

L O O P

Version 4.0

Looped Water Distribution Network Design Program

LOOP: Looped Water Distribution Design Program - (C) The World Bank

Output Data File : BPRUIDS1.OUT

Echoing Input Design Variables

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Title of the Project           : uidssmt at BPR Zone1
Name of the User              : otd
Number of Pipes               : 46
Number of Nodes               : 43
Type of Pipe Materials Used   : DI/
Number of Commercial Dia per Material : 6/
Peak Design Factor            : 3
Newton-Raphson Stopping Criterion lps : .001
Minimum Pressure              m   : 3
Maximum Pressure              m   : 45
Design Hydraulic Gradient m in km : 2
Simulate or Design?          (S/D) : D
No. of Res. Nodes with Fixed HGL : 1
No. of Res. Nodes with Variable HGL : 0
No. of Booster Pumps         : 0
No. of Pressure Reducing Valves : 0
No. of Check Valves          : 0
Type of Formula               : Hazen's

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Looped Water Distribution Network Design OutPut

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BandWidth                    =      2
Number of Loops              =      4
Newton Raphson Iterations =      4
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Pipe Details

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Pipe  From To   Flow    Dia    HL    HL/1000m  Length Velocity
No.  Node Node  (lps)  (mm)  (m )  (m )      (m )  (m/s )
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  1   23  24    0.180  100.0  0.00   0.01    100.00  0.02
  2   23  22   -1.590  100.0 -0.11  -0.55    200.00 -0.20
  3   22  42   -1.114  100.0 -0.03  -0.29    100.00 -0.14

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4	42	43	1.050	100.0	0.05	0.26	200.00	0.13
5	42	41	-3.214	100.0	-0.51	-2.03	250.00	-0.41
6	22	21	-2.066	100.0	-0.27	-0.90	300.00	-0.26
7	41	40	1.050	100.0	0.05	0.26	200.00	0.13
8	41	38	-5.314	100.0	-1.03	-5.16	200.00	-0.68
9	38	39	1.050	100.0	0.06	0.26	250.00	0.13
10	38	32	-7.414	150.0	-0.27	-1.33	200.00	-0.42
11	32	33	1.440	100.0	0.05	0.46	100.00	0.18
12	33	36	0.480	100.0	0.00	0.06	70.00	0.06
13	36	37	0.240	100.0	0.00	0.02	50.00	0.03
15	34	35	0.240	100.0	0.00	0.02	50.00	0.03
16	33	34	0.480	100.0	0.00	0.06	70.00	0.06
17	30	31	0.690	100.0	0.02	0.12	200.00	0.09
18	32	30	-8.137	150.0	-0.16	-1.58	100.00	-0.46
19	32	17	-1.437	100.0	-0.11	-0.46	250.00	-0.18
20	16	29	3.372	100.0	0.44	2.22	200.00	0.43
21	29	30	9.547	150.0	0.11	2.12	50.00	0.54
22	29	27	-6.895	150.0	-0.17	-1.16	150.00	-0.39
23	16	15	-16.415	200.0	-0.27	-2.65	100.00	-0.52
24	15	26	9.055	150.0	0.38	1.92	200.00	0.51
25	26	27	7.975	150.0	0.15	1.52	100.00	0.45
26	27	28	0.540	100.0	0.01	0.07	150.00	0.07
27	26	25	0.540	100.0	0.01	0.07	200.00	0.07
28	15	8	-26.880	250.0	-0.78	-1.20	650.00	-0.55
29	16	17	11.453	150.0	0.59	2.97	200.00	0.65
30	17	18	8.426	150.0	0.17	1.68	100.00	0.48
31	18	19	1.590	100.0	0.11	0.55	200.00	0.20
32	18	21	5.246	100.0	1.51	5.03	300.00	0.67
33	21	20	1.590	100.0	0.11	0.55	200.00	0.20
34	8	9	15.870	200.0	0.50	2.49	200.00	0.51
35	9	10	1.410	100.0	0.07	0.44	150.00	0.18
36	9	11	13.050	200.0	0.35	1.74	200.00	0.42
37	8	6	-44.160	250.0	-3.00	-3.00	1000.00	-0.90
38	11	12	5.924	100.0	0.63	6.30	100.00	0.75
39	11	13	5.236	100.0	1.00	5.02	200.00	0.67
40	12	13	3.584	100.0	0.37	2.49	150.00	0.46
41	13	14	5.550	100.0	2.01	5.59	360.00	0.71
42	6	7	0.930	100.0	0.08	0.20	402.00	0.12
43	6	2	-46.020	250.0	-0.16	-3.24	50.00	-0.94
44	2	3	6.570	150.0	0.27	1.06	250.00	0.37
45	3	5	1.890	100.0	0.11	0.76	150.00	0.24
46	3	4	0.930	100.0	0.02	0.20	100.00	0.12
47	2	1	-53.070	250.0	-6.75	-4.22	1600.00	-1.08

Note: Negative value indicates the flow in reverse direction in that Pipe

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Pipe Pressure Details

Pipe No.	From Node	To Node	Dia (mm)	Hazen's Const	Pipe Material	Max Press (m)	Allow Press (m)	Status (E/P)
1	23	24	100.0	140.00000	DI	31.65	125.00	
2	23	22	100.0	140.00000	DI	33.66	125.00	
3	22	42	100.0	140.00000	DI	33.66	125.00	
4	42	43	100.0	140.00000	DI	35.83	125.00	
5	42	41	100.0	140.00000	DI	36.39	125.00	
6	22	21	100.0	140.00000	DI	37.03	125.00	
7	41	40	100.0	140.00000	DI	38.14	125.00	
8	41	38	100.0	140.00000	DI	37.32	125.00	
9	38	39	100.0	140.00000	DI	39.66	125.00	
10	38	32	150.0	140.00000	DI	39.39	125.00	
11	32	33	100.0	140.00000	DI	40.54	125.00	
12	33	36	100.0	140.00000	DI	41.94	125.00	
13	36	37	100.0	140.00000	DI	42.64	125.00	
15	34	35	100.0	140.00000	DI	42.49	125.00	
16	33	34	100.0	140.00000	DI	41.99	125.00	
17	30	31	100.0	140.00000	DI	37.72	125.00	
18	32	30	150.0	140.00000	DI	39.39	125.00	
19	32	17	100.0	140.00000	DI	40.20	125.00	
20	16	29	100.0	140.00000	DI	40.00	125.00	
21	29	30	150.0	140.00000	DI	36.95	125.00	
22	29	27	150.0	140.00000	DI	36.95	125.00	
23	16	15	200.0	100.00000	DI	40.00	100.00	
24	15	26	150.0	140.00000	DI	38.51	125.00	
25	26	27	150.0	140.00000	DI	34.98	125.00	
26	27	28	100.0	140.00000	DI	36.82	125.00	
27	26	25	100.0	140.00000	DI	35.16	125.00	
28	15	8	250.0	140.00000	DI	38.51	100.00	
29	16	17	150.0	140.00000	DI	40.20	125.00	
30	17	18	150.0	140.00000	DI	40.20	125.00	
31	18	19	100.0	140.00000	DI	40.43	125.00	
32	18	21	100.0	140.00000	DI	39.54	125.00	
33	21	20	100.0	140.00000	DI	38.72	125.00	
34	8	9	200.0	100.00000	DI	25.24	100.00	
35	9	10	100.0	140.00000	DI	34.73	125.00	
36	9	11	200.0	100.00000	DI	32.60	100.00	
37	8	6	250.0	140.00000	DI	22.29	100.00	
38	11	12	100.0	140.00000	DI	33.66	125.00	
39	11	13	100.0	140.00000	DI	35.09	125.00	
40	12	13	100.0	140.00000	DI	35.09	125.00	
41	13	14	100.0	140.00000	DI	37.28	125.00	
42	6	7	100.0	140.00000	DI	20.06	125.00	
43	6	2	250.0	140.00000	DI	23.95	100.00	
44	2	3	150.0	140.00000	DI	26.19	125.00	
45	3	5	100.0	140.00000	DI	28.72	125.00	
46	3	4	100.0	140.00000	DI	26.19	125.00	
47	2	1	250.0	140.00000	DI	23.95	100.00	

Node Details

Node No.	Flow (lps)	Elev. (m)	H G L (m)	Pressure (m)
1 S	53.070	60.00	61.20	1.20
2	-0.480	30.50	54.45	23.95
3	-3.750	28.00	54.19	26.19
4	-0.930	30.25	54.17	23.92
5	-1.890	25.35	54.07	28.72
6	-0.930	35.00	54.29	19.29
7	-0.930	34.15	54.21	20.06
8	-1.410	29.00	51.29	22.29
9	-1.410	25.55	50.79	25.24
10	-1.410	16.00	50.73	34.73
11	-1.890	17.85	50.45	32.60
12	-2.340	16.15	49.81	33.66
13	-3.270	14.35	49.44	35.09
14	-5.550	10.15	47.43	37.28
15	-1.410	12.00	50.51	38.51
16	-1.590	10.25	50.25	40.00
17	-1.590	9.45	49.65	40.20
18	-1.590	9.95	49.49	39.54
19	-1.590	8.95	49.38	40.43
20	-1.590	9.15	47.87	38.72
21	-1.590	10.95	47.98	37.03
22	-1.590	14.05	47.71	33.66
23	-1.410	15.95	47.60	31.65
24	-0.180	17.00	47.60	30.60
25	-0.540	14.95	50.11	35.16
26	-0.540	15.25	50.13	34.88
27	-0.540	15.00	49.98	34.98
28	-0.540	13.15	49.97	36.82
29	-0.720	12.85	49.80	36.95
30	-0.720	12.95	49.70	36.75
31	-0.690	11.95	49.67	37.72
32	-0.720	10.15	49.54	39.39
33	-0.480	8.95	49.49	40.54
34	-0.240	7.50	49.49	41.99
35	-0.240	7.00	49.49	42.49
36	-0.240	7.55	49.49	41.94
37	-0.240	6.85	49.49	42.64
38	-1.050	11.95	49.27	37.32
39	-1.050	9.55	49.21	39.66
40	-1.050	10.05	48.19	38.14
41	-1.050	11.85	48.24	36.39
42	-1.050	14.95	47.74	32.79
43	-1.050	11.85	47.68	35.83

Pipe Cost Summary

Diameter (mm)	Pipe Material	Length (m)	Cost (1000 Rs)	Cum. Cost (1000 Rs)
100.0	DI	5452.00	5055.69	5055.69
150.0	DI	1350.00	1814.71	6870.40
200.0	DI	500.00	966.32	7836.72
250.0	DI	3300.00	8557.76	16394.48

Pipe-wise Cost Summary

Pipe No	Diameter (mm)	Pipe Material	Length (m)	Cost (1000 Rs)	Cum. Cost (1000 Rs)
1	100.0	DI	100.00	92.73	92.73
2	100.0	DI	200.00	185.46	278.19
3	100.0	DI	100.00	92.73	370.92
4	100.0	DI	200.00	185.46	556.39
5	100.0	DI	250.00	231.83	788.21
6	100.0	DI	300.00	278.19	1066.41
7	100.0	DI	200.00	185.46	1251.87
8	100.0	DI	200.00	185.46	1437.33
9	100.0	DI	250.00	231.83	1669.16
10	150.0	DI	200.00	268.85	1938.00
11	100.0	DI	100.00	92.73	2030.73
12	100.0	DI	70.00	64.91	2095.65
13	100.0	DI	50.00	46.37	2142.01
15	100.0	DI	50.00	46.37	2188.38
16	100.0	DI	70.00	64.91	2253.29
17	100.0	DI	200.00	185.46	2438.75
18	150.0	DI	100.00	134.42	2573.17
19	100.0	DI	250.00	231.83	2805.00
20	100.0	DI	200.00	185.46	2990.46
21	150.0	DI	50.00	67.21	3057.68
22	150.0	DI	150.00	201.63	3259.31
23	200.0	DI	100.00	193.26	3452.57
24	150.0	DI	200.00	268.85	3721.42
25	150.0	DI	100.00	134.42	3855.84
26	100.0	DI	150.00	139.10	3994.94
27	100.0	DI	200.00	185.46	4180.40
28	250.0	DI	650.00	1685.62	5866.02
29	150.0	DI	200.00	268.85	6134.87
30	150.0	DI	100.00	134.42	6269.29
31	100.0	DI	200.00	185.46	6454.75
32	100.0	DI	300.00	278.19	6732.94
33	100.0	DI	200.00	185.46	6918.41
34	200.0	DI	200.00	386.53	7304.93
35	100.0	DI	150.00	139.10	7444.03
36	200.0	DI	200.00	386.53	7830.56

37	250.0	DI	1000.00	2593.26	10423.82
38	100.0	DI	100.00	92.73	10516.55
39	100.0	DI	200.00	185.46	10702.01
40	100.0	DI	150.00	139.10	10841.11
41	100.0	DI	360.00	333.83	11174.94
42	100.0	DI	402.00	372.78	11547.72
43	250.0	DI	50.00	129.66	11677.38
44	150.0	DI	250.00	336.06	12013.44
45	100.0	DI	150.00	139.10	12152.54
46	100.0	DI	100.00	92.73	12245.27
47	250.0	DI	1600.00	4149.22	16394.48

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