

Hydraulic Calculations for

Project: ALFANDEGA DA RECEITA FEDERAL DO BRASIL NO ESTADO DE SAO PAULO
Drawing no.: SRG_1860_SPK_MC_R02_VGA3
Date: 14/01/2020

Design

Remote area number: AREA03
Remote area location: VGA03 + RACK17
Occupancy classification: high piled rack storage
Density: Min.=14,3lpm/m2
Area of application: 186m2
Coverage per sprinkler: 8,55m2
Type of sprinklers calculated: TETO: SPK K160 - 22UN
RACK: SPK K115 - 14UN
No. of sprinklers calculated: 36
In rack demand: 1780,31lpm
Hose streams: none outside + none inside
Total water required (including hose streams): 4759,7 lpm at -0,183 bar [0,193 bar safety margin (1932%)]
Total water required at base of system riser: 4759,7 lpm at 7,547 bar
Type of system: wet pipe
Volume of dry or preaction system: 656m3 (SPK) + 64m3 (HD)

Water Supply Information

Date:
Location:
Source:

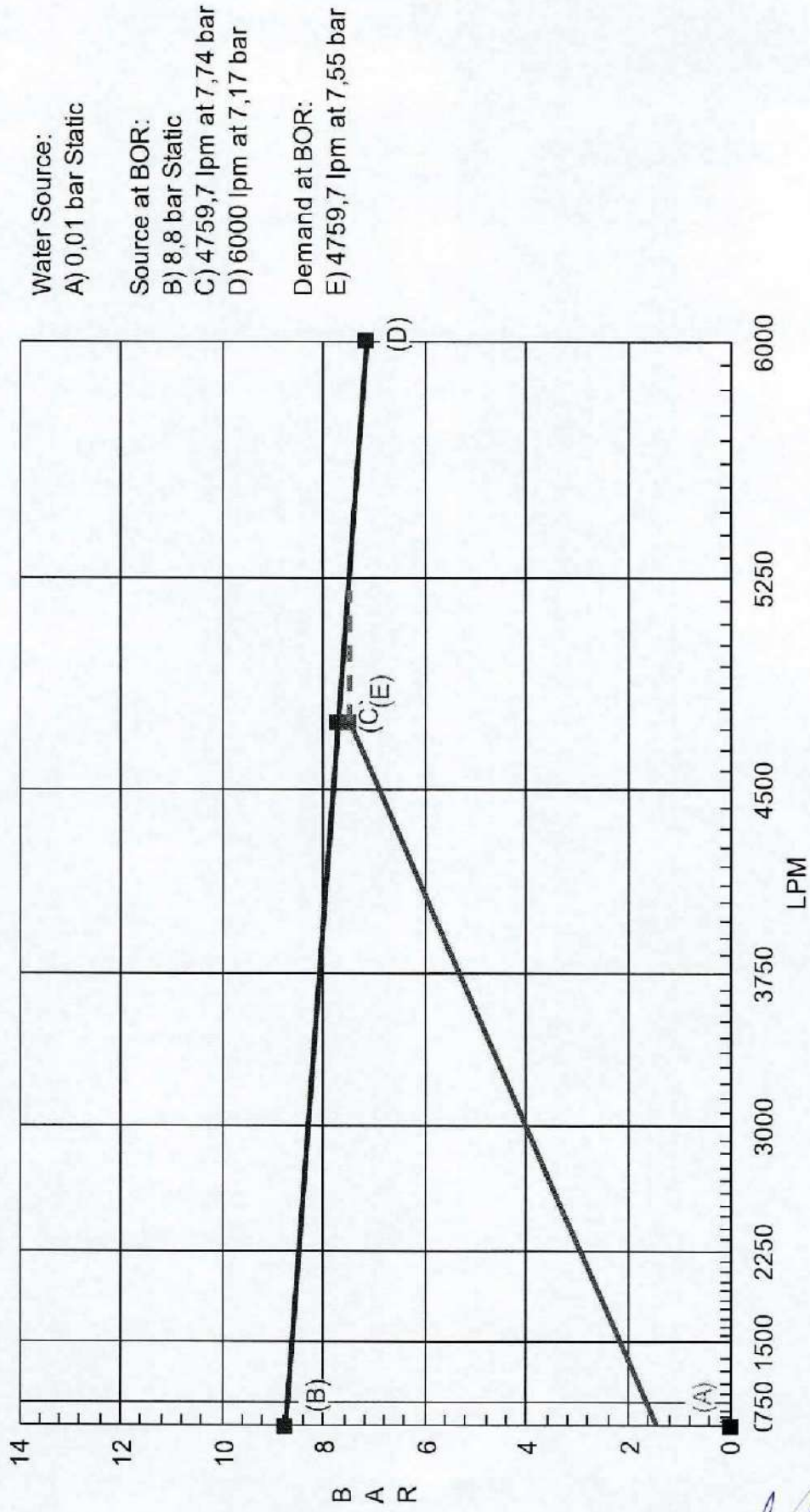
Contractor: RECEITA FEDERAL
Under contract with: SORENTE
Name of designer: LUIZ BUENO
Authority having jurisdiction: CORPO DE BOMBEIROS DE SAO PAULO

Notes

CALCULO HIDRAULICO DO SISTEMA DE CHUVEIROS AUTOMATICOS



Hydraulic Demand Graph



Supply Analysis

Node at	Static Pressure [bar]	Residual Pressure [bar]	Flow [lpm]	Available Pressure [bar]	Total Demand [lpm]	Required Pressure [bar]
RTI	0,01			0,01	4759,7	-0,18

Node Analysis

Node Tag	Elev [M]	Type	Pressure [bar]	Discharge [lpm]	Node Tag	Elev [M]	Type	Pressure [bar]	Discharge [lpm]
RTI	-1,850	source	-0,183	-4759,70	M2-16	13,500	ref	2,431	0,000
EB	0,000	ref	-0,400	0,000	M2-17	13,500	ref	2,361	0,000
SB	0,000	ref	8,048	0,000	M2-18	13,500	ref	2,291	0,000
M1-1	13,500	ref	3,285	0,000	M2-19	13,500	ref	2,221	0,000
M1-2	13,500	ref	3,280	0,000	M2-20	13,500	ref	2,151	0,000
M1-3	13,500	ref	3,260	0,000	M2-21	13,500	ref	2,082	0,000
M1-4	13,500	ref	3,225	0,000	M2-22	13,500	ref	2,012	0,000
M1-5	13,500	ref	3,177	0,000	M2-23	13,500	ref	1,942	0,000
M1-6	13,500	ref	3,120	0,000	M2-24	13,500	ref	1,872	0,000
M1-7	13,500	ref	3,056	0,000	M2-25	13,500	ref	1,803	0,000
M1-8	13,500	ref	2,989	0,000	M2-26	13,500	ref	1,734	0,000
M1-9	13,500	ref	2,920	0,000	M2-27	13,500	ref	1,666	0,000
M1-10	13,500	ref	2,850	0,000	M2-28	13,500	ref	1,601	0,000
M1-11	13,500	ref	2,780	0,000	M2-29	13,500	ref	1,540	0,000
M1-12	13,500	ref	2,710	0,000	M2-30	13,500	ref	1,484	0,000
M1-13	13,500	ref	2,640	0,000	M2-31	13,500	ref	1,434	0,000
M1-14	13,500	ref	2,571	0,000	M2-32	13,500	ref	1,398	0,000
M1-15	13,500	ref	2,501	0,000	M2-33	13,500	ref	1,379	0,000
M1-16	13,500	ref	2,431	0,000	M2-34	13,500	ref	1,377	0,000
M1-17	13,500	ref	2,361	0,000	L31-1	15,750	K=160,00	0,872	149,401
M1-18	13,500	ref	2,291	0,000	L31-2	15,750	K=160,00	0,867	148,966
M1-19	13,500	ref	2,221	0,000	L31-3	15,750	K=160,00	0,868	149,040
M1-20	13,500	ref	2,151	0,000	L31-4	15,750	K=160,00	0,882	150,279
M1-21	13,500	ref	2,082	0,000	L31-5	15,750	ref	0,925	0,000
M1-22	13,500	ref	2,012	0,000	L31-6	15,750	ref	0,967	0,000
M1-23	13,500	ref	1,942	0,000	L31-7	15,750	ref	1,010	0,000
M1-24	13,500	ref	1,872	0,000	L31-8	15,750	ref	1,052	0,000
M1-25	13,500	ref	1,801	0,000	L31-9	15,750	ref	1,095	0,000
M1-26	13,500	ref	1,728	0,000	L32-1	15,750	K=160,00	0,712	135,018
M1-27	13,500	ref	1,649	0,000	L32-2	15,750	K=160,00	0,694	133,335
M1-28	13,500	ref	1,561	0,000	L32-3	15,750	K=160,00	0,692	133,066
M1-29	13,500	ref	1,457	0,000	L32-4	15,750	K=160,00	0,693	133,205
M1-30	13,500	ref	1,329	0,000	L32-5	15,750	K=160,00	0,707	134,562
M1-31	13,500	ref	1,161	0,000	L32-6	15,750	K=160,00	0,746	138,177
M1-32	13,500	ref	1,051	0,000	L32-7	15,750	ref	0,820	0,000
M1-33	13,500	ref	1,002	0,000	L32-8	15,750	ref	0,895	0,000
M1-34	13,500	ref	0,988	0,000	L32-9	15,750	ref	0,969	0,000
DER'	13,500	ref	1,382	0,000	L33-1	15,750	K=160,00	0,677	131,645
M2-1	13,500	ref	3,539	0,000	L33-2	15,750	K=160,00	0,662	130,203
M2-2	13,500	ref	3,452	0,000	L33-3	15,750	K=160,00	0,660	130,025
M2-3	13,500	ref	3,364	0,000	L33-4	15,750	K=160,00	0,663	130,239
M2-4	13,500	ref	3,282	0,000	L33-5	15,750	K=160,00	0,678	131,770
M2-5	13,500	ref	3,205	0,000	L33-6	15,750	K=160,00	0,718	135,620
M2-6	13,500	ref	3,132	0,000	L33-7	15,750	ref	0,794	0,000
M2-7	13,500	ref	3,060	0,000	L33-8	15,750	ref	0,870	0,000
M2-8	13,500	ref	2,990	0,000	L33-9	15,750	ref	0,946	0,000
M2-9	13,500	ref	2,920	0,000	L34-1	15,750	K=160,00	0,668	130,741
M2-10	13,500	ref	2,850	0,000	L34-2	15,750	K=160,00	0,654	129,373
M2-11	13,500	ref	2,780	0,000	L34-3	15,750	K=160,00	0,652	129,221
M2-12	13,500	ref	2,710	0,000	L34-4	15,750	K=160,00	0,655	129,462
M2-13	13,500	ref	2,640	0,000	L34-5	15,750	K=160,00	0,671	131,055
M2-14	13,500	ref	2,571	0,000	L34-6	15,750	K=160,00	0,712	134,988
M2-15	13,500	ref	2,501	0,000	L34-7	15,750	ref	0,788	0,000

Node Analysis. cont.

Node Tag	Elev [M]	Type	Pressure [bar]	Discharge [lpm]	Node Tag	Elev [M]	Type	Pressure [bar]	Discharge [lpm]
L34-8	15,750	ref	0,865	0,000	R2-29	15,750	ref	1,307	0,000
L34-9	15,750	ref	0,942	0,000	R2-30	15,750	ref	1,240	0,000
R1-1	15,750	ref	3,103	0,000	R2-31	15,750	ref	1,129	0,000
R1-2	15,750	ref	3,085	0,000	R2-32	15,750	ref	1,028	0,000
R1-3	15,750	ref	3,055	0,000	R2-33	15,750	ref	1,007	0,000
R1-4	15,750	ref	3,013	0,000	R2-34	15,750	ref	1,003	0,000
R1-5	15,750	ref	2,961	0,000	BOR	0,500	ref	7,547	0,000
R1-6	15,750	ref	2,901	0,000	N5-232	8,950	K=115,00	1,146	123,098
R1-7	15,750	ref	2,836	0,000	N5-233	8,950	K=115,00	1,075	119,257
R1-8	15,750	ref	2,768	0,000	N5-234	8,950	K=115,00	1,032	116,931
R1-9	15,750	ref	2,699	0,000	N5-235	8,950	K=115,00	1,009	115,539
R1-10	15,750	ref	2,629	0,000	N5-236	8,950	K=115,00	1,001	115,053
R1-11	15,750	ref	2,560	0,000	N5-237	8,950	K=115,00	1,000	115,000
R1-12	15,750	ref	2,490	0,000	N5-238	8,950	K=115,00	1,002	115,089
R1-13	15,750	ref	2,420	0,000	N5-171	4,450	K=115,00	1,526	142,079
R1-14	15,750	ref	2,350	0,000	N5-173	4,450	K=115,00	1,469	139,382
R1-15	15,750	ref	2,280	0,000	N5-174	4,450	K=115,00	1,358	134,013
R1-16	15,750	ref	2,210	0,000	N5-175	4,450	K=115,00	1,458	138,862
R1-17	15,750	ref	2,140	0,000	N5-176	4,450	K=115,00	1,348	133,510
R1-18	15,750	ref	2,071	0,000	N5-177	4,450	K=115,00	1,460	138,977
R1-19	15,750	ref	2,001	0,000	N5-178	4,450	K=115,00	1,350	133,622
R1-20	15,750	ref	1,931	0,000	N5-2	8,950	ref	4,539	0,000
R1-21	15,750	ref	1,861	0,000	N5-1	4,450	ref	4,991	0,000
R1-22	15,750	ref	1,791	0,000	N5-2'	8,950	ref	1,007	0,000
R1-23	15,750	ref	1,721	0,000	N5-1'	4,450	ref	1,464	0,000
R1-24	15,750	ref	1,651	0,000	N5'	-0,100	ref	1,998	0,000
R1-25	15,750	ref	1,581	0,000	N5	-0,100	ref	5,486	0,000
R1-26	15,750	ref	1,508	0,000	DER	2,500	ref	5,541	0,000
R1-27	15,750	ref	1,431	0,000	N5-172	4,450	ref	1,526	0,000
R1-28	15,750	ref	1,346	0,000					
R1-29	15,750	ref	1,249	0,000					
R1-30	15,750	ref	1,131	0,000					
R1-31	15,750	ref	0,889	0,000					
R1-32	15,750	ref	0,742	0,000					
R1-33	15,750	ref	0,704	0,000					
R1-34	15,750	ref	0,693	0,000					
R2-1	15,750	ref	3,281	0,000					
R2-2	15,750	ref	3,206	0,000					
R2-3	15,750	ref	3,128	0,000					
R2-4	15,750	ref	3,053	0,000					
R2-5	15,750	ref	2,981	0,000					
R2-6	15,750	ref	2,910	0,000					
R2-7	15,750	ref	2,839	0,000					
R2-8	15,750	ref	2,769	0,000					
R2-9	15,750	ref	2,699	0,000					
R2-10	15,750	ref	2,629	0,000					
R2-11	15,750	ref	2,560	0,000					
R2-12	15,750	ref	2,490	0,000					
R2-13	15,750	ref	2,420	0,000					
R2-14	15,750	ref	2,350	0,000					
R2-15	15,750	ref	2,280	0,000					
R2-16	15,750	ref	2,210	0,000					
R2-17	15,750	ref	2,140	0,000					
R2-18	15,750	ref	2,071	0,000					
R2-19	15,750	ref	2,001	0,000					
R2-20	15,750	ref	1,931	0,000					
R2-21	15,750	ref	1,861	0,000					
R2-22	15,750	ref	1,791	0,000					
R2-23	15,750	ref	1,721	0,000					
R2-24	15,750	ref	1,652	0,000					
R2-25	15,750	ref	1,582	0,000					
R2-26	15,750	ref	1,512	0,000					
R2-27	15,750	ref	1,443	0,000					
R2-28	15,750	ref	1,375	0,000					



Pipe Information

negative pipe flow (Q) indicates flow is from node 2 towards node 1

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
RTI	-1,850		q=-4759,70 Q=4759,702	200 209,5	1E=6,447 1G=1,433	5,000 7,880		Pt= -0,183 Pe= 0,181	Mat="S10"
EB	0,000					12,880	C=120 0,003	Pf= 0,035	
EB	0,000		Pump inlet pressure = -0,400 bar						
			Net gain across pump = 8,447 bar						
SB	0,000		Pump outlet pressure = 8,048 bar						
SB	0,000		q= 0,000 Q=4759,702	200 209,5	6E=38,682 1B=4,298	88,400 77,670	C=120	Pt= 8,048 Pe= 0,049	Mat="S10"
BOR	0,500				1C=16,088 4TN=18,601	166,070	0,003	Pf= 0,452	
BOR	0,500		q= 0,000 Q=4759,702	100 108,2	1T=3,015 1B=4,809	5,000 21,641	C=120	Pt= 7,547 Pe= 0,196	Mat="S10"
DER	2,500				1A=4,809 1E=4,008	26,641	0,068	Pf= 1,810	
DER	2,500		q= 0,000 Q=3516,427	100 108,2	1T=8,015 1E=4,008	11,800 12,023	C=120	Pt= 5,541 Pe= 1,078	Mat="S10"
M2-1	13,500					23,823	0,039	Pf= 0,924	
M1-1	13,500		q= 0,000 Q= 218,465	65 66,9		2,500 0,000	C=120	Pt= 3,286 Pe= 0,000	Mat="S10"
M1-2	13,500					2,500	0,002	Pf= 0,006	
M1-2	13,500		q= 0,000 Q= 396,134	65 66,9		2,850 0,000	C=120	Pt= 3,280 Pe= 0,000	Mat="S10"
M1-3	13,500					2,850	0,007	Pf= 0,020	
M1-3	13,500		q= 0,000 Q= 531,291	65 66,9		2,850 0,000	C=120	Pt= 3,260 Pe= 0,000	Mat="S10"
M1-4	13,500					2,850	0,012	Pf= 0,035	
M1-4	13,500		q= 0,000 Q= 629,043	65 66,9		2,850 0,000	C=120	Pt= 3,225 Pe= 0,000	Mat="S10"
M1-5	13,500					2,850	0,017	Pf= 0,046	
M1-5	13,500		q= 0,000 Q= 695,412	65 66,9		2,850 0,000	C=120	Pt= 3,177 Pe= 0,000	Mat="S10"
M1-6	13,500					2,850	0,02	Pf= 0,057	
M1-6	13,500		q= 0,000 Q= 736,813	65 66,9		2,850 0,000	C=120	Pt= 3,120 Pe= 0,000	Mat="S10"
M1-7	13,500					2,850	0,022	Pf= 0,064	
M1-7	13,500		q= 0,000 Q= 759,642	65 66,9		2,850 0,000	C=120	Pt= 3,056 Pe= 0,000	Mat="S10"
M1-8	13,500					2,850	0,024	Pf= 0,068	
M1-8	13,500		q= 0,000 Q= 769,957	65 66,9		2,850 0,000	C=120	Pt= 2,989 Pe= 0,000	Mat="S10"
M1-9	13,500					2,850	0,024	Pf= 0,069	
M1-9	13,500		q= 0,000 Q= 773,170	65 66,9		2,850 0,000	C=120	Pt= 2,920 Pe= 0,000	Mat="S10"
M1-10	13,500					2,850	0,024	Pf= 0,070	
M1-10	13,500		q= 0,000 Q= 773,625	65 66,9		2,850 0,000	C=120	Pt= 2,850 Pe= 0,000	Mat="S10"
M1-11	13,500					2,850	0,025	Pf= 0,070	

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M1-11	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,780 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-12	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,710 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-13	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,640 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-14	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,571 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-15	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,501 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-16	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,431 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-17	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,361 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-18	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,291 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-19	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,221 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-20	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,151 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-21	13,500		q= 0,000 Q= 773,638	65 66,9		2,850 0,000 2,850		Pt= 2,082 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-22	13,500		q= 0,000 Q= 773,707	65 66,9		2,850 0,000 2,850		Pt= 2,012 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-23	13,500		q= 0,000 Q= 774,844	65 66,9		2,850 0,000 2,850		Pt= 1,942 Pe= 0,000 Pf= 0,070	Mat="S10"
M1-24	13,500		q= 0,000 Q= 780,296	65 66,9		2,850 0,000 2,850		Pt= 1,872 Pe= 0,000 Pf= 0,071	Mat="S10"
M1-25	13,500		q= 0,000 Q= 794,944	65 66,9		2,850 0,000 2,850		Pt= 1,801 Pe= 0,000 Pf= 0,073	Mat="S10"
M1-26	13,500								

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M1-26	13,500		q= 0,000 Q= 824,661	65 66,9		2,850 0,000		Pt= 1,728 Pe= 0,000	Mat="S10"
M1-27	13,500					2,850	C=120 0,028	Pf= 0,079	
M1-27	13,500		q= 0,000 Q= 876,187	65 66,9		2,850 0,000		Pt= 1,649 Pe= 0,000	Mat="S10"
M1-28	13,500					2,850	C=120 0,031	Pf= 0,088	
M1-28	13,500		q= 0,000 Q= 957,184	65 66,9		2,850 0,000		Pt= 1,561 Pe= 0,000	Mat="S10"
M1-29	13,500					2,850	C=120 0,036	Pf= 0,104	
M1-29	13,500		q= 0,000 Q=1076,431	65 66,9		2,850 0,000		Pt= 1,457 Pe= 0,000	Mat="S10"
M1-30	13,500					2,850	C=120 0,045	Pf= 0,129	
M1-30	13,500		q= 0,000 Q=1244,122	65 66,9		2,850 0,000		Pt= 1,329 Pe= 0,000	Mat="S10"
M1-31	13,500					2,850	C=120 0,059	Pf= 0,168	
M1-31	13,500		q= 0,000 Q= 986,920	65 66,9		2,850 0,000		Pt= 1,161 Pe= 0,000	Mat="S10"
M1-32	13,500					2,850	C=120 0,038	Pf= 0,110	
M1-32	13,500		q= 0,000 Q= 640,346	65 66,9		2,850 0,000		Pt= 1,051 Pe= 0,000	Mat="S10"
M1-33	13,500					2,850	C=120 0,017	Pf= 0,049	
M1-33	13,500		q= 0,000 Q= 316,693	65 66,9		2,850 0,000		Pt= 1,002 Pe= 0,000	Mat="S10"
M1-34	13,500					2,850	C=120 0,005	Pf= 0,013	
M2-1	13,500		q= 0,000 Q=3297,962	100 108,2		2,500 0,000		Pt= 3,539 Pe= 0,000	Mat="S10"
M2-2	13,500					2,500	C=120 0,034	Pf= 0,086	
M2-2	13,500		q= 0,000 Q=3120,293	100 108,2		2,850 0,000		Pt= 3,452 Pe= 0,000	Mat="S10"
M2-3	13,500					2,850	C=120 0,031	Pf= 0,089	
M2-3	13,500		q= 0,000 Q=2985,136	100 108,2		2,850 0,000		Pt= 3,364 Pe= 0,000	Mat="S10"
M2-4	13,500					2,850	C=120 0,029	Pf= 0,082	
M2-4	13,500		q= 0,000 Q=2887,384	100 108,2		2,850 0,000		Pt= 3,282 Pe= 0,000	Mat="S10"
M2-5	13,500					2,850	C=120 0,027	Pf= 0,077	
M2-5	13,500		q= 0,000 Q=2821,015	100 108,2		2,850 0,000		Pt= 3,205 Pe= 0,000	Mat="S10"
M2-6	13,500					2,850	C=120 0,026	Pf= 0,074	
M2-6	13,500		q= 0,000 Q=2779,614	100 108,2		2,850 0,000		Pt= 3,132 Pe= 0,000	Mat="S10"
M2-7	13,500					2,850	C=120 0,025	Pf= 0,072	
M2-7	13,500		q= 0,000 Q=2756,784	100 108,2		2,850 0,000		Pt= 3,060 Pe= 0,000	Mat="S10"
M2-8	13,500					2,850	C=120 0,025	Pf= 0,070	



Pipe Information. cont.

Node 1	Elev	Discharge	Nom	Fittings	L [M]		total (Pt)	
Node 2	[M]	K-factor	& Flow	num & length	F [M]	C factor	elev (Pe)	Notes
			[lpm]	[M]	T [M]	bar/M	frict (Pf)	
M2-8	13,500		q= 0,000 100		2,850		Pt= 2,990 Mat="S10"	
M2-9	13,500		Q=2746,470 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-9	13,500		q= 0,000 100		2,850		Pt= 2,920 Mat="S10"	
M2-10	13,500		Q=2743,257 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-10	13,500		q= 0,000 100		2,850		Pt= 2,850 Mat="S10"	
M2-11	13,500		Q=2742,802 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-11	13,500		q= 0,000 100		2,850		Pt= 2,780 Mat="S10"	
M2-12	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-12	13,500		q= 0,000 100		2,850		Pt= 2,710 Mat="S10"	
M2-13	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-13	13,500		q= 0,000 100		2,850		Pt= 2,640 Mat="S10"	
M2-14	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-14	13,500		q= 0,000 100		2,850		Pt= 2,571 Mat="S10"	
M2-15	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-15	13,500		q= 0,000 100		2,850		Pt= 2,501 Mat="S10"	
M2-16	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-16	13,500		q= 0,000 100		2,850		Pt= 2,431 Mat="S10"	
M2-17	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-17	13,500		q= 0,000 100		2,850		Pt= 2,361 Mat="S10"	
M2-18	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-18	13,500		q= 0,000 100		2,850		Pt= 2,291 Mat="S10"	
M2-19	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-19	13,500		q= 0,000 100		2,850		Pt= 2,221 Mat="S10"	
M2-20	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-20	13,500		q= 0,000 100		2,850		Pt= 2,151 Mat="S10"	
M2-21	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-21	13,500		q= 0,000 100		2,850		Pt= 2,082 Mat="S10"	
M2-22	13,500		Q=2742,789 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	
M2-22	13,500		q= 0,000 100		2,850		Pt= 2,012 Mat="S10"	
M2-23	13,500		Q=2742,719 108,2		0,000	C=120	Pe= 0,000	
					2,850	0,025	Pf= 0,070	

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M2-23	13,500		q= 0,000 100 Q=2741,583 108,2			2,850 0,000		Pt= 1,942 Mat="S10" Pe= 0,000	
M2-24	13,500					2,850	C=120 0,024	Pf= 0,070	
M2-24	13,500		q= 0,000 100 Q=2736,131 108,2			2,850 0,000		Pt= 1,872 Mat="S10" Pe= 0,000	
M2-25	13,500					2,850	C=120 0,024	Pf= 0,070	
M2-25	13,500		q= 0,000 100 Q=2721,483 108,2			2,850 0,000		Pt= 1,803 Mat="S10" Pe= 0,000	
M2-26	13,500					2,850	C=120 0,024	Pf= 0,069	
M2-26	13,500		q= 0,000 100 Q=2691,766 108,2			2,850 0,000		Pt= 1,734 Mat="S10" Pe= 0,000	
M2-27	13,500					2,850	C=120 0,024	Pf= 0,067	
M2-27	13,500		q= 0,000 100 Q=2640,240 108,2			2,850 0,000		Pt= 1,666 Mat="S10" Pe= 0,000	
M2-28	13,500					2,850	C=120 0,023	Pf= 0,065	
M2-28	13,500		q= 0,000 100 Q=2559,242 108,2			2,850 0,000		Pt= 1,601 Mat="S10" Pe= 0,000	
M2-29	13,500					2,850	C=120 0,022	Pf= 0,061	
M2-29	13,500		q= 0,000 100 Q=2439,996 108,2			2,850 0,000		Pt= 1,540 Mat="S10" Pe= 0,000	
M2-30	13,500					2,850	C=120 0,02	Pf= 0,056	
M2-30	13,500		q= 0,000 100 Q=2272,305 108,2			2,850 0,000		Pt= 1,484 Mat="S10" Pe= 0,000	
M2-31	13,500					2,850	C=120 0,017	Pf= 0,049	
M2-31	13,500		q= 0,000 100 Q=1931,820 108,2			2,850 0,000		Pt= 1,434 Mat="S10" Pe= 0,000	
M2-32	13,500					2,850	C=120 0,013	Pf= 0,037	
M2-32	13,500		q= 0,000 100 Q=1471,032 108,2			2,050 0,000		Pt= 1,398 Mat="S10" Pe= 0,000	
DER'	13,500					2,050	C=120 0,008	Pf= 0,016	
M2-33	13,500		q= 0,000 100 Q= 468,146 108,2			2,850 0,000		Pt= 1,379 Mat="S10" Pe= 0,000	
M2-34	13,500					2,850	C=120 0,001	Pf= 0,003	
DER'	13,500		q= 0,000 100 Q= 933,995 108,2			0,800 0,000		Pt= 1,382 Mat="S10" Pe= 0,000	
M2-33	13,500					0,800	C=120 0,003	Pf= 0,003	
R1-1	15,750		q= 0,000 50 Q=-218,465 54,8		2E=3,746	24,700 3,746		Pt= 3,103 Mat="S10" Pe= 0,000	
R2-1	15,750					28,446	C=120 0,006	Pf= -0,178	
R1-2	15,750		q= 0,000 50 Q=-177,669 54,8		2E=3,746	24,700 3,746		Pt= 3,085 Mat="S10" Pe= 0,000	
R2-2	15,750					28,446	C=120 0,004	Pf= -0,121	
R1-3	15,750		q= 0,000 50 Q=-135,157 54,8		2E=3,746	24,700 3,746		Pt= 3,055 Mat="S10" Pe= 0,000	
R2-3	15,750					28,446	C=120 0,003	Pf= -0,073	

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
R1-4	15,750		q= 0,000 Q= -97,752	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0,001	Pt= 3,013 Pe= 0,000 Pf= -0,040	Mat="S10"
R2-4	15,750								
R1-5	15,750		q= 0,000 Q= -66,370	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0,001	Pt= 2,961 Pe= 0,000 Pf= -0,020	Mat="S10"
R2-5	15,750								
R1-6	15,750		q= 0,000 Q= -41,401	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0,000	Pt= 2,901 Pe= 0,000 Pf= -0,008	Mat="S10"
R2-6	15,750								
R1-7	15,750		q= 0,000 Q= -22,829	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,836 Pe= 0,000 Pf= -0,003	Mat="S10"
R2-7	15,750								
R1-8	15,750		q= 0,000 Q= -10,314	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,768 Pe= 0,000 Pf= -0,001	Mat="S10"
R2-8	15,750								
R1-9	15,750		q= 0,000 Q= -3,213	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,699 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-9	15,750								
R1-10	15,750		q= 0,000 Q= -0,455	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,629 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-10	15,750								
R1-11	15,750		q= 0,000 Q= -0,013	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,560 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-11	15,750								
R1-12	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,490 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-12	15,750								
R1-13	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,420 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-13	15,750								
R1-14	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,350 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-14	15,750								
R1-15	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,280 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-15	15,750								
R1-16	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,210 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-16	15,750								
R1-17	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,140 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-17	15,750								
R1-18	15,750		q= 0,000 Q= 0,000	50 54,8	2E=3,746	24,700 3,746 28,446	C=120 0	Pt= 2,071 Pe= 0,000 Pf= 0,000	Mat="S10"
R2-18	15,750								

Pipe Information. cont.

Node 1	Elev	Discharge	Nom	Fittings	L [M]	C factor	total (Pt)		
Node 2	[M]	& Flow	i.d.	num & length	F [M]	bar/M	elev (Pe)	frict (Pf)	Notes
		[lpm]	[mm]	[M]	T [M]				
R1-19	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 2,001	Mat="S10"	
R2-19	15,750	Q= 0,000	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-20	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,931	Mat="S10"	
R2-20	15,750	Q= 0,000	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-21	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,861	Mat="S10"	
R2-21	15,750	Q= 0,000	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-22	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,791	Mat="S10"	
R2-22	15,750	Q= -0,069	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-23	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,721	Mat="S10"	
R2-23	15,750	Q= -1,137	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-24	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,651	Mat="S10"	
R2-24	15,750	Q= -5,451	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= 0,000		
R1-25	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,581	Mat="S10"	
R2-25	15,750	Q= -14,648	54,8		3,746	C=120	Pe= 0,000		
					28,446	0	Pf= -0,001		
R1-26	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,508	Mat="S10"	
R2-26	15,750	Q= -29,717	54,8		3,746	C=120	Pe= 0,000		
					28,446	0,000	Pf= -0,004		
R1-27	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,431	Mat="S10"	
R2-27	15,750	Q= -51,526	54,8		3,746	C=120	Pe= 0,000		
					28,446	0,000	Pf= -0,012		
R1-28	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,346	Mat="S10"	
R2-28	15,750	Q= -80,998	54,8		3,746	C=120	Pe= 0,000		
					28,446	0,001	Pf= -0,028		
R1-29	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,249	Mat="S10"	
R2-29	15,750	Q= -119,247	54,8		3,746	C=120	Pe= 0,000		
					28,446	0,002	Pf= -0,058		
R1-30	15,750	q= 0,000	50	2E=3,746	24,700		Pt= 1,131	Mat="S10"	
R2-30	15,750	Q= -167,691	54,8		3,746	C=120	Pe= 0,000		
					28,446	0,004	Pf= -0,109		
R1-31	15,750	q= 0,000	50	1E=1,873	0,200		Pt= 0,889	Mat="S10"	
L31-1	15,750	Q= 257,202	54,8		1,873	C=120	Pe= 0,000		
					2,073	0,008	Pf= 0,017		
L31-1	15,750	160 q= 149,401	50		3,000		Pt= 0,872	Mat="S10"	
L31-2	15,750	Q= 107,801	54,8		0,000	C=120	Pe= 0,000		
					3,000	0,002	Pf= 0,005		
L31-2	15,750	160 q= 148,966	50		3,000		Pt= 0,867	Mat="S10"	
L31-3	15,750	Q= -41,166	54,8		0,000	C=120	Pe= 0,000		
					3,000	0,000	Pf= -0,001		

Pipe Information. cont.

Node 1	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
L31-3	15,750	160	q= 149,040 Q=-190,206	50 54,8		3,000 0,000 3,000	C=120 0,005	Pt= 0,868 Pe= 0,000 Pf= -0,014	Mat="S10"
L31-4	15,750								
L31-4	15,750	160	q= 150,279 Q=-340,485	50 54,8		3,000 0,000 3,000	C=120 0,014	Pt= 0,882 Pe= 0,000 Pf= -0,043	Mat="S10"
L31-5	15,750								
L31-5	15,750		q= 0,000 Q=-340,485	50 54,8		3,000 0,000 3,000	C=120 0,014	Pt= 0,925 Pe= 0,000 Pf= -0,043	Mat="S10"
L31-6	15,750								
L31-6	15,750		q= 0,000 Q=-340,485	50 54,8		3,000 0,000 3,000	C=120 0,014	Pt= 0,967 Pe= 0,000 Pf= -0,043	Mat="S10"
L31-7	15,750								
L31-7	15,750		q= 0,000 Q=-340,485	50 54,8		3,000 0,000 3,000	C=120 0,014	Pt= 1,010 Pe= 0,000 Pf= -0,043	Mat="S10"
L31-8	15,750								
L31-8	15,750		q= 0,000 Q=-340,485	50 54,8		3,000 0,000 3,000	C=120 0,014	Pt= 1,052 Pe= 0,000 Pf= -0,043	Mat="S10"
L31-9	15,750								
L31-9	15,750		q= 0,000 Q=-340,485	50 54,8	1E=1,873	0,500 1,873 2,373	C=120 0,014	Pt= 1,095 Pe= 0,000 Pf= -0,034	Mat="S10"
R2-31	15,750								
R1-32	15,750		q= 0,000 Q= 346,574	50 54,8	1E=1,873	0,200 1,873 2,073	C=120 0,015	Pt= 0,742 Pe= 0,000 Pf= 0,030	Mat="S10"
L32-1	15,750								
L32-1	15,750	160	q= 135,018 Q= 211,556	50 54,8		3,000 0,000 3,000	C=120 0,006	Pt= 0,712 Pe= 0,000 Pf= 0,018	Mat="S10"
L32-2	15,750								
L32-2	15,750	160	q= 133,335 Q= 78,221	50 54,8		3,000 0,000 3,000	C=120 0,001	Pt= 0,694 Pe= 0,000 Pf= 0,003	Mat="S10"
L32-3	15,750								
L32-3	15,750	160	q= 133,066 Q= -54,844	50 54,8		3,000 0,000 3,000	C=120 0,000	Pt= 0,692 Pe= 0,000 Pf= -0,001	Mat="S10"
L32-4	15,750								
L32-4	15,750	160	q= 133,205 Q=-188,050	50 54,8		3,000 0,000 3,000	C=120 0,005	Pt= 0,693 Pe= 0,000 Pf= -0,014	Mat="S10"
L32-5	15,750								
L32-5	15,750	160	q= 134,562 Q=-322,612	50 54,8		3,000 0,000 3,000	C=120 0,013	Pt= 0,707 Pe= 0,000 Pf= -0,039	Mat="S10"
L32-6	15,750								
L32-6	15,750	160	q= 138,177 Q=-460,788	50 54,8		3,000 0,000 3,000	C=120 0,025	Pt= 0,746 Pe= 0,000 Pf= -0,074	Mat="S10"
L32-7	15,750								
L32-7	15,750		q= 0,000 Q=-460,788	50 54,8		3,000 0,000 3,000	C=120 0,025	Pt= 0,820 Pe= 0,000 Pf= -0,074	Mat="S10"
L32-8	15,750								

Pipe Information, cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom I.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
L32-8	15,750		q= 0,000 Q=-460,788	50 54,8		3,000 0,000 3,000		Pt= 0,895 Pe= 0,000 Pf= -0,074	Mat="S10"
L32-9	15,750						C=120 0,025		
L32-9	15,750		q= 0,000 Q=-460,788	50 54,8	1E=1,873	0,500 1,873 2,373		Pt= 0,969 Pe= 0,000 Pf= -0,059	Mat="S10"
R2-32	15,750						C=120 0,025		
R1-33	15,750		q= 0,000 Q= 323,653	50 54,8	1E=1,873	0,200 1,873 2,073		Pt= 0,704 Pe= 0,000 Pf= 0,027	Mat="S10"
L33-1	15,750						C=120 0,013		
L33-1	15,750	160	q= 131,645 Q= 192,008	50 54,8		3,000 0,000 3,000		Pt= 0,677 Pe= 0,000 Pf= 0,015	Mat="S10"
L33-2	15,750						C=120 0,005		
L33-2	15,750	160	q= 130,203 Q= 61,805	50 54,8		3,000 0,000 3,000		Pt= 0,662 Pe= 0,000 Pf= 0,002	Mat="S10"
L33-3	15,750						C=120 0,001		
L33-3	15,750	160	q= 130,025 Q= -68,220	50 54,8		3,000 0,000 3,000		Pt= 0,660 Pe= 0,000 Pf= -0,002	Mat="S10"
L33-4	15,750						C=120 0,001		
L33-4	15,750	160	q= 130,239 Q=-198,458	50 54,8		3,000 0,000 3,000		Pt= 0,663 Pe= 0,000 Pf= -0,016	Mat="S10"
L33-5	15,750						C=120 0,005		
L33-5	15,750	160	q= 131,770 Q=-330,229	50 54,8		3,000 0,000 3,000		Pt= 0,678 Pe= 0,000 Pf= -0,040	Mat="S10"
L33-6	15,750						C=120 0,013		
L33-6	15,750	160	q= 135,620 Q=-465,849	50 54,8		3,000 0,000 3,000		Pt= 0,716 Pe= 0,000 Pf= -0,076	Mat="S10"
L33-7	15,750						C=120 0,025		
L33-7	15,750		q= 0,000 Q=-465,849	50 54,8		3,000 0,000 3,000		Pt= 0,794 Pe= 0,000 Pf= -0,076	Mat="S10"
L33-8	15,750						C=120 0,025		
L33-8	15,750		q= 0,000 Q=-465,849	50 54,8		3,000 0,000 3,000		Pt= 0,870 Pe= 0,000 Pf= -0,076	Mat="S10"
L33-9	15,750						C=120 0,025		
L33-9	15,750		q= 0,000 Q=-465,849	50 54,8	1E=1,873	0,500 1,873 2,373		Pt= 0,946 Pe= 0,000 Pf= -0,060	Mat="S10"
R2-33	15,750						C=120 0,025		
R1-34	15,750		q= 0,000 Q= 316,693	50 54,8	1E=1,873	0,200 1,873 2,073		Pt= 0,693 Pe= 0,000 Pf= 0,026	Mat="S10"
L34-1	15,750						C=120 0,012		
L34-1	15,750	160	q= 130,741 Q= 185,953	50 54,8		3,000 0,000 3,000		Pt= 0,668 Pe= 0,000 Pf= 0,014	Mat="S10"
L34-2	15,750						C=120 0,005		
L34-2	15,750	160	q= 129,373 Q= 56,580	50 54,8		3,000 0,000 3,000		Pt= 0,654 Pe= 0,000 Pf= 0,002	Mat="S10"
L34-3	15,750						C=120 0,001		

Pipe Information. cont.

Node 1	Elev	K-factor	Discharge & Flow	Nom i.d.	Fittings num & length	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
Node 2	[M]		[lpm]	[mm]	[M]				
L34-3	15,750	160	q= 129,221 Q= -72,641	50 54,8		3,000 0,000 3,000		Pt= 0,652 Pe= 0,000 Pf= -0,002	Mat="S10"
L34-4	15,750						C=120 0,001		
L34-4	15,750	160	q= 129,462 Q=-202,103	50 54,8		3,000 0,000 3,000		Pt= 0,655 Pe= 0,000 Pf= -0,016	Mat="S10"
L34-5	15,750						C=120 0,005		
L34-5	15,750	160	q= 131,055 Q=-333,158	50 54,8		3,000 0,000 3,000		Pt= 0,671 Pe= 0,000 Pf= -0,041	Mat="S10"
L34-6	15,750						C=120 0,014		
L34-6	15,750	160	q= 134,988 Q=-468,146	50 54,8		3,000 0,000 3,000		Pt= 0,712 Pe= 0,000 Pf= -0,077	Mat="S10"
L34-7	15,750						C=120 0,026		
L34-7	15,750		q= 0,000 Q=-468,146	50 54,8		3,000 0,000 3,000		Pt= 0,788 Pe= 0,000 Pf= -0,077	Mat="S10"
L34-8	15,750						C=120 0,026		
L34-8	15,750		q= 0,000 Q=-468,146	50 54,8		3,000 0,000 3,000		Pt= 0,865 Pe= 0,000 Pf= -0,077	Mat="S10"
L34-9	15,750						C=120 0,026		
L34-9	15,750		q= 0,000 Q=-468,146	50 54,8	1E=1,873	0,500 1,873 2,373		Pt= 0,942 Pe= 0,000 Pf= -0,061	Mat="S10"
R2-34	15,750						C=120 0,026		
M1-1	13,500		q= 0,000 Q=-218,465	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,286 Pe= 0,221 Pf= -0,037	Mat="S10"
R1-1	15,750						C=120 0,006		
M1-2	13,500		q= 0,000 Q=-177,669	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,280 Pe= 0,221 Pf= -0,026	Mat="S10"
R1-2	15,750						C=120 0,004		
M1-3	13,500		q= 0,000 Q=-135,157	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,260 Pe= 0,221 Pf= -0,015	Mat="S10"
R1-3	15,750						C=120 0,003		
M1-4	13,500		q= 0,000 Q= -97,752	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,225 Pe= 0,221 Pf= -0,008	Mat="S10"
R1-4	15,750						C=120 0,001		
M1-5	13,500		q= 0,000 Q= -66,370	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,177 Pe= 0,221 Pf= -0,004	Mat="S10"
R1-5	15,750						C=120 0,001		
M1-6	13,500		q= 0,000 Q= -41,401	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,120 Pe= 0,221 Pf= -0,002	Mat="S10"
R1-6	15,750						C=120 0,000		
M1-7	13,500		q= 0,000 Q= -22,829	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 3,056 Pe= 0,221 Pf= -0,001	Mat="S10"
R1-7	15,750						C=120 0		
M1-8	13,500		q= 0,000 Q= -10,314	50 54,8	1T=3,758	2,250 3,758 6,008		Pt= 2,989 Pe= 0,221 Pf= 0,000	Mat="S10"
R1-8	15,750						C=120 0		

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom I.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M1-9 R1-9	13,500 15,750		q= 0,000 Q= -3,213	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,920 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-10 R1-10	13,500 15,750		q= 0,000 Q= -0,455	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,850 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-11 R1-11	13,500 15,750		q= 0,000 Q= -0,013	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,780 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-12 R1-12	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,710 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-13 R1-13	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,640 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-14 R1-14	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,571 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-15 R1-15	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,501 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-16 R1-16	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,431 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-17 R1-17	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,361 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-18 R1-18	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,291 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-19 R1-19	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,221 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-20 R1-20	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,151 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-21 R1-21	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,082 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-22 R1-22	13,500 15,750		q= 0,000 Q= -0,069	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,012 Pe= 0,221 Pf= 0,000	Mat="S10"
M1-23 R1-23	13,500 15,750		q= 0,000 Q= -1,137	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,942 Pe= 0,221 Pf= 0,000	Mat="S10"

Pipe Information. cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M1-24 R1-24	13,500 15,750		q= 0,000 Q= -5,451	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,872 Mat="S10" Pe= 0,221 Pf= 0,000	
M1-25 R1-25	13,500 15,750		q= 0,000 Q= -14,648	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,801 Mat="S10" Pe= 0,221 Pf= 0,000	
M1-26 R1-26	13,500 15,750		q= 0,000 Q= -29,717	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,000	Pt= 1,728 Mat="S10" Pe= 0,221 Pf= -0,001	
M1-27 R1-27	13,500 15,750		q= 0,000 Q= -51,526	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,000	Pt= 1,649 Mat="S10" Pe= 0,221 Pf= -0,003	
M1-28 R1-28	13,500 15,750		q= 0,000 Q= -80,998	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,001	Pt= 1,561 Mat="S10" Pe= 0,221 Pf= -0,006	
M1-29 R1-29	13,500 15,750		q= 0,000 Q= -119,247	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,002	Pt= 1,457 Mat="S10" Pe= 0,221 Pf= -0,012	
M1-30 R1-30	13,500 15,750		q= 0,000 Q= -167,691	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,004	Pt= 1,329 Mat="S10" Pe= 0,221 Pf= -0,023	
M1-31 R1-31	13,500 15,750		q= 0,000 Q= 257,202	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,008	Pt= 1,161 Mat="S10" Pe= 0,221 Pf= 0,051	
M1-32 R1-32	13,500 15,750		q= 0,000 Q= 346,574	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,015	Pt= 1,051 Mat="S10" Pe= 0,221 Pf= 0,088	
M1-33 R1-33	13,500 15,750		q= 0,000 Q= 323,653	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,013	Pt= 1,002 Mat="S10" Pe= 0,221 Pf= 0,078	
M1-34 R1-34	13,500 15,750		q= 0,000 Q= 316,693	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,012	Pt= 0,988 Mat="S10" Pe= 0,221 Pf= 0,075	
M2-1 R2-1	13,500 15,750		q= 0,000 Q= 218,465	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,006	Pt= 3,539 Mat="S10" Pe= 0,221 Pf= 0,037	
M2-2 R2-2	13,500 15,750		q= 0,000 Q= 177,669	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,004	Pt= 3,452 Mat="S10" Pe= 0,221 Pf= 0,026	
M2-3 R2-3	13,500 15,750		q= 0,000 Q= 135,157	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,003	Pt= 3,364 Mat="S10" Pe= 0,221 Pf= 0,015	
M2-4 R2-4	13,500 15,750		q= 0,000 Q= 97,752	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,001	Pt= 3,282 Mat="S10" Pe= 0,221 Pf= 0,008	

Pipe Information, cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M2-5 R2-5	13,500 15,750		q= 0,000 Q= 66,370	50 54,8	1T=3,758 1	2,250 3,758 6,008	C=120 0,001	Pt= 3,205 Pe= 0,221 Pf= 0,004	Mat="S10"
M2-6 R2-6	13,500 15,750		q= 0,000 Q= 41,401	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,000	Pt= 3,132 Pe= 0,221 Pf= 0,002	Mat="S10"
M2-7 R2-7	13,500 15,750		q= 0,000 Q= 22,829	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 3,060 Pe= 0,221 Pf= 0,001	Mat="S10"
M2-8 R2-8	13,500 15,750		q= 0,000 Q= 10,314	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,990 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-9 R2-9	13,500 15,750		q= 0,000 Q= 3,213	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,920 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-10 R2-10	13,500 15,750		q= 0,000 Q= 0,455	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,850 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-11 R2-11	13,500 15,750		q= 0,000 Q= 0,013	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,780 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-12 R2-12	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,710 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-13 R2-13	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,640 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-14 R2-14	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,571 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-15 R2-15	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,501 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-16 R2-16	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,431 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-17 R2-17	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,361 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-18 R2-18	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,291 Pe= 0,221 Pf= 0,000	Mat="S10"
M2-19 R2-19	13,500 15,750		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,221 Pe= 0,221 Pf= 0,000	Mat="S10"

Pipe Information, cont.

Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
M2-20	13,500		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,151 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-20	15,750								
M2-21	13,500		q= 0,000 Q= 0,000	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,082 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-21	15,750								
M2-22	13,500		q= 0,000 Q= 0,069	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 2,012 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-22	15,750								
M2-23	13,500		q= 0,000 Q= 1,137	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,942 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-23	15,750								
M2-24	13,500		q= 0,000 Q= 5,451	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,872 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-24	15,750								
M2-25	13,500		q= 0,000 Q= 14,648	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0	Pt= 1,803 Pe= 0,221 Pf= 0,000	Mat="S10"
R2-25	15,750								
M2-26	13,500		q= 0,000 Q= 29,717	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,000	Pt= 1,734 Pe= 0,221 Pf= 0,001	Mat="S10"
R2-26	15,750								
M2-27	13,500		q= 0,000 Q= 51,526	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,000	Pt= 1,666 Pe= 0,221 Pf= 0,003	Mat="S10"
R2-27	15,750								
M2-28	13,500		q= 0,000 Q= 80,998	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,001	Pt= 1,601 Pe= 0,221 Pf= 0,006	Mat="S10"
R2-28	15,750								
M2-29	13,500		q= 0,000 Q= 119,247	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,002	Pt= 1,540 Pe= 0,221 Pf= 0,012	Mat="S10"
R2-29	15,750								
M2-30	13,500		q= 0,000 Q= 167,691	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,004	Pt= 1,484 Pe= 0,221 Pf= 0,023	Mat="S10"
R2-30	15,750								
M2-31	13,500		q= 0,000 Q= 340,485	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,014	Pt= 1,434 Pe= 0,221 Pf= 0,085	Mat="S10"
R2-31	15,750								
M2-32	13,500		q= 0,000 Q= 460,788	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,025	Pt= 1,398 Pe= 0,221 Pf= 0,149	Mat="S10"
R2-32	15,750								
M2-33	13,500		q= 0,000 Q= 465,849	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,025	Pt= 1,379 Pe= 0,221 Pf= 0,152	Mat="S10"
R2-33	15,750								
M2-34	13,500		q= 0,000 Q= 468,146	50 54,8	1T=3,758	2,250 3,758 6,008	C=120 0,026	Pt= 1,377 Pe= 0,221 Pf= 0,154	Mat="S10"
R2-34	15,750								

Pipe Information. cont.

Node 1	Elev	Discharge	Nom	Fittings	L [M]	C factor	total (Pt)	
Node 2	[M]	K-factor	i.d. [mm]	num & length [M]	F [M] T [M]	bar/M	elev (Pe) frict (Pf)	Notes
DER	2,500	q= 0,000 Q=1243,275	100 108,2	1T=8,015 2E=8,015 4TN=9,618	29,050 25,649 54,699	C=120 0,006	Pt= 5,541 Pe= -0,255 Pf= 0,310	Mat="S10"
N5	-0,100							
N5	-0,100	q= 0,000 Q=1243,275	100 108,2	1E=4,008	4,550 4,008	C=120 0,006	Pt= 5,486 Pe= 0,446 Pf= 0,049	Mat="S10"
N5-1	4,450				8,558			
N5-1	4,450	q= 0,000 Q= 639,113	100 108,2	1TN=2,405	4,500 2,405	C=120 0,002	Pt= 4,991 Pe= 0,441 Pf= 0,011	Mat="S10"
N5-2	8,950				6,905			
DER'	13,500	q= 0,000 Q= 537,037	65 66,9	1T=5,019 5TN=8,365 1E=2,509	41,550 15,893 57,443	C=120 0,012	Pt= 1,382 Pe= -1,333 Pf= 0,716	Mat="S10"
N5'	-0,100	q= 0,000 Q= 537,037	65 66,9	1E=2,509	4,550 2,509	C=120 0,012	Pt= 1,998 Pe= 0,446 Pf= 0,088	Mat="S10"
N5-1'	4,450				7,059			
N5-1'	4,450	q= 0,000 Q= 180,755	65 66,9	1T=5,019	4,500 5,019	C=120 0,002	Pt= 1,464 Pe= 0,441 Pf= 0,016	Mat="S10"
N5-2'	8,950				9,519			
N5-2	8,950	q= 0,000 Q= 639,113	50 54,8	1E=1,873	72,750 1,873	C=120 0,045	Pt= 4,539 Pe= 0,000 Pf= 3,393	Mat="S10"
N5-232	8,950				74,623			
N5-232	8,950	115 q= 123,098 Q= 516,014	50 54,8		2,300 0,000	C=120 0,031	Pt= 1,146 Pe= 0,000 Pf= 0,070	Mat="S10"
N5-233	8,950				2,300			
N5-233	8,950	115 q= 119,257 Q= 396,758	50 54,8		2,300 0,000	C=120 0,019	Pt= 1,075 Pe= 0,000 Pf= 0,043	Mat="S10"
N5-234	8,950				2,300			
N5-234	8,950	115 q= 116,831 Q= 279,926	50 54,8		2,300 0,000	C=120 0,01	Pt= 1,032 Pe= 0,000 Pf= 0,023	Mat="S10"
N5-235	8,950				2,300			
N5-235	8,950	115 q= 115,539 Q= 164,387	50 54,8		2,300 0,000	C=120 0,004	Pt= 1,009 Pe= 0,000 Pf= 0,008	Mat="S10"
N5-236	8,950				2,300			
N5-236	8,950	115 q= 115,053 Q= 49,335	50 54,8		2,300 0,000	C=120 0,000	Pt= 1,001 Pe= 0,000 Pf= 0,001	Mat="S10"
N5-237	8,950				2,300			
N5-237	8,950	115 q= 115,000 Q= -65,665	50 54,8		2,300 0,000	C=120 0,001	Pt= 1,000 Pe= 0,000 Pf= -0,002	Mat="S10"
N5-238	8,950				2,300			
N5-238	8,950	115 q= 115,089 Q= -180,755	50 54,8		1,350 0,000	C=120 0,004	Pt= 1,002 Pe= 0,000 Pf= -0,006	Mat="S10"
N5-2'	8,950				1,350			
N5-1	4,450	q= 0,000 Q= 604,163	50 54,8	1T=3,758	80,800 3,758	C=120	Pt= 4,991 Pe= 0,000	Mat="S10"
N5-171	4,450				84,558	0,041	Pf= 3,465	

Pipe Information. cont.

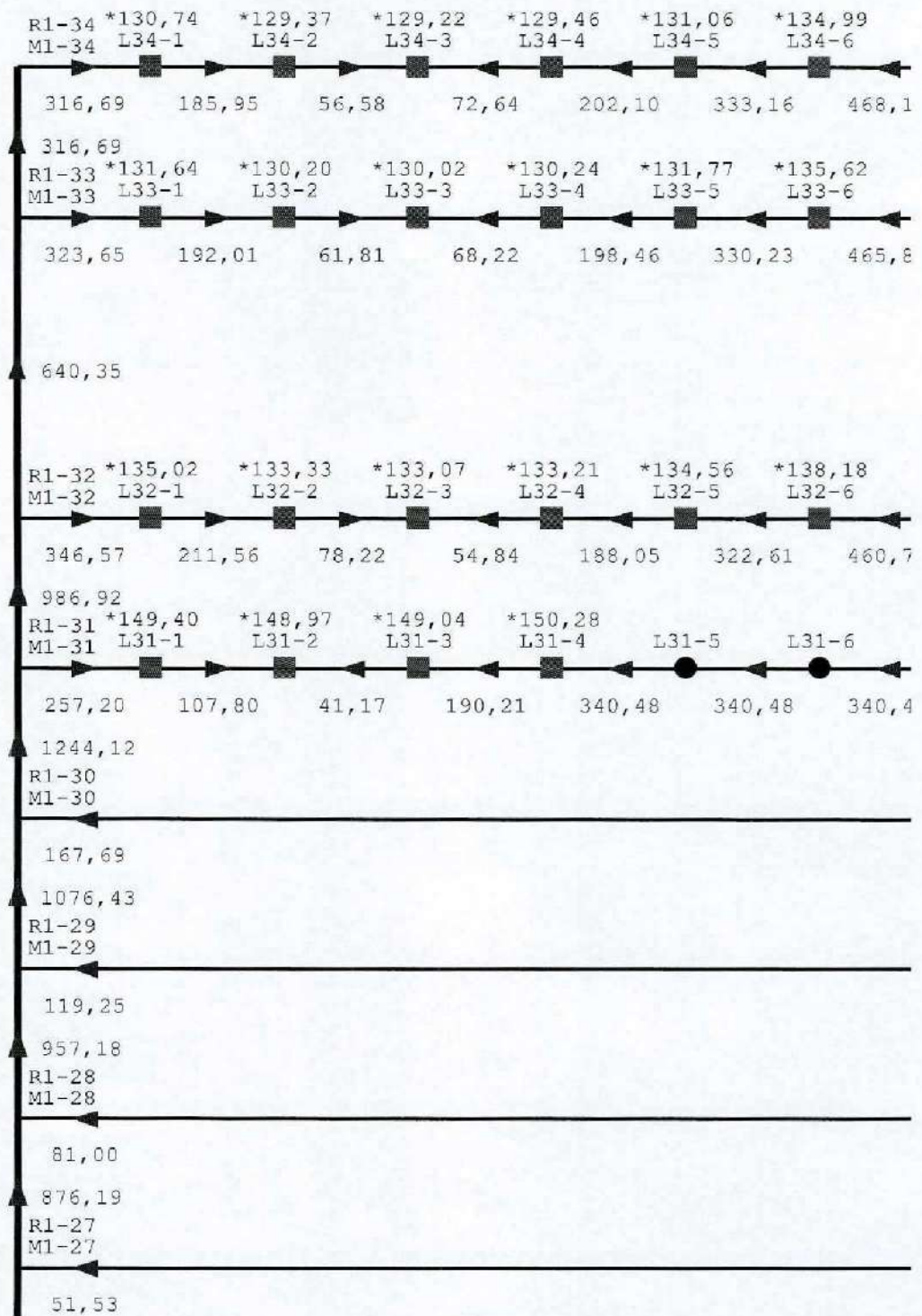
Node 1 Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [mm]	Fittings num & length [M]	L [M] F [M] T [M]	C factor bar/M	total (Pt) elev (Pe) frict (Pf)	Notes
N5-171	4,450	115	q= 142,079 Q= 462,084	50 54,8		2,300 0,000 2,300		Pt= 1,526 Pe= 0,000 Pf= 0,057	Mat="S10"
N5-173	4,450	115	q= 139,382 Q= 188,689	50 54,8		2,300 0,000 2,300		Pt= 1,469 Pe= 0,000 Pf= 0,011	Mat="S10"
N5-175	4,450	115	q= 138,862 Q= -83,682	50 54,8		2,300 0,000 2,300		Pt= 1,458 Pe= 0,000 Pf= -0,002	Mat="S10"
N5-177	4,450	115	q= 138,977 Q=-356,282	50 54,8		0,250 0,000 0,250		Pt= 1,460 Pe= 0,000 Pf= -0,004	Mat="S10"
N5-171	4,450	115	q= 142,079 Q= 0,000	25 26,6		1,300 0,000 1,300		Pt= 1,526 Pe= 0,000 Pf= 0,000	Mat="S40"
N5-172	4,450	115	q= 139,382 Q= 134,013	25 26,6		1,300 0,000 1,300		Pt= 1,469 Pe= 0,000 Pf= 0,111	Mat="S40"
N5-173	4,450	115	q= 138,862 Q= 133,510	25 26,6		1,300 0,000 1,300		Pt= 1,458 Pe= 0,000 Pf= 0,110	Mat="S40"
N5-175	4,450	115	q= 138,977 Q= 133,622	25 26,6		1,300 0,000 1,300		Pt= 1,460 Pe= 0,000 Pf= 0,110	Mat="S40"
N5-177	4,450	115							
N5-178	4,450								

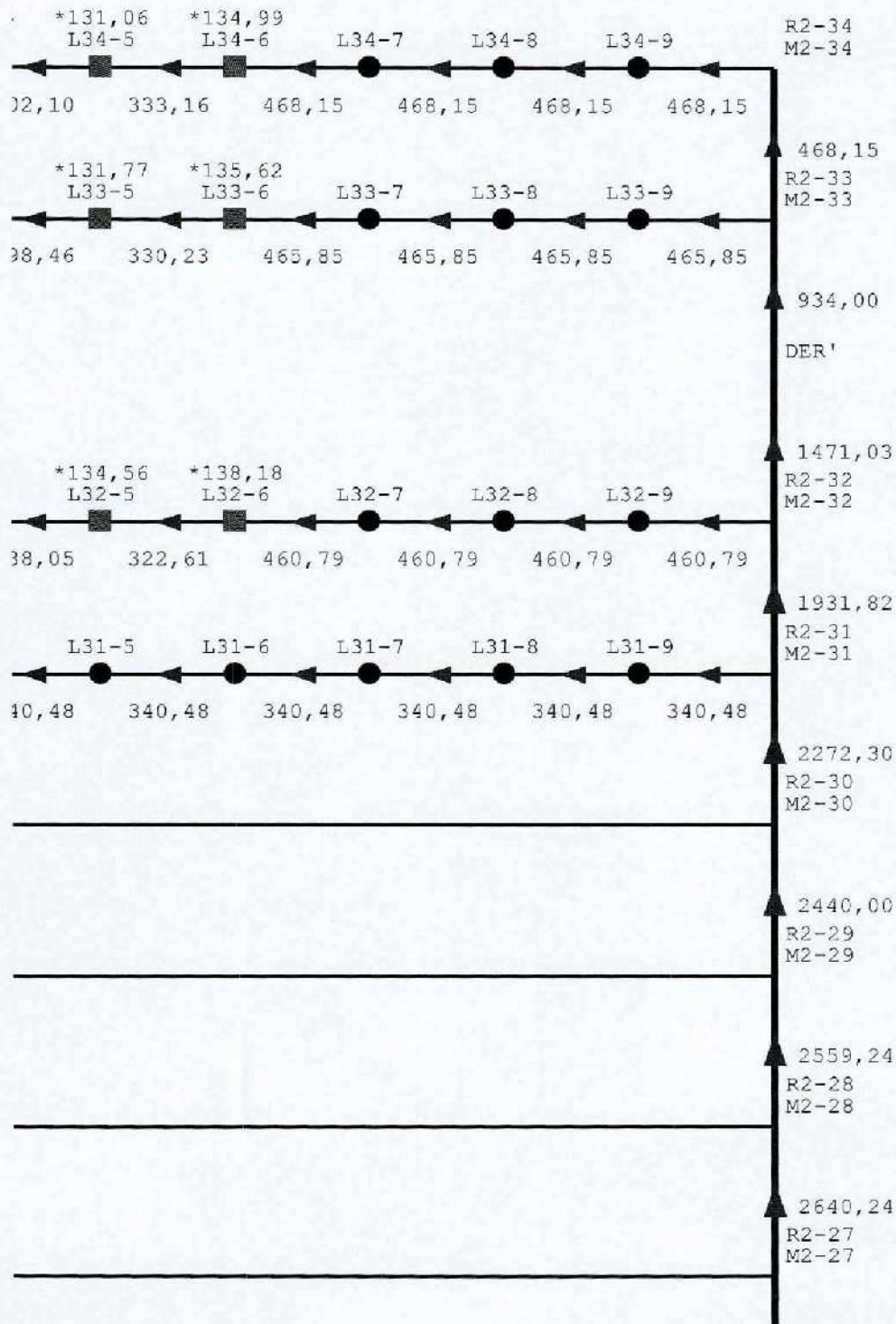
Material CodesPipe Material

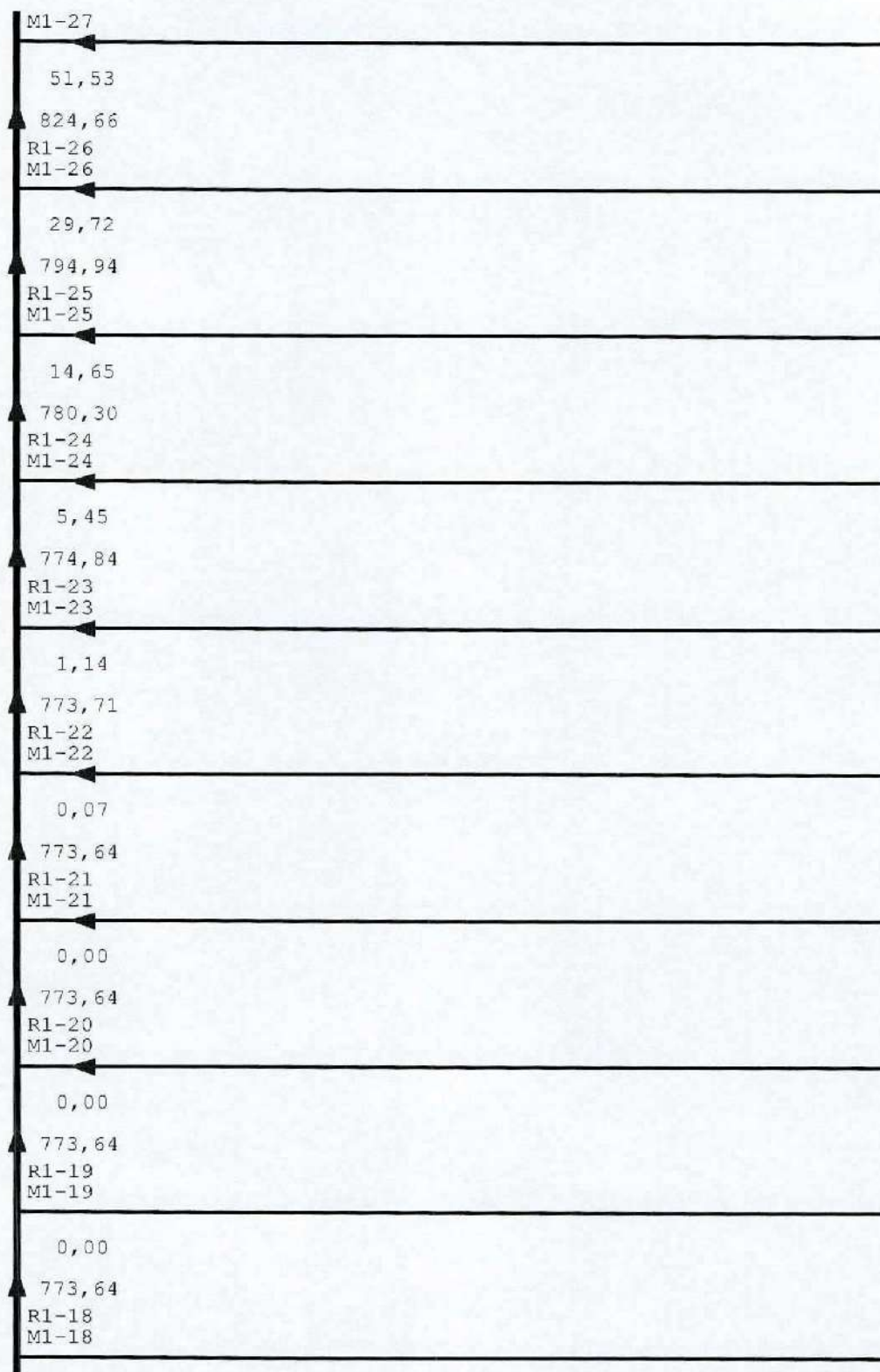
S10 - Schedule 10 Steel
S40 - Schedule 40 Steel

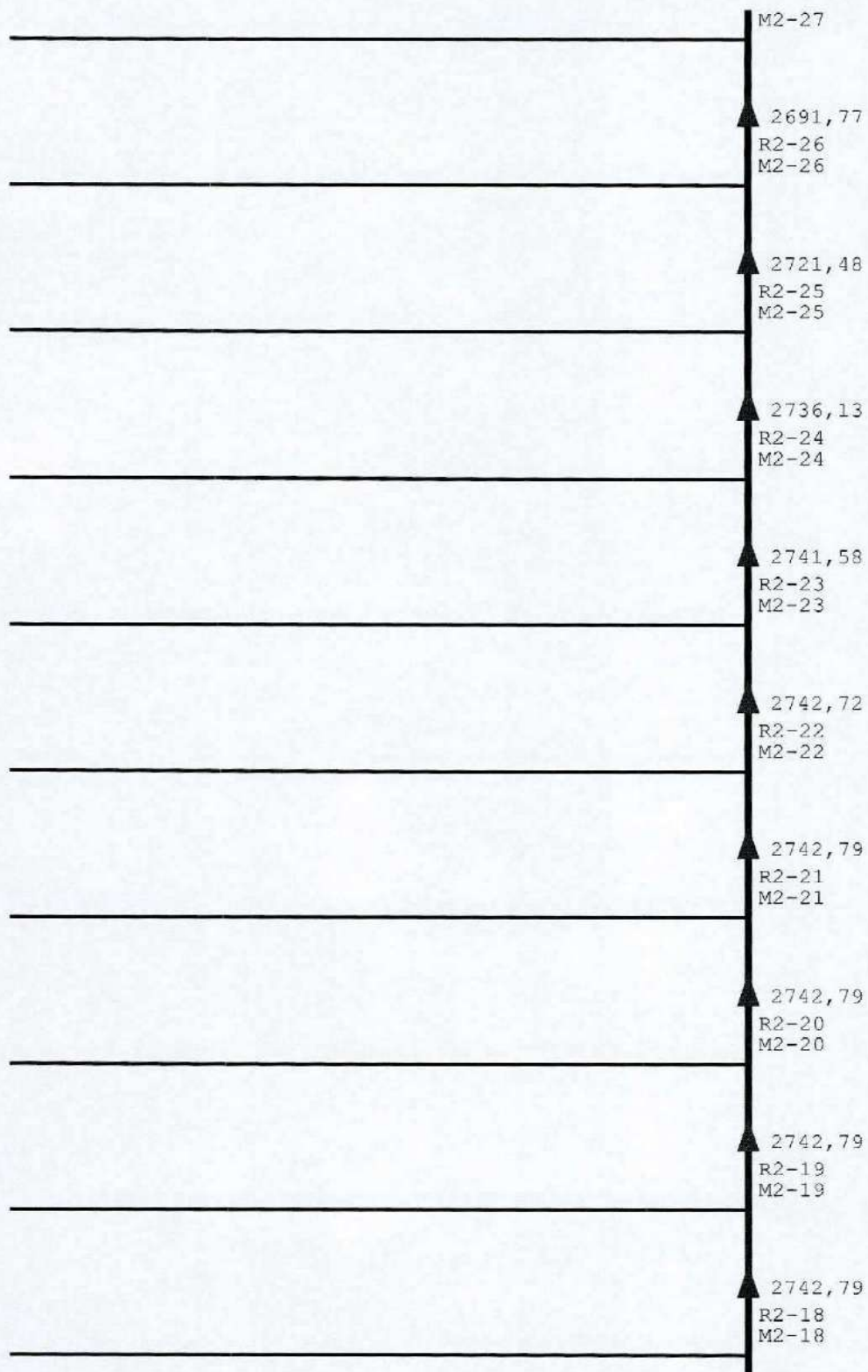
Fittings

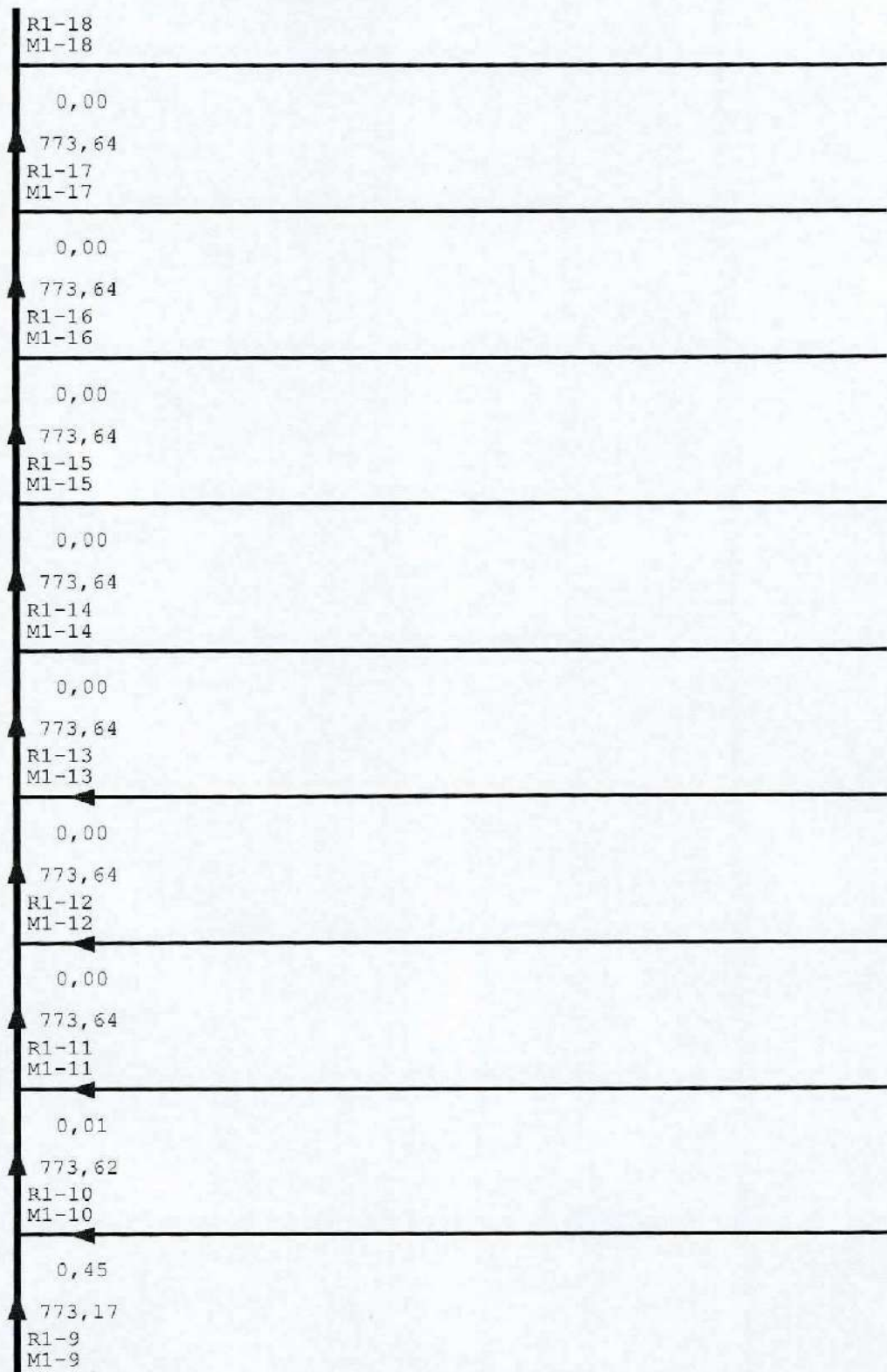
A - Alarm Valve
B - Butterfly Valve
C - Check Valve
E - Standard 90 degree elbow
G - Gate Valve
T - Tee - Flow turn 90 degrees
TN - Tee - Straight thru path

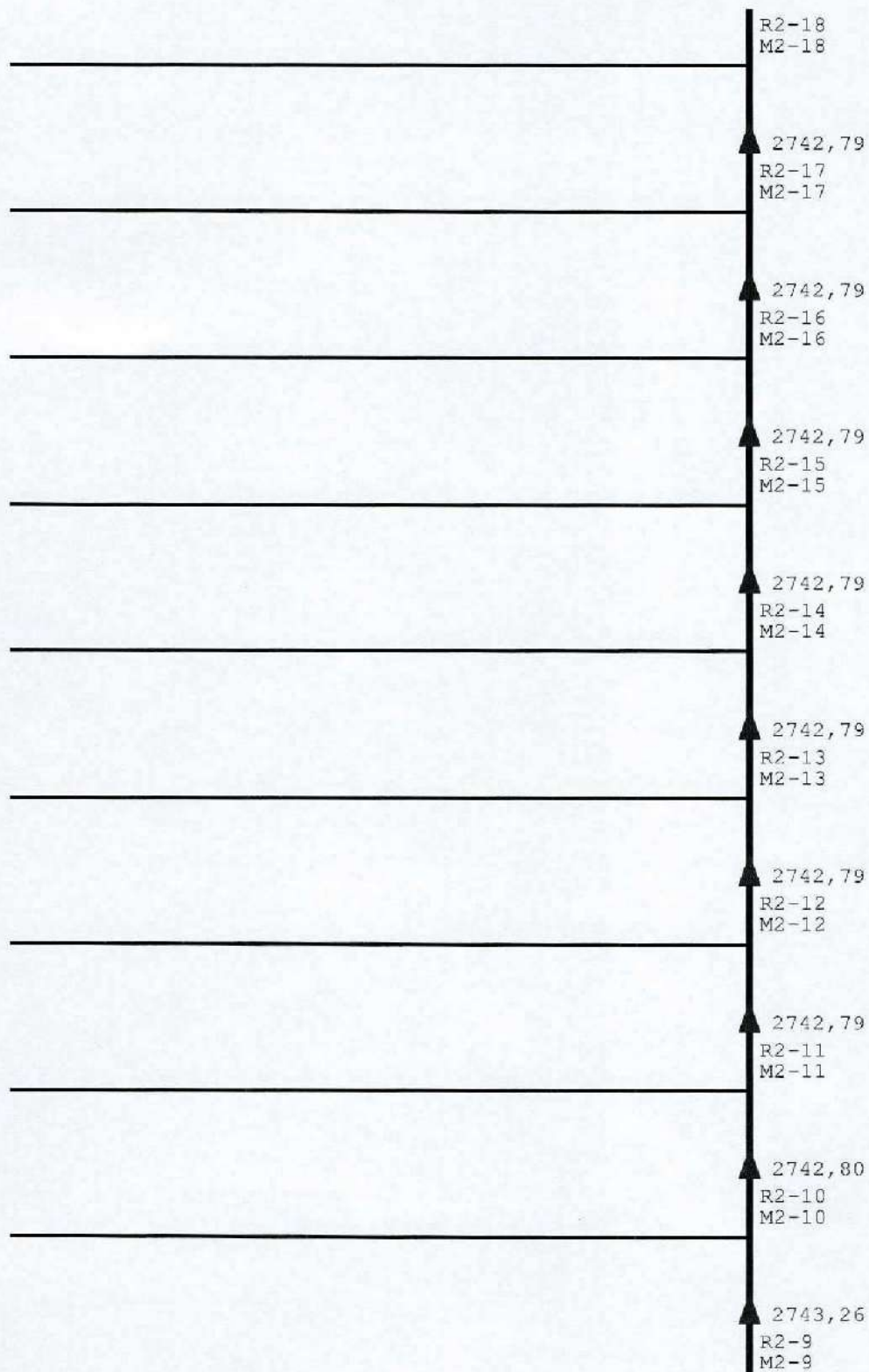
Flow Diagram (1 of 8)

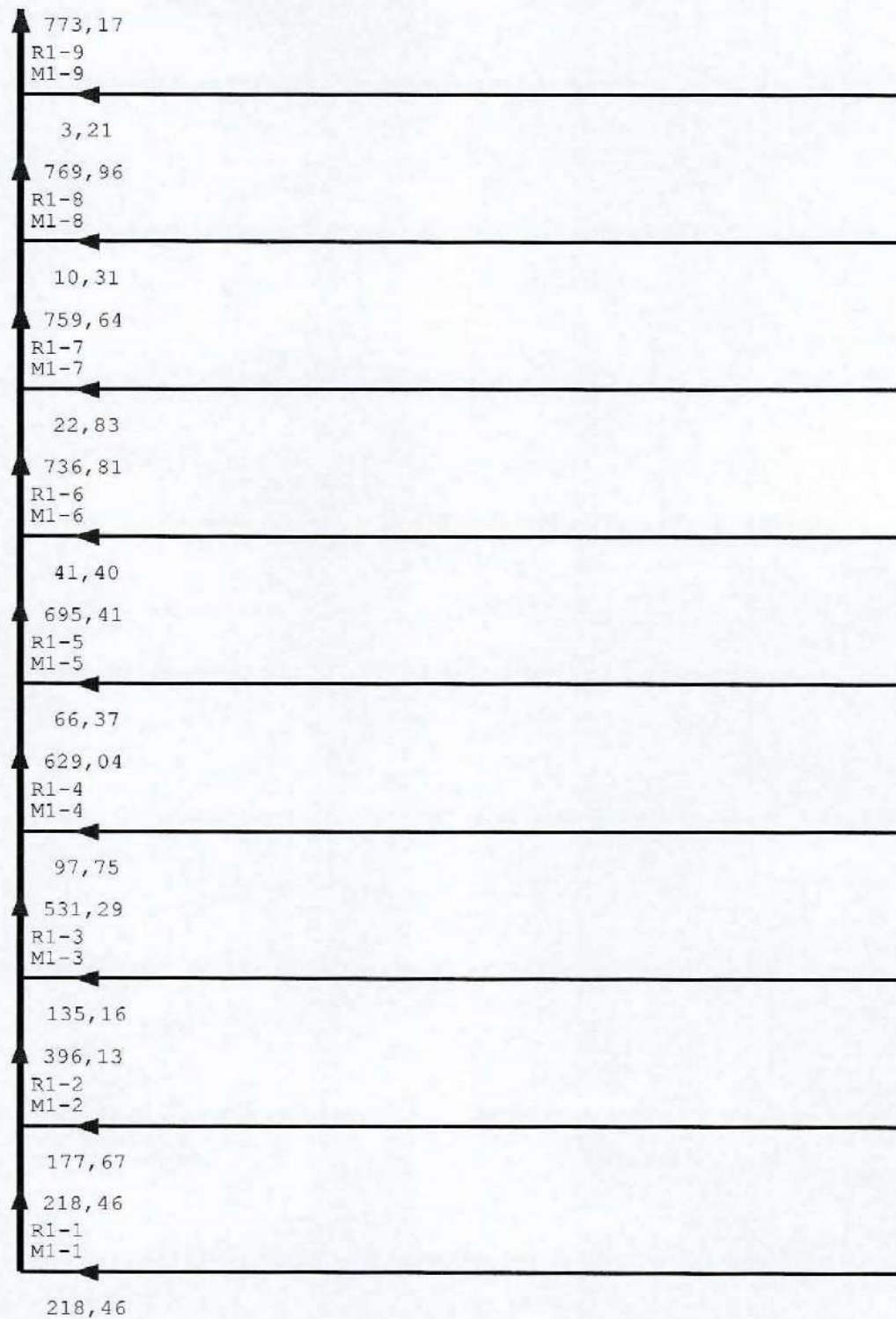
Flow Diagram (2 of 8)

Flow Diagram (3 of 8)

Flow Diagram (4 of 8)

Flow Diagram (5 of 8)

Flow Diagram (6 of 8)

Flow Diagram (7 of 8)

Flow Diagram (8 of 8)