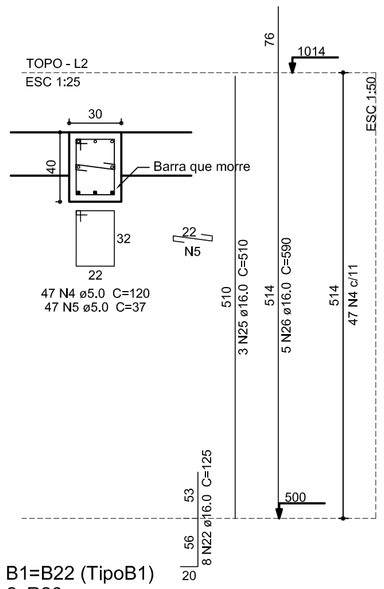
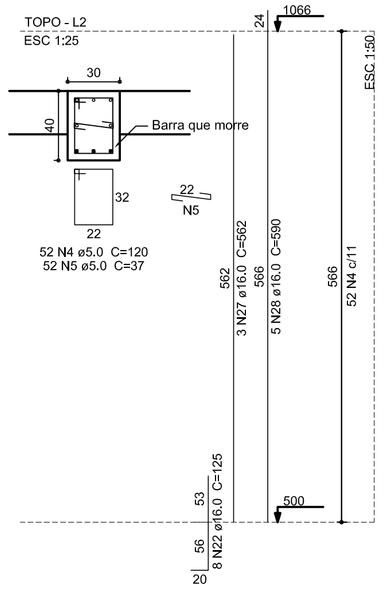
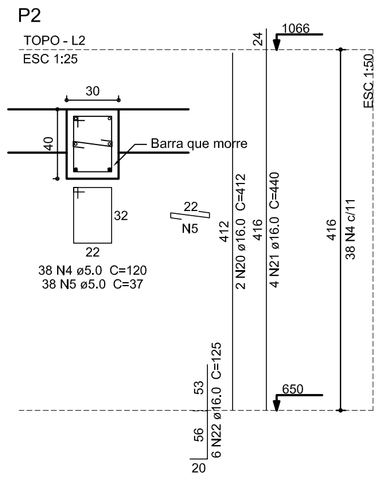
P3=P4=P5=P7=P10=P12=P14=P15=P17=P20
P25=P26=P27=P28=P29=P30=P31=P32=P33
P34=P35=P36=P37=P38=P39=P40=P41=P42 - 28X



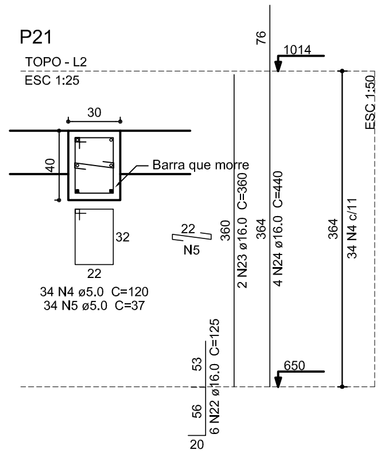
P6=P8=P9=P11=P13=P16=P18=P19



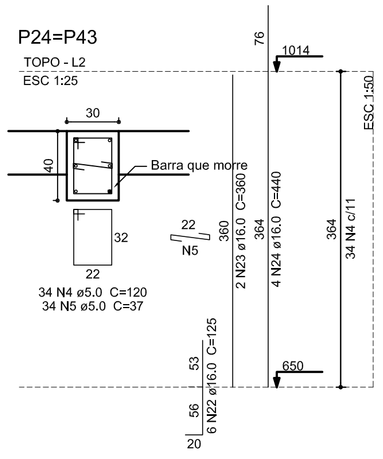
P2



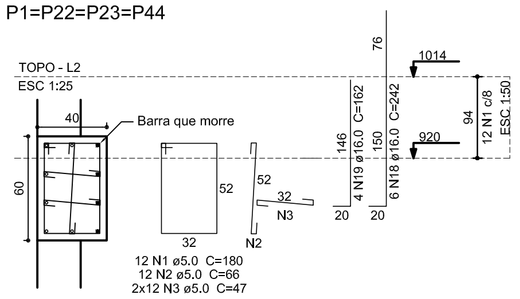
P21



P24=P43



P1=P22=P23=P44



Relação do aço

Base:	2xB1	4xB2	
	2xB23	24xB3-4	
	2xV1	2xV2	
	12xV3		
Topo:	P2	28xP3	
	8xP6	P21	
	4xP1	2xP24	

AÇO	N	DIAM (mm)	QUANT	C.UNIT (cm)	C.TOTAL (cm)
CA60	1	5.0	48	180	8640
	2	5.0	48	66	3168
	3	5.0	96	47	4512
	4	5.0	1872	120	224640
	5	5.0	1872	37	69264
	6	5.0	72	182	13104
	7	5.0	348	156	54288
CA50	8	6.3	120	202	24240
	9	6.3	120	174	20880
	10	6.3	150	464	69600
	11	6.3	210	232	48720
	12	6.3	20	VAR	VAR
	13	6.3	22	VAR	VAR
	14	6.3	22	VAR	VAR
	15	6.3	20	VAR	VAR
	16	6.3	10	655	6550
	17	10.0	100	266	26600
	18	16.0	24	242	5808
	19	16.0	16	162	2592
	20	16.0	2	412	824
	21	16.0	4	440	1760
	22	16.0	312	125	39000
	23	16.0	6	360	2160
	24	16.0	12	440	5280
	25	16.0	84	510	42840
	26	16.0	140	590	82600
	27	16.0	24	562	13488
	28	16.0	40	590	23600
	29	16.0	8	299	2392
	30	16.0	12	361	4332
	31	16.0	40	297	11880
	32	16.0	36	365	13140
	33	16.0	120	258	30960
	34	16.0	24	309	7416

Resumo do aço

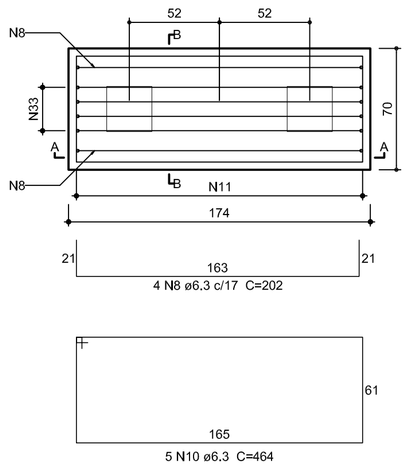
AÇO	DIAM (mm)	C.TOTAL (m)	PESO (kg)
CA50	6.3	1887.5	461.9
	10.0	266	164
	16.0	2900.8	4578.3
CA60	5.0	3776.2	582

PESO TOTAL (kg)	
CA50	5204.2
CA60	582

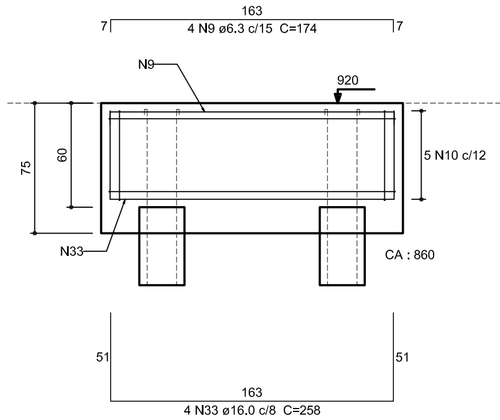
Volume de concreto (C-30) = 59,31 m³
Área de forma = 433,52 m²

B1=B22 (TipoB1)
2xR26

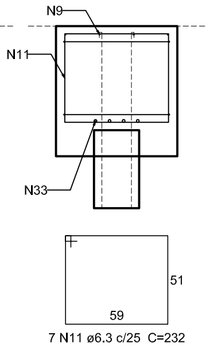
PLANTA
ESC 1:25



CORTE A-A
ESC 1:25



CORTE B-B
ESC 1:25

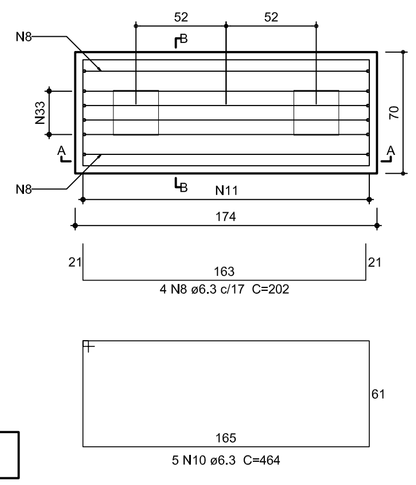


Aviso - Bloco com estaca tracionada: Prever armaduras das estacas ancoradas na face superior do bloco.

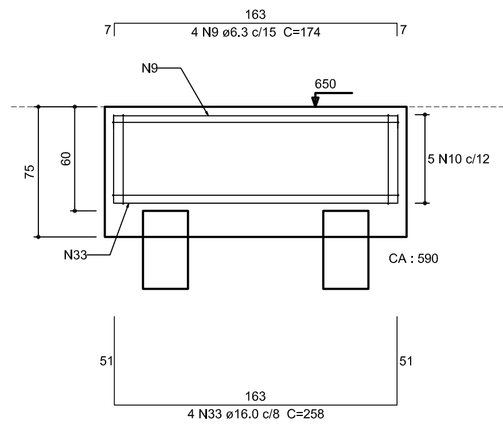
Aviso - Ver esperas dos pilares em Armação dos pilares

Base
B2=B21=B24=B43 (TipoB2)
2xR26

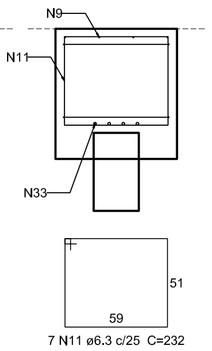
PLANTA
ESC 1:25



CORTE A-A
ESC 1:25



CORTE B-B
ESC 1:25

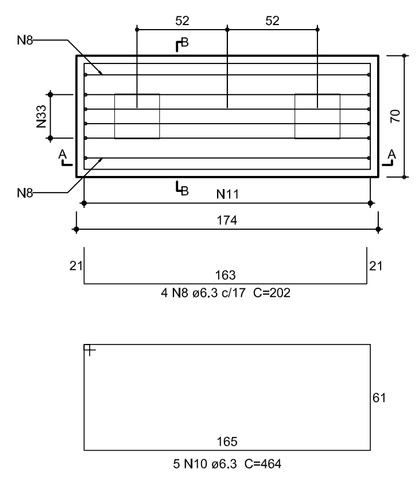


Aviso - Ver esperas dos pilares em Armação dos pilares

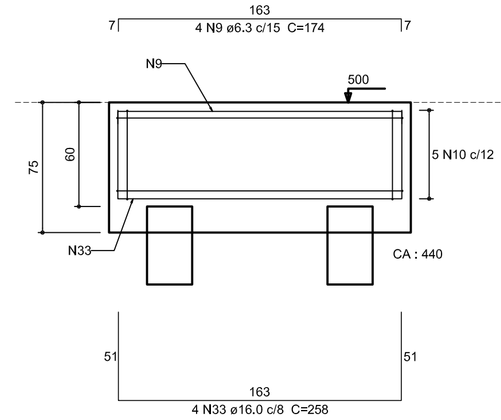
1 ARMAÇÃO DOS PILARES
ESCALA 1:25

Base
B3-4=B5=B6-7=B8=B9-10=B11=B12=B13-14=B15=B16-17=B18=B19-20
B25-26=B27=B28-29=B30=B31-32=B33=B34=B35-36=B37=B38-39=B40=B41-42 (Tipo B3) - 24X
2xR26

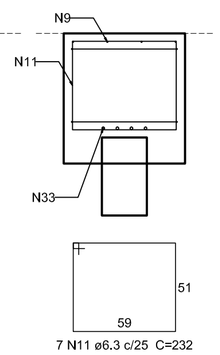
PLANTA
ESC 1:25



CORTE A-A
ESC 1:25



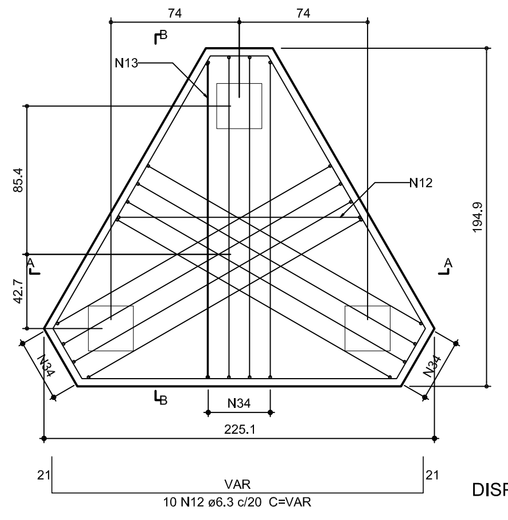
CORTE B-B
ESC 1:25



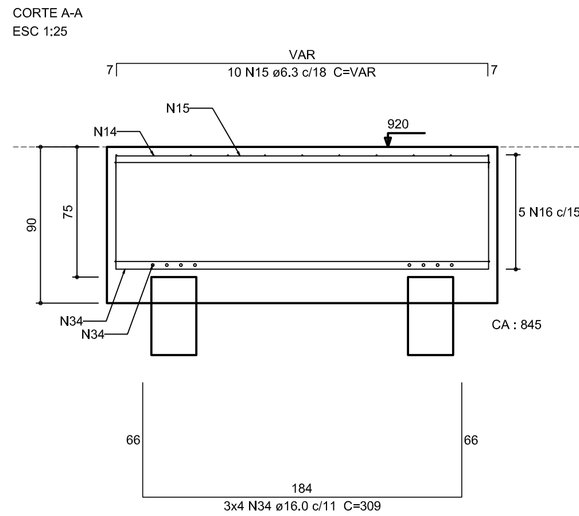
Aviso - Ver esperas dos pilares em Armação dos pilares

Base
B23=B44 (Tipo B23)
3xR26

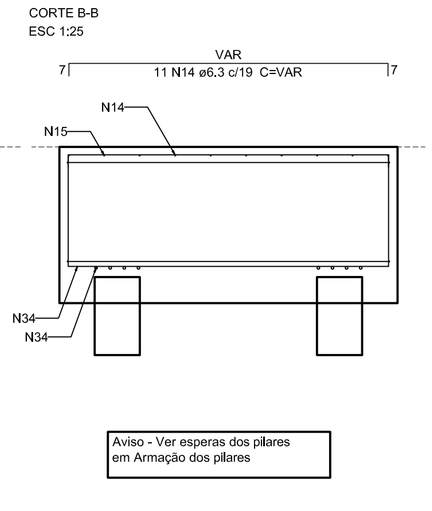
PLANTA
ESC 1:25



CORTE A-A
ESC 1:25

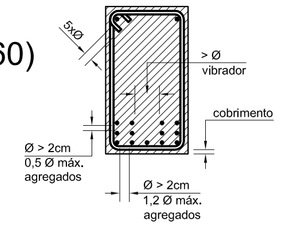


CORTE B-B
ESC 1:25

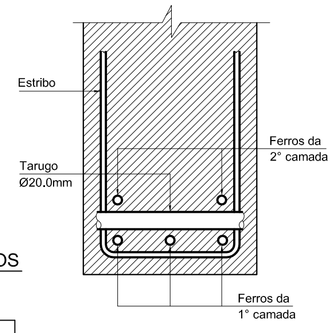


Aviso - Ver esperas dos pilares em Armação dos pilares

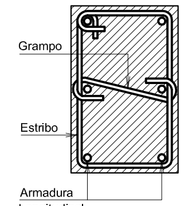
DISPOSIÇÃO DE ARMADURA EM VIGAS
SEÇÃO TRANSVERSAL
SEM ESCALA



ESPAÇADOR PARA CAMADAS
SEÇÃO TRANSVERSAL
SEM ESCALA

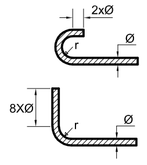


GRAMPO CONTRA FLAMBAGEM - EM PILAR
SEÇÃO TRANSVERSAL
SEM ESCALA



2 ARMAÇÃO DOS BLOCOS DE COROAMENTO DAS ESTACAS
ESCALA 1:25

RAIO (r) DE CURVATURA PARA GANCHOS
SEM ESCALA

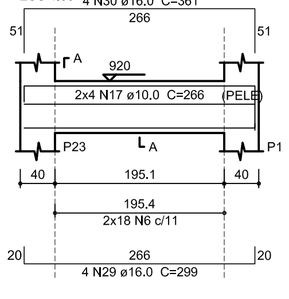


BITOLA (Ø)	CA50	CA60
≤20mm	2,5xØ	3xØ
>20mm	4xØ	—
estribo ≤10mm	1,5xØ	1,5xØ

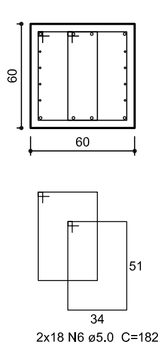
NBR-6118 (item 6.3.4.1)

4 DETALHES GENÉRICOS DE ARMAÇÃO
ESCALA S/E

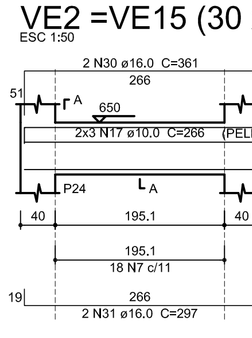
Base
VE1=VE16 (60 x 60)
ESC 1:50



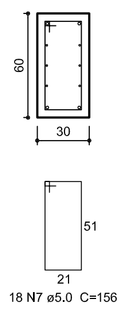
SEÇÃO A-A
ESC 1:25



Base
VE2 =VE15 (30 x 60)
ESC 1:50

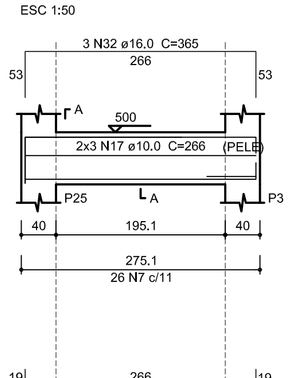


SEÇÃO A-A
ESC 1:25

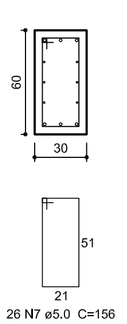


3 ARMAÇÃO DAS VIGAS DA BASE
ESCALA 1:25

Base
VE3 =VE4=VE5=VE6=VE7=VE8=VE9
VE10=VE11=VE12=VE13=VE14 (30 x 60)
ESC 1:50



SEÇÃO A-A
ESC 1:25



01	REVISÃO CONFORME OF. CAIXA – CE1542/2019 – CE6107/2019 e CE2202/2020	IRUPÉ/DAIANE	IRUPÉ/DAIANE	COMUSA	30/03/2021
REVISÃO	DESCRIÇÃO	DESENHO	VERIFICAÇÃO	APROVAÇÃO	DATA

SERVIÇOS DE ÁGUA E ESGOTO DE NOVO HAMBURGO
COMUSA FAZ PARTE DA SUA VIDA

Serviços de Água e Esgoto de Novo Hamburgo – RS
Av. Cel. Travassos, 287
Fone/Fax: (51) 3587–1121

HIDRÁULICA ENGENHARIA LTDA

Obra
SISTEMA DE RECALQUE E ADUÇÃO DE ÁGUA BRUTA DE NOVO HAMBURGO – RS

Responsável Técnico
AUTORIA: AMAURY AMARAL CALDEIRA DE ANDRADA
COAUTORIA: VITOR PEDRO WERLANG

Especificação
TRAVESSIA NO BANHADO DO RIO DOS SINOS
PROJETO ESTRUTURAL – ARMAÇÃO
BLOCOS DE COROAMENTO, VIGAS DA BASE E PILARES

Desenho	Escala	Unidade	Nome do arquivo	Data	Prancha
Eng. Vitor P. Werlang	Indicada	Centímetro	013-AG-PE-SAA-ES-009a013-R01.dwg	NOV/18	09/14