdxt	-4572.8	-5565.5	-2690.9	-2696.5
Mdyt	-5870.8	-2997.9	1450.5	1440.7
Comb	(112)	(112)	(1)	(112)

17.2.14 P2-d

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	136.3	136.3	136.3	136.3	136.3
Mdxt	-1943.6	-2675.8	-2111.8	-1938.4	-2669.8
Mdyt	571.8	292.9	-174.0	572.3	293.4
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	132.8	132.8	132.9	132.9
Mdxt	-1602.6	-2427.0	-1597.6	-2421.0
Mdyt	1798.4	1265.8	1798.9	1266.3
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	122.5	122.5	122.5	122.5
Mdxt	-1273.5	-1955.1	-1269.4	-1949.2
Mdyt	2444.9	2102.0	2445.8	2103.1
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	112.4	112.4	112.4	112.4
Mdxt	-1546.3	-1203.0	-1541.4	-1198.9
Mdyt	2518.5	2609.5	2520.1	2611.6
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	102.8	102.7	102.8
Mdxt	1194.7	-909.4	-906.8
Mdyt	2605.6	3011.6	3013.7
Comb	(112)	(1)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	93.7	93.7

Mdxt	2233.9	844.3
Mdyt	2465.4	2961.2
Comb	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	84.7	84.7
Mdxt	4231.8	1723.0
Mdyt	2830.4	2982.4
Comb	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	75.1	75.1
Mdxt	6185.3	6759.0
Mdyt	5213.3	4730.4

Comb	(112)	(112)

17.2.15 P2-e

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6
Fdzt	185.0	185.0	185.0	184.9	184.9	184.9
Mdxt	-1332.6	-1766.9	-1352.2	-1326.0	-1757.4	-1345.3
Mdyt	128.1	83.5	126.3	128.6	84.0	126.8
Comb	(1)	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	182.3	182.3	182.3	182.3
Mdxt	1299.0	1697.2	-1314.3	-1307.8
Mdyt	245.4	158.0	213.7	214.2

Comb	(112)	(112)	(1)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	180.1	180.1
Mdxt	1404.8	1843.9
Mdyt	387.2	267.3
Comb	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	179.8	179.8
Mdxt	1540.3	2025.6
Mdyt	499.4	380.3
Comb	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	181.9	181.9
Mdxt	2037.9	1556.8
Mdyt	391.8	537.3
Comb	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3
Fdzt	186.7	186.7	186.6
Mdxt	-1841.8	-2418.1	1522.4
Mdyt	-891.4	-414.4	436.1
Comb	(1)	(1)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	194.0	194.0	193.9	193.9
Mdxt	-3827.7	-4775.8	-3825.0	-4772.5
Mdyt	-3084.1	-2108.9	-3086.6	-2109.8
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	203.5	203.5
Mdxt	-6598.1	-7823.5
Mdyt	-6230.3	-4902.5
Comb	(112)	(112)

17.2.16 P2-f

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	131.0	131.0	131.0	131.0	131.0
Mdxt	1843.4	2584.0	2052.3	1851.3	2593.6
Mdyt	-515.4	-237.8	225.9	-515.0	-237.3
Comb	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	127.5	127.5	127.5	127.5
Mdxt	1401.6	2288.7	1408.7	2297.8
Mdyt	-1823.8	-1255.3	-1823.6	-1255.0
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	116.8	116.8	116.8	116.8

Mdxt	869.3	1675.4	875.8	1684.1
Mdyt	-2670.2	-2214.5	-2669.8	-2213.7
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	106.3	106.3	106.3	106.3
Mdxt	-1111.3	-1456.1	794.7	801.2
Mdyt	-3013.1	-2855.6	-2745.3	-2743.7
Comb	(1)	(1)	(1)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	96.1	96.1
Mdxt	-1521.0	-1043.5
Mdyt	-3004.0	-3428.5

Comb (1) (1)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	86.4	86.4	86.4	86.5
Mdxt	758.8	-1354.6	-1107.0	765.9
Mdyt	-615.7	-2161.5	-3260.4	-614.4
Comb	(1)	(1)	(1)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	76.8	76.8	76.7	76.8
Mdxt	2620.6	3091.4	686.8	694.1
Mdyt	2964.3	1193.0	-1685.2	-1682.1
Comb	(112)	(112)	(1)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	66.4	66.4
Mdxt	5250.7	5754.3
Mdyt	6659.8	4668.1
Comb	(112)	(112)

17.2.17 P2-g

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	175.3	175.3	175.2	175.2	175.2
Mdxt	3102.6	4119.0	3314.7	3111.9	4130.1
Mdyt	-1088.9	-450.5	569.8	-1088.3	-450.0
Comb	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	172.2	172.2	172.2	172.2
Mdxt	2692.7	3837.1	2701.3	3847.7
Mdyt	-3932.4	-2704.2	-3931.7	-2703.5
Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	166.1	166.1	166.1	166.1
Mdxt	2275.0	3331.6	2282.7	3341.4
Mdyt	-5525.7	-4506.1	-5524.3	-4504.8
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	161.5	161.5	161.4	161.4
Mdxt	1806.9	2837.4	1813.5	2846.3
Mdyt	-6387.2	-5828.2	-6385.6	-5826.4
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	159.0	159.0	159.0	159.0	159.0
Mdxt	-1130.4	2251.8	1790.8	2259.8	1797.4
Mdyt	-6154.9	-6404.5	-6696.7	-6402.2	-6694.1
Comb	(1)	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	160.0	160.0

Mdxt	-3135.5	-1137.8
Mdyt	-6269.5	-7258.4
Comb	(1)	(1)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	165.3	165.3
Mdxt	-5687.9	-2496.2
Mdyt	-5687.9	-6873.7
Comb	(1)	(1)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2
Fdzt	174.8	174.8
Mdxt	-8594.8	-4819.2
Mdyt	-6047.3	-6629.5

Comb	(1)	(1)

17.2.18 P2-h

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	180.2	180.2	180.2	180.2	180.2
Mdxt	3836.0	4785.8	3882.5	3846.6	4797.5
Mdyt	-1422.6	-577.6	979.6	-1422.2	-577.4
Comb	(1)	(1)	(112)	(112)	(112)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	176.1	176.1	176.1	176.1
Mdxt	3707.5	4696.4	3718.2	4708.2
Mdyt	-5642.0	-3796.4	-5641.3	-3795.8

Comb	(1)	(1)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	157.9	157.9	157.9	157.9
Mdxt	3409.4	4386.0	3420.0	4397.9
Mdyt	-8634.4	-6432.6	-8632.8	-6431.0
Comb	(1)	(1)	(112)	(112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	136.0	136.0	136.0	136.0
Mdxt	3028.2	3959.0	3038.2	3970.6
Mdyt	-12406.0	-9978.5	-12403.2	-9975.9
Comb	(1)	(1)	(112)	(112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	110.8	110.8	110.8	110.8
Mdxt	2666.1	3441.4	2674.8	3452.1
Mdyt	-15366.5	-13511.4	-15363.2	-13507.9
Comb	(1)	(1)	(112)	(112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	83.7	83.7	83.7	83.7
Mdxt	3043.5	2473.4	3050.4	2482.1
Mdyt	-14544.3	-14869.9	-14540.4	-14865.1
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	58.2	58.2	58.2	58.2
Mdxt	3347.6	2367.5	3351.2	2373.9
Mdyt	-11202.3	-15120.2	-11199.4	-15115.5
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6
Fdzt	40.1	40.1	40.1	40.1	40.1	40.1
Mdxt	3753.2	4066.2	2817.0	3753.3	4066.3	2820.4
Mdyt	8094.5	3241.6	-7972.9	8091.5	3240.4	-7970.1
Comb	(1)	(1)	(1)	(112)	(112)	(112)

17.2.19 P2-i

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	
Fdzt	546.7	546.7	546.7	546.7	
Mdxt	7319.3	9467.8	7149.4	7331.2	
Mdyt	-499.7	423.0	908.1	-499.1	
Comb	(1)	(112)	(112)	(112)	

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5
Fdzt	545.6	545.6	545.6	545.6	545.6
Mdxt	7687.6	9890.4	7323.4	7700.2	9905.3
Mdyt	-2942.8	-1682.0	546.0	-2942.3	-1681.4
Comb	(1)	(1)	(112)	(112)	(112)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	555.7	555.7	555.7	555.7

Mdxt 8191.5 10500.1 8205.2 10516.1

Mdyt -5517.4 -3492.1 -5516.4 -3491.2

Comb (1) (1) (112) (112)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr 1 2 3 4

Fdzt 566.9 566.9 566.9 566.9

Mdxt 8770.1 11195.6 8784.9 11212.8

Mdyt -11129.2 -7781.6 -11126.8 -7779.7

Comb (1) (1) (112) (112)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr 1 2 3 4

Fdzt 577.5 577.5 577.5 577.5

Mdxt 9388.2 11932.2 9405.0 11951.4

Mdyt -22305.7 -16742.3 -22300.5 -16738.0

Comb (1) (1) (112) (112)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	584.9	584.9	584.9	584.9
Mdxt	9951.6	12595.5	9970.6	12617.2
Mdyt	-41918.9	-33140.3	-41908.4	-33131.6
Comb	(1)	(1)	(112)	(112)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	585.1	585.1	585.1	585.1
Mdxt	10318.5	13015.8	10340.2	13040.6
Mdyt	-70685.2	-58652.5	-70666.7	-58636.9
Comb	(1)	(1)	(112)	(112)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4
Fdzt	573.2	573.2	573.2	573.2
Mdxt	10394.5	13076.8	10419.0	13104.7
Mdyt	-100708.7	-88929.1	-100681.8	-88904.9
Comb	(1)	(1)	(112)	(112)

17.3 Listagem de resultados por pilar

17.3.1 Legenda

nota a

Este carregamnto listado é, dentre os inúmeros carregamentos analisados, o que provocou a seleção desta

Armadura em primeiro lugar. Não necessariamente, este carregamento é o que necessita a maior quantidade de

Armadura na seção, pois o dimensionamento é feito de forma indireta, por verificação. Exemplificando,

Temos duas configurações de armaduras válidas para o lance, uma correspondendo a 17 cm2 e outra a 20 cm2.

Um carregamento inicial necessitou de 18 cm2 e, por esta razão foi selecionada a configuração de 20 cm2 como

A definitiva. Outros carregamentos posteriores necessitaram, por exemplo, de 19 cm2, 19.5 cm2 (sempre

Inferiores aos 20 cm2), mas a listagem com o carregamento mais desfavorável foi feita com aquele que necessitou

Os 18 cm2, pois foi o primeiro a requisitar os 20 cm2. A pesquisa do carregamento exato que provoca maior

Armadura na seção não é realizada automaticamente para não aumentar de forma significativa o tempo de proces-

Samento. Se o usuário quiser calcular a real necessidade de armadura para um carregamento específico, ele poderá

Fazê-lo facilmente no editor de esforços e armaduras, comando do próprio tqs pilar.

legenda

Sel = quantidade efetiva de barras na secao

Nb = quantidades de barras dimensionadas na secao

Nbh = numero de barras lado h

Nbb = numero de barras lado b

17.3.2 P1-a

Pilar:p1-a

num. 1 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

```
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        12.5  5.0  72  28   8  88.36 0.5  87.74|   35.0    52.2  |   432.1      -8475.0       81166.5    |
|                        16.0  5.0  44  17   5  88.47 0.5  87.61|              |  caso pórtico = 396 (combinação= 112)  |
|I. 10  80.0 239.0 0.5  28 20.0  5.0  28  11   3  87.96 0.5  87.25|              |  **ver nota (a)**                    |
|                        25.0  6.3  20   8   2  98.17 0.5  86.53|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:28   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                          |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   443.3      -8107.9       57183.2    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:27   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
```

```
|    2.5          45.0    1.15      1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                               |
|  50        a      2.0    15.0    1    1                                                        |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   444.4      -7606.2       33961.6     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:25   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0    1.15      1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                               |
|  50        a      2.0    15.0    1    1                                                        |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   439.7      -7115.2       18025.7     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
```

|I. 7 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:23   sub-projeto: 0001.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 432.4   -6691.5   8895.5 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:21   sub-projeto: 0001.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

```
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   424.7       -6346.9         4300.8     |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |
|  50        a       2.0     15.0    1    1                                                  |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   417.9       -6072.8         2203.1     |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0001.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a      2.0     15.0    1    1                                                                |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   419.4      -5900.0        260.2    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:17   sub-projeto: 0001.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a      2.0     15.0    1    1                                                                |
| fundacao                                                                                        |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________._______________|
```

17.3.3 P1-b

Pilar:p1-b

num. 2 esforço de cálculo do dimensionamento

```
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   79.7    58.5 |     2.0        -29.2       -3864.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                                          |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|
```

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   36.9   58.5 |   19.0      -1448.4       9640.6    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|            |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            | **ver nota (a)**                  |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                              |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:37   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                       |
|  50        a       2.0     15.0    1    1                                                       |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0   58.5 |   42.3      -2281.1       11705.7    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|            |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            | **ver nota (a)**                  |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                              |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:35   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
```

```
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                          |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    66.7      -2147.4       12099.7    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:34   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                          |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    89.4      -2615.6        9683.3    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
```

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:32   sub-projeto: 0002.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00   1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 109.1   -2942.4   6693.7 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:31   sub-projeto: 0002.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00   1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

```
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   125.8       -3165.1        4321.9     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                   |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:30   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50         a       2.0     15.0    1    1                                                                  |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   129.7       -3239.8        1085.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                   |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:29   sub-projeto: 0002.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                     |
|  50        a       2.0     15.0    1    1                                                                     |
| fundacao                                                                                                       |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.3.4 P1-c

Pilar:p1-c

```
 num.  3                                              esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   155.4       1101.0       -1377.6    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                      |
```

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:28   sub-projeto: 0003.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 144.8   1374.8   2997.8 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:27   sub-projeto: 0003.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

```
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   138.1      -1697.8        4727.3    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:25   sub-projeto: 0003.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                                 |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   135.5      -2071.8        5271.2    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:23   sub-projeto: 0003.sub
```

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 136.2   -1627.3   5303.6 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:21   sub-projeto: 0003.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 139.1   -1975.2   4577.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

```
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                               |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0003.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a      2.0     15.0    1    1                                                        |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   143.4       -2318.9        3239.0     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                               |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0003.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
```

```
|  50        a      2.0     15.0    1    1                                                             |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   146.3      -2640.0        918.9    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:16   sub-projeto: 0003.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0     1.15       1.40        8.00     0.40       1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a      2.0     15.0    1    1                                                             |
| fundacao                                                                                              |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________._______________|
```

17.3.5 P1-d

Pilar:p1-d

```
 num.  4                                             esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)    mxd (tf,cm)      myd (tf,cm) |

|____._____._____.___.___.____.____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    15.9       -126.0        -991.1     |

|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |

|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |

|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |

|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0004.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5            45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |

|  50         a       2.0      15.0    1    1                                                         |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    29.6       -281.7        -441.3     |

|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
```

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 9 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:42   sub-projeto: 0004.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 41.9   -679.6   1668.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:40   sub-projeto: 0004.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

```
| 50       a     2.0    15.0   1   1                                              |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    53.6       -949.9       2138.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                     |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0004.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40        8.00     0.40       1.00   1.00   1.00  1.00                           |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
| 50       a     2.0    15.0   1   1                                              |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    65.2       -769.7       2134.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                     |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
```

```
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:37   sub-projeto: 0004.sub

| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |

|  50        a       2.0     15.0    1    1                                                          |

| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    76.6       -1021.2        1992.8    |

|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  64 (combinação=   1)   |

|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                      |

|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |

|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:35   sub-projeto: 0004.sub

| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |

|  50        a       2.0     15.0    1    1                                                          |

| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    87.8       -1311.4        1403.8    |
```

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:34   sub-projeto: 0004.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                            |
|  50        a       2.0     15.0    1    1                                                              |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    91.4       -1563.1          404.7     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:33   sub-projeto: 0004.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                             |
|  50        a       2.0     15.0    1    1                                          |
| fundacao                                                                         |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.3.6 P1-e

```
Pilar:p1-e
 num.  5                                              esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   178.9       -1648.0        -580.5    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                 |
```

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:27 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 168.0 -1472.2 -380.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:26 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 159.6 -1328.0 -242.2 |

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|            |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            |  **ver nota (a)**                 |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                              |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:24   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                    |
|  50        a       2.0     15.0    1    1                                               |
| aux_07     .....|...|...|....|.....|...|...|...|.......|...|.......|.........|.........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   153.8      -1236.0        181.3    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|            |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            |  **ver nota (a)**                 |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                              |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:22   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                    |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   150.6      -1182.3         190.0    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  64 (combinação=   1)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:21   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                    |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   149.8      -1149.5         186.9    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  64 (combinação=   1)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
```

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:19 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 150.9 -1126.2 160.9 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:18 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   153.4      -1107.0        -89.4    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:16   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a      2.0     15.0    1    1                                                             |
| fundacao                                                                                             |
|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.3.7 P1-f

Pilar:p1-f

```
 num.  6                                             esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.---------------.
```

```
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   15.5        123.1        1181.6     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:44   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                  |
|  50        a       2.0      15.0    1    1                                                              |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   28.8       -315.6        562.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
```

```
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0006.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                 |

|  50        a       2.0     15.0    1    1                                                    |

| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    40.8       -676.9       -1729.7    |

|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |

|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |

|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |

|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:41   sub-projeto: 0006.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                 |

|  50        a       2.0     15.0    1    1                                                    |

| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    52.2        -767.8        -2209.7     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                          |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    63.5         753.6        -2165.7     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                    |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
```

```
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                              |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    74.8        843.0       -1989.3    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:37   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                              |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    85.9       1220.9       -1383.4    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
```

```
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:35   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                         |
|  50        a       2.0     15.0    1    1                                                   |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|  35.0    58.5 |   89.4       1566.7        -422.5     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:34   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                         |
|  50        a       2.0     15.0    1    1                                                   |
```

| fundacao |

|____.______.______.___.___._____._____.___.___.___._______.___.______|_________.________|_____________._______________._______________|

17.3.8 P1-g

Pilar:p1-g

num. 7 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___.______|_________.________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 142.0 -1252.8 1222.6 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:28 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

```
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                   |
|  50        a       2.0     15.0    1    1                                                      |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   132.7      -1532.5       -3084.2    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:27   sub-projeto: 0007.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                   |
|  50        a       2.0     15.0    1    1                                                      |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   127.2       -932.7       -3216.1    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
```

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:25   sub-projeto: 0007.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 125.6   1996.5   -5333.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:23   sub-projeto: 0007.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

```
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   127.1        1588.4        -5334.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico = 396 (combinação= 112)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                     |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                     |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:21   sub-projeto: 0007.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50         a       2.0     15.0    1    1                                                              |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   130.7        2024.1        -4590.5     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                     |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                     |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0007.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                  |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   135.7       2450.9       -3229.1    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                  |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0007.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                  |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   138.6       2847.0        -932.2    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
```

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 3 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:16   sub-projeto: 0007.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._______________._______________|

17.3.9 P1-h

Pilar:p1-h

num. 8   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._______________._______________|

```
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   90.0    58.5 |    2.1         36.0        3747.7    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico = 396 (combinação= 112)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:46   sub-projeto: 0008.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |
|  50        a       2.0     15.0    1    1                                                   |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   40.1    58.5 |   19.3       1832.3       -9767.4    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:44   sub-projeto: 0008.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a      2.0     15.0    1    1                                                                  |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |   42.7       2823.5      -11829.2    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0008.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a      2.0     15.0    1    1                                                                  |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |   67.3       2680.7      -12268.7    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
```

```
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            |  **ver nota (a)**                 |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:42   sub-projeto: 0008.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                       |
|  50        a       2.0     15.0    1    1                                                   |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    90.2       3218.2       -9825.0    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|            |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|            |  **ver nota (a)**                 |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|            |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|            |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0008.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                       |
```

```
| 50        a       2.0     15.0    1    1                                                                      |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |   110.0       3559.1       -6814.2    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0008.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
| 50        a       2.0     15.0    1    1                                                                      |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |   126.8       3759.4       -4430.1    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
```

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:37 sub-projeto: 0008.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 130.7 3791.2 -1142.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:35 sub-projeto: 0008.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.3.10 P1-i

Pilar:p1-i

num. 9 esforço de cálculo do dimensionamento

```
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                      12.5  5.0  72  28   8  88.36 0.5  88.36|   35.0    52.2  |   448.8       10851.3       -81461.8     |

|                      16.0  5.0  44  17   5  88.47 0.5  88.36|               |  caso pórtico =  64 (combinação=   1)   |

|l. 10  80.0 239.0 0.5  28 20.0  5.0  28  11   3  87.96 0.5  87.96|               |  **ver nota (a)**                     |

|                      25.0  6.3  20   8   2  98.17 0.5  87.96|               |                                   |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:28   sub-projeto: 0009.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                      |

|  50        a      2.0     15.0    1    1                                                  |
```

```
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   459.4       10291.7       -57447.6     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                    |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                    |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:26   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0     15.0    1    1                                                             |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   460.1       9550.3       -34191.3     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                    |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                    |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:24   sub-projeto: 0009.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                              |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   454.9       8822.7      -18215.8     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                               |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|             |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:23   sub-projeto: 0009.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                              |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   447.2       8183.5       -9051.1     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
```

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:21   sub-projeto: 0009.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 439.2   7646.8   -4428.8 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:19   sub-projeto: 0009.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

```
|  50       a      2.0     15.0    1    1                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   432.1       7199.8       -2308.5    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                   |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                       |
|  50       a      2.0     15.0    1    1                                                          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   433.5       6868.4        -324.5    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                   |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
```

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:16 sub-projeto: 0009.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.3.11 P2-a

Pilar:p2-a

num. 10 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 12.5 5.0 94 37 10 115.36 0.6 114.74| 35.0 52.2 | 586.8 -12018.6 102790.5 |

| 16.0 5.0 58 22 7 116.62 0.6 113.50| | caso pórtico = 396 (combinação= 112) |

|l. 10 80.0 239.0 0.6 36 20.0 5.0 36 13   5 113.10 0.6 111.53| | **ver nota (a)** |

| 25.0 6.3 24   9   3 117.81 0.6 112.02| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:47   sub-projeto: 0010.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 598.9   -11252.2   72687.3 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:46   sub-projeto: 0010.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

```
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   598.2      -10363.3       43394.3     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:44   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0     15.0    1    1                                                                             |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   590.3      -9583.0       23183.6     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0010.sub
```

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_06 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 579.0 -8935.3 11546.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:41 sub-projeto: 0010.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 567.2 -8395.9 5655.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

```
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|I.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0010.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a      2.0     15.0    1    1                                                     |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   556.7      -7937.9       2944.0    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |   caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0010.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
```

```
|  50        a      2.0     15.0    1    1                                                              |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   557.8       -7606.6         418.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:36   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5            45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                |
|  50        a      2.0     15.0    1    1                                                              |
| fundacao                                                                                                 |
|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|___________._____________._____________|
```

17.3.12 P2-b

Pilar:p2-b

num. 11 esforço de cálculo do dimensionamento

```
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   39.1    52.2 |    20.4       1912.7       -2509.5     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                    |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                    |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:28   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40        8.00     0.40       1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                              |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |    40.4        407.3        8226.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
```

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:27 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 67.9 -2601.5 15139.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:25 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

```
|  50      a     2.0    15.0   1   1                                      |
| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |    97.3       -2807.8       15543.1    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:23   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                   |
|  50      a     2.0    15.0   1   1                                      |
| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   124.6       -3365.7       12402.5    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
```

```
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:21   sub-projeto: 0011.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a      2.0     15.0    1    1                                                          |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   148.1      -3675.6       8617.2    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)   |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0011.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a      2.0     15.0    1    1                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   167.7      -3865.3       5619.0    |
```

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a      2.0     15.0    1    1                                                            |
| aux_03    .....|...|...|....|.....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   171.9      -3911.4        1454.6    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:17   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
```

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.3.13 P2-c

Pilar:p2-c

num. 12 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 181.7 -4572.8 -5870.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:47 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 171.3 -2625.9 -1686.2 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:46 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 165.1 -1846.7 6026.1 |

```
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:44   sub-projeto: 0012.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                        |
| aux_07    .....|...|...|....|.....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   163.2      -1979.1        6971.9    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0012.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                                 |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   165.0       -1555.4        6917.4     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                 |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:41   sub-projeto: 0012.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                              |
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                                 |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   169.2       -2111.4        5880.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                 |
```

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:40 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 174.9 -2668.8 4055.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:38 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   178.0      -3160.0       1161.5    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:36   sub-projeto: 0012.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                   |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                       |
| fundacao                                                                                      |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._____________._______________|
```

17.3.14 P2-d

Pilar:p2-d

```
 num. 13                                                   esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.---------------.
```

```
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   37.3    52.2  |    75.1        6185.3        5213.3     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:28   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0      15.0    1    1                                                           |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |    84.7        4231.8        2830.4     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
```

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:27   sub-projeto: 0013.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 93.7   2233.9   2465.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:25   sub-projeto: 0013.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

```
|                  10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   102.8       1194.7        2605.6    |
|                  12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico = 396 (combinação= 112)   |
|                  16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                   |
|                  25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                   |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:23   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                            |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                             |
|  50        a      2.0     15.0    1    1                                                                     |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                  10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   112.4      -1546.3        2518.5    |
|                  12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                  16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                   |
|                  25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                   |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:21   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
```

```
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                          |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   122.5      -1273.5        2444.9     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   132.8      -1602.6        1798.4     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
```

```
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                           |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   136.3      -1943.6        571.8    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:17   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                           |
```

| fundacao |

|____.______.______.___.___._____.____.___.___.___.______.___.______|________.________|____________._____________._____________|

17.3.15 P2-e

Pilar:p2-e

num. 14 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.--------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____.____.___.___.___.______.___.______|________.________|____________._____________._____________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|..............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 203.5 -6598.1 -6230.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:46 sub-projeto: 0014.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 194.0   -3827.7   -3084.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:44   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 186.7   -1841.8   -891.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

```
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:43   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5            45.0     1.15       1.40        8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0     15.0    1    1                                                           |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   181.9       2037.9        391.8     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:42   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5            45.0     1.15       1.40        8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0     15.0    1    1                                                           |
```

```
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   179.8        1540.3         499.4     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                        |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   180.1        1404.8         387.2     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|I.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0014.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   182.3       1299.0        245.4    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 396 (combinação= 112)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                     |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                     |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:37   sub-projeto: 0014.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                                          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   185.0      -1332.6        128.1    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
```

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:35   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|_____________._______________._______________|

17.3.16 P2-f

Pilar:p2-f

num. 15   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 36.7 52.2 | 66.4 5250.7 6659.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:28 sub-projeto: 0015.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 76.8 2620.6 2964.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 396 (combinação= 112) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:27 sub-projeto: 0015.sub

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                     |
|  50        a       2.0     15.0    1    1                                                       |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   86.4        758.8        -615.7     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|             |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:25   sub-projeto: 0015.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                     |
|  50        a       2.0     15.0    1    1                                                       |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   96.1      -1521.0       -3004.0     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)   |
```

```
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                 |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:23   sub-projeto: 0015.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15      1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a      2.0     15.0    1    1                                                         |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   106.3      -1111.3       -3013.1    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |   caso pórtico =  64 (combinação=   1)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                 |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                 |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:21   sub-projeto: 0015.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15      1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
```

```
|  50        a      2.0     15.0    1    1                                                              |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   116.8        869.3       -2670.2    |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00      0.40       1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a      2.0     15.0    1    1                                                              |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   127.5       1401.6       -1823.8    |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
```

```
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0015.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                        |
|  50        a      2.0     15.0    1    1                                                   |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   131.0       1843.4       -515.4    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:17   sub-projeto: 0015.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                        |
|  50        a      2.0     15.0    1    1                                                   |
| fundacao                                                                                   |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._______________._______________|
```

17.3.17 P2-g

Pilar:p2-g

```
 num. 16                                    esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________.________________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   174.8      -8594.8       -6047.3    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)   |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                   |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:46   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
```

```
|  50        a      2.0     15.0    1    1                                                              |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   165.3      -5687.9       -5687.9     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                      |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:44   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a      2.0     15.0    1    1                                                              |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   160.0      -3135.5       -6269.5     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                      |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
```

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:43 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_07 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 159.0 -1130.4 -6154.9 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 7 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:42 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_06 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 161.5 1806.9 -6387.2 |

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                  |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                              |
|  50        a       2.0     15.0    1    1                                                   |
| aux_05    .....|...|...|....|.....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   166.1       2275.0       -5525.7     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                  |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                    |
|  50        a       2.0     15.0    1    1                                  |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   172.2       2692.7       -3932.4     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:37   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                    |
|  50        a       2.0     15.0    1    1                                  |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   175.3       3102.6       -1088.9     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
```

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:35 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___._______.___.______|_________._________|_____________._______________._______________|

17.3.18 P2-h

Pilar:p2-h

num. 17 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___.______|_________._________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 39.0 52.2 | 40.1 3753.2 8094.5 |

```
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                   |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                   |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:28   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                        |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|  35.0    52.2 |    58.2       3347.6      -11202.3    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                   |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                   |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:27   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                        |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |    83.7        3043.5       -14544.3     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:25   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5            45.0     1.15       1.40       8.00      0.40       1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                        |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   110.8        2666.1       -15366.5     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  64 (combinação=   1)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
```

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:23   sub-projeto: 0017.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 136.0   3028.2   -12406.0 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:21   sub-projeto: 0017.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   157.9       3409.4       -8634.4     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:20   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                           |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   176.1       3707.5       -5642.0     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:18   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
```

```
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |
|  50        a      2.0     15.0    1    1                                                          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   180.2       3836.0       -1422.6    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:17   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |
|  50        a      2.0     15.0    1    1                                                          |
| fundacao                                                                                          |
|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|_____________._______________._______________|
```

17.3.19 P2-i

```
Pilar:p2-i

 num. 18                                    esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                    12.5  5.0  90  35  10 110.45 0.6 108.61|   35.0    52.2  |   573.2       10394.5      -100708.7     |

|                    16.0  5.0  54  20   7 108.57 0.6 107.57|              |  caso pórtico =  64 (combinação=   1)  |

|l. 10  80.0 239.0 0.6  36 20.0  5.0  36  13   5 113.10 0.6 106.00|              |  **ver nota (a)**                   |

|                    25.0  6.3  22   9   2 107.99 0.6 107.99|              |                                |

| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:46   sub-projeto: 0018.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |

|     2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                      |

|   50        a       2.0      15.0    1    1                                                  |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   585.1       10318.5       -70685.2     |
```

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:44 sub-projeto: 0018.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 584.9 9951.6 -41918.9 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 64 (combinação= 1) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:43 sub-projeto: 0018.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                  |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   577.5       9388.2      -22305.7     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:42   sub-projeto: 0018.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a       2.0     15.0    1    1                                  |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   566.9       8770.1      -11129.2     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  64 (combinação=   1)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
```

```
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:40   sub-projeto: 0018.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                          |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|  35.0    52.2  |   555.7       8191.5       -5517.4     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  64 (combinação=   1)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                     |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  05/01/22 - 13:21:38   sub-projeto: 0018.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 545.6   7687.6   -2942.8 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:37   sub-projeto: 0018.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_03   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 546.7   7319.3   -499.7 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 64 (combinação=   1) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 05/01/22 - 13:21:35   sub-projeto: 0018.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

```
|    2.5           45.0    1.15      1.40       8.00     0.40      1.00   1.00   1.00  1.00                    |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                |
|  50        a      2.0     15.0    1    1                                                         |
| fundacao                                                                                        |
|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.4 Seleção de bitolas de pilares

17.4.1 Legenda

Seção : dimensões da seção tansversal (seção retangular)

nome da seção (seção qualquer)

Área : área de concreto da seção transversal

Nfer : número de ferros

Pdd : pé-direito duplo (direções 'x' e 'y')

s: sim n: não

As : área total de armadura utilizada

Taxa : taxa de armadura da seção

Estr : bitola do estribo

C/ : espaçamento do estribo

Fck : fck utilizado no lance

Cobr : cobrimento utilizado no lance

Pp : pilar-parede: (s) sim (n)não

Pp : s* :pilar-parede (sim), mas ast não atende o item 18.5 da nbr6118

T : tensão de cálculo (carga vertical: combinação 1 tqs pilar) (kgf/cm2)

Lbd : índice de esbeltez (maior lambda)

Ni : força normal admensional (nsd / ac*fcd) (carga vertical: combinação 1 tqs pilar)

2ordm : método utilizado cálculo momento 2ªordem

Elol : efeito local (15.8.3)

Elzd : efeito localizado (15.9.3)

Kapa : pilar padrão com rigidez kapa aproximada (15.8.3.3.3)

Curv : pilar padrão com curvatura aproximada (15.8.3.3.2)

N,m,1/r : pilar padrão acoplado ao diagrama n,m,1/r (15.8.3.3.4)

Metgerl : método geral (15.8.3.2)

17.4.2 P1-a

```
-----------------------------------------------------------------------------------------------------------------------------
Pilar:p1-a                                                    num:  1 lances:  3 à  10
-----------------------------------------------------------------------------------------------------------------------------
Lance  título       seção      área   nfer  bitola pdd     as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm
                   [cm]       [cm2]       [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)
 10  travessa      80.x 239.   19120.0   28    20.0  n s     88.0  0.46   5.0  20.0 n  45.0    2.5  22.6  52. 0.0703 elol kapa
  9  fundacao      80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  23.2  52. 0.0721 elol kapa
  8  aux_08        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  23.2  52. 0.0723 elol kapa
  7  aux_07        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  23.0  52. 0.0716 elol kapa
  6  aux_06        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  22.6  52. 0.0704 elol kapa
  5  aux_05        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  22.2  52. 0.0691 elol kapa
  4  aux_04        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  21.9  52. 0.0680 elol kapa
  3  aux_03        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  21.9  52. 0.0682 elol kapa
```

17.4.3 P1-b

```
-----------------------------------------------------------------------------------------------------------------------------
```

Pilar:p1-b num: 2 lances: 3 à 10

Lance	título	seção [cm]	área [cm2]	nfer	bitola [mm]	pdd x y	as [cm2]	taxa [%]	estr [mm]	c/ [cm]	pp	fck (mpa)	cobr (cm)	t	lbd	ni	2ordm
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	0.1	58.	0.0003	----
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.0	58.	0.0031	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.2	58.	0.0069	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	3.5	58.	0.0109	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.7	58.	0.0145	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.7	58.	0.0178	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.6	58.	0.0205	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.8	58.	0.0211	elol kapa

17.4.4 P1-c

Pilar:p1-c num: 3 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.1 52. 0.0253 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.6 52. 0.0236 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.2 52. 0.0225 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.1 52. 0.0221 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.1 52. 0.0222 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.3 52. 0.0226 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.5 52. 0.0233 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.7 52. 0.0238 elol kapa

17.4.5 P1-d

Pilar:p1-d num: 4 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

```
 10  travessa      80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   0.8  58. 0.0026 elol kapa
  9  fundacao      80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   1.5  58. 0.0048 elol kapa
  8  aux_08        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   2.2  58. 0.0068 elol kapa
  7  aux_07        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   2.8  58. 0.0087 elol kapa
  6  aux_06        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   3.4  58. 0.0106 elol kapa
  5  aux_05        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   4.0  58. 0.0125 elol kapa
  4  aux_04        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   4.6  58. 0.0143 elol kapa
  3  aux_03        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   4.8  58. 0.0149 elol kapa
```

17.4.6 P1-e

```
------------------------------------------------------------------------------------------------------------------------------
Pilar:p1-e                                                 num:  5 lances:  3 à  10
------------------------------------------------------------------------------------------------------------------------------
Lance  título       seção        área   nfer  bitola pdd     as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm
                   [cm]        [cm2]        [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)
 10  travessa      80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   9.4  52. 0.0291 elol kapa
  9  fundacao      80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5   8.8  52. 0.0273 elol kapa
```

8	aux_08	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.3	52.	0.0260	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.0	52.	0.0250	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.9	52.	0.0245	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.8	52.	0.0244	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.9	52.	0.0246	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.0	52.	0.0250	elol kapa

17.4.7 P1-f

Pilar:p1-f num: 6 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd		as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x	y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	0.8	58.	0.0025	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.5	58.	0.0047	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.1	58.	0.0066	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.7	58.	0.0085	elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 3.3 58. 0.0103 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 3.9 58. 0.0122 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.5 58. 0.0140 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.7 58. 0.0145 elol kapa

17.4.8 P1-g

Pilar:p1-g num: 7 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.4 52. 0.0231 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.9 52. 0.0216 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.7 52. 0.0207 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.6 52. 0.0204 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.6 52. 0.0207 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.8 52. 0.0213 elol kapa

4	aux_04	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.1	52.	0.0221	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.2	52.	0.0226	elol kapa

17.4.9 P1-h

Pilar:p1-h num: 8 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd		as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x	y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	0.1	58.	0.0003	----
9	fundacao	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.0	58.	0.0031	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.2	58.	0.0070	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	3.5	58.	0.0110	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.7	58.	0.0147	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.8	58.	0.0179	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.6	58.	0.0206	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n	s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.8	58.	0.0213	elol kapa

17.4.10 P1-i

```
------------------------------------------------------------------------------------------------------------------------
Pilar:p1-i                                                    num:  9 lances:  3 à  10
------------------------------------------------------------------------------------------------------------------------
Lance  título       seção       área   nfer  bitola pdd     as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm
                   [cm]        [cm2]        [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)
 10  travessa      80.x 239.   19120.0   28    20.0  n s    88.0  0.46   5.0  20.0 n  45.0    2.5  23.5  52. 0.0730 elol kapa
  9  fundacao      80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  24.0  52. 0.0747 elol kapa
  8  aux_08        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  24.1  52. 0.0749 elol kapa
  7  aux_07        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  23.8  52. 0.0740 elol kapa
  6  aux_06        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  23.4  52. 0.0728 elol kapa
  5  aux_05        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  23.0  52. 0.0715 elol kapa
  4  aux_04        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  22.6  52. 0.0703 elol kapa
  3  aux_03        80.x 239.   19120.0   24    20.0  n s    75.4  0.39   5.0  20.0 n  45.0    2.5  22.7  52. 0.0705 elol kapa
```

17.4.11 P2-a

Pilar:p2-a num: 10 lances: 3 à 10

```
Lance  título       seção       área   nfer  bitola pdd     as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm
                   [cm]        [cm2]        [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)
 10  travessa      80.x 239.   19120.0   36    20.0  n s    113.1  0.59   5.0  20.0 n  45.0    2.5  30.7  52. 0.0955 elol kapa
  9  fundacao      80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  31.3  52. 0.0975 elol kapa
  8  aux_08        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  31.3  52. 0.0974 elol kapa
  7  aux_07        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  30.9  52. 0.0960 elol kapa
  6  aux_06        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  30.3  52. 0.0942 elol kapa
  5  aux_05        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  29.7  52. 0.0923 elol kapa
  4  aux_04        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  29.1  52. 0.0906 elol kapa
  3  aux_03        80.x 239.   19120.0   24    20.0  n s     75.4  0.39   5.0  20.0 n  45.0    2.5  29.2  52. 0.0908 elol kapa
```

17.4.12 P2-b

Pilar:p2-b num: 11 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.1	52.	0.0033	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.1	52.	0.0065	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	3.6	52.	0.0111	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.1	52.	0.0158	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.5	52.	0.0203	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.7	52.	0.0241	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.8	52.	0.0273	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.0	52.	0.0280	elol kapa

17.4.13 P2-c

Pilar:p2-c num: 12 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.5 52. 0.0296 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.0 52. 0.0279 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.6 52. 0.0269 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.5 52. 0.0266 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.6 52. 0.0268 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.9 52. 0.0275 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.1 52. 0.0285 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.3 52. 0.0290 elol kapa

17.4.14 P2-d

Pilar:p2-d num: 13 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 3.9 52. 0.0122 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.4 52. 0.0138 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.9 52. 0.0152 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.4 52. 0.0167 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.9 52. 0.0183 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.4 52. 0.0199 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.9 52. 0.0216 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.1 52. 0.0222 elol kapa

17.4.15 P2-e

Pilar:p2-e num: 14 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.6 52. 0.0331 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.1 52. 0.0316 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.8 52. 0.0304 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.5 52. 0.0296 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.4 52. 0.0293 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.4 52. 0.0293 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.5 52. 0.0297 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.7 52. 0.0301 elol kapa

17.4.16 P2-f

Pilar:p2-f num: 15 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 3.5 52. 0.0108 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.0 52. 0.0125 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.5 52. 0.0141 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.0 52. 0.0156 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.6 52. 0.0173 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.1 52. 0.0190 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.7 52. 0.0208 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.9 52. 0.0213 elol kapa

17.4.17 P2-g

Pilar:p2-g num: 16 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.1 52. 0.0284 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.6 52. 0.0269 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.4 52. 0.0260 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.3 52. 0.0259 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.4 52. 0.0263 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.7 52. 0.0270 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.0 52. 0.0280 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.2 52. 0.0285 elol kapa

17.4.18 P2-h

Pilar:p2-h num: 17 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.1	52.	0.0065	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	3.0	52.	0.0095	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.4	52.	0.0136	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.8	52.	0.0180	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.1	52.	0.0221	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.3	52.	0.0257	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.2	52.	0.0287	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.4	52.	0.0293	elol kapa

17.4.19 P2-i

Pilar:p2-i num: 18 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	36	20.0	n s	113.1	0.59	5.0	20.0	n	45.0	2.5	30.0	52.	0.0933	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	30.6	52.	0.0952	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	30.6	52.	0.0952	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	30.2	52.	0.0940	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	29.6	52.	0.0922	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	29.1	52.	0.0904	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	28.5	52.	0.0888	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	28.6	52.	0.0890	elol kapa

17.5 Etapa de utilização

17.6 Montagem de carregamentos de pilares

17.6.1 Legenda

nota a

Os valores apresentados equivalem a carregamentos de esforços finais de cálculo para o dimensionamento após a envoltória.

legenda

Fdzt = forca normal de calculo para dimensionamento de armaduras na secao

Mdxt = momento de calculo p/dimensionamento de armaduras na secao, momento x

Mdyt = momento de calculo p/dimensionamento de armaduras na secao, momento y

Carr = número do carregamento na envoltória

Comb = número da combinação de origem do carregamento

17.6.2 P1-a

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	561.9	553.6	553.6	568.7	562.4	566.1	558.2	558.8	558.5	592.1

Mdxt	4575.3	5366.8	4091.4	4439.5	5427.7	4193.7	5358.4	4060.4	4100.9	-4729.9
Mdyt	478.1	-907.3	-1525.3	514.1	-715.0	-1311.8	-745.2	365.0	358.1	573.0
Comb	(77)	(16)	(16)	(188)	(28)	(27)	(15)	(5)	(19)	(67)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	587.3	587.3	566.3	561.8	561.8	558.1	551.1	610.2	610.2	610.2
Mdxt	-5577.1	-4259.0	-4495.4	-5310.6	-4062.5	4123.0	4192.3	-4589.4	-6015.0	-4575.4
Mdyt	-678.4	-1297.3	499.0	-799.2	-1420.0	357.7	402.4	535.8	-644.2	-1286.2
Comb	(7)	(7)	(173)	(132)	(132)	(24)	(184)	(12)	(12)	(12)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	572.9	571.0	571.0	558.2	612.0	612.0	612.0	576.7	576.7	576.7
Mdxt	-4242.5	-5489.0	-4195.6	4085.0	4902.6	6440.3	4861.6	4486.5	5888.4	4475.7
Mdyt	402.8	-714.4	-1291.3	-1347.1	548.2	-642.1	-1290.5	391.3	-693.8	-1280.4
Comb	(119)	(13)	(13)	(15)	(17)	(17)	(17)	(18)	(18)	(18)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	558.1	558.1	594.7	589.0	589.0	571.5	571.5	571.5	566.1	527.9
Mdxt	5398.9	4118.6	4922.4	6118.9	4624.1	4413.0	5790.3	4393.8	5519.1	-3852.5
Mdyt	-719.5	-1305.2	590.8	-677.3	-1302.1	394.6	-701.2	-1296.1	-710.3	369.9
Comb	(24)	(24)	(72)	(22)	(22)	(23)	(23)	(23)	(27)	(169)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	528.3	528.0	523.9	511.3	511.3	519.2	518.7	518.2	559.5	559.5
Mdxt	-5096.3	-3715.2	3840.9	4942.2	3774.6	3699.1	3719.2	3777.1	-4264.3	-5592.2
Mdyt	-662.0	-1203.7	348.2	-920.1	-1511.3	332.9	328.9	319.1	463.0	-605.7
Comb	(63)	(57)	(83)	(71)	(71)	(59)	(60)	(74)	(62)	(62)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	559.5	528.3	528.3	519.3	517.7	592.1	592.1	536.2	536.2	536.2
Mdxt	-4247.0	-3877.1	-3894.3	-3841.4	3808.7	-6213.0	-4698.7	-4134.2	-5451.1	-4156.1
Mdyt	-1185.5	327.4	-1196.3	-1398.7	318.6	-556.9	-1169.7	313.4	-657.1	-1176.9
Comb	(62)	(63)	(63)	(187)	(79)	(67)	(67)	(68)	(68)	(68)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	522.5	519.3	517.9	517.9	594.7	594.7	544.3	544.3	544.3	517.7
Mdxt	-3825.0	-5028.4	4928.2	3765.5	6470.7	4875.0	4328.1	5684.5	4323.6	4992.2
Mdyt	315.8	-831.7	-701.1	-1256.6	-553.8	-1175.8	366.5	-627.8	-1161.5	-664.3
Comb	(192)	(187)	(70)	(70)	(72)	(72)	(73)	(73)	(73)	(79)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	517.7	518.6	512.5	512.5	561.9	561.9	536.8	536.8	536.8	529.1
Mdxt	3813.6	-3633.5	-4714.5	-3612.9	6012.6	4535.7	4223.0	5544.6	4206.6	3937.5

Mdyt	-1196.9	-1230.2	-886.3	-1467.9	-604.2	-1192.4	371.2	-638.3	-1184.0	369.2
Comb	(79)	(75)	(76)	(76)	(77)	(77)	(78)	(78)	(78)	(82)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	529.1	529.1	523.9	572.6	566.5	594.7	594.7	572.9	572.9	566.1
Mdxt	5158.0	3920.7	5027.3	-4126.8	-4019.3	-5918.0	-4506.4	-5577.1	-4259.5	-4060.4
Mdyt	-651.3	-1206.1	-658.0	427.0	406.6	-619.0	-1222.4	-658.4	-1229.9	405.3
Comb	(82)	(82)	(83)	(113)	(115)	(118)	(118)	(119)	(119)	(131)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	561.0	563.4	617.5	617.5	617.5	578.4	578.4	578.4	566.1	561.0
Mdxt	5158.1	-3939.5	-4839.4	-6353.2	-4822.5	-4422.5	-5825.4	-4442.7	-4066.7	3947.0
Mdyt	-822.9	-1357.6	574.7	-584.8	-1211.3	393.0	-654.9	-1216.4	385.0	-1450.4
Comb	(127)	(122)	(123)	(123)	(123)	(124)	(124)	(124)	(125)	(127)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	619.4	619.4	619.4	584.1	596.4	596.4	578.8	569.8	566.4	566.5
Mdxt	4755.5	6238.4	4717.4	4339.5	5915.9	4479.8	4265.9	3998.5	-4013.2	-4010.8
Mdyt	587.1	-582.6	-1215.5	430.1	-617.8	-1227.2	433.5	417.3	409.1	409.2
Comb	(128)	(128)	(128)	(129)	(133)	(133)	(134)	(139)	(150)	(152)
Carr	111	112	113	114	115	116	117	118	119	120

Fdzt	566.5	566.5	534.8	566.3	566.3	535.1	525.4	598.9	598.9	598.9
Mdxt	-4010.2	-4010.0	-3943.1	-5903.9	-4475.5	-4108.2	-3857.2	-4961.0	-6521.6	-4927.3
Mdyt	409.1	409.1	397.9	-550.7	-1116.2	363.4	338.1	609.0	-501.8	-1100.4
Comb	(145)	(146)	(168)	(173)	(173)	(174)	(180)	(178)	(178)	(178)

Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	543.0	543.0	543.0	518.1	518.1	601.6	601.6	601.6	551.1	551.1
Mdxt	-4365.4	-5758.5	-4384.7	4752.4	3641.3	4786.5	6286.7	4741.7	5497.3	4190.4
Mdyt	349.3	-602.2	-1107.7	-865.4	-1441.9	626.7	-498.8	-1106.5	-572.7	-1092.1
Comb	(179)	(179)	(179)	(182)	(182)	(183)	(183)	(183)	(184)	(184)

Carr	131	132	133	134	135	136	137	138
Fdzt	568.7	568.7	543.7	535.9	525.9	526.0	526.0	526.0
Mdxt	5827.3	4402.4	4087.2	3801.8	-3780.7	-3777.2	-3777.2	-3778.7
Mdyt	-549.2	-1123.1	407.2	405.2	372.4	372.5	372.4	372.4
Comb	(188)	(188)	(189)	(193)	(205)	(202)	(211)	(206)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	552.8	552.8	552.8	560.9	560.9	561.5	557.3	557.5	591.3	591.3
Mdxt	4106.5	5378.7	4092.7	4649.3	6111.9	4139.4	4087.7	4094.6	-4787.7	-6291.0
Mdyt	3335.4	1809.0	-821.2	3314.9	1881.4	-721.1	-738.4	-732.5	3519.9	2107.7
Comb	(16)	(16)	(16)	(77)	(77)	(28)	(15)	(19)	(67)	(67)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	586.5	565.3	565.3	570.1	557.3	557.3	609.4	609.4	609.4	572.0
Mdxt	-4257.7	-4529.7	-5950.5	-4166.1	4105.5	5375.1	-4613.1	-6047.9	-4584.0	-4202.3
Mdyt	-686.3	3248.1	1849.6	-756.7	3259.2	1797.6	3618.0	2060.4	-651.3	3198.7
Comb	(7)	(173)	(173)	(13)	(15)	(15)	(12)	(12)	(12)	(119)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	572.0	611.2	611.2	611.2	575.8	575.8	575.8	593.9	593.9	588.2
Mdxt	-5543.0	4980.3	6545.0	4897.3	4502.0	5909.8	4480.4	5012.8	6591.2	4654.0
Mdyt	1776.5	3654.4	2086.2	-642.8	3264.0	1808.3	-730.0	3572.0	2144.9	-679.4
Comb	(119)	(17)	(17)	(17)	(18)	(18)	(18)	(72)	(72)	(22)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	567.7	567.7	557.2	557.2	557.2	565.2	526.9	526.9	527.3	510.5
Mdxt	4507.9	5920.3	4125.2	5402.3	4116.7	4207.1	-3698.6	-4835.1	-3869.7	3764.4
Mdyt	3294.4	1882.0	3207.1	1768.7	-732.3	-713.5	3042.8	1688.4	-700.4	3116.2

Comb	(188)	(188)	(24)	(24)	(24)	(27)	(57)	(57)	(63)	(71)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	510.5	510.5	516.9	558.5	558.5	558.5	527.3	527.3	516.9	516.9
Mdxt	4932.2	3767.1	3759.8	-4293.1	-5632.0	-4257.6	-3835.2	-5060.6	3763.0	4923.3
Mdyt	1668.7	-817.1	-698.8	3268.6	1849.1	-624.4	2952.7	1621.4	3007.4	1652.3
Comb	(71)	(71)	(70)	(62)	(62)	(62)	(63)	(63)	(70)	(70)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	535.1	535.1	535.1	518.4	543.3	543.3	543.3	516.7	517.2	517.6
Mdxt	-4082.3	-5408.5	-4126.9	-3820.0	4329.6	5686.7	4320.9	4975.0	3769.7	4776.2
Mdyt	2901.0	1582.6	-724.9	-767.9	3014.4	1667.8	-686.8	1611.1	-690.4	1656.1
Comb	(68)	(68)	(68)	(187)	(73)	(73)	(73)	(79)	(74)	(75)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	511.6	560.9	535.8	535.8	535.8	516.7	516.7	528.1	528.1	528.1
Mdxt	-3588.9	4568.9	4249.0	5580.0	4215.9	3791.1	3801.3	3964.6	5195.7	3930.4
Mdyt	-795.8	-614.5	3045.9	1690.8	-672.1	2933.0	-690.1	3063.3	1702.9	-663.1
Comb	(76)	(77)	(78)	(78)	(78)	(79)	(79)	(82)	(82)	(82)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	522.9	571.7	571.7	561.0	565.6	565.2	565.2	564.8	564.8	593.8

Mdxt	3833.7	-4106.7	-5386.0	-4005.4	-5238.4	-3974.2	-5212.7	-3964.8	-5198.1	-4507.6
Mdyt	-674.0	3261.8	1823.4	3302.3	1791.3	3227.1	1796.0	3235.5	1797.8	-656.1
Comb	(83)	(113)	(113)	(132)	(115)	(116)	(116)	(117)	(117)	(118)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	577.5	565.7	565.7	560.2	616.8	616.8	616.8	577.5	577.5	565.2
Mdxt	-4416.1	-4024.2	-5294.5	3945.6	-4869.0	-6393.5	-4834.0	-4375.3	-5786.6	-5302.8
Mdyt	-726.5	3196.1	1774.7	-791.0	3595.8	2061.0	-621.1	3162.5	1749.2	1760.3
Comb	(124)	(120)	(120)	(127)	(123)	(123)	(123)	(124)	(124)	(125)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	618.6	618.6	583.2	583.2	583.2	561.0	595.5	578.0	572.5	533.7
Mdxt	4827.2	6336.2	4348.9	5697.5	4333.3	-4039.5	4506.8	5622.3	5349.5	-3935.2
Mdyt	3632.3	2170.3	3241.9	1808.9	-699.9	-776.1	-649.2	1825.0	1833.5	3022.3
Comb	(128)	(128)	(129)	(129)	(129)	(132)	(133)	(134)	(138)	(168)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	533.7	526.9	526.9	524.4	524.4	521.5	521.5	523.9	523.9	565.3
Mdxt	-5153.1	-3829.4	-5029.3	-3813.5	-5023.1	-3792.8	-4993.6	-3732.5	-4885.9	-4488.6
Mdyt	1688.9	2958.1	1642.6	2982.8	1656.6	3027.5	1660.9	2984.7	1652.4	-596.5
Comb	(168)	(169)	(169)	(186)	(186)	(192)	(192)	(172)	(172)	(173)

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	534.1	534.1	518.4	518.4	598.1	598.1	541.9	541.9	541.9	517.3
Mdxt	-4071.8	-5375.5	-3790.5	-4997.3	-5024.3	-6606.0	-4318.9	-5720.1	-4357.9	3622.9
Mdyt	2932.1	1622.0	3080.2	1668.7	3499.4	2109.2	2880.5	1583.1	-697.0	3095.7
Comb	(174)	(174)	(187)	(187)	(178)	(178)	(179)	(179)	(179)	(182)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	517.3	517.3	600.7	600.7	550.1	550.1	550.1	567.7	542.6	542.6
Mdxt	4738.1	3631.1	4871.3	6401.0	4188.0	5492.0	4184.9	4432.8	4107.4	5384.9
Mdyt	1669.3	-789.1	3551.5	2146.3	2993.9	1668.3	-659.0	-586.6	3025.4	1691.3
Comb	(182)	(182)	(183)	(183)	(184)	(184)	(184)	(188)	(189)	(189)
Carr	131									
Fdzt	534.9									
Mdxt	4996.2									
Mdyt	1703.4									
Comb	(193)									

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	565.9	565.9	572.7	572.7	603.7	603.7	569.6	569.6	622.8	622.8
Mdxt	4214.1	5520.5	4821.4	6339.4	-4948.4	-6503.7	4211.5	5515.0	-4741.0	-6217.1
Mdyt	6430.7	4046.6	6428.5	4094.5	6762.7	4331.0	6327.3	3990.2	6960.9	4439.9
Comb	(16)	(16)	(77)	(77)	(67)	(67)	(15)	(15)	(12)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	582.3	577.0	624.7	624.7	588.1	588.1	606.5	606.5	582.9	582.9
Mdxt	-4156.1	-6123.3	5166.0	6790.9	4612.8	6055.8	5208.0	6848.8	4574.9	6006.2
Mdyt	6251.5	3926.5	7051.8	4504.6	6357.2	4003.7	6892.6	4423.4	6381.8	4027.1
Comb	(13)	(173)	(17)	(17)	(18)	(18)	(72)	(72)	(23)	(23)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	569.2	569.2	537.9	537.9	522.5	522.5	527.8	570.2	570.2	538.1
Mdxt	4219.1	5525.7	-3769.7	-4926.2	3848.2	5039.4	3844.5	-4416.4	-5795.4	-3876.7
Mdyt	6267.4	3947.6	5928.5	3741.5	6005.3	3769.2	5857.6	6315.2	4014.3	5805.1
Comb	(24)	(24)	(57)	(57)	(71)	(71)	(70)	(62)	(62)	(63)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	538.1	527.8	545.9	545.9	554.2	554.2	546.8	546.8	527.2	527.2
Mdxt	-5111.2	5030.1	-4112.9	-5445.9	4417.7	5802.5	4363.6	5731.6	3855.3	5057.9

Mdyt	3639.1	3688.7	5749.2	3584.7	5900.3	3707.8	5935.3	3741.2	5772.0	3627.7
Comb	(63)	(70)	(68)	(68)	(73)	(73)	(78)	(78)	(79)	(79)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	539.1	539.1	583.9	583.9	584.1	584.1	630.0	630.0	589.5	589.5
Mdxt	4078.7	5347.1	-4179.8	-5478.0	-4254.8	-5606.8	-5005.0	-6573.3	-4420.2	-5841.1
Mdyt	5970.1	3771.5	6229.8	3932.3	6143.4	3860.6	6813.7	4344.9	6104.2	3822.6
Comb	(82)	(82)	(113)	(113)	(119)	(119)	(123)	(123)	(124)	(124)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	631.9	631.9	595.4	595.4	544.6	544.6	537.6	577.0	544.8	530.2
Mdxt	5003.6	6570.9	4450.5	5831.2	-4013.6	-5254.9	-3890.8	-4660.3	-4120.6	-3846.3
Mdyt	6904.7	4409.7	6210.0	3908.7	5792.4	3653.7	5687.1	6179.0	5669.0	5847.4
Comb	(128)	(128)	(129)	(129)	(168)	(168)	(169)	(173)	(174)	(187)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	530.2	610.5	610.5	552.6	552.6	529.3	613.2	613.2	561.0	561.0
Mdxt	-5064.5	-5192.3	-6827.7	-4356.9	-5765.6	-3699.8	5058.1	6648.7	4267.8	5596.4
Mdyt	3670.8	6626.5	4243.2	5613.0	3496.9	5869.1	6756.4	4335.6	5764.1	3620.0
Comb	(187)	(178)	(178)	(179)	(179)	(182)	(183)	(183)	(184)	(184)
Carr	71	72								

Fdzt	579.5	579.5
Mdxt	4671.6	6137.7
Mdyt	6292.3	4006.7
Comb	(188)	(188)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	585.6	585.6	590.9	590.9	617.3	617.3	582.9	582.9	637.3	637.3
Mdxt	5014.7	6594.6	4517.0	5924.4	-5131.3	-6745.7	4322.2	5660.8	-4885.3	-6408.2
Mdyt	13510.3	9478.7	13406.6	9379.5	14143.0	9938.6	13210.6	9235.6	14543.5	10205.0
Comb	(77)	(77)	(27)	(27)	(67)	(67)	(10)	(10)	(12)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	595.5	595.5	639.2	639.2	601.5	601.5	620.1	620.1	596.3	596.3
Mdxt	-4199.6	-5544.6	5373.3	7064.9	4736.8	6219.5	5427.7	7138.1	4718.8	6196.8
Mdyt	13145.9	9166.1	14793.3	10387.5	13270.7	9273.3	14499.8	10199.4	13325.1	9317.1
Comb	(13)	(13)	(17)	(17)	(18)	(18)	(72)	(72)	(23)	(23)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	549.9	549.9	535.5	535.5	539.7	539.7	583.0	583.0	549.9	549.9
Mdxt	-3848.4	-5027.4	3941.0	5159.4	3926.2	5136.6	-4555.7	-5980.1	-3926.1	-5171.7
Mdyt	12416.9	8684.6	12414.5	8671.0	12238.8	8553.8	13199.1	9252.1	12220.4	8523.9
Comb	(57)	(57)	(71)	(71)	(65)	(65)	(62)	(62)	(63)	(63)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	557.7	557.7	566.3	566.3	558.9	558.9	551.1	551.1	545.6	545.6
Mdxt	-4151.7	-5492.7	4518.5	5935.0	4492.8	5902.4	4204.4	5514.0	4065.6	5326.1
Mdyt	12146.4	8454.5	12324.7	8607.7	12402.3	8670.3	12518.8	8759.3	12300.0	8600.1
Comb	(68)	(68)	(73)	(73)	(78)	(78)	(82)	(82)	(83)	(83)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	597.3	597.3	597.4	597.4	644.6	644.6	602.8	602.8	646.5	646.5
Mdxt	-4263.6	-5583.6	-4318.0	-5684.1	-5161.6	-6780.4	-4475.9	-5908.6	5199.3	6830.7
Mdyt	12833.2	8963.5	12695.7	8851.0	14041.5	9841.3	12643.8	8802.4	14291.3	10023.9
Comb	(113)	(113)	(119)	(119)	(123)	(123)	(124)	(124)	(128)	(128)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	608.8	608.8	589.3	589.8	549.4	549.4	589.8	556.7	556.7	624.1
Mdxt	4562.8	5979.1	-4131.8	-6322.6	-3962.6	-5194.8	-4811.0	-4181.5	-5507.4	-5386.7
Mdyt	12768.7	8909.6	12757.3	8915.6	11749.3	8197.1	12734.6	11755.9	8187.4	13678.5

Comb	(129)	(129)	(137)	(173)	(169)	(169)	(173)	(174)	(174)	(178)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	624.1	564.5	564.5	542.3	542.3	626.9	626.9	573.0	573.0	547.0
Mdxt	-7084.0	-4407.0	-5825.0	-3800.0	-4959.0	5267.1	6925.3	4357.8	5714.3	-3926.8
Mdyt	9602.1	11681.9	8118.0	11950.0	8334.5	14035.3	9862.9	11860.1	8271.2	11770.7
Comb	(178)	(179)	(179)	(182)	(182)	(183)	(183)	(184)	(184)	(186)

Carr	71	72	73	74
Fdzt	543.1	543.1	592.3	592.3
Mdxt	-3912.8	-5145.3	4854.2	6379.9
Mdyt	11924.6	8318.9	13045.8	9142.2
Comb	(187)	(187)	(188)	(188)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	597.4	597.4	603.3	603.3	595.3	630.0	630.0	595.3	650.8	650.8
Mdxt	5220.2	6865.2	4659.4	6113.6	4440.7	-5325.0	-7001.8	5817.7	-5032.3	-6603.3
Mdyt	27878.5	20961.8	27549.7	20692.0	27108.8	29117.0	21903.5	20355.5	29909.1	22485.8

Comb	(77)	(77)	(27)	(27)	(10)	(67)	(67)	(10)	(12)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	607.9	652.7	652.7	608.9	608.9	632.7	632.7	561.0	561.0	547.6
Mdxt	-5589.1	5591.5	7353.1	4867.4	6393.6	5662.4	7446.4	-3921.9	-5122.2	4031.3
Mdyt	20285.3	30515.4	22949.1	27317.5	20513.7	29983.2	22565.6	25508.7	19159.4	25308.3
Comb	(13)	(17)	(17)	(23)	(23)	(72)	(72)	(57)	(57)	(71)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	547.6	550.8	550.8	594.9	594.9	560.9	560.9	568.8	568.8	577.5
Mdxt	5277.8	4018.3	5258.1	-4699.2	-6170.6	-3972.5	-5226.3	-4190.8	-5534.1	4624.8
Mdyt	18998.1	25116.7	18860.3	27120.4	20383.8	25154.6	18872.4	25025.5	18760.1	25208.3
Comb	(71)	(65)	(65)	(62)	(62)	(63)	(63)	(68)	(68)	(73)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	577.5	570.1	570.1	562.2	562.2	556.6	556.6	610.1	610.1	610.1
Mdxt	6075.2	4628.0	6081.4	4330.8	5682.0	4173.9	5469.8	-4344.4	-5686.2	-4379.7
Mdyt	18926.9	25414.8	19086.4	25746.6	19341.1	25258.7	18970.3	26089.4	19572.9	25841.4
Comb	(73)	(78)	(78)	(82)	(82)	(83)	(83)	(113)	(113)	(119)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	610.1	658.4	658.4	615.6	615.6	660.3	660.3	616.5	616.5	601.9

Mdxt	-5758.8	-5326.5	-6998.8	-4532.5	-5974.0	5403.8	7102.1	4679.6	6135.9	-4971.0
Mdyt	19372.0	28615.2	21493.8	25751.1	19293.4	29221.4	21957.1	26023.5	19521.7	25923.0
Comb	(119)	(123)	(123)	(124)	(124)	(128)	(128)	(134)	(134)	(173)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	568.0	560.6	560.6	601.9	568.0	568.0	637.0	637.0	575.8	575.8
Mdxt	-4193.8	-4032.7	-5282.5	-6534.4	-4244.3	-5581.0	-5596.9	-7360.6	-4462.7	-5885.5
Mdyt	24311.4	23903.3	17927.7	19465.8	23957.3	17954.5	27919.7	20985.6	23828.2	17842.2
Comb	(168)	(169)	(169)	(173)	(174)	(174)	(178)	(178)	(179)	(179)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	554.7	554.7	639.7	639.7	584.6	584.6	558.3	558.3	555.3	555.3
Mdxt	-3895.2	-5084.1	5489.2	7218.5	4451.5	5837.5	-3987.9	-5233.5	-3977.5	-5224.4
Mdyt	24111.0	18080.3	28785.9	21647.6	24010.9	18009.0	23912.6	17941.2	24082.7	18061.0
Comb	(182)	(182)	(183)	(183)	(184)	(184)	(186)	(186)	(187)	(187)
Carr	71	72	73							
Fdzt	604.5	604.5	556.9							
Mdxt	5046.8	6635.1	-3980.2							
Mdyt	26681.3	20043.9	23995.8							
Comb	(188)	(188)	(192)							

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	604.8	604.8	611.4	611.4	605.3	603.5	638.0	638.0	603.5	659.6
Mdxt	5415.4	7121.4	4780.2	6275.0	4508.8	5943.6	-5503.0	-7236.9	4535.1	-5154.7
Mdyt	53213.3	42132.4	52436.7	41497.4	51551.6	40791.7	55510.2	43958.6	51550.3	56977.9
Comb	(77)	(77)	(27)	(27)	(3)	(10)	(67)	(67)	(10)	(12)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	659.6	661.2	661.2	617.2	617.2	640.4	640.4	569.2	569.2	568.0
Mdxt	-6766.5	5796.1	7622.6	5000.4	6570.5	5888.2	7741.4	4436.8	5823.5	-3997.2
Mdyt	45107.8	58243.7	46117.9	51909.8	41077.2	57318.6	45401.7	49022.9	38800.9	47893.2
Comb	(12)	(17)	(17)	(23)	(23)	(72)	(72)	(82)	(82)	(63)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	555.6	555.6	557.8	557.8	602.5	602.5	568.0	576.0	576.0	584.9
Mdxt	4097.7	5365.2	4086.6	5348.7	-4822.4	-6334.8	-5248.8	-4217.2	-5548.9	4722.8
Mdyt	47953.3	37943.2	47756.5	37792.7	51624.5	40866.8	37884.1	47655.5	37680.8	47806.0
Comb	(71)	(71)	(65)	(65)	(62)	(62)	(63)	(68)	(68)	(73)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	584.9	577.4	577.4	619.0	619.0	619.0	619.0	667.9	667.9	624.5
Mdxt	6205.3	4751.3	6245.2	-4397.8	-5755.6	-4418.9	-5803.1	-5473.0	-7193.2	-4573.0
Mdyt	37830.7	48270.2	38200.6	49333.3	39012.7	48885.3	38644.1	54217.1	42896.2	48718.9
Comb	(73)	(78)	(78)	(113)	(113)	(119)	(119)	(123)	(123)	(124)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	624.5	669.6	669.6	625.5	625.5	575.8	575.8	568.2	568.2	563.8
Mdxt	-6012.8	5594.9	7355.8	4799.2	6295.4	-4261.2	-5580.4	-4079.6	-5341.3	-4017.9
Mdyt	38501.8	55483.0	43906.4	49149.1	38865.6	45978.5	36364.1	45203.6	35744.8	45369.4
Comb	(124)	(128)	(128)	(134)	(134)	(168)	(168)	(169)	(169)	(187)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	610.2	610.2	575.8	575.8	645.7	645.7	583.7	583.7	648.1	648.1
Mdxt	-5116.5	-6727.0	-4291.3	-5631.3	-5797.2	-7623.4	-4511.3	-5927.8	5702.4	7499.3
Mdyt	49069.9	38820.3	45338.5	35837.5	52955.5	41912.0	45100.8	35634.2	54763.9	43355.1
Comb	(173)	(173)	(174)	(174)	(178)	(178)	(179)	(179)	(183)	(183)
Carr	61	62	63	64	65	66				
Fdzt	592.7	592.7	563.8	612.5	612.5	565.0				
Mdxt	4537.1	5951.1	-5274.1	5229.7	6877.0	-4020.7				

Mdyt	45251.4	35784.2	35875.2	50658.6	40085.8	45282.8
Comb	(184)	(184)	(187)	(188)	(188)	(192)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	602.4	602.4	610.0	610.0	604.1	604.1	635.9	635.9	602.3	602.3
Mdxt	5557.5	7306.4	4841.8	6358.7	4544.7	5956.5	-5617.5	-7387.6	4570.0	5992.0
Mdyt	90352.7	75096.5	88873.2	73848.0	87341.4	72569.8	94180.7	78285.3	87320.4	72554.6
Comb	(77)	(77)	(27)	(27)	(3)	(3)	(67)	(67)	(10)	(10)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	658.0	658.0	659.2	659.2	616.1	616.1	637.6	637.6	567.4	567.4
Mdxt	-5207.4	-6838.4	5941.1	7812.4	5081.7	6679.7	6057.6	7959.9	4487.1	5892.3
Mdyt	96626.4	80305.0	98888.1	82193.6	87891.2	73028.0	97411.6	80983.3	83104.8	69061.0
Comb	(12)	(12)	(17)	(17)	(23)	(23)	(72)	(72)	(82)	(82)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	554.9	554.9	556.5	556.5	600.7	600.7	566.5	566.5	556.3	556.3
Mdxt	4106.8	5378.1	4097.9	5365.1	-4883.6	-6417.6	-3970.5	-5201.5	4098.8	5366.4

Mdyt	81064.6	67358.0	80901.9	67227.4	87503.9	72721.2	81166.0	67428.1	80886.5	67213.4
Comb	(71)	(71)	(61)	(61)	(62)	(62)	(63)	(63)	(65)	(65)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	574.7	574.7	583.8	583.8	576.1	576.1	556.7	556.7	619.2	619.2
Mdxt	-4207.3	-5507.4	4785.1	6289.1	4830.0	6350.3	4113.5	5386.4	-4386.9	-5745.6
Mdyt	80760.9	67074.9	80842.9	67171.6	81701.8	67889.5	80866.9	67198.4	83282.2	69166.8
Comb	(68)	(68)	(73)	(73)	(78)	(78)	(87)	(87)	(113)	(113)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	645.0	645.0	619.4	619.4	667.9	667.9	625.1	625.1	669.1	669.1
Mdxt	-5938.1	-7806.9	-4401.4	-5775.0	-5554.3	-7301.8	-4567.2	-5988.8	5732.5	7538.5
Mdyt	89571.2	74423.8	82535.0	68532.1	91645.2	76132.2	82251.4	68284.9	93906.9	78020.7
Comb	(178)	(178)	(119)	(119)	(123)	(123)	(124)	(124)	(128)	(128)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	646.7	646.7	626.0	626.0	575.5	575.5	568.0	568.0	609.9	609.9
Mdxt	5865.1	7712.1	4873.2	6396.0	-4270.3	-5593.0	-4069.3	-5329.6	-5204.1	-6843.4
Mdyt	92802.1	77121.7	82910.0	68855.2	77624.1	64473.3	76306.9	63373.5	82894.4	68859.8
Comb	(183)	(183)	(134)	(134)	(168)	(168)	(169)	(169)	(173)	(173)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	575.7	575.7	564.4	564.4	583.9	583.9	564.1	593.0	593.0	611.6
Mdxt	-4291.1	-5621.6	-3999.8	-5252.2	-4527.8	-5942.0	-3970.9	4592.6	6026.6	5365.0
Mdyt	76556.4	63566.5	76429.8	63476.6	76151.4	63213.4	76455.1	76233.3	63310.1	85743.1
Comb	(174)	(174)	(187)	(187)	(179)	(179)	(182)	(184)	(184)	(188)

Carr	71	72
Fdzt	611.6	565.1
Mdxt	7055.7	-4002.5
Mdyt	71235.0	76356.5
Comb	(188)	(192)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	583.7	583.7	592.7	592.7	585.3	585.3	585.4	585.4	585.6	585.6
Mdxt	5572.8	7322.2	4788.8	6292.2	4491.1	5891.4	4498.3	5901.1	4494.3	5895.6
Mdyt	129035.2	114166.5	126752.8	112132.4	124537.7	110172.0	124534.5	110168.4	124500.0	110139.2
Comb	(77)	(77)	(27)	(27)	(11)	(11)	(26)	(26)	(6)	(6)

Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	616.8	616.8	639.1	639.1	599.4	599.4	585.5	585.5	639.3	639.3
Mdxt	-5590.2	-7350.7	-5123.3	-6730.3	5052.2	6642.9	4494.4	5895.8	5949.1	7820.2
Mdyt	134416.2	118938.8	137862.8	121975.2	125262.5	110810.2	124494.2	110133.5	141205.1	124940.5
Comb	(67)	(67)	(12)	(12)	(23)	(23)	(15)	(15)	(17)	(17)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	605.2	605.2	617.1	617.1	550.5	550.5	539.6	539.6	540.1	540.1
Mdxt	5017.5	6595.9	6087.7	7992.3	4430.1	5820.3	4013.5	5257.3	4015.1	5259.3
Mdyt	124358.6	110005.8	139191.0	123175.0	118544.9	104877.8	115435.1	102122.6	115375.8	102072.1
Comb	(18)	(18)	(72)	(72)	(82)	(82)	(71)	(71)	(81)	(81)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	540.4	540.4	583.3	583.3	550.5	559.1	559.1	540.2	540.2	568.4
Mdxt	4009.4	5251.3	-4819.3	-6335.0	-5033.4	-4112.6	-5384.0	4009.6	5251.7	4756.8
Mdyt	115326.6	102030.3	124806.2	110421.4	102365.4	115123.4	101819.2	115318.3	102022.2	115124.7
Comb	(61)	(61)	(62)	(62)	(63)	(68)	(68)	(70)	(70)	(73)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	568.4	560.1	560.1	540.5	540.5	604.8	604.8	628.5	628.5	605.3
Mdxt	6254.0	4806.4	6320.6	4030.0	5279.6	-4260.9	-5595.0	-5935.1	-7799.8	-4276.2
Mdyt	101839.7	116416.0	102989.0	115299.3	102005.7	118448.7	104749.1	127566.9	112845.4	117376.3

Comb	(73)	(78)	(78)	(87)	(87)	(113)	(113)	(178)	(178)	(119)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	605.3	651.7	651.7	651.9	651.9	628.7	628.7	561.5	561.5	552.1
Mdxt	-5617.5	-5496.5	-7227.1	5752.1	7564.6	5905.8	7762.1	-4170.0	-5466.4	-3892.3
Mdyt	103789.1	130461.1	115390.5	133803.4	118355.8	132341.5	117081.6	110406.3	97643.4	108461.9
Comb	(119)	(123)	(123)	(128)	(128)	(183)	(183)	(168)	(168)	(205)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	552.1	552.0	551.5	552.0	594.9	594.9	562.2	562.2	549.8	549.8
Mdxt	-5109.5	-3888.5	-5102.1	-5098.8	-5164.2	-6791.5	-4191.8	-5498.3	-3912.3	-5133.5
Mdyt	95923.7	108477.1	96015.9	95936.9	117956.7	104327.9	108874.3	96272.0	108364.3	95838.3
Comb	(205)	(172)	(187)	(172)	(173)	(173)	(174)	(174)	(185)	(185)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	551.6	551.6	570.8	570.8	551.3	551.3	552.0	551.5	595.4	595.4
Mdxt	-3887.9	-5085.9	-4457.6	-5851.2	-3874.2	-5065.9	-5105.6	-3877.3	5391.0	7088.8
Mdyt	108531.1	95983.8	108273.9	95725.8	108585.6	96029.1	95921.3	108569.8	122185.7	108073.0
Comb	(177)	(177)	(179)	(179)	(182)	(182)	(186)	(187)	(188)	(188)
Carr	81	82	83	84	85	86	87			
Fdzt	552.1	552.1	552.1	552.1	552.1	552.0	552.0			

Mdxt	-5102.4	-3889.8	-5105.7	-5103.7	-5103.0	-3892.9	-5110.1
Mdyt	95936.9	108445.8	95909.2	95921.7	95922.6	108422.5	95888.6
Comb	(197)	(199)	(199)	(200)	(202)	(204)	(204)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	162.0	162.0	161.5	164.2	164.2	163.1	163.1	162.4	164.0	161.0
Mdxt	1688.9	2448.5	1398.5	1312.1	1939.2	1319.3	1948.7	1353.5	1449.4	1806.0
Mdyt	1714.3	745.1	-1058.6	1504.4	609.5	1469.9	595.7	-957.8	-942.4	1711.1
Comb	(183)	(183)	(16)	(138)	(138)	(3)	(3)	(10)	(19)	(72)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	161.0	162.3	162.3	167.3	167.3	166.7	165.7	161.9	161.9	169.9
Mdxt	2598.6	1359.5	2004.8	-1586.1	-2324.9	-1510.6	-1366.7	1381.8	2035.5	-1729.5
Mdyt	738.1	1460.8	592.0	1586.7	642.6	-935.0	-948.4	1433.2	581.0	1687.4
Comb	(72)	(6)	(6)	(118)	(118)	(119)	(8)	(11)	(11)	(123)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	169.9	167.3	169.5	164.5	164.5	162.7	162.3	162.3	162.8	162.8
Mdxt	-2517.6	-1590.8	-1483.4	-1395.3	-2064.5	-1393.5	1364.0	2011.1	1636.7	2381.0
Mdyt	689.3	-898.0	-960.7	1496.6	606.4	-1027.9	1460.3	591.8	1414.2	573.4
Comb	(123)	(118)	(13)	(113)	(113)	(132)	(15)	(15)	(73)	(73)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	168.5	168.5	168.5	169.7	164.0	164.0	165.9	165.9	165.9	166.2
Mdxt	1753.0	2541.9	1741.5	1619.7	1450.8	2132.4	1672.2	2432.0	1661.5	1570.9
Mdyt	1707.8	701.4	-868.2	-952.3	1458.9	591.3	1604.1	649.5	-900.0	-940.9
Comb	(17)	(17)	(17)	(18)	(19)	(19)	(22)	(22)	(22)	(23)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	164.1	162.3	162.3	154.8	154.8	152.3	152.6	153.6	153.6	151.1
Mdxt	1428.6	1353.0	1995.7	-1373.1	-2023.5	-1365.5	-1233.5	1357.1	1994.8	1303.8
Mdyt	-945.5	1466.6	594.3	1407.7	570.4	-1013.5	-963.7	1415.7	573.6	-1050.6
Comb	(24)	(25)	(25)	(168)	(168)	(187)	(177)	(82)	(82)	(71)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	152.4	152.4	152.3	152.3	158.9	158.9	158.0	157.1	153.1	153.1
Mdxt	1236.6	1826.4	1244.0	1836.8	-1645.5	-2389.4	-1532.9	-1399.8	-1280.7	-1893.7

Mdyt	1365.6	553.5	1358.2	550.5	1536.3	622.1	-880.8	-893.2	1369.6	555.1
Comb	(60)	(60)	(61)	(61)	(173)	(173)	(174)	(63)	(191)	(191)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	152.3	151.7	151.7	162.6	162.6	161.6	162.5	154.5	154.5	152.3
Mdxt	1239.5	1275.8	1880.9	-1850.6	-2659.0	-1717.9	-1566.5	-1392.8	-2057.0	1250.3
Mdyt	-906.7	1318.9	534.7	1680.3	717.1	-798.0	-910.7	1360.4	551.5	1357.4
Comb	(65)	(66)	(66)	(178)	(178)	(67)	(68)	(175)	(175)	(70)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	152.3	151.1	151.1	161.0	162.8	154.7	154.7	154.7	152.3	152.3
Mdxt	1845.6	1302.1	1919.2	1793.8	1619.8	1374.4	2022.3	1376.7	-1352.5	-2003.4
Mdyt	550.2	1277.8	518.3	-778.6	-898.6	1355.6	549.6	-884.7	1295.5	525.4
Comb	(70)	(71)	(71)	(72)	(73)	(74)	(74)	(74)	(187)	(187)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	151.3	157.3	157.3	157.3	157.8	154.8	152.2	152.2	152.8	152.8
Mdxt	-1232.4	1690.5	2443.4	1679.5	1550.1	1346.8	1234.7	1823.6	-1340.2	-1985.2
Mdyt	-1025.9	1562.9	632.6	-824.0	-882.4	-889.0	1366.5	553.8	1334.1	540.9
Comb	(76)	(77)	(77)	(77)	(78)	(79)	(80)	(80)	(192)	(192)
Carr	91	92	93	94	95	96	97	98	99	100

Fdzt	164.4	164.5	163.4	163.4	164.2	164.2	162.9	169.9	170.5	164.4
Mdxt	-1459.9	-1402.0	-1338.8	-1332.9	-1409.1	-2088.3	-1301.0	-1733.3	-1627.3	-1445.2
Mdyt	-938.1	-921.3	-933.2	-944.4	1463.5	593.2	-993.0	-868.4	-947.3	1454.2
Comb	(125)	(113)	(116)	(121)	(120)	(120)	(122)	(123)	(124)	(125)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	164.4	163.4	162.5	169.5	169.5	154.7	154.3	158.9	162.6	163.5
Mdxt	-2143.2	-1328.0	-1274.9	1626.3	2375.6	-1460.5	-1353.4	-1647.4	-1851.0	-1699.6
Mdyt	589.5	-945.0	-1045.2	1711.2	708.9	-885.2	-871.5	-828.0	-785.6	-898.3
Comb	(125)	(126)	(127)	(128)	(128)	(180)	(169)	(173)	(178)	(179)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	154.7	154.7	152.1	163.8	163.8	155.6	155.6	158.3	158.3	154.5
Mdxt	-1444.3	-2134.1	-1196.0	1519.6	2225.8	1257.3	1858.8	1573.4	2291.3	1240.0
Mdyt	1347.1	546.2	-1038.2	1417.2	574.6	1358.8	550.9	1566.1	637.6	1418.8
Comb	(180)	(180)	(182)	(184)	(184)	(185)	(185)	(188)	(188)	(193)
Carr	121	122	123							
Fdzt	154.5	153.3	153.3							
Mdxt	1832.3	-1301.5	-1927.3							
Mdyt	574.8	1366.3	553.8							

Comb (193) (197) (197)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	156.5	156.5	158.8	158.8	158.7	161.8	161.8	157.9	157.9	164.3
Mdxt	1791.7	2572.2	1418.4	2083.3	1915.2	-1399.8	-2070.6	1336.1	1969.1	-1544.1
Mdyt	6522.7	4441.2	6127.1	4117.3	4055.6	6337.7	4273.4	6052.3	4055.0	6602.6
Comb	(72)	(72)	(27)	(27)	(3)	(7)	(7)	(10)	(10)	(12)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	164.3	160.1	163.9	163.9	159.6	159.6	157.2	161.3	161.3	159.6
Mdxt	-2268.0	-2003.2	1737.5	2514.8	1418.0	2083.5	1892.2	1655.9	2404.3	1416.4
Mdyt	4469.7	4042.1	6674.1	4522.5	6009.7	4032.7	4064.7	6401.1	4320.0	6010.0
Comb	(12)	(113)	(17)	(17)	(19)	(19)	(21)	(22)	(22)	(24)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	149.5	149.5	146.8	146.8	153.5	153.5	150.5	150.5	149.2	149.2
Mdxt	-1199.7	-1782.4	1264.5	1866.7	-1475.3	-2159.4	-1328.9	-1966.6	1335.7	1961.6
Mdyt	5708.6	3838.5	5731.8	3786.9	6042.0	4085.4	5617.5	3784.4	5741.3	3862.4

Comb	(57)	(57)	(71)	(71)	(62)	(62)	(168)	(168)	(82)	(82)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	157.2	157.2	148.0	148.0	158.5	158.5	150.4	150.4	147.0	147.0
Mdxt	-1681.4	-2433.7	-1291.4	-1933.9	1635.5	2373.4	1335.2	1968.6	-1162.3	-1749.7
Mdyt	6420.5	4365.8	5627.8	3733.1	5714.7	3845.9	5573.4	3741.4	5718.9	3787.2
Comb	(67)	(67)	(187)	(187)	(73)	(73)	(74)	(74)	(76)	(76)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	152.9	152.9	150.5	160.1	158.1	162.3	162.3	159.8	159.8	165.4
Mdxt	1675.1	2416.3	1332.9	-1346.5	-2605.3	-1462.5	-2158.4	-1352.5	-2021.2	-1683.7
Mdyt	6132.7	4152.0	5574.0	6005.8	4311.6	5952.0	4002.7	5924.1	3980.9	6504.1
Comb	(77)	(77)	(79)	(113)	(178)	(119)	(119)	(120)	(120)	(123)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	165.4	160.0	160.0	166.3	166.3	154.5	154.5	150.2	150.2	158.1
Mdxt	-2459.1	-1379.7	-2069.8	1505.4	2209.0	-1604.4	-2335.2	-1337.3	-1991.8	-1810.5
Mdyt	4411.1	5907.2	3967.0	6010.1	4047.2	5950.9	4031.3	5500.7	3697.0	6329.4
Comb	(123)	(125)	(125)	(129)	(129)	(173)	(173)	(175)	(175)	(178)
Carr	61	62	63							
Fdzt	150.4	150.4	147.8							

Mdxt	-1376.3	-2060.0	-1164.0
Mdyt	5476.6	3677.2	5640.7
Comb	(180)	(180)	(182)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	135.2	136.8	136.8	137.0	135.2	135.3	139.3	139.3	136.1	136.1
Mdxt	1516.5	1841.1	1255.9	1654.4	2181.9	1760.9	-1212.0	-1797.6	1174.1	1728.5
Mdyt	10309.5	7340.8	9860.4	7303.5	7731.4	7225.0	10199.1	7605.2	9722.1	7222.2
Comb	(183)	(27)	(27)	(2)	(183)	(16)	(7)	(7)	(10)	(10)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	141.2	141.2	142.6	142.6	140.5	140.5	143.0	143.0	138.7	138.7
Mdxt	-1349.3	-1988.0	-1485.2	-2177.6	1563.6	2251.7	1477.5	2144.0	1487.5	2150.4
Mdyt	10659.6	7965.1	10337.4	7718.8	10826.6	8097.8	9785.5	7298.5	10346.2	7721.2
Comb	(12)	(12)	(123)	(123)	(17)	(17)	(18)	(18)	(22)	(22)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	128.8	128.8	126.4	128.4	128.4	126.9	132.0	132.0	128.7	126.4

Mdxt	-1029.5	-1531.6	1098.0	1731.1	1181.1	1594.9	-1296.1	-1902.4	-1543.8	1623.5
Mdyt	9158.1	6824.5	9152.2	6877.9	9227.3	6712.9	9711.1	7255.5	6679.6	6712.4
Comb	(57)	(57)	(71)	(82)	(82)	(66)	(62)	(62)	(64)	(71)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	134.7	134.7	136.1	136.1	128.8	128.8	133.8	133.8	137.4	137.4
Mdxt	-1492.2	-2165.7	-1617.8	-2335.6	-1054.8	-1596.4	1620.6	2311.7	1497.7	2161.5
Mdyt	10369.0	7769.7	10070.8	7541.8	8943.9	6653.5	10607.7	7959.3	9120.3	6817.5
Comb	(67)	(67)	(178)	(178)	(69)	(69)	(72)	(72)	(73)	(73)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	129.7	129.7	127.6	126.6	131.1	131.1	136.9	137.6	137.9	136.9
Mdxt	1166.2	1721.3	1536.8	-1002.1	1511.9	2168.9	-1125.7	-1664.0	-1112.7	-1696.1
Mdyt	8968.3	6689.9	6719.4	3234.7	9921.3	7421.3	9474.2	6983.6	9383.0	6980.8
Comb	(74)	(74)	(75)	(76)	(77)	(77)	(132)	(131)	(115)	(132)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	137.6	137.6	137.3	140.7	137.6	137.2	137.2	144.3	144.3	137.6
Mdxt	-1097.3	-1093.3	-1687.6	-1991.6	-1093.8	-1074.7	-1602.6	-1433.4	-2087.6	-1089.6
Mdyt	9394.1	9403.2	6981.1	7358.9	9399.9	9444.0	6979.0	9374.6	6986.8	9404.0
Comb	(116)	(117)	(137)	(118)	(121)	(122)	(122)	(124)	(124)	(126)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	137.6	142.0	142.0	144.5	144.5	130.2	130.2	127.9	133.3	133.3
Mdxt	-1630.0	1450.8	2107.4	1364.8	1996.3	-1155.1	-1715.1	-1104.2	-1326.8	-1941.0
Mdyt	6979.0	10504.4	7851.5	9463.3	7052.3	8859.9	6596.6	8837.7	8727.9	6504.0
Comb	(126)	(128)	(128)	(129)	(129)	(168)	(168)	(187)	(174)	(174)

Carr	71	72	73	74	75	76	77
Fdzt	130.0	138.4	138.4	130.2	130.2	127.9	128.4
Mdxt	-1726.9	-1543.9	-2222.8	-1180.4	-1777.7	-1662.6	-1650.8
Mdyt	6451.7	8695.6	6496.1	8645.7	6425.6	6487.4	6487.9
Comb	(175)	(179)	(179)	(180)	(180)	(187)	(192)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	108.3	108.3	111.4	111.4	113.3	113.3	110.0	110.0	115.3	115.3
Mdxt	1298.6	1863.6	1264.2	1828.3	-1108.0	-1643.8	971.6	1428.2	-1235.3	-1827.7
Mdyt	15215.9	12345.9	15329.5	12422.7	15785.8	12797.5	14359.3	11599.0	15189.9	12280.8
Comb	(183)	(183)	(22)	(22)	(12)	(12)	(10)	(10)	(123)	(123)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	112.4	112.4	116.3	116.3	104.0	104.0	102.0	102.0	103.5	103.5
Mdxt	1330.8	1918.3	1277.7	1842.5	-827.4	-1233.0	896.5	1331.0	985.5	1441.3
Mdyt	16071.8	13044.5	14414.8	11674.3	13512.3	10935.4	13503.2	10809.9	13629.2	11033.4
Comb	(17)	(17)	(18)	(18)	(57)	(57)	(71)	(71)	(82)	(82)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	106.2	106.2	104.0	107.8	107.8	111.7	111.7	104.1	104.1	106.5
Mdxt	-1072.3	-1585.1	-1233.8	-1248.8	-1827.5	-1231.9	-1775.7	-835.0	-1267.8	1387.7
Mdyt	14345.6	11625.8	10710.4	15358.8	12471.0	13219.5	10730.0	13213.6	10683.0	15767.3
Comb	(62)	(62)	(64)	(67)	(67)	(68)	(68)	(69)	(69)	(72)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	106.5	105.0	105.0	103.0	111.3	111.3	112.2	112.2	112.0	112.0
Mdxt	1983.7	1292.6	1857.3	1264.1	-898.6	-1361.3	-893.9	-1343.8	-880.4	-1322.4
Mdyt	12824.0	14706.9	11935.8	10766.7	13872.7	11114.9	13738.8	11074.0	13754.8	11082.4
Comb	(72)	(77)	(77)	(75)	(132)	(132)	(115)	(115)	(116)	(116)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	111.9	111.9	114.2	114.2	112.0	112.0	118.0	118.0	114.4	114.4
Mdxt	-877.7	-1316.9	-1111.8	-1655.8	-878.1	-1317.6	-1223.5	-1779.9	1234.4	1784.1

Mdyt	13768.2	11086.6	14480.8	11689.2	13763.4	11082.4	13692.5	11062.1	15475.8	12527.9
Comb	(117)	(117)	(118)	(118)	(121)	(121)	(124)	(124)	(128)	(128)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	118.3	118.3	103.9	103.9	104.8	104.8	104.8	104.8	104.3	109.6
Mdxt	1181.2	1719.4	-885.4	-1343.0	-855.6	-1280.8	-856.0	-1281.8	-837.0	-1366.5
Mdyt	13818.8	11157.6	12925.6	10327.4	12776.4	10287.0	12769.5	10281.0	12863.4	14807.4
Comb	(129)	(129)	(187)	(187)	(172)	(172)	(176)	(176)	(177)	(178)

Carr	61	62
Fdzt	109.6	113.5
Mdxt	-1991.7	-1929.0
Mdyt	11993.0	10251.9
Comb	(178)	(179)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	79.8	79.8	79.9	79.9	81.1	81.1	82.1	82.1	79.7	79.7
Mdxt	976.1	1436.9	1028.0	1509.4	-819.1	-1233.9	-693.1	-1024.4	726.2	1075.6

Mdyt	19321.5	17156.2	20271.8	18023.0	19896.2	17665.1	18044.5	16004.2	18076.5	16008.6
Comb	(22)	(22)	(17)	(17)	(12)	(12)	(8)	(8)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	85.0	85.0	85.3	85.3	81.0	81.0	82.4	82.4	81.1	81.1
Mdxt	-851.0	-1240.9	1015.3	1473.5	778.8	1156.9	956.2	1402.5	812.0	1191.9
Mdyt	17950.6	15939.4	18119.3	16074.8	18005.0	15978.0	19480.0	17251.2	17983.9	15957.5
Comb	(13)	(13)	(18)	(18)	(19)	(19)	(128)	(128)	(24)	(24)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	75.3	75.3	73.8	73.8	74.9	74.9	76.6	76.6	78.9	78.9
Mdxt	-596.4	-890.0	659.3	989.0	1079.4	1573.2	-945.4	-1412.0	-1048.2	-1564.6
Mdyt	17001.9	15075.4	17006.9	14955.8	19898.6	17719.3	19362.0	17207.9	18629.3	16493.7
Comb	(57)	(57)	(71)	(71)	(72)	(72)	(67)	(67)	(178)	(178)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	82.2	82.2	75.6	82.6	82.6	77.2	77.2	78.5	78.5	77.3
Mdxt	-990.9	-1426.2	-901.4	1061.3	1526.2	939.0	1375.2	950.2	1386.3	1013.1
Mdyt	16582.6	14742.7	14747.9	16823.7	14936.0	17808.3	15766.7	16953.8	15035.7	19165.9
Comb	(68)	(68)	(69)	(73)	(73)	(188)	(188)	(78)	(78)	(183)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	77.3	83.6	83.6	87.5	87.5	87.8	87.8	83.5	83.5	83.7
Mdxt	1478.5	-1404.8	-930.4	-962.2	-1413.4	943.5	1363.7	707.0	1041.9	740.1
Mdyt	17005.1	16893.2	19104.4	17158.9	15167.6	17327.6	15302.9	17213.2	15206.2	17192.1
Comb	(183)	(123)	(123)	(124)	(124)	(129)	(129)	(130)	(130)	(135)

Carr	51	52	53	54	55	56	57
Fdzt	83.7	80.3	84.5	78.0	78.0	80.8	80.8
Mdxt	1087.8	-1288.4	-1580.3	-697.2	-1068.3	883.9	1285.3
Mdyt	15185.6	14120.9	14028.5	15909.8	14033.6	16221.2	14321.4
Comb	(135)	(174)	(179)	(180)	(180)	(189)	(189)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	46.9	46.9	47.3	47.3	47.5	47.2	47.2	49.4	49.4	47.5
Mdxt	765.0	536.2	620.5	423.4	518.3	-660.0	-454.4	-923.6	-662.8	743.9
Mdyt	17956.5	18396.0	17841.5	18272.6	18157.4	18583.3	19035.5	18605.7	18958.6	17729.5
Comb	(27)	(27)	(2)	(2)	(28)	(7)	(7)	(123)	(123)	(28)
Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	47.2	46.9	46.4	46.4	51.4	51.4	48.0	47.1	46.7	45.0
Mdxt	683.0	474.4	-777.0	-547.7	-841.1	-588.4	951.6	473.4	480.1	1020.6
Mdyt	17658.7	18070.5	19505.7	19998.6	17571.5	18038.6	19017.2	18072.2	18063.7	19917.3
Comb	(10)	(11)	(12)	(12)	(13)	(13)	(128)	(15)	(16)	(17)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	45.0	51.8	51.8	48.2	48.0	47.2	46.0	46.0	49.2	49.2
Mdxt	754.7	1041.5	753.1	750.0	686.9	463.3	972.6	710.7	944.3	678.1
Mdyt	20456.8	17723.5	18168.6	17633.0	19416.7	18077.7	18947.5	19438.0	17805.4	18236.6
Comb	(17)	(18)	(18)	(19)	(128)	(20)	(22)	(22)	(23)	(23)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	48.4	48.4	44.3	44.3	44.0	44.0	44.3	43.9	43.2	43.2
Mdxt	793.3	555.7	-775.7	-550.4	1015.3	752.5	599.0	414.7	-931.2	-683.7
Mdyt	17608.5	18061.7	17687.8	18122.6	18760.7	19190.6	16367.0	16744.0	19005.6	19498.5
Comb	(24)	(24)	(62)	(62)	(183)	(183)	(65)	(66)	(67)	(67)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	50.4	50.2	45.0	44.3	43.6	41.2	41.2	50.9	50.9	44.3
Mdxt	-1025.0	-811.2	-354.6	413.4	422.8	1075.2	815.1	1109.3	812.8	398.8
Mdyt	16242.3	17683.3	16671.1	16751.2	16734.4	19593.5	20153.0	16459.6	16884.1	16754.4

Comb	(68)	(118)	(69)	(87)	(71)	(72)	(72)	(73)	(73)	(75)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	42.5	42.5	47.2	44.3	44.3	44.3	44.3	49.9	49.9	50.3
Mdxt	1009.1	752.2	971.6	603.6	408.3	408.4	408.5	684.2	468.3	-634.4
Mdyt	18208.1	18697.6	16576.5	16356.7	16753.6	16753.1	16753.0	17056.5	17356.0	16941.5
Comb	(77)	(77)	(78)	(87)	(91)	(101)	(102)	(138)	(138)	(113)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	50.2	50.2	50.5	50.1	52.0	52.0	50.2	49.9	49.9	54.4
Mdxt	-569.4	606.1	450.5	605.1	-790.5	-549.3	605.3	406.5	603.6	-988.3
Mdyt	17995.5	16755.9	17117.3	16764.4	16751.7	17053.7	16758.7	17030.4	16800.0	16671.4
Comb	(118)	(116)	(139)	(117)	(119)	(119)	(121)	(122)	(122)	(124)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	54.4	50.2	54.8	54.8	51.2	50.2	49.8	49.0	49.0	47.1
Mdxt	-703.4	405.6	968.9	685.2	454.3	395.4	593.9	901.3	642.8	-910.3
Mdyt	16998.5	17032.2	16823.5	17128.5	17049.2	17037.7	16824.9	18047.5	18398.0	16855.0
Comb	(124)	(126)	(129)	(129)	(130)	(131)	(132)	(133)	(133)	(173)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	47.8	47.8	46.0	46.0	53.1	53.1	47.8	47.8	53.6	53.6

Mdxt	-664.3	-457.4	-1062.3	-790.0	-1157.1	-848.0	-668.4	-460.8	1044.8	750.1
Mdyt	15462.7	15731.7	18172.8	18536.1	15409.6	15736.0	15445.0	15708.7	15626.7	15921.6
Comb	(175)	(175)	(178)	(178)	(179)	(179)	(180)	(180)	(184)	(184)

Carr	91
Fdzt	50.0
Mdxt	905.2
Mdyt	15743.7
Comb	(189)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	16.8	16.8	16.7	16.7	17.0	17.0	16.8	16.7	16.7	15.9
Mdxt	295.6	211.5	249.7	173.9	338.5	247.5	294.8	293.9	210.1	-257.6
Mdyt	14484.5	18975.5	14625.4	19177.1	14533.5	19056.6	14475.9	14486.5	18978.5	15236.6
Comb	(15)	(15)	(2)	(2)	(28)	(28)	(5)	(6)	(6)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	15.9	18.0	18.0	16.8	16.5	16.5	14.4	14.4	19.8	19.8

Mdxt	-182.3	-264.9	-184.2	294.1	296.0	212.8	-325.3	-244.1	-422.2	-312.2
Mdyt	19975.8	14458.3	18978.6	14482.0	14582.0	19008.1	15989.6	20982.2	14372.6	18898.9
Comb	(7)	(8)	(8)	(10)	(16)	(16)	(12)	(12)	(13)	(13)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	12.9	12.9	20.2	20.2	17.5	17.5	14.6	14.6	18.2	18.2
Mdxt	493.3	406.8	562.5	437.5	343.7	250.4	475.4	381.2	482.5	372.0
Mdyt	16310.8	21456.3	14517.9	19052.1	14438.4	18975.5	15523.3	20394.9	14595.0	19134.7
Comb	(17)	(17)	(18)	(18)	(19)	(19)	(22)	(22)	(23)	(23)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	17.9	17.7	16.6	16.6	16.3	16.3	17.1	17.1	15.7	15.9
Mdxt	404.7	344.3	288.2	205.3	347.9	257.7	323.1	233.8	484.2	249.8
Mdyt	17811.2	19322.8	14521.7	18990.6	14718.1	19307.1	14447.6	18951.5	14283.9	13427.8
Comb	(78)	(133)	(26)	(26)	(27)	(27)	(29)	(29)	(188)	(70)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	15.9	15.9	15.9	14.6	14.6	17.6	17.6	15.9	15.7	15.6
Mdxt	175.5	247.3	173.5	-344.8	-260.7	-432.7	-330.5	247.6	383.8	172.9
Mdyt	17583.6	13430.7	17588.2	14502.3	19012.7	15311.0	19910.0	13424.2	18619.3	17609.9
Comb	(70)	(61)	(61)	(62)	(62)	(123)	(123)	(65)	(188)	(66)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	12.5	12.5	20.2	20.2	15.4	15.4	10.4	10.4	20.8	20.8
Mdxt	-430.2	-349.0	-572.4	-446.3	250.8	177.5	526.2	454.5	630.7	498.3
Mdyt	15577.9	20450.3	13267.9	17474.2	13567.1	17630.3	16036.9	21127.8	13475.5	17693.2
Comb	(67)	(67)	(68)	(68)	(71)	(71)	(72)	(72)	(73)	(73)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	12.8	12.8	17.9	17.3	17.3	15.2	15.2	15.9	15.9	19.9
Mdxt	503.6	417.8	516.8	373.7	276.9	325.8	241.5	253.2	178.1	256.5
Mdyt	14911.8	19611.4	13585.7	13334.0	17543.2	13761.5	18057.5	13407.2	17579.0	13806.0
Comb	(77)	(77)	(78)	(79)	(79)	(82)	(82)	(87)	(87)	(126)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	19.9	20.2	19.9	19.9	19.9	19.9	19.0	19.0	21.2	21.2
Mdxt	174.6	-167.1	255.5	173.8	254.7	173.2	-368.0	-268.8	-376.6	-270.6
Mdyt	17903.3	17897.4	13797.4	17902.1	13808.0	17906.5	14558.1	18903.7	13779.7	17906.5
Comb	(126)	(114)	(116)	(116)	(117)	(117)	(118)	(118)	(119)	(119)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	20.3	19.9	19.4	19.4	23.0	23.0	16.1	16.1	23.4	23.4
Mdxt	-173.6	254.9	314.1	220.9	-530.1	-398.6	471.3	369.9	535.3	400.6

Mdyt	17859.2	13803.4	14039.6	18235.1	13694.0	17826.8	15632.3	20384.2	13839.4	17980.1
Comb	(120)	(121)	(138)	(138)	(124)	(124)	(128)	(128)	(129)	(129)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	20.7	17.7	21.4	21.4	20.9	20.0	20.0	18.7	18.7	18.8
Mdxt	213.4	450.7	454.1	335.1	245.6	259.0	176.3	-291.4	-205.2	222.5
Mdyt	17903.4	14844.8	13916.5	18062.6	17875.0	13791.5	17900.0	13001.2	16879.6	12787.6
Comb	(130)	(133)	(134)	(134)	(135)	(143)	(143)	(168)	(168)	(171)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	17.5	17.5	20.6	20.6	19.3	19.3	15.4	15.4	23.2	23.2
Mdxt	-443.9	-340.6	-459.1	-343.3	-292.1	-204.7	-528.4	-428.8	-670.9	-526.1
Mdyt	13874.4	18020.6	12762.3	16596.1	12727.0	16528.5	14950.0	19458.2	12639.9	16482.1
Comb	(173)	(173)	(174)	(174)	(175)	(175)	(178)	(178)	(179)	(179)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	18.8	18.4	13.3	13.3	23.7	23.7	19.9	19.9	18.4	18.4
Mdxt	221.4	-144.2	510.3	420.5	607.4	464.3	285.4	196.9	147.2	-231.5
Mdyt	12800.0	16638.1	15408.9	20135.7	12847.7	16701.2	12734.0	16591.5	7366.4	12917.4
Comb	(181)	(182)	(183)	(183)	(184)	(184)	(185)	(185)	(187)	(187)
Carr	121	122	123	124	125	126				

Fdzt	18.4	15.7	19.1	19.1	18.9	18.9
Mdxt	-158.9	266.1	278.7	192.9	225.8	223.2
Mdyt	16632.6	7799.4	12869.9	16707.5	12779.3	12780.7
Comb	(187)	(188)	(194)	(194)	(198)	(202)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	-0.1	-3.7	-3.7	-3.9	-3.9	-3.5	-3.5	-3.6	-3.6	-3.7
Mdxt	0.0	29.8	71.8	30.8	54.8	28.5	56.6	29.8	90.2	29.7
Mdyt	-5353.3	-6391.0	11769.8	-6459.3	11895.8	-6393.5	11765.8	-6419.5	11820.9	-6391.2
Comb	(190)	(39)	(36)	(2)	(2)	(3)	(3)	(28)	(28)	(41)

** aviso ** pilar tracionado, fn(tf)= -0.10

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	-3.7	-3.7	-3.7	-4.8	-4.8	-3.1	-3.1	-3.5	-3.5	-3.8
Mdxt	71.7	30.1	70.9	-38.6	-64.0	25.3	-47.2	28.1	81.5	30.5
Mdyt	11774.7	-6376.1	11776.7	-6716.5	12394.8	-6459.0	11762.8	-6399.1	11753.4	-6299.8

Comb	(31)	(25)	(6)	(7)	(7)	(24)	(8)	(29)	(29)	(11)

** aviso ** pilar tracionado, fn(tf)= -3.68

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	-3.8	-6.3	-6.3	-2.1	-2.1	-3.5	-3.5	-3.7	-3.8	-3.8
Mdxt	69.9	-51.2	-113.0	-16.7	-103.3	28.0	53.8	71.4	31.0	72.1
Mdyt	11798.3	-7085.2	13019.5	-6448.1	11697.3	-6391.4	11739.2	11774.9	-6228.1	11819.7
Comb	(11)	(12)	(12)	(13)	(13)	(14)	(14)	(15)	(16)	(16)

** aviso ** pilar tracionado, fn(tf)= -3.76

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	-7.5	-7.5	-1.7	-1.7	-3.3	-3.3	-3.7	-3.8	-3.8	-5.8
Mdxt	62.2	218.4	16.0	165.3	26.6	87.2	29.8	30.9	72.6	49.1
Mdyt	-7345.2	13305.1	-6435.1	11808.5	-6472.8	11759.3	-6381.2	-6251.6	11812.9	-6941.4
Comb	(17)	(17)	(18)	(18)	(19)	(19)	(20)	(21)	(21)	(22)

** aviso ** pilar tracionado, fn(tf)= -7.48

Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	-5.8	-2.9	-2.9	-3.1	-3.7	-3.7	-4.2	-4.2	-3.7	-3.7
Mdxt	185.6	25.4	146.0	103.3	30.2	72.0	34.4	102.1	29.7	73.0
Mdyt	12649.0	-6434.2	11868.1	11742.1	-6318.6	11792.8	-6520.1	11976.1	-6390.3	11768.9
Comb	(22)	(23)	(23)	(24)	(26)	(26)	(27)	(27)	(32)	(32)

** aviso ** pilar tracionado, fn(tf)= -5.85

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	-3.7	-3.7	-3.5	-3.2	-3.2	-4.9	-4.9	-2.4	-2.4	-3.0
Mdxt	29.7	29.7	-18.9	26.0	79.3	-40.2	-109.7	-20.3	-85.7	-14.6
Mdyt	-6391.3	-6391.0	4433.7	-5961.5	10977.9	-6386.0	11797.9	-5998.3	10894.8	4345.8
Comb	(36)	(40)	(57)	(83)	(83)	(62)	(62)	(118)	(63)	(64)

** aviso ** pilar tracionado, fn(tf)= -3.66

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	-3.4	-3.4	-7.0	-7.0	-0.9	-0.9	-3.0	-3.0	-8.7	-8.7
Mdxt	28.7	140.4	-58.2	-179.6	-8.8	-165.9	23.6	27.3	72.5	262.4
Mdyt	-6223.1	12019.4	-6912.5	12690.0	-6002.5	10801.3	-5921.6	10861.2	-7284.1	13098.1
Comb	(133)	(133)	(67)	(67)	(68)	(68)	(69)	(69)	(72)	(72)

** aviso ** pilar tracionado, fn(tf)= -3.38

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	-0.5	-0.5	-2.6	-2.6	-6.4	-6.4	-2.2	-2.2	-2.4	-2.4
Mdxt	6.3	186.6	21.6	74.9	53.6	220.6	19.9	159.0	19.6	98.0
Mdyt	-5984.0	10960.2	-6037.6	10890.0	-6707.2	12515.5	-5982.7	11045.3	-6018.0	10865.3
Comb	(73)	(73)	(74)	(74)	(77)	(183)	(78)	(78)	(79)	(79)

** aviso ** pilar tracionado, fn(tf)= -0.46

Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	-3.3	-3.3	-3.3	-3.3	-4.0	-4.0	-3.2	-3.2	-1.2	-1.2
Mdxt	26.4	49.0	26.8	53.1	32.7	96.2	25.7	52.7	-9.4	26.6
Mdyt	-5899.5	10899.8	-5817.5	10937.7	-6105.4	11199.7	-5916.0	10896.9	-5673.1	11140.1
Comb	(80)	(80)	(81)	(81)	(82)	(82)	(92)	(92)	(147)	(147)

** aviso ** pilar tracionado, fn(tf)= -3.29

Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	-1.4	-1.4	-1.4	-1.1	-1.1	-1.1	-1.2	-1.2	-1.2	-1.2

Mdxt	-11.3	6.9	-12.1	-8.6	-4.2	11.4	-9.1	45.0	-9.4	26.4
Mdyt	-5741.1	4506.3	11266.1	-5675.3	4454.4	11136.1	-5673.5	11191.2	-5664.1	11141.9
Comb	(113)	(113)	(113)	(114)	(114)	(114)	(115)	(139)	(116)	(116)

** aviso ** pilar tracionado, fn(tf)= -1.39

Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	-1.2	-1.2	-2.4	-0.6	-0.6	-1.0	-1.0	-1.2	-1.3	-1.3
Mdxt	-9.6	25.8	-70.5	-5.5	-53.7	-8.2	8.0	9.5	10.2	24.7
Mdyt	-5650.3	11147.0	11765.1	-5707.9	11133.1	-5673.7	11112.4	-5662.9	-5581.6	11168.6
Comb	(117)	(117)	(118)	(119)	(119)	(120)	(120)	(131)	(122)	(122)

** aviso ** pilar tracionado, fn(tf)= -1.22

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	-3.9	-3.9	0.4	0.4	-1.0	-1.0	-1.2	-1.2	-1.4	-1.4
Mdxt	-32.8	-119.4	-4.8	-116.4	-8.2	8.6	9.5	26.2	-10.6	26.9
Mdyt	-6366.9	12389.7	-5730.9	11068.6	-5673.2	11109.5	-5648.9	11145.2	-5509.8	11190.0
Comb	(123)	(123)	(124)	(124)	(125)	(125)	(126)	(126)	(127)	(127)

** aviso ** pilar tracionado, fn(tf)= -3.86

Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	-5.0	-5.0	0.7	0.7	-0.8	-0.8	-1.3	-1.3	-3.4	-0.5
Mdxt	41.9	173.3	7.3	131.8	6.2	42.0	10.5	27.4	98.9	5.1
Mdyt	-6626.9	12675.4	-5718.7	11180.6	-5754.5	11129.6	-5533.4	11183.3	4807.5	-5716.0
Comb	(128)	(128)	(129)	(129)	(130)	(130)	(132)	(132)	(133)	(134)

** aviso ** pilar tracionado, fn(tf)= -5.00

Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	-0.5	-0.6	-0.6	-1.2	-1.2	-1.3	-1.3	-1.2	-1.2	-1.0
Mdxt	100.9	4.9	58.1	9.7	23.9	10.0	26.8	9.4	31.1	7.8
Mdyt	11238.5	-5740.7	11112.4	-5657.8	11136.6	-5600.4	11163.1	-5701.2	4476.4	-5680.9
Comb	(134)	(135)	(135)	(136)	(136)	(137)	(137)	(139)	(139)	(140)

** aviso ** pilar tracionado, fn(tf)= -0.47

Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	-1.0	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Mdxt	36.4	-9.4	-9.5	26.5	9.3	27.9	-9.4	9.4	-10.4	-32.3

Mdyt	11123.7	-5671.1	-5658.0	11145.0	-5673.0	11139.1	-5672.8	-5672.3	-5353.8	10502.3
Comb	(140)	(141)	(142)	(142)	(152)	(143)	(151)	(154)	(168)	(168)

** aviso ** pilar tracionado, fn(tf)= -0.98

Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	-0.8	-0.8	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0
Mdxt	-6.7	-22.4	-7.3	37.5	-8.8	-7.8	-4.2	10.9	-8.0	-4.2
Mdyt	-5259.9	10316.5	-5257.3	10395.2	10312.4	-5253.8	4130.8	10324.7	-5224.2	4132.7
Comb	(169)	(169)	(170)	(194)	(170)	(196)	(176)	(171)	(172)	(172)

** aviso ** pilar tracionado, fn(tf)= -0.77

Carr	161	162	163	164	165	166	167	168	169	170
Fdzt	-2.6	-2.6	-0.1	-0.1	-0.7	-0.7	-1.0	-1.0	-1.1	-1.1
Mdxt	-23.3	-115.7	-2.2	-91.6	-6.0	-26.0	-7.9	10.6	-8.7	8.5
Mdyt	-5721.3	11215.2	-5306.5	10312.1	-5257.6	10282.5	-5242.2	10329.5	-5125.9	10362.9
Comb	(173)	(173)	(174)	(174)	(175)	(175)	(186)	(181)	(177)	(177)

** aviso ** pilar tracionado, fn(tf)= -2.63

Carr	171	172	173	174	175	176	177	178	179	180
Fdzt	-4.8	-4.8	1.4	1.4	-0.7	-0.7	-1.0	-1.0	-1.2	-1.2
Mdxt	-41.3	-185.6	-13.1	-193.0	-6.1	-25.3	-8.0	-3.8	-9.5	-5.3
Mdyt	-6247.8	12107.3	-5340.9	10221.8	-5256.9	10278.5	-5222.1	4131.7	-5023.4	4227.0
Comb	(178)	(178)	(179)	(179)	(180)	(180)	(181)	(181)	(182)	(182)

** aviso ** pilar tracionado, fn(tf)= -4.76

Carr	181	182	183	184	185	186	187	188	189	190
Fdzt	1.8	1.8	1.8	-0.4	-0.4	-1.0	-1.2	-1.2	-4.1	-4.1
Mdxt	16.1	175.9	173.4	2.8	33.2	-4.3	-9.3	-4.6	34.7	173.7
Mdyt	-5323.5	4152.9	10381.8	-5373.0	10307.2	4129.9	-5057.1	4207.7	-6042.4	11578.3
Comb	(184)	(184)	(184)	(185)	(185)	(186)	(187)	(187)	(188)	(188)

** aviso ** pilar tracionado, fn(tf)= -0.36

Carr	191	192	193	194	195	196	197	198	199	200
Fdzt	0.1	0.1	-0.1	-1.0	-1.7	-1.7	-0.9	-0.6	-0.6	-0.9
Mdxt	2.4	118.6	56.2	-8.5	13.8	54.5	7.1	-5.2	25.1	-7.8
Mdyt	-5318.2	10462.9	10282.6	10317.2	-5440.6	10617.1	-5296.9	-5267.9	10298.8	-5256.2

Comb	(189)	(189)	(190)	(191)	(193)	(193)	(194)	(195)	(195)	(206)

** aviso ** pilar tracionado, fn(tf)= -0.10

Carr	201	202	203	204	205	206	207	208	209	210
Fdzt	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-1.0
Mdxt	12.9	-3.6	-7.7	-3.6	-3.4	11.2	-3.3	10.9	-3.8	-7.8
Mdyt	10320.8	4128.1	-5256.6	4128.7	4128.7	10322.1	4128.7	10314.2	4127.2	-5256.1
Comb	(198)	(199)	(202)	(206)	(201)	(202)	(202)	(203)	(204)	(205)

** aviso ** pilar tracionado, fn(tf)= -0.94

Carr	211
Fdzt	-0.9
Mdxt	-7.7
Mdyt	-5256.5
Comb	(207)

** aviso ** pilar tracionado, fn(tf)= -0.95

17.6.4 P1-c

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	194.7	194.7	195.7	194.7	194.7	200.4	198.0	198.0	196.7	197.3
Mdxt	1586.7	2115.4	1435.1	-1492.2	-1966.1	-1524.0	-1401.2	-1829.8	1392.2	1432.7
Mdyt	1467.7	709.0	-703.9	1438.8	684.3	-596.2	1353.1	606.3	-599.7	1360.2
Comb	(22)	(22)	(16)	(7)	(7)	(14)	(3)	(3)	(10)	(28)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	197.3	194.7	204.3	204.3	204.7	199.4	199.4	196.0	196.0	192.6
Mdxt	1885.3	-1550.6	-1534.1	-2010.5	-1682.0	-1467.2	-1920.8	1407.1	1851.8	-1564.4
Mdyt	613.1	-573.0	1366.7	609.8	-601.7	1347.6	600.3	1316.8	558.0	1521.2
Comb	(28)	(119)	(8)	(8)	(124)	(9)	(9)	(11)	(11)	(12)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	192.6	192.6	214.3	214.3	214.3	200.4	200.4	195.7	195.7	193.0
Mdxt	-2074.2	-1579.7	-1668.7	-2190.1	-1656.3	-1529.6	-2006.1	1423.1	1876.8	1616.3
Mdyt	758.3	-454.4	1384.6	610.5	-626.8	1337.1	592.3	1289.8	525.2	1555.3
Comb	(12)	(12)	(13)	(13)	(13)	(14)	(14)	(16)	(16)	(17)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	193.0	193.0	209.5	209.5	209.5	201.3	201.3	203.1	195.8	194.7
Mdxt	2159.9	1645.4	1654.9	2181.5	1661.8	1574.2	2082.4	1567.9	-1390.2	1611.8
Mdyt	787.1	-433.9	1386.1	619.0	-606.0	1376.8	622.4	-594.1	-685.9	-498.3
Comb	(17)	(17)	(18)	(18)	(18)	(23)	(23)	(19)	(21)	(22)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	201.3	203.1	196.1	197.3	198.3	183.0	183.0	181.9	187.0	187.0
Mdxt	1587.2	1520.4	1457.4	1441.6	1430.1	-1582.7	-2108.3	-1336.2	-1410.7	-1852.9
Mdyt	-580.7	-600.1	-561.8	-577.8	-587.0	1460.6	730.6	-693.7	1309.8	594.8
Comb	(23)	(24)	(27)	(28)	(29)	(123)	(123)	(76)	(113)	(113)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	190.8	181.8	183.3	183.3	180.3	180.3	179.6	187.1	187.1	188.5
Mdxt	-1549.7	1332.8	1463.3	1948.4	-1475.3	-1959.2	-1550.9	-1439.5	-1888.6	-1527.2
Mdyt	-571.1	-719.4	1494.6	759.3	1377.4	671.2	-542.3	1246.9	551.3	-565.5
Comb	(125)	(71)	(128)	(128)	(62)	(62)	(180)	(64)	(64)	(69)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	183.1	182.4	180.8	177.4	177.4	177.4	208.4	208.4	208.4	188.5
Mdxt	-1304.5	1313.6	1838.7	-1578.3	-2109.2	-1606.8	-1727.3	-2270.7	-1716.2	-1528.7

Mdyt	-570.9	1246.1	557.2	1495.1	777.1	-363.0	1299.9	565.9	-609.2	1232.1
Comb	(70)	(80)	(189)	(67)	(67)	(67)	(68)	(68)	(68)	(69)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	188.5	180.3	180.3	177.8	177.8	177.8	201.5	201.5	201.5	192.3
Mdxt	-2008.8	1555.9	2080.7	1598.2	2142.7	1633.2	1653.3	2177.0	1656.6	1522.4
Mdyt	539.9	1418.6	706.6	1543.7	818.1	-333.7	1301.9	578.0	-579.6	-562.5
Comb	(69)	(77)	(77)	(72)	(72)	(72)	(73)	(73)	(73)	(74)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	180.3	189.8	189.8	189.8	192.4	183.4	184.0	185.5	185.5	185.5
Mdxt	1585.0	1538.1	2035.6	1550.1	1454.6	1374.0	1342.0	1323.5	1732.1	1325.6
Mdyt	-425.7	1288.8	582.9	-543.4	-570.9	-539.3	-539.2	1252.4	556.8	-552.5
Comb	(77)	(78)	(78)	(78)	(79)	(185)	(83)	(84)	(84)	(84)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	188.4	188.4	186.1	185.1	185.1	185.1	194.7	194.7	189.8	189.8
Mdxt	-1419.4	-1860.6	-1415.9	-1510.5	-2002.7	-1552.2	-1552.6	-2039.3	-1485.6	-1952.2
Mdyt	1292.5	578.5	-660.8	1378.2	656.6	-545.0	1306.0	582.1	1286.9	572.5
Comb	(114)	(114)	(132)	(118)	(118)	(174)	(119)	(119)	(120)	(120)
Carr	101	102	103	104	105	106	107	108	109	110

Fdzt	186.4	183.0	204.7	204.7	186.1	183.3	199.9	185.1	193.5	174.2
Mdxt	-1348.9	-1605.4	-1686.9	-2217.4	-1326.2	1485.0	1501.4	1451.2	1360.0	-1349.6
Mdyt	-624.8	-429.4	1323.9	582.8	-678.9	-408.9	-581.0	-473.3	-575.0	1223.4
Comb	(122)	(123)	(124)	(124)	(127)	(128)	(129)	(133)	(135)	(168)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	174.2	173.0	176.2	174.2	173.8	171.4	171.4	171.4	185.1	185.1
Mdxt	-1779.8	-1359.9	-1364.9	-1328.2	-1291.7	-1492.2	-1990.3	-1515.8	-1552.1	-2040.8
Mdyt	557.3	-670.5	-525.6	-547.7	-545.1	1321.3	645.6	-429.0	1218.2	539.3
Comb	(168)	(187)	(169)	(181)	(172)	(173)	(173)	(173)	(174)	(174)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	178.2	173.3	168.5	168.5	168.5	199.5	199.5	199.5	179.6	179.6
Mdxt	-1461.7	-1264.0	-1595.3	-2137.3	-1630.6	-1744.3	-2293.9	-1739.9	-1545.6	-2038.8
Mdyt	-535.6	-619.0	1438.9	751.4	-339.8	1243.8	540.2	-586.1	1176.1	514.3
Comb	(175)	(177)	(178)	(178)	(178)	(179)	(179)	(179)	(180)	(180)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	172.8	168.9	168.9	168.9	171.4	171.4	171.4	180.8	173.4	173.4
Mdxt	-1231.8	1456.6	1948.9	1484.7	1414.3	1885.9	1436.6	1401.7	1212.3	1586.8
Mdyt	-696.2	1487.6	792.4	-310.5	1362.5	680.9	-402.4	-520.3	1235.0	568.4

Comb	(182)	(183)	(183)	(183)	(188)	(188)	(188)	(189)	(193)	(193)
Carr	141									
Fdzt	173.4									
Mdxt	1216.2									
Mdyt	-493.1									
Comb	(193)									

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	191.9	191.9	193.9	193.9	195.3	195.3	194.5	194.5	191.9	191.9
Mdxt	1517.5	2052.9	-1381.2	-1804.6	-1396.1	-1824.5	1395.8	1846.6	-1457.7	-1929.7
Mdyt	4889.5	3427.2	4703.9	3273.1	4671.6	3246.1	4684.4	3256.9	4832.5	3380.2
Comb	(22)	(22)	(2)	(2)	(3)	(3)	(28)	(28)	(7)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	201.6	201.6	196.7	196.7	189.8	189.8	211.7	211.7	197.6	197.6
Mdxt	-1533.2	-2010.5	-1458.7	-1910.5	-1513.2	-2025.4	-1674.7	-2199.2	-1520.5	-1994.8
Mdyt	4708.3	3272.0	4660.8	3237.2	4987.3	3509.4	4764.8	3309.9	4637.5	3219.5

Comb	(8)	(8)	(9)	(9)	(12)	(12)	(13)	(13)	(14)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	190.1	190.1	206.8	206.8	200.4	198.6	198.6	180.1	180.1	184.2
Mdxt	1538.5	2091.2	1622.8	2146.5	1529.6	2037.9	1529.3	-1516.4	-2048.6	-1384.4
Mdyt	5055.1	3564.9	4751.3	3303.9	4662.5	3284.5	4720.7	4791.8	3371.1	4508.4
Comb	(17)	(17)	(18)	(18)	(19)	(23)	(23)	(123)	(123)	(113)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	184.2	177.5	177.5	177.5	191.9	184.3	184.3	177.5	174.5	174.5
Mdxt	-1822.3	1478.1	-1421.2	-1908.2	-1536.5	-1422.6	-1866.6	2012.4	-1500.4	-2041.4
Mdyt	3134.8	4651.2	4569.7	3206.1	4512.7	4324.3	3001.7	3273.2	4790.9	3390.7
Comb	(113)	(77)	(62)	(62)	(119)	(64)	(64)	(77)	(67)	(67)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	205.8	205.8	185.7	185.7	174.9	174.9	198.8	198.8	187.0	187.0
Mdxt	-1731.2	-2276.3	-1510.9	-1985.5	1508.1	2065.7	1628.4	2147.5	1495.1	1992.6
Mdyt	4473.0	3105.7	4291.2	2976.5	4887.8	3470.1	4453.6	3097.1	4410.1	3069.4
Comb	(68)	(68)	(69)	(69)	(72)	(72)	(73)	(73)	(78)	(78)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	180.4	180.4	182.7	182.7	185.6	185.6	182.2	182.2	191.9	187.0

Mdxt	1399.6	1889.4	1300.3	1703.6	-1399.3	-1834.7	-1461.0	-1954.9	-2018.3	-1461.9
Mdyt	4859.6	3426.7	4335.1	3010.4	4476.1	3107.8	4636.9	3241.9	3133.7	4465.1
Comb	(128)	(128)	(84)	(84)	(114)	(114)	(118)	(118)	(119)	(120)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	187.0	202.0	202.0	187.9	171.3	171.3	168.5	168.5	182.3	182.3
Mdxt	-1923.9	-1677.9	-2205.8	-1523.7	-1314.9	-1742.8	-1424.1	-1929.4	-1532.0	-2015.0
Mdyt	3098.8	4569.3	3171.6	4442.0	4205.2	2925.1	4388.8	3078.2	4211.3	2923.6
Comb	(120)	(124)	(124)	(125)	(168)	(168)	(173)	(173)	(174)	(174)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	170.5	165.5	165.5	196.8	196.8	176.7	176.7	166.0	166.0	168.5
Mdxt	-1245.8	-1503.4	-2059.8	-1734.1	-2280.6	-1513.9	-2004.8	1379.5	1880.8	1349.5
Mdyt	4208.8	4610.0	3262.7	4292.1	2977.7	4110.2	2848.5	4707.0	3342.1	4470.3
Comb	(177)	(178)	(178)	(179)	(179)	(180)	(180)	(183)	(183)	(188)
Carr	81	82	83	84						
Fdzt	168.5	170.5	170.5	170.5						
Mdxt	1826.5	-1198.2	-1564.0	1192.3						
Mdyt	3145.3	4226.2	2943.1	1193.6						
Comb	(188)	(193)	(193)	(193)						

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	190.7	190.7	190.1	192.2	192.2	188.4	188.4	188.4	198.9	198.9
Mdxt	-1365.4	-1784.5	1801.9	-1386.8	-1813.4	1954.0	-1414.9	-1877.3	-1530.3	-2007.7
Mdyt	6750.5	5546.1	5573.3	6693.5	5494.3	5847.3	6971.8	5751.7	6731.3	5529.3
Comb	(2)	(2)	(27)	(3)	(3)	(22)	(7)	(7)	(8)	(8)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	193.7	193.7	188.4	186.0	186.0	209.6	209.6	194.6	194.6	186.3
Mdxt	-1445.2	-1893.4	1442.5	-1450.1	-1947.8	-1685.1	-2213.8	-1502.8	-1971.9	1452.4
Mdyt	6674.3	5478.8	7074.1	7241.8	6003.4	6779.5	5570.0	6646.3	5457.8	7361.1
Comb	(9)	(9)	(22)	(12)	(12)	(13)	(13)	(14)	(14)	(17)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	186.3	204.4	204.4	197.5	197.5	195.6	195.6	197.7	191.4	192.5
Mdxt	1978.6	1595.0	2106.3	1494.6	1977.7	1484.2	1976.3	1469.2	1358.3	1362.3
Mdyt	6114.8	6771.2	5564.4	6684.8	5495.8	6758.3	5553.9	6688.9	6716.0	6686.5
Comb	(17)	(18)	(18)	(19)	(19)	(23)	(23)	(24)	(28)	(29)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	192.5	178.0	178.0	180.3	180.3	173.6	173.6	188.5	188.5	181.1
Mdxt	1791.4	-1397.8	-1876.3	-1348.4	-1777.9	-1355.2	-1825.8	-1520.1	-1997.3	-1398.5
Mdyt	5487.6	6675.6	5502.5	6454.2	5297.0	6611.7	5469.2	6268.2	5151.5	6186.7
Comb	(29)	(118)	(118)	(113)	(113)	(62)	(62)	(63)	(63)	(64)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	181.1	175.9	170.1	170.1	203.8	203.8	184.1	184.1	175.9	175.7
Mdxt	-1836.8	1789.2	-1405.5	-1924.2	-1741.1	-2289.6	-1485.8	-1966.1	1323.5	1643.4
Mdyt	5079.4	5865.6	6997.4	5828.7	6337.0	5209.6	6350.1	5208.6	7064.9	5065.4
Comb	(64)	(128)	(67)	(67)	(68)	(68)	(125)	(125)	(128)	(71)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	170.5	170.5	196.3	196.3	186.5	175.5	173.5	173.5	183.8	183.8
Mdxt	1404.4	1933.2	1608.2	2116.9	1464.7	-1433.1	1390.4	1899.0	1449.9	1931.8
Mdyt	7167.9	5987.9	6325.2	5201.7	6201.7	6945.6	6757.8	5605.7	6306.7	5186.6
Comb	(72)	(72)	(73)	(73)	(74)	(123)	(77)	(77)	(78)	(78)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	178.0	178.0	179.4	181.8	181.8	188.4	188.4	183.2	183.2	175.5
Mdxt	1313.7	1763.9	1275.7	-1369.8	-1799.4	-1513.3	-1988.1	-1428.2	-1884.0	-1945.4

Mdyt	6777.8	5598.1	6204.1	6397.3	5245.1	6435.1	5280.1	6378.1	5229.6	5754.2
Comb	(133)	(133)	(84)	(114)	(114)	(119)	(119)	(120)	(120)	(123)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	199.1	199.1	167.2	167.2	163.9	163.9	178.8	178.8	160.4	160.4
Mdxt	-1668.0	-2193.1	-1268.7	-1684.8	-1339.3	-1823.5	-1504.3	-1981.6	-1389.7	-1919.8
Mdyt	6483.3	5320.8	6021.3	4944.9	6337.6	5238.6	5994.1	4920.9	6723.3	5598.1
Comb	(124)	(124)	(168)	(168)	(173)	(173)	(174)	(174)	(178)	(178)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	194.1	194.1	172.7	172.7	166.0	160.9	160.9	176.8	166.1	163.9
Mdxt	-1725.3	-2268.9	-1465.1	-1951.3	-1197.8	1285.1	1759.2	1345.4	-1258.4	1271.1
Mdyt	6062.9	4979.1	5872.7	4818.7	6036.1	6893.9	5757.4	5927.6	6025.5	6483.7
Comb	(179)	(179)	(180)	(180)	(182)	(183)	(183)	(185)	(187)	(188)
Carr	91	92	93							
Fdzt	163.9	166.3	166.3							
Mdxt	1724.3	-1175.2	-1534.6							
Mdyt	5375.1	6062.8	4983.8							
Comb	(188)	(193)	(193)							

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	189.9	189.9	191.5	191.5	187.2	187.2	198.5	198.5	193.0	193.0
Mdxt	-1362.2	-1780.6	-1390.3	-1818.8	-1382.3	-1839.8	-1543.7	-2026.0	-1442.9	-1890.6
Mdyt	7899.6	7258.0	7827.2	7184.9	8169.9	7538.8	7854.7	7214.6	7800.0	7160.9
Comb	(2)	(2)	(3)	(3)	(7)	(7)	(8)	(8)	(9)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	189.2	184.4	184.4	209.9	209.9	193.8	193.8	189.1	189.2	184.8
Mdxt	1330.3	-1395.2	-1883.1	-1719.5	-2259.9	-1491.0	-1963.9	-1326.4	1762.2	1381.1
Mdyt	7936.8	8500.1	7883.5	7885.7	7241.0	7765.4	7134.3	7943.5	7297.2	8645.9
Comb	(27)	(12)	(12)	(13)	(13)	(14)	(14)	(16)	(27)	(17)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	184.8	204.3	204.3	196.9	196.9	189.2	187.2	187.2	195.0	195.0
Mdxt	1883.9	1593.4	2092.7	1473.7	1951.8	-1353.7	1383.5	1874.0	1459.5	1937.4
Mdyt	8036.5	7902.3	7252.9	7814.4	7185.4	7929.4	8296.3	7671.3	7901.2	7257.9
Comb	(17)	(18)	(18)	(19)	(19)	(21)	(22)	(22)	(23)	(23)
Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	197.2	190.6	190.6	191.8	191.8	175.8	175.8	178.5	178.5	173.0
Mdxt	1467.5	1339.8	1764.8	1351.6	1771.7	-1343.7	-1810.3	-1323.6	-1748.7	-1356.6
Mdyt	7818.6	7857.7	7214.6	7821.1	7177.0	7809.5	7201.0	7539.2	6920.3	8139.8
Comb	(24)	(28)	(28)	(29)	(29)	(118)	(118)	(113)	(113)	(123)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	173.0	187.8	181.6	181.6	167.7	167.7	204.1	204.1	181.1	182.4
Mdxt	-1852.6	-2007.6	-1404.3	-1857.9	-1315.5	-1816.1	-1778.8	-2339.4	-1452.3	-1933.6
Mdyt	7545.7	6709.1	7439.6	6823.2	8222.2	7664.7	7344.4	6746.8	7172.5	6796.5
Comb	(123)	(63)	(120)	(120)	(67)	(67)	(68)	(68)	(69)	(125)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	173.4	173.4	168.2	168.2	196.1	196.1	185.5	174.5	171.7	171.7
Mdxt	1261.0	1705.9	1312.5	1814.6	1615.8	2123.8	1912.4	-1256.2	1315.8	1801.1
Mdyt	8285.6	7698.8	8430.5	7883.2	7368.1	6763.9	6667.4	7406.8	7931.0	7361.6
Comb	(128)	(128)	(72)	(72)	(73)	(73)	(74)	(76)	(77)	(77)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	182.8	182.8	175.8	175.8	176.5	176.5	178.3	178.3	180.1	180.1
Mdxt	1424.5	1891.9	1263.3	1695.7	1253.3	1646.6	1270.3	1659.7	-1351.6	-1779.1
Mdyt	7366.7	6771.0	7935.9	7333.6	7304.4	6709.1	7252.1	6655.4	7466.8	6847.2

Comb	(78)	(78)	(133)	(133)	(83)	(83)	(84)	(84)	(114)	(114)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	187.1	198.5	198.5	182.4	177.8	192.9	192.9	177.8	177.8	165.0
Mdxt	-1977.3	-1680.8	-2210.1	-1452.3	-1287.8	1473.3	1932.3	-1315.0	-1667.0	-1232.7
Mdyt	6876.9	7525.3	6903.3	7405.0	7583.1	7541.9	6915.2	7568.9	6959.5	7030.9
Comb	(119)	(124)	(124)	(125)	(127)	(129)	(129)	(132)	(138)	(168)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	165.0	166.0	161.2	161.2	177.3	169.4	169.4	157.2	157.2	193.6
Mdxt	-1640.4	-1236.9	-1261.4	-1727.4	-1963.6	-1347.9	-1795.7	-1279.8	-1786.4	-2292.1
Mdyt	6458.7	6918.9	7417.1	6859.7	6396.6	6888.5	6319.9	7888.7	7352.1	6434.3
Comb	(168)	(170)	(173)	(173)	(174)	(175)	(175)	(178)	(178)	(179)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	170.6	170.6	163.9	157.7	157.7	185.6	175.0	164.0	161.1	161.1
Mdxt	-1416.6	-1902.7	-1181.5	1201.3	1650.8	1977.1	1748.8	-1220.5	1204.6	1636.8
Mdyt	6839.1	6281.8	7093.6	8097.0	7570.7	6451.4	6354.9	7073.3	7597.5	7049.0
Comb	(180)	(180)	(182)	(183)	(183)	(184)	(185)	(187)	(188)	(188)
Carr	101									
Fdzt	164.0									

Mdxt -1520.0

Mdyt 6514.6

Comb (193)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	192.5	192.5	194.2	194.2	189.5	189.5	201.6	201.6	195.7	195.7
Mdxt	-1804.9	-1380.4	-1853.5	-1409.3	-1827.0	-1398.2	-2088.3	-1565.9	-1916.3	-1462.3
Mdyt	7939.7	8473.1	7853.8	8377.3	8260.6	8847.3	7870.8	8410.3	7824.3	8350.0
Comb	(2)	(2)	(3)	(3)	(7)	(7)	(8)	(8)	(9)	(9)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	186.4	186.4	213.9	213.9	196.4	196.4	186.8	186.8	207.8	207.8
Mdxt	-1840.3	-1408.9	-2371.1	-1747.6	-1978.6	-1509.7	1820.3	1395.4	2152.6	1618.0
Mdyt	8655.2	9311.0	7877.1	8426.0	7795.8	8329.3	8829.9	9520.8	7935.0	8451.3
Comb	(12)	(12)	(13)	(13)	(14)	(14)	(17)	(17)	(18)	(18)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	199.8	199.8	189.5	189.5	197.9	197.9	200.3	191.7	191.7	193.2

Mdxt	1955.4	1494.0	1826.1	1399.5	1937.2	1479.5	1968.3	-1760.7	1347.9	1771.8
Mdyt	7864.4	8404.4	8413.7	9030.0	7941.6	8469.1	7855.5	7986.3	8527.7	7892.0
Comb	(19)	(19)	(22)	(22)	(23)	(23)	(24)	(27)	(27)	(28)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	193.2	194.6	194.6	176.9	176.9	179.9	179.9	173.8	173.8	190.5
Mdxt	1358.2	1790.4	1370.8	-1766.5	-1351.1	-1744.5	-1333.3	-1779.4	-1361.8	-2066.4
Mdyt	8415.9	7850.2	8367.1	7875.3	8424.7	7554.5	8050.6	8269.9	8888.4	7307.5
Comb	(28)	(29)	(29)	(118)	(118)	(113)	(113)	(123)	(123)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	183.2	183.2	168.7	168.7	208.0	208.0	183.0	183.0	176.9	169.3
Mdxt	-1855.3	-1415.2	-1724.8	-1322.0	-2467.1	-1805.7	-1921.7	-1466.0	1656.7	1722.2
Mdyt	7439.0	7927.4	8428.1	9104.8	7316.5	7840.3	7200.4	7702.4	8028.4	8677.7
Comb	(120)	(120)	(67)	(67)	(68)	(68)	(69)	(69)	(133)	(72)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	169.3	199.3	187.8	173.1	173.1	185.1	188.6	176.9	176.3	178.5
Mdxt	1319.7	2205.7	1915.2	1730.8	1325.6	1889.4	1944.8	1271.0	1633.4	1654.3
Mdyt	9404.5	7399.2	7298.3	8083.1	8703.2	7408.6	7285.7	8607.4	7472.5	7337.7
Comb	(72)	(73)	(74)	(77)	(77)	(78)	(79)	(133)	(82)	(83)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	178.5	180.4	180.4	179.9	181.6	181.6	189.1	201.4	201.4	183.9
Mdxt	1266.7	1692.3	1284.6	-1719.5	-1362.1	-1784.3	-2011.6	-2293.2	-1700.4	-1917.3
Mdyt	7825.9	7278.1	7756.3	7470.1	7954.7	7468.5	7485.6	7491.8	8003.4	7410.6
Comb	(83)	(84)	(84)	(112)	(114)	(114)	(119)	(124)	(124)	(125)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	183.9	174.3	174.3	195.3	195.3	179.2	179.2	165.7	165.7	166.8
Mdxt	-1462.6	1651.0	1266.8	1999.5	1489.5	-1685.6	-1284.7	-1618.7	-1237.6	-1625.7
Mdyt	7906.8	8444.7	9098.3	7549.7	8028.8	7601.1	8105.2	7049.5	7516.7	6919.7
Comb	(125)	(128)	(128)	(129)	(129)	(138)	(138)	(168)	(168)	(170)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	166.8	161.5	161.5	178.8	170.4	170.4	157.0	157.0	196.4	171.4
Mdxt	-1242.5	-1649.8	-1263.0	-1994.7	-1776.4	-1354.6	-1667.8	-1278.4	-2394.0	-1864.3
Mdyt	7368.3	7507.9	8051.2	6951.0	6884.6	7340.8	8071.5	8713.6	6960.0	6843.9
Comb	(170)	(173)	(173)	(174)	(175)	(175)	(178)	(178)	(179)	(180)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	171.4	157.7	157.7	187.6	176.1	161.5	161.5	173.4	177.0	164.6
Mdxt	-1422.4	1566.4	1200.9	2064.2	1759.3	1574.7	1206.8	1743.1	1802.9	-1531.0

Mdyt	7311.3	8321.2	9013.4	7042.7	6941.8	7726.5	8312.1	7052.1	6929.2	7116.0
Comb	(180)	(183)	(183)	(184)	(185)	(188)	(188)	(189)	(190)	(193)

Carr	101
Fdzt	164.6
Mdxt	-1168.2
Mdyt	7594.8
Comb	(193)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	200.1	200.1	201.9	201.9	200.8	196.9	196.9	209.9	209.9	203.5
Mdxt	-1877.6	-1434.0	-1940.5	-1470.3	-1892.5	-1856.0	-1421.7	-2232.5	-1648.2	-1997.8
Mdyt	7123.7	8908.6	7043.4	8805.9	7045.6	7395.9	9288.0	7022.7	8814.0	7010.5
Comb	(2)	(2)	(3)	(3)	(4)	(7)	(7)	(8)	(8)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	203.5	193.6	193.6	223.2	223.2	204.1	204.1	194.2	194.2	216.5
Mdxt	-1517.0	-1838.7	-1409.9	-2597.7	-1868.0	-2029.6	-1548.9	-1794.6	1388.7	2313.5

Mdyt	8771.9	7727.1	9756.6	6993.5	8803.2	6979.4	8745.0	7866.8	9965.7	7191.4
Comb	(9)	(12)	(12)	(13)	(13)	(14)	(14)	(17)	(17)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	216.5	205.8	207.7	197.0	197.0	205.8	208.5	208.5	199.3	199.3
Mdxt	1699.9	2014.0	1533.7	-1811.1	1404.3	1525.7	2087.8	1558.9	-1849.5	-1401.8
Mdyt	8919.3	7156.7	8842.6	7522.6	9472.8	8919.0	7090.8	8828.3	7164.9	8965.7
Comb	(18)	(23)	(19)	(22)	(22)	(23)	(24)	(24)	(27)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	202.3	202.3	182.7	182.7	187.8	187.8	185.9	179.5	179.5	197.8
Mdxt	1871.0	1425.4	-1765.4	-1351.1	-1843.9	-1399.7	-1784.2	-1747.9	-1339.2	-2218.7
Mdyt	7061.5	8808.4	7039.2	8830.8	6686.7	8348.7	6767.0	7370.4	9299.5	6496.2
Comb	(29)	(29)	(118)	(118)	(114)	(114)	(113)	(123)	(123)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	197.8	189.4	189.4	175.4	174.5	174.5	216.8	216.8	189.6	189.6
Mdxt	-1623.7	-1900.9	-1446.4	1678.7	-1670.0	-1283.2	-2735.0	-1937.8	-1942.2	-1481.9
Mdyt	8173.9	6653.7	8314.7	7702.0	7502.4	9520.5	6454.5	8158.4	6434.3	8075.4
Comb	(63)	(120)	(120)	(72)	(67)	(67)	(68)	(68)	(69)	(69)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	175.4	207.3	207.3	195.8	194.7	179.4	179.4	192.0	192.0	195.8
Mdxt	1288.7	2405.5	1733.3	2087.1	1495.9	1709.4	1311.0	1982.7	1484.4	1531.8
Mdyt	9819.1	6737.1	8324.3	6593.4	8214.7	7210.3	9115.0	6687.6	8323.9	8194.2
Comb	(72)	(73)	(73)	(79)	(74)	(77)	(77)	(78)	(78)	(79)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	182.9	182.7	185.0	185.0	187.0	187.0	185.9	186.7	195.8	195.8
Mdxt	-1714.9	1281.6	1717.9	1310.1	1780.2	1341.1	-1363.4	-1796.1	-2134.6	-1577.5
Mdyt	7165.9	8390.5	6593.8	8232.2	6551.6	8165.9	8451.4	6688.9	6666.0	8356.9
Comb	(133)	(82)	(83)	(83)	(84)	(84)	(113)	(115)	(119)	(119)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	209.1	209.1	190.0	190.0	180.1	180.1	202.4	202.4	191.7	193.6
Mdxt	-2498.2	-1797.3	-1938.3	-1478.3	-1698.4	1261.8	2152.7	1572.9	1852.8	1406.8
Mdyt	6636.9	8346.1	6622.7	8287.9	7510.1	9508.6	6834.7	8462.2	6800.0	8385.4
Comb	(124)	(124)	(125)	(125)	(128)	(128)	(129)	(129)	(134)	(130)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	182.9	191.7	194.3	194.3	185.1	185.1	188.2	188.2	170.7	170.7
Mdxt	-1278.6	1398.8	1926.7	1431.9	-1753.2	-1331.2	-1738.0	-1332.1	-1637.8	-1252.3
Mdyt	9015.7	8461.8	6734.1	8371.1	6808.1	8508.5	6704.8	8351.3	6310.3	7885.8

Comb	(133)	(134)	(135)	(135)	(138)	(138)	(140)	(140)	(168)	(168)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	173.3	173.3	171.8	166.1	166.1	184.8	184.8	175.6	175.6	161.5
Mdxt	-1714.4	-1304.4	-1653.3	-1611.1	-1234.9	-2127.2	-1558.3	-1799.1	-1370.9	-1586.1
Mdyt	6195.7	7739.2	6198.7	6699.2	8427.9	6166.1	7750.8	6148.5	7690.6	7172.4
Comb	(169)	(169)	(170)	(173)	(173)	(174)	(174)	(175)	(175)	(178)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	161.5	203.8	203.8	176.5	176.5	162.4	162.4	194.2	194.2	182.7
Mdxt	-1217.9	-2641.5	-1872.3	-1857.3	-1416.5	-1506.6	1171.3	2256.8	1615.9	1938.4
Mdyt	9097.4	6124.5	7735.4	6104.2	7652.3	7371.9	9396.1	6407.0	7901.2	6263.3
Comb	(178)	(179)	(179)	(180)	(180)	(183)	(183)	(184)	(184)	(190)
Carr	111	112	113	114	115	116	117	118	119	
Fdzt	181.6	166.3	166.3	178.9	178.9	182.7	169.6	169.6	171.9	
Mdxt	1378.6	1554.6	1193.6	1833.7	1367.1	1414.4	-1584.8	-1206.5	1202.0	
Mdyt	7791.6	6880.3	8692.1	6357.5	7900.8	7771.1	6369.2	7967.5	4149.5	
Comb	(185)	(188)	(188)	(189)	(189)	(190)	(193)	(193)	(194)	

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	213.9	213.9	216.8	215.8	214.7	214.7	210.9	210.6	224.5	224.5
Mdxt	-2019.9	-1532.8	-2103.6	-1579.6	-2038.1	-1544.0	-1971.9	-1493.7	-2493.2	-1801.0
Mdyt	4467.3	7145.1	6013.1	7056.8	4425.1	7064.5	4666.9	7429.4	4312.3	7006.1
Comb	(2)	(2)	(179)	(3)	(4)	(4)	(22)	(7)	(8)	(8)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	217.5	217.5	213.4	207.3	208.2	238.9	238.9	218.0	218.0	213.4
Mdxt	-2166.3	-1622.4	-1997.7	1900.2	-1472.7	-2977.2	-2085.4	-2170.0	-1636.6	-1991.7
Mdyt	4375.3	7020.7	4536.8	4775.4	7917.4	4213.6	6942.3	4350.2	6994.3	4553.5
Comb	(9)	(9)	(21)	(12)	(17)	(13)	(13)	(14)	(14)	(16)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	208.2	231.6	231.6	220.0	220.0	210.9	222.9	222.9	213.5	213.1
Mdxt	-1966.4	2594.8	1865.6	2193.8	1636.0	-1485.2	2296.6	1692.5	-2000.5	-1512.3
Mdyt	4824.8	4716.7	7292.4	4578.6	7214.0	7562.7	4567.2	7162.3	4490.3	7190.5
Comb	(17)	(18)	(18)	(23)	(23)	(22)	(24)	(24)	(26)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	216.3	216.3	197.7	197.7	199.7	199.7	198.5	198.5	191.3	192.1

Mdxt	2012.5	1529.9	-1915.4	-1443.3	-1998.5	-1490.2	-1933.5	-1454.6	1768.1	-1383.2
Mdyt	4474.6	7096.4	4224.7	6760.1	4165.5	6671.7	4182.4	6679.4	4363.1	7532.4
Comb	(29)	(29)	(113)	(113)	(114)	(114)	(115)	(115)	(62)	(128)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	211.1	211.1	201.4	201.4	194.8	186.6	187.9	231.7	231.7	231.7
Mdxt	-2503.6	-1780.0	-2061.0	-1532.9	-1867.6	1770.6	1315.0	-2431.7	-3185.8	-2186.2
Mdyt	3937.5	6460.5	4132.6	6635.7	4424.3	4599.1	7762.3	-331.9	3754.8	6369.4
Comb	(63)	(63)	(120)	(120)	(133)	(67)	(72)	(68)	(68)	(68)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	201.9	201.9	195.3	187.9	221.3	221.3	208.8	208.8	192.1	191.7
Mdxt	-2064.8	-1547.2	-1791.3	-1755.4	2750.3	1926.8	2331.3	1679.6	-1862.0	1351.2
Mdyt	4107.4	6609.2	4282.2	4669.7	4515.2	6869.4	4301.6	6683.6	4582.1	7255.7
Comb	(125)	(125)	(71)	(72)	(73)	(73)	(79)	(79)	(128)	(77)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	204.7	204.7	197.3	194.5	197.2	197.2	199.4	199.4	208.3	208.3
Mdxt	2186.5	1598.8	-1893.3	-1404.3	1843.5	1400.4	1930.7	1447.2	-2386.0	-1711.5
Mdyt	4318.0	6757.4	4294.1	7044.3	4166.8	6622.6	4169.4	6589.4	4069.6	6621.1
Comb	(78)	(78)	(132)	(118)	(83)	(83)	(84)	(84)	(119)	(119)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	222.8	222.8	197.3	215.4	215.4	194.8	203.9	203.9	206.8	206.8
Mdxt	-2867.6	-1996.0	-1887.6	2406.3	1729.7	-1395.7	2004.6	1500.1	2107.7	1556.6
Mdyt	3970.9	6557.3	4310.8	4474.0	6907.3	7177.7	4335.9	6828.9	4324.4	6777.2
Comb	(124)	(124)	(127)	(129)	(129)	(133)	(134)	(134)	(135)	(135)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	197.4	197.0	200.1	200.1	181.1	181.1	183.8	183.8	182.2	182.2
Mdxt	-1896.3	-1422.9	-1831.3	-1403.5	-1735.0	-1314.1	-1853.7	-1380.9	-1761.0	-1330.0
Mdyt	4247.6	6805.5	4231.9	6711.3	3934.5	6302.7	3850.1	6176.6	3874.2	6187.5
Comb	(137)	(138)	(140)	(140)	(168)	(168)	(169)	(169)	(170)	(170)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	176.8	176.4	196.2	196.2	186.2	186.2	180.4	171.7	173.0	216.8
Mdxt	-1666.8	-1258.1	-2402.9	-1697.3	-1942.9	-1442.1	-1703.5	1595.1	-1228.3	-2355.8
Mdyt	4219.7	6708.8	3713.0	6104.3	3803.0	6125.0	4033.8	4374.6	7406.0	-341.5
Comb	(188)	(173)	(174)	(174)	(175)	(175)	(187)	(178)	(183)	(179)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	216.8	187.0	187.0	180.4	173.0	206.4	206.4	193.9	193.9	176.8
Mdxt	-3081.9	-1948.3	-1462.4	-1695.1	-1658.8	2575.7	1801.1	2156.8	1553.9	-1246.0

Mdyt	3533.0	3767.1	6087.2	4057.6	4445.1	4290.7	6513.1	4077.1	6327.3	6899.4
Comb	(179)	(180)	(180)	(182)	(183)	(184)	(184)	(190)	(190)	(188)

Carr	111	112	113	114	115	116	117	118
Fdzt	189.8	189.8	180.6	179.9	182.3	182.3	184.5	184.5
Mdxt	2011.9	1473.1	-1707.8	-1284.9	1667.8	1274.8	1755.4	1321.5
Mdyt	4093.4	6401.1	3967.3	6367.7	3942.2	6266.4	3944.9	6233.1
Comb	(189)	(189)	(192)	(193)	(194)	(194)	(195)	(195)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	238.0	235.5	233.7	235.7	235.7	234.5	234.5	228.6	228.6	228.6
Mdxt	-1844.7	-2487.7	-1683.3	-2337.2	-1745.1	-2251.0	-1696.8	-1657.5	-2168.1	-1647.1
Mdyt	-2344.7	2717.8	3761.7	1501.5	3697.7	1512.8	3726.4	-2851.5	1641.4	4049.2
Comb	(14)	(179)	(2)	(3)	(3)	(4)	(4)	(17)	(17)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	245.2	245.2	245.2	237.5	237.5	232.6	233.3	233.2	227.3	227.3
Mdxt	-2160.3	-2841.1	-2041.5	-2417.7	-1792.4	-1697.2	-2194.2	-1667.4	-1591.0	-2076.1

Mdyt	-2605.1	1438.7	3538.7	1487.1	3661.3	-2250.3	1540.5	3787.6	-2680.1	1630.9
Comb	(8)	(8)	(8)	(9)	(9)	(25)	(16)	(21)	(12)	(12)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	227.3	260.9	260.9	260.9	238.0	238.0	233.3	252.9	252.9	252.9
Mdxt	1596.4	-2628.4	-3448.6	-2420.8	-2420.8	-1794.6	-1663.2	2244.0	2951.1	2122.6
Mdyt	4023.3	-2903.3	1373.6	3372.1	1481.1	3646.2	3795.9	-1622.5	1930.4	4179.1
Comb	(12)	(13)	(13)	(13)	(14)	(14)	(16)	(18)	(18)	(18)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	242.1	241.1	241.1	235.5	233.2	230.1	231.0	231.0	240.3	243.4
Mdxt	1807.5	3175.3	2232.3	-2784.5	-2197.7	-2192.9	-2167.9	-1650.5	1863.9	1955.9
Mdyt	-2067.1	2052.7	4096.1	-2947.9	1537.2	-2587.7	1593.8	3929.8	-1997.6	-1879.7
Comb	(19)	(73)	(73)	(179)	(21)	(63)	(22)	(22)	(23)	(24)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	243.4	243.4	233.4	233.4	232.9	232.9	232.9	236.2	234.4	234.4
Mdxt	2569.6	1893.1	-2201.6	-1669.3	-1678.3	-2194.4	-1664.8	1687.4	2720.7	1962.9
Mdyt	1700.3	3971.5	1528.7	3766.5	-2308.3	1537.2	3787.8	-2122.3	1807.2	3935.4
Comb	(24)	(24)	(26)	(26)	(27)	(27)	(27)	(29)	(129)	(129)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	219.5	215.2	215.2	216.6	217.2	217.2	216.0	216.0	209.0	210.4
Mdxt	-1761.5	-2125.3	-1584.6	-1653.5	-2231.1	-1646.5	-2145.7	-1598.1	1471.7	2428.0
Mdyt	-2274.0	1427.6	3518.0	-2162.9	1402.2	3454.0	1413.6	3482.7	-2374.0	1610.1
Comb	(125)	(113)	(113)	(58)	(114)	(114)	(115)	(115)	(62)	(190)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	209.0	230.1	230.1	219.8	219.0	219.0	212.5	210.1	204.5	204.5
Mdxt	1479.0	-2881.4	-2037.3	-1741.9	-2311.0	-1693.8	-2063.0	-1548.5	1479.2	1936.3
Mdyt	3675.9	1294.4	3181.3	-2215.7	1387.8	3417.6	1494.6	3805.5	-2694.9	1568.8
Comb	(62)	(63)	(63)	(69)	(120)	(120)	(133)	(128)	(67)	(67)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	204.5	252.6	252.6	252.6	219.5	219.5	214.8	206.4	206.4	206.4
Mdxt	1480.6	-2861.6	-3735.7	-2579.2	-2314.2	-1695.9	-1564.5	-1474.6	-1927.1	-1473.9
Mdyt	3873.5	-3013.6	-1229.4	2943.2	1381.9	3402.6	3552.2	-2939.7	1583.8	3910.6
Comb	(67)	(68)	(68)	(68)	(125)	(125)	(127)	(72)	(72)	(72)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	241.1	225.8	227.5	227.5	210.1	210.1	208.8	208.8	223.2	224.0
Mdxt	2419.8	1796.3	2641.0	1904.3	-2063.0	-1574.3	-1971.7	-1481.5	1876.9	2962.2
Mdyt	-1184.0	-1819.0	1724.0	3799.7	1542.1	-2780.8	1531.7	3779.6	-1719.8	1938.9

Comb	(73)	(74)	(79)	(79)	(128)	(128)	(123)	(123)	(78)	(184)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	224.0	227.5	214.8	214.8	213.0	212.5	215.0	215.0	215.0	217.3
Mdxt	2084.5	2008.2	-2089.2	-1568.8	-2115.9	-1551.8	1544.7	2019.4	1534.9	1624.6
Mdyt	3870.7	-1551.5	1441.3	3543.9	-2522.1	3686.1	-2006.7	1435.6	3537.9	-1898.0
Comb	(184)	(79)	(127)	(132)	(174)	(133)	(83)	(83)	(83)	(84)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	217.3	217.3	226.7	226.7	226.7	242.4	242.4	242.4	234.4	223.6
Mdxt	2128.6	1599.9	-2077.2	-2731.0	-1942.9	-2545.2	-3334.5	-2322.2	2068.8	1632.4
Mdyt	1447.1	3566.2	-2534.4	1339.5	3295.0	-2832.5	1274.3	3128.4	-1551.8	-1996.3
Comb	(84)	(84)	(119)	(119)	(119)	(124)	(124)	(124)	(129)	(130)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	214.8	221.8	214.1	214.9	214.9	214.4	214.4	214.4	217.7	217.7
Mdxt	-2092.7	1688.8	-1614.0	-2096.6	-1570.7	-1595.1	-2089.5	-1566.2	-1998.9	-1523.2
Mdyt	1437.9	-1926.8	-2179.6	1429.5	3522.7	-2237.6	1438.0	3544.1	1446.4	3564.4
Comb	(132)	(134)	(136)	(137)	(137)	(138)	(138)	(138)	(140)	(140)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	196.6	196.6	196.6	199.5	199.5	199.5	197.7	197.7	192.8	192.8

Mdxt	-1464.8	-1918.9	-1434.2	-1576.4	-2070.1	-1522.5	-1948.2	-1453.4	-1398.8	-1829.8
Mdyt	-2080.1	1328.4	3274.4	-2097.3	1292.1	3183.1	1308.3	3224.0	-2471.6	1424.1
Comb	(168)	(168)	(168)	(169)	(169)	(169)	(170)	(170)	(188)	(188)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	192.8	213.0	213.0	202.7	202.1	202.1	196.0	196.0	187.4	187.4
Mdxt	-1387.3	-2777.3	-1946.0	-1665.0	-2183.8	-1590.0	-1867.3	-1411.4	1317.2	1739.0
Mdyt	3514.6	1202.5	2955.8	-2150.1	1271.6	3131.0	1370.7	3311.4	-2629.3	1477.0
Comb	(188)	(174)	(174)	(180)	(175)	(175)	(182)	(187)	(178)	(178)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	187.4	235.5	202.7	202.7	196.0	189.3	189.3	189.3	224.0	208.7
Mdxt	1332.8	-3626.5	-2188.4	-1593.2	-1405.5	-1397.5	-1830.0	-1382.5	2257.7	1634.2
Mdyt	3648.1	-1201.5	1263.0	3109.5	3323.3	-2874.1	1492.0	3685.2	-1118.3	-1753.5
Comb	(178)	(179)	(180)	(180)	(182)	(183)	(183)	(183)	(184)	(185)
Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	208.7	210.4	196.0	206.0	206.0	206.0	210.4	196.1	196.1	195.5
Mdxt	2145.3	1756.6	-1872.2	1714.8	2254.4	1644.8	1846.2	-1877.9	-1414.2	-1427.2
Mdyt	1418.6	3574.3	1345.2	-1654.1	1521.1	3540.2	-1485.9	1331.1	3281.2	-2098.1
Comb	(185)	(190)	(187)	(189)	(189)	(189)	(190)	(192)	(192)	(193)

Carr	161	162	163	164	165	166
Fdzt	195.5	197.9	197.9	200.2	200.2	200.2
Mdxt	-1407.8	1809.7	1387.2	1462.6	1914.0	1452.2
Mdyt	3311.7	1343.8	3312.5	-1832.5	1355.3	3340.7
Comb	(193)	(194)	(194)	(195)	(195)	(195)

17.6.5 P1-d

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	111.8	111.8	112.3	112.3	112.8	112.8	111.0	111.8	109.5	109.5
Mdxt	-930.1	-1372.1	-958.9	-929.3	-950.7	-1401.4	-912.4	-899.0	-1010.3	-1488.9
Mdyt	619.6	328.9	-179.1	-179.8	604.8	314.4	-274.1	-179.1	741.6	454.8
Comb	(2)	(2)	(15)	(10)	(3)	(3)	(21)	(6)	(12)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	110.2	115.1	115.1	114.0	114.4	111.3	117.2	117.2	117.2	117.8
Mdxt	-1031.6	-1042.7	-1530.0	-1137.2	-1021.0	-895.3	-1108.6	-1621.4	-1091.0	-1121.1

Mdyt	-156.5	607.9	315.9	-168.3	-165.9	-235.2	609.5	313.5	-172.2	590.5
Comb	(63)	(8)	(8)	(69)	(9)	(11)	(13)	(13)	(13)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	117.8	117.8	112.3	112.3	110.9	109.4	109.4	115.7	115.7	115.3
Mdxt	-1638.8	-1098.1	-968.2	-1425.3	-881.1	952.2	1443.8	998.6	1487.4	1061.4
Mdyt	302.6	-171.3	597.6	302.9	-293.4	770.0	481.1	616.5	323.1	-162.6
Comb	(14)	(14)	(15)	(15)	(16)	(17)	(17)	(18)	(18)	(74)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	118.7	118.7	118.7	112.3	112.3	112.3	110.5	110.5	111.0	113.5
Mdxt	1031.5	1522.8	1035.6	914.8	1378.4	936.6	941.5	1425.2	1028.6	950.4
Mdyt	597.8	308.7	-167.3	606.7	313.3	-166.7	699.4	406.8	-149.6	618.7
Comb	(19)	(19)	(19)	(20)	(20)	(20)	(22)	(22)	(73)	(23)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	113.5	114.1	115.6	112.9	111.6	111.6	105.4	105.4	106.2	106.9
Mdxt	1425.0	1015.8	963.3	913.4	-879.6	-1300.7	-886.6	-1307.2	-896.1	-916.0
Mdyt	327.6	-159.2	-169.1	-166.8	627.2	336.2	583.8	311.8	-180.4	562.5
Comb	(23)	(185)	(24)	(25)	(27)	(27)	(57)	(57)	(65)	(58)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	106.9	106.1	105.0	103.1	103.8	103.8	103.8	110.2	110.2	109.2
Mdxt	-1349.0	-938.4	-923.2	-899.1	-949.8	-1405.0	-959.9	-1047.4	-1531.2	-1027.1
Mdyt	291.1	-179.5	-177.2	-311.8	662.5	390.2	-55.2	567.0	293.3	-160.6
Comb	(58)	(70)	(176)	(187)	(62)	(62)	(62)	(63)	(63)	(64)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	104.3	102.3	102.3	113.2	113.2	113.2	114.0	114.0	106.1	106.1
Mdxt	-872.0	-1001.1	-1484.4	-1141.6	-1660.3	-1127.0	-1159.4	-1685.0	-940.9	-1382.7
Mdyt	-315.2	758.0	489.2	569.4	289.9	-169.6	542.1	274.2	552.3	274.7
Comb	(76)	(67)	(67)	(68)	(68)	(68)	(69)	(69)	(70)	(70)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	104.1	102.0	102.0	111.0	111.0	115.3	115.3	106.2	106.8	106.2
Mdxt	-827.2	953.0	1442.0	1019.2	1505.5	1066.3	1562.2	899.5	1353.7	920.2
Mdyt	-342.8	798.6	526.9	579.3	303.5	552.6	283.0	565.3	293.9	-161.8
Comb	(71)	(72)	(72)	(73)	(73)	(74)	(74)	(75)	(189)	(75)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	103.7	103.7	108.0	108.0	108.0	110.9	107.1	105.2	105.2	111.0
Mdxt	937.7	1416.4	950.4	1417.1	966.5	958.3	887.1	832.4	1250.6	-988.3
Mdyt	697.9	427.9	582.5	310.0	-137.1	-165.1	-161.9	594.6	322.3	-175.5

Comb	(77)	(77)	(78)	(78)	(78)	(79)	(80)	(82)	(82)	(126)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	111.5	111.5	111.0	109.7	110.5	113.8	113.8	110.0	108.3	108.3
Mdxt	-976.6	-1436.4	-958.7	-941.7	-928.2	-1068.6	-1563.8	-924.6	-1036.2	-1526.3
Mdyt	573.8	297.1	-176.2	-270.4	-175.5	576.8	298.5	-231.4	710.6	437.4
Comb	(114)	(114)	(121)	(132)	(117)	(119)	(119)	(122)	(123)	(123)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	115.9	115.9	115.9	116.5	116.5	116.5	109.6	108.1	108.1	114.4
Mdxt	-1134.5	-1654.5	-1120.3	-1147.0	-1671.8	-1127.5	-910.4	906.2	1375.2	952.6
Mdyt	578.5	296.2	-168.6	559.5	285.2	-167.6	-289.8	739.0	463.8	585.5
Comb	(124)	(124)	(124)	(125)	(125)	(125)	(127)	(128)	(128)	(129)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	117.4	117.4	117.4	109.8	114.3	110.6	110.6	104.9	105.7	104.5
Mdxt	985.5	1454.0	986.2	983.0	913.9	-939.6	-1384.4	-965.5	-1381.1	-887.5
Mdyt	566.9	291.4	-163.6	-146.2	-165.3	574.0	297.3	-176.1	275.1	-160.2
Comb	(130)	(130)	(130)	(184)	(135)	(151)	(151)	(181)	(169)	(171)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	104.2	109.0	109.0	109.0	108.0	104.9	101.1	101.1	112.0	112.0

Mdxt	-879.8	-1071.4	-1561.9	-1058.7	-1054.2	-964.9	-1025.1	-1517.9	-1165.5	-1690.1
Mdyt	-176.1	538.3	277.2	-153.2	-157.2	523.6	729.3	473.1	540.7	273.8
Comb	(172)	(174)	(174)	(174)	(175)	(181)	(178)	(178)	(179)	(179)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	112.0	112.8	112.8	112.8	104.9	103.0	100.8	100.8	109.8	114.1
Mdxt	-1154.1	-1183.4	-1714.7	-1164.4	-1415.0	-854.3	910.4	1379.8	976.7	1023.7
Mdyt	-166.3	513.4	258.1	-164.9	258.6	-339.4	769.9	510.8	550.5	523.9
Comb	(179)	(180)	(180)	(180)	(181)	(182)	(183)	(183)	(184)	(185)
Carr	141	142	143	144	145	146	147			
Fdzt	114.1	105.0	105.0	105.0	106.8	106.8	109.7			
Mdxt	1503.1	856.8	1287.4	874.5	907.7	920.8	912.5			
Mdyt	266.9	536.5	273.5	-158.4	553.7	-133.8	-161.7			
Comb	(185)	(186)	(186)	(186)	(189)	(189)	(190)			

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	108.0	108.0	108.5	108.5	106.8	106.8	111.3	111.3	108.5	105.7

Mdxt	-923.1	-1359.7	-957.1	-1406.9	-946.2	-1390.6	-1051.3	-1537.7	-941.0	-968.0
Mdyt	2057.3	1441.3	2048.1	1424.5	2114.9	1502.3	2053.3	1432.0	2044.0	2185.8
Comb	(2)	(2)	(15)	(15)	(7)	(7)	(8)	(8)	(10)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	105.7	113.4	113.4	114.0	114.0	105.6	105.6	111.8	111.8	114.8
Mdxt	-1434.5	-1115.6	-1626.1	-1138.8	-1657.6	853.4	1347.2	941.1	1421.8	993.9
Mdyt	1577.0	2087.7	1449.8	1993.9	1392.2	2224.9	1613.4	2081.6	1451.2	2016.1
Comb	(12)	(13)	(13)	(14)	(14)	(17)	(17)	(18)	(18)	(19)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	114.8	108.5	106.7	106.7	109.7	109.7	101.7	101.7	102.4	102.4
Mdxt	1472.2	1300.5	850.6	1334.5	883.3	1352.1	-868.2	-1278.9	-916.8	-1346.4
Mdyt	1408.1	1430.2	2147.5	1533.4	2062.3	1443.1	1923.8	1349.8	1910.6	1325.8
Comb	(19)	(20)	(22)	(22)	(23)	(23)	(57)	(57)	(70)	(70)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	100.0	100.0	106.4	106.4	102.5	101.1	98.5	98.5	109.4	109.4
Mdxt	-901.3	-1346.7	-1051.4	-1532.0	-893.8	-845.9	-932.5	-1411.0	-1143.3	-1657.1
Mdyt	2006.1	1437.0	1918.1	1336.5	1904.8	1924.2	2107.5	1543.7	1967.3	1362.1
Comb	(62)	(62)	(63)	(63)	(65)	(66)	(67)	(67)	(68)	(68)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	110.3	110.3	98.3	98.3	107.2	107.2	111.5	111.5	102.5	102.5
Mdxt	-1176.4	-1701.5	846.7	1341.1	972.0	1447.9	1047.4	1532.7	828.0	1276.5
Mdyt	1833.2	1279.6	2163.3	1595.6	1958.6	1364.0	1864.9	1302.3	1912.9	1333.9
Comb	(69)	(69)	(72)	(72)	(73)	(73)	(74)	(74)	(75)	(75)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	99.9	99.9	104.2	104.2	101.4	101.4	101.3	107.2	107.2	107.3
Mdxt	842.7	1323.8	889.4	1349.4	-816.8	-1206.7	1217.2	-976.9	-1432.9	-960.9
Mdyt	2052.8	1481.4	1930.9	1352.3	1935.2	1361.9	1261.6	1932.6	1346.4	1928.5
Comb	(77)	(77)	(78)	(78)	(82)	(82)	(186)	(126)	(126)	(121)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	104.5	104.5	112.1	112.1	112.7	112.7	104.3	104.3	110.6	110.6
Mdxt	-987.8	-1467.4	-1135.4	-1650.7	-1158.7	-1682.1	-819.5	1283.6	901.5	1358.1
Mdyt	2070.4	1498.9	1972.3	1371.7	1878.4	1314.0	2109.5	1535.2	1966.2	1373.0
Comb	(123)	(123)	(124)	(124)	(125)	(125)	(128)	(128)	(129)	(129)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	113.6	113.6	101.2	101.2	105.3	105.3	101.3	97.3	97.3	108.3
Mdxt	954.3	1408.7	-935.1	-1371.1	-1069.9	-1554.8	-912.3	-950.8	-1440.6	-1161.7

Mdyt	1900.7	1329.9	1803.8	1253.5	1811.3	1264.2	1798.0	2000.6	1471.3	1860.5
Comb	(130)	(130)	(181)	(181)	(174)	(174)	(176)	(178)	(178)	(179)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	108.3	109.1	109.1	97.1	97.1	106.0	106.0	110.3	110.3	103.0
Mdxt	-1679.4	-1194.8	-1723.5	810.1	1283.3	935.4	1389.8	1010.7	1481.9	852.8
Mdyt	1289.8	1726.4	1207.3	2056.4	1523.3	1851.7	1291.7	1758.1	1230.0	1824.1
Comb	(179)	(180)	(180)	(183)	(183)	(184)	(184)	(185)	(185)	(189)
Carr	91									
Fdzt	103.0									
Mdxt	1290.8									
Mdyt	1280.0									
Comb	(189)									

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	94.4	94.4	95.3	95.3	93.2	93.2	97.5	97.5	94.8	92.1
Mdxt	-840.1	-1234.2	-878.3	-1287.2	-844.0	-1238.5	-984.2	-1431.2	-869.3	-852.9

Mdyt	2945.9	2485.8	2915.7	2453.3	3043.9	2604.7	2930.2	2460.6	2919.2	3163.9
Comb	(2)	(2)	(3)	(3)	(7)	(7)	(8)	(8)	(15)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	92.1	99.4	99.4	99.9	99.9	91.9	91.9	91.1	97.9	97.9
Mdxt	-1259.4	-1046.4	-1515.6	-1079.6	-1559.6	-758.1	-1118.8	757.7	807.0	1222.5
Mdyt	2750.4	2966.0	2467.2	2856.4	2423.8	3224.4	2815.9	2768.3	2980.0	2490.8
Comb	(12)	(13)	(13)	(14)	(14)	(17)	(17)	(78)	(18)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	100.8	100.8	93.1	93.1	93.8	96.0	96.0	96.9	95.5	94.2
Mdxt	878.2	1299.1	-772.3	-1139.4	852.8	-762.7	-1127.5	1169.6	-1174.9	-817.2
Mdyt	2909.9	2462.5	3095.7	2662.5	2802.3	2956.3	2489.1	2377.2	2453.8	2959.9
Comb	(19)	(19)	(22)	(22)	(73)	(23)	(23)	(129)	(25)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	94.2	88.7	88.7	90.1	90.1	87.1	87.1	93.2	93.2	89.4
Mdxt	-1202.6	-778.9	-1145.4	-833.4	-1221.1	-784.4	-1170.2	-984.7	-1425.7	-820.5
Mdyt	2503.3	2753.6	2327.1	2710.4	2280.6	2893.6	2496.9	2731.1	2291.0	2715.4
Comb	(27)	(57)	(57)	(58)	(58)	(62)	(62)	(63)	(63)	(70)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	85.5	85.5	96.0	96.0	96.7	96.7	85.2	85.2	93.8	97.9
Mdxt	-797.1	-1207.3	-1073.6	-1545.2	-1121.0	-1607.2	672.5	1085.1	1268.5	954.5
Mdyt	3064.9	2705.0	2782.3	2300.5	2625.7	2238.5	3151.3	2798.7	2334.2	2702.1
Comb	(67)	(67)	(68)	(68)	(69)	(69)	(72)	(72)	(73)	(74)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	97.9	90.1	86.9	86.9	91.1	91.1	88.0	88.0	88.5	88.5
Mdxt	1392.4	726.8	-681.9	1082.7	1153.6	-1286.4	-781.9	-1149.0	-746.2	-1100.0
Mdyt	2293.7	2622.0	2967.7	2579.5	2331.7	2636.8	2732.2	2241.4	2773.5	2352.0
Comb	(74)	(189)	(77)	(77)	(78)	(123)	(81)	(81)	(82)	(82)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	90.8	90.8	93.3	93.3	94.3	94.3	92.2	92.2	96.4	93.8
Mdxt	-775.2	-1141.9	-857.2	-1256.4	-895.2	-1308.9	-861.1	-1260.6	-1452.1	-886.2
Mdyt	3066.1	2702.4	2787.6	2372.3	2757.4	2339.8	2885.6	2491.2	2347.0	2760.9
Comb	(128)	(128)	(113)	(113)	(114)	(114)	(118)	(118)	(119)	(126)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	91.1	98.4	98.4	98.9	98.9	96.9	99.8	99.8	87.8	89.2
Mdxt	-869.8	-1063.5	-1536.2	-1096.6	-1579.8	773.6	844.8	1246.7	-794.7	-849.1
Mdyt	3005.5	2807.7	2353.7	2698.1	2310.2	2821.7	2751.6	2348.9	2607.2	2564.0

Comb	(123)	(124)	(124)	(125)	(125)	(129)	(130)	(130)	(168)	(169)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	89.2	88.1	86.1	92.2	88.4	84.5	84.5	95.0	95.0	95.7
Mdxt	-1241.1	-1163.5	-800.2	-1444.6	-836.3	-812.8	-1232.0	-1089.4	-1563.7	-1136.7
Mdyt	2175.6	2171.4	2747.1	2185.9	2569.0	2918.5	2599.9	2635.9	2195.4	2479.3
Comb	(169)	(171)	(173)	(174)	(181)	(178)	(178)	(179)	(179)	(180)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	95.7	84.2	84.2	84.2	92.8	92.8	90.1	87.1	88.0	88.0
Mdxt	-1625.2	-677.6	-1001.1	709.4	821.9	1220.6	1104.8	-797.7	-1155.7	-1153.8
Mdyt	2133.4	3004.9	2693.6	2326.5	2655.8	2229.1	2226.7	2585.7	2177.3	2176.6
Comb	(180)	(183)	(183)	(183)	(184)	(184)	(189)	(192)	(202)	(199)
Carr	101									
Fdzt	88.0									
Mdxt	-1153.3									
Mdyt	2177.0									
Comb	(201)									

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	80.0	80.5	81.4	81.4	80.7	80.7	79.2	79.3	83.3	83.3
Mdxt	-758.0	-1102.1	-798.5	-1164.2	-755.3	-1105.6	-1046.3	-1085.9	-911.7	-1315.2
Mdyt	3187.4	3096.1	3146.7	3055.0	3155.4	3055.5	3310.0	3234.8	3156.8	3058.4
Comb	(26)	(2)	(3)	(3)	(5)	(5)	(22)	(7)	(8)	(8)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	80.9	78.2	78.2	85.1	85.1	85.5	78.0	78.0	83.6	83.6
Mdxt	-778.9	-1087.3	-744.1	-972.2	-1396.0	-1449.0	-1034.1	-649.7	674.8	1022.6
Mdyt	3153.1	3431.1	3523.2	3206.1	3068.5	3002.2	3515.9	3625.1	3244.4	3117.8
Comb	(10)	(12)	(12)	(13)	(13)	(14)	(17)	(17)	(18)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	86.3	86.3	79.2	79.2	81.9	81.9	81.3	80.0	80.3	80.3
Mdxt	760.9	1123.7	-712.7	-663.7	-682.1	-1006.1	-1065.5	-1108.5	-740.4	-1085.1
Mdyt	3153.3	3083.1	3323.7	3363.5	3202.3	3107.0	3061.4	3038.2	3193.9	3116.4
Comb	(19)	(19)	(22)	(22)	(23)	(23)	(29)	(26)	(27)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	81.3	74.9	75.5	77.4	76.8	75.9	75.9	73.9	73.7	79.6

Mdxt	-725.4	-694.7	-1008.4	-1110.8	-1097.4	-690.8	-1013.3	-997.2	-928.1	-1311.9
Mdyt	3160.3	2980.6	2896.1	3301.5	2837.4	2934.9	2838.1	3106.8	3215.4	2842.2
Comb	(29)	(81)	(57)	(123)	(58)	(60)	(60)	(62)	(77)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	78.7	76.2	74.7	72.4	72.4	82.1	82.7	72.0	72.0	80.1
Mdxt	-1278.6	-724.5	-685.9	-1010.5	-693.9	-1426.2	-1501.0	-910.5	569.2	735.1
Mdyt	2801.1	2931.6	3017.3	3388.4	3528.5	2856.8	2770.2	3509.5	3674.1	3062.1
Comb	(64)	(65)	(76)	(67)	(67)	(68)	(69)	(72)	(72)	(73)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	80.1	83.9	74.9	73.7	73.7	77.6	77.6	77.2	76.8	75.3
Mdxt	1089.9	1246.6	-1017.6	-630.1	-579.0	629.5	958.6	-1055.3	-955.2	-983.8
Mdyt	2927.2	2877.6	2813.4	3175.4	3300.3	3001.9	2911.6	3386.3	2846.6	2925.1
Comb	(73)	(74)	(81)	(77)	(77)	(78)	(78)	(128)	(84)	(82)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	76.0	76.3	79.6	80.5	79.8	78.5	82.4	84.2	84.6	77.2
Mdxt	-663.7	-976.9	-1123.1	-1184.8	-1126.6	-1106.9	-1334.7	-1415.1	-1467.8	-668.3
Mdyt	2953.8	2844.1	2946.5	2905.4	2905.9	3104.4	2908.7	2918.9	2868.8	3535.1
Comb	(83)	(85)	(113)	(114)	(116)	(118)	(119)	(124)	(125)	(128)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	82.8	79.2	74.8	76.1	75.1	73.1	78.8	77.9	71.6	81.3
Mdxt	977.7	-1129.5	-1028.2	-1116.5	-1033.1	-1019.2	-1329.6	-1296.6	-1032.1	-1443.7
Mdyt	2968.2	2888.6	2757.7	2699.0	2699.7	2986.9	2703.8	2665.4	3268.5	2718.3
Comb	(129)	(137)	(168)	(169)	(171)	(173)	(174)	(175)	(178)	(179)

Carr	81	82	83	84	85	86	87
Fdzt	81.9	71.3	71.3	74.2	76.8	76.8	76.8
Mdxt	-1518.0	-930.8	-576.2	-1037.2	601.9	917.1	622.9
Mdyt	2650.2	3389.5	3590.7	2675.0	2826.1	2773.2	2785.0
Comb	(180)	(183)	(183)	(192)	(189)	(189)	(189)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	66.5	66.5	67.3	67.3	66.7	65.4	65.4	68.9	68.9	64.4
Mdxt	-954.8	-643.5	-1020.5	-688.3	-961.0	-927.7	-633.0	-1171.0	-799.6	-921.5
Mdyt	3201.0	3683.3	3154.3	3624.6	3157.8	3349.6	3905.1	3147.6	3612.1	3529.4
Comb	(2)	(2)	(3)	(3)	(5)	(7)	(7)	(8)	(8)	(12)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	64.4	70.5	70.8	70.8	64.2	64.2	69.2	69.2	71.7	71.7
Mdxt	-632.4	-1246.4	-898.7	-1302.3	-917.4	-596.8	827.3	561.5	947.6	646.0
Mdyt	4176.1	3148.9	3616.1	3089.3	3607.9	4285.9	3231.7	3664.4	3212.3	3718.6
Comb	(12)	(13)	(14)	(14)	(17)	(17)	(18)	(18)	(19)	(19)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	65.3	65.3	68.5	67.7	67.9	67.4	66.1	65.8	66.3	66.3
Mdxt	-924.2	-604.3	-948.3	-571.2	-964.7	-605.0	-962.9	-661.1	-946.8	-631.3
Mdyt	3419.9	4005.9	3353.3	3689.3	3237.5	3642.6	3138.0	3558.3	3222.9	3717.2
Comb	(22)	(22)	(69)	(23)	(180)	(25)	(26)	(113)	(27)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	67.2	66.5	66.6	62.3	62.3	63.4	63.7	62.6	62.6	60.8
Mdxt	-615.2	-645.2	-955.8	-862.7	-583.8	-957.1	-943.9	-871.7	-587.1	-831.6
Mdyt	3628.3	3609.2	3162.3	2994.8	3449.2	2928.0	3376.2	2933.0	3355.6	3207.2
Comb	(29)	(31)	(36)	(57)	(57)	(58)	(123)	(60)	(60)	(62)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	60.8	65.8	65.1	59.4	59.4	68.1	68.5	62.8	62.8	61.8
Mdxt	-568.7	-1171.1	-1132.7	-827.6	-567.8	-1277.7	-1356.5	-899.5	-617.1	-874.4

Mdyt	3766.2	2918.4	2880.0	3464.0	4153.4	2920.3	2835.2	2916.0	3329.9	2904.8
Comb	(62)	(63)	(64)	(67)	(67)	(68)	(69)	(70)	(70)	(81)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	61.7	59.1	59.1	66.2	66.2	69.7	69.7	60.6	60.6	64.1
Mdxt	-600.2	-809.2	-517.1	914.6	626.2	1084.1	746.9	-818.6	-527.8	770.5
Mdyt	3333.5	3576.1	4310.1	3038.6	3422.3	3011.0	3499.6	3307.4	3910.1	3019.5
Comb	(168)	(72)	(72)	(73)	(73)	(74)	(74)	(77)	(77)	(78)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	64.1	62.1	62.1	63.5	63.5	63.0	62.5	65.8	66.0	66.6
Mdxt	523.2	-851.2	-566.3	-939.0	-614.5	-835.0	-864.1	-976.5	-658.1	-1041.6
Mdyt	3457.8	3026.1	3497.8	3454.7	4160.9	2942.9	2939.5	3047.7	3503.6	3001.0
Comb	(78)	(82)	(82)	(128)	(128)	(85)	(91)	(113)	(112)	(114)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	66.6	66.0	64.8	64.8	68.3	68.3	63.7	69.9	70.1	70.1
Mdxt	-706.0	-982.6	-949.4	-650.6	-1191.2	-817.2	-650.0	-1266.2	-916.3	-1321.8
Mdyt	3499.6	3004.5	3196.4	3780.1	2994.4	3487.1	4051.1	2995.6	3491.1	2936.1
Comb	(114)	(116)	(118)	(118)	(119)	(119)	(123)	(124)	(125)	(125)
Carr	81	82	83	84	85	86	87	88	89	90

Fdzt	64.6	65.4	65.6	65.6	65.8	65.9	61.7	62.8	62.8	62.0
Mdxt	-945.9	-984.4	-968.5	-648.9	-662.8	-977.4	-883.2	-976.6	-664.2	-892.1
Mdyt	3266.6	2984.8	3069.7	3592.3	3484.2	3009.1	2853.0	2786.1	3249.6	2791.2
Comb	(133)	(137)	(138)	(138)	(142)	(147)	(168)	(169)	(169)	(171)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	62.0	60.2	60.2	65.2	64.4	58.7	58.7	67.5	67.9	62.2
Mdxt	-603.5	-852.8	-585.1	-1189.4	-1151.2	-848.6	-584.2	-1295.6	-1374.0	-920.3
Mdyt	3239.9	3065.4	3650.4	2776.6	2738.1	3322.1	4037.6	2778.5	2693.4	2774.1
Comb	(171)	(173)	(173)	(174)	(175)	(178)	(178)	(179)	(180)	(181)
Carr	101	102	103	104	105	106	107	108		
Fdzt	62.2	61.2	58.4	58.4	60.0	60.0	61.4	61.9		
Mdxt	-633.4	-894.7	-829.7	-533.5	-839.2	-544.1	-582.7	-884.5		
Mdyt	3214.1	2762.9	3434.3	4194.3	3165.7	3794.4	3382.0	2797.7		
Comb	(181)	(192)	(183)	(183)	(188)	(188)	(193)	(202)		

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	52.3	52.3	53.4	52.9	52.7	52.7	52.0	52.4	51.4	51.4
Mdxt	-787.4	-544.2	-872.5	-592.2	-825.2	-573.0	-796.2	-548.5	-762.0	-525.9
Mdyt	2511.5	3460.7	2963.0	3403.8	2474.8	3404.3	2500.1	3407.0	2602.0	3647.1
Comb	(2)	(2)	(180)	(3)	(4)	(4)	(26)	(5)	(7)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	54.3	54.3	52.6	50.4	50.4	55.7	55.8	55.8	52.1	54.4
Mdxt	-993.7	-704.9	-822.1	-755.9	-521.5	-1064.4	-803.6	-1116.8	-780.3	638.3
Mdyt	2461.0	3380.3	2477.1	2757.6	3963.4	2484.9	3354.8	2368.0	2524.2	2581.3
Comb	(8)	(8)	(10)	(17)	(17)	(13)	(14)	(14)	(27)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	54.4	56.6	56.6	51.9	52.0	51.3	51.3	53.9	53.3	54.6
Mdxt	432.3	764.5	522.9	-787.1	-551.4	-760.5	-524.1	-855.7	-475.8	638.7
Mdyt	3477.3	2533.0	3518.9	2512.5	3361.8	2645.3	3731.1	3088.5	3480.2	2532.3
Comb	(18)	(19)	(19)	(21)	(26)	(22)	(22)	(69)	(23)	(24)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	54.6	53.2	53.0	52.1	52.9	52.4	48.9	48.9	49.8	49.8
Mdxt	432.4	-810.7	-510.1	-538.6	-515.7	-544.6	-705.4	-485.3	-795.5	-553.7
Mdyt	3459.6	2949.4	3429.5	3489.2	3420.7	3414.2	2349.5	3239.9	2294.8	3158.6

Comb	(24)	(179)	(25)	(27)	(29)	(36)	(57)	(57)	(58)	(58)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	49.8	49.8	49.1	49.1	47.7	47.7	51.8	51.8	51.1	51.1
Mdxt	-778.3	-539.6	-713.8	-491.3	-668.8	-459.1	-999.4	-714.8	-962.6	-686.1
Mdyt	2606.1	3827.7	2312.6	3163.2	2478.7	3506.1	2277.3	3125.1	2230.0	3107.3
Comb	(128)	(128)	(60)	(60)	(62)	(62)	(63)	(63)	(64)	(64)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	49.4	46.2	46.2	53.7	53.9	48.7	48.4	52.0	52.0	55.0
Mdxt	-755.2	-660.8	-452.8	-1099.5	-1173.1	-695.0	-501.9	736.4	506.2	908.5
Mdyt	2300.3	2701.0	3957.9	2311.4	2144.4	2367.6	3114.3	2449.2	3263.7	2380.2
Comb	(65)	(72)	(72)	(68)	(69)	(82)	(168)	(73)	(73)	(74)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	55.0	48.4	47.5	47.5	50.3	50.3	52.2	52.2	48.5	48.7
Mdxt	635.7	-704.9	-666.6	-456.4	591.4	400.7	737.2	506.3	-718.1	-477.3
Mdyt	3323.0	2350.8	2540.7	3626.2	2392.0	3267.7	2379.1	3238.3	2333.2	3280.6
Comb	(74)	(76)	(77)	(77)	(78)	(78)	(79)	(79)	(81)	(82)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	50.0	50.0	49.5	49.1	49.1	51.7	51.7	52.4	52.4	52.1

Mdxt	-775.7	-538.4	-677.4	-706.7	-485.9	-809.9	-562.3	-872.0	-610.3	-847.3
Mdyt	2556.6	3736.5	2316.5	2314.5	3173.4	2360.1	3325.0	2321.8	3268.1	2323.3
Comb	(123)	(123)	(85)	(91)	(91)	(113)	(113)	(114)	(114)	(115)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	52.1	51.5	51.9	50.9	50.9	53.8	52.1	55.1	55.2	55.2
Mdxt	-591.1	-818.4	-566.5	-784.5	-543.9	-723.0	-844.0	-1084.8	-821.6	-1136.9
Mdyt	3268.6	2348.7	3271.4	2450.6	3511.4	3244.6	2325.6	2333.5	3219.2	2216.6
Comb	(115)	(137)	(116)	(118)	(118)	(119)	(121)	(124)	(125)	(125)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	51.6	51.3	51.5	50.7	50.7	51.6	51.8	48.4	49.3	49.3
Mdxt	-802.7	-809.4	-569.5	-783.0	-542.1	-556.7	-562.7	-726.5	-815.8	-570.5
Mdyt	2372.7	2361.0	3226.1	2493.9	3595.5	3353.5	3278.5	2209.4	2154.7	3033.0
Comb	(138)	(132)	(137)	(133)	(133)	(138)	(147)	(168)	(169)	(169)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	49.0	49.0	48.6	48.6	47.2	47.2	51.3	51.3	50.6	50.6
Mdxt	-780.4	-543.2	-734.9	-508.0	-690.1	-475.7	-1018.3	-731.6	-981.7	-702.9
Mdyt	2156.8	3033.6	2172.5	3037.5	2338.6	3380.6	2137.2	2999.5	2089.9	2981.7
Comb	(170)	(170)	(171)	(171)	(173)	(173)	(174)	(174)	(175)	(175)

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	48.9	45.7	45.7	53.2	53.4	47.7	48.0	47.9	47.0	47.0
Mdxt	-775.8	-681.4	-469.5	-1117.9	-1191.2	-711.6	-512.2	-725.8	-687.9	-473.1
Mdyt	2160.1	2560.8	3832.3	2171.3	2004.3	2212.9	2972.9	2210.7	2400.5	3500.5
Comb	(176)	(183)	(183)	(179)	(180)	(182)	(192)	(187)	(188)	(188)

Carr	121	122	123	124
Fdzt	48.0	48.2	48.6	48.6
Mdxt	-739.0	-494.0	-727.7	-502.6
Mdyt	2193.0	3154.9	2174.3	3047.8
Comb	(192)	(193)	(202)	(202)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	36.8	37.1	37.2	37.9	38.0	37.7	37.9	37.5	37.4	37.4
Mdxt	-373.3	-597.0	-414.0	-536.1	-647.6	-456.6	-701.8	-439.4	-595.3	-418.2
Mdyt	-724.5	1240.3	2371.4	-926.3	1998.5	2329.0	1931.5	2332.0	1195.1	2341.4
Comb	(113)	(26)	(2)	(180)	(179)	(3)	(180)	(4)	(5)	(5)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	37.0	36.1	36.9	36.5	38.7	38.7	38.7	38.3	38.4	38.3
Mdxt	-588.9	-364.2	-583.9	-403.5	-452.1	-762.7	-555.0	-527.6	-850.1	-536.2
Mdyt	1282.3	-924.0	1296.7	2525.6	-549.9	1171.6	2301.0	-802.2	1162.2	2285.0
Comb	(21)	(133)	(16)	(22)	(8)	(8)	(8)	(69)	(68)	(9)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	37.5	37.1	35.5	35.9	35.9	39.7	39.8	39.8	39.7	39.7
Mdxt	-618.8	-586.6	-362.0	-574.0	-403.6	-504.4	-819.6	-601.3	-863.0	-639.3
Mdyt	1191.3	1250.8	-1101.3	1216.6	2655.3	-762.7	1226.8	2291.1	1052.7	2244.2
Comb	(10)	(11)	(128)	(17)	(17)	(14)	(13)	(13)	(14)	(14)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	37.4	38.9	38.9	38.7	40.4	40.4	40.4	36.5	38.3	37.9
Mdxt	-606.5	398.1	465.1	303.5	355.7	557.4	383.8	-581.5	-686.2	-354.7
Mdyt	1191.7	-808.5	2207.4	2426.4	-680.3	1201.8	2437.3	2012.6	2039.3	2402.1
Comb	(15)	(185)	(185)	(18)	(19)	(19)	(19)	(174)	(69)	(23)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	38.9	38.9	37.8	37.7	36.9	37.1	37.3	37.1	37.7	36.9
Mdxt	452.1	305.8	-349.1	-388.5	-452.8	-420.3	-399.8	-411.4	-558.8	-373.9

Mdyt	1235.1	2401.4	-598.5	2356.1	-498.2	2334.5	-709.0	2387.4	1205.1	-695.0
Comb	(24)	(24)	(25)	(29)	(63)	(26)	(114)	(27)	(29)	(147)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	37.3	37.3	37.3	35.1	34.5	34.8	35.4	35.4	35.4	35.2
Mdxt	-364.6	-414.9	-414.1	-373.6	-533.7	-364.4	-365.0	-599.6	-425.2	-569.0
Mdyt	-560.8	2344.5	2344.8	-657.7	1181.5	2221.0	-533.6	1093.0	2160.5	1096.8
Comb	(36)	(36)	(39)	(169)	(81)	(57)	(58)	(58)	(58)	(59)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	35.5	34.6	34.9	34.9	34.8	33.4	34.0	33.8	36.9	36.9
Mdxt	-420.4	-347.4	-531.0	-370.4	-521.5	-322.6	-533.3	-349.3	-769.7	-565.8
Mdyt	2538.9	-607.2	1116.9	2178.1	1134.1	-964.9	1147.8	2441.3	1083.4	2120.4
Comb	(128)	(181)	(60)	(60)	(61)	(188)	(182)	(77)	(63)	(63)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	36.5	36.3	36.3	35.1	34.4	32.5	32.8	32.8	38.4	38.4
Mdxt	-461.3	-736.7	-538.9	-564.9	-521.8	-319.5	-500.6	-349.4	-496.1	-631.9
Mdyt	-622.3	1029.2	2097.5	1111.6	1241.6	-1218.2	1147.6	2626.6	-281.4	2106.3
Comb	(174)	(64)	(64)	(65)	(76)	(183)	(72)	(72)	(68)	(68)
Carr	81	82	83	84	85	86	87	88	89	90

Fdzt	38.3	35.0	35.0	34.4	34.4	34.5	37.2	36.9	36.9	39.3
Mdxt	-911.0	-338.8	-547.1	-335.6	-514.6	-373.3	340.5	536.8	372.2	412.8
Mdyt	913.6	-483.0	1112.1	-679.9	1262.2	2168.3	-486.8	1257.2	2299.6	-684.4
Comb	(69)	(70)	(70)	(168)	(71)	(81)	(79)	(73)	(73)	(74)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	39.3	39.3	35.8	35.8	35.8	37.2	37.2	34.5	34.6	35.4
Mdxt	683.5	487.0	280.9	415.4	280.8	541.4	375.5	-339.5	-360.7	-477.5
Mdyt	1126.5	2315.2	-501.9	1168.3	2264.8	1174.1	2263.8	-623.7	2243.8	1131.2
Comb	(74)	(74)	(78)	(78)	(78)	(79)	(79)	(171)	(82)	(84)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	35.6	35.2	35.2	34.9	34.9	34.9	34.9	34.9	36.8	37.3
Mdxt	-407.4	-317.1	-345.6	-327.2	-327.9	-365.6	-327.3	-364.4	-430.9	-473.4
Mdyt	2487.6	-535.5	2191.6	-517.0	-513.6	2182.5	-515.4	2183.0	2255.0	2212.6
Comb	(123)	(85)	(85)	(94)	(91)	(91)	(93)	(96)	(113)	(114)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	37.1	36.9	36.5	36.1	38.3	38.0	37.9	36.6	39.3	39.3
Mdxt	-456.3	-435.1	-603.8	-420.4	-571.9	-866.6	-553.1	-608.8	-837.7	-513.6
Mdyt	2215.6	2224.9	1173.1	2409.3	2184.6	1047.8	2168.6	1158.7	1103.1	-896.9

Comb	(115)	(116)	(127)	(133)	(119)	(179)	(120)	(132)	(124)	(125)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	39.3	39.3	40.0	40.0	40.0	36.1	37.4	36.6	36.6	36.7
Mdxt	-880.8	-656.2	339.9	526.1	360.3	-595.2	-358.3	-616.8	-437.1	-371.1
Mdyt	929.1	2127.8	-814.5	1078.1	2320.9	1086.2	-732.7	1116.6	2218.2	-750.2
Comb	(125)	(125)	(130)	(130)	(130)	(133)	(136)	(137)	(137)	(138)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	36.7	36.8	36.9	36.9	36.9	34.1	34.4	35.1	35.1	34.8
Mdxt	-428.3	-375.5	-431.7	-373.4	-430.9	-552.2	-379.9	-617.5	-440.8	-587.3
Mdyt	2271.0	-666.0	2228.0	-696.3	2228.4	1067.1	2113.3	978.5	2052.7	982.4
Comb	(138)	(142)	(147)	(152)	(152)	(192)	(168)	(169)	(169)	(170)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	34.8	34.5	34.5	34.4	33.4	33.4	36.5	35.9	35.9	35.9
Mdxt	-416.3	-549.7	-386.0	-540.3	-521.1	-365.0	-786.5	-443.3	-753.5	-554.5
Mdyt	2056.8	1002.5	2070.3	1019.7	1023.7	2333.6	969.1	-723.1	914.9	1989.8
Comb	(170)	(171)	(171)	(172)	(188)	(188)	(174)	(175)	(175)	(175)
Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	34.7	34.0	37.9	34.6	34.1	34.1	32.5	32.5	36.8	36.5

Mdxt	-583.2	-540.6	-927.0	-565.7	-338.8	-388.9	-519.3	-365.1	325.8	508.1
Mdyt	997.2	1127.2	799.2	997.7	-447.3	2060.6	1033.2	2518.8	-610.8	1142.8
Comb	(176)	(187)	(180)	(181)	(192)	(192)	(183)	(183)	(190)	(184)

Carr	161	162	163	164	165	166	167	168	169	170
Fdzt	36.5	38.9	34.2	34.2	34.8	34.5	34.5	34.5	34.5	34.5
Mdxt	350.3	656.1	-332.5	-376.3	-325.8	-335.8	-336.4	-381.2	-335.8	-380.0
Mdyt	2191.9	1012.1	-716.6	2136.0	-659.6	-641.1	-637.6	2074.7	-639.5	2075.1
Comb	(184)	(185)	(193)	(193)	(196)	(205)	(202)	(202)	(204)	(205)

Carr	171
Fdzt	34.5
Mdxt	-380.0
Mdyt	2075.3
Comb	(207)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	20.5	20.2	20.1	20.4	20.7	20.4	20.5	20.5	20.4	20.4

Mdxt	-162.1	-362.4	-233.9	-162.1	-163.8	-507.0	-255.6	-161.2	-339.6	-245.5
Mdyt	-1465.5	-584.1	881.0	-1504.2	-1432.3	-664.4	850.9	-1425.0	-553.8	853.8
Comb	(120)	(114)	(26)	(180)	(69)	(180)	(3)	(25)	(4)	(4)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	20.3	20.2	19.9	19.9	20.1	21.2	21.2	21.1	20.8	20.7
Mdxt	-233.2	-230.1	-156.6	-314.2	-228.8	-168.2	-482.0	-313.5	-164.3	-497.8
Mdyt	863.2	868.9	-1571.9	-655.4	905.0	-1563.8	-664.1	835.0	-1403.0	-595.2
Comb	(5)	(6)	(7)	(22)	(16)	(125)	(125)	(8)	(119)	(69)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	20.8	20.3	20.1	19.6	19.5	19.5	21.7	21.5	21.7	21.5
Mdxt	-302.1	-244.3	-230.0	-154.3	-313.7	-225.1	-171.1	-471.9	-340.4	-170.0
Mdyt	818.3	858.0	899.3	-1767.6	-733.7	918.7	-1175.3	-596.4	852.6	-1486.0
Comb	(9)	(10)	(21)	(12)	(17)	(17)	(13)	(14)	(13)	(14)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	21.5	20.3	19.5	21.2	21.2	21.0	22.0	22.0	22.0	19.9
Mdxt	-361.9	-238.2	-153.2	166.3	357.3	-164.4	172.6	303.7	211.5	-155.8
Mdyt	771.1	858.4	-1825.9	-1614.1	-654.8	930.4	-1563.0	-627.3	903.6	-1633.9
Comb	(14)	(15)	(17)	(185)	(185)	(18)	(19)	(19)	(19)	(22)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	19.9	20.5	20.6	21.1	20.5	20.0	20.3	20.1	20.3	19.1
Mdxt	-224.7	-303.2	-195.1	165.9	-215.3	-333.5	-159.4	-350.7	-159.6	-149.7
Mdyt	897.3	-572.0	894.9	903.2	873.1	-598.0	-1502.8	-584.9	-1395.2	-1417.0
Comb	(22)	(25)	(23)	(24)	(29)	(113)	(136)	(115)	(28)	(191)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	19.0	18.7	19.3	19.2	19.2	19.1	19.1	19.1	18.9	18.9
Mdxt	-337.6	-206.7	-152.5	-327.4	-237.7	-149.9	-310.4	-223.3	-205.6	-201.3
Mdyt	-541.6	832.2	-1845.4	-512.9	789.1	-1280.3	-513.9	793.3	806.7	815.0
Comb	(169)	(81)	(123)	(58)	(58)	(59)	(59)	(59)	(60)	(61)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	18.4	18.3	18.3	20.0	20.0	19.7	19.7	19.7	19.0	18.7
Mdxt	-144.8	-273.8	-193.6	-421.7	-320.4	-155.3	-402.6	-304.1	-221.7	-201.1
Mdyt	-1555.0	-659.1	855.5	-482.9	766.4	-1291.9	-518.6	742.6	799.3	858.4
Comb	(62)	(77)	(77)	(63)	(63)	(64)	(64)	(64)	(65)	(76)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	17.9	17.9	17.9	20.9	20.9	20.7	19.0	18.9	18.6	18.7
Mdxt	-141.4	-273.2	-194.1	-466.2	-358.8	-389.6	-212.9	-148.2	-296.0	-199.4

Mdyt	-1834.5	-801.5	885.9	-397.4	791.5	675.1	799.9	-1379.5	-561.4	866.5
Comb	(67)	(72)	(72)	(68)	(68)	(69)	(70)	(196)	(168)	(71)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	17.9	20.1	20.1	19.9	21.4	21.4	21.4	19.3	18.3	19.4
Mdxt	140.0	158.1	294.4	205.0	168.4	373.3	272.5	-151.4	143.6	151.9
Mdyt	-1917.9	-1322.8	-531.0	902.8	-1542.2	-618.9	864.5	-1903.8	-1643.5	-1314.3
Comb	(72)	(79)	(79)	(73)	(74)	(74)	(74)	(128)	(77)	(78)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	19.4	19.4	20.1	19.3	19.3	18.9	19.0	19.0	19.1	18.8
Mdxt	225.1	152.3	207.3	-325.0	-235.5	-283.4	-149.0	-192.3	-272.5	-320.8
Mdyt	-527.6	852.0	863.9	-808.5	848.1	-553.6	-1302.6	816.3	-524.9	-542.7
Comb	(78)	(78)	(79)	(128)	(128)	(196)	(83)	(83)	(85)	(170)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	20.1	19.9	20.0	20.2	20.1	20.1	20.0	20.0	19.6	19.6
Mdxt	-157.7	-244.3	-157.2	-266.0	-158.4	-255.9	-243.5	-240.5	-154.8	-325.5
Mdyt	-1460.1	810.6	-1490.3	780.3	-1457.5	783.3	792.7	798.5	-1649.8	-701.9
Comb	(131)	(137)	(113)	(114)	(115)	(115)	(116)	(117)	(118)	(133)
Carr	111	112	113	114	115	116	117	118	119	120

Fdzt	19.8	20.5	20.1	19.8	21.4	21.2	20.1	21.7	21.7	21.7
Mdxt	-239.3	-312.6	-254.8	-240.4	-350.8	-372.3	-248.7	170.4	285.5	197.1
Mdyt	834.5	747.8	787.5	828.8	782.0	700.6	788.0	-1640.8	-658.4	833.1
Comb	(127)	(120)	(121)	(132)	(124)	(125)	(126)	(130)	(130)	(130)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	19.6	20.3	20.9	20.9	19.9	19.9	19.9	20.1	18.6	18.5
Mdxt	-235.1	-314.9	-163.5	-256.8	-336.8	-156.7	-331.5	-157.7	-146.6	-216.4
Mdyt	826.8	-603.1	-1487.2	-596.8	-541.1	-1518.3	-609.2	-1473.0	-1399.0	767.0
Comb	(133)	(136)	(135)	(135)	(137)	(138)	(138)	(139)	(168)	(192)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	19.0	18.8	18.8	18.7	18.6	18.2	18.1	18.1	19.8	19.8
Mdxt	-247.4	-148.2	-233.0	-215.4	-211.0	-143.1	-284.5	-203.2	-431.1	-330.1
Mdyt	723.9	-1352.2	728.1	741.5	749.8	-1626.9	-718.3	790.2	-511.6	701.2
Comb	(169)	(170)	(170)	(171)	(172)	(173)	(188)	(188)	(174)	(174)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	19.4	19.4	18.8	18.4	17.7	17.6	17.6	20.7	20.4	18.7
Mdxt	-412.2	-313.8	-231.3	-210.8	-139.7	-283.9	-203.8	-368.5	-399.3	-222.6
Mdyt	-552.9	677.4	734.1	793.1	-1906.4	-870.6	820.8	726.3	609.9	734.7

Comb	(175)	(175)	(176)	(187)	(178)	(183)	(183)	(179)	(180)	(181)
Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	18.5	18.5	18.4	17.6	19.9	19.9	19.7	21.2	18.1	19.1
Mdxt	-145.8	-300.8	-209.2	-138.2	156.0	277.7	191.5	259.0	-141.9	149.8
Mdyt	-1439.0	-480.1	801.3	-1989.8	-1394.6	-559.7	837.6	799.2	-1715.4	-1386.2
Comb	(193)	(192)	(182)	(183)	(190)	(190)	(184)	(185)	(188)	(189)
Carr	161	162	163	164						
Fdzt	19.1	18.5	18.7	18.6						
Mdxt	-268.7	-293.1	-147.3	-299.6						
Mdyt	-568.6	-577.4	-1374.5	-527.9						
Comb	(191)	(193)	(194)	(197)						

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	198.5	198.7	198.7	196.0	196.0	198.6	195.8	195.8	196.9	195.8

Mdxt	-1968.6	-1992.7	-1510.8	-1476.0	-1934.5	-2085.9	-1488.3	-1951.5	-1917.5	-1485.8
Mdyt	-201.3	-84.4	-135.9	195.5	162.1	-67.8	-227.2	-201.1	-86.2	-261.1
Comb	(127)	(10)	(10)	(12)	(12)	(13)	(16)	(16)	(6)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	196.0	201.4	201.4	201.4	203.9	203.9	203.9	198.6	198.6	216.0
Mdxt	-1472.9	-1601.4	-2103.2	-1592.3	-1614.1	-2119.7	-1598.7	-1587.9	-1581.3	-1748.4
Mdyt	217.3	-113.7	-68.0	-117.2	-114.9	-69.2	-119.3	-113.4	-116.0	-123.2
Comb	(12)	(124)	(124)	(124)	(9)	(9)	(9)	(13)	(13)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	216.0	216.0	198.5	198.5	195.8	195.8	198.6	198.6	215.7	215.7
Mdxt	-2297.4	-1726.9	-1559.2	-2047.0	-1834.0	-1385.0	1415.4	1847.5	1567.1	2050.1
Mdyt	-75.3	-128.7	-121.0	-80.6	183.7	239.6	106.9	59.6	-124.8	-71.6
Comb	(14)	(14)	(15)	(15)	(17)	(17)	(18)	(18)	(19)	(19)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	198.6	198.6	198.8	198.8	204.1	204.1	201.3	199.7	201.2	181.7
Mdxt	1443.0	1885.8	-1489.3	-1951.5	1443.5	1884.2	-1563.3	-1934.5	1408.6	-1371.6
Mdyt	-118.6	-68.5	198.2	163.6	-121.4	-70.5	-133.3	-86.3	-123.0	265.2
Comb	(20)	(20)	(123)	(123)	(24)	(24)	(126)	(117)	(25)	(67)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	181.7	183.8	185.5	185.5	181.3	181.3	183.8	184.7	183.0	184.7
Mdxt	-1797.6	-1836.1	-1877.7	-1425.8	-1390.0	-1822.9	-1400.2	-1391.9	-1770.3	-1389.4
Mdyt	208.4	-252.9	-86.0	-135.1	-314.0	-252.8	-315.1	-196.1	-88.5	-224.3
Comb	(67)	(182)	(65)	(65)	(71)	(71)	(182)	(177)	(61)	(177)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	181.7	187.9	187.9	187.9	192.9	192.9	192.9	185.4	185.4	185.4
Mdxt	-1350.4	-1541.5	-2026.0	-1536.6	-1566.4	-2058.4	-1551.2	-1529.2	-2010.1	-1526.4
Mdyt	178.0	-106.1	-62.6	-107.8	-108.0	-64.4	-111.5	-105.8	-62.4	-106.7
Comb	(62)	(179)	(179)	(179)	(64)	(64)	(64)	(68)	(68)	(68)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	210.2	210.2	210.2	185.2	185.2	181.3	181.3	183.8	185.4	209.7
Mdxt	-1758.4	-2311.9	-1734.5	-1488.0	-1954.8	1288.2	1680.2	1713.4	1805.6	1602.4
Mdyt	-119.9	-73.0	-124.8	-116.7	-80.7	296.9	239.2	240.6	62.0	-114.8
Comb	(69)	(69)	(69)	(70)	(70)	(72)	(72)	(183)	(73)	(74)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	209.7	209.7	185.4	185.4	181.5	185.8	185.8	193.3	193.3	189.1
Mdxt	2101.7	1596.3	1419.0	1859.5	1269.3	1737.8	1330.8	1419.9	1858.3	1369.9

Mdyt	-67.7	-119.2	-110.4	-63.3	-284.2	64.9	110.1	-114.4	-66.2	-116.7
Comb	(74)	(74)	(75)	(75)	(76)	(78)	(78)	(79)	(79)	(80)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	189.1	184.2	201.5	198.5	198.8	206.6	206.6	206.6	201.5	198.5
Mdxt	1790.8	-1381.8	-2009.8	-1501.6	-1484.1	-1627.4	-2136.8	-1609.8	-1521.9	-1496.9
Mdyt	-69.1	266.7	-84.5	-227.4	219.1	-115.2	-69.4	-120.6	-137.0	-262.3
Comb	(80)	(178)	(121)	(127)	(123)	(120)	(120)	(120)	(121)	(127)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	218.7	218.7	218.7	201.3	201.3	198.5	198.5	201.4	201.4	201.4
Mdxt	-1761.9	-2314.8	-1738.1	-1572.5	-2064.1	-1850.9	-1396.2	1427.2	1883.6	1442.8
Mdyt	-123.5	-75.4	-129.8	-121.2	-80.8	185.1	241.3	109.0	61.1	108.8
Comb	(125)	(125)	(125)	(126)	(126)	(128)	(128)	(129)	(129)	(129)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	218.4	218.4	201.4	201.4	201.7	201.7	206.9	206.9	204.0	204.0
Mdxt	1594.4	2086.0	1470.3	1921.8	-1425.4	-1861.3	1470.9	1920.3	1872.8	1435.9
Mdyt	-125.9	-71.7	-119.7	-68.6	111.6	63.3	-122.5	-70.6	-72.7	-124.1
Comb	(130)	(130)	(131)	(131)	(134)	(134)	(135)	(135)	(136)	(136)
Carr	111	112	113	114	115	116	117	118	119	120

Fdzt	184.2	188.0	187.8	185.5	185.5	184.2	195.4	188.0	212.7	212.7
Mdxt	-1810.8	-1893.5	-1495.1	-1786.0	-1356.5	-1360.6	-2074.3	-1436.0	-1770.8	-2328.0
Mdyt	209.8	-86.2	-130.9	-88.7	-137.1	179.6	-64.5	-136.2	-120.1	-73.1
Comb	(178)	(176)	(181)	(172)	(172)	(173)	(175)	(176)	(180)	(180)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	212.7	187.8	187.8	183.8	187.9	187.9	212.2	212.2	212.2	187.9
Mdxt	-1744.8	-1500.3	-1970.7	1313.4	1404.9	1838.8	1625.6	2132.3	1621.5	1444.2
Mdyt	-125.9	-117.0	-80.8	298.5	109.0	63.3	-115.0	-67.9	-120.3	-111.5
Comb	(180)	(181)	(181)	(183)	(184)	(184)	(185)	(185)	(185)	(186)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	187.9	184.1	188.3	188.3	195.8	195.8	191.6	191.6	186.2	186.2
Mdxt	1892.6	1294.6	1356.0	1771.0	1445.1	1891.5	1824.1	1395.1	-1340.0	-1752.0
Mdyt	-63.5	-285.3	111.7	66.3	-115.5	-66.4	-69.3	-117.8	100.4	49.0
Comb	(186)	(187)	(189)	(189)	(190)	(190)	(191)	(191)	(194)	(194)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	193.7	196.4	196.2	193.7	196.2	193.4	193.4	196.5	194.6	193.4
Mdxt	-1466.2	-1994.5	-1961.2	-1922.2	-1885.1	-1937.6	-1477.4	-1945.7	-1920.0	-1471.8
Mdyt	234.8	-104.4	-222.3	198.3	222.5	-222.6	-231.9	201.8	-105.2	-348.7
Comb	(12)	(10)	(127)	(12)	(128)	(16)	(16)	(123)	(6)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	193.7	193.7	193.7	199.0	199.0	199.0	201.5	201.5	201.5	196.2
Mdxt	-1459.5	-1910.3	-1446.8	-1602.1	-2104.9	-1585.1	-1628.3	-2139.4	-1597.9	-2081.3
Mdyt	306.6	153.9	245.1	210.5	100.5	-209.3	203.9	-100.1	-208.9	-99.2
Comb	(12)	(7)	(7)	(124)	(124)	(124)	(9)	(9)	(9)	(13)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	196.2	213.7	213.7	213.7	196.2	196.2	193.4	193.4	196.5	197.2
Mdxt	-1571.4	-1775.5	-2334.1	-1732.7	-2043.8	-1542.6	-1861.5	-1386.7	-1484.2	-1937.8
Mdyt	-207.6	218.6	-107.0	-223.7	-102.1	-214.8	219.0	331.4	240.5	124.3
Comb	(13)	(14)	(14)	(14)	(15)	(15)	(17)	(17)	(123)	(113)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	196.3	213.4	213.4	213.4	196.3	196.3	196.5	201.7	201.7	201.8
Mdxt	1412.7	1550.1	2028.7	1550.8	1385.0	1843.2	-1475.5	-1594.9	-2094.3	1420.6
Mdyt	-201.3	220.4	105.7	-220.0	198.6	-96.7	221.7	213.6	102.0	-210.9

Comb	(20)	(19)	(19)	(19)	(20)	(20)	(118)	(119)	(119)	(24)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	196.8	196.2	179.3	179.3	181.9	182.8	181.5	181.5	178.9	178.9
Mdxt	-1960.4	-1485.5	-1352.3	-1772.1	-1789.0	-1940.6	-1812.9	-1701.9	-1796.2	-1369.9
Mdyt	-175.7	-350.4	347.3	228.7	232.0	-120.8	-259.4	261.5	-259.6	-395.9
Comb	(122)	(127)	(67)	(67)	(178)	(70)	(182)	(183)	(71)	(71)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	181.5	182.3	182.3	178.9	179.3	179.3	185.5	185.5	185.5	190.5
Mdxt	-1382.6	-1809.9	-1375.3	-1680.2	-1750.1	-1334.1	-1533.5	-2015.8	-1524.7	-1579.9
Mdyt	-397.5	-192.8	-306.1	258.4	165.3	259.5	197.3	94.2	-195.8	190.9
Comb	(182)	(177)	(177)	(72)	(62)	(62)	(179)	(179)	(179)	(64)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	190.5	190.5	183.1	182.9	182.9	207.9	207.9	207.9	182.8	178.9
Mdxt	-2076.9	-1549.9	-1425.1	-1993.9	-1512.2	-1790.3	-2354.3	-1742.6	-1471.1	1252.2
Mdyt	-94.1	-196.1	183.3	-92.8	-194.4	211.9	-104.0	-217.2	-204.6	382.7
Comb	(64)	(64)	(65)	(68)	(68)	(69)	(69)	(69)	(70)	(72)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	183.0	183.0	183.0	207.5	207.5	207.5	183.0	183.0	183.0	181.9

Mdxt	1325.9	1765.1	1350.6	1598.9	2097.8	1586.6	1363.2	1818.1	1389.3	-1364.9
Mdyt	196.8	117.2	185.6	214.5	102.8	-212.0	183.3	-89.2	-185.4	351.0
Comb	(73)	(73)	(73)	(74)	(74)	(74)	(75)	(75)	(75)	(178)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	190.9	190.9	190.9	185.6	186.7	186.7	182.9	199.4	199.4	199.2
Mdxt	1394.5	1832.4	1400.6	1345.2	1758.5	1346.3	-1777.6	-1519.2	-1992.3	-1516.6
Mdyt	201.8	96.4	-199.1	202.1	-94.2	-197.1	119.0	208.7	99.9	-222.4
Comb	(79)	(79)	(79)	(184)	(80)	(80)	(168)	(114)	(114)	(121)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	196.5	196.5	204.3	204.3	204.3	199.2	216.5	216.5	216.5	199.0
Mdxt	-1933.7	-1473.2	-1646.3	-2163.0	-1611.5	-2018.0	-1793.6	-2357.8	-1746.3	-2067.4
Mdyt	157.4	310.5	209.6	-101.0	-210.5	-105.3	224.4	-107.9	-225.3	-102.9
Comb	(118)	(123)	(120)	(120)	(120)	(121)	(125)	(125)	(125)	(126)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	199.0	196.2	196.2	199.1	199.1	199.1	216.2	216.2	216.2	199.0
Mdxt	-1556.3	-1495.5	-1400.4	-1402.6	-1831.1	1411.0	1571.0	2061.8	1576.3	1406.0
Mdyt	-216.5	-231.7	335.2	213.9	125.5	197.3	226.2	108.2	-221.6	204.4
Comb	(126)	(127)	(128)	(129)	(129)	(129)	(130)	(130)	(130)	(131)

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	199.0	199.0	199.4	199.4	204.6	204.6	204.6	201.7	201.7	185.7
Mdxt	1876.3	1438.1	-1438.9	-1881.6	-1432.1	1885.7	1446.0	-1873.8	-1410.7	-1426.9
Mdyt	98.1	-203.0	211.3	125.4	217.3	103.7	-212.6	-101.0	-211.1	-214.7
Comb	(131)	(131)	(134)	(134)	(135)	(135)	(135)	(136)	(136)	(176)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	183.1	181.5	181.8	181.8	189.4	189.4	193.1	185.7	210.5	210.5
Mdxt	-1785.7	-1381.0	-1771.9	-1346.7	-1523.1	-2001.0	-2098.7	-1892.2	-1807.0	-2376.3
Mdyt	-128.2	-238.6	168.6	263.2	201.8	96.3	-94.9	-101.1	217.1	-104.8
Comb	(172)	(182)	(173)	(173)	(174)	(174)	(175)	(176)	(180)	(180)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	210.5	185.4	185.4	181.5	185.6	185.6	210.0	210.0	210.0	185.5
Mdxt	-1755.3	-1962.5	-1483.6	1275.8	1795.4	1374.0	1618.3	2123.1	1610.1	1382.5
Mdyt	-218.8	-97.7	-206.2	386.3	120.7	189.2	219.7	105.1	-213.6	188.5
Comb	(180)	(181)	(181)	(183)	(184)	(184)	(185)	(185)	(185)	(186)
Carr	141	142	143	144	145	146	147	148		
Fdzt	185.5	185.5	182.3	186.0	193.5	193.5	193.5	189.3		
Mdxt	1848.5	1412.8	1277.4	-1300.2	1413.9	1862.9	1424.0	1789.1		

Mdyt	90.7	-186.9	296.0	198.5	207.1	98.7	-200.5	-95.0		
Comb	(186)	(186)	(188)	(189)	(190)	(190)	(190)	(191)		

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	197.5	197.0	197.2	194.4	195.0	196.7	194.1	196.7	194.7	194.1
Mdxt	-1975.8	-2024.6	-1989.1	-1942.5	-1944.9	-2097.4	-1955.7	-1587.3	-1959.7	-1481.8
Mdyt	316.3	-169.8	-362.8	310.9	148.2	-125.7	-363.8	-267.6	-268.2	-550.3
Comb	(123)	(10)	(127)	(12)	(2)	(13)	(16)	(13)	(11)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	194.1	194.3	194.4	199.9	199.9	197.8	202.4	202.4	202.4	215.3
Mdxt	-1913.3	-1933.9	-1470.7	-1621.5	-2130.8	-1992.9	-1664.6	-2187.9	-1634.5	-1832.3
Mdyt	351.2	219.7	464.9	251.0	-126.3	-267.3	238.5	-121.0	-254.4	258.1
Comb	(17)	(7)	(12)	(124)	(124)	(122)	(9)	(9)	(9)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	215.3	215.3	196.7	196.7	194.1	194.1	197.2	215.0	215.0	215.0
Mdxt	-2409.4	-1786.7	-2064.8	-1559.8	-1490.8	-1426.8	-1946.7	1561.2	2042.3	1561.2

Mdyt	-129.8	-273.4	-164.2	-267.8	-314.2	516.6	356.6	263.9	-129.3	-272.3
Comb	(14)	(14)	(15)	(15)	(16)	(17)	(128)	(19)	(19)	(19)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	196.7	198.1	198.1	202.9	202.7	202.7	198.4	197.2	179.4	180.3
Mdxt	1388.2	-1508.6	-1978.3	-1630.1	-1875.8	-1420.3	-1984.2	-1502.4	-1769.8	-1773.3
Mdyt	-234.1	251.9	153.8	255.3	-123.5	-260.7	-174.7	-551.2	380.7	145.4
Comb	(20)	(113)	(113)	(119)	(24)	(24)	(117)	(127)	(67)	(57)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	179.0	182.3	183.2	182.7	181.9	182.7	179.8	179.0	179.0	181.9
Mdxt	-1727.9	-1800.6	-1887.2	-1825.2	-1758.8	-1992.1	-1794.3	-1364.8	-1789.7	-1819.5
Mdyt	438.2	385.6	-168.8	-308.4	443.1	-119.6	-309.3	-659.6	-445.8	-444.9
Comb	(72)	(178)	(65)	(177)	(183)	(68)	(66)	(71)	(71)	(182)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	179.4	185.6	185.6	185.6	190.9	190.9	190.9	182.7	209.4	209.4
Mdxt	-1348.9	-1537.9	-2021.7	-1534.6	-1612.2	-2119.9	-1582.9	-1515.5	-1851.7	-2435.2
Mdyt	560.0	235.5	-120.2	-256.5	-226.7	-142.3	-237.0	-255.6	249.5	-125.4
Comb	(67)	(179)	(179)	(179)	(64)	(64)	(64)	(68)	(69)	(69)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	209.4	182.7	182.7	179.0	182.9	182.9	182.8	208.9	208.9	208.9
Mdxt	-1800.4	-1944.4	-1476.3	-1286.2	1295.9	1729.4	1361.9	1622.6	2129.5	1608.9
Mdyt	-263.9	-160.6	-256.1	633.9	249.3	150.0	221.1	257.8	-124.8	-262.4
Comb	(69)	(70)	(70)	(72)	(73)	(73)	(75)	(74)	(74)	(74)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	182.8	182.8	182.3	183.2	191.3	191.3	191.3	186.9	186.9	200.5
Mdxt	1328.4	1779.5	-1367.9	-1804.1	1388.4	1827.8	1397.7	1334.3	1741.3	-1554.6
Mdyt	-214.6	105.8	566.0	150.4	243.7	-116.5	-245.9	-238.7	-143.1	248.2
Comb	(75)	(75)	(178)	(168)	(79)	(79)	(79)	(80)	(80)	(114)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	197.4	197.5	202.9	202.9	205.6	205.6	205.6	199.8	200.2	199.9
Mdxt	-1967.1	-1491.3	-2141.5	-1602.7	-1689.9	-2221.2	-1655.0	-2098.1	-1545.0	-1607.9
Mdyt	225.1	471.4	121.4	-255.3	246.0	-121.6	-255.3	-163.2	-283.3	-268.5
Comb	(118)	(123)	(119)	(119)	(120)	(120)	(120)	(126)	(121)	(124)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	218.5	218.5	218.5	199.8	197.2	197.2	200.0	218.2	218.2	218.2
Mdxt	-1857.5	-2442.6	-1807.4	-1580.4	-1516.2	-1447.3	-1443.7	1579.9	2072.5	1584.8
Mdyt	265.6	-130.4	-274.2	-268.7	-314.1	523.1	265.4	271.5	-130.0	-273.2

Comb	(125)	(125)	(125)	(126)	(127)	(128)	(129)	(130)	(130)	(130)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	199.9	200.4	200.4	205.9	205.9	205.9	202.8	202.8	183.2	183.2
Mdxt	1411.8	-1476.8	-1933.6	-1461.6	-1909.3	-1440.8	-1919.3	-1442.0	-1376.6	-1359.4
Mdyt	-235.0	258.1	156.8	261.6	-124.2	-261.6	-121.9	-256.6	236.7	237.7
Comb	(131)	(134)	(134)	(135)	(135)	(135)	(136)	(136)	(168)	(168)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	183.5	181.9	182.2	189.9	189.9	189.9	193.8	186.1	186.1	182.7
Mdxt	-1812.5	-1383.8	-1354.9	-1550.2	-2037.3	-1527.1	-2150.7	-1918.0	-1444.7	-1391.8
Mdyt	-176.2	-660.4	384.9	241.8	114.7	-237.8	-113.5	-167.9	-277.7	-280.3
Comb	(172)	(182)	(173)	(174)	(174)	(174)	(175)	(176)	(176)	(177)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	212.3	212.3	212.3	185.6	185.6	181.9	185.8	185.8	185.7	211.8
Mdxt	-1875.2	-2466.0	-1819.5	-1975.2	-1495.3	-1305.1	1313.2	1757.3	1383.6	1639.9
Mdyt	256.4	-126.0	-264.8	-159.7	-257.0	639.8	256.2	155.1	227.1	264.8
Comb	(180)	(180)	(180)	(181)	(181)	(183)	(184)	(184)	(186)	(185)
Carr	131	132	133	134	135	136	137	138		
Fdzt	211.8	211.8	185.7	186.4	186.4	194.2	194.2	194.2		

Mdxt	2152.0	1630.7	1807.3	-1331.2	-1739.6	1405.7	1855.6	1419.4
Mdyt	126.0	-263.3	136.7	245.6	154.5	250.6	118.7	-246.8
Comb	(185)	(185)	(186)	(189)	(189)	(190)	(190)	(190)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	197.8	200.4	201.1	201.4	198.6	201.1	199.9	201.6	200.0	197.6
Mdxt	-2002.2	-2088.6	-2056.8	-2046.6	-2008.7	-2037.4	-2136.0	-2062.9	-2113.2	-1993.0
Mdyt	332.1	-180.1	-391.3	338.1	163.0	383.3	-129.4	-285.3	-179.8	377.3
Comb	(12)	(10)	(127)	(123)	(27)	(128)	(13)	(122)	(15)	(17)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	198.1	198.1	197.8	197.6	197.8	203.4	203.4	203.2	206.1	206.1
Mdxt	-2018.4	-1517.6	-1526.0	-1993.6	-1505.3	-1659.0	-2180.3	-1629.4	-1727.7	-2271.5
Mdyt	-286.2	-465.1	272.5	231.0	528.3	261.1	-129.9	-259.8	-254.6	-162.5
Comb	(11)	(11)	(12)	(7)	(12)	(124)	(124)	(8)	(9)	(9)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	206.1	200.4	197.6	219.9	219.9	219.9	197.6	197.6	201.4	201.2

Mdxt	-1690.4	-1590.4	-2012.3	-1925.1	-2531.7	-1864.2	-1514.9	-1484.4	-1533.3	-2038.0
Mdyt	-264.0	-240.6	-392.2	-270.0	-173.3	-282.7	-628.9	593.2	536.3	236.9
Comb	(9)	(10)	(16)	(14)	(14)	(14)	(16)	(17)	(123)	(118)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	219.5	219.5	219.5	201.4	202.1	206.4	206.4	204.0	204.0	182.1
Mdxt	1595.5	2087.2	1593.0	-1559.6	-2053.2	-1484.5	-1940.8	-2133.0	-1594.1	-1811.6
Mdyt	282.5	133.8	-277.5	279.5	168.9	267.6	126.6	-179.1	-298.5	410.8
Comb	(19)	(19)	(19)	(123)	(138)	(24)	(24)	(121)	(121)	(67)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	185.0	181.7	185.4	185.8	185.7	185.4	185.0	182.5	181.7	185.0
Mdxt	-1839.5	-1798.3	-1852.7	-1935.3	-1876.0	-1412.8	-2011.1	-1834.9	-1826.2	-1867.4
Mdyt	480.9	475.4	416.3	-180.3	-331.1	275.5	-123.2	-332.0	-483.5	-482.6
Comb	(183)	(72)	(178)	(65)	(177)	(178)	(68)	(66)	(71)	(182)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	182.5	182.1	189.8	189.8	188.3	193.9	193.9	185.0	213.7	213.7
Mdxt	-1386.6	-1369.0	-1569.3	-2062.8	-1556.5	-1669.8	-2196.0	-1530.6	-1951.8	-2566.3
Mdyt	-533.9	649.3	237.4	-114.3	-264.4	-248.0	-155.5	-264.1	-269.9	-170.6
Comb	(66)	(67)	(63)	(63)	(179)	(64)	(64)	(68)	(69)	(69)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	213.7	185.1	185.1	181.7	181.7	185.4	186.4	185.3	213.1	213.1
Mdxt	-1881.6	-1970.4	-1496.7	-1382.8	-1339.0	-1394.9	-1862.0	1312.9	1672.9	2196.2
Mdyt	-273.3	-180.0	-277.9	-768.0	742.0	656.7	174.7	236.6	283.4	133.6
Comb	(69)	(70)	(70)	(71)	(72)	(178)	(193)	(73)	(74)	(74)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	213.1	185.1	185.1	185.1	185.1	186.1	185.0	194.4	194.4	194.4
Mdxt	1652.4	1295.3	1752.1	1344.6	-1403.7	-1773.0	-1365.0	1395.0	1842.2	1409.9
Mdyt	-265.9	-229.3	-109.3	226.5	250.6	158.3	749.4	262.2	123.3	-245.8
Comb	(74)	(75)	(75)	(75)	(173)	(78)	(183)	(79)	(79)	(79)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	189.1	189.7	201.9	203.5	201.6	206.8	209.7	209.7	209.7	223.5
Mdxt	-1976.5	1338.0	-2053.0	-2157.6	-1545.6	-1691.0	-1761.3	-2315.8	-1718.4	-1958.7
Mdyt	-179.4	-245.5	155.2	-178.9	-465.3	257.2	-255.9	-161.5	-264.3	-271.3
Comb	(176)	(80)	(113)	(126)	(122)	(119)	(120)	(120)	(120)	(125)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	223.5	223.5	203.5	201.1	201.1	203.6	203.6	223.1	223.1	223.1
Mdxt	-2576.0	-1892.1	-1622.6	-1542.9	-1512.4	-1515.0	-1984.6	1611.4	2111.1	1614.5

Mdyt	-172.3	-282.9	-286.2	-629.2	601.3	279.2	169.9	289.4	136.9	-277.7
Comb	(125)	(125)	(126)	(127)	(128)	(129)	(129)	(130)	(130)	(130)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	204.2	204.2	210.0	210.0	186.1	188.3	185.7	193.1	193.1	197.2
Mdxt	-1541.0	-2020.0	-1518.1	-1985.4	-1861.8	-1554.7	-1412.4	-1600.4	-2103.8	-2236.9
Mdyt	262.8	162.9	274.6	129.7	155.0	249.2	-534.2	243.8	115.8	-154.8
Comb	(134)	(134)	(135)	(135)	(168)	(179)	(177)	(174)	(174)	(175)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	189.1	188.3	216.9	216.9	216.9	188.4	188.4	185.0	188.6	188.6
Mdxt	-1481.7	-2045.8	-1982.9	-2607.2	-1907.5	-2011.4	-1522.5	-1408.6	-1349.0	-1763.1
Mdyt	-295.8	-123.6	-271.2	-169.8	-273.6	-179.1	-278.2	-768.2	275.1	173.2
Comb	(176)	(179)	(180)	(180)	(180)	(181)	(181)	(182)	(184)	(184)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	188.6	216.4	216.4	216.4	188.3	188.3	189.4	189.4	189.4	197.7
Mdxt	1332.6	1687.3	2214.8	1672.1	1776.9	1364.3	-1386.2	-1814.2	-1352.1	1409.4
Mdyt	243.9	289.8	136.5	-266.1	111.4	233.8	251.6	163.8	255.0	268.6
Comb	(184)	(185)	(185)	(185)	(186)	(186)	(189)	(189)	(189)	(190)
Carr	131	132								

Fdzt	197.7	197.7
Mdxt	1867.0	1429.7
Mdyt	126.2	-246.1
Comb	(190)	(190)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	208.4	206.6	204.8	208.4	204.5	208.5	207.6	208.7	203.8	204.1
Mdxt	-2186.7	-2210.9	-1616.1	-1659.5	-2121.5	-2190.5	-2208.4	-1660.1	-2390.8	-2138.3
Mdyt	-312.0	-205.4	-328.8	-340.2	271.9	-279.1	-170.5	-335.6	-208.1	-204.1
Comb	(127)	(15)	(12)	(128)	(17)	(132)	(3)	(123)	(175)	(26)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	204.9	204.8	204.8	210.2	210.2	210.5	213.2	213.2	204.9	208.4
Mdxt	-1585.8	-2122.1	-1574.2	-1754.5	-2306.6	-1726.4	-1841.5	-2421.7	-2134.1	-2179.7
Mdyt	-466.6	236.2	515.8	-269.8	-172.6	-300.6	-317.8	-205.3	-231.9	275.0
Comb	(11)	(12)	(12)	(8)	(8)	(126)	(9)	(9)	(11)	(128)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	206.4	228.1	228.1	204.5	204.5	204.5	204.5	204.5	208.7	227.7
Mdxt	-2217.2	-2087.1	-2744.1	-1620.8	-2128.5	-1581.8	-1615.6	-1567.9	-1610.5	1661.0
Mdyt	-133.2	-359.4	-232.9	300.5	-311.0	-621.8	-333.4	578.4	523.6	316.9
Comb	(13)	(14)	(14)	(16)	(16)	(16)	(17)	(17)	(123)	(19)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	227.7	227.7	204.6	204.6	208.7	213.6	213.6	210.5	188.3	188.8
Mdxt	2173.4	1652.6	-1623.5	-2132.2	-2180.4	-1569.0	-2053.9	-1691.1	-1927.0	-1922.2
Mdyt	148.4	-275.3	295.4	-278.1	239.3	274.4	130.0	-311.1	-261.9	126.8
Comb	(19)	(19)	(21)	(21)	(123)	(24)	(24)	(126)	(66)	(82)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	188.1	191.3	190.7	191.5	191.0	190.7	187.7	191.7	188.3	187.9
Mdxt	-1909.6	-1973.0	-2036.9	-1978.2	-2011.8	-1987.0	-1919.0	-1963.8	-1439.2	-1924.1
Mdyt	298.3	-375.9	-205.2	-328.8	-159.0	-223.2	-375.0	301.2	-528.0	-327.9
Comb	(67)	(182)	(70)	(187)	(59)	(192)	(71)	(178)	(66)	(76)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	187.7	188.1	195.8	195.8	195.8	200.2	200.2	191.6	190.4	221.4
Mdxt	-1908.7	-1422.9	-1653.0	-2173.5	-1611.0	-1777.3	-2337.3	-1513.9	-2051.3	-2128.1
Mdyt	349.3	630.0	-248.8	-158.4	-253.0	-317.3	-205.5	-309.5	-125.0	-376.7

Comb	(72)	(67)	(63)	(63)	(63)	(64)	(64)	(65)	(68)	(69)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	221.4	190.7	187.7	187.7	187.7	191.7	191.3	220.8	220.8	190.4
Mdxt	-2795.8	-1538.0	-1462.1	-1433.5	-1413.8	-1456.4	-1962.8	1766.1	2319.9	1332.8
Mdyt	-244.9	-303.9	320.8	-749.8	719.5	637.2	352.1	344.2	207.1	224.6
Comb	(69)	(70)	(71)	(71)	(72)	(178)	(183)	(74)	(74)	(75)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	191.9	200.7	200.7	200.7	194.0	187.0	208.8	210.5	209.7	209.2
Mdxt	-1882.4	1416.8	1877.7	1438.8	-1594.7	-1933.0	-1669.1	-2269.0	-2207.4	-2192.6
Mdyt	156.4	283.4	132.4	-239.9	-268.5	-222.2	268.2	-207.1	-178.3	-192.8
Comb	(78)	(79)	(79)	(79)	(179)	(81)	(122)	(126)	(116)	(117)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	208.8	217.2	217.2	208.8	210.3	210.3	232.0	232.0	208.4	208.4
Mdxt	-1622.0	-1885.5	-2479.6	-2192.4	-1731.0	-1707.3	-2131.0	-2801.8	-1664.8	-1618.0
Mdyt	-468.0	-324.5	-208.1	-232.9	252.1	-285.4	-366.1	-235.7	303.0	-623.2
Comb	(122)	(120)	(120)	(122)	(124)	(124)	(125)	(125)	(127)	(127)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	208.4	231.6	231.6	231.6	208.5	211.4	211.4	217.5	217.5	192.5

Mdxt	-1604.2	1671.8	2186.2	1671.2	-1667.6	-2161.6	-1591.3	-1613.1	-2112.6	-1976.2
Mdyt	586.2	319.4	149.7	-276.8	297.8	125.4	263.4	276.8	131.4	130.0
Comb	(128)	(130)	(130)	(130)	(132)	(134)	(134)	(135)	(135)	(193)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	191.9	194.3	193.1	194.0	191.9	203.8	195.2	191.9	191.7	225.0
Mdxt	-1508.8	-2090.7	-2002.6	-1597.3	-1472.8	-1818.0	-1547.4	-1981.0	-1496.1	-2168.8
Mdyt	273.4	-206.8	-165.7	250.4	-529.4	-323.6	-310.8	-262.9	-339.3	-383.1
Comb	(177)	(181)	(171)	(179)	(177)	(175)	(176)	(177)	(178)	(180)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	225.0	194.3	194.3	191.3	191.3	191.3	194.4	194.4	224.5	224.5
Mdxt	-2849.1	-1590.8	-1571.6	-1502.8	-1467.1	-1447.3	-1457.8	-1910.4	1775.8	2332.0
Mdyt	-247.5	-289.5	-305.3	323.0	-751.1	726.7	267.0	174.2	346.4	209.6
Comb	(180)	(181)	(181)	(182)	(182)	(183)	(184)	(184)	(185)	(185)
Carr	121	122	123							
Fdzt	195.5	204.3	204.3							
Mdxt	-1936.6	1898.1	1455.8							
Mdyt	159.9	133.6	-241.1							
Comb	(189)	(190)	(190)							

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	217.3	218.8	215.3	217.0	218.2	218.2	213.9	215.3	220.9	220.9
Mdxt	-1828.8	-2422.3	-1770.1	-2390.9	-1845.2	-2426.3	-2026.1	-1691.0	-1924.9	-2531.5
Mdyt	-380.0	-258.1	-584.4	-270.3	-378.4	-250.5	-508.7	458.9	-398.5	-265.4
Comb	(4)	(137)	(17)	(15)	(3)	(3)	(175)	(17)	(8)	(8)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	224.2	224.2	215.3	213.9	215.5	240.3	240.3	217.0	215.2	215.2
Mdxt	-2041.1	-2683.8	-1776.4	-2662.6	-1699.1	-2364.8	-3104.9	-1818.5	-1771.8	-1695.8
Mdyt	-480.9	-328.0	355.8	-348.9	-448.8	-596.7	-411.0	-384.1	386.6	-558.6
Comb	(9)	(9)	(21)	(175)	(11)	(14)	(14)	(15)	(16)	(16)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	239.9	239.9	214.5	197.2	199.6	201.4	201.4	200.1	200.8	199.6
Mdxt	1765.5	2311.4	-1784.2	-1585.2	-2174.6	-1692.4	-2225.2	-1669.0	-2215.4	-1654.2
Mdyt	370.4	228.1	-254.3	-638.3	-254.9	-344.1	-226.7	-346.4	-236.5	-352.3
Comb	(19)	(19)	(26)	(72)	(70)	(58)	(58)	(59)	(65)	(70)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	197.3	196.7	197.2	205.2	205.2	209.9	209.9	197.3	197.6	197.6
Mdxt	-2094.6	-1562.6	-1521.3	-1806.3	-2375.5	-1972.2	-2592.1	-1594.2	-2090.4	-1532.9
Mdyt	-248.0	-442.2	560.7	-372.8	-247.9	-490.5	-337.3	445.7	-209.5	-477.0
Comb	(76)	(62)	(72)	(63)	(63)	(64)	(64)	(76)	(66)	(66)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	197.2	232.9	232.9	197.2	197.2	197.2	201.2	232.3	232.3	201.2
Mdxt	-2085.7	-2434.7	-3190.3	-1587.5	-1528.2	-2082.6	-1564.5	1923.6	2528.6	-1639.1
Mdyt	-272.2	-655.9	-455.9	489.8	-633.8	-274.0	563.5	466.7	302.8	-656.6
Comb	(71)	(69)	(69)	(71)	(71)	(72)	(183)	(74)	(74)	(183)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	201.3	210.5	210.5	210.5	196.2	196.2	196.9	196.9	221.6	219.6
Mdxt	-1648.0	-1483.5	-1936.8	1485.3	-1605.2	-2109.7	-1602.0	-2105.2	-1887.0	-1828.3
Mdyt	436.7	295.4	180.3	257.2	293.7	-194.4	-284.5	-203.0	-399.7	-604.0
Comb	(187)	(79)	(79)	(79)	(81)	(81)	(86)	(86)	(115)	(128)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	219.6	228.5	228.5	219.6	244.6	244.6	221.2	221.2	219.5	244.1
Mdxt	-1737.6	-2099.2	-2759.9	-1834.5	-2423.0	-3180.7	-1876.6	-2467.7	-1829.9	1767.3

Mdyt	462.1	-500.6	-340.5	346.1	-616.3	-423.5	-403.8	-282.8	377.0	360.8
Comb	(128)	(120)	(120)	(132)	(125)	(125)	(126)	(126)	(127)	(130)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	244.1	201.5	201.1	236.9	236.9	203.6	201.1	201.1	201.2	203.7
Mdxt	2311.5	-1576.1	-2157.1	-2488.7	-3260.3	-2245.8	-1641.4	-1571.3	-2154.0	-1522.9
Mdyt	221.6	-483.4	-275.2	-674.1	-467.5	-266.5	480.8	-640.3	-281.7	262.1
Comb	(130)	(177)	(182)	(180)	(180)	(181)	(182)	(182)	(183)	(184)

Carr	81	82	83	84	85	86
Fdzt	236.3	236.3	205.1	214.4	200.1	201.9
Mdxt	1925.1	2529.9	-1544.3	-2009.4	-1659.1	-1644.6
Mdyt	457.8	296.7	251.6	174.2	284.8	-366.1
Comb	(185)	(185)	(189)	(190)	(192)	(193)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	231.5	231.5	230.0	230.0	232.5	232.5	229.8	227.5	235.4	235.4
Mdxt	-2069.2	-2721.1	-1997.2	-2626.5	-2091.7	-2750.6	-1996.1	-3087.8	-2190.6	-2879.6

Mdyt	-597.4	-424.8	-837.4	-523.9	-604.3	-429.6	-887.6	-638.5	-661.1	-474.0
Comb	(4)	(4)	(12)	(12)	(3)	(3)	(17)	(175)	(8)	(8)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	238.9	238.9	256.5	256.5	229.8	256.0	256.0	229.8	228.8	229.2
Mdxt	-2352.8	-3089.1	-2789.1	-3648.5	-1996.8	1913.0	2506.5	-2001.4	-2649.5	-2644.0
Mdyt	-799.1	-585.4	-1060.1	-787.1	338.8	443.5	289.4	287.7	-332.9	-377.9
Comb	(9)	(9)	(14)	(14)	(16)	(19)	(19)	(21)	(26)	(31)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	210.5	210.5	214.8	214.1	210.2	211.1	210.2	209.3	218.2	218.2
Mdxt	-1776.0	-2335.2	-2429.7	-2513.2	-2333.1	-2370.6	-1774.4	-2289.2	-2052.4	-2697.4
Mdyt	-878.7	-483.5	-550.7	-386.4	-514.2	-321.5	-950.3	-403.2	-626.7	-450.0
Comb	(67)	(67)	(178)	(58)	(72)	(60)	(72)	(62)	(63)	(63)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	223.2	223.2	210.2	248.3	248.3	210.2	210.2	247.6	247.6	211.3
Mdxt	-2284.1	-2995.3	-1782.2	-2907.4	-3788.7	-1775.4	-2334.5	2159.4	2839.9	-1777.8
Mdyt	-823.9	-609.2	451.5	-1196.7	-897.2	524.6	229.8	674.0	475.4	-514.3
Comb	(64)	(64)	(76)	(69)	(69)	(71)	(71)	(74)	(74)	(75)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	211.3	223.8	223.8	208.7	210.4	210.2	234.7	243.6	243.6	234.7
Mdxt	-2337.4	-1600.9	-2092.2	-2368.5	-1776.2	-2345.7	-2074.3	-2430.0	-3189.3	-2727.9
Mdyt	-353.9	287.0	176.4	-265.7	-521.4	-322.2	-880.1	-841.8	-617.1	-555.6
Comb	(75)	(79)	(79)	(81)	(82)	(91)	(123)	(120)	(120)	(123)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	261.1	261.1	234.5	234.5	234.5	260.7	260.7	214.8	213.6	227.5
Mdxt	-2866.3	-3747.8	-2073.9	-2073.2	-2726.5	1901.1	2487.6	-1847.6	-2383.8	-2355.6
Mdyt	-1102.7	-818.7	307.1	-930.3	-577.1	411.8	264.3	-918.2	-432.5	-863.5
Comb	(125)	(125)	(127)	(128)	(128)	(130)	(130)	(178)	(173)	(175)
Carr	61	62	63	64	65	66	67	68	69	
Fdzt	214.5	252.6	252.6	214.5	214.5	251.9	251.9	215.6	214.7	
Mdxt	-1853.7	-2979.0	-3880.3	-1847.0	-1845.9	2147.9	2824.5	-1849.4	-1847.8	
Mdyt	422.0	-1236.3	-926.6	495.1	-990.0	644.6	452.1	-553.9	-561.0	
Comb	(187)	(180)	(180)	(182)	(183)	(185)	(185)	(186)	(193)	

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	249.3	249.3	248.0	248.0	250.4	250.4	247.9	253.4	253.4	257.3
Mdxt	-2354.3	-3094.0	-2263.6	-2976.3	-2382.3	-3130.4	-2261.3	-2510.5	-3295.6	-2725.5
Mdyt	-896.1	-692.6	-1070.3	-781.4	-915.7	-708.3	-1117.4	-1023.3	-799.4	-1229.0
Comb	(4)	(4)	(12)	(12)	(3)	(3)	(17)	(8)	(8)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	257.3	276.5	276.5	247.9	276.0	276.0	244.6	226.7	229.6	231.2
Mdxt	-3569.3	-3279.9	-4270.8	-2973.2	2093.1	2744.3	-3591.9	-2000.2	-2776.3	-2744.6
Mdyt	-977.1	-1679.3	-1355.5	-809.4	518.8	359.7	-1073.0	-1043.7	-565.3	-833.5
Comb	(9)	(14)	(14)	(17)	(19)	(19)	(175)	(67)	(197)	(183)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	230.1	226.7	226.5	226.5	234.4	234.4	239.9	239.9	267.4	267.4
Mdxt	-2851.8	-2630.5	-1997.0	-2626.3	-2353.1	-3087.6	-2660.0	-3476.3	-3452.1	-4470.4
Mdyt	-634.7	-739.2	-1111.0	-779.3	-976.6	-764.9	-1270.5	-1018.7	-1913.7	-1559.4
Comb	(58)	(67)	(72)	(72)	(63)	(63)	(64)	(64)	(69)	(69)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	226.4	266.6	266.6	224.5	224.9	262.3	262.3	253.1	253.1	281.6
Mdxt	-1997.9	2439.3	3207.2	-2671.3	-2658.1	-2822.8	-3694.3	-2360.9	-3103.3	-3377.3
Mdyt	297.3	926.8	712.4	-429.3	-511.0	-1299.8	-1035.4	-1141.1	-839.8	-1750.1

Comb	(71)	(74)	(74)	(81)	(86)	(120)	(120)	(123)	(123)	(125)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	281.6	253.0	253.0	281.0	281.0	231.4	231.4	244.6	272.0	272.0
Mdxt	-4394.7	-2358.7	-3100.4	2066.5	2705.3	-2090.5	-2748.9	-2750.3	-3542.4	-4584.6
Mdyt	-1413.9	-1188.3	-867.9	459.9	308.4	-1109.5	-793.5	-1336.3	-1979.4	-1613.5
Comb	(125)	(128)	(128)	(130)	(130)	(178)	(178)	(175)	(180)	(180)
Carr	51	52	53							
Fdzt	231.2	271.3	271.3							
Mdxt	-2087.2	2414.2	3174.9							
Mdyt	-1176.8	872.0	664.7							
Comb	(183)	(185)	(185)							

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	110.8	110.8	111.0	109.6	112.0	112.0	111.4	110.6	109.3	109.3

Mdxt	-1006.4	-1476.4	-1064.9	-981.3	-1082.3	-1580.0	-1019.7	-1509.6	-1056.1	-1549.6
Mdyt	-628.9	-342.5	139.6	268.6	-638.7	-351.9	-619.7	-333.2	-712.1	-429.0
Comb	(5)	(5)	(13)	(17)	(10)	(10)	(4)	(121)	(11)	(11)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	109.6	110.0	111.6	111.6	114.3	114.3	114.2	112.8	109.7	117.4
Mdxt	-1087.7	-956.3	-1055.5	-1543.8	-1145.1	-1666.4	-1111.2	-1138.1	-948.9	-1200.2
Mdyt	141.1	192.4	-618.2	-331.2	-634.3	-345.0	141.5	135.1	248.0	-614.2
Comb	(64)	(7)	(8)	(8)	(15)	(15)	(9)	(180)	(12)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	117.4	117.4	114.1	108.1	108.1	116.0	116.0	116.0	108.2	111.0
Mdxt	-1743.2	-1183.7	-1191.3	-1090.4	-1602.9	942.0	1393.4	943.7	1282.9	-956.8
Mdyt	-329.4	139.5	138.1	-783.2	-498.7	-625.9	-333.9	145.4	-474.0	149.8
Comb	(14)	(14)	(69)	(16)	(16)	(20)	(20)	(20)	(21)	(23)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	110.4	110.4	105.0	105.1	103.6	105.0	106.4	106.7	104.7	104.7
Mdxt	-963.1	-1416.8	-1014.8	-1457.1	-895.9	-1021.6	-1044.0	-1525.9	-935.6	-1374.1
Mdyt	-635.2	-348.7	-578.9	-315.6	240.3	138.5	-601.5	-479.9	-587.4	-319.4
Comb	(31)	(31)	(68)	(176)	(77)	(68)	(65)	(127)	(60)	(60)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	103.9	103.9	103.7	102.9	106.7	105.0	109.6	109.6	106.4	102.5
Mdxt	-931.6	-1368.0	-968.4	-902.2	-1039.1	-1489.6	-1133.6	-1644.8	-1044.9	-1006.3
Mdyt	-608.5	-340.1	135.3	322.6	-750.1	-306.9	-595.1	-323.1	107.9	-706.4
Comb	(61)	(61)	(179)	(72)	(127)	(68)	(70)	(70)	(65)	(66)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	102.5	103.2	114.1	114.1	109.6	100.8	100.8	104.2	112.1	112.1
Mdxt	-1481.6	-856.0	-1212.3	-1754.2	-1129.9	-1055.5	-1556.7	-899.6	1008.4	1480.3
Mdyt	-440.6	293.2	-566.5	-300.9	124.0	-807.8	-540.2	155.8	-583.1	-307.2
Comb	(66)	(67)	(69)	(69)	(70)	(71)	(71)	(82)	(75)	(75)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	112.1	101.0	101.0	105.0	108.9	108.9	108.1	108.9	102.5	102.5
Mdxt	1008.0	869.9	1322.8	-867.3	894.7	1321.4	878.3	895.3	831.7	1261.5
Mdyt	146.6	-769.9	-504.9	152.9	-581.6	-311.5	136.4	132.3	-675.4	-411.5
Comb	(75)	(76)	(76)	(78)	(80)	(80)	(79)	(80)	(81)	(81)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	112.9	108.2	116.0	116.0	116.0	112.9	112.9	114.6	114.6	114.6
Mdxt	-1053.7	-923.9	-1148.9	-1673.7	-1126.2	-1093.8	-1596.5	972.0	1442.0	979.7

Mdyt	138.2	265.3	-581.1	-310.7	136.1	-601.2	-326.3	-592.8	-315.2	142.1
Comb	(120)	(128)	(125)	(125)	(125)	(126)	(126)	(131)	(131)	(131)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	106.9	106.9	112.4	112.4	108.3	103.7	103.7	112.8	112.8	108.4
Mdxt	875.0	1331.7	892.3	1329.9	-1034.5	-967.4	-1417.6	-1164.9	-1690.4	-1076.7
Mdyt	-723.5	-455.2	-591.7	-318.2	138.0	-548.3	-289.6	-535.9	-283.5	120.8
Comb	(132)	(132)	(136)	(136)	(175)	(179)	(179)	(180)	(180)	(181)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	99.6	99.6	101.6	103.6	103.6	103.6	110.8	110.8	110.8	99.7
Mdxt	-1008.0	-1486.1	-849.1	835.0	1256.2	852.8	1036.0	1523.2	1041.5	897.5
Mdyt	-777.2	-522.8	319.6	-536.3	-276.0	151.2	-552.6	-289.9	143.5	-739.4
Comb	(182)	(182)	(183)	(184)	(184)	(184)	(186)	(186)	(186)	(187)
Carr	101	102	103	104	105					
Fdzt	99.7	107.6	107.6	106.8	107.6					
Mdxt	1366.0	922.3	1366.2	911.6	928.6					
Mdyt	-487.6	-551.0	-294.2	133.2	129.2					
Comb	(187)	(191)	(191)	(190)	(191)					

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	108.2	107.0	107.0	107.3	108.2	105.5	105.5	107.8	107.8	110.5
Mdxt	-1056.6	-1444.5	-985.7	-993.6	-1541.2	-1014.7	-1495.9	-1034.3	-1511.0	-1126.1
Mdyt	-2057.1	-1438.4	-2041.4	-2028.7	-1451.8	-2134.6	-1533.9	-2026.9	-1425.3	-2075.0
Comb	(10)	(5)	(5)	(3)	(10)	(11)	(11)	(8)	(8)	(15)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	110.5	113.6	113.6	104.3	104.3	112.2	112.2	106.6	106.6	101.2
Mdxt	-1636.1	-1205.6	-1744.7	-1033.8	-1537.8	909.1	1346.6	-951.6	-1397.8	-972.7
Mdyt	-1458.0	-2006.7	-1412.6	-2213.0	-1614.8	-2080.9	-1455.7	-2048.7	-1445.7	-1904.6
Comb	(15)	(14)	(14)	(16)	(16)	(20)	(20)	(31)	(31)	(68)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	100.9	102.6	102.6	100.2	100.2	103.0	101.2	105.9	105.9	98.8
Mdxt	-1340.4	-1014.7	-1478.5	-904.6	-1327.7	-994.8	-1436.5	-1113.9	-1613.4	-954.8
Mdyt	-1341.6	-1926.2	-1360.8	-1926.4	-1365.3	-2092.4	-1337.5	-1951.9	-1369.6	-2036.9
Comb	(60)	(65)	(65)	(61)	(61)	(127)	(68)	(70)	(70)	(66)

Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	98.8	110.3	110.3	97.1	97.1	108.3	108.3	97.3	97.3	105.1
Mdxt	-1420.7	-1227.5	-1767.7	-982.0	-1480.1	980.3	1438.5	773.2	1228.1	864.3
Mdyt	-1478.0	-1854.2	-1304.7	-2149.0	-1593.5	-1960.1	-1366.3	-2096.6	-1544.9	-1911.2
Comb	(66)	(69)	(69)	(71)	(71)	(75)	(75)	(76)	(76)	(80)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	105.1	98.8	109.1	109.1	112.2	112.2	103.0	110.8	110.8	103.9
Mdxt	1277.0	802.6	-1087.1	-1582.8	-1166.6	-1691.8	-1470.1	927.1	1386.2	880.9
Mdyt	-1341.4	-705.1	-1954.5	-1376.0	-1886.1	-1330.7	-1532.8	-1960.2	-1373.7	-1799.7
Comb	(80)	(81)	(126)	(126)	(125)	(125)	(127)	(131)	(131)	(191)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	104.6	104.6	101.4	100.0	100.0	109.1	109.1	95.8	95.8	99.9
Mdxt	-1077.8	-1564.3	-978.6	-936.6	-1373.1	-1191.5	-1719.2	-945.9	-1417.7	806.0
Mdyt	-1840.3	-1293.7	-1814.7	-1793.0	-1261.7	-1742.6	-1228.9	-2037.4	-1517.7	-551.8
Comb	(181)	(181)	(176)	(179)	(179)	(180)	(180)	(182)	(182)	(184)
Carr	61	62	63	64	65					
Fdzt	107.1	107.1	96.0	96.0	103.9					
Mdxt	996.9	1471.7	789.8	1263.9	1313.5					
Mdyt	-1848.5	-1290.4	-1985.1	-1469.1	-1265.6					

Comb (186) (186) (187) (187) (191)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	94.6	94.6	93.5	93.8	94.1	93.5	93.0	93.0	94.3	96.7
Mdxt	-958.5	-1393.3	-891.7	-902.9	-1336.8	-1303.3	-882.2	-1289.9	-939.3	-1046.2
Mdyt	-2973.6	-2528.7	-2946.5	-2928.2	-2486.5	-2504.0	-2972.2	-2535.6	-2926.5	-2943.9
Comb	(10)	(10)	(5)	(3)	(4)	(5)	(6)	(6)	(8)	(9)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	96.7	92.0	92.0	99.6	99.6	96.7	96.7	90.8	90.8	98.6
Mdxt	-1511.1	-901.5	-1323.1	-1136.9	-1632.7	-1034.0	-1495.1	-906.6	-1344.5	802.6
Mdyt	-2493.2	-3100.2	-2686.1	-2922.6	-2496.1	-2994.7	-2526.1	-3230.5	-2841.0	-2872.5
Comb	(9)	(11)	(11)	(14)	(14)	(15)	(15)	(16)	(16)	(19)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	98.6	98.3	98.3	88.1	88.1	89.6	89.6	88.3	87.4	87.4
Mdxt	1185.3	797.9	1181.7	-822.1	-1203.5	-917.5	-1332.5	-1268.8	-808.5	-1184.5
Mdyt	-2459.0	-2980.0	-2500.3	-2743.5	-2332.4	-2782.1	-2367.7	-2317.4	-2780.3	-2377.6

Comb	(19)	(20)	(20)	(60)	(60)	(65)	(65)	(68)	(61)	(61)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	89.6	92.6	92.6	85.9	85.9	88.3	96.8	96.8	92.6	92.6
Mdxt	-1295.3	-1042.7	-1499.7	-836.1	-1240.9	-860.0	-1172.2	-1672.2	-1025.2	-1477.2
Mdyt	-2723.0	-2739.8	-2317.0	-2963.2	-2592.5	-2731.8	-2709.5	-2321.1	-2812.3	-2363.9
Comb	(127)	(64)	(64)	(66)	(66)	(68)	(69)	(69)	(70)	(70)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	84.1	84.1	95.4	95.4	94.9	94.9	84.4	92.0	92.0	95.6
Mdxt	-843.3	-1271.3	886.0	1297.7	879.3	1288.0	671.9	760.9	1123.1	-1020.1
Mdyt	-3149.2	-2813.9	-2637.9	-2268.1	-2791.3	-2327.0	-2312.9	-2742.8	-2320.7	-2780.4
Comb	(71)	(71)	(74)	(74)	(75)	(75)	(76)	(80)	(80)	(120)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	95.6	93.5	98.5	98.5	95.5	95.5	89.6	97.5	97.2	97.2
Mdxt	-1475.5	-1357.5	-1110.8	-1597.3	-1007.8	-1459.4	-880.5	811.3	1207.1	806.5
Mdyt	-2375.2	-2410.6	-2759.1	-2378.0	-2831.2	-2408.0	-3067.0	-2709.0	-2382.1	-2816.4
Comb	(120)	(121)	(125)	(125)	(126)	(126)	(127)	(130)	(131)	(131)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	88.6	91.6	88.6	87.3	87.3	95.8	95.8	91.5	83.1	83.1

Mdxt	-893.4	-1467.0	-1299.3	-835.9	-1223.0	-1148.2	-1639.8	-1444.4	-819.2	-1225.9
Mdyt	-2631.0	-2207.8	-2258.5	-2580.6	-2208.3	-2558.3	-2211.9	-2254.7	-2998.0	-2704.7
Comb	(176)	(175)	(176)	(179)	(179)	(180)	(180)	(181)	(182)	(182)

Carr	71	72	73	74	75	76	77
Fdzt	94.4	94.4	93.9	93.9	83.3	90.9	90.9
Mdxt	893.8	1307.0	887.1	1305.5	690.2	768.8	1146.4
Mdyt	-2486.7	-2158.9	-2640.0	-2217.8	-2265.5	-2591.5	-2211.5
Comb	(185)	(185)	(186)	(186)	(187)	(191)	(191)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	80.7	80.7	79.7	80.0	79.7	79.2	79.2	80.5	80.5	82.6
Mdxt	-860.7	-1244.9	-796.4	-810.3	-1159.3	-784.0	-1142.2	-842.6	-1221.0	-967.1
Mdyt	-3234.2	-3168.7	-3199.6	-3180.5	-3134.7	-3222.2	-3170.3	-3177.3	-3115.3	-3213.8
Comb	(10)	(10)	(5)	(3)	(5)	(6)	(6)	(8)	(8)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	82.6	78.2	78.2	85.3	85.3	82.5	82.5	77.0	77.0	84.1

Mdxt	-1384.9	-1153.5	-793.9	-1063.8	-1512.2	-941.3	-1351.9	-1157.1	-799.0	1013.6
Mdyt	-3134.8	-3364.7	-3440.1	-3184.8	-3140.9	-3274.8	-3175.0	-3572.7	-3703.9	-3123.8
Comb	(9)	(11)	(11)	(14)	(14)	(15)	(15)	(16)	(16)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	84.4	84.4	84.1	81.7	81.7	75.0	75.0	76.3	76.1	74.3
Mdxt	1025.4	690.8	684.7	-708.4	-1042.6	-729.8	-1064.7	-1187.5	-1125.0	-712.2
Mdyt	-3070.1	-3126.0	-3237.1	-3145.2	-3090.0	-2974.6	-2915.6	-2964.2	-3439.8	-3007.1
Comb	(19)	(19)	(20)	(24)	(24)	(60)	(60)	(65)	(127)	(61)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	74.3	76.0	76.0	79.1	72.8	72.8	73.7	75.2	75.2	83.0
Mdxt	-1040.4	-795.7	-1153.1	-1386.2	-1065.7	-733.8	-686.9	-747.2	-1100.0	-1566.5
Mdyt	-2966.6	-2942.8	-2888.0	-2915.8	-3251.9	-3356.4	-3033.6	-2955.1	-2890.9	-2929.8
Comb	(61)	(63)	(63)	(64)	(66)	(66)	(67)	(68)	(68)	(69)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	79.0	71.1	71.1	81.6	81.6	81.2	81.2	78.5	78.5	77.8
Mdxt	-1339.7	-1070.9	-741.1	1154.6	777.9	776.6	1134.8	655.8	967.2	622.1
Mdyt	-2973.2	-3549.0	-3733.2	-2830.9	-2907.5	-3028.1	-2900.0	-2963.4	-2891.8	-2876.3
Comb	(70)	(71)	(71)	(74)	(74)	(75)	(75)	(80)	(80)	(79)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	81.7	79.8	84.4	84.4	81.6	76.1	83.5	83.2	83.2	75.5
Mdxt	-1364.0	-1223.9	-1491.4	-1000.6	-1331.1	-774.6	1032.9	685.6	1026.0	-1168.1
Mdyt	-2982.2	-3022.2	-3006.4	-3082.6	-3022.3	-3610.2	-2937.3	-3044.3	-2971.0	-2829.5
Comb	(120)	(121)	(125)	(125)	(126)	(127)	(130)	(131)	(131)	(176)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	74.1	78.3	72.0	72.0	74.4	82.1	78.1	70.3	70.3	80.8
Mdxt	-1045.3	-1367.1	-1035.9	-711.2	-1070.2	-1547.4	-1320.4	-1041.2	-718.5	1154.5
Mdyt	-2780.9	-2774.6	-3129.0	-3269.7	-2753.9	-2806.9	-2832.0	-3426.1	-3646.5	-2708.1
Comb	(171)	(175)	(177)	(177)	(179)	(180)	(181)	(182)	(182)	(185)
Carr	71	72	73	74	75					
Fdzt	80.4	80.4	77.7	77.7	77.7					
Mdxt	777.4	1139.5	978.2	664.9	656.6					
Mdyt	-2849.9	-2758.8	-2751.6	-2790.6	-2785.3					
Comb	(186)	(186)	(191)	(191)	(191)					

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	66.7	66.7	66.4	65.9	65.9	65.5	65.5	68.4	68.4	64.5
Mdxt	-1084.0	-751.3	-716.9	-1003.5	-688.3	-984.7	-676.2	-1232.5	-856.2	-988.7
Mdyt	-3311.6	-3822.7	-3748.9	-3271.5	-3779.1	-3308.3	-3836.4	-3285.3	-3777.2	-3494.2
Comb	(10)	(10)	(4)	(5)	(5)	(6)	(6)	(9)	(9)	(11)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	64.5	66.0	66.0	70.8	70.8	68.3	68.3	63.4	63.4	69.9
Mdxt	-683.6	-1012.4	-700.0	-1358.8	-950.8	-1190.2	-830.0	-979.6	-678.5	859.6
Mdyt	-4109.3	-3249.0	-3750.3	-3305.3	-3846.5	-3320.3	-3788.8	-3684.5	-4392.0	-3184.0
Comb	(11)	(13)	(13)	(14)	(14)	(15)	(15)	(16)	(16)	(19)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	69.9	69.7	61.9	61.9	63.0	62.7	62.6	61.3	61.3	65.5
Mdxt	581.5	844.4	-916.8	-627.2	-1032.1	-961.6	-668.3	-889.9	-610.1	-1243.0
Mdyt	-3743.0	-3235.8	-3039.4	-3513.3	-3096.7	-3531.3	-3470.0	-3092.0	-3595.1	-3059.2
Comb	(19)	(20)	(60)	(60)	(65)	(127)	(59)	(61)	(61)	(64)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	65.5	59.9	59.9	62.0	68.9	68.9	65.3	65.3	58.3	58.3
Mdxt	-867.3	-898.8	-620.6	-932.6	-1421.6	-1002.2	-1183.1	-829.7	-885.8	-613.3

Mdyt	-3510.6	-3357.6	-3985.0	-3007.3	-3087.7	-3609.6	-3109.2	-3527.1	-3629.4	-4388.7
Comb	(64)	(66)	(66)	(68)	(69)	(69)	(70)	(70)	(71)	(71)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	60.6	61.2	67.6	67.6	67.4	64.9	64.9	66.0	65.2	67.7
Mdxt	-880.3	-614.7	996.8	681.4	973.1	809.9	549.6	-737.7	-993.0	-1222.0
Mdyt	-2950.4	-3396.7	-2914.4	-3461.7	-2988.4	-2996.8	-3456.4	-3696.5	-3118.3	-3132.2
Comb	(172)	(171)	(74)	(74)	(75)	(80)	(80)	(121)	(116)	(120)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	67.7	66.0	70.1	70.1	67.6	67.6	62.7	69.2	69.2	69.0
Mdxt	-842.6	-1073.5	-1348.3	-937.1	-1179.7	-816.3	-664.9	859.8	583.8	846.2
Mdyt	-3651.1	-3158.5	-3152.1	-3720.3	-3167.2	-3662.6	-4265.8	-3030.8	-3616.9	-3082.7
Comb	(120)	(121)	(125)	(125)	(126)	(126)	(127)	(130)	(130)	(131)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	62.3	61.6	61.9	61.2	60.6	64.8	59.2	59.2	64.6	57.6
Mdxt	-1022.7	-634.2	-655.7	-907.2	-597.6	-1233.4	-882.2	-608.0	-1173.4	-869.2
Mdyt	-2955.1	-3364.3	-3353.4	-2897.8	-3478.4	-2917.6	-3216.0	-3868.4	-2967.6	-3487.8
Comb	(176)	(169)	(170)	(171)	(172)	(175)	(177)	(177)	(181)	(182)
Carr	71	72	73	74	75	76	77			

Fdzt	57.6	66.9	66.7	63.6	63.6	64.3	64.3
Mdxt	-600.8	683.4	974.1	752.7	510.5	811.4	551.7
Mdyt	-4272.1	-3345.1	-2846.8	-2819.8	-3332.7	-2855.1	-3339.7
Comb	(182)	(185)	(186)	(190)	(190)	(191)	(191)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	52.5	52.5	51.9	52.3	51.9	51.5	51.5	52.4	54.0	54.0
Mdxt	-912.9	-643.3	-836.3	-613.9	-583.3	-818.7	-570.0	-890.6	-1054.7	-756.2
Mdyt	-2630.5	-3629.9	-2591.3	-3562.4	-3582.8	-2610.7	-3628.3	-2577.9	-2629.3	-3608.2
Comb	(10)	(10)	(5)	(4)	(5)	(6)	(6)	(8)	(9)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	50.7	50.7	56.0	56.0	53.8	53.8	49.8	49.8	55.1	55.1
Mdxt	-817.3	-570.4	-1173.8	-851.1	-1012.6	-722.1	-802.5	-560.2	687.6	467.0
Mdyt	-2724.7	-3856.7	-2629.3	-3671.0	-2669.4	-3620.5	-2838.8	-4091.6	-2466.9	-3506.5
Comb	(11)	(11)	(14)	(14)	(15)	(15)	(16)	(16)	(19)	(19)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	55.1	49.9	49.9	50.8	50.8	48.6	48.6	49.5	49.5	49.2
Mdxt	671.5	-805.7	-561.5	-818.8	-570.6	-759.4	-527.5	-869.0	-613.3	-571.2
Mdyt	-2573.9	-2792.3	-4005.9	-2688.1	-3782.6	-2403.5	-3325.8	-2459.7	-3393.2	-3296.7
Comb	(20)	(21)	(21)	(26)	(26)	(60)	(60)	(65)	(65)	(59)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	48.1	48.1	49.4	51.6	51.6	46.9	46.9	49.2	54.5	54.5
Mdxt	-734.1	-508.5	-837.4	-1070.2	-774.6	-732.3	-509.1	-794.2	-1238.6	-910.2
Mdyt	-2431.2	-3390.7	-2384.5	-2457.9	-3362.1	-2594.1	-3717.1	-2691.6	-2457.8	-3451.8
Comb	(61)	(61)	(63)	(64)	(64)	(66)	(66)	(127)	(69)	(69)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	51.3	51.3	45.6	45.6	53.2	53.2	53.2	45.8	45.8	51.1
Mdxt	-1010.7	-725.8	-711.0	-494.4	826.1	573.5	804.7	-715.8	-496.4	648.2
Mdyt	-2515.1	-3379.7	-2757.2	-4052.7	-2225.9	-3216.8	-2378.7	-2690.7	-3930.2	-2356.8
Comb	(70)	(70)	(71)	(71)	(74)	(74)	(75)	(76)	(76)	(80)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	51.1	47.0	47.0	51.9	51.7	51.3	53.4	53.4	51.9	50.1
Mdxt	440.8	-734.5	-509.5	-637.4	-607.9	-577.3	-1046.4	-750.4	-904.6	-809.1
Mdyt	-3252.6	-2541.9	-3611.4	-3498.0	-3430.5	-3450.9	-2482.1	-3476.3	-2483.3	-2577.4

Comb	(80)	(81)	(81)	(121)	(115)	(116)	(120)	(120)	(121)	(122)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	50.1	55.4	55.4	53.2	53.2	49.2	54.5	54.5	54.5	50.2
Mdxt	-564.4	-1165.4	-845.2	-1004.3	-716.2	-554.2	682.4	463.9	666.3	-810.6
Mdyt	-3724.8	-2482.0	-3539.1	-2522.1	-3488.6	-3959.7	-2319.7	-3374.6	-2426.7	-2540.9
Comb	(122)	(125)	(125)	(126)	(126)	(127)	(130)	(130)	(131)	(137)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	50.2	49.0	49.0	48.7	48.1	48.1	47.6	47.6	48.9	51.1
Mdxt	-564.8	-861.5	-607.9	-565.8	-752.0	-522.1	-726.5	-503.0	-829.9	-1062.6
Mdyt	-3650.8	-2323.5	-3271.2	-3174.9	-2267.4	-3203.8	-2295.1	-3268.8	-2248.3	-2321.7
Comb	(137)	(176)	(176)	(170)	(171)	(171)	(172)	(172)	(174)	(175)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	51.1	46.4	46.4	50.8	50.8	45.1	45.1	52.7	52.7	52.7
Mdxt	-769.3	-724.9	-503.7	-1003.1	-720.4	-703.5	-489.0	821.0	570.5	799.6
Mdyt	-3240.1	-2458.0	-3595.2	-2378.9	-3257.7	-2621.0	-3930.8	-2089.8	-3094.9	-2242.6
Comb	(175)	(177)	(177)	(181)	(181)	(182)	(182)	(185)	(185)	(186)
Carr	91	92	93							
Fdzt	50.0	50.6	50.6							

Mdxt	392.2	643.3	437.9
Mdyt	-3119.1	-2220.7	-3130.7
Comb	(190)	(191)	(191)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	37.5	37.5	37.5	36.8	37.2	37.5	37.0	37.0	36.5	36.8
Mdxt	-403.9	-691.3	-497.4	-617.5	-644.9	-413.7	-446.2	-402.1	-773.9	-434.2
Mdyt	672.0	-1275.7	-2535.4	-2380.7	-1240.2	640.7	-2493.8	805.1	-1287.2	-2516.6
Comb	(8)	(10)	(10)	(64)	(3)	(10)	(5)	(119)	(70)	(6)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	36.4	37.5	38.6	38.6	38.6	36.2	36.2	36.2	37.1	40.1
Mdxt	-616.0	-672.4	-556.2	-811.7	-597.8	-371.2	-610.4	-432.7	-411.9	-529.0
Mdyt	-2280.4	-1236.1	883.7	-1293.5	-2543.0	854.1	-1256.7	-2646.8	773.7	757.0
Comb	(175)	(8)	(180)	(9)	(9)	(11)	(11)	(11)	(121)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	40.1	40.1	38.4	38.4	35.2	35.6	35.6	39.3	39.3	39.3

Mdxt	-910.2	-679.7	-773.2	-565.0	-368.2	-597.2	-423.1	326.4	497.5	339.1
Mdyt	-1257.0	-2580.6	-1340.7	-2557.4	1114.9	-1264.3	-2778.4	830.4	-1112.0	-2388.3
Comb	(14)	(14)	(15)	(15)	(132)	(16)	(16)	(19)	(19)	(19)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	39.4	39.4	35.6	35.6	35.6	38.1	36.2	36.2	36.2	36.7
Mdxt	484.0	328.9	-370.0	-612.3	-435.5	-474.2	-375.5	-620.5	-441.0	-377.3
Mdyt	-1277.7	-2422.4	981.8	-1255.5	-2730.2	741.2	799.8	-1254.2	-2606.3	771.9
Comb	(20)	(20)	(21)	(21)	(21)	(120)	(26)	(26)	(26)	(124)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	36.9	37.0	34.5	34.5	34.6	35.3	35.3	35.3	35.3	34.6
Mdxt	-435.6	-617.3	-357.5	-545.5	-401.0	-379.1	-657.7	-474.0	-393.1	-568.1
Mdyt	-2500.2	-1242.0	732.7	-1163.6	-2310.7	639.2	-1194.3	-2370.0	594.3	-1154.4
Comb	(31)	(36)	(169)	(82)	(60)	(63)	(65)	(65)	(65)	(60)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	34.2	34.3	34.3	34.0	35.3	36.8	36.8	33.4	33.4	33.4
Mdxt	-336.2	-546.3	-383.8	-540.0	-630.6	-482.2	-828.3	-332.5	-541.9	-381.7
Mdyt	710.6	-1150.0	-2343.0	-1293.9	-1137.8	547.8	-1219.8	899.4	-1167.3	-2529.2
Comb	(203)	(61)	(61)	(72)	(63)	(64)	(64)	(66)	(66)	(66)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	39.0	39.0	39.0	36.5	32.2	32.5	32.5	37.9	37.9	37.9
Mdxt	-557.9	-967.6	-734.5	-570.7	-329.0	-522.8	-367.8	377.8	616.6	434.6
Mdyt	760.6	-1167.6	-2434.6	-2401.4	1204.8	-1178.2	-2717.2	865.4	-960.4	-2159.7
Comb	(69)	(69)	(69)	(70)	(187)	(71)	(71)	(74)	(74)	(74)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	38.1	38.1	32.6	32.6	32.6	36.5	36.5	36.5	33.5	33.5
Mdxt	599.0	420.1	-330.7	-544.5	-385.5	306.5	469.4	320.6	-338.5	-556.4
Mdyt	-1197.3	-2208.6	1081.8	-1165.5	-2648.2	565.5	-1127.5	-2238.9	821.6	-1163.6
Comb	(75)	(75)	(76)	(76)	(76)	(80)	(80)	(80)	(81)	(81)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	33.5	34.9	34.4	36.4	37.1	38.1	38.1	35.8	39.7	39.7
Mdxt	-393.6	-377.4	-385.7	-372.0	-495.7	-808.4	-596.1	-369.4	-527.2	-906.8
Mdyt	-2471.2	762.2	-2319.7	822.3	-2426.9	-1175.1	-2434.5	987.2	890.1	-1138.5
Comb	(81)	(174)	(86)	(117)	(121)	(120)	(120)	(122)	(125)	(125)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	39.7	37.9	37.9	35.1	35.1	38.9	38.9	38.9	39.0	35.2
Mdxt	-678.0	-769.9	-563.3	-362.0	-421.3	321.5	490.2	334.1	476.7	-433.8

Mdyt	-2472.2	-1222.2	-2448.9	1165.2	-2670.0	963.5	-993.5	-2279.8	-1159.2	-2621.7
Comb	(125)	(126)	(126)	(127)	(127)	(130)	(130)	(130)	(131)	(132)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	37.6	35.8	36.1	35.8	33.9	34.9	34.9	34.2	34.2	33.9
Mdxt	-335.4	-373.7	-771.0	-439.3	-334.5	-654.8	-472.5	-565.4	-399.4	-543.6
Mdyt	826.5	932.8	-1177.7	-2497.8	786.9	-1084.8	-2269.7	-1044.9	-2210.4	-1040.5
Comb	(135)	(137)	(181)	(137)	(172)	(176)	(176)	(171)	(171)	(172)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	33.9	34.9	36.4	36.4	34.9	33.0	33.0	33.0	38.6	38.6
Mdxt	-382.3	-627.9	-480.5	-825.3	-391.4	-330.8	-539.1	-380.1	-964.4	-733.0
Mdyt	-2242.7	-1028.3	670.8	-1110.3	717.4	1022.4	-1057.8	-2428.9	-1058.1	-2334.3
Comb	(172)	(174)	(175)	(175)	(176)	(177)	(177)	(177)	(180)	(180)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	36.1	32.1	32.1	32.1	33.6	37.5	37.5	37.5	37.7	32.2
Mdxt	-569.2	-320.2	-520.1	-366.3	-537.3	373.3	609.7	429.8	592.2	-541.9
Mdyt	-2301.2	1276.6	-1068.7	-2616.9	-1184.4	988.5	-850.9	-2059.4	-1087.7	-1056.0
Comb	(181)	(182)	(182)	(182)	(183)	(185)	(185)	(185)	(186)	(187)
Carr	131	132	133	134	135	136	137	138	139	140

Fdzt	32.2	36.1	36.1	36.1	33.1	33.1	33.1	34.0	34.0	34.2
Mdxt	-384.0	301.8	462.6	315.8	-336.8	-553.6	-392.0	-335.7	-384.2	-336.2
Mdyt	-2547.9	688.5	-1018.1	-2138.6	944.7	-1054.1	-2370.9	742.5	-2219.4	709.8
Comb	(187)	(191)	(191)	(191)	(192)	(192)	(192)	(197)	(197)	(204)
Carr	141	142								
Fdzt	34.1	34.1								
Mdxt	-337.6	-336.6								
Mdyt	706.5	708.2								
Comb	(202)	(207)								

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	20.4	20.4	20.4	20.1	20.5	20.4	20.2	20.2	20.0	20.4
Mdxt	-161.1	-368.0	-279.9	-242.8	-160.4	-378.7	-159.0	-366.8	-240.9	-270.4
Mdyt	1593.6	639.4	-960.7	-938.4	1652.4	634.2	1679.6	673.8	-966.6	-935.6
Comb	(8)	(8)	(10)	(6)	(135)	(10)	(119)	(119)	(12)	(8)
Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	21.1	21.1	21.0	19.8	19.8	19.8	20.2	20.2	20.2	21.9
Mdxt	-167.0	-530.0	-338.6	-155.7	-334.1	-242.3	-159.1	-377.3	-246.8	-173.4
Mdyt	1782.6	728.9	-979.6	1787.6	716.9	-962.8	1546.2	668.6	-928.3	1742.2
Comb	(180)	(180)	(9)	(11)	(11)	(11)	(13)	(121)	(13)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	21.9	21.9	20.9	19.4	19.4	19.4	20.0	21.4	21.4	21.4
Mdxt	-499.7	-386.4	-319.0	-153.1	-327.4	-237.2	-240.6	167.5	271.0	185.9
Mdyt	699.0	-979.4	-997.5	1981.2	800.3	-985.0	-971.9	1657.0	664.8	-848.5
Comb	(14)	(14)	(15)	(16)	(16)	(16)	(17)	(19)	(19)	(19)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	21.6	21.6	19.5	19.5	20.8	20.8	19.8	19.8	20.2	20.0
Mdxt	169.0	180.7	-334.8	-243.6	-164.1	-443.6	-339.3	-246.8	-159.1	-339.4
Mdyt	1337.5	-921.7	772.3	-975.4	1663.4	667.3	693.9	-956.7	1666.7	654.8
Comb	(20)	(20)	(21)	(21)	(120)	(120)	(26)	(26)	(121)	(124)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	20.1	20.1	19.0	18.9	18.8	19.2	19.2	19.2	19.2	19.2
Mdxt	-243.5	-244.3	-149.4	-358.8	-223.8	-151.3	-359.9	-266.8	-151.2	-344.9
Mdyt	-937.1	-931.3	1570.1	622.5	-866.0	1472.3	590.8	-899.2	1490.7	598.1

Comb	(31)	(36)	(174)	(176)	(60)	(65)	(65)	(65)	(63)	(63)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	18.9	18.5	18.6	18.6	19.2	20.0	20.0	18.2	18.2	18.2
Mdxt	-149.4	-298.6	-213.8	-211.1	-253.3	-454.0	-350.7	-143.5	-296.2	-213.0
Mdyt	1551.9	617.7	-867.2	-907.6	-863.2	588.9	-926.0	1767.8	708.9	-902.1
Comb	(176)	(197)	(61)	(67)	(63)	(64)	(64)	(66)	(66)	(66)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	18.9	21.3	21.3	21.3	19.9	19.8	19.8	17.7	17.7	17.7
Mdxt	-148.7	-168.8	-531.4	-419.1	-156.8	-452.7	-322.6	-140.0	-286.7	-205.8
Mdyt	1424.6	1702.9	683.2	-925.8	1650.1	620.7	-951.7	2044.5	858.2	-933.8
Comb	(84)	(69)	(69)	(69)	(116)	(175)	(70)	(71)	(71)	(71)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	18.5	20.5	20.5	20.5	20.8	20.8	20.8	17.8	17.8	19.6
Mdxt	-210.6	161.5	336.0	241.9	163.5	328.0	234.4	-297.2	-215.0	153.4
Mdyt	-915.2	1581.2	659.1	-738.7	1124.9	451.9	-843.5	816.4	-920.2	1451.8
Comb	(72)	(74)	(74)	(74)	(75)	(75)	(75)	(76)	(76)	(79)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	19.9	19.9	19.9	18.2	18.2	18.7	19.0	20.0	19.8	20.8

Mdxt	155.8	256.0	176.1	-303.7	-219.5	-146.9	-343.7	-157.8	-155.7	-338.2
Mdyt	1353.4	543.2	-828.1	675.9	-893.4	1460.4	629.9	1653.9	1690.6	-915.5
Comb	(80)	(80)	(80)	(81)	(81)	(86)	(174)	(114)	(117)	(120)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	19.5	21.7	21.7	21.7	20.6	19.2	19.2	19.2	21.1	21.1
Mdxt	-153.6	-171.4	-498.3	-386.1	-318.5	-151.1	-326.2	-236.8	165.6	266.1
Mdyt	1873.7	1828.2	737.0	-915.3	-933.5	2067.2	877.4	-920.9	1743.0	738.1
Comb	(122)	(125)	(125)	(125)	(126)	(127)	(127)	(127)	(130)	(130)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	21.1	21.3	19.2	19.2	20.5	19.5	19.5	19.8	18.9	18.6
Mdxt	182.4	177.1	-333.5	-243.2	-288.1	-338.0	-246.3	-155.9	-266.5	-223.5
Mdyt	-784.3	-857.6	848.2	-911.4	664.1	738.1	-892.6	1658.5	-840.0	-806.7
Comb	(130)	(131)	(132)	(132)	(135)	(137)	(137)	(142)	(176)	(171)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	18.4	19.0	19.8	18.0	18.0	18.0	18.7	18.6	21.1	19.6
Mdxt	-144.7	-252.9	-350.3	-141.6	-295.1	-212.6	-146.9	-304.4	-418.8	-154.7
Mdyt	1585.9	-804.0	-866.8	1847.4	776.4	-842.8	1504.1	602.7	-866.6	1415.2
Comb	(172)	(174)	(175)	(177)	(177)	(177)	(195)	(179)	(180)	(181)

Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	19.6	19.6	17.5	17.5	17.5	20.3	20.3	20.3	20.5	20.5
Mdxt	-421.8	-322.3	-138.1	-285.6	-205.5	159.6	331.5	238.6	161.7	231.1
Mdyt	567.9	-892.5	2123.9	929.5	-874.6	1660.8	730.4	-679.5	1204.4	-784.2
Comb	(181)	(181)	(182)	(182)	(182)	(185)	(185)	(185)	(186)	(186)

Carr	131	132	133	134	135	136	137	138	139
Fdzt	17.6	17.6	19.3	19.6	19.6	19.6	18.0	18.0	18.5
Mdxt	-296.2	-214.7	151.5	154.0	251.4	172.8	-302.5	-219.1	-145.0
Mdyt	887.8	-861.0	1531.3	1433.0	575.1	-768.9	730.5	-834.1	1540.0
Comb	(187)	(187)	(190)	(191)	(191)	(191)	(192)	(192)	(197)

17.6.8 P1-g

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	193.1	191.9	193.1	190.5	191.9	187.8	193.1	187.8	190.9	190.9
Mdxt	-1522.6	-1998.6	-1525.4	-1520.1	-1517.2	-2252.4	-2002.6	-1691.6	-1521.9	-1445.2

Mdyt	-1365.1	-637.3	549.2	668.5	-1375.5	-806.6	-626.9	-1565.5	546.9	598.0
Comb	(4)	(5)	(4)	(17)	(5)	(16)	(4)	(16)	(8)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	197.9	197.5	197.9	195.3	195.3	196.3	189.6	190.5	191.3	197.5
Mdxt	-1629.0	-2200.6	-1629.3	-1639.5	-2166.3	-1731.4	-1629.4	-1429.7	-1516.2	-1671.1
Mdyt	-1367.8	-624.7	561.7	-1394.2	-649.1	544.0	463.0	649.3	550.5	-1364.1
Comb	(9)	(14)	(9)	(10)	(10)	(70)	(11)	(12)	(13)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	197.5	204.1	204.1	204.1	187.8	194.9	209.3	209.3	209.3	187.4
Mdxt	-1673.8	-1747.0	-2302.2	-1751.1	-1715.4	-1384.4	1505.3	1967.9	1496.7	1398.2
Mdyt	554.7	-1401.2	-643.1	566.6	398.6	557.3	-1398.3	-632.8	589.8	-1533.3
Comb	(14)	(15)	(15)	(15)	(16)	(19)	(20)	(20)	(20)	(21)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	187.4	187.4	194.0	198.9	198.9	189.6	189.6	188.9	191.4	191.4
Mdxt	1854.5	1416.5	-1435.9	-1425.3	-1868.8	1346.6	1774.4	1368.0	-1441.6	-1889.7
Mdyt	-779.6	417.7	552.7	-1380.7	-632.9	-1452.2	-706.4	534.0	-1383.1	-644.3
Comb	(21)	(21)	(24)	(25)	(25)	(26)	(26)	(80)	(31)	(31)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	177.8	177.8	176.9	177.5	180.6	180.6	180.6	177.4	177.4	178.1
Mdxt	-1548.4	-2057.7	-1401.4	-1404.0	-1408.0	-1849.2	-1408.9	-1397.7	-1842.5	-1419.5
Mdyt	-1503.1	-778.0	689.6	515.9	-1263.5	-576.1	519.3	-1302.5	-613.7	513.2
Comb	(127)	(127)	(72)	(63)	(59)	(59)	(59)	(61)	(61)	(175)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	177.5	187.4	183.8	183.8	183.8	175.6	175.6	175.6	177.0	178.0
Mdxt	-1294.4	-1557.4	-1575.0	-2082.8	-1584.7	-1538.9	-2045.9	-1557.5	-1272.2	-1395.8
Mdyt	589.0	537.0	-1305.0	-607.9	503.2	-1424.3	-721.2	395.9	662.1	521.0
Comb	(62)	(64)	(65)	(65)	(65)	(66)	(66)	(66)	(67)	(68)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	186.9	196.3	196.3	173.1	173.1	173.1	183.3	183.3	183.3	203.8
Mdxt	-1621.0	-1728.7	-2276.7	-1649.4	-2203.1	-1680.4	1354.3	1773.5	1354.3	1586.6
Mdyt	527.1	-1315.1	-599.4	-1549.8	-832.8	304.1	-1244.0	-560.2	530.7	-1310.9
Comb	(69)	(70)	(70)	(71)	(71)	(71)	(74)	(74)	(74)	(75)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	203.8	203.8	172.6	172.6	172.6	180.4	175.6	175.6	175.6	181.8
Mdxt	2082.4	1577.4	1433.6	1919.7	1462.9	-1371.1	1360.0	1809.7	1380.5	-1374.0
Mdyt	-584.6	577.2	-1503.9	-794.3	331.5	642.8	-1387.9	-689.7	419.9	-1313.2

Comb	(75)	(75)	(76)	(76)	(76)	(128)	(81)	(81)	(81)	(116)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	181.8	180.8	180.8	183.0	180.8	180.8	185.3	185.3	179.5	180.5
Mdxt	-1801.3	-1372.1	-1799.9	-1376.5	-1296.3	-1373.0	-1496.2	-1969.8	-1480.4	-1280.7
Mdyt	-608.7	-1330.1	-624.6	523.5	572.3	521.2	-1331.8	-620.5	437.3	623.5
Comb	(116)	(117)	(117)	(115)	(118)	(119)	(121)	(121)	(122)	(123)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	181.2	194.0	177.8	184.9	184.9	184.9	199.2	199.2	199.2	177.4
Mdxt	-1367.2	-1602.1	-1566.5	1345.2	1764.4	1348.7	1507.8	1976.8	1505.0	1400.7
Mdyt	524.8	540.9	372.9	-1289.1	-587.2	531.5	-1335.9	-604.3	564.1	-1471.0
Comb	(124)	(126)	(127)	(130)	(130)	(130)	(131)	(131)	(131)	(132)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	177.4	177.4	183.9	179.5	179.5	179.6	169.6	169.6	167.6	168.1
Mdxt	1868.5	1424.7	-1286.9	1349.2	1790.3	1375.8	-1267.8	-1661.1	-1263.5	-1266.1
Mdyt	-751.0	392.1	527.0	-1389.8	-677.8	510.3	-1220.7	-564.6	665.7	492.1
Comb	(132)	(132)	(135)	(137)	(137)	(191)	(171)	(171)	(183)	(174)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	171.3	171.3	171.3	169.6	168.1	168.1	168.9	168.9	167.7	174.5

Mdxt	-1275.4	-1670.8	-1271.0	-1266.8	-1265.1	-1659.0	1200.5	1578.8	1209.5	-1446.8
Mdyt	-1205.9	-549.7	495.5	479.9	-1244.9	-587.3	-1231.6	-574.6	638.2	479.4
Comb	(170)	(170)	(170)	(171)	(172)	(172)	(197)	(197)	(178)	(176)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	166.3	166.3	166.3	166.3	166.3	168.7	177.6	163.8	163.8	163.8
Mdxt	-1406.3	-1865.1	-1419.6	1362.4	1821.6	-1257.9	-1483.1	-1516.9	-2024.0	-1542.5
Mdyt	-1366.7	-694.8	372.2	-1330.3	-663.4	497.2	503.3	-1492.1	-806.4	280.3
Comb	(177)	(177)	(177)	(192)	(192)	(179)	(180)	(182)	(182)	(182)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	174.0	194.5	194.5	194.5	163.2	163.2	163.2	179.6	179.6	166.3
Mdxt	1362.0	1589.1	2088.5	1585.1	1436.0	1929.4	1470.7	1374.1	1804.4	1388.2
Mdyt	507.0	-1253.2	-558.2	553.4	-1446.2	-767.9	307.6	-1228.0	-558.2	396.1
Comb	(185)	(186)	(186)	(186)	(187)	(187)	(187)	(191)	(191)	(192)
Carr	141									
Fdzt	170.6									
Mdxt	1194.3									
Mdyt	491.1									
Comb	(196)									

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	190.3	190.3	189.1	189.1	184.9	184.9	195.1	195.1	192.5	192.5
Mdxt	-1497.0	-1972.9	-1487.0	-1965.4	-1623.2	-2191.6	-1608.7	-2115.8	-1601.6	-2127.5
Mdyt	-4666.6	-3250.8	-4685.7	-3267.0	-5046.3	-3566.6	-4674.2	-3255.6	-4725.1	-3297.4
Comb	(4)	(4)	(5)	(5)	(16)	(16)	(9)	(9)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	194.7	194.7	201.3	201.3	187.7	206.6	206.6	184.5	184.5	196.1
Mdxt	-1645.3	-2171.0	-1719.3	-2271.1	-1475.6	1504.4	1968.3	1341.5	1800.4	-1396.2
Mdyt	-4658.1	-3245.8	-4752.2	-3313.7	-4735.2	-4763.5	-3317.6	-4982.6	-3514.4	-4706.9
Comb	(14)	(14)	(15)	(15)	(17)	(20)	(20)	(21)	(21)	(25)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	196.1	186.7	188.6	176.6	176.6	174.8	174.8	177.8	177.8	181.0
Mdxt	-1836.4	1729.7	-1863.8	-1430.8	-1903.8	-1490.7	-2004.1	-1386.2	-1822.2	-1535.6
Mdyt	-3279.9	-3387.1	-3279.0	-4680.2	-3286.8	-4846.9	-3425.3	-4332.3	-3015.8	-4415.9
Comb	(25)	(26)	(31)	(122)	(122)	(127)	(127)	(59)	(59)	(65)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	181.0	172.7	172.7	193.6	193.6	170.2	170.2	180.4	180.4	201.1
Mdxt	-2042.9	-1481.0	-1992.4	-1703.9	-2247.5	-1566.5	-2132.2	1334.3	1747.7	1587.2
Mdyt	-3082.5	-4636.4	-3269.1	-4454.6	-3105.7	-4874.7	-3467.0	-4289.4	-2982.9	-4470.6
Comb	(65)	(66)	(66)	(70)	(70)	(71)	(71)	(74)	(74)	(75)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	201.1	169.6	169.6	186.1	174.4	174.4	178.9	178.9	177.9	177.9
Mdxt	2084.1	1354.5	1849.8	1359.6	1332.3	1805.8	-1354.4	-1775.6	-1349.9	-1772.4
Mdyt	-3111.3	-4783.6	-3392.3	-4389.7	-4783.2	-3373.0	-4486.3	-3125.6	-4517.7	-3152.1
Comb	(75)	(76)	(76)	(80)	(132)	(132)	(116)	(116)	(117)	(117)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	178.3	178.3	180.2	180.2	182.4	182.4	182.0	182.0	196.5	196.5
Mdxt	-1336.4	-1751.3	-1364.5	-1788.9	-1469.1	-1938.7	1318.1	1732.9	1495.1	1960.5
Mdyt	-4462.1	-3106.1	-4467.3	-3109.4	-4525.7	-3156.1	-4437.2	-3086.4	-4564.1	-3176.2
Comb	(114)	(114)	(115)	(115)	(121)	(121)	(130)	(130)	(131)	(131)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	176.6	176.6	166.7	166.7	165.2	165.2	168.4	168.4	163.3	163.3
Mdxt	1293.6	1736.7	-1249.2	-1637.0	-1242.8	-1631.4	-1263.6	-1656.0	1756.8	-1358.4

Mdyt	-4630.7	-3245.7	-4175.1	-2908.2	-4220.0	-2946.0	-4147.9	-2885.1	-3079.8	-4452.0
Comb	(137)	(137)	(171)	(171)	(172)	(172)	(170)	(170)	(192)	(177)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	163.3	163.3	160.8	160.8	191.7	191.7	160.2	160.2	176.8	176.8
Mdxt	-1818.4	1290.7	-1443.9	-1959.6	1578.6	2075.0	1346.0	1851.7	1351.2	1775.9
Mdyt	-3138.4	-4381.3	-4690.2	-3336.3	-4286.1	-2980.5	-4599.2	-3261.6	-4205.2	-2926.5
Comb	(177)	(192)	(182)	(182)	(186)	(186)	(187)	(187)	(191)	(191)

Carr	81	82
Fdzt	166.0	166.0
Mdxt	1164.0	1539.6
Mdyt	-4195.9	-2925.4
Comb	(197)	(197)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	185.6	185.6	182.9	185.0	182.9	186.9	186.9	192.0	191.4	189.2
Mdxt	-1448.5	-1918.8	-1500.4	-1432.5	-2015.5	-1464.0	-1933.5	-1581.6	-2131.5	-1555.6

Mdyt	-6745.1	-5550.3	-7082.9	-6709.2	-5864.7	-6709.8	-5518.0	-6712.3	-5524.8	-6795.1
Comb	(5)	(5)	(11)	(3)	(11)	(4)	(4)	(9)	(14)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	189.2	191.4	198.5	198.5	180.7	180.7	204.1	204.1	180.3	180.3
Mdxt	-2071.7	-1608.3	-1688.3	-2233.1	-1539.5	-2089.2	1510.4	1977.9	1275.6	1711.7
Mdyt	-5596.7	-6706.1	-6800.0	-5599.8	-7371.7	-6133.4	-6803.3	-5600.8	-7259.6	-6028.6
Comb	(10)	(14)	(15)	(15)	(16)	(16)	(20)	(20)	(21)	(21)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	193.0	193.0	185.0	185.0	172.0	172.0	169.8	169.8	174.2	174.2
Mdxt	-1361.9	-1794.2	-1393.4	-1830.6	-1373.9	-1834.5	-1412.9	-1909.2	-1356.1	-1786.0
Mdyt	-6755.9	-5560.9	-6770.2	-5573.0	-6780.1	-5608.9	-7069.0	-5877.8	-6222.4	-5116.2
Comb	(25)	(25)	(31)	(31)	(122)	(122)	(127)	(127)	(59)	(59)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	177.4	177.4	168.4	168.4	180.6	190.7	190.7	165.4	165.4	176.7
Mdxt	-1486.8	-1983.2	-1408.1	-1902.7	-1562.1	-1676.5	-2213.2	-1463.9	-2006.8	1304.8
Mdyt	-6344.2	-5228.6	-6755.3	-5611.4	-6217.1	-6351.3	-5233.0	-7168.0	-5995.4	-6168.3
Comb	(65)	(65)	(66)	(66)	(69)	(70)	(70)	(71)	(71)	(74)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	176.7	198.8	198.8	164.8	164.8	182.9	182.9	169.4	169.4	174.7
Mdxt	1712.8	1595.8	2096.4	1260.4	1727.4	1346.7	1763.2	1249.5	1695.3	-1322.0
Mdyt	-5076.4	-6355.8	-5234.3	-7007.8	-5845.6	-6288.3	-5177.4	-6956.9	-5772.9	-6442.4
Comb	(74)	(75)	(75)	(76)	(76)	(80)	(80)	(132)	(132)	(116)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	174.7	173.5	174.0	173.5	176.0	176.0	178.2	178.2	187.5	177.7
Mdxt	-1736.5	-1314.0	-1305.9	-1729.6	-1337.5	-1753.8	-1429.0	-1890.8	-1561.8	1280.6
Mdyt	-5294.5	-6500.4	-6406.6	-5348.5	-6407.1	-5262.3	-6492.4	-5341.0	-6497.3	-6369.3
Comb	(116)	(117)	(114)	(117)	(115)	(115)	(121)	(121)	(126)	(130)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	177.7	193.2	193.2	182.1	182.1	171.9	171.9	162.2	162.2	160.6
Mdxt	1684.2	1484.3	1947.1	1309.8	1712.5	1226.9	1646.0	-1216.9	-1596.2	-1205.6
Mdyt	-5234.5	-6500.6	-5345.1	-6453.2	-5305.2	-6690.1	-5524.1	-5992.8	-4925.7	-6075.7
Comb	(130)	(131)	(131)	(136)	(136)	(137)	(137)	(171)	(171)	(172)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	160.6	158.3	158.3	161.4	170.5	155.3	155.3	166.6	166.6	188.7
Mdxt	-1586.2	-1291.0	-1735.7	1132.5	-1445.0	-1346.8	-1840.8	1280.7	1697.4	1571.7
Mdyt	-5002.8	-6475.4	-5374.9	-3544.0	-5937.1	-6888.0	-5758.9	-5888.4	-4839.9	-6075.8

Comb	(172)	(177)	(177)	(197)	(180)	(182)	(182)	(185)	(185)	(186)
Carr	81	82	83	84	85	86	87			
Fdzt	188.7	154.7	154.7	172.8	172.8	158.3	158.3			
Mdxt	2066.3	1236.3	1709.9	1322.6	1736.0	1204.0	1642.1			
Mdyt	-4997.9	-6727.8	-5609.1	-6008.4	-4940.9	-6346.7	-5253.6			
Comb	(186)	(187)	(187)	(191)	(191)	(192)	(192)			

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	184.3	184.3	181.2	181.2	183.7	183.7	185.7	185.7	191.1	190.3
Mdxt	-1421.2	-1887.3	-1446.6	-1951.4	-1406.2	-1865.6	-1442.8	-1909.6	-1566.5	-2101.5
Mdyt	-7904.0	-7274.3	-8317.0	-7705.1	-7862.2	-7232.1	-7860.1	-7229.0	-7857.8	-7236.8
Comb	(5)	(5)	(11)	(11)	(3)	(3)	(4)	(4)	(9)	(14)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	188.0	188.0	183.1	190.3	197.9	197.9	178.8	178.8	204.0	204.0
Mdxt	-1521.3	-2030.7	-1375.5	-1576.4	-1675.1	-2213.8	-1463.2	-1998.1	1547.1	2028.5
Mdyt	-7957.5	-7328.2	-7967.0	-7852.2	-7948.1	-7312.1	-8669.2	-8072.2	-7925.2	-7293.5

Comb	(10)	(10)	(12)	(14)	(15)	(15)	(16)	(16)	(20)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	178.3	183.3	192.2	192.2	183.7	183.7	169.3	169.3	168.8	168.8
Mdxt	1261.4	-1399.5	1349.0	1760.7	-1376.7	-1813.3	-1324.1	-1776.4	-1289.7	-1715.9
Mdyt	-7233.9	-7925.7	-7897.0	-7269.5	-7934.4	-7305.3	-7949.4	-7358.9	-7449.5	-6870.5
Comb	(21)	(22)	(25)	(25)	(31)	(31)	(122)	(122)	(61)	(61)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	172.7	172.7	175.9	175.9	166.2	166.2	179.2	190.0	190.0	162.7
Mdxt	-1337.6	-1764.6	-1449.7	-1937.4	-1342.9	-1824.1	-2038.3	-1669.4	-2198.3	-1366.7
Mdyt	-7283.5	-6697.8	-7422.7	-6839.5	-7936.4	-7378.0	-6709.1	-7409.4	-6816.6	-8439.5
Comb	(59)	(59)	(65)	(65)	(66)	(66)	(69)	(70)	(70)	(71)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	162.7	168.7	175.0	175.0	198.8	198.8	162.1	162.1	181.8	181.8
Mdxt	-1890.0	-1280.2	1284.2	1691.8	1638.0	2153.1	1177.5	1619.1	1355.0	1775.1
Mdyt	-7902.4	-7455.8	-7209.5	-6642.0	-7376.5	-6789.9	-8243.9	-7696.9	-7336.2	-6755.7
Comb	(71)	(72)	(74)	(74)	(75)	(75)	(76)	(76)	(80)	(80)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	166.4	166.4	172.4	172.4	171.1	171.1	171.7	171.7	173.8	173.8

Mdxt	1180.7	1601.9	-1298.8	-1711.4	-1286.8	-1699.7	-1283.7	-1689.7	-1320.3	-1733.9
Mdyt	-8164.7	-7582.2	-7536.4	-6928.1	-7608.6	-7003.8	-7494.6	-6885.9	-7492.4	-6882.8
Comb	(132)	(132)	(116)	(116)	(117)	(117)	(114)	(114)	(115)	(115)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	176.1	176.1	186.0	186.0	166.9	166.9	171.1	175.5	175.5	192.1
Mdxt	-1398.8	-1855.7	-1552.6	-2041.2	-1340.7	-1823.5	-1280.2	1255.5	1652.5	1503.2
Mdyt	-7589.8	-6982.0	-7580.4	-6965.9	-8301.7	-7726.1	-7613.0	-7440.6	-6843.8	-7557.5
Comb	(121)	(121)	(126)	(126)	(127)	(127)	(128)	(130)	(130)	(131)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	192.1	180.3	180.3	169.3	159.6	159.6	157.8	157.8	157.9	157.9
Mdxt	1973.3	1305.0	1706.9	1574.3	-1193.4	-1570.0	-1176.4	-1553.2	-1177.3	-1556.0
Mdyt	-6947.3	-7529.3	-6923.3	-7240.8	-7006.3	-6442.4	-7109.5	-6550.4	-6947.5	-6381.2
Comb	(131)	(136)	(136)	(137)	(171)	(171)	(172)	(172)	(174)	(174)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	168.2	155.2	155.2	179.0	151.7	151.7	157.7	164.0	164.0	187.8
Mdxt	-1877.0	-1229.6	-1662.4	-2046.4	-1253.4	-1728.9	-1166.9	1243.5	1653.7	1597.3
Mdyt	-6388.9	-7596.4	-7057.8	-6496.4	-8099.4	-7582.3	-7115.8	-6869.5	-6321.8	-7036.5
Comb	(180)	(177)	(177)	(181)	(182)	(182)	(183)	(185)	(185)	(186)

Carr	91	92	93	94	95	96
Fdzt	187.8	151.1	151.1	170.8	155.2	155.2
Mdxt	2100.4	1136.8	1580.2	1724.4	1129.9	1542.5
Mdyt	-6469.7	-7903.9	-7376.7	-6435.6	-7437.2	-6889.1
Comb	(186)	(187)	(187)	(191)	(192)	(192)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	186.4	186.4	185.1	185.7	185.1	188.0	188.0	192.7	192.7	190.3
Mdxt	-1881.5	-1435.9	-1864.3	-1860.8	-1423.4	-1912.2	-1458.3	-2090.1	-1592.8	-2016.9
Mdyt	-7971.0	-8513.3	-8057.5	-7923.3	-8615.9	-7920.5	-8454.0	-7935.6	-8492.2	-8031.8
Comb	(5)	(5)	(6)	(3)	(6)	(4)	(4)	(14)	(14)	(10)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	190.3	183.0	183.0	200.9	200.9	180.3	180.3	207.6	207.6	194.8
Mdxt	-1537.2	-1910.6	-1459.1	-2239.8	-1695.8	-1928.5	-1473.9	2148.6	1571.6	1825.1
Mdyt	-8580.8	-8463.1	-9093.0	-8012.9	-8547.8	-8881.7	-9585.8	-7948.3	-8513.8	-7947.2
Comb	(10)	(11)	(11)	(15)	(15)	(16)	(16)	(20)	(20)	(25)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	194.8	172.0	172.0	169.9	174.2	174.2	169.9	170.2	170.2	180.9
Mdxt	1367.3	-1724.8	-1316.5	-1738.2	-1768.8	-1348.5	-1327.7	-1700.7	-1299.3	-2022.2
Mdyt	-8501.9	-7407.0	-7911.8	-8068.2	-7335.0	-7827.4	-8657.3	-7337.0	-7831.9	-7356.5
Comb	(25)	(60)	(60)	(122)	(59)	(59)	(122)	(63)	(63)	(69)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	177.6	177.6	167.2	167.2	192.7	192.7	163.3	163.3	176.4	176.4
Mdxt	-1918.1	-1461.3	-1766.5	-1349.6	-2248.8	-1687.8	-1791.6	-1370.7	1692.1	1294.2
Mdyt	-7494.0	-8008.4	-8110.2	-8740.1	-7467.1	-7961.3	-8708.1	-9444.2	-7264.8	-7780.5
Comb	(65)	(65)	(66)	(66)	(70)	(70)	(71)	(71)	(74)	(74)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	202.2	202.2	162.5	184.0	184.0	166.6	173.2	173.2	171.9	172.5
Mdxt	2291.8	1661.7	1180.4	1835.6	1369.9	1181.8	-1708.6	-1304.6	-1691.4	-1687.8
Mdyt	-7374.7	-7912.6	-9161.7	-7373.2	-7895.8	-8952.4	-7576.0	-8077.6	-7662.6	-7528.4
Comb	(75)	(75)	(76)	(80)	(80)	(132)	(116)	(116)	(117)	(114)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	171.9	174.8	174.8	177.1	177.1	187.7	187.7	167.1	167.1	176.3
Mdxt	-1292.0	-1739.4	-1326.9	-1844.7	-1405.9	-2078.4	-1564.4	-1756.2	-1342.5	1647.1

Mdyt	-8180.2	-7525.5	-8018.3	-7636.9	-8145.1	-7618.0	-8112.1	-8486.8	-9150.2	-7476.4
Comb	(117)	(115)	(115)	(121)	(121)	(126)	(126)	(127)	(127)	(130)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	176.3	194.4	194.4	181.6	181.6	159.8	159.8	157.9	157.9	158.0
Mdxt	1261.4	2069.3	1518.6	1747.2	1314.4	-1564.9	-1195.0	-1540.3	-1177.0	-1540.6
Mdyt	-7985.6	-7553.4	-8078.1	-7552.3	-8066.3	-7041.8	-7508.9	-7165.4	-7655.5	-6971.7
Comb	(130)	(131)	(131)	(136)	(136)	(171)	(171)	(172)	(172)	(174)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	158.0	170.1	165.4	165.4	155.0	155.0	168.7	180.5	151.1	151.1
Mdxt	-1177.7	-1869.4	-1759.0	-1339.8	-1607.1	-1228.1	-1863.2	-2099.7	-1632.5	-1249.2
Mdyt	-7428.9	-6977.7	-7128.7	-7605.4	-7744.9	-8337.1	-6991.2	-7101.8	-8342.9	-9041.2
Comb	(174)	(175)	(176)	(176)	(177)	(177)	(180)	(181)	(182)	(182)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	164.2	164.2	190.0	190.0	150.3	150.3	163.3	171.8	171.8	154.9
Mdxt	1629.7	1245.2	2216.9	1612.7	1473.0	1131.5	1530.0	1762.7	1321.0	1468.6
Mdyt	-6899.5	-7377.5	-7009.5	-7509.7	-8107.7	-8758.7	-6941.5	-7007.9	-7492.8	-7549.2
Comb	(185)	(185)	(186)	(186)	(187)	(187)	(190)	(191)	(191)	(192)
Carr	91									

Fdzt 154.9

Mdxt 1127.7

Mdyt -8101.7

Comb (192)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	193.4	193.4	192.0	192.7	192.7	195.1	195.1	192.0	201.2	201.2
Mdxt	-1922.3	-1466.7	-1898.4	-1899.4	-1450.2	-1967.5	-1496.3	-1449.4	-2179.3	-1633.6
Mdyt	-7167.4	-8959.2	-7236.0	-7122.8	-8902.9	-7131.5	-8902.6	-9061.2	-7160.2	-8922.7
Comb	(5)	(5)	(6)	(3)	(3)	(4)	(4)	(6)	(9)	(9)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	197.6	197.6	189.9	189.9	199.9	209.0	209.0	187.1	187.1	216.2
Mdxt	-2061.3	-1566.2	-1916.8	-1463.8	-1615.7	-2384.7	-1759.5	-1906.0	-1456.9	2371.1
Mdyt	-7236.9	-9034.9	-7575.6	-9542.8	-8939.5	-7265.0	-9021.7	-7922.2	-10038.1	-7066.1
Comb	(10)	(10)	(11)	(11)	(14)	(15)	(15)	(16)	(16)	(20)

Carr 21 22 23 24 25 26 27 28 29 30

Fdzt	216.2	202.4	202.4	177.9	177.9	178.6	180.3	180.3	175.1	175.1
Mdxt	1697.0	1951.8	1449.7	-1760.7	-1343.4	-1745.4	-1831.5	-1385.7	-1740.1	-1329.6
Mdyt	-8899.4	-7107.1	-8918.6	-6656.2	-8321.7	-6803.4	-6604.8	-8240.9	-7211.6	-9073.0
Comb	(20)	(25)	(25)	(60)	(60)	(116)	(59)	(59)	(122)	(122)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	189.0	189.0	183.8	183.8	172.9	172.9	187.2	200.1	200.1	168.9
Mdxt	-2132.6	-1581.8	-1965.0	-1485.5	-1752.9	-1339.3	-1556.1	-2423.9	-1761.7	-1737.3
Mdyt	-6645.8	-8269.5	-6755.3	-8429.9	-7239.3	-9155.4	-8293.6	-6795.5	-8411.1	-7734.4
Comb	(64)	(64)	(65)	(65)	(66)	(66)	(69)	(70)	(70)	(71)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	168.9	182.4	182.4	210.5	210.5	181.7	190.8	190.8	177.2	178.6
Mdxt	-1329.4	1727.3	1322.1	2560.6	1800.6	1681.9	1970.8	1447.4	-1721.5	-1332.5
Mdyt	-9863.0	-6498.0	-8160.5	-6511.3	-8236.3	-6692.7	-6570.1	-8263.8	-6871.9	-8489.4
Comb	(71)	(74)	(74)	(75)	(75)	(130)	(80)	(80)	(117)	(116)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	177.9	177.8	177.8	180.3	180.3	177.2	186.3	186.3	182.7	182.7
Mdxt	-1711.7	-1722.4	-1315.9	-1794.6	-1362.1	-1315.2	-2006.8	-1499.3	-1888.6	-1431.9
Mdyt	-6767.0	-6758.8	-8433.0	-6767.5	-8432.8	-8591.4	-6796.2	-8452.9	-6872.8	-8565.1

Comb	(113)	(114)	(114)	(115)	(115)	(117)	(120)	(120)	(121)	(121)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	185.1	194.1	194.1	172.2	172.2	181.7	201.4	201.4	187.6	187.6
Mdxt	-1481.4	-2212.3	-1625.3	-1729.3	-1322.7	1288.7	2271.3	1623.8	1853.9	1376.4
Mdyt	-8469.6	-6901.0	-8551.9	-7558.2	-9568.3	-8376.5	-6702.0	-8429.5	-6743.1	-8448.8
Comb	(125)	(126)	(126)	(127)	(127)	(130)	(131)	(131)	(136)	(136)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	164.2	164.2	163.1	166.6	166.6	162.2	162.2	175.2	175.2	170.1
Mdxt	-1597.4	-1219.3	-1564.2	-1671.6	-1261.7	-1562.8	-1194.6	-1973.3	-1457.6	-1805.5
Mdyt	-6319.5	-7887.1	-6255.7	-6268.1	-7806.3	-6417.4	-8032.9	-6309.2	-7835.0	-6418.6
Comb	(171)	(171)	(169)	(170)	(170)	(172)	(172)	(175)	(175)	(176)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	170.1	159.2	159.2	173.5	173.5	186.4	186.4	155.1	155.1	168.7
Mdxt	-1361.4	-1589.4	-1215.1	-1881.7	-1432.0	-2264.4	-1637.5	-1573.9	-1205.2	1640.6
Mdyt	-7995.3	-6902.6	-8720.8	-6290.7	-7859.0	-6458.8	-7976.5	-7397.7	-9428.5	-6161.3
Comb	(176)	(177)	(177)	(180)	(180)	(181)	(181)	(182)	(182)	(185)
Carr	91	92	93	94	95	96	97	98		
Fdzt	168.7	196.8	196.8	154.1	167.8	167.8	177.1	177.1		

Mdxt	1254.3	2466.3	1732.9	1084.0	1574.7	1200.3	1879.2	1379.7
Mdyt	-7726.0	-6174.6	-7801.7	-9146.4	-6209.1	-7767.4	-6233.4	-7829.3
Comb	(185)	(186)	(186)	(187)	(190)	(190)	(191)	(191)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	206.5	206.5	206.3	205.1	205.7	208.3	208.3	205.1	214.8	214.8
Mdxt	-2066.4	-1552.7	-2484.2	-1529.2	-1531.3	-2135.5	-1592.0	-2024.3	-2407.3	-1753.4
Mdyt	-4542.5	-7216.2	-4534.0	-7283.4	-7166.0	-4543.8	-7187.3	-4564.0	-4633.7	-7251.8
Comb	(5)	(5)	(126)	(6)	(3)	(4)	(4)	(6)	(9)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	211.0	211.0	203.1	203.1	205.4	223.3	223.3	200.4	200.4	231.3
Mdxt	-2251.8	-1662.8	-2015.7	-1528.1	-2023.9	-2682.7	-1913.2	-1969.5	-1503.1	2708.5
Mdyt	-4633.7	-7308.4	-4731.0	-7637.5	-4621.2	-4779.6	-7384.0	-4890.1	-7994.2	-4289.2
Comb	(10)	(10)	(11)	(11)	(17)	(15)	(15)	(16)	(16)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	231.3	199.4	216.3	216.3	202.7	189.5	189.5	189.6	192.0	192.0

Mdxt	1909.0	-2020.1	2146.6	1587.7	-2025.7	-1893.6	-1421.4	-1407.1	-1992.1	-1477.4
Mdyt	-7038.0	-4840.0	-4414.3	-7121.4	-4678.7	-4211.7	-6696.9	-6822.2	-4213.6	-6655.5
Comb	(20)	(21)	(25)	(25)	(26)	(60)	(60)	(116)	(59)	(59)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	187.4	187.4	201.3	201.3	195.8	195.8	184.6	184.6	187.9	197.7
Mdxt	-1833.4	-1387.8	-2377.8	-1708.0	-2157.6	-1578.7	-1821.1	-1386.1	-1832.7	-2583.4
Mdyt	-4242.4	-6792.9	-4342.1	-6747.7	-4341.9	-6828.5	-4481.0	-7298.7	-4324.2	-4323.3
Comb	(61)	(61)	(64)	(64)	(65)	(65)	(66)	(66)	(72)	(181)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	199.2	213.4	213.4	180.6	180.6	194.0	194.0	224.8	224.8	224.8
Mdxt	-1632.0	-2767.2	-1936.4	-1767.8	-1350.5	1814.9	1389.1	2273.5	2982.6	2048.2
Mdyt	-6719.5	-4550.5	-6936.7	-4708.3	-7808.2	-4051.6	-6524.0	299.8	-3809.4	-6442.3
Comb	(69)	(70)	(70)	(71)	(71)	(74)	(74)	(75)	(75)	(75)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	179.2	193.3	193.3	203.4	203.4	184.0	191.4	191.4	188.2	197.9
Mdxt	-1827.3	1781.3	1357.5	2195.3	1589.2	-1835.4	-1936.5	-1446.3	-1383.6	-2208.8
Mdyt	-4636.6	-4096.1	-6568.7	-4028.6	-6561.4	-4406.3	-4298.2	-6793.3	-6889.4	-4388.2
Comb	(76)	(79)	(79)	(80)	(80)	(81)	(115)	(115)	(117)	(120)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	197.9	194.0	194.0	186.2	188.5	206.3	183.4	183.4	192.8	192.8
Mdxt	-1607.8	-2053.1	-1517.2	-1816.4	-1824.6	-1767.7	-1776.8	-1357.5	1770.0	1356.4
Mdyt	-6857.8	-4388.0	-6914.3	-4485.4	-4375.6	-6990.1	-4644.5	-7600.1	-4184.8	-6701.2
Comb	(120)	(121)	(121)	(122)	(128)	(126)	(127)	(127)	(130)	(130)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	214.3	214.3	182.4	199.3	199.3	185.8	173.8	173.8	172.5	176.3
Mdxt	2594.7	1817.8	-1821.0	2036.2	1496.5	-1826.5	-1709.3	-1286.7	-1256.1	-1808.3
Mdyt	-4043.6	-6644.0	-4594.4	-4168.7	-6727.4	-4433.1	-3984.5	-6332.5	-6260.7	-3986.4
Comb	(131)	(131)	(132)	(136)	(136)	(137)	(171)	(171)	(169)	(170)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	176.3	171.8	171.8	185.6	185.6	180.1	180.1	168.9	168.9	172.2
Mdxt	-1342.7	-1649.0	-1253.1	-2194.2	-1573.4	-1974.0	-1444.0	-1638.8	-1251.5	-1648.3
Mdyt	-6290.9	-4015.2	-6428.5	-4114.9	-6383.3	-4114.8	-6464.1	-4253.9	-6934.2	-4097.1
Comb	(170)	(172)	(172)	(175)	(175)	(176)	(176)	(177)	(177)	(183)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	183.5	183.5	197.7	165.0	165.0	178.3	178.3	209.1	209.1	209.1
Mdxt	-2026.4	-1497.2	-1801.7	-1589.4	-1215.8	1708.3	1304.7	2193.9	2874.3	1963.8

Mdyt -4034.3 -6355.1 -6572.2 -4481.2 -7443.8 -3824.5 -6159.6 302.9 -3585.1 -6077.9

Comb (180) (180) (181) (182) (182) (185) (185) (186) (186) (186)

Carr 101 102 103 104 105 106

Fdzt 163.5 177.6 177.6 187.7 187.7 168.4

Mdxt -1643.3 1680.0 1273.1 2091.7 1504.7 -1651.2

Mdyt -4409.5 -3869.0 -6204.3 -3801.5 -6196.9 -4179.1

Comb (187) (190) (190) (191) (191) (192)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr 1 2 3 4 5 6 7 8 9 10

Fdzt 224.8 224.3 224.3 222.5 224.7 222.5 227.5 227.5 227.5 225.6

Mdxt -1718.2 -2851.4 -2015.4 -2252.9 -1679.0 -1717.0 -1819.6 -2390.2 -1760.7 -1755.1

Mdyt 2117.3 -1887.1 -4019.1 -1633.5 -3852.6 2439.2 2018.0 -1603.1 -3909.3 2107.6

Comb (37) (126) (126) (11) (2) (11) (4) (4) (4) (5)

Carr 11 12 13 14 15 16 17 18 19 20

Fdzt 224.5 234.5 232.4 232.4 230.4 230.4 230.4 222.5 232.7 243.7

Mdxt -1677.5 -2081.2 -3216.9 -2241.6 -1935.2 -2544.4 -1849.2 -1671.9 -1963.6 -2350.6

Mdyt	-3894.4	1782.8	-2079.3	-4138.8	1966.1	-1690.1	-4018.2	-4031.0	1937.9	1548.6
Comb	(17)	(9)	(70)	(70)	(10)	(10)	(10)	(11)	(14)	(15)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	243.7	243.7	219.9	219.2	219.9	228.8	252.5	252.5	252.5	218.5
Mdxt	-3087.8	-2183.8	-1680.7	-2721.9	-1637.1	-1636.0	2360.9	3103.3	2209.4	-1714.8
Mdyt	-2010.2	-4267.0	2724.1	-1771.4	-4150.6	2218.9	2782.3	-1417.6	-3484.1	2573.6
Comb	(15)	(15)	(16)	(64)	(16)	(19)	(20)	(20)	(20)	(21)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	218.5	218.5	228.4	236.2	236.2	236.2	221.8	225.6	224.8	224.8
Mdxt	-2251.3	-1674.3	-1648.8	1820.9	2389.1	1776.9	-1678.4	-1702.3	-1702.3	-1718.0
Mdyt	-1668.6	-4119.6	2199.8	2418.6	-1499.4	-3692.4	-3986.0	2136.1	2178.6	2116.9
Comb	(21)	(21)	(24)	(25)	(25)	(25)	(26)	(29)	(31)	(34)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	224.8	224.7	224.8	224.9	224.7	224.8	206.5	208.0	208.0	204.5
Mdxt	-1717.8	-1719.9	-1717.6	-1716.6	-1718.8	-1718.3	-1605.5	-2153.2	-1592.4	-1550.4
Mdyt	2117.1	2113.1	2117.5	2118.6	2115.0	2116.6	1974.0	-1484.3	-3661.4	2102.4
Comb	(35)	(36)	(39)	(40)	(41)	(48)	(60)	(115)	(115)	(61)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	211.0	211.0	211.0	204.5	204.9	219.2	219.2	213.4	214.4	214.4
Mdxt	-1755.4	-2307.7	-1680.9	-2032.7	-1518.3	-2071.2	-1933.9	-1862.7	-2997.8	-2086.0
Mdyt	1887.9	-1567.1	-3770.3	-1461.2	-3606.6	1510.1	-3855.0	1771.7	-1965.5	-3909.6
Comb	(121)	(121)	(121)	(61)	(72)	(64)	(64)	(65)	(181)	(181)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	202.0	201.2	202.0	204.9	216.7	216.7	216.7	232.4	198.4	198.4
Mdxt	-1551.0	-2503.4	-1510.4	-2026.3	-1903.3	-2503.1	-1803.0	-2456.1	-1499.1	-1965.2
Mdyt	2447.7	-1657.7	-3801.6	-1516.9	1731.5	-1615.0	-3743.3	1175.3	2854.6	-1607.8
Comb	(66)	(175)	(66)	(67)	(69)	(69)	(69)	(70)	(71)	(71)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	198.4	204.9	211.2	211.2	211.2	245.0	245.0	245.0	196.4	196.4
Mdxt	-1460.7	-2025.6	1516.2	1982.1	1504.6	2656.4	3475.3	2416.2	-1547.8	-2032.3
Mdyt	-3972.5	-1539.9	2133.0	-1387.8	-3419.3	2937.9	-1231.4	-3020.3	2639.6	-1589.9
Comb	(71)	(72)	(74)	(74)	(74)	(75)	(75)	(75)	(76)	(76)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	196.4	210.6	210.6	221.6	221.6	221.6	201.1	206.1	204.7	207.2
Mdxt	-1513.8	1945.7	1485.0	1884.9	2478.6	1798.3	-1519.6	-1575.4	-1536.8	-1497.5
Mdyt	-3928.1	-1402.3	-3455.8	2418.1	-1348.2	-3318.0	-3737.4	2029.5	2119.4	2091.3

Comb	(76)	(79)	(79)	(80)	(80)	(80)	(81)	(116)	(117)	(141)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	205.3	205.4	205.2	205.4	205.4	205.3	205.3	208.0	205.0	213.3
Mdxt	-1552.7	-1552.2	-1555.1	-1551.9	-1550.5	-1553.6	-1552.8	-1639.9	-1509.2	-1783.8
Mdyt	1987.3	1987.5	1981.9	1988.1	1989.6	1984.6	1986.8	1939.9	-3646.5	1859.8
Comb	(93)	(90)	(91)	(94)	(95)	(96)	(103)	(115)	(128)	(125)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	224.3	200.4	200.4	200.4	209.4	209.4	209.4	233.1	233.1	233.1
Mdxt	-2170.8	-1500.9	-1966.6	-1468.7	1470.7	1919.6	1467.8	2268.8	2979.7	2105.9
Mdyt	1470.5	2646.0	-1580.1	-3902.8	2140.8	-1426.1	-3515.6	2704.3	-1316.6	-3236.3
Comb	(126)	(127)	(127)	(127)	(130)	(130)	(130)	(131)	(131)	(131)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	199.1	199.1	199.1	209.0	216.7	216.7	216.7	188.5	188.5	188.5
Mdxt	-1534.9	-2013.9	-1506.0	-1469.0	1728.8	2270.8	1673.3	-1439.2	-1887.6	-1407.1
Mdyt	2495.5	-1567.6	-3871.7	2121.8	2340.4	-1398.4	-3444.6	1901.6	-1364.7	-3367.1
Comb	(132)	(132)	(132)	(135)	(136)	(136)	(136)	(171)	(171)	(171)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	186.5	191.2	191.2	191.2	186.5	186.9	201.2	201.2	195.4	195.4

Mdxt	-1384.1	-1531.3	-2011.6	-1481.5	-1812.9	-1362.7	-1905.0	-1778.2	-1696.5	-2231.0
Mdyt	2030.0	1773.7	-1384.1	-3398.5	-1367.8	-3377.3	1437.8	-3625.9	1699.4	-1508.3
Comb	(172)	(170)	(170)	(170)	(172)	(183)	(175)	(175)	(176)	(176)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	195.4	184.0	184.0	184.0	186.9	198.7	198.7	198.7	214.4	180.4
Mdxt	-1608.0	-1384.8	-1815.1	-1354.7	-1806.4	-1737.0	-2284.4	-1647.4	-2289.8	-1332.9
Mdyt	-3554.1	2375.4	-1446.4	-3572.4	-1403.2	1659.3	-1501.3	-3514.2	1103.1	2782.3
Comb	(176)	(177)	(177)	(177)	(178)	(180)	(180)	(180)	(181)	(182)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	180.4	180.4	186.9	193.2	193.2	193.2	227.0	227.0	227.0	178.4
Mdxt	-1745.4	-1304.9	-1805.6	1430.9	1874.0	1408.8	2571.1	3356.6	2320.3	-1381.6
Mdyt	-1514.4	-3743.3	-1426.2	2060.7	-1294.4	-3190.2	2865.5	1167.7	-2791.2	2567.3
Comb	(182)	(182)	(183)	(185)	(185)	(185)	(186)	(186)	(186)	(187)
Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	178.4	178.4	192.6	192.6	203.6	203.6	203.6	183.1	187.3	188.5
Mdxt	-1813.0	-1358.2	1837.8	1389.1	1799.6	2366.7	1702.4	-1364.0	-1386.5	-1363.7
Mdyt	-1496.5	-3698.9	-1308.9	-3226.7	2345.8	-1254.8	-3088.8	-3508.2	1915.5	1942.4
Comb	(187)	(187)	(190)	(190)	(191)	(191)	(191)	(192)	(203)	(195)

Carr	161	162	163	164	165	166	167	168	169
Fdzt	190.1	190.1	187.3	187.4	187.2	187.4	187.5	187.3	187.3
Mdxt	1328.7	1733.6	-1386.5	-1385.9	-1388.8	-1385.6	-1384.2	-1387.4	-1386.5
Mdyt	1989.9	-1327.0	1915.0	1915.2	1909.6	1915.7	1917.2	1912.3	1914.5
Comb	(196)	(196)	(204)	(201)	(202)	(205)	(206)	(207)	(214)

17.6.9 P1-h

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	162.2	162.2	163.8	161.2	160.8	160.8	162.7	162.7	163.6	162.9
Mdxt	-1755.6	-2535.7	-1520.4	-1469.1	-1837.2	-2638.1	-1448.9	-2132.5	-1541.3	-1475.6
Mdyt	-1746.6	-771.4	921.3	1037.3	-1739.2	-762.2	-1503.8	-609.2	918.0	906.8
Comb	(182)	(182)	(9)	(17)	(71)	(71)	(4)	(4)	(14)	(6)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	161.7	161.9	163.6	163.6	165.5	165.5	165.8	165.5	161.4	168.2
Mdxt	-1373.8	-1427.8	-1531.6	-2253.6	-1641.9	-2391.5	-1616.1	-1641.9	-1354.2	-1794.5

Mdyt	969.4	920.9	-1496.8	-606.5	-1637.6	-662.9	915.1	876.9	1018.8	-1741.8
Comb	(7)	(8)	(14)	(14)	(11)	(11)	(10)	(11)	(12)	(16)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	168.2	169.4	168.2	162.6	162.6	170.1	170.1	169.1	168.6	162.9
Mdxt	-2595.7	-1698.4	-1793.3	-1705.9	-2471.5	1622.4	2371.2	1401.6	1502.9	-1377.1
Mdyt	-730.6	928.0	845.9	-1449.7	-587.6	-1727.6	-722.2	937.3	858.8	922.2
Comb	(16)	(15)	(16)	(70)	(70)	(132)	(132)	(20)	(21)	(24)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	165.3	167.7	167.7	166.2	153.3	153.3	150.8	153.0	153.0	153.0
Mdxt	-1319.2	1510.2	2216.9	1391.4	-1377.6	-2024.1	-1369.6	-1345.4	-1343.3	-1977.9
Mdyt	924.4	-1629.0	-659.6	888.4	-1449.2	-586.9	1034.0	864.5	-1399.3	-567.0
Comb	(25)	(137)	(137)	(26)	(61)	(61)	(72)	(59)	(59)	(59)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	154.5	154.3	152.8	151.8	154.3	154.3	157.0	157.0	157.4	157.0
Mdxt	-1443.0	-1472.8	-1265.7	-1310.5	-1461.6	-2150.9	-1619.0	-2349.7	-1579.6	-1616.6
Mdyt	868.3	863.4	949.2	867.7	-1389.3	-563.0	-1590.5	-654.6	859.6	804.9
Comb	(64)	(69)	(188)	(63)	(69)	(69)	(66)	(66)	(65)	(66)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	151.4	151.4	151.0	162.6	160.8	150.8	150.8	154.8	154.8	152.5
Mdxt	-1337.8	-1976.2	-1205.5	-1697.2	-1832.6	-1360.1	-2008.1	1322.9	1954.4	1262.0
Mdyt	-1346.5	-545.8	1007.6	877.8	760.6	-1307.3	-530.1	-1385.7	-561.6	996.3
Comb	(77)	(77)	(67)	(70)	(71)	(72)	(72)	(185)	(185)	(178)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	162.8	162.8	162.2	161.4	153.4	159.3	159.3	156.7	157.9	162.9
Mdxt	1743.9	2521.4	1487.1	1631.8	-1241.5	1583.6	2306.2	1297.8	1472.5	1282.8
Mdyt	-1715.1	-745.1	891.2	779.2	875.0	-1574.1	-643.1	872.6	821.3	1006.5
Comb	(187)	(187)	(75)	(76)	(184)	(192)	(192)	(80)	(81)	(123)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	169.7	169.7	164.5	170.7	170.7	170.7	170.1	163.1	166.8	167.7
Mdxt	-1706.6	-2482.9	1328.7	1527.9	2243.8	1511.8	1613.1	-1365.9	1379.3	1501.6
Mdyt	-1749.7	-740.5	914.9	-1515.0	-614.1	925.0	846.5	973.5	912.0	876.1
Comb	(127)	(127)	(130)	(131)	(131)	(131)	(132)	(133)	(136)	(137)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	164.7	164.7	154.7	154.7	153.0	153.0	158.4	158.4	152.5	152.5
Mdxt	1303.1	1926.6	-1296.2	-1914.6	1241.4	1834.7	-1537.6	-2243.8	1259.0	1861.8
Mdyt	-1537.9	-623.0	-1456.5	-589.9	-1369.6	-555.1	-1597.8	-663.8	-1330.8	-539.6

Comb	(142)	(142)	(172)	(172)	(173)	(173)	(177)	(177)	(178)	(178)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	155.1	155.1	154.8	163.6	163.6	163.6	162.8	154.6	154.6	158.1
Mdxt	1287.7	1899.7	1327.5	1608.8	2345.1	1589.2	1734.0	1264.2	1866.5	1399.9
Mdyt	-1444.1	-585.0	865.3	-1411.3	-572.3	879.8	767.7	-1398.6	-566.8	861.3
Comb	(197)	(197)	(185)	(186)	(186)	(186)	(187)	(190)	(190)	(191)
Carr	101									
Fdzt	159.3									
Mdxt	1574.7									
Mdyt	810.0									
Comb	(192)									

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	157.7	157.7	156.3	156.3	157.6	157.6	158.3	158.3	159.2	159.2
Mdxt	-1723.6	-2486.9	-1807.0	-2591.2	-1377.1	-2038.4	-1406.4	-2076.0	-1475.7	-2187.4
Mdyt	-6484.2	-4430.6	-6567.0	-4478.5	-6104.8	-4106.1	-6098.2	-4101.9	-6074.1	-4086.0

Comb	(182)	(182)	(71)	(71)	(3)	(3)	(4)	(4)	(14)	(14)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	161.0	161.0	163.6	163.6	164.0	164.0	161.7	161.7	149.0	149.0
Mdxt	-1604.1	-2338.4	-1758.1	-2541.8	1489.4	2185.1	1376.9	2028.5	-1340.2	-1971.8
Mdyt	-6453.9	-4364.9	-6728.9	-4568.6	-6662.4	-4519.4	-6402.3	-4326.8	-5800.4	-3910.8
Comb	(11)	(11)	(16)	(16)	(21)	(21)	(26)	(26)	(61)	(61)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	146.5	146.5	148.7	148.7	147.3	147.3	150.0	150.0	152.6	152.6
Mdxt	-1306.0	-1943.5	-1304.4	-1924.6	-1206.5	-1781.1	-1403.4	-2083.8	-1586.9	-2301.1
Mdyt	-5787.1	-3831.1	-5666.0	-3811.9	-5728.8	-3827.2	-5631.6	-3789.3	-6174.2	-4187.7
Comb	(72)	(72)	(59)	(59)	(62)	(62)	(69)	(69)	(66)	(66)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	146.7	146.7	158.2	158.2	148.2	148.2	156.9	156.9	153.5	153.5
Mdxt	-1184.7	-1750.2	-1687.3	-2440.7	1219.2	1807.6	1619.8	2350.6	1459.1	2133.1
Mdyt	-5775.0	-3832.7	-5780.5	-3899.0	-5692.2	-3784.7	-6472.0	-4408.4	-6100.5	-4133.3
Comb	(67)	(67)	(70)	(70)	(178)	(178)	(76)	(76)	(81)	(81)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	158.3	158.3	166.5	166.5	165.6	165.6	160.0	160.0	163.2	163.2

Mdxt 1725.9 2490.9 -1584.4 -2316.0 1603.9 2341.0 1258.8 1861.5 1491.4 2187.0

Mdyt -6389.3 -4360.5 -6088.7 -4110.9 -6572.8 -4467.5 -5999.1 -4042.0 -6312.7 -4274.9

Comb (187) (187) (126) (126) (132) (132) (135) (135) (137) (137)

Carr 51 52 53 54 55 56 57 58 59 60

Fdzt 149.2 148.7 154.5 154.5 150.5 150.5 159.3 159.3 150.8 150.8

Mdxt 1173.7 1783.9 -1465.7 -2143.8 1279.4 1897.7 1614.1 2346.4 1265.3 1865.6

Mdyt -5606.6 -3779.2 -5721.6 -3867.2 -5546.1 -3733.3 -5591.3 -3771.4 -5681.5 -3836.2

Comb (168) (173) (176) (176) (185) (185) (186) (186) (197) (197)

Carr 61 62 63 64

Fdzt 155.0 155.0 150.1 150.1

Mdxt 1565.2 2276.0 1209.5 1786.9

Mdyt -6017.6 -4085.3 -5598.1 -3774.4

Comb (192) (192) (196) (196)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr 1 2 3 4 5 6 7 8 9 10

Fdzt 135.3 135.3 135.0 135.8 135.8 135.8 136.4 136.4 138.3 138.3

Mdxt	-1539.9	-2222.2	-1216.0	-1755.2	-1193.8	-1770.7	-1225.4	-1811.4	-1417.2	-2069.0
Mdyt	-10360.4	-7773.1	-9894.0	-7298.1	-9797.1	-7295.2	-9786.2	-7289.6	-10414.6	-7779.6
Comb	(182)	(182)	(17)	(2)	(3)	(3)	(4)	(4)	(11)	(11)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	140.2	140.2	142.7	142.7	135.0	142.8	142.8	140.9	140.9	139.1
Mdxt	-1564.4	-2264.9	-1501.8	-2175.2	-1810.5	1433.8	2086.1	1315.7	1926.1	1209.7
Mdyt	-10897.0	-8157.2	-9884.1	-7379.5	-7295.1	-10417.3	-7784.6	-10740.1	-8032.2	-10285.3
Comb	(16)	(16)	(15)	(15)	(17)	(132)	(132)	(21)	(21)	(26)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	139.1	128.2	128.2	126.1	127.2	128.1	128.1	126.8	126.8	130.8
Mdxt	1780.0	-1170.3	-1724.4	-1123.2	-1620.3	-1136.7	-1678.8	-1049.1	-1547.9	-1410.7
Mdyt	-7677.0	-9308.2	-6943.9	-9226.1	-6770.6	-9072.0	-6762.7	-9153.7	-6775.3	-9969.6
Comb	(26)	(61)	(61)	(72)	(58)	(59)	(59)	(62)	(62)	(66)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	130.8	132.1	132.1	126.2	126.2	129.3	129.3	137.1	137.1	133.5
Mdxt	-2045.0	-1380.4	-2006.0	-1031.7	-1523.2	-1215.3	-1810.3	-1531.4	-2204.3	-1621.0
Mdyt	-7462.7	-9272.6	-6923.6	-9211.4	-6775.9	-9045.9	-6753.1	-9211.9	-6891.1	-10658.9
Comb	(66)	(65)	(65)	(67)	(67)	(69)	(69)	(70)	(70)	(71)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	133.5	126.1	128.1	136.2	136.2	134.4	134.4	132.0	132.0	137.1
Mdxt	-2320.8	-1677.4	1054.8	1557.0	2235.8	1447.6	2091.9	1296.3	1889.7	1082.2
Mdyt	-8002.1	-6770.6	-8912.9	-10136.1	-7594.5	-10434.7	-7823.5	-9784.9	-7316.0	-9561.0
Comb	(71)	(72)	(178)	(187)	(187)	(76)	(76)	(81)	(81)	(123)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	137.1	144.6	144.6	142.2	142.2	144.4	144.4	141.1	141.1	128.1
Mdxt	1600.1	-1414.3	-2062.6	-1476.9	-2155.5	1385.2	2023.5	1327.8	1942.7	1565.6
Mdyt	-7051.2	-9561.3	-7131.9	-10574.2	-7909.6	-9461.2	-7058.0	-9962.5	-7429.4	-6547.0
Comb	(123)	(126)	(126)	(127)	(127)	(131)	(131)	(137)	(137)	(178)
Carr	61	62	63	64	65	66	67	68	69	
Fdzt	129.1	130.4	130.3	138.5	138.5	130.1	130.4	129.9	129.9	
Mdxt	1519.7	1114.5	1648.6	1487.6	2150.3	1076.4	1641.6	1058.8	1563.5	
Mdyt	-6552.4	-8931.0	-6492.4	-8770.4	-6556.7	-8757.5	-6653.7	-8796.8	-6549.8	
Comb	(179)	(197)	(185)	(186)	(186)	(190)	(197)	(196)	(196)	

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	112.1	112.1	108.5	108.5	109.6	110.2	110.2	111.2	111.2	112.6
Mdxt	-1316.3	-1916.6	-1301.8	-1890.7	-1449.4	-1007.0	-1492.8	-1069.2	-1579.3	-1170.2
Mdyt	-16160.3	-13119.3	-15264.6	-12382.6	-11693.9	-14439.7	-11682.3	-14404.1	-11664.7	-14633.1
Comb	(16)	(16)	(182)	(182)	(3)	(4)	(4)	(9)	(9)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	112.6	109.0	109.0	109.6	115.9	115.9	115.4	115.4	113.0	113.0
Mdxt	-1717.7	-944.7	-1393.7	-1433.0	-1283.0	-1859.2	1211.1	1764.5	1092.5	1601.0
Mdyt	-11844.2	-14585.9	-11729.7	-11703.5	-14548.6	-11786.6	-15283.3	-12356.4	-15891.1	-12886.2
Comb	(10)	(12)	(12)	(13)	(15)	(15)	(132)	(132)	(21)	(21)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	110.2	110.4	110.4	103.2	103.2	102.1	102.1	103.5	103.5	104.7
Mdxt	-951.5	-918.3	-1368.3	-963.3	-1424.5	-896.7	-1343.1	-934.7	-1383.4	-1186.2
Mdyt	-14464.9	-14604.2	-11815.6	-13736.6	-11122.6	-13504.2	-10857.9	-13368.8	-10819.7	-14761.8
Comb	(30)	(31)	(31)	(61)	(61)	(77)	(77)	(59)	(59)	(66)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	104.7	106.3	106.3	101.6	101.6	111.7	111.3	111.3	107.5	107.5
Mdxt	-1728.2	-1376.4	-1982.1	-907.6	-1362.7	-1328.7	1206.0	1741.6	1220.2	1772.3

Mdyt	-11982.1	-15826.8	-12872.6	-13601.7	-10888.6	-13524.3	-13321.8	-10815.5	-15442.1	-12539.5
Comb	(66)	(71)	(71)	(72)	(72)	(70)	(75)	(75)	(76)	(76)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	106.1	106.1	103.7	103.7	111.4	111.4	114.6	114.6	118.3	118.3
Mdxt	1085.8	1586.7	816.8	1207.8	880.9	1303.2	-1235.8	-1814.5	-1202.5	-1754.5
Mdyt	-14438.7	-11702.1	-13603.7	-11010.1	-13978.1	-11199.9	-15552.5	-12589.6	-13940.8	-11256.8
Comb	(81)	(81)	(86)	(86)	(123)	(123)	(127)	(127)	(126)	(126)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	118.1	118.1	104.0	104.0	109.2	109.2	113.9	113.5	109.7	109.7
Mdxt	1201.3	1745.7	858.3	1277.3	-1093.1	-1606.0	-1254.2	1886.6	1330.1	1919.1
Mdyt	-13799.0	-11149.6	-13015.4	-10397.4	-13082.9	-10560.9	-12962.1	-10325.5	-14880.0	-12049.5
Comb	(131)	(131)	(178)	(178)	(176)	(176)	(181)	(186)	(187)	(187)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	79.6	79.6	78.7	78.7	79.9	79.9	80.8	80.8	82.6	82.6
Mdxt	-1006.1	-1489.8	-725.0	-1095.1	-750.7	-1121.2	-808.9	-1203.4	-939.8	-1402.0

Mdyt	-20375.5	-18113.1	-18388.4	-16210.8	-18167.4	-16104.2	-18119.3	-16077.3	-19564.5	-17317.5
Comb	(16)	(16)	(17)	(17)	(4)	(4)	(9)	(9)	(127)	(127)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	80.5	80.5	84.9	84.9	84.6	84.6	80.7	80.7	81.6	81.6
Mdxt	-781.4	-1174.8	-1008.2	-1477.2	848.3	1234.3	815.9	1214.7	674.2	994.8
Mdyt	-18147.6	-16103.6	-18282.2	-16218.4	-18094.4	-16067.8	-20021.8	-17775.2	-18201.5	-16143.5
Comb	(14)	(14)	(15)	(15)	(20)	(20)	(21)	(21)	(25)	(25)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	74.7	74.7	73.9	73.9	75.1	75.1	76.4	76.4	77.5	77.5
Mdxt	-1062.5	-1558.4	-654.3	-987.7	-697.6	-1039.5	-780.8	-1157.0	-1001.0	-1480.8
Mdyt	-19966.2	-17774.2	-16998.5	-14993.0	-16811.8	-14904.3	-16743.0	-14865.9	-19216.0	-17038.4
Comb	(71)	(71)	(77)	(77)	(59)	(59)	(64)	(64)	(182)	(182)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	73.4	73.4	76.0	76.0	82.2	82.2	81.8	81.8	76.3	76.3
Mdxt	-660.9	-1002.1	-741.4	-1116.1	-1065.4	-1544.1	975.9	1394.5	929.6	1377.4
Mdyt	-17127.4	-15056.6	-16783.4	-14903.4	-16975.8	-15067.5	-16707.5	-14852.3	-19460.9	-17291.5
Comb	(72)	(72)	(69)	(69)	(70)	(70)	(75)	(75)	(76)	(76)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	77.6	77.6	75.0	75.0	82.5	83.8	83.8	82.5	83.5	83.5
Mdxt	727.1	1064.2	595.0	879.6	-830.8	-742.6	-1106.1	-1242.7	-715.0	-1076.5
Mdyt	-16860.6	-14960.6	-17111.1	-15167.4	-18608.8	-17308.3	-15281.7	-16447.5	-17336.6	-15308.0
Comb	(80)	(80)	(86)	(86)	(122)	(120)	(120)	(122)	(125)	(125)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	87.8	87.8	83.7	83.7	87.5	87.5	82.8	82.8	80.6	80.6
Mdxt	-941.8	-1386.7	928.5	1376.9	961.0	1387.2	694.3	1023.7	-842.9	-1252.6
Mdyt	-17471.2	-15422.9	-19210.8	-16979.7	-17283.5	-15272.3	-17566.0	-15492.9	-16400.5	-14470.8
Comb	(126)	(126)	(132)	(132)	(131)	(131)	(142)	(142)	(176)	(176)

Carr	61	62	63	64	65	66
Fdzt	77.3	77.3	84.5	79.0	79.0	80.3
Mdxt	-845.4	-1259.1	1541.0	1034.0	1523.1	1215.8
Mdyt	-17850.8	-15795.4	-14116.5	-18710.9	-16555.7	-14224.8
Comb	(177)	(177)	(186)	(187)	(187)	(191)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	47.1	47.1	46.5	47.3	47.3	46.5	48.2	48.2	48.6	48.6
Mdxt	-724.9	-504.4	-727.4	-713.5	-495.1	-507.2	-930.5	-670.1	-890.9	-635.6
Mdyt	-17884.7	-18307.1	-18093.8	-17759.4	-18182.8	-18527.9	-19077.8	-19456.5	-17988.5	-18414.0
Comb	(5)	(5)	(6)	(4)	(4)	(6)	(127)	(127)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	45.6	45.6	47.7	47.7	51.3	51.3	44.7	44.7	51.0	51.0
Mdxt	-878.6	-632.0	-751.7	-524.7	-1030.7	-745.6	-994.2	-733.0	837.3	585.6
Mdyt	-19035.1	-19518.7	-17764.9	-18214.2	-17875.8	-18314.8	-20008.8	-20539.5	-17707.8	-18171.3
Comb	(11)	(11)	(14)	(14)	(15)	(15)	(16)	(16)	(20)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	46.1	46.1	48.5	48.5	46.9	46.9	47.0	47.0	43.5	43.5
Mdxt	773.0	544.6	611.7	415.3	689.2	476.7	-603.4	-411.4	-682.3	-475.8
Mdyt	-19620.3	-20105.7	-17800.4	-18237.9	-18704.1	-19148.1	-17962.6	-18385.6	-16910.3	-17318.7
Comb	(21)	(21)	(25)	(25)	(26)	(26)	(31)	(31)	(61)	(61)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	44.2	44.2	46.6	42.3	42.3	50.4	50.4	41.0	41.0	49.9
Mdxt	-1000.5	-740.1	-914.1	-895.1	-654.1	-1111.6	-816.5	-1055.3	-798.3	1006.8
Mdyt	-18784.8	-19190.5	-16759.7	-18254.9	-18734.0	-16598.7	-17014.1	-19645.9	-20192.2	-16358.8

Comb	(182)	(182)	(65)	(66)	(66)	(70)	(70)	(71)	(71)	(75)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	49.5	42.9	42.9	44.2	44.2	44.0	44.0	50.5	50.7	49.9
Mdxt	923.0	912.6	668.0	801.2	571.1	-605.6	-415.7	-441.6	-432.3	-650.9
Mdyt	-18689.3	-19090.9	-19572.5	-17782.2	-18204.7	-16470.3	-16855.6	-17224.1	-17100.0	-17162.8

Comb	(132)	(76)	(76)	(81)	(81)	(94)	(94)	(116)	(115)	(117)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	49.9	49.5	50.4	50.4	52.0	52.0	49.1	49.1	49.8	54.7
Mdxt	-444.4	660.7	842.4	592.9	-820.8	-572.8	-810.0	-569.1	395.9	-964.1
Mdyt	-17445.1	-19022.7	-17773.2	-18065.2	-17057.4	-17331.0	-18104.0	-18435.7	-17108.8	-16944.8

Comb	(117)	(132)	(137)	(137)	(121)	(121)	(122)	(122)	(123)	(126)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	54.7	54.4	54.4	51.9	51.9	49.7	53.6	53.6	47.3	47.8
Mdxt	-682.8	988.1	701.9	769.4	531.6	-851.4	-1052.7	-758.3	938.8	438.7
Mdyt	-17231.8	-16776.8	-17088.4	-16869.4	-17154.9	-15898.6	-15737.6	-16012.4	-16921.1	-15782.2

Comb	(126)	(131)	(131)	(136)	(136)	(176)	(181)	(181)	(192)	(185)
Carr	71	72	73	74	75	76				
Fdzt	53.1	53.1	46.1	46.1	47.7	47.7				

Mdxt	1142.7	834.5	1047.8	775.7	627.3	428.2
Mdyt	-15497.6	-15807.5	-18229.7	-18570.8	-15560.4	-15810.6
Comb	(186)	(186)	(187)	(187)	(190)	(190)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	16.5	16.5	16.4	16.4	16.8	16.8	15.9	15.9	16.2	16.2
Mdxt	-318.3	-231.5	-281.7	-200.8	-313.6	-226.8	-317.2	-232.1	-444.2	-345.1
Mdyt	-14666.5	-19210.0	-14596.1	-19105.9	-14560.9	-19078.2	-14835.9	-19441.1	-15693.5	-20423.4
Comb	(5)	(5)	(2)	(2)	(4)	(4)	(6)	(6)	(127)	(127)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	17.4	17.4	17.6	17.6	14.3	14.3	16.1	16.1	17.3	17.1
Mdxt	-370.4	-274.0	-436.4	-332.5	-409.0	-320.0	-281.9	-201.9	-361.5	-247.4
Mdyt	-14526.5	-19066.7	-14751.5	-19317.3	-15599.7	-20473.8	-14694.6	-19132.1	-17993.0	-19102.7
Comb	(9)	(9)	(10)	(10)	(11)	(11)	(17)	(17)	(65)	(14)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	19.8	19.8	12.7	12.7	19.4	19.4	14.1	14.1	17.6	17.6

Mdxt	-547.7	-425.9	-471.1	-386.8	423.4	314.1	327.6	246.8	448.0	343.2
Mdyt	-14648.8	-19201.9	-16392.2	-21539.0	-14488.8	-19034.0	-16089.4	-21090.5	-15390.8	-19974.9
Comb	(15)	(15)	(16)	(16)	(20)	(20)	(21)	(21)	(132)	(132)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	15.5	15.6	16.4	15.5	15.5	16.1	16.1	15.8	15.8	14.8
Mdxt	431.9	203.8	-160.0	-252.4	-173.3	-292.6	-210.5	-399.1	-305.1	-297.9
Mdyt	-19494.2	-20089.9	-19292.1	-13526.3	-17691.0	-13471.7	-17651.4	-14309.4	-18613.1	-13864.6
Comb	(187)	(26)	(31)	(73)	(57)	(59)	(59)	(177)	(177)	(61)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	14.8	15.3	15.4	17.0	17.0	17.3	15.1	15.1	16.6	16.6
Mdxt	-218.2	-243.7	-166.2	-373.8	-278.1	-466.8	-246.9	-175.0	-328.5	-239.9
Mdyt	-18169.8	-13586.7	-17706.6	-13422.6	-17635.1	-13743.9	-13662.7	-17728.5	-13459.9	-17686.6
Comb	(61)	(77)	(62)	(64)	(64)	(65)	(72)	(72)	(69)	(69)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	20.4	20.4	10.3	10.3	15.5	19.9	19.9	12.2	12.2	15.3
Mdxt	-624.8	-495.0	-509.6	-439.1	-178.4	563.0	438.8	422.4	342.5	-171.8
Mdyt	-13597.2	-17828.0	-16087.7	-21166.9	-17689.5	-13368.7	-17588.2	-15655.3	-20526.1	-17696.3
Comb	(70)	(70)	(71)	(71)	(73)	(75)	(75)	(76)	(76)	(77)

Carr	61	62	63	64	65	66	67	68	69	70	
Fdzt	15.5	15.5	17.3	17.3	14.5	14.5	20.3	20.0	20.0	19.4	
Mdxt	-252.4	-178.5	327.8	237.3	367.3	281.3	-185.1	-275.3	-189.8	-275.1	
Mdyt	-13521.5	-17685.8	-13506.9	-17720.3	-14587.7	-19096.7	-17962.5	-13967.9	-18094.3	-14137.2	
Comb	(78)	(78)	(80)	(80)	(81)	(81)	(115)	(116)	(116)	(117)	
Carr	71	72	73	74	75	76	77	78	79	80	
Fdzt	19.4	19.6	19.9	21.1	21.1	17.8	17.8	19.6	20.6	20.6	
Mdxt	-190.4	156.3	193.1	-400.9	-290.8	-376.4	-278.3	230.7	-296.6	-205.7	
Mdyt	-18325.4	-18016.0	-18176.4	-14052.8	-18201.7	-14901.0	-19358.1	-13982.1	-13854.0	-17987.1	
Comb	(117)	(123)	(142)	(121)	(121)	(122)	(122)	(123)	(125)	(125)	
Carr	81	82	83	84	85	86	87	88	89	90	
Fdzt	23.3	23.3	20.2	20.2	22.9	22.9	20.2	20.2	21.1	21.1	
Mdxt	-515.4	-384.2	264.1	180.7	544.3	410.6	259.6	177.2	376.2	269.5	
Mdyt	-13950.1	-18086.2	-13849.0	-17942.6	-13790.2	-17918.3	-13857.4	-17956.2	-13886.9	-18010.8	
Comb	(126)	(126)	(130)	(130)	(131)	(131)	(135)	(135)	(136)	(136)	
Carr	91	92	93	94	95	96	97	98	99	100	
Fdzt	19.1	19.1	20.1	20.1	18.8	18.8	18.7	18.8	19.0	19.0	
Mdxt	405.8	300.3	172.8	253.7	307.6	217.4	243.6	160.0	-259.3	-178.7	

Mdyt	-14643.5	-18974.3	-17992.6	-13888.8	-13068.6	-16925.0	-12854.5	-16646.3	-12976.4	-16807.7
Comb	(137)	(137)	(141)	(141)	(197)	(197)	(174)	(169)	(171)	(171)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	18.1	18.1	18.7	18.4	18.4	23.6	23.6	13.5	13.5	18.3
Mdxt	-259.0	-179.6	166.6	240.5	164.9	-597.2	-456.3	-489.6	-400.4	225.3
Mdyt	-13218.3	-17137.9	-16637.9	-12996.8	-16695.7	-12951.0	-16796.1	-15441.6	-20134.9	-13016.4
Comb	(172)	(172)	(174)	(178)	(178)	(181)	(181)	(182)	(182)	(183)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	18.3	23.1	23.1	15.5	20.5	20.5	17.7	17.7	18.8	18.8
Mdxt	150.8	673.8	528.2	533.0	441.0	326.6	478.4	370.6	230.9	156.8
Mdyt	-16696.5	-12722.4	-16556.2	-15009.0	-12860.7	-16688.3	-13941.4	-18064.7	-12866.8	-16655.2
Comb	(183)	(186)	(186)	(187)	(191)	(191)	(192)	(192)	(194)	(194)
Carr	121	122								
Fdzt	18.9	18.9								
Mdxt	243.3	166.1								
Mdyt	-12850.7	-16644.5								
Comb	(195)	(195)								

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	-3.9	-3.9	-4.0	-3.9	-3.9	-3.7	-3.7	-4.4	-4.4	-4.0
Mdxt	-31.5	-83.5	-31.5	-68.4	-31.2	-29.4	-78.5	-35.6	-90.8	-31.7
Mdyt	6421.5	-11920.5	6371.1	-11858.9	6383.4	6390.6	-11836.4	6516.3	-12063.3	6311.5
Comb	(5)	(5)	(8)	(2)	(3)	(4)	(4)	(6)	(6)	(7)

** aviso ** pilar tracionado, fn(tf)= -3.92

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	-4.0	-3.3	-3.3	-3.4	-3.4	-6.0	-6.0	-4.1	-4.1	-3.5
Mdxt	-68.0	-26.6	-99.2	-28.0	-127.7	-48.9	-155.5	-32.3	-68.2	-28.2
Mdyt	-11875.7	6447.9	-11820.2	6443.6	-11986.3	6916.2	-12701.3	6243.7	-11896.7	6463.3
Comb	(7)	(9)	(9)	(10)	(10)	(11)	(11)	(12)	(12)	(14)

** aviso ** pilar tracionado, fn(tf)= -3.99

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	-3.5	-2.0	-2.0	-7.6	-7.6	-4.1	-4.1	-3.7	-3.7	-2.3

Mdxt	-86.9	-17.9	-160.6	-62.5	-208.3	-32.4	-68.1	-29.7	-54.7	19.2
Mdyt	-11843.0	6434.5	-11905.9	7317.4	-13360.9	6216.9	-11901.9	6391.4	-11833.4	6451.5
Comb	(14)	(15)	(15)	(16)	(16)	(17)	(17)	(24)	(24)	(20)

** aviso ** pilar tracionado, fn(tf)= -3.50

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	-2.3	-6.5	-6.5	-4.0	-4.0	-3.3	-3.3	-5.0	-5.0	-3.9
Mdxt	110.7	53.2	120.6	-31.8	-67.0	26.4	47.8	40.6	80.6	-30.8
Mdyt	-11784.7	7069.4	-13091.0	6284.1	-11876.0	6430.8	-11858.8	6699.2	-12470.1	6387.0
Comb	(20)	(21)	(21)	(22)	(22)	(25)	(25)	(26)	(26)	(29)

** aviso ** pilar tracionado, fn(tf)= -2.32

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	-3.9	-3.8	-3.8	-4.1	-4.1	-4.1	-3.1	-3.1	-4.2	-4.2
Mdxt	-65.4	-30.2	-57.0	-31.9	13.8	-48.0	-25.0	-68.8	-33.8	-86.1
Mdyt	-11849.2	6392.2	-11856.3	6443.7	-4788.4	-11971.9	5912.1	-10950.0	6091.5	-11274.1
Comb	(29)	(30)	(30)	(31)	(31)	(31)	(59)	(59)	(61)	(61)

** aviso ** pilar tracionado, fn(tf)= -3.87

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	-3.6	-3.6	-2.6	-2.6	-2.7	-2.7	-6.4	-6.4	-2.9	-2.9
Mdxt	-28.2	-53.8	-20.8	-98.2	-22.9	-138.9	-52.7	-178.8	-23.2	-80.7
Mdyt	5799.0	-11006.2	5993.8	-10927.0	5987.7	-11164.2	6662.8	-12185.6	6015.8	-10959.4
Comb	(62)	(62)	(64)	(64)	(65)	(65)	(66)	(66)	(69)	(69)

** aviso ** pilar tracionado, fn(tf)= -3.56

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	-0.8	-0.8	-8.7	-8.7	-3.2	-3.2	-3.2	-1.2	-1.2	-7.2
Mdxt	-8.5	-185.9	-72.3	-254.0	25.2	13.7	-34.7	11.1	168.2	59.8
Mdyt	5974.7	-11049.4	7236.0	-13128.0	5907.4	-4374.9	-10945.7	5999.0	-10876.3	6881.7
Comb	(70)	(70)	(71)	(71)	(74)	(74)	(79)	(75)	(75)	(76)

** aviso ** pilar tracionado, fn(tf)= -0.76

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	-7.2	-3.6	-3.2	-3.2	-2.6	-2.6	-5.0	-5.0	-3.5	-3.5
Mdxt	182.3	-52.1	-25.3	12.3	21.3	78.3	41.7	125.3	-27.5	-54.5

Mdyt	-12742.3	-11006.7	5913.0	-4378.0	5969.4	-10982.1	6352.8	-11855.3	5893.4	-10977.9
Comb	(76)	(77)	(79)	(79)	(80)	(80)	(81)	(81)	(83)	(83)

** aviso ** pilar tracionado, fn(tf)= -7.21

Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	-3.4	-3.5	-3.7	-3.7	-3.5	-3.5	-3.5	-3.5	-3.5	-1.2
Mdxt	-26.9	-54.7	29.1	32.4	-27.5	-27.4	-54.6	-27.4	-54.5	9.8
Mdyt	5906.9	-10975.5	5987.9	-11143.6	5904.0	5904.5	-10975.6	5904.7	-10975.7	5618.8
Comb	(84)	(93)	(86)	(86)	(102)	(93)	(88)	(92)	(99)	(144)

** aviso ** pilar tracionado, fn(tf)= -3.40

Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	-1.2	-1.2	-1.2	-1.2	-1.2	-1.0	-1.0	-1.2	-1.2	-1.8
Mdxt	6.3	-25.7	9.9	6.4	-10.7	-7.8	-20.8	-9.9	-13.0	-13.9
Mdyt	-4480.7	-11266.7	5617.0	-4482.0	-11205.1	5624.3	-11182.6	5655.2	-4506.6	5749.9
Comb	(139)	(116)	(114)	(113)	(113)	(115)	(115)	(116)	(116)	(117)

** aviso ** pilar tracionado, fn(tf)= -1.24

Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	-1.8	-1.3	-1.3	-1.3	-1.3	-1.3	-0.6	-0.6	-0.7	-0.7
Mdxt	-33.0	10.4	-10.4	10.2	-5.7	12.4	-5.0	-41.4	-6.3	-69.9
Mdyt	-11409.5	5545.1	-11221.9	5604.7	-4477.7	-11194.5	5681.5	-11166.5	5677.3	-11332.5
Comb	(117)	(118)	(118)	(119)	(119)	(119)	(120)	(120)	(121)	(121)

** aviso ** pilar tracionado, fn(tf)= -1.75

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	-3.3	-3.3	-1.4	-1.4	-1.4	-1.2	-0.8	-0.8	0.7	0.7
Mdxt	-27.3	-97.8	11.4	-7.5	31.3	9.9	-6.6	-29.2	-6.6	-113.2
Mdyt	6149.8	-12047.5	5677.4	-4555.1	-11318.1	5609.1	5696.9	-11189.2	5669.6	-11253.8
Comb	(122)	(122)	(142)	(123)	(142)	(124)	(125)	(125)	(126)	(126)

** aviso ** pilar tracionado, fn(tf)= -3.31

Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	-4.9	-4.9	-1.4	-1.4	-1.4	-1.3	-1.3	-1.1	-1.1	0.4
Mdxt	-40.9	-150.5	11.0	-7.4	11.5	9.9	6.2	8.6	21.2	4.4
Mdyt	6551.1	-12707.2	5450.5	-4569.0	-11248.2	5595.4	-4485.5	5621.0	-11174.3	5686.0

Comb	(127)	(127)	(128)	(128)	(128)	(129)	(129)	(130)	(130)	(131)

** aviso ** pilar tracionado, fn(tf)= -4.93

Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	0.4	-3.9	-3.9	-1.3	-1.3	-1.2	-1.1	-1.1	-0.6	-0.6
Mdxt	132.1	32.8	136.2	10.5	11.4	6.3	8.6	19.6	6.0	63.5
Mdyt	-11131.8	6303.1	-12437.2	5517.7	-11222.3	-4483.5	5625.0	-11179.6	5664.4	-11205.1
Comb	(131)	(132)	(132)	(133)	(133)	(134)	(135)	(135)	(136)	(136)

** aviso ** pilar tracionado, fn(tf)= -3.86

Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	-2.3	-2.3	-1.2	-1.2	-1.2	-1.1	-1.1	-1.4	-1.2	-1.2
Mdxt	20.2	96.4	10.0	-5.7	11.0	9.2	18.4	17.0	9.8	9.6
Mdyt	5932.8	-11816.4	5594.3	-4478.1	-11195.5	5625.9	-11202.6	-4527.1	5618.7	5613.7
Comb	(137)	(137)	(138)	(140)	(140)	(141)	(141)	(142)	(156)	(147)

** aviso ** pilar tracionado, fn(tf)= -2.33

Carr	151	152	153	154	155	156	157	158	159	160

Fdzt	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.0	-1.0	-1.0
Mdxt	-9.7	9.7	9.7	6.4	-10.4	-10.6	6.3	8.1	14.8	8.0
Mdyt	-11197.7	5619.2	5619.0	-4480.1	-11200.5	-11198.7	-4480.1	5181.3	-10377.4	5192.6
Comb	(147)	(148)	(149)	(151)	(151)	(152)	(156)	(179)	(168)	(169)

** aviso ** pilar tracionado, fn(tf)= -1.21

Carr	161	162	163	164	165	166	167	168	169	170
Fdzt	-1.0	-0.6	-0.6	-1.0	-1.0	-1.7	-1.7	-1.1	-1.1	-1.0
Mdxt	15.7	5.1	-15.3	-7.9	-22.3	-13.7	-32.7	8.8	16.6	8.5
Mdyt	-10373.3	5203.1	-10345.3	5247.3	-10465.4	5382.5	-10669.4	5090.0	-10401.5	5175.0
Comb	(179)	(170)	(170)	(171)	(171)	(172)	(172)	(173)	(173)	(174)

** aviso ** pilar tracionado, fn(tf)= -1.00

Carr	171	172	173	174	175	176	177	178	179	180
Fdzt	-1.0	-0.1	-0.1	-0.2	-0.2	-3.9	-3.9	-0.4	-0.4	1.7
Mdxt	19.9	-0.9	-44.7	-2.9	-85.4	-32.7	-125.3	-3.2	-27.2	-15.5
Mdyt	-10362.3	5284.9	-10322.3	5278.8	-10559.5	5953.8	-11581.0	5306.8	-10354.7	5269.7
Comb	(174)	(175)	(175)	(176)	(176)	(177)	(177)	(180)	(180)	(181)

** aviso ** pilar tracionado, fn(tf)= -1.05

Carr	181	182	183	184	185	186	187	188	189	190
Fdzt	1.7	1.7	-6.3	-6.3	-1.2	-1.2	-1.0	-1.0	-0.7	-0.7
Mdxt	-162.2	-159.5	-52.2	-200.5	9.6	18.5	8.1	14.2	6.3	32.6
Mdyt	-4179.7	-10448.7	6527.0	-12523.3	4954.8	-10439.0	5164.9	-10378.5	5198.4	-10333.3
Comb	(181)	(181)	(182)	(182)	(183)	(183)	(189)	(184)	(185)	(185)

** aviso ** pilar tracionado, fn(tf)= -6.26

Carr	191	192	193	194	195	196	197	198	199	200
Fdzt	1.3	1.3	-4.7	-4.7	-1.1	-1.1	-0.7	-0.7	-0.1	-0.1
Mdxt	12.6	203.1	40.9	196.9	8.9	18.4	6.2	30.3	2.5	92.9
Mdyt	5293.1	-10274.6	6172.7	-12137.6	5050.9	-10401.9	5204.1	-10341.0	5260.4	-10377.5
Comb	(186)	(186)	(187)	(187)	(188)	(188)	(190)	(190)	(191)	(191)

** aviso ** pilar tracionado, fn(tf)= -4.73

Carr	201	202	203	204	205	206	207	208	209	210
Fdzt	-2.5	-2.5	-1.0	-1.0	-1.0	-0.9	-0.9	-0.8	-0.8	-1.0

Mdxt	22.9	139.9	8.2	15.4	14.3	7.5	17.8	7.0	28.4	7.9
Mdyt	5643.8	-11250.7	5160.2	-10376.9	-10373.1	5197.9	-10363.7	5205.3	-10373.8	5195.8
Comb	(192)	(192)	(193)	(193)	(194)	(195)	(195)	(196)	(196)	(203)

** aviso ** pilar tracionado, fn(tf)= -2.54

Carr	211	212	213	214	215	216	217	218	219
Fdzt	-1.0	-1.0	-1.0	-1.0	-1.0	-0.9	-0.9	-1.0	-1.0
Mdxt	14.8	7.9	7.9	14.3	7.9	7.7	15.5	14.1	7.8
Mdyt	-10370.9	5195.5	5195.2	-10371.1	5195.0	5187.9	-10366.9	-10370.9	5191.9
Comb	(206)	(204)	(208)	(205)	(201)	(202)	(202)	(204)	(207)

** aviso ** pilar tracionado, fn(tf)= -0.97

17.6.10 P1-i

Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10

Fdzt	575.1	559.3	559.3	564.1	564.1	564.6	564.6	566.1	565.1	565.1
Mdxt	-4382.0	-5430.5	-4147.5	-5436.9	-4153.7	-5364.2	-4100.9	-4442.0	-5419.2	-4141.0
Mdyt	-555.3	852.7	1501.7	711.1	1318.4	688.7	1288.8	-514.1	686.3	1283.8
Comb	(177)	(17)	(17)	(18)	(18)	(3)	(3)	(66)	(4)	(4)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	564.1	572.0	572.0	562.5	562.5	559.4	564.1	578.3	578.3	578.3
Mdxt	-5490.1	-4218.4	-5523.1	-5276.2	-4036.2	-4340.1	-4192.8	-4422.5	-5800.5	-4421.7
Mdyt	685.0	1284.0	676.8	759.6	1381.4	-447.6	1276.3	-442.2	667.2	1269.6
Comb	(9)	(6)	(6)	(7)	(7)	(181)	(9)	(10)	(10)	(10)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	599.5	594.0	594.0	560.2	560.2	564.3	583.0	583.0	583.0	617.4
Mdxt	-4934.9	-5994.7	-4558.1	-5226.9	-3997.7	-4160.0	-4540.1	-5966.0	-4545.9	-4914.4
Mdyt	-626.1	643.9	1273.4	827.3	1469.5	-403.2	-436.3	660.5	1253.5	-590.0
Comb	(71)	(11)	(11)	(12)	(12)	(14)	(15)	(15)	(15)	(16)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	617.4	617.4	580.8	576.4	576.4	615.8	615.8	615.8	565.7	569.9
Mdxt	-6454.7	-4892.8	4200.0	5501.3	4204.7	4610.3	6041.0	4579.0	4324.1	5263.9
Mdyt	609.4	1262.7	-452.6	682.4	1264.7	-578.4	611.6	1258.9	-502.3	764.3

Comb	(16)	(16)	(136)	(20)	(20)	(21)	(21)	(21)	(81)	(123)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	569.9	597.2	593.7	593.7	564.9	564.9	569.0	565.1	564.9	524.5
Mdxt	4028.2	4722.8	5667.5	4307.4	-4104.1	-4103.8	-5341.4	-4100.2	-4103.8	-3777.3
Mdyt	1391.7	-609.5	644.5	1269.0	-413.4	-413.8	789.6	-414.0	-413.4	-373.8
Comb	(123)	(76)	(26)	(26)	(49)	(37)	(128)	(36)	(42)	(104)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	523.3	523.3	519.8	519.8	524.7	524.7	524.7	534.7	530.0	534.7
Mdxt	-5032.6	-3845.5	-5000.8	-3821.3	-3821.0	-5007.2	-3827.3	-3940.1	-5099.3	-3937.8
Mdyt	671.7	1232.3	773.4	1362.8	-370.3	636.3	1182.9	-408.3	629.6	1183.1
Comb	(73)	(73)	(77)	(77)	(59)	(59)	(59)	(61)	(60)	(61)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	534.7	516.5	516.5	523.3	523.3	523.3	543.6	543.6	543.6	566.1
Mdxt	-5158.6	-5023.5	-3836.7	-3884.1	-5108.6	-3901.3	-4232.1	-5554.7	-4228.3	-5831.6
Mdyt	622.6	897.1	1494.1	-358.2	634.4	1172.1	-415.0	609.0	1162.7	575.7
Comb	(61)	(72)	(72)	(64)	(64)	(64)	(65)	(65)	(65)	(66)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	566.1	517.8	517.8	523.6	550.4	550.4	550.4	599.5	599.5	540.9

Mdxt	-4423.2	-4735.2	-3622.6	-3857.3	-4400.0	-5786.7	-4405.7	-6486.6	-4901.4	4136.2
Mdyt	1168.0	861.0	1448.1	-359.2	-406.5	599.5	1139.6	526.5	1152.6	-349.2
Comb	(66)	(67)	(67)	(69)	(70)	(70)	(70)	(71)	(71)	(75)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	540.9	540.9	597.2	597.2	533.4	533.4	533.4	565.7	565.7	524.5
Mdxt	5437.3	4146.2	6201.9	4680.9	3850.7	5038.7	3853.2	5671.4	4292.8	-3776.9
Mdyt	630.6	1155.5	529.5	1147.2	-366.3	634.1	1174.5	576.5	1161.6	-374.2
Comb	(75)	(75)	(76)	(76)	(80)	(80)	(80)	(81)	(81)	(92)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	524.5	535.3	526.7	524.8	581.7	574.8	574.6	580.9	573.8	588.0
Mdxt	-3776.9	3798.9	3795.8	-3771.7	-4153.3	-4069.9	4509.7	4122.9	-4114.1	-4357.8
Mdyt	-373.8	-413.4	1376.1	-374.6	-482.0	-455.3	-543.5	-476.1	-447.0	-486.7
Comb	(102)	(196)	(178)	(91)	(117)	(115)	(192)	(142)	(120)	(121)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	603.7	603.7	574.0	592.7	627.1	627.1	627.1	569.0	586.1	586.1
Mdxt	-5901.7	-4498.2	-4095.3	-4475.3	-4849.7	-6363.7	-4832.9	-4087.6	4399.9	5766.5
Mdyt	580.8	1195.6	-447.6	-480.7	-634.5	546.4	1184.9	1423.9	-440.5	619.3
Comb	(122)	(122)	(125)	(126)	(127)	(127)	(127)	(128)	(131)	(131)

Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	586.1	625.5	625.5	625.5	606.2	603.4	603.4	574.6	574.6	574.8
Mdxt	4400.2	4810.5	6310.9	4774.5	4908.3	5938.6	4502.9	-4039.3	-4039.1	-4035.5
Mdyt	1186.9	-622.9	548.5	1181.1	-650.7	581.5	1191.2	-457.9	-458.1	-458.4
Comb	(131)	(132)	(132)	(132)	(187)	(137)	(137)	(160)	(148)	(147)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	574.6	533.8	543.7	526.7	552.6	526.7	532.8	559.4	559.4	608.4
Mdxt	-4039.1	3749.5	-3880.1	4963.0	-4172.1	3794.4	3812.5	-5708.0	-4350.1	-4874.9
Mdyt	-457.9	-415.7	-449.5	779.4	-456.1	-303.1	-409.4	541.1	1067.5	-667.2
Comb	(153)	(202)	(172)	(178)	(176)	(178)	(179)	(181)	(181)	(182)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	608.4	608.4	525.4	525.4	549.9	549.9	549.9	606.2	606.2	542.3
Mdxt	-6404.0	-4845.8	-4941.0	-3781.1	4321.8	5681.0	4327.4	6449.5	4862.0	4036.3
Mdyt	468.1	1080.7	815.6	1422.1	-390.2	572.3	1083.5	471.1	1075.2	-407.5
Comb	(182)	(182)	(183)	(183)	(186)	(186)	(186)	(187)	(187)	(191)
Carr	141	142	143	144	145	146	147	148		
Fdzt	574.6	574.6	533.1	533.6	542.5	533.5	533.5	533.5		
Mdxt	5920.6	4473.9	-3728.0	3748.6	3926.0	3740.7	3740.8	3741.1		

Mdyt	518.1	1089.5	-408.9	-412.2	-441.1	-415.0	-414.9	-414.9
Comb	(192)	(192)	(194)	(195)	(197)	(199)	(200)	(201)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	571.2	574.1	563.2	558.5	558.5	558.5	563.2	565.2	565.2	567.9
Mdxt	-4211.9	-5778.2	-4172.6	-4108.4	-5406.2	-4130.7	-4138.5	-4474.1	-5875.4	-4180.0
Mdyt	-3365.8	-2010.0	697.3	-3399.8	-1861.6	789.9	703.8	-3367.1	-1925.5	686.5
Comb	(6)	(177)	(9)	(17)	(17)	(17)	(18)	(66)	(66)	(5)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	571.2	561.6	561.6	561.6	563.3	563.2	563.2	577.4	577.4	582.2
Mdxt	-4212.0	-4031.0	-5269.3	-4030.5	-5315.7	-4145.0	-5460.8	-4418.6	-5795.6	-4533.8
Mdyt	678.9	-3351.3	-1856.0	733.1	-1850.9	-3273.2	-1823.8	-3362.2	-1886.2	695.6
Comb	(6)	(7)	(7)	(7)	(8)	(9)	(9)	(10)	(10)	(15)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	598.6	598.6	593.2	559.4	559.4	559.4	563.6	563.6	582.2	582.2
Mdxt	-4997.7	-6570.5	-4563.7	-3999.0	-5226.2	-3994.4	-4043.8	-5285.9	-4522.3	-5949.2

Mdyt	-3623.7	-2188.7	645.2	-3389.4	-1862.0	773.7	-3321.5	-1854.2	-3333.6	-1865.5
Comb	(71)	(71)	(11)	(12)	(12)	(12)	(13)	(13)	(15)	(15)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	616.6	616.6	579.9	579.9	575.5	615.1	615.1	615.1	564.7	564.7
Mdxt	-4953.6	-6507.7	4203.4	5498.0	4193.5	4668.2	6120.9	4605.0	4380.9	5749.2
Mdyt	-3715.2	-2220.5	-3276.7	-1839.8	723.4	-3681.3	-2113.2	617.9	-3329.0	-1898.4
Comb	(16)	(16)	(136)	(136)	(20)	(21)	(21)	(21)	(81)	(81)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	596.4	596.4	592.9	522.3	522.3	522.3	518.8	518.8	522.2	523.7
Mdxt	4801.9	6308.8	4325.6	-3807.8	-5007.7	-3828.1	-3779.4	-4974.2	-3876.7	-3801.3
Mdyt	-3575.2	-2154.1	652.3	-3065.2	-1700.3	669.0	-3112.8	-1702.6	659.8	-3031.6
Comb	(76)	(76)	(26)	(73)	(73)	(73)	(77)	(77)	(64)	(59)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	523.7	533.7	533.7	529.0	533.7	515.6	515.6	515.6	524.6	522.2
Mdxt	-4988.1	-3938.2	-5156.5	-3887.3	-3933.0	-3790.2	-4995.0	-3817.0	-4905.3	-3842.5
Mdyt	-1687.1	-3124.4	-1752.8	644.4	633.5	-3173.1	-1714.2	792.0	-1721.2	-2992.2
Comb	(59)	(61)	(61)	(60)	(61)	(72)	(72)	(72)	(183)	(64)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	522.2	542.6	542.6	542.6	565.2	516.9	516.9	516.9	524.6	522.8
Mdxt	-5072.9	-4233.3	-5556.7	-4225.1	-4435.4	-3634.0	-4743.6	-3622.2	-3721.1	-4829.1
Mdyt	-1660.2	-3119.3	-1749.2	640.3	585.2	-3158.3	-1714.8	768.9	-3161.6	-1703.5
Comb	(64)	(65)	(65)	(65)	(66)	(67)	(67)	(67)	(183)	(68)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	549.4	549.4	549.4	524.6	539.9	539.9	539.9	532.3	532.3	532.3
Mdxt	-4381.5	-5768.9	-4392.9	-3756.9	4107.8	5412.7	4128.9	3837.9	5025.2	3843.4
Mdyt	-3078.6	-1719.6	657.3	762.7	-2955.7	-1627.6	697.1	-3015.1	-1672.3	670.0
Comb	(70)	(70)	(70)	(183)	(75)	(75)	(75)	(80)	(80)	(80)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	564.7	532.5	532.5	569.1	573.7	580.9	587.1	587.1	602.9	569.1
Mdxt	4317.6	3752.4	4898.9	4030.4	6009.7	-5418.0	-4344.0	-5698.1	-4498.8	4025.3
Mdyt	595.5	-3101.3	-1736.3	-3376.9	-1982.8	-1896.2	-3349.7	-1893.7	613.5	742.1
Comb	(81)	(86)	(86)	(123)	(192)	(117)	(121)	(121)	(122)	(123)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	573.7	573.3	591.8	591.8	591.8	626.3	626.3	568.2	568.2	585.2
Mdxt	4575.4	5280.2	-4447.7	-5855.5	-4469.1	-4879.0	-6403.8	-4033.8	-4066.0	4392.3
Mdyt	-3317.5	-1861.7	-3321.2	-1873.0	663.9	-3702.8	-2229.3	-3387.3	758.2	-3235.1

Comb	(192)	(124)	(126)	(126)	(126)	(127)	(127)	(128)	(128)	(131)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	585.2	585.2	624.8	624.8	605.4	605.4	602.6	580.1	580.1	525.8
Mdxt	5757.8	4393.6	4878.2	6403.3	4996.5	6567.8	4525.7	4143.5	5414.7	3785.5
Mdyt	-1808.6	691.8	-3668.8	-2205.1	-3563.7	-2162.3	620.7	-3337.1	-1884.7	-3146.8
Comb	(131)	(131)	(132)	(132)	(187)	(187)	(137)	(142)	(142)	(178)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	525.8	542.6	525.8	551.5	551.5	531.8	531.8	558.3	558.3	558.3
Mdxt	4952.7	-5060.2	3788.2	-4164.2	-5459.7	3804.9	4973.3	-4312.4	-5683.4	-4332.8
Mdyt	-1721.8	-1759.8	739.7	-3107.8	-1756.2	-3049.7	-1710.5	-3067.1	-1726.7	628.0
Comb	(178)	(172)	(178)	(176)	(176)	(179)	(179)	(181)	(181)	(181)
Carr	121	122	123	124	125	126	127	128	129	
Fdzt	607.6	607.6	548.8	548.8	548.8	541.3	541.3	541.5	541.5	
Mdxt	-4928.5	-6476.3	4302.5	5662.9	4314.4	4032.5	5282.7	3947.0	5164.4	
Mdyt	-3612.3	-2197.0	-2944.2	-1634.7	667.8	-3003.7	-1679.3	-3089.8	-1743.3	
Comb	(182)	(182)	(186)	(186)	(186)	(191)	(191)	(197)	(197)	

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	583.6	583.6	571.7	577.0	577.0	575.6	574.3	574.3	575.2	575.2
Mdxt	-4302.0	-5632.6	-4181.2	-6045.9	-4602.9	-5503.6	-4121.6	-5387.8	-4204.5	-5533.0
Mdyt	-6496.7	-4123.5	-6516.2	-4150.6	-6493.2	-4062.5	-6450.4	-4082.4	-6354.2	-4020.3
Comb	(6)	(6)	(17)	(66)	(66)	(18)	(7)	(7)	(9)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	589.8	589.8	611.2	611.2	572.4	572.4	575.9	575.9	575.4	594.5
Mdxt	-4512.6	-5918.8	-5166.0	-6792.7	-4096.3	-5353.6	-4134.2	-5404.3	-5506.0	-4601.5
Mdyt	-6486.1	-4112.0	-6955.4	-4477.0	-6501.9	-4110.8	-6408.9	-4061.8	-4020.9	-6451.1
Comb	(10)	(10)	(71)	(71)	(12)	(12)	(13)	(13)	(14)	(15)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	594.5	630.1	630.1	587.7	585.5	628.5	628.5	582.5	582.5	608.9
Mdxt	-6047.2	-5101.4	-6703.1	4254.5	6224.2	4829.7	6335.9	4077.1	5322.9	4983.0
Mdyt	-4080.9	-7129.5	-4570.5	-6336.3	-3994.8	-7043.7	-4509.3	-6382.7	-4032.4	-6832.8
Comb	(15)	(16)	(16)	(20)	(192)	(21)	(21)	(25)	(25)	(76)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	608.9	533.3	533.3	530.4	530.4	534.5	534.5	544.8	544.8	527.8

Mdxt	6549.0	-3867.7	-5080.8	-3839.7	-5047.9	-3866.3	-5069.6	-4024.0	-5269.2	-3851.6
Mdyt	-4389.5	-5933.0	-3751.3	-5996.9	-3782.5	-5890.1	-3723.2	-6051.4	-3838.5	-6079.2
Comb	(76)	(73)	(73)	(77)	(77)	(59)	(59)	(61)	(61)	(72)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	527.8	532.9	532.9	553.7	553.7	528.9	528.9	533.8	533.8	533.2
Mdxt	-5069.5	-3884.8	-5122.8	-4324.8	-5677.0	-3730.3	-4870.4	-3784.3	-4942.8	-5084.2
Mdyt	-3829.3	-5847.9	-3691.0	-6036.4	-3822.0	-6058.9	-3820.2	-5925.9	-3750.2	-3691.9
Comb	(72)	(64)	(64)	(65)	(65)	(67)	(67)	(68)	(68)	(69)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	560.4	560.4	550.7	550.7	543.2	543.2	576.5	576.5	543.6	543.6
Mdxt	-4451.9	-5855.5	4161.3	5483.1	3907.9	5117.1	4532.0	5950.1	3848.3	5025.9
Mdyt	-5986.3	-3777.5	-5822.3	-3645.3	-5888.7	-3708.2	-6392.6	-4077.9	-6003.0	-3803.2
Comb	(70)	(70)	(75)	(75)	(80)	(80)	(81)	(81)	(86)	(86)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	583.9	604.2	604.2	639.8	639.8	597.4	597.4	638.1	638.1	592.1
Mdxt	5388.8	-4515.2	-5939.2	-5015.2	-6584.0	4475.7	5867.6	5050.9	6632.8	4298.4
Mdyt	-3992.3	-6310.9	-3990.8	-6989.4	-4480.5	-6196.2	-3898.3	-6903.6	-4419.2	-6242.5
Comb	(118)	(126)	(126)	(127)	(127)	(131)	(131)	(132)	(132)	(136)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	592.1	617.9	617.9	592.4	592.4	585.9	585.9	537.8	537.8	569.4
Mdxt	5622.8	5188.0	6821.2	4256.7	5564.8	-4522.9	-5934.4	3867.1	5058.3	-4371.9
Mdyt	-3942.3	-6703.2	-4306.2	-6322.6	-4008.8	-6363.6	-4067.4	-5929.3	-3737.0	-5856.7
Comb	(136)	(187)	(187)	(142)	(142)	(177)	(177)	(178)	(178)	(181)

Carr	81	82	83	84	85	86	87	88	89
Fdzt	569.4	620.2	620.2	536.7	559.6	559.6	585.5	552.5	552.5
Mdxt	-5756.8	-5086.1	-6684.9	-3771.6	4366.4	5746.0	4737.0	4053.4	5305.7
Mdyt	-3694.3	-6825.9	-4393.8	-5949.7	-5692.7	-3562.0	-6263.2	-5873.5	-3719.9
Comb	(181)	(182)	(182)	(183)	(186)	(186)	(192)	(197)	(197)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	597.0	597.0	589.9	589.9	589.6	589.0	588.0	588.0	588.4	603.4
Mdxt	-4405.1	-5767.9	-4750.6	-6241.4	-4278.6	-5606.5	-4222.8	-5520.3	-5619.0	-4622.2
Mdyt	-13537.9	-9487.2	-13585.7	-9545.2	-13298.5	-9342.0	-13381.5	-9369.5	-9284.4	-13487.0
Comb	(6)	(6)	(66)	(66)	(4)	(18)	(7)	(7)	(9)	(10)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	603.4	625.0	625.0	586.5	586.5	589.2	608.1	608.1	644.7	644.7
Mdxt	-6062.8	-5359.7	-7048.3	-4203.7	-5494.6	-5536.2	-4695.5	-6161.6	-5271.4	-6928.0
Mdyt	-9446.5	-14573.4	-10262.7	-13439.9	-9408.3	-9339.1	-13410.3	-9386.3	-14894.1	-10472.9
Comb	(10)	(71)	(71)	(12)	(12)	(13)	(15)	(15)	(16)	(16)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	589.0	601.0	601.0	643.1	643.1	595.8	595.8	622.6	622.6	540.9
Mdxt	-4276.5	4332.1	5684.3	5006.2	6570.6	4166.3	5441.7	5184.4	6815.7	-3923.6
Mdyt	-13339.6	-13270.3	-9268.3	-14658.0	-10299.9	-13331.8	-9325.1	-14236.2	-10015.6	-12518.6
Comb	(18)	(20)	(20)	(21)	(21)	(25)	(25)	(76)	(76)	(72)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	540.9	545.3	546.3	546.3	556.9	556.9	543.9	543.9	544.5	565.9
Mdxt	-5156.8	-5167.0	-3941.5	-5163.1	-4122.1	-5398.2	-3861.6	-5044.2	-5184.7	-4432.2
Mdyt	-8754.8	-8647.1	-12293.9	-8605.3	-12635.9	-8854.6	-12412.5	-8686.4	-8564.8	-12563.2
Comb	(72)	(73)	(59)	(59)	(61)	(61)	(62)	(62)	(64)	(65)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	565.9	541.8	541.8	545.7	572.6	572.6	545.3	562.6	562.6	555.1
Mdxt	-5818.4	-3834.5	-5007.7	-5067.2	-4537.0	-5958.2	-3938.5	4221.5	5561.1	3984.6

Mdyt	-8796.4	-12496.0	-8741.8	-8643.0	-12453.7	-8710.5	-12352.7	-12253.6	-8541.9	-12341.5
Comb	(65)	(67)	(67)	(68)	(70)	(70)	(73)	(75)	(75)	(80)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	555.1	589.4	589.4	555.6	555.6	617.8	617.8	654.5	654.5	610.8
Mdxt	5217.3	4698.7	6171.6	3951.1	5161.7	-4596.1	-6038.4	-5171.9	-6791.4	4568.2
Mdyt	-8623.1	-13302.9	-9336.8	-12516.8	-8766.5	-12901.8	-9017.4	-14385.5	-10104.0	-12761.7
Comb	(80)	(81)	(81)	(86)	(86)	(126)	(126)	(127)	(127)	(131)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	610.8	652.9	652.9	605.6	605.6	631.7	631.7	605.9	605.9	598.9
Mdxt	5988.0	5242.2	6886.8	4402.4	5759.4	5403.2	7105.3	4379.0	5726.7	-4658.2
Mdyt	-8899.4	-14149.4	-9931.0	-12823.3	-8956.3	-13765.7	-9674.4	-12945.9	-9056.7	-13115.3
Comb	(131)	(132)	(132)	(136)	(136)	(187)	(187)	(142)	(142)	(177)
Carr	71	72	73	74	75	76	77	78	79	
Fdzt	598.9	581.6	581.6	634.0	634.0	571.6	571.6	598.5	598.5	
Mdxt	-6113.7	-4444.7	-5845.4	-5267.4	-6924.6	4440.4	5840.2	4917.6	6463.6	
Mdyt	-9204.0	-11983.4	-8369.3	-14103.0	-9921.5	-11783.3	-8200.7	-12832.5	-8995.6	
Comb	(177)	(181)	(181)	(182)	(182)	(186)	(186)	(192)	(192)	

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	609.6	609.6	601.8	601.8	602.0	602.0	600.7	600.7	616.1	616.1
Mdxt	-4508.9	-5904.6	-4907.1	-6448.8	-4365.0	-5709.6	-4321.7	-5650.2	-4736.4	-6213.6
Mdyt	-27752.9	-20859.0	-27958.1	-21034.7	-27239.6	-20468.5	-27352.1	-20550.5	-27591.7	-20733.4
Comb	(6)	(6)	(66)	(66)	(4)	(4)	(7)	(7)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	637.6	637.6	599.6	599.6	620.7	620.7	658.3	658.3	601.5	601.5
Mdxt	-5569.0	-7323.9	-4308.5	-5632.5	-4795.3	-6292.0	-5452.7	-7167.8	-4360.4	-5708.2
Mdyt	-30065.2	-22637.6	-27415.4	-20595.8	-27398.4	-20584.8	-30649.9	-23063.6	-27306.6	-20518.2
Comb	(71)	(71)	(12)	(12)	(15)	(15)	(16)	(16)	(18)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	613.5	613.5	656.7	656.7	635.4	635.4	553.1	553.1	557.2	557.2
Mdxt	4404.3	5776.8	5184.2	6807.4	5394.7	7093.8	-3994.6	-5241.8	-4015.2	-5253.4
Mdyt	-27241.8	-20446.9	-30077.4	-22625.4	-29247.5	-22011.6	-25467.5	-19126.6	-25193.3	-18930.2
Comb	(20)	(20)	(21)	(21)	(76)	(76)	(72)	(72)	(59)	(59)
Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	568.1	568.1	555.4	555.4	577.3	577.3	553.8	553.8	584.0	584.0
Mdxt	-4220.7	-5528.5	-3953.2	-5164.8	-4545.7	-5968.4	-3934.4	-5139.5	-4629.8	-6080.1
Mdyt	-25926.7	-19488.0	-25354.1	-19047.5	-25696.5	-19308.7	-25444.5	-19112.1	-25420.2	-19096.3
Comb	(61)	(61)	(62)	(62)	(65)	(65)	(67)	(67)	(70)	(70)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	556.5	556.5	573.7	573.7	566.3	566.3	601.4	601.4	566.8	566.8
Mdxt	-4008.6	-5251.3	4280.6	5631.9	4056.7	5309.6	4869.6	6398.6	4047.5	5289.1
Mdyt	-25289.1	-19001.3	-25196.7	-18899.4	-25344.4	-19027.8	-27266.1	-20503.4	-25650.9	-19276.3
Comb	(73)	(73)	(75)	(75)	(80)	(80)	(81)	(81)	(86)	(86)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	630.9	630.9	668.4	668.4	623.7	623.7	666.8	666.8	618.5	618.5
Mdxt	-4680.2	-6138.8	-5337.7	-7011.3	4661.2	6107.2	5441.0	7150.6	4504.4	5893.6
Mdyt	-26063.1	-19560.2	-29314.5	-22039.0	-25906.6	-19422.3	-28742.1	-21600.8	-26009.9	-19512.2
Comb	(126)	(126)	(127)	(127)	(131)	(131)	(132)	(132)	(136)	(136)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	644.8	644.8	618.9	618.9	611.2	611.2	593.4	593.4	647.1	647.1
Mdxt	5632.9	7407.9	4498.1	5884.5	-4800.4	-6302.4	-4523.1	-5936.5	-5462.2	-7182.1
Mdyt	-28012.4	-21063.9	-26224.6	-19686.1	-26723.0	-20087.0	-24185.1	-18148.6	-28830.0	-21689.8

Comb	(187)	(187)	(142)	(142)	(177)	(177)	(181)	(181)	(182)	(182)
Carr	71	72	73	74	75	76				
Fdzt	583.1	583.1	575.7	610.8	610.8	576.3				
Mdxt	4518.8	5933.1	4294.9	5107.8	6715.3	4285.7				
Mdyt	-23961.5	-17951.7	-24109.3	-26031.0	-19555.7	-24415.8				
Comb	(186)	(186)	(191)	(192)	(192)	(197)				

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	617.8	617.8	609.2	609.2	610.1	610.1	609.2	609.2	624.4	624.4
Mdxt	-4590.7	-6013.1	-5050.1	-6638.7	-4428.7	-5793.4	-4395.6	-5747.9	-4833.9	-6343.2
Mdyt	-52753.5	-41762.1	-53279.0	-42198.3	-51744.9	-40960.2	-51905.1	-41084.2	-52374.8	-41457.8
Comb	(6)	(6)	(66)	(66)	(4)	(4)	(7)	(7)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	645.4	645.4	608.4	608.4	629.2	629.2	666.9	666.9	609.7	609.7
Mdxt	-5769.5	-7587.2	-4387.7	-5737.3	-4882.5	-6407.5	-5620.3	-7389.9	-4421.6	-5783.7
Mdyt	-57399.8	-45476.1	-51969.0	-41132.8	-51952.0	-41121.2	-58422.1	-46272.3	-51859.2	-41049.5

Comb	(71)	(71)	(12)	(12)	(15)	(15)	(16)	(16)	(18)	(18)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	621.8	621.8	665.5	665.5	609.7	609.7	643.5	643.5	561.3	561.3
Mdxt	4453.3	5831.9	5337.0	7011.1	-4422.2	-5784.6	5588.2	7349.2	-4043.1	-5297.1
Mdyt	-51794.1	-40975.4	-57228.7	-45318.9	-51852.5	-41043.7	-55694.9	-44114.1	-48200.7	-38146.9
Comb	(20)	(20)	(21)	(21)	(23)	(23)	(76)	(76)	(72)	(72)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	564.2	564.2	575.2	575.2	562.9	562.9	584.7	584.7	561.8	561.8
Mdxt	-4067.2	-5318.1	-4298.6	-5632.2	-4019.9	-5253.0	-4646.1	-6102.0	-4008.6	-5238.0
Mdyt	-47860.9	-37887.3	-49301.8	-39032.9	-48089.8	-38064.4	-48760.8	-38598.2	-48181.0	-38133.8
Comb	(59)	(59)	(61)	(61)	(62)	(62)	(65)	(65)	(67)	(67)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	591.5	591.5	563.7	563.7	581.0	581.0	563.7	574.0	574.0	609.1
Mdxt	-4715.3	-6193.5	-4057.0	-5306.6	4325.9	5674.2	-4057.9	4115.0	5378.7	5020.7
Mdyt	-48156.8	-38117.3	-48024.2	-38014.8	-47931.3	-37909.1	-48014.5	-48738.8	-38582.5	-51830.6
Comb	(70)	(70)	(73)	(73)	(75)	(75)	(78)	(86)	(86)	(81)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	609.1	655.7	655.7	677.9	677.9	632.8	632.8	676.6	676.6	628.0

Mdxt	6599.4	-5646.8	-7426.0	-5488.2	-7211.3	4739.5	6210.5	5623.2	7392.3	4591.9
Mdyt	-41039.3	-54744.8	-43348.0	-55551.9	-43971.8	-48924.0	-38675.0	-54358.4	-43018.4	-49489.2
Comb	(81)	(182)	(182)	(127)	(127)	(131)	(131)	(132)	(132)	(142)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	628.0	653.7	653.7	619.4	619.4	574.7	574.7	601.7	601.7	591.2
Mdxt	6009.4	5853.5	7697.6	-4927.4	-6471.7	4119.2	5384.2	-4592.7	-6023.3	4591.2
Mdyt	-39146.4	-53039.9	-41986.1	-50623.9	-40070.3	-45324.6	-35852.4	-45501.8	-35989.3	-45276.2
Comb	(142)	(187)	(187)	(177)	(177)	(202)	(202)	(181)	(181)	(186)
Carr	71	72	73	74	75	76	77			
Fdzt	591.2	574.5	574.5	584.2	584.2	619.3	619.3			
Mdxt	6025.5	4115.9	5379.7	4380.4	5740.3	5286.1	6951.3			
Mdyt	-35781.1	-45281.9	-35810.1	-46083.8	-36454.5	-49175.6	-38911.2			
Comb	(186)	(190)	(190)	(197)	(197)	(192)	(192)			

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	616.4	616.4	606.9	606.9	608.8	608.8	607.5	607.5	623.4	623.4

Mdxt	-4613.7	-6045.5	-5139.6	-6758.2	-4434.8	-5802.5	-4413.8	-5774.1	-4878.2	-6403.7
Mdyt	-89338.2	-74249.5	-90368.5	-75126.5	-87595.9	-72798.0	-87881.4	-73030.4	-88623.0	-73649.0
Comb	(6)	(6)	(66)	(66)	(4)	(4)	(17)	(17)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	642.7	642.7	607.7	607.7	628.4	628.4	664.9	664.9	620.9	620.9
Mdxt	-5914.6	-7776.1	-4405.8	-5762.9	-4924.4	-6464.7	-5729.1	-7534.2	4450.6	5817.4
Mdyt	-97470.8	-81043.5	-87874.3	-73026.0	-87850.6	-73004.1	-99110.5	-82392.6	-87706.0	-72864.9
Comb	(71)	(71)	(12)	(12)	(15)	(15)	(16)	(16)	(20)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	664.1	664.1	608.5	608.5	641.5	641.5	562.2	562.2	562.6	562.6
Mdxt	5419.4	7122.1	-4425.7	-5790.1	5718.0	7519.6	-4051.0	-5296.8	-4065.7	-5317.0
Mdyt	-96981.2	-80613.1	-87769.8	-72941.3	-94429.1	-78501.4	-81281.6	-67551.8	-81021.3	-67336.9
Comb	(21)	(21)	(23)	(23)	(76)	(76)	(73)	(73)	(59)	(59)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	573.4	573.4	560.7	560.7	583.4	583.4	561.0	561.0	590.5	590.5
Mdxt	-4321.2	-5664.0	-4035.6	-5280.7	-4699.0	-6173.7	-4024.2	-5260.2	-4765.0	-6260.6
Mdyt	-83510.3	-69410.5	-81429.3	-67669.0	-82488.7	-68552.6	-81419.0	-67662.6	-81385.2	-67631.3
Comb	(61)	(61)	(72)	(72)	(65)	(65)	(67)	(67)	(70)	(70)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	579.8	579.8	562.2	562.2	572.4	572.4	607.5	607.5	636.1	636.1
Mdxt	4334.0	5678.6	-4052.6	-5299.1	4119.5	5385.9	5110.7	6719.8	-4729.6	-6195.2
Mdyt	-81178.7	-67432.5	-81269.9	-67541.7	-82516.9	-68579.4	-87780.2	-72960.6	-83426.3	-69293.9
Comb	(75)	(75)	(78)	(78)	(86)	(86)	(81)	(81)	(121)	(121)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	654.5	654.5	677.7	677.7	633.6	633.6	676.8	676.8	628.4	628.4
Mdxt	-5776.7	-7597.0	-5580.5	-7335.2	4776.9	6261.4	5745.6	7555.2	4626.6	6057.2
Mdyt	-92663.7	-77015.0	-93913.7	-78037.5	-82509.4	-68509.9	-91784.6	-76258.0	-83446.0	-69312.6
Comb	(182)	(182)	(127)	(127)	(131)	(131)	(132)	(132)	(142)	(142)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	653.3	653.3	573.5	573.5	573.1	573.1	618.7	618.7	572.8	572.8
Mdxt	6020.4	7915.0	4125.4	5393.5	4130.5	5400.9	-5001.7	-6571.9	4120.2	5386.7
Mdyt	-89622.0	-74472.8	-76532.7	-63569.8	-76505.9	-63543.6	-85561.4	-71097.9	-76612.0	-63634.0
Comb	(187)	(187)	(173)	(173)	(188)	(188)	(177)	(177)	(178)	(178)
Carr	71	72	73	74	75	76	77	78		
Fdzt	572.2	572.2	591.5	591.5	584.2	584.2	619.3	619.3		
Mdxt	4140.0	5414.6	4636.4	6086.7	4422.0	5797.3	5413.2	7119.0		

Mdyt	-76323.8	-63401.3	-76371.6	-63404.0	-77709.7	-64550.8	-82973.1	-68932.1
Comb	(180)	(180)	(186)	(186)	(197)	(197)	(192)	(192)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	599.0	599.0	588.3	588.3	591.9	591.9	591.3	591.3	606.6	606.6
Mdxt	-4524.5	-5931.2	-5109.4	-6719.4	-4333.2	-5671.2	-4313.3	-5644.0	-4810.6	-6317.6
Mdyt	-127378.0	-112694.8	-128984.0	-114136.3	-124861.9	-110464.9	-125176.0	-110740.4	-126287.8	-111722.6
Comb	(6)	(6)	(66)	(66)	(4)	(4)	(12)	(12)	(10)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	622.4	622.4	611.9	611.9	645.1	645.1	591.7	591.7	591.7	591.7
Mdxt	-5921.8	-7781.2	-4862.8	-6386.6	-5703.2	-7500.3	-4319.6	-5652.5	-4320.9	-5654.3
Mdyt	-139231.5	-123215.6	-125135.5	-110698.1	-141479.6	-125190.8	-125111.9	-110685.6	-125068.7	-110641.6
Comb	(71)	(71)	(15)	(15)	(16)	(16)	(18)	(18)	(19)	(19)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	604.3	604.3	645.2	645.2	591.6	591.6	622.5	622.5	591.8	591.8
Mdxt	4350.3	5687.8	5365.4	7053.6	-4320.7	-5654.0	5709.0	7506.1	-4320.6	-5653.8

Mdyt	-125011.7	-110576.3	-138338.2	-122401.3	-125102.3	-110677.1	-134743.9	-119230.6	-125107.7	-110682.5
Comb	(20)	(20)	(21)	(21)	(23)	(23)	(76)	(76)	(38)	(38)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	591.8	591.8	591.8	591.8	546.2	546.2	546.4	546.4	556.6	556.6
Mdxt	-4320.4	-5653.5	-4320.1	-5653.1	-3944.0	-5157.6	-3964.6	-5186.1	-4238.1	-5557.7
Mdyt	-125107.9	-110682.6	-125109.4	-110683.9	-115854.1	-102498.5	-115491.9	-102178.5	-119086.4	-105364.1
Comb	(34)	(34)	(39)	(39)	(57)	(57)	(59)	(59)	(61)	(61)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	545.6	545.6	567.4	567.4	575.0	575.0	546.1	546.1	546.1	546.1
Mdxt	-3936.3	-5147.3	-4646.6	-6107.0	-4721.1	-6205.3	-3945.2	-5159.4	-3947.1	-5162.0
Mdyt	-115940.7	-102572.2	-117529.0	-103975.3	-115882.8	-102511.6	-115849.1	-102494.0	-115787.5	-102431.0
Comb	(67)	(67)	(65)	(65)	(70)	(70)	(73)	(73)	(74)	(74)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	564.1	564.1	546.0	546.0	556.0	556.0	590.2	590.2	546.3	546.3
Mdxt	4258.8	5582.7	-3946.8	-5161.6	4017.4	5253.8	5076.5	6676.0	-3946.7	-5161.3
Mdyt	-115706.0	-102337.6	-115835.3	-102481.6	-117630.2	-104070.2	-125162.3	-110739.3	-115843.2	-102489.4
Comb	(75)	(75)	(78)	(78)	(86)	(86)	(81)	(81)	(93)	(93)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	548.2	548.2	546.3	546.3	546.3	546.3	636.9	636.9	660.7	660.7
Mdxt	-3910.0	-5109.1	-3946.4	-5160.8	-3946.0	-5160.3	-5776.4	-7595.4	-5546.5	-7292.5
Mdyt	-115955.3	-102585.8	-115843.4	-102489.5	-115845.6	-102491.5	-132075.6	-116847.2	-133743.8	-118306.4
Comb	(85)	(85)	(89)	(89)	(94)	(94)	(182)	(182)	(127)	(127)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	660.8	660.8	614.3	614.3	637.0	637.0	558.4	558.4	581.8	581.8
Mdxt	5740.8	7549.8	4556.7	5968.0	6056.9	7958.9	4050.7	5298.7	-4501.1	-5906.4
Mdyt	-130602.5	-115516.9	-118623.0	-104904.6	-127588.0	-112862.3	-107985.5	-95503.2	-110373.1	-97607.0
Comb	(132)	(132)	(142)	(142)	(187)	(187)	(175)	(175)	(176)	(176)
Carr	81	82	83	84	85	86	87	88		
Fdzt	602.8	602.8	578.6	578.6	570.5	570.5	604.7	604.7		
Mdxt	-4963.9	-6524.7	4606.7	6050.6	4365.4	5725.8	5424.4	7133.3		
Mdyt	-121828.1	-107768.0	-108550.1	-95969.3	-110474.4	-97701.8	-118006.4	-104370.9		
Comb	(177)	(177)	(186)	(186)	(197)	(197)	(192)	(192)		

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	707.9	702.0	702.0	700.2	700.2	698.0	698.0	703.3	703.2	703.2
Mdxt	7704.4	10054.9	7654.6	9984.2	7593.3	9967.3	7581.0	9933.8	9933.3	7545.7
Mdyt	506.0	-842.7	-1550.9	-897.5	-1623.3	-962.4	-1707.7	-808.2	-808.4	-1507.4
Comb	(42)	(25)	(25)	(26)	(26)	(31)	(31)	(6)	(7)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	703.3	703.3	703.3	703.3	703.4	703.3	714.8	703.2	703.4	731.3
Mdxt	7591.0	7591.0	9934.8	7546.8	7589.6	7592.2	7975.6	7603.1	7657.5	8202.9
Mdyt	490.5	490.6	-808.2	-1507.2	490.8	490.5	512.9	486.7	486.1	584.5
Comb	(9)	(10)	(16)	(16)	(12)	(16)	(38)	(19)	(34)	(37)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	731.3	731.3	695.6	756.4	755.0	756.4	714.5	714.8	702.7	756.4
Mdxt	10714.2	8136.5	7803.8	8429.5	9861.2	8357.2	9775.0	7928.5	7683.7	11013.8
Mdyt	-766.4	-1493.5	576.9	672.0	-730.4	-1482.6	-819.0	-1487.8	482.4	-728.4
Comb	(37)	(37)	(92)	(32)	(27)	(32)	(142)	(38)	(39)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	717.7	717.7	717.7	707.9	707.9	659.0	653.7	653.7	651.2	651.2

Mdxt	8033.5	10494.1	7994.3	10077.9	7654.9	7035.0	9250.5	7044.5	9149.5	6957.2
Mdyt	486.7	-790.2	-1471.3	-801.3	-1505.0	451.8	-807.4	-1465.4	-885.6	-1568.8
Comb	(33)	(33)	(33)	(42)	(42)	(98)	(80)	(80)	(81)	(81)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	655.5	655.4	655.5	655.5	655.5	655.5	655.5	655.5	662.2	669.0
Mdxt	6930.1	9102.3	6889.4	6931.4	6889.4	6929.7	9078.3	6890.6	7091.8	6920.7
Mdyt	442.5	-774.5	-1403.1	442.5	-1403.2	442.6	-758.1	-1403.0	464.7	526.7
Comb	(60)	(79)	(61)	(71)	(63)	(65)	(71)	(71)	(97)	(191)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	662.2	662.2	655.5	655.7	697.0	663.3	653.7	731.4	676.1	666.5
Mdxt	9283.2	7045.1	6947.0	7024.8	6764.6	8946.1	7069.8	8127.7	7562.0	8970.1
Mdyt	-748.3	-1399.8	437.1	436.2	575.9	-845.0	412.2	701.7	437.0	-752.2
Comb	(97)	(97)	(74)	(89)	(77)	(197)	(80)	(87)	(88)	(192)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	672.0	654.8	648.1	648.1	676.1	676.1	695.6	695.6	672.0	722.1
Mdxt	7436.0	7062.2	9125.3	6939.4	9878.5	7530.0	10192.9	7733.2	7479.3	7503.3
Mdyt	-1375.3	430.9	-1007.6	-1689.5	-732.4	-1351.7	-698.3	-1383.4	474.5	620.1
Comb	(93)	(94)	(86)	(86)	(88)	(88)	(92)	(92)	(93)	(154)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	719.7	719.7	719.8	719.7	719.7	719.9	747.8	747.8	718.4	772.9
Mdxt	7430.1	7429.7	7428.4	7431.0	7441.8	7496.2	8041.5	7977.6	7527.7	8268.2
Mdyt	613.5	613.6	613.9	613.5	609.8	609.1	707.6	-1332.5	592.4	795.0
Comb	(119)	(121)	(123)	(127)	(130)	(145)	(148)	(148)	(136)	(143)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	771.5	772.9	719.2	714.5	772.9	747.8	677.5	670.8	670.8	670.8
Mdxt	9659.9	8198.2	7522.4	7422.0	10823.7	10524.6	6942.4	6782.3	6781.0	6780.5
Mdyt	-587.0	-1321.7	605.4	-1546.8	-585.0	-622.9	579.1	556.9	556.8	557.1
Comb	(138)	(143)	(150)	(142)	(143)	(148)	(208)	(182)	(174)	(176)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	671.0	679.7	670.7	671.0	710.9	669.0	666.5	746.7	687.2	687.4
Mdxt	6778.5	6735.5	6797.8	6875.5	7654.5	9071.9	6810.1	7978.4	7330.0	8476.6
Mdyt	557.4	583.8	551.5	550.6	691.3	-673.9	-1419.1	816.1	589.0	-617.3
Comb	(178)	(183)	(185)	(200)	(203)	(191)	(192)	(198)	(204)	(194)
Carr	101	102	103	104						
Fdzt	687.2	670.1	663.3	687.2						
Mdxt	7288.9	6912.9	6792.4	9596.8						

Mdyt	-1225.6	545.3	-1539.7	-597.5
Comb	(204)	(205)	(197)	(204)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	707.3	710.2	701.4	699.7	697.5	707.3	702.6	699.7	694.9	701.6
Mdxt	7801.3	10185.7	7685.0	7629.6	7617.5	10198.3	7586.9	7711.8	10365.2	7735.9
Mdyt	4033.7	2425.9	-878.2	-909.7	-948.7	2254.9	-856.2	4047.7	2271.0	4013.3
Comb	(42)	(203)	(25)	(26)	(31)	(42)	(7)	(26)	(92)	(30)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	702.6	702.6	697.5	702.8	702.6	708.9	708.9	704.0	702.6	702.3
Mdxt	10045.0	7588.0	7699.7	10041.6	7680.2	7641.1	9999.5	7568.7	7688.7	10067.5
Mdyt	2229.6	-856.0	4084.2	2230.1	3998.0	4039.0	2258.7	-859.3	3993.4	2229.6
Comb	(16)	(16)	(31)	(12)	(13)	(17)	(17)	(18)	(19)	(20)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	730.8	730.8	731.8	709.1	701.4	755.9	755.9	754.6	714.2	755.9
Mdxt	8334.5	10876.7	7471.7	7485.8	10138.3	8574.1	11192.6	7509.7	7354.9	8426.3

Mdyt	4212.9	2382.4	-815.9	-871.2	2228.3	4412.8	2524.8	-779.7	-890.0	-772.8
Comb	(37)	(37)	(22)	(23)	(25)	(32)	(32)	(27)	(28)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	717.0	717.0	717.0	730.8	714.2	714.2	707.3	653.0	650.5	653.0
Mdxt	8109.3	10587.5	8029.2	8199.1	8067.9	10534.0	7700.3	7117.7	9228.6	7064.8
Mdyt	3966.1	2205.2	-878.0	-813.6	4035.9	2256.9	-849.1	3712.1	2063.4	-843.5
Comb	(33)	(33)	(33)	(37)	(38)	(38)	(42)	(80)	(81)	(80)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	650.5	658.2	650.5	654.8	654.7	653.2	654.8	658.2	654.7	661.4
Mdxt	6985.6	9311.0	7054.0	9174.6	6925.0	7088.4	9174.2	7116.0	6926.2	7181.8
Mdyt	-888.5	2066.3	3764.2	2052.6	-811.9	3715.2	2052.7	3712.3	-811.8	3744.3
Comb	(81)	(98)	(81)	(61)	(63)	(85)	(64)	(98)	(71)	(97)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	661.4	654.7	654.7	654.7	663.7	673.5	661.4	656.7	654.7	654.2
Mdxt	9395.4	7008.7	7009.7	9175.9	6953.1	9126.5	7086.5	6898.5	7020.9	9208.3
Mdyt	2088.8	3693.3	3693.3	2052.6	3751.8	2125.3	-801.9	-816.5	3686.7	2052.6
Comb	(97)	(68)	(71)	(71)	(72)	(209)	(97)	(73)	(74)	(75)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	696.4	662.7	653.0	730.9	730.9	675.3	675.3	671.3	647.4	647.4
Mdxt	8920.5	6819.1	9309.8	8285.8	10816.5	7621.8	9952.1	6593.1	7036.5	9204.9
Mdyt	2263.1	-852.4	2050.8	4285.7	2573.1	3647.8	2017.8	-860.3	3816.3	2071.7
Comb	(77)	(197)	(80)	(87)	(87)	(88)	(88)	(83)	(86)	(86)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	647.4	675.3	694.9	694.9	671.2	671.2	721.5	718.0	714.0	719.1
Mdxt	6968.4	7556.4	7943.5	7799.2	7562.5	9875.6	9941.5	9915.3	9867.4	9845.3
Mdyt	-944.2	-843.2	4000.3	-751.2	3747.5	2091.7	2302.7	2294.5	2306.5	2293.2
Comb	(86)	(88)	(92)	(92)	(93)	(93)	(154)	(141)	(142)	(120)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	719.2	718.7	717.9	716.1	747.2	747.2	717.9	772.4	772.4	718.0
Mdxt	9843.1	9869.3	7590.1	7545.5	8168.2	10682.4	9940.9	8407.7	10997.8	7569.6
Mdyt	2293.7	2293.1	4044.5	4081.0	4246.3	2546.8	2291.8	4446.1	2692.6	4046.6
Comb	(123)	(131)	(136)	(137)	(148)	(148)	(136)	(143)	(143)	(141)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	714.0	721.5	665.8	668.5	676.7	670.0	679.0	679.0	669.5	711.6
Mdxt	7533.3	7588.9	9044.3	9089.1	9211.1	8990.4	6799.1	8922.4	9023.2	8726.4
Mdyt	4117.6	4044.7	2122.4	2113.6	2147.8	2111.6	3782.6	2153.2	2111.6	2418.1

Comb	(142)	(154)	(192)	(196)	(208)	(182)	(183)	(183)	(186)	(188)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	668.3	665.8	746.1	746.1	686.5	686.5	686.6	662.7	662.7	690.6
Mdxt	6915.5	6900.0	8131.9	10636.4	7408.7	9694.8	6443.8	6882.7	9020.8	7407.1
Mdyt	-751.6	3795.1	4316.5	2634.1	3778.3	2150.7	-768.5	3847.2	2130.7	-751.4
Comb	(191)	(192)	(198)	(198)	(204)	(204)	(194)	(197)	(197)	(199)

Carr	111
Fdzt	676.7
Mdxt	7027.9
Mdyt	3775.1
Comb	(208)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	721.9	721.9	714.7	714.7	716.2	716.2	712.9	712.9	717.1	717.1
Mdxt	8027.1	10489.2	10352.3	7921.0	7936.9	10373.1	7911.2	10338.9	7895.9	10323.5
Mdyt	8111.9	5196.8	5188.0	8114.3	8067.5	5161.8	8163.6	5215.1	8047.1	5151.1

Comb	(42)	(42)	(26)	(26)	(30)	(30)	(31)	(31)	(13)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	728.7	728.7	717.1	717.1	745.9	745.9	771.7	771.7	731.3	731.3
Mdxt	8289.7	10819.7	7901.7	10329.9	8603.3	11220.6	8861.3	11559.9	8310.5	10847.4
Mdyt	8133.5	5210.3	8041.9	5145.9	8435.8	5425.3	8787.2	5673.5	8063.0	5153.8
Comb	(38)	(38)	(19)	(19)	(37)	(37)	(32)	(32)	(33)	(33)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	671.3	671.3	664.3	664.3	666.5	666.5	661.8	661.8	674.7	674.7
Mdxt	7313.6	9566.2	7238.5	9467.9	7261.2	9497.7	9448.9	7224.6	7390.0	9663.8
Mdyt	7493.9	4789.8	7552.8	4816.4	7486.0	4779.0	4855.2	7623.3	7549.4	4829.1
Comb	(98)	(98)	(81)	(81)	(85)	(85)	(86)	(86)	(97)	(97)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	667.8	667.8	676.9	676.9	667.8	667.8	745.8	688.0	688.0	745.8
Mdxt	7203.4	9426.3	7136.7	9348.2	7210.9	9435.7	11194.1	7794.9	10176.0	8581.9
Mdyt	7456.8	4763.8	7555.3	4832.5	7449.4	4756.4	5510.1	7479.5	4767.6	8514.1
Comb	(71)	(71)	(72)	(72)	(74)	(74)	(87)	(88)	(88)	(87)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	709.0	709.0	684.4	684.4	762.6	762.6	788.4	788.4	761.3	699.8

Mdxt	8213.1	10709.0	7765.2	10136.4	8432.9	11022.5	8691.0	11361.6	11010.9	7607.7
Mdyt	8012.1	5155.5	7580.2	4848.2	8281.6	5332.2	8632.9	5580.4	5423.5	7436.9
Comb	(92)	(92)	(93)	(93)	(148)	(148)	(143)	(143)	(198)	(204)

Carr	51	52
Fdzt	699.8	761.3
Mdxt	9951.9	8424.3
Mdyt	4761.7	8370.8
Comb	(204)	(198)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	737.3	737.3	730.4	730.4	731.7	731.7	729.0	729.0	744.1	744.1
Mdxt	8282.8	10817.8	8159.0	10659.2	8167.7	10670.8	8151.6	10648.9	8542.8	11144.5
Mdyt	17099.6	12104.1	17037.4	12053.9	16983.4	12017.7	17093.3	12091.0	17139.6	12135.6
Comb	(42)	(42)	(26)	(26)	(30)	(30)	(31)	(31)	(38)	(38)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	733.8	732.4	732.4	761.6	761.6	788.4	788.4	746.3	746.3	685.2

Mdxt	8123.0	8143.2	10641.0	8920.3	11624.0	9189.5	11978.0	8537.5	11139.7	7536.7
Mdyt	16961.6	16954.8	11997.3	17991.5	12764.4	18537.1	13146.6	17024.1	12053.2	15817.4
Comb	(18)	(19)	(19)	(87)	(87)	(32)	(32)	(33)	(33)	(98)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	685.2	678.8	680.6	678.8	676.8	680.6	681.6	676.8	688.7	688.7
Mdxt	9853.7	7448.3	7460.7	9739.1	7437.6	9755.8	7421.4	9724.5	7625.0	9965.9
Mdyt	11188.0	15849.2	15772.1	11203.4	15929.1	11151.7	15739.6	11256.4	15938.0	11275.1
Comb	(98)	(81)	(85)	(81)	(86)	(85)	(71)	(86)	(97)	(97)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	683.6	681.6	681.6	698.3	698.3	723.8	723.8	777.6	777.6	805.6
Mdxt	7396.8	7425.7	9712.9	7996.5	10433.3	8520.4	11099.6	8764.9	11445.4	9021.3
Mdyt	15740.9	15731.1	11122.6	15995.1	11320.1	16927.8	11993.9	17423.3	12339.3	17925.0
Comb	(73)	(74)	(74)	(93)	(93)	(92)	(92)	(198)	(198)	(143)
Carr	41	42	43	44	45					
Fdzt	805.6	706.9	706.9	714.2	714.2					
Mdxt	11784.2	7187.6	9427.6	7841.1	10252.5					
Mdyt	12688.6	15367.7	10847.0	15426.9	10894.9					
Comb	(143)	(183)	(183)	(204)	(204)					

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	750.9	750.9	744.4	744.4	745.3	745.3	743.3	743.3	745.9	745.9
Mdxt	8541.9	11148.8	8399.0	10967.0	8401.8	10971.3	10959.5	8393.5	10951.3	8385.1
Mdyt	35059.6	26539.5	34847.1	26373.9	34787.6	26330.7	26417.4	34907.9	26314.0	34762.9
Comb	(42)	(42)	(26)	(26)	(30)	(30)	(31)	(31)	(16)	(13)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	745.9	757.6	757.6	747.3	747.3	745.9	745.9	775.6	775.6	803.2
Mdxt	10951.0	8801.2	11474.1	8367.7	10930.4	8386.5	10952.7	9279.3	12076.6	9534.3
Mdyt	26313.7	35107.7	26583.3	34771.0	26317.5	34755.5	26306.7	37078.8	28074.0	38125.2
Comb	(13)	(38)	(38)	(18)	(18)	(19)	(19)	(87)	(87)	(32)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	803.2	759.5	759.5	697.4	697.4	691.6	691.6	693.0	693.0	690.1
Mdxt	12414.2	8761.9	11427.3	7759.9	10139.8	7657.5	10008.3	7661.5	10014.3	7649.7
Mdyt	28868.2	34850.9	26399.2	32435.2	24547.4	32395.7	24510.5	32310.8	24448.9	32482.7
Comb	(32)	(33)	(33)	(98)	(98)	(81)	(81)	(85)	(85)	(86)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	690.1	693.8	693.8	701.0	701.0	695.8	695.8	693.8	693.8	710.6
Mdxt	9997.6	7637.7	9985.2	7861.6	10268.5	7612.7	9955.5	7639.6	9987.7	8232.2
Mdyt	24572.7	32275.4	24424.6	32699.4	24747.2	32287.2	24430.1	32264.9	24414.5	32768.1
Comb	(86)	(68)	(68)	(97)	(97)	(73)	(73)	(74)	(74)	(93)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	710.6	736.9	736.9	821.3	821.3	792.5	792.5	727.4	727.4	717.8
Mdxt	10733.9	8842.5	11506.0	9382.8	12243.6	9139.5	11919.9	8092.4	10574.3	7721.8
Mdyt	24809.7	34810.6	26353.1	36542.0	27621.9	35609.2	26917.0	31298.5	23652.9	31229.7
Comb	(93)	(92)	(92)	(143)	(143)	(198)	(198)	(204)	(204)	(208)
Carr	51									
Fdzt	717.8									
Mdxt	10105.9									
Mdyt	23590.2									
Comb	(208)									

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	758.2	758.2	752.1	752.1	751.3	751.3	753.2	753.2	764.9	764.9
Mdxt	8751.6	11413.5	8588.1	11206.9	8584.5	11201.8	8579.1	11196.5	9013.3	11741.0
Mdyt	66498.4	52898.3	66005.2	52502.8	66067.1	52549.9	65918.3	52436.7	66538.1	52940.8
Comb	(42)	(42)	(26)	(26)	(31)	(31)	(13)	(13)	(38)	(38)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	754.6	754.6	783.0	783.0	811.1	811.1	766.5	766.5	703.8	703.8
Mdxt	8560.0	11174.2	9607.3	12483.8	9842.2	12798.0	8930.2	11640.4	7933.3	10359.5
Mdyt	65937.6	52449.8	70608.5	56154.9	72496.8	57664.6	65993.8	52527.1	61513.7	48929.6
Comb	(18)	(18)	(87)	(87)	(32)	(32)	(33)	(33)	(98)	(98)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	698.6	698.6	697.5	697.5	700.2	700.2	700.2	700.2	716.9	716.9
Mdxt	7815.9	10210.1	7810.7	10202.9	7802.9	10195.2	7802.8	10195.0	8423.4	10974.4
Mdyt	61334.6	48780.9	61423.1	48848.3	61211.4	48687.3	61210.4	48686.5	62096.0	49406.6
Comb	(81)	(81)	(86)	(86)	(71)	(71)	(68)	(68)	(93)	(93)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	707.4	707.4	719.2	719.2	743.7	743.7	774.4	774.4	831.0	831.0
Mdxt	8049.4	10505.9	8304.7	10830.5	9128.5	11861.4	8451.5	11053.7	9733.6	12683.7

Mdyt 62039.2 49345.9 61318.4 48815.7 66167.1 52629.1 62593.9 49720.5 69153.1 54935.2

Comb (97) (97) (88) (88) (92) (92) (129) (129) (143) (143)

Carr 41 42 43 44 45 46

Fdzt 735.4 735.4 801.4 801.4 762.2 762.2

Mdxt 8323.5 10866.7 9507.6 12379.9 9028.8 11757.5

Mdyt 58992.5 46873.4 67504.9 53621.6 63063.5 50095.8

Comb (204) (204) (198) (198) (203) (203)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr 1 2 3 4 5 6 7 8 9 10

Fdzt 752.6 752.6 746.8 746.8 746.4 746.4 747.6 747.6 747.5 747.5

Mdxt 8834.3 11510.3 8649.7 11278.5 8647.5 11275.3 8645.1 11273.5 8645.1 11273.4

Mdyt 112423.6 93751.9 111503.1 92983.0 111558.2 93027.6 111425.3 92920.0 111424.1 92919.0

Comb (42) (42) (26) (26) (31) (31) (16) (16) (13) (13)

Carr 11 12 13 14 15 16 17 18 19 20

Fdzt 747.6 747.6 759.2 759.2 749.0 749.0 776.6 776.6 805.0 805.0

Mdxt 8644.8 11273.1 9102.2 11844.6 8623.3 11247.7 9819.3 12734.1 10026.7 13016.0

Mdyt	111426.4	92921.0	112437.2	93775.9	111458.4	92945.4	119674.3	99772.3	122766.8	102362.4
Comb	(15)	(15)	(38)	(38)	(18)	(18)	(87)	(87)	(32)	(32)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	760.4	760.4	698.2	698.2	693.6	693.6	692.9	692.9	694.6	694.6
Mdxt	8968.4	11682.0	7985.7	10419.9	7852.2	10251.3	10246.7	7849.0	10243.4	7845.5
Mdyt	111448.4	92977.1	103984.2	86711.9	103583.2	86373.1	86436.8	103662.0	86284.8	103472.2
Comb	(33)	(33)	(98)	(98)	(81)	(81)	(86)	(86)	(61)	(71)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	694.6	694.6	694.6	694.6	694.6	711.2	711.2	701.8	701.8	713.0
Mdxt	10243.8	7845.2	10243.4	7845.5	10243.8	8498.6	11061.3	8115.7	10583.1	8307.6
Mdyt	86283.2	103474.6	86285.2	103470.5	86281.8	104917.7	87505.9	104898.3	87471.6	103505.1
Comb	(71)	(66)	(66)	(68)	(68)	(93)	(93)	(97)	(97)	(88)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	713.0	737.7	737.7	827.8	827.8	768.7	768.7	723.0	723.0	796.8
Mdxt	10828.7	9297.5	12060.0	9994.8	13000.5	8589.9	11221.8	8087.2	10564.6	7159.9
Mdyt	86364.8	112011.0	93397.1	116783.0	97280.6	104942.5	87435.4	99344.6	82755.1	111392.6
Comb	(88)	(92)	(92)	(143)	(143)	(150)	(150)	(208)	(208)	(193)
Carr	51	52	53							

Fdzt	796.8	758.8	758.8
Mdxt	9415.4	9268.9	12047.5
Mdyt	92774.2	106457.3	88680.5
Comb	(193)	(203)	(203)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	725.4	725.4	720.6	720.6	720.3	720.6	720.6	720.6	720.6	720.6
Mdxt	8712.7	11336.4	8510.2	11084.3	8510.2	11084.2	8510.2	11084.1	8510.4	11084.4
Mdyt	160272.8	142134.4	158834.9	140860.1	158887.7	140860.1	158835.5	140860.6	158833.5	140858.9
Comb	(42)	(42)	(14)	(14)	(26)	(4)	(6)	(6)	(16)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	720.6	720.6	720.6	720.6	731.9	731.9	720.0	720.3	720.5	747.4
Mdxt	8510.1	11084.1	8510.5	11084.5	8989.4	11680.1	8508.9	11083.9	11084.1	9808.8
Mdyt	158836.2	140861.2	158831.8	140857.3	160253.4	142128.7	158925.1	140905.8	140862.9	170864.4
Comb	(11)	(11)	(13)	(13)	(38)	(38)	(31)	(26)	(20)	(87)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	747.4	775.3	775.3	720.0	733.0	733.0	720.1	720.1	672.7	672.7
Mdxt	12687.4	9984.9	12932.4	11082.0	8810.3	11462.9	8509.1	11082.4	7851.3	10233.0
Mdyt	151497.4	175191.7	155346.7	140938.2	158796.9	140863.5	158921.1	140934.7	148227.7	131451.0
Comb	(87)	(32)	(32)	(31)	(33)	(33)	(36)	(36)	(98)	(98)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	669.3	669.3	668.8	669.3	669.3	669.3	669.2	669.2	685.3	685.3
Mdxt	7702.3	10046.7	7702.3	10046.5	7702.5	10046.9	7702.6	10047.1	8386.7	10899.6
Mdyt	147497.5	130802.2	147573.0	130803.8	147495.6	130800.4	147493.1	130798.3	149523.9	132614.5
Comb	(69)	(69)	(81)	(66)	(71)	(71)	(68)	(68)	(93)	(93)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	668.4	668.8	669.2	686.9	686.9	668.4	668.6	668.6	710.2	710.2
Mdxt	7700.3	10046.2	10046.4	8130.9	10588.8	10043.5	7700.6	10044.1	9254.0	11975.9
Mdyt	147626.4	130867.6	130806.3	147443.2	130806.9	130913.7	147620.6	130908.8	159806.8	141709.7
Comb	(86)	(81)	(75)	(88)	(88)	(86)	(91)	(91)	(92)	(92)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	676.1	676.1	759.4	759.4	802.9	802.9	760.5	760.5	698.3	698.3
Mdxt	7991.6	10408.1	9056.2	11788.5	10051.6	13044.0	8877.1	11569.9	7914.4	10331.8
Mdyt	149551.5	132622.6	151361.3	134143.1	166299.7	147361.1	149904.8	132877.8	139974.7	124039.4

Comb	(97)	(97)	(149)	(149)	(143)	(143)	(144)	(144)	(209)	(209)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	701.6	701.6	694.3	694.8	694.8	694.8	694.8	694.7	694.8	694.8
Mdxt	8054.5	10507.6	7765.2	10144.4	7765.5	10144.8	7765.1	10144.4	7765.7	10145.0
Mdyt	141298.6	125211.0	139320.1	123391.2	139242.6	123388.8	139246.4	123394.7	139240.1	123386.6
Comb	(208)	(208)	(192)	(172)	(182)	(182)	(177)	(186)	(179)	(179)
Carr	71	72	73	74	75	76	77			
Fdzt	694.0	694.3	694.0	694.1	694.1	735.8	735.8			
Mdxt	7763.3	10144.1	10141.5	7763.7	10142.0	9317.0	12081.4			
Mdyt	139373.5	123456.0	123502.1	139367.6	123497.1	151553.9	134298.1			
Comb	(197)	(192)	(197)	(202)	(202)	(203)	(203)			

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	243.8	243.8	242.4	243.2	243.2	243.2	243.2	243.2	243.2	243.2

Mdxt	3873.4	4933.1	3802.0	3813.0	4861.8	3759.9	3812.8	4861.7	3760.1	3811.4
Mdyt	2107.8	854.7	-1328.6	2087.4	846.5	-1216.0	2087.4	846.5	-1216.0	2087.6
Comb	(42)	(42)	(31)	(11)	(11)	(2)	(6)	(6)	(8)	(12)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	243.2	243.2	243.2	243.2	246.3	246.3	243.9	243.9	243.4	243.2
Mdxt	4860.1	3813.5	4862.5	3760.7	4132.2	5236.7	3792.4	4839.2	3754.3	3822.6
Mdyt	846.6	2087.3	846.5	-1216.0	2209.9	895.7	2088.1	846.8	-1218.8	2082.7
Comb	(12)	(16)	(16)	(16)	(37)	(37)	(18)	(18)	(19)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	243.2	244.3	244.3	248.0	248.0	246.7	246.7	246.7	243.1	243.1
Mdxt	4873.0	3938.3	5009.2	4195.8	5313.2	3669.7	3720.0	4759.4	3845.2	4899.0
Mdyt	844.6	2080.5	843.8	2317.7	969.9	-1224.9	2091.9	848.5	2072.0	840.3
Comb	(20)	(34)	(34)	(32)	(32)	(23)	(23)	(23)	(25)	(25)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	242.7	242.7	248.2	248.2	250.6	250.6	250.6	243.1	243.1	242.4
Mdxt	3849.2	4903.0	3531.8	4540.2	3634.2	4664.6	3592.0	3829.8	4881.2	3851.4
Mdyt	2051.5	832.1	2297.6	953.4	2089.4	847.7	-1238.1	2075.0	841.5	2025.5
Comb	(26)	(26)	(27)	(27)	(28)	(28)	(28)	(30)	(30)	(31)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	242.4	248.0	256.8	256.8	256.8	246.0	246.3	248.5	226.6	226.6
Mdxt	4905.0	4137.8	4149.1	5276.2	4087.8	3896.5	4074.4	4021.0	3770.1	4781.5
Mdyt	821.7	-1140.0	2139.0	867.8	-1253.2	-1221.7	-1178.0	-1219.5	2265.9	1014.0
Comb	(31)	(32)	(33)	(33)	(33)	(39)	(37)	(38)	(198)	(198)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	226.7	229.1	227.9	227.9	227.9	227.9	227.9	227.9	227.9	228.0
Mdxt	3463.8	3449.3	3449.6	4412.0	3449.4	4411.7	3449.2	4411.5	3404.6	3447.4
Mdyt	-1307.5	-1150.1	1942.7	787.9	1942.7	787.9	1942.7	787.9	-1146.6	1943.0
Comb	(86)	(99)	(66)	(66)	(61)	(61)	(65)	(65)	(71)	(67)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	228.0	229.1	229.1	228.9	228.9	228.2	227.9	227.9	229.5	229.5
Mdxt	4409.4	3382.1	4334.8	3420.4	4379.4	3395.7	3463.5	4428.1	3628.6	4623.3
Mdyt	788.0	1975.4	801.0	1943.7	788.3	-1150.6	1936.0	785.2	1932.8	784.0
Comb	(67)	(72)	(72)	(73)	(73)	(74)	(75)	(75)	(89)	(89)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	232.3	232.3	233.5	234.8	234.8	227.7	227.7	227.2	227.2	235.0
Mdxt	3905.7	4948.8	3554.9	3996.5	5058.0	3495.7	4465.5	3501.5	4471.4	3048.0

Mdyt	2117.7	866.7	-1227.8	2271.8	981.2	1920.7	779.1	1891.4	767.3	2243.1
Comb	(92)	(92)	(142)	(87)	(87)	(80)	(80)	(81)	(81)	(82)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	235.0	239.2	239.2	238.5	227.8	227.8	226.7	226.7	234.8	229.5
Mdxt	3945.8	3951.8	5015.2	3163.7	3473.6	4439.8	3504.5	4474.0	3943.5	3591.2
Mdyt	957.7	2311.3	1005.2	-1178.2	1924.9	780.8	1854.4	752.5	-1038.2	-1143.1
Comb	(82)	(143)	(143)	(83)	(85)	(85)	(86)	(86)	(87)	(89)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	232.3	235.5	231.9	228.9	237.9	237.9	239.3	239.3	237.4	239.2
Mdxt	3853.0	3776.6	3598.7	3469.6	3475.9	4458.8	3287.8	4238.2	3827.3	3890.5
Mdyt	-1092.4	-1151.7	-1154.8	-1144.7	2085.6	845.5	2291.3	988.7	-1077.1	-1039.2
Comb	(92)	(93)	(94)	(98)	(134)	(134)	(138)	(138)	(148)	(143)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	239.7	220.5	220.5	218.5	219.7	219.7	220.9	219.7	219.7	219.7
Mdxt	3773.8	3309.6	4235.9	3234.5	3223.2	4133.3	3219.9	3223.0	4133.0	3174.5
Mdyt	-1118.6	1966.0	796.9	-1213.7	1936.9	785.2	-1056.2	1936.8	785.2	-1052.9
Comb	(149)	(208)	(208)	(197)	(177)	(177)	(210)	(172)	(172)	(174)
Carr	111	112	113	114	115	116	117	118	119	120

Fdzt	219.7	219.7	219.7	219.7	219.7	220.9	220.9	220.7	220.7	220.0
Mdxt	3222.8	4132.8	3221.0	4130.7	3175.3	3155.8	4055.5	3194.0	4100.4	3166.3
Mdyt	1936.9	785.2	1937.1	785.3	-1052.8	1969.5	798.3	1937.9	785.6	-1056.8
Comb	(176)	(176)	(178)	(178)	(182)	(183)	(183)	(184)	(184)	(185)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	219.7	219.7	221.2	221.2	224.1	224.1	223.6	224.8	224.8	219.5
Mdxt	3237.1	4149.5	3402.3	4345.5	3679.2	4672.0	3369.4	3090.4	3983.5	3269.3
Mdyt	1930.2	782.5	1927.0	781.3	2112.0	899.7	-1060.9	1943.4	788.0	1914.9
Comb	(186)	(186)	(200)	(200)	(203)	(203)	(205)	(189)	(189)	(191)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	219.5	219.0	219.0	226.8	226.8	219.5	219.5	218.5	218.5	226.6
Mdxt	4187.1	3275.1	4193.1	2821.6	3663.1	3247.3	4161.3	3278.1	4195.8	3714.1
Mdyt	776.4	1885.6	764.6	2237.3	990.6	1919.1	778.1	1848.6	749.8	-944.4
Comb	(191)	(192)	(192)	(193)	(193)	(196)	(196)	(197)	(197)	(198)
Carr	141	142	143							
Fdzt	221.2	224.1	220.7							
Mdxt	3361.8	3623.7	3240.2							
Mdyt	-1049.2	-998.5	-1050.8							

Comb (200) (203) (209)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	238.0	239.4	239.4	238.8	238.8	238.9	238.9	238.8	241.8	241.8
Mdxt	3904.2	4996.6	3935.3	4924.4	4923.8	3871.8	4922.2	3873.8	4199.5	5305.0
Mdyt	8115.6	5492.9	8096.3	5452.7	5452.8	8042.6	5453.2	8042.0	8366.7	5693.3
Comb	(31)	(42)	(42)	(16)	(5)	(12)	(12)	(16)	(37)	(37)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	239.5	239.5	238.8	243.5	243.5	242.4	242.4	238.7	243.6	243.6
Mdxt	3853.0	4901.7	4933.6	4262.8	5380.8	3775.0	4816.2	4956.9	3586.0	4597.2
Mdyt	8043.6	5454.0	5452.5	8652.4	5905.0	8051.7	5460.6	5450.9	8592.5	5860.6
Comb	(18)	(18)	(20)	(32)	(32)	(23)	(23)	(25)	(27)	(27)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	246.2	246.2	252.5	252.5	239.9	239.9	222.0	224.4	222.0	223.7
Mdxt	3673.2	4703.6	4225.6	5356.3	3985.6	5055.5	3835.0	4565.5	4846.9	4461.0
Mdyt	8042.3	5454.4	8158.0	5540.2	8014.0	5434.6	8155.1	5135.0	5602.9	5077.7

Comb	(28)	(28)	(33)	(33)	(34)	(34)	(198)	(97)	(198)	(60)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	224.4	223.7	223.7	223.7	223.7	223.7	224.8	224.8	224.7	224.7
Mdxt	3586.6	4462.0	4460.8	3495.8	4458.7	3498.7	3428.2	4381.8	3469.0	4429.2
Mdyt	7568.0	5077.6	5077.7	7491.3	5078.2	7490.5	7574.7	5140.1	7492.8	5079.5
Comb	(97)	(71)	(65)	(67)	(67)	(71)	(72)	(72)	(73)	(73)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	223.6	230.3	230.3	227.9	227.9	223.5	230.5	230.5	234.5	234.5
Mdxt	4475.2	4054.5	5115.1	3964.1	5006.9	4508.8	3087.7	3987.9	4026.3	5091.7
Mdyt	5077.3	8362.6	5723.8	7954.4	5421.3	5075.0	8276.9	5660.3	8429.1	5774.8
Comb	(75)	(87)	(87)	(92)	(92)	(80)	(82)	(82)	(143)	(143)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	225.2	225.2	233.4	233.4	234.7	234.7	214.2	216.1	215.4	216.1
Mdxt	3658.4	4650.0	3538.5	4525.0	3349.6	4305.0	3322.8	4295.8	4191.0	3367.2
Mdyt	7450.5	5051.7	7828.4	5330.3	8369.1	5730.4	7388.1	5014.2	4956.8	7360.7
Comb	(89)	(89)	(134)	(134)	(138)	(138)	(197)	(208)	(172)	(208)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	215.4	215.4	215.4	215.4	215.4	216.5	216.5	216.4	216.4	215.3

Mdxt	4192.0	3278.6	3276.4	4188.6	3279.3	3208.8	4111.3	3249.6	4158.9	4205.2
Mdyt	4956.7	7283.0	7283.9	4957.3	7283.0	7367.4	5019.3	7285.3	4958.5	4956.3
Comb	(182)	(177)	(178)	(178)	(182)	(183)	(183)	(184)	(184)	(186)

Carr	71	72	73	74	75	76	77	78	79
Fdzt	219.6	219.6	220.4	215.2	222.2	222.2	216.9	216.9	214.3
Mdxt	3744.7	4738.7	4034.0	4238.9	2868.3	3714.4	3439.0	4380.6	4083.0
Mdyt	7747.0	5300.4	4967.9	4954.1	8069.4	5539.4	7243.0	4930.8	4969.6
Comb	(203)	(203)	(189)	(191)	(193)	(193)	(200)	(200)	(202)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	217.8	217.8	216.6	216.6	219.5	219.5	217.4	218.0	218.0	218.0
Mdxt	3838.2	4841.8	3800.3	4796.0	5140.2	4097.3	4771.6	3726.7	4714.6	3757.1
Mdyt	12800.4	9620.2	12795.7	9545.3	9996.9	13280.7	9544.5	12800.9	9620.5	12705.4
Comb	(42)	(42)	(31)	(31)	(37)	(37)	(16)	(17)	(17)	(18)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	217.3	217.3	220.3	220.3	222.6	222.6	217.2	220.6	220.6	224.3

Mdxt	4753.1	4779.0	4153.1	5205.1	4056.9	5101.4	4798.3	3481.5	4436.6	3555.1
Mdyt	9549.8	9543.3	13792.7	10396.5	12851.5	9668.4	9539.2	13651.8	10283.6	12689.1
Comb	(35)	(20)	(32)	(32)	(38)	(38)	(25)	(27)	(27)	(28)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	224.3	231.3	231.3	203.9	203.9	202.2	203.4	202.2	203.4	203.4
Mdxt	4528.7	4147.5	5223.5	3489.2	4413.8	4348.1	4312.2	3435.0	3402.5	4313.0
Mdyt	9553.6	12815.6	9655.3	11948.6	8982.9	8875.9	8874.9	11942.0	11810.8	8874.8
Comb	(28)	(33)	(33)	(97)	(97)	(86)	(61)	(86)	(71)	(71)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	203.4	203.4	204.2	204.2	204.3	203.3	203.3	207.5	207.5	210.5
Mdxt	3402.1	4312.6	3329.8	4230.9	3373.1	4286.4	4323.6	3939.0	4933.5	3917.0
Mdyt	11810.7	8874.6	11949.5	8983.4	11813.0	8882.4	8873.1	13366.4	10092.0	13323.5
Comb	(68)	(68)	(72)	(72)	(73)	(90)	(75)	(87)	(87)	(143)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	210.5	203.2	208.0	208.0	212.9	212.9	204.8	204.8	210.9	210.9
Mdxt	4915.5	4351.4	2979.6	3828.2	3820.7	4811.4	3538.1	4471.6	3801.6	4785.2
Mdyt	10051.2	8867.1	13165.1	9930.7	12382.1	9323.0	11770.0	8852.9	12021.7	9051.8
Comb	(143)	(80)	(82)	(82)	(149)	(149)	(89)	(89)	(93)	(93)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	210.9	210.9	210.8	210.8	194.8	194.8	193.1	193.1	194.3	194.3
Mdxt	3437.3	4367.7	3245.4	4144.8	3270.2	4144.1	3216.0	4078.4	4042.5	4042.3
Mdyt	12246.0	9216.8	13182.5	9938.2	11512.9	8662.3	11506.3	8555.4	8554.4	8554.3
Comb	(134)	(134)	(138)	(138)	(208)	(208)	(197)	(197)	(177)	(172)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	194.3	194.3	194.3	194.3	195.2	195.2	195.2	194.2	194.2	198.4
Mdxt	3182.7	4042.2	3183.0	4042.6	3110.8	3960.8	3154.1	4016.4	4053.7	3720.0
Mdyt	11375.3	8554.4	11374.9	8554.0	11513.6	8662.8	11377.3	8561.9	8552.6	12930.6
Comb	(172)	(176)	(179)	(179)	(183)	(183)	(184)	(201)	(186)	(198)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	198.4	199.0	199.0	194.1	198.9	198.9	195.7	195.7	201.8	201.8
Mdxt	4664.9	3034.7	3878.8	4081.6	2760.6	3555.8	3319.1	4202.1	3582.6	4516.1
Mdyt	9771.5	11391.4	8579.5	8546.6	12729.3	9610.1	11334.2	8532.3	11585.9	8731.2
Comb	(198)	(189)	(189)	(191)	(193)	(193)	(200)	(200)	(204)	(204)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	192.2	192.2	191.0	190.7	190.7	191.3	191.4	191.4	191.8	191.8
Mdxt	3955.8	4916.3	3629.8	4544.7	3629.6	4548.8	3614.2	4529.0	3564.0	4473.1
Mdyt	20320.9	16537.9	18708.3	15156.6	18766.0	15121.5	18627.2	15118.8	18773.9	15241.2
Comb	(32)	(32)	(26)	(31)	(31)	(25)	(7)	(7)	(17)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	192.0	192.0	192.6	192.6	194.4	194.4	192.8	192.8	196.6	196.6
Mdxt	3594.6	4508.3	3403.2	4292.1	3507.6	4414.9	3319.3	4196.3	3893.4	4855.9
Mdyt	18629.9	15123.0	19363.2	15729.5	18634.8	15136.8	20079.8	16328.2	18830.3	15295.1
Comb	(18)	(18)	(22)	(22)	(23)	(23)	(27)	(27)	(38)	(38)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	205.8	205.8	194.4	194.4	180.0	180.0	177.8	178.2	178.7	177.8
Mdxt	4004.9	5003.7	3754.1	4694.0	3735.8	4648.7	4108.0	3270.2	4113.7	3269.8
Mdyt	18732.4	15225.5	18569.5	15085.5	19719.0	16067.6	14094.3	17415.3	14044.1	17497.8
Comb	(33)	(33)	(39)	(39)	(87)	(87)	(86)	(81)	(80)	(86)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	178.9	178.9	178.9	179.4	179.4	179.7	179.7	181.8	181.8	183.6
Mdxt	4085.5	3247.8	4085.3	3175.9	4004.8	3219.8	4055.4	3153.3	3983.9	3257.6

Mdyt	14043.2	17302.3	14043.0	17509.0	14215.1	17303.2	14046.2	18567.1	15069.9	17838.6
Comb	(71)	(68)	(68)	(72)	(72)	(73)	(73)	(133)	(133)	(134)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	183.6	180.7	180.7	186.2	186.2	199.4	199.4	183.6	183.6	181.9
Mdxt	4106.8	2826.4	3604.6	3646.5	4553.2	3806.0	4764.2	3504.2	4386.6	3069.3
Mdyt	14477.2	19374.5	15768.0	17589.6	14292.1	17449.7	14192.8	17773.4	14426.0	19283.6
Comb	(134)	(82)	(82)	(93)	(93)	(88)	(88)	(150)	(150)	(138)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	181.9	185.8	185.8	170.0	169.1	167.8	168.2	170.0	167.8	168.8
Mdxt	3887.8	3643.4	4548.6	3503.8	3893.2	3823.4	3038.3	4370.1	3038.0	3799.8
Mdyt	15668.6	18034.2	14635.5	18979.8	13610.2	13482.1	16676.1	15455.3	16758.6	13430.9
Comb	(138)	(149)	(149)	(198)	(208)	(197)	(192)	(198)	(197)	(182)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	169.4	169.4	169.7	169.7	170.5	170.5	173.1	173.1	170.7	170.7
Mdxt	2944.1	3718.8	2987.9	3769.4	2714.5	3456.6	2863.6	3633.8	2594.5	3317.1
Mdyt	16769.8	13602.9	16564.0	13433.9	17611.7	14300.4	16571.0	13453.7	18635.3	15155.8
Comb	(183)	(183)	(184)	(184)	(188)	(188)	(189)	(189)	(193)	(193)
Carr	71	72	73	74						

Fdzt	176.2	176.2	173.1	173.1
Mdxt	3414.7	4268.0	3215.8	4036.1
Mdyt	16850.4	13679.9	16477.8	13380.5
Comb	(204)	(204)	(205)	(205)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	159.8	159.8	161.5	161.5	160.8	160.8	161.5	161.5	161.5	161.5
Mdxt	3690.2	4569.4	3463.8	4285.5	3423.1	4238.6	3414.9	4231.1	4231.0	3414.9
Mdyt	25736.0	22846.1	23763.0	21043.5	23755.4	20952.3	23571.6	20865.6	20868.4	23571.5
Comb	(32)	(32)	(42)	(42)	(31)	(31)	(16)	(7)	(8)	(13)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	161.6	161.6	162.0	161.4	161.4	164.1	164.1	160.5	160.5	166.5
Mdxt	3367.9	4179.1	4212.7	3218.8	4011.9	3313.5	4124.7	3134.4	3914.7	3684.4
Mdyt	23753.7	21032.8	20869.6	24502.2	21706.7	23567.1	20877.7	25419.5	22542.7	23824.3
Comb	(17)	(17)	(18)	(22)	(22)	(23)	(23)	(27)	(27)	(38)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	166.5	176.2	176.2	162.3	162.3	164.6	164.6	150.3	150.3	147.7
Mdxt	4544.0	3831.3	4733.8	3465.2	4301.9	3553.5	4393.6	3428.4	4250.4	3391.4
Mdyt	21098.7	23695.2	20984.2	23525.2	20840.7	23491.7	20811.8	23519.8	20866.9	24647.9
Comb	(38)	(33)	(33)	(34)	(34)	(39)	(39)	(92)	(92)	(143)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	147.7	149.7	149.7	150.6	150.6	150.6	150.6	150.6	150.6	150.6
Mdxt	4244.4	3078.9	3825.7	3066.8	3814.4	3067.1	3814.8	3814.5	3067.1	3814.7
Mdyt	21846.4	22146.7	19491.2	21884.5	19371.8	21880.0	19367.4	19371.8	21884.0	19371.2
Comb	(143)	(86)	(86)	(61)	(61)	(62)	(62)	(64)	(68)	(68)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	152.0	152.0	152.5	150.6	150.6	154.4	154.4	148.2	148.2	171.7
Mdxt	3014.8	3781.1	4060.4	2787.1	3499.4	3385.7	4217.4	3460.3	4296.8	3662.1
Mdyt	22478.9	19878.0	19812.2	23213.4	20568.8	22736.2	20099.0	24976.2	22196.6	22060.6
Comb	(134)	(134)	(150)	(77)	(77)	(149)	(149)	(87)	(87)	(88)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	171.7	152.5	151.8	157.8	157.8	155.1	155.1	152.0	152.0	155.0
Mdxt	4533.5	3254.8	3914.2	3452.1	4262.6	3265.1	4047.4	3120.2	3877.7	2883.1
Mdyt	19536.7	22403.7	19331.7	22245.1	19700.4	21770.0	19290.6	21854.7	19347.4	22378.8

Comb	(88)	(150)	(89)	(93)	(93)	(94)	(94)	(99)	(99)	(139)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	155.0	139.1	139.1	138.8	138.8	138.5	138.5	139.4	139.4	139.4
Mdxt	3638.2	3151.2	3948.9	2802.6	3519.4	2801.8	3518.7	3495.7	3495.7	2789.9
Mdyt	19806.8	22509.6	19938.9	21025.9	18512.7	21136.4	18563.2	18443.7	18443.8	20869.8
Comb	(139)	(203)	(203)	(192)	(192)	(197)	(197)	(171)	(172)	(173)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	139.4	139.4	139.6	139.6	140.1	139.3	139.3	143.1	143.1	137.0
Mdxt	3496.0	3496.0	2722.7	3413.8	3466.1	2509.8	3159.6	2645.0	3330.4	3183.2
Mdyt	18439.4	18443.3	21133.9	18678.2	18445.1	22203.2	19640.9	20867.3	18456.6	23965.9
Comb	(173)	(179)	(183)	(183)	(184)	(188)	(188)	(189)	(189)	(198)
Carr	81	82	83	84	85	86	87			
Fdzt	137.0	140.5	140.5	143.8	143.8	140.8	140.8			
Mdxt	3995.2	2861.8	3612.8	2987.9	3732.0	2842.9	3557.6			
Mdyt	21268.6	20807.4	18403.7	20759.8	18362.6	20844.4	18419.4			
Comb	(198)	(200)	(200)	(205)	(205)	(210)	(210)			

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	129.8	129.8	128.5	130.0	130.0	130.0	130.4	128.7	130.0	129.5
Mdxt	4001.7	3241.4	4156.6	3194.0	3193.8	3193.7	4006.8	3778.8	3193.7	3965.6
Mdyt	23508.2	23894.0	24482.6	23687.5	23687.6	23687.8	23390.6	24237.0	23687.9	23392.6
Comb	(42)	(42)	(37)	(16)	(3)	(6)	(43)	(22)	(11)	(31)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	129.8	129.8	130.4	130.4	129.9	128.5	132.2	132.2	125.7	125.7
Mdxt	3920.9	3145.0	3951.4	3175.6	3196.5	3437.6	3884.0	3089.2	4159.6	3451.1
Mdyt	23492.9	23874.4	23313.6	23691.1	23686.1	24921.9	23320.4	23714.4	25518.4	26014.5
Comb	(17)	(17)	(18)	(18)	(21)	(37)	(23)	(23)	(32)	(32)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	134.9	134.9	145.2	145.2	131.0	130.7	133.2	133.2	121.0	121.0
Mdxt	4248.2	3462.6	4502.6	3613.6	4009.3	3243.4	4119.2	3333.5	3815.8	3151.8
Mdyt	23577.9	23957.9	23472.5	23837.8	23296.1	23678.0	23258.3	23649.1	22351.7	22651.9
Comb	(38)	(38)	(33)	(33)	(44)	(34)	(39)	(39)	(149)	(149)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	121.6	120.8	121.0	120.9	121.0	119.3	120.9	121.0	121.0	121.0

Mdxt	3647.0	3281.2	3092.9	3591.0	2858.8	3671.7	2863.4	3586.4	3586.4	2859.1
Mdyt	21745.3	22007.5	22044.8	21649.6	21977.7	22032.0	21974.0	21633.4	21633.3	21976.8
Comb	(98)	(139)	(149)	(85)	(66)	(150)	(75)	(63)	(68)	(68)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	120.8	120.8	121.6	121.6	120.9	118.8	118.8	124.1	124.1	122.0
Mdxt	3524.0	2789.1	3567.6	2832.8	2862.6	3872.8	3207.1	3470.3	2709.5	2929.7
Mdyt	21891.4	22244.2	21635.3	21982.4	21975.1	23305.3	23740.7	21645.0	22015.6	21963.8
Comb	(72)	(72)	(73)	(73)	(76)	(92)	(92)	(78)	(78)	(89)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	120.6	116.2	116.2	114.9	114.9	142.7	142.7	122.5	120.9	116.5
Mdxt	2872.6	3182.1	2434.7	3876.9	3226.5	4355.3	3458.5	3650.5	2847.0	3558.5
Mdyt	21968.1	24285.3	24742.5	24784.9	25301.5	21862.3	22191.9	21610.3	21978.1	22164.3
Comb	(81)	(82)	(82)	(87)	(87)	(88)	(88)	(99)	(90)	(154)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	116.1	116.1	116.1	116.1	116.1	116.1	116.5	111.8	111.8	120.8
Mdxt	3509.9	3509.7	3509.6	3509.9	3509.6	3509.8	3491.8	3765.2	3140.3	2643.5
Mdyt	22086.0	22086.2	22086.4	22082.8	22086.4	22086.1	22087.4	24292.1	24708.4	22345.1
Comb	(119)	(114)	(117)	(118)	(122)	(127)	(129)	(143)	(143)	(139)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	131.3	116.8	107.8	107.8	107.7	108.1	107.4	108.1	108.1	108.1
Mdxt	4019.2	3563.7	3216.6	2638.3	3158.1	2570.4	3156.9	2570.4	2570.4	3145.4
Mdyt	22246.2	22058.6	20774.8	21059.9	20561.5	20765.6	20609.8	20765.2	20765.3	20490.4
Comb	(144)	(145)	(208)	(208)	(192)	(177)	(197)	(170)	(172)	(173)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	108.0	108.1	108.1	107.9	107.9	108.7	108.7	108.0	105.9	105.9
Mdxt	2574.9	3145.3	2570.6	3069.3	2500.7	3119.3	2544.4	2574.2	3506.9	2918.7
Mdyt	20761.8	20494.9	20764.6	20753.0	21032.0	20496.9	20770.1	20762.9	22167.0	22528.5
Comb	(186)	(179)	(179)	(183)	(183)	(184)	(184)	(187)	(203)	(203)
Carr	91	92	93	94	95	96	97	98	99	
Fdzt	107.7	103.3	103.3	102.0	102.0	109.1	109.1	108.0	109.6	
Mdxt	2584.3	2725.6	2146.3	3510.7	2938.0	3222.5	2641.3	2558.5	3208.9	
Mdyt	20755.8	23147.0	23530.3	23646.5	24089.3	20455.8	20751.5	20765.9	20471.9	
Comb	(192)	(193)	(193)	(198)	(198)	(200)	(200)	(201)	(210)	

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	102.5	102.5	103.3	103.3	102.9	102.9	102.9	102.9	102.9	102.9
Mdxt	3872.7	3099.1	3888.3	3102.6	3070.5	3065.5	3858.5	3065.7	3858.4	3065.6
Mdyt	20242.3	25679.3	20152.0	25552.0	25465.9	25465.1	20082.0	25460.9	20084.5	25464.8
Comb	(42)	(42)	(43)	(43)	(25)	(11)	(7)	(7)	(8)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	102.9	102.9	102.9	102.5	102.5	102.9	103.3	100.4	100.4	104.6
Mdxt	3858.3	3858.3	3858.3	3827.6	3024.4	3858.1	3051.6	3921.1	3233.6	3826.7
Mdyt	20084.6	20084.7	20084.6	20229.0	25657.0	20099.5	25467.6	21025.7	26745.8	20082.3
Comb	(11)	(14)	(15)	(17)	(17)	(21)	(18)	(37)	(37)	(23)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	104.6	102.8	96.6	96.6	106.3	106.3	102.6	118.6	118.6	104.0
Mdxt	2982.1	3857.1	3852.8	3217.4	3997.2	3198.7	3856.0	4437.1	3518.2	3902.8
Mdyt	25482.3	20146.7	21845.6	27871.0	20054.4	25430.5	20191.7	20347.0	25698.3	20079.2
Comb	(23)	(26)	(32)	(32)	(39)	(39)	(31)	(33)	(33)	(44)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	104.0	107.7	107.7	94.9	94.9	95.4	95.0	95.4	95.4	95.4
Mdxt	3104.1	4096.6	3310.8	3541.8	2804.0	3522.0	2761.2	3521.2	2763.2	2756.1

Mdyt	25452.5	20343.3	25770.4	18860.5	23929.5	18660.1	23672.7	18644.0	23624.6	23623.3
Comb	(44)	(38)	(38)	(97)	(97)	(85)	(86)	(75)	(80)	(61)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	95.5	95.5	95.4	95.4	95.4	95.4	94.9	94.9	95.4	91.8
Mdxt	3521.5	2756.4	2756.0	3521.3	3521.2	2756.2	3477.1	2697.4	3520.8	3610.9
Mdyt	18631.4	23617.2	23623.4	18634.9	18635.0	23622.9	18841.5	23897.5	18656.5	19979.7
Comb	(62)	(62)	(66)	(68)	(71)	(71)	(72)	(72)	(76)	(92)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	91.8	97.8	97.8	95.2	87.8	87.8	95.0	86.5	86.5	102.3
Mdxt	2996.1	3475.7	2637.0	3519.5	3191.5	2382.5	3517.9	3513.2	2973.1	3106.6
Mdyt	25452.9	18632.0	23648.0	18723.9	20759.0	26481.0	18788.1	21150.9	27060.5	24059.5
Comb	(92)	(78)	(78)	(81)	(82)	(82)	(86)	(87)	(87)	(93)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	83.9	83.9	88.1	81.1	81.1	89.8	89.8	80.1	80.1	87.5
Mdxt	3307.5	2806.3	2554.8	2928.7	2376.7	3302.1	2771.3	3271.5	2790.0	3203.9
Mdyt	19838.7	25224.7	23961.2	20384.1	25944.3	18867.3	23909.3	20658.5	26349.9	18892.1
Comb	(148)	(148)	(134)	(138)	(138)	(150)	(150)	(143)	(143)	(155)
Carr	71	72	73	74	75	76	77	78	79	80

Fdzt	87.5	76.5	76.5	82.5	82.5	72.5	72.5	84.9	84.9	71.1
Mdxt	2676.8	3057.1	2599.5	2826.1	2240.2	2542.2	1985.9	3070.6	2549.6	3005.3
Mdyt	23931.3	18877.5	24041.0	17529.9	22236.0	19656.8	25069.0	17489.9	22161.9	20048.8
Comb	(155)	(203)	(203)	(189)	(189)	(193)	(193)	(205)	(205)	(198)

Carr	81	82	83
Fdzt	71.1	81.7	81.7
Mdxt	2576.3	2935.6	2414.5
Mdyt	25648.5	17525.4	22193.3
Comb	(198)	(210)	(210)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	91.7	91.0	90.2	91.0	90.5	90.6	90.6	90.6	90.6	90.6
Mdxt	3433.0	4006.0	3172.3	3184.2	3157.8	3415.0	3157.9	3157.8	3989.5	3988.8
Mdyt	-4640.8	8717.2	17640.3	17571.0	17559.3	-4612.4	17507.8	17510.1	8705.4	8687.0
Comb	(23)	(43)	(42)	(43)	(31)	(11)	(7)	(16)	(25)	(16)
Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	90.2	90.5	90.1	90.9	90.6	87.9	87.9	87.9	91.8	91.7
Mdxt	3410.0	3988.5	3129.5	3152.0	3988.7	3376.4	3936.4	3223.5	4031.5	3118.4
Mdyt	-4698.6	8740.3	17622.9	17512.8	8699.8	-5136.6	8940.1	18282.9	8707.5	17519.1
Comb	(42)	(26)	(17)	(18)	(21)	(37)	(37)	(37)	(44)	(23)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	90.6	83.9	83.9	83.9	92.9	92.9	92.9	90.6	90.5	106.8
Mdxt	3415.7	3286.3	3824.1	3171.2	3449.4	4034.9	3060.7	3415.4	3988.3	3932.8
Mdyt	-4577.4	-5648.9	9126.0	18936.1	-4650.2	8640.8	17457.4	-4581.4	8778.7	-4149.1
Comb	(25)	(32)	(32)	(32)	(28)	(28)	(28)	(30)	(31)	(33)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	106.8	106.8	91.8	95.5	95.5	95.5	94.0	94.0	94.0	91.8
Mdxt	4604.1	3647.6	3195.7	3575.1	4178.4	3363.7	3514.8	4108.3	3275.9	3450.8
Mdyt	9110.4	17899.4	17518.7	-4544.6	8874.8	17775.8	-4544.5	8725.9	17528.2	-4574.7
Comb	(33)	(33)	(44)	(38)	(38)	(38)	(39)	(39)	(39)	(44)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	90.6	90.6	90.6	83.0	83.0	83.0	79.8	79.8	79.8	85.1
Mdxt	3414.1	3415.0	3415.0	3142.4	3668.8	2893.3	3094.2	3604.0	2966.6	3175.2
Mdyt	-4614.1	-4611.9	-4612.0	-4403.7	8116.0	16423.1	-5029.5	8415.6	17341.2	-4321.4

Comb	(45)	(52)	(53)	(97)	(97)	(97)	(92)	(92)	(92)	(78)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	85.3	85.1	75.0	75.0	75.0	86.9	86.9	86.1	74.1	74.1
Mdxt	3739.9	2816.4	2952.9	3434.2	2585.6	3198.6	3744.7	3022.2	2965.5	3443.3
Mdyt	8083.2	16250.1	-5455.6	8592.7	17922.6	-4334.7	7988.1	16579.5	-5761.4	8681.1
Comb	(99)	(78)	(82)	(82)	(82)	(83)	(83)	(144)	(87)	(87)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	74.1	85.3	85.3	70.3	70.3	69.5	70.3	69.9	70.3	69.9
Mdxt	2891.8	3200.7	2926.7	2609.7	3058.3	2546.9	2558.8	3041.9	2615.0	2532.5
Mdyt	18274.3	-4226.8	16249.5	-4701.0	7892.3	16320.3	16251.2	7880.5	-4696.2	16187.9
Comb	(87)	(99)	(99)	(145)	(154)	(153)	(154)	(136)	(154)	(118)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	69.9	69.9	69.8	69.5	69.8	69.4	70.2	69.9	67.2	67.2
Mdxt	2532.4	3041.1	2532.4	2595.3	3040.9	2504.0	2526.6	3041.0	2561.6	3023.4
Mdyt	16190.1	7862.1	16239.4	-4766.3	7915.3	16303.0	16192.8	7874.9	-5204.4	8115.2
Comb	(124)	(127)	(142)	(153)	(137)	(128)	(129)	(132)	(148)	(148)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	67.2	71.0	71.1	71.0	70.3	70.3	63.9	63.9	63.9	72.2

Mdxt	2598.2	2618.3	3083.8	2493.0	2607.0	3049.7	2462.6	2870.0	2331.5	2634.6
Mdyt	16963.0	-4708.6	7882.5	16199.2	-4673.4	7854.4	-5502.7	8239.1	17370.0	-4718.0
Comb	(148)	(134)	(155)	(134)	(135)	(135)	(138)	(138)	(138)	(139)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	72.2	72.2	70.2	69.8	63.2	63.2	63.2	86.1	70.3	73.3
Mdxt	3087.2	2435.2	2605.9	3040.7	2471.5	2946.7	2545.9	3656.4	2543.9	2700.0
Mdyt	7815.9	16137.5	-4678.7	7953.8	-5716.7	8301.0	17616.2	8285.5	16175.9	-4612.3
Comb	(139)	(139)	(140)	(142)	(143)	(143)	(143)	(144)	(145)	(150)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	73.3	73.3	71.1	71.1	65.0	64.9	64.9	60.6	60.6	60.6
Mdxt	3160.6	2650.5	2636.1	2570.3	2406.3	2823.3	2329.6	2337.7	2769.5	2385.8
Mdyt	7900.9	16208.3	-4642.5	16198.8	-4374.1	7331.0	15098.9	-5093.2	7649.4	16115.8
Comb	(150)	(150)	(155)	(155)	(200)	(209)	(209)	(203)	(203)	(203)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	65.9	66.0	65.9	64.9	64.9	55.8	55.8	55.8	64.8	54.8
Mdxt	2418.6	2859.8	2235.6	2414.0	2811.2	2196.3	2554.2	2004.9	2400.8	2209.0
Mdyt	-4385.0	7317.1	15024.8	-4367.1	7277.0	-5519.3	7826.5	16697.2	-4342.2	-5825.1
Comb	(189)	(210)	(189)	(209)	(190)	(193)	(193)	(193)	(195)	(198)

Carr	121	122	123	124	125	126	127
Fdzt	54.8	54.8	65.0	65.0	71.3	66.0	66.0
Mdxt	2659.6	2311.1	2815.5	2308.3	2585.9	2444.1	2345.9
Mdyt	7914.9	17048.9	7263.7	14991.4	15391.3	-4290.5	15024.2
Comb	(198)	(198)	(200)	(200)	(204)	(210)	(210)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	216.7	216.7	216.8	217.7	217.9	217.6	217.6	217.6	217.6	217.6
Mdxt	3540.7	4514.3	3373.6	3379.8	3419.1	3347.7	4275.6	4275.6	3347.6	4275.5
Mdyt	1775.8	904.1	-671.0	-561.0	-556.6	1668.1	810.0	810.0	1668.2	810.1
Comb	(37)	(37)	(31)	(35)	(40)	(4)	(4)	(9)	(11)	(11)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	218.4	217.7	217.7	220.5	220.5	217.6	218.2	217.5	217.7	215.2
Mdxt	3382.2	3313.1	4235.3	3549.8	4517.1	3340.0	3322.5	3353.1	4312.8	3575.7

Mdyt	-557.0	1686.8	826.0	1694.8	830.5	-562.5	-558.2	1659.9	807.8	1871.5
Comb	(44)	(17)	(17)	(38)	(38)	(20)	(19)	(21)	(35)	(32)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	215.2	227.3	227.3	227.3	220.4	217.7	217.1	217.1	214.6	214.6
Mdxt	4557.0	3611.1	4599.0	3604.0	3260.6	3306.0	3365.9	4297.5	3110.2	3992.3
Mdyt	988.8	1691.6	818.0	-573.1	-568.5	-580.4	1634.3	762.7	1842.2	964.5
Comb	(32)	(33)	(33)	(33)	(24)	(25)	(26)	(26)	(27)	(27)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	216.7	235.4	235.4	235.4	221.3	221.3	221.4	216.8	216.8	215.2
Mdxt	3556.3	3291.2	4240.3	3294.4	3536.4	4501.6	3248.0	3371.0	4304.2	3596.3
Mdyt	-480.5	1700.7	813.7	-600.6	1657.3	802.9	-569.4	1610.0	728.5	-411.7
Comb	(37)	(28)	(28)	(28)	(34)	(34)	(29)	(31)	(31)	(32)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	221.3	220.5	222.2	202.9	202.9	203.1	204.3	204.2	204.2	204.6
Mdxt	3534.1	3551.2	3528.4	3313.1	4233.6	3075.4	3084.3	3037.2	3890.3	3140.3
Mdyt	-557.5	-544.4	-565.6	1702.7	880.8	-696.3	-539.2	1549.1	746.6	-533.0
Comb	(34)	(38)	(39)	(92)	(92)	(86)	(90)	(66)	(66)	(95)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	204.2	204.2	205.4	204.2	204.3	204.3	209.6	209.6	206.3	204.2
Mdxt	3037.1	3890.2	3087.6	3036.6	2988.0	3832.7	3392.1	4329.1	3014.6	3027.3
Mdyt	1549.1	746.5	-533.7	-530.1	1575.6	769.2	1839.7	994.7	-534.4	-541.4
Comb	(65)	(65)	(99)	(71)	(72)	(72)	(143)	(143)	(73)	(75)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	205.4	205.6	200.8	200.8	208.2	204.4	203.5	203.5	199.9	199.9
Mdxt	3089.7	4002.8	3363.2	4294.2	2914.1	2978.9	3063.6	3923.1	2698.2	3482.8
Mdyt	1547.3	744.2	1839.6	1001.9	-549.9	-567.2	1500.6	678.9	1797.7	967.1
Comb	(99)	(205)	(87)	(87)	(79)	(80)	(81)	(81)	(82)	(82)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	197.9	229.8	229.8	229.6	209.5	209.5	211.2	203.1	203.1	200.8
Mdxt	2900.2	3107.4	4010.6	2962.2	3307.0	4214.2	3184.9	3070.7	3932.6	3393.5
Mdyt	-636.3	1668.8	819.6	-595.8	1533.4	736.1	-606.4	1466.0	629.9	-326.1
Comb	(197)	(139)	(139)	(83)	(89)	(89)	(142)	(86)	(86)	(87)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	218.0	209.5	202.9	208.3	210.8	210.8	210.8	211.9	211.9	212.0
Mdxt	3404.4	3304.7	3336.6	3329.1	3301.9	4210.5	3296.7	3200.2	4093.7	3164.3
Mdyt	-556.7	-534.4	-424.4	-515.7	1545.0	738.6	-546.0	1654.2	831.5	1636.2

Comb	(88)	(89)	(92)	(93)	(94)	(94)	(94)	(153)	(153)	(127)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	212.0	212.0	212.0	212.0	212.1	212.1	213.5	212.3	212.3	210.5
Mdxt	4051.9	4051.6	3163.9	4051.4	3129.4	4011.0	3142.3	3231.9	4131.5	3000.8
Mdyt	815.9	815.8	1636.3	816.0	1654.9	831.9	-493.1	1634.6	814.2	1725.6
Comb	(127)	(119)	(122)	(122)	(128)	(128)	(129)	(151)	(151)	(133)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	210.5	212.8	212.8	209.0	209.0	229.8	211.2	209.6	211.1	199.1
Mdxt	3857.0	3200.6	4095.7	2926.5	3767.0	3105.7	3187.3	3407.6	3367.7	2909.1
Mdyt	895.0	1635.1	814.3	1810.4	970.4	-536.0	1578.1	-347.3	-416.0	-479.2
Comb	(133)	(155)	(155)	(138)	(138)	(139)	(142)	(143)	(148)	(201)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	199.4	200.2	199.0	195.6	195.6	196.9	199.2	197.7	197.7	194.7
Mdxt	2965.2	2912.4	2852.2	3192.7	4082.9	2607.7	2803.7	3142.6	4021.8	2527.6
Mdyt	-473.0	-473.6	-481.4	1810.1	1007.5	-377.9	-507.1	1673.3	886.4	1768.3
Comb	(206)	(210)	(186)	(198)	(198)	(188)	(191)	(203)	(203)	(193)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	194.7	194.7	224.4	224.4	197.9	197.9	195.6	212.8	212.8	197.7

Mdxt	3271.9	2493.7	2786.2	3618.6	2900.1	3719.4	3218.4	3243.2	4145.4	3161.3
Mdyt	972.8	-289.7	1566.0	757.3	1436.5	635.6	-266.0	1553.1	763.5	-364.2
Comb	(193)	(193)	(194)	(194)	(197)	(197)	(198)	(199)	(199)	(203)

Carr	131	132
Fdzt	203.1	205.6
Mdxt	3154.0	3131.4
Mdyt	-455.6	1515.5
Comb	(204)	(205)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	211.8	211.8	214.2	214.2	214.4	214.4	217.2	217.2	214.6	212.8
Mdxt	3519.0	4498.1	3365.6	4290.5	3306.9	4222.6	3532.4	4489.3	3368.0	3200.4
Mdyt	6142.0	4333.5	5792.8	4042.9	5794.2	4043.9	5816.4	4059.8	5772.9	5925.0
Comb	(32)	(32)	(42)	(42)	(17)	(17)	(38)	(38)	(43)	(22)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	212.8	224.0	224.0	214.4	211.2	211.2	232.2	232.2	218.1	218.1

Mdxt	4095.4	3611.8	4593.7	3312.1	3136.9	4018.5	3270.2	4207.4	3245.1	4156.3
Mdyt	4153.4	5839.3	4068.6	5768.6	6083.0	4285.5	5856.3	4081.3	5731.1	3992.6
Comb	(22)	(33)	(33)	(25)	(27)	(27)	(28)	(28)	(29)	(29)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	218.0	218.0	214.6	214.6	214.6	199.6	199.6	201.0	201.0	201.0
Mdxt	3526.1	4483.5	3393.5	4323.7	4294.1	3250.7	4171.5	3907.1	3870.0	3053.6
Mdyt	5722.4	3990.7	5756.1	4012.6	4026.3	5659.3	3980.6	3747.5	3738.0	5383.1
Comb	(34)	(34)	(40)	(40)	(43)	(92)	(92)	(90)	(70)	(90)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	201.0	201.0	201.0	201.0	206.2	206.2	201.0	197.4	197.4	201.1
Mdxt	3869.9	3024.9	2983.3	3821.9	3343.9	4276.6	3019.6	3286.2	4222.9	2990.8
Mdyt	3738.0	5366.4	5417.7	3780.1	5887.8	4177.4	5371.5	5914.6	4193.8	5381.1
Comb	(69)	(71)	(72)	(72)	(143)	(143)	(75)	(87)	(87)	(80)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	196.5	196.5	226.6	226.6	207.5	207.5	214.7	214.7	206.2	206.2
Mdxt	2740.5	3528.6	3095.1	3991.6	3297.8	4199.9	3418.8	4353.3	3296.3	4195.8
Mdyt	5830.3	4125.2	5602.0	3925.1	5357.8	3730.8	5482.0	3815.4	5315.0	3704.0
Comb	(82)	(82)	(139)	(139)	(94)	(94)	(88)	(88)	(89)	(89)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	202.1	202.1	207.9	208.6	208.6	209.0	208.7	208.7	208.7	208.8
Mdxt	3078.8	3935.5	3176.2	4076.9	3190.5	4080.4	4042.2	4042.3	4042.6	3131.8
Mdyt	5364.8	3736.1	5572.6	3886.8	5538.6	3870.1	3858.4	3858.4	3858.3	5540.0
Comb	(99)	(99)	(142)	(153)	(153)	(154)	(121)	(122)	(127)	(128)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	208.8	209.0	207.2	207.2	208.8	205.6	205.6	209.0	209.0	209.5
Mdxt	4008.5	3192.9	3025.4	3881.0	3137.1	2961.9	3803.9	3218.5	4110.2	3198.7
Mdyt	3887.8	5518.6	5670.8	3997.3	5514.4	5828.8	4129.4	5501.9	3856.5	5503.0
Comb	(128)	(154)	(133)	(133)	(136)	(138)	(138)	(151)	(151)	(155)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	209.5	192.2	192.2	194.4	194.4	191.3	191.3	221.3	221.3	194.7
Mdxt	4088.0	3123.5	4017.4	3088.1	3965.6	2577.8	3328.0	2768.3	3592.6	3574.4
Mdyt	3857.0	5678.5	4049.0	5423.3	3835.7	5594.3	3980.3	5270.3	3688.5	3604.6
Comb	(155)	(198)	(198)	(203)	(203)	(193)	(193)	(194)	(194)	(202)
Carr	81	82								
Fdzt	202.3	202.3								
Mdxt	3135.3	4001.8								

Mdyt	5121.7	3585.9
Comb	(205)	(205)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	205.0	205.0	206.3	206.2	206.2	206.2	206.2	206.3	206.3	209.0
Mdxt	3413.0	4351.8	3306.2	4192.9	3293.8	4192.8	4193.0	3270.3	4165.7	3483.8
Mdyt	8905.7	7354.3	8566.8	7027.8	8555.8	7027.9	7027.8	8614.3	7082.2	8647.1
Comb	(37)	(37)	(35)	(4)	(16)	(11)	(16)	(17)	(17)	(38)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	209.0	206.3	206.1	203.2	203.2	215.9	215.9	205.8	202.6	202.6
Mdxt	4417.6	3291.7	4195.6	3424.7	4373.3	3584.8	4547.4	4201.4	3132.4	3998.9
Mdyt	7109.9	8558.8	7025.0	9213.5	7643.9	8655.0	7102.1	7016.1	9111.0	7548.4
Comb	(38)	(20)	(21)	(32)	(32)	(33)	(33)	(26)	(27)	(27)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	225.1	225.1	210.9	210.9	205.5	191.3	191.3	193.4	193.4	193.4
Mdxt	3222.8	4140.9	3492.4	4431.2	4201.8	3153.4	4043.4	3025.7	3888.5	3858.8

Mdyt	8646.2	7107.6	8546.0	7024.6	7008.7	8461.2	7002.4	7996.1	6536.7	6568.2
Comb	(28)	(28)	(39)	(39)	(31)	(92)	(92)	(98)	(95)	(98)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	193.1	193.0	193.0	193.1	193.1	193.1	197.6	197.6	193.1	192.9
Mdxt	2983.2	3808.4	2983.0	3808.1	2949.5	3769.4	3258.5	4162.1	2980.0	3812.3
Mdyt	7961.4	6535.8	7961.3	6536.1	8044.9	6613.7	8810.1	7362.6	7965.7	6532.0
Comb	(71)	(63)	(63)	(65)	(72)	(72)	(143)	(143)	(75)	(76)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	188.7	188.7	192.4	187.8	187.8	219.5	219.5	199.7	199.7	192.0
Mdxt	3170.1	4074.1	3820.8	2752.6	3530.0	3056.6	3936.1	3266.8	4149.7	3821.3
Mdyt	8901.0	7416.1	6519.3	8754.6	7279.8	8242.8	6826.3	7947.4	6531.4	6508.7
Comb	(87)	(87)	(81)	(82)	(82)	(139)	(139)	(94)	(94)	(86)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	193.4	198.8	198.8	199.9	200.5	197.0	197.0	200.9	200.5	200.9
Mdxt	3050.8	3019.7	3860.9	3136.5	4015.8	2966.3	3795.5	4045.6	3150.0	3175.1
Mdyt	7959.3	8434.0	7010.1	8220.6	6801.1	8707.6	7267.2	6747.0	8211.0	8150.8
Comb	(95)	(133)	(133)	(142)	(153)	(138)	(138)	(151)	(153)	(151)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	200.9	200.9	183.5	183.5	182.6	182.6	186.1	186.1	194.5	194.5
Mdxt	3157.5	4025.2	3015.7	3878.0	2598.2	3340.1	2999.1	3847.0	3112.5	3961.5
Mdyt	8176.6	6769.0	8526.4	7155.1	8380.0	7018.7	8086.6	6741.4	7572.8	6270.4
Comb	(154)	(154)	(198)	(198)	(193)	(193)	(203)	(203)	(205)	(205)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	198.3	198.3	199.1	199.8	199.8	199.8	199.8	199.8	199.8	202.4
Mdxt	3319.0	4255.5	3244.5	4127.8	4127.6	3246.9	3223.0	4101.0	3239.4	4350.1
Mdyt	10670.8	9872.3	10357.6	9429.3	9429.5	10256.4	10315.9	9501.5	10252.0	9540.5
Comb	(37)	(37)	(31)	(16)	(11)	(35)	(17)	(17)	(20)	(38)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	196.2	196.2	209.4	209.4	202.4	195.5	195.5	219.8	219.8	202.9
Mdxt	3316.3	4261.2	3549.9	4494.6	3425.2	3121.6	3973.9	3156.0	4085.6	4347.9
Mdyt	11043.0	10265.1	10367.2	9522.7	10359.7	10918.2	10134.5	10307.2	9487.9	9431.4
Comb	(32)	(32)	(33)	(33)	(38)	(27)	(27)	(28)	(28)	(34)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	204.5	204.5	184.5	186.3	186.9	187.0	185.7	186.7	187.0	186.7
Mdxt	3448.8	4368.6	3043.2	3779.3	3821.3	3793.9	2936.8	3744.1	2970.7	3744.6
Mdyt	10235.6	9424.6	10130.4	8866.7	8761.9	8804.7	9683.1	8761.0	9567.2	8760.9
Comb	(39)	(39)	(92)	(97)	(95)	(98)	(86)	(65)	(98)	(71)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	186.6	186.6	190.6	190.3	186.7	183.5	184.5	190.6	191.2	181.5
Mdxt	2906.0	3707.6	4060.7	4062.9	2929.6	2820.5	3927.8	3166.7	4059.9	3039.3
Mdyt	9623.6	8863.9	9835.6	8919.7	9532.2	10009.5	9393.7	10503.3	8763.8	10662.2
Comb	(72)	(72)	(143)	(93)	(75)	(77)	(92)	(143)	(89)	(87)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	181.5	214.1	214.1	191.2	193.4	193.4	187.8	192.6	189.9	192.6
Mdxt	3936.1	3006.4	3882.5	3189.6	3228.6	4093.5	2990.5	4054.7	2972.1	3169.4
Mdyt	9954.8	9767.6	9058.5	9482.9	9508.9	8754.2	9520.6	9442.9	10378.5	10131.1
Comb	(87)	(139)	(139)	(89)	(94)	(94)	(99)	(148)	(138)	(148)
Carr	51	52	53	54	55	56	57	58		
Fdzt	193.4	193.5	179.3	179.3	176.3	176.3	188.1	188.1		
Mdxt	3939.2	3897.9	2904.2	3741.2	2900.4	3749.8	3089.7	3923.3		
Mdyt	9004.1	9005.8	9629.3	8995.1	10161.1	9556.1	9007.7	8355.5		

Comb	(142)	(147)	(203)	(203)	(198)	(198)	(205)	(205)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	194.5	194.5	196.2	196.2	196.2	196.2	196.2	196.2	196.2	196.2
Mdxt	4154.7	3292.6	4073.2	3215.4	4073.1	3215.4	4073.2	3215.5	3215.5	4073.0
Mdyt	11015.5	11776.8	10509.7	11180.9	10509.8	11181.2	10509.6	11178.9	11180.6	10509.8
Comb	(37)	(37)	(3)	(4)	(11)	(11)	(16)	(7)	(8)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	196.2	196.2	196.2	198.7	198.7	196.1	196.1	192.3	192.3	205.9
Mdxt	3215.3	4053.5	3197.9	4289.6	3399.3	4074.7	3217.0	4144.2	3288.7	4451.0
Mdyt	11181.1	10590.5	11276.2	10643.9	11325.0	10509.5	11164.5	11463.0	12309.5	10620.8
Comb	(10)	(17)	(17)	(38)	(38)	(21)	(21)	(32)	(32)	(33)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	205.9	195.8	195.8	191.5	191.5	217.6	217.6	200.9	200.9	195.6
Mdxt	3525.2	4077.8	3220.4	3929.6	3093.7	4016.3	3140.7	4324.2	3424.0	4077.1
Mdyt	11266.7	10508.8	11112.4	11314.0	12131.2	10532.8	11232.2	10517.5	11192.3	10509.2

Comb	(33)	(26)	(26)	(27)	(27)	(28)	(28)	(39)	(39)	(31)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	182.6	183.1	183.1	182.6	183.3	183.3	183.0	182.9	183.0	182.9
Mdxt	3712.6	2958.7	3751.0	2926.2	3736.2	2944.7	3690.2	2905.4	2905.0	3661.7
Mdyt	9873.2	10383.9	9755.3	10516.1	9804.2	10433.0	9752.3	10371.3	10374.3	9867.9
Comb	(97)	(95)	(95)	(97)	(98)	(98)	(71)	(62)	(65)	(72)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	182.9	186.5	186.5	182.8	184.1	180.6	180.6	188.7	186.5	182.4
Mdxt	2880.1	3999.9	3964.2	3692.2	2964.7	3807.0	3015.4	3974.5	3137.8	3696.7
Mdyt	10510.2	9944.2	10972.7	9752.2	10368.6	10475.1	11225.4	10525.3	11866.2	9751.2
Comb	(72)	(93)	(143)	(76)	(99)	(92)	(92)	(148)	(143)	(81)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	182.4	177.4	177.4	211.8	211.8	182.1	189.7	184.1	185.7	188.7
Mdxt	2912.2	3792.3	3009.8	3834.3	2989.8	3695.7	4049.4	3761.6	2942.9	3141.7
Mdyt	10276.2	11114.2	11986.3	10042.6	10789.0	9751.6	9763.4	9750.2	11687.9	11333.5
Comb	(81)	(87)	(87)	(139)	(139)	(86)	(94)	(99)	(138)	(148)
Carr	61	62	63	64	65	66	67	68	69	
Fdzt	175.2	175.2	172.0	172.0	208.1	208.1	181.1	184.3	184.3	

Mdxt	3639.5	2875.2	3624.9	2869.7	3430.8	2658.3	3832.5	3882.0	3063.0	
Mdyt	10020.0	10814.2	10659.1	11575.2	9330.5	10036.3	9489.1	9308.4	9979.1	
Comb	(203)	(203)	(198)	(198)	(194)	(194)	(204)	(205)	(205)	

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	195.5	195.5	196.7	198.0	198.0	197.2	197.2	197.2	197.2	197.2
Mdxt	3996.8	3171.6	3957.0	3175.8	4009.4	3131.1	3955.4	3131.0	3130.9	3131.0
Mdyt	10012.7	12552.5	9647.7	11951.6	9593.9	11948.3	9586.2	11950.0	11950.3	11950.1
Comb	(37)	(37)	(31)	(44)	(44)	(7)	(8)	(8)	(10)	(16)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	197.2	197.2	199.6	197.2	197.1	193.3	193.3	207.0	207.0	199.6
Mdxt	3942.4	3119.4	3313.7	3955.1	3131.8	3972.4	3155.1	4359.2	3462.1	4172.5
Mdyt	9652.8	12045.0	12117.7	9588.4	11943.0	10381.1	13085.6	9750.6	12079.1	9735.4
Comb	(17)	(17)	(38)	(20)	(21)	(32)	(32)	(33)	(33)	(38)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	196.9	192.4	192.4	220.2	220.2	202.0	202.0	183.2	183.6	181.1

Mdxt	3133.7	3870.1	3059.7	3847.3	3019.2	3354.1	4225.3	3583.9	2862.4	3631.5
Mdyt	11919.9	10261.0	12907.5	9529.5	11945.3	11983.6	9629.5	8977.5	11082.6	9484.6
Comb	(26)	(27)	(27)	(28)	(28)	(39)	(39)	(97)	(95)	(92)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	183.2	183.8	183.8	187.1	187.1	183.5	183.5	183.5	186.9	186.9
Mdxt	2832.7	3616.8	2859.2	3842.4	3043.4	2821.3	3553.4	2804.8	3883.0	3082.5
Mdyt	11217.1	8926.3	11137.4	9911.2	12563.7	11073.7	8970.4	11208.9	9088.5	11312.7
Comb	(97)	(98)	(98)	(143)	(143)	(66)	(72)	(72)	(93)	(93)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	183.6	183.4	179.9	181.1	189.4	189.4	183.1	177.9	177.9	216.4
Mdxt	3571.7	2822.7	3497.1	2879.4	3866.7	3060.0	2825.4	3596.9	2855.7	3407.6
Mdyt	8878.5	11063.1	9360.9	11934.0	9542.8	12030.6	11030.2	10011.0	12695.5	8794.4
Comb	(75)	(76)	(77)	(92)	(148)	(148)	(81)	(87)	(87)	(83)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	216.4	197.5	197.5	190.3	190.3	214.1	214.1	200.8	193.4	193.4
Mdxt	2661.7	4149.7	3294.4	3958.3	3140.1	3716.9	2907.6	4229.2	4042.5	3202.1
Mdyt	11066.4	9110.1	11257.6	8937.2	11121.2	9059.6	11423.4	9280.6	9265.5	11595.8
Comb	(83)	(88)	(88)	(94)	(94)	(139)	(139)	(144)	(149)	(149)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	195.8	195.8	175.4	175.4	172.2	172.2	210.7	210.7	181.2	181.2
Mdxt	4095.3	3242.6	3510.8	2775.7	3476.2	2752.0	3285.8	2558.0	3762.2	2978.8
Mdyt	9159.5	11461.7	9048.4	11449.7	9574.5	12211.1	8358.0	10582.1	8652.2	10828.4
Comb	(150)	(150)	(203)	(203)	(198)	(198)	(194)	(194)	(204)	(204)

Carr	71	72
Fdzt	184.6	184.6
Mdxt	3837.6	3036.4
Mdyt	8500.8	10636.9
Comb	(205)	(205)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	202.6	202.6	203.6	204.2	204.2	206.2	204.7	203.9	203.9	204.0
Mdxt	3679.3	2916.3	3661.4	2925.9	3693.7	3090.7	3721.3	2920.0	2898.5	3652.3
Mdyt	6274.7	10183.7	6162.8	9775.8	6085.0	9919.4	6080.5	9740.8	9733.4	6084.7
Comb	(37)	(37)	(31)	(43)	(43)	(38)	(44)	(40)	(12)	(17)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	204.0	201.5	200.6	213.8	213.8	206.2	208.7	200.6	199.4	228.9
Mdxt	2891.6	3648.2	2892.4	4095.5	3252.8	3893.8	3145.5	3648.1	2881.7	3425.9
Mdyt	9801.8	6230.3	10568.4	6301.2	9939.3	6219.6	9829.5	6445.1	10445.4	5838.5
Comb	(17)	(22)	(32)	(33)	(33)	(38)	(39)	(32)	(27)	(28)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	228.9	208.7	187.5	187.5	188.9	189.8	189.8	190.5	190.5	189.4
Mdxt	2698.9	3963.3	3304.4	2616.9	3278.5	2630.7	3324.7	2662.6	3364.3	2591.7
Mdyt	9606.4	6174.9	5873.4	9627.8	5713.5	9045.1	5602.3	9008.9	5595.8	8983.4
Comb	(28)	(39)	(92)	(92)	(86)	(98)	(98)	(99)	(99)	(62)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	189.4	189.5	189.5	193.8	193.8	184.6	184.6	196.2	196.2	182.9
Mdxt	2591.5	3265.3	2581.7	3628.0	2868.2	3259.8	2582.8	3710.7	2944.3	3247.2
Mdyt	8984.5	5601.8	9082.2	6195.9	10164.6	6116.7	10177.3	5730.8	9121.8	6051.4
Comb	(67)	(72)	(72)	(143)	(143)	(87)	(87)	(94)	(94)	(82)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	182.9	225.1	225.1	225.1	202.0	202.0	195.8	195.8	196.8	197.4
Mdxt	2567.5	-1626.5	2924.2	2306.2	3942.3	3121.3	3659.2	2892.0	3641.5	2901.7

Mdyt	10001.6	-340.5	5209.7	8803.0	5925.7	9425.7	6025.5	9779.9	5913.7	9372.0
Comb	(82)	(83)	(83)	(83)	(150)	(150)	(148)	(148)	(142)	(154)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	199.5	197.4	197.2	197.2	197.3	197.3	198.0	194.8	194.8	192.6
Mdxt	3066.5	3673.7	2895.8	2874.3	3632.6	2867.4	3701.2	3628.1	2864.3	2857.5
Mdyt	9515.6	5835.8	9337.0	9329.6	5835.5	9398.0	5831.3	5981.1	9687.3	10041.6
Comb	(149)	(154)	(151)	(123)	(128)	(128)	(155)	(133)	(133)	(138)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	222.2	222.2	207.0	207.0	199.5	181.2	178.3	182.8	178.3	176.6
Mdxt	3409.7	2674.6	4074.3	3228.6	3873.0	3286.2	2560.1	3261.4	3241.5	2545.0
Mdyt	5589.4	9202.6	6052.1	9535.4	5970.5	5641.8	9802.4	5416.8	5885.2	9626.7
Comb	(139)	(139)	(144)	(144)	(149)	(203)	(198)	(192)	(198)	(193)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	218.8	218.8	218.8	182.6	181.2	197.2	197.2	186.4	186.4	189.9
Mdxt	1642.9	2911.6	2283.7	3260.6	2594.3	3879.9	3075.0	3592.2	2843.5	3691.3
Mdyt	-349.7	4979.3	8428.1	5482.0	9252.9	5679.7	8903.7	5563.0	8875.2	5499.2
Comb	(194)	(194)	(194)	(197)	(203)	(199)	(199)	(204)	(204)	(205)
Carr	81	82	83	84	85					

Fdzt	189.9	183.5	183.5	184.3	184.3
Mdxt	2921.8	3306.7	2608.2	3346.2	2640.1
Mdyt	8747.0	5370.7	8670.2	5364.3	8634.0
Comb	(205)	(209)	(209)	(210)	(210)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	217.2	215.1	215.1	215.1	216.0	216.0	216.0	218.4	218.4	216.0
Mdxt	1765.1	3100.5	2439.5	1762.0	1719.4	1720.4	1720.3	3717.5	2924.8	1719.5
Mdyt	-3607.2	2133.8	5283.6	-3768.3	-3503.5	-3501.2	-3501.4	2185.1	5347.3	-3503.2
Comb	(34)	(37)	(37)	(37)	(9)	(7)	(12)	(144)	(144)	(13)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	216.2	216.2	216.2	216.0	216.0	211.9	211.9	211.9	227.6	225.9
Mdxt	1714.0	3067.5	2414.8	3073.6	2419.6	1781.9	3116.1	2453.3	-1681.3	3548.1
Mdyt	-3557.6	2064.9	5111.0	2058.3	5094.6	-3925.1	2178.1	5394.9	-3787.6	2182.6
Comb	(17)	(17)	(17)	(21)	(21)	(27)	(27)	(27)	(23)	(33)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	225.9	219.6	220.7	220.7	243.2	243.2	243.2	220.1	216.7	213.5
Mdxt	2796.2	1653.7	3432.8	2703.4	-2224.5	-2924.8	2064.9	1640.8	1785.8	1749.9
Mdyt	5402.9	-3579.3	2140.5	5298.9	-4159.9	1914.4	4728.3	-3605.6	-3437.1	-4061.5
Comb	(33)	(24)	(39)	(39)	(28)	(28)	(28)	(29)	(44)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	213.5	213.5	225.9	218.2	220.7	201.9	199.0	199.0	199.0	204.4
Mdxt	3074.0	2418.1	2112.2	1973.7	2044.7	1500.2	2727.8	2147.0	1495.8	3289.3
Mdyt	2189.2	5422.4	-3116.1	-3317.7	-3223.9	-3545.8	1976.9	4895.1	-3776.0	2155.1
Comb	(32)	(32)	(33)	(38)	(39)	(89)	(92)	(92)	(92)	(138)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	200.3	200.3	199.9	200.2	200.2	204.4	200.3	200.5	200.5	199.9
Mdxt	1434.8	1434.8	3362.6	1436.4	1436.3	2581.8	1435.2	1427.2	2679.9	2643.2
Mdyt	-3398.3	-3398.0	1965.1	-3394.3	-3394.7	5339.4	-3397.2	-3474.9	1878.4	4865.3
Comb	(66)	(60)	(205)	(62)	(67)	(138)	(68)	(72)	(72)	(205)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	203.2	203.2	203.2	200.4	200.2	197.1	196.4	196.4	216.9	216.9
Mdxt	-1454.7	2649.5	2088.9	2687.4	2118.7	1483.9	3244.5	2549.4	-1909.3	-2510.9
Mdyt	-3465.8	1851.9	4581.5	1866.0	4625.1	-3688.6	1967.7	4872.7	-3803.6	1785.7

Comb	(73)	(73)	(73)	(75)	(76)	(77)	(204)	(204)	(78)	(78)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	206.2	207.6	207.6	201.3	194.5	194.5	194.5	239.1	239.1	239.1
Mdxt	-1559.3	3274.9	2568.0	1529.8	1524.3	2751.1	2166.8	-2685.2	-3507.1	-1729.6
Mdyt	-3543.4	2110.9	5228.0	-3302.6	-4000.1	2040.1	5054.0	-4335.3	-1756.8	4101.7
Comb	(84)	(148)	(148)	(99)	(82)	(82)	(82)	(83)	(83)	(83)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	198.4	196.7	196.7	196.7	214.4	213.1	213.1	204.4	209.6	207.6
Mdxt	1630.4	1478.7	2690.0	2116.6	1996.2	3602.5	2831.8	2093.5	2076.6	2073.6
Mdyt	-3133.0	-4194.8	2056.0	5093.4	-2844.1	2117.5	5243.3	-3522.8	-3204.9	-3366.0
Comb	(190)	(87)	(87)	(87)	(88)	(150)	(150)	(138)	(145)	(148)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	208.5	210.7	210.7	208.4	208.4	208.5	208.6	207.4	208.6	208.4
Mdxt	2030.9	3519.9	2766.1	2031.9	2031.9	2031.1	2025.6	3526.8	2543.3	3248.8
Mdyt	-3101.2	2119.4	5248.5	-3098.8	-3099.1	-3100.9	-3155.3	2078.9	5055.5	2035.4
Comb	(120)	(149)	(149)	(118)	(123)	(124)	(128)	(199)	(128)	(132)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	208.4	206.2	206.2	206.2	220.1	212.1	212.1	212.1	235.6	235.6

Mdxt	2548.1	2065.2	3271.9	2567.4	1812.3	1965.3	3201.7	2509.9	-1807.4	2791.2
Mdyt	5039.1	-3304.8	2095.1	5188.9	-3385.3	-3177.0	2011.2	4977.7	-3757.5	1891.4
Comb	(132)	(133)	(133)	(133)	(134)	(135)	(135)	(135)	(139)	(139)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	235.6	212.6	206.0	206.0	206.0	218.4	210.7	213.1	209.2	194.9
Mdxt	2193.4	1952.4	2061.5	3248.4	2546.6	2423.8	2285.3	2356.3	2097.4	1789.4
Mdyt	4672.7	-3203.2	-3659.1	2166.3	5366.9	-2713.7	-2915.4	-2821.5	-3034.7	-3172.8
Comb	(139)	(140)	(143)	(143)	(143)	(144)	(149)	(150)	(155)	(200)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	192.0	192.0	192.0	194.9	193.3	193.2	193.2	194.9	193.3	193.5
Mdxt	2892.7	2266.3	1785.1	2998.9	1724.1	1725.6	1725.6	2359.5	1724.4	1716.5
Mdyt	1955.6	4843.4	-3402.9	1860.8	-3025.3	-3021.2	-3021.6	4605.9	-3024.2	-3101.8
Comb	(203)	(203)	(203)	(200)	(177)	(173)	(178)	(200)	(179)	(183)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	194.3	194.3	196.2	196.2	196.2	193.4	193.4	190.1	190.1	190.1
Mdxt	2957.9	2319.7	1674.5	2817.4	2208.1	2853.5	2237.0	1773.2	2888.6	2265.4
Mdyt	1868.7	4625.6	-3092.7	1830.6	4529.9	1844.7	4566.0	-3315.5	1933.0	4787.5
Comb	(210)	(210)	(184)	(184)	(184)	(186)	(186)	(188)	(188)	(188)

Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	209.9	198.4	198.4	194.3	187.5	187.5	187.5	232.1	232.1	232.1
Mdxt	-1522.1	2785.5	2183.4	1819.1	1813.6	2914.0	2286.0	-2298.1	-3016.8	1731.1
Mdyt	-3430.4	1813.1	4485.7	-2929.6	-3627.0	2018.8	5002.4	-3962.3	1642.0	4050.1
Comb	(189)	(190)	(190)	(210)	(193)	(193)	(193)	(194)	(194)	(194)

Carr	141	142	143	144	145	146	147	148	149
Fdzt	199.2	192.9	189.7	189.7	189.7	207.4	207.4	196.4	199.9
Mdxt	1612.0	1727.6	1768.0	2854.9	2235.8	2285.4	2776.0	2087.5	2188.9
Mdyt	-3170.3	-2752.3	-3821.7	2034.7	5041.7	-2471.1	5013.9	-2759.2	-2625.0
Comb	(195)	(197)	(198)	(198)	(198)	(199)	(199)	(204)	(205)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	180.5	179.0	179.0	179.0	178.8	180.5	181.6	181.8	181.8	180.1
Mdxt	2878.8	3693.5	2805.1	2876.0	3583.1	2905.1	3652.5	2963.6	2939.5	3576.4

Mdyt	925.0	612.8	-270.9	1008.4	630.3	-150.9	537.6	-149.1	923.1	521.1
Comb	(35)	(37)	(31)	(37)	(148)	(35)	(151)	(40)	(40)	(5)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	180.1	180.1	180.1	179.8	179.8	182.7	179.9	179.5	177.8	177.8
Mdxt	2805.3	2787.6	3576.3	2769.1	3551.4	2941.2	2803.7	2796.9	2899.7	3722.9
Mdyt	-145.4	922.8	521.2	936.8	535.0	944.3	-162.8	-218.0	1085.1	687.8
Comb	(9)	(11)	(11)	(17)	(17)	(38)	(21)	(26)	(32)	(32)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	185.0	185.0	183.6	183.0	180.4	177.9	177.6	185.5	184.8	186.6
Mdxt	2980.6	3808.3	2744.8	2661.9	2675.8	2664.8	3612.7	2677.4	3697.7	2917.1
Mdyt	936.1	530.9	-148.2	-155.3	-172.1	1061.1	705.4	927.1	556.7	-164.7
Comb	(33)	(33)	(23)	(24)	(25)	(27)	(143)	(28)	(144)	(89)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	186.0	186.0	186.1	186.0	192.5	192.5	192.5	180.5	182.7	182.7
Mdxt	3014.8	3846.4	2707.3	3028.0	3056.9	3901.8	3064.9	3692.7	3762.6	2961.4
Mdyt	925.0	519.7	-156.3	-154.5	927.1	520.0	-159.3	520.4	540.9	-129.2
Comb	(39)	(39)	(29)	(39)	(34)	(34)	(34)	(35)	(38)	(38)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	181.8	182.6	169.4	167.2	167.3	169.4	168.8	169.3	167.2	168.8
Mdxt	3763.0	3652.0	2659.1	3422.8	2546.0	2688.8	2546.0	3318.2	2655.1	3254.5
Mdyt	520.1	566.6	856.8	605.1	-324.3	-152.7	-145.0	493.6	975.9	478.2
Comb	(40)	(149)	(90)	(92)	(86)	(90)	(59)	(201)	(92)	(61)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	169.3	168.8	168.8	168.8	168.8	168.4	167.0	171.2	168.6	167.9
Mdxt	2563.8	2529.3	2546.2	2528.8	3254.5	2502.5	3320.0	2745.9	2544.0	2534.2
Mdyt	862.1	853.4	-144.9	853.6	478.3	873.6	621.6	854.1	-169.8	-248.6
Comb	(98)	(63)	(64)	(66)	(66)	(72)	(203)	(95)	(76)	(81)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	165.5	165.5	172.5	172.5	173.8	172.9	169.2	165.6	165.3	176.5
Mdxt	2689.1	3464.8	2748.2	3521.3	2459.8	2341.3	2361.3	2353.5	3362.3	2392.9
Mdyt	1085.3	712.3	884.4	506.4	-148.9	-159.2	-183.2	1051.2	728.8	-162.0
Comb	(87)	(87)	(93)	(93)	(78)	(79)	(80)	(82)	(198)	(83)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	175.8	175.8	177.2	169.4	171.2	171.2	169.8	180.9	185.3	192.4
Mdxt	2804.6	3586.6	2864.3	3421.3	2772.5	3521.9	3321.1	3448.6	3347.1	3791.2
Mdyt	872.6	492.0	-157.9	477.1	-150.2	476.7	477.9	538.7	537.3	537.5

Comb	(88)	(88)	(94)	(90)	(95)	(95)	(100)	(129)	(139)	(145)

Carr	81	82	83	84	85
Fdzt	185.8	175.7	172.4	169.1	169.7
Mdxt	3735.9	3483.7	3418.3	3193.9	3217.4
Mdyt	537.3	508.5	530.7	502.8	494.3
Comb	(150)	(199)	(204)	(209)	(211)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	177.1	177.1	175.5	175.5	178.4	178.4	176.6	176.6	174.3	176.4
Mdxt	2801.2	3624.6	2785.7	3616.8	2866.4	3697.7	3520.2	3520.0	2801.5	3498.8
Mdyt	2768.0	1976.8	2855.5	2069.2	2758.6	1970.9	1969.7	1969.7	2941.5	1986.2
Comb	(35)	(35)	(37)	(37)	(40)	(40)	(10)	(11)	(32)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	179.3	176.5	175.3	174.3	181.5	181.5	174.4	174.4	182.0	182.0
Mdxt	3702.3	2727.3	2673.4	3641.0	2923.6	3753.0	2642.9	3379.9	2610.0	3398.6
Mdyt	1997.1	2761.1	2832.8	2157.1	2796.9	1997.0	2907.7	2126.1	2805.3	1995.7

Comb	(38)	(21)	(22)	(32)	(33)	(33)	(27)	(27)	(28)	(28)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	182.5	182.5	189.1	189.1	179.3	166.0	166.0	163.7	163.7	165.3
Mdxt	2964.3	3795.3	3017.3	3857.6	2876.4	2574.5	3349.2	3338.2	2552.2	2471.2
Mdyt	2769.0	1976.4	2754.0	1969.3	2787.2	2581.3	1840.3	1972.2	2706.4	2565.5
Comb	(39)	(39)	(34)	(34)	(38)	(90)	(90)	(92)	(92)	(63)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	165.8	165.4	163.9	165.0	165.1	167.8	162.0	162.0	169.1	169.1
Mdxt	3240.8	2470.7	2465.4	3168.8	2469.0	3453.9	2575.0	3372.9	2681.9	3460.3
Mdyt	1840.4	2565.7	2610.5	1853.7	2571.6	1831.9	2829.2	2097.8	2608.8	1869.2
Comb	(98)	(69)	(86)	(72)	(76)	(95)	(87)	(87)	(93)	(93)
Carr	41	42	43	44	45					
Fdzt	162.2	162.2	172.4	172.4	173.8					
Mdxt	2348.3	3014.6	2749.3	3532.8	2807.5					
Mdyt	2781.1	2053.4	2622.6	1869.1	2582.9					
Comb	(82)	(82)	(88)	(88)	(94)					

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	167.1	167.1	165.5	165.5	166.7	166.7	166.7	166.7	166.6	166.7
Mdxt	2671.4	3462.0	2646.5	3439.7	3379.8	2618.2	3380.2	3379.7	2618.2	3379.8
Mdyt	3932.7	3375.1	4084.6	3554.1	3366.3	3922.5	3365.6	3366.3	3922.9	3366.2
Comb	(35)	(35)	(37)	(37)	(10)	(7)	(7)	(11)	(12)	(15)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	166.4	166.4	166.5	164.3	164.3	171.5	171.5	164.4	164.4	171.7
Mdxt	2610.0	3365.0	2616.3	2655.5	3454.6	2812.9	3613.4	2566.2	3279.7	2485.6
Mdyt	3949.9	3396.6	3925.1	4226.3	3721.4	3985.4	3408.7	4174.2	3665.7	3971.9
Comb	(17)	(17)	(21)	(32)	(32)	(33)	(33)	(27)	(27)	(28)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	172.7	172.7	172.2	165.7	179.5	179.5	169.3	169.3	156.2	156.2
Mdxt	3665.3	2863.5	3252.8	2611.3	2929.5	3742.4	2761.3	3555.2	2437.9	3180.5
Mdyt	3380.6	3944.1	3338.2	3939.4	3926.7	3385.4	3975.0	3418.9	3657.8	3135.9
Comb	(39)	(39)	(29)	(31)	(34)	(34)	(38)	(38)	(90)	(90)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	155.3	155.3	156.1	156.1	155.6	153.9	153.9	155.4	158.1	152.2

Mdxt	2367.4	3077.2	2391.8	3100.9	3062.4	2402.2	3148.7	2359.2	3292.8	2415.3
Mdyt	3682.6	3168.0	3662.1	3143.2	3123.4	3874.9	3391.7	3646.9	3135.4	4077.2
Comb	(97)	(97)	(98)	(98)	(66)	(92)	(92)	(76)	(95)	(87)

Carr	41	42	43	44	45	46	47	48	49
Fdzt	152.2	159.4	159.4	152.4	152.4	154.2	162.5	162.5	164.2
Mdxt	3170.1	2566.5	3313.8	2287.7	2927.9	2352.1	2640.1	3397.0	3471.3
Mdyt	3630.7	3718.2	3198.6	4002.9	3551.2	3667.3	3733.1	3184.0	3143.9
Comb	(87)	(93)	(93)	(82)	(82)	(86)	(88)	(88)	(94)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	155.2	159.3	160.4	157.4	157.4	159.3	158.0	157.6	157.6	157.6
Mdxt	3279.1	3386.7	2646.8	2557.7	3247.3	2676.5	3268.5	2553.5	2526.9	3243.8
Mdyt	4658.7	4203.8	4290.6	4297.3	4227.7	4267.2	4208.6	4245.4	4279.3	4190.6
Comb	(32)	(40)	(149)	(42)	(42)	(40)	(43)	(10)	(7)	(7)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	157.6	157.6	157.6	157.6	157.6	155.4	157.4	155.2	160.3	160.3

Mdxt	2554.0	3243.1	2553.4	3243.8	2554.0	3184.7	3234.4	2591.1	2667.9	3414.1
Mdyt	4244.2	4191.3	4245.6	4191.0	4244.7	4586.9	4226.8	4841.2	4342.8	4261.0
Comb	(7)	(11)	(11)	(12)	(12)	(27)	(17)	(32)	(38)	(38)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	160.3	155.4	155.4	162.3	162.3	163.8	163.8	170.8	170.8	163.8
Mdxt	2697.3	2503.8	2502.3	2719.3	3476.5	3540.7	2783.1	2867.9	3633.9	2800.4
Mdyt	4328.5	4518.0	4755.7	4368.8	4256.9	4219.2	4318.0	4319.2	4224.4	4265.2
Comb	(38)	(27)	(27)	(33)	(33)	(39)	(39)	(34)	(34)	(39)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	157.4	145.0	147.3	146.4	147.2	148.0	146.8	147.3	147.2	146.7
Mdxt	2526.5	2968.0	3013.6	2914.7	2963.7	2333.3	2927.4	2374.4	2297.7	2928.1
Mdyt	4305.8	4233.4	3892.5	3933.9	3908.0	3977.1	3883.1	3942.7	3987.7	3882.1
Comb	(42)	(92)	(90)	(72)	(98)	(99)	(65)	(90)	(98)	(62)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	147.2	146.7	146.8	146.8	146.7	146.7	145.0	150.6	144.9	143.3
Mdxt	2329.0	2268.3	2927.1	2298.2	2928.1	2299.1	2339.1	2456.8	2876.9	2979.1
Mdyt	3962.9	3967.8	3883.2	3930.6	3882.7	3929.2	4377.6	4014.4	4165.5	4553.3
Comb	(98)	(64)	(66)	(66)	(67)	(67)	(92)	(204)	(77)	(87)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	150.6	150.6	150.6	143.3	143.5	153.5	153.5	153.5	165.6	165.6
Mdxt	2470.5	3171.9	2503.8	2352.1	2225.2	2544.0	3261.1	2576.3	2752.3	3491.0
Mdyt	4057.8	3982.8	4049.0	4781.4	4659.4	4094.9	3977.0	3982.1	3974.9	3932.8
Comb	(93)	(93)	(93)	(87)	(82)	(88)	(88)	(88)	(89)	(89)

Carr	61	62
Fdzt	165.6	155.5
Mdxt	2747.5	3352.9
Mdyt	4035.6	3923.1
Comb	(89)	(94)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	148.8	151.7	151.7	148.9	150.4	150.0	148.7	150.0	150.0	150.0
Mdxt	3199.5	2580.2	3311.1	2479.3	3222.2	2471.6	3204.5	2472.4	3197.9	3197.8
Mdyt	4662.0	5146.6	4493.2	5455.3	4494.2	5118.5	4502.1	5117.8	4474.1	4474.2
Comb	(22)	(40)	(40)	(37)	(43)	(10)	(133)	(12)	(10)	(11)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	150.0	150.0	149.8	149.8	147.7	152.8	152.8	152.3	147.7	147.9
Mdxt	2471.5	2471.6	3196.7	2468.3	2484.4	3364.8	2613.7	3119.7	3191.8	2450.6
Mdyt	5118.5	5118.3	4511.6	5171.1	5758.5	4558.8	5220.0	4436.1	4911.5	5666.1
Comb	(11)	(15)	(17)	(17)	(32)	(38)	(38)	(24)	(32)	(27)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	154.6	154.6	163.6	163.6	156.3	156.3	140.5	139.6	139.7	138.9
Mdxt	3421.5	2664.0	3651.3	2813.6	3515.7	2729.6	2949.4	2264.6	2905.5	2214.4
Mdyt	4555.6	5180.0	4528.7	5207.3	4521.6	5157.1	4146.4	4741.4	4164.6	4812.0
Comb	(33)	(33)	(34)	(34)	(39)	(39)	(99)	(90)	(98)	(97)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	139.2	139.7	139.1	140.5	140.3	139.2	139.2	139.2	139.2	138.8
Mdxt	2870.9	2243.7	2872.2	2279.4	2262.7	2870.7	2214.1	2870.6	2213.9	2868.9
Mdyt	4135.9	4769.9	4135.7	4738.6	4742.8	4136.0	4732.5	4136.0	4732.6	4189.6
Comb	(64)	(98)	(67)	(99)	(100)	(65)	(65)	(66)	(66)	(72)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	137.6	137.4	137.4	143.1	143.1	141.6	136.0	136.0	145.8	145.8
Mdxt	2225.1	2873.2	2200.8	3109.8	2417.0	3032.8	2862.3	2232.4	3190.7	2488.9

Mdyt	5213.6	4404.3	5126.1	4256.9	4877.4	4163.3	4760.7	5646.7	4252.4	4820.4
Comb	(92)	(77)	(77)	(93)	(93)	(95)	(87)	(87)	(88)	(88)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	158.6	158.6	137.6	148.2	141.6	138.9	147.7	154.6	163.6	152.7
Mdxt	3519.1	2702.5	2860.9	3325.4	2369.2	2866.8	3196.8	3426.4	3656.3	3369.7
Mdyt	4213.8	4859.2	4466.8	4203.7	4772.6	4190.9	4751.5	4395.7	4368.7	4398.9
Comb	(89)	(89)	(92)	(94)	(95)	(97)	(143)	(144)	(145)	(149)

Carr	61	62	63	64	65	66	67	68
Fdzt	156.3	137.4	135.9	145.8	158.6	143.1	148.2	141.6
Mdxt	3520.7	2877.5	2866.7	3195.0	3523.4	3114.1	3329.8	3037.2
Mdyt	4361.7	4255.9	4612.4	4104.1	4065.5	4108.5	4055.4	4014.9
Comb	(150)	(188)	(198)	(199)	(200)	(204)	(205)	(206)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	142.9	142.9	145.6	145.6	143.9	143.9	142.7	143.9	143.9	143.9
Mdxt	3443.6	2485.1	3534.7	2575.4	3437.5	3437.5	2488.2	3438.0	2481.0	2480.0

Mdyt	4065.6	5312.9	3969.8	5113.9	3949.1	3949.1	5174.2	3948.8	5080.6	5081.0
Comb	(22)	(22)	(40)	(40)	(4)	(9)	(133)	(7)	(12)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	143.9	143.7	143.7	146.8	146.8	146.0	146.6	142.2	142.0	148.5
Mdxt	2480.0	3437.1	2479.6	3598.4	2621.4	3383.4	2624.5	3440.5	2480.8	3645.1
Mdyt	5081.0	3973.5	5125.6	4033.8	5190.7	3906.0	5052.0	4175.3	5616.2	4057.5
Comb	(11)	(17)	(17)	(38)	(38)	(24)	(149)	(27)	(32)	(33)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	142.0	148.5	158.0	158.0	150.4	150.4	133.6	134.4	133.6	134.3
Mdxt	3428.8	2666.3	3932.6	2855.1	3754.0	2747.6	3124.9	2280.1	2243.4	3147.2
Mdyt	4218.1	5171.8	4038.6	5200.4	4032.4	5153.6	3662.8	4701.9	4722.6	3651.6
Comb	(32)	(33)	(34)	(34)	(39)	(39)	(98)	(99)	(98)	(100)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	133.1	133.0	133.0	133.1	133.1	133.1	131.6	131.6	137.2	137.2
Mdxt	2214.1	3091.9	2215.3	3091.3	2213.9	2213.8	3100.0	2221.2	3321.3	2415.9
Mdyt	4685.9	3638.0	4685.5	3638.4	4686.0	4686.1	3804.9	5017.3	3759.5	4842.7
Comb	(64)	(62)	(67)	(63)	(65)	(66)	(77)	(77)	(93)	(93)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	135.4	135.4	130.5	130.3	138.0	139.4	139.6	130.3	139.6	153.1
Mdxt	3230.2	2350.2	3095.6	2215.1	2880.4	2482.6	2480.0	3078.9	3388.1	3798.9
Mdyt	3668.1	4733.2	3961.5	5450.6	3641.4	4687.2	4815.7	4022.7	3793.3	3766.2
Comb	(95)	(95)	(82)	(87)	(83)	(199)	(88)	(87)	(88)	(89)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	153.1	131.7	142.3	142.3	142.7	144.1	143.7	143.7	143.5	142.0
Mdxt	2749.9	2209.3	3543.7	2596.3	3473.7	3491.4	3468.3	3467.7	3467.3	3470.6
Mdyt	4856.6	5089.4	3757.5	4789.8	3886.0	3786.5	3769.2	3769.5	3793.9	3995.7
Comb	(89)	(92)	(94)	(94)	(133)	(154)	(118)	(120)	(128)	(138)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	141.8	141.8	148.3	148.3	157.8	157.8	144.0	146.6	150.2	150.2
Mdxt	2483.9	3458.9	3675.2	2669.3	3962.6	2858.2	2503.9	3628.4	3784.0	2750.7
Mdyt	5477.5	4038.5	3877.9	5033.1	3858.9	5061.7	4945.0	3854.2	3852.7	5014.9
Comb	(143)	(143)	(144)	(144)	(145)	(145)	(146)	(149)	(150)	(150)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	144.1	131.4	131.4	130.3	130.1	130.1	139.4	153.0	153.0	137.0
Mdxt	2503.8	3128.0	2223.8	3123.5	2217.7	3106.7	3416.0	3826.6	2752.5	3349.1
Mdyt	4967.9	3638.0	4888.8	3794.7	5322.2	3855.9	3626.5	3599.4	4728.1	3592.6

Comb	(154)	(188)	(188)	(193)	(198)	(198)	(199)	(200)	(200)	(204)
Carr	81	82	83	84	85	86				
Fdzt	137.0	142.1	142.1	135.2	135.2	133.4				
Mdxt	2418.5	3571.4	2598.9	3258.0	2352.8	3152.9				
Mdyt	4714.1	3590.6	4661.2	3501.2	4604.6	3496.0				
Comb	(204)	(205)	(205)	(206)	(206)	(209)				

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	139.9	137.7	138.8	138.2	139.0	139.4	139.9	137.7	139.0	142.0
Mdxt	4114.8	2720.2	2710.5	4068.8	4068.7	2730.3	2754.7	4067.8	4067.2	4214.4
Mdyt	3084.9	4560.9	4325.5	3077.1	3063.8	4320.4	4318.8	3085.1	3067.3	3139.8
Comb	(44)	(27)	(17)	(22)	(9)	(43)	(44)	(27)	(20)	(38)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	142.0	140.7	141.5	138.7	141.6	138.5	137.6	143.4	143.4	153.5
Mdxt	2847.6	4056.9	2873.0	4064.2	3997.3	4061.6	2709.5	4254.7	2884.1	4606.8
Mdyt	4406.0	3032.3	4265.4	3118.1	3104.5	3157.9	4604.5	3193.2	4417.9	3225.6

Comb	(38)	(24)	(149)	(26)	(28)	(31)	(32)	(33)	(33)	(34)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	153.5	139.2	145.7	145.7	129.3	126.1	126.8	126.5	128.5	129.3
Mdxt	3123.7	4076.5	4364.8	2978.8	3754.3	2439.6	3688.6	2441.7	2453.9	2488.8
Mdyt	4482.0	3062.6	3190.5	4419.3	2839.2	4322.4	2828.0	4049.9	3978.9	3976.6
Comb	(34)	(35)	(39)	(39)	(99)	(82)	(77)	(203)	(98)	(99)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	127.9	127.8	130.2	130.2	131.8	131.8	127.6	126.1	132.2	132.2
Mdxt	3688.4	3687.0	3799.5	2542.4	3916.1	2644.9	3682.2	3687.1	3896.8	3595.2
Mdyt	2809.0	2827.8	2837.3	3999.0	2767.4	3970.6	2886.5	2839.4	2917.5	2646.7
Comb	(64)	(76)	(95)	(95)	(204)	(204)	(81)	(82)	(93)	(84)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	132.2	127.3	126.0	126.0	134.3	134.3	148.8	148.8	128.2	137.5
Mdxt	2621.6	3678.2	3678.6	2424.4	3954.3	2673.7	4457.3	3016.0	3699.6	4111.6
Mdyt	4101.0	2943.4	2852.2	4384.6	2993.8	4118.0	3040.2	4209.7	2807.2	2990.0
Comb	(93)	(86)	(87)	(87)	(88)	(88)	(89)	(89)	(90)	(94)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	137.5	127.8	137.2	138.3	138.9	139.4	138.0	137.1	142.9	142.9

Mdxt	2809.0	2421.9	2745.6	2735.8	2755.7	2780.1	4082.6	2735.0	4275.7	2909.5
Mdyt	4120.1	3986.8	4420.4	4185.0	4180.0	4178.3	2996.5	4463.9	3031.8	4277.3
Comb	(94)	(97)	(138)	(128)	(154)	(155)	(142)	(143)	(144)	(144)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	153.0	153.0	141.5	145.1	145.1	139.4	128.7	126.3	127.4	125.6
Mdxt	4627.8	3149.1	4235.4	4385.8	3004.2	4135.8	3761.1	3708.1	3706.4	2463.0
Mdyt	3064.2	4341.5	2978.3	3029.1	4278.8	2923.6	2677.7	2677.9	2677.7	4191.9
Comb	(145)	(145)	(149)	(150)	(150)	(155)	(211)	(188)	(187)	(193)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	127.1	125.6	126.8	125.5	125.5	133.9	133.9	148.3	148.3	128.8
Mdxt	3701.6	3706.6	3697.7	3698.1	2447.7	3973.7	2697.1	4476.7	3039.5	3773.8
Mdyt	2736.5	2689.3	2793.3	2702.2	4254.2	2843.8	3987.6	2890.1	4079.2	2689.1
Comb	(192)	(193)	(197)	(198)	(198)	(199)	(199)	(200)	(200)	(210)
Carr	81	82	83	84	85					
Fdzt	128.8	137.0	137.0	129.8	129.8					
Mdxt	2512.2	4130.9	2832.4	3819.1	2565.8					
Mdyt	3846.1	2839.9	3989.7	2687.2	3868.5					
Comb	(210)	(205)	(205)	(206)	(206)					

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	135.5	133.3	135.6	135.0	134.0	133.3	135.0	134.0	133.9	134.0
Mdxt	4937.8	3299.6	4956.4	4938.4	4900.5	3294.0	3331.9	4900.8	3291.9	4900.0
Mdyt	2816.3	3630.3	2808.6	2813.5	2787.6	3638.6	3608.2	2787.4	3586.6	2802.6
Comb	(23)	(27)	(40)	(44)	(7)	(32)	(44)	(15)	(17)	(21)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	135.6	135.4	136.4	133.8	135.7	137.2	133.8	138.4	138.4	149.1
Mdxt	3358.2	4943.0	3436.9	4898.1	4926.7	5026.2	4896.6	5067.6	3449.2	5475.7
Mdyt	3617.1	2789.3	3578.2	2850.5	2871.9	2858.2	2896.5	2925.6	3718.2	3077.5
Comb	(40)	(24)	(149)	(26)	(28)	(38)	(31)	(33)	(33)	(34)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	149.1	140.9	140.9	124.2	121.8	123.2	123.1	122.8	121.7	124.2
Mdxt	3747.1	5164.8	3545.6	4534.2	2985.4	4494.4	4489.8	4480.0	2977.3	3031.5
Mdyt	3881.0	2957.6	3753.8	2586.0	3344.8	2554.3	2576.8	2548.9	3356.7	3313.4
Comb	(34)	(39)	(39)	(99)	(82)	(74)	(80)	(62)	(87)	(99)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	122.8	122.8	122.6	122.7	124.9	125.0	125.0	124.8	122.6	125.2
Mdxt	4480.5	4480.5	2974.4	4479.4	4533.3	3069.0	4559.9	2949.3	4476.6	4517.6
Mdyt	2548.8	2548.7	3282.5	2570.4	2590.0	3326.0	2579.0	3256.5	2638.9	2669.5
Comb	(69)	(70)	(72)	(76)	(78)	(95)	(95)	(79)	(81)	(83)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	126.6	122.4	129.1	129.1	144.4	144.4	127.4	127.4	132.7	132.5
Mdxt	4626.8	4474.4	4718.8	3199.1	5301.7	3624.6	4659.5	3154.6	3336.8	3318.4
Mdyt	2547.1	2704.5	2746.1	3470.4	2963.1	3703.1	2649.8	3415.3	3521.4	3528.9
Comb	(204)	(86)	(88)	(88)	(89)	(89)	(93)	(93)	(94)	(138)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	132.5	137.6	148.3	140.1	134.7	132.3	121.1	121.0	123.4	121.9
Mdxt	3312.8	3468.0	3765.9	3564.4	3377.0	4835.8	3002.8	2994.7	3048.9	2991.8
Mdyt	3537.3	3616.8	3779.7	3652.5	3515.8	2699.8	3250.6	3262.6	3219.1	3188.3
Comb	(143)	(144)	(145)	(150)	(151)	(152)	(193)	(198)	(210)	(183)
Carr	61	62	63	64	65	66	67			
Fdzt	121.1	128.4	143.6	126.6	131.9	124.3	120.8			
Mdxt	4435.4	3216.5	3642.0	3172.0	3354.2	3086.4	4405.3			

Mdyt	2272.6	3376.2	3608.9	3321.0	3427.2	3231.8	2478.4
Comb	(193)	(199)	(200)	(204)	(205)	(206)	(207)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	213.0	215.9	216.1	216.0	213.2	216.5	213.0	213.0	214.1	219.4
Mdxt	3814.9	3930.0	3973.9	3901.0	3722.4	3835.6	2966.7	2921.6	3763.0	3950.9
Mdyt	294.3	174.5	162.0	180.7	276.1	343.2	358.8	323.9	172.8	223.4
Comb	(32)	(33)	(35)	(38)	(27)	(143)	(32)	(32)	(17)	(144)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	216.8	213.4	216.7	219.5	219.4	219.5	213.2	232.2	232.2	213.2
Mdxt	3759.9	2901.7	3743.0	3994.7	3073.0	3921.6	2887.4	3219.2	4144.7	2878.6
Mdyt	268.5	278.8	325.0	210.9	281.0	229.5	340.0	274.6	217.3	-149.9
Comb	(133)	(22)	(138)	(146)	(144)	(149)	(27)	(145)	(145)	(31)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	213.2	228.8	228.8	217.5	213.2	213.2	216.0	218.8	218.8	218.0
Mdxt	3711.9	3206.5	4124.0	3783.6	3806.9	2960.0	3035.2	3160.9	4054.5	4060.9
Mdyt	-90.9	224.4	168.4	221.7	-63.3	-131.3	236.7	218.1	164.2	161.5
Comb	(31)	(34)	(34)	(128)	(36)	(36)	(38)	(39)	(39)	(40)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	213.1	199.1	203.3	202.3	199.4	201.3	202.8	201.4	202.6	199.1
Mdxt	3822.4	3500.8	3665.6	3519.9	3368.1	3442.3	3411.2	3440.4	3386.8	2718.5
Mdyt	119.5	335.3	164.2	381.0	309.2	145.3	274.3	145.6	354.8	401.0
Comb	(41)	(87)	(88)	(198)	(82)	(64)	(188)	(66)	(193)	(87)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	200.7	203.4	203.4	199.6	206.5	206.5	210.0	210.0	199.4	199.4
Mdxt	3426.2	2816.3	3623.8	2625.7	2863.9	3684.8	2616.0	3392.4	3352.8	3489.3
Mdyt	161.7	226.5	172.9	286.7	265.0	209.8	250.8	197.3	-153.3	-127.6
Comb	(72)	(93)	(93)	(77)	(199)	(199)	(189)	(189)	(86)	(91)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	199.4	204.5	199.4	221.8	222.2	203.8	203.5	199.4	206.6	207.4
Mdxt	2605.3	2677.6	2592.6	3747.5	4075.5	3445.1	3728.2	2708.9	3643.0	3843.4
Mdyt	374.0	242.2	-214.1	214.7	213.1	207.4	146.3	-187.6	218.6	149.5

Comb	(82)	(170)	(86)	(134)	(150)	(183)	(90)	(91)	(204)	(94)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	206.3	206.3	199.3	216.5	218.0	219.5	218.0	218.0	216.5	216.8
Mdxt	3852.4	3005.9	3511.5	2979.5	3793.7	3047.9	3793.5	2941.8	2940.5	2914.5
Mdyt	145.6	196.2	86.3	408.9	210.3	286.8	210.4	265.2	372.9	328.9
Comb	(95)	(95)	(96)	(143)	(117)	(149)	(122)	(122)	(143)	(133)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	221.8	222.2	224.4	216.7	235.7	235.7	221.5	222.2	221.5	204.5
Mdxt	2899.4	3173.8	3618.6	2900.2	2920.6	3787.8	3180.6	3146.2	4081.8	3460.6
Mdyt	271.0	268.3	208.3	390.1	272.4	212.9	265.6	262.1	210.4	190.9
Comb	(134)	(150)	(135)	(138)	(140)	(140)	(151)	(150)	(151)	(170)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	204.5	204.5	204.5	204.5	204.5	204.5	204.5	204.5	202.3	202.8
Mdxt	3460.5	2677.5	3459.6	2676.7	3461.1	2678.0	3459.3	2676.5	2730.4	2637.5
Mdyt	191.1	242.4	191.0	242.3	190.9	242.2	191.2	242.5	447.8	333.6
Comb	(176)	(176)	(172)	(172)	(175)	(175)	(177)	(177)	(198)	(188)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	202.6	206.6	229.8	229.8	202.6	202.6	224.8	224.8	206.7	206.7

Mdxt	2617.1	2828.1	2646.2	3446.7	2604.5	3371.5	3072.9	3961.6	2916.6	3747.5
Mdyt	420.9	273.3	252.7	194.8	-170.7	-109.5	255.8	201.0	241.8	191.9
Comb	(193)	(204)	(195)	(195)	(197)	(197)	(200)	(200)	(201)	(201)

Carr	101	102	103	104	105	106
Fdzt	202.6	202.6	210.6	210.6	209.5	209.5
Mdxt	2720.7	3508.3	3007.9	3862.8	3871.9	3017.8
Mdyt	-144.2	-83.9	246.9	195.1	191.2	243.0
Comb	(202)	(202)	(205)	(205)	(206)	(206)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	210.2	213.1	213.3	210.2	213.2	213.7	211.3	213.2	215.2	210.6
Mdxt	3730.4	3848.5	3890.6	2901.9	3823.2	3759.4	3689.4	2975.5	3983.3	3670.8
Mdyt	336.2	239.9	232.2	466.9	245.4	390.0	237.7	342.4	231.8	273.3
Comb	(32)	(33)	(35)	(32)	(38)	(143)	(17)	(38)	(40)	(22)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	210.6	213.7	216.0	216.6	216.8	210.4	210.4	229.5	229.5	210.4

Mdxt	2849.2	2921.1	3985.1	3016.8	3919.9	3656.3	2836.8	3181.5	4095.7	2827.8
Mdyt	384.0	526.4	237.3	392.7	286.0	318.8	446.1	397.9	298.5	-235.6
Comb	(22)	(143)	(39)	(144)	(146)	(27)	(27)	(145)	(145)	(31)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	213.3	226.0	226.0	210.4	216.0	214.0	210.4	196.4	200.5	199.6
Mdxt	3033.2	3162.3	4066.6	2893.2	3107.6	3699.8	3731.1	3416.9	3585.8	3443.7
Mdyt	327.5	338.5	244.7	-214.6	327.4	327.0	204.5	361.5	223.8	411.6
Comb	(35)	(34)	(34)	(36)	(39)	(133)	(41)	(87)	(88)	(198)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	200.1	198.6	197.3	198.6	199.9	197.9	196.4	200.7	200.7	196.8
Mdxt	3358.0	3370.1	2632.4	3369.8	3337.1	3358.0	2654.4	2841.9	3646.0	3331.3
Mdyt	321.7	208.8	404.3	209.0	386.7	220.8	502.5	303.3	212.9	271.5
Comb	(188)	(61)	(92)	(66)	(193)	(72)	(87)	(90)	(90)	(77)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	196.8	204.6	204.6	207.3	207.8	196.6	196.6	196.6	196.4	216.8
Mdxt	2579.1	2904.4	3781.0	2567.4	3808.2	2548.4	2561.4	3294.7	2579.1	3052.5
Mdyt	384.0	305.6	220.6	358.6	270.3	-295.1	472.6	-137.3	351.6	386.9
Comb	(77)	(94)	(94)	(189)	(205)	(86)	(82)	(86)	(87)	(146)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	219.5	196.6	196.6	200.6	200.6	204.6	203.5	196.5	216.6	216.7
Mdxt	3126.8	3401.8	2642.0	3549.7	2759.5	2948.3	2949.3	3417.7	3877.6	3852.4
Mdyt	386.9	-122.3	-265.3	231.8	324.5	303.3	301.3	174.8	293.6	299.2
Comb	(150)	(91)	(91)	(93)	(93)	(94)	(95)	(96)	(144)	(149)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	216.7	215.3	215.3	215.3	215.3	214.8	214.8	218.7	214.0	219.1
Mdxt	2994.8	3726.9	2890.8	3726.8	2890.7	3718.4	2884.0	4012.6	2868.4	2847.8
Mdyt	401.8	283.1	381.1	283.2	381.3	291.5	393.0	285.5	443.4	386.9
Comb	(149)	(117)	(117)	(122)	(122)	(128)	(128)	(151)	(133)	(134)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	219.5	221.7	222.1	213.9	233.1	233.1	218.7	213.8	203.7	203.7
Mdxt	4014.3	2738.6	3924.3	2856.0	2862.4	3711.3	3127.6	3760.1	2808.8	3612.8
Mdyt	291.1	383.0	280.8	505.4	396.2	289.1	385.6	256.2	366.9	274.0
Comb	(150)	(135)	(200)	(138)	(140)	(140)	(151)	(152)	(199)	(199)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	201.8	200.5	201.8	201.8	201.8	201.1	199.6	203.9	203.9	200.1
Mdxt	3397.6	2650.3	2630.1	3396.5	2628.6	3384.6	2672.2	2859.8	3673.2	2596.9

Mdyt	259.1	459.6	350.3	259.2	350.7	271.0	557.9	358.7	263.1	439.4
Comb	(176)	(203)	(175)	(177)	(177)	(183)	(198)	(201)	(201)	(188)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	199.9	227.2	227.2	199.9	199.6	203.9	222.1	199.8	203.9	207.8
Mdxt	2579.3	2588.3	3370.0	2566.3	2608.3	2777.4	3044.2	2659.8	3576.6	2966.1
Mdyt	528.1	371.9	267.6	-246.1	397.2	380.0	374.3	-216.3	282.0	358.6
Comb	(193)	(195)	(195)	(197)	(198)	(204)	(200)	(202)	(204)	(205)
Carr	101									
Fdzt	206.7									
Mdxt	2967.1									
Mdyt	356.8									
Comb	(206)									

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	206.8	209.5	209.7	206.8	209.8	210.7	208.3	210.9	207.8	207.8
Mdxt	3611.7	3732.3	3770.7	2801.1	3715.5	3658.3	3594.7	3617.2	3589.2	2779.9

Mdyt	600.3	401.6	394.5	789.0	413.6	703.9	382.4	670.0	399.6	513.9
Comb	(32)	(33)	(35)	(32)	(38)	(143)	(11)	(138)	(17)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	211.8	213.4	207.1	207.1	213.6	212.5	213.5	216.4	207.0	226.8
Mdxt	3875.3	3779.0	3579.2	2771.7	3762.2	3891.4	3817.4	3938.2	2763.2	3159.6
Mdyt	393.9	505.2	473.7	617.8	517.2	395.3	498.1	498.8	745.5	587.9
Comb	(40)	(144)	(22)	(22)	(149)	(39)	(146)	(150)	(27)	(145)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	226.8	207.0	222.9	222.9	209.7	212.5	192.8	196.7	196.9	193.1
Mdxt	4068.6	2753.9	3119.1	4015.0	2900.5	3028.4	3296.9	3469.5	3524.4	3237.8
Mdyt	504.5	-283.4	509.6	401.9	467.9	495.8	657.6	373.7	363.6	609.1
Comb	(145)	(31)	(34)	(34)	(35)	(39)	(87)	(88)	(90)	(82)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	196.4	196.7	194.2	192.8	197.0	197.0	193.2	200.3	200.9	204.5
Mdxt	3340.0	3287.2	3264.3	2553.2	2671.8	3445.3	2511.2	3512.8	3696.8	2909.5
Mdyt	754.3	705.8	370.9	873.4	499.9	390.8	628.8	470.4	367.3	569.9
Comb	(198)	(193)	(72)	(87)	(93)	(93)	(77)	(199)	(94)	(205)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	204.5	193.1	193.1	193.1	200.5	193.0	193.0	200.6	210.7	212.2
Mdxt	3740.4	2485.7	2499.0	3220.7	3567.8	3275.6	2535.6	3488.6	2835.3	3642.4
Mdyt	461.4	-417.6	811.3	-185.4	460.3	-160.7	-355.9	487.6	912.6	485.7
Comb	(205)	(86)	(82)	(86)	(201)	(91)	(91)	(204)	(143)	(120)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	212.2	213.5	212.2	213.6	211.7	215.7	211.0	216.4	216.2	218.9
Mdxt	3642.0	2966.2	3641.3	2918.5	2814.1	3051.2	2805.9	3062.5	3594.4	2667.9
Mdyt	485.9	635.0	486.0	651.2	637.4	628.5	741.4	619.4	491.2	609.5
Comb	(121)	(146)	(122)	(149)	(128)	(151)	(133)	(150)	(134)	(135)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	218.9	210.9	230.8	230.8	213.4	226.8	213.5	216.4	200.5	198.6
Mdxt	3468.0	2797.4	2781.3	3615.4	2913.2	3138.8	2940.9	3058.6	2771.9	3316.4
Mdyt	475.1	869.1	635.4	495.4	572.5	628.2	546.1	574.6	592.1	442.9
Comb	(135)	(138)	(140)	(140)	(144)	(145)	(146)	(150)	(201)	(176)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	197.3	198.6	198.6	198.6	198.6	197.8	196.4	200.6	200.9	196.8
Mdxt	2565.8	3315.6	2560.8	3315.5	2560.7	3307.4	2584.8	2703.6	3303.7	2542.9
Mdyt	785.7	442.6	560.5	443.0	561.0	467.6	988.7	615.3	445.5	744.2

Comb	(203)	(172)	(172)	(177)	(177)	(183)	(198)	(204)	(184)	(188)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	196.7	196.7	200.3	219.3	219.3	219.3	200.5	196.6	204.5	203.5
Mdxt	2530.7	2517.4	2701.8	3053.9	3932.6	3018.3	2741.5	2567.4	2909.6	2893.2
Mdyt	926.7	-310.7	537.9	560.0	469.4	582.5	500.3	-249.0	541.1	582.9
Comb	(193)	(197)	(199)	(200)	(200)	(200)	(201)	(202)	(205)	(206)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	205.8	208.5	205.6	209.9	208.2	205.6	207.0	207.0	210.1	210.1
Mdxt	3602.9	3713.7	3600.5	3646.1	3734.0	2765.3	3604.1	3603.9	3648.5	3642.9
Mdyt	619.9	559.5	760.9	883.1	530.3	1006.6	517.7	517.8	742.1	844.9
Comb	(22)	(38)	(32)	(143)	(35)	(32)	(5)	(6)	(133)	(138)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	207.0	208.5	206.5	206.5	206.5	212.7	210.5	210.5	205.8	212.4
Mdxt	3603.8	2854.4	2791.4	3602.7	2756.6	3759.5	3860.0	2983.9	2754.3	3779.8
Mdyt	518.0	686.1	591.8	537.5	664.5	681.7	539.1	660.1	793.4	652.5

Comb	(11)	(38)	(17)	(17)	(17)	(149)	(40)	(40)	(22)	(146)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	211.1	210.8	214.8	214.7	212.4	205.8	205.8	226.2	226.2	226.2
Mdxt	3905.4	3648.4	3906.0	3966.2	2932.1	2787.5	2749.0	3212.6	4130.6	3154.7
Mdyt	545.9	659.6	661.4	522.6	823.8	623.1	951.8	724.6	674.8	820.4
Comb	(39)	(128)	(151)	(89)	(146)	(27)	(27)	(145)	(145)	(145)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	222.0	222.0	208.2	191.6	195.4	191.4	195.0	195.6	191.6	193.3
Mdxt	3179.0	4084.6	2899.7	3277.5	3436.3	3274.2	3466.4	3319.6	2535.4	3278.8
Mdyt	658.4	552.8	581.1	613.3	527.1	814.8	485.3	727.4	557.1	467.9
Comb	(34)	(34)	(35)	(77)	(93)	(87)	(90)	(188)	(77)	(66)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	195.3	192.6	192.6	191.4	195.4	199.3	198.8	191.6	199.2	199.2
Mdxt	3316.4	2534.2	3277.3	2513.4	2640.6	3478.6	2690.5	2497.7	2890.7	3710.2
Mdyt	928.9	540.0	495.6	1106.7	649.1	641.1	768.7	802.3	606.6	509.2
Comb	(198)	(72)	(72)	(87)	(93)	(204)	(199)	(77)	(94)	(94)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	198.3	203.2	203.2	203.2	191.6	191.7	196.5	191.6	209.9	212.3

Mdxt	2825.6	2921.8	3752.8	2899.4	2490.0	2476.0	3319.5	2491.4	2808.4	2904.5
Mdyt	611.9	668.4	621.7	751.2	1028.6	-380.5	609.6	-304.8	1169.3	826.4
Comb	(95)	(205)	(205)	(205)	(82)	(86)	(183)	(91)	(143)	(144)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	211.3	212.7	211.3	211.3	210.8	214.8	210.1	215.4	215.4	215.4
Mdxt	3650.0	2897.5	3649.5	2802.0	2799.7	3027.0	2797.5	3074.5	3951.4	3050.6
Mdyt	640.2	849.0	640.2	797.2	827.3	823.0	956.3	704.5	668.1	814.1
Comb	(121)	(149)	(122)	(122)	(128)	(151)	(133)	(150)	(150)	(150)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	218.6	218.6	218.2	210.1	231.0	231.0	231.0	198.9	198.9	197.3
Mdxt	3119.0	4008.7	2660.6	2792.1	2761.9	3594.6	2758.1	3518.3	2730.0	2544.2
Mdyt	697.0	631.3	781.4	1114.7	655.1	644.2	819.5	599.3	765.0	726.5
Comb	(200)	(200)	(135)	(138)	(140)	(140)	(140)	(201)	(201)	(172)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	197.3	197.3	195.3	199.8	199.3	195.6	195.6	195.6	198.8	218.6
Mdxt	3320.9	2544.0	2553.3	3305.6	2680.5	2537.6	2529.9	2515.9	2692.5	3048.0
Mdyt	581.9	727.1	1258.8	584.6	801.1	954.3	1180.6	-237.8	655.5	760.3
Comb	(177)	(177)	(198)	(184)	(204)	(188)	(193)	(197)	(199)	(200)

Carr	91
Fdzt	202.3
Mdxt	2865.5
Mdyt	763.9
Comb	(206)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	207.3	209.8	207.3	209.4	207.4	208.5	207.3	211.8	208.5	209.4
Mdxt	3639.3	3740.9	2801.8	3743.2	3632.9	3636.9	3629.1	3660.9	3636.5	2907.2
Mdyt	719.0	688.0	943.0	648.7	795.0	642.0	825.1	922.2	642.0	816.5
Comb	(22)	(38)	(22)	(35)	(27)	(10)	(32)	(143)	(11)	(35)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	208.4	208.4	207.9	207.3	208.3	212.0	212.0	211.9	212.5	212.5
Mdxt	2818.3	3637.3	2819.3	2800.7	2813.7	3872.7	3658.7	3663.1	3935.9	3049.5
Mdyt	664.6	641.5	658.5	1145.7	673.9	676.0	892.1	816.1	696.9	830.9
Comb	(12)	(12)	(17)	(32)	(21)	(40)	(138)	(133)	(39)	(39)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	214.4	216.2	217.1	207.4	228.4	228.4	223.8	223.8	223.8	192.6
Mdxt	3772.4	4066.3	3964.4	2798.0	4179.5	3227.0	3250.2	4171.3	3191.2	3305.8
Mdyt	785.2	682.3	794.1	1092.9	812.7	1005.5	791.0	715.5	842.2	687.3
Comb	(149)	(89)	(150)	(27)	(145)	(145)	(34)	(34)	(34)	(77)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	193.5	192.6	192.8	196.3	192.6	195.6	194.3	194.3	196.8	196.9
Mdxt	3303.6	2541.8	3296.7	3451.2	3291.3	3467.1	3302.1	3301.8	3326.6	3329.6
Mdyt	598.9	932.2	795.8	643.1	838.8	586.9	577.2	577.3	929.5	777.9
Comb	(72)	(77)	(82)	(93)	(87)	(90)	(65)	(66)	(198)	(188)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	194.3	193.5	192.6	200.5	199.9	196.9	194.1	200.0	200.0	200.0
Mdxt	3302.1	2555.2	2540.4	3486.2	3508.5	2575.1	2547.4	2906.4	3729.9	2895.8
Mdyt	577.1	590.7	1221.7	733.7	677.5	1084.7	612.9	718.3	655.7	772.1
Comb	(70)	(72)	(87)	(204)	(201)	(188)	(76)	(94)	(94)	(94)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	204.3	204.7	204.3	192.8	195.5	199.3	213.9	211.9	214.0	214.4
Mdxt	3760.4	3140.3	2929.0	2536.6	3226.1	2842.8	3766.9	2837.6	3788.0	2927.1

Mdyt	746.4	520.8	924.6	1146.3	579.4	772.4	784.4	1106.3	745.9	1014.6
Comb	(205)	(79)	(205)	(82)	(83)	(95)	(144)	(133)	(146)	(149)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	213.0	214.0	213.0	213.0	213.0	213.0	211.8	214.9	216.5	217.3
Mdxt	3663.3	2943.1	3663.2	2836.7	3663.1	2836.7	2836.6	3653.2	3048.3	3620.0
Mdyt	738.9	980.0	738.9	954.7	739.1	955.1	1309.0	739.5	994.5	744.1
Comb	(116)	(146)	(117)	(117)	(122)	(122)	(143)	(129)	(151)	(134)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	217.1	220.5	220.5	212.0	233.9	233.9	228.4	200.5	199.9	198.5
Mdxt	3085.4	4073.8	3131.4	2834.0	3614.5	2781.8	3251.3	2702.9	2725.8	3329.5
Mdyt	994.3	773.0	940.7	1256.2	716.7	964.9	794.3	953.7	904.0	668.0
Comb	(150)	(200)	(200)	(138)	(140)	(140)	(145)	(204)	(201)	(177)
Carr	81	82	83	84	85	86	87	88	89	
Fdzt	198.5	197.7	196.8	201.2	201.2	197.1	220.5	204.3	203.5	
Mdxt	2573.7	3328.2	2573.6	3315.0	2559.6	2569.8	3171.8	2907.1	2876.1	
Mdyt	868.6	689.6	1374.2	668.4	871.0	1298.8	783.0	721.3	924.9	
Comb	(177)	(183)	(198)	(184)	(184)	(193)	(200)	(205)	(206)	

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	213.5	211.7	216.3	214.1	213.4	212.6	212.7	212.8	212.0	216.7
Mdxt	3741.4	2851.5	3892.2	2933.2	2923.7	2848.0	3658.7	3658.5	2847.3	3958.0
Mdyt	728.9	1025.9	730.7	979.0	934.5	915.8	678.4	678.4	1130.2	777.1
Comb	(33)	(22)	(40)	(38)	(35)	(12)	(9)	(10)	(27)	(39)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	216.7	220.5	220.5	212.0	233.4	233.4	211.9	211.9	228.6	228.6
Mdxt	3094.1	4098.6	3201.3	3657.1	4208.6	3286.5	3653.0	2844.2	4205.2	3283.7
Mdyt	993.6	813.0	981.2	726.7	846.2	1137.0	739.3	1168.9	827.9	1026.9
Comb	(39)	(89)	(89)	(27)	(145)	(145)	(32)	(32)	(34)	(34)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	213.4	216.7	196.3	196.3	199.9	198.9	198.9	197.9	197.9	196.8
Mdxt	3747.0	2938.7	3322.8	2584.1	2700.7	2687.2	3436.0	3317.3	2578.3	2578.0
Mdyt	675.6	709.4	639.2	979.7	912.7	849.2	671.7	599.4	823.1	1128.8
Comb	(35)	(39)	(77)	(77)	(93)	(90)	(88)	(65)	(65)	(82)

Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	199.9	200.8	203.5	203.5	208.0	208.0	196.8	198.8	229.8	196.6
Mdxt	3466.3	2586.6	3745.7	2930.5	3748.7	2933.0	2413.2	3243.1	2165.4	2408.2
Mdyt	668.6	1082.5	740.5	933.6	757.6	1036.3	-250.6	616.1	-277.8	-288.4
Comb	(93)	(188)	(94)	(94)	(205)	(205)	(82)	(83)	(84)	(87)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	196.6	196.6	220.5	203.5	216.5	219.0	218.3	217.5	221.5	225.0
Mdxt	3309.6	2573.6	3115.6	2778.6	2854.5	2936.0	2926.6	2850.8	3096.9	4101.9
Mdyt	651.0	1184.0	822.4	692.1	1136.1	1089.1	1044.7	1026.0	1103.8	830.1
Comb	(87)	(87)	(89)	(94)	(133)	(149)	(146)	(123)	(150)	(200)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	225.0	216.8	239.9	239.9	216.7	216.7	233.4	201.3	201.3	234.3
Mdxt	3203.8	2850.2	3567.4	2764.5	2624.0	2847.1	3119.2	2361.3	2580.5	2113.4
Mdyt	1084.0	1240.4	596.6	987.7	-276.2	1279.1	686.9	-367.3	1231.5	-394.5
Comb	(200)	(138)	(140)	(140)	(143)	(143)	(145)	(193)	(193)	(195)
Carr	61	62	63	64	65					
Fdzt	201.1	201.1	204.4	225.0	203.4					
Mdxt	2356.4	2576.0	2703.1	3063.8	2689.6					
Mdyt	-405.0	1286.9	1015.5	716.2	952.0					

Comb	(198)	(198)	(204)	(200)	(201)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	218.7	223.1	223.1	220.1	220.1	220.5	219.7	220.5	219.6	219.7
Mdxt	2210.3	3705.9	2913.2	2221.8	3534.1	2780.1	2733.8	2921.9	2200.9	2199.9
Mdyt	-476.6	536.0	970.6	-391.8	483.1	909.2	884.8	-362.3	-345.3	-346.9
Comb	(22)	(40)	(40)	(35)	(44)	(45)	(9)	(190)	(7)	(10)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	219.7	219.7	219.5	221.8	220.5	219.2	218.7	225.5	223.5	223.5
Mdxt	2733.6	2199.8	2201.8	2165.0	3541.8	2195.7	3492.0	2137.6	3796.4	2985.9
Mdyt	884.9	-347.0	-344.2	-384.4	482.1	-638.8	433.7	-590.6	661.0	1023.6
Comb	(10)	(11)	(12)	(18)	(45)	(27)	(22)	(156)	(39)	(39)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	226.1	227.4	227.4	219.5	219.2	243.7	243.7	243.7	219.4	219.1
Mdxt	2178.9	4023.1	3163.8	3465.0	2733.3	1872.1	3277.2	2569.0	3460.4	2193.9
Mdyt	-582.6	796.5	1091.1	520.9	972.4	-802.1	-343.9	716.9	539.1	-682.7

Comb	(149)	(89)	(89)	(26)	(27)	(29)	(29)	(29)	(31)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	219.1	220.5	236.1	236.1	221.0	223.1	220.1	202.5	205.9	202.5
Mdxt	2729.7	2249.9	4105.0	3226.9	2291.4	2384.4	2245.0	1954.6	3286.1	2469.2
Mdyt	989.6	-315.3	770.0	1106.6	-307.3	-274.8	-311.0	-577.1	446.9	848.6
Comb	(32)	(45)	(34)	(34)	(38)	(40)	(44)	(77)	(93)	(77)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	203.1	205.9	204.5	203.9	203.9	203.9	203.9	203.9	203.9	203.8
Mdxt	3142.8	2580.0	1971.0	2459.3	1939.7	1941.1	2459.2	1939.6	2459.0	1942.5
Mdyt	367.5	870.8	-456.2	774.3	-392.0	-389.6	774.4	-392.1	774.4	-388.1
Comb	(72)	(93)	(90)	(64)	(65)	(62)	(65)	(66)	(66)	(67)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	208.0	208.9	208.9	205.6	203.3	202.5	207.2	209.4	209.4	215.8
Mdxt	3068.4	3453.3	2715.7	1917.4	3133.6	3147.0	1849.8	3582.4	2819.4	1776.6
Mdyt	-446.1	482.0	897.0	-419.4	379.1	358.7	-834.1	640.8	972.6	-596.6
Comb	(193)	(95)	(95)	(74)	(82)	(77)	(188)	(94)	(94)	(79)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	214.1	214.1	203.6	203.3	203.3	238.3	238.3	203.6	203.2	203.2

Mdxt	3520.4	2768.7	3108.1	1933.6	2458.7	-1859.9	-2441.3	3101.4	1931.3	3127.6
Mdyt	498.7	967.6	440.8	-809.0	899.5	-1042.2	-479.4	466.7	-871.6	388.9
Comb	(205)	(205)	(81)	(82)	(82)	(84)	(84)	(86)	(87)	(87)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	203.2	205.1	227.4	207.9	208.9	204.6	223.7	225.1	224.7	224.7
Mdxt	2453.6	2011.2	2732.7	3062.2	2203.3	2004.1	2097.9	2109.4	2087.5	2088.4
Mdyt	924.1	-346.8	624.1	-471.1	-289.1	-340.7	-751.8	-667.1	-622.3	-620.6
Comb	(87)	(100)	(89)	(198)	(95)	(99)	(133)	(146)	(121)	(118)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	224.7	224.6	224.7	226.9	224.3	229.5	233.0	232.1	232.1	248.8
Mdxt	2087.4	2089.5	2087.5	2052.5	2083.2	2006.4	1973.3	3962.1	3113.0	1759.6
Mdyt	-622.3	-619.5	-622.1	-659.7	-914.1	-697.7	-765.4	692.9	1086.1	-1077.3
Comb	(122)	(123)	(126)	(129)	(138)	(134)	(135)	(200)	(200)	(140)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	248.8	248.8	224.2	241.1	241.1	241.1	228.5	228.2	225.2	209.2
Mdxt	3202.9	2514.7	2081.6	2642.5	4039.2	3172.6	2366.7	2271.9	2132.5	1866.1
Mdyt	-454.5	711.5	-957.9	-284.4	615.6	1101.2	-417.8	-550.1	-586.3	-712.9
Comb	(140)	(140)	(143)	(145)	(145)	(145)	(150)	(151)	(155)	(201)

Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	208.6	208.6	208.6	208.6	208.6	208.5	211.7	211.7	211.7	210.3
Mdxt	1835.4	1834.9	1834.8	1836.3	1834.7	1837.7	1785.0	3034.3	2380.0	1812.5
Mdyt	-648.5	-648.9	-648.7	-646.4	-649.1	-645.0	-702.4	319.9	749.4	-676.2
Comb	(170)	(176)	(172)	(173)	(177)	(178)	(184)	(184)	(184)	(185)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	215.5	215.5	215.5	220.5	208.0	243.0	243.0	207.9	209.8	232.1
Mdxt	1719.1	2978.5	2335.6	1671.8	1828.8	-2030.4	-2669.4	1826.5	1906.4	2627.9
Mdyt	-756.7	-323.1	730.4	-853.4	-1065.8	-1299.0	-636.8	-1128.5	-603.7	378.3
Comb	(189)	(189)	(189)	(190)	(193)	(195)	(195)	(198)	(211)	(200)
Carr	121	122	123	124						
Fdzt	210.6	214.1	213.6	209.3						
Mdxt	1965.6	2233.8	2098.5	1899.2						
Mdyt	-592.3	-356.8	-545.9	-597.5						
Comb	(204)	(205)	(206)	(210)						

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	229.5	227.7	232.3	228.7	228.5	229.4	228.0	228.5	228.5	233.8
Mdxt	-2374.2	2878.5	2538.0	2887.7	-1740.6	2309.5	2874.3	2866.1	-1739.4	-1948.0
Mdyt	-1670.6	-461.1	778.4	-428.6	-1192.6	586.8	-404.9	-402.1	-1234.6	-1571.1
Comb	(190)	(22)	(39)	(35)	(27)	(45)	(17)	(12)	(32)	(138)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	233.8	230.9	228.5	228.4	236.2	236.2	237.5	239.0	239.0	236.2
Mdxt	-2560.9	2225.7	2861.3	-1763.5	-2028.5	-2667.6	2426.3	-2136.0	-2809.0	3551.5
Mdyt	-863.0	508.4	-567.8	-1116.5	-1378.7	-757.7	611.9	-1458.9	-824.5	589.8
Comb	(138)	(18)	(27)	(37)	(129)	(129)	(150)	(134)	(134)	(89)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	254.0	254.0	254.6	228.5	228.9	245.6	245.6	245.6	230.0	232.3
Mdxt	-3190.0	-4138.8	1944.4	2859.2	2912.5	2074.6	3586.3	2819.7	2983.2	1782.2
Mdyt	-2432.7	-1713.7	-474.5	-593.6	-385.2	-431.1	461.8	940.6	-364.9	-634.8
Comb	(195)	(195)	(29)	(32)	(33)	(34)	(34)	(34)	(38)	(39)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	232.3	232.0	232.0	229.5	229.4	216.7	216.7	213.9	211.9	211.8
Mdxt	3224.7	1669.4	3103.2	-3112.2	2929.1	-1945.7	-2558.6	2123.2	1993.1	-1752.4

Mdyt	333.4	-803.1	-343.2	-1090.4	-375.3	-1714.8	-1032.0	541.8	420.0	-1361.8
Comb	(39)	(40)	(40)	(190)	(45)	(193)	(193)	(93)	(59)	(82)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	211.8	211.7	211.7	218.6	218.6	217.1	211.6	211.6	220.1	220.1
Mdxt	-2303.6	-2301.5	-1750.8	-2003.2	-2633.8	2390.3	-1785.2	-2347.3	-2060.7	-2708.5
Mdyt	-717.7	-754.5	-1421.7	-1382.5	-838.7	750.9	-1253.0	-659.5	-1440.0	-882.3
Comb	(82)	(87)	(87)	(185)	(185)	(94)	(92)	(92)	(184)	(184)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	217.1	224.1	224.1	224.6	214.2	249.1	249.1	236.2	213.9	217.1
Mdxt	3035.9	-2214.2	-2906.9	1836.1	1957.1	-2996.8	-3898.9	2792.9	2690.1	1677.0
Mdyt	321.0	-1554.5	-978.4	-325.4	355.6	-2079.5	-1437.4	982.7	-374.0	-564.8
Comb	(94)	(189)	(189)	(79)	(80)	(84)	(84)	(89)	(93)	(94)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	216.8	216.8	210.3	210.3	213.0	233.7	233.7	233.7	233.7	233.3
Mdxt	1515.8	2862.3	-1817.3	-2389.9	2612.4	-1946.8	-2559.3	-1970.9	-2591.5	-1923.9
Mdyt	-805.3	-342.7	-997.1	-533.5	-422.0	-1613.2	-888.8	-1495.1	-822.3	-1316.7
Comb	(95)	(95)	(96)	(96)	(100)	(143)	(143)	(148)	(148)	(128)
Carr	71	72	73	74	75	76	77	78	79	80

Fdzt	241.1	242.8	242.8	242.8	259.9	259.9	259.9	250.9	250.9	250.9
Mdxt	3423.5	-2248.0	-2955.2	2038.4	-2819.0	-3688.0	1832.8	1941.0	3447.5	2708.1
Mdyt	353.8	-1540.2	-945.9	-342.4	-2073.7	-1382.3	-653.4	-809.6	-347.6	774.1
Comb	(200)	(135)	(135)	(135)	(140)	(140)	(140)	(145)	(145)	(145)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	232.8	232.8	237.5	237.3	216.6	216.6	216.5	219.1	222.0	241.1
Mdxt	-1993.3	-2621.3	3083.1	2959.7	-1944.0	-2556.4	-1978.4	1853.0	2904.3	1970.1
Mdyt	-1315.9	-734.1	-430.8	-572.0	-1774.9	-1068.9	-1606.1	-313.9	-388.2	-626.9
Comb	(152)	(152)	(150)	(151)	(198)	(198)	(203)	(191)	(205)	(200)
Carr	91	92	93	94	95	96	97			
Fdzt	241.1	216.5	222.0	222.0	221.7	215.2	215.2			
Mdxt	2688.7	-2601.2	1552.4	2286.2	2727.8	-2010.6	-2642.8			
Mdyt	827.4	-973.9	-917.8	595.6	-577.3	-1350.1	-847.6			
Comb	(200)	(203)	(205)	(205)	(206)	(207)	(207)			

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	173.0	173.0	172.5	175.4	172.2	174.6	174.6	174.6	174.6	174.6
Mdxt	2923.0	3837.4	2948.5	2812.1	2947.7	2748.3	3608.4	2748.4	3608.2	2748.8
Mdyt	-775.8	-374.5	442.9	-726.7	498.9	-726.4	-324.3	-726.4	-324.3	-726.4
Comb	(41)	(41)	(133)	(45)	(138)	(3)	(12)	(4)	(4)	(9)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	174.6	173.6	175.1	175.4	174.3	174.3	175.0	175.0	179.6	179.6
Mdxt	3608.7	3012.5	2788.0	3682.2	2717.6	3568.0	2820.5	3698.3	3057.6	3969.4
Mdyt	-324.2	402.9	-726.0	-324.2	-747.7	-345.1	-718.4	-312.0	-730.7	-325.4
Comb	(9)	(144)	(44)	(45)	(21)	(21)	(33)	(33)	(40)	(40)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	179.1	176.2	176.2	172.4	172.4	183.1	183.1	181.5	178.4	178.4
Mdxt	3176.4	2471.2	3287.4	2885.3	3789.8	2649.8	3520.2	3175.6	2535.6	3372.9
Mdyt	396.3	-750.7	-347.3	-856.5	-453.1	-722.9	-319.9	399.1	-742.8	-337.4
Comb	(146)	(25)	(25)	(36)	(36)	(29)	(29)	(145)	(30)	(30)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	172.2	172.2	172.1	183.0	183.0	180.5	180.5	180.5	171.5	173.9

Mdxt	2626.5	3445.4	2914.1	2999.0	3903.3	2992.2	3898.4	3090.9	3140.0	2997.2
Mdyt	-880.0	-475.3	516.3	-717.7	-314.2	-729.7	-322.2	353.3	331.9	406.3
Comb	(31)	(31)	(143)	(34)	(34)	(35)	(35)	(35)	(152)	(149)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	178.1	178.1	178.2	165.5	164.1	162.0	164.1	164.3	161.6	163.5
Mdxt	2975.6	3870.8	3239.8	2573.6	3347.0	2671.0	2543.1	3269.1	2669.8	2762.3
Mdyt	-722.5	-319.1	389.5	-682.1	-314.9	441.1	-690.9	-305.8	520.9	383.9
Comb	(39)	(39)	(151)	(100)	(101)	(188)	(101)	(67)	(193)	(199)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	164.3	164.3	164.3	164.0	162.7	165.0	165.5	163.8	163.8	164.8
Mdxt	2482.6	2483.3	3269.5	2740.5	2654.4	2539.2	3375.0	2438.7	3211.2	2585.7
Mdyt	-681.8	-681.7	-305.7	388.7	373.8	-681.2	-305.6	-712.2	-335.6	-670.3
Comb	(63)	(64)	(64)	(204)	(183)	(99)	(100)	(76)	(76)	(88)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	164.8	165.6	170.9	170.9	167.9	166.5	167.9	161.1	161.1	169.7
Mdxt	3398.2	2506.5	2956.0	3882.6	2967.7	2086.7	2872.9	2678.2	3529.5	2178.7
Mdyt	-288.2	325.2	-758.9	-377.1	368.6	-716.5	-585.2	-867.6	-489.7	-705.2
Comb	(88)	(78)	(147)	(147)	(205)	(80)	(205)	(91)	(91)	(85)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	170.1	160.8	160.8	160.6	161.4	176.2	173.0	169.2	169.2	170.1
Mdxt	2989.9	2308.5	3034.8	2944.4	2621.8	2840.7	2936.9	2807.2	3645.1	3087.1
Mdyt	-597.0	-901.1	-521.4	282.5	545.9	-669.4	395.9	-676.2	-298.5	364.6
Comb	(206)	(86)	(86)	(207)	(198)	(89)	(128)	(94)	(94)	(206)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	161.9	161.9	173.2	173.2	173.2	173.2	176.6	181.7	181.5	181.5
Mdxt	2732.2	3597.5	2934.3	2934.9	2933.7	2933.2	3156.2	2847.3	3069.7	3996.6
Mdyt	-752.3	-377.5	384.1	384.1	384.2	384.4	392.3	392.6	-620.2	-256.7
Comb	(96)	(96)	(114)	(120)	(117)	(122)	(150)	(140)	(145)	(145)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	178.2	178.2	170.9	176.6	176.6	171.5	171.5	163.0	163.0	163.0
Mdxt	3128.1	4062.0	3099.1	3046.2	3963.8	2993.7	3930.0	2651.1	2649.9	2649.1
Mdyt	-633.1	-261.7	256.4	-624.9	-258.3	-678.2	-298.6	357.2	357.1	357.4
Comb	(151)	(151)	(147)	(150)	(150)	(152)	(152)	(176)	(172)	(177)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	168.5	161.6	159.4	159.4	159.7	161.4	174.9	174.9	171.3	159.7
Mdxt	2417.2	3376.1	2374.2	3124.2	2886.1	3320.6	2906.5	3778.5	2996.6	2743.9

Mdyt	365.1	216.0	-810.1	-450.6	174.5	226.0	-578.4	-239.7	374.4	-776.7
Comb	(190)	(193)	(197)	(197)	(202)	(198)	(200)	(200)	(201)	(202)

Carr	111	112	113	114	115	116	117	118
Fdzt	159.7	164.1	164.1	167.9	160.6	160.6	163.7	163.7
Mdxt	3615.9	2639.4	3462.8	3731.8	2797.9	3683.6	2604.9	3422.5
Mdyt	-418.9	-591.1	-244.2	-242.0	-661.4	-306.7	-590.2	-243.9
Comb	(202)	(211)	(211)	(205)	(207)	(207)	(210)	(210)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	168.9	169.5	169.5	171.5	171.1	171.1	171.9	171.1	171.5	170.8
Mdxt	2602.0	3636.3	2633.6	2579.3	3444.7	3444.9	2580.2	3445.3	3527.7	3409.3
Mdyt	-2724.3	-1827.3	-2634.8	-2590.7	-1772.9	-1772.9	-2586.2	-1772.9	-1772.4	-1797.4
Comb	(36)	(41)	(41)	(33)	(3)	(4)	(38)	(9)	(33)	(21)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	170.0	171.3	168.9	175.0	176.1	172.7	172.7	168.7	169.8	179.6
Mdxt	2501.6	3368.0	3592.4	2307.7	3812.2	2239.7	3121.8	2429.4	3309.3	2396.2

Mdyt	-2615.9	-1783.7	-1919.4	-2593.7	-1779.4	-2621.6	-1806.2	-2752.4	-1874.7	-2567.6
Comb	(32)	(20)	(36)	(24)	(40)	(25)	(25)	(31)	(26)	(29)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	179.6	174.9	174.9	168.7	179.5	179.5	177.0	177.0	176.1	174.6
Mdxt	3340.4	2292.2	3199.7	3302.3	2789.5	3752.6	2767.6	3738.2	2837.7	3715.2
Mdyt	-1762.7	-2632.8	-1806.9	-1947.3	-2555.8	-1752.9	-2623.0	-1793.8	-2593.5	-1764.9
Comb	(29)	(30)	(30)	(31)	(34)	(34)	(35)	(35)	(40)	(39)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	172.0	172.0	158.4	160.6	160.9	159.5	160.9	161.4	161.9	160.8
Mdxt	2585.3	3520.4	2440.8	3188.9	3120.4	2287.9	3120.7	2363.4	2364.5	3121.3
Mdyt	-2583.2	-1772.7	-2488.5	-1669.2	-1658.8	-2460.5	-1658.7	-2425.6	-2419.1	-1658.7
Comb	(45)	(45)	(96)	(101)	(58)	(82)	(59)	(88)	(93)	(64)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	161.4	162.1	159.3	160.4	158.4	167.5	167.5	163.1	164.5	157.6
Mdxt	3239.6	3014.7	2252.2	3069.5	3395.2	2645.6	3667.8	1878.1	2659.4	2395.7
Mdyt	-1658.1	-1662.1	-2461.5	-1693.7	-1736.5	-2492.9	-1742.5	-2469.7	-2186.0	-2616.5
Comb	(88)	(74)	(87)	(76)	(96)	(147)	(147)	(80)	(205)	(91)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	157.6	166.2	166.7	157.3	157.3	172.8	172.8	165.8	165.8	168.0
Mdxt	3332.5	1953.1	2773.0	2149.2	2915.7	2663.5	3561.1	2618.8	3508.0	2732.3
Mdyt	-1868.0	-2485.7	-2214.2	-2656.6	-1907.8	-2375.7	-1630.2	-2401.4	-1647.3	-2429.6
Comb	(91)	(85)	(206)	(86)	(86)	(89)	(89)	(94)	(94)	(95)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	162.0	162.0	160.6	178.1	178.1	175.6	174.7	174.7	168.1	156.0
Mdxt	2371.9	3229.1	2322.2	2833.2	3828.3	3813.7	2881.3	3887.2	3711.6	2189.8
Mdyt	-2414.9	-1658.4	-2425.7	-2324.4	-1576.0	-1616.9	-2362.1	-1602.5	-1650.4	-2441.2
Comb	(100)	(100)	(101)	(145)	(145)	(146)	(151)	(151)	(152)	(197)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	156.0	160.1	160.1	171.5	171.5	156.3	156.3	160.6	164.5	166.7
Mdxt	2988.2	2404.0	3310.7	2704.2	3631.9	2436.3	3402.7	2405.2	3578.2	3716.2
Mdyt	-1743.1	-2210.2	-1493.4	-2160.3	-1465.4	-2401.1	-1703.3	-2203.6	-1482.6	-1503.4
Comb	(197)	(199)	(199)	(200)	(200)	(202)	(202)	(204)	(205)	(206)
Carr	81	82	83	84						
Fdzt	157.1	157.1	160.7	160.7						
Mdxt	2481.5	3465.2	2412.5	3300.3						
Mdyt	-2273.1	-1571.8	-2199.5	-1493.7						

Comb	(207)	(207)	(211)	(211)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	159.1	160.7	158.5	160.9	160.7	160.9	160.9	160.9	160.9	160.9
Mdxt	2293.2	3138.4	2268.3	3103.5	2255.1	3103.3	2233.5	3103.2	2234.1	3103.8
Mdyt	-3704.2	-2997.5	-3851.3	-2984.4	-3627.9	-2984.2	-3616.3	-2984.2	-3616.2	-2984.2
Comb	(41)	(46)	(36)	(12)	(46)	(4)	(8)	(8)	(9)	(9)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	159.1	160.6	160.6	161.7	164.3	164.5	162.3	162.3	158.3	158.5
Mdxt	3226.4	2216.8	3076.0	3182.4	1985.8	2852.5	1945.3	2772.5	2174.3	3189.4
Mdyt	-3088.9	-3655.8	-3030.8	-2982.3	-3697.9	-3005.2	-3690.0	-3052.6	-3895.6	-3264.7
Comb	(41)	(21)	(21)	(45)	(30)	(24)	(25)	(25)	(31)	(36)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	169.1	169.1	164.3	158.3	161.2	169.2	169.2	166.5	166.5	161.7
Mdxt	2082.3	2964.9	2835.2	2997.0	2281.6	2523.4	3434.6	2485.8	3401.2	2303.0
Mdyt	-3618.3	-3001.2	-3038.8	-3317.1	-3615.2	-3571.7	-2962.0	-3656.0	-2995.3	-3612.7

Comb	(29)	(29)	(30)	(31)	(33)	(34)	(34)	(35)	(35)	(45)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	161.6	166.0	166.0	160.8	161.0	161.4	150.0	150.7	148.4	150.9
Mdxt	3175.6	2566.1	3484.4	2226.8	2241.4	3152.7	2029.5	2859.3	2101.8	2808.8
Mdyt	-2968.8	-3615.3	-2985.3	-3618.1	-3615.7	-2981.1	-3399.6	-2812.8	-3507.9	-2793.9
Comb	(38)	(40)	(40)	(42)	(43)	(44)	(77)	(101)	(96)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	150.7	150.9	150.9	150.9	152.1	150.4	150.4	151.4	155.8	157.4
Mdxt	2047.3	2808.9	2017.4	2809.6	2922.4	1992.7	2769.7	2908.1	1662.6	3238.6
Mdyt	-3399.0	-2793.8	-3382.2	-2793.7	-2791.0	-3438.8	-2860.4	-2781.1	-3498.9	-2970.1
Comb	(101)	(59)	(64)	(64)	(100)	(76)	(76)	(88)	(85)	(147)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	153.0	153.0	147.5	147.5	155.8	147.2	147.2	151.4	162.8	162.8
Mdxt	1604.7	2328.6	2066.3	2932.6	2419.2	1931.9	2656.4	2085.3	2430.7	3283.0
Mdyt	-3487.7	-2891.5	-3718.0	-3194.6	-2871.8	-3781.4	-3269.4	-3380.8	-3318.6	-2762.1
Comb	(80)	(80)	(91)	(91)	(85)	(86)	(86)	(88)	(89)	(89)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	159.0	159.0	152.1	151.9	155.9	155.9	158.1	158.1	148.4	168.1

Mdxt	2376.9	3235.4	2115.8	2912.5	2376.8	3218.0	2491.8	3354.2	2985.5	2554.1
Mdyt	-3438.9	-2809.5	-3377.1	-2771.8	-3343.7	-2766.2	-3380.8	-2795.2	-2943.4	-3228.0
Comb	(90)	(90)	(100)	(93)	(94)	(94)	(95)	(95)	(96)	(145)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	168.1	157.4	164.9	164.9	160.6	160.6	150.4	151.1	161.7	146.5
Mdxt	3483.7	2299.1	2596.9	3533.1	2333.7	3231.9	2113.8	2968.7	3328.8	2094.9
Mdyt	-2667.5	-3507.6	-3271.6	-2690.7	-3269.0	-2687.7	-3060.9	-2516.7	-2487.8	-3398.1
Comb	(145)	(147)	(151)	(151)	(156)	(156)	(199)	(211)	(200)	(202)

Carr	81	82	83	84	85	86	87	88
Fdzt	146.5	151.1	150.9	154.8	154.8	157.1	147.4	150.6
Mdxt	2978.6	2144.3	2958.9	2405.3	3263.5	3399.3	3031.4	2926.3
Mdyt	-2920.3	-3057.2	-2497.5	-3023.8	-2492.0	-2520.9	-2669.1	-2515.1
Comb	(202)	(211)	(204)	(205)	(205)	(206)	(207)	(210)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	149.6	151.3	148.9	151.3	151.4	151.4	151.4	151.4	151.5	151.4

Mdxt	1995.4	2785.6	2691.2	1992.9	2761.8	1979.1	2761.5	2761.4	1986.9	2762.2
Mdyt	-3982.4	-3706.0	-4075.5	-3907.6	-3690.8	-3896.5	-3690.6	-3690.6	-3896.3	-3690.4
Comb	(41)	(46)	(31)	(46)	(12)	(4)	(4)	(8)	(43)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	151.5	151.8	150.6	149.6	152.3	154.6	154.6	152.7	152.7	148.9
Mdxt	2770.9	2742.0	1978.6	2823.2	2845.2	1709.0	2463.0	1678.7	2414.6	1947.4
Mdyt	-3686.5	-3691.0	-3956.6	-3814.3	-3683.1	-4022.3	-3782.3	-4002.7	-3794.6	-4158.4
Comb	(43)	(18)	(27)	(41)	(45)	(30)	(30)	(25)	(25)	(31)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	159.3	159.3	148.9	149.1	151.7	159.7	159.7	156.9	156.9	152.2
Mdxt	1802.5	2584.9	2107.3	2794.5	2015.8	2286.4	3116.9	2233.5	3065.0	2037.8
Mdyt	-3908.6	-3725.7	-4127.7	-4016.5	-3892.0	-3812.1	-3640.5	-3938.0	-3697.7	-3888.8
Comb	(29)	(29)	(31)	(36)	(33)	(34)	(34)	(35)	(35)	(38)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	152.2	154.9	154.9	156.6	156.6	152.0	152.3	139.7	141.5	141.5
Mdxt	2833.0	2243.5	3064.6	2328.9	3162.4	2813.7	2052.1	2382.0	2529.5	1802.2
Mdyt	-3670.2	-3841.1	-3647.1	-3867.1	-3669.6	-3683.2	-3885.8	-3779.2	-3478.0	-3661.9
Comb	(38)	(39)	(39)	(40)	(40)	(44)	(45)	(81)	(101)	(101)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	141.7	141.7	141.7	141.7	141.7	141.9	141.7	141.9	141.2	141.2
Mdxt	2495.1	1782.4	2494.7	1782.3	2494.6	1793.6	2495.7	2508.2	2466.7	1766.6
Mdyt	-3456.3	-3646.0	-3456.1	-3646.1	-3456.2	-3645.8	-3455.8	-3450.2	-3533.5	-3699.6
Comb	(67)	(59)	(59)	(63)	(63)	(98)	(64)	(98)	(76)	(76)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	141.9	142.9	146.2	146.2	143.6	143.6	139.7	139.7	138.1	138.1
Mdxt	2384.5	2614.9	1396.5	2060.0	1353.3	1990.1	1716.4	1856.1	2394.2	1867.1
Mdyt	-3499.7	-3445.4	-3825.6	-3586.9	-3797.7	-3604.6	-3870.5	-3807.9	-4031.5	-4148.3
Comb	(75)	(100)	(85)	(85)	(80)	(80)	(81)	(81)	(86)	(86)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	142.1	149.5	138.3	142.7	142.7	146.7	146.7	149.1	139.1	141.5
Mdxt	1834.8	2929.2	2542.6	1866.3	2597.4	2160.1	2928.7	3068.1	2583.6	1773.1
Mdyt	-3639.5	-3466.2	-3933.3	-3635.0	-3426.9	-3566.9	-3394.0	-3426.0	-3632.7	-3655.1
Comb	(88)	(90)	(91)	(93)	(93)	(94)	(94)	(95)	(96)	(97)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	142.4	142.9	158.9	148.2	151.4	154.1	155.8	151.1	140.7	140.9
Mdxt	2569.9	1886.7	3153.5	2831.5	2882.1	3101.2	3198.7	2850.9	2564.3	2529.6

Mdyt	-3445.5	-3630.8	-3262.5	-3638.4	-3305.1	-3269.1	-3291.5	-3305.2	-3126.0	-3104.2
Comb	(99)	(100)	(145)	(147)	(156)	(150)	(151)	(155)	(212)	(174)
Carr	81	82	83	84	85	86	87	88		
Fdzt	140.9	140.7	142.1	137.6	142.0	145.9	148.3	138.3		
Mdxt	2530.6	2535.0	2649.5	2577.1	2632.1	2962.5	3101.7	2618.0		
Mdyt	-3103.9	-3097.9	-3093.4	-3589.0	-3074.9	-3042.0	-3074.0	-3280.7		
Comb	(175)	(183)	(211)	(202)	(204)	(205)	(206)	(207)		

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	143.1	143.1	143.3	143.3	143.3	143.3	143.3	143.3	143.3	143.3
Mdxt	2488.2	1933.6	2472.1	1919.4	2472.4	1919.7	2472.9	1919.8	2472.6	1919.8
Mdyt	-3756.1	-4308.3	-3740.4	-4285.7	-3740.4	-4285.7	-3740.3	-4285.5	-3740.3	-4285.7
Comb	(46)	(46)	(2)	(2)	(3)	(3)	(12)	(4)	(8)	(8)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	143.3	143.3	143.3	143.4	144.1	143.0	143.0	140.9	140.9	143.8
Mdxt	2473.4	1920.5	1920.2	2482.1	1993.0	2459.8	1909.1	2435.8	1889.6	2527.7

Mdyt	-3740.0	-4285.3	-4285.3	-3735.0	-4276.4	-3797.8	-4370.2	-4146.7	-4890.4	-3728.6
Comb	(9)	(9)	(12)	(43)	(45)	(21)	(21)	(31)	(31)	(44)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	143.5	146.8	146.0	144.4	144.4	150.8	150.8	151.5	151.5	148.5
Mdxt	1956.2	2184.6	1646.9	2106.9	1618.4	2263.3	1740.3	2849.5	2226.9	2779.3
Mdyt	-4252.1	-4233.2	-4370.6	-3875.0	-4428.6	-3827.0	-4390.6	-3667.4	-4262.9	-3726.6
Comb	(33)	(39)	(30)	(25)	(25)	(145)	(29)	(34)	(34)	(35)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	148.6	141.1	141.1	144.1	144.0	146.8	148.6	141.5	141.5	133.5
Mdxt	2270.8	2467.7	1920.1	2561.2	1978.5	2791.7	2896.3	2485.8	1935.7	2249.8
Mdyt	-4252.4	-4086.4	-4798.1	-3726.4	-4242.8	-3672.7	-3690.1	-3873.6	-4478.6	-3529.4
Comb	(40)	(36)	(36)	(45)	(38)	(39)	(40)	(41)	(41)	(101)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	133.5	133.7	133.7	133.7	133.7	133.7	133.7	133.7	133.7	133.7
Mdxt	1744.2	2227.0	1724.3	2227.9	1724.5	2227.3	1724.5	2228.4	1725.5	1725.0
Mdyt	-4051.0	-3506.9	-4018.6	-3506.9	-4018.5	-3506.8	-4018.6	-3506.4	-4018.1	-4018.2
Comb	(101)	(58)	(58)	(67)	(59)	(63)	(63)	(64)	(64)	(67)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	133.9	134.9	133.3	133.3	133.9	133.9	134.5	134.1	134.6	134.6
Mdxt	2241.1	1829.2	2209.0	1709.2	2114.7	1631.2	2306.4	1776.5	2155.6	1664.2
Mdyt	-3499.2	-4005.3	-3589.0	-4139.4	-3560.4	-4082.0	-3490.1	-3970.7	-3511.3	-4036.5
Comb	(98)	(100)	(76)	(76)	(75)	(75)	(99)	(88)	(78)	(78)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	138.7	137.6	134.7	135.4	131.9	131.9	130.4	130.4	141.1	130.5
Mdxt	2102.8	1334.6	1808.4	1293.9	2149.6	1659.8	2174.9	1681.4	2666.2	2220.7
Mdyt	-3943.8	-4140.0	-3957.4	-4223.0	-3850.1	-4522.6	-4087.3	-4882.5	-3487.3	-4001.3
Comb	(94)	(85)	(93)	(80)	(81)	(81)	(86)	(86)	(90)	(91)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	130.5	134.9	138.7	141.3	131.1	129.9	150.8	140.4	140.4	143.5
Mdxt	1724.8	2354.6	2683.8	2832.8	2246.6	1758.7	2893.3	2512.3	1956.5	2605.7
Mdyt	-4750.7	-3487.0	-3410.3	-3435.1	-3697.3	-4344.7	-3265.1	-3684.1	-4362.2	-3324.2
Comb	(91)	(100)	(94)	(95)	(96)	(202)	(145)	(147)	(147)	(156)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	146.1	146.1	147.9	147.9	143.1	132.8	133.1	133.1	133.1	133.1
Mdxt	2835.5	2221.1	2939.8	2307.3	2572.2	2291.8	2269.1	2269.9	2269.4	2270.5
Mdyt	-3270.5	-3797.4	-3287.8	-3816.6	-3326.3	-3154.9	-3132.4	-3132.4	-3132.3	-3131.9

Comb	(150)	(150)	(151)	(151)	(155)	(212)	(169)	(178)	(174)	(175)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	132.9	132.6	134.3	138.1	137.0	129.9	134.1	138.1	140.7	130.5
Mdxt	2275.4	2251.1	2396.0	2136.7	1368.4	2262.5	2370.5	2724.3	2873.0	2288.3
Mdyt	-3124.4	-3214.5	-3112.5	-3537.8	-3734.1	-3626.8	-3092.9	-3035.8	-3060.6	-3322.7
Comb	(183)	(187)	(211)	(205)	(196)	(202)	(204)	(205)	(206)	(207)
Carr	101									
Fdzt	134.3									
Mdxt	1863.0									
Mdyt	-3599.4									
Comb	(211)									

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	136.4	136.4	136.2	136.6	136.6	136.6	136.6	136.6	136.6	136.6
Mdxt	2654.8	1820.2	2652.5	1811.2	2649.1	1811.4	2649.3	1811.6	2649.3	2649.9
Mdyt	-2737.3	-3961.2	-2740.2	-3942.8	-2727.7	-3942.8	-2727.6	-3942.7	-2727.6	-2727.3

Comb	(46)	(46)	(22)	(2)	(3)	(3)	(4)	(8)	(8)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	136.6	136.6	136.7	136.3	136.3	134.6	134.6	137.1	138.8	138.8
Mdxt	1812.2	1811.9	1819.5	1805.2	2644.0	1804.1	2646.2	1857.7	2364.8	1529.4
Mdyt	-3942.3	-3942.5	-3934.4	-4013.5	-2762.8	-4443.2	-2970.0	-3926.8	-2878.9	-4072.5
Comb	(9)	(12)	(43)	(21)	(21)	(31)	(31)	(44)	(30)	(30)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	137.6	137.6	143.6	143.6	136.8	144.7	144.7	141.4	141.4	137.4
Mdxt	2344.9	1509.6	2495.9	1625.3	2670.8	3025.9	2128.6	2919.3	2058.5	2732.0
Mdyt	-2870.6	-4114.8	-2779.2	-4061.5	-2712.4	-2601.0	-3867.7	-2714.1	-3883.1	-2705.1
Comb	(25)	(25)	(29)	(29)	(33)	(34)	(34)	(35)	(35)	(45)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	137.4	140.1	140.1	142.0	142.0	136.7	137.1	126.8	126.8	126.5
Mdxt	1886.5	2945.1	2080.4	3058.9	2173.8	2658.0	2699.7	2407.3	1636.9	2404.0
Mdyt	-3923.1	-2631.2	-3853.4	-2636.3	-3863.3	-2724.5	-2711.0	-2578.6	-3728.9	-2582.7
Comb	(45)	(39)	(39)	(40)	(40)	(43)	(44)	(101)	(101)	(77)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	127.1	127.1	127.1	127.1	127.1	127.1	127.1	127.2	126.7	126.7

Mdxt	1624.4	2399.5	1624.6	2400.3	1625.6	1625.1	2398.6	1635.8	1615.5	2391.7
Mdyt	-3702.6	-2564.7	-3702.4	-2564.3	-3701.9	-3702.1	-2564.9	-3690.6	-3803.5	-2615.0
Comb	(58)	(63)	(63)	(64)	(64)	(67)	(69)	(98)	(76)	(76)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	127.3	127.8	131.5	130.3	128.5	128.5	125.5	125.5	124.2	124.2
Mdxt	1532.9	1690.5	2059.5	1221.3	1958.1	1193.1	2363.3	1583.3	2395.2	1613.9
Mdyt	-3770.9	-3679.8	-3177.4	-3887.9	-2768.9	-3948.3	-2776.2	-4125.0	-2911.1	-4417.5
Comb	(75)	(99)	(205)	(85)	(80)	(80)	(81)	(81)	(86)	(86)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	127.4	138.6	138.6	134.0	134.0	128.3	128.3	132.1	132.1	134.9
Mdxt	2430.2	2937.8	2077.5	2785.5	1977.3	2517.8	1731.6	2822.3	2008.7	2984.6
Mdyt	-2543.1	-2383.9	-3595.3	-2545.4	-3617.3	-2532.6	-3674.5	-2427.1	-3575.0	-2434.3
Comb	(88)	(89)	(89)	(90)	(90)	(100)	(100)	(94)	(94)	(95)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	134.9	127.2	127.8	133.9	133.9	144.0	144.0	136.8	136.8	139.4
Mdxt	2142.0	2411.9	2471.6	1858.8	2720.9	3099.8	2183.3	2806.5	1941.2	3018.8
Mdyt	-3588.9	-2560.3	-2541.1	-4016.2	-2628.1	-2259.1	-3440.7	-2363.1	-3496.1	-2289.3
Comb	(95)	(98)	(99)	(142)	(142)	(145)	(145)	(156)	(156)	(150)

Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	139.4	141.4	141.4	136.4	136.4	126.2	126.2	125.9	126.4	126.4
Mdxt	2135.1	3132.4	2228.4	2774.4	1912.3	2477.3	1687.7	2474.0	1675.3	2469.5
Mdyt	-3426.5	-2294.3	-3436.3	-2369.0	-3499.8	-2260.4	-3331.4	-2264.5	-3305.1	-2246.5
Comb	(150)	(151)	(151)	(155)	(155)	(212)	(212)	(188)	(173)	(174)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	126.4	126.4	126.4	126.4	126.3	126.1	126.1	127.2	129.6	129.6
Mdxt	1675.5	2470.5	1676.4	1675.9	1680.8	2461.9	1666.3	1741.3	2060.2	1272.2
Mdyt	-3304.9	-2246.0	-3304.4	-3304.6	-3287.3	-2296.8	-3406.0	-3282.3	-2462.6	-3490.4
Comb	(174)	(175)	(175)	(178)	(183)	(187)	(187)	(210)	(196)	(196)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	124.9	124.9	123.6	123.6	126.8	138.0	138.0	133.4	133.4	127.7
Mdxt	2433.3	1634.0	2464.9	1664.7	2500.1	3006.3	2128.3	2854.2	2028.1	2587.3
Mdyt	-2457.9	-3727.5	-2592.9	-4020.1	-2224.8	-2065.7	-3197.8	-2227.2	-3219.8	-2214.4
Comb	(192)	(192)	(197)	(197)	(199)	(200)	(200)	(201)	(201)	(211)
Carr	111	112	113	114	115	116				
Fdzt	127.7	131.5	134.3	134.3	126.6	127.2				
Mdxt	1782.4	2890.6	3052.4	2192.8	2482.0	2541.4				

Mdyt	-3277.0	-2108.8	-2116.0	-3191.4	-2242.0	-2222.8
Comb	(211)	(205)	(206)	(206)	(209)	(210)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	132.0	130.7	130.7	130.8	130.8	130.8	130.8	130.8	130.8	130.8
Mdxt	2984.2	3452.6	2033.7	2028.4	3452.2	2028.7	3452.4	2028.8	3452.3	2028.7
Mdyt	2345.2	-922.8	-2276.0	-2265.6	-918.7	-2265.6	-918.6	-2265.4	-918.6	-2265.5
Comb	(200)	(46)	(46)	(2)	(3)	(3)	(4)	(4)	(7)	(7)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	130.9	130.8	130.8	130.8	130.8	130.8	130.7	130.8	130.8	128.6
Mdxt	2872.7	3452.6	2029.4	3452.4	2029.1	3452.1	2859.7	3453.6	2032.0	2817.4
Mdyt	2169.2	-918.5	-2265.1	-918.6	-2265.3	-918.7	2128.6	-917.2	-2262.0	2521.8
Comb	(156)	(9)	(9)	(12)	(12)	(13)	(149)	(17)	(17)	(142)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	130.7	129.4	129.4	130.1	131.0	133.6	132.6	131.7	131.7	129.2
Mdxt	3448.8	2033.1	3445.5	2011.0	2036.1	3013.4	3309.8	1769.4	3298.4	2807.2

Mdyt	-934.7	-2544.6	-1030.1	-2435.1	-2260.0	2238.4	-978.8	-2428.3	-983.8	2356.4
Comb	(21)	(31)	(31)	(26)	(43)	(150)	(30)	(25)	(25)	(137)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	130.0	136.4	137.2	137.2	132.6	132.6	131.4	131.4	138.0	138.0
Mdxt	2820.0	2802.3	3449.1	1885.4	2656.9	1781.9	3489.1	2071.3	3105.0	3823.0
Mdyt	2144.7	2318.8	-955.8	-2357.0	1999.4	-2415.6	-910.6	-2245.3	2394.0	970.7
Comb	(115)	(140)	(29)	(29)	(30)	(30)	(44)	(44)	(145)	(145)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	138.8	135.7	135.3	135.3	131.7	131.7	133.6	134.4	136.5	135.7
Mdxt	2340.4	3100.1	3656.5	2251.0	3513.2	2098.5	3709.2	2278.7	3068.6	3810.9
Mdyt	-2130.5	2260.6	-894.5	-2204.2	-907.4	-2237.3	908.0	-2149.2	2240.5	917.1
Comb	(34)	(151)	(35)	(35)	(45)	(45)	(150)	(39)	(40)	(151)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	136.5	130.0	131.0	121.9	121.1	121.1	121.4	121.4	121.3	121.4
Mdxt	2375.2	2820.0	3459.4	2652.3	3159.4	1836.0	3159.0	1828.8	2622.5	3159.1
Mdyt	-2140.5	2144.5	-916.4	2023.9	-873.7	-2155.5	-867.8	-2140.7	2009.0	-867.7
Comb	(40)	(118)	(43)	(211)	(101)	(101)	(58)	(58)	(210)	(59)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	121.4	121.4	121.4	121.4	121.4	121.3	121.3	121.3	121.3	121.4
Mdxt	1829.0	3159.1	1829.0	3159.1	1829.1	3159.6	1829.9	3159.3	1829.4	3158.7
Mdyt	-2140.5	-867.8	-2140.7	-867.7	-2140.5	-867.5	-2140.0	-867.6	-2140.3	-867.8
Comb	(59)	(62)	(62)	(63)	(63)	(64)	(64)	(67)	(67)	(69)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	121.4	121.6	121.2	121.2	120.3	121.1	121.1	121.5	121.5	121.5
Mdxt	1828.4	2633.9	3161.1	1833.7	2573.2	3154.0	1823.9	3112.2	1751.0	1839.5
Mdyt	-2140.8	1965.9	-865.7	-2135.4	2062.1	-890.7	-2198.1	-890.9	-2198.4	-2132.7
Comb	(69)	(204)	(72)	(72)	(187)	(76)	(76)	(75)	(75)	(98)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	124.3	123.8	123.8	120.6	122.6	122.6	118.5	119.3	119.3	123.8
Mdxt	2350.4	2954.4	1476.4	2577.1	2938.2	1458.5	2573.5	3149.5	1835.1	2359.8
Mdyt	1924.2	-953.8	-2355.0	1988.9	-960.9	-2373.1	2527.8	-1027.1	-2539.3	1791.5
Comb	(79)	(85)	(85)	(170)	(80)	(80)	(197)	(86)	(86)	(85)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	122.1	122.1	132.0	132.8	125.7	127.7	127.7	122.6	122.6	125.7
Mdxt	3211.7	1889.8	3672.5	2274.1	2853.3	3450.9	2146.4	3246.3	1928.6	3509.9
Mdyt	-856.3	-2111.8	950.6	-1947.8	2122.9	-833.3	-2053.0	-851.7	-2100.2	861.1

Comb	(99)	(99)	(200)	(89)	(205)	(90)	(90)	(100)	(100)	(205)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	126.5	128.7	128.7	129.4	120.9	121.5	130.9	130.0	130.0	129.8
Mdxt	2186.0	2977.3	3655.1	2323.9	2563.2	3169.1	3546.0	3485.1	3485.1	2817.2
Mdyt	-1974.5	2154.5	874.0	-1962.0	2008.7	-864.6	880.1	870.2	870.1	2195.9
Comb	(94)	(206)	(206)	(95)	(184)	(98)	(156)	(115)	(118)	(132)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	129.8	128.6	128.6	129.2	129.6	130.1	130.1	136.4	138.0	134.5
Mdxt	3481.5	2097.3	3478.3	2075.2	3478.7	2817.5	3482.7	3482.3	2404.5	2992.9
Mdyt	890.7	-2231.0	1020.9	-2121.5	-787.1	2147.9	871.5	940.5	-1816.9	2066.6
Comb	(132)	(142)	(142)	(137)	(138)	(139)	(139)	(140)	(145)	(146)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	134.5	134.5	130.7	130.9	133.6	135.7	130.1	130.1	129.9	121.9
Mdxt	3689.1	2315.1	3531.1	2162.8	2342.9	2439.4	2826.0	3492.1	2097.9	3276.7
Mdyt	839.4	-1890.6	863.8	-1923.6	-1835.6	-1826.9	2137.6	867.4	-1962.3	821.1
Comb	(146)	(146)	(149)	(156)	(150)	(151)	(154)	(154)	(157)	(211)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	120.4	120.6	120.4	120.6	120.6	120.6	120.6	120.6	120.6	120.9

Mdxt	1895.7	1888.5	3190.0	1888.7	1888.6	1888.8	1889.6	1889.1	1888.0	2593.2
Mdyt	-1863.6	-1848.8	812.7	-1848.6	-1848.7	-1848.6	-1848.1	-1848.4	-1848.8	1956.7
Comb	(212)	(169)	(212)	(170)	(173)	(174)	(175)	(178)	(180)	(199)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	121.6	120.5	120.3	120.3	120.2	120.8	119.5	118.5	118.5	120.7
Mdxt	3255.6	1893.4	3184.7	1883.5	3189.7	1899.2	2558.9	3180.1	1894.8	2573.6
Mdyt	797.9	-1843.5	836.2	-1906.2	-744.7	-1840.8	2291.4	1022.4	-2247.4	1993.5
Comb	(204)	(183)	(187)	(187)	(188)	(209)	(192)	(197)	(197)	(194)
Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	120.7	121.3	132.0	127.0	127.0	127.0	120.0	121.9	125.7	128.7
Mdxt	3186.2	1949.4	2333.8	2824.2	3481.2	2206.1	3168.3	1988.3	2245.7	2383.6
Mdyt	808.9	-1819.8	-1655.8	1877.5	763.0	-1761.0	-747.7	-1808.3	-1682.6	-1670.1
Comb	(194)	(210)	(200)	(201)	(201)	(201)	(203)	(211)	(205)	(206)
Carr	161	162								
Fdzt	120.8	120.8								
Mdxt	2585.7	3199.7								
Mdyt	1978.8	803.0								
Comb	(209)	(209)								

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	126.7	127.0	127.7	126.0	125.0	125.0	125.3	125.3	124.7	124.7
Mdxt	3843.1	4611.8	4628.3	3837.2	3807.0	4543.2	3807.8	4545.1	3803.6	4538.4
Mdyt	4619.4	3079.4	3023.8	4648.2	4584.9	3007.3	4568.6	2999.3	4763.8	3104.3
Comb	(24)	(89)	(150)	(25)	(21)	(21)	(23)	(23)	(26)	(26)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	130.7	132.0	124.3	124.3	133.1	133.1	128.8	129.8	130.9	130.9
Mdxt	3955.0	4785.5	3796.6	4529.3	4054.1	4837.8	3922.3	4707.6	3988.9	4759.9
Mdyt	4830.7	3168.8	4931.8	3199.0	4772.6	3199.4	4579.8	3057.9	4614.3	3088.4
Comb	(29)	(145)	(31)	(31)	(34)	(34)	(39)	(151)	(40)	(40)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	116.9	116.9	116.2	115.9	115.5	115.5	115.9	115.9	117.8	117.8
Mdxt	3554.4	4242.2	4212.1	3521.3	3511.4	4191.1	3512.4	4193.7	3562.9	4254.9
Mdyt	4387.9	2815.4	2765.4	4268.8	4297.6	2805.1	4274.3	2793.7	4346.8	2795.8
Comb	(80)	(80)	(74)	(75)	(76)	(76)	(78)	(78)	(79)	(79)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	115.1	115.1	114.5	114.5	127.0	120.8	120.8	113.3	113.3	123.0
Mdxt	3506.4	4184.0	3496.4	4171.2	3864.4	3675.9	4387.1	3442.7	4109.3	3742.4
Mdyt	4553.2	2943.6	4793.1	3078.9	4565.6	4290.3	2872.3	4345.6	2814.3	4727.9
Comb	(81)	(81)	(86)	(86)	(89)	(94)	(94)	(96)	(96)	(147)

Carr	41	42	43
Fdzt	123.0	113.1	113.1
Mdxt	4466.4	3441.4	4107.2
Mdyt	3125.5	4568.5	2989.0
Comb	(147)	(202)	(202)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	213.5	213.5	213.5	216.9	214.2	214.2	214.2	214.2	214.2	214.2
Mdxt	3710.8	4811.5	3455.1	3929.4	3331.6	4343.5	3331.2	4343.0	3418.8	3420.0

Mdyt	-1529.3	-667.2	854.1	792.9	-1462.1	-608.7	-1462.0	-608.6	747.9	747.7
Comb	(41)	(41)	(27)	(146)	(9)	(12)	(4)	(4)	(6)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	214.2	214.1	214.1	216.0	211.6	211.6	216.2	213.8	220.9	220.9
Mdxt	3417.7	3338.1	4351.5	3272.8	3638.2	4723.4	3530.3	4377.5	3179.4	4193.6
Mdyt	748.0	-1457.1	-601.2	-1463.4	-1627.6	-755.2	-1454.6	-584.5	-1466.6	-605.4
Comb	(11)	(17)	(17)	(19)	(36)	(36)	(39)	(22)	(24)	(24)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	220.9	218.4	218.4	219.9	212.5	212.5	213.5	213.5	214.2	218.5
Mdxt	3283.4	2986.0	3946.7	3320.2	3134.7	4097.1	3361.8	4382.3	3304.8	3701.2
Mdyt	765.0	-1496.7	-633.7	758.1	-1573.1	-706.8	-1410.1	-574.2	-1462.3	-1466.5
Comb	(24)	(25)	(25)	(29)	(26)	(26)	(27)	(27)	(28)	(40)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	218.5	226.7	226.7	228.5	210.7	210.7	213.5	213.4	214.3	216.2
Mdxt	4774.1	3128.2	4134.1	3765.6	3118.2	4072.3	3831.7	3369.3	3358.2	4574.2
Mdyt	-608.3	-1499.4	-624.5	787.4	-1654.2	-779.3	701.8	870.4	-1454.3	-600.6
Comb	(40)	(30)	(30)	(35)	(31)	(31)	(41)	(32)	(33)	(39)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	217.5	217.5	217.5	228.5	228.5	218.5	200.0	200.0	201.9	199.1
Mdxt	3526.9	4576.0	3615.9	3683.8	4770.5	3786.2	3774.4	4879.5	3618.9	3254.3
Mdyt	-1444.6	-593.0	761.8	-1483.1	-607.5	756.8	-1493.6	-670.9	859.6	-1520.2
Comb	(34)	(34)	(34)	(35)	(35)	(40)	(147)	(147)	(138)	(142)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	199.1	201.9	201.9	202.2	203.1	202.6	202.6	204.6	201.0	201.0
Mdxt	4238.1	3846.9	4966.8	3614.1	3655.3	3583.0	3582.5	3779.8	3003.8	3926.6
Mdyt	-695.1	-1395.1	-582.9	807.9	754.5	753.3	753.3	762.8	-1360.2	-558.9
Comb	(142)	(152)	(152)	(133)	(156)	(116)	(117)	(150)	(72)	(72)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	203.6	203.6	205.9	200.5	200.5	202.1	202.1	209.3	207.1	207.2
Mdxt	2910.6	3828.4	3779.7	2918.5	3819.3	3414.5	4440.4	3447.1	2500.9	3522.6
Mdyt	-1369.2	-568.2	767.2	-1405.4	-603.3	-1354.7	-551.5	770.4	-1416.7	-1373.7
Comb	(74)	(74)	(145)	(76)	(76)	(132)	(132)	(135)	(80)	(95)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	206.9	197.4	197.4	200.1	200.1	201.1	208.3	196.1	196.4	196.4
Mdxt	3950.0	3432.6	4459.3	3037.8	3971.1	2956.3	3484.0	2689.8	3649.5	3746.2
Mdyt	762.3	-1603.8	-778.9	-1293.1	-526.7	-1367.8	763.6	-1641.8	-1248.9	716.8

Comb	(151)	(91)	(91)	(82)	(82)	(83)	(140)	(86)	(206)	(206)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	201.8	201.2	201.2	204.0	207.2	221.5	221.5	221.5	204.0	207.2
Mdxt	3533.1	3032.5	3963.8	3278.5	4531.9	3497.8	4526.2	3564.0	4245.9	3593.6
Mdyt	875.9	-1356.2	-552.0	-1356.7	-569.1	-1397.5	-569.5	755.3	-558.0	711.6
Comb	(143)	(88)	(88)	(94)	(95)	(90)	(90)	(90)	(94)	(95)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	201.9	201.3	202.6	202.6	202.6	202.6	202.6	202.6	202.6	202.6
Mdxt	3995.4	3197.6	3467.2	4505.4	3467.7	4506.0	3467.3	4505.6	3467.8	4506.0
Mdyt	707.3	691.1	-1328.1	-540.9	-1328.1	-540.8	-1328.0	-540.8	-1328.0	-540.8
Comb	(152)	(101)	(118)	(118)	(123)	(123)	(115)	(115)	(120)	(120)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	202.5	202.5	204.4	204.4	203.1	203.1	204.6	202.2	206.8	202.6
Mdxt	3474.2	4513.8	3409.0	4447.7	3379.1	4404.8	3666.5	4539.3	3239.6	3440.9
Mdyt	-1323.1	-538.8	-1329.3	-541.4	-1339.3	-545.3	-1320.5	-530.4	744.0	-1328.3
Comb	(128)	(128)	(130)	(130)	(131)	(131)	(150)	(133)	(136)	(139)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	202.6	202.7	204.6	206.9	206.9	216.9	216.9	189.2	189.2	189.3

Mdxt	4470.9	3494.3	4733.8	3837.3	4931.7	3819.9	4931.3	3663.2	4728.8	3273.2
Mdyt	-540.9	-1320.1	-537.9	-1332.5	-542.8	-1349.1	-549.9	-1338.4	-574.7	855.9
Comb	(139)	(144)	(150)	(151)	(151)	(146)	(146)	(207)	(207)	(193)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	190.2	190.2	190.2	190.2	191.0	190.3	190.2	190.2	190.2	190.3
Mdxt	3120.6	4068.1	3121.0	4068.5	3325.1	3221.1	3121.5	4069.1	3222.9	3219.7
Mdyt	-1242.5	-506.0	-1242.5	-506.0	705.7	704.1	-1242.4	-506.0	703.9	704.3
Comb	(169)	(169)	(170)	(170)	(211)	(172)	(175)	(175)	(175)	(177)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	190.3	190.1	190.1	192.8	192.8	193.2	189.6	189.6	190.6	189.7
Mdxt	3222.9	3130.7	4080.4	3037.5	3984.8	3503.0	3045.4	3974.8	3161.0	4117.2
Mdyt	703.9	-1235.4	-503.2	-1244.3	-506.9	717.7	-1280.5	-524.7	-1226.2	-491.1
Comb	(178)	(183)	(183)	(185)	(185)	(205)	(187)	(187)	(204)	(188)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	194.9	186.6	186.6	189.3	189.3	190.2	190.2	198.4	185.3	185.3
Mdxt	3502.8	3559.5	4604.1	3164.8	4124.0	3083.2	4018.6	3080.4	2816.7	3683.9
Mdyt	723.9	-1479.0	-700.4	-1168.3	-476.3	-1242.9	-506.2	718.7	-1516.9	-734.8
Comb	(200)	(202)	(202)	(193)	(193)	(194)	(194)	(195)	(197)	(197)

Carr	151	152	153	154	155	156	157	158	159	160
Fdzt	186.6	189.1	190.4	190.4	193.2	196.4	210.7	193.2	189.2	190.5
Mdxt	3705.6	3150.5	3159.4	4117.1	3405.4	4678.7	3716.6	4395.7	3811.1	3350.3
Mdyt	534.0	879.1	-1231.3	-501.5	-1231.8	-508.9	760.5	-501.9	638.3	696.4
Comb	(202)	(198)	(199)	(199)	(205)	(206)	(201)	(205)	(207)	(212)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	208.3	208.3	210.2	210.9	210.2	210.9	210.9	210.1	210.5	217.6
Mdxt	3382.4	4540.0	3453.2	3138.6	4627.0	3139.3	4199.0	3101.5	4136.8	2955.5
Mdyt	-5792.1	-4009.4	-5615.4	-5483.7	-3859.3	-5483.7	-3752.0	-5556.1	-3793.5	-5492.4
Comb	(36)	(36)	(41)	(4)	(41)	(9)	(9)	(32)	(21)	(24)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	217.6	215.1	215.1	209.2	209.2	215.2	215.2	223.4	223.4	207.4
Mdxt	4028.0	2790.3	3798.4	2968.4	3968.6	3516.0	4634.7	2919.6	3977.7	2956.8
Mdyt	-3757.9	-5549.9	-3805.3	-5690.5	-3924.8	-5504.1	-3765.3	-5571.2	-3816.2	-5840.7
Comb	(24)	(25)	(25)	(26)	(26)	(40)	(40)	(30)	(30)	(31)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	207.4	212.9	212.9	225.2	225.2	210.4	211.2	196.7	196.7	198.5
Mdxt	3946.7	3343.5	4433.6	3506.1	4635.3	4145.0	4231.6	3461.6	4663.0	3532.4
Mdyt	-4050.7	-5472.4	-3741.9	-5569.2	-3806.6	-3756.6	-3749.9	-5382.2	-3714.6	-5205.4
Comb	(31)	(39)	(39)	(35)	(35)	(37)	(38)	(147)	(147)	(152)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	198.5	198.8	197.8	197.8	197.8	200.4	200.4	195.7	195.7	203.8
Mdxt	4749.5	3172.6	3785.7	2827.3	3786.4	2728.2	3689.8	3036.1	4078.2	2328.7
Mdyt	-3564.6	-5123.5	-3504.3	-5120.0	-3504.2	-5123.6	-3506.7	-5430.8	-3756.0	-5214.6
Comb	(152)	(132)	(59)	(64)	(64)	(74)	(74)	(142)	(142)	(80)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	203.9	194.1	194.1	192.8	193.1	198.9	198.8	218.3	218.3	203.9
Mdxt	3365.5	3174.6	4275.2	2566.7	3439.4	3238.7	4266.3	3351.3	4411.0	4410.6
Mdyt	-5149.2	-5560.7	-3872.0	-5630.1	-4767.8	-5109.1	-3498.7	-5242.2	-3582.4	-3523.3
Comb	(95)	(91)	(91)	(86)	(206)	(133)	(132)	(90)	(90)	(95)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	199.4	198.9	199.5	199.4	199.3	199.3	199.3	199.3	199.3	198.8
Mdxt	3239.1	4356.8	3246.6	4357.4	3217.9	4327.0	3217.8	3218.5	4327.5	3179.1

Mdyt	-5086.4	-3462.8	-5081.0	-3460.0	-5073.8	-3457.2	-5073.8	-5073.7	-3457.2	-5112.8
Comb	(144)	(133)	(149)	(144)	(115)	(115)	(118)	(120)	(120)	(148)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	199.8	206.0	206.0	199.3	201.3	201.3	213.6	213.6	199.5	203.6
Mdxt	4227.0	3034.8	4161.4	4297.7	3422.7	4559.3	3585.2	4762.1	4359.8	3595.2
Mdyt	-3474.5	-5082.5	-3463.2	-3463.7	-5062.5	-3447.2	-5159.3	-3511.8	-3455.2	-5094.2
Comb	(131)	(135)	(135)	(139)	(150)	(150)	(146)	(146)	(149)	(151)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	203.6	185.9	185.9	187.0	187.4	187.0	187.0	187.0	189.5	189.5
Mdxt	4758.6	3349.7	4512.5	3907.5	2941.4	3908.0	2901.2	3908.6	2802.1	3814.4
Mdyt	-3470.5	-4926.7	-3383.4	-3230.0	-4748.9	-3229.9	-4738.5	-3229.9	-4742.1	-3232.2
Comb	(151)	(207)	(207)	(169)	(204)	(170)	(175)	(175)	(185)	(185)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	185.9	186.3	183.2	183.2	181.9	181.9	189.9	189.9	207.4	193.1
Mdxt	2847.3	3820.7	3248.6	4389.2	2640.7	3550.1	3192.9	4241.0	3425.2	4525.8
Mdyt	-4841.9	-3289.3	-5179.2	-3597.7	-5248.6	-3656.7	-4722.5	-3215.6	-4860.7	-3248.9
Comb	(198)	(187)	(202)	(202)	(197)	(197)	(205)	(205)	(201)	(206)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	201.9	201.9	202.3	203.0	203.0	203.0	203.2	203.0	202.9	202.5
Mdxt	3152.7	4274.9	2921.9	3921.9	3922.1	2924.7	2938.1	3922.7	3928.5	2871.1
Mdyt	-8146.0	-6600.6	-7997.3	-6406.0	-6405.9	-7941.4	-7935.5	-6405.9	-6405.2	-8017.7
Comb	(41)	(41)	(27)	(8)	(4)	(33)	(38)	(9)	(17)	(21)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	202.5	203.0	210.0	210.0	207.3	207.3	199.8	199.8	203.0	207.2
Mdxt	3868.4	3946.2	2693.3	3715.3	2555.4	3515.5	3081.6	4187.4	3901.8	3295.0
Mdyt	-6486.6	-6403.3	-7929.7	-6409.5	-8023.6	-6492.7	-8457.6	-6898.7	-6412.2	-7957.5
Comb	(21)	(33)	(24)	(24)	(25)	(25)	(36)	(36)	(28)	(40)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	207.2	216.0	216.0	198.9	198.9	202.2	205.0	205.0	217.7	217.7
Mdxt	4368.3	2673.4	3683.5	2757.0	3701.0	2879.8	3119.9	4164.5	3296.9	4381.1
Mdyt	-6430.0	-8020.6	-6486.8	-8549.0	-6986.1	-8003.9	-7912.0	-6390.4	-8014.4	-6468.2
Comb	(40)	(30)	(30)	(31)	(31)	(32)	(39)	(39)	(35)	(35)

Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	203.2	188.0	188.0	189.1	190.1	190.1	190.4	190.0	189.9	190.8
Mdxt	3956.0	3101.3	4246.1	2642.5	4333.1	3172.4	2665.8	3540.1	3548.6	2731.6
Mdyt	-6397.3	-7797.5	-6353.9	-7496.3	-6055.7	-7485.9	-7408.0	-5982.8	-5981.8	-7405.9
Comb	(38)	(147)	(147)	(82)	(152)	(152)	(93)	(64)	(72)	(100)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	192.7	189.3	189.3	190.5	196.1	196.1	185.5	185.5	190.0	184.1
Mdxt	3425.9	2570.0	3462.1	3599.7	2119.0	3175.5	2870.7	3919.3	3510.0	2407.1
Mdyt	-5982.2	-7525.4	-6098.0	-5979.6	-7533.7	-7439.3	-8153.7	-6686.9	-5991.9	-8284.4
Comb	(74)	(76)	(76)	(99)	(80)	(95)	(91)	(91)	(83)	(86)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	184.1	189.0	192.9	192.9	211.1	211.1	190.4	196.1	190.5	190.8
Mdxt	3221.6	2582.4	2925.4	3886.7	3178.4	4196.1	3588.0	4178.0	2676.6	2943.6
Mdyt	-6811.7	-7505.7	-7374.3	-5960.7	-7520.8	-6071.9	-5970.5	-6017.3	-7398.5	-7307.2
Comb	(86)	(87)	(94)	(94)	(90)	(90)	(93)	(95)	(99)	(133)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	191.2	190.5	191.2	191.2	191.2	191.4	191.2	191.1	190.7	190.7
Mdxt	3985.5	2941.6	3985.0	3985.1	2944.5	2957.8	3985.8	3991.5	2890.9	3932.1
Mdyt	-5861.2	-7337.2	-5861.1	-5861.0	-7281.3	-7275.4	-5861.0	-5860.3	-7357.6	-5941.7

Comb	(123)	(138)	(119)	(115)	(144)	(149)	(120)	(128)	(132)	(132)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	191.2	191.2	190.5	193.2	205.9	205.9	191.4	193.2	195.4	195.4
Mdxt	4008.9	3965.1	2899.5	4225.0	3316.7	4442.2	4018.7	3139.7	3314.7	4426.9
Mdyt	-5858.4	-5867.3	-7343.7	-5845.5	-7354.3	-5923.4	-5852.4	-7251.8	-7297.3	-5885.1
Comb	(144)	(139)	(143)	(150)	(146)	(146)	(149)	(150)	(151)	(151)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	177.6	177.6	178.1	179.8	179.1	179.0	179.4	179.0	178.9	181.7
Mdxt	2990.8	4098.0	2661.1	3723.7	2665.0	3599.7	2684.3	3600.9	3609.2	2528.1
Mdyt	-7094.4	-5753.8	-6881.9	-5478.9	-6802.0	-5475.8	-6793.5	-5475.6	-5474.6	-6785.8
Comb	(207)	(207)	(193)	(211)	(199)	(174)	(204)	(175)	(183)	(185)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	181.7	178.3	178.3	179.5	174.5	174.5	179.0	173.2	173.2	178.0
Mdxt	3489.0	2588.6	3523.7	3659.7	2889.2	3973.8	3571.1	2425.7	3285.4	2601.0
Mdyt	-5474.9	-6911.0	-5590.8	-5472.3	-7539.4	-6179.7	-5484.7	-7670.0	-6304.5	-6891.3
Comb	(185)	(187)	(187)	(210)	(202)	(202)	(194)	(197)	(197)	(198)
Carr	101	102	103	104	105	106				
Fdzt	181.9	179.4	181.9	185.1	185.1	179.8				

Mdxt	3943.6	3648.2	2944.0	3194.1	4232.1	2750.1
Mdyt	-5453.4	-5463.3	-6759.9	-6824.9	-5510.1	-6791.5
Comb	(205)	(204)	(205)	(206)	(206)	(211)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	195.3	195.3	196.0	196.0	196.6	196.6	196.7	196.6	196.0	198.6
Mdxt	2813.4	3921.6	2649.1	3663.4	3649.3	3649.2	2654.8	3650.1	2621.2	3556.4
Mdyt	-9585.5	-8723.8	-9434.4	-8471.3	-8464.2	-8464.3	-9341.4	-8464.1	-9447.0	-8462.9
Comb	(41)	(41)	(27)	(27)	(4)	(8)	(33)	(9)	(32)	(19)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	196.0	204.1	204.1	201.0	201.0	193.0	193.0	200.8	200.8	210.3
Mdxt	3604.4	2381.9	3400.1	2270.4	3231.1	2741.9	3833.2	3046.7	4109.1	2376.2
Mdyt	-8574.0	-9330.1	-8465.2	-9446.8	-8579.4	-9964.8	-9130.7	-9335.7	-8479.4	-9424.7
Comb	(21)	(24)	(24)	(25)	(25)	(36)	(36)	(40)	(40)	(30)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	210.3	192.0	192.0	196.7	198.6	198.6	211.9	211.9	196.9	196.9

Mdxt	3386.8	2527.5	3463.2	3667.5	2865.2	3901.1	3060.3	4136.5	2673.3	3684.3
Mdyt	-8550.1	-10077.8	-9252.7	-8461.5	-9291.8	-8434.3	-9389.4	-8509.8	-9335.4	-8455.0
Comb	(30)	(31)	(31)	(33)	(39)	(39)	(35)	(35)	(38)	(38)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	180.8	180.8	182.9	183.2	184.5	183.2	183.7	186.5	186.5	182.8
Mdxt	2715.4	3825.9	2397.7	3913.8	3426.2	2786.9	3298.5	2251.0	3163.0	2357.8
Mdyt	-9136.3	-8367.1	-8852.2	-7960.1	-7900.9	-8757.0	-7900.5	-8702.4	-7898.8	-8870.1
Comb	(147)	(147)	(82)	(152)	(100)	(152)	(64)	(74)	(74)	(87)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	182.9	190.0	189.7	180.3	180.3	177.0	177.0	183.8	186.5	186.5
Mdxt	3232.9	1856.7	2965.6	2225.7	3049.5	2223.9	3030.3	3323.5	2706.4	3658.1
Mdyt	-8057.4	-8870.0	-8711.2	-9322.0	-8552.4	-9771.3	-9027.0	-7896.9	-8648.5	-7857.9
Comb	(76)	(80)	(95)	(81)	(81)	(86)	(86)	(88)	(94)	(94)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	205.6	205.6	178.5	178.5	184.1	184.2	189.7	184.5	184.2	184.2
Mdxt	2985.0	3994.3	2530.2	3561.2	2432.3	3360.9	3955.0	2501.4	2626.4	3661.4
Mdyt	-8787.9	-7965.7	-9610.0	-8852.9	-8710.7	-7893.7	-7922.3	-8700.0	-8556.6	-7705.5
Comb	(90)	(90)	(91)	(91)	(93)	(99)	(95)	(100)	(133)	(133)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	183.9	183.9	184.6	185.0	183.9	183.9	184.6	186.5	186.5	199.8
Mdxt	2622.6	3658.7	2628.2	3733.7	2594.7	3600.3	3662.9	2838.7	3894.2	4129.9
Mdyt	-8605.8	-7707.7	-8512.9	-7700.7	-8618.4	-7810.3	-7697.9	-8463.3	-7670.7	-7746.1
Comb	(138)	(138)	(144)	(156)	(143)	(132)	(144)	(150)	(150)	(146)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	184.8	188.7	188.7	170.5	170.5	171.6	172.5	173.2	172.5	172.4
Mdxt	3679.5	3020.2	4100.6	2607.8	3679.8	2373.1	3393.3	3422.3	2433.3	3295.9
Mdyt	-7691.4	-8507.1	-7715.7	-8297.0	-7560.6	-8081.1	-7239.1	-7190.1	-7981.1	-7189.7
Comb	(149)	(151)	(151)	(207)	(207)	(193)	(212)	(211)	(212)	(175)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	175.3	171.5	171.6	169.1	169.1	165.8	165.8	172.5	175.3	194.3
Mdxt	3162.6	2333.2	3230.9	2201.2	3049.2	2199.4	3029.5	3320.6	3651.9	3988.6
Mdyt	-7187.9	-8099.0	-7346.6	-8550.9	-7841.6	-9000.2	-8316.2	-7186.1	-7147.2	-7254.9
Comb	(185)	(198)	(187)	(192)	(192)	(197)	(197)	(199)	(205)	(201)
Carr	91	92	93	94	95	96	97			
Fdzt	167.2	167.2	172.8	172.9	175.3	178.5	173.2			
Mdxt	2505.7	3554.3	2407.7	3357.6	2681.8	3946.4	2476.9			

Mdyt	-8838.9	-8142.1	-7939.7	-7182.9	-7877.5	-7211.6	-7928.9
Comb	(202)	(202)	(204)	(210)	(205)	(206)	(211)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	191.5	191.5	192.6	193.1	193.1	193.1	193.1	193.1	193.6	193.1
Mdxt	3524.9	2786.3	3341.6	2618.2	3335.2	2618.3	3335.1	3336.1	2696.8	2621.9
Mdyt	-9551.1	-10070.2	-9266.9	-9739.0	-9263.7	-9739.0	-9263.8	-9263.5	-9738.8	-9728.3
Comb	(41)	(41)	(27)	(8)	(4)	(12)	(8)	(9)	(45)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	192.5	192.5	193.2	201.0	199.1	197.3	197.7	189.1	189.1	193.0
Mdxt	3300.2	2588.8	2629.8	3020.2	2503.5	3021.5	2247.2	3436.0	2714.0	3328.5
Mdyt	-9389.2	-9887.7	-9716.5	-9295.7	-9770.2	-9755.0	-9895.1	-10021.2	-10635.8	-9267.2
Comb	(21)	(21)	(33)	(24)	(29)	(40)	(25)	(36)	(36)	(28)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	199.1	209.1	207.6	188.0	188.0	193.2	195.0	195.0	209.1	193.6
Mdxt	3202.5	3039.9	2357.3	3193.0	2500.0	3348.8	3604.3	2840.0	3863.1	3430.6

Mdyt	-9272.8	-9754.8	-9840.1	-10161.3	-10807.9	-9257.4	-9211.3	-9703.4	-9270.8	-9257.1
Comb	(29)	(35)	(30)	(31)	(31)	(33)	(39)	(39)	(35)	(45)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	193.4	197.3	180.1	180.1	176.4	178.8	178.8	180.8	180.0	180.0
Mdxt	2648.5	3823.1	3098.2	2431.5	3380.9	2755.1	3469.5	2475.5	3017.9	3019.3
Mdyt	-9708.8	-9245.5	-8698.6	-9154.9	-9139.1	-9143.8	-8668.9	-9094.9	-8647.1	-8646.7
Comb	(38)	(40)	(101)	(101)	(147)	(152)	(152)	(100)	(63)	(64)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	180.0	180.5	184.6	183.1	179.1	176.4	180.1	176.4	176.4	180.0
Mdxt	2364.4	2419.3	2990.2	2226.5	2967.7	2682.8	2379.8	2819.9	2198.1	3008.4
Mdyt	-9094.8	-9086.4	-8828.7	-9096.7	-8826.3	-9709.4	-9063.0	-9392.8	-9979.1	-8651.9
Comb	(64)	(99)	(151)	(74)	(76)	(147)	(88)	(81)	(81)	(83)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	172.8	172.8	180.1	182.8	182.8	202.8	174.3	174.3	180.8	180.4
Mdxt	2814.2	2194.3	3037.4	3403.2	2680.1	3772.7	3162.7	2500.1	3154.8	2406.4
Mdyt	-9929.2	-10622.1	-8638.0	-8572.0	-9044.3	-8657.1	-9729.1	-10376.3	-8637.4	-9052.0
Comb	(86)	(86)	(88)	(94)	(94)	(90)	(91)	(91)	(100)	(93)
Carr	61	62	63	64	65	66	67	68	69	70

Fdzt	186.0	186.0	180.1	179.9	180.4	180.4	180.4	179.8	179.8	180.3
Mdxt	3714.8	2939.2	3292.9	3288.1	3281.9	3281.8	3282.9	3247.1	2557.5	3275.3
Mdyt	-8621.0	-9118.2	-8384.0	-8384.7	-8381.5	-8381.7	-8381.4	-8507.1	-8961.4	-8385.1
Comb	(95)	(95)	(133)	(138)	(115)	(119)	(120)	(132)	(132)	(139)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	180.5	182.3	182.3	180.9	184.6	168.3	168.3	165.9	168.2	168.2
Mdxt	3295.3	3548.7	2808.8	3376.4	3765.8	3048.8	2402.6	3238.1	2334.4	2969.5
Mdyt	-8375.3	-8329.1	-8777.0	-8374.9	-8363.4	-7877.5	-8292.4	-8236.4	-8232.7	-7825.8
Comb	(144)	(150)	(150)	(156)	(151)	(212)	(212)	(207)	(178)	(170)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	168.2	168.2	168.2	168.9	168.7	169.0	169.0	167.3	165.9	168.3
Mdxt	2334.4	2969.4	2970.8	2446.5	2390.4	2821.2	2211.2	2919.5	2574.5	2350.9
Mdyt	-8232.5	-7826.0	-7825.6	-8232.4	-8224.0	-7904.4	-8314.5	-8005.2	-8705.9	-8200.5
Comb	(170)	(174)	(175)	(211)	(210)	(186)	(186)	(187)	(207)	(199)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	164.6	164.6	168.1	161.0	161.0	168.3	171.0	191.0	162.4	162.4
Mdxt	2772.9	2169.2	2959.9	2766.6	2165.4	2988.8	3351.3	3721.0	3111.7	2471.2
Mdyt	-8571.7	-9116.6	-7830.8	-9108.1	-9759.7	-7816.9	-7750.9	-7836.0	-8908.0	-9513.8

Comb	(192)	(192)	(194)	(197)	(197)	(199)	(205)	(201)	(202)	(202)
Carr	101	102	103	104						
Fdzt	168.9	168.6	171.0	174.2						
Mdxt	3104.9	2377.5	2651.2	3660.6						
Mdyt	-7816.3	-8189.6	-8181.9	-7799.9						
Comb	(211)	(204)	(205)	(206)						

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	192.3	192.3	193.6	194.1	194.1	194.0	194.1	194.0	194.0	194.0
Mdxt	2983.2	2361.3	2866.0	2260.4	2877.2	2260.7	2865.4	2865.9	2867.2	2261.7
Mdyt	-8698.3	-10657.2	-8528.7	-10331.4	-8468.8	-10331.2	-8468.8	-8468.6	-8468.1	-10330.8
Comb	(41)	(41)	(27)	(12)	(33)	(8)	(7)	(8)	(9)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	194.1	194.0	193.4	193.4	194.4	202.5	202.5	198.9	198.9	189.9
Mdxt	2866.0	2263.2	2841.9	2240.8	2305.0	-2263.8	1921.1	-2312.4	1828.3	2895.1
Mdyt	-8468.1	-10326.7	-8572.8	-10481.1	-10317.2	-8622.6	-10418.1	-8748.7	-10569.6	-9090.7

Comb	(15)	(17)	(21)	(21)	(44)	(24)	(24)	(25)	(25)	(36)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	189.9	200.1	200.1	209.5	209.5	188.9	188.9	193.6	196.7	198.2
Mdxt	2291.0	2708.7	2135.7	-2399.4	1926.1	2783.6	2191.3	2847.0	3081.6	2707.1
Mdyt	-11228.8	-8509.6	-10377.4	-8717.6	-10511.6	-9197.6	-11397.7	-8534.7	-8370.0	-10274.0
Comb	(36)	(29)	(29)	(30)	(30)	(31)	(31)	(32)	(34)	(40)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	210.7	210.7	194.3	194.5	195.9	195.9	198.2	194.4	194.5	180.2
Mdxt	3463.0	2729.2	2907.4	2348.0	3176.6	2507.6	3424.5	2922.2	2976.5	2600.6
Mdyt	-8404.2	-10292.1	-8456.7	-10316.2	-8358.2	-10252.7	-8339.9	-8448.8	-8439.4	-7951.8
Comb	(35)	(35)	(38)	(45)	(39)	(39)	(40)	(44)	(45)	(77)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	180.5	179.9	180.6	180.5	180.5	180.5	180.5	180.5	180.5	180.5
Mdxt	2095.7	2591.4	2041.7	2657.4	2042.0	2590.4	2593.2	2043.5	2591.3	2045.6
Mdyt	-9701.3	-7993.5	-9647.2	-7942.3	-9647.0	-7908.0	-7906.9	-9646.2	-7907.0	-9640.4
Comb	(101)	(82)	(67)	(101)	(63)	(62)	(64)	(64)	(70)	(72)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	185.2	183.2	183.7	179.8	178.0	178.0	181.0	192.6	187.4	176.9

Mdxt	-1932.4	2394.7	1861.9	-2226.2	2759.5	2185.7	2105.2	-2572.4	-2635.9	2448.4
Mdyt	-7869.8	-9534.7	-9686.3	-7309.6	-8235.8	-10112.5	-9626.8	-8127.6	-8307.7	-8529.2
Comb	(136)	(94)	(74)	(190)	(96)	(96)	(99)	(79)	(80)	(81)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	176.9	202.6	173.2	173.2	179.9	184.3	184.3	204.4	204.4	174.6
Mdxt	1925.1	-2763.0	2473.5	1942.9	2564.0	2900.0	2290.1	3444.2	2711.4	2633.5
Mdyt	-10538.2	-8263.3	-8949.1	-11170.5	-8002.1	-7766.8	-9545.6	-7815.7	-9591.0	-8796.4
Comb	(81)	(85)	(86)	(86)	(87)	(89)	(89)	(90)	(90)	(91)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	174.6	180.9	181.2	183.2	186.4	186.4	180.6	181.0	181.2	178.5
Mdxt	2085.2	2650.8	2166.7	3035.3	3387.1	2679.6	2048.1	2672.0	2749.8	2948.6
Mdyt	-10929.1	-7890.6	-9625.3	-7749.9	-7723.7	-9565.1	-9639.6	-7879.3	-7865.9	-7819.4
Comb	(91)	(93)	(100)	(94)	(95)	(95)	(98)	(99)	(100)	(152)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	178.5	179.9	180.4	180.3	180.3	180.3	180.3	180.3	180.3	180.3
Mdxt	2332.0	2833.2	2844.3	2231.1	2833.2	2231.4	2833.2	2231.3	2834.5	2232.3
Mdyt	-9630.8	-7649.9	-7589.9	-9305.0	-7589.8	-9304.7	-7589.8	-9304.8	-7589.2	-9304.3
Comb	(152)	(138)	(144)	(123)	(115)	(115)	(119)	(119)	(120)	(120)

Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	180.3	180.3	179.7	179.7	180.6	185.2	195.8	175.2	175.2	179.9
Mdxt	2833.3	2233.9	2809.4	2211.5	2275.6	-1471.3	-1537.4	2750.9	2162.0	2814.4
Mdyt	-7589.3	-9300.3	-7693.9	-9454.6	-9290.8	-5579.4	-5601.2	-8318.7	-10371.3	-7655.9
Comb	(126)	(128)	(132)	(132)	(155)	(136)	(141)	(142)	(142)	(143)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	183.0	184.5	197.0	176.1	176.1	180.6	180.8	182.2	182.2	184.5
Mdxt	3046.6	2677.7	3426.2	2861.1	2261.6	2874.1	2318.7	3140.3	2478.3	3385.5
Mdyt	-7491.1	-9247.6	-7525.4	-8211.9	-10202.3	-7577.9	-9289.7	-7479.4	-9226.3	-7461.0
Comb	(145)	(151)	(146)	(147)	(147)	(149)	(156)	(150)	(150)	(151)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	180.4	180.6	180.8	167.4	167.7	167.1	167.8	167.7	167.7	167.8
Mdxt	2235.6	2888.8	2942.4	2571.2	2068.5	2562.1	2014.5	2627.2	2014.8	2561.2
Mdyt	-9299.7	-7570.0	-7560.5	-7133.8	-8745.8	-7175.5	-8691.7	-7124.3	-8691.4	-7090.0
Comb	(154)	(155)	(156)	(188)	(212)	(193)	(178)	(212)	(174)	(173)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	167.7	167.7	167.7	167.7	170.4	171.0	168.6	168.6	165.2	165.2
Mdxt	2563.9	2016.3	2562.0	2018.4	2367.6	1834.7	2387.4	1877.4	2727.3	2158.6

Mdyt	-7088.9	-8690.7	-7089.0	-8684.9	-8579.3	-8730.8	-7197.5	-8798.0	-7417.8	-9157.0
Comb	(175)	(175)	(181)	(183)	(205)	(185)	(186)	(186)	(207)	(207)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	168.2	179.8	174.7	164.1	164.1	189.8	160.4	160.4	167.1	171.5
Mdxt	2078.1	-1693.9	-2292.0	2420.4	1897.9	-2418.0	2444.4	1915.7	2535.0	2867.4
Mdyt	-8671.3	-5264.0	-7489.8	-7711.3	-9582.7	-7445.4	-8131.0	-10215.0	-7184.1	-6948.8
Comb	(210)	(190)	(191)	(192)	(192)	(196)	(197)	(197)	(198)	(200)
Carr	141	142	143	144	145	146	147	148	149	150
Fdzt	191.6	161.8	161.8	168.1	168.4	170.4	173.7	173.7	167.8	168.2
Mdxt	3409.1	2602.3	2058.0	2620.8	2139.6	3000.8	3349.1	2652.5	2021.0	2641.7
Mdyt	-6997.7	-7978.5	-9973.6	-7072.7	-8669.8	-6932.0	-6905.7	-8609.6	-8684.2	-7061.4
Comb	(201)	(202)	(202)	(204)	(211)	(205)	(206)	(206)	(209)	(210)
Carr	151									
Fdzt	168.4									
Mdxt	2718.6									
Mdyt	-7048.0									
Comb	(211)									

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	201.3	198.8	199.2	200.6	200.6	200.6	200.6	200.6	200.0	203.0
Mdxt	-3127.9	1705.9	-4254.3	1647.3	1647.8	-2896.5	1649.1	-2892.8	1637.3	-3275.7
Mdyt	-5933.6	-8770.7	-6071.3	-8554.8	-8554.5	-5814.5	-8553.5	-5824.1	-8663.6	-5972.4
Comb	(20)	(41)	(79)	(3)	(8)	(7)	(9)	(17)	(21)	(19)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	201.3	209.7	209.7	205.8	205.8	198.3	196.7	200.3	206.8	217.2
Mdxt	1523.1	-3954.7	-1776.1	-4011.3	-1810.5	-2886.8	1640.4	1643.7	1483.9	-4125.5
Mdyt	-8663.3	-6253.6	-8856.8	-6354.6	-8992.0	-6022.0	-9195.3	-8573.2	-8667.2	-6366.7
Comb	(20)	(24)	(24)	(25)	(25)	(26)	(36)	(27)	(29)	(30)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	217.2	195.9	195.9	200.7	203.1	218.1	196.7	200.9	202.5	204.7
Mdxt	-1882.5	-2733.9	1641.3	1656.6	1819.8	2193.0	-2821.8	1686.6	1949.3	2755.7
Mdyt	-8965.4	-6109.6	-9302.1	-8545.7	-8444.1	-8404.6	-6086.5	-8528.0	-8384.9	-5458.8
Comb	(30)	(31)	(31)	(33)	(34)	(35)	(36)	(38)	(39)	(40)

Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	204.7	200.9	201.1	187.2	186.2	186.2	186.2	186.3	186.2	186.2
Mdxt	2190.6	1702.7	1755.6	-3091.2	1525.3	1476.2	1476.7	-2763.7	1476.9	1478.9
Mdyt	-8318.0	-8523.5	-8502.6	-5614.1	-8020.5	-7997.2	-7996.9	-5444.0	-7996.9	-7995.5
Comb	(40)	(44)	(45)	(75)	(101)	(58)	(59)	(62)	(63)	(64)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	186.2	183.6	189.7	189.7	187.2	199.2	199.2	193.7	193.7	182.9
Mdxt	-2758.6	1560.0	-3299.9	-1436.2	-1317.9	-3358.5	-2011.4	-4330.9	-2060.7	-2749.8
Mdyt	-5457.8	-8305.7	-5669.6	-8148.9	-8152.2	-2771.4	-8428.7	-6215.5	-8621.8	-5740.5
Comb	(72)	(96)	(74)	(74)	(75)	(79)	(79)	(80)	(80)	(81)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	182.9	185.8	210.0	210.0	179.4	179.4	186.3	189.8	211.3	211.3
Mdxt	1407.7	1471.2	-4497.8	-2163.4	-2532.0	1467.8	1489.6	1722.8	2847.9	2255.9
Mdyt	-8650.4	-8023.6	-6232.8	-8583.8	-5865.6	-9064.9	-7984.3	-7839.1	-5158.4	-7782.7
Comb	(81)	(82)	(85)	(85)	(86)	(86)	(88)	(89)	(90)	(90)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	180.6	186.6	188.9	192.1	192.1	186.3	186.7	186.9	183.5	185.4
Mdxt	-2657.1	1532.5	1907.6	2842.9	2252.5	1484.5	1555.4	1631.0	1789.8	1731.2
Mdyt	-5832.6	-7959.0	-7754.6	-4935.9	-7659.0	-7991.7	-7952.5	-7922.7	-7806.4	-7590.5

Comb	(91)	(93)	(94)	(95)	(95)	(98)	(99)	(100)	(152)	(114)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	185.4	185.4	185.4	185.4	184.8	190.6	190.6	181.5	185.1	202.0
Mdxt	1731.5	1730.8	1731.6	1733.1	1721.3	-3304.3	-1513.6	1724.3	1727.7	-3416.3
Mdyt	-7590.3	-7590.8	-7590.3	-7589.2	-7699.4	-5568.0	-8027.7	-8231.1	-7609.0	-5580.1
Comb	(115)	(118)	(119)	(120)	(132)	(136)	(136)	(147)	(138)	(141)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	202.0	180.6	185.4	187.9	202.9	202.9	185.6	187.2	187.2	189.5
Mdxt	-1585.5	1725.3	1740.5	2400.2	2890.7	2276.9	1770.6	2574.6	2033.2	2885.3
Mdyt	-8001.1	-8337.9	-7581.5	-4889.0	-4828.0	-7440.4	-7563.8	-4803.5	-7420.7	-4672.2
Comb	(141)	(142)	(144)	(145)	(146)	(146)	(149)	(150)	(150)	(151)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	189.5	185.4	185.7	185.9	173.0	172.0	172.1	172.1	172.1	172.0
Mdxt	2274.6	1737.0	1786.7	1839.5	-2415.9	1603.5	1554.5	1555.1	-2074.4	1557.2
Mdyt	-7353.7	-7586.6	-7559.1	-7538.4	-4882.1	-7122.9	-7099.7	-7099.4	-4711.8	-7097.9
Comb	(151)	(154)	(155)	(156)	(186)	(212)	(169)	(174)	(172)	(175)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	172.1	172.0	171.2	175.5	175.5	173.0	171.2	185.0	185.0	179.5

Mdxt	1554.3	-2069.2	1540.3	-2630.6	1293.7	1377.2	-2064.2	-3603.5	-1734.8	-3682.9
Mdyt	-7099.9	-4725.8	-7255.3	-4937.6	-7251.3	-7254.7	-4780.6	-5339.3	-7531.2	-5483.6
Comb	(179)	(183)	(187)	(185)	(185)	(186)	(187)	(190)	(190)	(191)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	179.5	168.8	168.8	171.6	195.8	195.8	165.2	165.2	172.1	175.6
Mdxt	-1784.2	-2062.2	1485.9	1549.5	-3847.2	-1886.8	-1834.7	1546.1	1567.9	2271.8
Mdyt	-7724.3	-5008.5	-7752.9	-7126.0	-5500.8	-7686.3	-5133.6	-8167.3	-7086.8	-4513.6
Comb	(191)	(192)	(192)	(193)	(196)	(196)	(197)	(197)	(199)	(200)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	175.6	197.1	197.1	166.5	172.4	174.7	174.7	177.9	177.9	169.4
Mdxt	1801.1	2969.0	2334.2	-1966.3	1610.7	2518.9	1985.9	2956.8	2330.7	1638.2
Mdyt	-6941.6	-4426.4	-6885.2	-5100.6	-7061.5	-4391.4	-6857.1	-4203.8	-6761.4	-7408.1
Comb	(200)	(201)	(201)	(202)	(204)	(205)	(205)	(206)	(206)	(207)
Carr	131	132	133							
Fdzt	172.1	172.5	172.7							
Mdxt	1562.8	1633.7	1709.3							
Mdyt	-7094.1	-7055.0	-7025.2							
Comb	(209)	(210)	(211)							

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	212.4	213.3	213.1	212.4	212.4	212.4	212.4	210.8	210.8	212.4
Mdxt	-3502.2	-4888.4	-2495.4	-3501.1	-3500.4	-3501.5	-3502.2	-3450.5	-6094.4	-3500.1
Mdyt	417.7	-3373.6	-5506.7	418.6	419.2	418.2	417.4	-6054.4	-4248.6	419.6
Comb	(7)	(141)	(20)	(3)	(4)	(13)	(12)	(79)	(79)	(8)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	212.3	212.4	212.4	212.4	212.2	215.0	215.0	211.9	211.4	222.5
Mdxt	-3496.9	-3502.2	-4441.3	-2304.5	-3516.1	-4919.4	-2616.4	-3495.0	-3502.3	-6408.4
Mdyt	422.7	417.0	-3097.8	-5330.7	403.3	-3451.7	-5589.1	504.6	411.6	-4460.1
Comb	(9)	(16)	(17)	(17)	(18)	(19)	(19)	(21)	(23)	(85)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	222.5	218.0	218.0	210.5	210.5	230.3	230.3	208.4	209.0	209.0
Mdxt	-3649.9	-5860.9	-3234.4	-3493.1	-2303.7	-5993.0	-3322.6	-3324.6	-4319.8	-2254.7
Mdyt	-6254.7	-4111.6	-6168.0	758.2	-5500.0	-4177.3	-6200.9	1171.9	-2977.2	-5523.7
Comb	(85)	(25)	(25)	(26)	(26)	(30)	(30)	(31)	(36)	(36)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	214.7	230.8	209.0	212.2	214.2	216.5	212.6	212.4	196.8	197.9
Mdxt	-3324.7	-2987.7	-3399.0	-3518.7	-3018.1	-2649.9	-3409.5	-3501.9	-3327.0	-4627.9
Mdyt	638.7	944.5	991.2	295.5	917.7	1321.5	512.6	417.8	336.0	-3246.8
Comb	(34)	(35)	(36)	(37)	(39)	(40)	(44)	(48)	(62)	(75)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	197.9	196.8	196.8	196.8	194.9	194.9	196.8	196.8	196.8	196.8
Mdxt	-2468.1	-3325.4	-3324.5	-3326.1	-5076.1	-2898.8	-3324.0	-3319.5	-3327.1	-3327.1
Mdyt	-5263.0	337.2	338.1	336.7	-3500.6	-5224.6	338.8	343.2	335.5	334.9
Comb	(75)	(58)	(59)	(68)	(190)	(190)	(63)	(64)	(67)	(71)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	196.8	196.8	196.5	200.5	200.5	196.1	195.4	195.4	210.8	204.9
Mdxt	-4207.8	-2195.5	-3347.0	-4886.4	-2641.0	-3316.7	-3327.2	-4210.7	-4974.2	-6215.2
Mdyt	-2937.1	-5011.5	315.5	-3423.6	-5380.7	460.0	327.3	-2928.5	-1789.8	-4366.3
Comb	(72)	(72)	(73)	(74)	(74)	(76)	(78)	(78)	(79)	(80)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	204.9	194.2	194.2	191.1	192.0	192.0	200.1	223.2	192.0	199.3
Mdxt	-3524.0	-3314.1	-2194.3	-3073.3	-4034.3	-2124.3	-3073.4	-2592.1	-3179.6	-2635.6

Mdyt	-6207.7	822.4	-5253.5	1413.4	-2765.0	-5287.4	651.7	1088.5	1155.3	1050.3
Comb	(80)	(81)	(81)	(86)	(91)	(91)	(89)	(90)	(91)	(94)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	202.6	202.6	202.6	197.2	197.4	196.8	195.4	195.3	195.3	195.3
Mdxt	-2109.5	-2764.6	1570.9	-3194.7	-3065.2	-3326.6	-2556.6	-2556.5	-2555.6	-2554.9
Mdyt	1627.1	-1925.5	-4197.8	471.6	609.8	336.1	1070.0	1070.0	1070.8	1071.5
Comb	(95)	(95)	(95)	(99)	(100)	(103)	(118)	(113)	(114)	(115)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	195.3	195.3	195.3	195.4	195.4	195.1	197.9	196.1	194.9	194.3
Mdxt	-2555.9	-2554.5	-2551.4	-2556.7	-2556.7	-2570.6	-2966.1	-2809.6	-2549.4	-2556.7
Mdyt	1070.5	1071.9	1075.0	1069.7	1069.2	1055.6	656.4	839.9	1156.8	1063.9
Comb	(124)	(119)	(120)	(123)	(127)	(129)	(130)	(131)	(132)	(134)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	201.0	193.5	201.7	213.3	191.3	197.6	213.8	213.8	192.0	195.2
Mdxt	-2641.9	-2547.5	-3016.3	-2730.0	-2379.0	-2379.1	-2042.2	1675.5	-2453.4	-2573.1
Mdyt	-5276.5	1410.5	681.0	-5309.4	1824.2	1291.0	1596.7	-4087.0	1643.5	947.8
Comb	(136)	(137)	(140)	(141)	(142)	(145)	(146)	(146)	(147)	(148)
Carr	101	102	103	104	105	106	107	108	109	110

Fdzt	197.1	197.1	199.4	199.4	195.6	181.0	182.0	182.0	180.9	180.9
Mdxt	-2072.6	1414.1	-1704.4	1729.5	-2464.1	-2446.8	-3585.8	-1916.4	-2445.3	-2444.3
Mdyt	1570.0	-4099.0	1973.7	-3869.5	1164.9	942.9	-2466.1	-4433.3	944.1	945.0
Comb	(150)	(150)	(151)	(151)	(155)	(173)	(186)	(186)	(169)	(170)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	180.9	180.9	180.9	181.0	180.9	180.9	181.0	180.9	180.9	180.6
Mdxt	-2445.8	-2446.6	-1647.6	-3158.1	-2443.8	-2439.2	-2446.9	-3152.0	-1643.8	-2466.8
Mdyt	943.6	942.3	-4177.5	-2181.4	945.6	950.0	941.8	-2192.0	-4181.8	922.3
Comb	(179)	(172)	(172)	(182)	(174)	(175)	(182)	(183)	(183)	(184)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	184.7	184.7	184.7	182.0	180.3	179.5	179.5	189.0	189.0	178.3
Mdxt	-3031.9	-3849.9	-2089.3	-2808.3	-2436.5	-2447.1	-3156.3	-5200.7	-2972.3	-2433.9
Mdyt	351.9	-2642.4	-4551.0	614.2	1066.9	934.2	-2183.4	-3618.3	-5378.0	1429.4
Comb	(185)	(185)	(185)	(186)	(187)	(189)	(189)	(191)	(191)	(192)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	178.3	190.0	175.2	176.2	176.2	184.2	207.3	207.3	176.2	180.7
Mdxt	-1642.6	-3103.5	-2193.1	-2975.3	-1572.7	-2193.2	-1711.9	1823.8	-2299.4	-2470.5
Mdyt	-4423.7	387.3	2020.3	-2019.9	-4457.7	1258.7	1695.3	-3678.6	1762.2	768.3

Comb	(192)	(195)	(197)	(202)	(202)	(200)	(201)	(201)	(202)	(203)

Carr	141	142	143	144	145	146	147	148
Fdzt	183.5	183.5	186.8	186.8	186.8	181.3	181.6	180.9
Mdxt	-1755.3	1450.4	1381.4	2427.3	1901.0	-2314.5	-2185.1	-2446.5
Mdyt	1657.2	-3695.8	2233.9	-1364.9	-3368.0	1078.5	1216.7	943.0
Comb	(205)	(205)	(206)	(206)	(206)	(210)	(211)	(215)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	241.2	241.2	239.3	240.8	240.1	240.1	241.2	240.1	240.1	240.1
Mdxt	3884.0	4940.6	3777.4	3878.8	3753.8	4787.5	3910.6	3753.6	4787.4	3754.8
Mdyt	-1896.0	-769.8	1494.4	1403.1	-1882.0	-764.2	1401.2	-1882.1	-764.2	-1881.8
Comb	(46)	(46)	(27)	(34)	(8)	(8)	(39)	(7)	(7)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	240.1	240.1	240.1	240.1	240.3	240.3	240.6	240.6	241.2	241.2

Mdxt	4788.7	3735.8	3754.0	4787.8	3784.3	4823.3	3689.2	4713.2	3929.2	4993.0
Mdyt	-764.1	1392.0	-1882.0	-764.2	-1880.5	-763.6	-1912.2	-776.3	-1872.2	-760.3
Comb	(9)	(11)	(12)	(12)	(44)	(44)	(21)	(21)	(39)	(39)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	243.8	243.8	244.2	239.3	239.3	248.1	248.1	248.1	245.1	239.2
Mdxt	3522.3	4522.4	4169.1	3788.9	4827.0	3441.6	4435.3	3443.6	4341.1	3670.3
Mdyt	-2103.1	-852.8	1406.1	-1826.7	-742.0	-1920.9	-780.1	1403.7	1376.4	1509.9
Comb	(31)	(31)	(40)	(27)	(27)	(30)	(30)	(30)	(41)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	252.1	252.1	252.1	244.9	244.9	245.1	245.1	228.2	228.2	223.9
Mdxt	4156.1	5275.5	4127.3	4276.4	5399.4	4367.2	5503.4	4165.6	5237.2	3398.8
Mdyt	-1901.9	-772.7	1433.0	-2082.9	-844.8	-1978.4	-803.0	-1816.2	-737.3	1446.3
Comb	(35)	(35)	(35)	(36)	(36)	(41)	(41)	(157)	(157)	(82)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	227.1	227.1	227.1	227.1	226.3	227.8	227.1	227.1	227.1	227.1
Mdxt	4035.7	5087.0	4036.5	5087.8	4052.2	4153.6	4035.3	5086.5	4035.5	5086.7
Mdyt	-1802.2	-731.6	-1802.1	-731.6	1444.6	1353.3	-1802.2	-731.7	-1802.1	-731.6
Comb	(123)	(123)	(120)	(120)	(138)	(145)	(118)	(118)	(119)	(119)

Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	228.2	227.1	227.3	227.3	227.6	227.6	228.2	228.2	227.1	230.3
Mdxt	4185.4	4011.9	4066.0	5121.9	3970.9	5014.0	4210.9	5288.7	4010.6	3024.6
Mdyt	1351.5	1342.1	-1800.7	-731.0	-1832.3	-743.7	-1792.3	-727.8	1342.2	-2078.6
Comb	(150)	(117)	(155)	(155)	(132)	(132)	(150)	(150)	(122)	(86)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	231.9	231.2	228.1	226.3	223.9	223.9	226.2	235.1	235.1	235.1
Mdxt	4101.9	4443.9	3018.1	4070.6	3405.4	4353.6	3945.0	3723.2	4743.2	3718.3
Mdyt	-2049.7	1356.3	-1943.0	-1747.0	-1683.7	-684.1	1460.2	-1841.1	-747.6	1353.9
Comb	(91)	(151)	(81)	(138)	(82)	(82)	(143)	(141)	(141)	(141)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	232.1	223.7	242.2	242.2	231.9	231.9	231.9	231.2	229.2	229.2
Mdxt	4615.8	3245.8	3930.0	4995.7	5172.6	4558.1	5689.2	3577.8	3799.4	4820.4
Mdyt	1326.6	1468.4	-1791.1	-727.9	-830.9	-2003.1	-812.2	1337.7	-1928.4	-782.2
Comb	(152)	(87)	(90)	(90)	(91)	(147)	(147)	(136)	(137)	(137)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	226.3	239.1	239.1	239.1	232.1	232.1	214.5	214.5	211.8	214.0
Mdxt	5125.0	4437.8	5570.5	4402.0	4648.8	5791.6	3803.9	4795.7	3655.0	3799.9

Mdyt	-709.5	-1822.1	-740.2	1383.2	-1898.5	-770.4	-1708.3	-693.5	1400.1	1269.7
Comb	(138)	(146)	(146)	(146)	(152)	(152)	(212)	(212)	(193)	(200)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	212.9	212.9	214.5	212.9	212.9	212.9	212.9	212.9	212.9	212.9
Mdxt	3618.4	4580.1	3845.3	3617.8	4579.5	3618.0	4579.7	3619.4	4581.3	3595.5
Mdyt	-1688.2	-685.4	1267.1	-1688.4	-685.4	-1688.3	-685.4	-1688.2	-685.4	1253.7
Comb	(170)	(170)	(205)	(173)	(173)	(174)	(174)	(175)	(175)	(177)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	212.9	212.9	213.2	213.2	213.6	213.6	214.5	214.5	215.5	218.2
Mdxt	3618.3	4580.1	3661.6	4630.3	3525.7	4474.9	3868.6	4869.5	3329.7	3287.3
Mdyt	-1688.3	-685.4	-1686.1	-684.6	-1731.4	-702.7	-1674.3	-679.9	1258.3	-2004.2
Comb	(178)	(178)	(210)	(210)	(187)	(187)	(205)	(205)	(190)	(197)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	219.8	218.8	216.0	216.0	211.8	211.8	214.9	220.1	211.6	219.8
Mdxt	4364.6	4214.6	3280.8	4194.8	3668.1	4635.0	3446.9	4460.2	3502.0	5442.2
Mdyt	-1975.4	1273.9	-1868.7	-757.7	-1609.4	-653.8	1255.2	1231.5	1422.3	-800.6
Comb	(202)	(206)	(192)	(192)	(193)	(193)	(195)	(207)	(198)	(202)
Carr	121	122								

Fdzt	220.1	220.1
Mdxt	4494.2	5588.1
Mdyt	-1826.0	-740.8
Comb	(207)	(207)

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	235.0	236.8	236.8	236.3	235.7	235.7	235.8	236.2	236.2	239.2
Mdxt	3762.3	4917.2	3870.8	4864.4	3737.4	4760.8	4759.6	3669.8	4683.1	3498.9
Mdyt	-7866.8	-5236.8	-7832.8	-5211.8	-7797.6	-5210.8	-5210.9	-7878.0	-5270.3	-8382.9
Comb	(27)	(46)	(46)	(45)	(9)	(9)	(12)	(21)	(21)	(31)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	239.2	243.7	243.7	234.9	236.9	236.9	247.8	247.8	240.4	240.4
Mdxt	4487.9	3388.7	4388.2	3683.3	3916.7	4970.3	4163.6	5275.8	4268.5	5380.8
Mdyt	-5644.0	-7887.0	-5279.0	-7874.7	-7777.1	-5194.5	-7844.7	-5245.8	-8321.9	-5599.2
Comb	(31)	(30)	(30)	(32)	(39)	(39)	(35)	(35)	(36)	(36)
Carr	21	22	23	24	25	26	27	28	29	30

Fdzt	240.7	240.7	235.9	235.9	221.8	223.7	221.9	221.9	223.7	223.2
Mdxt	4365.6	5492.1	3768.2	4796.8	3976.2	5225.1	4055.3	5097.9	4163.8	5173.0
Mdyt	-8041.4	-5391.5	-7794.3	-5208.3	-7506.9	-4984.5	-7499.1	-4968.2	-7465.1	-4959.5
Comb	(41)	(41)	(44)	(44)	(143)	(157)	(138)	(138)	(157)	(156)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	222.7	222.7	222.7	222.7	225.8	227.4	224.7	222.6	230.6	230.6
Mdxt	4029.5	5070.3	4029.3	5070.1	2995.9	4095.2	3785.5	4030.4	3681.6	4697.9
Mdyt	-7429.9	-4958.5	-7430.0	-4958.6	-8115.3	-8028.1	-7764.9	-7429.9	-7519.3	-5026.6
Comb	(115)	(115)	(119)	(119)	(86)	(91)	(137)	(120)	(141)	(141)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	219.5	223.1	222.6	238.0	238.0	227.4	227.3	227.3	222.8	223.1
Mdxt	3259.2	3962.8	5071.3	3945.3	5005.4	5155.5	4561.5	5681.7	4061.1	4995.4
Mdyt	-7389.4	-7510.3	-4958.5	-7346.3	-4917.2	-5422.1	-7954.2	-5346.9	-7426.6	-5018.0
Comb	(87)	(132)	(120)	(90)	(90)	(91)	(147)	(147)	(155)	(132)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	223.5	224.7	223.8	223.8	234.7	234.7	227.6	227.6	222.8	207.5
Mdxt	4931.8	4795.6	4209.7	5277.2	4456.5	5581.5	4658.5	5791.1	5106.6	3645.3
Mdyt	-4985.5	-5206.5	-7409.4	-4942.2	-7477.0	-4993.5	-7673.7	-5139.1	-4955.9	-7035.8

Comb	(131)	(137)	(150)	(150)	(146)	(146)	(152)	(152)	(155)	(193)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	207.5	210.1	210.1	208.6	208.6	208.6	209.3	209.3	213.6	215.2
Mdxt	4599.9	4782.2	3800.4	4560.1	3609.8	4561.5	3513.3	4452.1	3269.1	4368.6
Mdyt	-4646.3	-4669.7	-6987.2	-4632.5	-6937.1	-4632.5	-7051.7	-4717.4	-7773.1	-7686.0
Comb	(193)	(212)	(212)	(170)	(175)	(175)	(187)	(187)	(197)	(202)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	211.5	211.5	207.3	210.2	210.2	215.2	215.7	215.7	208.9	208.9
Mdxt	3260.0	4163.0	3532.4	3865.9	4856.9	5435.2	4507.2	5591.3	3653.7	4612.3
Mdyt	-7415.7	-4986.8	-7047.2	-6907.7	-4609.1	-5187.3	-7285.2	-4890.5	-6932.3	-4628.8
Comb	(192)	(192)	(198)	(205)	(205)	(202)	(207)	(207)	(210)	(210)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	213.8	215.6	215.6	214.5	214.6	214.6	214.6	214.6	214.8	214.8
Mdxt	3574.4	4702.1	3693.0	4557.2	3557.6	4546.2	3558.6	4547.2	4467.7	3488.9
Mdyt	-12272.1	-9060.0	-12235.8	-9026.0	-12186.3	-9020.8	-12186.2	-9020.7	-9131.8	-12328.7

Comb	(27)	(46)	(46)	(28)	(4)	(4)	(9)	(9)	(21)	(21)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	215.3	216.3	216.3	217.7	217.7	222.2	222.2	213.7	215.2	215.2
Mdxt	4404.0	3308.5	4259.6	4075.6	5146.7	3175.3	4147.9	3514.8	3669.6	4688.9
Mdyt	-9069.6	-13213.7	-9820.3	-13074.3	-9712.0	-12303.2	-9129.7	-12281.8	-12132.9	-8975.5
Comb	(20)	(31)	(31)	(36)	(36)	(30)	(30)	(32)	(34)	(34)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	226.8	226.8	219.0	219.0	215.1	215.1	202.2	202.2	200.7	203.6
Mdxt	4009.3	5064.7	4184.9	5268.1	3650.5	4650.3	3590.6	4562.0	3771.0	4357.6
Mdyt	-12213.0	-9064.9	-12554.8	-9309.5	-12185.3	-9020.3	-12340.4	-9112.6	-11455.4	-12200.9
Comb	(35)	(35)	(41)	(41)	(45)	(45)	(142)	(142)	(132)	(147)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	200.7	199.8	200.7	199.7	200.7	201.5	201.0	201.2	203.1	205.1
Mdxt	4764.8	3856.5	4065.1	3796.9	4066.9	3975.1	3068.7	3951.8	2811.0	3906.7
Mdyt	-8424.1	-11398.8	-8421.6	-11408.5	-8421.3	-11362.3	-11569.3	-11259.6	-12833.5	-12634.4
Comb	(132)	(138)	(63)	(143)	(64)	(157)	(76)	(145)	(86)	(91)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	205.1	202.2	200.1	211.6	212.8	199.4	200.4	203.6	207.0	207.0

Mdxt	4925.1	2805.9	3856.1	2620.7	4291.4	3105.7	3844.2	5431.9	4063.0	5098.1
Mdyt	-9409.0	-12212.8	-11358.4	-11532.8	-11339.6	-11502.4	-11322.5	-9004.3	-11892.4	-8834.0
Comb	(91)	(81)	(133)	(85)	(146)	(87)	(128)	(147)	(96)	(96)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	201.5	201.5	201.5	200.5	200.5	200.5	200.5	200.5	200.5	200.5
Mdxt	3299.5	4215.2	4994.6	3839.3	3839.7	4852.2	3839.4	4841.2	3840.7	4842.4
Mdyt	-11364.4	-8420.7	-8352.3	-11313.0	-11312.8	-8318.2	-11313.0	-8313.1	-11312.7	-8312.9
Comb	(100)	(100)	(157)	(114)	(115)	(139)	(119)	(119)	(120)	(120)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	201.1	201.2	201.2	212.8	204.9	204.9	201.1	201.1	186.6	186.6
Mdxt	4742.8	4702.6	4981.6	5355.3	4467.0	5551.7	3932.5	4943.8	3453.9	4383.1
Mdyt	-8315.1	-8361.7	-8267.8	-8357.1	-11681.5	-8601.8	-11312.0	-8312.5	-10675.7	-7766.6
Comb	(130)	(131)	(145)	(146)	(152)	(152)	(156)	(156)	(193)	(193)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	189.1	189.1	187.6	187.6	187.6	187.6	187.9	187.9	188.6	190.0
Mdxt	4564.8	3623.3	4345.0	3431.3	4346.4	3429.5	4234.6	3331.9	4144.8	3074.1
Mdyt	-7818.8	-10623.6	-7762.7	-10552.8	-7762.6	-10553.2	-7921.3	-10756.4	-7832.3	-12020.8
Comb	(212)	(212)	(170)	(175)	(175)	(178)	(187)	(187)	(186)	(197)

Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	192.0	192.0	189.1	190.0	186.4	189.2	189.2	193.9	193.9	188.4
Mdxt	4169.8	5189.9	3069.0	3941.1	3368.8	3693.8	4640.2	4326.2	5360.9	3562.6
Mdyt	-11821.7	-8750.3	-11400.1	-8905.0	-10689.5	-10498.0	-7718.8	-11079.5	-8175.3	-10551.7
Comb	(202)	(202)	(192)	(197)	(198)	(205)	(205)	(207)	(207)	(211)

Carr	91
Fdzt	188.4
Mdxt	4491.7
Mdyt	-7762.0
Comb	(211)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	190.2	190.2	188.4	188.4	189.1	189.1	189.1	189.1	189.0	189.0
Mdxt	3783.2	4817.8	3316.7	4266.2	3309.0	4250.1	3307.6	4248.6	4168.4	3239.6
Mdyt	-19127.9	-15386.0	-17906.5	-14301.7	-17779.1	-14266.5	-17779.5	-14266.9	-14451.2	-18000.3
Comb	(36)	(36)	(27)	(27)	(9)	(9)	(12)	(12)	(21)	(21)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	189.7	192.8	193.1	188.9	188.9	196.2	196.2	188.6	188.6	188.3
Mdxt	4100.3	3907.1	3803.8	3053.9	3949.7	2903.0	3815.4	3052.1	3945.7	3276.3
Mdyt	-14344.3	-18305.3	-17772.8	-18697.9	-15033.4	-17918.3	-14401.6	-19365.9	-15588.0	-17921.9
Comb	(20)	(41)	(40)	(26)	(26)	(30)	(30)	(31)	(31)	(32)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	188.3	189.6	189.6	201.5	201.5	192.8	175.0	175.0	175.6	175.6
Mdxt	4200.3	3405.3	4375.4	3781.8	4792.9	4957.2	4010.0	5074.4	2950.4	3813.1
Mdyt	-14303.5	-17715.2	-14208.8	-17760.9	-14277.5	-14700.2	-17636.1	-14067.8	-16752.4	-13355.2
Comb	(32)	(34)	(34)	(35)	(35)	(41)	(147)	(147)	(82)	(82)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	178.2	178.2	177.5	176.5	176.4	176.4	177.4	179.0	181.8	182.3
Mdxt	4602.3	3617.0	4133.9	2937.4	3672.0	2840.2	3573.3	2549.0	3794.0	3646.3
Mdyt	-14904.1	-18497.2	-16813.6	-16570.9	-13568.7	-16886.3	-13416.1	-16560.2	-17322.0	-16561.4
Comb	(91)	(91)	(152)	(67)	(76)	(76)	(75)	(79)	(96)	(95)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	176.2	173.7	175.8	173.8	175.4	175.4	177.3	177.5	181.8	173.5
Mdxt	2575.0	3529.9	2572.4	3466.3	2892.6	3718.2	3077.0	5212.4	4800.9	3545.1

Mdyt	-17883.0	-16304.8	-18837.3	-16508.5	-16774.4	-13357.8	-16478.9	-13382.1	-13924.5	-16354.2
Comb	(81)	(144)	(86)	(132)	(87)	(87)	(89)	(152)	(96)	(133)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	173.5	173.2	173.2	173.8	173.8	173.8	173.8	173.8	173.0	174.4
Mdxt	4533.2	3543.4	4532.9	3535.8	4517.5	3534.3	4516.1	4437.5	3503.0	4371.2
Mdyt	-12967.6	-16414.7	-12983.5	-16287.3	-12948.3	-16287.7	-12948.8	-13133.0	-16430.1	-13026.1
Comb	(133)	(138)	(138)	(120)	(120)	(123)	(123)	(132)	(143)	(131)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	173.6	173.6	173.3	173.3	173.0	174.4	174.4	186.2	186.2	177.9
Mdxt	3280.7	4223.8	3278.9	4219.8	4468.4	3632.0	4640.4	4008.5	5055.5	5069.1
Mdyt	-17206.2	-13715.3	-17874.2	-14269.9	-12985.3	-16223.3	-12890.6	-16269.1	-12959.3	-12946.0
Comb	(137)	(137)	(142)	(142)	(143)	(145)	(145)	(146)	(146)	(151)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	161.9	161.9	161.4	161.4	163.7	163.7	164.0	164.0	162.3	162.3
Mdxt	3164.3	4066.2	3162.0	4065.6	3337.5	4260.2	3828.6	4840.2	3928.3	3051.9
Mdyt	-15277.6	-12105.6	-15363.9	-12128.3	-15278.1	-12157.6	-17108.8	-13677.3	-12341.8	-15497.8
Comb	(188)	(188)	(193)	(193)	(212)	(212)	(202)	(202)	(187)	(187)
Carr	81	82	83	84	85	86	87	88	89	90

Fdzt	163.2	164.8	167.7	168.1	162.1	162.1	164.0	164.0	161.6	161.6
Mdxt	3832.6	2760.6	4005.6	3857.9	2786.6	3620.0	3008.4	3884.6	2784.0	3614.2
Mdyt	-12189.2	-15171.8	-15933.7	-15173.0	-16494.6	-13173.7	-15140.1	-12062.5	-17448.9	-13966.0
Comb	(186)	(190)	(207)	(206)	(192)	(192)	(195)	(195)	(197)	(197)

Carr	91	92	93	94	95	96	97
Fdzt	161.2	161.2	163.2	163.2	180.1	180.1	167.7
Mdxt	3104.3	3973.0	3288.6	4219.8	3826.4	4813.2	5037.2
Mdyt	-15385.9	-12130.9	-15090.6	-11995.6	-15155.9	-12093.7	-12697.7
Comb	(198)	(198)	(200)	(200)	(201)	(201)	(207)

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	158.4	158.4	159.0	159.0	160.4	160.4	159.6	159.6	159.2	159.2
Mdxt	3425.3	4369.4	3876.6	3039.8	4015.8	3156.9	3869.3	3037.1	2972.6	3787.9
Mdyt	-23993.6	-21123.5	-19650.4	-22441.0	-19643.0	-22351.9	-19571.0	-22270.9	-22554.6	-19829.5
Comb	(36)	(36)	(27)	(27)	(46)	(46)	(9)	(12)	(21)	(21)
Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	162.5	162.5	162.6	163.6	157.9	157.9	166.1	166.1	156.5	156.5
Mdxt	3567.3	4529.9	2517.8	3514.5	2793.1	3567.2	2643.4	3416.4	2779.9	3552.8
Mdyt	-22925.7	-20151.9	-22594.3	-22246.8	-23451.2	-20644.1	-22424.5	-19727.7	-24308.0	-21418.0
Comb	(41)	(41)	(25)	(40)	(26)	(26)	(30)	(30)	(31)	(31)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	158.9	158.9	160.1	160.1	172.2	172.2	160.7	160.7	163.6	160.1
Mdxt	3016.8	3832.9	3127.8	3976.0	3526.0	4433.2	3218.1	4079.9	4429.7	3974.8
Mdyt	-22462.8	-19658.5	-22263.2	-19506.1	-22196.8	-19532.8	-22194.1	-19499.7	-19551.0	-19564.0
Comb	(32)	(32)	(45)	(34)	(35)	(35)	(39)	(39)	(40)	(45)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	147.0	147.0	147.9	147.9	149.9	149.9	148.7	148.7	148.1	148.1
Mdxt	3252.0	4156.9	2701.4	3452.1	2868.7	3651.9	2697.6	3439.1	2605.4	3324.3
Mdyt	-23210.8	-20459.9	-20993.0	-18355.5	-20865.7	-18344.9	-20750.0	-18242.9	-21155.3	-18611.3
Comb	(91)	(91)	(82)	(82)	(101)	(101)	(67)	(67)	(76)	(76)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	151.0	151.1	152.8	154.4	146.3	145.7	144.3	144.3	147.8	147.8
Mdxt	2303.4	3472.3	3454.9	3379.5	2348.8	3648.7	2330.0	2985.4	2668.5	3389.3
Mdyt	-20740.6	-18858.3	-21685.5	-20715.5	-22436.1	-21007.0	-23660.2	-20880.7	-21024.2	-18367.0

Comb	(79)	(201)	(96)	(95)	(81)	(152)	(86)	(86)	(87)	(87)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	149.5	149.4	166.6	166.6	148.6	150.3	150.3	154.4	152.8	149.0
Mdxt	2827.2	3594.7	3395.9	4248.6	3452.3	2956.1	3743.7	4243.4	4386.0	2745.2
Mdyt	-20739.0	-18149.4	-20644.0	-18187.5	-18237.8	-20640.2	-18140.2	-18213.5	-19072.0	-20729.5
Comb	(100)	(89)	(90)	(90)	(93)	(94)	(94)	(95)	(96)	(99)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	149.5	141.7	141.7	142.3	142.3	143.7	143.7	142.9	142.9	142.9
Mdxt	3593.0	3506.7	4540.5	4057.9	3121.2	4194.9	3238.3	3120.1	4051.0	3118.6
Mdyt	-18232.1	-22074.8	-19237.4	-17764.4	-20522.3	-17757.0	-20433.2	-20351.7	-17685.0	-20352.2
Comb	(100)	(147)	(147)	(138)	(138)	(157)	(157)	(120)	(120)	(123)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	142.9	142.4	142.4	145.7	141.2	141.2	139.8	139.8	142.2	142.2
Mdxt	4049.5	3054.0	3971.2	4700.2	2874.5	3755.0	2861.3	3740.0	3098.2	4015.1
Mdyt	-17685.5	-20636.0	-17943.5	-18265.9	-21532.6	-18758.1	-22389.4	-19532.0	-20544.2	-17772.4
Comb	(123)	(132)	(132)	(152)	(137)	(137)	(142)	(142)	(143)	(143)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	143.4	143.3	155.4	155.4	144.0	144.0	146.8	143.4	131.5	131.5

Mdxt	3209.2	4155.7	3607.4	4610.4	3299.5	4257.9	4602.4	4154.6	3328.4	4315.0
Mdyt	-20344.6	-17620.1	-20278.1	-17646.7	-20275.4	-17613.7	-17664.9	-17678.0	-21425.2	-18704.5
Comb	(156)	(145)	(146)	(146)	(150)	(150)	(151)	(156)	(202)	(202)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	132.3	132.3	134.3	134.3	133.1	133.1	133.1	132.5	132.5	135.4
Mdxt	2777.8	3625.0	3821.5	2945.1	3615.1	2773.9	3612.8	2681.7	3500.3	2379.7
Mdyt	-19207.3	-16600.2	-16589.6	-19080.0	-16486.7	-18964.3	-16487.5	-19369.6	-16856.0	-18954.8
Comb	(193)	(193)	(212)	(212)	(175)	(178)	(178)	(187)	(187)	(190)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	135.4	137.2	137.2	130.8	130.8	133.9	133.9	128.7	128.7	132.2
Mdxt	3181.9	3531.4	4543.2	2425.3	3188.9	2903.5	3763.6	2406.5	3167.9	2744.9
Mdyt	-16511.4	-19899.7	-17316.6	-20650.4	-18019.7	-18953.3	-16476.7	-21874.4	-19125.3	-19238.5
Comb	(190)	(207)	(207)	(192)	(192)	(211)	(211)	(197)	(197)	(198)
Carr	111	112	113	114	115	116	117	118	119	
Fdzt	132.2	133.8	133.8	151.1	133.1	134.8	134.8	138.8	133.4	
Mdxt	3563.5	2888.3	3765.2	4415.1	3625.6	3032.5	3911.6	4403.8	3667.4	
Mdyt	-16611.7	-18868.3	-16394.0	-16432.1	-16482.5	-18854.6	-16384.9	-16458.0	-16468.5	
Comb	(198)	(200)	(200)	(201)	(204)	(205)	(205)	(206)	(210)	

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	129.3	129.3	128.5	128.6	128.6	128.6	128.6	128.6	128.5	128.6
Mdxt	3635.4	2937.1	3529.7	2818.5	3528.0	2818.6	2818.0	3529.0	2820.4	3527.6
Mdyt	-21453.0	-21863.5	-21383.5	-21787.5	-21377.1	-21787.2	-21787.6	-21376.8	-21787.1	-21377.4
Comb	(46)	(46)	(28)	(8)	(4)	(4)	(7)	(9)	(17)	(13)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	128.1	130.5	127.8	127.8	128.3	130.5	130.0	131.0	131.0	124.9
Mdxt	3524.8	4051.8	3462.6	2751.1	2824.4	3341.7	2540.9	3063.0	2294.8	3866.0
Mdyt	-21453.0	-22008.5	-21667.3	-22089.6	-21784.7	-22423.1	-21852.6	-21710.8	-22141.0	-23109.6
Comb	(27)	(41)	(21)	(21)	(22)	(41)	(24)	(25)	(25)	(36)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	124.9	134.3	134.3	122.7	122.7	128.1	129.1	129.1	141.2	141.2
Mdxt	3188.8	3189.4	2418.5	3230.0	2542.0	3514.6	3614.0	2908.8	4100.3	3307.9
Mdyt	-23568.7	-21543.1	-21982.7	-23448.9	-23936.7	-21460.6	-21366.9	-21776.5	-21299.7	-21763.1
Comb	(36)	(30)	(30)	(31)	(31)	(32)	(45)	(45)	(35)	(35)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	128.5	128.8	129.7	132.5	132.5	130.5	128.8	119.1	118.3	120.5
Mdxt	3538.6	2851.6	3703.1	4012.8	3295.1	3266.6	3560.2	3167.3	3071.8	3319.5
Mdyt	-21372.1	-21771.7	-21295.2	-21340.3	-21755.6	-21541.6	-21362.1	-19982.0	-20339.4	-20033.5
Comb	(38)	(44)	(39)	(40)	(40)	(41)	(44)	(77)	(76)	(101)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	120.5	119.4	119.4	119.3	119.4	120.2	120.7	119.9	119.9	118.3
Mdxt	2660.9	2491.0	3167.0	2494.3	3165.0	3023.4	2352.2	3003.3	2309.3	2395.1
Mdyt	-20423.8	-20315.3	-19924.6	-20314.6	-19925.5	-19938.9	-20348.4	-20096.5	-20495.5	-20746.7
Comb	(101)	(67)	(64)	(72)	(67)	(74)	(84)	(75)	(75)	(76)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	114.2	114.2	118.8	120.7	111.1	111.1	118.7	120.1	120.1	137.5
Mdxt	3644.4	3020.5	3161.2	3036.6	2738.4	2096.4	3146.5	3288.8	2620.5	3984.0
Mdyt	-22400.1	-22859.7	-20033.4	-19919.5	-22884.7	-23385.5	-20044.3	-19910.4	-20299.4	-19814.4
Comb	(91)	(91)	(82)	(84)	(86)	(86)	(87)	(100)	(100)	(90)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	137.5	119.4	122.2	122.2	119.7	119.7	108.8	110.4	108.8	109.2
Mdxt	3190.7	3180.9	3909.8	3238.9	3211.9	2538.7	3394.8	3598.2	2817.3	3471.3

Mdyt	-20280.2	-19917.8	-20827.1	-21223.1	-19903.5	-20292.5	-19551.3	-19343.5	-19562.4	-19384.5
Comb	(90)	(93)	(96)	(96)	(99)	(99)	(132)	(157)	(132)	(138)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	109.1	109.6	110.4	109.6	108.8	111.6	111.6	106.0	106.0	110.8
Mdxt	3447.7	3480.2	2748.1	3470.9	2595.5	4028.1	3057.0	3255.1	3842.3	2808.3
Mdyt	-19398.6	-19270.6	-19435.5	-19267.2	-19630.0	-19897.2	-19986.3	-21041.5	-20980.2	-19284.3
Comb	(143)	(149)	(157)	(120)	(132)	(152)	(152)	(147)	(147)	(150)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	103.8	103.8	109.1	110.1	122.3	110.8	113.5	109.8	102.2	101.5
Mdxt	3152.1	2608.3	2641.9	3567.8	4042.3	3666.7	3990.9	3505.7	2893.8	3095.9
Mdyt	-21319.5	-21409.5	-19585.3	-19257.7	-19170.3	-19187.8	-19229.0	-19252.8	-18124.3	-18044.7
Comb	(142)	(142)	(143)	(156)	(146)	(150)	(151)	(155)	(186)	(188)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	101.2	101.1	102.2	101.8	101.8	101.5	101.8	101.8	101.8	102.8
Mdxt	3090.9	3057.0	2371.6	3103.6	2553.9	2366.0	3090.2	2555.5	3087.9	3272.7
Mdyt	-18124.6	-18144.8	-18143.2	-17961.9	-17962.4	-18182.1	-17957.1	-17961.9	-17957.9	-18065.9
Comb	(193)	(198)	(186)	(204)	(170)	(188)	(175)	(175)	(178)	(212)
Carr	101	102	103	104	105	106	107	108	109	110

Fdzt	101.4	100.7	100.7	100.7	96.6	96.6	93.5	93.5	102.5	119.9
Mdxt	2345.1	2282.2	2981.2	2457.5	3621.2	3082.8	2633.3	2158.7	3229.2	3907.3
Mdyt	-18209.5	-18421.4	-18362.9	-18394.4	-20418.1	-20507.5	-20902.7	-21033.2	-17943.4	-17832.4
Comb	(203)	(187)	(187)	(187)	(202)	(202)	(197)	(197)	(211)	(201)

Carr	111	112	113	114	115	116	117
Fdzt	103.4	107.4	107.4	107.4	104.6	104.6	102.1
Mdxt	3370.7	2950.2	3833.9	3234.7	3886.7	3301.2	3140.2
Mdyt	-17843.5	-17977.4	-17902.4	-17917.3	-18857.0	-18870.8	-17936.4
Comb	(205)	(206)	(206)	(206)	(207)	(207)	(210)

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	102.1	102.1	101.5	101.5	101.5	101.5	101.5	101.5	101.5	101.5
Mdxt	3580.9	2764.7	3522.3	2669.9	3515.0	2670.3	2669.8	3515.5	2671.1	3515.6
Mdyt	-17208.0	-22721.0	-17150.9	-22644.5	-17147.8	-22644.3	-22644.7	-17147.6	-22643.9	-17145.6
Comb	(46)	(46)	(38)	(3)	(4)	(4)	(12)	(9)	(9)	(10)
Carr	11	12	13	14	15	16	17	18	19	20

Fdzt	101.5	101.5	101.2	101.2	102.7	100.4	100.4	101.4	102.7	102.8
Mdxt	3514.8	2669.9	2669.5	3511.3	3067.8	3463.6	2611.0	3514.3	3759.1	2431.4
Mdyt	-17148.0	-22644.6	-22678.8	-17247.0	-23303.4	-17388.1	-22962.3	-17199.4	-17667.9	-22707.0
Comb	(12)	(13)	(27)	(27)	(41)	(21)	(21)	(22)	(41)	(24)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	103.4	103.4	97.0	97.0	106.2	106.2	93.4	93.4	101.2	101.2
Mdxt	3280.2	2244.8	3310.3	2442.4	3371.9	2346.8	3223.2	2400.3	3510.2	2660.5
Mdyt	-17419.3	-23012.9	-18146.4	-23964.7	-17266.6	-22830.8	-18870.6	-24908.0	-17259.4	-22680.2
Comb	(25)	(25)	(26)	(26)	(30)	(30)	(31)	(31)	(32)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	101.8	101.8	114.3	114.3	95.7	95.7	101.5	102.7	102.7	105.4
Mdxt	3547.5	2726.6	4052.7	3157.1	3530.5	2894.0	2680.1	3631.4	2826.1	3833.4
Mdyt	-17101.0	-22581.9	-16995.9	-22548.5	-18595.1	-24520.8	-22630.5	-17075.5	-22551.7	-17094.1
Comb	(34)	(34)	(35)	(35)	(36)	(36)	(38)	(39)	(39)	(40)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	105.4	95.5	95.5	92.3	92.3	87.4	87.4	82.8	82.2	94.2
Mdxt	3080.4	3540.8	2944.9	3118.5	2292.3	2899.3	2051.4	2844.4	1991.4	3238.5
Mdyt	-22590.4	-16725.8	-22052.1	-16325.9	-21564.9	-17409.3	-22996.8	-20112.1	-24344.6	-15915.8

Comb	(40)	(96)	(96)	(76)	(76)	(81)	(81)	(151)	(86)	(89)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	94.2	112.1	112.1	85.6	85.6	99.3	99.3	94.1	79.6	79.6
Mdxt	2457.3	3960.1	3072.4	3214.1	2696.5	3646.9	2962.9	2417.8	2982.3	2528.7
Mdyt	-21021.4	-15765.7	-20973.7	-18050.2	-23791.3	-15905.9	-21033.5	-21086.2	-15790.1	-20242.7
Comb	(89)	(90)	(90)	(91)	(91)	(95)	(95)	(99)	(157)	(157)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	79.0	79.0	79.0	79.0	78.9	78.9	79.0	78.7	78.7	79.1
Mdxt	2892.8	2434.0	2882.7	2434.2	2883.6	2435.1	2882.3	2433.5	2880.7	2330.6
Mdyt	-15733.0	-20166.2	-15729.9	-20166.2	-15729.7	-20165.6	-15730.1	-20200.5	-15829.1	-20298.5
Comb	(149)	(114)	(115)	(119)	(120)	(120)	(123)	(138)	(138)	(131)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	77.9	77.9	80.1	80.1	80.1	80.8	74.5	74.5	79.6	83.7
Mdxt	2816.8	2375.0	3291.9	2831.8	2590.1	2008.8	2725.8	2206.4	2349.6	2571.7
Mdyt	-15970.2	-20484.0	-16250.1	-20825.1	-20073.4	-20534.5	-19745.4	-21486.4	-20184.8	-15848.7
Comb	(132)	(132)	(152)	(152)	(150)	(136)	(207)	(137)	(140)	(141)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	83.7	70.8	70.8	78.6	78.6	79.2	79.2	91.7	91.7	73.2

Mdxt	2110.9	2566.1	2164.3	2871.8	2424.5	2941.0	2490.6	3448.4	2921.1	3077.5
Mdyt	-20352.5	-17452.8	-22429.7	-15841.5	-20201.9	-15683.2	-20103.6	-15578.1	-20070.2	-17177.2
Comb	(141)	(142)	(142)	(143)	(143)	(145)	(145)	(146)	(146)	(147)

Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	73.2	79.0	80.1	82.8	79.2	79.2	75.5	75.5	66.4	66.4
Mdxt	2657.9	2444.0	3048.2	3321.3	2913.1	2462.9	2109.4	1550.1	2203.8	1832.4
Mdyt	-22042.5	-20152.2	-15657.7	-15676.2	-15716.5	-20148.9	-15050.7	-19330.2	-16089.5	-20690.0
Comb	(147)	(149)	(150)	(151)	(155)	(155)	(191)	(191)	(192)	(192)

Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	61.2	61.2	72.4	72.4	64.6	64.6	74.5	74.5	78.3	78.3
Mdxt	2116.6	1772.3	2553.5	2144.0	2847.1	2477.5	3153.7	2380.6	3195.9	2743.8
Mdyt	-17124.1	-22037.7	-14822.2	-18855.0	-16730.4	-21484.4	-15406.1	-18671.5	-14586.2	-18726.8
Comb	(197)	(197)	(198)	(198)	(202)	(202)	(207)	(205)	(206)	(206)

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	88.7	88.7	88.7	88.0	87.9	88.0	88.0	88.0	88.0	88.0

Mdxt	3282.2	3840.5	3050.2	3242.4	2832.1	3242.9	2832.8	3242.6	3795.7	3795.6
Mdyt	9559.5	-5462.4	-13635.1	9377.0	-13255.7	9376.8	-13235.4	9376.5	-5300.9	-5302.5
Comb	(41)	(41)	(41)	(2)	(22)	(16)	(33)	(6)	(6)	(33)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	88.0	88.0	88.0	88.0	88.0	88.0	88.0	87.9	88.0	88.0
Mdxt	2832.3	3243.0	3796.1	2832.4	3796.3	2831.6	3795.4	2830.4	3241.8	3795.0
Mdyt	-13231.7	9375.9	-5300.8	-13230.1	-5300.2	-13232.3	-5303.1	-13277.5	9427.7	-5334.2
Comb	(9)	(11)	(16)	(10)	(11)	(12)	(17)	(27)	(20)	(20)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	88.0	86.8	86.8	86.8	89.2	83.0	83.0	83.0	91.4	91.4
Mdxt	2775.1	3213.6	3760.1	2787.1	2605.3	3121.4	3646.7	2654.1	3301.8	3872.6
Mdyt	-13314.7	9475.8	-5382.1	-13434.7	-13460.1	9784.4	-5637.6	-14074.3	9510.8	-5341.4
Comb	(20)	(21)	(21)	(21)	(25)	(26)	(26)	(26)	(30)	(30)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	91.4	79.0	79.0	79.0	87.8	88.1	88.1	88.1	100.9	100.9
Mdxt	2675.9	3018.3	3520.6	2582.5	2829.7	3245.9	3799.9	2860.4	3654.8	4285.7
Mdyt	-13331.9	10040.9	-5880.5	-14682.5	-13282.5	9363.0	-5286.9	-13196.4	9689.2	-5228.7
Comb	(30)	(31)	(31)	(31)	(32)	(34)	(34)	(34)	(35)	(35)

Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	100.9	81.2	81.2	81.2	88.0	88.0	89.2	89.2	89.2	91.9
Mdxt	3290.3	3072.9	3587.6	2856.5	3797.4	2838.7	3284.3	3844.9	2936.6	3376.7
Mdyt	-13047.9	9881.3	-5782.7	-14437.4	-5299.5	-13227.9	9367.3	-5274.0	-13163.7	9437.2
Comb	(35)	(36)	(36)	(36)	(38)	(38)	(39)	(39)	(39)	(40)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	91.9	91.9	82.0	82.0	81.9	73.8	73.8	73.8	85.7	85.7
Mdxt	3953.9	3115.3	2986.2	3499.7	2873.7	2806.5	3275.0	2307.9	3064.2	3597.7
Mdyt	-5272.7	-13159.9	8902.9	-4962.3	-12917.2	9315.6	-5424.8	-13544.6	8924.9	-5001.8
Comb	(40)	(40)	(79)	(79)	(96)	(81)	(81)	(81)	(85)	(85)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	85.7	68.0	68.0	68.0	99.3	99.3	99.3	71.1	71.1	71.1
Mdxt	2339.0	2659.3	3094.8	2205.4	3568.5	4187.9	3216.8	2737.3	3190.6	2597.1
Mdyt	-12484.1	9682.2	-5771.8	-14413.4	9179.7	-4840.7	-12078.3	9454.1	-5632.1	-14063.3
Comb	(85)	(86)	(86)	(86)	(90)	(90)	(90)	(91)	(91)	(91)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	82.6	86.5	59.8	59.1	59.0	59.5	59.0	59.1	59.1	59.7
Mdxt	2711.4	2966.7	2111.9	2479.6	2116.3	2073.5	2479.4	2116.9	2480.3	2174.4

Mdyt	-12243.7	-12238.2	7047.4	-4852.7	-12136.6	6943.1	-4860.2	-12116.2	-4852.1	-12155.5
Comb	(94)	(95)	(152)	(128)	(133)	(140)	(133)	(144)	(144)	(157)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	59.1	59.7	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1
Mdxt	2072.8	2539.7	2072.2	2479.4	2116.5	2479.9	2072.9	2072.2	2479.2	2115.7
Mdyt	6864.8	-4867.9	6865.2	-4850.8	-12112.6	-4850.0	6863.8	6865.0	-4850.8	-12113.1
Comb	(127)	(157)	(118)	(119)	(120)	(121)	(122)	(123)	(123)	(123)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	59.8	59.0	59.1	59.1	59.1	57.9	57.9	57.9	59.8	60.3
Mdxt	2693.9	2114.5	2071.7	2437.4	2059.3	2043.4	2428.8	2071.2	2334.3	1889.4
Mdyt	-5012.0	-12158.3	6915.6	-4883.8	-12195.5	6963.8	-4931.7	-12315.5	-12515.9	-12340.9
Comb	(152)	(138)	(131)	(131)	(131)	(132)	(132)	(132)	(152)	(136)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	54.2	54.2	54.2	59.0	62.5	62.5	62.5	50.1	50.1	50.1
Mdxt	1951.2	2289.3	1938.2	2477.5	2131.6	2514.7	1960.0	1848.2	2180.7	1866.5
Mdyt	7272.3	-5187.2	-12955.2	-4868.9	6998.7	-4891.0	-12212.7	7528.8	-5430.1	-13563.3
Comb	(137)	(137)	(137)	(138)	(141)	(141)	(141)	(142)	(142)	(142)
Carr	111	112	113	114	115	116	117	118	119	120

Fdzt	59.0	59.0	59.3	59.3	59.3	72.1	72.1	72.1	52.3	52.3
Mdxt	2476.6	2113.8	2075.8	2507.6	2144.5	2484.6	3013.4	2574.4	1902.7	2455.4
Mdyt	-4870.9	-12163.3	6851.0	-4836.5	-12077.2	7177.2	-4778.3	-11928.7	7369.2	-5332.2
Comb	(143)	(143)	(145)	(145)	(145)	(146)	(146)	(146)	(147)	(147)
Carr	121	122	123	124	125	126	127	128	129	130
Fdzt	52.3	59.1	59.1	60.3	60.3	60.3	63.0	63.0	63.0	55.7
Mdxt	2140.7	2486.3	2122.9	2114.2	2588.5	2220.6	2206.6	2779.5	2399.4	1914.0
Mdyt	-13318.2	-4849.1	-12108.7	6855.2	-4823.5	-12044.5	6925.2	-4822.3	-12040.7	6612.6
Comb	(147)	(149)	(149)	(150)	(150)	(150)	(151)	(151)	(151)	(191)
Carr	131	132	133	134	135	136	137	138	139	140
Fdzt	55.7	55.0	55.7	46.9	46.9	46.9	41.1	41.1	41.1	44.3
Mdxt	2256.1	2208.0	1572.4	1717.9	2012.4	1642.2	1570.8	1832.4	1539.7	1648.8
Mdyt	-4655.4	-11875.3	-11625.2	6977.8	-5005.5	-12502.7	7344.3	-5352.5	-13371.6	7116.3
Comb	(191)	(207)	(191)	(192)	(192)	(192)	(197)	(197)	(197)	(202)
Carr	141	142	143	144	145	146	147			
Fdzt	44.3	44.3	55.7	55.7	55.7	55.0	55.0			
Mdxt	2194.8	1931.4	1950.9	2385.5	2045.6	1947.7	2535.8			
Mdyt	-5212.7	-13021.3	6382.0	-4486.0	-11201.8	6656.5	-4755.3			

Comb	(202)	(202)	(205)	(205)	(205)	(207)	(207)

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Lance: 3

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	697.3	690.8	690.8	693.3	693.3	688.5	688.5	693.3	692.9	693.3
Mdxt	7576.1	9679.0	7262.6	7372.1	7372.3	9671.3	7259.0	7372.8	9764.3	9870.5
Mdyt	-487.4	907.6	1637.2	-478.0	-477.9	980.6	1730.8	-477.9	848.6	842.8
Comb	(46)	(22)	(22)	(2)	(3)	(27)	(27)	(4)	(34)	(39)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	692.8	693.3	693.3	693.2	693.3	693.3	693.4	704.9	698.9	698.9
Mdxt	7289.8	7372.1	7372.6	7373.9	7372.4	7403.0	7263.4	8740.8	10392.4	7837.4
Mdyt	1552.8	-478.1	-477.9	-477.9	-477.9	-474.7	-479.7	-671.3	838.1	1537.3
Comb	(28)	(7)	(8)	(9)	(12)	(44)	(19)	(207)	(40)	(40)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	694.1	718.2	721.9	719.9	719.9	714.2	711.8	711.8	741.4	745.5

Mdxt	7483.3	8235.2	8176.3	10930.2	8210.9	8031.5	10513.7	7906.2	8790.6	10994.1
Mdyt	-474.1	-605.8	-718.1	786.5	1511.3	-596.4	799.5	1531.1	-828.1	733.2
Comb	(45)	(157)	(91)	(41)	(41)	(123)	(133)	(133)	(202)	(36)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	745.5	687.8	687.8	698.9	692.9	713.7	709.4	740.9	693.3	719.9
Mdxt	8248.2	9503.2	7111.8	7962.9	7335.4	8079.0	7902.7	9044.4	7421.4	8622.0
Mdyt	1489.7	1002.2	1758.3	-459.4	1550.8	-591.3	1624.6	-675.3	1545.2	-577.8
Comb	(36)	(32)	(32)	(40)	(34)	(139)	(138)	(152)	(39)	(151)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	653.1	643.8	643.8	647.3	647.3	646.7	646.7	647.4	647.3	647.3
Mdxt	6970.7	8793.6	6597.4	6679.8	6680.2	8915.9	6636.4	9068.3	6681.7	6723.3
Mdyt	-461.9	872.2	1556.7	-448.4	-448.3	787.9	1436.1	779.6	-448.2	-443.6
Comb	(101)	(77)	(77)	(63)	(59)	(89)	(83)	(94)	(64)	(99)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	647.5	672.5	655.4	655.4	648.5	666.8	663.3	661.5	691.0	640.5
Mdxt	6523.9	7584.9	9814.4	7418.7	6837.9	7293.4	9574.3	7317.3	6496.0	8783.0
Mdyt	-450.9	-571.9	772.9	1414.0	-442.9	-558.6	771.8	1380.2	-623.3	1005.3
Comb	(74)	(212)	(95)	(95)	(100)	(173)	(188)	(90)	(81)	(82)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	640.5	666.8	673.2	673.2	725.2	639.4	639.4	647.4	646.7	655.4
Mdxt	6592.4	7294.0	8067.1	5993.8	6719.3	8541.1	6382.2	6927.3	6701.5	7523.2
Mdyt	1690.3	-558.5	695.9	1339.0	-754.4	1036.1	1729.7	-419.0	1433.1	-421.9
Comb	(82)	(174)	(85)	(85)	(86)	(87)	(87)	(94)	(89)	(95)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	647.4	685.4	685.4	685.4	714.2	714.2	714.2	714.2	714.2	714.3
Mdxt	6824.4	8126.6	10582.1	7952.3	8031.9	8031.6	8033.0	8031.3	8062.1	7922.4
Mdyt	1425.1	-561.3	699.2	1376.9	-596.3	-596.3	-596.2	-596.4	-593.1	-598.2
Comb	(94)	(96)	(96)	(96)	(115)	(119)	(120)	(124)	(155)	(130)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	714.3	719.9	719.9	709.4	732.3	732.3	732.3	768.7	766.4	766.4
Mdxt	8204.9	11220.4	8481.1	10505.8	7650.5	10024.9	7483.7	8059.3	11823.2	8891.9
Mdyt	-575.9	730.0	1431.1	872.5	-638.4	676.1	1378.7	-810.5	625.1	1383.5
Comb	(150)	(151)	(151)	(138)	(141)	(141)	(141)	(142)	(147)	(147)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	708.7	708.7	766.4	740.9	740.9	660.0	666.7	666.2	666.7	666.9
Mdxt	10339.5	7755.6	9079.2	11756.1	8854.6	9563.2	7294.4	9695.6	7295.9	9846.2

Mdyt	894.1	1652.2	-785.2	678.4	1405.2	876.1	-558.3	687.5	-558.3	679.2
Comb	(143)	(143)	(147)	(152)	(152)	(193)	(170)	(200)	(175)	(205)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	666.8	667.0	677.1	674.9	674.9	663.3	687.0	710.5	660.0	692.7
Mdxt	7337.5	7138.0	7233.9	8018.6	10585.4	7197.4	6488.9	7110.2	7192.3	6749.6
Mdyt	-553.7	-561.0	-600.2	1315.3	672.5	1458.1	-635.3	-733.3	1591.8	-618.3
Comb	(210)	(185)	(187)	(206)	(206)	(188)	(191)	(192)	(193)	(196)
Carr	111	112	113	114	115	116	117	118		
Fdzt	744.7	658.9	658.9	666.9	666.9	674.9	704.9	704.9		
Mdxt	7333.6	9324.4	6982.1	7541.5	7424.3	8137.4	11350.1	8552.2		
Mdyt	-864.4	906.9	1631.1	-529.1	1326.5	-531.9	598.8	1278.3		
Comb	(197)	(198)	(198)	(205)	(205)	(206)	(207)	(207)		

Lance: 4

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	690.4	696.9	690.4	696.9	688.1	688.1	692.0	698.5	692.8	692.8
Mdxt	7660.4	10269.7	7390.9	7865.0	7386.3	7653.1	10015.9	7959.6	7647.5	7648.9

Mdyt	-3965.1	-2191.9	917.9	-3945.1	963.6	-3999.7	-2179.8	896.7	-3926.5	-3926.4
Comb	(22)	(46)	(22)	(46)	(27)	(27)	(23)	(40)	(8)	(9)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	684.8	700.1	704.4	702.7	711.4	717.9	721.5	721.5	723.7	717.9
Mdxt	11012.2	7595.9	11812.9	7889.4	8351.9	11138.4	8523.1	11100.7	8549.0	8556.5
Mdyt	-2188.0	-3987.1	-2369.9	916.4	-4060.3	-2285.3	-4209.5	-2530.5	838.7	-4040.3
Comb	(96)	(21)	(207)	(35)	(133)	(157)	(91)	(91)	(146)	(157)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	713.0	709.1	747.5	741.0	745.2	687.4	687.4	687.4	692.9	692.9
Mdxt	10886.8	8045.9	7633.1	11905.9	8417.7	7545.7	9866.4	7252.6	7797.6	10183.2
Mdyt	-2273.2	885.9	-4371.9	-2619.9	777.3	-4009.3	-2184.1	977.2	-3887.4	-2147.2
Comb	(134)	(138)	(31)	(202)	(36)	(32)	(32)	(32)	(39)	(39)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	704.4	698.5	745.2	745.2	692.9	719.5	719.5	693.6	693.6	643.2
Mdxt	9124.2	10705.1	8770.1	11424.9	7542.4	8739.8	11363.8	7753.5	10129.0	6937.8
Mdyt	-3962.7	-2143.8	-4321.3	-2465.5	890.0	-4086.5	-2293.9	-3918.7	-2172.2	-3700.6
Comb	(207)	(40)	(36)	(36)	(39)	(41)	(41)	(45)	(45)	(77)
Carr	41	42	43	44	45	46	47	48	49	50

Fdzt	658.5	643.2	658.5	645.6	646.1	646.6	646.6	662.8	672.0	660.9
Mdxt	9687.4	6706.3	7418.4	9085.5	6801.5	6919.4	9060.3	7582.2	10260.9	7418.4
Mdyt	-2117.9	877.0	-3852.4	-2025.0	845.5	-3645.5	-2023.3	-3789.2	-2129.0	874.8
Comb	(198)	(77)	(198)	(78)	(89)	(63)	(64)	(188)	(212)	(90)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	676.6	676.6	672.6	690.5	640.0	640.0	640.0	659.5	665.1	724.8
Mdxt	7490.1	9789.7	6130.7	8783.5	6927.3	9063.7	6699.7	7571.8	9900.3	6898.9
Mdyt	-3820.7	-2173.8	788.3	-2288.9	-3750.1	-2030.9	942.2	-3838.6	-2111.8	-4281.7
Comb	(187)	(187)	(85)	(81)	(82)	(82)	(82)	(193)	(189)	(86)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	724.8	638.9	638.9	638.9	646.7	646.7	654.8	654.8	646.7	654.8
Mdxt	9065.1	6774.0	8871.0	6508.7	7133.9	9325.7	7733.3	10072.3	6922.6	7518.6
Mdyt	-2586.5	-3763.9	-2031.1	961.7	-3589.8	-1978.4	-3584.6	-1973.5	837.1	846.5
Comb	(86)	(87)	(87)	(87)	(94)	(94)	(95)	(95)	(94)	(95)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	684.8	684.8	647.8	647.8	711.4	731.9	709.1	709.1	731.9	731.9
Mdxt	8479.8	8122.6	7070.8	9247.8	8050.5	7647.7	8344.5	10870.7	7989.9	10449.9
Mdyt	-3874.2	763.2	-3634.3	-2014.1	840.3	778.1	-4094.9	-2277.4	-4066.5	-2309.1

Comb	(96)	(96)	(100)	(100)	(133)	(141)	(138)	(138)	(141)	(141)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	768.5	768.5	708.4	708.4	708.4	719.5	719.5	766.2	766.2	719.5
Mdxt	8324.6	10891.5	8237.2	10738.3	7912.2	8908.8	11569.3	9461.6	12289.3	8619.1
Mdyt	-4467.1	-2701.6	-4104.5	-2277.5	899.5	-3979.0	-2237.2	-4416.5	-2662.3	818.9
Comb	(142)	(142)	(143)	(143)	(143)	(151)	(151)	(147)	(147)	(151)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	740.5	740.5	740.5	672.0	659.5	666.2	666.2	666.2	666.3	680.4
Mdxt	9431.2	12224.8	9042.0	7874.6	9877.7	7563.9	9873.4	9875.6	7537.5	8033.2
Mdyt	-4181.8	-2387.4	760.6	-3760.6	-2117.7	-3734.0	-2110.2	-2110.1	764.9	802.6
Comb	(152)	(152)	(152)	(212)	(193)	(174)	(174)	(175)	(205)	(201)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	686.5	710.0	744.3	658.5	666.3	666.3	741.0	674.3	674.3	674.3
Mdxt	8902.1	9611.2	9895.2	7123.4	7778.4	10137.8	9167.5	8377.8	10877.3	8133.4
Mdyt	-2206.9	-2471.6	-2676.0	889.5	-3678.3	-2065.2	-4298.1	-3673.1	-2060.3	774.3
Comb	(191)	(192)	(197)	(198)	(205)	(205)	(202)	(206)	(206)	(206)
Carr	111	112								
Fdzt	667.3	667.3								

Mdxt 7715.2 10060.9

Mdyt -3722.9 -2100.9

Comb (211) (211)

Lance: 5

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	706.4	706.4	712.5	712.5	708.3	708.3	708.3	708.3	708.0	708.0
Mdxt	8073.2	10534.4	8299.7	10818.5	8066.1	10527.3	8067.0	10528.4	8068.6	10530.1
Mdyt	-7678.0	-4850.0	-7654.4	-4841.8	-7623.0	-4820.6	-7622.9	-4820.6	-7622.6	-4820.4
Comb	(22)	(22)	(46)	(46)	(4)	(4)	(9)	(9)	(18)	(18)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	715.8	715.8	722.7	722.7	739.8	737.4	704.5	704.5	726.6	726.6
Mdxt	8004.4	10456.7	7531.4	9869.7	7869.7	11729.7	8065.9	10523.9	7748.5	10144.8
Mdyt	-7725.2	-4893.9	-7765.3	-4926.4	-8049.5	-5144.5	-7727.8	-4876.0	-7708.0	-4878.0
Comb	(21)	(21)	(25)	(25)	(26)	(91)	(27)	(27)	(30)	(30)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	764.4	764.4	703.9	703.9	714.0	708.4	718.0	714.0	762.0	762.0

Mdxt	8013.1	10498.7	7984.2	10422.6	8617.7	10683.5	8546.7	11209.5	9281.9	12066.6
Mdyt	-8366.5	-5351.9	-7741.1	-4882.4	-7580.1	-4775.9	-7525.2	-4775.5	-8274.0	-5283.2
Comb	(31)	(31)	(32)	(32)	(40)	(39)	(35)	(40)	(36)	(36)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	735.6	735.6	709.2	709.2	657.8	657.8	666.6	666.6	655.2	660.7
Mdxt	9251.8	12002.5	8167.6	10653.1	7298.9	9538.7	7622.5	9946.1	7288.4	9527.6
Mdyt	-7882.7	-5002.2	-7614.4	-4811.8	-7172.0	-4525.7	-7138.3	-4514.0	-7243.1	-4483.8
Comb	(41)	(41)	(45)	(45)	(77)	(77)	(101)	(101)	(82)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	660.6	660.6	660.2	660.2	671.3	671.3	681.2	681.2	705.6	655.2
Mdxt	7290.1	9529.8	7292.3	9532.2	7200.8	9425.3	6524.9	8572.6	9199.0	9523.7
Mdyt	-7093.3	-4483.6	-7092.8	-4483.3	-7239.5	-4588.4	-7296.8	-4634.8	-4920.1	-4562.8
Comb	(64)	(64)	(73)	(73)	(76)	(76)	(80)	(80)	(81)	(82)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	686.7	686.7	740.8	740.8	654.3	654.3	660.7	660.7	668.8	668.8
Mdxt	6835.1	8971.4	7213.2	9473.2	7171.9	9378.2	7469.7	9752.6	8076.7	10505.4
Mdyt	-7214.9	-4565.6	-8155.7	-5242.8	-7262.2	-4572.0	-7022.1	-4419.9	-7032.1	-4419.2
Comb	(85)	(85)	(86)	(86)	(87)	(87)	(94)	(94)	(95)	(95)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	737.4	699.7	699.7	661.8	661.8	726.4	726.4	748.5	748.5	786.4
Mdxt	9025.6	8982.7	11636.9	7433.7	9708.9	8806.0	11451.3	8488.6	11081.1	8753.2
Mdyt	-8023.3	-7464.4	-4743.1	-7081.1	-4471.1	-7521.2	-4740.6	-7501.5	-4742.6	-8160.0
Comb	(91)	(96)	(96)	(100)	(100)	(138)	(138)	(141)	(141)	(142)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	786.4	725.8	725.8	735.9	735.9	783.9	783.9	757.6	757.6	678.2
Mdxt	11437.5	8724.4	11351.1	9357.8	12130.9	10022.0	12987.1	9991.9	12919.6	7988.7
Mdyt	-5216.5	-7534.6	-4747.0	-7373.5	-4640.1	-8067.4	-5147.8	-7676.1	-4866.8	-6979.7
Comb	(142)	(143)	(143)	(151)	(151)	(147)	(147)	(152)	(152)	(188)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	678.2	687.0	687.0	681.0	681.0	681.0	675.6	680.6	680.6	691.7
Mdxt	10406.5	10810.4	8312.2	10396.6	7979.9	10398.2	7978.2	7982.1	10400.5	7890.5
Mdyt	-4399.6	-4387.9	-6946.0	-4357.6	-6901.0	-4357.5	-7050.8	-6900.5	-4357.2	-7047.2
Comb	(188)	(212)	(212)	(170)	(175)	(175)	(193)	(184)	(184)	(187)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	691.7	675.6	674.7	674.7	681.1	681.1	757.7	757.7	689.2	689.2
Mdxt	10297.1	10391.2	7861.6	10247.3	8159.4	10618.3	9715.3	12587.2	8766.3	11363.9

Mdyt	-4462.3	-4436.6	-7069.9	-4445.9	-6829.8	-4293.8	-7831.1	-5018.4	-6839.8	-4293.1
Comb	(187)	(193)	(198)	(198)	(205)	(205)	(202)	(202)	(206)	(206)

Carr	101	102	103	104
Fdzt	720.1	720.1	682.2	682.2
Mdxt	9672.4	12489.6	8123.4	10575.2
Mdyt	-7272.2	-4617.0	-6888.8	-4345.0
Comb	(207)	(207)	(211)	(211)

Lance: 6

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	723.3	729.1	729.1	724.5	724.9	724.9	724.8	724.8	724.5	724.5
Mdxt	8528.9	11421.9	8779.8	11128.9	8526.5	11108.0	8527.6	11109.4	8530.5	11112.6
Mdyt	-15983.8	-11198.2	-15980.8	-11165.6	-15919.9	-11155.3	-15919.7	-11155.1	-15917.8	-11153.9
Comb	(22)	(46)	(46)	(28)	(8)	(8)	(9)	(9)	(18)	(18)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	732.5	732.5	739.5	739.5	757.2	757.2	721.8	721.8	743.3	743.3
Mdxt	8453.7	11025.2	8000.1	10467.5	8290.8	10841.9	8521.7	11099.3	8238.6	10767.3

Mdyt	-16130.2	-11308.4	-16160.2	-11339.4	-16795.2	-11792.5	-16041.9	-11235.3	-16048.0	-11250.5
Comb	(21)	(21)	(25)	(25)	(26)	(26)	(27)	(27)	(30)	(30)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	782.5	782.5	721.3	721.3	730.6	730.6	734.3	734.3	780.0	780.0
Mdxt	8429.8	11031.8	8463.8	11027.8	9065.2	11770.8	8986.2	11678.7	9853.6	12779.3
Mdyt	-17438.0	-12258.2	-16057.1	-11244.4	-15897.0	-11120.3	-15831.4	-11071.5	-17217.1	-12095.5
Comb	(31)	(31)	(32)	(32)	(40)	(40)	(35)	(35)	(36)	(36)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	724.9	752.8	752.8	725.7	725.7	673.3	673.3	681.6	681.6	675.6
Mdxt	8630.9	9822.9	12710.9	8624.9	11229.3	7696.8	10043.2	8055.1	10491.1	7694.9
Mdyt	-15860.5	-16415.2	-11511.5	-15913.9	-11147.3	-14920.1	-10450.7	-14915.7	-10451.9	-14828.4
Comb	(39)	(41)	(41)	(45)	(45)	(77)	(77)	(101)	(101)	(64)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	675.6	675.6	675.6	675.1	675.1	686.6	686.6	696.4	696.4	721.8
Mdxt	10042.7	7693.2	10040.5	7699.1	10047.5	7589.4	9920.1	6941.2	9110.2	7356.5
Mdyt	-10390.2	-14828.8	-10390.6	-14825.7	-10388.6	-15129.1	-10609.3	-15172.0	-10653.5	-16079.2
Comb	(64)	(67)	(67)	(73)	(73)	(76)	(76)	(80)	(80)	(81)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	721.8	671.2	671.2	701.9	701.9	758.0	758.0	670.4	670.4	676.8
Mdxt	9648.3	7686.4	10028.7	7282.0	9544.6	7555.1	9915.9	7603.8	9926.0	7833.8
Mdyt	-11300.9	-15003.0	-10504.7	-15011.7	-10526.5	-16997.4	-11966.1	-15024.7	-10517.9	-14820.2
Comb	(81)	(82)	(82)	(85)	(85)	(86)	(86)	(87)	(87)	(100)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	675.7	683.8	683.8	754.4	754.4	675.7	715.5	715.5	675.6	676.8
Mdxt	10224.7	8463.0	10990.7	9589.2	12431.1	7842.5	9545.4	12331.9	7720.2	10215.0
Mdyt	-10311.5	-14796.1	-10340.5	-16681.9	-11733.7	-14743.8	-15536.3	-10899.4	-14813.3	-10379.1
Comb	(94)	(95)	(95)	(91)	(91)	(94)	(96)	(96)	(99)	(100)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	762.8	762.8	745.1	745.1	766.6	766.6	805.8	805.8	744.6	744.6
Mdxt	8813.1	11493.1	9334.8	12113.3	9051.8	11789.7	9242.9	12058.4	9277.0	12042.6
Mdyt	-15119.2	-10559.7	-15000.9	-10455.6	-15006.9	-10470.8	-16397.0	-11478.5	-15016.0	-10464.8
Comb	(136)	(136)	(138)	(138)	(141)	(141)	(142)	(142)	(143)	(143)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	803.3	803.3	753.9	753.9	776.1	776.1	695.0	695.0	703.3	703.3
Mdxt	10666.8	13785.4	9878.4	12778.9	10636.1	13713.3	8454.6	10992.0	8812.9	11435.9
Mdyt	-16176.1	-11315.9	-14856.0	-10340.6	-15374.3	-10731.9	-13951.1	-9725.1	-13946.8	-9726.2

Comb	(147)	(147)	(151)	(151)	(152)	(152)	(188)	(188)	(212)	(212)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	697.3	697.3	697.3	697.3	696.8	696.8	708.3	708.3	692.9	692.9
Mdxt	8451.0	10989.9	8452.7	10991.9	8456.9	10996.6	8347.2	10873.2	8444.3	10977.2
Mdyt	-13859.8	-9664.8	-13859.4	-9664.5	-13856.8	-9662.9	-14160.2	-9883.6	-14034.0	-9779.0
Comb	(174)	(174)	(175)	(175)	(184)	(184)	(187)	(187)	(193)	(193)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	692.1	692.1	698.5	697.4	776.1	776.1	697.4	705.4	705.4	737.2
Mdxt	8361.5	10875.7	8591.6	11171.5	10347.0	13368.1	8600.2	9220.7	11930.2	10303.2
Mdyt	-14055.7	-9792.2	-13851.3	-9585.8	-15712.9	-11008.1	-13774.8	-13827.0	-9614.8	-14567.3
Comb	(198)	(198)	(211)	(205)	(202)	(202)	(205)	(206)	(206)	(207)
Carr	111	112	113							
Fdzt	737.2	697.3	698.5							
Mdxt	13263.9	8478.0	11162.3							
Mdyt	-10173.7	-13844.4	-9653.5							
Comb	(207)	(210)	(211)							

Lance: 7

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	745.7	744.3	744.3	745.7	739.9	739.9	739.9	739.9	739.7	739.3
Mdxt	9532.8	12039.3	9274.5	12353.3	8998.8	11699.7	8998.8	11699.7	11698.2	9009.3
Mdyt	-32733.1	-24679.0	-32821.9	-24593.2	-32700.0	-24587.8	-32698.2	-24586.4	-24598.8	-32696.7
Comb	(40)	(46)	(46)	(40)	(9)	(9)	(15)	(15)	(17)	(23)

Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	739.3	747.8	747.8	738.8	738.8	773.1	773.1	737.6	737.6	758.6
Mdxt	11711.9	8911.2	11600.3	8996.0	11695.1	8713.9	11378.8	8988.8	11685.2	8730.3
Mdyt	-24585.7	-33141.6	-24923.5	-32771.2	-24639.0	-34532.7	-25981.1	-32835.1	-24684.4	-32857.5
Comb	(23)	(21)	(21)	(22)	(22)	(26)	(26)	(27)	(27)	(30)

Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	758.6	799.1	799.1	737.2	737.2	739.6	739.6	749.1	749.1	796.5
Mdxt	11387.5	8849.3	11566.0	8952.4	11640.4	9020.1	11725.3	9436.4	12240.6	10457.8
Mdyt	-24715.9	-35870.6	-26994.7	-32850.8	-24694.9	-32649.5	-24533.4	-32622.6	-24514.4	-35360.3
Comb	(30)	(31)	(31)	(32)	(32)	(34)	(34)	(35)	(35)	(36)

Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	796.5	740.0	740.0	768.6	768.6	695.3	695.3	688.8	689.2	690.4

Mdxt	13526.4	9082.2	11801.3	10425.5	13452.3	8499.4	11046.8	8117.6	10558.3	8242.3
Mdyt	-26604.8	-32632.3	-24523.0	-33681.1	-25328.5	-30637.6	-23038.6	-30480.1	-22908.5	-30468.9
Comb	(36)	(39)	(39)	(41)	(41)	(101)	(101)	(83)	(59)	(100)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	689.2	688.9	688.3	690.4	700.4	700.4	687.5	687.5	710.3	710.3
Mdxt	10559.6	10557.5	8120.4	10728.4	7980.3	10415.0	8101.4	10553.0	7344.3	9627.5
Mdyt	-22908.4	-22924.1	-30458.9	-22906.6	-31094.3	-23387.9	-30565.3	-22981.5	-31044.1	-23369.7
Comb	(64)	(72)	(78)	(100)	(76)	(76)	(77)	(77)	(80)	(80)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	736.5	730.0	685.8	685.8	715.8	715.8	773.7	685.2	685.2	688.7
Mdxt	7698.4	10143.5	8091.1	10539.0	7721.8	10104.7	7891.9	8039.1	10474.6	8135.9
Mdyt	-33081.8	-31865.2	-30656.5	-23046.4	-30688.4	-23091.3	-34993.1	-30679.0	-23061.4	-30391.5
Comb	(81)	(96)	(82)	(82)	(85)	(85)	(86)	(87)	(87)	(89)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	688.7	697.4	697.4	770.0	770.0	689.3	689.3	730.0	689.2	689.2
Mdxt	10596.5	8868.4	11496.4	10189.7	13172.1	8224.7	10705.7	13064.4	8125.8	10584.6
Mdyt	-22830.7	-30510.8	-22916.1	-34264.0	-25789.9	-30366.9	-22815.9	-23966.5	-30445.7	-22891.6
Comb	(89)	(95)	(95)	(91)	(91)	(94)	(94)	(96)	(99)	(99)

Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	780.3	780.3	784.1	784.1	824.6	824.6	822.0	822.0	771.2	771.2
Mdxt	9394.5	12221.8	9658.8	12547.5	9777.8	12732.1	11386.2	14668.4	10461.3	13498.5
Mdyt	-30195.0	-22638.3	-29946.1	-22443.4	-32959.4	-24722.3	-32449.0	-24332.4	-29821.8	-22320.7
Comb	(136)	(136)	(141)	(141)	(142)	(142)	(147)	(147)	(151)	(151)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	794.1	794.1	719.1	719.1	712.5	712.9	714.1	712.9	712.6	712.0
Mdxt	11353.9	14590.1	9364.6	12119.5	8982.8	11636.1	9107.5	11637.4	11635.2	8985.6
Mdyt	-30769.8	-23056.0	-27927.8	-20923.5	-27770.3	-20793.4	-27759.1	-20793.3	-20809.0	-27749.1
Comb	(152)	(152)	(212)	(212)	(194)	(170)	(211)	(175)	(183)	(189)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	714.1	718.6	718.6	711.2	711.2	709.6	709.6	709.0	709.0	712.5
Mdxt	11804.1	8760.0	11387.6	8966.6	11630.5	8956.3	11616.3	8904.4	11552.8	9001.1
Mdyt	-20791.5	-27983.4	-20972.5	-27855.5	-20866.4	-27946.7	-20931.3	-27969.2	-20946.3	-27681.7
Comb	(211)	(186)	(186)	(188)	(188)	(193)	(193)	(198)	(198)	(200)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	712.5	793.7	793.7	713.0	713.0	721.2	721.2	753.8	753.8	712.9
Mdxt	11673.6	11054.8	14235.4	9089.8	11781.4	9733.5	12564.1	11008.7	14122.1	8991.0

Mdyt	-20715.6	-31554.2	-23674.7	-27657.0	-20700.7	-27801.0	-20800.9	-29155.4	-21851.4	-27735.9
Comb	(200)	(202)	(202)	(205)	(205)	(206)	(206)	(207)	(207)	(210)

Carr	111
Fdzt	712.9
Mdxt	11662.0
Mdyt	-20776.5
Comb	(210)

Lance: 8

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	755.3	755.3	753.9	753.9	749.5	749.5	749.5	749.5	749.5	749.3
Mdxt	9956.4	12874.3	9713.3	12580.3	9409.8	12207.9	12208.8	9409.9	12208.9	9407.9
Mdyt	-62450.8	-49430.6	-62536.7	-49518.2	-62307.4	-49337.8	-49337.8	-62303.8	-49335.0	-62323.6
Comb	(40)	(40)	(46)	(46)	(9)	(4)	(9)	(15)	(15)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	749.3	749.2	749.2	757.5	757.5	748.6	748.6	748.9	748.9	783.1
Mdxt	12206.3	9415.2	12215.0	9305.6	12090.8	9403.4	12200.2	9419.3	12219.6	9066.6

Mdyt	-49350.3	-62296.7	-49329.6	-63163.2	-50018.0	-62382.1	-49395.0	-62293.4	-49327.0	-65856.3
Comb	(17)	(18)	(18)	(21)	(21)	(22)	(22)	(23)	(23)	(26)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	783.1	747.8	747.8	749.2	768.3	768.3	809.6	807.7	747.5	747.5
Mdxt	11822.4	9396.4	12190.7	9424.5	9141.0	11900.6	9199.9	12094.0	9379.0	12169.3
Mdyt	-52158.4	-62447.3	-49444.6	-62266.9	-62473.6	-49481.0	-68439.3	-57716.7	-62461.1	-49454.4
Comb	(26)	(27)	(27)	(34)	(30)	(30)	(31)	(152)	(32)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	749.2	758.4	758.4	807.1	807.1	749.6	749.6	778.7	778.7	703.9
Mdxt	12226.3	9829.6	12725.6	11023.4	14216.3	9479.6	12293.4	10989.0	14135.9	8889.6
Mdyt	-49290.5	-62258.6	-49285.7	-67396.6	-53375.6	-62230.8	-49263.1	-64147.6	-50793.0	-58371.8
Comb	(34)	(35)	(35)	(36)	(36)	(39)	(39)	(41)	(41)	(101)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	703.9	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.6	697.4
Mdxt	11529.3	8455.0	10995.0	8454.3	10994.1	8456.0	10996.2	8456.1	10996.4	8453.2
Mdyt	-46223.7	-58044.2	-45966.1	-58044.6	-45966.4	-58044.2	-45966.0	-58039.0	-45961.9	-58067.3
Comb	(101)	(59)	(59)	(62)	(62)	(64)	(64)	(70)	(70)	(72)
Carr	51	52	53	54	55	56	57	58	59	60

Fdzt	697.4	697.1	697.1	709.0	709.0	696.4	696.4	696.7	696.7	719.0
Mdxt	10992.6	8463.7	11005.1	8307.1	10824.6	8446.9	10984.0	8469.5	11011.9	7651.6
Mdyt	-45983.8	-58028.9	-45954.3	-59266.7	-46937.7	-58150.8	-46047.7	-58024.2	-45950.5	-59007.2
Comb	(72)	(73)	(73)	(76)	(76)	(77)	(77)	(78)	(78)	(80)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	719.0	745.7	739.3	695.2	695.2	697.2	724.5	724.5	783.5	694.8
Mdxt	10018.7	7965.7	10712.0	8436.7	10970.4	8477.0	8072.0	10546.9	8156.1	8412.0
Mdyt	-46755.0	-63114.0	-60673.1	-58244.1	-46118.6	-57986.3	-58281.6	-46170.6	-66804.0	-58263.8
Comb	(80)	(81)	(96)	(82)	(82)	(89)	(85)	(85)	(86)	(87)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	694.8	697.2	706.0	706.0	779.9	779.9	697.7	697.7	739.3	697.6
Mdxt	10939.7	11021.4	9236.8	11950.1	10761.2	13867.4	8555.6	11117.7	13750.3	8472.9
Mdyt	-46132.6	-45898.3	-58249.0	-46098.7	-65314.4	-51734.3	-57934.7	-45859.2	-48045.0	-58023.0
Comb	(87)	(89)	(95)	(95)	(91)	(91)	(94)	(94)	(96)	(99)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	697.6	793.5	793.5	797.4	797.4	838.6	838.6	784.4	784.4	836.1
Mdxt	11016.9	9951.7	12912.8	10246.0	13272.7	10304.9	13389.0	11061.4	14229.9	12128.4
Mdyt	-45945.8	-56550.5	-44692.1	-56042.7	-44283.2	-62008.3	-49009.1	-56019.9	-44232.8	-60965.6

Comb	(99)	(136)	(136)	(141)	(141)	(142)	(142)	(151)	(151)	(147)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	836.1	807.7	730.9	730.9	724.6	724.6	724.6	724.6	724.6	724.6
Mdxt	15567.2	15482.0	9919.1	12798.4	9484.5	12270.3	9483.8	12269.5	9483.8	12269.5
Mdyt	-48177.7	-45595.2	-52386.1	-41385.6	-52058.5	-41128.1	-52058.9	-41128.4	-52059.7	-41129.0
Comb	(147)	(152)	(212)	(212)	(170)	(170)	(173)	(173)	(174)	(174)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	724.6	724.6	724.6	724.6	724.4	724.4	724.1	724.1	730.4	730.4
Mdxt	9485.5	12271.5	9485.7	12271.7	9482.7	12267.9	9493.3	12280.2	9258.0	12004.2
Mdyt	-52058.5	-41128.0	-52053.3	-41123.9	-52081.7	-41145.9	-52043.3	-41116.3	-52473.8	-41463.4
Comb	(175)	(175)	(181)	(181)	(183)	(183)	(184)	(184)	(186)	(186)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	723.4	723.4	723.7	723.7	722.2	722.2	724.3	721.8	721.8	724.3
Mdxt	9476.5	12259.2	9499.1	12286.8	9466.3	12245.5	9506.5	9441.4	12215.1	12296.3
Mdyt	-52165.1	-41209.6	-52038.5	-41112.5	-52258.4	-41280.6	-52000.6	-52278.1	-41294.6	-41060.3
Comb	(188)	(188)	(189)	(189)	(193)	(193)	(200)	(198)	(198)	(200)
Carr	121	122	123	124	125	126	127	128		
Fdzt	806.9	806.9	724.8	724.8	766.3	766.3	724.6	724.6		

Mdxt	11790.7	15124.5	9585.2	12391.3	11741.5	15001.1	9502.4	12291.8		
Mdyt	-59328.7	-46896.4	-51949.0	-41021.2	-54687.3	-43207.0	-52037.2	-41107.7		
Comb	(202)	(202)	(205)	(205)	(207)	(207)	(210)	(210)		

Lance: 9

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	753.3	753.3	751.8	751.8	747.4	747.4	747.3	747.3	747.3	747.3
Mdxt	10234.5	13204.2	9988.0	12907.8	9652.8	12499.8	9654.3	12501.6	9651.4	12498.1
Mdyt	-106100.5	-88161.6	-106177.5	-88244.3	-105790.7	-87924.7	-105783.9	-87919.1	-105806.0	-87937.3
Comb	(40)	(40)	(46)	(46)	(7)	(7)	(15)	(15)	(17)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	747.0	747.0	755.3	755.3	746.7	746.7	746.8	746.8	780.9	780.9
Mdxt	9660.4	12508.5	9530.8	12361.7	9645.6	12490.4	9662.9	12511.3	9243.4	12037.5
Mdyt	-105771.2	-87908.8	-107256.9	-89145.7	-105864.5	-87984.9	-105760.1	-87899.5	-111869.6	-92986.5
Comb	(18)	(18)	(21)	(21)	(37)	(37)	(23)	(23)	(26)	(26)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	746.3	746.3	747.2	746.1	746.1	766.5	769.4	807.3	811.5	746.1

Mdxt	9637.9	12480.6	9651.5	9673.3	12523.0	9354.4	12392.4	9376.0	12742.0	9637.1
Mdyt	-105918.6	-88028.7	-105796.6	-105707.3	-87859.3	-105949.2	-91942.9	-116284.7	-97036.8	-105926.0
Comb	(27)	(27)	(28)	(29)	(29)	(30)	(207)	(31)	(152)	(32)
Carr	31	32	33	34	35	36	37	38	39	40
Fdzt	746.1	747.2	747.2	756.0	756.0	805.1	805.1	747.5	747.5	776.8
Mdxt	12479.4	9667.1	12516.9	10064.2	13004.3	11431.8	14698.4	9720.3	12581.2	11396.2
Mdyt	-88034.1	-105759.0	-87885.4	-105805.5	-87921.9	-114445.8	-95123.0	-105700.6	-87836.8	-108889.5
Comb	(32)	(34)	(34)	(35)	(35)	(36)	(36)	(39)	(39)	(41)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	776.8	701.5	701.5	695.1	695.1	695.2	695.2	695.1	695.1	695.0
Mdxt	14613.7	9127.2	11813.1	8650.1	11229.7	8648.3	11227.6	8650.4	11230.1	8646.3
Mdyt	-90494.4	-99100.6	-82366.9	-98547.5	-81909.9	-98548.8	-81911.0	-98538.4	-81902.3	-98570.0
Comb	(41)	(101)	(101)	(64)	(64)	(67)	(67)	(70)	(70)	(72)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	695.0	695.2	694.7	706.5	706.5	694.2	694.2	694.3	695.2	716.6
Mdxt	11225.0	8666.0	11240.0	8474.0	11026.8	8638.0	11214.1	8662.6	11249.1	7754.4
Mdyt	-81928.3	-98521.3	-81887.7	-100642.8	-83654.8	-98653.6	-81996.4	-98504.4	-81884.9	-100058.3
Comb	(72)	(99)	(73)	(76)	(76)	(92)	(92)	(78)	(99)	(80)

Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	716.6	743.0	737.2	693.6	693.6	695.0	695.0	693.4	693.4	722.4
Mdxt	10145.9	8063.3	11138.7	8627.0	11200.2	8646.8	11225.6	8677.5	11261.2	8221.9
Mdyt	-83189.0	-107232.2	-102974.9	-98730.8	-82058.8	-98566.3	-81925.3	-98429.0	-81817.1	-98774.5
Comb	(80)	(81)	(96)	(82)	(82)	(97)	(97)	(84)	(84)	(85)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	722.4	780.8	693.3	693.3	694.9	694.9	703.6	703.6	777.7	777.7
Mdxt	10730.9	8252.8	8625.8	11198.4	8668.7	11252.0	9479.1	12237.4	11189.5	14371.6
Mdyt	-82110.6	-113539.6	-98741.4	-82066.6	-98502.7	-81854.2	-98990.7	-82248.8	-110912.6	-92193.7
Comb	(85)	(86)	(87)	(87)	(89)	(89)	(95)	(95)	(91)	(91)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	695.4	695.4	737.2	790.0	790.0	815.5	815.5	842.0	842.0	787.9
Mdxt	8744.5	11344.5	14248.2	10876.6	14018.4	10589.1	13707.2	10721.8	13897.7	11580.2
Mdyt	-98419.3	-81784.7	-85581.4	-95404.2	-79173.2	-100016.9	-83014.0	-104432.0	-86685.7	-94247.8
Comb	(94)	(94)	(96)	(132)	(132)	(137)	(137)	(142)	(142)	(151)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	787.9	839.8	839.8	811.5	786.5	786.5	728.7	728.7	727.4	727.4
Mdxt	14847.5	12777.5	16334.8	16244.7	11333.9	14555.1	10052.3	12954.0	9903.8	12775.4

Mdyt	-78189.0	-102593.1	-85150.5	-80521.9	-94324.7	-78271.7	-87588.7	-72682.7	-87515.5	-72627.9
Comb	(151)	(147)	(147)	(152)	(157)	(157)	(211)	(211)	(175)	(175)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	727.4	727.4	727.3	727.3	727.4	727.4	727.2	727.2	727.4	726.9
Mdxt	9902.0	12773.3	9904.1	12775.7	9902.0	12773.3	9900.0	12770.7	9919.7	12785.3
Mdyt	-87516.0	-72628.3	-87506.4	-72620.3	-87516.8	-72629.0	-87538.1	-72646.3	-87489.3	-72605.7
Comb	(173)	(173)	(181)	(181)	(178)	(178)	(183)	(183)	(210)	(184)
Carr	111	112	113	114	115	116	117	118	119	120
Fdzt	726.4	726.4	726.6	727.4	725.9	725.9	727.2	727.2	725.6	725.6
Mdxt	9891.8	12759.8	9916.3	12794.4	9880.7	12745.9	9900.5	12771.3	9931.2	12805.8
Mdyt	-87621.5	-72714.3	-87472.4	-72602.9	-87698.8	-72776.8	-87534.3	-72643.3	-87397.0	-72535.0
Comb	(203)	(203)	(189)	(210)	(193)	(193)	(208)	(208)	(195)	(195)
Carr	121	122	123	124	125	126	127	128	129	
Fdzt	725.6	725.6	727.1	727.1	809.9	809.9	727.6	727.6	769.4	
Mdxt	9879.5	12744.1	9922.4	12797.3	12443.2	15894.1	9998.2	12888.2	15763.5	
Mdyt	-87709.4	-72784.6	-87470.7	-72572.2	-99880.6	-82911.7	-87387.3	-72502.7	-76299.4	
Comb	(198)	(198)	(200)	(200)	(202)	(202)	(205)	(205)	(207)	

Lance: 10

Carregamentos de esforços finais de cálculo para dimensionamento após a envoltória

Carr	1	2	3	4	5	6	7	8	9	10
Fdzt	731.8	731.8	730.3	730.3	725.9	725.9	725.8	725.8	725.5	725.8
Mdxt	10256.7	13201.2	9992.6	12885.1	9631.0	12447.5	9632.6	12449.4	9629.4	12445.4
Mdyt	-151809.4	-134244.4	-151881.4	-134322.1	-151330.6	-133837.5	-151320.2	-133828.3	-151380.0	-133847.9
Comb	(40)	(40)	(46)	(46)	(12)	(12)	(15)	(15)	(37)	(17)
Carr	11	12	13	14	15	16	17	18	19	20
Fdzt	725.5	725.5	733.5	733.5	725.2	725.2	725.8	725.8	758.1	758.1
Mdxt	9639.0	12456.7	9490.2	12287.8	9628.1	12443.2	9645.8	12465.2	9153.0	11905.5
Mdyt	-151301.8	-133812.3	-153438.5	-135704.3	-151419.6	-133914.4	-151298.5	-133800.5	-160068.9	-141575.8
Comb	(18)	(18)	(21)	(21)	(32)	(32)	(34)	(34)	(26)	(26)
Carr	21	22	23	24	25	26	27	28	29	30
Fdzt	725.3	725.3	724.5	724.5	745.3	745.3	783.8	783.8	734.3	734.3
Mdxt	9614.9	12427.6	9652.6	12471.7	9282.1	12049.5	9282.9	12088.6	10042.7	12950.2
Mdyt	-151423.0	-133917.7	-151228.5	-133750.3	-151467.2	-133958.4	-166402.9	-147180.6	-151432.2	-133912.3
Comb	(27)	(27)	(29)	(29)	(30)	(30)	(31)	(31)	(35)	(35)
Carr	31	32	33	34	35	36	37	38	39	40

Fdzt	782.3	782.3	725.5	726.1	726.1	755.1	755.1	680.9	680.9	674.6
Mdxt	11542.2	14793.9	12445.2	9703.1	12534.1	11510.6	14712.7	9118.1	11776.7	8601.4
Mdyt	-163712.6	-144792.5	-133880.5	-151219.8	-133730.1	-155741.1	-137728.9	-141753.0	-125369.3	-140966.9
Comb	(36)	(36)	(37)	(39)	(39)	(41)	(41)	(101)	(101)	(63)
Carr	41	42	43	44	45	46	47	48	49	50
Fdzt	674.6	674.6	674.6	674.6	674.6	674.1	674.6	674.7	674.7	685.5
Mdxt	11148.4	8603.5	11150.8	8603.9	11151.2	8599.3	11145.6	8620.6	11171.6	8400.4
Mdyt	-124677.0	-140964.4	-124675.4	-140951.2	-124663.8	-141036.6	-124691.8	-140931.6	-124644.1	-143977.4
Comb	(67)	(64)	(64)	(70)	(70)	(92)	(72)	(99)	(99)	(76)
Carr	51	52	53	54	55	56	57	58	59	60
Fdzt	685.5	673.7	673.7	674.5	674.5	695.9	695.9	720.7	716.4	673.9
Mdxt	10916.4	8597.3	11142.4	8622.8	11174.0	7591.9	9958.2	7918.6	11286.8	8578.5
Mdyt	-127343.9	-141093.3	-124786.8	-140920.3	-124624.2	-143050.0	-126533.2	-153449.4	-147267.0	-141098.1
Comb	(76)	(87)	(87)	(89)	(89)	(80)	(80)	(81)	(96)	(82)
Carr	61	62	63	64	65	66	67	68	69	70
Fdzt	673.9	672.6	672.6	702.3	702.3	757.4	683.2	683.2	755.2	755.2
Mdxt	11119.8	8632.5	11183.6	8103.2	10568.1	8104.3	9495.5	12229.4	11331.7	14503.6
Mdyt	-124791.6	-140820.2	-124552.5	-141161.1	-124849.6	-162498.0	-141650.2	-125258.3	-158654.7	-140327.0

Comb	(82)	(84)	(84)	(85)	(85)	(86)	(95)	(95)	(91)	(91)
Carr	71	72	73	74	75	76	77	78	79	80
Fdzt	674.1	675.0	675.0	716.4	674.5	674.5	773.6	775.2	769.2	773.6
Mdxt	11145.2	8704.5	11273.0	14385.2	8601.1	11147.9	11590.4	15148.2	11228.7	14836.7
Mdyt	-124738.3	-140807.8	-124523.6	-130236.2	-140977.8	-124687.2	-134001.1	-118301.4	-133450.1	-118379.2
Comb	(92)	(94)	(94)	(96)	(97)	(97)	(157)	(151)	(114)	(157)
Carr	81	82	83	84	85	86	87	88	89	90
Fdzt	769.2	769.2	769.2	769.2	768.9	769.2	769.2	768.9	773.1	773.1
Mdxt	11230.2	14406.6	11230.5	14406.9	11227.2	14402.9	11242.2	14413.9	11028.5	14174.6
Mdyt	-133449.1	-117893.5	-133439.8	-117885.3	-133499.6	-117904.9	-133426.2	-117869.4	-134131.0	-118499.3
Comb	(120)	(120)	(126)	(126)	(148)	(128)	(155)	(129)	(131)	(131)
Carr	91	92	93	94	95	96	97	98	99	100
Fdzt	768.6	768.6	769.1	769.1	801.4	801.4	768.7	768.7	767.8	767.8
Mdxt	11225.9	14400.6	11243.7	14422.4	10750.8	13883.5	11212.7	14385.2	11250.5	14428.3
Mdyt	-133539.3	-117971.4	-133418.2	-117857.6	-142188.6	-125632.8	-133542.7	-117974.8	-133348.1	-117807.4
Comb	(143)	(143)	(145)	(145)	(137)	(137)	(138)	(138)	(140)	(140)
Carr	101	102	103	104	105	106	107	108	109	110
Fdzt	827.1	827.1	777.6	825.6	825.6	768.9	769.5	769.5	798.4	798.4

Mdxt	10880.7	14071.5	14901.8	13140.0	16732.2	14402.5	11300.9	14490.2	13108.4	16645.4
Mdyt	-148522.6	-131237.7	-117969.3	-145832.3	-128849.5	-117937.4	-133339.5	-117787.2	-137860.9	-121786.0
Comb	(142)	(142)	(146)	(147)	(147)	(148)	(150)	(150)	(152)	(152)

Carr	111	112	113	114	115	116	117
Fdzt	769.1	742.7	797.7	727.0	795.5	795.5	756.7
Mdxt	11228.5	12420.4	9592.4	13691.2	12820.0	16306.6	16180.5
Mdyt	-133458.5	-110010.8	-145855.9	-109944.9	-142012.6	-125488.0	-115397.3
Comb	(153)	(196)	(197)	(201)	(202)	(202)	(207)

17.7 Listagem de resultados por pilar

17.7.1 Legenda

nota a

Este carregamnto listado é, dentre os inúmeros carregamentos analisados, o que provocou a seleção desta

Armadura em primeiro lugar. Não necessariamente, este carregamento é o que necessita a maior quantidade de

Armadura na seção, pois o dimensionamento é feito de forma indireta, por verificação. Exemplificando,

Temos duas configurações de armaduras válidas para o lance, uma correspondendo a 17 cm2 e outra a 20 cm2.

Um carregamento inicial necessitou de 18 cm2 e, por esta razão foi selecionada a configuração de 20 cm2 como

A definitiva. Outros carregamentos posteriores necessitaram, por exemplo, de 19 cm2, 19.5 cm2 (sempre

Inferiores aos 20 cm2), mas a listagem com o carregamento mais desfavorável foi feita com aquele que necessitou

Os 18 cm2, pois foi o primeiro a requisitar os 20 cm2. A pesquisa do carregamento exato que provoca maior

Armadura na seção não é realizada automaticamente para não aumentar de forma significativa o tempo de proces-

Samento. Se o usuário quiser calcular a real necessidade de armadura para um carregamento específico, ele poderá

Fazê-lo facilmente no editor de esforços e armaduras, comando do próprio tqs pilar.

legenda

Sel = quantidade efetiva de barras na secao

Nb = quantidades de barras dimensionadas na secao

Nbh = numero de barras lado h

Nbb = numero de barras lado b

17.7.2 P1-a

Pilar:p1-a

num. 1 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._____________._____________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 16.0 5.0 96 37 11 193.02 1.0 193.02| 35.0 52.2 | 639.3 5949.1 141205.1 |

|l. 10 80.0 239.0 1.0 60 20.0 5.0 60 20 10 188.50 1.0 185.35| | caso pórtico = 80 (combinação= 17) |

| 25.0 6.3 38 12 7 186.53 1.0 181.62| | **ver nota (a)** |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:54 sub-projeto: 0001.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 104 41 11 81.68 0.4 81.68| 35.0 52.2 | 659.2 5941.1 98888.1 |

| 12.5 5.0 66 25 8 80.99 0.4 80.38| | caso pórtico = 80 (combinação= 17) |

| 16.0 5.0 40 15 5 80.42 0.4 79.69| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 26 20.0 5.0 26 9 4 81.68 0.4 78.15| | |

| 25.0 6.3 20 8 2 98.17 0.5 79.79| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:53 sub-projeto: 0001.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

```
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00    1.00    1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                                |
|  50        a       2.0     15.0    1    1                                                       |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   604.8        5415.4        53213.3     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 140 (combinação=  77)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                     |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                     |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:51   sub-projeto: 0001.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00    1.00    1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                                |
|  50        a       2.0     15.0    1    1                                                       |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   597.4        5220.2        27878.5     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 140 (combinação=  77)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
```

```
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:50   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                          |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   585.6       5014.7       13510.3    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 140 (combinação=  77)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                 |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:48   sub-projeto: 0001.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                          |
```

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 565.9 4214.1 6430.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 79 (combinação= 16) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:47 sub-projeto: 0001.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 552.8 4106.5 3335.4 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 79 (combinação= 16) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:45 sub-projeto: 0001.sub

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm          |
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00          |
| tipoaço  classeaço  excmin  excmax  k12  k37          |
|  50       a      2.0    15.0   1    1          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   561.9       4575.3        478.1    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico = 140 (combinação=  77)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**          |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |          |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |          |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:44   sub-projeto: 0001.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm          |
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00          |
| tipoaço  classeaço  excmin  excmax  k12  k37          |
|  50       a      2.0    15.0   1    1          |
| fundacao          |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._______________.______________|
```

17.7.3 P1-b

Pilar:p1-b

num. 2 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | -0.1 0.0 -5353.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 474 (combinação= 190) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| ** aviso ** pilar com força normal de tração ** |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:05 sub-projeto: 0002.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 16.8 295.6 14484.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 78 (combinação= 15) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:02 sub-projeto: 0002.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 46.9 765.0 17956.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 90 (combinação= 27) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:00 sub-projeto: 0002.sub

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                       |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   79.8        976.1       19321.5     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  85 (combinação=  22)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:58   sub-projeto: 0002.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                       |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |  108.3       1298.6       15215.9     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 467 (combinação= 183)   |
```

```
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:57   sub-projeto: 0002.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                             |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                                             |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   135.2       1516.5       10309.5     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico = 467 (combinação= 183)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:56   sub-projeto: 0002.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                             |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
```

```
|  50        a       2.0     15.0    1    1                                                                  |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   156.5        1791.7         6522.7     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 135 (combinação=  72)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                       |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                       |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:55   sub-projeto: 0002.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                            |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                                  |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   162.0        1688.9         1714.3     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 467 (combinação= 183)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                       |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                       |
```

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:53 sub-projeto: 0002.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.7.4 P1-c

Pilar:p1-c

num. 3 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 238.0 -1844.7 -2344.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 77 (combinação= 14) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:54 sub-projeto: 0003.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 213.9 -2019.9 4467.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:53 sub-projeto: 0003.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 200.1 -1877.6 7123.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:51 sub-projeto: 0003.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_07 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 192.5 -1804.9 7939.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:50   sub-projeto: 0003.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 189.9   -1362.2   7899.6 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 65 (combinação=   2) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:48   sub-projeto: 0003.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 190.7   -1365.4   6750.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:47 sub-projeto: 0003.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|.....|...|...|...|......|...|......|.........|.........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 191.9 1517.5 4889.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:46 sub-projeto: 0003.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                         |
| aux_03     .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   194.7       1586.7        1467.7     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  85 (combinação=  22)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                               |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                               |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:44   sub-projeto: 0003.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                         |
| fundacao                                                                          |
|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.7.5 P1-d

Pilar:p1-d

num. 4 esforço de cálculo do dimensionamento

```
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    20.5       -162.1       -1465.5     |

|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 404 (combinação= 120)  |

|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |

|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |

|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:13   sub-projeto: 0004.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |

|    2.5            45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                         |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |

|  50        a       2.0     15.0    1    1                                                    |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    36.8       -373.3        -724.5     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 397 (combinação= 113)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                     |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:10   sub-projeto: 0004.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                            |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    52.3       -787.4        2511.5     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  65 (combinação=   2)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                     |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:07   sub-projeto: 0004.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
```

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_07 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 66.5 -954.8 3201.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 7 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:04 sub-projeto: 0004.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_06 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 80.0 -758.0 3187.4 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 89 (combinação= 26) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 6 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:02 sub-projeto: 0004.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 94.4 -840.1 2945.9 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:00 sub-projeto: 0004.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 108.0 -923.1 2057.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:58 sub-projeto: 0004.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 111.8 -930.1 619.6 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 65 (combinação= 2) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:57 sub-projeto: 0004.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____._____._____.___.___.____.____.___.___.___._____.___._____|_______._______|___________.____________._____________|

17.7.6 P1-e

Pilar:p1-e

num. 5   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____._____._____.___.___.____.____.___.___.___._____.___._____|_______._______|___________.____________._____________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 249.3   -2354.3   -896.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 67 (combinação=   4) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

```
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:54   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                            |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                                |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|  35.0    52.2  |   231.5       -2069.2        -597.4    |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  67 (combinação=   4)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                   |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:53   sub-projeto: 0005.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                            |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                                |
```

```
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   217.3       -1828.8        -380.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  67 (combinação=   4)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                     |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:51   sub-projeto: 0005.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                                   |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   208.4       -2186.7        -312.0     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 411 (combinação= 127)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                     |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:50   sub-projeto: 0005.sub
```

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                             |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   197.8      -2002.2         332.1     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  75 (combinação=  12)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               | **ver nota (a)**                    |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:48   sub-projeto: 0005.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                             |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   197.5      -1975.8         316.3     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 407 (combinação= 123)   |
```

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:47 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 193.7 -1466.2 234.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 75 (combinação= 12) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:45 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 198.5 -1968.6 -201.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 411 (combinação= 127) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:43 sub-projeto: 0005.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|_________.________|____________._______________.________________|

17.7.7 P1-f

Pilar:p1-f

```
 num.  6                                          esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)    mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    20.4       -161.1        1593.6    |

|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  71 (combinação=   8)  |

|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |

|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |

|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:14   sub-projeto: 0006.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |

|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                 |

|  50        a       2.0     15.0    1    1                                                        |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    37.5       -403.9         672.0    |

|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  71 (combinação=   8)  |
```

```
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:11   sub-projeto: 0006.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a       2.0     15.0    1    1                                                          |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |    52.5       -912.9       -2630.5     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  73 (combinação=  10)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:08   sub-projeto: 0006.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
```

```
|  50        a       2.0     15.0    1    1                                                      |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    66.7       -1084.0       -3311.6     |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  73 (combinação=  10)   |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                       |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                       |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:05   sub-projeto: 0006.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                      |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5 |    80.7       -860.7       -3234.2     |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  73 (combinação=  10)   |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                       |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                       |
```

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:03 sub-projeto: 0006.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 94.6 -958.5 -2973.6 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 73 (combinação= 10) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:01 sub-projeto: 0006.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 58.5 | 108.2 -1056.6 -2057.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 73 (combinação= 10) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:59   sub-projeto: 0006.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_03   .....|...|...|....|.....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 110.8   -1006.4   -628.9 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 68 (combinação=   5) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:57   sub-projeto: 0006.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.7.8 P1-g

Pilar:p1-g

num. 7 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 224.8 -1718.2 2117.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 100 (combinação= 37) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:54 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 206.5 -2066.4 -4542.5 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 68 (combinação= 5) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:53 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 193.4 -1922.3 -7167.4 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 68 (combinação= 5) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:51 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_07 .....|...|...|....|.....|...|...|...|......|...|......|.........|.........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 186.4 -1881.5 -7971.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 68 (combinação= 5) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 7 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:50 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                      |
|  50       a      2.0     15.0    1    1                                   |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   184.3      -1421.2       -7904.0    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  68 (combinação=   5)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                 |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:48   sub-projeto: 0007.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                    |
| tipoaço  classeaço  excmin  excmax  k12  k37                                      |
|  50       a      2.0     15.0    1    1                                   |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   185.6      -1448.5       -6745.1    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  68 (combinação=   5)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                 |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
```

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:47   sub-projeto: 0007.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_04   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 190.3   -1497.0   -4666.6 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 67 (combinação=   4) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 4 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:45   sub-projeto: 0007.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_03   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 193.1 -1522.6 -1365.1 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 67 (combinação= 4) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:44 sub-projeto: 0007.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._____________._______________|

17.7.9 P1-h

Pilar:p1-h

num. 8 esforço de cálculo do dimensionamento

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```
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   -3.9         -31.5        6421.5     |

|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  68 (combinação=   5)  |

|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |

|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |

|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |

| ** aviso ** pilar com força normal de tração **                                                      |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:15   sub-projeto: 0008.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                             |

|  50        a      2.0     15.0    1    1                                                   |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   16.5        -318.3       -14666.5     |

|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  68 (combinação=   5)  |

|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
```

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:12   sub-projeto: 0008.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 47.1   -724.9   -17884.7 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 68 (combinação=   5) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:09   sub-projeto: 0008.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 79.6   -1006.1   -20375.5 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 79 (combinação= 16) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:06   sub-projeto: 0008.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 112.1   -1316.3   -16160.3 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 79 (combinação= 16) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:04   sub-projeto: 0008.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 135.3   -1539.9   -10360.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 466 (combinação= 182) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:02   sub-projeto: 0008.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_04   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   58.5 | 157.7   -1723.6   -6484.2 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 466 (combinação= 182) |

```
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:00   sub-projeto: 0008.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
|  50        a       2.0     15.0    1    1                                                          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    58.5  |   162.2       -1755.6       -1746.6     |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico = 466 (combinação= 182)   |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                      |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:58   sub-projeto: 0008.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                      |
```

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|___________.____________.____________|

17.7.10 P1-i

Pilar:p1-i

num. 9 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|___________.____________.____________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|

| 16.0 5.0 96 37 11 193.02 1.0 192.01| 35.0 52.2 | 622.4 -5921.8 -139231.5 |

|l. 10 80.0 239.0 1.0 60 20.0 5.0 60 21 9 188.50 1.0 186.92| | caso pórtico = 134 (combinação= 71) |

| 25.0 6.3 38 13 6 186.53 1.0 184.69| | **ver nota (a)** |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:54 sub-projeto: 0009.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                         |
|  50        a       2.0     15.0    1    1                                            |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0 102  40  11  80.11 0.4  80.11|   35.0    52.2 |   642.7      -5914.6      -97470.8    |
|                      12.5  5.0  66  25   8  80.99 0.4  79.33|             |  caso pórtico = 134 (combinação=  71)  |
|                      16.0  5.0  40  15   5  80.42 0.4  78.95|             | **ver nota (a)**                       |
|l.  9  80.0 239.0 0.4  26 20.0  5.0  26   9   4  81.68 0.4  76.93|             |                           |
|                      25.0  6.3  20   8   2  98.17 0.5  78.51|             |                           |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:53   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                         |
|  50        a       2.0     15.0    1    1                                            |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   617.8      -4590.7      -52753.5    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  69 (combinação=   6)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|             | **ver nota (a)**                       |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                           |
```

```
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:51   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a      2.0     15.0    1    1                                                            |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|  35.0    52.2  |  609.6      -4508.9      -27752.9    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  69 (combinação=   6)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:50   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a      2.0     15.0    1    1                                                            |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

```
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   597.0      -4405.1      -13537.9    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  69 (combinação=   6)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:48   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                |
|  50        a       2.0     15.0    1    1                                                   |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   583.6      -4302.0       -6496.7    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  69 (combinação=   6)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:47   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
```

```
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                               |
|  50       a      2.0    15.0    1    1                                                     |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   571.2      -4211.9       -3365.8    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  69 (combinação=   6)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:45   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                               |
|  50       a      2.0    15.0    1    1                                                     |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   575.1      -4382.0        -555.3    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 461 (combinação= 177)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
```

```
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                   |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                   |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:43   sub-projeto: 0009.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                          |
|  50        a      2.0     15.0    1    1                                                    |
| fundacao                                                                                   |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.7.11 P2-a

```
Pilar:p2-a
 num. 10                                                   esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

|l. 10 80.0 239.0 1.4 54 25.0 6.3 54 19   8 265.07 1.4 260.16| 35.0   52.2 | 775.3   9984.9   175191.7 |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:23   sub-projeto: 0010.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 12.5 5.0 98 38 11 120.26 0.6 120.26| 35.0   52.2 | 805.0   10026.7   122766.8 |

| 16.0 5.0 60 22   8 120.64 0.6 118.30| | caso pórtico = 95 (combinação= 32) |

|l. 9 80.0 239.0 0.6 38 20.0 5.0 38 13   6 119.38 0.6 114.67| | **ver nota (a)** |

| 25.0 6.3 24   9   3 117.81 0.6 116.74| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:22   sub-projeto: 0010.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 758.2   8751.6   66498.4 |

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                    |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                    |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:20   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                           |
|  50        a       2.0     15.0    1    1                                                                   |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   750.9       8541.9       35059.6    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                    |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                    |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:19   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                          |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                             |
|  50        a      2.0     15.0    1    1                                          |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   737.3       8282.8       17099.6    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:18   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                             |
|  50        a      2.0     15.0    1    1                                          |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   721.9       8027.1        8111.9    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
```

```
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:16   sub-projeto: 0010.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                     |

|  50        a       2.0     15.0    1    1                                                        |

| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   707.3       7801.3       4033.7    |

|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)  |

|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |

|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |

|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:15   sub-projeto: 0010.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                                     |

|  50        a       2.0     15.0    1    1                                                        |

| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

```
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   707.9       7704.4        506.0    |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico = 105 (combinação=  42)  |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:12   sub-projeto: 0010.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                  |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                   |
|  50        a      2.0     15.0    1    1                                                        |
| fundacao                                                                                       |
|____.______.______.___.___.____.____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.7.12 P2-b

Pilar:p2-b

```
 num. 11                                               esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
```

```
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |    91.7        3433.0        -4640.8     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  86 (combinação=  23)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                         |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                         |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:55   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                            |
|    2.5            45.0     1.15       1.40        8.00      0.40       1.00   1.00   1.00  1.00                            |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                              |
|  50         a       2.0      15.0    1    1                                                                               |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   102.5        3872.7        20242.3     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 105 (combinação=  42)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                       |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                         |
```

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:53 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 129.8 4001.7 23508.2 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 105 (combinação= 42) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:52 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_07 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 159.8 3690.2 25736.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 95 (combinação= 32) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:50 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_06 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 192.2 3955.8 20320.9 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 95 (combinação= 32) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:49 sub-projeto: 0011.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 217.8   3838.2   12800.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 105 (combinação= 42) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:48   sub-projeto: 0011.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_04   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 238.0   3904.2   8115.6 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 94 (combinação= 31) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

```
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:46   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50         a       2.0     15.0    1    1                                                         |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   243.8       3873.4        2107.8     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 105 (combinação=  42)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:44   sub-projeto: 0011.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50         a       2.0     15.0    1    1                                                         |
```

| fundacao |

|____.______.______.___.___._____.____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.7.13 P2-c

Pilar:p2-c

num. 12 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____.____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 217.2 1765.1 -3607.2 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 97 (combinação= 34) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 10 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:24 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

```
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                               |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   202.6       3679.3        6274.7     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 100 (combinação=  37)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                               |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                               |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:23   sub-projeto: 0012.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                               |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   195.5       3996.8       10012.7    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 100 (combinação=  37)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
```

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:22   sub-projeto: 0012.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 194.5   4154.7   11015.5 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 100 (combinação= 37) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:21   sub-projeto: 0012.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 198.3 3319.0 10670.8 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 100 (combinação= 37) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:19 sub-projeto: 0012.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 205.0 3413.0 8905.7 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 100 (combinação= 37) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:18 sub-projeto: 0012.sub

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                              |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   211.8       3519.0        6142.0    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  95 (combinação=  32)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                               |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                               |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:16   sub-projeto: 0012.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a      2.0     15.0    1    1                                                              |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   216.7       3540.7        1775.8    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico = 100 (combinação=  37)  |
```

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 3 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:15   sub-projeto: 0012.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._____________.______________|

17.7.14 P2-d

Pilar:p2-d

num. 13   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________._____________.______________|

```
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   135.5       4937.8        2816.3    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  86 (combinação=  23)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:55   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                       |
|  50        a       2.0     15.0    1    1                                                   |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   139.9       4114.8        3084.9    |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 107 (combinação=  44)  |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:53   sub-projeto: 0013.sub
```

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_08   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 142.9   3443.6   4065.6 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 8 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:52   sub-projeto: 0013.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 148.8   3199.5   4662.0 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

```
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:50   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
|  50        a      2.0     15.0    1    1                                                          |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   155.2       3279.1        4658.7     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  95 (combinação=  32)   |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                 |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                 |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:49   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                         |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                         |
```

```
|  50        a      2.0     15.0    1    1                                                          |
| aux_05    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   167.1       2671.4        3932.7    |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  98 (combinação=  35)  |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                     |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                     |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:47   sub-projeto: 0013.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                        |
|  50        a      2.0     15.0    1    1                                                          |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                         10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   177.1       2801.2        2768.0    |
|                         12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  98 (combinação=  35)  |
|                         16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                   |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                     |
|                         25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                     |
```

```
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:46   sub-projeto: 0013.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a       2.0     15.0    1    1                                                             |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|.............|..............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   180.5       2878.8        925.0    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  98 (combinação=  35)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:44   sub-projeto: 0013.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                    |
|  50        a       2.0     15.0    1    1                                                             |
| fundacao                                                                                            |
|____.______.______.___.___._____.____.___.___.___.______.___.______|________.________|____________._____________._____________|
```

17.7.15 P2-e

Pilar:p2-e

```
 num. 14                                          esforço de cálculo do dimensionamento
+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.
Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |
|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|
| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   229.5      -2374.2       -1670.6     |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 474 (combinação= 190)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              | **ver nota (a)**                    |
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                              |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:23   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5            45.0     1.15       1.40        8.00     0.40       1.00   1.00   1.00  1.00                         |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
```

```
|  50       a      2.0    15.0    1    1                                                       |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   218.7       2210.3        -476.6    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  85 (combinação=  22)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:22   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5          45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50       a      2.0    15.0    1    1                                                       |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   213.5       3741.4         728.9    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  96 (combinação=  33)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                  |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                  |
```

```
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:21   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5          45.0     1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                              |

|  50       a      2.0     15.0    1    1                                                    |

| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   207.3       3639.3        719.0     |

|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  85 (combinação=  22)  |

|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |

|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |

|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:19   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |

|    2.5          45.0     1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                        |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                              |

|  50       a      2.0     15.0    1    1                                                    |

| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   205.8       3602.9        619.9     |
```

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:18   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 206.8   3611.7   600.3 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 95 (combinação= 32) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 5 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:16   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                          |
|  50       a      2.0     15.0    1    1                                     |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   210.2       3730.4        336.2    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  95 (combinação=  32)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                             |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                             |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:15   sub-projeto: 0014.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00      0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                          |
|  50       a      2.0     15.0    1    1                                     |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   213.0       3814.9        294.3    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  95 (combinação=  32)   |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                  |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                             |
```

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:13   sub-projeto: 0014.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|_____________._______________._______________|

17.7.16 P2-f

Pilar:p2-f

num. 15   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 126.7   3843.1   4619.4 |

```
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico =  87 (combinação=  24)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |
|I. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:54   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                       |
|  50        a       2.0     15.0    1    1                                                          |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                    10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   132.0       2984.2        2345.2     |
|                    12.5  5.0  64  25   7  78.54 0.4  76.48|             |  caso pórtico = 484 (combinação= 200)   |
|                    16.0  5.0  40  15   5  80.42 0.4  76.48|             |  **ver nota (a)**                  |
|I.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|             |                                |
|                    25.0  6.3  20   8   2  98.17 0.5  76.48|             |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:53   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                     |
|    2.5           45.0     1.15       1.40       8.00     0.40       1.00   1.00   1.00  1.00                       |
```

```
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                          |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   136.4       2654.8       -2737.3     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 109 (combinação=  46)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                        25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:51   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                              |
|  50        a       2.0     15.0    1    1                                          |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                        10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   143.1       2488.2       -3756.1     |
|                        12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 109 (combinação=  46)  |
|                        16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
```

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:50   sub-projeto: 0015.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 149.6   1995.4   -3982.4 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:48   sub-projeto: 0015.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

```
|                10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   159.1       2293.2       -3704.2    |
|                12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico = 104 (combinação=  41)  |
|                16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:47   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                  |
|  50        a       2.0     15.0    1    1                                                           |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   168.9       2602.0       -2724.3    |
|                12.5  5.0  64  25   7  78.54 0.4  76.48|               |  caso pórtico =  99 (combinação=  36)  |
|                16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                      |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                  |
|                25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                  |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:45   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
```

```
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                  |
|  50       a      2.0    15.0   1    1                                                          |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   173.0       2923.0       -775.8    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 104 (combinação=  41)  |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:44   sub-projeto: 0015.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5          45.0    1.15      1.40      8.00     0.40      1.00   1.00   1.00  1.00                       |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                  |
|  50       a      2.0    15.0   1    1                                                          |
| fundacao                                                                                       |
|____.______.______.___.___._____._____.___.___.___.______.___.______|_________._________|____________._______________._______________|
```

17.7.17 P2-g

```
Pilar:p2-g

 num. 16                                          esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite  nb nbh nbb as(cm)  ro asnec | lbdalm   lambda | fnd (tf)     mxd (tf,cm)      myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2 |   212.4      -3502.2         417.7     |

|                       12.5  5.0  64  25   7  78.54 0.4  76.48|               |   caso pórtico =  70 (combinação=   7)   |

|                       16.0  5.0  40  15   5  80.42 0.4  76.48|               |  **ver nota (a)**                     |

|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|               |                                       |

|                       25.0  6.3  20   8   2  98.17 0.5  76.48|               |                                       |

| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:25   sub-projeto: 0016.sub

|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                          |

|    2.5            45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |

| tipoaço  classeaço  excmin  excmax  k12  k37                                                              |

|  50        a       2.0     15.0    1    1                                                         |

| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
```

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 201.3 -3127.9 -5933.6 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 83 (combinação= 20) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 9 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:23 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_08 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 192.3 2983.2 -8698.3 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 8 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:22 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_07   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 191.5   3524.9   -9551.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 7 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:21   sub-projeto: 0016.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 195.3   2813.4   -9585.5 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 6 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:20 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 201.9 3152.7 -8146.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|I. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:18 sub-projeto: 0016.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

```
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   208.3       3382.4       -5792.1     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico =  99 (combinação=  36)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:17   sub-projeto: 0016.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                  |
|  50        a       2.0     15.0    1    1                                                    |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   213.5       3710.8       -1529.3     |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |   caso pórtico = 104 (combinação=  41)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:15   sub-projeto: 0016.sub
```

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

17.7.18 P2-h

Pilar:p2-h

num. 17   esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.-------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm   lambda | fnd (tf)   mxd (tf,cm)   myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|.............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 88.7   3282.2   9559.5 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 104 (combinação= 41) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

```
|l. 10  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:55   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                    |
|  50        a       2.0     15.0    1    1                                              |
| fundacao  .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   102.1       3580.9      -17208.0    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 109 (combinação=  46)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  9  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:53   sub-projeto: 0017.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                     |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                    |
|  50        a       2.0     15.0    1    1                                              |
```

```
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|.............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   129.3       3635.4      -21453.0    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 109 (combinação=  46)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:52   sub-projeto: 0017.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                      |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                      |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                   |
|  50        a       2.0     15.0    1    1                                                          |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|.............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   158.4       3425.3      -23993.6    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  99 (combinação=  36)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:50   sub-projeto: 0017.sub
```

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_06   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 190.2   3783.2   -19127.9 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 99 (combinação= 36) |

| 16.0 5.0 40 15   5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 6 80.0 239.0 0.4 24 20.0 5.0 24   9   3 75.40 0.4 75.94| | |

| 25.0 6.3 20   8   2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:49   sub-projeto: 0017.sub

| cobrimento[cm]   fck[mpa] gamaaço gamaconcreto   asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5   45.0   1.15   1.40   8.00   0.40   1.00   1.00   1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50   a   2.0   15.0   1   1 |

| aux_05   .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0   52.2 | 213.8   3574.4   -12272.1 |

| 12.5 5.0 64 25   7 78.54 0.4 76.48| | caso pórtico = 90 (combinação= 27) |

```
|                16.0  5.0  40  15   5  80.42 0.4  76.48|           | **ver nota (a)**              |
|I.  5  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|           |                        |
|                25.0  6.3  20   8   2  98.17 0.5  76.48|           |                        |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:48   sub-projeto: 0017.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                |
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
|  50        a      2.0     15.0    1    1                                  |
| aux_04    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   235.0       3762.3       -7866.8     |
|                12.5  5.0  64  25   7  78.54 0.4  76.48|           |  caso pórtico =  90 (combinação=  27)  |
|                16.0  5.0  40  15   5  80.42 0.4  76.48|           | **ver nota (a)**              |
|I.  4  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|           |                        |
|                25.0  6.3  20   8   2  98.17 0.5  76.48|           |                        |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:08:46   sub-projeto: 0017.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                |
|    2.5          45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                |
| tipoaço  classeaço  excmin  excmax  k12  k37                                        |
```

| 50 a 2.0 15.0 1 1 |

| aux_03 .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 241.2 3884.0 -1896.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 109 (combinação= 46) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 3 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:08:44 sub-projeto: 0017.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao |

|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________._______________|

17.7.19 P2-i

Pilar:p2-i

num. 18 esforço de cálculo do dimensionamento

+----.-----.-----.---.---.----.----.---.---.---.------.---.------.--------.--------+------------.--------------.---------------.

Lance b(cm) h(cm) ros sel bitl bite nb nbh nbb as(cm) ro asnec | lbdalm lambda | fnd (tf) mxd (tf,cm) myd (tf,cm) |

|____.______.______.___.___._____._____.___.___.___._______.___._______|_________._________|_____________._______________._______________|

| travessa .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

|l. 10 80.0 239.0 1.2 76 20.0 5.0 76 27 11 238.76 1.2 234.05| 35.0 52.2 | 783.8 9282.9 -166402.9 |

| 25.0 6.3 48 16 8 235.62 1.2 228.26| | caso pórtico = 94 (combinação= 31) |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:25 sub-projeto: 0018.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| fundacao .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|

| 12.5 5.0 82 31 10 100.63 0.5 100.63| 35.0 52.2 | 807.3 9376.0 -116284.7 |

| 16.0 5.0 50 18 7 100.53 0.5 99.02| | caso pórtico = 94 (combinação= 31) |

|l. 9 80.0 239.0 0.5 32 20.0 5.0 32 11 5 100.53 0.5 97.71| | **ver nota (a)** |

| 25.0 6.3 22 8 3 107.99 0.6 96.82| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:23 sub-projeto: 0018.sub

```
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a      2.0     15.0    1    1                                                                |
| aux_08    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   755.3       9956.4      -62450.8     |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 103 (combinação=  40)   |
|                     16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|l.  8  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                     25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:22   sub-projeto: 0018.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                    |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                          |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a      2.0     15.0    1    1                                                                |
| aux_07    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                     10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   745.7       9532.8      -32733.1     |
|                     12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 103 (combinação=  40)   |
```

```
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|I.  7  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:21   sub-projeto: 0018.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                           |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
|  50        a       2.0     15.0    1    1                                                             |
| aux_06    .....|...|...|....|....|...|...|...|......|...|......|........|........|............|..............|...............|
|                       10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   723.3       8528.9      -15983.8    |
|                       12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico =  85 (combinação=  22)  |
|                       16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                     |
|I.  6  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                                      |
|                       25.0  6.3  20   8   2  98.17 0.5  76.48|              |                                      |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:20   sub-projeto: 0018.sub
|  cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                        |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                           |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                          |
```

| 50 a 2.0 15.0 1 1 |

| aux_05 .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 706.4 8073.2 -7678.0 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 5 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

| valores cálculos definidos arquivo critérios - 08/01/22 - 08:09:18 sub-projeto: 0018.sub

| cobrimento[cm] fck[mpa] gamaaço gamaconcreto asmax[%] asmin[%] gmapn gmapm gmavn gmavm |

| 2.5 45.0 1.15 1.40 8.00 0.40 1.00 1.00 1.00 1.00 |

| tipoaço classeaço excmin excmax k12 k37 |

| 50 a 2.0 15.0 1 1 |

| aux_04 .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|..............|...............|

| 10.0 5.0 98 39 10 76.97 0.4 76.48| 35.0 52.2 | 690.4 7660.4 -3965.1 |

| 12.5 5.0 64 25 7 78.54 0.4 76.48| | caso pórtico = 85 (combinação= 22) |

| 16.0 5.0 40 15 5 80.42 0.4 76.48| | **ver nota (a)** |

|l. 4 80.0 239.0 0.4 24 20.0 5.0 24 9 3 75.40 0.4 75.94| | |

| 25.0 6.3 20 8 2 98.17 0.5 76.48| | |

```
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:17   sub-projeto: 0018.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                         |
| aux_03    .....|...|...|....|....|...|...|...|......|...|......|........|........|...........|.............|..............|
|                      10.0  5.0  98  39  10  76.97 0.4  76.48|   35.0    52.2  |   697.3       7576.1        -487.4    |
|                      12.5  5.0  64  25   7  78.54 0.4  76.48|              |  caso pórtico = 109 (combinação=  46)   |
|                      16.0  5.0  40  15   5  80.42 0.4  76.48|              |  **ver nota (a)**                    |
|I.  3  80.0 239.0 0.4  24 20.0  5.0  24   9   3  75.40 0.4  75.94|              |                              |
|                      25.0  6.3  20   8   2  98.17 0.5  76.48|              |                              |
| valores cálculos definidos arquivo critérios  -  08/01/22 - 08:09:15   sub-projeto: 0018.sub
| cobrimento[cm]   fck[mpa] gamaaço  gamaconcreto   asmax[%]  asmin[%]  gmapn  gmapm  gmavn gmavm                       |
|    2.5           45.0     1.15       1.40       8.00     0.40      1.00   1.00   1.00  1.00                        |
| tipoaço  classeaço  excmin  excmax  k12  k37                                                                        |
|  50        a       2.0     15.0    1    1                                                         |
| fundacao                                                                                         |
|____.______.______.___.___._____._____.___.___.___.______.___.______|________.________|____________.______________.______________|
```

17.8 Seleção de bitolas de pilares

17.8.1 Legenda

Seção : dimensões da seção tansversal (seção retangular)

nome da seção (seção qualquer)

Área : área de concreto da seção transversal

Nfer : número de ferros

Pdd : pé-direito duplo (direções 'x' e 'y')

s: sim n: não

As : área total de armadura utilizada

Taxa : taxa de armadura da seção

Estr : bitola do estribo

C/ : espaçamento do estribo

Fck : fck utilizado no lance

Cobr : cobrimento utilizado no lance

Pp : pilar-parede: (s) sim (n)não

Pp : s* :pilar-parede (sim), mas ast não atende o item 18.5 da nbr6118

T : tensão de cálculo (carga vertical: combinação 1 tqs pilar) (kgf/cm2)

Lbd : índice de esbeltez (maior lambda)

Ni : força normal admensional (nsd / ac*fcd) (carga vertical: combinação 1 tqs pilar)

2ordm : método utilizado cálculo momento 2ªordem

Elol : efeito local (15.8.3)

Elzd : efeito localizado (15.9.3)

Kapa : pilar padrão com rigidez kapa aproximada (15.8.3.3.3)

Curv : pilar padrão com curvatura aproximada (15.8.3.3.2)

N,m,1/r : pilar padrão acoplado ao diagrama n,m,1/r (15.8.3.3.4)

Metgerl : método geral (15.8.3.2)

17.8.2 P1-a

Pilar:p1-a num: 1 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

```
 10  travessa       80.x 239.   19120.0   60    20.0  n s    188.5  0.99    5.0  20.0 n  45.0    2.5  30.6  52. 0.0953 elol kapa
  9  fundacao       80.x 239.   19120.0   26    20.0  n s     81.7  0.43    5.0  20.0 n  45.0    2.5  31.5  52. 0.0980 elol kapa
  8  aux_08         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  31.6  52. 0.0983 elol kapa
  7  aux_07         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  31.2  52. 0.0970 elol kapa
  6  aux_06         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  30.5  52. 0.0950 elol kapa
  5  aux_05         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  29.8  52. 0.0928 elol kapa
  4  aux_04         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  29.2  52. 0.0908 elol kapa
  3  aux_03         80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  29.2  52. 0.0910 elol kapa
```

17.8.3 P1-b

```
-----------------------------------------------------------------------------------------------------------------------------

Pilar:p1-b                                                  num:  2 lances:  3 à  10

-----------------------------------------------------------------------------------------------------------------------------

Lance  título        seção        área   nfer  bitola pdd     as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm

                     [cm]        [cm2]        [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)

 10  travessa       80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  -0.2  58. -.0006 elol kapa
  9  fundacao       80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5   0.9  58. 0.0027 elol kapa
```

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 2.5 58. 0.0077 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.2 58. 0.0130 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.8 58. 0.0179 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 7.1 58. 0.0222 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.3 58. 0.0257 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.5 58. 0.0264 elol kapa

17.8.4 P1-c

Pilar:p1-c num: 3 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 12.2 52. 0.0380 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.2 52. 0.0348 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.5 52. 0.0326 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.1 52. 0.0313 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.9 52. 0.0309 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.0 52. 0.0310 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.1 52. 0.0315 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.3 52. 0.0320 elol kapa

17.8.5 P1-d

Pilar:p1-d num: 4 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 1.1 58. 0.0033 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 2.0 58. 0.0061 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 2.7 58. 0.0085 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 3.5 58. 0.0108 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.2 58. 0.0131 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 4.9 58. 0.0154 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.7 58. 0.0176 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 5.9 58. 0.0182 elol kapa

17.8.6 P1-e

Pilar:p1-e num: 5 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 13.0 52. 0.0403 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 12.0 52. 0.0374 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.3 52. 0.0351 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.7 52. 0.0334 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.4 52. 0.0323 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.2 52. 0.0318 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.2 52. 0.0317 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.3 52. 0.0321 elol kapa

17.8.7 P1-f

Pilar:p1-f num: 6 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.1	58.	0.0033	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	1.9	58.	0.0060	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.7	58.	0.0084	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	3.4	58.	0.0107	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.2	58.	0.0129	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.9	58.	0.0152	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.6	58.	0.0174	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.8	58.	0.0180	elol kapa

17.8.8 P1-g

Pilar:p1-g num: 7 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	11.8	52.	0.0366	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.8	52.	0.0335	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.1	52.	0.0314	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.7	52.	0.0302	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.6	52.	0.0299	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.7	52.	0.0301	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.9	52.	0.0307	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.0	52.	0.0311	elol kapa

17.8.9 P1-h

Pilar:p1-h num: 8 lances: 3 à 10

Lance	título	seção [cm]	área [cm2]	nfer	bitola [mm]	pdd x y	as [cm2]	taxa [%]	estr [mm]	c/ [cm]	pp	fck (mpa)	cobr (cm)	t	lbd	ni	2ordm
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	-0.2	58.	-.0006	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	0.9	58.	0.0027	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	2.4	58.	0.0076	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.2	58.	0.0129	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.7	58.	0.0179	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.1	58.	0.0221	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.2	58.	0.0257	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.5	58.	0.0264	elol kapa

17.8.10 P1-i

Pilar:p1-i num: 9 lances: 3 à 10

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Lance  título      seção       área   nfer  bitola pdd    as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm

                 [cm]       [cm2]       [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)

 10  travessa      80.x 239.   19120.0   60    20.0  n s    188.5  0.99    5.0  20.0 n  45.0    2.5  31.0  52. 0.0963 elol kapa

  9  fundacao      80.x 239.   19120.0   26    20.0  n s     81.7  0.43    5.0  20.0 n  45.0    2.5  31.8  52. 0.0991 elol kapa

  8  aux_08        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  31.9  52. 0.0993 elol kapa

  7  aux_07        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  31.5  52. 0.0979 elol kapa

  6  aux_06        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  30.8  52. 0.0959 elol kapa

  5  aux_05        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  30.1  52. 0.0938 elol kapa

  4  aux_04        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  29.5  52. 0.0918 elol kapa

  3  aux_03        80.x 239.   19120.0   24    20.0  n s     75.4  0.39    5.0  20.0 n  45.0    2.5  29.5  52. 0.0919 elol kapa
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17.8.11 P2-a

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Pilar:p2-a                                                              num: 10 lances:  3 à  10

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Lance  título      seção       área   nfer  bitola pdd    as   taxa  estr   c/  pp  fck   cobr    t  lbd    ni  2ordm

                 [cm]       [cm2]       [mm]  x y    [cm2]   [%]  [mm]  [cm]    (mpa)  (cm)
```

10	travessa	80.x 239.	19120.0	54	25.0	n s	265.1	1.39	6.3	20.0 n	45.0	2.5	37.7	52.	0.1172	elol	kapa
9	fundacao	80.x 239.	19120.0	38	20.0	n s	119.4	0.62	5.0	20.0 n	45.0	2.5	39.1	52.	0.1216	elol	kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	39.4	52.	0.1226	elol	kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	39.0	52.	0.1214	elol	kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	38.3	52.	0.1192	elol	kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	37.5	52.	0.1167	elol	kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	36.7	52.	0.1143	elol	kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	36.8	52.	0.1144	elol	kapa

17.8.12 P2-b

Pilar:p2-b num: 11 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.7	52.	0.0147	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.4	52.	0.0168	elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 6.8 52. 0.0211 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 8.4 52. 0.0263 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.0 52. 0.0312 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.4 52. 0.0354 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 12.5 52. 0.0389 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 12.7 52. 0.0396 elol kapa

17.8.13 P2-c

Pilar:p2-c num: 12 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.3 52. 0.0352 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.7 52. 0.0332 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.3 52. 0.0321 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.3 52. 0.0319 elol kapa

6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	10.4	52.	0.0325	elol	kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	10.8	52.	0.0336	elol	kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	11.2	52.	0.0349	elol	kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0 n	45.0	2.5	11.4	52.	0.0354	elol	kapa

17.8.14 P2-d

Pilar:p2-d num: 13 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.0	52.	0.0218	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.3	52.	0.0226	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.5	52.	0.0234	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.8	52.	0.0244	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.2	52.	0.0256	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.7	52.	0.0271	elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.2 52. 0.0287 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 9.4 52. 0.0293 elol kapa

17.8.15 P2-e

Pilar:p2-e num: 14 lances: 3 à 10

Lance título seção área nfer bitola pdd as taxa estr c/ pp fck cobr t lbd ni 2ordm

[cm] [cm2] [mm] x y [cm2] [%] [mm] [cm] (mpa) (cm)

10 travessa 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 12.0 52. 0.0372 elol kapa

9 fundacao 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.5 52. 0.0357 elol kapa

8 aux_08 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.1 52. 0.0346 elol kapa

7 aux_07 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.9 52. 0.0339 elol kapa

6 aux_06 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.8 52. 0.0337 elol kapa

5 aux_05 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 10.9 52. 0.0339 elol kapa

4 aux_04 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.1 52. 0.0345 elol kapa

3 aux_03 80.x 239. 19120.0 24 20.0 n s 75.4 0.39 5.0 20.0 n 45.0 2.5 11.2 52. 0.0349 elol kapa

17.8.16 P2-f

Pilar:p2-f num: 15 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.5	52.	0.0204	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.8	52.	0.0213	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.1	52.	0.0222	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.5	52.	0.0233	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	7.9	52.	0.0246	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.4	52.	0.0262	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.0	52.	0.0278	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.1	52.	0.0284	elol kapa

17.8.17 P2-g

Pilar:p2-g num: 16 lances: 3 à 10

Lance	título	seção [cm]	área [cm2]	nfer	bitola [mm]	pdd x y	as [cm2]	taxa [%]	estr [mm]	c/ [cm]	pp	fck (mpa)	cobr (cm)	t	lbd	ni	2ordm
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	11.1	52.	0.0346	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.5	52.	0.0326	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.1	52.	0.0316	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.1	52.	0.0314	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.3	52.	0.0320	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	10.6	52.	0.0330	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	11.0	52.	0.0343	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	11.2	52.	0.0348	elol kapa

17.8.18 P2-h

Pilar:p2-h num: 17 lances: 3 à 10

Lance	título	seção [cm]	área [cm2]	nfer	bitola [mm]	pdd x y	as [cm2]	taxa [%]	estr [mm]	c/ [cm]	pp	fck (mpa)	cobr (cm)	t	lbd	ni	2ordm
10	travessa	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	4.6	52.	0.0143	elol kapa
9	fundacao	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	5.3	52.	0.0165	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	6.7	52.	0.0209	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	8.3	52.	0.0260	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	9.9	52.	0.0308	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	11.2	52.	0.0349	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	12.3	52.	0.0384	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	12.6	52.	0.0391	elol kapa

17.8.19 P2-i

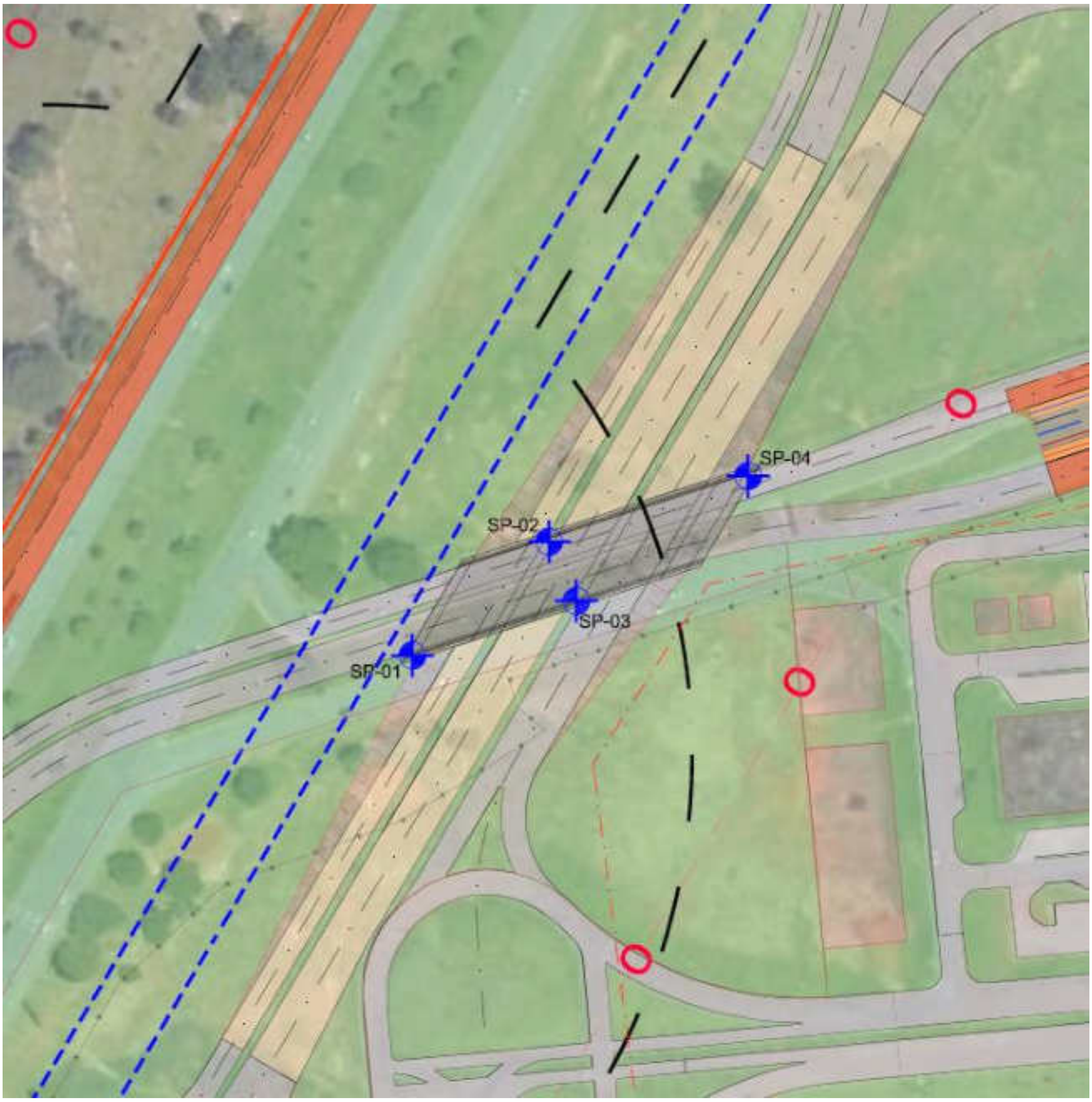
Pilar:p2-i num: 18 lances: 3 à 10

Lance	título	seção	área	nfer	bitola	pdd	as	taxa	estr	c/	pp	fck	cobr	t	lbd	ni	2ordm
		[cm]	[cm2]		[mm]	x y	[cm2]	[%]	[mm]	[cm]		(mpa)	(cm)				
10	travessa	80.x 239.	19120.0	76	20.0	n s	238.8	1.25	5.0	20.0	n	45.0	2.5	38.0	52.	0.1181	elol kapa
9	fundacao	80.x 239.	19120.0	32	20.0	n s	100.5	0.53	5.0	20.0	n	45.0	2.5	39.1	52.	0.1216	elol kapa
8	aux_08	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	39.2	52.	0.1220	elol kapa
7	aux_07	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	38.7	52.	0.1204	elol kapa
6	aux_06	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	37.9	52.	0.1179	elol kapa
5	aux_05	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	37.0	52.	0.1153	elol kapa
4	aux_04	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	36.2	52.	0.1127	elol kapa
3	aux_03	80.x 239.	19120.0	24	20.0	n s	75.4	0.39	5.0	20.0	n	45.0	2.5	36.3	52.	0.1128	elol kapa

18 Sondagens

Projeto de fundações elaborado com base no relatório de sondagem da aet arquitetura planejamento e transportes ltda de abril de 2021.

- Cliente: der/df
- Local: ligação stn-epia - setor noroeste - brasília / df
- Relatórios: spt 01 até spt 04.



LAUDO DE SONDAGEM - SPT

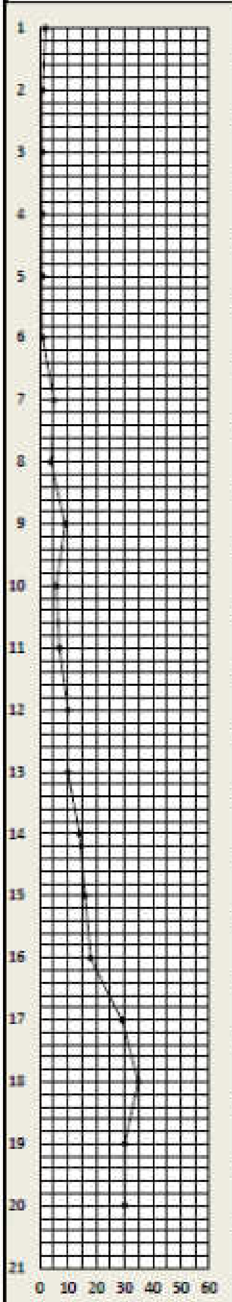
SPT 01

Cliente:	Volar Engenharia			Data:	
Local:	Ligação STN-EPIA - Setor Noroeste - Brasília/DF			16/07/2021	
Obra:	Fundação		Sondador:	Darisvan	
Amostrador:		SPT 2"	Revestimento:		2 1/2"
Peso do pilão:		65Kg	Altura de queda:		75 cm
			Comp. revestimento:		1,00 m

LEGENDA:

- (N) Número de golpes para uma penetração de X cm.
- (NA) Nível d'água.
- (A) Número da amostra.

NA INICIAL (m):	5,10
NA FINAL (m):	3,61
COORDENADAS:	187550.00 m E
FUSO 23L	8257753.00 m S



N/30		A	Prof (m)	N.A.(m)	CLASSIFICAÇÃO DO SOLO
2	/30	1	1,00 1,45		Argila arenosa, Variegada, MUITO MOLE.
1	/30	2	2,00 2,45		Argila pouco arenosa, Amarela, MUITO MOLE.
1	/30	3	3,00 3,45		Argila pouco arenosa, Amarela, MUITO MOLE.
1	/30	4	4,00 4,45		Argila pouco arenosa pouco siltosa, Variegada, MUITO MOLE.
1	/30	5	5,00 5,45		Argila pouco arenosa pouco siltosa, Variegada, MUITO MOLE.
1	/30	6	6,00 6,45		Argila pouco arenosa pouco siltosa, Variegada, MUITO MOLE.
5	/30	7	7,00 7,45		Argila pouco arenosa pouco siltosa, Variegada, MOLE.
4	/30	8	8,00 8,45		Argila pouco arenosa pouco siltosa, Variegada, MOLE.
9	/30	9	9,00 9,45		Areia argilosa, Variegada, MEDIANAMENTE COMPACTA.
6	/30	10	10,00 10,45		Areia argilosa, Variegada, POUCO COMPACTA.
7	/30	11	11,00 11,45		Areia argilosa com pedregulho, Variegada, POUCO COMPACTA.
10	/30	12	12,00 12,45		Areia argilosa com pedregulho, Variegada, MEDIANAMENTE COMPACTA.
10	/30	13	13,00 13,45		Areia argilosa com pedregulho, Variegada, MEDIANAMENTE COMPACTA.
14	/12	14	14,00 14,45		Areia argilosa com pedregulho, Variegada, MEDIANAMENTE COMPACTA.
16	/30	15	15,00 15,45		Silte argiloso, Variegado, RIJO.
18	/30	16	16,00 16,45		Silte argiloso, Variegado, RIJO.
29	/30	17	17,00 17,45		Silte argiloso, Variegado, MUITO RIJO.
35	/30	18	18,00 18,45		Silte pouco argiloso, Variegado, DURO.
30	/14	19	19,00 19,29		Silte pouco argiloso, Variegado, DURO.
30	/10 cm iniciais	20	20,00 20,10		Silte pouco argiloso, Variegado, DURO.
					OBS: Limite da sondagem, penetração interrompida antes de 45 cm, quando um dos segmentos de 15 cm ultrapassar 30 golpes.

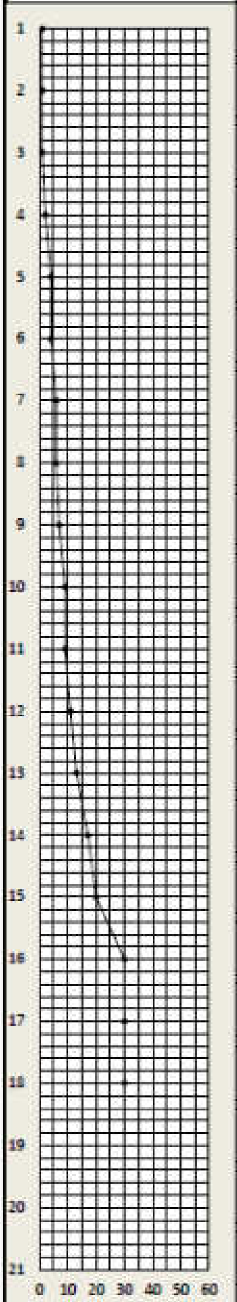
OBS: Término da sondagem.

LAUDO DE SONDAGEM - SPT

SPT 02

Cliente:	Volar Engenharia				Data:
Local:	Ligação STN-EPIA - Setor Noroeste - Brasília/DF				15/07/2021
Obra:	Fundação		Sondador:	Danisvan	
Amostrador:		SPT 2"	Revestimento:	2 1/2"	
Peso do pilão:		65Kg	Altura de queda:	75 cm	
			Comp. revestimento:	1,00 m	

LEGENDA:	(N)	Número de golpes para uma penetração de X cm.	NA INICIAL (m):	4,57
	(NA)	Nível d'água.	NA FINAL (m):	3,63
	(A)	Número da amostra.	COORDENADAS:	187591.00 m E
			FUSO 23L	8257789.00 m S



N/30		A	Prof (m)	N.A.(m)	CLASSIFICAÇÃO DO SOLO
1	/30	1	1,00 1,45		Argila arenosa, Amarela, MUITO MOLE.
1	/30	2	2,00 2,45		Argila arenosa, Amarela, MUITO MOLE.
1	/30	3	3,00 3,45		Argila arenosa, Variegada, MUITO MOLE.
2	/30	4	4,00 4,45		Argila arenosa pouco siltosa, Variegada, MUITO MOLE.
4	/30	5	5,00 5,45		Argila arenosa pouco siltosa, Variegada, MOLE.
4	/30	6	6,00 6,45		Argila arenosa pouco siltosa, Variegada, MOLE.
6	/30	7	7,00 7,45		Argila arenosa pouco siltosa, Variegada, MÉDIA.
6	/30	8	8,00 8,45		Argila siltosa, Variegada, MÉDIA.
7	/30	9	9,00 9,45		Argila siltosa, Variegada, MÉDIA.
9	/30	10	10,00 10,45		Argila siltosa, Variegada, MÉDIA.
9	/30	11	11,00 11,45		Argila siltosa, Variegada, MÉDIA.
11	/30	12	12,00 12,45		Silte argiloso, Variegado, RIJO.
13	/30	13	13,00 13,45		Silte argiloso, Variegado, RIJO.
17	/12	14	14,00 14,45		Silte pouco argiloso, Variegado, RIJO.
20	/28	15	15,00 15,43		Silte pouco argiloso, Variegado, MUITO RIJO.
30	/14 cm iniciais	16	16,00 16,14		Silte pouco argiloso, Variegado, DURO.
30	/10 cm iniciais	17	17,00 17,10		Silte pouco argiloso, Variegado, DURO.
30	/5 cm iniciais	18	18,00 18,05		Silte pouco argiloso, Variegado, DURO.
					OBS: Limite da sondagem, penetração interrompida antes de 45 cm, quando um dos segmentos de 15 cm ultrapassar 30 golpes.

OBS: Término da sondagem.

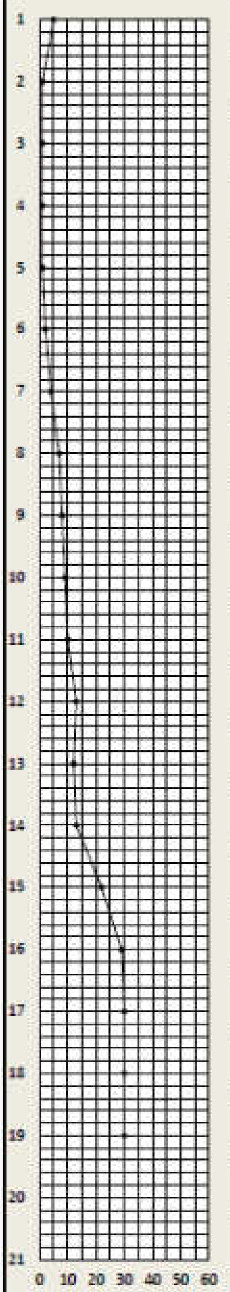
LAUDO DE SONDAGEM - SPT

SPT 03

Cliente:	Volar Engenharia	Data:	
Local:	Ligação STN-EPIA - Setor Noroeste - Brasília/DF	19/07/2021	
Obra:	Fundação	Sondador:	Darisvan
Amostrador:	SPT 2"	Revestimento:	2 1/2"
Peso do pilão:	65Kg	Altura de queda:	75 cm
		Comp. revestimento:	1,00 m

LEGENDA:
(N) Número de golpes para uma penetração de X cm.
(NA) Nível d'água.
(A) Número da amostra.

NA INICIAL (m):	4,57
NA FINAL (m):	3,85
COORDENADAS:	187599.00 m E
FUSO 23L	8257769.00 m S



N/30		A	Prof (m)	N.A.(m)	CLASSIFICAÇÃO DO SOLO
5	/30	1	1,00 – 1,45		Argila arenosa com pouco pedregulho, Amarela, MOLE.
1	/30	2	2,00 – 2,45		Argila arenosa com pouco pedregulho, Amarela, MUITO MOLE.
1	/30	3	3,00 – 3,45		Argila arenosa com pouco pedregulho, Amarela, MUITO MOLE.
1	/30	4	4,00 – 4,45		Argila arenosa, Vermelha, MUITO MOLE.
1	/30	5	5,00 – 5,45		Argila arenosa, Vermelha, MUITO MOLE.
2	/30	6	6,00 – 6,45		Argila arenosa, Vermelha, MUITO MOLE.
4	/30	7	7,00 – 7,45		Argila arenosa, Vermelha, MOLE.
7	/30	8	8,00 – 8,45		Argila arenosa, Vermelha, MÉDIA.
8	/30	9	9,00 – 9,45		Argila siltosa pouco arenosa, Variegada, MÉDIA.
9	/30	10	10,00 – 10,45		Argila siltosa pouco arenosa, Variegada, MÉDIA.
10	/30	11	11,00 – 11,45		Argila siltosa pouco arenosa, Variegada, MÉDIA.
13	/30	12	12,00 – 12,45		Argila siltosa pouco arenosa, Variegada, RIJA.
12	/30	13	13,00 – 13,45		Argila siltosa pouco arenosa, Variegada, RIJA.
13	/12	14	14,00 – 14,45		Argila siltosa pouco arenosa, Variegada, RIJA.
22	/30	15	15,00 – 15,45		Silte pouco argiloso, Variegado, MUITO RIJO.
29	/30	16	16,00 – 16,45		Silte pouco argiloso, Variegado, MUITO RIJO.
30	/10	17	17,00 – 17,25		Silte pouco argiloso, Variegado, DURO.
30	/13 cm iniciais	18	18,00 – 18,13		Silte pouco argiloso, Variegado, DURO.
30	/10 cm iniciais	19	19,00 – 19,10		Silte pouco argiloso, Variegado, DURO.
					OBS: Limite da sondagem, penetração interrompida antes de 45 cm, quando um dos segmentos de 15 cm ultrapassar 30 golpes.

OBS: Término da sondagem.

LAUDO DE SONDAGEM - SPT

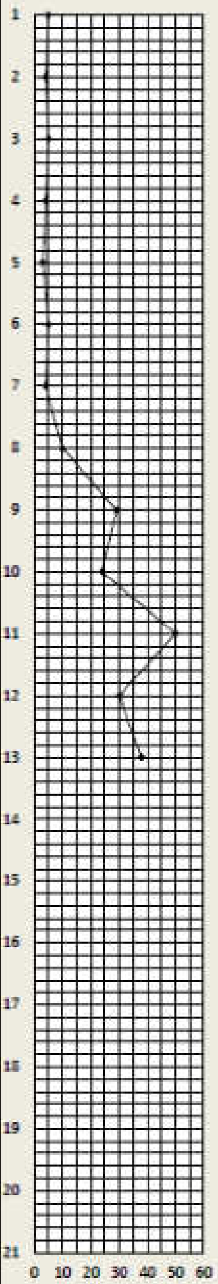
SPT 04

Cliente:	Volar Engenharia			Data:	
Local:	Ligação STN-EPIA - Setor Noroeste - Brasília/DF			14/07/2021	
Obra:	Fundação		Sondador:	Darisvan	
Amostrador:		SPT 2"	Revestimento:		2 1/2"
Peso do pilão:		65Kg	Altura de queda:		75 cm
			Comp. revestimento:		1,00 m

LEGENDA:

(N)	Número de golpes para uma penetração de X cm.
(NA)	Nível d'água.
(A)	Número da amostra.

NA INICIAL (m):	5,05
NA FINAL (m):	4,06
COORDENADAS:	187651.00 m E
FUSO 23L	8257809.00 m S



N/30		A	Prof (m)	N.A.(m)	CLASSIFICAÇÃO DO SOLO
5	/30	1	1,00 1,45		Argila arenosa com pedregulho, Amarela, MOLE.
4	/30	2	2,00 2,45		Argila arenosa com pedregulho, Variegada, MOLE.
5	/30	3	3,00 3,45		Silte argiloso, Variegado, MOLE.
4	/30	4	4,00 4,45	4,06	Silte argiloso, Variegado, MOLE.
3	/30	5	5,00 5,45		Silte argiloso, Variegado, MOLE.
5	/30	6	6,00 6,45		Silte argiloso, Cinza, MOLE.
4	/30	7	7,00 7,45		Silte argiloso, Cinza, MOLE.
10	/30	8	8,00 8,45		Silte argiloso, Cinza, MÉDIO.
29	/30	9	9,00 9,45		Silte argiloso, Amarelo, MUITO RIJO.
24	/30	10	10,00 10,45		Silte argiloso, Amarelo, MUITO RIJO.
50	/29	11	11,00 11,44		Silte argiloso, Variegado, DURO.
30	/14	12	12,00 12,29		Silte pouco argiloso, Variegado, DURO.
38	/14 cm iniciais	13	13,00 13,14		Silte pouco argiloso, Variegado, DURO.
					OBS: Limite da sondagem, penetração interrompida antes de 45 cm, quando um dos segmentos de 15 cm ultrapassar 30 golpes.

OBS: Término da sondagem.

19 Memorial De Cálculo Das Fundações

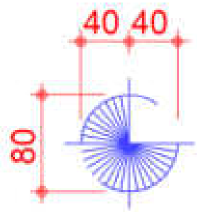
A seguir são apresentados os dados e resultados do cálculo/dimensionamento das fundações:

19.1 Estacas

19.2 Geometria

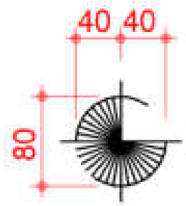
19.2.1 E1

As estacas e1 são do tipo hélice contínua com diâmetro de 80 cm e profundidade de 19 metros.



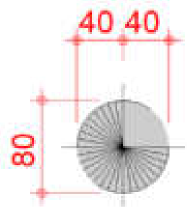
19.2.2 E2

As estacas e2 são do tipo hélice contínua com diâmetro de 80 cm e profundidade de 10 metros.



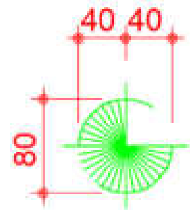
19.2.3 E3

As estacas e3 são do tipo hélice contínua com diâmetro de 80 cm e profundidade de 11 metros.



19.2.4 E4

As estacas e4 são do tipo hélice contínua com diâmetro de 80 cm e profundidade de 13 metros.



19.3 Resistência geotécnica das estacas

Foram utilizadas estacas do tipo hélice contínua com diâmetro de 80 cm. O cálculo da resistência geotécnica foi feito utilizando o método de aoki velloso.

19.3.1 E1

Para cálculo da resistência geotécnica das estacas e1 foi utilizado o laudo de sondagem sm1. Existem 2 metros de aterro para estaca e1, logo o spt dos 2 primeiros metros foi considerdo o valor de 0.

Ponta	Prof. (cm)	SPT	K	α	Carga (Kgf)		
	100	0	3.5	0.024	Nf=	0.0	Argila arenosa
	200	0	3.5	0.024	Nf=	0.0	Argila arenosa
	300	2	3.5	0.024	Nf=	1055.6	Argila arenosa
	400	1	3.5	0.024	Nf=	527.8	Argila arenosa
	500	1	3.5	0.024	Nf=	527.8	Argila arenosa
	600	1	3.0	0.028	Nf=	527.8	Argila areno-siltosa
	700	1	3.0	0.028	Nf=	527.8	Argila areno-siltosa
	800	1	3.0	0.028	Nf=	527.8	Argila areno-siltosa
	900	5	3.0	0.028	Nf=	2638.9	Argila areno-siltosa
	1000	4	3.0	0.028	Nf=	2111.2	Argila areno-siltosa
	1100	9	6.0	0.030	Nf=	10178.8	Areia argilosa
	1200	6	6.0	0.030	Nf=	6785.8	Areia argilosa
	1300	7	6.0	0.030	Nf=	7916.8	Areia argilosa
	1400	10	6.0	0.030	Nf=	11309.7	Areia argilosa
	1500	10	6.0	0.030	Nf=	11309.7	Areia argilosa
	1600	14	6.0	0.030	Nf=	15833.6	Areia argilosa
	1700	16	2.3	0.034	Nf=	7861.5	Silte argiloso
	1800	18	2.3	0.034	Nf=	8844.2	Silte argiloso
	1900	29	2.3	0.034	Nf=	14249.0	Silte argiloso
x	Ponta	35	2.3	0.034	Np=	167635.4	Silte argiloso

Resistência total da estaca (tf)	
N=	128.417

19.3.2 E2

Para cálculo da resistência geotécnica das estacas e2 foi utilizado o laudo de sondagem sm2.

Existem 7 metros de corte para estaca e2, logo o spt dos 7 primeiros metros foram descartados.

Ponta	Prof. (cm)	SPT	K	α	Carga (Kgf)		
	100	6	2.2	0.040	Nf=	3317.5	Argila siltosa
	200	7	2.2	0.040	Nf=	3870.4	Argila siltosa
	300	9	2.2	0.040	Nf=	4976.3	Argila siltosa
	400	9	2.2	0.040	Nf=	4976.3	Argila siltosa
	500	11	2.3	0.034	Nf=	5404.8	Silte argiloso
	600	13	2.3	0.034	Nf=	6387.5	Silte argiloso
	700	17	2.3	0.034	Nf=	8352.9	Silte argiloso
	800	20	2.3	0.034	Nf=	9826.9	Silte argiloso
	900	30	2.3	0.034	Nf=	14740.4	Silte argiloso
	1000	30	2.3	0.034	Nf=	14740.4	Silte argiloso
x	Ponta	30	2.3	0.034	Np=	173415.9	Silte argiloso

Resistência total da estaca (tf)	
N=	95.742

19.3.3 E3

Para cálculo da resistência geotécnica das estacas e3 foi utilizado o laudo de sondagem sm3. Existem 7 metros de corte para estaca e3, logo o spt dos 7 primeiros metros foram descartados.

Ponta	Prof. (cm)	SPT	K	α	Carga (Kgf)		
	100	7	3.5	0.024	Nf=	3694.5	Argila arenosa
	200	8	3.3	0.030	Nf=	4976.3	Argila silto-arenosa
	300	9	3.3	0.030	Nf=	5598.3	Argila silto-arenosa
	400	10	3.3	0.030	Nf=	6220.4	Argila silto-arenosa
	500	13	3.3	0.030	Nf=	8086.5	Argila silto-arenosa
	600	12	3.3	0.030	Nf=	7464.4	Argila silto-arenosa
	700	13	3.3	0.030	Nf=	8086.5	Argila silto-arenosa
	800	22	2.3	0.034	Nf=	10809.6	Silte argiloso
	900	29	2.3	0.034	Nf=	14249.0	Silte argiloso
	1000	30	2.3	0.034	Nf=	14740.4	Silte argiloso
	1100	30	2.3	0.034	Nf=	14740.4	Silte argiloso
x	Ponta	30	2.3	0.034	Np=	173415.9	Silte argiloso

Resistência total da estaca (tf)	
N=	123.333

19.3.4 E4

Para cálculo da resistência geotécnica das estacas e4 foi utilizado o laudo de sondagem sm4. Existe metro de aterro para estaca e4, logo o spt do 1 primeiro metro foi considerdo o valor de 0.

Ponta	Prof. (cm)	SPT	K	α	Carga (Kgf)		
	100	0	3.5	0.024	Nf=	0.0	Argila arenosa
	200	5	3.5	0.024	Nf=	2638.9	Argila arenosa
	300	4	3.5	0.024	Nf=	2111.2	Argila arenosa
	400	5	2.3	0.034	Nf=	2456.7	Silte argiloso
	500	4	2.3	0.034	Nf=	1965.4	Silte argiloso
	600	3	2.3	0.034	Nf=	1474.0	Silte argiloso
	700	5	2.3	0.034	Nf=	2456.7	Silte argiloso
	800	4	2.3	0.034	Nf=	1965.4	Silte argiloso
	900	10	2.3	0.034	Nf=	4913.5	Silte argiloso
	1000	29	2.3	0.034	Nf=	14249.0	Silte argiloso
	1100	24	2.3	0.034	Nf=	11792.3	Silte argiloso
	1200	50	2.3	0.034	Nf=	24567.3	Silte argiloso
	1300	30	2.3	0.034	Nf=	14740.4	Silte argiloso
x	Ponta	38	2.3	0.034	Np=	173415.9	Silte argiloso

Resistência total da estaca (tf)	
N=	106.663

19.4 Esforços

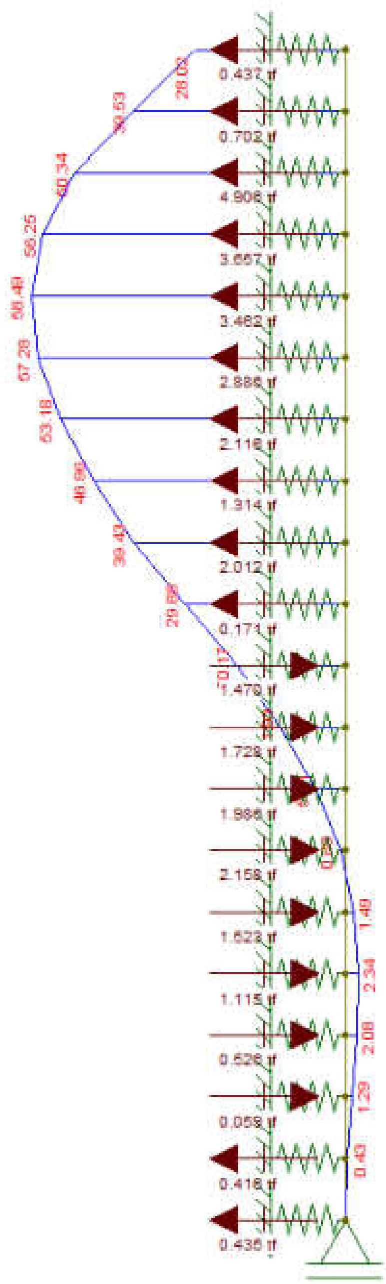
Para o cálculo dos momentos nas estacas será utilizada a estaca com as maiores reações no topo.

19.4.1 E1

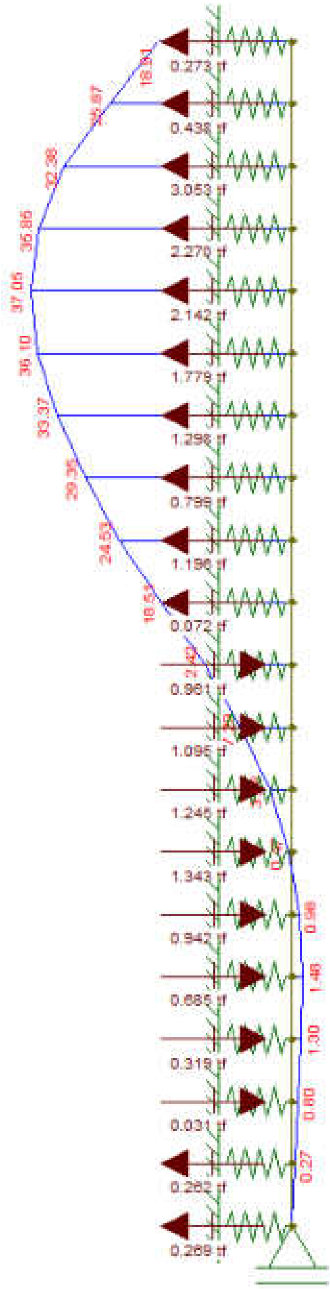
Reações de cálculo no topo da estaca:

F_y= 11.95 tf / m_x= 28.02 tf.m / f_x= 7.23 tf / m_y= 18.91 tf.m / f_{zmax}= 93.93 tf / f_{zmin}= 19.38 tf

Momentos ao longo da estaca, provocados pela força horizontal no topo. M_x= 58.49 tf.m / m_y= 37.05 tf.m.



Momento mx



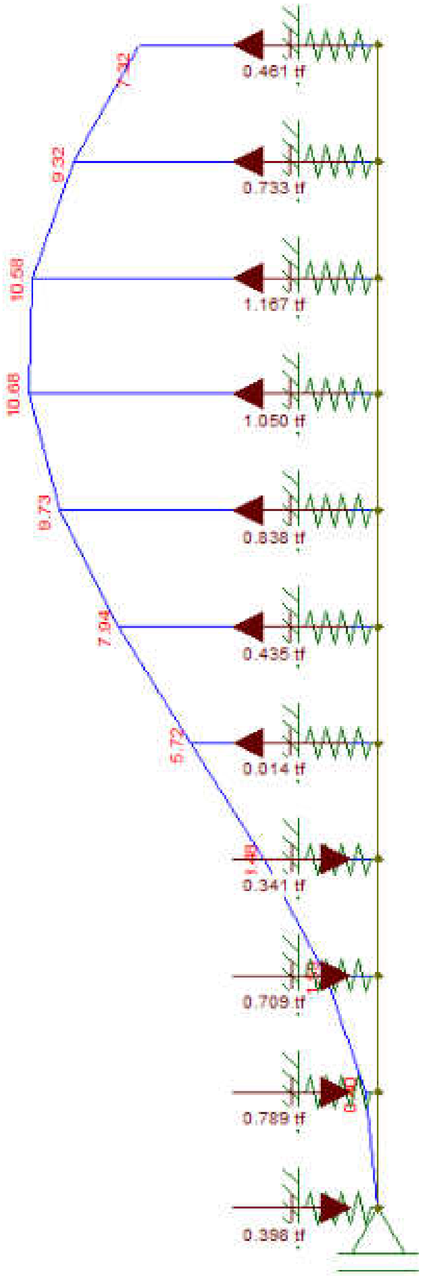
momento my

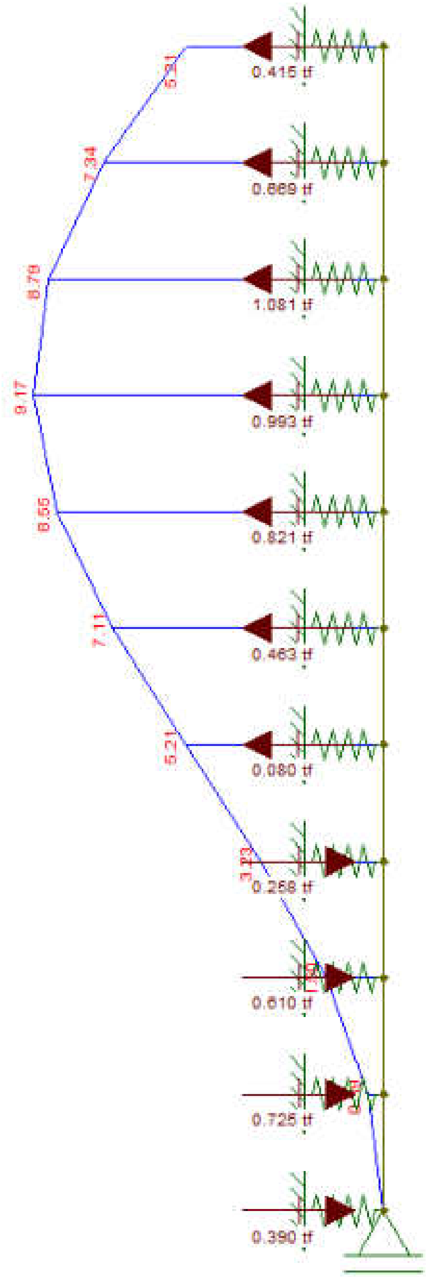
19.4.2 E2

Reações de cálculo no topo da estaca:

F_y= 2.46 tf / m_x= 7.32 tf.m / f_x= 2.54 tf / m_y= 5.21 tf.m / f_{zmax}= 132.16 tf / f_{zmin}= 69.13 tf

Momentos ao longo da estaca, provocados pela força horizontal no topo. M_x= 10.68 tf.m / m_y= 9.17 tf.m.





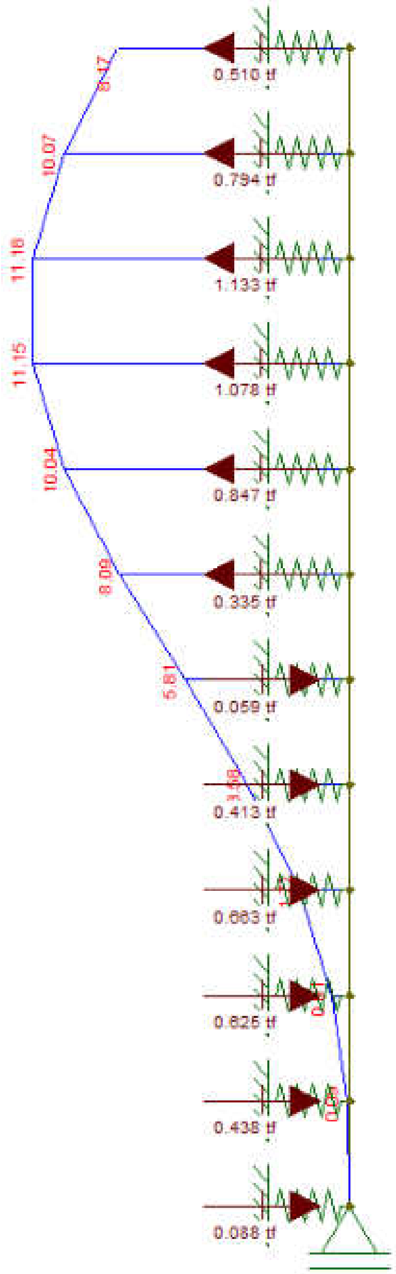
Momento mx momento my

19.4.3 E3

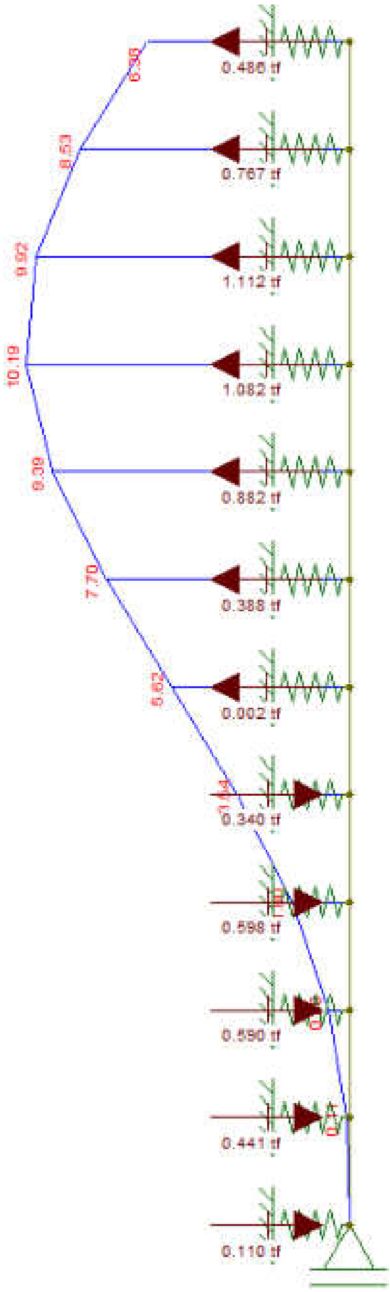
Reações de cálculo no topo da estaca:

F_y= 2.41 tf / m_x= 8.17 tf.m / f_x= 2.64 tf / m_y= 6.38 tf.m / f_{zmax}= 168.24 tf / f_{zmin}= 75.87 tf

Momentos ao longo da estaca, provocados pela força horizontal no topo. M_x= 11.18 tf.m / m_y= 10.19 tf.m.



Momento mx



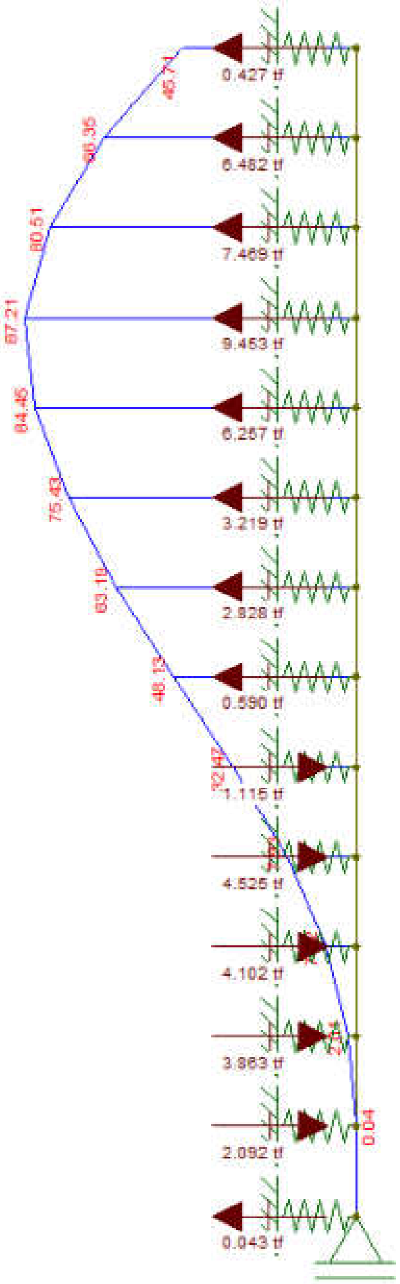
momento my

19.4.4 E4

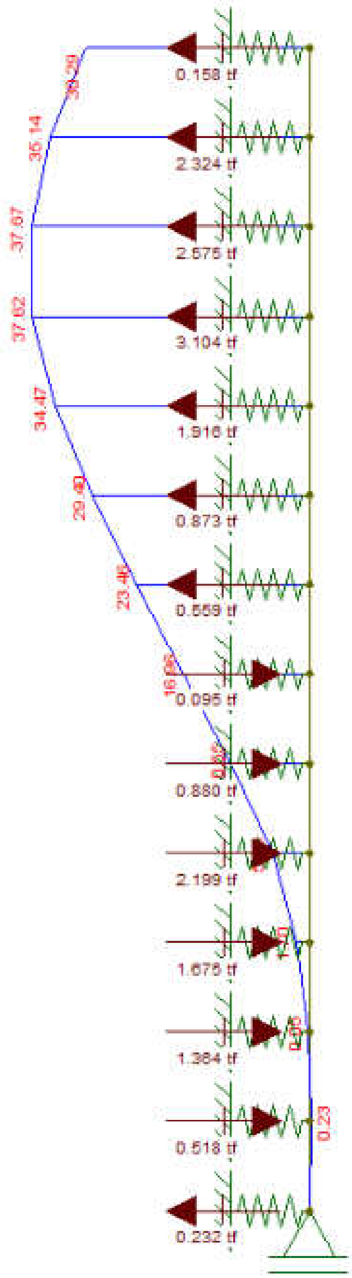
Reações de cálculo no topo da estaca:

F_y= 21.07 tf / m_x= 45.71 tf.m / f_x= 5.01 tf / m_y= 30.29 tf.m / f_{zmax}= 138.48 tf / f_{zmin}= 76.17 tf

Momentos ao longo da estaca, provocados pela força horizontal no topo. M_x= 87.21 tf.m / m_y= 37.67 tf.m.



Momento mx



momento my

19.5 Detalhamento

19.5.1 E1

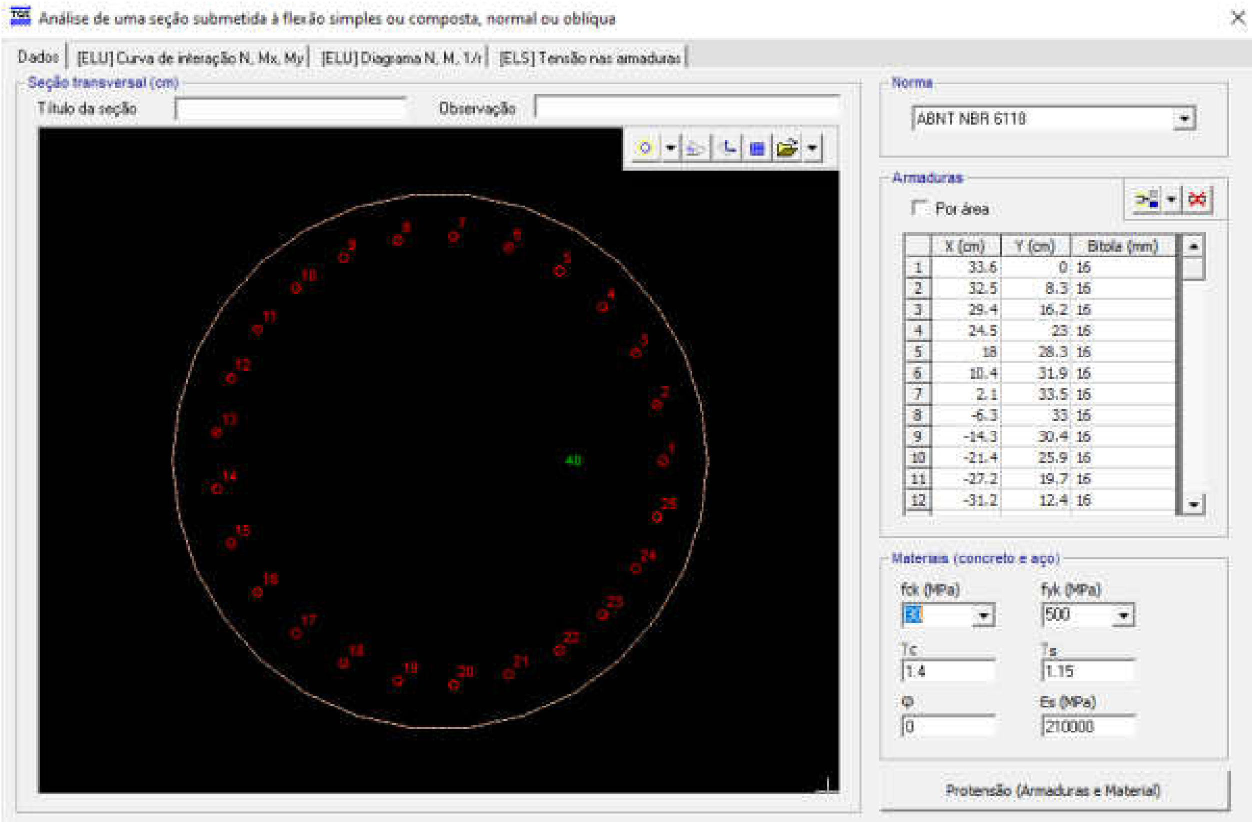
Para o detalhamento foram utilizados os esforços da estaca mais solicitada.

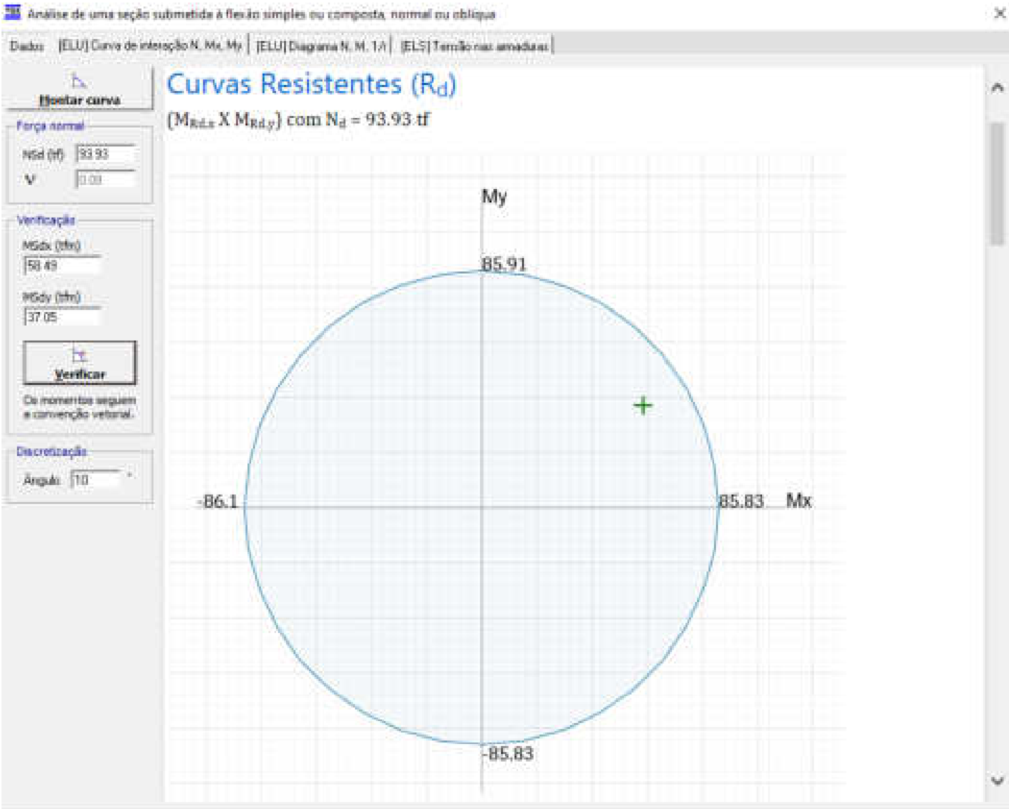
Fzmax= 93.93 tf / fzmin= 19.38 tf / my= 58.49 tf.m / mx= 37.05 tf.m

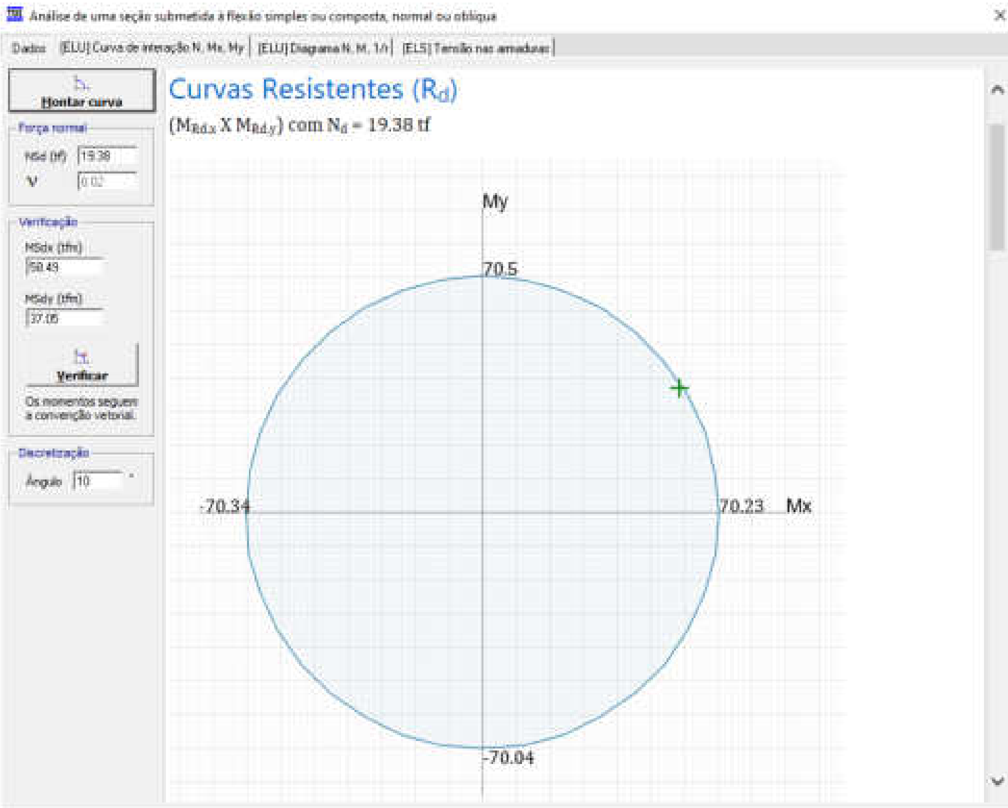
Para dimensionamento das estacas foi utilizado a calculadora de flexão composta oblíqua do tqs.

Na sequência das imagens a seguir estão:

1- Os dados de entrada para cálculo;
2- Verificação para carga normal máxima;
3- Verificação para carga normal mínima.




Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 93.93
V 0.09
Verificação
MSdx (tfm) 58.49
MSdy (tfm) 37.05
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (R_d)
($M_{Rd,x}$ X $M_{Rd,y}$) com N_d = 93.93 tf
My
85.91
-86.1
85.83
Mx
-85.83


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 19.38
V 0.02
Verificação
MSdx (tfm) 58.49
MSdy (tfm) 37.05
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (R_d)
($M_{Rd,x}$ X $M_{Rd,y}$) com N_d = 19.38 tf
My
70.5
-70.34
70.23
Mx
-70.04

19.5.2 E2

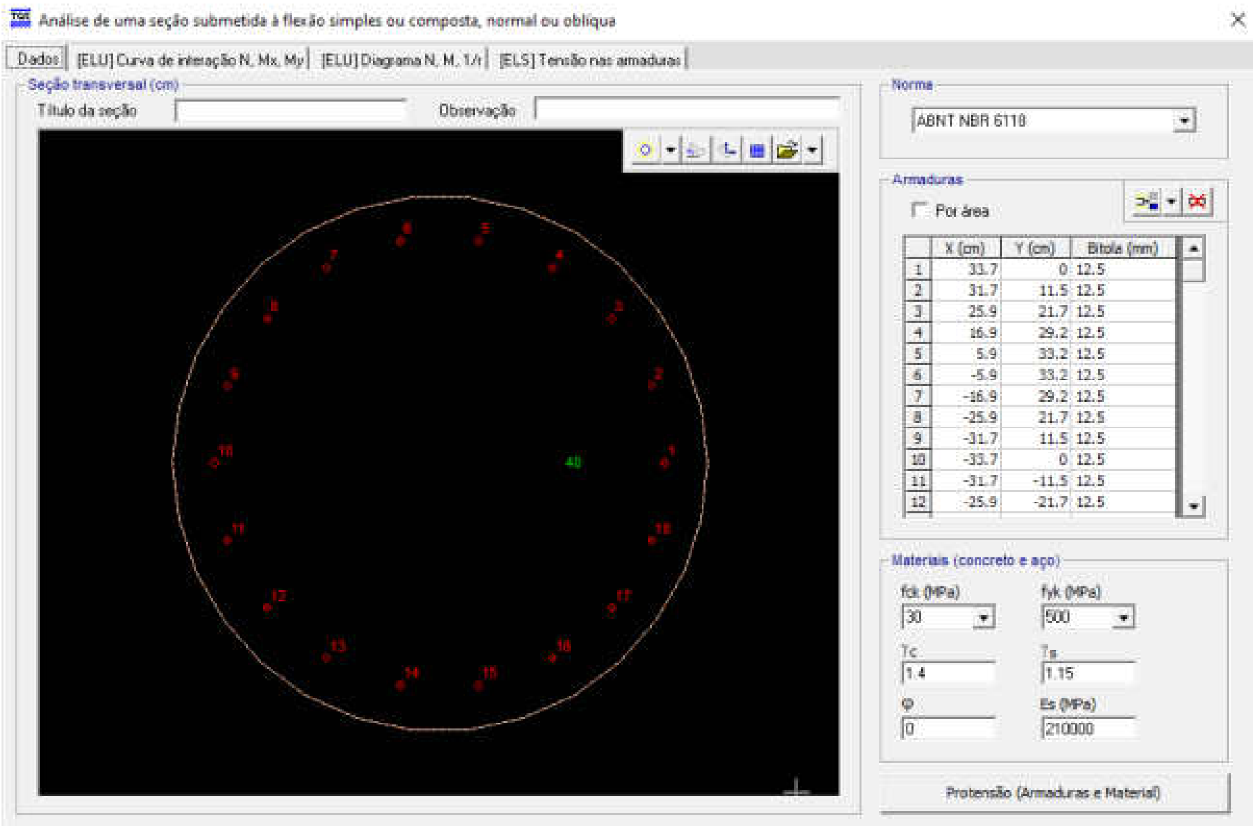
Para o detalhamento foram utilizados os esforços da estaca mais solicitada.

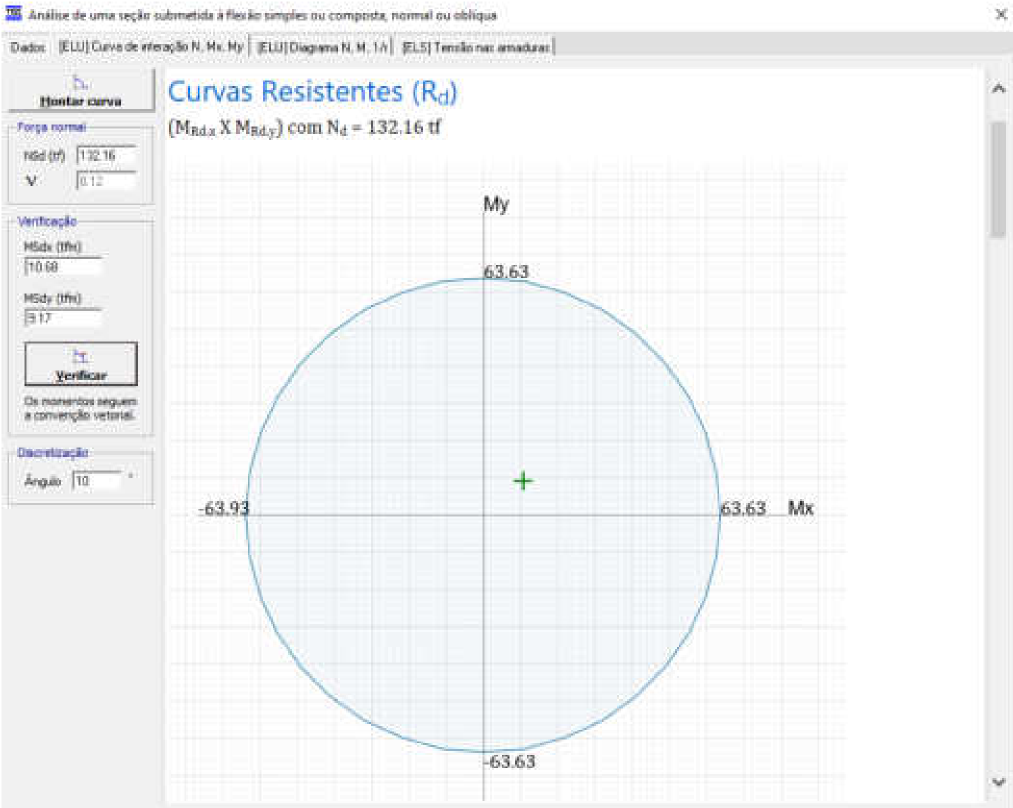
F_{zmax}= 132.16 tf / f_{zmin}= 69.13 tf / m_y= 10.68 tf.m / m_x= 9.17 tf.m

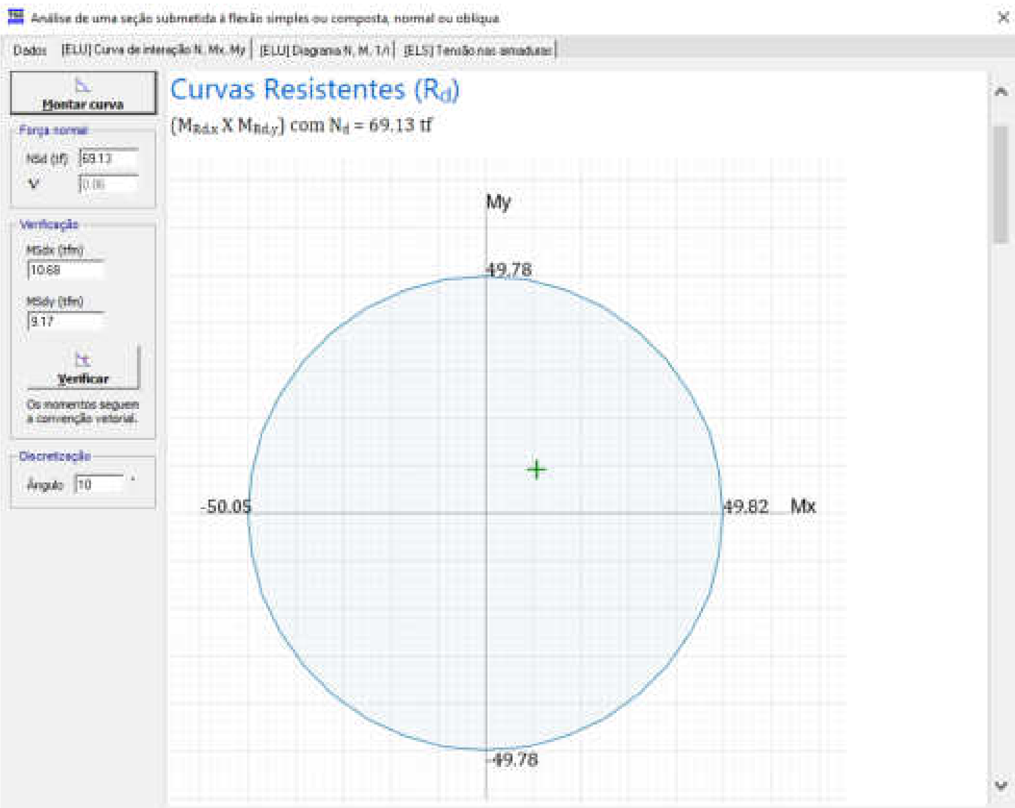
Para dimensionamento das estacas foi utilizado a calculadora de flexão composta oblíqua do tqs.

Na sequência das imagens a seguir estão:

1- Os dados de entrada para cálculo;
2- Verificação para carga normal máxima;
3- Verificação para carga normal mínima.




Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 132.16
V 0.12
Verificação
MSdx (tfm) 10.68
MSdy (tfm) 9.17
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (Rd)
(MRd.x X MRd.y) com Nd = 132.16 tf
My
63.63
-63.93
63.63
Mx
-63.63


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 69.13
V 0.06
Verificação
MSdx (tfm) 10.68
MSdy (tfm) 9.17
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (Rd)
(MRd.x X MRd.y) com Nd = 69.13 tf
My
49.78
-50.05
49.82
Mx
-49.78

19.5.3 E3

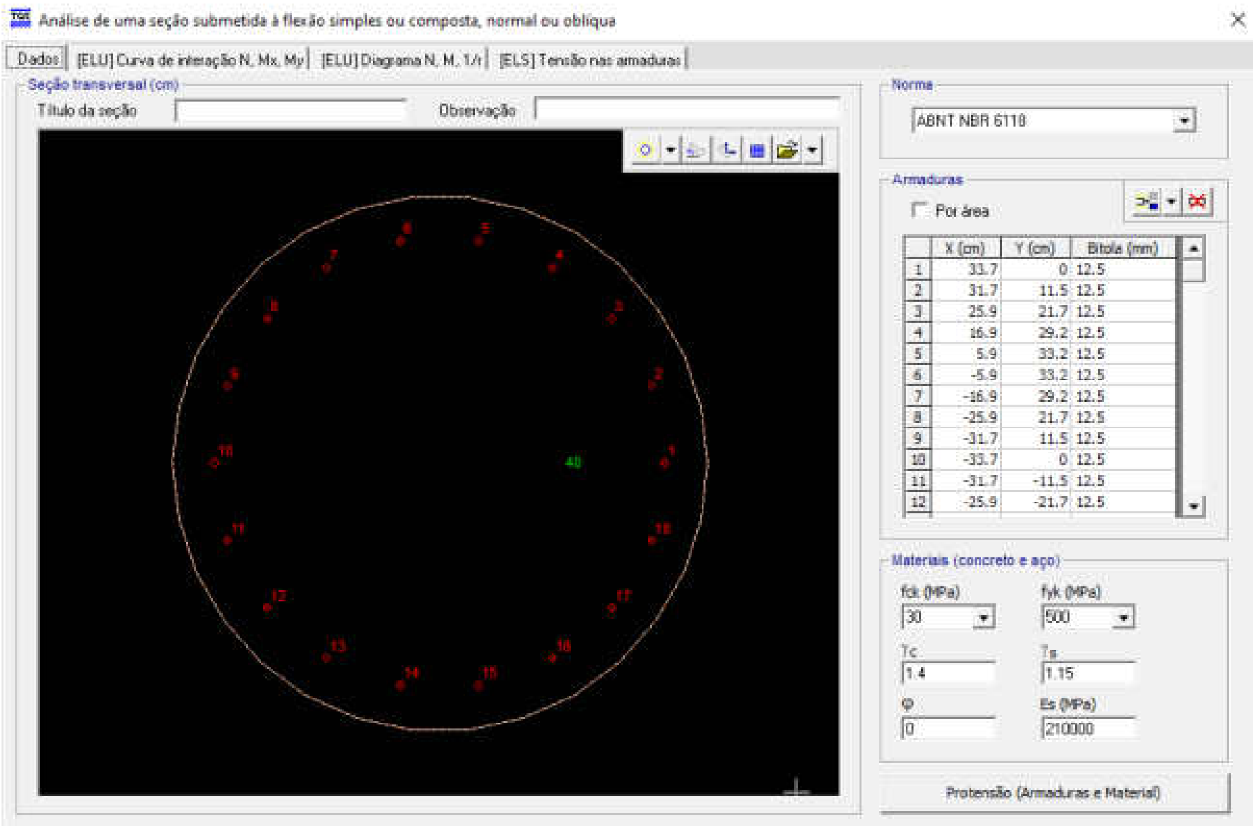
Para o detalhamento foram utilizados os esforços da estaca mais solicitada.

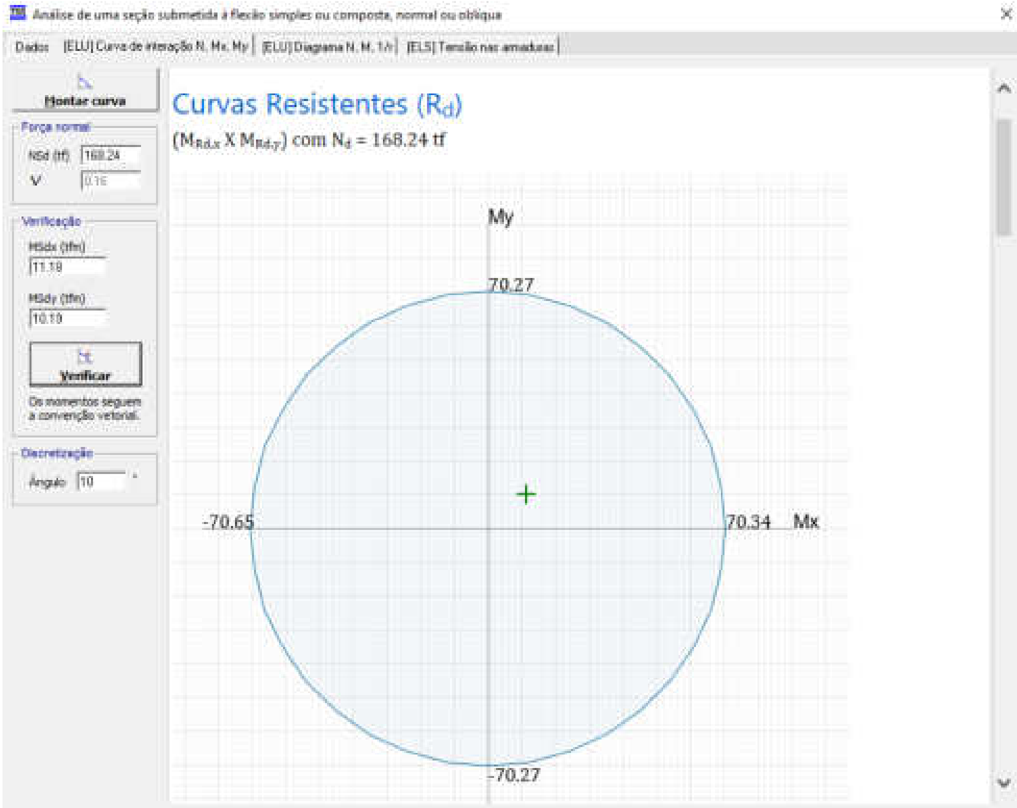
Fzmax= 168.24 tf / fzmin= 75.87 tf / my= 11.18 tf.m / mx= 10.19tf.m

Para dimensionamento das estacas foi utilizado a calculadora de flexão composta oblíqua do tqs.

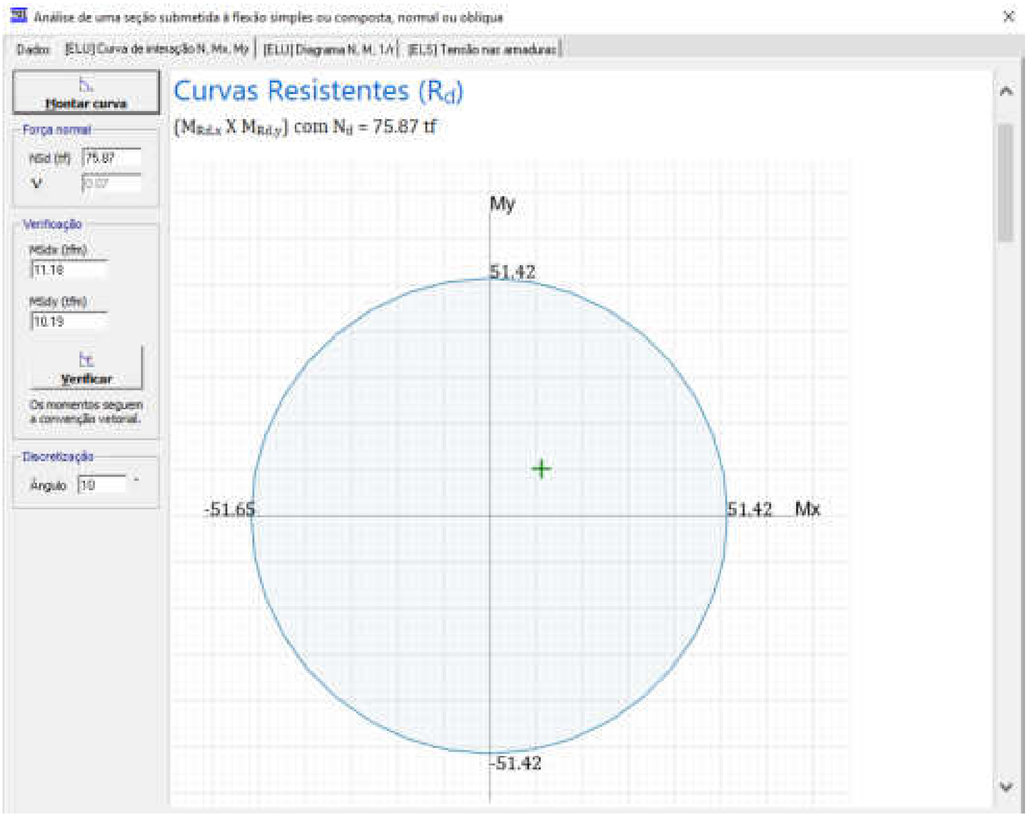
Na sequência das imagens a seguir estão:

1- Os dados de entrada para cálculo;
2- Verificação para carga normal máxima;
3- Verificação para carga normal mínima.





Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf)
168.24
V
0.16
Verificação
MSdx (tfm)
11.18
MSdy (tfm)
10.19
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo
10
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 168.24 tf
My
70.27
-70.65
70.34
Mx
-70.27



Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados
[ELU] Curva de interação N, Mx, My
[ELU] Diagrama N, M, 1/r
[ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf)
75.87
V
0.07
Verificação
MSdx (tfm)
11.18
MSdy (tfm)
10.19
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo
10
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 75.87 tf
My
51.42
-51.65
51.42
Mx
-51.42

19.5.4 E4

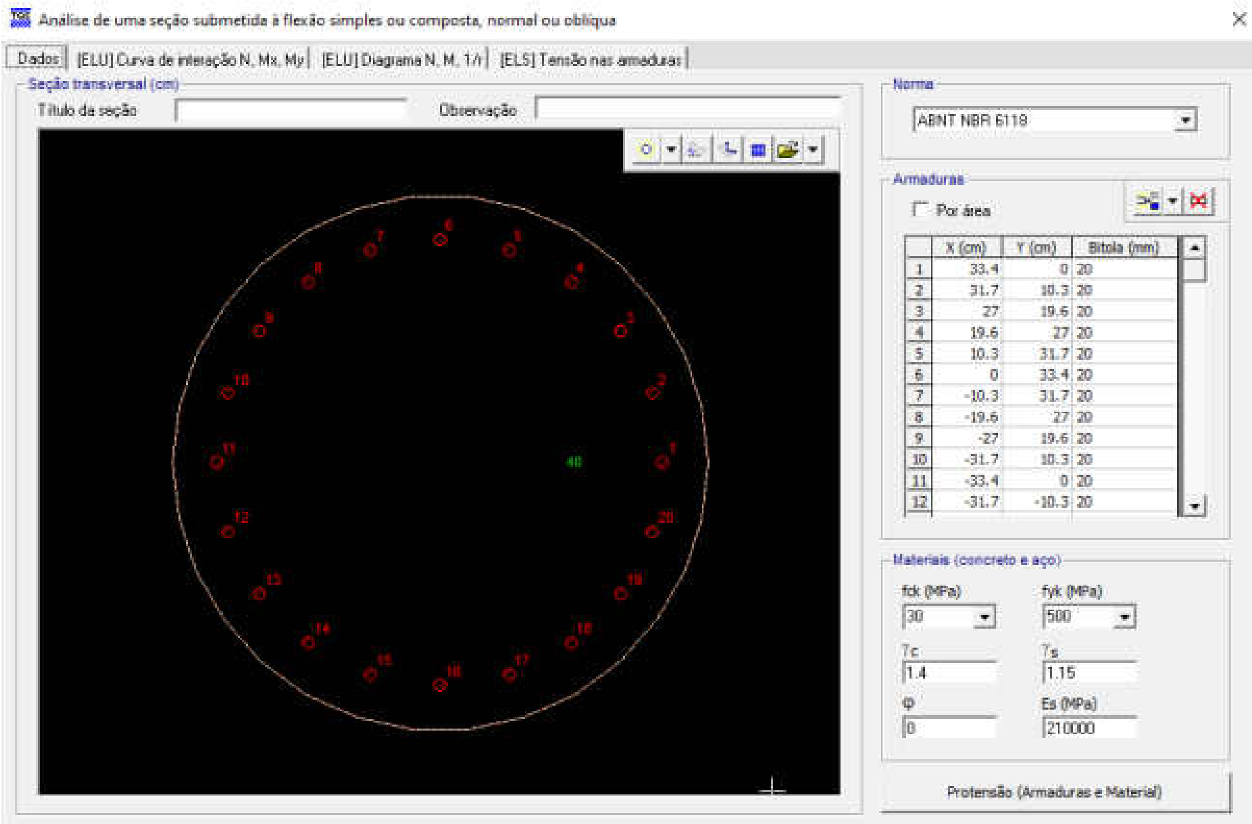
Para o detalhamento foram utilizados os esforços da estaca mais solicitada.

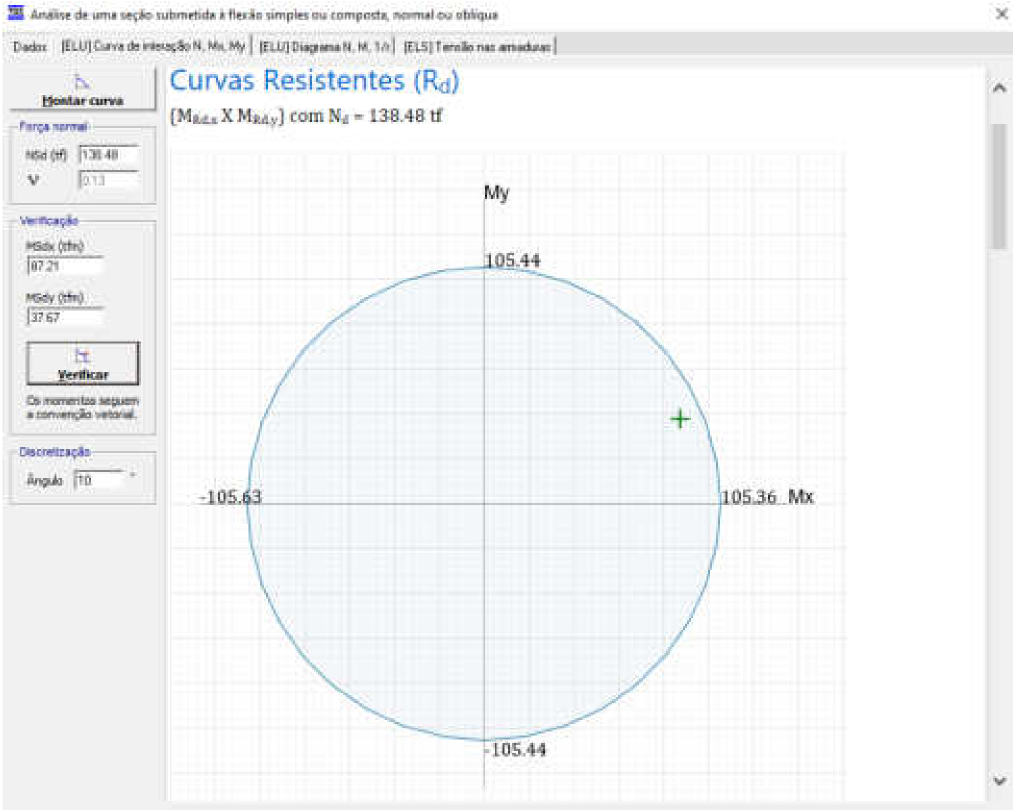
F_{zmax}= 138.48 tf / f_{zmin}= 76.17tf / my= 87.21tf.m / mx= 37.67 tf.m

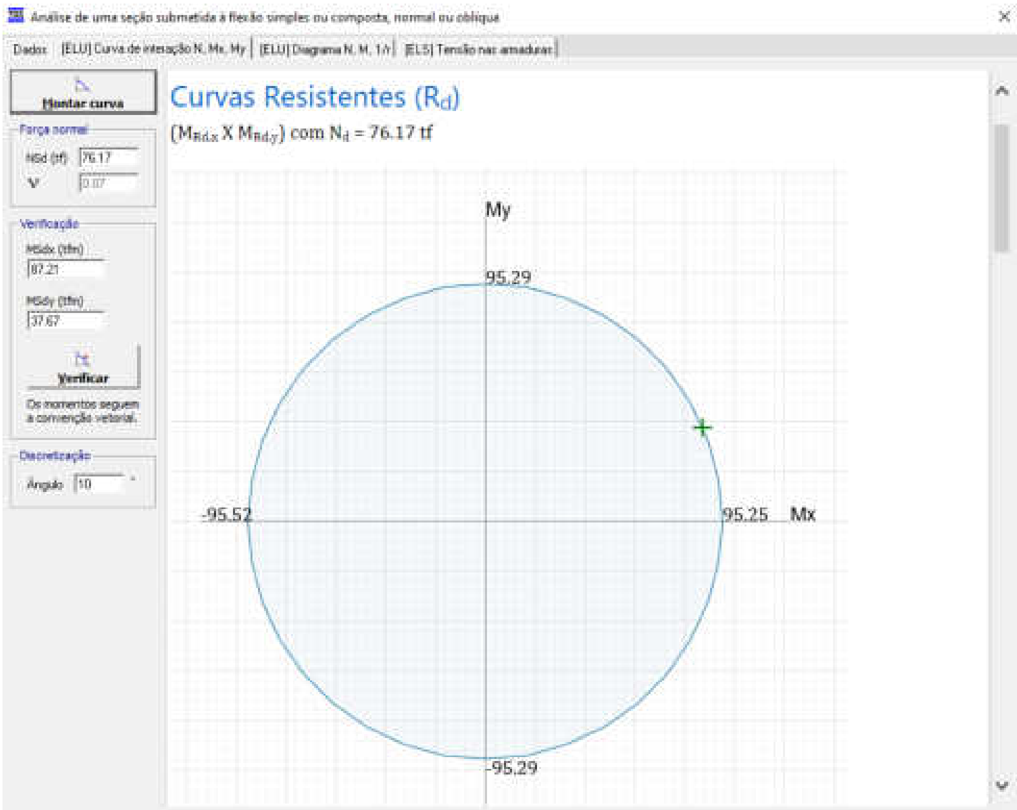
Para dimensionamento das estacas foi utilizado a calculadora de flexão composta oblíqua do tqs.

Na sequência das imagens a seguir estão:

1- Os dados de entrada para cálculo;
2- Verificação para carga normal máxima;
3- Verificação para carga normal mínima.



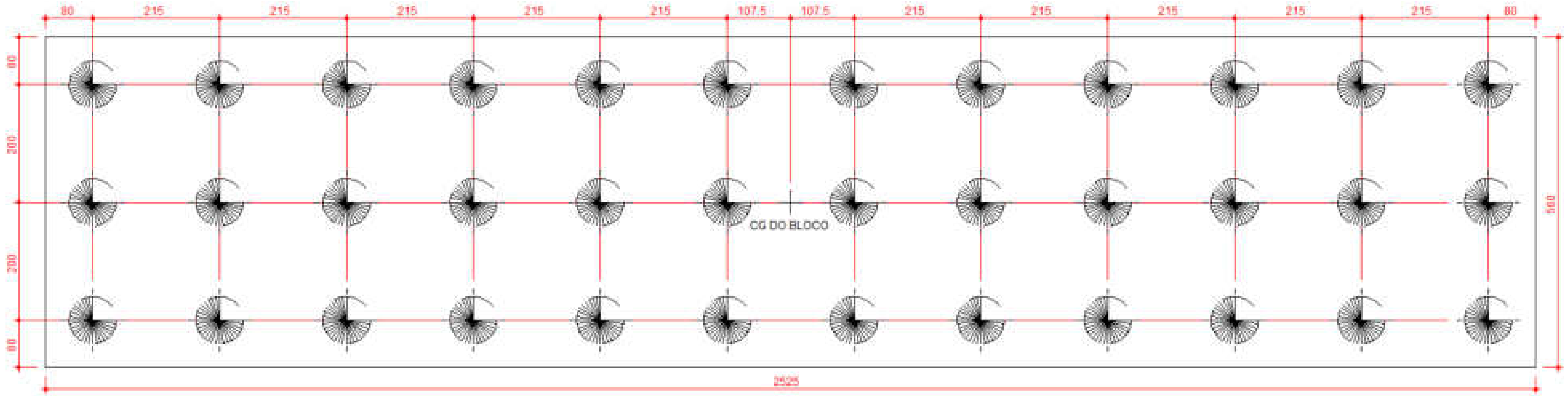

Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados [ELU] Curva de interação N, Mx, My [ELU] Diagrama N, M, 1/r [ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 138.48
V 0.13
Verificação
MSdx (tfm) 87.21
MSdy (tfm) 37.67
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 138.48 tf
My
105.44
-105.63
105.36
Mx
-105.44


Análise de uma seção submetida à flexão simples ou composta, normal ou oblíqua
Dados [ELU] Curva de interação N, Mx, My [ELU] Diagrama N, M, 1/r [ELS] Tensão nas armaduras
Montar curva
Força normal
NSd (tf) 76.17
V 0.07
Verificação
MSdx (tfm) 87.21
MSdy (tfm) 37.67
Verificar
Os momentos seguem a convenção vetorial.
Discretização
Ângulo 10 °
Curvas Resistentes (Rd)
(MRd,x X MRd,y) com Nd = 76.17 tf
My
95.29
-95.52
95.25
Mx
-95.29

19.6 Blocos

19.7 Geometria

19.7.1 B2 = b3



19.8 Detalhamento

19.9 Legenda

Observação:

Este programa utiliza o método simplificado das bielas em blocos

Considerados rígidos (com um ângulo ótimo entre 45 e 55 graus).

Nos casos com momentos fletores atuantes, considera-se para o

Dimensionamento do bloco, a força normal equivalente (fe), mais crítica,

Dentre os casos de carregamentos transferidos.

Cabe ao engenheiro o cálculo e o detalhamento de armaduras

Complementares para esforços de tração em pontos localizados do bloco e

Estaca(s), se houver, em função da geometria do bloco e das solicitações.

Legenda:

Fe: força normal equivalente total para dimensionamento, que provoca o

mesmo efeito das ações (compressão e flexões concomitantes), na estaca

mais solicitada, dentre todos os casos de carregamento;

F1: fe/estacas (esforço crítico p/ simples conferência, para a 'estaca

mais solicitada');

Asxfdz,asyfdz: a soma de armaduras necessárias para fendilhamento e

cintamento (quando houver);

Ascin: armadura necessária para cintamento;

Obs: observar possíveis conversões entre armaduras e tipos de aço (ex: ca50 para ca60)

19.9.1 B2 = b3

Bloco: 1 – b2 = b3 retang. (2x)

.--.

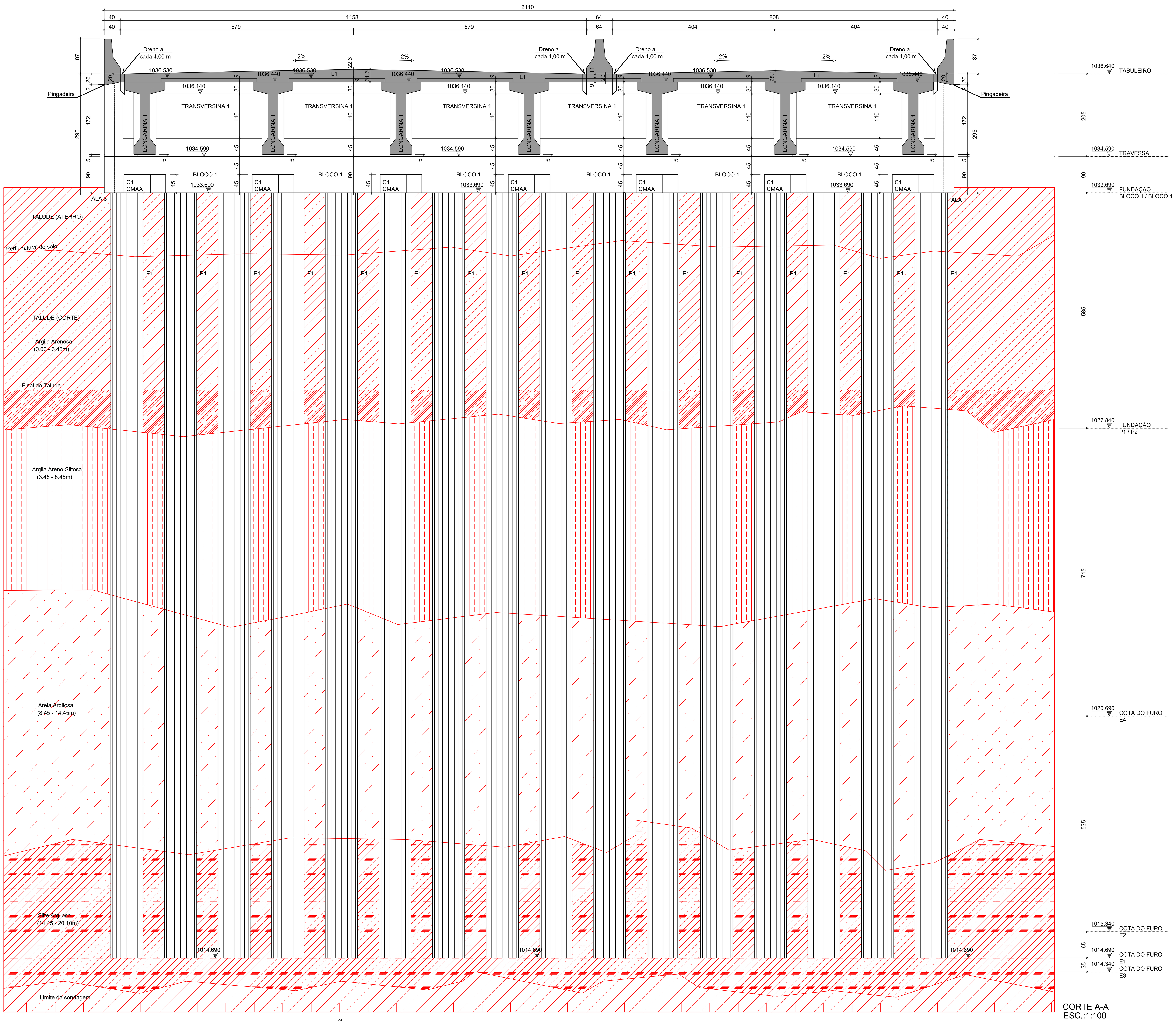
```
|          total de carregamentos = 222  /  carregamentos principais:          |
.----------.---------.---------.---------.--------.--------.---------.---------.
|   caso    | nd[tf]  |mxd[tf.m]|myd[tf.m]| fxd[tf]| fyd[tf]|mx*[tf.m]|my*[tf.m]|
.----------.---------.---------.---------.--------.--------.---------.---------.
| 143(dim )|  3126.84|   145.75|  -373.15|  70.144|  61.486|   299.47|  -548.36|
| 198(rmin)|  2344.42|    86.01|  -253.64|  58.921|  34.432|   172.07|  -400.94|
.-------------------------.-------------.------------------.------------------.
| geometria[cm,m2,m3]       | cargas[tf,m]| tensoes[kgf/cm2] | verif.[cm,graus] |
|                         | dimensionam.| bielas           | altura/ang.biela |
| estacas= 36  fi  =  80.0 | fn=  3126.8 | tenslimp=  578.6 | angulox=   52.4  |
| disx= 215.0  disy= 200.0 | mx=   299.5 | tenspil =  196.8 | anguloy=   49.4  |
| xbl =2525.0  ybl = 560.0 | my=  -548.4 |                  | d      =  233.0  |
| alt = 260.0  vol =367.64 |-------------| tenslime=  578.6 |                  |
| xpil=2360.0  ypil=  80.0 | feq= 6055.2 | tensest =  501.9 |                  |
| área de forma:    160.42 | fmx=  168.2 |                  |                  |
| altb=  10.0  disf=  80.0 | fmn=   75.8 |                  |                  |
| ************************ |             |                  | ****             |
.-------------------------.-------------.------------------.------------------.
| armaduras [cm2,cm]       | peso próprio:      919.1 tf (x1)                  |
.-----------------------------------------------------------------------------.
| prin.x:  314.5 = 108 {20.0 c/  10.0(d) prin.y:   62.2 =  21 {20.0 c/  13.0(d)|
| susp.x:   94.6 = 128 {10.0 c/  20.0(d) susp.y:   18.7 =  29 {10.0 c/  20.0(d)|
| laterl:   47.2 =  24 {16.0 c/  11.0(d)                                      |
.-----------------------------------------------------------------------------.
(d): armadura distribuida uniforme, pela largura/lado x/y/h do bloco.
```

20 Apresentação do Projeto

O Projeto Estrutural de Obra de Arte Especial é composto de 28 arquivos, abaixo descritos:

Arquivo	Descrição	Revisão
2101-OAE-RPE-R00	Relatório de Projeto / Memorial Descritivo / Memória de Cálculo	R00
2101-OAE-MCA-R00	Memória de Cálculo de Quantidades	R00
2101-LOC-EX-001-R00	Locação do Viaduto	R00
2101-LOC-EX-002-R00	Implantação do Viaduto	R00
2101-DGE-EX-000-R00	Detalhes Gerais	R00
2101-FOR-EX-101-R00	Planta de Formas do Tabuleiro	R00
2101-FOR-EX-102-R00	Detalhe Pórtico 01	R00
2101-FOR-EX-103-R00	Detalhe Pórtico 02	R00
2101-FOR-EX-104-R00	Detalhe Pórtico 03	R00
2101-FOR-EX-105-R00	Detalhe Pórtico 04	R00
2101-COR-EX-801-R00	Cortes Transversais	R00
2101-COR-EX-802-R00	Cortes Longitudinais	R00
2101-FUN-EX-051-R00	Fundação	R00
2101-FUN-EX-052-R00	Detalhamento armaduras Fundação	R00
2101-FUN-EX-053-R00	Detalhamento armaduras Fundação	R00
2101-LAJ-EX-401-R00	Detalhamento Pré Lajes	R00
2101-LAJ-EX-402-R00	Detalhamento Armaduras Lajes	R00
2101-LAJ-EX-403-R00	Detalhamento Armaduras Lajes	R00
2101-LAJ-EX-404-R00	Detalhamento Lajes Aproximação	R00
2101-MOD-EX-201-R00	Modulação Pré Lajes	R00
2101-PIL-EX-301-R00	Detalhamento Pilares	R00
2101-VIG-EX-601-R00	Detalhamento Longarina 01	R00
2101-VIG-EX-602-R00	Detalhamento Longarina 02	R00
2101-VIG-EX-603-R00	Detalhamento Longarina 03	R00
2101-VIG-EX-604-R00	Detalhamento Blocos 01 e 04	R00
2101-VIG-EX-605-R00	Detalhamento Travessa 01	R00
2101-VIG-EX-606-R00	Detalhamento Travessa 02	R00
2101-VIG-EX-607-R00	Detalhamento Transversinas e Alas	R00

21 Pranchas



CORTE A-A
ESC.:1:100

*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
PARA fck = 30 MPa Ecs = 26.8 GPa
PARA fck = 35 MPa Ecs = 29.4 GPa
PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

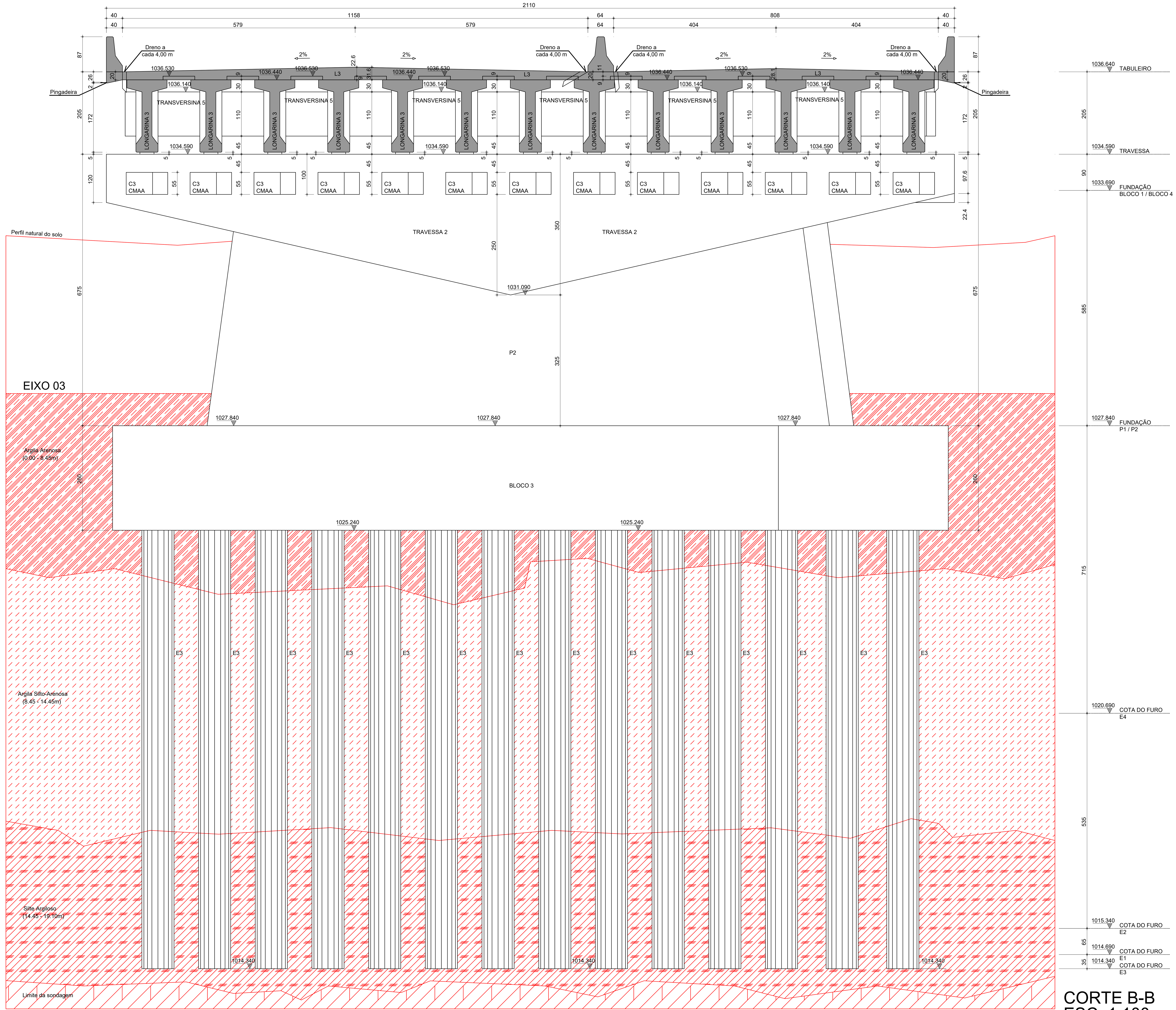
CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:100	TRECHO/SUBTRECHO: CORTE A-A	COORD.: HERMES BUENO
FOLHA: 01/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-COR-EX-001-R00	DATA: JANEIRO/2022



CORTE B-B
ESC.:1:100

*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  PARA fck = 30 MPa Ecs = 26.8 GPa
  PARA fck = 35 MPa Ecs = 29.4 GPa
  PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:100	TRECHO/SUBTRECHO: CORTE B-B	COORD.: HERMES BUENO
FOLHA: 02/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-COR-EX-002-R00	DATA: JANEIRO/2022

*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO
A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

ATENÇÃO

O aterro dos encontros deverá ser feito somente após a montagem das longarinas e concretagem das lajes do tabuleiro.

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

CORTE C-C
ESC.:1:100

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

CONCRETO: fck = 45 MPa

TREM TIPO: CLASSE 45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
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04	-	-
05	-	-
06	-	-

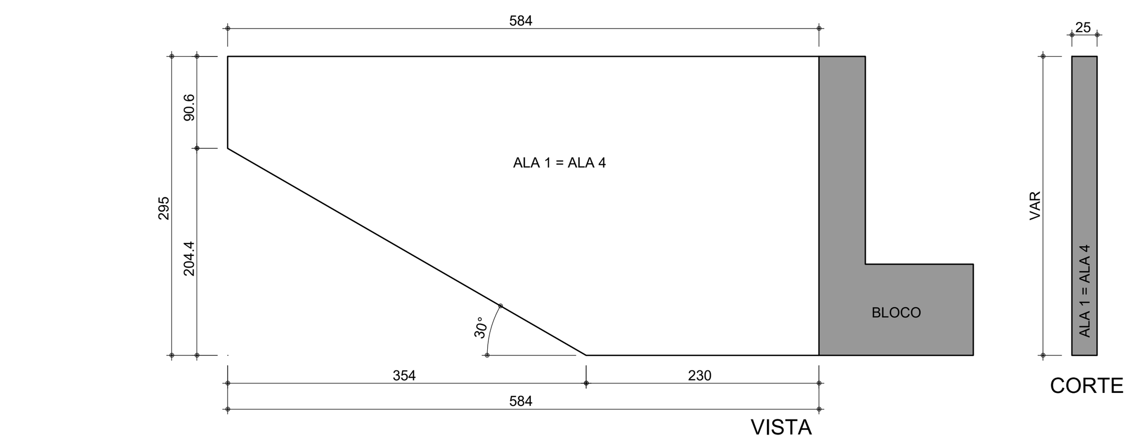
CONFERIDO | APROVADO | VISTO

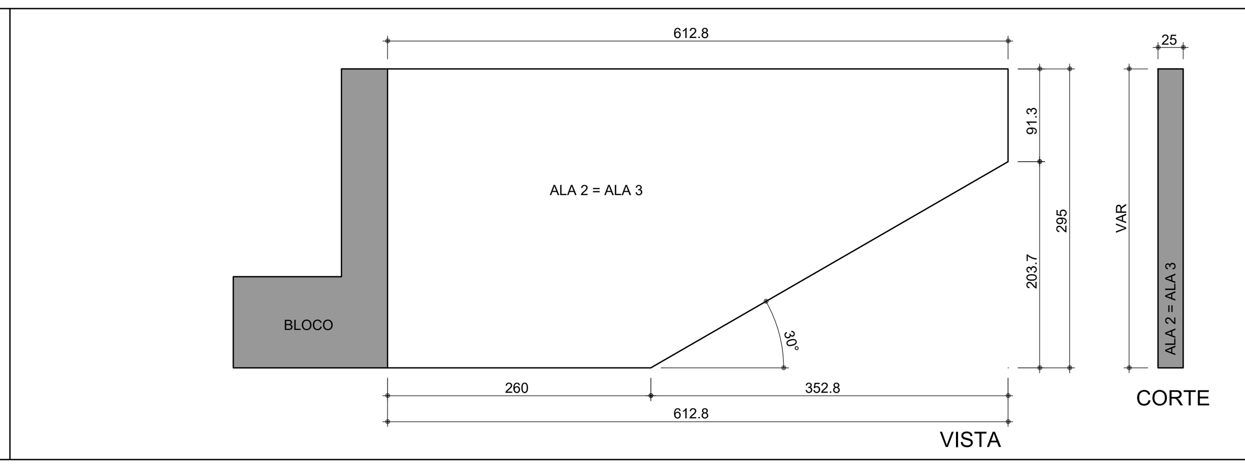
DER DF

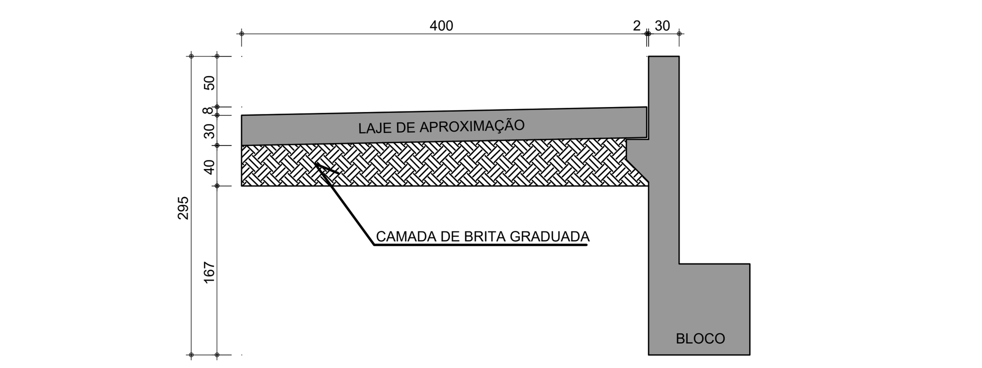
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

A&T Arquitetura Planejamento e Transportes Ltda.

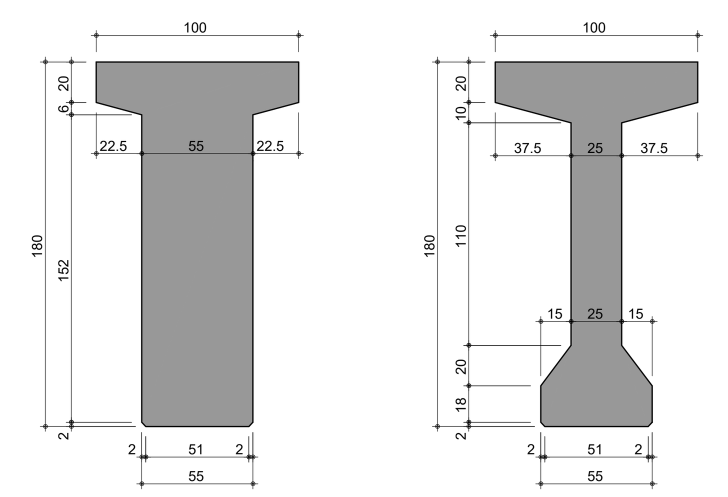
ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:100	TRECHO/SUBTRECHO: CORTE C-C	COORD.: HERMES BUENO
FOLHA: 03/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-COR-EX-003-R00	DATA: JANEIRO/2022





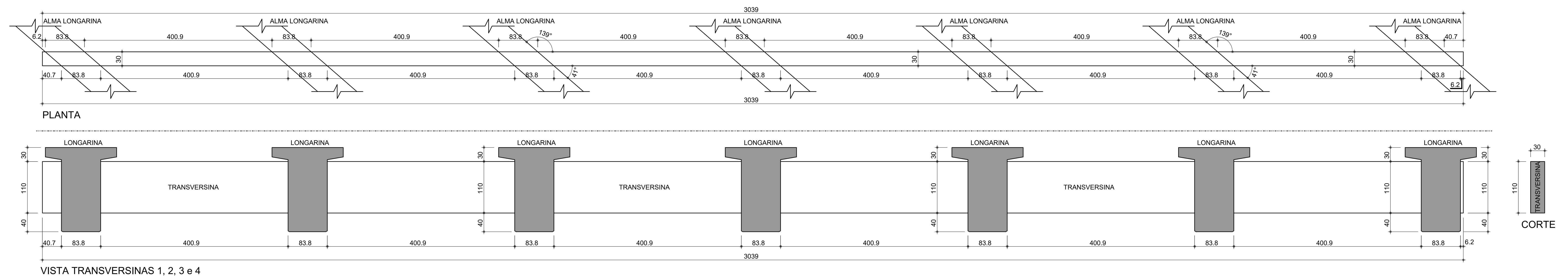


DETALHE 3
ESC.:1:125

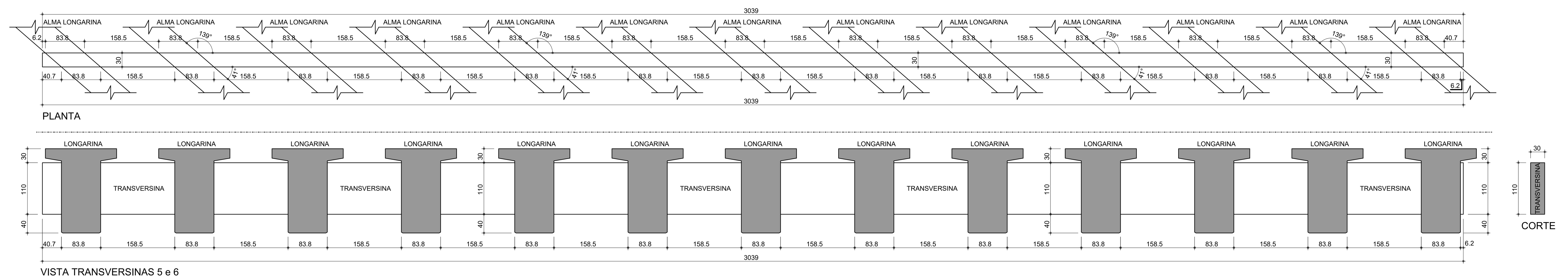


As longarinas possuem seção "T" nos dois primeiros metros das extremidades e seção "I" no meio da peça, conforme indicado a seguir:
LONGARINA 1 => Seção "T" = 457.5 cm / Seção "I" = 2149.3 cm / Comprimento TOTAL = 2606.8 cm
LONGARINA 2 => Seção "T" = 400.0 cm / Seção "I" = 2134.0 cm / Comprimento TOTAL = 2534.0 cm
LONGARINA 3 => Seção "T" = 457.5 cm / Seção "I" = 3211.2 cm / Comprimento TOTAL = 3668.7 cm

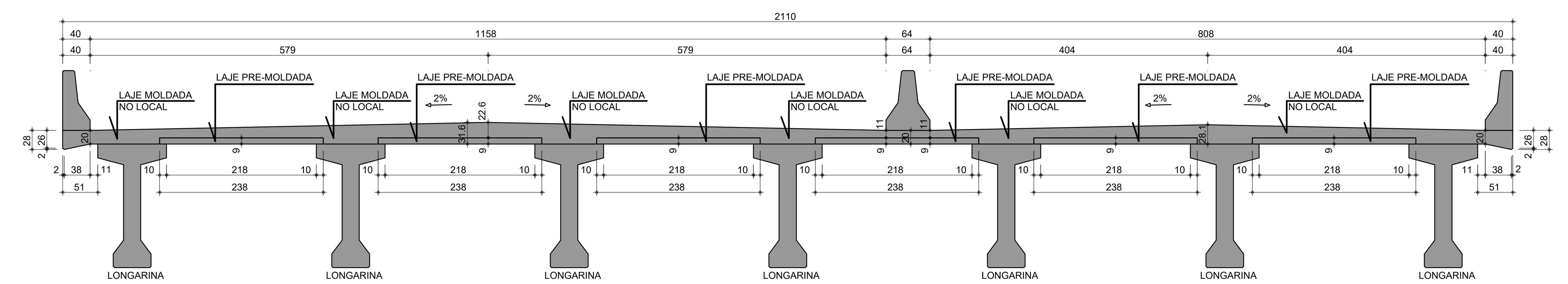
DETALHE LONGARINAS
ESC.:1:125

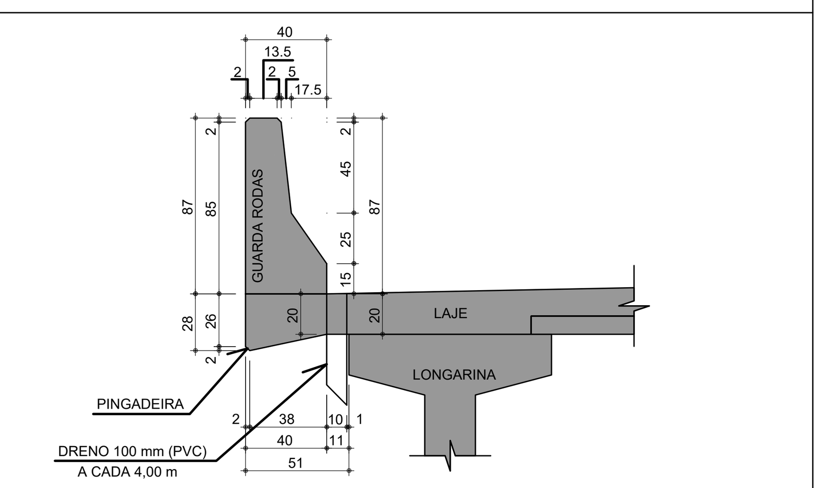


DETALHE 4
ESC.:1:125

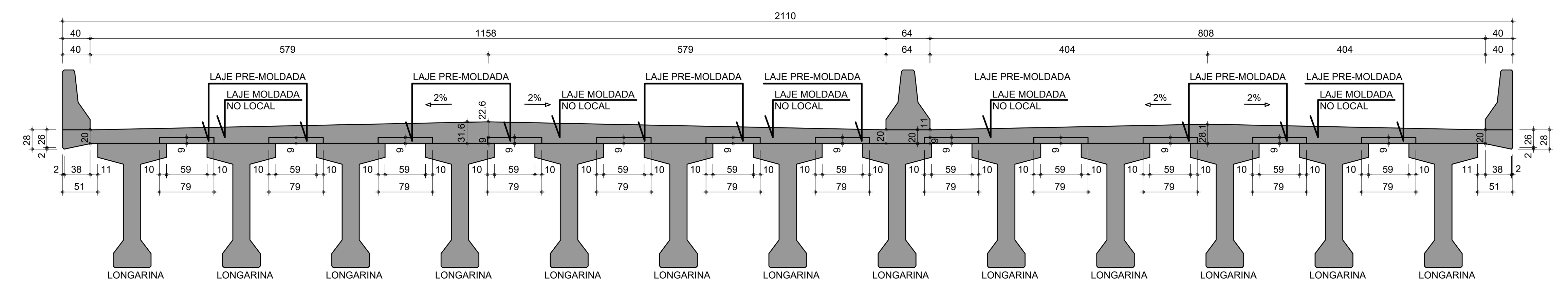


DETALHE 5
ESC.:1:125



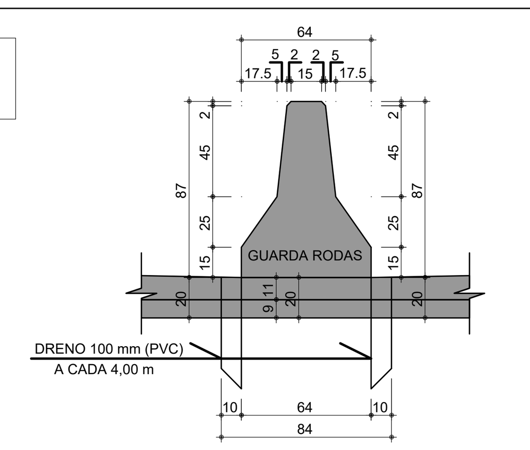


DETALHE 9
ESC.:1:75

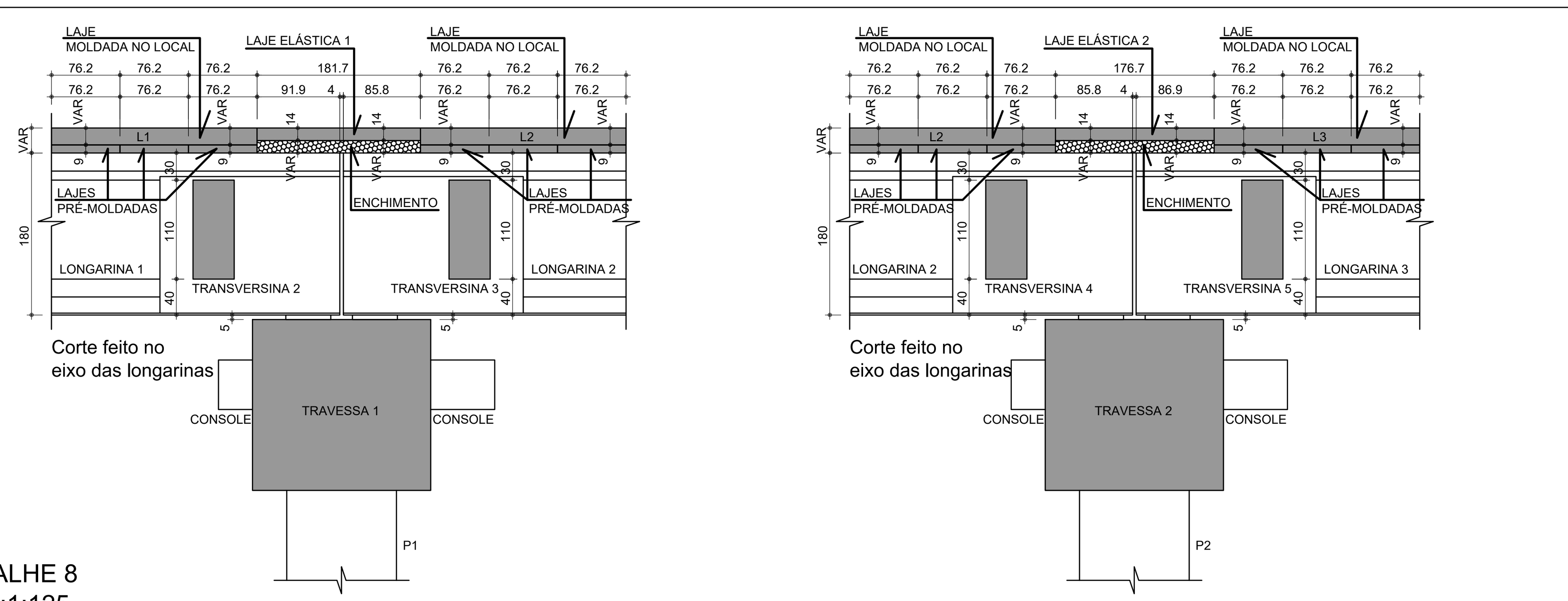


DETALHE 7
ESC.:1:125

ATENÇÃO
Os drenos deverão ser colocados distantes das travessas no mínimo 1 (um) metro.



DETALHE 10
ESC.:1:75



DETALHE 8
ESC.:1:125

OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA , O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	Hérbio Henrique Lopes
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

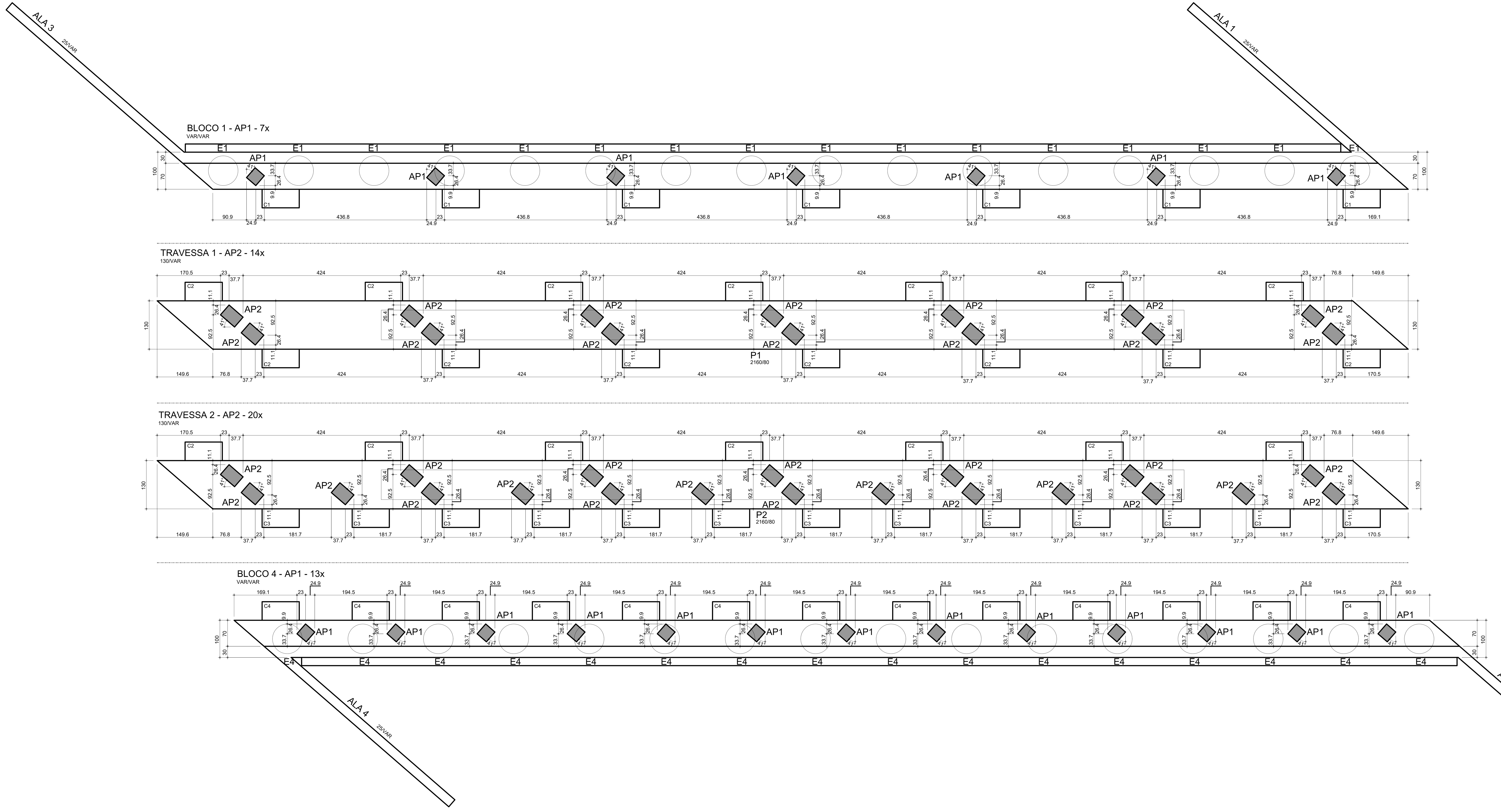
CONFERIDO	APROVADO	VISTO

DER DF

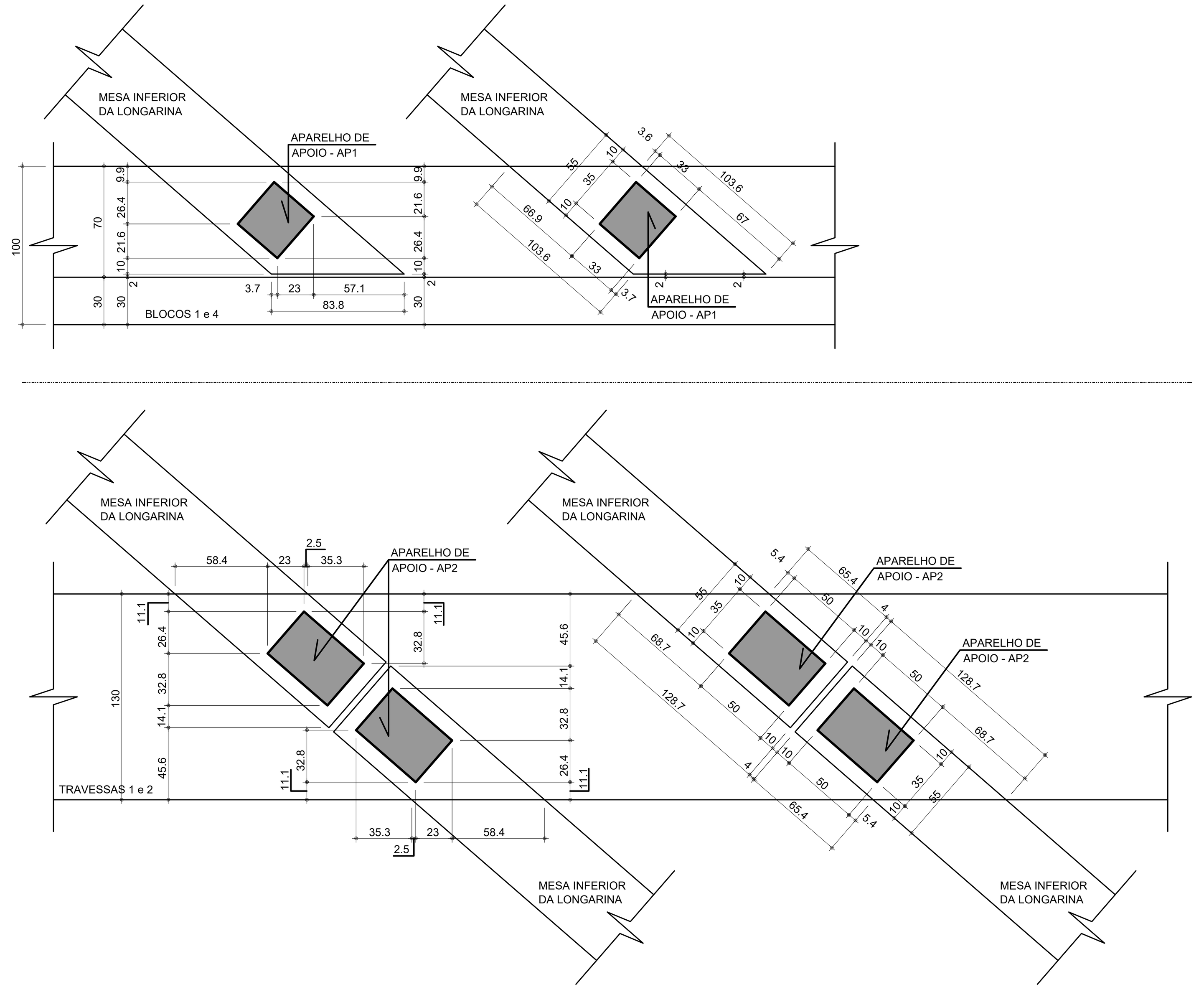
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

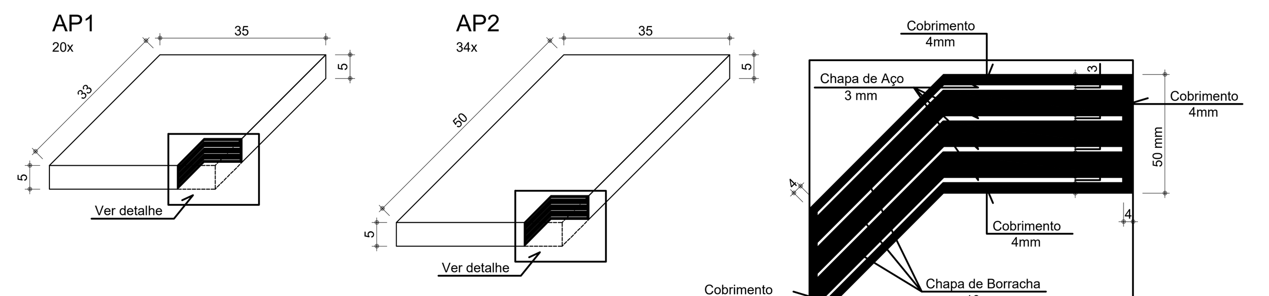
ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1/125	TRECHO/SUBTRECHO: DETALHES GENÉRICOS - TABULEIRO	COORD.: HERMES BUENO
FOLHA: 04/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-DGE-EX-004-R00	DATA: JANEIRO/2022



LOCAÇÃO DOS APARELHOS DE APOIO
ESC.:1:50



DETALHE POSICIONAMENTO DO APARELHO DE APOIO
ESC.:1:25



Informações do aparelho de apoio (elastômetro):

- Módulo de Elasticidade Longitudinal: 1,2 MPa (dureza shore A - 70);
- Tensão Admissível Aparelho de Apoio= 14 MPa;
- Composto por 3 chapas de borracha e 4 chapas de aço;
- Todo o aparelho de apoio deverá ser revestido por uma camada de 4 cm de borracha.

DETALHE DOS APARELHOS DE APOIO
ESC.:1:10

TABELA DE NÍVEIS

ELEMENTO	NÍVEL
BLOCOS 1 e 4	Ver detalhes Pórtico 1 e 4
TOPO BLOCOS 2 e 3	+ 1027.840
TOPO DOS PILARES	+ 1034.590
TRAVESSAS 1 e 2	+ 1034.590
ALAS	+ 1036.640
LAJES DE APROXIMAÇÃO	Ver detalhe 3
LONGARINAS	+ 1036.440
TRANSVERSINAS	+ 1036.140
LAJES PRE-MOLDADAS	+ 1036.530
LAJES "IN-LOCO"	Ver detalhes 6 e 7

RESUMO DE MATERIAIS TOTAL

	VOLUME DE CONCRETO (m³)	ÁREA DE FORMAS (m²)
ESTACAS	637.37	-
BLOCOS 1 e 4	106.19	454.25
BLOCOS 2 e 3	735.28	320.84
PILARES	150.29	391.62
TRAVESSAS	200.95	387.82
ALAS	14.05	119.82
LAJES DE APROXIMAÇÃO	114.64	44.92
LONGARINAS	652.16	4058.26
TRANSVERSINAS	45.23	346.62
LAJES PRE-MOLDADAS	93.25	503.03
LAJES MOLDADAS NO LOCAL	362.14	180.37
GUARDA RODAS	69.31	476.13
TOTAL	3180.87	7283.68

CARGAS DE PAVIMENTAÇÃO

TIPO	CARGA	ESPESSURA	PESO ESPECÍFICO
PAVIMENTAÇÃO	100.0 Kgf/m²	4.17 cm	2400.00 Kgf/m³
RECAPEAMENTO	200.0 Kgf/m²	8.33 cm	2400.00 Kgf/m³

A pavimentação asfáltica deverá ser feita em CBUQ.

OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA , O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

CONCRETO: fck = 45 MPa

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	Hérbio Henrique Lopes
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
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02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

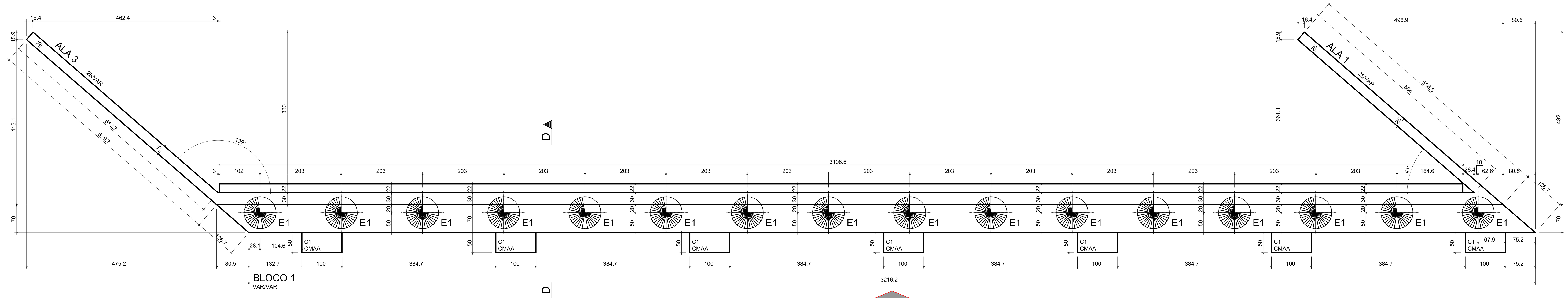
CONFERIDO	APROVADO	VISTO

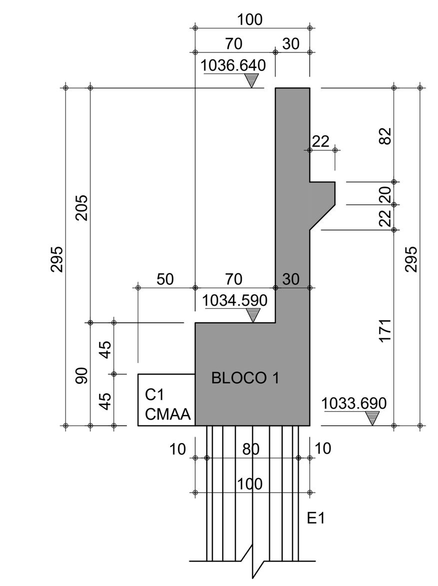
DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

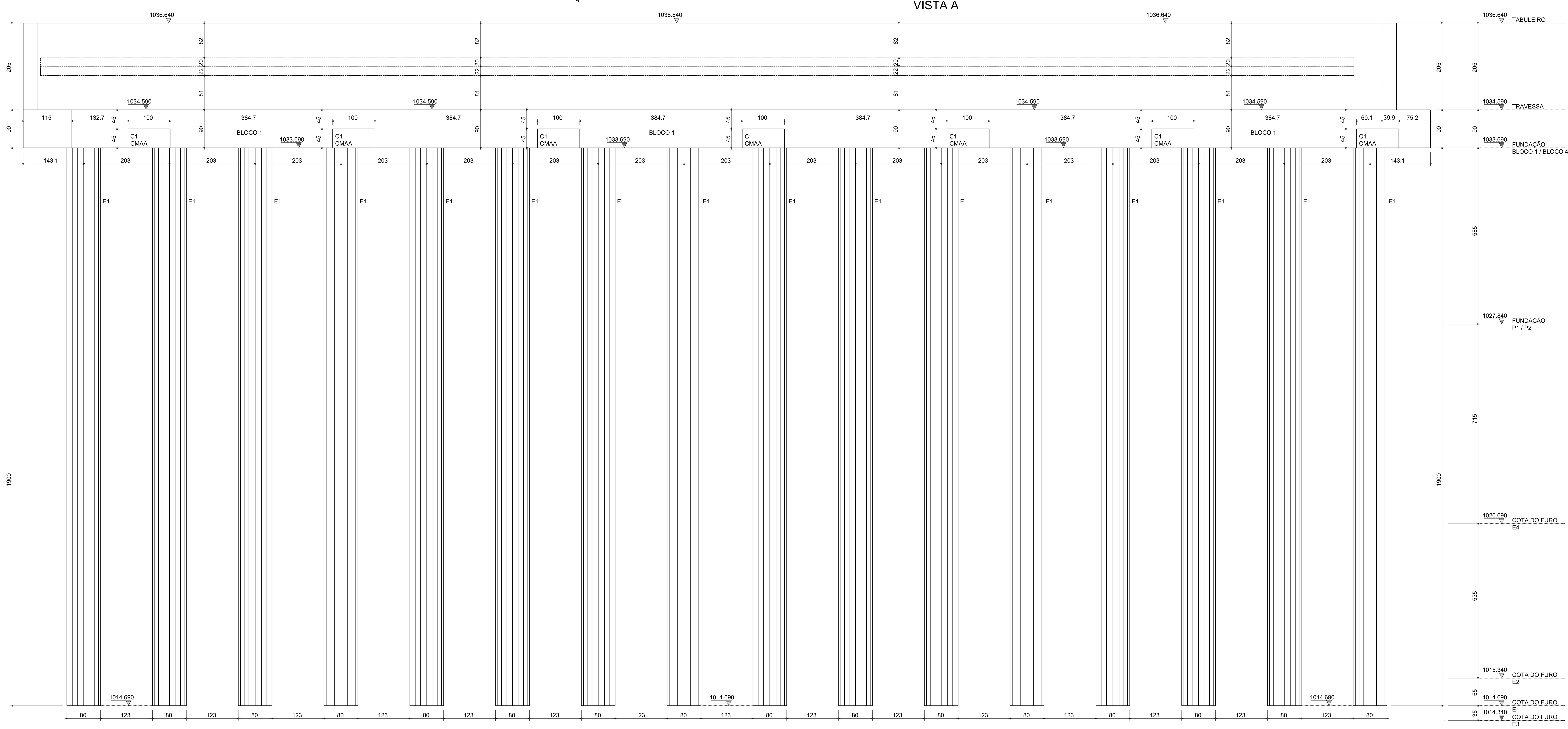
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO	LOCAL	PROJETO
EXECUTIVO	BRASÍLIA	HERMES BUENO
ESCALA	TRECHO/SUBTRECHO	COORD.
INDICADA	CORTE C-C	HERMES BUENO
FOLHA	ESPECIALIDADE/SUBESPECIALIDADE	CÁLCULO
05/27	PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	HÉRBIO LOPES
REVISÃO	CÓDIGO	DATA
00	2101-FOR-EX-005-R00	JANEIRO/2022





CORTE D-D



*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

VISTA A

DETALHE PÓRTICO 1
ESC.:1:50

OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA, O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
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02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

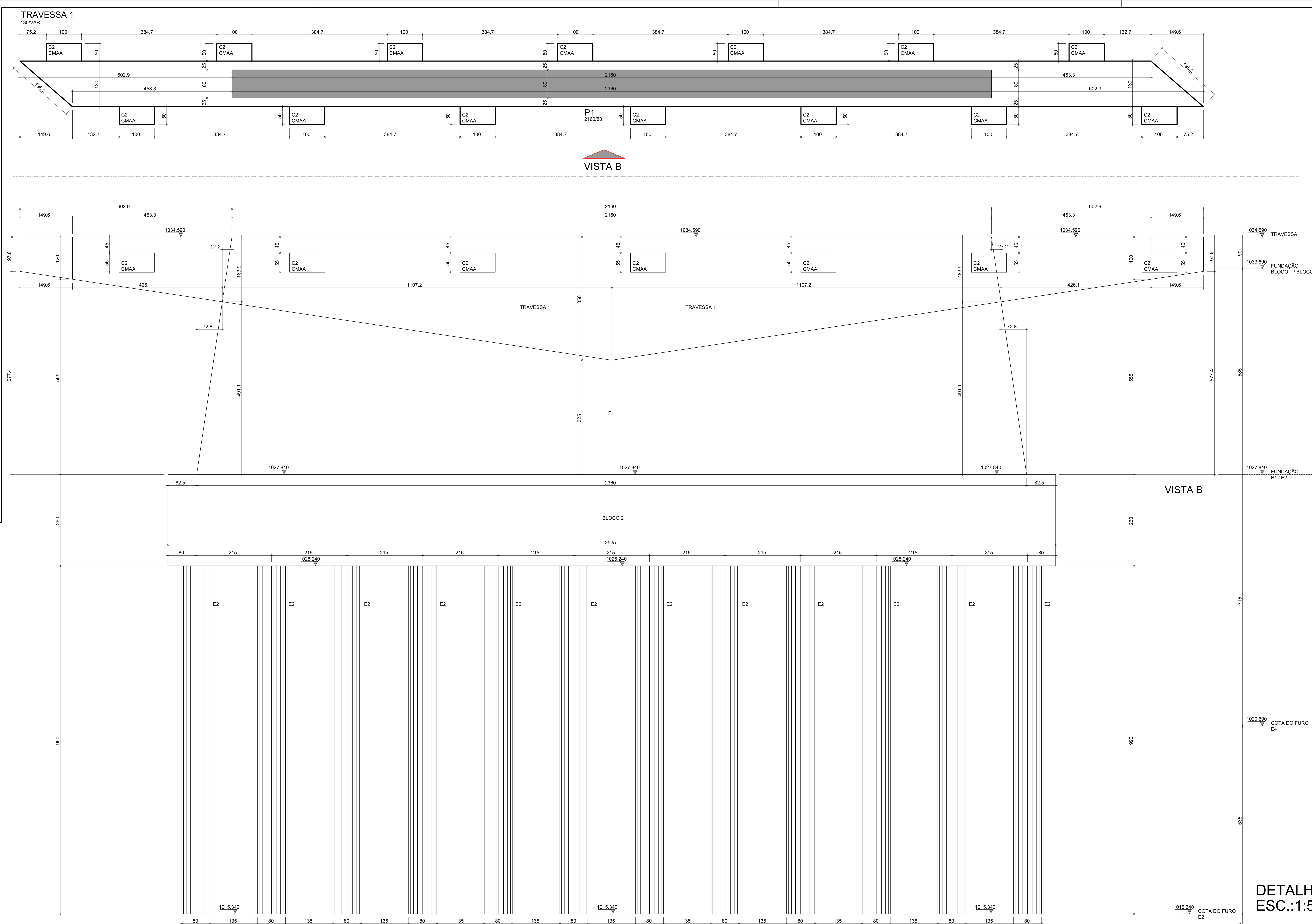
CONFERIDO	APROVADO	VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: DETALHE PÓRTICO 1	COORD.: HERMES BUENO
FOLHA: 06/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FOR-EX-006-R00	DATA: JANEIRO/2022



DETALHE PÓRTICO 2
ESC.:1:50

*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA , O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

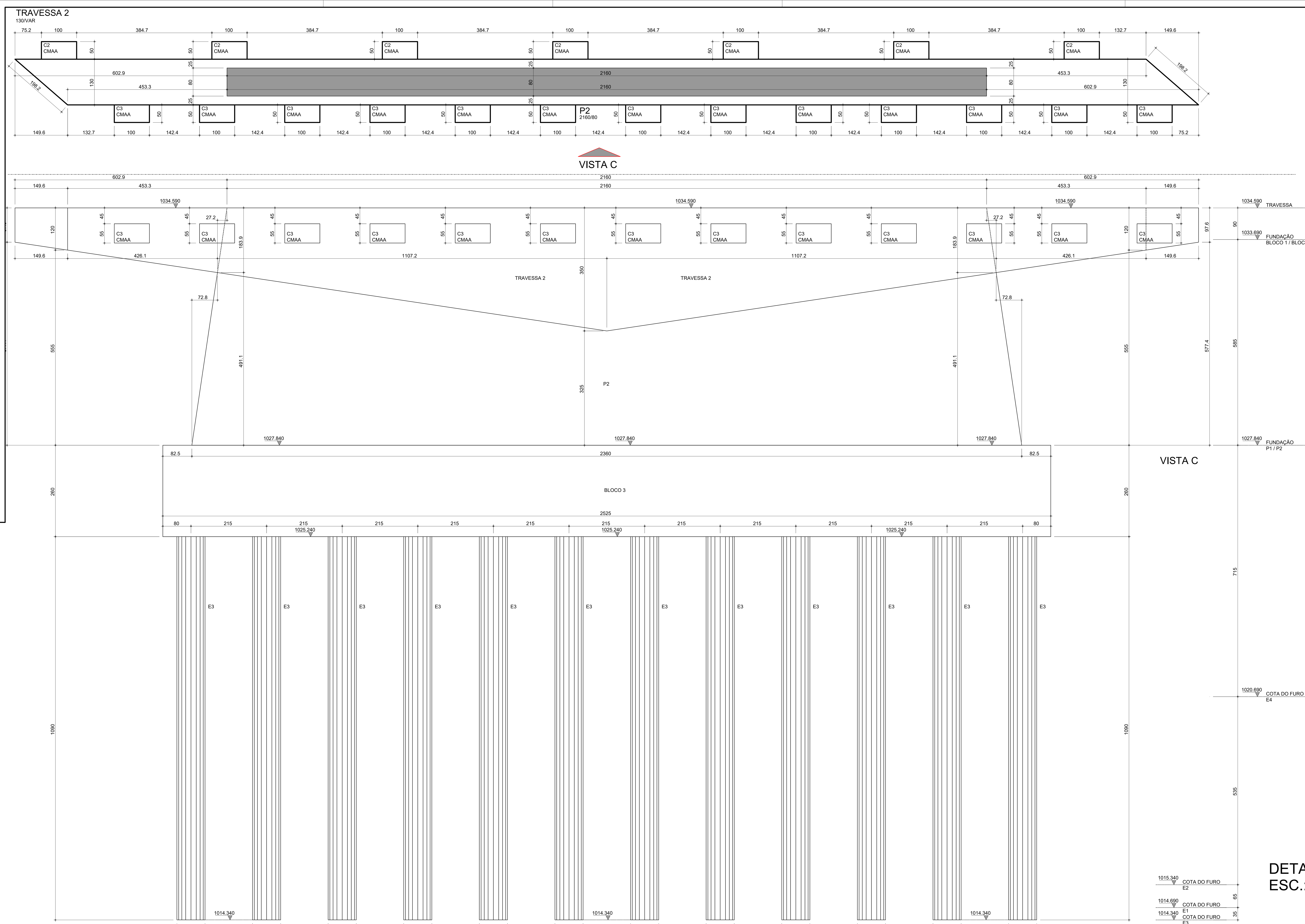
CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: DETALHE PÓRTICO 2	COORD.: HERMES BUENO
FOLHA: 07/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FOR-EX-007-R00	DATA: JANEIRO/2022



DETALHE PÓRTICO 3
ESC.:1:50

*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA , O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
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- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
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06	-	-

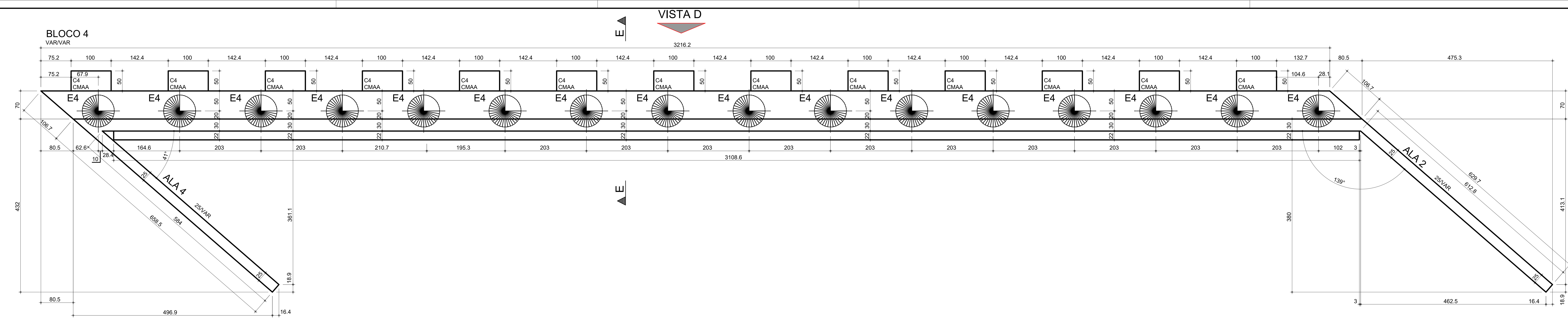
CONFERIDO | APROVADO | VISTO

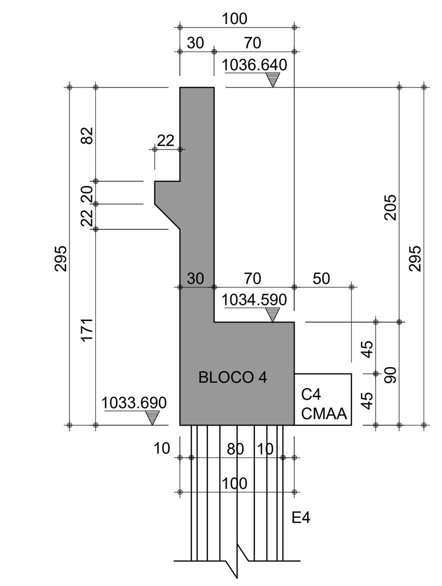
DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

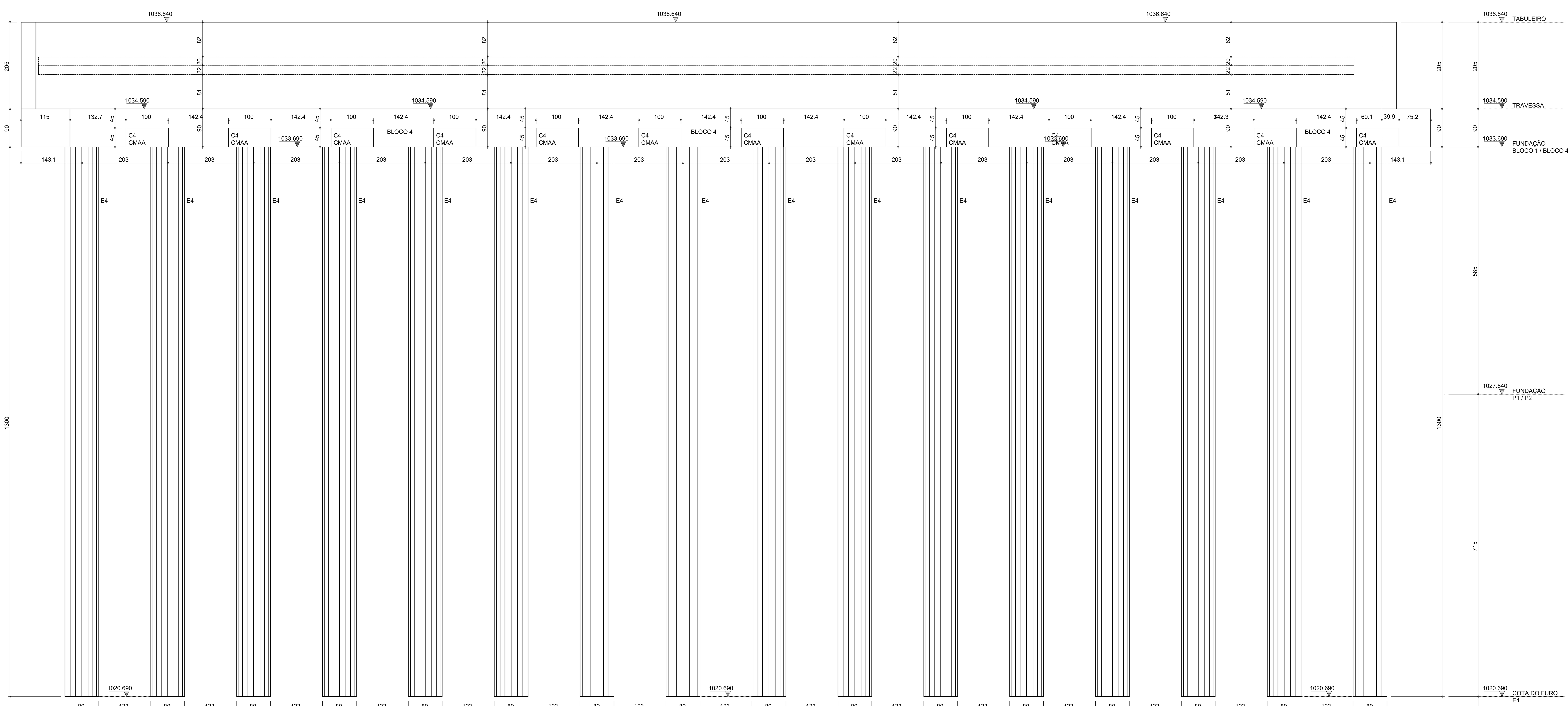
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: DETALHE PÓRTICO 3	COORD.: HERMES BUENO
FOLHA: 08/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FOR-EX-008-R00	DATA: JANEIRO/2022





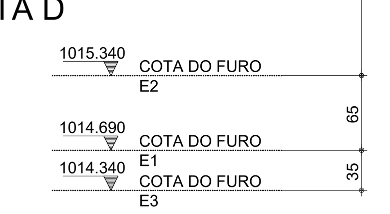
CORTE E-E



*CMAA - CONSOLE PARA APOIO DO MACACO DE MANUTENÇÃO DO APARELHO DE APOIO. A TROCA DOS APARELHOS DE APOIO DEVERÁ SER FEITA USANDO UM MACACO EM CADA CONSOLE E TODOS ACIONADOS SIMULTANEAMENTE

DETALHE PÓRTICO 4
ESC.:1:50

VISTA D



OBSERVAÇÕES GERAIS SOBRE A EXECUÇÃO DA ESTRUTURA

1) AS COTAS DE IMPLANTAÇÃO DA OBRA, AS COTAS E OS NÍVEIS DAS FORMAS DEVERÃO SER VERIFICADAS E ACEITAS PELO RESPONSÁVEL TÉCNICO PELA OBRA ANTES DA EXECUÇÃO DAS MESMAS.

2) COMO REFERÊNCIA PARA O PROJETO DE IMPLANTAÇÃO FOI UTILIZADO SOMENTE O PROJETO GEOMÉTRICO.

3) AS QUANTIDADES DE MATERIAIS CONSTANTES EM CADA PRANCHA SÃO INDICATIVAS, DEVENDO SER VERIFICADAS PELO RESPONSÁVEL TÉCNICO PELA OBRA TANTO PARA FINS DE ORÇAMENTO COMO PARA COMPRA DE MATERIAL.

4) OS COBRIMENTOS DAS ARMADURAS, AS DOBRAS E OS DIÂMETROS DE CURVATURA DOS GANCHOS DEVERÃO ATENDER O PRESCRITO NOS ITENS ESPECÍFICOS DA NBR 6118.

5) O ESCORAMENTO, O RE-ESCORAMENTO E O CIMBRAMENTO DESTA ESTRUTURA DE CONCRETO DEVERÁ SER OBJETO DE UM PROJETO ADICIONAL ESPECÍFICO DE RESPONSABILIDADE DO EXECUTANTE DA ESTRUTURA , O QUAL DEVERÁ RESPEITAR A NBR 15696, BEM COMO A RESISTÊNCIA E A MATURIDADE DOS CONCRETOS SEM EXCEDER AOS CARREGAMENTOS MÁXIMOS CONSIDERADOS NO PROJETO ESTRUTURAL. CONFORME A NBR 12655, O PROJETO DE RE-ESCORAMENTO DEVERÁ SER OBJETO DE APROVAÇÃO FORMAL PELO PROJETISTA ESTRUTURAL ANTES DE SEU EMPREGO NA OBRA. ESPECIAL ATENÇÃO DEVERÁ SER DADA PARA NÃO CAUSAR CARREGAMENTOS INADEQUADOS NEM TAMPOUCO SUBMETER O CONCRETO A AÇÕES EM IDADE PRECOCE, O QUE PODERÁ AUMENTAR SIGNIFICATIVAMENTE AS DEFORMAÇÕES LENTAS APRESENTADAS PELA ESTRUTURA.

6) A EXECUÇÃO DO ESCORAMENTO, DO RE-ESCORAMENTO E DO CIMBRAMENTO DEVE RESPEITAR A NBR 15696 BEM COMO O PROJETO ESPECÍFICO ACIMA MENCIONADO.

7) QUALQUER MODIFICAÇÃO, DÚVIDA OU DIVERGÊNCIA ENTRE DETALHES GENÉRICOS E OS DESENHOS ESPECÍFICOS NAS PLANTAS DEVERÁ SER IMEDIATAMENTE COMUNICADA POR ESCRITO AO PROJETISTA ESTRUTURAL.

8) DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa   Ecs = 26.8 GPa
  - PARA fck = 35 MPa   Ecs = 29.4 GPa
  - PARA fck = 45 MPa   Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: DETALHE PÓRTICO 4	COORD.: HERMES BUENO
FOLHA: 09/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FOR-EX-009-R00	DATA: JANEIRO/2022

PLANTA DE FORMAS DA FUNDAÇÃO
ESC.: 1:100

PONTOS DE SONDAGEM

ESTAQUEAMENTO EIXOS 4 E 1

Baricentros de estacas

Pilar	X (cm)	Y (cm)
ESTACA 3 + 80	237.4	1230.0
ESTACA 4 + 00	2237.4	1230.0
ESTACA 4 + 20	4237.4	1230.0
ESTACA 4 + 40	6237.4	1230.0
ESTACA 4 + 60	8237.4	1230.0
ESTACA 4 + 80	10237.4	1230.0
ESTACA 11 + 00	0.0	0.0
ESTACA 11 + 20	2000.0	0.0
ESTACA 11 + 40	4000.0	0.0
ESTACA 11 + 60	6000.0	0.0
ESTACA 11 + 80	8000.0	0.0
ESTACA 12 + 00	10000.0	0.0

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E2-a	4554.3	1541.7
E2-aa	3518.6	111.4
E2-ab	3093.9	272.3
E2-ac	3225.1	121.3
E2-ad	3356.4	-29.6
E2-ae	2931.7	131.2
E2-af	3062.9	-19.7
E2-ag	3194.1	-170.7
E2-ah	2769.4	-9.8
E2-ai	2900.6	-160.8
E2-aj	3031.8	-311.7
E2-b	4685.5	1390.8

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E2-c	4816.7	1239.9
E2-d	4392.0	1400.7
E2-e	4523.2	1249.7
E2-f	4654.5	1098.8
E2-g	4229.8	1259.6
E2-h	4361.0	1108.7
E2-i	4492.2	957.7
E2-j	4067.5	1118.6
E2-k	4198.7	967.6
E2-l	4329.9	816.7
E2-m	3905.2	977.5
E2-n	4036.5	826.6

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E2-o	4167.7	675.6
E2-p	3743.0	836.5
E2-q	3874.2	685.5
E2-r	4005.4	534.6
E2-s	3580.7	695.4
E2-t	3711.9	544.5
E2-u	3843.1	393.5
E2-v	3418.5	554.4
E2-w	3549.7	403.4
E2-x	3680.9	252.5
E2-y	3256.2	413.3
E2-z	3387.4	262.4

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E3-a	7092.3	1541.7
E3-aa	6056.6	111.4
E3-ab	5631.9	272.3
E3-ac	5763.1	121.3
E3-ad	5894.4	-29.6
E3-ae	5469.7	131.2
E3-af	5600.9	-19.7
E3-ag	5732.1	-170.7
E3-ah	5307.4	-9.8
E3-ai	5438.6	-160.8
E3-aj	5569.8	-311.7
E3-b	7223.5	1390.8

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E3-c	7354.7	1239.9
E3-d	7061.2	1249.7
E3-e	6930.0	1400.7
E3-f	7192.5	1098.8
E3-g	6767.8	1259.6
E3-h	6899.0	1108.7
E3-i	7030.2	957.7
E3-j	6605.5	1118.6
E3-k	6736.7	967.6
E3-l	6867.9	816.7
E3-m	6443.2	977.5
E3-n	6574.5	826.6

Baricentros de estacas

Pilar	X (cm)	Y (cm)
E3-o	6705.7	675.6
E3-p	6281.0	836.5
E3-q	6412.2	685.5
E3-r	6543.4	534.6
E3-s	6118.7	695.4
E3-t	6249.9	544.5
E3-u	6381.1	393.5
E3-v	5956.5	554.4
E3-w	6087.7	403.4
E3-x	6218.9	252.5
E3-y	5794.2	413.3
E3-z	5925.4	262.4

CAPACIDADE GEOTÉCNICA DAS ESTACAS

E1 = 128.41 tf E3 = 123.32 tf
E2 = 95.73 tf E4 = 106.65 tf

ESFORÇOS ATUANTES

Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)	Elem	Fz (tf)
E1-a	107.94	E1-n	28.08	E2-k	91.81	E2-x	69.73	E3-a	66.82	E3-n	93.44	E3-aa	94.36	E4-d	106.28
E1-b	61.39	E1-o	99.71	E2-l	79.05	E2-y	78.79	E3-b	78.40	E3-o	83.05	E3-ab	104.39	E4-e	98.88
E1-c	64.86	E1-p	120.64	E2-m	70.35	E2-z	91.23	E3-c	68.98	E3-p	75.16	E3-ac	123.09	E4-f	99.41
E1-d	90.58	E2-a	59.21	E2-n	80.95	E2-aa	78.62	E3-e	102.23	E3-q	91.65	E3-ad	110.42	E4-g	91.96
E1-e	71.91	E2-b	67.88	E2-o	70.07	E2-ab	92.37	E3-d	123.18	E3-r	81.17	E3-ae	101.79	E4-h	95.53
E1-f	91.28	E2-c	59.18	E2-p	69.03	E2-ac	95.59	E3-f	105.97	E3-s	74.52	E3-af	123.11	E4-i	98.84
E1-g	77.09	E2-d	88.92	E2-q	80.22	E2-ad	92.11	E3-g	105.75	E3-t	91.09	E3-ag	105.53	E4-j	95.00
E1-h	96.34	E2-e	95.60	E2-r	69.13	E2-ae	89.65	E3-h	123.16	E3-u	80.91	E3-ah	66.18	E4-k	99.75
E1-i	67.07	E2-f	88.82	E2-s	69.04	E2-af	95.62	E3-i	111.18	E3-v	75.38	E3-ai	77.97	E4-l	102.71
E1-j	82.80	E2-g	92.08	E2-t	80.02	E2-ag	89.41	E3-j	88.58	E3-w	92.11	E3-aj	68.37	E4-m	105.32
E1-k	86.89	E2-h	95.61	E2-u	68.72	E2-ah	59.78	E3-k	106.76	E3-x	83.17	E4-a	106.44	E4-n	102.59
E1-l	67.32	E2-i	91.89	E2-v	69.68	E2-ai	68.50	E3-l	94.39	E3-y	86.78	E4-b	104.55	E4-o	100.43
E1-m	111.13	E2-j	79.22	E2-w	80.33	E2-aj	59.65	E3-m	77.45	E3-z	105.48	E4-c	106.51	E4-p	105.39

NOTAS :

1. Todas as ESTACAS são do tipo HÉLICE CONTÍNUA;
2. As estacas deverão obedecer a profundidade mínima (CE) como indicado na planta de formas dos blocos;
3. A profundidade das estacas deverá ser cotada a partir da face inferior do respectivo bloco;
4. A locação das estacas será feita a partir da planta de locação e formas dos blocos.
5. Projeto de fundações elaborado com base no Relatório de Sondagem da AeT Arquitetura Planejamento e Transportes LTDA de abril de 2021.
Cliente: DER/DF
Local: Ligação STN-EPIA - Setor Noroeste - Brasília / DF
Relatórios: SPT 01 até SPT 04.

LEGENDA DOS BLOCOS:

Bx (Px)
H / B (h / b)
HF
CA / CF
NB
nØDE
CE

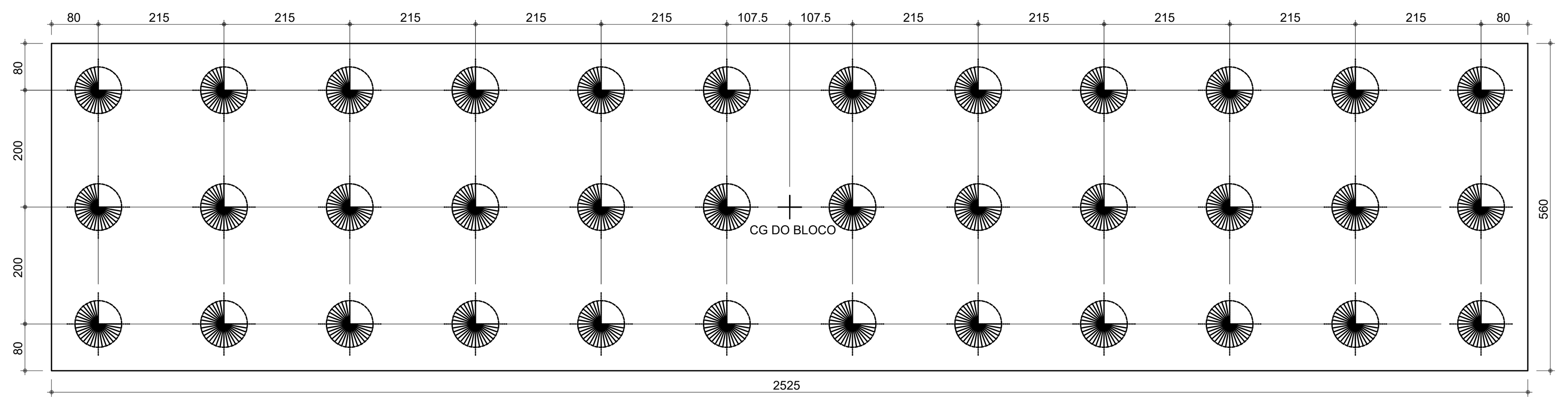
Onde:
Bx - Nome do bloco
Px - Nome do pilar
H e B - Dimensões do bloco (cm)
h e h - Dimensões do pilar (cm)
HF - Altura do bloco (cm)
CA - Cota de arrasamento (m)
CF - Cota do furo (m)
NB - Nível do topo do bloco (m)
n - Número de estacas no bloco
DE - Diâmetro da estaca (cm)
CE - Comprimento das estacas (cm)

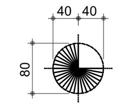
TABELA DE ESTACAS

Símbolo	Tipo	Quantidade (un)	Diâmetro (cm)	Comprimento unitário (cm)	Comprimento total (m)
	Estaca Hélice Contínua	16	80	1900	304
	Estaca Hélice Contínua	16	80	1300	208
	Estaca Hélice Contínua	36	80	1100	396
	Estaca Hélice Contínua	36	80	1000	360

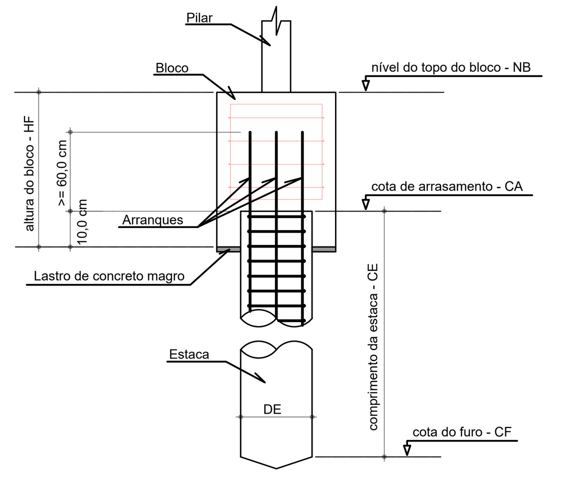
RESUMO DE MATERIAL FUNDAÇÃO

	Blocos	Estacas
Forma (m²)	320.84	-
Concreto (m³)	735.28	637.37





DETALHES DAS FUNDAÇÕES
ESC.:1:75



Corte esquemático bloco sobre estaca
Sem escala

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
PARA fck = 30 MPa Ecs = 26.8 GPa
PARA fck = 35 MPa Ecs = 29.4 GPa
PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
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05	-	-
06	-	-

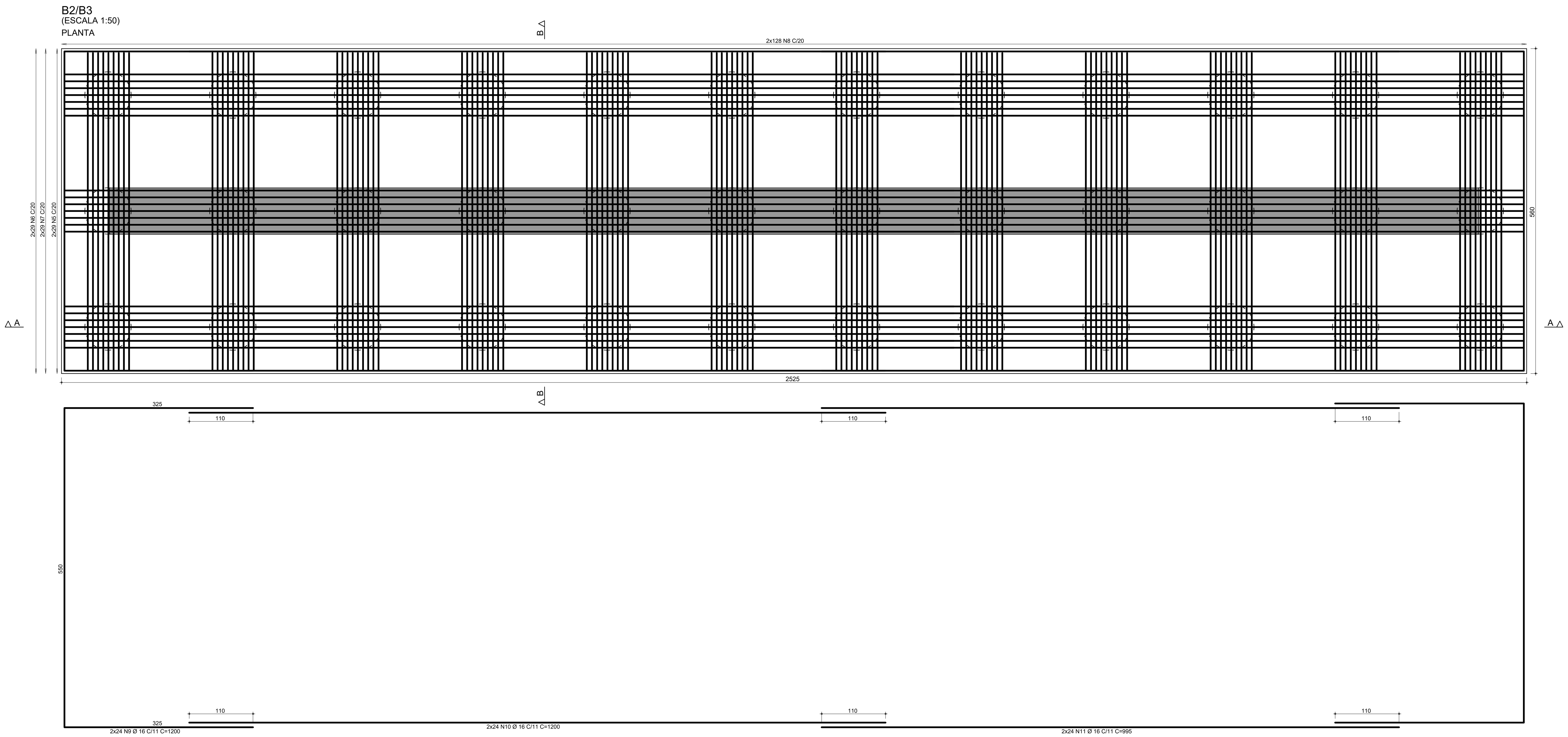
CONFERIDO | APROVADO | VISTO

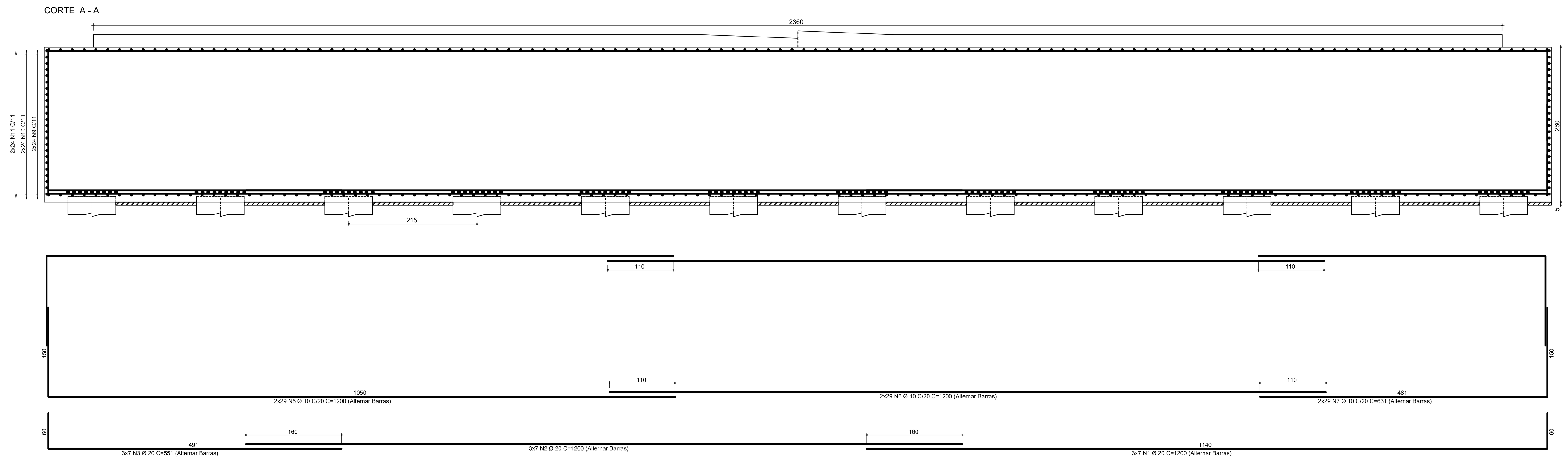
DER DF

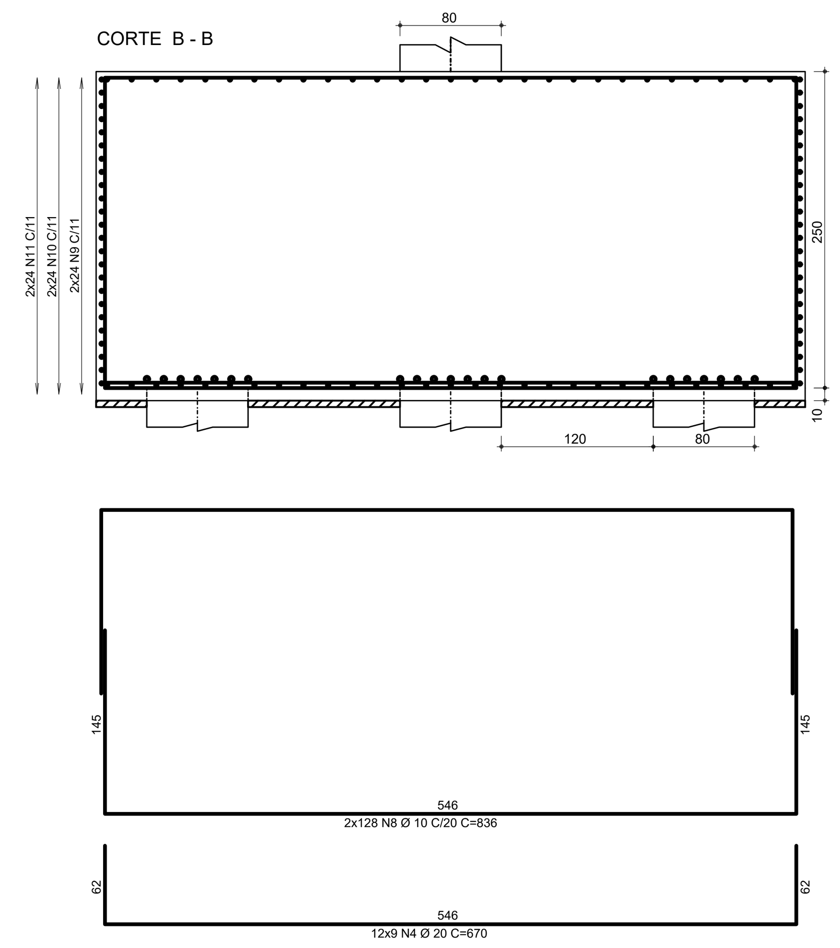
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO	LOCAL	PROJETO
EXECUTIVO	BRASÍLIA	HERMES BUENO
ESCALA: INDICADA	TRECHO/SUBTRECHO: PLANTA DE FORMAS - FUNDAÇÃO	COORD.: HERMES BUENO
FOLHA: 10/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FUN-EX-010-R00	DATA: JANEIRO/2022







AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
B2/B3 (X2)					
50A	1	20	42	1200	50400
50A	2	20	42	1200	50400
50A	3	20	42	551	23142
50A	4	20	216	670	144720
50A	5	10	116	1200	139200
50A	6	10	116	1200	139200
50A	7	10	116	631	73196
50A	8	10	512	836	428032
50A	9	16	96	1200	115200
50A	10	16	96	1200	115200
50A	11	16	96	995	95520

RESUMO DE AÇO			
AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	10	7796	4807
50A	16	3259	5144
50A	20	2687	6626
Peso Total	50A =		16577 kgf

DETALHAMENTO DOS BLOCOS
ESC.:1:50

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	[signature]
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	[signature]
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	[signature]
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	Hérbio Henrique Lopes
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	[signature]

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

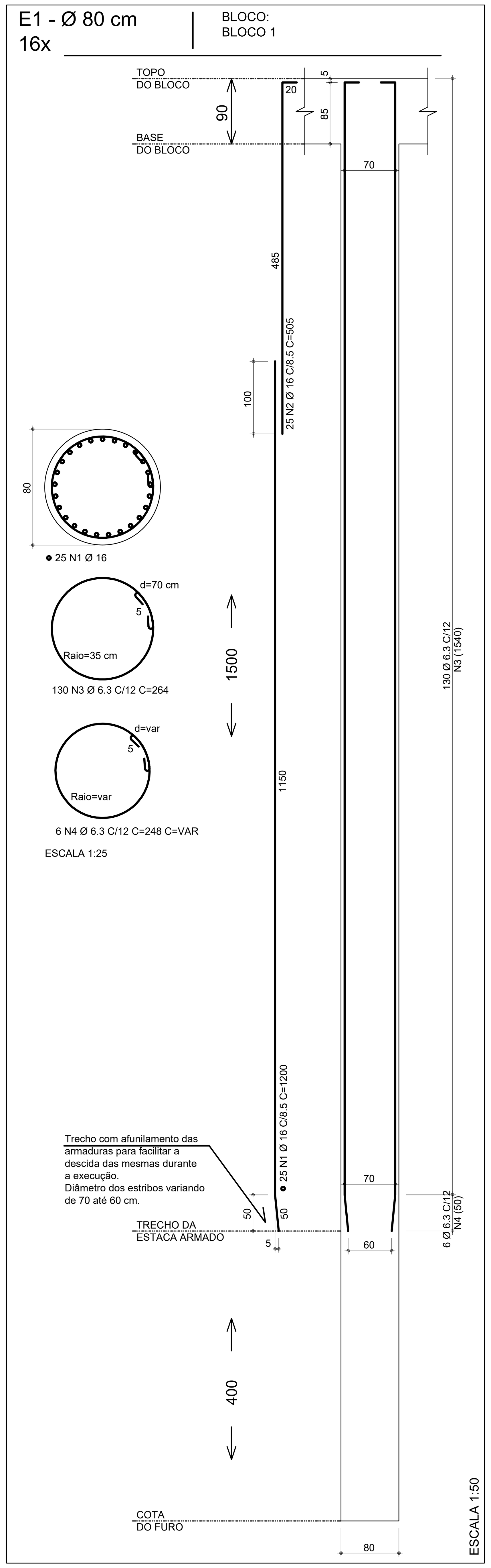
CONFERIDO	APROVADO	VISTO

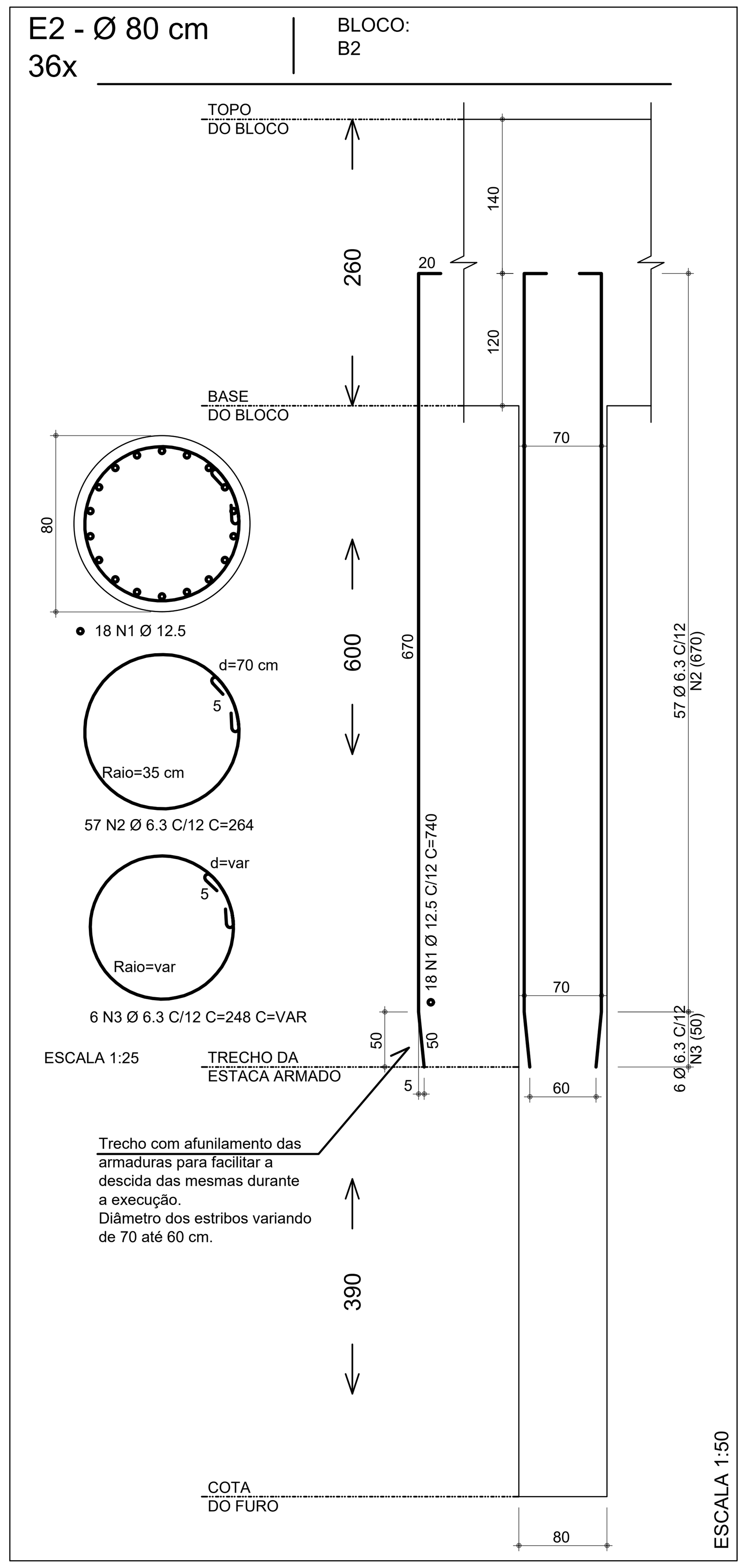
DER DF

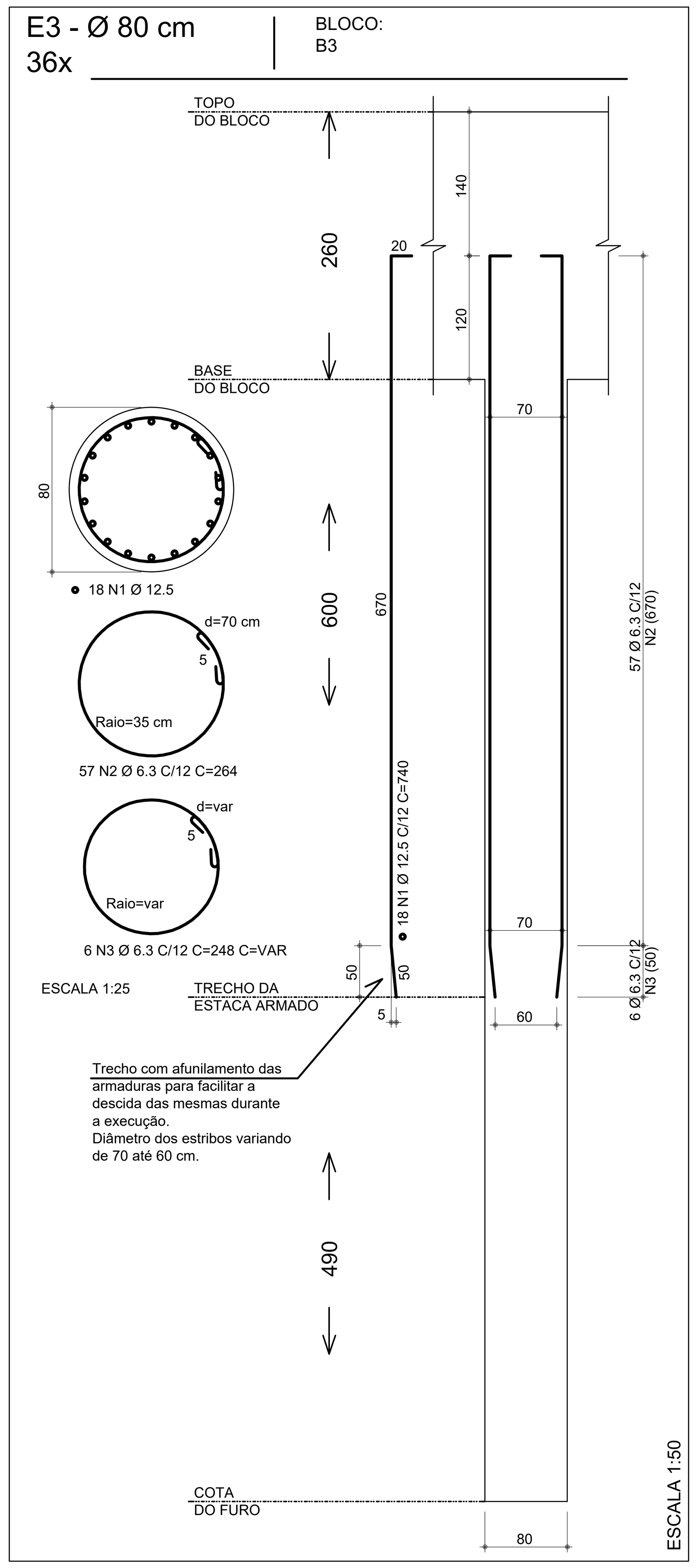
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

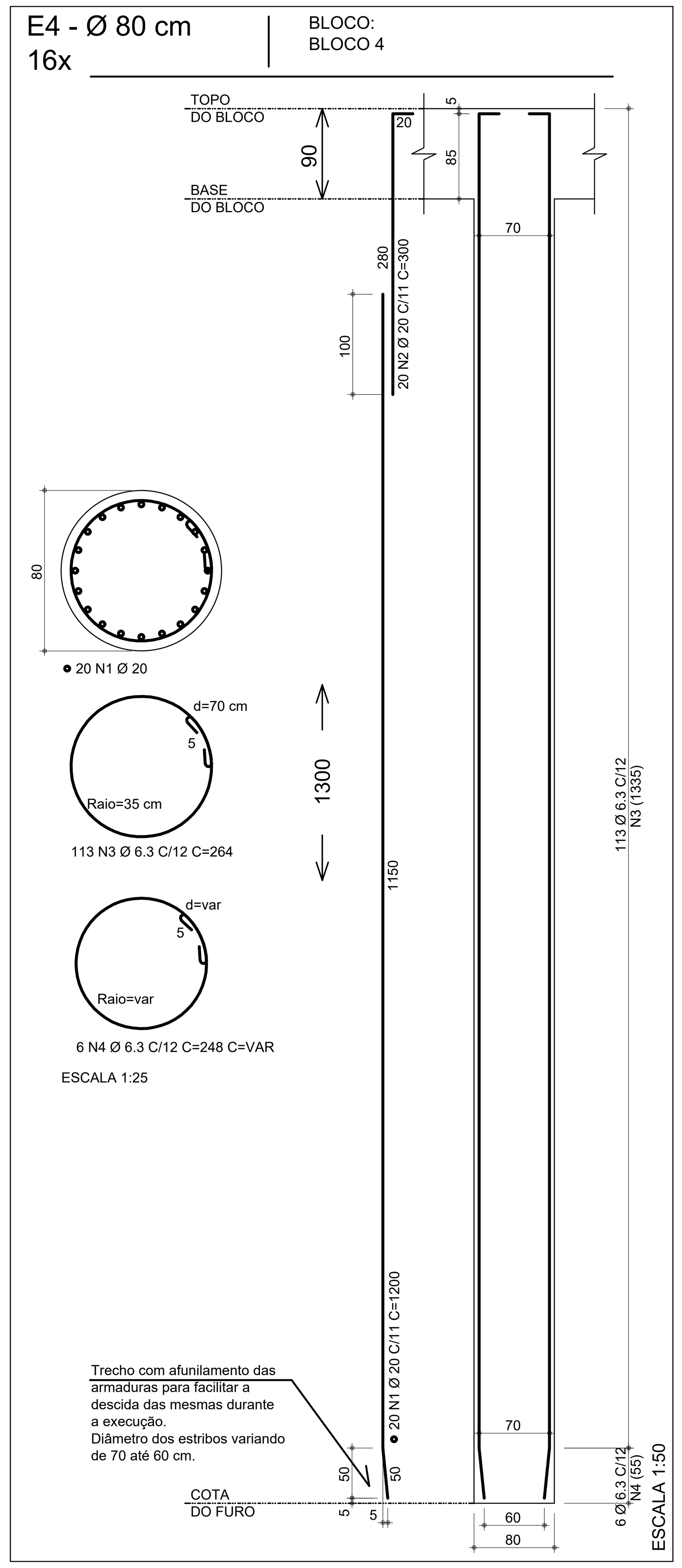
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: DETALHAMENTO DOS BLOCOS	COORD.: HERMES BUENO
FOLHA: 11/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FUN-EX-011-R00	DATA: JANEIRO/2022









AÇO		POS	BIT	QUANT	COMPRIMENTO	
					UNIT	TOTAL
			mm		cm	cm
E1 - Ø 80 cm (X16)						
	50A	1	16	400	1200	480000
	50A	2	16	400	505	202000
	50A	3	6.3	2080	264	549120
	50A	4	6.3	96	248	23808
E2 - Ø 80 cm (X36)						
	50A	1	12.5	648	740	479520
	50A	2	6.3	2052	264	541728
	50A	3	6.3	216	248	53568
E3 - Ø 80 cm (X36)						
	50A	1	12.5	648	740	479520
	50A	2	6.3	2052	264	541728
	50A	3	6.3	216	248	53568
E4 - Ø 80 cm (X16)						
	50A	1	20	320	1200	384000
	50A	2	20	320	300	96000
	50A	3	6.3	1808	264	477312
	50A	4	6.3	96	248	23808

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	22646	5544
50A	12.5	9590	9239
50A	16	6820	10765
50A	20	4800	11838
Peso Total	50A =		37386 kgf

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  PARA fck = 30 MPa   Ecs = 26.8 GPa
  PARA fck = 35 MPa   Ecs = 29.4 GPa
  PARA fck = 45 MPa   Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:25	TRECHO/SUBTRECHO: DETALHAMENTO DAS ESTACAS FUNDAÇÃO	COORD.: HERMES BUENO
FOLHA: 12/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-FUN-EX-012-R00	DATA: JANEIRO/2022

AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
		mm		cm	cm
LP1 (X384)					
50A	1	12.5	1920	513	984960
50A	2	6.3	9600	--VAR-	508800
LP2 (X564)					
50A	1	10	2820	270	761400
50A	2	6.3	5640	--VAR-	253800

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	7626	1867
50A	10	7614	4695
50A	12.5	9850	9489
Peso Total	50A =		16051 kgf

AÇO	POS	QUANT	COMPRIMENTO	
			UNIT	TOTAL
			(cm)	(cm)
LP1 (384x)				
TR 16745	3	384	359	137856
LP2 (564x)				
TR 16745	3	564	116	65424

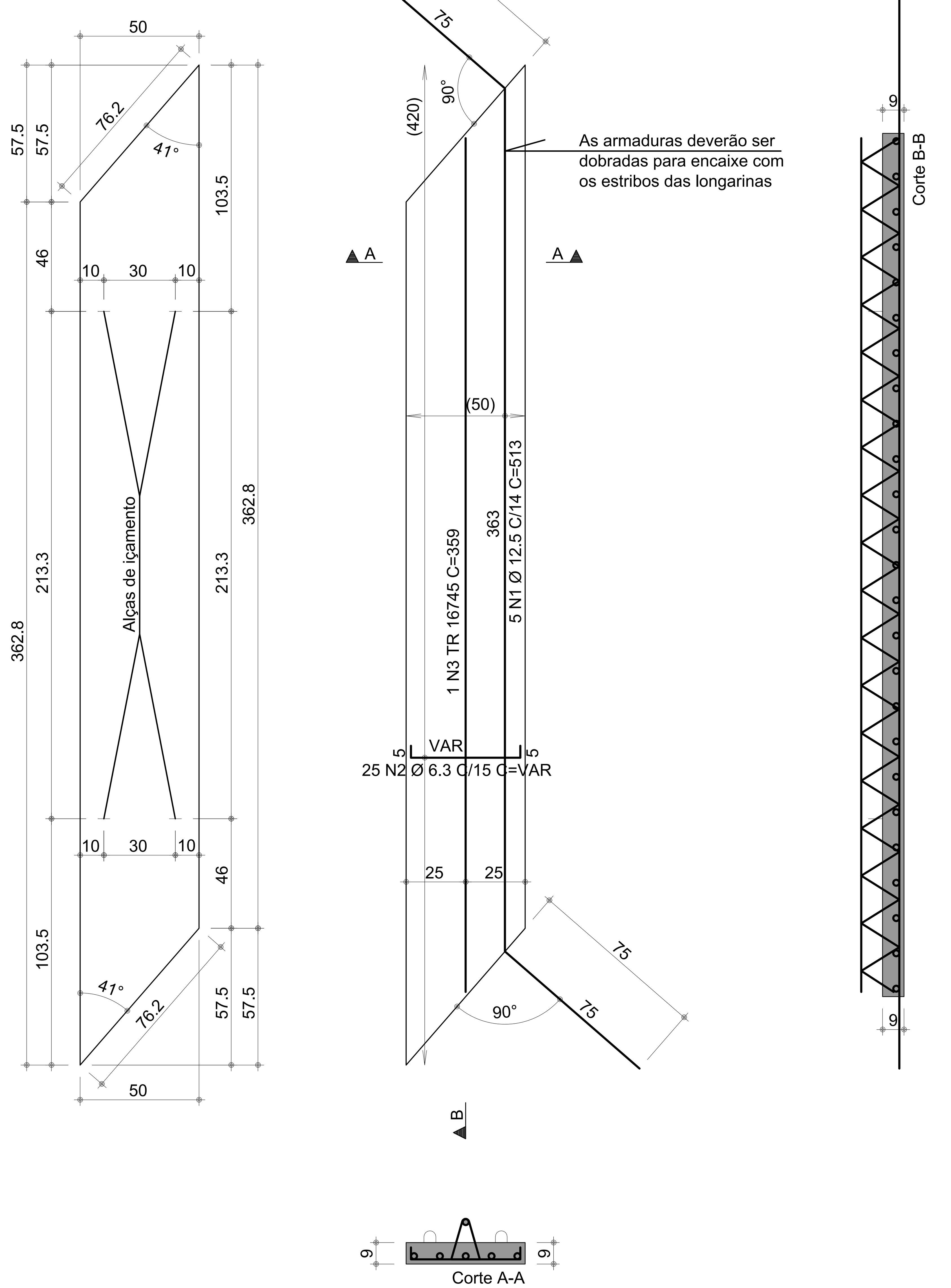
RESUMO AÇO CA 50-60		
AÇO	COMPR	PESO
	(m)	(kg)
TR 16745	2033	2098
Peso Total TR 16745 =		2098 kg

LP1

h=9

384x

Vol. Concreto Unit. (m³) = 0.164



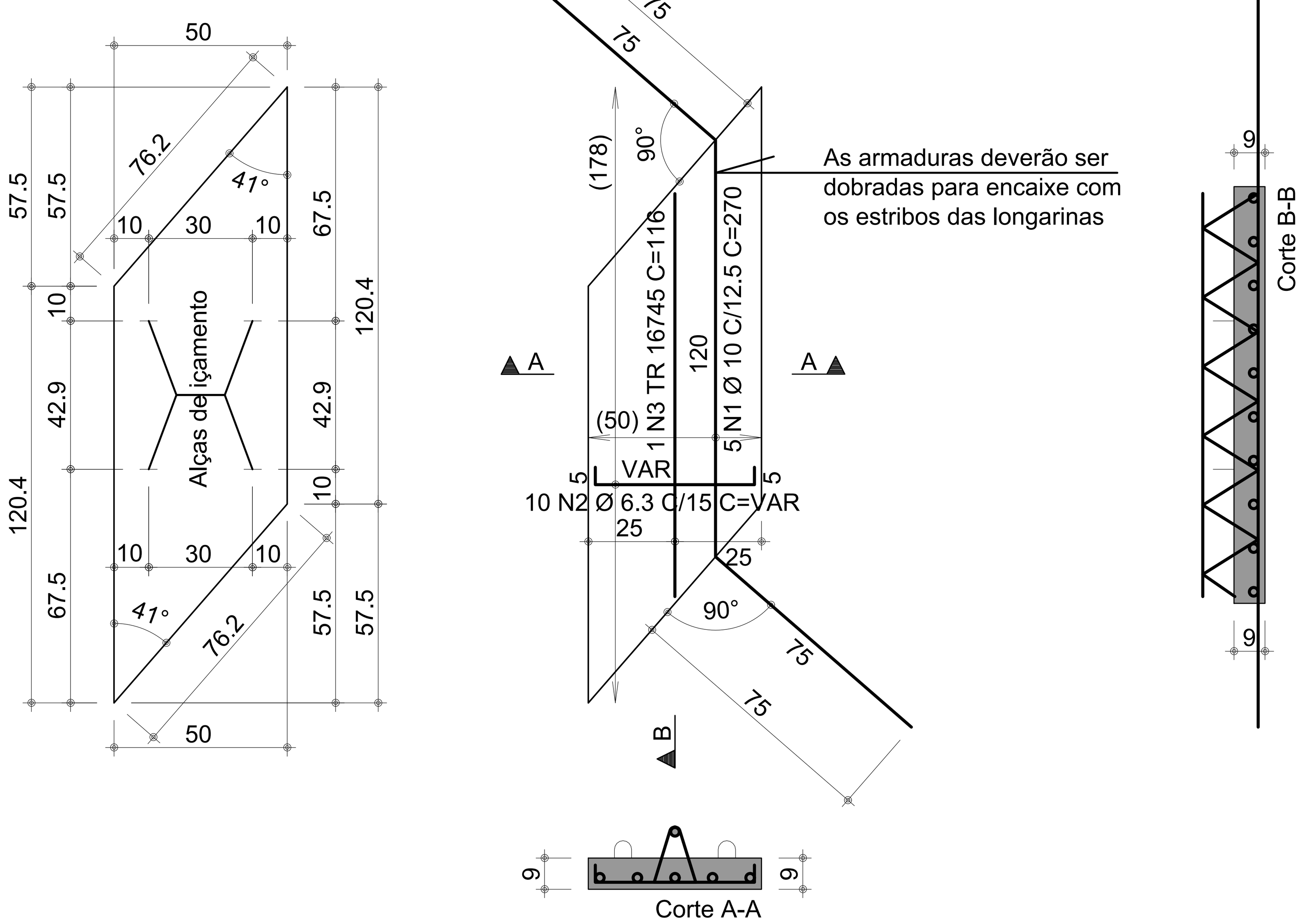
25 N2 Ø 6.3 C/15	
N2A	32
N2B	45
N2C	56
N2D	56
N2E	56
N2F	56
N2G	56
N2H	56
N2I	56
N2J	56
N2K	56
N2L	56
N2M	56
N2N	56
N2O	56
N2P	56
N2Q	56
N2R	56
N2S	56
N2T	56
N2U	56
N2V	56
N2W	56
N2X	45
N2Y	32

LP2

h=9

564x

Vol. Concreto Unit. (m³) = 0.054



10 N2 Ø 6.3 C/15	
N2A	25
N2B	38
N2C	51
N2D	56
N2E	56
N2F	56
N2G	56
N2H	51
N2I	38
N2J	25

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

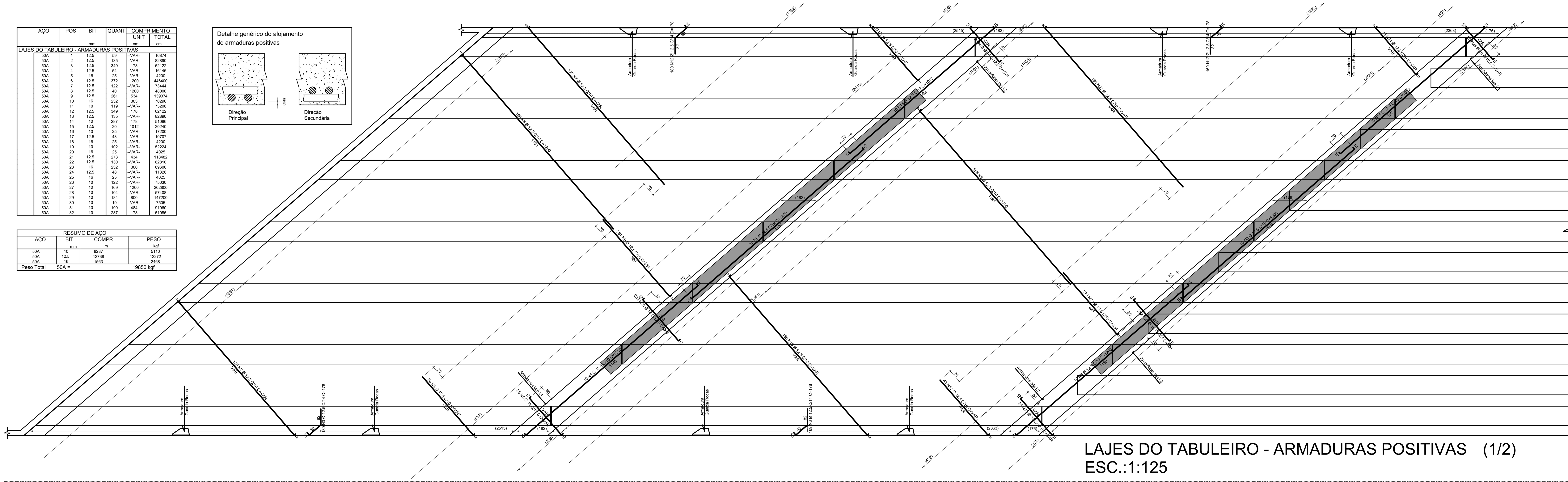
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:15	TRECHO/SUBTRECHO: DET. LAJES PRÉ-MOLDADAS TABULEIRO	COORD.: HERMES BUENO
FOLHA: 13/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-LAJ-EX-013-R00	DATA: JANEIRO/2022

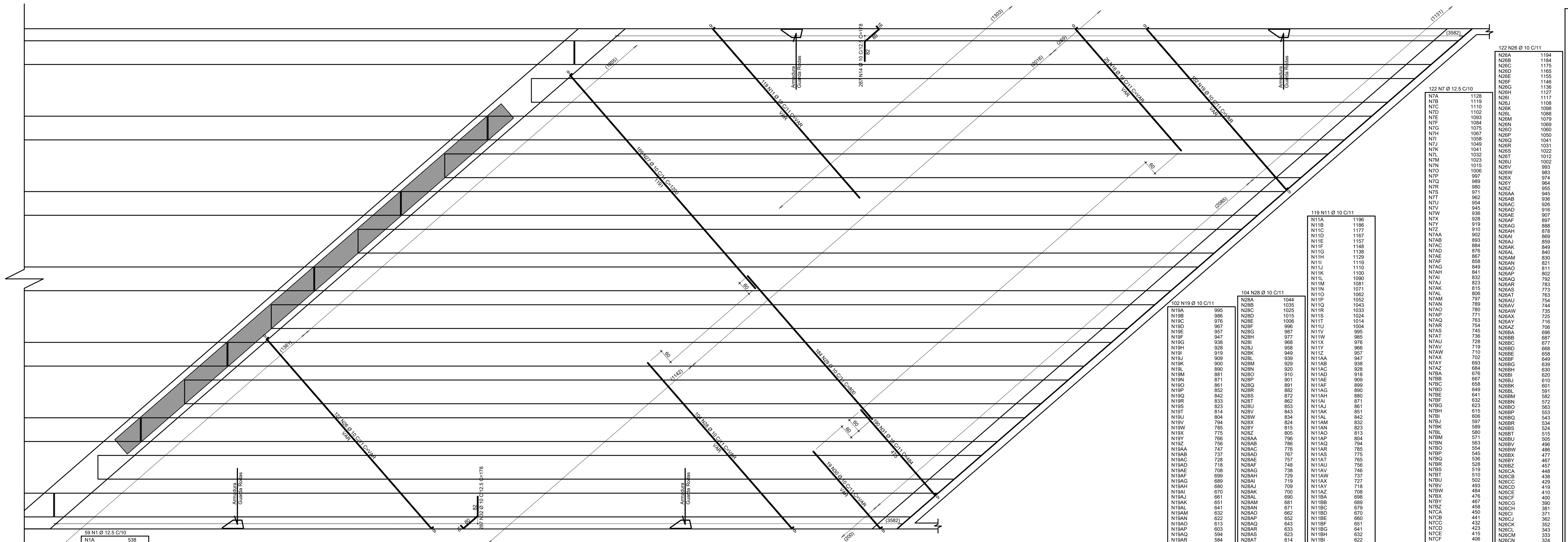
AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
		mm		cm	cm
LAJES DO TABULEIRO - ARMADURAS POSITIVAS					
50A	1	12.5	59	--VAR-	16874
50A	2	12.5	135	--VAR-	82890
50A	3	12.5	349	178	62122
50A	4	12.5	54	--VAR-	16146
50A	5	16	25	--VAR-	4200
50A	6	12.5	372	1200	446400
50A	7	12.5	122	--VAR-	73444
50A	8	12.5	40	1200	48000
50A	9	12.5	261	534	139374
50A	10	16	232	303	70296
50A	11	10	119	--VAR-	75208
50A	12	12.5	349	178	62122
50A	13	12.5	135	--VAR-	82890
50A	14	10	287	178	51086
50A	15	12.5	20	1012	20240
50A	16	10	25	--VAR-	17200
50A	17	12.5	43	--VAR-	10707
50A	18	16	25	--VAR-	4200
50A	19	10	102	--VAR-	52224
50A	20	16	25	--VAR-	4025
50A	21	12.5	273	434	118482
50A	22	12.5	130	--VAR-	82810
50A	23	16	232	300	69600
50A	24	12.5	48	--VAR-	11328
50A	25	16	25	--VAR-	4025
50A	26	10	122	--VAR-	75030
50A	27	10	169	1200	202800
50A	28	10	104	--VAR-	57408
50A	29	10	184	800	147200
50A	30	10	19	--VAR-	7505
50A	31	10	190	484	91960
50A	32	10	287	178	51086

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	10	8287	5110
50A	12.5	12738	12272
50A	16	1563	2468
Peso Total	50A =		19850 kgf

Detalhe genérico do alojamento de armaduras positivas



LAJES DO TABULEIRO - ARMADURAS POSITIVAS (1/2)
ESC.:1:125



LAJES DO TABULEIRO - ARMADURAS POSITIVAS (2/2)
ESC.:1:125

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	Hérbio Henrique Lopes
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

A&T Arquitetura Planejamento e Transportes Ltda.

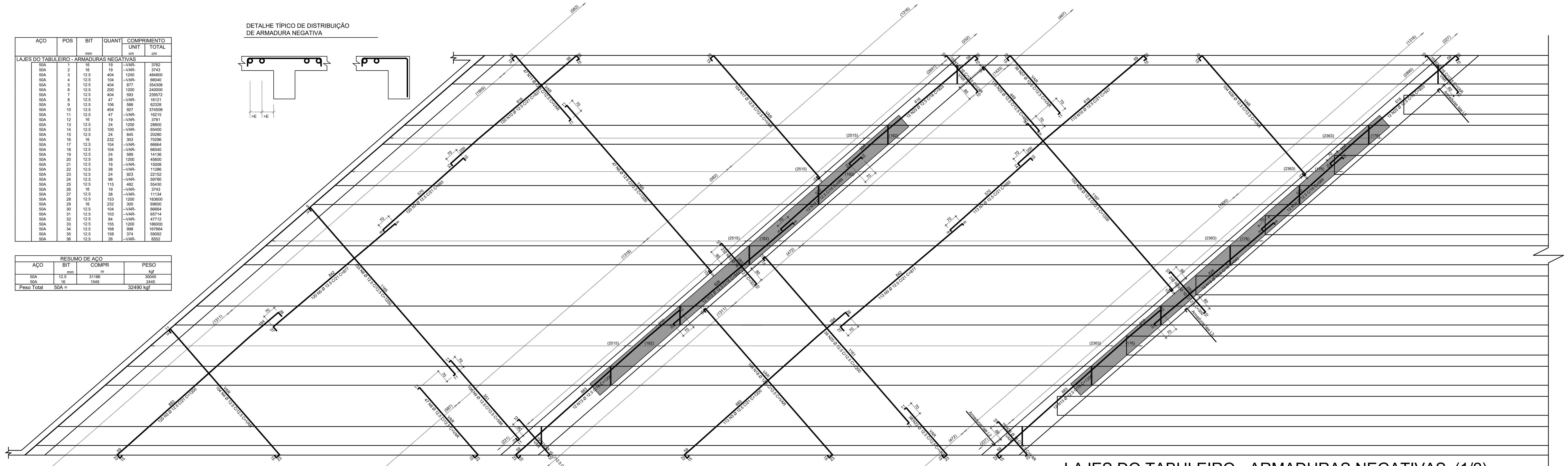
ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:125	TRECHO/SUBTRECHO: DETALHAMENTO LAJES TABULEIRO	COORD.: HERMES BUENO
FOLHA: 14/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-LAJ-EX-014-R00	DATA: JANEIRO/2022

AÇO	POS	BIT	QUANT	COMPRIMENTO UNIT	COMPRIMENTO TOTAL
		mm		cm	cm
LAJES DO TABULEIRO - ARMADURAS NEGATIVAS					
50A	1	16	19	--VAR-	3762
50A	2	16	19	--VAR-	3743
50A	3	12.5	404	1200	484800
50A	4	12.5	104	--VAR-	66040
50A	5	12.5	404	877	354308
50A	6	12.5	200	1200	240000
50A	7	12.5	404	593	239572
50A	8	12.5	47	--VAR-	16121
50A	9	12.5	106	588	62328
50A	10	12.5	404	927	374508
50A	11	12.5	47	--VAR-	16215
50A	12	16	19	--VAR-	3781
50A	13	12.5	24	1200	28800
50A	14	12.5	100	--VAR-	65400
50A	15	12.5	24	845	20280
50A	16	16	232	303	70296
50A	17	12.5	104	--VAR-	66664
50A	18	12.5	104	--VAR-	66040
50A	19	12.5	24	589	14136
50A	20	12.5	38	1200	45600
50A	21	12.5	16	--VAR-	15008
50A	22	12.5	38	--VAR-	11286
50A	23	12.5	24	923	22152
50A	24	12.5	98	--VAR-	59780
50A	25	12.5	115	482	55430
50A	26	16	19	--VAR-	3743
50A	27	12.5	38	--VAR-	11134
50A	28	12.5	153	1200	183600
50A	29	16	232	300	69600
50A	30	12.5	104	--VAR-	66664
50A	31	12.5	103	--VAR-	65714
50A	32	12.5	84	--VAR-	47712
50A	33	12.5	155	1200	186000
50A	34	12.5	168	998	167664
50A	35	12.5	158	374	59092
50A	36	12.5	26	--VAR-	6552

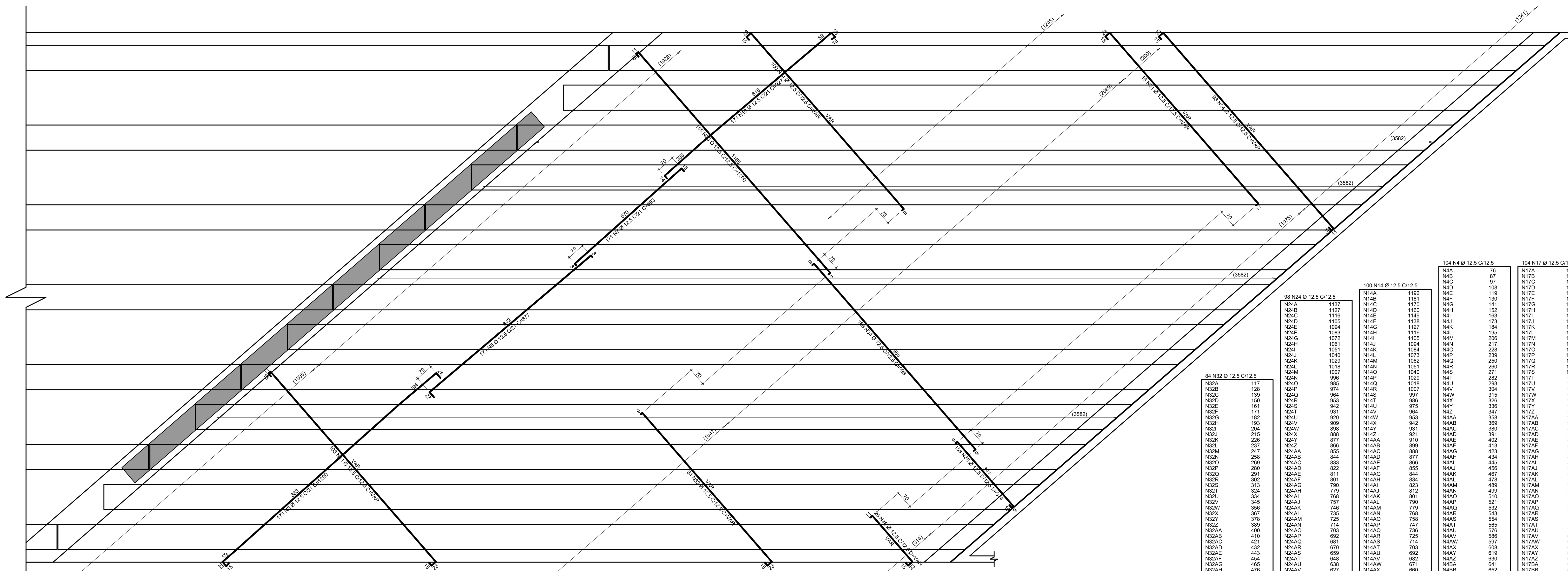
RESUMO DE AÇO

AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	12.5	31186	30045
50A	16	1549	2445
Peso Total	50A =		32490 kgf

DETALHE TÍPICO DE DISTRIBUIÇÃO DE ARMADURA NEGATIVA



LAJES DO TABULEIRO - ARMADURAS NEGATIVAS (1/2)
ESC.:1:75



LAJES DO TABULEIRO - ARMADURAS NEGATIVAS (2/2)
ESC.:1:75

47 N8 Ø 12.5 C/12.5

N8A	93
N8B	104
N8C	115
N8D	125
N8E	136
N8F	147
N8G	158
N8H	169
N8I	180
N8J	191
N8K	202
N8L	212
N8M	223
N8N	234
N8O	245
N8P	256
N8Q	267
N8R	278
N8S	288
N8T	299
N8U	310
N8V	321
N8W	332
N8X	343
N8Y	354
N8Z	365
N8AA	375
N8AB	386
N8AC	397
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N8AE	419
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N8AH	451
N8AI	462
N8AJ	473
N8AK	484
N8AL	495
N8AM	506
N8AN	517
N8AO	528
N8AP	538
N8AQ	549
N8AR	560
N8AS	571
N8AT	582
N8AU	593

47 N11 Ø 12.5 C/12.5

N11A	595
N11B	584
N11C	573
N11D	562
N11E	551
N11F	541
N11G	530
N11H	519
N11I	508
N11J	497
N11K	486
N11L	475
N11M	464
N11N	454
N11O	443
N11P	432
N11Q	421
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N11AL	193
N11AM	182
N11AN	171
N11AO	160
N11AP	149
N11AQ	139
N11AR	128
N11AS	117
N11AT	106
N11AU	95

38 N22 Ø 12.5 C/12.5

N22A	96
N22B	107
N22C	117
N22D	128
N22E	139
N22F	150
N22G	161
N22H	172
N22I	183
N22J	193
N22K	204
N22L	215
N22M	226
N22N	237
N22O	248
N22P	259
N22Q	270
N22R	280
N22S	291
N22T	302
N22U	313
N22V	324
N22W	335
N22X	346
N22Y	356
N22Z	367
N22AA	378
N22AB	389
N22AC	400
N22AD	411
N22AE	422
N22AF	433
N22AG	443
N22AH	454
N22AI	465
N22AJ	476
N22AK	487
N22AL	498

38 N27 Ø 12.5 C/12.5

N27A	494
N27B	483
N27C	472
N27D	461
N27E	450
N27F	440
N27G	429
N27H	418
N27I	407
N27J	396
N27K	385
N27L	374
N27M	363
N27N	353
N27O	342
N27P	331
N27Q	320
N27R	309
N27S	298
N27T	287
N27U	277
N27V	266
N27W	255
N27X	244
N27Y	233
N27Z	222
N27AA	211
N27AB	200
N27AC	190
N27AD	179
N27AE	168
N27AF	157
N27AG	146
N27AH	135
N27AI	124
N27AJ	114
N27AK	103
N27AL	92

19 N1 Ø 16 C/12.5

N1A	296
N1B	285
N1C	274
N1D	264
N1E	253
N1F	242
N1G	231
N1H	220
N1I	209
N1J	198
N1K	188
N1L	177
N1M	166
N1N	155
N1O	144
N1P	133
N1Q	122
N1R	111
N1S	101

19 N2 Ø 16 C/12.5

N2A	295
N2B	284
N2C	273
N2D	262
N2E	251
N2F	240
N2G	229
N2H	219
N2I	208
N2J	197
N2K	186
N2L	175
N2M	164
N2N	153
N2O	142
N2P	132
N2Q	121
N2R	110
N2S	99

19 N12 Ø 16 C/12.5

N12A	101
N12B	112
N12C	123
N12D	133
N12E	144
N12F	155
N12G	166
N12H	177
N12I	188
N12J	199
N12K	210
N12L	220
N12M	231
N12N	242
N12O	253
N12P	264
N12Q	275
N12R	286
N12S	296

16 N21 Ø 12.5 C/12.5

N21A	1020
N21B	1009
N21C	998
N21D	987
N21E	976
N21F	965
N21G	954
N21H	944
N21I	933
N21J	922
N21K	911
N21L	900
N21M	889
N21N	878
N21O	867
N21P	857

19 N26 Ø 16 C/12.5

N26A	99
N26B	110
N26C	121
N26D	132
N26E	142
N26F	153
N26G	164
N26H	175
N26I	186
N26J	197
N26K	208
N26L	219
N26M	229
N26N	240
N26O	251
N26P	262
N26Q	273
N26R	284
N26S	295

26 N36 Ø 12.5 C/12.5

N36A	116
N36B	127
N36C	137
N36D	148
N36E	159
N36F	170
N36G	181
N36H	192
N36I	203
N36J	213
N36K	224
N36L	235
N36M	246
N36N	257
N36O	268
N36P	279
N36Q	290
N36R	300
N36S	311
N36T	322
N36U	333
N36V	344
N36W	355
N36X	366
N36Y	376
N36Z	387

84 N32 Ø 12.5 C/12.5

N32A	117
N32B	128
N32C	139
N32D	150
N32E	161
N32F	171
N32G	182
N32H	193
N32I	204
N32J	215
N32K	226
N32L	237
N32M	247
N32N	258
N32O	269
N32P	280
N32Q	291
N32R	302
N32S	313
N32T	324
N32U	334
N32V	345
N32W	356
N32X	367
N32Y	378
N32Z	389
N32AA	400
N32AB	410
N32AC	421
N32AD	432
N32AE	443
N32AF	454
N32AG	465
N32AH	476
N32AI	486
N32AJ	497
N32AK	508
N32AL	519
N32AM	530
N32AN	541
N32AO	552
N32AP	563
N32AQ	573
N32AR	584
N32AS	595
N32AT	606
N32AU	617
N32AV	628
N32AW	639
N32AX	649
N32AY	660
N32AZ	671
N32BA	682
N32BB	693
N32BC	704
N32BD	715
N32BE	726
N32BF	736
N32BG	747
N32BH	758
N32BI	769
N32BJ	780
N32BK	791
N32BL	802
N32BM	812
N32BN	823
N32BO	834
N32BP	845
N32BQ	856
N32BR	867
N32BS	878
N32BT	889
N32BU	899
N32BV	910
N32BW	921
N32BX	932
N32BY	943
N32BZ	954
N32CA	965
N32CB	975
N32CC	986
N32CD	997
N32CE	1008
N32CF	1019

98 N24 Ø 12.5 C/12.5

N24A	1137
N24B	1127
N24C	1116
N24D	1105
N24E	1094
N24F	1083
N24G	1072
N24H	1061
N24I	1051
N24J	1040
N24K	1029
N24L	1018
N24M	1007
N24N	996
N24O	985
N24P	974
N24Q	964
N24R	953
N24S	942
N24T	931
N24U	920
N24V	909
N24W	898
N24X	888
N24Y	877
N24Z	866
N24AA	855
N24AB	844
N24AC	833
N24AD	822
N24AE	811
N24AF	801
N24AG	790
N24AH	779
N24AI	768
N24AJ	757
N24AK	746
N24AL	735
N24AM	725
N24AN	714
N24AO	703
N24AP	692
N24AQ	681
N24AR	670
N24AS	659
N24AT	648
N24AU	638
N24AV	627
N24AW	616
N24AX	605
N24AY	594
N24AZ	583
N24BA	572
N24BB	562
N24BC	551
N24BD	540
N24BE	529
N24BF	518
N24BG	507
N24BH	496
N24BI	486
N24BJ	475
N24BK	464
N24BL	453
N24BM	442
N24BN	431
N24BO	420
N24BP	409
N24BQ	399
N24BR	388
N24BS	377
N24BT	366
N24BU	355
N24BV	344
N24BW	333
N24BX	323
N24BY	312
N24BZ	301
N24CA	290
N24CB	279
N24CC	268
N24CD	257
N24CE	246
N24CF	236
N24CG	225
N24CH	214
N24CI	203
N24CJ	192
N24CK	181
N24CL	170
N24CM	160
N24CN	149
N24CO	138
N24CP	127
N24CQ	116
N24CR	105
N24CS	94
N24CT	83

100 N14 Ø 12.5 C/12.5

N14A	1192
N14B	1181
N14C	1170
N14D	1160
N14E	1149
N14F	1138
N14G	1127
N14H	1116
N14I	1105
N14J	1094
N14K	1084
N14L	1073
N14M	1062
N14N	1051
N14O	1040
N14P	1029
N14Q	1018
N14R	1007
N14S	997
N14T	986
N14U	975
N14V	964
N14W	953
N14X	942
N14Y	931
N14Z	921
N14AA	910
N14AB	899
N14AC	888
N14AD	877
N14AE	866
N14AF	855
N14AG	844
N14AH	834
N14AI	823
N14AJ	812
N14AK	801
N14AL	790
N14AM	779
N14AN	768
N14AO	758
N14AP	747
N14AQ	736
N14AR	725
N14AS	714
N14AT	703
N14AU	692
N14AV	682
N14AW	671
N14AX	660
N14AY	649
N14AZ	638
N14BA	627
N14BB	616
N14BC	605
N14BD	595
N14BE	584
N14BF	573
N14BG	562
N14BH	551
N14BI	540
N14BJ	529
N14BK	519
N14BL	508
N14BM	497
N14BN	486
N14BO	475
N14BP	464
N14BQ	453
N14BR	442
N14BS	432
N14BT	421
N14BU	410
N14BV	399
N14BW	388
N14BX	377
N14BY	366
N14BZ	356
N14CA	345
N14CB	334
N14CC	323
N14CD	312
N14CE	301
N14CF	290
N14CG	279
N14CH	269
N14CI	258
N14CJ	247
N14CK	236
N14CL	225
N14CM	214
N14CN	203
N14CO	193
N14CP	182
N14CQ	171
N14CR	160
N14CS	149
N14CT	138
N14CU	127
N14CV	116

104 N4 Ø 12.5 C/12.5

N4A	76
N4B	87
N4C	97
N4D	108
N4E	119
N4F	130
N4G	141
N4H	152
N4I	163
N4J	173
N4K	184
N4L	195
N4M	206
N4N	217
N4O	228
N4P	239
N4Q	250
N4R	260
N4S	271
N4T	282
N4U	293
N4V	304
N4W	315
N4X	326
N4Y	336
N4Z	347
N4AA	358
N4AB	369
N4AC	380
N4AD	391
N4AE	402
N4AF	413
N4AG	423
N4AH	434
N4AI	445
N4AJ	456
N4AK	467
N4AL	478
N4AM	489
N4AN	499
N4AO	510
N4AP	521
N4AQ	532
N4AR	543
N4AS	554
N4AT	565
N4AU	576
N4AV	586
N4AW	597
N4AX	608
N4AY	619
N4AZ	630
N4BA	641
N4BB	652
N4BC	662
N4BD	673
N4BE	684
N4BF	695
N4BG	706
N4BH	717
N4BI	728
N4BJ	738
N4BK	749
N4BL	760
N4BM	771
N4BN	782
N4BO	793
N4BP	804
N4BQ	815
N4BR	825
N4BS	836
N4BT	847
N4BU	858
N4BV	869
N4BW	880
N4BX	891
N4BY	901
N4BZ	912
N4CA	923
N4CB	934
N4CC	945
N4CD	956
N4CE	967
N4CF	978
N4CG	988
N4CH	999
N4CI	1010
N4CJ	1021
N4CK	1032
N4CL	1043
N4CM	1054
N4CN	1064
N4CO	1075
N4CP	1086
N4CQ	1097
N4CR	1108
N4CS	1119
N4CT	1130
N4CU	1141
N4CV	1151
N4CW	1162
N4CX	1173
N4CY	1184
N4CZ	1195

104 N17 Ø 12.5 C/12.5

N17A	1200
N17B	1190
N17C	1179
N17D	1168
N17E	1157
N17F	1146
N17G	1135
N17H	1124
N17I	1114
N17J	1103
N17K	1092
N17L	1081
N17M	1070
N17N	1059
N17O	1048
N17P	1037
N17Q	1027
N17R	1016
N17S	1005
N17T	994
N17U	983
N17V	972
N17W	961
N17X	951
N17Y	940
N17Z	929
N17AA	918
N17AB	907
N17AC	896
N17AD	885
N17AE	874
N17AF	864
N17AG	853
N17AH	842
N17AI	831
N17AJ	820
N17AK	809
N17AL	798
N17AM	788
N17AN	777
N17AO	766
N17AP	755
N17AQ	744
N17AR	733
N17AS	722
N17AT	711
N17AU	701
N17AV	690
N17AW	679
N17AX	668
N17AY	657
N17AZ	646
N17BA	635
N17BB	625
N17BC	614
N17BD	603
N17BE	592
N17BF	581
N17BG	570
N17BH	559
N17BI	548
N17BJ	538
N17BK	527
N17BL	516
N17BM	505
N17BN	494
N17BO	483
N17BP	472
N17BQ	462
N17BR	451
N17BS	440
N17BT	429
N17BU	418
N17BV	407
N17BW	396
N17BX	385
N17BY	375
N17BZ	364
N17CA	353
N17CB	342
N17CC	331
N17CD	320
N17CE	309
N17CF	299
N17CG	288
N17CH	277
N17CI	266
N17CJ	255
N17CK	244
N17CL	233
N17CM	222
N17CN	212
N17CO	201
N17CP	190
N17CQ	179
N17CR	168
N17CS	157
N17CT	146
N17CU	136
N17CV	125
N17CW	114
N17CX	103
N17CY	92
N17CZ	81

104 N18 Ø 12.5 C/12.5

N18A	76
N18B	86
N18C	97
N18D	108
N18E	119
N18F	130
N18G	141
N18H	152
N18I	162
N18J	173
N18K	184
N18L	195
N18M	206
N18N	217
N18O	228
N18P	239
N18Q	249
N18R	260
N18S	271
N18T	282
N18U	293
N18V	304
N18W	315
N18X	325
N18Y	336
N18Z	347
N18AA	358
N18AB	369
N18AC	380
N18AD	391
N18AE	402
N18AF	412
N18AG	423
N18AH	434
N18AI	445
N18AJ	456
N18AK	467
N18AL	478
N18AM	488
N18AN	499
N18AO	510
N18AP	521
N18AQ	532
N18AR	543
N18AS	554
N18AT	565
N18AU	575
N18AV	586
N18AW	597
N18AX	608
N18AY	619
N18AZ	630
N18BA	641
N18BB	651
N18BC	662
N18BD	673
N18BE	684
N18BF	695
N18BG	706
N18BH	717
N18BI	728
N18BJ	738
N18BK	749
N18BL	760
N18BM	771
N18BN	782
N18BO	793
N18BP	804
N18BQ	814
N18BR	825
N18BS	836
N18BT	847
N18BU	858
N18BV	869
N18BW	880
N18BX	890
N18BY	901
N18BZ	912
N18CA	923
N18CB	934
N18CC	945
N18CD	956
N18CE	967
N18CF	977
N18CG	988
N18CH	999
N18CI	1010
N18CJ	1021
N18CK	1032
N18CL	1043
N18CM	1053
N18CN	1064
N18CO	1075
N18CP	1086
N18CQ	1097
N18CR	1108
N18CS	1119
N18CT	1130
N18CU	1140
N18CV	1151
N18CW	1162
N18CX	1173
N18CY	1184
N18CZ	1195

104 N30 Ø 12.5 C/12.5

N30A	1200
N30B	1190
N30C	1179
N30D	1168
N30E	1157
N30F	1146
N30G	1135
N30H	1124
N30I	1113
N30J	1103
N30K	1092
N30L	1081
N30M	1070
N30N	1059
N30O	1048
N30P	1037
N30Q	1027
N30R	1016
N30S	1005
N30T	994
N30U	983
N30V	972
N30W	961
N30X	950
N30Y	940
N30Z	929
N30AA	918
N30AB	907
N30AC	896
N30AD	885
N30AE	874
N30AF	864
N30AG	853
N30AH	842
N30AI	831
N30AJ	820
N30AK	809
N30AL	798
N30AM	787
N30AN	777
N30AO	766
N30AP	755
N30AQ	744
N30AR	733
N30AS	722
N30AT	711
N30AU	701
N30AV	690
N30AW	679
N30AX	668
N30AY	657
N30AZ	646
N30BA	635
N30BB	624
N30BC	614
N30BD	603
N30BE	592
N30BF	581
N30BG	570
N30BH	559
N30BI	548
N30BJ	538
N30BK	527
N30BL	516
N30BM	505
N30BN	494
N30BO	483
N30BP	472
N30BQ	462
N30BR	451
N30BS	440
N30BT	429
N30BU	418
N30BV	407
N30BW	396
N30BX	385
N30BY	375
N30BZ	364
N30CA	353
N30CB	342
N30CC	331
N30CD	320
N30CE	309
N30CF	299
N30CG	288
N30CH	277
N30CI	266
N30CJ	255
N30CK	244
N30CL	233
N30CM	222
N30CN	212
N30CO	201
N30CP	190
N30CQ	179
N30CR	168
N30CS	157
N30CT	146
N30CU	136
N30CV	125
N30CW	114
N30CX	103
N30CY	92
N30CZ	81

103 N31 Ø 12.5 C/12.5

N31A	84
N31B	95
N31C	106
N31D	116
N31E	127
N31F	138
N31G	149
N31H	160
N31I	171
N31J	182
N31K	193
N31L	203
N31M	214
N31N	225
N31O	236
N31P	247
N31Q	258
N31R	269
N31S	279
N31T	290
N31U	301
N31V	312
N31W	323
N31X	334
N31Y	345
N31Z	356
N31AA	366
N31AB	377
N31AC	388
N31AD	399
N31AE	410
N31AF	421
N31AG	432
N31AH	442
N31AI	453
N31AJ	464
N31AK	475
N31AL	486
N31AM	497
N31AN	508
N31AO	519
N31AP	529
N31AQ	540
N31AR	551
N31AS	562
N31AT	573
N31AU	584
N31AV	595
N31AW	605
N31AX	616
N31AY	627
N31AZ	638
N31BA	649
N31BB	660
N31BC	671
N31BD	682
N31BE	692
N31BF	703
N31BG	714
N31BH	725
N31BI	736
N31BJ	747
N31BK	758
N31BL	768
N31BM	779
N31BN	790
N31BO	801
N31BP	812
N31BQ	823
N31BR	834
N31BS	845
N31BT	855
N31BU	866
N31BV	877
N31BW	888
N31BX	899
N31BY	910
N31BZ	921
N31CA	931
N31CB	942
N31CC	953
N31CD	964
N31CE	975
N31CF	986
N31CG	997
N31CH	1007
N31CI	1018
N31CJ	1029
N31CK	1040
N31CL	1051
N31CM	1062
N31CN	1073
N31CO	1084
N31CP	1094
N31CQ	1105
N31CR	1116
N31CS	1127
N31CT	1138
N31CU	1149
N31CV	1160
N31CW	1170
N31CX	1181
N31CY	1192

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

DER DF

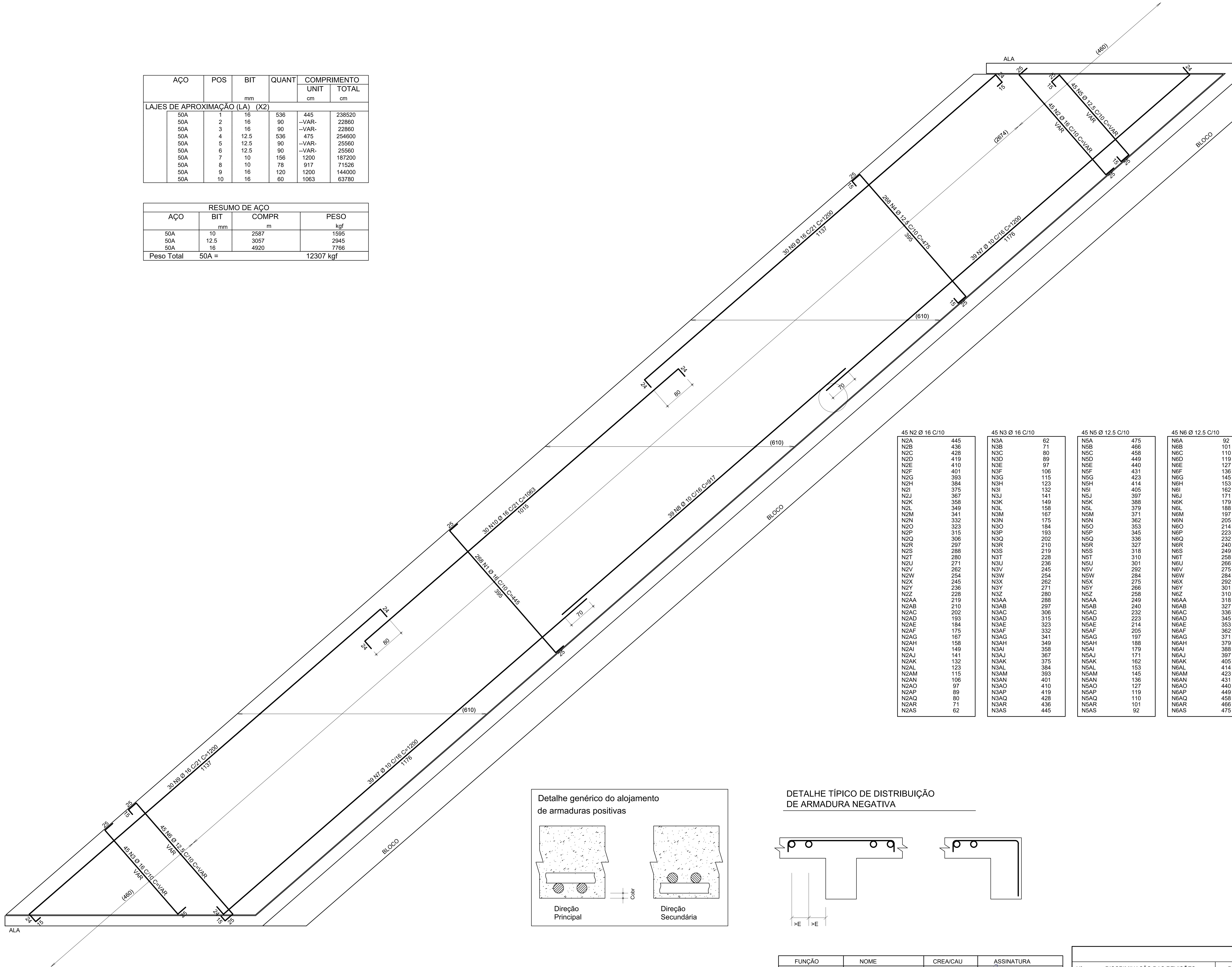
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:125	TRECHO/SUBTRECHO: DETALHAMENTO LAJES TABULEIRO	COORD.: HERMES BUENO
FOLHA: 15/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-LAJ-EX-015-R00	DATA: JANEIRO/2022

AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
		mm		cm	cm
LAJES DE APROXIMAÇÃO (LA) (X2)					
50A	1	16	536	445	238520
50A	2	16	90	--VAR-	22860
50A	3	16	90	--VAR-	22860
50A	4	12.5	536	475	254600
50A	5	12.5	90	--VAR-	25560
50A	6	12.5	90	--VAR-	25560
50A	7	10	156	1200	187200
50A	8	10	78	917	71526
50A	9	16	120	1200	144000
50A	10	16	60	1063	63780

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	10	2587	1595
50A	12.5	3057	2945
50A	16	4920	7766
Peso Total	50A =		12307 kgf



45 N2 Ø 16 C/10		45 N3 Ø 16 C/10		45 N5 Ø 12.5 C/10		45 N6 Ø 12.5 C/10	
N2A	445	N3A	62	N5A	475	N6A	92
N2B	436	N3B	71	N5B	466	N6B	101
N2C	428	N3C	80	N5C	458	N6C	110
N2D	419	N3D	89	N5D	449	N6D	119
N2E	410	N3E	97	N5E	440	N6E	127
N2F	401	N3F	106	N5F	431	N6F	136
N2G	393	N3G	115	N5G	423	N6G	145
N2H	384	N3H	123	N5H	414	N6H	153
N2I	375	N3I	132	N5I	405	N6I	162
N2J	367	N3J	141	N5J	397	N6J	171
N2K	358	N3K	149	N5K	388	N6K	179
N2L	349	N3L	158	N5L	379	N6L	188
N2M	341	N3M	167	N5M	371	N6M	197
N2N	332	N3N	175	N5N	362	N6N	205
N2O	323	N3O	184	N5O	353	N6O	214
N2P	315	N3P	193	N5P	345	N6P	223
N2Q	306	N3Q	202	N5Q	336	N6Q	232
N2R	297	N3R	210	N5R	327	N6R	240
N2S	288	N3S	219	N5S	318	N6S	249
N2T	280	N3T	228	N5T	310	N6T	258
N2U	271	N3U	236	N5U	301	N6U	266
N2V	262	N3V	245	N5V	292	N6V	275
N2W	254	N3W	254	N5W	284	N6W	284
N2X	245	N3X	262	N5X	275	N6X	292
N2Y	236	N3Y	271	N5Y	266	N6Y	301
N2Z	228	N3Z	280	N5Z	258	N6Z	310
N2AA	219	N3AA	288	N5AA	249	N6AA	318
N2AB	210	N3AB	297	N5AB	240	N6AB	327
N2AC	202	N3AC	306	N5AC	232	N6AC	336
N2AD	193	N3AD	315	N5AD	223	N6AD	345
N2AE	184	N3AE	323	N5AE	214	N6AE	353
N2AF	175	N3AF	332	N5AF	205	N6AF	362
N2AG	167	N3AG	341	N5AG	197	N6AG	371
N2AH	158	N3AH	349	N5AH	188	N6AH	379
N2AI	149	N3AI	358	N5AI	179	N6AI	388
N2AJ	141	N3AJ	367	N5AJ	171	N6AJ	397
N2AK	132	N3AK	375	N5AK	162	N6AK	405
N2AL	123	N3AL	384	N5AL	153	N6AL	414
N2AM	115	N3AM	393	N5AM	145	N6AM	423
N2AN	106	N3AN	401	N5AN	136	N6AN	431
N2AO	97	N3AO	410	N5AO	127	N6AO	440
N2AP	89	N3AP	419	N5AP	119	N6AP	449
N2AQ	80	N3AQ	428	N5AQ	110	N6AQ	458
N2AR	71	N3AR	436	N5AR	101	N6AR	466
N2AS	62	N3AS	445	N5AS	92	N6AS	475

Detalhe genérico do alojamento de armaduras positivas

Cobr
Direção Principal
Direção Secundária

DETALHE TÍPICO DE DISTRIBUIÇÃO DE ARMADURA NEGATIVA

>E >E

LAJES DE APROXIMAÇÃO (LA) 2X
ESC.:1:50

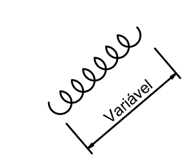
OBSERVAÇÕES

1 - O CONCRETO DEVE ATENDER AS ESPECIFICAÇÕES DA NORMA BRASILEIRA ABNT NBR 12655:2006 - CONCRETO - PREPARO, CONTROLE E RECEBIMENTO - PROCEDIMENTO
2 - OS APOIOS DEVERÃO SER POSICIONADOS NA MESMA DIREÇÃO DAS ALÇAS
3 - DESVIAR OS ESTRIBOS QUANDO COINCIDIR COM OS FUROS
4 - fcj = RESISTÊNCIA À COMPRESSÃO DO CONCRETO NA NA IDADE DO ATO DA PROTENSÃO

AÇO CA-50 / CA-60

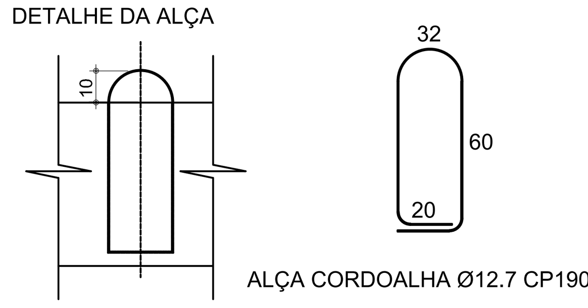
1 - OBEDECER OS DIÂMETROS DE DOBRAMENTO ESPECIFICADOS NA ABNT NBR 6118:2003 - TAB. 9.1
2 - AS BARRAS DE ARMADURA ESTÃO DESENHADAS E COTADAS EM SEUS TRECHOS RETOS SEM DESCONTO DEVIDO A DOBRAMENTOS. O CORTE E DOBRA DAS ARMADURAS É RESPONSABILIDADE DO EXECUTOR.

MOLA DE FRETAGEM
P/ FURO DE IÇAMENTO



Ø6.3cm

DETALHE DA ALÇA



ALÇA CORDOALHA Ø12.7 CP190

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:50	TRECHO/SUBTRECHO: LAJES DE APROXIMAÇÃO (LA)	COORD.: HERMES BUENO
FOLHA: 16/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-LAJ-EX-016-R00	DATA: JANEIRO/2022

LOCAÇÃO DOS PILARES
ESC.:1:100

PONTOS DE SONDAGEM

ESTAQUEAMENTO EIXOS 4 E 1

Baricentros de pilares e estacas		
Pilar	X cm	Y cm
ESTACA 3 + 80	237.4	1230.0
ESTACA 4 + 00	2237.4	1230.0
ESTACA 4 + 20	4237.4	1230.0
ESTACA 4 + 40	6237.4	1230.0
ESTACA 4 + 60	8237.4	1230.0
ESTACA 4 + 80	10237.4	1230.0
ESTACA 11 + 00	0.0	0.0
ESTACA 11 + 20	2000.0	0.0
ESTACA 11 + 40	4000.0	0.0
ESTACA 11 + 60	6000.0	0.0
ESTACA 11 + 80	8000.0	0.0
ESTACA 12 + 00	10000.0	0.0
BLOCO 1	1211.7	615.0
BLOCO 4	9974.3	615.0
P1	3793.1	615.0
P2	6331.1	615.0

Baricentros de pilares e estacas		
Pilar	X cm	Y cm
E1-a	2360.7	1613.9
E1-b	2207.5	1480.7
E1-c	2054.3	1347.5
E1-d	1901.1	1214.3
E1-e	1747.9	1081.1
E1-f	1594.7	948.0
E1-g	1441.5	814.8
E1-h	1288.3	681.6
E1-i	1135.1	548.4
E1-j	981.9	415.2
E1-k	828.7	282.1
E1-l	675.5	148.9
E1-m	522.3	15.7
E1-n	369.1	-117.5
E1-o	215.9	-250.7
E1-p	62.6	-383.8

Baricentros de pilares e estacas		
Pilar	X cm	Y cm
E4-a	11123.3	1613.9
E4-b	10970.1	1480.7
E4-c	10816.9	1347.5
E4-d	10663.7	1214.3
E4-e	10510.5	1081.1
E4-f	10357.3	948.0
E4-g	10204.1	814.8
E4-h	10050.9	681.6
E4-i	9897.7	548.4
E4-j	9744.5	415.2
E4-k	9591.3	282.1
E4-l	9438.0	148.9
E4-m	9284.8	15.7
E4-n	9131.6	-117.5
E4-o	8978.4	-250.7
E4-p	8825.2	-383.8

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:

PARA fck = 30 MPa Ecs = 26.8 GPa
PARA fck = 35 MPa Ecs = 29.4 GPa
PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

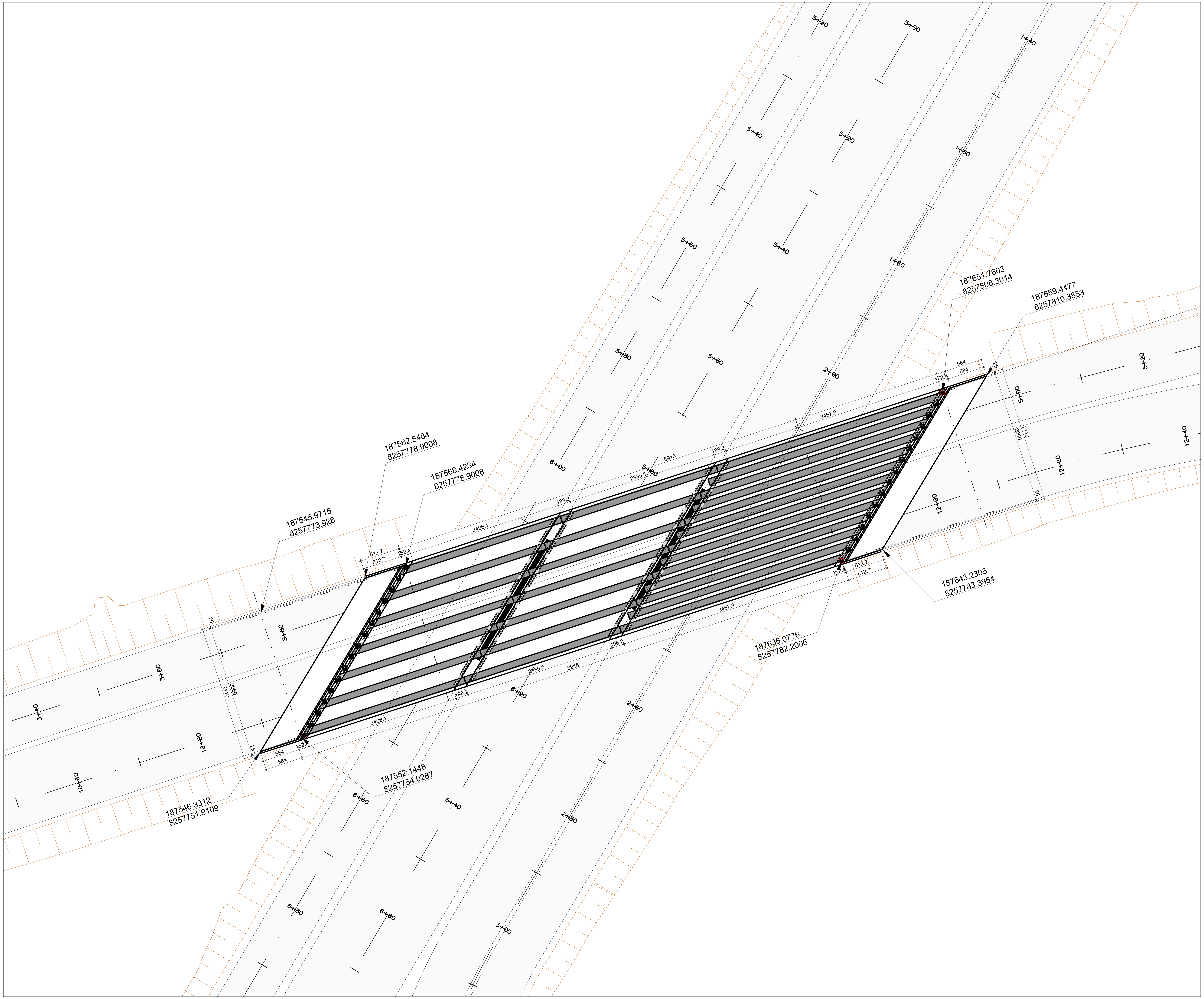
CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO	LOCAL	PROJETO
EXECUTIVO	BRASÍLIA	HERMES BUENO
ESCALA	TRECHO/SUBTRECHO	COORD.
INDICADA	LOCAÇÃO DOS PILARES	HERMES BUENO
FOLHA	ESPECIALIDADE/SUBESPECIALIDADE	CÁLCULO
17/27	PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	HÉRBIO LOPES
REVISÃO	CÓDIGO	DATA
00	2101-LOC-EX-017-R00	JANEIRO/2022



DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:

PARA fck = 30 MPa Ecs = 26.8 GPa
PARA fck = 35 MPa Ecs = 29.4 GPa
PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

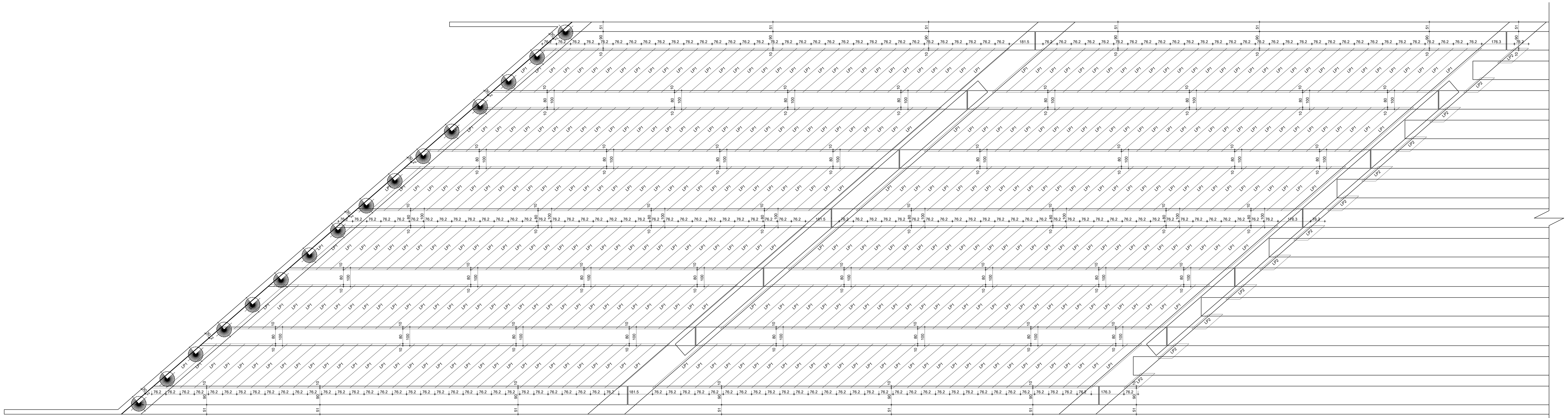
CONFERIDO | APROVADO | VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:300	TRECHO/SUBTRECHO: IMPLANTAÇÃO	COORD.: HERMES BUENO
FOLHA: 18/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-LOC-EX-018-R00	DATA: JANEIRO/2022



MODULAÇÃO DAS LAJES PRÉ-MOLDADAS (1/2)
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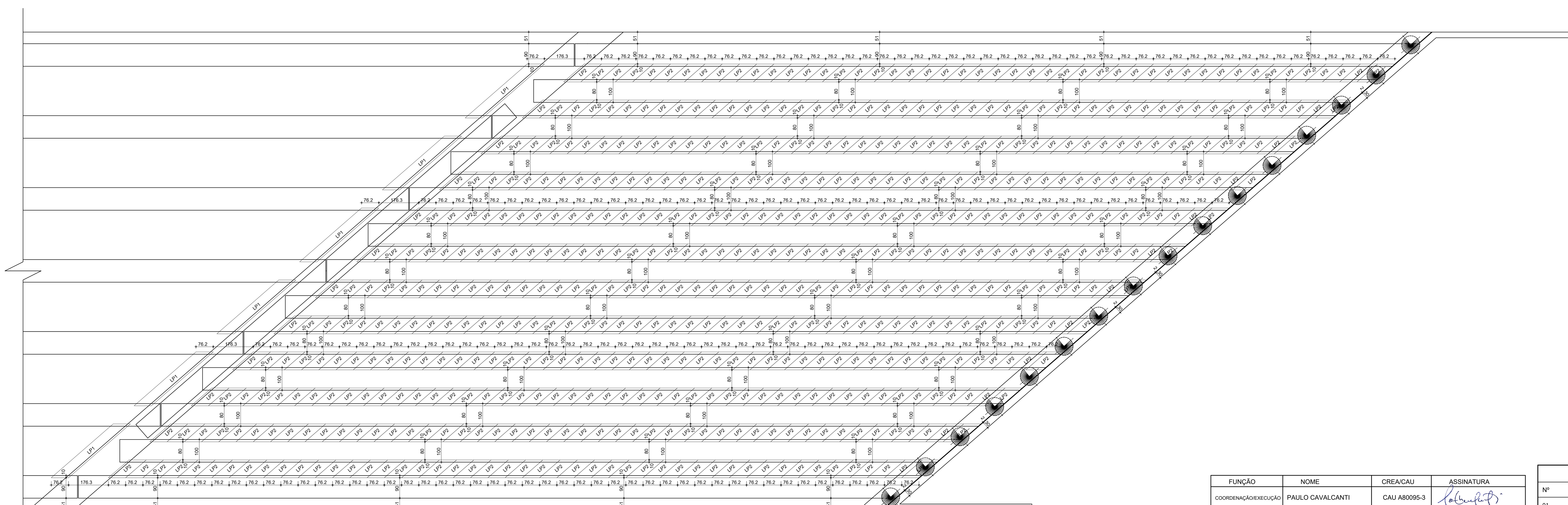


MODULAÇÃO DAS LAJES PRÉ-MOLDADAS (2/2)
ESC.:1:100

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa   Ecs = 26.8 GPa
  - PARA fck = 35 MPa   Ecs = 29.4 GPa
  - PARA fck = 45 MPa   Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

DER DF

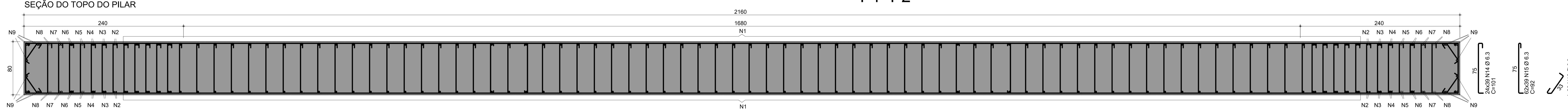
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

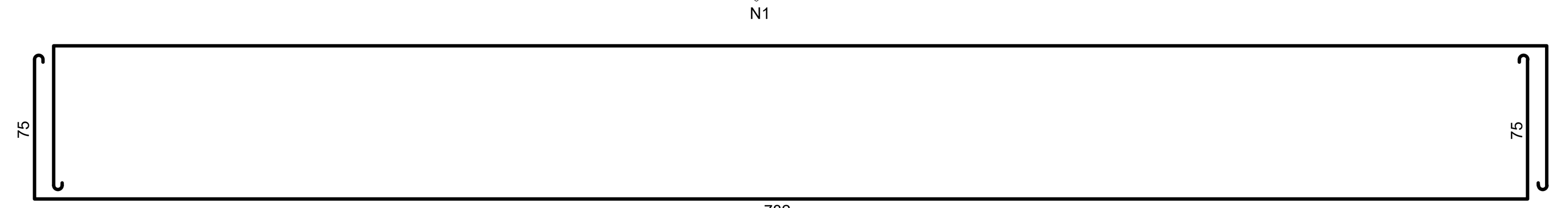
ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:100	TRECHO/SUBTRECHO: MODULAÇÃO DAS LAJES PRÉ-MOLDADAS	COORD.: HERMES BUENO
FOLHA: 19/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-MOD-EX-019-R00	DATA: JANEIRO/2022

P1=P2

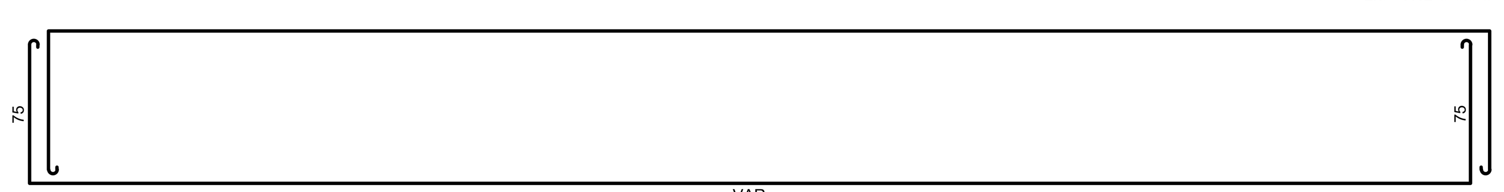
SEÇÃO DO TOPO DO PILAR



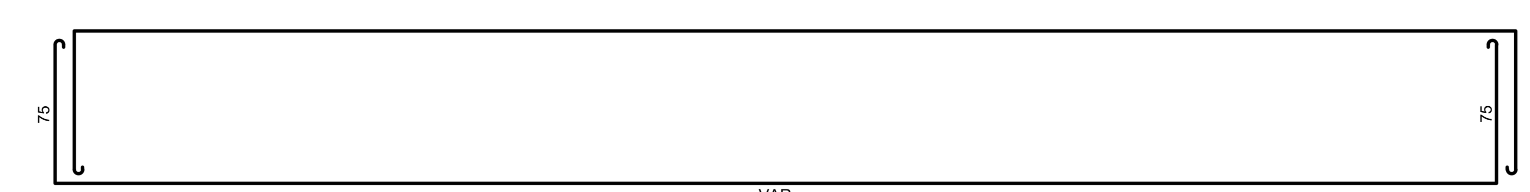
- 20 N9 Ø 25
- 8 N8 Ø 25
- 8 N7 Ø 25
- 8 N6 Ø 25
- 8 N5 Ø 25
- 8 N4 Ø 25
- 8 N3 Ø 25
- 8 N2 Ø 25
- 172 N1 Ø 25



2x39 N12 Ø 6.3 C=944



2x39 N11 Ø 6.3 C=VAR



2x39 N13 Ø 6.3 C=VAR

AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
P1=P2 (X2)					
50A	1	25	344	672	231168
50A	2	25	16	673	10768
50A	3	25	16	673	10768
50A	4	25	16	674	10784
50A	5	25	16	674	10784
50A	6	25	16	675	10800
50A	7	25	16	677	10832
50A	8	25	16	678	10848
50A	9	25	40	680	27200
50A	10	25	496	240	119040
50A	11	6.3	156	--VAR-	152100
50A	12	6.3	156	944	147264
50A	13	6.3	156	--VAR-	152100
50A	14	6.3	1872	101	189072
50A	15	6.3	4836	92	444912
50A	16	6.3	312	55	17160

RESUMO DE AÇO			
AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	11026	2699
50A	25	4530	17456
Peso Total	50A =		20155 kgf

2x39 N11 Ø 6.3 C/20

N11A	1018
N11B	1018
N11C	1018
N11D	1018
N11E	1018
N11F	1017
N11G	1014
N11H	1011
N11I	1008
N11J	1005
N11K	1002
N11L	1000
N11M	997
N11N	994
N11O	991
N11P	988
N11Q	985
N11R	982
N11S	979
N11T	976
N11U	973
N11V	970
N11W	967
N11X	964
N11Y	961
N11Z	958
N11AA	955
N11AB	952
N11AC	949
N11AD	946
N11AE	943
N11AF	940
N11AG	937
N11AH	934
N11AI	931
N11AJ	928
N11AK	925
N11AL	922
N11AM	920

2x39 N13 Ø 6.3 C/20

N13A	1018
N13B	1018
N13C	1018
N13D	1018
N13E	1018
N13F	1017
N13G	1014
N13H	1011
N13I	1008
N13J	1005
N13K	1002
N13L	1000
N13M	997
N13N	994
N13O	991
N13P	988
N13Q	985
N13R	982
N13S	979
N13T	976
N13U	973
N13V	970
N13W	967
N13X	964
N13Y	961
N13Z	958
N13AA	955
N13AB	952
N13AC	949
N13AD	946
N13AE	943
N13AF	940
N13AG	937
N13AH	934
N13AI	931
N13AJ	928
N13AK	925
N13AL	922
N13AM	920

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa   Ecs = 26.8 GPa
  - PARA fck = 35 MPa   Ecs = 29.4 GPa
  - PARA fck = 45 MPa   Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

DER DF

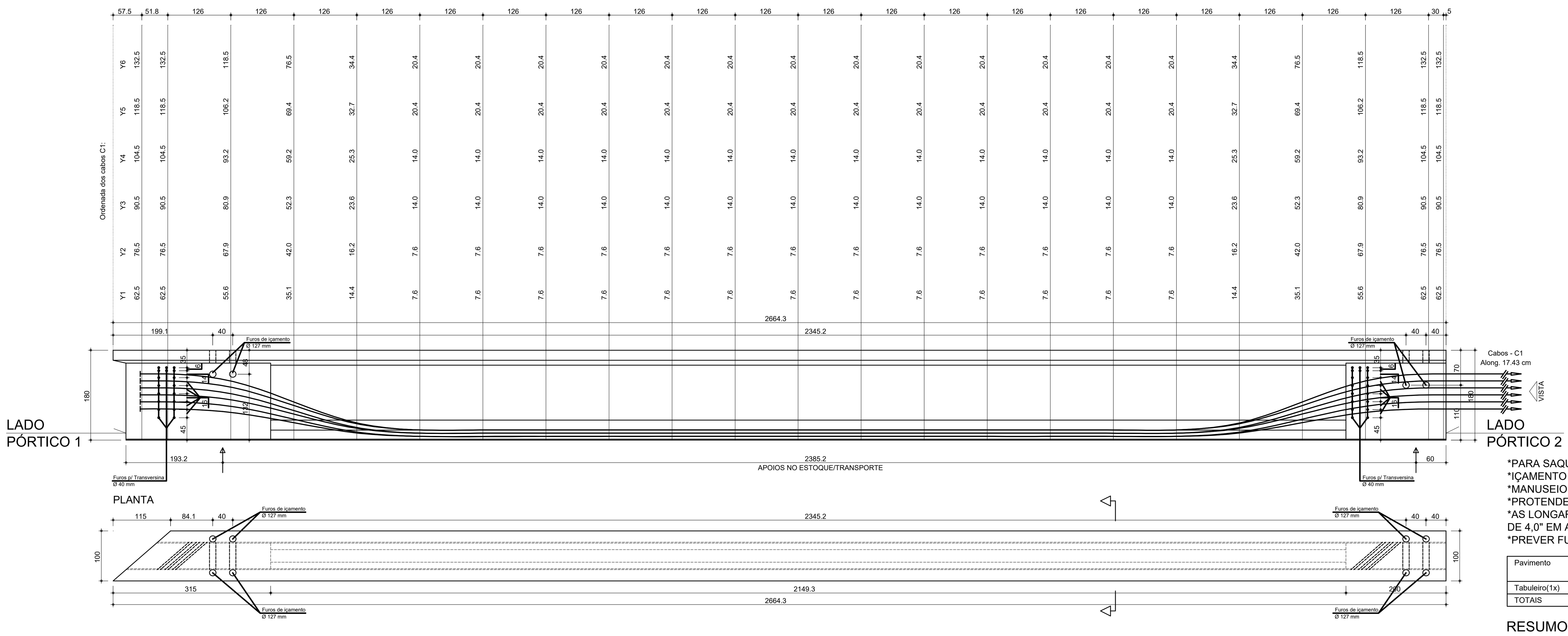
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:30	TRECHO/SUBTRECHO: DETALHAMENTO DOS PILARES	COORD.: HERMES BUENO
FOLHA: 20/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-PIL-EX-020-R00	DATA: JANEIRO/2022

LONGARINA 1

ELEVAÇÃO



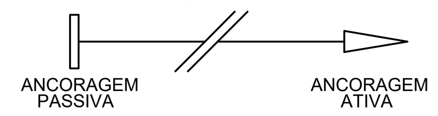
*PARA SAQUE Fck>=30 Mpa;
*IÇAMENTO DA PEÇA DEVERÁ OBRIGATORIAMENTE SER FEITO POR DIS GUINDASTES;
*MANUSEIO E UTILIZAÇÃO APÓS A PROTENSÃO DE TODOS OS CABOS;
*PROTENDER TODOS OS CABOS APÓS A RESISTÊNCIA DO CONCRETO ATINGIR 30 Mpa;
*AS LONGARINAS DEVERÃO OBRIGATORIAMENTE SEREM IÇADAS/MONTADAS POR PINOS DE 4,0" EM AÇO 1045 EM TODOS OS 4 FUROS;
*PREVER FUROS NAS LONGARINAS PARA ANCORAGEM DAS ARMADURAS DAS TRANSVERSINAS.

Pavimento	Quant	Volume unit m3	Volume total m3	Peso unit tf	Peso total tf
Tabuleiro(1x)	07	20.629	144.403	51.572	361.004
TOTAIS	07		144.403		361.004

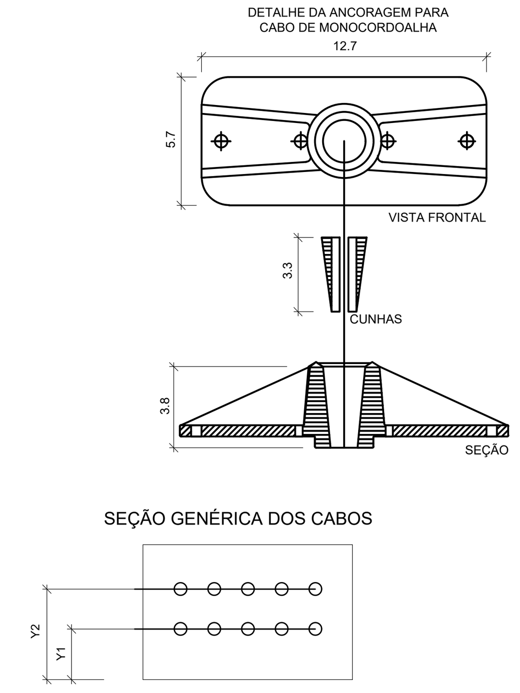
NOTAS PARA PROTENSÃO:

1. Todos os cabos são constituidos de 1Ø12,7mm - CP 190 RB-EP;
2. Força de protensão a ser aplicada em cada cabo: F=15tf;
3. Os alongamentos após a cravação, estão indicados no detalhamento dos elementos (nesta prancha);
4. A sequência de protensão deverá ser feita protendendo os cabos na sequência do centro para as extremidades;
5. As etapas de protensão, estão indicadas no detalhamento dos elementos (nesta prancha).

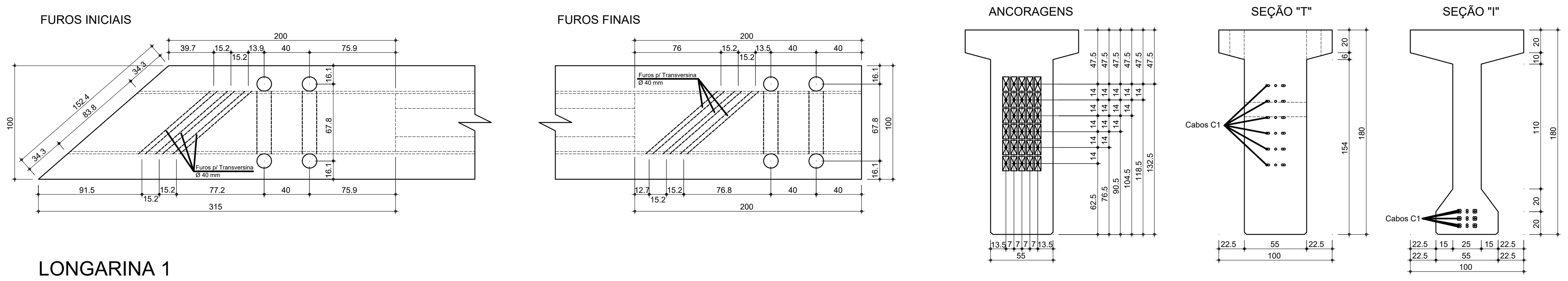
CONVENÇÃO DOS CABOS



DETALHE DA ANCORAGEM PARA CABO DE MONOCORDOALHA



ATENÇÃO!
TODAS AS ANCORAGENS PASSIVAS DEVERÃO SER PRÉ-BLOCADAS.



RESUMO DE PROTENSÃO PARA UMA LONGARINA

PROTENSÃO: AÇO CP190 RB-EP - 12.7 - ArcelorMittal ou similar

CABO	Ø	QUANT	COMPRIMENTO (m) UNITÁRIO	COMPRIMENTO (m) TOTAL	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I	ALONG (cm) FIN
C1	12.7	30	27.60	828.00	30	30	-	17.43

RESUMO DE PROTENSÃO

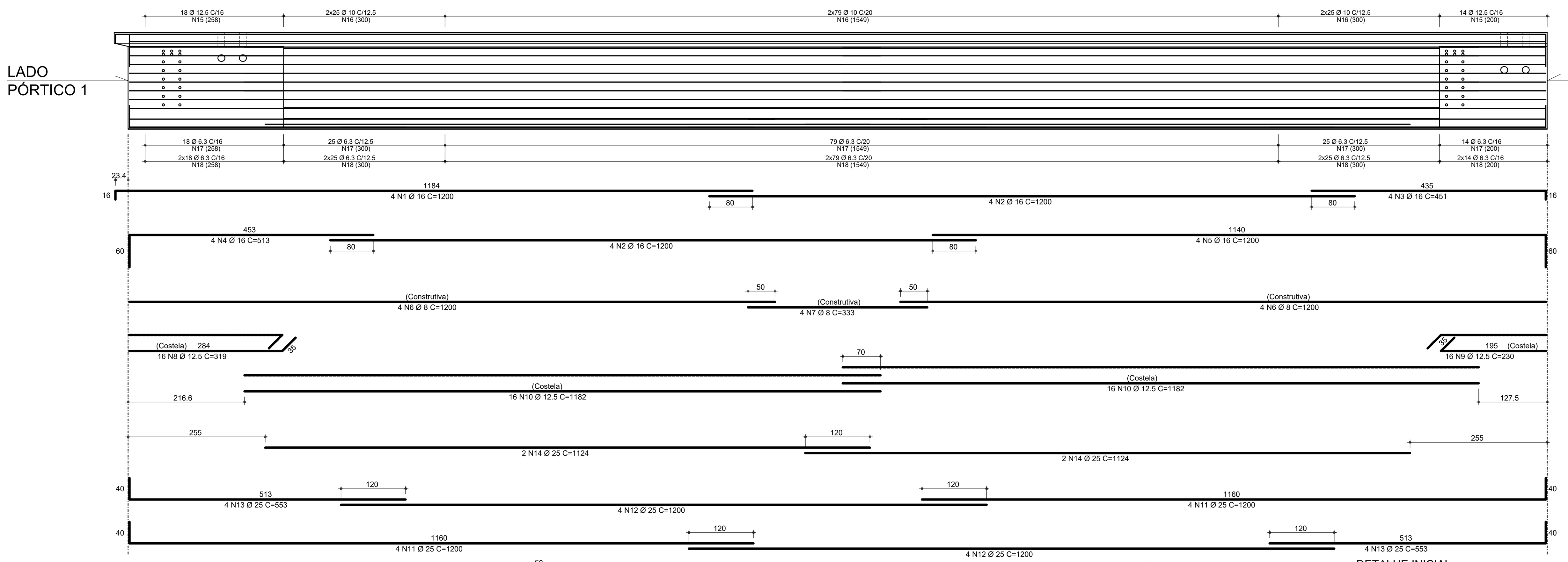
Monocordoalhas não aderentes

CABO Ø	COMPR. (m)	PESO kg/m	PESO kg	PESO kg+4%	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I
12.7	828.00	0.890	737.00	767.00	30	30	-

RESUMO DE PROTENSÃO TOTAL

QUANT. LONGARINAS	COMPR. (m)	PESO kg/m	PESO kg	PESO kg+4%	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I
07	5796.00	0.890	5159.00	5365.00	210	210	-

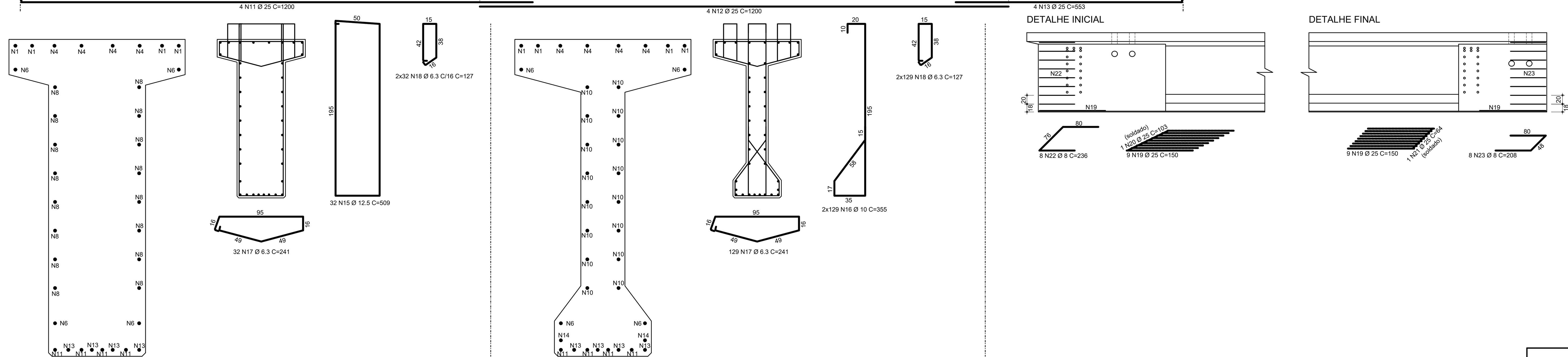
LONGARINA 1



AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
LONGARINA 1 (X13)					
50A	1	16	52	1200	62400
50A	2	16	104	1200	124800
50A	3	16	52	451	23452
50A	4	16	52	513	26676
50A	5	16	52	1200	62400
50A	6	8	104	1200	124800
50A	7	8	52	333	17316
50A	8	12.5	208	319	66352
50A	9	12.5	208	230	47840
50A	10	12.5	416	1182	491712
50A	11	25	104	1200	124800
50A	12	25	104	1200	124800
50A	13	25	104	553	57512
50A	14	25	52	1124	58448
50A	15	12.5	416	509	211744
50A	16	10	3354	355	1190670
50A	17	6.3	2093	241	504413
50A	18	6.3	4186	127	531622
50A	19	25	234	150	35100
50A	20	25	13	103	1339
50A	21	25	13	64	832
50A	22	8	104	236	24544
50A	23	8	104	208	21632

RESUMO DE AÇO

AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	10360	2536
50A	8	1883	743
50A	10	11907	7342
50A	12.5	8176	7877
50A	16	2997	4731
50A	25	4028	15523
Peso Total	50A =		38752 kgf



OBSERVAÇÕES

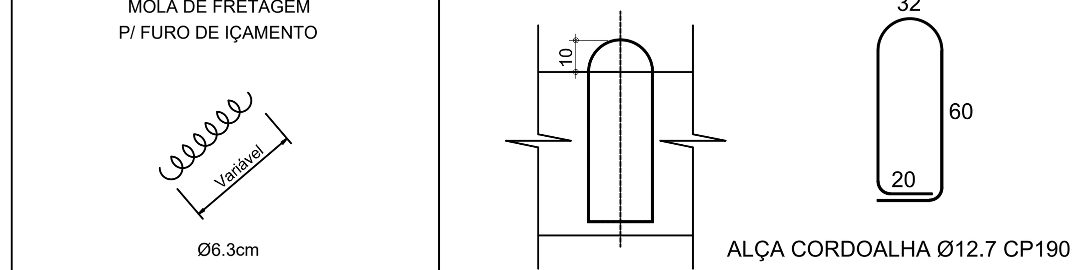
1 - O CONCRETO DEVE ATENDER AS ESPECIFICAÇÕES DA NORMA BRASILEIRA ABNT NBR 12655:2006 - CONCRETO - PREPARO, CONTROLE E RECEBIMENTO - PROCEDIMENTO
2 - OS APOIOS DEVERÃO SER POSICIONADOS NA MESMA DIREÇÃO DAS ALÇAS
3 - DESVIAR OS ESTRIBOS QUANDO COINCIDIR COM OS FUROS
4 - fcj = RESISTÊNCIA À COMPRESSÃO DO CONCRETO NA NA IDADE DO ATO DA PROTENSÃO

AÇO CA-50 / CA-60

1 - OBEDECER OS DIÂMETROS DE DOBRAMENTO ESPECIFICADOS NA ABNT NBR 6118:2003 - TAB. 9.1
2 - AS BARRAS DE ARMADURA ESTÃO DESENHADAS E COTADAS EM SEUS TRECHOS RETOS SEM DESCONTO DEVIDO A DOBRAMENTOS. O CORTE E DOBRA DAS ARMADURAS É RESPONSABILIDADE DO EXECUTOR.

MOLA DE FRETAGEM P/ FURO DE IÇAMENTO

DETALHE DA ALÇA



DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

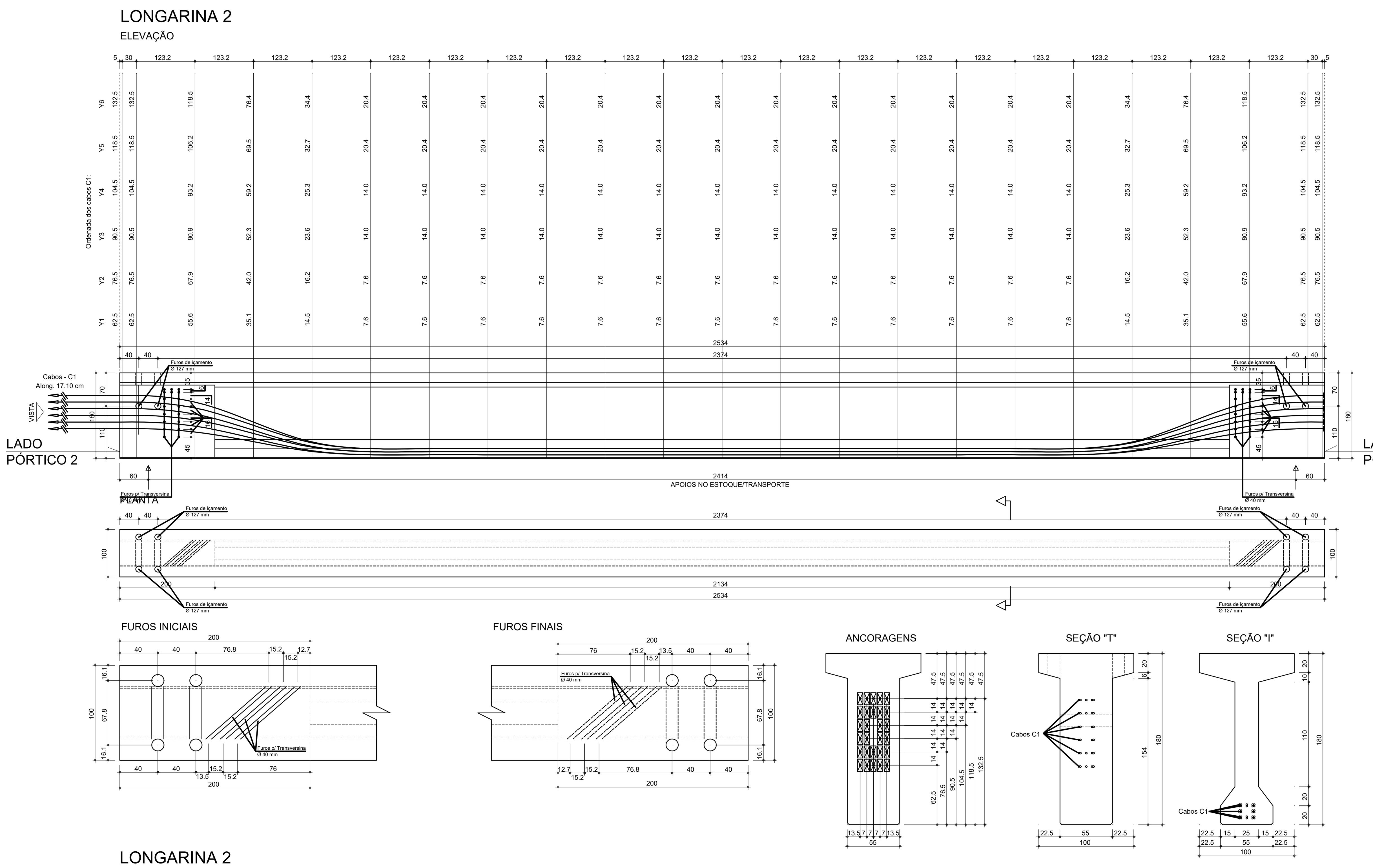
CONFERIDO | APROVADO | VISTO

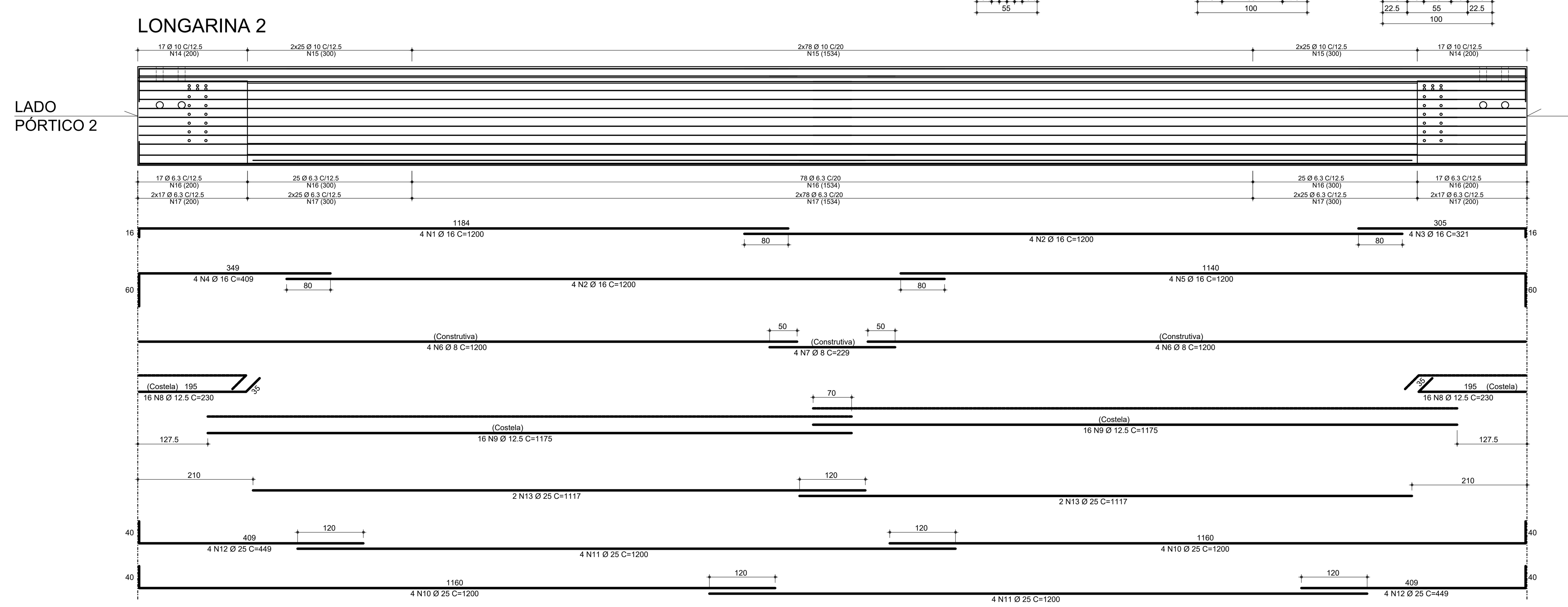
DER DF

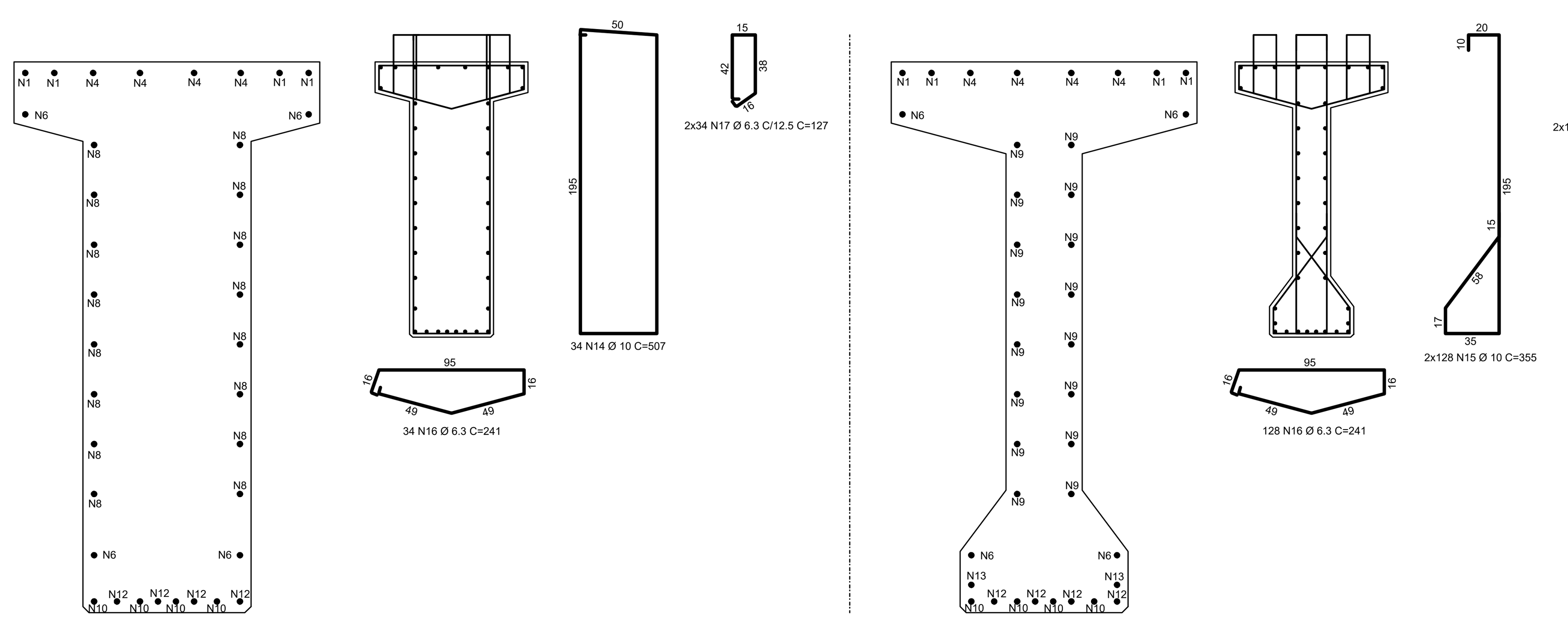
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO LONGARINA 1	COORD.: HERMES BUENO
FOLHA: 21/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-021-R00	DATA: JANEIRO/2022

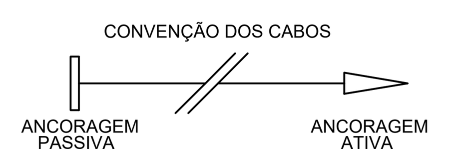


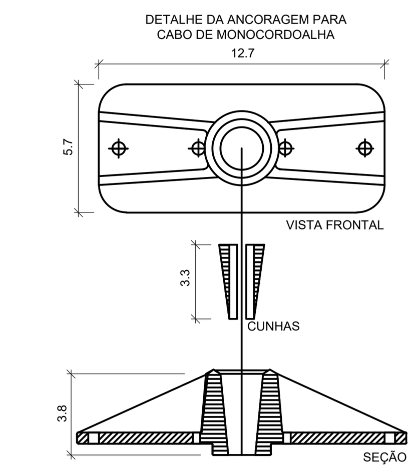




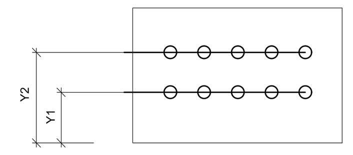
NOTAS PARA PROTENSÃO:

1. Todos os cabos são constituidos de 1Ø12,7mm - CP 190 RB-EP;
2. Força de protensão a ser aplicada em cada cabo: F=15tf;
3. Os alongamentos após a cravação, estão indicados no detalhamento dos elementos (nesta prancha);
4. A sequência de protensão deverá ser feita protendendo os cabos na sequência do centro para as extremidades;
5. As etapas de protensão, estão indicadas no detalhamento dos elementos (nesta prancha).





SEÇÃO GENÉRICA DOS CABOS



ATENÇÃO!

TODAS AS ANCORAGENS PASSIVAS DEVERÃO SER PRÉ-BLOCADAS.

*PARA SAQUE Fck>=30 Mpa;
*IÇAMENTO DA PEÇA DEVERÁ OBRIGATORIAMENTE SER FEITO POR DIS GUINDASTES;
*MANUSEIO E UTILIZAÇÃO APÓS A PROTENSÃO DE TODOS OS CABOS;
*PROTENDER TODOS OS CABOS APÓS A RESISTÊNCIA DO CONCRETO ATINGIR 30 Mpa;
*AS LONGARINAS DEVERÃO OBRIGATORIAMENTE SEREM IÇADAS/MONTADAS POR PINOS DE 4,0" EM AÇO 1045 EM TODOS OS 4 FUROS;
*PREVER FUROS NAS LONGARINAS PARA ANCORAGEM DAS ARMADURAS DAS TRANSVERSINAS.

Pavimento	Quant	Volume unit m3	Volume total m3	Peso unit tf	Peso total tf
Tabuleiro(1x)	07	19.889	139.223	49.722	348.054
TOTAIS	07		139.223		348.054

RESUMO DE PROTENSÃO PARA UMA LONGARINA

PROTENSÃO: AÇO CP190 RB-EP - 12.7 - ArcelorMittal ou similar

CABO	Ø	QUANT	COMPRIMENTO (m) UNITÁRIO	COMPRIMENTO (m) TOTAL	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I	ALONG (cm) FIN
C1	12.7	28	26.50	742.00	28	28	-	17.10

RESUMO DE PROTENSÃO

Monocordoalhas não aderentes

CABO Ø	COMPR. (m)	PESO kg/m	PESO kg	PESO kg+4%	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I
12.7	742.00	0.890	661.00	687.00	28	28	-

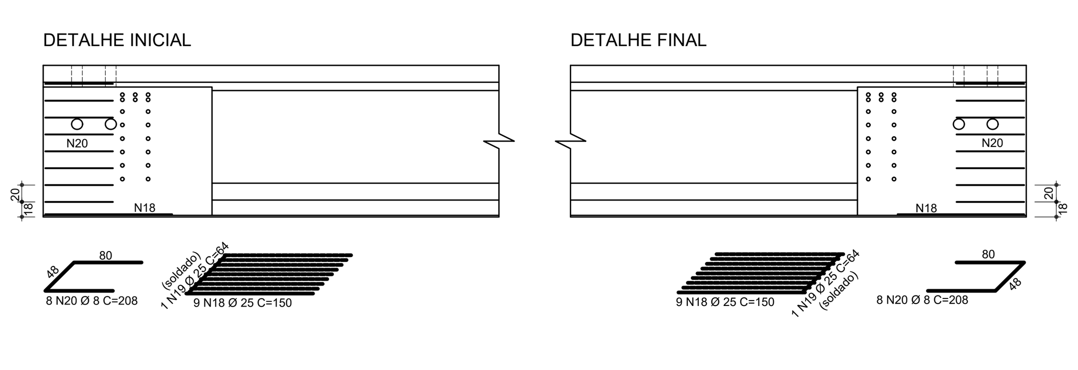
RESUMO DE PROTENSÃO TOTAL

QUANT. LONGARINAS	COMPR. (m)	PESO kg/m	PESO kg	PESO kg+4%	ANCORAGENS A	ANCORAGENS P	ANCORAGENS I
07	5194.00	0.890	4623.00	4808.00	196	196	-

AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
LONGARINA 2 (X13)					
50A	1	16	52	1200	62400
50A	2	16	104	1200	124800
50A	3	16	52	321	16692
50A	4	16	52	409	21268
50A	5	16	52	1200	62400
50A	6	8	104	1200	124800
50A	7	8	52	229	11908
50A	8	12.5	416	230	95680
50A	9	12.5	416	1175	488800
50A	10	25	104	1200	124800
50A	11	25	104	1200	124800
50A	12	25	104	449	46696
50A	13	25	52	1117	58084
50A	14	10	442	507	224094
50A	15	10	3328	355	1181440
50A	16	6.3	2106	241	507546
50A	17	6.3	4212	127	534924
50A	18	25	234	150	35100
50A	19	25	26	64	1664
50A	20	8	208	208	43264

RESUMO DE AÇO

AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	10425	2552
50A	8	1800	710
50A	10	14055	8667
50A	12.5	5845	5631
50A	16	2876	4539
50A	25	3911	15072
Peso Total	50A =		37171 kgf



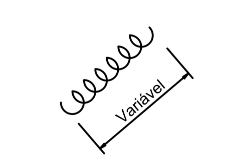
OBSERVAÇÕES

1 - O CONCRETO DEVE ATENDER AS ESPECIFICAÇÕES DA NORMA BRASILEIRA ABNT NBR 12655:2006 - CONCRETO - PREPARO, CONTROLE E RECEBIMENTO - PROCEDIMENTO
2 - OS APOIOS DEVERÃO SER POSICIONADOS NA MESMA DIREÇÃO DAS ALÇAS
3 - DESVIAR OS ESTRIBOS QUANDO COINCIDIR COM OS FUROS
4 - fcj = RESISTÊNCIA À COMPRESSÃO DO CONCRETO NA NA IDADE DO ATO DA PROTENSÃO

AÇO CA-50 / CA-60

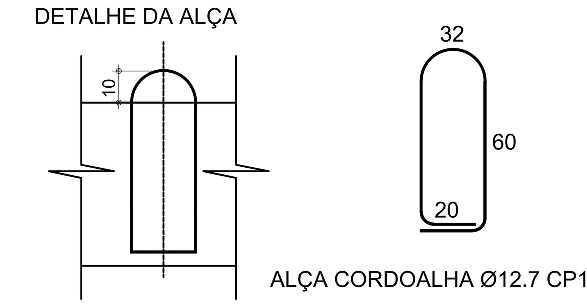
1 - OBEDECER OS DIÂMETROS DE DOBRAMENTO ESPECIFICADOS NA ABNT NBR 6118:2003 - TAB. 9.1
2 - AS BARRAS DE ARMADURA ESTÃO DESENHADAS E COTADAS EM SEUS TRECHOS RETOS SEM DESCONTO DEVIDO A DOBRAMENTOS. O CORTE E DOBRA DAS ARMADURAS É RESPONSABILIDADE DO EXECUTOR.

MOLA DE FRETAGEM
P/ FURO DE IÇAMENTO



Ø6.3cm

DETALHE DA ALÇA



ALÇA CORDOALHA Ø12.7 CP190

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	Hérbio Henrique Lopes
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

DER DF

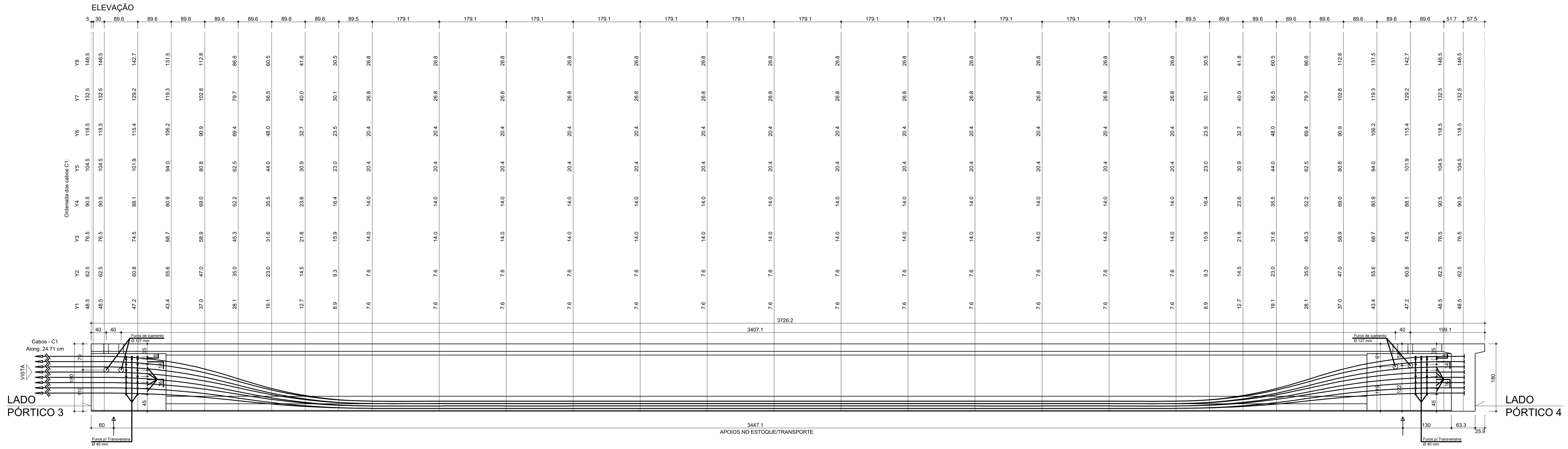
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

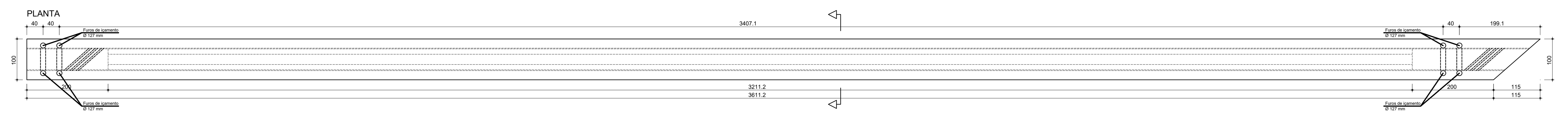
ETAPA DE PROJETO	LOCAL	PROJETO
EXECUTIVO	BRASÍLIA	HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO LONGARINA 2	COORD.: HERMES BUENO
FOLHA: 22/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-022-R00	DATA: JANEIRO/2022

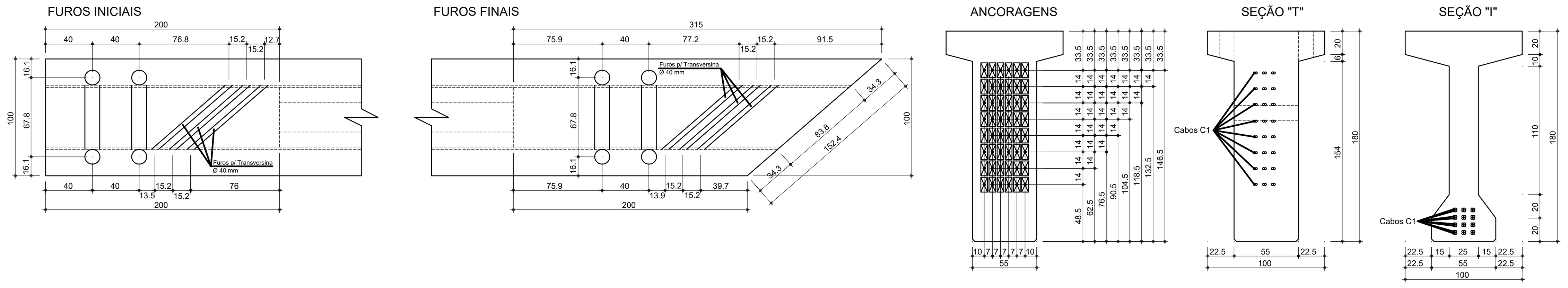
LONGARINA 3

ELEVAÇÃO



PLANTA

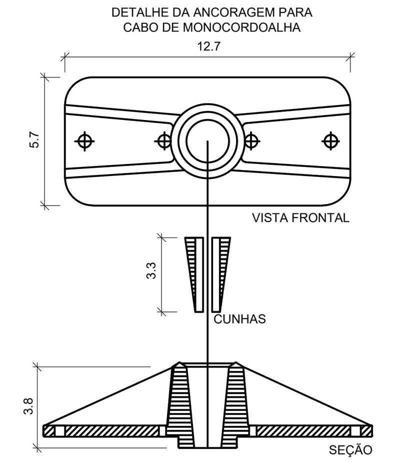




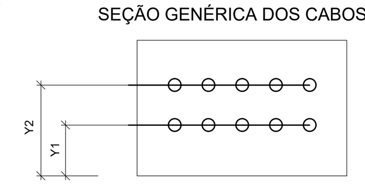
NOTAS PARA PROTENSÃO:

1. Todos os cabos são constituidos de 1Ø12,7mm - CP 190 RB-EP;
2. Força de protensão a ser aplicada em cada cabo: F=15tf;
3. Os alongamentos após a cravação, estão indicados no detalhamento dos elementos (nesta prancha);
4. A sequência de protensão deverá ser feita protendendo os cabos na sequência do centro para as extremidades;
5. As etapas de protensão, estão indicadas no detalhamento dos elementos (nesta prancha).

DETALHE DA ANCORAGEM PARA CABO DE MONOCORDOALHA

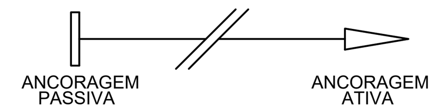


SEÇÃO GENÉRICA DOS CABOS



ATENÇÃO!
TODAS AS ANCORAGENS PASSIVAS DEVERÃO SER PRÉ-BLOCADAS.

CONVENÇÃO DOS CABOS



RESUMO DE PROTENSÃO PARA UMA LONGARINA

PROTENSÃO: AÇO CP190 RB-EP - 12.7 - ArcelorMittal ou similar

CABO	Ø	QUANT	COMPRIMENTO (m)		ANCORAGENS			ALONG (cm)
			UNITÁRIO	TOTAL	A	P	I	FIN
C1	12.7	48	38.20	1833.60	48	48	-	24.71

RESUMO DE PROTENSÃO

Monocordoalhas não aderentes

CABO					ANCORAGENS		
Ø	COMPR. (m)	PESO			A	P	I
		kg/m	kg	kg+4%			
12.7	1833.60	0.890	1632.00	1698.00	48	48	-

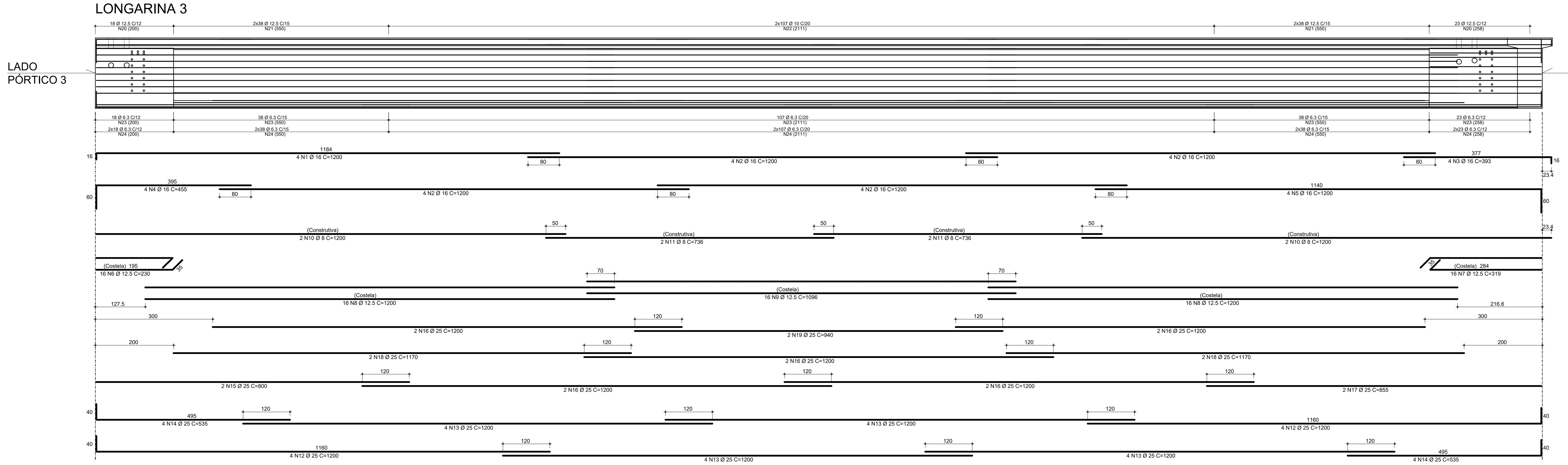
RESUMO DE PROTENSÃO TOTAL

CABO					ANCORAGENS		
QUANT. LONGARINAS	COMPR. (m)	PESO			A	P	I
		kg/m	kg	kg+4%			
13	23836.80	0.890	21215.00	22064.00	624	624	-

*IÇAMENTO DA PEÇA DEVERÁ OBRIGATORIAMENTE SER FEITO POR DIS GUINDASTES;
*SAQUE, MANUSEIO E UTILIZAÇÃO APÓS A PROTENSÃO DE TODOS OS CABOS;
*PROTENDER TODOS OS CABOS APÓS A RESISTÊNCIA DO CONCRETO ATINGIR 35 Mpa;
*AS LONGARINAS DEVERÃO OBRIGATORIAMENTE SEREM IÇADAS/MONTADAS POR PINOS DE 4,0" EM AÇO 1045 EM TODOS OS 4 FUROS;
*PREVER FUROS NAS LONGARINAS PARA ANCORAGEM DAS ARMADURAS DAS TRANSVERSINAS.

Pavimento	Quant	Volume unit m3	Volume total m3	Peso unit tf	Peso total tf
Tabuleiro(1x)	13	28.350	368.550	70.874	921.362
TOTAIS	13		368.550		921.362

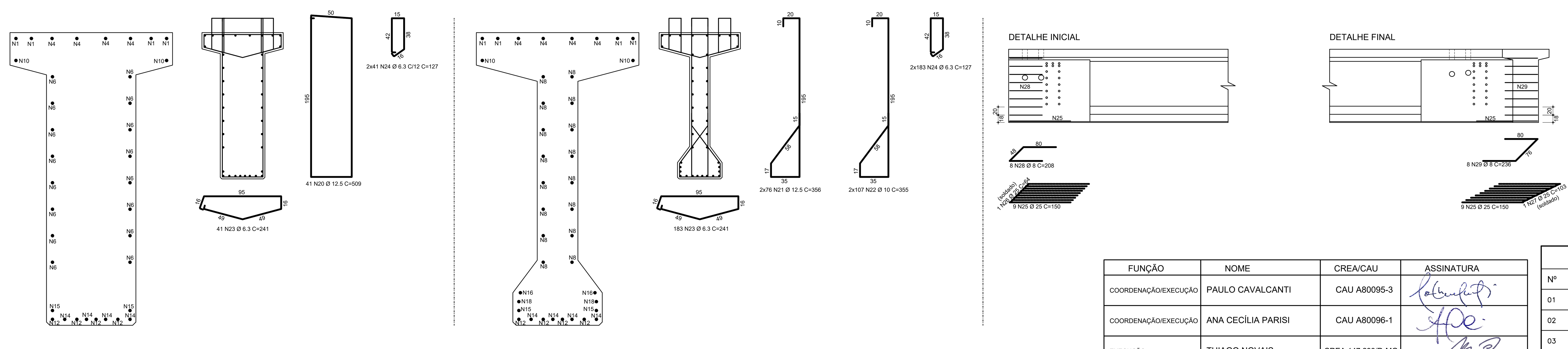
LONGARINA 3



AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
LONGARINA 3 (X13)					
50A	1	16	52	1200	62400
50A	2	16	208	1200	249600
50A	3	16	52	393	20436
50A	4	16	52	455	23660
50A	5	16	52	1200	62400
50A	6	12.5	208	230	47840
50A	7	12.5	208	319	66352
50A	8	12.5	416	1200	499200
50A	9	12.5	208	1096	227968
50A	10	8	52	1200	62400
50A	11	8	52	736	38272
50A	12	25	104	1200	124800
50A	13	25	208	1200	249600
50A	14	25	104	535	55640
50A	15	25	26	800	20800
50A	16	25	130	1200	156000
50A	17	25	26	855	22230
50A	18	25	52	1170	60840
50A	19	25	26	940	24440
50A	20	12.5	533	509	271297
50A	21	12.5	1976	356	703456
50A	22	10	2782	355	987610
50A	23	6.3	2912	241	701792
50A	24	6.3	5824	127	739648
50A	25	25	234	150	35100
50A	26	25	13	64	832
50A	27	25	13	103	1339
50A	28	8	104	208	21632
50A	29	8	104	236	24544

RESUMO DE AÇO

AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	14414	3529
50A	8	1468	579
50A	10	9876	6090
50A	12.5	18161	17496
50A	16	4185	6606
50A	25	7516	28963
Peso Total	50A =		63263 kgf



OBSERVAÇÕES

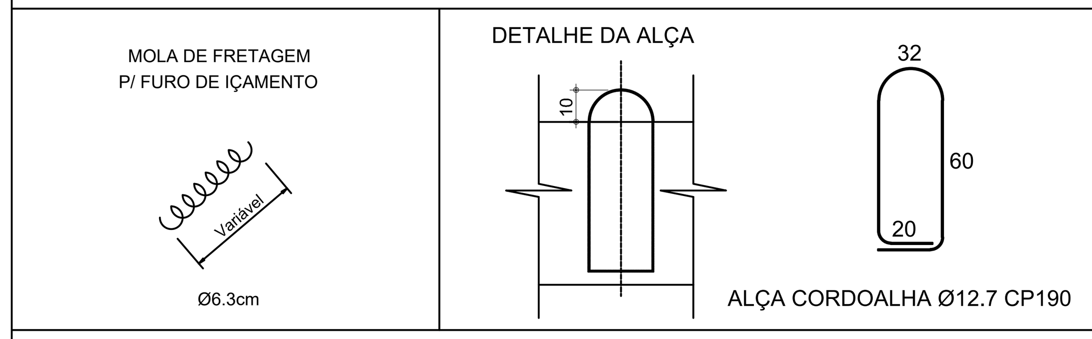
1 - O CONCRETO DEVE ATENDER AS ESPECIFICAÇÕES DA NORMA BRASILEIRA ABNT NBR 12655:2006 - CONCRETO - PREPARO, CONTROLE E RECEBIMENTO - PROCEDIMENTO
2 - OS APOIOS DEVERÃO SER POSICIONADOS NA MESMA DIREÇÃO DAS ALÇAS
3 - DESVIAR OS ESTRIBOS QUANDO COINCIDIR COM OS FUROS
4 - fcj = RESISTÊNCIA À COMPRESSÃO DO CONCRETO NA NA IDADE DO ATO DA PROTENSÃO

AÇO CA-50 / CA-60

1 - OBEDECER OS DIÂMETROS DE DOBRAMENTO ESPECIFICADOS NA ABNT NBR 6118:2003 - TAB. 9.1
2 - AS BARRAS DE ARMADURA ESTÃO DESENHADAS E COTADAS EM SEUS TRECHOS RETOS SEM DESCONTO DEVIDO A DOBRAMENTOS. O CORTE E DOBRA DAS ARMADURAS É RESPONSABILIDADE DO EXECUTOR.

MOLA DE FRETAGEM P/ FURO DE IÇAMENTO

DETALHE DA ALÇA



DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):

PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm

ARMADURAS ATIVAS (CP-190 RB):

VIGAS:	3,0 cm
LAJES:	2,5 cm

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO	APROVADO	VISTO

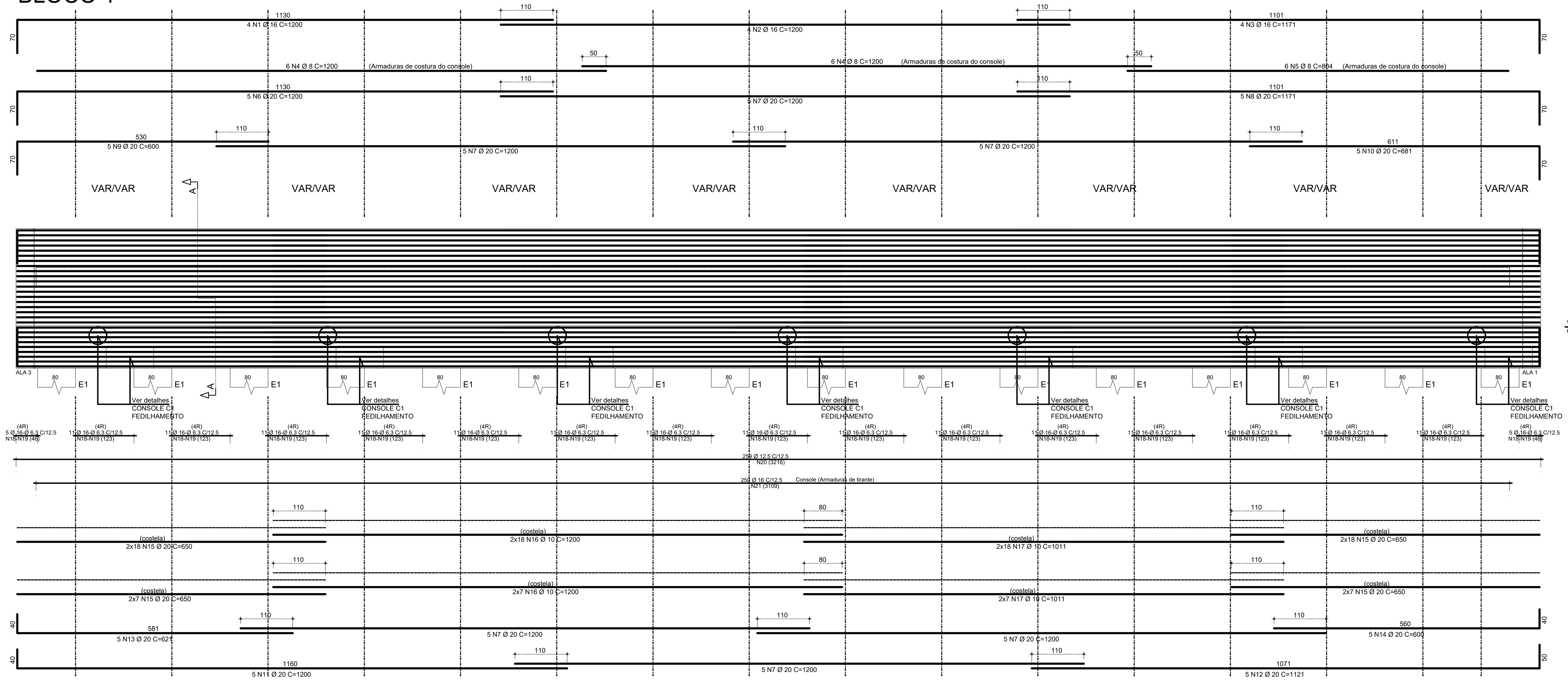
DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

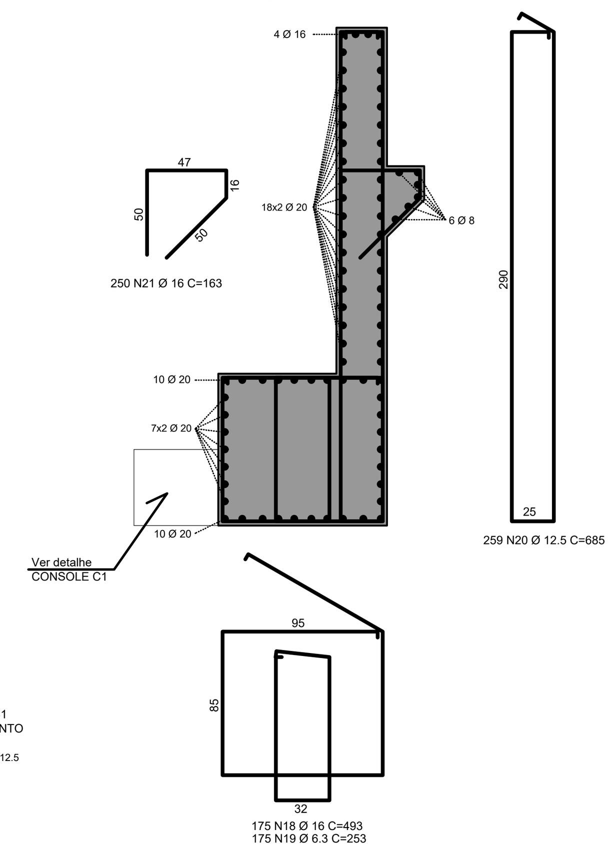
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO LONGARINA 3	COORD.: HERMES BUENO
FOLHA: 23/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-023-R00	DATA: JANEIRO/2022

BLOCO 1



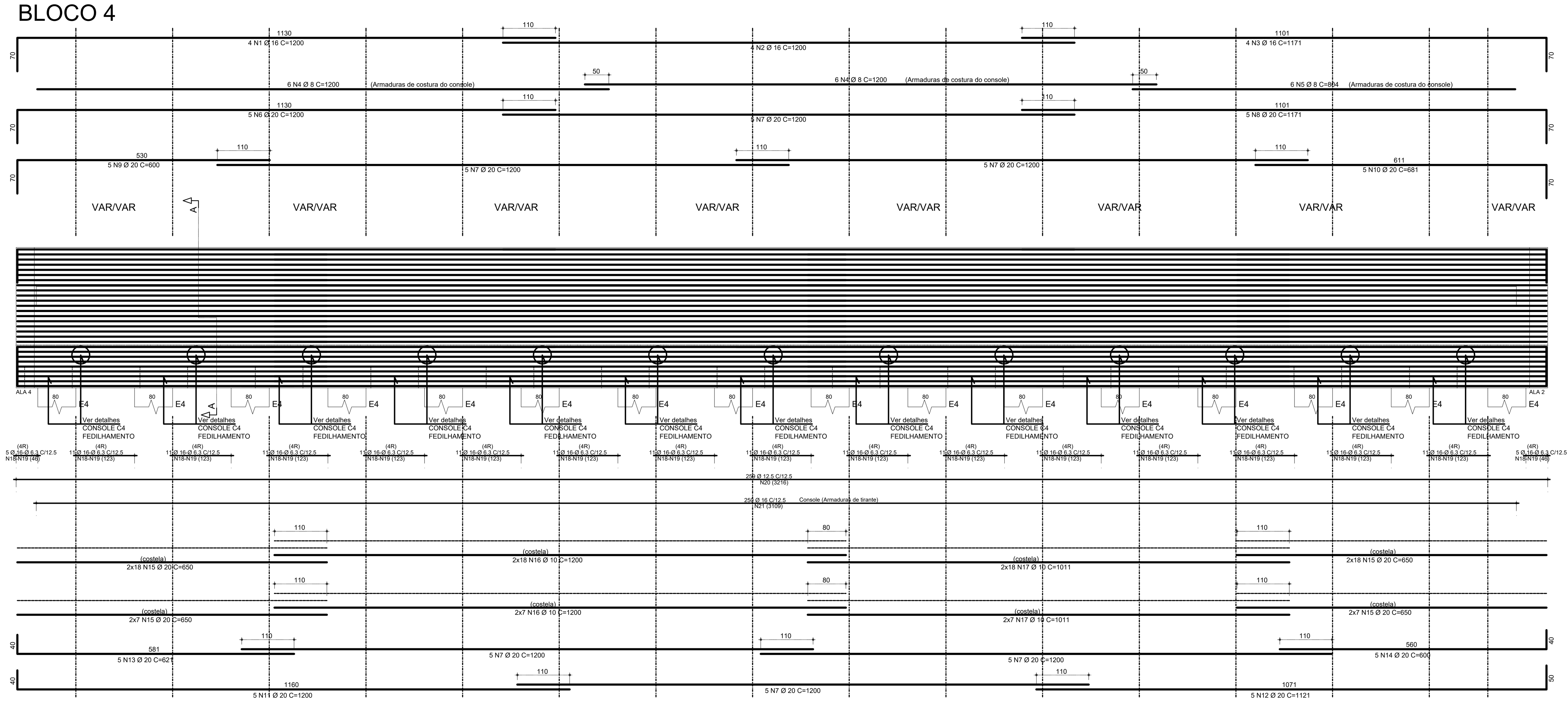
Corte A



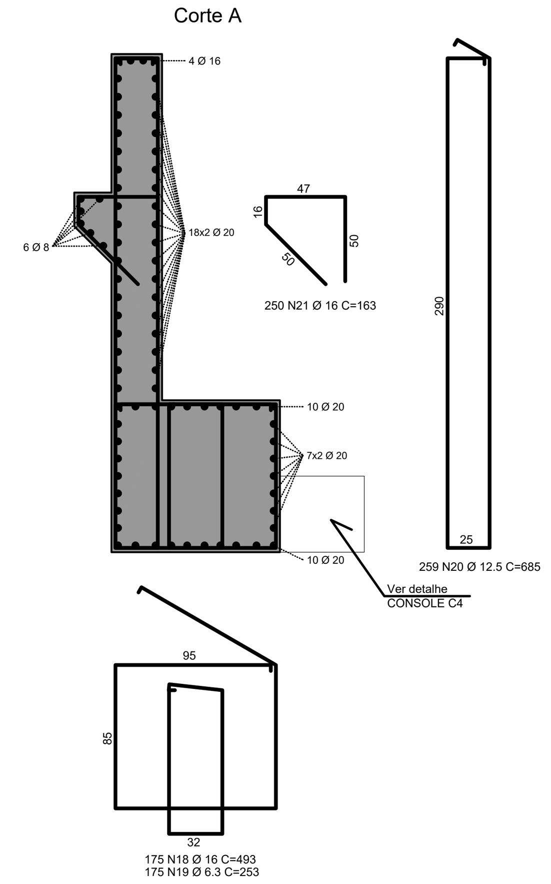
AÇO	POS	BIT	QUANT	COMPRIMENTO UNIT	COMPRIMENTO TOTAL
		mm		cm	cm
CONSOLE C1 (X7)					
50A	1	20	49	140	6860
50A	2	20	7	94	658
50A	3	8	49	508	24892
50A	4	6.3	84	204	17136
50A	5	6.3	14	101	1414
CONSOLE C4 (X13)					
50A	1	20	91	140	12740
50A	2	20	13	94	1222
50A	3	8	104	508	52832
50A	4	6.3	156	204	31824
50A	5	6.3	26	101	2626
DETALHE FENDILHAMENTO BLOCOS 1 e 4					
50A	1	10	120	452	54240
50A	2	6.3	80	85	6800
BLOCO 1					
50A	1	16	4	1200	4800
50A	2	16	4	1200	4800
50A	3	16	4	1171	4684
50A	4	8	12	1200	14400
50A	5	8	6	804	4824
50A	6	20	5	1200	6000
50A	7	20	30	1200	36000
50A	8	20	5	1171	5855
50A	9	20	5	600	3000
50A	10	20	5	681	3405
50A	11	20	5	1200	6000
50A	12	20	5	1121	5605
50A	13	20	5	621	3105
50A	14	20	5	600	3000
50A	15	20	100	650	65000
50A	16	10	50	1200	60000
50A	17	10	50	1011	50550
50A	18	16	175	493	86275
50A	19	6.3	175	253	44275
50A	20	12.5	259	685	177415
50A	21	16	250	163	40750
BLOCO 4					
50A	1	16	4	1200	4800
50A	2	16	4	1200	4800
50A	3	16	4	1171	4684
50A	4	8	12	1200	14400
50A	5	8	6	804	4824
50A	6	20	5	1200	6000
50A	7	20	30	1200	36000
50A	8	20	5	1171	5855
50A	9	20	5	600	3000
50A	10	20	5	681	3405
50A	11	20	5	1200	6000
50A	12	20	5	1121	5605
50A	13	20	5	621	3105
50A	14	20	5	600	3000
50A	15	20	100	650	65000
50A	16	10	50	1200	60000
50A	17	10	50	1011	50550
50A	18	16	175	493	86275
50A	19	6.3	175	253	44275
50A	20	12.5	259	685	177415
50A	21	16	250	163	40750

RESUMO DE AÇO			
AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	1484	363
50A	8	1162	458
50A	10	2753	1698
50A	12.5	3548	3418
50A	16	2826	4461
50A	20	2954	7286
Peso Total	50A =		17684 kgf

BLOCO 4



Corte A



DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO — PILAR QUE PASSA PELO PAVIMENTO

PILAR QUE MORRE NESTE PAVIMENTO — PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):

PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm

ARMADURAS ATIVAS (CP-190 RB):

VIGAS:	3,0 cm
LAJES:	2,5 cm

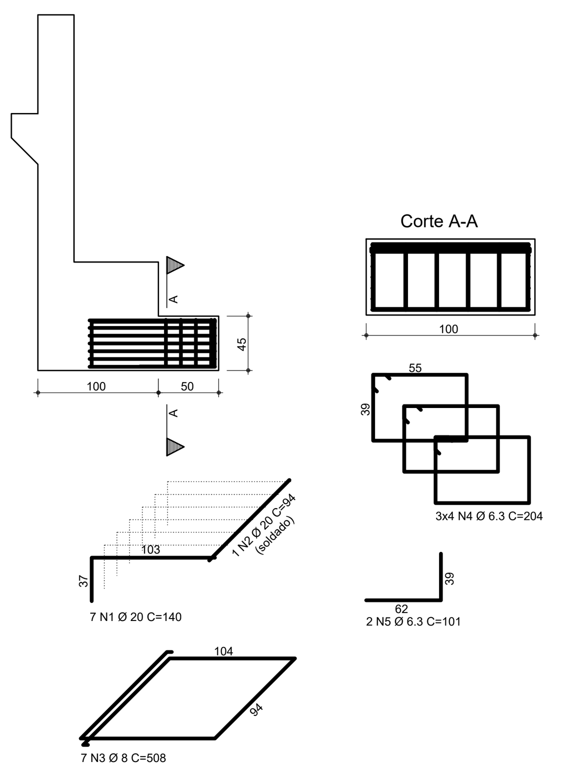
ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

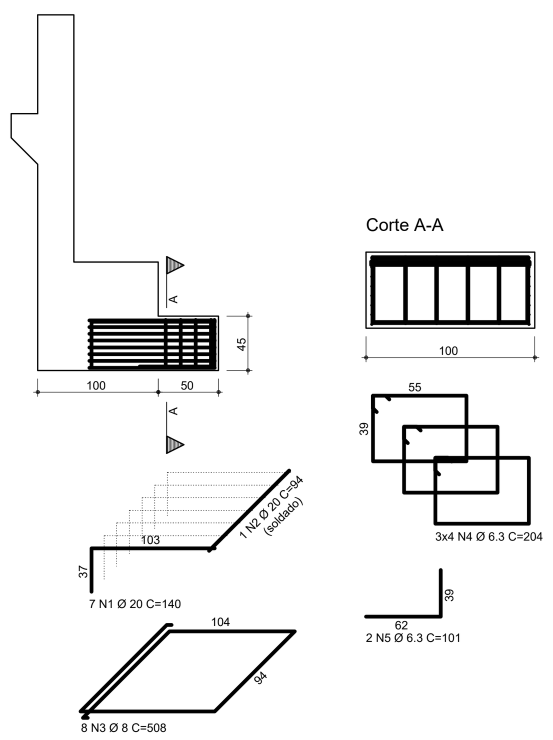
CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

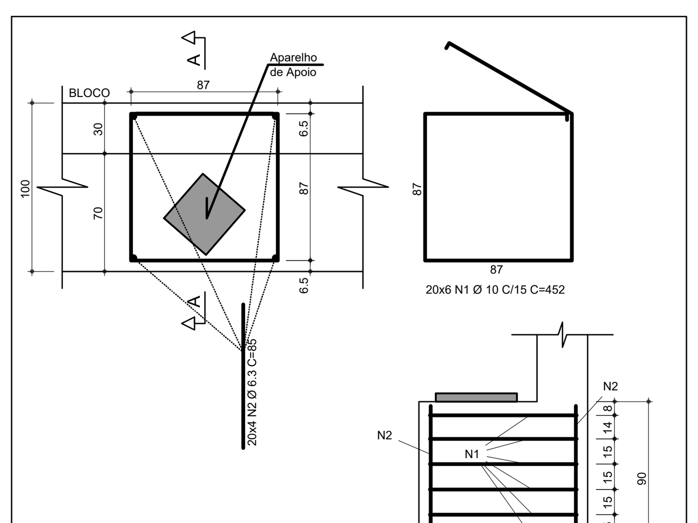
CONSOLE C1
BLOCO 1
ESC.:1:35



CONSOLE C4
BLOCO 4
ESC.:1:35



DETALHAMENTO DOS BLOCOS
ESC.:1:50/1:25



OBSERVAÇÃO
As armaduras de fendilhamento deverão ser posicionadas rigorosamente a 6 cm da face superior do bloco, na projeção do aparelho de apoio conforme detalhe acima.

DETALHE FENDILHAMENTO BLOCOS 1 e 4
ESC.1:25

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

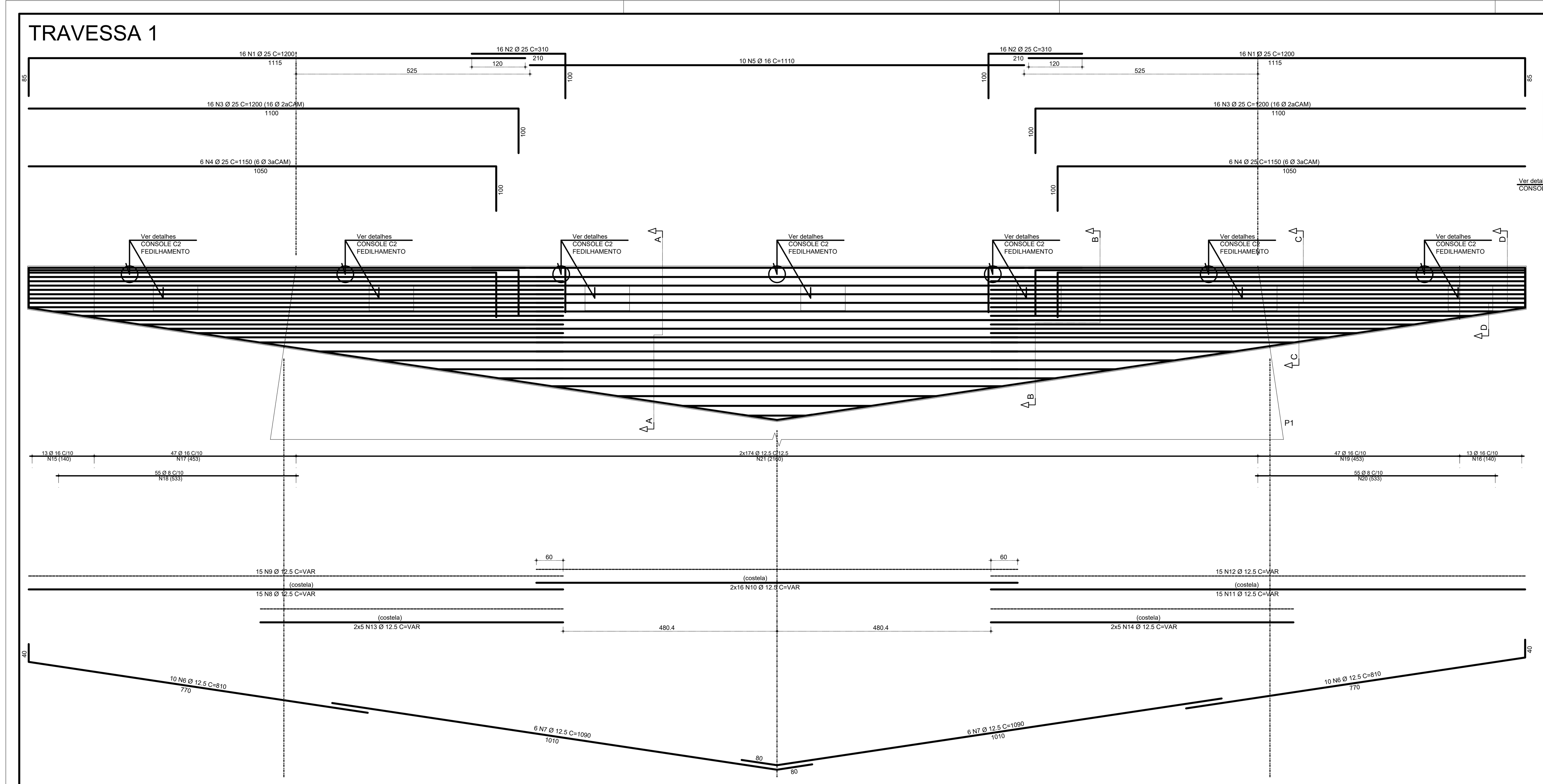
DER DF

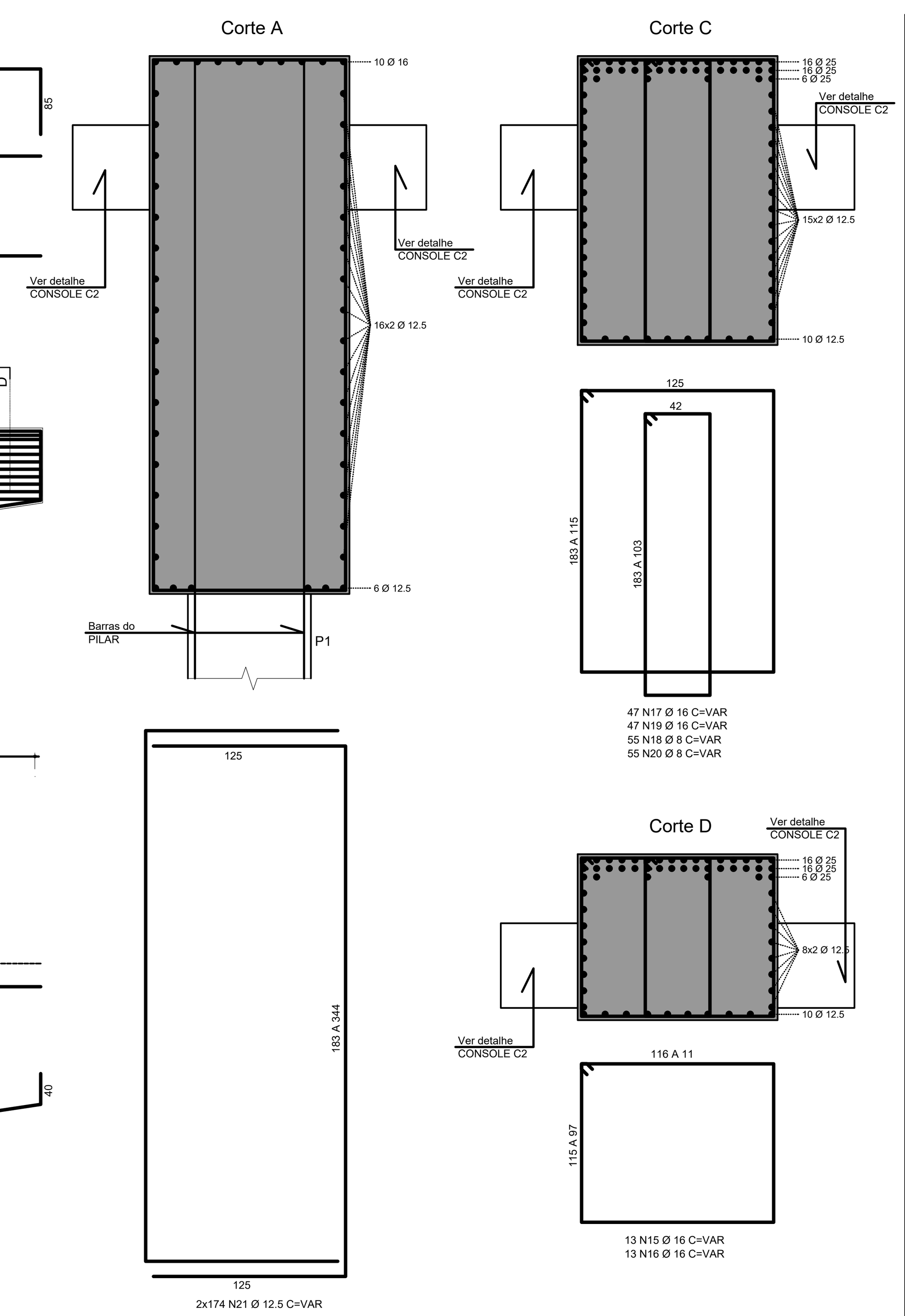
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

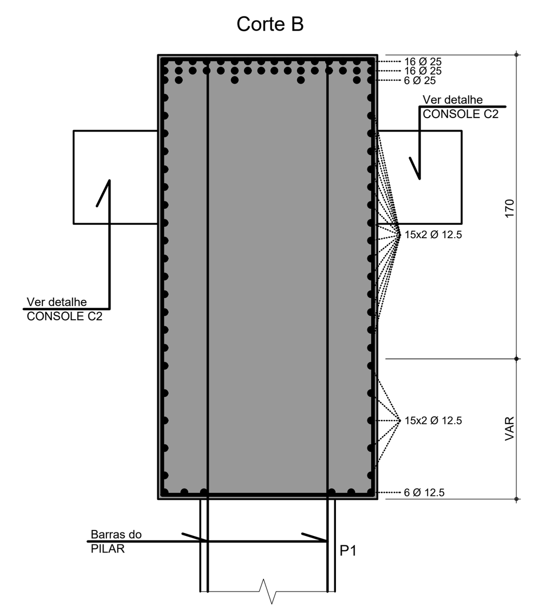
AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO DOS BLOCOS	COORD.: HERMES BUENO
FOLHA: 24/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-024-R00	DATA: JANEIRO/2022

TRAVESSA 1







AÇO	POS	BIT	QUANT	COMPRIMENTO	
				UNIT	TOTAL
		mm		cm	cm
CONSOLE C2 (X21)					
50A	1	20	168	159	26712
50A	2	20	21	94	1974
50A	3	8	189	508	96012
50A	4	6.3	252	224	56448
50A	5	6.3	42	111	4662
DETALHE FENDILHAMENTO TRAVESSA 1					
50A	1	12.5	56	664	37184
50A	2	6.3	28	115	3220
TRAVESSA 1					
50A	1	25	32	1200	38400
50A	2	25	32	310	9920
50A	3	25	32	1200	38400
50A	4	25	12	1150	13800
50A	5	16	10	1110	11100
50A	6	12.5	20	810	16200
50A	7	12.5	12	1090	13080
50A	8	12.5	15	--VAR-	15015
50A	9	12.5	15	--VAR-	16395
50A	10	12.5	32	--VAR-	30496
50A	11	12.5	15	--VAR-	16395
50A	12	12.5	15	--VAR-	15015
50A	13	12.5	10	--VAR-	4190
50A	14	12.5	10	--VAR-	4190
50A	15	16	13	--VAR-	5091
50A	16	16	13	--VAR-	5091
50A	17	16	47	--VAR-	28275
50A	18	8	55	--VAR-	21704
50A	19	16	47	--VAR-	28275
50A	20	8	55	--VAR-	21704
50A	21	12.5	348	--VAR-	178524

RESUMO DE AÇO			
AÇO	BIT	COMPR	PESO
	mm	m	kgf
50A	6.3	643	157
50A	8	1394	550
50A	12.5	3467	3340
50A	16	778	1228
50A	20	287	707
50A	25	1005	3873
Peso Total	50A =		9857 kgf

15 N8 Ø 12.5 C/9.7

N8A	778
N8B	843
N8C	907
N8D	972
N8E	1037
N8F	1048
N8G	1048
N8H	1048
N8I	1048
N8J	1048
N8K	1048
N8L	1048
N8M	1048
N8N	1048
N8O	1048

15 N9 Ø 12.5 C/9.7

N9A	778
N9B	843
N9C	907
N9D	972
N9E	1037
N9F	1101
N9G	1166
N9H	1198
N9I	1198
N9J	1198
N9K	1198
N9L	1198
N9M	1198
N9N	1198
N9O	1198

2x16 N10 Ø 12.5 C/22

N10A	128
N10B	422
N10C	715
N10D	1008
N10E	1081
N10F	1081
N10G	1081
N10H	1081
N10I	1081
N10J	1081
N10K	1081
N10L	1081
N10M	1081
N10N	1081
N10O	1081
N10P	1081

15 N11 Ø 12.5 C/9.7

N11A	778
N11B	843
N11C	907
N11D	972
N11E	1037
N11F	1101
N11G	1166
N11H	1198
N11I	1198
N11J	1198
N11K	1198
N11L	1198
N11M	1198
N11N	1198
N11O	1198

15 N12 Ø 12.5 C/9.7

N12A	778
N12B	843
N12C	907
N12D	972
N12E	1037
N12F	1048
N12G	1048
N12H	1048
N12I	1048
N12J	1048
N12K	1048
N12L	1048
N12M	1048
N12N	1048
N12O	1048

2x5 N13 Ø 12.5 C/21

N13A	680
N13B	564
N13C	424
N13D	284
N13E	144

2x5 N14 Ø 12.5 C/21

N14A	144
N14B	284
N14C	424
N14D	564
N14E	680

13 N15 Ø 16 C/10

N15 A	270
N15 B	290
N15 C	312
N15 D	330
N15 E	352
N15 F	372
N15 G	390
N15 H	412
N15 I	432
N15 J	452
N15 K	472
N15 L	494
N15 M	514

13 N16 Ø 16 C/10

N16 A	514
N16 B	494
N16 C	472
N16 D	452
N16 E	432
N16 F	412
N16 G	390
N16 H	372
N16 I	352
N16 J	330
N16 K	312
N16 L	290
N16 M	270

47 N17 Ø 16 C/10

N17A	534
N17B	537
N17C	540
N17D	542
N17E	545
N17F	548
N17G	551
N17H	554
N17I	557
N17J	560
N17K	563
N17L	566
N17M	569
N17N	572
N17O	575
N17P	578
N17Q	581
N17R	584
N17S	587
N17T	590
N17U	593
N17V	596
N17W	599
N17X	602
N17Y	605
N17Z	608
N17AA	610
N17AB	613
N17AC	616
N17AD	619
N17AE	622
N17AF	625
N17AG	628
N17AH	631
N17AI	634
N17AJ	637
N17AK	640
N17AL	643
N17AM	646
N17AN	649
N17AO	652
N17AP	655
N17AQ	658
N17AR	661
N17AS	664
N17AT	667
N17AU	670

55 N18 Ø 8

N18A	315
N18B	318
N18C	321
N18D	324
N18E	326
N18F	329
N18G	332
N18H	335
N18I	338
N18J	341
N18K	344
N18L	347
N18M	350
N18N	353
N18O	356
N18P	359
N18Q	362
N18R	365
N18S	368
N18T	371
N18U	374
N18V	377
N18W	380
N18X	383
N18Y	386
N18Z	389
N18AA	392
N18AB	395
N18AC	398
N18AD	401
N18AE	404
N18AF	406
N18AG	409
N18AH	412
N18AI	415
N18AJ	418
N18AK	421
N18AL	424
N18AM	427
N18AN	430
N18AO	433
N18AP	436
N18AQ	439
N18AR	442
N18AS	445
N18AT	448
N18AU	451
N18AV	454
N18AW	457
N18AX	460
N18AY	463
N18AZ	466
N18BA	469
N18BB	472
N18BC	475

47 N19 Ø 16 C/10

N19A	670
N19B	667
N19C	664
N19D	661
N19E	658
N19F	655
N19G	652
N19H	649
N19I	646
N19J	643
N19K	640
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N19AH	572
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N19AM	557
N19AN	554
N19AO	551
N19AP	548
N19AQ	545
N19AR	542
N19AS	540
N19AT	537
N19AU	534

55 N20 Ø 8

N20A	475
N20B	472
N20C	469
N20D	466
N20E	463
N20F	460
N20G	457
N20H	454
N20I	451
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N20AN	359
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N20AV	335
N20AW	332
N20AX	329
N20AY	326
N20AZ	324
N20BA	321
N20BB	318
N20BC	315

2x174 N21 Ø 12.5 C/12.5

N21A	433
N21B	435
N21C	437
N21D	438
N21E	440
N21F	442
N21G	444
N21H	446
N21I	448
N21J	450
N21K	452
N21L	453
N21M	455
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N21X	476
N21Y	478
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N21AC	485
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N21AF	491
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N21AH	495
N21AI	497
N21AJ	498
N21AK	500
N21AL	502
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N21AN	506
N21AO	508
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N21AQ	512
N21AR	513
N21AS	515
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N21AU	519
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N21AW	523
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N21AY	527
N21AZ	528
N21BA	530
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N21BC	534
N21BD	536
N21BE	538
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N21BG	542
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N21BI	545
N21BJ	547
N21BK	549
N21BL	551
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N21BN	555
N21BO	557
N21BP	558
N21BQ	560
N21BR	562
N21BS	564
N21BT	566
N21BU	568
N21BV	570
N21BW	572
N21BX	573
N21BY	575
N21BZ	577
N21CA	579
N21CB	581
N21CC	583
N21CD	585
N21CE	587
N21CF	588
N21CG	590
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N21CR	579
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N21DD	557
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N21DF	553
N21DG	551
N21DH	549
N21DI	547
N21DJ	545
N21DK	543
N21DL	542
N21DM	540
N21DN	538
N21DO	536
N21DP	534
N21DQ	532
N21DR	530
N21DS	528
N21DT	527
N21DU	525
N21DV	523
N21DW	521
N21DX	519
N21DY	517
N21DZ	515
N21EA	513
N21EB	512
N21EC	510
N21ED	508
N21EE	506
N21EF	504
N21EG	502
N21EH	500
N21EI	498
N21EJ	497
N21EK	495
N21EL	493
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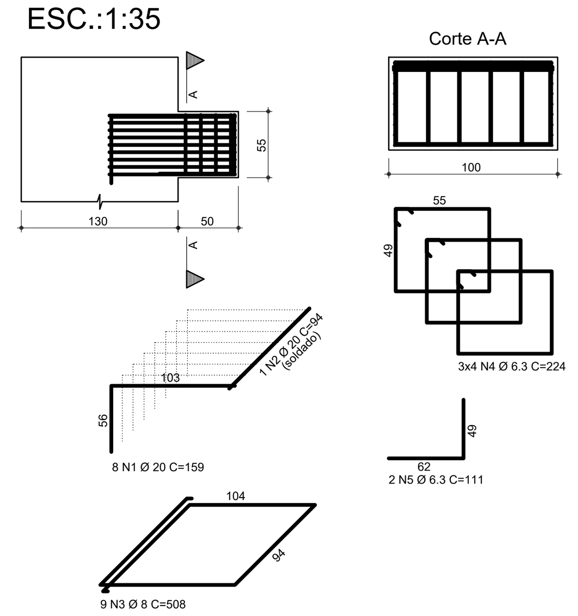
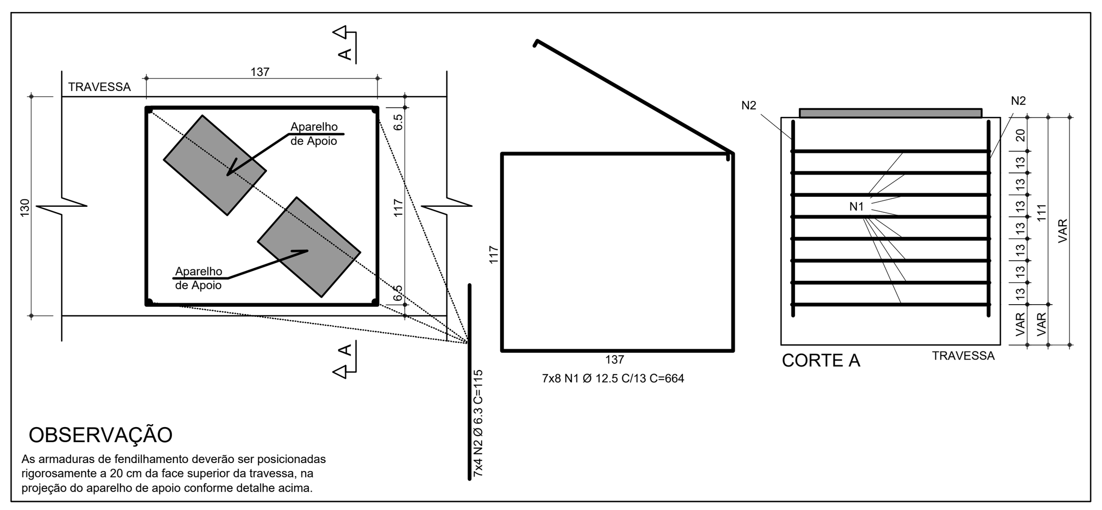
N21EO	487
N21EP	485
N21EQ	483
N21ER	482
N21ES	480
N21ET	478
N21EU	476
N21EV	474
N21EW	472
N21EX	470
N21EY	468
N21EZ	467
N21FA	465
N21FB	463
N21FC	461
N21FD	459
N21FE	457
N21FF	455
N21FG	453
N21FH	452
N21FI	450
N21FJ	448
N21FK	446
N21FL	444
N21FM	442
N21FN	440
N21FO	438
N21FP	437
N21FQ	435
N21FR	433

DETALHAMENTO DA TRAVESSA 1
ESC.:1:50/1:25

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  - PARA fck = 30 MPa Ecs = 26.8 GPa
  - PARA fck = 35 MPa Ecs = 29.4 GPa
  - PARA fck = 45 MPa Ecs = 34.3 GPa

CONSOLE C2
TRAVESSA 1 / TRAVESSA 2
ESC.:1:35





OBSERVAÇÃO

As armaduras de fendilhamento deverão ser posicionadas rigorosamente a 20 cm da face superior da travessa, na projeção do aparelho de apoio conforme detalhe acima.

DETALHE FENDILHAMENTO TRAVESSA 1
ESC.1:25

DETALHES DE FORMAS

CONVENÇÕES

- PILAR QUE NASCE NESTE PAVIMENTO
- PILAR QUE PASSA PELO PAVIMENTO
- PILAR QUE MORRE NESTE PAVIMENTO
- PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRÉ-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-
CONFERIDO	APROVADO	VISTO

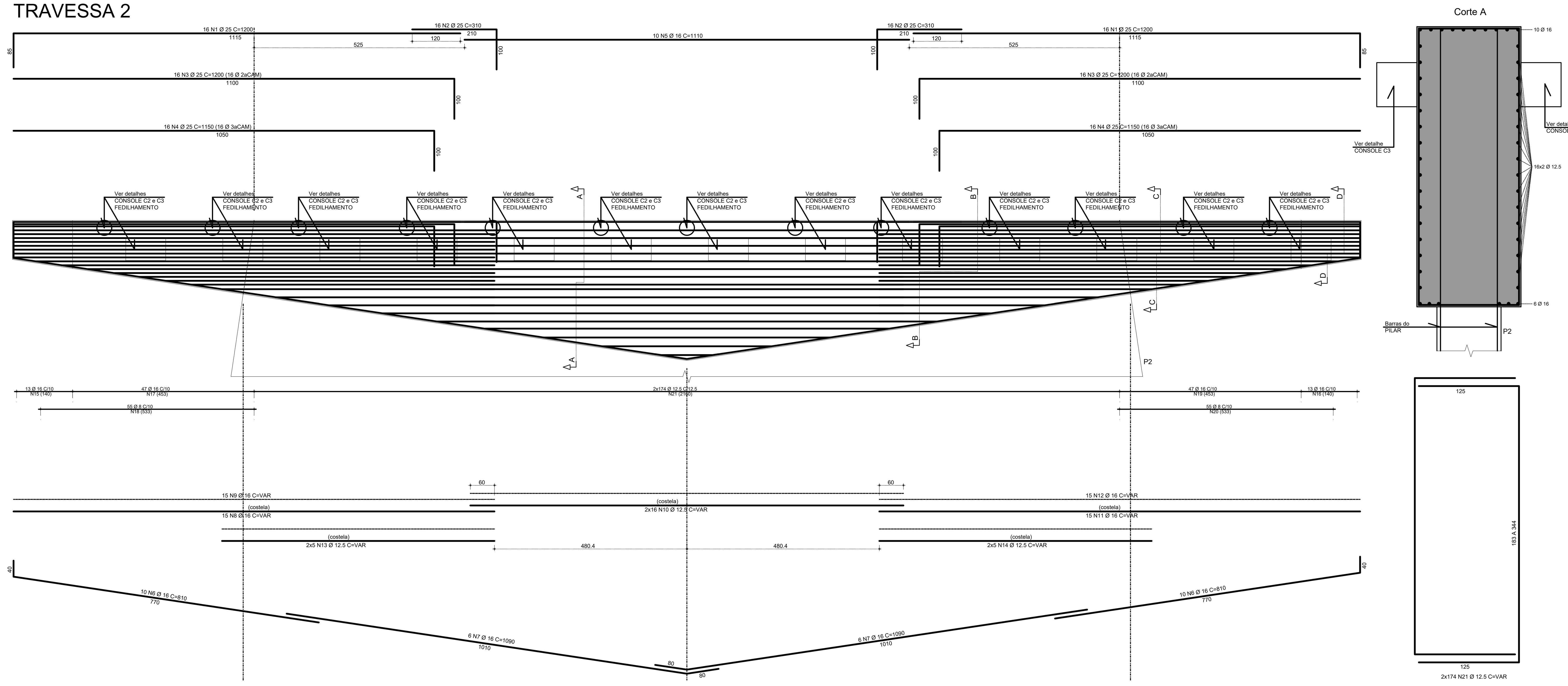
DER DF

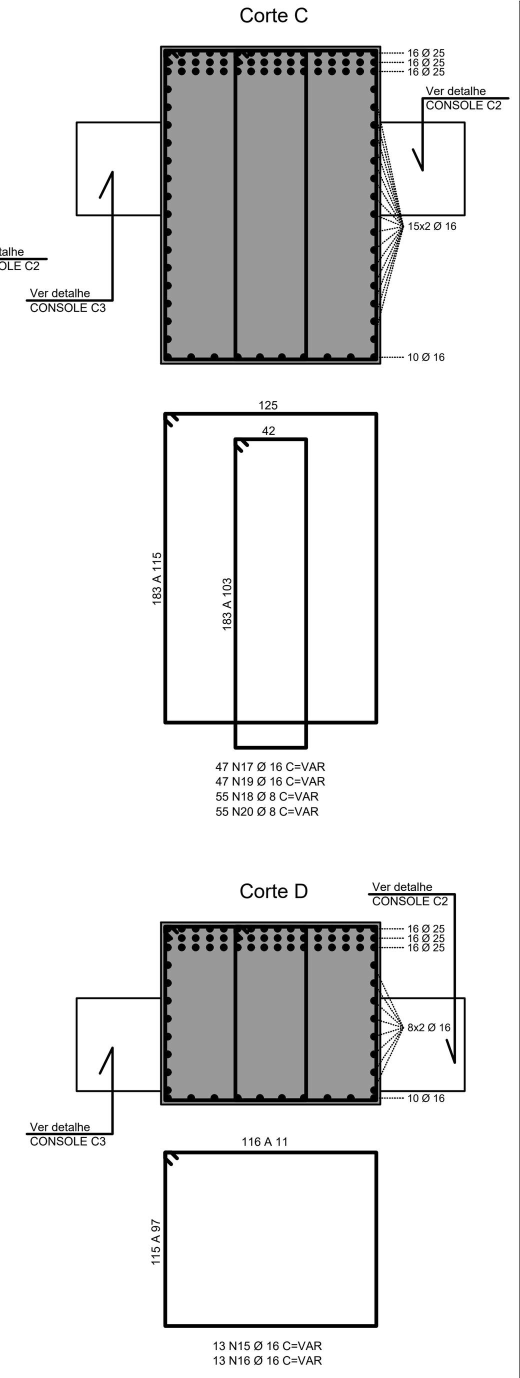
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO DA TRAVESSA 1	COORD.: HERMES BUENO
FOLHA: 25/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-025-R00	DATA: JANEIRO/2022

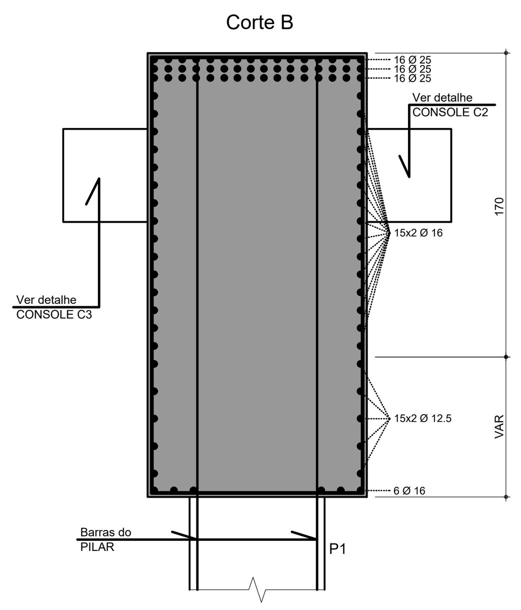
TRAVESSA 2





AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
CONSOLE C3 (X13)					
50A	1	20	117	159	18603
50A	2	20	13	94	1222
50A	3	8	130	508	66040
50A	4	6.3	156	224	34944
50A	5	6.3	26	111	2886
DETALHE FENDILHAMENTO TRAVESSA 2					
50A	1	12.5	63	664	41832
50A	2	8	54	511	27594
50A	3	6.3	52	115	5980
TRAVESSA 2					
50A	1	25	32	1200	38400
50A	2	25	32	310	9920
50A	3	25	32	1200	38400
50A	4	25	32	1150	36800
50A	5	16	10	1110	11100
50A	6	16	20	810	16200
50A	7	16	12	1090	13080
50A	8	16	15	--VAR-	15015
50A	9	16	15	--VAR-	16395
50A	10	12.5	32	--VAR-	30496
50A	11	16	15	--VAR-	16395
50A	12	16	15	--VAR-	15015
50A	13	12.5	10	--VAR-	4190
50A	14	12.5	10	--VAR-	4190
50A	15	16	13	--VAR-	5091
50A	16	16	13	--VAR-	5091
50A	17	16	47	--VAR-	28275
50A	18	8	55	--VAR-	21704
50A	19	16	47	--VAR-	28275
50A	20	8	55	--VAR-	21704
50A	21	12.5	348	--VAR-	178524

RESUMO DE AÇO			
AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	438	107
50A	8	1370	541
50A	12.5	2592	2497
50A	16	1699	2682
50A	20	198	489
50A	25	1235	4760
Peso Total	50A =		11076 kgf



15 N8 Ø 16 C/9.7

N8A	778
N8B	843
N8C	907
N8D	972
N8E	1037
N8F	1048
N8G	1048
N8H	1048
N8I	1048
N8J	1048
N8K	1048
N8L	1048
N8M	1048
N8N	1048
N8O	1048

15 N9 Ø 16 C/9.7

N9A	778
N9B	843
N9C	907
N9D	972
N9E	1037
N9F	1101
N9G	1166
N9H	1198
N9I	1198
N9J	1198
N9K	1198
N9L	1198
N9M	1198
N9N	1198
N9O	1198

2x16 N10 Ø 12.5 C/22

N10A	128
N10B	422
N10C	715
N10D	1008
N10E	1081
N10F	1081
N10G	1081
N10H	1081
N10I	1081
N10J	1081
N10K	1081
N10L	1081
N10M	1081
N10N	1081
N10O	1081
N10P	1081

15 N11 Ø 16 C/9.7

N11A	778
N11B	843
N11C	907
N11D	972
N11E	1037
N11F	1101
N11G	1166
N11H	1198
N11I	1198
N11J	1198
N11K	1198
N11L	1198
N11M	1198
N11N	1198
N11O	1198

15 N12 Ø 16 C/9.7

N12A	778
N12B	843
N12C	907
N12D	972
N12E	1037
N12F	1048
N12G	1048
N12H	1048
N12I	1048
N12J	1048
N12K	1048
N12L	1048
N12M	1048
N12N	1048
N12O	1048

2x5 N13 Ø 12.5 C/21

N13A	680
N13B	564
N13C	424
N13D	284
N13E	144

2x5 N14 Ø 12.5 C/21

N14A	144
N14B	284
N14C	424
N14D	564
N14E	680

13 N15 Ø 16 C/10

N15 A	270
N15 B	290
N15 C	312
N15 D	330
N15 E	352
N15 F	372
N15 G	390
N15 H	412
N15 I	432
N15 J	452
N15 K	472
N15 L	494
N15 M	514

13 N16 Ø 16 C/10

N16 A	514
N16 B	494
N16 C	472
N16 D	452
N16 E	432
N16 F	412
N16 G	390
N16 H	372
N16 I	352
N16 J	330
N16 K	312
N16 L	290
N16 M	270

47 N17 Ø 16 C/10

N17A	534
N17B	537
N17C	540
N17D	542
N17E	545
N17F	548
N17G	551
N17H	554
N17I	557
N17J	560
N17K	563
N17L	566
N17M	569
N17N	572
N17O	575
N17P	578
N17Q	581
N17R	584
N17S	587
N17T	590
N17U	593
N17V	596
N17W	599
N17X	602
N17Y	605
N17Z	608
N17AA	610
N17AB	613
N17AC	616
N17AD	619
N17AE	622
N17AF	625
N17AG	628
N17AH	631
N17AI	634
N17AJ	637
N17AK	640
N17AL	643
N17AM	646
N17AN	649
N17AO	652
N17AP	655
N17AQ	658
N17AR	661
N17AS	664
N17AT	667
N17AU	670

55 N18 Ø 8

N18A	315
N18B	318
N18C	321
N18D	324
N18E	326
N18F	329
N18G	332
N18H	335
N18I	338
N18J	341
N18K	344
N18L	347
N18M	350
N18N	353
N18O	356
N18P	359
N18Q	362
N18R	365
N18S	368
N18T	371
N18U	374
N18V	377
N18W	380
N18X	383
N18Y	386
N18Z	389
N18AA	392
N18AB	395
N18AC	398
N18AD	401
N18AE	404
N18AF	406
N18AG	409
N18AH	412
N18AI	415
N18AJ	418
N18AK	421
N18AL	424
N18AM	427
N18AN	430
N18AO	433
N18AP	436
N18AQ	439
N18AR	442
N18AS	445
N18AT	448
N18AU	451
N18AV	454
N18AW	457
N18AX	460
N18AY	463
N18AZ	466
N18BA	469
N18BB	472
N18BC	475

47 N19 Ø 16 C/10

N19A	670
N19B	667
N19C	664
N19D	661
N19E	658
N19F	655
N19G	652
N19H	649
N19I	646
N19J	643
N19K	640
N19L	637
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N19X	602
N19Y	599
N19Z	596
N19AA	593
N19AB	590
N19AC	587
N19AD	584
N19AE	581
N19AF	578
N19AG	575
N19AH	572
N19AI	569
N19AJ	566
N19AK	563
N19AL	560
N19AM	557
N19AN	554
N19AO	551
N19AP	548
N19AQ	545
N19AR	542
N19AS	540
N19AT	537
N19AU	534

55 N20 Ø 8

N20A	475
N20B	472
N20C	469
N20D	466
N20E	463
N20F	460
N20G	457
N20H	454
N20I	451
N20J	448
N20K	445
N20L	442
N20M	439
N20N	436
N20O	433
N20P	430
N20Q	427
N20R	424
N20S	421
N20T	418
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N20V	412
N20W	409
N20X	406
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N20Z	401
N20AA	398
N20AB	395
N20AC	392
N20AD	389
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N20AH	377
N20AI	374
N20AJ	371
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N20AN	359
N20AO	356
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N20AQ	350
N20AR	347
N20AS	344
N20AT	341
N20AU	338
N20AV	335
N20AW	332
N20AX	329
N20AY	326
N20AZ	324
N20BA	321
N20BB	318
N20BC	315

2x174 N21 Ø 12.5 C/12.5

N21A	433
N21B	435
N21C	437
N21D	438
N21E	440
N21F	442
N21G	444
N21H	446
N21I	448
N21J	450
N21K	452
N21L	453
N21M	455
N21N	457
N21O	459
N21P	461
N21Q	463
N21R	465
N21S	467
N21T	468
N21U	470
N21V	472
N21W	474
N21X	476
N21Y	478
N21Z	480
N21AA	482
N21AB	483
N21AC	485
N21AD	487
N21AE	489
N21AF	491
N21AG	493
N21AH	495
N21AI	497
N21AJ	498
N21AK	500
N21AL	502
N21AM	504
N21AN	506
N21AO	508
N21AP	510
N21AQ	512
N21AR	513
N21AS	515
N21AT	517
N21AU	519
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N21AW	523
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N21BB	532
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N21BD	536
N21BE	538
N21BF	540
N21BG	542
N21BH	543
N21BI	545
N21BJ	547
N21BK	549
N21BL	551
N21BM	553
N21BN	555
N21BO	557
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N21BQ	560
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N21BU	568
N21BV	570
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N21CI	594
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N21CO	585
N21CP	583
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N21DI	547
N21DJ	545
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N21DN	538
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N21DR	530
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N21DW	521
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N21DY	517
N21DZ	515
N21EA	513
N21EB	512
N21EC	510
N21ED	508
N21EE	506
N21EF	504
N21EG	502
N21EH	500
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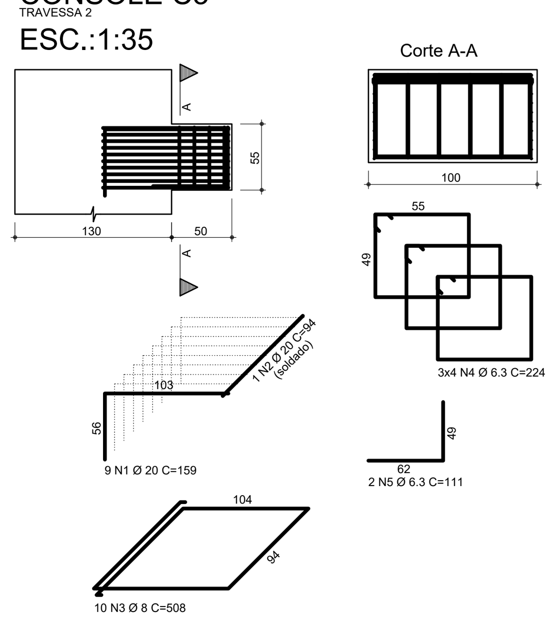
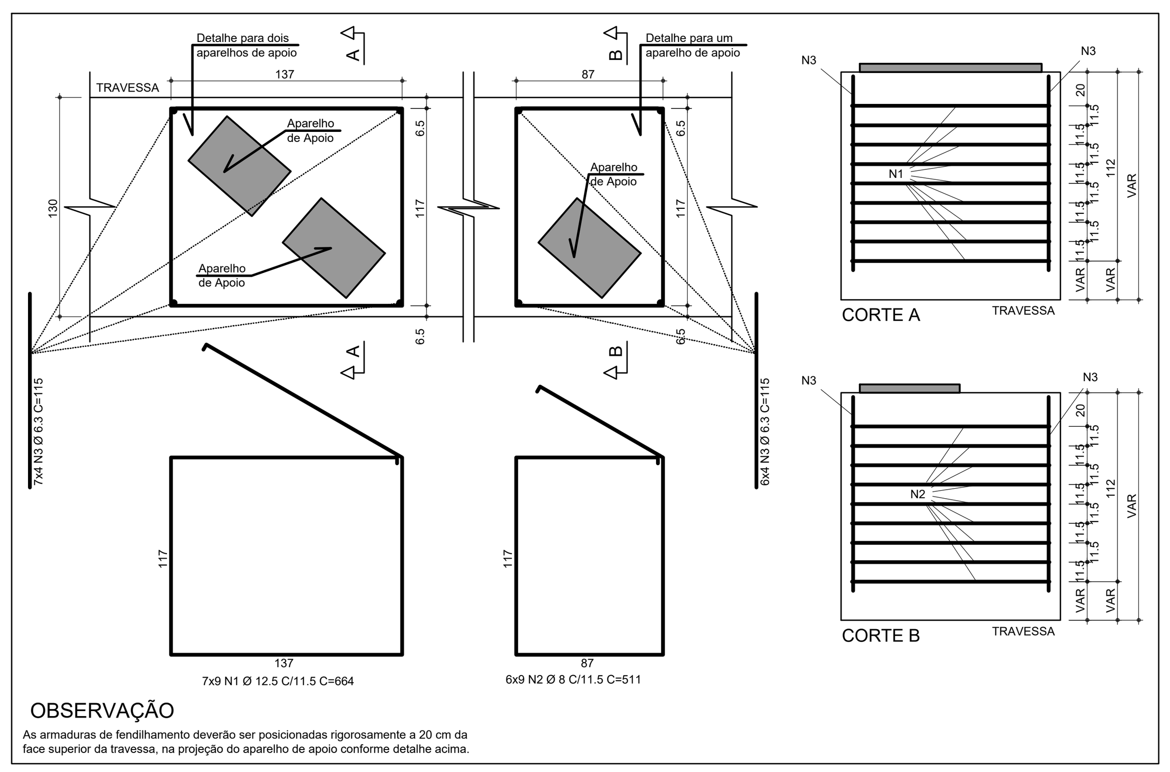
N21FK	446
N21FL	444
N21FM	442
N21FN	440
N21FO	438
N21FP	437
N21FQ	435
N21FR	433

DETALHAMENTO DA TRAVESSA 2
ESC.:1:50/1:25

DADOS DO PROJETO:
- CLASSE DE AGRESSIVIDADE AMBIENTAL II
- CONSUMO DE CIMENTO ≥ 280Kg/m³
- FATOR ÁGUA/CIMENTO ≤ 0,55
- VIDA UTIL DO PROJETO (VUP) DE 50 ANOS
- fcj = 35 MPa
- MÓDULOS DE ELASTICIDADE:
  PARA fck = 30 MPa   Ecs = 26.8 GPa
  PARA fck = 35 MPa   Ecs = 29.4 GPa
  PARA fck = 45 MPa   Ecs = 34.3 GPa

CONSOLE C3
TRAVESSA 2
ESC.:1:35





DETALHE FENDILHAMENTO TRAVESSA 2
ESC.1:25

DETALHES DE FORMAS

CONVENÇÕES

PILAR QUE NASCE NESTE PAVIMENTO
PILAR QUE PASSA PELO PAVIMENTO
PILAR QUE MORRE NESTE PAVIMENTO
PILAR QUE MUDA DE SEÇÃO NESTE PAVIMENTO

COBRIMENTOS

ARMADURAS PASSIVAS (CA50 E CA60):				ARMADURAS ATIVAS (CP-190 RB):	
PILARES:	2,5 cm	Pilares em contato com solo:	4,0 cm	VIGAS:	3,0 cm
VIGAS:	2,5 cm	Vigas/Lajes em contato com solo:	2,5 cm	LAJES:	2,5 cm
LAJES:	2,0 cm	FUNDAÇÕES:	5,0 cm		

ATENÇÃO:
DEVE SER ADOTADO CONTROLE RIGOROSO DE QUALIDADE E RÍGIDOS LIMITES DE TOLERÂNCIA DA VARIABILIDADE DAS MEDIDAS DURANTE A EXECUÇÃO.

TREM TIPO: CLASSE 45

CONCRETO

ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)	ELEMENTO	fck (MPa)
GUARDA RODAS	30	PILARES	45	TRANSVERSINAS	45
ESTACAS	30	TRAVESSAS	45	LONGARINAS	45
BLOCOS 2 e 3	30	ALAS	45	LAJES PRE-MOLDADAS	45
BLOCOS 1 e 4	45	LAJES DE APROXIMAÇÃO	45	LAJES "IN-LOCO"	45

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-

CONFERIDO | APROVADO | VISTO

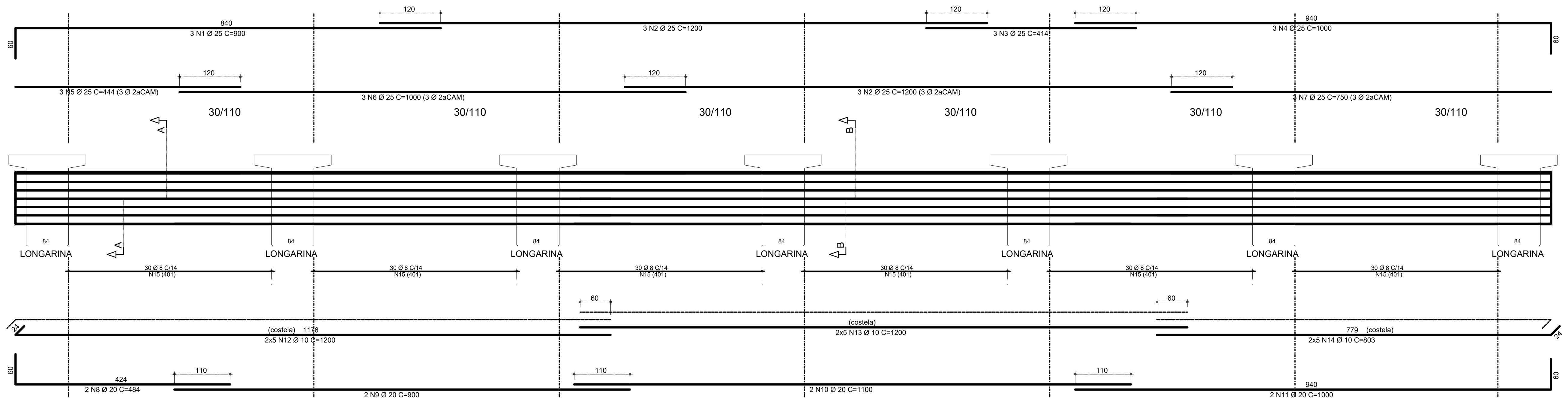
DER DF

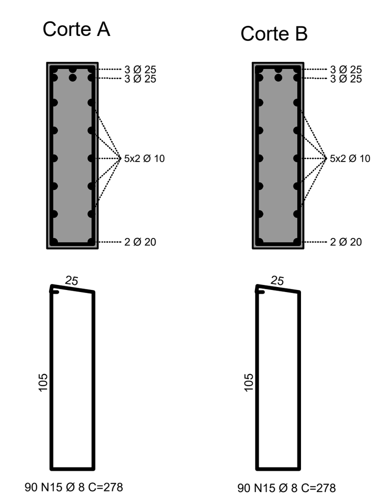
TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

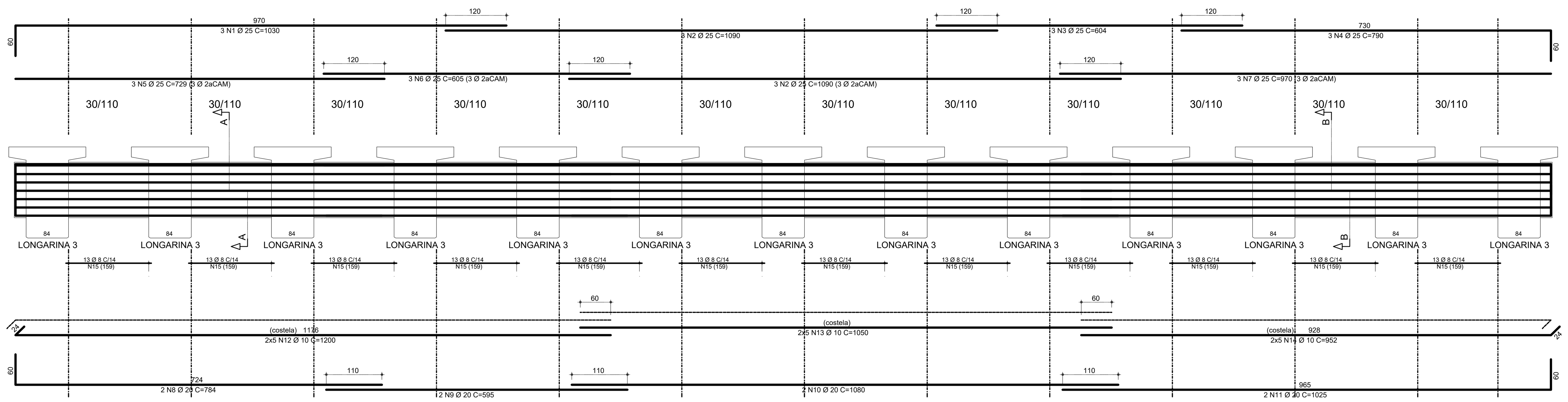
ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: 1:75	TRECHO/SUBTRECHO: DETALHAMENTO DA TRAVESSA 2	COORD.: HERMES BUENO
FOLHA: 26/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-026-R00	DATA: JANEIRO/2022

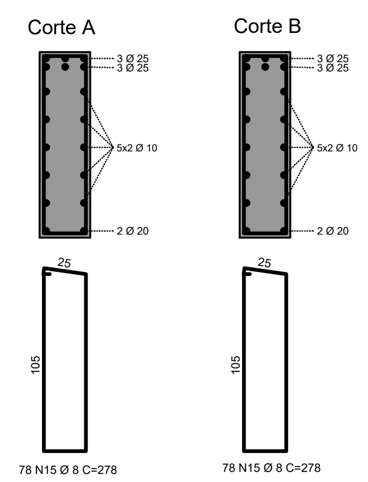
TRANSVERSINA 1 até TRANSVERSINA 4



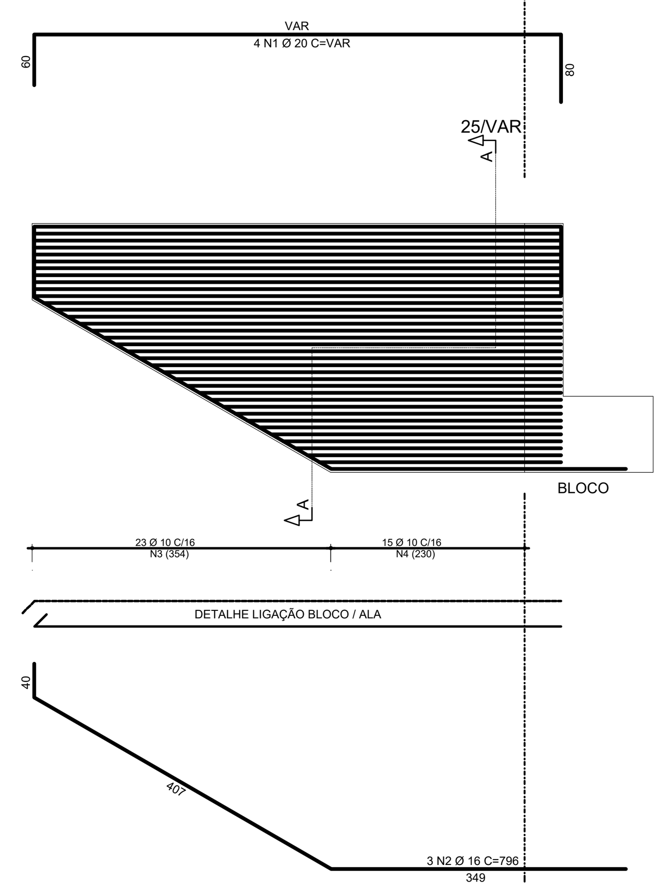


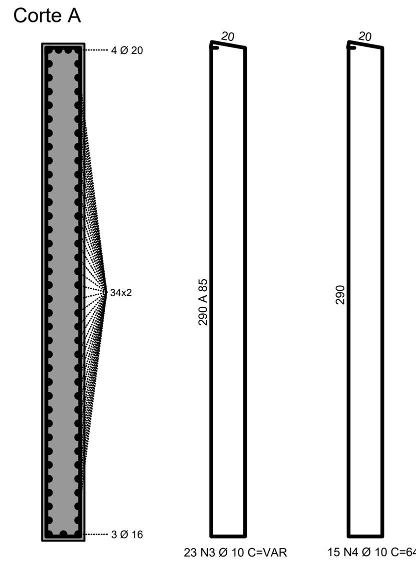
TRANSVERSINA 5 = TRANSVERSINA 6





ALA 1 = ALA 4





4 N1 Ø 20 C/5

N1A	770
N1B	776
N1C	782
N1D	788

23 N3 Ø 10 C/16

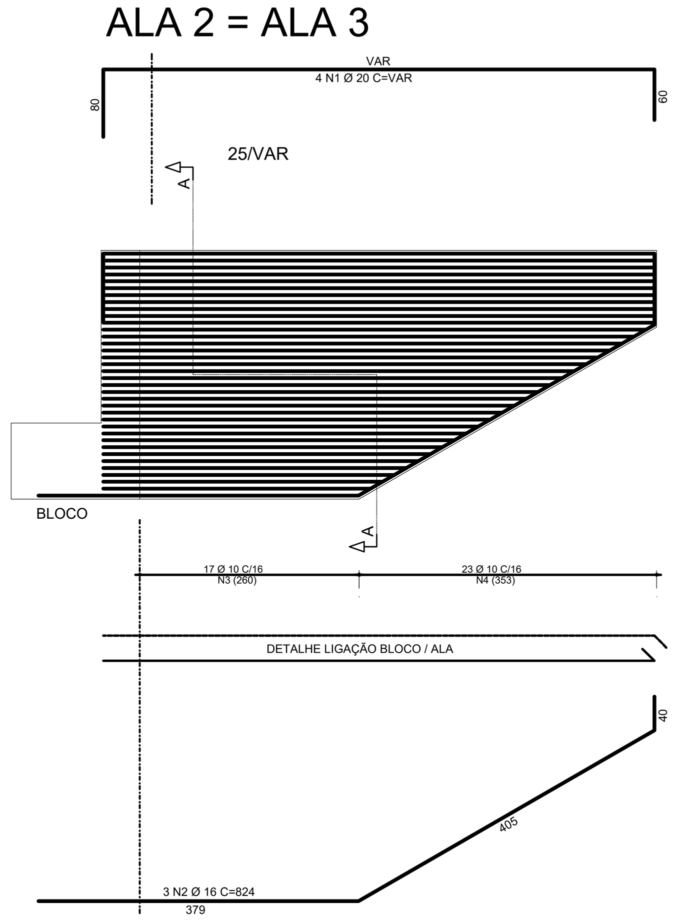
N3A	634
N3B	616
N3C	598
N3D	580
N3E	563
N3F	545
N3G	527
N3H	509
N3I	491
N3J	474
N3K	456
N3L	438
N3M	420
N3N	402
N3O	384
N3P	367
N3Q	349
N3R	331
N3S	313
N3T	295
N3U	277
N3V	260
N3W	242

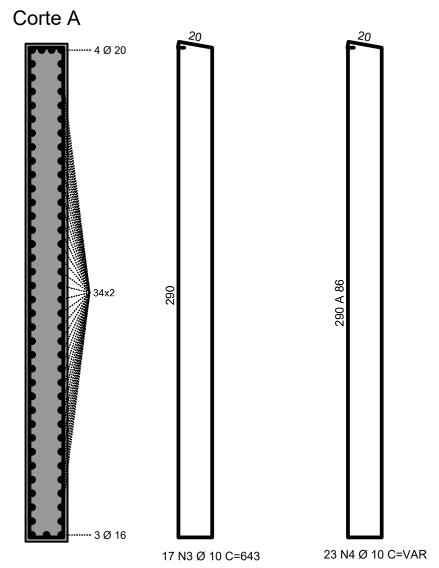
AÇO	POS	BIT (mm)	QUANT	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
GUARDA RODAS					
50A	1	10	1178	211	248558
50A	2	10	1178	184	216752
50A	3	6.3	24	-CORR-	219912
50A	4	10	343	246	84378
50A	5	10	589	187	110143
50A	6	10	246	256	62976
50A	7	6.3	12	-CORR-	64140
50A	8	6.3	12	-CORR-	45816
LIGAÇÕES BLOCO - ALA (X2)					
50A	1	16	68	--VAR-	48172
50A	2	16	68	--VAR-	49746
50A	3	10	68	--VAR-	45258
50A	4	10	68	--VAR-	43752
ALA 1 = ALA 4 (X2)					
50A	1	20	8	--VAR-	6232
50A	2	16	6	796	4776
50A	3	10	46	--VAR-	20187
50A	4	10	30	643	19290
ALA 2 = ALA 3 (X2)					
50A	1	20	8	--VAR-	6232
50A	2	16	6	824	4944
50A	3	10	34	643	21862
50A	4	10	46	--VAR-	20187
TRANSVERSINA 1 até TRANSVERSINA 4 (X4)					
50A	1	25	12	900	10800
50A	2	25	24	1200	28800
50A	3	25	12	414	4968
50A	4	25	12	1000	12000
50A	5	25	12	444	5328
50A	6	25	12	1000	12000
50A	7	25	12	750	9000
50A	8	20	8	484	3872
50A	9	20	8	900	7200
50A	10	20	8	1100	8800
50A	11	20	8	1000	8000
50A	12	10	40	1200	48000
50A	13	10	40	1200	48000
50A	14	10	40	803	32120
50A	15	8	720	278	200160
TRANSVERSINA 5 = TRANSVERSINA 6 (X2)					
50A	1	25	6	1030	6180
50A	2	25	12	1090	13080
50A	3	25	6	604	3624
50A	4	25	6	790	4740
50A	5	25	6	729	4374
50A	6	25	6	605	3630
50A	7	25	6	970	5820
50A	8	20	4	784	3136
50A	9	20	4	595	2380
50A	10	20	4	1080	4320
50A	11	20	4	1025	4100
50A	12	10	20	1200	24000
50A	13	10	20	1050	21000
50A	14	10	20	952	19040
50A	15	8	312	278	86736

RESUMO DE AÇO

AÇO	BIT (mm)	COMPR (m)	PESO (kgf)
50A	6.3	3299	808
50A	8	2869	1132
50A	10	10855	6693
50A	16	1076	1699
50A	20	543	1338
50A	25	1243	4791
Peso Total	50A =		16462 kgf

ALA 2 = ALA 3





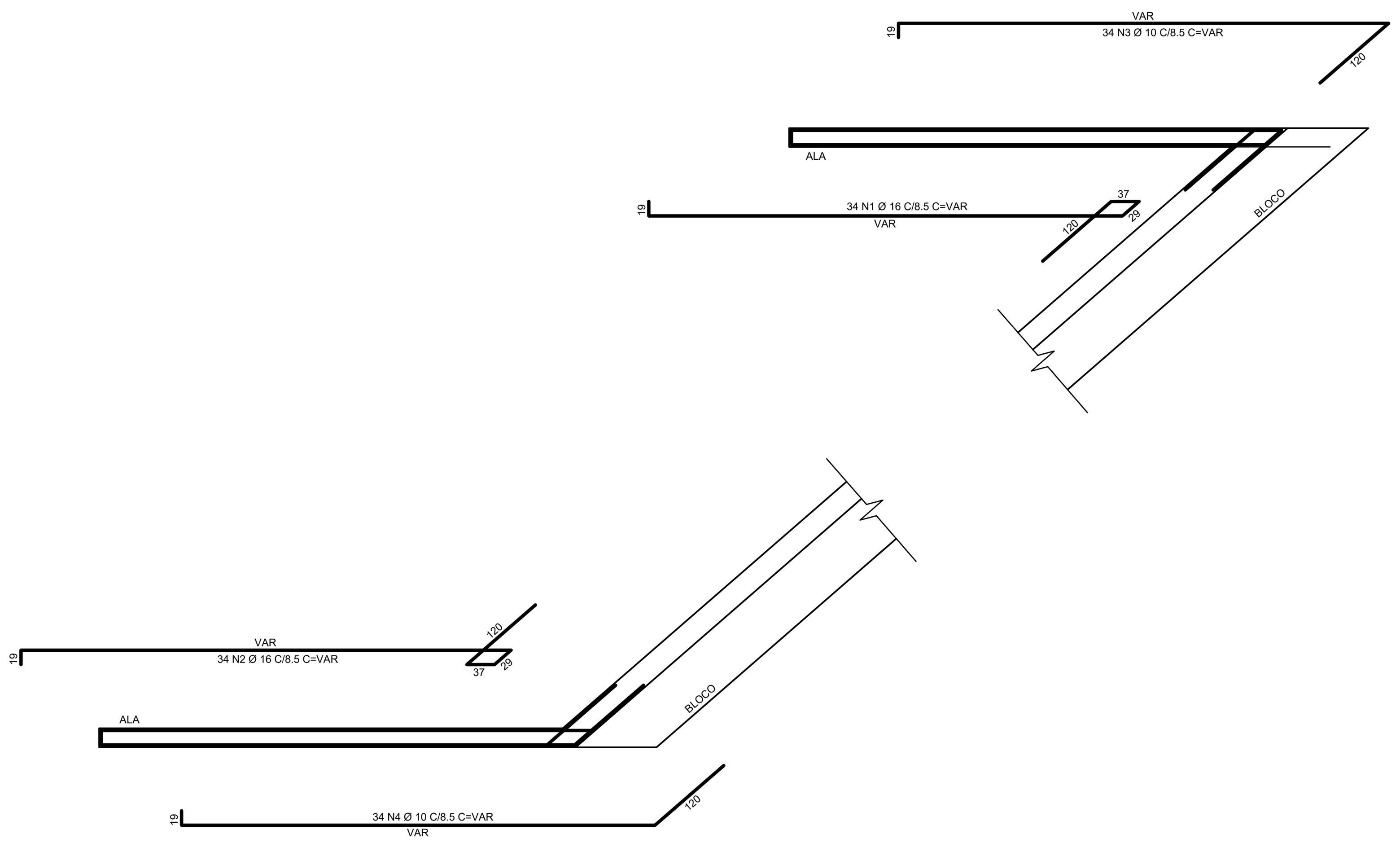
4 N1 Ø 20 C/5

N1A	788
N1B	782
N1C	776
N1D	770

23 N4 Ø 10 C/16

N4A	634
N4B	616
N4C	599
N4D	581
N4E	563
N4F	545
N4G	528
N4H	510
N4I	492
N4J	474
N4K	457
N4L	439
N4M	421
N4N	403
N4O	386
N4P	368
N4Q	350
N4R	332
N4S	315
N4T	297
N4U	279
N4V	261
N4W	244

DETALHAMENTO DAS VIGAS
ESC.:1:75



LIGAÇÕES BLOCO - ALA 2X
ESC.:1:75

34 N1 Ø 16 C/8.5

N1A	489
N1B	503
N1C	518
N1D	533
N1E	548
N1F	562
N1G	577
N1H	592
N1I	606
N1J	621
N1K	636
N1L	651
N1M	665
N1N	680
N1O	695
N1P	710
N1Q	724
N1R	739
N1S	754
N1T	768
N1U	783
N1V	798
N1W	813
N1X	827
N1Y	830
N1Z	830
N1AA	830
N1AB	830
N1AC	830
N1AD	830
N1AE	830
N1AF	830
N1AG	830
N1AH	830

34 N3 Ø 10 C/8.5

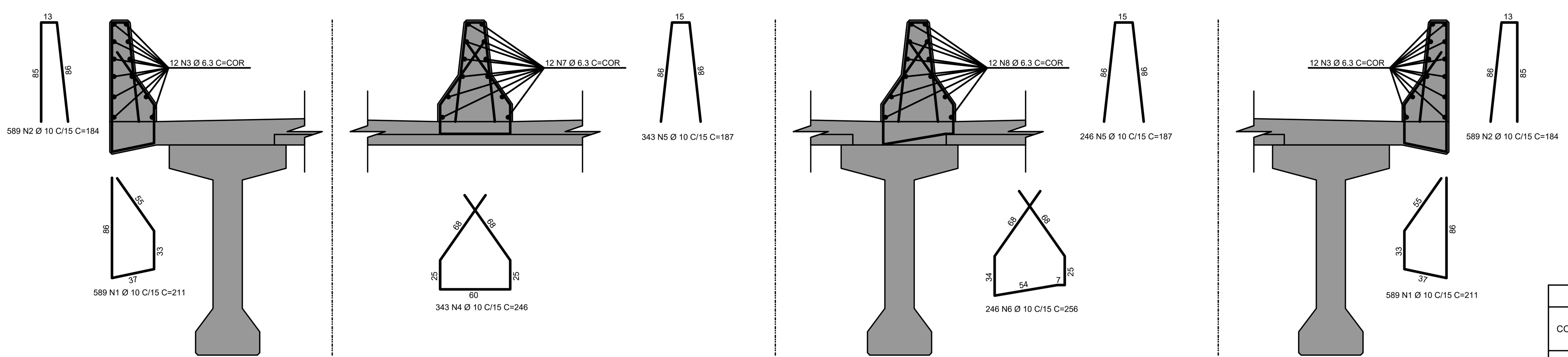
N3A	445
N3B	460
N3C	475
N3D	489
N3E	504
N3F	519
N3G	534
N3H	548
N3I	563
N3J	578
N3K	593
N3L	607
N3M	622
N3N	637
N3O	651
N3P	666
N3Q	681
N3R	696
N3S	710
N3T	725
N3U	740
N3V	754
N3W	769
N3X	784
N3Y	787
N3Z	787
N3AA	787
N3AB	787
N3AC	787
N3AD	787
N3AE	787
N3AF	787
N3AG	787
N3AH	787

34 N2 Ø 16 C/8.5

N2A	512
N2B	527
N2C	541
N2D	556
N2E	571
N2F	586
N2G	600
N2H	615
N2I	630
N2J	644
N2K	659
N2L	674
N2M	689
N2N	703
N2O	718
N2P	733
N2Q	747
N2R	762
N2S	777
N2T	792
N2U	806
N2V	821
N2W	836
N2X	851
N2Y	852
N2Z	852
N2AA	852
N2AB	852
N2AC	852
N2AD	852
N2AE	852
N2AF	852
N2AG	852
N2AH	852

34 N4 Ø 10 C/8.5

N4A	424
N4B	439
N4C	453
N4D	468
N4E	483
N4F	498
N4G	512
N4H	527
N4I	542
N4J	556
N4K	571
N4L	586
N4M	601
N4N	615
N4O	630
N4P	645
N4Q	659
N4R	674
N4S	689
N4T	704
N4U	718
N4V	733
N4W	748
N4X	763
N4Y	764
N4Z	764
N4AA	764
N4AB	764
N4AC	764
N4AD	764
N4AE	764
N4AF	764
N4AG	764
N4AH	764



GUARDA RODAS
ESC.1:50

FUNÇÃO	NOME	CREA/CAU	ASSINATURA
COORDENAÇÃO/EXECUÇÃO	PAULO CAVALCANTI	CAU A80095-3	
COORDENAÇÃO/EXECUÇÃO	ANA CECÍLIA PARISI	CAU A80096-1	
EXECUÇÃO	THIAGO NOVAIS	CREA 147.293/D-MG	
RESP. PROJETO	HÉRBIO H. LOPES	CREA 20918/D-GO	
RESP. PROJETO	HERMES B. PROCÓPIO	CREA 12206/D-GO	

Nº	DISCRIMINAÇÃO DAS REVISÕES	DATA
01	-	-
02	-	-
03	-	-
04	-	-
05	-	-
06	-	-
CONFERIDO	APROVADO	VISTO

DER DF

TÍTULO/ESPECIFICAÇÃO DO DOCUMENTO
PROJETOS BÁSICO E EXECUTIVO DE ENGENHARIA DO SISTEMA VIÁRIO DE ACESSO AO SHCNW VIA STN E TERMINAL ASA NORTE

AeT Arquitetura Planejamento e Transportes Ltda.

ETAPA DE PROJETO: EXECUTIVO	LOCAL: BRASÍLIA	PROJETO: HERMES BUENO
ESCALA: INDICADAS	TRECHO/SUBTRECHO: DETALHAMENTO DAS VIGAS TABULEIRO	COORD.: HERMES BUENO
FOLHA: 27/27	ESPECIALIDADE/SUBESPECIALIDADE: PROJETO ESTRUTURAL DE OBRA DE ARTE ESPECIAL	CÁLCULO: HÉRBIO LOPES
REVISÃO: 00	CÓDIGO: 2101-VIG-EX-027-R00	DATA: JANEIRO/2022

22 Anotações de Responsabilidade Técnica – ARTs

CAU/BR Conselho de Arquitetura e Urbanismo do Brasil

Registro de Responsabilidade Técnica - RRT

RRT 10521574

Verificar Autenticidade

1. RESPONSÁVEL TÉCNICO

Nome Civil/Social: PAULO CAVALCANTI DE ALBUQUERQUE
Título Profissional: Arquiteto(a) e Urbanista

CPF: 357.XXX.XXX-34
Nº do Registro: 000A800953

1.1 Empresa Contratada

Razão Social: AeT Arquitetura, Planejamento e Transportes Ltda.

CNPJ: 01.XXX.XXX/0001-50
Nº Registro: PJ17703-2

2. DETALHES DO RRT

Nº do RRT: SI10521574R01CT001
Data de Cadastro: 01/02/2022
Data de Registro: 01/02/2022
Tipologia: Público

Modalidade: RRT SIMPLES
Forma de Registro: RETIFICADOR
Forma de Participação: EQUIPE

2.1 Valor do RRT

DOCUMENTO ISENTO DE PAGAMENTO

2.2 Equipe Técnica

Nome Civil/Social	CPF	RRT Vinculado
ANA CECILIA PARISI	308.XXX.XXX-15	

3. DADOS DO SERVIÇO/CONTRATANTE

3.1 Serviço 001

Contratante: DEPARTAMENTO DE ESTRADAS DE RODAGEM DO DISTRITO FEDERAL
Tipo: Pessoa jurídica de direito privado
Valor do Serviço/Honorários: R$372.635,45

CPF/CNPJ: 00.XXX.XXX/0001-03
Data de Início: 18/02/2021
Data de Previsão de Término: 20/02/2022

3.1.1 Dados da Obra/Serviço Técnico

CEP: 70620030
Logradouro: SAM
Bairro: SETORES COMPLEMENTARES
UF: DF

Nº: BLOCO C
Complemento: ED. SEDE DO DER/DF
Cidade: BRASÍLIA
Longitude:

Latitude:

3.1.2 Descrição da Obra/Serviço Técnico

Elaboração de Projetos Básico e Executivo de Engenharia, destinados à Implantação e Adequação do Sistema Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rodovia DF-003 (EPIA – Estrada Parque Industria e Abastecimento) e o acesso/interligação do Sistema com o TAN – Terminal Asa Norte/BRT Norte, conforme todos os anexos do edital de Tomada de Preços Nº 006/2020 do Departamento de Estradas de Rodagem do Distrito Federal - DER/DF

3.1.3 Declaração de Acessibilidade

Declaro o atendimento às regras de acessibilidade previstas em legislação e em normas técnicas pertinentes para as

Paulo Cavalcanti de Albuquerque
CAU A80095-3

edificações abertas ao público, de uso público ou privativas de uso coletivo, conforme § 1º do art. 56 da Lei nº 13146, de 06 de julho de 2015.

3.1.4 Dados da Atividade Técnica

Grupo: PROJETO Atividade: 1.8.1 - Levantamento cadastral	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.8.8 - Projeto especializado de tráfego e trânsito de veículos e sistemas de estacionamento	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.8.7 - Projeto de sistema viário e acessibilidade	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.9.1 - Projeto de movimentação de terra, drenagem e pavimentação	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.9.4 - Projeto de sinalização viária	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.6.3 - Projeto de arquitetura paisagística	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.7.3 - Orçamento	Quantidade: 280 Unidade: metro quadrado

4. RRT VINCULADO POR FORMA DE REGISTRO

Nº do RRT	Contratante	Forma de Registro	Data de Registro
SI10521574I00CT001	DEPARTAMENTO DE ESTRADAS DE RODAGEM DO DISTRITO FEDERAL	INICIAL	02/03/2021
SI10521574R01CT001	**DEPARTAMENTO DE ESTRADAS DE RODAGEM DO DISTRITO FEDERAL**	**RETIFICADOR**	**01/02/2022**

5. DECLARAÇÃO DE VERACIDADE

Declaro para os devidos fins de direitos e obrigações, sob as penas previstas na legislação vigente, que as informações cadastradas neste RRT são verdadeiras e de minha responsabilidade técnica e civil.

6. ASSINATURA ELETRÔNICA

Documento assinado eletronicamente por meio do SICCAU do arquiteto(a) e urbanista PAULO CAVALCANTI DE ALBUQUERQUE, registro CAU nº 000A800953, na data e hora: 01/02/2022 12:24:51, com o uso de login e de senha. O **CPF/CNPJ** está oculto visando proteger os direitos fundamentais de liberdade, privacidade e o livre desenvolvimento da personalidade da pessoa natural **(LGPD)**
A autenticidade deste RRT pode ser verificada em: https://siccau.caubr.gov.br/app/view/sight/externo?form=Servicos, ou via QRCode.

Paulo Cavalcanti de Albuquerque
CAU A80095-3

Fauzi Nacfur Junior
Diretor Geral

Anotação de Responsabilidade Técnica - ART
Lei n° 6.496, de 7 de dezembro de 1977

CREA-DF

ART Obra ou serviço
0720210014471

Conselho Regional de Engenharia e Agronomia do Distrito Federal

1. Responsável Técnico

THIAGO PEIXOTO NOVAIS

Título profissional: **Engenheiro Civil** RNP: **1410401294**
Registro: **147293/D-MG**

Empresa contratada: **VOLAR ENGENHARIA LTDA** Registro: **14457-DF**

2. Dados do Contrato

Contratante: **AET ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA - EPP**			CPF/CNPJ: **01.136.983/0001-50**
SEPS 705/905	Número: 135	Bairro: Asa Sul	CEP: 70390-055
Cidade: Brasília	UF: DF	Complemento:	
E-Mail: pcavalbuq@gmail.com		Fone: (61)32420564	
Contrato:		Celebrado em: 18/02/2021	Valor Obra/Serviço R$: 36.000,00
Vinculada a ART:		Tipo de contratante: Pessoa Jurídica de Direito Privado	
Ação institucional: Nenhuma/Não Aplicável			

3. Dados da Obra/Serviço

SAM Bloco C	Número: 133	Bairro: Setores Complementares	CEP: 70620-030
Cidade: Brasília	UF: DF	Complemento:	
Data de Inicio: 18/02/2021	Previsão término: 18/07/2021	Coordenadas Geográficas: ,	
Finalidade: **Infra-estrutura**		Código/Obra pública:	
Proprietário: **Departamento de Estradas de Rodagem do Distrito Federal DER**		CPF/CNPJ: **00.070.532/0001-03**	
E-Mail: sutec@der.df.gov.br		Fone: (61) 31115500	

4. Atividade Técnica

Realização	**Quantidade**	**Unidade**
Projeto Estudos geotécnicos	180,0000	homem hora
Projeto Executivo Fundações Estaca	180,0000	homem hora
Projeto Pavimentacao asfáltica	180,0000	homem hora
Projeto Movimento de Terra Terraplanagem	180,0000	homem hora
Execução Levantamento topográfico Planialtimétrico	180,0000	homem hora
Orçamento Sistema Viário	180,0000	homem hora
Projeto Executivo Drenagem	180,0000	homem hora
Projeto Viadutos	180,0000	homem hora
Estudo de Viabilidade Ambiental Qualidade ambiental	180,0000	homem hora
Projeto Sinalização	180,0000	homem hora
Projeto Executivo Projeto Geométrico	180,0000	homem hora

Após a conclusão das atividades técnicas o profissional deverá proceder a baixa desta ART

5. Observações

Elab. de Proj. Básico e Exec. de Eng., dest. à Impl. e Adequação do Sist.Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rod.DF-003 (EPIA – Estr. Parque Industria e Abast.) e o acesso/interligação do Sist. com o TAN – Terminal Asa Norte/BRT Norte.

6. Declarações

Qualquer conflito ou litígio originado do presente contrato, bem como sua interpretação ou execução, será resolvido por arbitragem, de acordo com a Lei nº 9.307, de 23 de setembro de 1996, nos termos do respectivo regulamento de arbitragem que, expressamente, as partes declaram concordar.

THIAGO PEIXOTO NOVAIS:10154861693 Assinado de forma digital por THIAGO PEIXOTO NOVAIS:10154861693 Dados: 2022.02.02 11:20:15 -03'00'

Profissional

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Dados: 2022.02.02 11:26:38 -03'00'

Contratante

Acessibilidade: Sim: Declaro atendimento às regras de acessibilidade, previstas nas normas técnicas da ABNT e no Decreto nº 5.296, de 2 de dezembro de 2004.

7. Entidade de Classe

SENGE-DF

8. Assinaturas

Declaro serem verdadeiras as informações acima

_______________, ____ de __________ de _____
Local Data

THIAGO PEIXOTO NOVAIS:10154861693 Assinado de forma digital por THIAGO PEIXOTO NOVAIS:10154861693 Dados: 2022.02.02 11:20:29 -03'00'

THIAGO PEIXOTO NOVAIS - CPF: 101.548.616-93

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Dados: 2022.02.02 11:27:11 -03'00'

AET ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA - EPP - CPF/CNPJ: 01.136.983/0001-50

9. Informações

- A ART é válida somente quando quitada, mediante apresentação do comprovante de pagamento ou conferência no site do Crea.
- A autenticidade deste documento pode ser verificada no site: www.creadf.org.br
- A guarda da via assinada da ART será de responsabilidade do profissional e do contratante com o objetivo de documentar o vínculo contratual.

www.creadf.org.br
informacao@creadf.org.br
Tel: (61) 3961-2800 Fax:

Valor da ART: R$ 233.94 Registrada em: 01/03/2021 Valor Pago: R$ 233,94 Nosso Número/Baixa: 0121012754

Anotação de Responsabilidade Técnica - ART
Lei n° 6.496, de 7 de dezembro de 1977

CREA-DF

ART Obra ou serviço
0720210014472

Conselho Regional de Engenharia e Agronomia do Distrito Federal

1. Responsável Técnico

RENATO GRILLO ELY

Título profissional: **Engenheiro Civil**

RNP: **2204789143**
Registro: **13611/D-RS**

2. Dados do Contrato

Contratante: **AeT ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA-EPP** CPF/CNPJ: **01.136.983/0001-50**

SEPS 705/905 Número: 135 Bairro: Asa Sul CEP: 70390-055

Cidade: Brasília UF: DF Complemento: Bloco A Ed. Santa Cruz

E-Mail: pcavalbuq@gmail.com Fone: (61)32420564

Contrato: Celebrado em: 18/02/2021 Valor Obra/Serviço R$: 42.000,00

Vinculada a ART: Tipo de contratante: Pessoa Jurídica de Direito Privado

Ação institucional: Nenhuma/Não Aplicável

3. Dados da Obra/Serviço

SAM Bloco C Número: 133 Bairro: Setores Complementares CEP: 70620-030

Cidade: Brasília UF: DF Complemento:

Data de Inicio: 18/02/2021 Previsão término: 18/07/2021 Coordenadas Geográficas: ,

Finalidade: **Infra-estrutura** Código/Obra pública: 710.390-055

Proprietário: **Departamento de Estradas de Rodagem do Distrito Federal DER** CPF/CNPJ: **00.070.532/0001-03**

E-Mail: sutec@der.df.gov.br Fone: (61) 31115500

4. Atividade Técnica

Coordenação	**Quantidade**	**Unidade**
Projeto Movimento de Terra Terraplanagem	280,0000	homem hora
Projeto Sinalização	280,0000	homem hora
Execução Estudos geotécnicos	280,0000	homem hora
Projeto Pavimentacao asfáltica	280,0000	homem hora
Estudo de Viabilidade Ambiental Qualidade ambiental	280,0000	homem hora
Projeto Fundações Estaca	280,0000	homem hora
Projeto Estrutura Concreto Protendido	280,0000	homem hora
Execução Levantamento topográfico Planialtimétrico	280,0000	homem hora
Projeto Geométrico	280,0000	homem hora
Realização	**Quantidade**	**Unidade**
Projeto Executivo Drenagem	280,0000	homem hora
Orçamento Sistema Viário	280,0000	homem hora

Após a conclusão das atividades técnicas o profissional deverá proceder a baixa desta ART

5. Observações

Elab. de Proj. Básico e Exec. de Eng., dest. à Impl. e Adequação do Sist.Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rod.DF-003 (EPIA – Estr. Parque Industria e Abast.) e o acesso/interligação do Sist. com o TAN – Terminal Asa Norte/BRT Norte.

6. Declarações

Qualquer conflito ou litígio originado do presente contrato, bem como sua interpretação ou execução, será resolvido por arbitragem, de acordo com a Lei nº 9.307, de 23 de setembro de 1996, nos termos do respectivo regulamento de arbitragem que, expressamente, as partes declaram concordar.

RENATO GRILLO ELY:27878945004 Assinado de forma digital por RENATO GRILLO ELY:27878945004 Dados: 2022.02.02 11:19:26 -03'00'

Profissional

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Dados: 2022.02.02 11:24:28 -03'00'

Contratante

Acessibilidade: Sim: Declaro atendimento às regras de acessibilidade, previstas nas normas técnicas da ABNT e no Decreto nº 5.296, de 2 de dezembro de 2004.

7. Entidade de Classe

NENHUMA

8. Assinaturas

Declaro serem verdadeiras as informações acima

_______________, ____ de __________ de _____
Local Data

RENATO GRILLO ELY:27878945004 Assinado de forma digital por RENATO GRILLO ELY:27878945004 Dados: 2022.02.02 11:19:49 -03'00'

RENATO GRILLO ELY - CPF: 278.789.450-04

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434 Dados: 2022.02.02 11:26:00 -03'00'

AeT ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA-EPP - CPF/CNPJ: 01.136.983/0001-50

9. Informações

- A ART é válida somente quando quitada, mediante apresentação do comprovante de pagamento ou conferência no site do Crea.
- A autenticidade deste documento pode ser verificada no site: www.creadf.org.br
- A guarda da via assinada da ART será de responsabilidade do profissional e do contratante com o objetivo de documentar o vínculo contratual.

www.creadf.org.br
informacao@creadf.org.br
Tel: (61) 3961-2800 Fax:

Valor da ART: R$ 233.94 Registrada em: 01/03/2021 Valor Pago: R$ 233,94 Nosso Número/Baixa: 0121012756

CAU/BR Conselho de Arquitetura e Urbanismo do Brasil

Registro de Responsabilidade Técnica - RRT

RRT 10521811

Verificar Autenticidade

1. RESPONSÁVEL TÉCNICO

Nome Civil/Social: ANA CECILIA PARISI

Título Profissional: Arquiteto(a) e Urbanista

CPF: 308.XXX.XXX-15

Nº do Registro: 000A800961

1.1 Empresa Contratada

Razão Social: AeT Arquitetura, Planejamento e Transportes Ltda.

CNPJ: 01.XXX.XXX/0001-50

Nº Registro: PJ17703-2

2. DETALHES DO RRT

Nº do RRT: SI10521811R01CT001

Data de Cadastro: 01/02/2022

Data de Registro: 01/02/2022

Tipologia: Público

Modalidade: RRT SIMPLES

Forma de Registro: RETIFICADOR

Forma de Participação: EQUIPE

2.1 Valor do RRT

DOCUMENTO ISENTO DE PAGAMENTO

2.2 Equipe Técnica

Nome Civil/Social	CPF	RRT Vinculado
PAULO CAVALCANTI DE ALBUQUERQUE	357.XXX.XXX-34	

3. DADOS DO SERVIÇO/CONTRATANTE

3.1 Serviço 001

Contratante: Departamento de Estradas de Rodagem do Distrito Federal

Tipo: Órgão Público

Valor do Serviço/Honorários: R$372.635,45

CPF/CNPJ: 00.XXX.XXX/0001-03

Data de Início: 18/02/2021

Data de Previsão de Término: 20/02/2022

3.1.1 Dados da Obra/Serviço Técnico

CEP: 70610600

Logradouro: SAM

Bairro: SETOR DE ADMINISTRACAO MUNICIPAL

UF: DF

Nº: Bloco C

Complemento: Edifício Sede DER/DF

Cidade: BRASÍLIA

Longitude:

Latitude:

3.1.2 Descrição da Obra/Serviço Técnico

Elaboração de Projetos Básico e Executivo de Engenharia, destinados à Implantação e Adequação do Sistema Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rodovia DF-003 (EPIA - Estrada Parque Industria e Abastecimento) e o acesso/interligação do Sistema com o TAN - Terminal Asa Norte/BRT Norte, conforme todos os anexos do edital de Tomada de Preços Nº 006/2020 do Departamento de Estradas de Rodagem do Distrito Federal - DER/DF.

Ana Cecília Parisi
CAU A80096-1

3.1.3 Declaração de Acessibilidade

Declaro o atendimento às regras de acessibilidade previstas em legislação e em normas técnicas pertinentes para as edificações abertas ao público, de uso público ou privativas de uso coletivo, conforme § 1º do art. 56 da Lei nº 13146, de 06 de julho de 2015.

3.1.4 Dados da Atividade Técnica

Grupo: PROJETO Atividade: 1.8.1 - Levantamento cadastral	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.8.8 - Projeto especializado de tráfego e trânsito de veículos e sistemas de estacionamento	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.8.7 - Projeto de sistema viário e acessibilidade	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.9.1 - Projeto de movimentação de terra, drenagem e pavimentação	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.9.4 - Projeto de sinalização viária	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.6.3 - Projeto de arquitetura paisagística	Quantidade: 280 Unidade: hora
Grupo: PROJETO Atividade: 1.7.3 - Orçamento	Quantidade: 280 Unidade: hora

4. RRT VINCULADO POR FORMA DE REGISTRO

Nº do RRT	Contratante	Forma de Registro	Data de Registro
SI10521811I00CT001	Departamento de Estradas de Rodagem do Distrito Federal	INICIAL	02/03/2021
SI10521811R01CT001	**Departamento de Estradas de Rodagem do Distrito Federal**	**RETIFICADOR**	**01/02/2022**

5. DECLARAÇÃO DE VERACIDADE

Declaro para os devidos fins de direitos e obrigações, sob as penas previstas na legislação vigente, que as informações cadastradas neste RRT são verdadeiras e de minha responsabilidade técnica e civil.

6. ASSINATURA ELETRÔNICA

Documento assinado eletronicamente por meio do SICCAU do arquiteto(a) e urbanista ANA CECILIA PARISI, registro CAU nº 000A800961, na data e hora: 01/02/2022 12:07:23, com o uso de login e de senha. O **CPF/CNPJ** está oculto visando proteger os direitos fundamentais de liberdade, privacidade e o livre desenvolvimento da personalidade da pessoa natural **(LGPD)**

A autenticidade deste RRT pode ser verificada em: https://siccau.caubr.gov.br/app/view/sight/externo?form=Servicos, ou via QRCode.

Ana Cecilia Parisi
CAU A80096-1

CAU/BR Conselho de Arquitetura e Urbanismo do Brasil

Registro de Responsabilidade Técnica - RRT

RRT 10526224

Verificar Autenticidade

1. RESPONSÁVEL TÉCNICO

Nome Civil/Social: JORDAN PAULO MEROS

Título Profissional: Arquiteto(a) e Urbanista

CPF: 044.XXX.XXX-12

Nº do Registro: 000A551538

2. DETALHES DO RRT

Nº do RRT: SI10526224R01CT001

Data de Cadastro: 01/02/2022

Data de Registro: 01/02/2022

Tipologia: Público

Modalidade: RRT SIMPLES

Forma de Registro: RETIFICADOR

Forma de Participação: INDIVIDUAL

2.1 Valor do RRT

DOCUMENTO ISENTO DE PAGAMENTO

3. DADOS DO SERVIÇO/CONTRATANTE

3.1 Serviço 001

Contratante: AeT Arquitetura, Planejamento e Transportes Ltda.

Tipo: Pessoa jurídica de direito privado

Valor do Serviço/Honorários: R$34.000,00

CPF/CNPJ: 01.XXX.XXX/0001-50

Data de Início: 18/02/2021

Data de Previsão de Término: 20/02/2022

3.1.1 Dados da Obra/Serviço Técnico

CEP: 70620030

Logradouro: SAM BLOCO C

Bairro: SETORES COMPLEMENTARES

UF: DF

Nº: BLOCO C

Complemento: ED SEDE DO DER DF

Cidade: BRASÍLIA

Longitude:

Latitude:

3.1.2 Descrição da Obra/Serviço Técnico

Elaboração de Projetos Básico e Executivo de Engenharia, destinados à Implantação e Adequação do Sistema Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rodovia DF-003 (EPIA - Estrada Parque Industria e Abastecimento) e o acesso/interligação do Sistema com o TAN - Terminal Asa Norte/BRT Norte, conforme todos os anexos do edital de Tomada de Preços Nº 006/2020 do Departamento de Estradas de Rodagem do Distrito Federal - DER/DF

3.1.3 Declaração de Acessibilidade

Declaro o atendimento às regras de acessibilidade previstas em legislação e em normas técnicas pertinentes para as edificações abertas ao público, de uso público ou privativas de uso coletivo, conforme § 1º do art. 56 da Lei nº 13146, de 06 de julho de 2015.

3.1.4 Dados da Atividade Técnica

Grupo: PROJETO

Atividade: 1.8.1 - Levantamento cadastral

Quantidade: 280

Unidade: hora

Grupo: PROJETO

Atividade: 1.8.8 - Projeto especializado de tráfego e trânsito de veículos e sistemas de estacionamento

Quantidade: 280

Unidade: hora

Grupo: PROJETO	Quantidade: 280
Atividade: 1.8.7 - Projeto de sistema viário e acessibilidade	Unidade: hora
Grupo: PROJETO	Quantidade: 280
Atividade: 1.9.1 - Projeto de movimentação de terra, drenagem e pavimentação	Unidade: hora
Grupo: PROJETO	Quantidade: 280
Atividade: 1.9.4 - Projeto de sinalização viária	Unidade: hora
Grupo: PROJETO	Quantidade: 280
Atividade: 1.6.3 - Projeto de arquitetura paisagística	Unidade: hora
Grupo: PROJETO	Quantidade: 280
Atividade: 1.7.3 - Orçamento	Unidade: hora

4. RRT VINCULADO POR FORMA DE REGISTRO

Nº do RRT	Contratante	Forma de Registro	Data de Registro
SI10526224I00CT001	AeT Arquitetura, Planejamento e Transportes Ltda.	INICIAL	03/03/2021
SI10526224R01CT001	**AeT Arquitetura, Planejamento e Transportes Ltda.**	**RETIFICADOR**	**01/02/2022**

5. DECLARAÇÃO DE VERACIDADE

Declaro para os devidos fins de direitos e obrigações, sob as penas previstas na legislação vigente, que as informações cadastradas neste RRT são verdadeiras e de minha responsabilidade técnica e civil.

6. ASSINATURA ELETRÔNICA

Documento assinado eletronicamente por meio do SICCAU do arquiteto(a) e urbanista JORDAN PAULO MEROS, registro CAU nº 000A551538, na data e hora: 01/02/2022 12:35:11, com o uso de login e de senha. O **CPF/CNPJ** está oculto visando proteger os direitos fundamentais de liberdade, privacidade e o livre desenvolvimento da personalidade da pessoa natural **(LGPD)**

A autenticidade deste RRT pode ser verificada em: https://siccau.caubr.gov.br/app/view/sight/externo?form=Servicos, ou via QRCode.

Paulo Cavalcanti de Albuquerque
CAU A80095-3

Jordan Paulo Meros

Anotação de Responsabilidade Técnica - ART
Lei nº 6.496, de 7 de dezembro de 1977

CREA-MG

ART OBRA / SERVIÇO
Nº MG20220923253

Conselho Regional de Engenharia e Agronomia de Minas Gerais

INICIAL

1. Responsável Técnico

GERALDO AUGUSTO NOVAIS
Título profissional: **ENGENHEIRO CIVIL**
RNP: **1404049916**
Registro: **MG0000030616D MG**

2. Dados do Contrato

Contratante: **AeT Arquitetura Planejamento e Transportes LTDA** CPF/CNPJ: **01.136.983/0001-50**
QUADRA SEPS 705/905 Nº: **135**
Complemento: **Edifício Santa Cruz, Salas 135, 137, 138 e 139** Bairro: **ASA SUL**
Cidade: **BRASÍLIA** UF: **DF** CEP: **70390055**

Contrato: **Não especificado** Celebrado em:
Valor: **R$ 25.000,00** Tipo de contratante: **Pessoa Juridica de Direito Privado**
Ação Institucional: **Outros**

3. Dados da Obra/Serviço

SETOR SAM BLOCO C Nº: **S/N**
Complemento: Bairro: **SETORES COMPLEMENTARES**
Cidade: **BRASÍLIA** UF: **DF** CEP: **70620030**
Data de Início: **01/03/2021** Previsão de término: **30/04/2022** Coordenadas Geográficas: **-15.777153, -47.904260**
Finalidade: **INFRAESTRUTURA** Código: **Não Especificado**
Proprietário: **DEPARTAMENTO DE ESTRADAS DE RODAGEM DO DISTRITO FEDERAL - DER/DF** CPF/CNPJ: **00.070.532/0001-03**

4. Atividade Técnica

14 - Elaboração	Quantidade	Unidade
40 - Estudo > GEOTECNIA E GEOLOGIA DA ENGENHARIA > SONDAGENS > DE SONDAGEM GEOTÉCNICA > #3.2.1.1 - A TRADO	150,00	hh
40 - Estudo > GEOTECNIA E GEOLOGIA DA ENGENHARIA > SONDAGENS > DE SONDAGEM GEOTÉCNICA > #3.2.1.2 - A PERCUSSÃO	150,00	hh
40 - Estudo > MEIO AMBIENTE > GESTÃO AMBIENTAL > #7.6.6 - DE ESTUDOS AMBIENTAIS	150,00	hh
80 - Projeto > GEOTECNIA E GEOLOGIA DA ENGENHARIA > OBRAS DE TERRA > DE OBRAS DE TERRA > #3.3.1.9 - TERRAPLENAGEM	150,00	hh
80 - Projeto > ESTRUTURAS > FUNDAÇÕES > DE FUNDAÇÕES PROFUNDAS > #2.9.2.3 - EM ESTACAS DE CONCRETO MOLDADAS IN LOCO	150,00	hh
80 - Projeto > ESTRUTURAS > OBRAS DE ARTE > #2.6.2 - DE VIADUTOS	150,00	hh
80 - Projeto > TRANSPORTES > INFRAESTRUTURA RODOVIÁRIA > #4.1.2 - DE PAVIMENTAÇÃO ASFÁLTICA PARA RODOVIAS	150,00	hh
80 - Projeto > TRANSPORTES > INFRAESTRUTURA URBANA > DE PAVIMENTAÇÃO > #4.2.1.2 - ASFÁLTICA PARA VIAS URBANAS	150,00	hh
80 - Projeto > OBRAS HIDRÁULICAS E RECURSOS HÍDRICOS > SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > DE SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > #5.3.1.2 - BUEIRO	150,00	hh
80 - Projeto > OBRAS HIDRÁULICAS E RECURSOS HÍDRICOS > SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > DE SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > #5.3.1.5 - DRENO	150,00	hh
80 - Projeto > OBRAS HIDRÁULICAS E RECURSOS HÍDRICOS > SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > DE SISTEMAS DE DRENAGEM PARA OBRAS CIVIS > #5.3.1.7 - MEIO-FIO	150,00	hh
80 - Projeto > TRANSPORTES > INFRAESTRUTURA RODOVIÁRIA > #4.1.5 - DE TRAÇADO VIÁRIO PARA RODOVIAS	150,00	hh
80 - Projeto > TRANSPORTES > INFRAESTRUTURA URBANA > #4.2.2 - DE INFRAESTRUTURA PARA VIAS URBANAS	150,00	hh
80 - Projeto > TRANSPORTES > SINALIZAÇÃO > DE SINALIZAÇÃO > #4.9.1.5 - RODOVIÁRIA	150,00	hh
80 - Projeto > ESTRUTURAS > FUNDAÇÕES > DE FUNDAÇÕES PROFUNDAS > #2.9.2.2 - EM ESTACAS DE CONCRETO PRÉ-MOLDADO	150,00	hh
67 - Levantamento > TOPOGRAFIA > LEVANTAMENTOS TOPOGRÁFICOS BÁSICOS > DE LEVANTAMENTO TOPOGRÁFICO > #33.1.1.3 - PLANIALTIMÉTRICO	150,00	hh
35 - Elaboração de orçamento > TRANSPORTES > INFRAESTRUTURA RODOVIÁRIA > #4.1.3 - DE INFRAESTRUTURA RODOVIÁRIA	150,00	hh
35 - Elaboração de orçamento > TRANSPORTES > INFRAESTRUTURA URBANA > #4.2.2 - DE INFRAESTRUTURA PARA VIAS URBANAS	150,00	hh

Após a conclusão das atividades técnicas o profissional deve proceder a baixa desta ART

5. Observações

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Dados: 2022.02.16 15:59:02 -03'00'

A autenticidade desta ART pode ser verificada em: https://crea-mg.sitac.com.br/publico/, com a chave: D8aYz
Impresso em: 15/02/2022 às 16:00:13 por: , ip: 189.6.27.109

Anotação de Responsabilidade Técnica - ART
Lei nº 6.496, de 7 de dezembro de 1977

CREA-MG

ART OBRA / SERVIÇO
Nº MG20220923253

Conselho Regional de Engenharia e Agronomia de Minas Gerais

INICIAL

Elaboração de projeto básico e executivo de engenharia, destinado a implantação e adequação do sistema viário de acesso à Via STN, e ao Setor Noroeste pela W9 e W7, na Rodovia DF-003 (EPIA), e acesso/interligação com o Terminal Asa Norte (TAN)

6. Declarações

- A Resolução n° 1.094/17 instituiu o Livro de Ordem de obras e serviços que será obrigatório para a emissão de Certidão de Acervo Técnico - CAT aos responsáveis pela execução e fiscalização de obras iniciadas a partir de 1º de janeiro de 2018. (Res. 1.094, Confea) .
- Declaro que estou cumprindo as regras de acessibilidade previstas nas normas técnicas da ABNT, na legislação específica e no decreto n. 5296/2004.
- Cláusula Compromissória: Qualquer conflito ou litígio originado do presente contrato, bem como sua interpretação ou execução, será resolvido por arbitragem, de acordo com a Lei no. 9.307, de 23 de setembro de 1996, por meio do Centro de Mediação e Arbitragem - CMA vinculado ao Crea-MG, nos termos do respectivo regulamento de arbitragem que, expressamente, as partes declaram concordar

7. Entidade de Classe

- SEM INDICAÇÃO DE ENTIDADE DE CLASSE

8. Assinaturas

Declaro serem verdadeiras as informações acima

Brasília, 16 de fevereiro de 2022
Local data

GERALDO AUGUSTO NOVAIS:27445682600
Assinado de forma digital por GERALDO AUGUSTO NOVAIS:27445682600
Dados: 2022.02.16 15:11:15 -03'00'

GERALDO AUGUSTO NOVAIS - CPF: 274.456.826-00

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Dados: 2022.02.16 15:59:39 -03'00'

AeT Arquitetura Planejamento e Transportes LTDA - CNPJ: 01.136.983/0001-50

9. Informações

* A ART é válida somente quando quitada, mediante apresentação do comprovante do pagamento ou conferência no site do Crea.
* O comprovante de pagamento deverá ser apensado para comprovação de quitação

10. Valor

Valor da ART: **R$ 233,94** Registrada em: **15/02/2022** Valor pago: **R$ 219,91** Nosso Número: **8597634182**

Anotação de Responsabilidade Técnica - ART
Lei nº 6.496, de 7 de dezembro de 1977

CREA-GO

ART Obra ou serviço
1020210048903

Conselho Regional de Engenharia e Agronomia de Goiás

1. Responsável Técnico

HERMES BUENO PROCOPIO — RNP: **1000142213**
Título profissional: **Engenheiro Civil** — Registro: **12206/D-GO**

2. Dados do Contrato

Contratante: **AET ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA - EPP** — CPF/CNPJ: **01.136.983/0001-50**
Quadra 705/905, Nº 135 — Bairro: Asa Sul — CEP: 70390-055
Quadra - Lote - — Complemento: — Cidade: Brasília-DF
E-Mail: — Fone: (61)3242-0564
Contrato: 0 — Celebrado em: 18/02/2021 — Valor Obra/Serviço R$: 26.000,00
Tipo de contratante: Pessoa Jurídica de Direito Privado
Ação institucional: Nenhuma/Não Aplicável

3. Dados da Obra/Serviço

Bloco Bloco C, Nº 133 — Bairro: Setores Complementares — CEP: 70620-030
Quadra - Lote - — Complemento: — Cidade: Brasília-DF
Data de Início: 18/02/2021 — Previsão término: 18/07/2021 — Coordenadas Geográficas: -14.2651632,-43.3538596
Finalidade: **Infra-estrutura**
Proprietário: **Departamento de Estradas de Rodagem do Distrito Federal DER** — CPF/CNPJ: **00.070.532/0001-03**
E-Mail: — Fone: (61) 3111-5500 — Tipo de proprietário: Pessoa Jurídica de Direito Público

4. Atividade Técnica

	Quantidade	Unidade
ATUACAO		
PROJETO MURO DE CONTENCAO	180,00	HOMENS-HORA

O registro da A.R.T. não obriga ao CREA-GO a emitir a Certidão de Acervo Técnico (C.A.T.), a confecção e emissão do documento apenas ocorrerá se as atividades declaradas na A.R.T. forem condizentes com as atribuições do Profissional. As informações constantes desta ART são de responsabilidade do(a) profissional. Este documento poderá, a qualquer tempo, ter seus dados, preenchimento e atribuições profissionais conferidos pelo CREA-GO.
Após a conclusão das atividades técnicas o profissional deverá proceder a baixa desta ART

5. Observações

Elaboração de Projeto Básico e Executivo de Engenharia, destinado à Implantação e Adequação do Sistema Viário de acesso à Via STN e ao Setor Noroeste pela W9 e W7 (SHCNW trecho 1), na Rodovia DF-003 (EPIA – Estrada Parque Industria e Abastecimento) e o acesso/interligação do Sistema com o TAN – Terminal Asa Norte/BRT Norte.

6. Declarações

Acessibilidade: Não. Declaro que as regras de acessibilidade previstas nas normas técnicas da ABNT, na legislação específica e no Decreto nº 5.296, de 2 de dezembro de 2004, não se aplicam às atividades profissionais acima relacionadas.

7. Entidade de Classe

NENHUMA

8. Assinaturas

Declaro serem verdadeiras as informações acima

_______________, ___ de ________ de ____
Local — Data

HERMES BUENO PROCOPIO - CPF: 055.705.001-20

PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Assinado de forma digital por PAULO CAVALCANTI DE ALBUQUERQUE:35727578434
Dados: 2021.12.17 16:08:45 -03'00'

AET ARQUITETURA, PLANEJAMENTO E TRANSPORTES LTDA - EPP - CPF/CNPJ: 01.136.983/0001-50

9. Informações

- A ART é válida somente após a conferência e o CREA-GO receber a informação do PAGAMENTO PELO BANCO.
- A autenticidade deste documento pode ser verificada no site www.creago.org.br.
- A guarda da via assinada da ART será de responsabilidade do profissional e do contratante com o objetivo de documentar o vínculo contratual.
- Não é mais necessário enviar o documento original para o CREA-GO. O CREA-GO não mais afixará carimbo na nova ART.

www.creago.org.br atendimento@creago.org.br
Tel: (62) 3221-6200 Fax: (62) 3221-6277

CREA-GO

Valor da ART:	Registrada em	Valor Pago	Nosso Numero	Situação		Não possui Livro de Ordem	Não Possui CAT
233,94	08/03/2021	R$ 233,94	28320690121048886	Registrada/OK			

Anotação de Responsabilidade Técnica - ART
Lei n° 6.496, de 7 de dezembro de 1977

CREA-GO

ART Obra ou serviço
1020210232047

Conselho Regional de Engenharia e Agronomia de Goiás

1. Responsável Técnico

HERBIO HENRIQUE LOPES RNP: **1010721950**
Título profissional: **Engenheiro Civil** Registro: **20918/D-GO**

2. Dados do Contrato

Contratante: **AeT Arquitetura, Planejamento e Transportes Ltda** CPF/CNPJ: **01.136.983/0001-50**
Setor SEPS 705/905, Nº 135 Bairro: Asa Sul CEP: 70390-055
Quadra: - Lote: - Complemento: Cidade: Brasilia-DF
E-Mail: tnovais@volar.com.br Fone: (31)99745-7822
Contrato: 1470 Celebrado em: 23/08/2021 Valor Obra/Serviço R$: 8.000,00
Tipo de contratante: Pessoa Jurídica de Direito Privado
Ação institucional: Nenhuma/Não Aplicável

3. Dados da Obra/Serviço

Setor SAM Bloco C, Nº 133 Bairro: Setores Complementares CEP: 70620-030
Quadra: - Lote: - Complemento: Cidade: Brasilia-DF
Data de Inicio: 23/08/2021 Previsão término: 24/01/2022 Coordenadas Geográficas: -14.2651632,-43.3538596
Finalidade: **Infra-estrutura**
Proprietário: **Departamento de Estradas de Rodagem do Distrito Federal DER** CPF/CNPJ: **00.070.532/0001-03**
E-Mail: sutec@der.df.gov.br Fone: (61) 31115500 Tipo de proprietário: Pessoa Jurídica de Direito Privado

4. Atividade Técnica

ATUACAO	**Quantidade**	**Unidade**
PROJETO PONTE, VIADUTO OU ELEVADO DE CONCRETO	1.881,00	METROS QUADRADOS

O registro da A.R.T. não obriga ao CREA-GO a emitir a Certidão de Acervo Técnico (C.A.T.), a confecção e emissão do documento apenas ocorrerá se as atividades declaradas na A.R.T. forem condizentes com as atribuições do Profissional. As informações constantes desta ART são de responsabilidade do(a) profissional. Este documento poderá, a qualquer tempo, ter seus dados, preenchimento e atribuições profissionais conferidos pelo CREA-GO.
Após a conclusão das atividades técnicas o profissional deverá proceder a baixa desta ART

5. Observações

Projeto estrutural de um viaduto de concreto armado na ligação STN-APIA - Setor Noroeste

6. Declarações

Acessibilidade: Sim: Declaro atendimento às regras de acessibilidade previstas nas normas técnicas da ABNT, na legislação específica e no Decreto nº 5.296, de 2 de dezembro de 2004.

7. Entidade de Classe

NENHUMA

8. Assinaturas

Declaro serem verdadeiras as informações acima

Brasília, 25 de novembro de 2021
Local Data

Herbio Henrique Lopes

HERBIO HENRIQUE LOPES - CPF: 023.604.901-17

AeT Arquitetura, Planejamento e Transportes Ltda - CPF/CNPJ: 01.136.983/0001-50

9. Informações

- A ART é válida somente após a conferência e o CREA-GO receber a informação do PAGAMENTO PELO BANCO.
- A autenticidade deste documento pode ser verificada no site www.creago.org.br.
- A guarda da via assinada da ART será de responsabilidade do profissional e do contratante com o objetivo de documentar o vínculo contratual.
- Não é mais necessário enviar o documento original para o CREA-GO. O CREA-GO não mais afixará carimbo na nova ART.

www.creago.org.br atendimento@creago.org.br
Tel: (62) 3221-6200

Valor da ART:	Registrada em	Valor Pago	Nosso Numero	Situação		Não possui Livro de Ordem	Não Possui CAT
88,78	18/10/2021	R$ 88,78	28320690121230552	Registrada/OK			