

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
TRECHO 01 - EE-02 / RAP-03					
EE-02	0,00	97,000	96,660	0,340	-
2	40,00	99,200	98,150	1,050	0,03725
4	80,00	99,441	98,391	1,050	0,00603
6	120,00	104,031	102,981	1,050	0,11475
7	140,00	106,160	105,110	1,050	0,10645
9	180,00	112,558	111,508	1,050	0,15995
11	220,00	117,003	114,203	2,800	0,06737
14	280,00	115,660	114,610	1,050	0,00678
15	300,00	117,090	115,090	2,000	0,02400
16	320,00	116,931	115,881	1,050	0,03955
17	340,00	116,034	114,984	1,050	-0,04485
19	380,00	117,852	116,802	1,050	0,04545
22	440,00	118,157	117,107	1,050	0,00508
24	480,00	118,828	117,778	1,050	0,01678
27	540,00	118,652	117,602	1,050	-0,00293
29	580,00	117,083	116,033	1,050	-0,03923
32	640,00	117,723	116,673	1,050	0,01067
34	680,00	118,959	117,909	1,050	0,03090
37	740,00	119,061	118,011	1,050	0,00170
39	780,00	119,264	118,214	1,050	0,00507
42	840,00	121,009	119,959	1,050	0,02908
44	880,00	123,306	122,256	1,050	0,05743
47	940,00	124,586	123,536	1,050	0,02133
49	980,00	127,639	126,589	1,050	0,07633
52	1.040,00	128,788	127,738	1,050	0,01915
54	1.080,00	129,704	128,654	1,050	0,02290
55	1.100,00	130,257	129,207	1,050	0,02765
58	1.160,00	132,569	131,519	1,050	0,03853
60	1.200,00	133,893	132,843	1,050	0,03310
63	1.260,00	135,099	134,049	1,050	0,02010
65	1.300,00	134,575	133,525	1,050	-0,01310
68	1.360,00	134,517	133,467	1,050	-0,00097
70	1.400,00	133,485	132,435	1,050	-0,02580
73	1.460,00	132,190	131,140	1,050	-0,02158
75	1.500,00	131,608	130,558	1,050	-0,01455
78	1.560,00	131,259	130,209	1,050	-0,00582
80	1.600,00	130,212	129,162	1,050	-0,02618
83	1.660,00	129,165	128,115	1,050	-0,01745
85	1.700,00	128,918	127,868	1,050	-0,00617
88	1.760,00	129,485	128,435	1,050	0,00945
90	1.800,00	130,828	129,778	1,050	0,03357
93	1.860,00	129,282	128,232	1,050	-0,02577
95	1.900,00	129,223	128,173	1,050	-0,00147
98	1.960,00	129,209	127,709	1,500	-0,00773
100	2.000,00	129,427	128,377	1,050	0,01670
103	2.060,00	130,241	129,091	1,150	0,01190
105	2.100,00	130,416	129,366	1,050	0,00687
108	2.160,00	129,151	128,101	1,050	-0,02108
110	2.200,00	129,427	128,377	1,050	0,00690
113	2.260,00	130,416	129,366	1,050	0,01648
115	2.300,00	131,463	130,413	1,050	0,02618
118	2.360,00	133,208	132,158	1,050	0,02908
120	2.400,00	133,819	132,769	1,050	0,01527
123	2.460,00	134,735	133,685	1,050	0,01527
125	2.500,00	136,757	135,707	1,050	0,05055

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
128	2.560,00	140,245	139,195	1,050	0,05813
130	2.600,00	142,891	141,841	1,050	0,06615
133	2.660,00	145,827	144,777	1,050	0,04893
135	2.700,00	147,354	146,304	1,050	0,03818
138	2.760,00	129,151	128,101	1,050	-0,30338
140	2.800,00	147,484	146,434	1,050	0,45833
143	2.860,00	146,495	145,445	1,050	-0,01648
145	2.900,00	148,226	147,176	1,050	0,04327
148	2.960,00	150,847	149,797	1,050	0,04368
149	2.980,00	152,971	151,921	1,050	0,10620
152	3.040,00	154,326	153,076	1,250	0,01925
154	3.080,00	154,338	153,288	1,050	0,00530
155	3.100,00	148,115	147,065	1,050	-0,31115
157	3.140,00	150,705	149,655	1,050	0,06475
158	3.160,00	148,115	147,065	1,050	-0,12950
160	3.200,00	138,261	137,211	1,050	-0,24635
163	3.260,00	130,979	129,929	1,050	-0,12137
165	3.300,00	136,172	135,122	1,050	0,12983
168	3.360,00	142,760	141,710	1,050	0,10980
170	3.400,00	145,352	144,302	1,050	0,06480
173	3.460,00	146,020	144,970	1,050	0,01113
175	3.500,00	144,850	143,800	1,050	-0,02925
178	3.560,00	145,440	143,290	2,150	-0,00850
180	3.600,00	142,530	141,480	1,050	-0,04525
183	3.660,00	142,970	141,920	1,050	0,00733
185	3.700,00	145,740	144,690	1,050	0,06925
188	3.760,00	146,790	145,740	1,050	0,01750
190	3.800,00	142,070	141,020	1,050	-0,11800
193	3.860,00	138,104	137,054	1,050	-0,06610
195	3.900,00	136,280	135,230	1,050	-0,04560
198	3.960,00	134,640	133,590	1,050	-0,02733
200	4.000,00	137,270	136,220	1,050	0,06575
203	4.060,00	139,370	138,320	1,050	0,03500
205	4.100,00	146,380	145,330	1,050	0,17525
208	4.160,00	152,740	151,690	1,050	0,10600
210	4.200,00	153,960	152,460	1,500	0,01925
213	4.260,00	153,990	152,940	1,050	0,00800
215	4.300,00	155,230	154,180	1,050	0,03100
218	4.360,00	154,800	153,750	1,050	-0,00717
219	4.380,00	155,530	153,530	2,000	-0,01100
220	4.400,00	155,130	152,630	2,500	-0,04500
221	4.420,00	152,302	151,252	1,050	-0,06890
222	4.440,00	144,814	143,764	1,050	-0,37440
224	4.480,00	141,170	140,120	1,050	-0,09110
227	4.540,00	141,831	140,781	1,050	0,01102
229	4.580,00	144,250	143,200	1,050	0,06048
230	4.600,00	149,732	148,682	1,050	0,27410
231	4.620,00	149,820	148,770	1,050	0,00440
233	4.660,00	149,940	148,890	1,050	0,00300
236	4.720,00	151,509	150,459	1,050	0,02615
238	4.760,00	153,021	151,971	1,050	0,03780
241	4.820,00	154,390	153,340	1,050	0,02282
243	4.860,00	155,813	154,763	1,050	0,03558
246	4.920,00	157,070	156,020	1,050	0,02095
248	4.960,00	155,790	154,740	1,050	-0,03200
251	5.020,00	156,490	155,440	1,050	0,01167

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
253	5.060,00	157,630	156,580	1,050	0,02850
256	5.120,00	160,090	159,040	1,050	0,04100
258	5.160,00	161,790	160,740	1,050	0,04250
261	5.220,00	164,655	163,605	1,050	0,04775
263	5.260,00	166,735	165,685	1,050	0,05200
266	5.320,00	167,680	166,630	1,050	0,01575
268	5.360,00	168,650	167,600	1,050	0,02425
271	5.420,00	170,880	169,830	1,050	0,03717
273	5.460,00	172,785	171,735	1,050	0,04763
276	5.520,00	174,440	173,390	1,050	0,02758
278	5.560,00	176,940	175,890	1,050	0,06250
281	5.620,00	180,300	179,250	1,050	0,05600
283	5.660,00	181,960	180,910	1,050	0,04150
286	5.720,00	183,120	182,070	1,050	0,01933
288	5.760,00	185,070	184,020	1,050	0,04875
291	5.820,00	187,130	186,080	1,050	0,03433
293	5.860,00	189,440	188,390	1,050	0,05775
296	5.920,00	191,200	190,150	1,050	0,02933
298	5.960,00	192,850	191,800	1,050	0,04125
301	6.020,00	195,400	194,350	1,050	0,04250
303	6.060,00	198,040	196,990	1,050	0,06600
306	6.120,00	198,770	197,720	1,050	0,01217
308	6.160,00	199,900	198,850	1,050	0,02825
311	6.220,00	202,460	201,410	1,050	0,04267
313	6.260,00	204,530	203,480	1,050	0,05175
316	6.320,00	207,140	206,090	1,050	0,04350
318	6.360,00	209,236	208,186	1,050	0,05240
RAP-03	6.420,00	211,770	210,720	1,050	0,04223
TRECHO 02 - EE-03 / RAP-04					
EE-03	-	211,770	210,720	1,050	-
323	6.460,00	214,190	213,140	1,050	0,06050
324	6.480,00	215,009	213,959	1,050	0,04095
326	6.520,00	219,780	218,730	1,050	0,11928
329	6.580,00	225,440	224,390	1,050	0,09433
331	6.620,00	231,050	230,000	1,050	0,14025
334	6.680,00	231,970	230,920	1,050	0,01533
336	6.720,00	228,090	227,040	1,050	-0,09700
339	6.780,00	225,300	224,250	1,050	-0,04650
340	6.800,00	225,890	224,840	1,050	0,02950
341	6.820,00	227,520	226,470	1,050	0,08150
344	6.880,00	232,060	231,010	1,050	0,07567
346	6.920,00	236,210	235,160	1,050	0,10375
349	6.980,00	241,930	240,880	1,050	0,09533
351	7.020,00	248,670	247,620	1,050	0,16850
354	7.080,00	255,790	254,740	1,050	0,11867
356	7.120,00	259,420	258,370	1,050	0,09075
359	7.180,00	261,600	260,550	1,050	0,03633
361	7.220,00	264,800	263,750	1,050	0,08000
364	7.280,00	269,014	267,964	1,050	0,07023
366	7.320,00	274,130	273,080	1,050	0,12790
369	7.380,00	278,530	277,480	1,050	0,07333
371	7.420,00	284,590	283,540	1,050	0,15150
374	7.480,00	288,980	287,930	1,050	0,07317
376	7.520,00	293,690	292,640	1,050	0,11775
379	7.580,00	298,830	297,780	1,050	0,08567
381	7.620,00	302,200	301,150	1,050	0,08425

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
382	7.640,00	303,202	302,152	1,050	0,05010
384	7.680,00	316,775	315,725	1,050	0,33933
RAP-04	7.740,00	330,486	329,436	1,050	0,22852
TRECHO 03 - EE-04 / RAP-05					
EE-04	-	330,486	329,436	1,050	-
389	7.780,00	339,555	338,505	1,050	0,22673
392	7.840,00	346,370	345,320	1,050	0,11358
394	7.880,00	350,289	349,239	1,050	0,09797
396	7.920,00	351,583	350,533	1,050	0,03235
399	7.980,00	359,555	358,505	1,050	0,13287
401	8.020,00	372,987	371,937	1,050	0,33580
403	8.060,00	380,889	379,839	1,050	0,19755
405	8.100,00	387,646	386,596	1,050	0,16893
408	8.160,00	382,781	381,731	1,050	-0,08108
410	8.200,00	383,487	382,437	1,050	0,01765
413	8.260,00	395,061	394,011	1,050	0,19290
415	8.300,00	406,931	405,881	1,050	0,29675
417	8.340,00	414,347	413,297	1,050	0,18540
419	8.380,00	422,341	421,291	1,050	0,19985
422	8.440,00	430,048	428,998	1,050	0,12845
424	8.480,00	434,452	433,402	1,050	0,11010
RAP-05	8.520,00	442,403	441,353	1,050	0,19878
TRECHO 04 - EE-05 / RAP-06					
EE-05	-	442,403	441,353	1,050	-
428	8.560,00	451,625	450,575	1,050	0,23055
431	8.620,00	454,997	453,947	1,050	0,05620
433	8.660,00	457,981	456,931	1,050	0,07460
435	8.700,00	461,875	460,825	1,050	0,09735
437	8.740,00	464,466	463,416	1,050	0,06478
439	8.780,00	467,460	466,410	1,050	0,07485
442	8.840,00	471,180	470,130	1,050	0,06200
444	8.880,00	473,972	472,922	1,050	0,06980
447	8.940,00	478,940	477,890	1,050	0,08280
449	8.980,00	484,008	482,958	1,050	0,12670
451	9.020,00	486,116	485,066	1,050	0,05270
453	9.060,00	489,691	488,641	1,050	0,08937
456	9.120,00	492,308	491,258	1,050	0,04362
458	9.160,00	494,271	493,221	1,050	0,04908
460	9.200,00	497,219	496,169	1,050	0,07370
463	9.260,00	492,282	491,232	1,050	-0,08228
465	9.300,00	494,107	493,057	1,050	0,04563
468	9.360,00	500,840	499,790	1,050	0,11222
470	9.400,00	507,512	506,462	1,050	0,16680
472	9.440,00	515,149	514,099	1,050	0,19093
475	9.500,00	510,951	509,901	1,050	-0,06997
477	9.540,00	526,325	525,275	1,050	0,38435
480	9.600,00	532,866	531,816	1,050	0,10902
482	9.640,00	539,234	538,184	1,050	0,15920
485	9.700,00	545,400	544,350	1,050	0,10277
487	9.740,00	547,915	546,865	1,050	0,06287
RAP-06	9.800,00	552,782	551,732	1,050	0,08112
TRECHO 05 - EE-06 / RAP-07					
EE-06	-	552,782	551,732	1,050	-
492	9.840,00	558,948	557,898	1,050	0,15415
495	9.900,00	565,027	563,977	1,050	0,10132
497	9.940,00	569,254	568,204	1,050	0,10568

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
499	9.980,00	574,451	573,401	1,050	0,12993
501	10.020,00	577,214	576,164	1,050	0,06908
504	10.080,00	579,061	578,011	1,050	0,03078
506	10.120,00	583,377	582,327	1,050	0,10790
508	10.160,00	587,336	586,286	1,050	0,09898
510	10.200,00	591,561	590,511	1,050	0,10563
512	10.240,00	593,582	592,532	1,050	0,05052
515	10.300,00	596,184	595,134	1,050	0,04337
517	10.340,00	600,805	599,755	1,050	0,11553
520	10.400,00	603,088	602,038	1,050	0,03805
522	10.440,00	606,678	605,628	1,050	0,08975
525	10.500,00	609,004	607,954	1,050	0,03877
527	10.540,00	611,214	610,164	1,050	0,05525
532	10.640,00	618,884	617,834	1,050	0,07670
542	10.840,00	618,406	616,906	1,500	-0,00464
545	10.900,00	617,016	615,966	1,050	-0,01567
546	10.920,00	617,569	615,569	2,000	-0,01985
553	11.060,00	620,483	619,433	1,050	0,02760
563	11.260,00	630,016	628,966	1,050	0,04767
573	11.460,00	643,118	642,068	1,050	0,06551
RAP-07	11.660,00	666,406	665,356	1,050	0,11644
TRECHO 06 - EE-07 / Estaca 614					
EE-07	-	666,406	665,356	1,050	-
599	11.980,00	702,756	701,706	1,050	0,11359
601	12.020,00	706,603	705,553	1,050	0,09617
603	12.060,00	715,271	714,221	1,050	0,21670
605	12.100,00	719,862	718,812	1,050	0,11478
607	12.140,00	724,618	723,568	1,050	0,11890
609	12.180,00	731,928	730,878	1,050	0,18275
611	12.220,00	737,591	736,541	1,050	0,14158
614	12.280,00	746,453	745,403	1,050	0,14770
TRECHO 07 - Estaca 614 / Estaca 943					
615	12.300,00	744,667	743,617	1,050	-0,08930
618	12.360,00	737,802	736,752	1,050	-0,11442
621	12.420,00	729,727	728,677	1,050	-0,13458
622	12.440,00	725,774	724,724	1,050	-0,19765
624	12.480,00	722,295	721,245	1,050	-0,08698
626	12.520,00	717,403	716,353	1,050	-0,12230
630	12.600,00	705,540	704,490	1,050	-0,14829
634	12.680,00	696,726	695,676	1,050	-0,11018
638	12.760,00	684,957	683,907	1,050	-0,14711
642	12.840,00	677,963	676,913	1,050	-0,08743
645	12.900,00	674,466	673,416	1,050	-0,05828
646	12.920,00	670,555	669,505	1,050	-0,19555
650	13.000,00	662,633	661,583	1,050	-0,09902
654	13.080,00	660,671	659,621	1,050	-0,02452
656	13.120,00	661,409	660,359	1,050	0,01845
659	13.180,00	663,307	662,257	1,050	0,03163
661	13.220,00	664,695	663,645	1,050	0,03470
663	13.260,00	667,324	666,274	1,050	0,06572
665	13.300,00	665,176	664,126	1,050	-0,05370
666	13.320,00	662,836	661,786	1,050	-0,11700
671	13.420,00	657,843	656,793	1,050	-0,04993
672	13.440,00	652,950	651,900	1,050	-0,24465
674	13.480,00	648,361	647,311	1,050	-0,11473
679	13.580,00	643,516	642,466	1,050	-0,04845

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
681	13.620,00	640,744	639,694	1,050	-0,06930
684	13.680,00	638,076	637,026	1,050	-0,04447
687	13.740,00	631,715	630,665	1,050	-0,10602
691	13.820,00	626,986	625,936	1,050	-0,05911
695	13.900,00	622,126	621,076	1,050	-0,06075
698	13.960,00	619,296	618,246	1,050	-0,04717
701	14.020,00	613,483	612,433	1,050	-0,09688
706	14.120,00	614,225	613,175	1,050	0,00742
708	14.160,00	614,974	613,924	1,050	0,01873
711	14.220,00	611,965	610,915	1,050	-0,05015
713	14.260,00	609,981	608,931	1,050	-0,04960
715	14.300,00	608,698	607,648	1,050	-0,03208
717	14.340,00	607,101	606,051	1,050	-0,03992
720	14.400,00	604,649	603,599	1,050	-0,04087
722	14.440,00	604,433	603,383	1,050	-0,00540
725	14.500,00	604,392	603,342	1,050	-0,00068
729	14.580,00	602,789	601,739	1,050	-0,02004
732	14.640,00	601,590	600,540	1,050	-0,01998
735	14.700,00	598,959	597,909	1,050	-0,04385
741	14.820,00	596,739	595,689	1,050	-0,01850
745	14.900,00	596,319	595,269	1,050	-0,00525
748	14.960,00	596,292	595,242	1,050	-0,00045
751	15.020,00	595,254	594,204	1,050	-0,01730
753	15.060,00	594,026	592,976	1,050	-0,03070
758	15.160,00	591,332	590,282	1,050	-0,02694
760	15.200,00	593,095	590,045	3,050	-0,00592
766	15.320,00	591,628	589,428	2,200	-0,00514
771	15.420,00	589,880	588,830	1,050	-0,00598
772	15.440,00	589,880	587,830	2,050	-0,05000
774	15.480,00	588,373	587,323	1,050	-0,01267
779	15.580,00	588,171	586,771	1,400	-0,00552
784	15.680,00	586,008	584,958	1,050	-0,01813
786	15.720,00	580,857	579,807	1,050	-0,12878
791	15.820,00	578,979	577,929	1,050	-0,01878
821	16.420,00	577,142	574,892	2,250	-0,00506
850	17.000,00	575,755	571,955	3,800	-0,00506
854	17.080,00	575,119	574,069	1,050	0,02643
856	17.120,00	576,263	575,213	1,050	0,02860
858	17.160,00	574,334	573,284	1,050	-0,04823
859	17.180,00	573,720	572,670	1,050	-0,03070
861	17.220,00	572,678	571,628	1,050	-0,02605
863	17.260,00	572,337	571,287	1,050	-0,00853
866	17.320,00	572,793	570,793	2,000	-0,00823
869	17.380,00	573,023	570,473	2,550	-0,00533
872	17.440,00	571,588	570,538	1,050	0,00108
874	17.480,00	570,518	569,468	1,050	-0,02675
879	17.580,00	566,724	565,674	1,050	-0,03794
881	17.620,00	565,395	564,345	1,050	-0,03323
884	17.680,00	564,076	563,026	1,050	-0,02198
889	17.780,00	563,701	562,451	1,250	-0,00575
892	17.840,00	563,602	562,102	1,500	-0,00582
894	17.880,00	561,503	560,453	1,050	-0,04122
896	17.920,00	561,235	560,185	1,050	-0,00670
899	17.980,00	563,609	562,559	1,050	0,03957
902	18.040,00	561,894	560,844	1,050	-0,02858
906	18.120,00	562,187	560,187	2,000	-0,00821

CÁLCULO DAS DECLIVIDADES

Estaca	Distância Acumulada	Cota (m)		Profundidade (m)	Declividade (m/m)
		Terreno	Projeto		
907	18.140,00	562,133	559,633	2,500	-0,02770
912	18.240,00	561,146	559,046	2,100	-0,00587
915	18.300,00	559,842	558,692	1,150	-0,00590
917	18.340,00	559,670	558,470	1,200	-0,00555
919	18.380,00	560,202	559,152	1,050	0,01705
922	18.440,00	562,002	560,952	1,050	0,03000
925	18.500,00	563,745	562,595	1,150	0,02738
927	18.540,00	563,172	562,122	1,050	-0,01182
931	18.620,00	560,963	559,913	1,050	-0,02761
937	18.740,00	557,723	556,673	1,050	-0,02700
943	18.860,00	569,079	568,029	1,050	0,09463

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
TRECHO 01 - EE-02 / RAP-03									
EE-02	0,00	97,000	96,660	10,22	130	150	-	231,240	134,58
2	40,00	99,200	98,150	10,22	130	150	0,123	231,117	132,97
4	40,00	99,441	98,391	10,22	130	150	0,123	230,994	132,60
6	40,00	104,031	102,981	10,22	130	150	0,123	230,871	127,89
7	20,00	106,160	105,110	10,22	130	150	0,061	230,810	125,70
9	40,00	112,558	111,508	10,22	130	150	0,123	230,687	119,18
11	40,00	117,003	114,203	10,22	130	150	0,123	230,564	116,36
14	60,00	115,660	114,610	10,22	130	150	0,184	230,380	115,77
15	20,00	117,090	115,090	10,22	130	150	0,061	230,318	115,23
16	20,00	116,931	115,881	10,22	130	150	0,061	230,257	114,38
17	20,00	116,034	114,984	10,22	130	150	0,061	230,196	115,21
19	40,00	117,852	116,802	10,22	130	150	0,123	230,073	113,27
22	60,00	118,157	117,107	10,22	130	150	0,184	229,888	112,78
24	40,00	118,828	117,778	10,22	130	150	0,123	229,766	111,99
27	60,00	118,652	117,602	10,22	130	150	0,184	229,581	111,98
29	40,00	117,083	116,033	10,22	130	150	0,123	229,458	113,43
32	60,00	117,723	116,673	10,22	130	150	0,184	229,274	112,60
34	40,00	118,959	117,909	10,22	130	150	0,123	229,151	111,24
37	60,00	119,061	118,011	10,22	130	150	0,184	228,967	110,96
39	40,00	119,264	118,214	10,22	130	150	0,123	228,844	110,63
42	60,00	121,009	119,959	10,22	130	150	0,184	228,660	108,70
44	40,00	123,306	122,256	10,22	130	150	0,123	228,537	106,28
47	60,00	124,586	123,536	10,22	130	150	0,184	228,353	104,82
49	40,00	127,639	126,589	10,22	130	150	0,123	228,230	101,64
52	60,00	128,788	127,738	10,22	130	150	0,184	228,045	100,31
54	40,00	129,704	128,654	10,22	130	150	0,123	227,922	99,27
55	20,00	130,257	129,207	10,22	130	150	0,061	227,861	98,65
58	60,00	132,569	131,519	10,22	130	150	0,184	227,677	96,16
60	40,00	133,893	132,843	10,22	130	150	0,123	227,554	94,71
63	60,00	135,099	134,049	10,22	130	150	0,184	227,370	93,32
65	40,00	134,575	133,525	10,22	130	150	0,123	227,247	93,72
68	60,00	134,517	133,467	10,22	130	150	0,184	227,062	93,60
70	40,00	133,485	132,435	10,22	130	150	0,123	226,940	94,50
73	60,00	132,190	131,140	10,22	130	150	0,184	226,755	95,62
75	40,00	131,608	130,558	10,22	130	150	0,123	226,632	96,07
78	60,00	131,259	130,209	10,22	130	150	0,184	226,448	96,24
80	40,00	130,212	129,162	10,22	130	150	0,123	226,325	97,16
83	60,00	129,165	128,115	10,22	130	150	0,184	226,141	98,03
85	40,00	128,918	127,868	10,22	130	150	0,123	226,018	98,15
88	60,00	129,485	128,435	10,22	130	150	0,184	225,834	97,40
90	40,00	130,828	129,778	10,22	130	150	0,123	225,711	95,93
93	60,00	129,282	128,232	10,22	130	150	0,184	225,526	97,29
95	40,00	129,223	128,173	10,22	130	150	0,123	225,404	97,23
98	60,00	129,209	127,709	10,22	130	150	0,184	225,219	97,51
100	40,00	129,427	128,377	10,22	130	150	0,123	225,096	96,72
103	60,00	130,241	129,091	10,22	130	150	0,184	224,912	95,82
105	40,00	130,416	129,366	10,22	130	150	0,123	224,789	95,42
108	60,00	129,151	128,101	10,22	130	150	0,184	224,605	96,50
110	40,00	129,427	128,377	10,22	130	150	0,123	224,482	96,11
113	60,00	130,416	129,366	10,22	130	150	0,184	224,298	94,93
115	40,00	131,463	130,413	10,22	130	150	0,123	224,175	93,76
118	60,00	133,208	132,158	10,22	130	150	0,184	223,991	91,83
120	40,00	133,819	132,769	10,22	130	150	0,123	223,868	91,10
123	60,00	134,735	133,685	10,22	130	150	0,184	223,683	90,00
125	40,00	136,757	135,707	10,22	130	150	0,123	223,561	87,85
128	60,00	140,245	139,195	10,22	130	150	0,184	223,376	84,18
130	40,00	142,891	141,841	10,22	130	150	0,123	223,253	81,41
133	60,00	145,827	144,777	10,22	130	150	0,184	223,069	78,29

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
135	40,00	147,354	146,304	10,22	130	150	0,123	222,946	76,64
138	60,00	129,151	128,101	10,22	130	150	0,184	222,762	94,66
140	40,00	147,484	146,434	10,22	130	150	0,123	222,639	76,21
143	60,00	146,495	145,445	10,22	130	150	0,184	222,455	77,01
145	40,00	148,226	147,176	10,22	130	150	0,123	222,332	75,16
148	60,00	150,847	149,797	10,22	130	150	0,184	222,148	72,35
149	20,00	152,971	151,921	10,22	130	150	0,061	222,086	70,17
152	60,00	154,326	153,076	10,22	130	150	0,184	221,902	68,83
154	40,00	154,338	153,288	10,22	130	150	0,123	221,779	68,49
155	20,00	148,115	147,065	10,22	130	150	0,061	221,717	74,65
157	40,00	150,705	149,655	10,22	130	150	0,123	221,595	71,94
158	20,00	148,115	147,065	10,22	130	150	0,061	221,533	74,47
160	40,00	138,261	137,211	10,22	130	150	0,123	221,410	84,20
163	60,00	130,979	129,929	10,22	130	150	0,184	221,226	91,30
165	40,00	136,172	135,122	10,22	130	150	0,123	221,103	85,98
168	60,00	142,760	141,710	10,22	130	150	0,184	220,919	79,21
170	40,00	145,352	144,302	10,22	130	150	0,123	220,796	76,49
173	60,00	146,020	144,970	10,22	130	150	0,184	220,612	75,64
175	40,00	144,850	143,800	10,22	130	150	0,123	220,489	76,69
178	60,00	145,440	143,290	10,22	130	150	0,184	220,304	77,01
180	40,00	142,530	141,480	10,22	130	150	0,123	220,182	78,70
183	60,00	142,970	141,920	10,22	130	150	0,184	219,997	78,08
185	40,00	145,740	144,690	10,22	130	150	0,123	219,874	75,18
188	60,00	146,790	145,740	10,22	130	150	0,184	219,690	73,95
190	40,00	142,070	141,020	10,22	130	150	0,123	219,567	78,55
193	60,00	138,104	137,054	10,22	130	150	0,184	219,383	82,33
195	40,00	136,280	135,230	10,22	130	150	0,123	219,260	84,03
198	60,00	134,640	133,590	10,22	130	150	0,184	219,076	85,49
200	40,00	137,270	136,220	10,22	130	150	0,123	218,953	82,73
203	60,00	139,370	138,320	10,22	130	150	0,184	218,769	80,45
205	40,00	146,380	145,330	10,22	130	150	0,123	218,646	73,32
208	60,00	152,740	151,690	10,22	130	150	0,184	218,461	66,77
210	40,00	153,960	152,460	10,22	130	150	0,123	218,339	65,88
213	60,00	153,990	152,940	10,22	130	150	0,184	218,154	65,21
215	40,00	155,230	154,180	10,22	130	150	0,123	218,031	63,85
218	60,00	154,800	153,750	10,22	130	150	0,184	217,847	64,10
219	20,00	155,530	153,530	10,22	130	150	0,061	217,786	64,26
220	20,00	155,130	152,630	10,22	130	150	0,061	217,724	65,09
221	20,00	152,302	151,252	10,22	130	150	0,061	217,663	66,41
222	20,00	144,814	143,764	10,22	130	150	0,061	217,601	73,84
224	40,00	141,170	140,120	10,22	130	150	0,123	217,478	77,36
227	60,00	141,831	140,781	10,22	130	150	0,184	217,294	76,51
229	40,00	144,250	143,200	10,22	130	150	0,123	217,171	73,97
230	20,00	149,732	148,682	10,22	130	150	0,061	217,110	68,43
231	20,00	149,820	148,770	10,22	130	150	0,061	217,048	68,28
233	40,00	149,940	148,890	10,22	130	150	0,123	216,926	68,04
236	60,00	151,509	150,459	10,22	130	150	0,184	216,741	66,28
238	40,00	153,021	151,971	10,22	130	150	0,123	216,618	64,65
241	60,00	154,390	153,340	10,22	130	150	0,184	216,434	63,09
243	40,00	155,813	154,763	10,22	130	150	0,123	216,311	61,55
246	60,00	157,070	156,020	10,22	130	150	0,184	216,127	60,11
248	40,00	155,790	154,740	10,22	130	150	0,123	216,004	61,26
251	60,00	156,490	155,440	10,22	130	150	0,184	215,820	60,38
253	40,00	157,630	156,580	10,22	130	150	0,123	215,697	59,12
256	60,00	160,090	159,040	10,22	130	150	0,184	215,513	56,47
258	40,00	161,790	160,740	10,22	130	150	0,123	215,390	54,65
261	60,00	164,655	163,605	10,22	130	150	0,184	215,205	51,60
263	40,00	166,735	165,685	10,22	130	150	0,123	215,082	49,40
266	60,00	167,680	166,630	10,22	130	150	0,184	214,898	48,27

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
268	40,00	168,650	167,600	10,22	130	150	0,123	214,775	47,18
271	60,00	170,880	169,830	10,22	130	150	0,184	214,591	44,76
273	40,00	172,785	171,735	10,22	130	150	0,123	214,468	42,73
276	60,00	174,440	173,390	10,22	130	150	0,184	214,284	40,89
278	40,00	176,940	175,890	10,22	130	150	0,123	214,161	38,27
281	60,00	180,300	179,250	10,22	130	150	0,184	213,977	34,73
283	40,00	181,960	180,910	10,22	130	150	0,123	213,854	32,94
286	60,00	183,120	182,070	10,22	130	150	0,184	213,669	31,60
288	40,00	185,070	184,020	10,22	140	150	0,107	213,562	29,54
291	60,00	187,130	186,080	10,22	140	150	0,161	213,402	27,32
293	40,00	189,440	188,390	10,22	140	150	0,107	213,294	24,90
296	60,00	191,200	190,150	10,22	140	150	0,161	213,134	22,98
298	40,00	192,850	191,800	10,22	140	150	0,107	213,027	21,23
301	60,00	195,400	194,350	10,22	140	150	0,161	212,866	18,52
303	40,00	198,040	196,990	10,22	140	150	0,107	212,759	15,77
306	60,00	198,770	197,720	10,22	140	150	0,161	212,598	14,88
308	40,00	199,900	198,850	10,22	140	150	0,107	212,491	13,64
311	60,00	202,460	201,410	10,22	140	150	0,161	212,330	10,92
313	40,00	204,530	203,480	10,22	140	150	0,107	212,223	8,74
316	60,00	207,140	206,090	10,22	140	150	0,161	212,063	5,97
318	40,00	209,236	208,186	10,22	140	150	0,107	211,955	3,77
RAP-03	60,00	211,770	210,720	10,22	140	150	0,161	211,795	1,07
TRECHO 02 - EE-03 / RAP-04									
EE-03	-	211,770	210,720	10,22	130	150	-	333,351	122,63
323	40,00	214,190	213,140	10,22	130	150	0,123	333,228	120,09
324	20,00	215,009	213,959	10,22	130	150	0,061	333,167	119,21
326	40,00	219,780	218,730	10,22	130	150	0,123	333,044	114,31
329	60,00	225,440	224,390	10,22	130	150	0,184	332,860	108,47
331	40,00	231,050	230,000	10,22	130	150	0,123	332,737	102,74
334	60,00	231,970	230,920	10,22	130	150	0,184	332,552	101,63
336	40,00	228,090	227,040	10,22	130	150	0,123	332,429	105,39
339	60,00	225,300	224,250	10,22	130	150	0,184	332,245	108,00
340	20,00	225,890	224,840	10,22	130	150	0,061	332,184	107,34
341	20,00	227,520	226,470	10,22	130	150	0,061	332,122	105,65
344	60,00	232,060	231,010	10,22	130	150	0,184	331,938	100,93
346	40,00	236,210	235,160	10,22	130	150	0,123	331,815	96,66
349	60,00	241,930	240,880	10,22	130	150	0,184	331,631	90,75
351	40,00	248,670	247,620	10,22	130	150	0,123	331,508	83,89
354	60,00	255,790	254,740	10,22	130	150	0,184	331,324	76,58
356	40,00	259,420	258,370	10,22	130	150	0,123	331,201	72,83
359	60,00	261,600	260,550	10,22	130	150	0,184	331,016	70,47
361	40,00	264,800	263,750	10,22	130	150	0,123	330,894	67,14
364	60,00	269,014	267,964	10,22	130	150	0,184	330,709	62,75
366	40,00	274,130	273,080	10,22	130	150	0,123	330,586	57,51
369	60,00	278,530	277,480	10,22	140	150	0,161	330,426	52,95
371	40,00	284,590	283,540	10,22	140	150	0,107	330,319	46,78
374	60,00	288,980	287,930	10,22	140	150	0,161	330,158	42,23
376	40,00	293,690	292,640	10,22	140	150	0,107	330,051	37,41
379	60,00	298,830	297,780	10,22	140	150	0,161	329,890	32,11
381	40,00	302,200	301,150	10,22	140	150	0,107	329,783	28,63
382	20,00	303,202	302,152	10,22	140	150	0,054	329,729	27,58
384	40,00	316,775	315,725	10,22	140	150	0,107	329,622	13,90
RAP-04	60,00	330,486	329,436	10,22	140	150	0,161	329,462	0,03
TRECHO 03 - EE-04 / RAP-05									
EE-04	-	330,486	329,436	10,22	130	150	-	443,530	114,09
389	40,00	339,555	338,505	10,22	130	150	0,123	443,407	104,90
392	60,00	346,370	345,320	10,22	130	150	0,184	443,223	97,90
394	40,00	350,289	349,239	10,22	130	150	0,123	443,100	93,86
396	40,00	351,583	350,533	10,22	130	150	0,123	442,977	92,44

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
399	60,00	359,555	358,505	10,22	130	150	0,184	442,793	84,29
401	40,00	372,987	371,937	10,22	140	150	0,107	442,686	70,75
403	40,00	380,889	379,839	10,22	140	150	0,107	442,579	62,74
405	40,00	387,646	386,596	10,22	140	150	0,107	442,471	55,88
408	60,00	382,781	381,731	10,22	140	150	0,161	442,311	60,58
410	40,00	383,487	382,437	10,22	140	150	0,107	442,204	59,77
413	60,00	395,061	394,011	10,22	140	150	0,161	442,043	48,03
415	40,00	406,931	405,881	10,22	140	150	0,107	441,936	36,05
417	40,00	414,347	413,297	10,22	140	150	0,107	441,829	28,53
419	40,00	422,341	421,291	10,22	140	150	0,107	441,721	20,43
422	60,00	430,048	428,998	10,22	140	150	0,161	441,561	12,56
424	40,00	434,452	433,402	10,22	140	150	0,107	441,454	8,05
RAP-05	40,00	442,403	441,353	10,22	140	150	0,107	441,357	0,00
TRECHO 04 - EE-05 / RAP-06									
EE-05	-	442,403	441,353	10,22	130	150	-	556,393	115,04
428	40,00	451,625	450,575	10,22	130	150	0,123	556,270	105,70
431	60,00	454,997	453,947	10,22	130	150	0,184	556,086	102,14
433	40,00	457,981	456,931	10,22	130	150	0,123	555,963	99,03
435	40,00	461,875	460,825	10,22	130	150	0,123	555,840	95,02
437	40,00	464,466	463,416	10,22	130	150	0,123	555,717	92,30
439	40,00	467,460	466,410	10,22	130	150	0,123	555,594	89,18
442	60,00	471,180	470,130	10,22	130	150	0,184	555,410	85,28
444	40,00	473,972	472,922	10,22	130	150	0,123	555,287	82,37
447	60,00	478,940	477,890	10,22	130	150	0,184	555,103	77,21
449	40,00	484,008	482,958	10,22	140	150	0,107	554,996	72,04
451	40,00	486,116	485,066	10,22	140	150	0,107	554,889	69,82
453	40,00	489,691	488,641	10,22	140	150	0,107	554,781	66,14
456	60,00	492,308	491,258	10,22	140	150	0,161	554,621	63,36
458	40,00	494,271	493,221	10,22	140	150	0,107	554,514	61,29
460	40,00	497,219	496,169	10,22	140	150	0,107	554,407	58,24
463	60,00	492,282	491,232	10,22	140	150	0,161	554,246	63,01
465	40,00	494,107	493,057	10,22	140	150	0,107	554,139	61,08
468	60,00	500,840	499,790	10,22	140	150	0,161	553,978	54,19
470	40,00	507,512	506,462	10,22	140	150	0,107	553,871	47,41
472	40,00	515,149	514,099	10,22	140	150	0,107	553,764	39,66
475	60,00	510,951	509,901	10,22	140	150	0,161	553,603	43,70
477	40,00	526,325	525,275	10,22	140	150	0,107	553,496	28,22
480	60,00	532,866	531,816	10,22	140	150	0,161	553,335	21,52
482	40,00	539,234	538,184	10,22	140	150	0,107	553,228	15,04
485	60,00	545,400	544,350	10,22	140	150	0,161	553,067	8,72
487	40,00	547,915	546,865	10,22	140	150	0,107	552,960	6,10
RAP-06	60,00	552,782	551,732	10,22	140	150	0,161	552,800	1,07
TRECHO 05 - EE-06 / RAP-07									
EE-06	-	552,782	551,732	10,22	130	150	-	670,513	118,78
492	40,00	558,948	557,898	10,22	130	150	0,123	670,390	112,49
495	60,00	565,027	563,977	10,22	130	150	0,184	670,206	106,23
497	40,00	569,254	568,204	10,22	130	150	0,123	670,083	101,88
499	40,00	574,451	573,401	10,22	130	150	0,123	669,960	96,56
501	40,00	577,214	576,164	10,22	130	150	0,123	669,837	93,67
504	60,00	579,061	578,011	10,22	130	150	0,184	669,653	91,64
506	40,00	583,377	582,327	10,22	130	150	0,123	669,530	87,20
508	40,00	587,336	586,286	10,22	130	150	0,123	669,407	83,12
510	40,00	591,561	590,511	10,22	130	150	0,123	669,284	78,77
512	40,00	593,582	592,532	10,22	140	150	0,107	669,177	76,65
515	60,00	596,184	595,134	10,22	140	150	0,161	669,016	73,88
517	40,00	600,805	599,755	10,22	140	150	0,107	668,909	69,15
520	60,00	603,088	602,038	10,22	140	150	0,161	668,749	66,71
522	40,00	606,678	605,628	10,22	140	150	0,107	668,642	63,01
525	60,00	609,004	607,954	10,22	140	150	0,161	668,481	60,53

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
527	40,00	611,214	610,164	10,22	140	150	0,107	668,374	58,21
532	100,00	618,884	617,834	10,22	140	150	0,268	668,106	50,27
542	200,00	618,406	616,906	10,22	140	150	0,536	667,570	50,66
545	60,00	617,016	615,966	10,22	140	150	0,161	667,410	51,44
546	20,00	617,569	615,569	10,22	140	150	0,054	667,356	51,79
553	140,00	620,483	619,433	10,22	140	150	0,375	666,981	47,55
563	200,00	630,016	628,966	10,22	140	150	0,536	666,445	37,48
573	200,00	643,118	642,068	10,22	140	150	0,536	665,910	23,84
RAP-07	200,00	666,406	665,356	10,22	140	150	0,536	665,374	0,02
TRECHO 06 - EE-07 / Estaca 614									
EE-07	-	666,406	665,356	10,22	130	150	-	747,206	81,85
599	320,00	702,756	701,706	10,22	130	150	0,983	746,223	44,52
601	40,00	706,603	705,553	10,22	140	150	0,107	746,116	40,56
603	40,00	715,271	714,221	10,22	140	150	0,107	746,009	31,79
605	40,00	719,862	718,812	10,22	140	150	0,107	745,902	27,09
607	40,00	724,618	723,568	10,22	140	150	0,107	745,795	22,23
609	40,00	731,928	730,878	10,22	140	150	0,107	745,687	14,81
611	40,00	737,591	736,541	10,22	140	150	0,107	745,580	9,04
614	60,00	746,453	745,403	10,22	140	150	0,161	745,420	0,02
TRECHO 07 - Estaca 614 / Estaca 943									
615	20,00	744,667	743,617	10,22	140	150	0,054	745,366	1,75
618	60,00	737,802	736,752	10,22	140	150	0,161	745,205	8,45
621	60,00	729,727	728,677	10,22	140	150	0,161	745,045	16,37
622	20,00	725,774	724,724	10,22	140	150	0,054	744,991	20,27
624	40,00	722,295	721,245	10,22	140	150	0,107	744,884	23,64
626	40,00	717,403	716,353	10,22	140	150	0,107	744,777	28,42
630	80,00	705,540	704,490	10,22	140	150	0,214	744,563	40,07
634	80,00	696,726	695,676	10,22	140	150	0,214	744,348	48,67
638	80,00	684,957	683,907	10,22	140	150	0,214	744,134	60,23
642	80,00	677,963	676,913	10,22	140	150	0,214	743,920	67,01
645	60,00	674,466	673,416	10,22	140	150	0,161	743,759	70,34
646	20,00	670,555	669,505	10,22	140	150	0,054	743,705	74,20
650	80,00	662,633	661,583	10,22	140	150	0,214	743,491	81,91
654	80,00	660,671	659,621	10,22	140	150	0,214	743,277	83,66
656	40,00	661,409	660,359	10,22	140	150	0,107	743,170	82,81
659	60,00	663,307	662,257	10,22	140	150	0,161	743,009	80,75
661	40,00	664,695	663,645	10,22	140	150	0,107	742,902	79,26
663	40,00	667,324	666,274	10,22	140	150	0,107	742,795	76,52
665	40,00	665,176	664,126	10,22	140	150	0,107	742,688	78,56
666	20,00	662,836	661,786	10,22	140	150	0,054	742,634	80,85
671	100,00	657,843	656,793	10,22	140	150	0,268	742,366	85,57
672	20,00	652,950	651,900	10,22	140	150	0,054	742,313	90,41
674	40,00	648,361	647,311	10,22	140	150	0,107	742,206	94,89
679 (*)	100,00	643,516	642,466	10,22	140	150	0,268	644,466	2,00
681	40,00	640,744	639,694	10,22	140	150	0,107	644,359	4,66
684	60,00	638,076	637,026	10,22	140	150	0,161	644,198	7,17
687	60,00	631,715	630,665	10,22	140	150	0,161	644,037	13,37
691	80,00	626,986	625,936	10,22	140	150	0,214	643,823	17,89
695	80,00	622,126	621,076	10,22	140	150	0,214	643,609	22,53
698	60,00	619,296	618,246	10,22	140	150	0,161	643,448	25,20
701	60,00	613,483	612,433	10,22	140	150	0,161	643,288	30,85
706	100,00	614,225	613,175	10,22	140	150	0,268	643,020	29,84
708	40,00	614,974	613,924	10,22	140	150	0,107	642,913	28,99
711	60,00	611,965	610,915	10,22	140	150	0,161	642,752	31,84
713	40,00	609,981	608,931	10,22	140	150	0,107	642,645	33,71
715	40,00	608,698	607,648	10,22	140	150	0,107	642,538	34,89
717	40,00	607,101	606,051	10,22	140	150	0,107	642,431	36,38
720	60,00	604,649	603,599	10,22	140	150	0,161	642,270	38,67
722	40,00	604,433	603,383	10,22	140	150	0,107	642,163	38,78

CÁLCULO DAS PRESSÕES DISPONÍVEIS

Estaca	Distância (m)	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Perda de Carga(m)	Cota Piezométrica	Pressão (m)
		Terreno	Projeto						
725	60,00	604,392	603,342	10,22	140	150	0,161	642,002	38,66
729	80,00	602,789	601,739	10,22	140	150	0,214	641,788	40,05
732	60,00	601,590	600,540	10,22	140	150	0,161	641,627	41,09
735	60,00	598,959	597,909	10,22	140	150	0,161	641,466	43,56
741	120,00	596,739	595,689	10,22	140	150	0,321	641,145	45,46
745	80,00	596,319	595,269	10,22	140	150	0,214	640,931	45,66
748	60,00	596,292	595,242	10,22	140	150	0,161	640,770	45,53
751	60,00	595,254	594,204	10,22	140	150	0,161	640,609	46,41
753	40,00	594,026	592,976	10,22	140	150	0,107	640,502	47,53
758	100,00	591,332	590,282	10,22	140	150	0,268	640,234	49,95
760	40,00	593,095	590,045	10,22	140	150	0,107	640,127	50,08
766	120,00	591,628	589,428	10,22	140	150	0,321	639,806	50,38
771	100,00	589,880	588,830	10,22	140	150	0,268	639,538	50,71
772	20,00	589,880	587,830	10,22	140	150	0,054	639,484	51,65
774	40,00	588,373	587,323	10,22	140	150	0,107	639,377	52,05
779	100,00	588,171	586,771	10,22	140	150	0,268	639,110	52,34
784	100,00	586,008	584,958	10,22	140	150	0,268	638,842	53,88
786	40,00	580,857	579,807	10,22	140	150	0,107	638,735	58,93
791	100,00	578,979	577,929	10,22	140	150	0,268	638,467	60,54
821	600,00	577,142	574,892	10,22	140	150	1,607	636,860	61,97
850	580,00	575,755	571,955	10,22	140	150	1,553	635,306	63,35
854	80,00	575,119	574,069	10,22	140	150	0,214	635,092	61,02
856	40,00	576,263	575,213	10,22	140	150	0,107	634,985	59,77
858	40,00	574,334	573,284	10,22	140	150	0,107	634,878	61,59
859	20,00	573,720	572,670	10,22	140	150	0,054	634,824	62,15
861	40,00	572,678	571,628	10,22	140	150	0,107	634,717	63,09
863	40,00	572,337	571,287	10,22	140	150	0,107	634,610	63,32
866	60,00	572,793	570,793	10,22	140	150	0,161	634,449	63,66
869	60,00	573,023	570,473	10,22	140	150	0,161	634,289	63,82
872	60,00	571,588	570,538	10,22	140	150	0,161	634,128	63,59
874	40,00	570,518	569,468	10,22	140	150	0,107	634,021	64,55
879	100,00	566,724	565,674	10,22	140	150	0,268	633,753	68,08
881	40,00	565,395	564,345	10,22	140	150	0,107	633,646	69,30
884	60,00	564,076	563,026	10,22	140	150	0,161	633,485	70,46
889	100,00	563,701	562,451	10,22	140	150	0,268	633,217	70,77
892	60,00	563,602	562,102	10,22	140	150	0,161	633,057	70,95
894	40,00	561,503	560,453	10,22	140	150	0,107	632,950	72,50
896	40,00	561,235	560,185	10,22	140	150	0,107	632,842	72,66
899	60,00	563,609	562,559	10,22	140	150	0,161	632,682	70,12
902	60,00	561,894	560,844	10,22	140	150	0,161	632,521	71,68
906	80,00	562,187	560,187	10,22	140	150	0,214	632,307	72,12
907	20,00	562,133	559,633	10,22	140	150	0,054	632,253	72,62
912	100,00	561,146	559,046	10,22	140	150	0,268	631,985	72,94
915	60,00	559,842	558,692	10,22	140	150	0,161	631,825	73,13
917	40,00	559,670	558,470	10,22	140	150	0,107	631,718	73,25
919	40,00	560,202	559,152	10,22	140	150	0,107	631,611	72,46
922	60,00	562,002	560,952	10,22	140	150	0,161	631,450	70,50
925	60,00	563,745	562,595	10,22	140	150	0,161	631,289	68,69
927	40,00	563,172	562,122	10,22	140	150	0,107	631,182	69,06
931	80,00	560,963	559,913	10,22	140	150	0,214	630,968	71,05
937	120,00	557,723	556,673	10,22	140	150	0,321	630,646	73,97
943	120,00	569,079	568,029	10,22	140	150	0,321	630,325	62,30

(*) Deverá ser implantada uma caixa para quebra de pressão

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTÂNEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
TRECHO 01 - EE-02 / RAP-03													
EE-02	97,000	96,660	10,22	130	150	231,240	134,580	0,58	5,90	1,00	1.153,01	67,97	182,03
2	99,200	98,150	10,22	130	150	231,117	132,967	0,58	5,90	1,00	1.153,01	67,97	180,54
4	99,441	98,391	10,22	130	150	230,994	132,603	0,58	5,90	1,00	1.153,01	67,97	180,30
6	104,031	102,981	10,22	130	150	230,871	127,890	0,58	5,90	1,00	1.153,01	67,97	175,71
7	106,160	105,110	10,22	130	150	230,810	125,700	0,58	5,90	1,00	1.153,01	67,97	173,58
9	112,558	111,508	10,22	130	150	230,687	119,179	0,58	5,90	1,00	1.153,01	67,97	167,19
11	117,003	114,203	10,22	130	150	230,564	116,361	0,58	5,90	1,00	1.153,01	67,97	164,49
14	115,660	114,610	10,22	130	150	230,380	115,770	0,58	5,90	1,00	1.153,01	67,97	164,08
15	117,090	115,090	10,22	130	150	230,318	115,228	0,58	5,90	1,00	1.153,01	67,97	163,60
16	116,931	115,881	10,22	130	150	230,257	114,376	0,58	5,90	1,00	1.153,01	67,97	162,81
17	116,034	114,984	10,22	130	150	230,196	115,212	0,58	5,90	1,00	1.153,01	67,97	163,71
19	117,852	116,802	10,22	130	150	230,073	113,271	0,58	5,90	1,00	1.153,01	67,97	161,89
22	118,157	117,107	10,22	130	150	229,888	112,781	0,58	5,90	1,00	1.153,01	67,97	161,59
24	118,828	117,778	10,22	130	150	229,766	111,988	0,58	5,90	1,00	1.153,01	67,97	160,92
27	118,652	117,602	10,22	130	150	229,581	111,979	0,58	5,90	1,00	1.153,01	67,97	161,09
29	117,083	116,033	10,22	130	150	229,458	113,425	0,58	5,90	1,00	1.153,01	67,97	162,66
32	117,723	116,673	10,22	130	150	229,274	112,601	0,58	5,90	1,00	1.153,01	67,97	162,02
34	118,959	117,909	10,22	130	150	229,151	111,242	0,58	5,90	1,00	1.153,01	67,97	160,78
37	119,061	118,011	10,22	130	150	228,967	110,956	0,58	5,90	1,00	1.153,01	67,97	160,68
39	119,264	118,214	10,22	130	150	228,844	110,630	0,58	5,90	1,00	1.153,01	67,97	160,48
42	121,009	119,959	10,22	130	150	228,660	108,701	0,58	5,90	1,00	1.153,01	67,97	158,73
44	123,306	122,256	10,22	130	150	228,537	106,281	0,58	5,90	1,00	1.153,01	67,97	156,44
47	124,586	123,536	10,22	130	150	228,353	104,817	0,58	5,90	1,00	1.153,01	67,97	155,16
49	127,639	126,589	10,22	130	150	228,230	101,641	0,58	5,90	1,00	1.153,01	67,97	152,10
52	128,788	127,738	10,22	130	150	228,045	100,307	0,58	5,90	1,00	1.153,01	67,97	150,96
54	129,704	128,654	10,22	130	150	227,922	99,268	0,58	5,90	1,00	1.153,01	67,97	150,04
55	130,257	129,207	10,22	130	150	227,861	98,654	0,58	5,90	1,00	1.153,01	67,97	149,49
58	132,569	131,519	10,22	130	150	227,677	96,158	0,58	5,90	1,00	1.153,01	67,97	147,17
60	133,893	132,843	10,22	130	150	227,554	94,711	0,58	5,90	1,00	1.153,01	67,97	145,85
63	135,099	134,049	10,22	130	150	227,370	93,321	0,58	5,90	1,00	1.153,01	67,97	144,64
65	134,575	133,525	10,22	130	150	227,247	93,722	0,58	5,90	1,00	1.153,01	67,97	145,17

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
68	134,517	133,467	10,22	130	150	227,062	93,595	0,58	5,90	1,00	1.153,01	67,97	145,23
70	133,485	132,435	10,22	130	150	226,940	94,505	0,58	5,90	1,00	1.153,01	67,97	146,26
73	132,190	131,140	10,22	130	150	226,755	95,615	0,58	5,90	1,00	1.153,01	67,97	147,55
75	131,608	130,558	10,22	130	150	226,632	96,074	0,58	5,90	1,00	1.153,01	67,97	148,14
78	131,259	130,209	10,22	130	150	226,448	96,239	0,58	5,90	1,00	1.153,01	67,97	148,48
80	130,212	129,162	10,22	130	150	226,325	97,163	0,58	5,90	1,00	1.153,01	67,97	149,53
83	129,165	128,115	10,22	130	150	226,141	98,026	0,58	5,90	1,00	1.153,01	67,97	150,58
85	128,918	127,868	10,22	130	150	226,018	98,150	0,58	5,90	1,00	1.153,01	67,97	150,83
88	129,485	128,435	10,22	130	150	225,834	97,399	0,58	5,90	1,00	1.153,01	67,97	150,26
90	130,828	129,778	10,22	130	150	225,711	95,933	0,58	5,90	1,00	1.153,01	67,97	148,92
93	129,282	128,232	10,22	130	150	225,526	97,294	0,58	5,90	1,00	1.153,01	67,97	150,46
95	129,223	128,173	10,22	130	150	225,404	97,231	0,58	5,90	1,00	1.153,01	67,97	150,52
98	129,209	127,709	10,22	130	150	225,219	97,510	0,58	5,90	1,00	1.153,01	67,97	150,98
100	129,427	128,377	10,22	130	150	225,096	96,719	0,58	5,90	1,00	1.153,01	67,97	150,32
103	130,241	129,091	10,22	130	150	224,912	95,821	0,58	5,90	1,00	1.153,01	67,97	149,60
105	130,416	129,366	10,22	130	150	224,789	95,423	0,58	5,90	1,00	1.153,01	67,97	149,33
108	129,151	128,101	10,22	130	150	224,605	96,504	0,58	5,90	1,00	1.153,01	67,97	150,59
110	129,427	128,377	10,22	130	150	224,482	96,105	0,58	5,90	1,00	1.153,01	67,97	150,32
113	130,416	129,366	10,22	130	150	224,298	94,932	0,58	5,90	1,00	1.153,01	67,97	149,33
115	131,463	130,413	10,22	130	150	224,175	93,762	0,58	5,90	1,00	1.153,01	67,97	148,28
118	133,208	132,158	10,22	130	150	223,991	91,833	0,58	5,90	1,00	1.153,01	67,97	146,54
120	133,819	132,769	10,22	130	150	223,868	91,099	0,58	5,90	1,00	1.153,01	67,97	145,92
123	134,735	133,685	10,22	130	150	223,683	89,998	0,58	5,90	1,00	1.153,01	67,97	145,01
125	136,757	135,707	10,22	130	150	223,561	87,854	0,58	5,90	1,00	1.153,01	67,97	142,99
128	140,245	139,195	10,22	130	150	223,376	84,181	0,58	5,90	1,00	1.153,01	67,97	139,50
130	142,891	141,841	10,22	130	150	223,253	81,412	0,58	5,90	1,00	1.153,01	67,97	136,85
133	145,827	144,777	10,22	130	150	223,069	78,292	0,58	5,90	1,00	1.153,01	67,97	133,92
135	147,354	146,304	10,22	130	150	222,946	76,642	0,58	5,90	1,00	1.153,01	67,97	132,39
138	129,151	128,101	10,22	130	150	222,762	94,661	0,58	5,90	1,00	1.153,01	67,97	150,59
140	147,484	146,434	10,22	130	150	222,639	76,205	0,58	5,90	1,00	1.153,01	67,97	132,26
143	146,495	145,445	10,22	130	150	222,455	77,010	0,58	5,90	1,00	1.153,01	67,97	133,25
145	148,226	147,176	10,22	130	150	222,332	75,156	0,58	5,90	1,00	1.153,01	67,97	131,52

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
148	150,847	149,797	10,22	130	150	222,148	72,351	0,58	5,90	1,00	1.153,01	67,97	128,90
149	152,971	151,921	10,22	130	150	222,086	70,165	0,58	5,90	1,00	1.153,01	67,97	126,77
152	154,326	153,076	10,22	130	150	221,902	68,826	0,58	5,90	1,00	1.153,01	67,97	125,62
154	154,338	153,288	10,22	130	150	221,779	68,491	0,58	5,90	1,00	1.153,01	67,97	125,41
155	148,115	147,065	10,22	130	150	221,717	74,652	0,58	5,90	1,00	1.153,01	67,97	131,63
157	150,705	149,655	10,22	130	150	221,595	71,940	0,58	5,90	1,00	1.153,01	67,97	129,04
158	148,115	147,065	10,22	130	150	221,533	74,468	0,58	5,90	1,00	1.153,01	67,97	131,63
160	138,261	137,211	10,22	130	150	221,410	84,199	0,58	5,90	1,00	1.153,01	67,97	141,48
163	130,979	129,929	10,22	130	150	221,226	91,297	0,58	5,90	1,00	1.153,01	67,97	148,76
165	136,172	135,122	10,22	130	150	221,103	85,981	0,58	5,90	1,00	1.153,01	67,97	143,57
168	142,760	141,710	10,22	130	150	220,919	79,209	0,58	5,90	1,00	1.153,01	67,97	136,98
170	145,352	144,302	10,22	130	150	220,796	76,494	0,58	5,90	1,00	1.153,01	67,97	134,39
173	146,020	144,970	10,22	130	150	220,612	75,642	0,58	5,90	1,00	1.153,01	67,97	133,72
175	144,850	143,800	10,22	130	150	220,489	76,689	0,58	5,90	1,00	1.153,01	67,97	134,89
178	145,440	143,290	10,22	130	150	220,304	77,014	0,58	5,90	1,00	1.153,01	67,97	135,40
180	142,530	141,480	10,22	130	150	220,182	78,702	0,58	5,90	1,00	1.153,01	67,97	137,21
183	142,970	141,920	10,22	130	150	219,997	78,077	0,58	5,90	1,00	1.153,01	67,97	136,77
185	145,740	144,690	10,22	130	150	219,874	75,184	0,58	5,90	1,00	1.153,01	67,97	134,00
188	146,790	145,740	10,22	130	150	219,690	73,950	0,58	5,90	1,00	1.153,01	67,97	132,95
190	142,070	141,020	10,22	130	150	219,567	78,547	0,58	5,90	1,00	1.153,01	67,97	137,67
193	138,104	137,054	10,22	130	150	219,383	82,329	0,58	5,90	1,00	1.153,01	67,97	141,64
195	136,280	135,230	10,22	130	150	219,260	84,030	0,58	5,90	1,00	1.153,01	67,97	143,46
198	134,640	133,590	10,22	130	150	219,076	85,486	0,58	5,90	1,00	1.153,01	67,97	145,10
200	137,270	136,220	10,22	130	150	218,953	82,733	0,58	5,90	1,00	1.153,01	67,97	142,47
203	139,370	138,320	10,22	130	150	218,769	80,449	0,58	5,90	1,00	1.153,01	67,97	140,37
205	146,380	145,330	10,22	130	150	218,646	73,316	0,58	5,90	1,00	1.153,01	67,97	133,36
208	152,740	151,690	10,22	130	150	218,461	66,771	0,58	5,90	1,00	1.153,01	67,97	127,00
210	153,960	152,460	10,22	130	150	218,339	65,879	0,58	5,90	1,00	1.153,01	67,97	126,23
213	153,990	152,940	10,22	130	150	218,154	65,214	0,58	5,90	1,00	1.153,01	67,97	125,75
215	155,230	154,180	10,22	130	150	218,031	63,851	0,58	5,90	1,00	1.153,01	67,97	124,51
218	154,800	153,750	10,22	130	150	217,847	64,097	0,58	5,90	1,00	1.153,01	67,97	124,94
219	155,530	153,530	10,22	130	150	217,786	64,256	0,58	5,90	1,00	1.153,01	67,97	125,16

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
220	155,130	152,630	10,22	130	150	217,724	65,094	0,58	5,90	1,00	1.153,01	67,97	126,06
221	152,302	151,252	10,22	130	150	217,663	66,411	0,58	5,90	1,00	1.153,01	67,97	127,44
222	144,814	143,764	10,22	130	150	217,601	73,837	0,58	5,90	1,00	1.153,01	67,97	134,93
224	141,170	140,120	10,22	130	150	217,478	77,358	0,58	5,90	1,00	1.153,01	67,97	138,57
227	141,831	140,781	10,22	130	150	217,294	76,513	0,58	5,90	1,00	1.153,01	67,97	137,91
229	144,250	143,200	10,22	130	150	217,171	73,971	0,58	5,90	1,00	1.153,01	67,97	135,49
230	149,732	148,682	10,22	130	150	217,110	68,428	0,58	5,90	1,00	1.153,01	67,97	130,01
231	149,820	148,770	10,22	130	150	217,048	68,278	0,58	5,90	1,00	1.153,01	67,97	129,92
233	149,940	148,890	10,22	130	150	216,926	68,036	0,58	5,90	1,00	1.153,01	67,97	129,80
236	151,509	150,459	10,22	130	150	216,741	66,282	0,58	5,90	1,00	1.153,01	67,97	128,23
238	153,021	151,971	10,22	130	150	216,618	64,647	0,58	5,90	1,00	1.153,01	67,97	126,72
241	154,390	153,340	10,22	130	150	216,434	63,094	0,58	5,90	1,00	1.153,01	67,97	125,35
243	155,813	154,763	10,22	130	150	216,311	61,548	0,58	5,90	1,00	1.153,01	67,97	123,93
246	157,070	156,020	10,22	130	150	216,127	60,107	0,58	5,90	1,00	1.153,01	67,97	122,67
248	155,790	154,740	10,22	130	150	216,004	61,264	0,58	5,90	1,00	1.153,01	67,97	123,95
251	156,490	155,440	10,22	130	150	215,820	60,380	0,58	5,90	1,00	1.153,01	67,97	123,25
253	157,630	156,580	10,22	130	150	215,697	59,117	0,58	5,90	1,00	1.153,01	67,97	122,11
256	160,090	159,040	10,22	130	150	215,513	56,473	0,58	5,90	1,00	1.153,01	67,97	119,65
258	161,790	160,740	10,22	130	150	215,390	54,650	0,58	5,90	1,00	1.153,01	67,97	117,95
261	164,655	163,605	10,22	130	150	215,205	51,600	0,58	5,90	1,00	1.153,01	67,97	115,09
263	166,735	165,685	10,22	130	150	215,082	49,397	0,58	5,90	1,00	1.153,01	67,97	113,01
266	167,680	166,630	10,22	130	150	214,898	48,268	0,58	5,90	1,00	1.153,01	67,97	112,06
268	168,650	167,600	10,22	130	150	214,775	47,175	0,58	5,90	1,00	1.153,01	67,97	111,09
271	170,880	169,830	10,22	130	150	214,591	44,761	0,58	5,90	1,00	1.153,01	67,97	108,86
273	172,785	171,735	10,22	130	150	214,468	42,733	0,58	5,90	1,00	1.153,01	67,97	106,96
276	174,440	173,390	10,22	130	150	214,284	40,894	0,58	5,90	1,00	1.153,01	67,97	105,30
278	176,940	175,890	10,22	130	150	214,161	38,271	0,58	5,90	1,00	1.153,01	67,97	102,80
281	180,300	179,250	10,22	130	150	213,977	34,727	0,58	5,90	1,00	1.153,01	67,97	99,44
283	181,960	180,910	10,22	130	150	213,854	32,944	0,58	5,90	1,00	1.153,01	67,97	97,78
286	183,120	182,070	10,22	130	150	213,669	31,599	0,58	5,90	1,00	1.153,01	67,97	96,62
288	185,070	184,020	10,22	140	150	213,562	29,542	0,58	6,80	18,00	469,12	27,66	54,36
291	187,130	186,080	10,22	140	150	213,402	27,322	0,58	6,80	18,00	469,12	27,66	52,30

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
293	189,440	188,390	10,22	140	150	213,294	24,904	0,58	6,80	18,00	469,12	27,66	49,99
296	191,200	190,150	10,22	140	150	213,134	22,984	0,58	6,80	18,00	469,12	27,66	48,23
298	192,850	191,800	10,22	140	150	213,027	21,227	0,58	6,80	18,00	469,12	27,66	46,58
301	195,400	194,350	10,22	140	150	212,866	18,516	0,58	6,80	18,00	469,12	27,66	44,03
303	198,040	196,990	10,22	140	150	212,759	15,769	0,58	6,80	18,00	469,12	27,66	41,39
306	198,770	197,720	10,22	140	150	212,598	14,878	0,58	6,80	18,00	469,12	27,66	40,66
308	199,900	198,850	10,22	140	150	212,491	13,641	0,58	6,80	18,00	469,12	27,66	39,53
311	202,460	201,410	10,22	140	150	212,330	10,920	0,58	6,80	18,00	469,12	27,66	36,97
313	204,530	203,480	10,22	140	150	212,223	8,743	0,58	6,80	18,00	469,12	27,66	34,90
316	207,140	206,090	10,22	140	150	212,063	5,973	0,58	6,80	18,00	469,12	27,66	32,29
318	209,236	208,186	10,22	140	150	211,955	3,769	0,58	6,80	18,00	469,12	27,66	30,19
RAP-03	211,770	210,720	10,22	140	150	211,795	1,075	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 02 - EE-03 / RAP-04													
EE-03	211,770	210,720	10,22	130	150	333,351	122,631	0,58	5,90	1,00	1.153,01	67,97	187,69
323	214,190	213,140	10,22	130	150	333,228	120,088	0,58	5,90	1,00	1.153,01	67,97	184,27
324	215,009	213,959	10,22	130	150	333,167	119,208	0,58	5,90	1,00	1.153,01	67,97	183,45
326	219,780	218,730	10,22	130	150	333,044	114,314	0,58	5,90	1,00	1.153,01	67,97	178,68
329	225,440	224,390	10,22	130	150	332,860	108,470	0,58	5,90	1,00	1.153,01	67,97	173,02
331	231,050	230,000	10,22	130	150	332,737	102,737	0,58	5,90	1,00	1.153,01	67,97	167,41
334	231,970	230,920	10,22	130	150	332,552	101,632	0,58	5,90	1,00	1.153,01	67,97	166,49
336	228,090	227,040	10,22	130	150	332,429	105,389	0,58	5,90	1,00	1.153,01	67,97	170,37
339	225,300	224,250	10,22	130	150	332,245	107,995	0,58	5,90	1,00	1.153,01	67,97	173,16
340	225,890	224,840	10,22	130	150	332,184	107,344	0,58	5,90	1,00	1.153,01	67,97	172,57
341	227,520	226,470	10,22	130	150	332,122	105,652	0,58	5,90	1,00	1.153,01	67,97	170,94
344	232,060	231,010	10,22	130	150	331,938	100,928	0,58	5,90	1,00	1.153,01	67,97	166,40
346	236,210	235,160	10,22	130	150	331,815	96,655	0,58	5,90	1,00	1.153,01	67,97	162,25
349	241,930	240,880	10,22	130	150	331,631	90,751	0,58	5,90	1,00	1.153,01	67,97	156,53
351	248,670	247,620	10,22	130	150	331,508	83,888	0,58	5,90	1,00	1.153,01	67,97	149,79
354	255,790	254,740	10,22	130	150	331,324	76,584	0,58	5,90	1,00	1.153,01	67,97	142,67
356	259,420	258,370	10,22	130	150	331,201	72,831	0,58	5,90	1,00	1.153,01	67,97	139,04
359	261,600	260,550	10,22	130	150	331,016	70,466	0,58	5,90	1,00	1.153,01	67,97	136,86
361	264,800	263,750	10,22	130	150	330,894	67,144	0,58	5,90	1,00	1.153,01	67,97	133,66

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
364	269,014	267,964	10,22	130	150	330,709	62,745	0,58	5,90	1,00	1.153,01	67,97	129,45
366	274,130	273,080	10,22	130	150	330,586	57,506	0,58	5,90	1,00	1.153,01	67,97	124,33
369	278,530	277,480	10,22	140	150	330,426	52,946	0,58	6,80	18,00	469,12	27,66	79,61
371	284,590	283,540	10,22	140	150	330,319	46,779	0,58	6,80	18,00	469,12	27,66	73,55
374	288,980	287,930	10,22	140	150	330,158	42,228	0,58	6,80	18,00	469,12	27,66	69,16
376	293,690	292,640	10,22	140	150	330,051	37,411	0,58	6,80	18,00	469,12	27,66	64,45
379	298,830	297,780	10,22	140	150	329,890	32,110	0,58	6,80	18,00	469,12	27,66	59,31
381	302,200	301,150	10,22	140	150	329,783	28,633	0,58	6,80	18,00	469,12	27,66	55,94
382	303,202	302,152	10,22	140	150	329,729	27,577	0,58	6,80	18,00	469,12	27,66	54,94
384	316,775	315,725	10,22	140	150	329,622	13,897	0,58	6,80	18,00	469,12	27,66	41,37
RAP-04	330,486	329,436	10,22	140	150	329,462	0,026	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 03 - EE-04 / RAP-05													
EE-04	330,486	329,436	10,22	130	150	443,530	114,094	0,58	5,90	1,00	1.153,01	67,97	179,89
389	339,555	338,505	10,22	130	150	443,407	104,902	0,58	5,90	1,00	1.153,01	67,97	170,82
392	346,370	345,320	10,22	130	150	443,223	97,903	0,58	5,90	1,00	1.153,01	67,97	164,01
394	350,289	349,239	10,22	130	150	443,100	93,861	0,58	5,90	1,00	1.153,01	67,97	160,09
396	351,583	350,533	10,22	130	150	442,977	92,444	0,58	5,90	1,00	1.153,01	67,97	158,79
399	359,555	358,505	10,22	130	150	442,793	84,288	0,58	5,90	1,00	1.153,01	67,97	150,82
401	372,987	371,937	10,22	140	150	442,686	70,749	0,58	6,80	18,00	469,12	27,66	97,07
403	380,889	379,839	10,22	140	150	442,579	62,740	0,58	6,80	18,00	469,12	27,66	89,17
405	387,646	386,596	10,22	140	150	442,471	55,875	0,58	6,80	18,00	469,12	27,66	82,41
408	382,781	381,731	10,22	140	150	442,311	60,580	0,58	6,80	18,00	469,12	27,66	87,28
410	383,487	382,437	10,22	140	150	442,204	59,767	0,58	6,80	18,00	469,12	27,66	86,57
413	395,061	394,011	10,22	140	150	442,043	48,032	0,58	6,80	18,00	469,12	27,66	75,00
415	406,931	405,881	10,22	140	150	441,936	36,055	0,58	6,80	18,00	469,12	27,66	63,13
417	414,347	413,297	10,22	140	150	441,829	28,532	0,58	6,80	18,00	469,12	27,66	55,71
419	422,341	421,291	10,22	140	150	441,721	20,430	0,58	6,80	18,00	469,12	27,66	47,72
422	430,048	428,998	10,22	140	150	441,561	12,563	0,58	6,80	18,00	469,12	27,66	40,01
424	434,452	433,402	10,22	140	150	441,454	8,052	0,58	6,80	18,00	469,12	27,66	35,61
RAP-05	442,403	441,353	10,22	140	150	441,357	0,004	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 04 - EE-05 / RAP-06													
EE-05	442,403	441,353	10,22	130	150	556,393	115,040	0,58	5,90	1,00	1.153,01	67,97	180,40

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
428	451,625	450,575	10,22	130	150	556,270	105,695	0,58	5,90	1,00	1.153,01	67,97	169,13
431	454,997	453,947	10,22	130	150	556,086	102,139	0,58	5,90	1,00	1.153,01	67,97	165,76
433	457,981	456,931	10,22	130	150	555,963	99,032	0,58	5,90	1,00	1.153,01	67,97	162,77
435	461,875	460,825	10,22	130	150	555,840	95,015	0,58	5,90	1,00	1.153,01	67,97	158,88
437	464,466	463,416	10,22	130	150	555,717	92,301	0,58	5,90	1,00	1.153,01	67,97	156,29
439	467,460	466,410	10,22	130	150	555,594	89,184	0,58	5,90	1,00	1.153,01	67,97	153,30
442	471,180	470,130	10,22	130	150	555,410	85,280	0,58	5,90	1,00	1.153,01	67,97	149,58
444	473,972	472,922	10,22	130	150	555,287	82,365	0,58	5,90	1,00	1.153,01	67,97	146,78
447	478,940	477,890	10,22	130	150	555,103	77,213	0,58	5,90	1,00	1.153,01	67,97	141,82
449	484,008	482,958	10,22	140	150	554,996	72,038	0,58	6,80	18,00	469,12	27,66	96,43
451	486,116	485,066	10,22	140	150	554,889	69,823	0,58	6,80	18,00	469,12	27,66	94,32
453	489,691	488,641	10,22	140	150	554,781	66,140	0,58	6,80	18,00	469,12	27,66	90,75
456	492,308	491,258	10,22	140	150	554,621	63,363	0,58	6,80	18,00	469,12	27,66	88,13
458	494,271	493,221	10,22	140	150	554,514	61,293	0,58	6,80	18,00	469,12	27,66	86,17
460	497,219	496,169	10,22	140	150	554,407	58,238	0,58	6,80	18,00	469,12	27,66	83,22
463	492,282	491,232	10,22	140	150	554,246	63,014	0,58	6,80	18,00	469,12	27,66	88,16
465	494,107	493,057	10,22	140	150	554,139	61,082	0,58	6,80	18,00	469,12	27,66	86,33
468	500,840	499,790	10,22	140	150	553,978	54,188	0,58	6,80	18,00	469,12	27,66	79,60
470	507,512	506,462	10,22	140	150	553,871	47,409	0,58	6,80	18,00	469,12	27,66	72,93
472	515,149	514,099	10,22	140	150	553,764	39,665	0,58	6,80	18,00	469,12	27,66	65,29
475	510,951	509,901	10,22	140	150	553,603	43,702	0,58	6,80	18,00	469,12	27,66	69,49
477	526,325	525,275	10,22	140	150	553,496	28,221	0,58	6,80	18,00	469,12	27,66	54,11
480	532,866	531,816	10,22	140	150	553,335	21,519	0,58	6,80	18,00	469,12	27,66	47,57
482	539,234	538,184	10,22	140	150	553,228	15,044	0,58	6,80	18,00	469,12	27,66	41,20
485	545,400	544,350	10,22	140	150	553,067	8,717	0,58	6,80	18,00	469,12	27,66	35,04
487	547,915	546,865	10,22	140	150	552,960	6,095	0,58	6,80	18,00	469,12	27,66	32,52
RAP-06	552,782	551,732	10,22	140	150	552,800	1,068	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 05 - EE-06 / RAP-07													
EE-06	552,782	551,732	10,22	130	150	670,513	118,781	0,58	5,90	1,00	1.153,01	67,97	181,55
492	558,948	557,898	10,22	130	150	670,390	112,492	0,58	5,90	1,00	1.153,01	67,97	175,43
495	565,027	563,977	10,22	130	150	670,206	106,229	0,58	5,90	1,00	1.153,01	67,97	169,35
497	569,254	568,204	10,22	130	150	670,083	101,879	0,58	5,90	1,00	1.153,01	67,97	165,13

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
499	574,451	573,401	10,22	130	150	669,960	96,559	0,58	5,90	1,00	1.153,01	67,97	159,93
501	577,214	576,164	10,22	130	150	669,837	93,673	0,58	5,90	1,00	1.153,01	67,97	157,17
504	579,061	578,011	10,22	130	150	669,653	91,642	0,58	5,90	1,00	1.153,01	67,97	155,32
506	583,377	582,327	10,22	130	150	669,530	87,203	0,58	5,90	1,00	1.153,01	67,97	151,00
508	587,336	586,286	10,22	130	150	669,407	83,121	0,58	5,90	1,00	1.153,01	67,97	147,04
510	591,561	590,511	10,22	130	150	669,284	78,773	0,58	5,90	1,00	1.153,01	67,97	142,82
512	593,582	592,532	10,22	140	150	669,177	76,645	0,58	6,80	18,00	469,12	27,66	100,48
515	596,184	595,134	10,22	140	150	669,016	73,882	0,58	6,80	18,00	469,12	27,66	97,88
517	600,805	599,755	10,22	140	150	668,909	69,154	0,58	6,80	18,00	469,12	27,66	93,26
520	603,088	602,038	10,22	140	150	668,749	66,711	0,58	6,80	18,00	469,12	27,66	90,97
522	606,678	605,628	10,22	140	150	668,642	63,014	0,58	6,80	18,00	469,12	27,66	87,38
525	609,004	607,954	10,22	140	150	668,481	60,527	0,58	6,80	18,00	469,12	27,66	85,06
527	611,214	610,164	10,22	140	150	668,374	58,210	0,58	6,80	18,00	469,12	27,66	82,85
532	618,884	617,834	10,22	140	150	668,106	50,272	0,58	6,80	18,00	469,12	27,66	75,18
542	618,406	616,906	10,22	140	150	667,570	50,664	0,58	6,80	18,00	469,12	27,66	76,11
545	617,016	615,966	10,22	140	150	667,410	51,444	0,58	6,80	18,00	469,12	27,66	77,05
546	617,569	615,569	10,22	140	150	667,356	51,787	0,58	6,80	18,00	469,12	27,66	77,44
553	620,483	619,433	10,22	140	150	666,981	47,548	0,58	6,80	18,00	469,12	27,66	73,58
563	630,016	628,966	10,22	140	150	666,445	37,479	0,58	6,80	18,00	469,12	27,66	64,05
573	643,118	642,068	10,22	140	150	665,910	23,842	0,58	6,80	18,00	469,12	27,66	50,94
RAP-07	666,406	665,356	10,22	140	150	665,374	0,018	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 06 - EE-07 / Estaca 614													
EE-07	666,406	665,356	10,22	130	150	747,206	81,850	0,58	5,90	1,00	1.153,01	67,97	149,02
599	702,756	701,706	10,22	130	150	746,223	44,517	0,58	5,90	1,00	1.153,01	67,97	111,67
601	706,603	705,553	10,22	140	150	746,116	40,563	0,58	6,80	18,00	469,12	27,66	67,51
603	715,271	714,221	10,22	140	150	746,009	31,788	0,58	6,80	18,00	469,12	27,66	58,84
605	719,862	718,812	10,22	140	150	745,902	27,090	0,58	6,80	18,00	469,12	27,66	54,25
607	724,618	723,568	10,22	140	150	745,795	22,227	0,58	6,80	18,00	469,12	27,66	49,49
609	731,928	730,878	10,22	140	150	745,687	14,809	0,58	6,80	18,00	469,12	27,66	42,18
611	737,591	736,541	10,22	140	150	745,580	9,039	0,58	6,80	18,00	469,12	27,66	36,52
614	746,453	745,403	10,22	140	150	745,420	0,017	0,58	6,80	18,00	469,12	27,66	27,66
TRECHO 07 - Estaca 614 / Estaca 943													

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
615	744,667	743,617	10,22	140	150	745,366	1,749	0,58	-	-	-	-	-
618	737,802	736,752	10,22	140	150	745,205	8,453	0,58	-	-	-	-	-
621	729,727	728,677	10,22	140	150	745,045	16,368	0,58	-	-	-	-	-
622	725,774	724,724	10,22	140	150	744,991	20,267	0,58	-	-	-	-	-
624	722,295	721,245	10,22	140	150	744,884	23,639	0,58	-	-	-	-	-
626	717,403	716,353	10,22	140	150	744,777	28,424	0,58	-	-	-	-	-
630	705,540	704,490	10,22	140	150	744,563	40,073	0,58	-	-	-	-	-
634	696,726	695,676	10,22	140	150	744,348	48,672	0,58	-	-	-	-	-
638	684,957	683,907	10,22	140	150	744,134	60,227	0,58	-	-	-	-	-
642	677,963	676,913	10,22	140	150	743,920	67,007	0,58	-	-	-	-	-
645	674,466	673,416	10,22	140	150	743,759	70,343	0,58	-	-	-	-	-
646	670,555	669,505	10,22	140	150	743,705	74,200	0,58	-	-	-	-	-
650	662,633	661,583	10,22	140	150	743,491	81,908	0,58	-	-	-	-	-
654	660,671	659,621	10,22	140	150	743,277	83,656	0,58	-	-	-	-	-
656	661,409	660,359	10,22	140	150	743,170	82,811	0,58	-	-	-	-	-
659	663,307	662,257	10,22	140	150	743,009	80,752	0,58	-	-	-	-	-
661	664,695	663,645	10,22	140	150	742,902	79,257	0,58	-	-	-	-	-
663	667,324	666,274	10,22	140	150	742,795	76,521	0,58	-	-	-	-	-
665	665,176	664,126	10,22	140	150	742,688	78,562	0,58	-	-	-	-	-
666	662,836	661,786	10,22	140	150	742,634	80,848	0,58	-	-	-	-	-
671	657,843	656,793	10,22	140	150	742,366	85,573	0,58	-	-	-	-	-
672	652,950	651,900	10,22	140	150	742,313	90,413	0,58	-	-	-	-	-
674	648,361	647,311	10,22	140	150	742,206	94,895	0,58	-	-	-	-	-
679 (*)	643,516	642,466	10,22	140	150	644,466	2,000	0,58	-	-	-	-	-
681	640,744	639,694	10,22	140	150	644,359	4,665	0,58	-	-	-	-	-
684	638,076	637,026	10,22	140	150	644,198	7,172	0,58	-	-	-	-	-
687	631,715	630,665	10,22	140	150	644,037	13,372	0,58	-	-	-	-	-
691	626,986	625,936	10,22	140	150	643,823	17,887	0,58	-	-	-	-	-
695	622,126	621,076	10,22	140	150	643,609	22,533	0,58	-	-	-	-	-
698	619,296	618,246	10,22	140	150	643,448	25,202	0,58	-	-	-	-	-
701	613,483	612,433	10,22	140	150	643,288	30,855	0,58	-	-	-	-	-
706	614,225	613,175	10,22	140	150	643,020	29,845	0,58	-	-	-	-	-

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTANEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
708	614,974	613,924	10,22	140	150	642,913	28,989	0,58	-	-	-	-	-
711	611,965	610,915	10,22	140	150	642,752	31,837	0,58	-	-	-	-	-
713	609,981	608,931	10,22	140	150	642,645	33,714	0,58	-	-	-	-	-
715	608,698	607,648	10,22	140	150	642,538	34,890	0,58	-	-	-	-	-
717	607,101	606,051	10,22	140	150	642,431	36,380	0,58	-	-	-	-	-
720	604,649	603,599	10,22	140	150	642,270	38,671	0,58	-	-	-	-	-
722	604,433	603,383	10,22	140	150	642,163	38,780	0,58	-	-	-	-	-
725	604,392	603,342	10,22	140	150	642,002	38,660	0,58	-	-	-	-	-
729	602,789	601,739	10,22	140	150	641,788	40,049	0,58	-	-	-	-	-
732	601,590	600,540	10,22	140	150	641,627	41,087	0,58	-	-	-	-	-
735	598,959	597,909	10,22	140	150	641,466	43,557	0,58	-	-	-	-	-
741	596,739	595,689	10,22	140	150	641,145	45,456	0,58	-	-	-	-	-
745	596,319	595,269	10,22	140	150	640,931	45,662	0,58	-	-	-	-	-
748	596,292	595,242	10,22	140	150	640,770	45,528	0,58	-	-	-	-	-
751	595,254	594,204	10,22	140	150	640,609	46,405	0,58	-	-	-	-	-
753	594,026	592,976	10,22	140	150	640,502	47,526	0,58	-	-	-	-	-
758	591,332	590,282	10,22	140	150	640,234	49,952	0,58	-	-	-	-	-
760	593,095	590,045	10,22	140	150	640,127	50,082	0,58	-	-	-	-	-
766	591,628	589,428	10,22	140	150	639,806	50,378	0,58	-	-	-	-	-
771	589,880	588,830	10,22	140	150	639,538	50,708	0,58	-	-	-	-	-
772	589,880	587,830	10,22	140	150	639,484	51,654	0,58	-	-	-	-	-
774	588,373	587,323	10,22	140	150	639,377	52,054	0,58	-	-	-	-	-
779	588,171	586,771	10,22	140	150	639,110	52,339	0,58	-	-	-	-	-
784	586,008	584,958	10,22	140	150	638,842	53,884	0,58	-	-	-	-	-
786	580,857	579,807	10,22	140	150	638,735	58,928	0,58	-	-	-	-	-
791	578,979	577,929	10,22	140	150	638,467	60,538	0,58	-	-	-	-	-
821	577,142	574,892	10,22	140	150	636,860	61,968	0,58	-	-	-	-	-
850	575,755	571,955	10,22	140	150	635,306	63,351	0,58	-	-	-	-	-
854	575,119	574,069	10,22	140	150	635,092	61,023	0,58	-	-	-	-	-
856	576,263	575,213	10,22	140	150	634,985	59,772	0,58	-	-	-	-	-
858	574,334	573,284	10,22	140	150	634,878	61,594	0,58	-	-	-	-	-
859	573,720	572,670	10,22	140	150	634,824	62,154	0,58	-	-	-	-	-

CÁLCULO DAS SOBREPRESSÕES MÁXIMAS INSTANTÂNEAS

Estaca	Cota (m)		Vazão (l/s)	Rugosidade	Diâmetro (mm)	Cota Piezométrica	Pressão (m)	Veloc (m/s)	Espessura (mm)	Constante k	Celeridade	Sobre Pressão Instantanea	Sobre Pressão Máxima
	Terreno	Projeto											
861	572,678	571,628	10,22	140	150	634,717	63,089	0,58	-	-	-	-	-
863	572,337	571,287	10,22	140	150	634,610	63,323	0,58	-	-	-	-	-
866	572,793	570,793	10,22	140	150	634,449	63,656	0,58	-	-	-	-	-
869	573,023	570,473	10,22	140	150	634,289	63,816	0,58	-	-	-	-	-
872	571,588	570,538	10,22	140	150	634,128	63,590	0,58	-	-	-	-	-
874	570,518	569,468	10,22	140	150	634,021	64,553	0,58	-	-	-	-	-
879	566,724	565,674	10,22	140	150	633,753	68,079	0,58	-	-	-	-	-
881	565,395	564,345	10,22	140	150	633,646	69,301	0,58	-	-	-	-	-
884	564,076	563,026	10,22	140	150	633,485	70,459	0,58	-	-	-	-	-
889	563,701	562,451	10,22	140	150	633,217	70,766	0,58	-	-	-	-	-
892	563,602	562,102	10,22	140	150	633,057	70,955	0,58	-	-	-	-	-
894	561,503	560,453	10,22	140	150	632,950	72,497	0,58	-	-	-	-	-
896	561,235	560,185	10,22	140	150	632,842	72,657	0,58	-	-	-	-	-
899	563,609	562,559	10,22	140	150	632,682	70,123	0,58	-	-	-	-	-
902	561,894	560,844	10,22	140	150	632,521	71,677	0,58	-	-	-	-	-
906	562,187	560,187	10,22	140	150	632,307	72,120	0,58	-	-	-	-	-
907	562,133	559,633	10,22	140	150	632,253	72,620	0,58	-	-	-	-	-
912	561,146	559,046	10,22	140	150	631,985	72,939	0,58	-	-	-	-	-
915	559,842	558,692	10,22	140	150	631,825	73,133	0,58	-	-	-	-	-
917	559,670	558,470	10,22	140	150	631,718	73,248	0,58	-	-	-	-	-
919	560,202	559,152	10,22	140	150	631,611	72,459	0,58	-	-	-	-	-
922	562,002	560,952	10,22	140	150	631,450	70,498	0,58	-	-	-	-	-
925	563,745	562,595	10,22	140	150	631,289	68,694	0,58	-	-	-	-	-
927	563,172	562,122	10,22	140	150	631,182	69,060	0,58	-	-	-	-	-
931	560,963	559,913	10,22	140	150	630,968	71,055	0,58	-	-	-	-	-
937	557,723	556,673	10,22	140	150	630,646	73,973	0,58	-	-	-	-	-
943	569,079	568,029	10,22	140	150	630,325	62,296	0,58	-	-	-	-	-

CÁLCULO DOS VOLUMES

Estaca	DISTANCIA	Distância Acumulada	Cota (m)		Profundidade (m)	Profundidade Média
			Terreno	Projeto		
EE-02	0	0,00	97,000	96,660	0,340	
2	40	40,00	99,200	98,150	1,050	0,695
4	40	80,00	99,441	98,391	1,050	1,050
6	40	120,00	104,031	102,981	1,050	1,575
7	20	140,00	106,160	105,110	1,050	1,575
9	40	180,00	112,558	111,508	1,050	1,575
11	40	220,00	117,003	114,203	2,800	3,325
14	60	280,00	115,660	114,610	1,050	2,450
15	20	300,00	117,090	115,090	2,000	2,525
16	20	320,00	116,931	115,881	1,050	2,050
17	20	340,00	116,034	114,984	1,050	1,575
19	40	380,00	117,852	116,802	1,050	1,575
22	60	440,00	118,157	117,107	1,050	1,575
24	40	480,00	118,828	117,778	1,050	1,575
27	60	540,00	118,652	117,602	1,050	1,575
29	40	580,00	117,083	116,033	1,050	1,575
32	60	640,00	117,723	116,673	1,050	1,575
34	40	680,00	118,959	117,909	1,050	1,575
37	60	740,00	119,061	118,011	1,050	1,575
39	40	780,00	119,264	118,214	1,050	1,575
42	60	840,00	121,009	119,959	1,050	1,575
44	40	880,00	123,306	122,256	1,050	1,575
47	60	940,00	124,586	123,536	1,050	1,575
49	40	980,00	127,639	126,589	1,050	1,575
52	60	1.040,00	128,788	127,738	1,050	1,575
54	40	1.080,00	129,704	128,654	1,050	1,575
55	20	1.100,00	130,257	129,207	1,050	1,575
58	60	1.160,00	132,569	131,519	1,050	1,575
60	40	1.200,00	133,893	132,843	1,050	1,575
63	60	1.260,00	135,099	134,049	1,050	1,575
65	40	1.300,00	134,575	133,525	1,050	1,575
68	60	1.360,00	134,517	133,467	1,050	1,575
70	40	1.400,00	133,485	132,435	1,050	1,575
73	60	1.460,00	132,190	131,140	1,050	1,575
75	40	1.500,00	131,608	130,558	1,050	1,575
78	60	1.560,00	131,259	130,209	1,050	1,575
80	40	1.600,00	130,212	129,162	1,050	1,575
83	60	1.660,00	129,165	128,115	1,050	1,575
85	40	1.700,00	128,918	127,868	1,050	1,575
88	60	1.760,00	129,485	128,435	1,050	1,575
90	40	1.800,00	130,828	129,778	1,050	1,575
93	60	1.860,00	129,282	128,232	1,050	1,575
95	40	1.900,00	129,223	128,173	1,050	1,575
98	60	1.960,00	129,209	127,709	1,500	2,025
100	40	2.000,00	129,427	128,377	1,050	1,800
103	60	2.060,00	130,241	129,091	1,150	1,675
105	40	2.100,00	130,416	129,366	1,050	1,625
108	60	2.160,00	129,151	128,101	1,050	1,575
110	40	2.200,00	129,427	128,377	1,050	1,575
113	60	2.260,00	130,416	129,366	1,050	1,575
115	40	2.300,00	131,463	130,413	1,050	1,575
118	60	2.360,00	133,208	132,158	1,050	1,575
120	40	2.400,00	133,819	132,769	1,050	1,575
123	60	2.460,00	134,735	133,685	1,050	1,575
125	40	2.500,00	136,757	135,707	1,050	1,575
128	60	2.560,00	140,245	139,195	1,050	1,575

130	40	2.600,00	142,891	141,841	1,050	1,575
133	60	2.660,00	145,827	144,777	1,050	1,575
135	40	2.700,00	147,354	146,304	1,050	1,575
138	60	2.760,00	129,151	128,101	1,050	1,575
140	40	2.800,00	147,484	146,434	1,050	1,575
143	60	2.860,00	146,495	145,445	1,050	1,575
145	40	2.900,00	148,226	147,176	1,050	1,575
148	60	2.960,00	150,847	149,797	1,050	1,575
149	20	2.980,00	152,971	151,921	1,050	1,575
152	60	3.040,00	154,326	153,076	1,250	1,775
154	40	3.080,00	154,338	153,288	1,050	1,675
155	20	3.100,00	148,115	147,065	1,050	1,575
157	40	3.140,00	150,705	149,655	1,050	1,575
158	20	3.160,00	148,115	147,065	1,050	1,575
160	40	3.200,00	138,261	137,211	1,050	1,575
163	60	3.260,00	130,979	129,929	1,050	1,575
165	40	3.300,00	136,172	135,122	1,050	1,575
168	60	3.360,00	142,760	141,710	1,050	1,575
170	40	3.400,00	145,352	144,302	1,050	1,575
173	60	3.460,00	146,020	144,970	1,050	1,575
175	40	3.500,00	144,850	143,800	1,050	1,575
178	60	3.560,00	145,440	143,290	2,150	2,675
180	40	3.600,00	142,530	141,480	1,050	2,125
183	60	3.660,00	142,970	141,920	1,050	1,575
185	40	3.700,00	145,740	144,690	1,050	1,575
188	60	3.760,00	146,790	145,740	1,050	1,575
190	40	3.800,00	142,070	141,020	1,050	1,575
193	60	3.860,00	138,104	137,054	1,050	1,575
195	40	3.900,00	136,280	135,230	1,050	1,575
198	60	3.960,00	134,640	133,590	1,050	1,575
200	40	4.000,00	137,270	136,220	1,050	1,575
203	60	4.060,00	139,370	138,320	1,050	1,575
205	40	4.100,00	146,380	145,330	1,050	1,575
208	60	4.160,00	152,740	151,690	1,050	1,575
210	40	4.200,00	153,960	152,460	1,500	2,025
213	60	4.260,00	153,990	152,940	1,050	1,800
215	40	4.300,00	155,230	154,180	1,050	1,575
218	60	4.360,00	154,800	153,750	1,050	1,575
219	20	4.380,00	155,530	153,530	2,000	2,525
220	20	4.400,00	155,130	152,630	2,500	3,500
221	20	4.420,00	152,302	151,252	1,050	2,300
222	20	4.440,00	144,814	143,764	1,050	1,575
224	40	4.480,00	141,170	140,120	1,050	1,575
227	60	4.540,00	141,831	140,781	1,050	1,575
229	40	4.580,00	144,250	143,200	1,050	1,575
230	20	4.600,00	149,732	148,682	1,050	1,575
231	20	4.620,00	149,820	148,770	1,050	1,575
233	40	4.660,00	149,940	148,890	1,050	1,575
236	60	4.720,00	151,509	150,459	1,050	1,575
238	40	4.760,00	153,021	151,971	1,050	1,575
241	60	4.820,00	154,390	153,340	1,050	1,575
243	40	4.860,00	155,813	154,763	1,050	1,575
246	60	4.920,00	157,070	156,020	1,050	1,575
248	40	4.960,00	155,790	154,740	1,050	1,575
251	60	5.020,00	156,490	155,440	1,050	1,575
253	40	5.060,00	157,630	156,580	1,050	1,575
256	60	5.120,00	160,090	159,040	1,050	1,575
258	40	5.160,00	161,790	160,740	1,050	1,575
261	60	5.220,00	164,655	163,605	1,050	1,575
263	40	5.260,00	166,735	165,685	1,050	1,575
266	60	5.320,00	167,680	166,630	1,050	1,575
268	40	5.360,00	168,650	167,600	1,050	1,575

271	60	5.420,00	170,880	169,830	1,050	1,575
273	40	5.460,00	172,785	171,735	1,050	1,575
276	60	5.520,00	174,440	173,390	1,050	1,575
278	40	5.560,00	176,940	175,890	1,050	1,575
281	60	5.620,00	180,300	179,250	1,050	1,575
283	40	5.660,00	181,960	180,910	1,050	1,575
286	60	5.720,00	183,120	182,070	1,050	1,575
288	40	5.760,00	185,070	184,020	1,050	1,575
291	60	5.820,00	187,130	186,080	1,050	1,575
293	40	5.860,00	189,440	188,390	1,050	1,575
296	60	5.920,00	191,200	190,150	1,050	1,575
298	40	5.960,00	192,850	191,800	1,050	1,575
301	60	6.020,00	195,400	194,350	1,050	1,575
303	40	6.060,00	198,040	196,990	1,050	1,575
306	60	6.120,00	198,770	197,720	1,050	1,575
308	40	6.160,00	199,900	198,850	1,050	1,575
311	60	6.220,00	202,460	201,410	1,050	1,575
313	40	6.260,00	204,530	203,480	1,050	1,575
316	60	6.320,00	207,140	206,090	1,050	1,575
318	40	6.360,00	209,236	208,186	1,050	1,575
RAP-03	60	6.420,00	211,770	210,720	1,050	1,575
321	-	-	211,770	210,720	1,050	1,575
323	40	6.460,00	214,190	213,140	1,050	1,575
324	20	6.480,00	215,009	213,959	1,050	1,575
326	40	6.520,00	219,780	218,730	1,050	1,575
329	60	6.580,00	225,440	224,390	1,050	1,575
331	40	6.620,00	231,050	230,000	1,050	1,575
334	60	6.680,00	231,970	230,920	1,050	1,575
336	40	6.720,00	228,090	227,040	1,050	1,575
339	60	6.780,00	225,300	224,250	1,050	1,575
340	20	6.800,00	225,890	224,840	1,050	1,575
341	20	6.820,00	227,520	226,470	1,050	1,575
344	60	6.880,00	232,060	231,010	1,050	1,575
346	40	6.920,00	236,210	235,160	1,050	1,575
349	60	6.980,00	241,930	240,880	1,050	1,575
351	40	7.020,00	248,670	247,620	1,050	1,575
354	60	7.080,00	255,790	254,740	1,050	1,575
356	40	7.120,00	259,420	258,370	1,050	1,575
359	60	7.180,00	261,600	260,550	1,050	1,575
361	40	7.220,00	264,800	263,750	1,050	1,575
364	60	7.280,00	269,014	267,964	1,050	1,575
366	40	7.320,00	274,130	273,080	1,050	1,575
369	60	7.380,00	278,530	277,480	1,050	1,575
371	40	7.420,00	284,590	283,540	1,050	1,575
374	60	7.480,00	288,980	287,930	1,050	1,575
376	40	7.520,00	293,690	292,640	1,050	1,575
379	60	7.580,00	298,830	297,780	1,050	1,575
381	40	7.620,00	302,200	301,150	1,050	1,575
382	20	7.640,00	303,202	302,152	1,050	1,575
384	40	7.680,00	316,775	315,725	1,050	1,575
RAP-04	60	7.740,00	330,486	329,436	1,050	1,575
EE-04	-	-	330,486	329,436	1,050	1,575
389	40	7.780,00	339,555	338,505	1,050	1,575
392	60	7.840,00	346,370	345,320	1,050	1,575
394	40	7.880,00	350,289	349,239	1,050	1,575
396	40	7.920,00	351,583	350,533	1,050	1,575
399	60	7.980,00	359,555	358,505	1,050	1,575
401	40	8.020,00	372,987	371,937	1,050	1,575
403	40	8.060,00	380,889	379,839	1,050	1,575
405	40	8.100,00	387,646	386,596	1,050	1,575
408	60	8.160,00	382,781	381,731	1,050	1,575
410	40	8.200,00	383,487	382,437	1,050	1,575

413	60	8.260,00	395,061	394,011	1,050	1,575
415	40	8.300,00	406,931	405,881	1,050	1,575
417	40	8.340,00	414,347	413,297	1,050	1,575
419	40	8.380,00	422,341	421,291	1,050	1,575
422	60	8.440,00	430,048	428,998	1,050	1,575
424	40	8.480,00	434,452	433,402	1,050	1,575
RAP-05	40	8.520,00	442,403	441,353	1,050	1,575
EE-05	-	-	442,403	441,353	1,050	1,575
428	40	8.560,00	451,625	450,575	1,050	1,575
431	60	8.620,00	454,997	453,947	1,050	1,575
433	40	8.660,00	457,981	456,931	1,050	1,575
435	40	8.700,00	461,875	460,825	1,050	1,575
437	40	8.740,00	464,466	463,416	1,050	1,575
439	40	8.780,00	467,460	466,410	1,050	1,575
442	60	8.840,00	471,180	470,130	1,050	1,575
444	40	8.880,00	473,972	472,922	1,050	1,575
447	60	8.940,00	478,940	477,890	1,050	1,575
449	40	8.980,00	484,008	482,958	1,050	1,575
451	40	9.020,00	486,116	485,066	1,050	1,575
453	40	9.060,00	489,691	488,641	1,050	1,575
456	60	9.120,00	492,308	491,258	1,050	1,575
458	40	9.160,00	494,271	493,221	1,050	1,575
460	40	9.200,00	497,219	496,169	1,050	1,575
463	60	9.260,00	492,282	491,232	1,050	1,575
465	40	9.300,00	494,107	493,057	1,050	1,575
468	60	9.360,00	500,840	499,790	1,050	1,575
470	40	9.400,00	507,512	506,462	1,050	1,575
472	40	9.440,00	515,149	514,099	1,050	1,575
475	60	9.500,00	510,951	509,901	1,050	1,575
477	40	9.540,00	526,325	525,275	1,050	1,575
480	60	9.600,00	532,866	531,816	1,050	1,575
482	40	9.640,00	539,234	538,184	1,050	1,575
485	60	9.700,00	545,400	544,350	1,050	1,575
487	40	9.740,00	547,915	546,865	1,050	1,575
RAP-06	60	9.800,00	552,782	551,732	1,050	1,575
EE-06	-	-	552,782	551,732	1,050	1,575
492	40	9.840,00	558,948	557,898	1,050	1,575
495	60	9.900,00	565,027	563,977	1,050	1,575
497	40	9.940,00	569,254	568,204	1,050	1,575
499	40	9.980,00	574,451	573,401	1,050	1,575
501	40	10.020,00	577,214	576,164	1,050	1,575
504	60	10.080,00	579,061	578,011	1,050	1,575
506	40	10.120,00	583,377	582,327	1,050	1,575
508	40	10.160,00	587,336	586,286	1,050	1,575
510	40	10.200,00	591,561	590,511	1,050	1,575
512	40	10.240,00	593,582	592,532	1,050	1,575
515	60	10.300,00	596,184	595,134	1,050	1,575
517	40	10.340,00	600,805	599,755	1,050	1,575
520	60	10.400,00	603,088	602,038	1,050	1,575
522	40	10.440,00	606,678	605,628	1,050	1,575
525	60	10.500,00	609,004	607,954	1,050	1,575
527	40	10.540,00	611,214	610,164	1,050	1,575
532	100	10.640,00	618,884	617,834	1,050	1,575
542	200	10.840,00	618,406	616,906	1,500	2,025
545	60	10.900,00	617,016	615,966	1,050	1,800
546	20	10.920,00	617,569	615,569	2,000	2,525
553	140	11.060,00	620,483	619,433	1,050	2,050
563	200	11.260,00	630,016	628,966	1,050	1,575
573	200	11.460,00	643,118	642,068	1,050	1,575
RAP-07	200	11.660,00	666,406	665,356	1,050	1,575
EE-07	-	-	666,406	665,356	1,050	1,575
599	320	11.980,00	702,756	701,706	1,050	1,575

601	40	12.020,00	706,603	705,553	1,050	1,575
603	40	12.060,00	715,271	714,221	1,050	1,575
605	40	12.100,00	719,862	718,812	1,050	1,575
607	40	12.140,00	724,618	723,568	1,050	1,575
609	40	12.180,00	731,928	730,878	1,050	1,575
611	40	12.220,00	737,591	736,541	1,050	1,575
614	60	12.280,00	746,453	745,403	1,050	1,575
615	20	12.300,00	744,667	743,617	1,050	1,575
618	60	12.360,00	737,802	736,752	1,050	1,575
621	60	12.420,00	729,727	728,677	1,050	1,575
622	20	12.440,00	725,774	724,724	1,050	1,575
624	40	12.480,00	722,295	721,245	1,050	1,575
626	40	12.520,00	717,403	716,353	1,050	1,575
630	80	12.600,00	705,540	704,490	1,050	1,575
634	80	12.680,00	696,726	695,676	1,050	1,575
638	80	12.760,00	684,957	683,907	1,050	1,575
642	80	12.840,00	677,963	676,913	1,050	1,575
645	60	12.900,00	674,466	673,416	1,050	1,575
646	20	12.920,00	670,555	669,505	1,050	1,575
650	80	13.000,00	662,633	661,583	1,050	1,575
654	80	13.080,00	660,671	659,621	1,050	1,575
656	40	13.120,00	661,409	660,359	1,050	1,575
659	60	13.180,00	663,307	662,257	1,050	1,575
661	40	13.220,00	664,695	663,645	1,050	1,575
663	40	13.260,00	667,324	666,274	1,050	1,575
665	40	13.300,00	665,176	664,126	1,050	1,575
666	20	13.320,00	662,836	661,786	1,050	1,575
671	100	13.420,00	657,843	656,793	1,050	1,575
672	20	13.440,00	652,950	651,900	1,050	1,575
674	40	13.480,00	648,361	647,311	1,050	1,575
679	100	13.580,00	643,516	642,466	1,050	1,575
681	40	13.620,00	640,744	639,694	1,050	1,575
684	60	13.680,00	638,076	637,026	1,050	1,575
687	60	13.740,00	631,715	630,665	1,050	1,575
691	80	13.820,00	626,986	625,936	1,050	1,575
695	80	13.900,00	622,126	621,076	1,050	1,575
698	60	13.960,00	619,296	618,246	1,050	1,575
701	60	14.020,00	613,483	612,433	1,050	1,575
706	100	14.120,00	614,225	613,175	1,050	1,575
708	40	14.160,00	614,974	613,924	1,050	1,575
711	60	14.220,00	611,965	610,915	1,050	1,575
713	40	14.260,00	609,981	608,931	1,050	1,575
715	40	14.300,00	608,698	607,648	1,050	1,575
717	40	14.340,00	607,101	606,051	1,050	1,575
720	60	14.400,00	604,649	603,599	1,050	1,575
722	40	14.440,00	604,433	603,383	1,050	1,575
725	60	14.500,00	604,392	603,342	1,050	1,575
729	80	14.580,00	602,789	601,739	1,050	1,575
732	60	14.640,00	601,590	600,540	1,050	1,575
735	60	14.700,00	598,959	597,909	1,050	1,575
741	120	14.820,00	596,739	595,689	1,050	1,575
745	80	14.900,00	596,319	595,269	1,050	1,575
748	60	14.960,00	596,292	595,242	1,050	1,575
751	60	15.020,00	595,254	594,204	1,050	1,575
753	40	15.060,00	594,026	592,976	1,050	1,575
758	100	15.160,00	591,332	590,282	1,050	1,575
760	40	15.200,00	593,095	590,045	3,050	3,575
766	120	15.320,00	591,628	589,428	2,200	3,725
771	100	15.420,00	589,880	588,830	1,050	2,150
772	20	15.440,00	589,880	587,830	2,050	2,575
774	40	15.480,00	588,373	587,323	1,050	2,075
779	100	15.580,00	588,171	586,771	1,400	1,925

784	100	15.680,00	586,008	584,958	1,050	1,750
786	40	15.720,00	580,857	579,807	1,050	1,575
791	100	15.820,00	578,979	577,929	1,050	1,575
821	600	16.420,00	577,142	574,892	2,250	2,775
850	580	17.000,00	575,755	571,955	3,800	4,925
854	80	17.080,00	575,119	574,069	1,050	2,950
856	40	17.120,00	576,263	575,213	1,050	1,575
858	40	17.160,00	574,334	573,284	1,050	1,575
859	20	17.180,00	573,720	572,670	1,050	1,575
861	40	17.220,00	572,678	571,628	1,050	1,575
863	40	17.260,00	572,337	571,287	1,050	1,575
866	60	17.320,00	572,793	570,793	2,000	2,525
869	60	17.380,00	573,023	570,473	2,550	3,550
872	60	17.440,00	571,588	570,538	1,050	2,325
874	40	17.480,00	570,518	569,468	1,050	1,575
879	100	17.580,00	566,724	565,674	1,050	1,575
881	40	17.620,00	565,395	564,345	1,050	1,575
884	60	17.680,00	564,076	563,026	1,050	1,575
889	100	17.780,00	563,701	562,451	1,250	1,775
892	60	17.840,00	563,602	562,102	1,500	2,125
894	40	17.880,00	561,503	560,453	1,050	1,800
896	40	17.920,00	561,235	560,185	1,050	1,575
899	60	17.980,00	563,609	562,559	1,050	1,575
902	60	18.040,00	561,894	560,844	1,050	1,575
906	80	18.120,00	562,187	560,187	2,000	2,525
907	20	18.140,00	562,133	559,633	2,500	3,500
912	100	18.240,00	561,146	559,046	2,100	3,350
915	60	18.300,00	559,842	558,692	1,150	2,200
917	40	18.340,00	559,670	558,470	1,200	1,775
919	40	18.380,00	560,202	559,152	1,050	1,650
922	60	18.440,00	562,002	560,952	1,050	1,575
925	60	18.500,00	563,745	562,595	1,150	1,675
927	40	18.540,00	563,172	562,122	1,050	1,625
931	80	18.620,00	560,963	559,913	1,050	1,575
937	120	18.740,00	557,723	556,673	1,050	1,575
943	120	18.860,00	569,079	568,029	1,050	1,575

0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	0,00				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	0,00				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	47,25				
0,500	31,50				
0,500	78,75	V	X		1
0,500	202,50				
0,500	54,00		X		
0,500	25,25	RD		1	
0,500	143,50				
0,500	157,50				
0,500	157,50				
0,500	157,50				
0,500	0,00				
0,500	252,00				

0,500	31,50
0,500	31,50
0,500	31,50
0,500	31,50
0,500	31,50
0,500	31,50
0,500	47,25
0,500	15,75
0,500	47,25
0,500	47,25
0,500	15,75
0,500	31,50
0,500	31,50
0,500	63,00
0,500	63,00
0,500	63,00
0,500	63,00
0,500	47,25
0,500	15,75
0,500	63,00
0,500	63,00
0,500	31,50
0,500	47,25
0,500	31,50
0,500	31,50
0,500	31,50
0,500	15,75
0,500	78,75
0,500	15,75
0,500	31,50
0,500	78,75
0,500	31,50
0,500	47,25
0,500	47,25
0,500	63,00
0,500	63,00
0,500	47,25
0,500	47,25
0,500	78,75
0,500	31,50
0,500	47,25
0,500	31,50
0,500	31,50
0,500	47,25
0,500	31,50
0,500	47,25
0,500	63,00
0,500	47,25
0,500	47,25
0,500	94,50
0,500	63,00
0,500	47,25
0,500	47,25
0,500	31,50
0,500	78,75
0,500	71,50
0,500	223,50
0,500	107,50
0,500	25,75
0,500	41,50
0,500	96,25

V

X X

1

RD

1

X

X

V

1

RD

1

X

V

X

1

X

X

0,500	87,50				
0,500	31,50				
0,500	78,75				
0,500	832,50				
0,500	1.428,25	RD		1	
0,500	118,00		X		
0,500	31,50	V	X		1
0,500	31,50				
0,500	15,75				
0,500	31,50				
0,500	31,50		X		
0,500	75,75				
0,500	106,50		X		
0,500	69,75				
0,500	31,50				
0,500	78,75				
0,500	31,50				
0,500	47,25				
0,500	88,75				
0,500	63,75				
0,500	36,00				
0,500	31,50	RD	X	1	
0,500	47,25	V	X		1
0,500	47,25				
0,500	101,00				
0,500	35,00				
0,500	167,50				
0,500	66,00				
0,500	35,50	RD	X	1	
0,500	33,00				
0,500	47,25				
0,500	50,25	V			1
0,500	32,50		X		
0,500	63,00				
0,500	94,50	RD	X	1	
0,500	94,50				

17.065,90

25
RD = 25

24
V = 24