

**WinCan****Notes:**

Thank you for choosing to use WinCan to carry out your drainage investigation works.

The results and views carried in this report are those of the engineer(s) appointed to carry out the investigation and are considered relevant on the day of the survey. Drain and sewer performance is known to alter over time, so liability cannot be accepted for differences between the recorded data and the actual data at a time after this report was generated.

This survey has been created in accordance with the drainage standard used in the country and language settings for this PC.

If a DVD has been supplied with this report, please note that it can only be used in a Windows based PC. Please browse the DVD and navigate to the PDF folder to find project-based documents such as drawings, engineer's site notes and survey specifications amongst others.

CCTV subsidence investigations do not account for the water tightness of the pipes and are merely a visual inspection of inside of the drains. CCTV drainage engineers are generally not qualified to comment on the causes of subsidence, and can only suggest required remedial actions for the pipes, and not the affected buildings.

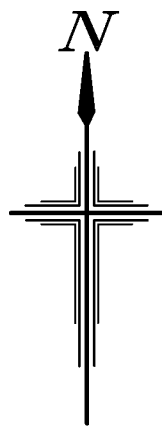
Subsidence is a building structural failure, which can occur for many reasons. Although drainage failures can contribute to subsidence problems, other causes should always be investigated as part of a considered approach. In order to eliminate drains from suspicion, WinCan suggests that all pipes within at least 10m of the subsidence area be pressure tested over and above a CCTV inspection, and remedial suggestions considered based on the findings.

Unless otherwise specified in an associated task order (or similar), the data gathered in this report may not be suitable for use as a pre-lining investigation. WinCan are happy to carry out such surveys, but this must be agreed prior to the commencement of the works, and the client must specify the data they wish to capture and the acceptable tolerances.

Where GPS coordinates and heights have been issued within this report, they are to 1m accuracy, and 2m accuracy for heights. Greater accuracy can be provided on request.

Appendix (E)

Proposed Surface Water Strategy



NOTES

1. All dimensions are in metres unless stated otherwise.
2. Do not scale from this drawing. Only written dimensions are to be used.
3. Site layout based on Cooper Baillie Planning Layout, drawing number CB_84-139_001 Rev G dated 16th August 2021.
4. Topographical survey based on MK Surveys layout, drawing number 22496-2 dated January 2021.
5. Level strategy is subject to further design development. Cover Levels are indicative only and subject to further detailed review
6. The proposed surface and foul water drainage show is indicative only and subject to further design development. Detailed proposals for the surface and foul water drainage strategy will be provided as part of the Discharge of Conditions applications associated with the current Outline Planning Consent P.134.16.0UT
7. **ANY VARIANCE OR DISCREPANCY MUST BE REPORTED BACK TO RCP ENGINEERING BEFORE WORK BEGINS.**

KEY

- Site Boundary
- Potential School, care home or residential site under separate planning application
- Proposed Surface Water Sewer
- Proposed Foul Water Sewer
- Basin and swale base to consist of 300mm free draining topsoil and clean coarse granular material nominal size 40/60mm with full depth 0.5m channel to allow for water flow
- Proposed Headwall
- Existing Trees And Hedgerows root protection areas. Any works to be carried out to be undertaken in accordance with arboriculturalists method statement and approval
- Proposed indicative permeable paving (Subject to further soakage and infiltration testing to inform permeability rates and depths within parking areas and driveway)
- Indicative location of 0.5m high bund to prevent over ground water flow entering existing residents plots from SuDs features.
- Indicative location of 140m² attenuation tank
- Indicative gradient for SuDs basins and swale

GENERAL POND DETAIL NOTES:

- Basins to be lined with an impermeable geo-membrane and backfilled with 300mm free draining topsoil 900mm sand and gravel (1200mm total depth to counter groundwater buoyancy
- 0.5m wide gravel channel to full 600mm depth to add with water flow
- Top Protective geotextile - Terram T1000 or similar and Geomembrane - Visqueen HD UDG or similar and Bottom Protective geotextile - Terram T1000 or similar.
- 300 x 300 anchor trench filled with compacted earth.
- Geotextiles and geomembrane to extend around 300 x 300 anchor trench filled with compacted earth.

Existing watercourse to be diverted around proposed pond 4 and culverted under proposed road. Subject to OWC application

Headwall design (to be confirmed)
CL 5.752
IL 4.071

Pond 4
Attenuation Base Level = 4.071m
Base level = 2.871m
Surface Area = 325.6m²
Base Area = 95.2m²
Depth = 1.681m
Total volume = 234.8m³

Proposed manholes S73 and F32 allowing for future provision of surface water run-off and foul water sewage from potential school, care home or residential site into the proposed main development drainage network.

GENERAL POND DETAIL NOTES:

- Basins to be lined with an impermeable geo-membrane and backfilled with 300mm free draining topsoil 1000mm sand and gravel (1300mm total depth to counter groundwater buoyancy
- 0.5m wide gravel channel to full 500mm depth to add with water flow
- Top Protective geotextile - Terram T1000 or similar and Geomembrane - Visqueen HD UDG or similar and Bottom Protective geotextile - Terram T1000 or similar.
- 300 x 300 anchor trench filled with compacted earth.
- Geotextiles and geomembrane to extend around 300 x 300 anchor trench filled with compacted earth.

Headwall design (to be confirmed)
CL 5.55
IL 4.056

Pond 5
Attenuation Base Level = 4.023m
Base level = 2.723m
Surface Area = 263.5m²
Base Area = 67.6m²
Depth = 1.333m
Total volume = 315.1m³

Headwall design (to be confirmed)
CL 5.55
IL 4.023

Attenuation Tank
Cover Level = 5.7m
Top Level = 5.269m
Invert Level = 4.069m
Surface Area = 140m²
Base Area = 140m²
Depth = 1.2m
Total volume = 168m³

Hydrobrake
Design flow of 3.5 L/S
Design head 1.2m
CL 5.550
IL 4.012

Proposed outfall into existing culvert

Hydrobrake
Design flow of 5 L/S
Design head 1.2m
CL 5.550
IL 4.019

Headwall design (to be confirmed)
CL 5.62
IL 4.035

Pond 6
Attenuation Base Level = 4.035m
Base level = 2.634m
Surface Area = 424.7m²
Base Area = 184.6m²
Depth = 1.3m
Total volume = 399.3m³

Headwall design (to be confirmed)
CL 5.62
IL 4.058

CDM NOTES

1. **EXISTING SERVICES.** Depth of existing services must be determined prior to works commencing. The contractor is responsible for establishing underground services in accordance with HSE Guidance note HS (G) 47. Any services which would be within the proposed construction layers must be lowered to below the sub-base.

SCALE BAR 1:500 at A1

Rev. Date Details By Chkd Appd

Client: Taylor Wimpey

Site: Sefter Road, Bognor
Drawing Title: Surface Water Drainage Strategy Layout
Sheet 1 of 3

Date: August 2021
Drawn: TRS
Checked: TRS
Approved: TRS

Drawing No. WSC/E4775/01/008

FOR INFORMATION ONLY

RCP Rogers Cory Partnership
Architectural and Civil Consultants
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Appendix (F)

Micro Drainage Calculations

Rogers Cory Partnership		Page 0
The Old School Old School Road Hook Hampshire RG27 9NJ		
Date 26/07/2021 12:10	Designed by Terry	
File SW1- FEH REVIEW.MDX	Checked by Terry S	
Innovyze		Network 2017.1.2

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 489800 99500 SZ 89800 99500
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	10
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Network Design Table for Storm - Net 1

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	8.170	0.020	405.0	0.134	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	16.082	0.040	405.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	6.076	0.015	405.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	51.953	0.128	405.0	0.052	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	24.842	0.061	405.0	0.158	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	8.430	0.021	405.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	12.254	0.030	405.0	0.060	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	-11.68	5.14	5.447	0.134	0.0	0.0	0.0	1.00	159.7	0.0
1.001	-11.11	5.40	5.426	0.134	0.0	0.0	0.0	1.00	159.7	0.0
1.002	-10.90	5.50	5.386	0.134	0.0	0.0	0.0	1.00	159.7	0.0
1.003	-9.43	6.37	5.371	0.186	0.0	0.0	0.0	1.00	159.7	0.0
1.004	-8.85	6.78	5.243	0.344	0.0	0.0	0.0	1.00	159.7	0.0
1.005	-8.67	6.92	5.182	0.344	0.0	0.0	0.0	1.00	159.7	0.0
1.006	-8.43	7.12	5.161	0.404	0.0	0.0	0.0	1.00	159.7	0.0

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Rogers Cory Partnership										Page 1																																																																																																																																																																																																																																																																																																																																																										
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<u>Network Design Table for Storm - Net 1</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>1.007</td><td>11.965</td><td>0.030</td><td>405.0</td><td>0.084</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>450</td><td>Pipe/Conduit</td><td></td></tr><tr><td>2.000</td><td>46.726</td><td>0.080</td><td>585.0</td><td>0.103</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.008</td><td>44.678</td><td>0.076</td><td>587.9</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>3.000</td><td>36.559</td><td>0.062</td><td>585.0</td><td>0.370</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.009</td><td>12.064</td><td>0.021</td><td>574.5</td><td>0.104</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>4.000</td><td>43.717</td><td>0.075</td><td>585.0</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.010</td><td>18.207</td><td>0.094</td><td>193.7</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.011</td><td>36.653</td><td>0.031</td><td>1182.3</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.012</td><td>17.479</td><td>0.030</td><td>585.0</td><td>0.233</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>5.000</td><td>36.452</td><td>0.149</td><td>245.0</td><td>0.091</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>5.001</td><td>35.432</td><td>0.145</td><td>245.0</td><td>0.036</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>5.002</td><td>22.241</td><td>0.091</td><td>245.0</td><td>0.115</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>5.003</td><td>61.045</td><td>0.249</td><td>245.0</td><td>0.061</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr><tr><td>6.000</td><td>12.093</td><td>0.049</td><td>245.0</td><td>0.135</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td>Pipe/Conduit</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>E I.Area (ha)</th><th>E Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>1.007</td><td>-8.20</td><td>7.32</td><td>5.131</td><td>0.488</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>159.7</td><td>0.0</td></tr><tr><td>2.000</td><td>-10.38</td><td>5.78</td><td>5.931</td><td>0.103</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>1.008</td><td>-7.44</td><td>8.07</td><td>4.951</td><td>0.591</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>281.9</td><td>0.0</td></tr><tr><td>3.000</td><td>-10.70</td><td>5.61</td><td>4.938</td><td>0.370</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>1.009</td><td>-7.26</td><td>8.27</td><td>4.874</td><td>1.065</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.01</td><td>285.2</td><td>0.0</td></tr><tr><td>4.000</td><td>-10.47</td><td>5.73</td><td>4.925</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>1.010</td><td>-7.11</td><td>8.44</td><td>4.850</td><td>1.065</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.75</td><td>493.7</td><td>0.0</td></tr><tr><td>1.011</td><td>-6.44</td><td>9.31</td><td>4.813</td><td>1.065</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.70</td><td>197.8</td><td>0.0</td></tr><tr><td>1.012</td><td>-6.25</td><td>9.60</td><td>4.760</td><td>1.298</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>5.000</td><td>-10.70</td><td>5.61</td><td>5.255</td><td>0.091</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>70.7</td><td>0.0</td></tr><tr><td>5.001</td><td>-9.68</td><td>6.20</td><td>5.112</td><td>0.127</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>70.7</td><td>0.0</td></tr><tr><td>5.002</td><td>-9.13</td><td>6.57</td><td>5.962</td><td>0.242</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>70.7</td><td>0.0</td></tr><tr><td>5.003</td><td>-7.91</td><td>7.59</td><td>5.872</td><td>0.303</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>70.7</td><td>0.0</td></tr><tr><td>6.000</td><td>-11.54</td><td>5.20</td><td>5.153</td><td>0.135</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>70.7</td><td>0.0</td></tr></table> ©1982-2017 XP Solutions												PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design	1.007	11.965	0.030	405.0	0.084	0.00	0.0	0.600	o	450	Pipe/Conduit		2.000	46.726	0.080	585.0	0.103	5.00	0.0	0.600	o	600	Pipe/Conduit		1.008	44.678	0.076	587.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		3.000	36.559	0.062	585.0	0.370	5.00	0.0	0.600	o	600	Pipe/Conduit		1.009	12.064	0.021	574.5	0.104	0.00	0.0	0.600	o	600	Pipe/Conduit		4.000	43.717	0.075	585.0	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit		1.010	18.207	0.094	193.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		1.011	36.653	0.031	1182.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		1.012	17.479	0.030	585.0	0.233	0.00	0.0	0.600	o	600	Pipe/Conduit		5.000	36.452	0.149	245.0	0.091	5.00	0.0	0.600	o	300	Pipe/Conduit		5.001	35.432	0.145	245.0	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit		5.002	22.241	0.091	245.0	0.115	0.00	0.0	0.600	o	300	Pipe/Conduit		5.003	61.045	0.249	245.0	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit		6.000	12.093	0.049	245.0	0.135	5.00	0.0	0.600	o	300	Pipe/Conduit		PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	1.007	-8.20	7.32	5.131	0.488	0.0	0.0	0.0	1.00	159.7	0.0	2.000	-10.38	5.78	5.931	0.103	0.0	0.0	0.0	1.00	282.6	0.0	1.008	-7.44	8.07	4.951	0.591	0.0	0.0	0.0	1.00	281.9	0.0	3.000	-10.70	5.61	4.938	0.370	0.0	0.0	0.0	1.00	282.6	0.0	1.009	-7.26	8.27	4.874	1.065	0.0	0.0	0.0	1.01	285.2	0.0	4.000	-10.47	5.73	4.925	0.000	0.0	0.0	0.0	1.00	282.6	0.0	1.010	-7.11	8.44	4.850	1.065	0.0	0.0	0.0	1.75	493.7	0.0	1.011	-6.44	9.31	4.813	1.065	0.0	0.0	0.0	0.70	197.8	0.0	1.012	-6.25	9.60	4.760	1.298	0.0	0.0	0.0	1.00	282.6	0.0	5.000	-10.70	5.61	5.255	0.091	0.0	0.0	0.0	1.00	70.7	0.0	5.001	-9.68	6.20	5.112	0.127	0.0	0.0	0.0	1.00	70.7	0.0	5.002	-9.13	6.57	5.962	0.242	0.0	0.0	0.0	1.00	70.7	0.0	5.003	-7.91	7.59	5.872	0.303	0.0	0.0	0.0	1.00	70.7	0.0	6.000	-11.54	5.20	5.153	0.135	0.0	0.0	0.0	1.00	70.7	0.0
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design																																																																																																																																																																																																																																																																																																																																																									
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2.000	46.726	0.080	585.0	0.103	5.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
1.008	44.678	0.076	587.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
3.000	36.559	0.062	585.0	0.370	5.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
1.009	12.064	0.021	574.5	0.104	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
4.000	43.717	0.075	585.0	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
1.010	18.207	0.094	193.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
1.011	36.653	0.031	1182.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
1.012	17.479	0.030	585.0	0.233	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
5.000	36.452	0.149	245.0	0.091	5.00	0.0	0.600	o	300	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
5.001	35.432	0.145	245.0	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
5.002	22.241	0.091	245.0	0.115	0.00	0.0	0.600	o	300	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
5.003	61.045	0.249	245.0	0.061	0.00	0.0	0.600	o	300	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
6.000	12.093	0.049	245.0	0.135	5.00	0.0	0.600	o	300	Pipe/Conduit																																																																																																																																																																																																																																																																																																																																																										
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																																																																																																																																																																																																																																																																																																										
1.007	-8.20	7.32	5.131	0.488	0.0	0.0	0.0	1.00	159.7	0.0																																																																																																																																																																																																																																																																																																																																																										
2.000	-10.38	5.78	5.931	0.103	0.0	0.0	0.0	1.00	282.6	0.0																																																																																																																																																																																																																																																																																																																																																										
1.008	-7.44	8.07	4.951	0.591	0.0	0.0	0.0	1.00	281.9	0.0																																																																																																																																																																																																																																																																																																																																																										
3.000	-10.70	5.61	4.938	0.370	0.0	0.0	0.0	1.00	282.6	0.0																																																																																																																																																																																																																																																																																																																																																										
1.009	-7.26	8.27	4.874	1.065	0.0	0.0	0.0	1.01	285.2	0.0																																																																																																																																																																																																																																																																																																																																																										
4.000	-10.47	5.73	4.925	0.000	0.0	0.0	0.0	1.00	282.6	0.0																																																																																																																																																																																																																																																																																																																																																										
1.010	-7.11	8.44	4.850	1.065	0.0	0.0	0.0	1.75	493.7	0.0																																																																																																																																																																																																																																																																																																																																																										
1.011	-6.44	9.31	4.813	1.065	0.0	0.0	0.0	0.70	197.8	0.0																																																																																																																																																																																																																																																																																																																																																										
1.012	-6.25	9.60	4.760	1.298	0.0	0.0	0.0	1.00	282.6	0.0																																																																																																																																																																																																																																																																																																																																																										
5.000	-10.70	5.61	5.255	0.091	0.0	0.0	0.0	1.00	70.7	0.0																																																																																																																																																																																																																																																																																																																																																										
5.001	-9.68	6.20	5.112	0.127	0.0	0.0	0.0	1.00	70.7	0.0																																																																																																																																																																																																																																																																																																																																																										
5.002	-9.13	6.57	5.962	0.242	0.0	0.0	0.0	1.00	70.7	0.0																																																																																																																																																																																																																																																																																																																																																										
5.003	-7.91	7.59	5.872	0.303	0.0	0.0	0.0	1.00	70.7	0.0																																																																																																																																																																																																																																																																																																																																																										
6.000	-11.54	5.20	5.153	0.135	0.0	0.0	0.0	1.00	70.7	0.0																																																																																																																																																																																																																																																																																																																																																										

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The Old School Old School Road Hook Hampshire RG27 9NJ						Designed by Terry Checked by Terry S						
Date 26/07/2021 12:10 File SW1- FEH REVIEW.MDX												
Innovyze						Network 2017.1.2						
Network Design Table for Storm - Net 1												
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
6.001	12.311	0.050	245.0	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit		
6.002	48.848	0.199	245.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit		
6.003	12.549	0.051	245.0	0.126	0.00	0.0	0.600	o	300	Pipe/Conduit		
6.004	32.313	0.132	245.0	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit		
6.005	16.781	0.068	245.0	0.169	0.00	0.0	0.600	o	300	Pipe/Conduit		
5.004	25.610	0.044	585.0	0.089	0.00	0.0	0.600	o	600	Pipe/Conduit		
5.005	21.502	0.037	585.0	0.044	0.00	0.0	0.600	o	600	Pipe/Conduit		
5.006	41.994	0.072	585.0	0.075	0.00	0.0	0.600	o	600	Pipe/Conduit		
7.000	47.265	0.081	585.0	0.152	5.00	0.0	0.600	o	600	Pipe/Conduit		
5.007	11.281	0.019	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
8.000	12.138	0.021	585.0	0.089	5.00	0.0	0.600	o	600	Pipe/Conduit		
8.001	28.753	0.049	585.0	0.087	0.00	0.0	0.600	o	600	Pipe/Conduit		
5.008	19.574	0.033	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
5.009	69.926	0.120	585.0	0.110	0.00	0.0	0.600	o	600	Pipe/Conduit		
9.000	51.692	0.088	585.0	0.198	5.00	0.0	0.600	o	600	Pipe/Conduit		
9.001	42.526	0.073	585.0	0.074	0.00	0.0	0.600	o	600	Pipe/Conduit		
Network Results Table												
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)		
6.001	-11.10	5.41	5.164	0.158	0.0	0.0	0.0	1.00	70.7	0.0		
6.002	-9.64	6.22	5.054	0.184	0.0	0.0	0.0	1.00	70.7	0.0		
6.003	-9.33	6.43	5.855	0.310	0.0	0.0	0.0	1.00	70.7	0.0		
6.004	-8.61	6.97	5.864	0.319	0.0	0.0	0.0	1.00	70.7	0.0		
6.005	-8.28	7.25	5.672	0.488	0.0	0.0	0.0	1.00	70.7	0.0		
5.004	-7.49	8.01	5.314	0.880	0.0	0.0	0.0	1.00	282.6	0.0		
5.005	-7.17	8.37	5.270	0.924	0.0	0.0	0.0	1.00	282.6	0.0		
5.006	-6.61	9.07	5.253	0.999	0.0	0.0	0.0	1.00	282.6	0.0		
7.000	-10.37	5.79	5.242	0.152	0.0	0.0	0.0	1.00	282.6	0.0		
5.007	-6.48	9.26	5.161	1.151	0.0	0.0	0.0	1.00	282.6	0.0		
8.000	-11.53	5.20	5.212	0.089	0.0	0.0	0.0	1.00	282.6	0.0		
8.001	-10.56	5.68	5.191	0.176	0.0	0.0	0.0	1.00	282.6	0.0		
5.008	-6.26	9.59	5.142	1.327	0.0	0.0	0.0	1.00	282.6	0.0		
5.009	-5.58	10.75	5.109	1.437	0.0	0.0	0.0	1.00	282.6	0.0		
9.000	-10.24	5.86	5.354	0.198	0.0	0.0	0.0	1.00	282.6	0.0		
9.001	-9.13	6.57	5.265	0.272	0.0	0.0	0.0	1.00	282.6	0.0		
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Date 26/07/2021 12:10 File SW1- FEH REVIEW.MDX											
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Innovyze						Network 2017.1.2					
<u>Network Design Table for Storm - Net 1</u>											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
9.002	33.343	0.057	585.0	0.066	0.00	0.0	0.600	o	600	Pipe/Conduit	
9.003	38.205	0.065	585.0	0.051	0.00	0.0	0.600	o	600	Pipe/Conduit	
9.004	53.115	0.091	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.010	32.690	0.033	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.011	17.114	0.017	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.012	19.459	0.019	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.013	45.631	0.046	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.014	15.473	0.015	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
5.015	9.647	0.010	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
10.000	24.809	0.042	585.0	0.018	5.00	0.0	0.600	o	600	Pipe/Conduit	
10.001	24.411	0.042	585.0	0.095	0.00	0.0	0.600	o	600	Pipe/Conduit	
10.002	11.560	0.020	585.0	0.137	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.016	126.325	0.126	1002.6	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
1.013	61.657	0.062	1000.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
1.014	16.789	0.029	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.015	35.851	0.061	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.016	51.505	0.088	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.017	30.185	0.052	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
<u>Network Results Table</u>											
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
9.002	-8.42	7.13	5.193	0.338	0.0	0.0	0.0	1.00	282.6	0.0	
9.003	-7.73	7.76	5.136	0.389	0.0	0.0	0.0	1.00	282.6	0.0	
9.004	-6.94	8.65	5.071	0.389	0.0	0.0	0.0	1.00	282.6	0.0	
5.010	-5.31	11.31	5.004	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
5.011	-5.17	11.60	4.971	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
5.012	-5.03	11.93	4.954	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
5.013	-4.72	12.70	4.934	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
5.014	-4.63	12.96	4.888	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
5.015	-4.57	13.13	4.872	1.826	0.0	0.0	0.0	0.98	625.0	0.0	
10.000	-11.08	5.41	4.967	0.018	0.0	0.0	0.0	1.00	282.6	0.0	
10.001	-10.31	5.82	4.925	0.113	0.0	0.0	0.0	1.00	282.6	0.0	
10.002	-9.98	6.01	4.883	0.250	0.0	0.0	0.0	1.00	282.6	0.0	
5.016	34.30	15.27	4.868	2.076	0.0	0.0	19.3	0.98	624.2	212.1	
1.013	33.04	16.32	4.737	3.374	0.0	0.0	30.2	0.98	625.0	332.1	
1.014	32.73	16.60	4.674	3.374	0.0	0.0	30.2	1.00	282.6	332.1	
1.015	32.08	17.20	4.657	3.374	0.0	0.0	30.2	1.00	282.6	332.1	
1.016	31.20	18.06	4.569	3.374	0.0	0.0	30.2	1.00	282.6	332.1	
1.017	30.71	18.56	4.517	3.374	0.0	0.0	30.2	1.00	282.6	332.1	
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<u>Network Design Table for Storm - Net 1</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>1.018</td><td>22.128</td><td>0.038</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.019</td><td>31.014</td><td>0.053</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.020</td><td>22.497</td><td>0.038</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>1.021</td><td>18.212</td><td>0.031</td><td>587.5</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>Σ I.Area (ha)</th><th>Σ Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>1.018</td><td>30.36</td><td>18.93</td><td>4.465</td><td>3.374</td><td>0.0</td><td>0.0</td><td>30.2</td><td>1.00</td><td>282.6</td><td>332.1</td></tr><tr><td>1.019</td><td>29.90</td><td>19.45</td><td>4.427</td><td>3.374</td><td>0.0</td><td>0.0</td><td>30.2</td><td>1.00</td><td>282.6</td><td>332.1</td></tr><tr><td>1.020</td><td>29.57</td><td>19.82</td><td>4.374</td><td>3.374</td><td>0.0</td><td>0.0</td><td>30.2</td><td>1.00</td><td>282.6</td><td>332.1</td></tr><tr><td>1.021</td><td>29.30</td><td>20.12</td><td>4.343</td><td>3.374</td><td>0.0</td><td>0.0</td><td>30.2</td><td>1.00</td><td>282.6</td><td>332.1</td></tr></table>												PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design	1.018	22.128	0.038	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		1.019	31.014	0.053	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		1.020	22.497	0.038	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		1.021	18.212	0.031	587.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	1.018	30.36	18.93	4.465	3.374	0.0	0.0	30.2	1.00	282.6	332.1	1.019	29.90	19.45	4.427	3.374	0.0	0.0	30.2	1.00	282.6	332.1	1.020	29.57	19.82	4.374	3.374	0.0	0.0	30.2	1.00	282.6	332.1	1.021	29.30	20.12	4.343	3.374	0.0	0.0	30.2	1.00	282.6	332.1
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design																																																																																																																			
1.018	22.128	0.038	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																				
1.019	31.014	0.053	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																				
1.020	22.497	0.038	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																				
1.021	18.212	0.031	587.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit																																																																																																																				
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																																																																				
1.018	30.36	18.93	4.465	3.374	0.0	0.0	30.2	1.00	282.6	332.1																																																																																																																				
1.019	29.90	19.45	4.427	3.374	0.0	0.0	30.2	1.00	282.6	332.1																																																																																																																				
1.020	29.57	19.82	4.374	3.374	0.0	0.0	30.2	1.00	282.6	332.1																																																																																																																				
1.021	29.30	20.12	4.343	3.374	0.0	0.0	30.2	1.00	282.6	332.1																																																																																																																				
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<u>Manhole Schedules for Storm - Net 1</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	6.717	1.270	Open Manhole	1350	1.000	5.447	450				
2	6.631	1.205	Open Manhole	1500	1.001	5.426	450	1.000	5.427	450	1
3	6.500	1.114	Open Manhole	1350	1.002	5.386	450	1.001	5.386	450	
4	6.475	1.104	Open Manhole	1350	1.003	5.371	450	1.002	5.371	450	
5	7.035	1.792	Open Manhole	1350	1.004	5.243	450	1.003	5.243	450	
6	7.287	2.105	Open Manhole	1350	1.005	5.182	450	1.004	5.182	450	
7	7.350	2.189	Open Manhole	1350	1.006	5.161	450	1.005	5.161	450	
8	7.041	1.910	Open Manhole	1350	1.007	5.131	450	1.006	5.131	450	
22	6.450	1.419	Open Manhole	1500	2.000	5.031	600				
9	7.094	2.143	Open Manhole	1500	1.008	4.951	600	1.007	5.101	450	
								2.000	4.951	600	
23	7.100	2.162	Open Manhole	1500	3.000	4.938	600				
10	6.825	1.951	Open Manhole	1500	1.009	4.874	600	1.008	4.875	600	1
								3.000	4.876	600	2
24	6.234	1.309	Open Manhole	1500	4.000	4.925	600				
11	6.900	2.050	Open Manhole	1500	1.010	4.850	600	1.009	4.853	600	3
								4.000	4.850	600	
11a	6.750	1.994	Open Manhole	1500	1.011	4.819	600	1.010	4.756	600	
12	6.425	1.665	Open Manhole		1.012	4.760	600	1.011	4.788	600	28
25	7.389	1.134	Open Manhole	1200	5.000	6.255	300				
26	6.930	0.824	Open Manhole	1200	5.001	6.112	300	5.000	6.106	300	
27	6.550	0.588	Open Manhole	1200	5.002	5.962	300	5.001	5.967	300	5
28	6.550	0.679	Open Manhole	1200	5.003	5.872	300	5.002	5.871	300	
29	7.300	1.147	Open Manhole	1200	6.000	6.153	300				
30	6.850	0.746	Open Manhole	1200	6.001	6.104	300	6.000	6.104	300	
31	6.975	0.921	Open Manhole	1200	6.002	6.054	300	6.001	6.054	300	
32	7.400	1.545	Open Manhole	1200	6.003	5.855	300	6.002	5.855	300	
33	7.450	1.646	Open Manhole	1200	6.004	5.804	300	6.003	5.804	300	
34	7.275	1.603	Open Manhole	1200	6.005	5.672	300	6.004	5.672	300	
35	7.100	1.786	Open Manhole	1500	5.004	5.314	600	5.003	5.623	300	9
								6.005	5.604	300	
36	7.400	2.130	Open Manhole	1500	5.005	5.270	600	5.004	5.270	600	
37	7.250	2.017	Open Manhole	1500	5.006	5.233	600	5.005	5.233	600	
48	6.600	1.358	Open Manhole	1500	7.000	5.242	600				
38	6.635	1.474	Open Manhole	1500	5.007	5.161	600	5.006	5.161	600	
								7.000	5.161	600	
53	7.036	1.824	Open Manhole	1500	8.000	5.212	600				
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<u>Manhole Schedules for Storm - Net 1</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	
54	6.922	1.731	Open Manhole	1500	8.001	5.191	600	8.000	5.191	600	
39	6.730	1.588	Open Manhole	1500	5.008	5.142	600	5.007	5.142	600	
								8.001	5.142	600	
40	6.330	1.221	Open Manhole		5.009	5.109	600	5.008	5.109	600	
48	7.150	1.796	Open Manhole	1350	9.000	5.354	600				
49	6.766	1.500	Open Manhole	1500	9.001	5.266	600	9.000	5.266	600	
50	6.350	1.157	Open Manhole	1500	9.002	5.193	600	9.001	5.193	600	
51	6.387	1.251	Open Manhole	1500	9.003	5.136	600	9.002	5.136	600	
52	6.571	1.500	Open Manhole		9.004	5.071	600	9.003	5.071	600	
41	5.990	1.010	Junction	0	5.010	5.004	900	5.009	4.989	600	
								9.004	4.980	600	
42	6.040	1.069	Open Manhole		5.011	4.971	900	5.010	4.971	900	
43	6.140	1.186	Junction	0	5.012	4.954	900	5.011	4.954	900	
44	6.187	1.253	Open Manhole		5.013	4.934	900	5.012	4.935	900	
45	6.280	1.392	Junction	0	5.014	4.888	900	5.013	4.888	900	
46	6.210	1.338	Open Manhole		5.015	4.872	900	5.014	4.873	900	
55	7.225	2.258	Open Manhole	1500	10.000	4.967	600				
56	7.091	2.166	Open Manhole	1500	10.001	4.925	600	10.000	4.925	600	
57	6.831	1.948	Open Manhole		10.002	4.883	600	10.001	4.883	600	
47	6.210	1.348	Junction		5.016	4.863	900	5.015	4.862	900	
								10.002	4.863	600	
13	6.210	1.480	Junction	0	1.013	4.737	900	1.012	4.730	600	
								5.016	4.737	900	
14	5.970	1.296	Open Manhole	2100	1.014	4.674	600	1.013	4.675	900	
15	5.980	1.335	Open Manhole	1800	1.015	4.657	600	1.014	4.645	600	
16	6.050	1.481	Open Manhole	1800	1.016	4.569	600	1.015	4.596	600	
17	6.175	1.694	Open Manhole	1800	1.017	4.517	600	1.016	4.481	600	
18	6.395	1.930	Open Manhole	1800	1.018	4.465	600	1.017	4.465	600	
19	6.500	2.073	Open Manhole	1800	1.019	4.427	600	1.018	4.427	600	
20	5.678	1.304	Open Manhole	1800	1.020	4.374	600	1.019	4.374	600	
20a	5.678	1.342	Open Manhole	1500	1.021	4.343	600	1.020	4.336	600	
21	6.100	1.788	Open Manhole	0		OUTFALL		1.021	4.312	600	
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Surcharged Outfall Details for Storm - Net 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.021	21	6.100	4.312	0.000	0	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	0.000	41	0.000	81	0.000	121	0.000	161	0.000	201	0.000
2	0.000	42	0.000	82	0.000	122	0.000	162	0.000	202	0.000
3	0.000	43	0.000	83	0.000	123	0.000	163	0.000	203	0.000
4	0.000	44	0.000	84	0.000	124	0.000	164	0.000	204	0.000
5	0.000	45	0.000	85	0.000	125	0.000	165	0.000	205	0.000
6	0.000	46	0.000	86	0.000	126	0.000	166	0.000	206	0.000
7	0.000	47	0.000	87	0.000	127	0.000	167	0.000	207	0.000
8	0.000	48	0.000	88	0.000	128	0.000	168	0.000	208	0.000
9	0.000	49	0.000	89	0.000	129	0.000	169	0.000	209	0.000
10	0.000	50	0.000	90	0.000	130	0.000	170	0.000	210	0.000
11	0.000	51	0.000	91	0.000	131	0.000	171	0.000	211	0.000
12	0.000	52	0.000	92	0.000	132	0.000	172	0.000	212	0.000
13	0.000	53	0.000	93	0.000	133	0.000	173	0.000	213	0.000
14	0.000	54	0.000	94	0.000	134	0.000	174	0.000	214	0.000
15	0.000	55	0.000	95	0.000	135	0.000	175	0.000	215	0.000
16	0.000	56	0.000	96	0.000	136	0.000	176	0.000	216	0.000
17	0.000	57	0.000	97	0.000	137	0.000	177	0.000	217	0.000
18	0.000	58	0.000	98	0.000	138	0.000	178	0.000	218	0.000
19	0.000	59	0.000	99	0.000	139	0.000	179	0.000	219	0.000
20	0.000	60	0.000	100	0.000	140	0.000	180	0.000	220	0.000
21	0.000	61	0.000	101	0.000	141	0.000	181	0.000	221	0.000
22	0.000	62	0.000	102	0.000	142	0.000	182	0.000	222	0.000
23	0.000	63	0.000	103	0.000	143	0.000	183	0.000	223	0.000
24	0.000	64	0.000	104	0.000	144	0.000	184	0.000	224	0.000
25	0.000	65	0.000	105	0.000	145	0.000	185	0.000	225	0.000
26	0.000	66	0.000	106	0.000	146	0.000	186	0.000	226	0.000
27	0.000	67	0.000	107	0.000	147	0.000	187	0.000	227	0.000
28	0.000	68	0.000	108	0.000	148	0.000	188	0.000	228	0.000
29	0.000	69	0.000	109	0.000	149	0.000	189	0.000	229	0.000
30	0.000	70	0.000	110	0.000	150	0.000	190	0.000	230	0.000
31	0.000	71	0.000	111	0.000	151	0.000	191	0.000	231	0.000
32	0.000	72	0.000	112	0.000	152	0.000	192	0.000	232	0.000
33	0.000	73	0.000	113	0.000	153	0.000	193	0.000	233	0.000
34	0.000	74	0.000	114	0.000	154	0.000	194	0.000	234	0.000
35	0.000	75	0.000	115	0.000	155	0.000	195	0.000	235	0.000
36	0.000	76	0.000	116	0.000	156	0.000	196	0.000	236	0.000
37	0.000	77	0.000	117	0.000	157	0.000	197	0.000	237	0.000
38	0.000	78	0.000	118	0.000	158	0.000	198	0.000	238	0.000
39	0.000	79	0.000	119	0.000	159	0.000	199	0.000	239	0.000
40	0.000	80	0.000	120	0.000	160	0.000	200	0.000	240	0.000

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<u>Surcharged Outfall Details for Storm - Net 1</u>											
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
281	0.000	330	0.000	379	0.000	428	0.000	477	0.000	526	0.000
282	0.000	331	0.000	380	0.000	429	0.000	478	0.000	527	0.000
283	0.000	332	0.000	381	0.000	430	0.000	479	0.000	528	0.000
284	0.000	333	0.000	382	0.000	431	0.000	480	0.000	529	0.000
285	0.000	334	0.000	383	0.000	432	0.000	481	0.000	530	0.000
286	0.000	335	0.000	384	0.000	433	0.000	482	0.000	531	0.000
287	0.000	336	0.000	385	0.000	434	0.000	483	0.000	532	0.000
288	0.000	337	0.000	386	0.000	435	0.000	484	0.000	533	0.000
289	0.000	338	0.000	387	0.000	436	0.000	485	0.000	534	0.000
290	0.000	339	0.000	388	0.000	437	0.000	486	0.000	535	0.000
291	0.000	340	0.000	389	0.000	438	0.000	487	0.000	536	0.000
292	0.000	341	0.000	390	0.000	439	0.000	488	0.000	537	0.000
293	0.000	342	0.000	391	0.000	440	0.000	489	0.000	538	0.000
294	0.000	343	0.000	392	0.000	441	0.000	490	0.000	539	0.000
295	0.000	344	0.000	393	0.000	442	0.000	491	0.000	540	0.000
296	0.000	345	0.000	394	0.000	443	0.000	492	0.000	541	0.000
297	0.000	346	0.000	395	0.000	444	0.000	493	0.000	542	0.000
298	0.000	347	0.000	396	0.000	445	0.000	494	0.000	543	0.000
299	0.000	348	0.000	397	0.000	446	0.000	495	0.000	544	0.000
300	0.000	349	0.000	398	0.000	447	0.000	496	0.000	545	0.000
301	0.000	350	0.000	399	0.000	448	0.000	497	0.000	546	0.000
302	0.000	351	0.000	400	0.000	449	0.000	498	0.000	547	0.000
303	0.000	352	0.000	401	0.000	450	0.000	499	0.000	548	0.000
304	0.000	353	0.000	402	0.000	451	0.000	500	0.000	549	0.000
305	0.000	354	0.000	403	0.000	452	0.000	501	0.000	550	0.000
306	0.000	355	0.000	404	0.000	453	0.000	502	0.000	551	0.000
307	0.000	356	0.000	405	0.000	454	0.000	503	0.000	552	0.000
308	0.000	357	0.000	406	0.000	455	0.000	504	0.000	553	0.000
309	0.000	358	0.000	407	0.000	456	0.000	505	0.000	554	0.000
310	0.000	359	0.000	408	0.000	457	0.000	506	0.000	555	0.000
311	0.000	360	0.000	409	0.000	458	0.000	507	0.000	556	0.000
312	0.000	361	0.000	410	0.000	459	0.000	508	0.000	557	0.000
313	0.000	362	0.000	411	0.000	460	0.000	509	0.000	558	0.000
314	0.000	363	0.000	412	0.000	461	0.000	510	0.000	559	0.000
315	0.000	364	0.000	413	0.000	462	0.000	511	0.000	560	0.000
316	0.000	365	0.000	414	0.000	463	0.000	512	0.000	561	0.000
317	0.000	366	0.000	415	0.000	464	0.000	513	0.000	562	0.000
318	0.000	367	0.000	416	0.000	465	0.000	514	0.000	563	0.000
319	0.000	368	0.000	417	0.000	466	0.000	515	0.000	564	0.000
320	0.000	369	0.000	418	0.000	467	0.000	516	0.000	565	0.000
321	0.000	370	0.000	419	0.000	468	0.000	517	0.000	566	0.000
322	0.000	371	0.000	420	0.000	469	0.000	518	0.000	567	0.000
323	0.000	372	0.000	421	0.000	470	0.000	519	0.000	568	0.000
324	0.000	373	0.000	422	0.000	471	0.000	520	0.000	569	0.000
325	0.000	374	0.000	423	0.000	472	0.000	521	0.000	570	0.000
326	0.000	375	0.000	424	0.000	473	0.000	522	0.000	571	0.000
327	0.000	376	0.000	425	0.000	474	0.000	523	0.000	572	0.000
328	0.000	377	0.000	426	0.000	475	0.000	524	0.000	573	0.000
329	0.000	378	0.000	427	0.000	476	0.000	525	0.000	574	0.000
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<u>Surcharged Outfall Details for Storm - Net 1</u>											
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
624	0.000	673	0.000	722	0.000	771	0.000	820	0.000	869	0.000
625	0.000	674	0.000	723	0.000	772	0.000	821	0.000	870	0.000
626	0.000	675	0.000	724	0.000	773	0.000	822	0.000	871	0.000
627	0.000	676	0.000	725	0.000	774	0.000	823	0.000	872	0.000
628	0.000	677	0.000	726	0.000	775	0.000	824	0.000	873	0.000
629	0.000	678	0.000	727	0.000	776	0.000	825	0.000	874	0.000
630	0.000	679	0.000	728	0.000	777	0.000	826	0.000	875	0.000
631	0.000	680	0.000	729	0.000	778	0.000	827	0.000	876	0.000
632	0.000	681	0.000	730	0.000	779	0.000	828	0.000	877	0.000
633	0.000	682	0.000	731	0.000	780	0.000	829	0.000	878	0.000
634	0.000	683	0.000	732	0.000	781	0.000	830	0.000	879	0.000
635	0.000	684	0.000	733	0.000	782	0.000	831	0.000	880	0.000
636	0.000	685	0.000	734	0.000	783	0.000	832	0.000	881	0.000
637	0.000	686	0.000	735	0.000	784	0.000	833	0.000	882	0.000
638	0.000	687	0.000	736	0.000	785	0.000	834	0.000	883	0.000
639	0.000	688	0.000	737	0.000	786	0.000	835	0.000	884	0.000
640	0.000	689	0.000	738	0.000	787	0.000	836	0.000	885	0.000
641	0.000	690	0.000	739	0.000	788	0.000	837	0.000	886	0.000
642	0.000	691	0.000	740	0.000	789	0.000	838	0.000	887	0.000
643	0.000	692	0.000	741	0.000	790	0.000	839	0.000	888	0.000
644	0.000	693	0.000	742	0.000	791	0.000	840	0.000	889	0.000
645	0.000	694	0.000	743	0.000	792	0.000	841	0.000	890	0.000
646	0.000	695	0.000	744	0.000	793	0.000	842	0.000	891	0.000
647	0.000	696	0.000	745	0.000	794	0.000	843	0.000	892	0.000
648	0.000	697	0.000	746	0.000	795	0.000	844	0.000	893	0.000
649	0.000	698	0.000	747	0.000	796	0.000	845	0.000	894	0.000
650	0.000	699	0.000	748	0.000	797	0.000	846	0.000	895	0.000
651	0.000	700	0.000	749	0.000	798	0.000	847	0.000	896	0.000
652	0.000	701	0.000	750	0.000	799	0.000	848	0.000	897	0.000
653	0.000	702	0.000	751	0.000	800	0.000	849	0.000	898	0.000
654	0.000	703	0.000	752	0.000	801	0.000	850	0.000	899	0.000
655	0.000	704	0.000	753	0.000	802	0.000	851	0.000	900	0.000
656	0.000	705	0.000	754	0.000	803	0.000	852	0.000	901	0.000
657	0.000	706	0.000	755	0.000	804	0.000	853	0.000	902	0.000
658	0.000	707	0.000	756	0.000	805	0.000	854	0.000	903	0.000
659	0.000	708	0.000	757	0.000	806	0.000	855	0.000	904	0.000
660	0.000	709	0.000	758	0.000	807	0.000	856	0.000	905	0.000
661	0.000	710	0.000	759	0.000	808	0.000	857	0.000	906	0.000
662	0.000	711	0.000	760	0.000	809	0.000	858	0.000	907	0.000
663	0.000	712	0.000	761	0.000	810	0.000	859	0.000	908	0.000
664	0.000	713	0.000	762	0.000	811	0.000	860	0.000	909	0.000
665	0.000	714	0.000	763	0.000	812	0.000	861	0.000	910	0.000
666	0.000	715	0.000	764	0.000	813	0.000	862	0.000	911	0.000
667	0.000	716	0.000	765	0.000	814	0.000	863	0.000	912	0.000
668	0.000	717	0.000	766	0.000	815	0.000	864	0.000	913	0.000
669	0.000	718	0.000	767	0.000	816	0.000	865	0.000	914	0.000
670	0.000	719	0.000	768	0.000	817	0.000	866	0.000	915	0.000
671	0.000	720	0.000	769	0.000	818	0.000	867	0.000	916	0.000
672	0.000	721	0.000	770	0.000	819	0.000	868	0.000	917	0.000
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<u>Surcharged Outfall Details for Storm - Net 1</u>													
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
967	0.000	1016	0.000	1065	0.000	1114	0.000	1163	0.000	1212	0.000	1261	0.000
968	0.000	1017	0.000	1066	0.000	1115	0.000	1164	0.000	1213	0.000	1262	0.000
969	0.000	1018	0.000	1067	0.000	1116	0.000	1165	0.000	1214	0.000	1263	0.000
970	0.000	1019	0.000	1068	0.000	1117	0.000	1166	0.000	1215	0.000	1264	0.000
971	0.000	1020	0.000	1069	0.000	1118	0.000	1167	0.000	1216	0.000	1265	0.000
972	0.000	1021	0.000	1070	0.000	1119	0.000	1168	0.000	1217	0.000	1266	0.000
973	0.000	1022	0.000	1071	0.000	1120	0.000	1169	0.000	1218	0.000	1267	0.000
974	0.000	1023	0.000	1072	0.000	1121	0.000	1170	0.000	1219	0.000	1268	0.000
975	0.000	1024	0.000	1073	0.000	1122	0.000	1171	0.000	1220	0.000	1269	0.000
976	0.000	1025	0.000	1074	0.000	1123	0.000	1172	0.000	1221	0.000	1270	0.000
977	0.000	1026	0.000	1075	0.000	1124	0.000	1173	0.000	1222	0.000	1271	0.000
978	0.000	1027	0.000	1076	0.000	1125	0.000	1174	0.000	1223	0.000	1272	0.000
979	0.000	1028	0.000	1077	0.000	1126	0.000	1175	0.000	1224	0.000	1273	0.000
980	0.000	1029	0.000	1078	0.000	1127	0.000	1176	0.000	1225	0.000	1274	0.000
981	0.000	1030	0.000	1079	0.000	1128	0.000	1177	0.000	1226	0.000	1275	0.000
982	0.000	1031	0.000	1080	0.000	1129	0.000	1178	0.000	1227	0.000	1276	0.000
983	0.000	1032	0.000	1081	0.000	1130	0.000	1179	0.000	1228	0.000	1277	0.000
984	0.000	1033	0.000	1082	0.000	1131	0.000	1180	0.000	1229	0.000	1278	0.000
985	0.000	1034	0.000	1083	0.000	1132	0.000	1181	0.000	1230	0.000	1279	0.000
986	0.000	1035	0.000	1084	0.000	1133	0.000	1182	0.000	1231	0.000	1280	0.000
987	0.000	1036	0.000	1085	0.000	1134	0.000	1183	0.000	1232	0.000	1281	0.000
988	0.000	1037	0.000	1086	0.000	1135	0.000	1184	0.000	1233	0.000	1282	0.000
989	0.000	1038	0.000	1087	0.000	1136	0.000	1185	0.000	1234	0.000	1283	0.000
990	0.000	1039	0.000	1088	0.000	1137	0.000	1186	0.000	1235	0.000	1284	0.000
991	0.000	1040	0.000	1089	0.000	1138	0.000	1187	0.000	1236	0.000	1285	0.000
992	0.000	1041	0.000	1090	0.000	1139	0.000	1188	0.000	1237	0.000	1286	0.000
993	0.000	1042	0.000	1091	0.000	1140	0.000	1189	0.000	1238	0.000	1287	0.000
994	0.000	1043	0.000	1092	0.000	1141	0.000	1190	0.000	1239	0.000	1288	0.000
995	0.000	1044	0.000	1093	0.000	1142	0.000	1191	0.000	1240	0.000	1289	0.000
996	0.000	1045	0.000	1094	0.000	1143	0.000	1192	0.000	1241	0.000	1290	0.000
997	0.000	1046	0.000	1095	0.000	1144	0.000	1193	0.000	1242	0.000	1291	0.000
998	0.000	1047	0.000	1096	0.000	1145	0.000	1194	0.000	1243	0.000	1292	0.000
999	0.000	1048	0.000	1097	0.000	1146	0.000	1195	0.000	1244	0.000	1293	0.000
1000	0.000	1049	0.000	1098	0.000	1147	0.000	1196	0.000	1245	0.000	1294	0.000
1001	0.000	1050	0.000	1099	0.000	1148	0.000	1197	0.000	1246	0.000	1295	0.000
1002	0.000	1051	0.000	1100	0.000	1149	0.000	1198	0.000	1247	0.000	1296	0.000
1003	0.000	1052	0.000	1101	0.000	1150	0.000	1199	0.000	1248	0.000	1297	0.000
1004	0.000	1053	0.000	1102	0.000	1151	0.000	1200	0.000	1249	0.000	1298	0.000
1005	0.000	1054	0.000	1103	0.000	1152	0.000	1201	0.000	1250	0.000	1299	0.000
1006	0.000	1055	0.000	1104	0.000	1153	0.000	1202	0.000	1251	0.000	1300	0.000
1007	0.000	1056	0.000	1105	0.000	1154	0.000	1203	0.000	1252	0.000	1301	0.000
1008	0.000	1057	0.000	1106	0.000	1155	0.000	1204	0.000	1253	0.000	1302	0.000
1009	0.000	1058	0.000	1107	0.000	1156	0.000	1205	0.000	1254	0.000	1303	0.000
1010	0.000	1059	0.000	1108	0.000	1157	0.000	1206	0.000	1255	0.000	1304	0.000
1011	0.000	1060	0.000	1109	0.000	1158	0.000	1207	0.000	1256	0.000	1305	0.000
1012	0.000	1061	0.000	1110	0.000	1159	0.000	1208	0.000	1257	0.000	1306	0.000
1013	0.000	1062	0.000	1111	0.000	1160	0.000	1209	0.000	1258	0.000	1307	0.000
1014	0.000	1063	0.000	1112	0.000	1161	0.000	1210	0.000	1259	0.000	1308	0.000
1015	0.000	1064	0.000	1113	0.000	1162	0.000	1211	0.000	1260	0.000	1309	0.000
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Online Controls for Storm - Net 1

Hydro-Brake® Optimum Manhole: 42, DS/PN: 5.011, Volume (m³): 23.8

Unit Reference MD-SHE-0143-1000-1200-1000	
Design Head (m)	1.200
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	143
Invert Level (m)	4.971
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	10.0	Kick-Flo®	0.778	8.2
Flush-Flo™	0.357	10.0	Mean Flow over Head Range	-	8.7

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	5.1	1.200	10.0	3.000	15.4	7.000	23.2
0.200	9.4	1.400	10.8	3.500	16.6	7.500	23.9
0.300	9.9	1.600	11.5	4.000	17.7	8.000	24.7
0.400	10.0	1.800	12.1	4.500	18.7	8.500	25.4
0.500	9.8	2.000	12.7	5.000	19.7	9.000	26.1
0.600	9.5	2.200	13.3	5.500	20.6	9.500	26.8
0.800	8.3	2.400	13.9	6.000	21.5		
1.000	9.2	2.600	14.4	6.500	22.3		

Hydro-Brake® Optimum Manhole: 44, DS/PN: 5.013, Volume (m³): 16.1

Unit Reference MD-SHE-0143-1000-1200-1000	
Design Head (m)	1.200
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	143
Invert Level (m)	4.935
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: 44, DS/PN: 5.013, Volume (m³): 16.1

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	10.0	Kick-Flo®	0.778	8.2
Flush-Flo™	0.357	10.0	Mean Flow over Head Range	-	8.7

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	5.1	1.200	10.0	3.000	15.4	7.000	23.2
0.200	9.4	1.400	10.8	3.500	16.6	7.500	23.9
0.300	9.9	1.600	11.5	4.000	17.7	8.000	24.7
0.400	10.0	1.800	12.1	4.500	18.7	8.500	25.4
0.500	9.8	2.000	12.7	5.000	19.7	9.000	26.1
0.600	9.5	2.200	13.3	5.500	20.6	9.500	26.8
0.800	8.3	2.400	13.9	6.000	21.5		
1.000	9.2	2.600	14.4	6.500	22.3		

Hydro-Brake® Optimum Manhole: 46, DS/PN: 5.015, Volume (m³): 13.8

Unit Reference MD-SHE-0230-3000-1500-3000	
Design Head (m)	1.500
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	230
Invert Level (m)	4.873
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	30.0	Kick-Flo®	1.016	24.9
Flush-Flo™	0.462	30.0	Mean Flow over Head Range	-	25.7

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	7.7	0.600	29.6	1.600	30.9	2.600	39.1
0.200	23.1	0.800	28.5	1.800	32.7	3.000	41.9
0.300	29.0	1.000	25.4	2.000	34.4	3.500	45.1
0.400	29.9	1.200	27.0	2.200	36.0	4.000	48.1
0.500	29.9	1.400	29.0	2.400	37.6	4.500	50.9

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Hydro-Brake® Optimum Manhole: 46, DS/PN: 5.015, Volume (m³): 13.8

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
5.000	53.6	6.500	60.8	8.000	67.3	9.500	73.2
5.500	56.1	7.000	63.1	8.500	69.3		
6.000	58.5	7.500	65.2	9.000	71.3		

Hydro-Brake® Optimum Manhole: 14, DS/PN: 1.014, Volume (m³): 43.0

Unit Reference MD-SHE-0134-1000-1800-1000	
Design Head (m)	1.800
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	134
Invert Level (m)	4.674
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	10.0	Kick-Flo®	1.089	7.9
Flush-Flo™	0.525	10.0	Mean Flow over Head Range	-	8.7

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	4.8	1.200	8.3	3.000	12.7	7.000	19.1
0.200	8.6	1.400	8.9	3.500	13.7	7.500	19.7
0.300	9.5	1.600	9.5	4.000	14.6	8.000	20.3
0.400	9.8	1.800	10.0	4.500	15.4	8.500	20.9
0.500	10.0	2.000	10.5	5.000	16.2	9.000	21.5
0.600	9.9	2.200	11.0	5.500	17.0	9.500	22.1
0.800	9.6	2.400	11.5	6.000	17.7		
1.000	8.7	2.600	11.9	6.500	18.4		

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 5
 Number of Online Controls 4 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

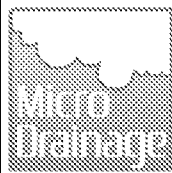
Rainfall Model FEH
 FEH Rainfall Version 2013
 Site Location GB 489800 99500 SZ 89800 99500
 Data Type Catchment
 Cv (Summer) 0.750
 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 30, 100
 Climate Change (%) 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Winter	30	+0%	100/30	Summer			5.833
1.001	2	30 Winter	30	+0%	100/30	Summer			5.816
1.002	3	30 Winter	30	+0%	100/30	Summer			5.782
1.003	4	30 Winter	30	+0%	100/30	Summer			5.765
1.004	5	30 Winter	30	+0%	30/30	Winter			5.699
1.005	6	30 Winter	30	+0%	30/30	Winter			5.640
1.006	7	30 Winter	30	+0%	30/30	Winter			5.628
1.007	8	30 Winter	30	+0%	30/30	Winter			5.609
2.000	22	30 Summer	30	+0%	100/30	Summer			5.631
1.008	9	30 Winter	30	+0%	30/30	Summer			5.587
3.000	23	30 Winter	30	+0%	30/30	Winter			5.579
1.009	10	30 Winter	30	+0%	30/30	Summer			5.563
4.000	24	30 Winter	30	+0%	30/30	Winter			5.535
1.010	11	30 Winter	30	+0%	30/30	Summer			5.535
1.011	11a	30 Winter	30	+0%	100/30	Summer			5.419

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>							
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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.012	12	30 Summer	30	+0%	100/30 Summer			
5.000	25	30 Summer	30	+0%	100/30 Summer			
5.001	26	30 Summer	30	+0%	100/30 Summer			
5.002	27	30 Summer	30	+0%	30/30 Summer	100/30 Summer		
5.003	28	30 Summer	30	+0%	30/30 Summer	100/30 Summer		
6.000	29	30 Summer	30	+0%	30/30 Summer			
6.001	30	30 Summer	30	+0%	30/30 Summer	100/30 Summer		
6.002	31	30 Summer	30	+0%	30/30 Summer			
6.003	32	30 Summer	30	+0%	30/30 Summer			
6.004	33	30 Summer	30	+0%	30/30 Summer			
6.005	34	30 Summer	30	+0%	30/30 Summer			
5.004	35	30 Summer	30	+0%	30/30 Summer			
5.005	36	30 Winter	30	+0%	30/30 Summer			
5.006	37	30 Winter	30	+0%	30/30 Winter			
7.000	48	30 Winter	30	+0%	100/30 Summer			
5.007	38	30 Winter	30	+0%	30/30 Summer			
8.000	53	30 Winter	30	+0%	100/30 Summer			
8.001	54	30 Winter	30	+0%	100/30 Summer			
5.008	39	30 Winter	30	+0%	30/30 Winter			
5.009	40	30 Winter	30	+0%	100/30 Summer			
9.000	48	30 Summer	30	+0%				
9.001	49	30 Summer	30	+0%				
9.002	50	30 Summer	30	+0%				
9.003	51	30 Winter	30	+0%				
9.004	52	480 Winter	30	+0%				
5.010	41	480 Winter	30	+0%				
5.011	42	360 Winter	30	+0%				
5.012	43	1440 Winter	30	+0%				
5.013	44	1440 Winter	30	+0%				
5.014	45	960 Winter	30	+0%				
5.015	46	1440 Winter	30	+0%				
10.000	55	30 Summer	30	+0%				
10.001	56	30 Summer	30	+0%				
10.002	57	30 Summer	30	+0%				
5.016	47	480 Winter	30	+0%				
1.013	13	480 Winter	30	+0%				
1.014	14	480 Winter	30	+0%	100/240 Winter			
1.015	15	480 Winter	30	+0%				
1.016	16	480 Winter	30	+0%				
1.017	17	480 Winter	30	+0%				
1.018	18	480 Winter	30	+0%				
1.019	19	480 Winter	30	+0%				
1.020	20	480 Winter	30	+0%				
1.021	20a	480 Winter	30	+0%				
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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.012	12	5.360	0.000	0.000	1.06		169.8	OK	
5.000	25	6.388	-0.167	0.000	0.40		26.2	OK	
5.001	26	6.315	-0.097	0.000	0.50		32.4	OK	
5.002	27	6.273	0.011	0.000	0.91		56.5	FLOOD RISK	4
5.003	28	6.192	0.020	0.000	1.03		69.2	SURCHARGED	2
6.000	29	6.629	0.176	0.000	0.59		33.9	SURCHARGED	
6.001	30	6.548	0.144	0.000	0.67		38.7	SURCHARGED	4
6.002	31	6.458	0.104	0.000	0.65		43.1	SURCHARGED	
6.003	32	6.367	0.212	0.000	1.18		68.1	SURCHARGED	
6.004	33	6.289	0.185	0.000	1.09		70.2	SURCHARGED	
6.005	34	6.140	0.168	0.000	1.85		111.3	SURCHARGED	
5.004	35	5.917	0.003	0.000	0.88		183.8	SURCHARGED	
5.005	36	5.877	0.007	0.000	1.05		194.9	SURCHARGED	
5.006	37	5.840	0.007	0.000	0.84		202.9	SURCHARGED	
7.000	48	5.842	0.000	0.000	0.14		34.8	OK	
5.007	38	5.792	0.031	0.000	1.71		233.6	SURCHARGED	
8.000	53	5.812	0.000	0.000	0.15		20.5	OK	
8.001	54	5.791	0.000	0.000	0.15		35.0	OK	
5.008	39	5.758	0.016	0.000	1.50		259.7	SURCHARGED	
5.009	40	5.709	0.000	0.000	1.00		255.8	OK	
9.000	48	5.592	-0.362	0.000	0.22		55.0	OK	
9.001	49	5.533	-0.333	0.000	0.28		68.8	OK	
9.002	50	5.470	-0.323	0.000	0.34		79.7	OK	
9.003	51	5.405	-0.331	0.000	0.36		85.7	OK	
9.004	52	5.326	-0.345	0.000	0.06		15.1	OK	
5.010	41	5.325	-0.579	0.000	0.02		10.8	OK*	
5.011	42	5.324	-0.547	0.000	0.04		9.7	OK	
5.012	43	5.198	-0.656	0.000	0.01		5.8	OK*	
5.013	44	5.255	-0.579	0.000	0.01		5.0	OK	
5.014	45	5.098	-0.690	0.000	0.01		5.9	OK*	
5.015	46	5.132	-0.640	0.000	0.02		5.9	OK	
10.000	55	5.205	-0.362	0.000	0.02		5.0	OK	
10.001	56	5.204	-0.321	0.000	0.15		30.3	OK	
10.002	57	5.188	-0.295	0.000	0.50		67.4	OK	
5.016	47	5.068	-0.695	0.000	0.01		6.5	OK*	
1.013	13	5.068	-0.569	0.000	0.02		11.3	OK*	
1.014	14	5.065	-0.209	0.000	0.06		9.5	OK	
1.015	15	4.743	-0.514	0.000	0.04		9.5	OK	
1.016	16	4.665	-0.504	0.000	0.04		9.5	OK	
1.017	17	4.612	-0.505	0.000	0.04		9.5	OK	
1.018	18	4.565	-0.500	0.000	0.05		9.5	OK	
1.019	19	4.523	-0.504	0.000	0.04		9.5	OK	
1.020	20	4.476	-0.498	0.000	0.05		9.5	OK	
1.021	20a	4.436	-0.507	0.000	0.06		9.5	OK	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Storage Structures 5
 Number of Online Controls 4 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
 FEH Rainfall Version 2013
 Site Location GB 489800 99500 SZ 89800 99500
 Data Type Catchment
 Cv (Summer) 0.750
 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 30, 100
 Climate Change (%) 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Winter	100	+40%	100/30	Summer			6.397
1.001	2	30 Winter	100	+40%	100/30	Summer			6.385
1.002	3	30 Winter	100	+40%	100/30	Summer			6.365
1.003	4	30 Winter	100	+40%	100/30	Summer			6.355
1.004	5	30 Summer	100	+40%	30/30	Winter			6.316
1.005	6	30 Winter	100	+40%	30/30	Winter			6.258
1.006	7	30 Winter	100	+40%	30/30	Winter			6.229
1.007	8	30 Winter	100	+40%	30/30	Winter			6.182
2.000	22	30 Winter	100	+40%	100/30	Summer			6.094
1.008	9	30 Winter	100	+40%	30/30	Summer			6.083
3.000	23	30 Summer	100	+40%	30/30	Winter			6.060
1.009	10	30 Winter	100	+40%	30/30	Summer			6.022
4.000	24	30 Winter	100	+40%	30/30	Winter			5.862
1.010	11	30 Winter	100	+40%	30/30	Summer			5.862
1.011	11a	30 Winter	100	+40%	100/30	Summer			5.703

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.012	12	30 Winter	100	+40%	100/30 Summer			
5.000	25	30 Summer	100	+40%	100/30 Summer			
5.001	26	30 Summer	100	+40%	100/30 Summer			
5.002	27	30 Winter	100	+40%	30/30 Summer	100/30 Summer		
5.003	28	30 Summer	100	+40%	30/30 Summer	100/30 Summer		
6.000	29	30 Summer	100	+40%	30/30 Summer			
6.001	30	30 Winter	100	+40%	30/30 Summer	100/30 Summer		
6.002	31	30 Summer	100	+40%	30/30 Summer			
6.003	32	30 Summer	100	+40%	30/30 Summer			
6.004	33	30 Summer	100	+40%	30/30 Summer			
6.005	34	30 Summer	100	+40%	30/30 Summer			
5.004	35	30 Summer	100	+40%	30/30 Summer			
5.005	36	30 Summer	100	+40%	30/30 Summer			
5.006	37	30 Summer	100	+40%	30/30 Winter			
7.000	48	30 Winter	100	+40%	100/30 Summer			
5.007	38	30 Winter	100	+40%	30/30 Summer			
8.000	53	30 Winter	100	+40%	100/30 Summer			
8.001	54	30 Winter	100	+40%	100/30 Summer			
5.008	39	30 Winter	100	+40%	30/30 Winter			
5.009	40	30 Winter	100	+40%	100/30 Summer			
9.000	48	30 Summer	100	+40%				
9.001	49	30 Summer	100	+40%				
9.002	50	30 Summer	100	+40%				
9.003	51	600 Winter	100	+40%				
9.004	52	600 Winter	100	+40%				
5.010	41	600 Winter	100	+40%				
5.011	42	600 Winter	100	+40%				
5.012	43	1440 Winter	100	+40%				
5.013	44	960 Winter	100	+40%				
5.014	45	1440 Winter	100	+40%				
5.015	46	1440 Winter	100	+40%				
10.000	55	30 Summer	100	+40%				
10.001	56	30 Summer	100	+40%				
10.002	57	30 Summer	100	+40%				
5.016	47	600 Winter	100	+40%				
1.013	13	600 Winter	100	+40%				
1.014	14	600 Winter	100	+40%	100/240 Winter			
1.015	15	2880 Winter	100	+40%				
1.016	16	2880 Winter	100	+40%				
1.017	17	2880 Winter	100	+40%				
1.018	18	2880 Winter	100	+40%				
1.019	19	2880 Winter	100	+40%				
1.020	20	2880 Winter	100	+40%				
1.021	20a	2880 Winter	100	+40%				
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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.012	12	5.526	0.166	0.000	2.93		468.7	SURCHARGED	
5.000	25	6.777	0.222	0.000	0.67		44.0	SURCHARGED	
5.001	26	6.690	0.278	0.000	0.91		59.2	FLOOD RISK	
5.002	27	6.576	0.308	20.439	1.07		66.8	FLOOD	4
5.003	28	6.550	0.378	0.000	1.22		82.4	FLOOD	2
5.000	29	6.958	0.505	0.000	1.22		69.8	SURCHARGED	
6.001	30	6.876	0.472	25.855	0.99		57.1	FLOOD	4
6.002	31	6.919	0.565	0.000	0.86		57.3	FLOOD RISK	
6.003	32	6.965	0.610	0.000	1.55		89.5	SURCHARGED	
6.004	33	6.923	0.819	0.000	1.31		84.6	SURCHARGED	
6.005	34	6.813	0.841	0.000	2.73		164.3	SURCHARGED	
5.004	35	6.464	0.550	0.000	1.27		265.8	SURCHARGED	
5.005	36	6.417	0.547	0.000	1.59		278.9	SURCHARGED	
5.006	37	6.364	0.531	0.000	1.21		294.4	SURCHARGED	
7.000	48	6.271	0.429	0.000	0.25		61.8	SURCHARGED	
5.007	38	6.254	0.493	0.000	2.58		352.7	SURCHARGED	
8.000	53	6.149	0.337	0.000	0.27		36.9	SURCHARGED	
8.001	54	6.143	0.352	0.000	0.31		70.8	SURCHARGED	
5.008	39	6.128	0.386	0.000	2.43		421.5	SURCHARGED	
5.009	40	5.949	0.249	0.000	1.73		443.4	SURCHARGED	
9.000	48	5.695	-0.259	0.000	0.39		97.3	OK	
9.001	49	5.644	-0.222	0.000	0.50		121.8	OK	
9.002	50	5.581	-0.212	0.000	0.60		141.7	OK	
9.003	51	5.556	-0.180	0.000	0.09		20.8	OK	
9.004	52	5.555	-0.116	0.000	0.08		19.9	OK	
5.010	41	5.554	-0.350	0.000	0.03		13.6	OK*	
5.011	42	5.550	-0.321	0.000	0.04		9.9	OK	
5.012	43	5.417	-0.437	0.000	0.01		4.9	OK*	
5.013	44	5.412	-0.422	0.000	0.01		5.3	OK	
5.014	45	5.318	-0.470	0.000	0.02		7.3	OK*	
5.015	46	5.363	-0.409	0.000	0.02		8.1	OK	
10.000	55	5.352	-0.215	0.000	0.04		8.9	OK	
10.001	56	5.347	-0.178	0.000	0.27		54.4	OK	
10.002	57	5.322	-0.161	0.000	0.89		120.4	OK	
5.016	47	5.293	-0.470	0.000	0.01		7.8	OK*	
1.013	13	5.294	-0.343	0.000	0.02		12.2	OK*	
1.014	14	5.287	0.013	0.000	0.06		10.0	SURCHARGED	
1.015	15	4.745	-0.512	0.000	0.04		10.0	OK	
1.016	16	4.667	-0.502	0.000	0.04		10.0	OK	
1.017	17	4.615	-0.502	0.000	0.04		10.0	OK	
1.018	18	4.568	-0.497	0.000	0.05		10.0	OK	
1.019	19	4.525	-0.502	0.000	0.04		10.0	OK	
1.020	20	4.478	-0.496	0.000	0.05		10.0	OK	
1.021	20a	4.438	-0.505	0.000	0.06		10.0	OK	
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 489800 99500 SZ 89800 99500
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	10
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm - Net 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	13.258	0.023	576.4	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit	
S2.000	8.721	0.039	223.6	0.048	5.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	13.307	0.023	578.6	0.124	5.00	0.0	0.600	o	600	Pipe/Conduit	
S3.001	32.843	0.056	586.5	0.018	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.002	13.364	0.023	581.0	0.014	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.003	56.843	0.097	586.0	0.050	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	-11.50	5.22	4.071	0.000	0.0	0.0	0.0	1.01	284.7	0.0
S2.000	-11.79	5.09	4.167	0.048	0.0	0.0	0.0	1.62	459.3	0.0
S3.000	-11.49	5.22	4.448	0.124	0.0	0.0	0.0	1.01	284.2	0.0
S3.001	-10.40	5.77	4.425	0.142	0.0	0.0	0.0	1.00	282.3	0.0
S3.002	-10.01	5.99	4.369	0.156	0.0	0.0	0.0	1.00	283.6	0.0
S3.003	-8.65	6.94	4.346	0.206	0.0	0.0	0.0	1.00	282.4	0.0

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<u>Network Design Table for Storm - Net 2</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>S3.004</td><td>17.615</td><td>0.030</td><td>587.2</td><td>0.023</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S3.005</td><td>22.812</td><td>0.039</td><td>584.9</td><td>0.026</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S3.006</td><td>30.540</td><td>0.052</td><td>587.3</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S2.001</td><td>18.275</td><td>0.032</td><td>571.0</td><td>0.243</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S4.000</td><td>14.791</td><td>0.025</td><td>585.0</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.001</td><td>12.836</td><td>0.022</td><td>583.5</td><td>0.023</td><td>0.00</td><td>0.0</td><td>0.600</td><td>oo</td><td>600</td><td>Double Pipe</td><td></td></tr><tr><td>S1.002</td><td>26.302</td><td>0.045</td><td>584.5</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.003</td><td>6.101</td><td>0.010</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.004</td><td>4.800</td><td>0.008</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td>Pipe/Conduit</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>I.Area (ha)</th><th>Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>S3.004</td><td>-8.29</td><td>7.23</td><td>4.249</td><td>0.229</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.1</td><td>0.0</td></tr><tr><td>S3.005</td><td>-7.88</td><td>7.61</td><td>4.219</td><td>0.255</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>S3.006</td><td>-7.39</td><td>8.12</td><td>4.189</td><td>0.255</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.1</td><td>0.0</td></tr><tr><td>S2.001</td><td>-7.12</td><td>8.43</td><td>4.128</td><td>0.546</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.01</td><td>286.1</td><td>0.0</td></tr><tr><td>S4.000</td><td>-11.44</td><td>5.25</td><td>4.071</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>S1.001</td><td>-6.95</td><td>8.64</td><td>4.096</td><td>0.569</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>566.0</td><td>0.0</td></tr><tr><td>S1.002</td><td>-6.61</td><td>9.08</td><td>4.074</td><td>0.569</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.7</td><td>0.0</td></tr><tr><td>S1.003</td><td>-6.54</td><td>9.18</td><td>4.023</td><td>0.569</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>S1.004</td><td>-6.48</td><td>9.26</td><td>4.019</td><td>0.569</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr></table>												PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design	S3.004	17.615	0.030	587.2	0.023	0.00	0.0	0.600	o	600	Pipe/Conduit		S3.005	22.812	0.039	584.9	0.026	0.00	0.0	0.600	o	600	Pipe/Conduit		S3.006	30.540	0.052	587.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		S2.001	18.275	0.032	571.0	0.243	0.00	0.0	0.600	o	600	Pipe/Conduit		S4.000	14.791	0.025	585.0	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit		S1.001	12.836	0.022	583.5	0.023	0.00	0.0	0.600	oo	600	Double Pipe		S1.002	26.302	0.045	584.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		S1.003	6.101	0.010	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		S1.004	4.800	0.008	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	S3.004	-8.29	7.23	4.249	0.229	0.0	0.0	0.0	1.00	282.1	0.0	S3.005	-7.88	7.61	4.219	0.255	0.0	0.0	0.0	1.00	282.6	0.0	S3.006	-7.39	8.12	4.189	0.255	0.0	0.0	0.0	1.00	282.1	0.0	S2.001	-7.12	8.43	4.128	0.546	0.0	0.0	0.0	1.01	286.1	0.0	S4.000	-11.44	5.25	4.071	0.000	0.0	0.0	0.0	1.00	282.6	0.0	S1.001	-6.95	8.64	4.096	0.569	0.0	0.0	0.0	1.00	566.0	0.0	S1.002	-6.61	9.08	4.074	0.569	0.0	0.0	0.0	1.00	282.7	0.0	S1.003	-6.54	9.18	4.023	0.569	0.0	0.0	0.0	1.00	282.6	0.0	S1.004	-6.48	9.26	4.019	0.569	0.0	0.0	0.0	1.00	282.6	0.0
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<u>Manhole Schedules for Storm - Net 2</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S75	5.752	1.681	Open Manhole	1500	S1.000	4.071	600				
S73	7.270	3.103	Open Manhole	1500	S2.000	4.167	600				
S66	6.560	2.112	Open Manhole	1500	S3.000	4.448	600				
S67	6.512	2.087	Open Manhole	1500	S3.001	4.425	600	S3.000	4.425	600	
S68	6.059	1.689	Open Manhole	1500	S3.002	4.369	600	S3.001	4.369	600	
S69	6.166	1.822	Open Manhole	1500	S3.003	4.346	600	S3.002	4.346	600	
S70	6.740	2.491	Open Manhole	1500	S3.004	4.249	600	S3.003	4.249	600	
S71	6.916	2.697	Open Manhole	1500	S3.005	4.219	600	S3.004	4.219	600	
S72	7.142	2.962	Open Manhole	1500	S3.006	4.180	600	S3.005	4.180	600	
S74	6.200	2.072	Open Manhole	1500	S2.001	4.128	600	S2.000	4.128	600	
								S3.006	4.128	600	
S80	6.530	2.459	Open Manhole	1500	S4.000	4.071	600				
S76	7.500	3.454	Open Manhole	2100	S1.001	4.096	600	S1.000	4.048	600	
								S2.001	4.096	600	
								S4.000	4.046	600	
S77	7.500	3.426	Open Manhole	2100	S1.002	4.074	600	S1.001	4.074	600	
S78	5.500	1.471	Open Manhole	1500	S1.003	4.029	600	S1.002	4.029	600	
S79	5.500	1.481	Open Manhole	2100	S1.004	4.019	600	S1.003	4.019	600	
S80	5.500	1.489	Open Manhole	0		OUTFALL		S1.004	4.011	600	
<u>Free Flowing Outfall Details for Storm - Net 2</u>											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)					
S1.004	S80	5.500	4.011	0.000	0	0					
<u>Simulation Criteria for Storm - Net 2</u>											
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 Coefficient	0.800								
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000								
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60								
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1								
Number of Input Hydrographs	0	Number of Storage Structures	3								
Number of Online Controls	1	Number of Time/Area Diagrams	0								
Number of Offline Controls	0	Number of Real Time Controls	0								
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<u>Simulation Criteria for Storm - Net 2</u> <u>Synthetic Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FEH</td> </tr> <tr> <td>Return Period (years)</td> <td>2</td> </tr> <tr> <td>FEH Rainfall Version</td> <td>2013</td> </tr> <tr> <td>Site Location</td> <td>GB 489800 99500 SZ 89800 99500</td> </tr> <tr> <td>Data Type</td> <td>Catchment</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> </tr> <tr> <td>Winter Storms</td> <td>No</td> </tr> <tr> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>Storm Duration (mins)</td> <td>30</td> </tr> </table>			Rainfall Model	FEH	Return Period (years)	2	FEH Rainfall Version	2013	Site Location	GB 489800 99500 SZ 89800 99500	Data Type	Catchment	Summer Storms	Yes	Winter Storms	No	Cv (Summer)	0.750	Cv (Winter)	0.840	Storm Duration (mins)	30
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Online Controls for Storm - Net 2

Hydro-Brake® Optimum Manhole: S79, DS/PN: S1.004, Volume (m³): 6.3

Unit Reference MD-SHE-0079-3000-1200-3000	
Design Head (m)	1.200
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	79
Invert Level (m)	4.019
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	3.0	Kick-Flo®	0.707	2.4
Flush-Flo™	0.348	2.9	Mean Flow over Head Range	-	2.6

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	2.3	1.200	3.0	3.000	4.6	7.000	6.8
0.200	2.8	1.400	3.2	3.500	4.9	7.500	7.0
0.300	2.9	1.600	3.4	4.000	5.2	8.000	7.3
0.400	2.9	1.800	3.6	4.500	5.5	8.500	7.5
0.500	2.8	2.000	3.8	5.000	5.8	9.000	7.7
0.600	2.7	2.200	4.0	5.500	6.1	9.500	7.9
0.800	2.5	2.400	4.1	6.000	6.3		
1.000	2.8	2.600	4.3	6.500	6.6		

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Storage Structures for Storm - Net 2

Tank or Pond Manhole: S75, DS/PN: S1.000

Invert Level (m) 4.600

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	95.2	1.180	325.6

Tank or Pond Manhole: S80, DS/PN: S4.000

Invert Level (m) 4.121

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	140.0	0.400	140.0	0.410	0.0

Tank or Pond Manhole: S78, DS/PN: S1.003

Invert Level (m) 4.167

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	67.6	1.333	263.5

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 2

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
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	FEH
FEH Rainfall Version	2013
Site Location	GB 489800 99500 SZ 89800 99500
Data Type	Catchment
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S75	1440 Winter	30	+0%	30/120 Winter			
S2.000	S73	1440 Winter	30	+0%	100/60 Summer			
S3.000	S66	1440 Winter	30	+0%	100/120 Winter			
S3.001	S67	1440 Winter	30	+0%	100/120 Winter			
S3.002	S68	1440 Winter	30	+0%	100/120 Summer			
S3.003	S69	1440 Winter	30	+0%	100/60 Summer			
S3.004	S70	1440 Winter	30	+0%	100/60 Summer			
S3.005	S71	1440 Winter	30	+0%	100/60 Summer			
S3.006	S72	1440 Winter	30	+0%	100/60 Summer			
S2.001	S74	1440 Winter	30	+0%	30/240 Winter			
S4.000	S80	1440 Winter	30	+0%	30/120 Winter			
S1.001	S76	1440 Winter	30	+0%	30/180 Winter			
S1.002	S77	1440 Winter	30	+0%	30/180 Winter			
S1.003	S78	1440 Winter	30	+0%	30/120 Winter			
S1.004	S79	4320 Summer	30	+0%	30/120 Winter	100/1440 Winter		

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 2</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S75	4.768	0.097	0.000	0.01		1.0	SURCHARGED	
S2.000	S73	4.765	-0.002	0.000	0.00		0.8	OK	
S3.000	S66	4.774	-0.274	0.000	0.02		2.1	OK	
S3.001	S67	4.774	-0.251	0.000	0.01		2.3	OK	
S3.002	S68	4.773	-0.196	0.000	0.02		2.3	OK	
S3.003	S69	4.772	-0.174	0.000	0.01		3.1	OK	
S3.004	S70	4.771	-0.078	0.000	0.02		2.8	OK	
S3.005	S71	4.770	-0.049	0.000	0.02		3.1	OK	
S3.006	S72	4.769	-0.011	0.000	0.01		2.9	OK	
S2.001	S74	4.765	0.037	0.000	0.04		7.3	SURCHARGED	
S4.000	S80	4.764	0.093	0.000	0.01		1.5	SURCHARGED	
S1.001	S76	4.764	0.068	0.000	0.02		6.1	SURCHARGED	
S1.002	S77	4.762	0.088	0.000	0.03		5.8	SURCHARGED	
S1.003	S78	4.769	0.140	0.000	0.02		4.4	SURCHARGED	
S1.004	S79	5.025	0.406	0.000	0.01		2.9	SURCHARGED	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 2

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
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	FEH
FEH Rainfall Version	2013
Site Location	GB 489800 99500 SZ 89800 99500
Data Type	Catchment
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S75	1440 Winter	100	+40%	30/120 Winter			
S2.000	S73	1440 Winter	100	+40%	100/60 Summer			
S3.000	S66	1440 Winter	100	+40%	100/120 Winter			
S3.001	S67	1440 Winter	100	+40%	100/120 Winter			
S3.002	S68	1440 Winter	100	+40%	100/120 Summer			
S3.003	S69	1440 Winter	100	+40%	100/60 Summer			
S3.004	S70	1440 Winter	100	+40%	100/60 Summer			
S3.005	S71	1440 Winter	100	+40%	100/60 Summer			
S3.006	S72	1440 Winter	100	+40%	100/60 Summer			
S2.001	S74	1440 Winter	100	+40%	30/240 Winter			
S4.000	S80	1440 Winter	100	+40%	30/120 Winter			
S1.001	S76	1440 Winter	100	+40%	30/180 Winter			
S1.002	S77	1440 Winter	100	+40%	30/180 Winter			
S1.003	S78	1440 Winter	100	+40%	30/120 Winter			
S1.004	S79	480 Winter	100	+40%	30/120 Winter	100/1440 Winter		

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 2</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S75	5.315	0.644	0.000	0.01		1.8	SURCHARGED	
S2.000	S73	5.312	0.545	0.000	0.00		1.4	SURCHARGED	
S3.000	S66	5.314	0.266	0.000	0.03		3.6	SURCHARGED	
S3.001	S67	5.314	0.289	0.000	0.02		3.8	SURCHARGED	
S3.002	S68	5.313	0.344	0.000	0.03		3.7	SURCHARGED	
S3.003	S69	5.313	0.367	0.000	0.02		4.9	SURCHARGED	
S3.004	S70	5.313	0.464	0.000	0.03		5.5	SURCHARGED	
S3.005	S71	5.312	0.493	0.000	0.03		6.1	SURCHARGED	
S3.006	S72	5.312	0.532	0.000	0.03		6.1	SURCHARGED	
S2.001	S74	5.312	0.584	0.000	0.08		14.1	SURCHARGED	
S4.000	S80	5.311	0.640	0.000	0.00		0.1	SURCHARGED	
S1.001	S76	5.311	0.615	0.000	0.03		9.3	SURCHARGED	
S1.002	S77	5.314	0.640	0.000	0.04		9.0	SURCHARGED	
S1.003	S78	5.319	0.690	0.000	0.03		5.8	FLOOD RISK	
S1.004	S79	5.385	0.766	0.000	0.01		2.9	FLOOD RISK	
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 489800 99500 SZ 89800 99500
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	10
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm - Net 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	14.282	0.024	585.0	0.036	5.00	0.0	0.600	o	600	Pipe/Conduit	
S1.001	23.685	0.040	585.0	0.089	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.002	63.535	0.109	585.0	0.111	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.003	20.138	0.034	585.0	0.047	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	26.439	0.045	585.0	0.053	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	9.354	0.016	584.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.006	4.409	0.008	585.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	-11.45	5.24	4.288	0.036	0.0	0.0	0.0	1.00	282.6	0.0
S1.001	-10.65	5.63	4.283	0.125	0.0	0.0	0.0	1.00	282.6	0.0
S1.002	-8.97	6.69	4.223	0.236	0.0	0.0	0.0	1.00	282.6	0.0
S1.003	-8.54	7.03	4.114	0.283	0.0	0.0	0.0	1.00	282.6	0.0
S1.004	-8.03	7.47	4.080	0.336	0.0	0.0	0.0	1.00	282.6	0.0
S1.005	-7.87	7.62	4.035	0.336	0.0	0.0	0.0	1.00	282.7	0.0
S1.006	-7.79	7.70	4.013	0.336	0.0	0.0	0.0	1.00	282.6	0.0

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<u>Manhole Schedules for Storm - Net 3</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S58	6.320	2.032	Open Manhole	1500	S1.000	4.288	600				
S59	6.360	2.097	Open Manhole	1500	S1.001	4.263	600	S1.000	4.264	600	1
S60	6.130	1.907	Open Manhole	1500	S1.002	4.223	600	S1.001	4.223	600	
S61	5.910	1.796	Open Manhole	1500	S1.003	4.114	600	S1.002	4.114	600	
S62	5.970	1.890	Open Manhole	1500	S1.004	4.080	600	S1.003	4.080	600	
S63	5.620	1.585	Open Manhole	1500	S1.005	4.035	600	S1.004	4.035	600	
S64	5.500	1.481	Open Manhole	2100	S1.006	4.019	600	S1.005	4.019	600	
S65	5.500	1.489	Open Manhole	0		OUTFALL		S1.006	4.011	600	
<u>Free Flowing Outfall Details for Storm - Net 3</u>											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)					
S1.006	S65	5.500	4.011	0.000	0	0					
<u>Simulation Criteria for Storm - Net 3</u>											
Volumetric Runoff Coeff		0.840	Additional Flow - % of Total Flow		10.000						
Areal Reduction Factor		1.000	MADD Factor * 10m³/ha Storage		2.000						
Hot Start (mins)		0	Inlet Coefficient		0.800						
Hot Start Level (mm)		0	Flow per Person per Day (l/per/day)		0.000						
Manhole Headloss Coeff (Global)		0.500	Run Time (mins)		480						
Foul Sewage per hectare (l/s)		0.000	Output Interval (mins)		4						
Number of Input Hydrographs		0	Number of Storage Structures		1						
Number of Online Controls		1	Number of Time/Area Diagrams		0						
Number of Offline Controls		0	Number of Real Time Controls		0						
<u>Synthetic Rainfall Details</u>											
Rainfall Model		FEH									
Return Period (years)		100									
FEH Rainfall Version		2013									
Site Location		GB 489800 99500 SZ 89800 99500									
Data Type		Catchment									
Summer Storms		No									
Winter Storms		Yes									
Cv (Summer)		0.750									
Cv (Winter)		0.840									
Storm Duration (mins)		240									
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Online Controls for Storm - Net 3

Hydro-Brake® Optimum Manhole: S64, DS/PN: S1.006, Volume (m³): 7.3

Unit Reference MD-SHE-0082-3000-1000-3000	
Design Head (m)	1.000
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	82
Invert Level (m)	4.019
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.0	Kick-Flo®	0.623	2.4
Flush-Flo™	0.297	3.0	Mean Flow over Head Range	-	2.6

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	2.4	1.200	3.3	3.000	5.0	7.000	7.4
0.200	2.9	1.400	3.5	3.500	5.4	7.500	7.7
0.300	3.0	1.600	3.7	4.000	5.7	8.000	7.9
0.400	2.9	1.800	3.9	4.500	6.0	8.500	8.2
0.500	2.8	2.000	4.1	5.000	6.3	9.000	8.4
0.600	2.5	2.200	4.3	5.500	6.6	9.500	8.6
0.800	2.7	2.400	4.5	6.000	6.9		
1.000	3.0	2.600	4.7	6.500	7.2		

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<u>Storage Structures for Storm - Net 3</u> <u>Tank or Pond Manhole: S63, DS/PN: S1.005</u> Invert Level (m) 4.197 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>184.1</td> <td>1.000</td> <td>378.0</td> <td>1.300</td> <td>450.0</td> </tr> </tbody> </table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	184.1	1.000	378.0	1.300	450.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)									
0.000	184.1	1.000	378.0	1.300	450.0									
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 3

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
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	0.350
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S58	240 Winter	30	+0%	100/360 Winter				4.528
S1.001	S59	240 Winter	30	+0%	100/360 Winter				4.528
S1.002	S60	240 Winter	30	+0%	100/180 Winter				4.528
S1.003	S61	240 Winter	30	+0%	100/120 Summer				4.528
S1.004	S62	240 Winter	30	+0%	100/60 Winter				4.527
S1.005	S63	240 Winter	30	+0%	100/60 Winter				4.525
S1.006	S64	2160 Summer	30	+0%	30/2160 Summer				4.658

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S58	-0.360	0.000	0.02		2.4	OK	
S1.001	S59	-0.335	0.000	0.04		8.3	OK	
S1.002	S60	-0.295	0.000	0.06		15.5	OK	
S1.003	S61	-0.186	0.000	0.09		16.1	OK	
S1.004	S62	-0.153	0.000	0.09		18.9	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 3

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Flow (l/s)		
S1.005	S63	-0.110	0.000	0.03		4.0	OK	
S1.006	S64	0.039	0.000	0.01		2.8	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 3

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 Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
 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 0.350
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 30, 100
 Climate Change (%) 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S58	360 Winter	100	+40%	100/360 Winter				4.907
S1.001	S59	360 Winter	100	+40%	100/360 Winter				4.907
S1.002	S60	360 Winter	100	+40%	100/180 Winter				4.907
S1.003	S61	360 Winter	100	+40%	100/120 Summer				4.907
S1.004	S62	360 Winter	100	+40%	100/60 Winter				4.906
S1.005	S63	360 Winter	100	+40%	100/60 Winter				4.906
S1.006	S64	1440 Winter	100	+40%	30/2160 Summer				4.996

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S58	0.019	0.000	0.02		3.1	SURCHARGED	
S1.001	S59	0.044	0.000	0.05		10.5	SURCHARGED	
S1.002	S60	0.084	0.000	0.08		19.7	SURCHARGED	
S1.003	S61	0.193	0.000	0.13		23.6	SURCHARGED	
S1.004	S62	0.226	0.000	0.13		28.0	SURCHARGED	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	10
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.000
Ratio R	0.350	Maximum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Inverts

Network Design Table for Storm - Net 1

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.000	8.170	0.020	405.0	0.134	5.00	0.0	0.600	o	450	⊗
1.001	16.082	0.040	405.0	0.000	0.00	0.0	0.600	o	450	⊗
1.002	6.076	0.015	405.0	0.000	0.00	0.0	0.600	o	450	⊗
1.003	51.953	0.128	405.0	0.052	0.00	0.0	0.600	o	450	⊗
1.004	24.842	0.061	405.0	0.158	0.00	0.0	0.600	o	450	⊗
1.005	8.430	0.021	405.0	0.000	0.00	0.0	0.600	o	450	⊗
1.006	12.254	0.030	405.0	0.060	0.00	0.0	0.600	o	450	⊗
1.007	11.965	0.030	405.0	0.084	0.00	0.0	0.600	o	450	⊗
2.000	46.726	0.080	585.0	0.103	5.00	0.0	0.600	o	600	⊗

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.14	5.447	0.134	0.0	0.0	1.8	1.00	159.7	20.0
1.001	50.00	5.40	5.426	0.134	0.0	0.0	1.8	1.00	159.7	20.0
1.002	50.00	5.50	5.386	0.134	0.0	0.0	1.8	1.00	159.7	20.0
1.003	50.00	6.37	5.371	0.186	0.0	0.0	2.5	1.00	159.7	27.7
1.004	50.00	6.78	5.243	0.344	0.0	0.0	4.7	1.00	159.7	51.2
1.005	50.00	6.92	5.182	0.344	0.0	0.0	4.7	1.00	159.7	51.2
1.006	50.00	7.12	5.161	0.404	0.0	0.0	5.5	1.00	159.7	60.2
1.007	50.00	7.32	5.131	0.488	0.0	0.0	6.6	1.00	159.7	72.7
2.000	50.00	5.78	5.031	0.103	0.0	0.0	1.4	1.00	282.6	15.3

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Rogers Cory Partnership										Page 1																																																																																																																																																																																																																																																																																																																																																																																							
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<u>Network Design Table for Storm - Net 1</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Auto Design</th></tr><tr><td>1.008</td><td>44.678</td><td>0.076</td><td>587.9</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>3.000</td><td>36.559</td><td>0.062</td><td>585.0</td><td>0.370</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>1.009</td><td>12.064</td><td>0.021</td><td>574.5</td><td>0.104</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>4.000</td><td>43.717</td><td>0.075</td><td>585.0</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>1.010</td><td>18.207</td><td>0.094</td><td>193.7</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>1.011</td><td>36.653</td><td>0.031</td><td>1182.3</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>1.012</td><td>17.479</td><td>0.030</td><td>585.0</td><td>0.233</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.000</td><td>36.452</td><td>0.149</td><td>245.0</td><td>0.091</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>5.001</td><td>35.432</td><td>0.145</td><td>245.0</td><td>0.036</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>5.002</td><td>22.241</td><td>0.091</td><td>245.0</td><td>0.115</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>5.003</td><td>61.045</td><td>0.249</td><td>245.0</td><td>0.061</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>6.000</td><td>12.093</td><td>0.049</td><td>245.0</td><td>0.135</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>6.001</td><td>12.311</td><td>0.050</td><td>245.0</td><td>0.023</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>6.002</td><td>48.848</td><td>0.199</td><td>245.0</td><td>0.026</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>6.003</td><td>12.549</td><td>0.051</td><td>245.0</td><td>0.126</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>6.004</td><td>32.313</td><td>0.132</td><td>245.0</td><td>0.009</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL E (m)</th><th>I.Area (ha)</th><th>E Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>1.008</td><td>50.00</td><td>8.07</td><td>4.951</td><td>0.591</td><td>0.0</td><td>0.0</td><td>8.0</td><td>1.00</td><td>281.9</td><td>88.0</td></tr><tr><td>3.000</td><td>50.00</td><td>5.61</td><td>4.938</td><td>0.370</td><td>0.0</td><td>0.0</td><td>5.0</td><td>1.00</td><td>282.6</td><td>55.1</td></tr><tr><td>1.009</td><td>49.77</td><td>8.27</td><td>4.874</td><td>1.065</td><td>0.0</td><td>0.0</td><td>14.4</td><td>1.01</td><td>285.2</td><td>157.9</td></tr><tr><td>4.000</td><td>50.00</td><td>5.73</td><td>4.925</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>1.010</td><td>49.26</td><td>8.44</td><td>4.850</td><td>1.065</td><td>0.0</td><td>0.0</td><td>14.4</td><td>1.75</td><td>493.7</td><td>157.9</td></tr><tr><td>1.011</td><td>46.90</td><td>9.31</td><td>4.819</td><td>1.065</td><td>0.0</td><td>0.0</td><td>14.4</td><td>0.70</td><td>197.8</td><td>157.9</td></tr><tr><td>1.012</td><td>46.17</td><td>9.60</td><td>4.769</td><td>1.298</td><td>0.0</td><td>0.0</td><td>16.2</td><td>1.00</td><td>282.6</td><td>178.5</td></tr><tr><td>5.000</td><td>50.00</td><td>5.61</td><td>6.255</td><td>0.091</td><td>0.0</td><td>0.0</td><td>1.2</td><td>1.00</td><td>70.7</td><td>13.6</td></tr><tr><td>5.001</td><td>50.00</td><td>6.20</td><td>6.112</td><td>0.127</td><td>0.0</td><td>0.0</td><td>1.7</td><td>1.00</td><td>70.7</td><td>18.9</td></tr><tr><td>5.002</td><td>50.00</td><td>6.57</td><td>5.962</td><td>0.242</td><td>0.0</td><td>0.0</td><td>3.3</td><td>1.00</td><td>70.7</td><td>36.0</td></tr><tr><td>5.003</td><td>50.00</td><td>7.59</td><td>5.872</td><td>0.303</td><td>0.0</td><td>0.0</td><td>4.1</td><td>1.00</td><td>70.7</td><td>45.1</td></tr><tr><td>6.000</td><td>50.00</td><td>5.20</td><td>6.153</td><td>0.135</td><td>0.0</td><td>0.0</td><td>1.8</td><td>1.00</td><td>70.7</td><td>20.1</td></tr><tr><td>6.001</td><td>50.00</td><td>5.41</td><td>6.104</td><td>0.158</td><td>0.0</td><td>0.0</td><td>2.1</td><td>1.00</td><td>70.7</td><td>23.5</td></tr><tr><td>6.002</td><td>50.00</td><td>6.22</td><td>6.054</td><td>0.184</td><td>0.0</td><td>0.0</td><td>2.5</td><td>1.00</td><td>70.7</td><td>27.4</td></tr><tr><td>6.003</td><td>50.00</td><td>6.43</td><td>5.855</td><td>0.310</td><td>0.0</td><td>0.0</td><td>4.2</td><td>1.00</td><td>70.7</td><td>46.2</td></tr><tr><td>6.004</td><td>50.00</td><td>6.97</td><td>5.804</td><td>0.319</td><td>0.0</td><td>0.0</td><td>4.3</td><td>1.00</td><td>70.7</td><td>47.5</td></tr></table> ©1982-2014 XP Solutions												PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design	1.008	44.678	0.076	587.9	0.000	0.00	0.0	0.600	o	600		3.000	36.559	0.062	585.0	0.370	5.00	0.0	0.600	o	600		1.009	12.064	0.021	574.5	0.104	0.00	0.0	0.600	o	600		4.000	43.717	0.075	585.0	0.000	5.00	0.0	0.600	o	600		1.010	18.207	0.094	193.7	0.000	0.00	0.0	0.600	o	600		1.011	36.653	0.031	1182.3	0.000	0.00	0.0	0.600	o	600		1.012	17.479	0.030	585.0	0.233	0.00	0.0	0.600	o	600		5.000	36.452	0.149	245.0	0.091	5.00	0.0	0.600	o	300		5.001	35.432	0.145	245.0	0.036	0.00	0.0	0.600	o	300		5.002	22.241	0.091	245.0	0.115	0.00	0.0	0.600	o	300		5.003	61.045	0.249	245.0	0.061	0.00	0.0	0.600	o	300		6.000	12.093	0.049	245.0	0.135	5.00	0.0	0.600	o	300		6.001	12.311	0.050	245.0	0.023	0.00	0.0	0.600	o	300		6.002	48.848	0.199	245.0	0.026	0.00	0.0	0.600	o	300		6.003	12.549	0.051	245.0	0.126	0.00	0.0	0.600	o	300		6.004	32.313	0.132	245.0	0.009	0.00	0.0	0.600	o	300		PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	1.008	50.00	8.07	4.951	0.591	0.0	0.0	8.0	1.00	281.9	88.0	3.000	50.00	5.61	4.938	0.370	0.0	0.0	5.0	1.00	282.6	55.1	1.009	49.77	8.27	4.874	1.065	0.0	0.0	14.4	1.01	285.2	157.9	4.000	50.00	5.73	4.925	0.000	0.0	0.0	0.0	1.00	282.6	0.0	1.010	49.26	8.44	4.850	1.065	0.0	0.0	14.4	1.75	493.7	157.9	1.011	46.90	9.31	4.819	1.065	0.0	0.0	14.4	0.70	197.8	157.9	1.012	46.17	9.60	4.769	1.298	0.0	0.0	16.2	1.00	282.6	178.5	5.000	50.00	5.61	6.255	0.091	0.0	0.0	1.2	1.00	70.7	13.6	5.001	50.00	6.20	6.112	0.127	0.0	0.0	1.7	1.00	70.7	18.9	5.002	50.00	6.57	5.962	0.242	0.0	0.0	3.3	1.00	70.7	36.0	5.003	50.00	7.59	5.872	0.303	0.0	0.0	4.1	1.00	70.7	45.1	6.000	50.00	5.20	6.153	0.135	0.0	0.0	1.8	1.00	70.7	20.1	6.001	50.00	5.41	6.104	0.158	0.0	0.0	2.1	1.00	70.7	23.5	6.002	50.00	6.22	6.054	0.184	0.0	0.0	2.5	1.00	70.7	27.4	6.003	50.00	6.43	5.855	0.310	0.0	0.0	4.2	1.00	70.7	46.2	6.004	50.00	6.97	5.804	0.319	0.0	0.0	4.3	1.00	70.7	47.5
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design																																																																																																																																																																																																																																																																																																																																																																																							
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6.004	32.313	0.132	245.0	0.009	0.00	0.0	0.600	o	300																																																																																																																																																																																																																																																																																																																																																																																								
PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																																																																																																																																																																																																																																																																																																																																							
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3.000	50.00	5.61	4.938	0.370	0.0	0.0	5.0	1.00	282.6	55.1																																																																																																																																																																																																																																																																																																																																																																																							
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1.011	46.90	9.31	4.819	1.065	0.0	0.0	14.4	0.70	197.8	157.9																																																																																																																																																																																																																																																																																																																																																																																							
1.012	46.17	9.60	4.769	1.298	0.0	0.0	16.2	1.00	282.6	178.5																																																																																																																																																																																																																																																																																																																																																																																							
5.000	50.00	5.61	6.255	0.091	0.0	0.0	1.2	1.00	70.7	13.6																																																																																																																																																																																																																																																																																																																																																																																							
5.001	50.00	6.20	6.112	0.127	0.0	0.0	1.7	1.00	70.7	18.9																																																																																																																																																																																																																																																																																																																																																																																							
5.002	50.00	6.57	5.962	0.242	0.0	0.0	3.3	1.00	70.7	36.0																																																																																																																																																																																																																																																																																																																																																																																							
5.003	50.00	7.59	5.872	0.303	0.0	0.0	4.1	1.00	70.7	45.1																																																																																																																																																																																																																																																																																																																																																																																							
6.000	50.00	5.20	6.153	0.135	0.0	0.0	1.8	1.00	70.7	20.1																																																																																																																																																																																																																																																																																																																																																																																							
6.001	50.00	5.41	6.104	0.158	0.0	0.0	2.1	1.00	70.7	23.5																																																																																																																																																																																																																																																																																																																																																																																							
6.002	50.00	6.22	6.054	0.184	0.0	0.0	2.5	1.00	70.7	27.4																																																																																																																																																																																																																																																																																																																																																																																							
6.003	50.00	6.43	5.855	0.310	0.0	0.0	4.2	1.00	70.7	46.2																																																																																																																																																																																																																																																																																																																																																																																							
6.004	50.00	6.97	5.804	0.319	0.0	0.0	4.3	1.00	70.7	47.5																																																																																																																																																																																																																																																																																																																																																																																							

Rogers Cory Partnership										Page 2																																																																																																																																																																																																																																																																																																																																																																	
The Old School Old School Road Hook Hampshire RG27 9NJ																																																																																																																																																																																																																																																																																																																																																																											
Date 02.02.2021 File SW1-STRAT SEPARATE.MDX					Designed by Tim K Checked by Terry S																																																																																																																																																																																																																																																																																																																																																																						
Innovyze					Network 2014.1.1																																																																																																																																																																																																																																																																																																																																																																						
<u>Network Design Table for Storm - Net 1</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Auto Design</th></tr><tr><td>6.005</td><td>16.781</td><td>0.068</td><td>245.0</td><td>0.169</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>300</td><td></td></tr><tr><td>5.004</td><td>25.610</td><td>0.044</td><td>585.0</td><td>0.089</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.005</td><td>21.502</td><td>0.037</td><td>585.0</td><td>0.044</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.006</td><td>41.994</td><td>0.072</td><td>585.0</td><td>0.075</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>7.000</td><td>47.265</td><td>0.081</td><td>585.0</td><td>0.152</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.007</td><td>11.281</td><td>0.019</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>8.000</td><td>12.138</td><td>0.021</td><td>585.0</td><td>0.089</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>8.001</td><td>28.753</td><td>0.049</td><td>585.0</td><td>0.087</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.008</td><td>19.574</td><td>0.033</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>5.009</td><td>69.926</td><td>0.120</td><td>585.0</td><td>0.110</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>9.000</td><td>51.692</td><td>0.088</td><td>585.0</td><td>0.198</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>9.001</td><td>42.526</td><td>0.073</td><td>585.0</td><td>0.074</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>9.002</td><td>33.343</td><td>0.057</td><td>585.0</td><td>0.066</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>9.003</td><td>38.205</td><td>0.065</td><td>585.0</td><td>0.051</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr><tr><td>9.004</td><td>53.115</td><td>0.091</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>600</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL E (m)</th><th>I.Area (ha)</th><th>E Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>6.005</td><td>50.00</td><td>7.25</td><td>5.672</td><td>0.488</td><td></td><td>0.0</td><td>0.0</td><td>6.6</td><td>1.00</td><td>70.7</td></tr><tr><td>5.004</td><td>50.00</td><td>8.01</td><td>5.314</td><td>0.880</td><td></td><td>0.0</td><td>0.0</td><td>11.9</td><td>1.00</td><td>282.6</td></tr><tr><td>5.005</td><td>49.46</td><td>8.37</td><td>5.276</td><td>0.924</td><td></td><td>0.0</td><td>0.0</td><td>12.4</td><td>1.00</td><td>282.6</td></tr><tr><td>5.006</td><td>47.53</td><td>9.07</td><td>5.233</td><td>0.999</td><td></td><td>0.0</td><td>0.0</td><td>12.9</td><td>1.00</td><td>282.6</td></tr><tr><td>7.000</td><td>50.00</td><td>5.79</td><td>5.242</td><td>0.152</td><td></td><td>0.0</td><td>0.0</td><td>2.1</td><td>1.00</td><td>282.6</td></tr><tr><td>5.007</td><td>47.04</td><td>9.26</td><td>5.161</td><td>1.151</td><td></td><td>0.0</td><td>0.0</td><td>14.7</td><td>1.00</td><td>282.6</td></tr><tr><td>8.000</td><td>50.00</td><td>5.20</td><td>5.212</td><td>0.089</td><td></td><td>0.0</td><td>0.0</td><td>1.2</td><td>1.00</td><td>282.6</td></tr><tr><td>8.001</td><td>50.00</td><td>5.68</td><td>5.191</td><td>0.176</td><td></td><td>0.0</td><td>0.0</td><td>2.4</td><td>1.00</td><td>282.6</td></tr><tr><td>5.008</td><td>46.21</td><td>9.59</td><td>5.142</td><td>1.327</td><td></td><td>0.0</td><td>0.0</td><td>16.6</td><td>1.00</td><td>282.6</td></tr><tr><td>5.009</td><td>43.53</td><td>10.75</td><td>5.109</td><td>1.437</td><td></td><td>0.0</td><td>0.0</td><td>16.9</td><td>1.00</td><td>282.6</td></tr><tr><td>9.000</td><td>50.00</td><td>5.86</td><td>5.354</td><td>0.198</td><td></td><td>0.0</td><td>0.0</td><td>2.7</td><td>1.00</td><td>282.6</td></tr><tr><td>9.001</td><td>50.00</td><td>6.57</td><td>5.266</td><td>0.272</td><td></td><td>0.0</td><td>0.0</td><td>3.7</td><td>1.00</td><td>282.6</td></tr><tr><td>9.002</td><td>50.00</td><td>7.13</td><td>5.193</td><td>0.338</td><td></td><td>0.0</td><td>0.0</td><td>4.6</td><td>1.00</td><td>282.6</td></tr><tr><td>9.003</td><td>50.00</td><td>7.76</td><td>5.136</td><td>0.389</td><td></td><td>0.0</td><td>0.0</td><td>5.3</td><td>1.00</td><td>282.6</td></tr><tr><td>9.004</td><td>48.67</td><td>8.65</td><td>5.071</td><td>0.389</td><td></td><td>0.0</td><td>0.0</td><td>5.3</td><td>1.00</td><td>282.6</td></tr></table> ©1982-2014 XP Solutions												PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design	6.005	16.781	0.068	245.0	0.169	0.00	0.0	0.600	o	300		5.004	25.610	0.044	585.0	0.089	0.00	0.0	0.600	o	600		5.005	21.502	0.037	585.0	0.044	0.00	0.0	0.600	o	600		5.006	41.994	0.072	585.0	0.075	0.00	0.0	0.600	o	600		7.000	47.265	0.081	585.0	0.152	5.00	0.0	0.600	o	600		5.007	11.281	0.019	585.0	0.000	0.00	0.0	0.600	o	600		8.000	12.138	0.021	585.0	0.089	5.00	0.0	0.600	o	600		8.001	28.753	0.049	585.0	0.087	0.00	0.0	0.600	o	600		5.008	19.574	0.033	585.0	0.000	0.00	0.0	0.600	o	600		5.009	69.926	0.120	585.0	0.110	0.00	0.0	0.600	o	600		9.000	51.692	0.088	585.0	0.198	5.00	0.0	0.600	o	600		9.001	42.526	0.073	585.0	0.074	0.00	0.0	0.600	o	600		9.002	33.343	0.057	585.0	0.066	0.00	0.0	0.600	o	600		9.003	38.205	0.065	585.0	0.051	0.00	0.0	0.600	o	600		9.004	53.115	0.091	585.0	0.000	0.00	0.0	0.600	o	600		PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	6.005	50.00	7.25	5.672	0.488		0.0	0.0	6.6	1.00	70.7	5.004	50.00	8.01	5.314	0.880		0.0	0.0	11.9	1.00	282.6	5.005	49.46	8.37	5.276	0.924		0.0	0.0	12.4	1.00	282.6	5.006	47.53	9.07	5.233	0.999		0.0	0.0	12.9	1.00	282.6	7.000	50.00	5.79	5.242	0.152		0.0	0.0	2.1	1.00	282.6	5.007	47.04	9.26	5.161	1.151		0.0	0.0	14.7	1.00	282.6	8.000	50.00	5.20	5.212	0.089		0.0	0.0	1.2	1.00	282.6	8.001	50.00	5.68	5.191	0.176		0.0	0.0	2.4	1.00	282.6	5.008	46.21	9.59	5.142	1.327		0.0	0.0	16.6	1.00	282.6	5.009	43.53	10.75	5.109	1.437		0.0	0.0	16.9	1.00	282.6	9.000	50.00	5.86	5.354	0.198		0.0	0.0	2.7	1.00	282.6	9.001	50.00	6.57	5.266	0.272		0.0	0.0	3.7	1.00	282.6	9.002	50.00	7.13	5.193	0.338		0.0	0.0	4.6	1.00	282.6	9.003	50.00	7.76	5.136	0.389		0.0	0.0	5.3	1.00	282.6	9.004	48.67	8.65	5.071	0.389		0.0	0.0	5.3	1.00	282.6
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design																																																																																																																																																																																																																																																																																																																																																																	
6.005	16.781	0.068	245.0	0.169	0.00	0.0	0.600	o	300																																																																																																																																																																																																																																																																																																																																																																		
5.004	25.610	0.044	585.0	0.089	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
5.005	21.502	0.037	585.0	0.044	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
5.006	41.994	0.072	585.0	0.075	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
7.000	47.265	0.081	585.0	0.152	5.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
5.007	11.281	0.019	585.0	0.000	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
8.000	12.138	0.021	585.0	0.089	5.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
8.001	28.753	0.049	585.0	0.087	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
5.008	19.574	0.033	585.0	0.000	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
5.009	69.926	0.120	585.0	0.110	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
9.000	51.692	0.088	585.0	0.198	5.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
9.001	42.526	0.073	585.0	0.074	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
9.002	33.343	0.057	585.0	0.066	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
9.003	38.205	0.065	585.0	0.051	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
9.004	53.115	0.091	585.0	0.000	0.00	0.0	0.600	o	600																																																																																																																																																																																																																																																																																																																																																																		
PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																																																																																																																																																																																																																																																																																																																	
6.005	50.00	7.25	5.672	0.488		0.0	0.0	6.6	1.00	70.7																																																																																																																																																																																																																																																																																																																																																																	
5.004	50.00	8.01	5.314	0.880		0.0	0.0	11.9	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
5.005	49.46	8.37	5.276	0.924		0.0	0.0	12.4	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
5.006	47.53	9.07	5.233	0.999		0.0	0.0	12.9	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
7.000	50.00	5.79	5.242	0.152		0.0	0.0	2.1	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
5.007	47.04	9.26	5.161	1.151		0.0	0.0	14.7	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
8.000	50.00	5.20	5.212	0.089		0.0	0.0	1.2	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
8.001	50.00	5.68	5.191	0.176		0.0	0.0	2.4	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
5.008	46.21	9.59	5.142	1.327		0.0	0.0	16.6	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
5.009	43.53	10.75	5.109	1.437		0.0	0.0	16.9	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
9.000	50.00	5.86	5.354	0.198		0.0	0.0	2.7	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
9.001	50.00	6.57	5.266	0.272		0.0	0.0	3.7	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
9.002	50.00	7.13	5.193	0.338		0.0	0.0	4.6	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
9.003	50.00	7.76	5.136	0.389		0.0	0.0	5.3	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	
9.004	48.67	8.65	5.071	0.389		0.0	0.0	5.3	1.00	282.6																																																																																																																																																																																																																																																																																																																																																																	

Rogers Cory Partnership									Page 3	
The Old School Old School Road Hook Hampshire RG27 9NJ										
Date 02.02.2021				Designed by Tim K						
File SW1-STRAT SEPARATE.MDX				Checked by Terry S						
Innovyze				Network 2014.1.1						
<u>Network Design Table for Storm - Net 1</u>										
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
5.010	32.690	0.033	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
5.011	17.114	0.017	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
5.012	19.459	0.019	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
5.013	45.631	0.046	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
5.014	15.473	0.015	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
5.015	9.647	0.010	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
10.000	24.809	0.042	585.0	0.018	5.00	0.0	0.600	o	600	⚙
10.001	24.411	0.042	585.0	0.095	0.00	0.0	0.600	o	600	⚙
10.002	11.560	0.020	585.0	0.137	0.00	0.0	0.600	o	600	⚙
5.016	126.325	0.126	1002.6	0.000	0.00	0.0	0.600	o	900	⚙
1.013	61.657	0.062	1000.0	0.000	0.00	0.0	0.600	o	900	⚙
1.014	16.789	0.029	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.015	35.851	0.061	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.016	51.505	0.088	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.017	30.185	0.052	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.018	22.128	0.038	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.019	31.014	0.053	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.020	22.497	0.038	585.0	0.000	0.00	0.0	0.600	o	600	⚙
1.021	18.212	0.031	587.5	0.000	0.00	0.0	0.600	o	600	⚙
<u>Network Results Table</u>										
PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
5.010	42.39	11.31	4.904	1.826	0.0	0.0	21.0	0.98	625.0	230.6
5.011	41.83	11.60	4.971	1.826	0.0	0.0	21.0	0.98	625.0	230.6
5.012	41.22	11.93	4.954	1.826	0.0	0.0	21.0	0.98	625.0	230.6
5.013	39.85	12.70	4.934	1.826	0.0	0.0	21.0	0.98	625.0	230.6
5.014	39.41	12.96	4.888	1.826	0.0	0.0	21.0	0.98	625.0	230.6
5.015	39.14	13.13	4.872	1.826	0.0	0.0	21.0	0.98	625.0	230.6
10.000	50.00	5.41	4.967	0.018	0.0	0.0	0.2	1.00	282.6	2.7
10.001	50.00	5.82	4.925	0.113	0.0	0.0	1.5	1.00	282.6	16.8
10.002	50.00	6.01	4.883	0.250	0.0	0.0	3.4	1.00	282.6	37.2
5.016	36.00	15.27	4.863	2.076	0.0	0.0	21.0	0.98	624.2	230.6
1.013	34.67	16.32	4.737	3.374	0.0	0.0	31.7	0.98	625.0	348.5
1.014	34.34	16.60	4.674	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.015	33.65	17.20	4.657	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.016	32.71	18.06	4.569	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.017	32.19	18.56	4.517	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.018	31.82	18.93	4.465	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.019	31.32	19.45	4.427	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.020	30.97	19.82	4.374	3.374	0.0	0.0	31.7	1.00	282.6	348.5
1.021	30.69	20.12	4.343	3.374	0.0	0.0	31.7	1.00	282.6	348.5
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Innovyze										Network 2014.1.1	
Manhole Schedules for Storm - Net 1											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	
1	6.717	1.270	Open Manhole	1350	1.000	5.447	450				
2	6.631	1.205	Open Manhole	1500	1.001	5.426	450	1.000	5.427	450	
3	6.590	1.114	Open Manhole	1350	1.002	5.386	450	1.001	5.386	450	
4	6.475	1.104	Open Manhole	1350	1.003	5.371	450	1.002	5.371	450	
5	7.035	1.792	Open Manhole	1350	1.004	5.243	450	1.003	5.243	450	
6	7.287	2.105	Open Manhole	1350	1.005	5.182	450	1.004	5.182	450	
7	7.350	2.189	Open Manhole	1350	1.006	5.161	450	1.005	5.161	450	
8	7.041	1.910	Open Manhole	1350	1.007	5.131	450	1.006	5.131	450	
22	6.450	1.419	Open Manhole	1500	2.000	5.031	600				
9	7.094	2.143	Open Manhole	1500	1.008	4.951	600	1.007	5.101	450	
								2.000	4.951	600	
23	7.100	2.162	Open Manhole	1500	3.000	4.928	600				
10	6.825	1.951	Open Manhole	1500	1.009	4.874	600	1.008	4.875	600	
								3.000	4.876	600	
24	6.234	1.309	Open Manhole	1500	4.000	4.925	600				
11	6.900	2.050	Open Manhole	1500	1.010	4.850	600	1.009	4.853	600	
								4.000	4.850	600	
11a	6.750	1.994	Open Manhole	1500	1.011	4.819	600	1.010	4.756	600	
12	6.425	1.665	Open Manhole		1.012	4.760	600	1.011	4.788	600	
25	7.389	1.134	Open Manhole	1200	5.000	6.255	300				
26	6.950	0.824	Open Manhole	1200	5.001	6.112	300	5.000	6.106	300	
27	6.550	0.588	Open Manhole	1200	5.002	5.962	300	5.001	5.967	300	
28	6.550	0.679	Open Manhole	1200	5.003	5.872	300	5.002	5.871	300	
29	7.300	1.147	Open Manhole	1200	6.000	6.153	300				
30	6.850	0.746	Open Manhole	1200	6.001	6.104	300	6.000	6.104	300	
31	6.975	0.921	Open Manhole	1200	6.002	6.054	300	6.001	6.054	300	
32	7.400	1.545	Open Manhole	1200	6.003	5.855	300	6.002	5.855	300	
33	7.450	1.646	Open Manhole	1200	6.004	5.804	300	6.003	5.804	300	
34	7.275	1.603	Open Manhole	1200	6.005	5.672	300	6.004	5.672	300	
35	7.100	1.786	Open Manhole	1500	5.004	5.314	600	5.003	5.623	300	
								6.005	5.604	300	
36	7.400	2.130	Open Manhole	1500	5.005	5.270	600	5.004	5.270	600	
37	7.250	2.017	Open Manhole	1500	5.006	5.233	600	5.005	5.233	600	
48	6.600	1.358	Open Manhole	1500	7.000	5.242	600				
38	6.635	1.474	Open Manhole	1500	5.007	5.161	600	5.006	5.161	600	
								7.000	5.161	600	
53	7.036	1.824	Open Manhole	1500	8.000	5.212	600				
54	6.922	1.731	Open Manhole	1500	8.001	5.191	600	8.000	5.191	600	
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<u>Manhole Schedules for Storm - Net 1</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
39	6.730	1.588	Open Manhole	1500	5.008	5.142	600	5.007	5.142	600	
								8.001	5.142	600	
40	6.330	1.221	Open Manhole		5.009	5.109	600	5.008	5.109	600	
48	7.150	1.796	Open Manhole	1350	9.000	5.354	600				
49	6.766	1.500	Open Manhole	1500	9.001	5.266	600	9.000	5.266	600	
50	6.350	1.157	Open Manhole	1500	9.002	5.193	600	9.001	5.193	600	
51	6.387	1.251	Open Manhole	1500	9.003	5.136	600	9.002	5.136	600	
52	6.571	1.500	Open Manhole		9.004	5.071	600	9.003	5.071	600	
41	5.990	1.010	Junction	0	5.010	5.004	900	5.009	4.989	600	
								9.004	4.980	600	
42	6.040	1.069	Open Manhole		5.011	4.971	900	5.010	4.971	900	
43	6.140	1.186	Junction	0	5.012	4.954	900	5.011	4.954	900	
44	6.187	1.253	Open Manhole		5.013	4.934	900	5.012	4.935	900	1
45	6.280	1.392	Junction	0	5.014	4.888	900	5.013	4.888	900	
46	6.210	1.338	Open Manhole		5.015	4.872	900	5.014	4.873	900	1
55	7.225	2.258	Open Manhole	1500	10.000	4.967	600				
56	7.091	2.166	Open Manhole	1500	10.001	4.925	600	10.000	4.925	600	
57	6.831	1.948	Open Manhole		10.002	4.883	600	10.001	4.883	600	
47	6.210	1.348	Junction		5.016	4.863	900	5.015	4.862	900	
								10.002	4.863	600	
13	6.210	1.480	Junction	0	1.013	4.737	900	1.012	4.730	600	
								5.016	4.737	900	
14	5.970	1.296	Open Manhole	2100	1.014	4.674	600	1.013	4.675	900	301
15	5.980	1.335	Open Manhole	1800	1.015	4.657	600	1.014	4.645	600	
16	6.050	1.481	Open Manhole	1800	1.016	4.569	600	1.015	4.596	600	27
17	6.175	1.694	Open Manhole	1800	1.017	4.517	600	1.016	4.481	600	
18	6.395	1.930	Open Manhole	1800	1.018	4.465	600	1.017	4.465	600	
19	6.500	2.073	Open Manhole	1800	1.019	4.427	600	1.018	4.427	600	
20	5.678	1.304	Open Manhole	1800	1.020	4.374	600	1.019	4.374	600	
20a	5.678	1.342	Open Manhole	1500	1.021	4.343	600	1.020	4.336	600	
21	6.100	1.788	Open Manhole	0		OUTFALL		1.021	4.312	600	
<u>Surcharged Outfall Details for Storm - Net 1</u>											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)					
1.021	21	6.100	4.312	0.000	0	0					
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Simulation Criteria for Storm - Net 1

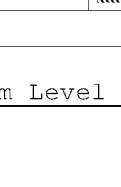
Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	15
Ratio R	0.350		

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	4	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	0.350
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%	100/15 Summer				
1.001	15 Winter	1	0%	100/15 Summer				
1.002	15 Winter	1	0%	100/15 Summer				
1.003	15 Winter	1	0%	100/15 Summer				
1.004	15 Winter	1	0%	30/15 Winter				
1.005	15 Winter	1	0%	100/15 Summer				
1.006	15 Winter	1	0%	100/15 Summer				
1.007	15 Winter	1	0%	100/15 Summer				
2.000	15 Winter	1	0%	100/15 Summer				
1.008	15 Winter	1	0%	100/15 Summer				
3.000	30 Winter	1	0%	100/15 Summer				
1.009	15 Winter	1	0%	30/15 Winter				
4.000	30 Winter	1	0%	100/15 Summer				
1.010	30 Winter	1	0%	30/30 Winter				
1.011	30 Winter	1	0%	100/15 Summer				
1.012	30 Winter	1	0%	100/15 Summer				
5.000	15 Winter	1	0%	100/15 Summer				
5.001	15 Winter	1	0%	100/15 Summer				
5.002	15 Winter	1	0%	30/15 Summer	100/15 Summer			5
5.003	15 Winter	1	0%	30/15 Summer	100/15 Winter			2
6.000	15 Winter	1	0%	30/15 Summer				

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm - Net 1</u>																																																																																						
PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.																																																																														
6.001	15 Winter	1	0%	30/15 Summer	100/15 Summer			6																																																																														
6.002	15 Winter	1	0%	30/15 Summer																																																																																		
6.003	15 Winter	1	0%	30/15 Summer																																																																																		
6.004	15 Winter	1	0%	30/15 Summer																																																																																		
6.005	15 Winter	1	0%	30/15 Summer																																																																																		
5.004	15 Winter	1	0%	100/15 Summer																																																																																		
5.005	15 Winter	1	0%	30/15 Winter																																																																																		
5.006	15 Winter	1	0%	30/30 Summer																																																																																		
7.000	15 Winter	1	0%	100/15 Summer																																																																																		
5.007	15 Winter	1	0%	30/15 Winter																																																																																		
8.000	30 Winter	1	0%	100/15 Summer																																																																																		
8.001	30 Winter	1	0%	100/15 Summer																																																																																		
5.008	30 Winter	1	0%	100/15 Summer																																																																																		
5.009	30 Winter	1	0%	100/15 Summer																																																																																		
9.000	15 Winter	1	0%																																																																																			
9.001	15 Winter	1	0%																																																																																			
9.002	15 Winter	1	0%																																																																																			
9.003	15 Winter	1	0%																																																																																			
9.004	15 Winter	1	0%																																																																																			
5.010	1440 Winter	1	0%																																																																																			
5.011	1440 Winter	1	0%																																																																																			
5.012	2880 Winter	1	0%																																																																																			
5.013	2880 Winter	1	0%																																																																																			
5.014	2880 Winter	1	0%																																																																																			
5.015	2880 Winter	1	0%																																																																																			
10.000	15 Winter	1	0%																																																																																			
10.001	15 Winter	1	0%																																																																																			
10.002	15 Winter	1	0%																																																																																			
5.016	2880 Winter	1	0%																																																																																			
1.013	2880 Winter	1	0%																																																																																			
1.014	2880 Winter	1	0%	100/360 Winter																																																																																		
1.015	2880 Winter	1	0%																																																																																			
1.016	2880 Winter	1	0%																																																																																			
1.017	2880 Winter	1	0%																																																																																			
1.018	2880 Winter	1	0%																																																																																			
1.019	2880 Winter	1	0%																																																																																			
1.020	2880 Winter	1	0%																																																																																			
1.021	2880 Winter	1	0%																																																																																			
<table><tr><td rowspan="2">PN</td><td rowspan="2">US/MH Name</td><td colspan="2">Water</td><td colspan="2">Flooded</td><td colspan="2">Pipe</td><td rowspan="2">Status</td></tr><tr><td>Level (m)</td><td>Surch'd Depth (m)</td><td>Volume (m³)</td><td>Flow / Cap.</td><td>O'flow (l/s)</td><td>Flow (l/s)</td></tr><tr><td>1.000</td><td>1</td><td>5.579</td><td>-0.318</td><td>0.000</td><td>0.18</td><td>0.0</td><td>16.7</td><td>OK</td></tr><tr><td>1.001</td><td>2</td><td>5.549</td><td>-0.327</td><td>0.000</td><td>0.15</td><td>0.0</td><td>16.6</td><td>OK</td></tr><tr><td>1.002</td><td>3</td><td>5.510</td><td>-0.326</td><td>0.000</td><td>0.14</td><td>0.0</td><td>15.9</td><td>OK</td></tr><tr><td>1.003</td><td>4</td><td>5.495</td><td>-0.326</td><td>0.000</td><td>0.14</td><td>0.0</td><td>20.4</td><td>OK</td></tr><tr><td>1.004</td><td>5</td><td>5.428</td><td>-0.265</td><td>0.000</td><td>0.25</td><td>0.0</td><td>33.1</td><td>OK</td></tr><tr><td>1.005</td><td>6</td><td>5.388</td><td>-0.244</td><td>0.000</td><td>0.36</td><td>0.0</td><td>32.8</td><td>OK</td></tr><tr><td>1.006</td><td>7</td><td>5.369</td><td>-0.242</td><td>0.000</td><td>0.37</td><td>0.0</td><td>37.4</td><td>OK</td></tr></table>									PN	US/MH Name	Water		Flooded		Pipe		Status	Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Flow (l/s)	1.000	1	5.579	-0.318	0.000	0.18	0.0	16.7	OK	1.001	2	5.549	-0.327	0.000	0.15	0.0	16.6	OK	1.002	3	5.510	-0.326	0.000	0.14	0.0	15.9	OK	1.003	4	5.495	-0.326	0.000	0.14	0.0	20.4	OK	1.004	5	5.428	-0.265	0.000	0.25	0.0	33.1	OK	1.005	6	5.388	-0.244	0.000	0.36	0.0	32.8	OK	1.006	7	5.369	-0.242	0.000	0.37	0.0	37.4	OK
PN	US/MH Name	Water		Flooded		Pipe		Status																																																																														
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1.001	2	5.549	-0.327	0.000	0.15	0.0	16.6	OK																																																																														
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1.003	4	5.495	-0.326	0.000	0.14	0.0	20.4	OK																																																																														
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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm - Net 1</u>								
		Water		Flooded		Pipe		
	US/MH	Level	Surch'd	Volume	Flow /	O'flow	Flow	
PN	Name	(m)	Depth (m)	(m³)	Cap.	(l/s)	(l/s)	Status
1.007	8	5.340	-0.241	0.000	0.44	0.0	43.8	OK
2.000	22	5.226	-0.405	0.000	0.05	0.0	11.4	OK
1.008	9	5.225	-0.326	0.000	0.20	0.0	48.1	OK
3.000	23	5.220	-0.318	0.000	0.15	0.0	35.1	OK
1.009	10	5.195	-0.279	0.000	0.56	0.0	76.3	OK
4.000	24	5.161	-0.364	0.000	0.00	0.0	0.5	OK
1.010	11	5.161	-0.289	0.000	0.20	0.0	70.4	OK
1.011	11a	5.139	-0.280	0.000	0.44	0.0	68.9	OK
1.012	12	5.060	-0.300	0.000	0.50	0.0	79.7	OK
5.000	25	6.340	-0.215	0.000	0.17	0.0	11.2	OK
5.001	26	6.209	-0.203	0.000	0.22	0.0	14.6	OK
5.002	27	6.097	-0.165	0.000	0.42	0.0	25.9	OK
5.003	28	6.017	-0.155	0.000	0.47	0.0	31.5	OK
6.000	29	6.265	-0.188	0.000	0.29	0.0	16.9	OK
6.001	30	6.225	-0.179	0.000	0.34	0.0	19.4	OK
6.002	31	6.172	-0.182	0.000	0.32	0.0	21.4	OK
6.003	32	6.021	-0.134	0.000	0.58	0.0	33.7	OK
6.004	33	5.960	-0.144	0.000	0.53	0.0	34.1	OK
6.005	34	5.879	-0.093	0.000	0.81	0.0	48.9	OK
5.004	35	5.636	-0.278	0.000	0.41	0.0	85.6	OK
5.005	36	5.595	-0.275	0.000	0.46	0.0	85.6	OK
5.006	37	5.553	-0.280	0.000	0.36	0.0	86.6	OK
7.000	48	5.507	-0.335	0.000	0.07	0.0	17.0	OK
5.007	38	5.507	-0.254	0.000	0.63	0.0	86.1	OK
8.000	53	5.456	-0.356	0.000	0.06	0.0	8.1	OK
8.001	54	5.455	-0.336	0.000	0.06	0.0	13.9	OK
5.008	39	5.453	-0.289	0.000	0.53	0.0	92.2	OK
5.009	40	5.363	-0.346	0.000	0.37	0.0	96.0	OK
9.000	48	5.497	-0.457	0.000	0.10	0.0	23.7	OK
9.001	49	5.427	-0.439	0.000	0.11	0.0	27.9	OK
9.002	50	5.365	-0.428	0.000	0.14	0.0	31.9	OK
9.003	51	5.304	-0.432	0.000	0.14	0.0	34.4	OK
9.004	52	5.218	-0.453	0.000	0.14	0.0	34.0	OK
5.010	41	5.166	-0.738	0.000	0.01	0.0	4.9	OK*
5.011	42	5.170	-0.701	0.000	0.02	0.0	4.8	OK
5.012	43	5.068	-0.786	0.000	0.01	0.0	3.2	OK*
5.013	44	5.065	-0.769	0.000	0.01	0.0	3.2	OK
5.014	45	4.980	-0.808	0.000	0.01	0.0	3.4	OK*
5.015	46	4.975	-0.797	0.000	0.01	0.0	3.4	OK
10.000	55	5.070	-0.497	0.000	0.01	0.0	2.0	OK
10.001	56	5.068	-0.457	0.000	0.05	0.0	10.9	OK
10.002	57	5.053	-0.430	0.000	0.18	0.0	24.1	OK
5.016	47	4.926	-0.837	0.000	0.01	0.0	3.8	OK*
1.013	13	4.904	-0.733	0.000	0.01	0.0	7.2	OK*
1.014	14	4.901	-0.373	0.000	0.05	0.0	7.2	OK
1.015	15	4.731	-0.526	0.000	0.03	0.0	7.2	OK
1.016	16	4.651	-0.518	0.000	0.03	0.0	7.2	OK
1.017	17	4.599	-0.518	0.000	0.03	0.0	7.2	OK
1.018	18	4.551	-0.514	0.000	0.04	0.0	7.2	OK
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 1

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Flow (l/s)	
1.019	19	4.509	-0.518	0.000	0.03	0.0	7.2	OK
1.020	20	4.463	-0.511	0.000	0.04	0.0	7.2	OK
1.021	20a	4.426	-0.517	0.000	0.04	0.0	7.2	OK

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	4	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	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

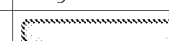
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%	100/15	Summer			
1.001	15 Winter	30	0%	100/15	Summer			
1.002	15 Winter	30	0%	100/15	Summer			
1.003	15 Winter	30	0%	100/15	Summer			
1.004	15 Winter	30	0%	30/15	Winter			
1.005	30 Winter	30	0%	100/15	Summer			
1.006	15 Winter	30	0%	100/15	Summer			
1.007	30 Summer	30	0%	100/15	Summer			
2.000	15 Winter	30	0%	100/15	Summer			
1.008	15 Winter	30	0%	100/15	Summer			
3.000	30 Summer	30	0%	100/15	Summer			
1.009	30 Winter	30	0%	30/15	Winter			
4.000	30 Winter	30	0%	100/15	Summer			
1.010	30 Winter	30	0%	30/30	Winter			
1.011	30 Winter	30	0%	100/15	Summer			
1.012	30 Winter	30	0%	100/15	Summer			
5.000	15 Winter	30	0%	100/15	Summer			
5.001	15 Winter	30	0%	100/15	Summer			
5.002	15 Winter	30	0%	30/15	Summer	100/15	Summer	5
5.003	15 Winter	30	0%	30/15	Summer	100/15	Winter	2
6.000	15 Winter	30	0%	30/15	Summer			

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PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Lvl Act. Exc.
6.001	15 Winter	30	0%	30/15 Summer	100/15 Summer		6
6.002	15 Winter	30	0%	30/15 Summer			
6.003	15 Winter	30	0%	30/15 Summer			
6.004	15 Winter	30	0%	30/15 Summer			
6.005	15 Winter	30	0%	30/15 Summer			
5.004	15 Summer	30	0%	100/15 Summer			
5.005	15 Winter	30	0%	30/15 Winter			
5.006	30 Summer	30	0%	30/30 Summer			
7.000	30 Summer	30	0%	100/15 Summer			
5.007	30 Winter	30	0%	30/15 Winter			
8.000	30 Winter	30	0%	100/15 Summer			
8.001	30 Winter	30	0%	100/15 Summer			
5.008	15 Winter	30	0%	100/15 Summer			
5.009	30 Winter	30	0%	100/15 Summer			
9.000	15 Winter	30	0%				
9.001	15 Winter	30	0%				
9.002	15 Winter	30	0%				
9.003	15 Winter	30	0%				
9.004	1440 Winter	30	0%				
5.010	1440 Winter	30	0%				
5.011	1440 Winter	30	0%				
5.012	2880 Winter	30	0%				
5.013	2160 Winter	30	0%				
5.014	2880 Winter	30	0%				
5.015	2880 Winter	30	0%				
10.000	15 Winter	30	0%				
10.001	15 Winter	30	0%				
10.002	15 Winter	30	0%				
5.016	1440 Winter	30	0%				
1.013	1440 Winter	30	0%				
1.014	1440 Winter	30	0%	100/360 Winter			
1.015	1440 Winter	30	0%				
1.016	1440 Winter	30	0%				
1.017	1440 Winter	30	0%				
1.018	1440 Winter	30	0%				
1.019	1440 Winter	30	0%				
1.020	1440 Winter	30	0%				
1.021	1440 Winter	30	0%				
PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s) Status
1.000	1	5.801	-0.096	0.000	0.45	0.0	40.5 OK
1.001	2	5.790	-0.086	0.000	0.34	0.0	38.1 OK
1.002	3	5.767	-0.069	0.000	0.30	0.0	33.7 OK
1.003	4	5.756	-0.065	0.000	0.31	0.0	45.2 OK
1.004	5	5.699	0.006	0.000	0.55	0.0	73.1 SURCHARGED
1.005	6	5.632	0.000	0.000	0.69	0.0	63.4 OK
1.006	7	5.611	0.000	0.000	0.79	0.0	79.8 OK
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1									
PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status	
1.007	8	5.581	0.000	0.000	0.95	0.0	94.8	OK	
2.000	22	5.631	0.000	0.000	0.10	0.0	25.1	OK	
1.008	9	5.551	0.000	0.000	0.36	0.0	86.6	OK	
3.000	23	5.538	0.000	0.000	0.39	0.0	92.4	OK	
1.009	10	5.508	0.034	0.000	1.18	0.0	161.5	SURCHARGED	
4.000	24	5.485	-0.040	0.000	0.00	0.0	1.2	OK	
1.010	11	5.485	0.035	0.000	0.43	0.0	150.7	SURCHARGED	
1.011	11a	5.419	0.000	0.000	0.95	0.0	147.1	OK	
1.012	12	5.357	-0.003	0.000	1.00	0.0	159.9	OK	
5.000	25	6.393	-0.162	0.000	0.42	0.0	27.5	OK	
5.001	26	6.333	-0.079	0.000	0.50	0.0	32.4	OK	
5.002	27	6.291	0.029	0.000	0.93	0.0	58.1	FLOOD RISK	
5.003	28	6.208	0.036	0.000	1.05	0.0	70.6	SURCHARGED	
6.000	29	6.666	0.213	0.000	0.64	0.0	36.6	SURCHARGED	
6.001	30	6.578	0.174	0.000	0.72	0.0	41.5	FLOOD RISK	
6.002	31	6.492	0.138	0.000	0.67	0.0	44.8	SURCHARGED	
6.003	32	6.401	0.246	0.000	1.23	0.0	70.8	SURCHARGED	
6.004	33	6.316	0.212	0.000	1.12	0.0	72.3	SURCHARGED	
6.005	34	6.149	0.177	0.000	1.89	0.0	113.9	SURCHARGED	
5.004	35	5.914	0.000	0.000	0.86	0.0	179.6	OK	
5.005	36	5.870	0.000	0.000	1.00	0.0	184.8	SURCHARGED	
5.006	37	5.833	0.000	0.000	0.72	0.0	174.1	SURCHARGED	
7.000	48	5.842	0.000	0.000	0.14	0.0	35.2	OK	
5.007	38	5.774	0.013	0.000	1.56	0.0	213.3	SURCHARGED	
8.000	53	5.812	0.000	0.000	0.14	0.0	19.2	OK	
8.001	54	5.791	0.000	0.000	0.15	0.0	33.1	OK	
5.008	39	5.742	0.000	0.000	1.28	0.0	222.1	OK	
5.009	40	5.578	-0.131	0.000	0.91	0.0	234.0	OK	
9.000	48	5.597	-0.357	0.000	0.23	0.0	57.9	OK	
9.001	49	5.535	-0.331	0.000	0.29	0.0	71.5	OK	
9.002	50	5.473	-0.320	0.000	0.35	0.0	81.0	OK	
9.003	51	5.406	-0.330	0.000	0.36	0.0	85.8	OK	
9.004	52	5.330	-0.341	0.000	0.03	0.0	6.3	OK	
5.010	41	5.330	-0.574	0.000	0.02	0.0	8.5	OK*	
5.011	42	5.334	-0.537	0.000	0.03	0.0	8.3	OK	
5.012	43	5.220	-0.634	0.000	0.01	0.0	5.1	OK*	
5.013	44	5.256	-0.578	0.000	0.01	0.0	4.9	OK	
5.014	45	5.120	-0.668	0.000	0.01	0.0	6.1	OK*	
5.015	46	5.161	-0.611	0.000	0.02	0.0	6.2	OK	
10.000	55	5.210	-0.357	0.000	0.03	0.0	5.2	OK	
10.001	56	5.209	-0.316	0.000	0.15	0.0	31.1	OK	
10.002	57	5.195	-0.288	0.000	0.53	0.0	70.8	OK	
5.016	47	5.073	-0.690	0.000	0.01	0.0	7.0	OK*	
1.013	13	5.073	-0.564	0.000	0.02	0.0	9.8	OK*	
1.014	14	5.069	-0.205	0.000	0.06	0.0	9.5	OK	
1.015	15	4.743	-0.514	0.000	0.04	0.0	9.5	OK	
1.016	16	4.665	-0.504	0.000	0.04	0.0	9.5	OK	
1.017	17	4.612	-0.505	0.000	0.04	0.0	9.5	OK	
1.018	18	4.565	-0.500	0.000	0.05	0.0	9.5	OK	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 1

PN	US/MH Name	Water	Surch'd Depth (m)	Flooded	Flow / Cap.	O'flow	Pipe	Status
		Level (m)		Volume (m³)		(l/s)	Flow (l/s)	
1.019	19	4.523	-0.504	0.000	0.04	0.0	9.5	OK
1.020	20	4.476	-0.498	0.000	0.05	0.0	9.5	OK
1.021	20a	4.436	-0.507	0.000	0.06	0.0	9.5	OK

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	4	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	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080	Summer and Winter
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Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+40%	100/15	Summer			
1.001	15 Winter	100	+40%	100/15	Summer			
1.002	15 Winter	100	+40%	100/15	Summer			
1.003	15 Winter	100	+40%	100/15	Summer			
1.004	15 Winter	100	+40%	30/15	Winter			
1.005	15 Winter	100	+40%	100/15	Summer			
1.006	15 Winter	100	+40%	100/15	Summer			
1.007	15 Winter	100	+40%	100/15	Summer			
2.000	15 Winter	100	+40%	100/15	Summer			
1.008	15 Winter	100	+40%	100/15	Summer			
3.000	15 Winter	100	+40%	100/15	Summer			
1.009	15 Winter	100	+40%	30/15	Winter			
4.000	15 Winter	100	+40%	100/15	Summer			
1.010	15 Winter	100	+40%	30/30	Winter			
1.011	15 Winter	100	+40%	100/15	Summer			
1.012	15 Winter	100	+40%	100/15	Summer			
5.000	15 Winter	100	+40%	100/15	Summer			
5.001	15 Winter	100	+40%	100/15	Summer			
5.002	15 Winter	100	+40%	30/15	Summer	100/15	Summer	5
5.003	30 Summer	100	+40%	30/15	Summer	100/15	Winter	2
6.000	15 Summer	100	+40%	30/15	Summer			

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Date 02.02.2021 File SW1-STRAT SEPARATE.MDX				Designed by Tim K Checked by Terry S				
Innovyze				Network 2014.1.1				
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>								
PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
6.001	15 Winter	100	+40%	30/15 Summer	100/15 Summer			6
6.002	15 Winter	100	+40%	30/15 Summer				
6.003	15 Summer	100	+40%	30/15 Summer				
6.004	15 Winter	100	+40%	30/15 Summer				
6.005	15 Winter	100	+40%	30/15 Summer				
5.004	15 Winter	100	+40%	100/15 Summer				
5.005	15 Winter	100	+40%	30/15 Winter				
5.006	15 Winter	100	+40%	30/30 Summer				
7.000	15 Winter	100	+40%	100/15 Summer				
5.007	15 Winter	100	+40%	30/15 Winter				
8.000	15 Winter	100	+40%	100/15 Summer				
8.001	15 Winter	100	+40%	100/15 Summer				
5.008	15 Winter	100	+40%	100/15 Summer				
5.009	15 Winter	100	+40%	100/15 Summer				
9.000	15 Winter	100	+40%					
9.001	15 Winter	100	+40%					
9.002	2160 Winter	100	+40%					
9.003	2160 Winter	100	+40%					
9.004	2160 Winter	100	+40%					
5.010	2160 Winter	100	+40%					
5.011	2160 Winter	100	+40%					
5.012	2160 Winter	100	+40%					
5.013	2160 Winter	100	+40%					
5.014	2160 Winter	100	+40%					
5.015	2160 Winter	100	+40%					
10.000	15 Winter	100	+40%					
10.001	15 Winter	100	+40%					
10.002	15 Winter	100	+40%					
5.016	2160 Winter	100	+40%					
1.013	2160 Winter	100	+40%					
1.014	2160 Winter	100	+40%	100/360 Winter				
1.015	1440 Summer	100	+40%					
1.016	1440 Summer	100	+40%					
1.017	1440 Summer	100	+40%					
1.018	1440 Summer	100	+40%					
1.019	1440 Summer	100	+40%					
1.020	2160 Summer	100	+40%					
1.021	2160 Summer	100	+40%					

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Innovyze				Network 2014.1.1					
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>									
PN	US/MH Name	Water Level (m)	Surch'd Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status	
1.007	8	6.178	0.597	0.000	1.77	0.0	177.2	SURCHARGED	
2.000	22	6.105	0.474	0.000	0.18	0.0	43.9	SURCHARGED	
1.008	9	6.094	0.543	0.000	0.87	0.0	211.9	SURCHARGED	
3.000	23	6.074	0.536	0.000	0.77	0.0	182.6	SURCHARGED	
1.009	10	6.036	0.562	0.000	3.01	0.0	412.0	SURCHARGED	
4.000	24	5.868	0.343	0.000	0.01	0.0	2.8	SURCHARGED	
1.010	11	5.868	0.418	0.000	1.17	0.0	404.7	SURCHARGED	
1.011	11a	5.702	0.283	0.000	2.53	0.0	393.1	SURCHARGED	
1.012	12	5.518	0.158	0.000	2.84	0.0	453.5	SURCHARGED	
5.000	25	6.796	0.241	0.000	0.72	0.0	47.1	SURCHARGED	
5.001	26	6.707	0.295	0.000	0.96	0.0	62.7	FLOOD RISK	
5.002	27	6.568	0.306	18.017	1.02	0.0	63.5	FLOOD	
5.003	28	6.550	0.378	0.042	1.25	0.0	83.8	FLOOD	
6.000	29	6.985	0.532	0.000	1.30	0.0	74.5	SURCHARGED	
6.001	30	6.875	0.471	25.103	1.02	0.0	58.4	FLOOD	
6.002	31	6.933	0.579	0.000	0.88	0.0	58.8	FLOOD RISK	
6.003	32	6.965	0.810	0.000	1.56	0.0	88.9	SURCHARGED	
6.004	33	6.895	0.791	0.000	1.38	0.0	88.9	SURCHARGED	
6.005	34	6.804	0.832	0.000	2.93	0.0	176.3	SURCHARGED	
5.004	35	6.656	0.542	0.000	1.33	0.0	279.4	SURCHARGED	
5.005	36	6.413	0.543	0.000	1.53	0.0	284.6	SURCHARGED	
5.006	37	6.364	0.531	0.000	1.24	0.0	300.6	SURCHARGED	
7.000	48	6.276	0.434	0.000	0.28	0.0	68.2	SURCHARGED	
5.007	38	6.259	0.498	0.000	2.61	0.0	357.8	SURCHARGED	
8.000	53	6.148	0.336	0.000	0.31	0.0	41.5	SURCHARGED	
8.001	54	6.142	0.351	0.000	0.32	0.0	71.7	SURCHARGED	
5.008	39	6.127	0.385	0.000	2.44	0.0	422.9	SURCHARGED	
5.009	40	5.945	0.236	0.000	1.66	0.0	424.7	SURCHARGED	
9.000	48	5.707	-0.247	0.000	0.42	0.0	104.9	OK	
9.001	49	5.651	-0.215	0.000	0.53	0.0	129.2	OK	
9.002	50	5.591	-0.202	0.000	0.03	0.0	6.9	OK	
9.003	51	5.591	-0.145	0.000	0.03	0.0	7.8	OK	
9.004	52	5.591	-0.080	0.000	0.03	0.0	7.5	OK	
5.010	41	5.591	-0.313	0.000	0.02	0.0	10.1	OK*	
5.011	42	5.586	-0.285	0.000	0.03	0.0	9.5	OK	
5.012	43	5.478	-0.376	0.000	0.01	0.0	5.6	OK*	
5.013	44	5.472	-0.362	0.000	0.01	0.0	6.4	OK	
5.014	45	5.374	-0.414	0.000	0.02	0.0	8.6	OK*	
5.015	46	5.417	-0.355	0.000	0.02	0.0	8.1	OK	
10.000	55	5.368	-0.199	0.000	0.05	0.0	9.4	OK	
10.001	56	5.364	-0.161	0.000	0.28	0.0	57.7	OK	
10.002	57	5.338	-0.145	0.000	0.97	0.0	130.4	OK	
5.016	47	5.327	-0.436	0.000	0.01	0.0	8.6	OK*	
1.013	13	5.327	-0.310	0.000	0.02	0.0	10.6	OK*	
1.014	14	5.319	0.045	0.000	0.06	0.0	10.0	SURCHARGED	
1.015	15	4.745	-0.512	0.000	0.04	0.0	10.0	OK	
1.016	16	4.667	-0.502	0.000	0.04	0.0	10.0	OK	
1.017	17	4.615	-0.502	0.000	0.04	0.0	10.0	OK	
1.018	18	4.568	-0.497	0.000	0.05	0.0	10.0	OK	
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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 1</u>										

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Micro Drainage		Network 2017.1.2

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	10
Ratio R	0.350	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm - Net 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	13.258	0.023	576.4	0.000	5.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S2.000	8.721	0.039	223.6	0.048	5.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.000	13.307	0.023	578.6	0.124	5.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.001	32.843	0.056	586.5	0.018	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.002	13.364	0.023	581.0	0.014	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.003	56.843	0.097	586.0	0.050	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.004	17.615	0.030	587.2	0.023	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.005	22.812	0.039	584.9	0.026	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S3.006	30.540	0.052	587.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗
S2.001	18.275	0.032	571.0	0.243	0.00	0.0	0.600	o	600	Pipe/Conduit	⊗

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.22	4.071	0.000	0.0	0.0	0.0	1.01	284.7	0.0
S2.000	50.00	5.09	4.167	0.048	0.0	0.0	0.6	1.62	459.3	7.1
S3.000	50.00	5.22	4.448	0.124	0.0	0.0	1.7	1.01	284.2	18.5
S3.001	50.00	5.77	4.425	0.142	0.0	0.0	1.9	1.00	282.3	21.2
S3.002	50.00	5.99	4.369	0.156	0.0	0.0	2.1	1.00	283.6	23.2
S3.003	50.00	6.94	4.346	0.206	0.0	0.0	2.8	1.00	282.4	30.7
S3.004	50.00	7.23	4.249	0.229	0.0	0.0	3.1	1.00	282.1	34.1
S3.005	50.00	7.61	4.219	0.255	0.0	0.0	3.5	1.00	282.6	38.0
S3.006	50.00	8.12	4.180	0.255	0.0	0.0	3.5	1.00	282.1	38.0
S2.001	49.31	8.43	4.128	0.546	0.0	0.0	7.3	1.01	286.1	80.2

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Date 22/01/2021 17:34						Designed by Tim K																																																																																																																																																
File SW2.MDX						Checked by Terry S																																																																																																																																																
Micro Drainage						Network 2017.1.2																																																																																																																																																
<u>Network Design Table for Storm - Net 2</u> <table><tr><th>PN</th><th>Length (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>I.Area (ha)</th><th>T.E. (mins)</th><th>Base Flow (l/s)</th><th>k (mm)</th><th>HYD SECT</th><th>DIA (mm)</th><th>Section Type</th><th>Auto Design</th></tr><tr><td>S4.000</td><td>14.791</td><td>0.025</td><td>585.0</td><td>0.000</td><td>5.00</td><td>0.0</td><td>0.600</td><td>o</td><td>500</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.001</td><td>12.836</td><td>0.022</td><td>583.5</td><td>0.023</td><td>0.00</td><td>0.0</td><td>0.600</td><td>oo</td><td>500</td><td>Double Pipe</td><td></td></tr><tr><td>S1.002</td><td>26.302</td><td>0.045</td><td>584.5</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>500</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.003</td><td>6.101</td><td>0.010</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>500</td><td>Pipe/Conduit</td><td></td></tr><tr><td>S1.004</td><td>4.800</td><td>0.008</td><td>585.0</td><td>0.000</td><td>0.00</td><td>0.0</td><td>0.600</td><td>o</td><td>500</td><td>Pipe/Conduit</td><td></td></tr></table> <u>Network Results Table</u> <table><tr><th>PN</th><th>Rain (mm/hr)</th><th>T.C. (mins)</th><th>US/IL (m)</th><th>Σ I.Area (ha)</th><th>Σ Base Flow (l/s)</th><th>Foul (l/s)</th><th>Add Flow (l/s)</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th></tr><tr><td>S4.000</td><td>50.00</td><td>5.25</td><td>4.071</td><td>0.000</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.00</td><td>282.6</td><td>0.0</td></tr><tr><td>S1.001</td><td>48.70</td><td>8.64</td><td>4.096</td><td>0.569</td><td>0.0</td><td>0.0</td><td>7.5</td><td>1.00</td><td>566.0</td><td>82.6</td></tr><tr><td>S1.002</td><td>47.51</td><td>9.08</td><td>4.074</td><td>0.569</td><td>0.0</td><td>0.0</td><td>7.5</td><td>1.00</td><td>282.7</td><td>82.6</td></tr><tr><td>S1.003</td><td>47.24</td><td>9.18</td><td>4.029</td><td>0.569</td><td>0.0</td><td>0.0</td><td>7.5</td><td>1.00</td><td>282.6</td><td>82.6</td></tr><tr><td>S1.004</td><td>47.04</td><td>9.26</td><td>4.019</td><td>0.569</td><td>0.0</td><td>0.0</td><td>7.5</td><td>1.00</td><td>282.6</td><td>82.6</td></tr></table>													PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design	S4.000	14.791	0.025	585.0	0.000	5.00	0.0	0.600	o	500	Pipe/Conduit		S1.001	12.836	0.022	583.5	0.023	0.00	0.0	0.600	oo	500	Double Pipe		S1.002	26.302	0.045	584.5	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit		S1.003	6.101	0.010	585.0	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit		S1.004	4.800	0.008	585.0	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit		PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	S4.000	50.00	5.25	4.071	0.000	0.0	0.0	0.0	1.00	282.6	0.0	S1.001	48.70	8.64	4.096	0.569	0.0	0.0	7.5	1.00	566.0	82.6	S1.002	47.51	9.08	4.074	0.569	0.0	0.0	7.5	1.00	282.7	82.6	S1.003	47.24	9.18	4.029	0.569	0.0	0.0	7.5	1.00	282.6	82.6	S1.004	47.04	9.26	4.019	0.569	0.0	0.0	7.5	1.00	282.6	82.6
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design																																																																																																																																											
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S1.004	4.800	0.008	585.0	0.000	0.00	0.0	0.600	o	500	Pipe/Conduit																																																																																																																																												
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)																																																																																																																																												
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S1.004	47.04	9.26	4.019	0.569	0.0	0.0	7.5	1.00	282.6	82.6																																																																																																																																												
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Area Summary for Storm - Net 2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.048	0.048	0.048
3.000	-	-	100	0.124	0.124	0.124
3.001	-	-	100	0.018	0.018	0.018
3.002	-	-	100	0.014	0.014	0.014
3.003	-	-	100	0.050	0.050	0.050
3.004	-	-	100	0.023	0.023	0.023
3.005	-	-	100	0.026	0.026	0.026
3.006	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.243	0.243	0.243
4.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.023	0.023	0.023
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.569	0.569	0.569

Free Flowing Outfall Details for Storm - Net 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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S1.004	S80	5.500	4.011	0.000	0	0
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Simulation Criteria for Storm - Net 2

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 Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	3
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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.350		

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Online Controls for Storm - Net 2

Hydro-Brake® Optimum Manhole: S79, DS/PN: S1.004, Volume (m³): 6.3

Unit Reference	MD-SHE-0079-3000-1200-3000
Design Head (m)	1.200
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	79
Invert Level (m)	4.019
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	3.0
Flush-Flo™	0.348	2.9
Kick-Flo®	0.707	2.4
Mean Flow over Head Range	-	2.6

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	2.3	1.200	3.0	3.000	4.6	7.000	6.8
0.200	2.8	1.400	3.2	3.500	4.9	7.500	7.0
0.300	2.9	1.600	3.4	4.000	5.2	8.000	7.3
0.400	2.9	1.800	3.6	4.500	5.5	8.500	7.5
0.500	2.8	2.000	3.8	5.000	5.8	9.000	7.7
0.600	2.7	2.200	4.0	5.500	6.1	9.500	7.9
0.800	2.5	2.400	4.1	6.000	6.3		
1.000	2.8	2.600	4.3	6.500	6.6		

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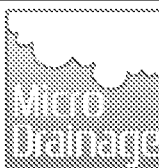
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Storage Structures for Storm - Net 2

Tank or Pond Manhole: S75, DS/PN: S1.000

Invert Level (m) 4.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	95.2	1.180	325.6

Tank or Pond Manhole: S80, DS/PN: S4.000

Invert Level (m) 4.121

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	140.0	0.400	140.0	0.410	0.0

Tank or Pond Manhole: S78, DS/PN: S1.003

Invert Level (m) 4.167

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	67.6	1.333	263.5

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 2

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
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	0.350
Region England and Wales Cv (Summer)			0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S75	2160 Winter	1	+0%	30/180 Winter			
S2.000	S73	2160 Winter	1	+0%	30/1440 Winter			
S3.000	S66	15 Winter	1	+0%	100/120 Winter			
S3.001	S67	15 Winter	1	+0%	100/15 Winter			
S3.002	S68	15 Winter	1	+0%	100/15 Winter			
S3.003	S69	2160 Winter	1	+0%	100/120 Summer			
S3.004	S70	2160 Winter	1	+0%	100/60 Winter			
S3.005	S71	2160 Winter	1	+0%	30/1440 Winter			
S3.006	S72	2160 Winter	1	+0%	30/1440 Winter			
S2.001	S74	2160 Winter	1	+0%	30/480 Winter			
S4.000	S80	2160 Winter	1	+0%	30/180 Winter			
S1.001	S76	2160 Winter	1	+0%	30/360 Winter			
S1.002	S77	2160 Winter	1	+0%	30/180 Winter			
S1.003	S78	2160 Winter	1	+0%	30/120 Winter			
S1.004	S79	1440 Summer	1	+0%	1/1440 Summer	100/960 Winter		

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm - Net 2</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S75	4.524	-0.147	0.000	0.00		0.0	OK	
S2.000	S73	4.525	-0.242	0.000	0.00		0.3	OK	
S3.000	S66	4.596	-0.452	0.000	0.12		16.8	OK	
S3.001	S67	4.563	-0.462	0.000	0.08		18.0	OK	
S3.002	S68	4.521	-0.448	0.000	0.13		18.3	OK	
S3.003	S69	4.521	-0.425	0.000	0.01		1.4	OK	
S3.004	S70	4.522	-0.327	0.000	0.01		1.5	OK	
S3.005	S71	4.524	-0.295	0.000	0.01		1.7	OK	
S3.006	S72	4.527	-0.253	0.000	0.01		1.6	OK	
S2.001	S74	4.525	-0.203	0.000	0.02		3.4	OK	
S4.000	S80	4.519	-0.152	0.000	0.00		0.4	OK	
S1.001	S76	4.524	-0.172	0.000	0.01		2.7	OK	
S1.002	S77	4.526	-0.148	0.000	0.01		2.7	OK	
S1.003	S78	4.522	-0.107	0.000	0.01		2.6	OK	
S1.004	S79	4.937	0.318	0.000	0.01		2.5	SURCHARGED	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 2

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
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	0.350
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S75	1440 Winter	30	+0%	30/180 Winter			
S2.000	S73	1440 Winter	30	+0%	30/1440 Winter			
S3.000	S66	1440 Winter	30	+0%	100/120 Winter			
S3.001	S67	1440 Winter	30	+0%	100/15 Winter			
S3.002	S68	1440 Winter	30	+0%	100/15 Winter			
S3.003	S69	1440 Winter	30	+0%	100/120 Summer			
S3.004	S70	1440 Winter	30	+0%	100/60 Winter			
S3.005	S71	1440 Winter	30	+0%	30/1440 Winter			
S3.006	S72	1440 Winter	30	+0%	30/1440 Winter			
S2.001	S74	1440 Winter	30	+0%	30/480 Winter			
S4.000	S80	1440 Winter	30	+0%	30/180 Winter			
S1.001	S76	1440 Winter	30	+0%	30/360 Winter			
S1.002	S77	1440 Winter	30	+0%	30/180 Winter			
S1.003	S78	1440 Winter	30	+0%	30/120 Winter			
S1.004	S79	1440 Winter	30	+0%	1/1440 Summer	100/960 Winter		

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm - Net 2</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S75	4.820	0.149	0.000	0.01		1.1	SURCHARGED	
S2.000	S73	4.826	0.059	0.000	0.00		0.8	SURCHARGED	
S3.000	S66	4.824	-0.224	0.000	0.02		2.2	OK	
S3.001	S67	4.824	-0.201	0.000	0.01		2.5	OK	
S3.002	S68	4.824	-0.145	0.000	0.02		2.5	OK	
S3.003	S69	4.825	-0.121	0.000	0.01		3.2	OK	
S3.004	S70	4.825	-0.024	0.000	0.02		3.1	OK	
S3.005	S71	4.825	0.006	0.000	0.02		3.3	SURCHARGED	
S3.006	S72	4.825	0.045	0.000	0.01		3.1	SURCHARGED	
S2.001	S74	4.825	0.097	0.000	0.05		7.7	SURCHARGED	
S4.000	S80	4.825	0.154	0.000	0.00		0.0	SURCHARGED	
S1.001	S76	4.826	0.130	0.000	0.02		6.5	SURCHARGED	
S1.002	S77	4.829	0.155	0.000	0.03		6.2	SURCHARGED	
S1.003	S78	4.828	0.199	0.000	0.02		4.4	SURCHARGED	
S1.004	S79	5.219	0.600	0.000	0.01		2.9	FLOOD RISK	
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 2

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	3
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	0.350
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

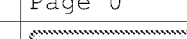
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S75	1440 Winter	100	+40%	30/180 Winter			
S2.000	S73	1440 Winter	100	+40%	30/1440 Winter			
S3.000	S66	1440 Winter	100	+40%	100/120 Winter			
S3.001	S67	1440 Winter	100	+40%	100/15 Winter			
S3.002	S68	1440 Winter	100	+40%	100/15 Winter			
S3.003	S69	1440 Winter	100	+40%	100/120 Summer			
S3.004	S70	1440 Winter	100	+40%	100/60 Winter			
S3.005	S71	1440 Winter	100	+40%	30/1440 Winter			
S3.006	S72	1440 Winter	100	+40%	30/1440 Winter			
S2.001	S74	1440 Winter	100	+40%	30/480 Winter			
S4.000	S80	1440 Winter	100	+40%	30/180 Winter			
S1.001	S76	1440 Winter	100	+40%	30/360 Winter			
S1.002	S77	1440 Winter	100	+40%	30/180 Winter			
S1.003	S78	1440 Winter	100	+40%	30/120 Winter			
S1.004	S79	480 Winter	100	+40%	1/1440 Summer	100/960 Winter		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for Storm - Net 2

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status	Level
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)		Exceeded
S1.000	S75	5.421	0.750	0.000	0.01		1.4	SURCHARGED	
S2.000	S73	5.418	0.651	0.000	0.01		1.5	SURCHARGED	
S3.000	S66	5.418	0.370	0.000	0.03		3.9	SURCHARGED	
S3.001	S67	5.418	0.393	0.000	0.02		4.2	SURCHARGED	
S3.002	S68	5.418	0.449	0.000	0.03		4.3	SURCHARGED	
S3.003	S69	5.418	0.472	0.000	0.02		5.7	SURCHARGED	
S3.004	S70	5.418	0.569	0.000	0.04		6.4	SURCHARGED	
S3.005	S71	5.418	0.599	0.000	0.04		7.1	SURCHARGED	
S3.006	S72	5.418	0.638	0.000	0.03		7.0	SURCHARGED	
S2.001	S74	5.418	0.690	0.000	0.09		15.9	SURCHARGED	
S4.000	S80	5.417	0.746	0.000	0.00		0.0	SURCHARGED	
S1.001	S76	5.417	0.721	0.000	0.04		10.2	SURCHARGED	
S1.002	S77	5.419	0.745	0.000	0.05		9.9	SURCHARGED	
S1.003	S78	5.424	0.795	0.000	0.02		3.7	FLOOD RISK	
S1.004	S79	5.414	0.795	0.000	0.01		2.9	FLOOD RISK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm - Net 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	10
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.000
Ratio R	0.350	Maximum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm - Net 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
S1.000	14.282	0.024	585.0	0.036	5.00	0.0	0.600	o	600	⊗
S1.001	23.685	0.040	585.0	0.089	0.00	0.0	0.600	o	600	⊗
S1.002	63.535	0.109	585.0	0.111	0.00	0.0	0.600	o	600	⊗
S1.003	20.138	0.034	585.0	0.047	0.00	0.0	0.600	o	600	⊗
S1.004	26.439	0.045	585.0	0.053	0.00	0.0	0.600	o	600	⊗
S1.005	9.354	0.016	584.6	0.000	0.00	0.0	0.600	o	600	⊗
S1.006	4.409	0.008	585.0	0.000	0.00	0.0	0.600	o	600	⊗

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.24	4.288	0.036	0.0	0.0	0.5	1.00	282.6	5.4
S1.001	50.00	5.63	4.263	0.125	0.0	0.0	1.7	1.00	282.6	18.6
S1.002	50.00	6.69	4.223	0.236	0.0	0.0	3.2	1.00	282.6	35.2
S1.003	50.00	7.03	4.114	0.283	0.0	0.0	3.8	1.00	282.6	42.2
S1.004	50.00	7.47	4.080	0.336	0.0	0.0	4.5	1.00	282.6	50.0
S1.005	50.00	7.62	4.035	0.336	0.0	0.0	4.5	1.00	282.7	50.0
S1.006	50.00	7.70	4.019	0.336	0.0	0.0	4.5	1.00	282.6	50.0

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Innovyze										Network 2014.1.1	
<u>Manhole Schedules for Storm - Net 3</u>											
MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S58	6.320	2.032	Open Manhole	1500	S1.000	4.288	600				
S59	6.360	2.097	Open Manhole	1500	S1.001	4.263	600	S1.000	4.264	600	1
S60	6.130	1.907	Open Manhole	1500	S1.002	4.223	600	S1.001	4.223	600	
S61	5.919	1.796	Open Manhole	1500	S1.003	4.114	600	S1.002	4.114	600	
S62	5.970	1.890	Open Manhole	1500	S1.004	4.080	600	S1.003	4.080	600	
S63	5.620	1.585	Open Manhole	1500	S1.005	4.035	600	S1.004	4.035	600	
S64	5.500	1.481	Open Manhole	2100	S1.006	4.019	600	S1.005	4.019	600	
S65	5.500	1.489	Open Manhole	0		OUTFALL		S1.006	4.011	600	
<u>Free Flowing Outfall Details for Storm - Net 3</u>											
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)					
S1.006	S65	5.500	4.011	0.000	0	0					
<u>Simulation Criteria for Storm - Net 3</u>											
Volumetric Runoff Coeff 0.840 Additional Flow - % of Total Flow 10.000											
Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000											
Hot Start (mins) 0 Inlet Coefficient 0.800											
Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000											
Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 480											
Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 4											
Number of Input Hydrographs 0 Number of Storage Structures 1											
Number of Online Controls 1 Number of Time/Area Diagrams 0											
Number of Offline Controls 0 Number of Real Time Controls 0											
<u>Synthetic Rainfall Details</u>											
Rainfall Model FSR Profile Type Winter											
Return Period (years) 100 Cv (Summer) 0.750											
Region England and Wales Cv (Winter) 0.840											
M5-60 (mm) 19.000 Storm Duration (mins) 240											
Ratio R 0.350											
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 3

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
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	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	15 Winter	1	0%	100/360 Winter				
S1.001	15 Winter	1	0%	100/360 Winter				
S1.002	15 Winter	1	0%	100/180 Winter				
S1.003	360 Winter	1	0%	100/120 Summer				
S1.004	360 Winter	1	0%	100/60 Winter				
S1.005	360 Winter	1	0%	100/60 Winter				
S1.006	480 Summer	1	0%	100/60 Summer				

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap. (l/s)	O'flow (l/s)	Pipe Flow (l/s)	
S1.000	S58	4.406	-0.482	0.000	0.03	0.0	4.8	OK
S1.001	S59	4.399	-0.464	0.000	0.07	0.0	14.5	OK
S1.002	S60	4.369	-0.454	0.000	0.10	0.0	24.8	OK
S1.003	S61	4.322	-0.392	0.000	0.03	0.0	6.1	OK
S1.004	S62	4.323	-0.357	0.000	0.03	0.0	7.1	OK
S1.005	S63	4.323	-0.312	0.000	0.01	0.0	2.2	OK
S1.006	S64	4.354	-0.265	0.000	0.01	0.0	2.8	OK

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm - Net 3

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
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	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	480 Winter	30	0%	100/360 Winter				
S1.001	480 Winter	30	0%	100/360 Winter				
S1.002	480 Winter	30	0%	100/180 Winter				
S1.003	480 Winter	30	0%	100/120 Summer				
S1.004	480 Winter	30	0%	100/60 Winter				
S1.005	480 Winter	30	0%	100/60 Winter				
S1.006	1440 Winter	30	0%	100/60 Summer				

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	
S1.000	S58	4.569	-0.319	0.000	0.01	0.0	1.5	OK
S1.001	S59	4.569	-0.294	0.000	0.02	0.0	5.0	OK
S1.002	S60	4.569	-0.254	0.000	0.04	0.0	9.2	OK
S1.003	S61	4.569	-0.145	0.000	0.05	0.0	9.6	OK
S1.004	S62	4.570	-0.110	0.000	0.05	0.0	11.4	OK
S1.005	S63	4.570	-0.065	0.000	0.01	0.0	2.2	OK
S1.006	S64	4.618	-0.001	0.000	0.01	0.0	2.9	OK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm - Net 3

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
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	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	Storm	Return Period	Climate Change	First X Surge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
S1.000	360 Winter	100	+40%	100/360 Winter				
S1.001	360 Winter	100	+40%	100/360 Winter				
S1.002	360 Winter	100	+40%	100/180 Winter				
S1.003	360 Winter	100	+40%	100/120 Summer				
S1.004	360 Winter	100	+40%	100/60 Winter				
S1.005	360 Winter	100	+40%	100/60 Winter				
S1.006	1440 Winter	100	+40%	100/60 Summer				

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap.	O'flow (l/s)	Flow (l/s)	
S1.000	S58	4.902	0.014	0.000	0.02	0.0	3.1	SURCHARGED
S1.001	S59	4.902	0.039	0.000	0.05	0.0	10.5	SURCHARGED
S1.002	S60	4.902	0.079	0.000	0.08	0.0	19.8	SURCHARGED
S1.003	S61	4.902	0.188	0.000	0.13	0.0	23.7	SURCHARGED
S1.004	S62	4.902	0.222	0.000	0.13	0.0	28.1	SURCHARGED
S1.005	S63	4.901	0.266	0.000	0.03	0.0	4.6	SURCHARGED
S1.006	S64	5.052	0.433	0.000	0.01	0.0	2.9	SURCHARGED

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Appendix (G)

SuDS Maintenance Strategy

Land North of Sefter Road
Bognor Regis, West Sussex

OWNERS MANUAL

Relating to Surface Water Drainage Maintenance

The site has been designed in accordance with Sustainable Drainage Systems (SuDS) techniques.

An extract from the SuDS Manual (CIRIA C753) states “Sedimentation is one of the primary removal mechanisms in SUDS. Most pollution in runoff is attached to sediment particles and therefore removal of sediment results in a significant reduction in pollutant loads..”.

In order to remove sedimentation the surface water drainage design utilises deep seal trapped gullies throughout, catchpit manholes upstream of the surface water granular filter drains and bio-retention areas in attenuation ponds.

CONTENTS

- 1) Explanation of the Surface Water Drainage System
- 2) Operating and Maintenance Responsibility
- 3) Maintenance Schedule for catchpits, control chambers, flow control devices and gullies
- 4) Maintenance Schedule for attenuation basins, bioretention areas and swales
- 5) Maintenance Schedule for filter trenches and porous pipework
- 6) Maintenance Schedule for solid wall pipes
- 7) Reasons for Maintenance

1) Explanation of the Surface Water Drainage System

The Principle of SUDs has been adopted for the whole of the site, calculations have been carried out using MicroDrainage with a storm return period of 100 years and an allowance of 40% for climate change and 10% allowance for urban creep.

Generally roof water drains direct to the domestic drainage system within each curtilage and from there will be directed to the below ground surface water network

Hardstanding areas and access roads or drives, drain to trapped gullies which outfall to the surface water drainage system within the site.

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2) Operating and Maintenance Responsibility

Taylor Wimpey (TW) are responsible for maintaining the surface water drainage systems on this site during the construction period. A management company nominated by TW which during the construction period will have TW as the sole directors. Upon handover and occupation, a Maintenance Company will be handed over to residents who will take over as Directors.

The Management Company will appoint a managing agent who will ensure that the SuDS are maintained as set out in this document. The maintenance and operation will be funded through contributions from the residents to the maintenance company.

3) Maintenance Schedule for catchpits, control chambers, flow control devices and gullies

Flow Control Maintenance

Normally, little maintenance is required as there are no moving parts within the Flow Control. The Flow Control is fitted with pivoting by-pass door, which allows the manhole to be drained down should blockage occur. It is recommended that the unit be inspected at six monthly intervals with hose down if required. All flow controls are typically manufactured from grade 304 Stainless Steel which has an estimated life span in excess of the design life of drainage systems.

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Remove sediment and oil deposits from all trapped gullies.	Annually, or as required.
	Remove sediment from structures upstream of the cellular storage tanks.	Annually, or as required.
Remedial actions	Repair/rehabilitation of inlets, outlets, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms

4) Maintenance Schedule for Attenuation basins , bio-retention areas and swales

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Litter and debris removal.	Monthly
	Grass cutting – for spillways and access routes.	Monthly (during growing season), or as required.
	Grass cutting – meadow grass in and around basin.	Annually
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required).
	Tidy all dead growth before start of growing season.	Annually.
	Remove sediment from inlets, outlet and forebay.	Annually (or as required).
Occasional maintenance	Check for poor vegetation growth due to lack of sunlight or leaf dropping litter and cut back adjacent vegetation where possible/	Annually
	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required	Annually, or if bare soil is exposed over 10% or more of the basin/swale treatment area
	Prune and trim trees and remove cuttings.	2 years (or as required). Ensure this is undertaken outside of bird nesting season.
Remedial actions	Repair of erosion or other damage by re-turfing or reseeding.	As required
	Re-level uneven surfaces and reinstate design levels.	As required.
	Repair/rehabilitation of inlets, outlets and overflows.	As required.

Monitoring		
	Remove and dispose of oils or petrol residues using safe standard practices	As required
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly/ after large storms.
	Inspect banksides, structures, pipework etc. for evidence of physical damage.	Monthly/ after large storms.
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.
	Check flow control device and other mechanical devices.	Half yearly.

5) Maintenance Schedule for Filter trenches and porous pipework

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Litter and debris removal from trench surface, access chambers and pre-treatment devices.	Monthly (or as required).
	Removal and washing of exposed stones on the trench surface.	Annual (bi-annual the first year) or when silt is evident on the surface.
	Trimming of any roots that may be causing blockages.	Annual (semi-annual the first year).
	Remove weeds on the trench surface.	Monthly (at start, then as required).
Occasional maintenance	Removal of sediment from pre-treatment devices.	Six monthly
	Remove tree roots or trees that grow close to the trench.	As required.
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace filter media.	Five yearly.
Remedial actions	Clear perforated pipework of blockages.	As required.
	Rehabilitate infiltration or filtration surfaces.	As required.
	Replace geotextiles and clean and replace filter media, if clogging occurs.	As required.
	Inspect inlets, outlets and inspection points for blockages, clogging, standing water and structural damage.	As required.
Monitoring	Inspect pre-treatment systems, inlets, trench surfaces and perforated pipework for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.

6) Maintenance Schedule for Grilles

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Litter and debris removal.	Monthly (or as required).
Occasional maintenance	Check moving parts and locks. Oil and ensure free moving. Replace when necessary.	As required.
Remedial actions	Remove build-up of sediment.	As required.
Monitoring	Inspect for blockages, and clear if required.	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.

7) Maintenance Schedule for solid wall pipes

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Inspect chambers and manholes for evidence of pipes operating correctly and take remedial action if necessary, to include jetting of pipework.	Monthly for 3 months, then annually

8) Reasons for Maintenance

Surface water contains variable amounts of sediment which settles out at certain locations and could cause blockages if left. Road gullies also trap oil and prevent it entering the surface water sewer system.