## Existing Network Details for 223-008 S.W NETWORK.SWS

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) | Section Type |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 14.235 | 0.084 | 169.5 | 0.073 | 5.00 | 0.600 | o | 225 | Pipe/Conduit |
| 1.001 | 6.377 | 0.016 | 398.6 | 0.040 | 0.00 | 0.600 | o | 1200 | Pipe/Conduit |
| 1.002 | 27.985 | 0.070 | 400.0 | 0.015 | 0.00 | 0.600 | o | 1200 | Pipe/Conduit |
| 1.003 | 9.770 | 0.024 | 400.0 | 0.000 | 0.00 | 0.600 | o | 1200 | Pipe/Conduit |
| 1.004 | 16.665 | 0.167 | 100.0 | 0.031 | 0.00 | 0.600 | o | 225 | Pipe/Conduit |
| 1.005 | 33.158 | 0.332 | 100.0 | 0.000 | 0.00 | 0.600 | o | 225 | Pipe/Conduit |
| 1.006 | 9.732 | 0.487 | 20.0 | 0.000 | 0.00 | 1.500 | o | 225 | Pipe/Conduit |

| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | 101.315 | 99.600 | 1.490 | 101.079 | 99.516 | 1.338 | | 1350 |
| 1.001 | 7 | 101.079 | 98.541 | 1.338 | 101.000 | 98.525 | 1.275 | | 2700 |
| 1.002 | 6 | 101.000 | 98.525 | 1.275 | 100.964 | 98.455 | 1.309 | | 2700 |
| 1.003 | 5 | 100.964 | 98.455 | 1.309 | 100.867 | 98.431 | 1.236 | | 2700 |
| 1.004 | 4 | 100.867 | 98.431 | 2.211 | 101.010 | 98.264 | 2.521 | Hydro-Brake® | 2700 |
| 1.005 | 3 | 101.010 | 98.264 | 2.521 | 100.675 | 97.932 | 2.518 | | 1200 |
| 1.006 | 2 | 100.675 | 97.932 | 2.518 | 100.324 | 97.446 | 2.653 | | 1200 |

## Free Flowing Outfall Details for 223-008 S.W NETWORK.SWS

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---|---|---|---|---|---|---|
| 1.006 | 1 | 100.324 | 97.446 | 94.725 | 1500 | 0 |

## Simulation Criteria for 223-008 S.W NETWORK.SWS

| | | | |
|---|---|---|---|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 10.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coeffiecient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 0 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

## Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | M5-60 (mm) 18.800 |
| Return Period (years) | | 2 | Ratio R 0.302 |
| Region | England and Wales | Profile Type | Summer |

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## Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30
Cv (Winter) 0.840

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## Online Controls for 223-008 S.W NETWORK.SWS

### Hydro-Brake® Optimum Manhole: 4, DS/PN: 1.004, Volume (m³): 21.9

| | |
|---|---|
| Unit Reference | MD-SHE-0100-5000-1350-5000 |
| Design Head (m) | 1.350 |
| Design Flow (l/s) | 5.0 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Application | Surface |
| Sump Available | Yes |
| Diameter (mm) | 100 |
| Invert Level (m) | 98.431 |
| Minimum Outlet Pipe Diameter (mm) | 150 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.350 | 5.0 |
| Flush-Flo™ | 0.400 | 5.0 |
| Kick-Flo® | 0.829 | 4.0 |
| Mean Flow over Head Range | - | 4.4 |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 3.3 | 1.200 | 4.7 | 3.000 | 7.3 | 7.000 | 10.9 |
| 0.200 | 4.6 | 1.400 | 5.1 | 3.500 | 7.8 | 7.500 | 11.2 |
| 0.300 | 4.9 | 1.600 | 5.4 | 4.000 | 8.3 | 8.000 | 11.6 |
| 0.400 | 5.0 | 1.800 | 5.7 | 4.500 | 8.8 | 8.500 | 11.9 |
| 0.500 | 5.0 | 2.000 | 6.0 | 5.000 | 9.2 | 9.000 | 12.2 |
| 0.600 | 4.8 | 2.200 | 6.3 | 5.500 | 9.7 | 9.500 | 12.6 |
| 0.800 | 4.2 | 2.400 | 6.5 | 6.000 | 10.1 | | |
| 1.000 | 4.4 | 2.600 | 6.8 | 6.500 | 10.5 | | |

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## 2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 223-008 S.W NETWORK.SWS

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 10.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start Level (mm) | 0 | Inlet Coeffiecient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 | Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | | |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 0 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | Ratio R 0.302 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | ON |
| Analysis Timestep | Fine | Inertia Status | ON |
| DTS Status | ON | | |

| | |
|---|---|
| Profile(s) | Summer and Winter |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 1440 |
| Return Period(s) (years) | 2, 30, 100 |
| Climate Change (%) | 0, 0, 45 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | 15 Winter | 2 | +0% | 100/15 Summer | | | | 99.693 |
| 1.001 | 7 | 60 Winter | 2 | +0% | 100/120 Winter | | | | 98.767 |
| 1.002 | 6 | 60 Winter | 2 | +0% | 100/120 Winter | | | | 98.767 |
| 1.003 | 5 | 60 Winter | 2 | +0% | 100/120 Winter | | | | 98.767 |
| 1.004 | 4 | 60 Winter | 2 | +0% | 2/15 Summer | | | | 98.767 |
| 1.005 | 3 | 60 Winter | 2 | +0% | | | | | 98.312 |
| 1.006 | 2 | 60 Winter | 2 | +0% | | | | | 97.967 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | -0.132 | 0.000 | 0.35 | | | 12.2 | OK | |
| 1.001 | 7 | -0.974 | 0.000 | 0.01 | | | 9.4 | OK | |
| 1.002 | 6 | -0.958 | 0.000 | 0.01 | | | 9.3 | OK | |
| 1.003 | 5 | -0.888 | 0.000 | 0.01 | | | 4.8 | OK | |
| 1.004 | 4 | 0.112 | 0.000 | 0.11 | | | 5.0 | SURCHARGED | |
| 1.005 | 3 | -0.177 | 0.000 | 0.10 | | | 5.0 | OK | |
| 1.006 | 2 | -0.191 | 0.000 | 0.06 | | | 5.0 | OK | |

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## 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 223-008 S.W NETWORK.SWS

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 10.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start Level (mm) | 0 | Inlet Coeffiecient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 | Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | | |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 0 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FSR | Ratio R 0.302 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | ON |
| Analysis Timestep | Fine | Inertia Status | ON |
| DTS Status | ON | | |

| | |
|---|---|
| Profile(s) | Summer and Winter |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 1440 |
| Return Period(s) (years) | 2, 30, 100 |
| Climate Change (%) | 0, 0, 45 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | 15 Winter | 30 | +0% | 100/15 Summer | | | | 99.736 |
| 1.001 | 7 | 60 Winter | 30 | +0% | 100/120 Winter | | | | 99.057 |
| 1.002 | 6 | 60 Winter | 30 | +0% | 100/120 Winter | | | | 99.057 |
| 1.003 | 5 | 60 Winter | 30 | +0% | 100/120 Winter | | | | 99.057 |
| 1.004 | 4 | 60 Winter | 30 | +0% | 2/15 Summer | | | | 99.057 |
| 1.005 | 3 | 15 Summer | 30 | +0% | | | | | 98.312 |
| 1.006 | 2 | 60 Winter | 30 | +0% | | | | | 97.967 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | -0.089 | 0.000 | 0.66 | | | 23.1 | OK | |
| 1.001 | 7 | -0.684 | 0.000 | 0.02 | | | 17.8 | OK | |
| 1.002 | 6 | -0.668 | 0.000 | 0.01 | | | 16.8 | OK | |
| 1.003 | 5 | -0.598 | 0.000 | 0.01 | | | 6.6 | OK | |
| 1.004 | 4 | 0.402 | 0.000 | 0.11 | | | 5.0 | SURCHARGED | |
| 1.005 | 3 | -0.177 | 0.000 | 0.10 | | | 5.0 | OK | |
| 1.006 | 2 | -0.191 | 0.000 | 0.06 | | | 5.0 | OK | |

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## 100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 223-008 S.W NETWORK.SWS

### Simulation Criteria

| | | | |
|---|---|---|---|
| Areal Reduction Factor | 1.000 | Additional Flow - % of Total Flow | 10.000 |
| Hot Start (mins) | 0 | MADD Factor * 10m³/ha Storage | 2.000 |
| Hot Start Level (mm) | 0 | Inlet Coeffiecient | 0.800 |
| Manhole Headloss Coeff (Global) | 0.500 | Flow per Person per Day (l/per/day) | 0.000 |
| Foul Sewage per hectare (l/s) | 0.000 | | |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 0 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | FSR | Ratio R | 0.302 |
| Region | England and Wales | Cv (Summer) | 0.750 |
| M5-60 (mm) | 18.800 | Cv (Winter) | 0.840 |

| | | | |
|---|---|---|---|
| Margin for Flood Risk Warning (mm) | 300.0 | DVD Status | ON |
| Analysis Timestep | Fine | Inertia Status | ON |
| DTS Status | ON | | |

| | |
|---|---|
| Profile(s) | Summer and Winter |
| Duration(s) (mins) | 15, 30, 60, 120, 240, 360, 480, 960, 1440 |
| Return Period(s) (years) | 2, 30, 100 |
| Climate Change (%) | 0, 0, 45 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | 15 Winter | 100 | +45% | 100/15 Summer | | | | 99.866 |
| 1.001 | 7 | 120 Winter | 100 | +45% | 100/120 Winter | | | | 99.801 |
| 1.002 | 6 | 120 Winter | 100 | +45% | 100/120 Winter | | | | 99.801 |
| 1.003 | 5 | 120 Winter | 100 | +45% | 100/120 Winter | | | | 99.801 |
| 1.004 | 4 | 120 Winter | 100 | +45% | 2/15 Summer | | | | 99.801 |
| 1.005 | 3 | 120 Winter | 100 | +45% | | | | | 98.312 |
| 1.006 | 2 | 120 Winter | 100 | +45% | | | | | 97.967 |

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 8 | 0.041 | 0.000 | 1.24 | | | 43.0 | SURCHARGED | |
| 1.001 | 7 | 0.060 | 0.000 | 0.03 | | | 22.2 | SURCHARGED | |
| 1.002 | 6 | 0.076 | 0.000 | 0.01 | | | 20.6 | SURCHARGED | |
| 1.003 | 5 | 0.146 | 0.000 | 0.01 | | | 4.6 | SURCHARGED | |
| 1.004 | 4 | 1.146 | 0.000 | 0.11 | | | 5.0 | SURCHARGED | |
| 1.005 | 3 | -0.177 | 0.000 | 0.10 | | | 5.0 | OK | |
| 1.006 | 2 | -0.190 | 0.000 | 0.06 | | | 5.0 | OK | |

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