

Appendix D

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	F	10.29	8.81	
0002	F	10.43	7.17	
0003	F	10.46	4.21	
0004	F	10.55	8.99	
0005	F	10.58	7.98	
0101	F	0.00	0.00	
0201	F	10.67	4.41	
0202	F	9.34	0.00	
0203	F	7.79	6.34	
0203	F	9.70	4.40	
0204	F	9.35	5.17	
0205	F	9.45	5.10	
0206	F	9.37	0.00	
0301	F	10.40	0.00	
0302	F	9.01	5.17	
0303	F	8.95	5.08	
0304	F	9.22	4.93	
0305	F	0.00	0.00	
0306	F	10.15	4.91	
0307	F	7.80	4.73	
0308	F	7.71	6.19	
0309	F	7.35	3.50	
0701	F	11.00	9.26	
0702	F	11.01	0.00	
0704	F	10.87	8.53	
0705	F	10.90	9.47	
0706	F	10.87	9.62	
0801	F	11.14	8.84	
0802	F	11.70	9.55	
0901	F	10.91	8.41	
0902	F	10.89	0.00	
0903	F	10.23	8.14	
0905	F	0.00	0.00	
0906	F	0.00	0.00	
0907	F	0.00	0.00	
0908	F	0.00	0.00	
1001	F	8.39	1.70	
1001	F	0.00	0.00	
1002	F	8.54	1.39	
1003	F	8.46	6.33	
1004	F	8.48	7.33	
1004	F	10.27	0.00	
1101	F	9.09	5.60	
1102	F	8.77	5.25	
1201	F	8.24	7.19	
1202	F	8.20	7.43	
1203	F	8.34	7.22	
1204	F	8.36	6.87	
1205	F	8.29	6.82	
1205	F	8.97	6.24	
1206	F	8.71	7.87	
1206	F	9.10	6.50	
1207	F	8.35	8.01	
1208	F	8.45	7.46	
1209	F	8.08	6.81	
1210	F	7.92	6.54	
1211	F	8.73	7.63	
1212	F	8.38	7.70	
1213	F	8.38	7.55	
1214	F	8.38	7.03	
1215	F	8.38	7.20	
1216	F	8.38	7.04	
1301	F	7.78	5.18	
1302	F	8.01	6.84	
1303	F	7.87	6.68	
1304	F	7.87	6.18	
1304	F	8.94	5.22	
1305	F	7.56	5.96	
1305	F	8.97	0.00	
1306	F	7.40	4.31	
1307	F	7.52	5.71	
1308	F	7.65	5.33	
1309	F	0.00	0.00	
1310	F	7.57	5.64	
1311	F	7.87	6.35	
1312	F	7.89	6.55	
1406	F	0.00	0.00	
1701	F	9.90	0.00	
1703	F	9.95	0.00	
1704	F	9.95	8.29	
1707	F	10.68	8.80	
1710	F	0.00	0.00	
1801	F	9.73	8.26	
1802	F	9.69	7.26	
1803	F	0.00	0.00	
1804	F	9.60	8.92	
1805	F	9.78	0.00	
1806	F	9.88	8.62	
1807	F	10.18	8.43	
1808	F	10.29	8.95	
1810	F	0.00	0.00	
1813	F	0.00	0.00	
1814	F	0.00	0.00	
1901	F	8.96	2.12	
1902	F	9.63	2.31	
1903	F	9.56	7.13	
1904	F	9.35	7.32	
1905	F	9.48	7.77	
1906	F	9.03	8.05	
1907	F	10.02	7.51	
2001	F	9.83	6.90	
2002	F	9.80	6.73	
2003	F	0.00	0.00	
2004	F	9.79	6.43	
2005	F	9.63	1.37	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2006	F	9.58	6.64	
2101	F	9.56	6.44	
2102	F	9.61	6.28	
2103	F	9.60	6.23	
2201	F	8.18	6.64	
2202	F	0.00	0.00	
2203	F	8.23	6.77	
2204	F	8.35	7.35	
2205	F	0.00	0.00	
2206	F	8.68	7.77	
2207	F	8.71	7.66	
2208	F	8.64	7.19	
2209	F	8.63	7.02	
2210	F	8.63	7.08	
2211	F	8.70	7.23	
2212	F	7.90	7.02	
2213	F	8.69	7.36	
2214	F	8.68	7.36	
2215	F	8.69	7.49	
2216	F	8.24	6.93	
2217	F	7.95	6.45	
2301	F	8.08	7.42	
2302	F	0.00	0.00	
2303	F	0.00	0.00	
2304	F	8.02	6.33	
2305	F	8.09	6.22	
2306	F	8.28	6.77	
2307	F	8.22	6.17	
2308	F	7.67	6.00	
2309	F	0.00	0.00	
2310	F	7.87	6.17	
2311	F	7.95	5.38	
2312	F	7.76	5.66	
2313	F	7.94	6.88	
2314	F	7.94	6.30	
2315	F	8.05	7.03	
2316	F	8.07	7.21	
2317	F	0.00	0.00	
2801	F	0.00	0.00	
2802	F	10.42	7.65	
2803	F	10.84	9.00	
2804	F	10.73	7.88	
2805	F	10.71	7.88	
2806	F	11.09	9.71	
2807	F	11.18	10.19	
2901	F	0.00	0.00	
2902	F	0.00	0.00	
2903	F	10.09	8.90	
2904	F	9.90	8.75	
2905	F	9.90	6.97	
2906	F	9.96	7.11	
2907	F	10.18	0.00	
2908	F	10.12	7.69	
2909	F	10.12	7.74	
2910	F	10.80	8.03	
2911	F	9.43	0.00	
2912	F	10.47	8.69	
2913	F	10.74	9.75	
3001	F	9.92	7.27	
3002	F	0.00	0.00	
3003	F	10.53	9.32	
3004	F	10.17	1.27	
3201	F	9.13	8.80	
3202	F	8.82	7.99	
3203	F	8.83	8.20	
3204	F	8.77	8.04	
3205	F	8.76	7.88	
3206	F	8.33	7.79	
3207	F	8.36	7.62	
3208	F	8.40	7.52	
3209	F	8.66	7.44	
3210	F	9.10	8.66	
3211	F	9.10	8.55	
3212	F	9.10	8.39	
3213	F	9.05	8.25	
3214	F	8.73	8.18	
3215	F	8.68	8.04	
3216	F	8.67	7.90	
3301	F	0.00	0.00	
3302	F	7.88	6.95	
3303	F	8.06	6.62	
3304	F	8.33	6.96	
3305	F	8.30	6.29	
3306	F	8.65	7.21	
3307	F	7.91	6.72	
3308	F	7.95	6.79	
3309	F	7.91	6.89	
3310	F	0.00	0.00	
3801	F	10.97	9.26	
3901	F	10.83	0.00	
3902	F	10.87	8.59	
3903	F	10.99	9.57	
3904	F	10.93	10.04	
3905	F	10.89	10.29	
3906	F	10.75	9.90	
3907	F	10.50	9.65	
3908	F	10.60	9.56	
3909	F	10.61	9.45	
3910	F	10.59	9.13	
3911	F	10.54	9.03	
3912	F	0.00	0.00	
3913	F	10.87	8.80	
3914	F	10.89	8.68	
3915	F	10.98	9.58	
3916	F	11.01	9.54	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3917	F	10.95	9.12	
3918	F	11.50	9.07	
3919	F	0.00	0.00	
3920	F	0.00	0.00	
4000	F	11.51	10.08	
4201	F	9.54	9.17	
4202	F	9.96	8.88	
4203	F	8.77	7.79	
4204	F	9.57	9.09	
4205	F	9.58	8.89	
4206	F	9.56	8.59	
4207	F	9.45	8.33	
4208	F	8.77	8.04	
4209	F	8.77	7.77	
4210	F	8.63	7.67	
4211	F	9.54	9.03	
4212	F	9.53	8.93	
4213	F	0.00	0.00	
4301	F	8.59	7.30	
4302	F	8.08	7.33	
4303	F	0.00	0.00	
4304	F	8.30	7.24	
4305	F	7.96	7.19	
4306	F	8.47	7.75	
4307	F	8.23	7.20	
4308	F	8.16	7.00	
4309	F	8.78	7.55	
4310	F	0.00	0.00	
4801	F	10.62	8.26	
4802	F	10.59	8.05	
4901	F	11.03	8.24	
4902	F	10.97	3.62	
4903	F	11.13	8.80	
4904	F	10.94	9.45	
4905	F	10.90	9.40	
4906	F	11.65	9.91	
5207	F	9.93	7.59	
5208	F	0.00	0.00	
5301	F	8.28	6.85	
5302	F	0.00	0.00	
5303	F	8.23	6.64	
5304	F	8.24	6.64	
5305	F	8.36	6.44	
5306	F	8.91	7.24	
5307	F	8.04	6.97	
5308	F	8.16	6.75	
5705	F	10.61	8.27	
5706	F	10.67	8.44	
5802	F	11.05	8.66	
5803	F	11.04	8.82	
5901	F	11.01	7.54	
5902	F	10.93	3.69	
5903	F	10.98	9.61	
5904	F	10.98	9.63	
5905	F	11.02	9.32	
5906	F	10.94	8.35	
5907	F	11.03	8.52	
6201	F	9.93	7.99	
6202	F	10.21	7.80	
6203	F	10.03	0.00	
6204	F	10.06	7.33	
6205	F	9.95	7.14	
6206	F	0.00	0.00	
6207	F	0.00	0.00	
6208	F	0.00	0.00	
6209	F	0.00	0.00	
6210	F	0.00	0.00	
6211	F	0.00	0.00	
6212	F	0.00	0.00	
6213	F	0.00	0.00	
6214	F	0.00	0.00	
6302	F	8.42	6.35	
6303	F	8.48	6.20	
6304	F	8.38	6.37	
6305	F	8.51	7.33	
6306	F	9.04	7.52	
6702	F	10.74	8.02	
6703	F	10.87	7.66	
6801	F	11.06	8.01	
6802	F	11.05	7.90	
6901	F	10.97	3.82	
6902	F	11.00	8.66	
6903	F	10.97	8.00	
6904	F	10.99	0.57	
7202	F	9.24	7.91	
7203	F	19.64	18.62	
7204	F	9.44	8.00	
7205	F	9.48	7.80	
7206	F	9.52	7.12	
7207	F	9.76	7.02	
7208	F	9.52	6.85	
7209	F	9.44	8.21	

Appendix E



Josh Haddow
The Hallmark Building
52-56 Leadenhall Street
London
EC3M 5JE

Your ref
22491

Our ref
DSA000047721

Date
27 October 2025

Contact
Tel 0330 303 0119

Dear Mr Haddow,

Level 1 Capacity Check Enquiry: Martlets Way, Worthing, West Sussex, BN12 4UB.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

The enquiry has been reassessed to determine the capacity available for 9.55 l/s at manhole reference TQ11033004 Grid Reference: 511359 , 103027.

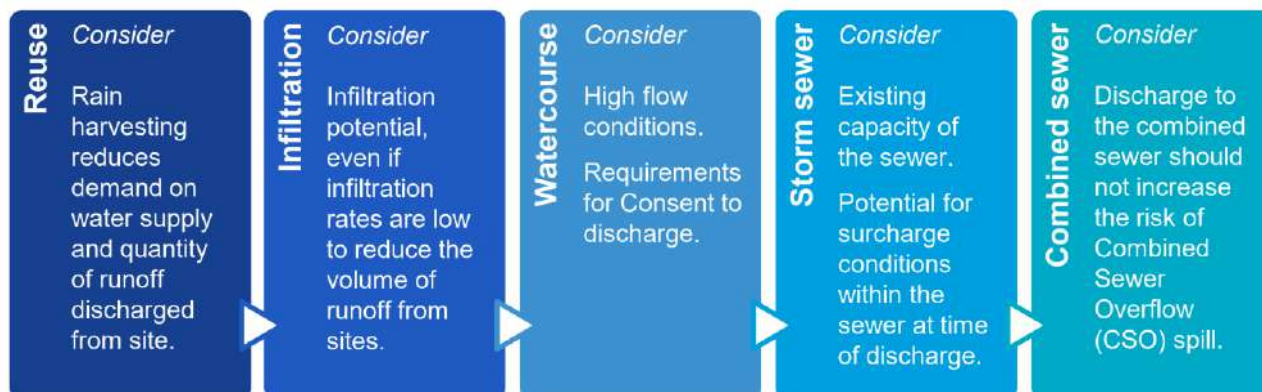
There is currently adequate capacity in the local sewerage network to accommodate a foul flow of 9.55 l/s for the above development at manhole reference TQ11033004. Southern Water will not permit a surface water connection into the foul network. Please refer to our surface water management policy.

Surface Water

The enquiry has been reassessed to determine the capacity available for 11.5 l/s at manhole reference TQ11032055 Grid Reference: 511239 , 103018.

There is currently adequate capacity in the local surface water/foul sewerage network to accommodate a surface water flow of 11.5 l/s for the above development at manhole reference TQ11032055.

Although capacity in the surface water network has been identified, in all situations where surface water is being considered for discharge to our network, we require the below hierarchy for surface water to be followed which is reflected in part H3 of the Building Regulations. Whilst reuse does not strictly form part of this hierarchy, Southern Water would encourage the consideration of reuse for new developments.



Guidance on Building Regulations is here: [gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h](https://www.gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h)

We would welcome the opportunity to engage with you on the design for disposal of surface water, with a particular focus on the potential for incorporating Sustainable Drainage Systems (SuDS), for this development at the earliest opportunity and we recommend that civil engineers and landscape architects work together and with Southern Water.

Where a surface water connection to the foul or combined sewer is being considered, this should be agreed by the Lead Local Flood Authority, in consultation with Southern Water.

It should be noted that although the above assessment indicates that there is capacity available for your proposed surface water flows the LLFA (Local Lead Flood Authority) may impose/request that a lower flow is discharged to the public surface water sewer.

If the excess surface water flows are to be attenuated on site, it could have a significant effect on any proposed Sewer Adoption (S104) Agreements. Any attenuation proposals should be agreed before any works are implemented on site. Where capacity is limited/restricted, agreement should be sought if you are to include any highway drainage within your proposals as Southern Water is not obligated to accept highway flows.



Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

The results quoted above are only valid for 12 months from the date of issue of this letter. **Any revisions in flow rate or alternative point of connection will require a new Pre-Planning Application to be submitted.**

Please get in touch via the Get Connected customer dashboard if you have any queries.

Should it be necessary to contact us please quote our above reference number in all communications relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

Appendix F

MEETING MINUTES

DATE AND TIME: 15:00 – 16:00 Thursday 27th November 2025

SUBJECT: Pre-Application Meeting with West Sussex County Council (WSCC) LLFA and Ardent Consulting Engineers (ACE) for Durrington Gasworks (Elizabeth Gardens Phase 2)

VENUE: Video Call (Microsoft Teams)

REF: 2025-11-27_LLFA Meeting Minutes – Durrington Gasworks (Elizabeth Gardens Phase 2)

THOSE PRESENT: Eleanor Read – West Sussex County Council (SuDS);
Jay Moriarty (JM) – Ardent Consulting Engineers;
Josh Haddow (JH) – Ardent Consulting Engineers;

APOLOGIES: N/A

DISCUSSION: 1.0 Welcome and Introductions
2.0 Martlets Way (NIB & SGN Land), Durrington
3.0 Any Other Business

Head Office: Third Floor, The Hallmark Building, 52-56 Leadenhall Street, London E

Offices also in Edinburgh, Essex, Kent, Midlands,

ITEM	NOTES	ACTION
1.0	Welcome and Introductions	
1.01	JM introduced JH and outlined the purpose of the meeting which was to discuss the proposed development at Martlets Way (NIB & SGN Land), Durrington and to address the drainage parameters which are acceptable to WSCC.	
2.0	Martlets Way (NIB & SGN Land), Durrington	
		
2.01	JM gave an overview of the history of the site as there have been separate planning applications for various parcels of land within the current redline boundary and that the current redline boundary would be delivered as a stand-alone full planning application which is due to be submitted mid-December.	
2.02	JM stated that this site is Phase 2 of the wider Bellway development, with Phase 1 located to the east. JM stated that Phase 1 was a standalone application, but the drainage was designed to accommodate flows of up to 10 l/s from Phase 2 and that ACE have been asked by the client to explore the discharging parts of Phase 2 into the Phase 1 drainage, but noted that as the two phases were under separate planning applications that ACE would need advice from WSCC on the viability of that arrangement. JM noted that the 10l/s enters a downstream basin, and that no additional flows would come off Phase 1. ER noted this would be acceptable if calculations demonstrated flows could be accommodated.	
2.03	JM stated that the initial drainage strategy for Phase 2 was designed based on Greenfield rates and the typical design parameters that WSCC would expect to see, such as latest FEH data and CV of 1.	
2.04	JM discussed the use of infiltration on Phase 1 was discounted due to risk of ground water contamination. The ground conditions on Phase 2 pose a higher risk due to previous industrial uses (wastewater treatment and gas holders) - therefore infiltration has again been discounted. JM asked if WSCC would agree with the approach.	
2.05	ER stated that if land is contaminated that testing is recommended to prove so.	

ITEM	NOTES	ACTION
	Also, based on the drainage hierarchy, infiltration into contaminated land is not recommended, so we would need to establish another means of disposal.	
2.06	JM outlined the surface water drainage strategy for the site and identified the existing drainage within Martlets Way which would be used as the outfall locations for both the surface water and foul water drainage networks from the development. JM stated that capacity checks have been carried out for both surface and foul water which both came back positively and that discharge rates for the site had been calculated based on Greenfield runoff rates.	
2.07	JM asked, from a planning policy point of view, how would we best approach the potential use of the 10 l/s capacity within the Phase 1 drainage network? The downstream drainage is owned by the applicant.	
2.08	ER stated that the explanation of the strategy within documentation would need to be carefully written and that drainage calculations would be needed to prove that the capacity exists but confirmed that it would be possible to utilise the 10 l/s allowance for a section of the site, as flows would not increase downstream of Phase 1.	
2.09	ER mentioned that as the site is brownfield, that WSCC allow a proposed discharge rate of up to 5 times 2yr Greenfield runoff rates to be used, in line with National SuDS Standards, but recommended that the proposed discharge rate should still be as close to Greenfield rates as possible.	
2.10	JM discussed the site summary in terms of drainage parameters used within the drainage calculations. ER asked if urban creep had been allowed for. JM stated that it has been accommodated for.	
2.11	JM stated that Qbar was originally used to determine the discharge rate for the site and to size the storage requirements but stated that ACE would look into a brownfield relaxation rate.	
2.12	JM mentioned that permeable paving is not proposed within highways to allow for the possibility of road adoption from WSCC but could be used in private parking areas.	
2.13	JH asked if placing a geo-cellular 'attenuation' tank beneath the proposed play space area on site would be acceptable to WSCC. ER stated that if the cover is sufficient and if access and maintenance are both viable then it would be acceptable.	
2.14	JM agreed that ACE would simulate the various discharge arrangements (using 10 l/s from Phase 1 with the rest of the site discharging at Greenfield rates into Martlets Way; and discharging at up to 5 times 2yr Greenfield rates as the site is brownfield; and would issue them along with drainage calculations to ER for review.	ACE

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Offices also in Edinburgh, Essex, Kent, Midlands,

ITEM	NOTES	ACTION
	<u>POST MEETING INFO:</u> ACE explored using 10l/s to Phase 1, however, without significant layout changes this would provide limited benefit and has therefore been discounted for this application. This outfall may be reconsidered in the future if the layout allows.	
2.15	ER confirmed the parameters used for the overall surface water drainage strategy is compliant with WSCC standards.	
3.0	AoB	
3.01	JM mentioned National SuDS standards and what the WSCC approach is on that matter for sites in the future.	
3.02	ER stated that all new applications would need to follow the national policy standards	
3.03	JM asked about how ACE should proceed in terms of Standard 2 – Interception on a site like this as we have very limited opportunity for interception. We will be improving water quality and quantity compared to existing which is the key aim of the standards so would expect this to be sufficient.	
3.04	ER stated that this would be the first brownfield and contaminated site being submitted under the new national standards so she would need to double check with other members of the team, but for now to follow previous guidance.	ER
3.05	JM mentioned that for the other national standards (biodiversity and amenity), there is only a certain amount that would be possible due to restrictions/constraints with root protection areas, ground conditions and available space on this site but we will note these in our FRA and refer to other reports as necessary.	
3.06	ER stated that rainwater harvesting (RWH) will need to be mentioned with the Flood Risk Assessment (FRA).	
3.07	JM mentioned that the cost and practicality of RWH for individual residential dwelling makes it unfeasible, and that it is not possible to have shared RWH within communal areas as it would not be adopted by management companies etc. JM mentioned that being able to quantify the storage provisions of a RWH system is difficult and makes the system hard to rely on within storage calculations for the site and how that impacts other SuDS elements; but that water butts could be a possibility for the site. There is also a risk that they are removed by homeowners in the future or not maintained.	

Appendix G

1.0 INTRODUCTION

- 1.1 The development at Durrington Gasworks, Martlets Way, Worthing, BN12 4UB includes a number of Sustainable Drainage Systems (SuDS) as part of the surface water drainage system including roadside swales/tree pits, permeable paving, attenuation basins and attenuation tanks in sequence with flow control features such as flow control chambers. This Technical Note sets out an outline management plan for the SuDS components.
- 1.2 The maintenance of all SuDS components will be in accordance with the best practices and CIRIA document C753 "The SuDS Manual". Typical maintenance activities for the proposed SuDS components have been reproduced from Table 32.1 of "The SuDS Manual" in **Table 1** below.
- 1.3 The drainage features will be maintained and managed by a private management company responsible to the owner of the site.

Table 1: Typical SuDS Maintenance Activities

Operation and Maintenance Activity	SuDS Component			
	Roadside Tree Pits	Lined Permeable Paving	Attenuation Basin	Attenuation Tanks
Regular Maintenance				
Inspection	■	■	■	■
Litter and debris removal	■	■	■	□
Grass cutting	■		■	
Weed and invasive plant control		□	□	
Shrub management	□	□	□	
Inspection of Perforated Pipework		□	□	□
Inspection of inlet and outlet pipes and chambers		□	□	□
Aquatic vegetation management			□	
Occasional Maintenance				
Sediment management	■	■	■	■
Vegetation replacement	□		□	
Vacuum sweeping and brushing		■		
Structure rehabilitation / repair	□	□	□	□
Reseeding of grassed surfaces	□		□	
■ will be required □ may be required				

2.0 SuDS MANAGEMENT PLAN

- 2.1 This long-term Management Plan for the Sustainable Drainage System (SuDS) should be implemented at the site to ensure that the drainage network functions as designed. Maintenance and cleaning of catchpit manholes, connecting pipework and SuDS components will ensure adequate hydraulic performance.
- 2.2 This plan is intended to cover all on-site drainage structures. The Site Management Team should oversee and implement the SuDS Management Plan and designate a qualified person who will be responsible for the proper operation and maintenance of the surface water drainage structures.

Water Quality Management

- 2.3 The surface drainage network has been designed to protect and enhance the quality of surface water runoff through the removal of sediment and pollutants, in accordance with guidance presented in CIRIA C753 'The SuDS Manual'.
- 2.4 The 'Simple Index Method' has been utilised to demonstrate that the proposed permeable paving provides sufficient treatment of surface water runoff for a site of this nature and intended use.
- 2.5 Catchpit manholes will add further treatment by reducing the amount of pollutants conveyed through the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular sweeping and litter removal, prohibitions on the use of pesticides and provision of best practices.

Maintenance Program

- 2.6 The Site Management Team will conduct the SuDS Management Plan set out in this document. The responsible party will ensure that inspections and record keeping are timely and accurate.
- 2.7 Inspection & Maintenance Log Forms (attached) should include the date and physical conditions of the structures, depth of sediment in structures / features, evidence of overtopping or debris blockage and maintenance required of each structure.
- 2.8 Records of maintenance will be kept on file on-site and copies of Inspection & Maintenance Log sheets indicating all work and inspections will be available to the Council upon request.

Regular maintenance should include:

- Inspect paving surfacing and sweep any debris every 6 months, or as determined to be reasonable based on experience with the installed systems, to ensure that the permeable paving is working in the intended fashion.
- All litter shall be picked up and removed from access roads, paving and soft landscaping.
- The inlets, outlet and vents and overflows of SuDS components should be checked annually and after large storms to ensure that they are in good condition and operating as designed. Regular maintenance includes inspection and identification of any areas that are not operating correctly monthly for the first 3 months and then every 6 months after.

Winter Maintenance Program

- 2.9 Ensure that drainage structures are not blocked by ice, snow, debris or rubbish during winter months. Inspections and maintenance should be carried out on a more regular basis due to likely adverse weather conditions.
- 2.10 Avoid de-icing agents wherever possible to allow bio-remediation of pollutants in SuDS features.

Fertiliser Use

- 2.11 Only slow-release organic low-phosphorous fertilisers will be used in any landscaped areas in order to limit the amount of nutrients that could enter the surface water drainage system.
- 2.12 Avoid use of weed killers and pesticides to prevent chemical pollution.

Operation and Maintenance requirements

- 2.13 Recommendations for the operation and maintenance including typical frequencies are included in **Table 2 to 5** below:

Table 2 : Typical SuDS Maintenance Activity Frequencies:
Roadside Tree Pits

SuDS Element	Roadside Tree Pits	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season) or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth; alter plant types to better suit conditions, if required	As required or if bare soil is exposed over > 10% of the filter strip area
Remedial Actions	Repair erosion or other damage by re-turfing or reseedling	As required
	Re-level uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required

	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

**Table 3 : Typical SuDS Maintenance Activity Frequencies:
Lined Permeable Paving**

SuDS Element	Lined Permeable Paving	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Brushing and vacuuming	Once a year or as required
Occasional Maintenance	Stabilise and mow contributing adjacent area	As required
	Removal of weed or management using glyphosate applied directly into weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which has been raised to within 50mm of the level of the paving	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to structural performance or a hazard to users.	As required.
	Rehabilitation of surface or upper structure by remedial sweeping	Every 10 to 15 years, or as required
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48hrs after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

**Table 4 : Typical SuDS Maintenance Activity Frequencies:
Attenuation Basin**

SuDS Element	Attenuation Basin	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass - meadow grass in and around basin	Half yearly (spring, before nesting season, and autumn)
	Manage other vegetation and remove invasive/nuisance plants (e.g. Himalayan Balsam)	Monthly (at start, then as required)
	Inspect inlets, outlets, and overflows for blockages, and clear is required	Monthly
	Inspect banksides, structures, pipework etc. for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlets and forebays	Annually (or as required)
	Manage wetland plants in outlet pool- where provided	Annually
Occasional Maintenance	Reseed areas of poor vegetation growth	As required

	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial Actions	Repair erosion or other damage by reseedling or returfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven levels and reinstate design levels	As required

**Table 5 : Typical SuDS Maintenance Activity Frequencies:
Attenuation Tank**

SuDS Element	Attenuation Tank	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risk to performance)	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required.
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Pipework and Outfall Flap Valves

2.14 The connecting pipework under the site roads and outfall pipework, should be regularly checked to ensure there is no significant damage affecting the function of the proposed drainage system. This would include:

- Quarterly visual inspection of the upstream and downstream chambers / outfalls to ensure surface water flows through the network (also to be undertaken after severe storms);
- CCTV survey on an annual basis to inspect condition of pipework;
- Jetting of the pipework to remove sediment / blockages, as required; and
- Repairs / replacement of damaged or collapsed pipework, as required.

2.15 Flap valves are constructed in a way that minimum maintenance is required. To ensure correct functioning of the flap valve it is recommended to carry the following maintenance:

- Half yearly visual check of the flap valve;
- Half yearly visual inspection of the material sealing and replacement / cleaning, as required;
- Replacement / repair of damaged flap valve, as required.

Exclusions

2.16 This SuDS Management and Maintenance Strategy does not allow for the maintenance of the pumping station or proprietary treatment structures. The manufacturer's guidance and expertise should be used.

Additional Support

2.17 In the event of concern or failure of a SuDS feature, it is recommended that Ardent Consulting Engineers are contacted to provide expert advice.

Drainage Operation and Maintenance Log

Site Maintenance Supervisor: _____ Date: _____

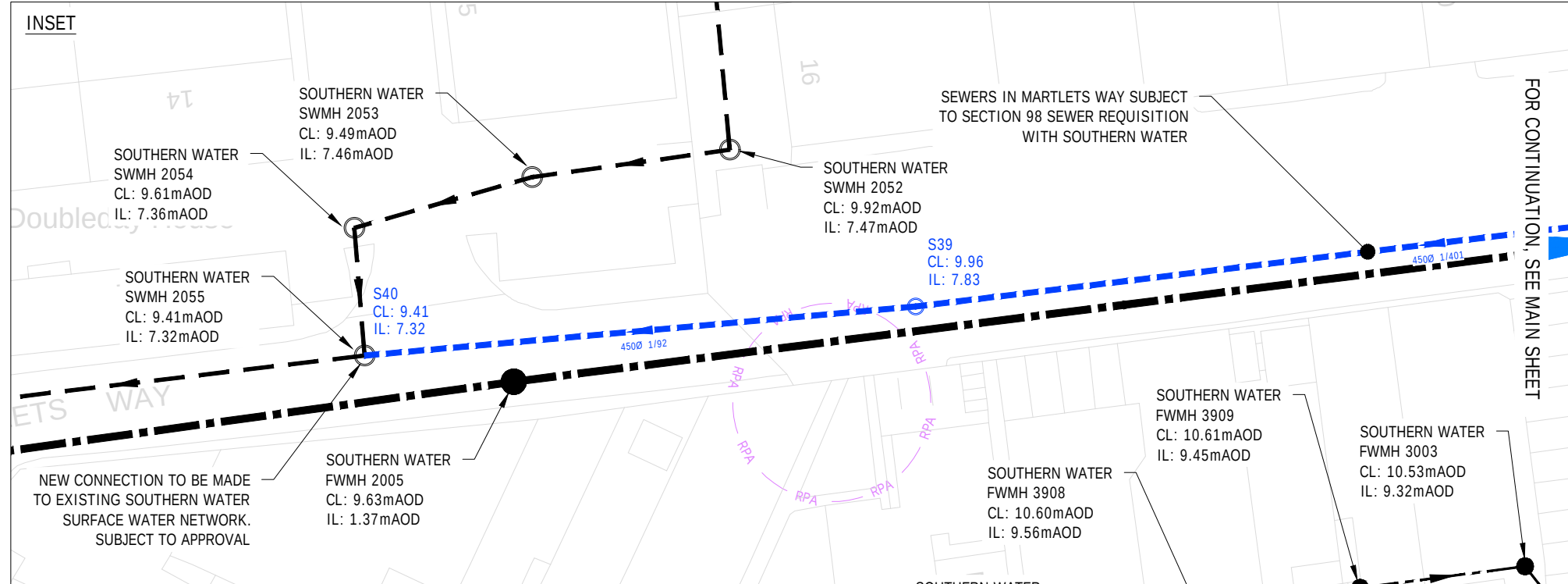
☐ Routine ☐ Response to rainfall event ☐ Other: _____

Maintenance Area	Frequency	Date Performed	Comments
Catchpit Manholes and Pipework	Monthly Inspections of condition and operation		
	Monthly (for the first 3 months) then as required; removal of silt accumulation		
	Reparation of physical damage to pipes and chambers		
Inlet, outlets and Headwalls	Inspect and identify areas not operating properly every 3 months (for the first 3 months) and every 6 months after.		
	Monthly trash screens inspection and remove debris		
Pavement Areas/Hard Surfaces	Monthly trash screens inspection and remove debris		

(parking, driveways, service areas)	Rubbish, litter & debris removal on a monthly basis		
	Specialist sweeping, jetting and vacuuming, as required		
	Remediation of any depressions, rutting or broken paving elements, as required		
Landscaped & Vegetated Areas	Maintenance as necessary		

Appendix H

INSET



FOR CONTINUATION, SEE MAIN SHEET

2.5

TOTAL SITE AREA = 4.21ha
DEVELOPABLE AREA = 3.39ha
IMPERMEABLE AREA (65% - INCLUDES URBAN CREEP) = 2.205ha

$Q_{max} = 3.6 \text{ l/s/ha}$
 $Q_1 = 3.0 \text{ l/s/ha}$
 $Q_2 = 3.1 \text{ l/s/ha}$
 $Q_3 = 8.2 \text{ l/s/ha}$
 $Q_{100} = 11.3 \text{ l/s/ha}$

TOTAL SITE DISCHARGE RATE
= (3.39ha x 3.1l/s/ha) x 5 (AS PER NATIONAL SuDS GUIDANCE)
= 52.6l/s

DRAINAGE PARAMETERS USED
CV = 1.0 MADD = 0 FEH22 DATA

STORAGE REQUIRED = 1,568m³

STORAGE PROVIDED BY BASINS = 992m³
STORAGE PROVIDED BY ATTENUATION TANKS = 384m³
STORAGE PROVIDED BY PERMEABLE PAVING = 205m³
TOTAL STORAGE PROVIDED = 1,581m³

STORAGE SIZED TO ACCOMMODATE 1 IN 100YR STORM EVENT PLUS 45% CLIMATE CHANGE ALLOWANCE

NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
- ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
- NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
- ANY WORKS OUTSIDE RED SITE BOUNDARY ARE FOR INFORMATION PURPOSES ONLY. UNLESS SPECIFICALLY NOTED, ALL WORKS OUTSIDE THE SITE BOUNDARY WILL BE UNDERTAKEN BY OTHERS UNDER A SEPARATE CONTRACT.

KEY:

- EXISTING SURFACE WATER SEWER AND CHAMBER
- EXISTING FOUL WATER SEWER AND CHAMBER
- EXISTING PHASE 1 SURFACE WATER SPUR
- PROPOSED SURFACE WATER SEWER AND CHAMBER
- PROPOSED SURFACE WATER CONTROL CHAMBER
- PROPOSED HEADWALL
- PROPOSED FOUL WATER SEWER AND CHAMBER
- PROPOSED BASIN
- PROPOSED BANKING (1:3 SLOPES)
- TREE ROOT PROTECTION AREA
- GEOCELLULAR 'ATTENUATION TANK'
- MAJOR CONTOUR
- MINOR CONTOUR
- AREA TO DISCHARGE INTO PHASE 1 DRAINAGE
- RETAINED SGN LAND/EQUIPMENT
- PROPOSED PERMEABLE PAVING
- EXCEEDANCE FLOW ROUTES
- PROPOSED TREE PIT / BIO-RETENTION FEATURE
- APPROXIMATE LOCATION OF FORMER GASHOLDER

0m 5m 25m
Scale: 1:500 @ A1

P3	UPDATED TO SUIT LAYOUT CHANGES	JH	JH	JM	30.04.26
P2	UPDATED TO SUIT COMMERCIAL LAYOUT CHANGES	JH	JH	JM	26.02.26
P1	PRELIMINARY ISSUE	JH	JM	BB	19.12.25
Rev	Description	Drn	Chk	App	Date
Purpose:	PRELIMINARY				Status: NOT YET APPROVED

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abdee

Client

BELLWAY HOMES LTD
(SOUTH LONDON)

Project Title:

DURRINGTON GASWORKS
(ELIZABETH SQUARE PHASE 2)

Drawing Title:

PROPOSED DRAINAGE STRATEGY

Drawn by	Checked by	Approved by	Revision
JH	JM	BB	
A1 Scale	Date		
1:500@A1	19.12.25		

Drawing Number
2505550_C-ACE-XX-XX-DR-C-0601

INFORMATION SUMMARY

INFORMATION TYPE	SOURCE	REFERENCE	REVISION & DATE
SITE LAYOUT	MD DESIGN	SL-01	REV. A 15.04.26
OS	MD DESIGN	OS SURVEY MDD BASE SCALE	REV. - 25.06.24
TOPOGRAPHICAL SURVEY	MK SURVEYS	30510	REV. 1 12.08.25
TREE SURVEY	KEEN CONSULTANTS	draft 2440-KC-XX-YTRE E-TreeProtectionPI an01Rev0	REV. 0 29.10.25

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File Location: \\ardent\projects\1505550_c_martlets way_nib and sgn - durington - planning\technical\acad\drawings\2505550_c-ace-xx-xx-dr-c-0601\proposed drainage strategy.dwg

Appendix I

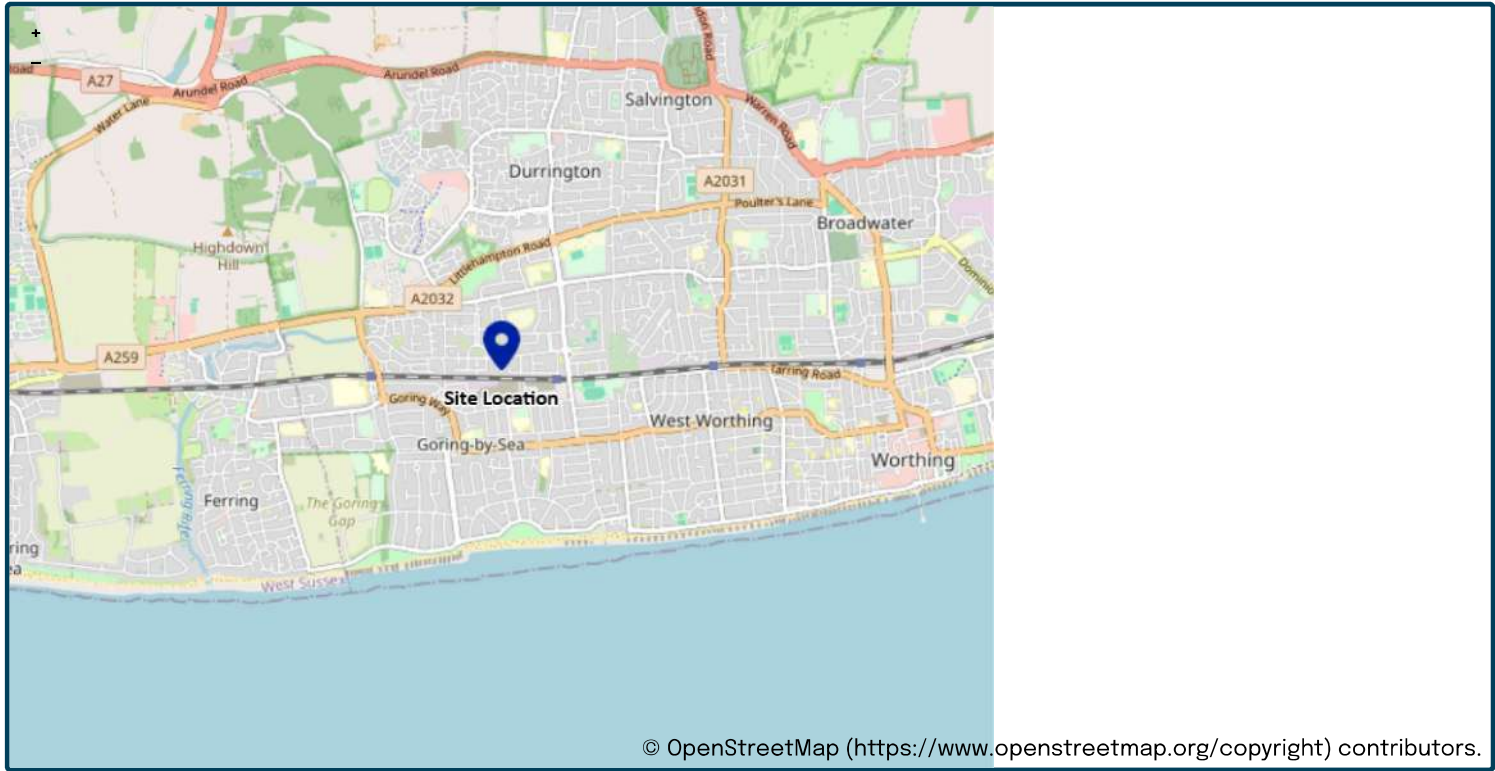
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	20/11/2025
Calculated by	Josh Haddow
Reference	2505550_C
Model version	2.2.2

Location

Site name	2505550_C
Site location	Martlets Way, Durrington



Site easting (British National Grid)	511547
Site northing (British National Grid)	103080

Site details

Total site area (ha)	1	ha
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Greenfield runoff

Method

Method

FEH statistical (2025)

FEH statistical (2025)

	My value	Map value
SAAR9120 (mm)	786 mm	
BFIHOST19scaled	0.537	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	3.1 l/s	
QBar (FEH statistical 2025) (l/s)	3.6 l/s	

Growth curve factors

	My value	Map value
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	3.0 l/s
Flow rate 2 year (l/s)	3.1 l/s
Flow rate 10 years (l/s)	5.8 l/s
Flow rate 30 years (l/s)	8.2 l/s
Flow rate 100 years (l/s)	11.3 l/s
Flow rate 200 years (l/s)	13.3 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix J

**Design Settings**

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S2	0.072	5.00	11.633	1350	511659.613	103125.817	1.503
S3	0.072	5.00	11.508	1350	511656.983	103139.136	1.558
S4	0.072	5.00	11.401	1350	511647.169	103146.944	1.506
S5	0.072	5.00	11.206	1350	511626.721	103146.599	1.471
S6	0.072	5.00	11.042	1350	511569.252	103145.629	1.562
S7	0.072	5.00	11.211	1350	511569.768	103135.456	1.766
S8 (HW1)	0.000	5.00	10.900	1350	511555.927	103133.293	1.500
S9	0.072	5.00	11.650	1350	511649.635	103092.818	1.650
S10	0.072	5.00	11.495	1350	511583.354	103082.711	1.775
S11	0.071	5.00	11.562	1350	511577.507	103086.757	1.947
S12	0.071	5.00	11.416	1350	511572.890	103115.547	1.946
S13 (HW2)	0.000	5.00	10.900		511558.992	103113.406	1.500
S14 (HW3)	0.000	5.00	10.900		511553.689	103105.136	1.500
S15	0.071	5.00	11.197	1200	511551.871	103071.806	2.167
S16	0.071	5.00	10.829	1350	511635.623	103036.197	1.499
S17	0.071	5.00	11.090	1200	511563.605	103025.101	2.060
S18	0.071	5.00	10.979	1200	511556.298	103030.636	2.064
S19 (Tank 1)	0.000	5.00	10.960	1350	511563.313	103049.474	1.560
S20	0.071	5.00	10.839	1200	511552.473	103047.804	1.979
S21	0.071	5.00	10.815	1200	511551.314	103053.008	1.975
S22 (FC1)	0.071	5.00	10.866	2700	511548.515	103054.590	2.041
S23	0.071	5.00	10.973	1350	511532.854	103058.189	2.203
S24	0.071	5.00	10.914	1350	511528.046	103061.951	2.164
S25	0.071	5.00	10.776	1350	511525.309	103072.506	2.061
S26	0.071	5.00	10.670	1350	511517.914	103077.595	1.985
S27 (Tank 2)	0.000	5.00	10.400	1350	511494.870	103091.361	1.600
S28	0.071	5.00	10.712	1350	511497.538	103074.457	2.092
S29	0.071	5.00	10.885	1350	511483.701	103072.326	2.310
S30 (Tank 3)	0.000	5.00	10.500	1350	511459.238	103093.970	1.750
S31	0.071	5.00	10.538	1200	511460.303	103087.224	1.893
S32	0.071	5.00	10.768	1350	511462.445	103073.654	2.258
S33 (HW4)	0.000	5.00	9.900		511425.139	103067.766	1.500
S34 (HW5)	0.000	5.00	9.900		511421.544	103047.103	1.500

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S35 (Tank 4)	0.000	5.00	10.200	1350	511404.559	103064.931	1.800
S36	0.141	5.00	10.117	1350	511407.646	103044.899	1.882
S37	0.141	5.00	10.041	1350	511408.736	103037.832	1.831
S38 (FC2)	0.140	5.00	10.146	2700	511373.771	103032.441	2.096
S39	0.000	5.00	9.960	1350	511286.159	103021.839	2.130
S40	0.000		9.410	1200	511239.444	103017.688	2.090

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	13.576	75.4	300	Circular	11.633	10.130	1.203	11.508	9.950	1.258
1.001	12.541	228.0	300	Circular	11.508	9.950	1.258	11.401	9.895	1.206
1.002	20.451	240.6	300	Circular	11.401	9.895	1.206	11.206	9.810	1.096
1.003	57.477	225.4	375	Circular	11.206	9.735	1.096	11.042	9.480	1.187
1.004	10.186	291.0	375	Circular	11.042	9.480	1.187	11.211	9.445	1.391
1.005	14.009	311.3	375	Circular	11.211	9.445	1.391	10.900	9.400	1.125
1.006	28.246	0.0	450	Circular	10.900	9.400	1.050	10.900	9.400	1.050
2.000	67.047	239.5	300	Circular	11.650	10.000	1.350	11.495	9.720	1.475
2.001	7.110	237.0	300	Circular	11.495	9.720	1.475	11.562	9.690	1.572
2.002	29.158	201.1	375	Circular	11.562	9.615	1.572	11.416	9.470	1.571
2.003	14.062	200.9	375	Circular	11.416	9.470	1.571	10.900	9.400	1.125
2.004	9.824	0.0	450	Circular	10.900	9.400	1.050	10.900	9.400	1.050
1.007	33.380	90.2	375	Circular	10.900	9.400	1.125	11.197	9.030	1.792
1.008	17.540	85.6	375	Circular	11.197	9.030	1.792	10.866	8.825	1.666
3.000	72.868	242.9	300	Circular	10.829	9.330	1.199	11.090	9.030	1.760

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S2	1350	Manhole	Adoptable	S3	1350	Manhole	Adoptable
1.001	S3	1350	Manhole	Adoptable	S4	1350	Manhole	Adoptable
1.002	S4	1350	Manhole	Adoptable	S5	1350	Manhole	Adoptable
1.003	S5	1350	Manhole	Adoptable	S6	1350	Manhole	Adoptable
1.004	S6	1350	Manhole	Adoptable	S7	1350	Manhole	Adoptable
1.005	S7	1350	Manhole	Adoptable	S8 (HW1)	1350	Manhole	Adoptable
1.006	S8 (HW1)	1350	Manhole	Adoptable	S14 (HW3)		Junction	
2.000	S9	1350	Manhole	Adoptable	S10	1350	Manhole	Adoptable
2.001	S10	1350	Manhole	Adoptable	S11	1350	Manhole	Adoptable
2.002	S11	1350	Manhole	Adoptable	S12	1350	Manhole	Adoptable
2.003	S12	1350	Manhole	Adoptable	S13 (HW2)		Junction	
2.004	S13 (HW2)		Junction		S14 (HW3)		Junction	
1.007	S14 (HW3)		Junction		S15	1200	Manhole	Adoptable
1.008	S15	1200	Manhole	Adoptable	S22 (FC1)	2700	Manhole	Adoptable
3.000	S16	1350	Manhole	Adoptable	S17	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.001	9.167	229.2	300	Circular	11.090	9.030	1.760	10.979	8.990	1.689
3.002	17.589	319.8	375	Circular	10.979	8.915	1.689	10.839	8.860	1.604
4.000	10.968	23.6	300	Circular	10.960	9.400	1.260	10.839	8.935	1.604
3.003	5.332	266.6	375	Circular	10.839	8.860	1.604	10.815	8.840	1.600
3.004	3.215	214.3	375	Circular	10.815	8.840	1.600	10.866	8.825	1.666
1.009	16.069	292.2	375	Circular	10.866	8.825	1.666	10.973	8.770	1.828
1.010	6.105	305.3	375	Circular	10.973	8.770	1.828	10.914	8.750	1.789
1.011	10.904	311.5	375	Circular	10.914	8.750	1.789	10.776	8.715	1.686
1.012	8.977	299.2	375	Circular	10.776	8.715	1.686	10.670	8.685	1.610
1.013	20.616	317.2	375	Circular	10.670	8.685	1.610	10.712	8.620	1.717
5.000	17.113	163.0	300	Circular	10.400	8.800	1.300	10.712	8.695	1.717
1.014	14.000	311.1	375	Circular	10.712	8.620	1.717	10.885	8.575	1.935
1.015	18.779	288.9	375	Circular	10.885	8.575	1.935	10.768	8.510	1.883
6.000	5.165	49.2	300	Circular	10.500	8.750	1.450	10.538	8.645	1.593
6.001	23.673	394.6	300	Circular	10.538	8.645	1.593	10.768	8.585	1.883
1.016	39.857	362.3	375	Circular	10.768	8.510	1.883	9.900	8.400	1.125
1.017	20.973	0.0	375	Circular	9.900	8.400	1.125	9.900	8.400	1.125
1.018	10.139	61.4	375	Circular	9.900	8.400	1.125	10.117	8.235	1.507

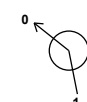
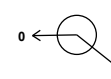
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.001	S17	1200	Manhole	Adoptable	S18	1200	Manhole	Adoptable
3.002	S18	1200	Manhole	Adoptable	S20	1200	Manhole	Adoptable
4.000	S19 (Tank 1)	1350	Manhole	Adoptable	S20	1200	Manhole	Adoptable
3.003	S20	1200	Manhole	Adoptable	S21	1200	Manhole	Adoptable
3.004	S21	1200	Manhole	Adoptable	S22 (FC1)	2700	Manhole	Adoptable
1.009	S22 (FC1)	2700	Manhole	Adoptable	S23	1350	Manhole	Adoptable
1.010	S23	1350	Manhole	Adoptable	S24	1350	Manhole	Adoptable
1.011	S24	1350	Manhole	Adoptable	S25	1350	Manhole	Adoptable
1.012	S25	1350	Manhole	Adoptable	S26	1350	Manhole	Adoptable
1.013	S26	1350	Manhole	Adoptable	S28	1350	Manhole	Adoptable
5.000	S27 (Tank 2)	1350	Manhole	Adoptable	S28	1350	Manhole	Adoptable
1.014	S28	1350	Manhole	Adoptable	S29	1350	Manhole	Adoptable
1.015	S29	1350	Manhole	Adoptable	S32	1350	Manhole	Adoptable
6.000	S30 (Tank 3)	1350	Manhole	Adoptable	S31	1200	Manhole	Adoptable
6.001	S31	1200	Manhole	Adoptable	S32	1350	Manhole	Adoptable
1.016	S32	1350	Manhole	Adoptable	S33 (HW4)		Junction	
1.017	S33 (HW4)		Junction		S34 (HW5)		Junction	
1.018	S34 (HW5)		Junction		S36	1350	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
7.000	20.268	225.2	300	Circular	10.200	8.400	1.500	10.117	8.310	1.507
1.019	11.618	464.7	375	Circular	10.117	8.235	1.507	10.041	8.210	1.456
1.020	31.075	194.2	375	Circular	10.041	8.210	1.456	10.146	8.050	1.721
1.021	88.251	401.1	450	Circular	10.146	8.050	1.646	9.960	7.830	1.680
1.022	46.899	74.4	450	Circular	9.960	7.950	1.560	9.410	7.320	1.640

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
7.000	S35 (Tank 4)	1350	Manhole	Adoptable	S36	1350	Manhole	Adoptable
1.019	S36	1350	Manhole	Adoptable	S37	1350	Manhole	Adoptable
1.020	S37	1350	Manhole	Adoptable	S38 (FC2)	2700	Manhole	Adoptable
1.021	S38 (FC2)	2700	Manhole	Adoptable	S39	1350	Manhole	Adoptable
1.022	S39	1350	Manhole	Adoptable	S40	1200	Manhole	Adoptable

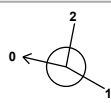
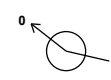
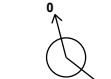
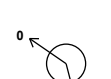
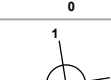
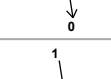
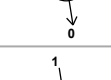
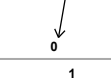
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S2	511659.613	103125.817	11.633	1.503	1350		0	1.000	10.130	300
S3	511656.983	103139.136	11.508	1.558	1350		1	1.000	9.950	300
						0	1.001	9.950	300	
S4	511647.169	103146.944	11.401	1.506	1350		1	1.001	9.895	300
						0	1.002	9.895	300	
S5	511626.721	103146.599	11.206	1.471	1350		1	1.002	9.810	300
						0	1.003	9.735	375	
S6	511569.252	103145.629	11.042	1.562	1350		1	1.003	9.480	375
						0	1.004	9.480	375	
S7	511569.768	103135.456	11.211	1.766	1350		1	1.004	9.445	375
						0	1.005	9.445	375	
S8 (HW1)	511555.927	103133.293	10.900	1.500	1350		1	1.005	9.400	375
						0	1.006	9.400	450	

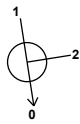
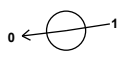
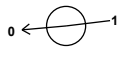
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S9	511649.635	103092.818	11.650	1.650	1350		0	2.000	10.000	300
S10	511583.354	103082.711	11.495	1.775	1350		1	2.000	9.720	300
							0	2.001	9.720	300
S11	511577.507	103086.757	11.562	1.947	1350		1	2.001	9.690	300
							0	2.002	9.615	375
S12	511572.890	103115.547	11.416	1.946	1350		1	2.002	9.470	375
							0	2.003	9.470	375
S13 (HW2)	511558.992	103113.406	10.900	1.500			1	2.003	9.400	375
							0	2.004	9.400	450
S14 (HW3)	511553.689	103105.136	10.900	1.500			1	2.004	9.400	450
							2	1.006	9.400	450
							0	1.007	9.400	375
S15	511551.871	103071.806	11.197	2.167	1200		1	1.007	9.030	375
							0	1.008	9.030	375
S16	511635.623	103036.197	10.829	1.499	1350		0	3.000	9.330	300
S17	511563.605	103025.101	11.090	2.060	1200		1	3.000	9.030	300
							0	3.001	9.030	300
S18	511556.298	103030.636	10.979	2.064	1200		1	3.001	8.990	300
							0	3.002	8.915	375
S19 (Tank 1)	511563.313	103049.474	10.960	1.560	1350		0	4.000	9.400	300
S20	511552.473	103047.804	10.839	1.979	1200		1	4.000	8.935	300
							2	3.002	8.860	375
							0	3.003	8.860	375
S21	511551.314	103053.008	10.815	1.975	1200		1	3.003	8.840	375
							0	3.004	8.840	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S22 (FC1)	511548.515	103054.590	10.866	2.041	2700		1	3.004	8.825	375
							2	1.008	8.825	375
							0	1.009	8.825	375
S23	511532.854	103058.189	10.973	2.203	1350		1	1.009	8.770	375
							0	1.010	8.770	375
S24	511528.046	103061.951	10.914	2.164	1350		1	1.010	8.750	375
							0	1.011	8.750	375
S25	511525.309	103072.506	10.776	2.061	1350		1	1.011	8.715	375
							0	1.012	8.715	375
S26	511517.914	103077.595	10.670	1.985	1350		1	1.012	8.685	375
							0	1.013	8.685	375
S27 (Tank 2)	511494.870	103091.361	10.400	1.600	1350		0	5.000	8.800	300
S28	511497.538	103074.457	10.712	2.092	1350		1	5.000	8.695	300
							2	1.013	8.620	375
							0	1.014	8.620	375
S29	511483.701	103072.326	10.885	2.310	1350		1	1.014	8.575	375
							0	1.015	8.575	375
S30 (Tank 3)	511459.238	103093.970	10.500	1.750	1350		0	6.000	8.750	300
							0	6.000	8.645	300
S31	511460.303	103087.224	10.538	1.893	1200		1	6.000	8.645	300
							0	6.001	8.645	300
S32	511462.445	103073.654	10.768	2.258	1350		1	6.001	8.585	300
							2	1.015	8.510	375
							0	1.016	8.510	375
S33 (HW4)	511425.139	103067.766	9.900	1.500			1	1.016	8.400	375
							0	1.017	8.400	375
S34 (HW5)	511421.544	103047.103	9.900	1.500			1	1.017	8.400	375
							0	1.018	8.400	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S35 (Tank 4)	511404.559	103064.931	10.200	1.800	1350		0	7.000	8.400	300
S36	511407.646	103044.899	10.117	1.882	1350		1 2 0	7.000 1.018 1.019	8.310 8.235 8.235	300 375 375
S37	511408.736	103037.832	10.041	1.831	1350		1 0	1.019 1.020	8.210 8.210	375 375
S38 (FC2)	511373.771	103032.441	10.146	2.096	2700		1 0	1.020 1.021	8.050 8.050	375 450
S39	511286.159	103021.839	9.960	2.130	1350		1 0	1.021 1.022	7.830 7.950	450 450
S40	511239.444	103017.688	9.410	2.090	1200		1	1.022	7.320	450

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s) x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume x
Winter CV	1.000	Additional Storage (m³/ha)	0.0	

Storm Durations

15	60	180	360	600	960	10080
30	120	240	480	720	1440	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node S22 (FC1) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	8.825	Product Number	CTL-SHE-0280-5000-2075-5000
Design Depth (m)	2.075	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	50.0	Min Node Diameter (mm)	2700

Node S38 (FC2) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	8.050	Product Number	CTL-SHE-0290-5260-1850-5260
Design Depth (m)	1.850	Min Outlet Diameter (m)	0.375
Design Flow (l/s)	52.6	Min Node Diameter (mm)	2700

Node S14 (HW3) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	9.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	90

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	254.0	0.0	1.500	654.0	0.0

Node S19 (Tank 1) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	9.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	98

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	128.0	0.0	0.800	128.0	0.0	0.801	0.0	0.0

Node S27 (Tank 2) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	126.0	0.0	0.800	126.0	0.0	0.801	0.0	0.0

Node S30 (Tank 3) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	98.0	0.0	0.800	98.0	0.0	0.801	0.0	0.0

Node S34 (HW5) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	216.0	0.0	1.500	769.0	0.0

Node S35 (Tank 4) Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	153.0	0.0	0.800	153.0	0.0	0.801	0.0	0.0

Node S36 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	8.235	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	55.000		

Node S38 (FC2) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	8.050	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	26.000		

Node S7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.445	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	34	Depth (m)	0.300
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	72.500		

Node S32 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	8.510	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	32	Depth (m)	0.300
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	68.000		

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S2	10	10.195	0.065	13.5	0.0931	0.0000	OK
15 minute summer	S3	10	10.094	0.144	26.9	0.2065	0.0000	OK
15 minute summer	S4	11	10.063	0.168	39.8	0.2410	0.0000	OK
15 minute summer	S5	11	9.896	0.161	52.4	0.2306	0.0000	OK
15 minute summer	S6	12	9.714	0.234	65.4	0.3346	0.0000	OK
15 minute summer	S7	12	9.679	0.234	76.1	3.7625	0.0000	OK
30 minute summer	S8 (HW1)	22	9.617	0.217	66.1	0.3098	0.0000	OK
15 minute summer	S9	11	10.086	0.086	13.5	0.1226	0.0000	OK
15 minute summer	S10	11	9.856	0.136	26.3	0.1949	0.0000	OK
15 minute summer	S11	11	9.752	0.137	38.5	0.1960	0.0000	OK
15 minute summer	S12	11	9.647	0.177	51.2	0.2531	0.0000	OK
15 minute winter	S13 (HW2)	11	9.631	0.231	47.9	0.0000	0.0000	OK
30 minute summer	S14 (HW3)	24	9.562	0.162	130.7	44.6397	0.0000	OK
60 minute summer	S15	40	9.562	0.532	60.0	0.6015	0.0000	SURCHARGED
30 minute summer	S16	20	9.650	0.320	28.8	0.4572	0.0000	SURCHARGED
60 minute summer	S17	35	9.568	0.538	25.6	0.6082	0.0000	SURCHARGED
60 minute summer	S18	35	9.561	0.646	33.3	0.7309	0.0000	SURCHARGED
120 minute summer	S19 (Tank 1)	78	9.542	0.142	27.1	17.5281	0.0000	OK
60 minute summer	S20	35	9.558	0.698	41.3	0.7890	0.0000	SURCHARGED
60 minute summer	S21	35	9.557	0.717	34.1	0.8109	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S2	1.000	S3	13.4	0.621	0.105	0.3036	
15 minute summer	S3	1.001	S4	26.3	0.711	0.360	0.4644	
15 minute summer	S4	1.002	S5	39.6	1.028	0.555	0.7866	
15 minute summer	S5	1.003	S6	52.6	0.916	0.396	3.3751	
15 minute summer	S6	1.004	S7	63.3	0.909	0.542	0.7367	
15 minute summer	S7	1.005	S8 (HW1)	71.7	1.061	0.636	0.9461	
30 minute summer	S8 (HW1)	1.006	S14 (HW3)	65.3	1.422	0.411	1.7603	
15 minute summer	S9	2.000	S10	13.0	0.558	0.182	1.5977	
15 minute summer	S10	2.001	S11	25.8	0.887	0.359	0.2067	
15 minute summer	S11	2.002	S12	38.5	0.884	0.274	1.2753	
15 minute summer	S12	2.003	S13 (HW2)	51.6	0.966	0.366	0.8312	
15 minute winter	S13 (HW2)	2.004	S14 (HW3)	74.5	2.216	0.468	0.5058	
30 minute summer	S14 (HW3)	1.007	S15	61.5	0.869	0.292	2.6010	
60 minute summer	S15	1.008	S22 (FC1)	59.0	0.535	0.273	1.9346	
30 minute summer	S16	3.000	S17	-17.9	0.438	-0.252	5.1313	
60 minute summer	S17	3.001	S18	25.6	0.531	0.350	0.6455	
60 minute summer	S18	3.002	S20	33.6	0.334	0.302	1.9400	
120 minute summer	S19 (Tank 1)	4.000	S20	-27.1	0.556	-0.118	0.5669	
60 minute summer	S20	3.003	S21	26.4	0.334	0.216	0.5881	
60 minute summer	S21	3.004	S22 (FC1)	33.1	0.451	0.243	0.3546	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S22 (FC1)	35	9.555	0.730	62.5	4.1784	0.0000	SURCHARGED
15 minute summer	S23	12	9.067	0.297	59.2	0.4251	0.0000	OK
15 minute summer	S24	12	9.052	0.302	69.6	0.4325	0.0000	OK
15 minute summer	S25	12	9.028	0.313	80.0	0.4481	0.0000	OK
15 minute summer	S26	12	8.998	0.313	90.5	0.4478	0.0000	OK
120 minute summer	S27 (Tank 2)	78	8.852	0.052	8.5	6.3324	0.0000	OK
15 minute summer	S28	12	8.940	0.320	101.0	0.4579	0.0000	OK
15 minute summer	S29	12	8.891	0.316	102.9	0.4519	0.0000	OK
30 minute summer	S30 (Tank 3)	25	8.762	0.012	3.9	1.0916	0.0000	OK
30 minute summer	S31	20	8.817	0.172	12.0	0.1949	0.0000	OK
30 minute summer	S32	20	8.819	0.309	120.1	6.7825	0.0000	OK
180 minute summer	S33 (HW4)	140	8.712	0.312	83.4	0.0000	0.0000	OK
180 minute summer	S34 (HW5)	140	8.697	0.297	82.3	80.5437	0.0000	OK
180 minute summer	S35 (Tank 4)	144	8.694	0.294	34.4	43.1293	0.0000	OK
480 minute summer	S36	304	8.693	0.458	103.6	16.3833	0.0000	SURCHARGED
480 minute summer	S37	304	8.704	0.494	62.9	0.7068	0.0000	SURCHARGED
240 minute summer	S38 (FC2)	172	8.656	0.606	61.7	16.7808	0.0000	SURCHARGED
240 minute summer	S39	172	8.065	0.235	51.8	0.3364	0.0000	OK
180 minute summer	S40	144	7.431	0.111	51.9	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S22 (FC1)	1.009	S23	49.8	0.798	0.428	1.2760	
15 minute summer	S23	1.010	S24	59.2	0.791	0.520	0.5764	
15 minute summer	S24	1.011	S25	69.6	0.818	0.618	1.0552	
15 minute summer	S25	1.012	S26	80.1	0.847	0.696	0.8826	
15 minute summer	S26	1.013	S28	90.7	0.914	0.811	2.0458	
120 minute summer	S27 (Tank 2)	5.000	S28	-8.5	-0.382	-0.097	0.4199	
15 minute summer	S28	1.014	S29	92.5	0.934	0.820	1.3947	
15 minute summer	S29	1.015	S32	102.8	1.079	0.878	1.8316	
30 minute summer	S30 (Tank 3)	6.000	S31	-3.9	-0.243	-0.024	0.1084	
30 minute summer	S31	6.001	S32	9.3	0.415	0.168	1.1932	
30 minute summer	S32	1.016	S33 (HW4)	111.5	1.256	1.068	3.5220	
180 minute summer	S33 (HW4)	1.017	S34 (HW5)	82.3	1.477	0.745	2.0101	
180 minute summer	S34 (HW5)	1.018	S36	71.9	0.934	0.281	1.0344	
180 minute summer	S35 (Tank 4)	7.000	S36	-34.4	-0.658	-0.467	1.4236	
480 minute summer	S36	1.019	S37	61.6	0.719	0.669	1.2814	
480 minute summer	S37	1.020	S38 (FC2)	65.2	0.591	0.455	3.4275	
240 minute summer	S38 (FC2)	1.021	S39	51.8	0.744	0.323	6.1582	
240 minute summer	S39	1.022	S40	51.9	1.661	0.138	1.4639	529.5

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S2	11	11.386	1.256	49.9	1.7967	0.0000	FLOOD RISK
15 minute summer	S3	11	11.352	1.402	92.5	2.0057	0.0000	FLOOD RISK
15 minute summer	S4	11	11.224	1.329	137.5	1.9014	0.0000	FLOOD RISK
15 minute summer	S5	11	10.814	1.079	182.5	1.5436	0.0000	SURCHARGED
30 minute summer	S6	20	10.303	0.823	211.9	1.1778	0.0000	SURCHARGED
30 minute summer	S7	22	10.178	0.733	255.3	34.4319	0.0000	SURCHARGED
120 minute summer	S8 (HW1)	98	10.173	0.773	91.9	1.1060	0.0000	SURCHARGED
15 minute summer	S9	11	10.342	0.342	49.9	0.4900	0.0000	SURCHARGED
15 minute summer	S10	11	10.222	0.502	94.6	0.7187	0.0000	SURCHARGED
120 minute summer	S11	98	10.173	0.558	64.8	0.7988	0.0000	SURCHARGED
120 minute summer	S12	98	10.173	0.703	81.5	1.0054	0.0000	SURCHARGED
120 minute summer	S13 (HW2)	98	10.172	0.772	79.3	0.0000	0.0000	SURCHARGED
120 minute summer	S14 (HW3)	98	10.172	0.772	200.0	275.5260	0.0000	SURCHARGED
120 minute summer	S15	98	10.164	1.134	40.9	1.2824	0.0000	SURCHARGED
15 minute summer	S16	10	10.694	1.364	69.5	1.9513	0.0000	FLOOD RISK
15 minute summer	S17	10	10.516	1.486	98.7	1.6803	0.0000	SURCHARGED
15 minute summer	S18	10	10.385	1.470	148.6	1.6629	0.0000	SURCHARGED
120 minute summer	S19 (Tank 1)	96	10.159	0.759	68.9	93.3251	0.0000	SURCHARGED
15 minute summer	S20	10	10.232	1.372	199.0	1.5522	0.0000	SURCHARGED
15 minute summer	S21	10	10.216	1.376	163.6	1.5564	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S2	1.000	S3	44.9	0.696	0.351	0.9560	
15 minute summer	S3	1.001	S4	89.9	1.276	1.226	0.8831	
15 minute summer	S4	1.002	S5	135.0	1.917	1.892	1.4401	
15 minute summer	S5	1.003	S6	180.4	1.636	1.358	6.3395	
30 minute summer	S6	1.004	S7	209.7	1.901	1.796	1.1235	
30 minute summer	S7	1.005	S8 (HW1)	159.2	1.444	1.412	1.5452	
120 minute summer	S8 (HW1)	1.006	S14 (HW3)	89.8	1.046	0.564	4.4754	
15 minute summer	S9	2.000	S10	47.1	0.726	0.658	4.7214	
15 minute summer	S10	2.001	S11	93.0	1.320	1.294	0.5007	
120 minute summer	S11	2.002	S12	59.4	0.867	0.422	3.2160	
120 minute summer	S12	2.003	S13 (HW2)	79.3	0.823	0.563	1.5510	
120 minute summer	S13 (HW2)	2.004	S14 (HW3)	78.8	1.257	0.496	1.5565	
120 minute summer	S14 (HW3)	1.007	S15	40.1	0.798	0.190	3.6817	
120 minute summer	S15	1.008	S22 (FC1)	40.2	0.364	0.186	1.9346	
15 minute summer	S16	3.000	S17	51.4	0.729	0.724	5.1313	
15 minute summer	S17	3.001	S18	101.4	1.440	1.387	0.6455	
15 minute summer	S18	3.002	S20	151.2	1.371	1.358	1.9400	
120 minute summer	S19 (Tank 1)	4.000	S20	-68.9	-0.978	-0.300	0.7724	
15 minute summer	S20	3.003	S21	116.6	1.058	0.956	0.5881	
15 minute summer	S21	3.004	S22 (FC1)	159.8	1.449	1.173	0.3546	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S22 (FC1)	10	10.172	1.347	206.8	7.7122	0.0000	SURCHARGED
15 minute summer	S23	10	10.019	1.249	75.9	1.7869	0.0000	SURCHARGED
15 minute summer	S24	10	10.002	1.252	116.9	1.7919	0.0000	SURCHARGED
15 minute summer	S25	10	9.935	1.220	165.8	1.7465	0.0000	SURCHARGED
15 minute summer	S26	10	9.814	1.129	214.7	1.6159	0.0000	SURCHARGED
360 minute winter	S27 (Tank 2)	344	9.384	0.584	15.9	70.7899	0.0000	SURCHARGED
15 minute summer	S28	10	9.471	0.851	263.9	1.2181	0.0000	SURCHARGED
360 minute winter	S29	352	9.371	0.796	77.3	1.1390	0.0000	SURCHARGED
360 minute winter	S30 (Tank 3)	352	9.356	0.606	14.0	57.2549	0.0000	SURCHARGED
360 minute winter	S31	352	9.356	0.711	14.5	0.8038	0.0000	SURCHARGED
360 minute winter	S32	352	9.356	0.846	82.6	46.7497	0.0000	SURCHARGED
360 minute winter	S33 (HW4)	352	9.329	0.929	78.6	0.0000	0.0000	SURCHARGED
360 minute winter	S34 (HW5)	360	9.317	0.917	77.8	353.3264	0.0000	SURCHARGED
360 minute winter	S35 (Tank 4)	360	9.309	0.909	18.4	117.6537	0.0000	SURCHARGED
360 minute winter	S36	360	9.309	1.074	56.6	17.2644	0.0000	SURCHARGED
360 minute winter	S37	352	9.298	1.088	52.1	1.5569	0.0000	SURCHARGED
360 minute winter	S38 (FC2)	352	9.275	1.225	53.1	20.3258	0.0000	SURCHARGED
30 minute summer	S39	198	8.066	0.236	52.6	0.3376	0.0000	OK
30 minute summer	S40	198	7.432	0.112	52.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S22 (FC1)	1.009	S23	52.4	0.784	0.450	1.7724	
15 minute summer	S23	1.010	S24	76.2	0.754	0.669	0.6734	
15 minute summer	S24	1.011	S25	116.6	1.057	1.034	1.2027	
15 minute summer	S25	1.012	S26	165.9	1.504	1.441	0.9901	
15 minute summer	S26	1.013	S28	215.2	1.951	1.926	2.2739	
360 minute winter	S27 (Tank 2)	5.000	S28	-15.9	0.385	-0.183	1.2051	
15 minute summer	S28	1.014	S29	160.3	1.453	1.420	1.5442	
360 minute winter	S29	1.015	S32	76.9	0.925	0.656	2.0713	
360 minute winter	S30 (Tank 3)	6.000	S31	-14.0	0.461	-0.088	0.3637	
360 minute winter	S31	6.001	S32	-8.4	0.342	-0.151	1.6670	
360 minute winter	S32	1.016	S33 (HW4)	78.6	1.021	0.752	4.3961	
360 minute winter	S33 (HW4)	1.017	S34 (HW5)	77.8	1.370	0.705	2.3133	
360 minute winter	S34 (HW5)	1.018	S36	50.9	0.923	0.199	1.1183	
360 minute winter	S35 (Tank 4)	7.000	S36	-18.4	-0.391	-0.249	1.4273	
360 minute winter	S36	1.019	S37	52.1	0.769	0.566	1.2814	
360 minute winter	S37	1.020	S38 (FC2)	52.2	0.474	0.365	3.4275	
360 minute winter	S38 (FC2)	1.021	S39	52.6	0.749	0.328	6.1994	
30 minute summer	S39	1.022	S40	52.6	1.668	0.140	1.4786	801.8

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S2	11	11.090	0.960	44.9	1.3736	0.0000	SURCHARGED
15 minute summer	S3	11	11.062	1.112	83.5	1.5913	0.0000	SURCHARGED
15 minute summer	S4	11	10.957	1.062	124.3	1.5197	0.0000	SURCHARGED
15 minute summer	S5	11	10.620	0.885	165.1	1.2670	0.0000	SURCHARGED
30 minute summer	S6	20	10.208	0.728	192.1	1.0415	0.0000	SURCHARGED
30 minute summer	S7	21	10.103	0.658	231.2	27.8662	0.0000	SURCHARGED
60 minute winter	S8 (HW1)	59	10.100	0.700	100.9	1.0010	0.0000	SURCHARGED
15 minute summer	S9	11	10.193	0.193	44.9	0.2761	0.0000	OK
15 minute summer	S10	10	10.122	0.402	86.2	0.5753	0.0000	SURCHARGED
60 minute winter	S11	59	10.099	0.484	67.2	0.6931	0.0000	SURCHARGED
60 minute winter	S12	59	10.099	0.629	86.7	0.9001	0.0000	SURCHARGED
60 minute winter	S13 (HW2)	60	10.099	0.699	83.0	0.0000	0.0000	SURCHARGED
60 minute winter	S14 (HW3)	60	10.099	0.699	191.6	242.7201	0.0000	SURCHARGED
60 minute winter	S15	59	10.091	1.061	42.9	1.2002	0.0000	SURCHARGED
15 minute summer	S16	10	10.531	1.201	46.1	1.7181	0.0000	FLOOD RISK
15 minute summer	S17	10	10.382	1.352	88.7	1.5286	0.0000	SURCHARGED
15 minute summer	S18	10	10.276	1.361	133.9	1.5398	0.0000	SURCHARGED
60 minute winter	S19 (Tank 1)	59	10.087	0.687	91.2	84.5183	0.0000	SURCHARGED
15 minute summer	S20	10	10.152	1.292	179.0	1.4615	0.0000	SURCHARGED
15 minute summer	S21	10	10.132	1.292	161.7	1.4615	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S2	1.000	S3	40.7	0.688	0.318	0.9560	
15 minute summer	S3	1.001	S4	81.5	1.157	1.112	0.8831	
15 minute summer	S4	1.002	S5	122.3	1.737	1.715	1.4401	
15 minute summer	S5	1.003	S6	163.3	1.481	1.230	6.3395	
30 minute summer	S6	1.004	S7	190.1	1.723	1.628	1.1235	
30 minute summer	S7	1.005	S8 (HW1)	152.8	1.385	1.354	1.5452	
60 minute winter	S8 (HW1)	1.006	S14 (HW3)	98.4	1.243	0.619	4.4754	
15 minute summer	S9	2.000	S10	43.4	0.741	0.607	3.9659	
15 minute summer	S10	2.001	S11	87.8	1.247	1.222	0.5007	
60 minute winter	S11	2.002	S12	64.2	0.920	0.456	3.2160	
60 minute winter	S12	2.003	S13 (HW2)	83.0	0.979	0.589	1.5510	
60 minute winter	S13 (HW2)	2.004	S14 (HW3)	82.0	1.524	0.515	1.5565	
60 minute winter	S14 (HW3)	1.007	S15	39.6	0.659	0.188	3.6817	
60 minute winter	S15	1.008	S22 (FC1)	39.6	0.362	0.183	1.9346	
15 minute summer	S16	3.000	S17	46.5	0.660	0.655	5.1313	
15 minute summer	S17	3.001	S18	91.7	1.303	1.255	0.6455	
15 minute summer	S18	3.002	S20	136.8	1.240	1.229	1.9400	
60 minute winter	S19 (Tank 1)	4.000	S20	-91.2	-1.346	-0.397	0.7724	
15 minute summer	S20	3.003	S21	119.6	1.084	0.980	0.5881	
15 minute summer	S21	3.004	S22 (FC1)	154.2	1.398	1.132	0.3546	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S22 (FC1)	10	10.087	1.262	196.3	7.2271	0.0000	SURCHARGED
15 minute summer	S23	10	9.903	1.133	73.9	1.6215	0.0000	SURCHARGED
15 minute summer	S24	10	9.886	1.136	113.0	1.6258	0.0000	SURCHARGED
15 minute summer	S25	10	9.824	1.109	156.9	1.5868	0.0000	SURCHARGED
15 minute summer	S26	10	9.715	1.030	200.8	1.4744	0.0000	SURCHARGED
240 minute winter	S27 (Tank 2)	236	9.276	0.476	18.2	57.7066	0.0000	SURCHARGED
15 minute summer	S28	10	9.415	0.795	244.8	1.1376	0.0000	SURCHARGED
15 minute summer	S29	10	9.295	0.720	198.0	1.0298	0.0000	SURCHARGED
240 minute winter	S30 (Tank 3)	240	9.241	0.491	18.2	46.4542	0.0000	SURCHARGED
240 minute winter	S31	240	9.241	0.596	18.7	0.6745	0.0000	SURCHARGED
240 minute winter	S32	240	9.241	0.731	90.8	36.3037	0.0000	SURCHARGED
360 minute winter	S33 (HW4)	352	9.213	0.813	77.8	0.0000	0.0000	SURCHARGED
360 minute winter	S34 (HW5)	352	9.201	0.801	77.1	291.2528	0.0000	SURCHARGED
360 minute winter	S35 (Tank 4)	352	9.193	0.793	16.3	116.3887	0.0000	SURCHARGED
360 minute winter	S36	352	9.193	0.958	59.8	17.0980	0.0000	SURCHARGED
360 minute winter	S37	352	9.181	0.971	52.1	1.3896	0.0000	SURCHARGED
360 minute winter	S38 (FC2)	352	9.157	1.107	53.1	19.6480	0.0000	SURCHARGED
960 minute winter	S39	540	8.066	0.236	52.6	0.3376	0.0000	OK
960 minute winter	S40	540	7.432	0.112	52.6	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S22 (FC1)	1.009	S23	52.4	0.798	0.450	1.7724	
15 minute summer	S23	1.010	S24	75.3	0.778	0.661	0.6734	
15 minute summer	S24	1.011	S25	112.7	1.022	0.999	1.2027	
15 minute summer	S25	1.012	S26	157.1	1.425	1.365	0.9901	
15 minute summer	S26	1.013	S28	201.6	1.828	1.804	2.2739	
240 minute winter	S27 (Tank 2)	5.000	S28	-18.2	0.390	-0.210	1.2051	
15 minute summer	S28	1.014	S29	155.8	1.413	1.381	1.5442	
15 minute summer	S29	1.015	S32	195.0	1.768	1.665	2.0713	
240 minute winter	S30 (Tank 3)	6.000	S31	-18.2	-0.434	-0.115	0.3637	
240 minute winter	S31	6.001	S32	13.2	0.356	0.238	1.6670	
240 minute winter	S32	1.016	S33 (HW4)	84.9	1.051	0.812	4.3961	
360 minute winter	S33 (HW4)	1.017	S34 (HW5)	77.1	1.370	0.698	2.3133	
360 minute winter	S34 (HW5)	1.018	S36	53.8	0.889	0.210	1.1183	
360 minute winter	S35 (Tank 4)	7.000	S36	-16.3	0.545	-0.222	1.4273	
360 minute winter	S36	1.019	S37	52.1	0.755	0.566	1.2814	
360 minute winter	S37	1.020	S38 (FC2)	52.2	0.474	0.365	3.4275	
360 minute winter	S38 (FC2)	1.021	S39	52.6	0.749	0.328	6.1994	
960 minute winter	S39	1.022	S40	52.6	1.668	0.140	1.4786	1886.3

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S2	10	11.585	1.455	65.0	2.0815	0.0000	FLOOD RISK
15 minute summer	S3	10	11.508	1.558	130.2	2.2295	6.5595	FLOOD
15 minute summer	S4	10	11.401	1.506	149.3	2.1551	1.9860	FLOOD
30 minute summer	S5	19	11.041	1.306	195.9	1.8695	0.0000	FLOOD RISK
30 minute summer	S6	20	10.529	1.049	254.1	1.5007	0.0000	SURCHARGED
120 minute winter	S7	116	10.494	1.049	115.8	63.3412	0.0000	SURCHARGED
120 minute winter	S8 (HW1)	116	10.493	1.093	80.4	1.5635	0.0000	SURCHARGED
15 minute summer	S9	11	10.876	0.876	65.0	1.2538	0.0000	SURCHARGED
15 minute summer	S10	11	10.644	0.924	124.3	1.3227	0.0000	SURCHARGED
30 minute summer	S11	19	10.502	0.887	173.0	1.2694	0.0000	SURCHARGED
120 minute winter	S12	116	10.492	1.022	76.4	1.4631	0.0000	SURCHARGED
120 minute winter	S13 (HW2)	116	10.492	1.092	75.8	0.0000	0.0000	SURCHARGED
120 minute winter	S14 (HW3)	116	10.492	1.092	186.0	436.2587	0.0000	SURCHARGED
120 minute winter	S15	114	10.484	1.454	62.2	1.6444	0.0000	SURCHARGED
15 minute summer	S16	9	10.829	1.499	64.1	2.1451	3.7763	FLOOD
15 minute summer	S17	9	10.761	1.731	108.3	1.9582	0.0000	SURCHARGED
15 minute summer	S18	9	10.634	1.719	170.3	1.9447	0.0000	SURCHARGED
120 minute winter	S19 (Tank 1)	114	10.479	1.079	54.8	98.8851	0.0000	SURCHARGED
120 minute winter	S20	114	10.479	1.619	77.6	1.8313	0.0000	SURCHARGED
120 minute winter	S21	114	10.479	1.639	86.2	1.8533	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S2	1.000	S3	65.2	0.926	0.509	0.9560	
15 minute summer	S3	1.001	S4	87.3	1.239	1.191	0.8831	
15 minute summer	S4	1.002	S5	133.4	1.895	1.871	1.4401	
30 minute summer	S5	1.003	S6	194.3	1.762	1.463	6.3395	
30 minute summer	S6	1.004	S7	250.6	2.272	2.147	1.1235	
120 minute winter	S7	1.005	S8 (HW1)	80.4	0.756	0.713	1.5452	
120 minute winter	S8 (HW1)	1.006	S14 (HW3)	79.8	1.120	0.502	4.4754	
15 minute summer	S9	2.000	S10	61.3	0.871	0.858	4.7214	
15 minute summer	S10	2.001	S11	123.8	1.758	1.723	0.5007	
30 minute summer	S11	2.002	S12	170.4	1.545	1.211	3.2160	
120 minute winter	S12	2.003	S13 (HW2)	75.8	0.782	0.539	1.5510	
120 minute winter	S13 (HW2)	2.004	S14 (HW3)	75.4	1.330	0.474	1.5565	
120 minute winter	S14 (HW3)	1.007	S15	-60.8	0.621	-0.288	3.6817	
120 minute winter	S15	1.008	S22 (FC1)	48.9	0.444	0.226	1.9346	
15 minute summer	S16	3.000	S17	55.5	0.788	0.781	5.1313	
15 minute summer	S17	3.001	S18	109.1	1.549	1.492	0.6455	
15 minute summer	S18	3.002	S20	171.2	1.553	1.539	1.9400	
120 minute winter	S19 (Tank 1)	4.000	S20	-54.8	-0.779	-0.239	0.7724	
120 minute winter	S20	3.003	S21	71.0	0.644	0.582	0.5881	
120 minute winter	S21	3.004	S22 (FC1)	86.1	0.780	0.632	0.3546	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	S22 (FC1)	114	10.478	1.653	101.3	9.4645	0.0000	SURCHARGED
15 minute summer	S23	10	10.358	1.588	72.1	2.2722	0.0000	SURCHARGED
15 minute summer	S24	10	10.343	1.593	126.8	2.2801	0.0000	SURCHARGED
15 minute summer	S25	10	10.265	1.550	190.0	2.2182	0.0000	SURCHARGED
15 minute summer	S26	10	10.107	1.422	253.4	2.0342	0.0000	SURCHARGED
360 minute winter	S27 (Tank 2)	352	9.707	0.907	19.5	97.1173	0.0000	SURCHARGED
360 minute winter	S28	352	9.707	1.087	92.0	1.5550	0.0000	SURCHARGED
360 minute winter	S29	352	9.692	1.117	83.7	1.5989	0.0000	SURCHARGED
360 minute winter	S30 (Tank 3)	352	9.675	0.925	14.7	75.8496	0.0000	SURCHARGED
360 minute winter	S31	352	9.675	1.030	15.1	1.1644	0.0000	SURCHARGED
360 minute winter	S32	352	9.674	1.164	91.9	75.8924	0.0000	SURCHARGED
360 minute winter	S33 (HW4)	360	9.648	1.248	78.6	0.0000	0.0000	FLOOD RISK
360 minute winter	S34 (HW5)	368	9.636	1.236	77.9	548.8981	0.0000	FLOOD RISK
360 minute winter	S35 (Tank 4)	368	9.629	1.229	18.5	118.1112	0.0000	SURCHARGED
360 minute winter	S36	368	9.629	1.394	54.0	17.7218	0.0000	SURCHARGED
360 minute winter	S37	368	9.618	1.408	49.4	2.0152	0.0000	SURCHARGED
360 minute winter	S38 (FC2)	360	9.598	1.548	53.2	22.1738	0.0000	SURCHARGED
720 minute winter	S39	330	8.066	0.236	52.6	0.3376	0.0000	OK
15 minute summer	S40	182	7.432	0.112	52.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	S22 (FC1)	1.009	S23	50.0	0.719	0.429	1.7724	
15 minute summer	S23	1.010	S24	77.0	0.698	0.676	0.6734	
15 minute summer	S24	1.011	S25	128.5	1.165	1.139	1.2027	
15 minute summer	S25	1.012	S26	191.8	1.739	1.667	0.9901	
15 minute summer	S26	1.013	S28	254.9	2.312	2.281	2.2739	
360 minute winter	S27 (Tank 2)	5.000	S28	-19.5	-0.295	-0.224	1.2051	
360 minute winter	S28	1.014	S29	75.3	0.879	0.667	1.5442	
360 minute winter	S29	1.015	S32	83.5	0.925	0.713	2.0713	
360 minute winter	S30 (Tank 3)	6.000	S31	-14.7	-0.425	-0.093	0.3637	
360 minute winter	S31	6.001	S32	-8.0	0.346	-0.145	1.6670	
360 minute winter	S32	1.016	S33 (HW4)	78.6	0.997	0.753	4.3961	
360 minute winter	S33 (HW4)	1.017	S34 (HW5)	77.9	1.340	0.705	2.3133	
360 minute winter	S34 (HW5)	1.018	S36	49.3	0.943	0.193	1.1183	
360 minute winter	S35 (Tank 4)	7.000	S36	-18.5	-0.317	-0.250	1.4273	
360 minute winter	S36	1.019	S37	49.4	0.809	0.536	1.2814	
360 minute winter	S37	1.020	S38 (FC2)	49.4	0.502	0.345	3.4275	
360 minute winter	S38 (FC2)	1.021	S39	52.6	0.749	0.328	6.1993	
720 minute winter	S39	1.022	S40	52.6	1.668	0.140	1.4786	2407.3