

Obra: TRF-4 VARAS VERTICAL PARTE 5

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 5
Grupo no 1 Piso 1 --- Piso igual 1

V 1 --- Grupo: 1

Tramo nº 1 (*P50-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.038 cm.
(C/13087)

Arm.sup: ----- 1.2 1.2 1.2 1.2 ----- 1.2 1.2 0.0(0.17)
1.2(4.67)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(0.73) 1.2(2.04)

Moment.: -0.1 0.3 0.6 0.6 0.4 -0.1 -0.9 -0.1(0.11) 0.3(0.83) 0.6(2.04)
-0.9(5.00)

Cortant.: ----- 0.5 0.2 -0.1 -0.5 -0.8 -1.1 0.7(x= 0.40)
-1.1(x= 5.00)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.00) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.27=4.35) ----- 2Ø10(1.50>>)

Arm.Inferior: 2Ø10(0.12D+5.37>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*V 1-V 1*) (C= 4.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.019 cm.
(C/26419)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.00)
1.2(4.60)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(2.48)

Moment.: -0.9 -0.2 0.2 0.4 0.3 -0.0 -0.6 -0.9(0.00) 0.4(2.48)
0.0(4.13) -0.6(4.95)

Cortant.: -1.1 0.7 0.4 0.0 -0.3 -0.6 -0.9 1.0(x= 0.00)
-1.1(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= 4.95) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.50+1.60=3.10) ----- 2Ø10(1.25>>)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø10(<<5.49+5.11=10.60)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 3 (*V 1-P50*) (C= 5.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.017 cm.
(C/29842)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.00)
1.2(4.99)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(2.33)

Moment.: -0.6 -0.0 0.3 0.4 0.2 -0.2 -1.9 -0.6(0.00) 0.1(1.00) 0.4(2.33)
-1.9(5.05)

Cortant.: -0.9 0.6 0.2 -0.1 -0.4 -0.7 ----- 0.9(x= 0.00)
-0.9(x= 0.00)

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

Arm.Superior: 2Ø10(<<1.25+1.20=2.45) ----- 2Ø12.5(1.60>>)

Arm.Montagem: 2Ø5(2.80)

Arm.Inferior: 2Ø10(5.45)

Estribos: 35x1Ø5c/0.14(4.85)

Tramo nº 4 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7143)

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 ----- 1.2(1.00) 1.7(2.50)
1.2(4.00)

Moment.: -1.9 -0.8 1.7 2.3 1.7 -0.8 -3.0 -2.5(0.29) 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(5.30)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7148)

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	-----	1.2(1.00) 1.7(2.50)
1.2(4.00)								
Moment.:	-3.0	-0.8	1.7	2.3	1.7	-0.8	-1.9	-3.0(0.00) 0.3(1.00) 2.3(2.50)
0.3(4.00) -2.5(4.77)								
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(5.50)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 6 (*P50-P50*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.003 cm.
(C/94141)

Arm.sup:	1.2	1.2	-----	-----	-----	-----	-----	1.2(0.06)
0.1(2.33)								
Arm.inf:	-----	1.2	1.2	1.2	1.2	-----		1.2(1.37)
Moment.:	-1.9	-0.5	0.1	0.4	0.4	0.0	-0.1	-1.9(0.00) 0.4(1.37)
0.0(2.08) -0.1(2.39)								
Cortant.:	-----	1.8	1.1	0.3	-0.4	-1.2	-----	1.8(x= 0.40)
-1.2(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(<<1.55+1.15=2.70) ----- 2Ø6.3(2.12+0.08D=2.20)

Arm.Inferior: 2Ø12.5(3.10+0.15D=3.25)

Estribos: 17x1Ø5c/0.14(2.30)

V 2 --- Grupo: 1

Tramo nº 1 (*V 1-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.129 cm.

(C/3879)

Arm.sup: ----- 1.5 2.1
2.9(4.66)

Arm.inf: ----- 1.5 2.1 1.8 1.2 ----- 1.7(0.99) 2.1(1.97)

Moment.: -0.0 2.1 2.9 2.5 0.9 -2.0 -4.0 -0.0(0.00) 2.3(0.99) 2.9(1.97)
-4.4(4.77)

Cortant.: 3.3 1.8 0.3 -1.2 -2.7 -4.2 ----- 3.3(x= 0.00)
-5.0(x= 4.60)

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

Arm.Superior: 2Ø6.3(0.08D+3.77=3.85) ----- 2Ø12.5(1.65>>), 1Ø10(1.05>>)

Arm.Inferior: 2Ø12.5(0.15D+5.25=5.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P50-P50*) (C= 4.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.062 cm.
(C/7993)

Arm.sup: 2.1 1.2 ----- 1.2 2.1 2.0(0.06)
2.1(4.89)

Arm.inf: ----- 1.2 1.2 1.6 1.2 1.2 ----- 1.6(2.48)

Moment.: -4.0 -0.8 1.7 2.3 1.6 -0.8 -4.1 -4.0(x= 0.00) 2.3(x=
2.48) -4.1(x= 4.95)

Cortant.: ----- 3.0 1.5 -0.0 -1.5 -3.0 ----- 3.7(x= 0.40)
-3.7(x= 4.55)

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

Arm.Superior: 2Ø12.5(<<1.65+1.60=3.25), 1Ø10(<<1.05+1.00=2.05) ----- 2Ø12.5(1.60>>),
1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.20)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 3 (*P50-V 2*) (C= 5.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.145 cm.
(C/3479)

Arm.sup: 2.1 1.5 1.2 ----- 3.0(0.34)

Arm.inf: ----- 1.2 1.8 2.1 1.5 ----- 2.1(3.39)
1.7(4.05)

Moment.: -4.1 -2.1 0.8 2.5 2.9 2.1 -0.0 -4.6(0.23) 2.9(3.39)

2.4(4.05) -0.0(5.05)

Cortant.: ----- 4.3 2.8 1.3 -0.3 -1.8 -3.1 5.1(x= 0.40)
-3.1(x= 5.05)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.05) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+2.00=3.60), 1Ø10(<<1.00+1.15=2.15) -----
2Ø6.3(3.47+0.08D=3.55)

Arm.Inferior: 2Ø12.5(5.30+0.15D=5.45)

Estribos: 35x1Ø5c/0.14(4.85)

V 3 --- Grupo: 1

Tramo nº 1 (*P50-V 1*) (C= 4.80) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.063 cm.
(C/7634)

Arm.sup: ----- 1.2 0.1(0.17)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.71) 1.2(2.60)
1.2(3.86)

Moment.: -0.1 0.3 0.8 0.9 0.9 0.6 0.0 -0.1(0.11) 0.3(0.80) 1.0(2.60)
0.7(3.86) -0.0(4.80)

Cortant.: ----- 0.7 0.4 0.1 -0.2 -0.5 -0.9 0.9(x= 0.40)
-0.9(x= 4.80)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 4.80) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+4.37=4.45) ----- 2Ø10(1.10>>)

Arm.Inferior: 2Ø12.5(0.15D+5.17>>)

Estribos: 33x1Ø5c/0.14(4.60)

Tramo nº 2 (*V 1-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.087 cm.
(C/5754)

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

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.: 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.: -0.9 0.6 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: 2Ø10(<<1.10+1.10=2.20) ----- 2Ø6.3(4.27+0.08D=4.35)

Arm.Inferior: 2Ø12.5(<<5.32+5.07+0.15D=10.54)

Estribos: 35x1Ø5c/0.14(4.80)

V 4 --- Grupo: 1

Tramo nº 1 (*P40-P50*) (C= 4.99) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.025 cm.
(C/20025)

Arm.sup: ----- 1.2 1.2 0.0(0.17)
1.2(4.82)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(0.70) 1.2(2.19)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.3 -0.8 -0.1(0.11) 0.2(0.83) 0.5(2.19)
-0.8(4.82)

Cortant.: ----- 0.5 0.2 -0.2 -0.5 -0.8 ----- 0.6(x= 0.40)
-1.0(x= 4.59)

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

Arm.Superior: 2Ø6.3(0.08D+4.17=4.25) ----- 2Ø10(1.55>>)

Arm.Inferior: 2Ø10(0.12D+5.53=5.65)

Estribos: 35x1Ø5c/0.14(4.79)

Tramo nº 2 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/34900)

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.: -0.8 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.8(0.00) 0.1(1.00) 0.5(2.50)
0.1(4.00) -0.7(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(5.45)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P50-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/34555)

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.: -0.7 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.7(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(5.35)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm.
(C/34545)

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)
1.2(4.00)

Moment.: -0.7 -0.2 0.4 0.5 0.4 -0.2 -0.7 -0.7(0.00) 0.5(2.50)
0.1(4.00) -0.7(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(5.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
(C/33814)

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	-0.7	-----	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)
4.60) Lim.: 0.54								0.00(x=

Arm.Superior: 2Ø10(<<1.55+1.55=3.10) ----- 2Ø10(4.23+0.12D=4.35)

Arm.Inferior: 2Ø10(5.58+0.12D=5.70)

Estribos: 35x1Ø5c/0.14(4.80)

V 5 --- Grupo: 1

Tramo nº 1 (*P51-P51*) (C= 6.40) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.205 cm.
(C/3125)

Arm.sup:	-----	-----	-----	-----	-----	-----	-----	0.1(0.07)
0.1(6.33)								
Arm.inf:	-----	1.2	1.2	1.3	1.2	1.2	-----	1.2(1.04) 1.3(3.20)
1.2(5.37)								
Moment.:	-0.1	0.9	1.6	1.8	1.6	0.9	-0.1	-0.1(0.00) 0.9(1.07) 1.8(3.20)
0.9(5.34)	-0.1(6.40)							
Cortant.:	-----	0.8	0.4	0.0	-0.4	-0.8	-----	1.4(x= 0.17)
-1.4(x= 6.23)								
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio: 0.00(x= 0.17)
6.23) Lim.: 0.54								0.00(x=

Arm.Superior: 2Ø6.3(0.08D+7.36+0.08D=7.52) -----

Arm.Inferior: 2Ø10(0.12D+7.36+0.12D=7.60)

Estribos: 45x1Ø5c/0.14(6.20)

V 6 --- Grupo: 1

Tramo nº 1 (*P40-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.025 cm.
(C/19834)

Arm.sup:	-----	-----	-----	-----	-----	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: $2\varnothing 6.3(0.08D+4.12=4.20)$ ----- $2\varnothing 10(1.55>>)$

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

Estribos: $35 \times 1\varnothing 5c/0.14(4.80)$

Tramo nº 2 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.012 cm.
(C/42592)

Arm.sup: 1.2 1.2 ----- 1.2 1.6 1.2(0.06)
1.4(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.: -0.8 -0.2 0.4 0.5 0.4 -0.2 -3.1 -0.8(0.00) 0.1(1.00) 0.5(2.50)
0.1(4.00) -3.1(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: $2\varnothing 10(<<1.55+1.55=3.10)$ ----- $2\varnothing 12.5(1.60>>)$, $1\varnothing 10(1.00>>)$

Arm.Montagem: $2\varnothing 5(2.35)$

Arm.Inferior: $2\varnothing 10(5.45)$

Estribos: $35 \times 1\varnothing 5c/0.14(4.80)$

Tramo nº 3 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.150 cm.
(C/3330)

Arm.sup: 1.6 1.2 ----- 1.2 1.3 3.0(0.34)
2.4(4.66)
Arm.inf: ----- 2.4 2.8 1.7 1.2 ----- 3.1(1.90)
1.2(4.02)
Moment.: -3.1 -1.6 3.4 4.0 2.4 -1.4 -2.5 -4.5(0.29) 4.3(1.90)
0.1(4.02) -3.6(4.71)

Cortant.: ----- 5.6 4.1 -1.2 -2.6 -4.1 ----- 6.4(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: 2Ø12.5(<<1.60+1.65=3.25), 1Ø10(<<1.00+1.15=2.15) ----- 2Ø12.5(1.80>>)

Arm.Montagem: 2Ø5(2.00)

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

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

Tramo nº 4 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.012 cm.
 (C/40026)

Arm.sup: 1.3 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.: -2.5 -0.2 0.4 0.5 0.4 -0.2 -0.6 -2.5(0.00) 0.1(1.00) 0.5(2.50)
 0.1(4.00) -0.6(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(<<1.80+1.60=3.40) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.35)

Arm.Inferior: 2Ø10(5.30)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.013 cm.
 (C/37754)

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.: -0.6 -0.2 0.4 0.5 0.4 -0.2 -1.8 -0.6(0.00) 0.1(1.00) 0.5(2.50)
 0.1(4.00) -1.8(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) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 6 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7136)

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 ----- 1.2(1.00) 1.7(2.50)
1.2(4.00)

Moment.: -1.8 -0.8 1.7 2.3 1.7 -0.8 -3.0 -2.5(0.29) 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(<<1.55+1.55=3.10) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø12.5(5.40)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 7 (*P51-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.070 cm.
(C/7148)

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 ----- 1.2(1.00) 1.7(2.50)
1.2(4.00)

Moment.: -3.0 -0.8 1.7 2.3 1.7 -0.8 -1.9 -3.0(0.00) 0.3(1.00) 2.3(2.50)
0.3(4.00) -2.5(4.77)

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(4.75)

Tramo nº 8 (*P52-P52*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.003 cm.
(C/91761)

Arm.sup: 1.2 1.2 ----- 1.2(0.06)
0.1(2.33)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.37)

Moment.: -1.9 -0.5 0.1 0.4 0.4 0.0 -0.1 -1.9(0.00) 0.4(1.37)
0.0(2.08) -0.1(2.39)

Cortant.: ----- 1.8 1.1 0.3 -0.4 -1.2 ----- 1.8(x= 0.40)
-1.2(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(<<1.55+1.15=2.70) ----- 2Ø6.3(1.97+0.08D=2.05)

Arm.Inferior: 2Ø10(3.08+0.12D=3.20)

Estribos: 17x1Ø5c/0.14(2.30)

V 7 --- Grupo: 1

Tramo nº 1 (*V 1- *) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.210 cm.
(C/2385)

Arm.sup: ----- 1.2 3.7
2.4(4.64)

Arm.inf: 0.1 1.7 2.4 2.3 1.2 ----- 1.5(0.71) 2.5(1.79)

Moment.: 0.2 2.4 3.4 3.2 1.6 -1.3 -5.2 0.0(-0.00) 2.4(0.83) 3.4(1.79)
-5.2(5.00)

Cortant.: 3.3 1.9 0.4 -1.0 -2.5 -4.0 -5.4 3.3(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+3.77=3.85) ----- 2Ø12.5(1.68>>), 1Ø16(1.00>>)

Arm.Inferior: 2Ø12.5(0.15D+5.07>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (* -V 1*) (C= 2.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.288 cm.
(C/695)

Arm.sup: 3.7 3.3 2.3 1.5 1.2 1.2 1.2 4.4(0.00)
1.2(1.36)

Arm.inf: ----- 0.0(1.94)

Moment.: -5.2 -4.6 -3.3 -2.1 -1.2 -0.4 0.0 -6.2(0.00) -0.5(1.49)
0.0(1.94) 0.0(2.00)

Cortant.: -5.4 4.3 3.7 3.1 2.5 2.0 0.0 4.8(x= 0.00)
-5.4(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= 1.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.68+1.97+0.15D=3.80), 1Ø16(<<1.00+1.95=2.95) -----

Arm.Inferior: 2Ø12.5(<<5.22+1.97+0.15D=7.34)

Estribos: 14x1Ø5c/0.14(1.87)

V 8 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 3.10) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.060 cm.
(C/5143)

Arm.sup: -----

Arm.inf: ----- 1.2 1.4 1.5 1.4 1.2 ----- 1.2(0.44) 1.5(1.55)
1.2(2.66)

Moment.: 0.0 1.2 1.9 2.1 1.9 1.2 -0.0 0.0(0.00) 1.2(0.52) 2.1(1.55)
1.2(2.58) -0.0(3.10)

Cortant.: 2.6 1.9 0.9 ----- -0.9 -1.9 -2.6 2.6(x= 0.00)
-2.6(x= 3.10)

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= 3.10) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.23+0.08D=3.39) -----

Arm.Inferior: 2Ø12.5(0.15D+3.23+0.15D=3.53)

Estribos: 21x1Ø5c/0.14(2.90)

V 9 --- Grupo: 1

Tramo nº 1 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.019 cm.
(C/26180)

Arm.sup: ----- 1.2 2.5 0.0(0.17)
2.2(4.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(1.00) 1.2(1.90)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.4 -4.8 -0.1(0.11) 0.3(1.00) 0.5(1.90)
-4.8(5.00)

Cortant.: ----- 0.4 0.1 -0.2 -0.6 -0.9 ----- 0.6(x= 0.40)
-1.1(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+3.97=4.05) ----- 2Ø16(1.85>>), 1Ø10(0.90>>)

Arm.Inferior: 2Ø10(0.12D+5.58=5.70), 1Ø6.3(3.60)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.276 cm. (C/1815)

Arm.sup: 2.5 2.0 ----- 1.5 2.0 4.8(0.34)
2.9(4.60)

Arm.inf: ----- 4.1 4.1 1.8 ----- 5.6(1.90)

Moment.: -4.8 -2.8 5.8 5.7 2.5 -2.1 -3.9 -7.2(x= 0.29) 7.8(x= 1.90)
-4.4(x= 4.77)

Cortant.: ----- 9.2 8.8 -3.4 -3.7 -4.1 ----- 9.3(x= 0.40)
-4.2(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(<<1.85+1.80=3.65), 1Ø10(<<0.90+1.35=2.25) ----- 2Ø12.5(1.80>>), 1Ø10(1.05>>)

Arm.Montagem: 2Ø6.3(1.90)

Arm.Inferior: 2Ø16(5.30), 1Ø16(3.00)

Estribos: 19x1Ø6.3c/0.11(2.09), 16x1Ø6.3c/0.17(2.71)

Tramo nº 3 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.068 cm. (C/7311)

Arm.sup: 2.0 1.2 ----- 1.2 1.2 2.0(0.06)
1.6(4.66)

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.: -3.9 -0.8 1.7 2.3 1.7 -0.8 -1.8 -3.9(0.00) 0.3(1.00) 2.3(2.50)
0.3(4.00) -2.5(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(<<1.80+1.60=3.40), 1Ø10(<<1.05+1.00=2.05) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.35)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.012 cm. (C/40324)

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 -1.7 -1.8(0.00) 0.1(1.00) 0.5(2.50)
0.1(4.00) -1.7(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) ----- 2Ø10(1.55>>), 1Ø6.3(1.00>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(5.35)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.034 cm. (C/14858)

Arm.sup: 1.2 1.2 ----- 1.3(0.29)
0.0(4.83)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.87) 1.2(2.88)
1.2(4.03)

Moment.: -1.7 -0.1 0.5 0.8 0.7 0.4 -0.1 -2.1(0.17) 0.1(0.87) 0.8(2.88)
0.5(4.03) -0.1(4.89)

Cortant.: ----- 0.9 0.6 0.2 -0.1 -0.4 ----- 6.5(x= 0.40)
-0.6(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+1.40=2.95), 1Ø6.3(<<1.00+1.00=2.00) -----
 2Ø6.3(4.32+0.08D=4.40)

Arm.Inferior: 2Ø10(5.58+0.12D=5.70)

Estribos: 8x1Ø5c/0.11(0.80), 29x1Ø5c/0.14(4.00)

V 10 --- Grupo: 1

Tramo nº 1 (*V 1- *) (C= 4.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.300 cm.
 (C/1651)

Arm.sup: ----- 1.3 5.2
 4.6(4.83)

Arm.inf: 0.3 2.0 2.9 2.9 2.0 ----- 2.2(0.94) 3.0(2.12)

Moment.: 0.5 2.9 4.1 4.1 2.8 -1.8 -7.2 0.0(0.00) 3.1(0.94) 4.2(2.12)
 -7.2(4.95)

Cortant.: 3.5 2.2 0.7 -0.8 -2.4 -5.8 -7.2 3.5(x= 0.00)
 -7.2(x= 4.95)

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= 4.95) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.67=3.75) ----- 2Ø16(1.70>>), 1Ø12.5(1.00>>)

Arm.Inferior: 2Ø12.5(0.15D+5.02>>), 1Ø10(3.60)

Estribos: 27x1Ø5c/0.14(3.79), 8x1Ø5c/0.12(0.96)

Tramo nº 2 (* -V 2*) (C= 5.63) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.664 cm.
 (C/847)

Arm.sup: 5.2 1.2 ----- 5.2(0.00)

Arm.inf: ----- 2.8 3.8 3.7 2.4 ----- 1.2(1.13) 3.9(3.14)
 2.7(4.52)

Moment.: -7.2 -0.7 3.9 5.3 5.1 3.3 0.0 -7.2(0.00) 0.4(1.13) 5.4(3.14)
 3.8(4.52) 0.0(5.63)

Cortant.: -7.2 6.1 2.3 0.6 -1.1 -2.7 -4.3 7.6(x= 0.00)
 -7.2(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= 5.63) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.70+1.60=3.30), 1Ø12.5(<<1.00+1.15=2.15) -----
 2Ø6.3(4.47+0.08D=4.55)

Arm.Inferior: 2Ø12.5(<<5.17+5.70+0.15D=11.02), 1Ø16(4.40)

Estribos: 13x1Ø5c/0.1(1.30), 30x1Ø5c/0.14(4.13)

V 11 --- Grupo: 1

Tramo nº 1 (*V 1-P52*) (C= 3.21) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.376 cm.
(C/853)

Arm.sup: 1.2 1.2 1.2 1.2 1.6 2.3 1.9 1.2(1.07)
2.4(2.81)

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

Moment.: 0.0 -0.4 -0.9 -1.5 -2.3 -3.2 -3.7 -0.0(0.10) 0.0(0.06) -0.3(0.68)
-3.7(3.16)

Cortant.: 0.0 -0.9 -1.1 -1.3 -1.5 -1.7 ----- 0.0(x= 0.00)
-1.8(x= 2.81)

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

Arm.Superior: 2Ø12.5(0.15D+3.18>>) -----

Arm.Inferior: 2Ø10(0.12D+3.38=3.50)

Estribos: 22x1Ø5c/0.14(3.08)

Tramo nº 2 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.092 cm.
(C/5429)

Arm.sup: 1.9 1.2 ----- 1.2 2.5 2.0(0.23)
2.6(4.83)

Arm.inf: ----- 1.2 1.5 2.3 2.0 ----- 2.3(2.87)
1.2(4.04)

Moment.: -3.7 -1.1 2.1 3.2 2.9 -1.2 -4.9 -3.7(0.00) 3.2(2.87)
0.3(4.04) -4.9(5.00)

Cortant.: ----- 3.5 2.0 0.5 -3.1 -4.6 ----- 4.3(x= 0.40)
-5.4(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: 2Ø12.5(<<3.33+1.62=4.95) ----- 2Ø12.5(1.65>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.15)

Arm.Inferior: 2Ø12.5(5.35)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P52-P53*) (C= 5.56) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.150 cm.
(C/3705)

Arm.sup: 2.5 1.2 ----- 1.2 1.3 3.0(0.29)
 2.4(5.22)
 Arm.inf: ----- 2.4 2.7 1.9 1.2 ----- 1.2(1.04) 2.7(2.68)
 Moment.: -4.9 -1.2 3.4 3.8 2.6 -1.1 -2.5 -4.9(0.11) 0.4(1.04) 3.8(2.68)
 0.0(4.64) -3.6(5.28)
 Cortant.: ----- 5.0 1.3 -0.4 -2.1 -3.7 ----- 6.0(x= 0.40)
 -4.7(x= 5.16)
 Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x=
 5.16) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.65+1.75=3.40), 1Ø10(<<1.00+1.15=2.15) ----- 2Ø10(1.70>>),
 1Ø10(1.35>>)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø16(6.00)

Estribos: 39x1Ø5c/0.14(5.36)

Tramo nº 4 (*P53-P53*) (C= 4.60) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.015 cm.
 (C/31264)

Arm.sup: 1.3 1.2 ----- 1.2(0.06)
 0.0(4.42)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(2.83)
 1.2(3.91)

Moment.: -2.5 -0.3 0.2 0.4 0.4 0.2 -0.1 -2.5(0.00) 0.4(2.83)
 0.2(3.84) -0.1(4.48)

Cortant.: ----- 0.8 0.5 0.2 -0.1 -0.4 ----- 1.0(x= 0.40)
 -0.5(x= 4.18)

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

Arm.Superior: 2Ø10(<<1.70+1.50=3.20), 1Ø10(<<1.35+0.95=2.30) -----
 2Ø6.3(3.87+0.08D=3.95)

Arm.Inferior: 2Ø10(5.18+0.12D=5.30)

Estribos: 32x1Ø5c/0.14(4.40)

V 12 --- Grupo: 1

Tramo nº 1 (*P53-P53*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.116 cm.
 (C/4322)

Arm.sup: 0.2 ----- 1.2 2.5 0.2(0.17)
 2.5(4.83)

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 -4.8 -0.4(0.11) 1.5(1.00) 2.4(2.20)
 -4.8(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+4.02=4.10) ----- 2Ø12.5(1.63>>), 1Ø10(1.00>>)

Arm.Inferior: 2Ø12.5(0.15D+5.37>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P53-V 1*) (C= 2.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.241 cm.
 (C/829)

Arm.sup: 2.5 3.2 2.6 1.9 1.2 1.2 1.2 3.3(0.40)
 1.2(1.37)
 Arm.inf: ----- 0.0(1.94)
 Moment.: -4.8 -4.8 -3.7 -2.6 -1.6 -0.7 -0.0 -4.9(0.17) -0.5(1.58)
 0.0(1.94) -0.0(2.00)
 Cortant.: ----- 3.2 3.1 3.0 2.9 0.0 3.4(x= 0.40)
 -0.0(x= 2.00)
 Torsores: ----- 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 1.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.63+1.97+0.15D=3.75), 1Ø10(<<1.00+1.35=2.35) -----

Arm.Inferior: 2Ø12.5(<<5.52+1.97+0.15D=7.64)

Estribos: 14x1Ø5c/0.14(1.87)

V 13 --- Grupo: 1

Tramo nº 1 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.119 cm.
 (C/4209)

Arm.sup: 0.2 ----- 1.2 1.9 0.2(0.17)
 2.4(4.66)
 Arm.inf: ----- 1.2 1.7 1.6 1.2 ----- 1.2(0.70) 1.7(2.20)
 Moment.: -0.3 1.1 2.3 2.3 1.0 -1.5 -3.7 -0.4(0.11) 1.1(0.83) 2.4(2.20)
 -3.9(4.83)
 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+4.07=4.15) ----- 2Ø12.5(1.60>>)

Arm.Inferior: 2Ø12.5(0.15D+5.55=5.70)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.085 cm. (C/5910)

Arm.sup: 1.9 1.2 ----- 1.2 1.3 2.0(0.06)
2.5(4.66)

Arm.inf: ----- 1.2 1.5 2.1 1.7 1.2 ----- 1.2(0.92) 2.1(2.75)
1.2(4.05)

Moment.: -3.7 -0.9 2.1 2.9 2.4 -0.6 -2.6 -3.7(0.00) 0.3(0.92) 2.9(2.75)
1.1(4.05) -3.8(4.71)

Cortant.: ----- 3.2 1.7 0.2 -1.3 -6.0 ----- 4.0(x= 0.40)
-6.8(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(5.30)

Estribos: 27x1Ø5c/0.14(3.70), 10x1Ø5c/0.11(1.10)

Tramo nº 3 (*P51-P50*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.001 cm. (C/-388468)

Arm.sup: 1.3 1.2 ----- 1.2 1.8 1.2(0.06)
1.5(3.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.00)

Moment.: -2.6 -0.2 0.2 0.3 0.2 -0.1 -3.4 -2.6(x= 0.00) 0.3(x= 2.00)
-3.4(x= 4.00)

Cortant.: ----- 0.5 0.3 0.0 -0.3 -0.5 ----- 0.6(x= 0.40)
-0.6(x= 3.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.60) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.55+1.45=3.00) ----- 2Ø16(1.54>>), 1Ø10(0.80>>)

Arm.Montagem: 2Ø5(1.45)

Arm.Inferior: 2Ø10(4.21>>)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P50-V 3*) (C= 3.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.762 cm.
(C/394)

Arm.sup: 1.8 3.9 3.0 2.1 1.3 1.2 1.2 4.1(0.40)
1.3(2.01)

Arm.inf: ----- 0.0(2.94)

Moment.: -3.4 -5.5 -4.2 -2.9 -1.8 -0.8 -0.0 -5.9(0.34) -0.5(2.36)
0.0(2.94) -0.0(3.00)

Cortant.: ----- 2.8 2.6 2.4 2.2 2.0 0.0 2.8(x= 0.40)
-0.0(x= 3.00)

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

Arm.Superior: 2Ø16(<<1.54+2.97+0.19D=4.70), 1Ø10(<<0.80+0.95=1.75) -----

Arm.Inferior: 2Ø10(<<4.21+2.97+0.12D=7.30)

Estribos: 21x1Ø5c/0.14(2.87)

V 14 --- Grupo: 1

Tramo nº 1 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.025 cm.
(C/20099)

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(0.70) 1.2(2.20)

Moment.: -0.1 0.2 0.5 0.5 0.2 -0.3 -1.2 -0.1(0.11) 0.2(0.83) 0.5(2.20)
-1.2(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: 2Ø6.3(0.08D+4.17=4.25) ----- 2Ø10(1.55>>)

Arm.Inferior: 2Ø12.5(0.15D+5.55=5.70)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.065 cm.
(C/7741)

Arm.sup: 1.2 1.2 ----- 1.8 1.2(0.17)
3.2(4.66)

Arm.inf: ----- 1.2 1.2 1.7 2.0 1.2 ----- 1.2(0.92) 2.1(3.79)
2.1(4.05)

Moment.: -1.2 0.7 1.7 2.4 2.8 1.7 -3.4 -1.3(0.17) 0.8(0.92) 2.9(3.79)
2.9(4.05) -4.9(4.77)

Cortant.: ----- 1.3 1.0 0.7 0.4 -10.6 ----- 1.5(x= 0.40)
-10.8(x= 4.60)

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

Arm.Superior: 2Ø10(<<1.55+1.70=3.25) ----- 2Ø12.5(1.55>>), 1Ø10(1.10>>)

Arm.Montagem: 2Ø8(2.25)

Arm.Inferior: 2Ø12.5(5.30)

Estribos: 25x1Ø8c/0.15(3.68), 8x1Ø8c/0.14(1.12)

Tramo nº 3 (*P51-P50*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.002 cm.
(C/-243451)

Arm.sup: 1.8 1.2 ----- 1.2 1.9 1.5(0.06)
1.6(3.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.00)

Moment.: -3.4 -0.2 0.2 0.3 0.2 -0.1 -3.6 -3.4(x= 0.00) 0.3(x=
2.00) -3.6(x= 4.00)

Cortant.: ----- 0.5 0.3 0.0 -0.3 -0.5 ----- 0.6(x= 0.40)
-0.6(x= 3.60)

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

Arm.Superior: 2Ø12.5(<<1.55+1.45=3.00), 1Ø10(<<1.10+0.80=1.90) ----- 2Ø12.5(1.40>>),
2Ø10(0.80>>)

Arm.Montagem: 2Ø5(1.55)

Arm.Inferior: 2Ø10(4.30)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P50-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.425 cm.
(C/1406)

Arm.sup: 1.9 1.6 ----- 1.2 4.0(0.40)
1.2(5.75)

Arm.inf: ----- 1.3 3.0 2.7 1.2 ----- 3.0(3.26)
 1.3(4.90)

Moment.: -3.6 -2.3 1.9 4.2 3.8 1.6 -1.2 -5.8(0.29) 4.2(3.26)
 1.9(4.90) -1.6(5.75)

Cortant.: ----- 5.1 3.3 0.5 -1.3 -3.1 ----- 6.1(x= 0.40)
 -6.9(x= 5.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.40+2.05=3.45), 2Ø10(<<0.80+1.35=2.15) -----
 2Ø10(1.73+0.12D=1.85)

Arm.Montagem: 2Ø5(3.15)

Arm.Inferior: 2Ø12.5(6.55+0.15D=6.70), 1Ø10(3.60)

Estribos: 36x1Ø5c/0.14(4.98), 8x1Ø5c/0.1(0.80)

V 15 --- Grupo: 1

Tramo nº 1 (*V 1- *) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.119 cm.
 (C/4210)

Arm.sup: ----- 1.4 4.3
 3.3(4.74)

Arm.inf: ----- 1.2 1.7 1.5 1.2 ----- 1.3(0.96) 1.7(1.87)

Moment.: 0.0 1.7 2.3 2.1 0.7 -2.0 -6.0 0.0(0.00) 1.8(0.96) 2.4(1.87)
 -6.0(5.00)

Cortant.: 2.8 1.3 0.5 -1.0 -2.5 -4.0 -5.3 2.8(x= 0.00)
 -5.3(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: 2Ø6.3(0.08D+3.32=3.40) ----- 2Ø16(2.00>>), 1Ø10(1.00>>)

Arm.Inferior: 2Ø16(0.19D+5.06>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (* -V 6*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.465 cm.
 (C/1075)

Arm.sup: 4.3 1.2 ----- 3.6(0.00)

Arm.inf: ----- 2.0 3.5 3.7 1.9 ----- 4.1(3.12)
 2.1(4.05)

Moment.: -6.0 -0.5 2.8 4.9 5.2 2.7 0.0 -6.0(0.00) 5.7(3.12)

2.9(4.05) 0.0(5.00)

Cortant.: -5.3 4.8 3.3 1.8 -2.5 -2.5 -3.8 6.1(x= 0.00)
-5.3(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= 5.00) Lim.: 0.54

Arm.Superior: 2Ø16(<<2.00+1.55=3.55), 1Ø10(<<1.00+1.00=2.00) -----
2Ø6.3(3.82+0.08D=3.90)

Arm.Inferior: 2Ø16(<<5.25+5.07+0.19D=10.51), 1Ø10(3.00)

Estribos: 35x1Ø5c/0.14(4.80)

V 16 --- Grupo: 1

Tramo nº 1 (*P52-P52*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.048 cm.
(C/7538)

Arm.sup: 0.1 ----- 1.3 2.1 0.2(0.17)
2.3(3.42)

Arm.inf: ----- 1.2 1.2 1.3 1.2 ----- 1.2(0.68) 1.3(1.79)

Moment.: -0.3 0.5 1.5 1.9 1.3 -1.8 -4.1 -0.3(0.11) 0.7(0.68) 1.9(1.79)
-4.1(3.65)

Cortant.: ----- 2.2 1.1 0.0 -4.5 -5.6 ----- 2.6(x= 0.40)
-5.9(x= 3.25)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.25)
Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.77=2.85) ----- 2Ø12.5(1.50>>)

Arm.Inferior: 2Ø10(0.12D+4.23=4.35)

Estribos: 25x1Ø5c/0.14(3.45)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.116 cm.
(C/4312)

Arm.sup: 2.1 1.2 ----- 1.2 1.4 2.3(0.23)
2.6(4.66)

Arm.inf: ----- 1.2 1.6 2.5 2.1 ----- 1.2(0.98) 2.6(2.93)

Moment.: -4.1 -1.2 2.2 3.5 3.0 -1.4 -2.6 -4.1(0.00) 0.2(0.98) 3.7(2.93)
-4.0(4.71)

Cortant.: ----- 3.8 2.3 0.8 -3.4 -4.9 ----- 4.6(x= 0.40)
-5.7(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(<<1.50+1.75=3.25) ----- 2Ø10(1.60>>), 1Ø12.5(1.35>>)

Arm.Montagem: 2Ø5(2.10)

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

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.002 cm.
(C/170132)

Arm.sup: 1.2(3.94)	1.4	1.2	-----	-----	-----	1.2	1.2	1.2(0.06)	
Arm.inf: -----	1.2	1.2	1.2	1.2	1.2	-----		1.2(2.00)	
Moment.: 2.00)	-2.6 -0.6(x= 4.00)	-0.2	0.2	0.3	0.2	-0.1	-0.6	-2.6(x= 0.00)	0.3(x=
Cortant.: -----		0.5	0.3	0.0	-0.2	-0.5	-----		0.6(x= 0.40)
Torsores: -----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio:	0.00(x= 0.40)	0.00(x=
3.60) Lim.: 0.54									

Arm.Superior: 2Ø10(<<1.60+1.40=3.00), 1Ø12.5(<<1.35+0.80=2.15) ----- 2Ø10(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø10(4.40)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P51-P50*) (C= 5.44) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.022 cm.
(C/24839)

Arm.sup: 1.2(5.38)	1.2	1.2	-----	-----	-----	1.2	1.2	1.2(0.23)		
Arm.inf: -----	1.2	1.2	1.2	1.2	1.2	-----		1.2(1.06)	1.2(2.72)	
Moment.: 0.1(4.38)	-0.6 -0.8(5.44)	-0.2	0.5	0.6	0.5	-0.2	-0.8	-0.7(0.23)	0.1(1.06)	0.6(2.72)
Cortant.: -----		0.7	0.4	0.0	-0.4	-0.7	-----		0.9(x= 0.40)	
-0.9(x= 5.04)										
Torsores: -----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio:	0.00(x= 0.40)	0.00(x=	
5.04) Lim.: 0.54										

Arm.Superior: 2Ø10(<<1.40+1.60=3.00) ----- 2Ø10(1.63>>)

Arm.Montagem: 2Ø5(2.80)

Arm.Inferior: 2Ø10(5.58>>)

Estribos: 38x1Ø5c/0.14(5.24)

Tramo nº 5 (*P50-V 1*) (C= 0.68) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm.
(C/17273)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.06)
1.2(0.47)

Arm.inf: ----- 0.0(0.62)

Moment.: -0.8 -0.8 -0.7 -0.5 -0.3 -0.0 0.0 -0.8(0.00) -0.0(0.54)
0.0(0.62) -0.4(0.40)

Cortant.: ----- 2.2 2.1 0.0 2.2(x= 0.40)
-0.0(x= 0.68)

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

Arm.Superior: 2Ø10(<<1.63+0.65+0.12D=2.40) -----

Arm.Inferior: 2Ø10(<<5.58+0.64+0.13D=6.35)

Estribos: 4x1Ø5c/0.14(0.55)

V 17 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 2.35) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.020 cm.
(C/11840)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.34) 1.2(1.17)
1.2(2.01)

Moment.: 0.0 0.7 1.1 1.2 1.1 0.7 -0.0 -0.0(0.00) 0.7(0.39) 1.2(1.17)
0.7(1.96) -0.0(2.35)

Cortant.: 2.0 1.4 0.7 ----- -0.7 -1.4 -2.0 2.0(x= 0.00)
-2.0(x= 2.35)

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= 2.35) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.48+0.08D=2.64) -----

Arm.Inferior: 2Ø10(0.12D+2.48+0.12D=2.72)

Estribos: 16x1Ø5c/0.14(2.15)

V 18 --- Grupo: 1

Tramo nº 1 (*P52-P52*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.084 cm.
(C/4339)

Arm.sup: 1.2 1.4 ----- 2.2 2.3 2.1(0.34)
4.2(3.31)

Arm.inf: ----- 1.4 3.2 3.9 ----- 4.6(2.35)

Moment.: -1.9 -2.0 2.0 4.5 5.5 -3.1 -4.4 -3.1(x= 0.29) 6.5(x=
2.35) -6.4(x= 3.37)

Cortant.: ----- 4.4 4.2 3.9 -11.9 -12.1 ----- 4.5(x= 0.40)
-12.2(x= 3.25)

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

Arm.Superior: 2Ø12.5(0.15D+2.60=2.75) ----- 2Ø16(1.70>>), 1Ø10(0.90>>)

Arm.Inferior: 2Ø16(0.19D+4.21=4.40), 1Ø10(2.45)

Estribos: 14x1Ø8c/0.15(2.01), 12x1Ø8c/0.12(1.44)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.011 cm.
(C/47546)

Arm.sup: 2.3 1.2 ----- 1.2 1.2 2.0(0.06)
1.2(4.83)

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

Moment.: -4.4 -0.2 0.4 0.5 0.4 -0.2 -0.5 -4.4(0.00) 0.5(2.50)
0.1(4.00) -0.6(4.83)

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: 2Ø16(<<1.70+1.70=3.40), 1Ø10(<<0.90+1.00=1.90) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.25)

Arm.Inferior: 2Ø10(5.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.005 cm.
(C/88637)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.06)
1.2(3.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.00)

Moment.: -0.5 -0.1 0.2 0.3 0.2 -0.1 -0.6 -0.5(x= 0.00) 0.3(x= 2.00) -0.6(x= 4.00)

Cortant.: ----- 0.5 0.3 -0.0 -0.3 -0.5 ----- 0.6(x= 0.40) -0.6(x= 3.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.60) Lim.: 0.54

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

Arm.Montagem: 2Ø5(1.70)

Arm.Inferior: 2Ø10(4.35)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P51-P50*) (C= 5.44) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.022 cm. (C/24808)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.23) 1.2(5.38)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.06) 1.2(2.72) 1.2(4.38)

Moment.: -0.6 -0.2 0.5 0.6 0.5 -0.2 -0.8 -0.7(0.23) 0.1(1.06) 0.6(2.72) 0.1(4.38) -0.8(5.38)

Cortant.: ----- 0.7 0.4 -0.0 -0.4 -0.7 ----- 0.9(x= 0.40) -0.9(x= 5.04)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.04) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.40+1.60=3.00) ----- 2Ø10(1.63>>)

Arm.Montagem: 2Ø5(2.80)

Arm.Inferior: 2Ø10(5.61>>)

Estribos: 38x1Ø5c/0.14(5.24)

Tramo nº 5 (*P50-V 1*) (C= 0.68) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm. (C/18450)

Arm.sup: 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2(0.06) 1.2(0.47)

Arm.inf: ----- ----- ----- ----- ----- 0.0(0.62)

Moment.: -0.8 -0.7 -0.6 -0.4 -0.2 -0.0 0.0 -0.8(0.00) -0.0(0.54) 0.0(0.62) -0.3(0.40)

Cortant.: ----- ----- ----- ----- 1.9 1.8 0.0 1.9(x= 0.40) -0.0(x= 0.68)

Torsores: ----- 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.40) 0.00(x= 0.58) Lim.: 0.54

Arm.Superior: 2Ø10(<<1.63+0.65+0.12D=2.40) -----

Arm.Inferior: 2Ø10(<<5.61+0.64+0.20D=6.45)

Estribos: 4x1Ø5c/0.14(0.55)

V 19 --- Grupo: 1

Tramo nº 1 (*V 1-V 1*) (C= 2.35) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.020 cm. (C/11840)

Arm.sup: -----

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.34) 1.2(1.17)
1.2(2.01)

Moment.: 0.0 0.7 1.1 1.2 1.1 0.7 0.0 0.0(0.00) 0.7(0.39) 1.2(1.17)
0.7(1.96) 0.0(2.35)

Cortant.: 2.0 1.4 0.7 ----- -0.7 -1.4 -2.0 2.0(x= 0.00)
-2.0(x= 2.35)

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= 2.35) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.48+0.08D=2.64) -----

Arm.Inferior: 2Ø10(0.12D+2.48+0.12D=2.72)

Estribos: 16x1Ø5c/0.14(2.15)

V 20 --- Grupo: 1

Tramo nº 1 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.014 cm. (C/35196)

Arm.sup: 1.2 1.2 ----- 1.2 1.2 1.2(0.29)
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.: -0.3 -0.2 0.4 0.5 0.4 -0.2 -1.3 -0.5(0.29) 0.0(0.83) 0.5(2.50)
0.1(4.00) -1.3(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(0.12D+1.93=2.05) ----- 2Ø10(1.55>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø10(0.12D+5.53=5.65)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.020 cm.
(C/19917)

Arm.sup: 1.2 1.2 ----- 1.2 2.2 1.2(0.23)
2.0(3.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(2.00)

Moment.: -1.3 -0.6 1.0 1.4 0.9 -0.6 -4.2 -1.5(x= 0.23) 1.4(x=
2.00) -4.2(x= 4.00)

Cortant.: ----- 2.4 1.2 -0.0 -1.2 -2.4 ----- 2.8(x= 0.40)
-2.9(x= 3.60)

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

Arm.Superior: 2Ø10(<<1.55+1.40=2.95) ----- 2Ø16(1.40>>)

Arm.Montagem: 2Ø5(1.65)

Arm.Inferior: 2Ø10(4.45)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 3 (*P51-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.380 cm.
(C/1574)

Arm.sup: 2.2 1.6 ----- 0.3 3.8(0.40)
0.5(5.81)

Arm.inf: ----- 1.2 2.6 2.7 1.6 ----- 2.8(3.64)
1.4(5.08)

Moment.: -4.2 -2.2 1.6 3.6 3.8 2.2 -0.7 -5.6(0.29) 3.9(3.64)
2.2(4.99) -0.8(5.87)

Cortant.: ----- 4.7 2.9 1.1 -0.7 -2.5 ----- 5.7(x= 0.40)
-6.7(x= 5.58)

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

Arm.Superior: 2Ø16(<<1.40+2.05=3.45) ----- 2Ø6.3(4.67+0.08D=4.75)

Arm.Inferior: 2Ø10(6.53+0.12D=6.65), 1Ø12.5(4.50)

Estribos: 36x1Ø5c/0.14(4.98), 8x1Ø5c/0.1(0.80)

V 21 --- Grupo: 1

Tramo nº 1 (*P53-V 9*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.261 cm. (C/1399)

Arm.sup:	0.2	-----					0.3(0.17)			
Arm.inf:	-----	1.2	2.2	3.4	3.8	2.1	-----	1.2(0.68)	4.0(2.35)	
	2.2(3.00)									
Moment.:	-0.5	0.9	3.1	4.7	5.3	3.0	0.0	-0.5(0.11)	1.2(0.68)	5.5(2.35)
	3.1(3.00)	0.0(3.65)								
Cortant.:	-----	4.2	3.1	2.0	-3.2	-4.3	-5.3	4.6(x= 0.40)		
	-5.3(x= 3.65)									
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	0.00	Extr. apoio:	0.00(x= 0.40)	0.00(x= 3.65)
	Lim.: 0.54									

Arm.Superior: 2Ø6.3(0.08D+4.09+0.08D=4.25) -----

Arm.Inferior: 2Ø16(0.19D+4.09+0.19D=4.47), 1Ø10(3.15)

Estribos: 25x1Ø5c/0.14(3.45)

V 22 --- Grupo: 1

Tramo nº 1 (*P51-P50*) (C= 7.80) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.475 cm. (C/1641)

Arm.sup:	0.1	-----					0.1(0.07)			
	0.1(7.73)									
Arm.inf:	-----	1.2	1.7	2.0	1.7	1.2	-----	1.2(1.24)	2.0(3.90)	
	1.2(6.56)									
Moment.:	-0.2	1.4	2.4	2.7	2.4	1.4	-0.2	-0.2(0.00)	1.4(1.30)	2.7(3.90)
	1.4(6.50)	-0.2(7.80)								
Cortant.:	-----	1.0	0.5	-0.0	-0.5	-1.0	-----	1.7(x= 0.17)		
	-1.7(x= 7.63)									
Torsores:	-----	0.00	0.00	0.00	0.00	0.00	-----	Extr. apoio:	0.00(x= 0.17)	0.00(x= 7.63)
	Lim.: 0.54									

Arm.Superior: 2Ø6.3(0.08D+8.77+0.08D=8.93) -----

Arm.Inferior: 2Ø12.5(0.15D+8.77+0.15D=9.07)

Estribos: 55x1Ø5c/0.14(7.60)

V 23 --- Grupo: 1

Tramo nº 1 (*P30-P53*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.119 cm. (C/4208)

Arm.sup: 0.2 ----- 1.2 1.9 0.2(0.17)
 2.4(4.66)

Arm.inf: ----- 1.2 1.6 1.6 1.2 ----- 1.2(0.70) 1.7(2.20)

Moment.: -0.3 1.1 2.3 2.3 1.0 -1.5 -3.6 -0.4(0.11) 1.1(0.83) 2.4(2.20)
 -3.8(4.83)

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+4.02=4.10) ----- 2Ø12.5(1.60>>)

Arm.Inferior: 2Ø12.5(0.15D+5.60=5.75)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.067 cm. (C/7446)

Arm.sup: 1.9 1.2 ----- 1.2 1.9 1.9(0.06)
 1.9(4.94)

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.: -3.6 -0.8 1.7 2.3 1.7 -0.8 -3.6 -3.6(0.00) 0.3(1.00) 2.3(2.50)
 0.3(4.00) -3.6(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+1.60=3.20) ----- 2Ø12.5(1.60>>)

Arm.Montagem: 2Ø5(2.25)

Arm.Inferior: 2Ø12.5(5.45)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.119 cm. (C/4198)

Arm.sup: 1.9 1.2 ----- 0.2 2.4(0.34)
 0.2(4.83)

Arm.inf: ----- 1.2 1.6 1.7 1.2 ----- 1.7(2.80)

1.2(4.00)

Moment.: -3.6 -1.5 1.0 2.3 2.3 1.1 -0.3 -3.8(0.17) 2.4(2.80)
1.5(4.00) -0.4(4.89)

Cortant.: ----- 3.8 2.3 0.8 -0.7 -2.2 ----- 4.6(x= 0.40)
-3.0(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: 2Ø12.5(<<1.60+1.60=3.20) ----- 2Ø6.3(4.07+0.08D=4.15)

Arm.Inferior: 2Ø12.5(5.55+0.15D=5.70)

Estribos: 35x1Ø5c/0.14(4.80)

V 24 --- Grupo: 1

Tramo nº 1 (*P52-P51*) (C= 4.72) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.039 cm.
(C/12046)

Arm.sup: ----- 0.1(0.20)
0.1(4.51)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(0.74) 1.2(2.36)
1.2(3.98)

Moment.: -0.1 0.2 0.6 0.7 0.6 0.2 -0.1 -0.1(0.13) 0.2(0.79) 0.7(2.36)
0.2(3.93) -0.1(4.58)

Cortant.: ----- 0.6 0.3 0.0 -0.3 -0.6 ----- 0.7(x= 0.47)
-0.7(x= 4.25)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.47) 0.00(x= 4.25) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+5.59+0.08D=5.75) -----

Arm.Inferior: 2Ø10(0.12D+5.60+0.12D=5.84)

Estribos: 33x1Ø5c/0.14(4.52)

V 25 --- Grupo: 1

Tramo nº 1 (*P50-P51*) (C= 6.48) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.171 cm.
(C/3781)

Arm.sup: ----- 0.1(0.19)
0.1(6.30)

Arm.inf: ----- 1.2 1.2 1.2 1.2 1.2 ----- 1.2(1.24) 1.2(3.24)
1.2(5.25)

Moment.: -0.1 0.6 1.3 1.5 1.3 0.6 -0.1 -0.1(0.12) 0.8(1.24) 1.5(3.24)
0.8(5.25) -0.1(6.36)

Cortant.: ----- 0.8 0.4 0.0 -0.4 -0.8 ----- 1.1(x= 0.43)
 -1.1(x= 6.05)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.43) 0.00(x= 6.05) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+7.29+0.08D=7.45) -----

Arm.Inferior: 2Ø10(0.12D+7.29+0.12D=7.53)

Estribos: 45x1Ø5c/0.14(6.28)

V 26 --- Grupo: 1

Tramo nº 1 (*P52-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.039 cm.
 (C/10378)

Arm.sup: 0.1 ----- 1.2 2.3 0.2(0.17)
 2.2(3.94)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- 1.2(0.63) 1.2(1.77)

Moment.: -0.2 0.5 1.3 1.3 0.5 -1.1 -4.4 -0.3(0.11) 0.5(0.67) 1.4(1.77)
 -4.4(4.00)

Cortant.: ----- 1.8 0.6 -0.6 -1.8 -3.0 ----- 2.3(x= 0.40)
 -3.5(x= 3.60)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 3.60) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.27=3.35) ----- 2Ø12.5(1.45>>), 1Ø12.5(0.80>>)

Arm.Inferior: 2Ø12.5(0.15D+4.55=4.70)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 2 (*P51-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.345 cm.
 (C/1733)

Arm.sup: 2.3 1.5 ----- 0.2 3.6(0.40)
 0.3(5.81)

Arm.inf: ----- 1.2 2.5 2.5 1.3 ----- 2.7(3.36)
 1.6(4.84)

Moment.: -4.4 -2.1 1.6 3.5 3.5 1.8 -0.4 -5.4(0.29) 3.7(3.36)
 2.2(4.84) -0.4(5.87)

Cortant.: ----- 4.6 2.8 1.0 -0.8 -2.6 ----- 5.6(x= 0.40)
 -3.7(x= 5.58)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.40) 0.00(x= 5.58) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.45+1.80=3.25), 1Ø12.5(<<0.80+1.40=2.20) -----
 2Ø6.3(4.82+0.08D=4.90)

Arm.Inferior: 2Ø12.5(6.55+0.15D=6.70), 1Ø10(4.10)

Estribos: 42x1Ø5c/0.14(5.78)

Armadura de vigas
 Obra: TRF-4 VARAS VERTICAL PARTE 1
 Grupo no 2 Piso 2 --- Pisoigual 1

V 1 --- Grupo: 2

Tramo nº 1 (*P50-V 1*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.138 cm.
 (C/3621)

Arm.sup: 2.5(5.00)	1.2	-----	-----	-----	-----	1.2	2.5	1.2(0.09)
Arm.inf: 1.2(4.01)	-----	1.4	2.3	2.4	1.9	1.2	-----	1.6(0.99) 2.4(2.24)
Moment.: 1.3(4.01) -3.5(5.00)	-0.7	1.9	3.2	3.4	2.6	0.9	-3.5	-1.2(0.09) 2.3(0.99) 3.4(2.24)
Cortant.: -5.7(x= 4.99)	-----	2.3	0.8	-0.3	-1.4	-2.7	-5.6	3.5(x= 0.10)
Torsores: 5.00 Lim.: 0.54	-----	0.00	0.00	0.00	0.00	0.00	0.00	Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.00)

Arm.Superior: 2Ø10(0.12D+1.23=1.35) ----- 2Ø12.5(1.45>>)

Arm.Montagem: 2Ø5(2.90)

Arm.Inferior: 2Ø12.5(0.15D+5.35=5.50)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*V 1-V 1*) (C= 4.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.089 cm.
 (C/5535)

Arm.sup: 2.1(4.93)	2.5	1.2	-----	-----	-----	1.2	2.2	2.5(0.00)
Arm.inf: 1.2(3.97)	-----	1.2	1.6	2.0	1.7	1.2	-----	1.2(0.99) 2.0(2.49)
Moment.: 1.3(3.97) -3.1(4.95)	-3.5	0.7	2.2	2.8	2.4	1.0	-3.1	-3.5(0.00) 1.1(0.99) 2.8(2.49)
Cortant.: -6.0(x= 4.95)	-5.6	2.5	1.2	0.1	-1.0	-2.4	-6.0	5.8(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= 4.95) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.45+1.55=3.00) ----- 2Ø12.5(1.40>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø16(5.27>>)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 3 (*V 1-P50*) (C= 5.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.146 cm.
(C/3448)

Arm.sup: 2.2 ----- 3.2 2.2(0.00)
3.3(5.01)

Arm.inf: ----- 1.2 2.1 2.5 2.2 1.2 ----- 1.2(1.00) 2.5(2.56)
1.2(4.06)

Moment.: -3.1 1.3 2.9 3.6 3.1 1.1 -5.0 -3.1(0.00) 1.7(1.00) 3.6(2.56)
1.7(4.06) -5.0(5.05)

Cortant.: -6.0 2.7 1.3 0.1 -1.3 -3.9 ----- 5.6(x= 0.04)
-9.1(x= 4.95)

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

Arm.Superior: 2Ø12.5(<<1.40+1.30=2.70) ----- 2Ø16(1.40>>)

Arm.Montagem: 2Ø6.3(2.90)

Arm.Inferior: 2Ø16(<<5.27+5.14=10.40)

Estribos: 24x1Ø6.3c/0.17(4.05), 7x1Ø6.3c/0.12(0.80)

Tramo nº 4 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.170 cm.
(C/2940)

Arm.sup: 3.2 1.2 ----- 1.2 3.4 3.3(0.06)
3.5(4.94)

Arm.inf: ----- 1.2 2.8 3.3 2.7 1.2 ----- 1.5(0.99) 3.3(2.49)
1.3(4.01)

Moment.: -5.0 1.4 3.9 4.7 3.7 1.1 -5.2 -5.0(0.00) 2.1(0.99) 4.7(2.49)
1.8(4.01) -5.2(5.00)

Cortant.: ----- 4.2 1.9 -0.1 -2.1 -4.3 ----- 8.6(x= 0.10)
-8.3(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(<<1.40+1.50=2.90) ----- 2Ø16(1.55>>)

Arm.Montagem: 2Ø6.3(2.45)

Arm.Inferior: 2Ø16(5.60)

Estribos: 7x1Ø6.3c/0.13(0.80), 19x1Ø6.3c/0.17(3.20), 6x1Ø6.3c/0.14(0.80)

Tramo nº 5 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.252 cm.
(C/1983)

Arm.sup: 3.4 1.2 ----- 2.3 3.5(0.06)
2.3(4.99)

Arm.inf: ----- 1.2 2.3 3.1 2.7 1.2 ----- 1.2(0.99) 3.1(2.67)
1.5(4.01)

Moment.: -5.2 0.5 3.3 4.3 3.8 1.5 -3.5 -5.2(0.00) 1.1(0.99) 4.4(2.67)
2.1(4.01) -3.5(5.00)

Cortant.: ----- 4.5 2.3 0.3 -1.6 -3.7 ----- 8.7(x= 0.10)
-7.0(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(<<1.55+1.50=3.05) ----- 2Ø12.5(1.23>>)

Arm.Montagem: 2Ø6.3(2.80)

Arm.Inferior: 2Ø16(5.40)

Estribos: 7x1Ø6.3c/0.13(0.80), 24x1Ø6.3c/0.17(4.00)

Tramo nº 6 (*P50-P50*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.020 cm.
(C/-12653)

Arm.sup: 2.3 1.6 1.2 1.2 1.2 1.2 ----- 2.5(0.09)
1.2(1.68)

Arm.inf: ----- 1.2 1.2 1.2 0.4 1.2(1.99)
1.2(2.24)

Moment.: -3.5 -2.2 -1.3 -0.8 0.7 1.0 0.6 -3.6(0.04) 0.9(1.99)
1.3(2.24) -0.0(2.47)

Cortant.: ----- 3.1 1.7 0.9 0.5 0.1 ----- 4.8(x= 0.10)
-1.5(x= 2.40)

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

Arm.Superior: 2Ø12.5(<<1.23+2.57+0.15D=3.95) -----

Arm.Inferior: 2Ø10(2.83+0.12D=2.95)

Estribos: 17x1Ø5c/0.14(2.30)

V 2 --- Grupo: 2

Tramo nº 1 (*V 1-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.103 cm.
(C/4856)

Arm.sup: ----- 1.2 2.1 1.2(0.24)
2.2(4.91)

Arm.inf: ----- 1.2 1.2 1.5 1.2 ----- 1.2(0.99) 1.5(2.49)

Moment.: 0.0 0.3 1.6 2.1 1.3 -0.6 -3.2 -0.4(0.24) 0.6(0.99) 2.1(2.49)
-3.2(4.98)

Cortant.: -1.6 1.5 1.1 -0.2 -1.6 -2.9 ----- 1.6(x= 0.99)
-3.3(x= 4.90)

Torsores: 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: 2Ø10(0.12D+1.28=1.40) ----- 2Ø12.5(1.60>>)

Arm.Montagem: 2Ø5(2.70)

Arm.Inferior: 2Ø10(0.12D+5.23=5.35)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P50-P50*) (C= 4.95) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.076 cm.
(C/6544)

Arm.sup: 2.1 1.2 ----- 1.2 1.9 2.1(0.09)
2.0(4.86)

Arm.inf: ----- 1.2 1.6 2.0 1.6 1.2 ----- 1.2(0.99) 2.0(2.49)
1.2(3.97)

Moment.: -3.2 -0.7 2.2 2.8 2.2 -0.6 -2.9 -3.2(0.00) 0.8(0.99) 2.8(2.49)
0.8(3.97) -2.9(4.95)

Cortant.: ----- 2.7 1.5 0.0 -1.4 -2.7 ----- 3.1(x= 0.10)
-2.9(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.: 0.54

Arm.Superior: 2Ø12.5(<<1.60+1.65=3.25) ----- 2Ø12.5(1.55>>)

Arm.Montagem: 2Ø5(2.20)

Arm.Inferior: 2Ø12.5(5.10)

Estribos: 34x1Ø5c/0.14(4.75)

Tramo nº 3 (*P50-V 1*) (C= 5.05) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.092 cm.

(C/5515)

Arm.sup:	1.9	1.2	-----	-----	-----	-----	-----	2.0(0.09)		
1.2(4.79)										
Arm.inf:	-----	-----	1.2	1.3	1.2	1.2	-----	1.3(2.54)		
1.2(4.06)										
Moment.:	-2.9	-0.5	1.3	1.9	1.3	0.0	0.0	-2.9(0.00)	1.9(2.54)	
0.2(4.06)	-0.3(4.79)									
Cortant.:	-----	2.7	1.4	-0.0	-1.2	-1.1	1.3	3.0(x= 0.10)		
-1.4(x= 3.79)										
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=
5.05) Lim.:	0.54									

Arm.Superior: 2Ø12.5(<<1.55+1.55=3.10) ----- 2Ø10(1.43+0.12D=1.55)

Arm.Montagem: 2Ø5(2.70)

Arm.Inferior: 2Ø10(5.28+0.12D=5.40)

Estribos: 35x1Ø5c/0.14(4.85)

V 3 --- Grupo: 2

Tramo nº 1 (*P50- *) (C= 9.29) Vigas alta Tipo R	Seção B*H = 20 X 40	Flecha= 0.837 cm.								
(C/1110)										
Arm.sup:	-----	-----	-----	-----	-----	-----	1.2	0.1(0.04)		
1.2(9.27)										
Arm.inf:	-----	2.0	2.4	1.7	1.8	1.2	-----	2.2(1.84)	2.4(2.77)	
1.5(7.43)										
Moment.:	-0.1	2.8	3.4	2.4	2.6	1.7	-0.5	-0.1(0.03)	3.1(1.84)	3.4(2.77)
2.1(7.43)	-0.5(9.29)									
Cortant.:	-----	1.6	0.3	-0.4	-0.3	-1.8	-0.4	2.7(x= 0.10)		
-3.3(x= 8.23)										
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=
9.29) Lim.:	0.54									

Arm.Superior: 2Ø10(0.12D+9.36>>) -----

Arm.Inferior: 2Ø12.5(0.15D+9.36>>)

Estribos: 66x1Ø5c/0.14(9.16)

Tramo nº 2 (* -V 1*) (C= 0.61) Vigas alta Tipo R	Seção B*H = 20 X 40	Flecha= 0.003 cm.							
(C/21285)									
Arm.sup:	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2(0.00)
1.2(0.42)									

Arm.inf: ----- 0.0(0.55)

Moment.: -0.5 -0.5 -0.5 -0.4 -0.2 -0.0 -0.0 -0.5(0.00) -0.0(0.48)
0.0(0.55) -0.0(0.61)

Cortant.: -0.4 0.1 0.7 1.1 1.5 1.9 0.0 1.9(x= 0.51)
-0.4(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= 0.51) Lim.: 0.54

Arm.Superior: 2Ø10(<<9.48+0.58+0.12D=10.18) -----

Arm.Inferior: 2Ø12.5(<<9.51+0.58+0.15D=10.24)

Estribos: 4x1Ø5c/0.14(0.55)

V 4 --- Grupo: 2

Tramo nº 1 (*P40-P50*) (C= 4.89) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.184 cm.
(C/2661)

Arm.sup: ----- 1.5 4.1
4.6(4.79)

Arm.inf: ----- 1.4 2.3 2.2 1.2 ----- 1.7(0.96) 2.4(1.87)

Moment.: -0.0 2.0 3.3 3.1 1.3 -2.1 -6.3 -0.0(0.12) 2.3(0.96) 3.4(1.87)
-6.6(4.82)

Cortant.: 0.0 2.1 0.6 -1.2 -3.1 -5.1 ----- 5.6(x= 0.12)
-6.5(x= 4.79)

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

Arm.Superior: ----- 2Ø16(1.85>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(0.06D+3.29=3.35)

Arm.Inferior: 2Ø12.5(0.15D+5.15=5.30)

Estribos: 34x1Ø5c/0.14(4.76)

Tramo nº 2 (*P50-P50*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.123 cm.
(C/4081)

Arm.sup: 4.1 1.2 ----- 1.2 2.5 4.1(0.01)
2.6(4.93)

Arm.inf: ----- 1.2 2.3 3.1 2.7 1.2 ----- 1.2(0.99) 3.2(2.74)
1.5(4.01)

Moment.: -6.3 -1.4 3.2 4.4 3.8 1.4 -3.9 -6.3(0.00) 1.0(0.99) 4.4(2.74)
2.0(4.01) -3.9(5.00)

Cortant.: ----- 4.5 2.4 0.3 -1.7 -3.7 ----- 5.8(x= 0.10)
 -5.0(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(<<1.85+1.70=3.55), 1Ø10(<<1.00+0.90=1.90) ----- 2Ø16(1.45>>)

Arm.Montagem: 2Ø5(2.30)

Arm.Inferior: 2Ø16(5.30)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P50-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.165 cm.
 (C/3028)

Arm.sup: 2.5 1.2 ----- 1.2 2.6 2.6(0.07)
 2.7(4.93)

Arm.inf: ----- 1.2 2.2 2.8 2.2 1.2 ----- 1.2(0.99) 2.8(2.49)
 1.2(4.01)

Moment.: -3.9 0.7 3.1 3.9 3.0 0.6 -4.0 -3.9(0.00) 1.3(0.99) 3.9(2.49)
 1.2(4.01) -4.0(5.00)

Cortant.: ----- 3.8 1.9 -0.0 -1.9 -3.7 ----- 5.1(x= 0.10)
 -5.2(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(<<1.45+1.45=2.90) ----- 2Ø16(1.45>>)

Arm.Montagem: 2Ø5(2.55)

Arm.Inferior: 2Ø16(5.50)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.129 cm.
 (C/3870)

Arm.sup: 2.6 1.2 ----- 1.2 2.7 2.7(0.07)
 2.7(4.99)

Arm.inf: ----- 1.2 2.1 2.7 2.1 1.2 ----- 1.2(0.99) 2.7(2.49)
 1.2(4.01)

Moment.: -4.0 0.7 3.0 3.8 3.0 0.6 -4.1 -4.0(0.00) 1.2(0.99) 3.8(2.49)
 1.2(4.01) -4.1(5.00)

Cortant.: ----- 3.6 1.8 -0.0 -1.8 -3.6 ----- 5.0(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: 2Ø16(<<1.45+1.50=2.95) ----- 2Ø16(1.60>>)

Arm.Montagem: 2Ø5(2.40)

Arm.Inferior: 2Ø16(5.50)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.151 cm.
(C/3307)

Arm.sup: 2.7 1.2 ----- 2.9(0.09)
1.2(4.49)

Arm.inf: ----- 1.4 2.0 1.5 1.2 ----- 1.2(0.99) 2.0(2.49)
1.2(4.01)

Moment.: -4.1 -0.5 2.0 2.8 2.1 0.2 0.0 -4.1(0.04) 0.1(0.99) 2.8(2.49)
0.6(4.01) -0.4(4.49)

Cortant.: ----- 3.8 1.9 0.0 -1.6 -2.1 ----- 5.4(x= 0.10)
-2.3(x= 3.99)

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(<<1.60+1.55=3.15) ----- 2Ø10(1.43+0.12D=1.55)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø12.5(5.30+0.15D=5.45)

Estribos: 35x1Ø5c/0.14(4.80)

V 5 --- Grupo: 2

Tramo nº 1 (*P40-P51*) (C= 4.90) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.102 cm.
(C/4824)

Arm.sup: ----- 1.4 3.2
3.7(4.80)

Arm.inf: ----- 1.2 1.8 1.5 1.2 ----- 1.4(0.98) 1.8(1.80)

Moment.: 0.0 1.7 2.5 2.1 0.6 -1.9 -5.0 -0.0(0.12) 2.0(0.98) 2.5(1.80)
-5.2(4.83)

Cortant.: 0.0 1.5 0.2 -1.1 -2.4 -3.6 ----- 5.1(x= 0.12)
-5.2(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: ----- 2Ø16(2.00>>)
 Arm.Montagem: 2Ø5(0.06D+3.09=3.15)
 Arm.Inferior: 2Ø12.5(0.15D+5.15=5.30)
 Estribos: 35x1Ø5c/0.14(4.77)

Tramo nº 2 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.101 cm.
 (C/4940)

Arm.sup:	3.2	1.2	-----	-----	-----	1.2	2.2	3.2(0.01)
2.3(4.93)								
Arm.inf:	-----	1.2	1.9	2.6	2.2	1.2	-----	1.2(0.99) 2.6(2.49)
1.2(4.01)								
Moment.:	-5.0	-1.0	2.7	3.6	3.0	1.0	-3.4	-5.0(0.00) 0.9(0.99) 3.6(2.49)
1.5(4.01) -3.4(5.00)								
Cortant.:	-----	3.6	1.9	0.2	-1.5	-3.1	-----	5.1(x= 0.10)
-4.4(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(<<2.00+1.75=3.75) ----- 2Ø12.5(1.50>>)
 Arm.Montagem: 2Ø5(2.25)
 Arm.Inferior: 2Ø16(5.60)
 Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.140 cm.
 (C/3582)

Arm.sup:	2.2	1.2	-----	-----	-----	1.2	2.5	2.3(0.06)
2.6(4.93)								
Arm.inf:	-----	1.2	2.1	2.6	2.0	1.2	-----	1.2(0.99) 2.6(2.49)
1.2(4.01)								
Moment.:	-3.4	0.7	2.9	3.6	2.8	0.5	-3.9	-3.4(0.00) 1.2(0.99) 3.6(2.49)
1.0(4.01) -3.9(5.00)								
Cortant.:	-----	3.3	1.7	-0.0	-1.8	-3.5	-----	4.6(x= 0.10)
-5.0(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(<<1.50+1.45=2.95) ----- 2Ø16(1.50>>)
 Arm.Montagem: 2Ø5(2.55)

Arm.Inferior: 2Ø16(5.45)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.137 cm.
(C/3661)

Arm.sup: 2.5 1.2 ----- 1.2 2.5 2.6(0.07)
2.5(4.97)

Arm.inf: ----- 1.2 2.1 2.6 2.1 1.2 ----- 1.2(0.99) 2.6(2.49)
1.2(4.01)

Moment.: -3.9 0.6 2.9 3.7 2.9 0.6 -3.8 -3.9(0.00) 1.1(0.99) 3.7(2.49)
1.2(4.01) -3.8(5.00)

Cortant.: ----- 3.5 1.8 -0.0 -1.8 -3.4 ----- 5.0(x= 0.10)
-4.6(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+1.50=3.00) ----- 2Ø16(1.45>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø16(5.60)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 5 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.136 cm.
(C/3677)

Arm.sup: 2.5 1.2 ----- 1.2 2.5 2.7(0.09)
2.5(4.93)

Arm.inf: ----- 1.2 2.1 2.7 2.1 1.2 ----- 1.2(0.99) 2.7(2.49)
1.2(4.01)

Moment.: -3.8 0.7 3.0 3.8 2.9 0.6 -3.8 -3.9(0.04) 1.2(0.99) 3.8(2.49)
1.2(4.01) -3.8(5.00)

Cortant.: ----- 3.6 1.8 -0.0 -1.8 -3.5 ----- 5.2(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: 2Ø16(<<1.45+1.50=2.95) ----- 2Ø16(1.50>>)

Arm.Montagem: 2Ø5(2.50)

Arm.Inferior: 2Ø16(5.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 6 (*P51-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.158 cm.
(C/3171)

Arm.sup: 2.5 1.2 ----- 1.2 4.5 2.5(0.07)
4.6(4.94)

Arm.inf: ----- 1.2 2.7 3.3 2.8 1.2 ----- 1.4(0.99) 3.3(2.49)
1.3(4.01)

Moment.: -3.8 1.4 3.8 4.7 3.9 1.1 -7.1 -3.8(0.00) 2.0(0.99) 4.7(2.49)
1.8(4.01) -7.1(5.00)

Cortant.: ----- 3.6 1.9 -0.0 -2.1 -5.1 ----- 4.9(x= 0.10)
-14.3(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.: 0.54

Arm.Superior: 2Ø16(<<1.50+1.45=2.95) ----- 2Ø16(1.50>>), 1Ø10(0.95>>)

Arm.Montagem: 2Ø8(2.50)

Arm.Inferior: 2Ø16(5.50)

Estribos: 27x1Ø8c/0.15(3.95), 8x1Ø8c/0.1(0.80)

Tramo nº 7 (*P51-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.320 cm.
(C/1564)

Arm.sup: 4.5 1.2 ----- 2.7 4.6(0.06)
2.7(4.99)

Arm.inf: ----- 1.2 2.9 3.7 3.2 1.4 ----- 1.2(0.99) 3.7(2.51)
1.9(4.01)

Moment.: -7.1 0.8 4.0 5.2 4.5 1.9 -4.1 -7.1(0.00) 1.6(0.99) 5.2(2.51)
2.6(4.01) -4.1(5.00)

Cortant.: ----- 5.6 2.5 0.3 -1.9 -4.2 ----- 15.3(x= 0.15)
-8.5(x= 4.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.15) 0.00(x=
4.90) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.50+1.45=2.95), 1Ø10(<<0.95+1.00=1.95) -----

Arm.Montagem: 2Ø10(2.85)

Arm.Inferior: 2Ø16(5.55)

Estribos: 6x1Ø10c/0.15(0.80), 23x1Ø10c/0.17(3.95)

Tramo nº 8 (*P52-P52*) (C= 2.50) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.021 cm.
(C/-11976)

Arm.sup: 2.7 1.8 1.2 1.2 1.2 1.2 ----- 2.9(0.09)

1.2(1.68)

Arm.inf: ----- 1.2 1.2 1.2 0.4 1.2(1.99)
1.2(2.24)

Moment.: -4.1 -2.5 -1.4 -0.8 0.9 1.2 0.6 -4.2(0.04) 1.0(1.99)
1.4(2.24) -0.0(2.47)

Cortant.: ----- 3.9 2.1 1.1 0.6 0.2 ----- 6.1(x= 0.10)
-1.0(x= 2.40)

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

Arm.Montagem: 2Ø16(3.96+0.19D=4.15)

Arm.Inferior: 2Ø10(2.83+0.12D=2.95)

Estribos: 17x1Ø5c/0.14(2.30)

V 6 --- Grupo: 2

Tramo nº 1 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.307 cm.
(C/1629)

Arm.sup: ----- 1.2 3.4 0.0(0.04)
3.5(4.93)

Arm.inf: ----- 1.3 2.6 2.8 1.9 ----- 1.6(0.99) 2.9(2.24)
1.2(4.01)

Moment.: -0.1 1.8 3.6 4.0 2.6 -0.6 -5.1 -0.1(0.03) 2.2(0.99) 4.1(2.24)
0.2(4.01) -5.1(5.00)

Cortant.: ----- 2.3 1.0 -1.0 -3.0 -5.1 ----- 2.3(x= 0.74)
-6.8(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: 2Ø6.3(0.08D+3.87=3.95) ----- 2Ø12.5(1.55>>), 1Ø12.5(1.00>>)

Arm.Inferior: 2Ø12.5(0.15D+5.30=5.45), 1Ø10(3.00)

Estribos: 29x1Ø5c/0.14(4.00), 7x1Ø5c/0.12(0.80)

Tramo nº 2 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.140 cm.
(C/3575)

Arm.sup: 3.4 1.2 ----- 1.2 2.5 3.5(0.07)
2.6(4.93)

Arm.inf: ----- 1.2 2.3 3.0 2.5 1.2 ----- 1.2(0.99) 3.0(2.49)
1.2(4.01)

Moment.: -5.1 -0.9 3.2 4.2 3.5 1.1 -3.9 -5.1(0.00) 1.1(0.99) 4.2(2.49)

1.7(4.01) -3.9(5.00)

Cortant.: ----- 4.3 2.3 0.2 -1.7 -3.6 ----- 6.0(x= 0.10)
-5.0(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+1.65=3.20), 1Ø12.5(<<1.00+1.00=2.00) ----- 2Ø10(1.45>>), 1Ø12.5(1.05>>)

Arm.Montagem: 2Ø5(2.35)

Arm.Inferior: 2Ø12.5(5.40), 1Ø10(3.00)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.145 cm. (C/3452)

Arm.sup: 2.5 1.2 ----- 1.2 2.7 2.6(0.07)
2.7(4.99)

Arm.inf: ----- 1.2 2.2 2.7 2.1 1.2 ----- 1.2(0.99) 2.7(2.49)
1.2(4.01)

Moment.: -3.9 0.7 3.0 3.8 3.0 0.6 -4.1 -3.9(0.00) 1.3(0.99) 3.8(2.49)
1.2(4.01) -4.1(5.00)

Cortant.: ----- 3.6 1.8 -0.1 -1.9 -3.6 ----- 5.0(x= 0.10)
-4.9(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: 2Ø10(<<1.45+1.45=2.90), 1Ø12.5(<<1.05+1.05=2.10) ----- 2Ø12.5(1.55>>), 1Ø10(1.00>>)

Arm.Montagem: 2Ø5(2.45)

Arm.Inferior: 2Ø10(5.35), 1Ø12.5(3.40)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 4 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.187 cm. (C/2673)

Arm.sup: 2.7 1.2 ----- 1.2 3.4 2.9(0.09)
3.5(4.94)

Arm.inf: ----- 1.2 2.6 3.2 2.7 1.2 ----- 1.2(0.99) 3.2(2.49)
1.3(4.01)

Moment.: -4.1 1.0 3.6 4.5 3.7 1.1 -5.2 -4.2(0.04) 1.6(0.99) 4.5(2.49)
1.8(4.01) -5.2(5.00)

Cortant.: ----- 3.9 2.0 0.0 -2.1 -4.5 ----- 5.6(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(<<1.55+1.50=3.05), 1Ø10(<<1.00+1.00=2.00) ----- 2Ø12.5(1.50>>), 1Ø12.5(1.00>>)

Arm.Montagem: 2Ø6.3(2.45)

Arm.Inferior: 2Ø12.5(5.45), 1Ø10(3.00)

Estribos: 24x1Ø6.3c/0.17(4.00), 7x1Ø6.3c/0.13(0.80)

Tramo nº 5 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.146 cm. (C/3420)

Arm.sup: 3.4 1.2 ----- ----- ----- ----- 3.5(0.04)
1.2(4.49)

Arm.inf: ----- 1.2 1.6 2.0 1.5 1.2 ----- 1.2(0.99) 2.0(2.49)
1.2(4.01)

Moment.: -5.2 0.1 2.3 2.9 2.0 0.3 0.1 -5.2(0.00) 0.7(0.99) 2.9(2.49)
0.7(4.01) -0.3(4.49)

Cortant.: ----- 5.1 1.9 0.2 -1.2 -1.4 ----- 9.5(x= 0.10)
-1.7(x= 3.99)

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+1.45=2.95), 1Ø12.5(<<1.00+1.00=2.00) -----
2Ø10(1.38+0.12D=1.50)

Arm.Montagem: 2Ø6.3(2.75)

Arm.Inferior: 2Ø12.5(5.40+0.15D=5.55)

Estribos: 8x1Ø6.3c/0.11(0.80), 24x1Ø6.3c/0.17(4.00)

V 7 --- Grupo: 2

Tramo nº 1 (*V 1-P52*) (C= 5.02) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.063 cm. (C/8008)

Arm.sup: ----- ----- ----- ----- ----- 1.2 1.9 1.2(0.24)
2.1(4.92)

Arm.inf: ----- 1.2 1.2 1.2 1.2 ----- ----- 1.2(0.99) 1.2(2.24)

Moment.: -0.0 0.2 1.0 1.4 0.7 -0.9 -2.9 -0.3(0.24) 0.4(0.99) 1.5(2.24)
-3.0(4.94)

Cortant.: -1.1 1.0 1.4 -0.3 -1.3 -2.2 ----- 2.3(x= 1.90)
-3.4(x= 4.92)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x= 4.92) Lim.: 0.54

Arm.Superior: 2Ø10(0.12D+1.23=1.35) ----- 2Ø12.5(1.85>>)

Arm.Montagem: 2Ø5(2.55)

Arm.Inferior: 2Ø10(0.12D+5.28=5.40)

Estribos: 35x1Ø5c/0.14(4.82)

Tramo nº 2 (*P52-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.033 cm. (C/15085)

Arm.sup: 1.9 1.2 ----- 1.2 1.8 1.9(0.01)
1.8(4.93)

Arm.inf: ----- 1.2 1.3 1.6 1.2 1.2 ----- 1.2(0.99) 1.6(2.47)
1.2(4.01)

Moment.: -2.9 -0.7 1.8 2.2 1.7 -0.7 -2.7 -2.9(0.00) 0.8(0.99) 2.2(2.47)
0.7(4.01) -2.7(5.00)

Cortant.: ----- 1.8 0.9 -0.0 -1.0 -1.8 ----- 3.1(x= 0.10)
-3.1(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.: 0.54

Arm.Superior: 2Ø12.5(<<1.85+1.75=3.60) ----- 2Ø12.5(1.75>>)

Arm.Montagem: 2Ø5(1.95)

Arm.Inferior: 2Ø10(5.15)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P52-P53*) (C= 5.56) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.196 cm. (C/2841)

Arm.sup: 1.8 1.2 ----- 0.1 1.8(0.07)
0.1(5.52)

Arm.inf: ----- 1.3 1.8 1.7 1.2 ----- 1.2(1.10) 1.9(2.99)
1.2(4.45)

Moment.: -2.7 -0.1 1.8 2.6 2.4 1.3 -0.2 -2.7(0.01) 0.3(1.10) 2.6(2.99)
1.6(4.45) -0.2(5.56)

Cortant.: ----- 2.4 1.4 0.3 -0.7 -1.4 ----- 3.7(x= 0.10)
-2.9(x= 5.46)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.46) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<1.75+1.50=3.25) ----- 2Ø6.3(4.62+0.08D=4.70)

Arm.Inferior: 2Ø12.5(6.00+0.15D=6.15)

Estribos: 39x1Ø5c/0.14(5.36)

V 8 --- Grupo: 2

Tramo nº 1 (*P53-P53*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.095 cm.
(C/5285)

Arm.sup: ----- 1.5 1.5 0.0(0.03)
1.5(4.99)

Arm.inf: ----- 1.5 1.6 1.7 1.5 1.5 ----- 1.5(0.99) 1.7(2.24)
1.5(4.01)

Moment.: -0.1 1.6 2.8 3.0 2.1 0.1 -2.9 -0.1(0.03) 1.9(0.99) 3.1(2.24)
0.5(4.01) -2.9(5.00)

Cortant.: ----- 1.7 0.7 -0.5 -1.7 -2.8 ----- 2.1(x= 0.10)
-3.8(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.: 0.72

Arm.Superior: 2Ø6.3(0.08D+3.87=3.95) ----- 2Ø12.5(1.48>>)

Arm.Inferior: 2Ø12.5(0.15D+5.07>>)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P53-V 1*) (C= 2.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.046 cm.
(C/4367)

Arm.sup: 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.6(0.09)
1.5(1.34)

Arm.inf: ----- 0.0(1.93)

Moment.: -2.9 -2.3 -1.5 -0.9 -0.5 -0.2 0.0 -3.0(0.06) -0.1(1.59)
0.0(1.93) 0.0(2.00)

Cortant.: ----- 2.4 2.0 1.6 1.3 0.9 0.0 2.7(x= 0.10)
-0.0(x= 2.00)

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

Arm.Superior: 2Ø12.5(<<1.48+1.97+0.15D=3.60) -----

Arm.Inferior: 2Ø12.5(<<5.22+1.96+0.15D=7.33)

Estribos: 14x1Ø5c/0.14(1.87)

V 9 --- Grupo: 2

Tramo nº 1 (*P53-V 1*) (C= 2.08) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.019 cm.
(C/11183)

Arm.sup: 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5(0.68)
1.5(1.47)

Arm.inf: ----- 1.5 1.5 ----- ----- -----
1.5(1.98) 1.5(0.10) 1.5(0.43)

Moment.: 0.1 0.3 -0.3 -0.4 -0.6 -0.6 -0.0 -0.1(0.07) 0.3(0.10) 0.2(0.43)
0.1(1.99) -0.6(1.47)

Cortant.: ----- 0.4 0.2 -0.0 0.0 0.5 0.0 0.7(x= 1.98)
-0.0(x= 1.22)

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

Arm.Superior: 2Ø10(0.12D+2.12+0.13D=2.37) -----

Arm.Inferior: 2Ø10(0.12D+2.12+0.12D=2.36)

Estribos: 14x1Ø5c/0.14(1.95)

V 10 --- Grupo: 2

Tramo nº 1 (*V 5-P50*) (C= 6.90) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.201 cm.
(C/3427)

Arm.sup: ----- ----- ----- ----- ----- -----
0.0(6.86) 1.2(0.00)

Arm.inf: ----- 1.2 1.5 1.2 1.2 1.2 -----
1.2(5.52) 1.3(1.36) 1.5(1.99)

Moment.: -0.0 1.7 2.1 1.1 0.8 1.0 -0.1 -0.0(0.00) 1.9(1.36) 2.2(1.99)
1.1(5.52) -0.1(6.87)

Cortant.: 1.7 1.0 -0.3 -1.5 0.3 -0.9 ----- 1.7(x= 0.00)
-2.3(x= 6.80)

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

Arm.Superior: 2Ø10(0.12D+7.04+0.12D=7.28) -----

Arm.Inferior: 2Ø12.5(0.15D+7.04+0.15D=7.34)

Estribos: 48x1Ø5c/0.14(6.70)

V 11 --- Grupo: 2

Tramo nº 1 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.311 cm.
(C/1606)

Arm.sup: ----- 1.2 3.7 0.1(0.04)
3.8(4.94)

Arm.inf: ----- 1.8 2.8 2.8 1.7 ----- 2.1(0.99) 2.9(1.99)
1.2(4.01)

Moment.: -0.1 2.5 3.9 3.9 2.3 -0.7 -5.7 -0.1(0.03) 2.9(0.99) 4.1(1.99)
0.0(4.01) -5.7(5.00)

Cortant.: ----- 2.5 0.8 -0.9 -2.7 -4.7 ----- 5.0(x= 0.10)
-8.1(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.: 0.54

Arm.Superior: 2Ø6.3(0.08D+3.82=3.90) ----- 2Ø16(1.55>>), 1Ø10(1.00>>)

Arm.Inferior: 2Ø12.5(0.15D+5.35=5.50), 1Ø10(3.35)

Estribos: 24x1Ø6.3c/0.17(4.00), 6x1Ø6.3c/0.14(0.80)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.167 cm.
(C/2986)

Arm.sup: 3.7 1.2 ----- 1.2 3.8(0.06)
1.2(4.99)

Arm.inf: ----- 1.8 2.6 2.4 1.3 ----- 1.2(0.99) 2.7(2.74)
1.6(4.01)

Moment.: -5.7 -1.0 2.5 3.7 3.4 1.8 -1.8 -5.7(0.00) 0.4(0.99) 3.7(2.74)
2.2(4.01) -1.8(5.00)

Cortant.: ----- 4.3 2.3 0.6 -1.1 -2.7 ----- 7.8(x= 0.10)
-3.8(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: 2Ø16(<<1.55+1.65=3.20), 1Ø10(<<1.00+1.00=2.00) ----- 3Ø16(1.14>>)

Arm.Montagem: 2Ø6.3(2.70)

Arm.Inferior: 2Ø10(5.45), 1Ø12.5(5.15)

Estribos: 6x1Ø6.3c/0.14(0.80), 24x1Ø6.3c/0.17(4.00)

Tramo nº 3 (*P51-P50*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.110 cm.
(C/-3641)

Arm.sup: 1.2 1.2 1.2 1.2 1.8 4.0 6.5 1.3(0.09)
6.9(3.90)

Arm.inf: ----- 1.6 1.9 1.5 1.2 ----- 1.7(0.79) 1.9(1.24)

Moment.: -1.8 2.2 2.7 2.1 -2.5 -5.6 -9.7 -1.8(0.06) 2.4(0.79) 2.7(1.24)
-9.7(4.00)

Cortant.: ----- 1.4 -0.2 -1.7 -3.5 -5.3 ----- 2.1(x= 0.10)
-6.9(x= 3.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.90) Lim.: 0.54

Arm.Superior: 3Ø16(<<4.00>>) ----- 1Ø12.5(1.00>>)

Arm.Inferior: 2Ø12.5(4.60)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P50-V 3*) (C= 3.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.673 cm.
(C/446)

Arm.sup: 6.5 4.9 3.0 1.6 1.2 1.2 1.2 7.2(0.10)
1.2(2.01)

Arm.inf: ----- 0.0(2.94)

Moment.: -9.7 -6.8 -4.2 -2.3 -1.0 -0.3 0.0 -9.8(0.03) -0.2(2.40)
0.0(2.94) 0.0(3.00)

Cortant.: ----- 5.9 4.4 3.2 2.0 1.1 0.0 7.2(x= 0.10)
-0.0(x= 3.00)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.10) 0.00(x= 2.90) Lim.: 0.54

Arm.Superior: 3Ø16(<<5.14+2.97+0.19D=8.30), 1Ø12.5(<<1.00+1.05=2.05) -----

Arm.Inferior: 2Ø12.5(3.15+0.15D=3.30)

Estribos: 7x1Ø5c/0.13(0.80), 15x1Ø5c/0.14(2.07)

V 12 --- Grupo: 2

Tramo nº 1 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.389 cm.
(C/1287)

Arm.sup: ----- 1.2 3.8 0.1(0.04)
4.0(4.93)

Arm.inf: ----- 2.1 3.3 3.2 1.8 ----- 2.5(0.99) 3.4(1.99)

Moment.: -0.1 2.9 4.7 4.5 2.6 -0.9 -5.9 -0.1(0.03) 3.4(0.99) 4.8(1.99)
-5.9(5.00)

Cortant.: ----- 3.1 0.9 -1.2 -3.1 -5.1 ----- 4.3(x= 0.10)
-6.9(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: 2Ø6.3(0.08D+3.82=3.90) ----- 2Ø16(1.60>>), 1Ø12.5(1.05>>)

Arm.Inferior: 2Ø12.5(0.15D+5.30=5.45), 1Ø12.5(4.00)

Estribos: 29x1Ø5c/0.14(4.00), 7x1Ø5c/0.12(0.80)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.192 cm. (C/2602)

Arm.sup: 3.8 1.2 ----- ----- ----- ----- 1.5 4.0(0.07)
1.5(4.99)

Arm.inf: ----- ----- 1.9 2.9 2.6 1.2 ----- 1.2(0.99) 3.0(2.74)
1.6(4.01)

Moment.: -5.9 -1.3 2.7 4.1 3.7 1.7 -2.3 -5.9(0.00) 0.3(0.99) 4.1(2.74)
2.2(4.01) -2.3(5.00)

Cortant.: ----- 4.7 2.6 0.6 -1.3 -3.1 ----- 6.5(x= 0.10)
-4.3(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(<<1.60+1.70=3.30), 1Ø12.5(<<1.05+1.05=2.10) ----- 2Ø12.5(1.20>>)

Arm.Montagem: 2Ø5(2.60)

Arm.Inferior: 2Ø16(5.40)

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

Tramo nº 3 (*P51-P50*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.082 cm. (C/-4901)

Arm.sup: 1.5 1.2 1.2 1.2 1.3 2.9 4.4 1.7(0.10)
4.9(3.90)

Arm.inf: ----- 1.2 1.5 1.3 1.2 ----- ----- 1.2(0.79) 1.5(1.49)

Moment.: -2.3 1.3 2.0 1.8 -1.8 -4.1 -6.7 -2.4(0.06) 1.5(0.79) 2.1(1.49)
-7.0(3.93)

Cortant.: ----- 1.7 0.4 -1.1 -2.6 -4.1 ----- 2.5(x= 0.10)
-5.5(x= 3.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<4.00>>) ----- 2Ø12.5(1.40>>)

Arm.Inferior: 2Ø10(4.30)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P50-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.874 cm.
(C/684)

Arm.sup: 4.4 ----- 1.2 4.4(0.01)
1.2(5.90)

Arm.inf: ----- 1.2 3.4 4.6 4.1 1.8 ----- 1.2(1.18) 4.9(3.24)
2.3(4.79)

Moment.: -6.7 0.2 4.8 6.5 5.7 2.5 -0.9 -6.7(0.00) 1.2(1.18) 6.8(3.24)
3.3(4.79) -1.6(5.90)

Cortant.: ----- 5.5 3.3 1.0 -2.2 -4.2 ----- 7.8(x= 0.10)
-6.4(x= 5.44)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.88) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<5.20+1.55=6.75), 2Ø12.5(<<1.40+1.20=2.60) -----
2Ø10(4.83+0.12D=4.95)

Arm.Inferior: 2Ø16(6.31+0.19D=6.50), 1Ø12.5(4.50)

Estribos: 10x1Ø5c/0.1(1.00), 28x1Ø5c/0.14(3.94), 7x1Ø5c/0.12(0.84)

V 13 --- Grupo: 2

Tramo nº 1 (*V 8-V 7*) (C= 1.35) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.001 cm.
(C/120363)

Arm.sup: -----

Arm.inf: ----- 1.5 1.5 1.5 1.5 1.5 ----- 1.5(0.25) 1.5(0.74)
1.5(1.09)

Moment.: 0.0 0.2 0.3 0.4 0.4 0.3 0.0 0.0(0.00) 0.2(0.25) 0.4(0.74)
0.3(1.09) 0.0(1.35)

Cortant.: 0.7 0.6 0.4 0.1 -0.3 -0.8 -1.5 0.7(x= 0.00)
-1.5(x= 1.35)

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= 1.35) Lim.: 0.72

Arm.Montagem: 2Ø5(0.08D+1.48+0.06D=1.62)

Arm.Inferior: 2Ø10(0.12D+1.48+0.12D=1.72)

Estribos: 9x1Ø5c/0.14(1.15)

V 14 --- Grupo: 2

Tramo nº 1 (*P52-P52*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.044 cm.
(C/8361)

Arm.sup: ----- 1.2 2.5 0.0(0.04)
2.6(3.58)

Arm.inf: ----- 1.2 1.6 1.4 1.2 ----- 1.2(0.73) 1.6(1.39)

Moment.: 0.1 1.5 2.2 2.0 0.9 -1.4 -3.9 -0.0(0.03) 1.7(0.73) 2.2(1.39)
-3.9(3.65)

Cortant.: ----- 1.6 0.3 -1.0 -2.4 -3.7 ----- 2.0(x= 0.39)
-4.6(x= 3.55)

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

Arm.Superior: 2Ø6.3(0.08D+2.37=2.45) ----- 2Ø10(1.60>>), 1Ø12.5(1.05>>)

Arm.Inferior: 2Ø10(0.12D+3.93=4.05)

Estribos: 25x1Ø5c/0.14(3.45)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.228 cm.
(C/2192)

Arm.sup: 2.5 1.2 ----- 2.0 2.6(0.07)
2.1(4.94)

Arm.inf: ----- 1.2 2.0 2.7 2.2 1.2 ----- 1.2(0.99) 2.7(2.49)
1.2(4.01)

Moment.: -3.9 0.3 2.8 3.8 3.1 0.8 -3.1 -3.9(0.00) 0.9(0.99) 3.8(2.49)
1.4(4.01) -3.1(5.00)

Cortant.: ----- 3.9 2.1 0.1 -1.8 -3.6 ----- 5.3(x= 0.10)
-4.9(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: 2Ø10(<<1.60+1.40=3.00), 1Ø12.5(<<1.05+1.05=2.10) ----- 2Ø12.5(1.30>>)

Arm.Montagem: 2Ø5(2.80)

Arm.Inferior: 2Ø10(5.40), 1Ø12.5(3.45)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.004 cm.
(C/92145)

Arm.sup: 2.0 1.2 ----- 1.2 2.5 2.1(0.07)
2.6(3.93)

Arm.inf: ----- 1.2 1.6 1.9 1.4 1.2 ----- 1.2(0.79) 1.9(1.99)

1.2(3.20)

Moment.: -3.1 -1.0 2.2 2.6 2.0 -1.4 -3.8 -3.1(0.00) 1.2(0.79) 2.6(1.99)
0.8(3.20) -3.8(4.00)

Cortant.: ----- 2.7 1.3 -0.2 -1.6 -3.1 ----- 3.6(x= 0.10)
-4.1(x= 3.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.90) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<4.00>>) ----- 1Ø10(1.15>>)

Arm.Inferior: 2Ø12.5(4.35)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P51-P50*) (C= 5.44) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.370 cm.
(C/1472)

Arm.sup: 2.5 ----- 1.2 3.4 2.6(0.07)
3.4(5.43)

Arm.inf: ----- 1.2 2.8 3.4 2.5 1.2 ----- 1.2(1.08) 3.4(2.74)
1.2(4.36)

Moment.: -3.8 1.1 3.9 4.7 3.6 0.4 -5.3 -3.8(0.00) 1.7(1.08) 4.7(2.74)
1.1(4.36) -5.3(5.44)

Cortant.: ----- 4.0 2.0 -0.2 -2.3 -4.4 ----- 5.6(x= 0.10)
-6.4(x= 5.34)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.34) Lim.: 0.54

Arm.Superior: 2Ø12.5(<<5.30+1.35=6.65), 1Ø10(<<1.15+1.20=2.35) ----- 2Ø16(1.60>>)

Arm.Montagem: 2Ø5(3.05)

Arm.Inferior: 2Ø12.5(5.59>>), 1Ø12.5(3.30)

Estribos: 32x1Ø5c/0.14(4.44), 7x1Ø5c/0.13(0.80)

Tramo nº 5 (*P50-V 1*) (C= 0.64) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.031 cm.
(C/2092)

Arm.sup: 3.4 3.5 2.7 1.9 1.2 1.2 1.2 3.6(0.07)
1.2(0.44)

Arm.inf: ----- 0.1(0.58)

Moment.: -5.3 -4.9 -3.8 -2.6 -1.4 -0.2 -0.0 -5.3(0.03) -0.2(0.51)
0.1(0.58) -0.0(0.64)

Cortant.: ----- 10.5 10.7 11.0 11.2 11.4 0.0 11.4(x= 0.54)
-0.0(x= 0.64)

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

Arm.Superior: 2Ø16(<<1.60+0.61+0.19D=2.40) -----

Arm.Inferior: 2Ø12.5(<<5.59+0.61+0.15D=6.35)

Estribos: 4x1Ø8c/0.13(0.51)

V 15 --- Grupo: 2

Tramo nº 1 (*P52-P52*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.043 cm. (C/8410)

Arm.sup: ----- 1.2 2.6 0.0(0.04)
2.6(3.58)

Arm.inf: 0.1 1.2 1.6 1.4 1.2 ----- 1.3(0.73) 1.6(1.39)

Moment.: 0.2 1.6 2.2 2.0 0.9 -1.4 -3.9 -0.0(0.03) 1.8(0.73) 2.3(1.39)
-3.9(3.65)

Cortant.: ----- 1.6 0.3 -1.1 -2.4 -3.7 ----- 2.0(x= 0.39)
-4.7(x= 3.55)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.55) Lim.: 0.54

Arm.Superior: 2Ø6.3(0.08D+2.42=2.50) ----- 2Ø10(1.60>>), 1Ø12.5(1.05>>)

Arm.Inferior: 2Ø12.5(0.15D+3.95=4.10)

Estribos: 25x1Ø5c/0.14(3.45)

Tramo nº 2 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.240 cm. (C/2088)

Arm.sup: 2.6 1.2 ----- 2.0 2.7(0.07)
2.1(4.94)

Arm.inf: ----- 1.2 2.1 2.8 2.2 1.2 ----- 1.2(0.99) 2.8(2.49)
1.2(4.01)

Moment.: -3.9 0.3 2.9 3.9 3.1 0.8 -3.1 -3.9(0.00) 0.9(0.99) 3.9(2.49)
1.4(4.01) -3.1(5.00)

Cortant.: ----- 4.0 2.1 0.1 -1.8 -3.6 ----- 5.5(x= 0.10)
-5.0(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(<<1.60+1.40=3.00), 1Ø12.5(<<1.05+1.05=2.10) ----- 2Ø12.5(1.30>>)

Arm.Montagem: 2Ø5(2.80)

Arm.Inferior: 2Ø10(5.40), 1Ø12.5(3.50)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 3 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.002 cm.
(C/206172)

Arm.sup: 2.0 1.2 ----- 1.2 2.5 2.1(0.07)
2.6(3.93)

Arm.inf: ----- 1.2 1.6 1.9 1.4 1.2 ----- 1.2(0.79) 1.9(1.99)
1.2(3.20)

Moment.: -3.1 -1.0 2.2 2.6 2.0 -1.5 -3.8 -3.1(0.00) 1.2(0.79) 2.6(1.99)
0.8(3.20) -3.8(4.00)

Cortant.: ----- 2.7 1.3 -0.2 -1.6 -3.1 ----- 3.6(x= 0.10)
-4.1(x= 3.90)

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

Arm.Superior: 2Ø12.5(<<4.00>>) ----- 1Ø10(0.95>>)

Arm.Inferior: 2Ø12.5(4.35)

Estribos: 28x1Ø5c/0.14(3.80)

Tramo nº 4 (*P51-P50*) (C= 5.44) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.379 cm.
(C/1436)

Arm.sup: 2.5 ----- 1.2 3.4 2.6(0.06)
3.4(5.43)

Arm.inf: ----- 1.2 2.8 3.4 2.5 1.2 ----- 1.2(1.08) 3.4(2.74)
1.2(4.36)

Moment.: -3.8 1.0 3.9 4.7 3.6 0.4 -5.2 -3.8(0.00) 1.7(1.08) 4.7(2.74)
1.1(4.36) -5.2(5.44)

Cortant.: ----- 4.0 2.0 -0.2 -2.3 -4.4 ----- 5.7(x= 0.10)
-6.3(x= 5.34)

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

Arm.Superior: 2Ø12.5(<<5.30+1.35=6.65), 1Ø10(<<0.95+0.95=1.90) ----- 2Ø16(1.60>>)

Arm.Montagem: 2Ø5(3.05)

Arm.Inferior: 2Ø12.5(5.65>>), 1Ø12.5(3.30)

Estribos: 32x1Ø5c/0.14(4.44), 7x1Ø5c/0.13(0.80)

Tramo nº 5 (*P50-V 1*) (C= 0.64) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.030 cm.
(C/2167)

Arm.sup: 3.4 3.5 2.7 1.8 1.2 1.2 1.2 3.6(0.07)
1.2(0.44)

Arm.inf: ----- 0.1(0.58)

Moment.: -5.2 -4.8 -3.7 -2.6 -1.3 -0.1 0.0 -5.2(0.03) -0.2(0.51)
0.1(0.58) 0.0(0.64)

Cortant.: ----- 10.3 10.6 10.9 11.1 11.3 0.0 11.3(x= 0.54)
-0.0(x= 0.64)

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

Arm.Superior: 2Ø16(<<1.60+0.61+0.19D=2.40) -----

Arm.Inferior: 2Ø12.5(<<5.65+0.60+0.15D=6.40)

Estribos: 4x1Ø8c/0.13(0.51)

V 16 --- Grupo: 2

Tramo nº 1 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.268 cm.
(C/1863)

Arm.sup: ----- 2.3 0.0(0.04)
2.3(4.99)

Arm.inf: ----- 1.2 2.2 2.6 2.0 1.2 ----- 1.2(0.99) 2.6(2.49)
1.2(4.01)

Moment.: -0.0 1.3 3.1 3.7 2.7 0.3 -3.5 -0.1(0.03) 1.7(0.99) 3.7(2.49)
0.9(4.01) -3.5(5.00)

Cortant.: ----- 2.3 1.5 -0.2 -2.0 -3.7 ----- 2.4(x= 0.99)
-5.0(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: 2Ø6.3(0.08D+3.87=3.95) ----- 2Ø16(1.40>>)

Arm.Inferior: 2Ø16(0.19D+5.26=5.45)

Estribos: 35x1Ø5c/0.14(4.80)

Tramo nº 2 (*P51-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= -0.066 cm.
(C/-6082)

Arm.sup: 2.3 1.3 1.2 1.2 1.2 2.4 5.3 2.5(0.10)
5.8(3.91)

Arm.inf: ----- 1.2 1.6 1.7 1.2 ----- 1.2(0.79) 1.8(1.74)

Moment.: -3.5 -1.8 2.2 2.4 1.5 -3.4 -8.0 -3.6(0.06) 1.2(0.79) 2.5(1.74)
-8.2(3.96)

Cortant.: ----- 2.5 1.1 -0.5 -2.3 -5.2 ----- 3.4(x= 0.10)
-12.1(x= 3.90)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.90) Lim.: 0.54

Arm.Superior: 2Ø16(<<4.00>>) ----- 1Ø16(1.25>>)

Arm.Inferior: 2Ø16(4.55)

Estribos: 20x1Ø8c/0.15(3.00), 7x1Ø8c/0.13(0.80)

Tramo nº 3 (*P51-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.838 cm. (C/713)

Arm.sup: 5.3 ----- 5.2(0.01)
0.1(5.94)

Arm.inf: ----- 1.2 3.4 4.4 3.7 1.8 ----- 1.3(1.18) 4.4(2.99)
2.3(4.79)

Moment.: -8.0 0.9 4.8 6.1 5.2 2.5 -0.1 -8.0(0.00) 1.8(1.18) 6.1(2.99)
3.2(4.79) -0.1(5.95)

Cortant.: ----- 5.5 2.6 0.2 -1.8 -3.3 ----- 14.8(x= 0.10)
-3.9(x= 5.44)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.88) Lim.: 0.54

Arm.Superior: 2Ø16(<<5.40+1.50=6.90), 1Ø16(<<1.25+1.20=2.45) ----- 2Ø8(4.80+0.10D=4.90)

Arm.Inferior: 2Ø12.5(6.45+0.15D=6.60), 1Ø16(6.25)

Estribos: 8x1Ø8c/0.1(0.80), 34x1Ø8c/0.15(4.98)

V 17 --- Grupo: 2

Tramo nº 1 (*P53-V 6*) (C= 3.65) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.053 cm. (C/6900)

Arm.sup: ----- 0.1(0.03)
1.5(3.39)

Arm.inf: ----- 1.5 1.7 1.6 1.5 1.5 ----- 1.5(0.73) 1.7(1.39)
1.5(2.92)

Moment.: -0.1 2.3 3.0 2.9 1.9 0.4 -0.0 -0.1(0.03) 2.6(0.73) 3.1(1.39)
0.7(2.92) -0.2(3.39)

Cortant.: ----- 3.6 0.5 -0.9 -2.0 -2.0 0.9 4.8(x= 0.39)

-2.3(x= 2.89)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 0.00 Extr. apoio: 0.00(x= 0.10) 0.00(x= 3.65) Lim.: 0.72

Arm.Superior: 2Ø10(0.12D+3.79+0.12D=4.03) -----

Arm.Inferior: 2Ø12.5(0.15D+3.79+0.15D=4.09)

Estribos: 25x1Ø5c/0.14(3.45)

V 18 --- Grupo: 2

Tramo nº 1 (*P53-P53*) (C= 6.60) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.289 cm. (C/2281)

Arm.sup: ----- 1.5 2.3 2.4 2.0 1.5 ----- 1.7(1.32) 2.5(2.93)
0.0(6.57)

Arm.inf: ----- 1.5 2.3 2.4 2.0 1.5 ----- 1.7(1.32) 2.5(2.93)
1.5(5.28)

Moment.: 0.0 2.7 4.2 4.4 3.6 2.1 -0.1 -0.0(0.01) 3.1(1.32) 4.4(2.93)
2.4(5.28) -0.1(6.60)

Cortant.: 4.5 2.2 0.9 -0.3 -1.3 -2.3 ----- 4.5(x= 0.00)
-3.2(x= 6.56)

Torsores: 0.00 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.00) 0.00(x= 6.56) Lim.: 0.72

Arm.Superior: 2Ø10(0.12D+6.71+0.12D=6.95) -----

Arm.Inferior: 2Ø12.5(0.18D+6.71+0.15D=7.04)

Estribos: 47x1Ø5c/0.14(6.53)

V 19 --- Grupo: 2

Tramo nº 1 (*P30-P53*) (C= 4.90) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.114 cm. (C/4288)

Arm.sup: ----- 1.9 5.2
5.7(4.81)

Arm.inf: ----- 1.8 2.6 2.3 1.5 ----- 2.0(0.98) 2.6(1.89)

Moment.: -0.0 3.2 4.6 4.1 1.6 -3.3 -10.0 -0.0(0.12) 3.6(0.98) 4.7(1.89)
-10.4(4.84)

Cortant.: 0.0 3.0 0.6 -1.8 -4.5 -7.6 ----- 6.9(x= 0.12)
-11.6(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.: 0.72

Arm.Superior: ----- 2Ø16(2.10>>), 1Ø16(1.35>>)

Arm.Montagem: 2Ø6.3(0.08D+3.02=3.10)

Arm.Inferior: 2Ø16(0.19D+5.21=5.40)

Estribos: 17x1Ø6.3c/0.22(3.69), 9x1Ø6.3c/0.12(1.08)

Tramo nº 2 (*P53-P52*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.070 cm.
(C/7104)

Arm.sup: 5.2 1.5 ----- 1.5 3.0 5.1(0.01)
3.0(4.96)

Arm.inf: ----- 1.5 2.6 3.5 3.2 1.6 ----- 1.5(0.99) 3.6(2.74)
2.0(4.01)

Moment.: -10.0 -2.4 4.7 6.4 5.8 2.9 -5.7 -10.0(0.00) 1.6(0.99) 6.4(2.74)
3.7(4.01) -5.7(5.00)

Cortant.: ----- 6.6 3.4 0.6 -2.0 -4.9 ----- 10.7(x= 0.10)
-10.0(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: 2Ø16(<<2.10+2.05=4.15), 1Ø16(<<1.35+1.00=2.35) ----- 2Ø12.5(1.55>>),
1Ø10(1.00>>)

Arm.Montagem: 2Ø6.3(1.90)

Arm.Inferior: 2Ø12.5(5.70), 1Ø12.5(3.85)

Estribos: 6x1Ø6.3c/0.14(0.84), 14x1Ø6.3c/0.22(3.16), 6x1Ø6.3c/0.14(0.80)

Tramo nº 3 (*P52-P51*) (C= 5.00) Viga alta Tipo R Seção B*H = 20 X 50 Flecha= 0.102 cm.
(C/4926)

Arm.sup: 3.0 ----- 1.5 ----- 3.0(0.04)
1.5(4.49)

Arm.inf: ----- 1.5 1.7 2.1 1.5 1.5 ----- 1.5(0.99) 2.1(2.45)
1.5(4.01)

Moment.: -5.7 0.1 3.0 3.7 2.5 0.1 0.0 -5.7(0.00) 0.8(0.99) 3.7(2.45)
0.6(4.01) -0.6(4.49)

Cortant.: ----- 5.1 2.2 -0.2 -2.2 -2.5 ----- 10.3(x= 0.10)
-2.8(x= 3.99)

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: 2Ø12.5(<<1.55+1.55=3.10), 1Ø10(<<1.00+1.00=2.00) -----
2Ø10(3.83+0.12D=3.95)

Arm.Inferior: 2Ø12.5(5.40+0.15D=5.55)

Estribos: 6x1Ø6.3c/0.14(0.80), 18x1Ø6.3c/0.22(4.00)

V 20 --- Grupo: 2

Tramo nº 1 (*P52-P50*) (C= 9.98) Vig.alt.inv. Tipo R Seção B*H = 30 X 80 Flecha= 0.847 cm.
(C/1178)

Arm.sup: ----- 0.1(0.03)
0.1(9.95)

Arm.inf: ----- 3.9 7.0 8.7 8.5 5.1 ----- 4.7(1.99) 8.9(5.74)
6.1(7.99)

Moment.: -0.2 11.7 21.0 26.0 25.3 15.4 -0.2 -0.2(0.03) 14.0(1.99) 26.7(5.74)
18.1(7.99) -0.3(9.95)

Cortant.: ----- 7.2 4.0 1.7 -3.1 -8.6 ----- 8.1(x= 0.99)
-10.3(x= 9.24)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x=
9.88) Lim.: 4.75

Arm.Superior: 2Ø8(0.10D+10.12+0.10D=10.32) -----

Arm.Pele: 3Ø10(0.12D+10.12+0.12D=10.36), 3Ø10(0.12D+10.12+0.12D=10.36)

Arm.Inferior: 3Ø16(0.19D+10.12+0.19D=10.50), 2Ø16(7.90)

Estribos: 70x1Ø6.3c/0.14(9.78)

V 21 --- Grupo: 2

Tramo nº 1 (*P52-P51*) (C= 4.00) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.027 cm.
(C/15048)

Arm.sup: ----- 1.3 4.0 0.1(0.04)
4.0(3.96)

Arm.inf: 0.4 1.3 1.8 1.8 1.2 ----- 1.4(0.79) 1.8(1.74)

Moment.: 0.6 1.8 2.5 2.5 1.6 -1.8 -6.1 -0.1(0.03) 2.0(0.79) 2.6(1.74)
0.0(3.20) -6.1(4.00)

Cortant.: ----- 1.1 0.5 -0.7 -2.2 -4.6 ----- 3.1(x= 0.10)
-9.1(x= 3.90)

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

Arm.Superior: 2Ø6.3(0.08D+2.52=2.60) ----- 2Ø16(1.85>>), 1Ø10(0.80>>)

Arm.Inferior: 2Ø12.5(0.15D+4.40=4.55)

Estribos: 18x1Ø6.3c/0.17(3.00), 7x1Ø6.3c/0.12(0.80)

Tramo nº 2 (*P51-P50*) (C= 5.98) Viga alta Tipo R Seção B*H = 20 X 40 Flecha= 0.596 cm. (C/1003)

Arm.sup: 4.0 ----- 4.1(0.06)
0.1(5.94)

Arm.inf: ----- 1.2 2.5 3.3 2.9 1.5 ----- 1.2(1.18) 3.3(3.24)
1.9(4.79)

Moment.: -6.1 0.4 3.5 4.7 4.1 2.1 -0.1 -6.1(0.01) 1.2(1.18) 4.7(3.24)
2.6(4.79) -0.2(5.95)

Cortant.: ----- 4.4 2.0 0.3 -1.3 -2.5 ----- 10.6(x= 0.10)
-5.2(x= 5.88)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 5.88) Lim.: 0.54

Arm.Superior: 2Ø16(<<1.85+1.60=3.45), 1Ø10(<<0.80+1.20=2.00) -----
2Ø6.3(4.67+0.08D=4.75)

Arm.Inferior: 2Ø12.5(6.45+0.15D=6.60), 1Ø12.5(3.80)

Estribos: 8x1Ø6.3c/0.1(0.80), 30x1Ø6.3c/0.17(4.98)

V 22 --- Grupo: 2

Tramo nº 1 (*P51-P50*) (C= 9.98) Vig.alt.inv. Tipo R Seção B*H = 30 X 80 Flecha= 1.430 cm. (C/698)

Arm.sup: ----- 0.1 0.1(0.03)
0.1(9.95)

Arm.inf: ----- 6.0 11.6 13.6 12.2 7.1 ----- 7.3(1.99) 13.6(4.99)
8.4(7.99)

Moment.: -0.2 17.9 34.6 40.7 36.4 21.2 -0.3 -0.2(0.03) 21.7(1.99) 40.7(4.99)
25.1(7.99) -0.4(9.95)

Cortant.: ----- 12.0 8.0 -0.2 -5.7 -12.1 ----- 12.8(x= 0.99)
-14.0(x= 9.24)

Torsores: ----- 0.00 0.00 0.00 0.00 0.00 ----- Extr. apoio: 0.00(x= 0.10) 0.00(x= 9.88) Lim.: 4.75

Arm.Superior: 2Ø10(0.12D+10.12+0.12D=10.36) -----

Arm.Pele: 3Ø10(0.12D+10.12+0.12D=10.36), 3Ø10(0.12D+10.12+0.12D=10.36)

Arm.Inferior: 3Ø20(0.26D+10.12+0.26D=10.64), 3Ø16(8.10)

Estribos: 70x1Ø6.3c/0.14(9.78)

Tramo nº 1 (*P51-P51*) (C=12.50) Vig.alt.inv. Tipo R Seção B*H = 30 X 80 Flecha= 1.288 cm. (C/970)

Arm.sup: ----- 0.0(0.03)
0.1(12.5)

Arm.inf: ----- 5.6(10.0) 9.2(7.29)
4.9 6.9 8.5 8.6 4.7 -----

Moment.: -0.1 14.6 20.5 25.5 25.8 14.1 -0.1 -0.1(0.03) 16.8(2.49) 27.4(7.29)
16.9(10.0) -0.2(12.5)

Cortant.: ----- 8.6(x= 0.99)
-7.9(x=11.49) 6.2 0.2 3.1 -3.2 -6.9 -----

Torsores: ----- Extr. apoio: 0.00(x= 0.10)
0.00(x=12.40) Lim.: 4.75 0.00 0.00 0.00 0.00 0.00 -----

Arm.Superior: 2Ø10(0.12D+2.88=3.00) ----- 2Ø10(2.88+0.12D=3.00)

Arm.Montagem: 2Ø8(7.40)

Arm.Pele: 3Ø10(0.12D+6.73=6.85), 3Ø10(6.73+0.12D=6.85), 3Ø10(0.12D+6.73=6.85),
3Ø10(6.73+0.12D=6.85)

Arm.Inferior: 3Ø16(0.19D+11.81=12.00), 3Ø16(11.81+0.19D=12.00)

Estribos: 88x1Ø6.3c/0.14(12.30)