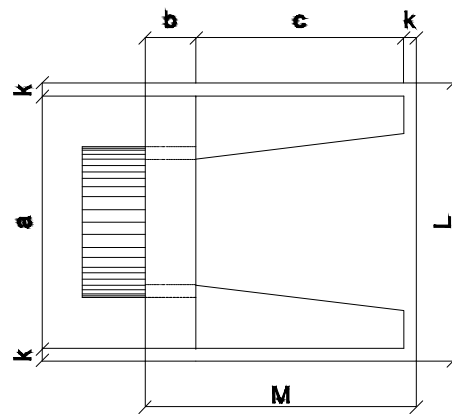
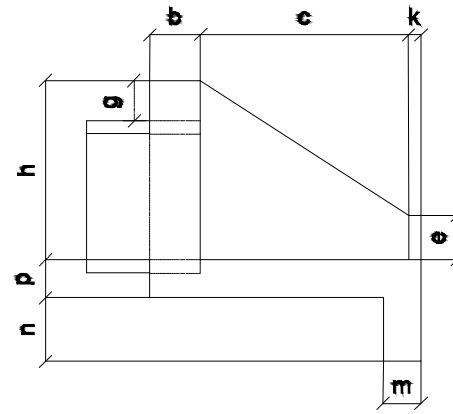


BUEIRO SIMPLES TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS (II)

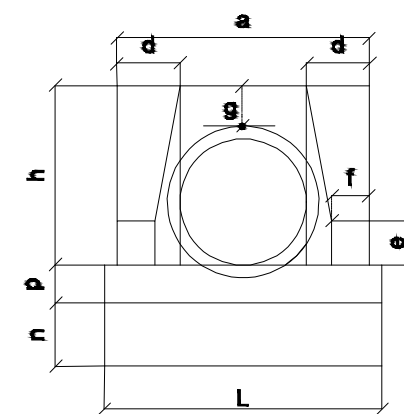
PLANTA NORMAL



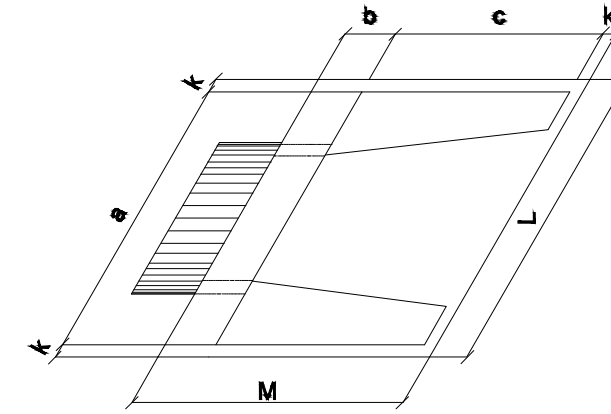
VISTA LATERAL



VISTA FRONTAL



PLANTA ESCONSO



DIMENSÕES E CONSUMOS MÉDIOS PARA UMA UNIDADE

Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 40$															formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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		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		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 ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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	27	27		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	27	27		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 ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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 ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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 ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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	

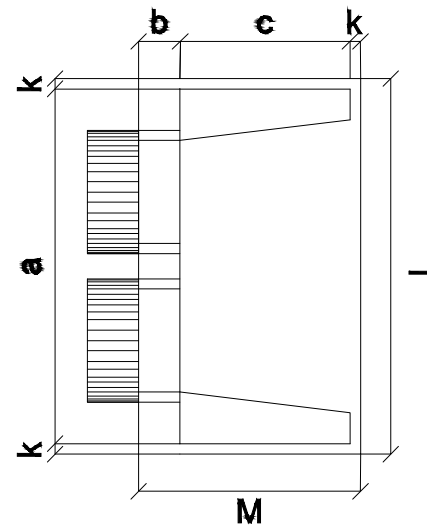
Esc.	BUEIRO SIMPLES TUBULAR $\Phi = 150$															formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	a	b	c	d	e	f	g	h	k	m	n	p	L	M								
0°	240			45									260	320	20,39	6,487	31,784	4,411	4,800	1,038	0,510	
5°	241			45									261	320	20,43	6,488	31,791	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	260	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	260	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	



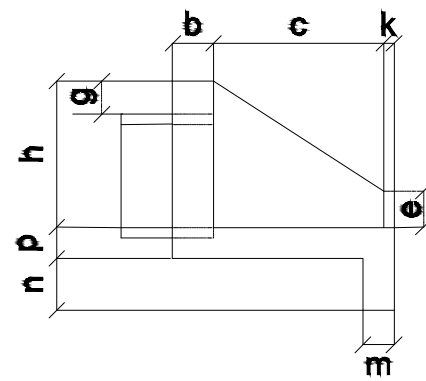
PREFEITURA MUNICIPAL DE MILHÃ RECUPERAÇÃO DE ESTRADAS VICINAIS NO MUNICÍPIO DE MILHÃ-CE PT 1087120-41		PRANCHA:
		1 / 03
DETALHAMENTO E DIMENSIONAMENTO DE BUEIROS		ESCALA:
		N/D
PROJETISTA:	ENG. CIVIL ARTHUR MOREIRA TORQUATO - CREA 53.900D-CE	

BUEIRO DUPLO TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS

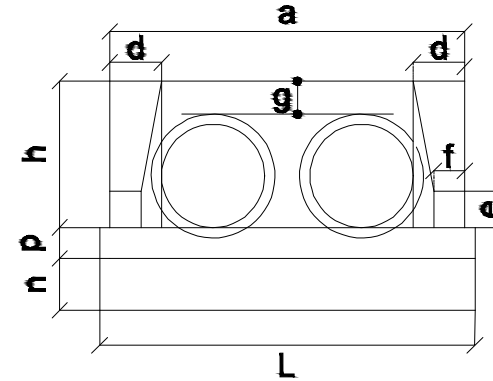
PLANTA NORMAL



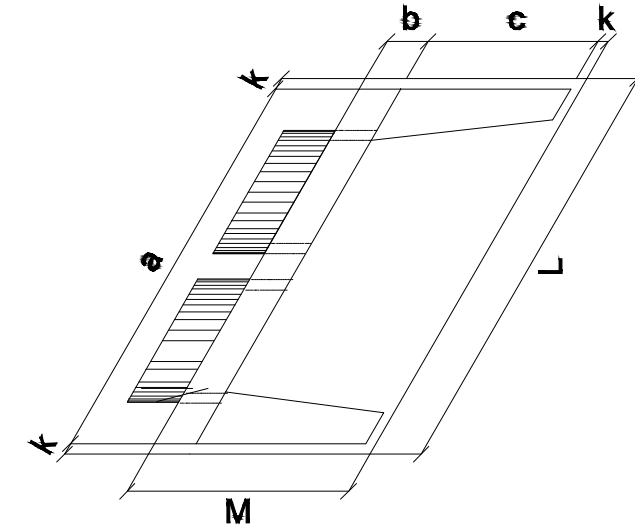
VISTA LATERAL



VISTA FRONTAL



PLANTA ESCONSO



DIMENSÕES E CONSUMOS MÉDIOS PARA UMA UNIDADE

Esc.	BUEIRO DUPLO TUBULAR $\Phi = 80$														formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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			33									287	180	8,90	1,981	9,704	1,347	1,466	0,317	0,222
30°	277			35									300	180	9,24	1,991	9,755	1,354	1,473	0,319	0,231
35°	293			37									317	180	9,71	2,003	9,813	1,362	1,482	0,320	0,243
40°	313			39									339	180	10,34	2,016	9,879	1,371	1,492	0,323	0,259
45°	339			42									368	180	11,22	2,031	9,953	1,381	1,503	0,325	0,281

Esc.	BUEIRO DUPLO TUBULAR $\Phi = 120$														formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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			44									397	230	16,10	4,494	22,019	3,056	3,325	0,719	0,403
30°	393			46									416	230	16,74	4,531	22,200	3,081	3,353	0,725	0,418
35°	415			49									439	230	17,59	4,573	22,410	3,110	3,384	0,732	0,440
40°	444			52									470	230	18,76	4,622	22,647	3,143	3,420	0,740	0,469
45°	481			57									509	230	20,39	4,676	22,911	3,180	3,460	0,748	0,510

Esc.	BUEIRO DUPLO TUBULAR $\Phi = 100$														formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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	330	205	12,06	3,065	15,019	2,084	2,268	0,490	0,301
25°	320			39									342	205	12,41	3,080	15,093	2,095	2,279	0,493	0,310
30°	335			40									358	205	12,89	3,099	15,184	2,107	2,293	0,496	0,322
35°	354			43									378	205	13,54	3,120	15,289	2,122	2,309	0,499	0,339
40°	379			46									405	205	14,43	3,145	15,408	2,138	2,327	0,503	0,361
45°	410			49									348	205	15,66	3,171	15,540	2,157	2,347	0,507	0,391

Esc.	BUEIRO DUPLO TUBULAR $\Phi = 150$														formas m ²	con creto m ³	cimento saco 50kg	areia m ³	brita 1 brita 2 m ³	água m ³	madeira m ³
	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									474	320	25,41	8,032	39,359	5,462	5,944	1,285	0,635
30°	473			52									497	320	26,29	8,096	39,669	5,505	5,991	1,295	0,657
35°	501			55									525	320	27,49	8,169	40,029	5,555	6,045	1,307	0,687
40°	535			59									561	320	29,13	8,253	40,438	5,612	6,107	1,320	0,728
45°	580			64									608	320	31,41	8,345	40,891	5,675	6,175	1,335	0,785

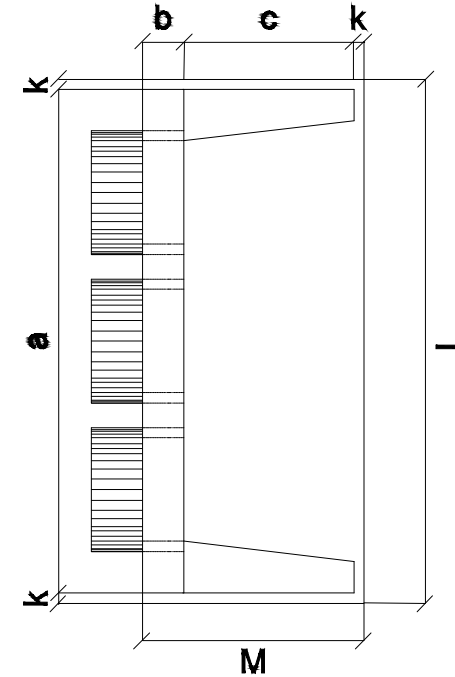


PREFEITURA MUNICIPAL DE MILHÃ		PRANCHA:
RECUPERAÇÃO DE ESTRADAS VICINAIS NO MUNICÍPIO DE MILHÃ-CE PT 1087120-41		
DETALHAMENTO E DIMENSIONAMENTO DE BUEIROS		
PROJETISTA:	ENG. CIVIL ARTHUR MOREIRA TORQUATO - CREA 53.900D-CE	ESCALA:
ARQUIVO:	BOM ACERTO A MONTE BELO - DRENAGEM.DWG	

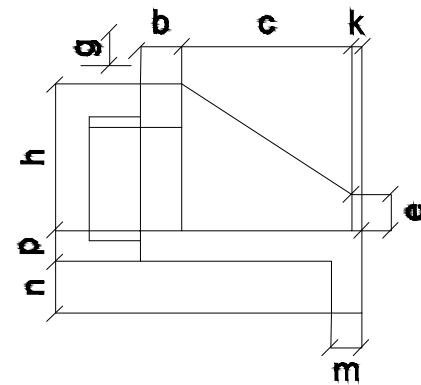
2 / 03
N/D

BUEIRO TRIPLO TUBULAR DE CONCRETO - BOCAS NORMAIS E ESCONSAS

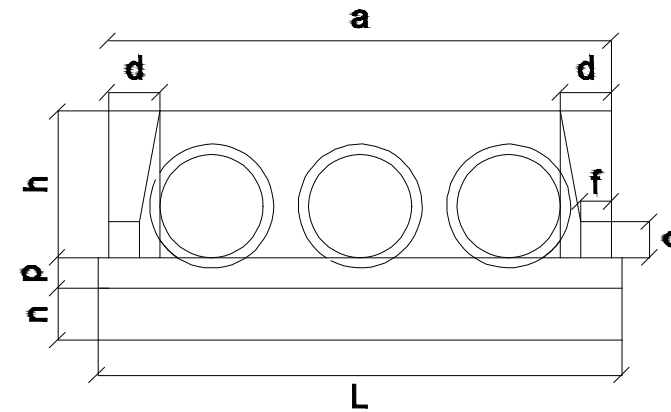
PLANTA NORMAL



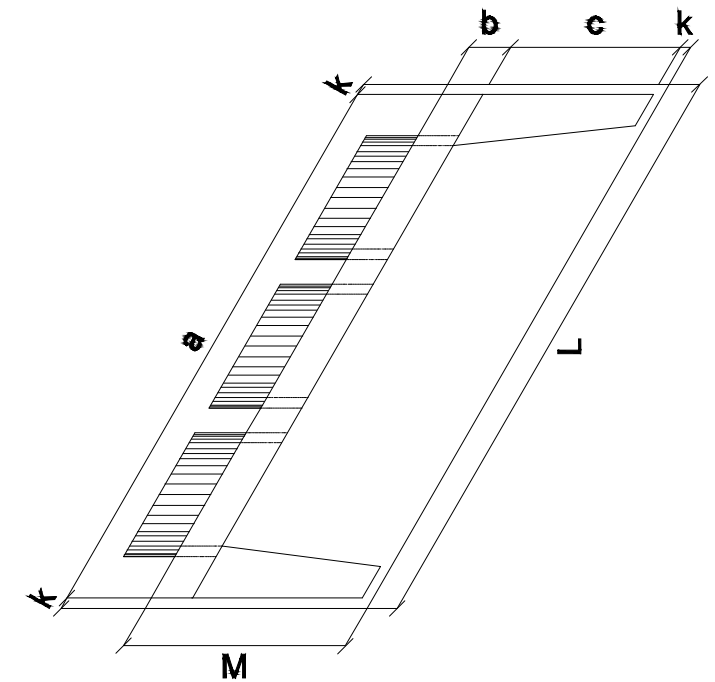
VISTA LATERAL



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 ²	creto	saco	m ³	m ³	m ³	m ³	m ³	m ³	Esc.	a	b	c	d	e	f	g	h	k	m	n	p	L	M	m ²	creto	saco	m ³	m ³	m ³	m ³	
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 ²	creto	saco	m ³	m ³	m ³	m ³	m ³
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:	BOM ACERTO A MONTE BELO - DRENAGEM.DWG	

3 / 03
N/D