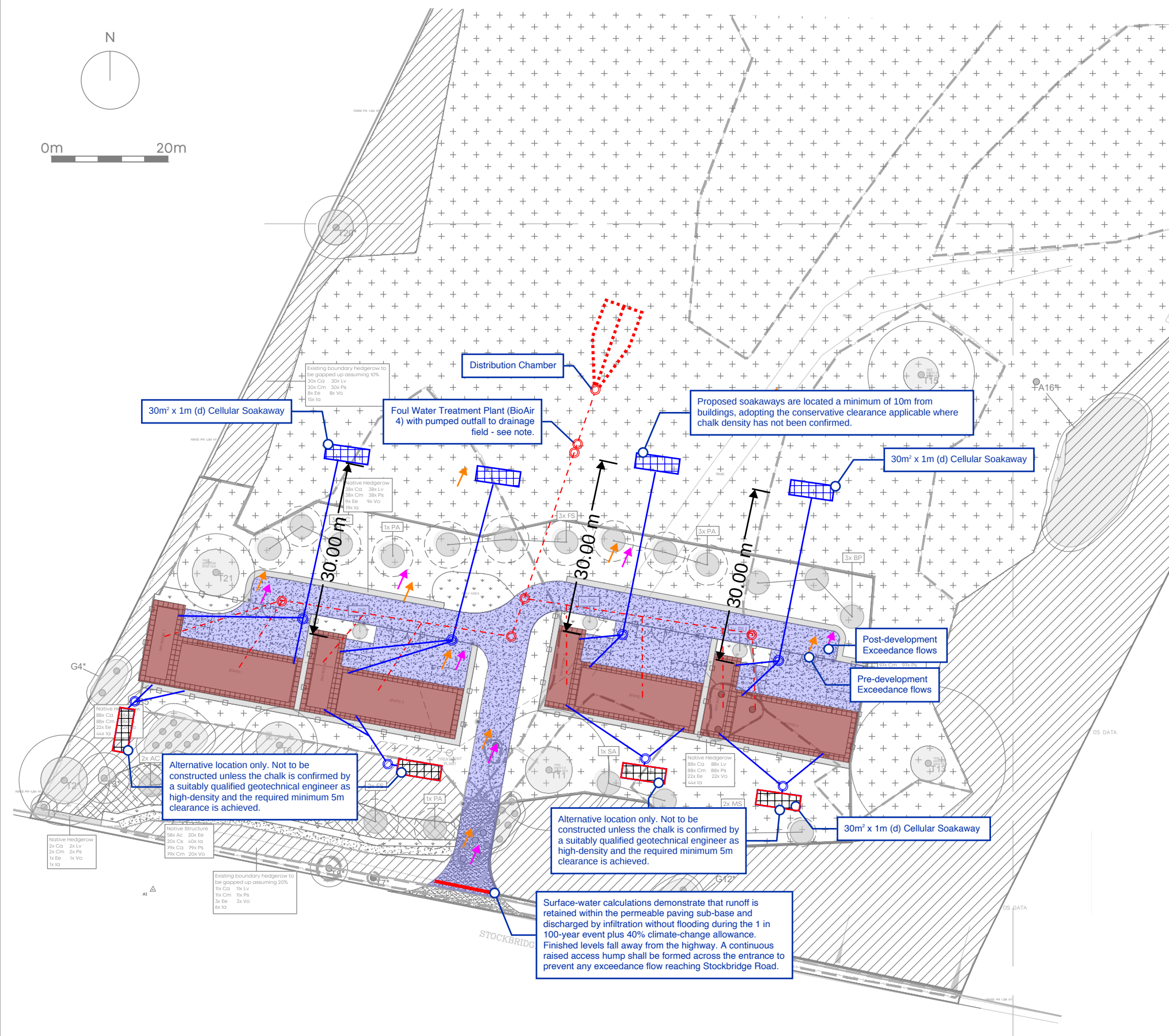




1. Drainage strategy

This drawing and the accompanying calculations comprise the drainage scheme required by Condition 10.

The previous rainwater-harvesting and outfall proposals are superseded. All surface water will infiltrate within the site through four cellular roof-water soakaways and the permeable paving.

There will be no surface-water discharge to the foul system, highway drainage, sewer, ditch, watercourse or adjoining land.

2. Surface-water design

The system has been designed in accordance with BRE Digest 365, CIRIA C753, Approved Document H and the National Standards for SuDS.

Design rainfall: 1 in 100-year event plus 40% climate change.

Site-specific BRE 365 testing was undertaken by IBEX Consulting Engineers on 21-22 July 2026.

Refer to the accompanying hydraulic calculations for design inputs, storm simulations, storage utilisation and drain-down results.

3. Surface-water components

Provide one 6.0m x 5.0m x 1.0m-deep cellular soakaway for each pitch, serving a maximum roof catchment of 269m². Provide a trapped silt catchpit, permeable geotextile, ventilation and inspection access to each soakaway.

Provide approximately 1,430m² of Type B, unlined permeable paving over a minimum 350mm open-graded sub-base with 30% effective voids.

Roof water must not discharge into the permeable-paving sub-base. No piped overflow or off-site surface-water discharge is proposed.

4. Groundwater and exceedance

Maintain at least 1.0m between the base of each infiltration feature and the maximum likely seasonal groundwater level. Refer unexpected groundwater, chalk features or differing ground conditions to the drainage engineer.

Exceedance flows must follow the arrows shown towards on-site permeable and landscaped areas and away from buildings, adjoining land and Stockbridge Road.

5. Highway protection – Condition 16

Provide a raised impermeable threshold across the vehicular access and a traffic-rated channel drain immediately behind it on the site side.

Discharge the channel through a silt catchpit to the on-site infiltration system. Do not connect it to highway drainage.

6. Foul-water drainage

All domestic foul water from the four pitches and day rooms will discharge to a Kingspan Klargester BioAir 4 treatment plant rated for 12 PE, or an equivalent with equal or improved performance.

The design flow is 1.80m³/day. Install, commission and maintain the plant in accordance with BS EN 12566-3, the manufacturer's instructions and Condition 9.

Treated effluent will discharge through a raised drainage mound constructed in accordance with BS 6297:2007+A1:2008, Approved Document H and the Environment Agency General Binding Rules.

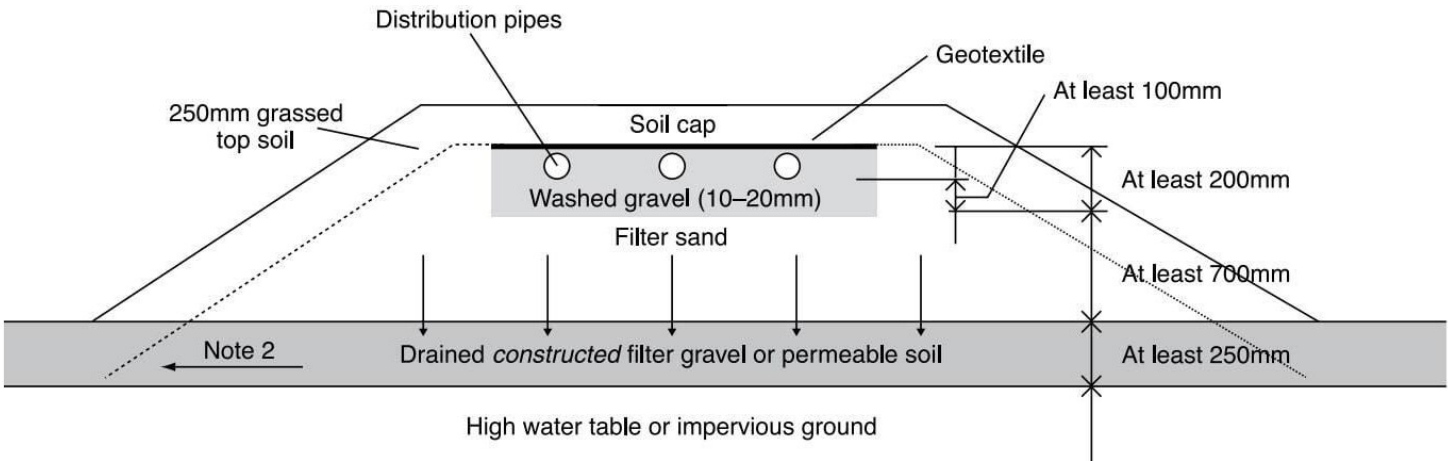
Provide at least 36m² effective drainage area using certified engineered filter media with a verified percolation value of at least $V_p = 15$.

7. Ownership and maintenance

The drainage systems will remain private and will be maintained by the site owner or operator for the lifetime of the development.

Inspect and maintain the permeable paving, catchpits, channel drains, soakaways, treatment plant and drainage mound in accordance with the accompanying maintenance schedule and manufacturers' requirements.

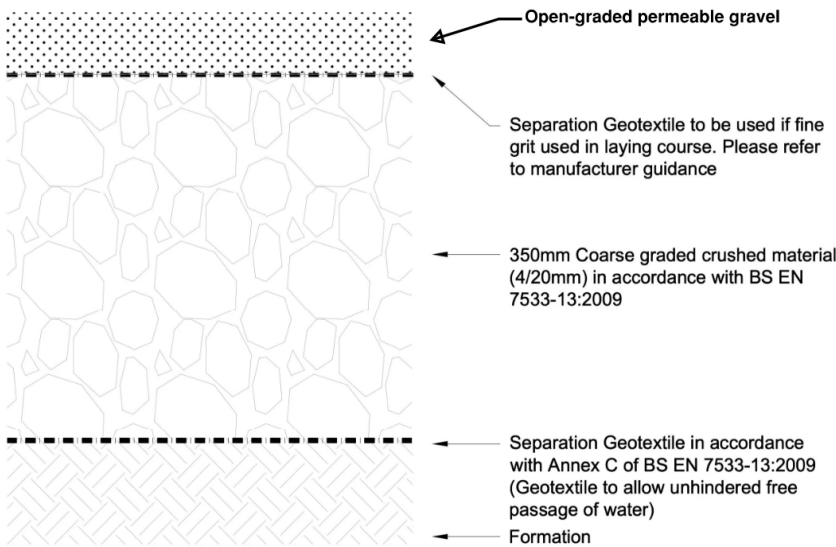
Provide as-constructed drawings, commissioning records and maintenance information before occupation.



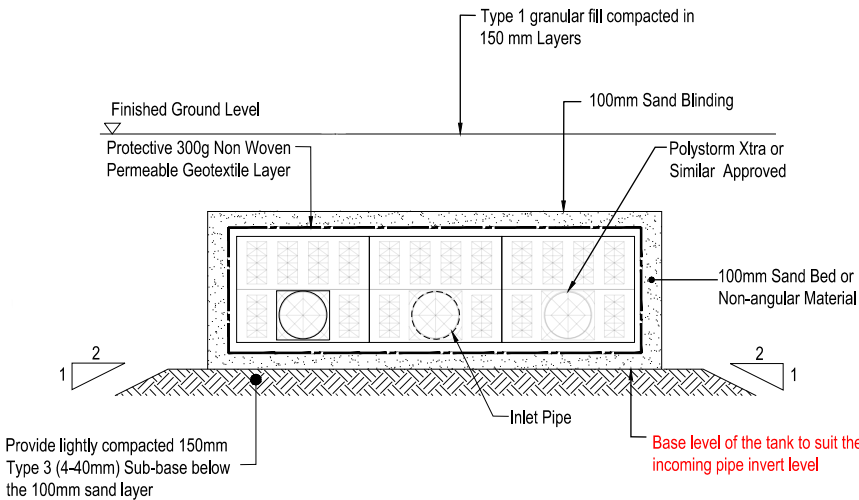
Notes:

1. To provide venting of the filter, the upstream ends of the distribution pipes may be extended vertically above mound level and capped with a cowl or grille.
2. Surface water runoff and uncontaminated seepage from the surrounding soil may be cut off by shallow interceptor drains and diverted away from the mound. There must be no seepage of wastewater to such an interceptor drain.
3. Where the permeable soil is slow draining and overlaid on an impervious layer, the mound filter system should be constructed on a gently sloping site.

TYPICAL DRAINAGE MOUND DETAIL



PERMEABLE PAVING DETAIL



TYPICAL CELLULAR SOAKAWAY DETAIL

Drainage mound construction

The mound will receive secondary-treated effluent from the 12 PE package treatment plant at a maximum design flow of 1.80m³/day.

Provide three parallel distribution trenches, each 900mm wide x 13.5m long, giving a total effective floor area of 36.45m². Trench sides are not included in the effective area.

Feed all trenches equally from an accessible inspection and distribution chamber. Provide 100mm diameter perforated distribution pipes, laid at a uniform gradient not steeper than 1:200. Extend the upstream pipe ends vertically to provide rodding and ventilation access.

Lay pipes within 200-300mm of clean washed distribution aggregate. Cover the aggregate with a permeable geotextile to prevent migration of the soil cover.

Provide at least 700mm of certified medium or coarse washed filter sand beneath the distribution layer. The engineered material must achieve a verified percolation value of at least Vp = 15.

Finish with at least 100mm soil cover and 250mm grassed topsoil, graded to shed rainfall without causing erosion or ponding.

Maintain the required separation from maximum seasonal groundwater. Prevent surface-water entry, vehicle trafficking, building, storage and deep-rooted planting over the mound.

MAINTENANCE AND GENERAL BINDING RULES

The site owner/operator shall remain responsible for the drainage systems throughout the lifetime of the development.

Surface-water drainage

Permeable paving shall be inspected every six months and after exceptional storms. The surface shall be vacuum swept at least annually and any areas of silting, settlement or damage repaired.

Roof drainage, silt traps and cellular soakaways shall be inspected annually and accumulated debris or sediment removed.

The access hump and adjoining levels shall be inspected annually and maintained so that no surface water can discharge onto the highway.

Maintenance access to all drainage components shall be retained.

Foul-water drainage

The BioAir 4 treatment plant shall be operated, serviced and desludged in accordance with the manufacturer's instructions by a competent contractor.

The alarm and electrical supply shall remain operational at all times.

The drainage mound and distribution system shall be inspected annually for ponding, erosion, odour or sewage breakout. It shall be kept free from vehicles, structures, storage and deep-rooted planting.

Inspection, servicing, desludging and repair records shall be retained by the site owner/operator and transferred to any future operator.

General Binding Rules

The discharge shall comprise domestic sewage only and shall not exceed the design flow of 1.80m³/day.

The BioAir 4 treatment plant shall comply with BS EN 12566-3 and discharge to the drainage mound constructed in accordance with BS 6297.

Surface water shall not enter the foul-water system.

The discharge shall not cause pollution of surface water or groundwater.

Before the system is brought into use, the owner/operator shall confirm that the discharge satisfies the Environment Agency's location restrictions, including those relating to groundwater source protection zones, water-supply abstractions and nearby sewage discharges.

Where the General Binding Rules cannot be satisfied, an Environment Agency permit shall be obtained before the discharge commences.



22/07/2026

Our ref: ICE0527/LD02/260722

Mr. Robert Jones

Dear Robert,

RE: Land at Lopcombe Corner, Salisbury, Wiltshire, SP5 1BX – BRE 365 Soakage Testing

We are pleased to present the results of the soakage testing undertaken at the above site. The soakage tests were undertaken in general accordance with BRE Digest 365 'Soakaway Design' BRE, 2016.

The intrusive investigation was undertaken between 21st and 22nd July 2026, with the works supervised by an IBEX Engineer.

Background

The site is understood to be occupied by an open undeveloped parcel of land. Published geological records indicate that the ground conditions are likely to comprise the Head Deposits over the Newhaven Chalk Formation.

Scope of Site Works

Two machine excavated trial pits were excavated to a maximum depth of 1.60m bgl and two soakage tests in general accordance with BRE Digest 365 as well as BS 6297:2007 were undertaken within the trial pits SA101 and SA102.

Ground Conditions

The ground conditions encountered were broadly consistent with those anticipated, namely a thickness of Topsoil overlying the Head Deposits (or Cohesive Superficial Deposits) over the Chalk.

For further details of the ground conditions, reference should be made to the exploratory hole logs presented in Appendix A.

Groundwater

Groundwater was not encountered during the investigation.

Soakaways

Table 1 summarises the soakage rates, which were calculated based on the results of the soakage testing:

Reference	Geology	Calculated Infiltration Rates (m/s)		
		1 st Cycle	2 nd Cycle	3 rd Cycle
SA101	Newhaven Chalk Formation	8.9×10^{-6}	1.6×10^{-5}	3.9×10^{-5}
SA102	Newhaven Chalk Formation	9.6×10^{-6}	1.3×10^{-5}	1.3×10^{-5}

Table 1 Summary of Soakage Test Results

IBEX Consulting Engineers Limited

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Geotechnical and Environmental Specialists | Site Investigations

IBEX Consulting Engineers Limited registered in England and Wales under the company registration number: 13585544

In addition, given the absence of standard sewage mains' network, a new sewage treatment is required on site in close proximity of SA101. Therefore, an independent assessment was also undertaken based on the guidance given in DETR Circular 3/99 by converting the above results into Vp values from SA101.

The equivalent Vp values are summarised below:

Location		Time		Difference		Vp
		75%	25%	Minutes	Seconds	
SA101	Test 01	25.5	157	131.5	7890	15.78
	Test 02	11	102	91	5460	10.92
	Test 03	19.5	54	34.5	2070	4.14
Average		10.28				

Table 2 Summary of Percolation Test Results

Closure

We trust that we have interpreted your instructions correctly; please do not hesitate to contact us should you have any queries.

Yours sincerely

For and on Behalf of IBEX Consulting Engineers Limited



Levent Dogan BSc, MSc, PGDip, CEng MCIHT, AMICE, AMIEnvSc
Director

levent.dogan@ibexconsultant.com

Enc. Figure 1 Site Location Plan
 Figure 2 Exploratory Hole Logs Location Plan
 Appendix A Exploratory Hole Logs
 Appendix B BRE 365 Soakage Testing Results



Figures





Project:	Land at Lopcombe Corner, Salisbury, Wiltshire, SP5 1BX			Title	Site Location Plan	
Client:	Mr. Robert Jones			IBEX Consulting Engineers Limited Abbey House, 25 Clarendon Road Redhill, Surrey. RH1 1QZ +44(0)1737 452622 www.ibexconsultant.com		
Ref No:	ICE0527	Revision:	0			
Drawn:	LD	Date:	22/07/2026			
Figure:	1	Scale:	Not To Scale			



Project:	Land at Lopcombe Corner, Salisbury, Wiltshire, SP5 1BX			Title	Exploratory Hole Logs Location Plan	
Client:	Mr. Robert Jones			IBEX Consulting Engineers Limited Abbey House, 25 Clarendon Road Redhill, Surrey. RH1 1QZ +44(0)1737 452622 www.ibexconsultant.com		
Ref No:	ICE0527	Revision:	0			
Drawn:	LD	Date:	22/07/2026			
Figure:	2	Scale:	Not To Scale			

Appendix A

Exploratory Hole Logs



IBEX
CONSULTING
ENGINEERS

Key to exploratory hole symbols and abbreviations

SAMPLE TYPES

ACM - Asbestos sample	AMAL - Amalgamated sample	B - Bulk disturbed sample
BLK - Block sample	C - Core sample	CBR - CBR test sample
D - Disturbed sample	ES - Environmental sample	EW - Environmental water sample
G - Gas sample	J - Jar sample	L - Liner sample
TW - Pushed thin wall sample	U - Undisturbed sample	UT - Undisturbed thin wall sample
W - Water sample		

IN-SITU TESTS

HV - Hand shear vane	HV(r) - Hand shear vane residual	PID - Photo ionisation detector
PP - Hand penetrometer	SPT - Standard penetration test	SPT(C) - SPT using cone

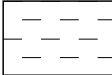
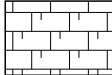
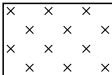
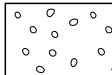
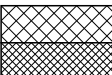
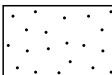
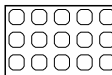
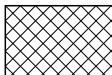
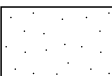
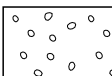
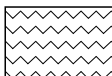
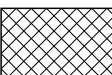
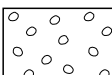
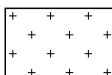
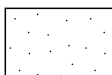
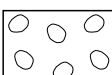
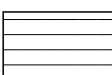
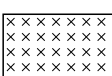
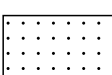
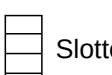
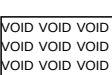
GROUNDWATER

 Groundwater strike	 Groundwater rest level
--	--

ROTARY CORE DETAILS

TCR - Total core recovery (%)	SCR - Solid core recovery (%)	RQD - Rock quality designation (%)
FI - Fracture index	NI - Non-intact core	AZCL - Assumed zone of core loss

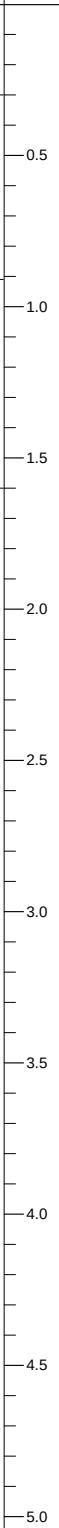
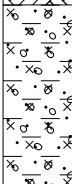
LEGEND

 Topsoil	 Clay	 Chalk	 Sand backfill
 Peat	 Silt	 Breccia	 Gravel backfill
 Made ground [cohesive]	 Sand	 Conglomerate	 Arising
 Concrete	 Gravel	 Metamorphic	 Bentonite
 Wood	 Cobbles	 Igneous	 Concrete
 Brick	 Boulders		 Grout
 Bituminous material	 Mudstone		 Plain pipe
 Gypsum	 Siltstone		
 Coal	 Sandstone		 Slotted pipe
 Void	 Limestone		



SA102

Sheet 1 of 1

Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (thickness) (m)	Strata						
		Depth (m)	Type/ Ref	Results			Legend	Description					
						(0.30)		Grass over brown gravelly sandy silty clay.					
						0.30		Greyish brown gravelly sandy silty CLAY.					
						(0.61)							
						0.91							
						(0.69)							
						1.60							
						End of Trial Pit at 1.60m							



$W = 0.35m$

Appendix B

BRE 365 Soakage Testing Results

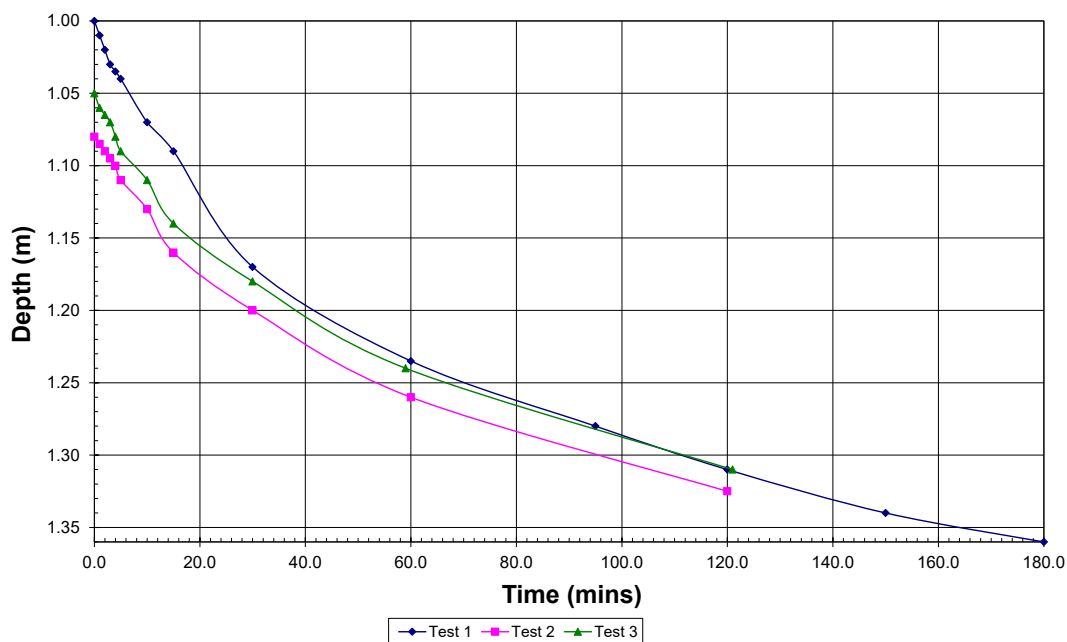


Project Name :	Land at Lopcombe Corner, Salisbury, Wiltshire, SP5 1BX
Client :	Mr. Ashley Jones

Job No. :	ICE0527
Date :	22/07/2026

Pit reference	SA102
Pit depth (m)	1.60
Pit width (m)	0.35
Pit length (m)	1.82
Depth to standing water (m)	

Test 1	
Time (min)	Depth (m)
0.0	1.00
1.0	1.01
2.0	1.02
3.0	1.03
4.0	1.04
5.0	1.04
10.0	1.07
15.0	1.09
30.0	1.17
60.0	1.24
95.0	1.28
120.0	1.31
150.0	1.34
180.0	1.36

[illegible][illegible]

Max. depth (m)	1.48	1.40	1.40
Effective depth (m)	0.48	0.32	0.35
75% effective depth (m)	1.12	1.16	1.14
50% effective depth (m)	1.24	1.24	1.23
25% effective depth (m)	1.36	1.32	1.31
t75 (min)	20.00	15.00	15.00
t50 (min)			
t25 (min)	180.00	115.00	121.00
Vp 75-25	0.15	0.10	0.11
ap 50	1.6786	1.3314	1.3965
tp 75-25	160.00	100.00	106.00

Soil infiltration rate (m/s)	9.5E-06	1.3E-05	1.3E-05
Soil infiltration rate (mm/hr)	3.42E+01	4.59E+01	4.52E+01

Notes:

- 1 Orange cells require input data
2 Infiltration calculated to method in 'BRE Digest 365 (1991) - Soakaway Design'
3 First line of table must be depth at time = 0

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	150.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)	Invert Level (m)
Soakaway	0.027	5.00	2.000	450	2.000	0.000
Outfall	0.000		2.000	450	2.000	0.000

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	Soakaway	Outfall	3.000	0.600	0.000	0.000	0.000	0.0	100	5.05	54.5

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	1.000	7.9	5.3	1.900	1.900	0.027	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	3.000	0.0	100	Circular	2.000	0.000	1.900	2.000	0.000	1.900

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Soakaway	450	Manhole	Adoptable	Outfall	450	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Soakaway	2.000	2.000	450				
					0	1.000	100
Outfall	2.000	2.000	450				
					1	1.000	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	1440
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Node Soakaway Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	0.000	Design Flow (l/s)	0.2
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	0.000	1.000	0.000

Node Soakaway Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.03420	Safety Factor	2.0	Invert Level (m)	0.000
Side Inf Coefficient (m/hr)	0.03420	Porosity	0.95	Time to half empty (mins)	1215

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	30.0	30.0	1.000	30.0	30.0	1.001	0.0	30.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC +10% A 15 minute summer	488.233	138.153
100 year +40% CC +10% A 15 minute winter	342.620	138.153
100 year +40% CC +10% A 30 minute summer	320.551	90.705
100 year +40% CC +10% A 30 minute winter	224.948	90.705
100 year +40% CC +10% A 60 minute summer	214.603	56.713
100 year +40% CC +10% A 60 minute winter	142.577	56.713
100 year +40% CC +10% A 120 minute summer	129.587	34.246
100 year +40% CC +10% A 120 minute winter	86.094	34.246
100 year +40% CC +10% A 180 minute summer	97.729	25.149
100 year +40% CC +10% A 180 minute winter	63.526	25.149
100 year +40% CC +10% A 240 minute summer	75.977	20.078
100 year +40% CC +10% A 240 minute winter	50.477	20.078
100 year +40% CC +10% A 360 minute summer	56.677	14.585
100 year +40% CC +10% A 360 minute winter	36.841	14.585
100 year +40% CC +10% A 480 minute summer	43.979	11.622
100 year +40% CC +10% A 480 minute winter	29.219	11.622

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC +10% A 600 minute summer	35.604	9.738
100 year +40% CC +10% A 600 minute winter	24.327	9.738
100 year +40% CC +10% A 720 minute summer	31.433	8.424
100 year +40% CC +10% A 720 minute winter	21.125	8.424
100 year +40% CC +10% A 960 minute summer	25.432	6.697
100 year +40% CC +10% A 960 minute winter	16.847	6.697
100 year +40% CC +10% A 1440 minute summer	18.055	4.839
100 year +40% CC +10% A 1440 minute winter	12.134	4.839
100 year +40% CC +10% A 2160 minute summer	12.630	3.490
100 year +40% CC +10% A 2160 minute winter	8.702	3.490
100 year +40% CC +10% A 2880 minute summer	10.319	2.766
100 year +40% CC +10% A 2880 minute winter	6.935	2.766
100 year +40% CC +10% A 4320 minute summer	7.609	1.989
100 year +40% CC +10% A 4320 minute winter	5.011	1.989
100 year +40% CC +10% A 5760 minute summer	6.145	1.573
100 year +40% CC +10% A 5760 minute winter	3.978	1.573
100 year +40% CC +10% A 7200 minute summer	5.137	1.311
100 year +40% CC +10% A 7200 minute winter	3.316	1.311
100 year +40% CC +10% A 8640 minute summer	4.424	1.129
100 year +40% CC +10% A 8640 minute winter	2.855	1.129
100 year +40% CC +10% A 10080 minute summer	3.897	0.994
100 year +40% CC +10% A 10080 minute winter	2.515	0.994

Results for 100 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
600 minute winter	Soakaway	600	0.861	0.861	2.0	24.6815	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.000	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)			
600 minute winter	Soakaway	Depth/Flow	Outfall	0.0	0.0			
600 minute winter	Soakaway	Infiltration		0.1				

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	150.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)	Invert Level (m)
Permeable Paving	0.143	5.00	0.500	450	0.500	0.000
Outfall	0.000		0.500	450	0.500	0.000

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	Permeable Paving	Outfall	3.000	0.600	0.000	0.000	0.000	0.0	100	5.05	54.5

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	1.000	7.9	28.2	0.400	0.400	0.143	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	3.000	0.0	100	Circular	0.500	0.000	0.400	0.500	0.000	0.400

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Permeable Paving	450	Manhole	Adoptable	Outfall	450	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Permeable Paving	0.500	0.500	450				
					0	1.000	100
Outfall	0.500	0.500	450		1	1.000	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	1440
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Node Permeable Paving Online Depth/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 0.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	0.000	1.000	0.000

Node Permeable Paving Depth/Area Storage Structure

Base Inf Coefficient (m/hr) 0.03204 | Safety Factor 5.0 | Invert Level (m) 0.000
Side Inf Coefficient (m/hr) 0.03204 | Porosity 0.30 | Time to half empty (mins) 160

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1430.0	1430.0	0.350	1430.0	1430.0	0.351	0.0	1430.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC +10% A 15 minute summer	488.233	138.153
100 year +40% CC +10% A 15 minute winter	342.620	138.153
100 year +40% CC +10% A 30 minute summer	320.551	90.705
100 year +40% CC +10% A 30 minute winter	224.948	90.705
100 year +40% CC +10% A 60 minute summer	214.603	56.713
100 year +40% CC +10% A 60 minute winter	142.577	56.713
100 year +40% CC +10% A 120 minute summer	129.587	34.246
100 year +40% CC +10% A 120 minute winter	86.094	34.246
100 year +40% CC +10% A 180 minute summer	97.729	25.149
100 year +40% CC +10% A 180 minute winter	63.526	25.149
100 year +40% CC +10% A 240 minute summer	75.977	20.078
100 year +40% CC +10% A 240 minute winter	50.477	20.078
100 year +40% CC +10% A 360 minute summer	56.677	14.585
100 year +40% CC +10% A 360 minute winter	36.841	14.585
100 year +40% CC +10% A 480 minute summer	43.979	11.622
100 year +40% CC +10% A 480 minute winter	29.219	11.622
100 year +40% CC +10% A 600 minute summer	35.604	9.738

Rainfall

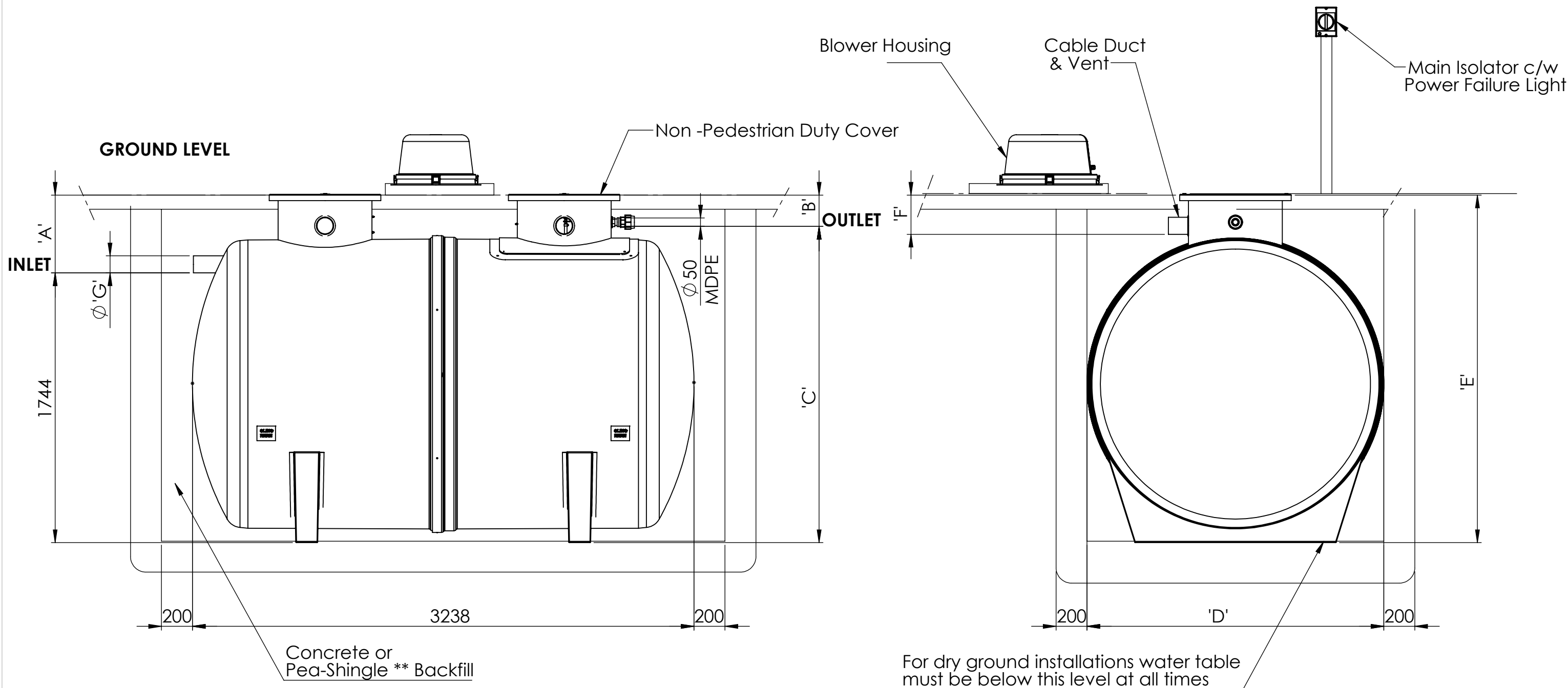
Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC +10% A 600 minute winter	24.327	9.738
100 year +40% CC +10% A 720 minute summer	31.433	8.424
100 year +40% CC +10% A 720 minute winter	21.125	8.424
100 year +40% CC +10% A 960 minute summer	25.432	6.697
100 year +40% CC +10% A 960 minute winter	16.847	6.697
100 year +40% CC +10% A 1440 minute summer	18.055	4.839
100 year +40% CC +10% A 1440 minute winter	12.134	4.839
100 year +40% CC +10% A 2160 minute summer	12.630	3.490
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Results for 100 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
240 minute winter	Permeable Paving	236	0.230	0.230	22.1	98.5603	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.000	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)			
240 minute winter	Permeable Paving	Depth/Flow	Outfall	0.0	0.0			
240 minute winter	Permeable Paving	Infiltration		2.5				

1. This drawing is for 'Dimensional information Only', it is essential that this drawing is read in conjunction with the 'Installation Guidelines' supplied with the unit.
(Copies available from our Sales Department)
2. Inlet pipe is Ø110mm PVCu and Outlet is 50mm MDPE compression fitting
3. Extension neck kit is available for deer inverts up to a maximum invert of 2000mm. See extension neck drawing for assembly details.
4. Blower located inside external housing. Alarm beacon to be fitted to outside of blower housing (if applicable).
5. Vent pipe connection is supplied but vent runs and stacks are supplied by others.
6. Air hose for tank internals is supplied with blower housing and is run through the vent.
7. **Pea -shingle backfill is reliant on use of correct strapping and anchoring.

Unit Ref	A' (mm)	B' (mm)	C' (mm)	D' (mm)	E' (mm)	F' (mm)	G' (mm)	Unit Weight (Kgs)
BIA 4	500	200	2045	1920	2245	250	110	375
	1000	200	2545	1920	2745	250	110	385
	1500	200	3045	1920	3245	250	110	415
	2000	200	3545	1920	3745	250	110	425



Please check with Kingspan Water & Energy for the latest Issue of the drawing					LN Number :	Tolerance : +/- 5 mm	Drawing : DS1447B BioAir 4 (12PE) IPS Sales Drawing	Page 1 of 1
Issue	Date	Drawn By	Approved By	Description	Finish : n/a	Thickness : n/a		
01	19/01/2024	JMcM	JMcM	Initial Issue	Weight : See Table Kgs	Surface Area : n/a		
					Modelled By :	Material : Various		
All dimensions in mm				Scale: Not to scale		Clearwater reserve the right to alter the details of this drawing without prior notice. This drawing is copyright and may not be reproduced or used without the written permission of Clearwater.		
A:\Wastewater\Engineering\Engineering Projects\980A - BioAir Treatment Plant (Clearwater Brand)\Sales Drawings\DS1447B								



Clearwater

BioAir Sewage Treatment Plant

The Clearwater BioAir sewage treatment plant employs aerated technology, delivering a high level of water discharge quality. With adaptable installation choices to accommodate diverse domestic locations and a discreet visual profile, the Clearwater BioAir stands as a financially sensible option for your household wastewater treatment needs.

PRODUCT BENEFITS



Affordable



Flexible installation & lightweight robust design



Low impact visual footprint



1 year warranty (terms apply)

APPLICATIONS

The Clearwater BioAir is suitable for use across the following applications:



Single & Multiple Homes



Barn Conversions



Small Offices



Farms

TECHNICAL SPECIFICATIONS

Clearwater BioAir	Model	CW 2	CW 3	CW 4	CW 5	CW 6	CW 7	CW 8
Population Equivalent	Unit	6	9	12	15	20	25	35
Daily Flow	m ³ /d	0.9	1.35	1.8	2.25	3	3.75	5.25
Daily Load	kg BOD5/d	0.36	0.54	0.72	0.9	1.2	1.5	2.1
Measurements								
Inlet invert	mm	455-755	575-875	500-2000	645-945	500-2000	500-2000	500-2000
Discharge option		Gravity / IPS	Gravity / IPS	Gravity / IPS	Gravity / IPS	Gravity	Gravity	Gravity
Outlet invert (Gravity / IPS)	mm	555-855 / 400-700	675-975 / 350-650	600-2100	745-1045 / 415-715	600-2100	600-2100	600-2100
Diameter	mm	1540	1690	1920	2010	1920	1920	1920
Length	mm	2500	2480	3238	3190	4400	5550	7400
Installation depth	mm	1805-2105	2075-2375	2245-3745	2485-2785	2245-3745	2245-3745	2245-3745
Inlet pipe work	mm	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø160
Outlet pipe work (Gravity / IPS)	mm	Ø110 / Ø50	Ø110 / Ø50	Ø110 / Ø50	Ø110 / Ø50	Ø110	Ø110	Ø160
Material Construction	MDPE / GRP	MDPE	MDPE	GRP	MDPE	GRP	GRP	GRP
Unit Weight	kg	170	200	500*	650	800*	1250*	1450*
Note:		* Tank weight based on 500mm Invert						



Certificate

423.01C02

Kingspan Water & Energy Ltd.
College Road North, HP22 5EW Aylesbury, United Kingdom

On the basis of EN 12566-3, Annex B
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system BioAir
Activated sludge system

Evaluation of the nominal sequences of the 38-week testing*

Nominal organic daily load (influent)	0.32 kg BOD ₅ /d		
Nominal hydraulic daily load	0.9 m ³ /d		
Material	MDPE		
Treatment efficiency		Efficiency	Effluent
	COD	93.2 %	57 mg/l
	BOD ₅	97.5 %	9 mg/l
	TN _b **	60.1 %	25.4 mg/l
	NH ₄ -N**	67.6 %	15.6 mg/l
	P _{tot}	46.9 %	4.3 mg/l
	SS	95.9 %	16 mg/l

Evaluation of the complete 38-week testing*

Electrical consumption	1.2 kWh/d
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* second phase nominal – power breakdown was substituted by an additional test phase

** determined for temperatures $\geq 12^{\circ}$ C in the bioreactor

Tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.

PIA – Sustainable Certification

geprüft – tested – testé

Martina Wermter

March 2023



Notified Body
No.: 1739

