

Upper Seagry – Commercial FRA Addendum (October 2025)

1. Background

A Flood Risk Assessment (FRA) including a drainage strategy was provided in July 2025 with the planning application for the proposed development of land at Seagry House located off Henn Lane and Startley Road, Upper Seagry, Chippenham, SN15 5HD. The planning application number is PL/2025/06615.

Wiltshire Council (WC) as the Local Planning Authority (LPA) and Lead Local Flood Authority (LLFA) provided comments on the FRA, which required the provision of additional information to demonstrate compliance with the National Standards for SuDS (2025). These comments have been addressed in our response as below.

There were also certain flood risk and drainage comments following an independent review of the FRA on behalf of the owners of Oak Hill House by Copperfield, which have been responded to where relevant.

2. Summary of Amended Drainage Strategy

The amended drainage strategy plan (Drawing PDL-01 Revision D) has been included as Appendix A and the updated drainage strategy calculations are included as Appendix B. Typical details of the proposed SuDS features (Drawing PDL-02 Revision B) are included as Appendix C. The requested drainage catchment assessment (Drawing PDL-03 Revision A) has been included as Appendix D.

The drainage strategy plan included as Appendix A shows the two drainage catchments of the post-development layout with the majority of the site draining to the west / south-west (0.306ha) and with a smaller area draining to the east (0.039ha).

Overland flow routes are denoted using pink arrows on the drainage strategy plan. These are the overland flow routes for storm events that exceed the design standards of the drainage strategy.

Proposed ground levels will be provided to ensure runoff is conveyed away from buildings before being intercepted by the drainage network. These arrows identify the assumed overland flow routes for the site. The existing flow routes can be seen on the drainage catchment assessment (Appendix D).

The drainage strategy plan shows existing tree root protection areas and provides notes in relation to parts of the drainage strategy that cross these areas (i.e. the permeable sub-base / cellweb construction).

We have added notes on the proposed flow control chambers. A low flow rate is required from the site to meet with the drainage requirements and comments. We are not therefore able to avoid having a low flow rate. We have proposed including Polypipe's Permafilter unit (or similar approved) to reduce the risk of blockages, as shown on the drainage plan (Appendix A) and typical SuDS details (Appendix C).

We have shown on the drainage strategy plan the areas of permeable paving / sub-base. We also show the proposed rainfall harvesting tank. This feature has a minimum volume of 16m³ and would provide the requested interception storage volume for the 5mm of rainfall. Additional interception storage would be provided by the permeable paving / sub-base and by the and the filter drain / gravel strip.

The detention basin is shown on the drainage strategy plan. There is a slight increase to the extent of this drainage feature to increase the volume from 155m³ to 169m³ – to enable us to address the comments.

Typical SuDS details of the features in the drainage strategy plan are included as Appendix C. This includes the cellular attenuation; permeable paving; pond liner for the detention basin; drainage outlet details; filter drain; flow control chamber and the permeable sub-base / cellweb construction.

As noted on the drainage strategy plan (Appendix A), the details of the rainwater harvesting tank would be confirmed by the specialist manufacturer at the next design stage. All construction details will be reviewed and confirmed at the detailed design stage by the appointed manufacturer / engineer.

An analysis of the existing catchment areas and land uses based on the topographical survey is provided as Appendix D. It shows the existing building extent, with this part of each catchment a hardstanding area and the remainder a permeable area. The drainage catchments of the post-development layout as shown on the drainage strategy plan are similar to the extents of these existing drainage catchment areas.

In terms of the runoff rates that the drainage strategy plan has been designed to achieve, these have been based on the areas as shown on the drainage catchment assessment (Appendix D). The values are shown in Table 1 for the western discharge receptor and in Table 2 for the eastern discharge receptor. The Q_{BAR} values from these are the runoff rates that are used in the drainage strategy plan and calculations.

The drainage strategy calculations for the western (Network 1) and eastern (Network 2) drainage catchments are included as Appendix B. These demonstrate that the surface water runoff rate from each drainage catchment up to the 1 in 100-year plus climate change event are being managed to the Q_{BAR} rate from the pre-development catchment areas and land uses.

In response to the comment from the LLFA, the values on the drainage strategy calculations shown in orange indicate flood risk – not flooding. The parameters of the drainage model were set to indicate flood risk if water rose to a certain level within the manhole chamber. This is a typical procedure in a drainage model particularly with the 1 in 100-year storm event – and does not indicate flooding from the system.

Also, in response to the comment from the LLFA on management and maintenance of the drainage strategy. The drainage strategy will be privately managed and maintained and incorporated into the existing maintenances and landscaping activities of the wider estate.

3. Response to Comments

The following comments were received from the LLFA:

“The applicant is required to confirm whether a Rainwater Harvesting (RWH) system will be included in the proposed design, and to provide further details regarding its planned implementation.”

As noted above – a rainwater harvesting system will be included, as shown in Appendix A.

“A demonstration of the inclusion and arrangement of interception storage features in accordance with Standard 2 of the National Standards for SuDS. Evidence and calculations shall be provided to demonstrate that the runoff from each positively drained surface, for at least 5mm of rainfall, is either collected for use, or else captured, conveyed and stored within SuDS features.”

As noted above – interception storage would be provided through inclusion of a rainwater harvesting system and by the inclusion of permeable paving / sub-base and the filter drain / gravel strip.

“The applicant must provide a catchment plan based on the topographical survey, clearly identifying which areas of the site drain to the east and west. This plan should demonstrate no catchment transfer as a result of the development, support the calculation of existing runoff rates, and inform the allowable discharge rate at each outfall.”

As noted above – the two drainage catchments of the post-development layout have been provided and an analysis of the existing catchment areas and land uses based on the topographical survey.

“The submitted exceedance flow routing does not match the levels shown on the topographic survey in all locations. The applicant should confirm whether any re-levelling is planned to facilitate exceedance routing, and submit any supporting plans where required.”

As noted above – overland flow routes are denoted using pink arrows on the drainage strategy plan. These are the overland flow routes for rainfall events that exceed the design standards of the drainage strategy.

“The applicant shall submit clear arrangements for the ownership and ongoing maintenance of the proposed drainage system (including SuDS features) over the lifetime of the development.”

As noted above – the drainage strategy will be privately managed and maintained and incorporated into the existing maintenances and landscaping activities of the wider estate.

Some other comments were received on behalf of the owners of Oak Hill House by Copperfield, which have been responded to where relevant:

“The Government Flood Maps for Planning indicate that parts of the site, including the primary access are affected by 1 in 100 and 1 in 1,000 year surface water events. The NPPF is concerned with all forms of flood risk, including surface water flooding which affects the site access and extends across the main road at this point.”

The FRA has already considered the risk of surface water flooding using the most up to date information available, as provided in the Flood Map for Planning (FMfP) and the release of the Risk of Flooding from Surface Water (RoFSW). This provides peak flood extents for surface water flood extents with a 1 in 30-year, 1 in 100-year and 1 in 1000-year storm event.

Given that the surface water flow path is along a road that is served by highway drainage, the likelihood of the flood depth being greater than 0.30m is considered to be very low. Furthermore, no built development within the site is affected by flooding. The proposals are for a commercial development, which is classified as a low vulnerability land use. Emergency access and egress would remain available via Henn Lane.

“The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).”

I can find no evidence of a sequential test being applied as a result of the access road being within an area affected by flooding. It is also important to note the minor developments exception (para 176 and footnote 62) does not apply in this case. Whilst the access road remains on its current route, the sequential test for alternative sites applies.”

The Sequential Test is intended to be a tool to inform the planning process in situations where built development is proposed in flood affected areas. This was not requested by WC in their pre-application or application response and the submitted FRA demonstrates that no development within the site boundary is at risk of flooding. The proposals are for a commercial development, which is classified as a low vulnerability land use. Emergency access and egress would remain available via Henn Lane.

Also, the advice in the NPPF on the application of the Sequential Test has recently been updated to provide a much more pragmatic approach to when it should be applied.

As of 17th September 2025, it now advises that the Sequential Test should be applied to 'Major' and 'Non-major' development proposed in areas at risk of flooding, as set out in paragraphs 173 to 174 of the NPPF. Paragraphs 175, 176 and 180 set out exemptions from the sequential test ID:7-027-20220825).

It goes on to advise that in applying paragraph 175 a *"proportionate approach should be taken"* and relevantly *"Where a site-specific FRA demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by EA flood risk mapping), without increasing flood risk elsewhere, then the Sequential Test need not be applied."*

There is no vulnerable development proposed within areas affected by flooding. Emergency access would remain available via Henn Lane. Based on this, a Sequential Test is not needed for the proposed development and furthermore not requested by WC in their pre-application or application response.

"Against the NPPF tests, the proposals are not necessary and do not provide any sustainability benefits for the community which would outweigh the flood risk."

This is an unsupported and subjective statement. Sustainability benefits can be defined as the practice of meeting present human needs without compromising the ability of future generations to meet their own needs, balancing environmental, social, and economic factors for long-term well-being.

The drainage strategy incorporates a detention basin, filter drain, permeable paving, geocellular storage and a rainwater harvesting system. In addition to managing the surface water runoff, this would result in benefits to water quality, biodiversity, landscape, and to recreational amenity.

In addition to the sustainability benefits to drainage and flood risk, the proposed development is a redevelopment of an existing but dilapidated building. The socio-economic benefits are detailed in other reports supporting the application and include the redevelopment of contaminated previously developed land, farm and estate diversification, inward investment and direct and indirect job creation

"Flow Control Chambers rely on Ø25–26 mm orifices which are very small for surface-water controls and are prone to blockage/silting/icing. Many adopters/LLFAs typically look for ≥75 mm (some prefer ≥100 mm)."

The drainage strategy would be privately owned and maintained. We are therefore not reliant on the system being adopted. However, to achieve the runoff rates that are required necessitates a restricted flow control. This is typically achieved through inclusion of a reduced orifice size. As noted above – we have proposed including Polypipe's Permafilter unit (or similar approved) to reduce the risk of blockages.

“Model Cv values are 0.75 (Summer) and 0.84 (Winter). Wiltshire requires a CV value of 1 as set out in the Drainage and Betterment Strategy (June 2024) by Wiltshire Council. Wiltshire also required a 30% betterment on greenfield runoff rates.”

The Cv values used in the original drainage strategy calculations are those that apply to this area. Although not raised by WC in their pre-application or application response, there can be occasions where WC request Cv values to be set to 1. We have therefore used a Cv value of 1 in the revised drainage strategy.

The 30% betterment has not been referenced by WC in their pre-application or application response. Run off rates are already being significantly reduced from the site and this is not considered to be required.

4. Summary

WC as the LPA and LLFA provided comments on the FRA, which required the provision of additional information to demonstrate compliance with the National Standards for SuDS (2025).

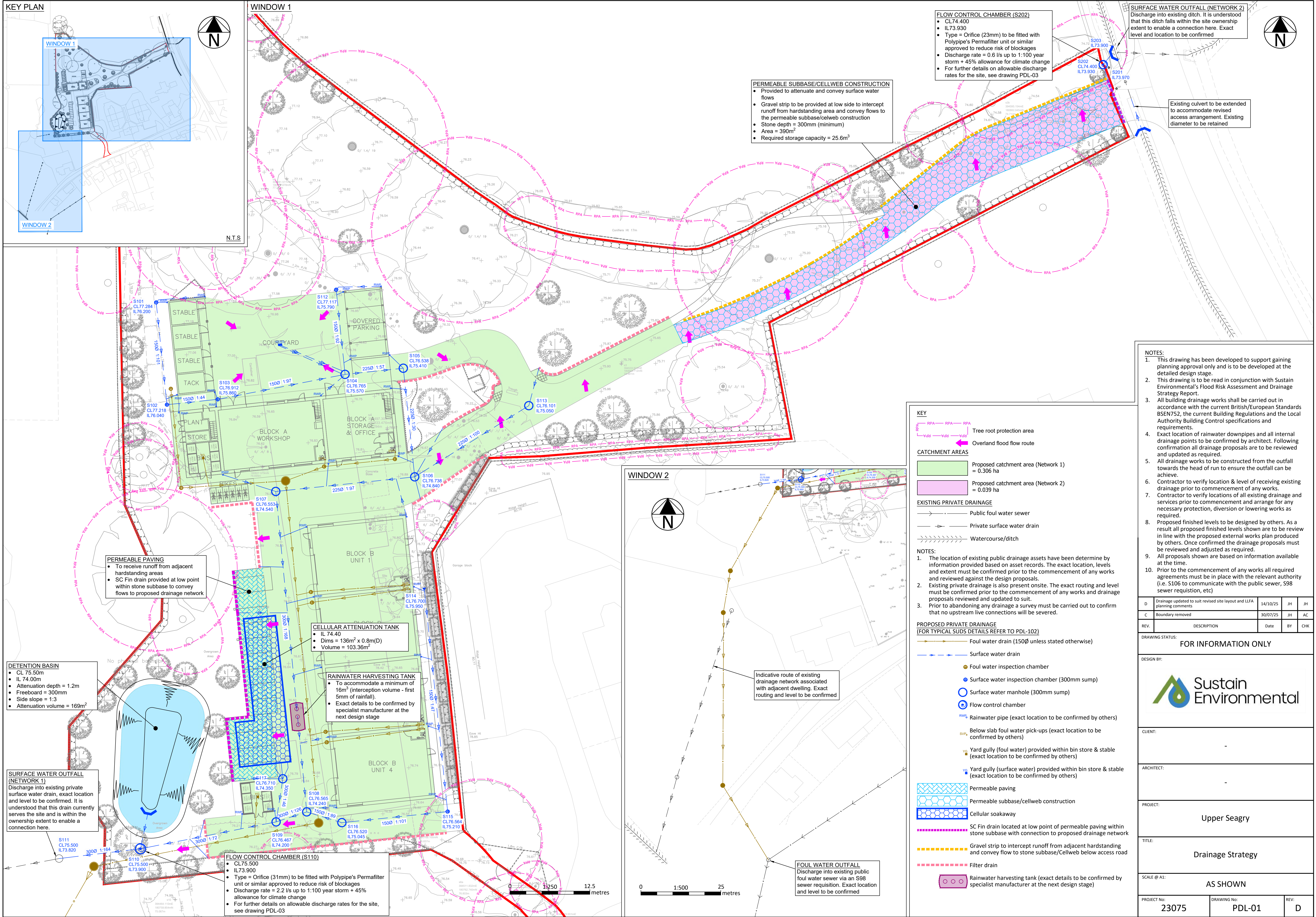
We have amended the drainage strategy plan and updated the drainage strategy calculations. Typical details of the proposed SuDS features have been included and the requested drainage catchment assessment provided.

These comments have been addressed and a holding objection is therefore no longer required.

Appendix A

Drainage Strategy Plan (Drawing PDL-01 Revision D)

KEY PLAN



NOTES:

1. This drawing has been developed to support gaining planning approval only and is to be developed at the detailed design stage.
2. This drawing is to be read in conjunction with Sustain Environmental's Flood Risk Assessment and Drainage Strategy Report.
3. All building drainage works shall be carried out in accordance with the current British/European Standards BS EN752, the current Building Regulations and the Local Authority Building Control specifications and requirements.
4. Exact location of rainwater downpipes and all internal drainage points to be confirmed by architect. Following confirmation all drainage proposals are to be reviewed and updated as required.
5. All drainage works to be constructed from the outfall towards the head of run to ensure the outfall can be achieved.
6. Contractor to verify location & level of receiving existing drainage prior to commencement of any works.
7. Contractor to verify locations of all existing drainage and services prior to commencement and arrange for any necessary protection, diversion or lowering works as required.
8. Proposed finished levels to be designed by others. As a result all proposed finished levels shown are to be revised in line with the proposed external works plan produced by others. Once confirmed the drainage proposals must be reviewed and adjusted as required.
9. All proposals shown are based on information available at the time.
10. Prior to the commencement of any works all required agreements must be in place with the relevant authority (i.e. S106 to communicate with the public sewer, S98 sewer requirement, etc)

D	Drainage updated to suit revised site layout and LFA planning comments	14/10/25	JH	JH
C	Boundary removed	30/07/25	JH	AC
REV.	DESCRIPTION	Date	BY	CHK

DRAWING STATUS: **FOR INFORMATION ONLY**

DESIGN BY:



CLIENT:

ARCHITECT:

PROJECT:

TITLE: Drainage Strategy

SCALE @ A1: AS SHOWN

PROJECT No: 23075	DRAWING No: PDL-01	REV: D
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Appendix B

Updated Drainage Strategy Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.900
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)
101	0.015	5.00	77.284	450	394461.133	180853.327	1.084
102	0.015	5.00	77.218	450	394462.816	180837.315	1.178
103	0.015	5.00	76.912	450	394470.776	180838.151	1.052
112	0.022	5.00	77.117	450	394489.323	180855.321	1.327
104	0.022	5.00	76.765	1200	394490.716	180842.062	1.195
105	0.022	5.00	76.538	1200	394499.834	180843.020	1.128
113	0.022	5.00	76.101	1200	394519.484	180837.165	1.051
106	0.022	5.00	76.738	1200	394501.621	180826.018	1.898
107	0.022	5.00	76.553	1200	394479.861	180823.732	2.013
114	0.022	5.00	76.700	450	394503.149	180808.141	0.750
115	0.022	5.00	76.564	1200	394506.777	180773.618	1.354
116	0.022	5.00	76.520	1200	394490.218	180771.878	1.475
108	0.022	5.00	76.565	1200	394484.708	180773.565	2.325
117	0.021	5.00	76.710	1200	394480.968	180778.755	2.360
109	0.020	5.00	76.467	1200	394479.919	180772.000	2.267
110			75.500	1500	394458.675	180767.791	1.600
111			75.500	1200	394445.638	180766.265	1.680

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	101	102	16.100	0.600	76.200	76.040	0.160	100.6	150	5.27	32.9
1.001	102	103	8.004	0.600	76.040	75.860	0.180	44.5	150	5.36	32.6
1.002	103	104	20.320	0.600	75.860	75.650	0.210	96.8	150	5.69	31.7
2.000	112	104	13.332	0.600	75.790	75.645	0.145	91.9	150	5.21	33.0
1.003	104	105	9.168	0.600	75.570	75.410	0.160	57.3	225	5.78	31.5
1.004	105	106	17.096	0.600	75.410	74.840	0.570	30.0	225	5.89	31.1
3.000	113	106	21.056	0.600	75.050	74.840	0.210	100.3	225	5.27	32.9
1.005	106	107	21.880	0.600	74.840	74.615	0.225	97.2	225	6.17	30.5

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	1.001	17.7	1.8	0.934	1.028	0.015	0.0	32	0.640
1.001	1.513	26.7	3.5	1.028	0.902	0.030	0.0	37	1.050
1.002	1.021	18.1	5.2	0.902	0.965	0.045	0.0	55	0.882
2.000	1.048	18.5	2.6	1.177	0.970	0.022	0.0	38	0.746
1.003	1.731	68.8	10.1	0.970	0.903	0.089	0.0	58	1.251
1.004	2.397	95.3	12.5	0.903	1.673	0.111	0.0	55	1.674
3.000	1.305	51.9	2.6	0.826	1.673	0.022	0.0	34	0.682
1.005	1.326	52.7	17.1	1.673	1.713	0.155	0.0	87	1.183

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	107	108	50.401	0.600	74.540	74.240	0.300	168.0	300	6.86	28.9
4.000	114	115	34.713	0.600	75.950	75.210	0.740	46.9	150	5.39	32.5
4.001	115	116	16.650	0.600	75.210	75.045	0.165	100.9	150	5.67	31.8
4.002	116	108	5.762	0.600	75.045	74.980	0.065	88.7	150	5.76	31.5
1.007	108	109	5.038	0.600	74.240	74.200	0.040	126.0	300	6.92	28.7
5.000	117	109	6.836	0.600	74.350	74.200	0.150	45.6	300	5.05	33.5
1.008	109	110	21.657	0.600	74.200	73.900	0.300	72.2	300	7.12	28.3
1.009	110	111	13.126	0.600	73.900	73.820	0.080	164.1	300	7.30	28.0

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	1.210	85.5	18.5	1.713	2.025	0.177	0.0	94	0.970
4.000	1.473	26.0	2.6	0.600	1.204	0.022	0.0	32	0.943
4.001	1.000	17.7	5.0	1.204	1.325	0.044	0.0	55	0.864
4.002	1.068	18.9	7.5	1.325	1.435	0.066	0.0	66	1.009
1.007	1.399	98.9	27.5	2.025	1.967	0.265	0.0	108	1.205
5.000	2.335	165.0	2.5	2.060	1.967	0.021	0.0	25	0.860
1.008	1.852	130.9	31.3	1.967	1.300	0.306	0.0	99	1.528
1.009	1.224	86.6	30.9	1.300	1.380	0.306	0.0	124	1.126

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	✓	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
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Node 110 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	74.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	63.0	63.0	1.500	297.0	306.4

Node 109 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	74.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	136.0	136.0	0.800	136.0	169.1	0.801	0.0	169.1

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	101	10	76.230	0.030	1.6	0.0048	0.0000	OK
15 minute summer	102	10	76.075	0.035	3.2	0.0055	0.0000	OK
15 minute summer	103	10	75.913	0.053	4.7	0.0085	0.0000	OK
15 minute summer	112	10	75.827	0.037	2.4	0.0059	0.0000	OK
15 minute summer	104	10	75.630	0.060	9.4	0.0674	0.0000	OK
15 minute summer	105	10	75.463	0.053	11.7	0.0596	0.0000	OK
15 minute summer	113	10	75.082	0.032	2.4	0.0365	0.0000	OK
15 minute summer	106	11	74.929	0.089	16.2	0.1004	0.0000	OK
15 minute summer	107	11	74.633	0.093	18.4	0.1054	0.0000	OK
15 minute summer	114	10	75.980	0.030	2.4	0.0048	0.0000	OK
15 minute summer	115	11	75.262	0.052	4.7	0.0591	0.0000	OK
15 minute summer	116	11	75.113	0.068	6.9	0.0774	0.0000	OK
720 minute summer	108	525	74.391	0.151	5.9	0.1709	0.0000	OK
720 minute summer	117	525	74.391	0.041	0.4	0.0465	0.0000	OK
720 minute summer	109	525	74.391	0.191	6.7	0.2162	0.0000	OK
720 minute summer	110	525	74.391	0.491	6.6	37.4729	0.0000	SURCHARGED
720 minute summer	111	525	73.846	0.026	1.4	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	101	1.000	102	1.6	0.563	0.089	0.0452	
15 minute summer	102	1.001	103	3.1	0.732	0.118	0.0347	
15 minute summer	103	1.002	104	4.7	0.849	0.258	0.1114	
15 minute summer	112	2.000	104	2.3	0.708	0.126	0.0441	
15 minute summer	104	1.003	105	9.3	1.201	0.135	0.0708	
15 minute summer	105	1.004	106	11.5	1.105	0.121	0.1844	
15 minute summer	113	3.000	106	2.3	0.281	0.045	0.1892	
15 minute summer	106	1.005	107	16.2	1.147	0.307	0.3092	
15 minute summer	107	1.006	108	18.3	0.817	0.214	1.1300	
15 minute summer	114	4.000	115	2.3	0.597	0.090	0.1383	
15 minute summer	115	4.001	116	4.6	0.695	0.260	0.1105	
15 minute summer	116	4.002	108	6.9	0.934	0.366	0.0426	
720 minute summer	108	1.007	109	5.9	0.775	0.060	0.2089	
720 minute summer	117	5.000	109	0.4	0.134	0.002	0.1817	
720 minute summer	109	1.008	110	6.6	0.241	0.050	1.2754	
720 minute summer	110	1.009	111	1.4	0.454	0.016	0.0395	55.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.61%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	101	10	76.262	0.062	6.1	0.0098	0.0000	OK
15 minute summer	102	10	76.116	0.076	12.1	0.0121	0.0000	OK
15 minute summer	103	11	75.993	0.133	18.3	0.0212	0.0000	OK
15 minute summer	112	10	75.867	0.077	8.9	0.0122	0.0000	OK
15 minute summer	104	10	75.699	0.129	35.4	0.1461	0.0000	OK
15 minute summer	105	11	75.517	0.107	44.1	0.1209	0.0000	OK
15 minute summer	113	11	75.148	0.098	8.9	0.1104	0.0000	OK
15 minute summer	106	11	75.139	0.299	61.6	0.3385	0.0000	SURCHARGED
15 minute summer	107	11	74.740	0.200	67.3	0.2257	0.0000	OK
15 minute summer	114	10	76.010	0.060	8.9	0.0096	0.0000	OK
15 minute summer	115	11	75.453	0.243	17.7	0.2743	0.0000	SURCHARGED
15 minute summer	116	11	75.283	0.238	24.6	0.2693	0.0000	SURCHARGED
600 minute winter	108	555	74.688	0.448	10.8	0.5067	0.0000	SURCHARGED
600 minute winter	117	555	74.688	0.338	0.8	0.3823	0.0000	SURCHARGED
600 minute winter	109	555	74.688	0.488	12.3	37.8257	0.0000	SURCHARGED
600 minute winter	110	555	74.688	0.788	8.6	81.6856	0.0000	SURCHARGED
600 minute winter	111	555	73.849	0.029	1.7	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	101	1.000	102	6.1	0.775	0.342	0.1273	
15 minute summer	102	1.001	103	12.2	0.942	0.455	0.1017	
15 minute summer	103	1.002	104	17.9	1.132	0.992	0.3252	
15 minute summer	112	2.000	104	8.8	1.005	0.476	0.1170	
15 minute summer	104	1.003	105	35.3	1.674	0.512	0.1930	
15 minute summer	105	1.004	106	43.9	1.436	0.461	0.4988	
15 minute summer	113	3.000	106	9.9	0.374	0.191	0.5924	
15 minute summer	106	1.005	107	58.8	1.481	1.116	0.8415	
15 minute summer	107	1.006	108	67.2	1.127	0.786	2.9594	
15 minute summer	114	4.000	115	8.8	0.790	0.339	0.4202	
15 minute summer	115	4.001	116	16.1	0.917	0.913	0.2931	
15 minute summer	116	4.002	108	24.4	1.384	1.291	0.0996	
600 minute winter	108	1.007	109	10.5	0.726	0.106	0.3548	
600 minute winter	117	5.000	109	1.1	0.133	0.007	0.4814	
600 minute winter	109	1.008	110	8.6	0.232	0.066	1.5251	
600 minute winter	110	1.009	111	1.7	0.487	0.020	0.0471	71.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	101	12	76.940	0.740	11.3	0.1177	0.0000	SURCHARGED
15 minute summer	102	12	76.904	0.864	18.6	0.1375	0.0000	SURCHARGED
15 minute summer	103	12	76.824	0.964	26.4	0.1533	0.0000	FLOOD RISK
15 minute summer	112	12	76.512	0.722	16.5	0.1149	0.0000	SURCHARGED
15 minute summer	104	12	76.425	0.855	55.5	0.9666	0.0000	SURCHARGED
15 minute summer	105	12	76.304	0.894	68.5	1.0116	0.0000	FLOOD RISK
15 minute summer	113	12	76.014	0.964	16.5	1.0897	0.0000	FLOOD RISK
15 minute summer	106	12	75.997	1.157	87.3	1.3091	0.0000	SURCHARGED
15 minute summer	107	12	75.234	0.694	100.3	0.7848	0.0000	SURCHARGED
15 minute summer	114	12	76.378	0.428	16.5	0.0680	0.0000	SURCHARGED
15 minute summer	115	12	76.127	0.917	30.3	1.0369	0.0000	SURCHARGED
15 minute summer	116	11	75.615	0.570	43.2	0.6451	0.0000	SURCHARGED
1440 minute summer	108	1170	75.129	0.889	15.5	1.0051	0.0000	SURCHARGED
1440 minute summer	117	1170	75.129	0.779	1.2	0.8807	0.0000	SURCHARGED
1440 minute summer	109	1170	75.129	0.929	17.8	95.2579	0.0000	SURCHARGED
1440 minute summer	110	1170	75.129	1.229	11.4	172.6388	0.0000	SURCHARGED
1440 minute summer	111	1170	73.853	0.033	2.2	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	101	1.000	102	8.4	0.798	0.474	0.2834	
15 minute summer	102	1.001	103	16.8	0.955	0.629	0.1409	
15 minute summer	103	1.002	104	25.3	1.437	1.402	0.3577	
15 minute summer	112	2.000	104	15.4	1.063	0.832	0.2347	
15 minute summer	104	1.003	105	52.8	1.663	0.767	0.3646	
15 minute summer	105	1.004	106	60.9	1.532	0.639	0.6799	
15 minute summer	113	3.000	106	16.1	0.434	0.310	0.8374	
15 minute summer	106	1.005	107	87.0	2.187	1.650	0.8702	
15 minute summer	107	1.006	108	99.9	1.419	1.168	3.5492	
15 minute summer	114	4.000	115	14.5	0.923	0.558	0.6111	
15 minute summer	115	4.001	116	28.2	1.605	1.598	0.2931	
15 minute summer	116	4.002	108	42.4	2.407	2.246	0.1004	
1440 minute summer	108	1.007	109	15.4	0.599	0.156	0.3548	
1440 minute summer	117	5.000	109	1.1	0.109	0.007	0.4814	
1440 minute summer	109	1.008	110	11.4	0.161	0.087	1.5251	
1440 minute summer	110	1.009	111	2.2	0.521	0.025	0.0553	168.8

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	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)
201	0.039	5.00	74.400		394610.140	180888.178	0.430
202			74.400	500	394609.439	180890.552	0.470
203			74.400		394610.828	180892.190	0.500

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	201	202	2.475	0.600	73.970	73.930	0.040	61.9	100	5.04	33.5
1.001	202	203	2.148	0.600	73.930	73.900	0.030	71.6	100	5.08	33.4

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	0.980	7.7	4.7	0.330	0.370	0.039	0.0	57	1.030
1.001	0.911	7.2	4.7	0.370	0.400	0.039	0.0	59	0.971

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	✓	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 %)
1	0	0	0
30	0	0	0
100	45	0	0

Node 202 Online Orifice Control

Flap Valve	x	Invert Level (m)	73.930	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.023		

Node 201 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	73.970	Slope (1:X)	400.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.30	Length (m)	65.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	201	232	74.058	0.088	1.5	2.7692	0.0000	OK
360 minute summer	202	232	74.058	0.128	1.4	0.0250	0.0000	SURCHARGED
360 minute summer	203	232	73.915	0.015	0.4	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)
360 minute summer	201	1.000	202	1.4	0.309	0.180	0.0187	
360 minute summer	202	1.001	203	0.4	0.473	0.052	0.0017	7.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	201	200	74.147	0.177	4.4	11.1495	0.0000	FLOOD RISK
240 minute summer	202	200	74.146	0.216	1.3	0.0424	0.0000	FLOOD RISK
240 minute summer	203	200	73.918	0.018	0.5	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)
240 minute summer	201	1.000	202	1.3	0.304	0.171	0.0194	
240 minute summer	202	1.001	203	0.5	0.513	0.069	0.0021	12.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	201	480	74.269	0.299	2.9	25.4963	0.0000	FLOOD RISK
600 minute winter	202	480	74.269	0.339	1.1	0.0664	0.0000	FLOOD RISK
600 minute winter	203	480	73.920	0.020	0.6	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)
600 minute winter	201	1.000	202	1.1	0.218	0.137	0.0194	
600 minute winter	202	1.001	203	0.6	0.549	0.087	0.0024	25.0

Appendix C

Typical Details of the Proposed SuDS Features (Drawing PDL-02 Revision B)

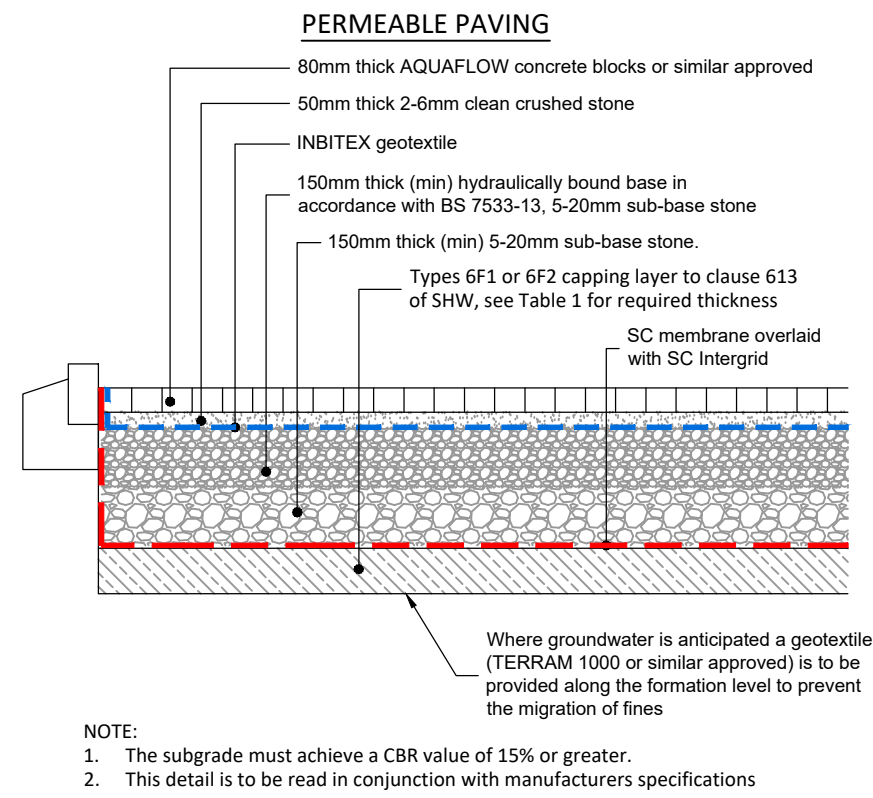
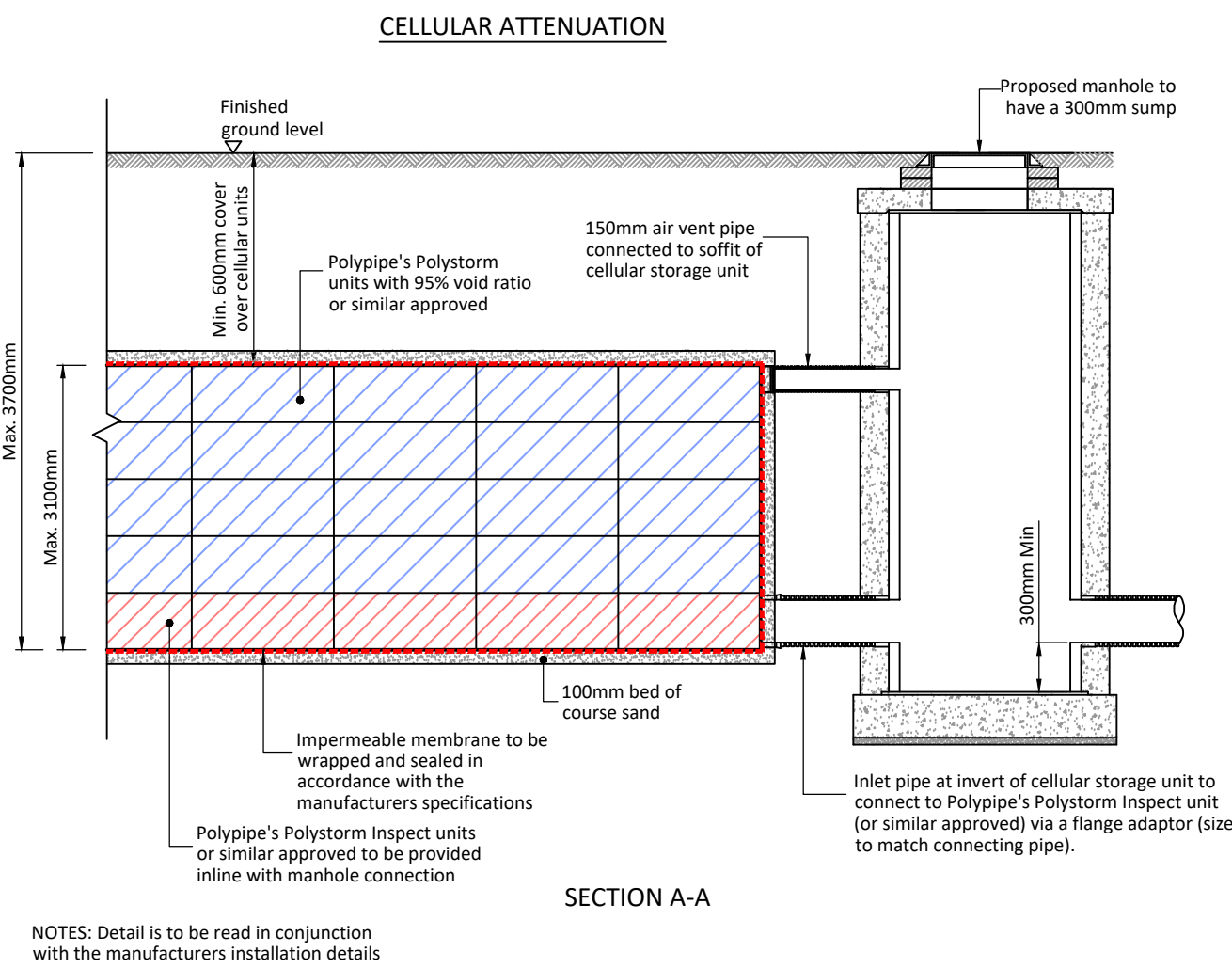
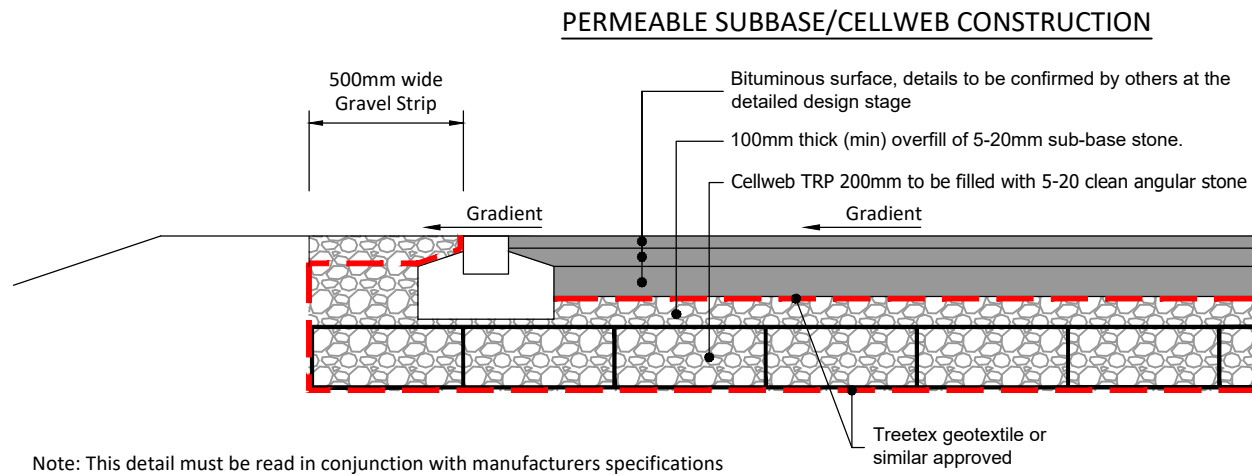
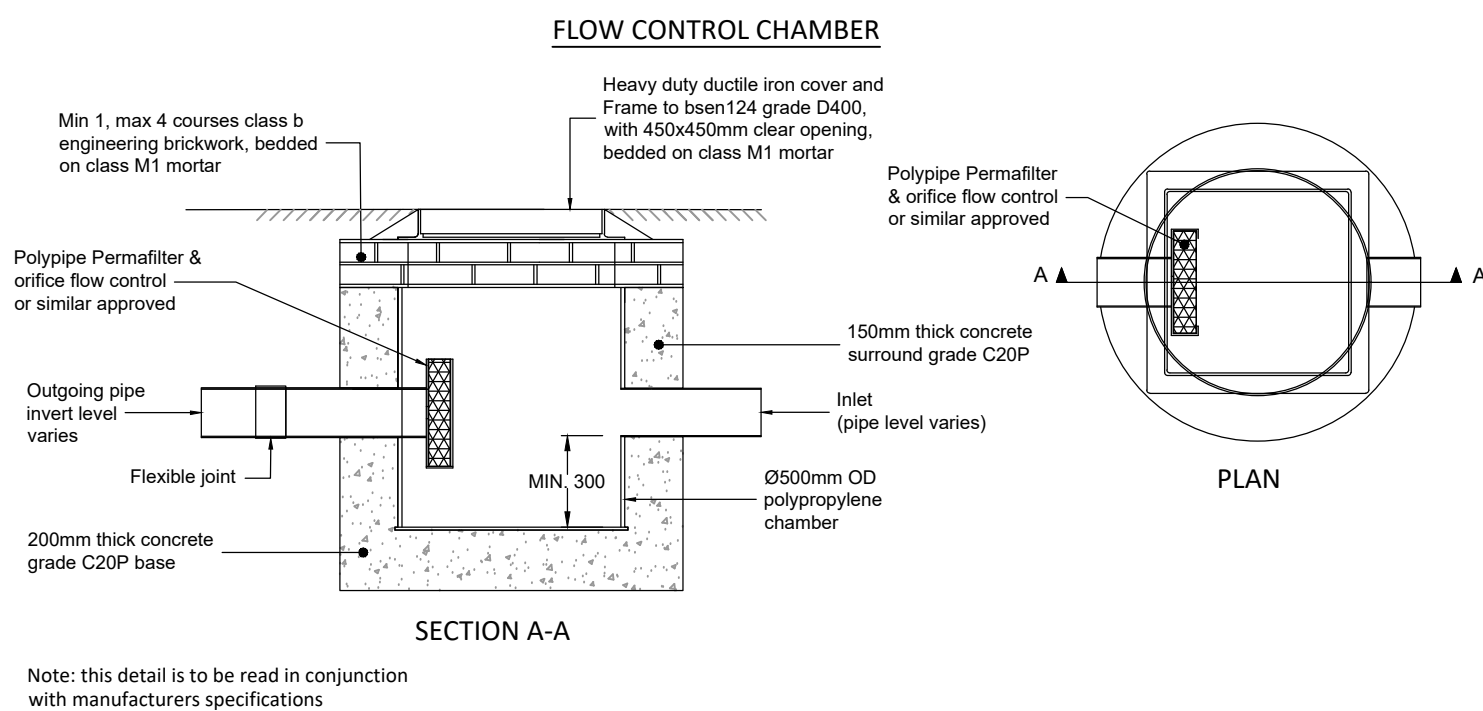
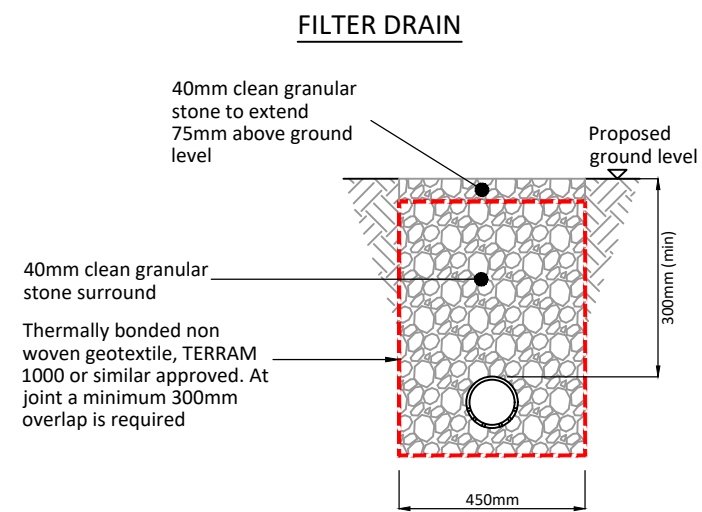
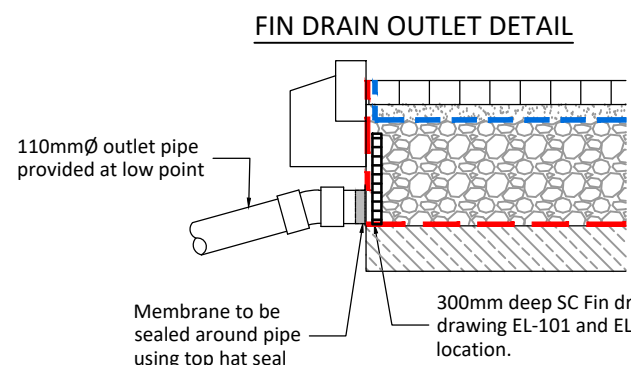
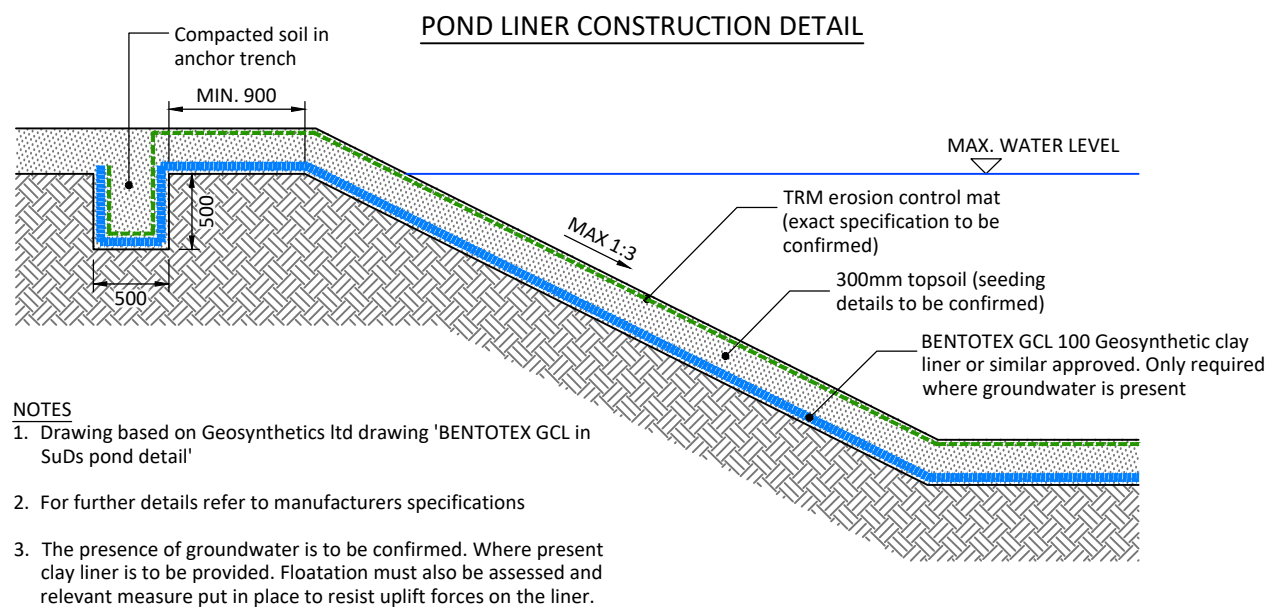


TABLE 1
TOTAL THICKNESS OF CAPPING MATERIAL (EXTRACTED FROM BS7533-13:2009)

SUBGRADE CBR (%)	THICKNESS (mm) (CAPPING)
1	600 (SEE NOTE)
2	350
3	250
4	200
5 or above	150

Note: where CBR values are 1% or below expert advice is to be sought



- NOTES:**
- This drawing has been developed to support gaining planning approval only and is subject to confirmation at the detailed design stage.
 - This drawing is to be read in conjunction with Sustain Environmental's Flood Risk Assessment and Drainage Strategy Report.

B	Cellular attenuation detail updated	14/10/25	JH	AC
A	First issue	17/07/25	JH	AC
REV.	DESCRIPTION	Date	BY	CHK.

DRAWING STATUS: **FOR INFORMATION ONLY**

DESIGN BY:



CLIENT:

-

ARCHITECT:

-

PROJECT:

Upper Seagry

TITLE:

Drainage Strategy
Typical SuDs Details

SCALE @ A1:

AS SHOWN

PROJECT No:	DRAWING No:	REV:
23075	PDL-02	B

Appendix D

Drainage Catchment Assessment (Drawing PDL-03 Revision A)

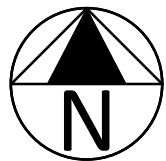
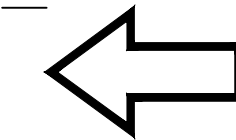


TABLE 1: WESTERN DISCHARGE RECEPTOR	
Storm	Greenfield runoff rate
1:1 year storm	0.5 l/s
QBAR	0.7 l/s
1:30 year storm	1.4 l/s
1:100 year storm	1.7 l/s
Above rate is based on a catchment area of 0.133 ha	
Storm	Brownfield runoff rate
1:2 year storm (QBAR event)	1.5 l/s
1:30 year storm	3.6 l/s
1:100 year storm	4.5 l/s
Above rates are based on existing catchment area 0.1 ha	
PROPOSED ALLOWABLE DISCHARGE RATES	
Storm	Discharge rate
QBAR	2.2 l/s
The above provides a betterment over the existing discharge rates as follows: - 1: 2 year storm (QBAR) = 0% betterment - 1: 30 year storm = 56% betterment - 1: 100 year storm = 65% betterment	

TABLE 2: EASTERN DISCHARGE RECEPTOR	
Storm	Greenfield runoff rate
1:1 year storm	0.5 l/s
QBAR	0.6 l/s
1:30 year storm	1.2 l/s
1:100 year storm	1.4 l/s
Above rate is based on a catchment area of 0.112 ha	
PROPOSED ALLOWABLE DISCHARGE RATES	
Storm	Discharge rate
QBAR	0.6 l/s
The above provides a betterment over the existing discharge rates as follows: - 1: 2 year storm (QBAR) = 0% betterment - 1: 30 year storm = 50% betterment - 1: 100 year storm = 57% betterment	

KEY
 Existing Overland flood flow route

CATCHMENT AREAS
 Existing harstanding area (Western Discharge Receptor) = 0.1 ha
 Proposed harstanding area (Western Discharge Receptor) = 0.133 ha
 Proposed harstanding area (Eastern Discharge Receptor) = 0.112 ha

A	First issue	14/10/25	JH	AC
REV.	DESCRIPTION	Date	BY	CHK

DRAWING STATUS: FOR INFORMATION ONLY

DESIGN BY:



CLIENT:

ARCHITECT:

PROJECT:

Upper Seagry

TITLE:

Drainage Strategy
Catchment Assessment

SCALE @ A1:

0 1:250 12.5 metres

PROJECT NO:

23075

DRAWING NO:

PDL-03

REV:

A