

Hobbits, Copyhold Lane, Cuckfield

Technical Note

Document Ref: 25187-HOD-XX-XX-RP-C-5806

Planning Ref. DM/25/1882

Condition 7 – Foul and Surface Water Drainage Strategies (DM/26/0265)

The proposed strategy for disposal of foul and surface waters at Hobbits is based on the report submitted for planning (document ref. 25187-HOD-XX-XX-RP-C-5800-Z01), which has been appended to this report for reference. It is proposed to discharge surface water to ground via soakaways and permeable paving. A packaged treatment plant is proposed to deal with foul water generated onsite, with a drainage field to discharge the treated effluent to ground, in accordance with the EA General Binding Rules.

1. Surface Water

1.1 The greenfield runoff rate for the site has been calculated to be 4.4l/s (QBar), based on the HR Wallingford design estimation tool, results are appended to this note. Onsite BRE365 infiltration testing was undertaken and gave a soil infiltration rate of 1.43×10^{-6} m/s. As part of the intrusive site investigation (Ref. LS8636), no groundwater was encountered in any of the trial bores, nor was it encountered during subsequent monitoring.

1.2 The updated layout can be found appended below, hydraulic calculations have been included. A 10% allowance for urban creep is included, CV values of 1.0 applied to all areas, FEH rainfall data has been used, and climate change allowances have been taken as 45% as per the Adur and Ouse Catchment peak rainfall allowances for a 1% annual rainfall event and 40% for the 3.3% annual rainfall event. The drained area going to each modelled network is, the new house roof area for the network going to SA1, and the pool plant room roof going to SA2.

1.3 The soakaway serving the pool plantroom is a standard gravel filled trench, the soakaway serving the main house is a hybrid gravel trench with a geo-cellular crate

above, this provides the larger surface area for better infiltration capacity in the lower section, with the crates providing the additional storage required to deal with the rarer, larger scale rainfall events. During the more frequently occurring rainfall events where only the lower gravel section of the main house soakaway is used, the half drain time for this gravel section, from full, is 16.5 hours. During the less frequent, larger events, the volume in the crates is used for storage and, although the half drain time for entire structure is longer than 24 hours, modelling of two subsequent 6 hour rainfall events has shown that there is capacity for a 1 in 30 year event to follow the 1 in 100, both events including the upper climate change allowance as 45% and 40% respectively.

1.4 The site is situated on a sloped site, falling to the south. Exceedance routing is shown on the proposed layout, the network is sized to contain the 1 in 100 year event, plus climate change, so the exceedance is in case of blockage, failure, or events greater than the designed.

1.5 Water quality has been assessed using the simple index approach as per the CIRIA SuDS Manual. The proposed pollutions hazard indices related to the proposed development are outlined in the tables below.

Land Use	Pollution hazard level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, low traffic roads	Low	0.5	0.4	0.4

Table A - Pollution hazard indices

SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Constructed permeable pavement (with a suitable filtration material and geotextile at formation level) underlain by a soil with good containment attenuation potential of at least 300mm in depth.	0.7	0.6	0.7

Table B - SuDS mitigation indices for permeable paving discharge to ground

1.6 It is deemed that adequate treatment will be provided as the mitigation indices for discharge to ground is equal to or exceeds that of the pollution hazard indices for the chosen SuDS feature.

1.7 Residential roofs are deemed very low risk and regular maintenance outlined in Section 4 of the original strategy, to remove debris from gutters and catchpits is deemed suitable mitigation.

2. Foul Water

2.1 Sewer records obtained from Southern Water confirmed there are no sewer in the area, it is therefore proposed that foul water generated onsite is to be treated in a packaged treatment plant onsite before discharging the treated effluent to ground via a drainage field, in accordance with EA General Binding Rules.

2.2 Onsite percolation testing within the topsoil was undertaken and gave a result of 180s/mm, too slow for a belowground drainage field, therefore an above ground drainage mound is proposed. The drainage mound is to be built into the natural slope of the site to create the required base area. The anticipated volume of foul water produced from a single, 4 bedroom property is 0.9m³, as per British Water - Flows and Loads.

3. Summary

3.1 Surface water is to discharge to ground through the use of permeable paving and soakaways for the roof areas. Foul water is to be treated through an onsite packaged treatment plant and discharge the treated effluent to ground through a drainage mound, following the guidance as set out within the EA General Binding Rules.

4. Appendices

- Drained Areas Schematic
- Greenfield Runoff Calculator
- Proposed Drainage Layout
- Proposed Soakaway Sections
- Flow Modelling and Results – Singular Events
- Flow Modelling and Results – Consecutive Events
- Proposed Drainage Mound Construction

Revision	Purpose	Date	Author	Checked	Authorised
Z01	Initial issue	01/04/26	MJ	JOD	
Z02	Updated to latest comments from LPA	03/06/26	MJ	JOD	

PART 1 – SURFACE WATER DRAINAGE DESIGN CHECKLIST

Requirement	Summary of Expectation	Summary	Reference (Drawing / Report Section)
For all strategies			
Greenfield runoff rate (Q_{bar})	<i>FEH method or similar approved; based on pre-development catchment</i>	4.4 l/s	Section 1.1
On-site infiltration testing	<i>BRE365-compliant tests at SuDS location/depth; safety factor applied</i>	1.43x10 ⁻⁶ m/s	Section 1.1
Groundwater monitoring (if relevant)	<i>Demonstrates seasonal high water table is >1m below base</i>	Not found	Section 1.1
Catchment and drainage areas	<i>Plans show areas drained and contributing catchments for each SuDS feature</i>		Appended
Climate change allowances	<i>EA guidance applied to rainfall intensity</i>		Section 1.2
Urban creep allowance	<i>10% additional impermeable area unless justified</i>		Section 1.2
Design rainfall	<i>Latest FEH data; FSR not accepted without justification</i>		Section 1.2
Cv value	<i>1.0 applied to all impermeable surfaces</i>		Section 1.2
Hydraulic calculations	<i>1 in 1, 1 in 30, 1 in 30 + CC, and 1 in 100 + CC critical storm durations; no flooding</i>		Appended
Flow control structures	<i>Head-discharge curve, outlet sizing, orifice protection from blockage</i>	N/A	
SuDS layout plan	<i>Full drainage layout with invert levels, cover levels, flow directions, and labels</i>		25187-HOD-XX-ZZ-DR-C-5100
Longitudinal and cross sections	<i>For basins, pipes, flow controls, below-ground structures</i>		Appended
Exceedance flow routing	<i>Plans show how exceedance flows are managed/safely routed</i>		25187-HOD-XX-ZZ-DR-C-5100
Finished floor levels	<i>FFLs at least 150mm above surrounding ground/exceedance routes</i>		Landscaping layout
Water quality treatment	<i>Simple Index Approach; mitigation index ≥ hazard index</i>		Sections 1.5 - 1.7
Proprietary systems (if used)	<i>Certification, design basis, and O&M provided</i>	N/A	
SuDS details	<i>Type, size, function, inlet/outlet, invert and cover levels, safety features</i>		25187-HOD-XX-ZZ-DR-C-5100
Maintenance plan	<i>Asset register and inspection/maintenance schedule; CIRIA Table 32.1 referenced</i>	Previously submitted report	Section 4
Maintenance party and mechanism	<i>Legal body named; landowner, management company or adoption route clear</i>	Previously submitted report	Section 4
For infiltration based strategies			
Soakaway or infiltration design	<i>Sizing for 6-hour 1 in 100 +CC storm; half-drain time <24h</i>		Section 1.3
For strategies which discharge to watercourse			
Discharge to watercourse	<i>Restricted to Q_{bar}; outfall location and construction details provided</i>	N/A	
Attenuation sizing	<i>Demonstrates storage for 1 in 100 +CC event without flooding</i>	N/A	
For strategies which discharge to sewer			
Discharge to sewer	<i>Q_{bar} max unless sewerage undertaker agrees higher rate</i>	N/A	
Sewer connection approval	<i>Undertaker correspondence confirming acceptability of rate and location; S106 not required</i>	N/A	

Attenuation sizing	<i>Demonstrates storage for 1 in 100 +CC event without flooding</i>	N/A	
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PART 2 – FOUL WATER DRAINAGE DESIGN CHECKLIST

Requirement	Summary of Expectation	Summary	Reference (Drawing / Report Section)
<i>For all strategies</i>			
Foul drainage layout	<i>Inverts, pipe sizes, gradients, connection points</i>		25187-HOD-XX-ZZ-DR-C-5100
System type	<i>Gravity or pumped; pump design and calculations if applicable</i>	Gravity	
Peak flow rate	<i>Based on occupancy and discharge volume</i>		Section 2.2
<i>For strategies which discharge to sewer</i>			
Public sewer connection	<i>Location confirmed; manhole ID and route to sewer</i>	N/A	
Undertaker correspondence	<i>Email or letter showing awareness of proposal and preliminary approval</i>	N/A	
<i>For strategies which discharge via non-mains foul system</i>			
Non-mains foul system	<i>Justification for use; compliance with General Binding Rules</i>		Section 2.1
Drainage field infiltration	<i>BS6297-compliant infiltration test results provided</i>		Section 2.2
EA Permit	<i>Submitted or confirmed not required (e.g. for discharge to water)</i>		Not required

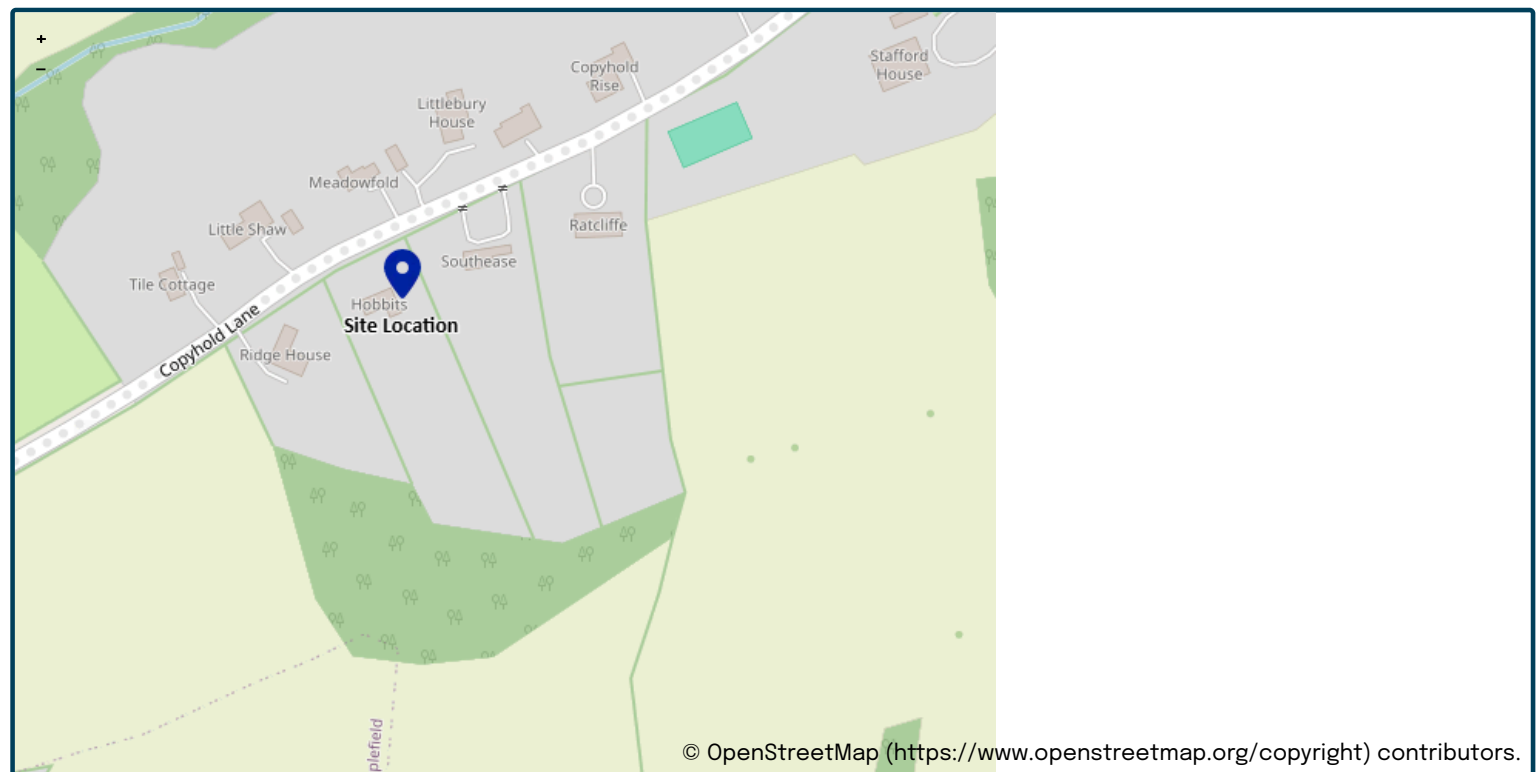
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	24/02/2026
Calculated by	MJ
Reference	25187
Model version	2.2.3

Location

Site name	Hobbits
Site location	



Site easting (British National Grid)	530966
Site northing (British National Grid)	123601

Site details

Total site area (ha)	0.75	ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	890	mm
BFIHOST19scaled	0.467	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	3.9	l/s
QBar (FEH statistical 2025) (l/s)	4.4	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	

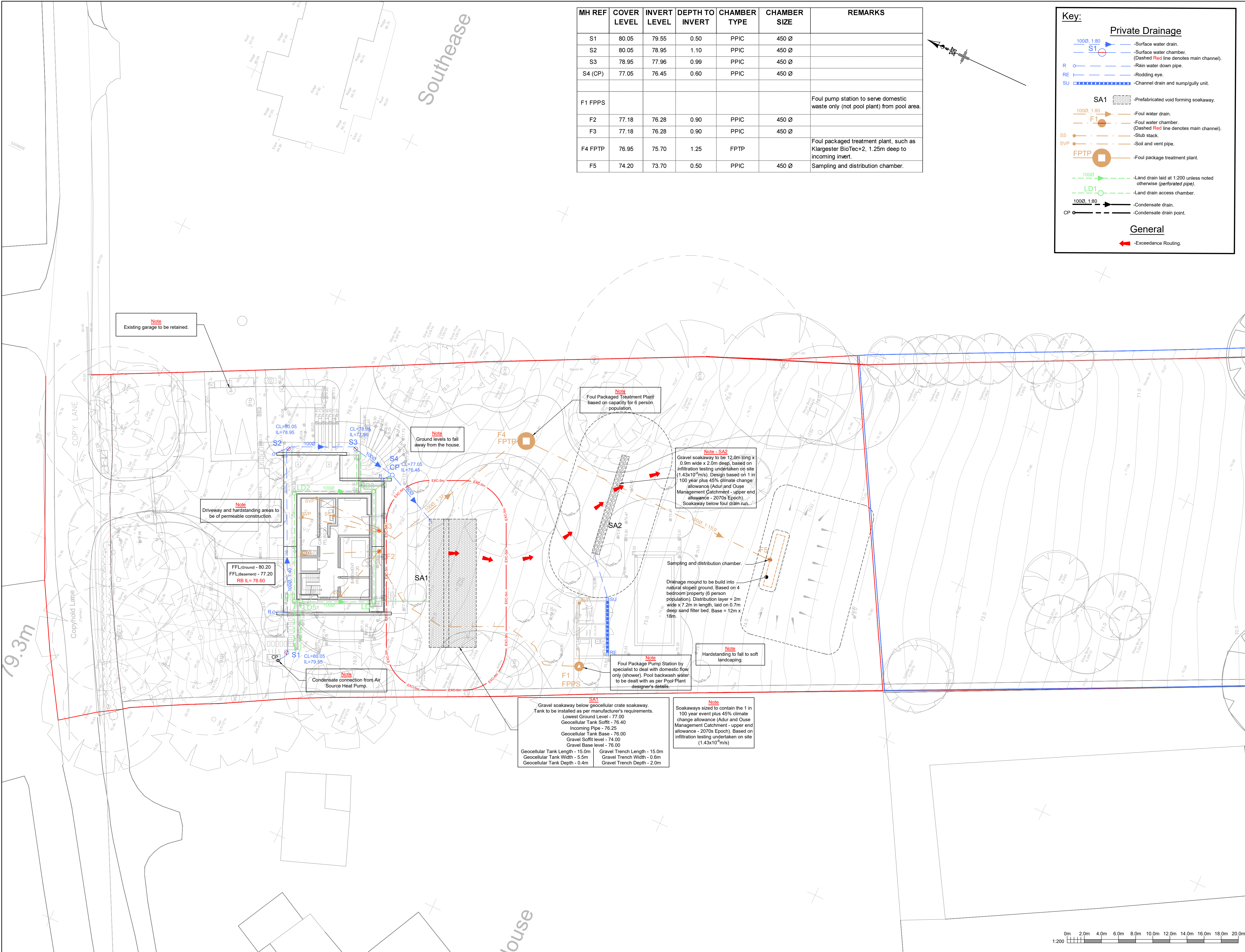
Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	3.7
Flow rate 2 year (l/s)	3.9
Flow rate 10 years (l/s)	7.1
Flow rate 30 years (l/s)	10.1
Flow rate 100 years (l/s)	14.0
Flow rate 200 years (l/s)	16.4

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.



MH REF	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	CHAMBER TYPE	CHAMBER SIZE	REMARKS
S1	80.05	79.55	0.50	PPIC	450 Ø	
S2	80.05	78.95	1.10	PPIC	450 Ø	
S3	78.95	77.96	0.99	PPIC	450 Ø	
S4 (CP)	77.05	76.45	0.60	PPIC	450 Ø	
F1 FPPS						Foul pump station to serve domestic waste only (not pool plant) from pool area.
F2	77.18	76.28	0.90	PPIC	450 Ø	
F3	77.18	76.28	0.90	PPIC	450 Ø	
F4 FPTP	76.95	75.70	1.25	FPTP		Foul packaged treatment plant, such as Klargester BioTec+2, 1.25m deep to incoming invert.
F5	74.20	73.70	0.50	PPIC	450 Ø	Sampling and distribution chamber.

Key:

Private Drainage

SA1

General

NOTES

Drawings References:

RISK ASSESSMENT

Job Title

Client

Engineering Layout. Sheet 1 of 2.

Scale at A1: 1:200

Status: PRELIMINARY

Drawn: DR

Checked: JOD

Approved: -

Date: Aug '25

Date: Aug '25

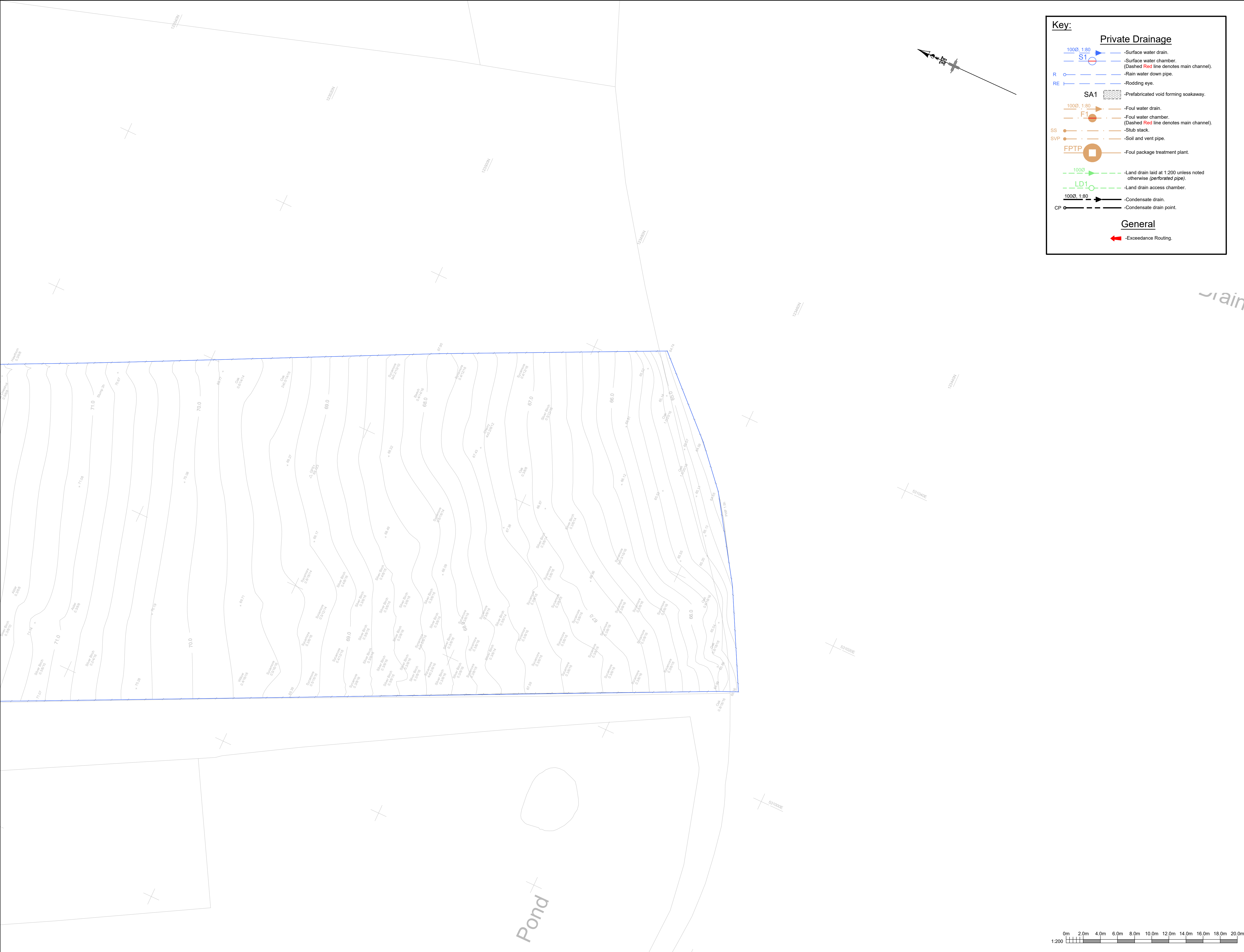
Date:

Document Reference:

25187-HOD-XX-ZZ-DR-C-5100

Revision:

P07



Key:

1000, 1:80

S1

R

RE

SA1

F1

SS

SVP

FPTP

LD1

1000, 1:80

CP

General

-Surface water drain.

-Surface water chamber.
(Dashed Red line denotes main channel).

-Rain water down pipe.

-Rodding eye.

-Prefabricated void forming soakaway.

-Foul water drain.

-Foul water chamber.
(Dashed Red line denotes main channel).

-Stub stack.

-Soil and vent pipe.

-Foul package treatment plant.

-Land drain laid at 1:200 unless noted otherwise (perforated pipe).

-Land drain access chamber.

-Condensate drain.

-Condensate drain point.

-Exceedance Routing.

NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.

2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.

Sheet 1/2

Sheet 2/2

Master Plan (NTS)

Drawings References:

Drawing:	Drawing no:	Rev:	Date:
Proposed Site Plan	b1204	D	15/07/25
Tree Root Protection	Hobbits ADT TCP 01_25_07_BOUND		July '25
Proposed Basement	Smith B		28/07/25
Proposed Ground Floor	Smith GF		28/07/25

RISK ASSESSMENT

Residual Risks Identified

1. None currently identified (08/08/25)

Contractor's General Risk Items

(List is not exhaustive but includes commonly raised issues)

1. Location of all buried services.

2. Existing drainage:

i) Gases, confined spaces, diseases.

ii) Maintain flow in drains during works.

3. Manual lifting of heavy objects; manhole covers, drainage pipes, concrete rings, kerbs etc.

4. Excavation for drainage trenches and manholes.

5. Security:

Keep site secure from members of the public.

maintain public safety when accessing site.

P01

08/08/25

DR

JOD

Preliminary issue.

Rev

Date

By

Chkd

Revision notes

Job Title

Huf Smith, Copyhold Lane,
Cuckfield, Haywards Heath, RH17 5EB.

Drawing Title

Engineering Layout.
Sheet 2 of 2.

Client

Eclipse

HODEL

CONSULTING ENGINEERS

01732 617555

mail@hodel.uk

Scale at A1: 1:200

Status: PRELIMINARY

Drawn: DR

Checked: JOD

Approved: -

Date: Aug '25

Date: Aug '25

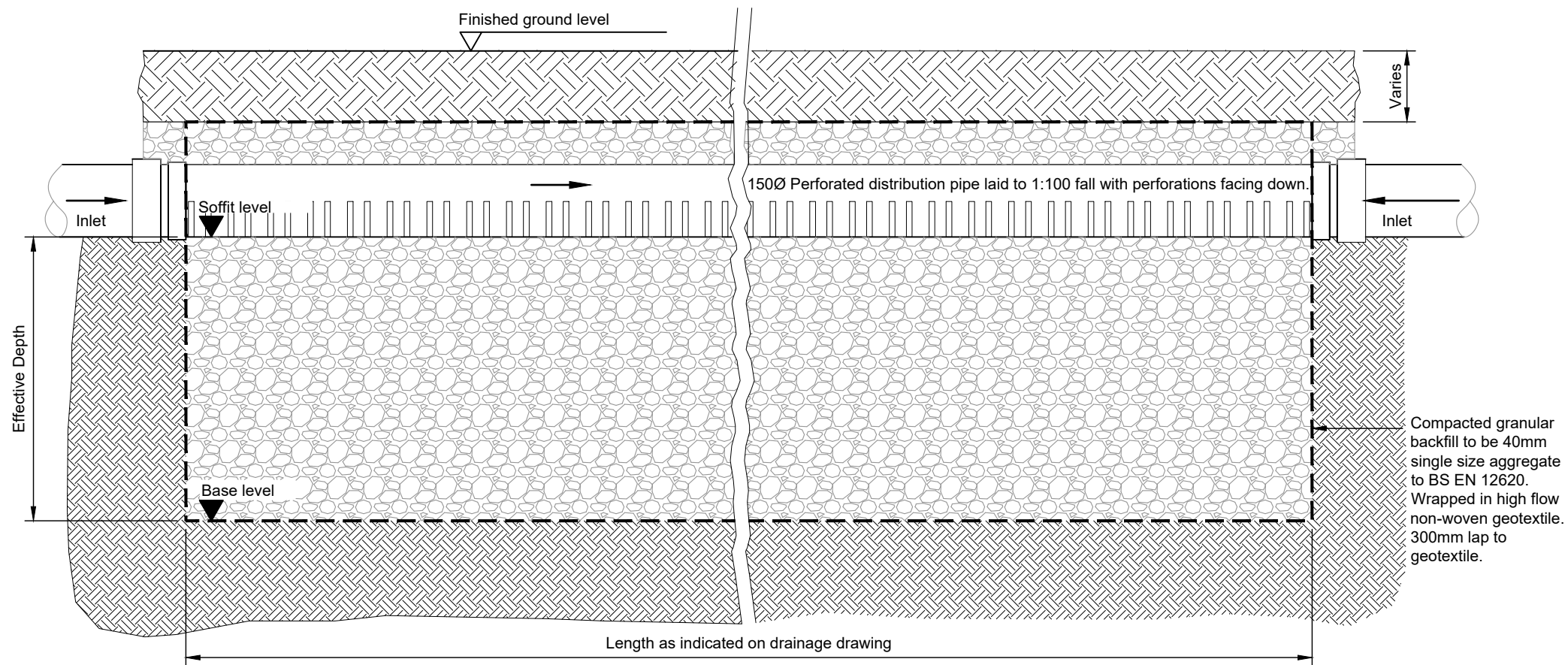
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Document Reference:

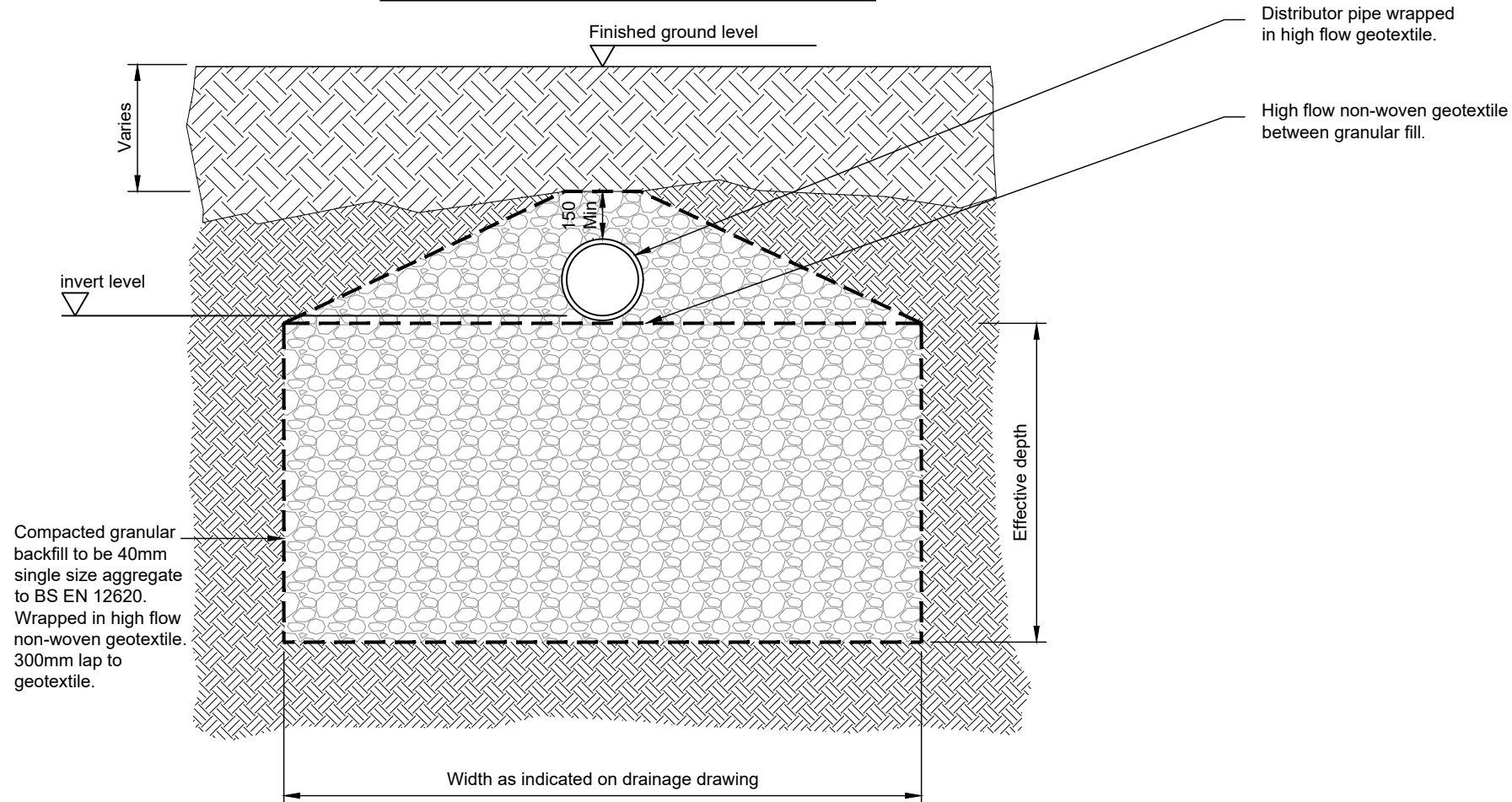
25187-HOD-XX-ZZ-DR-C-5101

Revision:

P01



**Typical gravel filled
soakaway - longitudinal section**



**Typical gravel filled
soakaway - cross section**

NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.
2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.

P01	01/04/26	JOD	JOD	Preliminary issue.
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Rev	Date	By	Chkd.	Revision notes
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Job Title

Huf Smith, Copyhold Lane
Cuckfield, Haywards Heath
RH17 5EB.

Drawing Title

Gravel Soakaway
Construction Details.

Client

Eclipse

HODEL
CONSULTING
ENGINEERS

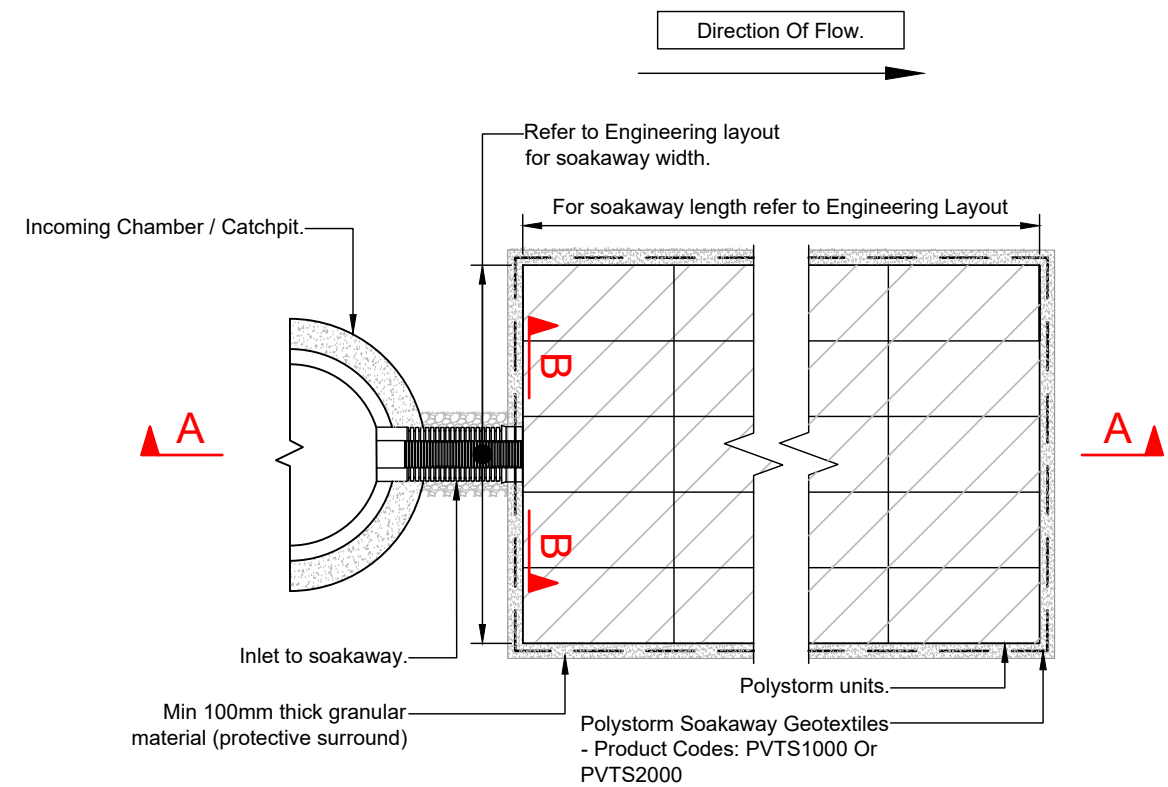
01732 617555 mail@hodel.uk

Scale at A3: NTS

Status: PRELIMINARY

Drawn: <i>JOD</i>	Checked: JOD	Approved: -
Date: Apr '26	Date: Apr '26	Date: -

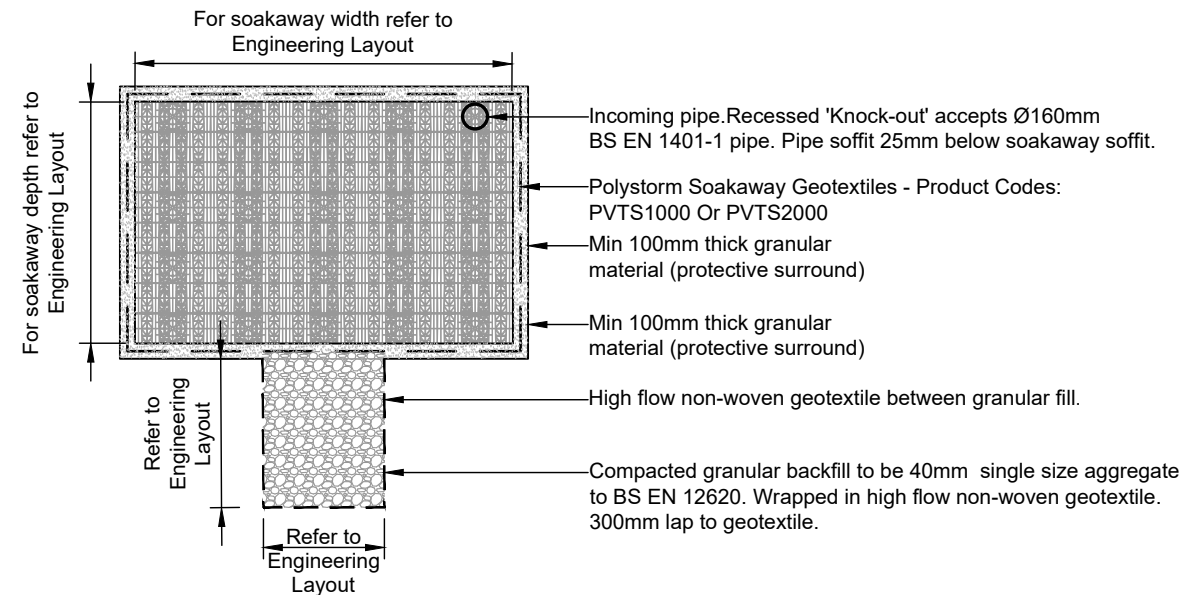
Document Reference:	Revision:
25187-HOD-XX-ZZ-DR-C-5203	P01



Polystorm Construction Detail

Plan

Scale 1:50



Section B-B

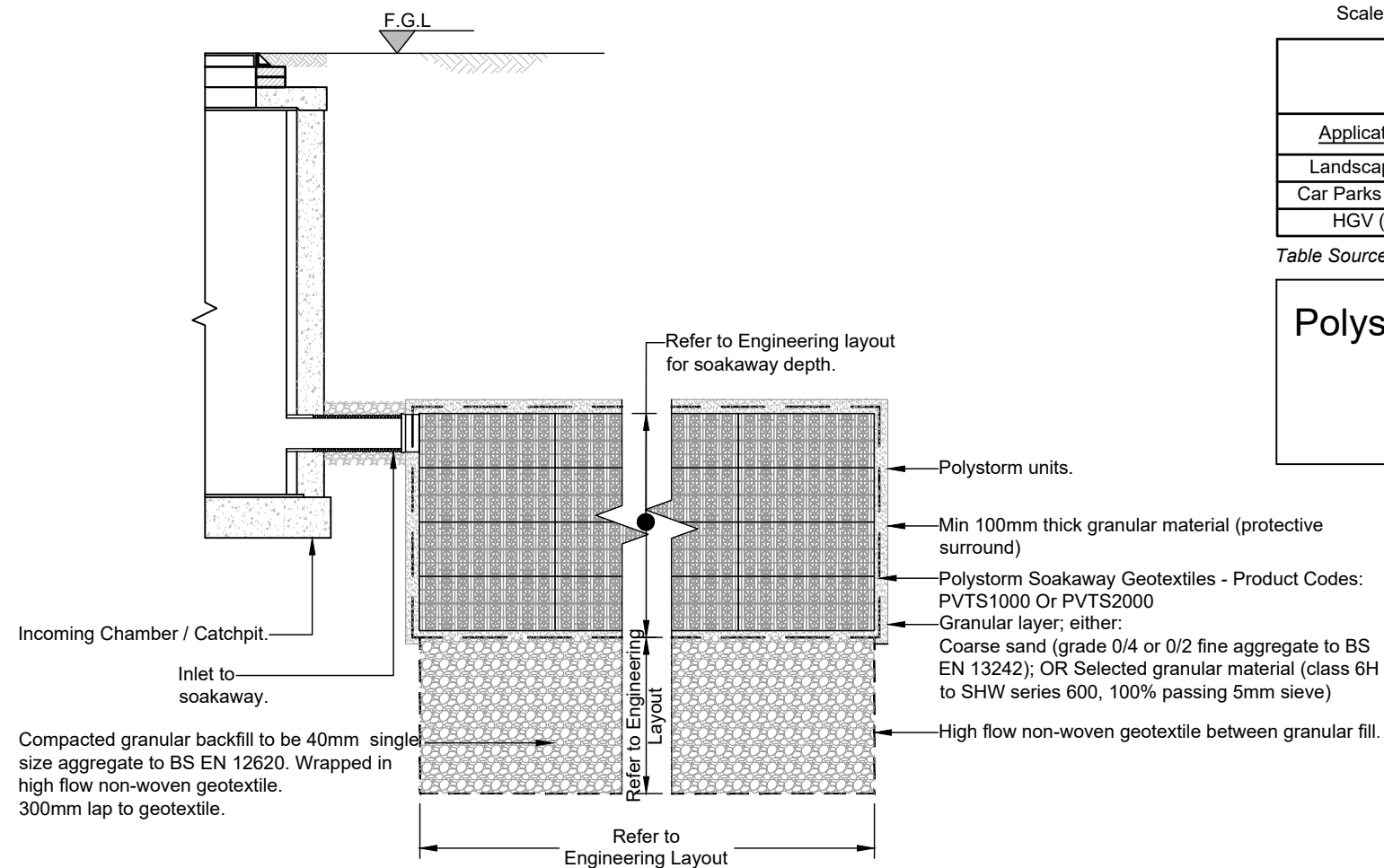
Scale 1:50

Polystorm Soakaway Geotextiles Product Codes: PVTS1000 & PVTS2000

Application (Cover Above Tank)	Product - TS1000	Product - TS2000
Landscape (min cover 0.50m)	✓	✗
Car Parks (min cover 0.6-1.0m+)	✓	✗
HGV (min cover 1.0m+)	✗	✓

Table Source: Polystorm data sheets dated June 2018 and November 2018

Polystorm to be installed fully in accordance with manufacturer's specifications and recommendations.



Section A-A

Scale 1:50

NOTES

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- This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.

P01	01/04/26	MJ	JOD	Preliminary issue.
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Rev	Date	By	Chkd.	Revision notes
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Job Title

Huf Smith, Copyhold Lane
Cuckfield, Haywards Heath
RH17 5EB.

Drawing Title

Typical Geocellular
Soakaway by Polystorm
with gravel base section.

Client

Eclipse

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Scale at A3: 1:50

Status: PRELIMINARY

Drawn: MJ

Checked: JOD

Approved: -

Date: Apr '26

Date: Apr '26

Date: -

Document Reference:

25187-HOD-XX-ZZ-DR-C-5204

Revision:

P01

Design Settings

Rainfall Methodology	FEH-22	CV	1.000	Maximum Rainfall (mm/hr)	50.0	Minimum Backdrop Height (m)	0.200	Enforce best practice design rules	x
Return Period (years)	100	Time of Entry (mins)	5.00	Minimum Velocity (m/s)	1.00	Preferred Cover Depth (m)	0.500		
Additional Flow (%)	0	Maximum Time of Concentration (mins)	30.00	Connection Type	Level Soffits	Include Intermediate Ground	✓		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.005	5.00	80.050	450	530939.800	123608.012	0.600
S2	0.006	5.00	80.050	450	530961.509	123617.773	1.200
S3			78.950	450	530964.802	123610.657	1.000
S4	0.010	5.00	77.050	450	530963.822	123605.486	0.600
SA1			77.000		530959.154	123597.796	0.700
Pool Plant	0.005	5.00	75.500		530960.268	123577.091	0.600
SA2			75.500		530966.895	123581.725	0.900
X			78.000	100	530957.919	123599.031	0.800

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	S1	S2	23.826	0.600	79.450	78.850	0.600	39.7	100	5.32	50.0
1.001	S2	S3	7.974	0.600	78.850	77.950	0.900	8.9	100	5.37	50.0
1.002	S3	S4	5.277	0.600	77.950	76.540	1.410	3.7	100	5.40	50.0
1.003	S4	SA1	9.009	0.600	76.450	76.300	0.150	60.1	150	5.51	50.0
2.000	Pool Plant	SA2	8.089	0.600	74.900	74.600	0.300	27.0	100	5.09	50.0
X	SA1	X	7.360	0.600	76.900	77.200	-0.300	-24.5	100	30.00	50.0

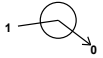
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.227	9.6	0.9	0.500	1.100	0.005	0.0	21	0.767
1.001	2.612	20.5	2.1	1.100	0.900	0.011	0.0	21	1.674
1.002	4.026	31.6	2.1	0.900	0.410	0.011	0.0	18	2.286
1.003	1.300	23.0	3.8	0.450	0.550	0.021	0.0	41	0.966
2.000	1.492	11.7	0.9	0.500	0.800	0.005	0.0	19	0.889
X	0.005	0.0	3.8	0.000	0.700	0.021	0.0	100	0.000

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	23.826	39.7	100	Circular	80.050	79.450	0.500	80.050	78.850	1.100
1.001	7.974	8.9	100	Circular	80.050	78.850	1.100	78.950	77.950	0.900
1.002	5.277	3.7	100	Circular	78.950	77.950	0.900	77.050	76.540	0.410
1.003	9.009	60.1	150	Circular	77.050	76.450	0.450	77.000	76.300	0.550
2.000	8.089	27.0	100	Circular	75.500	74.900	0.500	75.500	74.600	0.800
X	7.360	-24.5	100	Circular	77.000	76.900	0.000	78.000	77.200	0.700

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	PPIC	S2	450	Manhole	PPIC
1.001	S2	450	Manhole	PPIC	S3	450	Manhole	PPIC
1.002	S3	450	Manhole	PPIC	S4	450	Manhole	PPIC
1.003	S4	450	Manhole	PPIC	SA1		Junction	
2.000	Pool Plant		Junction		SA2		Junction	
X	SA1		Junction		X	100	Manhole	PPIC

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	530939.800	123608.012	80.050	0.600	450				
						0	1.000	79.450	100
S2	530961.509	123617.773	80.050	1.200	450				
						1	1.000	78.850	100
S3	530964.802	123610.657	78.950	1.000	450				
						0	1.001	78.850	100
						1	1.001	77.950	100
S4	530963.822	123605.486	77.050	0.600	450				
						0	1.002	77.950	100
						1	1.002	76.540	100
SA1	530959.154	123597.796	77.000	0.700					
						0	1.003	76.450	150
						1	1.003	76.300	150
Pool Plant	530960.268	123577.091	75.500	0.600			0	X	76.900 100
SA2	530966.895	123581.725	75.500	0.900					
						1	2.000	74.600	100
X	530957.919	123599.031	78.000	0.800	100				
						1	X	77.200	100

Simulation Settings

Rainfall Methodology		FEH-22		Summer CV		1.000		Analysis Speed		Detailed		Drain Down Time (mins)		10080		Starting Level (m)			Check Discharge Volume		x
Rainfall Events		Singular		Winter CV		1.000		Skip Steady State		x		Additional Storage (m³/ha)		20.0		Check Discharge Rate(s)			x		
Storm Durations																					
		15	30	60	120	180	240	360	480	600	720	960	1440	2160	2880	4320	5760	7200	8640	10080	
Return Period (years)	Climate Change (CC %)	Additional Area (A %)		Additional Flow (Q %)		Return Period (years)	Climate Change (CC %)	Additional Area (A %)		Additional Flow (Q %)		Return Period (years)	Climate Change (CC %)	Additional Area (A %)		Additional Flow (Q %)					
2		0		10		0		30		0		10		100		0		10		0	
10		0		10		0		30		40		10		100		45		10		0	

Node SA1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	76.000	Pit Width (m)	5.500	Depth (m)	0.400	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.95	Time to half empty (mins)	2430	Pit Length (m)	15.000	Inf Depth (m)	0.400		

Node SA1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00513	Safety Factor	1.5	Invert Level (m)	74.000	Pit Width (m)	0.600	Depth (m)	2.000	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.33	Time to half empty (mins)	990	Pit Length (m)	15.000	Inf Depth (m)	2.000		

Node SA2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00513	Safety Factor	1.5	Invert Level (m)	72.700	Pit Width (m)	0.900	Depth (m)	2.000	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.33	Time to half empty (mins)	1708	Pit Length (m)	12.000	Inf Depth (m)	2.000		

Results for 2 year +10% A 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	S1	11	79.472	0.022	1.0	0.0075	0.0000	OK
15 minute summer	S2	10	78.874	0.024	2.3	0.0066	0.0000	OK
15 minute summer	S3	10	77.969	0.019	2.3	0.0030	0.0000	OK
15 minute summer	S4	10	76.494	0.044	4.2	0.0225	0.0000	OK
2880 minute summer	SA1	1740	75.924	-0.376	0.3	5.7156	0.0000	OK
15 minute summer	Pool Plant	10	74.920	0.020	1.0	0.0036	0.0000	OK
960 minute winter	SA2	630	73.088	-1.512	0.1	1.3813	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	1.0	0.748	0.104	0.0322	
15 minute summer	S2	1.001	S3	2.3	1.854	0.111	0.0099	
15 minute summer	S3	1.002	S4	2.3	2.291	0.072	0.0052	
15 minute summer	S4	1.003	SA1	4.1	0.974	0.180	0.0383	
2880 minute summer	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
2880 minute summer	SA1	Infiltration		0.0				
2880 minute summer	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	1.0	0.906	0.084	0.0088	
960 minute winter	SA2	Infiltration		0.0				

Results for 10 year +10% A 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	S1	10	79.481	0.031	2.0	0.0106	0.0000	OK
15 minute summer	S2	10	78.884	0.034	4.5	0.0094	0.0000	OK
15 minute summer	S3	10	77.977	0.027	4.5	0.0042	0.0000	OK
15 minute summer	S4	10	76.514	0.064	8.2	0.0326	0.0000	OK
720 minute winter	SA1	675	76.048	-0.252	0.7	9.7363	0.0000	OK
15 minute summer	Pool Plant	10	74.927	0.027	1.9	0.0050	0.0000	OK
2160 minute winter	SA2	1380	73.350	-1.250	0.1	2.3155	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	2.0	0.897	0.205	0.0526	
15 minute summer	S2	1.001	S3	4.5	2.211	0.217	0.0161	
15 minute summer	S3	1.002	S4	4.4	2.758	0.140	0.0085	
15 minute summer	S4	1.003	SA1	8.2	1.169	0.356	0.0631	
720 minute winter	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
720 minute winter	SA1	Infiltration		0.0				
720 minute winter	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	1.9	1.098	0.162	0.0140	
2160 minute winter	SA2	Infiltration		0.0				

Results for 30 year +10% A 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	S1	10	79.485	0.035	2.6	0.0122	0.0000	OK
15 minute summer	S2	10	78.890	0.040	5.9	0.0109	0.0000	OK
15 minute summer	S3	10	77.981	0.031	5.8	0.0049	0.0000	OK
15 minute summer	S4	10	76.525	0.075	10.7	0.0381	0.0000	OK
600 minute winter	SA1	585	76.088	-0.212	1.0	12.8518	0.0000	OK
15 minute summer	Pool Plant	10	74.931	0.031	2.5	0.0057	0.0000	OK
360 minute summer	SA2	344	73.523	-1.077	0.5	2.9340	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	2.6	0.960	0.268	0.0641	
15 minute summer	S2	1.001	S3	5.8	2.364	0.285	0.0198	
15 minute summer	S3	1.002	S4	5.8	2.966	0.184	0.0104	
15 minute summer	S4	1.003	SA1	10.7	1.248	0.464	0.0769	
600 minute winter	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
600 minute winter	SA1	Infiltration		0.0				
600 minute winter	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	2.5	1.184	0.212	0.0170	
360 minute summer	SA2	Infiltration		0.0				

Results for 30 year +40% CC +10% A 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	S1	10	79.492	0.042	3.6	0.0146	0.0000	OK
15 minute summer	S2	10	78.898	0.048	8.2	0.0133	0.0000	OK
15 minute summer	S3	10	77.987	0.037	8.1	0.0059	0.0000	OK
15 minute summer	S4	10	76.543	0.093	15.0	0.0471	0.0000	OK
720 minute winter	SA1	705	76.174	-0.126	1.3	19.6374	0.0000	OK
15 minute summer	Pool Plant	10	74.938	0.038	3.6	0.0069	0.0000	OK
720 minute winter	SA2	675	73.950	-0.650	0.3	4.4546	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	3.6	1.044	0.372	0.0820	
15 minute summer	S2	1.001	S3	8.1	2.554	0.396	0.0254	
15 minute summer	S3	1.002	S4	8.1	3.230	0.257	0.0133	
15 minute summer	S4	1.003	SA1	14.9	1.348	0.649	0.0996	
720 minute winter	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
720 minute winter	SA1	Infiltration		0.0				
720 minute winter	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	3.6	1.310	0.305	0.0221	
720 minute winter	SA2	Infiltration		0.0				

Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	79.490	0.040	3.3	0.0139	0.0000	OK
15 minute summer	S2	10	78.895	0.045	7.4	0.0125	0.0000	OK
15 minute summer	S3	10	77.985	0.035	7.3	0.0056	0.0000	OK
15 minute summer	S4	10	76.536	0.086	13.5	0.0439	0.0000	OK
1440 minute winter	SA1	1320	76.145	-0.155	0.7	17.3356	0.0000	OK
15 minute summer	Pool Plant	10	74.936	0.036	3.2	0.0065	0.0000	OK
600 minute winter	SA2	570	73.805	-0.795	0.3	3.9370	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	3.3	1.023	0.339	0.0761	
15 minute summer	S2	1.001	S3	7.3	2.493	0.357	0.0234	
15 minute summer	S3	1.002	S4	7.3	3.143	0.231	0.0123	
15 minute summer	S4	1.003	SA1	13.4	1.317	0.583	0.0917	
1440 minute winter	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
1440 minute winter	SA1	Infiltration		0.0				
1440 minute winter	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	3.2	1.270	0.272	0.0203	
600 minute winter	SA2	Infiltration		0.0				

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	79.499	0.049	4.7	0.0170	0.0000	OK
15 minute summer	S2	10	78.907	0.057	10.6	0.0156	0.0000	OK
15 minute summer	S3	10	77.993	0.043	10.5	0.0069	0.0000	OK
15 minute summer	S4	10	76.562	0.112	19.4	0.0570	0.0000	OK
1440 minute winter	SA1	1380	76.281	-0.019	0.9	27.9752	0.0000	OK
15 minute summer	Pool Plant	10	74.944	0.044	4.6	0.0079	0.0000	OK
720 minute summer	SA2	720	74.395	-0.205	0.6	6.0417	0.0000	OK
15 minute summer	X	1	77.200	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	4.7	1.111	0.484	0.1000	
15 minute summer	S2	1.001	S3	10.5	2.697	0.513	0.0311	
15 minute summer	S3	1.002	S4	10.5	3.441	0.332	0.0161	
15 minute summer	S4	1.003	SA1	19.3	1.415	0.840	0.1228	
1440 minute winter	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
1440 minute winter	SA1	Infiltration		0.0				
1440 minute winter	SA1	Infiltration		0.1				
15 minute summer	Pool Plant	2.000	SA2	4.6	1.400	0.391	0.0265	
720 minute summer	SA2	Infiltration		0.1				

Design Settings

Rainfall Methodology	FEH-22	CV	1.000	Maximum Rainfall (mm/hr)	50.0	Minimum Backdrop Height (m)	0.200	Enforce best practice design rules	x
Return Period (years)	100	Time of Entry (mins)	5.00	Minimum Velocity (m/s)	1.00	Preferred Cover Depth (m)	0.500		
Additional Flow (%)	0	Maximum Time of Concentration (mins)	30.00	Connection Type	Level Soffits	Include Intermediate Ground	✓		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.005	5.00	80.050	450	530939.800	123608.012	0.600
S2	0.006	5.00	80.050	450	530961.509	123617.773	1.200
S3			78.950	450	530964.802	123610.657	1.000
S4	0.010	5.00	77.050	450	530963.822	123605.486	0.600
SA1			77.000		530959.154	123597.796	0.700
Pool Plant	0.005	5.00	75.500		530960.268	123577.091	0.600
SA2			75.500		530966.895	123581.725	0.900
X			78.000	100	530957.919	123599.031	0.800

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	S1	S2	23.826	0.600	79.450	78.850	0.600	39.7	100	5.32	50.0
1.001	S2	S3	7.974	0.600	78.850	77.950	0.900	8.9	100	5.37	50.0
1.002	S3	S4	5.277	0.600	77.950	76.540	1.410	3.7	100	5.40	50.0
1.003	S4	SA1	9.009	0.600	76.450	76.300	0.150	60.1	150	5.51	50.0
2.000	Pool Plant	SA2	8.089	0.600	74.900	74.600	0.300	27.0	100	5.09	50.0
X	SA1	X	7.360	0.600	76.900	77.200	-0.300	-24.5	100	30.00	50.0

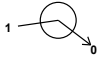
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.227	9.6	0.9	0.500	1.100	0.005	0.0	21	0.767
1.001	2.612	20.5	2.1	1.100	0.900	0.011	0.0	21	1.674
1.002	4.026	31.6	2.1	0.900	0.410	0.011	0.0	18	2.286
1.003	1.300	23.0	3.8	0.450	0.550	0.021	0.0	41	0.966
2.000	1.492	11.7	0.9	0.500	0.800	0.005	0.0	19	0.889
X	0.005	0.0	3.8	0.000	0.700	0.021	0.0	100	0.000

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	23.826	39.7	100	Circular	80.050	79.450	0.500	80.050	78.850	1.100
1.001	7.974	8.9	100	Circular	80.050	78.850	1.100	78.950	77.950	0.900
1.002	5.277	3.7	100	Circular	78.950	77.950	0.900	77.050	76.540	0.410
1.003	9.009	60.1	150	Circular	77.050	76.450	0.450	77.000	76.300	0.550
2.000	8.089	27.0	100	Circular	75.500	74.900	0.500	75.500	74.600	0.800
X	7.360	-24.5	100	Circular	77.000	76.900	0.000	78.000	77.200	0.700

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	PPIC	S2	450	Manhole	PPIC
1.001	S2	450	Manhole	PPIC	S3	450	Manhole	PPIC
1.002	S3	450	Manhole	PPIC	S4	450	Manhole	PPIC
1.003	S4	450	Manhole	PPIC	SA1		Junction	
2.000	Pool Plant		Junction		SA2		Junction	
X	SA1		Junction		X	100	Manhole	PPIC

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	530939.800	123608.012	80.050	0.600	450				
						0	1.000	79.450	100
S2	530961.509	123617.773	80.050	1.200	450		1	1.000	78.850
						0	1.001	78.850	100
S3	530964.802	123610.657	78.950	1.000	450		1	1.001	77.950
						0	1.002	77.950	100
S4	530963.822	123605.486	77.050	0.600	450		1	1.002	76.540
						0	1.003	76.450	150
SA1	530959.154	123597.796	77.000	0.700			1	1.003	76.300
						0	X	76.900	100
Pool Plant	530960.268	123577.091	75.500	0.600					
						0	2.000	74.900	100
SA2	530966.895	123581.725	75.500	0.900			1	2.000	74.600
X	530957.919	123599.031	78.000	0.800	100		1	X	77.200

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Additional Flow (Q %)	0	Skip Steady State	x	Additional Storage (m³/ha)	20.0	Check Discharge Rate(s)	x
Rainfall Events	Consecutive	Additional Area (A %)	10	Analysis Speed	Detailed	Drain Down Time (mins)	10080	Starting Level (m)		Check Discharge Volume	x
Time Offset (mins)	0	Duration (mins)	360	Return Period (years)	100	Climate Change (CC %)	45	Time Offset (mins)	0	Duration (mins)	360
										Return Period (years)	30
										Climate Change (CC %)	40

Node SA1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	76.000	Pit Width (m)	5.500	Depth (m)	0.400	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.95	Time to half empty (mins)	3272	Pit Length (m)	15.000	Inf Depth (m)	0.400		

Node SA1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00513	Safety Factor	1.5	Invert Level (m)	74.000	Pit Width (m)	0.600	Depth (m)	2.000	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.33	Time to half empty (mins)	976	Pit Length (m)	15.000	Inf Depth (m)	2.000		

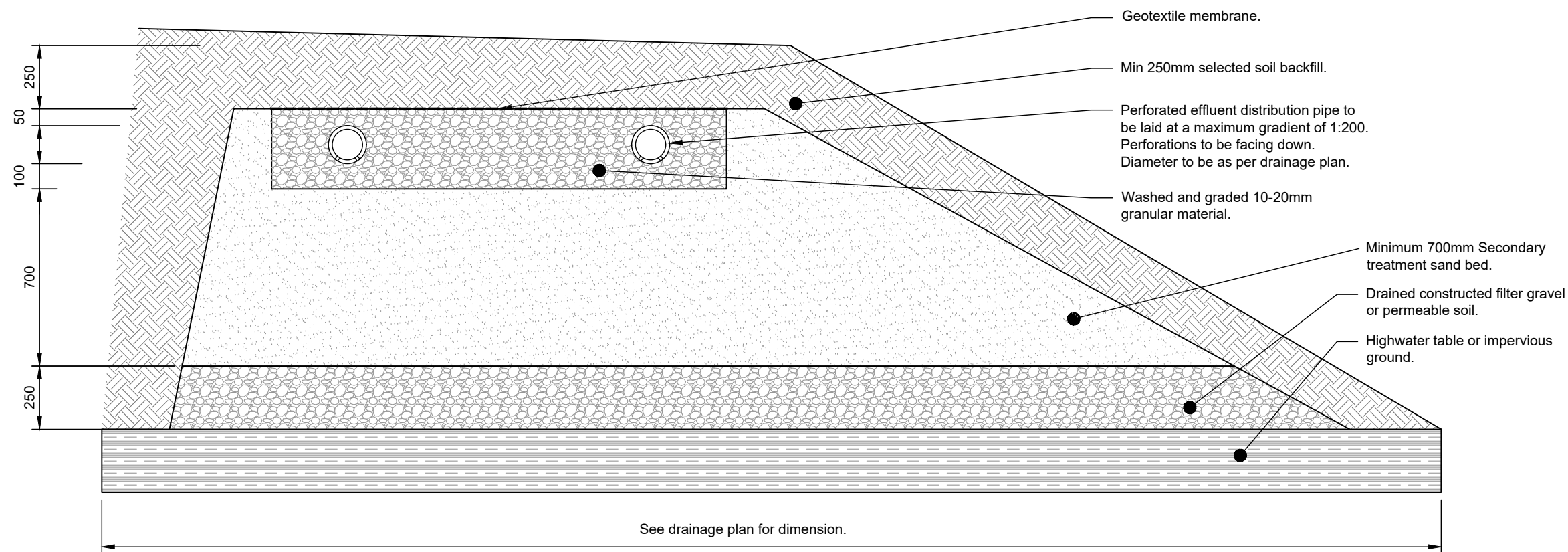
Node SA2 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00513	Safety Factor	1.5	Invert Level (m)	72.700	Pit Width (m)	0.900	Depth (m)	2.000	Number Required	1
Side Inf Coefficient (m/hr)	0.00513	Porosity	0.33	Time to half empty (mins)	1708	Pit Length (m)	12.000	Inf Depth (m)	2.000		

Results for Consecutive Rainfall 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
360-360	S1	184	79.468	0.018	0.7	0.0063	0.0000	OK
360-360	S2	184	78.869	0.019	1.5	0.0053	0.0000	OK
360-360	S3	184	77.965	0.015	1.5	0.0024	0.0000	OK
360-360	S4	184	76.485	0.035	2.7	0.0180	0.0000	OK
360-360	SA1	720	76.398	0.098	2.7	37.1884	0.0000	OK
360-360	Pool Plant	712	75.260	0.360	0.6	0.0655	0.0000	FLOOD RISK
360-360	SA2	712	75.260	0.660	0.6	7.1298	0.0000	OK
360-360	X	8	77.200	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360-360	S1	1.000	S2	0.7	0.682	0.072	0.0243	
360-360	S2	1.001	S3	1.5	1.650	0.073	0.0073	
360-360	S3	1.002	S4	1.5	2.033	0.047	0.0039	
360-360	S4	1.003	SA1	2.7	0.864	0.117	0.0576	
360-360	SA1	X	X	0.0	0.000	0.000	0.0000	0.0
360-360	SA1	Infiltration		0.0				
360-360	SA1	Infiltration		0.1				
360-360	Pool Plant	2.000	SA2	0.6	0.784	0.051	0.0633	
360-360	SA2	Infiltration		0.1				



**Typical Section Through Drainage Mound
Built into Existing Sloped Site**
NTS

NOTES

1. Do not scale this drawing unless for Planning Permission purposes only.
2. This drawing is to be read in conjunction with all other relevant Engineer's and Architect's drawings and specifications.
3. To provide venting of the filter, the upstream ends of the distribution pipes may be extended vertically above the mound level and capped with a cowl or grille.

P01	01/04/26	MJ	JOD	Preliminary issue.
Rev	Date	By	Chkd.	Revision notes

Job Title
**Huf Smith, Copyhold
Lane, Cuckfield,
Haywards Heath, RH17
5EB.**

Drawing Title
**Drainage Mound
Construction Detail.**

Client
Eclipse

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Scale at A3: NTS		Status: PRELIMINARY	
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