

## **APPENDIX J    SOURCE CONTROL CALCULATIONS**

Vectos (South) Limited

Unit 704  
The Paintworks  
Bristol BS4 3EH

Date 14/07/2020  
File 195104 Havant Drive Thr...

XP Solutions

Havant  
Drive Thru Network  
Catchment 1

Designed by LTD  
Checked by NB

Source Control 2019.1

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

Half Drain Time : 73 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    | 19.485        | 0.685         | 0.0                    | 14.8              | 14.8                | 68.4            | O K    |
| 30 min Summer    | 19.685        | 0.885         | 0.0                    | 14.8              | 14.8                | 88.3            | O K    |
| 60 min Summer    | 19.808        | 1.008         | 0.0                    | 14.8              | 14.8                | 100.6           | O K    |
| 120 min Summer   | 19.826        | 1.026         | 0.0                    | 14.8              | 14.8                | 102.4           | O K    |
| 180 min Summer   | 19.785        | 0.985         | 0.0                    | 14.8              | 14.8                | 98.2            | O K    |
| 240 min Summer   | 19.724        | 0.924         | 0.0                    | 14.8              | 14.8                | 92.2            | O K    |
| 360 min Summer   | 19.593        | 0.793         | 0.0                    | 14.8              | 14.8                | 79.1            | O K    |
| 480 min Summer   | 19.452        | 0.652         | 0.0                    | 14.8              | 14.8                | 65.0            | O K    |
| 600 min Summer   | 19.335        | 0.535         | 0.0                    | 14.8              | 14.8                | 53.4            | O K    |
| 720 min Summer   | 19.238        | 0.438         | 0.0                    | 14.8              | 14.8                | 43.7            | O K    |
| 960 min Summer   | 19.101        | 0.301         | 0.0                    | 14.7              | 14.7                | 30.1            | O K    |
| 1440 min Summer  | 18.982        | 0.182         | 0.0                    | 13.6              | 13.6                | 18.2            | O K    |
| 2160 min Summer  | 18.941        | 0.141         | 0.0                    | 10.3              | 10.3                | 14.1            | O K    |
| 2880 min Summer  | 18.921        | 0.121         | 0.0                    | 8.3               | 8.3                 | 12.1            | O K    |
| 4320 min Summer  | 18.899        | 0.099         | 0.0                    | 6.0               | 6.0                 | 9.9             | O K    |
| 5760 min Summer  | 18.887        | 0.087         | 0.0                    | 4.8               | 4.8                 | 8.7             | O K    |
| 7200 min Summer  | 18.879        | 0.079         | 0.0                    | 4.0               | 4.0                 | 7.8             | O K    |
| 8640 min Summer  | 18.873        | 0.073         | 0.0                    | 3.5               | 3.5                 | 7.2             | O K    |
| 10080 min Summer | 18.868        | 0.068         | 0.0                    | 3.1               | 3.1                 | 6.8             | O K    |
| 15 min Winter    | 19.581        | 0.781         | 0.0                    | 14.8              | 14.8                | 77.9            | O K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 15 min Summer    | 128.442      | 0.0                 | 80.0                  | 20               |
| 30 min Summer    | 86.477       | 0.0                 | 107.8                 | 33               |
| 60 min Summer    | 55.544       | 0.0                 | 138.7                 | 60               |
| 120 min Summer   | 34.408       | 0.0                 | 171.8                 | 92               |
| 180 min Summer   | 25.594       | 0.0                 | 191.7                 | 126              |
| 240 min Summer   | 20.587       | 0.0                 | 205.6                 | 162              |
| 360 min Summer   | 15.171       | 0.0                 | 227.3                 | 230              |
| 480 min Summer   | 12.195       | 0.0                 | 243.6                 | 290              |
| 600 min Summer   | 10.287       | 0.0                 | 256.8                 | 350              |
| 720 min Summer   | 8.946        | 0.0                 | 268.0                 | 408              |
| 960 min Summer   | 7.170        | 0.0                 | 286.4                 | 520              |
| 1440 min Summer  | 5.239        | 0.0                 | 313.9                 | 738              |
| 2160 min Summer  | 3.819        | 0.0                 | 343.3                 | 1100             |
| 2880 min Summer  | 3.048        | 0.0                 | 365.3                 | 1468             |
| 4320 min Summer  | 2.214        | 0.0                 | 397.9                 | 2200             |
| 5760 min Summer  | 1.762        | 0.0                 | 422.4                 | 2904             |
| 7200 min Summer  | 1.477        | 0.0                 | 442.5                 | 3640             |
| 8640 min Summer  | 1.279        | 0.0                 | 459.9                 | 4312             |
| 10080 min Summer | 1.133        | 0.0                 | 475.1                 | 5088             |
| 15 min Winter    | 128.442      | 0.0                 | 89.7                  | 20               |

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Source Control 2019.1

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Summary of Results for 100 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    | 19.807        | 1.007         | 0.0                    | 14.8              | 14.8                | 100.4           | O K    |
| 60 min Winter    | 19.957        | 1.157         | 0.0                    | 14.8              | 14.8                | 115.4           | O K    |
| 120 min Winter   | 19.972        | 1.172         | 0.0                    | 14.8              | 14.8                | 116.9           | O K    |
| 180 min Winter   | 19.908        | 1.108         | 0.0                    | 14.8              | 14.8                | 110.6           | O K    |
| 240 min Winter   | 19.817        | 1.017         | 0.0                    | 14.8              | 14.8                | 101.4           | O K    |
| 360 min Winter   | 19.619        | 0.819         | 0.0                    | 14.8              | 14.8                | 81.6            | O K    |
| 480 min Winter   | 19.392        | 0.592         | 0.0                    | 14.8              | 14.8                | 59.1            | O K    |
| 600 min Winter   | 19.224        | 0.424         | 0.0                    | 14.8              | 14.8                | 42.3            | O K    |
| 720 min Winter   | 19.105        | 0.305         | 0.0                    | 14.7              | 14.7                | 30.4            | O K    |
| 960 min Winter   | 18.985        | 0.185         | 0.0                    | 13.7              | 13.7                | 18.5            | O K    |
| 1440 min Winter  | 18.941        | 0.141         | 0.0                    | 10.2              | 10.2                | 14.0            | O K    |
| 2160 min Winter  | 18.914        | 0.114         | 0.0                    | 7.5               | 7.5                 | 11.3            | O K    |
| 2880 min Winter  | 18.899        | 0.099         | 0.0                    | 6.0               | 6.0                 | 9.9             | O K    |
| 4320 min Winter  | 18.882        | 0.082         | 0.0                    | 4.3               | 4.3                 | 8.2             | O K    |
| 5760 min Winter  | 18.873        | 0.073         | 0.0                    | 3.5               | 3.5                 | 7.2             | O K    |
| 7200 min Winter  | 18.866        | 0.066         | 0.0                    | 2.9               | 2.9                 | 6.5             | O K    |
| 8640 min Winter  | 18.861        | 0.061         | 0.0                    | 2.5               | 2.5                 | 6.0             | O K    |
| 10080 min Winter | 18.857        | 0.057         | 0.0                    | 2.3               | 2.3                 | 5.7             | O K    |

| Storm Event      | Rain (mm/hr) | Flooded Volume (m³) | Discharge Volume (m³) | Time-Peak (mins) |
|------------------|--------------|---------------------|-----------------------|------------------|
| 30 min Winter    | 86.477       | 0.0                 | 120.8                 | 33               |
| 60 min Winter    | 55.544       | 0.0                 | 155.3                 | 60               |
| 120 min Winter   | 34.408       | 0.0                 | 192.4                 | 98               |
| 180 min Winter   | 25.594       | 0.0                 | 214.7                 | 136              |
| 240 min Winter   | 20.587       | 0.0                 | 230.3                 | 174              |
| 360 min Winter   | 15.171       | 0.0                 | 254.5                 | 250              |
| 480 min Winter   | 12.195       | 0.0                 | 272.8                 | 308              |
| 600 min Winter   | 10.287       | 0.0                 | 287.7                 | 362              |
| 720 min Winter   | 8.946        | 0.0                 | 300.2                 | 414              |
| 960 min Winter   | 7.170        | 0.0                 | 320.8                 | 504              |
| 1440 min Winter  | 5.239        | 0.0                 | 351.6                 | 738              |
| 2160 min Winter  | 3.819        | 0.0                 | 384.5                 | 1104             |
| 2880 min Winter  | 3.048        | 0.0                 | 409.2                 | 1460             |
| 4320 min Winter  | 2.214        | 0.0                 | 445.7                 | 2204             |
| 5760 min Winter  | 1.762        | 0.0                 | 473.1                 | 2936             |
| 7200 min Winter  | 1.477        | 0.0                 | 495.6                 | 3592             |
| 8640 min Winter  | 1.279        | 0.0                 | 515.1                 | 4448             |
| 10080 min Winter | 1.133        | 0.0                 | 532.2                 | 5104             |

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|----------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------|
| Vectos (South) Limited                             |                                             | Page 3                                                                              |
| Unit 704<br>The Paintworks<br>Bristol BS4 3EH      | Havant<br>Drive Thru Network<br>Catchment 1 |  |
| Date 14/07/2020<br>File 195104 Havant Drive Thr... | Designed by LTD<br>Checked by NB            |                                                                                     |
| XP Solutions                                       | Source Control 2019.1                       |                                                                                     |

#### Rainfall Details

|                       |                   |                       |       |
|-----------------------|-------------------|-----------------------|-------|
| 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)            | 19.600            | Shortest Storm (mins) | 15    |
| Ratio R               | 0.346             | Longest Storm (mins)  | 10080 |
| Summer Storms         | Yes               | Climate Change %      | +40   |

#### Time Area Diagram

Total Area (ha) 0.333

| Time (mins) Area |     |       | Time (mins) Area |     |       |
|------------------|-----|-------|------------------|-----|-------|
| From:            | To: | (ha)  | From:            | To: | (ha)  |
| 0                | 4   | 0.167 | 4                | 8   | 0.166 |

| Vectos (South) Limited                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                             | Page 4     |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
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| Unit 704<br>The Paintworks<br>Bristol BS4 3EH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            | Havant<br>Drive Thru Network<br>Catchment 1 |            |  |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Date 14/07/2020<br>File 195104 Havant Drive Thr...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | Designed by LTD<br>Checked by NB            |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| XP Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            | Source Control 2019.1                       |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| <div>Model Details</div> <div>Storage is Online Cover Level (m) 20.600</div> <div>Cellular Storage Structure</div> <div>Invert Level (m) 18.800 Safety Factor 2.0<br/>Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95<br/>Infiltration Coefficient Side (m/hr) 0.00000</div> <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>105.0</td><td>105.0</td><td>1.201</td><td>0.0</td><td>156.6</td></tr><tr><td>1.200</td><td>105.0</td><td>156.6</td><td></td><td></td><td></td></tr></table> <div>Hydro-Brake® Optimum Outflow Control</div> <div>Unit Reference MD-SHE-0171-1480-1200-1480<br/>Design Head (m) 1.200<br/>Design Flow (l/s) 14.8<br/>Flush-Flo™ Calculated<br/>Objective Minimise upstream storage<br/>Application Surface<br/>Sump Available Yes<br/>Diameter (mm) 171<br/>Invert Level (m) 18.800<br/>Minimum Outlet Pipe Diameter (mm) 225<br/>Suggested Manhole Diameter (mm) 1500</div> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.200</td><td>14.8</td></tr><tr><td>Flush-Flo™</td><td>0.366</td><td>14.8</td></tr><tr><td>Kick-Flo®</td><td>0.805</td><td>12.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>12.7</td></tr></table> <div>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</div> <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>6.1</td><td>1.200</td><td>14.8</td><td>3.000</td><td>22.9</td><td>7.000</td><td>34.4</td></tr><tr><td>0.200</td><td>13.9</td><td>1.400</td><td>15.9</td><td>3.500</td><td>24.7</td><td>7.500</td><td>35.6</td></tr><tr><td>0.300</td><td>14.7</td><td>1.600</td><td>17.0</td><td>4.000</td><td>26.3</td><td>8.000</td><td>36.7</td></tr><tr><td>0.400</td><td>14.8</td><td>1.800</td><td>17.9</td><td>4.500</td><td>27.8</td><td>8.500</td><td>37.8</td></tr><tr><td>0.500</td><td>14.6</td><td>2.000</td><td>18.9</td><td>5.000</td><td>29.3</td><td>9.000</td><td>38.9</td></tr><tr><td>0.600</td><td>14.2</td><td>2.200</td><td>19.7</td><td>5.500</td><td>30.6</td><td>9.500</td><td>39.9</td></tr><tr><td>0.800</td><td>12.4</td><td>2.400</td><td>20.6</td><td>6.000</td><td>32.0</td><td></td><td></td></tr><tr><td>1.000</td><td>13.6</td><td>2.600</td><td>21.4</td><td>6.500</td><td>33.2</td><td></td><td></td></tr></table> |            |                                             |            |                                                                                     | Depth (m)      | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²) | Inf. Area (m²) | 0.000 | 105.0 | 105.0 | 1.201 | 0.0 | 156.6 | 1.200 | 105.0 | 156.6 |  |  |  | Control Points | Head (m) | Flow (l/s) | Design Point (Calculated) | 1.200 | 14.8 | Flush-Flo™ | 0.366 | 14.8 | Kick-Flo® | 0.805 | 12.3 | Mean Flow over Head Range | - | 12.7 | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | 0.100 | 6.1 | 1.200 | 14.8 | 3.000 | 22.9 | 7.000 | 34.4 | 0.200 | 13.9 | 1.400 | 15.9 | 3.500 | 24.7 | 7.500 | 35.6 | 0.300 | 14.7 | 1.600 | 17.0 | 4.000 | 26.3 | 8.000 | 36.7 | 0.400 | 14.8 | 1.800 | 17.9 | 4.500 | 27.8 | 8.500 | 37.8 | 0.500 | 14.6 | 2.000 | 18.9 | 5.000 | 29.3 | 9.000 | 38.9 | 0.600 | 14.2 | 2.200 | 19.7 | 5.500 | 30.6 | 9.500 | 39.9 | 0.800 | 12.4 | 2.400 | 20.6 | 6.000 | 32.0 |  |  | 1.000 | 13.6 | 2.600 | 21.4 | 6.500 | 33.2 |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Area (m²)  | Inf. Area (m²)                              | Depth (m)  | Area (m²)                                                                           | Inf. Area (m²) |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 105.0      | 105.0                                       | 1.201      | 0.0                                                                                 | 156.6          |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 1.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 105.0      | 156.6                                       |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Control Points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Head (m)   | Flow (l/s)                                  |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Design Point (Calculated)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.200      | 14.8                                        |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Flush-Flo™                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.366      | 14.8                                        |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Kick-Flo®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.805      | 12.3                                        |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Mean Flow over Head Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -          | 12.7                                        |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| Depth (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Flow (l/s) | Depth (m)                                   | Flow (l/s) | Depth (m)                                                                           | Flow (l/s)     | Depth (m) | Flow (l/s)     |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6.1        | 1.200                                       | 14.8       | 3.000                                                                               | 22.9           | 7.000     | 34.4           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 13.9       | 1.400                                       | 15.9       | 3.500                                                                               | 24.7           | 7.500     | 35.6           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.7       | 1.600                                       | 17.0       | 4.000                                                                               | 26.3           | 8.000     | 36.7           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.8       | 1.800                                       | 17.9       | 4.500                                                                               | 27.8           | 8.500     | 37.8           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.6       | 2.000                                       | 18.9       | 5.000                                                                               | 29.3           | 9.000     | 38.9           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 14.2       | 2.200                                       | 19.7       | 5.500                                                                               | 30.6           | 9.500     | 39.9           |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 0.800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12.4       | 2.400                                       | 20.6       | 6.000                                                                               | 32.0           |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 13.6       | 2.600                                       | 21.4       | 6.500                                                                               | 33.2           |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                                             |            |                                                                                     |                |           |                |           |           |                |       |       |       |       |     |       |       |       |       |  |  |  |                |          |            |                           |       |      |            |       |      |           |       |      |                           |   |      |           |            |           |            |           |            |           |            |       |     |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |       |      |  |  |       |      |       |      |       |      |  |  |

## **APPENDIX K   MICRODRAINAGE NETWORK**

|                                                    |                                  |                                                                                     |
|----------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
| Vectos (South) Limited                             |                                  | Page 1                                                                              |
| Unit 704<br>The Paintworks<br>Bristol BS4 3EH      | Havant<br>Southern Network       |  |
| Date 09/07/2020<br>File 195104 Havant Storm Net... | Designed by LTD<br>Checked by NB |                                                                                     |
| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Existing Network Details for Storm

# - Indicates pipe length does not match coordinates

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|
| S1.000 | 20.752        | 0.700       | 29.6           | 0.007          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S1.001 | 52.859        | 1.100       | 48.1           | 0.013          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S2.000 | 36.720        | 0.375       | 97.9           | 0.064          | 5.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S2.001 | 31.773        | 0.600       | 53.0           | 0.103          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.002 | 17.547        | 0.125       | 140.4          | 0.112          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.003 | 15.558        | 0.100       | 155.6          | 0.025          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.004 | 12.065        | 0.075       | 160.9          | 0.009          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S3.000 | 5.274         | 0.000       | 0.0            | 0.000          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S3.001 | 4.178         | 0.300       | 13.9           | 0.222          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S1.005 | 9.158#        | 0.100       | 91.6           | 0.010          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.006 | 12.494        | 0.100       | 124.9          | 0.197          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.007 | 5.555         | 0.100       | 55.5           | 0.018          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |

### Network Results Table

| PN     | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Vel<br>(m/s) | Cap<br>(l/s) |
|--------|--------------|------------------|----------------------|--------------|--------------|
| S1.000 | 20.300       | 0.007            | 0.0                  | 1.42         | 11.2         |
| S1.001 | 19.600       | 0.020            | 0.0                  | 1.11         | 8.8          |
| S2.000 | 19.275       | 0.064            | 0.0                  | 1.59         | 112.3        |
| S2.001 | 18.900       | 0.167            | 0.0                  | 2.17         | 153.1        |
| S1.002 | 18.300       | 0.299            | 0.0                  | 1.33         | 93.7         |
| S1.003 | 18.175       | 0.324            | 0.0                  | 1.26         | 88.9         |
| S1.004 | 18.075       | 0.333            | 0.0                  | 1.24         | 87.4         |
| S3.000 | 19.700       | 0.000            | 0.0                  | 0.00         | 0.0          |
| S3.001 | 18.500       | 0.222            | 0.0                  | 2.08         | 16.3         |
| S1.005 | 18.000       | 0.566            | 0.0                  | 1.64         | 116.2        |
| S1.006 | 17.900       | 0.763            | 0.0                  | 1.41         | 99.3         |
| S1.007 | 17.800       | 0.781            | 0.0                  | 2.11         | 149.4        |

|                                                    |                                  |                                                                                     |
|----------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
| Vectos (South) Limited                             |                                  | Page 2                                                                              |
| Unit 704<br>The Paintworks<br>Bristol BS4 3EH      | Havant<br>Southern Network       |  |
| Date 09/07/2020<br>File 195104 Havant Storm Net... | Designed by LTD<br>Checked by NB |                                                                                     |
| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Manhole Schedules for Storm

| MH Name     | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN     | Pipe Out Invert Level (m) | Diameter (mm) | PN     | Pipes In Invert Level (m) | Diameter (mm) | Back (m) |
|-------------|-----------|--------------|---------------|--------------------|--------|---------------------------|---------------|--------|---------------------------|---------------|----------|
| S1          | 21.600    | 1.300        | Open Manhole  | 1200               | S1.000 | 20.300                    | 100           |        |                           |               |          |
| S2          | 20.900    | 1.300        | Open Manhole  | 1200               | S1.001 | 19.600                    | 100           | S1.000 | 19.600                    | 100           |          |
| S3          | 20.700    | 1.425        | Open Manhole  | 1200               | S2.000 | 19.275                    | 300           |        |                           |               |          |
| S4          | 20.400    | 1.500        | Open Manhole  | 1200               | S2.001 | 18.900                    | 300           | S2.000 | 18.900                    | 300           |          |
| S5          | 19.800    | 1.500        | Open Manhole  | 1200               | S1.002 | 18.300                    | 300           | S1.001 | 18.500                    | 100           |          |
|             |           |              |               |                    |        |                           |               | S2.001 | 18.300                    | 300           |          |
| S6          | 19.400    | 1.225        | Open Manhole  | 1200               | S1.003 | 18.175                    | 300           | S1.002 | 18.175                    | 300           |          |
| S7          | 19.200    | 1.125        | Open Manhole  | 1200               | S1.004 | 18.075                    | 300           | S1.003 | 18.075                    | 300           |          |
| SDummy Pipe | 19.800    | 0.100        | Open Manhole  | 1200               | S3.000 | 19.700                    | 100           |        |                           |               |          |
| SPCP 1      | 19.800    | 1.300        | Open Manhole  | 50 x 50            | S3.001 | 18.500                    | 100           | S3.000 | 19.700                    | 100           |          |
| S8          | 19.600    | 1.600        | Open Manhole  | 1200               | S1.005 | 18.000                    | 300           | S1.004 | 18.000                    | 300           |          |
|             |           |              |               |                    |        |                           |               | S3.001 | 18.200                    | 100           |          |
| SPCP 2      | 18.800    | 0.900        | Open Manhole  | 50 x 50            | S1.006 | 17.900                    | 300           | S1.005 | 17.900                    | 300           |          |
| S9          | 18.700    | 0.900        | Open Manhole  | 1200               | S1.007 | 17.800                    | 300           | S1.006 | 17.800                    | 300           |          |
| S           | 18.600    | 0.900        | Open Manhole  | 0                  |        | OUTFALL                   |               | S1.007 | 17.700                    | 300           |          |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)                                                                        |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---------------------------------------------------------------------------------------|
| S1      | 1115.952            | 1308.107             | 1115.952                 | 1308.107                  | Required       |  |
| S2      | 1113.509            | 1287.499             | 1113.509                 | 1287.499                  | Required       |                                                                                       |
| S3      | 1032.327            | 1267.342             | 1032.327                 | 1267.342                  | Required       |                                                                                       |
| S4      | 1065.562            | 1251.728             | 1065.562                 | 1251.728                  | Required       |                                                                                       |
| S5      | 1094.331            | 1238.242             | 1094.331                 | 1238.242                  | Required       |                                                                                       |
| S6      | 1087.680            | 1222.005             | 1087.680                 | 1222.005                  | Required       |                                                                                       |
| S7      | 1076.826            | 1210.858             | 1076.826                 | 1210.858                  | Required       |                                                                                       |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Manhole Schedules for Storm

| MH<br>Name  | Manhole<br>Easting<br>(m) | Manhole<br>Northing<br>(m) | Intersection<br>Easting<br>(m) | Intersection<br>Northing<br>(m) | Manhole<br>Access | Layout<br>(North)                                                                    |
|-------------|---------------------------|----------------------------|--------------------------------|---------------------------------|-------------------|--------------------------------------------------------------------------------------|
| SDummy Pipe | 1056.349                  | 1216.371                   | 1056.349                       | 1216.371                        | Required          |  |
| SPCP 1      | 1061.078                  | 1214.036                   | 1061.078                       | 1214.036                        | Required          |                                                                                      |
| S8          | 1064.836                  | 1212.210                   | 1064.836                       | 1212.210                        | Required          |                                                                                      |
| SPCP 2      | 1033.177                  | 1149.754                   | 1033.177                       | 1149.754                        | Required          |                                                                                      |
| S9          | 1030.269                  | 1137.603                   | 1030.269                       | 1137.603                        | Required          |                                                                                      |
| S           | 1034.549                  | 1134.063                   |                                |                                 | No Entry          |                                                                                      |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### PIPELINE SCHEDULES for Storm

#### Upstream Manhole

# - Indicates pipe length does not match coordinates

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name  | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|-------------|----------------|----------------|----------------|------------------|-----------------------|
| S1.000 | o           | 100          | S1          | 21.600         | 20.300         | 1.200          | Open Manhole     | 1200                  |
| S1.001 | o           | 100          | S2          | 20.900         | 19.600         | 1.200          | Open Manhole     | 1200                  |
| S2.000 | o           | 300          | S3          | 20.700         | 19.275         | 1.125          | Open Manhole     | 1200                  |
| S2.001 | o           | 300          | S4          | 20.400         | 18.900         | 1.200          | Open Manhole     | 1200                  |
| S1.002 | o           | 300          | S5          | 19.800         | 18.300         | 1.200          | Open Manhole     | 1200                  |
| S1.003 | o           | 300          | S6          | 19.400         | 18.175         | 0.925          | Open Manhole     | 1200                  |
| S1.004 | o           | 300          | S7          | 19.200         | 18.075         | 0.825          | Open Manhole     | 1200                  |
| S3.000 | o           | 100          | SDummy Pipe | 19.800         | 19.700         | 0.000          | Open Manhole     | 1200                  |
| S3.001 | o           | 100          | SPCP 1      | 19.800         | 18.500         | 1.200          | Open Manhole     | 50 x 50               |
| S1.005 | o           | 300          | S8          | 19.600         | 18.000         | 1.300          | Open Manhole     | 1200                  |
| S1.006 | o           | 300          | SPCP 2      | 18.800         | 17.900         | 0.600          | Open Manhole     | 50 x 50               |
| S1.007 | o           | 300          | S9          | 18.700         | 17.800         | 0.600          | Open Manhole     | 1200                  |

#### Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| S1.000 | 20.752        | 29.6           | S2         | 20.900         | 19.600         | 1.200          | Open Manhole     | 1200                  |
| S1.001 | 52.859        | 48.1           | S5         | 19.800         | 18.500         | 1.200          | Open Manhole     | 1200                  |
| S2.000 | 36.720        | 97.9           | S4         | 20.400         | 18.900         | 1.200          | Open Manhole     | 1200                  |
| S2.001 | 31.773        | 53.0           | S5         | 19.800         | 18.300         | 1.200          | Open Manhole     | 1200                  |
| S1.002 | 17.547        | 140.4          | S6         | 19.400         | 18.175         | 0.925          | Open Manhole     | 1200                  |
| S1.003 | 15.558        | 155.6          | S7         | 19.200         | 18.075         | 0.825          | Open Manhole     | 1200                  |
| S1.004 | 12.065        | 160.9          | S8         | 19.600         | 18.000         | 1.300          | Open Manhole     | 1200                  |
| S3.000 | 5.274         | 0.0            | SPCP 1     | 19.800         | 19.700         | 0.000          | Open Manhole     | 50 x 50               |
| S3.001 | 4.178         | 13.9           | S8         | 19.600         | 18.200         | 1.300          | Open Manhole     | 1200                  |
| S1.005 | 9.158#        | 91.6           | SPCP 2     | 18.800         | 17.900         | 0.600          | Open Manhole     | 50 x 50               |
| S1.006 | 12.494        | 124.9          | S9         | 18.700         | 17.800         | 0.600          | Open Manhole     | 1200                  |
| S1.007 | 5.555         | 55.5           | S          | 18.600         | 17.700         | 0.600          | Open Manhole     | 0                     |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

#### Area Summary for Storm

| Pipe Number | PIMP Type | PIMP Name | PIMP (%) | Gross Area (ha) | Imp. Area (ha) | Pipe Total (ha) |
|-------------|-----------|-----------|----------|-----------------|----------------|-----------------|
| 1.000       | User      | -         | 100      | 0.007           | 0.007          | 0.007           |
| 1.001       | User      | -         | 100      | 0.013           | 0.013          | 0.013           |
| 2.000       | User      | -         | 100      | 0.015           | 0.015          | 0.015           |
|             | User      | -         | 100      | 0.049           | 0.049          | 0.064           |
| 2.001       | User      | -         | 100      | 0.076           | 0.076          | 0.076           |
|             | User      | -         | 100      | 0.027           | 0.027          | 0.103           |
| 1.002       | User      | -         | 100      | 0.049           | 0.049          | 0.049           |
|             | User      | -         | 100      | 0.063           | 0.063          | 0.112           |
| 1.003       | User      | -         | 100      | 0.021           | 0.021          | 0.021           |
|             | User      | -         | 100      | 0.004           | 0.004          | 0.025           |
| 1.004       | User      | -         | 100      | 0.009           | 0.009          | 0.009           |
| 3.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 3.001       | User      | -         | 100      | 0.032           | 0.032          | 0.032           |
|             | User      | -         | 100      | 0.021           | 0.021          | 0.054           |
|             | User      | -         | 100      | 0.030           | 0.030          | 0.084           |
|             | User      | -         | 100      | 0.138           | 0.138          | 0.222           |
| 1.005       | User      | -         | 100      | 0.010           | 0.010          | 0.010           |
| 1.006       | User      | -         | 100      | 0.010           | 0.010          | 0.010           |
|             | User      | -         | 100      | 0.099           | 0.099          | 0.109           |
|             | User      | -         | 100      | 0.089           | 0.089          | 0.197           |
| 1.007       | User      | -         | 100      | 0.018           | 0.018          | 0.018           |
|             |           |           |          | Total           | Total          | Total           |
|             |           |           |          | 0.781           | 0.781          | 0.781           |

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|        |   |        |        |       |   |   |
|--------|---|--------|--------|-------|---|---|
| S1.007 | S | 18.600 | 17.700 | 0.000 | 0 | 0 |
|--------|---|--------|--------|-------|---|---|

#### Simulation Criteria for Storm

|                                 |       |                                            |       |
|---------------------------------|-------|--------------------------------------------|-------|
| Volumetric Runoff Coeff         | 0.750 | Additional Flow - % of Total Flow          | 0.000 |
| Areal Reduction Factor          | 1.000 | MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000 |
| Hot Start (mins)                | 0     | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)            | 0     | Flow per Person per Day (l/per/day)        | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins)                            | 60    |
| Foul Sewage per hectare (l/s)   | 0.000 | Output Interval (mins)                     | 1     |
|                                 |       |                                            |       |
| Number of Input Hydrographs     | 0     | Number of Storage Structures               | 2     |
| Number of Online Controls       | 2     | Number of Time/Area Diagrams               | 0     |
| Number of Offline Controls      | 0     | Number of Real Time Controls               | 0     |

#### Synthetic Rainfall Details

Rainfall Model FSR Return Period (years) 1

|                                                                                                                                                                                                                                                               |                                  |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
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| Unit 704<br>The Paintworks<br>Bristol BS4 3EH                                                                                                                                                                                                                 | Havant<br>Southern Network       |  |
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| XP Solutions                                                                                                                                                                                                                                                  | Network 2019.1                   |                                                                                     |
| <div>Synthetic Rainfall Details</div> <div><div>Region England and Wales</div><div>M5-60 (mm)19.600</div><div>Ratio R0.346</div><div>Profile TypeSummer</div><div>Cv (Summer) 0.750</div><div>Cv (Winter) 0.840</div><div>Storm Duration (mins)30</div></div> |                                  |                                                                                     |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                           |                                  |                                                                                     |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Online Controls for Storm

Orifice Manhole: SPCP 1, DS/PN: S3.001, Volume (m<sup>3</sup>): 0.0

Diameter (m) 0.054 Discharge Coefficient 0.600 Invert Level (m) 18.500

Hydro-Brake® Optimum Manhole: S9, DS/PN: S1.007, Volume (m<sup>3</sup>): 1.9

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0257-3610-0900-3610 |
| Design Head (m)                   | 0.900                      |
| Design Flow (l/s)                 | 36.1                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 257                        |
| Invert Level (m)                  | 17.800                     |
| Minimum Outlet Pipe Diameter (mm) | 300                        |
| Suggested Manhole Diameter (mm)   | 1800                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.900    | 36.1       |
| Flush-Flo™                | 0.393    | 36.1       |
| Kick-Flo®                 | 0.703    | 32.1       |
| Mean Flow over Head Range | -        | 29.1       |

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     | 8.3        | 1.200     | 41.4       | 3.000     | 64.5       | 7.000     | 97.4       |
| 0.200     | 26.4       | 1.400     | 44.6       | 3.500     | 69.5       | 7.500     | 100.8      |
| 0.300     | 35.6       | 1.600     | 47.6       | 4.000     | 74.2       | 8.000     | 104.0      |
| 0.400     | 36.1       | 1.800     | 50.4       | 4.500     | 78.6       | 8.500     | 107.1      |
| 0.500     | 35.6       | 2.000     | 53.0       | 5.000     | 82.7       | 9.000     | 110.2      |
| 0.600     | 34.5       | 2.200     | 55.5       | 5.500     | 86.6       | 9.500     | 112.4      |
| 0.800     | 34.1       | 2.400     | 57.9       | 6.000     | 90.4       |           |            |
| 1.000     | 38.0       | 2.600     | 60.2       | 6.500     | 94.0       |           |            |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Storage Structures for Storm

#### Porous Car Park Manhole: SPCP 1, DS/PN: S3.001

|                                      |         |                         |      |
|--------------------------------------|---------|-------------------------|------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 26.4 |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 26.4 |
| Max Percolation (l/s)                | 193.6   | Slope (1:X)             | 0.0  |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5    |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3    |
| Invert Level (m)                     | 19.170  | Membrane Depth (mm)     | 130  |

#### Porous Car Park Manhole: SPCP 2, DS/PN: S1.006

|                                      |         |                         |      |
|--------------------------------------|---------|-------------------------|------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 16.4 |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 60.4 |
| Max Percolation (l/s)                | 275.2   | Slope (1:X)             | 0.0  |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5    |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3    |
| Invert Level (m)                     | 17.900  | Membrane Depth (mm)     | 130  |

### Manhole Headloss for Storm

| PN     | US/MH<br>Name | US/MH<br>Headloss |
|--------|---------------|-------------------|
| S1.000 | S1            | 0.500             |
| S1.001 | S2            | 0.500             |
| S2.000 | S3            | 0.500             |
| S2.001 | S4            | 0.500             |
| S1.002 | S5            | 0.500             |
| S1.003 | S6            | 0.500             |
| S1.004 | S7            | 0.500             |
| S3.000 | SDummy Pipe   | 0.500             |
| S3.001 | SPCP 1        | 0.500             |
| S1.005 | S8            | 0.500             |
| S1.006 | SPCP 2        | 0.500             |
| S1.007 | S9            | 0.500             |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Volume Summary (Static)

Length Calculations based on Centre-Centre

| Pipe Number | USMH Name   | Manhole Volume (m³) | Pipe Volume (m³) | Storage Structure Volume (m³) | Total Volume (m³) |
|-------------|-------------|---------------------|------------------|-------------------------------|-------------------|
| S1.000      | S1          | 1.470               | 0.163            | 0.000                         | 1.633             |
| S1.001      | S2          | 1.470               | 0.415            | 0.000                         | 1.885             |
| S2.000      | S3          | 1.612               | 2.596            | 0.000                         | 4.207             |
| S2.001      | S4          | 1.696               | 2.246            | 0.000                         | 3.942             |
| S1.002      | S5          | 1.696               | 1.240            | 0.000                         | 2.937             |
| S1.003      | S6          | 1.385               | 1.100            | 0.000                         | 2.485             |
| S1.004      | S7          | 1.272               | 0.853            | 0.000                         | 2.125             |
| S3.000      | SDummy Pipe | 0.113               | 0.041            | 0.000                         | 0.155             |
| S3.001      | SPCP 1      | 0.003               | 0.033            | 104.544                       | 104.580           |
| S1.005      | S8          | 1.810               | 0.647            | 0.000                         | 2.457             |
| S1.006      | SPCP 2      | 0.002               | 0.883            | 228.819                       | 229.705           |
| S1.007      | S9          | 1.018               | 0.393            | 0.000                         | 1.411             |
| Total       |             | 13.549              | 10.610           | 333.363                       | 357.522           |

### Volume Summary (Static)

Length Calculations based on True Length

| Pipe Number | USMH Name   | Manhole Volume (m³) | Pipe Volume (m³) | Storage Structure Volume (m³) | Total Volume (m³) |
|-------------|-------------|---------------------|------------------|-------------------------------|-------------------|
| S1.000      | S1          | 1.470               | 0.154            | 0.000                         | 1.624             |
| S1.001      | S2          | 1.470               | 0.406            | 0.000                         | 1.876             |
| S2.000      | S3          | 1.612               | 2.511            | 0.000                         | 4.122             |
| S2.001      | S4          | 1.696               | 2.161            | 0.000                         | 3.858             |
| S1.002      | S5          | 1.696               | 1.156            | 0.000                         | 2.852             |
| S1.003      | S6          | 1.385               | 1.015            | 0.000                         | 2.400             |
| S1.004      | S7          | 1.272               | 0.768            | 0.000                         | 2.040             |
| S3.000      | SDummy Pipe | 0.113               | 0.037            | 0.000                         | 0.150             |
| S3.001      | SPCP 1      | 0.003               | 0.028            | 104.544                       | 104.575           |
| S1.005      | S8          | 1.810               | 0.603            | 0.000                         | 2.413             |
| S1.006      | SPCP 2      | 0.002               | 0.839            | 228.819                       | 229.661           |
| S1.007      | S9          | 1.018               | 0.350            | 0.000                         | 1.368             |
| Total       |             | 13.549              | 10.026           | 333.363                       | 356.939           |

|                                                                                                       |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
|-------------------------------------------------------------------------------------------------------|---------------|-----------------------|----------------------------|---------------------------|----------------------------------|--------------------|-----------------------|------------------|-------------------------------------------------------------------------------------|--|
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| Date 09/07/2020<br>File 195104 Havant Storm Net...                                                    |               |                       |                            |                           | Designed by LTD<br>Checked by NB |                    |                       |                  |                                                                                     |  |
| XP Solutions                                                                                          |               |                       |                            |                           | Network 2019.1                   |                    |                       |                  |                                                                                     |  |
| <u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u><br><u>for Storm</u> |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| <u>Simulation Criteria</u>                                                                            |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000                               |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Hot Start (mins) 0    MADD Factor * 10m³/ha Storage 2.000                                             |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Hot Start Level (mm) 0    Inlet Coefficient 0.800                                                     |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000                    |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Foul Sewage per hectare (l/s) 0.000                                                                   |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Number of Input Hydrographs 0    Number of Storage Structures 2                                       |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Number of Online Controls 2    Number of Time/Area Diagrams 0                                         |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Number of Offline Controls 0    Number of Real Time Controls 0                                        |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| <u>Synthetic Rainfall Details</u>                                                                     |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Rainfall Model    FSR    Ratio R 0.346                                                                |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Region England and Wales Cv (Summer) 0.750                                                            |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| M5-60 (mm)    19.600 Cv (Winter) 0.840                                                                |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Margin for Flood Risk Warning (mm)    300.0                                                           |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Analysis Timestep 2.5 Second Increment (Extended)                                                     |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| DTS Status    OFF                                                                                     |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| DVD Status    ON                                                                                      |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Inertia Status    ON                                                                                  |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Profile(s)    Summer and Winter                                                                       |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440                                          |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Return Period(s) (years)    1, 30, 100                                                                |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| Climate Change (%)    0, 0, 40                                                                        |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
|                                                                                                       |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| PN                                                                                                    | US/MH<br>Name | Storm                 | Return<br>Period           | Climate<br>Change         | First (X)<br>Surcharge           | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. |                                                                                     |  |
| S1.000                                                                                                | S1            | 15 Winter             | 1                          | +0%                       | 100/15 Winter                    |                    |                       |                  |                                                                                     |  |
| S1.001                                                                                                | S2            | 15 Winter             | 1                          | +0%                       | 100/15 Summer                    |                    |                       |                  |                                                                                     |  |
| S2.000                                                                                                | S3            | 15 Winter             | 1                          | +0%                       | 100/15 Summer                    |                    |                       |                  |                                                                                     |  |
| S2.001                                                                                                | S4            | 15 Winter             | 1                          | +0%                       | 100/15 Summer                    |                    |                       |                  |                                                                                     |  |
| S1.002                                                                                                | S5            | 15 Winter             | 1                          | +0%                       | 30/15 Summer                     |                    |                       |                  |                                                                                     |  |
| S1.003                                                                                                | S6            | 15 Winter             | 1                          | +0%                       | 30/15 Summer                     |                    |                       |                  |                                                                                     |  |
| S1.004                                                                                                | S7            | 15 Winter             | 1                          | +0%                       | 30/15 Summer                     |                    |                       |                  |                                                                                     |  |
| S3.000                                                                                                | SDummy Pipe   | 60 Winter             | 1                          | +0%                       |                                  |                    |                       |                  |                                                                                     |  |
| S3.001                                                                                                | SPCP 1        | 60 Winter             | 1                          | +0%                       | 1/15 Summer                      |                    |                       |                  |                                                                                     |  |
| S1.005                                                                                                | S8            | 15 Winter             | 1                          | +0%                       | 30/15 Summer                     |                    |                       |                  |                                                                                     |  |
| S1.006                                                                                                | SPCP 2        | 120 Winter            | 1                          | +0%                       | 100/15 Summer                    |                    |                       |                  |                                                                                     |  |
| S1.007                                                                                                | S9            | 120 Winter            | 1                          | +0%                       | 30/30 Winter                     |                    |                       |                  |                                                                                     |  |
|                                                                                                       |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |
| PN                                                                                                    | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m³) | Flow /<br>Cap.                   | Overflow<br>(l/s)  | Pipe<br>Flow<br>(l/s) | Status           | Level<br>Exceeded                                                                   |  |
| S1.000                                                                                                | S1            | 20.320                | -0.080                     | 0.000                     | 0.09                             |                    | 1.0                   | OK               |                                                                                     |  |
| ©1982-2019 Innovyze                                                                                   |               |                       |                            |                           |                                  |                    |                       |                  |                                                                                     |  |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

| PN     | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------|----------------------------|----------------------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| S1.001 | S2            | 19.636                | -0.064                     | 0.000                                  | 0.28           |                   | 2.4                   | OK         |                   |
| S2.000 | S3            | 19.332                | -0.243                     | 0.000                                  | 0.08           |                   | 8.2                   | OK         |                   |
| S2.001 | S4            | 18.975                | -0.225                     | 0.000                                  | 0.14           |                   | 19.5                  | OK         |                   |
| S1.002 | S5            | 18.437                | -0.163                     | 0.000                                  | 0.43           |                   | 34.2                  | OK         |                   |
| S1.003 | S6            | 18.324                | -0.151                     | 0.000                                  | 0.49           |                   | 36.9                  | OK         |                   |
| S1.004 | S7            | 18.235                | -0.140                     | 0.000                                  | 0.55           |                   | 37.5                  | OK         |                   |
| S3.000 | SDummy Pipe   | 19.700                | -0.100                     | 0.000                                  | 0.00           |                   | 0.0                   | OK         |                   |
| S3.001 | SPCP 1        | 19.205                | 0.605                      | 0.000                                  | 0.36           |                   | 5.0                   | SURCHARGED |                   |
| S1.005 | S8            | 18.160                | -0.140                     | 0.000                                  | 0.55           |                   | 43.8                  | OK         |                   |
| S1.006 | SPCP 2        | 18.011                | -0.189                     | 0.000                                  | 0.27           |                   | 21.3                  | OK         |                   |
| S1.007 | S9            | 17.976                | -0.124                     | 0.000                                  | 0.28           |                   | 21.8                  | OK         |                   |



|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

| PN     | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------|----------------------------|---------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| S1.001 | S2            | 19.667                | -0.033                     | 0.000                     | 0.75           |                   | 6.5                   | OK         |                   |
| S2.000 | S3            | 19.365                | -0.210                     | 0.000                     | 0.19           |                   | 20.0                  | OK         |                   |
| S2.001 | S4            | 19.031                | -0.169                     | 0.000                     | 0.39           |                   | 54.7                  | OK         |                   |
| S1.002 | S5            | 18.840                | 0.240                      | 0.000                     | 1.10           |                   | 88.6                  | SURCHARGED |                   |
| S1.003 | S6            | 18.689                | 0.214                      | 0.000                     | 1.26           |                   | 94.7                  | SURCHARGED |                   |
| S1.004 | S7            | 18.525                | 0.150                      | 0.000                     | 1.42           |                   | 97.4                  | SURCHARGED |                   |
| S3.000 | SDummy Pipe   | 19.700                | -0.100                     | 0.000                     | 0.00           |                   | 0.0                   | OK         |                   |
| S3.001 | SPCP 1        | 19.339                | 0.739                      | 0.000                     | 0.39           |                   | 5.5                   | SURCHARGED |                   |
| S1.005 | S8            | 18.368                | 0.068                      | 0.000                     | 1.33           |                   | 105.6                 | SURCHARGED |                   |
| S1.006 | SPCP 2        | 18.170                | -0.030                     | 0.000                     | 0.44           |                   | 34.7                  | OK         |                   |
| S1.007 | S9            | 18.130                | 0.030                      | 0.000                     | 0.45           |                   | 35.9                  | SURCHARGED |                   |

|                                                                                               |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
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| Unit 704<br>The Paintworks<br>Bristol BS4 3EH                                                 |             |                 | Havant<br>Southern Network       |                     |                 |  |                    |               |                |
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| XP Solutions                                                                                  |             |                 | Network 2019.1                   |                     |                 |                                                                                     |                    |               |                |
| <u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u> |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| <u>Simulation Criteria</u>                                                                    |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000                          |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000                                        |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Hot Start Level (mm) 0 Inlet Coeffiecient 0.800                                               |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000               |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Foul Sewage per hectare (l/s) 0.000                                                           |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Number of Input Hydrographs 0 Number of Storage Structures 2                                  |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Number of Online Controls 2 Number of Time/Area Diagrams 0                                    |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Number of Offline Controls 0 Number of Real Time Controls 0                                   |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| <u>Synthetic Rainfall Details</u>                                                             |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Rainfall Model FSR Ratio R 0.346                                                              |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Region England and Wales Cv (Summer) 0.750                                                    |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| M5-60 (mm) 19.600 Cv (Winter) 0.840                                                           |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Margin for Flood Risk Warning (mm) 300.0                                                      |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Analysis Timestep 2.5 Second Increment (Extended)                                             |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| DTS Status OFF                                                                                |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| DVD Status ON                                                                                 |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Inertia Status ON                                                                             |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Profile(s) Summer and Winter                                                                  |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440                                  |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Return Period(s) (years) 1, 30, 100                                                           |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| Climate Change (%) 0, 0, 40                                                                   |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
|                                                                                               |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| PN                                                                                            | US/MH Name  | Storm           | Return Period                    | Climate Change      | First (X) Surge | First (Y) Flood                                                                     | First (Z) Overflow | Overflow Act. |                |
| S1.000                                                                                        | S1          | 15 Winter       | 100                              | +40%                | 100/15 Winter   |                                                                                     |                    |               |                |
| S1.001                                                                                        | S2          | 15 Winter       | 100                              | +40%                | 100/15 Summer   |                                                                                     |                    |               |                |
| S2.000                                                                                        | S3          | 15 Winter       | 100                              | +40%                | 100/15 Summer   |                                                                                     |                    |               |                |
| S2.001                                                                                        | S4          | 15 Winter       | 100                              | +40%                | 100/15 Summer   |                                                                                     |                    |               |                |
| S1.002                                                                                        | S5          | 15 Winter       | 100                              | +40%                | 30/15 Summer    |                                                                                     |                    |               |                |
| S1.003                                                                                        | S6          | 15 Winter       | 100                              | +40%                | 30/15 Summer    |                                                                                     |                    |               |                |
| S1.004                                                                                        | S7          | 15 Winter       | 100                              | +40%                | 30/15 Summer    |                                                                                     |                    |               |                |
| S3.000                                                                                        | SDummy Pipe | 60 Winter       | 100                              | +40%                |                 |                                                                                     |                    |               |                |
| S3.001                                                                                        | SPCP 1      | 120 Winter      | 100                              | +40%                | 1/15 Summer     |                                                                                     |                    |               |                |
| S1.005                                                                                        | S8          | 15 Winter       | 100                              | +40%                | 30/15 Summer    |                                                                                     |                    |               |                |
| S1.006                                                                                        | SPCP 2      | 120 Winter      | 100                              | +40%                | 100/15 Summer   |                                                                                     |                    |               |                |
| S1.007                                                                                        | S9          | 120 Winter      | 100                              | +40%                | 30/30 Winter    |                                                                                     |                    |               |                |
|                                                                                               |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |
| PN                                                                                            | US/MH Name  | Water Level (m) | Surcharged Depth (m)             | Flooded Volume (m³) | Flow / Cap.     | Overflow (l/s)                                                                      | Pipe Flow (l/s)    | Status        | Level Exceeded |
| S1.000                                                                                        | S1          | 20.418          | 0.018                            | 0.000               | 0.40            |                                                                                     | 4.3                | SURCHARGED    |                |
| ©1982-2019 Innovyze                                                                           |             |                 |                                  |                     |                 |                                                                                     |                    |               |                |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| PN     | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------|----------------------------|----------------------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| S1.001 | S2            | 20.368                | 0.668                      | 0.000                                  | 0.98           |                   | 8.4                   | SURCHARGED |                   |
| S2.000 | S3            | 20.017                | 0.442                      | 0.000                                  | 0.31           |                   | 31.8                  | SURCHARGED |                   |
| S2.001 | S4            | 19.931                | 0.731                      | 0.000                                  | 0.55           |                   | 76.3                  | SURCHARGED |                   |
| S1.002 | S5            | 19.737                | 1.137                      | 0.000                                  | 1.69           |                   | 135.3                 | FLOOD RISK |                   |
| S1.003 | S6            | 19.364                | 0.889                      | 0.000                                  | 1.95           |                   | 146.2                 | FLOOD RISK |                   |
| S1.004 | S7            | 18.970                | 0.595                      | 0.000                                  | 2.20           |                   | 150.9                 | FLOOD RISK |                   |
| S3.000 | SDummy Pipe   | 19.700                | -0.100                     | 0.000                                  | 0.00           |                   | 0.0                   | OK         |                   |
| S3.001 | SPCP 1        | 19.580                | 0.980                      | 0.000                                  | 0.45           |                   | 6.2                   | FLOOD RISK |                   |
| S1.005 | S8            | 18.601                | 0.301                      | 0.000                                  | 2.02           |                   | 160.2                 | SURCHARGED |                   |
| S1.006 | SPCP 2        | 18.490                | 0.290                      | 0.000                                  | 0.45           |                   | 35.9                  | SURCHARGED |                   |
| S1.007 | S9            | 18.448                | 0.348                      | 0.000                                  | 0.46           |                   | 36.0                  | FLOOD RISK |                   |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Existing Network Details for Storm

# - Indicates pipe length does not match coordinates

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|
| S1.000 | 20.752        | 0.700       | 29.6           | 0.007          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S1.001 | 52.859        | 1.100       | 48.1           | 0.013          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S2.000 | 36.720        | 0.375       | 97.9           | 0.064          | 5.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S2.001 | 31.773        | 0.600       | 53.0           | 0.103          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.002 | 17.547        | 0.125       | 140.4          | 0.112          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.003 | 15.558        | 0.100       | 155.6          | 0.025          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.004 | 12.065        | 0.075       | 160.9          | 0.009          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S3.000 | 5.274         | 0.000       | 0.0            | 0.000          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S3.001 | 4.178         | 0.300       | 13.9           | 0.222          | 5.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |
| S1.005 | 9.158#        | 0.100       | 91.6           | 0.010          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.006 | 12.494        | 0.100       | 124.9          | 0.197          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |
| S1.007 | 5.555         | 0.100       | 55.5           | 0.018          | 0.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |

### Network Results Table

| PN     | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Vel<br>(m/s) | Cap<br>(l/s) |
|--------|--------------|------------------|----------------------|--------------|--------------|
| S1.000 | 20.300       | 0.007            | 0.0                  | 1.42         | 11.2         |
| S1.001 | 19.600       | 0.020            | 0.0                  | 1.11         | 8.8          |
| S2.000 | 19.275       | 0.064            | 0.0                  | 1.59         | 112.3        |
| S2.001 | 18.900       | 0.167            | 0.0                  | 2.17         | 153.1        |
| S1.002 | 18.300       | 0.299            | 0.0                  | 1.33         | 93.7         |
| S1.003 | 18.175       | 0.324            | 0.0                  | 1.26         | 88.9         |
| S1.004 | 18.075       | 0.333            | 0.0                  | 1.24         | 87.4         |
| S3.000 | 19.700       | 0.000            | 0.0                  | 0.00         | 0.0          |
| S3.001 | 18.500       | 0.222            | 0.0                  | 2.08         | 16.3         |
| S1.005 | 18.000       | 0.566            | 0.0                  | 1.64         | 116.2        |
| S1.006 | 17.900       | 0.763            | 0.0                  | 1.41         | 99.3         |
| S1.007 | 17.800       | 0.781            | 0.0                  | 2.11         | 149.4        |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Manhole Schedules for Storm

| MH Name     | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN     | Pipe Out Invert Level (m) | Diameter (mm) | PN     | Pipes In Invert Level (m) | Diameter (mm) | Back (m) |
|-------------|-----------|--------------|---------------|--------------------|--------|---------------------------|---------------|--------|---------------------------|---------------|----------|
| S1          | 21.600    | 1.300        | Open Manhole  | 1200               | S1.000 | 20.300                    | 100           |        |                           |               |          |
| S2          | 20.900    | 1.300        | Open Manhole  | 1200               | S1.001 | 19.600                    | 100           | S1.000 | 19.600                    | 100           |          |
| S3          | 20.700    | 1.425        | Open Manhole  | 1200               | S2.000 | 19.275                    | 300           |        |                           |               |          |
| S4          | 20.400    | 1.500        | Open Manhole  | 1200               | S2.001 | 18.900                    | 300           | S2.000 | 18.900                    | 300           |          |
| S5          | 19.800    | 1.500        | Open Manhole  | 1200               | S1.002 | 18.300                    | 300           | S1.001 | 18.500                    | 100           |          |
|             |           |              |               |                    |        |                           |               | S2.001 | 18.300                    | 300           |          |
| S6          | 19.400    | 1.225        | Open Manhole  | 1200               | S1.003 | 18.175                    | 300           | S1.002 | 18.175                    | 300           |          |
| S7          | 19.200    | 1.125        | Open Manhole  | 1200               | S1.004 | 18.075                    | 300           | S1.003 | 18.075                    | 300           |          |
| SDummy Pipe | 19.800    | 0.100        | Open Manhole  | 1200               | S3.000 | 19.700                    | 100           |        |                           |               |          |
| SPCP 1      | 19.800    | 1.300        | Open Manhole  | 50 x 50            | S3.001 | 18.500                    | 100           | S3.000 | 19.700                    | 100           |          |
| S8          | 19.600    | 1.600        | Open Manhole  | 1200               | S1.005 | 18.000                    | 300           | S1.004 | 18.000                    | 300           |          |
|             |           |              |               |                    |        |                           |               | S3.001 | 18.200                    | 100           |          |
| SPCP 2      | 18.800    | 0.900        | Open Manhole  | 50 x 50            | S1.006 | 17.900                    | 300           | S1.005 | 17.900                    | 300           |          |
| S9          | 18.700    | 0.900        | Open Manhole  | 1200               | S1.007 | 17.800                    | 300           | S1.006 | 17.800                    | 300           |          |
| S           | 18.600    | 0.900        | Open Manhole  | 0                  |        | OUTFALL                   |               | S1.007 | 17.700                    | 300           |          |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)                                                                        |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---------------------------------------------------------------------------------------|
| S1      | 1115.952            | 1308.107             | 1115.952                 | 1308.107                  | Required       |  |
| S2      | 1113.509            | 1287.499             | 1113.509                 | 1287.499                  | Required       |                                                                                       |
| S3      | 1032.327            | 1267.342             | 1032.327                 | 1267.342                  | Required       |                                                                                       |
| S4      | 1065.562            | 1251.728             | 1065.562                 | 1251.728                  | Required       |                                                                                       |
| S5      | 1094.331            | 1238.242             | 1094.331                 | 1238.242                  | Required       |                                                                                       |
| S6      | 1087.680            | 1222.005             | 1087.680                 | 1222.005                  | Required       |                                                                                       |
| S7      | 1076.826            | 1210.858             | 1076.826                 | 1210.858                  | Required       |                                                                                       |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Manhole Schedules for Storm

| MH<br>Name  | Manhole<br>Easting<br>(m) | Manhole<br>Northing<br>(m) | Intersection<br>Easting<br>(m) | Intersection<br>Northing<br>(m) | Manhole<br>Access | Layout<br>(North)                                                                    |
|-------------|---------------------------|----------------------------|--------------------------------|---------------------------------|-------------------|--------------------------------------------------------------------------------------|
| SDummy Pipe | 1056.349                  | 1216.371                   | 1056.349                       | 1216.371                        | Required          |  |
| SPCP 1      | 1061.078                  | 1214.036                   | 1061.078                       | 1214.036                        | Required          |                                                                                      |
| S8          | 1064.836                  | 1212.210                   | 1064.836                       | 1212.210                        | Required          |                                                                                      |
| SPCP 2      | 1033.177                  | 1149.754                   | 1033.177                       | 1149.754                        | Required          |                                                                                      |
| S9          | 1030.269                  | 1137.603                   | 1030.269                       | 1137.603                        | Required          |                                                                                      |
| S           | 1034.549                  | 1134.063                   |                                |                                 | No Entry          |                                                                                      |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### PIPELINE SCHEDULES for Storm

#### Upstream Manhole

# - Indicates pipe length does not match coordinates

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name  | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|-------------|----------------|----------------|----------------|------------------|-----------------------|
| S1.000 | o           | 100          | S1          | 21.600         | 20.300         | 1.200          | Open Manhole     | 1200                  |
| S1.001 | o           | 100          | S2          | 20.900         | 19.600         | 1.200          | Open Manhole     | 1200                  |
| S2.000 | o           | 300          | S3          | 20.700         | 19.275         | 1.125          | Open Manhole     | 1200                  |
| S2.001 | o           | 300          | S4          | 20.400         | 18.900         | 1.200          | Open Manhole     | 1200                  |
| S1.002 | o           | 300          | S5          | 19.800         | 18.300         | 1.200          | Open Manhole     | 1200                  |
| S1.003 | o           | 300          | S6          | 19.400         | 18.175         | 0.925          | Open Manhole     | 1200                  |
| S1.004 | o           | 300          | S7          | 19.200         | 18.075         | 0.825          | Open Manhole     | 1200                  |
| S3.000 | o           | 100          | SDummy Pipe | 19.800         | 19.700         | 0.000          | Open Manhole     | 1200                  |
| S3.001 | o           | 100          | SPCP 1      | 19.800         | 18.500         | 1.200          | Open Manhole     | 50 x 50               |
| S1.005 | o           | 300          | S8          | 19.600         | 18.000         | 1.300          | Open Manhole     | 1200                  |
| S1.006 | o           | 300          | SPCP 2      | 18.800         | 17.900         | 0.600          | Open Manhole     | 50 x 50               |
| S1.007 | o           | 300          | S9          | 18.700         | 17.800         | 0.600          | Open Manhole     | 1200                  |

#### Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| S1.000 | 20.752        | 29.6           | S2         | 20.900         | 19.600         | 1.200          | Open Manhole     | 1200                  |
| S1.001 | 52.859        | 48.1           | S5         | 19.800         | 18.500         | 1.200          | Open Manhole     | 1200                  |
| S2.000 | 36.720        | 97.9           | S4         | 20.400         | 18.900         | 1.200          | Open Manhole     | 1200                  |
| S2.001 | 31.773        | 53.0           | S5         | 19.800         | 18.300         | 1.200          | Open Manhole     | 1200                  |
| S1.002 | 17.547        | 140.4          | S6         | 19.400         | 18.175         | 0.925          | Open Manhole     | 1200                  |
| S1.003 | 15.558        | 155.6          | S7         | 19.200         | 18.075         | 0.825          | Open Manhole     | 1200                  |
| S1.004 | 12.065        | 160.9          | S8         | 19.600         | 18.000         | 1.300          | Open Manhole     | 1200                  |
| S3.000 | 5.274         | 0.0            | SPCP 1     | 19.800         | 19.700         | 0.000          | Open Manhole     | 50 x 50               |
| S3.001 | 4.178         | 13.9           | S8         | 19.600         | 18.200         | 1.300          | Open Manhole     | 1200                  |
| S1.005 | 9.158#        | 91.6           | SPCP 2     | 18.800         | 17.900         | 0.600          | Open Manhole     | 50 x 50               |
| S1.006 | 12.494        | 124.9          | S9         | 18.700         | 17.800         | 0.600          | Open Manhole     | 1200                  |
| S1.007 | 5.555         | 55.5           | S          | 18.600         | 17.700         | 0.600          | Open Manhole     | 0                     |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

#### Area Summary for Storm

| Pipe Number | PIMP Type | PIMP Name | PIMP (%) | Gross Area (ha) | Imp. Area (ha) | Pipe Total (ha) |
|-------------|-----------|-----------|----------|-----------------|----------------|-----------------|
| 1.000       | User      | -         | 100      | 0.007           | 0.007          | 0.007           |
| 1.001       | User      | -         | 100      | 0.013           | 0.013          | 0.013           |
| 2.000       | User      | -         | 100      | 0.015           | 0.015          | 0.015           |
|             | User      | -         | 100      | 0.049           | 0.049          | 0.064           |
| 2.001       | User      | -         | 100      | 0.076           | 0.076          | 0.076           |
|             | User      | -         | 100      | 0.027           | 0.027          | 0.103           |
| 1.002       | User      | -         | 100      | 0.049           | 0.049          | 0.049           |
|             | User      | -         | 100      | 0.063           | 0.063          | 0.112           |
| 1.003       | User      | -         | 100      | 0.021           | 0.021          | 0.021           |
|             | User      | -         | 100      | 0.004           | 0.004          | 0.025           |
| 1.004       | User      | -         | 100      | 0.009           | 0.009          | 0.009           |
| 3.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 3.001       | User      | -         | 100      | 0.032           | 0.032          | 0.032           |
|             | User      | -         | 100      | 0.021           | 0.021          | 0.054           |
|             | User      | -         | 100      | 0.030           | 0.030          | 0.084           |
|             | User      | -         | 100      | 0.138           | 0.138          | 0.222           |
| 1.005       | User      | -         | 100      | 0.010           | 0.010          | 0.010           |
| 1.006       | User      | -         | 100      | 0.010           | 0.010          | 0.010           |
|             | User      | -         | 100      | 0.099           | 0.099          | 0.109           |
|             | User      | -         | 100      | 0.089           | 0.089          | 0.197           |
| 1.007       | User      | -         | 100      | 0.018           | 0.018          | 0.018           |
|             |           |           |          | Total           | Total          | Total           |
|             |           |           |          | 0.781           | 0.781          | 0.781           |

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|        |   |        |        |       |   |   |
|--------|---|--------|--------|-------|---|---|
| S1.007 | S | 18.600 | 17.700 | 0.000 | 0 | 0 |
|--------|---|--------|--------|-------|---|---|

#### Simulation Criteria for Storm

|                                 |       |                                            |       |
|---------------------------------|-------|--------------------------------------------|-------|
| Volumetric Runoff Coeff         | 0.750 | Additional Flow - % of Total Flow          | 0.000 |
| Areal Reduction Factor          | 1.000 | MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000 |
| Hot Start (mins)                | 0     | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)            | 0     | Flow per Person per Day (l/per/day)        | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins)                            | 60    |
| Foul Sewage per hectare (l/s)   | 0.000 | Output Interval (mins)                     | 1     |
|                                 |       |                                            |       |
| Number of Input Hydrographs     | 0     | Number of Storage Structures               | 2     |
| Number of Online Controls       | 2     | Number of Time/Area Diagrams               | 0     |
| Number of Offline Controls      | 0     | Number of Real Time Controls               | 0     |

#### Synthetic Rainfall Details

Rainfall Model FSR Return Period (years) 1

|                                                                                                                                                                                                                                                               |                                  |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
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| Unit 704<br>The Paintworks<br>Bristol BS4 3EH                                                                                                                                                                                                                 | Havant<br>Southern Network       |  |
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| XP Solutions                                                                                                                                                                                                                                                  | Network 2019.1                   |                                                                                     |
| <div>Synthetic Rainfall Details</div> <div><div>Region England and Wales</div><div>M5-60 (mm)19.600</div><div>Ratio R0.346</div><div>Profile TypeSummer</div><div>Cv (Summer) 0.750</div><div>Cv (Winter) 0.840</div><div>Storm Duration (mins)30</div></div> |                                  |                                                                                     |
| ©1982-2019 Innovyze                                                                                                                                                                                                                                           |                                  |                                                                                     |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

Online Controls for Storm

Orifice Manhole: SPCP 1, DS/PN: S3.001, Volume (m<sup>3</sup>): 0.0

Diameter (m) 0.054 Discharge Coefficient 0.600 Invert Level (m) 18.500

Hydro-Brake® Optimum Manhole: S9, DS/PN: S1.007, Volume (m<sup>3</sup>): 1.9

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0257-3610-0900-3610 |
| Design Head (m)                   | 0.900                      |
| Design Flow (l/s)                 | 36.1                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 257                        |
| Invert Level (m)                  | 17.800                     |
| Minimum Outlet Pipe Diameter (mm) | 300                        |
| Suggested Manhole Diameter (mm)   | 1800                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.900    | 36.1       |
| Flush-Flo™                | 0.393    | 36.1       |
| Kick-Flo®                 | 0.703    | 32.1       |
| Mean Flow over Head Range | -        | 29.1       |

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     | 8.3        | 1.200     | 41.4       | 3.000     | 64.5       | 7.000     | 97.4       |
| 0.200     | 26.4       | 1.400     | 44.6       | 3.500     | 69.5       | 7.500     | 100.8      |
| 0.300     | 35.6       | 1.600     | 47.6       | 4.000     | 74.2       | 8.000     | 104.0      |
| 0.400     | 36.1       | 1.800     | 50.4       | 4.500     | 78.6       | 8.500     | 107.1      |
| 0.500     | 35.6       | 2.000     | 53.0       | 5.000     | 82.7       | 9.000     | 110.2      |
| 0.600     | 34.5       | 2.200     | 55.5       | 5.500     | 86.6       | 9.500     | 112.4      |
| 0.800     | 34.1       | 2.400     | 57.9       | 6.000     | 90.4       |           |            |
| 1.000     | 38.0       | 2.600     | 60.2       | 6.500     | 94.0       |           |            |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Storage Structures for Storm

#### Porous Car Park Manhole: SPCP 1, DS/PN: S3.001

|                                      |         |                         |      |
|--------------------------------------|---------|-------------------------|------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 26.4 |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 26.4 |
| Max Percolation (l/s)                | 193.6   | Slope (1:X)             | 0.0  |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5    |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3    |
| Invert Level (m)                     | 19.170  | Membrane Depth (mm)     | 130  |

#### Porous Car Park Manhole: SPCP 2, DS/PN: S1.006

|                                      |         |                         |      |
|--------------------------------------|---------|-------------------------|------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 16.4 |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 60.4 |
| Max Percolation (l/s)                | 275.2   | Slope (1:X)             | 0.0  |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5    |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3    |
| Invert Level (m)                     | 17.900  | Membrane Depth (mm)     | 130  |

### Manhole Headloss for Storm

| PN     | US/MH<br>Name | US/MH<br>Headloss |
|--------|---------------|-------------------|
| S1.000 | S1            | 0.500             |
| S1.001 | S2            | 0.500             |
| S2.000 | S3            | 0.500             |
| S2.001 | S4            | 0.500             |
| S1.002 | S5            | 0.500             |
| S1.003 | S6            | 0.500             |
| S1.004 | S7            | 0.500             |
| S3.000 | SDummy Pipe   | 0.500             |
| S3.001 | SPCP 1        | 0.500             |
| S1.005 | S8            | 0.500             |
| S1.006 | SPCP 2        | 0.500             |
| S1.007 | S9            | 0.500             |

|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

### Volume Summary (Static)

Length Calculations based on Centre-Centre

| Pipe Number | USMH Name   | Manhole Volume (m³) | Pipe Volume (m³) | Storage Structure Volume (m³) | Total Volume (m³) |
|-------------|-------------|---------------------|------------------|-------------------------------|-------------------|
| S1.000      | S1          | 1.470               | 0.163            | 0.000                         | 1.633             |
| S1.001      | S2          | 1.470               | 0.415            | 0.000                         | 1.885             |
| S2.000      | S3          | 1.612               | 2.596            | 0.000                         | 4.207             |
| S2.001      | S4          | 1.696               | 2.246            | 0.000                         | 3.942             |
| S1.002      | S5          | 1.696               | 1.240            | 0.000                         | 2.937             |
| S1.003      | S6          | 1.385               | 1.100            | 0.000                         | 2.485             |
| S1.004      | S7          | 1.272               | 0.853            | 0.000                         | 2.125             |
| S3.000      | SDummy Pipe | 0.113               | 0.041            | 0.000                         | 0.155             |
| S3.001      | SPCP 1      | 0.003               | 0.033            | 104.544                       | 104.580           |
| S1.005      | S8          | 1.810               | 0.647            | 0.000                         | 2.457             |
| S1.006      | SPCP 2      | 0.002               | 0.883            | 228.819                       | 229.705           |
| S1.007      | S9          | 1.018               | 0.393            | 0.000                         | 1.411             |
| Total       |             | 13.549              | 10.610           | 333.363                       | 357.522           |

### Volume Summary (Static)

Length Calculations based on True Length

| Pipe Number | USMH Name   | Manhole Volume (m³) | Pipe Volume (m³) | Storage Structure Volume (m³) | Total Volume (m³) |
|-------------|-------------|---------------------|------------------|-------------------------------|-------------------|
| S1.000      | S1          | 1.470               | 0.154            | 0.000                         | 1.624             |
| S1.001      | S2          | 1.470               | 0.406            | 0.000                         | 1.876             |
| S2.000      | S3          | 1.612               | 2.511            | 0.000                         | 4.122             |
| S2.001      | S4          | 1.696               | 2.161            | 0.000                         | 3.858             |
| S1.002      | S5          | 1.696               | 1.156            | 0.000                         | 2.852             |
| S1.003      | S6          | 1.385               | 1.015            | 0.000                         | 2.400             |
| S1.004      | S7          | 1.272               | 0.768            | 0.000                         | 2.040             |
| S3.000      | SDummy Pipe | 0.113               | 0.037            | 0.000                         | 0.150             |
| S3.001      | SPCP 1      | 0.003               | 0.028            | 104.544                       | 104.575           |
| S1.005      | S8          | 1.810               | 0.603            | 0.000                         | 2.413             |
| S1.006      | SPCP 2      | 0.002               | 0.839            | 228.819                       | 229.661           |
| S1.007      | S9          | 1.018               | 0.350            | 0.000                         | 1.368             |
| Total       |             | 13.549              | 10.026           | 333.363                       | 356.939           |



|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

| PN     | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------|----------------------------|----------------------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| S1.001 | S2            | 19.636                | -0.064                     | 0.000                                  | 0.28           |                   | 2.4                   | OK         |                   |
| S2.000 | S3            | 19.332                | -0.243                     | 0.000                                  | 0.08           |                   | 8.2                   | OK         |                   |
| S2.001 | S4            | 18.975                | -0.225                     | 0.000                                  | 0.14           |                   | 19.5                  | OK         |                   |
| S1.002 | S5            | 18.437                | -0.163                     | 0.000                                  | 0.43           |                   | 34.2                  | OK         |                   |
| S1.003 | S6            | 18.324                | -0.151                     | 0.000                                  | 0.49           |                   | 36.9                  | OK         |                   |
| S1.004 | S7            | 18.235                | -0.140                     | 0.000                                  | 0.55           |                   | 37.5                  | OK         |                   |
| S3.000 | SDummy Pipe   | 19.700                | -0.100                     | 0.000                                  | 0.00           |                   | 0.0                   | OK         |                   |
| S3.001 | SPCP 1        | 19.205                | 0.605                      | 0.000                                  | 0.36           |                   | 5.0                   | SURCHARGED |                   |
| S1.005 | S8            | 18.160                | -0.140                     | 0.000                                  | 0.55           |                   | 43.8                  | OK         |                   |
| S1.006 | SPCP 2        | 18.011                | -0.189                     | 0.000                                  | 0.27           |                   | 21.3                  | OK         |                   |
| S1.007 | S9            | 17.976                | -0.124                     | 0.000                                  | 0.28           |                   | 21.8                  | OK         |                   |

|                                                                                                |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
|------------------------------------------------------------------------------------------------|-------------|-----------------|----------------------|---------------------|----------------------------------|-----------------|--------------------|---------------|-------------------------------------------------------------------------------------|--|
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| Unit 704<br>The Paintworks<br>Bristol BS4 3EH                                                  |             |                 |                      |                     | Havant<br>Southern Network       |                 |                    |               |  |  |
| Date 09/07/2020<br>File 195104 Havant Storm Net...                                             |             |                 |                      |                     | Designed by LTD<br>Checked by NB |                 |                    |               |                                                                                     |  |
| XP Solutions                                                                                   |             |                 |                      |                     | Network 2019.1                   |                 |                    |               |                                                                                     |  |
| <u>30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm</u> |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| <u>Simulation Criteria</u>                                                                     |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000                        |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Hot Start (mins) 0    MADD Factor * 10m³/ha Storage 2.000                                      |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Hot Start Level (mm) 0    Inlet Coefficient 0.800                                              |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000             |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Foul Sewage per hectare (l/s) 0.000                                                            |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Number of Input Hydrographs 0    Number of Storage Structures 2                                |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Number of Online Controls 2    Number of Time/Area Diagrams 0                                  |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Number of Offline Controls 0    Number of Real Time Controls 0                                 |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| <u>Synthetic Rainfall Details</u>                                                              |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Rainfall Model FSR    Ratio R 0.346                                                            |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Region England and Wales Cv (Summer) 0.750                                                     |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| M5-60 (mm) 19.600 Cv (Winter) 0.840                                                            |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Margin for Flood Risk Warning (mm) 300.0                                                       |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Analysis Timestep 2.5 Second Increment (Extended)                                              |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| DTS Status OFF                                                                                 |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| DVD Status ON                                                                                  |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Inertia Status ON                                                                              |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Profile(s) Summer and Winter                                                                   |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440                                   |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Return Period(s) (years) 1, 30, 100                                                            |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| Climate Change (%) 0, 0, 40                                                                    |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
|                                                                                                |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| PN                                                                                             | US/MH Name  | Storm           | Return Period        | Climate Change      | First (X) Surcharge              | First (Y) Flood | First (Z) Overflow | Overflow Act. |                                                                                     |  |
| S1.000                                                                                         | S1          | 15 Winter       | 30                   | +0%                 | 100/15 Winter                    |                 |                    |               |                                                                                     |  |
| S1.001                                                                                         | S2          | 15 Winter       | 30                   | +0%                 | 100/15 Summer                    |                 |                    |               |                                                                                     |  |
| S2.000                                                                                         | S3          | 15 Winter       | 30                   | +0%                 | 100/15 Summer                    |                 |                    |               |                                                                                     |  |
| S2.001                                                                                         | S4          | 15 Winter       | 30                   | +0%                 | 100/15 Summer                    |                 |                    |               |                                                                                     |  |
| S1.002                                                                                         | S5          | 15 Winter       | 30                   | +0%                 | 30/15 Summer                     |                 |                    |               |                                                                                     |  |
| S1.003                                                                                         | S6          | 15 Winter       | 30                   | +0%                 | 30/15 Summer                     |                 |                    |               |                                                                                     |  |
| S1.004                                                                                         | S7          | 15 Winter       | 30                   | +0%                 | 30/15 Summer                     |                 |                    |               |                                                                                     |  |
| S3.000                                                                                         | SDummy Pipe | 60 Winter       | 30                   | +0%                 |                                  |                 |                    |               |                                                                                     |  |
| S3.001                                                                                         | SPCP 1      | 120 Winter      | 30                   | +0%                 | 1/15 Summer                      |                 |                    |               |                                                                                     |  |
| S1.005                                                                                         | S8          | 15 Winter       | 30                   | +0%                 | 30/15 Summer                     |                 |                    |               |                                                                                     |  |
| S1.006                                                                                         | SPCP 2      | 15 Winter       | 30                   | +0%                 | 100/15 Summer                    |                 |                    |               |                                                                                     |  |
| S1.007                                                                                         | S9          | 60 Winter       | 30                   | +0%                 | 30/30 Winter                     |                 |                    |               |                                                                                     |  |
|                                                                                                |             |                 |                      |                     |                                  |                 |                    |               |                                                                                     |  |
| PN                                                                                             | US/MH Name  | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap.                      | Overflow (l/s)  | Pipe Flow (l/s)    | Status        | Level Exceeded                                                                      |  |
| S1.000                                                                                         | S1          | 20.332          | -0.068               | 0.000               | 0.22                             |                 | 2.4                | OK            |                                                                                     |  |
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|                                                    |                                  |                                                                                     |
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

| PN     | US/MH<br>Name | Water        |              |                | Surcharged     |                   | Flooded       |               | Pipe          |               | Status     | Level<br>Exceeded |
|--------|---------------|--------------|--------------|----------------|----------------|-------------------|---------------|---------------|---------------|---------------|------------|-------------------|
|        |               | Level<br>(m) | Depth<br>(m) | Volume<br>(m³) | Flow /<br>Cap. | Overflow<br>(l/s) | Flow<br>(l/s) | Flow<br>(l/s) | Flow<br>(l/s) | Flow<br>(l/s) |            |                   |
| S1.001 | S2            | 19.667       | -0.033       | 0.000          | 0.75           |                   | 6.5           |               |               |               | OK         |                   |
| S2.000 | S3            | 19.365       | -0.210       | 0.000          | 0.19           |                   | 20.0          |               |               |               | OK         |                   |
| S2.001 | S4            | 19.031       | -0.169       | 0.000          | 0.39           |                   | 54.7          |               |               |               | OK         |                   |
| S1.002 | S5            | 18.840       | 0.240        | 0.000          | 1.10           |                   | 88.6          |               |               |               | SURCHARGED |                   |
| S1.003 | S6            | 18.689       | 0.214        | 0.000          | 1.26           |                   | 94.7          |               |               |               | SURCHARGED |                   |
| S1.004 | S7            | 18.525       | 0.150        | 0.000          | 1.42           |                   | 97.4          |               |               |               | SURCHARGED |                   |
| S3.000 | SDummy Pipe   | 19.700       | -0.100       | 0.000          | 0.00           |                   | 0.0           |               |               |               | OK         |                   |
| S3.001 | SPCP 1        | 19.339       | 0.739        | 0.000          | 0.39           |                   | 5.5           |               |               |               | SURCHARGED |                   |
| S1.005 | S8            | 18.368       | 0.068        | 0.000          | 1.33           |                   | 105.6         |               |               |               | SURCHARGED |                   |
| S1.006 | SPCP 2        | 18.104       | -0.096       | 0.000          | 0.44           |                   | 34.7          |               |               |               | OK         |                   |
| S1.007 | S9            | 18.130       | 0.030        | 0.000          | 0.45           |                   | 35.9          |               |               |               | SURCHARGED |                   |



|                                                    |                                  |                                                                                     |
|----------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|
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| XP Solutions                                       | Network 2019.1                   |                                                                                     |

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

| PN     | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------|----------------------------|----------------------------------------|----------------|-------------------|-----------------------|------------|-------------------|
| S1.001 | S2            | 20.368                | 0.668                      | 0.000                                  | 0.98           |                   | 8.4                   | SURCHARGED |                   |
| S2.000 | S3            | 20.017                | 0.442                      | 0.000                                  | 0.31           |                   | 31.8                  | SURCHARGED |                   |
| S2.001 | S4            | 19.931                | 0.731                      | 0.000                                  | 0.55           |                   | 76.3                  | SURCHARGED |                   |
| S1.002 | S5            | 19.737                | 1.137                      | 0.000                                  | 1.69           |                   | 135.3                 | FLOOD RISK |                   |
| S1.003 | S6            | 19.364                | 0.889                      | 0.000                                  | 1.95           |                   | 146.2                 | FLOOD RISK |                   |
| S1.004 | S7            | 18.970                | 0.595                      | 0.000                                  | 2.20           |                   | 150.9                 | FLOOD RISK |                   |
| S3.000 | SDummy Pipe   | 19.700                | -0.100                     | 0.000                                  | 0.00           |                   | 0.0                   | OK         |                   |
| S3.001 | SPCP 1        | 19.580                | 0.980                      | 0.000                                  | 0.45           |                   | 6.2                   | FLOOD RISK |                   |
| S1.005 | S8            | 18.601                | 0.301                      | 0.000                                  | 2.02           |                   | 160.2                 | SURCHARGED |                   |
| S1.006 | SPCP 2        | 18.404                | 0.204                      | 0.000                                  | 0.46           |                   | 36.1                  | SURCHARGED |                   |
| S1.007 | S9            | 18.381                | 0.281                      | 0.000                                  | 0.46           |                   | 36.1                  | SURCHARGED |                   |