
LLFA Response

Selsfield Lane, Ardingly, West Sussex, RH17 6UG

Client

Antler Homes plc
Knightway House
Park Street, Bagshot
Surrey, GU19 5AQ
Ref: 14267
Date: June 2026

Consulting Engineers

GTA Civils & Transport Limited
Maple House
192-198 London Road
Burgess Hill
West Sussex, RH15 9RD
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Issue	Issue date	Compiled	Checked
Preliminary Issue		KW	NS

1. Introduction

- 1.1. Further to the submission of the Reserved Matters Application (Ref. DM/26/1186) for the above project comments have been received from West Sussex CC LLFA.
- 1.2. The below list outlines the comments and queries to address within this report:
 - 1.2.1. In July, the National Standards for SUDS (NSfS) were updated. We require evidence that these are followed, in particular to Standard 2. The site currently uses no source control SUDS features. We would suggest that these shall be included to meet the NSfS. The use of source control SUDS features was also raised by MSDC Drainage at outline stage and within the LLFA pre-app in 2024.
 - 1.2.2. There are several comments raised during the pre-app which are not met. These are:
 - i) *Evidence of the ditch's connection to the wider watercourse network and reservoir, however this must be demonstrated at Reserved Matters, to ensure this is a viable method of draining the site.*
 - ii) *A 3m easement around the basin and nearby off-road parking for maintenance access is required.*
 - iii) *Basin cross sections required. It is recommended the basin is designed using guidance in the SUDS manual.*
 - 1.2.3. It appears that there may be a tree proposed to be planted on top of the attenuation tank, which may affect the longevity of the structure.
 - 1.2.4. It is proposed to use a pump for part of the site. We require details regarding pump failure, as per the NSfS.
 - 1.2.5. A full water quality assessment is required using the SUDS manual, following

the NSfS.

- 1.2.6. While SUDS planters are mentioned in 10.6, the location of these are unclear.
- 1.2.7. Part of the basin is designed with 1:2 side slopes, which does not follow SUDS manual.
- 1.2.8. The exceedance plan must show expected flood volume, depth and area for 1 in 100 plus 45% climate change event.
- 1.2.9. Updated calculations to demonstrate there is no surcharging in 50% AEP event are required,
- 1.2.10. For the southern network, 30 year plus climate change and 100 year plus correct climate change results are required.
- 1.2.11. A drawing showing maintenance responsibilities is required.

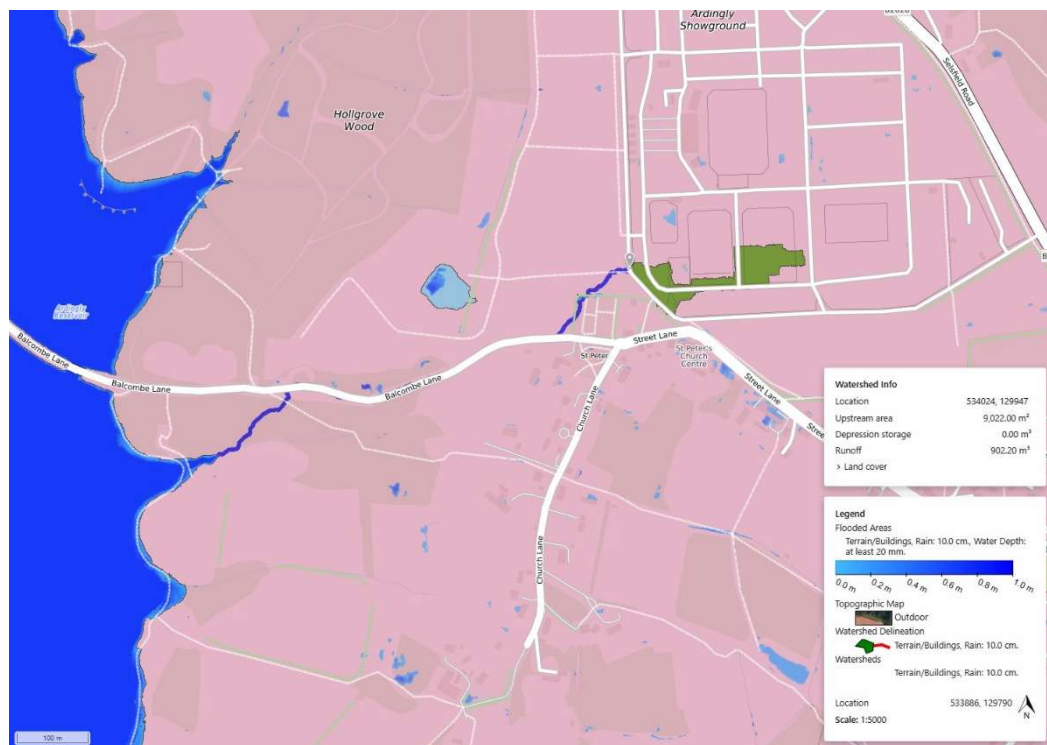
2. Response to LLFA Comments

2.1. GTA Civils & Transport's response to the LLFA comments numbered as the LLFA list:

1. SUDS planters are proposed to cater for the initial 5mm of rainfall associated with dwelling roofs. The dry basin will cater for approximately 1300 square metres of carriageway with a total road area of 3450 square metres (This equates to approximately 38%). Additional swales, one alongside the western residential road and a second prior to the outfall will provide interception of a further 500 square metres. Therefore, in total over 50% of the road network will have some form of interception. All private drives will be lined permeable paving and therefore comply. It should be noted that infiltration tests have been undertaken and no rate could be established due to the impermeability of the soil.

Pre-app Comments

2. The below image taken from the Scalgo software indicates the connectivity route from the proposed outfall to the existing reservoir. The flow follows Balcombe Lane before entering the reservoir easement. The proposed access road provides an area on the northern side of the basin to undertake maintenance tasks. 3m is available for the majority of the perimeter with the exception of some of the southern edge. We feel this is suitable for the likely maintenance tasks involved. Drawing 14267_1604 is provided in Appendix B indicating proposed sections through the basin.



3. Landscaping layout to be adjusted to avoid potential issues arising from proximity of the proposed tree.
4. It is proposed to enter into a Maintenance contract with the pump supplier to enable 24hr emergency support during failure. Suitable 24hr emergency storage is provided within the foul pumping station and cellular storage is provided for the surface water pumping station which can cater for the storage requirements for all storms below a 30 year return period with no outflow.
5. The site consists of residential roofs (Very low) and low traffic roads (Low). Utilising the simple Index approach within Ciria C753 the residential roofs will be mitigated by the SUDS planters and the basin will provide sufficient mitigation for the remaining hard surfaces.

		TSS	Metals	Hydrocarbons
Pollution hazard indices	Hardstanding – Low	0.5	0.4	0.4
SuDS mitigation indices	Basin	0.5	0.5	0.6

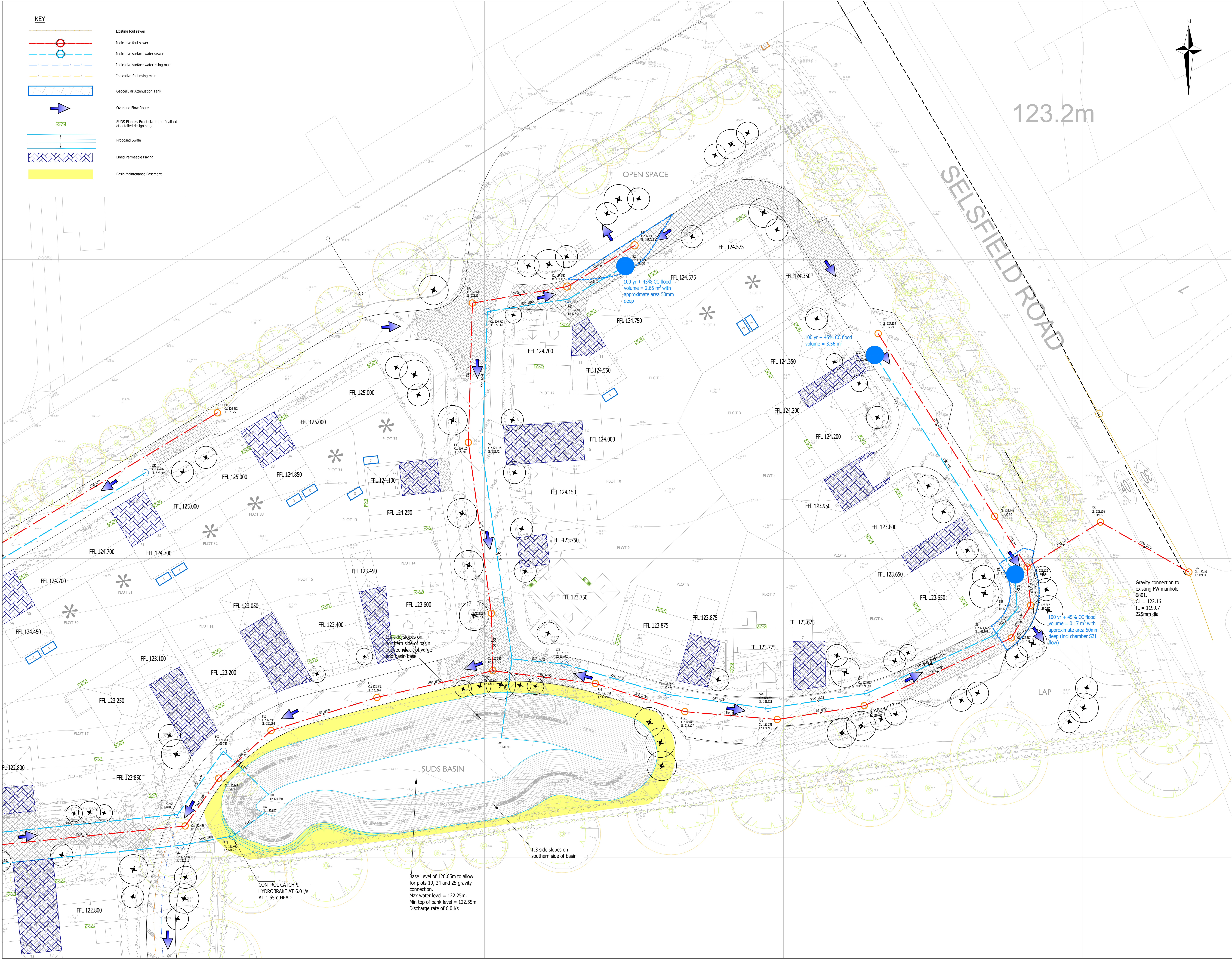
6. Indicative SUDS planters now indicated throughout the site, this is subject to detailed design.
7. Basin design has been updated with maximum side slopes of 1:3.
8. Flood volume and area now shown on drainage layout drawings. A depth of 50mm is assumed.
9. The surcharging present in the network during the critical 50% AEP event (Nodes 12, 13, 41, 42, 43 and 56) are a combination of dummy manholes within the basin footprint and water backing up into Nodes 41 and 42 as the basin fills. The surcharging is not caused by insufficient capacity. Updated calculations are included in Appendix C.
10. Calculations for the southern network have been updated with correct climate change, design updated to suit. Calculations included within Appendix C.
11. All surface water features and networks will be maintained by management company with specialist maintenance and emergency support for the pumping stations provided by the pump supplier through a maintenance agreement. The main foul network will be offered for adoption to the Local Water Authority or NAV with the southern pumped network being maintained by Management Company. Maintenance regime is included within the Drainage Statement previously submitted.

- End of Statement -

LLFA Response: Selsfield Road, Ardingly

Appendix A

Updated Drainage Layout Drawings



- GENERAL NOTES**
1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non-intrusive observations, record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gta prior to works commencing.
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P3	Updated in line with LIA comments	06.5.26	KLH	105	
P2	Minor updates to surface water outfall	06.5.26	KW	106	
P2	Initial Issue	13.4.26	KW	105	
Rev	Amendments	Date	Drawn	CHK	
Status PRELIMINARY					
Client ANTLER HOMES plc					
Architect					
Project SELSFIELD ROAD ARDINGLY					
Title PROPOSED DRAINAGE STRATEGY SHEET 1 OF 3					
Date 13/04/2026 Scale @ A0 1:200					
Client's Ref.		Project Ref. 14267			
 Civils & Transport Maple House, 192-198 London Road, Burgess Hill, West Sussex, BN15 9BD Tel:01444 871444 Web: www.gtacivils.co.uk					
Drawing Number 14267/1601			Rev: P3		



KEY

- Existing foul sewer
- Indicative foul sewer
- Indicative surface water sewer
- Indicative surface water rising main
- Indicative foul rising main
- Geocellular Attenuation Tank
- Overland Flow Route
- SUDS Planter. Exact size to be finalised at detailed design stage
- Proposed Swale
- Lined Permeable Paving
- Basin Maintenance Easement

GENERAL NOTES

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STATUS

Rev	Updated in line with LIA comments	Rev	Rev
P3	Minor updates to surface water outfall	06.05.26	KW
P2	Initial Issue	23.04.26	KW

Client ANTLER HOMES plc

Architect SELSFIELD ROAD ARDINGLY

Title PROPOSED DRAINAGE STRATEGY SHEET 2 OF 3

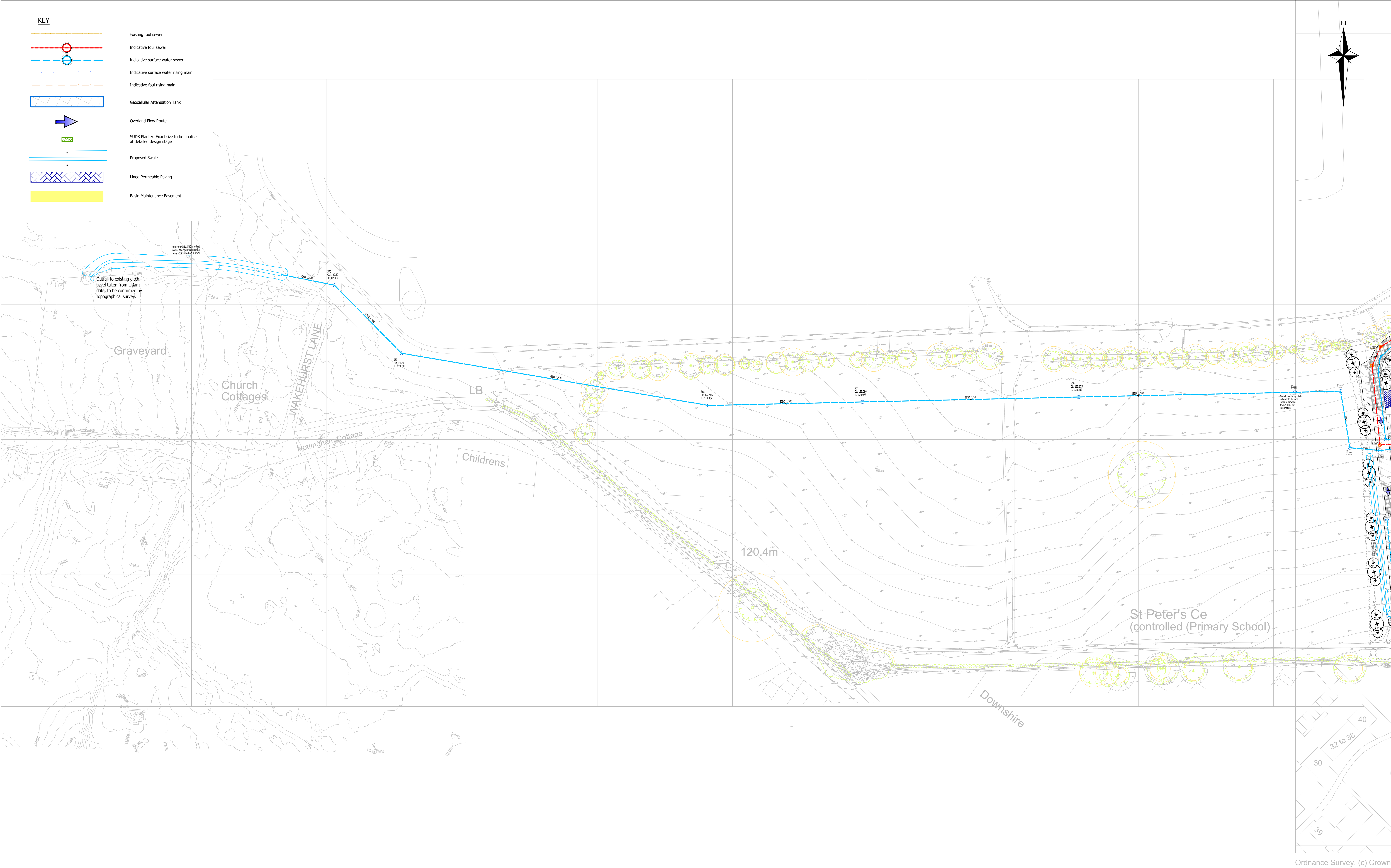
Date 13/04/2026 **Scale** B1:1000 **Project Ref** 14267

Drawing Number 14267/1602 **Rev** P3

gta Civils & Transport

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Ordnance Survey, (c) Crown

GENERAL NOTES

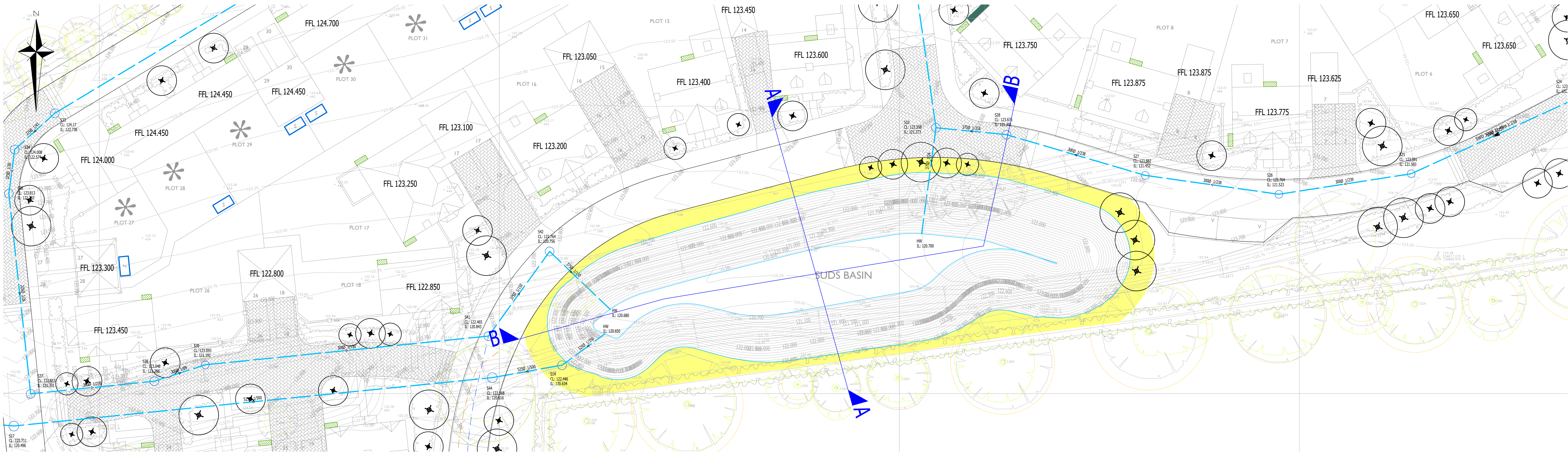
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P3	Updated in line with LPA comments	08.06.26	KW	NS	
P2	Minor updates to surface water outfall	06.05.26	KW	NS	
P1	Initial Issue	13.04.26	KW	NS	
Rev	Amendments	Date	Drawn	Chk	
Status					
PRELIMINARY					
Client					
ANTLER HOMES plc					
Architect					
Project					
SELSFIELD ROAD ARDINGLY					
Title					
PROPOSED DRAINAGE STRATEGY SHEET 3 OF 3					
Date	13/04/2026	Scale @ A0	1:500		
Client Ref.	Project Ref.		14267		
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Drawing Number			14267/1603	Rev.	P3

LLFA Response: Selsfield Road, Ardingly

Appendix B

Basin Sections Drawing

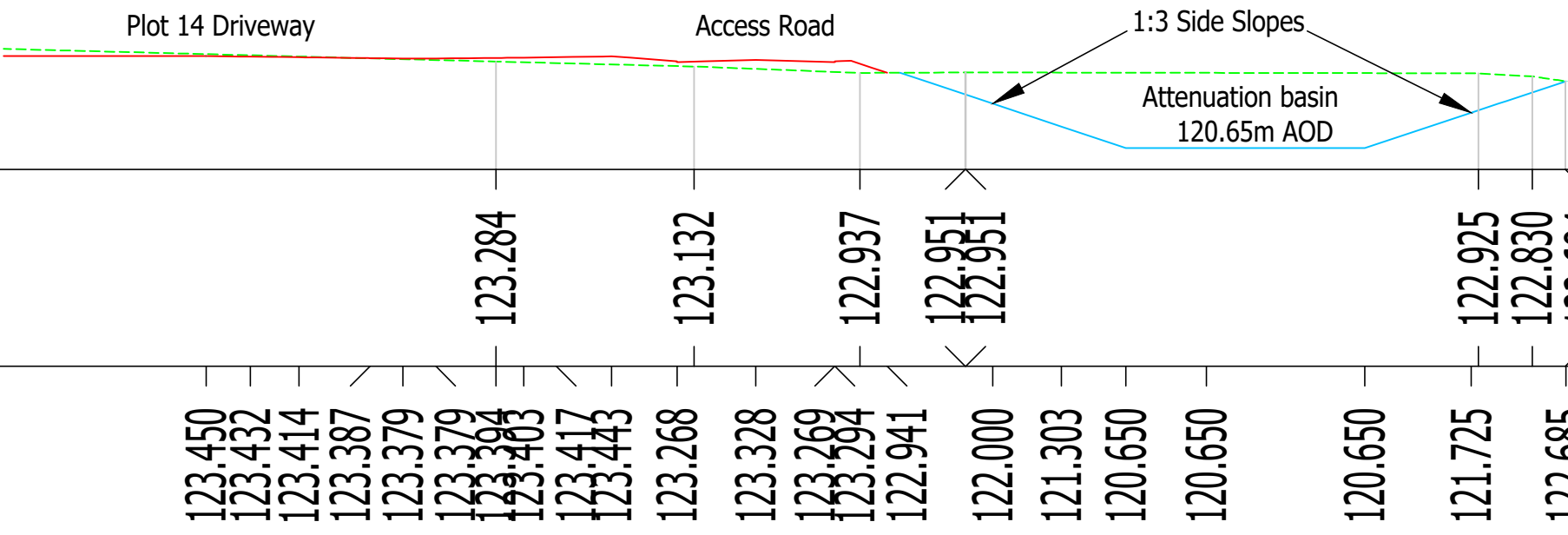


A-A

Vertical Exaggeration: 1
Datum: 120.000M AOD

EXISTING LEVELS (m)

PROPOSED LEVELS (m)



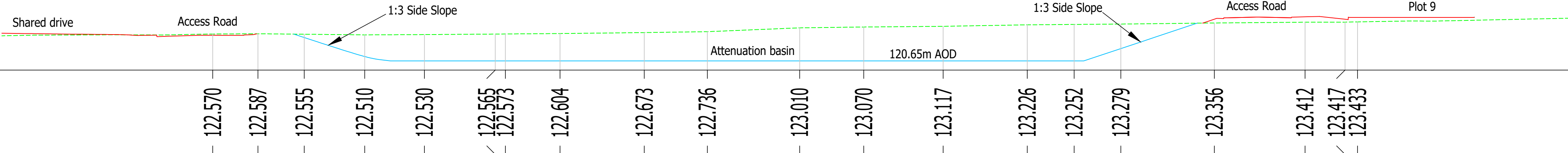
123.450	123.432	123.414	123.387	123.379	123.364	123.403	123.413	123.268	123.328	123.289	123.294	122.941	122.000	121.303	120.650	120.650	120.650	121.725	122.830	122.685	122.684
123.284								123.132		122.937		122.951									

B-B

Vertical Exaggeration: 1
Datum: 120.000M AOD

EXISTING LEVELS (m)

PROPOSED LEVELS (m)



122.670	122.593	122.578	122.549	122.536	122.529	122.490	122.432	122.484	122.477	122.468	122.552	122.555	122.510	122.530	122.555	122.573	122.604	122.673	122.736	123.010	123.070	123.117	123.226	123.252	123.279	123.356	123.412	123.417	123.433
122.610	122.593	122.578	122.549	122.536	122.529	122.490	122.432	122.484	122.477	122.468	122.552	122.555	122.510	122.530	122.555	122.573	122.604	122.673	122.736	123.010	123.070	123.117	123.226	123.252	123.279	123.356	123.412	123.417	123.433

122.670	122.593	122.578	122.549	122.536	122.529	122.490	122.432	122.484	122.477	122.468	122.552	122.555	122.510	122.530	122.555	122.573	122.604	122.673	122.736	123.010	123.070	123.117	123.226	123.252	123.279	123.356	123.412	123.417	123.433
122.610	122.593	122.578	122.549	122.536	122.529	122.490	122.432	122.484	122.477	122.468	122.552	122.555	122.510	122.530	122.555	122.573	122.604	122.673	122.736	123.010	123.070	123.117	123.226	123.252	123.279	123.356	123.412	123.417	123.433

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P1	Initial Issue		10.6.26	N/A	MS
Rev	Amendments		Date	Don	Chk
Status		PRELIMINARY			
Client		ANTLER HOMES plc			
Architect					
Project		SELSFIELD ROAD ARDINGLY			
Title		INDICATIVE BASIN SECTIONS			
Date		June 2026		Scale @ A0 1:200	
Client's Ref.		Project Ref.		14267	
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Drawing Number		14267/1604		Rev: P1	

Appendix C

Updated Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.900	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	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S21	0.114	5.00		124.101	1350	534615.287	129934.052	1.490	122.611
S22				123.327	1350	534638.785	129897.324	1.491	121.836
S23				123.320	1350	534639.097	129891.481	1.519	121.801
S24	0.031	5.00		123.352	1350	534635.318	129887.177	1.660	121.692
S25				123.591	1200	534613.983	129877.447	1.998	121.593
S26	0.050	5.00		123.764	1200	534597.434	129874.886	2.241	121.523
S27	0.021	5.00		123.882	1200	534580.732	129877.242	2.430	121.452
S28	0.020	5.00		123.676	1350	534563.381	129882.330	2.375	121.301
S61	0.038	5.00		124.479	1350	534573.550	129948.909	1.350	123.129
S62	0.018	5.00		124.595	1350	534563.948	129943.374	1.652	122.943
S8	0.059	5.00		124.531	1350	534550.448	129941.307	1.670	122.861
S9	0.070	5.00		124.145	1350	534549.574	129918.132	1.425	122.720
S10	0.026	5.00		123.556	1350	534554.579	129883.189	2.283	121.273
S11				122.340	1350	534553.446	129874.820	1.236	121.104
S56				122.340	1350	534553.390	129869.388	1.540	120.800
S12				122.340	1350	534538.246	129864.465	1.640	120.700
S57	0.095	5.00		124.827	1350	534493.232	129914.345	1.425	123.402
S33	0.012	5.00		124.170	1350	534444.436	129885.003	1.432	122.738
S34				124.008	1350	534439.422	129880.474	1.434	122.574
S36	0.029	5.00		123.813	1350	534438.694	129874.972	1.426	122.387
S37				122.853	1350	534441.420	129849.967	1.522	121.331
S38	0.015	5.00		123.048	1350	534456.886	129851.551	1.782	121.266
S39	0.045	5.00		123.093	1200	534463.267	129853.592	1.902	121.191
S41	0.098	5.00	5.0	122.465	1350	534498.640	129857.180	1.622	120.843
S42	0.022	5.00		122.764	1350	534506.287	129867.747	2.008	120.756
S43				122.340	1350	534511.722	129862.556	1.634	120.706
S13				122.550	1350	534514.329	129858.278	1.900	120.650
S14				122.446	1350	534507.838	129853.544	1.836	120.610
S44				122.368	1500	534499.113	129851.993	1.776	120.592
S17				122.711	1500	534439.312	129845.952	2.239	120.472
S18				122.447	1500	534428.181	129846.961	1.997	120.450
S19				123.410	1500	534424.771	129867.920	3.003	120.407
S20				123.538	1500	534407.937	129867.471	3.165	120.373

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S21	S22	43.602	0.600	122.611	121.836	0.775	56.3	225	5.42	50.0
1.001	S22	S23	5.852	0.600	121.836	121.801	0.035	167.2	225	5.51	50.0
1.002	S23	S24	5.728	0.600	121.801	121.767	0.034	168.5	225	5.61	50.0
1.003	S24	S25	23.449	0.600	121.692	121.593	0.099	236.9	300	5.99	50.0
1.004	S25	S26	16.745	0.600	121.593	121.523	0.070	239.2	300	6.27	50.0
1.005	S26	S27	16.867	0.600	121.523	121.452	0.071	237.6	300	6.54	50.0
1.006	S27	S28	18.082	0.600	121.452	121.376	0.076	237.9	300	6.84	50.0
1.007	S28	S10	8.844	0.600	121.301	121.273	0.028	315.9	375	6.99	50.0
2.000	S61	S62	11.083	0.600	123.129	123.018	0.111	99.8	150	5.18	50.0
2.001	S62	S8	13.657	0.600	122.943	122.861	0.082	166.5	225	5.41	50.0
2.002	S8	S9	23.192	0.600	122.861	122.720	0.141	164.5	225	5.79	50.0
2.003	S9	S10	35.299	0.600	122.720	121.423	1.297	27.2	225	6.02	50.0
1.008	S10	S11	8.445	0.600	121.273	121.104	0.169	50.0	375	7.04	50.0
1.009	S11	S56	5.433	0.600	121.104	120.800	0.304	17.9	375	7.06	50.0
1.010	S56	S12	15.924	0.600	120.800	120.700	0.100	159.2	450	7.23	50.0
1.011	S12	S13	24.704	0.600	120.700	120.650	0.050	494.1	525	7.64	50.0
3.000	S57	S33	56.938	0.600	123.402	122.738	0.664	85.8	225	5.67	50.0
3.001	S33	S34	6.757	0.600	122.738	122.574	0.164	41.2	225	5.73	50.0
3.002	S34	S36	5.550	0.600	122.574	122.387	0.187	29.7	225	5.77	50.0
3.003	S36	S37	25.152	0.600	122.387	121.406	0.981	25.6	225	5.93	50.0
3.004	S37	S38	15.547	0.600	121.331	121.266	0.065	239.2	300	6.18	50.0
3.005	S38	S39	6.700	0.600	121.266	121.191	0.075	89.3	300	6.25	50.0
3.006	S39	S41	35.554	0.600	121.191	120.918	0.273	130.2	300	6.68	50.0
3.007	S41	S42	13.043	0.600	120.843	120.756	0.087	149.9	375	6.83	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.747	69.5	18.6	1.265	1.266	0.114	0.0	80	1.488
1.001	1.008	40.1	18.6	1.266	1.294	0.114	0.0	108	0.990
1.002	1.004	39.9	18.6	1.294	1.360	0.114	0.0	108	0.986
1.003	1.017	71.9	23.6	1.360	1.698	0.145	0.0	118	0.914
1.004	1.012	71.5	23.6	1.698	1.941	0.145	0.0	118	0.909
1.005	1.015	71.8	31.7	1.941	2.130	0.195	0.0	140	0.986
1.006	1.015	71.7	35.1	2.130	2.000	0.216	0.0	148	1.009
1.007	1.014	112.0	38.4	2.000	1.908	0.236	0.0	151	0.922
2.000	1.005	17.8	6.2	1.200	1.427	0.038	0.0	61	0.917
2.001	1.010	40.2	9.2	1.427	1.445	0.057	0.0	73	0.825
2.002	1.016	40.4	18.8	1.445	1.200	0.116	0.0	108	0.998
2.003	2.517	100.1	30.2	1.200	1.908	0.185	0.0	85	2.215
1.008	2.568	283.6	72.8	1.908	0.861	0.447	0.0	129	2.166
1.009	4.303	475.2	72.8	0.861	1.165	0.447	0.0	99	3.149
1.010	1.608	255.8	72.8	1.090	1.190	0.447	0.0	164	1.394
1.011	1.001	216.6	72.8	1.115	1.375	0.447	0.0	209	0.905
3.000	1.413	56.2	15.5	1.200	1.207	0.095	0.0	80	1.210
3.001	2.044	81.3	17.5	1.207	1.209	0.107	0.0	71	1.639
3.002	2.410	95.8	17.5	1.209	1.201	0.107	0.0	65	1.841
3.003	2.594	103.1	22.1	1.201	1.222	0.136	0.0	71	2.081
3.004	1.012	71.5	22.1	1.222	1.482	0.136	0.0	114	0.894
3.005	1.664	117.6	24.5	1.482	1.602	0.151	0.0	92	1.321
3.006	1.376	97.3	31.8	1.602	1.247	0.195	0.0	117	1.234
3.007	1.477	163.2	52.8	1.247	1.633	0.294	5.0	146	1.322

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
3.008	S42	S43	7.517	0.600	120.756	120.706	0.050	150.3	375	6.91	50.0
3.009	S43	S13	5.010	0.600	120.706	120.650	0.056	89.5	375	6.96	50.0
1.012	S13	S14	8.034	0.600	120.650	120.610	0.040	200.9	525	7.72	50.0
1.013	S14	S44	8.861	0.600	120.610	120.592	0.018	492.3	525	7.87	50.0
1.014	S44	S17	60.105	0.600	120.592	120.472	0.120	500.9	525	8.88	50.0
1.015	S17	S18	11.177	0.600	120.472	120.450	0.022	508.0	525	9.07	50.0
1.016	S18	S19	21.235	0.600	120.450	120.407	0.043	493.8	525	9.42	50.0
1.017	S19	S20	16.840	0.600	120.407	120.373	0.034	495.3	525	9.70	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.008	1.475	162.9	56.4	1.633	1.259	0.316	5.0	152	1.345
3.009	1.916	211.6	56.4	1.259	1.525	0.316	5.0	131	1.629
1.012	1.577	341.3	129.2	1.375	1.311	0.764	5.0	223	1.471
1.013	1.003	217.0	129.2	1.311	1.251	0.764	5.0	292	1.044
1.014	0.994	215.1	129.2	1.251	1.714	0.764	5.0	294	1.037
1.015	0.987	213.6	129.2	1.714	1.472	0.764	5.0	295	1.031
1.016	1.001	216.7	129.2	1.472	2.478	0.764	5.0	292	1.043
1.017	0.999	216.4	129.2	2.478	2.640	0.764	5.0	292	1.041

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	43.602	56.3	225	Circular	124.101	122.611	1.265	123.327	121.836	1.266
1.001	5.852	167.2	225	Circular	123.327	121.836	1.266	123.320	121.801	1.294
1.002	5.728	168.5	225	Circular	123.320	121.801	1.294	123.352	121.767	1.360
1.003	23.449	236.9	300	Circular	123.352	121.692	1.360	123.591	121.593	1.698
1.004	16.745	239.2	300	Circular	123.591	121.593	1.698	123.764	121.523	1.941
1.005	16.867	237.6	300	Circular	123.764	121.523	1.941	123.882	121.452	2.130
1.006	18.082	237.9	300	Circular	123.882	121.452	2.130	123.676	121.376	2.000
1.007	8.844	315.9	375	Circular	123.676	121.301	2.000	123.556	121.273	1.908
2.000	11.083	99.8	150	Circular	124.479	123.129	1.200	124.595	123.018	1.427
2.001	13.657	166.5	225	Circular	124.595	122.943	1.427	124.531	122.861	1.445
2.002	23.192	164.5	225	Circular	124.531	122.861	1.445	124.145	122.720	1.200
2.003	35.299	27.2	225	Circular	124.145	122.720	1.200	123.556	121.423	1.908

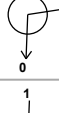
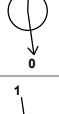
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S21	1350	Manhole	Adoptable	S22	1350	Manhole	Adoptable
1.001	S22	1350	Manhole	Adoptable	S23	1350	Manhole	Adoptable
1.002	S23	1350	Manhole	Adoptable	S24	1350	Manhole	Adoptable
1.003	S24	1350	Manhole	Adoptable	S25	1200	Manhole	Adoptable
1.004	S25	1200	Manhole	Adoptable	S26	1200	Manhole	Adoptable
1.005	S26	1200	Manhole	Adoptable	S27	1200	Manhole	Adoptable
1.006	S27	1200	Manhole	Adoptable	S28	1350	Manhole	Adoptable
1.007	S28	1350	Manhole	Adoptable	S10	1350	Manhole	Adoptable
2.000	S61	1350	Manhole	Adoptable	S62	1350	Manhole	Adoptable
2.001	S62	1350	Manhole	Adoptable	S8	1350	Manhole	Adoptable
2.002	S8	1350	Manhole	Adoptable	S9	1350	Manhole	Adoptable
2.003	S9	1350	Manhole	Adoptable	S10	1350	Manhole	Adoptable

Pipeline Schedule

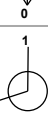
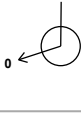
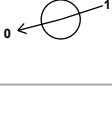
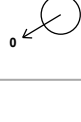
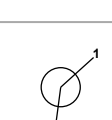
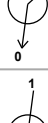
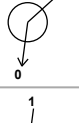
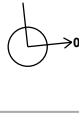
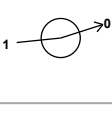
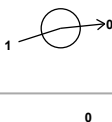
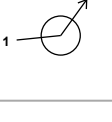
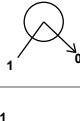
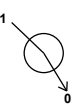
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.008	8.445	50.0	375	Circular	123.556	121.273	1.908	122.340	121.104	0.861
1.009	5.433	17.9	375	Circular	122.340	121.104	0.861	122.340	120.800	1.165
1.010	15.924	159.2	450	Circular	122.340	120.800	1.090	122.340	120.700	1.190
1.011	24.704	494.1	525	Circular	122.340	120.700	1.115	122.550	120.650	1.375
3.000	56.938	85.8	225	Circular	124.827	123.402	1.200	124.170	122.738	1.207
3.001	6.757	41.2	225	Circular	124.170	122.738	1.207	124.008	122.574	1.209
3.002	5.550	29.7	225	Circular	124.008	122.574	1.209	123.813	122.387	1.201
3.003	25.152	25.6	225	Circular	123.813	122.387	1.201	122.853	121.406	1.222
3.004	15.547	239.2	300	Circular	122.853	121.331	1.222	123.048	121.266	1.482
3.005	6.700	89.3	300	Circular	123.048	121.266	1.482	123.093	121.191	1.602
3.006	35.554	130.2	300	Circular	123.093	121.191	1.602	122.465	120.918	1.247
3.007	13.043	149.9	375	Circular	122.465	120.843	1.247	122.764	120.756	1.633
3.008	7.517	150.3	375	Circular	122.764	120.756	1.633	122.340	120.706	1.259
3.009	5.010	89.5	375	Circular	122.340	120.706	1.259	122.550	120.650	1.525
1.012	8.034	200.9	525	Circular	122.550	120.650	1.375	122.446	120.610	1.311
1.013	8.861	492.3	525	Circular	122.446	120.610	1.311	122.368	120.592	1.251
1.014	60.105	500.9	525	Circular	122.368	120.592	1.251	122.711	120.472	1.714
1.015	11.177	508.0	525	Circular	122.711	120.472	1.714	122.447	120.450	1.472
1.016	21.235	493.8	525	Circular	122.447	120.450	1.472	123.410	120.407	2.478
1.017	16.840	495.3	525	Circular	123.410	120.407	2.478	123.538	120.373	2.640

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.008	S10	1350	Manhole	Adoptable	S11	1350	Manhole	Adoptable
1.009	S11	1350	Manhole	Adoptable	S56	1350	Manhole	Adoptable
1.010	S56	1350	Manhole	Adoptable	S12	1350	Manhole	Adoptable
1.011	S12	1350	Manhole	Adoptable	S13	1350	Manhole	Adoptable
3.000	S57	1350	Manhole	Adoptable	S33	1350	Manhole	Adoptable
3.001	S33	1350	Manhole	Adoptable	S34	1350	Manhole	Adoptable
3.002	S34	1350	Manhole	Adoptable	S36	1350	Manhole	Adoptable
3.003	S36	1350	Manhole	Adoptable	S37	1350	Manhole	Adoptable
3.004	S37	1350	Manhole	Adoptable	S38	1350	Manhole	Adoptable
3.005	S38	1350	Manhole	Adoptable	S39	1200	Manhole	Adoptable
3.006	S39	1200	Manhole	Adoptable	S41	1350	Manhole	Adoptable
3.007	S41	1350	Manhole	Adoptable	S42	1350	Manhole	Adoptable
3.008	S42	1350	Manhole	Adoptable	S43	1350	Manhole	Adoptable
3.009	S43	1350	Manhole	Adoptable	S13	1350	Manhole	Adoptable
1.012	S13	1350	Manhole	Adoptable	S14	1350	Manhole	Adoptable
1.013	S14	1350	Manhole	Adoptable	S44	1500	Manhole	Adoptable
1.014	S44	1500	Manhole	Adoptable	S17	1500	Manhole	Adoptable
1.015	S17	1500	Manhole	Adoptable	S18	1500	Manhole	Adoptable
1.016	S18	1500	Manhole	Adoptable	S19	1500	Manhole	Adoptable
1.017	S19	1500	Manhole	Adoptable	S20	1500	Manhole	Adoptable

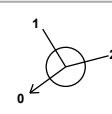
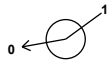
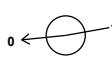
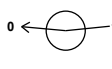
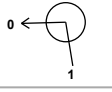
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S21	534615.287	129934.052	124.101	1.490	1350	 0	1.000	122.611	225
S22	534638.785	129897.324	123.327	1.491	1350	 1	1.000	121.836	225
						0	1.001	121.836	225
S23	534639.097	129891.481	123.320	1.519	1350	 1	1.001	121.801	225
						0	1.002	121.801	225
S24	534635.318	129887.177	123.352	1.660	1350	 1	1.002	121.767	225
						0	1.003	121.692	300
S25	534613.983	129877.447	123.591	1.998	1200	 1	1.003	121.593	300
						0	1.004	121.593	300
S26	534597.434	129874.886	123.764	2.241	1200	 1	1.004	121.523	300
						0	1.005	121.523	300
S27	534580.732	129877.242	123.882	2.430	1200	 1	1.005	121.452	300
						0	1.006	121.452	300
S28	534563.381	129882.330	123.676	2.375	1350	 1	1.006	121.376	300
						0	1.007	121.301	375
S61	534573.550	129948.909	124.479	1.350	1350	 0	2.000	123.129	150
S62	534563.948	129943.374	124.595	1.652	1350	 1	2.000	123.018	150
						0	2.001	122.943	225
S8	534550.448	129941.307	124.531	1.670	1350	 1	2.001	122.861	225
						0	2.002	122.861	225
S9	534549.574	129918.132	124.145	1.425	1350	 1	2.002	122.720	225
						0	2.003	122.720	225
S10	534554.579	129883.189	123.556	2.283	1350	 1	2.003	121.423	225
						2	1.007	121.273	375
						0	1.008	121.273	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S11	534553.446	129874.820	122.340	1.236	1350		1	1.008	121.104	375
							0	1.009	121.104	375
S56	534553.390	129869.388	122.340	1.540	1350		1	1.009	120.800	375
							0	1.010	120.800	450
S12	534538.246	129864.465	122.340	1.640	1350		1	1.010	120.700	450
							0	1.011	120.700	525
S57	534493.232	129914.345	124.827	1.425	1350					
							0	3.000	123.402	225
S33	534444.436	129885.003	124.170	1.432	1350		1	3.000	122.738	225
							0	3.001	122.738	225
S34	534439.422	129880.474	124.008	1.434	1350		1	3.001	122.574	225
							0	3.002	122.574	225
S36	534438.694	129874.972	123.813	1.426	1350		1	3.002	122.387	225
							0	3.003	122.387	225
S37	534441.420	129849.967	122.853	1.522	1350		1	3.003	121.406	225
							0	3.004	121.331	300
S38	534456.886	129851.551	123.048	1.782	1350		1	3.004	121.266	300
							0	3.005	121.266	300
S39	534463.267	129853.592	123.093	1.902	1200		1	3.005	121.191	300
							0	3.006	121.191	300
S41	534498.640	129857.180	122.465	1.622	1350		1	3.006	120.918	300
							0	3.007	120.843	375
S42	534506.287	129867.747	122.764	2.008	1350		1	3.007	120.756	375
							0	3.008	120.756	375
S43	534511.722	129862.556	122.340	1.634	1350		1	3.008	120.706	375
							0	3.009	120.706	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S13	534514.329	129858.278	122.550	1.900	1350		1	3.009	120.650	375
							2	1.011	120.650	525
							0	1.012	120.650	525
S14	534507.838	129853.544	122.446	1.836	1350		1	1.012	120.610	525
							0	1.013	120.610	525
S44	534499.113	129851.993	122.368	1.776	1500		1	1.013	120.592	525
							0	1.014	120.592	525
S17	534439.312	129845.952	122.711	2.239	1500		1	1.014	120.472	525
							0	1.015	120.472	525
S18	534428.181	129846.961	122.447	1.997	1500		1	1.015	120.450	525
							0	1.016	120.450	525
S19	534424.771	129867.920	123.410	3.003	1500		1	1.016	120.407	525
							0	1.017	120.407	525
S20	534407.937	129867.471	123.538	3.165	1500		1	1.017	120.373	525

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	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 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

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

Node S13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	120.650	Product Number	CTL-SHE-0106-6000-1650-6000
Design Depth (m)	1.650	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	6.0	Min Node Diameter (mm)	1200

Node S13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	120.650
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	256.6	0.0	1.690	965.4	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	S21	10	122.694	0.083	20.8	0.1194	0.0000	OK
15 minute summer	S22	11	121.968	0.132	20.6	0.1889	0.0000	OK
15 minute summer	S23	11	121.927	0.126	20.3	0.1800	0.0000	OK
15 minute summer	S24	11	121.822	0.130	25.7	0.1865	0.0000	OK
15 minute summer	S25	11	121.728	0.135	25.7	0.1528	0.0000	OK
15 minute summer	S26	11	121.681	0.158	34.0	0.1791	0.0000	OK
15 minute summer	S27	12	121.614	0.162	37.2	0.1829	0.0000	OK
15 minute summer	S28	11	121.472	0.171	39.8	0.2442	0.0000	OK
15 minute summer	S61	10	123.198	0.068	7.0	0.0980	0.0000	OK
15 minute summer	S62	10	123.020	0.077	10.3	0.1097	0.0000	OK
15 minute summer	S8	10	122.980	0.119	20.9	0.1699	0.0000	OK
15 minute summer	S9	11	122.812	0.092	33.3	0.1312	0.0000	OK
15 minute summer	S10	11	121.429	0.156	77.1	0.2230	0.0000	OK
1440 minute summer	S11	1440	121.356	0.252	19.1	0.3601	0.0000	OK
1440 minute summer	S56	1440	121.355	0.555	7.8	0.7948	0.0000	SURCHARGED
1440 minute summer	S12	1470	121.355	0.655	18.2	0.9369	0.0000	SURCHARGED
15 minute summer	S57	10	123.489	0.087	17.4	0.1245	0.0000	OK
15 minute summer	S33	11	122.821	0.083	19.3	0.1185	0.0000	OK
15 minute summer	S34	11	122.651	0.077	19.3	0.1095	0.0000	OK
15 minute summer	S36	11	122.464	0.077	24.3	0.1100	0.0000	OK
15 minute summer	S37	11	121.458	0.127	24.4	0.1818	0.0000	OK
15 minute summer	S38	11	121.382	0.116	27.0	0.1657	0.0000	OK
1440 minute summer	S39	1440	121.355	0.164	3.5	0.1852	0.0000	OK
1440 minute summer	S41	1440	121.355	0.512	10.2	0.7322	0.0000	SURCHARGED
1440 minute summer	S42	1410	121.355	0.599	10.4	0.8571	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	S21	1.000	S22	20.6	1.142	0.296	0.8144	
15 minute summer	S22	1.001	S23	20.3	0.863	0.506	0.1376	
15 minute summer	S23	1.002	S24	20.3	0.952	0.509	0.1222	
15 minute summer	S24	1.003	S25	25.7	0.857	0.358	0.7048	
15 minute summer	S25	1.004	S26	25.3	0.747	0.354	0.5732	
15 minute summer	S26	1.005	S27	33.5	0.878	0.467	0.6434	
15 minute summer	S27	1.006	S28	37.0	1.008	0.515	0.6634	
15 minute summer	S28	1.007	S10	40.2	0.914	0.359	0.4071	
15 minute summer	S61	2.000	S62	6.9	0.912	0.387	0.0835	
15 minute summer	S62	2.001	S8	10.1	0.613	0.252	0.2265	
15 minute summer	S8	2.002	S9	20.7	1.139	0.512	0.4213	
15 minute summer	S9	2.003	S10	33.2	2.235	0.332	0.5246	
15 minute summer	S10	1.008	S11	76.8	2.090	0.271	0.3112	
1440 minute summer	S11	1.009	S56	-12.5	0.554	-0.026	0.5132	
1440 minute summer	S56	1.010	S12	18.2	0.285	0.071	2.5231	
1440 minute summer	S12	1.011	S13	9.2	0.074	0.043	5.3369	
15 minute summer	S57	3.000	S33	17.1	1.258	0.305	0.7763	
15 minute summer	S33	3.001	S34	19.3	1.533	0.237	0.0849	
15 minute summer	S34	3.002	S36	19.3	1.619	0.202	0.0662	
15 minute summer	S36	3.003	S37	24.4	2.089	0.237	0.2937	
15 minute summer	S37	3.004	S38	24.4	0.914	0.341	0.4154	
15 minute summer	S38	3.005	S39	26.9	1.005	0.229	0.1794	
1440 minute summer	S39	3.006	S41	3.5	0.484	0.036	1.9510	
1440 minute summer	S41	3.007	S42	10.0	0.659	0.061	1.4386	
1440 minute summer	S42	3.008	S43	10.3	0.732	0.063	0.8291	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	S43	1440	121.355	0.649	12.4	0.9293	0.0000	SURCHARGED
1440 minute summer	S13	1440	121.354	0.704	17.6	285.7393	0.0000	SURCHARGED
360 minute summer	S14	256	120.672	0.061	5.8	0.0880	0.0000	OK
360 minute summer	S44	256	120.651	0.059	5.8	0.1034	0.0000	OK
360 minute summer	S17	264	120.534	0.062	5.8	0.1088	0.0000	OK
360 minute summer	S18	264	120.510	0.060	5.8	0.1056	0.0000	OK
360 minute summer	S19	264	120.468	0.060	5.8	0.1068	0.0000	OK
360 minute summer	S20	264	120.422	0.049	5.8	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)
1440 minute summer	S43	3.009	S13	10.4	0.888	0.049	0.5526	
1440 minute summer	S13	1.012	S14	5.8	0.484	0.017	0.0972	
360 minute summer	S14	1.013	S44	5.8	0.429	0.027	0.1203	
360 minute summer	S44	1.014	S17	5.8	0.428	0.027	0.8170	
360 minute summer	S17	1.015	S18	5.8	0.422	0.027	0.1544	
360 minute summer	S18	1.016	S19	5.8	0.428	0.027	0.2892	
360 minute summer	S19	1.017	S20	5.8	0.492	0.027	0.2002	176.0

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S21	11	123.621	1.010	74.9	1.4452	0.0000	SURCHARGED
15 minute summer	S22	12	122.859	1.022	67.6	1.4631	0.0000	SURCHARGED
15 minute summer	S23	12	122.702	0.901	63.6	1.2894	0.0000	SURCHARGED
15 minute summer	S24	12	122.547	0.855	79.5	1.2229	0.0000	SURCHARGED
15 minute summer	S25	12	122.388	0.795	79.6	0.8989	0.0000	SURCHARGED
15 minute summer	S26	12	122.264	0.741	105.6	0.8377	0.0000	SURCHARGED
1440 minute winter	S27	1470	122.050	0.598	6.8	0.6758	0.0000	SURCHARGED
1440 minute summer	S28	1470	122.050	0.749	10.7	1.0717	0.0000	SURCHARGED
15 minute summer	S61	12	123.936	0.807	25.0	1.1552	0.0000	SURCHARGED
15 minute summer	S62	12	123.743	0.800	32.2	1.1450	0.0000	SURCHARGED
15 minute summer	S8	12	123.674	0.813	64.9	1.1636	0.0000	SURCHARGED
15 minute summer	S9	12	123.252	0.532	105.0	0.7608	0.0000	SURCHARGED
1440 minute winter	S10	1470	122.050	0.777	13.6	1.1113	0.0000	SURCHARGED
1440 minute winter	S11	1500	122.053	0.949	37.0	1.3577	0.0000	FLOOD RISK
1440 minute winter	S56	1560	122.051	1.251	22.1	1.7907	0.0000	FLOOD RISK
1440 minute summer	S12	1470	122.048	1.348	20.7	1.9295	0.0000	FLOOD RISK
15 minute summer	S57	11	123.710	0.308	62.6	0.4412	0.0000	SURCHARGED
15 minute summer	S33	12	122.980	0.242	66.7	0.3468	0.0000	SURCHARGED
15 minute summer	S34	12	122.825	0.251	65.6	0.3585	0.0000	SURCHARGED
15 minute summer	S36	12	122.681	0.294	84.0	0.4207	0.0000	SURCHARGED
1440 minute winter	S37	1470	122.049	0.718	4.2	1.0274	0.0000	SURCHARGED
1440 minute winter	S38	1470	122.049	0.783	4.5	1.1210	0.0000	SURCHARGED
1440 minute winter	S39	1440	122.048	0.857	5.9	0.9694	0.0000	SURCHARGED
1440 minute winter	S41	1440	122.049	1.206	13.8	1.7251	0.0000	SURCHARGED
1440 minute winter	S42	1440	122.047	1.291	14.4	1.8480	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	S21	1.000	S22	67.6	1.699	0.973	1.7341	
15 minute summer	S22	1.001	S23	63.6	1.600	1.587	0.2327	
15 minute summer	S23	1.002	S24	63.6	1.600	1.593	0.2278	
15 minute summer	S24	1.003	S25	79.6	1.130	1.107	1.6513	
15 minute summer	S25	1.004	S26	82.3	1.169	1.151	1.1792	
15 minute summer	S26	1.005	S27	105.8	1.503	1.475	1.1878	
1440 minute winter	S27	1.006	S28	6.8	0.618	0.095	1.2733	
1440 minute summer	S28	1.007	S10	14.0	0.634	0.125	0.9755	
15 minute summer	S61	2.000	S62	21.0	1.190	1.179	0.1951	
15 minute summer	S62	2.001	S8	35.8	0.900	0.891	0.5432	
15 minute summer	S8	2.002	S9	64.1	1.612	1.586	0.9224	
15 minute summer	S9	2.003	S10	100.9	2.738	1.008	1.4039	
1440 minute winter	S10	1.008	S11	37.0	1.214	0.130	0.9315	
1440 minute winter	S11	1.009	S56	22.1	0.775	0.047	0.5992	
1440 minute winter	S56	1.010	S12	13.2	0.366	0.052	2.5231	
1440 minute summer	S12	1.011	S13	26.4	0.160	0.122	5.3369	
15 minute summer	S57	3.000	S33	59.1	1.573	1.052	2.2645	
15 minute summer	S33	3.001	S34	65.6	1.858	0.808	0.2687	
15 minute summer	S34	3.002	S36	65.3	2.024	0.681	0.2207	
15 minute summer	S36	3.003	S37	81.2	2.424	0.788	1.0003	
1440 minute winter	S37	3.004	S38	4.0	0.579	0.056	1.0948	
1440 minute winter	S38	3.005	S39	4.7	0.610	0.040	0.4718	
1440 minute winter	S39	3.006	S41	5.8	0.487	0.059	2.5037	
1440 minute winter	S41	3.007	S42	13.7	0.700	0.084	1.4386	
1440 minute winter	S42	3.008	S43	14.4	0.764	0.088	0.8291	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	S43	1470	122.050	1.344	14.4	1.9239	0.0000	FLOOD RISK
1440 minute winter	S13	1440	122.048	1.398	27.5	770.4932	0.0000	SURCHARGED
15 minute summer	S14	15	120.672	0.062	5.8	0.0883	0.0000	OK
15 minute summer	S44	14	120.652	0.060	5.8	0.1063	0.0000	OK
15 minute summer	S17	18	120.534	0.062	6.0	0.1091	0.0000	OK
15 minute summer	S18	18	120.510	0.060	5.8	0.1059	0.0000	OK
15 minute summer	S19	19	120.468	0.061	5.8	0.1070	0.0000	OK
15 minute summer	S20	19	120.422	0.049	5.8	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)
1440 minute winter	S43	3.009	S13	19.4	0.888	0.092	0.5526	
1440 minute winter	S13	1.012	S14	5.8	0.484	0.017	0.0972	
15 minute summer	S14	1.013	S44	5.8	0.539	0.027	0.1229	
15 minute summer	S44	1.014	S17	6.0	0.508	0.028	0.8203	
15 minute summer	S17	1.015	S18	5.8	0.427	0.027	0.1549	
15 minute summer	S18	1.016	S19	5.8	0.464	0.027	0.2900	
15 minute summer	S19	1.017	S20	5.8	0.492	0.027	0.2007	84.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S21	10	124.101	1.490	97.5	2.1322	3.5594	FLOOD
15 minute summer	S22	12	123.327	1.491	76.3	2.1336	0.1745	FLOOD
15 minute summer	S23	12	123.179	1.378	68.9	1.9722	0.0000	FLOOD RISK
15 minute summer	S24	12	123.032	1.340	87.3	1.9176	0.0000	SURCHARGED
15 minute summer	S25	12	122.859	1.266	86.7	1.4315	0.0000	SURCHARGED
15 minute summer	S26	12	122.722	1.199	120.0	1.3561	0.0000	SURCHARGED
30 minute summer	S27	20	122.451	0.999	131.1	1.1300	0.0000	SURCHARGED
1440 minute winter	S28	1380	122.313	1.012	9.0	1.4476	0.0000	SURCHARGED
15 minute summer	S61	11	124.479	1.350	32.6	1.9319	2.6610	FLOOD
15 minute summer	S62	11	124.479	1.536	35.3	2.1976	0.0000	FLOOD RISK
15 minute summer	S8	11	124.459	1.598	73.5	2.2869	0.0000	FLOOD RISK
15 minute summer	S9	11	124.028	1.308	121.2	1.8720	0.0000	FLOOD RISK
1440 minute winter	S10	1440	122.315	1.042	21.2	1.4914	0.0000	SURCHARGED
1440 minute winter	S11	1500	122.316	1.212	25.0	1.7349	0.0000	FLOOD RISK
1440 minute winter	S56	1440	122.323	1.523	18.6	2.1794	0.0000	FLOOD RISK
1440 minute winter	S12	1470	122.311	1.611	17.5	2.3059	0.0000	FLOOD RISK
15 minute summer	S57	12	124.822	1.420	81.4	2.0317	0.0000	FLOOD RISK
15 minute summer	S33	12	123.782	1.044	81.1	1.4937	0.0000	SURCHARGED
15 minute summer	S34	12	123.556	0.982	74.3	1.4055	0.0000	SURCHARGED
15 minute summer	S36	12	123.365	0.978	91.3	1.3993	0.0000	SURCHARGED
30 minute summer	S37	20	122.465	1.134	86.9	1.6227	0.0000	SURCHARGED
30 minute summer	S38	20	122.324	1.057	96.2	1.5132	0.0000	SURCHARGED
1440 minute winter	S39	1440	122.312	1.121	7.8	1.2677	0.0000	SURCHARGED
1440 minute winter	S41	1440	122.313	1.470	16.8	2.1031	0.0000	FLOOD RISK
1440 minute winter	S42	1440	122.312	1.556	17.6	2.2263	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	S21	1.000	S22	76.3	1.919	1.099	1.7341	
15 minute summer	S22	1.001	S23	68.9	1.733	1.720	0.2327	
15 minute summer	S23	1.002	S24	69.2	1.740	1.733	0.2278	
15 minute summer	S24	1.003	S25	86.7	1.231	1.205	1.6513	
15 minute summer	S25	1.004	S26	90.1	1.279	1.259	1.1792	
15 minute summer	S26	1.005	S27	118.3	1.680	1.648	1.1878	
30 minute summer	S27	1.006	S28	129.8	1.844	1.810	1.2733	
1440 minute winter	S28	1.007	S10	13.9	0.605	0.124	0.9755	
15 minute summer	S61	2.000	S62	22.8	1.293	1.281	0.1951	
15 minute summer	S62	2.001	S8	40.1	1.009	0.999	0.5432	
15 minute summer	S8	2.002	S9	68.5	1.722	1.694	0.9224	
15 minute summer	S9	2.003	S10	116.5	2.930	1.164	1.4039	
1440 minute winter	S10	1.008	S11	25.0	1.213	0.088	0.9315	
1440 minute winter	S11	1.009	S56	18.6	0.842	0.039	0.5992	
1440 minute winter	S56	1.010	S12	17.5	0.397	0.068	2.5231	
1440 minute winter	S12	1.011	S13	22.2	0.159	0.103	5.3369	
15 minute summer	S57	3.000	S33	71.2	1.790	1.268	2.2645	
15 minute summer	S33	3.001	S34	74.3	1.869	0.915	0.2687	
15 minute summer	S34	3.002	S36	73.2	1.941	0.764	0.2207	
15 minute summer	S36	3.003	S37	90.2	2.354	0.874	1.0003	
30 minute summer	S37	3.004	S38	89.3	1.268	1.248	1.0948	
30 minute summer	S38	3.005	S39	98.7	1.401	0.839	0.4718	
1440 minute winter	S39	3.006	S41	7.8	0.499	0.080	2.5037	
1440 minute winter	S41	3.007	S42	16.7	0.706	0.102	1.4386	
1440 minute winter	S42	3.008	S43	17.6	0.760	0.108	0.8291	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	S43	1440	122.313	1.607	17.6	2.2995	0.0000	FLOOD RISK
1440 minute winter	S13	1440	122.312	1.662	37.4	1008.3570	0.0000	FLOOD RISK
1440 minute winter	S14	1440	120.672	0.062	5.9	0.0889	0.0000	OK
15 minute summer	S44	13	120.652	0.060	5.8	0.1067	0.0000	OK
1440 minute winter	S17	1440	120.534	0.062	5.9	0.1100	0.0000	OK
1440 minute winter	S18	1440	120.510	0.060	5.9	0.1067	0.0000	OK
1440 minute winter	S19	1440	120.468	0.061	5.9	0.1078	0.0000	OK
1440 minute winter	S20	1440	120.422	0.049	5.9	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)
1440 minute winter	S43	3.009	S13	17.5	0.888	0.083	0.5526	
1440 minute winter	S13	1.012	S14	5.9	0.486	0.017	0.0988	
1440 minute winter	S14	1.013	S44	5.9	0.432	0.027	0.1221	
15 minute summer	S44	1.014	S17	6.0	0.512	0.028	0.8210	
1440 minute winter	S17	1.015	S18	5.9	0.424	0.028	0.1568	
1440 minute winter	S18	1.016	S19	5.9	0.430	0.027	0.2935	
1440 minute winter	S19	1.017	S20	5.9	0.495	0.027	0.2030	531.3

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
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	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S45	0.050	5.00	121.726	1350	534441.906	129820.403	1.356	120.370
S46			120.470	1350	534445.303	129787.668	1.357	119.113
S47			120.241	1350	534448.621	129780.880	1.621	118.620
S48			120.136	1350	534452.743	129778.376	1.545	118.591
S54	0.063	5.00	120.009	1350	534458.513	129776.530	1.454	118.555
S53			119.911	1350	534482.750	129776.084	1.501	118.410
S50	0.032	5.00	121.853	1350	534497.465	129831.102	1.419	120.434
S59	0.012	5.00	121.414	1350	534498.740	129818.438	1.447	119.967
S58	0.016	5.00	120.689	1350	534495.330	129801.458	1.351	119.338
S51	0.012	5.00	120.150	1350	534493.951	129785.723	1.399	118.751
S52			119.981	1200	534488.538	129778.373	1.731	118.250
S60			119.250	1350	534490.930	129771.128	1.596	117.654
dummy			119.250	1200	534494.566	129772.346	1.619	117.631

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S45	S46	32.911	0.600	120.370	119.113	1.257	26.2	150	5.28	50.0
1.001	S46	S47	7.556	0.600	119.113	118.695	0.418	18.1	150	5.33	50.0
1.002	S47	S48	4.823	0.600	118.620	118.591	0.029	166.3	225	5.41	50.0
1.003	S48	S54	6.058	0.600	118.591	118.555	0.036	168.3	225	5.51	50.0
1.004	S54	S53	24.241	0.600	118.555	118.410	0.145	167.2	225	5.91	50.0
1.005	S53	S52	6.224	0.600	118.410	118.250	0.160	38.9	225	5.96	50.0
2.000	S50	S59	12.728	0.600	120.434	119.967	0.467	27.3	150	5.11	50.0
2.001	S59	S58	17.320	0.600	119.967	119.338	0.629	27.5	150	5.26	50.0
2.002	S58	S51	15.795	0.600	119.338	118.751	0.587	26.9	150	5.39	50.0
2.003	S51	S52	9.128	0.600	118.751	118.325	0.426	21.4	150	5.46	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.975	34.9	9.0	1.206	1.207	0.050	0.0	52	1.660
1.001	2.380	42.1	9.0	1.207	1.396	0.050	0.0	47	1.903
1.002	1.011	40.2	9.0	1.396	1.320	0.050	0.0	73	0.820
1.003	1.005	40.0	9.0	1.320	1.229	0.050	0.0	73	0.815
1.004	1.008	40.1	20.4	1.229	1.276	0.113	0.0	114	1.013
1.005	2.104	83.6	20.4	1.276	1.506	0.113	0.0	75	1.741
2.000	1.936	34.2	5.8	1.269	1.297	0.032	0.0	42	1.451
2.001	1.926	34.0	7.9	1.297	1.201	0.044	0.0	49	1.570
2.002	1.948	34.4	10.8	1.201	1.249	0.060	0.0	58	1.728
2.003	2.185	38.6	12.9	1.249	1.506	0.072	0.0	59	1.967

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.006	S52	S60	7.630	0.600	118.250	117.654	0.596	12.8	225	6.00	50.0
1.007	S60	dummy	3.835	0.600	117.654	117.631	0.023	166.7	225	6.06	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.006	3.676	146.2	33.3	1.506	1.371	0.184	0.0	73	2.988
1.007	1.010	40.1	33.3	1.371	1.394	0.184	0.0	157	1.125

Pipeline Schedule

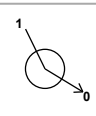
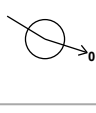
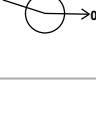
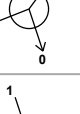
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	32.911	26.2	150	Circular	121.726	120.370	1.206	120.470	119.113	1.207
1.001	7.556	18.1	150	Circular	120.470	119.113	1.207	120.241	118.695	1.396
1.002	4.823	166.3	225	Circular	120.241	118.620	1.396	120.136	118.591	1.320
1.003	6.058	168.3	225	Circular	120.136	118.591	1.320	120.009	118.555	1.229
1.004	24.241	167.2	225	Circular	120.009	118.555	1.229	119.911	118.410	1.276
1.005	6.224	38.9	225	Circular	119.911	118.410	1.276	119.981	118.250	1.506
2.000	12.728	27.3	150	Circular	121.853	120.434	1.269	121.414	119.967	1.297
2.001	17.320	27.5	150	Circular	121.414	119.967	1.297	120.689	119.338	1.201
2.002	15.795	26.9	150	Circular	120.689	119.338	1.201	120.150	118.751	1.249
2.003	9.128	21.4	150	Circular	120.150	118.751	1.249	119.981	118.325	1.506
1.006	7.630	12.8	225	Circular	119.981	118.250	1.506	119.250	117.654	1.371
1.007	3.835	166.7	225	Circular	119.250	117.654	1.371	119.250	117.631	1.394

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S45	1350	Manhole	Adoptable	S46	1350	Manhole	Adoptable
1.001	S46	1350	Manhole	Adoptable	S47	1350	Manhole	Adoptable
1.002	S47	1350	Manhole	Adoptable	S48	1350	Manhole	Adoptable
1.003	S48	1350	Manhole	Adoptable	S54	1350	Manhole	Adoptable
1.004	S54	1350	Manhole	Adoptable	S53	1350	Manhole	Adoptable
1.005	S53	1350	Manhole	Adoptable	S52	1200	Manhole	Adoptable
2.000	S50	1350	Manhole	Adoptable	S59	1350	Manhole	Adoptable
2.001	S59	1350	Manhole	Adoptable	S58	1350	Manhole	Adoptable
2.002	S58	1350	Manhole	Adoptable	S51	1350	Manhole	Adoptable
2.003	S51	1350	Manhole	Adoptable	S52	1200	Manhole	Adoptable
1.006	S52	1200	Manhole	Adoptable	S60	1350	Manhole	Adoptable
1.007	S60	1350	Manhole	Adoptable	dummy	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S45	534441.906	129820.403	121.726	1.356	1350		0	1.000	120.370	150
S46	534445.303	129787.668	120.470	1.357	1350		1	1.000	119.113	150
							0	1.001	119.113	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S47	534448.621	129780.880	120.241	1.621	1350		1	1.001	118.695	150
							0	1.002	118.620	225
S48	534452.743	129778.376	120.136	1.545	1350		1	1.002	118.591	225
							0	1.003	118.591	225
S54	534458.513	129776.530	120.009	1.454	1350		1	1.003	118.555	225
							0	1.004	118.555	225
S53	534482.750	129776.084	119.911	1.501	1350		1	1.004	118.410	225
							0	1.005	118.410	225
S50	534497.465	129831.102	121.853	1.419	1350		0	2.000	120.434	150
S59	534498.740	129818.438	121.414	1.447	1350		1	2.000	119.967	150
							0	2.001	119.967	150
S58	534495.330	129801.458	120.689	1.351	1350		1	2.001	119.338	150
							0	2.002	119.338	150
S51	534493.951	129785.723	120.150	1.399	1350		1	2.002	118.751	150
							0	2.003	118.751	150
S52	534488.538	129778.373	119.981	1.731	1200		1	2.003	118.325	150
							2	1.005	118.250	225
							0	1.006	118.250	225
S60	534490.930	129771.128	119.250	1.596	1350		1	1.006	117.654	225
							0	1.007	117.654	225
dummy	534494.566	129772.346	119.250	1.619	1200		1	1.007	117.631	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	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 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

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

Node S60 Online Pump Control

Flap Valve	x	Design Depth (m)	1.500	Switch off depth (m)	0.000
Replaces Downstream Link	✓	Design Flow (l/s)	5.0		
Invert Level (m)	117.654	Switch on depth (m)	0.001		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	5.000	1.500	5.000

Node S60 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	117.654
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	178

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	108.0	0.0	1.000	108.0	0.0	1.001	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S45	10	120.423	0.053	9.1	0.0765	0.0000	OK
15 minute summer	S46	10	119.163	0.050	9.0	0.0717	0.0000	OK
15 minute summer	S47	10	118.708	0.088	8.9	0.1254	0.0000	OK
15 minute summer	S48	10	118.687	0.096	9.0	0.1371	0.0000	OK
15 minute summer	S54	10	118.679	0.124	21.3	0.1771	0.0000	OK
15 minute summer	S53	9	118.670	0.260	21.3	0.3721	0.0000	SURCHARGED
15 minute summer	S50	10	120.476	0.042	5.9	0.0604	0.0000	OK
15 minute summer	S59	10	120.016	0.049	7.9	0.0703	0.0000	OK
15 minute summer	S58	10	119.397	0.059	10.8	0.0850	0.0000	OK
15 minute summer	S51	11	118.815	0.064	12.9	0.0916	0.0000	OK
15 minute summer	S52	9	118.648	0.398	44.4	0.4500	0.0000	SURCHARGED
120 minute summer	S60	82	117.762	0.107	17.1	11.7617	0.0000	OK
15 minute summer	dummy	1	117.631	0.000	5.0	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	S45	1.000	S46	9.0	1.674	0.258	0.1773	
15 minute summer	S46	1.001	S47	8.9	1.810	0.212	0.0372	
15 minute summer	S47	1.002	S48	9.0	0.654	0.223	0.0733	
15 minute summer	S48	1.003	S54	9.8	0.524	0.247	0.1165	
15 minute summer	S54	1.004	S53	21.3	1.175	0.531	0.6948	
15 minute summer	S53	1.005	S52	31.6	1.498	0.378	0.2475	
15 minute summer	S50	2.000	S59	5.8	1.291	0.171	0.0577	
15 minute summer	S59	2.001	S58	7.9	1.374	0.231	0.0995	
15 minute summer	S58	2.002	S51	10.7	1.644	0.310	0.1065	
15 minute summer	S51	2.003	S52	12.9	1.879	0.333	0.1075	
15 minute summer	S52	1.006	S60	64.3	3.342	0.440	0.1525	
120 minute summer	S60	Pump	dummy	5.0				33.4

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S45	11	120.486	0.116	32.7	0.1661	0.0000	OK
15 minute summer	S46	11	119.415	0.302	32.4	0.4324	0.0000	SURCHARGED
15 minute summer	S47	11	119.121	0.501	29.5	0.7165	0.0000	SURCHARGED
15 minute summer	S48	11	119.092	0.501	30.6	0.7169	0.0000	SURCHARGED
15 minute summer	S54	11	119.061	0.506	67.2	0.7236	0.0000	SURCHARGED
15 minute winter	S53	6	118.699	0.289	62.8	0.4136	0.0000	SURCHARGED
15 minute summer	S50	10	120.521	0.087	21.0	0.1246	0.0000	OK
15 minute summer	S59	12	120.204	0.237	28.7	0.3388	0.0000	SURCHARGED
15 minute summer	S58	12	119.792	0.454	37.5	0.6503	0.0000	SURCHARGED
15 minute summer	S51	12	119.089	0.337	40.7	0.4829	0.0000	SURCHARGED
15 minute winter	S52	6	118.698	0.448	101.0	0.5064	0.0000	SURCHARGED
120 minute winter	S60	118	118.333	0.679	37.7	74.3005	0.0000	SURCHARGED
15 minute summer	dummy	1	117.631	0.000	5.0	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	S45	1.000	S46	32.4	2.159	0.929	0.5304	
15 minute summer	S46	1.001	S47	29.5	2.113	0.702	0.1330	
15 minute summer	S47	1.002	S48	30.6	0.769	0.761	0.1918	
15 minute summer	S48	1.003	S54	33.5	0.842	0.838	0.2409	
15 minute summer	S54	1.004	S53	66.4	1.676	1.656	0.9261	
15 minute winter	S53	1.005	S52	62.5	1.887	0.747	0.2475	
15 minute summer	S50	2.000	S59	21.0	1.703	0.613	0.1790	
15 minute summer	S59	2.001	S58	27.0	1.703	0.794	0.3049	
15 minute summer	S58	2.002	S51	33.7	1.914	0.979	0.2781	
15 minute summer	S51	2.003	S52	40.2	2.286	1.042	0.1607	
15 minute winter	S52	1.006	S60	100.9	3.828	0.690	0.2734	
120 minute winter	S60	Pump	dummy	5.0				105.2

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.27%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S45	12	121.336	0.966	42.6	1.3830	0.0000	SURCHARGED
15 minute summer	S46	12	119.852	0.738	35.4	1.0568	0.0000	SURCHARGED
15 minute summer	S47	12	119.469	0.849	34.5	1.2148	0.0000	SURCHARGED
15 minute summer	S48	12	119.431	0.840	37.5	1.2025	0.0000	SURCHARGED
15 minute summer	S54	12	119.390	0.835	78.2	1.1951	0.0000	SURCHARGED
30 minute summer	S53	21	118.847	0.437	71.8	0.6255	0.0000	SURCHARGED
15 minute summer	S50	12	120.987	0.553	27.4	0.7917	0.0000	SURCHARGED
15 minute summer	S59	12	120.754	0.787	34.0	1.1265	0.0000	SURCHARGED
15 minute summer	S58	12	120.226	0.888	40.6	1.2707	0.0000	SURCHARGED
30 minute summer	S51	20	119.366	0.615	45.4	0.8794	0.0000	SURCHARGED
30 minute summer	S52	21	118.671	0.421	112.3	0.4762	0.0000	SURCHARGED
120 minute winter	S60	120	118.612	0.958	48.6	104.8333	0.0000	SURCHARGED
15 minute summer	dummy	1	117.631	0.000	5.0	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	S45	1.000	S46	35.4	2.208	1.015	0.5794	
15 minute summer	S46	1.001	S47	34.5	2.111	0.821	0.1330	
15 minute summer	S47	1.002	S48	37.5	0.942	0.932	0.1918	
15 minute summer	S48	1.003	S54	41.7	1.048	1.043	0.2409	
15 minute summer	S54	1.004	S53	75.9	1.909	1.894	0.9641	
30 minute summer	S53	1.005	S52	69.4	1.874	0.830	0.2475	
15 minute summer	S50	2.000	S59	24.5	1.712	0.717	0.2241	
15 minute summer	S59	2.001	S58	28.0	1.748	0.823	0.3049	
15 minute summer	S58	2.002	S51	37.6	2.138	1.093	0.2781	
30 minute summer	S51	2.003	S52	43.2	2.455	1.119	0.1607	
30 minute summer	S52	1.006	S60	111.1	3.196	0.760	0.3035	
120 minute winter	S60	Pump	dummy	5.0				105.3



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