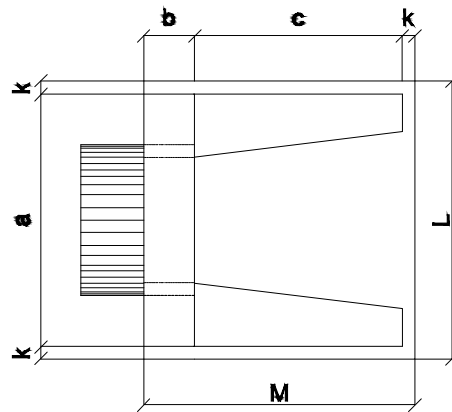
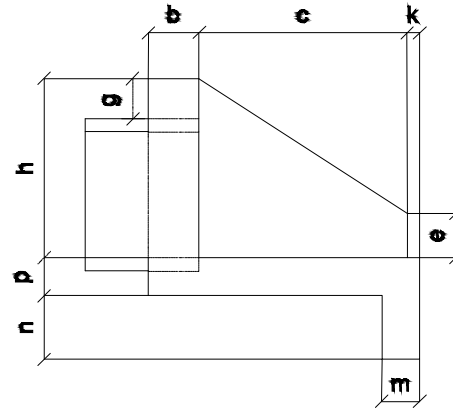


# BUEIRO SIMPLES TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS (II)

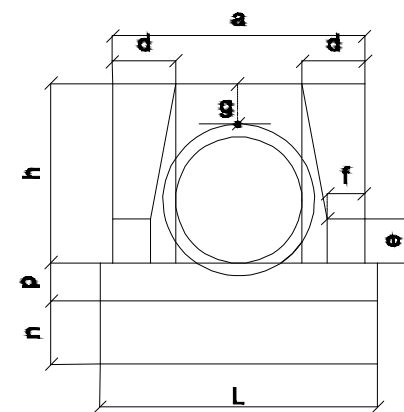
PLANTA NORMAL



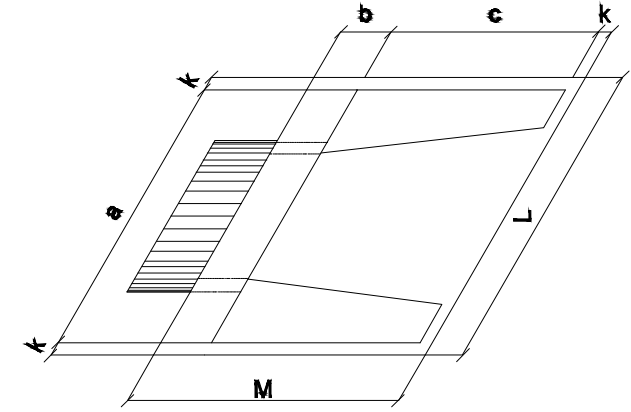
VISTA LATERAL



VISTA FRONTAL



PLANTA ESCONSO



DIMENSÕES E CONSUMOS MÉDIOS PARA UMA UNIDADE

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 40$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	80			20									90	115	2,29	0,423	2,072	0,288	0,313	0,068	0,057
5°	80			20									90	115	2,30	0,423	2,072	0,288	0,313	0,068	0,057
10°	81			20									91	115	2,31	0,423	2,073	0,288	0,313	0,068	0,058
15°	83			21									93	115	2,33	0,423	2,074	0,288	0,313	0,068	0,058
20°	85	20	90	21	15	10	20	66	5	20	20	20	96	115	2,36	0,424	2,076	0,288	0,314	0,068	0,059
25°	88	20	90	22	15	10	20	66	5	20	20	20	99	115	2,41	0,424	2,078	0,288	0,314	0,068	0,060
30°	92			23									104	115	2,47	0,425	2,081	0,289	0,314	0,068	0,062
35°	98			24									110	115	2,56	0,425	2,084	0,289	0,315	0,068	0,064
40°	104			26									117	115	2,67	0,426	2,088	0,290	0,315	0,068	0,067
45°	113			28									127	115	2,84	0,427	2,092	0,290	0,316	0,068	0,071

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 100$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	170			35									190	205	9,68	2,514	12,318	1,709	1,860	0,402	0,242
5°	171			35									191	205	9,69	2,514	12,320	1,710	1,861	0,402	0,242
10°	173			36									193	205	9,75	2,515	12,325	1,710	1,861	0,402	0,244
15°	176			36									197	205	9,85	2,517	12,334	1,712	1,863	0,403	0,246
20°	181	30	165	37	15	10	20	142	10	20	20	20	202	205	9,99	2,520	12,346	1,713	1,865	0,403	0,250
25°	188	30	165	39	15	10	20	142	10	20	20	20	210	205	10,19	2,523	12,362	1,716	1,867	0,404	0,255
30°	196			40									219	205	10,47	2,527	12,381	1,718	1,870	0,404	0,262
35°	208			43									232	205	10,84	2,531	12,403	1,721	1,873	0,405	0,271
40°	222			46									248	205	10,36	2,536	12,427	1,725	1,877	0,406	0,284
45°	240			49									269	205	12,07	2,542	12,455	1,728	1,881	0,407	0,302

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 60$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	110			25									130	155	4,17	0,932	4,567	0,634	0,690	0,149	0,104
5°	110			25									130	155	4,18	0,932	4,568	0,634	0,690	0,149	0,104
10°	112			25									132	155	4,20	0,933	4,570	0,634	0,690	0,149	0,105
15°	114			26									135	155	4,24	0,933	4,573	0,635	0,691	0,149	0,106
20°	117	20	125	27	25	10	30	88	10	23	33	23	138	155	4,30	0,934	4,577	0,635	0,691	0,149	0,107
25°	121	20	125	28	25	10	30	88	10	23	33	23	143	155	4,38	0,935	4,583	0,636	0,692	0,150	0,110
30°	127			29									150	155	4,49	0,937	4,589	0,637	0,693	0,150	0,112
35°	134			31									159	155	4,65	0,938	4,597	0,638	0,694	0,150	0,116
40°	144			33									170	155	4,85	0,940	4,605	0,639	0,695	0,150	0,121
45°	156			35									184	155	5,14	0,942	4,615	0,640	0,697	0,151	0,129

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 120$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	200			40									220	230	12,61	3,638	17,825	2,474	2,692	0,582	0,315
5°	201			40									221	230	12,64	3,639	17,830	2,474	2,693	0,582	0,316
10°	203			41									223	230	12,71	3,642	17,844	2,476	2,695	0,583	0,318
15°	207			41									228	230	12,84	3,646	17,866	2,479	2,698	0,583	0,321
20°	213	40	180	43	60	25	30	163	10	28	38	28	234	230	13,03	3,653	17,898	2,484	2,703	0,584	0,326
25°	221	40	180	44	60	25	30	163	10	28	38	28	243	230	13,30	3,661	17,937	2,489	2,709	0,586	0,332
30°	231			46									254	230	13,67	3,671	17,986	2,496	2,716	0,587	0,342
35°	244			49									269	230	14,16	3,682	18,042	2,504	2,725	0,589	0,354
40°	261			52									287	230	14,85	3,695	18,105	2,513	2,734	0,591	0,371
45°	283			57									311	230	15,79	3,709	18,176	2,522	2,745	0,593	0,395

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 80$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	140			30									160	180	6,83	1,619	7,932	1,101	1,198	0,259	0,171
5°	141			30									161	180	6,85	1,619	7,934	1,101	1,198	0,259	0,171
10°	142			30									162	180	6,88	1,620	7,937	1,101	1,199	0,259	0,172
15°	145			31									166	180	6,95	1,621	7,942	1,102	1,199	0,259	0,174
20°	149	25	145	32	35	15	30	120	10	25	35	25	170	180	7,06	1,622	7,950	1,103	1,201	0,260	0,176
25°	154	25	145	33	35	15	30	120	10	25	35	25	177	180	7,20	1,624	7,960	1,105	1,202	0,260	0,180
30°	162			35									185	180	7,39	1,627	7,971	1,106	1,204	0,260	0,185
35°	171			37									195	180	7,66	1,630	7,985	1,108	1,206	0,261	0,191
40°	183			39									209	180	8,02	1,633	8,000	1,110	1,208	0,261	0,201
45°	198			42									226	180	8,52	1,636	8,017	1,113	1,211	0,262	0,213

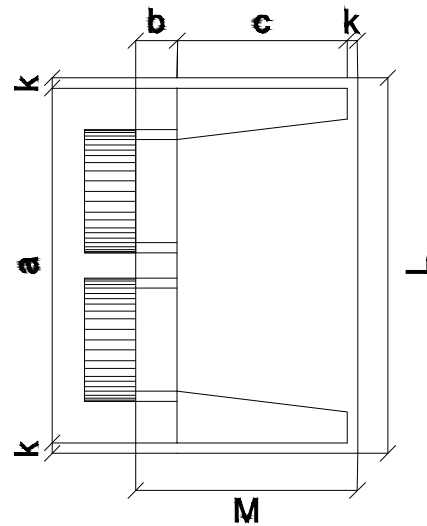
Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 150$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	240			45									260	320	20,39	6,487	31,784	4,411	4,800	1,038	0,510
5°	241			45									261	320	20,43	6,488	31,791	4,412	4,801	1,038	0,511
10°	244			46									264	320	20,53	6,492	31,810	4,414	4,804	1,039	0,513
15°	248			47									269	320	20,71	6,499	31,843	4,419	4,809	1,040	0,518
20°	255	50	280	48	75	30	30	194	10	29	39	29	277	320	20,98	6,508	31,888	4,425	4,816	1,041	0,524
25°	265	50	280	50	75	30	30	194	10	29	39	29	287	320	21,35	6,520	31,946	4,433	4,824	1,043	0,534
30°	277			52									300	320	21,86	6,534	32,015	4,443	4,835	1,045	0,547
35°	293			55									317	320	22,56	6,550	32,096	4,454	4,847	1,048	0,564
40°	313			59									339	320	23,51	6,569	32,188	4,467	4,861	1,051	0,588
45°	339			64									368	320	24,84	6,590	32,290	4,481	4,876	1,054	0,621



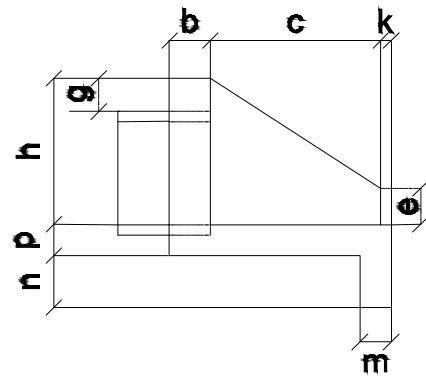
PREFEITURA MUNICIPAL DE MILHÃ		PRANCHA: <b>1 / 03</b>
RECUPERAÇÃO DE ESTRADAS VICINAIS NO MUNICÍPIO DE MILHÃ-CE PT 1087120-41		
DETALHAMENTO E DIMENSIONAMENTO DE BUEIROS		
PROJETISTA:	ENG. CIV	

# BUEIRO DUPLO TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS

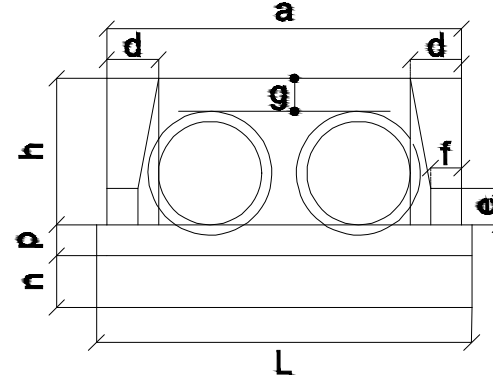
PLANTA NORMAL



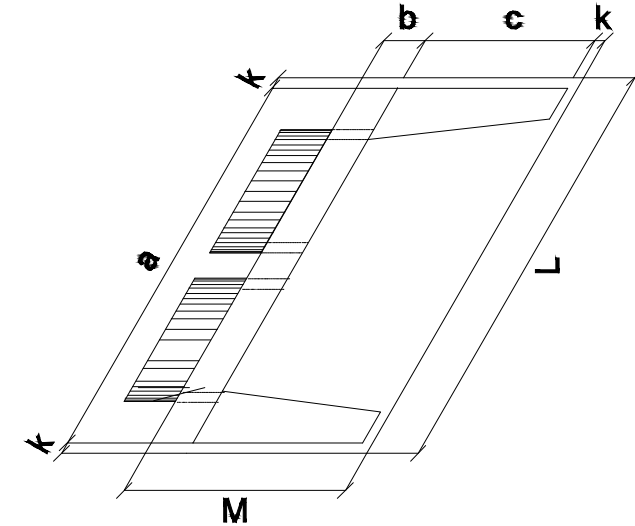
VISTA LATERAL



VISTA FRONTAL



PLANTA ESCONSO



## DIMENSÕES E CONSUMOS MÉDIOS PARA UMA UNIDADE

Esc	BUEIRO DUPLO TUBULAR $\Phi = 80$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	240			30									260	180	8,25	1,957	9,588	1,331	1,448	0,313	0,206
5°	241			30									261	180	8,27	1,958	9,592	1,331	1,449	0,313	0,207
10°	244			30									264	180	8,34	1,961	9,607	1,333	1,451	0,314	0,209
15°	248			31									269	180	8,46	1,965	9,630	1,336	1,454	0,314	0,212
20°	255	25	145	32	35	15	30	120	10	20	30	20	277	180	8,65	1,972	9,663	1,341	1,459	0,316	0,216
25°	265	25	145	33	35	15	30	120	10	20	30	20	287	180	8,90	1,981	9,704	1,347	1,466	0,317	0,222
30°	277	25	145	35	35	15	30	120	10	20	30	20	300	180	9,24	1,991	9,755	1,354	1,473	0,319	0,231
35°	293	25	145	37	35	15	30	120	10	20	30	20	317	180	9,71	2,003	9,813	1,362	1,482	0,320	0,243
40°	313	25	145	39	35	15	30	120	10	20	30	20	339	180	10,34	2,016	9,879	1,371	1,492	0,323	0,259
45°	339	25	145	42	35	15	30	120	10	20	30	20	368	180	11,22	2,031	9,953	1,381	1,503	0,325	0,281

Esc	BUEIRO DUPLO TUBULAR $\Phi = 120$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	340			40									360	230	14,92	4,408	21,600	2,998	3,262	0,705	0,373
5°	341			40									361	230	14,96	4,412	21,617	3,000	3,265	0,706	0,374
10°	345			41									366	230	15,09	4,422	21,668	3,007	3,272	0,708	0,377
15°	352			41									373	230	15,31	4,439	21,753	3,019	3,285	0,710	0,383
20°	362	40	180	43	60	25	30	163	10	23	33	23	383	230	15,64	4,463	21,870	3,035	3,303	0,714	0,391
25°	375	40	180	44	60	25	30	163	10	23	33	23	397	230	16,10	4,494	22,019	3,056	3,325	0,719	0,403
30°	393	40	180	46	60	25	30	163	10	23	33	23	416	230	16,74	4,531	22,200	3,081	3,353	0,725	0,418
35°	415	40	180	49	60	25	30	163	10	23	33	23	439	230	17,59	4,573	22,410	3,110	3,384	0,732	0,440
40°	444	40	180	52	60	25	30	163	10	23	33	23	470	230	18,76	4,622	22,647	3,143	3,420	0,740	0,469
45°	481	40	180	57	60	25	30	163	10	23	33	23	509	230	20,39	4,676	22,911	3,180	3,460	0,748	0,510

Esc	BUEIRO DUPLO TUBULAR $\Phi = 100$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	290			35									310	205	11,51	3,037	14,883	2,065	2,248	0,486	0,288
5°	291			35									311	205	11,54	3,039	14,892	2,067	2,249	0,486	0,289
10°	294			36									315	205	11,64	3,044	14,917	2,070	2,253	0,487	0,291
15°	300			36									321	205	11,81	3,053	14,960	2,076	2,259	0,488	0,295
20°	309	30	165	37	50	20	30	142	10	22	32	22	338	205	12,06	3,065	15,019	2,084	2,268	0,490	0,301
25°	320	30	165	39	50	20	30	142	10	22	32	22	342	205	12,41	3,080	15,093	2,095	2,279	0,493	0,310
30°	335	30	165	40	50	20	30	142	10	22	32	22	358	205	12,89	3,099	15,184	2,107	2,293	0,496	0,322
35°	354	30	165	43	50	20	30	142	10	22	32	22	378	205	13,54	3,120	15,289	2,122	2,309	0,499	0,339
40°	379	30	165	46	50	20	30	142	10	22	32	22	405	205	14,43	3,145	15,408	2,138	2,327	0,503	0,361
45°	410	30	165	49	50	20	30	142	10	22	32	22	448	205	15,66	3,171	15,540	2,157	2,347	0,507	0,391

Esc	BUEIRO DUPLO TUBULAR $\Phi = 150$														formas m <sup>2</sup>	con creto m <sup>3</sup>	cimento saco 50kg	areia m <sup>3</sup>	brita 1 brita 2 m <sup>3</sup>	água m <sup>3</sup>	madeira m <sup>3</sup>
	a	b	c	d	e	f	g	h	k	m	n	p	L	M							
0°	410			45									430	320	23,76	7,885	38,639	5,362	5,835	1,262	0,594
5°	412			45									432	320	23,82	7,891	38,668	5,366	5,840	1,263	0,595
10°	416			46									437	320	24,00	7,909	38,755	5,378	5,853	1,265	0,600
15°	424			47									445	320	24,30	7,939	38,901	5,398	5,875	1,270	0,608
20°	436	50	260	48	80	30	30	194	10	24	34	24	458	320	24,76	7,980	39,102	5,426	5,905	1,277	0,619
25°	452	50	260	50	80	30	30	194	10	24	34	24	474	320	25,41	8,032	39,359	5,462	5,944	1,285	0,635
30°	473	50	260	52	80	30	30	194	10	24	34	24	497	320	26,29	8,096	39,669	5,505	5,991	1,295	0,657
35°	501	50	260	55	80	30	30	194	10	24	34	24	525	320	27,49	8,169	40,029	5,555	6,045	1,307	0,687
40°	535	50	260	59	80	30	30	194	10	24	34	24	561	320	29,13	8,253	40,438	5,612	6,107	1,320	0,728
45°	580	50	260	64	80	30	30	194	10	24	34	24	608	320	31,41	8,345	40,891	5,675	6,175	1,335	0,785



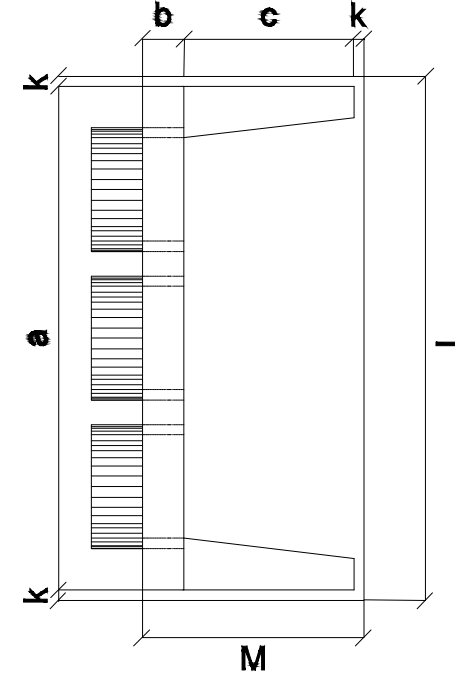
PREFEITURA MUNICIPAL DE MILHÃ  
 RECUPERAÇÃO DE ESTRADAS VICINAIS NO MUNICÍPIO DE MILHÃ-CE  
 PT 1087120-41  
**DETALHAMENTO E DIMENSIONAMENTO DE BUEIROS**  
 PROJETISTA: ENG. CIVIL ARTHUR MOREIRA TORQUATO - CREA 53.900D-CE  
 ARQUIVO: SANTA FÉ A CAFUNDÓ\_DRENAGEM.DWG

PRANCHA:  
**2 / 03**  
 ESCALA:  
 N/D

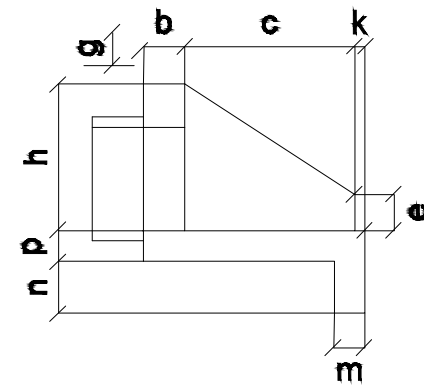


# BUEIRO TRIPLO TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS

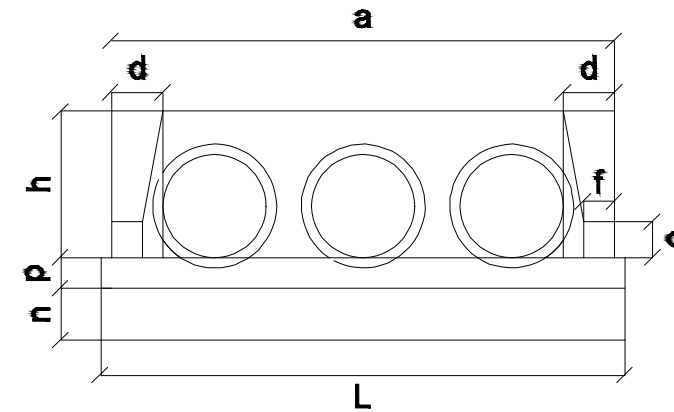
PLANTA NORMAL



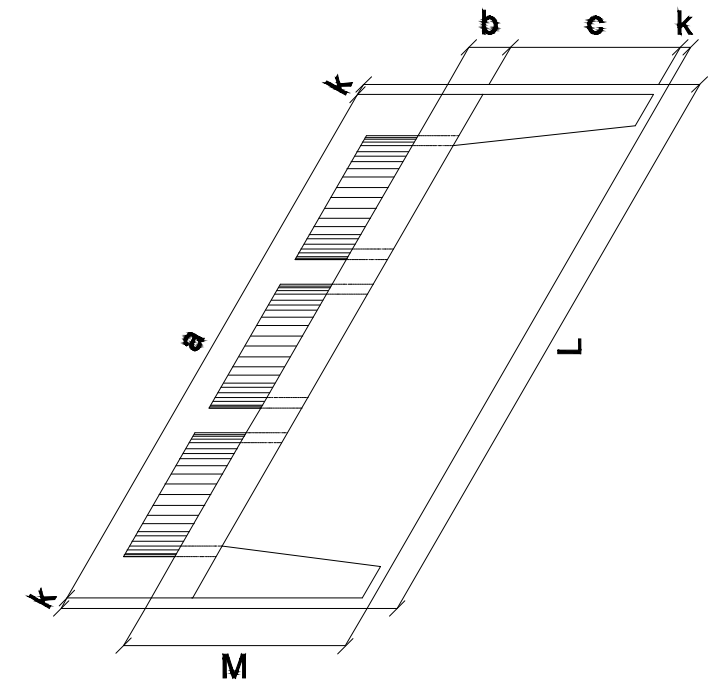
VISTA LATERAL



VISTA FRONTAL



PLANTA ESCONSO



DIMENSÕES E CONSUMOS MÉDIOS PARA UMA UNIDADE

BUEIRO TRIPLO TUBULAR $\Phi = 100$															formas	con	cimento	areia	brita 1	água	madeira	BUEIRO TRIPLO TUBULAR $\Phi = 150$															formas	con	cimento	areia	brita 1	água	madeira				
Esc.	a	b	c	d	e	f	g	h	k	m	n	p	L	M	m <sup>2</sup>	creto	saco	m <sup>3</sup>	m <sup>3</sup>	brita 2	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	Esc.	a	b	c	d	e	f	g	h	k	m	n	p	L	M	m <sup>2</sup>	creto	saco	m <sup>3</sup>	m <sup>3</sup>	brita 2	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>
0°	410			35									430	205	13,34	3,811	18,672	2,591	2,820	0,610	0,333		0°	580			45												600	320	25,44	9,733	47,689	6,618	7,202	1,557	0,636
5°	412			35									432	205	13,38	3,814	18,688	2,598	2,822	0,610	0,335		5°	582			45												602	320	25,53	9,743	47,742	6,625	7,210	1,559	0,638
10°	416			36									437	205	13,52	3,823	18,733	2,600	2,829	0,612	0,338		10°	589			46												609	320	25,78	9,775	47,899	6,647	7,234	1,564	0,644
15°	424			36									445	205	13,76	3,839	18,809	2,610	2,841	0,614	0,344		15°	600			47												621	320	26,22	9,828	48,159	6,683	7,273	1,573	0,655
20°	436	30	165	37	50	20	30	142	10	22	32	22	458	205	14,12	3,860	18,915	2,625	2,857	0,618	0,353		20°	617	50	260	48	80	30	30	194	10	24	34	24			639	320	26,87	9,902	48,521	6,734	7,328	1,584	0,672	
25°	452			39									474	205	14,62	3,888	19,049	2,644	2,877	0,622	0,366		25°	640			50											662	320	27,79	9,996	48,981	6,797	7,397	1,599	0,695	
30°	473			40									497	205	15,31	3,921	19,211	2,666	2,901	0,627	0,383		30°	670			52											693	320	29,04	10,110	49,537	6,875	7,481	1,618	0,726	
35°	501			43									525	205	16,23	3,959	19,400	2,692	2,930	0,633	0,406		35°	708			55											732	320	30,74	10,242	50,183	6,964	7,579	1,639	0,768	
40°	535			46									561	205	17,50	4,003	19,613	2,722	2,962	0,640	0,437		40°	757			59											783	320	33,06	10,391	50,916	7,066	7,689	1,663	0,827	
45°	580			49									608	205	19,24	4,051	19,850	2,755	2,998	0,648	0,481		45°	820			64											849	320	36,29	10,557	51,729	7,179	7,812	1,689	0,907	

BUEIRO TRIPLO TUBULAR $\Phi = 120$															formas	con	cimento	areia	brita 1	água	madeira		
Esc.	a	b	c	d	e	f	g	h	k	m	n	p	L	M	m <sup>2</sup>	creto	saco	m <sup>3</sup>	m <sup>3</sup>	brita 2	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>
0°	480			40									500	230	16,66	5,497	26,934	3,738	4,068	0,879	0,416		
5°	482			40									502	230	16,72	5,503	26,963	3,742	4,072	0,880	0,418		
10°	487			41									508	230	16,90	5,521	27,052	3,754	4,085	0,883	0,422		
15°	497			41									518	230	17,21	5,551	27,198	3,774	4,107	0,888	0,430		
20°	511	40	180	43	60	25	30	163	10	23	33	23	532	230	17,68	5,592	27,402	3,803	4,138	0,895	0,442		
25°	530			44									552	230	18,34	5,645	27,661	3,839	4,177	0,903	0,458		
30°	554			46									577	230	19,24	5,709	27,974	3,882	4,225	0,913	0,481		
35°	586			49									610	230	20,45	5,783	28,337	3,933	4,280	0,925	0,511		
40°	627			52									653	230	22,12	5,867	28,750	3,990	4,342	0,939	0,553		
45°	679			57									707	230	24,42	5,961	29,207	4,053	4,411	0,954	0,610		



PREFEITURA MUNICIPAL DE MILHÃ		PRANCHA:
RECUPERAÇÃO DE ESTRADAS VICINAIS NO MUNICÍPIO DE MILHÃ-CE PT 1087120-41		
DETALHAMENTO E DIMENSIONAMENTO DE BUEIROS		
PROJETISTA:	ENG. CIVIL ARTHUR MOREIRA TORQUATO - CREA 53.900D-CE	ESCALA:
ARQUIVO:	SANTA FÉ A CAFUNDÓ_DRENAGEM.DWG	

3 / 03  
N/D