

Drainage Statement

Selsfield Lane, Ardingly
West Sussex RH17 6UF

Client

Antler Homes plc
Knightway House
Park Street, Bagshot
Surrey, GU19 5AQ
Ref: 14339
Date: April 2026

Consulting Engineers

GTA Civils & Transport Ltd
Maple House
192-198 London Road
Burgess Hill
West Sussex
RH15 9RD
Tel: 01444 871444

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Annex: SuDS Drainage Management & Maintenance Plan

Issue	Issue date	Compiled	Checked
Preliminary Issue	13 April 2026	KW	NS

8 Introduction & Planning Background

- 8.1 This Statement has been prepared for Antler Homes in relation to the proposal to build up to 35 residential units on land to the west of Selsfield Road, Ardingly, West Sussex, RH17 6UF.
- 8.2 This statement will support the Reserved Matters Application and clearance of condition 9 associated with the outline planning approval Ref. DM/22/1575, Condition 9 wording is as follows:

The development hereby permitted shall not commence unless and until details of the proposed foul and surface water drainage and means of disposal have been submitted to and approved in writing by the local planning authority. No building shall be occupied until all the approved drainage works have been carried out in accordance with the approved details. The details shall include a timetable for its implementation and a management and maintenance plan for the lifetime of the development which shall include arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime. Maintenance and management during the lifetime of the development should be in accordance with the approved details.

Reason: To ensure that the proposal is satisfactorily drained and to accord with the NPPF requirements and Policy DP41 of the District Plan (2014 - 2031).

9 Existing Site

- 9.1 The application site lies directly west of Selsfield Lane in Ardingly to the south of The South of England Showground. This area is administered by Mid Sussex District Council (MSDC). A site location map and aerial view are shown in Appendix A.
- 9.2 Hydrology: There are no ditches/watercourses within the development boundary.
- 9.3 Topography: a topographic survey is shown in Appendix B. The site slopes from north to south with levels ranging from 125.00m AOD on the north boundary to 118.30m AOD on the south boundary.
- 9.4 Geology: Mapping from the BGS suggests that the entire site is underlain by the Cuckfield Stone Bed - Sandstone. Superficial deposits are absent across the investigation area.
- 9.5 An infiltration Assessment was undertaken by T&P Regen in March 2024. This established that infiltration rates could not be calculated due to the poor infiltration characteristics. In addition it was noted that shallow groundwater was present, typically 1.5-1.8m below surface level.
- 9.6 Flood risk: the EA's online flood maps for fluvial, pluvial and reservoir failure flooding were studied. The site is removed from the nearest flood pattern.

10 Proposed Development's Surface Water Drainage

- 10.1 The proposal is to build 35 new dwelling houses on this development.
- 10.2 The previously approved FRA/Drainage strategy prepared by Ardent Consultants submitted as part of the Outline application utilised infiltration as the form of surface water discharge. Later infiltration testing indicated that this was not a viable solution. A further report was prepared by Calibro in response to comments raised by West Sussex County Council as LLFA. The above report by Calibro utilises an existing ditch to the west of the site as a positive outfall, this method of discharge has been taken forward as the scheme has progressed.
- 10.3 The current proposals for the site now place properties within the lower part of the development to the south. In order to allow a gravity discharge to the existing ditch to the west (and to avoid excessive fill) a smaller catchment will be pumped via a package surface water pumping station into the northern gravity network upstream of the proposed attenuation basin.

- 10.4 From the UK SUDS greenfield estimation tool it has been established that the QBAR rate for the site is 6.0 l/s/Ha. Confirmation can be found in Appendix C.
- 10.5 An attenuation basin is provided within the parcel to cater for the volume in the critical 1% + 45% CC storm event with a maximum discharge rate of 5.8 l/s. Minimal flooding is shown in the Causeway Flow Drainage calculations for this return period; refer to Appendix C for the Network calculations.
- 10.6 Treatment: Treatment is provided by the attenuation basin, opportunity for SUDS planters for the properties will further enhance the water quality prior to discharge.
- 10.7 Drainage Details: The main/public and private drainage details are provided as part of the Reserved Matters Application.
- 10.8 Exceedance flows: if the surface water system were to 'fail', ie get silted up – or in an extreme storm event, the resulting flow would go south through the existing area adjacent to the tennis courts. This mimics the existing scenario.
- 10.9 A SuDS Maintenance Plan has been set up in line with industry best practice – as set out in The SuDS Manual (CIRIA C753, 2015) - and the susdrain website (www.susdrain.org). Refer to the Annex of this report. The responsibility of maintenance, repair, renewal and replacement of the surface water drainage system will be contracted to a management company. This shall be formed/charged with the responsibility of the management / maintenance all communal areas/infrastructure within the development site.
- 10.10 Phasing of Construction Works: The attenuation basin and outfall to the western ditch would form the first phase of construction to provide a positive outfall from the outset of the development.
- 10.11 It is contended that this development's drainage design is fully compliant with the PPG/NPPF. An implementable drainage solution can be provided which addresses Condition 9 of the outline application.

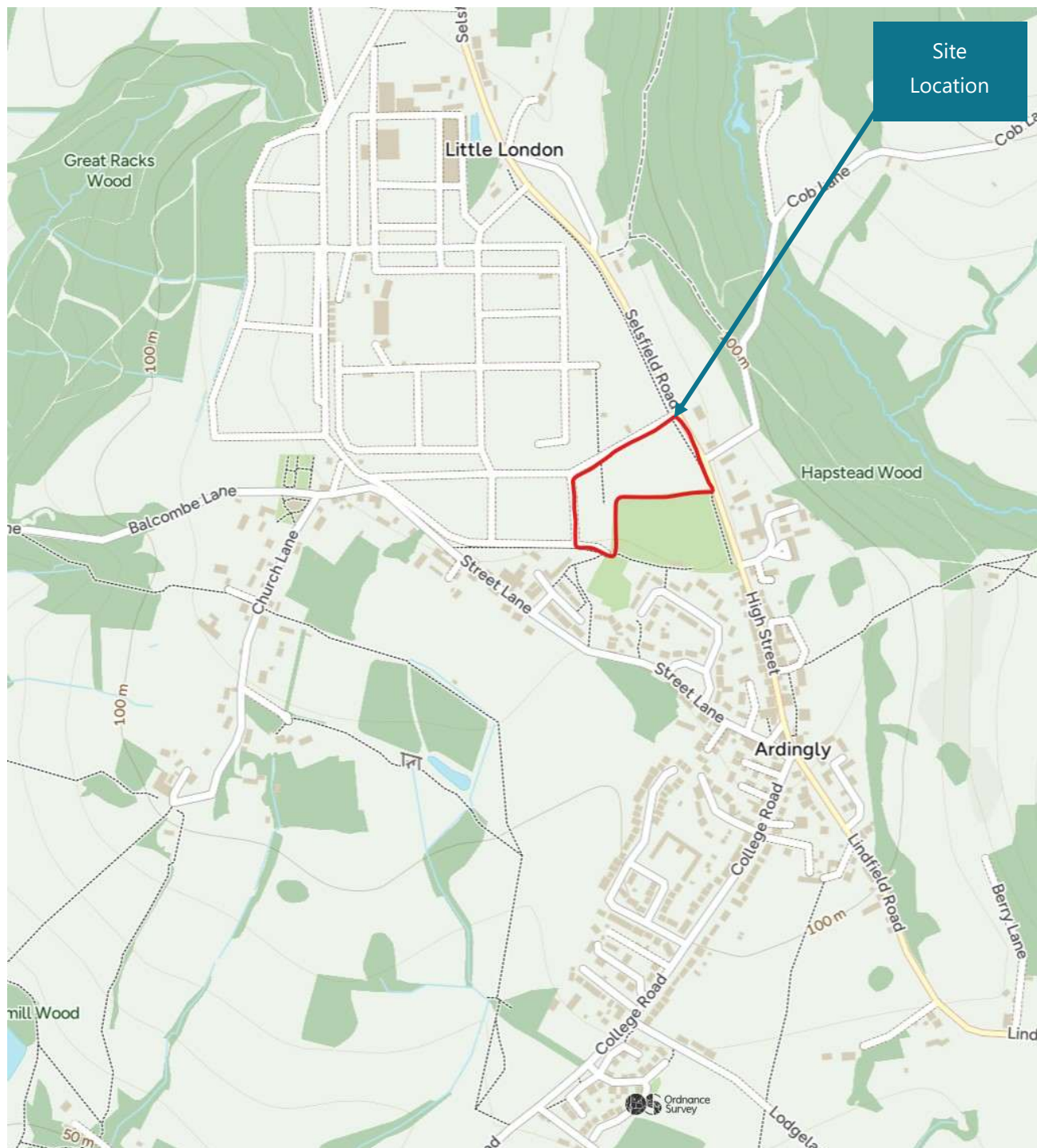
11 Proposed Development's Foul Water Drainage

- 11.1 In line with previous proposals for the site, the foul discharge point will be via a gravity connection to the existing manhole 6601 within Selsfield Road to the east of the site.
- 11.2 Due to the expansion of the site into the southern area a package pumping station will be provided to cater for the lowest 4 properties. This pumping station will discharge into the proposed gravity network to the north.

- End of Statement -

Appendix A

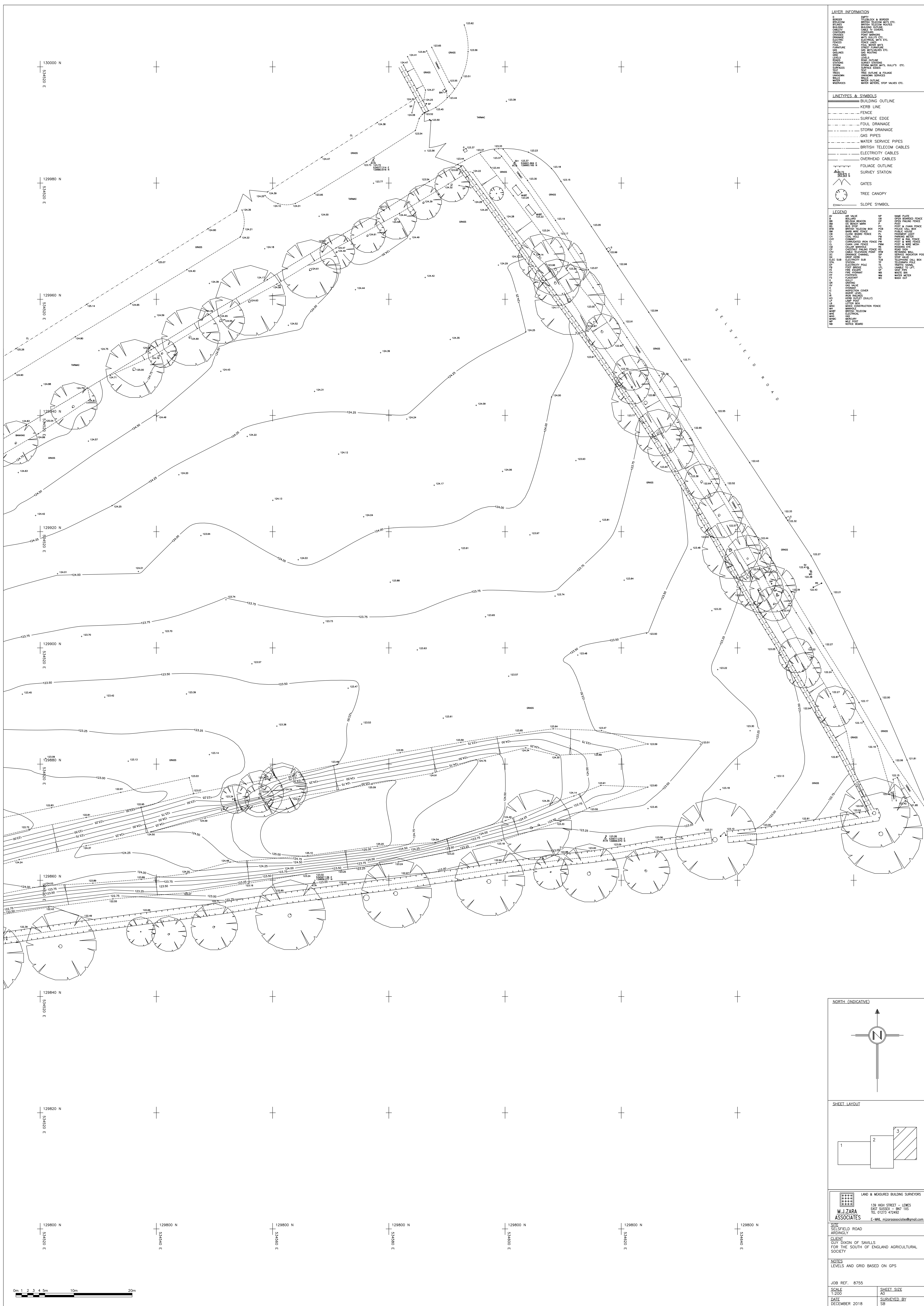
Site Location Map & Aerial View





Appendix B

Topographic Survey



[illegible]

Appendix C

Drainage Design Layout & Calculations

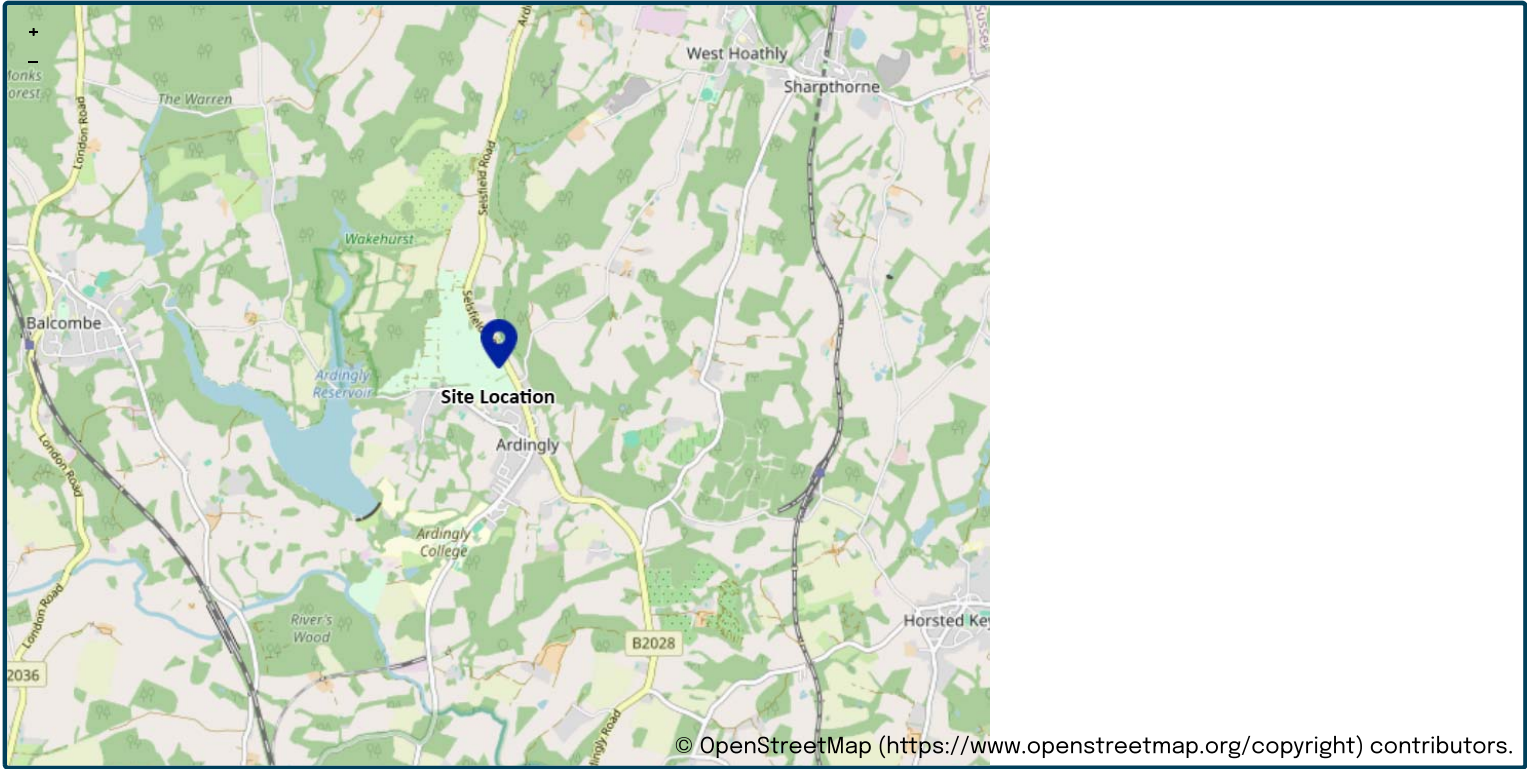
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	13/04/2026
Calculated by	Kris Willis
Reference	14267
Model version	2.2.3

Location

Site name	Selsfield Road
Site location	Ardingly



Site easting (British National Grid)	534505
Site northing (British National Grid)	129860

Site details

Total site area (ha)	1	ha
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Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	847	mm	847
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	6	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
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		

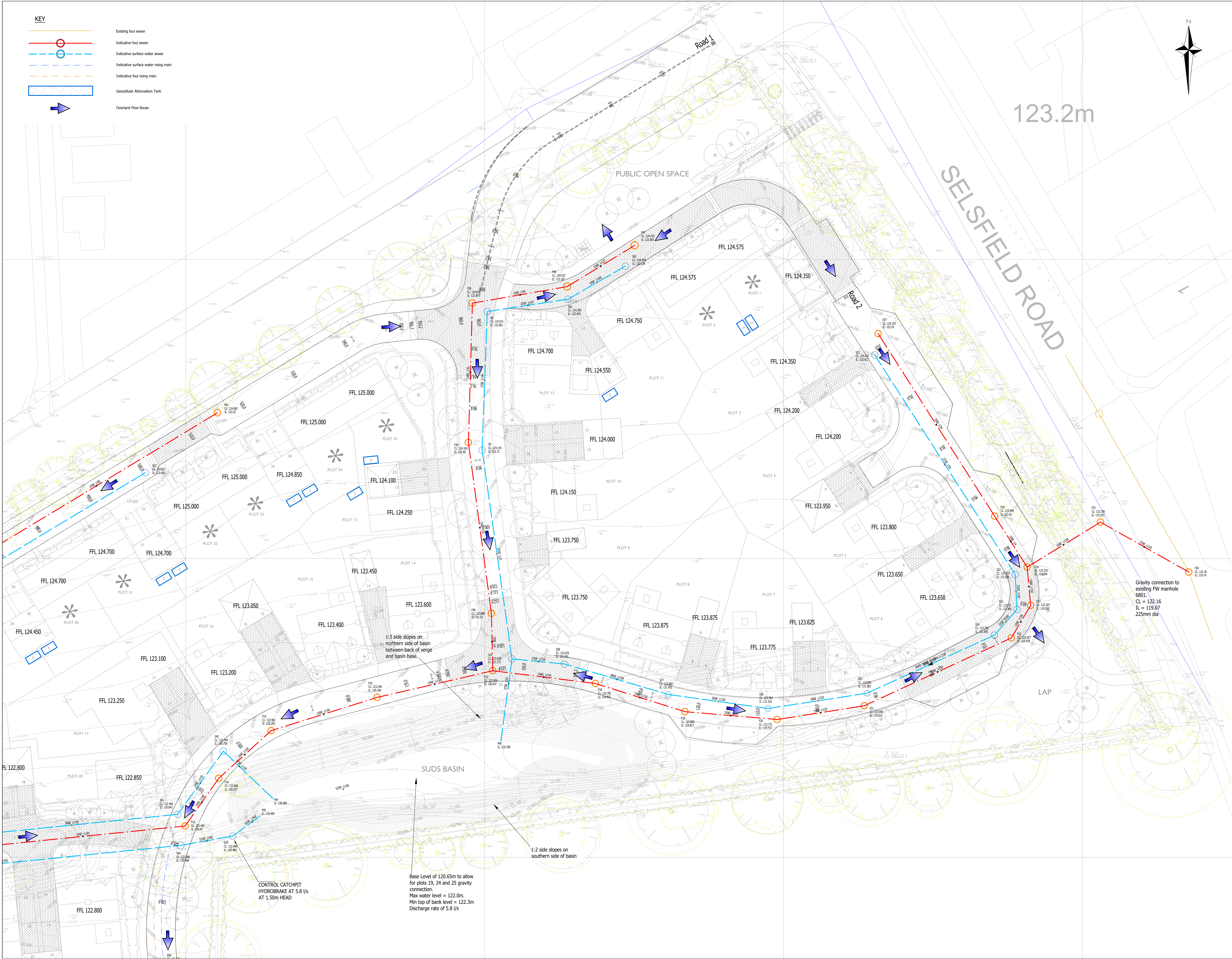
Results

Method	IH124	
Flow rate 1 year (l/s)	5.1	l/s
Flow rate 2 year (l/s)	5.3	l/s
Flow rate 10 years (l/s)	9.8	l/s
Flow rate 30 years (l/s)	13.9	l/s
Flow rate 100 years (l/s)	19.2	l/s
Flow rate 200 years (l/s)	22.6	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

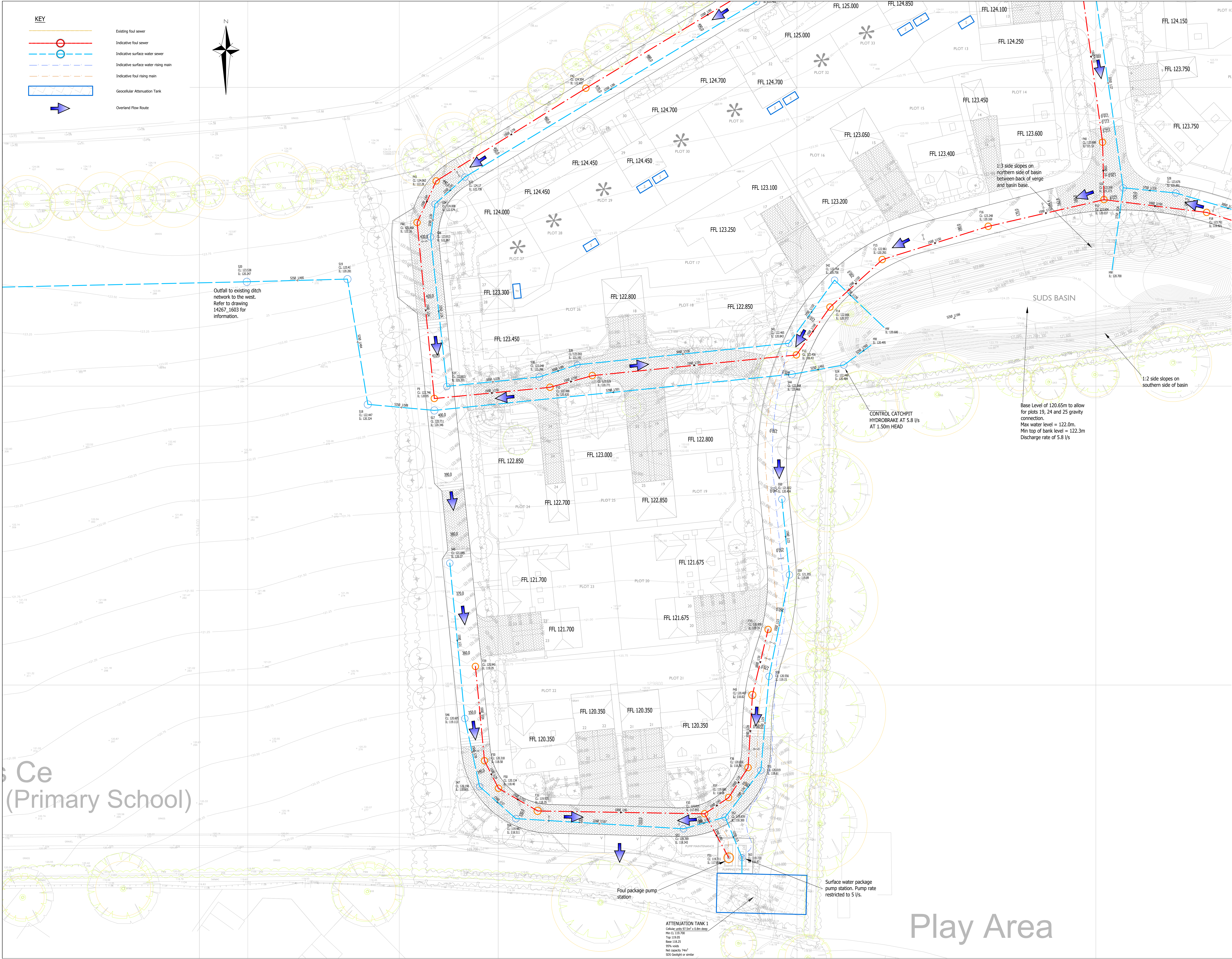
This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). 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.



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Rev	Initial Issue	13.4.26	Rev	Rev
Rev	Amendments	Date	Rev	Rev
PRELIMINARY				
Client				
ANTLER HOMES plc				
Architect				
Project				
SELSFIELD ROAD ARDINGLY				
Title				
PROPOSED DRAINAGE STRATEGY SHEET 1 OF 3				
Date		Scale @ A0		
13/04/2026		1:200		
Client Ref		Project Ref		
		14267		
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Drawing Number			Rev:	
14267/1601			P1	



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

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1:13 side slopes on northern side of basin between back of verge and basin base.

1:2 side slopes on southern side of basin

Base Level of 120.65m to allow for plots 19, 24 and 25 gravity connection.
Max water level = 122.0m.
Min top of bank level = 122.3m
Discharge rate of 5.8 l/s

CONTROL CATCHPIT HYDROBRAKE AT 5.8 l/s AT 1.50m HEAD

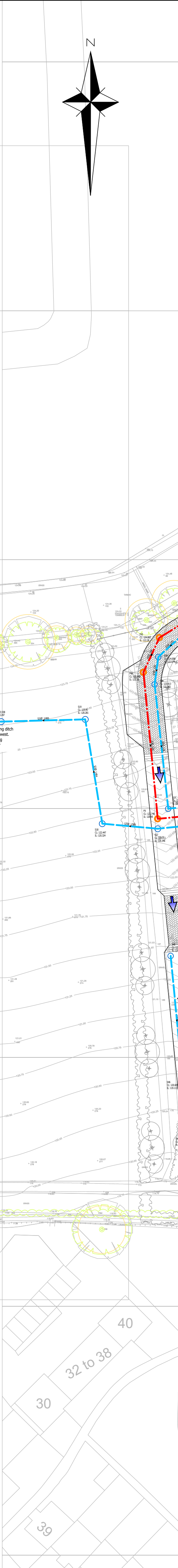
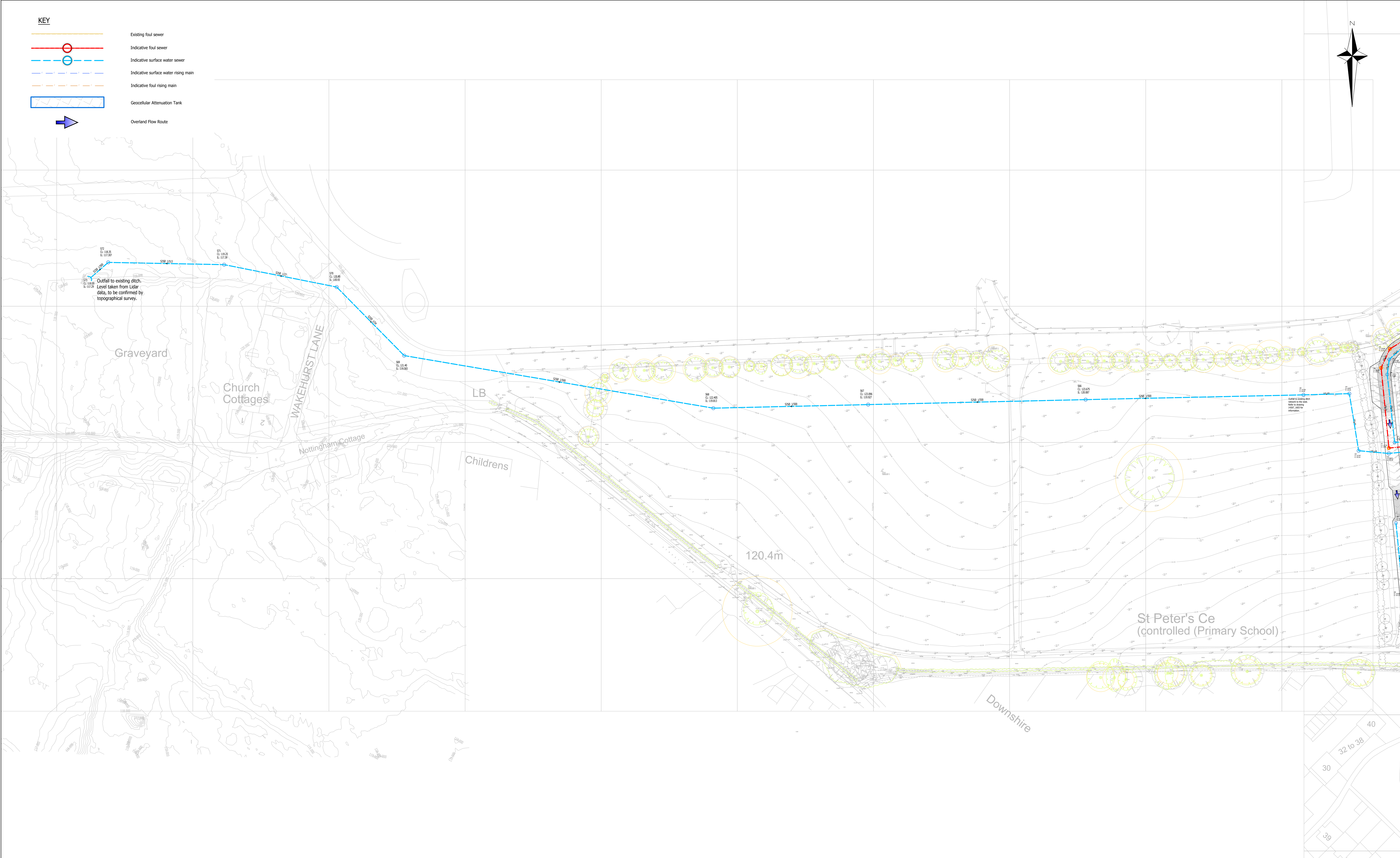
Outfall to existing ditch network to the west. Refer to drawing 14267_1603 for information.

ATTENUATION TANK 1
Culvert entry 0.5m x 0.5m deep
Min 0.175m
Top 110.0m
Base 118.25
90% voids
Net capacity 7m³
S25 Geoflight or similar

Foul package pump station

Surface water package pump station. Pump rate restricted to 5 l/s.

TL	Initial Issue	13.4.26	KW	MS	
Rev	Amendments	Date	Drawn	Check	
Status	PRELIMINARY				
Client	ANTLER HOMES plc				
Architect					
Project	SELSFIELD ROAD ARDINGLY				
Title	PROPOSED DRAINAGE STRATEGY SHEET 2 OF 3				
Date	13/04/2026	Scale @ A0	1:200		
Client's Ref		Project Ref	14267		
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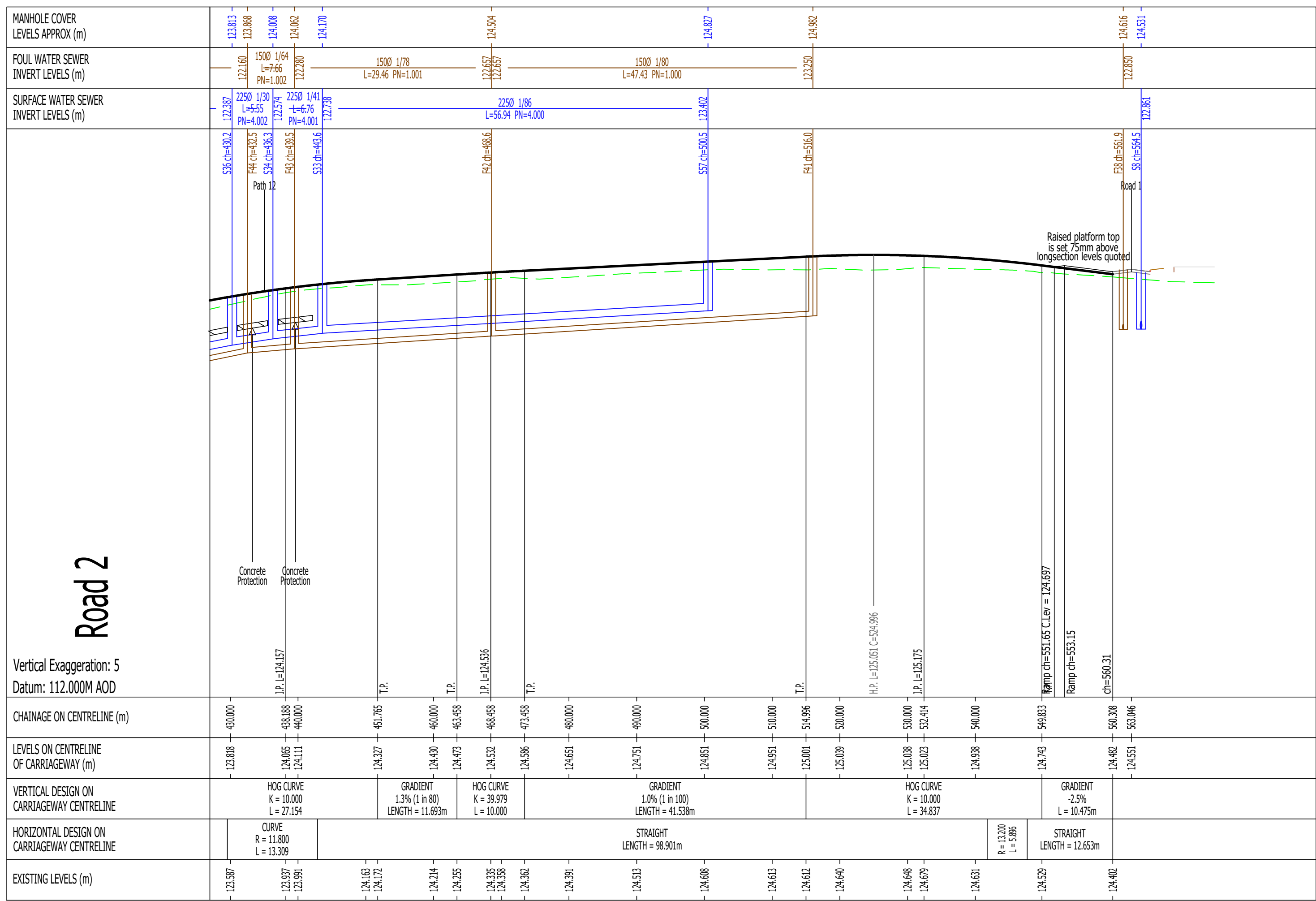
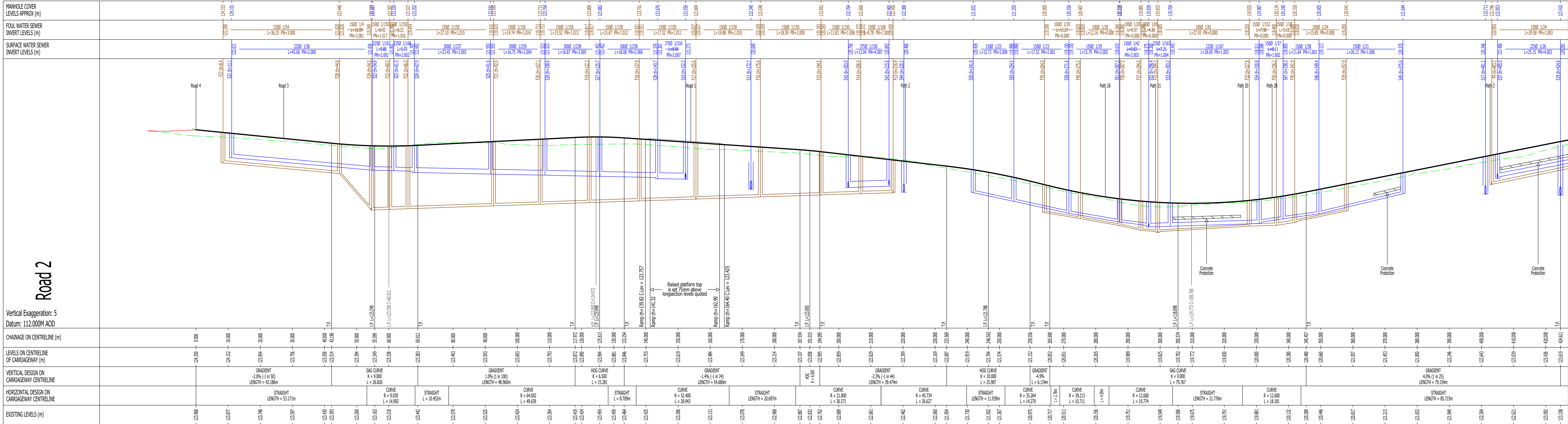
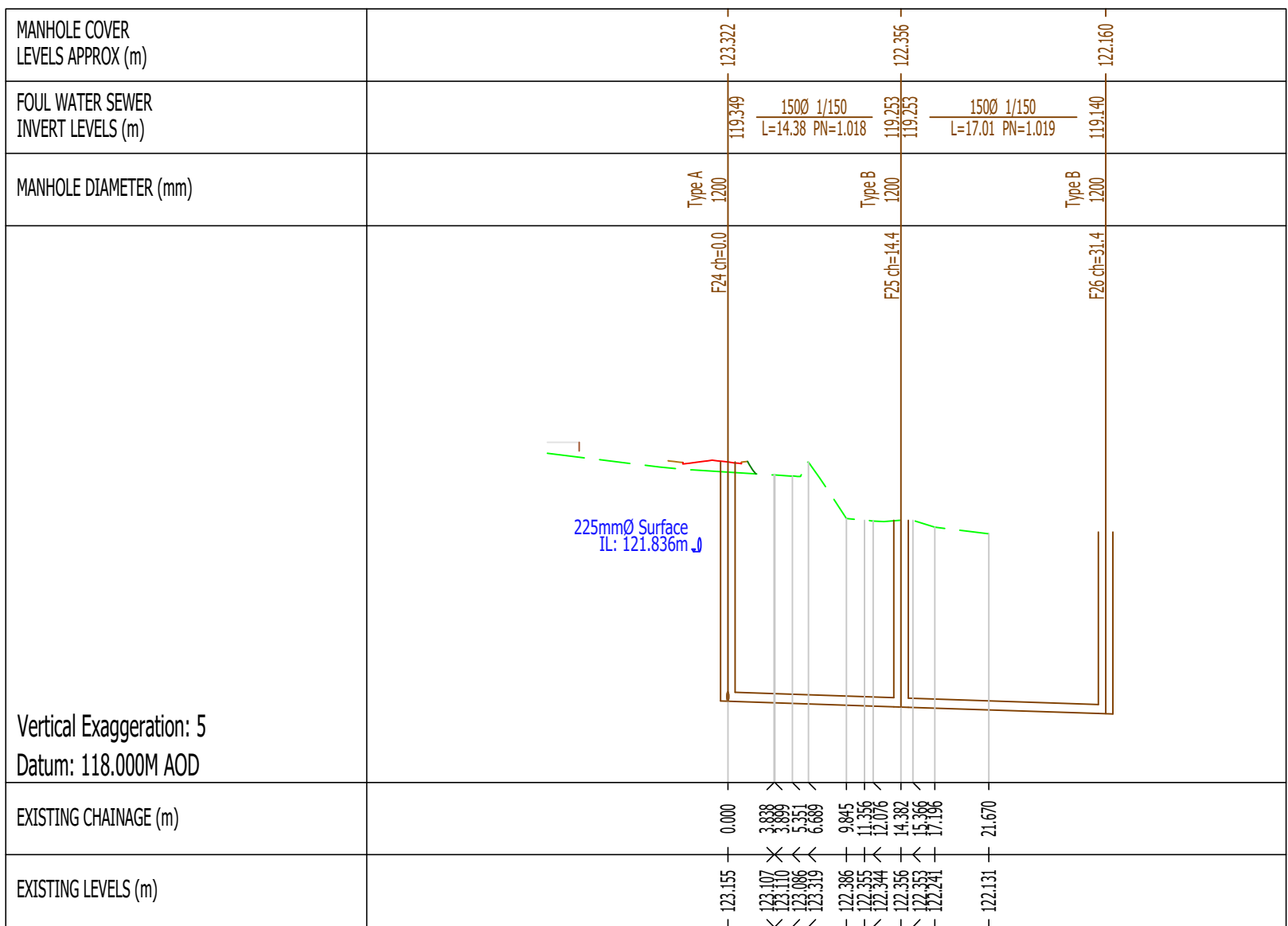
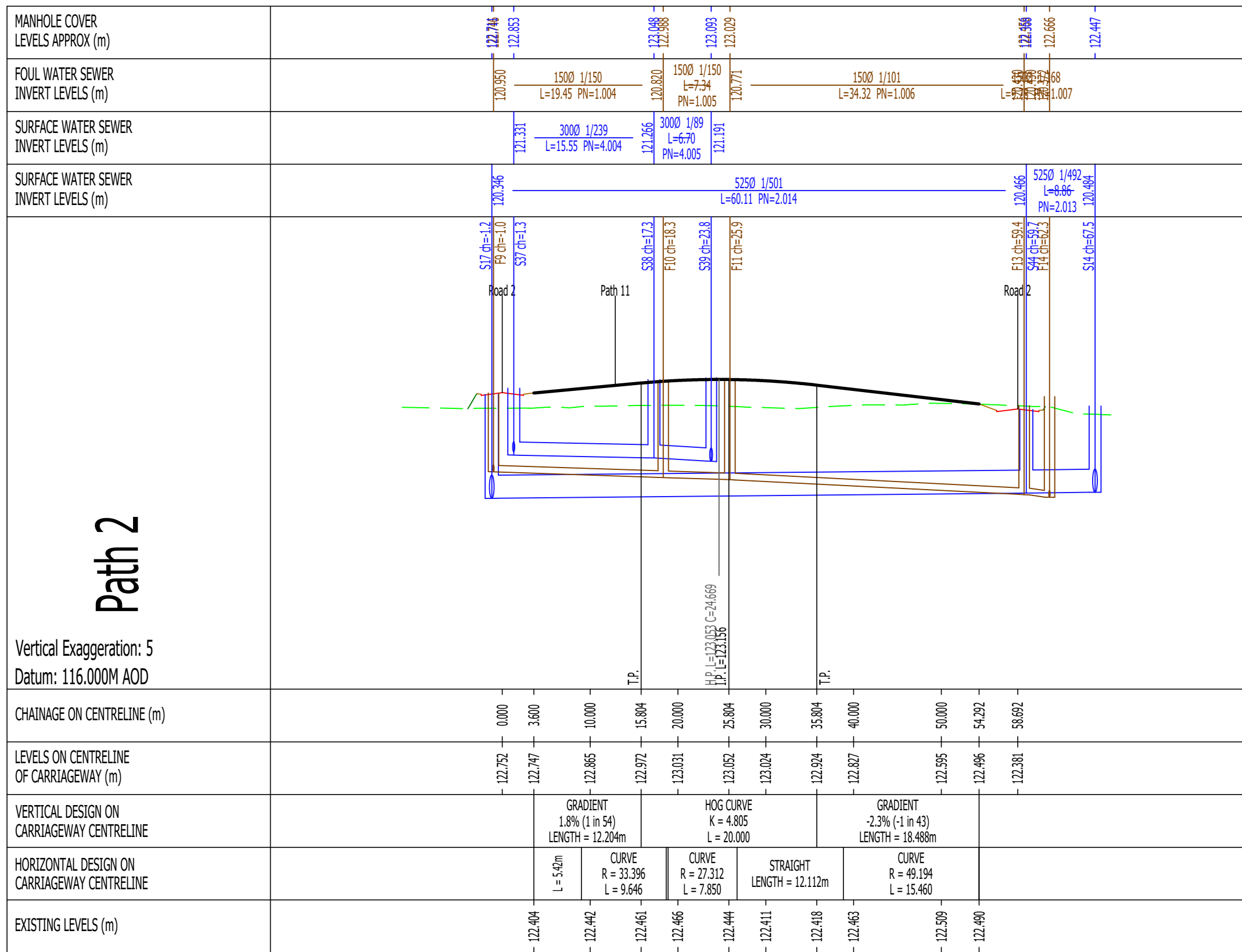
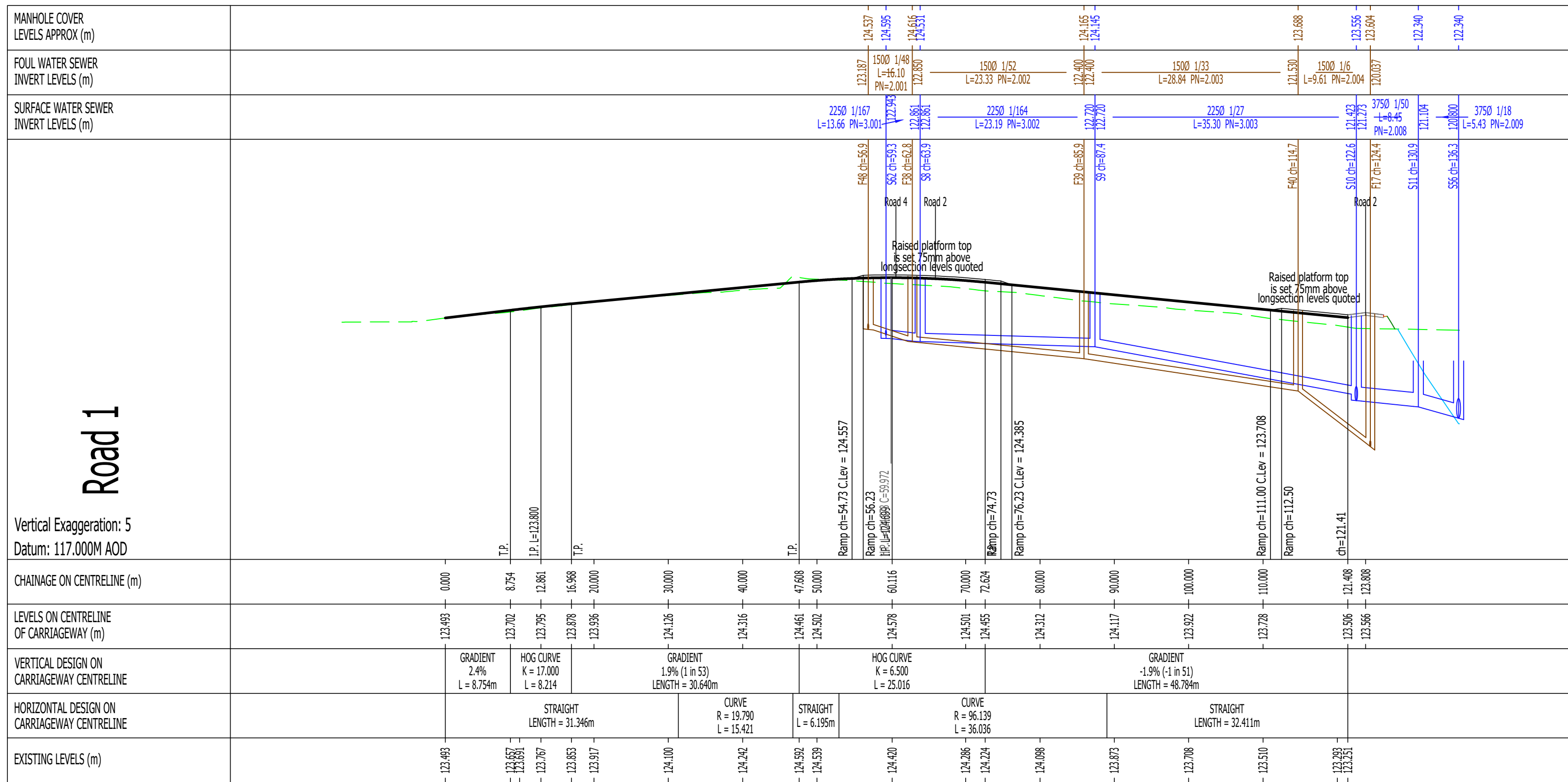
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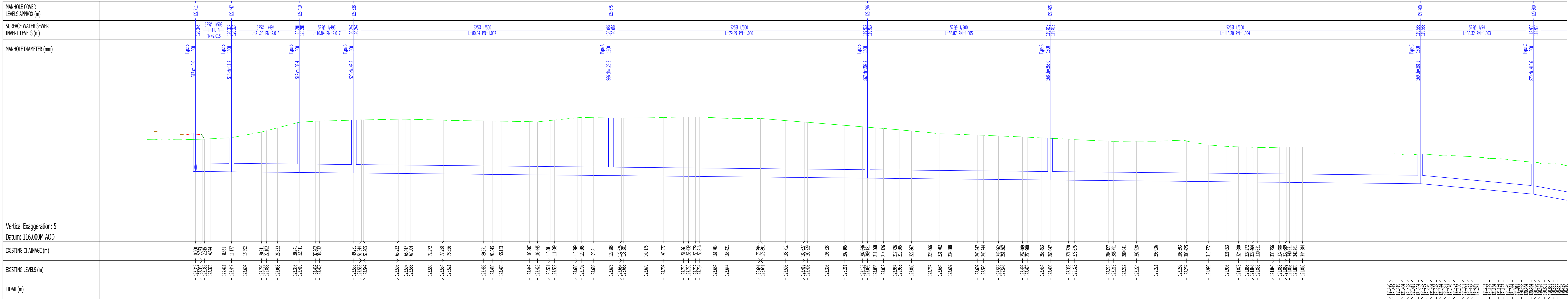
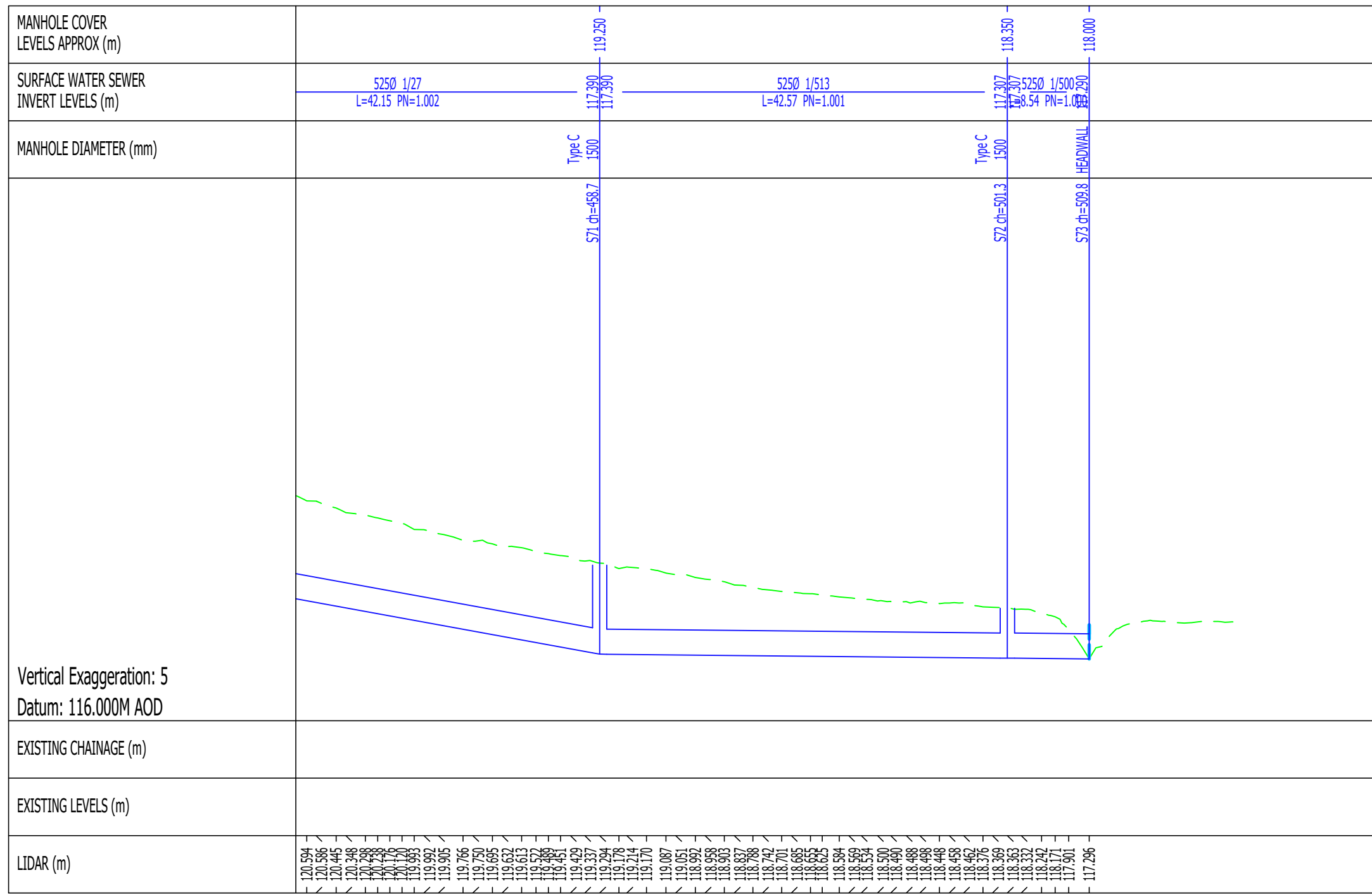
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Rev	Amendments	Date	Drawn	Check	
Status					
PRELIMINARY					
Client					
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Architect					
Project					
SELSFIELD ROAD					
ARDINGLY					
Title					
PROPOSED DRAINAGE STRATEGY					
SHEET 3 OF 3					
Date					
13/04/2026		Scale @ A0			
		1:500			
Client's Ref.		Project Ref.			
		14267			
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Rev	Amendments	Date		Dim Chk
Status				
Client				
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Architect				
Project				
SELSFIELD ROAD				
ARDINGLY				
Title				
PROPOSED LONGITUDINAL				
SECTIONS SHEET 1 OF 2				
Date	13/04/2026	Scale @ A0	1:500/1:100	
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PRELIMINARY					
Client					
ANTLER HOMES plc					
Architect					
Project					
SELSFIELD ROAD					
ARDINGLY					
Title					
PROPOSED LONGITUDINAL					
SECTIONS SHEET 2 OF 2					
Date		Scale @ A0		1:500/1:100	
13/04/2026					
Client's Ref		Project Ref		14267	

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)	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	1.691	120.649
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	0.023	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	0.031	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				122.340	1350	534514.329	129858.278	1.840	120.500
S14				122.446	1350	534507.838	129853.544	1.962	120.484
S44				122.368	1500	534499.113	129851.993	1.902	120.466
S17				122.711	1500	534439.312	129845.952	2.365	120.346
S18				122.447	1500	534428.181	129846.961	2.123	120.324
S19				123.410	1500	534424.771	129867.920	3.129	120.281
S20				123.538	1500	534407.937	129867.471	3.291	120.247

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	120.649	0.151	105.5	525	7.18	50.0
1.011	S12	S13	24.704	0.600	120.649	120.500	0.149	165.8	525	7.42	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	20.6	1.265	1.266	0.114	0.0	84	1.529
1.001	1.008	40.1	20.6	1.266	1.294	0.114	0.0	115	1.016
1.002	1.004	39.9	20.6	1.294	1.360	0.114	0.0	115	1.012
1.003	1.017	71.9	26.2	1.360	1.698	0.145	0.0	125	0.939
1.004	1.012	71.5	26.2	1.698	1.941	0.145	0.0	125	0.935
1.005	1.015	71.8	35.2	1.941	2.130	0.195	0.0	149	1.011
1.006	1.015	71.7	39.0	2.130	2.000	0.216	0.0	158	1.036
1.007	1.014	112.0	42.6	2.000	1.908	0.236	0.0	160	0.947
2.000	1.005	17.8	6.9	1.200	1.427	0.038	0.0	65	0.942
2.001	1.010	40.2	10.2	1.427	1.445	0.057	0.0	77	0.845
2.002	1.016	40.4	20.9	1.445	1.200	0.116	0.0	115	1.025
2.003	2.517	100.1	33.5	1.200	1.908	0.185	0.0	89	2.270
1.008	2.568	283.6	80.8	1.908	0.861	0.447	0.0	137	2.226
1.009	4.303	475.2	80.8	0.861	1.165	0.447	0.0	104	3.236
1.010	2.181	472.0	80.8	1.015	1.166	0.447	0.0	146	1.647
1.011	1.736	375.9	80.8	1.166	1.315	0.447	0.0	164	1.396
3.000	1.413	56.2	17.2	1.200	1.207	0.095	0.0	86	1.248
3.001	2.044	81.3	19.4	1.207	1.209	0.107	0.0	74	1.681
3.002	2.410	95.8	19.4	1.209	1.201	0.107	0.0	68	1.895
3.003	2.594	103.1	24.6	1.201	1.222	0.136	0.0	74	2.134
3.004	1.012	71.5	24.6	1.222	1.482	0.136	0.0	121	0.920
3.005	1.664	117.6	28.7	1.482	1.602	0.159	0.0	100	1.381
3.006	1.376	97.3	36.8	1.602	1.247	0.204	0.0	127	1.282
3.007	1.477	163.2	59.6	1.247	1.633	0.302	5.0	156	1.365

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	120.500	120.484	0.016	502.1	525	7.56	50.0
1.013	S14	S44	8.861	0.600	120.484	120.466	0.018	492.3	525	7.70	50.0
1.014	S44	S17	60.105	0.600	120.466	120.346	0.120	500.9	525	8.71	50.0
1.015	S17	S18	11.177	0.600	120.346	120.324	0.022	508.0	525	8.90	50.0
1.016	S18	S19	21.235	0.600	120.324	120.281	0.043	493.8	525	9.25	50.0
1.017	S19	S20	16.840	0.600	120.281	120.247	0.034	495.3	525	9.54	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	65.2	1.633	1.259	0.333	5.0	164	1.395
3.009	1.916	211.6	65.2	1.259	1.315	0.333	5.0	142	1.695
1.012	0.993	214.9	146.0	1.315	1.437	0.780	5.0	318	1.064
1.013	1.003	217.0	146.0	1.437	1.377	0.780	5.0	316	1.072
1.014	0.994	215.1	146.0	1.377	1.840	0.780	5.0	318	1.065
1.015	0.987	213.6	146.0	1.840	1.598	0.780	5.0	320	1.059
1.016	1.001	216.7	146.0	1.598	2.604	0.780	5.0	317	1.071
1.017	0.999	216.4	146.0	2.604	2.766	0.780	5.0	317	1.069

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

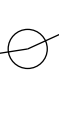
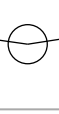
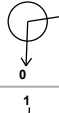
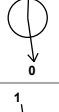
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S21	1350	Manhole	Adoptable	S22	1350	Manhole	Adoptable
1.001	S22	1350	Manhole	Adoptable	S23	1350	Manhole	Adoptable
1.002	S23	1350	Manhole	Adoptable	S24	1350	Manhole	Adoptable
1.003	S24	1350	Manhole	Adoptable	S25	1200	Manhole	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

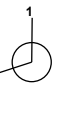
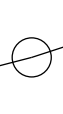
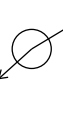
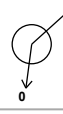
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.008	8.445	50.0	375	Circular	123.556	121.273	1.908	122.340	121.104	0.861
1.009	5.433	17.9	375	Circular	122.340	121.104	0.861	122.340	120.800	1.165
1.010	15.924	105.5	525	Circular	122.340	120.800	1.015	122.340	120.649	1.166
1.011	24.704	165.8	525	Circular	122.340	120.649	1.166	122.340	120.500	1.315
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	122.340	120.650	1.315
1.012	8.034	502.1	525	Circular	122.340	120.500	1.315	122.446	120.484	1.437
1.013	8.861	492.3	525	Circular	122.446	120.484	1.437	122.368	120.466	1.377
1.014	60.105	500.9	525	Circular	122.368	120.466	1.377	122.711	120.346	1.840
1.015	11.177	508.0	525	Circular	122.711	120.346	1.840	122.447	120.324	1.598
1.016	21.235	493.8	525	Circular	122.447	120.324	1.598	123.410	120.281	2.604
1.017	16.840	495.3	525	Circular	123.410	120.281	2.604	123.538	120.247	2.766

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

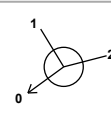
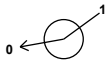
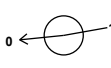
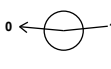
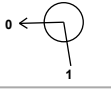
Manhole Schedule

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	525
S12	534538.246	129864.465	122.340	1.691	1350		1	1.010	120.649	525
							0	1.011	120.649	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	122.340	1.840	1350		1	3.009	120.650	375
							2	1.011	120.500	525
							0	1.012	120.500	525
S14	534507.838	129853.544	122.446	1.962	1350		1	1.012	120.484	525
							0	1.013	120.484	525
S44	534499.113	129851.993	122.368	1.902	1500		1	1.013	120.466	525
							0	1.014	120.466	525
S17	534439.312	129845.952	122.711	2.365	1500		1	1.014	120.346	525
							0	1.015	120.346	525
S18	534428.181	129846.961	122.447	2.123	1500		1	1.015	120.324	525
							0	1.016	120.324	525
S19	534424.771	129867.920	123.410	3.129	1500		1	1.016	120.281	525
							0	1.017	120.281	525
S20	534407.937	129867.471	123.538	3.291	1500		1	1.017	120.247	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)	120.484	Product Number	CTL-SHE-0104-5800-1650-5800
Design Depth (m)	1.650	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.8	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)	120.500
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)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	290.2	0.0	0.500	465.6	0.0	1.000	654.5	0.0	1.500	865.0	0.0
0.100	323.7	0.0	0.600	502.4	0.0	1.100	693.7	0.0	1.600	910.6	0.0
0.200	358.4	0.0	0.700	539.6	0.0	1.200	733.5	0.0	1.690	952.3	0.0
0.300	393.6	0.0	0.800	577.4	0.0	1.300	773.9	0.0			
0.400	429.4	0.0	0.900	615.7	0.0	1.400	820.0	0.0			

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	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	0.1866	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	0.2231	0.0000	OK
1440 minute summer	S11	1470	121.254	0.150	7.8	0.2143	0.0000	OK
1440 minute summer	S56	1470	121.254	0.454	8.4	0.6493	0.0000	OK
1440 minute summer	S12	1470	121.254	0.605	21.4	0.8654	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	121.459	0.128	24.4	0.1833	0.0000	OK
15 minute summer	S38	11	121.385	0.119	28.4	0.1709	0.0000	OK
15 minute summer	S39	11	121.322	0.131	36.2	0.1476	0.0000	OK
1440 minute summer	S41	1470	121.254	0.411	10.3	0.5885	0.0000	SURCHARGED
1440 minute summer	S42	1470	121.253	0.497	10.6	0.7117	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	20.6	1.141	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	2.095	0.271	0.3105	
1440 minute summer	S11	1.009	S56	7.8	0.975	0.016	0.4111	
1440 minute summer	S56	1.010	S12	19.5	0.372	0.041	3.2997	
1440 minute summer	S12	1.011	S13	11.1	0.089	0.030	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	0.891	0.341	0.4260	
15 minute summer	S38	3.005	S39	28.3	1.021	0.241	0.1860	
15 minute summer	S39	3.006	S41	35.7	1.256	0.367	1.0132	
1440 minute summer	S41	3.007	S42	10.1	0.692	0.062	1.4386	
1440 minute summer	S42	3.008	S43	15.7	0.751	0.096	0.8291	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	S43	1470	121.254	0.548	15.7	0.7848	0.0000	SURCHARGED
1440 minute summer	S13	1470	121.254	0.754	32.5	319.5644	0.0000	SURCHARGED
360 minute summer	S14	256	120.544	0.060	5.6	0.0862	0.0000	OK
360 minute summer	S44	264	120.523	0.057	5.6	0.1013	0.0000	OK
360 minute summer	S17	264	120.406	0.060	5.6	0.1066	0.0000	OK
360 minute summer	S18	264	120.383	0.059	5.6	0.1035	0.0000	OK
360 minute summer	S19	264	120.340	0.059	5.6	0.1048	0.0000	OK
360 minute summer	S20	264	120.295	0.048	5.6	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)
1440 minute summer	S43	3.009	S13	21.3	0.802	0.101	0.5526	
1440 minute summer	S13	1.012	S14	5.6	0.404	0.026	0.1110	
360 minute summer	S14	1.013	S44	5.6	0.424	0.026	0.1167	
360 minute summer	S44	1.014	S17	5.6	0.423	0.026	0.7925	
360 minute summer	S17	1.015	S18	5.6	0.417	0.026	0.1496	
360 minute summer	S18	1.016	S19	5.6	0.422	0.026	0.2805	
360 minute summer	S19	1.017	S20	5.6	0.484	0.026	0.1946	166.3

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S21	11	123.618	1.007	74.8	1.4412	0.0000	SURCHARGED
15 minute summer	S22	12	122.847	1.011	67.7	1.4467	0.0000	SURCHARGED
15 minute summer	S23	12	122.689	0.888	64.0	1.2703	0.0000	SURCHARGED
15 minute summer	S24	12	122.530	0.838	80.0	1.1998	0.0000	SURCHARGED
15 minute summer	S25	12	122.368	0.775	80.4	0.8767	0.0000	SURCHARGED
15 minute summer	S26	12	122.241	0.718	106.6	0.8119	0.0000	SURCHARGED
15 minute summer	S27	12	122.018	0.566	118.1	0.6403	0.0000	SURCHARGED
1440 minute winter	S28	1470	121.954	0.652	7.4	0.9337	0.0000	SURCHARGED
15 minute summer	S61	12	123.926	0.797	25.0	1.1410	0.0000	SURCHARGED
15 minute summer	S62	12	123.729	0.786	32.2	1.1249	0.0000	SURCHARGED
15 minute summer	S8	12	123.658	0.797	65.0	1.1406	0.0000	SURCHARGED
15 minute summer	S9	12	123.226	0.505	105.1	0.7233	0.0000	SURCHARGED
1440 minute winter	S10	1440	121.954	0.681	13.3	0.9745	0.0000	SURCHARGED
1440 minute winter	S11	1530	121.956	0.852	38.8	1.2191	0.0000	SURCHARGED
1440 minute winter	S56	1500	121.957	1.157	29.8	1.6562	0.0000	SURCHARGED
1440 minute winter	S12	1530	121.954	1.305	22.4	1.8671	0.0000	SURCHARGED
15 minute summer	S57	11	123.738	0.336	62.6	0.4812	0.0000	SURCHARGED
15 minute summer	S33	12	123.035	0.297	66.2	0.4254	0.0000	SURCHARGED
15 minute summer	S34	12	122.879	0.305	65.6	0.4369	0.0000	SURCHARGED
15 minute summer	S36	12	122.736	0.349	83.7	0.4997	0.0000	SURCHARGED
15 minute summer	S37	11	122.068	0.737	80.4	1.0546	0.0000	SURCHARGED
15 minute summer	S38	11	121.968	0.702	90.6	1.0039	0.0000	SURCHARGED
1440 minute winter	S39	1440	121.953	0.762	6.2	0.8620	0.0000	SURCHARGED
1440 minute winter	S41	1440	121.954	1.111	13.8	1.5893	0.0000	SURCHARGED
1440 minute winter	S42	1470	121.956	1.200	14.7	1.7167	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	67.7	1.701	0.974	1.7341	
15 minute summer	S22	1.001	S23	64.0	1.609	1.597	0.2327	
15 minute summer	S23	1.002	S24	64.2	1.615	1.609	0.2278	
15 minute summer	S24	1.003	S25	80.4	1.141	1.118	1.6513	
15 minute summer	S25	1.004	S26	83.7	1.188	1.170	1.1792	
15 minute summer	S26	1.005	S27	107.1	1.521	1.492	1.1878	
15 minute summer	S27	1.006	S28	118.5	1.684	1.653	1.2733	
1440 minute winter	S28	1.007	S10	7.0	0.623	0.063	0.9755	
15 minute summer	S61	2.000	S62	21.3	1.208	1.197	0.1951	
15 minute summer	S62	2.001	S8	36.1	0.908	0.899	0.5432	
15 minute summer	S8	2.002	S9	63.7	1.602	1.576	0.9224	
15 minute summer	S9	2.003	S10	102.6	2.738	1.025	1.4039	
1440 minute winter	S10	1.008	S11	38.8	1.364	0.137	0.9315	
1440 minute winter	S11	1.009	S56	29.8	0.962	0.063	0.5992	
1440 minute winter	S56	1.010	S12	19.6	0.537	0.042	3.4401	
1440 minute winter	S12	1.011	S13	22.3	0.164	0.059	5.3369	
15 minute summer	S57	3.000	S33	58.3	1.573	1.038	2.2645	
15 minute summer	S33	3.001	S34	65.6	1.851	0.807	0.2687	
15 minute summer	S34	3.002	S36	66.7	2.029	0.696	0.2207	
15 minute summer	S36	3.003	S37	80.4	2.403	0.780	1.0003	
15 minute summer	S37	3.004	S38	82.9	1.177	1.159	1.0948	
15 minute summer	S38	3.005	S39	94.9	1.348	0.807	0.4718	
1440 minute winter	S39	3.006	S41	5.8	0.610	0.060	2.5037	
1440 minute winter	S41	3.007	S42	13.7	0.701	0.084	1.4386	
1440 minute winter	S42	3.008	S43	15.9	0.786	0.097	0.8291	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	S43	1500	121.953	1.247	22.4	1.7851	0.0000	SURCHARGED
1440 minute winter	S13	1470	121.953	1.453	35.5	808.2364	0.0000	SURCHARGED
15 minute summer	S14	15	120.544	0.060	5.6	0.0865	0.0000	OK
15 minute summer	S44	14	120.525	0.059	5.6	0.1042	0.0000	OK
15 minute summer	S17	18	120.407	0.060	5.7	0.1068	0.0000	OK
15 minute summer	S18	19	120.383	0.059	5.6	0.1037	0.0000	OK
15 minute summer	S19	20	120.340	0.059	5.6	0.1050	0.0000	OK
15 minute summer	S20	20	120.295	0.048	5.6	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)
1440 minute winter	S43	3.009	S13	19.8	0.842	0.094	0.5526	
1440 minute winter	S13	1.012	S14	5.6	0.404	0.026	0.1110	
15 minute summer	S14	1.013	S44	5.6	0.514	0.026	0.1191	
15 minute summer	S44	1.014	S17	5.7	0.503	0.027	0.7955	
15 minute summer	S17	1.015	S18	5.6	0.432	0.026	0.1501	
15 minute summer	S18	1.016	S19	5.6	0.453	0.026	0.2814	
15 minute summer	S19	1.017	S20	5.6	0.485	0.026	0.1951	80.3

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.69%

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	97.6	2.1322	3.3753	FLOOD
15 minute summer	S22	12	123.296	1.460	76.5	2.0895	0.0000	FLOOD RISK
15 minute summer	S23	12	123.127	1.326	69.2	1.8969	0.0000	FLOOD RISK
15 minute summer	S24	12	122.957	1.265	87.7	1.8099	0.0000	SURCHARGED
15 minute summer	S25	12	122.763	1.170	90.4	1.3227	0.0000	SURCHARGED
15 minute summer	S26	12	122.609	1.086	123.3	1.2278	0.0000	SURCHARGED
15 minute summer	S27	11	122.319	0.867	138.7	0.9802	0.0000	SURCHARGED
1440 minute winter	S28	1440	122.222	0.921	9.5	1.3178	0.0000	SURCHARGED
15 minute summer	S61	11	124.479	1.350	32.6	1.9319	2.3926	FLOOD
15 minute summer	S62	11	124.466	1.523	35.4	2.1796	0.0000	FLOOD RISK
15 minute summer	S8	11	124.442	1.580	73.8	2.2616	0.0000	FLOOD RISK
15 minute summer	S9	11	123.988	1.268	122.5	1.8148	0.0000	FLOOD RISK
1440 minute winter	S10	1470	122.223	0.950	19.8	1.3589	0.0000	SURCHARGED
1440 minute winter	S11	1440	122.223	1.119	41.2	1.6019	0.0000	FLOOD RISK
1440 minute winter	S56	1500	122.226	1.426	27.6	2.0403	0.0000	FLOOD RISK
1440 minute winter	S12	1470	122.222	1.573	18.5	2.2505	0.0000	FLOOD RISK
15 minute summer	S57	11	124.827	1.425	81.5	2.0392	0.4679	FLOOD
15 minute summer	S33	12	123.842	1.104	79.9	1.5799	0.0000	SURCHARGED
15 minute summer	S34	12	123.627	1.053	73.0	1.5069	0.0000	SURCHARGED
15 minute summer	S36	12	123.443	1.056	90.2	1.5109	0.0000	SURCHARGED
15 minute summer	S37	12	122.561	1.230	90.4	1.7605	0.0000	FLOOD RISK
15 minute summer	S38	12	122.415	1.149	105.8	1.6446	0.0000	SURCHARGED
15 minute summer	S39	12	122.295	1.104	135.2	1.2483	0.0000	SURCHARGED
1440 minute winter	S41	1440	122.223	1.380	17.1	1.9742	0.0000	FLOOD RISK
1440 minute winter	S42	1440	122.222	1.466	18.3	2.0978	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	76.5	1.924	1.101	1.7341	
15 minute summer	S22	1.001	S23	69.2	1.741	1.728	0.2327	
15 minute summer	S23	1.002	S24	72.4	1.821	1.814	0.2278	
15 minute summer	S24	1.003	S25	90.4	1.284	1.258	1.6513	
15 minute summer	S25	1.004	S26	94.4	1.341	1.320	1.1792	
15 minute summer	S26	1.005	S27	123.6	1.756	1.722	1.1878	
15 minute summer	S27	1.006	S28	138.9	1.973	1.937	1.2733	
1440 minute winter	S28	1.007	S10	11.5	0.647	0.103	0.9755	
15 minute summer	S61	2.000	S62	23.3	1.326	1.314	0.1951	
15 minute summer	S62	2.001	S8	41.3	1.039	1.029	0.5432	
15 minute summer	S8	2.002	S9	70.8	1.780	1.752	0.9224	
15 minute summer	S9	2.003	S10	118.6	2.983	1.185	1.4039	
1440 minute winter	S10	1.008	S11	41.2	1.370	0.145	0.9315	
1440 minute winter	S11	1.009	S56	27.6	0.998	0.058	0.5992	
1440 minute winter	S56	1.010	S12	18.5	0.585	0.039	3.4401	
1440 minute winter	S12	1.011	S13	21.3	0.196	0.057	5.3369	
15 minute summer	S57	3.000	S33	70.0	1.761	1.247	2.2645	
15 minute summer	S33	3.001	S34	73.0	1.835	0.898	0.2687	
15 minute summer	S34	3.002	S36	72.9	1.945	0.761	0.2207	
15 minute summer	S36	3.003	S37	90.4	2.347	0.877	1.0003	
15 minute summer	S37	3.004	S38	96.2	1.366	1.345	1.0948	
15 minute summer	S38	3.005	S39	111.9	1.589	0.951	0.4718	
15 minute summer	S39	3.006	S41	136.4	1.937	1.402	2.5037	
1440 minute winter	S41	3.007	S42	17.0	0.701	0.104	1.4386	
1440 minute winter	S42	3.008	S43	18.6	0.779	0.114	0.8291	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	S43	1410	122.223	1.517	18.6	2.1708	0.0000	FLOOD RISK
1440 minute winter	S13	1440	122.222	1.722	38.7	1051.7590	0.0000	FLOOD RISK
1440 minute winter	S14	1440	120.546	0.061	5.8	0.0880	0.0000	OK
15 minute summer	S44	14	120.525	0.059	5.6	0.1045	0.0000	OK
1440 minute winter	S17	1440	120.408	0.062	5.8	0.1088	0.0000	OK
1440 minute winter	S18	1440	120.384	0.060	5.8	0.1056	0.0000	OK
1440 minute winter	S19	1440	120.341	0.060	5.8	0.1068	0.0000	OK
1440 minute winter	S20	1440	120.296	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	18.8	0.863	0.089	0.5526	
1440 minute winter	S13	1.012	S14	5.8	0.409	0.027	0.1144	
1440 minute winter	S14	1.013	S44	5.8	0.429	0.027	0.1202	
15 minute summer	S44	1.014	S17	5.7	0.496	0.027	0.7957	
1440 minute winter	S17	1.015	S18	5.8	0.422	0.027	0.1543	
1440 minute winter	S18	1.016	S19	5.8	0.428	0.027	0.2890	
1440 minute winter	S19	1.017	S20	5.8	0.491	0.027	0.2001	512.5

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

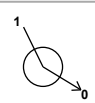
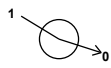
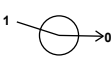
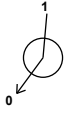
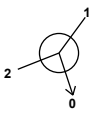
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	32.911	26.2	150	Circular	121.726	120.370	1.206	120.470	119.113	1.207
1.001	7.556	18.1	150	Circular	120.470	119.113	1.207	120.241	118.695	1.396
1.002	4.823	166.3	225	Circular	120.241	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		0				
30	0		0		0		0				
100	40		0		0		0				

Node S60 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	117.654	Product Number	CTL-SHE-0098-5000-1500-5000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

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)			190		
Depth			Area			Inf Area			Depth			Area			Inf Area		
(m)			(m²)			(m²)			(m)			(m²)			(m²)		
0.000			95.0			0.0			1.000			95.0			0.0		
1.001			0.0			0.0			1.001			0.0			0.0		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

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	11	118.704	0.084	8.9	0.1206	0.0000	OK
15 minute summer	S48	11	118.681	0.090	9.0	0.1292	0.0000	OK
15 minute summer	S54	11	118.673	0.118	20.0	0.1682	0.0000	OK
15 minute summer	S53	11	118.494	0.084	20.2	0.1204	0.0000	OK
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	0.0839	0.0000	OK
15 minute summer	S51	11	118.815	0.064	12.9	0.0915	0.0000	OK
15 minute summer	S52	10	118.335	0.085	33.0	0.0965	0.0000	OK
180 minute summer	S60	120	117.884	0.230	13.4	22.2127	0.0000	SURCHARGED
180 minute summer	dummy	120	117.680	0.049	4.3	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	0.634	0.223	0.0686	
15 minute summer	S48	1.003	S54	9.0	0.524	0.226	0.1086	
15 minute summer	S54	1.004	S53	20.2	1.171	0.503	0.4180	
15 minute summer	S53	1.005	S52	20.2	1.560	0.241	0.0833	
15 minute summer	S50	2.000	S59	5.8	1.291	0.171	0.0577	
15 minute summer	S59	2.001	S58	7.9	1.385	0.231	0.0986	
15 minute summer	S58	2.002	S51	10.7	1.581	0.310	0.1066	
15 minute summer	S51	2.003	S52	12.8	1.878	0.332	0.0624	
15 minute summer	S52	1.006	S60	33.2	3.334	0.227	0.1042	
180 minute summer	S60	1.007	dummy	4.3	0.630	0.107	0.0262	37.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S45	10	120.464	0.094	23.4	0.1343	0.0000	OK
15 minute summer	S46	11	119.198	0.085	23.1	0.1215	0.0000	OK
15 minute summer	S47	11	118.890	0.270	23.2	0.3857	0.0000	SURCHARGED
15 minute summer	S48	11	118.872	0.281	22.2	0.4026	0.0000	SURCHARGED
15 minute summer	S54	11	118.853	0.298	50.1	0.4265	0.0000	SURCHARGED
15 minute summer	S53	11	118.561	0.151	49.6	0.2164	0.0000	OK
15 minute summer	S50	10	120.505	0.071	15.0	0.1021	0.0000	OK
15 minute summer	S59	10	120.052	0.085	20.4	0.1210	0.0000	OK
15 minute summer	S58	10	119.445	0.107	27.7	0.1534	0.0000	OK
15 minute summer	S51	11	118.876	0.125	33.0	0.1788	0.0000	OK
15 minute summer	S52	11	118.388	0.138	82.2	0.1564	0.0000	OK
120 minute summer	S60	102	118.223	0.569	39.1	54.8283	0.0000	SURCHARGED
60 minute summer	dummy	81	117.684	0.053	4.9	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)
15 minute summer	S45	1.000	S46	23.1	2.134	0.662	0.3565	
15 minute summer	S46	1.001	S47	23.2	2.071	0.551	0.1053	
15 minute summer	S47	1.002	S48	22.2	0.629	0.553	0.1918	
15 minute summer	S48	1.003	S54	23.1	0.605	0.577	0.2409	
15 minute summer	S54	1.004	S53	49.6	1.378	1.237	0.8259	
15 minute summer	S53	1.005	S52	49.3	1.895	0.590	0.1679	
15 minute summer	S50	2.000	S59	14.9	1.613	0.436	0.1176	
15 minute summer	S59	2.001	S58	20.2	1.703	0.595	0.2052	
15 minute summer	S58	2.002	S51	27.5	1.886	0.799	0.2296	
15 minute summer	S51	2.003	S52	32.9	2.257	0.852	0.1326	
15 minute summer	S52	1.006	S60	82.3	3.511	0.563	0.2439	
120 minute summer	S60	1.007	dummy	4.9	0.653	0.122	0.0288	71.9

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S45	12	121.186	0.816	41.2	1.1683	0.0000	SURCHARGED
15 minute summer	S46	12	119.785	0.672	34.7	0.9620	0.0000	SURCHARGED
30 minute summer	S47	20	119.421	0.801	31.6	1.1468	0.0000	SURCHARGED
30 minute summer	S48	20	119.387	0.795	33.2	1.1383	0.0000	SURCHARGED
30 minute summer	S54	20	119.346	0.791	71.5	1.1322	0.0000	SURCHARGED
180 minute winter	S53	136	119.257	0.847	21.1	1.2124	0.0000	SURCHARGED
15 minute summer	S50	12	120.890	0.456	26.5	0.6528	0.0000	SURCHARGED
15 minute summer	S59	12	120.671	0.704	33.8	1.0072	0.0000	SURCHARGED
15 minute summer	S58	12	120.164	0.826	39.7	1.1823	0.0000	SURCHARGED
30 minute summer	S51	20	119.352	0.601	44.3	0.8597	0.0000	SURCHARGED
180 minute winter	S52	136	119.256	1.005	34.5	1.1372	0.0000	SURCHARGED
180 minute winter	S60	136	119.250	1.596	34.2	97.3314	4.7948	FLOOD
120 minute summer	dummy	98	117.685	0.054	5.1	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	34.7	2.202	0.994	0.5794	
15 minute summer	S46	1.001	S47	33.5	2.094	0.796	0.1330	
30 minute summer	S47	1.002	S48	33.2	0.834	0.826	0.1918	
30 minute summer	S48	1.003	S54	35.8	0.900	0.896	0.2409	
30 minute summer	S54	1.004	S53	68.9	1.732	1.718	0.9641	
180 minute winter	S53	1.005	S52	21.1	1.608	0.252	0.2475	
15 minute summer	S50	2.000	S59	24.6	1.700	0.719	0.2241	
15 minute summer	S59	2.001	S58	27.5	1.746	0.807	0.3049	
15 minute summer	S58	2.002	S51	36.8	2.093	1.070	0.2781	
30 minute summer	S51	2.003	S52	41.8	2.373	1.082	0.1607	
180 minute winter	S52	1.006	S60	34.2	2.304	0.234	0.3035	
180 minute winter	S60	1.007	dummy	5.1	0.659	0.126	0.0295	103.6

Annex

SuDS Drainage Management & Maintenance Plan

1. Introduction

This Drainage Maintenance & Management Plan (DMMP) has been prepared by GTA Civils & Transport Ltd for Antler Homes plc in relation to the proposed development at Selsfield Lane, Ardingly, West Sussex, RH17 6UF. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

This Plan sets out the framework for the management of the proposed sustainable drainage systems (SuDS) and foul drainage network. The document will be updated with further information through the next stage of detailed design and coordination.

2. Ownership & Maintenance Responsibilities

Responsibility for the maintenance of the drainage system will be apportioned generally as follows:

The drainage features will be cared for by the Estate Management Company which will be set up by the developer to administer the site-wide infrastructure. This includes:

- Attenuation Basin
- Cellular Storage

The following sections show schedules detailing the maintenance requirements for each of the main drainage items used within the scheme. The Estate Management Company will undertake the inspections and maintenance activities in accordance with these schedules.

Additional reference has been made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).

This Plan is to be a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance of the drainage systems over time. Changes are to be agreed with the drainage authority (LFA) and recorded and dated in the Plan.

Important safety information is set out in the next section.

3. Health and Safety

All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:

- The Health and Safety at Work etc Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Workplace (Health, Safety and Welfare) Regulations 1992

The Estate Management Company is responsible for suitable risk assessment and management to ensure safe working conditions and practices. Measures to protect potential visitors must also be drawn up.

Specialist contractors should work to industry guidelines and be able to demonstrate safe working practices.

Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and practices/policies implemented based on risk assessments.

Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.

Entry of pipes, chambers and culverts should be avoided. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.

For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

4. Schedule A – Sewers, Manholes, Gullies, Channel Drains

Regular inspection and maintenance are required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.

Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems, prior to connection with adopted sewers.

The survey report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client for future reference.

Operation and maintenance requirements for all sewers, manholes, gullies and channel drains are described in

the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	6 monthly
	Hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems	Monthly
	Debris removal from gullies & channel drains (where may cause risks to performance)	Monthly intervals, after autumn leaf fall, or as required based on specific observations
	Lift and inspect receiving manholes to check for any blockages	Monthly
Remedial Actions	Repair any damaged gully or channel drain gratings	As required
	Replace / fix any loose channel drain covers	As required
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits & drainage channels during the survey	10-yearly intervals

Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements. In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in 'Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services.

Further information on safety is set out in Section 3.

5. Schedule B – Control Chambers

Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	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 sediment from catchpits	Half yearly or as required
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows and vents	As required
Monitoring	Inspect/check all inlets & outlets, to ensure they are in good condition and operating properly	Annually
	Survey inside for sediment build-up and remove if necessary	Every 5 years or as required
Control Chambers and Hydrobrakes	Check hydrobrake orifice is clear and retention tank door is closed; check function of retention tank door and oil if necessary	First 2 years of occupation – monthly, then annually

Further information on safety is set out in Section 3.

6 Schedule C – Attenuation Basin

Inspection Frequency and Maintenance Requirements: as per table below:

Schedule	Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets & overflows for blockages and clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then 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% or more of the pond's banks
Remedial Actions	Repair erosion or other damage by re-turfing or reseed	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Further information on safety is set out in Section 3.

7 Schedule D - Cellular Soakaway Storage

This refers to the cellular soakaway within the proposed parking area. This will be maintained by the Management Company.

7.1 Make: SDS, Model: Geolight Tank

8.2 Inspection Frequency: Annually

8.3 Product Function: Rainwater storage.

8.4 Maintenance Requirements: Carry out periodic removal of particulate material from connecting catchpit and channel outlet sumps in accordance with Wavin Technical Data to ensure the crates do not become blocked and ineffective.

Both package pumping stations will be maintained in accordance with manufacturers recommendations, this may involve a maintenance agreement with the manufacturer during the lifetime of the stations.

8 Contamination or Dilution of Spillage

In the event of a spillage, it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

Environment Agency – Emergency Contact Number: In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is 0800 80 70 60 (Freephone 24hrs).