## Global Variables

| | |
|---|---|
| Region | FSR - England & Wales |
| Return Period (yrs) | 100 |
| M5-60 (mm) | 18.000 |
| Ratio R | 0.350 |
| 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 * 10m³/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 | 1 |
| Number of On-Line Controls | 1 |

**Starting Storm file name**

C:\Leek\system 15-04-2010\System 6\proposed system 6.SWS

## Freely Discharging Outfalls

| Outfall Pipe Number | Outfall MH/No | C.Level (m) | I.Level (m) | D,L (mm) | B (mm) |
|---|---|---|---|---|---|
| 1.002 | headwall | 154.000 | 152.700 | 1800 | 0 |

On-Line Controls (Hydro-Brake®)

| US/PN | Volume ($m^3$) | Ctrl MH Name | Invert (m) | Type | Dia (m) | D.Head (m) | D.Flow (l/s) | Headloss (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|
| 1.001 | 1.414 | 3 | 152.942 | Md4 | 0.132 | 1.000 | 13.6 | 0.2 | 10.7 |
| | | | | | | | | 0.4 | 11.0 |
| | | | | | | | | 0.6 | 10.8 |
| | | | | | | | | 0.8 | 12.2 |
| | | | | | | | | 1.0 | 13.6 |
| | | | | | | | | 1.4 | 16.1 |
| | | | | | | | | 1.8 | 18.2 |
| | | | | | | | | 2.2 | 20.2 |
| | | | | | | | | 2.6 | 21.9 |
| | | | | | | | | 3.0 | 23.6 |
| | | | | | | | | 3.4 | 25.1 |

## Infiltration Systems

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier.

| DS/PN | MH Loss | Height above DS PN (m) | Filename | Type | Include Volume |
|---|---|---|---|---|---|
| 1.002 | 0.500 | 0.000 | cellular storage system 6.src | Cellular Storage | Yes (capped) (lvl 153.642m) |

## Network Details

* - Indicates pipe has been modified outside of WinDes's Storm/Foul & Schedules

| PN | Length (m) | Fall (m) | Slope (1:x) | Area (ha) | T.E. (mins) | Rain Pro | k (mm) | Hyd Sect | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 12.43 | 0.058 | 214.3 | 0.223 | 5.00 | 1 | 0.600 | o | 750 |
| 1.001 | 5.00 | 0.130 | 38.5 | 2.500 | 0.00 | 1 | 0.600 | o | 750 |
| 1.002 | 15.58 | 0.242 | 64.4 | 0.000 | 0.00 | 1 | 0.600 | o | 450 |

| PN | USMH No. | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl No. | US/MH (mm) |
|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 1 | 154.780 | 153.130 | 0.900 | 154.730 | 153.072 | 0.908 | | 1800 |
| 1.001 | 2 | 154.730 | 153.072 | 0.908 | 155.900 | 152.942 | 2.208 | | 1800 |
| 1.002 | 3 | 155.900 | 152.942 | 2.508 | 154.000 | 152.700 | 0.850 | 9 | 1800 |

## PIPELINE SCHEDULES

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH No. | C.Level (m) | I.Level (m) | C.Depth (m) | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|
| 1.000 | o | 750 | 1 | 154.780 | 153.130 | 0.900 | 1800 |
| 1.001 | o | 750 | 2 | 154.730 | 153.072 | 0.908 | 1800 |
| 1.002 | o | 450 | 3 | 155.900 | 152.942 | 2.508 | 1800 |

### Downstream Manhole

| PN | Length (m) | Slope (1:x) | MH No. | C.Level (m) | I.Level (m) | C.Depth (m) | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|
| 1.000 | 12.43 | 214.3 | 2 | 154.730 | 153.072 | 0.908 | 1800 |
| 1.001 | 5.00 | 38.5 | 3 | 155.900 | 152.942 | 2.208 | 1800 |
| 1.002 | 15.58 | 64.4 | headwall | 154.000 | 152.700 | 0.850 | 1800 |

## Design Audit Report

| | |
|---|---|
| Filename | C:\Leek\system 15-04-2010\System 6\Design Audit Wizard\proposed system 6.SUM |
| Date Audited | 20/04/10 16:59 |
| Pipes Audited | 3 |
| Site Slope (1:x) | 76.8 |
| Storms Used (mins) | 15 Summer, 30 Summer, 60 Summer, 120 Summer, 240 Summer, 360 Summer, 480 Summer, 960 Summer, 1440 Summer, 2160 Summer, 2880 Summer, 4320 Summer, 15 Winter, 30 Winter, 60 Winter, 120 Winter, 240 Winter, 360 Winter, 480 Winter, 960 Winter, 1440 Winter, 2160 Winter, 2880 Winter, 4320 Winter |

| Audit | Failures | Status |
|---|---|---|
| Manhole Sizes | 0 | Passed |
| Surcharge | 0 | Passed |
| Flood | 0 | Passed |
| Storage | 0 | Passed |
| Pipe Diameters | 0 | Passed |
| Pipe Lengths | 0 | Passed |
| Coordinate Accuracy | 0 | Passed |
| Cover Levels | 1 | Failed |
| Backdrops | 0 | Passed |
| Full Bore Velocity | 1 | Failed |
| Proportional Velocity | 1 | Failed |
| Crossings / Clashes | 0 | Not Run |
| Manhole Headloss | 0 | Not Run |
| ICP Audit | 0 | Not Run |

### Manhole Size Audit

All Manhole Sizes comply with the manhole size file:
C:\Program Files\Micro Drainage Ltd\WinDes\STANDARD.MHS

### Surcharge Audit

No pipes surcharge passed the 50 mm limit for the 30 year +0% climate change storm

### Flood Audit

No pipes flood for the 100 year +30% climate change storm

### Storage Audit

Storage Volume is at typical design values

## Pipe Diameter Audit

All pipe diameters are => 150 mm

## Pipe Length Audit

All pipe lengths are <= 100.00 m

## Coordinate Accuracy Audit

All pipe lengths are within 1.000 m of coordinates

## Cover Level Audit

The following pipes have Cover Depths outside of the range 0.900-6.000 m

| PN | USIL (m) | USCL (m) | US Depth (m) | Dia (mm) | DSIL (m) | DSCL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|
| 1.002 | | | | 450 | 152.700 | 154.000 | 0.850 |

## Backdrop Audit

All backdrops are within the range 0.200-1.500m

## Full Bore Velocity Audit

The following pipes have Full Bore Velocity outside of the range 1.00-3.00 m/s

| PN | Vel (m/s) |
|---|---|
| 1.001 | 4.52 |

## Proportional Velocity Audit

The following pipes have Proportional Velocity outside of the range 1.00-3.00 m/s for the 1 year +0% climate change storm

| PN | Storm (mins) | Vel (m/s) |
|---|---|---|
| 1.000 | 15 Summer | 0.26 |

## Crossings / Clashes Audit

The Crossings / Clashes Audit was not completed by user request

## Manhole Headloss Audit

The Manhole Headloss Audit was not completed by user request

## Interim Code of Practice Audit

The ICP Audit was not completed by user request

Summary Wizard of "CRITICAL BY RETURN PERIOD"(Rank 1 by Max Level)
Results for Design Storms

Margin for Flood Risk warning (mm) 300 Inertia Status OFF
DTS Status ON Analysis Time Step Fine
DVD Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 30

| PN | Storm | Return Period | Climate Change | Rank | First X Surcharge | First Y Flood | First Z Overflow | O/F Act |
|---|---|---|---|---|---|---|---|---|
| 1.000 | 15 Winter | 100 | 30% | 1 | 100/15 Summer | | | |
| 1.001 | 15 Winter | 100 | 30% | 1 | 30/15 Winter | | | |
| 1.002 | 1440 Winter | 100 | 30% | 1 | 100/360 Summer | | | 0 |

| Lvl Ex. | PN | Water Lvl. (m) | Surcharged Depth (m) | Flooded Vol (m³) | Flow/ Capacity | Overflow (l/s) | Pipe Flow (l/s) | Status |
|---|---|---|---|---|---|---|---|---|
| | 1.000 | 154.199 | 0.319 | 0.000 | 0.20 | 0.0 | 106.2 | SURCH'ED |
| | 1.001 | 154.189 | 0.367 | 0.000 | 1.87 | 0.0 | 1135.7 | SURCH'ED |
| | 1.002 | 153.546 | 0.154 | 0.000 | 0.04 | 0.0 | 11.0 | SURCH'ED |

## Rainfall Hyetograph

| | |
|---|---|
| Region | FSR - England & Wales |
| Return Period (yrs) | 100 |
| M5-60 (mm) | 18.000 |
| Ratio R | 0.350 |
| Profile Type | Winter |
| Storm Duration (mins) | 1440 |

| Time (mins) | Rain (mm/hr) | Time (mins) | Rain (mm/hr) | Time (mins) | Rain (mm/hr) | Time (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|
| 24 | 0.25 | 384 | 2.32 | 744 | 8.72 | 1104 | 2.05 |
| 48 | 0.71 | 408 | 2.62 | 768 | 8.48 | 1128 | 1.86 |
| 72 | 1.05 | 432 | 2.96 | 792 | 8.14 | 1152 | 1.72 |
| 96 | 1.30 | 456 | 3.41 | 816 | 7.66 | 1176 | 1.62 |
| 120 | 1.43 | 480 | 3.87 | 840 | 7.17 | 1200 | 1.57 |
| 144 | 1.51 | 504 | 4.35 | 864 | 6.65 | 1224 | 1.55 |
| 168 | 1.54 | 528 | 4.94 | 888 | 6.03 | 1248 | 1.54 |
| 192 | 1.55 | 552 | 5.48 | 912 | 5.48 | 1272 | 1.55 |
| 216 | 1.54 | 576 | 6.03 | 936 | 4.94 | 1296 | 1.54 |
| 240 | 1.55 | 600 | 6.65 | 960 | 4.35 | 1320 | 1.51 |
| 264 | 1.57 | 624 | 7.17 | 984 | 3.87 | 1344 | 1.43 |
| 288 | 1.62 | 648 | 7.66 | 1008 | 3.41 | 1368 | 1.30 |
| 312 | 1.72 | 672 | 8.14 | 1032 | 2.96 | 1392 | 1.05 |
| 336 | 1.86 | 696 | 8.48 | 1056 | 2.62 | 1416 | 0.71 |
| 360 | 2.05 | 720 | 8.72 | 1080 | 2.32 | 1440 | 0.25 |