

Obra: TRF-4 VARAS VERTICAL PARTE 3

Sistema de unidades: M.K.S (m.tf.s)

Materiais:

Concreto: C25, em geral

Aço: CA-50-A e CA-60-B

Armadura de vigas
Obra: TRF-4 VARAS VERTICAL PARTE 3
Grupo no 1 Piso 1 --- Piso igual 1

V 1 --- Grupo: 1

Tramo nº 1 (*P30-P30*) (C= 3.20) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.033 cm.
(C/9571)

Arm.sup: 0.1 ----- 0.1 0.1(0.17)
0.1(3.03)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.57) 1.2(1.60)
1.2(2.63)

Moment.: -0.2 0.3 1.0 1.3 1.0 0.3 -0.2 -0.3(0.11) 0.3(0.57) 1.3(1.60)
0.3(2.63) -0.3(3.09)

Cortant.: ----- 1.9 1.0 0.0 -1.0 -1.9 ----- 2.2(x= 0.40)
-2.2(x= 2.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
2.80) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.94+0.08D=4.10) -----

Arm.Inferior: 2Ø10(0.12D+3.94+0.12D=4.18)

Estribos: 22x1Ø5c/0.14(3.00)

V 2 --- Grupo: 1

Tramo nº 1 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.139 cm.
(C/3598)

Arm.sup: 0.2 ----- 1.2 2.0 0.2(0.17)
2.6(4.66)

Arm.inf: ----- 1.2 1.7 1.7 1.2 ----- 1.2(0.80) 1.8(2.00)

Moment.: -0.3 1.1 2.4 2.4 1.2 -1.6 -3.8 -0.4(0.11) 1.1(0.83) 2.6(2.00)
-4.1(4.83)

Cortant.: ----- 2.3 0.8 -0.7 -2.6 -4.1 ----- 3.0(x= 0.40)
-4.9(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=

4.60) Lim.: 0.54

Arm.Superior: $2\emptyset 6.3(0.08D+3.97=4.05)$ ----- $2\emptyset 16(1.75>>)$

Arm.Inferior: $2\emptyset 12.5(0.15D+5.65=5.80)$

Estribos: $33 \times 1\emptyset 5c/0.14(4.60)$

Tramo nº 2 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.066 cm.
(C/7592)

Arm.sup: 2.0 1.2 ----- 1.2 2.1 2.0(0.06)
2.1(4.94)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)

Moment.: -3.8 -0.8 1.7 2.3 1.7 -0.8 -4.1 -3.8(x= 0.00) 2.3(x=
2.50) -4.1(x= 5.00)

Cortant.: ----- 3.0 1.5 0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: $2\emptyset 16(<<1.75+1.55=3.30)$ ----- $2\emptyset 12.5(1.60>>)$, $1\emptyset 10(1.00>>)$

Arm.Montagem: $2\emptyset 5(2.30)$

Arm.Inferior: $2\emptyset 12.5(5.40)$

Estribos: $34 \times 1\emptyset 5c/0.14(4.65)$

Tramo nº 3 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.216 cm.
(C/2316)

Arm.sup: 2.1 1.3 ----- 1.6 3.4 2.9(0.34)
4.1(4.71)

Arm.inf: ----- 1.2 2.0 3.6 3.4 ----- 1.2(0.99) 4.2(3.15)

Moment.: -4.1 -1.8 2.8 5.0 4.8 -2.2 -6.5 -4.6(0.23) 0.2(0.99) 5.9(3.15)
-6.7(4.89)

Cortant.: ----- 4.9 3.4 1.9 -6.1 -7.6 ----- 5.6(x= 0.40)
-8.4(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: $2\emptyset 12.5(<<1.60+1.80=3.40)$, $1\emptyset 10(<<1.00+1.05=2.05)$ ----- $2\emptyset 16(1.80>>)$,
 $1\emptyset 10(1.00>>)$

Arm.Montagem: $2\emptyset 6.3(1.85)$

Arm.Inferior: 2Ø16(5.30), 1Ø10(3.00)

Estribos: 20x1Ø6.3c/0.17(3.30), 10x1Ø6.3c/0.14(1.40)

Tramo nº 4 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.197 cm. (C/2539)

Arm.sup: 3.4 1.2 ----- 1.4 2.5 3.4(0.11)
3.6(4.66)

Arm.inf: ----- 2.0 3.4 2.9 ----- 3.9(3.05)

Moment.: -6.5 -1.6 2.8 4.8 4.1 -1.9 -4.7 -6.5(x= 0.00) 5.4(x=
3.05) -5.5(x= 4.77)

Cortant.: ----- 4.6 3.1 1.7 -5.1 -6.6 ----- 7.9(x= 0.40)
-7.3(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.80+1.75=3.55), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø12.5(1.70>>),
1Ø12.5(1.35>>)

Arm.Montagem: 2Ø6.3(2.00)

Arm.Inferior: 2Ø16(5.30)

Estribos: 6x1Ø6.3c/0.14(0.80), 23x1Ø6.3c/0.17(3.90)

Tramo nº 5 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.067 cm. (C/7428)

Arm.sup: 2.5 1.2 ----- 1.2 1.2 2.4(0.06)
1.6(4.66)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)

Moment.: -4.7 -0.8 1.7 2.3 1.7 -0.8 -1.5 -4.7(x= 0.00) 2.3(x=
2.50) -2.4(x= 4.71)

Cortant.: ----- 3.0 1.5 0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.7(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.70+1.60=3.30), 1Ø12.5(<<1.35+1.00=2.35) -----
2Ø8(4.00+0.10D=4.10), 1Ø10(1.58+0.12D=1.70)

Arm.Inferior: 2Ø12.5(5.55+0.15D=5.70)

Estribos: 34x1Ø5c/0.14(4.75)

V 3 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.086 cm.
(C/5793)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.71) 1.2(2.50)
1.2(4.29)

Moment.: 0.0 0.7 1.1 1.2 1.1 0.7 -0.0 0.0(0.00) 0.7(0.83) 1.2(2.50)
0.7(4.17) -0.0(5.00)

Cortant.: 1.0 0.7 0.3 0.0 -0.3 -0.7 -1.0 1.0(x= 0.00)
-1.0(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+5.14+0.08D=5.30) -----

Arm.Inferior: 2Ø10(0.12D+5.14+0.12D=5.38)

Estribos: 35x1Ø5c/0.14(4.80)

V 4 --- Grupo: 1

Tramo nº 1 (*V 1-V 2*) (C= 4.90) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.904 cm.
(C/542)

Arm.sup: -----

Arm.inf: ----- 2.9 4.9 6.1 4.8 2.8 ----- 3.0(0.86) 6.2(2.40)
3.1(4.01)

Moment.: -0.0 4.0 6.8 8.4 6.8 4.0 -0.0 -0.0(0.00) 4.2(0.86) 8.4(2.40)
4.3(4.01) -0.0(4.90)

Cortant.: 5.5 4.2 2.7 -1.2 -2.7 -4.1 -5.5 5.5(x= 0.00)
-5.5(x= 4.90)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+5.03+0.08D=5.19) -----

Arm.Inferior: 2Ø16(0.19D+5.03+0.19D=5.41), 2Ø12.5(3.55)

Estribos: 34x1Ø5c/0.14(4.70)

V 5 --- Grupo: 1

Tramo nº 1 (*V 2-V 2*) (C= 0.82) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.000 cm.
(C/952013)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.12) 1.2(0.41)
1.2(0.71)

Moment.: 0.0 0.0 0.0 0.0 0.0 0.0 -0.0 0.0(0.00) 0.0(0.14) 0.0(0.41)
0.0(0.69) -0.0(0.82)

Cortant.: 0.2 0.1 0.1 0.0 -0.1 -0.1 -0.2 0.2(x= 0.00)
-0.2(x= 0.82)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 0.82) Lim.: 0.54

Arm.Montagem: 2Ø5(0.06D+0.96+0.06D=1.08)

Arm.Inferior: 2Ø10(0.12D+0.96+0.12D=1.20)

Estribos: 5x1Ø5c/0.14(0.63)

V 6 --- Grupo: 1

Tramo nº 1 (*V 1-V 2*) (C= 1.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.346 cm.
(C/564)

Arm.sup: 1.2 1.2 1.3 2.3 3.4 4.6 6.1 1.3(0.63)
5.4(1.82)

Arm.inf: ----- 3.2 2.4 1.4 1.2 ----- 3.7(0.10) 2.8(0.50)

Moment.: 0.0 4.5 3.3 -3.2 -4.7 -6.5 -8.4 0.0(0.00) 5.2(0.10) 3.9(0.50)
-8.4(1.95)

Cortant.: 0.0 -3.3 -3.8 -4.4 -5.0 -5.6 -6.3 0.0(x= 0.00)
-6.3(x= 1.95)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.10)
0.00(x= 1.95) Lim.: 0.54

Arm.Superior: 2Ø16(0.19D+1.91>>) ----- 2Ø12.5(1.10>>)

Arm.Inferior: 2Ø16(0.32D+1.91>>)

Estribos: 13x1Ø5c/0.14(1.82)

Tramo nº 2 (*V 2-V 2*) (C= 3.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.097 cm.
(C/-3130)

Arm.sup: 6.1 4.1 2.7 1.5 1.2 1.2 ----- 6.1(0.00)
1.2(2.18)

Arm.inf: ----- 1.2 2.2 3.0 3.5 3.7 3.4(2.40)
3.6(2.83)

Moment.: -8.4 -5.8 -3.7 3.1 4.2 4.9 5.2 -8.4(0.00) 4.8(2.40)
5.2(3.05) -0.0(3.05)

Cortant.: -6.3 4.6 3.6 2.7 1.8 0.9 0.1 5.5(x= 0.00)
 -6.3(x= 0.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
 0.00(x= 3.05) Lim.: 0.54

Arm.Superior: 2Ø16(<<2.10+3.12+0.19D=5.41), 2Ø12.5(<<1.10+1.00=2.10) -----

Arm.Inferior: 2Ø16(<<2.23+3.12+0.32D=5.67)

Estribos: 21x1Ø5c/0.14(2.85)

V 7 --- Grupo: 1

Tramo nº 1 (*P30-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.025 cm.
 (C/19801)

Arm.sup: ----- 1.2 1.2 ----- 1.2 1.2 0.0(0.17)
 1.2(4.83)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.20)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.3 -0.8 -0.1(0.11) 0.3(1.00) 0.5(2.20)
 -0.8(4.83)

Cortant.: ----- 0.5 0.2 -0.2 -0.5 -0.8 ----- 0.6(x= 0.40)
 -1.0(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
 4.60) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.07=4.15) ----- 2Ø10(1.55>>)

Arm.Inferior: 2Ø10(0.12D+5.58=5.70)

Estribos: 33x1Ø5c/0.14(4.62)

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.013 cm.
 (C/37471)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
 1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)

Moment.: -0.8 -0.2 0.4 0.5 0.4 -0.2 -1.5 -0.8(x= 0.00) 0.5(x=
 2.50) -1.5(x= 5.00)

Cortant.: ----- 0.6 0.3 -0.0 -0.3 -0.7 ----- 0.8(x= 0.40)
 -0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.40)

Estribos: 33x1Ø5c/0.14(4.62)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.086 cm.
(C/5786)

Arm.sup: 1.2 1.2 ----- 1.2 2.9 1.4(0.40)
2.8(4.94)

Arm.inf: ----- 1.2 1.9 2.0 ----- 2.6(3.15)

Moment.: -1.5 -1.0 1.3 2.7 2.9 -1.3 -5.6 -2.1(x= 0.29) 3.6(x=
3.15) -5.6(x= 5.00)

Cortant.: ----- 2.2 1.8 1.5 -4.1 -4.4 ----- 2.3(x= 0.40)
-4.6(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.70=3.25) ----- 2Ø16(1.80>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(1.95)

Arm.Inferior: 2Ø16(5.30)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.397 cm.
(C/1260)

Arm.sup: 2.9 2.2 ----- 2.8 3.2 4.1(0.40)
6.9(4.60)

Arm.inf: ----- 2.5 5.9 5.6 ----- 8.5(3.05)

Moment.: -5.6 -3.1 3.5 8.1 7.7 -3.9 -6.2 -6.2(x= 0.23) 11.0(x=
3.05) -9.8(x= 4.71)

Cortant.: ----- 6.0 5.7 5.4 -11.8 -12.1 ----- 6.2(x= 0.40)
-12.3(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.01 0.01 ----- Extr. apoio: 0.00(x= 0.40) 0.01(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.80+2.00=3.80), 1Ø10(<<1.00+1.00=2.00) ----- 3Ø16(1.80>>),
1Ø12.5(1.35>>)

Arm.Montagem: 2Ø8(1.65)

Arm.Inferior: 4Ø16(5.30), 1Ø12.5(3.00)

Estribos: 19x1Ø8c/0.15(2.72), 16x1Ø8c/0.12(1.92)

Tramo nº 5 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.006 cm.
(C/84912)

Arm.sup: 3.2 1.2 ----- 1.2 1.2 2.7(0.06)
1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)

Moment.: -6.2 -0.2 0.4 0.5 0.4 -0.2 -1.0 -6.2(0.00) 0.5(2.50)
0.0(4.17) -1.0(5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.6 ----- 0.8(x= 0.40)
-0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 3Ø16(<<1.80+1.60=3.40), 1Ø12.5(<<1.35+1.20=2.55) ----- 2Ø10(1.54>>)

Arm.Montagem: 2Ø5(2.35)

Arm.Inferior: 2Ø10(5.16>>)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 6 (*P31-V 2*) (C= 0.92) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.011 cm.
(C/8252)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.17)
1.2(0.64)

Arm.inf: ----- 0.0(0.86)

Moment.: -1.0 -1.1 -1.1 -0.8 -0.4 -0.1 -0.0 -1.2(0.17) -0.1(0.73)
0.0(0.86) -0.0(0.93)

Cortant.: ----- 2.3 2.2 2.1 0.0 2.3(x= 0.40)
-0.0(x= 0.93)

Torsores: ----- 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 0.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.54+0.90+0.12D=2.55) -----

Arm.Inferior: 2Ø10(<<5.16+0.89+0.15D=6.20)

Estribos: 6x1Ø5c/0.14(0.80)

V 8 --- Grupo: 1

Tramo nº 1 (*V 2-V 2*) (C= 3.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.057 cm.

(C/5391)

Arm.sup: -----

Arm.inf: ----- 1.2 1.3 1.5 1.3 1.2 ----- 1.2(0.44) 1.5(1.52)
1.2(2.61)

Moment.: 0.0 1.1 1.8 2.1 1.8 1.1 -0.0 0.0(0.00) 1.1(0.51) 2.1(1.52)
1.1(2.54) -0.0(3.05)

Cortant.: 2.6 1.8 0.9 ----- -0.9 -1.8 -2.6 2.6(x= 0.00)
-2.6(x= 3.05)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 3.05) Lim.: 0.54

Arm.Superior: $2\emptyset 6.3(0.08D+3.18+0.08D=3.34)$ -----

Arm.Inferior: $2\emptyset 10(0.12D+3.18+0.12D=3.42)$

Estribos: $21 \times 1\emptyset 5c/0.14(2.85)$

V 9 --- Grupo: 1

Tramo nº 1 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.024 cm.
(C/20944)

Arm.sup: ----- 1.2 1.2 0.0(0.17)
1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.20)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.3 -2.0 -0.1(0.11) 0.3(1.00) 0.5(2.20)
-2.0(5.00)

Cortant.: ----- 0.5 0.2 -0.2 -0.5 -0.8 ----- 0.6(x= 0.40)
-1.0(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: $2\emptyset 6.3(0.08D+4.17=4.25)$ ----- $2\emptyset 12.5(1.55>>)$

Arm.Inferior: $2\emptyset 10(0.12D+5.53=5.65)$

Estribos: $34 \times 1\emptyset 5c/0.14(4.67)$

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.071 cm.
(C/7031)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.6(0.34)
1.6(4.66)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)

Moment.: -2.0 -0.8 1.7 2.3 1.7 -0.8 -1.8 -2.5(x= 0.23) 2.3(x=

2.50) -2.5(x= 4.71)

Cortant.: ----- 3.0 1.5 -0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.40)

Estribos: 34x1Ø5c/0.14(4.67)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.012 cm.
(C/40554)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.50)
1.2(4.00)

Moment.: -1.8 -0.2 0.4 0.5 0.4 -0.2 -1.5 -1.8(0.00) 0.1(1.00) 0.5(2.50)
0.1(4.00) -1.5(5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.7 ----- 0.8(x= 0.40)
-0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.30)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.081 cm.
(C/6210)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.3(0.40)
2.0(4.66)

Arm.inf: ----- 1.2 1.8 1.6 ----- 2.3(3.05)

Moment.: -1.5 -0.9 1.2 2.5 2.3 -1.1 -2.1 -2.0(x= 0.29) 3.2(x= 3.05)
-3.0(x= 4.71)

Cortant.: ----- 2.0 1.7 1.4 -3.3 -3.6 ----- 2.2(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=

4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.70=3.25) ----- 2Ø12.5(1.60>>)

Arm.Montagem: 2Ø5(2.20)

Arm.Inferior: 2Ø10(5.30), 1Ø10(3.00)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.012 cm.
(C/40346)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)

Moment.: -2.1 -0.2 0.4 0.5 0.4 -0.2 -1.2 -2.1(0.00) 0.5(2.50)
0.0(4.17) -1.2(5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.6 ----- 0.8(x= 0.40)
-0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.55=3.15) ----- 2Ø10(1.54>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.19>>)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 6 (*P32-V 2*) (C= 0.92) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/6439)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.23)
1.2(0.64)

Arm.inf: ----- 0.0(0.86)

Moment.: -1.2 -1.5 -1.4 -1.0 -0.6 -0.2 0.0 -1.5(0.23) -0.1(0.73)
0.0(0.86) 0.0(0.93)

Cortant.: ----- 3.0 2.9 2.8 0.0 3.0(x= 0.40)
-0.0(x= 0.93)

Torsores: ----- 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x=
0.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.54+0.90+0.12D=2.55) -----

Arm.Inferior: 2Ø10(<<5.19+0.90+0.12D=6.20)

Estribos: 6x1Ø5c/0.14(0.80)

V 10 --- Grupo: 1

Tramo nº 1 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.025 cm.
(C/19780)

Arm.sup: ----- 1.2 1.2 ----- 1.2 1.2 0.0(0.17)
1.2(4.83)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.20)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.3 -0.8 -0.1(0.11) 0.3(1.00) 0.5(2.20)
-0.8(4.83)

Cortant.: ----- 0.5 0.2 -0.2 -0.5 -0.8 ----- 0.6(x= 0.40)
-1.0(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.02=4.10) ----- 2Ø10(1.55>>)

Arm.Inferior: 2Ø10(0.12D+5.37>>)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/34917)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)

Moment.: -0.8 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.8(x= 0.00) 0.5(x=
2.50) -0.7(x= 5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.7 ----- 0.8(x= 0.40)
-0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(<<5.49+5.21=10.70)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 3 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.

(C/34579)

Arm.sup: 1.2(4.94)	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.06)
Arm.inf: 1.2(4.00)	----- 1.2	1.2	1.2	1.2	1.2	-----	1.2(1.00)	1.2(2.50)
Moment.: 0.1(4.00) -0.7(5.00)	-0.7	-0.2	0.4	0.5	0.4	-0.2	-0.7	-0.7(0.00) 0.1(1.00) 0.5(2.50)
Cortant.: -0.8(x= 4.60)	-----	0.7	0.3	-0.0	-0.3	-0.7	-----	0.8(x= 0.40)
Torsores: 4.60) Lim.: 0.54	-----	0.00	0.00	0.00	0.00	0.00	----- Extr. apoio:	0.00(x= 0.40) 0.00(x=

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.15>>)

Estribos: 34x1Ø5c/0.14(4.70)

Tramo nº 4 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/34457)

Arm.sup: 1.2(4.94)	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.06)
Arm.inf: 1.2(4.00)	----- 1.2	1.2	1.2	1.2	1.2	-----	1.2(2.50)	
Moment.: 2.50) -0.7(x= 5.00)	-0.7	-0.2	0.4	0.5	0.4	-0.2	-0.7	-0.7(x= 0.00) 0.5(x=
Cortant.: -0.8(x= 4.60)	-----	0.7	0.3	0.0	-0.3	-0.7	-----	0.8(x= 0.40)
Torsores: 4.60) Lim.: 0.54	-----	0.00	0.00	0.00	0.00	0.00	----- Extr. apoio:	0.00(x= 0.40) 0.00(x=

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(<<5.15+5.15=10.30)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/34547)

Arm.sup: 1.2(4.94)	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.06)
Arm.inf: 1.2(4.00)	----- 1.2	1.2	1.2	1.2	1.2	-----	1.2(2.50)	

Moment.: -0.7 -0.2 0.4 0.5 0.4 -0.2 -0.6 -0.7(x= 0.00) 0.5(x= 2.50) -0.6(x= 4.94)

Cortant.: ----- 0.7 0.3 -0.0 -0.3 -0.7 ----- 0.8(x= 0.40) -0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.54>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.19>>)

Estribos: 34x1Ø5c/0.14(4.70)

Tramo nº 6 (*P32-V 2*) (C= 0.92) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.005 cm. (C/16952)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.06) 1.2(0.64)

Arm.inf: ----- 0.0(0.86)

Moment.: -0.6 -0.6 -0.5 -0.3 -0.2 -0.0 -0.0 -0.6(0.00) -0.0(0.73) 0.0(0.86) -0.0(0.93)

Cortant.: ----- ----- 1.0 0.9 0.8 0.0 1.0(x= 0.40) -0.0(x= 0.93)

Torsores: ----- ----- 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 0.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.54+0.90+0.12D=2.55) -----

Arm.Inferior: 2Ø10(<<5.19+0.89+0.12D=6.20)

Estribos: 6x1Ø5c/0.14(0.80)

V 11 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.862 cm. (C/580)

Arm.sup: -----

Arm.inf: ----- 2.9 4.9 5.9 4.8 2.8 ----- 3.0(0.86) 6.0(2.40) 3.1(4.07)

Moment.: 0.0 4.0 6.8 8.2 6.7 4.0 0.0 0.0(0.00) 4.1(0.86) 8.3(2.40) 4.3(4.07) 0.0(5.00)

Cortant.: 5.5 4.1 2.6 -1.0 -2.5 -4.0 -5.4 5.5(x= 0.00) -5.4(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
 0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+1.17=1.25) ----- 2Ø6.3(1.17+0.08D=1.25)

Arm.Montagem: 2Ø5(3.20)

Arm.Inferior: 3Ø16(0.19D+5.14+0.19D=5.52), 1Ø10(3.60)

Estribos: 35x1Ø5c/0.14(4.80)

V 12 --- Grupo: 1

Tramo nº 1 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.117 cm.
 (C/4263)

Arm.sup: 0.2 ----- 1.2 2.2 0.2(0.17)
 2.4(4.71)

Arm.inf: ----- 1.2 1.6 1.6 1.2 ----- 1.2(1.00) 1.7(2.20)

Moment.: -0.3 1.1 2.3 2.3 1.0 -1.6 -4.2 -0.4(0.11) 1.5(1.00) 2.4(2.20)
 -4.2(5.00)

Cortant.: ----- 2.2 0.7 -0.8 -2.3 -3.8 ----- 3.0(x= 0.40)
 -4.6(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.22=4.30) ----- 2Ø12.5(1.60>>)

Arm.Inferior: 2Ø12.5(0.15D+5.55=5.70)

Estribos: 34x1Ø5c/0.14(4.70)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.112 cm.
 (C/4473)

Arm.sup: 2.2 1.2 ----- 1.2 1.8 2.4(0.23)
 2.3(4.66)

Arm.inf: ----- 1.6 2.5 1.5 ----- 2.6(2.40)

Moment.: -4.2 -1.3 2.2 3.6 2.1 -1.3 -3.5 -4.2(x= 0.00) 3.7(x= 2.40)
 -3.7(x= 4.83)

Cortant.: ----- 4.1 2.6 -1.0 -2.5 -4.0 ----- 4.9(x= 0.40)
 -4.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.75=3.35) ----- 2Ø12.5(1.60>>)

Arm.Montagem: 2Ø5(2.15)

Arm.Inferior: 2Ø12.5(5.30), 1Ø10(3.00)

Estribos: 33x1Ø5c/0.14(4.60)

Tramo nº 3 (*P32-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.068 cm.
(C/7337)

Arm.sup: 1.8 1.2 ----- 1.2 1.6 1.8(0.06)
1.7(4.77)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.2(1.00) 1.7(2.50)
1.2(4.00)

Moment.: -3.5 -0.8 1.7 2.3 1.7 -0.8 -3.0 -3.5(0.00) 0.3(1.00) 2.3(2.50)
0.3(4.00) -3.0(5.00)

Cortant.: ----- 3.0 1.5 -0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.55=3.15) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.40)

Estribos: 33x1Ø5c/0.14(4.60)

Tramo nº 4 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.069 cm.
(C/7257)

Arm.sup: 1.6 1.2 ----- 1.2 1.6 1.7(0.23)
1.7(4.77)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)

Moment.: -3.0 -0.8 1.7 2.3 1.7 -0.8 -3.0 -3.0(x= 0.00) 2.3(x=
2.50) -3.0(x= 5.00)

Cortant.: ----- 3.0 1.5 -0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.40)

Estribos: 33x1Ø5c/0.14(4.60)

Tramo nº 5 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7109)

Arm.sup: 1.6 1.2 ----- 1.2 1.2 1.7(0.23)
1.6(4.66)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)

Moment.: -3.0 -0.8 1.7 2.3 1.7 -0.8 -1.5 -3.0(x= 0.00) 2.3(x=
2.50) -2.4(x= 4.71)

Cortant.: ----- 3.0 1.5 0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.90+0.15D=2.05)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.55+0.15D=5.70)

Estribos: 34x1Ø5c/0.14(4.70)

V 13 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.061 cm.
(C/8152)

Arm.sup: ----- 1.2 1.2
1.2(4.64)

Arm.inf: 0.8 1.3 1.5 1.5 1.2 1.2 ----- 1.2(0.71) 1.5(2.14)
1.2(4.29)

Moment.: 1.1 1.8 2.1 2.1 1.7 0.9 -1.3 0.0(0.00) 1.8(0.83) 2.1(2.14)
0.9(4.17) -1.3(5.00)

Cortant.: 1.1 0.6 0.2 -0.3 -0.7 -1.2 -1.6 1.1(x= 0.00)
-1.6(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.17=4.25) ----- 2Ø10(1.25>>)

Arm.Inferior: 2Ø10(0.12D+5.23=5.35)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*V 1-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.

(C/33338)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.00)
1.2(4.64)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.71) 1.2(2.50)
1.2(4.29)

Moment.: -1.3 0.7 1.3 1.5 1.4 0.9 -1.1 -1.3(0.00) 0.7(0.83) 1.5(2.50)
0.9(4.17) -1.1(5.00)

Cortant.: -1.6 0.9 0.5 0.1 -0.4 -0.8 -1.3 1.4(x= 0.00)
-1.6(x= 0.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.25+1.60=2.85) ----- 2Ø10(1.60>>)

Arm.Montagem: 2Ø5(2.30)

Arm.Inferior: 2Ø10(5.10>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*V 1-V 2*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.026 cm.
(C/19061)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.00)
1.2(4.64)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.71) 1.2(2.50)
1.2(4.29)

Moment.: -1.1 0.9 1.5 1.7 1.5 0.9 -1.1 -1.1(0.00) 0.9(0.83) 1.7(2.50)
0.9(4.17) -1.1(5.00)

Cortant.: -1.3 0.9 0.4 0.0 -0.4 -0.9 -1.3 1.3(x= 0.00)
-1.3(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.60+1.25=2.85) ----- 2Ø10(1.25>>)

Arm.Montagem: 2Ø5(3.00)

Arm.Inferior: 2Ø10(<<5.10+5.10=10.20)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*V 2- *) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/32453)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.00)
1.2(4.64)

Arm.inf: 1.2 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.71) 1.2(2.50)
 1.2(4.29)
 Moment.: -1.1 0.9 1.4 1.5 1.3 0.7 -1.3 -1.1(0.00) 0.9(0.83) 1.5(2.50)
 0.7(4.17) -1.3(5.00)
 Cortant.: -1.3 0.8 0.4 -0.1 -0.5 -0.9 -1.4 1.3(x= 0.00)
 -1.4(x= 5.00)
 Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
 0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.25+1.60=2.85) ----- 2Ø10(1.60>>)

Arm.Montagem: 2Ø5(2.30)

Arm.Inferior: 2Ø10(5.16>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (* -V 2*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7137)

Arm.sup: 1.2 1.2 ----- 1.2(0.00)
 Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.86)
 1.2(4.29)
 Moment.: -1.3 -0.1 0.7 1.1 1.1 0.7 -0.0 -1.3(0.00) 0.0(0.83) 1.1(2.86)
 0.7(4.17) -0.0(5.00)
 Cortant.: -1.4 1.1 0.7 0.2 -0.2 -0.7 -1.1 1.6(x= 0.00)
 -1.4(x= 0.00)
 Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
 0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.60+1.25=2.85) ----- 2Ø6.3(4.22+0.08D=4.30)

Arm.Inferior: 2Ø10(<<5.16+5.07+0.12D=10.35)

Estribos: 35x1Ø5c/0.14(4.80)

V 14 --- Grupo: 1

Tramo nº 1 (*V 1-P32*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.072 cm.
(C/2329)

Arm.sup: 1.2 1.2 1.2 1.2 1.4 1.7 1.2 1.2(0.52)
 1.8(1.33)
 Arm.inf: ----- 0.0(0.06)
 Moment.: 0.0 -0.2 -0.7 -1.3 -2.0 -2.7 -1.9 0.0(0.00) 0.0(0.06) -0.2(0.35)
 -2.7(1.39)

Cortant.: 0.0 -1.4 -1.9 -2.4 -2.9 ----- 0.0(x= 0.00)
 -3.2(x= 1.27)

Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 1.27) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+1.65>>) -----

Arm.Inferior: 2Ø8(0.10D+1.80=1.90)

Estribos: 11x1Ø5c/0.14(1.50)

Tramo nº 2 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.361 cm. (C/1660)

Arm.sup: 1.2 ----- 1.5 1.7 0.9(0.06)
 3.6(5.60)

Arm.inf: ----- 1.3 2.5 2.5 1.2 ----- 1.6(1.14) 2.7(2.63)

Moment.: -1.9 1.9 3.6 3.5 1.6 -2.1 -3.3 -1.9(0.00) 2.2(1.14) 3.7(2.63)
 -5.3(5.71)

Cortant.: ----- 2.6 0.8 -1.0 -2.8 -4.6 ----- 3.7(x= 0.40)
 -5.6(x= 5.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.80+1.36=3.15) ----- 2Ø12.5(1.80>>), 1Ø12.5(1.45>>)

Arm.Montagem: 2Ø5(3.30)

Arm.Inferior: 2Ø10(6.30), 1Ø12.5(4.10)

Estribos: 41x1Ø5c/0.14(5.67)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.000 cm. (C/1364317)

Arm.sup: 1.7 1.2 ----- 1.2 1.2 1.5(0.06)
 1.2(3.93)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)

Moment.: -3.3 -0.2 0.2 0.3 0.2 -0.1 -1.7 -3.3(x= 0.00) 0.3(x= 1.99)
 -1.7(x= 3.98)

Cortant.: ----- 0.5 0.3 0.0 -0.2 -0.5 ----- 0.6(x= 0.40)
 -0.6(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.80+1.45=3.25), 1Ø12.5(<<1.45+0.80=2.25) ----- 2Ø12.5(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø12.5(4.45)

Estribos: 26x1Ø5c/0.14(3.63)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7123)

Arm.sup: 1.2 1.2 ----- 1.2 1.6 1.6(0.34)
1.7(4.77)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.7(2.50)
1.2(4.00)

Moment.: -1.7 -0.8 1.7 2.3 1.7 -0.8 -3.0 -2.5(0.29) 2.3(2.50)
0.3(4.00) -3.0(5.00)

Cortant.: ----- 3.0 1.5 0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.40+1.55=2.95) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.40)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.076 cm.
(C/6609)

Arm.sup: 1.6 1.2 ----- 1.2 1.2 1.7(0.23)
1.9(4.66)

Arm.inf: ----- 1.2 1.3 1.8 1.4 1.2 ----- 1.2(0.91) 1.8(2.67)
1.2(4.03)

Moment.: -3.0 -0.8 1.8 2.5 2.0 -0.8 -2.1 -3.0(0.00) 0.1(0.91) 2.5(2.67)
0.5(4.03) -2.9(4.71)

Cortant.: ----- 3.1 1.6 0.1 -1.4 -3.9 ----- 3.9(x= 0.40)
-4.7(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.50=3.05) ----- 2Ø12.5(1.53>>)

Arm.Montagem: 2Ø5(2.45)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 6 (*P30-P30*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.000 cm.
(C/678613)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(2.27)

Arm.inf: ----- 1.2 1.2 1.2 ----- 1.2(1.25)

Moment.: -2.1 -0.4 0.2 0.4 0.2 -0.3 -0.3 -2.1(x= 0.00) 0.4(x=
1.25) -0.5(x= 2.27)

Cortant.: ----- 1.5 0.8 0.0 -0.7 -1.5 ----- 1.6(x= 0.40)
-1.5(x= 2.10)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
2.10) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.53+2.87+0.15D=4.55) -----

Arm.Inferior: 2Ø10(3.08+0.12D=3.20)

Estribos: 17x1Ø5c/0.14(2.30)

V 15 --- Grupo: 1

Tramo nº 1 (*V 2-P30*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm.
(C/68589)

Arm.sup: ----- 0.0(2.33)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.45) 1.2(1.05)

Moment.: -0.0 0.1 0.2 0.2 0.1 0.0 -0.0 -0.0(0.00) 0.1(0.45) 0.2(1.05)
0.0(2.08) -0.0(2.39)

Cortant.: 0.4 0.2 0.1 -0.1 -0.2 -0.4 ----- 0.4(x= 0.00)
-0.4(x= 2.10)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
2.10) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.94+0.08D=3.10) -----

Arm.Inferior: 2Ø10(0.12D+2.94+0.12D=3.18)

Estribos: 17x1Ø5c/0.14(2.30)

V 16 --- Grupo: 1

Tramo nº 1 (*V 1-P32*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.167 cm.
(C/1008)

Arm.sup: 1.2 1.2 1.2 1.6 2.3 2.8 3.0 1.2(0.52)
 3.0(1.62)
 Arm.inf: ----- 0.0(0.06)
 Moment.: 0.0 -0.5 -1.4 -2.3 -3.2 -4.3 -5.8 0.0(0.00) 0.0(0.06) -0.4(0.35)
 -5.8(1.67)
 Cortant.: 0.0 -3.0 -3.2 -3.3 -3.4 ----- 0.0(x= 0.00)
 -3.4(x= 1.27)
 Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
 1.27) Lim.: 0.54

Arm.Superior: 2Ø16(0.19D+1.65>>) ----- 1Ø10(1.10>>)

Arm.Inferior: 2Ø12.5(0.17D+1.64>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.315 cm.
(C/1904)

Arm.sup: 3.0 1.2 ----- 1.2 1.2 4.0(0.34)
 2.4(5.60)
 Arm.inf: ----- 1.2 3.3 3.5 1.8 ----- 1.2(1.11) 4.4(2.40)
 Moment.: -5.8 -1.7 4.6 4.9 2.5 -1.5 -2.3 -6.3(0.23) 0.2(1.11) 6.2(2.40)
 -3.5(5.66)
 Cortant.: ----- 6.0 4.2 -2.2 -2.6 -3.0 ----- 7.1(x= 0.40)
 -3.3(x= 5.60)
 Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
 5.60) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.84+1.92=3.75), 1Ø10(<<1.10+1.20=2.30) ----- 2Ø12.5(1.95>>)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(<<1.81+6.19=8.00), 1Ø16(3.60)

Estribos: 12x1Ø5c/0.11(1.32), 32x1Ø5c/0.14(4.38)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.003 cm.
(C/148528)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
 1.2(3.93)
 Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)
 Moment.: -2.3 -0.1 0.2 0.3 0.2 -0.1 -0.5 -2.3(x= 0.00) 0.3(x=
 1.99) -0.5(x= 3.98)

Cortant.: ----- 0.5 0.3 0.0 -0.3 -0.5 ----- 0.6(x= 0.40)
 -0.6(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.95+1.45=3.40) ----- 2Ø10(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø10(4.45)

Estribos: 27x1Ø5c/0.14(3.68)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
 (C/34264)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.17)
 1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)
 1.2(4.00)

Moment.: -0.5 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.6(0.17) 0.5(2.50)
 0.1(4.00) -0.7(5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.6 ----- 0.8(x= 0.40)
 -0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.40+1.55=2.95) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.30)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.020 cm.
 (C/24688)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
 1.2(4.71)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.91) 1.2(2.67)
 1.2(4.03)

Moment.: -0.7 -0.2 0.5 0.7 0.6 -0.2 -0.6 -0.7(0.06) 0.1(0.91) 0.7(2.67)
 0.3(4.03) -1.0(4.71)

Cortant.: ----- 0.7 0.4 0.1 -0.2 -1.6 ----- 0.9(x= 0.40)
 -1.7(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.45=3.00) ----- 2Ø10(1.83+0.12D=1.95)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø10(5.58+0.12D=5.70)

Estribos: 35x1Ø5c/0.14(4.80)

V 17 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 2.40) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.022 cm.
(C/11065)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.34) 1.2(1.20)
1.2(2.06)

Moment.: -0.0 0.7 1.1 1.3 1.1 0.7 0.0 -0.0(0.00) 0.7(0.40) 1.3(1.20)
0.7(2.00) 0.0(2.40)

Cortant.: 2.0 1.4 0.7 ----- -0.7 -1.4 -2.0 2.0(x= 0.00)
-2.0(x= 2.40)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 2.40) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.54+0.08D=2.70) -----

Arm.Inferior: 2Ø10(0.12D+2.54+0.12D=2.78)

Estribos: 16x1Ø5c/0.14(2.20)

V 18 --- Grupo: 1

Tramo nº 1 (*V 1-P32*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.146 cm.
(C/1155)

Arm.sup: 1.2 1.2 1.2 1.5 2.0 2.5 2.9 1.2(0.52)
2.8(1.62)

Arm.inf: ----- 0.0(0.06)

Moment.: 0.0 -0.5 -1.2 -2.0 -2.9 -3.9 -5.5 -0.0(0.10) 0.0(0.06) -0.4(0.35)
-5.5(1.67)

Cortant.: 0.0 -2.7 -2.8 -2.9 -3.0 ----- 0.0(x= 0.00)
-3.1(x= 1.27)

Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
1.27) Lim.: 0.54

Arm.Superior: 2Ø16(0.19D+1.65>>) ----- 1Ø10(1.15>>)

Arm.Inferior: 2Ø12.5(0.15D+1.65>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.314 cm.
(C/1908)

Arm.sup: 2.9 1.2 ----- 1.2 1.2 4.0(0.34)
2.4(5.60)

Arm.inf: ----- 1.2 3.3 3.5 1.8 ----- 1.2(1.11) 4.4(2.40)

Moment.: -5.5 -1.7 4.6 4.9 2.5 -1.5 -2.3 -6.2(0.23) 0.2(1.11) 6.2(2.40)
-3.5(5.66)

Cortant.: ----- 6.0 4.2 -2.2 -2.6 -3.0 ----- 7.1(x= 0.40)
-3.3(x= 5.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
5.60) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.84+1.92=3.75), 1Ø10(<<1.15+1.20=2.35) ----- 2Ø12.5(1.95>>)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(<<1.80+6.16=7.95), 1Ø16(3.60)

Estribos: 12x1Ø5c/0.11(1.32), 32x1Ø5c/0.14(4.48)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.003 cm.
(C/153040)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(3.93)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)

Moment.: -2.3 -0.2 0.2 0.3 0.2 -0.1 -0.5 -2.3(x= 0.00) 0.3(x=
1.99) -0.5(x= 3.98)

Cortant.: ----- 0.5 0.3 0.0 -0.2 -0.5 ----- 0.6(x= 0.40)
-0.6(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
3.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.95+1.45=3.40) ----- 2Ø10(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø10(4.35)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/33994)

Arm.sup:	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.17)
1.2(4.94)								
Arm.inf:	-----	1.2	1.2	1.2	1.2	1.2	-----	1.2(2.50)
1.2(4.00)								
Moment.:	-0.5	-0.2	0.4	0.5	0.4	-0.2	-0.7	-0.6(0.17)
0.1(4.00)	-0.7(5.00)							0.5(2.50)
Cortant.:	-----	0.7	0.3	0.0	-0.3	-0.6	-----	0.8(x= 0.40)
-0.8(x= 4.60)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	0.00(x= 0.40)
4.60) Lim.: 0.54								0.00(x= 4.60)

Arm.Superior: 2Ø10(<<1.40+1.55=2.95) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.35)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/34272)

Arm.sup:	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.06)
1.2(4.71)								
Arm.inf:	-----	1.2	1.2	1.2	1.2	1.2	-----	1.2(2.50)
1.2(4.00)								
Moment.:	-0.7	-0.2	0.4	0.5	0.4	-0.2	-0.3	-0.7(0.00)
0.1(4.00)	-0.5(4.71)							0.5(2.50)
Cortant.:	-----	0.7	0.3	0.0	-0.3	-0.6	-----	0.8(x= 0.40)
-0.8(x= 4.60)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	0.00(x= 0.40)
4.60) Lim.: 0.54								0.00(x= 4.60)

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.93+0.12D=2.05)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.58+0.12D=5.70)

Estribos: 34x1Ø5c/0.14(4.72)

V 19 --- Grupo: 1

Tramo nº 1 (*V 7-V 2*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 1.155 cm.
(C/433)

Arm.sup: -----

Arm.inf: ----- 2.7 6.3 8.1 6.1 3.4 ----- 3.2(0.96) 8.6(2.21)
4.0(4.00)

Moment.: -0.0 3.8 8.6 10.6 8.3 4.8 -0.0 -0.0(0.00) 4.5(0.96) 11.1(2.21)
5.6(4.00) -0.0(5.00)

Cortant.: 5.1 3.7 5.1 -2.0 -3.5 -5.0 -6.4 6.6(x= 0.86)
-6.4(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+5.14+0.08D=5.30) -----

Arm.Inferior: 4Ø16(0.19D+5.14+0.19D=5.52), 1Ø12.5(4.10)

Estribos: 10x1Ø5c/0.12(1.20), 20x1Ø5c/0.14(2.80), 7x1Ø5c/0.12(0.80)

V 20 --- Grupo: 1

Tramo nº 1 (*V 1-P33*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.117 cm.
(C/1442)

Arm.sup: 1.2 1.2 1.2 1.4 2.0 2.2 1.3 1.2(0.52)
2.4(1.27)

Arm.inf: ----- 0.0(0.06)

Moment.: 0.0 -0.5 -1.2 -2.0 -2.9 -3.5 -2.5 0.0(0.00) 0.0(0.06) -0.4(0.35)
-3.5(1.39)

Cortant.: 0.0 -2.7 -2.8 -2.9 -3.0 ----- 0.0(x= 0.00)
-3.1(x= 1.27)

Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
1.27) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+1.65>>) -----

Arm.Inferior: 2Ø10(0.12D+1.65>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.033 cm.
(C/18449)

Arm.sup: 1.3 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(5.77)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.14) 1.2(3.00)
1.2(4.86)

Moment.: -2.5 -0.2 0.6 0.8 0.6 -0.2 -0.7 -2.5(0.00) 0.1(1.14) 0.8(3.00)

0.1(4.86) -0.8(5.77)

Cortant.: ----- 0.8 0.4 0.0 -0.4 -0.8 ----- 1.0(x= 0.40)
-1.0(x= 5.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.80+1.76=3.55) ----- 2Ø10(1.65>>)

Arm.Montagem: 2Ø5(3.10)

Arm.Inferior: 2Ø10(<<1.77+6.24=8.00)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.002 cm.
(C/180345)

Arm.sup: 1.2 1.2 ----- 1.2 1.4 1.2(0.06)
1.2(3.93)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)

Moment.: -0.7 -0.1 0.2 0.3 0.2 -0.2 -2.6 -0.7(x= 0.00) 0.3(x= 1.99)
-2.6(x= 3.98)

Cortant.: ----- 0.5 0.2 -0.0 -0.3 -0.5 ----- 0.6(x= 0.40)
-0.6(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.58) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.65+1.40=3.05) ----- 2Ø10(1.40>>), 1Ø12.5(0.80>>)

Arm.Montagem: 2Ø5(1.70)

Arm.Inferior: 2Ø10(4.35)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.113 cm.
(C/4427)

Arm.sup: 1.4 1.2 ----- 1.2 3.1 2.6(0.34)
3.1(4.94)

Arm.inf: ----- 2.1 2.5 1.6 1.2 ----- 1.2(0.95) 2.7(1.95)
1.2(4.03)

Moment.: -2.6 -1.4 2.9 3.6 2.2 -1.3 -6.1 -3.9(0.29) 0.1(0.95) 3.8(1.95)
0.1(4.03) -6.1(5.00)

Cortant.: ----- 4.8 3.3 -0.9 -2.4 -3.9 ----- 5.6(x= 0.40)
-4.6(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=

4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.40+1.65=3.05), 1Ø12.5(<<0.80+1.35=2.15) ----- 2Ø16(1.83>>), 1Ø10(1.02>>)

Arm.Montagem: 2Ø5(2.00)

Arm.Inferior: 2Ø16(5.16>>)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-V 6*) (C= 0.96) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.108 cm. (C/889)

Arm.sup: 3.1 3.9 4.2 3.3 1.9 1.2 1.2 4.2(0.29)
1.7(0.67)

Arm.inf: ----- 0.1(0.90)

Moment.: -6.1 -6.8 -6.3 -4.6 -2.6 -0.7 -0.0 -6.8(0.17) -0.7(0.76)
0.2(0.90) -0.0(0.96)

Cortant.: ----- 12.3 12.0 11.8 0.0 12.5(x= 0.40)
-0.0(x= 0.96)

Torsores: ----- 0.02 0.02 0.02 0.00 Extr. apoio: 0.02(x= 0.40) 0.02(x= 0.86) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.83+0.93+0.19D=2.95), 1Ø10(<<1.02+0.93=1.95) -----

Arm.Inferior: 2Ø16(<<5.16+0.93+0.21D=6.30)

Estribos: 7x1Ø8c/0.12(0.76)

V 21 --- Grupo: 1

Tramo nº 1 (*V 4-V 2*) (C= 2.79) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.039 cm. (C/7067)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.40) 1.2(1.39)
1.2(2.39)

Moment.: -0.0 1.0 1.5 1.7 1.5 1.0 0.0 -0.0(0.00) 1.0(0.46) 1.7(1.39)
1.0(2.32) 0.0(2.79)

Cortant.: 2.5 1.7 0.8 -0.0 -0.8 -1.7 -2.4 2.5(x= 0.00)
-2.4(x= 2.79)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 2.79) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.92+0.08D=3.08) -----

Arm.Inferior: 2Ø10(0.12D+2.92+0.12D=3.16)

Estribos: 19x1Ø5c/0.14(2.59)

V 22 --- Grupo: 1

Tramo nº 1 (*V 9- *) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.342 cm.
(C/1460)

Arm.sup: ----- 1.7 5.5
4.4(4.78)

Arm.inf: 0.3 2.6 4.0 3.4 1.4 ----- 2.9(0.98) 4.3(1.95)

Moment.: 0.4 3.6 5.6 4.8 2.0 -2.4 -7.6 -0.0(0.00) 4.0(0.98) 6.0(1.95)
-7.6(5.00)

Cortant.: 4.5 3.1 1.6 -2.6 -4.1 -5.6 -6.9 4.5(x= 0.00)
-6.9(x= 5.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.57=3.65) ----- 2Ø16(1.75>>), 2Ø10(1.00>>)

Arm.Inferior: 2Ø16(0.19D+5.07>>), 1Ø10(3.00)

Estribos: 29x1Ø5c/0.14(4.00), 7x1Ø5c/0.13(0.80)

Tramo nº 2 (* -V 2*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.792 cm.
(C/631)

Arm.sup: 5.5 1.2 ----- 5.5(0.00)

Arm.inf: ----- 3.7 5.9 4.8 2.8 ----- 1.2(0.96) 6.1(2.21)
3.3(4.00)

Moment.: -7.6 -0.6 5.2 8.1 6.7 3.9 0.0 -7.6(0.00) 0.4(0.96) 8.4(2.21)
4.6(4.00) 0.0(5.00)

Cortant.: -6.9 7.6 6.2 -1.0 -2.5 -4.0 -5.4 9.1(x= 0.00)
-6.9(x= 0.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.75+1.55=3.30), 2Ø10(<<1.00+1.00=2.00) -----
2Ø6.3(3.72+0.08D=3.80)

Arm.Inferior: 2Ø16(<<5.26+5.07+0.19D=10.52), 2Ø12.5(3.60)

Estribos: 11x1Ø6.3c/0.13(1.43), 20x1Ø6.3c/0.17(3.37)

Tramo nº 1 (*V 1-P33*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.136 cm.
(C/1236)

Arm.sup: 1.2 1.2 1.2 1.6 2.3 2.5 1.4 1.2(0.52)
2.7(1.27)

Arm.inf: ----- 0.0(0.06)

Moment.: 0.0 -0.5 -1.4 -2.3 -3.2 -3.9 -2.7 0.0(0.00) 0.0(0.06) -0.4(0.35)
-3.9(1.39)

Cortant.: 0.0 -3.0 -3.2 -3.3 -3.4 ----- 0.0(x= 0.00)
-3.4(x= 1.27)

Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
1.27) Lim.: 0.54

Arm.Superior: 2Ø16(0.19D+1.65>>) -----

Arm.Inferior: 2Ø10(0.12D+1.65>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.032 cm.
(C/18661)

Arm.sup: 1.4 1.2 ----- 1.2 1.2 1.3(0.06)
1.2(5.77)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.14) 1.2(3.00)
1.2(4.86)

Moment.: -2.7 -0.2 0.6 0.8 0.6 -0.2 -0.7 -2.7(0.00) 0.1(1.14) 0.8(3.00)
0.1(4.86) -0.8(5.77)

Cortant.: ----- 0.8 0.4 0.0 -0.4 -0.8 ----- 1.0(x= 0.40)
-1.0(x= 5.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
5.60) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.84+1.77=3.60) ----- 2Ø10(1.65>>)

Arm.Montagem: 2Ø5(3.10)

Arm.Inferior: 2Ø10(<<1.77+6.24=8.00)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm.
(C/91075)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(3.93)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)

Moment.: -0.7 -0.1 0.2 0.3 0.2 -0.1 -0.5 -0.7(x= 0.00) 0.3(x= 1.99) -0.5(x= 3.98)

Cortant.: ----- 0.5 0.3 -0.0 -0.3 -0.5 ----- 0.6(x= 0.40) -0.6(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.58) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.65+1.40=3.05) ----- 2Ø10(1.40>>)

Arm.Montagem: 2Ø5(1.75)

Arm.Inferior: 2Ø10(4.30)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm. (C/34065)

Arm.sup: 1.2 1.2 ----- ----- ----- 1.2 1.2 1.2(0.17) 1.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.50)

Moment.: -0.5 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.6(x= 0.17) 0.5(x= 2.50) -0.7(x= 5.00)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.6 ----- 0.8(x= 0.40) -0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.40+1.55=2.95) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.40)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm. (C/34201)

Arm.sup: 1.2 1.2 ----- ----- ----- 1.2 1.2 1.2(0.06) 1.2(4.71)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.50) 1.2(4.00)

Moment.: -0.7 -0.2 0.4 0.5 0.4 -0.2 -0.3 -0.7(0.00) 0.1(1.00) 0.5(2.50) 0.1(4.00) -0.5(4.71)

Cortant.: ----- 0.7 0.3 0.0 -0.3 -0.7 ----- 0.8(x= 0.40)
 -0.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.60) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(1.93+0.12D=2.05)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.58+0.12D=5.70)

Estribos: 34x1Ø5c/0.14(4.72)

V 24 --- Grupo: 1

Tramo nº 1 (*V 1-P33*) (C= 1.67) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.088 cm.
 (C/1913)

Arm.sup: 1.2 1.2 1.2 1.2 1.4 1.9 1.9 1.2(0.52)
 1.9(1.62)

Arm.inf: ----- 0.0(0.06)

Moment.: 0.0 -0.2 -0.7 -1.3 -2.0 -2.9 -3.7 0.0(0.00) 0.0(0.06) -0.2(0.35)
 -3.7(1.67)

Cortant.: 0.0 -1.4 -1.9 -2.4 -2.9 ----- 0.0(x= 0.00)
 -3.2(x= 1.27)

Torsores: 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 1.27) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+1.65>>) -----

Arm.Inferior: 2Ø10(0.12D+1.65>>)

Estribos: 11x1Ø5c/0.14(1.50)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.162 cm.
 (C/3709)

Arm.sup: 1.9 1.2 ----- 1.2 1.6 2.5(0.34)
 2.5(5.66)

Arm.inf: ----- 1.2 1.9 2.5 1.9 1.2 ----- 1.2(1.14) 2.5(3.00)
 1.2(4.86)

Moment.: -3.7 -1.0 2.6 3.6 2.6 -1.0 -3.1 -3.9(0.17) 0.5(1.14) 3.6(3.00)
 0.5(4.86) -3.8(5.77)

Cortant.: ----- 3.6 1.8 0.0 -1.8 -3.6 ----- 4.7(x= 0.40)
 -4.7(x= 5.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.80+1.76=3.55) ----- 2Ø12.5(1.75>>)

Arm.Montagem: 2Ø5(2.95)

Arm.Inferior: 2Ø10(<<1.77+6.19=7.95), 1Ø12.5(3.60)

Estribos: 41x1Ø5c/0.14(5.70)

Tramo nº 3 (*P32-P32*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.020 cm.
(C/19460)

Arm.sup: 1.6 1.2 ----- 1.2 1.3 1.5(0.06)
1.2(3.93)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.99)

Moment.: -3.1 -0.6 0.9 1.3 0.9 -0.6 -2.4 -3.1(x= 0.00) 1.3(x=
1.99) -2.4(x= 3.98)

Cortant.: ----- 2.4 1.2 0.0 -1.2 -2.4 ----- 2.9(x= 0.40)
-2.9(x= 3.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
3.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.75+1.45=3.20) ----- 2Ø12.5(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø10(4.35)

Estribos: 27x1Ø5c/0.14(3.73)

Tramo nº 4 (*P32-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.069 cm.
(C/7206)

Arm.sup: 1.3 1.2 ----- 1.2 1.6 1.6(0.34)
1.7(4.77)

Arm.inf: ----- 1.2 1.2 1.7 1.2 1.2 ----- 1.2(1.00) 1.7(2.50)
1.2(4.00)

Moment.: -2.4 -0.8 1.7 2.3 1.7 -0.8 -3.1 -2.6(0.17) 0.3(1.00) 2.3(2.50)
0.3(4.00) -3.1(5.00)

Cortant.: ----- 3.0 1.5 -0.0 -1.5 -3.0 ----- 3.8(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.40+1.55=2.95) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.35)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.072 cm.
(C/6919)

Arm.sup: 1.6 1.2 ----- 1.2 1.2 1.8(0.23)
1.6(4.66)

Arm.inf: ----- 1.3 1.7 1.2 ----- 1.2(0.99) 1.7(2.43)

Moment.: -3.1 -0.8 1.8 2.4 1.7 -0.8 -1.5 -3.1(0.00) 0.3(0.99) 2.4(2.43)
0.0(4.12) -2.4(4.71)

Cortant.: ----- 3.2 1.5 -0.1 -1.5 -3.0 ----- 4.0(x= 0.40)
-3.8(x= 4.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
4.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.85+0.15D=2.00)

Arm.Montagem: 2Ø5(2.45)

Arm.Inferior: 2Ø12.5(5.55+0.15D=5.70)

Estribos: 34x1Ø5c/0.14(4.75)

V 25 --- Grupo: 1

Tramo nº 1 (*V 1-V 9*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/26099)

Arm.sup: ----- 1.2 1.2
1.2(3.70)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(0.57) 1.2(1.42)

Moment.: 0.0 0.4 0.5 0.5 0.1 -0.4 -1.2 0.0(0.00) 0.4(0.66) 0.5(1.42)
-1.2(3.98)

Cortant.: 0.8 0.4 0.1 -0.3 -0.7 -1.0 -1.4 0.8(x= 0.00)
-1.4(x= 3.98)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 3.98) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.87=2.95) ----- 2Ø10(1.40>>)

Arm.Inferior: 2Ø10(0.12D+4.05>>)

Estribos: 27x1Ø5c/0.14(3.78)

Tramo nº 2 (*V 9-V 7*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.039 cm.
(C/12936)

Arm.sup:	1.2	1.2	-----	-----	-----	-----	1.2	1.2(0.00)
1.2(4.64)								
Arm.inf:	-----	1.2	1.2	1.2	1.2	1.2	-----	1.2(2.86)
1.2(4.29)								
Moment.:	-1.2	-0.2	0.5	0.7	0.6	0.2	-0.7	-1.2(0.00)
0.2(4.17)	-0.7(5.00)							0.7(2.86)
Cortant.:	-1.4	1.0	0.5	0.1	-0.3	-0.8	-1.2	1.4(x= 0.00)
-1.4(x= 0.00)								
Torsores:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 Extr. apoio:
0.00(x= 5.00)	Lim.: 0.54							0.00(x= 0.00)

Arm.Superior: 2Ø10(<<1.40+1.25=2.65) ----- 2Ø10(1.14>>)

Arm.Montagem: 2Ø5(3.10)

Arm.Inferior: 2Ø10(<<5.00>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*V 7-V 5*) (C= 1.32) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.007 cm.
(C/19447)

Arm.sup:	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2(0.00)
1.2(0.96)								
Arm.inf:	-----	-----	-----	-----	-----	-----	-----	-----
Moment.:	-0.7	-0.5	-0.3	-0.2	-0.1	-0.0	0.0	-0.7(0.00)
0.0(1.26)	0.0(1.32)							-0.0(1.05)
Cortant.:	-1.2	0.8	0.6	0.5	0.4	0.3	0.0	0.9(x= 0.00)
-1.2(x= 0.00)								
Torsores:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 Extr. apoio:
0.00(x= 1.22)	Lim.: 0.54							0.00(x= 0.00)

Arm.Superior: 2Ø10(<<1.14+1.29+0.12D=2.55) -----

Arm.Inferior: 2Ø10(<<9.17+1.29+0.15D=10.61)

Estribos: 9x1Ø5c/0.14(1.19)

Armadura de vigas
Obra: TRF-2 VARAS VERTICAL PARTE 3
Grupo no 2 Piso 2 --- Pisoigual 1

V 1 --- Grupo: 2

Tramo nº 1 (*P30-P30*) (C= 3.10) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.038 cm.
(C/8108)

Arm.sup: ----- 1.5 1.5 1.7 1.5 1.5 ----- 1.5 1.5(0.12)
1.5(3.04)

Arm.inf: ----- 1.5 1.5 1.7 1.5 1.5 ----- 1.5(0.62) 1.7(1.51)
1.5(2.49)

Moment.: 0.0 1.4 2.6 3.0 2.5 0.9 -0.8 -0.0(0.12) 1.7(0.62) 3.0(1.51)
1.3(2.49) -0.9(3.04)

Cortant.: 0.1 2.2 0.8 -0.7 -2.2 -3.7 ----- 3.0(x= 0.13)
-4.6(x= 3.00)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
3.00) Lim.: 0.72

Arm.Superior: 2Ø10(0.12D+3.21+0.12D=3.45) -----

Arm.Inferior: 2Ø12.5(0.15D+3.21+0.15D=3.51)

Estribos: 22x1Ø5c/0.14(2.97)

V 2 --- Grupo: 2

Tramo nº 1 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.204 cm.
(C/2445)

Arm.sup: 1.5 ----- 1.5 3.9 1.5(0.14)
4.2(4.87)

Arm.inf: ----- 1.5 2.9 3.3 2.0 ----- 1.6(0.99) 3.3(2.31)

Moment.: -1.2 2.2 5.3 5.9 3.7 -1.6 -7.8 -2.0(0.14) 2.9(0.99) 6.0(2.31)
-7.9(4.94)

Cortant.: ----- 4.8 2.0 -1.0 -4.1 -7.1 ----- 6.7(x= 0.20)
-8.8(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 2Ø10(0.12D+1.33=1.45) ----- 2Ø16(1.85>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø12.5(0.15D+5.40=5.55), 1Ø12.5(3.45)

Estribos: 28x1Ø5c/0.14(3.81), 9x1Ø5c/0.11(0.99)

Tramo nº 2 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.140 cm.
(C/3579)

Arm.sup: 3.9 1.5 ----- 1.5 3.2 3.9(0.02)

3.4(4.89)

Arm.inf: ----- 1.5 2.8 3.8 2.8 1.5 ----- 1.5(0.99) 3.8(2.49)
1.5(4.00)

Moment.: -7.8 -1.3 5.1 6.8 5.1 -1.1 -6.4 -7.8(0.00) 1.4(0.99) 6.8(2.49)
1.6(4.00) -6.5(4.94)

Cortant.: ----- 6.5 3.5 -0.0 -3.3 -6.0 ----- 8.2(x= 0.15)
-7.6(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.85+1.80=3.65), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø12.5(1.70>>),
1Ø12.5(1.15>>)

Arm.Montagem: 2Ø5(1.95)

Arm.Inferior: 2Ø16(5.45), 1Ø10(3.20)

Estribos: 7x1Ø5c/0.13(0.80), 29x1Ø5c/0.14(4.00)

Tramo nº 3 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.112 cm.
(C/4454)

Arm.sup: 3.2 1.5 ----- ----- 1.5 4.3 3.2(0.02)
4.4(4.89)

Arm.inf: ----- 1.5 3.1 3.8 2.7 1.5 ----- 1.5(0.99) 3.8(2.36)
1.5(4.00)

Moment.: -6.4 1.5 5.6 6.8 4.8 -2.2 -8.5 -6.4(0.00) 2.4(0.99) 6.8(2.36)
1.0(4.00) -8.5(5.00)

Cortant.: ----- 5.7 2.8 -0.4 -3.8 -6.7 ----- 7.5(x= 0.15)
-8.3(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 2Ø12.5(<<1.70+1.65=3.35), 1Ø12.5(<<1.15+1.00=2.15) ----- 2Ø12.5(1.85>>),
1Ø16(1.45>>)

Arm.Montagem: 2Ø5(1.95)

Arm.Inferior: 2Ø16(5.40), 1Ø10(3.50)

Estribos: 29x1Ø5c/0.14(4.00), 7x1Ø5c/0.13(0.80)

Tramo nº 4 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.289 cm.
(C/1727)

Arm.sup: 4.3 1.5 ----- ----- 1.5 4.4(0.09)
1.5(4.93)

Arm.inf: ----- ----- 2.3 3.9 3.8 2.1 ----- 4.0(2.86)

2.6(4.00)

Moment.: -8.5 -1.5 4.2 6.9 6.8 3.9 -0.6 -8.5(0.00) 7.2(2.86)
4.6(4.00) -1.0(4.93)

Cortant.: ----- 7.7 4.8 1.6 -1.5 -4.4 ----- 9.4(x= 0.15)
-6.6(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.01(x= 4.90) Lim.: 0.72

Arm.Superior: 2Ø12.5(<<1.85+1.75=3.60), 1Ø16(<<1.45+1.45=2.90) -----
2Ø10(1.18+0.12D=1.30)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø16(5.26+0.19D=5.45), 1Ø10(3.00)

Estribos: 11x1Ø5c/0.1(1.10), 27x1Ø5c/0.14(3.70)

V 3 --- Grupo: 2

Tramo nº 1 (*V 8-V 1*) (C= 4.77) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.756 cm.
(C/631)

Arm.sup: -----

Arm.inf: ----- 4.4 7.8 8.8 7.6 3.7 ----- 5.2(0.95) 8.8(2.27)
4.5(3.82)

Moment.: 0.0 8.0 13.7 15.2 13.5 6.7 0.0 0.0(0.00) 9.3(0.95) 15.2(2.27)
8.0(3.82) 0.0(4.77)

Cortant.: 9.8 8.7 4.8 -0.2 -7.2 -9.2 -8.7 9.9(x= 0.13)
-9.4(x= 4.13)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 4.77) Lim.: 0.72

Arm.Superior: 2Ø6.3(0.08D+4.90+0.08D=5.06) -----

Arm.Inferior: 2Ø20(0.26D+4.90+0.26D=5.42), 1Ø20(3.75)

Estribos: 8x1Ø6.3c/0.14(1.12), 9x1Ø6.3c/0.22(2.05), 10x1Ø6.3c/0.14(1.40)

V 4 --- Grupo: 2

Tramo nº 1 (*P30-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.324 cm.
(C/1541)

Arm.sup: 1.5 ----- 1.6 5.4 2.1(0.15)
6.1(4.83)

Arm.inf: ----- 1.8 4.6 4.9 2.8 ----- 2.5(0.99) 5.1(2.11)

Moment.: -2.5 3.2 8.2 8.8 5.1 -2.8 -11.2 -3.9(0.12) 4.4(0.99) 9.1(2.11)

-11.5(4.91)

Cortant.: ----- 8.0 3.2 -1.9 -6.6 -10.7 ----- 10.2(x= 0.18)
-13.5(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.80) Lim.: 0.72

Arm.Superior: 2Ø12.5(0.15D+1.50=1.65), 1Ø10(0.12D+1.18=1.30) ----- 3Ø16(1.85>>),
1Ø10(1.20>>)

Arm.Montagem: 2Ø6.3(2.35)

Arm.Inferior: 3Ø16(0.19D+5.41=5.60)

Estribos: 8x1Ø6.3c/0.13(1.04), 9x1Ø6.3c/0.22(1.98), 17x1Ø6.3c/0.1(1.70)

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.209 cm.
(C/2391)

Arm.sup: 5.4 1.5 ----- 1.5 4.7 5.4(0.03)
5.4(4.85)

Arm.inf: ----- 1.5 4.2 5.4 4.0 1.5 ----- 1.5(0.99) 5.4(2.36)
1.5(4.00)

Moment.: -11.2 -1.6 7.5 9.6 7.1 -2.2 -9.5 -11.2(0.00) 2.5(0.99) 9.7(2.36)
2.0(4.00)-10.1(4.90)

Cortant.: ----- 9.7 5.1 -0.3 -5.5 -9.7 ----- 12.5(x= 0.20)
-11.7(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x=
4.82) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.85+1.70=3.55), 1Ø10(<<1.20+1.05=2.25) ----- 2Ø16(1.85>>),
2Ø10(1.15>>)

Arm.Montagem: 2Ø6.3(1.90)

Arm.Inferior: 2Ø16(5.50), 2Ø10(3.00)

Estribos: 13x1Ø6.3c/0.11(1.43), 8x1Ø6.3c/0.22(1.85), 12x1Ø6.3c/0.12(1.44)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.207 cm.
(C/2420)

Arm.sup: 4.7 1.5 ----- 1.5 4.6 4.7(0.03)
5.3(4.85)

Arm.inf: ----- 1.5 3.9 5.0 3.7 1.5 ----- 1.5(0.99) 5.0(2.45)
1.5(4.00)

Moment.: -9.5 1.1 7.0 9.0 6.7 -2.1 -9.4 -9.5(0.00) 2.4(0.99) 9.0(2.45)
1.6(4.00)-10.0(4.90)

Cortant.: ----- 8.5 4.7 -0.1 -5.3 -9.7 ----- 10.0(x= 0.18)

-11.8(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.85+1.75=3.60), 2Ø10(<<1.15+1.00=2.15) ----- 3Ø16(1.80>>)

Arm.Montagem: 2Ø6.3(1.95)

Arm.Inferior: 3Ø16(5.50)

Estribos: 9x1Ø6.3c/0.14(1.26), 9x1Ø6.3c/0.22(1.95), 12x1Ø6.3c/0.12(1.44)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.205 cm. (C/2436)

Arm.sup: 4.6 1.5 ----- 1.7 5.8 4.6(0.03)
6.2(4.87)

Arm.inf: ----- 1.5 4.3 5.3 3.7 ----- 1.8(0.99) 5.3(2.36)
1.5(4.00)

Moment.: -9.4 1.9 7.8 9.5 6.6 -3.1 -11.9 -9.4(0.00) 3.2(0.99) 9.6(2.36)
1.1(4.00)-11.9(4.97)

Cortant.: ----- 8.7 4.5 -0.7 -5.9 -10.3 ----- 10.3(x= 0.18)
-12.4(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.80+1.60=3.40) ----- 3Ø16(1.85>>), 1Ø10(1.25>>)

Arm.Montagem: 2Ø6.3(2.00)

Arm.Inferior: 3Ø16(5.55)

Estribos: 9x1Ø6.3c/0.14(1.26), 8x1Ø6.3c/0.22(1.85), 14x1Ø6.3c/0.11(1.54)

Tramo nº 5 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.356 cm. (C/1403)

Arm.sup: 5.8 1.5 ----- 1.5 6.0(0.08)
1.5(4.91)

Arm.inf: ----- 2.9 4.9 4.7 2.3 ----- 5.1(2.86)
2.9(4.00)

Moment.: -11.9 -2.4 5.1 8.8 8.4 4.2 -1.0 -11.9(0.00) 9.1(2.86)
5.2(4.00) -1.7(4.91)

Cortant.: ----- 10.6 6.6 1.9 -2.7 -6.6 ----- 12.7(x= 0.18)
-7.7(x= 4.86)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.85+1.75=3.60), 1Ø10(<<1.25+1.00=2.25) ----- 2Ø10(1.18+0.12D=1.30)

Arm.Montagem: 2Ø6.3(2.55)

Arm.Inferior: 3Ø16(5.31+0.19D=5.50)

Estribos: 15x1Ø6.3c/0.11(1.65), 11x1Ø6.3c/0.22(2.27), 4x1Ø6.3c/0.2(0.80)

V 5 --- Grupo: 2

Tramo nº 1 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.306 cm. (C/1631)

Arm.sup: 1.5 ----- 1.5 4.6 2.1(0.15)
5.1(4.87)

Arm.inf: ----- 1.5 4.0 4.5 2.8 ----- 2.0(0.99) 4.6(2.36)
1.5(4.00)

Moment.: -2.5 2.4 7.1 8.0 5.1 -1.6 -9.3 -3.9(0.12) 3.6(0.99) 8.2(2.36)
0.1(4.00) -9.5(4.94)

Cortant.: ----- 7.5 3.3 -1.2 -5.6 -9.3 ----- 9.8(x= 0.18)
-11.6(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.85) Lim.: 0.72

Arm.Superior: 2Ø12.5(0.15D+1.50=1.65), 1Ø10(0.12D+1.18=1.30) ----- 2Ø16(1.75>>), 1Ø12.5(1.10>>)

Arm.Montagem: 2Ø6.3(2.40)

Arm.Inferior: 2Ø16(0.19D+5.46=5.65), 1Ø12.5(3.50)

Estribos: 7x1Ø6.3c/0.14(0.98), 11x1Ø6.3c/0.22(2.30), 12x1Ø6.3c/0.12(1.44)

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.124 cm. (C/4036)

Arm.sup: 4.6 1.5 ----- 1.5 3.2 4.6(0.02)
3.9(4.85)

Arm.inf: ----- 1.5 3.8 4.1 2.8 1.5 ----- 1.5(0.99) 4.3(1.88)
1.5(4.00)

Moment.: -9.3 1.4 6.9 7.3 5.1 -2.0 -6.5 -9.3(0.00) 2.6(0.99) 7.6(1.88)
1.5(4.00) -7.2(4.87)

Cortant.: ----- 8.1 3.6 -1.5 -3.9 -6.3 ----- 10.8(x= 0.15)
-7.7(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.75+1.70=3.45), 1Ø12.5(<<1.10+1.00=2.10) ----- 2Ø16(1.80>>), 1Ø10(1.20>>)

Arm.Montagem: 2Ø6.3(1.95)

Arm.Inferior: 2Ø16(5.40), 1Ø10(3.00)

Estribos: 9x1Ø6.3c/0.13(1.17), 16x1Ø6.3c/0.22(3.55)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.118 cm. (C/4247)

Arm.sup: 3.2 1.5 ----- 1.5 3.2 3.1(0.03)
4.0(4.85)

Arm.inf: ----- 1.5 2.8 3.5 2.5 1.5 ----- 1.5(0.99) 3.5(2.36)
1.5(4.00)

Moment.: -6.5 1.0 5.0 6.3 4.6 -1.6 -6.5 -6.5(0.00) 1.8(0.99) 6.4(2.36)
0.9(4.00) -7.4(4.87)

Cortant.: ----- 5.8 3.2 -0.3 -3.8 -7.0 ----- 6.5(x= 0.18)
-9.0(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.80+1.60=3.40), 1Ø10(<<1.20+1.00=2.20) ----- 3Ø10(1.75>>), 2Ø10(1.20>>)

Arm.Montagem: 2Ø5(2.10)

Arm.Inferior: 2Ø12.5(5.45), 1Ø12.5(3.15)

Estribos: 27x1Ø5c/0.14(3.77), 8x1Ø5c/0.11(0.88)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.097 cm. (C/5153)

Arm.sup: 3.2 1.5 ----- 1.5 4.5 3.1(0.03)
4.7(4.87)

Arm.inf: ----- 1.5 3.1 3.6 2.4 ----- 1.5(0.99) 3.7(2.36)
1.5(4.00)

Moment.: -6.5 1.9 5.7 6.6 4.4 -2.7 -9.0 -6.5(0.00) 2.8(0.99) 6.6(2.36)
0.5(4.00) -9.1(4.95)

Cortant.: ----- 5.6 2.8 -0.7 -4.3 -7.4 ----- 7.1(x= 0.18)
-9.3(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 3Ø10(<<1.75+1.55=3.30), 2Ø10(<<1.20+1.00=2.20) ----- 2Ø16(1.95>>), 1Ø10(1.50>>)

Arm.Montagem: 2Ø5(2.00)

Arm.Inferior: 2Ø12.5(5.50), 1Ø12.5(3.55)

Estribos: 26x1Ø5c/0.14(3.66), 9x1Ø5c/0.11(0.99)

Tramo nº 5 (*P31-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.267 cm.
(C/1874)

Arm.sup: 4.5 1.5 ----- 1.5 4.5(0.08)
1.5(4.93)

Arm.inf: ----- 2.3 3.9 3.7 1.9 ----- 4.0(2.86)
2.4(4.00)

Moment.: -9.0 -1.6 4.1 7.0 6.7 3.4 -0.7 -9.0(0.00) 7.3(2.86)
4.2(4.00) -1.2(4.93)

Cortant.: ----- 8.1 5.1 1.5 -2.1 -5.2 ----- 10.1(x= 0.18)
-6.2(x= 4.86)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.90) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.95+1.75=3.70), 1Ø10(<<1.50+1.45=2.95) ----- 2Ø10(1.18+0.12D=1.30)

Arm.Montagem: 2Ø6.3(2.60)

Arm.Inferior: 2Ø16(5.26+0.19D=5.45), 1Ø10(3.00)

Estribos: 8x1Ø6.3c/0.14(1.12), 17x1Ø6.3c/0.22(3.60)

V 6 --- Grupo: 2

Tramo nº 1 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.435 cm.
(C/1150)

Arm.sup: 1.5 ----- 1.5 6.2 2.3(0.15)
6.5(4.91)

Arm.inf: ----- 1.9 5.1 5.7 3.6 ----- 2.7(0.99) 5.8(2.32)
1.5(4.00)

Moment.: -2.8 3.5 9.2 10.2 6.5 -1.7 -11.9 -4.3(0.12) 4.9(0.99) 10.4(2.32)
0.3(4.00)-12.1(4.96)

Cortant.: ----- 9.1 3.9 -1.6 -6.9 -11.6 ----- 12.0(x= 0.18)
-13.8(x= 4.86)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.90) Lim.: 0.72

Arm.Superior: 2Ø12.5(0.15D+1.50=1.65) ----- 1Ø10(1.10>>), 3Ø16(1.75>>)

Arm.Montagem: 2Ø6.3(2.50)

Arm.Inferior: 2Ø16(0.19D+5.46=5.65), 1Ø16(3.70)

Estribos: 10x1Ø6.3c/0.11(1.10), 11x1Ø6.3c/0.19(2.02), 16x1Ø6.3c/0.1(1.60)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.215 cm.
(C/2330)

Arm.sup: 6.2 1.5 ----- 1.5 5.0 6.1(0.01)
5.3(4.89)

Arm.inf: ----- 1.5 4.2 5.7 4.6 1.5 ----- 1.5(0.99) 5.7(2.61)
2.0(4.00)

Moment.: -11.9 -2.2 7.6 10.2 8.3 2.1 -10.0 -11.9(0.00) 2.3(0.99) 10.2(2.61)
3.6(4.00)-10.1(4.96)

Cortant.: ----- 9.9 5.5 0.4 -4.7 -9.8 ----- 12.1(x= 0.10)
-13.4(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 1Ø10(<<1.10+1.10=2.20), 3Ø16(<<1.75+2.10=3.85) ----- 2Ø16(1.65>>),
1Ø16(1.15>>)

Arm.Montagem: 2Ø6.3(2.05)

Arm.Inferior: 2Ø16(5.70), 1Ø16(3.35)

Estribos: 12x1Ø6.3c/0.12(1.44), 9x1Ø6.3c/0.22(1.96), 14x1Ø6.3c/0.1(1.40)

Tramo nº 3 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.240 cm.
(C/2085)

Arm.sup: 5.0 1.5 ----- 1.5 4.6 5.1(0.04)
5.0(4.89)

Arm.inf: ----- 1.5 4.0 5.2 4.1 1.5 ----- 1.5(0.99) 5.2(2.56)
1.5(4.00)

Moment.: -10.0 -1.1 7.2 9.4 7.3 1.1 -9.2 -10.0(0.00) 2.4(0.99) 9.4(2.56)
2.6(4.00) -9.3(4.96)

Cortant.: ----- 9.3 4.9 0.0 -4.9 -9.4 ----- 12.3(x= 0.15)
-12.4(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.65+1.65=3.30), 1Ø16(<<1.15+1.05=2.20) ----- 2Ø16(1.70>>),
1Ø12.5(1.30>>)

Arm.Montagem: 2Ø6.3(2.10)

Arm.Inferior: 2Ø16(5.40), 1Ø12.5(3.00)

Estribos: 13x1Ø6.3c/0.11(1.43), 9x1Ø6.3c/0.22(1.94), 13x1Ø6.3c/0.11(1.43)

Tramo nº 4 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.163 cm. (C/3061)

Arm.sup: 4.6 1.5 ----- 2.0 6.4 4.6(0.02)
6.6(4.89)

Arm.inf: ----- 1.5 4.5 5.3 3.7 ----- 2.2(0.99) 5.4(2.36)
1.5(4.00)

Moment.: -9.2 2.6 8.1 9.6 6.7 -3.6 -13.2 -9.2(0.00) 3.9(0.99) 9.7(2.36)
1.4(4.00)-13.2(5.00)

Cortant.: ----- 8.5 4.1 -0.8 -5.8 -10.5 ----- 11.5(x= 0.15)
-13.9(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x= 4.80) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.70+1.65=3.35), 1Ø12.5(<<1.30+1.15=2.45) ----- 3Ø16(1.90>>),
1Ø12.5(1.20>>)

Arm.Montagem: 2Ø6.3(1.90)

Arm.Inferior: 2Ø16(5.60), 1Ø16(3.20)

Estribos: 10x1Ø6.3c/0.12(1.20), 10x1Ø6.3c/0.22(2.10), 15x1Ø6.3c/0.1(1.50)

Tramo nº 5 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.455 cm. (C/1098)

Arm.sup: 6.4 1.5 ----- 1.5 6.7(0.11)
1.5(4.91)

Arm.inf: ----- 3.5 5.7 5.5 2.8 ----- 1.5(0.99) 5.9(2.86)
3.5(4.00)

Moment.: -13.2 -2.2 6.3 10.3 9.8 5.0 -1.5 -13.3(0.03) 0.0(0.99) 10.7(2.86)
6.2(4.00) -2.5(4.91)

Cortant.: ----- 12.5 7.3 2.1 -3.1 -7.9 ----- 17.0(x= 0.20)
-10.8(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.01(x= 4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.90+1.70=3.60), 1Ø12.5(<<1.20+1.20=2.40) -----
2Ø10(1.18+0.17D=1.35)

Arm.Montagem: 2Ø8(2.60)

Arm.Inferior: 2Ø16(5.41+0.19D=5.60), 1Ø16(4.05)

Estribos: 7x1Ø8c/0.12(0.84), 27x1Ø8c/0.15(3.96)

V 7 --- Grupo: 2

Tramo nº 1 (*P32-P32*) (C= 4.90) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.386 cm. (C/1271)

Arm.sup: 1.5 ----- 1.9 6.0 1.5(0.03)
7.0(4.73)

Arm.inf: ----- 3.8 5.6 5.2 2.7 ----- 4.3(0.98) 5.7(1.99)

Moment.: -0.3 6.8 10.0 9.4 4.9 -3.4 -12.3 -0.3(0.00) 7.7(0.98) 10.3(1.99)
-13.0(4.79)

Cortant.: 1.0 6.4 1.7 -3.0 -7.6 -12.1 ----- 22.3(x= 0.12)
-15.9(x= 4.70)

Torsores: 0.05 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.05(x= 0.00) 0.00(x= 4.70) Lim.: 0.72

Arm.Superior: 2Ø12.5(0.15D+3.45=3.60) ----- 3Ø16(1.80>>), 2Ø10(1.15>>)

Arm.Inferior: 3Ø16(0.36D+5.24=5.60)

Estribos: 5x1Ø12.5c/0.19(0.77), 18x1Ø12.5c/0.22(4.00)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.156 cm. (C/3196)

Arm.sup: 6.0 1.5 ----- 1.5 4.9 5.9(0.03)
5.2(4.86)

Arm.inf: ----- 1.5 3.9 5.1 4.1 1.5 ----- 1.5(0.99) 5.1(2.61)
1.6(4.00)

Moment.: -12.3 -2.4 7.0 9.2 7.4 -1.8 -10.1 -12.3(0.00) 2.2(0.99) 9.2(2.61)
2.9(4.00)-10.2(4.97)

Cortant.: ----- 9.3 5.0 0.2 -4.6 -9.3 ----- 12.5(x= 0.20)
-13.2(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x= 4.80) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.80+1.80=3.60), 2Ø10(<<1.15+1.00=2.15) ----- 2Ø16(1.75>>), 1Ø12.5(1.15>>)

Arm.Montagem: 2Ø6.3(1.90)

Arm.Inferior: 3Ø16(5.35)

Estribos: 13x1Ø6.3c/0.11(1.43), 9x1Ø6.3c/0.22(2.07), 13x1Ø6.3c/0.1(1.30)

Tramo nº 3 (*P32-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.273 cm. (C/1829)

Arm.sup: 4.9 1.5 ----- 1.5 5.7 5.0(0.06)
6.2(4.86)

Arm.inf: ----- 1.5 4.3 5.7 4.7 1.5 ----- 1.5(0.99) 5.8(2.61)
1.5(4.00)

Moment.: -10.1 1.3 7.8 10.3 8.4 -1.8 -11.7 -10.1(0.00) 2.7(0.99) 10.4(2.61)
2.5(4.00)-11.9(4.91)

Cortant.: ----- 9.6 5.3 0.6 -5.6 -12.0 ----- 12.8(x= 0.20)
-15.8(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x=
4.80) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.75+1.65=3.40), 1Ø12.5(<<1.15+1.00=2.15) ----- 3Ø16(1.70>>),
1Ø12.5(1.35>>)

Arm.Montagem: 2Ø10(2.10)

Arm.Inferior: 2Ø16(5.60), 1Ø16(3.35)

Estribos: 19x1Ø10c/0.22(4.00), 4x1Ø10c/0.21(0.80)

Tramo nº 4 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.211 cm.
(C/2373)

Arm.sup: 5.7 1.5 ----- 2.1 6.5 5.7(0.03)
6.7(4.89)

Arm.inf: ----- 1.5 5.2 5.9 4.0 ----- 2.3(0.99) 6.0(2.33)
1.5(4.00)

Moment.: -11.7 2.4 9.4 10.6 7.2 -3.7 -13.4 -11.7(0.00) 4.1(0.99) 10.8(2.33)
1.5(4.00)-13.4(5.00)

Cortant.: ----- 10.8 4.9 -1.5 -6.4 -10.8 ----- 14.4(x= 0.20)
-14.2(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x=
4.80) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.70+1.65=3.35), 1Ø12.5(<<1.35+1.10=2.45) ----- 3Ø16(1.90>>),
1Ø12.5(1.35>>)

Arm.Montagem: 2Ø8(1.90)

Arm.Inferior: 3Ø16(5.45), 1Ø12.5(3.20)

Estribos: 6x1Ø8c/0.14(0.80), 27x1Ø8c/0.15(4.00)

Tramo nº 5 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.450 cm.
(C/1112)

Arm.sup: 6.5 1.5 ----- 1.5 6.7(0.11)
1.5(4.93)

Arm.inf: ----- 3.3 5.6 5.5 3.1 ----- 5.9(2.86)
 3.7(4.00)

Moment.: -13.4 -2.4 5.9 10.1 9.9 5.5 -1.2 -13.4(0.00) 10.6(2.86)
 6.7(4.00) -1.9(4.93)

Cortant.: ----- 12.2 7.3 2.4 -2.6 -7.5 ----- 16.5(x= 0.20)
 -11.7(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x= 4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.90+1.75=3.65), 1Ø12.5(<<1.35+1.05=2.40) -----
 2Ø10(1.18+0.12D=1.30)

Arm.Montagem: 2Ø8(2.60)

Arm.Inferior: 2Ø16(5.46+0.19D=5.65), 1Ø16(4.20)

Estribos: 7x1Ø8c/0.12(0.84), 27x1Ø8c/0.15(3.96)

V 8 --- Grupo: 2

Tramo nº 1 (*V 7-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.539 cm.
 (C/1114)

Arm.sup: ----- 1.5 4.5 1.5(0.00)
 5.7(5.85)

Arm.inf: ----- 2.3 4.5 4.8 2.9 ----- 2.8(1.19) 4.9(2.69)

Moment.: -0.1 4.1 8.1 8.6 5.3 -1.8 -9.2 -0.1(0.00) 5.1(1.19) 8.9(2.69)
 -10.4(5.87)

Cortant.: 0.8 4.7 1.9 -1.4 -4.9 -8.2 ----- 5.1(x= 0.70)
 -11.0(x= 5.82)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.01(x= 5.82) Lim.: 0.72

Arm.Superior: 2Ø10(0.12D+1.43=1.55) ----- 2Ø16(2.00>>), 1Ø16(1.40>>)

Arm.Montagem: 2Ø6.3(3.15)

Arm.Inferior: 2Ø16(0.19D+6.41=6.60), 1Ø12.5(5.10)

Estribos: 20x1Ø6.3c/0.22(4.29), 11x1Ø6.3c/0.13(1.43)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.009 cm.
 (C/46088)

Arm.sup: 4.5 1.9 1.5 ----- 1.5 1.9 4.4(0.03)
 1.8(3.96)

Arm.inf: ----- 1.5 2.0 1.9 1.5 ----- 2.1(2.26)
 1.5(3.20)

Moment.: -9.2 -3.5 1.8 3.6 3.5 1.6 -3.8 -9.2(0.00) 3.8(2.26)
 2.0(3.20) -3.8(3.98)

Cortant.: ----- 5.5 3.6 1.3 -1.3 -3.3 ----- 6.9(x= 0.18)
 -4.5(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.18) 0.01(x= 3.81) Lim.: 0.72

Arm.Superior: 2Ø16(<<2.00+2.20=4.20), 1Ø16(<<1.40+0.80=2.20) ----- 2Ø12.5(2.00>>), 1Ø10(0.80>>)

Arm.Inferior: 2Ø12.5(4.35)

Estribos: 26x1Ø5c/0.14(3.63)

Tramo nº 3 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.079 cm. (C/6318)

Arm.sup: 1.9 1.5 ----- 1.5 4.0 2.3(0.15)
 4.0(4.97)

Arm.inf: ----- 1.5 2.5 3.0 2.0 ----- 1.5(0.99) 3.0(2.35)
 1.5(4.01)

Moment.: -3.8 1.4 4.5 5.3 3.6 -2.0 -8.1 -4.2(0.10) 2.1(0.99) 5.4(2.35)
 0.5(4.01) -8.1(5.00)

Cortant.: ----- 4.6 2.2 -0.5 -3.2 -5.6 ----- 6.3(x= 0.18)
 -7.3(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 2Ø12.5(<<2.00+1.55=3.55), 1Ø10(<<0.80+1.10=1.90) ----- 2Ø16(1.90>>), 1Ø10(1.35>>)

Arm.Montagem: 2Ø5(2.00)

Arm.Inferior: 2Ø12.5(5.30), 1Ø10(3.00)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.316 cm. (C/1584)

Arm.sup: 4.0 1.5 ----- 5.0 4.6(0.15)
 5.0(4.99)

Arm.inf: ----- 1.5 3.4 5.1 5.1 2.3 ----- 1.5(0.99) 5.3(2.97)
 3.5(4.02)

Moment.: -8.1 -1.7 6.1 9.2 9.2 4.2 -9.6 -8.6(0.10) 1.3(0.99) 9.6(2.97)
 6.3(4.02) -9.6(5.00)

Cortant.: ----- 8.1 5.0 1.8 -1.6 -14.0 ----- 10.3(x= 0.18)

-14.6(x= 4.47)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.02(x= 0.18) 0.02(x= 4.90) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.90+1.75=3.65), 1Ø10(<<1.35+1.45=2.80) ----- 2Ø16(1.54>>), 2Ø10(1.00>>)

Arm.Montagem: 2Ø10(2.15)

Arm.Inferior: 3Ø16(5.50)

Estribos: 18x1Ø10c/0.22(3.88), 4x1Ø10c/0.21(0.84)

Tramo nº 5 (*P30-V 1*) (C= 2.60) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.246 cm. (C/1055)

Arm.sup: 5.0 4.0 2.4 1.5 1.5 1.5 1.5 5.4(0.10)
1.5(1.74)

Arm.inf: ----- 0.0(2.53)

Moment.: -9.6 -7.2 -4.3 -2.2 -0.9 -0.3 0.0 -9.9(0.06) -0.2(2.08)
0.0(2.53) 0.0(2.60)

Cortant.: ----- 7.2 6.0 4.5 3.0 1.7 0.0 7.3(x= 0.22)
-0.0(x= 2.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.02(x= 0.10) 0.00(x= 2.50) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.54+2.57+0.19D=4.30), 2Ø10(<<1.00+1.10=2.10) -----

Arm.Inferior: 2Ø12.5(2.80+0.15D=2.95)

Estribos: 18x1Ø5c/0.14(2.47)

V 9 --- Grupo: 2

Tramo nº 1 (*V 3-P30*) (C= 3.57) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.087 cm. (C/4087)

Arm.sup: ----- 1.5
1.5(3.48)

Arm.inf: ----- 1.7 2.6 2.6 1.9 1.5 ----- 1.9(0.70) 2.7(1.54)
1.5(2.86)

Moment.: 0.0 3.1 4.6 4.7 3.4 0.9 -1.2 0.0(0.00) 3.5(0.70) 4.9(1.54)
1.4(2.86) -2.1(3.48)

Cortant.: 6.3 3.6 1.3 -1.1 -3.2 -5.0 ----- 6.3(x= 0.00)
-6.1(x= 3.47)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x= 3.47) Lim.: 0.72

Arm.Superior: 2Ø10(0.17D+3.70+0.13D=4.00) -----

Arm.Inferior: 2Ø16(0.19D+3.70+0.19D=4.08)

Estribos: 25x1Ø5c/0.14(3.37)

V 10 --- Grupo: 2

Tramo nº 1 (* -P32*) (C= 1.68) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.080 cm.
(C/2106)

Arm.sup: 1.5 1.5 1.5 1.5 2.1 3.0 3.8 1.5(0.56)
3.8(1.66)

Arm.inf: -----

Moment.: 0.0 -0.5 -1.3 -2.5 -3.8 -5.4 -7.4 0.0(0.00) 0.0(0.00) -0.2(0.34)
-7.4(1.68)

Cortant.: -1.3 -2.2 -3.3 -4.2 -4.9 -5.2 ----- -0.5(x= 0.00)
-5.4(x= 1.58)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
1.58) Lim.: 0.72

Arm.Superior: 2Ø16(0.19D+1.65>>) ----- 1Ø10(0.95>>)

Arm.Inferior: 3Ø16(0.19D+1.64>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.887 cm.
(C/676)

Arm.sup: 3.8 ----- 1.5 7.5 4.2(0.07)
9.1(5.83)

Arm.inf: ----- 2.5 7.1 8.4 5.5 ----- 3.6(1.19) 8.5(2.72)
1.5(4.81)

Moment.: -7.4 4.5 12.7 14.6 9.9 -1.5 -15.5 -7.7(0.06) 6.4(1.19) 14.7(2.72)
1.3(4.81)-16.4(5.89)

Cortant.: ----- 10.5 4.9 -1.3 -7.7 -13.8 ----- 14.0(x= 0.10)
-20.9(x= 5.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.80) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.84+1.51=3.35), 1Ø10(<<0.95+1.20=2.15) ----- 1Ø16(1.65>>),
1Ø16(1.65>>), 3Ø16(2.02>>)

Arm.Montagem: 2Ø10(2.95)

Arm.Inferior: 3Ø16(<<1.83+6.32=8.15), 2Ø12.5(3.85)

Estribos: 21x1Ø10c/0.22(4.60), 8x1Ø10c/0.15(1.20)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= -0.005 cm.
(C/-80425)

Arm.sup: 7.5 3.8 1.5 ----- 1.5 2.9 7.5(0.03)
2.9(3.94)

Arm.inf: ----- 1.6 3.3 3.2 1.5 ----- 3.5(2.31)
1.9(3.20)

Moment.: -15.5 -6.8 2.8 5.9 5.8 2.8 -5.6 -15.5(0.00) 6.3(2.31)
3.5(3.20) -5.6(3.98)

Cortant.: ----- 10.0 6.3 2.3 -2.4 -5.8 ----- 12.4(x= 0.20)
-7.6(x= 3.88)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.20) 0.00(x=
3.88) Lim.: 0.72

Arm.Superior: 1Ø16(<<1.65+1.20=2.85), 1Ø16(<<1.65+1.20=2.85), 3Ø16(<<3.98>>) -----

Arm.Inferior: 2Ø16(4.50), 1Ø12.5(4.25)

Estribos: 12x1Ø6.3c/0.11(1.32), 11x1Ø6.3c/0.22(2.46)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.183 cm.
(C/2729)

Arm.sup: 2.9 ----- 2.8 8.4 2.9(0.04)
8.4(4.96)

Arm.inf: ----- 2.6 5.2 5.5 3.3 ----- 3.3(0.99) 5.6(2.22)
1.5(4.01)

Moment.: -5.6 4.7 9.3 9.8 6.0 -5.0 -15.8 -5.6(0.00) 5.9(0.99) 10.2(2.22)
0.0(4.01)-15.8(5.00)

Cortant.: ----- 7.2 3.0 -1.9 -6.7 -10.9 ----- 9.8(x= 0.10)
-14.1(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<6.00+1.50=7.50) ----- 3Ø16(2.35>>), 1Ø16(1.30>>), 1Ø16(1.30>>)

Arm.Montagem: 2Ø10(1.80)

Arm.Inferior: 3Ø16(5.65)

Estribos: 6x1Ø6.3c/0.14(0.84), 11x1Ø6.3c/0.2(2.26), 17x1Ø6.3c/0.1(1.70)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.708 cm. (C/706)

Arm.sup: 8.4 1.5 ----- 1.5 9.0(0.09)
1.8(4.91)

Arm.inf: ----- 5.0 8.7 9.8 5.7 ----- 1.5(0.99) 9.8(3.22)
7.4(4.01)

Moment.: -15.8 -2.1 9.0 15.1 16.6 10.3 -2.0 -15.9(0.04) 0.7(0.99) 16.6(3.22)
13.1(4.01) -3.4(4.93)

Cortant.: ----- 15.3 9.8 4.2 -0.8 -17.7 ----- 19.3(x= 0.10)
-18.9(x= 3.94)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<2.35+1.90=4.25), 1Ø16(<<1.30+1.55=2.85), 1Ø16(<<1.30+1.55=2.85)
----- 2Ø12.5(3.60+0.15D=3.75)

Arm.Inferior: 3Ø16(5.46+0.19D=5.65), 2Ø16(5.46+0.19D=5.65)

Estribos: 7x1Ø10c/0.17(1.19), 10x1Ø10c/0.22(2.26), 9x1Ø10c/0.15(1.35)

V 11 --- Grupo: 2

Tramo nº 1 (* -P32*) (C= 1.68) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.072 cm. (C/2324)

Arm.sup: 1.5 1.5 1.5 1.5 2.0 2.8 3.7 1.5(0.56)
3.6(1.66)

Arm.inf: -----

Moment.: 0.0 -0.5 -1.2 -2.3 -3.5 -5.0 -7.1 0.0(0.00) 0.0(0.00) -0.2(0.34)
-7.1(1.68)

Cortant.: -1.2 -2.0 -3.0 -3.9 -4.5 -4.9 ----- -0.4(x= 0.00)
-5.1(x= 1.58)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
1.58) Lim.: 0.72

Arm.Superior: 2Ø16(0.19D+1.65>>) ----- 1Ø10(0.70>>)

Arm.Inferior: 4Ø16(0.19D+1.64>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.933 cm. (C/643)

Arm.sup: 3.7 ----- 7.2 4.1(0.09)
7.3(5.94)

Arm.inf: ----- 2.4 7.1 8.6 6.1 1.5 ----- 3.5(1.19) 8.7(2.95)
 1.7(4.81)

Moment.: -7.1 4.3 12.6 14.9 10.9 0.8 -13.8 -7.6(0.06) 6.3(1.19) 15.0(2.95)
 3.1(4.81)-13.8(6.00)

Cortant.: ----- 10.5 5.1 -0.8 -6.8 -12.3 ----- 13.7(x= 0.10)
 -16.3(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.90) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.84+1.51=3.35), 1Ø10(<<0.70+1.20=1.90) ----- 4Ø16(1.67>>)

Arm.Montagem: 2Ø8(3.30)

Arm.Inferior: 4Ø16(<<1.83+6.27=8.10), 1Ø16(4.25)

Estribos: 33x1Ø8c/0.15(4.84), 8x1Ø8c/0.12(0.96)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= -0.066 cm.
 (C/-6026)

Arm.sup: 7.2 4.6 1.9 1.5 ----- 1.5 2.2 7.7(0.10)
 2.1(3.96)

Arm.inf: ----- 1.5 2.0 2.4 1.8 0.3 2.4(2.69)
 2.0(3.19)

Moment.: -13.8 -8.2 -3.5 3.5 4.4 3.1 -4.4 -13.8(0.03) 4.4(2.69)
 3.6(3.19) -4.4(3.98)

Cortant.: ----- 7.9 5.5 2.7 -0.4 -3.5 ----- 9.8(x= 0.10)
 -5.4(x= 3.70)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.81) Lim.: 0.72

Arm.Superior: 4Ø16(<<3.98>>) -----

Arm.Inferior: 2Ø12.5(4.60)

Estribos: 8x1Ø5c/0.11(0.80), 21x1Ø5c/0.14(2.91)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.112 cm.
 (C/4463)

Arm.sup: 2.2 ----- 1.5 2.5 7.3 2.5(0.13)
 7.2(4.97)

Arm.inf: 0.3 2.1 4.2 4.3 2.5 ----- 2.6(0.99) 4.5(2.22)

Moment.: -4.4 3.7 7.5 7.7 4.4 -4.5 -14.9 -4.7(0.08) 4.7(0.99) 8.1(2.22)
 -14.9(5.00)

Cortant.: ----- 6.2 2.3 -1.7 -5.6 -8.7 ----- 9.2(x= 0.18)
 -11.4(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 4Ø16(<<5.65+1.40=7.05) ----- 3Ø16(2.55>>), 1Ø16(1.00>>), 1Ø16(1.00>>)

Arm.Montagem: 2Ø10(1.55)

Arm.Inferior: 2Ø16(5.50), 1Ø10(5.30)

Estribos: 6x1Ø6.3c/0.14(0.80), 12x1Ø6.3c/0.22(2.55), 10x1Ø6.3c/0.13(1.30)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.623 cm. (C/802)

Arm.sup: 7.3 2.1 ----- 1.5 9.2(0.15)
1.5(4.93)

Arm.inf: ----- 4.4 8.4 8.3 4.4 ----- 9.0(2.97)
5.4(4.01)

Moment.: -14.9 -3.7 7.8 14.6 14.4 8.0 -1.3 -16.2(0.13) 15.4(2.97)
9.7(4.01) -2.0(4.93)

Cortant.: ----- 15.3 10.7 4.1 -4.0 -10.5 ----- 20.0(x= 0.18)
-13.7(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<2.55+2.00=4.55), 1Ø16(<<1.00+1.70=2.70), 1Ø16(<<1.00+1.70=2.70)
----- 2Ø10(3.38+0.12D=3.50)

Arm.Inferior: 4Ø16(5.44+0.26D=5.70), 1Ø16(5.44+0.26D=5.70)

Estribos: 13x1Ø8c/0.1(1.30), 18x1Ø8c/0.15(2.62), 6x1Ø8c/0.14(0.80)

V 12 --- Grupo: 2

Tramo nº 1 (* -P33*) (C= 1.68) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.127 cm. (C/1326)

Arm.sup: 1.5 1.5 1.5 1.8 3.0 4.2 5.1 1.5(0.56)
5.1(1.62)

Arm.inf: -----

Moment.: 0.0 -0.6 -1.6 -3.3 -5.3 -7.6 -9.8 0.0(0.00) 0.0(0.00) -0.3(0.34)
-9.8(1.68)

Cortant.: -1.4 -2.7 -4.7 -6.3 -7.3 -8.0 ----- -0.6(x= 0.00)
-8.3(x= 1.58)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x= 1.58) Lim.: 0.72

Arm.Superior: 3Ø16(0.19D+1.65>>) -----

Arm.Inferior: 2Ø16(0.19D+1.64>>)

Estribos: 12x1Ø5c/0.13(1.55)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.796 cm.
(C/754)

Arm.sup: 5.1 ----- 5.8 5.2(0.06)
6.1(5.93)

Arm.inf: ----- 2.0 6.4 7.6 5.4 1.5 ----- 3.1(1.19) 7.6(2.78)
1.7(4.81)

Moment.: -9.8 3.5 11.6 13.4 9.7 1.0 -11.2 -9.8(0.01) 5.6(1.19) 13.4(2.78)
3.0(4.81)-11.3(5.97)

Cortant.: ----- 11.0 4.4 -0.9 -5.9 -10.4 ----- 14.3(x= 0.10)
-13.6(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<1.84+1.56=3.40) ----- 3Ø16(1.67>>), 1Ø16(1.30>>)

Arm.Montagem: 2Ø8(3.25)

Arm.Inferior: 2Ø16(<<1.83+6.42=8.25), 2Ø16(4.50)

Estribos: 6x1Ø8c/0.14(0.80), 34x1Ø8c/0.15(5.00)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= -0.031 cm.
(C/-12784)

Arm.sup: 5.8 3.3 1.5 ----- 1.5 1.8 5.9(0.06)
1.8(3.96)

Arm.inf: ----- 1.5 2.1 2.3 1.5 0.2 2.3(2.45)
1.6(3.19)

Moment.: -11.2 -6.0 -1.9 3.8 4.0 2.5 -3.7 -11.2(0.00) 4.2(2.45)
3.0(3.19) -3.7(3.98)

Cortant.: ----- 6.9 4.5 1.8 -0.9 -3.1 ----- 8.6(x= 0.10)
-4.1(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
3.81) Lim.: 0.72

Arm.Superior: 3Ø16(<<3.98>>), 1Ø16(<<1.30+1.40=2.70) -----

Arm.Inferior: 2Ø12.5(4.45)

Estribos: 7x1Ø5c/0.13(0.80), 21x1Ø5c/0.14(2.91)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.089 cm.
(C/5639)

Arm.sup: 1.8 ----- 1.5 2.6 7.3 2.0(0.13)
7.1(4.97)

Arm.inf: 0.2 2.0 3.9 4.0 2.3 ----- 2.5(0.99) 4.2(2.22)

Moment.: -3.7 3.5 7.0 7.3 4.1 -4.6 -14.8 -3.9(0.08) 4.4(0.99) 7.6(2.22)
-14.8(5.00)

Cortant.: ----- 5.5 2.2 -1.7 -5.4 -8.4 ----- 7.4(x= 0.18)
-11.1(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.82) Lim.: 0.72

Arm.Superior: 3Ø16(<<5.65+1.50=7.15) ----- 3Ø16(2.60>>), 1Ø16(1.00>>), 1Ø16(1.00>>)

Arm.Montagem: 2Ø10(1.50)

Arm.Inferior: 2Ø16(5.45), 1Ø10(3.00)

Estribos: 15x1Ø6.3c/0.22(3.35), 10x1Ø6.3c/0.13(1.30)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.601 cm.
(C/832)

Arm.sup: 7.3 1.6 ----- 1.5 9.1(0.15)
1.5(4.93)

Arm.inf: ----- 4.9 8.0 7.5 4.0 ----- 1.5(0.99) 8.3(2.72)
4.8(4.01)

Moment.: -14.8 -2.8 8.8 14.0 13.2 7.1 -1.2 -16.1(0.10) 0.4(0.99) 14.4(2.72)
8.7(4.01) -2.0(4.93)

Cortant.: ----- 16.2 9.5 2.5 -4.0 -9.7 ----- 21.1(x= 0.18)
-12.5(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<2.60+2.00=4.60), 1Ø16(<<1.00+1.65=2.65), 1Ø16(<<1.00+1.65=2.65)
----- 2Ø10(3.38+0.12D=3.50)

Arm.Inferior: 3Ø16(5.49+0.26D=5.75), 2Ø16(3.65)

Estribos: 8x1Ø10c/0.15(1.20), 16x1Ø10c/0.22(3.52)

V 13 --- Grupo: 2

Tramo nº 1 (* -P33*) (C= 1.68) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.080 cm.

(C/2108)

Arm.sup: 1.5 1.5 1.5 1.5 2.1 3.0 3.9 1.5(0.56)
3.8(1.66)

Arm.inf: -----

Moment.: 0.0 -0.5 -1.3 -2.5 -3.8 -5.3 -7.5 0.0(0.00) 0.0(0.00) -0.2(0.34)
-7.5(1.68)

Cortant.: -1.3 -2.2 -3.3 -4.2 -4.8 -5.1 ----- -0.5(x= 0.00)
-5.2(x= 1.58)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
1.58) Lim.: 0.72

Arm.Superior: 2Ø16(0.19D+1.65>>) ----- 1Ø10(1.15>>)

Arm.Inferior: 3Ø16(0.19D+1.64>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.968 cm.
(C/620)

Arm.sup: 3.9 ----- 7.4 4.3(0.07)
7.7(5.93)

Arm.inf: ----- 2.5 7.4 9.0 6.3 1.5 ----- 3.6(1.19) 9.0(2.95)
1.7(4.81)

Moment.: -7.5 4.5 13.1 15.5 11.3 0.7 -14.2 -7.9(0.06) 6.5(1.19) 15.5(2.95)
3.1(4.81)-14.2(6.00)

Cortant.: ----- 10.9 5.3 -0.9 -7.1 -12.8 ----- 14.1(x= 0.10)
-16.8(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.90) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.84+1.51=3.35), 1Ø10(<<1.15+1.20=2.35) ----- 2Ø16(1.87>>),
2Ø16(1.25>>)

Arm.Montagem: 2Ø8(3.10)

Arm.Inferior: 3Ø16(<<1.83+6.37=8.20), 1Ø16(4.00), 1Ø16(4.00)

Estribos: 6x1Ø8c/0.14(0.80), 26x1Ø8c/0.15(3.92), 9x1Ø8c/0.12(1.08)

Tramo nº 3 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= -0.074 cm.
(C/-5392)

Arm.sup: 7.4 4.7 2.1 1.5 1.5 1.5 1.7 7.7(0.10)
1.7(3.96)

Arm.inf: ----- 1.5 1.8 2.3 1.7 0.4 2.3(2.65)
1.9(3.19)

Moment.: -14.2 -8.5 -3.7 3.3 4.1 3.0 -3.5 -14.2(0.00) 4.1(2.65)
 3.4(3.19) -3.5(3.98)

Cortant.: ----- 7.9 5.5 2.6 0.3 -2.4 ----- 9.4(x= 0.10)
 -3.1(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.81) Lim.: 0.72

Arm.Superior: 2Ø16(<<3.98>>), 2Ø16(<<1.25+1.55=2.80) -----

Arm.Inferior: 2Ø12.5(4.50)

Estribos: 7x1Ø5c/0.12(0.80), 21x1Ø5c/0.14(2.91)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.122 cm.
 (C/4105)

Arm.sup: 1.7 ----- 2.5 7.1 2.0(0.13)
 7.0(4.97)

Arm.inf: 0.4 2.0 4.0 4.2 2.4 ----- 2.5(0.99) 4.4(2.22)

Moment.: -3.5 3.5 7.2 7.6 4.3 -4.5 -14.5 -3.8(0.10) 4.5(0.99) 7.9(2.22)
 -14.5(5.00)

Cortant.: ----- 5.8 2.4 -1.7 -5.6 -8.9 ----- 7.5(x= 0.18)
 -11.6(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.72

Arm.Superior: 2Ø16(<<5.85+1.45=7.30) ----- 3Ø16(2.30>>), 1Ø16(1.10>>), 1Ø16(1.10>>)

Arm.Montagem: 2Ø10(1.70)

Arm.Inferior: 2Ø12.5(5.50), 1Ø16(5.30)

Estribos: 4x1Ø6.3c/0.21(0.80), 11x1Ø6.3c/0.22(2.42), 11x1Ø6.3c/0.13(1.43)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.575 cm.
 (C/870)

Arm.sup: 7.1 1.5 ----- 1.5 8.5(0.15)
 1.5(4.93)

Arm.inf: ----- 4.5 7.3 6.9 3.8 ----- 1.5(0.99) 7.6(2.72)
 4.6(4.01)

Moment.: -14.5 -2.8 8.1 13.0 12.4 6.7 -1.2 -15.4(0.10) 0.3(0.99) 13.4(2.72)
 8.2(4.01) -1.9(4.93)

Cortant.: ----- 15.2 8.8 2.4 -3.6 -9.1 ----- 19.7(x= 0.18)
 -11.9(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=

4.90) Lim.: 0.72

Arm.Superior: 3Ø16(<<2.30+1.75=4.05), 1Ø16(<<1.10+1.30=2.40), 1Ø16(<<1.10+1.30=2.40)
 ----- 2Ø10(3.63+0.12D=3.75)

Arm.Inferior: 4Ø16(5.51+0.19D=5.70)

Estribos: 12x1Ø8c/0.1(1.20), 24x1Ø8c/0.15(3.52)

V 14 --- Grupo: 2

Tramo nº 1 (* -P33*) (C= 1.68) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.043 cm.
 (C/3879)

Arm.sup: 1.5 1.5 1.5 1.5 1.5 1.7 2.3 1.5(0.56)
 2.3(1.65)

Arm.inf: -----

Moment.: -0.0 -0.2 -0.6 -1.3 -2.1 -3.1 -4.6 -0.0(x= 0.00) -0.1(x= 0.34)
 -4.6(x= 1.68)

Cortant.: -0.1 -1.0 -1.8 -2.5 -3.2 -3.8 ----- -0.0(x= 0.00)
 -4.0(x= 1.53)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x= 1.53) Lim.: 0.72

Arm.Superior: 2Ø16(0.19D+1.65>>) -----

Arm.Inferior: 2Ø12.5(0.15D+1.64>>)

Estribos: 12x1Ø5c/0.14(1.55)

Tramo nº 2 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.546 cm.
 (C/1099)

Arm.sup: 2.3 ----- 1.5 4.4 2.7(0.11)
 5.0(5.87)

Arm.inf: ----- 1.5 4.2 4.9 3.4 ----- 2.0(1.19) 5.0(2.81)
 1.5(4.81)

Moment.: -4.6 2.4 7.6 8.9 6.1 -0.6 -8.9 -4.9(0.09) 3.6(1.19) 8.9(2.81)
 1.0(4.81) -9.3(5.91)

Cortant.: ----- 6.3 2.9 -0.7 -4.4 -7.8 ----- 8.6(x= 0.15)
 -10.5(x= 5.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.15) 0.01(x= 5.85) Lim.: 0.72

Arm.Superior: 2Ø16(<<1.84+1.41=3.25) ----- 2Ø16(1.82>>), 1Ø16(1.40>>)

Arm.Montagem: 2Ø6.3(3.30)

Arm.Inferior: 2Ø12.5(<<1.79+6.36=8.15), 2Ø12.5(4.55)

Estribos: 5x1Ø6.3c/0.18(0.90), 17x1Ø6.3c/0.22(3.64), 9x1Ø6.3c/0.14(1.26)

Tramo nº 3 (*P32-P32*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.007 cm.
(C/55952)

Arm.sup: 4.4 1.7 ----- 1.5 2.8 4.4(0.02)
2.9(3.95)

Arm.inf: ----- 1.5 2.0 2.8 2.5 1.5 ----- 1.5(0.79) 2.8(2.20)
1.5(3.20)

Moment.: -8.9 -3.1 3.6 5.1 4.5 2.0 -5.5 -8.9(0.00) 1.0(0.79) 5.1(2.20)
2.6(3.20) -5.5(3.98)

Cortant.: ----- 6.4 3.5 0.6 -2.2 -5.0 ----- 9.5(x= 0.15)
-7.7(x= 3.88)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.15) 0.00(x=
3.88) Lim.: 0.72

Arm.Superior: 2Ø16(<<3.98>>), 1Ø16(<<1.40+1.95=3.35) -----

Arm.Inferior: 2Ø16(4.50)

Estribos: 8x1Ø5c/0.1(0.80), 15x1Ø5c/0.14(2.18), 7x1Ø5c/0.13(0.80)

Tramo nº 4 (*P32-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.203 cm.
(C/2460)

Arm.sup: 2.8 ----- 1.5 5.1 2.9(0.04)
5.3(4.91)

Arm.inf: ----- 1.6 3.8 4.3 2.9 ----- 2.1(0.99) 4.4(2.22)
1.5(4.01)

Moment.: -5.5 2.8 6.9 7.7 5.2 -2.1 -10.1 -5.5(0.01) 3.8(0.99) 7.8(2.22)
0.8(4.01)-10.2(4.98)

Cortant.: ----- 6.5 2.9 -1.0 -4.7 -8.4 ----- 10.4(x= 0.10)
-12.6(x= 4.85)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.85) Lim.: 0.72

Arm.Superior: 2Ø16(<<5.80+1.35=7.15) ----- 2Ø16(1.80>>), 1Ø16(1.15>>)

Arm.Montagem: 2Ø6.3(2.30)

Arm.Inferior: 2Ø12.5(5.70), 1Ø16(5.20)

Estribos: 7x1Ø6.3c/0.13(0.80), 12x1Ø6.3c/0.22(2.79), 11x1Ø6.3c/0.11(1.21)

Tramo nº 5 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.255 cm. (C/1958)

Arm.sup:	5.1	1.5	-----	-----	-----	-----	1.5	5.2(0.06)
1.5(4.93)								
Arm.inf:	-----	2.0	3.6	3.7	2.2	-----		3.8(2.97)
2.6(4.01)								
Moment.:	-10.1	-1.9	3.6	6.5	6.6	3.9	-0.5	-10.1(0.00)
4.6(4.01)	-0.8(4.93)							6.9(2.97)
Cortant.:	-----	8.2	4.4	1.7	-1.3	-4.2	-----	12.7(x= 0.15)
-6.5(x= 4.90)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio: 0.00(x= 0.15)
4.90) Lim.:	0.72							0.01(x= 4.90)

Arm.Superior: 2Ø16(<<1.80+1.80=3.60), 1Ø16(<<1.15+1.10=2.25) ----- 2Ø10(3.63+0.12D=3.75)

Arm.Inferior: 2Ø16(5.36+0.19D=5.55)

Estribos: 12x1Ø6.3c/0.1(1.20), 17x1Ø6.3c/0.22(3.60)

Armadura de vigas
 Obra: TRF-2 VARAS VERTICAL PARTE 3
 Grupo no 3 Piso 3 --- Pisoigual 1

V 1 --- Grupo: 3

Tramo nº 1 (*P30-P30*) (C= 3.10) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.035 cm. (C/8779)

Arm.sup:	-----	-----	-----	-----	-----	-----	-----	-----
0.0(3.06)								
Arm.inf:	-----	1.2	1.2	1.2	1.2	1.2	-----	1.2(0.61) 1.2(1.59)
1.2(2.48)								
Moment.:	0.0	0.6	1.1	1.3	1.2	0.7	-0.1	-0.0(0.12) 0.7(0.61) 1.4(1.59)
0.9(2.48)	-0.1(3.07)							
Cortant.:	0.0	0.8	0.3	-0.3	-0.9	-1.7	-----	1.1(x= 0.12)
-2.4(x= 3.00)								
Torsores:	0.00	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio: 0.00(x= 0.00) 0.00(x= 3.00)
Lim.:	0.54							

Arm.Superior: 2Ø6.3(0.08D+3.14+0.08D=3.30) -----

Arm.Inferior: 2Ø10(0.12D+3.14+0.12D=3.38)

Estribos: 22x1Ø5c/0.14(2.97)

Tramo nº 1 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.192 cm.
(C/2598)

Arm.sup: 1.2 ----- 1.2 3.3 1.2(0.09)
3.5(4.94)

Arm.inf: ----- 1.2 2.1 2.5 1.9 1.2 ----- 1.2(0.99) 2.5(2.44)
1.2(4.01)

Moment.: -0.8 1.2 3.0 3.5 2.6 -0.2 -5.1 -1.4(0.09) 1.6(0.99) 3.6(2.44)
0.8(4.01) -5.1(4.99)

Cortant.: ----- 2.8 1.4 -0.2 -2.0 -4.2 ----- 4.2(x= 0.10)
-8.7(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø10(0.13D+1.17=1.30) ----- 2Ø12.5(1.50>>), 1Ø12.5(1.00>>)

Arm.Montagem: 2Ø6.3(2.85)

Arm.Inferior: 2Ø16(0.19D+5.41=5.60)

Estribos: 24x1Ø6.3c/0.17(4.00), 7x1Ø6.3c/0.13(0.80)

Tramo nº 2 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.164 cm.
(C/3048)

Arm.sup: 3.3 1.2 ----- 1.2 3.1 3.4(0.03)
3.2(4.94)

Arm.inf: ----- 1.2 2.6 3.2 2.7 1.2 ----- 1.3(0.99) 3.2(2.44)
1.4(4.01)

Moment.: -5.1 1.3 3.7 4.5 3.7 1.4 -4.8 -5.1(0.00) 1.9(0.99) 4.5(2.44)
2.0(4.01) -4.8(4.99)

Cortant.: ----- 4.1 1.9 0.0 -1.8 -4.0 ----- 9.3(x= 0.10)
-8.4(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.50+1.50=3.00), 1Ø12.5(<<1.00+1.00=2.00) ----- 2Ø12.5(1.45>>),
1Ø10(1.00>>)

Arm.Montagem: 2Ø6.3(2.50)

Arm.Inferior: 2Ø12.5(5.31>>), 1Ø10(3.00)

Estribos: 8x1Ø6.3c/0.11(0.80), 18x1Ø6.3c/0.17(3.20), 7x1Ø6.3c/0.13(0.80)

Tramo nº 3 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.161 cm.

(C/3102)

Arm.sup:	3.1	1.2	-----	-----	-----	1.2	3.4	3.1(0.03)
3.5(4.94)								
Arm.inf:	-----	1.2	2.7	3.2	2.6	1.2	-----	1.5(0.99) 3.2(2.44)
1.3(4.01)								
Moment.:	-4.8	1.5	3.8	4.5	3.7	1.2	-5.2	-4.8(0.00) 2.0(0.99) 4.5(2.44)
1.8(4.01) -5.2(4.99)								
Cortant.:	-----	3.9	1.7	-0.1	-1.9	-4.1	-----	9.1(x= 0.10)
-8.7(x= 4.90)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54								

Arm.Superior: 2Ø12.5(<<1.45+1.45=2.90), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø12.5(1.50>>), 1Ø12.5(1.00>>)

Arm.Montagem: 2Ø6.3(2.50)

Arm.Inferior: 2Ø12.5(<<5.31+5.29=10.60), 1Ø10(3.00)

Estribos: 8x1Ø6.3c/0.11(0.80), 18x1Ø6.3c/0.17(3.20), 7x1Ø6.3c/0.13(0.80)

Tramo nº 4 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.191 cm. (C/2617)

Arm.sup:	3.4	1.2	-----	-----	-----	-----	-----	3.4(0.04)
0.1(4.96)								
Arm.inf:	-----	1.6	2.2	1.8	1.2	-----	-----	1.2(0.99) 2.2(2.69)
1.2(4.01)								
Moment.:	-5.2	-0.2	2.2	3.0	2.5	1.0	-0.1	-5.2(0.00) 0.4(0.99) 3.1(2.69)
1.3(4.01) -0.1(4.97)								
Cortant.:	-----	4.1	1.9	0.2	-1.3	-2.1	-----	9.5(x= 0.10)
-2.9(x= 4.90)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54								

Arm.Superior: 2Ø12.5(<<1.50+1.50=3.00), 1Ø12.5(<<1.00+1.00=2.00) ----- 2Ø6.3(3.82+0.08D=3.90)

Arm.Inferior: 2Ø12.5(5.40+0.15D=5.55)

Estribos: 8x1Ø6.3c/0.11(0.80), 24x1Ø6.3c/0.17(4.00)

V 3 --- Grupo: 3

Tramo nº 1 (*V 8-V 1*) (C= 4.78) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.238 cm. (C/2009)

Arm.sup: -----
1.2(4.46)

Arm.inf: ----- 1.5 2.3 2.4 1.6 1.2 ----- 1.7(0.95) 2.5(1.96)
1.2(3.82)

Moment.: -0.0 2.1 3.3 3.3 2.2 0.3 0.0 -0.0(0.00) 2.4(0.95) 3.5(1.96)
0.7(3.82) -0.3(4.46)

Cortant.: 2.7 2.1 0.7 -0.7 -1.8 -1.9 1.0 2.7(x= 0.00)
-2.2(x= 3.71)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 4.78) Lim.: 0.54

Arm.Superior: $2\emptyset 6.3(0.08D+1.17=1.25)$ ----- $2\emptyset 10(1.23+0.12D=1.35)$

Arm.Montagem: $2\emptyset 5(3.05)$

Arm.Inferior: $2\emptyset 12.5(0.15D+4.91+0.15D=5.21)$

Estribos: $33 \times 1\emptyset 5c/0.14(4.58)$

V 4 --- Grupo: 3

Tramo nº 1 (*P30-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.643 cm.
(C/778)

Arm.sup: 1.2 ----- 3.9 1.2(0.12)
4.1(4.93)

Arm.inf: ----- 1.9 4.2 4.6 3.3 1.2 ----- 2.5(0.99) 4.7(2.24)
1.2(4.01)

Moment.: -0.9 2.7 5.8 6.5 4.6 0.3 -6.0 -1.3(0.12) 3.5(0.99) 6.6(2.24)
1.3(4.01) -6.0(4.99)

Cortant.: ----- 4.9 2.2 -0.7 -3.6 -6.5 ----- 6.1(x= 0.18)
-8.8(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90)
Lim.: 0.54

Arm.Superior: $2\emptyset 10(0.12D+1.33=1.45)$ ----- $2\emptyset 16(1.45>>)$, $1\emptyset 10(1.00>>)$

Arm.Montagem: $2\emptyset 6.3(2.85)$

Arm.Inferior: $2\emptyset 16(0.19D+5.51=5.70)$, $1\emptyset 10(3.70)$

Estribos: $23 \times 1\emptyset 6.3c/0.17(3.81)$, $7 \times 1\emptyset 6.3c/0.13(0.91)$

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.053 cm.
(C/9518)

Arm.sup: 3.9 1.4 ----- 1.2 2.0 4.0(0.09)
2.4(4.85)

Arm.inf: ----- 1.2 2.0 2.8 2.5 1.2 ----- 1.2(0.99) 2.9(2.69)
1.4(4.01)

Moment.: -6.0 -1.9 2.9 4.0 3.5 1.5 -3.3 -6.0(0.00) 0.8(0.99) 4.0(2.69)
2.0(4.01) -3.5(4.90)

Cortant.: ----- 4.0 2.2 0.4 -1.4 -3.2 ----- 5.6(x= 0.10)
-4.5(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.82) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.45+2.20=3.65), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø10(1.55>>),
1Ø10(1.10>>)

Arm.Montagem: 2Ø5(1.70)

Arm.Inferior: 2Ø12.5(5.30), 1Ø10(3.00)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.136 cm.
(C/3677)

Arm.sup: 2.0 1.2 ----- ----- ----- 1.2 2.4 2.0(0.03)
2.8(4.85)

Arm.inf: ----- 1.2 2.1 2.5 1.8 1.2 ----- 1.2(0.99) 2.5(2.44)
1.2(4.01)

Moment.: -3.3 0.8 2.9 3.5 2.5 -0.7 -3.9 -3.3(0.00) 1.3(0.99) 3.5(2.44)
0.6(4.01) -4.1(4.90)

Cortant.: ----- 3.2 1.6 -0.2 -2.0 -3.9 ----- 4.2(x= 0.18)
-5.4(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.40=2.95), 1Ø10(<<1.10+1.00=2.10) ----- 2Ø10(1.60>>),
1Ø12.5(1.25>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø12.5(5.15>>), 1Ø10(3.25)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.112 cm.
(C/4451)

Arm.sup: 2.4 1.2 ----- ----- ----- 1.2 2.6 2.4(0.03)
2.9(4.85)

Arm.inf: ----- 1.2 2.1 2.6 1.9 1.2 ----- 1.2(0.99) 2.6(2.44)
1.2(4.01)

Moment.: -3.9 0.8 2.9 3.6 2.7 -0.9 -4.2 -3.9(0.00) 1.3(0.99) 3.6(2.44)
 0.8(4.01) -4.3(4.92)

Cortant.: ----- 3.3 1.6 -0.1 -2.0 -3.8 ----- 4.3(x= 0.18)
 -5.3(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.60+1.50=3.10), 1Ø12.5(<<1.25+1.00=2.25) ----- 2Ø12.5(1.70>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.30)

Arm.Inferior: 2Ø12.5(<<5.15+5.15=10.30), 1Ø10(3.25)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.135 cm. (C/3693)

Arm.sup: 2.6 1.2 ----- ----- ----- ----- 2.6(0.03)
 1.2(4.44)

Arm.inf: ----- ----- 1.3 1.9 1.5 1.2 ----- 1.2(0.99) 1.9(2.58)
 1.2(4.01)

Moment.: -4.2 -0.6 1.8 2.6 2.1 0.5 -0.0 -4.2(0.00) 0.0(0.99) 2.6(2.58)
 0.8(4.01) -0.1(4.44)

Cortant.: ----- 3.6 1.8 0.2 -1.3 -1.8 ----- 4.7(x= 0.18)
 -1.9(x= 3.94)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.70+1.60=3.30), 1Ø10(<<1.00+1.00=2.00) -----
 2Ø10(1.28+0.12D=1.40)

Arm.Montagem: 2Ø5(2.70)

Arm.Inferior: 2Ø12.5(5.25+0.15D=5.40)

Estribos: 34x1Ø5c/0.14(4.72)

V 5 --- Grupo: 3

Tramo nº 1 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.606 cm. (C/825)

Arm.sup: 1.2 ----- ----- ----- ----- 3.6 1.2(0.12)
 3.8(4.93)

Arm.inf: ----- 1.9 4.0 4.4 3.1 1.2 ----- 2.4(0.99) 4.4(2.19)
 1.2(4.01)

Moment.: -0.8 2.6 5.6 6.1 4.4 0.3 -5.5 -1.2(0.12) 3.4(0.99) 6.2(2.19)
 1.2(4.01) -5.5(4.99)

Cortant.: ----- 4.5 2.0 -0.7 -3.4 -6.1 ----- 5.7(x= 0.18)
 -8.1(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+1.33=1.45) ----- 3Ø12.5(1.35>>)

Arm.Montagem: 2Ø6.3(3.00)

Arm.Inferior: 2Ø12.5(0.15D+5.45=5.60), 1Ø16(4.05)

Estribos: 23x1Ø6.3c/0.17(3.92), 6x1Ø6.3c/0.14(0.80)

Tramo nº 2 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.043 cm.
 (C/11610)

Arm.sup: 3.6 1.3 ----- 1.2 1.9 3.7(0.07)
 2.3(4.85)

Arm.inf: ----- 1.2 1.9 2.6 2.3 1.2 ----- 1.2(0.99) 2.6(2.69)
 1.3(4.01)

Moment.: -5.5 -1.8 2.6 3.6 3.2 1.3 -3.1 -5.5(0.00) 0.8(0.99) 3.7(2.69)
 1.8(4.01) -3.3(4.90)

Cortant.: ----- 3.6 2.0 0.4 -1.3 -3.0 ----- 5.1(x= 0.10)
 -4.3(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 3Ø12.5(<<1.35+2.10=3.45) ----- 2Ø10(1.60>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(1.75)

Arm.Inferior: 2Ø10(5.18>>), 1Ø12.5(3.70)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.125 cm.
 (C/4001)

Arm.sup: 1.9 ----- 1.2 2.2 1.9(0.03)
 2.7(4.85)

Arm.inf: ----- 1.2 1.9 2.3 1.7 1.2 ----- 1.2(0.99) 2.3(2.44)
 1.2(4.01)

Moment.: -3.1 0.8 2.7 3.2 2.3 -0.7 -3.6 -3.1(0.00) 1.3(0.99) 3.3(2.44)
 0.5(4.01) -3.9(4.90)

Cortant.: ----- 3.0 1.4 -0.2 -1.9 -3.7 ----- 3.8(x= 0.18)

-5.2(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.60+1.35=2.95), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø10(1.60>>), 1Ø12.5(1.20>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø10(<<5.18+5.17=10.35), 1Ø10(3.20)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.103 cm. (C/4850)

Arm.sup: 2.2 1.2 ----- 1.2 2.4 2.2(0.03)
2.8(4.85)

Arm.inf: ----- 1.2 2.0 2.4 1.7 1.2 ----- 1.2(0.99) 2.4(2.44)
1.2(4.01)

Moment.: -3.6 0.8 2.7 3.3 2.4 -0.9 -3.9 -3.6(0.00) 1.2(0.99) 3.3(2.44)
0.6(4.01) -4.1(4.90)

Cortant.: ----- 3.0 1.5 -0.2 -1.9 -3.6 ----- 3.9(x= 0.18)
-5.1(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.60+1.45=3.05), 1Ø12.5(<<1.20+1.00=2.20) ----- 2Ø10(1.65>>), 1Ø12.5(1.25>>)

Arm.Montagem: 2Ø5(2.35)

Arm.Inferior: 2Ø10(5.30), 1Ø10(3.20)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 5 (*P31-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.124 cm. (C/4038)

Arm.sup: 2.4 1.2 ----- 2.4(0.03)
1.2(4.44)

Arm.inf: ----- 1.2 1.7 1.3 1.2 ----- 1.2(0.99) 1.7(2.51)
1.2(4.01)

Moment.: -3.9 -0.5 1.7 2.4 1.9 0.4 -0.0 -3.9(0.00) 0.0(0.99) 2.4(2.51)
0.7(4.01) -0.1(4.44)

Cortant.: ----- 3.3 1.7 0.1 -1.2 -1.6 ----- 4.3(x= 0.18)
-1.8(x= 3.94)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=

4.90) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.65+1.55=3.20), 1Ø12.5(<<1.25+1.00=2.25) -----
 2Ø10(1.28+0.12D=1.40)

Arm.Montagem: 2Ø5(2.75)

Arm.Inferior: 2Ø12.5(5.25+0.15D=5.40)

Estribos: 34x1Ø5c/0.14(4.72)

V 6 --- Grupo: 3

Tramo nº 1 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.254 cm.
 (C/1969)

Arm.sup: 1.2 ----- 1.2 2.8 1.2(0.10)
 2.9(4.91)

Arm.inf: ----- 1.2 2.4 2.5 1.6 ----- 1.5(0.99) 2.6(2.19)
 1.2(4.01)

Moment.: -0.4 1.7 3.3 3.5 2.2 -0.5 -4.2 -0.6(0.10) 2.1(0.99) 3.6(2.19)
 0.1(4.01) -4.3(4.97)

Cortant.: ----- 2.6 1.1 -0.6 -2.3 -4.0 ----- 3.3(x= 0.18)
 -5.4(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
 4.90) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+1.33=1.45) ----- 2Ø12.5(1.55>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.75)

Arm.Inferior: 2Ø12.5(0.15D+5.17>>), 1Ø10(3.80)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.103 cm.
 (C/4871)

Arm.sup: 2.8 1.2 ----- 1.2 2.2 2.8(0.04)
 2.3(4.93)

Arm.inf: ----- 1.2 1.9 2.5 2.1 1.2 ----- 1.2(0.99) 2.5(2.62)
 1.2(4.01)

Moment.: -4.2 -0.8 2.7 3.5 2.9 0.9 -3.4 -4.2(0.00) 1.0(0.99) 3.5(2.62)
 1.4(4.01) -3.4(4.97)

Cortant.: ----- 3.4 1.8 0.1 -1.5 -3.1 ----- 4.8(x= 0.10)
 -4.5(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
 4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.70=3.25), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø10(1.50>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.30)

Arm.Inferior: 2Ø12.5(<<5.32+5.18=10.50), 1Ø10(3.25)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.137 cm. (C/3656)

Arm.sup: 2.2 1.2 ----- 1.2 2.4 2.2(0.04)
2.5(4.91)

Arm.inf: ----- 1.2 2.0 2.5 1.9 1.2 ----- 1.2(0.99) 2.5(2.44)
1.2(4.01)

Moment.: -3.4 0.7 2.8 3.5 2.7 0.5 -3.6 -3.4(0.00) 1.2(0.99) 3.5(2.44)
1.0(4.01) -3.6(4.97)

Cortant.: ----- 3.2 1.6 -0.1 -1.8 -3.4 ----- 4.5(x= 0.10)
-4.8(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.50+1.40=2.90), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø12.5(5.20)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.121 cm. (C/4136)

Arm.sup: 2.4 1.2 ----- 1.2 2.4 2.4(0.04)
2.5(4.93)

Arm.inf: ----- 1.2 2.0 2.5 2.0 1.2 ----- 1.2(0.99) 2.5(2.44)
1.2(4.01)

Moment.: -3.6 0.7 2.8 3.5 2.8 0.6 -3.7 -3.6(0.00) 1.2(0.99) 3.5(2.44)
1.1(4.01) -3.7(4.99)

Cortant.: ----- 3.3 1.6 -0.0 -1.7 -3.4 ----- 4.6(x= 0.10)
-4.7(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø12.5(1.50>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.30), 1Ø10(3.15)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.128 cm.
(C/3900)

Arm.sup: 2.4 1.2 ----- 2.5(0.06)
1.2(4.44)

Arm.inf: ----- 1.3 1.8 1.4 1.2 ----- 1.2(0.99) 1.8(2.44)
1.2(4.01)

Moment.: -3.7 -0.4 1.8 2.5 1.9 0.4 -0.0 -3.7(0.00) 0.1(0.99) 2.5(2.44)
0.7(4.01) -0.2(4.44)

Cortant.: ----- 3.3 1.7 0.1 -1.3 -1.7 ----- 4.7(x= 0.10)
-1.8(x= 3.94)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.50+1.50=3.00), 1Ø10(<<1.00+1.00=2.00) -----
2Ø10(1.33+0.12D=1.45)

Arm.Montagem: 2Ø5(2.70)

Arm.Inferior: 2Ø12.5(5.30+0.15D=5.45)

Estribos: 35x1Ø5c/0.14(4.80)

V 7 --- Grupo: 3

Tramo nº 1 (*P32-P32*) (C= 4.90) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.538 cm.
(C/911)

Arm.sup: ----- 1.2 5.8 1.2(0.12)
6.1(4.83)

Arm.inf: ----- 3.0 4.1 4.0 2.6 ----- 3.3(0.96) 4.2(2.09)
1.2(3.93)

Moment.: -0.0 4.3 5.7 5.6 3.7 -0.4 -8.8 -0.0(0.12) 4.6(0.96) 5.9(2.09)
0.5(3.93) -8.8(4.89)

Cortant.: 0.3 3.2 0.9 -1.2 -3.6 -7.3 ----- 13.6(x= 0.12)
-14.7(x= 4.80)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
4.80) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+1.08=1.20) ----- 3Ø16(1.50>>), 1Ø16(1.00>>)

Arm.Montagem: 2Ø8(2.75)

Arm.Inferior: 2Ø16(0.25D+5.30=5.55), 1Ø10(2.95)

Estribos: 8x1Ø8c/0.1(0.77), 21x1Ø8c/0.15(3.20), 8x1Ø8c/0.1(0.80)

Tramo nº 2 (*P32-P32*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.258 cm.
(C/1937)

Arm.sup: 5.8 1.2 ----- 4.7 5.9(0.04)
4.8(4.94)

Arm.inf: ----- 1.5 4.0 4.9 4.3 2.1 ----- 2.2(0.99) 4.9(2.67)
2.6(4.01)

Moment.: -8.8 2.1 5.7 6.9 6.0 2.9 -7.1 -8.8(0.00) 3.0(0.99) 6.9(2.67)
3.7(4.01) -7.2(4.99)

Cortant.: ----- 6.4 2.8 0.2 -2.3 -5.8 ----- 14.7(x= 0.10)
-12.8(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 3Ø16(<<1.50+1.55=3.05), 1Ø16(<<1.00+1.00=2.00) ----- 2Ø12.5(1.45>>),
2Ø12.5(1.10>>)

Arm.Montagem: 2Ø8(2.45)

Arm.Inferior: 2Ø16(5.75), 1Ø12.5(5.15)

Estribos: 8x1Ø8c/0.1(0.80), 21x1Ø8c/0.15(3.20), 7x1Ø8c/0.12(0.80)

Tramo nº 3 (*P32-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.329 cm.
(C/1519)

Arm.sup: 4.7 ----- 4.8 4.7(0.03)
5.0(4.94)

Arm.inf: ----- 1.7 4.0 4.7 3.9 1.6 ----- 2.3(0.99) 4.7(2.44)
2.2(4.01)

Moment.: -7.1 2.4 5.6 6.6 5.5 2.2 -7.4 -7.1(0.00) 3.2(0.99) 6.6(2.44)
3.0(4.01) -7.4(4.99)

Cortant.: ----- 5.9 2.4 -0.1 -2.5 -6.1 ----- 13.7(x= 0.10)
-13.1(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.45+1.40=2.85), 2Ø12.5(<<1.10+1.05=2.15) ----- 2Ø12.5(1.45>>),
2Ø12.5(1.15>>)

Arm.Montagem: 2Ø8(2.60)

Arm.Inferior: 2Ø16(5.60), 1Ø12.5(3.40)

Estribos: 8x1Ø8c/0.11(0.80), 21x1Ø8c/0.15(3.20), 7x1Ø8c/0.12(0.80)

Tramo nº 4 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.296 cm.
(C/1689)

Arm.sup: 4.8 ----- 1.2 5.1 4.9(0.03)
5.3(4.94)

Arm.inf: ----- 1.8 4.1 4.8 4.0 1.6 ----- 2.4(0.99) 4.8(2.44)
2.2(4.01)

Moment.: -7.4 2.5 5.8 6.7 5.6 2.2 -7.8 -7.4(0.00) 3.4(0.99) 6.7(2.44)
3.1(4.01) -7.8(4.99)

Cortant.: ----- 5.9 2.4 -0.1 -2.6 -6.2 ----- 13.8(x= 0.10)
-13.4(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.45+1.45=2.90), 2Ø12.5(<<1.15+1.10=2.25) ----- 2Ø16(1.50>>),
1Ø16(1.00>>)

Arm.Montagem: 2Ø8(2.55)

Arm.Inferior: 2Ø16(5.65), 1Ø12.5(5.15)

Estribos: 8x1Ø8c/0.11(0.80), 21x1Ø8c/0.15(3.20), 7x1Ø8c/0.12(0.80)

Tramo nº 5 (*P33-P33*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.353 cm.
(C/1418)

Arm.sup: 5.1 1.2 ----- 5.2(0.04)
0.1(4.96)

Arm.inf: ----- 2.3 3.2 2.8 1.4 ----- 1.2(0.99) 3.2(2.69)
1.7(4.01)

Moment.: -7.8 -0.2 3.3 4.4 3.9 2.0 -0.1 -7.8(0.00) 0.7(0.99) 4.5(2.69)
2.4(4.01) -0.1(4.97)

Cortant.: ----- 6.1 2.6 0.3 -1.6 -3.1 ----- 14.1(x= 0.10)
-5.1(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.50+1.45=2.95), 1Ø16(<<1.00+1.00=2.00) ----- 2Ø8(3.95+0.10D=4.05)

Arm.Inferior: 2Ø16(5.36+0.19D=5.55)

Estribos: 8x1Ø8c/0.11(0.80), 27x1Ø8c/0.15(4.00)

Tramo nº 1 (*V 7-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.118 cm.
(C/5088)

Arm.sup: ----- 1.2 ----- ----- ----- 1.2 1.2(0.44)
1.4(5.85)

Arm.inf: ----- 1.2 1.3 1.2 1.2 ----- 1.3(3.32)
1.2(4.82)

Moment.: -0.1 -0.7 0.9 1.8 1.5 0.1 -2.0 -1.2(0.44) 1.8(3.32)
0.5(4.82) -2.0(5.92)

Cortant.: -2.6 1.4 1.1 0.2 -0.8 -1.9 ----- 1.4(x= 1.19)
-2.7(x= 5.82)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
5.82) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+2.18=2.30) ----- 2Ø10(1.52>>)

Arm.Montagem: 2Ø5(2.90)

Arm.Inferior: 2Ø10(0.12D+6.07>>), 1Ø6.3(4.20)

Estribos: 41x1Ø5c/0.14(5.72)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.035 cm.
(C/-11305)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.7 1.2(0.03)
1.7(3.96)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- ----- 1.2(0.78) 1.2(1.87)

Moment.: -2.0 -1.0 0.7 0.8 -0.7 -1.4 -2.7 -2.0(0.00) 0.2(0.78) 0.8(1.87)
-2.7(3.98)

Cortant.: ----- 1.0 0.4 -0.3 -0.9 -1.5 ----- 1.5(x= 0.18)
-1.9(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
3.81) Lim.: 0.54

Arm.Superior: 2Ø10(<<3.98>>) ----- 1Ø8(0.80>>)

Arm.Inferior: 2Ø10(<<6.19+4.21=10.40)

Estribos: 26x1Ø5c/0.14(3.63)

Tramo nº 3 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.238 cm.
(C/2105)

Arm.sup: 1.7 ----- ----- ----- ----- 1.2 2.1 2.0(0.15)
2.2(4.87)

Arm.inf: ----- 1.2 2.0 2.5 1.9 1.2 ----- 1.2(0.99) 2.5(2.46)
 1.2(4.01)

Moment.: -2.7 0.3 2.8 3.5 2.6 0.2 -3.4 -3.0(0.10) 0.9(0.99) 3.6(2.46)
 0.7(4.01) -3.4(5.00)

Cortant.: ----- 3.3 1.6 -0.1 -1.8 -3.4 ----- 4.5(x= 0.18)
 -4.6(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.18) 0.00(x=
 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<5.50+1.35=6.85), 1Ø8(<<0.80+1.00=1.80) ----- 2Ø10(1.40>>),
 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.75)

Arm.Inferior: 2Ø10(5.30), 2Ø8(3.10)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P30-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.048 cm.
 (C/10378)

Arm.sup: 2.1 1.2 ----- ----- ----- 1.7 2.2(0.15)
 1.7(4.99)

Arm.inf: ----- ----- 1.2 1.7 1.8 1.2 ----- 1.2(0.99) 1.8(3.21)
 1.5(4.00)

Moment.: -3.4 -1.4 1.4 2.3 2.6 1.6 -2.6 -3.4(0.00) 0.2(0.99) 2.6(3.21)
 2.2(4.00) -2.6(5.00)

Cortant.: ----- 2.4 1.6 0.7 0.0 -3.3 ----- 3.1(x= 0.18)
 -4.2(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
 4.90) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.40+2.20=3.60), 1Ø10(<<1.00+1.05=2.05) ----- 2Ø12.5(1.23>>)

Arm.Montagem: 2Ø5(2.05)

Arm.Inferior: 2Ø10(5.21>>), 1Ø8(4.40)

Estribos: 34x1Ø5c/0.14(4.72)

Tramo nº 5 (*P30-V 1*) (C= 2.60) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.085 cm.
 (C/3070)

Arm.sup: 1.7 1.2 1.2 1.2 1.2 1.2 1.2 1.9(0.10)
 1.2(1.74)

Arm.inf: -----

Moment.: -2.6 -1.7 -0.9 -0.4 -0.1 -0.0 0.0 -2.7(0.06) -0.0(2.06)

0.0(2.53) -0.0(1.96)

Cortant.: ----- 2.4 1.8 1.3 0.8 0.5 0.0 3.0(x= 0.10)
-0.0(x= 2.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.10) 0.00(x= 2.50) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.23+2.57+0.15D=3.95) -----

Arm.Inferior: 2Ø10(<<5.21+2.57+0.12D=7.90)

Estribos: 18x1Ø5c/0.14(2.47)

V 9 --- Grupo: 3

Tramo nº 1 (*V 3- *) (C= 0.64) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.000 cm.
(C/281401)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.20)
1.2(0.62)

Arm.inf: -----

Moment.: 0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 0.0(0.00) 0.0(0.06) -0.0(0.14)
-0.0(0.64)

Cortant.: 0.0 -0.1 -0.1 -0.0 -0.0 0.0 0.1 0.1(x= 0.64)
-0.1(x= 0.10)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.10)
0.00(x= 0.64) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+0.61>>) -----

Arm.Inferior: 2Ø10(0.12D+0.61>>)

Estribos: 5x1Ø5c/0.14(0.58)

Tramo nº 2 (* - *) (C= 2.12) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm.
(C/57213)

Arm.sup: 1.2 ----- 1.2(0.00)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.41) 1.2(1.50)
1.2(1.70)

Moment.: -0.0 0.0 0.1 0.3 0.4 0.4 -0.0 -0.0(0.00) 0.0(0.41) 0.4(1.50)
0.4(1.70) -0.0(2.12)

Cortant.: 0.1 0.2 0.3 0.3 0.1 -0.6 -1.0 0.3(x= 1.00)
-1.0(x= 2.08)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.00)
0.00(x= 2.12) Lim.: 0.54

Arm.Superior: 2Ø10(<<2.12>>) -----

Arm.Inferior: 2Ø10(<<2.12>>)

Estribos: 15x1Ø5c/0.14(2.06)

Tramo nº 3 (* -P30*) (C= 0.93) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.001 cm.
(C/-150528)

Arm.sup: ----- 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.29)
1.2(0.84)

Arm.inf: -----

Moment.: -0.0 -0.0 -0.1 -0.2 -0.3 -0.5 -0.3 -0.0(x= 0.13) -0.0(x= 0.19)
-0.6(x= 0.84)

Cortant.: -1.0 -1.0 -1.1 -1.2 -1.3 -1.4 ----- -0.5(x= 0.00)
-1.4(x= 0.83)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x=
0.83) Lim.: 0.54

Arm.Superior: 2Ø10(<<2.85+1.00+0.12D=3.96) -----

Arm.Inferior: 2Ø10(<<2.85+1.00+0.12D=3.96)

Estribos: 6x1Ø5c/0.14(0.80)

V 10 --- Grupo: 3

Tramo nº 1 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.279 cm.
(C/2153)

Arm.sup: ----- 1.2 ----- 2.2 1.7(0.69)
2.2(5.97)

Arm.inf: ----- 1.2 2.3 2.3 1.2 ----- 0.0(0.04) 2.5(3.44)
1.2(4.82)

Moment.: 0.0 -1.7 1.3 3.3 3.2 0.9 -3.4 -2.4(0.69) 0.0(0.03) 3.5(3.44)
1.5(4.82) -3.4(6.00)

Cortant.: ----- 2.3 2.6 0.9 -1.2 -3.3 ----- 3.0(x= 1.44)
-4.9(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+2.25=2.40) ----- 2Ø12.5(1.37>>)

Arm.Montagem: 2Ø5(2.90)

Arm.Inferior: 2Ø12.5(0.15D+6.30=6.45), 1Ø10(4.00)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.053 cm.
(C/-7504)

Arm.sup: 2.2 1.2 1.2 1.2 1.2 1.9 3.1 2.3(0.10)
3.5(3.88)

Arm.inf: ----- 1.2 1.2 1.4 1.2 ----- ----- 1.2(0.78) 1.4(1.82)
1.2(3.19)

Moment.: -3.4 -1.6 1.7 2.0 1.2 -2.7 -4.8 -3.4(0.04) 0.8(0.78) 2.0(1.82)
0.1(3.19) -5.0(3.93)

Cortant.: ----- 2.4 1.0 -0.5 -1.8 -3.2 ----- 3.3(x= 0.10)
-4.2(x= 3.88)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
3.88) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<3.98>>) ----- 1Ø12.5(1.05>>)

Arm.Inferior: 2Ø12.5(4.30), 1Ø8(3.20)

Estribos: 27x1Ø5c/0.14(3.78)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.499 cm.
(C/1002)

Arm.sup: 3.1 ----- ----- ----- ----- 1.2 4.1 3.1(0.01)
4.2(4.94)

Arm.inf: ----- 1.2 3.5 4.3 3.2 1.2 ----- 1.6(0.99) 4.3(2.46)
1.2(4.01)

Moment.: -4.8 1.3 5.0 6.0 4.5 0.4 -6.3 -4.8(0.00) 2.2(0.99) 6.0(2.46)
1.3(4.01) -6.3(5.00)

Cortant.: ----- 5.6 2.7 -0.3 -3.3 -6.3 ----- 7.7(x= 0.10)
-8.7(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<5.35+1.30=6.65), 1Ø12.5(<<1.05+1.00=2.05) ----- 2Ø16(1.50>>),
1Ø10(1.00>>)

Arm.Montagem: 2Ø6.3(2.65)

Arm.Inferior: 2Ø16(5.40), 1Ø10(3.00)

Estribos: 6x1Ø6.3c/0.14(0.80), 18x1Ø6.3c/0.17(3.09), 7x1Ø6.3c/0.13(0.91)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.165 cm.

(C/3033)

Arm.sup: 4.1 1.3 ----- 4.3(0.09)
0.1(4.96)

Arm.inf: ----- 1.3 2.5 2.7 1.7 0.2 2.7(3.06)
1.9(4.01)

Moment.: -6.3 -1.9 1.9 3.5 3.7 2.4 0.2 -6.3(0.01) 3.8(3.06)
2.6(4.01) -0.1(4.97)

Cortant.: ----- 4.6 2.7 1.1 -0.6 -1.9 ----- 6.3(x= 0.10)
-3.9(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.50+2.05=3.55), 1Ø10(<<1.00+1.00=2.00) -----
2Ø6.3(3.32+0.08D=3.40)

Arm.Inferior: 2Ø12.5(5.35+0.15D=5.50), 1Ø10(4.50)

Estribos: 35x1Ø5c/0.14(4.80)

V 11 --- Grupo: 3

Tramo nº 1 (*P32-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.259 cm.
(C/2319)

Arm.sup: ----- 1.2 ----- 2.0 1.7(0.69)
2.1(5.93)

Arm.inf: ----- 1.2 2.2 2.2 1.2 ----- 0.0(0.04) 2.4(3.44)
1.2(4.82)

Moment.: 0.0 -1.7 1.2 3.1 3.0 0.8 -3.1 -2.3(0.69) 0.0(0.03) 3.4(3.44)
1.4(4.82) -3.1(5.97)

Cortant.: ----- 2.2 2.5 0.9 -1.1 -3.2 ----- 2.9(x= 1.44)
-4.8(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+2.30=2.45) ----- 2Ø10(1.35>>), 1Ø10(1.20>>)

Arm.Montagem: 2Ø5(2.90)

Arm.Inferior: 2Ø10(0.12D+6.07>>), 1Ø10(3.95)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.009 cm.
(C/45567)

Arm.sup: 2.0 1.2 ----- 1.2 1.8 2.0(0.03)

1.8(3.96)

Arm.inf: ----- 1.2 1.2 1.6 1.3 1.2 ----- 1.2(0.78) 1.6(1.94)
1.2(3.19)

Moment.: -3.1 -1.0 1.7 2.2 1.8 -0.9 -3.0 -3.1(0.00) 0.7(0.78) 2.2(1.94)
0.8(3.19) -3.0(3.98)

Cortant.: ----- 2.6 1.3 0.0 -1.3 -2.5 ----- 3.5(x= 0.10)
-3.3(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
3.81) Lim.: 0.54

Arm.Superior: 2Ø10(<<3.98>>), 1Ø10(<<1.20+0.80=2.00) ----- 1Ø8(0.80>>)

Arm.Inferior: 2Ø10(<<6.19+4.16=10.35)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.131 cm.
(C/3816)

Arm.sup: 1.8 1.2 ----- ----- ----- 1.2 2.5 2.0(0.13)
2.5(4.97)

Arm.inf: ----- 1.2 1.9 2.4 1.8 1.2 ----- 1.2(0.99) 2.4(2.46)
1.2(4.01)

Moment.: -3.0 0.6 2.7 3.4 2.5 -0.5 -4.1 -3.0(0.08) 1.1(0.99) 3.4(2.46)
0.7(4.01) -4.1(5.00)

Cortant.: ----- 3.3 1.6 -0.1 -1.9 -3.5 ----- 4.5(x= 0.18)
-4.8(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x=
4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<5.33+1.42=6.75), 1Ø8(<<0.80+1.00=1.80) ----- 2Ø12.5(1.60>>),
1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.45)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.118 cm.
(C/4230)

Arm.sup: 2.5 1.2 ----- ----- ----- ----- 2.9(0.15)
1.2(4.46)

Arm.inf: ----- ----- 1.2 1.8 1.5 1.2 ----- 1.8(2.71)
1.2(4.01)

Moment.: -4.1 -0.9 1.6 2.5 2.0 0.5 0.0 -4.2(0.08) 2.5(2.71)

0.9(4.01) -0.1(4.46)

Cortant.: ----- 3.7 1.9 0.2 -1.2 -1.7 ----- 5.2(x= 0.18)
-1.8(x= 3.96)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.70=3.30), 1Ø10(<<1.00+1.00=2.00) -----
2Ø10(1.28+0.12D=1.40)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(5.25+0.15D=5.40)

Estribos: 34x1Ø5c/0.14(4.72)

V 12 --- Grupo: 3

Tramo nº 1 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.264 cm.
(C/2269)

Arm.sup: ----- 1.2 ----- ----- ----- 2.1 1.6(0.69)
2.2(5.93)

Arm.inf: ----- 1.2 2.3 2.2 1.2 ----- 0.0(0.04) 2.4(3.44)
1.2(4.82)

Moment.: 0.0 -1.7 1.3 3.2 3.1 0.8 -3.2 -2.3(0.69) 0.0(0.03) 3.4(3.44)
1.4(4.82) -3.2(5.97)

Cortant.: ----- 2.2 2.5 0.9 -1.1 -3.2 ----- 2.9(x= 1.44)
-4.9(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+2.25=2.40) ----- 2Ø10(1.35>>), 1Ø10(1.20>>)

Arm.Montagem: 2Ø5(2.95)

Arm.Inferior: 2Ø12.5(0.15D+6.20=6.35)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.007 cm.
(C/53654)

Arm.sup: 2.1 1.2 ----- ----- ----- 1.2 1.9 2.1(0.04)
1.9(3.91)

Arm.inf: ----- 1.2 1.3 1.6 1.3 1.2 ----- 1.2(0.78) 1.6(1.94)
1.2(3.19)

Moment.: -3.2 -1.0 1.8 2.3 1.8 -1.0 -3.1 -3.2(0.00) 0.7(0.78) 2.3(1.94)
0.8(3.19) -3.1(3.98)

Cortant.: ----- 2.6 1.4 -0.0 -1.3 -2.6 ----- 3.5(x= 0.10)
 -3.4(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.81) Lim.: 0.54

Arm.Superior: 2Ø10(<<3.98>>), 1Ø10(<<1.20+0.85=2.05) ----- 1Ø8(0.80>>)

Arm.Inferior: 2Ø12.5(4.30)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.144 cm.
 (C/3471)

Arm.sup: 1.9 1.2 ----- ----- 1.2 2.6 2.0(0.13)
 2.6(4.92)

Arm.inf: ----- 1.2 2.0 2.5 1.8 1.2 ----- 1.2(0.99) 2.5(2.46)
 1.2(4.01)

Moment.: -3.1 0.7 2.8 3.5 2.6 -0.6 -4.3 -3.1(0.05) 1.2(0.99) 3.5(2.46)
 0.7(4.01) -4.3(5.00)

Cortant.: ----- 3.4 1.6 -0.2 -1.9 -3.7 ----- 4.6(x= 0.18)
 -5.1(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<5.33+1.42=6.75), 1Ø8(<<0.80+1.00=1.80) ----- 2Ø12.5(1.60>>),
 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.45)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.119 cm.
 (C/4194)

Arm.sup: 2.6 1.2 ----- ----- ----- 2.9(0.15)
 1.2(4.46)

Arm.inf: ----- ----- 1.2 1.8 1.5 1.2 ----- 1.8(2.71)
 1.2(4.01)

Moment.: -4.3 -0.9 1.6 2.6 2.0 0.5 0.0 -4.3(0.05) 2.6(2.71)
 0.8(4.01) -0.1(4.46)

Cortant.: ----- 3.7 1.9 0.2 -1.2 -1.7 ----- 5.2(x= 0.18)
 -1.8(x= 3.96)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.70=3.30), 1Ø10(<<1.00+1.00=2.00) -----
 2Ø10(1.28+0.12D=1.40)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(5.25+0.15D=5.40)

Estribos: 34x1Ø5c/0.14(4.72)

V 13 --- Grupo: 3

Tramo nº 1 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.238 cm.
 (C/2525)

Arm.sup: ----- 1.3 ----- ----- ----- 2.0 1.7(0.69)
 2.2(5.93)

Arm.inf: ----- 1.2 2.2 2.1 1.2 ----- 0.0(0.04) 2.3(3.44)
 1.2(4.82)

Moment.: 0.0 -1.8 1.2 3.0 3.0 0.8 -3.1 -2.4(0.69) 0.0(0.03) 3.3(3.44)
 1.3(4.82) -3.2(5.97)

Cortant.: ----- 2.2 2.5 0.9 -1.1 -3.2 ----- 2.8(x= 1.44)
 -4.8(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
 5.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(0.15D+2.30=2.45) ----- 2Ø10(1.35>>), 1Ø10(1.20>>)

Arm.Montagem: 2Ø5(2.85)

Arm.Inferior: 2Ø12.5(0.15D+6.25=6.40), 1Ø10(3.85)

Estribos: 42x1Ø5c/0.14(5.80)

Tramo nº 2 (*P32-P31*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.010 cm.
 (C/41509)

Arm.sup: 2.0 1.2 ----- ----- ----- 1.2 1.9 2.1(0.03)
 1.9(3.88)

Arm.inf: ----- 1.2 1.3 1.6 1.3 1.2 ----- 1.2(0.78) 1.6(1.94)
 1.2(3.19)

Moment.: -3.1 -1.0 1.8 2.3 1.8 -1.0 -3.1 -3.1(0.00) 0.7(0.78) 2.3(1.94)
 0.7(3.19) -3.1(3.98)

Cortant.: ----- 2.6 1.3 -0.1 -1.4 -2.7 ----- 3.5(x= 0.10)
 -3.4(x= 3.81)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
 3.81) Lim.: 0.54

Arm.Superior: 2Ø10(<<3.98>>), 1Ø10(<<1.20+0.80=2.00) ----- 1Ø8(0.80>>)

Arm.Inferior: 2Ø12.5(4.30)

Estribos: 27x1Ø5c/0.14(3.71)

Tramo nº 3 (*P31-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.142 cm. (C/3517)

Arm.sup: 1.9 1.2 ----- 1.2 2.6 2.0(0.13)
2.7(4.90)

Arm.inf: ----- 1.2 2.1 2.5 1.8 1.2 ----- 1.2(0.99) 2.5(2.46)
1.2(4.01)

Moment.: -3.1 0.7 2.9 3.5 2.6 -0.6 -4.3 -3.1(0.03) 1.3(0.99) 3.5(2.46)
0.7(4.01) -4.3(5.00)

Cortant.: ----- 3.3 1.6 -0.2 -2.0 -3.8 ----- 4.5(x= 0.18)
-5.2(x= 4.82)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.82) Lim.: 0.54

Arm.Superior: 2Ø10(<<5.33+1.42=6.75), 1Ø8(<<0.80+1.00=1.80) ----- 2Ø10(1.55>>), 1Ø12.5(1.15>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø12.5(5.30), 1Ø10(3.25)

Estribos: 34x1Ø5c/0.14(4.65)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.120 cm. (C/4180)

Arm.sup: 2.6 1.2 ----- 2.8(0.13)
1.2(4.46)

Arm.inf: ----- 1.2 1.8 1.4 1.2 ----- 1.8(2.64)
1.2(4.01)

Moment.: -4.3 -0.8 1.6 2.5 2.0 0.5 0.0 -4.3(0.03) 2.5(2.64)
0.8(4.01) -0.2(4.46)

Cortant.: ----- 3.7 1.9 0.2 -1.3 -1.7 ----- 5.1(x= 0.18)
-1.9(x= 3.96)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.18) 0.00(x= 4.90) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.55+1.65=3.20), 1Ø12.5(<<1.15+1.25=2.40) ----- 2Ø10(1.33+0.12D=1.45)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(5.25+0.15D=5.40)

Estribos: 34x1Ø5c/0.14(4.72)

V 14 --- Grupo: 3

Tramo nº 1 (*P33-P32*) (C= 6.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.344 cm.
(C/1745)

Arm.sup: 0.1 1.2 ----- 3.2 1.2(0.69)
3.3(5.94)

Arm.inf: ----- 1.4 2.6 2.4 1.2 ----- 1.2(0.19) 2.7(3.44)
1.2(4.82)

Moment.: -0.2 -0.9 1.9 3.6 3.3 0.8 -4.8 -1.5(0.69) 0.1(0.19) 3.7(3.44)
1.5(4.82) -4.9(5.97)

Cortant.: ----- 2.4 2.4 0.7 -1.3 -3.8 ----- 9.0(x= 0.10)
-9.1(x= 5.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
5.90) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+2.03=2.15) ----- 1Ø10(1.20>>), 2Ø12.5(1.42>>)

Arm.Montagem: 2Ø6.3(3.15)

Arm.Inferior: 2Ø16(0.19D+6.36=6.55)

Estribos: 8x1Ø6.3c/0.11(0.80), 25x1Ø6.3c/0.17(4.20), 7x1Ø6.3c/0.12(0.80)

Tramo nº 2 (*P32-P32*) (C= 3.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.022 cm.
(C/18182)

Arm.sup: 3.2 1.2 ----- 1.2 2.4 3.2(0.03)
2.5(3.94)

Arm.inf: ----- 1.2 1.8 2.3 2.0 1.2 ----- 1.2(0.78) 2.3(2.19)
1.3(3.19)

Moment.: -4.8 -1.2 2.5 3.2 2.8 1.4 -3.7 -4.8(0.00) 1.2(0.78) 3.2(2.19)
1.8(3.19) -3.7(3.97)

Cortant.: ----- 3.8 1.8 0.2 -1.3 -3.3 ----- 8.6(x= 0.10)
-6.9(x= 3.88)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
3.88) Lim.: 0.54

Arm.Superior: 1Ø10(<<1.20+0.85=2.05), 2Ø12.5(<<3.98>>) -----

Arm.Inferior: 2Ø12.5(4.50)

Estribos: 7x1Ø6.3c/0.13(0.80), 18x1Ø6.3c/0.17(2.98)

Tramo nº 3 (*P32-P31*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.211 cm.
(C/2374)

Arm.sup: 2.4 ----- 1.2 3.6 2.4(0.03)
3.7(4.94)

Arm.inf: ----- 1.3 2.7 3.1 2.4 1.2 ----- 1.6(0.99) 3.1(2.46)
1.2(4.01)

Moment.: -3.7 1.8 3.8 4.4 3.3 0.7 -5.5 -3.7(0.00) 2.3(0.99) 4.4(2.46)
1.4(4.01) -5.5(4.99)

Cortant.: ----- 3.6 1.5 -0.3 -2.1 -4.4 ----- 8.5(x= 0.10)
-9.3(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<5.40+1.25=6.65) ----- 2Ø12.5(1.55>>), 1Ø12.5(1.10>>)

Arm.Montagem: 2Ø6.3(2.65)

Arm.Inferior: 2Ø12.5(5.60), 1Ø10(3.05)

Estribos: 7x1Ø6.3c/0.12(0.80), 19x1Ø6.3c/0.17(3.20), 8x1Ø6.3c/0.11(0.80)

Tramo nº 4 (*P31-P30*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.177 cm.
(C/2825)

Arm.sup: 3.6 1.2 ----- 3.6(0.04)
0.1(4.96)

Arm.inf: ----- 1.5 2.2 1.8 1.2 ----- 1.2(0.99) 2.2(2.71)
1.2(4.01)

Moment.: -5.5 -0.4 2.2 3.1 2.6 1.1 -0.1 -5.5(0.00) 0.3(0.99) 3.1(2.71)
1.4(4.01) -0.1(4.97)

Cortant.: ----- 4.2 2.0 0.2 -1.3 -2.0 ----- 9.7(x= 0.10)
-3.5(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.01(x= 0.10) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10), 1Ø12.5(<<1.10+1.05=2.15) -----
2Ø6.3(3.77+0.08D=3.85)

Arm.Inferior: 2Ø12.5(5.40+0.15D=5.55)

Estribos: 8x1Ø6.3c/0.11(0.80), 24x1Ø6.3c/0.17(4.00)