

|                                                  |                                       |                                                                                     |
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| Coopers                                          |                                       | Page 1                                                                              |
| Park House<br>Sandpiper Court<br>Chester CH4 9QU | 9A 9B Stanley Road<br>Ponciau Wrexham |  |
| Date 01/03/2021<br>File 7576 ROOF CRATE.srcx     | Designed by Coopers<br>Checked by AJ  |                                                                                     |
| Micro Drainage<br>Source Control 2018.1.1        |                                       |                                                                                     |

Source Control 2018.1.1

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

Half Drain Time : 857 minutes.

| Storm Event      | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-----------------|--------|
| 15 min Summer    | 98.613        | 0.113         | 0.0                    | 1.1             | 0 K    |
| 30 min Summer    | 98.656        | 0.156         | 0.0                    | 1.6             | 0 K    |
| 60 min Summer    | 98.704        | 0.204         | 0.0                    | 2.0             | 0 K    |
| 120 min Summer   | 98.755        | 0.255         | 0.0                    | 2.5             | 0 K    |
| 180 min Summer   | 98.784        | 0.284         | 0.0                    | 2.8             | 0 K    |
| 240 min Summer   | 98.802        | 0.302         | 0.0                    | 3.0             | 0 K    |
| 360 min Summer   | 98.825        | 0.325         | 0.0                    | 3.2             | 0 K    |
| 480 min Summer   | 98.838        | 0.338         | 0.0                    | 3.4             | 0 K    |
| 600 min Summer   | 98.844        | 0.344         | 0.0                    | 3.4             | 0 K    |
| 720 min Summer   | 98.848        | 0.348         | 0.0                    | 3.5             | 0 K    |
| 960 min Summer   | 98.852        | 0.352         | 0.0                    | 3.5             | 0 K    |
| 1440 min Summer  | 98.851        | 0.351         | 0.0                    | 3.5             | 0 K    |
| 2160 min Summer  | 98.841        | 0.341         | 0.0                    | 3.4             | 0 K    |
| 2880 min Summer  | 98.827        | 0.327         | 0.0                    | 3.3             | 0 K    |
| 4320 min Summer  | 98.797        | 0.297         | 0.0                    | 3.0             | 0 K    |
| 5760 min Summer  | 98.767        | 0.267         | 0.0                    | 2.7             | 0 K    |
| 7200 min Summer  | 98.740        | 0.240         | 0.0                    | 2.4             | 0 K    |
| 8640 min Summer  | 98.714        | 0.214         | 0.0                    | 2.1             | 0 K    |
| 10080 min Summer | 98.691        | 0.191         | 0.0                    | 1.9             | 0 K    |
| 15 min Winter    | 98.627        | 0.127         | 0.0                    | 1.3             | 0 K    |
| 30 min Winter    | 98.675        | 0.175         | 0.0                    | 1.7             | 0 K    |
| 60 min Winter    | 98.729        | 0.229         | 0.0                    | 2.3             | 0 K    |
| 120 min Winter   | 98.787        | 0.287         | 0.0                    | 2.9             | 0 K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|------------------|
| 15 min Summer    | 79.390       | 0.0                 | 32               |
| 30 min Summer    | 54.489       | 0.0                 | 44               |
| 60 min Summer    | 35.949       | 0.0                 | 72               |
| 120 min Summer   | 23.043       | 0.0                 | 130              |
| 180 min Summer   | 17.547       | 0.0                 | 188              |
| 240 min Summer   | 14.376       | 0.0                 | 246              |
| 360 min Summer   | 10.831       | 0.0                 | 364              |
| 480 min Summer   | 8.853        | 0.0                 | 482              |
| 600 min Summer   | 7.564        | 0.0                 | 600              |
| 720 min Summer   | 6.649        | 0.0                 | 650              |
| 960 min Summer   | 5.420        | 0.0                 | 778              |
| 1440 min Summer  | 4.057        | 0.0                 | 1040             |
| 2160 min Summer  | 3.030        | 0.0                 | 1456             |
| 2880 min Summer  | 2.461        | 0.0                 | 1864             |
| 4320 min Summer  | 1.833        | 0.0                 | 2688             |
| 5760 min Summer  | 1.488        | 0.0                 | 3480             |
| 7200 min Summer  | 1.266        | 0.0                 | 4264             |
| 8640 min Summer  | 1.110        | 0.0                 | 5008             |
| 10080 min Summer | 0.993        | 0.0                 | 5760             |
| 15 min Winter    | 79.390       | 0.0                 | 32               |
| 30 min Winter    | 54.489       | 0.0                 | 45               |
| 60 min Winter    | 35.949       | 0.0                 | 72               |
| 120 min Winter   | 23.043       | 0.0                 | 128              |

|                                                  |                                       |                                                                                     |
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| Micro Drainage<br>Source Control 2018.1.1        |                                       |                                                                                     |

Source Control 2018.1.1

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

| Storm Event      | Max Level (m) | Max Depth (m) | Max Infiltration (l/s) | Max Volume (m³) | Status |
|------------------|---------------|---------------|------------------------|-----------------|--------|
| 180 min Winter   | 98.821        | 0.321         | 0.0                    | 3.2             | 0 K    |
| 240 min Winter   | 98.843        | 0.343         | 0.0                    | 3.4             | 0 K    |
| 360 min Winter   | 98.871        | 0.371         | 0.0                    | 3.7             | 0 K    |
| 480 min Winter   | 98.887        | 0.387         | 0.0                    | 3.9             | 0 K    |
| 600 min Winter   | 98.897        | 0.397         | 0.0                    | 4.0             | 0 K    |
| 720 min Winter   | 98.902        | 0.402         | 0.0                    | 4.0             | 0 K    |
| 960 min Winter   | 98.905        | 0.405         | 0.0                    | 4.0             | 0 K    |
| 1440 min Winter  | 98.903        | 0.403         | 0.0                    | 4.0             | 0 K    |
| 2160 min Winter  | 98.886        | 0.386         | 0.0                    | 3.9             | 0 K    |
| 2880 min Winter  | 98.863        | 0.363         | 0.0                    | 3.6             | 0 K    |
| 4320 min Winter  | 98.814        | 0.314         | 0.0                    | 3.1             | 0 K    |
| 5760 min Winter  | 98.768        | 0.268         | 0.0                    | 2.7             | 0 K    |
| 7200 min Winter  | 98.726        | 0.226         | 0.0                    | 2.3             | 0 K    |
| 8640 min Winter  | 98.689        | 0.189         | 0.0                    | 1.9             | 0 K    |
| 10080 min Winter | 98.656        | 0.156         | 0.0                    | 1.6             | 0 K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|------------------|
| 180 min Winter   | 17.547       | 0.0                 | 186              |
| 240 min Winter   | 14.376       | 0.0                 | 242              |
| 360 min Winter   | 10.831       | 0.0                 | 358              |
| 480 min Winter   | 8.853        | 0.0                 | 472              |
| 600 min Winter   | 7.564        | 0.0                 | 584              |
| 720 min Winter   | 6.649        | 0.0                 | 696              |
| 960 min Winter   | 5.420        | 0.0                 | 900              |
| 1440 min Winter  | 4.057        | 0.0                 | 1122             |
| 2160 min Winter  | 3.030        | 0.0                 | 1584             |
| 2880 min Winter  | 2.461        | 0.0                 | 2036             |
| 4320 min Winter  | 1.833        | 0.0                 | 2888             |
| 5760 min Winter  | 1.488        | 0.0                 | 3744             |
| 7200 min Winter  | 1.266        | 0.0                 | 4504             |
| 8640 min Winter  | 1.110        | 0.0                 | 5320             |
| 10080 min Winter | 0.993        | 0.0                 | 6040             |

|                                                  |                                       |                                                                                     |
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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)            | 18.000            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.291             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +30   |

#### Pipe Network

|                             |     |                                |       |
|-----------------------------|-----|--------------------------------|-------|
| Volume in Pipe Network (m³) | 1   | Dia of Outfall Pipe (m)        | 0.1   |
| Slope of Outfall Pipe (1:X) | 100 | Roughness of Outfall Pipe (mm) | 0.600 |

#### Time Area Diagram

Total Area (ha) 0.008

| Time (mins) |     | Area  |
|-------------|-----|-------|
| From:       | To: | (ha)  |
| 0           | 4   | 0.008 |

|                                                  |                                       |                                                                                     |
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#### Model Details

Storage is Online Cover Level (m) 100.000

#### Cellular Storage Structure

Invert Level (m) 98.500 Safety Factor 1.5  
Infiltration Coefficient Base (m/hr) 0.01490 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.01490

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 10.5                   | 10.5                        | 0.500     | 0.0                    | 15.7                        |
| 0.400     | 10.5                   | 15.7                        |           |                        |                             |