

| Trial 1     | 12.7 |           |             |             |             |             |          |              |      |
|-------------|------|-----------|-------------|-------------|-------------|-------------|----------|--------------|------|
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           | h           | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.5       | 1277607.34  | 0.015575641 | 8.85        | 55.3125     | 44.25    |              | -9%  |
|             | b    | 0.51      | 764000.7686 | 0.019529811 | 1648.7      | 428.82687   | 1681.674 |              | -42% |
|             |      |           |             |             | Summations: | -373.51437  | 1725.924 | -0.216414147 |      |
|             |      |           |             |             |             |             |          |              |      |
| Trial 2     |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           |             | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.6       | 1328711.634 | 0.01555381  | 8.85        | 59.826      | 46.02    |              | -6%  |
|             | b    | 0.41      | 614196.6963 | 0.019642309 | 1648.7      | 277.14647   | 1351.934 |              | -38% |
|             |      |           |             |             | Summations: | -217.32047  | 1397.954 | -0.155456095 |      |
|             |      |           |             |             |             |             |          |              |      |
| Trial 3     |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           |             | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.7       | 1379815.927 | 0.015533433 | 8.85        | 64.5165     | 47.79    |              | -3%  |
|             | b    | 0.31      | 464392.624  | 0.019819362 | 1648.7      | 158.44007   | 1022.194 |              | -28% |
|             |      |           |             |             | Summations: | -93.92357   | 1069.984 | -0.08778035  |      |
| Trial 4     |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           |             | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.8       | 1430920.221 | 0.015514365 | 8.85        | 69.384      | 49.56    |              | 0%   |
|             | b    | 0.21      | 314588.5518 | 0.020142757 | 1648.7      | 72.70767    | 692.454  |              | -2%  |
|             |      |           |             |             | Summations: | -3.32367    | 742.014  | -0.004479255 |      |
|             |      |           |             |             |             |             |          |              |      |
| Trial 5     |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           |             | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.81      | 1436030.65  | 0.015512526 | 8.85        | 69.880485   | 49.737   |              | 0%   |
|             | b    | 0.2       | 299608.1445 | 0.020190705 | 1648.7      | 65.948      | 659.48   |              | 3%   |
|             |      |           |             |             | Summations: | 3.932485    | 709.217  | 0.005544826  |      |
|             |      |           |             |             |             |             |          |              |      |
| Trial 6     |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | NR          | f           | k           |             | 2kQ      | DQ           | %Chg |
| 1           | a    | 2.805     | 1433475.436 | 0.015513444 | 8.85        | 69.63202125 | 49.6485  |              | 0%   |
|             | b    | 0.205     | 307098.3482 | 0.020166212 | 1648.7      | 69.2866175  | 675.967  |              | 0%   |
|             |      |           |             |             | Summations: | 0.34540375  | 725.6155 | 0.000476015  |      |
| Final flows |      |           |             |             |             |             |          |              |      |
| Circuit     | Pipe | Q (ft³/s) | Q (gpm)     |             |             |             |          |              |      |
| 1           | a    | 2.805     | 1258.97078  |             |             |             |          |              |      |
|             | b    | 0.205     | 92.01034219 |             |             |             |          |              |      |
|             |      |           | 1350.981122 |             |             |             |          |              |      |
|             |      | Original  | 1350        |             |             |             |          |              |      |

| Trial 1     | 12.8 |          |          |            |           |          |           |    |       |
|-------------|------|----------|----------|------------|-----------|----------|-----------|----|-------|
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         | h        | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.00917  | 160475   | 0.021014   | 7167.8    | 0.602732 | 131.4575  |    | -24%  |
|             | b    | 0.005    | 87500    | 0.022189   | 342883.2  | 8.572079 | 3428.832  |    | -45%  |
|             |      |          |          | Summations | -7.969347 | 3560.289 | -0.002238 |    |       |
|             |      |          |          |            |           |          |           |    |       |
| Trial 2     |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         |          | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.01     | 175000   | 0.02088    | 7167.8    | 0.71678  | 143.356   |    | -18%  |
|             | b    | 0.0042   | 73500    | 0.022632   | 342883.2  | 6.048459 | 2880.219  |    | -42%  |
|             |      |          |          | Summations | -5.331679 | 3023.575 | -0.001763 |    |       |
|             |      |          |          |            |           |          |           |    |       |
| Trial 3     |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         |          | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.1167   | 2042250  | 0.019247   | 7167.8    | 97.61748 | 1672.965  |    | 24%   |
|             | b    | 0.0025   | 43750    | 0.024269   | 342883.2  | 2.14302  | 1714.416  |    | 1127% |
|             |      |          |          | Summations | 95.47446  | 3387.38  | 0.028185  |    |       |
| Trial 4     |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         |          | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.01083  | 189525   | 0.020764   | 7167.8    | 0.840703 | 155.2545  |    | -11%  |
|             | b    | 0.0033   | 57750    | 0.02333    | 342883.2  | 3.733998 | 2263.029  |    | -36%  |
|             |      |          |          | Summations | -2.893294 | 2418.283 | -0.001196 |    |       |
|             |      |          |          |            |           |          |           |    |       |
| Trial 5     |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         |          | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.01125  | 196875   | 0.020712   | 7167.8    | 0.907175 | 161.2755  |    | -8%   |
|             | b    | 0.002917 | 51047.5  | 0.023729   | 342883.2  | 2.917555 | 2000.38   |    | -32%  |
|             |      |          |          | Summations | -2.01038  | 2161.656 | -0.00093  |    |       |
|             |      |          |          |            |           |          |           |    |       |
| Trial 6     |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | NR       | f          | k         |          | 2kQ       | DQ | %Chg  |
| 1           | a    | 0.011583 | 202702.5 | 0.020672   | 7167.8    | 0.961674 | 166.0493  |    | -6%   |
|             | b    | 0.002583 | 45202.5  | 0.02415    | 342883.2  | 2.287678 | 1771.334  |    | -26%  |
|             |      |          |          | Summations | -1.326004 | 1937.384 | -0.000684 |    |       |
| Final flows |      |          |          |            |           |          |           |    |       |
| Circuit     | Pipe | Q (m³/s) | Q (lpm)  |            |           |          |           |    |       |
| 1           | a    | 0.011583 | 694.98   |            |           |          |           |    |       |
|             | b    | 0.002583 | 154.98   |            |           |          |           |    |       |
|             |      |          | 849.96   |            |           |          |           |    |       |
|             |      | Original | 850      |            |           |          |           |    |       |