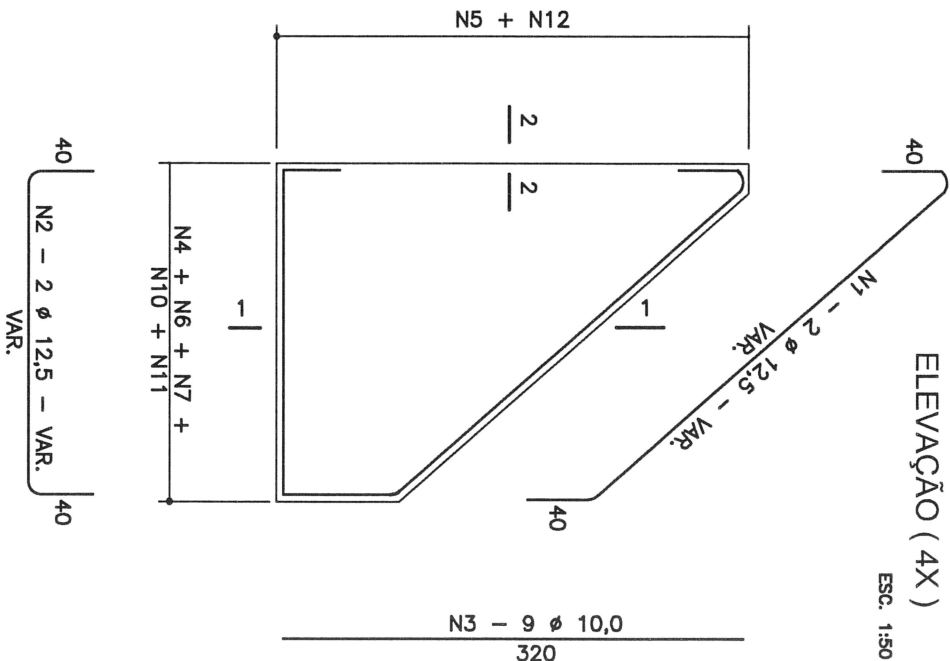


CABECEIRAS - 200 X 200 - $\alpha = 0^\circ - 15^\circ - 30^\circ - 45^\circ$

ELEVAÇÃO (4X)

ESC. 1:50



SEÇÃO 1-1 (4X)

ESC. 1:50

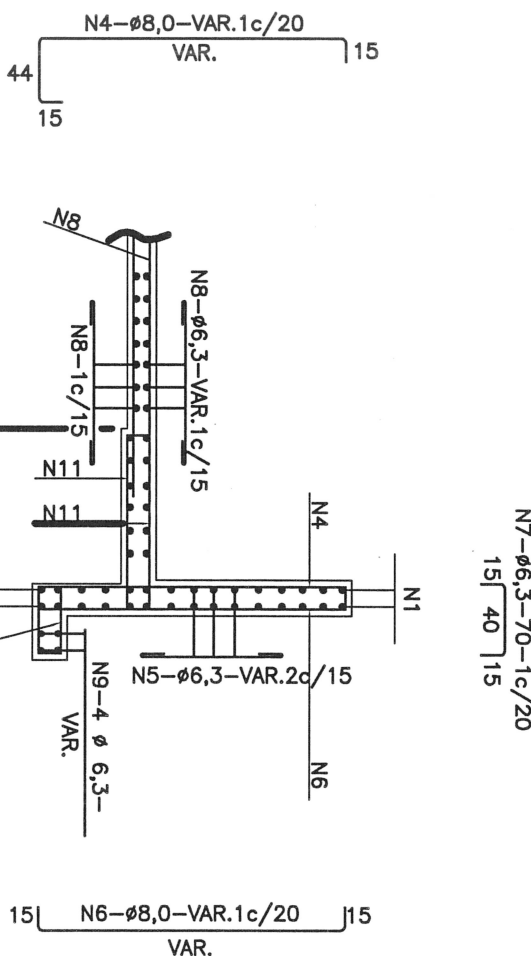
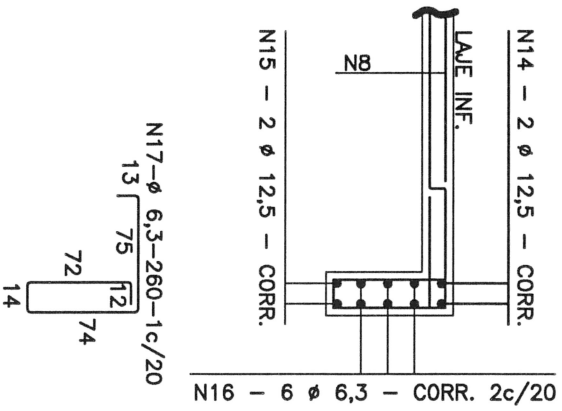


TABELA				
Nº	Ø	Q	COMP.	
1	12,5	8	VAR.	
2	12,5	8	VAR.	
3	10,0	36	320	
4	8,0	-	VAR.	
5	6,3	-	VAR.	
6	8,0	-	VAR.	
7	6,3	-	70	
8	6,3	-	VAR.	
9	6,3	16	VAR.	
10	8,0	-	171	
11	8,0	-	160	
12	8,0	-	294	
13	8,0	-	VAR.	
14	12,5	4	CORR.	
15	12,5	4	CORR.	
16	6,3	12	CORR.	
17	6,3	-	260	

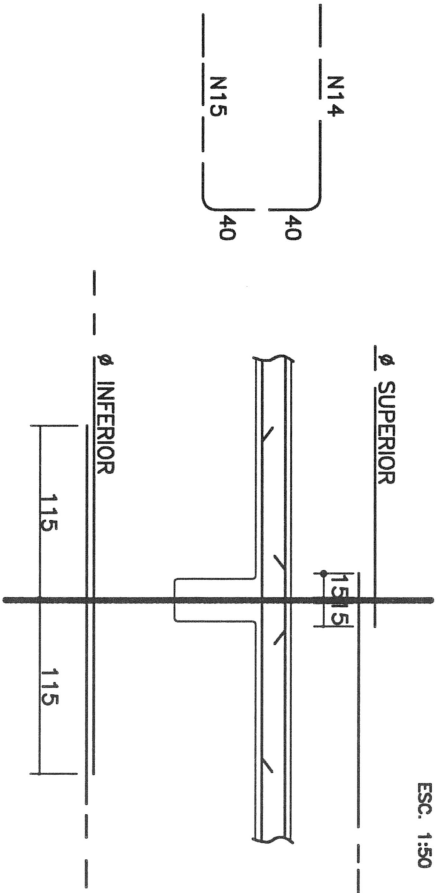
SEÇÃO DA VIGA DE TOPO DA LAJE INFERIOR (2X)

ESC. 1:50



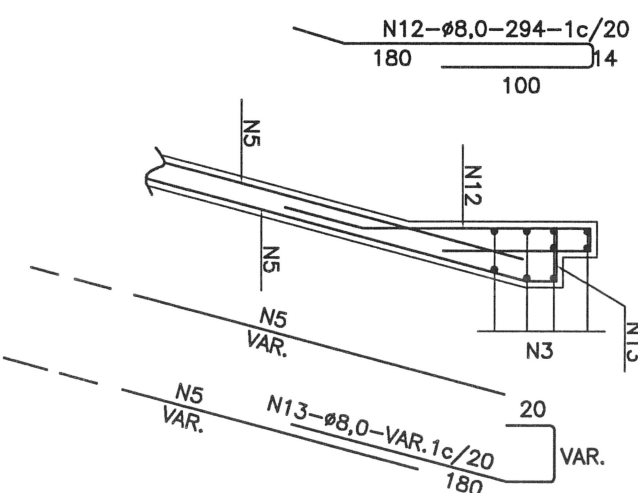
LIGAÇÃO DOS BUEIROS COM AS CABECEIRAS (LAJE INFERIOR)

ESC. 1:50



SEÇÃO 2-2 (4X)

ESC. 1:50



NOTAS:

1 - AS QUANTIDADES DAS ARMADURAS SERÃO DETERMINADAS PELAS MEDIDAS REAIS DA FORMA PARA CADA TIPO DE BUEIRO.
2 - A TABELA ESTÁ COMPUTADA PARA DUAS CABECEIRAS.

3 - VER RESUMOS NO DESENHO 6.42
4 - VER NOTAS E COMPLEMENTOS DESTA NO DESENHO 6.23

MT

DEPARTAMENTO NACIONAL DE INFRA-ESTRUTURA DE TRANSPORTES - DNIT

IPR

BUEIROS CELULARES DE CONCRETO
ARMADURAS DAS CABECEIRAS - 2,00 X 2,00

ALBUM DE PROJETOS-TIPO DE DISPOSITIVOS DE DRENAGEM

DESENHO
6.38

BUEIRO SIMPLES - RESUMO PARA DUAS CABECEIRAS

1,50 x 1,50 m					2,00 x 2,00 m					2,50 x 2,50 m					3,00 x 3,00 m				
φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°
6,3	492	541	570	765	6,3	531	580	595	797	6,3	621	700	829	1.116	6,3	178	205	209	278
8,0	15	17	30	36	8,0	420	495	513	686	8,0	505	570	636	849	8,0	1.485	1.646	1.909	2.560
10,0	95	110	88	110	10,0	115	130	100	127	10,0	345	380	419	559	10,0	560	610	575	770
12,5	161	185	201	259	12,5	187	210	188	250	12,5	210	235	234	308	12,5	240	280	262	346
16,0	-	-	-	-	16,0	22	-	85	99	16,0	75	90	124	146	16,0	53	70	-	-
20,0	-	-	-	-	20,0	-	-	-	-	20,0	-	-	-	-	20,0	88	100	224	264
TOTAL	763 Kg	853 Kg	889 Kg	1.170Kg	TOTAL	1.275Kg	1.415Kg	1.481Kg	1.959Kg	TOTAL	1.756Kg	1.975Kg	2.242Kg	2.978Kg	TOTAL	2.604Kg	2.911Kg	3.179Kg	4.218Kg

BUEIRO DUPLA - RESUMO PARA DUAS CABECEIRAS

1,50 x 1,50 m					2,00 x 2,00 m					2,50 x 2,50 m					3,00 x 3,00 m				
φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°
6,3	545		692	914	6,3	701	782	762	1.024	6,3	852	937	1.090	1.466	6,3	233	260	231	309
8,0	96	105	54	66	8,0	450	505	553	731	8,0	568	628	591	785	8,0	1.891	2.085	2.314	3.100
10,0	111	120	96	117	10,0	122	134	107	132	10,0	344	408	506	656	10,0	652	760	771	1.004
12,5	220	258	258	330	12,5	281	310	224	296	12,5	198	225	226	305	12,5	229	249	260	351
16,0	-	-	-	-	16,0	-	164	193	193	16,0	237	260	162	190	16,0	245	272	-	-
20,0	-	-	-	-	20,0	-	-	-	-	20,0	-	233	270	270	20,0	102	120	246	291
25,0	-	-	-	-	25,0	-	-	-	-	25,0	-	-	-	-	25,0	-	-	509	596
TOTAL	972 Kg	1.088Kg	1.100Kg	1.422Kg	TOTAL	1.554Kg	1.731Kg	1.810Kg	2.376Kg	TOTAL	2.199Kg	2.458Kg	2.808Kg	3.672Kg	TOTAL	3.352Kg	3.746Kg	4.331Kg	5.651Kg

BUEIRO TRIPLO - RESUMO PARA DUAS CABECEIRAS

1,50 x 1,50 m					2,00 x 2,00 m					2,50 x 2,50 m					3,00 x 3,00 m				
φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°	φ	α = 0°	α = 15°	α = 30°	α = 45°
6,3	748	828	817	1.093	6,3	865	960	1.041	1.398	6,3	1.217	1.338	1.558	2.098	6,3	273	300	271	364
8,0	46	52	81	98	8,0	514	560	630	832	8,0	644	710	657	867	8,0	2.296	2.525	3.094	4.139
10,0	161	185	114	135	10,0	172	196	125	150	10,0	433	485	590	757	10,0	746	835	883	1.137
12,5	274	312	333	424	12,5	368	412	214	288	12,5	223	245	254	342	12,5	250	280	290	391
16,0	-	-	-	-	16,0	-	292	350	350	16,0	339	385	291	345	16,0	390	176	-	-
20,0	-	-	-	-	20,0	-	-	-	-	20,0	-	320	376	376	20,0	198	224	413	489
25,0	-	-	-	-	25,0	-	-	-	-	25,0	-	-	-	-	25,0	-	-	648	736
TOTAL	1.229Kg	1.377Kg	1.345Kg	1.750Kg	TOTAL	1.919Kg	2.128Kg	2.302Kg	3.018Kg	TOTAL	2.856Kg	3.163Kg	3.670Kg	4.785Kg	TOTAL	4.153Kg	4.340Kg	5.599Kg	7.256Kg

NOTAS:

- 1 - CARACTERISTICAS DO AÇO : C.A. -50.
- 2 - QUANTITATIVOS DO AÇO EM Kg.
- 3 - RESUMOS SEM PERDAS .

MT DEPARTAMENTO NACIONAL DE INFRA-ESTRUTURA DE TRANSPORTES - DNIT

IPR

BUEIROS CELULARES DE CONCRETO
RESUMOS DAS ARMADURAS DAS CABECEIRAS

ALBUM DE PROJETOS-TIPO DE DISPOSITIVOS DE DRENAGEM

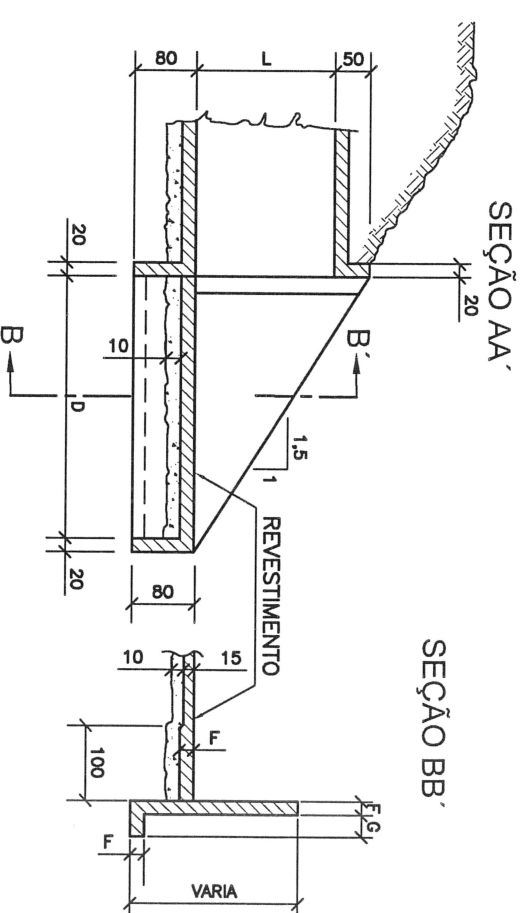
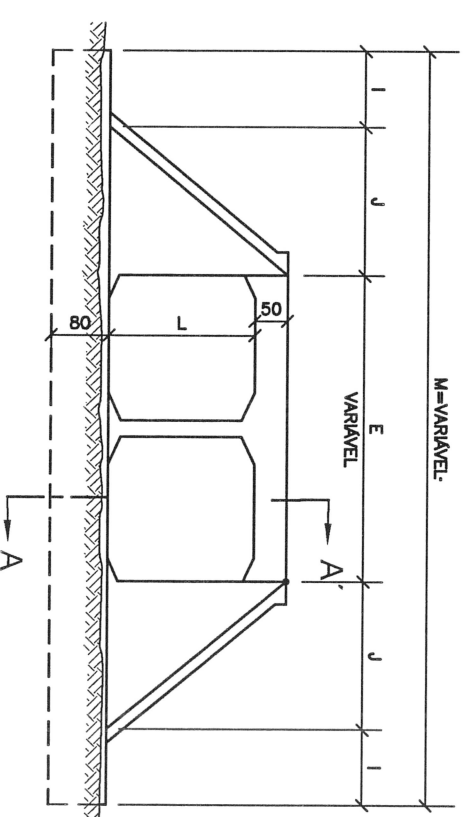
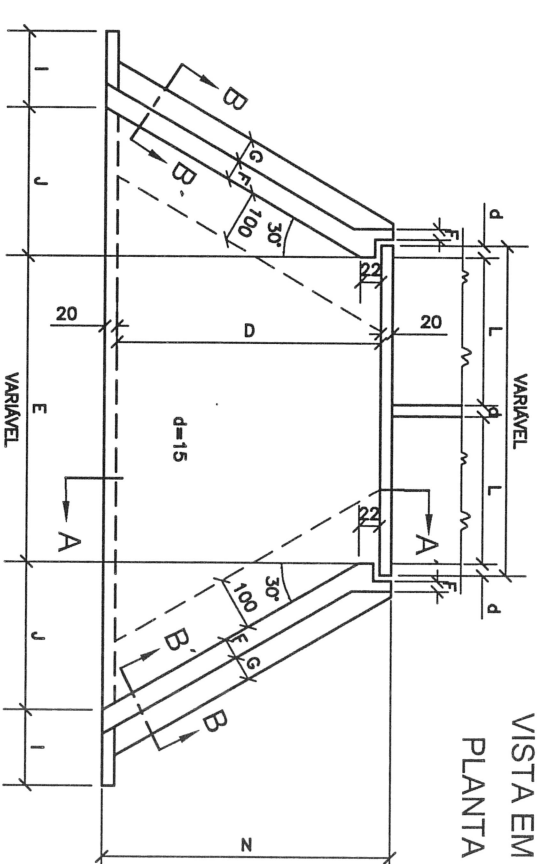
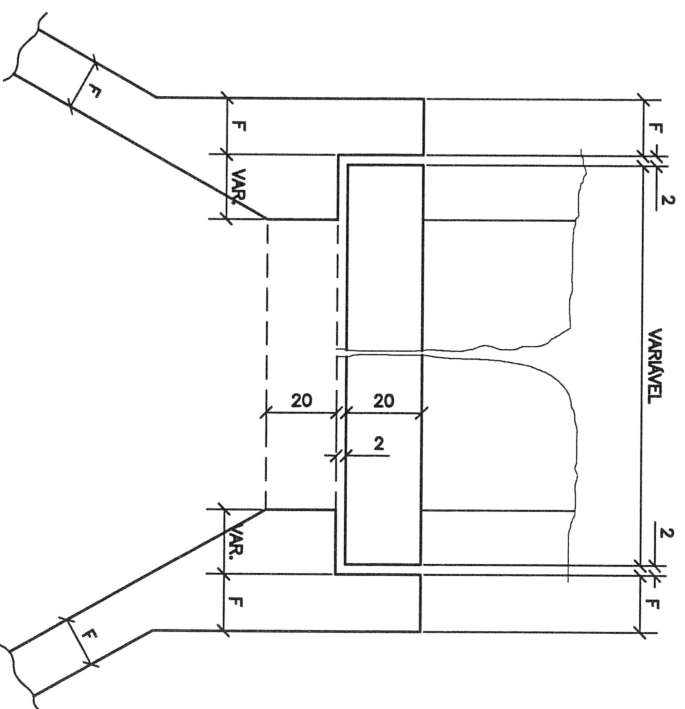
DESENHO
6.41

TABELA DE QUANTIDADES DE SERVIÇOS PARA DUAS
DUAS CABECEIRAS COMPLETAS PARA BUEIROS NORMAIS

SERVIÇO	UNID.	BUEIROS		
		1,50 x 1,50 m	2,00 x 2,00 m	2,50 x 2,50 m
LASTRO	m ³	3,93	6,45	9,75
FORMAS	m ²	92,00	120,80	155,00
CONCRETO	m ³	12,35	20,86	30,05
REVESTIMENTO	m ³	0,79	1,38	1,95
				2,72

MEDIDAS	TAMANHO DOS BUEIROS			
	1,50 x 1,50 m fs ≥ 0,10 MPa	2,00 x 2,00 m fs ≥ 0,13 MPa	2,50 x 2,50 m fs ≥ 0,21 MPa	3,00 x 3,00 m fs ≥ 0,21 MPa
D	280	355	430	505
E	2L+D	VER FOLHA Nº 51	2L+D	VER FOLHA Nº 52
F	15	20	20	25
G	30	30	50	50
I	100	100	100	100
J	160s	204	247	290s
L	150	200	250	300
M		200 + 2J + E		
N	320	395	470	545

DETALHE DA VISTA EM PLANTA



- NOTAS:
- 1 - O desenho das cabeceiras se aplica a todos os tipos de bueiros celulares normais estando representado o bueiro de 2,00x2,00m, na escala de 1:100 e detalhe na escala 1:20.
 - 2 - As quantidades de serviço da tabela são para duas cabeceiras completas, estando computadas portanto alas (4x), laje de piso de entre-dias (2x), viga de topo definida pelo comprimento m (2x), viga de topo superior do corpo do bueiro (2x) e viga topo inferior do corpo do bueiro (2x).
 - 3 - O lastro sob a laje de entre-dias é de concreto magro na espessura de 10cm.
 - 4 - O revestimento sobre a laje de entre-dias é de cimento e areia (1:3), alisado e de espessura média de 3cm.
 - 5 - Concreto fck ≥ 15MPa.
 - 6 - Veículo classe 45.
 - 7 - Nomenclatura: fs-tenção admissível do solo sob a galeria.

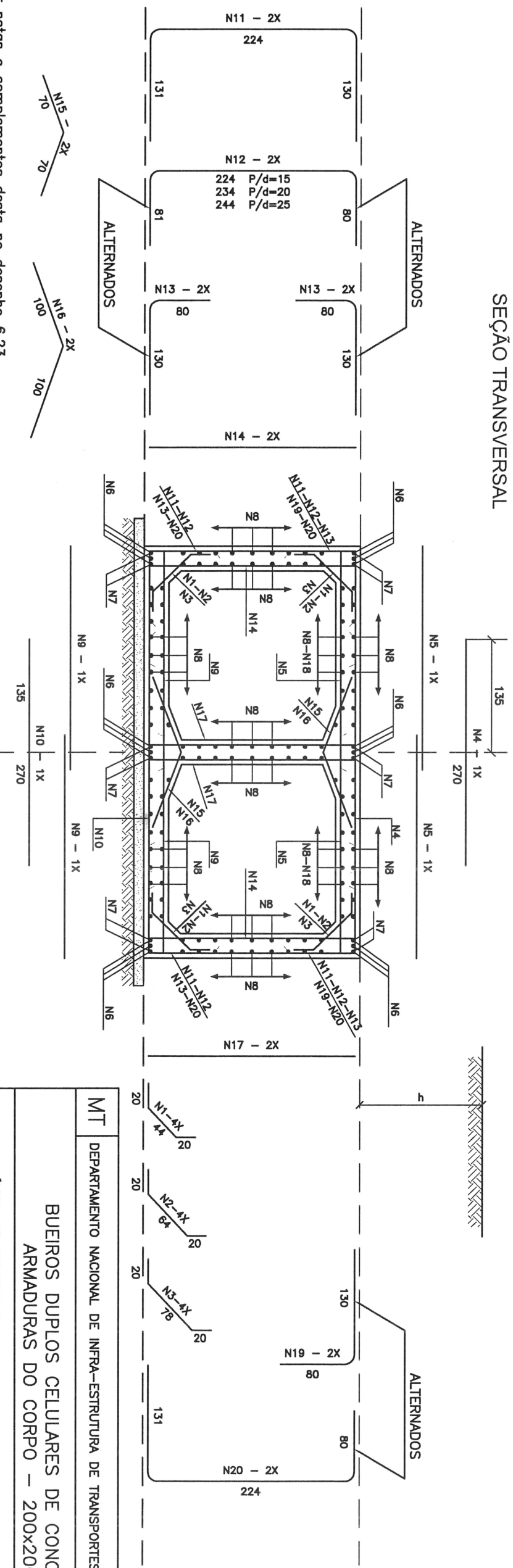
MT	DEPARTAMENTO NACIONAL DE INFRA-ESTRUTURA DE TRANSPORTES - DNIT	IPR
BUEIROS DUPLAS CELULARES DE CONCRETO BOCAS NORMAIS - FORMAS		
ALBUM DE PROJETOS-TIPO DE DISPOSITIVOS DE DRENAGEM		DESENHO 6,24

TABELA DAS ARMADURAS (POR METRO DE GALERIA)

0 ≤ h ≤ 100			100 ≤ h ≤ 250			250 ≤ h ≤ 500			500 ≤ h ≤ 750			750 ≤ h ≤ 1000			1000 ≤ h ≤ 1250			1250 ≤ h ≤ 1500						
f _s ≥ 0,13 MPa			f _s ≥ 0,15 MPa			f _s ≥ 0,23 MPa			f _s ≥ 0,26 MPa			f _s ≥ 0,32 MPa			f _s ≥ 0,36 MPa			f _s ≥ 0,41 MPa						
Nº	Ø	Q	Nº	Ø	Q	Nº	Ø	Q	Nº	Ø	Q	Nº	Ø	Q	Nº	Ø	Q	Nº	Ø	Q				
COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.	COMP.	ESP.					
1	6,3	20	84	c/20	1	6,3	20	84	c/20	1	6,3	20	104	c/20	2	6,3	20	104	c/20	1	6,3	20	118	c/20
2	---	---	---	---	2	---	---	---	---	3	---	---	---	---	3	6,3	20	118	c/20	3	6,3	20	118	c/20
3	---	---	---	---	3	---	---	---	---	4	---	---	---	---	4	6,3	20	118	c/20	4	6,3	20	118	c/20
4	12,5	8	270	c/12	4	10,0	6	270	c/18	4	12,5	6	270	c/16	4	16,0	6	270	c/16	4	16,0	6	270	c/16
5	10,0	17	230	c/12	5	10,0	13	230	c/16	5	12,5	14	230	c/14	5	16,0	13	250	c/16	5	16,0	14	250	c/14
6	---	---	---	---	6	---	---	---	---	6	12,5	18	CORR.	---	6	16,0	18	CORR.	---	6	16,0	18	CORR.	---
7	12,5	12	CORR.	---	7	12,5	12	CORR.	---	7	12,5	12	CORR.	---	7	16,0	18	CORR.	---	7	16,0	18	CORR.	---
8	6,3	108	CORR.	c/20	8	6,3	126	CORR.	c/20	8	6,3	126	CORR.	c/20	8	6,3	126	CORR.	c/20	8	6,3	126	CORR.	c/20
9	10,0	13	230	c/15	9	10,0	15	230	c/13	9	12,5	17	230	c/12	9	16,0	14	240	c/14	9	16,0	14	250	c/12
10	10,0	5	270	c/20	10	10,0	7	270	c/15	10	12,5	7	270	c/15	10	16,0	7	270	c/14	10	16,0	7	270	c/14
11	---	---	---	---	11	10,0	10	485	c/20	11	---	---	---	11	---	---	---	---	---	11	---	---	---	---
12	---	---	---	---	12	---	---	---	---	12	10,0	8	385	c/26	12	10,0	10	395	c/20	12	10,0	10	405	c/20
13	---	---	---	---	13	---	---	---	---	13	10,0	15	210	c/26	13	10,0	20	210	c/20	13	10,0	20	210	c/20
14	6,3	13	225	c/15	14	6,3	13	225	c/15	14	6,3	13	225	c/15	14	10,0	8	235	c/25	14	10,0	10	245	c/20
15	6,3	10	140	c/20	15	6,3	10	140	c/20	15	---	---	---	15	---	---	---	---	15	---	---	---	---	---
16	---	---	---	---	16	---	---	---	---	16	6,3	10	200	c/20	16	6,3	10	200	c/20	16	6,3	10	200	c/20
17	6,3	10	225	c/20	17	6,3	10	225	c/20	17	10,0	7	235	c/30	17	10,0	7	235	c/30	17	10,0	8	245	c/25
18	10,0	20	CORR.	c/18	18	---	---	---	---	18	---	---	---	18	---	---	---	---	18	---	---	---	---	---
19	12,5	10	210	c/20	19	---	---	---	---	19	---	---	---	19	---	---	---	---	19	---	---	---	---	---
20	12,5	10	435	c/20	20	---	---	---	---	20	---	---	---	20	---	---	---	---	20	---	---	---	---	---

RESUMO			RESUMO			RESUMO			RESUMO			RESUMO			RESUMO									
Ø	Kg/m	PESO (kg)	Ø	Kg/m	PESO (kg)	Ø	Kg/m	PESO (kg)	Ø	Kg/m	PESO (kg)	Ø	Kg/m	PESO (kg)	Ø	Kg/m	PESO (kg)							
6,3	0,252	50	6,3	0,252	55	6,3	0,252	44	6,3	0,252	44	6,3	0,252	45	6,3	0,252	45							
10,0	0,624	65	10,0	0,624	93	10,0	0,624	39	10,0	0,624	62	10,0	0,624	73	10,0	0,624	79							
12,5	0,988	99	12,5	0,988	13	12,5	0,988	133	16,0	1,570	188	16,0	1,570	193	16,0	1,570	208							
TOTAL		214Kg	TOTAL		161Kg	TOTAL		213Kg	TOTAL		239Kg	TOTAL		305Kg	TOTAL		317Kg	TOTAL						332Kg

SEÇÃO TRANSVERSAL



MT	DEPARTAMENTO NACIONAL DE INFRA-ESTRUTURA DE TRANSPORTES - DNIT	IPR
BUEIROS DUPLOS CELULARES DE CONCRETO ARMADURAS DO CORPO - 200x200		
ALBUM DE PROJETOS-TIPO DE DISPOSITIVOS DE DRENAGEM		
		DESENHO 6.15