


Summary of Results for 30 year Return Period (+40%)

Half Drain Time : 64 minutes.

| Storm Event | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Control (l/s) | Max Σ Outflow (l/s) | Max Volume (m ³) | Status |
|------------------|---------------|---------------|------------------------|-------------------|----------------------------|------------------------------|--------|
| 15 min Summer | 135.999 | 0.299 | 0.0 | 1.0 | 1.0 | 4.5 | O K |
| 30 min Summer | 136.076 | 0.376 | 0.0 | 1.1 | 1.1 | 5.7 | O K |
| 60 min Summer | 136.123 | 0.423 | 0.0 | 1.2 | 1.2 | 6.4 | O K |
| 120 min Summer | 136.133 | 0.433 | 0.0 | 1.2 | 1.2 | 6.6 | O K |
| 180 min Summer | 136.120 | 0.420 | 0.0 | 1.2 | 1.2 | 6.4 | O K |
| 240 min Summer | 136.103 | 0.403 | 0.0 | 1.1 | 1.1 | 6.1 | O K |
| 360 min Summer | 136.066 | 0.366 | 0.0 | 1.1 | 1.1 | 5.6 | O K |
| 480 min Summer | 136.028 | 0.328 | 0.0 | 1.1 | 1.1 | 5.0 | O K |
| 600 min Summer | 135.993 | 0.293 | 0.0 | 1.0 | 1.0 | 4.4 | O K |
| 720 min Summer | 135.960 | 0.260 | 0.0 | 1.0 | 1.0 | 3.9 | O K |
| 960 min Summer | 135.903 | 0.203 | 0.0 | 0.9 | 0.9 | 3.1 | O K |
| 1440 min Summer | 135.820 | 0.120 | 0.0 | 0.8 | 0.8 | 1.8 | O K |
| 2160 min Summer | 135.743 | 0.043 | 0.0 | 0.7 | 0.7 | 0.7 | O K |
| 2880 min Summer | 135.705 | 0.005 | 0.0 | 0.7 | 0.7 | 0.1 | O K |
| 4320 min Summer | 135.700 | 0.000 | 0.0 | 0.5 | 0.5 | 0.0 | O K |
| 5760 min Summer | 135.700 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K |
| 7200 min Summer | 135.700 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K |
| 8640 min Summer | 135.700 | 0.000 | 0.0 | 0.3 | 0.3 | 0.0 | O K |
| 10080 min Summer | 135.700 | 0.000 | 0.0 | 0.3 | 0.3 | 0.0 | O K |
| 15 min Winter | 136.041 | 0.341 | 0.0 | 1.1 | 1.1 | 5.2 | O K |


| Storm Event | Rain (mm/hr) | Flooded Volume (m ³) | Discharge Volume (m ³) | Time-Peak (mins) |
|------------------|--------------|----------------------------------|------------------------------------|------------------|
| 15 min Summer | 96.589 | 0.0 | 5.4 | 17 |
| 30 min Summer | 65.915 | 0.0 | 7.4 | 31 |
| 60 min Summer | 43.136 | 0.0 | 9.7 | 52 |
| 120 min Summer | 27.342 | 0.0 | 12.3 | 86 |
| 180 min Summer | 20.648 | 0.0 | 14.0 | 120 |
| 240 min Summer | 16.870 | 0.0 | 15.2 | 154 |
| 360 min Summer | 12.674 | 0.0 | 17.1 | 222 |
| 480 min Summer | 10.330 | 0.0 | 18.6 | 288 |
| 600 min Summer | 8.808 | 0.0 | 19.8 | 352 |
| 720 min Summer | 7.729 | 0.0 | 20.8 | 416 |
| 960 min Summer | 6.283 | 0.0 | 22.6 | 540 |
| 1440 min Summer | 4.684 | 0.0 | 25.3 | 780 |
| 2160 min Summer | 3.486 | 0.0 | 28.2 | 1128 |
| 2880 min Summer | 2.824 | 0.0 | 30.5 | 1468 |
| 4320 min Summer | 2.098 | 0.0 | 34.0 | 0 |
| 5760 min Summer | 1.701 | 0.0 | 36.7 | 0 |
| 7200 min Summer | 1.445 | 0.0 | 39.0 | 0 |
| 8640 min Summer | 1.266 | 0.0 | 41.0 | 0 |
| 10080 min Summer | 1.131 | 0.0 | 42.8 | 0 |
| 15 min Winter | 96.589 | 0.0 | 6.1 | 17 |

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| Paul Waite Associates Ltd | | Page 2 |
| Summit House, Riparian Way The Crossings, Cross Hills Keighley, BD20 7BW | 24030-PWA-00-XX-CA-C-3001 P01 SURFACE WATER CALCULATIONS HERSCHEL AVENUE, BURNLEY |  |
| Date 19/03/2024 File 24030-PWA-00-XX-CA-C-30... | Designed by IB Checked by LS | |
| Innovyze | Source Control 2020.1.3 | |

Summary of Results for 30 year Return Period (+40%)

| 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 | 136.133 | 0.433 | 0.0 | 1.2 | 1.2 | 6.6 | O K |
| 60 min Winter | 136.193 | 0.493 | 0.0 | 1.2 | 1.2 | 7.5 | O K |
| 120 min Winter | 136.204 | 0.504 | 0.0 | 1.2 | 1.2 | 7.7 | O K |
| 180 min Winter | 136.177 | 0.477 | 0.0 | 1.2 | 1.2 | 7.3 | O K |
| 240 min Winter | 136.148 | 0.448 | 0.0 | 1.2 | 1.2 | 6.8 | O K |
| 360 min Winter | 136.086 | 0.386 | 0.0 | 1.1 | 1.1 | 5.9 | O K |
| 480 min Winter | 136.028 | 0.328 | 0.0 | 1.1 | 1.1 | 5.0 | O K |
| 600 min Winter | 135.975 | 0.275 | 0.0 | 1.0 | 1.0 | 4.2 | O K |
| 720 min Winter | 135.929 | 0.229 | 0.0 | 1.0 | 1.0 | 3.5 | O K |
| 960 min Winter | 135.854 | 0.154 | 0.0 | 0.9 | 0.9 | 2.3 | O K |
| 1440 min Winter | 135.754 | 0.054 | 0.0 | 0.7 | 0.7 | 0.8 | O K |
| 2160 min Winter | 135.700 | 0.000 | 0.0 | 0.6 | 0.6 | 0.0 | O K |
| 2880 min Winter | 135.700 | 0.000 | 0.0 | 0.5 | 0.5 | 0.0 | O K |
| 4320 min Winter | 135.700 | 0.000 | 0.0 | 0.4 | 0.4 | 0.0 | O K |
| 5760 min Winter | 135.700 | 0.000 | 0.0 | 0.3 | 0.3 | 0.0 | O K |
| 7200 min Winter | 135.700 | 0.000 | 0.0 | 0.3 | 0.3 | 0.0 | O K |
| 8640 min Winter | 135.700 | 0.000 | 0.0 | 0.2 | 0.2 | 0.0 | O K |
| 10080 min Winter | 135.700 | 0.000 | 0.0 | 0.2 | 0.2 | 0.0 | O K |

| Storm Event | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 30 min Winter | 65.915 | 0.0 | 8.3 | 31 |
| 60 min Winter | 43.136 | 0.0 | 10.9 | 58 |
| 120 min Winter | 27.342 | 0.0 | 13.8 | 92 |
| 180 min Winter | 20.648 | 0.0 | 15.6 | 130 |
| 240 min Winter | 16.870 | 0.0 | 17.0 | 168 |
| 360 min Winter | 12.674 | 0.0 | 19.2 | 238 |
| 480 min Winter | 10.330 | 0.0 | 20.8 | 306 |
| 600 min Winter | 8.808 | 0.0 | 22.2 | 374 |
| 720 min Winter | 7.729 | 0.0 | 23.4 | 436 |
| 960 min Winter | 6.283 | 0.0 | 25.3 | 560 |
| 1440 min Winter | 4.684 | 0.0 | 28.3 | 794 |
| 2160 min Winter | 3.486 | 0.0 | 31.6 | 0 |
| 2880 min Winter | 2.824 | 0.0 | 34.2 | 0 |
| 4320 min Winter | 2.098 | 0.0 | 38.1 | 0 |
| 5760 min Winter | 1.701 | 0.0 | 41.1 | 0 |
| 7200 min Winter | 1.445 | 0.0 | 43.7 | 0 |
| 8640 min Winter | 1.266 | 0.0 | 45.9 | 0 |
| 10080 min Winter | 1.131 | 0.0 | 47.9 | 0 |

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| Date 19/03/2024 File 24030-PWA-00-XX-CA-C-30... | Designed by IB Checked by LS | |
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Rainfall Details

| | | | |
|-----------------------|-------------------|-----------------------|-------|
| Rainfall Model | FSR | Winter Storms | Yes |
| Return Period (years) | 30 | Cv (Summer) | 0.750 |
| Region | England and Wales | Cv (Winter) | 0.840 |
| M5-60 (mm) | 20.000 | Shortest Storm (mins) | 15 |
| Ratio R | 0.300 | Longest Storm (mins) | 10080 |
| Summer Storms | Yes | Climate Change % | +40 |

Time Area Diagram

Total Area (ha) 0.030

| Time (mins) | | Area |
|-------------|-----|-------|
| From: | To: | (ha) |
| 0 | 4 | 0.030 |

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|--|---|---|
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Model Details

Storage is Online Cover Level (m) 137.200

Cellular Storage Structure

Invert Level (m) 135.700 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m ²) | Inf. Area (m ²) | Depth (m) | Area (m ²) | Inf. Area (m ²) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000 | 16.0 | 0.0 | 0.800 | 0.0 | 0.0 |
| 0.799 | 16.0 | 0.0 | | | |

Crown Vortex Valve® Outflow Control

Design Head (m) 1.000 Vortex Valve® Type R1 SW Only Invert Level (m) 135.500
 Design Flow (l/s) 1.5 Diameter (mm) 50

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 0.5 | 1.200 | 1.6 | 3.000 | 2.6 | 7.000 | 3.9 |
| 0.200 | 0.7 | 1.400 | 1.7 | 3.500 | 2.8 | 7.500 | 4.0 |
| 0.300 | 0.8 | 1.600 | 1.9 | 4.000 | 3.0 | 8.000 | 4.2 |
| 0.400 | 0.9 | 1.800 | 2.0 | 4.500 | 3.1 | 8.500 | 4.3 |
| 0.500 | 1.0 | 2.000 | 2.1 | 5.000 | 3.3 | 9.000 | 4.4 |
| 0.600 | 1.1 | 2.200 | 2.2 | 5.500 | 3.5 | 9.500 | 4.6 |
| 0.800 | 1.3 | 2.400 | 2.3 | 6.000 | 3.6 | | |
| 1.000 | 1.5 | 2.600 | 2.4 | 6.500 | 3.8 | | |