# CE372

# Lab Report #1

# Head Losses In Pipes

# 19.10.2011

# Measurements

# 1 2 3 4

h1 214 320 355 450

h2 143 230 280 341

h3 122 212 258 315

h4 91 177 225 279

h5 92 177 224 278

h6 105 200 235 310

h7 103 205 235 310

h8 69 166 198 260

h9 68 166 200 260

h10 51 150 183 245

V 1.00E+007 1.00E+007 1.00E+007 1.00E+007

T 33 28 33 26

Q 3.03E+05 3.57E+05 3.03E+05 3.85E+05

# Velocity

1 2 3 4 Area

1 762.13 898.23 762.13 967.32 3.98E+02

2 762.13 898.23 762.13 967.32 3.98E+02

3 762.13 898.23 762.13 967.32 3.98E+02

4 762.13 898.23 762.13 967.32 3.98E+02

5 762.13 898.23 762.13 967.32 3.98E+02

6 440.36 519.00 440.37 558.92 6.88E+02

7 440.36 519.00 440.37 558.92 6.88E+02

8 762.13 898.23 762.13 967.32 3.98E+02

9 762.13 898.23 762.13 967.32 3.98E+02

10 762.13 898.23 762.13 967.32 3.98E+02

# Velocity Head

1 2 3 4

1 29.60 41.12 29.60 47.69

2 29.60 41.12 29.60 47.69

3 29.60 41.12 29.60 47.69

4 29.60 41.12 29.60 47.69

5 29.60 41.12 29.60 47.69

6 9.88 13.73 9.88 15.92

7 9.88 13.73 9.88 15.92

8 29.60 41.12 29.60 47.69

9 29.60 41.12 29.60 47.69

10 29.60 41.12 29.60 47.69

# Total Head

1 2 3 4

1 243.60 361.12 384.60 497.69

2 172.60 271.12 309.60 388.69

3 151.60 253.12 287.60 362.69

4 120.60 218.12 254.60 326.69

5 121.60 218.12 253.60 325.69

6 114.88 213.73 244.88 325.92

7 112.88 218.73 244.88 325.92

8 98.60 207.12 227.60 307.69

9 97.60 207.12 229.60 307.69

10 80.60 191.12 212.60 292.69

# Square of Discharge Versus Head Loss Graph

# Minor Losses At Elbows & Minor loss coefficients

1st 2nd 3rd 4th

Head loss 1-2: 71 90 75 109

Head loss 3-4: 31 35 33 36

Head loss 8-9: 17 16 17 15

Km(1-2): 2.40E+00 2.19E+00 2.53E+00 2.29E+00

Km(3-4): 1.05E+00 8.51E-01 1.11E+00 7.55E-01

Km(8-9): 5.74E-01 3.89E-01 5.74E-01 3.15E-01

1 2 3 4

Minor losses across the expansion 6.72 4.39 8.72 -0.23

Minor loss derived from the equation 5.28 7.33 5.28 8.50

Minor loss across the contraction 14.28 11.61 17.28 18.23

# Conclusion

Head losses and minor losses were calculated from the measurements and when they were compared to the ones from the formula some diffrences were seen though it should have been same. But real life is not always perfect there are lots of errors. For example our friend reading the numbers could’ve read wrong and the pipes were really dirty, they were full of dirt and that affected the results.

All in all the results we found were reasonable.