

MEMÓRIA DE CÁLCULO

TRECHO		PONTO INICIAL			PONTO FINAL			DADOS DA REDE		ESCAVAÇÃO					
INICIAL	FINAL	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	DIÂMETRO (mm)	COMPRIMENTO DA REDE (m)	ALTURA BASE - b+e (m)	ALTURA MÉDIA (m)	ALTURA ESCAVAÇÃO (m)	LARGURA DA VALA (m)	VOLUME ESCAVAÇÃO < 1,50M (m3)	VOLUME ESCAVAÇÃO ENTRE 1,50M E 3,00M (m3)
BL-1A	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	400	10,32	0,16	1,00	1,16	0,80	9,58	-
BL-1B	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	400	7,20	0,16	1,00	1,16	0,80	6,68	-
BL-1C	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	400	6,22	0,16	1,00	1,16	0,80	5,77	-
BL-1D	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	400	10,23	0,16	1,00	1,16	0,80	9,49	-
PV-1	PV-2	120,435	118,835	1,600	119,300	117,700	1,600	600	85,87	0,22	1,60	1,82	1,00	128,81	27,48
BL-2A	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	400	4,51	0,16	1,00	1,16	0,80	4,19	-
BL-2B	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	400	5,58	0,16	1,00	1,16	0,80	5,18	-
BL-2C	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	400	4,97	0,16	1,00	1,16	0,80	4,61	-
BL-2D	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	400	6,99	0,16	1,00	1,16	0,80	6,49	-
PV-2	PV-3	119,300	117,700	1,600	119,177	117,577	1,600	600	31,14	0,22	1,60	1,82	1,00	46,71	9,96
BL-3A	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	400	2,35	0,16	1,00	1,16	0,80	2,18	-
BL-3B	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	400	4,20	0,16	1,00	1,16	0,80	3,90	-
PV-3	PV-4	119,300	117,700	1,600	118,895	117,295	1,600	600	48,74	0,22	1,60	1,82	1,00	73,11	15,60
PV-4	PV-5	118,895	117,295	1,600	118,473	116,873	1,600	600	28,92	0,22	1,60	1,82	1,00	43,38	9,25
PV-5	PV-6	118,473	116,873	1,600	118,140	116,540	1,600	400	42,17	0,22	1,60	1,82	1,00	63,26	13,49
BL-6A	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	400	3,12	0,16	1,00	1,16	0,80	2,90	-
BL-6B	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	400	99,74	0,29	2,00	2,29	1,60	239,38	126,07
PV-6	PV-7	118,473	116,473	2,000	117,388	115,388	2,000	800	132,64	0,29	2,00	2,29	1,60	318,34	167,66
PV-7	PV-8	117,388	115,388	2,000	116,347	114,347	2,000	800		0,16	1,00	1,16	0,80	5,04	-
BL-8A	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	400	5,43	0,16	1,00	1,16	0,80	5,29	-
BL-8B	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	400	5,70	0,16	1,00	1,16	0,80	5,29	-
PV-8	PV-9	116,347	114,347	2,000	114,460	112,460	2,000	800	72,68	0,29	2,00	2,29	1,60	174,43	91,87
BL-9A	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	400	9,33	0,16	1,00	1,16	0,80	8,66	-
BL-9B	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	400	9,73	0,16	1,00	1,16	0,80	9,03	-
PV-9	PV-10	114,460	112,460	2,000	110,211	108,211	2,000	800	144,52	0,29	2,00	2,29	1,60	346,85	182,67
BL-10A	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	400	11,76	0,16	1,00	1,16	0,80	10,91	-
BL-10B	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	400	12,17	0,16	1,00	1,16	0,80	11,29	-
PV-10	PV-11	110,211	108,211	2,000	105,581	103,581	2,000	800	121,98	0,29	2,00	2,29	1,60	292,75	154,18
BL-11A	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	400	11,42	0,16	1,00	1,16	0,80	10,60	-
BL-11B	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	400	10,96	0,16	1,00	1,16	0,80	10,17	-
PV-11	PV-12	105,581	103,581	2,000	105,581	103,581	2,000	800	88,11	0,29	2,00	2,29	1,60	211,46	111,37
PV-12	BL-12A	105,581	103,581	2,000	105,581	103,581	2,000	600	8,31	0,22	2,00	2,22	1,00	12,47	5,98
PV-12	BL-12B	105,581	103,581	2,000	105,581	103,581	2,000	600	7,65	0,22	2,00	2,22	1,00	11,48	5,51
TOTAL									1.058,18					2.097,63	921,10



MEMÓRIA DE CÁLCULO

TRECHO		PONTO INICIAL			PONTO FINAL			DEMOLIÇÃO DE PAVIMENTO	REATERRO MANUAL/MECÂNICO						TRANSPORTE
INICIAL	FINAL	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	DEMOLIÇÃO PAVIMENTO ASFÁLTICO (m2)	DIÂMETRO EXTERNO (mm)	VOLUME DA TUBULAÇÃO (m3/m)	VOLUME DA TUBULAÇÃO (m3)	REATERRO MANUAL (m3/m)	REATERRO MANUAL (m3)	REATERRO MECÂNICO (m3)	BOTA FORA (m3)
BL-1A	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	8,26	518	0,21	2,17	0,30	3,10	4,31	2,17
BL-1B	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	5,76	518	0,21	1,51	0,30	2,16	3,01	1,51
BL-1C	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	4,98	518	0,21	1,31	0,30	1,87	2,60	1,31
BL-1D	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	8,18	518	0,21	2,15	0,30	3,07	4,28	2,15
PV-1	PV-2	120,435	118,835	1,600	119,300	117,700	1,600	85,87	749	0,44	37,78	0,41	35,21	83,29	37,78
BL-2A	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	3,61	518	0,21	0,95	0,30	1,35	1,89	0,95
BL-2B	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	4,46	518	0,21	1,17	0,30	1,67	2,33	1,17
BL-2C	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	3,98	518	0,21	1,04	0,30	1,49	2,08	1,04
BL-2D	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	5,59	518	0,21	1,47	0,30	2,10	2,92	1,47
PV-2	PV-3	119,300	117,700	1,600	119,177	117,577	1,600	31,14	749	0,44	13,70	0,41	12,77	30,21	13,70
BL-3A	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	1,88	518	0,21	0,49	0,30	0,71	0,98	0,49
BL-3B	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	3,36	518	0,21	0,88	0,30	1,26	1,76	0,88
PV-3	PV-4	119,300	117,700	1,600	118,895	117,295	1,600		749	0,44	21,45	0,41	19,98	47,28	21,45
PV-4	PV-5	118,895	117,295	1,600	118,473	116,873	1,600	28,92	749	0,44	12,72	0,41	17,29	40,90	18,55
PV-5	PV-6	118,473	116,873	1,600	118,140	116,540	1,600	42,17	749	0,44	18,55	0,41	17,29	40,90	18,55
BL-6A	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	2,82	518	0,21	0,74	0,30	1,06	1,47	0,74
BL-6B	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	2,50	518	0,21	0,66	0,30	0,94	1,30	0,66
PV-6	PV-7	118,473	116,473	2,000	117,388	115,388	2,000		980	0,75	74,81	0,61	60,84	229,80	74,81
PV-7	PV-8	117,388	115,388	2,000	116,347	114,347	2,000		980	0,75	99,48	0,61	80,91	305,60	99,48
BL-8A	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	4,34	518	0,21	1,14	0,30	1,63	2,27	1,14
BL-8B	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	4,56	518	0,21	1,20	0,30	1,71	2,38	1,20
PV-8	PV-9	116,347	114,347	2,000	114,460	112,460	2,000	116,29	980	0,75	54,51	0,61	44,33	167,45	54,51
BL-9A	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	7,46	518	0,21	1,96	0,30	2,80	3,90	1,96
BL-9B	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	7,78	518	0,21	2,04	0,30	2,92	4,07	2,04
PV-9	PV-10	114,460	112,460	2,000	110,211	108,211	2,000	231,23	980	0,75	108,39	0,61	88,16	332,97	108,39
BL-10A	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	9,41	518	0,21	2,47	0,30	3,53	4,92	2,47
BL-10B	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	9,74	518	0,21	2,56	0,30	3,65	5,09	2,56
PV-10	PV-11	110,211	108,211	2,000	105,581	103,581	2,000	195,17	980	0,75	91,49	0,61	74,41	281,04	91,49
BL-11A	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	9,14	518	0,21	2,40	0,30	3,43	4,77	2,40
BL-11B	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	8,77	518	0,21	2,30	0,30	3,29	4,58	2,30
PV-11	PV-12	105,581	103,581	2,000	105,581	103,581	2,000	140,98	980	0,75	66,08	0,61	53,75	203,01	66,08
PV-12	BL-12A	105,581	103,581	2,000	105,581	103,581	2,000	8,31	749	0,44	3,66	0,41	3,41	11,38	3,66
PV-12	BL-12B	105,581	103,581	2,000	105,581	103,581	2,000	7,65	749	0,44	3,37	0,41	3,14	10,48	3,37
TOTAL								1.004,29					549,76	1.832,39	636,58



MEMÓRIA DE CÁLCULO

TRECHO		PONTO INICIAL			PONTO FINAL			ESCORAMENTO DE VALA	APILOAMENTO		LASTRO DE CONCRETO			FORMA PARA BERÇO	
INICIAL	FINAL	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)	ESCORAMENTO DE VALA (m2)	APILOAMENTO (m2/m)	REGULARIZAÇÃO (m2)	ESPESSURA (m)	CONCRETO (m3/m)	CONCRETO (m3)	FORMA (m2/m)	FORMA (m2)
BL-1A	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	23,94	0,80	8,26	0,22	0,13	1,34	0,44	4,54
BL-1B	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	16,70	0,80	5,76	0,22	0,13	0,94	0,44	3,17
BL-1C	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	14,43	0,80	4,98	0,22	0,13	0,81	0,44	2,74
BL-1D	PV-1	120,435	119,435	1,000	120,435	119,435	1,000	23,73	0,80	8,18	0,22	0,13	1,33	0,44	4,50
PV-1	PV-2	120,435	118,835	1,600	119,300	117,700	1,600	312,57	1,00	85,87	0,33	0,25	21,47	0,66	56,67
BL-2A	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	10,46	0,80	3,61	0,22	0,13	0,59	0,44	1,98
BL-2B	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	12,95	0,80	4,46	0,22	0,13	0,73	0,44	2,46
BL-2C	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	11,53	0,80	3,98	0,22	0,13	0,65	0,44	2,19
BL-2D	PV-2	119,300	118,300	1,000	119,300	118,300	1,000	16,22	0,80	5,59	0,22	0,13	0,91	0,44	3,08
PV-2	PV-3	119,300	117,700	1,600	119,177	117,577	1,600	113,35	1,00	31,14	0,33	0,25	7,79	0,66	20,55
BL-3A	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	5,45	0,80	1,88	0,22	0,13	0,31	0,44	1,03
BL-3B	PV-3	119,300	118,300	1,000	119,300	118,300	1,000	9,74	0,80	3,36	0,22	0,13	0,55	0,44	1,85
PV-3	PV-4	119,300	117,700	1,600	118,895	117,295	1,600	177,41	1,00	48,74	0,33	0,25	12,19	0,66	32,17
PV-4	PV-5	118,895	117,295	1,600	118,473	116,873	1,600	105,27	1,00	28,92	0,33	0,25	7,23	0,66	19,09
PV-5	PV-6	118,473	116,873	1,600	118,140	116,540	1,600	153,50	1,00	42,17	0,33	0,25	10,54	0,66	27,83
BL-6A	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	8,17	0,80	2,82	0,22	0,13	0,46	0,44	1,55
BL-6B	PV-6	118,473	117,473	1,000	118,140	117,140	1,000	7,24	0,80	2,50	0,22	0,13	0,41	0,44	1,37
PV-6	PV-7	118,473	116,473	2,000	117,388	115,388	2,000	456,81	1,60	159,58	0,44	0,43	42,89	0,88	87,77
PV-7	PV-8	117,388	115,388	2,000	116,347	114,347	2,000	607,49	1,60	212,22	0,44	0,43	57,04	0,88	116,72
BL-8A	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	12,60	0,80	4,34	0,22	0,13	0,71	0,44	2,39
BL-8B	PV-8	116,347	115,347	1,000	116,347	115,347	1,000	13,22	0,80	4,56	0,22	0,13	0,74	0,44	2,51
PV-8	PV-9	116,347	114,347	2,000	114,460	112,460	2,000	332,87	1,60	116,29	0,44	0,43	31,25	0,88	63,96
BL-9A	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	21,65	0,80	7,46	0,22	0,13	1,21	0,44	4,11
BL-9B	PV-9	114,460	113,460	1,000	114,460	113,460	1,000	22,57	0,80	7,78	0,22	0,13	1,26	0,44	4,28
PV-9	PV-10	114,460	112,460	2,000	110,211	108,211	2,000	661,90	1,60	231,23	0,44	0,43	62,14	0,88	127,18
BL-10A	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	27,28	0,80	9,41	0,22	0,13	1,53	0,44	5,17
BL-10B	PV-10	110,211	109,211	1,000	110,211	109,211	1,000	28,23	0,80	9,74	0,22	0,13	1,58	0,44	5,35
PV-10	PV-11	110,211	108,211	2,000	105,581	103,581	2,000	558,67	1,60	195,17	0,44	0,43	52,45	0,88	107,34
BL-11A	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	26,49	0,80	9,14	0,22	0,13	1,48	0,44	5,02
BL-11B	PV-11	105,581	104,581	1,000	105,581	104,581	1,000	25,43	0,80	8,77	0,22	0,13	1,42	0,44	4,82
PV-11	PV-12	105,581	103,581	2,000	105,581	103,581	2,000	403,54	1,60	140,98	0,44	0,43	37,89	0,88	77,54
PV-12	BL-12A	105,581	103,581	2,000	105,581	103,581	2,000	36,90	1,00	8,31	0,33	0,25	2,08	0,66	5,48
PV-12	BL-12B	105,581	103,581	2,000	105,581	103,581	2,000	33,97	1,00	7,65	0,33	0,25	1,91	0,66	5,05
TOTAL								4.292,30		1.424,84			365,80		811,47



MEMÓRIA DE CÁLCULO

TRECHO		PONTO INICIAL				PONTO FINAL				ASSENTAMENTO DE TUBOS				
INICIAL	FINAL	COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)		COTA TERRENO (m)	COTA FUNDO (m)	ALTURA (m)		400	600	800	1.000	1.200
BL-1A	PV-1	120,435	119,435	1,000		120,435	119,435	1,000		10,32	-	-	-	-
BL-1B	PV-1	120,435	119,435	1,000		120,435	119,435	1,000		7,20	-	-	-	-
BL-1C	PV-1	120,435	119,435	1,000		120,435	119,435	1,000		6,22	-	-	-	-
BL-1D	PV-1	120,435	119,435	1,000		120,435	119,435	1,000		10,23	-	-	-	-
PV-1	PV-2	120,435	118,835	1,600		119,300	117,700	1,600		-	85,87	-	-	-
BL-2A	PV-2	119,300	118,300	1,000		119,300	118,300	1,000		4,51	-	-	-	-
BL-2B	PV-2	119,300	118,300	1,000		119,300	118,300	1,000		5,58	-	-	-	-
BL-2C	PV-2	119,300	118,300	1,000		119,300	118,300	1,000		4,97	-	-	-	-
BL-2D	PV-2	119,300	118,300	1,000		119,300	118,300	1,000		6,99	-	-	-	-
PV-2	PV-3	119,300	117,700	1,600		119,177	117,577	1,600		-	31,14	-	-	-
BL-3A	PV-3	119,300	118,300	1,000		119,300	118,300	1,000		2,35	-	-	-	-
BL-3B	PV-3	119,300	118,300	1,000		119,300	118,300	1,000		4,20	-	-	-	-
PV-3	PV-4	119,300	117,700	1,600		118,895	117,295	1,600		-	48,74	-	-	-
PV-4	PV-5	118,895	117,295	1,600		118,473	116,873	1,600		-	28,92	-	-	-
PV-5	PV-6	118,473	116,873	1,600		118,140	116,540	1,600		-	42,17	-	-	-
BL-6A	PV-6	118,473	117,473	1,000		118,140	117,140	1,000		3,52	-	-	-	-
BL-6B	PV-6	118,473	117,473	1,000		118,140	117,140	1,000		3,12	-	-	-	-
PV-6	PV-7	118,473	116,473	2,000		117,388	115,388	2,000		-	-	99,74	-	-
PV-7	PV-8	117,388	115,388	2,000		116,347	114,347	2,000		-	-	132,64	-	-
BL-8A	PV-8	116,347	115,347	1,000		116,347	115,347	1,000		5,43	-	-	-	-
BL-8B	PV-8	116,347	115,347	1,000		116,347	115,347	1,000		5,70	-	-	-	-
PV-8	PV-9	116,347	114,347	2,000		114,460	112,460	2,000		-	-	72,68	-	-
BL-9A	PV-9	114,460	113,460	1,000		114,460	113,460	1,000		9,33	-	-	-	-
BL-9B	PV-9	114,460	113,460	1,000		114,460	113,460	1,000		9,73	-	-	-	-
PV-9	PV-10	114,460	112,460	2,000		110,211	108,211	2,000		-	-	144,52	-	-
BL-10A	PV-10	110,211	109,211	1,000		110,211	109,211	1,000		11,76	-	-	-	-
BL-10B	PV-10	110,211	109,211	1,000		110,211	109,211	1,000		12,17	-	-	-	-
PV-10	PV-11	110,211	108,211	2,000		105,581	103,581	2,000		-	-	121,98	-	-
BL-11A	PV-11	105,581	104,581	1,000		105,581	104,581	1,000		11,42	-	-	-	-
BL-11B	PV-11	105,581	104,581	1,000		105,581	104,581	1,000		10,96	-	-	-	-
PV-11	PV-12	105,581	103,581	2,000		105,581	103,581	2,000		-	-	88,11	-	-
PV-12	BL-12A	105,581	103,581	2,000		105,581	103,581	2,000		-	8,31	-	-	-
PV-12	BL-12B	105,581	103,581	2,000		105,581	103,581	2,000		-	7,65	-	-	-
TOTAL										145,71	252,80	659,67	-	-