## Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 18 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max Σ Outflow (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|---|---|
| 15 min Summer | 98.297 | 0.297 | 0.0 | 2.7 | 2.7 | 4.2 | O K |
| 30 min Summer | 98.353 | 0.353 | 0.0 | 2.7 | 2.7 | 5.0 | O K |
| 60 min Summer | 98.359 | 0.359 | 0.0 | 2.7 | 2.7 | 5.1 | O K |
| 120 min Summer | 98.308 | 0.308 | 0.0 | 2.7 | 2.7 | 4.4 | O K |
| 180 min Summer | 98.235 | 0.235 | 0.0 | 2.7 | 2.7 | 3.3 | O K |
| 240 min Summer | 98.176 | 0.176 | 0.0 | 2.7 | 2.7 | 2.5 | O K |
| 360 min Summer | 98.108 | 0.108 | 0.0 | 2.7 | 2.7 | 1.5 | O K |
| 480 min Summer | 98.088 | 0.088 | 0.0 | 2.3 | 2.3 | 1.3 | O K |
| 600 min Summer | 98.077 | 0.077 | 0.0 | 2.0 | 2.0 | 1.1 | O K |
| 720 min Summer | 98.070 | 0.070 | 0.0 | 1.8 | 1.8 | 1.0 | O K |
| 960 min Summer | 98.060 | 0.060 | 0.0 | 1.4 | 1.4 | 0.9 | O K |
| 1440 min Summer | 98.050 | 0.050 | 0.0 | 1.1 | 1.1 | 0.7 | O K |
| 2160 min Summer | 98.042 | 0.042 | 0.0 | 0.8 | 0.8 | 0.6 | O K |
| 2880 min Summer | 98.037 | 0.037 | 0.0 | 0.6 | 0.6 | 0.5 | O K |
| 4320 min Summer | 98.031 | 0.031 | 0.0 | 0.5 | 0.5 | 0.4 | O K |
| 5760 min Summer | 98.027 | 0.027 | 0.0 | 0.4 | 0.4 | 0.4 | O K |
| 7200 min Summer | 98.025 | 0.025 | 0.0 | 0.3 | 0.3 | 0.4 | O K |
| 8640 min Summer | 98.023 | 0.023 | 0.0 | 0.3 | 0.3 | 0.3 | O K |
| 10080 min Summer | 98.022 | 0.022 | 0.0 | 0.2 | 0.2 | 0.3 | O K |
| 15 min Winter | 98.341 | 0.341 | 0.0 | 2.7 | 2.7 | 4.9 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 15 min Summer | 116.192 | 0.0 | 6.1 | 18 |
| 30 min Summer | 77.964 | 0.0 | 8.2 | 27 |
| 60 min Summer | 49.937 | 0.0 | 10.5 | 44 |
| 120 min Summer | 30.897 | 0.0 | 13.0 | 78 |
| 180 min Summer | 22.993 | 0.0 | 14.5 | 108 |
| 240 min Summer | 18.515 | 0.0 | 15.5 | 138 |
| 360 min Summer | 13.595 | 0.0 | 17.1 | 192 |
| 480 min Summer | 10.918 | 0.0 | 18.3 | 250 |
| 600 min Summer | 9.202 | 0.0 | 19.3 | 310 |
| 720 min Summer | 7.998 | 0.0 | 20.1 | 370 |
| 960 min Summer | 6.405 | 0.0 | 21.5 | 490 |
| 1440 min Summer | 4.674 | 0.0 | 23.5 | 734 |
| 2160 min Summer | 3.404 | 0.0 | 25.7 | 1084 |
| 2880 min Summer | 2.715 | 0.0 | 27.4 | 1456 |
| 4320 min Summer | 1.970 | 0.0 | 29.8 | 2188 |
| 5760 min Summer | 1.567 | 0.0 | 31.6 | 2904 |
| 7200 min Summer | 1.311 | 0.0 | 33.0 | 3568 |
| 8640 min Summer | 1.134 | 0.0 | 34.3 | 4392 |
| 10080 min Summer | 1.004 | 0.0 | 35.4 | 5096 |
| 15 min Winter | 116.192 | 0.0 | 6.8 | 18 |

©1982-2020 Innovyze

## Summary of Results for 100 year Return Period (+30%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max Σ Outflow (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|---|---|
| 30 min Winter | 98.403 | 0.403 | 0.0 | 2.7 | 2.7 | 5.7 | O K |
| 60 min Winter | 98.398 | 0.398 | 0.0 | 2.7 | 2.7 | 5.7 | O K |
| 120 min Winter | 98.310 | 0.310 | 0.0 | 2.7 | 2.7 | 4.4 | O K |
| 180 min Winter | 98.195 | 0.195 | 0.0 | 2.7 | 2.7 | 2.8 | O K |
| 240 min Winter | 98.121 | 0.121 | 0.0 | 2.7 | 2.7 | 1.7 | O K |
| 360 min Winter | 98.083 | 0.083 | 0.0 | 2.2 | 2.2 | 1.2 | O K |
| 480 min Winter | 98.070 | 0.070 | 0.0 | 1.8 | 1.8 | 1.0 | O K |
| 600 min Winter | 98.062 | 0.062 | 0.0 | 1.5 | 1.5 | 0.9 | O K |
| 720 min Winter | 98.057 | 0.057 | 0.0 | 1.3 | 1.3 | 0.8 | O K |
| 960 min Winter | 98.050 | 0.050 | 0.0 | 1.1 | 1.1 | 0.7 | O K |
| 1440 min Winter | 98.041 | 0.041 | 0.0 | 0.8 | 0.8 | 0.6 | O K |
| 2160 min Winter | 98.035 | 0.035 | 0.0 | 0.6 | 0.6 | 0.5 | O K |
| 2880 min Winter | 98.031 | 0.031 | 0.0 | 0.5 | 0.5 | 0.4 | O K |
| 4320 min Winter | 98.026 | 0.026 | 0.0 | 0.3 | 0.3 | 0.4 | O K |
| 5760 min Winter | 98.023 | 0.023 | 0.0 | 0.3 | 0.3 | 0.3 | O K |
| 7200 min Winter | 98.021 | 0.021 | 0.0 | 0.2 | 0.2 | 0.3 | O K |
| 8640 min Winter | 98.019 | 0.019 | 0.0 | 0.2 | 0.2 | 0.3 | O K |
| 10080 min Winter | 98.018 | 0.018 | 0.0 | 0.2 | 0.2 | 0.3 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|---|---|---|---|---|
| 30 min Winter | 77.964 | 0.0 | 9.2 | 29 |
| 60 min Winter | 49.937 | 0.0 | 11.7 | 48 |
| 120 min Winter | 30.897 | 0.0 | 14.5 | 84 |
| 180 min Winter | 22.993 | 0.0 | 16.2 | 114 |
| 240 min Winter | 18.515 | 0.0 | 17.4 | 138 |
| 360 min Winter | 13.595 | 0.0 | 19.2 | 190 |
| 480 min Winter | 10.918 | 0.0 | 20.5 | 248 |
| 600 min Winter | 9.202 | 0.0 | 21.6 | 312 |
| 720 min Winter | 7.998 | 0.0 | 22.6 | 368 |
| 960 min Winter | 6.405 | 0.0 | 24.1 | 490 |
| 1440 min Winter | 4.674 | 0.0 | 26.4 | 736 |
| 2160 min Winter | 3.404 | 0.0 | 28.8 | 1092 |
| 2880 min Winter | 2.715 | 0.0 | 30.6 | 1464 |
| 4320 min Winter | 1.970 | 0.0 | 33.4 | 2204 |
| 5760 min Winter | 1.567 | 0.0 | 35.4 | 2896 |
| 7200 min Winter | 1.311 | 0.0 | 37.0 | 3672 |
| 8640 min Winter | 1.134 | 0.0 | 38.4 | 4408 |
| 10080 min Winter | 1.004 | 0.0 | 39.6 | 4960 |

©1982-2020 Innovyze

## Model Details

Storage is Online Cover Level (m) 100.000

## Cellular Storage Structure

Invert Level (m) 98.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²) | Inf. Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 15.0 | 15.0 | 0.500 | 0.0 | 21.4 |
| 0.400 | 15.0 | 21.4 | | | |

## Hydro-Brake® Optimum Outflow Control

| | |
|---|---|
| Unit Reference | MD-SHE-0087-2700-0400-2700 |
| Design Head (m) | 0.400 |
| Design Flow (l/s) | 2.7 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Application | Surface |
| Sump Available | Yes |
| Diameter (mm) | 87 |
| Invert Level (m) | 98.000 |
| Minimum Outlet Pipe Diameter (mm) | 100 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 0.400 | 2.7 |
| Flush-Flo™ | 0.137 | 2.7 |
| Kick-Flo® | 0.296 | 2.4 |
| Mean Flow over Head Range | - | 2.2 |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 2.6 | 1.200 | 4.5 | 3.000 | 6.9 | 7.000 | 10.4 |
| 0.200 | 2.6 | 1.400 | 4.8 | 3.500 | 7.4 | 7.500 | 10.8 |
| 0.300 | 2.4 | 1.600 | 5.1 | 4.000 | 7.9 | 8.000 | 11.1 |
| 0.400 | 2.7 | 1.800 | 5.4 | 4.500 | 8.3 | 8.500 | 11.5 |
| 0.500 | 3.0 | 2.000 | 5.7 | 5.000 | 8.8 | 9.000 | 11.8 |
| 0.600 | 3.2 | 2.200 | 5.9 | 5.500 | 9.2 | 9.500 | 12.1 |
| 0.800 | 3.7 | 2.400 | 6.2 | 6.000 | 9.6 | | |
| 1.000 | 4.1 | 2.600 | 6.4 | 6.500 | 10.0 | | |

©1982-2020 Innovyze