



ONN POINT
CIVIL ENGINEERING

DRAINAGE **STRATEGY**

Sustainable Urban Drainage Systems

Prepared by

Rees Wedderburn

Civil Engineer

March 2025

Pagefield Hotel, 168 Gidlow Lane, Wigan

Project ref: 25-OP-1462	Prepared by: Rees Wedderburn	Client: ICI Developments
Note ref: 100	Date: 15.02.25	

1. Introduction

- 1.1. Onn Point was commissioned by the client to develop a detailed drainage strategy to support an existing SuD's report carried out by GeoSmart for the site known as Pagefield Hotel, 168 Gidlow Lane, located in Wigan.
- 1.2. This technical note should be read in conjunction with:
 - a) Proposed Drainage Strategy Layout – 25-OP-1462-A1-100_P01
 - b) Hydraulic Simulation Analysis

2. Development Proposal

- 2.1. The development proposal comprises of 18 properties along with associated access and parking.

It is proposed the runoff from the new impermeable areas will discharge into the adoptable surface water sewer at a limited discharge rate. The discharge rate has been set to 2.88 l/s to be confirmed by United Utilities.

3. Runoff Rate

- 3.1. As per Geo Smarts report a greenfield run-off rate has been calculated at 2.88l/s

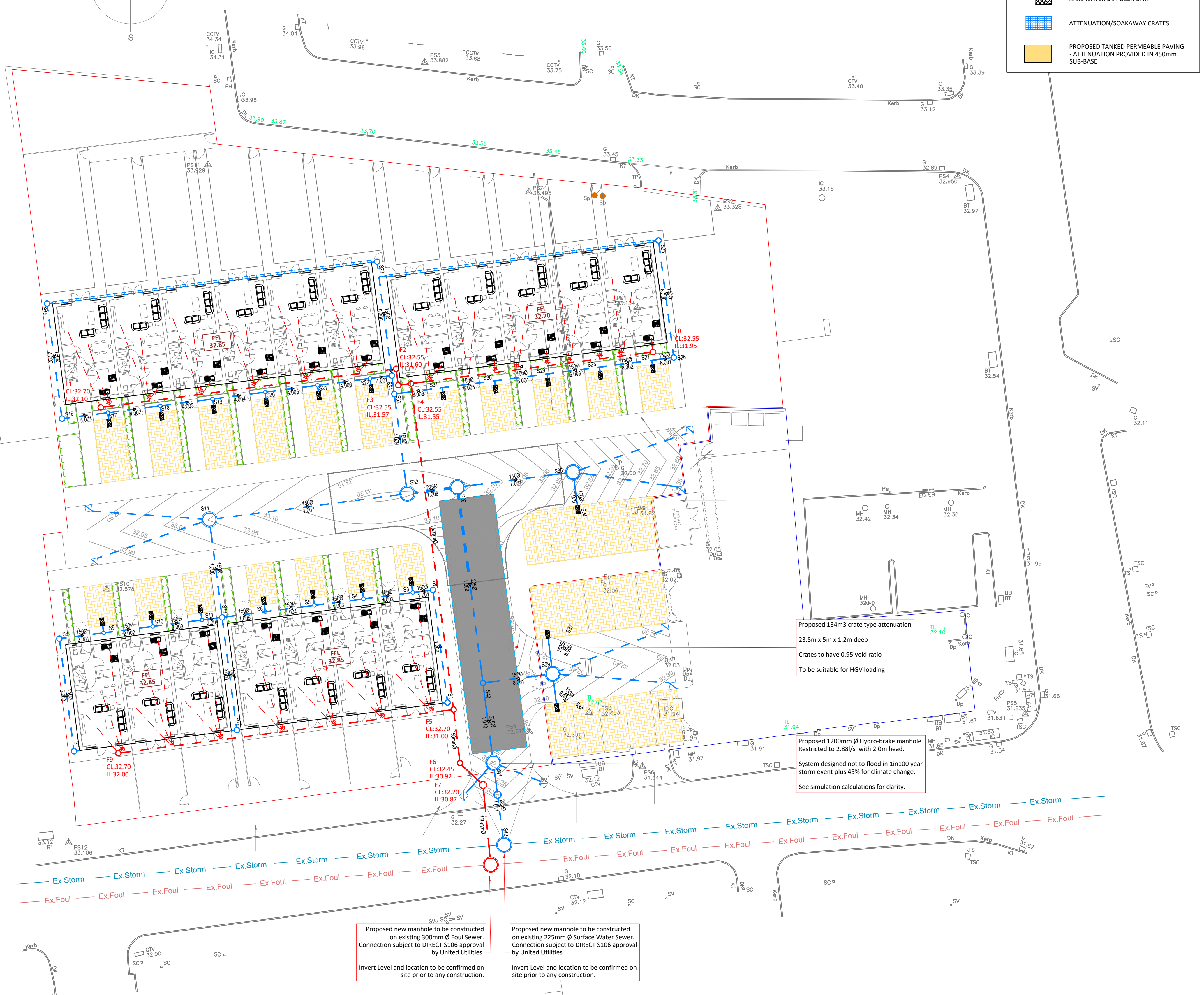
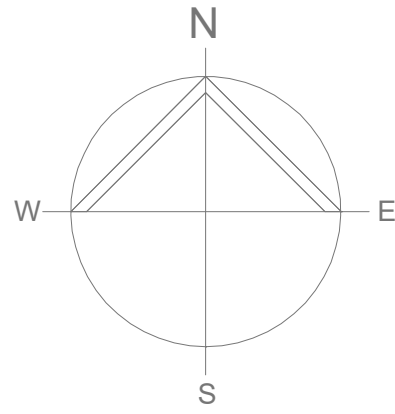
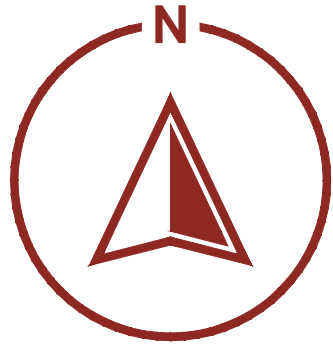
4. Attenuation Storage

- 4.1. Attenuation storage is provided to enable the runoff rate from the site into the receiving sewer to be limited to an acceptable rate to protect against flooding downstream.
- 4.2. The estimate storage volume has been calculated using FSR hydrological zones and factor for FEH, climate change and hydrological region. Using a hydraulic modelling software, the total required attenuation for the proposed development is approximately 190m³ in a 1 in 100 year plus 45% climate change event.
 - a) The attenuation storage is provided through tanked permeable surfacing to all parking areas (75m³)
 - b) Crate type attenuation sited within the access Road. (115.6m³)

5. Drainage Strategy

- 5.1. The proposed drainage system will comprise of rainwater pipes, pipes, manholes, attenuation crates and a flow control chamber.
- 5.2. In accordance with the CIRIA SuDS Manual and the LLFA guidance the proposed drainage system will be discharging via flow control chamber at 2.88 l/s to the surface water sewer.
- 5.3. To demonstrate the compliance of the proposed drainage strategy a Hydraulic simulation analysis for the drainage system has been carried out using Flow.
- 5.4. The proposed drainage strategy layout has been appended within this technical note.
- 5.5. The hydraulic simulation analysis results have been appended within this technical note.

APPENDIX A – Proposed Drainage Strategy



PHASE 0						
MH No.	MANHOLE DIMENSION (mm)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
S1	4500	32.750	32.100	0.500	636.053	-1107.635
S2	4500	32.750	31.997	0.603	634.718	-1097.408
S3	4500	32.750	31.979	0.621	632.930	-1097.633
S4	4500	32.750	31.932	0.668	628.260	-1098.234
S5	4500	32.750	31.889	0.711	623.977	-1098.795
S6	4500	32.750	31.845	0.755	619.649	-1099.367
S7	4500	32.750	32.100	0.500	602.130	-1112.060
S8	4500	32.750	31.997	0.603	600.786	-1101.853
S9	4500	32.750	31.954	0.646	605.011	-1101.261
S10	4500	32.750	31.912	0.688	609.204	-1100.730
S11	4500	32.750	31.868	0.734	613.763	-1100.138
S12	4500	32.750	32.100	0.500	618.910	-1110.132
S13	4500	32.750	31.804	0.796	615.576	-1099.905
S14	4500	33.050	31.714	1.186	614.417	-1091.027
S15	4500	32.700	32.100	0.450	599.684	-1071.525
S16	4500	32.700	32.004	0.546	600.927	-1081.055
S17	4500	32.700	31.961	0.589	605.165	-1080.499
S18	4500	32.700	31.913	0.637	609.929	-1079.981
S19	4500	32.700	31.865	0.685	614.693	-1079.267
S20	4500	32.700	31.816	0.732	619.359	-1078.657
S21	4500	32.700	31.767	0.783	624.398	-1077.989
S22	4500	32.700	31.721	0.829	628.983	-1077.393
S23	4500	32.700	32.100	0.450	629.843	-1087.617
S24	4500	32.700	31.702	0.848	630.987	-1077.147
S25	4500	32.550	32.100	0.300	655.218	-1065.791
S26	4500	32.550	32.003	0.397	656.861	-1075.354
S27	4500	32.700	31.963	0.367	654.671	-1075.597
S28	4500	32.700	31.934	0.616	649.785	-1076.232
S29	4500	32.700	31.887	0.663	645.165	-1076.825
S30	4500	32.700	31.838	0.712	640.311	-1077.450
S31	4500	32.700	31.789	0.761	635.365	-1078.096
S32	4500	32.700	31.687	0.963	631.083	-1078.653
S33	4500	33.200	31.458	1.517	632.391	-1088.682
S34	4500	32.850	32.100	0.600	648.227	-1091.149
S35	4500	32.850	32.055	0.745	647.454	-1096.717
S36	4500	33.150	31.431	1.494	636.945	-1088.088
S37	4500	32.350	32.100	0.100	647.747	-1100.453
S38	4500	32.350	32.100	0.100	648.127	-1106.752
S39	4500	32.420	32.037	0.233	646.594	-1105.053
S40	12000	32.550	30.325	2.000	639.263	-1105.859
S41	12000	32.300	30.277	1.798	640.294	-1112.947
S42	12000	32.100	30.223	1.652	641.238	-1121.002

KEY:

450mm (DIA MH)

PRIVATE SURFACE WATER PIPE

RODDING EYE

SEE SIMULATION CALCULATIONS FOR CLARITY

1200mm (DIA MH)

PRIVATE FOUL SEWER. PIPE TO BE 100mm IN DIAMETER UNLESS STATED OTHERWISE AND MANHOLE TO BE POLYTHENE 450mm IN DIAMETER UP TO 1m DEPTH AND 1200mm DIAMETER CONCRETE RINGS GRATER THAN 1m DEPTH OR WITHIN ROAD

RAIN WATER DIFFUSER UNIT

ATTENUATION/SOAKAWAY CRATES

PROPOSED TANKED PERMEABLE PAVING - ATTENUATION PROVIDED IN 450mm SUB-BASE

- NOTES
1.

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2.

WORK TO FIGURED DIMENSIONS ONLY.
3.

THIS DRAWING SHOULD ONLY BE USED AS INTENDED
4.

ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.
5.

ALL PRIVATE DRAINAGE WORKS ARE TO COMPLY WITH THE REQUIREMENTS OF BS 752 BUILDING DRAINAGE AND BUILDING REGULATIONS 2000 APPROVED DOCUMENT H 2002 EDITION.
6.

ALL ADAPTABLE DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DCG.
7.

ALL MATERIALS, UNLESS SPECIFIED OTHERWISE, SHALL COMPLY WITH THE RELEVANT BRITISH STANDARD. SOURCES OF MATERIALS ARE TO BE AGREED WITH THE EMPLOYER'S REPRESENTATIVE/ENGINEER IN ADVANCE OF THE WORKS.
8.

ANY DISCREPANCIES IN THE DETAILS SHOWN TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
9.

LOCATION AND LEVELS OF EXISTING DRAINAGE RUNS ARE BASED UPON SEWER RECORD PLANS AND MUST BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS.
10.

ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.
11.

ALL ADAPTABLE DRAINAGE AND FITTINGS TO BE FLEXIBLY JOINTED CLAYWARE TO BS EN295 OR CONCRETE TO BS5911 PART 100. FLEXIBLY JOINTED UPVC PIPES AND FITTINGS TO WIS No 4-13-05 MAY BE USED FOR PRIVATE BUILDING DRAINAGE SYSTEMS ONLY.
12.

TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 600mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADAPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS 5 (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 Dia AND 20-40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 Dia)
13.

BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL, ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL, FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL CLAY LUMPS AND LARGE STONES. TO BE COMPACTED IN AYERS NOT EXCEEDING 150mm THICK.
14.

CONCRETE MIXES INDICATED ON THIS DRAWING ARE DESIGNATED MIXES CONFORMING TO BS 8500-1, 2002.
15.

BACKGROUND PLAN BASED ON TOPOGRAPHIC SURVEY DATA CREATED BY OTHERS AND SUPPLIED FOR THE PURPOSE OF CARRYING OUR ENGINEERING WORKS. WE CANNOT BE HELD RESPONSIBLE FOR THE CONTENT, COMPLETENESS AND ACCURACY PROVIDED TO US BY OTHERS.
16.

PROPOSED HOUSING LAYOUT PROVIDED BY CLIENT. LOCATION OF RWPS AND SVPS ARE INDICATIVE ONLY AND SHOULD BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.

P01	Initial Issue - Preliminary	RJS	05.03.25
Rev	Description	By	Date

Status

FOR PLANNING

Science Park Wolverhampton, Glaisier Drive
Wolverhampton, WV10 9RU
Tel:01902 585 206 www.onn-point.co.uk

CLIENT

JHC N/W

PROJECT

PAGEFIELD HOTEL
168 GIDLOW LANE
WIGAN, WN6 7AW

DRAWING

PROPOSED DRAINAGE
STRATEGY

SCALE @ A1

DATE

DRAWN BY

CHECKED BY

1:200

MAR 25

RAW

RJS

PROJECT NO.

DWG NO.

REV.

25-OP-1462

100

P01

APPENDIX B – Hydraulic Simulation Analysis

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1	0.005	0.450	Unknown	32.750	32.100	0.500	636.053	-1107.635
S2	0.000	0.450	Unknown	32.750	31.997	0.603	634.718	-1097.408
S3	0.004	0.450	Unknown	32.750	31.979	0.621	632.930	-1097.633
S4	0.003	0.450	Unknown	32.750	31.932	0.668	628.260	-1098.234
S5	0.003	0.450	Unknown	32.750	31.889	0.711	623.977	-1098.795
S6	0.004	0.450	Unknown	32.750	31.845	0.755	619.649	-1099.367
S7	0.005	0.450	Unknown	32.750	32.100	0.500	602.130	-1112.060
S8	0.002	0.450	Unknown	32.750	31.997	0.603	600.796	-1101.833
S9	0.003	0.450	Unknown	32.750	31.954	0.646	605.011	-1101.261
S10	0.003	0.450	Unknown	32.750	31.912	0.688	609.204	-1100.730
S11	0.001	0.450	Unknown	32.750	31.866	0.734	613.763	-1100.138
S12	0.008	0.450	Unknown	32.750	32.100	0.500	616.910	-1110.132
S13	0.000	0.450	Unknown	32.750	31.804	0.796	615.576	-1099.905
S14	0.030	0.450	Unknown	33.050	31.714	1.186	614.417	-1091.027
S15	0.007	0.450	Unknown	32.700	32.100	0.450	599.684	-1071.525
S16	0.003	0.450	Unknown	32.700	32.004	0.546	600.927	-1081.055
S17	0.005	0.450	Unknown	32.700	31.961	0.589	605.165	-1080.499
S18	0.005	0.450	Unknown	32.700	31.913	0.637	609.929	-1079.881
S19	0.005	0.450	Unknown	32.700	31.865	0.685	614.693	-1079.257
S20	0.005	0.450	Unknown	32.700	31.818	0.732	619.359	-1078.657
S21	0.005	0.450	Unknown	32.700	31.767	0.783	624.398	-1077.989
S22	0.002	0.450	Unknown	32.700	31.721	0.829	628.983	-1077.393
S23	0.012	0.450	Unknown	32.700	32.100	0.450	629.643	-1067.617
S24	0.000	0.450	Unknown	32.700	31.702	0.848	630.887	-1077.147
S25	0.007	0.450	Unknown	32.550	32.100	0.300	655.218	-1065.791
S26	0.000	0.450	Unknown	32.550	32.003	0.397	656.661	-1075.354
S27	0.004	0.450	Unknown	32.700	31.983	0.567	654.671	-1075.587
S28	0.004	0.450	Unknown	32.700	31.934	0.616	649.785	-1076.232
S29	0.004	0.450	Unknown	32.700	31.887	0.663	645.165	-1076.825
S30	0.004	0.450	Unknown	32.700	31.838	0.712	640.311	-1077.450
S31	0.004	0.450	Unknown	32.700	31.789	0.761	635.365	-1078.096
S32	0.000	0.450	Unknown	32.700	31.687	0.863	631.083	-1078.653
S33	0.000	0.450	Unknown	33.200	31.458	1.517	632.391	-1088.682
S34	0.006	0.450	Unknown	32.850	32.100	0.600	648.227	-1091.149
S35	0.024	0.450	Unknown	32.950	32.055	0.745	647.454	-1086.717
S36	0.000	0.450	Unknown	33.150	31.431	1.494	636.945	-1088.088
S37	0.006	0.450	Unknown	32.350	32.100	0.100	647.747	-1100.453
S38	0.014	0.450	Unknown	32.350	32.100	0.100	648.127	-1108.752
S39	0.000	0.450	Unknown	32.420	32.037	0.233	645.594	-1105.033
S40	0.028	1.200	Type B	32.550	30.325	2.000	639.263	-1105.859
S41	0.000	1.200	Type B	32.300	30.277	1.798	640.294	-1112.947
S42	0.000	1.200	Type B	32.100	30.223	1.652	641.236	-1121.002

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1	32.100	S2	31.997	Circ	0.15mØ	10.313	100.0	0.600	0.500	0.603
1.001	S2	31.997	S3	31.979	Circ	0.15mØ	1.802	100.0	0.600	0.603	0.621
1.002	S3	31.979	S4	31.932	Circ	0.15mØ	4.709	100.0	0.600	0.621	0.668
1.003	S4	31.932	S5	31.889	Circ	0.15mØ	4.319	100.0	0.600	0.668	0.711
1.004	S5	31.889	S6	31.845	Circ	0.15mØ	4.366	100.0	0.600	0.711	0.755
1.005	S6	31.845	S13	31.804	Circ	0.15mØ	4.109	100.0	0.600	0.755	0.796
2.000	S7	32.100	S8	31.997	Circ	0.15mØ	10.313	100.0	0.600	0.500	0.603
2.001	S8	31.997	S9	31.954	Circ	0.15mØ	4.254	100.0	0.600	0.603	0.646
2.002	S9	31.954	S10	31.912	Circ	0.15mØ	4.226	100.0	0.600	0.646	0.688
2.003	S10	31.912	S11	31.866	Circ	0.15mØ	4.597	100.0	0.600	0.688	0.734
2.004	S11	31.866	S13	31.804	Circ	0.15mØ	1.828	29.3	0.600	0.734	0.796
3.000	S12	32.100	S13	31.804	Circ	0.15mØ	10.313	34.8	0.600	0.500	0.796
1.006	S13	31.804	S14	31.714	Circ	0.15mØ	8.954	100.0	0.600	0.796	1.186
1.007	S14	31.714	S33	31.533	Circ	0.15mØ	18.127	100.0	0.600	1.186	1.517
4.000	S15	32.100	S16	32.004	Circ	0.15mØ	9.611	100.0	0.600	0.450	0.546

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
4.001	S16	32.004	S17	31.961	Circ	0.15mØ	4.274	100.0	0.600	0.546	0.589
4.002	S17	31.961	S18	31.913	Circ	0.15mØ	4.804	100.0	0.600	0.589	0.637
4.003	S18	31.913	S19	31.865	Circ	0.15mØ	4.805	100.0	0.600	0.637	0.685
4.004	S19	31.865	S20	31.818	Circ	0.15mØ	4.704	100.0	0.600	0.685	0.732
4.005	S20	31.818	S21	31.767	Circ	0.15mØ	5.083	100.0	0.600	0.732	0.783
4.006	S21	31.767	S22	31.721	Circ	0.15mØ	4.624	100.0	0.600	0.783	0.829
4.007	S22	31.721	S24	31.702	Circ	0.15mØ	1.920	100.0	0.600	0.829	0.848
5.000	S23	32.100	S24	31.702	Circ	0.15mØ	9.611	24.1	0.600	0.450	0.848
4.008	S24	31.702	S32	31.687	Circ	0.15mØ	1.519	100.0	0.600	0.848	0.863
6.000	S25	32.100	S26	32.003	Circ	0.15mØ	9.672	100.0	0.600	0.300	0.397
6.001	S26	32.003	S27	31.983	Circ	0.15mØ	2.003	100.0	0.600	0.397	0.567
6.002	S27	31.983	S28	31.934	Circ	0.15mØ	4.928	100.0	0.600	0.567	0.616
6.003	S28	31.934	S29	31.887	Circ	0.15mØ	4.659	100.0	0.600	0.616	0.663
6.004	S29	31.887	S30	31.838	Circ	0.15mØ	4.894	100.0	0.600	0.663	0.712
6.005	S30	31.838	S31	31.789	Circ	0.15mØ	4.988	100.0	0.600	0.712	0.761
6.006	S31	31.789	S32	31.687	Circ	0.15mØ	4.318	42.3	0.600	0.761	0.863
4.009	S32	31.687	S33	31.533	Circ	0.15mØ	10.114	65.9	0.600	0.863	1.517
1.008	S33	31.458	S36	31.431	Circ	0.225mØ	4.592	167.0	0.600	1.517	1.494
7.000	S34	32.100	S35	32.055	Circ	0.15mØ	4.500	100.0	0.600	0.600	0.745
7.001	S35	32.055	S36	31.506	Circ	0.15mØ	10.598	19.3	0.600	0.745	1.494
1.009	S36	31.431	S40	30.325	Circ	0.225mØ	17.922	16.2	0.600	1.494	2.000
8.000	S37	32.100	S39	32.037	Circ	0.15mØ	5.061	79.9	0.600	0.100	0.233
9.000	S38	32.100	S39	32.037	Circ	0.15mØ	4.500	71.0	0.600	0.100	0.233
8.001	S39	32.037	S40	30.400	Circ	0.15mØ	6.385	3.9	0.600	0.233	2.000
1.010	S40	30.325	S41	30.277	Circ	0.225mØ	7.163	150.0	0.600	2.000	1.798
1.011	S41	30.277	S42	30.223	Circ	0.225mØ	8.110	150.0	0.600	1.798	1.652

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving15	S3	1.744	32.750	32.170	0.00000000	2.00	632.607	-1095.640
Permeable Paving16	S4	1.687	32.750	32.170	0.00000000	2.00	628.095	-1095.734
Permeable Paving17	S5	1.718	32.750	32.170	0.00000000	2.00	623.653	-1096.316
Permeable Paving18	S6	1.687	32.750	32.170	0.00000000	2.00	619.170	-1096.898
Permeable Paving21	S9	1.687	32.750	32.170	0.00000000	2.00	604.489	-1098.814
Permeable Paving20	S10	1.687	32.750	32.170	0.00000000	2.00	608.951	-1098.231
Permeable Paving19	S11	1.687	32.750	32.170	0.00000000	2.00	613.413	-1097.649
Permeable Paving1	S17	3.326	32.700	32.120	0.00000000	2.00	605.586	-1084.274
Permeable Paving2	S18	3.326	32.700	32.120	0.00000000	2.00	610.345	-1083.653
Permeable Paving3	S19	3.326	32.700	32.120	0.00000000	2.00	615.105	-1083.032
Permeable Paving4	S20	3.326	32.700	32.120	0.00000000	2.00	619.865	-1082.411
Permeable Paving5	S21	3.326	32.700	32.120	0.00000000	2.00	624.624	-1081.790
Permeable Paving6	S22	3.448	32.700	32.120	0.00000000	2.00	629.435	-1081.163
Permeable Paving11	S27	2.573	32.700	32.120	0.00000000	2.00	654.871	-1078.598
Permeable Paving10	S28	2.571	32.700	32.120	0.00000000	2.00	650.112	-1079.219
Permeable Paving9	S29	2.583	32.700	32.120	0.00000000	2.00	645.359	-1079.839
Permeable Paving8	S30	2.571	32.700	32.120	0.00000000	2.00	640.593	-1080.463
Permeable Paving7	S31	2.571	32.700	32.120	0.00000000	2.00	635.831	-1081.084
Permeable Paving12	S34	10.353	32.850	32.270	0.00000000	2.00	650.427	-1091.831
Permeable Paving13	S37	10.369	32.350	31.770	0.00000000	2.00	649.813	-1098.789
Permeable Paving14	S38	10.367	32.350	31.770	0.00000000	2.00	651.187	-1109.503

Outfall Details

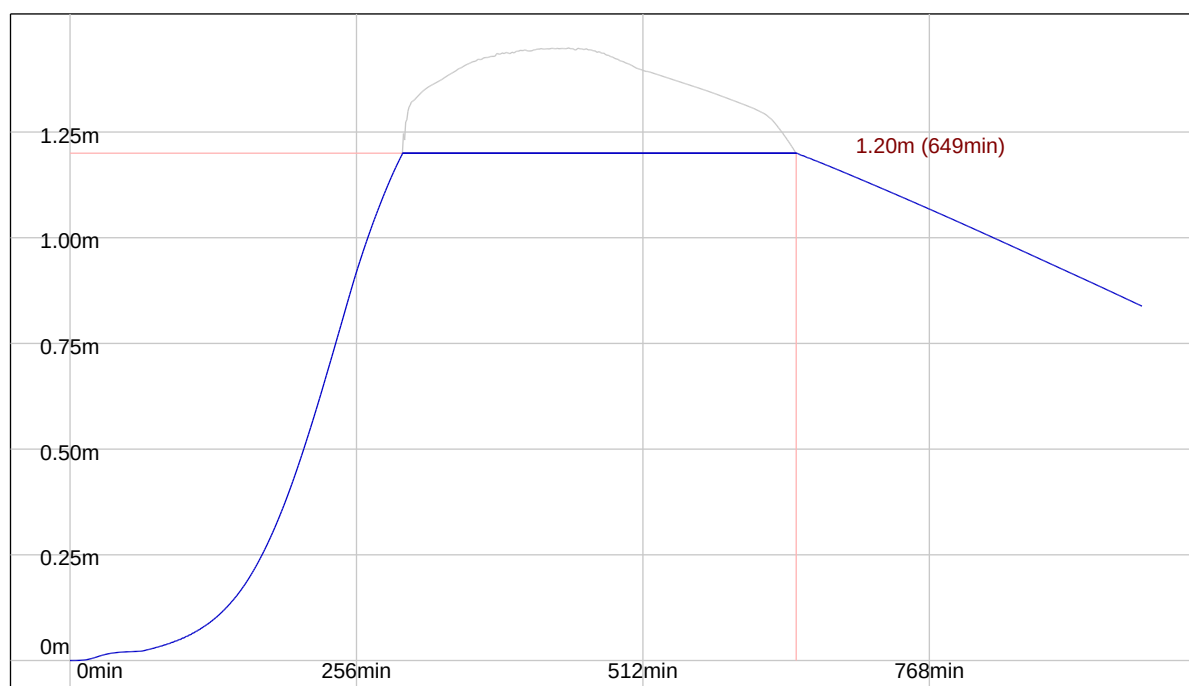
Outfall Manhole S42 : Free Discharge

Flow Control Details

Tank Structure at Manhole S40

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
30.325	1.200	95.00	115.590	109.810	131.772	0.00000000	0.00000000	2.00

Tank at S40 (100Yr+45% 480Min Winter)

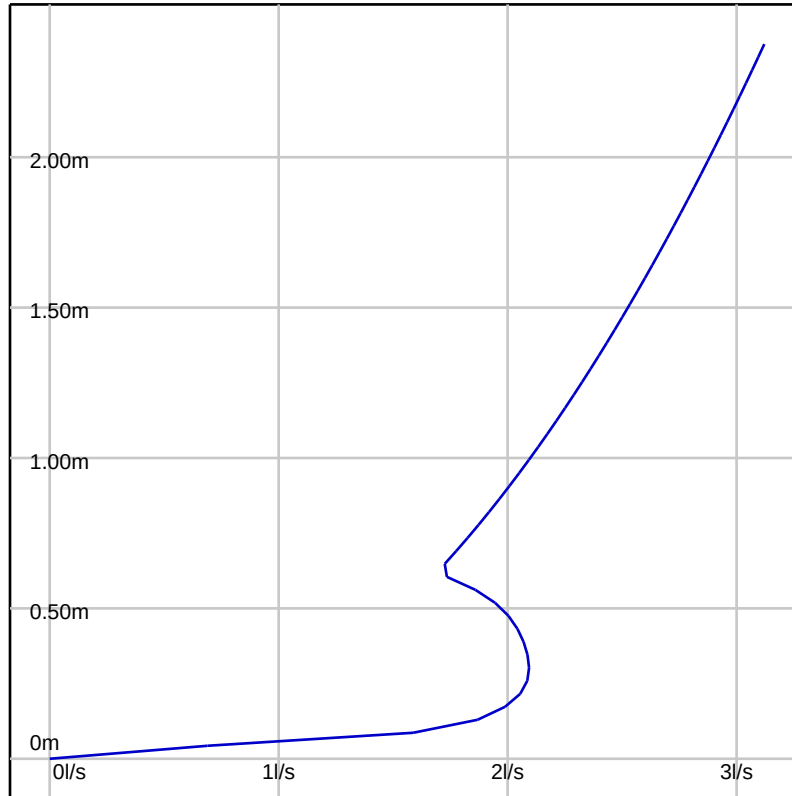


Controls within Manhole S41

Hydro-Brake® Optimum Control at Manhole S41

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0069-2880-2000-2880	2.000	2.880	0.000	0.301	2.094	0.617	1.688

Hydro-Brake® Optimum Control at S41



Simulation Settings

FSR: M5-60=19.00, R=0.34, Locale=England and Wales

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (1, +0%), (10, +0%), (30, +0%), (100, +45%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
1Yr 15Min Winter	32.997	0.00	1.16	30Yr 15Min Summer	68.165	-0.34	1.01
1Yr 15Min Summer	32.997	0.00	1.12	30Yr 15Min Winter	68.165	0.00	0.99
1Yr 30Min Winter	21.461	0.00	0.93	30Yr 30Min Summer	45.597	0.00	1.08
1Yr 30Min Summer	21.461	0.00	0.93	30Yr 30Min Winter	45.597	0.00	1.07
1Yr 60Min Winter	13.523	0.00	0.79	30Yr 60Min Summer	29.238	0.00	1.10
1Yr 60Min Summer	13.523	0.00	0.79	30Yr 60Min Winter	29.238	0.00	1.10
1Yr 120Min Summer	8.405	0.00	0.54	30Yr 120Min Summer	18.202	0.00	0.90
1Yr 120Min Winter	8.405	0.00	0.54	30Yr 120Min Winter	18.202	0.00	0.91
1Yr 180Min Summer	6.358	0.00	0.42	30Yr 180Min Summer	13.636	0.00	0.73
1Yr 180Min Winter	6.358	0.00	0.43	30Yr 180Min Winter	13.636	0.00	0.74
1Yr 240Min Summer	5.222	0.00	0.09	30Yr 240Min Summer	11.052	0.00	0.57
1Yr 240Min Winter	5.222	0.00	0.15	30Yr 240Min Winter	11.052	0.00	0.58
1Yr 360Min Summer	3.952	0.00	0.00	30Yr 360Min Summer	8.204	0.00	0.29
1Yr 360Min Winter	3.952	0.00	0.00	30Yr 360Min Winter	8.204	0.00	0.30
1Yr 480Min Summer	3.240	0.00	0.00	30Yr 480Min Summer	6.636	0.00	0.16
1Yr 480Min Winter	3.240	0.00	0.00	30Yr 480Min Winter	6.636	0.00	0.16
1Yr 600Min Summer	2.778	0.00	0.00	30Yr 600Min Summer	5.625	0.00	0.00
1Yr 600Min Winter	2.778	0.00	0.00	30Yr 600Min Winter	5.625	0.00	0.00
1Yr 720Min Winter	2.449	0.00	0.00	30Yr 720Min Summer	4.913	0.00	0.00
1Yr 720Min Summer	2.449	0.00	0.00	30Yr 720Min Winter	4.913	0.00	0.00
1Yr 960Min Summer	2.008	0.00	0.00	30Yr 960Min Summer	3.965	0.00	0.00
1Yr 960Min Winter	2.008	0.00	0.00	30Yr 960Min Winter	3.965	0.00	0.00
1Yr 1440Min Summer	1.518	0.00	0.00	30Yr 1440Min Summer	2.927	0.00	0.00
1Yr 1440Min Winter	1.518	0.00	0.00	30Yr 1440Min Winter	2.927	0.00	0.00
10Yr 15Min Summer	53.925	0.00	0.89	100Yr+45% 15Min Summer	127.781	-0.27	1.19
10Yr 15Min Winter	53.925	0.00	0.88	100Yr+45% 15Min Winter	127.781	-0.23	1.18
10Yr 30Min Summer	35.745	0.00	0.95	100Yr+45% 30Min Summer	86.330	-0.14	1.25
10Yr 30Min Winter	35.745	0.00	0.95	100Yr+45% 30Min Winter	86.330	0.00	1.25
10Yr 60Min Summer	22.792	0.00	0.98	100Yr+45% 60Min Summer	55.699	0.00	1.54
10Yr 60Min Winter	22.792	0.00	0.99	100Yr+45% 60Min Winter	55.699	0.00	1.54
10Yr 120Min Winter	14.181	0.00	0.75	100Yr+45% 120Min Summer	34.695	0.00	1.80
10Yr 120Min Summer	14.181	0.00	0.74	100Yr+45% 120Min Winter	34.695	0.00	1.77
10Yr 180Min Summer	10.657	0.00	0.54	100Yr+45% 180Min Summer	25.904	0.00	1.61
10Yr 180Min Winter	10.657	0.00	0.55	100Yr+45% 180Min Winter	25.904	0.00	1.61
10Yr 240Min Summer	8.675	0.00	0.36	100Yr+45% 240Min Summer	20.895	0.00	1.37
10Yr 240Min Winter	8.675	0.00	0.37	100Yr+45% 240Min Winter	20.895	0.00	1.39
10Yr 360Min Summer	6.480	0.00	0.21	100Yr+45% 360Min Summer	15.405	0.00	1.08
10Yr 360Min Winter	6.480	0.00	0.21	100Yr+45% 360Min Winter	15.405	0.00	1.15
10Yr 480Min Summer	5.264	0.00	0.00	100Yr+45% 480Min Summer	12.401	0.00	0.87
10Yr 480Min Winter	5.264	0.00	0.00	100Yr+45% 480Min Winter	12.401	0.00	0.92
10Yr 600Min Winter	4.479	0.00	0.00	100Yr+45% 600Min Summer	10.471	0.00	0.67
10Yr 600Min Summer	4.479	0.00	0.00	100Yr+45% 600Min Winter	10.471	0.00	0.77
10Yr 720Min Summer	3.923	0.00	0.00	100Yr+45% 720Min Summer	9.114	0.00	0.42
10Yr 720Min Winter	3.923	0.00	0.00	100Yr+45% 720Min Winter	9.114	0.00	0.58
10Yr 960Min Summer	3.182	0.00	0.00	100Yr+45% 960Min Summer	7.314	0.00	0.07
10Yr 960Min Winter	3.182	0.00	0.00	100Yr+45% 960Min Winter	7.314	0.00	0.15
10Yr 1440Min Summer	2.368	0.00	0.00	100Yr+45% 1440Min Winter	5.354	0.00	0.00
10Yr 1440Min Winter	2.368	0.00	0.00	100Yr+45% 1440Min Summer	5.354	0.00	0.00

Simulation Results

Return Period Yrs: 1.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	32.123	0.023	0.959		OK
S2	15 min Summer	8	32.021	0.024	0.949		OK
S3	15 min Summer	9	32.011	0.032	1.773		OK
S4	15 min Summer	9	31.971	0.039	2.577		OK
S5	15 min Summer	9	31.934	0.045	3.394		OK
S6	15 min Summer	9	31.896	0.052	4.230		OK
S7	15 min Summer	8	32.124	0.024	1.001		OK
S8	15 min Summer	8	32.026	0.029	1.466		OK
S9	15 min Summer	9	31.990	0.036	2.238		OK
S10	15 min Summer	9	31.954	0.042	3.062		OK
S11	15 min Summer	9	31.898	0.032	3.239		OK
S12	15 min Summer	8	32.122	0.022	1.465		OK
S13	15 min Summer	9	31.880	0.076	8.894		OK
S14	15 min Summer	9	31.817	0.103	14.598		OK
S15	15 min Summer	8	32.128	0.028	1.379		OK
S16	15 min Summer	8	32.037	0.033	1.890		OK
S17	15 min Summer	9	32.003	0.041	2.919		OK
S18	15 min Summer	9	31.962	0.049	4.012		OK
S19	15 min Summer	9	31.921	0.056	5.097		OK
S20	15 min Summer	9	31.880	0.062	6.172		OK
S21	15 min Summer	9	31.836	0.069	7.278		OK
S22	15 min Summer	9	31.799	0.078	7.505		OK
S23	15 min Summer	8	32.126	0.026	2.336		OK
S24	15 min Summer	9	31.791	0.089	9.743		OK
S25	15 min Summer	8	32.128	0.028	1.413		OK
S26	15 min Summer	8	32.033	0.030	1.401		OK
S27	15 min Summer	9	32.020	0.037	2.361		OK
S28	15 min Summer	9	31.978	0.044	3.326		OK
S29	15 min Summer	9	31.938	0.051	4.300		OK
S30	15 min Summer	9	31.894	0.056	5.270		OK
S31	15 min Summer	9	31.838	0.050	6.258		OK
S32	15 min Summer	9	31.781	0.095	15.994		OK
S33	15 min Summer	9	31.603	0.145	30.601		OK
S34	60 min Summer	36	32.115	0.015	0.387		OK
S35	15 min Summer	8	32.090	0.035	4.771		OK
S36	15 min Summer	8	31.530	0.099	33.341		OK
S37	-	0	32.100	0.000	0.000		OK
S38	15 min Summer	8	32.132	0.032	2.796		OK
S39	15 min Summer	8	32.053	0.016	1.936		OK
S40	180 min Winter	153	31.072	0.247	1.870		Surcharged
S41	180 min Winter	153	31.071	0.794	1.857		Surcharged
S42	1440 min Winter	660	30.257	0.034	2.094		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.024	0.523	0.949	0.054	OK
1.001	15 min Summer	9	S2	S3	0.028	0.409	0.938	0.053	OK
1.002	15 min Summer	9	S3	S4	0.035	0.559	1.783	0.101	OK
1.003	15 min Summer	9	S4	S5	0.042	0.640	2.587	0.146	OK
1.004	15 min Summer	9	S5	S6	0.048	0.693	3.403	0.192	OK
1.005	15 min Summer	9	S6	S13	0.064	0.591	4.236	0.239	OK
2.000	15 min Summer	8	S7	S8	0.026	0.471	0.990	0.056	OK
2.001	15 min Summer	8	S8	S9	0.033	0.513	1.451	0.082	OK
2.002	15 min Summer	9	S9	S10	0.039	0.615	2.251	0.127	OK
2.003	15 min Summer	9	S10	S11	0.037	0.912	3.074	0.173	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
2.004	15 min Summer	9	S11	S13	0.054	0.567	3.245	0.099	OK
3.000	15 min Summer	9	S12	S13	0.049	0.531	1.456	0.048	OK
1.006	15 min Summer	9	S13	S14	0.090	0.810	8.908	0.502	OK
1.007	15 min Summer	9	S14	S33	0.103	1.133	14.630	0.825	OK
4.000	15 min Summer	8	S15	S16	0.031	0.529	1.367	0.077	OK
4.001	15 min Summer	8	S16	S17	0.037	0.547	1.874	0.106	OK
4.002	15 min Summer	9	S17	S18	0.045	0.653	2.933	0.165	OK
4.003	15 min Summer	9	S18	S19	0.052	0.733	4.024	0.227	OK
4.004	15 min Summer	9	S19	S20	0.059	0.794	5.107	0.288	OK
4.005	15 min Summer	9	S20	S21	0.066	0.832	6.180	0.349	OK
4.006	15 min Summer	9	S21	S22	0.074	0.841	7.281	0.411	OK
4.007	15 min Summer	9	S22	S24	0.084	0.739	7.496	0.423	OK
5.000	15 min Summer	9	S23	S24	0.057	0.636	2.325	0.064	OK
4.008	15 min Summer	9	S24	S32	0.092	0.859	9.734	0.549	OK
6.000	15 min Summer	8	S25	S26	0.029	0.580	1.401	0.079	OK
6.001	15 min Summer	9	S26	S27	0.033	0.473	1.386	0.078	OK
6.002	15 min Summer	9	S27	S28	0.041	0.612	2.372	0.134	OK
6.003	15 min Summer	9	S28	S29	0.047	0.695	3.336	0.188	OK
6.004	15 min Summer	9	S29	S30	0.053	0.769	4.308	0.243	OK
6.005	15 min Summer	9	S30	S31	0.053	0.952	5.273	0.297	OK
6.006	15 min Summer	9	S31	S32	0.072	0.745	6.260	0.229	OK
4.009	15 min Summer	9	S32	S33	0.094	1.362	15.971	0.729	OK
1.008	15 min Summer	9	S33	S36	0.122	1.408	30.575	0.763	OK
7.000	15 min Summer	12	S34	S35	0.023	0.446	0.326	0.018	OK
7.001	15 min Summer	8	S35	S36	0.034	1.544	4.738	0.116	OK
1.009	180 min Winter	122	S36	S40	0.129	1.380	8.706	0.067	OK
8.000	15 min Summer	8	S37	S39	0.008	0.000	0.000	0.000	OK
9.000	15 min Summer	8	S38	S39	0.024	1.055	1.936	0.092	OK
8.001	60 min Summer	36	S39	S40	0.080	0.996	1.219	0.013	OK
1.010	360 min Winter	244	S40	S41	0.225	0.597	16.462	0.389	OK
1.011	1440 min Winter	660	S41	S42	0.034	0.562	2.094	0.050	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving15	15 min Summer	9	32.181	0.011	0.168		OK
Permeable Paving16	15 min Summer	9	32.181	0.011	0.162		OK
Permeable Paving17	15 min Summer	9	32.181	0.011	0.165		OK
Permeable Paving18	15 min Summer	9	32.181	0.011	0.162		OK
Permeable Paving21	15 min Summer	9	32.181	0.011	0.162		OK
Permeable Paving20	15 min Summer	9	32.181	0.011	0.162		OK
Permeable Paving19	15 min Summer	9	32.181	0.011	0.162		OK
Permeable Paving1	15 min Summer	10	32.133	0.013	0.175		OK
Permeable Paving2	15 min Summer	10	32.133	0.013	0.175		OK
Permeable Paving3	15 min Summer	10	32.133	0.013	0.175		OK
Permeable Paving4	15 min Summer	10	32.133	0.013	0.175		OK
Permeable Paving5	15 min Summer	10	32.133	0.013	0.175		OK
Permeable Paving6	30 min Summer	18	32.133	0.013	0.208		OK
Permeable Paving11	15 min Summer	9	32.132	0.012	0.249		OK
Permeable Paving10	15 min Summer	9	32.132	0.012	0.249		OK
Permeable Paving9	15 min Summer	9	32.132	0.012	0.249		OK
Permeable Paving8	15 min Summer	9	32.132	0.012	0.249		OK
Permeable Paving7	15 min Summer	9	32.132	0.012	0.249		OK
Permeable Paving12	60 min Summer	36	32.289	0.019	0.393		OK
Permeable Paving13	1440 min Summer	2873	31.870	0.100	0.000		OK
Permeable Paving14	1440 min Winter	2866	32.005	0.235	0.000		OK

Return Period Yrs: 10.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	32.130	0.030	1.567		OK
S2	15 min Summer	8	32.029	0.032	1.555		OK
S3	15 min Summer	9	32.021	0.042	2.926		OK
S4	15 min Summer	9	31.984	0.052	4.264		OK
S5	15 min Summer	10	31.974	0.085	4.952		OK
S6	15 min Summer	10	31.980	0.135	6.306		OK
S7	15 min Summer	8	32.130	0.030	1.634		OK
S8	15 min Summer	8	32.035	0.038	2.398		OK
S9	15 min Summer	9	32.002	0.047	3.683		OK
S10	15 min Summer	9	31.968	0.056	5.052		OK
S11	15 min Summer	10	31.980	0.114	6.228		OK
S12	15 min Summer	8	32.128	0.028	2.395		OK
S13	15 min Summer	11	31.958	0.154	13.065		Surcharged
S14	15 min Summer	9	31.923	0.209	21.545		Surcharged
S15	15 min Summer	8	32.136	0.036	2.255		OK
S16	15 min Summer	8	32.047	0.044	3.094		OK
S17	15 min Summer	9	32.016	0.055	4.828		OK
S18	15 min Summer	9	31.979	0.066	6.674		OK
S19	15 min Summer	9	31.942	0.077	8.506		OK
S20	15 min Summer	9	31.907	0.089	10.315		OK
S21	15 min Summer	10	31.896	0.128	11.096		OK
S22	15 min Summer	10	31.884	0.163	11.811		Surcharged
S23	15 min Summer	8	32.133	0.033	3.817		OK
S24	15 min Summer	10	31.875	0.173	15.090		Surcharged
S25	15 min Summer	8	32.136	0.036	2.309		OK
S26	15 min Summer	8	32.043	0.039	2.294		OK
S27	15 min Summer	9	32.032	0.049	3.901		OK
S28	15 min Summer	9	31.993	0.059	5.527		OK
S29	15 min Summer	9	31.955	0.068	7.171		OK
S30	15 min Summer	9	31.913	0.074	8.810		OK
S31	15 min Summer	10	31.858	0.070	9.430		OK
S32	15 min Summer	10	31.864	0.178	24.958		Surcharged
S33	15 min Summer	10	31.648	0.190	46.785		OK
S34	60 min Summer	36	32.121	0.021	0.738		OK
S35	15 min Summer	8	32.100	0.045	7.915		OK
S36	15 min Summer	8	31.554	0.124	49.147		OK
S37	-	0	32.100	0.000	0.000		OK
S38	15 min Summer	8	32.141	0.041	4.568		OK
S39	15 min Summer	8	32.058	0.021	3.312		OK
S40	240 min Winter	216	31.320	0.495	2.105		Surcharged
S41	240 min Winter	216	31.320	1.043	2.107		Surcharged
S42	240 min Winter	216	30.257	0.034	2.107		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.031	0.592	1.555	0.088	OK
1.001	15 min Summer	8	S2	S3	0.037	0.456	1.538	0.087	OK
1.002	15 min Summer	9	S3	S4	0.047	0.626	2.936	0.166	OK
1.003	15 min Summer	10	S4	S5	0.066	0.698	4.251	0.240	OK
1.004	15 min Summer	10	S5	S6	0.110	0.730	5.473	0.309	OK
1.005	15 min Summer	11	S6	S13	0.141	0.623	6.615	0.373	OK
2.000	15 min Summer	8	S7	S8	0.034	0.537	1.622	0.091	OK
2.001	15 min Summer	8	S8	S9	0.043	0.577	2.379	0.134	OK
2.002	15 min Summer	9	S9	S10	0.052	0.702	3.696	0.208	OK
2.003	15 min Summer	10	S10	S11	0.085	1.019	5.313	0.300	OK
2.004	15 min Summer	11	S11	S13	0.130	0.618	5.212	0.158	OK
3.000	15 min Summer	10	S12	S13	0.086	0.540	2.383	0.079	OK
1.006	15 min Summer	11	S13	S14	0.150	0.853	15.081	0.851	Surcharged
1.007	15 min Summer	10	S14	S33	0.141	1.254	21.647	1.221	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
4.000	15 min Summer	8	S15	S16	0.040	0.599	2.240	0.126	OK
4.001	15 min Summer	8	S16	S17	0.049	0.607	3.069	0.173	OK
4.002	15 min Summer	9	S17	S18	0.061	0.727	4.847	0.273	OK
4.003	15 min Summer	9	S18	S19	0.071	0.808	6.690	0.377	OK
4.004	15 min Summer	9	S19	S20	0.083	0.863	8.511	0.480	OK
4.005	15 min Summer	10	S20	S21	0.107	0.887	10.280	0.580	OK
4.006	15 min Summer	10	S21	S22	0.139	0.881	11.562	0.652	OK
4.007	15 min Summer	10	S22	S24	0.150	0.752	11.994	0.676	Surcharged
5.000	15 min Summer	9	S23	S24	0.091	0.754	3.803	0.105	OK
4.008	15 min Summer	10	S24	S32	0.150	0.894	15.272	0.861	Surcharged
6.000	15 min Summer	8	S25	S26	0.038	0.657	2.294	0.129	OK
6.001	15 min Summer	8	S26	S27	0.044	0.526	2.273	0.128	OK
6.002	15 min Summer	9	S27	S28	0.054	0.687	3.919	0.221	OK
6.003	15 min Summer	9	S28	S29	0.063	0.784	5.546	0.313	OK
6.004	15 min Summer	9	S29	S30	0.071	0.875	7.189	0.405	OK
6.005	15 min Summer	9	S30	S31	0.071	1.098	8.822	0.498	OK
6.006	15 min Summer	10	S31	S32	0.110	0.801	10.391	0.379	OK
4.009	15 min Summer	10	S32	S33	0.144	1.440	25.138	1.148	OK
1.008	15 min Summer	10	S33	S36	0.155	1.712	49.914	1.246	OK
7.000	15 min Summer	11	S34	S35	0.031	0.535	0.641	0.036	OK
7.001	15 min Summer	8	S35	S36	0.047	1.756	7.884	0.194	OK
1.009	30 min Summer	19	S36	S40	0.163	2.559	51.474	0.397	OK
8.000	15 min Summer	8	S37	S39	0.010	0.000	0.000	0.000	OK
9.000	15 min Summer	8	S38	S39	0.031	1.250	3.312	0.157	OK
8.001	15 min Summer	10	S39	S40	0.084	1.662	3.303	0.036	OK
1.010	15 min Winter	14	S40	S41	0.225	0.869	19.528	0.462	OK
1.011	240 min Winter	216	S41	S42	0.034	0.563	2.107	0.050	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving15	15 min Summer	9	32.186	0.016	0.276		OK
Permeable Paving16	15 min Summer	9	32.186	0.016	0.266		OK
Permeable Paving17	15 min Summer	9	32.186	0.016	0.271		OK
Permeable Paving18	15 min Summer	9	32.186	0.016	0.266		OK
Permeable Paving21	15 min Summer	9	32.186	0.016	0.266		OK
Permeable Paving20	15 min Summer	9	32.186	0.016	0.266		OK
Permeable Paving19	15 min Summer	9	32.186	0.016	0.266		OK
Permeable Paving1	15 min Summer	9	32.140	0.020	0.528		OK
Permeable Paving2	15 min Summer	9	32.140	0.020	0.528		OK
Permeable Paving3	15 min Summer	9	32.140	0.020	0.528		OK
Permeable Paving4	15 min Summer	9	32.140	0.020	0.528		OK
Permeable Paving5	15 min Summer	9	32.140	0.020	0.528		OK
Permeable Paving6	15 min Summer	9	32.140	0.020	0.546		OK
Permeable Paving11	15 min Summer	9	32.139	0.019	0.407		OK
Permeable Paving10	15 min Summer	9	32.139	0.019	0.407		OK
Permeable Paving9	15 min Summer	9	32.139	0.019	0.408		OK
Permeable Paving8	15 min Summer	9	32.139	0.019	0.407		OK
Permeable Paving7	15 min Summer	9	32.139	0.019	0.407		OK
Permeable Paving12	60 min Summer	35	32.299	0.029	0.780		OK
Permeable Paving13	1440 min Summer	2872	31.926	0.156	0.000		OK
Permeable Paving14	1440 min Winter	1288	32.106	0.336	0.015		OK

Return Period Yrs: 30.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	32.134	0.034	1.980		OK
S2	15 min Summer	10	32.068	0.071	2.464		OK
S3	15 min Summer	10	32.069	0.090	1.497		OK
S4	15 min Summer	10	32.074	0.143	5.884		OK
S5	15 min Summer	10	32.066	0.177	6.052		Surcharged
S6	15 min Summer	10	32.066	0.221	6.202		Surcharged
S7	15 min Summer	8	32.134	0.034	2.065		OK
S8	15 min Summer	10	32.062	0.065	2.486		OK
S9	15 min Summer	10	32.062	0.108	3.258		OK
S10	15 min Summer	10	32.057	0.145	5.008		OK
S11	15 min Summer	10	32.057	0.191	4.832		Surcharged
S12	15 min Summer	8	32.132	0.032	3.027		OK
S13	15 min Summer	10	32.058	0.254	14.411		Surcharged
S14	15 min Summer	10	31.997	0.283	24.498		Surcharged
S15	15 min Summer	8	32.140	0.040	2.849		OK
S16	15 min Summer	8	32.054	0.050	3.911		OK
S17	15 min Summer	9	32.025	0.064	6.141		OK
S18	15 min Summer	10	32.027	0.114	7.268		OK
S19	15 min Summer	10	32.024	0.159	9.244		Surcharged
S20	15 min Summer	10	32.012	0.194	11.266		Surcharged
S21	15 min Summer	10	31.992	0.225	13.350		Surcharged
S22	15 min Summer	10	31.967	0.246	13.863		Surcharged
S23	15 min Summer	8	32.137	0.037	4.823		OK
S24	15 min Summer	10	31.955	0.254	17.703		Surcharged
S25	15 min Summer	8	32.141	0.041	2.919		OK
S26	15 min Summer	8	32.048	0.045	2.901		OK
S27	15 min Summer	9	32.039	0.056	4.957		OK
S28	15 min Summer	9	32.003	0.069	7.042		OK
S29	15 min Summer	10	31.970	0.082	8.088		OK
S30	15 min Summer	10	31.969	0.131	9.964		OK
S31	15 min Summer	10	31.959	0.171	11.821		Surcharged
S32	15 min Summer	10	31.941	0.254	29.471		Surcharged
S33	15 min Summer	10	31.669	0.211	53.931		OK
S34	30 min Summer	19	32.124	0.024	1.014		OK
S35	15 min Summer	8	32.106	0.051	10.074		OK
S36	15 min Summer	9	31.563	0.132	53.982		OK
S37	-	0	32.100	0.000	0.000		OK
S38	15 min Summer	8	32.147	0.047	5.772		OK
S39	15 min Summer	8	32.060	0.024	4.268		OK
S40	240 min Winter	229	31.501	0.676	2.117		Surcharged
S41	240 min Winter	229	31.501	1.224	2.268		Surcharged
S42	240 min Winter	227	30.258	0.035	2.270		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	10	S1	S2	0.051	0.626	1.966	0.111	OK
1.001	15 min Summer	10	S2	S3	0.080	0.477	1.946	0.110	OK
1.002	15 min Summer	10	S3	S4	0.116	0.640	4.463	0.252	OK
1.003	15 min Summer	12	S4	S5	0.146	0.713	5.108	0.288	OK
1.004	15 min Winter	11	S5	S6	0.150	0.722	6.882	0.388	Surcharged
1.005	30 min Summer	16	S6	S13	0.150	0.627	8.752	0.494	Surcharged
2.000	15 min Summer	10	S7	S8	0.048	0.567	2.051	0.116	OK
2.001	15 min Summer	10	S8	S9	0.086	0.602	3.007	0.170	OK
2.002	15 min Summer	10	S9	S10	0.127	0.726	4.866	0.274	OK
2.003	15 min Summer	11	S10	S11	0.148	1.002	5.757	0.325	OK
2.004	30 min Summer	17	S11	S13	0.150	0.792	11.791	0.358	Surcharged
3.000	15 min Summer	8	S12	S13	0.091	0.581	3.014	0.100	OK
1.006	30 min Summer	19	S13	S14	0.150	0.878	15.514	0.875	Surcharged
1.007	15 min Summer	10	S14	S33	0.144	1.405	24.501	1.382	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
4.000	15 min Summer	8	S15	S16	0.045	0.633	2.832	0.160	OK
4.001	15 min Summer	8	S16	S17	0.057	0.632	3.890	0.219	OK
4.002	15 min Summer	10	S17	S18	0.087	0.750	6.205	0.350	OK
4.003	15 min Summer	10	S18	S19	0.132	0.822	8.319	0.469	OK
4.004	15 min Summer	10	S19	S20	0.150	0.874	10.324	0.582	Surcharged
4.005	15 min Winter	10	S20	S21	0.150	0.892	11.174	0.630	Surcharged
4.006	30 min Summer	18	S21	S22	0.150	0.886	12.731	0.718	Surcharged
4.007	30 min Summer	19	S22	S24	0.150	0.768	13.576	0.766	Surcharged
5.000	15 min Summer	8	S23	S24	0.093	0.801	4.808	0.132	OK
4.008	30 min Summer	18	S24	S32	0.150	0.959	16.952	0.956	Surcharged
6.000	15 min Summer	8	S25	S26	0.043	0.695	2.901	0.164	OK
6.001	15 min Summer	8	S26	S27	0.051	0.550	2.876	0.162	OK
6.002	15 min Summer	9	S27	S28	0.063	0.717	4.979	0.281	OK
6.003	15 min Summer	9	S28	S29	0.076	0.805	7.061	0.398	OK
6.004	15 min Summer	10	S29	S30	0.107	0.887	9.147	0.516	OK
6.005	15 min Summer	10	S30	S31	0.140	1.122	10.542	0.595	OK
6.006	15 min Summer	9	S31	S32	0.150	0.803	11.945	0.436	Surcharged
4.009	15 min Summer	10	S32	S33	0.147	1.674	29.430	1.344	OK
1.008	15 min Summer	10	S33	S36	0.171	1.800	56.613	1.413	OK
7.000	15 min Summer	11	S34	S35	0.036	0.581	0.885	0.050	OK
7.001	15 min Summer	9	S35	S36	0.054	1.808	10.037	0.247	OK
1.009	30 min Summer	18	S36	S40	0.175	2.493	59.759	0.460	OK
8.000	15 min Summer	8	S37	S39	0.012	0.000	0.000	0.000	OK
9.000	15 min Summer	8	S38	S39	0.035	1.354	4.268	0.202	OK
8.001	30 min Summer	16	S39	S40	0.086	1.540	3.792	0.042	OK
1.010	30 min Summer	18	S40	S41	0.225	0.771	18.010	0.426	OK
1.011	240 min Winter	227	S41	S42	0.035	0.575	2.270	0.054	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving15	15 min Summer	9	32.190	0.020	0.347		OK
Permeable Paving16	15 min Summer	9	32.189	0.019	0.337		OK
Permeable Paving17	15 min Summer	9	32.189	0.019	0.343		OK
Permeable Paving18	15 min Summer	9	32.189	0.019	0.337		OK
Permeable Paving21	15 min Summer	9	32.189	0.019	0.337		OK
Permeable Paving20	15 min Summer	9	32.189	0.019	0.337		OK
Permeable Paving19	15 min Summer	9	32.189	0.019	0.337		OK
Permeable Paving1	15 min Summer	9	32.145	0.025	0.665		OK
Permeable Paving2	15 min Summer	9	32.145	0.025	0.665		OK
Permeable Paving3	15 min Summer	9	32.145	0.025	0.665		OK
Permeable Paving4	15 min Summer	9	32.145	0.025	0.665		OK
Permeable Paving5	15 min Summer	9	32.145	0.025	0.665		OK
Permeable Paving6	15 min Summer	9	32.145	0.025	0.688		OK
Permeable Paving11	15 min Summer	9	32.143	0.023	0.513		OK
Permeable Paving10	15 min Summer	9	32.143	0.023	0.513		OK
Permeable Paving9	15 min Summer	9	32.143	0.023	0.515		OK
Permeable Paving8	15 min Summer	9	32.143	0.023	0.513		OK
Permeable Paving7	15 min Summer	9	32.143	0.023	0.513		OK
Permeable Paving12	30 min Summer	19	32.306	0.036	0.941		OK
Permeable Paving13	1440 min Summer	2877	31.963	0.193	0.000		OK
Permeable Paving14	1440 min Winter	969	32.112	0.342	0.062		OK

Return Period Yrs: 100.0

Climate Change %: 45

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	11	32.293	0.193	1.749		Surcharged
S2	15 min Summer	11	32.293	0.296	1.696		Surcharged
S3	15 min Summer	11	32.293	0.314	2.911		Surcharged
S4	15 min Summer	11	32.292	0.360	4.147		Surcharged
S5	15 min Summer	11	32.289	0.400	5.578		Surcharged
S6	15 min Summer	11	32.283	0.438	7.263		Surcharged
S7	15 min Summer	11	32.290	0.190	1.825		Surcharged
S8	15 min Summer	11	32.289	0.292	2.763		Surcharged
S9	15 min Summer	11	32.288	0.334	4.544		Surcharged
S10	15 min Summer	11	32.285	0.373	6.391		Surcharged
S11	15 min Summer	11	32.279	0.413	7.071		Surcharged
S12	15 min Summer	10	32.278	0.178	4.520		Surcharged
S13	15 min Summer	11	32.275	0.471	17.458		Surcharged
S14	480 min Winter	441	32.275	0.560	0.943		Surcharged
S15	480 min Winter	453	32.280	0.180	0.106		Surcharged
S16	480 min Winter	452	32.279	0.275	0.071		Surcharged
S17	600 min Winter	521	32.280	0.319	0.418		Surcharged
S18	480 min Winter	452	32.279	0.366	0.077		Surcharged
S19	600 min Winter	521	32.279	0.414	0.311		Surcharged
S20	480 min Winter	452	32.276	0.458	0.091		Surcharged
S21	480 min Winter	451	32.278	0.511	0.319		Surcharged
S22	480 min Winter	414	32.276	0.555	0.744		Surcharged
S23	480 min Winter	454	32.276	0.176	0.126		Surcharged
S24	480 min Winter	414	32.280	0.578	0.382		Surcharged
S25	480 min Winter	427	32.276	0.176	0.090		Flood Risk
S26	480 min Winter	433	32.277	0.273	0.183		Flood Risk
S27	480 min Winter	455	32.275	0.292	0.375		Surcharged
S28	480 min Winter	455	32.277	0.343	0.195		Surcharged
S29	480 min Winter	439	32.276	0.388	0.806		Surcharged
S30	480 min Winter	455	32.276	0.437	0.127		Surcharged
S31	480 min Winter	440	32.276	0.487	0.932		Surcharged
S32	480 min Winter	455	32.276	0.589	1.923		Surcharged
S33	480 min Winter	439	32.274	0.816	1.853		Surcharged
S34	480 min Winter	436	32.274	0.174	0.072		Surcharged
S35	480 min Winter	436	32.274	0.219	0.337		Surcharged
S36	480 min Winter	455	32.274	0.843	2.216		Surcharged
S37	480 min Winter	445	32.274	0.174	0.045		Flood Risk
S38	480 min Winter	435	32.274	0.174	0.198		Flood Risk
S39	480 min Winter	446	32.274	0.237	0.356		Flood Risk
S40	480 min Winter	446	32.274	1.449	2.976		Surcharged
S41	480 min Winter	446	32.274	1.997	2.953		Flood Risk
S42	480 min Winter	439	30.262	0.039	2.853		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	10	S1	S2	0.150	0.677	3.162	0.178	Surcharged
1.001	30 min Winter	15	S2	S3	0.150	0.475	3.136	0.177	Surcharged
1.002	15 min Winter	16	S3	S4	0.150	0.632	4.933	0.278	Surcharged
1.003	15 min Winter	16	S4	S5	0.150	0.710	7.144	0.403	Surcharged
1.004	15 min Winter	16	S5	S6	0.150	0.747	9.303	0.525	Surcharged
1.005	15 min Winter	15	S6	S13	0.150	0.653	11.548	0.651	Surcharged
2.000	15 min Winter	10	S7	S8	0.150	0.609	3.300	0.186	Surcharged
2.001	15 min Winter	9	S8	S9	0.150	0.637	4.239	0.239	Surcharged
2.002	15 min Winter	7	S9	S10	0.150	0.724	5.881	0.332	Surcharged
2.003	15 min Winter	13	S10	S11	0.150	1.087	7.101	0.401	Surcharged
2.004	120 min Summer	60	S11	S13	0.150	0.827	12.825	0.389	Surcharged
3.000	15 min Winter	10	S12	S13	0.150	0.655	4.876	0.161	Surcharged
1.006	15 min Winter	15	S13	S14	0.150	1.267	22.391	1.263	Surcharged
1.007	15 min Winter	9	S14	S33	0.150	1.722	30.432	1.716	Surcharged

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
4.000	480 min Summer	393	S15	S16	0.150	0.478	0.954	0.054	Surcharged
4.001	30 min Summer	15	S16	S17	0.150	0.649	5.961	0.336	Surcharged
4.002	15 min Winter	8	S17	S18	0.150	0.783	7.636	0.431	Surcharged
4.003	15 min Winter	7	S18	S19	0.150	0.841	10.156	0.573	Surcharged
4.004	15 min Winter	15	S19	S20	0.150	0.867	11.695	0.660	Surcharged
4.005	15 min Winter	15	S20	S21	0.150	0.896	14.179	0.800	Surcharged
4.006	15 min Winter	14	S21	S22	0.150	0.917	16.200	0.914	Surcharged
4.007	15 min Winter	15	S22	S24	0.150	0.993	17.543	0.989	Surcharged
5.000	480 min Summer	396	S23	S24	0.150	0.497	1.614	0.044	Surcharged
4.008	15 min Winter	8	S24	S32	0.150	1.244	21.982	1.240	Surcharged
6.000	480 min Summer	398	S25	S26	0.150	0.527	1.028	0.058	Surcharged
6.001	15 min Winter	9	S26	S27	0.150	0.598	4.542	0.256	Surcharged
6.002	15 min Winter	8	S27	S28	0.150	0.739	7.824	0.441	Surcharged
6.003	30 min Summer	15	S28	S29	0.150	0.817	9.687	0.546	Surcharged
6.004	15 min Winter	12	S29	S30	0.150	0.878	10.613	0.599	Surcharged
6.005	15 min Winter	12	S30	S31	0.150	1.100	12.931	0.729	Surcharged
6.006	15 min Winter	11	S31	S32	0.150	0.870	15.378	0.562	Surcharged
4.009	15 min Winter	10	S32	S33	0.150	2.076	36.682	1.675	Surcharged
1.008	30 min Winter	21	S33	S36	0.225	1.836	65.901	1.645	OK
7.000	480 min Summer	399	S34	S35	0.150	0.390	0.941	0.053	Surcharged
7.001	360 min Summer	267	S35	S36	0.150	1.511	4.862	0.119	Surcharged
1.009	30 min Winter	21	S36	S40	0.225	2.699	78.989	0.608	OK
8.000	360 min Winter	395	S37	S39	0.150	0.349	0.457	0.023	Surcharged
9.000	600 min Summer	495	S38	S39	0.150	0.947	1.377	0.065	Surcharged
8.001	480 min Summer	316	S39	S40	0.150	0.858	3.154	0.035	Surcharged
1.010	15 min Winter	9	S40	S41	0.225	0.865	20.601	0.487	OK
1.011	480 min Winter	440	S41	S42	0.039	0.616	2.853	0.067	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving15	15 min Summer	11	32.293	0.123	0.226		OK
Permeable Paving16	15 min Summer	11	32.292	0.122	0.218		OK
Permeable Paving17	15 min Summer	11	32.289	0.119	0.222		OK
Permeable Paving18	15 min Summer	11	32.284	0.114	0.218		OK
Permeable Paving21	15 min Summer	11	32.289	0.119	0.218		OK
Permeable Paving20	15 min Summer	11	32.286	0.116	0.218		OK
Permeable Paving19	15 min Summer	11	32.279	0.109	0.218		OK
Permeable Paving1	480 min Winter	453	32.279	0.159	0.022		OK
Permeable Paving2	480 min Winter	453	32.279	0.159	0.022		OK
Permeable Paving3	480 min Winter	452	32.278	0.158	0.022		OK
Permeable Paving4	480 min Winter	452	32.278	0.158	0.185		OK
Permeable Paving5	480 min Winter	452	32.277	0.157	0.050		OK
Permeable Paving6	480 min Winter	415	32.277	0.157	0.028		OK
Permeable Paving11	480 min Winter	456	32.276	0.156	0.029		OK
Permeable Paving10	480 min Winter	456	32.276	0.156	0.016		OK
Permeable Paving9	480 min Winter	455	32.275	0.155	0.044		OK
Permeable Paving8	480 min Winter	455	32.275	0.155	0.016		OK
Permeable Paving7	480 min Winter	455	32.275	0.155	0.044		OK
Permeable Paving12	30 min Summer	18	32.332	0.062	2.468		OK
Permeable Paving13	480 min Winter	445	32.274	0.504	0.164		Flood Risk
Permeable Paving14	480 min Winter	431	32.274	0.504	0.077		Flood Risk