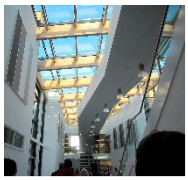

Church Raike,

Chipping

Report to Discharge Drainage Related Planning Condition

Project number: 3081

Date: February

Revision: 2

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tel: 0161 605 0831 www.scotthughesdesign.com

Document Control Sheet

Project No.: 3081

Project Title: Church Raike, Chipping

Report Title: Report to Discharge Drainage Related Planning Condition

Report Reference: 3081/PC/001

Issue: 2

Status: Final

Date: 09.02.17

Record of Issue

Issue	Status	Author	Approved	Date
1	Final	Ann Bacon	Paul Graveney	07.08.17
2	Final	Ann Bacon	Paul Graveney	09.02.18

Distribution

Issue	Organisation	Quantity
1	RVBC/LCC	1
2	RVBC/LCC	2

Table of Contents

1.0 Introduction

In 2017 a Reserved Matters application no. 3/2017/0183 was submitted to Ribble Valley Borough Council for the construction of a residential development on land off Church Raike in Chipping. The reserved matters application relates to the development of a piece of land in the Site Wide Planning Guide Drawing No. 05024_mp_00_105. A Site Wide Flood Risk Assessment for the development was submitted with the original planning application in October 2013. Planning approval has been granted subject to a number of planning conditions, including three conditions relating to the drainage of the development.

This report has been prepared to remove the drainage related planning condition applicable for the application.

2.0 Outline Drainage Strategy

2.1 Surface Water Strategy

The current site is undeveloped and is therefore defined as greenfield.

The outline drainage strategy is to provide new separate surface water and foul water adopted drainage networks. Foul water generated by the development will discharge unrestricted to the combined public sewer in Church Raike, as agreed with United Utilities. Correspondence with United Utilities is included in Appendix C of this report.

The Planning Policy Guidance (PPG) hierarchy for the disposal of surface water was considered and taking into consideration the local site conditions, details of the various options are illustrated in the table below:

Table 1: SuDS Hierarchal Approach

Method	Suitability	Suitability for Development
Infiltration to Ground	No	Site investigation has confirmed that infiltration based options would not be suitable
Connection to Watercourse	Yes	Connection to watercourse to north of the site.
Connection to Surface Water Sewer	No	Connection to watercourse is the preferred option.
Connection to a Combined Sewer	No	Connection to watercourse is the preferred option.

Ground Investigations have confirmed that the ground conditions are generally clay and therefore not suitable for infiltration methods of drainage, Therefore, discharge of surface water to the unnamed watercourse to the north of the site was considered to be the preferred option. An extract from the Grouund Investigation Report is shown below.

> **5.6 Soakaways**
>
> 5.6.1 The use of soakaways within the natural ground is not feasible at the site due to the presence of relatively impermeable strata underlying the site.

The surface water drainage strategy is to provide private surface water drainage networks which will discharge into a new surface water public sewer network to be adopted by United Utilities. The discharge rate from the development will be restricted to greenfield run off rates using a Hydrobrake flow control device. Below ground surface water attenuation will be provided by oversized pipes within the proposed public sewer system.

Drawings 3081-SHD-00-ZZ-DR-C-0100 and 0101 – Proposed Drainage GA in Appendix A defines the agreed drainage strategy.

Hydraulic calculations are included in Appendix B of this report.

The proposed private drainage layout for the new development site has been designed in accordance with BS EN 752: 2008 and Building Regulations Part H guidance, i.e. up to the 30 year storm return period criterion and tested for the extreme 100 year event to confirm no flood risk to the buildings. Note that the below ground drainage network has been sized to retain the peak 100 year plus 40% climate change event.

3.0 Drainage Related Planning Conditions

3.1 Planning Condition

Planning Condition No. 41

The written planning condition is:

Notwithstanding any indication on the approved plans, no development approved by this permission shall commence on a land parcel (as defined on Dwg No 05024_MP_00_105) until a scheme for the disposal of foul and surface waters for the parcel has been submitted to and approved in writing by the Local Planning Authority. For the avoidance of doubt, surface water must drain separate from the foul and no surface water will be permitted to discharge directly or indirectly into existing sewerage systems. The development shall be completed, maintained and managed in accordance with the approved details.

Planning Condition No. 42

The written planning condition is:

The development permitted by this planning permission shall only be carried out in accordance with the approved FRA (v1.1, dated October 2013) and the following mitigation measures detailed within the FRA: i) Limiting the surface water run-off generated by the 1 in 100 year plus climate change critical storm so that it will not exceed the run-off from the undeveloped site and not increase the risk of flooding off-site. ii) Implementation of all mitigation measures set out in Sections 4 and 7 of the FRA (v1.1, dated October 2013). The mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the timing / phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the Local Planning Authority.

Planning Condition No. 43

The written planning condition is:

No development shall take place until a surface water drainage scheme for a land parcel (as defined on Dwg No 05024_MP_00_105), based on sustainable drainage principles and an assessment of the hydrological and hydrogeological context of the development, has been submitted to and approved in writing by the Local Planning Authority. The drainage strategy for that land parcel should demonstrate the surface water run-off generated up to and including the 1 in 100 year plus climate change critical storm will not exceed the run-off from the undeveloped site following the corresponding rainfall event. The scheme for that land parcel shall subsequently be implemented in accordance with the approved details before the development is completed.

3.2 Input to Remove Drainage Conditions

Planning Condition No. 41

The proposed drainage strategy for the site is indicated in Section 2. The drainage layout drawing in Appendix A and the supporting calculations in Appendix B are deemed sufficient to remove the condition.

Planning Condition No. 42

Surface water discharge rates are to be restricted to the equivalent greenfield run-off rates for the site. The surface water drainage system has been designed so that no flooding will occur for events up to 1 in 30 year return period. Some minor exceedance flooding will occur for events of 1 in 100 year plus 40% climate change return period however due to the proposed levels of the site these will runoff away from properties whilst being contained within the development. The drainage layout drawing in Appendix A and the supporting calculations in Appendix B are deemed sufficient to remove this part of the condition.

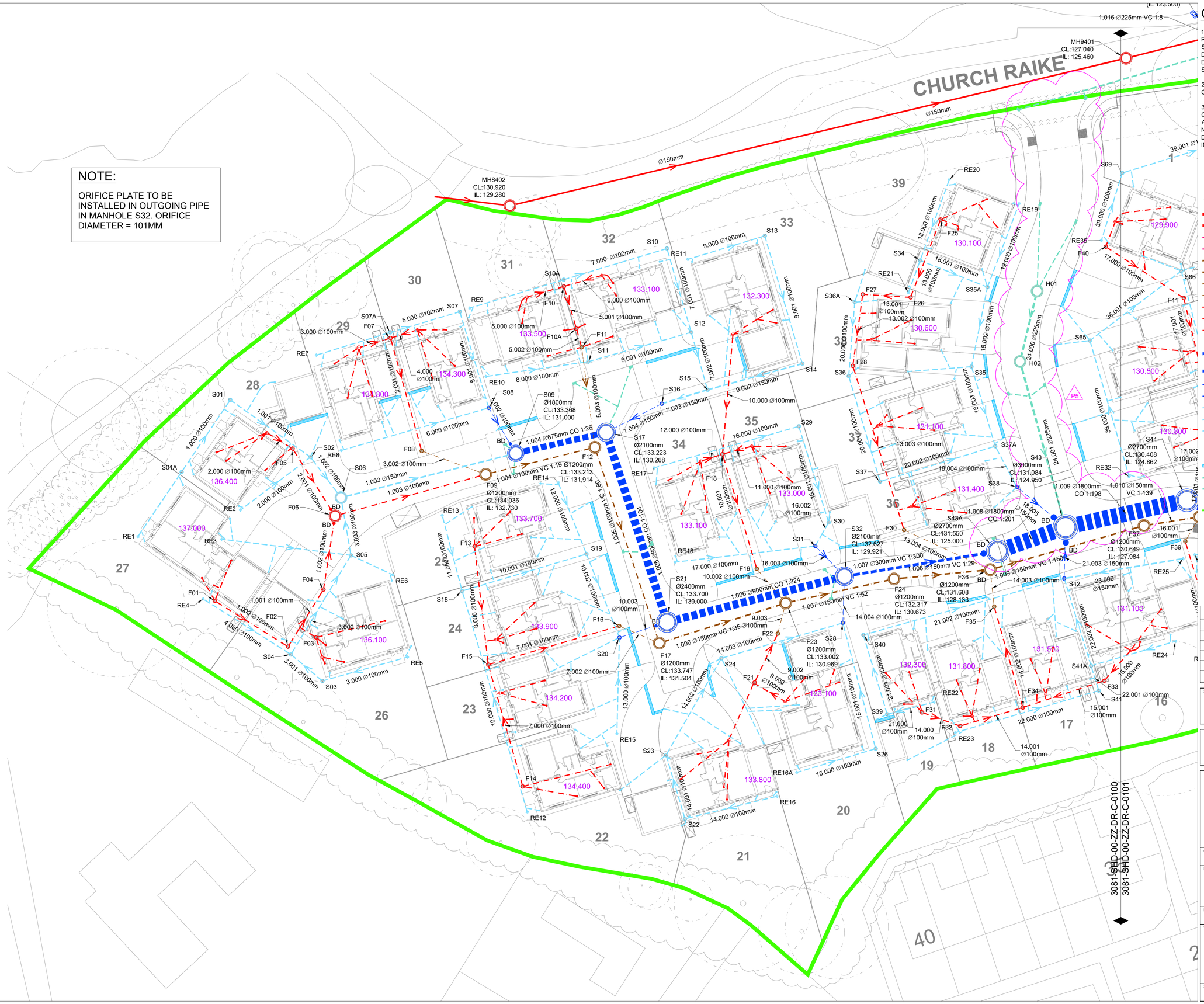
The reserve matters application to which this report refers, relates to a land parcel which is part of a wider development as defined on Dwg No. 05024_MP_00_105. The FRA submitted with the initial outline planning application relates to the wider development and the land parcel to which this application relates to is referred to as The Hive in the FRA. The Hive lies within a Flood Zone 1 area. The mitigation measures outlined in the FRA were designed to provide flood protection to the other land parcels which are at greater risk of flooding. Therefore, the mitigation measures are not required for this particular land parcel.

Planning Condition No. 43

The proposed drainage strategy for the site is indicated in Section 2. The drainage layout drawing in Appendix A and the supporting calculations in Appendix B are deemed sufficient to remove the condition.

Appendix A – Scott Hughes Design Drawings

CONTENTS	
Identifier	**Name**
3081-SHD-00-ZZ-DR-C-0100 & 0101	Proposed Drainage GA – Sheets 1 and 2



GENERAL NOTES

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.

2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

3. DO NOT SCALE FROM THIS DRAWING, WORK TO DIMENSIONS OR CO-ORDINATES PROVIDED. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS, SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.

DRAINAGE KEY

- EXISTING CW SEWER
- EXISTING CW SEWER MANHOLE
- PROPOSED LATERAL CW DRAIN
- PROPOSED LATERAL CW MANHOLE
- PROPOSED ADOPTED FW SEWER
- PROPOSED ADOPTED FW MANHOLE
- PROPOSED LATERAL FW DRAIN
- PROPOSED LATERAL FW PPIC
- PROPOSED PRIVATE FW DRAIN
- PROPOSED PRIVATE FW PPIC
- PROPOSED PRIVATE FW MINI-PPIC (600mm DP)
- PROPOSED WASTE POINT CONNECTION
- PROPOSED ADOPTED SW SEWER
- PROPOSED ADOPTED SW MANHOLE
- PROPOSED LATERAL SW DRAIN
- PROPOSED LATERAL SW PPIC
- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED PRIVATE SW DRAINAGE
- PROPOSED SW PPIC
- PROPOSED RAINWATER PIPE
- PROPOSED PRIVATE ROAD GULLY
- PROPOSED DRAINAGE CHANNEL
- PROPOSED HIGHWAY DRAIN
- PROPOSED HIGHWAY DRAIN MANHOLE
- PROPOSED HIGHWAY ROAD GULLY
- SITE BOUNDARY
- 129.500 FINISHED FLOOR LEVEL

No	DATE	DRAWN	REVD ENG.	AMENDMENT
P5	09.02.18	AB	PG	CLOUDED REVISIONS
P4	23.11.17	AB	PG	CLOUDED REVISIONS
P3	24.10.17	AB	PG	TENDER ISSUE
P2	17.10.17	AB	PG	LAYOUT UPDATED
P1	09.05.17	LED	PG	PRELIMINARY ISSUE

STATUS	PURPOSE OF ISSUE
D1	TENDER

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e.mail@scotthughesdesign.co.uk
Reg No. 4899745

CLIENT: CHIPPING HOMES LTD

PROJECT: CHURCH RAIKE, CHIPPING

DRAFTER	ENGINEER
MD	PG

TITLE: PROPOSED DRAINAGE GA SHEET 1 OF 2

SCALE	SHEET	DRAWING No	REV
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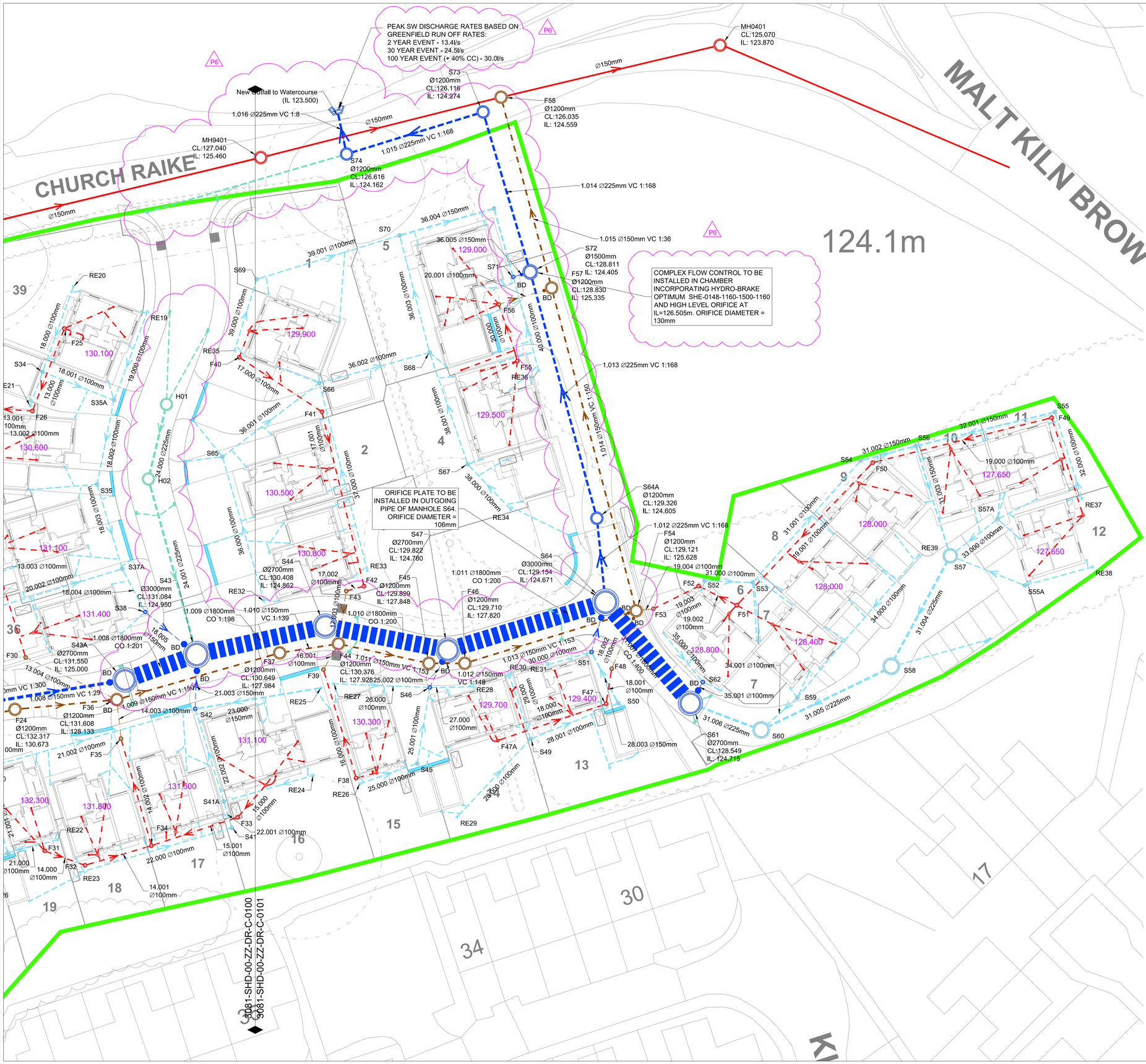
3081-SHD-00-ZZ-DR-C-0100
3081-SHD-00-ZZ-DR-C-0101



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- SITE BOUNDARY
- 129.500 FINISHED FLOOR LEVEL

No	DATE	DRAWN	REVD ENG.	AMENDMENT
P6	09.02.18	AB	PG	CLOUDED REVISIONS
P5	23.11.17	AB	PG	CLOUDED REVISIONS
P4	24.10.17	AB	PG	TENDER ISSUE
P3	17.10.17	AB	PG	DRAINAGE LAYOUT AMENDED
P2	07.08.17	AB	PG	DRAINAGE LAYOUT AMENDED
P1	09.05.17	MD	PG	PRELIMINARY ISSUE

STATUS	PURPOSE OF ISSUE
D1	TENDER

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Reg No. 4899745

CLIENT: CHIPPING HOMES LTD

PROJECT: CHURCH RAIKE, CHIPPING

DRAFTER	ENGINEER
MD	PG

TITLE: PROPOSED DRAINAGE GA SHEET 2 OF 2

SCALE	SHEET	DRAWING No	REV
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Appendix B – Hydraulic Calculations

Outputs from the Microdrainage software for the surface water drainage networks serving the development are provided. Pipe references from the hydraulic models can be located on the Proposed Drainage GA's.

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	12.130	0.438	27.7	0.007	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	13.774	0.138	99.8	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	12.280	0.639	19.2	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	7.074	0.729	9.7	0.020	0.00	0.0	0.600	o	100	Pipe/Conduit	
3.000	12.368	0.124	99.7	0.006	5.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	5.744	0.057	100.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.000	14.503	1.481	9.8	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
3.002	16.189	0.274	59.1	0.007	0.00	0.0	0.600	o	100	Pipe/Conduit	
3.003	8.181	0.300	27.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	25.181	2.140	11.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	9.905	0.125	79.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
5.001	14.030	0.676	20.8	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit	
6.000	20.911	1.304	16.0	0.007	5.00	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	5.00	5.14	135.850	0.007	0.0	0.0	0.0	1.47	11.6	0.1
1.001	5.00	5.44	135.412	0.011	0.0	0.0	0.0	0.77	6.0	0.1
2.000	5.00	5.12	135.913	0.004	0.0	0.0	0.0	1.77	13.9	0.1
1.002	5.00	5.48	135.274	0.035	0.0	0.0	0.0	2.50	19.6	0.5
3.000	5.00	5.27	135.300	0.006	0.0	0.0	0.0	0.77	6.0	0.1
3.001	5.00	5.39	135.176	0.006	0.0	0.0	0.0	0.77	6.0	0.1
4.000	5.00	5.10	136.600	0.004	0.0	0.0	0.0	2.48	19.5	0.1
3.002	5.00	5.66	135.119	0.017	0.0	0.0	0.0	1.00	7.9	0.2
3.003	5.00	5.75	134.845	0.017	0.0	0.0	0.0	1.48	11.7	0.2
1.003	5.00	5.90	134.495	0.052	0.0	0.0	0.0	2.95	52.2	0.7
5.000	5.00	5.19	133.625	0.008	0.0	0.0	0.0	0.87	6.8	0.1
5.001	5.00	5.33	133.500	0.009	0.0	0.0	0.0	1.70	13.4	0.1
6.000	5.00	5.18	134.128	0.007	0.0	0.0	0.0	1.94	15.2	0.1

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
5.002	7.107	0.419	17.0	0.006	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.004	12.963	0.507	25.6	0.025	0.00	0.0	0.600	o	675	Pipe/Conduit	
7.000	15.070	0.512	29.4	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.001	12.191	0.122	99.9	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
8.000	14.443	0.546	26.5	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
8.001	14.860	0.551	27.0	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
7.002	8.810	0.567	15.5	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
9.000	11.954	0.168	71.2	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
9.001	18.787	0.188	99.9	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
9.002	14.276	0.095	150.3	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.003	6.416	0.064	100.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.004	8.698	0.101	86.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	27.837	0.268	103.9	0.044	0.00	0.0	0.600	o	900	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)
5.002	5.00	5.39	132.824	0.022	0.0	0.0	0.0	1.88	14.8	0.3
1.004	5.00	5.94	131.000	0.099	0.0	0.0	0.0	5.20	1859.5	1.3
7.000	5.00	5.18	132.434	0.009	0.0	0.0	0.0	1.43	11.2	0.1
7.001	5.00	5.44	131.922	0.009	0.0	0.0	0.0	0.77	6.0	0.1
8.000	5.00	5.16	132.897	0.005	0.0	0.0	0.0	1.51	11.8	0.1
8.001	5.00	5.33	132.351	0.010	0.0	0.0	0.0	1.49	11.7	0.1
7.002	5.00	5.51	131.800	0.022	0.0	0.0	0.0	1.97	15.5	0.3
9.000	5.00	5.22	131.684	0.004	0.0	0.0	0.0	0.91	7.2	0.1
9.001	5.00	5.63	131.516	0.008	0.0	0.0	0.0	0.77	6.0	0.1
9.002	5.00	5.92	131.278	0.020	0.0	0.0	0.0	0.82	14.4	0.3
7.003	5.00	6.02	131.183	0.042	0.0	0.0	0.0	1.00	17.7	0.6
7.004	5.00	6.16	131.119	0.042	0.0	0.0	0.0	1.08	19.2	0.6
1.005	5.00	6.31	130.268	0.185	0.0	0.0	0.0	3.07	1955.9	2.5

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
10.000	32.195	0.603	53.4	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	
11.000	10.920	0.109	100.2	0.002	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.001	18.123	0.602	30.1	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
12.000	10.730	0.107	100.3	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.002	12.540	0.125	100.3	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
13.000	21.651	0.986	22.0	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.003	6.576	0.080	82.2	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.006	25.607	0.079	324.1	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
14.000	13.228	0.128	103.3	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
14.001	9.272	0.180	51.5	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
14.002	15.585	0.161	96.8	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
14.003	17.675	0.371	47.6	0.010	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)
10.000	5.00	5.51	133.800	0.011	0.0	0.0	0.0	1.06	8.3	0.1
11.000	5.00	5.24	133.306	0.002	0.0	0.0	0.0	0.77	6.0	0.0
10.001	5.00	5.72	133.197	0.013	0.0	0.0	0.0	1.41	11.1	0.2
12.000	5.00	5.23	132.702	0.009	0.0	0.0	0.0	0.77	6.0	0.1
10.002	5.00	5.99	132.595	0.033	0.0	0.0	0.0	0.77	6.0	0.4
13.000	5.00	5.22	133.456	0.005	0.0	0.0	0.0	1.65	13.0	0.1
10.003	5.00	6.12	132.470	0.047	0.0	0.0	0.0	0.85	6.7	0.6
1.006	5.00	6.55	130.000	0.232	0.0	0.0	0.0	1.73	1103.7	3.1
14.000	5.00	5.29	133.000	0.004	0.0	0.0	0.0	0.76	5.9	0.1
14.001	5.00	5.44	132.872	0.008	0.0	0.0	0.0	1.08	8.5	0.1
14.002	5.00	5.77	132.692	0.019	0.0	0.0	0.0	0.78	6.1	0.3
14.003	5.00	6.03	132.531	0.029	0.0	0.0	0.0	1.12	8.8	0.4

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
15.000	11.509	0.128	89.9	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
15.001	13.456	0.272	49.5	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
14.004	6.280	0.750	8.4	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
16.000	21.015	0.349	60.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
16.001	14.053	0.238	59.0	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
16.002	3.790	0.064	59.2	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
17.000	19.719	0.814	24.2	0.016	5.00	0.0	0.600	o	100	Pipe/Conduit	
16.003	5.872	1.128	5.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.007	21.717	0.072	301.6	0.042	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	10.036	0.050	200.7	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
18.000	12.005	0.120	100.0	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
18.001	10.114	0.236	42.9	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
19.000	12.481	0.437	28.6	0.004	5.00	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)
15.000	5.00	5.24	132.560	0.004	0.0	0.0	0.0	0.81	6.4	0.1
15.001	5.00	5.44	132.432	0.008	0.0	0.0	0.0	1.10	8.6	0.1
14.004	5.00	6.07	132.160	0.037	0.0	0.0	0.0	2.69	21.1	0.5
16.000	5.00	5.35	132.500	0.008	0.0	0.0	0.0	0.99	7.8	0.1
16.001	5.00	5.59	132.151	0.011	0.0	0.0	0.0	1.00	7.9	0.1
16.002	5.00	5.65	131.913	0.014	0.0	0.0	0.0	1.00	7.9	0.2
17.000	5.00	5.21	132.663	0.016	0.0	0.0	0.0	1.57	12.4	0.2
16.003	5.00	5.68	131.849	0.030	0.0	0.0	0.0	3.41	26.8	0.4
1.007	5.00	6.96	129.921	0.341	0.0	0.0	0.0	0.90	63.6	4.6
1.008	5.00	7.01	125.000	0.341	0.0	0.0	0.0	3.38	8602.3	4.6
18.000	5.00	5.26	129.383	0.004	0.0	0.0	0.0	0.77	6.0	0.1
18.001	5.00	5.40	129.263	0.007	0.0	0.0	0.0	1.18	9.3	0.1
19.000	5.00	5.14	129.464	0.004	0.0	0.0	0.0	1.45	11.4	0.1

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
18.002	11.335	0.113	100.3	0.006	0.00	0.0	0.600	o	100	Pipe/Conduit	
18.003	19.965	0.214	93.3	0.015	0.00	0.0	0.600	o	100	Pipe/Conduit	
20.000	15.367	0.104	147.8	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
20.001	16.829	0.192	87.7	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
20.002	8.356	1.004	8.3	0.003	0.00	0.0	0.600	o	100	Pipe/Conduit	
18.004	8.809	0.239	36.9	0.002	0.00	0.0	0.600	o	150	Pipe/Conduit	
18.005	8.457	0.333	25.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
21.000	6.785	0.068	99.8	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
21.001	11.575	0.196	59.1	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
21.002	29.154	1.413	20.6	0.014	0.00	0.0	0.600	o	100	Pipe/Conduit	
22.000	20.875	1.286	16.2	0.010	5.00	0.0	0.600	o	100	Pipe/Conduit	
22.001	3.637	0.036	101.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
22.002	12.756	0.128	99.7	0.008	0.00	0.0	0.600	o	100	Pipe/Conduit	
23.000	16.845	0.343	49.1	0.008	5.00	0.0	0.600	o	150	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)
18.002	5.00	5.65	129.027	0.017	0.0	0.0	0.0	0.77	6.0	0.2
18.003	5.00	6.07	128.914	0.032	0.0	0.0	0.0	0.80	6.3	0.4
20.000	5.00	5.41	130.000	0.004	0.0	0.0	0.0	0.63	5.0	0.1
20.001	5.00	5.75	129.896	0.009	0.0	0.0	0.0	0.82	6.5	0.1
20.002	5.00	5.80	129.704	0.012	0.0	0.0	0.0	2.70	21.2	0.2
18.004	5.00	6.16	128.650	0.046	0.0	0.0	0.0	1.66	29.4	0.6
18.005	5.00	6.23	128.411	0.046	0.0	0.0	0.0	2.01	35.5	0.6
21.000	5.00	5.15	131.500	0.003	0.0	0.0	0.0	0.77	6.0	0.0
21.001	5.00	5.34	131.432	0.008	0.0	0.0	0.0	1.00	7.9	0.1
21.002	5.00	5.62	131.236	0.022	0.0	0.0	0.0	1.71	13.4	0.3
22.000	5.00	5.18	131.273	0.010	0.0	0.0	0.0	1.93	15.1	0.1
22.001	5.00	5.26	129.987	0.010	0.0	0.0	0.0	0.76	6.0	0.1
22.002	5.00	5.54	129.951	0.018	0.0	0.0	0.0	0.77	6.0	0.2
23.000	5.00	5.20	130.116	0.008	0.0	0.0	0.0	1.44	25.4	0.1

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
21.003	5.919	0.059	100.3	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
24.000	10.125	0.051	198.5	0.031	5.00	0.0	0.600	o	225	Pipe/Conduit	
24.001	24.010	0.120	200.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.009	17.386	0.088	197.6	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.010	16.483	0.082	201.0	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
25.000	8.005	0.616	13.0	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
25.001	10.139	0.106	95.7	0.010	0.00	0.0	0.600	o	100	Pipe/Conduit	
26.000	12.271	0.777	15.8	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
27.000	5.712	0.106	53.9	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
25.002	5.679	1.411	4.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.011	21.729	0.109	199.3	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
28.000	13.507	0.530	25.5	0.002	5.00	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)
21.003	5.00	5.72	129.773	0.052	0.0	0.0	0.0	1.00	17.7	0.7
24.000	5.00	5.18	126.696	0.031	0.0	0.0	0.0	0.92	36.8	0.4
24.001	5.00	5.62	126.645	0.031	0.0	0.0	0.0	0.92	36.6	0.4
1.009	5.00	7.09	124.950	0.470	0.0	0.0	0.0	3.41	8670.9	6.4
1.010	5.00	7.17	124.862	0.470	0.0	0.0	0.0	3.38	8596.0	6.4
25.000	5.00	5.06	129.716	0.003	0.0	0.0	0.0	2.16	16.9	0.0
25.001	5.00	5.28	129.100	0.013	0.0	0.0	0.0	0.79	6.2	0.2
26.000	5.00	5.10	129.771	0.003	0.0	0.0	0.0	1.95	15.3	0.0
27.000	5.00	5.09	129.100	0.003	0.0	0.0	0.0	1.05	8.3	0.0
25.002	5.00	5.30	128.994	0.019	0.0	0.0	0.0	3.88	30.5	0.3
1.011	5.00	7.28	124.780	0.489	0.0	0.0	0.0	3.39	8632.0	6.6
28.000	5.00	5.15	129.130	0.002	0.0	0.0	0.0	1.54	12.1	0.0

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
29.000	8.997	0.264	34.1	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
28.001	12.025	0.295	40.8	0.005	0.00	0.0	0.600	o	100	Pipe/Conduit	
28.002	7.497	0.127	59.0	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit	
30.000	6.044	0.554	10.9	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
28.003	7.813	0.065	120.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
31.000	6.618	0.406	16.3	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
31.001	21.177	0.212	99.9	0.013	0.00	0.0	0.600	o	100	Pipe/Conduit	
31.002	7.570	0.618	12.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
32.000	11.963	0.120	99.7	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
32.001	18.858	0.126	149.7	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	
31.003	15.181	0.101	150.3	0.001	0.00	0.0	0.600	o	150	Pipe/Conduit	
33.000	7.916	0.423	18.7	0.007	5.00	0.0	0.600	o	100	Pipe/Conduit	
31.004	15.705	0.079	200.0	0.027	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)
29.000	5.00	5.11	128.864	0.003	0.0	0.0	0.0	1.33	10.4	0.0
28.001	5.00	5.31	128.600	0.010	0.0	0.0	0.0	1.21	9.5	0.1
28.002	5.00	5.44	128.305	0.012	0.0	0.0	0.0	1.00	7.9	0.2
30.000	5.00	5.04	128.732	0.003	0.0	0.0	0.0	2.35	18.5	0.0
28.003	5.00	5.58	128.128	0.015	0.0	0.0	0.0	0.92	16.2	0.2
31.000	5.00	5.06	127.973	0.004	0.0	0.0	0.0	1.92	15.1	0.1
31.001	5.00	5.52	127.567	0.017	0.0	0.0	0.0	0.77	6.0	0.2
31.002	5.00	5.56	127.305	0.017	0.0	0.0	0.0	2.89	51.2	0.2
32.000	5.00	5.26	126.983	0.005	0.0	0.0	0.0	0.77	6.0	0.1
32.001	5.00	5.64	126.813	0.013	0.0	0.0	0.0	0.82	14.5	0.2
31.003	5.00	5.95	126.687	0.031	0.0	0.0	0.0	0.82	14.4	0.4
33.000	5.00	5.07	127.059	0.007	0.0	0.0	0.0	1.79	14.1	0.1
31.004	5.00	6.24	126.511	0.065	0.0	0.0	0.0	0.92	36.6	0.9

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
31.005	18.376	0.092	199.7	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
34.000	22.275	0.247	90.2	0.010	5.00	0.0	0.600	o	100	Pipe/Conduit	
34.001	6.388	0.566	11.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
31.006	9.136	0.050	182.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
35.000	10.096	0.083	121.6	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
35.001	2.804	0.894	3.1	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
31.007	17.412	0.044	395.7	0.016	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.012	11.122	0.066	168.5	0.018	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.013	33.645	0.200	168.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
36.000	19.782	0.752	26.3	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	
36.001	16.054	0.161	99.7	0.014	0.00	0.0	0.600	o	100	Pipe/Conduit	
37.000	25.525	0.859	29.7	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit	
36.002	14.598	0.941	15.5	0.003	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)
31.005	5.00	6.57	126.432	0.081	0.0	0.0	0.0	0.92	36.6	1.1
34.000	5.00	5.46	127.278	0.010	0.0	0.0	0.0	0.81	6.4	0.1
34.001	5.00	5.50	127.031	0.010	0.0	0.0	0.0	2.31	18.2	0.1
31.006	5.00	6.73	126.340	0.091	0.0	0.0	0.0	0.96	38.3	1.2
35.000	5.00	5.24	128.226	0.004	0.0	0.0	0.0	0.70	5.5	0.1
35.001	5.00	5.25	128.143	0.004	0.0	0.0	0.0	4.40	34.6	0.1
31.007	5.00	6.85	124.715	0.111	0.0	0.0	0.0	2.40	6117.1	1.5
1.012	5.00	7.46	124.671	0.633	0.0	0.0	0.0	1.00	39.9	8.6
1.013	5.00	8.02	124.605	0.633	0.0	0.0	0.0	1.01	40.0	8.6
36.000	5.00	5.22	130.154	0.011	0.0	0.0	0.0	1.51	11.9	0.1
36.001	5.00	5.57	129.402	0.025	0.0	0.0	0.0	0.77	6.0	0.3
37.000	5.00	5.30	130.100	0.009	0.0	0.0	0.0	1.42	11.2	0.1
36.002	5.00	5.69	129.241	0.037	0.0	0.0	0.0	1.97	15.5	0.5

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
38.000	8.191	0.102	80.3	0.010	5.00	0.0	0.600	o	100	Pipe/Conduit	
38.001	15.685	0.549	28.6	0.006	0.00	0.0	0.600	o	100	Pipe/Conduit	
36.003	15.964	0.534	29.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
39.000	9.868	0.348	28.4	0.002	5.00	0.0	0.600	o	100	Pipe/Conduit	
39.001	19.720	1.178	16.7	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
36.004	12.942	0.117	110.6	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	
36.005	9.378	0.112	83.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
40.000	38.402	0.863	44.5	0.025	5.00	0.0	0.600	o	100	Pipe/Conduit	
36.006	2.335	0.087	26.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.014	21.986	0.131	167.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.015	18.842	0.112	168.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.016	4.994	0.662	7.5	0.015	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)
38.000	5.00	5.16	129.075	0.010	0.0	0.0	0.0	0.86	6.7	0.1
38.001	5.00	5.34	128.973	0.016	0.0	0.0	0.0	1.45	11.4	0.2
36.003	5.00	5.83	128.250	0.057	0.0	0.0	0.0	1.85	32.7	0.8
39.000	5.00	5.11	129.292	0.002	0.0	0.0	0.0	1.45	11.4	0.0
39.001	5.00	5.29	128.944	0.006	0.0	0.0	0.0	1.90	14.9	0.1
36.004	5.00	6.06	127.716	0.067	0.0	0.0	0.0	0.95	16.9	0.9
36.005	5.00	6.20	127.599	0.067	0.0	0.0	0.0	1.10	19.4	0.9
40.000	5.00	5.55	128.400	0.025	0.0	0.0	0.0	1.16	9.1	0.3
36.006	5.00	6.22	127.487	0.092	0.0	0.0	0.0	1.95	34.5	1.2
1.014	5.00	8.38	124.405	0.725	0.0	0.0	0.0	1.01	40.0	9.8
1.015	5.00	8.70	124.274	0.725	0.0	0.0	0.0	1.01	40.0	9.8
1.016	5.00	8.71	124.162	0.740	0.0	0.0	0.0	4.79	190.6	10.0

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	R1	136.578	135.850	0.628	Open Manhole	450
1.001	o	100	S01	136.012	135.412	0.500	Open Manhole	450
2.000	o	100	R2	136.513	135.913	0.500	Open Manhole	450
1.002	o	100	S02	135.990	135.274	0.616	Open Manhole	450
3.000	o	100	R5	135.900	135.300	0.500	Open Manhole	450
3.001	o	100	S03	136.086	135.176	0.810	Open Manhole	450
4.000	o	100	R4	136.953	136.600	0.253	Open Manhole	450
3.002	o	100	S04	136.418	135.119	1.199	Open Manhole	450
3.003	o	100	S05	136.003	134.845	1.058	Open Manhole	450
1.003	o	150	S06	135.845	134.495	1.200	Open Manhole	1200
5.000	o	100	R7	134.325	133.625	0.600	Open Manhole	450
5.001	o	100	S07	134.300	133.500	0.700	Open Manhole	450
6.000	o	100	R8	134.800	134.128	0.572	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)
1.000	12.130	27.7	S01	136.012	135.412	0.500	Open Manhole	450
1.001	13.774	99.8	S02	135.990	135.274	0.616	Open Manhole	450
2.000	12.280	19.2	S02	135.990	135.274	0.616	Open Manhole	450
1.002	7.074	9.7	S06	135.845	134.545	1.200	Open Manhole	1200
3.000	12.368	99.7	S03	136.086	135.176	0.810	Open Manhole	450
3.001	5.744	100.8	S04	136.418	135.119	1.199	Open Manhole	450
4.000	14.503	9.8	S04	136.418	135.119	1.199	Open Manhole	450
3.002	16.189	59.1	S05	136.003	134.845	1.058	Open Manhole	450
3.003	8.181	27.3	S06	135.845	134.545	1.200	Open Manhole	1200
1.003	25.181	11.8	S09	133.368	132.355	0.863	Open Manhole	1800
5.000	9.905	79.2	S07	134.300	133.500	0.700	Open Manhole	450
5.001	14.030	20.8	S08	134.018	132.824	1.094	Open Manhole	450
6.000	20.911	16.0	S08	134.018	132.824	1.094	Open Manhole	450

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)
5.002	o	100	S08	134.018	132.824	1.094	Open Manhole	450
1.004	o	675	S09	133.368	131.000	1.693	Open Manhole	1800
7.000	o	100	R9	133.047	132.434	0.513	Open Manhole	450
7.001	o	100	S10	132.956	131.922	0.934	Open Manhole	450
8.000	o	100	R10	133.497	132.897	0.500	Open Manhole	450
8.001	o	100	S11	133.059	132.351	0.608	Open Manhole	450
7.002	o	100	S12	132.519	131.800	0.619	Open Manhole	450
9.000	o	100	R11	132.284	131.684	0.500	Open Manhole	450
9.001	o	100	S13	132.279	131.516	0.663	Open Manhole	450
9.002	o	150	S14	132.389	131.278	0.961	Open Manhole	450
7.003	o	150	S15	132.607	131.183	1.274	Open Manhole	450
7.004	o	150	S16	132.893	131.119	1.624	Open Manhole	450
1.005	o	900	S17	133.223	130.268	2.055	Open Manhole	2100

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)
5.002	7.107	17.0	S09	133.368	132.405	0.863	Open Manhole	1800
1.004	12.963	25.6	S17	133.223	130.493	2.055	Open Manhole	2100
7.000	15.070	29.4	S10	132.956	131.922	0.934	Open Manhole	450
7.001	12.191	99.9	S12	132.519	131.800	0.619	Open Manhole	450
8.000	14.443	26.5	S11	133.059	132.351	0.608	Open Manhole	450
8.001	14.860	27.0	S12	132.519	131.800	0.619	Open Manhole	450
7.002	8.810	15.5	S15	132.607	131.233	1.274	Open Manhole	450
9.000	11.954	71.2	S13	132.279	131.516	0.663	Open Manhole	450
9.001	18.787	99.9	S14	132.389	131.328	0.961	Open Manhole	450
9.002	14.276	150.3	S15	132.607	131.183	1.274	Open Manhole	450
7.003	6.416	100.3	S16	132.893	131.119	1.624	Open Manhole	450
7.004	8.698	86.1	S17	133.223	131.018	2.055	Open Manhole	2100
1.005	27.837	103.9	S21	133.700	130.000	2.800	Open Manhole	2400

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)
10.000	o	100	R12	134.495	133.800	0.595	Open Manhole	450
11.000	o	100	R13	134.005	133.306	0.599	Open Manhole	450
10.001	o	100	S18	134.199	133.197	0.902	Open Manhole	450
12.000	o	100	R14	133.325	132.702	0.523	Open Manhole	450
10.002	o	100	S19	133.603	132.595	0.908	Open Manhole	450
13.000	o	100	R15	133.928	133.456	0.372	Open Manhole	450
10.003	o	100	S20	133.760	132.470	1.190	Open Manhole	450
1.006	o	900	S21	133.700	130.000	2.800	Open Manhole	2400
14.000	o	100	R16	133.600	133.000	0.500	Open Manhole	450
14.001	o	100	S22	133.901	132.872	0.929	Open Manhole	450
14.002	o	100	S23	133.864	132.692	1.072	Open Manhole	450
14.003	o	100	S24	133.547	132.531	0.916	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)
10.000	32.195	53.4	S18	134.199	133.197	0.902	Open Manhole	450
11.000	10.920	100.2	S18	134.199	133.197	0.902	Open Manhole	450
10.001	18.123	30.1	S19	133.603	132.595	0.908	Open Manhole	450
12.000	10.730	100.3	S19	133.603	132.595	0.908	Open Manhole	450
10.002	12.540	100.3	S20	133.760	132.470	1.190	Open Manhole	450
13.000	21.651	22.0	S20	133.760	132.470	1.190	Open Manhole	450
10.003	6.576	82.2	S21	133.700	132.390	1.210	Open Manhole	2400
1.006	25.607	324.1	S32	132.627	129.921	1.806	Open Manhole	2100
14.000	13.228	103.3	S22	133.901	132.872	0.929	Open Manhole	450
14.001	9.272	51.5	S23	133.864	132.692	1.072	Open Manhole	450
14.002	15.585	96.8	S24	133.547	132.531	0.916	Open Manhole	450
14.003	17.675	47.6	S28	132.874	132.160	0.614	Open Manhole	450

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)
15.000	o	100	S25	133.161	132.560	0.501	Open Manhole	450
15.001	o	100	S26	133.543	132.432	1.011	Open Manhole	450
14.004	o	100	S28	132.874	132.160	0.614	Open Manhole	450
16.000	o	100	R17	133.100	132.500	0.500	Open Manhole	450
16.001	o	100	S29	132.851	132.151	0.600	Open Manhole	450
16.002	o	100	S30	132.797	131.913	0.784	Open Manhole	450
17.000	o	100	R18	133.424	132.663	0.661	Open Manhole	450
16.003	o	100	S31	132.788	131.849	0.839	Open Manhole	450
1.007	o	300	S32	132.627	129.921	2.406	Open Manhole	2100
1.008	o	1800	48	131.550	125.000	4.750	Open Manhole	2700
18.000	o	100	49	130.085	129.383	0.602	Open Manhole	1200
18.001	o	100	S33	130.300	129.263	0.937	Open Manhole	450
19.000	o	100	50	130.064	129.464	0.500	Open Manhole	1200

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)
15.000	11.509	89.9	S26	133.543	132.432	1.011	Open Manhole	450
15.001	13.456	49.5	S28	132.874	132.160	0.614	Open Manhole	450
14.004	6.280	8.4	S32	132.627	131.410	1.117	Open Manhole	2100
16.000	21.015	60.2	S29	132.851	132.151	0.600	Open Manhole	450
16.001	14.053	59.0	S30	132.797	131.913	0.784	Open Manhole	450
16.002	3.790	59.2	S31	132.788	131.849	0.839	Open Manhole	450
17.000	19.719	24.2	S31	132.788	131.849	0.839	Open Manhole	450
16.003	5.872	5.2	S32	132.627	130.721	1.806	Open Manhole	2100
1.007	21.717	301.6	48	131.550	129.849	1.401	Open Manhole	2700
1.008	10.036	200.7	S43	131.084	124.950	4.334	Open Manhole	3000
18.000	12.005	100.0	S33	130.300	129.263	0.937	Open Manhole	450
18.001	10.114	42.9	S34	129.921	129.027	0.794	Open Manhole	450
19.000	12.481	28.6	S34	129.921	129.027	0.794	Open Manhole	450

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)
18.002	o	100	S34	129.921	129.027	0.794	Open Manhole	450
18.003	o	100	S35	130.546	128.914	1.532	Open Manhole	450
20.000	o	100	R21	130.600	130.000	0.500	Open Manhole	450
20.001	o	100	S36	130.657	129.896	0.661	Open Manhole	450
20.002	o	100	S37	131.443	129.704	1.639	Open Manhole	450
18.004	o	150	S38	131.069	128.650	2.269	Open Manhole	450
18.005	o	150	57	131.347	128.411	2.786	Open Manhole	1200
21.000	o	100	R22	132.100	131.500	0.500	Open Manhole	450
21.001	o	100	S39	132.188	131.432	0.656	Open Manhole	450
21.002	o	100	S40	132.357	131.236	1.021	Open Manhole	450
22.000	o	100	R23	131.811	131.273	0.438	Open Manhole	450
22.001	o	100	S41	131.098	129.987	1.011	Open Manhole	450
22.002	o	100	63	131.061	129.951	1.010	Open Manhole	1200
23.000	o	150	R25	130.766	130.116	0.500	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)
18.002	11.335	100.3	S35	130.546	128.914	1.532	Open Manhole	450
18.003	19.965	93.3	S38	131.069	128.700	2.269	Open Manhole	450
20.000	15.367	147.8	S36	130.657	129.896	0.661	Open Manhole	450
20.001	16.829	87.7	S37	131.443	129.704	1.639	Open Manhole	450
20.002	8.356	8.3	S38	131.069	128.700	2.269	Open Manhole	450
18.004	8.809	36.9	57	131.347	128.411	2.786	Open Manhole	1200
18.005	8.457	25.4	S43	131.084	128.078	2.856	Open Manhole	3000
21.000	6.785	99.8	S39	132.188	131.432	0.656	Open Manhole	450
21.001	11.575	59.1	S40	132.357	131.236	1.021	Open Manhole	450
21.002	29.154	20.6	S42	131.237	129.823	1.314	Open Manhole	450
22.000	20.875	16.2	S41	131.098	129.987	1.011	Open Manhole	450
22.001	3.637	101.0	63	131.061	129.951	1.010	Open Manhole	1200
22.002	12.756	99.7	S42	131.237	129.823	1.314	Open Manhole	450
23.000	16.845	49.1	S42	131.237	129.773	1.314	Open Manhole	450

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)
21.003	o	150	S42	131.237	129.773	1.314	Open Manhole	450
24.000	o	225	H01	129.663	126.696	2.742	Open Manhole	450
24.001	o	225	H02	130.448	126.645	3.578	Open Manhole	1200
1.009	o	1800	S43	131.084	124.950	4.334	Open Manhole	3000
1.010	o	1800	S44	130.408	124.862	3.746	Open Manhole	2700
25.000	o	100	R26	130.316	129.716	0.500	Open Manhole	450
25.001	o	100	S45	129.952	129.100	0.752	Open Manhole	450
26.000	o	100	R27	130.371	129.771	0.500	Open Manhole	450
27.000	o	100	R28	129.700	129.100	0.500	Open Manhole	450
25.002	o	100	S46	129.816	128.994	0.722	Open Manhole	450
1.011	o	1800	S47	129.822	124.780	3.242	Open Manhole	2700
28.000	o	100	R29	129.730	129.130	0.500	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)
21.003	5.919	100.3	S43	131.084	129.714	1.220	Open Manhole	3000
24.000	10.125	198.5	H02	130.448	126.645	3.578	Open Manhole	1200
24.001	24.010	200.1	S43	131.084	126.525	4.334	Open Manhole	3000
1.009	17.386	197.6	S44	130.408	124.862	3.746	Open Manhole	2700
1.010	16.483	201.0	S47	129.822	124.780	3.242	Open Manhole	2700
25.000	8.005	13.0	S45	129.952	129.100	0.752	Open Manhole	450
25.001	10.139	95.7	S46	129.816	128.994	0.722	Open Manhole	450
26.000	12.271	15.8	S46	129.816	128.994	0.722	Open Manhole	450
27.000	5.712	53.9	S46	129.816	128.994	0.722	Open Manhole	450
25.002	5.679	4.0	S47	129.822	127.583	2.139	Open Manhole	2700
1.011	21.729	199.3	S64	129.154	124.671	2.683	Open Manhole	3000
28.000	13.507	25.5	S49	129.496	128.600	0.796	Open Manhole	450

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)
29.000	o	100	R30	129.502	128.864	0.538	Open Manhole	450
28.001	o	100	S49	129.496	128.600	0.796	Open Manhole	450
28.002	o	100	S50	129.005	128.305	0.600	Open Manhole	450
30.000	o	100	R31	129.371	128.732	0.539	Open Manhole	450
28.003	o	150	S51	129.218	128.128	0.940	Open Manhole	450
31.000	o	100	S52	128.532	127.973	0.459	Open Manhole	450
31.001	o	100	S53	128.568	127.567	0.901	Open Manhole	450
31.002	o	150	S54	127.978	127.305	0.523	Open Manhole	450
32.000	o	100	RE37	127.853	126.983	0.770	Open Manhole	450
32.001	o	150	S55	127.540	126.813	0.577	Open Manhole	450
31.003	o	150	S56	127.648	126.687	0.811	Open Manhole	450
33.000	o	100	S57A	127.659	127.059	0.500	Open Manhole	450
31.004	o	225	S57	127.772	126.511	1.036	Open Manhole	1500

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)
29.000	8.997	34.1	S49	129.496	128.600	0.796	Open Manhole	450
28.001	12.025	40.8	S50	129.005	128.305	0.600	Open Manhole	450
28.002	7.497	59.0	S51	129.218	128.178	0.940	Open Manhole	450
30.000	6.044	10.9	S51	129.218	128.178	0.940	Open Manhole	450
28.003	7.813	120.2	S64	129.154	128.063	0.941	Open Manhole	3000
31.000	6.618	16.3	S53	128.568	127.567	0.901	Open Manhole	450
31.001	21.177	99.9	S54	127.978	127.355	0.523	Open Manhole	450
31.002	7.570	12.2	S56	127.648	126.687	0.811	Open Manhole	450
32.000	11.963	99.7	S55	127.540	126.863	0.577	Open Manhole	450
32.001	18.858	149.7	S56	127.648	126.687	0.811	Open Manhole	450
31.003	15.181	150.3	S57	127.772	126.586	1.036	Open Manhole	1500
33.000	7.916	18.7	S57	127.772	126.636	1.036	Open Manhole	1500
31.004	15.705	200.0	S58	127.888	126.432	1.231	Open Manhole	1800

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)
31.005	o	225	S58	127.888	126.432	1.231	Open Manhole	1800
34.000	o	100	RE39	127.889	127.278	0.511	Open Manhole	450
34.001	o	100	S59	128.113	127.031	0.982	Open Manhole	450
31.006	o	225	S60	128.068	126.340	1.503	Open Manhole	1800
35.000	o	100	RE40	128.826	128.226	0.500	Open Manhole	450
35.001	o	100	S62	128.925	128.143	0.682	Open Manhole	450
31.007	o	1800	S63	128.549	124.715	2.034	Open Manhole	2700
1.012	o	225	S64	129.154	124.671	4.258	Open Manhole	3000
1.013	o	225	99	129.326	124.605	4.496	Open Manhole	1200
36.000	o	100	R32	130.764	130.154	0.510	Open Manhole	450
36.001	o	100	S53	130.452	129.402	0.950	Open Manhole	450
37.000	o	100	R33	130.700	130.100	0.500	Open Manhole	450
36.002	o	100	S54	130.018	129.241	0.677	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)
31.005	18.376	199.7	S60	128.068	126.340	1.503	Open Manhole	1800
34.000	22.275	90.2	S59	128.113	127.031	0.982	Open Manhole	450
34.001	6.388	11.3	S60	128.068	126.465	1.503	Open Manhole	1800
31.006	9.136	182.7	S63	128.549	126.290	2.034	Open Manhole	2700
35.000	10.096	121.6	S62	128.925	128.143	0.682	Open Manhole	450
35.001	2.804	3.1	S63	128.549	127.249	1.200	Open Manhole	2700
31.007	17.412	395.7	S64	129.154	124.671	2.683	Open Manhole	3000
1.012	11.122	168.5	99	129.326	124.605	4.496	Open Manhole	1200
1.013	33.645	168.2	112	128.811	124.405	4.181	Open Manhole	1500
36.000	19.782	26.3	S53	130.452	129.402	0.950	Open Manhole	450
36.001	16.054	99.7	S54	130.018	129.241	0.677	Open Manhole	450
37.000	25.525	29.7	S54	130.018	129.241	0.677	Open Manhole	450
36.002	14.598	15.5	S56	128.920	128.300	0.520	Open Manhole	450

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)
38.000	o	100	R34	129.709	129.075	0.534	Open Manhole	450
38.001	o	100	S55	129.962	128.973	0.889	Open Manhole	450
36.003	o	150	S56	128.920	128.250	0.520	Open Manhole	450
39.000	o	100	R35	129.892	129.292	0.500	Open Manhole	450
39.001	o	100	S57	129.644	128.944	0.600	Open Manhole	450
36.004	o	150	S58	128.804	127.716	0.938	Open Manhole	450
36.005	o	150	110	128.595	127.599	0.846	Open Manhole	1200
40.000	o	100	R36	129.247	128.400	0.747	Open Manhole	450
36.006	o	150	S59	128.437	127.487	0.800	Open Manhole	450
1.014	o	225	112	128.811	124.405	4.181	Open Manhole	1500
1.015	o	225	113	126.116	124.274	1.617	Open Manhole	1200
1.016	o	225	114	126.616	124.162	2.229	Open Manhole	1200

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)
38.000	8.191	80.3	S55	129.962	128.973	0.889	Open Manhole	450
38.001	15.685	28.6	S56	128.920	128.424	0.396	Open Manhole	450
36.003	15.964	29.9	S58	128.804	127.716	0.938	Open Manhole	450
39.000	9.868	28.4	S57	129.644	128.944	0.600	Open Manhole	450
39.001	19.720	16.7	S58	128.804	127.766	0.938	Open Manhole	450
36.004	12.942	110.6	110	128.595	127.599	0.846	Open Manhole	1200
36.005	9.378	83.7	S59	128.437	127.487	0.800	Open Manhole	450
40.000	38.402	44.5	S59	128.437	127.537	0.800	Open Manhole	450
36.006	2.335	26.8	112	128.811	127.400	1.261	Open Manhole	1500
1.014	21.986	167.8	113	126.116	124.274	1.617	Open Manhole	1200
1.015	18.842	168.2	114	126.616	124.162	2.229	Open Manhole	1200
1.016	4.994	7.5		126.000	123.500	2.275	Open Manhole	0

Online Controls for Storm

Orifice Manhole: S32, DS/PN: 1.007, Volume (m³): 24.3

Diameter (m) 0.101 Discharge Coefficient 0.600 Invert Level (m) 129.921

Orifice Manhole: S64, DS/PN: 1.012, Volume (m³): 116.9

Diameter (m) 0.106 Discharge Coefficient 0.600 Invert Level (m) 124.671

Complex Manhole: 112, DS/PN: 1.014, Volume (m³): 9.1

Hydro-Brake® Optimum

Unit Reference	MD-SHE-0148-1160-1500-1160
Design Head (m)	1.500
Design Flow (l/s)	11.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	148
Invert Level (m)	124.405
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	11.6
Flush-Flo™	0.442	11.6
Kick-Flo®	0.943	9.3
Mean Flow over Head Range	-	10.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.3	1.200	10.4	3.000	16.1	7.000	24.2
0.200	10.5	1.400	11.2	3.500	17.3	7.500	25.0
0.300	11.3	1.600	12.0	4.000	18.5	8.000	25.8
0.400	11.6	1.800	12.6	4.500	19.6	8.500	26.5
0.500	11.6	2.000	13.3	5.000	20.6	9.000	27.3
0.600	11.4	2.200	13.9	5.500	21.5	9.500	28.0
0.800	10.7	2.400	14.5	6.000	22.5		
1.000	9.6	2.600	15.1	6.500	23.3		

Orifice

Diameter (m) 0.130 Discharge Coefficient 0.600 Invert Level (m) 126.505

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	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.281
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.800	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
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, 180, 240, 360, 480, 600, 720, 960
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	R1	15 Winter	2	+0%					135.871
1.001	S01	15 Winter	2	+0%	100/15 Summer				135.448
2.000	R2	15 Winter	2	+0%					135.927
1.002	S02	15 Winter	2	+0%	100/15 Summer				135.309
3.000	R5	15 Winter	2	+0%					135.327
3.001	S03	15 Winter	2	+0%	100/15 Summer				135.204
4.000	R4	15 Winter	2	+0%					136.612
3.002	S04	15 Winter	2	+0%	100/15 Summer				135.158
3.003	S05	15 Winter	2	+0%					134.877
1.003	S06	15 Winter	2	+0%					134.533
5.000	R7	15 Winter	2	+0%					133.655
5.001	S07	15 Winter	2	+0%					133.522
6.000	R8	15 Winter	2	+0%					134.146
5.002	S08	15 Winter	2	+0%					132.857
1.004	S09	15 Winter	2	+0%	100/15 Winter				131.048
7.000	R9	15 Winter	2	+0%	100/60 Winter				132.458
7.001	S10	15 Winter	2	+0%	100/30 Summer				131.955
8.000	R10	15 Winter	2	+0%					132.914

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	R1	-0.079	0.000	0.10		1.1	OK	
1.001	S01	-0.064	0.000	0.27		1.5	OK	
2.000	R2	-0.086	0.000	0.05		0.6	OK	
1.002	S02	-0.065	0.000	0.26		4.7	OK	
3.000	R5	-0.073	0.000	0.16		0.9	OK	
3.001	S03	-0.072	0.000	0.17		0.9	OK	
4.000	R4	-0.088	0.000	0.03		0.6	OK	
3.002	S04	-0.061	0.000	0.32		2.4	OK	
3.003	S05	-0.068	0.000	0.22		2.4	OK	
1.003	S06	-0.112	0.000	0.14		7.1	OK	
5.000	R7	-0.070	0.000	0.19		1.2	OK	
5.001	S07	-0.078	0.000	0.10		1.3	OK	
6.000	R8	-0.082	0.000	0.07		1.1	OK	
5.002	S08	-0.067	0.000	0.23		3.1	OK	
1.004	S09	-0.627	0.000	0.01		13.4	OK	
7.000	R9	-0.076	0.000	0.13		1.4	OK	
7.001	S10	-0.067	0.000	0.23		1.3	OK	
8.000	R10	-0.083	0.000	0.07		0.8	OK	

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.
8.001	S11	15 Winter	2	+0%	100/30 Winter			
7.002	S12	15 Winter	2	+0%	100/15 Winter			
9.000	R11	15 Winter	2	+0%	100/15 Winter	100/30 Winter		
9.001	S13	15 Winter	2	+0%	100/15 Winter	100/30 Winter		
9.002	S14	15 Winter	2	+0%	100/15 Summer	100/30 Winter		
7.003	S15	15 Winter	2	+0%	100/15 Summer			
7.004	S16	15 Winter	2	+0%	100/15 Summer			
1.005	S17	30 Winter	2	+0%	100/15 Summer			
10.000	R12	15 Winter	2	+0%				
11.000	R13	15 Winter	2	+0%	100/15 Summer			
10.001	S18	15 Winter	2	+0%	100/15 Summer			
12.000	R14	15 Winter	2	+0%	30/15 Summer			
10.002	S19	15 Winter	2	+0%	30/15 Summer			
13.000	R15	15 Winter	2	+0%				
10.003	S20	15 Winter	2	+0%	2/15 Winter			
1.006	S21	30 Winter	2	+0%	30/60 Winter			
14.000	R16	15 Winter	2	+0%	100/15 Summer			
14.001	S22	15 Winter	2	+0%	100/15 Summer			
14.002	S23	15 Winter	2	+0%	100/15 Summer			
14.003	S24	15 Winter	2	+0%	100/15 Summer			
15.000	S25	15 Winter	2	+0%	100/60 Winter			
15.001	S26	15 Winter	2	+0%	100/30 Winter			
14.004	S28	15 Winter	2	+0%	100/30 Winter			
16.000	R17	15 Winter	2	+0%	100/30 Winter			
16.001	S29	15 Winter	2	+0%	100/30 Winter			
16.002	S30	15 Winter	2	+0%	100/15 Summer			
17.000	R18	15 Winter	2	+0%				
16.003	S31	15 Winter	2	+0%	100/30 Summer			
1.007	S32	30 Winter	2	+0%	2/15 Summer	100/60 Winter		
1.008	48	120 Winter	2	+0%	100/120 Winter			
18.000	49	15 Winter	2	+0%	100/15 Summer			
18.001	S33	15 Winter	2	+0%	100/15 Summer			
19.000	50	15 Winter	2	+0%	100/15 Summer			
18.002	S34	15 Winter	2	+0%	30/15 Summer			
18.003	S35	15 Winter	2	+0%	30/15 Summer			
20.000	R21	15 Winter	2	+0%				
20.001	S36	15 Winter	2	+0%				
20.002	S37	15 Winter	2	+0%				
18.004	S38	15 Winter	2	+0%				
18.005	57	15 Winter	2	+0%				
21.000	R22	15 Winter	2	+0%				
21.001	S39	15 Winter	2	+0%				
21.002	S40	15 Winter	2	+0%				
22.000	R23	15 Winter	2	+0%				
22.001	S41	15 Winter	2	+0%	100/15 Summer			
22.002	63	15 Winter	2	+0%	100/15 Summer			
23.000	R25	15 Winter	2	+0%				
21.003	S42	15 Winter	2	+0%	100/15 Summer			

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)	Pipe Flow (l/s)	Status	Level Exceeded
8.001	S11	132.374	-0.077	0.000	0.12		1.4	OK	
7.002	S12	131.832	-0.068	0.000	0.22		3.1	OK	
9.000	R11	131.704	-0.080	0.000	0.09		0.6	OK	5
9.001	S13	131.546	-0.070	0.000	0.19		1.1	OK	5
9.002	S14	131.323	-0.105	0.000	0.20		2.6	OK	5
7.003	S15	131.248	-0.085	0.000	0.39		5.8	OK	
7.004	S16	131.179	-0.090	0.000	0.34		5.8	OK	
1.005	S17	130.445	-0.723	0.000	0.02		20.9	OK	
10.000	R12	133.831	-0.069	0.000	0.20		1.6	OK	
11.000	R13	133.321	-0.085	0.000	0.05		0.3	OK	
10.001	S18	133.226	-0.071	0.000	0.18		1.9	OK	
12.000	R14	132.735	-0.067	0.000	0.24		1.4	OK	
10.002	S19	132.665	-0.030	0.000	0.82		4.7	OK	
13.000	R15	133.472	-0.084	0.000	0.06		0.8	OK	
10.003	S20	132.579	0.009	0.000	1.07		6.4	SURCHARGED	
1.006	S21	130.444	-0.456	0.000	0.02		13.6	OK	
14.000	R16	133.022	-0.078	0.000	0.11		0.6	OK	
14.001	S22	132.897	-0.075	0.000	0.14		1.1	OK	
14.002	S23	132.738	-0.054	0.000	0.43		2.5	OK	
14.003	S24	132.578	-0.053	0.000	0.45		3.8	OK	
15.000	S25	132.581	-0.079	0.000	0.10		0.6	OK	
15.001	S26	132.457	-0.075	0.000	0.13		1.1	OK	
14.004	S28	132.195	-0.065	0.000	0.26		4.9	OK	
16.000	R17	132.527	-0.073	0.000	0.16		1.2	OK	
16.001	S29	132.182	-0.069	0.000	0.21		1.6	OK	
16.002	S30	131.950	-0.063	0.000	0.29		2.0	OK	
17.000	R18	132.694	-0.069	0.000	0.20		2.4	OK	
16.003	S31	131.878	-0.071	0.000	0.18		4.3	OK	
1.007	S32	130.442	0.221	0.000	0.26		14.6	SURCHARGED	1
1.008	48	125.379	-1.421	0.000	0.00		12.6	OK	
18.000	49	129.405	-0.078	0.000	0.10		0.6	OK	
18.001	S33	129.285	-0.078	0.000	0.11		1.0	OK	
19.000	50	129.479	-0.085	0.000	0.06		0.6	OK	
18.002	S34	129.072	-0.055	0.000	0.41		2.3	OK	
18.003	S35	128.977	-0.037	0.000	0.71		4.3	OK	
20.000	R21	130.024	-0.076	0.000	0.13		0.6	OK	
20.001	S36	129.926	-0.070	0.000	0.20		1.2	OK	
20.002	S37	129.723	-0.081	0.000	0.08		1.6	OK	
18.004	S38	128.699	-0.101	0.000	0.24		6.1	OK	
18.005	57	128.456	-0.105	0.000	0.20		6.1	OK	
21.000	R22	131.519	-0.081	0.000	0.08		0.4	OK	
21.001	S39	131.458	-0.074	0.000	0.15		1.1	OK	
21.002	S40	131.268	-0.068	0.000	0.22		2.9	OK	
22.000	R23	131.294	-0.079	0.000	0.10		1.5	OK	
22.001	S41	130.024	-0.063	0.000	0.30		1.5	OK	
22.002	63	129.998	-0.053	0.000	0.44		2.5	OK	
23.000	R25	130.138	-0.128	0.000	0.05		1.2	OK	

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 (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
21.003	S42	129.847	-0.076	0.000	0.48		7.1	OK	

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.
24.000	H01	15 Winter	2	+0%	100/120 Winter			
24.001	H02	15 Winter	2	+0%	100/120 Winter			
1.009	S43	120 Winter	2	+0%	100/120 Summer			
1.010	S44	120 Winter	2	+0%	100/120 Summer			
25.000	R26	15 Winter	2	+0%				
25.001	S45	15 Winter	2	+0%	100/15 Summer			
26.000	R27	15 Winter	2	+0%				
27.000	R28	15 Winter	2	+0%				
25.002	S46	15 Winter	2	+0%				
1.011	S47	120 Winter	2	+0%	100/120 Summer			
28.000	R29	15 Winter	2	+0%				
29.000	R30	15 Winter	2	+0%				
28.001	S49	15 Winter	2	+0%				
28.002	S50	15 Winter	2	+0%				
30.000	R31	15 Winter	2	+0%				
28.003	S51	15 Winter	2	+0%				
31.000	S52	15 Winter	2	+0%				
31.001	S53	15 Winter	2	+0%	100/15 Summer			
31.002	S54	15 Winter	2	+0%	100/180 Winter			
32.000	RE37	15 Winter	2	+0%	100/120 Winter			
32.001	S55	15 Winter	2	+0%	100/120 Winter	100/240 Winter		
31.003	S56	15 Winter	2	+0%	100/15 Summer			
33.000	S57A	15 Winter	2	+0%	100/120 Winter			
31.004	S57	15 Winter	2	+0%	100/15 Summer			
31.005	S58	15 Winter	2	+0%	100/15 Summer			
34.000	RE39	15 Winter	2	+0%	100/180 Winter			
34.001	S59	15 Winter	2	+0%	100/120 Winter			
31.006	S60	15 Winter	2	+0%	100/15 Summer			
35.000	RE40	15 Winter	2	+0%				
35.001	S62	15 Winter	2	+0%				
31.007	S63	120 Winter	2	+0%	100/60 Winter			
1.012	S64	120 Winter	2	+0%	2/15 Summer			
1.013	99	120 Winter	2	+0%	2/15 Summer			
36.000	R32	15 Winter	2	+0%	100/15 Summer			
36.001	S53	15 Winter	2	+0%	30/15 Summer			
37.000	R33	15 Winter	2	+0%				
36.002	S54	15 Winter	2	+0%	100/15 Summer			
38.000	R34	15 Winter	2	+0%				
38.001	S55	15 Winter	2	+0%	100/15 Winter			
36.003	S56	15 Winter	2	+0%	100/15 Summer			
39.000	R35	15 Winter	2	+0%				
39.001	S57	15 Winter	2	+0%				
36.004	S58	15 Winter	2	+0%	30/15 Summer			
36.005	110	15 Winter	2	+0%	30/15 Summer			
40.000	R36	15 Winter	2	+0%	100/15 Summer			
36.006	S59	15 Winter	2	+0%	30/15 Summer			
1.014	112	120 Winter	2	+0%	2/15 Summer			
1.015	113	960 Summer	2	+0%				

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)	Pipe Flow (l/s)	Status	Level Exceeded
24.000	H01	126.755	-0.166	0.000	0.15		4.7	OK	
24.001	H02	126.701	-0.169	0.000	0.14		4.7	OK	
1.009	S43	125.379	-1.371	0.000	0.00		16.5	OK	
1.010	S44	125.379	-1.283	0.000	0.00		13.3	OK	
25.000	R26	129.727	-0.089	0.000	0.03		0.5	OK	
25.001	S45	129.138	-0.062	0.000	0.30		1.7	OK	
26.000	R27	129.783	-0.088	0.000	0.03		0.5	OK	
27.000	R28	129.116	-0.084	0.000	0.06		0.5	OK	
25.002	S46	129.015	-0.079	0.000	0.10		2.6	OK	
1.011	S47	125.379	-1.201	0.000	0.00		11.7	OK	
28.000	R29	129.141	-0.089	0.000	0.03		0.3	OK	
29.000	R30	128.878	-0.086	0.000	0.05		0.5	OK	
28.001	S49	128.626	-0.074	0.000	0.15		1.4	OK	
28.002	S50	128.338	-0.067	0.000	0.23		1.6	OK	
30.000	R31	128.743	-0.089	0.000	0.03		0.5	OK	
28.003	S51	128.167	-0.111	0.000	0.15		2.1	OK	
31.000	S52	127.987	-0.086	0.000	0.04		0.6	OK	
31.001	S53	127.610	-0.057	0.000	0.39		2.3	OK	
31.002	S54	127.327	-0.128	0.000	0.05		2.3	OK	
32.000	RE37	127.007	-0.076	0.000	0.13		0.8	OK	
32.001	S55	126.849	-0.114	0.000	0.13		1.8	OK	1
31.003	S56	126.744	-0.093	0.000	0.31		4.2	OK	
33.000	S57A	127.078	-0.081	0.000	0.08		1.1	OK	
31.004	S57	126.589	-0.147	0.000	0.26		8.5	OK	
31.005	S58	126.520	-0.138	0.000	0.32		10.4	OK	
34.000	RE39	127.312	-0.066	0.000	0.24		1.5	OK	
34.001	S59	127.051	-0.080	0.000	0.09		1.5	OK	
31.006	S60	126.435	-0.130	0.000	0.38		11.8	OK	
35.000	RE40	128.249	-0.077	0.000	0.12		0.6	OK	
35.001	S62	128.153	-0.090	0.000	0.02		0.6	OK	
31.007	S63	125.378	-1.137	0.000	0.00		5.1	OK	
1.012	S64	125.378	0.482	0.000	0.33		11.2	SURCHARGED	
1.013	99	125.206	0.376	0.000	0.30		11.4	SURCHARGED	
36.000	R32	130.179	-0.075	0.000	0.14		1.7	OK	
36.001	S53	129.458	-0.044	0.000	0.59		3.4	OK	
37.000	R33	130.124	-0.076	0.000	0.12		1.3	OK	
36.002	S54	129.282	-0.059	0.000	0.35		5.1	OK	
38.000	R34	129.108	-0.067	0.000	0.24		1.5	OK	
38.001	S55	129.004	-0.069	0.000	0.21		2.3	OK	
36.003	S56	128.302	-0.098	0.000	0.26		7.9	OK	
39.000	R35	129.303	-0.089	0.000	0.03		0.3	OK	
39.001	S57	128.959	-0.085	0.000	0.06		0.8	OK	
36.004	S58	127.801	-0.065	0.000	0.60		9.3	OK	
36.005	110	127.677	-0.072	0.000	0.54		9.3	OK	
40.000	R36	128.445	-0.055	0.000	0.41		3.7	OK	
36.006	S59	127.579	-0.058	0.000	0.70		12.9	OK	
1.014	112	125.180	0.550	0.000	0.32		11.6	SURCHARGED	

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 (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	113	124.361	-0.138	0.000	0.32		11.6	OK	

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.	Water Level (m)
1.016	114	30 Winter	2	+0%					124.213

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.016	114	-0.174	0.000	0.12		13.2	OK	

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	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.281
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.800	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
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, 180, 240, 360, 480, 600, 720, 960
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	R1	15 Winter	30	+0%					135.879
1.001	S01	15 Winter	30	+0%	100/15 Summer				135.466
2.000	R2	15 Winter	30	+0%					135.933
1.002	S02	15 Winter	30	+0%	100/15 Summer				135.329
3.000	R5	15 Winter	30	+0%					135.337
3.001	S03	15 Winter	30	+0%	100/15 Summer				135.215
4.000	R4	15 Winter	30	+0%					136.616
3.002	S04	15 Winter	30	+0%	100/15 Summer				135.179
3.003	S05	15 Winter	30	+0%					134.893
1.003	S06	15 Winter	30	+0%					134.552
5.000	R7	15 Winter	30	+0%					133.667
5.001	S07	15 Winter	30	+0%					133.531
6.000	R8	15 Winter	30	+0%					134.152
5.002	S08	15 Winter	30	+0%					132.873
1.004	S09	15 Winter	30	+0%	100/15 Winter				131.079
7.000	R9	15 Winter	30	+0%	100/60 Winter				132.467
7.001	S10	15 Winter	30	+0%	100/30 Summer				131.969
8.000	R10	15 Winter	30	+0%					132.921

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	R1	-0.071	0.000	0.18		2.0	OK	
1.001	S01	-0.046	0.000	0.55		3.2	OK	
2.000	R2	-0.080	0.000	0.09		1.1	OK	
1.002	S02	-0.045	0.000	0.58		10.3	OK	
3.000	R5	-0.063	0.000	0.30		1.7	OK	
3.001	S03	-0.061	0.000	0.32		1.7	OK	
4.000	R4	-0.084	0.000	0.06		1.1	OK	
3.002	S04	-0.040	0.000	0.65		4.9	OK	
3.003	S05	-0.052	0.000	0.45		4.8	OK	
1.003	S06	-0.093	0.000	0.30		15.1	OK	
5.000	R7	-0.058	0.000	0.36		2.3	OK	
5.001	S07	-0.069	0.000	0.20		2.6	OK	
6.000	R8	-0.076	0.000	0.14		2.0	OK	
5.002	S08	-0.051	0.000	0.47		6.3	OK	
1.004	S09	-0.596	0.000	0.03		28.8	OK	
7.000	R9	-0.067	0.000	0.24		2.6	OK	
7.001	S10	-0.053	0.000	0.44		2.5	OK	
8.000	R10	-0.076	0.000	0.13		1.4	OK	

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.
8.001	S11	15 Winter	30	+0%	100/30 Winter			
7.002	S12	15 Winter	30	+0%	100/15 Winter			
9.000	R11	15 Winter	30	+0%	100/15 Winter	100/30 Winter		
9.001	S13	15 Winter	30	+0%	100/15 Winter	100/30 Winter		
9.002	S14	15 Winter	30	+0%	100/15 Summer	100/30 Winter		
7.003	S15	15 Winter	30	+0%	100/15 Summer			
7.004	S16	15 Winter	30	+0%	100/15 Summer			
1.005	S17	60 Winter	30	+0%	100/15 Summer			
10.000	R12	15 Winter	30	+0%				
11.000	R13	15 Winter	30	+0%	100/15 Summer			
10.001	S18	15 Winter	30	+0%	100/15 Summer			
12.000	R14	15 Winter	30	+0%	30/15 Summer			
10.002	S19	15 Winter	30	+0%	30/15 Summer			
13.000	R15	15 Winter	30	+0%				
10.003	S20	15 Winter	30	+0%	2/15 Winter			
1.006	S21	60 Winter	30	+0%	30/60 Winter			
14.000	R16	15 Winter	30	+0%	100/15 Summer			
14.001	S22	15 Winter	30	+0%	100/15 Summer			
14.002	S23	15 Winter	30	+0%	100/15 Summer			
14.003	S24	15 Winter	30	+0%	100/15 Summer			
15.000	S25	15 Winter	30	+0%	100/60 Winter			
15.001	S26	15 Winter	30	+0%	100/30 Winter			
14.004	S28	15 Winter	30	+0%	100/30 Winter			
16.000	R17	15 Winter	30	+0%	100/30 Winter			
16.001	S29	15 Winter	30	+0%	100/30 Winter			
16.002	S30	15 Winter	30	+0%	100/15 Summer			
17.000	R18	15 Winter	30	+0%				
16.003	S31	15 Winter	30	+0%	100/30 Summer			
1.007	S32	60 Winter	30	+0%	2/15 Summer	100/60 Winter		
1.008	48	180 Winter	30	+0%	100/120 Winter			
18.000	49	15 Winter	30	+0%	100/15 Summer			
18.001	S33	15 Winter	30	+0%	100/15 Summer			
19.000	50	15 Winter	30	+0%	100/15 Summer			
18.002	S34	15 Winter	30	+0%	30/15 Summer			
18.003	S35	15 Winter	30	+0%	30/15 Summer			
20.000	R21	15 Winter	30	+0%				
20.001	S36	15 Winter	30	+0%				
20.002	S37	15 Winter	30	+0%				
18.004	S38	15 Winter	30	+0%				
18.005	57	15 Winter	30	+0%				
21.000	R22	15 Winter	30	+0%				
21.001	S39	15 Winter	30	+0%				
21.002	S40	15 Winter	30	+0%				
22.000	R23	15 Winter	30	+0%				
22.001	S41	15 Winter	30	+0%	100/15 Summer			
22.002	63	15 Winter	30	+0%	100/15 Summer			
23.000	R25	15 Winter	30	+0%				
21.003	S42	15 Winter	30	+0%	100/15 Summer			

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)	Pipe Flow (l/s)	Status	Level Exceeded
8.001	S11	132.386	-0.065	0.000	0.26		2.9	OK	
7.002	S12	131.847	-0.053	0.000	0.44		6.3	OK	
9.000	R11	131.712	-0.072	0.000	0.17		1.1	OK	5
9.001	S13	131.560	-0.056	0.000	0.40		2.3	OK	5
9.002	S14	131.349	-0.079	0.000	0.44		5.9	OK	5
7.003	S15	131.288	-0.045	0.000	0.81		12.1	OK	
7.004	S16	131.215	-0.054	0.000	0.73		12.2	OK	
1.005	S17	130.918	-0.250	0.000	0.02		27.4	OK	
10.000	R12	133.843	-0.057	0.000	0.38		3.1	OK	
11.000	R13	133.327	-0.079	0.000	0.10		0.6	OK	
10.001	S18	133.238	-0.059	0.000	0.34		3.6	OK	
12.000	R14	133.064	0.262	0.000	0.43		2.4	FLOOD RISK	
10.002	S19	133.046	0.351	0.000	1.44		8.2	SURCHARGED	
13.000	R15	133.478	-0.078	0.000	0.11		1.4	OK	
10.003	S20	132.787	0.217	0.000	1.90		11.4	SURCHARGED	
1.006	S21	130.915	0.015	0.000	0.02		17.0	SURCHARGED	
14.000	R16	133.031	-0.069	0.000	0.20		1.1	OK	
14.001	S22	132.909	-0.063	0.000	0.30		2.3	OK	
14.002	S23	132.775	-0.017	0.000	0.96		5.6	OK	
14.003	S24	132.630	-0.001	0.000	1.00		8.4	OK	
15.000	S25	132.590	-0.070	0.000	0.19		1.1	OK	
15.001	S26	132.469	-0.063	0.000	0.29		2.3	OK	
14.004	S28	132.214	-0.046	0.000	0.57		10.7	OK	
16.000	R17	132.538	-0.062	0.000	0.30		2.2	OK	
16.001	S29	132.197	-0.054	0.000	0.42		3.1	OK	
16.002	S30	131.970	-0.043	0.000	0.60		4.0	OK	
17.000	R18	132.706	-0.057	0.000	0.38		4.5	OK	
16.003	S31	131.891	-0.058	0.000	0.35		8.5	OK	
1.007	S32	130.913	0.692	0.000	0.37		20.7	SURCHARGED	1
1.008	48	125.995	-0.805	0.000	0.01		17.0	OK	
18.000	49	129.413	-0.070	0.000	0.20		1.1	OK	
18.001	S33	129.296	-0.067	0.000	0.23		2.0	OK	
19.000	50	129.486	-0.078	0.000	0.11		1.1	OK	
18.002	S34	129.276	0.149	0.000	0.83		4.7	SURCHARGED	
18.003	S35	129.207	0.193	0.000	1.36		8.2	SURCHARGED	
20.000	R21	130.033	-0.067	0.000	0.24		1.1	OK	
20.001	S36	129.942	-0.054	0.000	0.42		2.6	OK	
20.002	S37	129.733	-0.071	0.000	0.18		3.5	OK	
18.004	S38	128.723	-0.077	0.000	0.47		12.1	OK	
18.005	57	128.476	-0.085	0.000	0.39		12.1	OK	
21.000	R22	131.526	-0.074	0.000	0.16		0.9	OK	
21.001	S39	131.471	-0.061	0.000	0.32		2.4	OK	
21.002	S40	131.286	-0.050	0.000	0.50		6.6	OK	
22.000	R23	131.303	-0.070	0.000	0.19		2.8	OK	
22.001	S41	130.041	-0.046	0.000	0.56		2.8	OK	
22.002	63	130.027	-0.024	0.000	0.90		5.2	OK	
23.000	R25	130.147	-0.119	0.000	0.10		2.3	OK	

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 (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
21.003	S42	129.911	-0.012	0.000	1.00		14.8	OK	

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.
24.000	H01	15 Winter	30	+0%	100/120 Winter			
24.001	H02	15 Winter	30	+0%	100/120 Winter			
1.009	S43	180 Winter	30	+0%	100/120 Summer			
1.010	S44	180 Winter	30	+0%	100/120 Summer			
25.000	R26	15 Winter	30	+0%				
25.001	S45	15 Winter	30	+0%	100/15 Summer			
26.000	R27	15 Winter	30	+0%				
27.000	R28	15 Winter	30	+0%				
25.002	S46	15 Winter	30	+0%				
1.011	S47	180 Winter	30	+0%	100/120 Summer			
28.000	R29	15 Winter	30	+0%				
29.000	R30	15 Winter	30	+0%				
28.001	S49	15 Winter	30	+0%				
28.002	S50	15 Winter	30	+0%				
30.000	R31	15 Winter	30	+0%				
28.003	S51	15 Winter	30	+0%				
31.000	S52	15 Winter	30	+0%				
31.001	S53	15 Winter	30	+0%	100/15 Summer			
31.002	S54	15 Winter	30	+0%	100/180 Winter			
32.000	RE37	15 Winter	30	+0%	100/120 Winter			
32.001	S55	15 Winter	30	+0%	100/120 Winter	100/240 Winter		
31.003	S56	15 Winter	30	+0%	100/15 Summer			
33.000	S57A	15 Winter	30	+0%	100/120 Winter			
31.004	S57	15 Winter	30	+0%	100/15 Summer			
31.005	S58	15 Winter	30	+0%	100/15 Summer			
34.000	RE39	15 Winter	30	+0%	100/180 Winter			
34.001	S59	15 Winter	30	+0%	100/120 Winter			
31.006	S60	15 Winter	30	+0%	100/15 Summer			
35.000	RE40	15 Winter	30	+0%				
35.001	S62	15 Winter	30	+0%				
31.007	S63	180 Winter	30	+0%	100/60 Winter			
1.012	S64	180 Winter	30	+0%	2/15 Summer			
1.013	99	180 Winter	30	+0%	2/15 Summer			
36.000	R32	15 Winter	30	+0%	100/15 Summer			
36.001	S53	15 Winter	30	+0%	30/15 Summer			
37.000	R33	15 Winter	30	+0%				
36.002	S54	15 Winter	30	+0%	100/15 Summer			
38.000	R34	15 Winter	30	+0%				
38.001	S55	15 Winter	30	+0%	100/15 Winter			
36.003	S56	15 Winter	30	+0%	100/15 Summer			
39.000	R35	15 Winter	30	+0%				
39.001	S57	15 Winter	30	+0%				
36.004	S58	15 Winter	30	+0%	30/15 Summer			
36.005	110	15 Winter	30	+0%	30/15 Summer			
40.000	R36	15 Winter	30	+0%	100/15 Summer			
36.006	S59	15 Winter	30	+0%	30/15 Summer			
1.014	112	180 Winter	30	+0%	2/15 Summer			
1.015	113	360 Summer	30	+0%				

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)	Pipe Flow (l/s)	Status	Level Exceeded
24.000	H01	126.778	-0.143	0.000	0.29		8.8	OK	
24.001	H02	126.723	-0.147	0.000	0.26		8.8	OK	
1.009	S43	125.995	-0.755	0.000	0.01		21.4	OK	
1.010	S44	125.994	-0.668	0.000	0.00		15.2	OK	
25.000	R26	129.731	-0.085	0.000	0.06		0.9	OK	
25.001	S45	129.160	-0.040	0.000	0.67		3.9	OK	
26.000	R27	129.787	-0.084	0.000	0.06		0.9	OK	
27.000	R28	129.123	-0.077	0.000	0.12		0.9	OK	
25.002	S46	129.025	-0.069	0.000	0.21		5.6	OK	
1.011	S47	125.994	-0.586	0.000	0.00		12.0	OK	
28.000	R29	129.144	-0.086	0.000	0.05		0.6	OK	
29.000	R30	128.884	-0.080	0.000	0.09		0.9	OK	
28.001	S49	128.639	-0.061	0.000	0.33		2.9	OK	
28.002	S50	128.355	-0.050	0.000	0.49		3.5	OK	
30.000	R31	128.747	-0.085	0.000	0.05		0.9	OK	
28.003	S51	128.186	-0.092	0.000	0.31		4.3	OK	
31.000	S52	127.992	-0.081	0.000	0.08		1.1	OK	
31.001	S53	127.639	-0.028	0.000	0.87		5.1	OK	
31.002	S54	127.339	-0.116	0.000	0.11		5.0	OK	
32.000	RE37	127.017	-0.066	0.000	0.25		1.4	OK	
32.001	S55	126.867	-0.096	0.000	0.28		3.8	OK	1
31.003	S56	126.779	-0.058	0.000	0.68		9.1	OK	
33.000	S57A	127.085	-0.074	0.000	0.15		2.0	OK	
31.004	S57	126.636	-0.100	0.000	0.58		18.6	OK	
31.005	S58	126.573	-0.085	0.000	0.70		23.0	OK	
34.000	RE39	127.326	-0.052	0.000	0.45		2.8	OK	
34.001	S59	127.059	-0.072	0.000	0.17		2.8	OK	
31.006	S60	126.496	-0.069	0.000	0.81		25.4	OK	
35.000	RE40	128.258	-0.068	0.000	0.22		1.1	OK	
35.001	S62	128.156	-0.087	0.000	0.04		1.1	OK	
31.007	S63	125.993	-0.522	0.000	0.00		7.7	OK	
1.012	S64	125.993	1.097	0.000	0.32		10.9	SURCHARGED	
1.013	99	125.802	0.972	0.000	0.29		11.0	SURCHARGED	
36.000	R32	130.190	-0.064	0.000	0.27		3.1	OK	
36.001	S53	129.590	0.088	0.000	1.23		7.1	SURCHARGED	
37.000	R33	130.133	-0.067	0.000	0.23		2.5	OK	
36.002	S54	129.304	-0.037	0.000	0.71		10.4	OK	
38.000	R34	129.123	-0.052	0.000	0.46		2.8	OK	
38.001	S55	129.019	-0.054	0.000	0.43		4.6	OK	
36.003	S56	128.329	-0.071	0.000	0.53		16.0	OK	
39.000	R35	129.307	-0.085	0.000	0.05		0.6	OK	
39.001	S57	128.967	-0.077	0.000	0.12		1.8	OK	
36.004	S58	127.984	0.118	0.000	1.20		18.4	SURCHARGED	
36.005	110	127.825	0.076	0.000	1.05		18.1	SURCHARGED	
40.000	R36	128.468	-0.032	0.000	0.78		7.0	OK	
36.006	S59	127.700	0.063	0.000	1.33		24.6	SURCHARGED	
1.014	112	125.775	1.145	0.000	0.32		11.6	SURCHARGED	

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 (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	113	124.361	-0.138	0.000	0.32		11.6	OK	

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.	Water Level (m)
1.016	114	15 Summer	30	+0%					124.218

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.016	114	-0.169	0.000	0.14		15.7	OK	

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	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.281
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.800	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
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, 180, 240, 360, 480, 600, 720, 960
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	R1	15 Winter	100	+40%					135.890
1.001	S01	15 Winter	100	+40%	100/15 Summer				135.531
2.000	R2	15 Winter	100	+40%					135.939
1.002	S02	15 Winter	100	+40%	100/15 Summer				135.399
3.000	R5	15 Winter	100	+40%					135.353
3.001	S03	15 Winter	100	+40%	100/15 Summer				135.305
4.000	R4	15 Winter	100	+40%					136.622
3.002	S04	15 Winter	100	+40%	100/15 Summer				135.288
3.003	S05	15 Winter	100	+40%					134.912
1.003	S06	15 Winter	100	+40%					134.573
5.000	R7	15 Winter	100	+40%					133.684
5.001	S07	15 Winter	100	+40%					133.542
6.000	R8	15 Winter	100	+40%					134.162
5.002	S08	15 Winter	100	+40%					132.896
1.004	S09	60 Winter	100	+40%	100/15 Winter				132.636
7.000	R9	60 Winter	100	+40%	100/60 Winter				132.554
7.001	S10	60 Winter	100	+40%	100/30 Summer				132.529
8.000	R10	15 Winter	100	+40%					132.929

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	R1	-0.060	0.000	0.33		3.6	OK	
1.001	S01	0.019	0.000	0.98		5.6	SURCHARGED	
2.000	R2	-0.074	0.000	0.16		2.1	OK	
1.002	S02	0.025	0.000	1.01		18.0	SURCHARGED	
3.000	R5	-0.047	0.000	0.53		3.0	OK	
3.001	S03	0.029	0.000	0.62		3.3	SURCHARGED	
4.000	R4	-0.078	0.000	0.11		2.1	OK	
3.002	S04	0.069	0.000	1.11		8.4	SURCHARGED	
3.003	S05	-0.033	0.000	0.78		8.4	OK	
1.003	S06	-0.072	0.000	0.53		26.3	OK	
5.000	R7	-0.041	0.000	0.65		4.1	OK	
5.001	S07	-0.058	0.000	0.36		4.6	OK	
6.000	R8	-0.066	0.000	0.24		3.6	OK	
5.002	S08	-0.028	0.000	0.85		11.4	OK	
1.004	S09	0.961	0.000	0.03		28.0	SURCHARGED	
7.000	R9	0.020	0.000	0.26		2.7	SURCHARGED	
7.001	S10	0.507	0.000	0.48		2.7	SURCHARGED	
8.000	R10	-0.068	0.000	0.23		2.6	OK	

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.
8.001	S11	60 Winter	100	+40%	100/30 Winter			
7.002	S12	60 Winter	100	+40%	100/15 Winter			
9.000	R11	120 Winter	100	+40%	100/15 Winter	100/30 Winter		
9.001	S13	60 Winter	100	+40%	100/15 Winter	100/30 Winter		
9.002	S14	60 Winter	100	+40%	100/15 Summer	100/30 Winter		
7.003	S15	60 Winter	100	+40%	100/15 Summer			
7.004	S16	60 Winter	100	+40%	100/15 Summer			
1.005	S17	60 Winter	100	+40%	100/15 Summer			
10.000	R12	15 Winter	100	+40%				
11.000	R13	15 Winter	100	+40%	100/15 Summer			
10.001	S18	15 Winter	100	+40%	100/15 Summer			
12.000	R14	15 Winter	100	+40%	30/15 Summer			
10.002	S19	15 Winter	100	+40%	30/15 Summer			
13.000	R15	15 Winter	100	+40%				
10.003	S20	15 Winter	100	+40%	2/15 Winter			
1.006	S21	60 Winter	100	+40%	30/60 Winter			
14.000	R16	15 Winter	100	+40%	100/15 Summer			
14.001	S22	15 Winter	100	+40%	100/15 Summer			
14.002	S23	15 Winter	100	+40%	100/15 Summer			
14.003	S24	15 Winter	100	+40%	100/15 Summer			
15.000	S25	60 Winter	100	+40%	100/60 Winter			
15.001	S26	60 Winter	100	+40%	100/30 Winter			
14.004	S28	60 Winter	100	+40%	100/30 Winter			
16.000	R17	60 Winter	100	+40%	100/30 Winter			
16.001	S29	60 Winter	100	+40%	100/30 Winter			
16.002	S30	60 Winter	100	+40%	100/15 Summer			
17.000	R18	60 Winter	100	+40%				
16.003	S31	60 Winter	100	+40%	100/30 Summer			
1.007	S32	60 Winter	100	+40%	2/15 Summer	100/60 Winter		
1.008	48	240 Winter	100	+40%	100/120 Winter			
18.000	49	15 Winter	100	+40%	100/15 Summer			
18.001	S33	15 Winter	100	+40%	100/15 Summer			
19.000	50	15 Winter	100	+40%	100/15 Summer			
18.002	S34	15 Winter	100	+40%	30/15 Summer			
18.003	S35	15 Winter	100	+40%	30/15 Summer			
20.000	R21	15 Winter	100	+40%				
20.001	S36	15 Winter	100	+40%				
20.002	S37	15 Winter	100	+40%				
18.004	S38	15 Winter	100	+40%				
18.005	57	15 Winter	100	+40%				
21.000	R22	15 Winter	100	+40%				
21.001	S39	15 Winter	100	+40%				
21.002	S40	15 Winter	100	+40%				
22.000	R23	15 Winter	100	+40%				
22.001	S41	15 Winter	100	+40%	100/15 Summer			
22.002	63	15 Winter	100	+40%	100/15 Summer			
23.000	R25	15 Winter	100	+40%				
21.003	S42	15 Winter	100	+40%	100/15 Summer			

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)	Pipe Flow (l/s)	Status	Level Exceeded
8.001	S11	132.537	0.086	0.000	0.27		3.0	SURCHARGED	
7.002	S12	132.516	0.616	0.000	0.47		6.7	FLOOD RISK	
9.000	R11	132.284	0.500	0.191	0.31		2.1	FLOOD	5
9.001	S13	132.286	0.670	6.782	1.97		11.4	FLOOD	5
9.002	S14	132.395	0.967	6.352	0.90		11.9	FLOOD	5
7.003	S15	132.499	1.166	0.000	0.86		12.9	FLOOD RISK	
7.004	S16	132.560	1.291	0.000	0.78		13.0	SURCHARGED	
1.005	S17	132.633	1.465	0.000	0.03		38.2	SURCHARGED	
10.000	R12	133.862	-0.038	0.000	0.68		5.5	OK	
11.000	R13	133.595	0.189	0.000	0.18		1.0	SURCHARGED	
10.001	S18	133.587	0.290	0.000	0.61		6.5	SURCHARGED	
12.000	R14	133.324	0.522	0.000	1.37		7.7	FLOOD RISK	
10.002	S19	133.381	0.686	0.000	1.81		10.3	FLOOD RISK	
13.000	R15	133.487	-0.069	0.000	0.20		2.6	OK	
10.003	S20	133.074	0.504	0.000	2.67		16.0	SURCHARGED	
1.006	S21	132.631	1.731	0.000	0.04		28.8	SURCHARGED	
14.000	R16	133.410	0.310	0.000	0.39		2.2	FLOOD RISK	
14.001	S22	133.395	0.423	0.000	0.53		4.1	SURCHARGED	
14.002	S23	133.362	0.570	0.000	1.37		8.0	SURCHARGED	
14.003	S24	133.057	0.426	0.000	1.45		12.2	SURCHARGED	
15.000	S25	132.737	0.077	0.000	0.20		1.2	SURCHARGED	
15.001	S26	132.731	0.199	0.000	0.30		2.4	SURCHARGED	
14.004	S28	132.717	0.457	0.000	0.59		11.1	FLOOD RISK	
16.000	R17	132.735	0.135	0.000	0.32		2.4	SURCHARGED	
16.001	S29	132.718	0.467	0.000	0.45		3.4	FLOOD RISK	
16.002	S30	132.698	0.685	0.000	0.64		4.3	FLOOD RISK	
17.000	R18	132.740	-0.023	0.000	0.41		4.9	OK	
16.003	S31	132.688	0.739	0.000	0.38		9.1	FLOOD RISK	
1.007	S32	132.629	2.408	2.079	0.62		34.7	FLOOD	1
1.008	48	127.568	0.768	0.000	0.01		28.9	SURCHARGED	
18.000	49	129.727	0.244	0.000	0.44		2.5	SURCHARGED	
18.001	S33	129.713	0.350	0.000	0.46		3.9	SURCHARGED	
19.000	50	129.704	0.140	0.000	0.24		2.6	SURCHARGED	
18.002	S34	129.698	0.571	0.000	1.28		7.2	FLOOD RISK	
18.003	S35	129.601	0.587	0.000	1.90		11.4	SURCHARGED	
20.000	R21	130.046	-0.054	0.000	0.43		2.0	OK	
20.001	S36	129.963	-0.033	0.000	0.76		4.7	OK	
20.002	S37	129.743	-0.061	0.000	0.32		6.3	OK	
18.004	S38	128.746	-0.054	0.000	0.72		18.5	OK	
18.005	57	128.495	-0.066	0.000	0.60		18.6	OK	
21.000	R22	131.536	-0.064	0.000	0.28		1.5	OK	
21.001	S39	131.487	-0.045	0.000	0.58		4.3	OK	
21.002	S40	131.311	-0.025	0.000	0.91		11.9	OK	
22.000	R23	131.314	-0.059	0.000	0.35		5.1	OK	
22.001	S41	130.342	0.255	0.000	0.96		4.9	SURCHARGED	
22.002	63	130.308	0.257	0.000	1.49		8.5	SURCHARGED	
23.000	R25	130.158	-0.108	0.000	0.17		4.1	OK	

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)	Pipe Flow (l/s)	Status	Level Exceeded
21.003	S42	130.038	0.115	0.000	1.73		25.5	SURCHARGED	

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.
24.000	H01	240 Winter	100	+40%	100/120 Winter			
24.001	H02	240 Winter	100	+40%	100/120 Winter			
1.009	S43	240 Winter	100	+40%	100/120 Summer			
1.010	S44	240 Winter	100	+40%	100/120 Summer			
25.000	R26	15 Winter	100	+40%				
25.001	S45	15 Winter	100	+40%	100/15 Summer			
26.000	R27	15 Winter	100	+40%				
27.000	R28	15 Winter	100	+40%				
25.002	S46	15 Winter	100	+40%				
1.011	S47	240 Winter	100	+40%	100/120 Summer			
28.000	R29	15 Winter	100	+40%				
29.000	R30	15 Winter	100	+40%				
28.001	S49	15 Winter	100	+40%				
28.002	S50	15 Winter	100	+40%				
30.000	R31	15 Winter	100	+40%				
28.003	S51	15 Winter	100	+40%				
31.000	S52	15 Winter	100	+40%				
31.001	S53	15 Winter	100	+40%	100/15 Summer			
31.002	S54	240 Winter	100	+40%	100/180 Winter			
32.000	RE37	240 Winter	100	+40%	100/120 Winter			
32.001	S55	240 Winter	100	+40%	100/120 Winter	100/240 Winter		
31.003	S56	240 Winter	100	+40%	100/15 Summer			
33.000	S57A	240 Winter	100	+40%	100/120 Winter			
31.004	S57	240 Winter	100	+40%	100/15 Summer			
31.005	S58	240 Winter	100	+40%	100/15 Summer			
34.000	RE39	240 Winter	100	+40%	100/180 Winter			
34.001	S59	240 Winter	100	+40%	100/120 Winter			
31.006	S60	240 Winter	100	+40%	100/15 Summer			
35.000	RE40	15 Winter	100	+40%				
35.001	S62	15 Winter	100	+40%				
31.007	S63	240 Winter	100	+40%	100/60 Winter			
1.012	S64	240 Winter	100	+40%	2/15 Summer			
1.013	99	240 Winter	100	+40%	2/15 Summer			
36.000	R32	15 Winter	100	+40%	100/15 Summer			
36.001	S53	15 Winter	100	+40%	30/15 Summer			
37.000	R33	15 Winter	100	+40%				
36.002	S54	15 Winter	100	+40%	100/15 Summer			
38.000	R34	15 Winter	100	+40%				
38.001	S55	15 Winter	100	+40%	100/15 Winter			
36.003	S56	15 Winter	100	+40%	100/15 Summer			
39.000	R35	15 Winter	100	+40%				
39.001	S57	15 Winter	100	+40%				
36.004	S58	15 Winter	100	+40%	30/15 Summer			
36.005	110	15 Winter	100	+40%	30/15 Summer			
40.000	R36	15 Winter	100	+40%	100/15 Summer			
36.006	S59	15 Winter	100	+40%	30/15 Summer			
1.014	112	180 Winter	100	+40%	2/15 Summer			
1.015	113	180 Winter	100	+40%				

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)	Pipe Flow (l/s)	Status	Level Exceeded
24.000	H01	127.570	0.649	0.000	0.13		3.9	SURCHARGED	
24.001	H02	127.570	0.700	0.000	0.11		3.9	SURCHARGED	
1.009	S43	127.568	0.818	0.000	0.01		33.5	SURCHARGED	
1.010	S44	127.568	0.906	0.000	0.01		27.2	SURCHARGED	
25.000	R26	129.737	-0.079	0.000	0.10		1.5	OK	
25.001	S45	129.248	0.048	0.000	1.21		7.0	SURCHARGED	
26.000	R27	129.793	-0.078	0.000	0.11		1.5	OK	
27.000	R28	129.131	-0.069	0.000	0.21		1.5	OK	
25.002	S46	129.036	-0.058	0.000	0.37		10.0	OK	
1.011	S47	127.568	0.988	0.000	0.00		20.9	SURCHARGED	
28.000	R29	129.150	-0.080	0.000	0.09		1.0	OK	
29.000	R30	128.891	-0.073	0.000	0.16		1.5	OK	
28.001	S49	128.656	-0.044	0.000	0.59		5.3	OK	
28.002	S50	128.379	-0.026	0.000	0.88		6.4	OK	
30.000	R31	128.753	-0.079	0.000	0.09		1.5	OK	
28.003	S51	128.209	-0.069	0.000	0.56		7.9	OK	
31.000	S52	127.999	-0.074	0.000	0.15		2.1	OK	
31.001	S53	127.940	0.273	0.000	1.50		8.8	SURCHARGED	
31.002	S54	127.556	0.101	0.000	0.05		2.1	SURCHARGED	
32.000	RE37	127.544	0.461	0.000	0.11		0.6	SURCHARGED	
32.001	S55	127.543	0.580	3.114	0.43		5.9	FLOOD	1
31.003	S56	127.555	0.718	0.000	0.45		6.0	FLOOD RISK	
33.000	S57A	127.567	0.408	0.000	0.07		0.9	FLOOD RISK	
31.004	S57	127.566	0.830	0.000	0.25		8.1	FLOOD RISK	
31.005	S58	127.568	0.910	0.000	0.31		10.1	SURCHARGED	
34.000	RE39	127.572	0.194	0.000	0.20		1.2	SURCHARGED	
34.001	S59	127.570	0.439	0.000	0.08		1.2	SURCHARGED	
31.006	S60	127.568	1.003	0.000	0.36		11.3	SURCHARGED	
35.000	RE40	128.270	-0.056	0.000	0.40		2.1	OK	
35.001	S62	128.162	-0.081	0.000	0.08		2.0	OK	
31.007	S63	127.568	1.053	0.000	0.00		11.7	SURCHARGED	
1.012	S64	127.568	2.672	0.000	0.63		21.3	SURCHARGED	
1.013	99	126.725	1.895	0.000	0.57		21.3	SURCHARGED	
36.000	R32	130.400	0.146	0.000	0.45		5.2	SURCHARGED	
36.001	S53	130.299	0.797	0.000	1.85		10.7	FLOOD RISK	
37.000	R33	130.146	-0.054	0.000	0.42		4.6	OK	
36.002	S54	129.840	0.499	0.000	1.01		14.9	FLOOD RISK	
38.000	R34	129.149	-0.026	0.000	0.83		5.1	OK	
38.001	S55	129.097	0.024	0.000	0.76		8.2	SURCHARGED	
36.003	S56	128.868	0.468	0.000	0.77		23.4	FLOOD RISK	
39.000	R35	129.313	-0.079	0.000	0.10		1.0	OK	
39.001	S57	128.976	-0.068	0.000	0.22		3.2	OK	
36.004	S58	128.551	0.685	0.000	1.78		27.4	FLOOD RISK	
36.005	110	128.182	0.433	0.000	1.57		27.0	SURCHARGED	
40.000	R36	129.097	0.597	0.000	1.17		10.4	FLOOD RISK	
36.006	S59	127.903	0.266	0.000	2.03		37.5	SURCHARGED	
1.014	112	126.659	2.029	0.000	0.64		23.4	SURCHARGED	

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)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	113	124.406	-0.093	0.000	0.65		23.4	OK	

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.	Water Level (m)
1.016	114	180 Winter	100	+40%					124.231

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.016	114	-0.156	0.000	0.21		23.7	OK	

Appendix C – United Utilities Correspondence

Ann Bacon

From: Dodd, Matthew <Matthew.Dodd@uuplc.co.uk>
Sent: 29 November 2016 10:16
To: Chris Finneran
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for Church Raike, Chipping - Our ref - DE2891

Importance: High

Chris

We have carried out an assessment of your application which is based on the information provided; this pre development advice will be valid for 12 months

Foul

Foul will be allowed to drain to the public combined sewer network at an unrestricted rate.

Surface Water

Surface water from this site should drain to either soak away or directly to watercourse. Discharge rates and consents must be discussed and agreed with all interested parties.

Connection Application

Although we may discuss and agree discharge points & rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below

http://www.unitedutilities.com/connecting-public-sewer.aspx

Sewer Adoption Agreement

You may wish to offer the proposed new sewers for adoption. United Utilities assess adoption application based on Sewers adoption 6th Edition and for any pumping stations our company addenda document. Please refer to link below to obtain further guidance and application pack:

http://www.unitedutilities.com/sewer-adoption.aspx

Please be aware that on site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

Please note, if you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements of Sewers for adoption and United Utilities Asset Standards. The proposed design should give consideration to long term operability and give United Utilities a cost effective proposal for the life of the assets. Therefore, further to this enquiry should you wish to progress a Section 104 agreement, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 agreement, has been assessed and accepted in writing by United Utilities. Any works carried out prior to the technical assessment being approved is done entirely at the developers own risk and could be subject to change.

Regards

Matthew Dodd
Assistant Developer Engineer
Developer Services and Planning
Operational Services
United Utilities
T: 01925 679369 (internal 79369)
unitedutilities.com

From: Chris Finneran [mailto:cfinneran@scotthughesdesign.co.uk]
Sent: 15 November 2016 09:53
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Cc: Paul Graveney <pgraveney@scotthughesdesign.co.uk>
Subject: Pre-development Enquiry - Church Raike, Chipping

Good Morning,

Please find attached a predevelopment enquiry for a scheme in Chipping.

Kind Regards

Chris Finneran
BEng (Hons) MICE
Graduate Civil Engineer

scott hughes

2016 CN AWARDS FINALIST

www.scotthughesdesign.co.uk
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