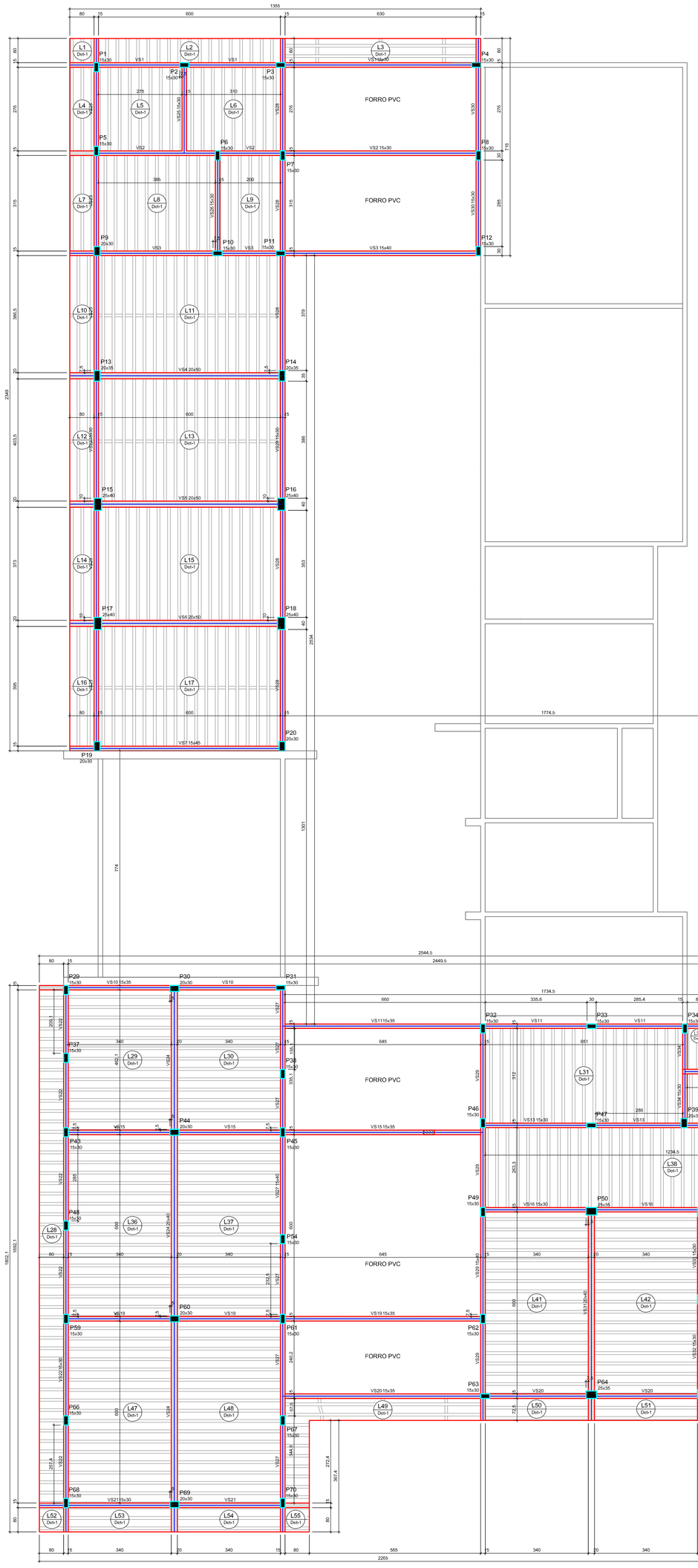
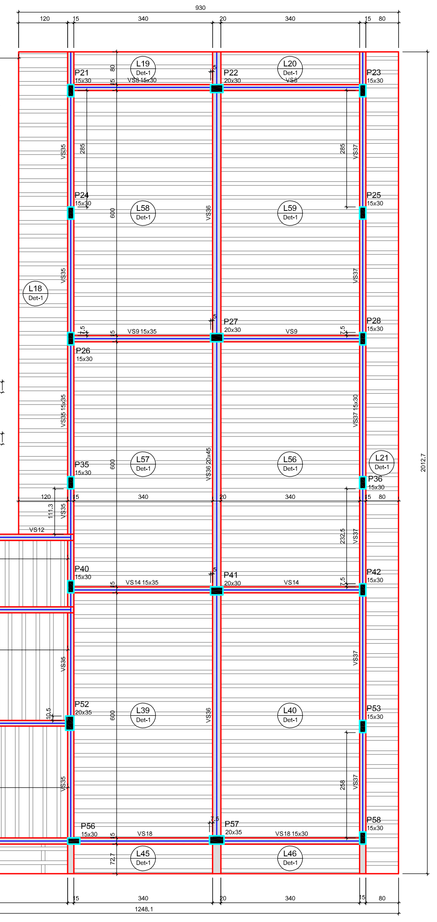




Lajes							
Dados					Sobrecarga (kgf/m²)		
Nome	Tipo	Altura (cm)	Elevação (cm)	Nível (cm)	Peso próprio (kgf/m²)	Acidental	Acidental
L1	Treliçada 10	12	0	300	259	80	50
L2	Treliçada 10	12	0	300	259	80	50
L3	Treliçada 10	12	0	300	261	80	50
L4	Treliçada 10	12	0	300	259	80	50
L5	Treliçada 10	12	0	300	259	80	50
L6	Treliçada 10	12	0	300	259	80	50
L7	Treliçada 10	12	0	300	259	80	50
L8	Treliçada 10	12	0	300	259	80	50
L9	Treliçada 10	12	0	300	259	80	50
L10	Treliçada 10	12	0	300	260	80	50
L11	Treliçada 10	12	0	300	260	80	50
L12	Treliçada 10	12	0	300	260	80	50
L13	Treliçada 10	12	0	300	260	80	50
L14	Treliçada 10	12	0	300	259	80	50
L15	Treliçada 10	12	0	300	259	80	50
L16	Treliçada 10	12	0	300	259	80	50
L17	Treliçada 10	12	0	300	260	80	50
L18	Treliçada 10	12	0	300	260	80	50
L19	Treliçada 10	12	0	300	259	80	50
L20	Treliçada 10	12	0	300	259	80	50
L21	Treliçada 10	12	0	300	259	80	50
L28	Treliçada 10	12	0	300	259	80	50
L29	Treliçada 10	12	0	300	259	80	50
L30	Treliçada 10	12	0	300	259	80	50
L31	Treliçada 10	12	0	300	259	80	50
L32	Treliçada 10	12	0	300	259	80	50
L35	Treliçada 10	12	0	300	259	80	50
L36	Treliçada 10	12	0	300	259	80	50
L37	Treliçada 10	12	0	300	259	80	50
L38	Treliçada 10	12	0	300	259	80	50
L39	Treliçada 10	12	0	300	259	80	50
L40	Treliçada 10	12	0	300	259	80	50
L41	Treliçada 10	12	0	300	259	80	50
L42	Treliçada 10	12	0	300	259	80	50
L43	Treliçada 10	12	0	300	259	80	50
L44	Treliçada 10	12	0	300	260	80	50
L45	Treliçada 10	12	0	300	259	80	50
L46	Treliçada 10	12	0	300	259	80	50
L47	Treliçada 10	12	0	300	259	80	50
L48	Treliçada 10	12	0	300	259	80	50
L49	Treliçada 10	12	0	300	259	80	50
L50	Treliçada 10	12	0	300	259	80	50
L51	Treliçada 10	12	0	300	259	80	50
L52	Treliçada 10	12	0	300	259	80	50
L53	Treliçada 10	12	0	300	259	80	50
L54	Treliçada 10	12	0	300	259	80	50
L55	Treliçada 10	12	0	300	259	80	50
L56	Treliçada 10	12	0	300	259	80	50
L57	Treliçada 10	12	0	300	259	80	50
L58	Treliçada 10	12	0	300	259	80	50
L59	Treliçada 10	12	0	300	259	80	50

Blocos de enchimento						
Detalhe	Tipo	Nome	Dimensões (cm)			Quantidade
			Hb	Wb	Lb	
1	Lajota cerâmica	EB-25-30	8	25	30	8240

Características dos materiais

Aço (kgf/cm²)	Betão (kgf/cm²)
2500	300

Legenda dos pilares

Pilar que morre

Detalhe 1 (esc. 1:30)

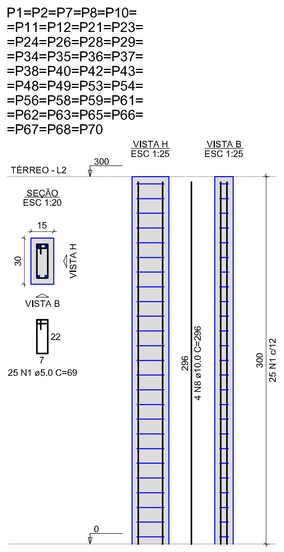
Legenda das vigas e paredes

Viga

Estrutura Existente

PILARES TÉRREO

P1=P2=P7=P8=P10=
=P11=P12=P21=P23=
=P24=P26=P28=P29=
=P34=P35=P36=P37=
=P38=P40=P42=P43=
=P48=P49=P53=P54=
=P56=P58=P59=P61=
=P62=P63=P65=P66=
=P67=P68=P70



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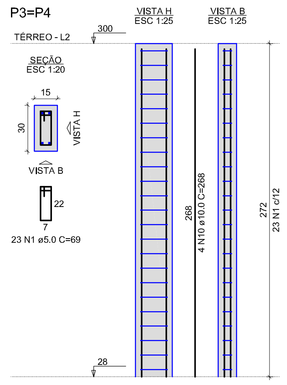

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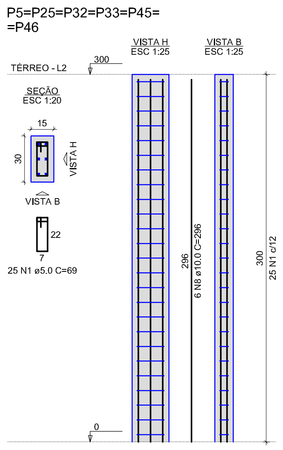
=P46



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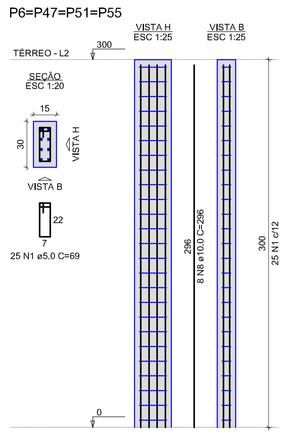

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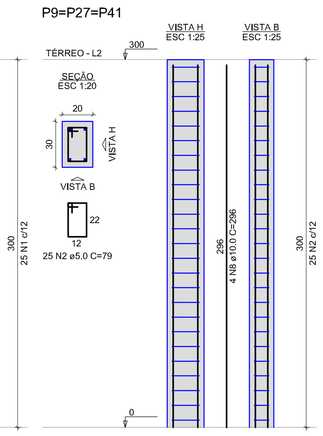

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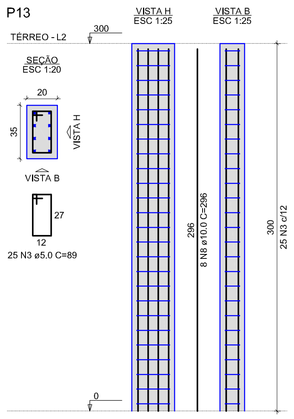


RELAÇÃO DO AÇO

36xP1-L2	32xP1-L1	2xP3-L2	
P3-L1	P4-L1	6xP5-L2	
4xP5-L1	4xP6-L2	P6-L1	
2xP8-L1	3xP9-L2	3xP9-L1	
P13-L2	P13-L1	2xP14-L2	
2xP14-L1	P15-L2	P15-L1	
2xP16-L2	P16-L1	P17-L2	
P17-L1	P18-L1	6xP19-L2	
P19-L1	P20-L1	4xP22-L1	
P29-L1	2xP30-L2	P30-L1	
P31-L2	P31-L1	P32-L1	
P33-L1	P34-L1	3xP47-L1	
P50-L2	P50-L1	P52-L2	
P52-L1	P64-L2	P64-L1	
P69-L1	6xP71-L1		

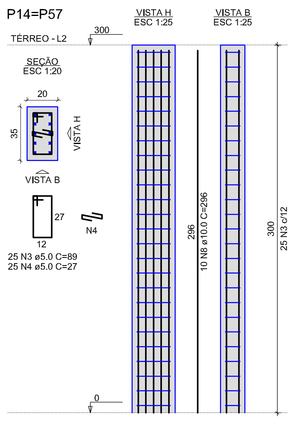
AÇO	N	DIAM (mm)	QUANT	C.UNIT (cm)	C.TOTAL (cm)
CA60	1	5.0	1714	69	118266
	2	5.0	374	79	29546
	3	5.0	129	89	11481
	4	5.0	48	97	4656
	5	5.0	137	32	4384
	6	5.0	126	109	13734
	7	5.0	64	99	6336
CA50	8	10.0	308	296	91168
	9	10.0	262	147	38514
	10	10.0	14	268	3752
	11	10.0	8	204	1632
	12	10.0	28	110	3080
	13	10.0	8	174	1392
	14	10.0	2	202	404
	15	10.0	6	239	1434
	16	10.0	12	224	2688
	17	10.0	10	209	2090
	18	10.0	12	189	2268
	19	10.0	4	214	856
	20	12.5	68	296	20128
	21	12.5	68	155	10540

RESUMO DO AÇO

AÇO	DIAM (mm)	C.TOTAL (m)	QUANT + 10% (Barras)	PESO + 10% (kg)
CA50	10.0	1492.8	137	1012.4
	12.5	306.7	29	325
CA60	5.0	1852.6	-	314.1
PESO TOTAL (kg)				
CA50	1337.4			
CA60	314.1			

Volume de concreto (C-30) = 15.11 m³
Área de forma = 273.04 m²

P14=P57



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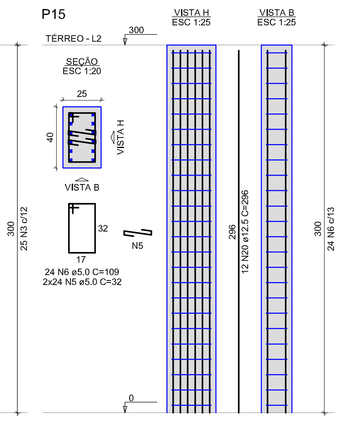

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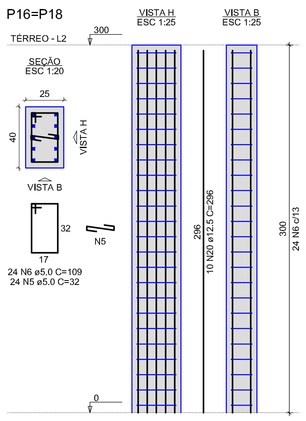

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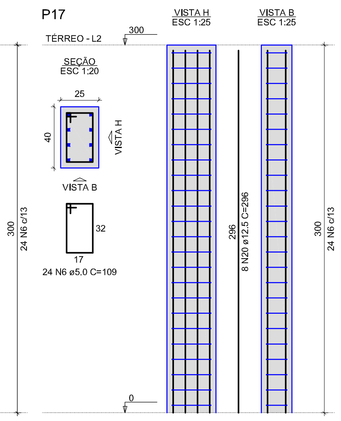

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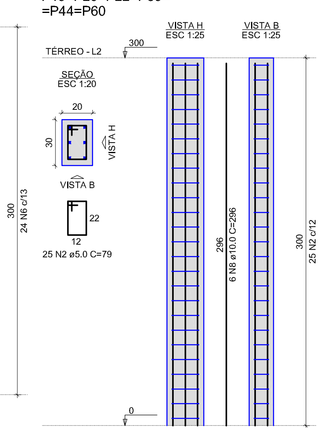

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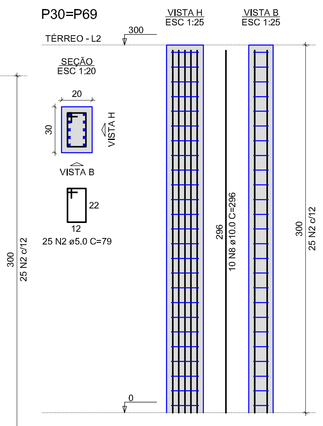

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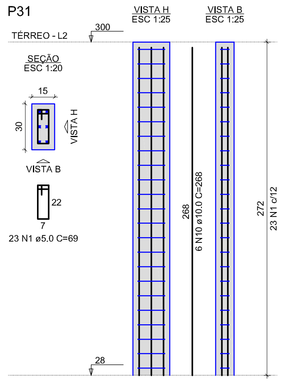

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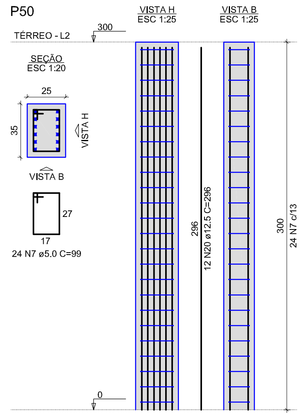

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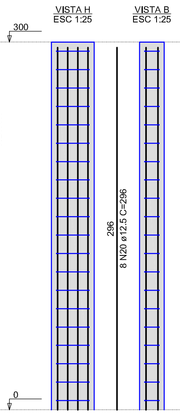

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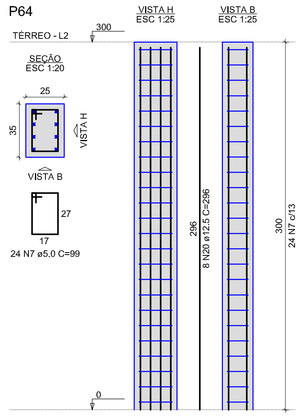

NOTAS

A. Confrontar medidas do projeto estrutural com projeto arquitetônico
B. Executar passagem de tubulação de água, esgoto e eletricidade
C. Molhar as formas antes da concretagem
D. Conservar úmida as peças concretadas durante o tempo de cura
E. Executar limpeza de formas ou partes da estrutura em contato com a concretagem
F. Usar apoio do tipo caranguejo para manter armaduras negativas em posição durante a concretagem

COBRIMENTO DAS ARMADURAS

ELEMENTOS ESTRUTURAIS	COBRIMENTO NOMINAL
Pilares	4,0 cm
Vigas	4,0 cm
Lajes	3,5 cm
Sapatas	4,0 cm
CLASSE DE AGRESSIVIDADE	III (FORTE) - CONTROLE RIGOROSO DAS DIMENSÕES

CARACTERÍSTICAS DO CONCRETO

Classe de Resistência	C-30
Módulo de Elasticidade	280 tf/cm²
Fator a/c	< 0,55

ENGEON ENGENHARIA
(46) engeonengenharia@gmail.com
3308-0801

ESCOLA MUNICIPAL
PROFESSORA MARIA TRINDADE DA SILVA

PROJETO ESTRUTURAL

PROJETO: ENGENHEIRO CIVIL JEFFERSON MACIEL VALDANOVER CREA/PR 19.637/D
EXECUÇÃO:

PROPRIETÁRIO: PREFEITURA MUNICIPAL DE PARANAGUÁ CNPJ: 76.017.458/0001-15

ESCALA: INDICADA
CONTEÚDO: PLANTA DE FORMA SUPERIOR PILARES
CATEGORIA: INSTITUCIONAL
DATA: OUTUBRO/2018
PRANCHA: 04/10
DESENHO: MATHEUS L. SANTOS
LOCAL: AVENIDA SENADOR ATÍLIO FONTANA – PARQUE SÃO JOÃO PARANAGUÁ – PR

FORMA VIGAS SUPERIORES - NÍVEL 300
ESCALA 1:75