Supplementary material

Tables

Table 1 Two Tank Network data (case(ii))

Pipe ID	Top Node	End Node	Length (m)	Diameter (mm)	Roughness (mm)	Node ID	Elevation (m)
1	$T01$	A	500	100	0.58	$T01$	$H_0 = 30$
2	A	B	500	100	0.58	$T02$	$H_0 = 20$
3	B	$T02$	500	100	0.58	A	0
						B	0

Table 2: Apulian WDN data

Pipe ID	Length (m)	Diameter (mm)	PDemand $\left(\frac{l}{s\ m}\right)$	Node ID	NDemand $\left(\frac{l}{s}\right)$	Elevation (m)
1	349	327	0.0164	1	0	6.4
2	956	290	0.0162	2	0	7
3	483	100	0.0161	3	0	6
4	401	290	0.0162	4	0	8.4
5	792	100	0.0163	5	0	7.4
6	404	368	0.0163	6	0	9
7	391	327	0.0161	7	0	9.1
8	482	100	0.0162	8	0	8.4
9	934	100	.01626	9	0	6.4
10	431	184	0.0162	10	0	10.5
11	513	100	0.0162	11	0	9.6
12	428	184	0.0163	12	0	11.7
13	419	100	0.0162	13	0	12.3
14	1023	100	0.0259	14	0	10.6
15	455	164	0.0382	15	0	10.1
16	183	290	0.0164	16	0	9.5
17	221	290	0.0163	17	0	10.2
18	584	164	0.0163	18	0	9.6
19	452	229	0.0162	19	0	9.1
20	795	100	0.0162	20	0	13.9
21	718	100	0.0163	21	0	11.1
22	656	258	0.0163	22	0	11.4
23	166	100	0.0163	23	0	10
24	252	100	0.0163	24		$H_0 = 36.4$
25	332	100	0.0163			
26	500	204	0.0162			

27	580	164	0.0162
28	843	100	0.0193
29	793	100	0.0163
30	846	184	0.0163
31	164	258	0.0165
32	428	100	0.0222
33	380	100	0.0163
34	158	368	0

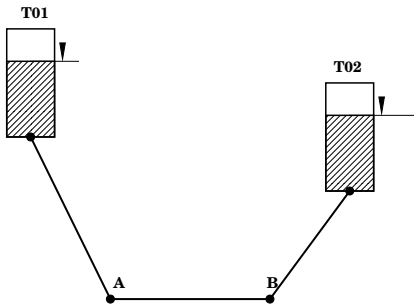

Fig. 8 Network scheme in simplify case study. Two tanks connected with three pipe. Water demand is located only in then pipe AB

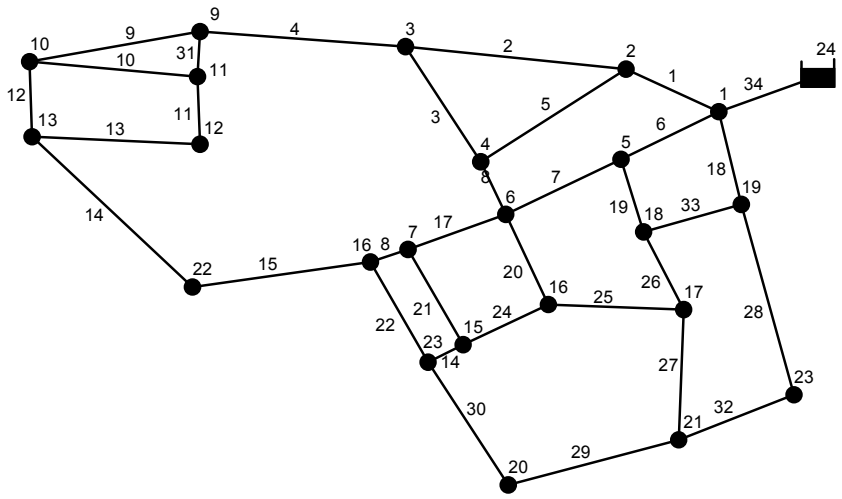

Fig. 9 Apulian Network layout.