

|                                                                             |                                    |                                                                                     |
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| M Design                                                                    |                                    | Page 1                                                                              |
| Unit 2 Bewick House<br>Horsley Business Centre<br>Horsley Village, NE15 0NY |                                    |  |
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| Micro Drainage                                                              | System1 W.11.2                     |                                                                                     |

### STORM SEWER DESIGN by the Modified Rational Method

#### Global Variables

Pipe Size File C:\Program Files\Micro Drainage Ltd\WinDes\STANDARD.PIP  
Manhole Size File C:\Program Files\Micro Drainage Ltd\WinDes\STANDARD.MHS

Location - England & Wales

|                               |        |                                      |        |
|-------------------------------|--------|--------------------------------------|--------|
| Return Period (years)         | 1      | Maximum Backdrop Height (m)          | 1.500  |
| M5-60 (mm)                    | 17.200 | Min Cover Depth for Optimisation (m) | 1.200  |
| Ratio R                       | 0.349  | Min Vel for Auto Design Only (m/s)   | 1.00   |
| Maximum Rainfall (mm/hr)      | 50     | Min Slope for Optimisation (1:X)     | 500    |
| Foul Sewage (l/s/ha)          | 0.00   | Minimum Outfall Invert (m)           | 10.280 |
| O'flow Setting (*Foul only)   | 0      | Ground Level at Outfall (m)          | 11.750 |
| Volumetric Runoff Coeff.      | 0.75   | Outfall Manhole Name                 |        |
| Add Flow / Climate Change (%) | 0      | Outfall Manhole Dia/Length (mm)      | 0      |
| Minimum Backdrop Height (m)   | 0.200  | Outfall Manhole Width (mm)           | 0      |

Designed with Level Soffits

#### Network Design Table

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | Area<br>(ha) | T.E.<br>(mins) | DWF<br>(l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) |
|-------|---------------|-------------|----------------|--------------|----------------|--------------|-----------|-------------|-------------|
| 1.000 | 24.88         | 3.200       | 7.8            | 0.013        | 5.00           | 0.0          | 0.600     | o           | 150         |
| 1.001 | 34.84         | 2.350       | 14.8           | 0.018        | 0.00           | 0.0          | 0.600     | o           | 150         |
| 1.002 | 5.49          | 0.200       | 27.5           | 0.006        | 0.00           | 0.0          | 0.600     | o           | 150         |
| 1.003 | 3.77          | 0.050       | 75.4           | 0.000        | 0.00           | 0.0          | 0.600     | o           | 150         |
| 2.000 | 30.75         | 1.050       | 29.3           | 0.051        | 5.00           | 0.0          | 0.600     | o           | 150         |
| 2.001 | 13.04         | 1.878       | 6.9            | 0.000        | 0.00           | 0.0          | 0.600     | o           | 150         |
| 1.004 | 1.04          | 0.050       | 20.7           | 0.000        | 0.00           | 0.0          | 0.600     | o           | 150         |
| 1.005 | 10.83         | 0.145       | 74.7           | 0.000        | 0.00           | 0.0          | 0.600     | o           | 150         |

#### Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | E.Area<br>(ha) | E.DWF<br>(l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | CAP<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|----------------|----------------|---------------|-------------------|--------------|--------------|---------------|
| 1.000 | 43.7            | 5.1            | 16.600       | 0.013          | 0.0            | 0.0           | 0.0               | 3.64         | 64.3         | 1.5           |
| 1.001 | 42.9            | 5.3            | 13.400       | 0.031          | 0.0            | 0.0           | 0.0               | 2.63         | 46.5         | 3.6           |
| 1.002 | 42.7            | 5.4            | 11.050       | 0.037          | 0.0            | 0.0           | 0.0               | 1.93         | 34.1         | 4.3           |
| 1.003 | 42.5            | 5.4            | 10.600       | 0.037          | 0.0            | 0.0           | 0.0               | 1.16         | 20.5         | 4.3           |
| 2.000 | 43.1            | 5.3            | 13.700       | 0.051          | 0.0            | 0.0           | 0.0               | 1.87         | 33.0         | 6.0           |
| 2.001 | 42.9            | 5.3            | 12.650       | 0.051          | 0.0            | 0.0           | 0.0               | 3.85         | 68.0         | 6.0           |
| 1.004 | 42.5            | 5.4            | 10.550       | 0.088          | 0.0            | 0.0           | 0.0               | 2.22         | 39.3         | 10.1          |
| 1.005 | 42.0            | 5.6            | 10.500       | 0.088          | 0.0            | 0.0           | 0.0               | 1.16         | 20.6         | 10.1          |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | System1 W.11.2                     |                                                                                     |

### PIPELINE SCHEDULES

#### Upstream Manhole

| PN    | Hyd<br>Sect | Diam<br>(mm) | MH No. | C.Level<br>(m) | I.Level<br>(m) | C.Depth<br>(m) | MH DIAM.,<br>(mm) | L*W  |
|-------|-------------|--------------|--------|----------------|----------------|----------------|-------------------|------|
| 1.000 | o           | 150          | 1      | 17.200         | 16.600         | 0.450          |                   | 150  |
| 1.001 | o           | 150          | 2      | 14.400         | 13.400         | 0.850          |                   | 450  |
| 1.002 | o           | 150          | 3      | 12.400         | 11.050         | 1.200          |                   | 450  |
| 1.003 | o           | 150          | 4      | 12.200         | 10.600         | 1.450          |                   | 150  |
| 2.000 | o           | 150          | 5      | 14.300         | 13.700         | 0.450          |                   | 150  |
| 2.001 | o           | 150          | 6      | 13.400         | 12.650         | 0.600          |                   | 450  |
| 1.004 | o           | 150          | 7      | 12.300         | 10.550         | 1.600          |                   | 1200 |
| 1.005 | o           | 150          | 8      | 12.300         | 10.500         | 1.650          |                   | 450  |

#### Downstream Manhole

| PN    | Length<br>(m) | Slope<br>(1:X) | MH No. | C.Level<br>(m) | I.Level<br>(m) | C.Depth<br>(m) | MH DIAM.,<br>(mm) | L*W  |
|-------|---------------|----------------|--------|----------------|----------------|----------------|-------------------|------|
| 1.000 | 24.88         | 7.8            | 2      | 14.400         | 13.400         | 0.850          |                   | 450  |
| 1.001 | 34.84         | 14.8           | 3      | 12.400         | 11.050         | 1.200          |                   | 450  |
| 1.002 | 5.49          | 27.5           | 4      | 12.200         | 10.850         | 1.200          |                   | 150  |
| 1.003 | 3.77          | 75.4           | 7      | 12.300         | 10.550         | 1.600          |                   | 1200 |
| 2.000 | 30.75         | 29.3           | 6      | 13.400         | 12.650         | 0.600          |                   | 450  |
| 2.001 | 13.04         | 6.9            | 7      | 12.300         | 10.772         | 1.378          |                   | 1200 |
| 1.004 | 1.04          | 20.7           | 8      | 12.300         | 10.500         | 1.650          |                   | 450  |
| 1.005 | 10.83         | 74.7           |        | 11.750         | 10.355         | 1.245          |                   | 0    |

MANHOLE SCHEDULES

| M/Hole<br>Number | Cover<br>Level<br>(m) | M/Hole<br>Depth<br>(m) | M/Hole<br>Diam., L*W<br>(mm) | Pipes Out |         |        | Pipes In |         |        |
|------------------|-----------------------|------------------------|------------------------------|-----------|---------|--------|----------|---------|--------|
|                  |                       |                        |                              | PN        | IL. (m) | D (mm) | PN       | IL. (m) | D (mm) |
| 1                | 17.200                | 0.600                  | 150                          | 1.000     | 16.600  | 150    |          |         |        |
| 2                | 14.400                | 1.000                  | 450                          | 1.001     | 13.400  | 150    | 1.000    | 13.400  | 150    |
| 3                | 12.400                | 1.350                  | 450                          | 1.002     | 11.050  | 150    | 1.001    | 11.050  | 150    |
| 4                | 12.200                | 1.600                  | 150                          | 1.003     | 10.600  | 150    | 1.002    | 10.850  | 150    |
| 5                | 14.300                | 0.600                  | 150                          | 2.000     | 13.700  | 150    |          |         |        |
| 6                | 13.400                | 0.750                  | 450                          | 2.001     | 12.650  | 150    | 2.000    | 12.650  | 150    |
| 7                | 12.300                | 1.750                  | 1200                         | 1.004     | 10.550  | 150    | 1.003    | 10.550  | 150    |
|                  |                       |                        |                              |           |         |        | 2.001    | 10.772  | 150    |
| 8                | 12.300                | 1.800                  | 450                          | 1.005     | 10.500  | 150    | 1.004    | 10.500  | 150    |
|                  | 11.750                | 1.395                  | 0                            |           | OUTFALL |        | 1.005    | 10.355  | 150    |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

On-Line Controls (Head/Flow)

| US/PN | Volume<br>(m <sup>3</sup> ) | Ctrl<br>MH Name | Invert<br>(m) | Headloss<br>(m) | Flow<br>(l/s) |
|-------|-----------------------------|-----------------|---------------|-----------------|---------------|
| 1.003 | 0.055                       | 7               | 10.550        | 0.1             | 2.2800        |
|       |                             |                 |               | 0.2             | 2.9600        |
|       |                             |                 |               | 0.3             | 2.9900        |
|       |                             |                 |               | 0.4             | 2.9000        |
|       |                             |                 |               | 0.5             | 2.5700        |
|       |                             |                 |               | 0.6             | 2.5600        |
|       |                             |                 |               | 0.7             | 2.7500        |
|       |                             |                 |               | 0.8             | 2.9200        |
|       |                             |                 |               | 0.9             | 3.0800        |
|       |                             |                 |               | 1.0             | 3.0800        |
|       |                             |                 |               | 1.2             | 3.0800        |
|       |                             |                 |               | 1.4             | 3.0800        |
|       |                             |                 |               | 1.6             | 3.0800        |
|       |                             |                 |               | 1.8             | 3.0800        |
|       |                             |                 |               | 2.0             | 3.0800        |
| 2.001 | 0.216                       | 7               | 10.550        | 0.1             | 2.2800        |
|       |                             |                 |               | 0.2             | 2.9600        |
|       |                             |                 |               | 0.3             | 2.9900        |
|       |                             |                 |               | 0.4             | 2.9000        |
|       |                             |                 |               | 0.5             | 2.5700        |
|       |                             |                 |               | 0.6             | 2.5600        |
|       |                             |                 |               | 0.7             | 2.7500        |
|       |                             |                 |               | 0.8             | 2.9200        |
|       |                             |                 |               | 0.9             | 3.0800        |
|       |                             |                 |               | 1.0             | 3.0800        |
|       |                             |                 |               | 1.2             | 3.0800        |
|       |                             |                 |               | 1.4             | 3.0800        |
|       |                             |                 |               | 1.6             | 3.0800        |
|       |                             |                 |               | 1.8             | 3.0800        |
|       |                             |                 |               | 2.0             | 3.0800        |

Storage Pond at pipe 1.003 USMH 4

Storage Pond Invert Level (m) 10.600

| Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) | Depth<br>(m) | Area<br>(m <sup>2</sup> ) |
|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|
| 0.0          | 33.3                      | 0.4          | 33.3                      | 0.8          | 33.3                      | 1.2          | 0.0                       | 1.6          | 0.0                       | 2.0          | 0.0                       | 2.4          | 0.0                       |
| 0.1          | 33.3                      | 0.5          | 33.3                      | 0.9          | 0.0                       | 1.3          | 0.0                       | 1.7          | 0.0                       | 2.1          | 0.0                       | 2.5          | 0.0                       |
| 0.2          | 33.3                      | 0.6          | 33.3                      | 1.0          | 0.0                       | 1.4          | 0.0                       | 1.8          | 0.0                       | 2.2          | 0.0                       |              |                           |
| 0.3          | 33.3                      | 0.7          | 33.3                      | 1.1          | 0.0                       | 1.5          | 0.0                       | 1.9          | 0.0                       | 2.3          | 0.0                       |              |                           |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 15                    |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

C:\DOCUMENTS AND SETTINGS\M DESIGN\MY DOCUMENTS\DROBOX (M DESIGN)\M DESIGN SERVER\001 - CURRENT PROJECTS\MD1899 ST AIDENS\MICRODRAINAGE\SURFACE WATER.SWS

#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 15                              |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.633            | -0.117                  | 0.000               | 0.11              | 0.0               | 6.8                | O K      |
| 1.001 | 13.464            | -0.086                  | 0.000               | 0.37              | 0.0               | 16.7               | O K      |
| 1.002 | 11.145            | -0.055                  | 0.000               | 0.71              | 0.0               | 20.0               | O K      |
| 1.003 | 11.135            | 0.385                   | 0.000               | 0.23              | 0.0               | 3.2                | SURCH'ED |
| 2.000 | 13.806            | -0.044                  | 0.000               | 0.83              | 0.0               | 26.2               | O K      |
| 2.001 | 12.719            | -0.081                  | 0.000               | 0.42              | 0.0               | 26.0               | O K      |
| 1.004 | 11.135            | 0.435                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 30                    |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 30                              |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.630            | -0.120                  | 0.000               | 0.09              | 0.0               | 5.4                | O K      |
| 1.001 | 13.455            | -0.095                  | 0.000               | 0.29              | 0.0               | 13.1               | O K      |
| 1.002 | 11.284            | 0.084                   | 0.000               | 0.56              | 0.0               | 15.6               | SURCH'ED |
| 1.003 | 11.282            | 0.532                   | 0.000               | 0.22              | 0.0               | 3.0                | SURCH'ED |
| 2.000 | 13.790            | -0.060                  | 0.000               | 0.67              | 0.0               | 21.3               | O K      |
| 2.001 | 12.711            | -0.089                  | 0.000               | 0.34              | 0.0               | 21.3               | O K      |
| 1.004 | 11.283            | 0.583                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 60                    |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 60                              |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.624            | -0.126                  | 0.000               | 0.06              | 0.0               | 3.7                | O K      |
| 1.001 | 13.445            | -0.105                  | 0.000               | 0.20              | 0.0               | 8.9                | O K      |
| 1.002 | 11.395            | 0.195                   | 0.000               | 0.38              | 0.0               | 10.6               | SURCH'ED |
| 1.003 | 11.392            | 0.642                   | 0.000               | 0.22              | 0.0               | 3.1                | SURCH'ED |
| 2.000 | 13.771            | -0.079                  | 0.000               | 0.46              | 0.0               | 14.6               | O K      |
| 2.001 | 12.699            | -0.101                  | 0.000               | 0.24              | 0.0               | 14.6               | O K      |
| 1.004 | 11.396            | 0.696                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 2                     |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 0                     |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 2                               |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.608            | -0.142                  | 0.000               | 0.01              | 0.0               | 0.7                | O K      |
| 1.001 | 13.418            | -0.132                  | 0.000               | 0.03              | 0.0               | 1.6                | O K      |
| 1.002 | 11.075            | -0.125                  | 0.000               | 0.07              | 0.0               | 1.9                | O K      |
| 1.003 | 10.701            | -0.049                  | 0.000               | 0.14              | 0.0               | 2.0                | O K      |
| 2.000 | 13.728            | -0.122                  | 0.000               | 0.08              | 0.0               | 2.6                | O K      |
| 2.001 | 12.670            | -0.130                  | 0.000               | 0.04              | 0.0               | 2.6                | O K      |
| 1.004 | 10.704            | 0.004                   | 0.000               | 0.19              | 0.0               | 2.6                | SURCH'ED |
| 1.005 | 10.537            | -0.113                  | 0.000               | 0.14              | 0.0               | 2.6                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 10                    |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 0                     |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 10                              |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.611            | -0.139                  | 0.000               | 0.02              | 0.0               | 1.0                | O K      |
| 1.001 | 13.422            | -0.128                  | 0.000               | 0.05              | 0.0               | 2.3                | O K      |
| 1.002 | 11.081            | -0.119                  | 0.000               | 0.10              | 0.0               | 2.8                | O K      |
| 1.003 | 10.796            | 0.046                   | 0.000               | 0.18              | 0.0               | 2.5                | SURCH'ED |
| 2.000 | 13.734            | -0.116                  | 0.000               | 0.12              | 0.0               | 3.8                | O K      |
| 2.001 | 12.674            | -0.126                  | 0.000               | 0.06              | 0.0               | 3.8                | O K      |
| 1.004 | 10.808            | 0.108                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 30                    |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 0                     |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, L<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 30                              |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.614            | -0.136                  | 0.000               | 0.02              | 0.0               | 1.2                | O K      |
| 1.001 | 13.425            | -0.125                  | 0.000               | 0.07              | 0.0               | 3.0                | O K      |
| 1.002 | 11.085            | -0.115                  | 0.000               | 0.13              | 0.0               | 3.6                | O K      |
| 1.003 | 10.903            | 0.153                   | 0.000               | 0.23              | 0.0               | 3.2                | SURCH'ED |
| 2.000 | 13.739            | -0.111                  | 0.000               | 0.15              | 0.0               | 4.9                | O K      |
| 2.001 | 12.678            | -0.122                  | 0.000               | 0.08              | 0.0               | 4.9                | O K      |
| 1.004 | 10.905            | 0.205                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 20                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.617            | -0.133                  | 0.000               | 0.03              | 0.0               | 2.0                | O K      |
| 1.001 | 13.432            | -0.118                  | 0.000               | 0.10              | 0.0               | 4.7                | O K      |
| 1.002 | 11.240            | 0.040                   | 0.000               | 0.20              | 0.0               | 5.6                | SURCH'ED |
| 1.003 | 11.237            | 0.487                   | 0.000               | 0.23              | 0.0               | 3.3                | SURCH'ED |
| 2.000 | 13.750            | -0.100                  | 0.000               | 0.24              | 0.0               | 7.7                | O K      |
| 2.001 | 12.685            | -0.115                  | 0.000               | 0.12              | 0.0               | 7.7                | O K      |
| 1.004 | 11.242            | 0.542                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.619            | -0.131                  | 0.000               | 0.04              | 0.0               | 2.4                | O K      |
| 1.001 | 13.435            | -0.115                  | 0.000               | 0.13              | 0.0               | 5.7                | O K      |
| 1.002 | 11.430            | 0.230                   | 0.000               | 0.24              | 0.0               | 6.8                | SURCH'ED |
| 1.003 | 11.427            | 0.677                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 2.000 | 13.755            | -0.095                  | 0.000               | 0.29              | 0.0               | 9.3                | O K      |
| 2.001 | 12.689            | -0.111                  | 0.000               | 0.15              | 0.0               | 9.3                | O K      |
| 1.004 | 11.437            | 0.737                   | 0.000               | 0.22              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.541            | -0.109                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 0                     |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, L<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.616            | -0.134                  | 0.000               | 0.03              | 0.0               | 1.6                | O K      |
| 1.001 | 13.430            | -0.120                  | 0.000               | 0.09              | 0.0               | 3.9                | O K      |
| 1.002 | 11.091            | -0.109                  | 0.000               | 0.17              | 0.0               | 4.7                | O K      |
| 1.003 | 11.085            | 0.335                   | 0.000               | 0.23              | 0.0               | 3.2                | SURCH'ED |
| 2.000 | 13.746            | -0.104                  | 0.000               | 0.20              | 0.0               | 6.4                | O K      |
| 2.001 | 12.682            | -0.118                  | 0.000               | 0.10              | 0.0               | 6.4                | O K      |
| 1.004 | 11.119            | 0.419                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 240                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Unit 2 Bewick House<br>Horsley Business Centre<br>Horsley Village, NE15 0NY |                                    |  |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 240                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.616            | -0.134                  | 0.000               | 0.02              | 0.0               | 1.5                | O K      |
| 1.001 | 13.428            | -0.122                  | 0.000               | 0.08              | 0.0               | 3.5                | O K      |
| 1.002 | 11.363            | 0.163                   | 0.000               | 0.15              | 0.0               | 4.1                | SURCH'ED |
| 1.003 | 11.360            | 0.610                   | 0.000               | 0.23              | 0.0               | 3.2                | SURCH'ED |
| 2.000 | 13.743            | -0.107                  | 0.000               | 0.18              | 0.0               | 5.7                | O K      |
| 2.001 | 12.680            | -0.120                  | 0.000               | 0.09              | 0.0               | 5.7                | O K      |
| 1.004 | 11.365            | 0.665                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 150                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 120                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, L<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 150                             |
| Storm Duration (mins)              | 120                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.620            | -0.130                  | 0.000               | 0.04              | 0.0               | 2.6                | O K      |
| 1.001 | 13.437            | -0.113                  | 0.000               | 0.14              | 0.0               | 6.2                | O K      |
| 1.002 | 12.220            | 1.020                   | 0.000               | 0.27              | 0.0               | 7.4                | FLD RISK |
| 1.003 | 12.217            | 1.467                   | 1.469               | 0.22              | 0.0               | 3.1                | FLOOD    |
| 2.000 | 13.758            | -0.092                  | 0.000               | 0.32              | 0.0               | 10.2               | O K      |
| 2.001 | 12.691            | -0.109                  | 0.000               | 0.16              | 0.0               | 10.2               | O K      |
| 1.004 | 12.222            | 1.522                   | 0.000               | 0.22              | 0.0               | 3.1                | FLD RISK |
| 1.005 | 10.541            | -0.109                  | 0.000               | 0.17              | 0.0               | 3.1                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 360                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 360                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.612            | -0.138                  | 0.000               | 0.02              | 0.0               | 1.1                | O K      |
| 1.001 | 13.423            | -0.127                  | 0.000               | 0.06              | 0.0               | 2.6                | O K      |
| 1.002 | 11.259            | 0.059                   | 0.000               | 0.11              | 0.0               | 3.1                | SURCH'ED |
| 1.003 | 11.257            | 0.507                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 2.000 | 13.736            | -0.114                  | 0.000               | 0.13              | 0.0               | 4.2                | O K      |
| 2.001 | 12.675            | -0.125                  | 0.000               | 0.07              | 0.0               | 4.2                | O K      |
| 1.004 | 11.258            | 0.558                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 480                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 480                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.610            | -0.140                  | 0.000               | 0.01              | 0.0               | 0.9                | O K      |
| 1.001 | 13.421            | -0.129                  | 0.000               | 0.05              | 0.0               | 2.1                | O K      |
| 1.002 | 11.150            | -0.050                  | 0.000               | 0.09              | 0.0               | 2.5                | O K      |
| 1.003 | 11.148            | 0.398                   | 0.000               | 0.21              | 0.0               | 2.9                | SURCH'ED |
| 2.000 | 13.733            | -0.117                  | 0.000               | 0.11              | 0.0               | 3.4                | O K      |
| 2.001 | 12.672            | -0.128                  | 0.000               | 0.05              | 0.0               | 3.4                | O K      |
| 1.004 | 11.155            | 0.455                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 960                   |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 960                             |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m³) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status   |
|-------|-------------------|-------------------------|---------------------|-------------------|-------------------|--------------------|----------|
| 1.000 | 16.606            | -0.144                  | 0.000               | 0.01              | 0.0               | 0.5                | O K      |
| 1.001 | 13.416            | -0.134                  | 0.000               | 0.03              | 0.0               | 1.2                | O K      |
| 1.002 | 11.072            | -0.128                  | 0.000               | 0.05              | 0.0               | 1.4                | O K      |
| 1.003 | 10.767            | 0.017                   | 0.000               | 0.13              | 0.0               | 1.9                | SURCH'ED |
| 2.000 | 13.724            | -0.126                  | 0.000               | 0.06              | 0.0               | 2.0                | O K      |
| 2.001 | 12.667            | -0.133                  | 0.000               | 0.03              | 0.0               | 2.0                | O K      |
| 1.004 | 10.775            | 0.075                   | 0.000               | 0.21              | 0.0               | 3.0                | SURCH'ED |
| 1.005 | 10.540            | -0.110                  | 0.000               | 0.16              | 0.0               | 3.0                | O K      |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

#### Global Variables

|                                            |                       |
|--------------------------------------------|-----------------------|
| Region                                     | FSR - England & Wales |
| Return Period (yrs)                        | 100                   |
| M5-60 (mm)                                 | 17.200                |
| Ratio R                                    | 0.349                 |
| Volumetric Runoff Coef                     | 0.840                 |
| Profile Type                               | Winter                |
| PIMP (%)                                   | 100                   |
| Areal Reduction Factor                     | 1.000                 |
| Storm Duration (mins)                      | 1440                  |
| Hot Start (mins)                           | 0                     |
| Hot Start Level (mm)                       | 0                     |
| Manhole Headloss Coefficient               | 0.500                 |
| MADD Factor * 10m <sup>3</sup> /ha Storage | 2.000                 |
| Foul Sewage/Hectare (l/s)                  | 0.00                  |
| Additional Flow - % of Total Flow          | 45                    |
| Number of Input Hydrographs                | 0                     |
| Number of Time/Area Diagrams               | 0                     |
| Number of Bifurcations                     | 0                     |
| Number of Overflows                        | 0                     |
| Number of Off-Line Controls                | 0                     |
| Number of On-Line Controls                 | 2                     |

#### **Starting Storm file name**

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#### Freely Discharging Outfalls

| Outfall<br>Pipe Number | Outfall<br>MH/No | C.Level<br>(m) | I.Level<br>(m) | D, I<br>(mm) | B<br>(mm) |
|------------------------|------------------|----------------|----------------|--------------|-----------|
| 1.005                  |                  | 11.750         | 10.355         | 1200         | 0         |

|                                                                             |                                    |                                                                                     |
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| Micro Drainage                                                              | Simulation W.11.2                  |                                                                                     |

### Summary of Results

|                                    |                                 |
|------------------------------------|---------------------------------|
| Return Period (years)              | 100                             |
| Storm Duration (mins)              | 1440                            |
| Profile Type                       | Winter                          |
| Margin for Flood Risk warning (mm) | 300                             |
| Analysis Time Step                 | 2.5 second increment (extended) |
| DTS Status                         | ON                              |
| DVD Status                         | OFF                             |
| Inertia Status                     | OFF                             |

| PN    | Water Lev.<br>(m) | Surcharged<br>Depth (m) | Flooded<br>Vol (m <sup>3</sup> ) | Flow/<br>Capacity | Overflow<br>(l/s) | Pipe Flow<br>(l/s) | Status |
|-------|-------------------|-------------------------|----------------------------------|-------------------|-------------------|--------------------|--------|
| 1.000 | 16.604            | -0.146                  | 0.000                            | 0.01              | 0.0               | 0.4                | O K    |
| 1.001 | 13.414            | -0.136                  | 0.000                            | 0.02              | 0.0               | 0.9                | O K    |
| 1.002 | 11.069            | -0.131                  | 0.000                            | 0.04              | 0.0               | 1.1                | O K    |
| 1.003 | 10.667            | -0.083                  | 0.000                            | 0.09              | 0.0               | 1.3                | O K    |
| 2.000 | 13.721            | -0.129                  | 0.000                            | 0.05              | 0.0               | 1.5                | O K    |
| 2.001 | 12.666            | -0.134                  | 0.000                            | 0.02              | 0.0               | 1.5                | O K    |
| 1.004 | 10.668            | -0.032                  | 0.000                            | 0.17              | 0.0               | 2.4                | O K    |
| 1.005 | 10.536            | -0.114                  | 0.000                            | 0.13              | 0.0               | 2.4                | O K    |