Job Title		Date
Fairfield Cottages, Cowfold, Sussex		27th May 2025
Item	**Reference**	**Issue**
Drainage Response Note	9395-SWP-XX-XX-RE-C-9504	01

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Introduction

This note has been produced in response to comments from Horsham District Council Engineers on the information submitted in support of discharge planning condition 8 for the planning application (DC/22/2010) for the residential development at Fairfield Cottages, Cowfold.

The comments from the Horsham DC engineers can be found in appendix 1. The comments can be spilt into 3 subjects covering silt capture at downpipes (1), drainage calculations (2), and urban creep (3). An advisory comment was made on the grade of manhole covers (4).

SWP Response

1. The Horsham DC engineers have raised concerned over silt captured from rainwater downpipes at source. The typical details have been updated to show that bottle gullies will be located at the bottom of all downpipes to reduce the probability of silt and debris entering the drainage system and subsequently entering the watercourse.

2. FEH2022 data has been used within the calculations. The 2022 data set has replaced the 2013 data in the file used by the MicroDrainage calculations due to MicroDrainage limitations. A printout of the data within the file used for the calculations and the original data has been included in appendix 2.

   The MADD factor has been set to 0 for all scenarios.

   The drainage calculations have been updated with the additional scenarios as requested. The scenarios included are:
   - 1in100 plus 45% climate change
   - As above +10% urban creep
   - As above +10% urban creep with surcharged outfall

   All modelled scenarios show that the proposed drainage system is capable of dealing with the expected rainfall without flooding occurring.

3. Additional scenarios have been modelled with an additional 10% flow added within the calculations. The calculations can be found in appendix 3.

4. The manhole covers have been specified in accordance with BS EN 124. The use of B125 covers in pedestrian access only areas is an over engineered specification and adds unnecessary cost to the development.

Prepared By	Seen By	Date
Craig Searle Civil Engineer	Dean Giles Director	27-05-2025
Copies to	Colin Coulthard (Sunninghill Construction Ltd)	

Appendix 1 – Horsham DC Engineers Comments
Appendix 2 – FEH Data Printouts
Appendix 3 – Surface Water Drainage Calculations

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Appendix 1

Horsham DC Engineers Comments

TO:	Horsham District Council – Planning Dept
LOCATION:	15- 18 Fairfield Cottages Cowfold Horsham West Sussex
DESCRIPTION:	Application for Approval of Details Reserved by Condition 8 to approved application DC/22/2010
REFERENCE:	DISC/25/0045
RECOMMENDATION:	More Information

SUMMARY OF COMMENTS & RECOMMENDATION:

We have reviewed the following information:

- Drainage Strategy note (SWP, 21 February 2025, 9395-SWP-XX-XX-RE-C-9502, Issue 02)
    - Appendix 1: Combined Geotechnical and Ground Contamination Risk Assessment (Ashdown Site Investigation Ltd, 12th April 2022, P15524, Issue 1)
    - Appendix 2: Drainage Calculations (SWP, February 2025 – March 2025)
        Calculation Pipe Reference Plan (SWP, March 2025, 9395-SWP-ZZ-XX-DP-C-1103, Issue P01)
        Impermeable Areas Proposed (SWP, March 2025, 9395-SWP-ZZ-XX-DP-C-1104, Issue P01)
        Impermeable Areas Existing (SWP, March 2025, 9395-SWP-ZZ-XX-DP-C-1105, Issue P01)
    - Appendix 3: Historic Plans
    - Appendix 4: Communications with WSCC Highways (21 February 2025)
    - Appendix 5: CCTV Drainage Report (19 February 2025)
        Drainage Layout (SWP, 11 February 2025, 9395-SWP-ZZ-XX-DP-C-1100, Issue P01)
    - Appendix 6: Response to Horsham Council Engineer Comments (SWP, 9395-SWP-XX-XX-RE-C-9502)
- Typical Details (SWP, 19 March 2025, 9395-SWP-ZZ-XX-DD-C-5100, Issue P01)
- Typical Details (SWP, 19 March 2025, 9395-SWP-ZZ-XX-DD-C-5101, Issue P01)
- Typical Details (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DD-C-5102, Issue P01)
- Ordinary Watercourse Consent – Typical Details (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DD-C-5350, Issue P01)
- Drainage Layout (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DP-C-1100, Issue P03)
- Finished Levels (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DP-C-1110, Issue P02)
- Ordinary Watercourse Consent Retaining Wall (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DP-C-1350, Issue P01)
- Ordinary Watercourse Consent Culvert Plan (SWP, 27 March 2025, 9395-SWP-ZZ-XX-DP-C-1351, Issue P01)
- Manhole Schedule (SWP, 27 March 2025, 9395-SWP-ZZ-XX-SH-C-1101, Issue P02)
- S106 Approval Letter (Southern Water, 07 April 2025)

Condition 8

Pre-Commencement Condition: No development shall commence until a drainage strategy detailing the proposed means of foul and surface water disposal including the rate at which surface water will discharge, has been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved scheme.

Reason: As this matter is fundamental to ensure that the development is properly drained and to comply with Policy 38 of the Horsham District Planning Framework (2015).

We have reviewed the evidence provided by the applicant in support of the planning application. We require **more information** to support the proposals to determine that the

site drainage meets the requirements of the NPPF and PPG, SuDS Non-Statutory Technical Standards (NSTS) (March, 2015), and the Horsham District Planning Framework (2015) – Policy 38.

The applicant has provided detailed information to address many of our previous requests. However as previously requested, we have the following comments:

- The applicant has assessed the pollution mitigation provided by permeable paving for the Driveways (Low risk) and Residential Roof (Very Low risk) areas. However, the Drainage Layout demonstrates there are roof areas that do not enter the permeable paving. The applicant has explained it is not possible for all roof runoff to enter the permeable paving due to site constraints. We are satisfied with the approach generally to the control of pollution and silt on the scheme but would welcome investigation into silt catchment from rainwater pipes at source to reduce the probability of silt and debris entering the watercourse.

- As previous requested, the drainage model must be updated with the following:
    - FEH22 data should be used.
        - It is noted that FEH 2013 data has been used rather than the FEH 2022 data. FEH 2022 data must be used, or an explanation provided why this has not been included.
        - It is known that currently the MicroDrainage software only recognises data located between the <2013> commands. Therefore, it is advised that the 2022 data should be inserted between the <2013> commands in the rainfall data file in order for the software to recognise the data. It should be evidenced that this has been done by providing an extract of the 2013 and 2022 data.
    - The MADD factor should be set to 0.
    - The design calculations must show consideration of a surcharged scenario if required and so have considered and evidenced the expected water level of the receiving watercourse in the design event.
        - We welcome an increase in culvert size, however we require a surcharged outfall scenario to be modelled, in order to understand if there will be a flood risk impact to the site.

- Thank you for providing the proposed and existing impermeable area plans. It is unclear if an additional 10% impermeable area, to account for urban creep, has been considered in the design calculations. A sensitivity check of 10% impermeable area on the proposed roof area is requested to demonstrate the drainage strategy has capacity to account for urban creep.

Advisory Comment

A15 grade manholes are not recommended, and we would advise the use of B125 rated covers as a minimum on schemes to prevent structural collapse.

MAIN COMMENTS: As above	
ANY RECOMMENDED CONDITIONS: N/A	
NAME:	Y Riley L Derrick A Johnson
DEPARTMENT:	Horsham District Council - Drainage
DATE:	21/05/2025

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Appendix 2.1

FEH Data Printouts
Original Data

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STEPHEN WILSON
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Appendix 2.2

FEH Data Printouts
Amended Data

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STEPHEN WILSON
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Appendix 3

Surface Water Drainage Calculations

STEPHEN WILSON PARTNERSHIP LTD

Title	Fairfield Cottages, Cowfold	Job No:	E9395
Description :	Surface Water Calculations	By:	CRS
		Date:	May-25
		Sheet No:	1

Design Data

FEH-22 = 521445, 122685

Design Criteria

Design Storm = 100Yr + 45% Climate Change

Design Discharge Rate = 2.0l/s

Discharge Point = Diverted Culverted Watercourse

CV = 1.00

Total Impermeable Area for drainage system = 740m^2 or 0.074Ha

Results

A traditional positive piped drainage system discharging at via a hydrobrake flow control at up to 2.0l/s to a diverted culvert. Attenuation is provided in a minimum 350mm sub-base to the permeable paving.

The restricted flow rate provides a betterment on the existing flow rate in accordance with the LLFA policy for brownfield sites.

Please refer to attached sheets

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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	11.881	0.150	79.2	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	7.952	0.295	27.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	16.724	0.210	79.6	0.004	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	4.822	0.195	24.7	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	12.444	0.130	95.7	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	0.653	0.535	1.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	3.660	0.135	27.1	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	10.704	0.285	37.6	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.000	8.116	0.085	95.5	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	4.269	0.055	77.6	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	14.594	0.305	47.8	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	11.732	0.150	78.2	0.003	6.00	0.0	0.600	o	100	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)
1.000	75.00	6.23	30.425	0.000	0.0	0.0	0.0	0.87	6.8	0.0
1.001	75.00	6.30	30.225	0.004	0.0	0.0	0.0	1.95	34.4	0.8
2.000	75.00	6.32	30.190	0.004	0.0	0.0	0.0	0.86	6.8	0.8
1.002	75.00	6.36	29.930	0.011	0.0	0.0	0.0	2.03	35.9	2.2
3.000	75.00	6.26	30.450	0.000	0.0	0.0	0.0	0.79	6.2	0.0
3.001	75.00	6.27	30.320	0.009	0.0	0.0	0.0	7.06	55.5	1.8
1.003	75.00	6.39	29.735	0.023	0.0	0.0	0.0	1.94	34.3	4.7
4.000	75.00	6.14	30.485	0.003	0.0	0.0	0.0	1.26	9.9	0.6
5.000	75.00	6.17	30.340	0.000	0.0	0.0	0.0	0.79	6.2	0.0
5.001	75.00	6.25	30.255	0.005	0.0	0.0	0.0	0.87	6.9	1.0
4.001	75.00	6.42	30.150	0.011	0.0	0.0	0.0	1.46	25.8	2.2
6.000	75.00	6.22	30.280	0.003	0.0	0.0	0.0	0.87	6.8	0.6

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
7.000	4.303	0.055	78.2	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	5.217	0.100	52.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	9.259	0.235	39.4	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.002	16.915	0.170	99.5	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.000	2.042	0.020	102.1	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	2.052	0.020	102.6	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
10.000	5.562	0.055	101.1	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
11.000	2.862	0.030	95.4	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	15.202	0.155	98.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	3.952	0.040	98.8	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	1.403	0.360	3.9	0.000	0.00	0.0	0.600	o	100	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)
7.000	75.00	6.08	30.335	0.003	0.0	0.0	0.0	0.87	6.8	0.6
7.001	75.00	6.16	30.280	0.003	0.0	0.0	0.0	1.07	8.4	0.6
6.001	75.00	6.35	30.130	0.009	0.0	0.0	0.0	1.23	9.7	1.8
4.002	75.00	6.70	29.845	0.028	0.0	0.0	0.0	1.01	17.8	5.7
8.000	75.00	6.04	30.145	0.000	0.0	0.0	0.0	0.76	6.0	0.0
9.000	75.00	6.05	30.300	0.000	0.0	0.0	0.0	0.76	6.0	0.0
10.000	75.00	6.12	30.335	0.003	0.0	0.0	0.0	0.76	6.0	0.6
11.000	75.00	6.06	30.310	0.003	0.0	0.0	0.0	0.79	6.2	0.6
9.001	75.00	6.45	30.280	0.009	0.0	0.0	0.0	0.78	6.1	1.8
8.001	75.00	6.53	30.125	0.020	0.0	0.0	0.0	0.77	6.1	4.1
8.002	75.00	6.54	30.085	0.020	0.0	0.0	0.0	3.95	31.0	4.1

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
4.003	7.515	0.075	100.2	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	1.630	0.010	163.0	0.000	0.00	0.0	0.600	o	225	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)
4.003	75.00	6.82	29.675	0.051	0.0	0.0	0.0	1.00	17.7	10.4
1.004	75.00	6.85	29.525	0.074	0.0	0.0	0.0	1.02	40.6	15.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
RE1	31.330	0.905	Open Manhole	100	1.000	30.425	100				
S1	31.020	0.795	Open Manhole	450	1.001	30.225	150	1.000	30.275	100	
RE2	31.180	0.990	Open Manhole	100	2.000	30.190	100				
Junction	31.020	1.090	Junction		1.002	29.930	150	1.001	29.930	150	
								2.000	29.980	100	
RE3	31.100	0.650	Open Manhole	100	3.000	30.450	100				
S2	30.950	0.630	Open Manhole	450	3.001	30.320	100	3.000	30.320	100	
Junction	31.000	1.265	Junction		1.003	29.735	150	1.002	29.735	150	
								3.001	29.785	100	
RE10	31.170	0.685	Open Manhole	100	4.000	30.485	100				
RE11	31.000	0.660	Open Manhole	100	5.000	30.340	100				
S3	30.900	0.645	Open Manhole	450	5.001	30.255	100	5.000	30.255	100	
S4	31.000	0.850	Open Manhole	450	4.001	30.150	150	4.000	30.200	100	
								5.001	30.200	100	
RE8	31.000	0.720	Open Manhole	100	6.000	30.280	100				
RE9	30.900	0.565	Open Manhole	100	7.000	30.335	100				
S5	30.880	0.600	Open Manhole	450	7.001	30.280	100	7.000	30.280	100	
S6	30.880	0.750	Open Manhole	450	6.001	30.130	100	6.000	30.130	100	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								7.001	30.180	100	50
S7	30.700	0.855	Open Manhole	450	4.002	29.845	150	4.001	29.845	150	
								6.001	29.895	100	
RE7	30.700	0.555	Open Manhole	100	8.000	30.145	100				
RE4	30.890	0.590	Open Manhole	100	9.000	30.300	100				
RE5	31.050	0.715	Open Manhole	100	10.000	30.335	100				
RE6	30.890	0.580	Open Manhole	100	11.000	30.310	100				
Junction	30.900	0.620	Junction		9.001	30.280	100	9.000	30.280	100	
								10.000	30.280	100	
								11.000	30.280	100	
Junction	30.700	0.575	Junction		8.001	30.125	100	8.000	30.125	100	
								9.001	30.125	100	
S9	30.750	0.665	Open Manhole	450	8.002	30.085	100	8.001	30.085	100	
S10	30.900	1.225	Open Manhole	450	4.003	29.675	150	4.002	29.675	150	
								8.002	29.725	100	
S11	31.000	1.475	Open Manhole	1200 x 900	1.004	29.525	225	1.003	29.600	150	
								4.003	29.600	150	
S12	30.900	1.385	Open Manhole	1200 x 900		OUTFALL		1.004	29.515	225	

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Manhole Schedules for Storm

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE1	31.330	30.425	0.805	Open Manhole	100
1.001	o	150	S1	31.020	30.225	0.645	Open Manhole	450
2.000	o	100	RE2	31.180	30.190	0.890	Open Manhole	100
1.002	o	150	Junction	31.020	29.930	0.940	Junction	
3.000	o	100	RE3	31.100	30.450	0.550	Open Manhole	100
3.001	o	100	S2	30.950	30.320	0.530	Open Manhole	450
1.003	o	150	Junction	31.000	29.735	1.115	Junction	
4.000	o	100	RE10	31.170	30.485	0.585	Open Manhole	100
5.000	o	100	RE11	31.000	30.340	0.560	Open Manhole	100
5.001	o	100	S3	30.900	30.255	0.545	Open Manhole	450
4.001	o	150	S4	31.000	30.150	0.700	Open Manhole	450
6.000	o	100	RE8	31.000	30.280	0.620	Open Manhole	100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.881	79.2	S1	31.020	30.275	0.645	Open Manhole	450
1.001	7.952	27.0	Junction	31.020	29.930	0.940	Junction	
2.000	16.724	79.6	Junction	31.020	29.980	0.940	Junction	
1.002	4.822	24.7	Junction	31.000	29.735	1.115	Junction	
3.000	12.444	95.7	S2	30.950	30.320	0.530	Open Manhole	450
3.001	0.653	1.2	Junction	31.000	29.785	1.115	Junction	
1.003	3.660	27.1	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
4.000	10.704	37.6	S4	31.000	30.200	0.700	Open Manhole	450
5.000	8.116	95.5	S3	30.900	30.255	0.545	Open Manhole	450
5.001	4.269	77.6	S4	31.000	30.200	0.700	Open Manhole	450
4.001	14.594	47.8	S7	30.700	29.845	0.705	Open Manhole	450
6.000	11.732	78.2	S6	30.880	30.130	0.650	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	o	100	RE9	30.900	30.335	0.465	Open Manhole	100
7.001	o	100	S5	30.880	30.280	0.500	Open Manhole	450
6.001	o	100	S6	30.880	30.130	0.650	Open Manhole	450
4.002	o	150	S7	30.700	29.845	0.705	Open Manhole	450
8.000	o	100	RE7	30.700	30.145	0.455	Open Manhole	100
9.000	o	100	RE4	30.890	30.300	0.490	Open Manhole	100
10.000	o	100	RE5	31.050	30.335	0.615	Open Manhole	100
11.000	o	100	RE6	30.890	30.310	0.480	Open Manhole	100
9.001	o	100	Junction	30.900	30.280	0.520	Junction	
8.001	o	100	Junction	30.700	30.125	0.475	Junction	
8.002	o	100	S9	30.750	30.085	0.565	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	4.303	78.2	S5	30.880	30.280	0.500	Open Manhole	450
7.001	5.217	52.2	S6	30.880	30.180	0.600	Open Manhole	450
6.001	9.259	39.4	S7	30.700	29.895	0.705	Open Manhole	450
4.002	16.915	99.5	S10	30.900	29.675	1.075	Open Manhole	450
8.000	2.042	102.1	Junction	30.700	30.125	0.475	Junction	
9.000	2.052	102.6	Junction	30.900	30.280	0.520	Junction	
10.000	5.562	101.1	Junction	30.900	30.280	0.520	Junction	
11.000	2.862	95.4	Junction	30.900	30.280	0.520	Junction	
9.001	15.202	98.1	Junction	30.700	30.125	0.475	Junction	
8.001	3.952	98.8	S9	30.750	30.085	0.565	Open Manhole	450
8.002	1.403	3.9	S10	30.900	29.725	1.075	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	o	150	S10	30.900	29.675	1.075	Open Manhole	450
1.004	o	225	S11	31.000	29.525	1.250	Open Manhole	1200 x 900

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	7.515	100.2	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
1.004	1.630	163.0	S12	30.900	29.515	1.160	Open Manhole	1200 x 900

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	S12	30.900	29.515	29.515	1200	900

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S11, DS/PN: 1.004, Volume (m³): 1.8

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	29.600
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

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	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Storage Structures for Storm

Porous Car Park Manhole: S2, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	13.5
Max Percolation (l/s)	25.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.320	Membrane Depth (mm)	230

Porous Car Park Manhole: S3, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	7.3
Max Percolation (l/s)	13.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.255	Membrane Depth (mm)	230

Porous Car Park Manhole: S7, DS/PN: 4.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.4
Max Percolation (l/s)	13.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	29.845	Membrane Depth (mm)	230

Porous Car Park Manhole: Junction, DS/PN: 8.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	17.2
Max Percolation (l/s)	29.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.125	Membrane Depth (mm)	230

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	2	+0%	100/60 Summer			
1.001	S1	15 Summer	2	+0%	100/15 Summer			
2.000	RE2	15 Summer	2	+0%	10/120 Summer			
1.002	Junction	60 Summer	2	+0%				
3.000	RE3	15 Summer	2	+0%	100/60 Summer			
3.001	S2	30 Summer	2	+0%	100/15 Summer			
1.003	Junction	15 Summer	2	+0%				
4.000	RE10	15 Summer	2	+0%	100/120 Summer			
5.000	RE11	15 Summer	2	+0%	100/30 Summer			
5.001	S3	30 Summer	2	+0%	30/60 Summer			
4.001	S4	30 Summer	2	+0%	30/30 Summer			
6.000	RE8	15 Summer	2	+0%	100/15 Summer			
7.000	RE9	15 Summer	2	+0%	100/15 Summer			
7.001	S5	15 Summer	2	+0%	100/15 Summer			
6.001	S6	15 Summer	2	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.241	-0.134	0.000	0.02			0.7	OK
2.000	RE2	30.212	-0.078	0.000	0.11			0.7	OK
1.002	Junction	30.080	0.000	0.000	0.05			1.4	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.337	-0.083	0.000	0.07		7	1.4	OK
1.003	Junction	29.885	0.000	0.000	0.10			2.3	SURCHARGED*
4.000	RE10	30.501	-0.084	0.000	0.06			0.6	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.277	-0.078	0.000	0.11		6	0.7	OK
4.001	S4	30.175	-0.125	0.000	0.06			1.5	OK
6.000	RE8	30.300	-0.080	0.000	0.09			0.6	OK
7.000	RE9	30.356	-0.079	0.000	0.09			0.6	OK
7.001	S5	30.298	-0.082	0.000	0.08			0.6	OK
6.001	S6	30.159	-0.071	0.000	0.18			1.6	OK

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Summer	2	+0%	2/15 Summer			
8.000	RE7	30 Summer	2	+0%	10/30 Summer			
9.000	RE4	15 Summer	2	+0%	100/15 Summer			
10.000	RE5	15 Summer	2	+0%	100/15 Summer			
11.000	RE6	15 Summer	2	+0%	100/15 Summer			
9.001	Junction	15 Summer	2	+0%				
8.001	Junction	30 Summer	2	+0%	10/30 Summer			
8.002	S9	120 Summer	2	+0%	10/15 Summer			
4.003	S10	120 Summer	2	+0%	2/15 Summer			
1.004	S11	120 Summer	2	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.138	0.143	0.000	-0.14		48	-2.3	SURCHARGED
8.000	RE7	30.175	-0.070	0.000	0.00			0.0	OK
9.000	RE4	30.315	-0.085	0.000	0.00			0.0	OK
10.000	RE5	30.356	-0.079	0.000	0.10			0.6	OK
11.000	RE6	30.332	-0.078	0.000	0.11			0.6	OK
9.001	Junction	30.315	-0.065	0.000	0.27			1.6	OK*
8.001	Junction	30.175	-0.050	0.000	0.49		7	2.7	OK*
8.002	S9	30.135	-0.050	0.000	0.12			2.0	OK
4.003	S10	30.135	0.310	0.000	0.13			2.0	SURCHARGED
1.004	S11	30.131	0.381	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	10	+0%	100/60 Summer			
1.001	S1	120 Summer	10	+0%	100/15 Summer			
2.000	RE2	120 Summer	10	+0%	10/120 Summer			
1.002	Junction	15 Summer	10	+0%				
3.000	RE3	15 Summer	10	+0%	100/60 Summer			
3.001	S2	15 Summer	10	+0%	100/15 Summer			
1.003	Junction	15 Summer	10	+0%				
4.000	RE10	15 Summer	10	+0%	100/120 Summer			
5.000	RE11	15 Summer	10	+0%	100/30 Summer			
5.001	S3	120 Summer	10	+0%	30/60 Summer			
4.001	S4	120 Summer	10	+0%	30/30 Summer			
6.000	RE8	15 Summer	10	+0%	100/15 Summer			
7.000	RE9	15 Summer	10	+0%	100/15 Summer			
7.001	S5	15 Summer	10	+0%	100/15 Summer			
6.001	S6	120 Summer	10	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.291	-0.084	0.000	0.02			0.7	OK
2.000	RE2	30.292	0.002	0.000	0.10			0.7	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.11			3.1	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.348	-0.072	0.000	0.17		4	3.4	OK
1.003	Junction	29.885	0.000	0.000	0.23			5.3	SURCHARGED*
4.000	RE10	30.506	-0.079	0.000	0.10			0.9	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.298	-0.057	0.000	0.14		40	0.8	OK
4.001	S4	30.297	-0.003	0.000	0.08			1.8	OK
6.000	RE8	30.305	-0.075	0.000	0.14			0.9	OK
7.000	RE9	30.361	-0.074	0.000	0.16			0.9	OK
7.001	S5	30.303	-0.077	0.000	0.13			0.9	OK
6.001	S6	30.298	0.068	0.000	0.16			1.5	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Summer	10	+0%	2/15 Summer			
8.000	RE7	120 Summer	10	+0%	10/30 Summer			
9.000	RE4	15 Summer	10	+0%	100/15 Summer			
10.000	RE5	15 Summer	10	+0%	100/15 Summer			
11.000	RE6	15 Summer	10	+0%	100/15 Summer			
9.001	Junction	15 Summer	10	+0%				
8.001	Junction	120 Summer	10	+0%	10/30 Summer			
8.002	S9	120 Summer	10	+0%	10/15 Summer			
4.003	S10	120 Summer	10	+0%	2/15 Summer			
1.004	S11	120 Summer	10	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.296	0.301	0.000	-0.20		105	-3.3	SURCHARGED
8.000	RE7	30.295	0.050	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.330	-0.070	0.000	0.00			0.0	OK
10.000	RE5	30.363	-0.072	0.000	0.18			0.9	OK
11.000	RE6	30.340	-0.070	0.000	0.19			0.9	OK
9.001	Junction	30.330	-0.050	0.000	0.48			2.9	OK*
8.001	Junction	30.296	0.071	0.000	0.54		53	3.0	SURCHARGED*
8.002	S9	30.294	0.109	0.000	0.16			2.7	SURCHARGED
4.003	S10	30.293	0.468	0.000	0.12			1.8	SURCHARGED
1.004	S11	30.290	0.540	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	30	+0%	100/60 Summer			
1.001	S1	120 Winter	30	+0%	100/15 Summer			
2.000	RE2	120 Summer	30	+0%	10/120 Summer			
1.002	Junction	15 Summer	30	+0%				
3.000	RE3	15 Summer	30	+0%	100/60 Summer			
3.001	S2	120 Winter	30	+0%	100/15 Summer			
1.003	Junction	15 Summer	30	+0%				
4.000	RE10	15 Summer	30	+0%	100/120 Summer			
5.000	RE11	120 Winter	30	+0%	100/30 Summer			
5.001	S3	120 Winter	30	+0%	30/60 Summer			
4.001	S4	120 Winter	30	+0%	30/30 Summer			
6.000	RE8	120 Winter	30	+0%	100/15 Summer			
7.000	RE9	120 Winter	30	+0%	100/15 Summer			
7.001	S5	120 Winter	30	+0%	100/15 Summer			
6.001	S6	120 Winter	30	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.364	-0.011	0.000	0.02			0.6	OK
2.000	RE2	30.365	0.075	0.000	0.13			0.8	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.13			3.5	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.362	-0.058	0.000	0.06		18	1.3	OK
1.003	Junction	29.885	0.000	0.000	0.30			6.9	SURCHARGED*
4.000	RE10	30.509	-0.076	0.000	0.13			1.2	OK
5.000	RE11	30.369	-0.071	0.000	0.00			0.0	OK
5.001	S3	30.369	0.014	0.000	0.12		38	0.7	SURCHARGED
4.001	S4	30.368	0.068	0.000	0.06			1.5	SURCHARGED
6.000	RE8	30.370	-0.010	0.000	0.07			0.4	OK
7.000	RE9	30.370	-0.065	0.000	0.07			0.4	OK
7.001	S5	30.369	-0.011	0.000	0.06			0.4	OK
6.001	S6	30.369	0.139	0.000	0.13			1.2	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Winter	30	+0%	2/15 Summer			
8.000	RE7	120 Winter	30	+0%	10/30 Summer			
9.000	RE4	120 Winter	30	+0%	100/15 Summer			
10.000	RE5	120 Winter	30	+0%	100/15 Summer			
11.000	RE6	120 Winter	30	+0%	100/15 Summer			
9.001	Junction	120 Winter	30	+0%				
8.001	Junction	120 Winter	30	+0%	10/30 Summer			
8.002	S9	120 Winter	30	+0%	10/15 Summer			
4.003	S10	120 Summer	30	+0%	2/15 Summer			
1.004	S11	120 Summer	30	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.367	0.372	0.000	-0.15			-2.4	SURCHARGED
8.000	RE7	30.367	0.122	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.369	-0.031	0.000	0.00			0.0	OK
10.000	RE5	30.370	-0.065	0.000	0.08			0.4	OK
11.000	RE6	30.369	-0.041	0.000	0.09			0.4	OK
9.001	Junction	30.369	-0.011	0.000	0.21			1.3	OK*
8.001	Junction	30.367	0.142	0.000	0.44		67	2.5	SURCHARGED*
8.002	S9	30.366	0.181	0.000	0.14			2.3	SURCHARGED
4.003	S10	30.366	0.541	0.000	-0.12			-1.9	SURCHARGED
1.004	S11	30.363	0.613	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	120 Winter	100	+45%	100/60 Summer			
1.001	S1	120 Winter	100	+45%	100/15 Summer			
2.000	RE2	120 Winter	100	+45%	10/120 Summer			
1.002	Junction	15 Summer	100	+45%				
3.000	RE3	120 Winter	100	+45%	100/60 Summer			
3.001	S2	120 Winter	100	+45%	100/15 Summer			
1.003	Junction	15 Summer	100	+45%				
4.000	RE10	120 Winter	100	+45%	100/120 Summer			
5.000	RE11	120 Winter	100	+45%	100/30 Summer			
5.001	S3	120 Winter	100	+45%	30/60 Summer			
4.001	S4	120 Winter	100	+45%	30/30 Summer			
6.000	RE8	120 Winter	100	+45%	100/15 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.606	0.081	0.000	0.00			0.0	SURCHARGED
1.001	S1	30.606	0.231	0.000	0.03			1.0	SURCHARGED
2.000	RE2	30.607	0.317	0.000	0.16			1.0	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.28			7.9	SURCHARGED*
3.000	RE3	30.606	0.056	0.000	0.00			0.0	SURCHARGED
3.001	S2	30.606	0.186	0.000	0.10		90	2.0	SURCHARGED
1.003	Junction	29.885	0.000	0.000	0.49			11.3	SURCHARGED*
4.000	RE10	30.615	0.030	0.000	0.08			0.8	SURCHARGED
5.000	RE11	30.614	0.174	0.000	0.00			0.0	SURCHARGED
5.001	S3	30.614	0.259	0.000	-0.39			-2.3	SURCHARGED
4.001	S4	30.614	0.314	0.000	0.08			2.0	SURCHARGED
6.000	RE8	30.616	0.236	0.000	0.12			0.8	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.000	RE9	120 Winter	100	+45%	100/15 Summer			
7.001	S5	120 Winter	100	+45%	100/15 Summer			
6.001	S6	120 Winter	100	+45%	10/30 Summer			
4.002	S7	120 Winter	100	+45%	2/15 Summer			
8.000	RE7	120 Winter	100	+45%	10/30 Summer			
9.000	RE4	120 Winter	100	+45%	100/15 Summer			
10.000	RE5	120 Winter	100	+45%	100/15 Summer			
11.000	RE6	120 Winter	100	+45%	100/15 Summer			
9.001	Junction	15 Summer	100	+45%				
8.001	Junction	30 Summer	100	+45%	10/30 Summer			
8.002	S9	120 Winter	100	+45%	10/15 Summer			
4.003	S10	120 Winter	100	+45%	2/15 Summer			
1.004	S11	120 Winter	100	+45%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
7.000	RE9	30.616	0.181	0.000	0.13			0.8	SURCHARGED
7.001	S5	30.616	0.236	0.000	0.10			0.7	SURCHARGED
6.001	S6	30.615	0.385	0.000	0.25			2.3	SURCHARGED
4.002	S7	30.613	0.618	0.000	-0.17			-2.8	SURCHARGED
8.000	RE7	30.611	0.366	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.615	0.215	0.000	0.00			0.0	SURCHARGED
10.000	RE5	30.615	0.180	0.000	0.15			0.8	SURCHARGED
11.000	RE6	30.615	0.205	0.000	0.16			0.8	SURCHARGED
9.001	Junction	30.380	0.000	0.000	1.02			6.2	SURCHARGED*
8.001	Junction	30.470	0.245	0.000	0.81			4.5	SURCHARGED*
8.002	S9	30.610	0.425	0.000	-0.15			-2.5	SURCHARGED
4.003	S10	30.609	0.784	0.000	-0.14			-2.1	SURCHARGED
1.004	S11	30.605	0.855	0.000	0.07			2.0	SURCHARGED

PN	US/MH Name	Level Exceeded
7.000	RE9	
7.001	S5	
6.001	S6	
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	

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

PN	US/MH Name	Level Exceeded
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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STEPHEN WILSON PARTNERSHIP LTD

Title	Fairfield Cottages, Cowfold	Job No:	E9395
Description :	Surface Water Calculations	By:	CRS
	Urban Creep	Date:	May-25
		Sheet No:	26

Design Data

FEH-22 = 521445, 122685

Design Criteria

Design Storm = 100Yr + 45% Climate Change

Design Discharge Rate = 2.0l/s

Discharge Point = Diverted Culverted Watercourse

CV = 1.00

Total Impermeable Area for drainage system = 740m^2 or 0.074Ha

Urban Creep = +10%

Results

A traditional positive piped drainage system discharging at via a hydrobrake flow control at up to 2.0l/s to a diverted culvert. Attenuation is provided in a minimum 350mm sub-base to the permeable paving.

The restricted flow rate provides a betterment on the existing flow rate in accordance with the LLFA policy for brownfield sites.

Please refer to attached sheets

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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	11.881	0.150	79.2	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	7.952	0.295	27.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	16.724	0.210	79.6	0.004	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	4.822	0.195	24.7	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	12.444	0.130	95.7	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	0.653	0.535	1.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	3.660	0.135	27.1	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	10.704	0.285	37.6	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.000	8.116	0.085	95.5	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	4.269	0.055	77.6	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	14.594	0.305	47.8	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	11.732	0.150	78.2	0.003	6.00	0.0	0.600	o	100	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)
1.000	75.00	6.23	30.425	0.000	0.0	0.0	0.0	0.87	6.8	0.0
1.001	75.00	6.30	30.225	0.004	0.0	0.0	0.0	1.95	34.4	0.8
2.000	75.00	6.32	30.190	0.004	0.0	0.0	0.0	0.86	6.8	0.8
1.002	75.00	6.36	29.930	0.011	0.0	0.0	0.0	2.03	35.9	2.2
3.000	75.00	6.26	30.450	0.000	0.0	0.0	0.0	0.79	6.2	0.0
3.001	75.00	6.27	30.320	0.009	0.0	0.0	0.0	7.06	55.5	1.8
1.003	75.00	6.39	29.735	0.023	0.0	0.0	0.0	1.94	34.3	4.7
4.000	75.00	6.14	30.485	0.003	0.0	0.0	0.0	1.26	9.9	0.6
5.000	75.00	6.17	30.340	0.000	0.0	0.0	0.0	0.79	6.2	0.0
5.001	75.00	6.25	30.255	0.005	0.0	0.0	0.0	0.87	6.9	1.0
4.001	75.00	6.42	30.150	0.011	0.0	0.0	0.0	1.46	25.8	2.2
6.000	75.00	6.22	30.280	0.003	0.0	0.0	0.0	0.87	6.8	0.6

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
7.000	4.303	0.055	78.2	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	5.217	0.100	52.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	9.259	0.235	39.4	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.002	16.915	0.170	99.5	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.000	2.042	0.020	102.1	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	2.052	0.020	102.6	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
10.000	5.562	0.055	101.1	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
11.000	2.862	0.030	95.4	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	15.202	0.155	98.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	3.952	0.040	98.8	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	1.403	0.360	3.9	0.000	0.00	0.0	0.600	o	100	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)
7.000	75.00	6.08	30.335	0.003	0.0	0.0	0.0	0.87	6.8	0.6
7.001	75.00	6.16	30.280	0.003	0.0	0.0	0.0	1.07	8.4	0.6
6.001	75.00	6.35	30.130	0.009	0.0	0.0	0.0	1.23	9.7	1.8
4.002	75.00	6.70	29.845	0.028	0.0	0.0	0.0	1.01	17.8	5.7
8.000	75.00	6.04	30.145	0.000	0.0	0.0	0.0	0.76	6.0	0.0
9.000	75.00	6.05	30.300	0.000	0.0	0.0	0.0	0.76	6.0	0.0
10.000	75.00	6.12	30.335	0.003	0.0	0.0	0.0	0.76	6.0	0.6
11.000	75.00	6.06	30.310	0.003	0.0	0.0	0.0	0.79	6.2	0.6
9.001	75.00	6.45	30.280	0.009	0.0	0.0	0.0	0.78	6.1	1.8
8.001	75.00	6.53	30.125	0.020	0.0	0.0	0.0	0.77	6.1	4.1
8.002	75.00	6.54	30.085	0.020	0.0	0.0	0.0	3.95	31.0	4.1

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
4.003	7.515	0.075	100.2	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	1.630	0.010	163.0	0.000	0.00	0.0	0.600	o	225	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)
4.003	75.00	6.82	29.675	0.051	0.0	0.0	0.0	1.00	17.7	10.4
1.004	75.00	6.85	29.525	0.074	0.0	0.0	0.0	1.02	40.6	15.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
RE1	31.330	0.905	Open Manhole	100	1.000	30.425	100				
S1	31.020	0.795	Open Manhole	450	1.001	30.225	150	1.000	30.275	100	
RE2	31.180	0.990	Open Manhole	100	2.000	30.190	100				
Junction	31.020	1.090	Junction		1.002	29.930	150	1.001	29.930	150	
								2.000	29.980	100	
RE3	31.100	0.650	Open Manhole	100	3.000	30.450	100				
S2	30.950	0.630	Open Manhole	450	3.001	30.320	100	3.000	30.320	100	
Junction	31.000	1.265	Junction		1.003	29.735	150	1.002	29.735	150	
								3.001	29.785	100	
RE10	31.170	0.685	Open Manhole	100	4.000	30.485	100				
RE11	31.000	0.660	Open Manhole	100	5.000	30.340	100				
S3	30.900	0.645	Open Manhole	450	5.001	30.255	100	5.000	30.255	100	
S4	31.000	0.850	Open Manhole	450	4.001	30.150	150	4.000	30.200	100	
								5.001	30.200	100	
RE8	31.000	0.720	Open Manhole	100	6.000	30.280	100				
RE9	30.900	0.565	Open Manhole	100	7.000	30.335	100				
S5	30.880	0.600	Open Manhole	450	7.001	30.280	100	7.000	30.280	100	
S6	30.880	0.750	Open Manhole	450	6.001	30.130	100	6.000	30.130	100	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								7.001	30.180	100	50
S7	30.700	0.855	Open Manhole	450	4.002	29.845	150	4.001	29.845	150	
								6.001	29.895	100	
RE7	30.700	0.555	Open Manhole	100	8.000	30.145	100				
RE4	30.890	0.590	Open Manhole	100	9.000	30.300	100				
RE5	31.050	0.715	Open Manhole	100	10.000	30.335	100				
RE6	30.890	0.580	Open Manhole	100	11.000	30.310	100				
Junction	30.900	0.620	Junction		9.001	30.280	100	9.000	30.280	100	
								10.000	30.280	100	
								11.000	30.280	100	
Junction	30.700	0.575	Junction		8.001	30.125	100	8.000	30.125	100	
								9.001	30.125	100	
S9	30.750	0.665	Open Manhole	450	8.002	30.085	100	8.001	30.085	100	
S10	30.900	1.225	Open Manhole	450	4.003	29.675	150	4.002	29.675	150	
								8.002	29.725	100	
S11	31.000	1.475	Open Manhole	1200 x 900	1.004	29.525	225	1.003	29.600	150	
								4.003	29.600	150	
S12	30.900	1.385	Open Manhole	1200 x 900		OUTFALL		1.004	29.515	225	

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Manhole Schedules for Storm

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE1	31.330	30.425	0.805	Open Manhole	100
1.001	o	150	S1	31.020	30.225	0.645	Open Manhole	450
2.000	o	100	RE2	31.180	30.190	0.890	Open Manhole	100
1.002	o	150	Junction	31.020	29.930	0.940	Junction	
3.000	o	100	RE3	31.100	30.450	0.550	Open Manhole	100
3.001	o	100	S2	30.950	30.320	0.530	Open Manhole	450
1.003	o	150	Junction	31.000	29.735	1.115	Junction	
4.000	o	100	RE10	31.170	30.485	0.585	Open Manhole	100
5.000	o	100	RE11	31.000	30.340	0.560	Open Manhole	100
5.001	o	100	S3	30.900	30.255	0.545	Open Manhole	450
4.001	o	150	S4	31.000	30.150	0.700	Open Manhole	450
6.000	o	100	RE8	31.000	30.280	0.620	Open Manhole	100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.881	79.2	S1	31.020	30.275	0.645	Open Manhole	450
1.001	7.952	27.0	Junction	31.020	29.930	0.940	Junction	
2.000	16.724	79.6	Junction	31.020	29.980	0.940	Junction	
1.002	4.822	24.7	Junction	31.000	29.735	1.115	Junction	
3.000	12.444	95.7	S2	30.950	30.320	0.530	Open Manhole	450
3.001	0.653	1.2	Junction	31.000	29.785	1.115	Junction	
1.003	3.660	27.1	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
4.000	10.704	37.6	S4	31.000	30.200	0.700	Open Manhole	450
5.000	8.116	95.5	S3	30.900	30.255	0.545	Open Manhole	450
5.001	4.269	77.6	S4	31.000	30.200	0.700	Open Manhole	450
4.001	14.594	47.8	S7	30.700	29.845	0.705	Open Manhole	450
6.000	11.732	78.2	S6	30.880	30.130	0.650	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	o	100	RE9	30.900	30.335	0.465	Open Manhole	100
7.001	o	100	S5	30.880	30.280	0.500	Open Manhole	450
6.001	o	100	S6	30.880	30.130	0.650	Open Manhole	450
4.002	o	150	S7	30.700	29.845	0.705	Open Manhole	450
8.000	o	100	RE7	30.700	30.145	0.455	Open Manhole	100
9.000	o	100	RE4	30.890	30.300	0.490	Open Manhole	100
10.000	o	100	RE5	31.050	30.335	0.615	Open Manhole	100
11.000	o	100	RE6	30.890	30.310	0.480	Open Manhole	100
9.001	o	100	Junction	30.900	30.280	0.520	Junction	
8.001	o	100	Junction	30.700	30.125	0.475	Junction	
8.002	o	100	S9	30.750	30.085	0.565	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	4.303	78.2	S5	30.880	30.280	0.500	Open Manhole	450
7.001	5.217	52.2	S6	30.880	30.180	0.600	Open Manhole	450
6.001	9.259	39.4	S7	30.700	29.895	0.705	Open Manhole	450
4.002	16.915	99.5	S10	30.900	29.675	1.075	Open Manhole	450
8.000	2.042	102.1	Junction	30.700	30.125	0.475	Junction	
9.000	2.052	102.6	Junction	30.900	30.280	0.520	Junction	
10.000	5.562	101.1	Junction	30.900	30.280	0.520	Junction	
11.000	2.862	95.4	Junction	30.900	30.280	0.520	Junction	
9.001	15.202	98.1	Junction	30.700	30.125	0.475	Junction	
8.001	3.952	98.8	S9	30.750	30.085	0.565	Open Manhole	450
8.002	1.403	3.9	S10	30.900	29.725	1.075	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	o	150	S10	30.900	29.675	1.075	Open Manhole	450
1.004	o	225	S11	31.000	29.525	1.250	Open Manhole	1200 x 900

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	7.515	100.2	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
1.004	1.630	163.0	S12	30.900	29.515	1.160	Open Manhole	1200 x 900

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	S12	30.900	29.515	29.515	1200	900

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S11, DS/PN: 1.004, Volume (m³): 1.8

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	29.600
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

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	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Storage Structures for Storm

Porous Car Park Manhole: S2, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	13.5
Max Percolation (l/s)	25.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.320	Membrane Depth (mm)	230

Porous Car Park Manhole: S3, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	7.3
Max Percolation (l/s)	13.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.255	Membrane Depth (mm)	230

Porous Car Park Manhole: S7, DS/PN: 4.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.4
Max Percolation (l/s)	13.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	29.845	Membrane Depth (mm)	230

Porous Car Park Manhole: Junction, DS/PN: 8.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	17.2
Max Percolation (l/s)	29.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.125	Membrane Depth (mm)	230

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	2	+0%	100/30 Summer			
1.001	S1	15 Summer	2	+0%	30/60 Summer			
2.000	RE2	15 Summer	2	+0%	10/60 Summer			
1.002	Junction	30 Summer	2	+0%				
3.000	RE3	15 Summer	2	+0%	100/60 Summer			
3.001	S2	30 Summer	2	+0%	100/15 Summer			
1.003	Junction	15 Summer	2	+0%				
4.000	RE10	15 Summer	2	+0%	100/60 Summer			
5.000	RE11	15 Summer	2	+0%	100/15 Summer			
5.001	S3	30 Summer	2	+0%	30/60 Summer			
4.001	S4	30 Summer	2	+0%	10/60 Summer			
6.000	RE8	15 Summer	2	+0%	30/60 Summer			
7.000	RE9	15 Summer	2	+0%	100/15 Summer			
7.001	S5	15 Summer	2	+0%	30/60 Summer			
6.001	S6	120 Summer	2	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.241	-0.134	0.000	0.03			0.8	OK
2.000	RE2	30.213	-0.077	0.000	0.13			0.8	OK
1.002	Junction	30.080	0.000	0.000	0.07			2.0	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.338	-0.082	0.000	0.07		6	1.5	OK
1.003	Junction	29.885	0.000	0.000	0.12			2.7	SURCHARGED*
4.000	RE10	30.502	-0.083	0.000	0.07			0.6	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.278	-0.077	0.000	0.12		7	0.7	OK
4.001	S4	30.177	-0.123	0.000	0.07			1.7	OK
6.000	RE8	30.301	-0.079	0.000	0.09			0.6	OK
7.000	RE9	30.356	-0.079	0.000	0.10			0.6	OK
7.001	S5	30.299	-0.081	0.000	0.08			0.6	OK
6.001	S6	30.177	-0.053	0.000	0.11			1.0	OK

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Summer	2	+0%	2/15 Summer			
8.000	RE7	30 Summer	2	+0%	10/30 Summer			
9.000	RE4	15 Summer	2	+0%	100/15 Summer			
10.000	RE5	15 Summer	2	+0%	100/15 Summer			
11.000	RE6	15 Summer	2	+0%	100/15 Summer			
9.001	Junction	15 Summer	2	+0%				
8.001	Junction	30 Summer	2	+0%	10/15 Summer			
8.002	S9	120 Summer	2	+0%	10/15 Summer			
4.003	S10	120 Summer	2	+0%	2/15 Summer			
1.004	S11	120 Summer	2	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.176	0.181	0.000	-0.15		56	-2.4	SURCHARGED
8.000	RE7	30.178	-0.067	0.000	0.00			0.0	OK
9.000	RE4	30.317	-0.083	0.000	0.00			0.0	OK
10.000	RE5	30.357	-0.078	0.000	0.11			0.6	OK
11.000	RE6	30.333	-0.077	0.000	0.13			0.6	OK
9.001	Junction	30.317	-0.063	0.000	0.29			1.8	OK*
8.001	Junction	30.178	-0.047	0.000	0.54		7	3.0	OK*
8.002	S9	30.175	-0.010	0.000	0.13			2.2	OK
4.003	S10	30.175	0.350	0.000	0.13			2.0	SURCHARGED
1.004	S11	30.175	0.425	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	10	+0%	100/30 Summer			
1.001	S1	120 Summer	10	+0%	30/60 Summer			
2.000	RE2	120 Summer	10	+0%	10/60 Summer			
1.002	Junction	15 Summer	10	+0%				
3.000	RE3	15 Summer	10	+0%	100/60 Summer			
3.001	S2	15 Summer	10	+0%	100/15 Summer			
1.003	Junction	15 Summer	10	+0%				
4.000	RE10	15 Summer	10	+0%	100/60 Summer			
5.000	RE11	15 Summer	10	+0%	100/15 Summer			
5.001	S3	120 Summer	10	+0%	30/60 Summer			
4.001	S4	120 Summer	10	+0%	10/60 Summer			
6.000	RE8	120 Summer	10	+0%	30/60 Summer			
7.000	RE9	15 Summer	10	+0%	100/15 Summer			
7.001	S5	120 Summer	10	+0%	30/60 Summer			
6.001	S6	120 Summer	10	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.317	-0.058	0.000	0.02			0.7	OK
2.000	RE2	30.319	0.029	0.000	0.11			0.7	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.11			3.0	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.349	-0.071	0.000	0.18		4	3.7	OK
1.003	Junction	29.885	0.000	0.000	0.24			5.6	SURCHARGED*
4.000	RE10	30.507	-0.078	0.000	0.11			1.0	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.323	-0.032	0.000	0.15		37	0.9	OK
4.001	S4	30.322	0.022	0.000	0.08			2.0	SURCHARGED
6.000	RE8	30.325	-0.055	0.000	0.08			0.5	OK
7.000	RE9	30.363	-0.072	0.000	0.17			1.0	OK
7.001	S5	30.325	-0.055	0.000	0.07			0.5	OK
6.001	S6	30.324	0.094	0.000	0.17			1.6	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Summer	10	+0%	2/15 Summer			
8.000	RE7	120 Summer	10	+0%	10/30 Summer			
9.000	RE4	15 Summer	10	+0%	100/15 Summer			
10.000	RE5	15 Summer	10	+0%	100/15 Summer			
11.000	RE6	15 Summer	10	+0%	100/15 Summer			
9.001	Junction	15 Summer	10	+0%				
8.001	Junction	120 Summer	10	+0%	10/15 Summer			
8.002	S9	120 Summer	10	+0%	10/15 Summer			
4.003	S10	120 Summer	10	+0%	2/15 Summer			
1.004	S11	120 Summer	10	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.321	0.326	0.000	-0.21		118	-3.4	SURCHARGED
8.000	RE7	30.320	0.075	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.332	-0.068	0.000	0.00			0.0	OK
10.000	RE5	30.365	-0.070	0.000	0.19			1.0	OK
11.000	RE6	30.342	-0.068	0.000	0.21			1.0	OK
9.001	Junction	30.333	-0.047	0.000	0.53			3.2	OK*
8.001	Junction	30.321	0.096	0.000	0.55		61	3.1	SURCHARGED*
8.002	S9	30.319	0.134	0.000	0.17			2.8	SURCHARGED
4.003	S10	30.318	0.493	0.000	0.12			1.9	SURCHARGED
1.004	S11	30.315	0.565	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	30	+0%	100/30 Summer			
1.001	S1	120 Winter	30	+0%	30/60 Summer			
2.000	RE2	120 Winter	30	+0%	10/60 Summer			
1.002	Junction	15 Summer	30	+0%				
3.000	RE3	15 Summer	30	+0%	100/60 Summer			
3.001	S2	120 Winter	30	+0%	100/15 Summer			
1.003	Junction	15 Summer	30	+0%				
4.000	RE10	15 Summer	30	+0%	100/60 Summer			
5.000	RE11	120 Winter	30	+0%	100/15 Summer			
5.001	S3	120 Winter	30	+0%	30/60 Summer			
4.001	S4	120 Winter	30	+0%	10/60 Summer			
6.000	RE8	120 Winter	30	+0%	30/60 Summer			
7.000	RE9	120 Winter	30	+0%	100/15 Summer			
7.001	S5	120 Winter	30	+0%	30/60 Summer			
6.001	S6	120 Winter	30	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.394	0.019	0.000	0.02			0.6	SURCHARGED
2.000	RE2	30.395	0.105	0.000	0.10			0.6	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.14			3.8	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.392	-0.028	0.000	0.07		23	1.4	OK
1.003	Junction	29.885	0.000	0.000	0.35			8.0	SURCHARGED*
4.000	RE10	30.510	-0.075	0.000	0.14			1.3	OK
5.000	RE11	30.399	-0.041	0.000	0.00			0.0	OK
5.001	S3	30.399	0.044	0.000	-0.19		50	-1.1	SURCHARGED
4.001	S4	30.398	0.098	0.000	0.07			1.6	SURCHARGED
6.000	RE8	30.400	0.020	0.000	0.07			0.5	SURCHARGED
7.000	RE9	30.400	-0.035	0.000	0.08			0.5	OK
7.001	S5	30.399	0.019	0.000	0.06			0.5	SURCHARGED
6.001	S6	30.399	0.169	0.000	0.14			1.2	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Winter	30	+0%	2/15 Summer			
8.000	RE7	120 Winter	30	+0%	10/30 Summer			
9.000	RE4	120 Winter	30	+0%	100/15 Summer			
10.000	RE5	120 Winter	30	+0%	100/15 Summer			
11.000	RE6	120 Winter	30	+0%	100/15 Summer			
9.001	Junction	60 Summer	30	+0%				
8.001	Junction	120 Winter	30	+0%	10/15 Summer			
8.002	S9	120 Winter	30	+0%	10/15 Summer			
4.003	S10	120 Winter	30	+0%	2/15 Summer			
1.004	S11	120 Winter	30	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.397	0.402	0.000	-0.16			-2.6	SURCHARGED
8.000	RE7	30.397	0.152	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.399	-0.001	0.000	0.00			0.0	OK
10.000	RE5	30.400	-0.035	0.000	0.09			0.5	OK
11.000	RE6	30.399	-0.011	0.000	0.10			0.5	OK
9.001	Junction	30.380	0.000	0.000	0.50			3.1	SURCHARGED*
8.001	Junction	30.397	0.172	0.000	0.45		80	2.5	SURCHARGED*
8.002	S9	30.396	0.211	0.000	0.14			2.4	SURCHARGED
4.003	S10	30.396	0.571	0.000	0.12			1.9	SURCHARGED
1.004	S11	30.394	0.644	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	240 Winter	100	+45%	100/30 Summer			
1.001	S1	240 Winter	100	+45%	30/60 Summer			
2.000	RE2	240 Winter	100	+45%	10/60 Summer			
1.002	Junction	15 Summer	100	+45%				
3.000	RE3	240 Winter	100	+45%	100/60 Summer			
3.001	S2	240 Winter	100	+45%	100/15 Summer			
1.003	Junction	15 Summer	100	+45%				
4.000	RE10	120 Winter	100	+45%	100/60 Summer			
5.000	RE11	240 Winter	100	+45%	100/15 Summer			
5.001	S3	240 Winter	100	+45%	30/60 Summer			
4.001	S4	120 Winter	100	+45%	10/60 Summer			
6.000	RE8	120 Winter	100	+45%	30/60 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.665	0.140	0.000	0.00			0.0	SURCHARGED
1.001	S1	30.665	0.290	0.000	0.02			0.6	SURCHARGED
2.000	RE2	30.666	0.376	0.000	0.11			0.7	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.32			8.8	SURCHARGED*
3.000	RE3	30.665	0.115	0.000	0.00			0.0	SURCHARGED
3.001	S2	30.665	0.245	0.000	-0.08		116	-1.6	SURCHARGED
1.003	Junction	29.885	0.000	0.000	0.50			11.4	SURCHARGED*
4.000	RE10	30.674	0.089	0.000	0.09			0.9	SURCHARGED
5.000	RE11	30.673	0.233	0.000	0.00			0.0	SURCHARGED
5.001	S3	30.673	0.318	0.000	-0.26		161	-1.5	SURCHARGED
4.001	S4	30.673	0.373	0.000	0.08			2.0	SURCHARGED
6.000	RE8	30.675	0.295	0.000	0.13			0.9	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
7.000	RE9	120 Winter	100	+45%	100/15 Summer			
7.001	S5	120 Winter	100	+45%	30/60 Summer			
6.001	S6	120 Winter	100	+45%	10/30 Summer			
4.002	S7	240 Winter	100	+45%	2/15 Summer			
8.000	RE7	240 Winter	100	+45%	10/30 Summer			
9.000	RE4	240 Winter	100	+45%	100/15 Summer			
10.000	RE5	240 Winter	100	+45%	100/15 Summer			
11.000	RE6	240 Winter	100	+45%	100/15 Summer			
9.001	Junction	15 Summer	100	+45%				
8.001	Junction	30 Summer	100	+45%	10/15 Summer			
8.002	S9	240 Winter	100	+45%	10/15 Summer			
4.003	S10	240 Winter	100	+45%	2/15 Summer			
1.004	S11	240 Winter	100	+45%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
7.000	RE9	30.675	0.240	0.000	0.15			0.9	SURCHARGED
7.001	S5	30.675	0.295	0.000	0.11			0.8	SURCHARGED
6.001	S6	30.674	0.444	0.000	0.28			2.5	SURCHARGED
4.002	S7	30.671	0.676	0.000	0.13			2.2	FLOOD RISK
8.000	RE7	30.671	0.426	0.000	0.00			0.0	FLOOD RISK
9.000	RE4	30.673	0.273	0.000	0.00			0.0	SURCHARGED
10.000	RE5	30.674	0.239	0.000	0.10			0.5	SURCHARGED
11.000	RE6	30.674	0.264	0.000	0.11			0.5	SURCHARGED
9.001	Junction	30.380	0.000	0.000	1.12			6.8	SURCHARGED*
8.001	Junction	30.470	0.245	0.000	-0.87			-4.8	SURCHARGED*
8.002	S9	30.669	0.484	0.000	0.10			1.7	SURCHARGED
4.003	S10	30.668	0.843	0.000	0.13			1.9	SURCHARGED
1.004	S11	30.664	0.914	0.000	0.07			2.1	SURCHARGED

PN	US/MH Name	Level Exceeded
7.000	RE9	
7.001	S5	
6.001	S6	
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	

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

PN	US/MH Name	Level Exceeded
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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STEPHEN WILSON PARTNERSHIP LTD

Title	Fairfield Cottages, Cowfold	Job No:	E9395
Description :	Surface Water Calculations	By:	CRS
	Urban Creep + Surcharged Outfall	Date:	May-25
		Sheet No:	51

Design Data

FEH-22 = 521445, 122685

Design Criteria

Design Storm = 100Yr + 45% Climate Change

Design Discharge Rate = 2.0l/s

Discharge Point = Diverted Culverted Watercourse

CV = 1.00

Total Impermeable Area for drainage system = 740m^2 or 0.074Ha

Urban Creep = +10%

Outfall surcharged. Water Level = 29.740

Results

A traditional positive piped drainage system discharging at via a hydrobrake flow control at up to 2.0l/s to a diverted culvert. Attenuation is provided in a minimum 350mm sub-base to the permeable paving.

The restricted flow rate provides a betterment on the existing flow rate in accordance with the LLFA policy for brownfield sites.

Please refer to attached sheets

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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	11.881	0.150	79.2	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	7.952	0.295	27.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	16.724	0.210	79.6	0.004	6.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	4.822	0.195	24.7	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	12.444	0.130	95.7	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	0.653	0.535	1.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	3.660	0.135	27.1	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.000	10.704	0.285	37.6	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.000	8.116	0.085	95.5	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	4.269	0.055	77.6	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	14.594	0.305	47.8	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	11.732	0.150	78.2	0.003	6.00	0.0	0.600	o	100	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)
1.000	75.00	6.23	30.425	0.000	0.0	0.0	0.0	0.87	6.8	0.0
1.001	75.00	6.30	30.225	0.004	0.0	0.0	0.0	1.95	34.4	0.8
2.000	75.00	6.32	30.190	0.004	0.0	0.0	0.0	0.86	6.8	0.8
1.002	75.00	6.36	29.930	0.011	0.0	0.0	0.0	2.03	35.9	2.2
3.000	75.00	6.26	30.450	0.000	0.0	0.0	0.0	0.79	6.2	0.0
3.001	75.00	6.27	30.320	0.009	0.0	0.0	0.0	7.06	55.5	1.8
1.003	75.00	6.39	29.735	0.023	0.0	0.0	0.0	1.94	34.3	4.7
4.000	75.00	6.14	30.485	0.003	0.0	0.0	0.0	1.26	9.9	0.6
5.000	75.00	6.17	30.340	0.000	0.0	0.0	0.0	0.79	6.2	0.0
5.001	75.00	6.25	30.255	0.005	0.0	0.0	0.0	0.87	6.9	1.0
4.001	75.00	6.42	30.150	0.011	0.0	0.0	0.0	1.46	25.8	2.2
6.000	75.00	6.22	30.280	0.003	0.0	0.0	0.0	0.87	6.8	0.6

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
7.000	4.303	0.055	78.2	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	5.217	0.100	52.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.001	9.259	0.235	39.4	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.002	16.915	0.170	99.5	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
8.000	2.042	0.020	102.1	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	2.052	0.020	102.6	0.000	6.00	0.0	0.600	o	100	Pipe/Conduit	
10.000	5.562	0.055	101.1	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
11.000	2.862	0.030	95.4	0.003	6.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	15.202	0.155	98.1	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	3.952	0.040	98.8	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.002	1.403	0.360	3.9	0.000	0.00	0.0	0.600	o	100	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)
7.000	75.00	6.08	30.335	0.003	0.0	0.0	0.0	0.87	6.8	0.6
7.001	75.00	6.16	30.280	0.003	0.0	0.0	0.0	1.07	8.4	0.6
6.001	75.00	6.35	30.130	0.009	0.0	0.0	0.0	1.23	9.7	1.8
4.002	75.00	6.70	29.845	0.028	0.0	0.0	0.0	1.01	17.8	5.7
8.000	75.00	6.04	30.145	0.000	0.0	0.0	0.0	0.76	6.0	0.0
9.000	75.00	6.05	30.300	0.000	0.0	0.0	0.0	0.76	6.0	0.0
10.000	75.00	6.12	30.335	0.003	0.0	0.0	0.0	0.76	6.0	0.6
11.000	75.00	6.06	30.310	0.003	0.0	0.0	0.0	0.79	6.2	0.6
9.001	75.00	6.45	30.280	0.009	0.0	0.0	0.0	0.78	6.1	1.8
8.001	75.00	6.53	30.125	0.020	0.0	0.0	0.0	0.77	6.1	4.1
8.002	75.00	6.54	30.085	0.020	0.0	0.0	0.0	3.95	31.0	4.1

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
4.003	7.515	0.075	100.2	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	1.630	0.010	163.0	0.000	0.00	0.0	0.600	o	225	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)
4.003	75.00	6.82	29.675	0.051	0.0	0.0	0.0	1.00	17.7	10.4
1.004	75.00	6.85	29.525	0.074	0.0	0.0	0.0	1.02	40.6	15.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
RE1	31.330	0.905	Open Manhole	100	1.000	30.425	100				
S1	31.020	0.795	Open Manhole	450	1.001	30.225	150	1.000	30.275	100	
RE2	31.180	0.990	Open Manhole	100	2.000	30.190	100				
Junction	31.020	1.090	Junction		1.002	29.930	150	1.001	29.930	150	
								2.000	29.980	100	
RE3	31.100	0.650	Open Manhole	100	3.000	30.450	100				
S2	30.950	0.630	Open Manhole	450	3.001	30.320	100	3.000	30.320	100	
Junction	31.000	1.265	Junction		1.003	29.735	150	1.002	29.735	150	
								3.001	29.785	100	
RE10	31.170	0.685	Open Manhole	100	4.000	30.485	100				
RE11	31.000	0.660	Open Manhole	100	5.000	30.340	100				
S3	30.900	0.645	Open Manhole	450	5.001	30.255	100	5.000	30.255	100	
S4	31.000	0.850	Open Manhole	450	4.001	30.150	150	4.000	30.200	100	
								5.001	30.200	100	
RE8	31.000	0.720	Open Manhole	100	6.000	30.280	100				
RE9	30.900	0.565	Open Manhole	100	7.000	30.335	100				
S5	30.880	0.600	Open Manhole	450	7.001	30.280	100	7.000	30.280	100	
S6	30.880	0.750	Open Manhole	450	6.001	30.130	100	6.000	30.130	100	

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								7.001	30.180	100	50
S7	30.700	0.855	Open Manhole	450	4.002	29.845	150	4.001	29.845	150	
								6.001	29.895	100	
RE7	30.700	0.555	Open Manhole	100	8.000	30.145	100				
RE4	30.890	0.590	Open Manhole	100	9.000	30.300	100				
RE5	31.050	0.715	Open Manhole	100	10.000	30.335	100				
RE6	30.890	0.580	Open Manhole	100	11.000	30.310	100				
Junction	30.900	0.620	Junction		9.001	30.280	100	9.000	30.280	100	
								10.000	30.280	100	
								11.000	30.280	100	
Junction	30.700	0.575	Junction		8.001	30.125	100	8.000	30.125	100	
								9.001	30.125	100	
S9	30.750	0.665	Open Manhole	450	8.002	30.085	100	8.001	30.085	100	
S10	30.900	1.225	Open Manhole	450	4.003	29.675	150	4.002	29.675	150	
								8.002	29.725	100	
S11	31.000	1.475	Open Manhole	1200 x 900	1.004	29.525	225	1.003	29.600	150	
								4.003	29.600	150	
S12	30.900	1.385	Open Manhole	1200 x 900		OUTFALL		1.004	29.515	225	

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Manhole Schedules for Storm

No coordinates have been specified, layout information cannot be produced.

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	RE1	31.330	30.425	0.805	Open Manhole	100
1.001	o	150	S1	31.020	30.225	0.645	Open Manhole	450
2.000	o	100	RE2	31.180	30.190	0.890	Open Manhole	100
1.002	o	150	Junction	31.020	29.930	0.940	Junction	
3.000	o	100	RE3	31.100	30.450	0.550	Open Manhole	100
3.001	o	100	S2	30.950	30.320	0.530	Open Manhole	450
1.003	o	150	Junction	31.000	29.735	1.115	Junction	
4.000	o	100	RE10	31.170	30.485	0.585	Open Manhole	100
5.000	o	100	RE11	31.000	30.340	0.560	Open Manhole	100
5.001	o	100	S3	30.900	30.255	0.545	Open Manhole	450
4.001	o	150	S4	31.000	30.150	0.700	Open Manhole	450
6.000	o	100	RE8	31.000	30.280	0.620	Open Manhole	100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.881	79.2	S1	31.020	30.275	0.645	Open Manhole	450
1.001	7.952	27.0	Junction	31.020	29.930	0.940	Junction	
2.000	16.724	79.6	Junction	31.020	29.980	0.940	Junction	
1.002	4.822	24.7	Junction	31.000	29.735	1.115	Junction	
3.000	12.444	95.7	S2	30.950	30.320	0.530	Open Manhole	450
3.001	0.653	1.2	Junction	31.000	29.785	1.115	Junction	
1.003	3.660	27.1	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
4.000	10.704	37.6	S4	31.000	30.200	0.700	Open Manhole	450
5.000	8.116	95.5	S3	30.900	30.255	0.545	Open Manhole	450
5.001	4.269	77.6	S4	31.000	30.200	0.700	Open Manhole	450
4.001	14.594	47.8	S7	30.700	29.845	0.705	Open Manhole	450
6.000	11.732	78.2	S6	30.880	30.130	0.650	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	o	100	RE9	30.900	30.335	0.465	Open Manhole	100
7.001	o	100	S5	30.880	30.280	0.500	Open Manhole	450
6.001	o	100	S6	30.880	30.130	0.650	Open Manhole	450
4.002	o	150	S7	30.700	29.845	0.705	Open Manhole	450
8.000	o	100	RE7	30.700	30.145	0.455	Open Manhole	100
9.000	o	100	RE4	30.890	30.300	0.490	Open Manhole	100
10.000	o	100	RE5	31.050	30.335	0.615	Open Manhole	100
11.000	o	100	RE6	30.890	30.310	0.480	Open Manhole	100
9.001	o	100	Junction	30.900	30.280	0.520	Junction	
8.001	o	100	Junction	30.700	30.125	0.475	Junction	
8.002	o	100	S9	30.750	30.085	0.565	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.000	4.303	78.2	S5	30.880	30.280	0.500	Open Manhole	450
7.001	5.217	52.2	S6	30.880	30.180	0.600	Open Manhole	450
6.001	9.259	39.4	S7	30.700	29.895	0.705	Open Manhole	450
4.002	16.915	99.5	S10	30.900	29.675	1.075	Open Manhole	450
8.000	2.042	102.1	Junction	30.700	30.125	0.475	Junction	
9.000	2.052	102.6	Junction	30.900	30.280	0.520	Junction	
10.000	5.562	101.1	Junction	30.900	30.280	0.520	Junction	
11.000	2.862	95.4	Junction	30.900	30.280	0.520	Junction	
9.001	15.202	98.1	Junction	30.700	30.125	0.475	Junction	
8.001	3.952	98.8	S9	30.750	30.085	0.565	Open Manhole	450
8.002	1.403	3.9	S10	30.900	29.725	1.075	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	o	150	S10	30.900	29.675	1.075	Open Manhole	450
1.004	o	225	S11	31.000	29.525	1.250	Open Manhole	1200 x 900

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.003	7.515	100.2	S11	31.000	29.600	1.250	Open Manhole	1200 x 900
1.004	1.630	163.0	S12	30.900	29.515	1.160	Open Manhole	1200 x 900

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	S12	30.900	29.515	29.515	1200	900

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)
60	29.740	300	29.740	540	29.740	780	29.740	1020	29.740	1260	29.740
120	29.740	360	29.740	600	29.740	840	29.740	1080	29.740	1320	29.740
180	29.740	420	29.740	660	29.740	900	29.740	1140	29.740	1380	29.740
240	29.740	480	29.740	720	29.740	960	29.740	1200	29.740	1440	29.740

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S11, DS/PN: 1.004, Volume (m³): 1.8

Unit Reference	MD-SHE-0067-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	67
Invert Level (m)	29.600
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.0
Flush-Flo™	0.296	1.9
Kick-Flo®	0.599	1.6
Mean Flow over Head Range	-	1.7

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	1.6	1.200	2.2	3.000	3.3	7.000	4.9
0.200	1.9	1.400	2.3	3.500	3.5	7.500	5.1
0.300	1.9	1.600	2.5	4.000	3.8	8.000	5.2
0.400	1.9	1.800	2.6	4.500	4.0	8.500	5.4
0.500	1.8	2.000	2.7	5.000	4.2	9.000	5.5
0.600	1.6	2.200	2.9	5.500	4.4	9.500	5.7
0.800	1.8	2.400	3.0	6.000	4.6		
1.000	2.0	2.600	3.1	6.500	4.7		

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Storage Structures for Storm

Porous Car Park Manhole: S2, DS/PN: 3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	13.5
Max Percolation (l/s)	25.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.320	Membrane Depth (mm)	230

Porous Car Park Manhole: S3, DS/PN: 5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	7.3
Max Percolation (l/s)	13.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.255	Membrane Depth (mm)	230

Porous Car Park Manhole: S7, DS/PN: 4.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	9.4
Max Percolation (l/s)	13.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	29.845	Membrane Depth (mm)	230

Porous Car Park Manhole: Junction, DS/PN: 8.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	17.2
Max Percolation (l/s)	29.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.33	Evaporation (mm/day)	3
Invert Level (m)	30.125	Membrane Depth (mm)	230

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	2	+0%	100/30 Summer			
1.001	S1	15 Summer	2	+0%	30/60 Summer			
2.000	RE2	15 Summer	2	+0%	10/60 Summer			
1.002	Junction	30 Summer	2	+0%				
3.000	RE3	15 Summer	2	+0%	100/60 Summer			
3.001	S2	30 Summer	2	+0%	100/15 Summer			
1.003	Junction	15 Summer	2	+0%				
4.000	RE10	15 Summer	2	+0%	100/60 Summer			
5.000	RE11	15 Summer	2	+0%	100/15 Summer			
5.001	S3	30 Summer	2	+0%	30/60 Summer			
4.001	S4	240 Summer	2	+0%	10/60 Summer			
6.000	RE8	15 Summer	2	+0%	30/60 Summer			
7.000	RE9	15 Summer	2	+0%	100/15 Summer			
7.001	S5	15 Summer	2	+0%	30/60 Summer			
6.001	S6	240 Summer	2	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.241	-0.134	0.000	0.03			0.8	OK
2.000	RE2	30.213	-0.077	0.000	0.13			0.8	OK
1.002	Junction	30.080	0.000	0.000	0.07			2.0	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.338	-0.082	0.000	0.07		6	1.5	OK
1.003	Junction	29.885	0.000	0.000	0.12			2.7	SURCHARGED*
4.000	RE10	30.502	-0.083	0.000	0.07			0.6	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.278	-0.077	0.000	0.12		7	0.7	OK
4.001	S4	30.181	-0.119	0.000	0.04			0.8	OK
6.000	RE8	30.301	-0.079	0.000	0.09			0.6	OK
7.000	RE9	30.356	-0.079	0.000	0.10			0.6	OK
7.001	S5	30.299	-0.081	0.000	0.08			0.6	OK
6.001	S6	30.182	-0.048	0.000	0.08			0.7	OK

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	240 Summer	2	+0%	2/15 Summer			
8.000	RE7	240 Summer	2	+0%	10/30 Summer			
9.000	RE4	15 Summer	2	+0%	30/120 Winter			
10.000	RE5	15 Summer	2	+0%	100/15 Summer			
11.000	RE6	15 Summer	2	+0%	100/15 Summer			
9.001	Junction	15 Summer	2	+0%				
8.001	Junction	240 Summer	2	+0%	10/15 Summer			
8.002	S9	240 Summer	2	+0%	10/15 Summer			
4.003	S10	240 Summer	2	+0%	2/15 Summer			
1.004	S11	240 Summer	2	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.180	0.185	0.000	0.08		61	1.4	SURCHARGED
8.000	RE7	30.180	-0.065	0.000	0.00			0.0	OK
9.000	RE4	30.317	-0.083	0.000	0.00			0.0	OK
10.000	RE5	30.357	-0.078	0.000	0.11			0.6	OK
11.000	RE6	30.333	-0.077	0.000	0.13			0.6	OK
9.001	Junction	30.317	-0.063	0.000	0.29			1.8	OK*
8.001	Junction	30.180	-0.045	0.000	0.28		19	1.5	OK*
8.002	S9	30.177	-0.008	0.000	0.09			1.5	OK
4.003	S10	30.177	0.352	0.000	0.10			1.6	SURCHARGED
1.004	S11	30.175	0.425	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	10	+0%	100/30 Summer			
1.001	S1	240 Summer	10	+0%	30/60 Summer			
2.000	RE2	240 Summer	10	+0%	10/60 Summer			
1.002	Junction	15 Summer	10	+0%				
3.000	RE3	15 Summer	10	+0%	100/60 Summer			
3.001	S2	15 Summer	10	+0%	100/15 Summer			
1.003	Junction	15 Summer	10	+0%				
4.000	RE10	15 Summer	10	+0%	100/60 Summer			
5.000	RE11	15 Summer	10	+0%	100/15 Summer			
5.001	S3	240 Summer	10	+0%	30/60 Summer			
4.001	S4	240 Summer	10	+0%	10/60 Summer			
6.000	RE8	240 Summer	10	+0%	30/60 Summer			
7.000	RE9	15 Summer	10	+0%	100/15 Summer			
7.001	S5	240 Summer	10	+0%	30/60 Summer			
6.001	S6	240 Summer	10	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.315	-0.060	0.000	0.02			0.5	OK
2.000	RE2	30.316	0.026	0.000	0.07			0.5	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.11			3.0	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.349	-0.071	0.000	0.18		4	3.7	OK
1.003	Junction	29.885	0.000	0.000	0.24			5.6	SURCHARGED*
4.000	RE10	30.507	-0.078	0.000	0.11			1.0	OK
5.000	RE11	30.340	-0.100	0.000	0.00			0.0	OK
5.001	S3	30.322	-0.033	0.000	0.10		44	0.6	OK
4.001	S4	30.321	0.021	0.000	0.05			1.2	SURCHARGED
6.000	RE8	30.322	-0.058	0.000	0.05			0.4	OK
7.000	RE9	30.363	-0.072	0.000	0.17			1.0	OK
7.001	S5	30.322	-0.058	0.000	0.05			0.4	OK
6.001	S6	30.322	0.092	0.000	0.11			1.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	240 Summer	10	+0%	2/15 Summer			
8.000	RE7	240 Summer	10	+0%	10/30 Summer			
9.000	RE4	15 Summer	10	+0%	30/120 Winter			
10.000	RE5	15 Summer	10	+0%	100/15 Summer			
11.000	RE6	15 Summer	10	+0%	100/15 Summer			
9.001	Junction	15 Summer	10	+0%				
8.001	Junction	240 Summer	10	+0%	10/15 Summer			
8.002	S9	240 Summer	10	+0%	10/15 Summer			
4.003	S10	240 Summer	10	+0%	2/15 Summer			
1.004	S11	240 Summer	10	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.320	0.325	0.000	0.10		131	1.6	SURCHARGED
8.000	RE7	30.319	0.074	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.332	-0.068	0.000	0.00			0.0	OK
10.000	RE5	30.365	-0.070	0.000	0.19			1.0	OK
11.000	RE6	30.342	-0.068	0.000	0.21			1.0	OK
9.001	Junction	30.333	-0.047	0.000	0.53			3.2	OK*
8.001	Junction	30.320	0.095	0.000	0.36		82	2.0	SURCHARGED*
8.002	S9	30.318	0.133	0.000	0.11			1.9	SURCHARGED
4.003	S10	30.317	0.492	0.000	0.12			1.8	SURCHARGED
1.004	S11	30.314	0.564	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	15 Summer	30	+0%	100/30 Summer			
1.001	S1	120 Winter	30	+0%	30/60 Summer			
2.000	RE2	120 Winter	30	+0%	10/60 Summer			
1.002	Junction	15 Summer	30	+0%				
3.000	RE3	15 Summer	30	+0%	100/60 Summer			
3.001	S2	120 Winter	30	+0%	100/15 Summer			
1.003	Junction	15 Summer	30	+0%				
4.000	RE10	15 Summer	30	+0%	100/60 Summer			
5.000	RE11	120 Winter	30	+0%	100/15 Summer			
5.001	S3	120 Winter	30	+0%	30/60 Summer			
4.001	S4	120 Winter	30	+0%	10/60 Summer			
6.000	RE8	120 Winter	30	+0%	30/60 Summer			
7.000	RE9	120 Winter	30	+0%	100/15 Summer			
7.001	S5	120 Winter	30	+0%	30/60 Summer			
6.001	S6	120 Winter	30	+0%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.425	-0.100	0.000	0.00			0.0	OK
1.001	S1	30.394	0.019	0.000	0.02			0.6	SURCHARGED
2.000	RE2	30.396	0.106	0.000	0.10			0.6	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.14			3.8	SURCHARGED*
3.000	RE3	30.450	-0.100	0.000	0.00			0.0	OK
3.001	S2	30.393	-0.027	0.000	0.07		23	1.4	OK
1.003	Junction	29.885	0.000	0.000	0.35			8.0	SURCHARGED*
4.000	RE10	30.510	-0.075	0.000	0.14			1.3	OK
5.000	RE11	30.401	-0.039	0.000	0.00			0.0	OK
5.001	S3	30.400	0.045	0.000	-0.19		52	-1.1	SURCHARGED
4.001	S4	30.400	0.100	0.000	0.07			1.6	SURCHARGED
6.000	RE8	30.401	0.021	0.000	0.07			0.5	SURCHARGED
7.000	RE9	30.401	-0.034	0.000	0.08			0.5	OK
7.001	S5	30.401	0.021	0.000	0.06			0.5	SURCHARGED
6.001	S6	30.400	0.170	0.000	0.14			1.2	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	120 Winter	30	+0%	2/15 Summer			
8.000	RE7	120 Winter	30	+0%	10/30 Summer			
9.000	RE4	120 Winter	30	+0%	30/120 Winter			
10.000	RE5	120 Winter	30	+0%	100/15 Summer			
11.000	RE6	120 Winter	30	+0%	100/15 Summer			
9.001	Junction	60 Summer	30	+0%				
8.001	Junction	120 Winter	30	+0%	10/15 Summer			
8.002	S9	120 Winter	30	+0%	10/15 Summer			
4.003	S10	120 Winter	30	+0%	2/15 Summer			
1.004	S11	120 Winter	30	+0%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.399	0.404	0.000	-0.16			-2.6	SURCHARGED
8.000	RE7	30.398	0.153	0.000	0.00			0.0	SURCHARGED
9.000	RE4	30.400	0.000	0.000	0.00			0.0	SURCHARGED
10.000	RE5	30.401	-0.034	0.000	0.09			0.5	OK
11.000	RE6	30.401	-0.009	0.000	0.10			0.5	OK
9.001	Junction	30.380	0.000	0.000	0.50			3.1	SURCHARGED*
8.001	Junction	30.398	0.173	0.000	0.45		82	2.5	SURCHARGED*
8.002	S9	30.398	0.213	0.000	0.14			2.4	SURCHARGED
4.003	S10	30.398	0.573	0.000	0.12			1.9	SURCHARGED
1.004	S11	30.396	0.646	0.000	0.07			1.9	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	4
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 521445 122685 TQ 21445 22685
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	50.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 10, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	RE1	240 Winter	100	+45%	100/30 Summer			
1.001	S1	240 Winter	100	+45%	30/60 Summer			
2.000	RE2	240 Winter	100	+45%	10/60 Summer			
1.002	Junction	15 Summer	100	+45%				
3.000	RE3	240 Winter	100	+45%	100/60 Summer			
3.001	S2	240 Winter	100	+45%	100/15 Summer			
1.003	Junction	15 Summer	100	+45%				
4.000	RE10	240 Winter	100	+45%	100/60 Summer			
5.000	RE11	240 Winter	100	+45%	100/15 Summer			
5.001	S3	240 Winter	100	+45%	30/60 Summer			
4.001	S4	240 Winter	100	+45%	10/60 Summer			
6.000	RE8	240 Winter	100	+45%	30/60 Summer			
7.000	RE9	240 Winter	100	+45%	100/15 Summer			
7.001	S5	240 Winter	100	+45%	30/60 Summer			
6.001	S6	240 Winter	100	+45%	10/30 Summer			

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	RE1	30.671	0.146	0.000	0.00			0.0	SURCHARGED
1.001	S1	30.671	0.296	0.000	0.02			0.6	SURCHARGED
2.000	RE2	30.672	0.382	0.000	0.11			0.7	SURCHARGED
1.002	Junction	30.080	0.000	0.000	0.32			8.8	SURCHARGED*
3.000	RE3	30.670	0.120	0.000	0.00			0.0	SURCHARGED
3.001	S2	30.670	0.250	0.000	-0.08		119	-1.6	SURCHARGED
1.003	Junction	29.885	0.000	0.000	0.50			11.4	SURCHARGED*
4.000	RE10	30.678	0.093	0.000	0.06			0.5	SURCHARGED
5.000	RE11	30.678	0.238	0.000	0.00			0.0	SURCHARGED
5.001	S3	30.678	0.323	0.000	-0.26		167	-1.5	SURCHARGED
4.001	S4	30.678	0.378	0.000	0.05			1.3	SURCHARGED
6.000	RE8	30.679	0.299	0.000	0.08			0.5	SURCHARGED
7.000	RE9	30.680	0.245	0.000	0.09			0.5	SURCHARGED
7.001	S5	30.679	0.299	0.000	0.07			0.5	SURCHARGED
6.001	S6	30.679	0.449	0.000	0.17			1.5	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	RE1	
1.001	S1	
2.000	RE2	
1.002	Junction	
3.000	RE3	
3.001	S2	
1.003	Junction	
4.000	RE10	
5.000	RE11	
5.001	S3	
4.001	S4	
6.000	RE8	
7.000	RE9	
7.001	S5	
6.001	S6	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
4.002	S7	240 Winter	100	+45%	2/15 Summer			
8.000	RE7	240 Winter	100	+45%	10/30 Summer			
9.000	RE4	240 Winter	100	+45%	30/120 Winter			
10.000	RE5	240 Winter	100	+45%	100/15 Summer			
11.000	RE6	240 Winter	100	+45%	100/15 Summer			
9.001	Junction	15 Summer	100	+45%				
8.001	Junction	1440 Summer	100	+45%	10/15 Summer			
8.002	S9	240 Winter	100	+45%	10/15 Summer			
4.003	S10	240 Winter	100	+45%	2/15 Summer			
1.004	S11	240 Winter	100	+45%	2/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
4.002	S7	30.677	0.682	0.000	0.13			2.2	FLOOD RISK
8.000	RE7	30.675	0.430	0.000	0.00			0.0	FLOOD RISK
9.000	RE4	30.678	0.278	0.000	0.00			0.0	SURCHARGED
10.000	RE5	30.678	0.243	0.000	0.10			0.5	SURCHARGED
11.000	RE6	30.678	0.268	0.000	0.11			0.5	SURCHARGED
9.001	Junction	30.380	0.000	0.000	1.12			6.8	SURCHARGED*
8.001	Junction	30.470	0.245	0.000	0.18		266	1.0	SURCHARGED*
8.002	S9	30.674	0.489	0.000	0.10			1.7	SURCHARGED
4.003	S10	30.673	0.848	0.000	0.12			1.9	SURCHARGED
1.004	S11	30.670	0.920	0.000	0.07			2.0	SURCHARGED

PN	US/MH Name	Level Exceeded
4.002	S7	
8.000	RE7	
9.000	RE4	
10.000	RE5	
11.000	RE6	
9.001	Junction	
8.001	Junction	
8.002	S9	
4.003	S10	
1.004	S11	

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