



CONSELHO MUNICIPAL DE MAPUTO



CONSELHO MUNICIPAL DE MAPUTO

ANEXO I - DIMENSIONAMENTO HIDRÁULICO

CHAMANCULO A – COLETOR UNITÁRIO

Critérios de Dimensionamento (Rede Unitária)

Material da tubagem (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)	Rácio de escavação (-)
Betão	75	0.8	24	45.61	-

Velocidade mínima (m/s)	Velocidade máxima (m/s)
0.9	5.0

Inclinação mínima (-)	Inclinação máxima (-)	Alturas de recobrimento	
		mín (m)	máx (m)
0.0030	0.1500	1.00	5.00

Período de retorno (anos)	Parâmetros das Curvas IDF	
	a	b
2 *	798.68	-0.594
5	534.05	-0.608

* Nota: A usar exclusivamente nos troços a montante ou a integrar na intervenção PSU

Comprimento total da rede (m)	Diâmetro médio (int.) (m)	Altura média de escavação (m)	Área média de escavação (m^2)
910.70	1.280	3.03	3.89



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Caudais de Dimensionamento (Rede Unitária)

Colec. (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)	T _{conc.} Jus. (min)	
1	44.00	18.00	0.56	6.310	0.000	3.534	255.9	904.33	18.42	*
2	30.83	18.42	1.00	0.000	3.534	3.534	252.3	891.59	18.72	*
3	44.68	19.00	0.59	3.330	3.534	5.498	386.0	2122.04	19.33	
4	33.00	19.33	1.00	0.000	5.498	5.498	382.0	2100.50	19.57	
5	43.00	19.57	1.00	0.000	5.498	5.498	379.2	2084.96	19.89	
6	37.80	19.89	1.00	0.000	5.498	5.498	375.6	2065.11	20.17	
7	59.96	20.17	1.00	0.000	5.498	5.498	372.5	2048.09	20.41	
8	25.04	20.41	0.57	3.630	5.498	7.567	369.9	2799.20	20.49	
9	56.00	20.49	1.00	0.000	7.567	7.567	369.0	2792.40	20.68	
10	55.30	20.68	1.00	0.000	7.567	7.567	367.0	2777.07	20.87	
11	50.02	20.87	0.74	0.130	7.567	7.664	365.1	2797.59	21.23	
12	49.97	21.23	1.00	0.000	7.664	7.664	361.4	2769.21	21.59	
13	17.00	21.59	0.52	0.780	7.664	8.069	357.7	2886.66	21.71	
14	49.00	21.71	0.35	1.340	8.069	8.538	356.5	3044.19	22.06	
15	6.20	22.06	1.00	0.000	8.538	8.538	353.2	3015.32	22.11	
16	27.06	22.11	1.00	0.000	8.538	8.538	352.7	3011.71	22.30	
17	39.00	22.30	0.36	0.440	8.538	8.697	350.9	3051.68	22.58	
18	45.00	22.58	1.00	0.000	8.697	8.697	348.3	3029.20	22.90	
19	40.00	22.90	0.37	0.490	8.697	8.878	345.4	3066.40	23.19	
20	39.84	23.19	1.00	0.000	8.878	8.878	342.9	3043.77	23.36	
21	41.30	23.36	0.52	0.730	12.053	12.433	341.3	4243.82	23.50	
22	25.57	23.50	1.00	0.000	12.433	12.433	340.2	4229.07	23.59	
23	22.17	23.59	0.63	0.210	12.433	12.565	339.4	4264.89	23.68	
24	7.43	20.00	0.49	6.480	0.000	3.175	374.4	1188.68	20.04	
25	7.38	15.00	0.51	1.570	0.000	0.801	444.1	355.61	15.04	
26	14.15	15.04	1.00	0.000	0.801	0.801	443.3	354.98	15.13	



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Verificação das Condições Hidráulicas do Escoamento (Rede Unitária)

Troço (-)	Cx. Visita Mont. (-)	Jus. (-)	Diam. (m)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m ²)	Inclin Troço (%)	Inclin Terr. (%)
1	1	2	0.900	904.33	1.73	0.691	0.82	0.30	-1.39
2	2	3	0.900	891.59	1.72	0.682	0.82	0.30	-0.62
3	3	4	1.200	2122.04	2.26	0.927	1.27	0.35	-1.37
4	4	5	1.200	2100.50	2.26	0.918	1.27	0.35	-1.15
5	5	6	1.200	2084.96	2.26	0.914	1.27	0.35	-0.40
6	6	7	1.200	2065.11	2.26	0.905	1.27	0.35	3.31
7	7	8	1.200	2048.09	4.19	0.536	4.75	1.71	3.65
8	8	9	1.200	2799.20	4.98	0.597	6.65	2.23	3.19
9	9	10	1.200	2792.40	4.89	0.605	6.30	2.09	2.09
10	10	11	1.200	2777.07	5.00	0.591	6.65	2.24	2.33
11	11	12	1.400	2797.59	2.31	1.029	1.26	0.30	-0.28
12	12	13	1.400	2769.21	2.30	1.021	1.26	0.30	-0.76
13	13	14	1.400	2886.66	2.31	1.058	1.27	0.30	1.12
14	14	15	1.400	3044.19	2.33	1.110	1.28	0.30	-0.04
15	15	16	1.400	3015.32	2.32	1.100	1.28	0.30	0.48
16	16	17	1.400	3011.71	2.32	1.100	1.28	0.30	0.33
17	17	18	1.400	3051.68	2.33	1.113	1.28	0.30	0.56
18	18	19	1.400	3029.20	2.32	1.105	1.28	0.30	0.73
19	19	20	1.400	3066.40	2.32	1.121	1.28	0.30	0.87
20	20	21	1.400	3043.77	3.85	0.715	3.74	1.05	1.81
21	21	22	1.400	4243.82	5.01	0.755	6.21	1.69	2.49
22	22	23	1.400	4229.07	5.00	0.755	6.21	1.69	2.66
23	23	24	1.400	4264.89	3.75	0.970	3.36	0.81	0.81
24	25	21	0.800	1188.68	2.91	0.606	2.42	1.00	0.67
25	26	27	0.500	355.61	2.75	0.313	2.56	1.81	2.57
26	27	24	0.500	354.98	2.74	0.313	2.56	1.81	0.78

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Elementos do Perfil Longitudinal (Rede Unitária)

Colec. (troço)	Cx. Visita Mont. (-)	Jus. (-)	Diâm. Nominal (m)	Compr. (m)	Inclin. Colec. (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Cx.Mont. (m)	Cx.Jus. (m)	Cx.Mont. (m)	Cx.Jus. (m)	C.Mont. (m)	C.Jus. (m)
1	1	2	0.900	44.00	0.30	57.29	57.90	55.59	55.46	1.70	2.44
2	2	3	0.900	30.83	0.30	57.90	58.09	55.46	55.37	2.44	2.72
3	3	4	1.200	44.68	0.35	58.09	58.70	55.07	54.91	3.02	3.79
4	4	5	1.200	33.00	0.35	58.70	59.08	54.91	54.80	3.79	4.28
5	5	6	1.200	43.00	0.35	59.08	59.25	54.80	54.65	4.28	4.60
6	6	7	1.200	37.80	0.35	59.25	58.00	54.65	54.51	4.60	3.49
7	7	8	1.200	59.96	1.71	58.00	55.81	54.51	53.49	3.49	2.32
8	8	9	1.200	25.04	2.23	55.81	55.01	53.25	52.69	2.56	2.32
9	9	10	1.200	56.00	2.09	55.01	53.84	52.69	51.52	2.32	2.32
10	10	11	1.200	55.30	2.24	53.84	52.55	51.47	50.23	2.37	2.32
11	11	12	1.400	50.02	0.30	52.55	52.69	50.01	49.86	2.54	2.83
12	12	13	1.400	49.97	0.30	52.69	53.07	49.86	49.71	2.83	3.36
13	13	14	1.400	17.00	0.30	53.07	52.88	49.71	49.66	3.36	3.22
14	14	15	1.400	49.00	0.30	52.88	52.90	49.66	49.51	3.22	3.39
15	15	16	1.400	6.20	0.30	52.90	52.87	49.51	49.49	3.39	3.38
16	16	17	1.400	27.06	0.30	52.87	52.78	49.49	49.41	3.38	3.37
17	17	18	1.400	39.00	0.30	52.78	52.56	49.41	49.30	3.37	3.26
18	18	19	1.400	45.00	0.30	52.56	52.23	49.30	49.16	3.26	3.07
19	19	20	1.400	40.00	0.30	52.23	51.88	49.16	49.04	3.07	2.84
20	20	21	1.400	39.84	1.05	51.88	51.16	49.04	48.62	2.84	2.54
21	21	22	1.400	41.30	1.69	51.16	50.13	48.29	47.59	2.87	2.54
22	22	23	1.400	25.57	1.69	50.13	49.45	47.34	46.91	2.79	2.54
23	23	24	1.400	22.17	0.81	49.45	49.27	45.93	45.75	3.52	3.52
24	25	21	0.800	7.43	1.00	51.21	51.16	48.98	48.91	2.23	2.25
25	26	27	0.500	7.38	1.81	49.57	49.38	47.00	46.87	2.57	2.51
26	27	24	0.500	14.15	1.81	49.38	49.27	46.87	46.61	2.51	2.66

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Elementos das Caixas de Visita (Rede Unitária)

Caixa de Visita (-)	Caudal da Caixa (l/s)	Cota Terreno (m)	Cota Soleira (m)	Profundidade Escavação (m)	Altura da queda máx. (m)
1	0.00	57.29	55.59	1.70	0.00
2	0.00	57.90	55.46	2.44	0.00
3	0.00	58.09	55.07	3.02	0.30
4	0.00	58.70	54.91	3.79	0.00
5	0.00	59.08	54.80	4.28	0.00
6	0.00	59.25	54.65	4.60	0.00
7	0.00	58.00	54.51	3.49	0.00
8	0.00	55.81	53.25	2.56	0.24
9	0.00	55.01	52.69	2.32	0.00
10	0.00	53.84	51.47	2.37	0.05
11	0.00	52.55	50.01	2.54	0.22
12	0.00	52.69	49.86	2.83	0.00
13	0.00	53.07	49.71	3.36	0.00
14	0.00	52.88	49.66	3.22	0.00
15	0.00	52.90	49.51	3.39	0.00
16	0.00	52.87	49.49	3.38	0.00
17	0.00	52.78	49.41	3.37	0.00
18	0.00	52.56	49.30	3.26	0.00
19	0.00	52.23	49.16	3.07	0.00
20	0.00	51.88	49.04	2.84	0.00
21	0.00	51.16	48.29	2.87	0.62
22	0.00	50.13	47.34	2.79	0.25
23	0.00	49.45	45.93	3.52	0.98
24	0.00	49.27	45.61	3.66	1.00
25	0.00	51.21	48.98	2.23	0.00
26	0.00	49.57	47.00	2.57	0.00
27	0.00	49.38	46.87	2.51	0.00

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CHAMANCULO A – RUA 2253 – VALA 1 (TROÇO LOCALIZADO A MONTANTE DO TROÇO A INTEGRAR NA PSU)

Crítérios de Dimensionamento (Rede Pluvial)

Material da vala (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D [T=5 anos] (-)	Nó mais a jusante (-)	Cota de soleira do ultimo nó (m)
Betão	75	1	20	56.46

Velocidade mínima [T=2] (m/s)	Velocidade máxima* [T=2] (m/s)	Inclinação mínima (-)	Inclinação máxima (-)
0.9	3 5	0.0030	0.1500

* Nota: Vala aberta Vel. Máx. 3 m/s | Vala coberta Vel. Máx. 5 m/s

Período de retorno (anos)	Parâmetros das Curvas IDF	
	a	b
2 *	614.15	-0.61

* Nota: A usar exclusivamente nos troços a montante ou a integrar na intervenção PSU



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Caudais de Dimensionamento (Rede Pluvial), T=2 anos

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	15.00	0.41	1.83	0.000	0.750	286.29	214.80
2	10.00	15.06	1.00	0.00	0.750	0.000	285.64	214.31
3	10.00	15.11	1.00	0.00	0.750	0.000	284.98	213.82
4	10.00	15.17	1.00	0.00	0.750	0.000	284.33	213.33
5	10.00	15.23	1.00	0.00	0.750	0.000	283.63	212.81
6	10.00	15.30	1.00	0.00	0.750	0.000	282.91	212.27
7	10.00	15.36	1.00	0.00	0.750	0.000	282.15	211.70
8	0.58	15.42	1.00	0.00	0.750	0.000	281.48	211.19
9	3.37	15.43	1.00	0.00	0.750	0.000	281.42	211.15
10	6.04	15.46	1.00	0.00	0.750	0.000	281.11	210.91
11	8.22	15.51	1.00	0.00	0.750	0.000	280.55	210.49
12	1.78	15.58	1.00	0.00	0.750	0.000	279.72	209.87
13	10.00	15.60	1.00	0.00	0.750	0.000	279.54	209.74
14	3.46	15.69	1.00	0.00	0.750	0.000	278.54	208.99
15	6.54	15.72	1.00	0.00	0.750	0.000	278.20	208.73
16	10.00	15.79	1.00	0.00	0.750	0.000	277.55	208.25
17	10.00	15.91	1.00	0.00	0.750	0.000	276.26	207.28
18	10.00	16.03	1.00	0.00	0.750	0.000	274.98	206.32
19	2.70	16.15	1.00	0.00	0.750	0.000	273.72	205.37



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Verificação das condições hidráulicas do escoamento, T=2 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
1	1	2	0.400	0.400	90.0	214.80	2.97	0.181	33.57	3.60
2	2	3	0.400	0.400	90.0	214.31	2.93	0.183	32.78	3.50
3	3	4	0.400	0.400	90.0	213.82	2.90	0.184	32.00	3.40
4	4	5	0.400	0.400	90.0	213.33	2.73	0.195	28.11	2.90
5	5	6	0.400	0.400	90.0	212.81	2.58	0.206	24.89	2.50
6	6	7	0.400	0.400	90.0	212.27	2.46	0.216	22.41	2.20
7	7	8	0.400	0.400	90.0	211.70	2.76	0.192	28.81	3.00
8	8	9	0.400	0.530	90.0	211.19	1.98	0.267	14.02	1.25
9	9	10	0.400	0.526	90.0	211.15	1.98	0.267	14.02	1.25
10	10	11	0.400	0.526	90.0	210.91	1.98	0.267	14.02	1.25
11	11	12	0.400	0.550	90.0	210.49	1.81	0.291	11.62	1.00
12	12	13	0.400	0.599	90.0	209.87	1.81	0.290	11.61	1.00
13	13	14	0.400	0.607	90.0	209.74	1.81	0.290	11.61	1.00
14	14	15	0.400	0.680	90.0	208.99	1.81	0.289	11.60	1.00
15	15	16	0.400	0.704	90.0	208.73	1.81	0.289	11.59	1.00
16	16	17	0.400	0.750	90.0	208.25	1.37	0.380	6.43	0.50
17	17	18	0.400	0.770	90.0	207.28	1.37	0.379	6.42	0.50
18	18	19	0.400	0.800	90.0	206.32	1.37	0.377	6.41	0.50
19	19	20	0.400	0.880	90.0	205.37	1.37	0.376	6.40	0.50



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Elementos do perfil longitudinal

Vala (troço)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	Compr. (m)	Inclin. Troço (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
1	1	2	0.40	10.00	3.60	59.56	59.20	59.16	58.80	0.40	0.40
2	2	3	0.40	10.00	3.50	59.20	58.85	58.80	58.45	0.40	0.40
3	3	4	0.40	10.00	3.40	58.85	58.51	58.45	58.11	0.40	0.40
4	4	5	0.40	10.00	2.90	58.51	58.22	58.11	57.82	0.40	0.40
5	5	6	0.40	10.00	2.50	58.22	57.97	57.82	57.57	0.40	0.40
6	6	7	0.40	10.00	2.20	57.97	57.75	57.57	57.35	0.40	0.40
7	7	8	0.40	10.00	3.00	57.75	57.58	57.35	57.05	0.40	0.53
8	8	9	0.40	0.58	1.25	57.58	57.57	57.05	57.04	0.53	0.53
9	9	10	0.40	3.37	1.25	57.57	57.52	57.04	57.00	0.53	0.53
10	10	11	0.40	6.04	1.25	57.52	57.47	57.00	56.92	0.53	0.55
11	11	12	0.40	8.22	1.00	57.47	57.44	56.92	56.84	0.55	0.60
12	12	13	0.40	1.78	1.00	57.44	57.43	56.84	56.82	0.60	0.61
13	13	14	0.40	10.00	1.00	57.43	57.40	56.82	56.72	0.61	0.68
14	14	15	0.40	3.46	1.00	57.40	57.39	56.72	56.69	0.68	0.70
15	15	16	0.40	6.54	1.00	57.39	57.37	56.69	56.62	0.70	0.75
16	16	17	0.40	10.00	0.50	57.37	57.34	56.62	56.57	0.75	0.77
17	17	18	0.40	10.00	0.50	57.34	57.32	56.57	56.52	0.77	0.80
18	18	19	0.40	10.00	0.50	57.32	57.35	56.52	56.47	0.80	0.88
19	19	20	0.40	2.70	0.50	57.35	57.45	56.47	56.46	0.88	0.99



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CHAMANCULO A – LIGAÇÃO DA VALA RUA 2253 À REDE DE DRENAGEM UNITÁRIA

Critérios de Dimensionamento (Rede Pluvial)

Material da tubagem (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)	Rácio de escavação (-)
Betão	75	0.8	2	55.59	-

Velocidade mínima (m/s)	Velocidade máxima (m/s)
0.9	5.0

Inclinação mínima (-)	Inclinação máxima (-)	Alturas de recobrimento	
		min (m)	máx (m)
0.0030	0.1500	1.00	5.00

Parâmetros das Curvas IDF	
a	b
798.68	-0.594

Comprimento total da rede (m)	Diâmetro médio (int.) (m)	Altura média de escavação (m)	Área média de escavação (m^2)
5.96	0.400	1.62	7.39



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Caudais de Dimensionamento (Rede Pluvial)

Colec. (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)	T _{conc.} Jus. (min)
1	5.96	16.15	0.41	1.830	0.000	0.750	0.07	0.21	0.00

Verificação das Condições Hidráulicas do Escoamento (Rede Pluvial)

Troço (-)	Cx. Visita Mont. (-)	Jus. (-)	Diam. (m)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m ²)	Inclin Troço (%)	Inclin Terr. (%)
1	1	2	0.400	0.21	3.42	3.416	3.42	0.03	2.68



CONSELHO MUNICIPAL DE MAPUTO

Elementos do Perfil Longitudinal (Rede Pluvial)

Colec. (troço)	Cx. Visita Mont. (-)	Jus. (-)	Diâm. Nominal (m)	Compr. (m)	Inclin. Colec. (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Cx.Mont. (m)	Cx.Jus. (m)	Cx.Mont. (m)	Cx.Jus. (m)	C.Mont. (m)	C.Jus. (m)
1	1	2	0.400	5.96	0.03	57.45	57.29	56.05	55.59	1.40	1.40



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Elementos das Caixas de Visita (Rede Pluvial)

Caixa de Visita (-)	Caudal da Caixa (l/s)	Cota Terreno (m)	Cota Soleira (m)	Profundidade Escavação (m)	Altura da queda máx. (m)
1	0.21	57.45	56.05	1.40	0.00
2	0.00	57.29	55.59	1.70	0.30



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Concepção de Planos, Estudos de Engenharia e Projecto
Executivo de Infra-estruturas Integradas em Assentamentos
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CONSELHO MUNICIPAL DE MAPUTO

MALANGA - MACRO

Critérios de Dimensionamento (Rede Unitária)

Material da tubagem (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)	Rácio de escavação (-)
Betão	75	0.8	BL	27.41	-

Velocidade mínima (m/s)	Velocidade máxima (m/s)
0.9	5.0

Inclinação mínima (-)	Inclinação máxima (-)	Alturas de recobrimento	
		mín (m)	máx (m)
0.0030	0.1500	1.00	5.00

Período de retorno (anos)	Parâmetros das Curvas IDF	
	a	b
10	916.99	-0.59

Comprimento total da rede (m)	Diâmetro médio (int.) (m)	Altura média de escavação (m)	Área média de escavação (m^2)
1304.80	2.355	3.44	8.20



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Unitária)

Colec. (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)	T _{conc.} Jus. (min)
1	42.34	21.86	0.52	23.900	0.000	12.428	416.7	5178.73	22.06
2	60.00	22.06	0.52	3.500	23.900	25.720	414.5	5905.58	22.33
3	59.99	22.33	0.52	0.430	27.400	27.624	411.5	5960.18	22.64
4	49.05	22.64	0.49	9.523	27.830	32.523	408.2	7513.98	22.88
5	50.54	22.88	0.49	0.340	37.353	37.520	405.7	7520.54	23.12
6	51.78	23.12	0.50	0.427	37.693	37.904	403.2	7609.01	23.37
7	47.87	23.37	0.49	1.380	38.120	38.798	400.7	7776.78	23.54
8	42.26	23.54	0.49	1.090	39.500	40.031	399.0	7894.29	23.69
9	59.69	23.69	0.48	3.620	40.590	42.317	397.5	8381.34	23.90
10	47.97	23.90	0.48	0.685	44.210	44.539	395.4	8530.15	24.07
11	11.53	24.07	0.48	1.015	44.895	45.385	393.8	8727.06	24.11
12	45.05	27.57	0.42	0.000	138.751	138.751	363.7	21328.72	27.72
13	48.47	27.72	0.42	0.000	138.751	138.751	362.5	21257.73	27.89
14	39.98	27.89	0.42	0.290	138.751	138.873	361.2	21215.64	28.03
15	35.00	28.03	0.43	0.063	144.915	144.942	360.1	22448.15	28.15
16	37.16	28.15	0.43	0.000	144.978	144.978	359.2	22391.73	28.28
17	70.72	28.28	0.43	0.073	144.978	145.010	358.3	22339.47	28.52
18	75.14	28.52	0.43	0.070	145.051	145.081	356.5	22241.29	28.78
19	48.84	28.78	0.43	0.000	145.121	145.121	354.6	22123.58	28.94
20	85.74	30.74	0.45	62.267	149.882	177.864	341.1	32522.56	30.74
21	60.00	26.63	0.38	71.054	0.000	27.213	371.1	10099.41	26.84
22	60.00	26.84	0.38	0.813	71.054	71.365	369.4	10143.36	27.05
23	60.00	27.05	0.39	0.678	71.867	72.128	367.8	10286.67	27.25
24	50.31	27.25	0.39	0.551	72.545	72.759	366.1	10384.74	27.43
25	41.10	27.43	0.39	19.438	73.096	80.715	364.8	13229.49	27.57
26	11.42	27.57	0.39	0.307	92.534	92.655	363.7	13269.39	27.60
27	12.87	20.00	0.61	5.874	0.000	3.583	439.0	1573.20	20.04



CONSELHO MUNICIPAL DE MAPUTO

Verificação das Condições Hidráulicas do Escoamento (Rede Unitária)

Troço (-)	Cx. Visita Mont. (-)	Jus. (-)	Diam. (m)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m ²)	Inclin Troço (%)	Inclin Terr. (%)
1	1	2	1.5 x 1.5	5178.73	3.54	0.975	2.97	0.70	0.87
2	2	3	1.5 x 1.5	5905.58	3.64	1.081	3.10	0.70	1.13
3	3	4	2.0 x 1.5	5960.18	3.25	0.918	2.39	0.50	0.27
4	4	5	2.0 x 1.5	7513.98	3.44	1.091	2.61	0.50	0.27
5	5	6	2.0 x 1.5	7520.54	3.49	1.077	2.70	0.52	2.24
6	6	7	2.0 x 1.5	7609.01	3.45	1.102	2.62	0.50	1.45
7	7	8	2.0 x 1.5	7776.78	4.66	0.835	5.00	1.10	3.22
8	8	9	2.0 x 1.5	7894.29	4.67	0.844	5.03	1.10	2.91
9	9	10	2.0 x 1.5	8381.34	4.74	0.883	5.16	1.10	3.03
10	10	11	2.0 x 1.5	8530.15	4.77	0.894	5.19	1.10	2.58
11	11	12	2.0 x 1.5	8727.06	4.86	0.898	5.37	1.14	2.69
12	12	13	3.0 x 2.0	21328.72	4.78	1.487	4.48	0.60	3.02
13	13	14	3.0 x 2.0	21257.73	4.78	1.483	4.47	0.60	3.40
14	14	15	3.0 x 2.0	21215.64	4.78	1.481	4.47	0.60	3.08
15	15	16	3.0 x 2.5	22448.15	4.84	1.545	4.56	0.60	3.00
16	16	17	3.0 x 2.5	22391.73	4.84	1.542	4.56	0.60	2.93
17	17	18	3.0 x 2.5	22339.47	4.84	1.539	4.56	0.60	1.95
18	18	19	3.0 x 2.5	22241.29	4.83	1.534	4.55	0.60	-0.09
19	19	20	3.0 x 2.5	22123.58	4.83	1.528	4.54	0.60	5.79
20	20	BL	4.0 x 2.5	32522.56	4.56	1.783	3.77	0.40	-1.33
21	22	23	2.0 x 1.5	10099.41	4.80	1.051	5.12	1.00	1.48
22	23	24	2.0 x 1.5	10143.36	4.81	1.055	5.13	1.00	2.55
23	24	25	2.0 x 1.5	10286.67	4.82	1.066	5.16	1.00	2.22
24	25	26	2.0 x 1.5	10384.74	4.84	1.073	5.17	1.00	0.72
25	26	27	2.0 x 2.0	13229.49	4.92	1.346	5.16	0.90	0.51
26	27	12	2.0 x 2.0	13269.39	4.92	1.350	5.17	0.90	1.75
27	28	15	0.700	1573.20	4.99	0.535	7.41	3.50	3.42



CONSELHO MUNICIPAL DE MAPUTO

Elementos do Perfil Longitudinal (Rede Unitária)

Colec. (troço)	Cx. Visita Mont. (-)	Jus. (-)	Diâm. Nominal (m)	Compr. (m)	Inclin. Colec. (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Cx.Mont. (m)	Cx.Jus. (m)	Cx.Mont. (m)	Cx.Jus. (m)	C.Mont. (m)	C.Jus. (m)
1	1	2	1.5 x 1.5	42.34	0.70	49.27	48.90	45.61	45.31	3.66	3.59
2	2	3	1.5 x 1.5	60.00	0.70	48.90	48.22	45.31	44.89	3.59	3.33
3	3	4	2.0 x 1.5	59.99	0.50	48.22	48.06	44.89	44.59	3.33	3.47
4	4	5	2.0 x 1.5	49.05	0.50	48.06	47.93	44.06	43.81	4.00	4.12
5	5	6	2.0 x 1.5	50.54	0.52	47.93	46.80	43.81	43.55	4.12	3.25
6	6	7	2.0 x 1.5	51.78	0.50	46.80	46.05	43.55	43.29	3.25	2.76
7	7	8	2.0 x 1.5	47.87	1.10	46.05	44.51	42.29	41.76	3.76	2.75
8	8	9	2.0 x 1.5	42.26	1.10	44.51	43.28	40.94	40.48	3.57	2.80
9	9	10	2.0 x 1.5	59.69	1.10	43.28	41.47	39.48	38.82	3.80	2.65
10	10	11	2.0 x 1.5	47.97	1.10	41.47	40.23	37.82	37.29	3.65	2.94
11	11	12	2.0 x 1.5	11.53	1.14	40.23	39.92	36.29	36.16	3.94	3.76
12	12	13	3.0 x 2.0	45.05	0.60	39.92	38.56	35.16	34.89	4.76	3.67
13	13	14	3.0 x 2.0	48.47	0.60	38.56	36.91	33.89	33.60	4.67	3.31
14	14	15	3.0 x 2.0	39.98	0.60	36.91	35.68	32.60	32.36	4.31	3.32
15	15	16	3.0 x 2.5	35.00	0.60	35.68	34.63	31.36	31.15	4.32	3.48
16	16	17	3.0 x 2.5	37.16	0.60	34.63	33.54	30.15	29.93	4.48	3.61
17	17	18	3.0 x 2.5	70.72	0.60	33.54	32.16	28.93	28.50	4.61	3.66
18	18	19	3.0 x 2.5	75.14	0.60	32.16	32.23	28.50	28.05	3.66	4.18
19	19	20	3.0 x 2.5	48.84	0.60	32.23	29.40	28.05	27.75	4.18	1.65
20	20	BL	4.0 x 2.5	85.74	0.40	29.40	30.54	27.75	27.41	1.65	3.13
21	22	23	2.0 x 1.5	60.00	1.00	44.44	43.55	41.00	40.40	3.44	3.15
22	23	24	2.0 x 1.5	60.00	1.00	43.55	42.02	39.92	39.32	3.63	2.70
23	24	25	2.0 x 1.5	60.00	1.00	42.02	40.69	38.59	37.99	3.43	2.70
24	25	26	2.0 x 1.5	50.31	1.00	40.69	40.33	37.99	37.49	2.70	2.84
25	26	27	2.0 x 2.0	41.10	0.90	40.33	40.12	37.01	36.64	3.32	3.48
26	27	12	2.0 x 2.0	11.42	0.90	40.12	39.92	36.26	36.16	3.86	3.76
27	28	15	0.700	12.87	3.50	36.12	35.68	32.81	32.36	3.31	3.32



CONSELHO MUNICIPAL DE MAPUTO

Elementos das Caixas de Visita (Rede Unitária)

Caixa de Visita (-)	Caudal da Caixa (l/s)	Cota Terreno (m)	Cota Soleira (m)	Profundidade Escavação (m)	Altura da queda máx. (m)
1	0.00	49.27	45.61	3.66	0.00
2	0.00	48.90	45.31	3.59	0.00
3	0.00	48.22	44.89	3.33	0.00
4	0.00	48.06	44.06	4.00	0.53
5	0.00	47.93	43.81	4.12	0.00
6	0.00	46.80	43.55	3.25	0.00
7	0.00	46.05	42.29	3.76	1.00
8	0.00	44.51	40.94	3.57	0.82
9	0.00	43.28	39.48	3.80	1.00
10	0.00	41.47	37.82	3.65	1.00
11	0.00	40.23	36.29	3.94	1.00
12	0.00	39.92	35.16	4.76	1.00
13	0.00	38.56	33.89	4.67	1.00
14	0.00	36.91	32.60	4.31	1.00
15	0.00	35.68	31.36	4.32	1.00
16	0.00	34.63	30.15	4.48	1.00
17	0.00	33.54	28.93	4.61	1.00
18	0.00	32.16	28.50	3.66	0.00
19	0.00	32.23	28.05	4.18	0.00
20	0.00	29.40	27.75	1.65	0.00
BL	0.00	30.54	27.41	3.13	0.00
22	0.00	44.44	40.40	4.04	0.00
23	0.00	43.55	39.32	4.23	0.44
24	0.00	42.02	37.99	4.03	0.73
25	0.00	40.69	37.49	3.20	0.00
26	0.00	40.33	36.64	3.69	0.48
27	0.00	40.12	36.16	3.96	0.38
28	0.00	36.12	32.36	3.76	0.00



CONSELHO MUNICIPAL DE MAPUTO

CHAMANCULO B – RUA DA UFA

Critérios de Dimensionamento (Rede Pluvial)

Material da vala (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D [T=5 anos] (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)	Rácio de escavação (-)
Betão	75	1	125	40.63	-

Tipo de Canal (-)	Velocidade mínima [T=2] (m/s)	Velocidade máxima [T=2] (m/s)	Inclinação mínima (-)	Inclinação máxima (-)
Vala coberta	0.9	5.0	0.0030	0.1500
Box Culvert		5.0		

Período de Retorno (anos)	Parâmetros das Curvas IDF	
	a	b
2	614.15	-0.61
5	798.68	-0.59



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=2 anos

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	16.60	0.44	3.22	0.000	1.418	309.57	439.03
2	3.75	16.72	1.00	0.00	1.418	0.000	308.23	437.13
3	6.25	16.76	1.00	0.00	1.418	0.000	307.73	436.42
4	10.00	16.84	1.00	0.00	1.418	0.000	306.90	435.24
5	10.00	16.96	1.00	0.00	1.418	0.000	305.58	433.37
6	10.00	17.08	1.00	0.00	1.418	0.000	304.28	431.53
7	10.00	17.20	1.00	0.00	1.418	0.000	302.99	429.70
8	6.23	17.32	1.00	0.00	1.418	0.000	301.71	427.89
9	3.77	17.39	1.00	0.00	1.418	0.000	300.92	426.77
10	10.00	17.44	0.35	1.92	1.418	0.673	300.44	628.41
11	10.00	17.55	1.00	0.00	2.092	0.000	299.30	626.03
12	2.12	17.66	1.00	0.00	2.092	0.000	298.17	623.66
13	2.86	17.68	1.00	0.00	2.092	0.000	297.94	623.16
14	5.02	17.71	1.00	0.00	2.092	0.000	297.61	622.49
15	5.89	17.77	1.00	0.00	2.092	0.000	297.05	621.32
16	4.11	17.83	1.00	0.00	2.092	0.000	296.40	619.95
17	10.00	17.88	1.00	0.00	2.092	0.000	295.94	619.00
18	4.68	17.99	1.00	0.00	2.092	0.000	294.84	616.70
19	5.32	18.04	1.00	0.00	2.092	0.000	294.33	615.63
20	10.00	18.10	1.00	0.00	2.092	0.000	293.75	614.42
21	10.00	18.21	1.00	0.00	2.092	0.000	292.67	612.16
22	10.00	18.32	0.26	0.78	2.092	0.202	291.60	668.78
23	10.00	18.38	1.00	0.00	2.293	0.000	291.01	667.42
24	10.00	18.44	1.00	0.00	2.293	0.000	290.41	666.06
25	10.00	18.50	1.00	0.00	2.293	0.000	289.83	664.71
26	10.00	18.56	1.00	0.00	2.293	0.000	289.24	663.36
27	4.99	18.63	1.00	0.00	2.293	0.000	288.66	662.02
28	5.01	18.66	0.51	0.39	2.293	0.200	288.36	719.11
29	10.00	18.69	1.00	0.00	2.494	0.000	288.08	718.40
30	10.00	18.75	1.00	0.00	2.494	0.000	287.52	716.99
31	10.00	18.81	1.00	0.00	2.494	0.000	286.95	715.59
32	10.00	18.87	0.57	0.48	2.494	0.274	286.39	792.79
33	4.99	18.93	1.00	0.00	2.768	0.000	285.85	791.29
34	5.01	18.96	1.00	0.00	2.768	0.000	285.58	790.55
35	10.00	18.99	1.00	0.00	2.768	0.000	285.31	789.80
36	10.00	19.05	1.00	0.00	2.768	0.000	284.77	788.31
37	10.00	19.10	1.00	0.00	2.768	0.000	284.24	786.83
38	10.00	19.16	1.00	0.00	2.768	0.000	283.71	785.36
39	10.00	19.22	1.00	0.00	2.768	0.000	283.18	783.89
40	0.92	19.28	1.00	0.00	2.768	0.000	282.65	782.43
41	9.08	19.29	1.00	0.00	2.768	0.000	282.60	782.29
42	10.00	19.34	1.00	0.00	2.768	0.000	282.12	780.97
43	3.18	19.40	1.00	0.00	2.768	0.000	281.60	779.52



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
44	6.82	19.42	1.00	0.00	2.768	0.000	281.43	779.07
45	10.00	19.46	1.00	0.00	2.768	0.000	281.08	778.08
46	2.21	19.52	1.00	0.00	2.768	0.000	280.56	776.65
47	7.79	19.53	0.33	26.91	2.768	8.935	280.45	3282.18
48	10.00	19.58	1.00	0.00	11.703	0.000	280.04	3277.45
49	0.64	19.64	1.00	0.00	11.703	0.000	279.52	3271.41
50	9.36	19.64	1.00	0.00	11.703	0.000	279.49	3271.02
51	2.00	19.70	1.00	0.00	11.703	0.000	279.01	3265.38
52	8.00	19.71	1.00	0.00	11.703	0.000	278.91	3264.18
53	10.00	19.76	1.00	0.00	11.703	0.000	278.50	3259.39
54	10.00	19.82	1.00	0.00	11.703	0.000	277.99	3253.42
55	10.00	19.88	1.00	0.00	11.703	0.000	277.48	3247.48
56	10.00	19.94	0.37	0.99	11.703	0.366	276.97	3342.82
57	4.87	20.00	1.00	0.00	12.069	0.000	276.48	3336.79
58	5.13	20.02	0.30	0.97	12.069	0.292	276.23	3414.49
59	10.00	20.05	1.00	0.00	12.361	0.000	275.98	3411.36
60	10.00	20.11	1.00	0.00	12.361	0.000	275.49	3405.27
61	10.00	20.17	1.00	0.00	12.361	0.000	275.00	3399.21
62	10.00	20.23	1.00	0.00	12.361	0.000	274.51	3393.18
63	10.00	20.29	1.00	0.00	12.361	0.000	274.02	3387.17
64	10.00	20.35	1.00	0.00	12.361	0.000	273.54	3381.19
65	0.26	20.41	1.00	0.00	12.361	0.000	273.06	3375.23
66	7.09	20.41	1.00	0.00	12.361	0.000	273.04	3375.07
67	2.65	20.45	1.00	0.00	12.361	0.000	272.70	3370.87
68	10.00	20.47	0.36	0.35	12.361	0.128	272.58	3404.09
69	10.00	20.53	1.00	0.00	12.489	0.000	272.10	3398.14
70	10.00	20.59	1.00	0.00	12.489	0.000	271.62	3392.21
71	10.00	20.65	1.00	0.00	12.489	0.000	271.15	3386.31
72	10.00	20.71	1.00	0.00	12.489	0.000	270.68	3380.43
73	3.52	20.76	1.00	0.00	12.489	0.000	270.21	3374.57
74	6.48	20.79	1.00	0.00	12.489	0.000	270.05	3372.52
75	10.00	20.82	1.00	0.00	12.489	0.000	269.75	3368.74
76	10.00	20.88	1.00	0.00	12.489	0.000	269.28	3362.93
77	3.99	20.94	1.00	0.00	12.489	0.000	268.82	3357.15
78	6.01	20.97	1.00	0.00	12.489	0.000	268.63	3354.85
79	10.00	21.00	1.00	0.00	12.489	0.000	268.36	3351.39
80	1.18	21.06	1.00	0.00	12.489	0.000	267.90	3345.66
81	8.82	21.07	1.00	0.00	12.489	0.000	267.84	3344.98
82	10.00	21.12	1.00	0.00	12.489	0.000	267.44	3339.95
83	10.00	21.18	1.00	0.00	12.489	0.000	266.98	3334.26
84	10.00	21.24	1.00	0.00	12.489	0.000	266.53	3328.59
85	10.00	21.30	1.00	0.00	12.489	0.000	266.08	3322.95
86	7.21	21.36	1.00	0.00	12.489	0.000	265.63	3317.33
87	2.79	21.40	0.36	9.00	12.489	3.240	265.31	4172.88

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CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
88	10.00	21.42	1.00	0.00	15.729	0.000	265.19	4171.03
89	10.00	21.47	1.00	0.00	15.729	0.000	264.76	4164.38
90	10.00	21.53	1.00	0.00	15.729	0.000	264.34	4157.76
91	10.00	21.58	1.00	0.00	15.729	0.000	263.92	4151.16
92	10.00	21.64	1.00	0.00	15.729	0.000	263.51	4144.59
93	5.97	21.70	1.00	0.00	15.729	0.000	263.09	4138.04
94	4.03	21.73	1.00	0.00	15.729	0.000	262.84	4134.15
95	10.00	21.75	1.00	0.00	15.729	0.000	262.68	4131.52
96	10.00	21.81	1.00	0.00	15.729	0.000	262.26	4125.02
97	10.00	21.87	1.00	0.00	15.729	0.000	261.85	4118.55
98	0.37	21.92	1.00	0.00	15.729	0.000	261.44	4112.10
99	9.63	21.93	1.00	0.00	15.729	0.000	261.43	4111.87
100	10.00	21.98	1.00	0.00	15.729	0.000	261.06	4106.10
101	10.00	22.03	1.00	0.00	15.729	0.000	260.68	4100.13
102	10.00	22.08	1.00	0.00	15.729	0.000	260.30	4094.18
103	0.37	22.13	1.00	0.00	15.729	0.000	259.93	4088.25
104	9.63	22.14	0.36	0.50	15.729	0.180	259.91	4134.82
105	7.38	22.19	1.00	0.00	15.909	0.000	259.55	4129.08
106	2.62	22.23	1.00	0.00	15.909	0.000	259.27	4124.70
107	10.00	22.24	1.00	0.00	15.909	0.000	259.18	4123.14
108	1.01	22.29	1.00	0.00	15.909	0.000	258.81	4117.23
109	8.99	22.30	0.40	20.26	15.909	8.167	258.77	6229.91
110	10.00	22.34	1.00	0.00	24.075	0.000	258.46	6222.59
111	5.18	22.39	1.00	0.00	24.075	0.000	258.13	6214.47
112	4.82	22.41	1.00	0.00	24.075	0.000	257.95	6210.27
113	10.00	22.44	1.00	0.00	24.075	0.000	257.79	6206.37
114	10.00	22.48	1.00	0.00	24.075	0.000	257.46	6198.30
115	10.00	22.53	1.00	0.00	24.075	0.000	257.12	6190.26
116	7.15	22.58	1.00	0.00	24.075	0.000	256.79	6182.24
117	2.85	22.62	0.56	0.27	24.075	0.149	256.55	6214.80
118	10.00	22.63	1.00	0.00	24.224	0.000	256.46	6212.51
119	10.00	22.68	1.00	0.00	24.224	0.000	256.13	6204.51
120	10.00	22.73	1.00	0.00	24.224	0.000	255.80	6196.52
121	8.72	22.77	1.00	0.00	24.224	0.000	255.47	6188.57
122	1.28	22.82	0.56	0.13	24.224	0.075	255.18	6200.69
123	10.00	22.82	1.00	0.00	24.299	0.000	255.14	6199.67
124	2.63	22.87	1.00	0.00	24.299	0.000	254.81	6191.74

* troços em box-culvert



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=5 anos

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	16.60	0.44	3.22	0.000	1.418	418.34	593.30
2	3.75	16.71	1.00	0.00	1.418	0.000	416.69	590.96
3	6.25	16.75	1.00	0.00	1.418	0.000	416.08	590.08
4	10.00	16.82	1.00	0.00	1.418	0.000	415.06	588.63
5	10.00	16.93	1.00	0.00	1.418	0.000	413.43	586.34
6	10.00	17.04	1.00	0.00	1.418	0.000	411.83	584.06
7	10.00	17.16	1.00	0.00	1.418	0.000	410.24	581.81
8	6.23	17.27	1.00	0.00	1.418	0.000	408.67	579.57
9	3.77	17.34	1.00	0.00	1.418	0.000	407.69	578.19
10	10.00	17.38	0.35	1.92	1.418	0.673	407.10	851.50
11	10.00	17.48	1.00	0.00	2.092	0.000	405.68	848.53
12	2.12	17.58	1.00	0.00	2.092	0.000	404.27	845.58
13	2.86	17.61	1.00	0.00	2.092	0.000	403.98	844.96
14	5.02	17.64	1.00	0.00	2.092	0.000	403.58	844.13
15	5.89	17.69	1.00	0.00	2.092	0.000	402.88	842.66
16	4.11	17.75	1.00	0.00	2.092	0.000	402.06	840.95
17	10.00	17.79	1.00	0.00	2.092	0.000	401.49	839.76
18	4.68	17.89	1.00	0.00	2.092	0.000	400.12	836.89
19	5.32	17.94	1.00	0.00	2.092	0.000	399.48	835.56
20	10.00	18.00	1.00	0.00	2.092	0.000	398.76	834.04
21	10.00	18.10	1.00	0.00	2.092	0.000	397.41	831.22
22	10.00	18.20	0.26	0.78	2.092	0.202	396.07	908.37
23	10.00	18.26	1.00	0.00	2.293	0.000	395.33	906.69
24	10.00	18.32	1.00	0.00	2.293	0.000	394.60	905.01
25	10.00	18.37	1.00	0.00	2.293	0.000	393.88	903.34
26	10.00	18.43	1.00	0.00	2.293	0.000	393.15	901.68
27	4.99	18.49	1.00	0.00	2.293	0.000	392.43	900.03
28	5.01	18.52	0.51	0.39	2.293	0.200	392.07	977.73
29	10.00	18.54	1.00	0.00	2.494	0.000	391.72	976.86
30	10.00	18.60	1.00	0.00	2.494	0.000	391.02	975.11
31	10.00	18.66	1.00	0.00	2.494	0.000	390.33	973.37
32	10.00	18.71	0.57	0.48	2.494	0.274	389.63	1078.58
33	4.99	18.77	1.00	0.00	2.768	0.000	388.96	1076.72
34	5.01	18.79	1.00	0.00	2.768	0.000	388.62	1075.79
35	10.00	18.82	1.00	0.00	2.768	0.000	388.29	1074.86
36	10.00	18.88	1.00	0.00	2.768	0.000	387.62	1073.02
37	10.00	18.93	1.00	0.00	2.768	0.000	386.96	1071.18
38	10.00	18.98	1.00	0.00	2.768	0.000	386.30	1069.34
39	10.00	19.04	1.00	0.00	2.768	0.000	385.64	1067.52
40	0.92	19.09	1.00	0.00	2.768	0.000	384.98	1065.70
41	9.08	19.10	1.00	0.00	2.768	0.000	384.92	1065.54
42	10.00	19.15	1.00	0.00	2.768	0.000	384.33	1063.89
43	3.18	19.20	1.00	0.00	2.768	0.000	383.68	1062.09

Concepção de Planos, Estudos de Engenharia e Projecto
Executivo de Infra-estruturas Integradas em Assentamentos
Informais

NIPPON KOEI MOZAMBIQUE

ENGIDRO
engineering solutions

AGRI.PRO AMBIENTE
AGRICULTURAL ENGINEERING



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
44	6.82	19.22	1.00	0.00	2.768	0.000	383.47	1061.52
45	10.00	19.26	1.00	0.00	2.768	0.000	383.03	1060.30
46	2.21	19.31	1.00	0.00	2.768	0.000	382.38	1058.51
47	7.79	19.32	0.33	26.91	2.768	8.935	382.24	4473.52
48	10.00	19.37	1.00	0.00	11.703	0.000	381.73	4467.59
49	0.64	19.42	1.00	0.00	11.703	0.000	381.09	4460.02
50	9.36	19.43	1.00	0.00	11.703	0.000	381.04	4459.53
51	2.00	19.48	1.00	0.00	11.703	0.000	380.44	4452.47
52	8.00	19.49	1.00	0.00	11.703	0.000	380.31	4450.97
53	10.00	19.53	1.00	0.00	11.703	0.000	379.80	4444.96
54	10.00	19.59	1.00	0.00	11.703	0.000	379.16	4437.48
55	10.00	19.65	1.00	0.00	11.703	0.000	378.52	4430.03
56	10.00	19.70	0.37	0.99	11.703	0.366	377.89	4560.76
57	4.87	19.76	1.00	0.00	12.069	0.000	377.26	4553.19
58	5.13	19.78	0.30	0.97	12.069	0.292	376.96	4659.54
59	10.00	19.81	1.00	0.00	12.361	0.000	376.64	4655.60
60	10.00	19.87	1.00	0.00	12.361	0.000	376.02	4647.95
61	10.00	19.92	1.00	0.00	12.361	0.000	375.40	4640.34
62	10.00	19.98	1.00	0.00	12.361	0.000	374.79	4632.75
63	10.00	20.03	1.00	0.00	12.361	0.000	374.18	4625.19
64	10.00	20.09	1.00	0.00	12.361	0.000	373.57	4617.67
65	0.26	20.14	1.00	0.00	12.361	0.000	372.96	4610.17
66	7.09	20.14	1.00	0.00	12.361	0.000	372.95	4609.98
67	2.65	20.18	1.00	0.00	12.361	0.000	372.52	4604.68
68	10.00	20.20	0.36	0.35	12.361	0.128	372.36	4650.24
69	10.00	20.25	1.00	0.00	12.489	0.000	371.76	4642.74
70	10.00	20.31	1.00	0.00	12.489	0.000	371.16	4635.28
71	10.00	20.36	1.00	0.00	12.489	0.000	370.57	4627.84
72	10.00	20.42	1.00	0.00	12.489	0.000	369.97	4620.43
73	3.52	20.47	1.00	0.00	12.489	0.000	369.38	4613.05
74	6.48	20.49	1.00	0.00	12.489	0.000	369.17	4610.46
75	10.00	20.53	1.00	0.00	12.489	0.000	368.79	4605.70
76	10.00	20.58	1.00	0.00	12.489	0.000	368.21	4598.38
77	3.99	20.64	1.00	0.00	12.489	0.000	367.62	4591.09
78	6.01	20.66	1.00	0.00	12.489	0.000	367.39	4588.19
79	10.00	20.69	1.00	0.00	12.489	0.000	367.04	4583.82
80	1.18	20.75	1.00	0.00	12.489	0.000	366.46	4576.59
81	8.82	20.75	1.00	0.00	12.489	0.000	366.39	4575.74
82	10.00	20.80	1.00	0.00	12.489	0.000	365.88	4569.38
83	10.00	20.86	1.00	0.00	12.489	0.000	365.31	4562.20
84	10.00	20.91	1.00	0.00	12.489	0.000	364.74	4555.05
85	10.00	20.97	1.00	0.00	12.489	0.000	364.17	4547.92
86	7.21	21.02	1.00	0.00	12.489	0.000	363.60	4540.83
87	2.79	21.06	0.36	9.00	12.489	3.240	363.19	5712.46

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CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
88	10.00	21.08	1.00	0.00	15.729	0.000	363.04	5710.10
89	10.00	21.13	1.00	0.00	15.729	0.000	362.50	5701.65
90	10.00	21.18	1.00	0.00	15.729	0.000	361.97	5693.24
91	10.00	21.23	1.00	0.00	15.729	0.000	361.43	5684.85
92	10.00	21.29	1.00	0.00	15.729	0.000	360.90	5676.50
93	5.97	21.34	1.00	0.00	15.729	0.000	360.37	5668.17
94	4.03	21.37	1.00	0.00	15.729	0.000	360.06	5663.22
95	10.00	21.39	1.00	0.00	15.729	0.000	359.85	5659.88
96	10.00	21.45	1.00	0.00	15.729	0.000	359.32	5651.62
97	10.00	21.50	1.00	0.00	15.729	0.000	358.80	5643.38
98	0.37	21.55	1.00	0.00	15.729	0.000	358.28	5635.18
99	9.63	21.55	1.00	0.00	15.729	0.000	358.26	5634.88
100	10.00	21.60	1.00	0.00	15.729	0.000	357.79	5627.55
101	10.00	21.65	1.00	0.00	15.729	0.000	357.31	5619.97
102	10.00	21.70	1.00	0.00	15.729	0.000	356.83	5612.42
103	0.37	21.75	1.00	0.00	15.729	0.000	356.35	5604.89
104	9.63	21.75	0.36	0.50	15.729	0.180	356.33	5668.75
105	7.38	21.80	1.00	0.00	15.909	0.000	355.87	5661.45
106	2.62	21.83	1.00	0.00	15.909	0.000	355.52	5655.88
107	10.00	21.85	1.00	0.00	15.909	0.000	355.40	5653.91
108	1.01	21.89	1.00	0.00	15.909	0.000	354.93	5646.38
109	8.99	21.90	0.40	20.26	15.909	8.167	354.88	8543.81
110	10.00	21.94	1.00	0.00	24.075	0.000	354.49	8534.41
111	5.18	21.99	1.00	0.00	24.075	0.000	354.05	8523.97
112	4.82	22.01	1.00	0.00	24.075	0.000	353.83	8518.58
113	10.00	22.03	1.00	0.00	24.075	0.000	353.62	8513.57
114	10.00	22.08	1.00	0.00	24.075	0.000	353.19	8503.20
115	10.00	22.12	1.00	0.00	24.075	0.000	352.76	8492.86
116	7.15	22.17	1.00	0.00	24.075	0.000	352.33	8482.55
117	2.85	22.20	0.56	0.27	24.075	0.149	352.03	8527.72
118	10.00	22.21	1.00	0.00	24.224	0.000	351.91	8524.77
119	10.00	22.26	1.00	0.00	24.224	0.000	351.48	8514.48
120	10.00	22.30	1.00	0.00	24.224	0.000	351.06	8504.21
121	8.72	22.35	1.00	0.00	24.224	0.000	350.64	8493.98
122	1.28	22.39	0.56	0.13	24.224	0.075	350.27	8511.20
123	10.00	22.39	1.00	0.00	24.299	0.000	350.21	8509.89
124	2.63	22.44	1.00	0.00	24.299	0.000	349.80	8499.69

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* troços em box-culvert



CONSELHO MUNICIPAL DE MAPUTO

Verificação das Condições Hidráulicas do Escoamento (Rede Pluvial), T=2 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
1	1	2	0.800	1.100	90.0	439.03	1.40	0.393	5.83	0.20
2	2	3	0.800	1.140	90.0	437.13	1.40	0.392	5.82	0.20
3	3	4	0.800	1.171	90.0	436.42	1.39	0.391	5.82	0.20
4	4	5	0.800	1.204	90.0	435.24	1.39	0.390	5.81	0.20
5	5	6	0.800	1.256	90.0	433.37	1.39	0.389	5.80	0.20
6	6	7	0.800	1.308	90.0	431.53	1.39	0.388	5.80	0.20
7	7	8	0.800	1.360	90.0	429.70	1.39	0.387	5.79	0.20
8	8	9	0.800	1.412	90.0	427.89	1.39	0.385	5.78	0.20
9	9	10	0.800	1.439	90.0	426.77	1.39	0.385	5.77	0.20
10	10	11	0.800	1.463	90.0	628.41	1.52	0.516	6.63	0.20
11	11	12	0.800	1.515	90.0	626.03	1.52	0.515	6.62	0.20
12	12	13	0.800	1.506	90.0	623.66	1.52	0.513	6.62	0.20
13	13	14	0.800	1.485	90.0	623.16	1.52	0.513	6.61	0.20
14	14	15	0.800	1.455	90.0	622.49	1.52	0.512	6.61	0.20
15	15	16	0.800	1.418	90.0	621.32	1.52	0.512	6.61	0.20
16	16	17	0.800	1.388	90.0	619.95	1.52	0.511	6.60	0.20
17	17	18	0.800	1.321	90.0	619.00	1.52	0.510	6.60	0.20
18	18	19	0.800	1.284	90.0	616.70	1.52	0.509	6.59	0.20
19	19	20	0.800	1.254	90.0	615.63	1.51	0.508	6.59	0.20
20	20	21	0.800	1.188	90.0	614.42	1.51	0.507	6.58	0.20
21	21	22	0.800	1.121	90.0	612.16	1.51	0.506	6.57	0.20
22	22	23	0.800	1.121	90.0	668.78	2.70	0.309	22.77	0.20
23	23	24	0.800	1.157	90.0	667.42	2.70	0.309	22.75	0.20
24	24	25	0.800	1.193	90.0	666.06	2.70	0.309	22.73	0.26
25	25	26	0.800	1.229	90.0	664.71	2.70	0.308	22.71	0.35
26	26	27	0.800	1.265	90.0	663.36	2.70	0.308	22.69	0.80
27	27	28	0.800	1.300	90.0	662.02	2.69	0.307	22.67	0.80
28	28	29	0.800	1.312	90.0	719.11	2.76	0.326	23.45	0.80
29	29	30	0.800	1.327	90.0	718.40	2.75	0.326	23.44	1.20
30	30	31	0.800	1.347	90.0	716.99	2.75	0.326	23.42	1.20
31	31	32	0.800	1.365	90.0	715.59	2.75	0.325	23.40	1.20
32	32	33	0.800	1.383	90.0	792.79	2.83	0.351	24.38	1.20
33	33	34	0.800	1.401	90.0	791.29	2.83	0.350	24.36	1.20
34	34	35	0.800	1.407	90.0	790.55	2.83	0.350	24.35	1.20
35	35	36	0.800	1.419	90.0	789.80	2.82	0.350	24.34	3.58
36	36	37	0.800	1.437	90.0	788.31	2.82	0.349	24.33	3.58
37	37	38	0.800	1.456	90.0	786.83	2.82	0.349	24.31	2.39
38	38	39	0.800	1.474	90.0	785.36	2.82	0.348	24.29	2.39
39	39	40	0.800	1.492	90.0	783.89	2.82	0.348	24.27	2.39
40	40	41	0.800	1.510	90.0	782.43	2.82	0.347	24.25	2.39
41	41	42	0.800	1.511	90.0	782.29	2.82	0.347	24.25	2.39
42	42	43	0.800	1.528	90.0	780.97	2.82	0.347	24.24	0.93



CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
43	43	44	0.800	1.546	90.0	779.52	2.81	0.346	24.22	0.93
44	44	45	0.800	1.547	90.0	779.07	2.81	0.346	24.21	0.93
45	45	46	0.800	1.564	90.0	778.08	2.81	0.346	24.20	0.50
46	46	47	0.800	1.582	90.0	776.65	2.81	0.345	24.18	0.50
47	47	48	1.500	1.577	90.0	3282.18	2.80	0.782	18.78	0.50
48	48	49	1.500	1.577	90.0	3277.45	2.80	0.782	18.77	0.50
49	49	50	1.500	1.638	90.0	3271.41	2.79	0.780	18.76	0.30
50	50	51	1.500	1.642	90.0	3271.02	2.79	0.780	18.76	0.30
51	51	52	1.500	1.703	90.0	3265.38	2.79	0.779	18.75	0.30
52	52	53	1.500	1.716	90.0	3264.18	2.79	0.779	18.74	0.30
53	53	54	1.500	1.768	90.0	3259.39	2.79	0.778	18.73	0.30
54	54	55	1.500	1.833	90.0	3253.42	2.79	0.777	18.72	0.30
55	55	56	1.500	1.898	90.0	3247.48	2.79	0.776	18.71	0.30
56	56	57	1.500	1.963	90.0	3342.82	2.81	0.793	18.91	0.30
57	57	58	1.500	2.028	90.0	3336.79	2.81	0.792	18.90	0.30
58	58	59	1.500	2.063	90.0	3414.49	2.82	0.806	19.06	0.30
59	59	60	1.500	2.092	90.0	3411.36	2.82	0.806	19.05	0.35
60	60	61	1.500	2.157	90.0	3405.27	2.82	0.804	19.04	0.35
61	61	62	1.500	2.222	90.0	3399.21	2.82	0.803	19.03	0.35
62	62	63	1.500	2.287	90.0	3393.18	2.82	0.802	19.01	0.35
63	63	64	1.500	2.349	90.0	3387.17	2.82	0.801	19.00	0.35
64	64	65	1.500	2.403	90.0	3381.19	2.82	0.800	18.99	0.35
65	65	66	1.500	2.450	90.0	3375.23	2.82	0.799	18.98	0.35
66	66	67	1.500	2.450	90.0	3375.07	2.82	0.799	18.98	0.35
67	67	68	1.500	2.476	90.0	3370.87	2.81	0.798	18.97	0.35
68	68	69	1.500	2.489	90.0	3404.09	2.82	0.804	19.04	0.35
69	69	70	1.500	2.521	90.0	3398.14	2.82	0.803	19.02	0.35
70	70	71	1.500	2.546	90.0	3392.21	2.82	0.802	19.01	0.35
71	71	72	1.500	2.563	90.0	3386.31	2.82	0.801	19.00	0.35
72	72	73	1.500	2.573	90.0	3380.43	2.82	0.800	18.99	0.35
73	73	74	1.500	2.576	90.0	3374.57	2.82	0.799	18.98	0.35
74	74	75	1.500	2.571	90.0	3372.52	2.82	0.799	18.97	0.35
75	75	76	1.500	2.559	90.0	3368.74	2.81	0.798	18.96	0.35
76	76	77	1.500	2.539	90.0	3362.93	2.81	0.797	18.95	0.35
77	77	78	1.500	2.529	90.0	3357.15	2.81	0.796	18.94	0.30
78	78	79	1.500	2.512	90.0	3354.85	2.81	0.795	18.93	0.30
79	79	80	1.500	2.478	90.0	3351.39	2.81	0.795	18.93	0.30
80	80	81	1.500	2.475	90.0	3345.66	2.81	0.794	18.92	0.30
81	81	82	1.500	2.436	90.0	3344.98	2.81	0.794	18.91	0.30
82	82	83	1.500	2.388	90.0	3339.95	2.81	0.793	18.90	0.30
83	83	84	1.500	2.339	90.0	3334.26	2.81	0.792	18.89	0.55
84	84	85	1.500	2.289	90.0	3328.59	2.81	0.791	18.88	0.55
85	85	86	1.500	2.240	90.0	3322.95	2.81	0.790	18.87	0.55

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CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
86	86	87	1.500	2.205	90.0	3317.33	2.80	0.789	18.86	0.55
87	87	88	1.500	2.190	90.0	4172.88	2.96	0.940	20.46	0.55
88	88	89	1.500	2.140	90.0	4171.03	2.96	0.939	20.46	0.55
89	89	90	1.500	2.092	90.0	4164.38	2.96	0.938	20.44	0.55
90	90	91	1.500	2.092	90.0	4157.76	2.96	0.937	20.43	0.60
91	91	92	1.500	2.123	90.0	4151.16	2.96	0.936	20.42	0.60
92	92	93	1.500	2.210	90.0	4144.59	2.96	0.935	20.41	0.60
93	93	94	1.500	2.297	90.0	4138.04	2.95	0.934	20.40	0.50
94	94	95	1.500	2.349	90.0	4134.15	2.95	0.933	20.39	0.50
95	95	96	1.500	2.385	90.0	4131.52	2.95	0.932	20.39	0.50
96	96	97	1.500	2.472	90.0	4125.02	2.95	0.931	20.38	0.50
97	97	98	1.500	2.559	90.0	4118.55	2.95	0.930	20.37	0.50
98	98	99	1.500	2.646	90.0	4112.10	2.95	0.929	20.36	0.50
99	99	100	1.500	2.651	90.0	4111.87	3.16	0.866	23.66	0.50
100	100	101	1.500	2.743	90.0	4106.10	3.16	0.865	23.65	0.50
101	101	102	1.500	2.840	90.0	4100.13	3.16	0.864	23.64	0.50
102	102	103	1.500	2.938	90.0	4094.18	3.16	0.863	23.62	0.50
103	103	104	1.500	3.035	90.0	4088.25	3.16	0.862	23.61	0.50
104	104	105	1.500	3.041	90.0	4134.82	3.17	0.870	23.71	0.50
105	105	106	1.500	3.132	90.0	4129.08	3.17	0.869	23.70	0.50
106	106	107	1.500	3.203	90.0	4124.70	3.17	0.868	23.69	0.50
107	107	108	1.500	3.229	90.0	4123.14	3.17	0.868	23.68	0.50
108	108	109	1.500	3.326	90.0	4117.23	3.17	0.867	23.67	0.50
109	109	110	1.500	3.335	90.0	6229.91	3.47	1.198	27.15	0.50
110	110	111	1.500	3.924	90.0	6222.59	3.47	1.197	27.14	0.50
111	111	112	1.500	4.021	90.0	6214.47	3.47	1.195	27.12	0.50
112	112	113	1.500	4.070	90.0	6210.27	3.47	1.195	27.12	1.10
113	113	114	1.500	4.118	90.0	6206.37	3.47	1.194	27.11	1.10
114	114	115	1.500	4.215	90.0	6198.30	3.46	1.193	27.10	1.10
115	115	116	1.500	4.312	90.0	6190.26	3.46	1.192	27.09	1.10
116	116	117	1.500	4.410	90.0	6182.24	3.46	1.190	27.08	1.10
117	117	118	1.500	4.471	90.0	6214.80	3.47	1.195	27.13	1.10
118	118	119	1.500	4.499	90.0	6212.51	3.47	1.195	27.12	1.10
119	119	120	1.500	4.389	90.0	6204.51	3.46	1.194	27.11	1.10
120	120	121	1.500	4.029	90.0	6196.52	3.46	1.193	27.10	1.10
121	121	122	1.500	3.881	90.0	6188.57	3.46	1.191	27.09	1.10
122	122	123	1.500	3.879	90.0	6200.69	3.46	1.193	27.11	1.10
123	123	124	1.500	3.859	90.0	6199.67	3.46	1.193	27.11	1.10
124	124	125	1.500	3.814	90.0	6191.74	3.46	1.192	27.09	1.10

* troços em box-culvert



CONSELHO MUNICIPAL DE MAPUTO

Verificação das Condições Hidráulicas do Escoamento (Rede Pluvial), T=5 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
1	1	2	0.800	1.100	90.0	593.30	1.50	0.494	6.50	0.20
2	2	3	0.800	1.140	90.0	590.96	1.50	0.492	6.49	0.20
3	3	4	0.800	1.171	90.0	590.08	1.50	0.492	6.49	0.20
4	4	5	0.800	1.204	90.0	588.63	1.50	0.491	6.49	0.20
5	5	6	0.800	1.256	90.0	586.34	1.50	0.489	6.48	0.20
6	6	7	0.800	1.308	90.0	584.06	1.50	0.488	6.47	0.20
7	7	8	0.800	1.360	90.0	581.81	1.50	0.486	6.46	0.20
8	8	9	0.800	1.412	90.0	579.57	1.49	0.485	6.45	0.20
9	9	10	0.800	1.439	90.0	578.19	1.49	0.484	6.45	0.20
10	10	11	0.800	1.463	90.0	851.50	1.62	0.656	7.31	0.20
11	11	12	0.800	1.515	90.0	848.53	1.62	0.654	7.30	0.20
12	12	13	0.800	1.506	90.0	845.58	1.62	0.652	7.30	0.20
13	13	14	0.800	1.485	90.0	844.96	1.62	0.652	7.29	0.20
14	14	15	0.800	1.455	90.0	844.13	1.62	0.651	7.29	0.20
15	15	16	0.800	1.418	90.0	842.66	1.62	0.650	7.29	0.20
16	16	17	0.800	1.388	90.0	840.95	1.62	0.649	7.28	0.20
17	17	18	0.800	1.321	90.0	839.76	1.62	0.648	7.28	0.20
18	18	19	0.800	1.284	90.0	836.89	1.62	0.647	7.27	0.20
19	19	20	0.800	1.254	90.0	835.56	1.62	0.646	7.27	0.20
20	20	21	0.800	1.188	90.0	834.04	1.62	0.645	7.27	0.20
21	21	22	0.800	1.121	90.0	831.22	1.62	0.643	7.26	0.20
22	22	23	0.800	1.121	90.0	908.37	2.93	0.388	25.70	0.20
23	23	24	0.800	1.157	90.0	906.69	2.93	0.387	25.68	0.20
24	24	25	0.800	1.193	90.0	905.01	2.93	0.387	25.66	0.26
25	25	26	0.800	1.229	90.0	903.34	2.92	0.386	25.64	0.35
26	26	27	0.800	1.265	90.0	901.68	2.92	0.386	25.62	0.80
27	27	28	0.800	1.300	90.0	900.03	2.92	0.385	25.61	0.80
28	28	29	0.800	1.312	90.0	977.73	2.98	0.410	26.42	0.80
29	29	30	0.800	1.327	90.0	976.86	2.98	0.410	26.41	1.20
30	30	31	0.800	1.347	90.0	975.11	2.98	0.409	26.39	1.20
31	31	32	0.800	1.365	90.0	973.37	2.98	0.408	26.37	1.20
32	32	33	0.800	1.383	90.0	1078.58	3.05	0.441	27.38	1.20
33	33	34	0.800	1.401	90.0	1076.72	3.05	0.441	27.37	1.20
34	34	35	0.800	1.407	90.0	1075.79	3.05	0.440	27.36	1.20
35	35	36	0.800	1.419	90.0	1074.86	3.05	0.440	27.35	3.58
36	36	37	0.800	1.437	90.0	1073.02	3.05	0.440	27.33	3.58
37	37	38	0.800	1.456	90.0	1071.18	3.05	0.439	27.31	2.39
38	38	39	0.800	1.474	90.0	1069.34	3.05	0.438	27.30	2.39
39	39	40	0.800	1.492	90.0	1067.52	3.05	0.438	27.28	2.39
40	40	41	0.800	1.510	90.0	1065.70	3.05	0.437	27.26	2.39
41	41	42	0.800	1.511	90.0	1065.54	3.05	0.437	27.26	2.39
42	42	43	0.800	1.528	90.0	1063.89	3.04	0.437	27.25	0.93



CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
43	43	44	0.800	1.546	90.0	1062.09	3.04	0.436	27.23	0.93
44	44	45	0.800	1.547	90.0	1061.52	3.04	0.436	27.23	0.93
45	45	46	0.800	1.564	90.0	1060.30	3.04	0.436	27.21	0.50
46	46	47	0.800	1.582	90.0	1058.51	3.04	0.435	27.20	0.50
47	47	48	1.500	1.577	90.0	4473.52	3.01	0.992	20.95	0.50
48	48	49	1.500	1.577	90.0	4467.59	3.01	0.991	20.94	0.50
49	49	50	1.500	1.638	90.0	4460.02	3.01	0.989	20.92	0.30
50	50	51	1.500	1.642	90.0	4459.53	3.01	0.989	20.92	0.30
51	51	52	1.500	1.703	90.0	4452.47	3.00	0.988	20.91	0.30
52	52	53	1.500	1.716	90.0	4450.97	3.00	0.988	20.91	0.30
53	53	54	1.500	1.768	90.0	4444.96	3.00	0.987	20.90	0.30
54	54	55	1.500	1.833	90.0	4437.48	3.00	0.985	20.89	0.30
55	55	56	1.500	1.898	90.0	4430.03	3.00	0.984	20.88	0.30
56	56	57	1.500	1.963	90.0	4560.76	3.02	1.007	21.08	0.30
57	57	58	1.500	2.028	90.0	4553.19	3.02	1.005	21.07	0.30
58	58	59	1.500	2.063	90.0	4659.54	3.03	1.024	21.23	0.30
59	59	60	1.500	2.092	90.0	4655.60	3.03	1.023	21.23	0.35
60	60	61	1.500	2.157	90.0	4647.95	3.03	1.022	21.21	0.35
61	61	62	1.500	2.222	90.0	4640.34	3.03	1.020	21.20	0.35
62	62	63	1.500	2.287	90.0	4632.75	3.03	1.019	21.19	0.35
63	63	64	1.500	2.349	90.0	4625.19	3.03	1.018	21.18	0.35
64	64	65	1.500	2.403	90.0	4617.67	3.03	1.016	21.17	0.35
65	65	66	1.500	2.450	90.0	4610.17	3.03	1.015	21.16	0.35
66	66	67	1.500	2.450	90.0	4609.98	3.03	1.015	21.16	0.35
67	67	68	1.500	2.476	90.0	4604.68	3.03	1.014	21.15	0.35
68	68	69	1.500	2.489	90.0	4650.24	3.03	1.022	21.22	0.35
69	69	70	1.500	2.521	90.0	4642.74	3.03	1.021	21.21	0.35
70	70	71	1.500	2.546	90.0	4635.28	3.03	1.019	21.19	0.35
71	71	72	1.500	2.563	90.0	4627.84	3.03	1.018	21.18	0.35
72	72	73	1.500	2.573	90.0	4620.43	3.03	1.017	21.17	0.35
73	73	74	1.500	2.576	90.0	4613.05	3.03	1.016	21.16	0.35
74	74	75	1.500	2.571	90.0	4610.46	3.03	1.015	21.16	0.35
75	75	76	1.500	2.559	90.0	4605.70	3.03	1.014	21.15	0.35
76	76	77	1.500	2.539	90.0	4598.38	3.03	1.013	21.14	0.35
77	77	78	1.500	2.529	90.0	4591.09	3.02	1.012	21.13	0.30
78	78	79	1.500	2.512	90.0	4588.19	3.02	1.011	21.12	0.30
79	79	80	1.500	2.478	90.0	4583.82	3.02	1.011	21.12	0.30
80	80	81	1.500	2.475	90.0	4576.59	3.02	1.009	21.11	0.30
81	81	82	1.500	2.436	90.0	4575.74	3.02	1.009	21.10	0.30
82	82	83	1.500	2.388	90.0	4569.38	3.02	1.008	21.09	0.30
83	83	84	1.500	2.339	90.0	4562.20	3.02	1.007	21.08	0.55
84	84	85	1.500	2.289	90.0	4555.05	3.02	1.006	21.07	0.55
85	85	86	1.500	2.240	90.0	4547.92	3.02	1.004	21.06	0.55

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CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
86	86	87	1.500	2.205	90.0	4540.83	3.02	1.003	21.05	0.55
87	87	88	1.500	2.190	90.0	5712.46	3.17	1.202	22.65	0.55
88	88	89	1.500	2.140	90.0	5710.10	3.17	1.201	22.65	0.55
89	89	90	1.500	2.092	90.0	5701.65	3.17	1.200	22.64	0.55
90	90	91	1.500	2.092	90.0	5693.24	3.17	1.199	22.63	0.60
91	91	92	1.500	2.123	90.0	5684.85	3.17	1.197	22.62	0.60
92	92	93	1.500	2.210	90.0	5676.50	3.16	1.196	22.61	0.60
93	93	94	1.500	2.297	90.0	5668.17	3.16	1.194	22.60	0.50
94	94	95	1.500	2.349	90.0	5663.22	3.16	1.194	22.59	0.50
95	95	96	1.500	2.385	90.0	5659.88	3.16	1.193	22.59	0.50
96	96	97	1.500	2.472	90.0	5651.62	3.16	1.192	22.58	0.50
97	97	98	1.500	2.559	90.0	5643.38	3.16	1.190	22.57	0.50
98	98	99	1.500	2.646	90.0	5635.18	3.16	1.189	22.56	0.50
99	99	100	1.500	2.651	90.0	5634.88	3.40	1.106	26.31	0.50
100	100	101	1.500	2.743	90.0	5627.55	3.40	1.105	26.30	0.50
101	101	102	1.500	2.840	90.0	5619.97	3.39	1.104	26.29	0.50
102	102	103	1.500	2.938	90.0	5612.42	3.39	1.103	26.27	0.50
103	103	104	1.500	3.035	90.0	5604.89	3.39	1.101	26.26	0.50
104	104	105	1.500	3.041	90.0	5668.75	3.40	1.111	26.36	0.50
105	105	106	1.500	3.132	90.0	5661.45	3.40	1.110	26.35	0.50
106	106	107	1.500	3.203	90.0	5655.88	3.40	1.109	26.34	0.50
107	107	108	1.500	3.229	90.0	5653.91	3.40	1.109	26.34	0.50
108	108	109	1.500	3.326	90.0	5646.38	3.40	1.108	26.32	0.50
109	109	110	1.500	3.335	90.0	8543.81	3.68	1.546	29.72	0.50
110	110	111	1.500	3.924	90.0	8534.41	3.68	1.545	29.72	0.50
111	111	112	1.500	4.021	90.0	8523.97	3.68	1.543	29.71	0.50
112	112	113	1.500	4.070	90.0	8518.58	3.68	1.542	29.70	1.10
113	113	114	1.500	4.118	90.0	8513.57	3.68	1.542	29.70	1.10
114	114	115	1.500	4.215	90.0	8503.20	3.68	1.540	29.69	1.10
115	115	116	1.500	4.312	90.0	8492.86	3.68	1.538	29.68	1.10
116	116	117	1.500	4.410	90.0	8482.55	3.68	1.537	29.67	1.10
117	117	118	1.500	4.471	90.0	8527.72	3.68	1.544	29.71	1.10
118	118	119	1.500	4.499	90.0	8524.77	3.68	1.543	29.71	1.10
119	119	120	1.500	4.389	90.0	8514.48	3.68	1.542	29.70	1.10
120	120	121	1.500	4.029	90.0	8504.21	3.68	1.540	29.69	1.10
121	121	122	1.500	3.881	90.0	8493.98	3.68	1.539	29.68	1.10
122	122	123	1.500	3.879	90.0	8511.20	3.68	1.541	29.69	1.10
123	123	124	1.500	3.859	90.0	8509.89	3.68	1.541	29.69	1.10
124	124	125	1.500	3.814	90.0	8499.69	3.68	1.539	29.68	1.10

* troços em box-culvert



CONSELHO MUNICIPAL DE MAPUTO

Elementos do Perfil Longitudinal (Rede Unitária)

Vala (troço)	Perfil	Jus. (-)	Larg. (m)	Compr. (m)	Inclin. Troço (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
	Mont. (-)					Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	
1	1	2	0.80	10.00	0.20	48.56	48.57	47.46	47.43	1.10	1.14
2	2	3	0.80	3.75	0.20	48.57	48.59	47.43	47.42	1.14	1.17
3	3	4	0.80	6.25	0.20	48.59	48.60	47.42	47.40	1.17	1.20
4	4	5	0.80	10.00	0.20	48.60	48.63	47.40	47.37	1.20	1.26
5	5	6	0.80	10.00	0.20	48.63	48.65	47.37	47.34	1.26	1.31
6	6	7	0.80	10.00	0.20	48.65	48.67	47.34	47.31	1.31	1.36
7	7	8	0.80	10.00	0.20	48.67	48.69	47.31	47.28	1.36	1.41
8	8	9	0.80	6.23	0.20	48.69	48.70	47.28	47.26	1.41	1.44
9	9	10	0.80	3.77	0.20	48.70	48.71	47.26	47.25	1.44	1.46
10	10	11	0.80	10.00	0.20	48.71	48.74	47.25	47.22	1.46	1.52
11	11	12	0.80	10.00	0.20	48.74	48.71	47.22	47.19	1.52	1.52
12	12	13	0.80	2.12	0.20	48.71	48.69	47.19	47.18	1.52	1.51
13	13	14	0.80	2.86	0.20	48.69	48.66	47.18	47.18	1.51	1.48
14	14	15	0.80	5.02	0.20	48.66	48.61	47.18	47.16	1.48	1.45
15	15	16	0.80	5.89	0.20	48.61	48.56	47.16	47.14	1.45	1.42
16	16	17	0.80	4.11	0.20	48.56	48.52	47.14	47.13	1.42	1.39
17	17	18	0.80	10.00	0.20	48.52	48.42	47.13	47.10	1.39	1.32
18	18	19	0.80	4.68	0.20	48.42	48.37	47.10	47.09	1.32	1.28
19	19	20	0.80	5.32	0.20	48.37	48.32	47.09	47.07	1.28	1.25
20	20	21	0.80	10.00	0.20	48.32	48.23	47.07	47.04	1.25	1.19
21	21	22	0.80	10.00	0.20	48.23	48.13	47.04	47.01	1.19	1.12
22	22	23	0.80	10.00	0.20	48.13	48.03	47.01	46.88	1.12	1.16
23	23	24	0.80	10.00	0.20	48.03	47.94	46.88	46.74	1.16	1.19
24	24	25	0.80	10.00	0.26	47.94	47.84	46.74	46.61	1.19	1.23
25	25	26	0.80	10.00	0.35	47.84	47.74	46.61	46.48	1.23	1.27
26	26	27	0.80	10.00	0.80	47.74	47.64	46.48	46.34	1.27	1.30
27	27	28	0.80	4.99	0.80	47.64	47.59	46.34	46.28	1.30	1.31
28	28	29	0.80	5.01	0.80	47.59	47.54	46.28	46.21	1.31	1.33
29	29	30	0.80	10.00	1.20	47.54	47.43	46.21	46.08	1.33	1.35
30	30	31	0.80	10.00	1.20	47.43	47.31	46.08	45.95	1.35	1.37
31	31	32	0.80	10.00	1.20	47.31	47.20	45.95	45.81	1.37	1.38
32	32	33	0.80	10.00	1.20	47.20	47.08	45.81	45.68	1.38	1.40
33	33	34	0.80	4.99	1.20	47.08	47.02	45.68	45.61	1.40	1.41
34	34	35	0.80	5.01	1.20	47.02	46.97	45.61	45.55	1.41	1.42
35	35	36	0.80	10.00	3.58	46.97	46.85	45.55	45.41	1.42	1.44
36	36	37	0.80	10.00	3.58	46.85	46.74	45.41	45.28	1.44	1.46
37	37	38	0.80	10.00	2.39	46.74	46.62	45.28	45.15	1.46	1.47
38	38	39	0.80	10.00	2.39	46.62	46.51	45.15	45.01	1.47	1.49
39	39	40	0.80	10.00	2.39	46.51	46.39	45.01	44.88	1.49	1.51
40	40	41	0.80	0.92	2.39	46.39	46.38	44.88	44.87	1.51	1.51
41	41	42	0.80	9.08	2.39	46.38	46.28	44.87	44.75	1.51	1.53
42	42	43	0.80	10.00	0.93	46.28	46.16	44.75	44.62	1.53	1.55



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Perfil Mont.	Jus.	Larg.	Compr.	Inclin. Troço	Cota Terreno		Cota Soleira		Prof. Escav.	
	(-)	(-)	(m)	(m)	(%)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
43	43	44	0.80	3.18	0.93	46.16	46.12	44.62	44.57	1.55	1.55
44	44	45	0.80	6.82	0.93	46.12	46.05	44.57	44.48	1.55	1.56
45	45	46	0.80	10.00	0.50	46.05	45.93	44.48	44.35	1.56	1.58
46	46	47	0.80	2.21	0.50	45.93	45.91	44.35	44.32	1.58	1.59
47	47	48	1.50	7.79	0.50	45.91	45.86	44.32	44.28	1.59	1.58
48	48	49	1.50	10.00	0.50	45.86	45.87	44.28	44.23	1.58	1.64
49	49	50	1.50	0.64	0.30	45.87	45.87	44.23	44.23	1.64	1.64
50	50	51	1.50	9.36	0.30	45.87	45.88	44.23	44.18	1.64	1.70
51	51	52	1.50	2.00	0.30	45.88	45.89	44.18	44.17	1.70	1.72
52	52	53	1.50	8.00	0.30	45.89	45.90	44.17	44.13	1.72	1.77
53	53	54	1.50	10.00	0.30	45.90	45.91	44.13	44.08	1.77	1.83
54	54	55	1.50	10.00	0.30	45.91	45.93	44.08	44.03	1.83	1.90
55	55	56	1.50	10.00	0.30	45.93	45.94	44.03	43.98	1.90	1.96
56	56	57	1.50	10.00	0.30	45.94	45.96	43.98	43.93	1.96	2.03
57	57	58	1.50	4.87	0.30	45.96	45.97	43.93	43.91	2.03	2.06
58	58	59	1.50	5.13	0.30	45.97	45.97	43.91	43.88	2.06	2.09
59	59	60	1.50	10.00	0.35	45.97	45.99	43.88	43.83	2.09	2.16
60	60	61	1.50	10.00	0.35	45.99	46.00	43.83	43.78	2.16	2.22
61	61	62	1.50	10.00	0.35	46.00	46.02	43.78	43.73	2.22	2.29
62	62	63	1.50	10.00	0.35	46.02	46.03	43.73	43.68	2.29	2.35
63	63	64	1.50	10.00	0.35	46.03	46.03	43.68	43.63	2.35	2.40
64	64	65	1.50	10.00	0.35	46.03	46.03	43.63	43.58	2.40	2.45
65	65	66	1.50	0.26	0.35	46.03	46.03	43.58	43.58	2.45	2.45
66	66	67	1.50	7.09	0.35	46.03	46.02	43.58	43.54	2.45	2.48
67	67	68	1.50	2.65	0.35	46.02	46.02	43.54	43.53	2.48	2.49
68	68	69	1.50	10.00	0.35	46.02	46.00	43.53	43.48	2.49	2.52
69	69	70	1.50	10.00	0.35	46.00	45.98	43.48	43.43	2.52	2.55
70	70	71	1.50	10.00	0.35	45.98	45.94	43.43	43.38	2.55	2.56
71	71	72	1.50	10.00	0.35	45.94	45.90	43.38	43.33	2.56	2.57
72	72	73	1.50	10.00	0.35	45.90	45.86	43.33	43.28	2.57	2.58
73	73	74	1.50	3.52	0.35	45.86	45.84	43.28	43.26	2.58	2.58
74	74	75	1.50	6.48	0.35	45.84	45.80	43.26	43.23	2.58	2.57
75	75	76	1.50	10.00	0.35	45.80	45.74	43.23	43.18	2.57	2.56
76	76	77	1.50	10.00	0.35	45.74	45.67	43.18	43.13	2.56	2.54
77	77	78	1.50	3.99	0.30	45.67	45.64	43.13	43.11	2.54	2.53
78	78	79	1.50	6.01	0.30	45.64	45.59	43.11	43.08	2.53	2.51
79	79	80	1.50	10.00	0.30	45.59	45.51	43.08	43.03	2.51	2.48
80	80	81	1.50	1.18	0.30	45.51	45.50	43.03	43.03	2.48	2.47
81	81	82	1.50	8.82	0.30	45.50	45.42	43.03	42.98	2.47	2.44
82	82	83	1.50	10.00	0.30	45.42	45.32	42.98	42.93	2.44	2.39
83	83	84	1.50	10.00	0.55	45.32	45.22	42.93	42.88	2.39	2.34
84	84	85	1.50	10.00	0.55	45.22	45.12	42.88	42.83	2.34	2.29
85	85	86	1.50	10.00	0.55	45.12	45.02	42.83	42.78	2.29	2.24

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CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Perfil Mont.	Jus.	Larg.	Compr.	Inclin. Troço	Cota Terreno		Cota Soleira		Prof. Escav.	
	(-)	(-)	(m)	(m)	(%)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
86	86	87	1.50	7.21	0.55	45.02	44.95	42.78	42.75	2.24	2.20
87	87	88	1.50	2.79	0.55	44.95	44.92	42.75	42.73	2.20	2.19
88	88	89	1.50	10.00	0.55	44.92	44.82	42.73	42.68	2.19	2.14
89	89	90	1.50	10.00	0.55	44.82	44.72	42.68	42.63	2.14	2.09
90	90	91	1.50	10.00	0.60	44.72	44.70	42.63	42.58	2.09	2.12
91	91	92	1.50	10.00	0.60	44.70	44.74	42.58	42.53	2.12	2.21
92	92	93	1.50	10.00	0.60	44.74	44.78	42.53	42.48	2.21	2.30
93	93	94	1.50	5.97	0.50	44.78	44.80	42.48	42.45	2.30	2.35
94	94	95	1.50	4.03	0.50	44.80	44.82	42.45	42.43	2.35	2.38
95	95	96	1.50	10.00	0.50	44.82	44.85	42.43	42.38	2.38	2.47
96	96	97	1.50	10.00	0.50	44.85	44.89	42.38	42.33	2.47	2.56
97	97	98	1.50	10.00	0.50	44.89	44.93	42.33	42.28	2.56	2.65
98	98	99	1.50	0.37	0.50	44.93	44.93	42.28	42.28	2.65	2.65
99	99	100	1.50	9.63	0.50	44.93	44.96	42.28	42.22	2.65	2.74
100	100	101	1.50	10.00	0.50	44.96	45.00	42.22	42.16	2.74	2.84
101	101	102	1.50	10.00	0.50	45.00	45.04	42.16	42.10	2.84	2.94
102	102	103	1.50	10.00	0.50	45.04	45.08	42.10	42.04	2.94	3.03
103	103	104	1.50	0.37	0.50	45.08	45.08	42.04	42.04	3.03	3.04
104	104	105	1.50	9.63	0.50	45.08	45.11	42.04	41.98	3.04	3.13
105	105	106	1.50	7.38	0.50	45.11	45.14	41.98	41.94	3.13	3.20
106	106	107	1.50	2.62	0.50	45.14	45.15	41.94	41.92	3.20	3.23
107	107	108	1.50	10.00	0.50	45.15	45.19	41.92	41.86	3.23	3.33
108	108	109	1.50	1.01	0.50	45.19	45.19	41.86	41.86	3.33	3.33
109	109	110	1.50	8.99	0.50	45.19	45.22	41.36	41.30	3.83	3.92
110	110	111	1.50	10.00	0.50	45.22	45.26	41.30	41.24	3.92	4.02
111	111	112	1.50	5.18	0.50	45.26	45.28	41.24	41.21	4.02	4.07
112	112	113	1.50	4.82	1.10	45.28	45.30	41.21	41.18	4.07	4.12
113	113	114	1.50	10.00	1.10	45.30	45.34	41.18	41.12	4.12	4.22
114	114	115	1.50	10.00	1.10	45.34	45.37	41.12	41.06	4.22	4.31
115	115	116	1.50	10.00	1.10	45.37	45.41	41.06	41.00	4.31	4.41
116	116	117	1.50	7.15	1.10	45.41	45.43	41.00	40.96	4.41	4.47
117	117	118	1.50	2.85	1.10	45.43	45.44	40.96	40.94	4.47	4.50
118	118	119	1.50	10.00	1.10	45.44	45.40	40.94	40.88	4.50	4.52
119	119	120	1.50	10.00	1.10	45.40	45.21	40.88	40.82	4.52	4.39
120	120	121	1.50	10.00	1.10	45.21	44.79	40.82	40.76	4.39	4.03
121	121	122	1.50	8.72	1.10	44.79	44.59	40.76	40.71	4.03	3.88
122	122	123	1.50	1.28	1.10	44.59	44.58	40.71	40.70	3.88	3.88
123	123	124	1.50	10.00	1.10	44.58	44.50	40.70	40.64	3.88	3.86
124	124	125	1.50	2.63	1.10	44.50	44.44	40.64	40.63	3.86	3.81

* troços em box-culvert



CONSELHO MUNICIPAL DE MAPUTO

CHAMANCULO B – RUA MARCELINO DOS SANTOS – VALA NORTE

Critérios de Dimensionamento (Rede Pluvial)

Material da vala (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D [T=5 anos] (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)
Betão	75	1	79	47.47

Velocidade mínima [T=2] (m/s)	Velocidade máxima [T=2] (m/s)	Inclinação mínima (-)	Inclinação máxima (-)
0.9	3.0 5.0	0.0030	0.1500

* Nota: Vala aberta Vel. Máx. 3 m/s | Vala coberta Vel. Máx. 5 m/s

Período de retorno (anos)	Parâmetros das Curvas IDF	
	a	b
2	614.15	-0.61
5	798.68	-0.59



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=2 anos

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	5.00	0.56	0.23	0.000	0.129	641.73	82.65
2	10.00	5.15	1.00	0.00	0.129	0.000	630.32	81.19
3	2.86	5.30	1.00	0.00	0.129	0.000	619.25	79.76
4	7.14	5.35	1.00	0.00	0.129	0.000	616.12	79.36
5	10.00	5.46	1.00	0.00	0.129	0.000	608.46	78.37
6	7.42	5.62	1.00	0.00	0.129	0.000	598.02	77.02
7	2.58	5.73	1.00	0.00	0.129	0.000	590.44	76.05
8	10.00	5.78	1.00	0.00	0.129	0.000	587.83	75.71
9	1.64	5.94	1.00	0.00	0.129	0.000	577.97	74.44
10	4.95	5.97	1.00	0.00	0.129	0.000	576.37	74.24
11	3.41	6.05	1.00	0.00	0.129	0.000	571.58	73.62
12	1.42	6.11	1.00	0.00	0.129	0.000	568.33	73.20
13	6.13	6.13	1.00	0.00	0.129	0.000	566.98	73.03
14	2.45	6.23	1.00	0.00	0.129	0.000	561.24	72.29
15	2.86	6.28	1.00	0.00	0.129	0.000	558.96	71.99
16	7.14	6.33	1.00	0.00	0.129	0.000	556.32	71.65
17	2.86	6.45	1.00	0.00	0.129	0.000	549.85	70.82
18	5.22	6.50	1.00	0.00	0.129	0.000	547.29	70.49
19	1.92	6.59	1.00	0.00	0.129	0.000	542.67	69.90
20	10.00	6.62	1.00	0.00	0.129	0.000	540.98	69.68
21	2.86	6.80	1.00	0.00	0.129	0.000	532.38	68.57
22	7.14	6.85	1.00	0.00	0.129	0.000	529.95	68.26
23	0.97	6.98	0.72	0.18	0.129	0.130	523.98	135.40
24	9.03	6.99	1.00	0.00	0.258	0.000	523.32	135.23
25	2.86	7.13	1.00	0.00	0.258	0.000	517.27	133.66
26	7.14	7.17	1.00	0.00	0.258	0.000	515.37	133.17
27	2.86	7.28	1.00	0.00	0.258	0.000	510.69	131.96
28	7.14	7.33	1.00	0.00	0.258	0.000	508.83	131.48
29	2.86	7.44	1.00	0.00	0.258	0.000	504.25	130.30
30	7.14	7.48	1.00	0.00	0.258	0.000	502.43	129.83
31	2.86	7.59	1.00	0.00	0.258	0.000	497.94	128.67
32	7.14	7.64	1.00	0.00	0.258	0.000	496.16	128.21
33	10.00	7.75	1.00	0.00	0.258	0.000	491.76	127.07
34	2.86	7.91	1.00	0.00	0.258	0.000	485.73	125.51
35	7.14	7.95	1.00	0.00	0.258	0.000	484.02	125.07
36	10.00	8.07	1.00	0.00	0.258	0.000	479.80	123.98
37	7.85	8.23	1.00	0.00	0.258	0.000	474.01	122.48
38	2.15	8.36	1.00	0.00	0.258	0.000	469.54	121.33
39	10.00	8.40	1.00	0.00	0.258	0.000	468.32	121.01
40	10.00	8.55	0.34	1.25	0.258	0.425	463.14	316.51
41	10.00	8.67	1.00	0.00	0.683	0.000	459.21	313.82



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
42	2.64	8.80	1.00	0.00	0.683	0.000	455.34	311.18
43	7.36	8.83	1.00	0.00	0.683	0.000	454.32	310.48
44	2.77	8.92	1.00	0.00	0.683	0.000	451.51	308.56
45	7.23	8.95	1.00	0.00	0.683	0.000	450.46	307.84
46	4.56	9.04	1.00	0.00	0.683	0.000	447.74	305.99
47	5.44	9.10	1.00	0.00	0.683	0.000	446.04	304.82
48	1.73	9.17	1.00	0.00	0.683	0.000	444.02	303.44
49	4.75	9.19	1.00	0.00	0.683	0.000	443.38	303.01
50	3.52	9.25	1.00	0.00	0.683	0.000	441.63	301.81
51	5.58	9.29	1.00	0.00	0.683	0.000	440.35	300.93
52	4.42	9.36	1.00	0.00	0.683	0.000	438.32	299.55
53	5.65	9.42	1.00	0.00	0.683	0.000	436.73	298.46
54	4.35	9.49	1.00	0.00	0.683	0.000	434.71	297.08
55	7.94	9.55	1.00	0.00	0.683	0.000	433.16	296.02
56	2.06	9.65	1.00	0.00	0.683	0.000	430.36	294.11
57	10.00	9.68	1.00	0.00	0.683	0.000	429.64	293.62
58	10.00	9.81	1.00	0.00	0.683	0.000	426.17	291.25
59	2.09	9.94	0.47	0.17	0.683	0.080	422.75	322.69
60	7.91	9.96	1.00	0.00	0.763	0.000	422.11	322.19
61	3.18	10.06	1.00	0.00	0.763	0.000	419.67	320.34
62	6.82	10.10	1.00	0.00	0.763	0.000	418.70	319.60
63	9.76	10.18	1.00	0.00	0.763	0.000	416.63	318.02
64	0.24	10.30	1.00	0.00	0.763	0.000	413.70	315.78
65	8.73	10.30	1.00	0.00	0.763	0.000	413.63	315.72
66	1.27	10.41	1.00	0.00	0.763	0.000	411.04	313.75
67	5.17	10.43	1.00	0.00	0.763	0.000	410.66	313.46
68	2.49	10.49	1.00	0.00	0.763	0.000	409.14	312.30
69	2.34	10.52	1.00	0.00	0.763	0.000	408.41	311.74
70	10.00	10.55	1.00	0.00	0.763	0.000	407.73	311.22
71	4.69	10.67	1.00	0.00	0.763	0.000	404.83	309.01
72	0.02	10.73	1.00	0.00	0.763	0.000	403.48	307.98
73	5.29	10.73	1.00	0.00	0.763	0.000	403.48	307.97
74	4.02	10.80	1.00	0.00	0.763	0.000	401.96	306.82
75	4.95	10.85	1.00	0.00	0.763	0.000	400.82	305.95
76	1.03	10.91	1.00	0.00	0.763	0.000	399.42	304.88
77	1.45	10.93	1.00	0.00	0.763	0.000	399.13	304.66
78	2.00	10.94	1.00	0.00	0.763	0.000	398.72	304.34



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=5 anos

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	5.00	0.56	0.23	0.000	0.129	853.10	109.88
2	10.00	5.15	1.00	0.00	0.129	0.000	838.28	107.97
3	2.86	5.30	1.00	0.00	0.129	0.000	823.88	106.12
4	7.14	5.35	1.00	0.00	0.129	0.000	819.82	105.59
5	10.00	5.46	1.00	0.00	0.129	0.000	809.85	104.31
6	7.42	5.62	1.00	0.00	0.129	0.000	796.26	102.56
7	2.58	5.73	1.00	0.00	0.129	0.000	786.40	101.29
8	10.00	5.78	1.00	0.00	0.129	0.000	783.00	100.85
9	1.64	5.94	1.00	0.00	0.129	0.000	770.15	99.20
10	4.95	5.97	1.00	0.00	0.129	0.000	768.07	98.93
11	3.41	6.05	1.00	0.00	0.129	0.000	761.84	98.12
12	1.42	6.11	1.00	0.00	0.129	0.000	757.59	97.58
13	6.13	6.13	1.00	0.00	0.129	0.000	755.83	97.35
14	2.45	6.23	1.00	0.00	0.129	0.000	748.35	96.39
15	2.86	6.28	1.00	0.00	0.129	0.000	745.38	96.01
16	7.14	6.33	1.00	0.00	0.129	0.000	741.95	95.56
17	2.86	6.45	1.00	0.00	0.129	0.000	733.51	94.48
18	5.22	6.50	1.00	0.00	0.129	0.000	730.17	94.05
19	1.92	6.59	1.00	0.00	0.129	0.000	724.14	93.27
20	10.00	6.62	1.00	0.00	0.129	0.000	721.93	92.99
21	2.86	6.80	1.00	0.00	0.129	0.000	710.72	91.54
22	7.14	6.85	1.00	0.00	0.129	0.000	707.54	91.13
23	0.97	6.98	0.72	0.18	0.129	0.130	699.75	180.82
24	9.03	6.99	1.00	0.00	0.258	0.000	698.89	180.59
25	2.86	7.13	1.00	0.00	0.258	0.000	690.99	178.55
26	7.14	7.17	1.00	0.00	0.258	0.000	688.51	177.91
27	2.86	7.28	1.00	0.00	0.258	0.000	682.40	176.33
28	7.14	7.33	1.00	0.00	0.258	0.000	679.97	175.70
29	2.86	7.44	1.00	0.00	0.258	0.000	673.98	174.16
30	7.14	7.48	1.00	0.00	0.258	0.000	671.61	173.54
31	2.86	7.59	1.00	0.00	0.258	0.000	665.74	172.03
32	7.14	7.64	1.00	0.00	0.258	0.000	663.42	171.43
33	10.00	7.75	1.00	0.00	0.258	0.000	657.67	169.94
34	2.86	7.91	1.00	0.00	0.258	0.000	649.78	167.90
35	7.14	7.95	1.00	0.00	0.258	0.000	647.55	167.33
36	10.00	8.07	1.00	0.00	0.258	0.000	642.03	165.90
37	7.85	8.23	1.00	0.00	0.258	0.000	634.45	163.94
38	2.15	8.36	1.00	0.00	0.258	0.000	628.60	162.43
39	10.00	8.40	1.00	0.00	0.258	0.000	627.01	162.02
40	10.00	8.55	0.34	1.25	0.258	0.425	620.22	423.86
41	10.00	8.67	1.00	0.00	0.683	0.000	615.08	420.35



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
42	2.64	8.80	1.00	0.00	0.683	0.000	610.01	416.88
43	7.36	8.83	1.00	0.00	0.683	0.000	608.68	415.97
44	2.77	8.92	1.00	0.00	0.683	0.000	605.00	413.46
45	7.23	8.95	1.00	0.00	0.683	0.000	603.62	412.52
46	4.56	9.04	1.00	0.00	0.683	0.000	600.06	410.08
47	5.44	9.10	1.00	0.00	0.683	0.000	597.83	408.56
48	1.73	9.17	1.00	0.00	0.683	0.000	595.19	406.75
49	4.75	9.19	1.00	0.00	0.683	0.000	594.35	406.18
50	3.52	9.25	1.00	0.00	0.683	0.000	592.06	404.61
51	5.58	9.29	1.00	0.00	0.683	0.000	590.38	403.46
52	4.42	9.36	1.00	0.00	0.683	0.000	587.72	401.65
53	5.65	9.42	1.00	0.00	0.683	0.000	585.63	400.22
54	4.35	9.49	1.00	0.00	0.683	0.000	582.98	398.41
55	7.94	9.55	1.00	0.00	0.683	0.000	580.95	397.02
56	2.06	9.65	1.00	0.00	0.683	0.000	577.29	394.52
57	10.00	9.68	1.00	0.00	0.683	0.000	576.34	393.87
58	10.00	9.81	1.00	0.00	0.683	0.000	571.79	390.76
59	2.09	9.94	0.47	0.17	0.683	0.080	567.30	433.02
60	7.91	9.96	1.00	0.00	0.763	0.000	566.46	432.38
61	3.18	10.06	1.00	0.00	0.763	0.000	563.27	429.94
62	6.82	10.10	1.00	0.00	0.763	0.000	561.99	428.97
63	9.76	10.18	1.00	0.00	0.763	0.000	559.27	426.89
64	0.24	10.30	1.00	0.00	0.763	0.000	555.43	423.96
65	8.73	10.30	1.00	0.00	0.763	0.000	555.34	423.89
66	1.27	10.41	1.00	0.00	0.763	0.000	551.93	421.29
67	5.17	10.43	1.00	0.00	0.763	0.000	551.44	420.91
68	2.49	10.49	1.00	0.00	0.763	0.000	549.44	419.39
69	2.34	10.52	1.00	0.00	0.763	0.000	548.48	418.66
70	10.00	10.55	1.00	0.00	0.763	0.000	547.58	417.97
71	4.69	10.67	1.00	0.00	0.763	0.000	543.78	415.07
72	0.02	10.73	1.00	0.00	0.763	0.000	542.01	413.72
73	5.29	10.73	1.00	0.00	0.763	0.000	542.00	413.71
74	4.02	10.80	1.00	0.00	0.763	0.000	540.02	412.20
75	4.95	10.85	1.00	0.00	0.763	0.000	538.52	411.05
76	1.03	10.91	1.00	0.00	0.763	0.000	536.68	409.65
77	1.45	10.93	1.00	0.00	0.763	0.000	536.30	409.36
78	2.00	10.94	1.00	0.00	0.763	0.000	535.76	408.95



CONSELHO MUNICIPAL DE MAPUTO

Verificação das condições hidráulicas do escoamento, T=2 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
1	1	2	0.500	0.450	90.0	82.65	0.91	0.181	3.09	0.30
2	2	3	0.500	0.490	90.0	81.19	0.90	0.181	3.09	0.30
3	3	4	0.500	0.490	90.0	79.76	0.88	0.181	3.09	0.30
4	4	5	0.500	0.498	90.0	79.36	0.88	0.181	3.09	0.30
5	5	6	0.500	0.540	90.0	78.37	0.87	0.181	3.09	0.30
6	6	7	0.500	0.540	90.0	77.02	0.85	0.181	3.09	0.30
7	7	8	0.500	0.562	90.0	76.05	0.84	0.181	3.09	0.30
8	8	9	0.500	0.600	90.0	75.71	0.84	0.181	3.09	0.30
9	9	10	0.500	0.680	90.0	74.44	0.82	0.181	3.09	0.30
10	10	11	0.500	0.695	90.0	74.24	0.82	0.181	3.09	0.30
11	11	12	0.500	0.699	90.0	73.62	0.81	0.181	3.09	0.30
12	12	13	0.500	0.704	90.0	73.20	0.81	0.181	3.09	0.30
13	13	14	0.500	0.704	90.0	73.03	0.81	0.181	3.09	0.30
14	14	15	0.500	0.712	90.0	72.29	0.80	0.181	3.09	0.30
15	15	16	0.500	0.720	90.0	71.99	0.80	0.181	3.09	0.30
16	16	17	0.500	0.740	90.0	71.65	0.79	0.181	3.09	0.30
17	17	18	0.500	0.740	90.0	70.82	0.78	0.181	3.09	0.30
18	18	19	0.500	0.748	90.0	70.49	0.78	0.181	3.09	0.30
19	19	20	0.500	0.774	90.0	69.90	0.77	0.181	3.09	0.30
20	20	21	0.500	0.780	90.0	69.68	0.77	0.181	3.09	0.30
21	21	22	0.500	0.810	90.0	68.57	0.76	0.181	3.09	0.30
22	22	23	0.500	0.810	90.0	68.26	0.76	0.181	3.09	0.30
23	23	24	0.500	0.810	90.0	135.40	1.04	0.260	3.75	0.30
24	24	25	0.500	0.813	90.0	135.23	1.04	0.260	3.75	0.30
25	25	26	0.500	0.838	90.0	133.66	1.03	0.260	3.75	0.30
26	26	27	0.500	0.800	90.0	133.17	1.02	0.260	3.75	0.30
27	27	28	0.500	0.800	90.0	131.96	1.01	0.260	3.75	0.30
28	28	29	0.500	0.800	90.0	131.48	1.01	0.260	3.75	0.30
29	29	30	0.500	0.798	90.0	130.30	1.00	0.260	3.75	0.30
30	30	31	0.500	0.780	90.0	129.83	1.00	0.260	3.75	0.30
31	31	32	0.500	0.778	90.0	128.67	0.99	0.260	3.75	0.30
32	32	33	0.500	0.770	90.0	128.21	0.99	0.260	3.75	0.30
33	33	34	0.500	0.770	90.0	127.07	0.98	0.260	3.75	0.30
34	34	35	0.500	0.798	90.0	125.51	0.97	0.260	3.75	0.30
35	35	36	0.500	0.760	90.0	125.07	0.96	0.260	3.75	0.30
36	36	37	0.500	0.730	90.0	123.98	0.95	0.260	3.75	0.30
37	37	38	0.500	0.730	90.0	122.48	0.94	0.260	3.75	0.33
38	38	39	0.500	0.720	90.0	121.33	0.93	0.260	3.75	0.33
39	39	40	0.700	0.640	90.0	121.01	0.98	0.176	3.44	0.20
40	40	41	0.700	0.620	90.0	316.51	1.29	0.351	5.16	0.20



CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
41	41	42	0.700	0.620	90.0	313.82	1.28	0.351	5.16	0.20
42	42	43	0.700	0.648	90.0	311.18	1.27	0.351	5.16	0.20
43	43	44	0.700	0.648	90.0	310.48	1.26	0.351	5.16	0.20
44	44	45	0.700	0.670	90.0	308.56	1.25	0.351	5.16	0.20
45	45	46	0.700	0.670	90.0	307.84	1.25	0.351	5.16	0.20
46	46	47	0.700	0.670	90.0	305.99	1.24	0.351	5.16	0.20
47	47	48	0.700	0.673	90.0	304.82	1.24	0.351	5.16	0.20
48	48	49	0.700	0.680	90.0	303.44	1.23	0.351	5.16	0.20
49	49	50	0.700	0.669	90.0	303.01	1.23	0.351	5.16	0.20
50	50	51	0.700	0.669	90.0	301.81	1.23	0.351	5.16	0.20
51	51	52	0.700	0.670	90.0	300.93	1.22	0.351	5.16	0.20
52	52	53	0.700	0.686	90.0	299.55	1.22	0.351	5.16	0.20
53	53	54	0.700	0.710	90.0	298.46	1.21	0.351	5.16	0.20
54	54	55	0.700	0.690	90.0	297.08	1.21	0.351	5.16	0.20
55	55	56	0.700	0.690	90.0	296.02	1.20	0.351	5.16	0.20
56	56	57	0.700	0.693	90.0	294.11	1.20	0.351	5.16	0.20
57	57	58	0.700	0.700	90.0	293.62	1.19	0.351	5.16	0.20
58	58	59	0.700	0.750	90.0	291.25	1.18	0.351	5.16	0.20
59	59	60	0.700	0.760	90.0	322.69	1.29	0.356	5.20	0.20
60	60	61	0.700	0.766	90.0	322.19	1.29	0.356	5.20	0.20
61	61	62	0.700	0.809	90.0	320.34	1.28	0.356	5.20	0.20
62	62	63	0.700	0.790	90.0	319.60	1.28	0.356	5.20	0.20
63	63	64	0.700	0.779	90.0	318.02	1.27	0.356	5.20	0.20
64	64	65	0.700	0.779	90.0	315.78	1.27	0.356	5.20	0.20
65	65	66	0.700	0.780	90.0	315.72	1.27	0.356	5.20	0.20
66	66	67	0.700	0.896	90.0	313.75	1.26	0.356	5.20	0.20
67	67	68	0.700	0.910	90.0	313.46	1.26	0.356	5.20	0.20
68	68	69	0.700	0.925	90.0	312.30	1.25	0.356	5.20	0.20
69	69	70	0.700	0.930	90.0	311.74	1.25	0.356	5.20	0.20
70	70	71	0.700	0.930	90.0	311.22	1.25	0.356	5.20	0.20
71	71	72	0.700	0.970	90.0	309.01	1.24	0.356	5.20	0.20
72	72	73	0.700	0.974	90.0	307.98	1.23	0.356	5.20	0.20
73	73	74	0.700	0.974	90.0	307.97	1.23	0.356	5.20	0.20
74	74	75	0.700	1.040	90.0	306.82	1.23	0.356	5.20	0.20
75	75	76	0.700	1.042	90.0	305.95	1.23	0.356	5.20	0.20
76	76	77	0.700	1.067	90.0	304.88	1.22	0.356	5.20	0.20
77	77	78	0.700	1.090	90.0	304.66	1.22	0.356	5.20	0.20
78	78	79	0.700	1.100	90.0	304.34	1.22	0.356	5.20	0.20



CONSELHO MUNICIPAL DE MAPUTO

Verificação das condições hidráulicas do escoamento, T=5 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m ²)	Inclin Troço (%)
1	1	2	0.500	0.450	90.0	109.88	0.99	0.223	3.46	0.30
2	2	3	0.500	0.490	90.0	107.97	0.97	0.223	3.46	0.30
3	3	4	0.500	0.490	90.0	106.12	0.95	0.223	3.46	0.30
4	4	5	0.500	0.498	90.0	105.59	0.95	0.223	3.46	0.30
5	5	6	0.500	0.540	90.0	104.31	0.94	0.223	3.46	0.30
6	6	7	0.500	0.540	90.0	102.56	0.92	0.223	3.46	0.30
7	7	8	0.500	0.562	90.0	101.29	0.91	0.223	3.46	0.30
8	8	9	0.500	0.600	90.0	100.85	0.91	0.223	3.46	0.30
9	9	10	0.500	0.680	90.0	99.20	0.89	0.223	3.46	0.30
10	10	11	0.500	0.695	90.0	98.93	0.89	0.223	3.46	0.30
11	11	12	0.500	0.699	90.0	98.12	0.88	0.223	3.46	0.30
12	12	13	0.500	0.704	90.0	97.58	0.88	0.223	3.46	0.30
13	13	14	0.500	0.704	90.0	97.35	0.88	0.223	3.46	0.30
14	14	15	0.500	0.712	90.0	96.39	0.87	0.223	3.46	0.30
15	15	16	0.500	0.720	90.0	96.01	0.86	0.223	3.46	0.30
16	16	17	0.500	0.740	90.0	95.56	0.86	0.223	3.46	0.30
17	17	18	0.500	0.740	90.0	94.48	0.85	0.223	3.46	0.30
18	18	19	0.500	0.748	90.0	94.05	0.85	0.223	3.46	0.30
19	19	20	0.500	0.774	90.0	93.27	0.84	0.223	3.46	0.30
20	20	21	0.500	0.780	90.0	92.99	0.84	0.223	3.46	0.30
21	21	22	0.500	0.810	90.0	91.54	0.82	0.223	3.46	0.30
22	22	23	0.500	0.810	90.0	91.13	0.82	0.223	3.46	0.30
23	23	24	0.500	0.810	90.0	180.82	1.11	0.324	4.16	0.30
24	24	25	0.500	0.813	90.0	180.59	1.11	0.324	4.16	0.30
25	25	26	0.500	0.838	90.0	178.55	1.10	0.324	4.16	0.30
26	26	27	0.500	0.800	90.0	177.91	1.10	0.324	4.16	0.30
27	27	28	0.500	0.800	90.0	176.33	1.09	0.324	4.16	0.30
28	28	29	0.500	0.800	90.0	175.70	1.08	0.324	4.16	0.30
29	29	30	0.500	0.798	90.0	174.16	1.07	0.324	4.16	0.30
30	30	31	0.500	0.780	90.0	173.54	1.07	0.324	4.16	0.30
31	31	32	0.500	0.778	90.0	172.03	1.06	0.324	4.16	0.30
32	32	33	0.500	0.770	90.0	171.43	1.06	0.324	4.16	0.30
33	33	34	0.500	0.770	90.0	169.94	1.05	0.324	4.16	0.30
34	34	35	0.500	0.798	90.0	167.90	1.03	0.324	4.16	0.30
35	35	36	0.500	0.760	90.0	167.33	1.03	0.324	4.16	0.30
36	36	37	0.500	0.730	90.0	165.90	1.02	0.324	4.16	0.30
37	37	38	0.500	0.730	90.0	163.94	1.01	0.324	4.16	0.33
38	38	39	0.500	0.720	90.0	162.43	1.00	0.324	4.16	0.33
39	39	40	0.700	0.640	90.0	162.02	1.07	0.216	3.93	0.20
40	40	41	0.700	0.620	90.0	423.86	1.38	0.439	5.73	0.20
41	41	42	0.700	0.620	90.0	420.35	1.37	0.439	5.73	0.20
42	42	43	0.700	0.648	90.0	416.88	1.36	0.439	5.73	0.20



CONSELHO MUNICIPAL DE MAPUTO

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
43	43	44	0.700	0.648	90.0	415.97	1.35	0.439	5.73	0.20
44	44	45	0.700	0.670	90.0	413.46	1.35	0.439	5.73	0.20
45	45	46	0.700	0.670	90.0	412.52	1.34	0.439	5.73	0.20
46	46	47	0.700	0.670	90.0	410.08	1.34	0.439	5.73	0.20
47	47	48	0.700	0.673	90.0	408.56	1.33	0.439	5.73	0.20
48	48	49	0.700	0.680	90.0	406.75	1.32	0.439	5.73	0.20
49	49	50	0.700	0.669	90.0	406.18	1.32	0.439	5.73	0.20
50	50	51	0.700	0.669	90.0	404.61	1.32	0.439	5.73	0.20
51	51	52	0.700	0.670	90.0	403.46	1.31	0.439	5.73	0.20
52	52	53	0.700	0.686	90.0	401.65	1.31	0.439	5.73	0.20
53	53	54	0.700	0.710	90.0	400.22	1.30	0.439	5.73	0.20
54	54	55	0.700	0.690	90.0	398.41	1.30	0.439	5.73	0.20
55	55	56	0.700	0.690	90.0	397.02	1.29	0.439	5.73	0.20
56	56	57	0.700	0.693	90.0	394.52	1.28	0.439	5.73	0.20
57	57	58	0.700	0.700	90.0	393.87	1.28	0.439	5.73	0.20
58	58	59	0.700	0.750	90.0	390.76	1.27	0.439	5.73	0.20
59	59	60	0.700	0.760	90.0	433.02	1.39	0.446	5.77	0.20
60	60	61	0.700	0.766	90.0	432.38	1.38	0.446	5.77	0.20
61	61	62	0.700	0.809	90.0	429.94	1.38	0.446	5.77	0.20
62	62	63	0.700	0.790	90.0	428.97	1.37	0.446	5.77	0.20
63	63	64	0.700	0.779	90.0	426.89	1.37	0.446	5.77	0.20
64	64	65	0.700	0.779	90.0	423.96	1.36	0.446	5.77	0.20
65	65	66	0.700	0.780	90.0	423.89	1.36	0.446	5.77	0.20
66	66	67	0.700	0.896	90.0	421.29	1.35	0.446	5.77	0.20
67	67	68	0.700	0.910	90.0	420.91	1.35	0.446	5.77	0.20
68	68	69	0.700	0.925	90.0	419.39	1.34	0.446	5.77	0.20
69	69	70	0.700	0.930	90.0	418.66	1.34	0.446	5.77	0.20
70	70	71	0.700	0.930	90.0	417.97	1.34	0.446	5.77	0.20
71	71	72	0.700	0.970	90.0	415.07	1.33	0.446	5.77	0.20
72	72	73	0.700	0.974	90.0	413.72	1.33	0.446	5.77	0.20
73	73	74	0.700	0.974	90.0	413.71	1.33	0.446	5.77	0.20
74	74	75	0.700	1.040	90.0	412.20	1.32	0.446	5.77	0.20
75	75	76	0.700	1.042	90.0	411.05	1.32	0.446	5.77	0.20
76	76	77	0.700	1.067	90.0	409.65	1.31	0.446	5.77	0.20
77	77	78	0.700	1.090	90.0	409.36	1.31	0.446	5.77	0.20
78	78	79	0.700	1.100	90.0	408.95	1.31	0.446	5.77	0.20



CONSELHO MUNICIPAL DE MAPUTO

Elementos do perfil longitudinal

Vala (troço)	Perfil		Jus. (-)	Larg. (m)	Compr. (m)	Inclin. Troço (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
	Mont. (-)						Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
1	1		2	0.50	10.00	0.30	49.16	49.18	48.71	48.68	0.45	0.50
2	2		3	0.50	10.00	0.30	49.18	49.14	48.68	48.65	0.50	0.49
3	3		4	0.50	2.86	0.30	49.14	49.14	48.65	48.64	0.49	0.50
4	4		5	0.50	7.14	0.30	49.14	49.21	48.64	48.62	0.50	0.59
5	5		6	0.50	10.00	0.30	49.21	49.13	48.62	48.59	0.59	0.54
6	6		7	0.50	7.42	0.30	49.13	49.13	48.59	48.57	0.54	0.56
7	7		8	0.50	2.58	0.30	49.13	49.16	48.57	48.56	0.56	0.60
8	8		9	0.50	10.00	0.30	49.16	49.21	48.56	48.53	0.60	0.68
9	9		10	0.50	1.64	0.30	49.21	49.22	48.53	48.53	0.68	0.69
10	10		11	0.50	4.95	0.30	49.22	49.21	48.53	48.51	0.69	0.70
11	11		12	0.50	3.41	0.30	49.21	49.21	48.51	48.50	0.70	0.71
12	12		13	0.50	1.42	0.30	49.21	49.20	48.50	48.50	0.71	0.70
13	13		14	0.50	6.13	0.30	49.20	49.19	48.50	48.48	0.70	0.71
14	14		15	0.50	2.45	0.30	49.19	49.19	48.48	48.47	0.71	0.72
15	15		16	0.50	2.86	0.30	49.19	49.21	48.47	48.46	0.72	0.75
16	16		17	0.50	7.14	0.30	49.21	49.18	48.46	48.44	0.75	0.74
17	17		18	0.50	2.86	0.30	49.18	49.18	48.44	48.43	0.74	0.75
18	18		19	0.50	5.22	0.30	49.18	49.19	48.43	48.42	0.75	0.77
19	19		20	0.50	1.92	0.30	49.19	49.19	48.42	48.41	0.77	0.78
20	20		21	0.50	10.00	0.30	49.19	49.19	48.41	48.38	0.78	0.81
21	21		22	0.50	2.86	0.30	49.19	49.19	48.38	48.37	0.81	0.82
22	22		23	0.50	7.14	0.30	49.19	49.16	48.37	48.35	0.82	0.81
23	23		24	0.50	0.97	0.30	49.16	49.16	48.35	48.35	0.81	0.81
24	24		25	0.50	9.03	0.30	49.16	49.16	48.35	48.32	0.81	0.84
25	25		26	0.50	2.86	0.30	49.16	49.15	48.32	48.31	0.84	0.84
26	26		27	0.50	7.14	0.30	49.15	49.09	48.31	48.29	0.84	0.80
27	27		28	0.50	2.86	0.30	49.09	49.09	48.29	48.28	0.80	0.81
28	28		29	0.50	7.14	0.30	49.09	49.06	48.28	48.26	0.81	0.80
29	29		30	0.50	2.86	0.30	49.06	49.05	48.26	48.25	0.80	0.80
30	30		31	0.50	7.14	0.30	49.05	49.01	48.25	48.23	0.80	0.78
31	31		32	0.50	2.86	0.30	49.01	49.00	48.23	48.22	0.78	0.78
32	32		33	0.50	7.14	0.30	49.00	48.97	48.22	48.20	0.78	0.77
33	33		34	0.50	10.00	0.30	48.97	48.97	48.20	48.17	0.77	0.80
34	34		35	0.50	2.86	0.30	48.97	48.96	48.17	48.16	0.80	0.80
35	35		36	0.50	7.14	0.30	48.96	48.90	48.16	48.14	0.80	0.76
36	36		37	0.50	10.00	0.30	48.90	48.84	48.14	48.11	0.76	0.73
37	37		38	0.50	7.85	0.33	48.84	48.83	48.11	48.09	0.73	0.74
38	38		39	0.50	2.15	0.33	48.83	48.80	48.09	48.08	0.74	0.72
39	39		40	0.70	10.00	0.20	48.80	48.69	48.08	48.05	0.72	0.64
40	40		41	0.70	10.00	0.20	48.69	48.64	48.05	48.02	0.64	0.62



CONSELHO MUNICIPAL DE MAPUTO

Vala (troço)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	Compr. (m)	Inclin. Troço (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
41	41	42	0.70	10.00	0.20	48.64	48.64	48.02	47.99	0.62	0.65
42	42	43	0.70	2.64	0.20	48.64	48.63	47.99	47.98	0.65	0.65
43	43	44	0.70	7.36	0.20	48.63	48.63	47.98	47.96	0.65	0.67
44	44	45	0.70	2.77	0.20	48.63	48.63	47.96	47.95	0.67	0.68
45	45	46	0.70	7.23	0.20	48.63	48.60	47.95	47.93	0.68	0.67
46	46	47	0.70	4.56	0.20	48.60	48.59	47.93	47.92	0.67	0.67
47	47	48	0.70	5.44	0.20	48.59	48.58	47.92	47.90	0.67	0.68
48	48	49	0.70	1.73	0.20	48.58	48.58	47.90	47.90	0.68	0.68
49	49	50	0.70	4.75	0.20	48.58	48.55	47.90	47.88	0.68	0.67
50	50	51	0.70	3.52	0.20	48.55	48.54	47.88	47.87	0.67	0.67
51	51	52	0.70	5.58	0.20	48.54	48.54	47.87	47.85	0.67	0.69
52	52	53	0.70	4.42	0.20	48.54	48.55	47.85	47.84	0.69	0.71
53	53	54	0.70	5.65	0.20	48.55	48.54	47.84	47.82	0.71	0.72
54	54	55	0.70	4.35	0.20	48.54	48.50	47.82	47.81	0.72	0.69
55	55	56	0.70	7.94	0.20	48.50	48.48	47.81	47.79	0.69	0.69
56	56	57	0.70	2.06	0.20	48.48	48.48	47.79	47.78	0.69	0.70
57	57	58	0.70	10.00	0.20	48.48	48.50	47.78	47.75	0.70	0.75
58	58	59	0.70	10.00	0.20	48.50	48.48	47.75	47.72	0.75	0.76
59	59	60	0.70	2.09	0.20	48.48	48.48	47.72	47.71	0.76	0.77
60	60	61	0.70	7.91	0.20	48.48	48.50	47.71	47.69	0.77	0.81
61	61	62	0.70	3.18	0.20	48.50	48.49	47.69	47.68	0.81	0.81
62	62	63	0.70	6.82	0.20	48.49	48.45	47.68	47.66	0.81	0.79
63	63	64	0.70	9.76	0.20	48.45	48.41	47.66	47.63	0.79	0.78
64	64	65	0.70	0.24	0.20	48.41	48.41	47.63	47.63	0.78	0.78
65	65	66	0.70	8.73	0.20	48.41	48.50	47.63	47.60	0.78	0.90
66	66	67	0.70	1.27	0.20	48.50	48.51	47.60	47.60	0.90	0.91
67	67	68	0.70	5.17	0.20	48.51	48.51	47.60	47.58	0.91	0.93
68	68	69	0.70	2.49	0.20	48.51	48.52	47.58	47.58	0.93	0.94
69	69	70	0.70	2.34	0.20	48.52	48.50	47.58	47.57	0.94	0.93
70	70	71	0.70	10.00	0.20	48.50	48.51	47.57	47.54	0.93	0.97
71	71	72	0.70	4.69	0.20	48.51	48.50	47.54	47.53	0.97	0.97
72	72	73	0.70	0.02	0.20	48.50	48.50	47.53	47.53	0.97	0.97
73	73	74	0.70	5.29	0.20	48.50	48.55	47.53	47.51	0.97	1.04
74	74	75	0.70	4.02	0.20	48.55	48.54	47.51	47.50	1.04	1.04
75	75	76	0.70	4.95	0.20	48.54	48.55	47.50	47.48	1.04	1.07
76	76	77	0.70	1.03	0.20	48.55	48.57	47.48	47.48	1.07	1.09
77	77	78	0.70	1.45	0.20	48.57	48.58	47.48	47.48	1.09	1.10
78	78	79	0.70	2.00	0.20	48.58	48.57	47.48	47.47	1.10	1.10



CONSELHO MUNICIPAL DE MAPUTO

CHAMANCULO B – RUA MARCELINO DOS SANTOS – VALA SUL

Critérios de Dimensionamento (Rede Pluvial)

Material da vala (-)	Coefficiente Manning ($m^{1/3}/s$)	hmáx/D [T=5 anos] (-)	Nó mais a jusante (-)	Cota de soleira do último nó (m)
Betão	75	1	27	47.47

Velocidade mínima [T=2] (m/s)	Velocidade máxima [T=2] (m/s)	Inclinação mínima (-)	Inclinação máxima (-)
0.9	3.0 5.0	0.0030	0.1500

* Nota: Vala aberta Vel. Máx. 3 m/s | Vala coberta Vel. Máx. 5 m/s

Período de retorno (anos)	Parâmetros das Curvas IDF	
	a	b
2	614.15	-0.61
5	798.68	-0.59



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=2 anos

Vala (troço)	Compr. (m)	T _{conc.} (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	10.00	0.42	1.16	0.000	0.487	421.19	205.20
2	10.00	10.11	1.00	0.00	0.487	0.000	418.35	203.82
3	7.88	10.22	1.00	0.00	0.487	0.000	415.55	202.46
4	2.12	10.31	1.00	0.00	0.487	0.000	413.36	201.39
5	8.91	10.34	1.00	0.00	0.487	0.000	412.78	201.10
6	1.09	10.44	1.00	0.00	0.487	0.000	410.33	199.91
7	10.00	10.45	1.00	0.00	0.487	0.000	410.04	199.77
8	4.11	10.57	1.00	0.00	0.487	0.000	407.33	198.45
9	5.89	10.61	0.55	0.20	0.487	0.110	406.22	242.59
10	10.00	10.68	1.00	0.00	0.597	0.000	404.75	241.71
11	10.00	10.79	1.00	0.00	0.597	0.000	402.27	240.24
12	10.00	10.89	1.00	0.00	0.597	0.000	399.82	238.77
13	9.10	11.00	1.00	0.00	0.597	0.000	397.40	237.33
14	0.90	11.10	1.00	0.00	0.597	0.000	395.21	236.02
15	10.00	11.11	1.00	0.00	0.597	0.000	395.00	235.89
16	5.23	11.23	1.00	0.00	0.597	0.000	392.62	234.47
17	4.77	11.28	1.00	0.00	0.597	0.000	391.38	233.74
18	10.00	11.34	1.00	0.00	0.597	0.000	390.26	233.07
19	5.38	11.44	1.00	0.00	0.597	0.000	388.14	231.80
20	4.62	11.51	1.00	0.00	0.597	0.000	386.66	230.92
21	10.00	11.57	1.00	0.00	0.597	0.000	385.40	230.16
22	10.00	11.71	1.00	0.00	0.597	0.000	382.70	228.55
23	10.00	11.84	1.00	0.00	0.597	0.000	380.03	226.95
24	2.59	11.98	1.00	0.00	0.597	0.000	377.39	225.38
25	2.10	12.02	1.00	0.00	0.597	0.000	376.71	224.97
26	2.49	12.05	1.00	0.00	0.597	0.000	376.16	224.64



CONSELHO MUNICIPAL DE MAPUTO

Caudais de Dimensionamento (Rede Pluvial), T=5 anos

Vala (troço)	Compr. (m)	Tconc. (min)	C (-)	Área Parc. (ha)	Área red. Mont. (ha)	Área Calc. (ha)	Intens. Precip. l/s/ha	Caudal Cálculo (l/s)
1	10.00	10.00	0.42	1.16	0.000	0.487	565.25	275.39
2	10.00	10.11	1.00	0.00	0.487	0.000	561.53	273.58
3	7.88	10.22	1.00	0.00	0.487	0.000	557.86	271.79
4	2.12	10.31	1.00	0.00	0.487	0.000	554.98	270.39
5	8.91	10.34	1.00	0.00	0.487	0.000	554.21	270.01
6	1.09	10.44	1.00	0.00	0.487	0.000	551.01	268.45
7	10.00	10.45	1.00	0.00	0.487	0.000	550.62	268.26
8	4.11	10.57	1.00	0.00	0.487	0.000	547.06	266.53
9	5.89	10.61	0.55	0.20	0.487	0.110	545.60	325.84
10	10.00	10.68	1.00	0.00	0.597	0.000	543.67	324.68
11	10.00	10.79	1.00	0.00	0.597	0.000	540.42	322.74
12	10.00	10.89	1.00	0.00	0.597	0.000	537.21	320.82
13	9.10	11.00	1.00	0.00	0.597	0.000	534.02	318.92
14	0.90	11.10	1.00	0.00	0.597	0.000	531.15	317.20
15	10.00	11.11	1.00	0.00	0.597	0.000	530.87	317.03
16	5.23	11.23	1.00	0.00	0.597	0.000	527.74	315.17
17	4.77	11.28	1.00	0.00	0.597	0.000	526.12	314.20
18	10.00	11.34	1.00	0.00	0.597	0.000	524.65	313.32
19	5.38	11.44	1.00	0.00	0.597	0.000	521.86	311.65
20	4.62	11.51	1.00	0.00	0.597	0.000	519.92	310.50
21	10.00	11.57	1.00	0.00	0.597	0.000	518.26	309.50
22	10.00	11.71	1.00	0.00	0.597	0.000	514.71	307.38
23	10.00	11.84	1.00	0.00	0.597	0.000	511.20	305.29
24	2.59	11.98	1.00	0.00	0.597	0.000	507.73	303.21
25	2.10	12.02	1.00	0.00	0.597	0.000	506.83	302.68
26	2.49	12.05	1.00	0.00	0.597	0.000	506.11	302.25



CONSELHO MUNICIPAL DE MAPUTO

Verificação das condições hidráulicas do escoamento, T=2 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclín Troço (%)
1	1	2	0.500	0.580	90.0	205.20	1.40	0.294	6.63	0.50
2	2	3	0.500	0.640	90.0	203.82	1.39	0.294	6.63	0.50
3	3	4	0.500	0.749	90.0	202.46	1.38	0.294	6.63	0.50
4	4	5	0.500	0.749	90.0	201.39	1.37	0.294	6.63	0.50
5	5	6	0.500	0.840	90.0	201.10	1.37	0.294	6.63	0.50
6	6	7	0.500	0.880	90.0	199.91	1.36	0.294	6.63	0.50
7	7	8	0.500	0.870	90.0	199.77	1.36	0.294	6.63	0.50
8	8	9	0.500	0.870	90.0	198.45	1.35	0.294	6.63	0.50
9	9	10	0.500	0.901	90.0	242.59	1.45	0.334	7.02	0.50
10	10	11	0.500	0.940	90.0	241.71	1.45	0.334	7.02	0.50
11	11	12	0.500	1.050	90.0	240.24	1.44	0.334	7.02	0.50
12	12	13	0.500	1.060	90.0	238.77	1.43	0.334	7.02	0.50
13	13	14	0.500	1.055	90.0	237.33	1.42	0.334	7.02	0.50
14	14	15	0.500	1.055	90.0	236.02	1.41	0.334	7.02	0.50
15	15	16	0.500	1.060	90.0	235.89	1.41	0.334	7.02	0.50
16	16	17	0.500	1.026	90.0	234.47	1.40	0.334	7.02	0.50
17	17	18	0.500	1.026	90.0	233.74	1.40	0.334	7.02	0.50
18	18	19	0.500	1.050	90.0	233.07	1.53	0.305	7.88	0.58
19	19	20	0.500	1.085	90.0	231.80	1.18	0.394	4.50	0.30
20	20	21	0.500	1.068	90.0	230.92	1.17	0.394	4.50	0.30
21	21	22	0.500	1.068	90.0	230.16	1.17	0.394	4.50	0.30
22	22	23	0.500	1.088	90.0	228.55	1.16	0.394	4.50	0.30
23	23	24	0.500	1.088	90.0	226.95	1.15	0.394	4.50	0.30
24	24	25	0.500	1.096	90.0	225.38	1.14	0.394	4.50	0.30
25	25	26	0.500	1.083	90.0	224.97	1.14	0.394	4.50	0.30
26	26	27	0.500	1.083	90.0	224.64	1.14	0.394	4.50	0.30



CONSELHO MUNICIPAL DE MAPUTO

Verificação das condições hidráulicas do escoamento, T=5 anos

Troço (-)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	h (m)	Ângulo (°)	Caudal Cálculo (l/s)	Vel. (m/s)	Altura Escoam. (m)	Poder Transp. (N/m²)	Inclin Troço (%)
1	1	2	0.500	0.580	90.0	275.39	1.49	0.369	7.31	0.50
2	2	3	0.500	0.640	90.0	273.58	1.48	0.369	7.31	0.50
3	3	4	0.500	0.749	90.0	271.79	1.47	0.369	7.31	0.50
4	4	5	0.500	0.749	90.0	270.39	1.46	0.369	7.31	0.50
5	5	6	0.500	0.840	90.0	270.01	1.46	0.369	7.31	0.50
6	6	7	0.500	0.880	90.0	268.45	1.45	0.369	7.31	0.50
7	7	8	0.500	0.870	90.0	268.26	1.45	0.369	7.31	0.50
8	8	9	0.500	0.870	90.0	266.53	1.44	0.369	7.31	0.50
9	9	10	0.500	0.901	90.0	325.84	1.54	0.422	7.70	0.50
10	10	11	0.500	0.940	90.0	324.68	1.54	0.422	7.70	0.50
11	11	12	0.500	1.050	90.0	322.74	1.53	0.422	7.70	0.50
12	12	13	0.500	1.060	90.0	320.82	1.52	0.422	7.70	0.50
13	13	14	0.500	1.055	90.0	318.92	1.51	0.422	7.70	0.50
14	14	15	0.500	1.055	90.0	317.20	1.50	0.422	7.70	0.50
15	15	16	0.500	1.060	90.0	317.03	1.50	0.422	7.70	0.50
16	16	17	0.500	1.026	90.0	315.17	1.49	0.422	7.70	0.50
17	17	18	0.500	1.026	90.0	314.20	1.49	0.422	7.70	0.50
18	18	19	0.500	1.050	90.0	313.32	1.63	0.384	8.69	0.58
19	19	20	0.500	1.085	90.0	311.65	1.24	0.501	4.91	0.30
20	20	21	0.500	1.068	90.0	310.50	1.24	0.501	4.91	0.30
21	21	22	0.500	1.068	90.0	309.50	1.24	0.501	4.91	0.30
22	22	23	0.500	1.088	90.0	307.38	1.23	0.501	4.91	0.30
23	23	24	0.500	1.088	90.0	305.29	1.22	0.501	4.91	0.30
24	24	25	0.500	1.096	90.0	303.21	1.21	0.501	4.91	0.30
25	25	26	0.500	1.083	90.0	302.68	1.21	0.501	4.91	0.30
26	26	27	0.500	1.083	90.0	302.25	1.21	0.501	4.91	0.30



CONSELHO MUNICIPAL DE MAPUTO

Elementos do perfil longitudinal

Vala (troço)	Perfil Mont. (-)	Jus. (-)	Larg. (m)	Compr. (m)	Inclin. Troço (%)	Cota Terreno		Cota Soleira		Prof. Escav.	
						Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)	Mont. (m)	Jus. (m)
1	1	2	0.50	10.00	0.50	48.85	48.86	48.27	48.22	0.58	0.64
2	2	3	0.50	10.00	0.50	48.86	48.92	48.22	48.17	0.64	0.75
3	3	4	0.50	7.88	0.50	48.92	48.88	48.17	48.13	0.75	0.75
4	4	5	0.50	2.12	0.50	48.88	48.96	48.13	48.12	0.75	0.84
5	5	6	0.50	8.91	0.50	48.96	48.96	48.12	48.08	0.84	0.88
6	6	7	0.50	1.09	0.50	48.96	48.95	48.08	48.07	0.88	0.88
7	7	8	0.50	10.00	0.50	48.95	48.89	48.07	48.02	0.88	0.87
8	8	9	0.50	4.11	0.50	48.89	48.90	48.02	48.00	0.87	0.90
9	9	10	0.50	5.89	0.50	48.90	48.91	48.00	47.97	0.90	0.94
10	10	11	0.50	10.00	0.50	48.91	48.97	47.97	47.92	0.94	1.05
11	11	12	0.50	10.00	0.50	48.97	48.96	47.92	47.87	1.05	1.09
12	12	13	0.50	10.00	0.50	48.96	48.88	47.87	47.82	1.09	1.06
13	13	14	0.50	9.10	0.50	48.88	48.83	47.82	47.77	1.06	1.06
14	14	15	0.50	0.90	0.50	48.83	48.83	47.77	47.77	1.06	1.06
15	15	16	0.50	10.00	0.50	48.83	48.78	47.77	47.72	1.06	1.06
16	16	17	0.50	5.23	0.50	48.78	48.72	47.72	47.69	1.06	1.03
17	17	18	0.50	4.77	0.50	48.72	48.72	47.69	47.67	1.03	1.05
18	18	19	0.50	10.00	0.58	48.72	48.74	47.67	47.61	1.05	1.13
19	19	20	0.50	5.38	0.30	48.74	48.68	47.61	47.60	1.13	1.08
20	20	21	0.50	4.62	0.30	48.68	48.65	47.60	47.58	1.08	1.07
21	21	22	0.50	10.00	0.30	48.65	48.66	47.58	47.55	1.07	1.11
22	22	23	0.50	10.00	0.30	48.66	48.61	47.55	47.52	1.11	1.09
23	23	24	0.50	2.49	0.30	48.61	48.59	47.52	47.49	1.09	1.10
24	24	25	0.50	0.00	0.30	48.59	48.58	47.49	47.48	1.10	1.10
25	25	26	0.50	0.00	0.30	48.58	48.56	47.48	47.48	1.10	1.08
26	26	27	0.50	0.00	0.30	48.56	48.57	47.48	47.47	1.08	1.10