

Rightwell House
Bretton
Peterborough PE3 8DW

Catchment 3D Cellular
Kent Int. Gateway
9T4125



Date 16 June 2009
File 2009.06.19 PQ Catchment 3D Stor...

Designed By PQ
Checked By

Micro Drainage

Source Control W.11.4

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1641 minutes

| Storm Duration (mins) | Maximum Control (l/s) | Maximum Filtration (l/s) | Maximum Outflow (l/s) | Maximum Water Level (m OD) | Maximum Depth (m) | Maximum Volume (m³) | Status |
|-----------------------|-----------------------|--------------------------|-----------------------|----------------------------|-------------------|---------------------|--------|
| 15 Summer | 7.8 | 0.0 | 7.8 | 56.3968 | 0.8968 | 706.6 | OK |
| 30 Summer | 8.5 | 0.0 | 8.5 | 56.5798 | 1.0798 | 923.6 | OK |
| 60 Summer | 9.2 | 0.0 | 9.2 | 56.7663 | 1.2663 | 1144.8 | OK |
| 120 Summer | 9.9 | 0.0 | 9.9 | 56.9477 | 1.4477 | 1360.1 | OK |
| 180 Summer | 10.2 | 0.0 | 10.2 | 57.0447 | 1.5447 | 1475.2 | OK |
| 240 Summer | 10.4 | 0.0 | 10.4 | 57.1047 | 1.6047 | 1546.9 | OK |
| 360 Summer | 10.6 | 0.0 | 10.6 | 57.1812 | 1.6812 | 1637.2 | OK |
| 480 Summer | 10.8 | 0.0 | 10.8 | 57.2267 | 1.7267 | 1691.2 | OK |
| 600 Summer | 10.9 | 0.0 | 10.9 | 57.2532 | 1.7532 | 1722.9 | OK |
| 720 Summer | 10.9 | 0.0 | 10.9 | 57.2677 | 1.7677 | 1740.2 | OK |
| 960 Summer | 10.9 | 0.0 | 10.9 | 57.2742 | 1.7742 | 1747.6 | OK |
| 1440 Summer | 10.9 | 0.0 | 10.9 | 57.2457 | 1.7457 | 1713.7 | OK |
| 2160 Summer | 10.7 | 0.0 | 10.7 | 57.1927 | 1.6927 | 1651.1 | OK |
| 2880 Summer | 10.5 | 0.0 | 10.5 | 57.1362 | 1.6362 | 1584.0 | OK |
| 4320 Summer | 10.1 | 0.0 | 10.1 | 57.0272 | 1.5272 | 1455.0 | OK |
| 5760 Summer | 9.8 | 0.0 | 9.8 | 56.9322 | 1.4322 | 1341.8 | OK |
| 7200 Summer | 9.5 | 0.0 | 9.5 | 56.8468 | 1.3467 | 1240.3 | OK |
| 8640 Summer | 9.2 | 0.0 | 9.2 | 56.7688 | 1.2688 | 1147.7 | OK |
| 10080 Summer | 9.0 | 0.0 | 9.0 | 56.6968 | 1.1968 | 1062.7 | OK |
| 15 Winter | 8.1 | 0.0 | 8.1 | 56.4688 | 0.9688 | 792.0 | OK |
| 30 Winter | 8.9 | 0.0 | 8.9 | 56.6738 | 1.1738 | 1035.5 | OK |
| 60 Winter | 9.7 | 0.0 | 9.7 | 56.8837 | 1.3837 | 1284.5 | OK |
| 120 Winter | 10.4 | 0.0 | 10.4 | 57.0897 | 1.5897 | 1528.9 | OK |
| 180 Winter | 10.7 | 0.0 | 10.7 | 57.2007 | 1.7007 | 1660.7 | OK |
| 240 Winter | 10.9 | 0.0 | 10.9 | 57.2712 | 1.7712 | 1743.9 | OK |
| 360 Winter | 11.2 | 0.0 | 11.2 | 57.3612 | 1.8612 | 1850.7 | OK |
| 480 Winter | 11.4 | 0.0 | 11.4 | 57.4172 | 1.9172 | 1917.1 | OK |

| Storm Duration (mins) | Rain (mm/hr) | Time-Peak (mins) |
|-----------------------|--------------|------------------|
| 15 Summer | 118.42 | 19 |
| 30 Summer | 77.75 | 34 |
| 60 Summer | 48.61 | 64 |
| 120 Summer | 29.35 | 124 |
| 180 Summer | 21.56 | 184 |
| 240 Summer | 17.21 | 242 |
| 360 Summer | 12.50 | 362 |
| 480 Summer | 9.96 | 482 |
| 600 Summer | 8.35 | 602 |
| 720 Summer | 7.22 | 722 |
| 960 Summer | 5.74 | 960 |
| 1440 Summer | 4.15 | 1242 |
| 2160 Summer | 2.99 | 1620 |
| 2880 Summer | 2.37 | 2016 |
| 4320 Summer | 1.71 | 2852 |
| 5760 Summer | 1.35 | 3680 |
| 7200 Summer | 1.12 | 4472 |
| 8640 Summer | 0.97 | 5272 |
| 10080 Summer | 0.85 | 6056 |
| 15 Winter | 118.42 | 19 |
| 30 Winter | 77.75 | 34 |
| 60 Winter | 48.61 | 64 |
| 120 Winter | 29.35 | 122 |
| 180 Winter | 21.56 | 180 |
| 240 Winter | 17.21 | 240 |
| 360 Winter | 12.50 | 356 |
| 480 Winter | 9.96 | 474 |

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Summary of Results for 100 year Return Period (+20%)

| Storm Duration (mins) | Maximum Control (l/s) | Maximum Filtration (l/s) | Maximum Outflow (l/s) | Maximum Water Level (m OD) | Maximum Depth (m) | Maximum Volume (m ³) | Status |
|-----------------------|-----------------------|--------------------------|-----------------------|----------------------------|-------------------|----------------------------------|--------|
| 600 Winter | 11.5 | 0.0 | 11.5 | 57.4522 | 1.9522 | 1958.9 | 0 K |
| 720 Winter | 11.5 | 0.0 | 11.5 | 57.4737 | 1.9737 | 1984.7 | 0 K |
| 960 Winter | 11.6 | 0.0 | 11.6 | 57.4922 | 1.9922 | 2006.2 | 0 K |
| 1440 Winter | 11.5 | 0.0 | 11.5 | 57.4737 | 1.9737 | 1984.3 | 0 K |
| 2160 Winter | 11.3 | 0.0 | 11.3 | 57.4062 | 1.9062 | 1904.6 | 0 K |
| 2880 Winter | 11.1 | 0.0 | 11.1 | 57.3377 | 1.8377 | 1823.0 | 0 K |
| 4320 Winter | 10.7 | 0.0 | 10.7 | 57.1887 | 1.6887 | 1646.5 | 0 K |
| 5760 Winter | 10.2 | 0.0 | 10.2 | 57.0517 | 1.5517 | 1483.7 | 0 K |
| 7200 Winter | 9.8 | 0.0 | 9.8 | 56.9278 | 1.4277 | 1336.9 | 0 K |
| 8640 Winter | 9.4 | 0.0 | 9.4 | 56.8163 | 1.3163 | 1204.1 | 0 K |
| 10080 Winter | 9.1 | 0.0 | 9.1 | 56.7148 | 1.2148 | 1084.2 | 0 K |

| Storm Duration (mins) | Rain (mm/hr) | Time-Peak (mins) |
|-----------------------|--------------|------------------|
| 600 Winter | 8.35 | 590 |
| 720 Winter | 7.22 | 702 |
| 960 Winter | 5.74 | 930 |
| 1440 Winter | 4.15 | 1356 |
| 2160 Winter | 2.99 | 1704 |
| 2880 Winter | 2.37 | 2160 |
| 4320 Winter | 1.71 | 3072 |
| 5760 Winter | 1.35 | 3976 |
| 7200 Winter | 1.12 | 4824 |
| 8640 Winter | 0.97 | 5624 |
| 10080 Winter | 0.85 | 6456 |

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Rainfall Details

| | | | | | |
|-----------------------|---------|-----------------------|-------|------------------|-----|
| Region | ENG+WAL | Cv (Summer) | 0.750 | Summer Storms | Yes |
| Return Period (years) | 100 | Cv (Winter) | 0.840 | Winter Storms | Yes |
| M5-60 (mm) | 20.000 | Shortest Storm (mins) | 15 | Climate Change % | +20 |
| Ratio-R | 0.400 | Longest Storm (mins) | 10080 | | |

Time / Area Diagram

Total Area (ha) = 3.211

| | |
|-------------|-----------|
| Time (mins) | Area (ha) |
| from: to: | |
| 0 4 | 3.211 |

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Cellular Storage Details

Infil Coef - Base (m/hr) 0.000000 Safety Factor 2.0 Invert Level (m) 55.500
Infil Coef - Sides (m/hr) 0.000000 Porosity 1.00 Ground Level (m) 58.000

| Depth (m) | Area (m ²) | Infil. Area (m ²) | Depth (m) | Area (m ²) | Infil. Area (m ²) | Depth (m) | Area (m ²) | Infil. Area (m ²) | Depth (m) | Area (m ²) | Infil. Area (m ²) |
|-----------|------------------------|-------------------------------|-----------|------------------------|-------------------------------|-----------|------------------------|-------------------------------|-----------|------------------------|-------------------------------|
| 0.00 | 392.1 | 1186.6 | 0.70 | 1186.6 | 1240.1 | 1.40 | 1186.6 | 1293.7 | 2.10 | 1186.6 | 1347.2 |
| 0.10 | 392.1 | 1194.1 | 0.80 | 1186.6 | 1247.8 | 1.50 | 1186.6 | 1301.3 | 2.20 | 1186.6 | 1354.7 |
| 0.20 | 392.1 | 1201.9 | 0.90 | 1186.6 | 1255.4 | 1.60 | 1186.6 | 1309.0 | 2.30 | 1186.6 | 1362.4 |
| 0.30 | 392.1 | 1209.5 | 1.00 | 1186.6 | 1263.1 | 1.70 | 1186.6 | 1316.6 | 2.40 | 1186.6 | 1370.2 |
| 0.40 | 392.1 | 1217.2 | 1.10 | 1186.6 | 1270.7 | 1.80 | 1186.6 | 1324.3 | 2.50 | 1186.6 | 1377.6 |
| 0.50 | 1186.6 | 1224.8 | 1.20 | 1186.6 | 1278.5 | 1.90 | 1186.6 | 1331.9 | | | |
| 0.60 | 1186.6 | 1232.5 | 1.30 | 1186.6 | 1286.0 | 2.00 | 1186.6 | 1339.7 | | | |

Hydro-Brake Outflow Control

Design Head (m) 2.000 Hydro-Brake Type MD5 Invert Level (m) 55.500
Design Flow (l/s) 11.7 Diameter (mm) 117

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.10 | 3.6 | 0.60 | 6.5 | 1.60 | 10.4 | 2.60 | 13.2 | 5.00 | 18.4 | 7.50 | 22.5 |
| 0.20 | 5.7 | 0.80 | 7.4 | 1.80 | 11.0 | 3.00 | 14.2 | 5.50 | 19.3 | 8.00 | 23.2 |
| 0.30 | 5.8 | 1.00 | 8.2 | 2.00 | 11.6 | 3.50 | 15.4 | 6.00 | 20.1 | 8.50 | 24.0 |
| 0.40 | 5.8 | 1.20 | 9.0 | 2.20 | 12.2 | 4.00 | 16.4 | 6.50 | 20.9 | 9.00 | 24.6 |
| 0.50 | 6.1 | 1.40 | 9.7 | 2.40 | 12.7 | 4.50 | 17.4 | 7.00 | 21.7 | 9.50 | 25.3 |