

SINGLE WALL FLOW CHART

| Pipe Diameter Inches | Product Type | Mannings Value n | Slope ft./100ft | Velocity ft./sec | Flow cu.Ft./sec | Flow GPM | Acres Drained | | | | | | |
|-------------------------|--------------|---------------------|--------------------|---------------------|--------------------|-------------|----------------------|-------|-------|------|------|------|------|
| | | | | | | | Drainage Coefficient | | | | | | |
| | | | | | | | 0.25 | 0.375 | 0.5 | 0.75 | 1 | 1.5 | 2 |
| 4 | SWP | 0.015 | 0.15 | 0.73 | 0.064 | 29 | 6 | 4.1 | 3 | 2 | 1.5 | 1 | 0.8 |
| 4 | SWP | 0.015 | 0.2 | 0.85 | 0.074 | 33 | 7 | 4.7 | 3.5 | 2.3 | 1.8 | 1.2 | 0.9 |
| 4 | SWP | 0.015 | 0.3 | 1.04 | 0.09 | 41 | 9 | 5.7 | 4.3 | 2.9 | 2.1 | 1.4 | 1.1 |
| 4 | SWP | 0.015 | 0.4 | 1.2 | 0.104 | 47 | 10 | 6.6 | 5 | 3.3 | 2.5 | 1.7 | 1.2 |
| 4 | SWP | 0.015 | 0.5 | 1.34 | 0.117 | 52 | 11 | 7.4 | 5.5 | 3.7 | 2.8 | 1.8 | 1.4 |
| 4 | SWP | 0.015 | 1 | 1.89 | 0.165 | 74 | 16 | 10.5 | 7.8 | 5.2 | 3.9 | 2.6 | 2 |
| 4 | SWP | 0.015 | 2 | 2.67 | 0.233 | 105 | 22 | 14.8 | 11.1 | 7.4 | 5.5 | 3.7 | 2.8 |
| 4 | SWP | 0.015 | 3 | 3.27 | 0.286 | 129 | 27 | 18.1 | 13.6 | 9.1 | 6.8 | 4.5 | 3.4 |
| 5 | SWP | 0.015 | 0.1 | 0.69 | 0.09 | 43 | 9 | 6 | 4.5 | 3 | 2.2 | 1.5 | 1.1 |
| 5 | SWP | 0.015 | 0.2 | 0.98 | 0.13 | 60 | 13 | 8.5 | 6.4 | 4.2 | 3.2 | 2.1 | 1.6 |
| 5 | SWP | 0.015 | 0.3 | 1.2 | 0.16 | 74 | 16 | 10.4 | 7.8 | 5.2 | 3.9 | 2.6 | 1.9 |
| 5 | SWP | 0.015 | 0.4 | 1.39 | 0.19 | 85 | 18 | 12 | 9 | 6 | 4.5 | 3 | 2.2 |
| 5 | SWP | 0.015 | 0.5 | 1.55 | 0.21 | 95 | 20 | 13.4 | 10.1 | 6.7 | 5 | 3.4 | 2.5 |
| 5 | SWP | 0.015 | 1 | 2.19 | 0.3 | 135 | 28 | 19 | 14.2 | 9.5 | 7.1 | 4.7 | 3.6 |
| 5 | SWP | 0.015 | 2 | 3.1 | 0.42 | 190 | 40 | 26.8 | 20.1 | 13.4 | 10.1 | 6.7 | 5 |
| 5 | SWP | 0.015 | 3 | 3.8 | 0.52 | 233 | 49 | 32.8 | 24.6 | 16.4 | 12.3 | 8.2 | 6.2 |
| 6 | SWP | 0.015 | 0.1 | 0.78 | 0.15 | 69 | 15 | 9.8 | 7.3 | 4.9 | 3.7 | 2.4 | 1.8 |
| 6 | SWP | 0.015 | 0.2 | 1.11 | 0.22 | 98 | 21 | 13.8 | 10.3 | 6.9 | 5.2 | 3.4 | 2.6 |
| 6 | SWP | 0.015 | 0.3 | 1.36 | 0.27 | 120 | 25 | 16.9 | 12.7 | 8.4 | 6.3 | 4.2 | 3.2 |
| 6 | SWP | 0.015 | 0.4 | 1.57 | 0.31 | 138 | 29 | 19.5 | 14.6 | 9.8 | 7.3 | 4.9 | 3.7 |
| 6 | SWP | 0.015 | 0.5 | 1.75 | 0.34 | 155 | 33 | 21.8 | 16.4 | 10.9 | 8.2 | 5.5 | 4.1 |
| 6 | SWP | 0.015 | 1 | 2.48 | 0.49 | 219 | 46 | 30.8 | 23.1 | 15.4 | 11.6 | 7.7 | 5.8 |
| 6 | SWP | 0.015 | 2 | 3.5 | 0.69 | 310 | 65 | 43.6 | 32.7 | 21.8 | 16.4 | 10.9 | 8.2 |
| 6 | SWP | 0.015 | 3 | 4.29 | 0.84 | 379 | 80 | 53.4 | 40.1 | 26.7 | 20 | 13.4 | 10 |
| 8 | SWP | 0.015 | 0.1 | 0.95 | 0.33 | 149 | 32 | 21 | 15.8 | 10.5 | 7.9 | 5.3 | 3.9 |
| 8 | SWP | 0.015 | 0.2 | 1.34 | 0.47 | 211 | 45 | 29.7 | 22.3 | 14.9 | 11.1 | 7.4 | 5.6 |
| 8 | SWP | 0.015 | 0.3 | 1.64 | 0.57 | 258 | 55 | 36.4 | 27.3 | 18.2 | 13.6 | 9.1 | 6.8 |
| 8 | SWP | 0.015 | 0.4 | 1.9 | 0.66 | 298 | 63 | 42 | 31.5 | 21 | 15.8 | 10.5 | 7.9 |
| 8 | SWP | 0.015 | 0.5 | 2.12 | 0.74 | 333 | 70 | 47 | 35.2 | 23.5 | 17.6 | 11.7 | 8.8 |
| 8 | SWP | 0.015 | 1 | 3 | 1.05 | 471 | 100 | 66.4 | 49.8 | 33.2 | 24.9 | 16.6 | 12.5 |
| 8 | SWP | 0.015 | 2 | 4.24 | 1.48 | 667 | 141 | 93.9 | 70.4 | 47 | 35.2 | 23.5 | 17.6 |
| 8 | SWP | 0.015 | 3 | 5.2 | 1.81 | 817 | 173 | 115 | 86.3 | 57.5 | 43.1 | 28.8 | 21.6 |
| 10 | SWP | 0.017 | 0.1 | 0.97 | 0.53 | 239 | 50 | 33.6 | 25.2 | 16.8 | 12.6 | 8.4 | 6.3 |
| 10 | SWP | 0.017 | 0.2 | 1.37 | 0.75 | 337 | 71 | 47.5 | 35.6 | 23.8 | 17.8 | 11.9 | 8.9 |
| 10 | SWP | 0.017 | 0.3 | 1.68 | 0.92 | 413 | 87 | 58.2 | 43.7 | 29.1 | 21.8 | 14.6 | 10.9 |
| 10 | SWP | 0.017 | 0.4 | 1.94 | 1.06 | 477 | 101 | 67.2 | 50.4 | 33.6 | 25.2 | 16.8 | 12.6 |
| 10 | SWP | 0.017 | 0.5 | 2.17 | 1.19 | 533 | 113 | 75.1 | 56.4 | 37.6 | 28.2 | 18.8 | 14.1 |
| 10 | SWP | 0.017 | 1 | 3.07 | 1.68 | 754 | 159 | 106.3 | 79.7 | 53.1 | 39.8 | 26.6 | 19.9 |
| 10 | SWP | 0.017 | 2 | 4.35 | 2.37 | 1067 | 225 | 150.3 | 112.7 | 75.1 | 56.4 | 37.6 | 28.2 |
| 10 | SWP | 0.017 | 3 | 5.32 | 2.9 | 1306 | 276 | 184 | 138 | 92 | 69 | 46 | 34.5 |

| | | | | | | | | | | | | | |
|----|-----|-------|-----|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| 12 | SWP | 0.017 | 0.1 | 1.1 | 0.86 | 388 | 82 | 54.6 | 41 | 27.3 | 20.5 | 13.7 | 10.2 |
| 12 | SWP | 0.017 | 0.2 | 1.55 | 1.22 | 549 | 116 | 77.3 | 58 | 38.6 | 29 | 19.3 | 14.5 |
| 12 | SWP | 0.017 | 0.3 | 1.9 | 1.49 | 672 | 142 | 94.6 | 71 | 47.3 | 35.5 | 23.7 | 17.7 |
| 12 | SWP | 0.017 | 0.4 | 2.19 | 1.72 | 776 | 164 | 109.3 | 82 | 54.6 | 41 | 27.3 | 20.5 |
| 12 | SWP | 0.017 | 0.5 | 2.45 | 1.93 | 867 | 183 | 122.2 | 91.6 | 61.1 | 45.8 | 30.5 | 22.9 |
| 12 | SWP | 0.017 | 1 | 3.47 | 2.73 | 1227 | 259 | 172.8 | 129.6 | 86.4 | 64.8 | 43.2 | 32.4 |
| 12 | SWP | 0.017 | 2 | 4.91 | 3.85 | 1735 | 367 | 244.4 | 183.3 | 122.2 | 91.6 | 61.1 | 45.8 |
| 12 | SWP | 0.017 | 3 | 6.01 | 4.72 | 2124 | 449 | 299.3 | 224.5 | 149.6 | 112.2 | 74.8 | 56.1 |
| 15 | SWP | 0.018 | 0.1 | 1.2 | 1.48 | 684 | 140 | 93.6 | 70.2 | 46.8 | 35.1 | 23.4 | 17.5 |
| 15 | SWP | 0.018 | 0.2 | 1.7 | 2.09 | 939 | 199 | 132.3 | 99.3 | 66.2 | 49.6 | 33.1 | 24.8 |
| 15 | SWP | 0.018 | 0.3 | 2.08 | 2.56 | 1151 | 243 | 162.1 | 121.6 | 81 | 60.8 | 40.5 | 30.14 |
| 15 | SWP | 0.018 | 0.4 | 2.41 | 2.95 | 1328 | 281 | 187.2 | 140.4 | 93.6 | 70.2 | 46.8 | 35.1 |
| 15 | SWP | 0.018 | 0.5 | 2.69 | 3.3 | 1485 | 314 | 209.2 | 156.9 | 104.6 | 78.5 | 52.3 | 39.2 |
| 15 | SWP | 0.018 | 1 | 3.8 | 4.67 | 2101 | 444 | 295.9 | 221.9 | 148 | 111 | 74 | 55.5 |
| 15 | SWP | 0.018 | 2 | 5.38 | 6.6 | 2971 | 628 | 418.5 | 313.9 | 209.2 | 156.9 | 104.6 | 78.5 |
| 15 | SWP | 0.018 | 3 | 6.59 | 8.08 | 3638 | 769 | 512.6 | 384.4 | 256.3 | 192.2 | 128.1 | 96.1 |
| 18 | SWP | 0.02 | 0.1 | 1.22 | 2.16 | 972 | 205 | 137 | 102.7 | 68.5 | 51.4 | 34.2 | 25.7 |
| 18 | SWP | 0.02 | 0.2 | 1.73 | 3.06 | 1375 | 291 | 193.7 | 145.3 | 96.8 | 72.6 | 48.8 | 36.3 |
| 18 | SWP | 0.02 | 0.3 | 2.12 | 3.74 | 1684 | 356 | 237.2 | 177.9 | 118.6 | 89 | 59.3 | 44.5 |
| 18 | SWP | 0.02 | 0.4 | 2.45 | 4.32 | 1944 | 411 | 273.9 | 205.4 | 137 | 102.7 | 68.5 | 51.4 |
| 18 | SWP | 0.02 | 0.5 | 2.73 | 4.83 | 2174 | 459 | 306.3 | 229.7 | 153.1 | 114.8 | 76.6 | 57.4 |
| 18 | SWP | 0.02 | 1 | 3.87 | 6.83 | 3074 | 650 | 433.1 | 324.8 | 216.6 | 162.4 | 108.3 | 81.2 |
| 18 | SWP | 0.02 | 2 | 5.47 | 9.56 | 4348 | 919 | 612.5 | 459.4 | 306.3 | 229.7 | 153.1 | 114.8 |
| 18 | SWP | 0.02 | 3 | 6.7 | 11.83 | 5325 | 1125 | 750.2 | 562.6 | 375.1 | 281.3 | 187.5 | 140.7 |
| 24 | SWP | 0.02 | 0.1 | 1.48 | 4.65 | 2094 | 442 | 295 | 221 | 147 | 111 | 74 | 55 |
| 24 | SWP | 0.02 | 0.2 | 2.09 | 6.58 | 2961 | 626 | 417 | 313 | 209 | 156 | 104 | 78 |
| 24 | SWP | 0.02 | 0.3 | 2.57 | 8.06 | 3627 | 766 | 511 | 383 | 255 | 192 | 128 | 96 |
| 24 | SWP | 0.02 | 0.4 | 2.96 | 9.31 | 4188 | 885 | 590 | 442 | 295 | 221 | 147 | 111 |
| 24 | SWP | 0.02 | 0.5 | 3.31 | 10.4 | 4682 | 989 | 660 | 495 | 330 | 247 | 165 | 124 |
| 24 | SWP | 0.02 | 1 | 4.68 | 14.71 | 6622 | 1399 | 933 | 700 | 466 | 350 | 233 | 175 |
| 24 | SWP | 0.02 | 2 | 6.62 | 20.81 | 9364 | 1979 | 1319 | 989 | 660 | 495 | 330 | 247 |
| 24 | SWP | 0.02 | 3 | 8.11 | 25.49 | 11469 | 2424 | 1616 | 1212 | 808 | 606 | 404 | 303 |