

COMPANHIA DE SANEAMENTO DO PARÁ - COSANPA															
SISTEMA DE ABASTECIMENTO DE ÁGUA - RES. BENEDITO MONTEIRO															
PLANILHA DE CÁLCULO DE REDE DE DISTRIBUIÇÃO DE ÁGUA															
Trecho	Comprimento m	Vazão (l/s)				Diâmetro mm	Velocidade m/s	Cota Piezométrica A Montante (m)	Perda de Carga (m)	Cota Piezométrica A Jusante (m)	Cota do Terreno (m)		Pressão Disponível		Observações
		A Jusante	Em Marcha	A Montante	Fictícia						A Montante	A Jusante	A Montante	A Jusante	
36-34	93,20	0,000	0,978	0,978	0,489	50	0,25	32,1983	0,1983	32,0000	22,000	22,000	10,198	10,000	
35-34	68,90	0,000	0,723	0,723	0,362	50	0,18	32,1983	0,0838	32,1145	22,000	19,000	10,198	13,114	
34-32	39,60	1,702	0,416	2,118	1,910	75	0,43	32,3436	0,1453	32,1983	21,000	22,000	11,344	10,198	
33-32	82,50	0,000	0,866	0,866	0,433	50	0,22	32,3436	0,1401	32,2035	21,000	19,000	11,344	13,203	
32-30	47,10	2,984	0,494	3,478	3,231	100	0,41	32,4562	0,1126	32,3436	21,000	21,000	11,456	11,344	
31-30	97,90	0,000	1,028	1,028	0,514	50	0,26	32,4562	0,2281	32,2280	21,000	19,000	11,456	13,228	
30-28	46,90	4,506	0,492	4,998	4,752	100	0,61	32,6851	0,2289	32,4562	20,000	21,000	12,685	11,456	
29-28	110,90	0,000	1,164	1,164	0,582	50	0,30	32,6851	0,3255	32,3596	20,000	18,000	12,685	14,360	
28-26	49,00	6,163	0,514	6,677	6,420	100	0,82	33,1023	0,4172	32,6851	19,000	20,000	14,102	12,685	
27-26	106,20	0,000	1,115	1,115	0,557	50	0,28	33,1023	0,2877	32,8146	19,000	17,000	14,102	15,815	
26-25	49,90	7,792	0,524	8,316	8,054	150	0,46	33,1920	0,0897	33,1023	18,000	19,000	15,192	14,102	
17-22	28,20	0,000	0,296	0,296	0,148	50	0,08	32,4205	0,0066	32,4139	16,000	15,000	16,421	17,414	
22-25	116,10	0,296	1,219	1,515	0,905	50	0,46	33,1920	0,7715	32,4205	18,000	16,000	15,192	16,421	
25-24	43,90	9,831	0,461	10,292	10,061	150	0,57	33,3112	0,1191	33,1920	18,000	18,000	15,311	15,192	
21-24	113,40	0,000	1,191	1,191	0,595	50	0,30	33,3112	0,3468	32,9643	18,000	15,000	15,311	17,964	
24-23	46,00	11,482	0,483	11,965	11,724	150	0,66	33,4768	0,1657	33,3112	18,000	18,000	15,477	15,311	
20-23	110,00	0,000	1,155	1,155	0,577	50	0,29	33,4768	0,3180	33,1588	18,000	16,000	15,477	17,159	
23-18	32,00	13,120	0,336	13,456	13,288	150	0,75	33,6221	0,1453	33,4768	17,000	18,000	16,622	15,477	
22-21	52,00	0,000	0,546	0,546	0,273	50	0,14	32,6605	0,0376	32,6229	15,000	16,000	17,660	16,623	
21-20	44,00	0,546	0,462	1,008	0,777	50	0,40	32,8807	0,2202	32,6605	16,000	15,000	16,881	17,660	
20-19	32,00	1,008	0,336	1,344	1,176	50	0,60	33,2255	0,3448	32,8807	17,000	16,000	16,226	16,881	
19-18	108,00	1,344	1,134	2,478	1,911	75	0,43	33,6221	0,3966	33,2255	17,000	17,000	16,622	16,226	
18-15	66,00	15,933	0,693	16,626	16,280	200	0,52	33,7296	0,1075	33,6221	17,000	17,000	16,730	16,622	
17-16	175,50	0,000	1,842	1,842	0,921	50	0,47	33,4010	1,2040	32,1969	16,000	15,000	17,401	17,197	
16-15	180,40	1,842	1,894	3,736	2,789	100	0,36	33,7296	0,3286	33,4010	17,000	16,000	16,730	17,401	
15-7	46,60	20,363	0,489	20,852	20,607	200	0,66	33,8470	0,1174	33,7296	17,000	17,000	16,847	16,730	
14-13	143,00	0,000	1,501	1,501	0,751	50	0,38	33,3059	0,6717	32,6342	16,000	13,000	17,306	19,634	
13-11	30,70	1,501	0,322	1,824	1,662	75	0,38	33,3930	0,0871	33,3059	16,000	16,000	17,393	17,306	
12-11	139,00	0,000	1,459	1,459	0,730	50	0,37	33,3930	0,6195	32,7735	16,000	13,000	17,393	19,774	
11-10	44,00	3,283	0,462	3,745	3,514	100	0,45	33,5159	0,1229	33,3930	16,000	16,000	17,516	17,393	
10-8	42,00	3,745	0,441	4,186	3,965	100	0,50	33,6626	0,1467	33,5159	16,000	16,000	17,663	17,516	
9-8	204,00	0,000	2,142	2,142	1,071	50	0,55	33,6626	1,8488	31,8137	16,000	14,000	17,663	17,814	
8-7	132,20	6,327	1,388	7,715	7,021	150	0,40	33,8470	0,1844	33,6626	17,000	16,000	16,847	17,663	
7-3	31,30	28,567	0,329	28,896	28,731	200	0,91	33,9928	0,1458	33,8470	16,000	17,000	17,993	16,847	
6-4	149,00	0,000	1,564	1,564	0,782	50	0,40	33,7635	0,7552	33,0084	17,000	15,000	16,764	18,008	
5-4	16,00	0,000	0,168	0,168	0,084	50	0,04	33,7635	0,0013	33,7622	17,000	17,000	16,764	16,762	
4-3	56,00	1,732	0,588	2,320	2,026	75	0,46	33,9928	0,2292	33,7635	16,000	17,000	17,993	16,764	
3-1	10,00	31,216	0,105	31,321	31,268	200	1,00	34,0473	0,0545	33,9928	16,000	16,000	18,047	17,993	
2-1	191,70	0,000	2,013	2,013	1,006	50	0,51	34,0473	1,5486	32,4987	16,000	15,000	18,047	17,499	
0-1	16,00	33,333		33,333	33,333	200	1,06	34,1454	0,0981	34,0473	16,000	16,000	18,145	18,047	Sem distribuição, barrilete do poço
A-12	70,00	16,660		16,660	16,660	150	0,94	32,7735	0,4829	32,2906	16,000	16,000	16,774	16,291	Interligação, sem ligações domiciliares

Parâmetros de Projeto:	
Vazão de distribuição	33,333 l/s
Metragem da Rede	3.175,1 m
Vazão/metro de canalização (Rede projetada)	0,0104984 l/s/m
Coeficiente Hazen-Williams C	130

Diâmetro do barrilete do poço	200 mm
Cota piezométrica na saída do poço	34,145 m
Cota do terreno do poço	16,000 m
Pressão mínima na rede	10,000 mca
Pressão máxima na rede	19,774 mca

DIÂMETRO	METRAGEM (m)
50 mm	2073,50
75 mm	234,30
100 mm	409,40
150 mm	374,00
200 mm	169,90

Pop.=	8000 hab.
K1=	1,2
K2=	1,5
q=	200 l/s.hab.