

|                                             |                                  |                                                                                     |
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| H2OK Systems Limited                        |                                  | Page 1                                                                              |
| Nanjerrick Court<br>Allet, Truro<br>TR4 9DJ |                                  |  |
| Date 19/06/2018 14:44<br>File Trench 7.srcx | Designed by HShort<br>Checked by |                                                                                     |

Micro Drainage

Source Control 2017.1.2

### Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 0 minutes.

| Storm<br>Event   | Max<br>Level<br>(m) | Max<br>Depth<br>(m) | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s) | Max<br>Overflow<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m <sup>3</sup> ) | Status |
|------------------|---------------------|---------------------|------------------------------|-------------------------|--------------------------|---------------------------|------------------------------------|--------|
| 15 min Summer    | 2.685               | 0.485               | 0.0                          | 91.2                    | 0.0                      | 91.2                      | 3.5                                | 0 K    |
| 30 min Summer    | 2.693               | 0.493               | 0.0                          | 93.2                    | 0.0                      | 93.2                      | 3.6                                | 0 K    |
| 60 min Summer    | 2.635               | 0.435               | 0.0                          | 78.7                    | 0.0                      | 78.7                      | 2.8                                | 0 K    |
| 120 min Summer   | 2.565               | 0.365               | 0.0                          | 56.6                    | 0.0                      | 56.6                      | 2.0                                | 0 K    |
| 180 min Summer   | 2.537               | 0.337               | 0.0                          | 44.5                    | 0.0                      | 44.5                      | 1.7                                | 0 K    |
| 240 min Summer   | 2.522               | 0.322               | 0.0                          | 36.4                    | 0.0                      | 36.4                      | 1.6                                | 0 K    |
| 360 min Summer   | 2.509               | 0.309               | 0.0                          | 27.9                    | 0.0                      | 27.9                      | 1.4                                | 0 K    |
| 480 min Summer   | 2.503               | 0.303               | 0.0                          | 22.9                    | 0.0                      | 22.9                      | 1.4                                | 0 K    |
| 600 min Summer   | 2.450               | 0.250               | 0.0                          | 18.8                    | 0.0                      | 18.8                      | 0.9                                | 0 K    |
| 720 min Summer   | 2.419               | 0.219               | 0.0                          | 16.6                    | 0.0                      | 16.6                      | 0.7                                | 0 K    |
| 960 min Summer   | 2.379               | 0.179               | 0.0                          | 13.1                    | 0.0                      | 13.1                      | 0.5                                | 0 K    |
| 1440 min Summer  | 2.347               | 0.147               | 0.0                          | 9.6                     | 0.0                      | 9.6                       | 0.3                                | 0 K    |
| 2160 min Summer  | 2.321               | 0.121               | 0.0                          | 7.2                     | 0.0                      | 7.2                       | 0.3                                | 0 K    |
| 2880 min Summer  | 2.303               | 0.103               | 0.0                          | 5.8                     | 0.0                      | 5.8                       | 0.2                                | 0 K    |
| 4320 min Summer  | 2.291               | 0.091               | 0.0                          | 4.5                     | 0.0                      | 4.5                       | 0.1                                | 0 K    |
| 5760 min Summer  | 2.280               | 0.080               | 0.0                          | 3.8                     | 0.0                      | 3.8                       | 0.1                                | 0 K    |
| 7200 min Summer  | 2.273               | 0.073               | 0.0                          | 3.4                     | 0.0                      | 3.4                       | 0.1                                | 0 K    |
| 8640 min Summer  | 2.264               | 0.064               | 0.0                          | 2.4                     | 0.0                      | 2.4                       | 0.1                                | 0 K    |
| 10080 min Summer | 2.258               | 0.058               | 0.0                          | 2.2                     | 0.0                      | 2.2                       | 0.1                                | 0 K    |
| 15 min Winter    | 2.725               | 0.525               | 0.0                          | 100.2                   | 0.0                      | 100.3                     | 4.1                                | 0 K    |

| Storm<br>Event   | Rain<br>(mm/hr) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Discharge<br>Volume<br>(m <sup>3</sup> ) | Overflow<br>Volume<br>(m <sup>3</sup> ) | Time-Peak<br>(mins) |
|------------------|-----------------|----------------------------------------|------------------------------------------|-----------------------------------------|---------------------|
| 15 min Summer    | 124.633         | 0.0                                    | 54.0                                     | 0.0                                     | 12                  |
| 30 min Summer    | 83.789          | 0.0                                    | 72.6                                     | 0.0                                     | 20                  |
| 60 min Summer    | 53.779          | 0.0                                    | 93.2                                     | 0.0                                     | 34                  |
| 120 min Summer   | 33.337          | 0.0                                    | 115.5                                    | 0.0                                     | 64                  |
| 180 min Summer   | 24.832          | 0.0                                    | 129.1                                    | 0.0                                     | 94                  |
| 240 min Summer   | 20.006          | 0.0                                    | 138.6                                    | 0.0                                     | 124                 |
| 360 min Summer   | 14.706          | 0.0                                    | 152.9                                    | 0.0                                     | 184                 |
| 480 min Summer   | 11.818          | 0.0                                    | 163.8                                    | 0.0                                     | 244                 |
| 600 min Summer   | 9.966           | 0.0                                    | 172.7                                    | 0.0                                     | 306                 |
| 720 min Summer   | 8.665           | 0.0                                    | 180.2                                    | 0.0                                     | 362                 |
| 960 min Summer   | 6.943           | 0.0                                    | 192.5                                    | 0.0                                     | 488                 |
| 1440 min Summer  | 5.071           | 0.0                                    | 210.9                                    | 0.0                                     | 714                 |
| 2160 min Summer  | 3.696           | 0.0                                    | 230.5                                    | 0.0                                     | 1088                |
| 2880 min Summer  | 2.949           | 0.0                                    | 245.0                                    | 0.0                                     | 1384                |
| 4320 min Summer  | 2.142           | 0.0                                    | 266.1                                    | 0.0                                     | 2192                |
| 5760 min Summer  | 1.705           | 0.0                                    | 279.3                                    | 0.0                                     | 2856                |
| 7200 min Summer  | 1.427           | 0.0                                    | 291.5                                    | 0.0                                     | 3640                |
| 8640 min Summer  | 1.235           | 0.0                                    | 305.2                                    | 0.0                                     | 4064                |
| 10080 min Summer | 1.093           | 0.0                                    | 313.9                                    | 0.0                                     | 5632                |
| 15 min Winter    | 124.633         | 0.0                                    | 60.5                                     | 0.0                                     | 12                  |

|                                                                 |                     |                                                                                     |                              |                            |                          |                           |                       |        |
|-----------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|------------------------------|----------------------------|--------------------------|---------------------------|-----------------------|--------|
| H20K Systems Limited                                            |                     | Page 2                                                                              |                              |                            |                          |                           |                       |        |
| Nanjerrick Court<br>Allet, Truro<br>TR4 9DJ                     |                     |  |                              |                            |                          |                           |                       |        |
| Date 19/06/2018 14:44<br>File Trench 7.srcx                     |                     |                                                                                     |                              |                            |                          |                           |                       |        |
| Designed by HShort<br>Checked by                                |                     |                                                                                     |                              |                            |                          |                           |                       |        |
| Micro Drainage                                                  |                     | Source Control 2017.1.2                                                             |                              |                            |                          |                           |                       |        |
| <div>Summary of Results for 100 year Return Period (+40%)</div> |                     |                                                                                     |                              |                            |                          |                           |                       |        |
| Storm<br>Event                                                  | Max<br>Level<br>(m) | Max<br>Depth<br>(m)                                                                 | Max<br>Infiltration<br>(l/s) | Max<br>Control<br>(l/s)    | Max<br>Overflow<br>(l/s) | Max<br>Σ Outflow<br>(l/s) | Max<br>Volume<br>(m³) | Status |
| 30 min Winter                                                   | 2.694               | 0.494                                                                               | 0.0                          | 93.3                       | 0.0                      | 93.3                      | 3.7                   | 0 K    |
| 60 min Winter                                                   | 2.600               | 0.400                                                                               | 0.0                          | 68.5                       | 0.0                      | 68.5                      | 2.4                   | 0 K    |
| 120 min Winter                                                  | 2.537               | 0.337                                                                               | 0.0                          | 44.5                       | 0.0                      | 44.5                      | 1.7                   | 0 K    |
| 180 min Winter                                                  | 2.517               | 0.317                                                                               | 0.0                          | 33.4                       | 0.0                      | 33.4                      | 1.5                   | 0 K    |
| 240 min Winter                                                  | 2.508               | 0.308                                                                               | 0.0                          | 27.1                       | 0.0                      | 27.1                      | 1.4                   | 0 K    |
| 360 min Winter                                                  | 2.472               | 0.272                                                                               | 0.0                          | 20.0                       | 0.0                      | 20.0                      | 1.1                   | 0 K    |
| 480 min Winter                                                  | 2.418               | 0.218                                                                               | 0.0                          | 16.6                       | 0.0                      | 16.6                      | 0.7                   | 0 K    |
| 600 min Winter                                                  | 2.384               | 0.184                                                                               | 0.0                          | 13.6                       | 0.0                      | 13.6                      | 0.5                   | 0 K    |
| 720 min Winter                                                  | 2.372               | 0.172                                                                               | 0.0                          | 12.1                       | 0.0                      | 12.1                      | 0.5                   | 0 K    |
| 960 min Winter                                                  | 2.347               | 0.147                                                                               | 0.0                          | 9.6                        | 0.0                      | 9.6                       | 0.3                   | 0 K    |
| 1440 min Winter                                                 | 2.321               | 0.121                                                                               | 0.0                          | 7.2                        | 0.0                      | 7.2                       | 0.2                   | 0 K    |
| 2160 min Winter                                                 | 2.304               | 0.104                                                                               | 0.0                          | 5.8                        | 0.0                      | 5.8                       | 0.2                   | 0 K    |
| 2880 min Winter                                                 | 2.291               | 0.091                                                                               | 0.0                          | 4.5                        | 0.0                      | 4.5                       | 0.1                   | 0 K    |
| 4320 min Winter                                                 | 2.273               | 0.073                                                                               | 0.0                          | 3.4                        | 0.0                      | 3.4                       | 0.1                   | 0 K    |
| 5760 min Winter                                                 | 2.264               | 0.064                                                                               | 0.0                          | 2.4                        | 0.0                      | 2.4                       | 0.1                   | 0 K    |
| 7200 min Winter                                                 | 2.260               | 0.060                                                                               | 0.0                          | 2.4                        | 0.0                      | 2.4                       | 0.1                   | 0 K    |
| 8640 min Winter                                                 | 2.260               | 0.060                                                                               | 0.0                          | 2.4                        | 0.0                      | 2.4                       | 0.1                   | 0 K    |
| 10080 min Winter                                                | 2.259               | 0.059                                                                               | 0.0                          | 2.2                        | 0.0                      | 2.2                       | 0.1                   | 0 K    |
| Storm<br>Event                                                  | Rain<br>(mm/hr)     | Flooded<br>Volume<br>(m³)                                                           | Discharge<br>Volume<br>(m³)  | Overflow<br>Volume<br>(m³) | Time-Peak<br>(mins)      |                           |                       |        |
| 30 min Winter                                                   | 83.789              | 0.0                                                                                 | 81.3                         | 0.0                        | 20                       |                           |                       |        |
| 60 min Winter                                                   | 53.779              | 0.0                                                                                 | 104.4                        | 0.0                        | 34                       |                           |                       |        |
| 120 min Winter                                                  | 33.337              | 0.0                                                                                 | 129.4                        | 0.0                        | 64                       |                           |                       |        |
| 180 min Winter                                                  | 24.832              | 0.0                                                                                 | 144.6                        | 0.0                        | 96                       |                           |                       |        |
| 240 min Winter                                                  | 20.006              | 0.0                                                                                 | 155.3                        | 0.0                        | 124                      |                           |                       |        |
| 360 min Winter                                                  | 14.706              | 0.0                                                                                 | 171.2                        | 0.0                        | 186                      |                           |                       |        |
| 480 min Winter                                                  | 11.818              | 0.0                                                                                 | 183.5                        | 0.0                        | 250                      |                           |                       |        |
| 600 min Winter                                                  | 9.966               | 0.0                                                                                 | 193.4                        | 0.0                        | 296                      |                           |                       |        |
| 720 min Winter                                                  | 8.665               | 0.0                                                                                 | 201.8                        | 0.0                        | 362                      |                           |                       |        |
| 960 min Winter                                                  | 6.943               | 0.0                                                                                 | 215.6                        | 0.0                        | 476                      |                           |                       |        |
| 1440 min Winter                                                 | 5.071               | 0.0                                                                                 | 236.2                        | 0.0                        | 746                      |                           |                       |        |
| 2160 min Winter                                                 | 3.696               | 0.0                                                                                 | 258.1                        | 0.0                        | 1220                     |                           |                       |        |
| 2880 min Winter                                                 | 2.949               | 0.0                                                                                 | 274.7                        | 0.0                        | 1356                     |                           |                       |        |
| 4320 min Winter                                                 | 2.142               | 0.0                                                                                 | 298.7                        | 0.0                        | 2036                     |                           |                       |        |
| 5760 min Winter                                                 | 1.705               | 0.0                                                                                 | 314.4                        | 0.0                        | 2728                     |                           |                       |        |
| 7200 min Winter                                                 | 1.427               | 0.0                                                                                 | 327.3                        | 0.0                        | 4544                     |                           |                       |        |
| 8640 min Winter                                                 | 1.235               | 0.0                                                                                 | 342.7                        | 0.0                        | 3568                     |                           |                       |        |
| 10080 min Winter                                                | 1.093               | 0.0                                                                                 | 347.8                        | 0.0                        | 4256                     |                           |                       |        |
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| H2OK Systems Limited                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  | Page 3                                                                              |                |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|----------------|-----|---------------|-----|-----------------------|-----|-------------|-------|--------|-------------------|-------------|-------|------------|--------|-----------------------|----|---------|-------|----------------------|-------|---------------|-----|------------------|-----|-------------|------|-------------|------|-----------|------|-----------|------|-----|-------|-----|-------|
| Nanjerrick Court<br>Allet, Truro<br>TR4 9DJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |  |                |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Date 19/06/2018 14:44<br>File Trench 7.srcx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Designed by HShort<br>Checked by |                                                                                     |                |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Micro Drainage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                  | Source Control 2017.1.2                                                             |                |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| <p style="text-align: center;"><u>Rainfall Details</u></p> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <p style="text-align: center;"><u>Time Area Diagram</u></p> <p style="text-align: center;">Total Area (ha) 0.231</p> <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>0.120</td> <td>4 8</td> <td>0.111</td> </tr> </tbody> </table> |                                  |                                                                                     | Rainfall Model | FSR | Winter Storms | Yes | Return Period (years) | 100 | Cv (Summer) | 0.750 | Region | England and Wales | Cv (Winter) | 0.840 | M5-60 (mm) | 19.000 | Shortest Storm (mins) | 15 | Ratio R | 0.350 | Longest Storm (mins) | 10080 | Summer Storms | Yes | Climate Change % | +40 | Time (mins) | Area | Time (mins) | Area | From: To: | (ha) | From: To: | (ha) | 0 4 | 0.120 | 4 8 | 0.111 |
| Rainfall Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FSR                              | Winter Storms                                                                       | Yes            |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Return Period (years)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 100                              | Cv (Summer)                                                                         | 0.750          |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Region                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | England and Wales                | Cv (Winter)                                                                         | 0.840          |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| M5-60 (mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 19.000                           | Shortest Storm (mins)                                                               | 15             |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Ratio R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.350                            | Longest Storm (mins)                                                                | 10080          |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Summer Storms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yes                              | Climate Change %                                                                    | +40            |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| Time (mins)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Area                             | Time (mins)                                                                         | Area           |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| From: To:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (ha)                             | From: To:                                                                           | (ha)           |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
| 0 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.120                            | 4 8                                                                                 | 0.111          |     |               |     |                       |     |             |       |        |                   |             |       |            |        |                       |    |         |       |                      |       |               |     |                  |     |             |      |             |      |           |      |           |      |     |       |     |       |
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|                                             |                                  |                                                                                     |
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| Nanjerrick Court<br>Allet, Truro<br>TR4 9DJ |                                  |  |
| Date 19/06/2018 14:44<br>File Trench 7.srcx | Designed by HShort<br>Checked by |                                                                                     |
| Micro Drainage                              |                                  | Source Control 2017.1.2                                                             |

Model Details

Storage is Online Cover Level (m) 3.000

Infiltration Trench Structure

|                                              |                                  |
|----------------------------------------------|----------------------------------|
| Infiltration Coefficient Base (m/hr) 0.00100 | Trench Width (m) 0.5             |
| Infiltration Coefficient Side (m/hr) 0.00100 | Trench Length (m) 276.0          |
| Safety Factor 2.0                            | Slope (1:X) 200.0                |
| Porosity 0.30                                | Cap Volume Depth (m) 0.000       |
| Invert Level (m) 2.200                       | Cap Infiltration Depth (m) 0.000 |

Pipe Outflow Control

|                        |                                  |
|------------------------|----------------------------------|
| Diameter (m) 0.300     | Entry Loss Coefficient 0.500     |
| Slope (1:X) 1000.0     | Coefficient of Contraction 0.600 |
| Length (m) 10.000      | Upstream Invert Level (m) 2.200  |
| Roughness k (mm) 0.600 |                                  |

Weir Overflow Control

Discharge Coef 0.544 Width (m) 10.000 Invert Level (m) 3.000

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|                                             |                    |                                                                                     |
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| Date 19/06/2018 14:44                       | Designed by HShort |                                                                                     |
| File Trench 7.srcx                          | Checked by         |                                                                                     |
| Micro Drainage                              |                    | Source Control 2017.1.2                                                             |

Event: 15 min Winter

