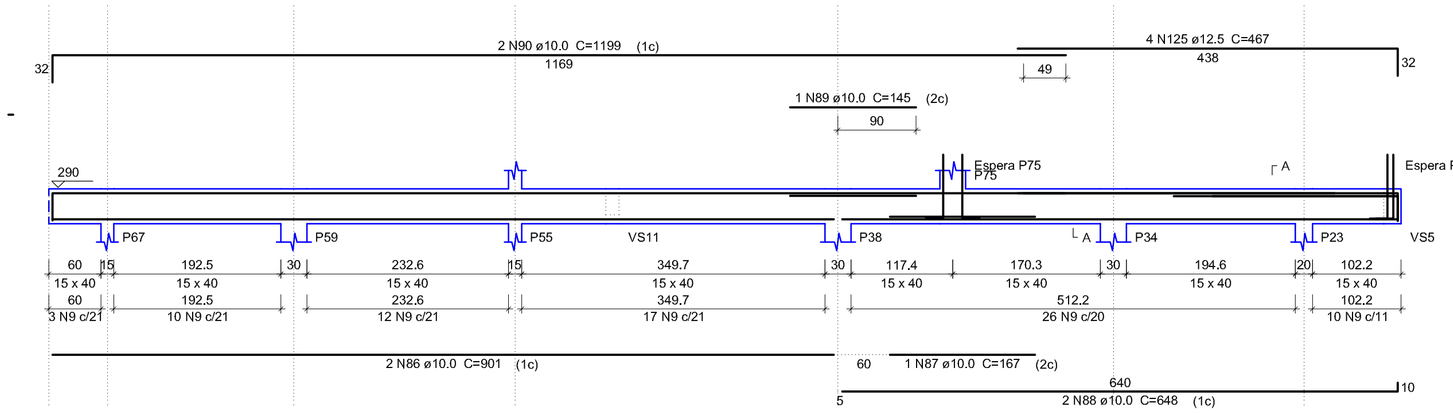
Relação do aço

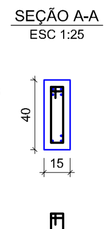
VS1	VS2	VS3
VS4	VS5	VS6
VS7	VS8	VS9
VS10	VS11	VS12
VS13	VS14	VS15
VS16	VS17	VS18
VS19	VS20	VS21
VS22	VS23	VS24
VS25	VS26	VS27
VS28	VS29	VS30
VS31	VS32	VS33
VS34	VS35	VS36
VS37	VS38	VS39
VS40		

AÇO	N	DIAM	Q	UNIT (cm)	C.TOTAL (cm)
CA60	1	5.0	42	120	5040
	2	5.0	295	80	23600
	3	5.0	68	90	6120
	4	5.0	129	100	12900
	5	5.0	1020	70	71400
	6	5.0	72	130	9360
	7	5.0	43	120	5160
	8	5.0	35	110	3850
	9	5.0	109	90	9810
CA50	10	8.0	2	701	1402
	11	8.0	2	751	1502
	12	8.0	2	510	1020
	13	8.0	2	479	958
	14	8.0	2	1116	2232
	15	8.0	2	271	542
	16	8.0	1	354	354
	17	8.0	2	709	1418
	18	8.0	2	943	1886
	19	8.0	3	150	450
	20	8.0	2	984	1968
	21	8.0	4	746	2984
	22	8.0	2	170	340
	23	8.0	4	778	3112
	24	8.0	2	519	1038
	25	8.0	2	1123	2246
	26	8.0	2	543	1086
	27	8.0	2	308	616
	28	8.0	2	324	648
	29	8.0	2	1058	2116
	30	8.0	2	1074	2148
	31	8.0	2	698	1396
	32	8.0	4	718	2872
	33	8.0	6	690	4140
	34	8.0	1	135	135
	35	8.0	2	393	786
	36	8.0	2	425	850
	37	8.0	2	742	1484
	38	8.0	2	493	986
	39	8.0	2	509	1018
	40	8.0	2	545	1090
	41	8.0	1	160	160
	42	8.0	2	574	1148
	43	8.0	2	727	1454
	44	8.0	2	589	1178
	45	8.0	2	625	1250
	46	8.0	2	657	1314
	47	8.0	2	230	460
	48	8.0	2	258	516
	49	8.0	2	1070	2140
	50	8.0	2	345	690
	51	8.0	2	1198	2396
	52	8.0	2	309	618
	53	8.0	4	188	752
	54	8.0	4	208	832
	55	8.0	2	705	1410
	56	8.0	2	721	1442
	57	8.0	2	358	716
	58	8.0	2	374	748
	59	8.0	2	342	684
	60	8.0	2	366	732
	61	8.0	2	608	1216
	62	8.0	2	640	1280
	63	10.0	2	985	1970
	64	10.0	2	502	1004
	65	10.0	1	158	158
	66	10.0	2	163	326
	67	10.0	1	243	243
	68	10.0	2	520	1040
	69	10.0	1	155	155
	70	10.0	2	548	1096
	71	10.0	2	542	1084
	72	10.0	1	148	148
	73	10.0	1	576	576
	74	10.0	2	1200	2400
	75	10.0	2	480	960
	76	10.0	2	514	1028
	77	10.0	3	673	2019
	78	10.0	4	96	384
	79	10.0	2	713	1426
	80	10.0	4	284	1136
	81	10.0	2	330	660
	82	10.0	4	86	344
	83	10.0	1	475	475
	84	10.0	2	739	1478
	85	10.0	1	153	153
	86	10.0	2	901	1802
	87	10.0	1	167	167
	88	10.0	2	648	1296
	89	10.0	1	145	145
	90	10.0	2	1199	2398
	91	10.0	12	91	1092
	92	10.0	4	617	2468
	93	10.0	2	688	1376
	94	12.5	2	208	416
	95	12.5	4	522	2088
	96	12.5	1	185	185
	97	12.5	2	1197	2394
	98	12.5	2	413	826
	99	12.5	1	325	325
	100	12.5	2	544	1088
	101	12.5	2	230	460
	102	12.5	2	1027	2054
	103	12.5	1	200	200
	104	12.5	2	1200	2400
	105	12.5	2	935	1870
	106	12.5	2	522	1044
	107	12.5	2	538	1076
	108	12.5	3	536	1608
	109	12.5	2	589	1178
	110	12.5	2	1052	2104
	111	12.5	4	76	304
	112	12.5	6	636	3816
	113	12.5	2	1019	2038
	114	12.5	3	265	795
	115	12.5	3	270	810
	116	12.5	2	1700	3400
	117	12.5	2	793	1586
	118	12.5	1	354	354
	119	12.5	3	638	1914
	120	12.5	4	211	844
	121	12.5	1	633	633
	122	12.5	3	640	1920
	123	12.5	6	305	1830
	124	12.5	2	1074	2148
	125	12.5	4	467	1868
	126	12.5	2	655	1310

VS29
ESC 1:50

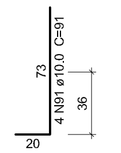


SEÇÃO A-A
ESC 1:25



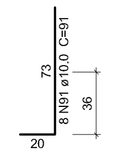
78 N9 ø5.0 C=90

ESPERA P75
ESC 1:25



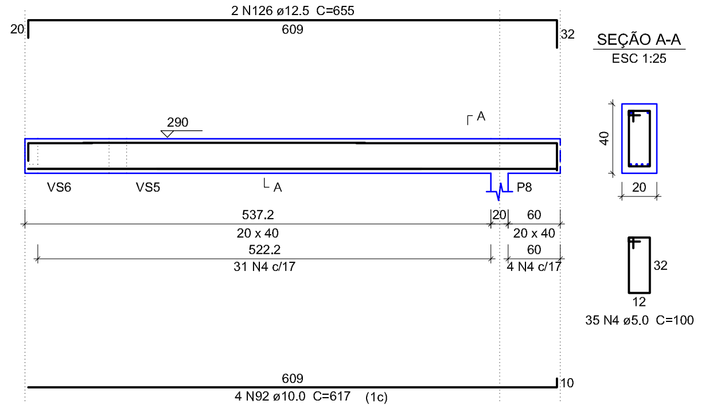
3 N5 ø5.0 c/12 C=70

ESPERA P73
ESC 1:25



3 N5 ø5.0 c/12 C=70

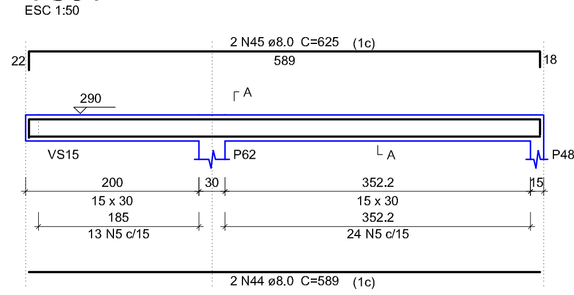
VS30
ESC 1:50



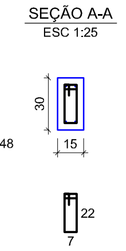
SEÇÃO A-A
ESC 1:25

35 N4 ø5.0 C=100

VS31
ESC 1:50

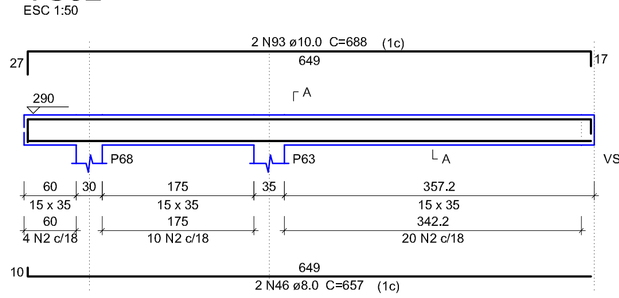


SEÇÃO A-A
ESC 1:25

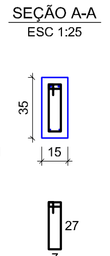


37 N5 ø5.0 C=70

VS32
ESC 1:50

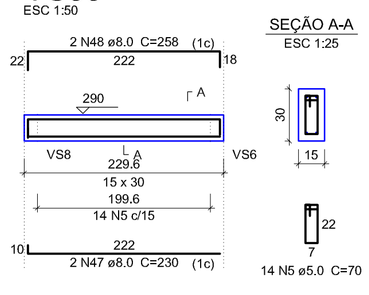


SEÇÃO A-A
ESC 1:25



34 N2 ø5.0 C=80

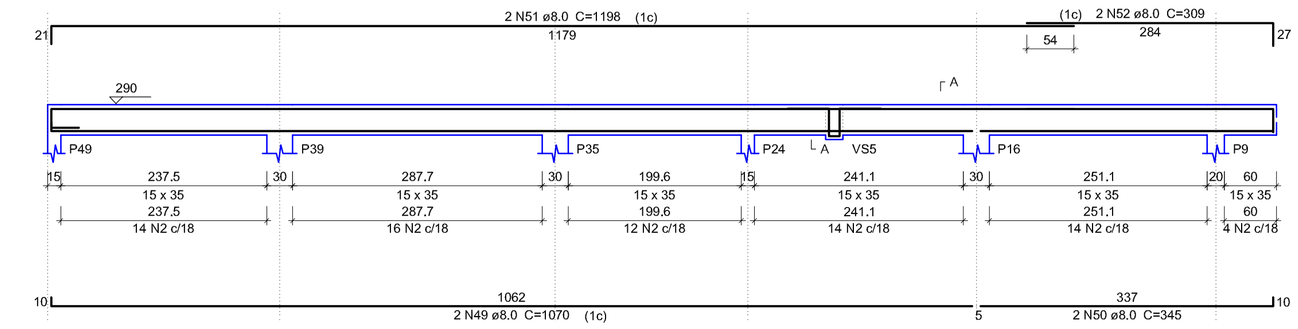
VS33
ESC 1:50



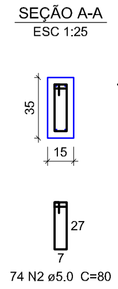
SEÇÃO A-A
ESC 1:25

14 N5 ø5.0 C=70

VS34
ESC 1:50

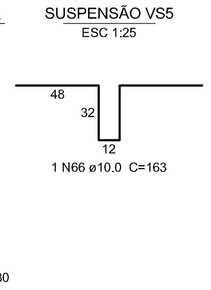


SEÇÃO A-A
ESC 1:25



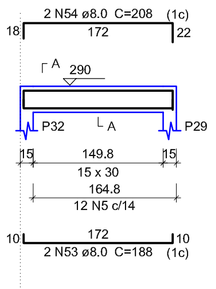
74 N2 ø5.0 C=80

SUSPENSÃO VS5
ESC 1:25

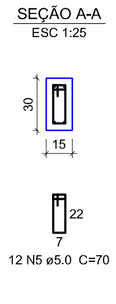


1 N66 ø10.0 C=163

VS35
ESC 1:50

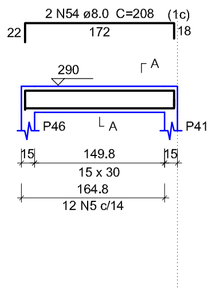


SEÇÃO A-A
ESC 1:25

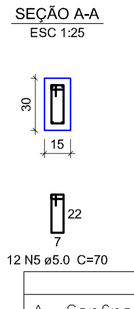


12 N5 ø5.0 C=70

VS36
ESC 1:50

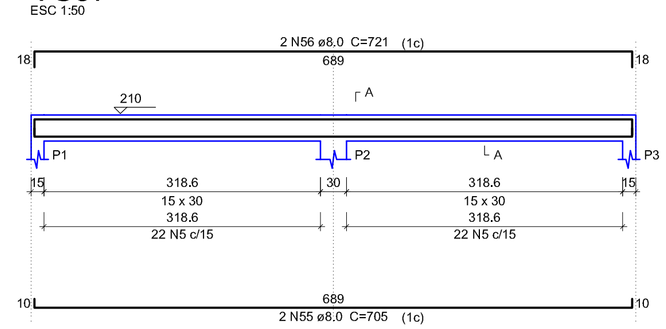


SEÇÃO A-A
ESC 1:25

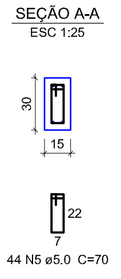


12 N5 ø5.0 C=70

VS37
ESC 1:50

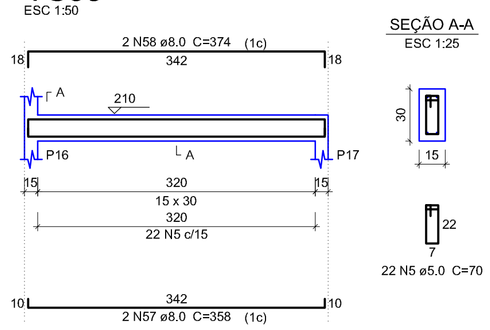


SEÇÃO A-A
ESC 1:25

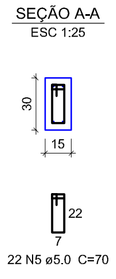


44 N5 ø5.0 C=70

VS38
ESC 1:50

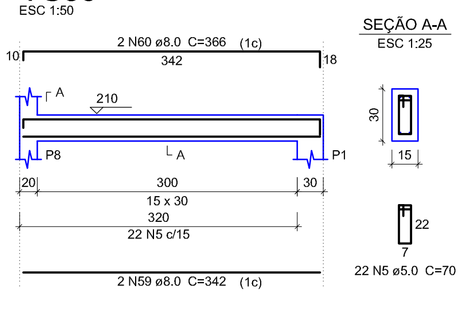


SEÇÃO A-A
ESC 1:25



22 N5 ø5.0 C=70

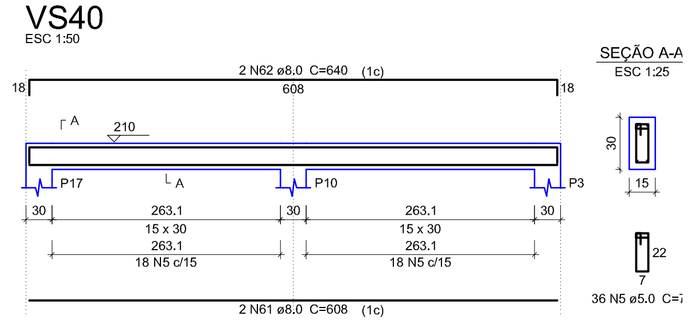
VS39
ESC 1:50



SEÇÃO A-A
ESC 1:25

22 N5 ø5.0 C=70

VS40
ESC 1:50



SEÇÃO A-A
ESC 1:25

36 N5 ø5.0 C=

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
(45) 3306-6601
engeonengenharia@gmail.com

CMEI
NOSSA SENHORA DOS NAVEGANTES

PROJETO ESTRUTURAL

PROJETO
ENGENHEIRO CIVIL
JEFFERSON MACIEL VALCANOVER CREA/PR 19.637/D

EXECUÇÃO

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

ESCALA: INDICADA
CONTEÚDO: VIGAS TÉRREO
CATEGORIA: INSTITUCIONAL
DATA: OUTUBRO/2018
PRANCHA: 12/19
DESENHO: MATHEUS I. SANTOS
LOCAL: ILHA DOS VALADARES - VILA BELA PARANAGUÁ - PR