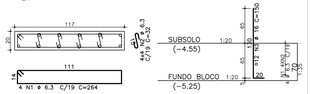
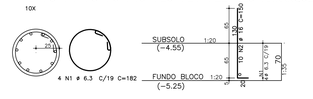
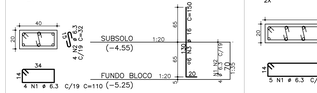
P1=P24–ARRANQUE



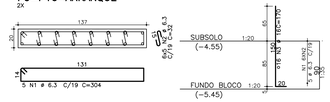
P2=P3=P4=P5=P6=P19=P20=P21=P22=P23–ARRANQUE



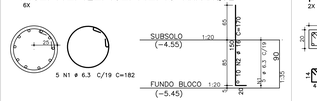
P7=P8=P31=P32=P41=P42–ARRANQUE



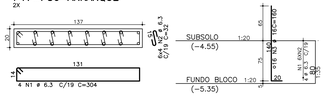
P9=P16–ARRANQUE



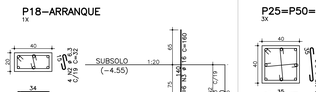
P10=P11=P12=P13=P14=P15–ARRANQUE



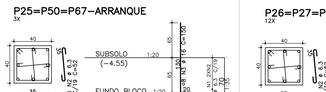
P17=P56–ARRANQUE



P18–ARRANQUE



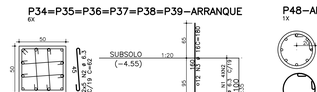
P25=P50=P67–ARRANQUE



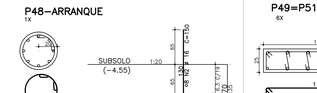
P26=P27=P28=P29=P30=P40=P43=P44=P45=P46=P47=P57–ARRANQUE



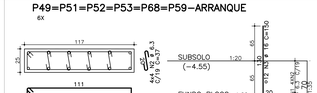
P34=P35=P36=P37=P38=P39–ARRANQUE



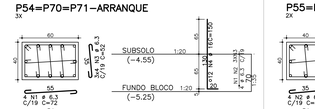
P48–ARRANQUE



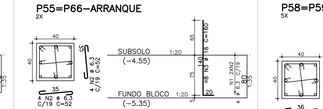
P49=P51=P52=P53=P68=P59–ARRANQUE



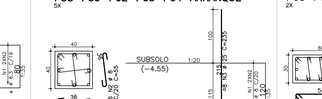
P54=P70=P71–ARRANQUE



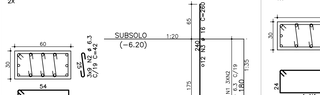
P55=P66–ARRANQUE



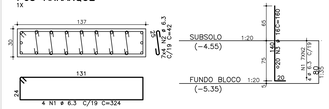
P58=P59=P62=P63=P64–ARRANQUE



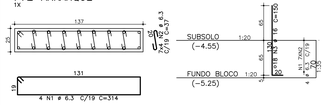
P60=P61=P79=P80–ARRANQUE



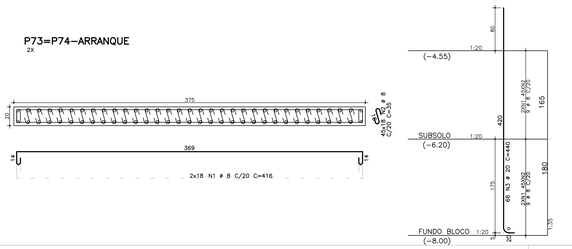
P65–ARRANQUE



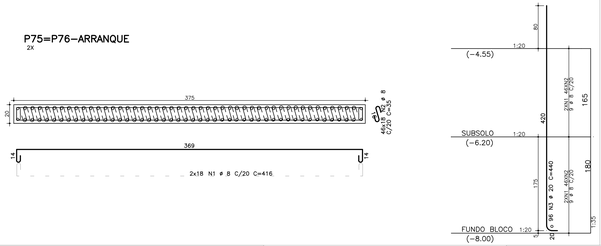
P72–ARRANQUE



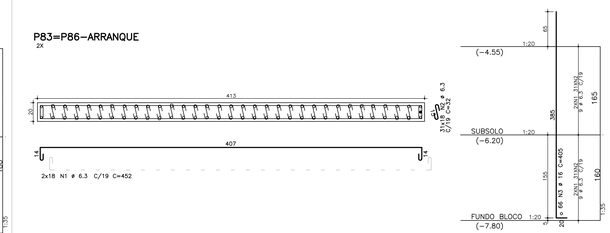
P73=P74–ARRANQUE



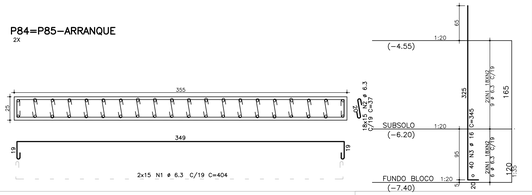
P75=P76–ARRANQUE



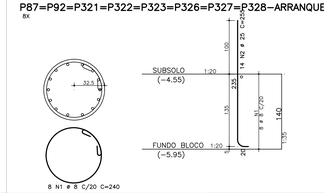
P83=P86–ARRANQUE



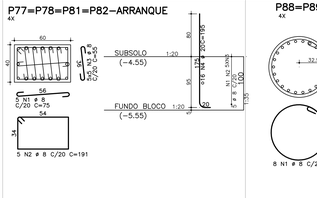
P84=P85–ARRANQUE



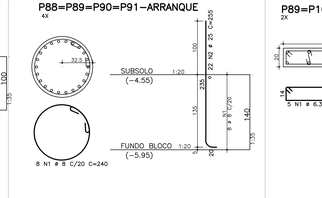
P87=P92=P321=P322=P323=P326=P327=P328–ARRANQUE



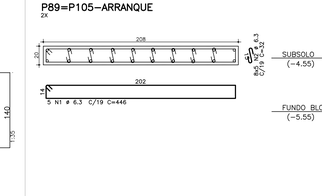
P77=P78=P81=P82–ARRANQUE



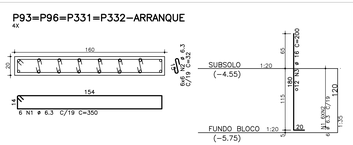
P88=P89=P90=P91–ARRANQUE



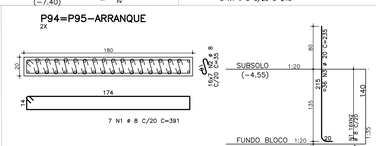
P89=P105–ARRANQUE



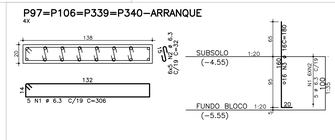
P93=P96=P331=P332–ARRANQUE



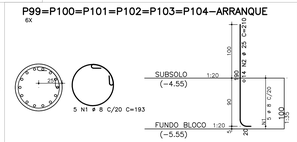
P94=P95–ARRANQUE



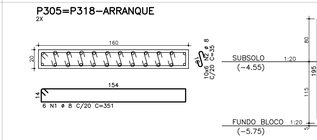
P97=P106=P339=P340–ARRANQUE



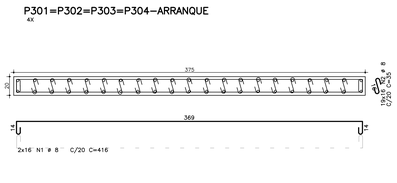
P99=P100=P101=P102=P103=P104–ARRANQUE



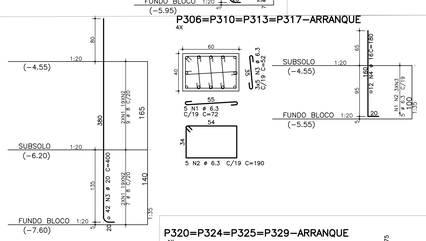
P305=P318–ARRANQUE



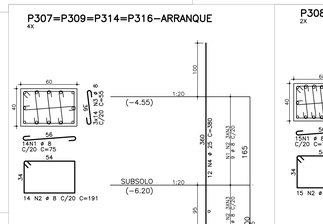
P301=P302=P303=P304–ARRANQUE



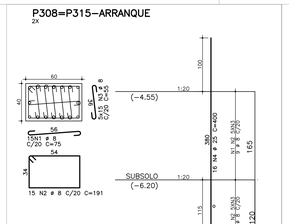
P306=P310=P313=P317–ARRANQUE



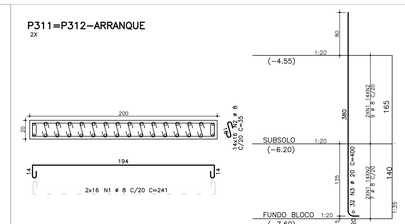
P307=P309=P314=P316–ARRANQUE



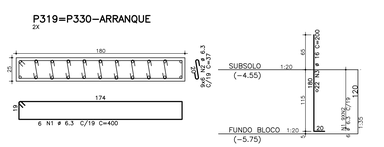
P308=P315–ARRANQUE



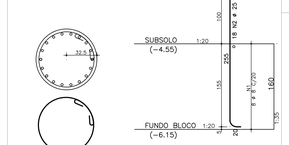
P311=P312–ARRANQUE



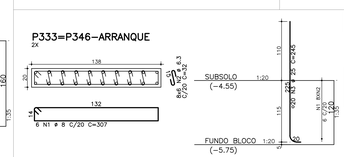
P319=P330–ARRANQUE



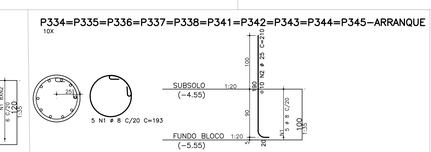
P320=P324=P325=P329–ARRANQUE



P333=P346–ARRANQUE



P334=P335=P336=P337=P338=P341=P342=P343=P344=P345–ARRANQUE



P341=P342=P343=P344=P345–ARRANQUE

Usar os espessuras indicadas e as cores pretas.

Cor	Espessura
P1	0,2
P2	0,4
P3	0,6
P4	0,8
P5	1,0
P6	1,2
P7	1,4
P8	1,6
P9	1,8
P10	2,0
P11	0,2
P12	0,2
P13	0,2
P14	0,2
P15	0,2
P16	0,2
P17	0,2
P18	1
P19	0,2
P20	0,2

Use Objeto Cor Cor

Cod	Cor
252	0, 0, 0
253	0, 0, 0
254	0, 0, 0
255	0, 0, 0

NOTAS GERAIS

01 – MEDIDAS EM CENTÍMETROS, NÍVEIS EM METRO.

02 – TABELA DE ARMADURA SEM A CONSIDERAÇÃO DE PERDAS.

NORMAS

–NBR 6118/2023 – PROJETO DE ESTRUTURAS DE CONCRETO.
–NBR 6120/2019 – AÇÕES PARA O CÁLCULO DE ESTRUTURA DE EDIFICAÇÕES.
–NBR 8681/2020 – AÇÕES E SEGURANÇA NAS ESTRUTURAS.
–NBR 6123/2023 – FORÇAS DEVIDAS AO VENTOS EM EDIFICAÇÕES.
–NBR 5674/2017 – MANUTENÇÃO DE EDIFICAÇÕES.
–NBR 14931/2023 – EXECUÇÃO DE ESTRUTURAS DE CONCRETO ARMADO.
–NBR 14432/2001 – EXIGÊNCIAS DE RESISTÊNCIA AO FOGO DE ELEMENTOS CONSTRUTIVOS DE EDIFICAÇÕES.
–NBR 15200/2024 – PROJETO DE ESTRUTURA DE CONCRETO EM SITUAÇÃO DE INCÊNDIO.
–NBR 12655/2022 – CONTROLE DE CIMENTO PORTLAND.

COBRIMENTOS

CLASSE DE AGRESSIVIDADE AMBIENTAL II
PILARES 3,0cm

CONCRETO

RESISTÊNCIA CARACTERÍSTICA MÍNIMA fck >	40 MPa
MODULO DE DEFORMAÇÕES SECANTE	32,0 GPa
CONSUMO MINIMO DE CIMENTO	320 kg/m³
RELAÇÃO AGUA CIMENTO	0,60

AÇO

RESISTÊNCIA CARACTERISTICA MINIMA DE ESCOAMENTO – CA50–A
RESISTÊNCIA CARACTERISTICA MINIMA DE ESCOAMENTO – CA60–B

CONTROLE DE MATERIAIS

1A– É RECOMENDAVEL A UTILIZAÇÃO DE CONTROLE ESTATISTICO DA RESITÊNCIA À COMPRESSÃO DO CONCRETO POR AMOSTRAGEM PARCIAL, CONFORME NBR 12655;
2A– RECOMENDAVEL QUE SEJA FEITO O ACOMPANHAMENTO DO DESCARREGAMENTO DO CONCRETO COM EXPERIMENTADOR PRESENTE EM TODA A ENTREGA;
3A– EM CASO DE NÃO CONFORMIDADE DA RESISTÊNCIA À COMPRESSÃO DO CONCRETO AOS 28 DIAS, EXTRAIR E ENSAIAR NO MINIMO 6 CORPOS DE PROVA DA REGIÃO AFETADA DECORRIDOS NO MAXIMO 5 DIAS DE ENSAIO QUE CONSTATOU A IRREGULARIDADE.

TABELA DE FERROS

ELEM.	POS.	BIT. (mm)	QUANT.	COMPRIMENTO UNIT (cm)	COMPRIMENTO TOTAL (cm)
P1=P24–ARRANQUE (X2)					
	1	6.3	8	264	2112
	2	6.3	32	32	1024
	3	16	26	150	3900
P2=P3=P4=P5=P6=P19=P20=P21=P22=P23–ARRANQUE (X10)					
	1	6.3	40	182	7280
	2	16	100	150	15000
P7=P8=P31=P32=P41=P42–ARRANQUE (X2)					
	1	6.3	8	110	880
	2	6.3	8	32	256
	3	16	12	150	1800
P9=P16–ARRANQUE (X2)					
	1	6.3	10	304	3040
	2	6.3	60	32	1920
	3	16	36	170	5440
P10=P11=P12=P13=P14=P15–ARRANQUE (X6)					
	1	6.3	10	304	3040
	2	16	60	170	10200
P17=P56–ARRANQUE (X2)					
	1	6.3	8	304	2432
	2	6.3	48	32	1536
	3	16	32	160	5120
P18–ARRANQUE (X2)					
	1	6.3	4	110	440
	2	6.3	4	32	128
	3	16	6	160	960
P25=P50=P67–ARRANQUE (X3)					
	1	6.3	12	150	1800
	2	6.3	24	32	1248
	3	16	24	150	3600
P26=P27=P28=P29=P30=P40=P43=P44=P45=P46=P47=P57–ARRANQUE (X12)					
	1	6.3	60	150	9000
	2	6.3	120	32	6240
	3	16	96	170	16320
P34=P35=P36=P37=P38=P39–ARRANQUE (X6)					
	1	6.3	30	190	5700
	2	6.3	120	62	7440
	3	16	72	180	12960
P48–ARRANQUE (X1)					
	1	6.3	4	151	604
	2	16	8	150	1200
P49=P51=P52=P53=P68=P59–ARRANQUE (X6)					
	1	6.3	24	274	6576
	2	6.3	96	37	3552
	3	16	72	150	10800
P54=P70=P71–ARRANQUE (X3)					
	1	6.3	12	72	864
	2	6.3	12	190	2280
	3	16	36	150	5400
P55=P66–ARRANQUE (X2)					
	1	6.3	8	150	1200
	2	6.3	16	52	832
	3	16	16	160	2560
P58=P59=P62=P63=P64–ARRANQUE (X5)					
	1	8	32	151	4530
	2	8	40	58	3300
	3	25	40	235	9400
P60=P61=P79=P80–ARRANQUE (X2)					
	1	6.3	18	170	3060
	2	6.3	54	42	2268
	3	16	24	260	6240
P65–ARRANQUE (X1)					
	1	6.3	4	324	1296
	2	6.3	28	42	1176
	3	16	20	160	3200
P72–ARRANQUE (X1)					
	1	6.3	4	314	1256
	2	6.3	28	37	1036
	3	16	18	150	2700
P73=P74–ARRANQUE (X2)					
	1	8	72	416	29952
	2	8	1620	35	56700
	3	20	132	440	58080
P75=P76–ARRANQUE (X2)					
	1	8	72	416	29952
	2	8	1656	35	57960
	3	20	192	440	84480
P77=P78=P81=P82–ARRANQUE (X4)					
	1	8	20	70	1500
	2	8	20	191	3820
	3	8	100	55	5500
	4	20	24	195	12480
P83=P86–ARRANQUE (X2)					
	1	6.3	72	452	32544
	2	6.3	1116	32	35712
	3	16	132	420	53460
P84=P85–ARRANQUE (X2)					
	1	6.3	60	404	24240
	2	6.3	540	37	19980
	3	16	80	345	27600
P87=P92=P321=P322=P323=P326=P327=P328–ARRANQUE (X8)					
	1	8	64	240	15360
	2	25	112	255	28560
P88=P89=P90=P91–ARRANQUE (X4)					
	1	8	32	240	7680
	2	25	88	255	22440
P89=P105–ARRANQUE (X2)					
	1	6.3	10	446	4460
	2	6.3	72	32	2560
	3	16	72	100	7200
P93=P96=P331=P332–ARRANQUE (X4)					
	1	6.3	24	350	8400
	2	6.3	144	32	4608
	3	16	48	200	9600
P94=P95–ARRANQUE (X2)					
	1	8	14	391	5474
	2	8	224	35	7840
	3	20	28	200	5920
P97=P106=P339=P340–ARRANQUE (X4)					
	1	6.3	20	306	6120
	2	6.3	120	38	4560
	3	16	64	132	8448
P99=P100=P101=P102=P103=P104–ARRANQUE (X6)					
	1	8	32	193	5790
	2	8	20	210	16640
P301=P302=P303=P304–ARRANQUE (X4)					
	1	8	128	416	53248
	2	8	1216	35	42560
	3	20	208	400	67200
P305=P318–ARRANQUE (X2)					
	1	8	12	351	4212
	2	8	120	35	4200
	3	20	48	215	16320
P306=P310=P313=P317–ARRANQUE (X4)					
	1	6.3	20	72	1440
	2	6.3	20	190	3800
	3	6.3	20	160	3120
	4	16	48	180	8640
P307=P309=P314=P316–ARRANQUE (X4)					
	1	8	56	191	14200
	2	8	56	191	19696
	3	8	168	55	9345
	4	25	48	380	18240
P308=P315–ARRANQUE (X2)					
	1	8	52	75	3250
	2	8	30	191	5730
	3	8	150	55	8250
	4	25	32	400	12800
P311=P312–ARRANQUE (X2)					
	1	8	64	241	15424
	2	8	448	35	15680
	3	20	64	400	25600
P319=P330–ARRANQUE (X2)					
	1	6.3	72	400	4800
	2	6.3	108	37	3996
	3	16	44	200	8800
P320=P324=P325=P329–ARRANQUE (X4)					
	1	8	12	307	3684
	2	8	96	32	3072
	3	25	42	245	9800
P334=P335=P336=P337=P338=P341=P342=P343=P344=P345–ARRANQUE (X10)					
	1	8	50	193	9650
	2	25	105	210	21000
P341=P342=P343=P344=P345–ARRANQUE (X5)					
	1	8	80	193	4825
	2	25	80	195	15600

RESUMO AÇO CA 50–60

BITOLA (mm)	COMPR (m)	PESO (kg)
6.3	1482	659
8	4369	1726
16	2339	3691
20	2907	7168
25	1597	6152
Peso Total	50A =	19346 kgf

DETALHES TÍPICOS

DETALHE TÍPICO DE PROTEÇÃO NA BASE DOS PILARES

SEM ESCALA

DETALHE ARMAÇÃO

SEM ESCALA

DETALHES DE DOBRAMENTOS

BARRAS DOBRADAS

GANCHOS

DIÂMETRO DO PINO DE DOBRAMENTO dB

	BITOLAS	25	20	16
BARRAS	d < 10mm	4 ⌀	4 ⌀	4 ⌀
	10 < ⌀ < 20	4 ⌀	5 ⌀	
	d > 20mm	5 ⌀	8 ⌀	
ESTRIBOS	d < 10mm	3 ⌀	3 ⌀	3 ⌀
	10 < ⌀ < 20	4 ⌀	5 ⌀	
	d > 20mm	5 ⌀	8 ⌀	

DETALHE TÍPICO ESTRIBO SUPLEMENTAR (GRAMPO)

SEM ESCALA

VISTA DO PILAR EM CORTE

O ESTRIBO SUPLEMENTAR DEVERÁ ENVOLVER A ARMADURA LONGITUDINAL E O ESTRIBO PRINCIPAL.

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MARCELO MASCARENHAS DE SOUZA
Data: 21/10/2026 13:16:05 -0300
Verifique em https://validar.iti.gov.br

Rev.	Descrição	Responsável	Aprovação	Data
00	EMISSÃO INICIAL	MARCELO	EDISON	07/10/2026

Cliente: PREFEITURA MUNICIPAL DE CONGONHAS
Área: ESTRUTURA
Projeto: HOSPITAL BOM JESUS – CONGONHAS/MG
Fase: PROJETO EXECUTIVO
Título: PRÉDIO PRINCIPAL
ARMAÇÃO DOS ARRANQUES DOS PILARES
Escala: 1:50
Folha: EST 114 /

MINHA
HOSPITAL BOM JESUS
PREFEITURA MUNICIPAL DE CONGONHAS

Nº do Contrato: 26005	E-Mail do Contratista: 26005@minha.com.br		
Resp. Téc.: CARLA	CREA: CARLOS		
Aprov.: EDISON	Data: 07 / 10 / 2026		
Nº do Cliente: 114–HBJC–PE–ARMG–EST–R00			