

Hydraulic Calculations for

Project: ALFANDEGA DA RECEITA FEDERAL DO BRASIL NO ESTADO DE SAO PAULO
Drawing no.: SRG_1860_SPK_MC_R02_VGA2
Date: 14/01/2020

Design

Remote area number: AREA02
Remote area location: VGA02 + RACK12
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: 1777,82lpm
Hose streams: none outside + none inside
Total water required (including hose streams): 4771,81 lpm at -0,845 bar [0,855 bar safety margin (8553,5%)]
Total water required at base of system riser: 4771,81 lpm at 6,964 bar
Type of system: wet pipe
Volume of dry or preaction system: 656m3 (SPK) + 64m3 (HD)

Water Supply Information

Date:
Location:
Source:

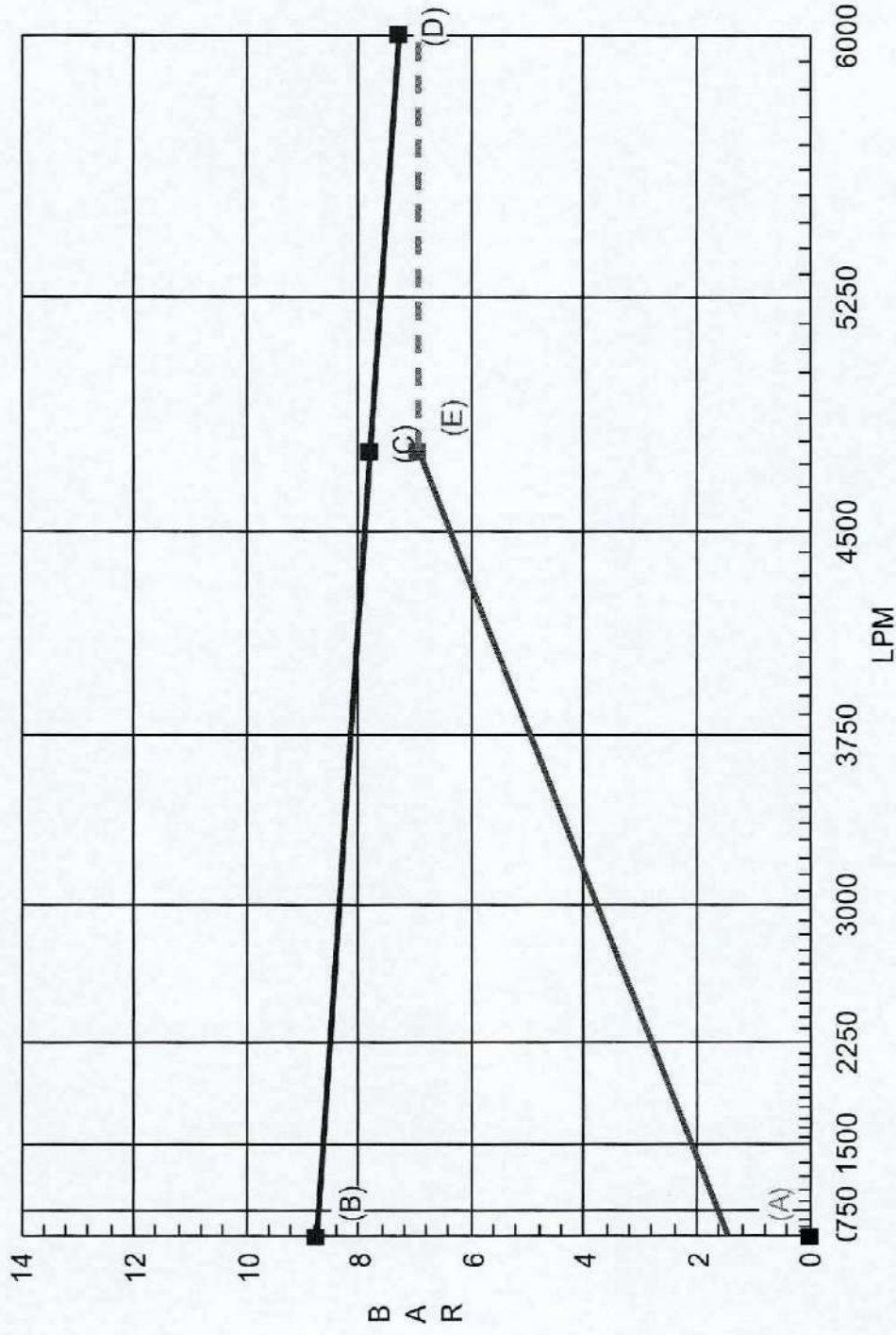
Contractor: RECEITA FEDERAL
Under contract with: SORENGE
Name of designer: LUIZ BUENO
Authority having jurisdiction: CORPO DE BOMBEIROS DE SAO PAULO

Notes

CALCULO HIDRAULICO DO SISTEMA DE CHUVEIROS AUTOMATICOS



Hydraulic Demand Graph



Water Source:
A) 0,01 bar Static

Source at BOR:
B) 8,8 bar Static
C) 4771,8 lpm at 7,82 bar
D) 6000 lpm at 7,3 bar

Demand at BOR:
E) 4771,8 lpm at 6,96 bar

[Handwritten signature]

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 | 4771,81 | -0,85 |

Node Analysis

| Node Tag | Elev [M] | Type | Pressure [bar] | Discharge [lpm] | Node Tag | Elev [M] | Type | Pressure [bar] | Discharge [lpm] |
|----------|----------|--------|----------------|-----------------|----------|----------|----------|----------------|-----------------|
| RTI | -1,850 | source | -0,845 | -4771,80 | M2-16 | 13,500 | ref | 2,512 | 0,000 |
| EB | 0,000 | ref | -1,062 | 0,000 | M2-17 | 13,500 | ref | 2,441 | 0,000 |
| SB | 0,000 | ref | 7,381 | 0,000 | M2-18 | 13,500 | ref | 2,370 | 0,000 |
| M1-1 | 13,500 | ref | 3,376 | 0,000 | M2-19 | 13,500 | ref | 2,299 | 0,000 |
| M1-2 | 13,500 | ref | 3,370 | 0,000 | M2-20 | 13,500 | ref | 2,227 | 0,000 |
| M1-3 | 13,500 | ref | 3,351 | 0,000 | M2-21 | 13,500 | ref | 2,156 | 0,000 |
| M1-4 | 13,500 | ref | 3,317 | 0,000 | M2-22 | 13,500 | ref | 2,085 | 0,000 |
| M1-5 | 13,500 | ref | 3,270 | 0,000 | M2-23 | 13,500 | ref | 2,014 | 0,000 |
| M1-6 | 13,500 | ref | 3,212 | 0,000 | M2-24 | 13,500 | ref | 1,943 | 0,000 |
| M1-7 | 13,500 | ref | 3,149 | 0,000 | M2-25 | 13,500 | ref | 1,872 | 0,000 |
| M1-8 | 13,500 | ref | 3,080 | 0,000 | M2-26 | 13,500 | ref | 1,802 | 0,000 |
| M1-9 | 13,500 | ref | 3,010 | 0,000 | M2-27 | 13,500 | ref | 1,734 | 0,000 |
| M1-10 | 13,500 | ref | 2,939 | 0,000 | M2-28 | 13,500 | ref | 1,669 | 0,000 |
| M1-11 | 13,500 | ref | 2,868 | 0,000 | M2-29 | 13,500 | ref | 1,607 | 0,000 |
| M1-12 | 13,500 | ref | 2,797 | 0,000 | M2-30 | 13,500 | ref | 1,551 | 0,000 |
| M1-13 | 13,500 | ref | 2,726 | 0,000 | M2-31 | 13,500 | ref | 1,502 | 0,000 |
| M1-14 | 13,500 | ref | 2,654 | 0,000 | M2-32 | 13,500 | ref | 1,465 | 0,000 |
| M1-15 | 13,500 | ref | 2,583 | 0,000 | M2-33 | 13,500 | ref | 1,447 | 0,000 |
| M1-16 | 13,500 | ref | 2,512 | 0,000 | M2-34 | 13,500 | ref | 1,444 | 0,000 |
| M1-17 | 13,500 | ref | 2,441 | 0,000 | L31-1 | 15,750 | K=160,00 | 0,894 | 151,306 |
| M1-18 | 13,500 | ref | 2,370 | 0,000 | L31-2 | 15,750 | K=160,00 | 0,889 | 150,831 |
| M1-19 | 13,500 | ref | 2,299 | 0,000 | L31-3 | 15,750 | K=160,00 | 0,889 | 150,891 |
| M1-20 | 13,500 | ref | 2,227 | 0,000 | L31-4 | 15,750 | K=160,00 | 0,904 | 152,089 |
| M1-21 | 13,500 | ref | 2,156 | 0,000 | L31-5 | 15,750 | ref | 0,946 | 0,000 |
| M1-22 | 13,500 | ref | 2,085 | 0,000 | L31-6 | 15,750 | ref | 0,988 | 0,000 |
| M1-23 | 13,500 | ref | 2,014 | 0,000 | L31-7 | 15,750 | ref | 1,031 | 0,000 |
| M1-24 | 13,500 | ref | 1,942 | 0,000 | L31-8 | 15,750 | ref | 1,073 | 0,000 |
| M1-25 | 13,500 | ref | 1,869 | 0,000 | L31-9 | 15,750 | ref | 1,116 | 0,000 |
| M1-26 | 13,500 | ref | 1,793 | 0,000 | L31-10 | 15,750 | ref | 1,158 | 0,000 |
| M1-27 | 13,500 | ref | 1,711 | 0,000 | L32-1 | 15,750 | K=160,00 | 0,720 | 135,726 |
| M1-28 | 13,500 | ref | 1,619 | 0,000 | L32-2 | 15,750 | K=160,00 | 0,700 | 133,900 |
| M1-29 | 13,500 | ref | 1,509 | 0,000 | L32-3 | 15,750 | K=160,00 | 0,697 | 133,569 |
| M1-30 | 13,500 | ref | 1,372 | 0,000 | L32-4 | 15,750 | K=160,00 | 0,698 | 133,668 |
| M1-31 | 13,500 | ref | 1,194 | 0,000 | L32-5 | 15,750 | K=160,00 | 0,711 | 134,909 |
| M1-32 | 13,500 | ref | 1,078 | 0,000 | L32-6 | 15,750 | K=160,00 | 0,748 | 138,350 |
| M1-33 | 13,500 | ref | 1,026 | 0,000 | L32-7 | 15,750 | ref | 0,820 | 0,000 |
| M1-34 | 13,500 | ref | 1,011 | 0,000 | L32-8 | 15,750 | ref | 0,892 | 0,000 |
| DER' | 13,500 | ref | 1,449 | 0,000 | L32-9 | 15,750 | ref | 0,964 | 0,000 |
| M2-1 | 13,500 | ref | 3,644 | 0,000 | L32-10 | 15,750 | ref | 1,036 | 0,000 |
| M2-2 | 13,500 | ref | 3,556 | 0,000 | L33-1 | 15,750 | K=160,00 | 0,683 | 132,268 |
| M2-3 | 13,500 | ref | 3,465 | 0,000 | L33-2 | 15,750 | K=160,00 | 0,667 | 130,692 |
| M2-4 | 13,500 | ref | 3,381 | 0,000 | L33-3 | 15,750 | K=160,00 | 0,665 | 130,461 |
| M2-5 | 13,500 | ref | 3,302 | 0,000 | L33-4 | 15,750 | K=160,00 | 0,667 | 130,625 |
| M2-6 | 13,500 | ref | 3,227 | 0,000 | L33-5 | 15,750 | K=160,00 | 0,681 | 132,033 |
| M2-7 | 13,500 | ref | 3,154 | 0,000 | L33-6 | 15,750 | K=160,00 | 0,719 | 135,700 |
| M2-8 | 13,500 | ref | 3,082 | 0,000 | L33-7 | 15,750 | ref | 0,793 | 0,000 |
| M2-9 | 13,500 | ref | 3,010 | 0,000 | L33-8 | 15,750 | ref | 0,866 | 0,000 |
| M2-10 | 13,500 | ref | 2,939 | 0,000 | L33-9 | 15,750 | ref | 0,940 | 0,000 |
| M2-11 | 13,500 | ref | 2,868 | 0,000 | L33-10 | 15,750 | ref | 1,013 | 0,000 |
| M2-12 | 13,500 | ref | 2,797 | 0,000 | L34-1 | 15,750 | K=160,00 | 0,674 | 131,339 |
| M2-13 | 13,500 | ref | 2,726 | 0,000 | L34-2 | 15,750 | K=160,00 | 0,659 | 129,839 |
| M2-14 | 13,500 | ref | 2,654 | 0,000 | L34-3 | 15,750 | K=160,00 | 0,656 | 129,637 |
| M2-15 | 13,500 | ref | 2,583 | 0,000 | L34-4 | 15,750 | K=160,00 | 0,658 | 129,826 |

Node Analysis. cont.

| Node Tag | Elev [M] | Type | Pressure [bar] | Discharge [lpm] | Node Tag | Elev [M] | Type | Pressure [bar] | Discharge [lpm] |
|----------|----------|----------|----------------|-----------------|----------|----------|----------|----------------|-----------------|
| L34-5 | 15,750 | K=160,00 | 0,673 | 131,291 | R2-25 | 15,750 | ref | 1,651 | 0,000 |
| L34-6 | 15,750 | K=160,00 | 0,712 | 135,037 | R2-26 | 15,750 | ref | 1,581 | 0,000 |
| L34-7 | 15,750 | ref | 0,786 | 0,000 | R2-27 | 15,750 | ref | 1,511 | 0,000 |
| L34-8 | 15,750 | ref | 0,861 | 0,000 | R2-28 | 15,750 | ref | 1,441 | 0,000 |
| L34-9 | 15,750 | ref | 0,935 | 0,000 | R2-29 | 15,750 | ref | 1,373 | 0,000 |
| L34-10 | 15,750 | ref | 1,009 | 0,000 | R2-30 | 15,750 | ref | 1,306 | 0,000 |
| R1-1 | 15,750 | ref | 3,192 | 0,000 | R2-31 | 15,750 | ref | 1,196 | 0,000 |
| R1-2 | 15,750 | ref | 3,175 | 0,000 | R2-32 | 15,750 | ref | 1,100 | 0,000 |
| R1-3 | 15,750 | ref | 3,146 | 0,000 | R2-33 | 15,750 | ref | 1,079 | 0,000 |
| R1-4 | 15,750 | ref | 3,105 | 0,000 | R2-34 | 15,750 | ref | 1,075 | 0,000 |
| R1-5 | 15,750 | ref | 3,053 | 0,000 | BOR | 0,500 | ref | 6,964 | 0,000 |
| R1-6 | 15,750 | ref | 2,994 | 0,000 | N6-232 | 8,950 | K=115,00 | 1,137 | 122,648 |
| R1-7 | 15,750 | ref | 2,929 | 0,000 | N6-233 | 8,950 | K=115,00 | 1,070 | 118,957 |
| R1-8 | 15,750 | ref | 2,860 | 0,000 | N6-234 | 8,950 | K=115,00 | 1,029 | 116,657 |
| R1-9 | 15,750 | ref | 2,790 | 0,000 | N6-235 | 8,950 | K=115,00 | 1,008 | 115,459 |
| R1-10 | 15,750 | ref | 2,719 | 0,000 | N6-236 | 8,950 | K=115,00 | 1,001 | 115,033 |
| R1-11 | 15,750 | ref | 2,647 | 0,000 | N6-237 | 8,950 | K=115,00 | 1,000 | 115,000 |
| R1-12 | 15,750 | ref | 2,576 | 0,000 | N6-238 | 8,950 | K=115,00 | 1,002 | 115,120 |
| R1-13 | 15,750 | ref | 2,505 | 0,000 | N6-171 | 4,450 | K=115,00 | 1,519 | 141,726 |
| R1-14 | 15,750 | ref | 2,434 | 0,000 | N6-173 | 4,450 | K=115,00 | 1,464 | 139,144 |
| R1-15 | 15,750 | ref | 2,363 | 0,000 | N6-174 | 4,450 | K=115,00 | 1,353 | 133,783 |
| R1-16 | 15,750 | ref | 2,292 | 0,000 | N6-175 | 4,450 | K=115,00 | 1,454 | 138,676 |
| R1-17 | 15,750 | ref | 2,220 | 0,000 | N6-176 | 4,450 | K=115,00 | 1,344 | 133,331 |
| R1-18 | 15,750 | ref | 2,149 | 0,000 | N6-177 | 4,450 | K=115,00 | 1,457 | 136,820 |
| R1-19 | 15,750 | ref | 2,078 | 0,000 | N6-178 | 4,450 | K=115,00 | 1,347 | 133,470 |
| R1-20 | 15,750 | ref | 2,007 | 0,000 | N6-2 | 8,950 | ref | 4,410 | 0,000 |
| R1-21 | 15,750 | ref | 1,936 | 0,000 | N6-1 | 4,450 | ref | 4,862 | 0,000 |
| R1-22 | 15,750 | ref | 1,865 | 0,000 | N6-2' | 8,950 | ref | 1,009 | 0,000 |
| R1-23 | 15,750 | ref | 1,793 | 0,000 | N6-1' | 4,450 | ref | 1,461 | 0,000 |
| R1-24 | 15,750 | ref | 1,722 | 0,000 | N6 | -0,100 | ref | 5,355 | 0,000 |
| R1-25 | 15,750 | ref | 1,649 | 0,000 | N6' | -0,100 | ref | 2,002 | 0,000 |
| R1-26 | 15,750 | ref | 1,574 | 0,000 | DER | 2,000 | ref | 5,511 | 0,000 |
| R1-27 | 15,750 | ref | 1,494 | 0,000 | N6-172 | 4,450 | ref | 1,519 | 0,000 |
| R1-28 | 15,750 | ref | 1,405 | 0,000 | | | | | |
| R1-29 | 15,750 | ref | 1,302 | 0,000 | | | | | |
| R1-30 | 15,750 | ref | 1,176 | 0,000 | | | | | |
| R1-31 | 15,750 | ref | 0,920 | 0,000 | | | | | |
| R1-32 | 15,750 | ref | 0,764 | 0,000 | | | | | |
| R1-33 | 15,750 | ref | 0,723 | 0,000 | | | | | |
| R1-34 | 15,750 | ref | 0,712 | 0,000 | | | | | |
| R2-1 | 15,750 | ref | 3,387 | 0,000 | | | | | |
| R2-2 | 15,750 | ref | 3,310 | 0,000 | | | | | |
| R2-3 | 15,750 | ref | 3,229 | 0,000 | | | | | |
| R2-4 | 15,750 | ref | 3,152 | 0,000 | | | | | |
| R2-5 | 15,750 | ref | 3,078 | 0,000 | | | | | |
| R2-6 | 15,750 | ref | 3,005 | 0,000 | | | | | |
| R2-7 | 15,750 | ref | 2,933 | 0,000 | | | | | |
| R2-8 | 15,750 | ref | 2,861 | 0,000 | | | | | |
| R2-9 | 15,750 | ref | 2,790 | 0,000 | | | | | |
| R2-10 | 15,750 | ref | 2,719 | 0,000 | | | | | |
| R2-11 | 15,750 | ref | 2,647 | 0,000 | | | | | |
| R2-12 | 15,750 | ref | 2,576 | 0,000 | | | | | |
| R2-13 | 15,750 | ref | 2,505 | 0,000 | | | | | |
| R2-14 | 15,750 | ref | 2,434 | 0,000 | | | | | |
| R2-15 | 15,750 | ref | 2,363 | 0,000 | | | | | |
| R2-16 | 15,750 | ref | 2,292 | 0,000 | | | | | |
| R2-17 | 15,750 | ref | 2,220 | 0,000 | | | | | |
| R2-18 | 15,750 | ref | 2,149 | 0,000 | | | | | |
| R2-19 | 15,750 | ref | 2,078 | 0,000 | | | | | |
| R2-20 | 15,750 | ref | 2,007 | 0,000 | | | | | |
| R2-21 | 15,750 | ref | 1,936 | 0,000 | | | | | |
| R2-22 | 15,750 | ref | 1,865 | 0,000 | | | | | |
| R2-23 | 15,750 | ref | 1,794 | 0,000 | | | | | |
| R2-24 | 15,750 | ref | 1,722 | 0,000 | | | | | |



Pipe Information

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

| 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 |
|--------|----------|----------|----------------------------------|---------------|--|-----------------------------|----------------|---------------------------------------|-----------|
| Node 2 | | | | | | | | | |
| RTI | -1,850 | | q=-4771,80 Q=4771,807 | 200 209,5 | 1E=6,447 1G=1,433 | 5,000 7,880 12,880 | | Pt= -0,845 Pe= 0,181 Pf= 0,035 | Mat="S10" |
| EB | 0,000 | | | | | | C=120 0,003 | | |
| EB | 0,000 | | Pump inlet pressure = -1,062 bar | | | | | | |
| | | | Net gain across pump = 8,443 bar | | | | | | |
| SB | 0,000 | | Pump outlet pressure = 7,381 bar | | | | | | |
| SB | 0,000 | | q= 0,000 Q=4771,807 | 200 209,5 | 6E=38,682 1B=4,298 1C=16,088 3TN=13,951 | 61,550 73,020 134,570 | C=120 0,003 | Pt= 7,381 Pe= 0,049 Pf= 0,368 | Mat="S10" |
| BOR | 0,500 | | | | | | | | |
| BOR | 0,500 | | q= 0,000 Q=4771,807 | 100 108,2 | 1B=4,809 1A=4,809 1T=8,015 | 1,500 17,634 19,134 | C=120 0,068 | Pt= 6,964 Pe= 0,147 Pf= 1,306 | Mat="S10" |
| DER | 2,000 | | | | | | | | |
| DER | 2,000 | | q= 0,000 Q=3552,428 | 100 108,2 | 1TN=2,405 1E=4,008 | 12,300 6,412 18,712 | C=120 0,04 | Pt= 5,511 Pe= 1,127 Pf= 0,740 | Mat="S10" |
| M2-1 | 13,500 | | | | | | | | |
| M1-1 | 13,500 | | q= 0,000 Q= 214,202 | 65 66,9 | | 2,500 0,000 2,500 | C=120 0,002 | Pt= 3,376 Pe= 0,000 Pf= 0,006 | Mat="S10" |
| M1-2 | 13,500 | | | | | | | | |
| M1-2 | 13,500 | | q= 0,000 Q= 389,840 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,007 | Pt= 3,370 Pe= 0,000 Pf= 0,020 | Mat="S10" |
| M1-3 | 13,500 | | | | | | | | |
| M1-3 | 13,500 | | q= 0,000 Q= 525,068 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,012 | Pt= 3,351 Pe= 0,000 Pf= 0,034 | Mat="S10" |
| M1-4 | 13,500 | | | | | | | | |
| M1-4 | 13,500 | | q= 0,000 Q= 624,453 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,016 | Pt= 3,317 Pe= 0,000 Pf= 0,047 | Mat="S10" |
| M1-5 | 13,500 | | | | | | | | |
| M1-5 | 13,500 | | q= 0,000 Q= 683,423 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,02 | Pt= 3,270 Pe= 0,000 Pf= 0,057 | Mat="S10" |
| M1-6 | 13,500 | | | | | | | | |
| M1-6 | 13,500 | | q= 0,000 Q= 737,804 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,022 | Pt= 3,212 Pe= 0,000 Pf= 0,064 | Mat="S10" |
| M1-7 | 13,500 | | | | | | | | |
| M1-7 | 13,500 | | q= 0,000 Q= 763,465 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,024 | Pt= 3,149 Pe= 0,000 Pf= 0,068 | Mat="S10" |
| M1-8 | 13,500 | | | | | | | | |
| M1-8 | 13,500 | | q= 0,000 Q= 776,023 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,025 | Pt= 3,080 Pe= 0,000 Pf= 0,070 | Mat="S10" |
| M1-9 | 13,500 | | | | | | | | |
| M1-9 | 13,500 | | q= 0,000 Q= 780,599 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,025 | Pt= 3,010 Pe= 0,000 Pf= 0,071 | Mat="S10" |
| M1-10 | 13,500 | | | | | | | | |
| M1-10 | 13,500 | | q= 0,000 Q= 781,508 | 65 66,9 | | 2,850 0,000 2,850 | C=120 0,025 | Pt= 2,939 Pe= 0,000 Pf= 0,071 | Mat="S10" |
| M1-11 | 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 |
|------------------|-------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| M1-11 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,868 | Mat="S10" |
| M1-12 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-12 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,797 | Mat="S10" |
| M1-13 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-13 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,726 | Mat="S10" |
| M1-14 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-14 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,654 | Mat="S10" |
| M1-15 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-15 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,583 | Mat="S10" |
| M1-16 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-16 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,512 | Mat="S10" |
| M1-17 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-17 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,441 | Mat="S10" |
| M1-18 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-18 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,370 | Mat="S10" |
| M1-19 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-19 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,299 | Mat="S10" |
| M1-20 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-20 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,227 | Mat="S10" |
| M1-21 | 13,500 | | Q= 781,558 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-21 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,156 | Mat="S10" |
| M1-22 | 13,500 | | Q= 781,563 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-22 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,085 | Mat="S10" |
| M1-23 | 13,500 | | Q= 781,815 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M1-23 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 2,014 | Mat="S10" |
| M1-24 | 13,500 | | Q= 784,023 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,025 | Pf= 0,072 | |
| M1-24 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 1,942 | Mat="S10" |
| M1-25 | 13,500 | | Q= 791,859 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,026 | Pf= 0,073 | |
| M1-25 | 13,500 | | Q= 0,000 | 65 | | 2,850 | | Pt= 1,869 | Mat="S10" |
| M1-26 | 13,500 | | Q= 810,132 | 66,9 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | | 2,850 | 0,027 | Pf= 0,076 | |



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 65 Q= 844,457 66,9 | | | 2,850 0,000 | | Pt= 1,793 Mat="S10" Pe= 0,000 | |
| M1-27 | 13,500 | | | | | 2,850 | C=120 0,029 | Pf= 0,082 | |
| M1-27 | 13,500 | | q= 0,000 65 Q= 901,215 66,9 | | | 2,850 0,000 | | Pt= 1,711 Mat="S10" Pe= 0,000 | |
| M1-28 | 13,500 | | | | | 2,850 | C=120 0,032 | Pf= 0,093 | |
| M1-28 | 13,500 | | q= 0,000 65 Q= 987,636 66,9 | | | 2,850 0,000 | | Pt= 1,619 Mat="S10" Pe= 0,000 | |
| M1-29 | 13,500 | | | | | 2,850 | C=120 0,038 | Pf= 0,110 | |
| M1-29 | 13,500 | | q= 0,000 65 Q=1111,986 66,9 | | | 2,850 0,000 | | Pt= 1,509 Mat="S10" Pe= 0,000 | |
| M1-30 | 13,500 | | | | | 2,850 | C=120 0,048 | Pf= 0,137 | |
| M1-30 | 13,500 | | q= 0,000 65 Q=1283,849 66,9 | | | 2,850 0,000 | | Pt= 1,372 Mat="S10" Pe= 0,000 | |
| M1-31 | 13,500 | | | | | 2,850 | C=120 0,063 | Pf= 0,178 | |
| M1-31 | 13,500 | | q= 0,000 65 Q=1018,771 66,9 | | | 2,850 0,000 | | Pt= 1,194 Mat="S10" Pe= 0,000 | |
| M1-32 | 13,500 | | | | | 2,850 | C=120 0,041 | Pf= 0,116 | |
| M1-32 | 13,500 | | q= 0,000 65 Q= 661,417 66,9 | | | 2,850 0,000 | | Pt= 1,078 Mat="S10" Pe= 0,000 | |
| M1-33 | 13,500 | | | | | 2,850 | C=120 0,018 | Pf= 0,052 | |
| M1-33 | 13,500 | | q= 0,000 65 Q= 327,224 66,9 | | | 2,850 0,000 | | Pt= 1,026 Mat="S10" Pe= 0,000 | |
| M1-34 | 13,500 | | | | | 2,850 | C=120 0,005 | Pf= 0,014 | |
| M2-1 | 13,500 | | q= 0,000 100 Q=3338,227 108,2 | | | 2,500 0,000 | | Pt= 3,644 Mat="S10" Pe= 0,000 | |
| M2-2 | 13,500 | | | | | 2,500 | C=120 0,035 | Pf= 0,088 | |
| M2-2 | 13,500 | | q= 0,000 100 Q=3162,589 108,2 | | | 2,850 0,000 | | Pt= 3,556 Mat="S10" Pe= 0,000 | |
| M2-3 | 13,500 | | | | | 2,850 | C=120 0,032 | Pf= 0,091 | |
| M2-3 | 13,500 | | q= 0,000 100 Q=3027,361 108,2 | | | 2,850 0,000 | | Pt= 3,465 Mat="S10" Pe= 0,000 | |
| M2-4 | 13,500 | | | | | 2,850 | C=120 0,029 | Pf= 0,084 | |
| M2-4 | 13,500 | | q= 0,000 100 Q=2927,975 108,2 | | | 2,850 0,000 | | Pt= 3,381 Mat="S10" Pe= 0,000 | |
| M2-5 | 13,500 | | | | | 2,850 | C=120 0,028 | Pf= 0,079 | |
| M2-5 | 13,500 | | q= 0,000 100 Q=2859,005 108,2 | | | 2,850 0,000 | | Pt= 3,302 Mat="S10" Pe= 0,000 | |
| M2-6 | 13,500 | | | | | 2,850 | C=120 0,026 | Pf= 0,075 | |
| M2-6 | 13,500 | | q= 0,000 100 Q=2814,624 108,2 | | | 2,850 0,000 | | Pt= 3,227 Mat="S10" Pe= 0,000 | |
| M2-7 | 13,500 | | | | | 2,850 | C=120 0,026 | Pf= 0,073 | |
| M2-7 | 13,500 | | q= 0,000 100 Q=2788,964 108,2 | | | 2,850 0,000 | | Pt= 3,154 Mat="S10" Pe= 0,000 | |
| M2-8 | 13,500 | | | | | 2,850 | C=120 0,025 | Pf= 0,072 | |

Pipe Information. cont.

| Node 1 | Elev | Discharge | Nom | Fittings | L [M] | | total (Pt) | |
|--------|--------|------------------|------|--------------|-------|----------|---------------------|-------|
| Node 2 | [M] | & Flow | i.d. | num & length | F [M] | C factor | elev (Pe) | Notes |
| | | [lpm] | [mm] | [M] | T [M] | bar/M | frict (Pf) | |
| M2-8 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 3,082 Mat="S10" | |
| M2-9 | 13,500 | Q=2776,405 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-9 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 3,010 Mat="S10" | |
| M2-10 | 13,500 | Q=2771,829 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-10 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,939 Mat="S10" | |
| M2-11 | 13,500 | Q=2770,921 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-11 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,868 Mat="S10" | |
| M2-12 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-12 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,797 Mat="S10" | |
| M2-13 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-13 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,726 Mat="S10" | |
| M2-14 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-14 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,654 Mat="S10" | |
| M2-15 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-15 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,583 Mat="S10" | |
| M2-16 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-16 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,512 Mat="S10" | |
| M2-17 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-17 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,441 Mat="S10" | |
| M2-18 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-18 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,370 Mat="S10" | |
| M2-19 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-19 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,299 Mat="S10" | |
| M2-20 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-20 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,227 Mat="S10" | |
| M2-21 | 13,500 | Q=2770,870 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-21 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,156 Mat="S10" | |
| M2-22 | 13,500 | Q=2770,865 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-22 | 13,500 | q= 0,000 100 | | | 2,850 | | Pt= 2,085 Mat="S10" | |
| M2-23 | 13,500 | Q=2770,613 108,2 | | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 2,850 | 0,025 | Pf= 0,071 | |



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=2768,405 108,2 | | | 2,850 0,000 | C=120 | Pt= 2,014 Mat="S10" Pe= 0,000 | |
| M2-24 | 13,500 | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-24 | 13,500 | | q= 0,000 100 Q=2760,569 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,943 Mat="S10" Pe= 0,000 | |
| M2-25 | 13,500 | | | | | 2,850 | 0,025 | Pf= 0,071 | |
| M2-25 | 13,500 | | q= 0,000 100 Q=2742,297 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,872 Mat="S10" Pe= 0,000 | |
| M2-26 | 13,500 | | | | | 2,850 | 0,024 | Pf= 0,070 | |
| M2-26 | 13,500 | | q= 0,000 100 Q=2707,972 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,802 Mat="S10" Pe= 0,000 | |
| M2-27 | 13,500 | | | | | 2,850 | 0,024 | Pf= 0,068 | |
| M2-27 | 13,500 | | q= 0,000 100 Q=2651,214 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,734 Mat="S10" Pe= 0,000 | |
| M2-28 | 13,500 | | | | | 2,850 | 0,023 | Pf= 0,066 | |
| M2-28 | 13,500 | | q= 0,000 100 Q=2564,792 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,669 Mat="S10" Pe= 0,000 | |
| M2-29 | 13,500 | | | | | 2,850 | 0,022 | Pf= 0,062 | |
| M2-29 | 13,500 | | q= 0,000 100 Q=2440,442 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,607 Mat="S10" Pe= 0,000 | |
| M2-30 | 13,500 | | | | | 2,850 | 0,02 | Pf= 0,056 | |
| M2-30 | 13,500 | | q= 0,000 100 Q=2268,579 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,551 Mat="S10" Pe= 0,000 | |
| M2-31 | 13,500 | | | | | 2,850 | 0,017 | Pf= 0,049 | |
| M2-31 | 13,500 | | q= 0,000 100 Q=1928,540 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,502 Mat="S10" Pe= 0,000 | |
| M2-32 | 13,500 | | | | | 2,850 | 0,013 | Pf= 0,036 | |
| M2-32 | 13,500 | | q= 0,000 100 Q=1475,773 108,2 | | | 2,050 0,000 | C=120 | Pt= 1,465 Mat="S10" Pe= 0,000 | |
| DER' | 13,500 | | | | | 2,050 | 0,008 | Pf= 0,016 | |
| M2-33 | 13,500 | | q= 0,000 100 Q= 459,745 108,2 | | | 2,850 0,000 | C=120 | Pt= 1,447 Mat="S10" Pe= 0,000 | |
| M2-34 | 13,500 | | | | | 2,850 | 0,001 | Pf= 0,003 | |
| DER' | 13,500 | | q= 0,000 100 Q= 917,329 108,2 | | | 0,800 0,000 | C=120 | Pt= 1,449 Mat="S10" Pe= 0,000 | |
| M2-33 | 13,500 | | | | | 0,800 | 0,003 | Pf= 0,003 | |
| R1-1 | 15,750 | | q= 0,000 50 Q=-214,202 54,8 | | 2E=3,746 | 28,800 3,746 | C=120 | Pt= 3,192 Mat="S10" Pe= 0,000 | |
| R2-1 | 15,750 | | | | | 32,546 | 0,006 | Pf= -0,196 | |
| R1-2 | 15,750 | | q= 0,000 50 Q=-175,638 54,8 | | 2E=3,746 | 28,800 3,746 | C=120 | Pt= 3,175 Mat="S10" Pe= 0,000 | |
| R2-2 | 15,750 | | | | | 32,546 | 0,004 | Pf= -0,136 | |
| R1-3 | 15,750 | | q= 0,000 50 Q=-135,228 54,8 | | 2E=3,746 | 28,800 3,746 | C=120 | Pt= 3,146 Mat="S10" Pe= 0,000 | |
| R2-3 | 15,750 | | | | | 32,546 | 0,003 | Pf= -0,084 | |

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= -99,385 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0,001 | Pt= 3,105 Mat="S10" Pe= 0,000 Pf= -0,047 | |
| R2-4 | 15,750 | | | | | | | | |
| R1-5 | 15,750 | | q= 0,000 Q= -68,970 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0,001 | Pt= 3,053 Mat="S10" Pe= 0,000 Pf= -0,024 | |
| R2-5 | 15,750 | | | | | | | | |
| R1-6 | 15,750 | | q= 0,000 Q= -44,382 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0,000 | Pt= 2,994 Mat="S10" Pe= 0,000 Pf= -0,011 | |
| R2-6 | 15,750 | | | | | | | | |
| R1-7 | 15,750 | | q= 0,000 Q= -25,660 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0,000 | Pt= 2,929 Mat="S10" Pe= 0,000 Pf= -0,004 | |
| R2-7 | 15,750 | | | | | | | | |
| R1-8 | 15,750 | | q= 0,000 Q= -12,559 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,860 Mat="S10" Pe= 0,000 Pf= -0,001 | |
| R2-8 | 15,750 | | | | | | | | |
| R1-9 | 15,750 | | q= 0,000 Q= -4,576 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,790 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-9 | 15,750 | | | | | | | | |
| R1-10 | 15,750 | | q= 0,000 Q= -0,908 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,719 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-10 | 15,750 | | | | | | | | |
| R1-11 | 15,750 | | q= 0,000 Q= -0,050 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,647 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-11 | 15,750 | | | | | | | | |
| R1-12 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,576 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-12 | 15,750 | | | | | | | | |
| R1-13 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,505 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-13 | 15,750 | | | | | | | | |
| R1-14 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,434 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-14 | 15,750 | | | | | | | | |
| R1-15 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,363 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-15 | 15,750 | | | | | | | | |
| R1-16 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,292 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-16 | 15,750 | | | | | | | | |
| R1-17 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,220 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| R2-17 | 15,750 | | | | | | | | |
| R1-18 | 15,750 | | q= 0,000 Q= 0,000 | 50 54,8 | 2E=3,746 | 28,800 3,746 32,546 | C=120 0 | Pt= 2,149 Mat="S10" Pe= 0,000 Pf= 0,000 | |
| 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) | Notes |
| | | [lpm] | [mm] | [M] | T [M] | | frict (Pf) | |
| R1-19 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 2,078 | Mat="S10" |
| R2-19 | 15,750 | Q= 0,000 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-20 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 2,007 | Mat="S10" |
| R2-20 | 15,750 | Q= 0,000 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-21 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,936 | Mat="S10" |
| R2-21 | 15,750 | Q= -0,005 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-22 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,865 | Mat="S10" |
| R2-22 | 15,750 | Q= -0,252 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-23 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,793 | Mat="S10" |
| R2-23 | 15,750 | Q= -2,208 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-24 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,722 | Mat="S10" |
| R2-24 | 15,750 | Q= -7,836 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= 0,000 | |
| R1-25 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,649 | Mat="S10" |
| R2-25 | 15,750 | Q= -18,273 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0 | Pf= -0,002 | |
| R1-26 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,574 | Mat="S10" |
| R2-26 | 15,750 | Q= -34,325 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0,000 | Pf= -0,007 | |
| R1-27 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,494 | Mat="S10" |
| R2-27 | 15,750 | Q= -56,758 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0,001 | Pf= -0,017 | |
| R1-28 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,405 | Mat="S10" |
| R2-28 | 15,750 | Q= -86,421 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0,001 | Pf= -0,037 | |
| R1-29 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,302 | Mat="S10" |
| R2-29 | 15,750 | Q= -124,350 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0,002 | Pf= -0,072 | |
| R1-30 | 15,750 | q= 0,000 | 50 | 2E=3,746 | 28,800 | | Pt= 1,176 | Mat="S10" |
| R2-30 | 15,750 | Q= -171,863 | 54,8 | | 3,746 | C=120 | Pe= 0,000 | |
| | | | | | 32,546 | 0,004 | Pf= -0,130 | |
| R1-31 | 15,750 | q= 0,000 | 50 | 1E=1,873 | 1,000 | | Pt= 0,920 | Mat="S10" |
| L31-1 | 15,750 | Q= 265,078 | 54,8 | | 1,873 | C=120 | Pe= 0,000 | |
| | | | | | 2,873 | 0,009 | Pf= 0,026 | |
| L31-1 | 15,750 | 160 q= 151,306 | 50 | | 3,000 | | Pt= 0,894 | Mat="S10" |
| L31-2 | 15,750 | Q= 113,772 | 54,8 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 3,000 | 0,002 | Pf= 0,006 | |
| L31-2 | 15,750 | 160 q= 150,831 | 50 | | 3,000 | | Pt= 0,889 | Mat="S10" |
| L31-3 | 15,750 | Q= -37,059 | 54,8 | | 0,000 | C=120 | Pe= 0,000 | |
| | | | | | 3,000 | 0,000 | Pf= -0,001 | |

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 |
|------------------|-------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| L31-3 | 15,750 | 160 | q= 150,891 Q=-187,950 | 50 54,8 | | 3,000 0,000 | | Pt= 0,889 Pe= 0,000 | Mat="S10" |
| L31-4 | 15,750 | | | | | 3,000 | C=120 0,005 | Pf= -0,014 | |
| L31-4 | 15,750 | 160 | q= 152,089 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 0,904 Pe= 0,000 | Mat="S10" |
| L31-5 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-5 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 0,946 Pe= 0,000 | Mat="S10" |
| L31-6 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-6 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 0,988 Pe= 0,000 | Mat="S10" |
| L31-7 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-7 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 1,031 Pe= 0,000 | Mat="S10" |
| L31-8 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-8 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 1,073 Pe= 0,000 | Mat="S10" |
| L31-9 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-9 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | | 3,000 0,000 | | Pt= 1,116 Pe= 0,000 | Mat="S10" |
| L31-10 | 15,750 | | | | | 3,000 | 0,014 | Pf= -0,042 | |
| L31-10 | 15,750 | | q= 0,000 Q=-340,039 | 50 54,8 | 1E-1,873 | 0,800 1,873 | | Pt= 1,158 Pe= 0,000 | Mat="S10" |
| R2-31 | 15,750 | | | | | 2,673 | 0,014 | Pf= -0,038 | |
| R1-32 | 15,750 | | q= 0,000 Q= 357,353 | 50 54,8 | 1E-1,873 | 1,000 1,873 | | Pt= 0,764 Pe= 0,000 | Mat="S10" |
| L32-1 | 15,750 | | | | | 2,873 | 0,016 | Pf= 0,045 | |
| L32-1 | 15,750 | 160 | q= 135,726 Q= 221,628 | 50 54,8 | | 3,000 0,000 | | Pt= 0,720 Pe= 0,000 | Mat="S10" |
| L32-2 | 15,750 | | | | | 3,000 | 0,006 | Pf= 0,019 | |
| L32-2 | 15,750 | 160 | q= 133,900 Q= 87,728 | 50 54,8 | | 3,000 0,000 | | Pt= 0,700 Pe= 0,000 | Mat="S10" |
| L32-3 | 15,750 | | | | | 3,000 | 0,001 | Pf= 0,003 | |
| L32-3 | 15,750 | 160 | q= 133,569 Q= -45,841 | 50 54,8 | | 3,000 0,000 | | Pt= 0,697 Pe= 0,000 | Mat="S10" |
| L32-4 | 15,750 | | | | | 3,000 | 0,000 | Pf= -0,001 | |
| L32-4 | 15,750 | 160 | q= 133,668 Q=-179,509 | 50 54,8 | | 3,000 0,000 | | Pt= 0,698 Pe= 0,000 | Mat="S10" |
| L32-5 | 15,750 | | | | | 3,000 | 0,004 | Pf= -0,013 | |
| L32-5 | 15,750 | 160 | q= 134,909 Q=-314,418 | 50 54,8 | | 3,000 0,000 | | Pt= 0,711 Pe= 0,000 | Mat="S10" |
| L32-6 | 15,750 | | | | | 3,000 | 0,012 | Pf= -0,037 | |
| L32-6 | 15,750 | 160 | q= 138,350 Q=-452,768 | 50 54,8 | | 3,000 0,000 | | Pt= 0,748 Pe= 0,000 | Mat="S10" |
| L32-7 | 15,750 | | | | | 3,000 | 0,024 | Pf= -0,072 | |

Pipe Information, cont.

| Node 1 | Elev | Discharge | Nom | Fittings | L [M] | | total (Pt) | |
|--------|--------|--------------------------|------------|--------------|----------------|----------------|------------------------|-----------|
| Node 2 | [M] | & Flow | i.d. | num & length | F [M] | C factor | elev (Pe) | Notes |
| | | [lpm] | [mm] | [M] | T [M] | bar/M | frict (Pf) | |
| L32-7 | 15,750 | q= 0,000 Q=-452,768 | 50 54,8 | | 3,000 0,000 | | Pt= 0,820 Pe= 0,000 | Mat="S10" |
| L32-8 | 15,750 | | | | 3,000 | C=120 0,024 | Pf= -0,072 | |
| L32-8 | 15,750 | q= 0,000 Q=-452,768 | 50 54,8 | | 3,000 0,000 | | Pt= 0,892 Pe= 0,000 | Mat="S10" |
| L32-9 | 15,750 | | | | 3,000 | C=120 0,024 | Pf= -0,072 | |
| L32-9 | 15,750 | q= 0,000 Q=-452,768 | 50 54,8 | | 3,000 0,000 | | Pt= 0,964 Pe= 0,000 | Mat="S10" |
| L32-10 | 15,750 | | | | 3,000 | C=120 0,024 | Pf= -0,072 | |
| L32-10 | 15,750 | q= 0,000 Q=-452,768 | 50 54,8 | 1E=1,873 | 0,800 1,873 | | Pt= 1,036 Pe= 0,000 | Mat="S10" |
| R2-32 | 15,750 | | | | 2,673 | C=120 0,024 | Pf= -0,064 | |
| R1-33 | 15,750 | q= 0,000 Q= 334,194 | 50 54,8 | 1E=1,873 | 1,000 1,873 | | Pt= 0,723 Pe= 0,000 | Mat="S10" |
| L33-1 | 15,750 | | | | 2,873 | C=120 0,014 | Pf= 0,039 | |
| L33-1 | 15,750 | q= 132,268 Q= 201,926 | 50 54,8 | | 3,000 0,000 | | Pt= 0,683 Pe= 0,000 | Mat="S10" |
| L33-2 | 15,750 | | | | 3,000 | C=120 0,005 | Pf= 0,016 | |
| L33-2 | 15,750 | q= 130,692 Q= 71,234 | 50 54,8 | | 3,000 0,000 | | Pt= 0,667 Pe= 0,000 | Mat="S10" |
| L33-3 | 15,750 | | | | 3,000 | C=120 0,001 | Pf= 0,002 | |
| L33-3 | 15,750 | q= 130,461 Q= -59,227 | 50 54,8 | | 3,000 0,000 | | Pt= 0,665 Pe= 0,000 | Mat="S10" |
| L33-4 | 15,750 | | | | 3,000 | C=120 0,001 | Pf= -0,002 | |
| L33-4 | 15,750 | q= 130,625 Q=-189,852 | 50 54,8 | | 3,000 0,000 | | Pt= 0,667 Pe= 0,000 | Mat="S10" |
| L33-5 | 15,750 | | | | 3,000 | C=120 0,005 | Pf= -0,014 | |
| L33-5 | 15,750 | q= 132,033 Q=-321,884 | 50 54,8 | | 3,000 0,000 | | Pt= 0,681 Pe= 0,000 | Mat="S10" |
| L33-6 | 15,750 | | | | 3,000 | C=120 0,013 | Pf= -0,038 | |
| L33-6 | 15,750 | q= 135,700 Q=-457,584 | 50 54,8 | | 3,000 0,000 | | Pt= 0,719 Pe= 0,000 | Mat="S10" |
| L33-7 | 15,750 | | | | 3,000 | C=120 0,025 | Pf= -0,074 | |
| L33-7 | 15,750 | q= 0,000 Q=-457,584 | 50 54,8 | | 3,000 0,000 | | Pt= 0,793 Pe= 0,000 | Mat="S10" |
| L33-8 | 15,750 | | | | 3,000 | C=120 0,025 | Pf= -0,074 | |
| L33-8 | 15,750 | q= 0,000 Q=-457,584 | 50 54,8 | | 3,000 0,000 | | Pt= 0,866 Pe= 0,000 | Mat="S10" |
| L33-9 | 15,750 | | | | 3,000 | C=120 0,025 | Pf= -0,074 | |
| L33-9 | 15,750 | q= 0,000 Q=-457,584 | 50 54,8 | | 3,000 0,000 | | Pt= 0,940 Pe= 0,000 | Mat="S10" |
| L33-10 | 15,750 | | | | 3,000 | C=120 0,025 | Pf= -0,074 | |
| L33-10 | 15,750 | q= 0,000 Q=-457,584 | 50 54,8 | 1E=1,873 | 0,800 1,873 | | Pt= 1,013 Pe= 0,000 | Mat="S10" |
| R2-33 | 15,750 | | | | 2,673 | C=120 0,025 | Pf= -0,066 | |

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) | Notes |
| | | [lpm] | [mm] | [M] | T [M] | | frict (Pf) | |
| R1-34 | 15,750 | q= 0,000 50 | 1E=1,873 | 1,000 | | Pt= 0,712 Mat="S10" | | |
| | | Q= 327,224 54,8 | | 1,873 | | Pe= 0,000 | | |
| L34-1 | 15,750 | | | 2,873 | | Pf= 0,038 | | |
| | | | | | | | | |
| L34-1 | 15,750 | q= 131,339 50 | | 3,000 | | Pt= 0,674 Mat="S10" | | |
| | | Q= 195,885 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-2 | 15,750 | | | 3,000 | | Pf= 0,015 | | |
| | | | | | | | | |
| L34-2 | 15,750 | q= 129,839 50 | | 3,000 | | Pt= 0,659 Mat="S10" | | |
| | | Q= 66,045 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-3 | 15,750 | | | 3,000 | | Pf= 0,002 | | |
| | | | | | | | | |
| L34-3 | 15,750 | q= 129,637 50 | | 3,000 | | Pt= 0,656 Mat="S10" | | |
| | | Q= -63,592 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-4 | 15,750 | | | 3,000 | | Pf= -0,002 | | |
| | | | | | | | | |
| L34-4 | 15,750 | q= 129,826 50 | | 3,000 | | Pt= 0,658 Mat="S10" | | |
| | | Q=-193,417 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-5 | 15,750 | | | 3,000 | | Pf= -0,015 | | |
| | | | | | | | | |
| L34-5 | 15,750 | q= 131,291 50 | | 3,000 | | Pt= 0,673 Mat="S10" | | |
| | | Q=-324,708 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-6 | 15,750 | | | 3,000 | | Pf= -0,039 | | |
| | | | | | | | | |
| L34-6 | 15,750 | q= 135,037 50 | | 3,000 | | Pt= 0,712 Mat="S10" | | |
| | | Q=-459,745 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-7 | 15,750 | | | 3,000 | | Pf= -0,074 | | |
| | | | | | | | | |
| L34-7 | 15,750 | q= 0,000 50 | | 3,000 | | Pt= 0,786 Mat="S10" | | |
| | | Q=-459,745 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-8 | 15,750 | | | 3,000 | | Pf= -0,074 | | |
| | | | | | | | | |
| L34-8 | 15,750 | q= 0,000 50 | | 3,000 | | Pt= 0,861 Mat="S10" | | |
| | | Q=-459,745 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-9 | 15,750 | | | 3,000 | | Pf= -0,074 | | |
| | | | | | | | | |
| L34-9 | 15,750 | q= 0,000 50 | | 3,000 | | Pt= 0,935 Mat="S10" | | |
| | | Q=-459,745 54,8 | | 0,000 | | Pe= 0,000 | | |
| L34-10 | 15,750 | | | 3,000 | | Pf= -0,074 | | |
| | | | | | | | | |
| L34-10 | 15,750 | q= 0,000 50 | 1E=1,873 | 0,800 | | Pt= 1,009 Mat="S10" | | |
| | | Q=-459,745 54,8 | | 1,873 | | Pe= 0,000 | | |
| R2-34 | 15,750 | | | 2,673 | | Pf= -0,066 | | |
| | | | | | | | | |
| M1-1 | 13,500 | q= 0,000 50 | 1T=3,758 | 2,250 | | Pt= 3,376 Mat="S10" | | |
| | | Q=-214,202 54,8 | | 3,758 | | Pe= 0,221 | | |
| R1-1 | 15,750 | | | 6,008 | | Pf= -0,036 | | |
| | | | | | | | | |
| M1-2 | 13,500 | q= 0,000 50 | 1T=3,758 | 2,250 | | Pt= 3,370 Mat="S10" | | |
| | | Q=-175,638 54,8 | | 3,758 | | Pe= 0,221 | | |
| R1-2 | 15,750 | | | 6,008 | | Pf= -0,025 | | |
| | | | | | | | | |
| M1-3 | 13,500 | q= 0,000 50 | 1T=3,758 | 2,250 | | Pt= 3,351 Mat="S10" | | |
| | | Q=-135,228 54,8 | | 3,758 | | Pe= 0,221 | | |
| R1-3 | 15,750 | | | 6,008 | | Pf= -0,015 | | |
| | | | | | | | | |
| M1-4 | 13,500 | q= 0,000 50 | 1T=3,758 | 2,250 | | Pt= 3,317 Mat="S10" | | |
| | | Q= -99,385 54,8 | | 3,758 | | Pe= 0,221 | | |
| R1-4 | 15,750 | | | 6,008 | | Pf= -0,009 | | |

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 |
|------------------|------------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|--|-------|
| M1-5 R1-5 | 13,500 15,750 | | q= 0,000 Q= -68,970 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 3,270 Mat="S10" Pe= 0,221 Pf= -0,004 | |
| M1-6 R1-6 | 13,500 15,750 | | q= 0,000 Q= -44,382 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 3,212 Mat="S10" Pe= 0,221 Pf= -0,002 | |
| M1-7 R1-7 | 13,500 15,750 | | q= 0,000 Q= -25,660 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 3,149 Mat="S10" Pe= 0,221 Pf= -0,001 | |
| M1-8 R1-8 | 13,500 15,750 | | q= 0,000 Q= -12,559 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 3,080 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| M1-9 R1-9 | 13,500 15,750 | | q= 0,000 Q= -4,576 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 3,010 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| M1-10 R1-10 | 13,500 15,750 | | q= 0,000 Q= -0,908 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,939 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| M1-11 R1-11 | 13,500 15,750 | | q= 0,000 Q= -0,050 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,868 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,797 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,726 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,654 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,583 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,512 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,441 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,370 Mat="S10" Pe= 0,221 Pf= 0,000 | |
| 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= 2,299 Mat="S10" Pe= 0,221 Pf= 0,000 | |

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 |
|------------------|------------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| M1-20 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= 2,227 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M1-21 R1-21 | 13,500 15,750 | | q= 0,000 Q= -0,005 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,156 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M1-22 R1-22 | 13,500 15,750 | | q= 0,000 Q= -0,252 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,085 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M1-23 R1-23 | 13,500 15,750 | | q= 0,000 Q= -2,208 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,014 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M1-24 R1-24 | 13,500 15,750 | | q= 0,000 Q= -7,836 | 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" |
| M1-25 R1-25 | 13,500 15,750 | | q= 0,000 Q= -18,273 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 1,869 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M1-26 R1-26 | 13,500 15,750 | | q= 0,000 Q= -34,325 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 1,793 Pe= 0,221 Pf= -0,001 | Mat="S10" |
| M1-27 R1-27 | 13,500 15,750 | | q= 0,000 Q= -56,758 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 1,711 Pe= 0,221 Pf= -0,003 | Mat="S10" |
| M1-28 R1-28 | 13,500 15,750 | | q= 0,000 Q= -86,421 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 1,619 Pe= 0,221 Pf= -0,007 | Mat="S10" |
| M1-29 R1-29 | 13,500 15,750 | | q= 0,000 Q= -124,350 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,002 | Pt= 1,509 Pe= 0,221 Pf= -0,013 | Mat="S10" |
| M1-30 R1-30 | 13,500 15,750 | | q= 0,000 Q= -171,863 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,004 | Pt= 1,372 Pe= 0,221 Pf= -0,024 | Mat="S10" |
| M1-31 R1-31 | 13,500 15,750 | | q= 0,000 Q= 265,078 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,009 | Pt= 1,194 Pe= 0,221 Pf= 0,054 | Mat="S10" |
| M1-32 R1-32 | 13,500 15,750 | | q= 0,000 Q= 357,353 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,016 | Pt= 1,078 Pe= 0,221 Pf= 0,093 | Mat="S10" |
| M1-33 R1-33 | 13,500 15,750 | | q= 0,000 Q= 334,194 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,014 | Pt= 1,026 Pe= 0,221 Pf= 0,082 | Mat="S10" |
| M1-34 R1-34 | 13,500 15,750 | | q= 0,000 Q= 327,224 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,013 | Pt= 1,011 Pe= 0,221 Pf= 0,079 | 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 |
|------------------|------------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| M2-1 R2-1 | 13,500 15,750 | | q= 0,000 Q= 214,202 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,006 | Pt= 3,644 Pe= 0,221 Pf= 0,036 | Mat="S10" |
| M2-2 R2-2 | 13,500 15,750 | | q= 0,000 Q= 175,638 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,004 | Pt= 3,556 Pe= 0,221 Pf= 0,025 | Mat="S10" |
| M2-3 R2-3 | 13,500 15,750 | | q= 0,000 Q= 135,228 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,003 | Pt= 3,465 Pe= 0,221 Pf= 0,015 | Mat="S10" |
| M2-4 R2-4 | 13,500 15,750 | | q= 0,000 Q= 99,385 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 3,381 Pe= 0,221 Pf= 0,009 | Mat="S10" |
| M2-5 R2-5 | 13,500 15,750 | | q= 0,000 Q= 68,970 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 3,302 Pe= 0,221 Pf= 0,004 | Mat="S10" |
| M2-6 R2-6 | 13,500 15,750 | | q= 0,000 Q= 44,382 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 3,227 Pe= 0,221 Pf= 0,002 | Mat="S10" |
| M2-7 R2-7 | 13,500 15,750 | | q= 0,000 Q= 25,660 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 3,154 Pe= 0,221 Pf= 0,001 | Mat="S10" |
| M2-8 R2-8 | 13,500 15,750 | | q= 0,000 Q= 12,559 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 3,082 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M2-9 R2-9 | 13,500 15,750 | | q= 0,000 Q= 4,576 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 3,010 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M2-10 R2-10 | 13,500 15,750 | | q= 0,000 Q= 0,908 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,939 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| M2-11 R2-11 | 13,500 15,750 | | q= 0,000 Q= 0,050 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,868 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= 2,797 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= 2,726 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= 2,654 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= 2,583 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 |
|------------------|-------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| M2-16 | 13,500 | | q= 0,000 Q= 0,000 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,512 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-16 | 15,750 | | | | | | | | |
| M2-17 | 13,500 | | q= 0,000 Q= 0,000 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,441 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-17 | 15,750 | | | | | | | | |
| M2-18 | 13,500 | | q= 0,000 Q= 0,000 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,370 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-18 | 15,750 | | | | | | | | |
| M2-19 | 13,500 | | q= 0,000 Q= 0,000 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,299 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-19 | 15,750 | | | | | | | | |
| 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= 2,227 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-20 | 15,750 | | | | | | | | |
| M2-21 | 13,500 | | q= 0,000 Q= 0,005 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,156 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-21 | 15,750 | | | | | | | | |
| M2-22 | 13,500 | | q= 0,000 Q= 0,252 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,085 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-22 | 15,750 | | | | | | | | |
| M2-23 | 13,500 | | q= 0,000 Q= 2,208 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 2,014 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-23 | 15,750 | | | | | | | | |
| M2-24 | 13,500 | | q= 0,000 Q= 7,836 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0 | Pt= 1,943 Pe= 0,221 Pf= 0,000 | Mat="S10" |
| R2-24 | 15,750 | | | | | | | | |
| M2-25 | 13,500 | | q= 0,000 Q= 18,273 | 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" |
| R2-25 | 15,750 | | | | | | | | |
| M2-26 | 13,500 | | q= 0,000 Q= 34,325 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,000 | Pt= 1,802 Pe= 0,221 Pf= 0,001 | Mat="S10" |
| R2-26 | 15,750 | | | | | | | | |
| M2-27 | 13,500 | | q= 0,000 Q= 56,758 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 1,734 Pe= 0,221 Pf= 0,003 | Mat="S10" |
| R2-27 | 15,750 | | | | | | | | |
| M2-28 | 13,500 | | q= 0,000 Q= 86,421 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,001 | Pt= 1,669 Pe= 0,221 Pf= 0,007 | Mat="S10" |
| R2-28 | 15,750 | | | | | | | | |
| M2-29 | 13,500 | | q= 0,000 Q= 124,350 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,002 | Pt= 1,607 Pe= 0,221 Pf= 0,013 | Mat="S10" |
| R2-29 | 15,750 | | | | | | | | |
| M2-30 | 13,500 | | q= 0,000 Q= 171,863 | 50 54,8 | 1T=3,758 | 2,250 3,758 6,008 | C=120 0,004 | Pt= 1,551 Pe= 0,221 Pf= 0,024 | Mat="S10" |
| R2-30 | 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 |
|------------------|-------------|----------|------------------------------|---------------------|---------------------------------|-------------------------|-------------------|---------------------------------------|-----------|
| M2-31 | 13,500 | | q= 0,000 Q= 340,039 | 50 54,8 | 1T=3,758 | 2,230 3,758 | | Pt= 1,502 Pe= 0,221 | Mat="S10" |
| R2-31 | 15,750 | | | | | 6,008 | C=120 0,014 | Pf= 0,085 | |
| M2-32 | 13,500 | | q= 0,000 Q= 452,768 | 50 54,8 | 1T=3,758 | 2,230 3,758 | | Pt= 1,465 Pe= 0,221 | Mat="S10" |
| R2-32 | 15,750 | | | | | 6,008 | C=120 0,024 | Pf= 0,144 | |
| M2-33 | 13,500 | | q= 0,000 Q= 457,584 | 50 54,8 | 1T=3,758 | 2,230 3,758 | | Pt= 1,447 Pe= 0,221 | Mat="S10" |
| R2-33 | 15,750 | | | | | 6,008 | C=120 0,025 | Pf= 0,147 | |
| M2-34 | 13,500 | | q= 0,000 Q= 459,745 | 50 54,8 | 1T=3,758 | 2,230 3,758 | | Pt= 1,444 Pe= 0,221 | Mat="S10" |
| R2-34 | 15,750 | | | | | 6,008 | C=120 0,025 | Pf= 0,149 | |
| DER | 2,000 | | q= 0,000 Q=1219,378 | 100 108,2 | 1T=8,015 3E=12,023 | 34,100 32,061 | | Pt= 5,511 Pe= -0,206 | Mat="S10" |
| N6 | -0,100 | | | | 5TN=12,023 | 66,161 | C=120 0,005 | Pf= 0,362 | |
| N6 | -0,100 | | q= 0,000 Q=1219,378 | 100 108,2 | 1E=4,008 | 4,550 4,008 | | Pt= 5,355 Pe= 0,446 | Mat="S10" |
| N6-1 | 4,450 | | | | | 8,558 | C=120 0,005 | Pf= 0,047 | |
| N6-1 | 4,450 | | q= 0,000 Q= 626,763 | 100 108,2 | 1TN=2,405 | 4,500 2,405 | | Pt= 4,862 Pe= 0,441 | Mat="S10" |
| N6-2 | 8,950 | | | | | 6,905 | C=120 0,002 | Pf= 0,011 | |
| DER' | 13,500 | | q= 0,000 Q= 558,443 | 65 66,9 | 1T=5,019 5TN=0,365 | 42,300 15,093 | | Pt= 1,449 Pe= -1,333 | Mat="S10" |
| N6' | -0,100 | | | | 1E=2,509 | 58,193 | C=120 0,013 | Pf= 0,780 | |
| N6' | -0,100 | | q= 0,000 Q= 558,443 | 65 66,9 | 1E=2,509 | 4,550 2,509 | | Pt= 2,002 Pe= 0,446 | Mat="S10" |
| N6-1' | 4,450 | | | | | 7,059 | C=120 0,013 | Pf= 0,095 | |
| N6-1' | 4,450 | | q= 0,000 Q= 192,110 | 65 66,9 | 1TN=1,673 | 4,500 1,673 | | Pt= 1,461 Pe= 0,441 | Mat="S10" |
| N6-2' | 8,950 | | | | | 6,173 | C=120 0,002 | Pf= 0,011 | |
| N6-2 | 8,950 | | q= 0,000 Q= 626,763 | 50 54,8 | 1E=1,873 | 72,750 1,873 | | Pt= 4,410 Pe= 0,000 | Mat="S10" |
| N6-232 | 8,950 | | | | | 74,623 | C=120 0,044 | Pf= 3,273 | |
| N6-232 | 8,950 | 115 | q= 122,648 Q= 504,115 | 50 54,8 | | 2,300 0,000 | | Pt= 1,137 Pe= 0,000 | Mat="S10" |
| N6-233 | 8,950 | | | | | 2,300 | C=120 0,029 | Pf= 0,067 | |
| N6-233 | 8,950 | 115 | q= 118,957 Q= 385,158 | 50 54,8 | | 2,300 0,000 | | Pt= 1,070 Pe= 0,000 | Mat="S10" |
| N6-234 | 8,950 | | | | | 2,300 | C=120 0,018 | Pf= 0,041 | |
| N6-234 | 8,950 | 115 | q= 116,657 Q= 268,502 | 50 54,8 | | 2,300 0,000 | | Pt= 1,029 Pe= 0,000 | Mat="S10" |
| N6-235 | 8,950 | | | | | 2,300 | C=120 0,009 | Pf= 0,021 | |
| N6-235 | 8,950 | 115 | q= 115,459 Q= 153,043 | 50 54,8 | | 2,300 0,000 | | Pt= 1,008 Pe= 0,000 | Mat="S10" |
| N6-236 | 8,950 | | | | | 2,300 | C=120 0,003 | Pf= 0,007 | |

Pipe Information, cont.

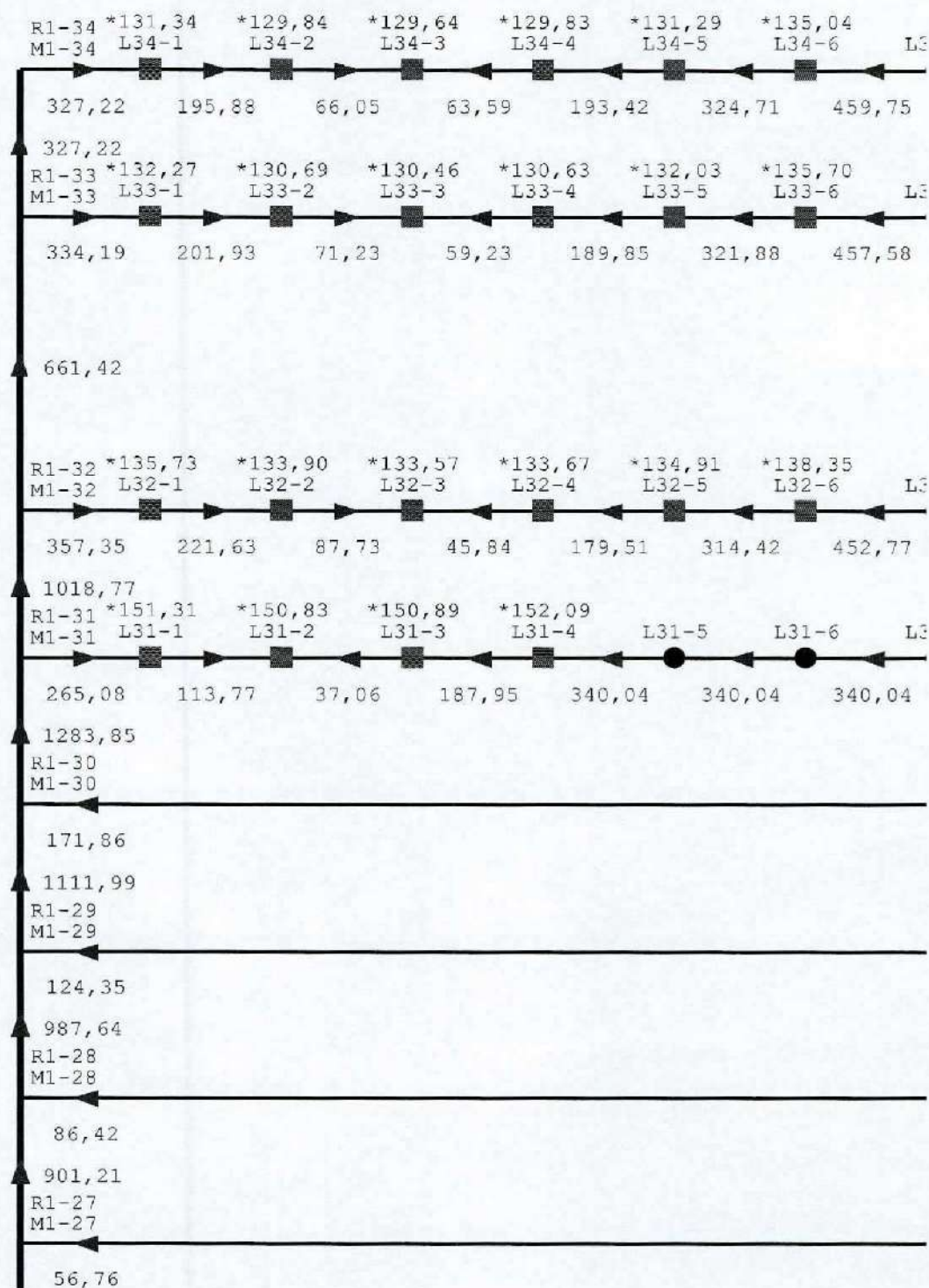
| Node 1 Node 2 | Elev [M] | K-factor | Discharge & Flow [lpm] | Nom i.d. [mm] | Fittings num & length [M] | L [M] F [M] T [M] | C factor bar/M | total (Pt) elev (Pe) frict (Pf) | Notes |
|------------------|-------------|----------|------------------------------|---------------------|---------------------------------|---------------------------|-------------------|---------------------------------------|-----------|
| N6-236 | 8,950 | 115 | q= 115,033 Q= 38,010 | 50 54,8 | | 2,300 0,000 2,300 | | Pt= 1,001 Pe= 0,000 Pf= 0,001 | Mat="S10" |
| N6-237 | 8,950 | | | | | | C=120 0,000 | | |
| N6-237 | 8,950 | 115 | q= 115,000 Q= -76,990 | 50 54,8 | | 2,300 0,000 2,300 | | Pt= 1,000 Pe= 0,000 Pf= -0,002 | Mat="S10" |
| N6-238 | 8,950 | | | | | | C=120 0,001 | | |
| N6-238 | 8,950 | 115 | q= 115,120 Q= -192,110 | 50 54,8 | | 1,350 0,000 1,350 | | Pt= 1,002 Pe= 0,000 Pf= -0,007 | Mat="S10" |
| N6-2' | 8,950 | | | | | | C=120 0,005 | | |
| N6-1 | 4,450 | | q= 0,000 Q= 592,616 | 50 54,8 | 1T=3,758 | 80,800 3,758 84,558 | | Pt= 4,862 Pe= 0,000 Pf= 3,343 | Mat="S10" |
| N6-171 | 4,450 | | | | | | C=120 0,04 | | |
| N6-171 | 4,450 | 115 | q= 141,726 Q= 450,889 | 50 54,8 | | 2,300 0,000 2,300 | | Pt= 1,519 Pe= 0,000 Pf= 0,055 | Mat="S10" |
| N6-173 | 4,450 | | | | | | C=120 0,024 | | |
| N6-173 | 4,450 | 115 | q= 139,144 Q= 177,963 | 50 54,8 | | 2,300 0,000 2,300 | | Pt= 1,464 Pe= 0,000 Pf= 0,010 | Mat="S10" |
| N6-175 | 4,450 | | | | | | C=120 0,004 | | |
| N6-175 | 4,450 | 115 | q= 138,676 Q= -94,044 | 50 54,8 | | 2,300 0,000 2,300 | | Pt= 1,454 Pe= 0,000 Pf= -0,003 | Mat="S10" |
| N6-177 | 4,450 | | | | | | C=120 0,001 | | |
| N6-177 | 4,450 | 115 | q= 138,820 Q= -366,334 | 50 54,8 | | 0,250 0,000 0,250 | | Pt= 1,457 Pe= 0,000 Pf= -0,004 | Mat="S10" |
| N6-1' | 4,450 | | | | | | C=120 0,016 | | |
| N6-171 | 4,450 | 115 | q= 141,726 Q= 0,000 | 25 26,6 | | 1,300 0,000 1,300 | | Pt= 1,519 Pe= 0,000 Pf= 0,000 | Mat="S40" |
| N6-172 | 4,450 | | | | | | C=120 0 | | |
| N6-173 | 4,450 | 115 | q= 139,144 Q= 133,783 | 25 26,6 | | 1,300 0,000 1,300 | | Pt= 1,464 Pe= 0,000 Pf= 0,111 | Mat="S40" |
| N6-174 | 4,450 | | | | | | C=120 0,085 | | |
| N6-175 | 4,450 | 115 | q= 138,676 Q= 133,331 | 25 26,6 | | 1,300 0,000 1,300 | | Pt= 1,454 Pe= 0,000 Pf= 0,110 | Mat="S40" |
| N6-176 | 4,450 | | | | | | C=120 0,085 | | |
| N6-177 | 4,450 | 115 | q= 138,820 Q= 133,470 | 25 26,6 | | 1,300 0,000 1,300 | | Pt= 1,457 Pe= 0,000 Pf= 0,110 | Mat="S40" |
| N6-178 | 4,450 | | | | | | C=120 0,085 | | |

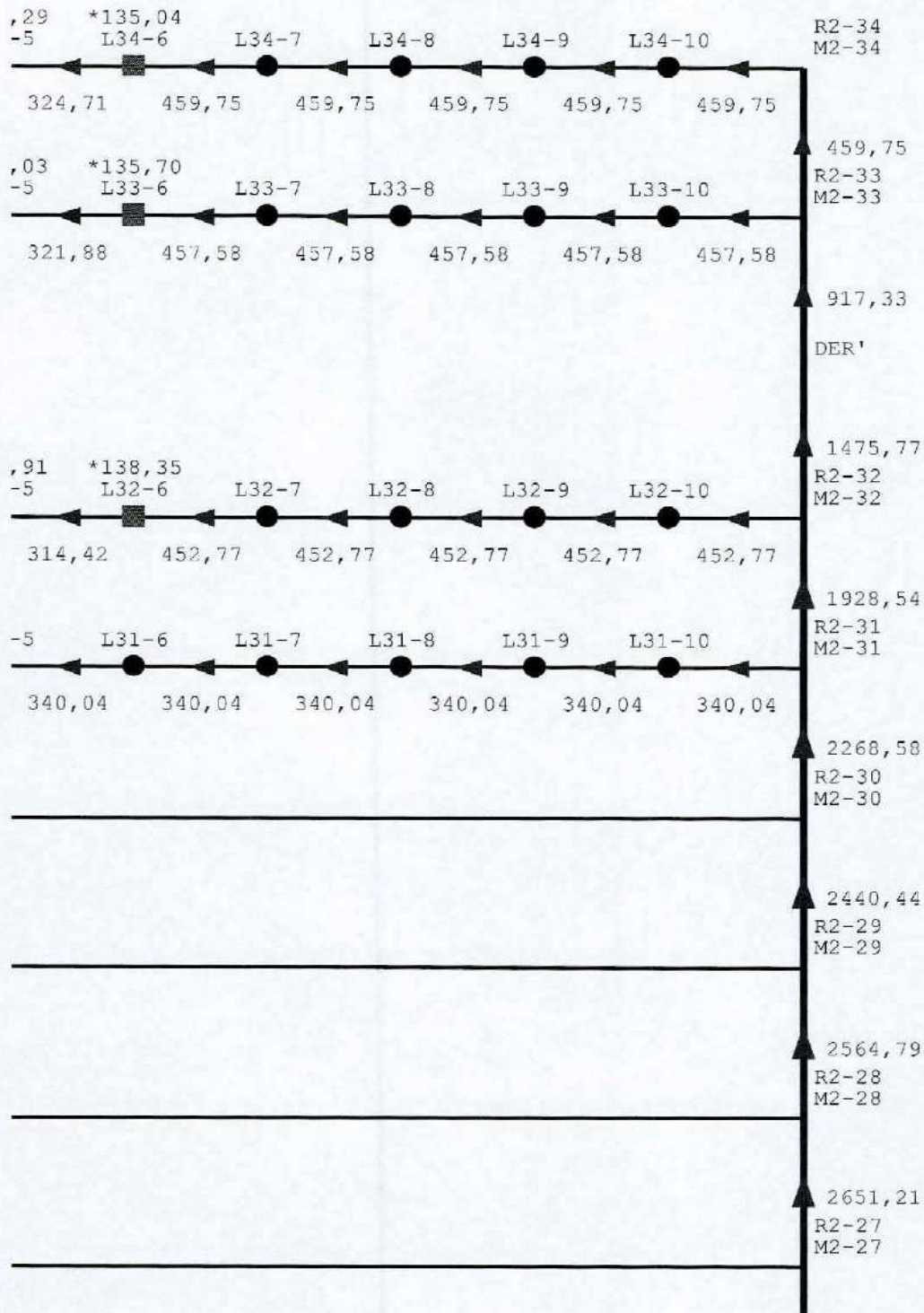
Material Codes**Pipe Material**

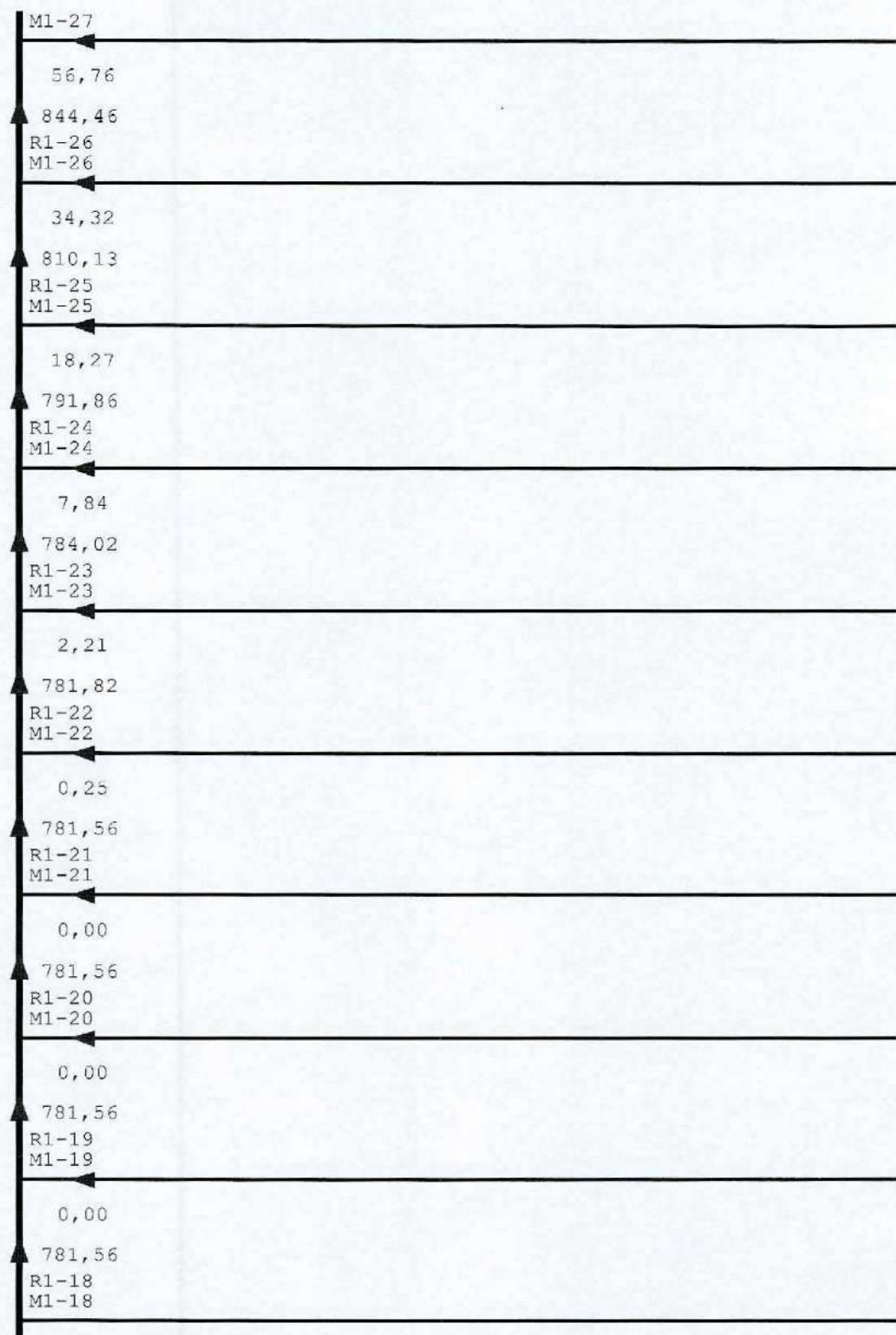
S10 - Schedule 10 Steel
S40 - Schedule 40 Steel

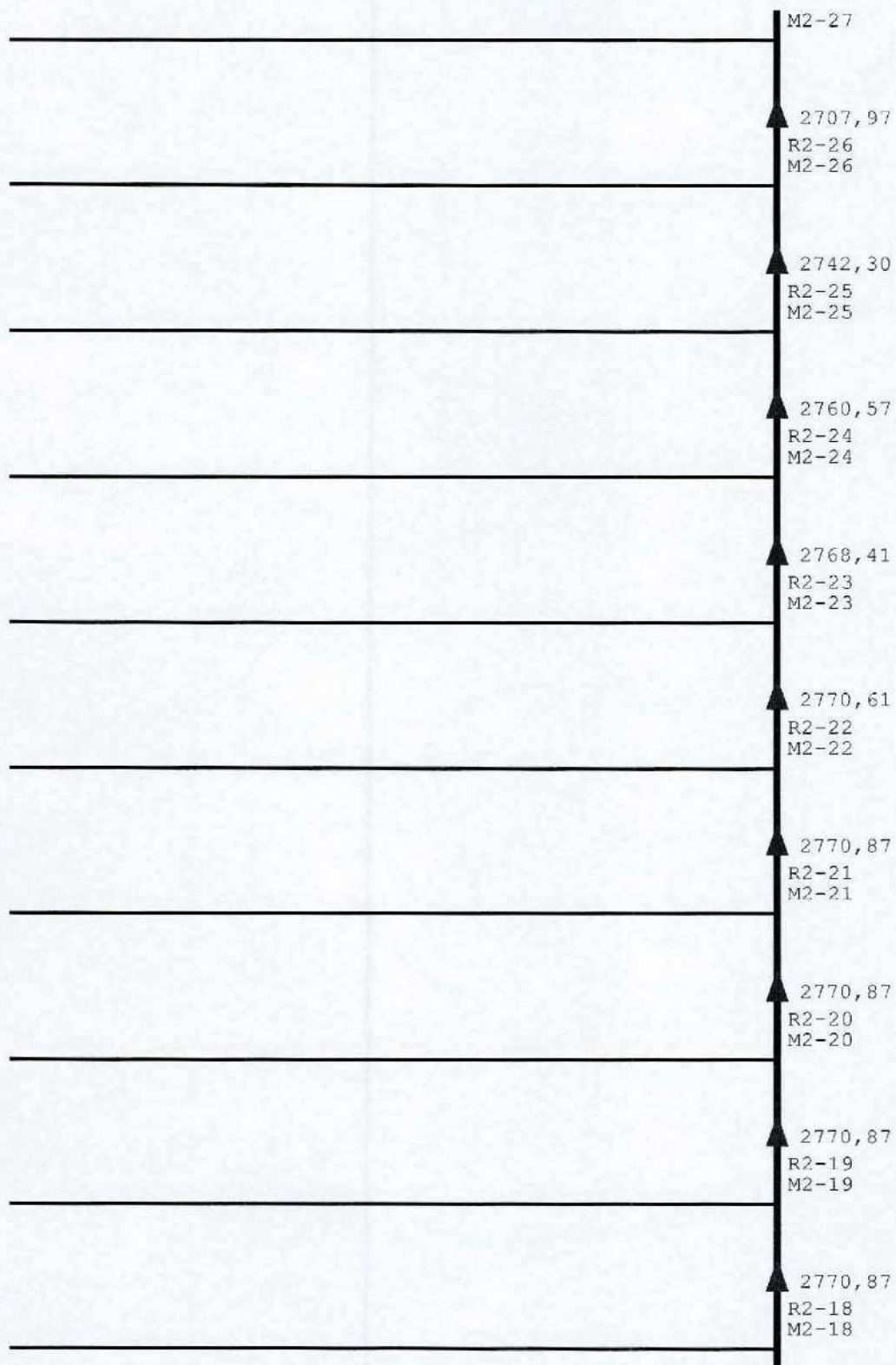
Fittings

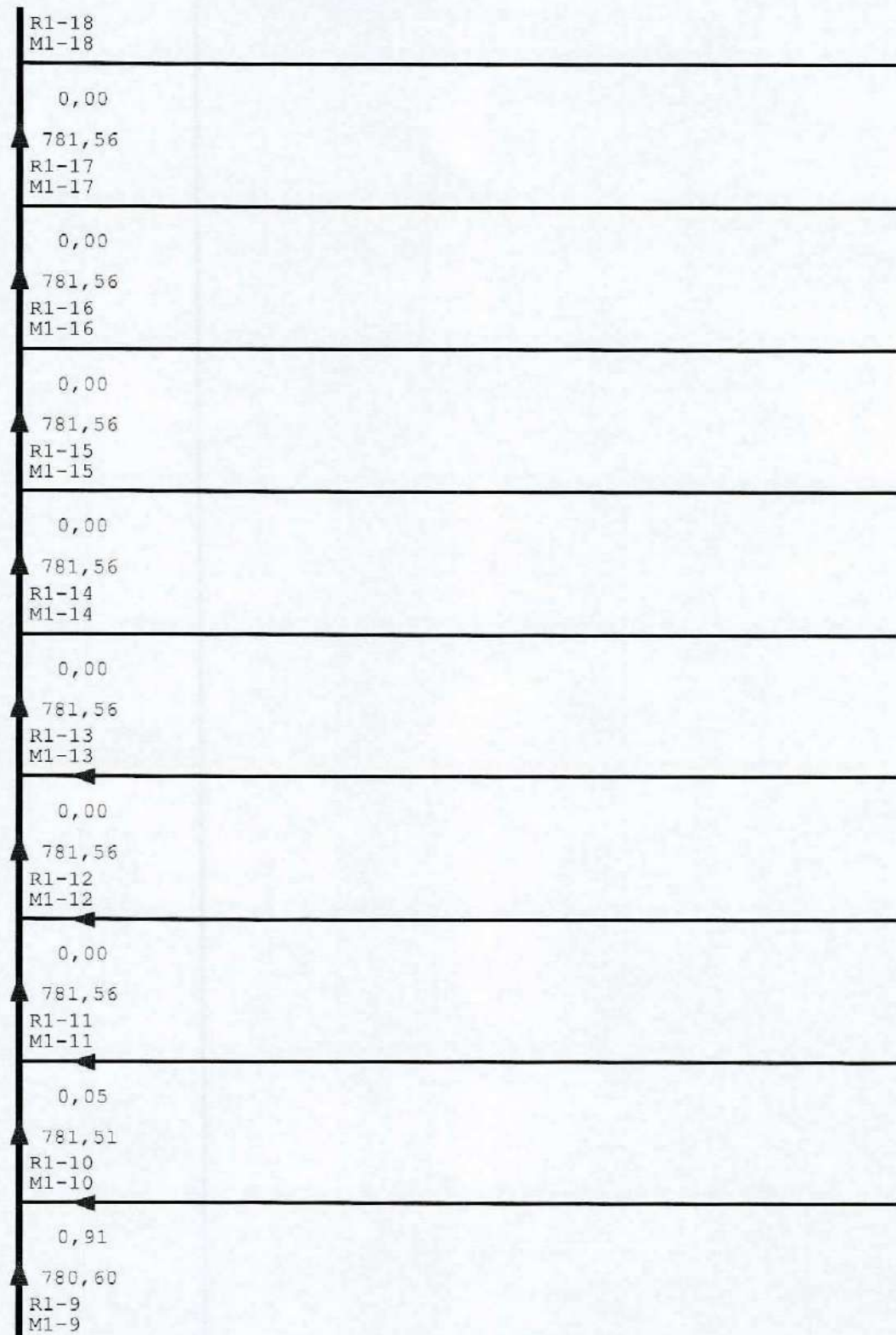
A - Alarm Valve
B - Butterfly Valve
C - Check Valve
E - Standard 90 degree elbow
G - Gate Valve
T - Tee - Flow turn 90 degrees
TN - Tee - Straight thru path

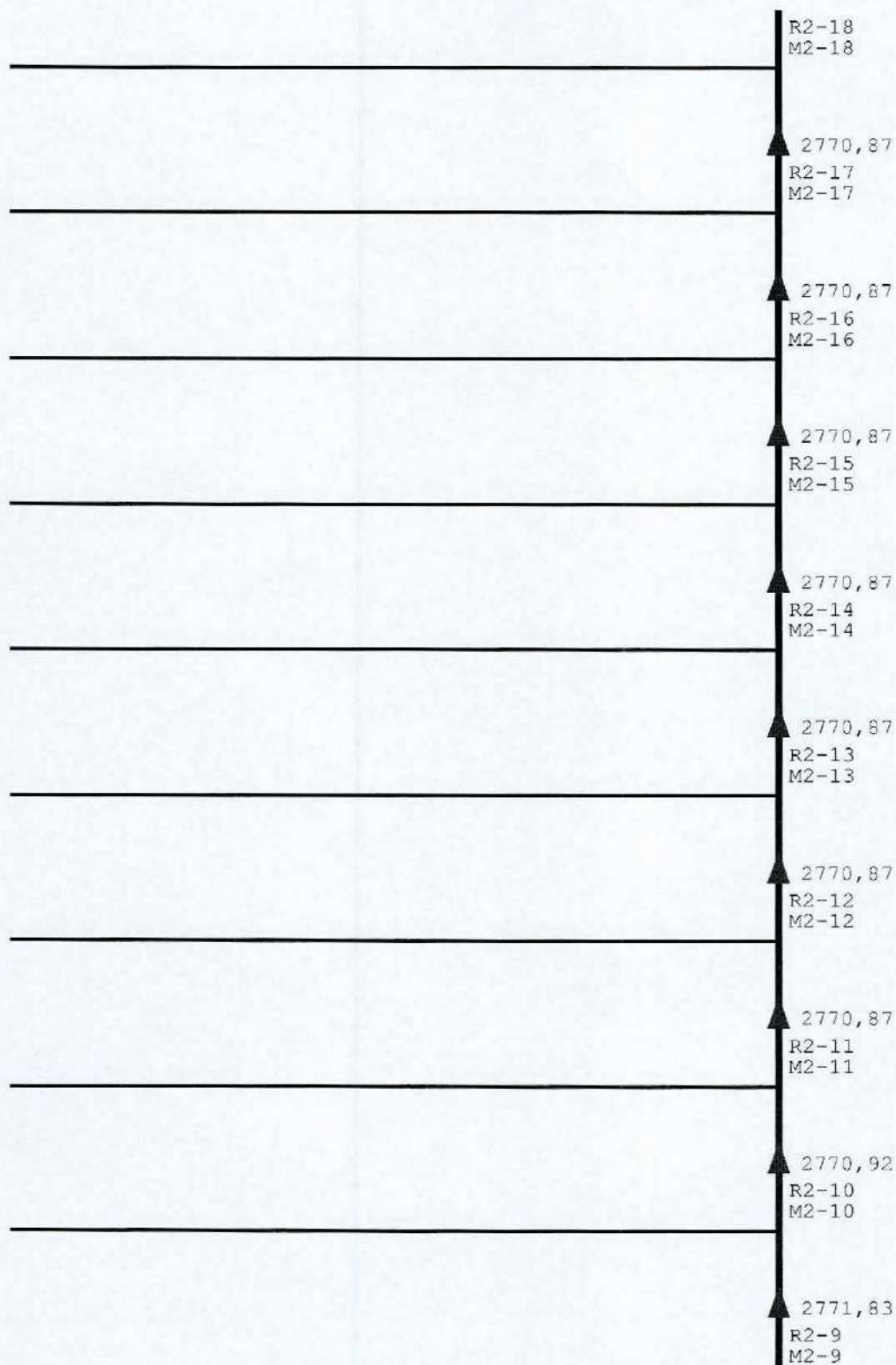
Flow Diagram (1 of 8)

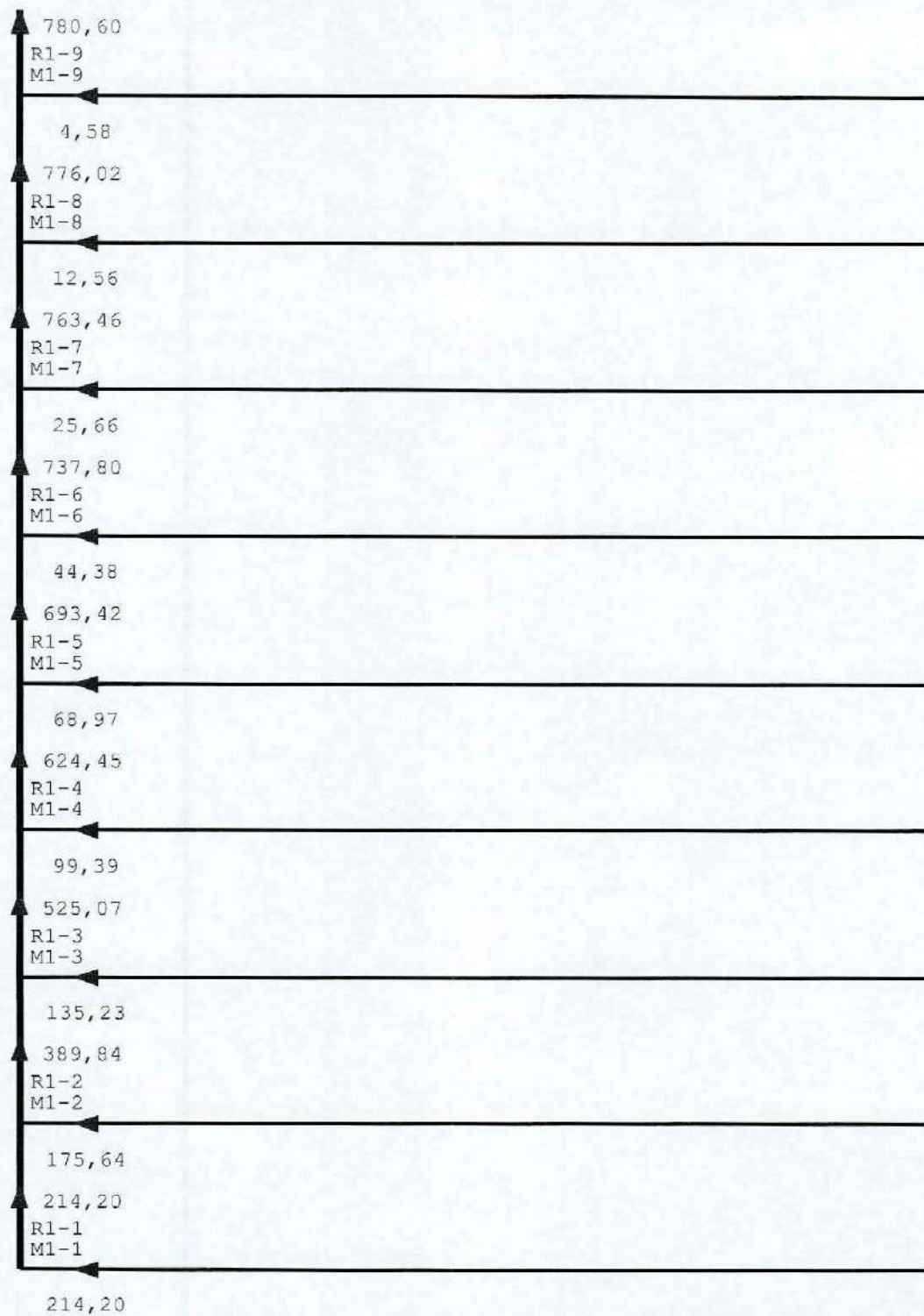
Flow Diagram (2 of 8)

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)