



ASTRA COTTAGE

Oare, Wiltshire

DRAINAGE STATEMENT

Project No	26-254-60
Revision No	01
Issue date	01/04/26

Control Sheet

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1 INTRODUCTION

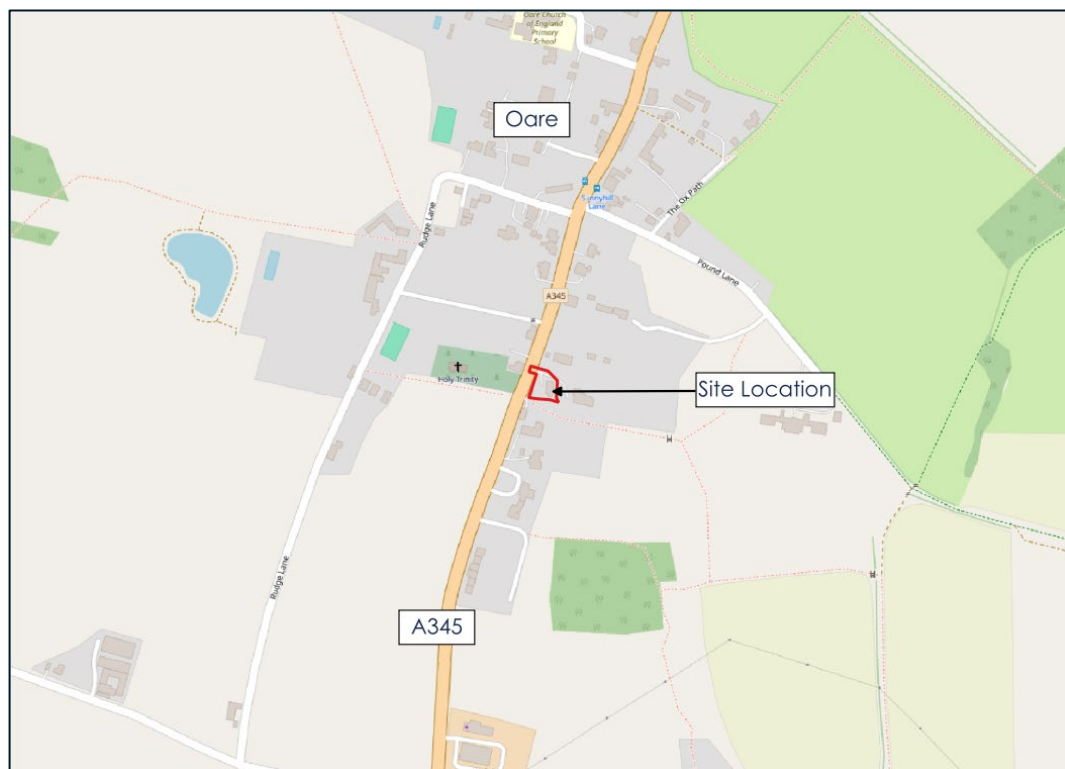
1.1 Background and Proposals

- 1.1.1 Calibro Consultants has been appointed to provide a drainage statement for a proposed replacement dwelling at Astra Cottage in Oare, Wiltshire.
- 1.1.2 The proposals include demolishing the existing bungalow and associated outbuildings and the erection of a self-build replacement dwelling; with associated parking, landscaping, private amenity space and access arrangements.
- 1.1.3 The proposed dwelling will have a footprint of 150m² and will include an area of greenroof measuring approximately 45m².
- 1.1.4 Access is, and will remain, from the A345 highway adjacent to the site.
- 1.1.5 The site proposals are provided in Appendix A.

1.2 Site Location

- 1.2.1 The site is located off the A345 highway at the southern end of the hamlet of Oare in Wiltshire. The nearest postcode is SN8 4JA and approximate coordinates are 415770, 162210. The site location is shown in Figure 1-1.

Figure 1-1 Site Location



2 EXISTING SITE CONDITIONS

2.1 Hydrology and Topography

- 2.1.1 There are no known watercourses within the vicinity of the site.
- 2.1.2 There is an existing Wessex Water foul sewer that flows beneath the A345 highway before diverting east, along the northern boundary of the site. To the east of the site, the sewer journeys south, past the eastern boundary of the site. Wessex Water records are shown in Appendix B.
- 2.1.3 The surface water drainage arrangements of the existing property are unknown, but the site-specific drainage survey (Appendix B) suggests surface water discharges to the ground.
- 2.1.4 Comparison of the survey results and Wessex Water asset map demonstrates the foul drainage from the existing site discharges to the existing public sewer. As this arrangement would be replicated for the replacement dwelling, foul flows are not considered further by this report.

2.2 Geology and Soils

- 2.2.1 Regarding bedrock geology, data held by the British Geological Survey (BGS) shows that the entirety of the site and surrounding areas are underlain by '*Upper Greensand Formation*' bedrock. This is a calcareous sandstone and siltstone bedrock.
- 2.2.2 BGS mapping shows the site to fall within an area underlain by '*Head – Clay, silt, sand and gravel*' superficial deposits.
- 2.2.3 BGS mapping shows the bedrock to be a '*Moderately productive aquifer*'.
- 2.2.4 Soils mapping records the soils under the site as '*Freely draining slightly acid loamy soils*'.
- 2.2.5 Soakage testing, compliant with BRE365 specifications, has been completed in March 2026 at the site, the results of which are provided in Appendix C. The testing proceeded a wet winter and was undertaken during wet conditions on the day of the testing.
- 2.2.6 The test pits measured 0.3m wide by 1m long and 1m deep. The tests yielded three rates, $1.6 \times 10^{-5} \text{m/s}$, $6.8 \times 10^{-6} \text{m/s}$ and $6.5 \times 10^{-6} \text{m/s}$. The slowest rate of $6.8 \times 10^{-6} \text{m/s}$ will be considered by this report to ensure a conservative approach. It equates to a rate of 0.023m/hr.
- 2.2.7 Groundwater and the water table is known to be deep in the area. This is evidenced from local BGS borehole records. For example, a record from the well at Trinity

Church¹, across the A345 from the site, shows the water to be 55 feet (17m) below the ground. Other nearby records show water being stuck 22m or 25m below the ground.

¹ <https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/401782>

3 DRAINAGE STRATEGY

3.1 Approach

- 3.1.1 The drainage strategy proposes to use a soakaway beneath the rear garden.
- 3.1.2 Water from the downpipes would discharge to water butts, with their overflows discharging to raised bed SuDS planters. The final number, location and dimensions of these is subject to detailed design and site setting out. For example, they will need to remain free from access points or windows.
- 3.1.3 Discharge from downpipes and/or SuDS features would be via filter drains with perforated pipes before discharge to the soakaway. The storage volume of the filter drains has been discounted to ensure a conservative estimate.
- 3.1.4 The soakaway itself would be constructed from Geocellular crates wrapped in permeable geotextile.
- 3.1.5 The areas contributing runoff to the soakaway would be the dwelling roof (150m²), which includes a 45m² greenroof, and the courtyard (18m²). This gives a total contributing area of 168m².
- 3.1.6 The greenhouse, parking area and external patio areas are presumed to drain to ground. However, an urban creep factor of 10% has been added to the area calculations, in accordance with the National Standards for SuDS. This results in a total area of 185m².
- 3.1.7 The perforated pipes and soakaway crates would have a cover of at least 600mm.
- 3.1.8 The parking and access is proposed to be formed from gravel and is therefore discounted from the drainage strategy.
- 3.1.9 MicroDrainage Source Control calculations show that soakaway crates measuring 3m x 6.5m with a depth of 1m and porosity of 0.95 would provide sufficient storage.
- 3.1.10 MicroDrainage Source Control calculations are included in Appendix D.
- 3.1.11 The resultant drainage strategy is included in Appendix E and is subject to detailed design and site setting out. For example, the type, depth and dimensions of the soakaway crates may be amended to reflect the detailed designs and procurement of the preferred crate types and manufacturer. Likewise the greenroof details are subject to more detailed assessment of the proposed building fabrication.

3.2 National Standards for SuDS

- 3.2.1 The National Standards for SuDS includes a drainage hierarchy, which requires that surface water runoff should be managed as high up the following list as practically possible:

- Priority 1 – collect for non-potable use, or then;
- Priority 2 – into the ground (infiltration), or then;
- Priority 3 – to a surface water body, or then;
- Priority 4 – to a surface water sewer, highway drain or another piped surface water drainage system, or then;
- Priority 5 – to a combined sewer.

3.2.2 To achieve Priority 1, water butts are proposed.

3.2.3 Specific testing has demonstrated the ground is suitable for infiltration and this is therefore the preferred method of discharge, achieving Priority 2. Given the deep water table at the site, a significant unsaturated zone would exist beneath the infiltration device and the groundwater.

3.3 National Standard 2: Management of Everyday Rainfall

3.3.1 All runoff would be routed through the proposed filter drains and soakaway, meaning zero piped discharge from the site in all storms, thereby achieving Standard 2.

3.4 National Standard 3: Management of Extreme Rainfall and Flooding

3.4.1 The design storm event applied by the drainage strategy is the 1 in 100 year +45% event commensurate with a residential development (therefore applying the upper end allowance for the 2070s epoch) in the Avon Hampshire Management Catchment.

3.4.2 As shown in the MicroDrainage calculations provided in Appendix D, the proposed soakaway would provide sufficient storage in the design event.

3.4.3 The calculations presume a Cv value of 1 for summer and winter storms, which is conservative as it presumes no losses which is highly unlikely.

3.4.4 It should be noted that the storage capacity of the filter drains, water butts and raised bed planters has been ignored in the calculations, meaning the system would have spare capacity to accommodate an exceedance event. The proposed dwelling drainage would also be designed to modern standards and to accommodate at least the design event, meaning the chance for exceedance flows is likely reduced when compared to the existing dwelling.

3.4.5 The natural slope of the site is to the east, away from the existing and proposed dwelling meaning exceedance flows would flow east, away from the dwelling.

3.4.6 Exceedance events would be unlikely to occur given the additional capacity in the filter drains.

- 3.4.7 The design has been based on applying a Factor of Safety of 3, in accordance with the National Standards for SuDS. The soakage test pit was dug precisely where the soakaway will be located and at a similar depth to its proposed base. In addition, the filter drains, water butts and raised bed planters would provide additional storage capacity in repeat storms. Therefore, there is relatively high certainty regarding the rates calculated and a lower Factor of Safety could be applied. When applying a Factor of Safety of 1.5, the half drain time is 740 minutes in the 1 in 30 year event (Appendix D).

3.5 National Standard 4: Water Quality

- 3.5.1 The proposals include filter drains, which will be wrapped in an impermeable geotextile wrap, and a soakaway.
- 3.5.2 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. To provide adequate treatment, the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices.
- 3.5.3 Surface water runoff from 'residential roofs' are considered by Table 26.3 of the SuDS Manual to present a Very Low hazard to water quality (see Table 3-1).
- 3.5.4 Table 26.4 of the SuDS Manual provides SuDS mitigation indices for various SuDS methods discharging to the ground, as summarised in Table 3-1. This shows that the filter drains will provide sufficient mitigation of the likely pollutants expected. It should be noted that to follow a conservative approach, the greenroof, water butts and raised bed planters have been ignored from this calculation.

Table 3-1 Water Quality Indices (as per C753 The SuDS Manual)

		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Land Use	Residential Roofs	Very Low	0.2	0.2	0.05
Mitigation Indices	Filter Drain	-	0.4	0.4	0.4

3.6 National Standard 5: Amenity

- 3.6.1 Given the nature and scale of the development, this standard is not entirely relevant.
- 3.6.2 The proposed greenroof, water butts and raised bed SuDS planters would provide amenity value to the occupiers.

3.7 National Standard 6: Biodiversity

- 3.7.1 Given the nature and scale of the development, this standard is not entirely relevant. However, the greenroof and raised bed SuDS planters will provide biodiversity benefit and betterment over the existing system. In addition, filter media such as permeable surfacing and filter drains can encourage the development of microbial habitats, providing supporting species for wider ecosystems.

3.8 National Standard 7: Design for Construction and Maintenance

- 3.8.1 Maintenance of the proposed drainage infrastructure is essential for their operation. The maintenance responsibility will lie with the site owner and would be subject to manufacturers requirements. The proposed maintenance activities outlined below in Table 3-2 and Table 3-3 has been sourced from the CIRIA SuDS Manual.
- 3.8.2 Maintenance of all products is subject to manufacturer's recommendations, this would include the water butts and raised bed planters.

Table 3-2 Filter Drain Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching on the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace the overlying filter medium	Five yearly, or as required

	Clear perforated pipework of blockages	As required
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Table 3-3 Geocellular Crates Maintenance

Maintenance Schedule	Action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

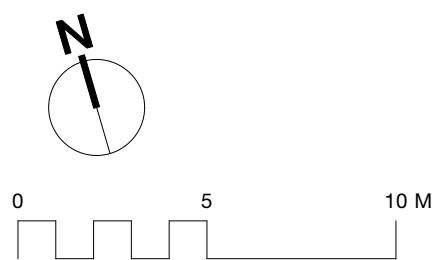
4 SUMMARY

- 4.1.1 The proposals are for the demolition of an existing dwelling and the erection of a self-build replacement dwelling; with associated parking, landscaping, private amenity space and access arrangements.
- 4.1.2 It is understood the existing dwelling drains directly to a soakaway. Testing to BRE365 specifications demonstrates infiltration to be viable.
- 4.1.3 It is therefore proposed to discharge runoff to a soakaway beneath the rear garden.
- 4.1.4 A greenroof and filter drains are proposed to provide additional storage, cleansing and slowing of flows to the soakaway. Water butts and raised bed SuDS planters would be proposed for additional cleansing, biodiversity, amenity and slowing of flows.
- 4.1.5 The various SuDS measures provide additional capacity in design or exceedance events, meaning the risk of system overload from repeat storms or exceedance is low and reduced when compared to existing.
- 4.1.6 As a result of the various SuDS measures and betterment proposed, the site is considered to be compliant with the National Standards for SuDS.

APPENDICES

APPENDIX A

Site Proposals



Milton Architects Ltd
Old Stables Court The Parade
Marlborough Wiltshire SN8 1NE

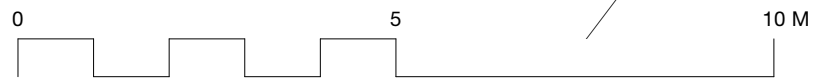
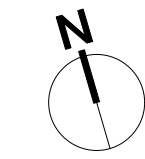
Telephone 01672 514354
Email mail@miltonarchitects.co.uk

Project : Astra Cottage
Oare
Replacement Dwelling
Contents: PROPOSED - Site Plan

Date : January 2026
Scale : 1:200
Size : ISO A2

Drawing : 2514 / 3_101 P4

milton architects



Milton Architects Ltd
Old Stables Court The Parade
Marlborough Wiltshire SN8 1NE
Telephone 01672 514354
Email mail@miltonarchitects.co.uk

Project : Astra Cottage
Oare
Replacement Dwelling
Contents: PROPOSED - Ground Floor Plan

Date : January 2026
Scale : 1:100
Size : ISO A2

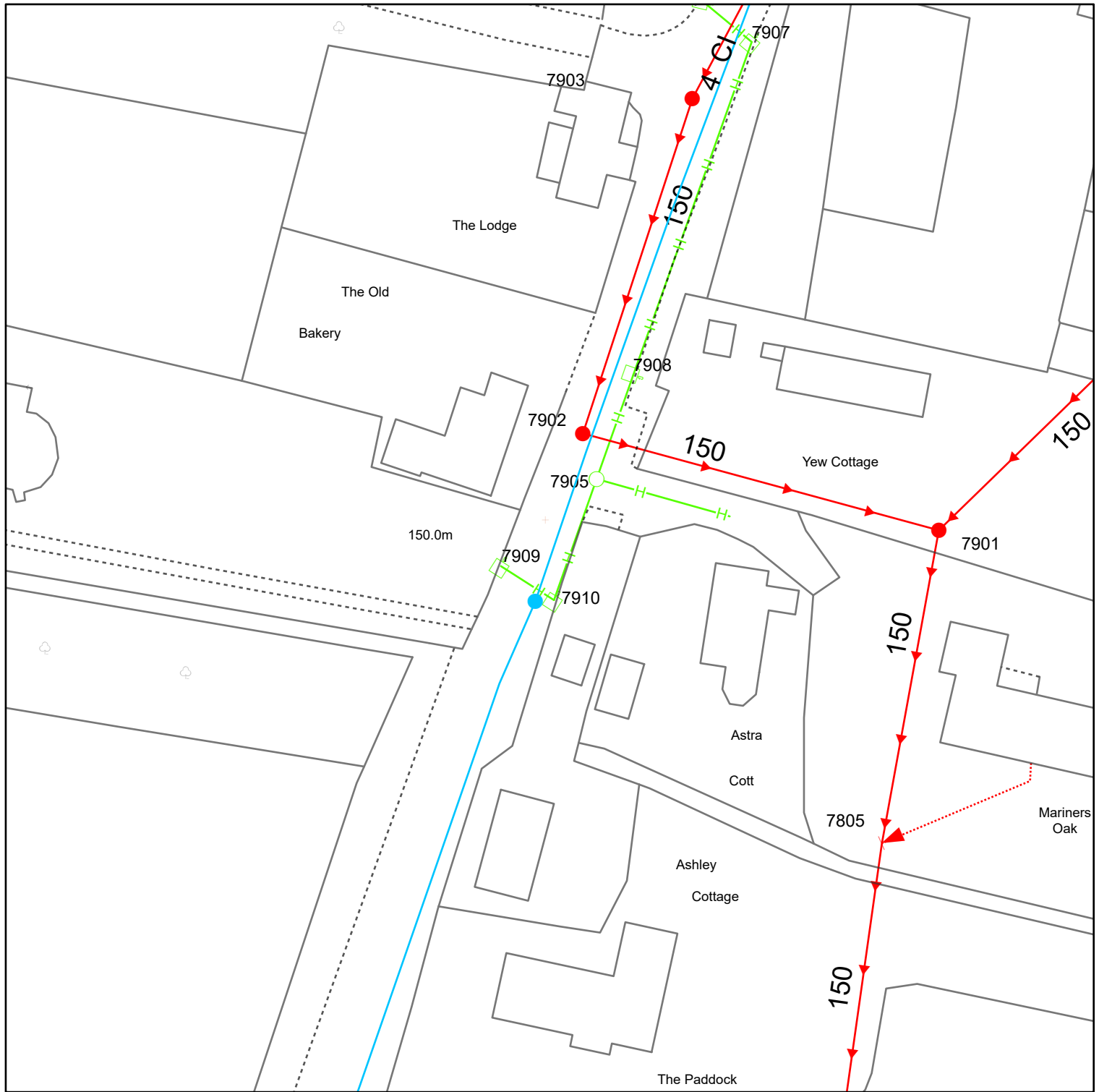
Drawing : 2514 / 3_201 P3

milton architects

APPENDIX B

Drainage Records

Wessex Water Network Map

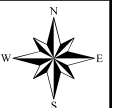


Reproduced from the Ordnance Survey map with the permission of the Controller of His Majesty's Stationery Office. © Crown copyright and database rights (2026) OS AC0000848304

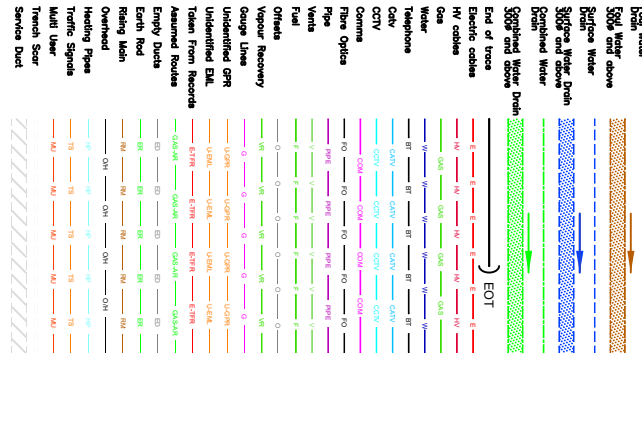
WATER MAINS		SEWERS		STRATEGIC		PUBLIC		PRIVATE		SECTION 104		OTHER WESSEX PIPES		NON-WESSEX / UNKNOWN	
	Distribution		Foul		Surface								Rising Mains		Private Rising Mains
	Washout		Surface		Combined								Standby Rising Mains		Culverted Watercourse
	Raw Water		Abandoned										Effluent Disposal		Highway Drain
	Abandoned												Overflow		Use Unknown
	Private												Syphon		Status Unknown
Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow). Some styles of line and symbol are shown on the key in sample/typical colours.															
FITTINGS		STRUCTURES													
	Hydrant		Manhole - Foul		Pumping Station - Surface										
	Other		Manhole - Surface		Pumping Stn - Foul/Combined										
			Manhole - Combined		Gully										
			Inlet		Outfall										
			Lamphole		Vent Column										
			Bifurcation - Foul		Rodding Eye										
			Bifurcation - Surface		Catchpit										
			Bifurcation - Combined		Flushing Chamber										
			Combined Sewage Overflow		Soakaway										
					Non Return Valve										
					Air Valve										
					Hatch Box										
					Washout										
OTHER STRUCTURES Attenuation Tank Chamber Storage Tank Tunnel Interceptor															
Wessex Water YTL GROUP															

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, tel: 01225 526633 or e-mail: developer.enquiries@wessexwater.co.uk to discuss your proposals. Details of assets within Wessex Water's land ownership are unavailable through this service.

Date: 27/03/2026
Centre: 415750E, 162912N
Scale: 1:625
(when printed at A4 size)



KEY FOR UNDERGROUND SERVICES



Always confirm location and depth of any service before excavation. Please refer to the relevant British Standard for the correct use of the symbols.

ABBREVIATION KEY

Abbreviation	Full Name
AS	Asphalt
BS	Brick
CS	Concrete
GS	Gravel
MS	Masonry
PS	Paving
SS	Subsoil
TS	Turf
VS	Vegetation
WS	Water
GS	Gravel
MS	Masonry
PS	Paving
SS	Subsoil
TS	Turf
VS	Vegetation
WS	Water

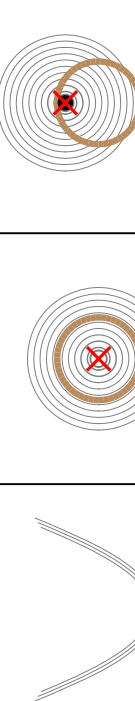
UTILITY SURVEY NOTES

The following notes apply to this survey. The survey was carried out on the 1st of October 2024. The survey was carried out by the following personnel: [Name], [Name], [Name]. The survey was carried out in accordance with the following standards: [Standard], [Standard], [Standard]. The survey was carried out in accordance with the following standards: [Standard], [Standard], [Standard].

Location of Depth Positions

Sewer/Duct

Metallic Service



Inset EM 1.20d of counter 1.20d

Topographical Survey Key



AMBER UTILITIES LTD

Milton Architects

SITE LOCATION

Astra Cottage,
Oare, Marlborough,
Wiltshire, SN8 4JA

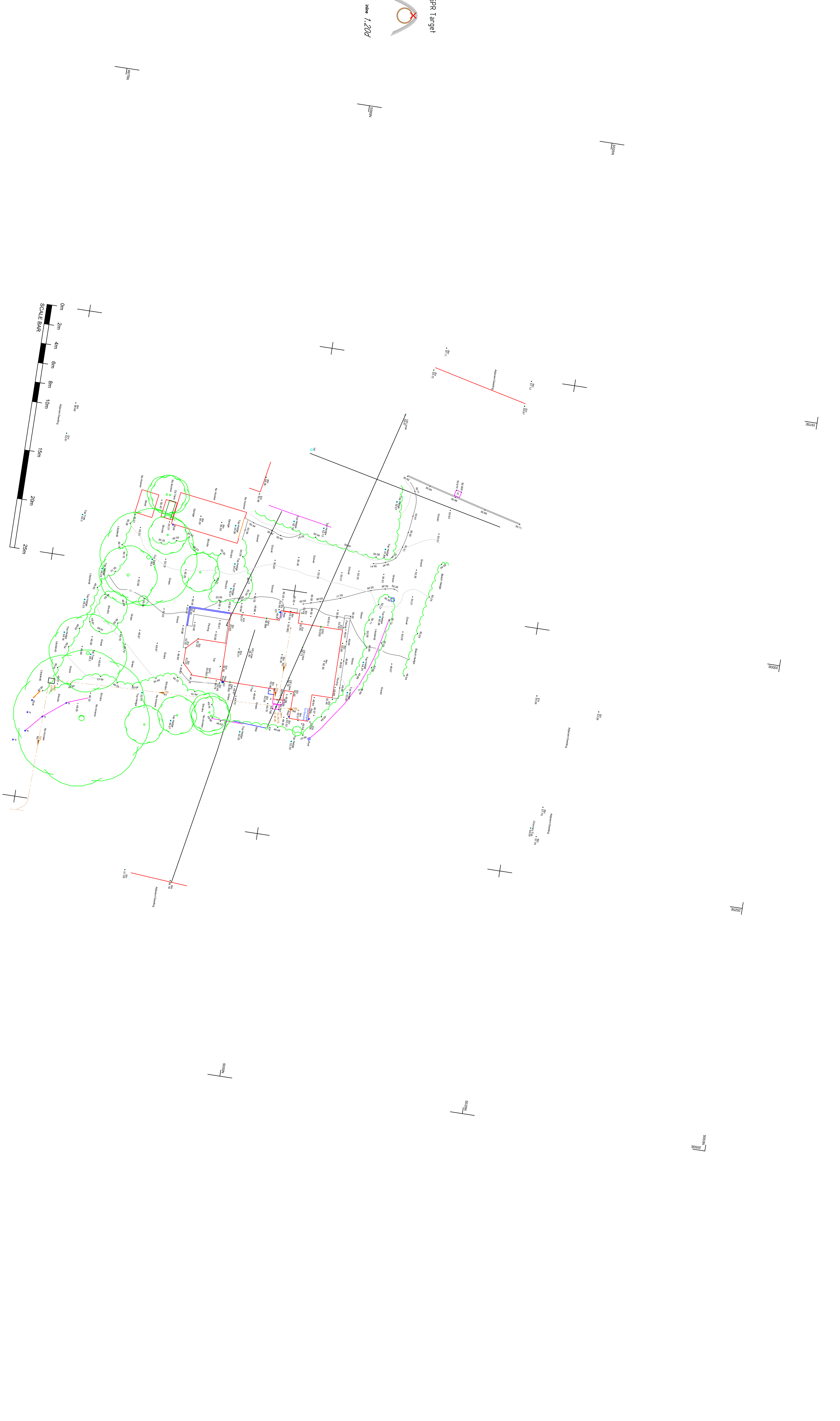
DRAWING TITLE

CCTV Survey

SUBMITTED BY: OH
DRAWN BY: OH
APPROVED BY: RM

DRAWING NO: U26-14549
SHEET DATE: March 2026

SCALE: 1:200 @ A1
SHEET NO: 1 OF 1



APPENDIX C

Soakage Test Results

CARTY

Building Contractors Ltd

UNIT 1, IVY HOUSE FARM, FYFIELD, MARLBOROUGH, WILTSHIRE, SN8 1PU

Astra Cottage, Oare

Ground condition very wet – overnight rain.

Test No. 1 – Date 25/3/26

Minutes	Mm
0	750
5	664
10	601
15	551
20	501
25	461
30	420
35	382
40	363
45	350
50	335
55	327
60	310
65	300
70	290
75	282
80	279
85	270
90	261
95	253
98	250

CARTY

Building Contractors Ltd

UNIT 1, IVY HOUSE FARM, FYFIELD, MARLBOROUGH, WILTSHIRE, SN8 1PU

Test No. 2 – Date 25/3/26

Minutes	Mm
0	750
5	700
10	651
15	610
20	568
25	530
30	495
35	470
40	460
45	455
50	450
55	445
60	440
65	436
70	431
90	405
110	384
130	357
150	336
200	282
230	250

Test No 3. – Date 26/3/26

Minutes	Mm
0	750
10	642
20	540
60	448
120	369
180	296
210	260
240	231

Tel: 01672 861399 - Email: admin@cartybuilders.co.uk

Company Reg: 3312570 - Reg'd Office: Amelia House, Crescent Road, Worthing, BN11 1QR

A345

Mariners Oak

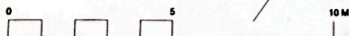
Soakaway to be 5m min. from the proposed building and 3m min. from boundaries

Proposal for Soakaway, Size to be Confirmed following Water Percolation Test

9707

8826

4131



Milton Architects Ltd
Old Stables Court The Parade
Marlborough Wiltshire SN8 1NE
Telephone 01672 514354
Email ma@miltonarchitects.co.uk

milton architects

Project : Astra Cottage
Oare
Replacement Dwelling
Contents: PROPOSED - Ground Floor Plan

Date : January 2026
Scale : 1:100
Size : ISO A2

Drawing : 2514 / 3_201_1

Soil Infiltration Calculation
to BRE Digest 365 *Soakaway Design*



Project No: 26-254-60
Project Name: Astra Cottage, Oare
Date: 27-Mar-26

$$\text{Soil infiltration rate } f = \frac{V_{p75-25}}{a_{s50} \times t_{p75-25}}$$

where:

V_{p75-25} = the effective storage volume of water in the soakage trial pit between 75% and 25% effective storage depth

a_{s50} = the internal surface area of the soakage trial pit up to 50% effective storage depth and including the base area

t_{p75-25} = the time for the water level to fall from 75% to 25% effective storage depth.

Soakaway test pit: Pit 1 - Test 1

Length of test pit = 1.000 m
Width of test pit = 0.300 m
Depth of test pit from ground level = 1.000 m

Soakaway test No. 1:

Depth at start of test = 1.000 m
Datum water level (always set to zero) = 0.000 m

75% of effective depth below datum = 0.750 m Time, t_{75} = 0 mins
50% of effective depth below datum = 0.500 m
25% of effective depth below datum = 0.250 m Time, t_{25} = 98 mins

V_{p75-25} = 0.150 m³ t_{p75-25} = 98 mins
 A_{p50} = 1.600 m²

Soil infiltration rate, f = 1.6E-05 m/sec
Soil infiltration rate, f = 0.057 m/hr

Soakaway test pit: Pit 1 - Test 2

Length of test pit = 1.000 m
Width of test pit = 0.300 m
Depth of test pit from ground level = 1.000 m

Soakaway test No. 2

Depth at start of test = 1.000 m

75% of effective depth below datum = 0.750 m Time, t_{75} = 0 mins
50% of effective depth below datum = 0.500 m
25% of effective depth below datum = 0.250 m Time, t_{25} = 230 mins

V_{p75-25} = 0.150 m³ t_{p75-25} = 230 mins
 A_{p50} = 1.600 m²

Soil infiltration rate, f = 6.8E-06 m/sec
Soil infiltration rate, f = 0.024 m/hr

Soakaway test pit: Pit 1 - Test 3

Length of test pit = 1.000 m
Width of test pit = 0.300 m
Depth of test pit from ground level = 1.000 m

Soakaway test No. 3:

Depth at start of test = 1.000 m

75% of effective depth below datum = 0.750 m Time, t_{75} = 0 mins
50% of effective depth below datum = 0.500 m
25% of effective depth below datum = 0.250 m Time, t_{25} = 240 mins

V_{p75-25} = 0.150 m³ t_{p75-25} = 240 mins
 A_{p50} = 1.600 m²

Soil infiltration rate, f = 6.5E-06 m/sec
Soil infiltration rate, f = 0.023 m/hr

APPENDIX D

Microdrainage Results

Calibro Consultants Ltd		Page 1
Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 100+45%	
Date 30/03/2026 File 26-254 - Soakaway.SRCX	Designed by PG Checked by CF	
XP Solutions	Source Control 2020.1	

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 2124 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	0.348	0.348	0.1	6.5	O K
30 min Summer	0.473	0.473	0.1	8.8	O K
60 min Summer	0.611	0.611	0.1	11.3	O K
120 min Summer	0.717	0.717	0.1	13.3	Flood Risk
180 min Summer	0.781	0.781	0.1	14.5	Flood Risk
240 min Summer	0.824	0.824	0.1	15.3	Flood Risk
360 min Summer	0.881	0.881	0.1	16.3	Flood Risk
480 min Summer	0.916	0.916	0.1	17.0	Flood Risk
600 min Summer	0.939	0.939	0.1	17.4	Flood Risk
720 min Summer	0.954	0.954	0.1	17.7	Flood Risk
960 min Summer	0.968	0.968	0.1	17.9	Flood Risk
1440 min Summer	0.961	0.961	0.1	17.8	Flood Risk
2160 min Summer	0.924	0.924	0.1	17.1	Flood Risk
2880 min Summer	0.890	0.890	0.1	16.5	Flood Risk
4320 min Summer	0.830	0.830	0.1	15.4	Flood Risk
5760 min Summer	0.782	0.782	0.1	14.5	Flood Risk
7200 min Summer	0.748	0.748	0.1	13.9	Flood Risk
8640 min Summer	0.721	0.721	0.1	13.4	Flood Risk
10080 min Summer	0.699	0.699	0.1	13.0	O K
15 min Winter	0.348	0.348	0.1	6.5	O K
30 min Winter	0.473	0.473	0.1	8.8	O K
60 min Winter	0.611	0.611	0.1	11.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	150.609	0.0	72
30 min Summer	100.948	0.0	84
60 min Summer	64.705	0.0	104
120 min Summer	38.028	0.0	148
180 min Summer	27.756	0.0	194
240 min Summer	22.156	0.0	246
360 min Summer	16.076	0.0	364
480 min Summer	12.780	0.0	484
600 min Summer	10.684	0.0	602
720 min Summer	9.222	0.0	722
960 min Summer	7.299	0.0	962
1440 min Summer	5.224	0.0	1440
2160 min Summer	3.720	0.0	1812
2880 min Summer	2.925	0.0	2164
4320 min Summer	2.089	0.0	2980
5760 min Summer	1.656	0.0	3808
7200 min Summer	1.397	0.0	4616
8640 min Summer	1.224	0.0	5448
10080 min Summer	1.099	0.0	6256
15 min Winter	150.609	0.0	72
30 min Winter	100.948	0.0	84
60 min Winter	64.705	0.0	106

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 100+45%	
Date 30/03/2026 File 26-254 - Soakaway.SRCX	Designed by PG Checked by CF	
XP Solutions	Source Control 2020.1	

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
120 min Winter	0.717	0.717	0.1	13.3	Flood Risk
180 min Winter	0.781	0.781	0.1	14.5	Flood Risk
240 min Winter	0.825	0.825	0.1	15.3	Flood Risk
360 min Winter	0.883	0.883	0.1	16.4	Flood Risk
480 min Winter	0.918	0.918	0.1	17.0	Flood Risk
600 min Winter	0.942	0.942	0.1	17.4	Flood Risk
720 min Winter	0.957	0.957	0.1	17.7	Flood Risk
960 min Winter	0.973	0.973	0.1	18.0	Flood Risk
1440 min Winter	0.970	0.970	0.1	18.0	Flood Risk
2160 min Winter	0.930	0.930	0.1	17.2	Flood Risk
2880 min Winter	0.891	0.891	0.1	16.5	Flood Risk
4320 min Winter	0.819	0.819	0.1	15.2	Flood Risk
5760 min Winter	0.756	0.756	0.1	14.0	Flood Risk
7200 min Winter	0.706	0.706	0.1	13.1	Flood Risk
8640 min Winter	0.664	0.664	0.1	12.3	O K
10080 min Winter	0.628	0.628	0.1	11.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
120 min Winter	38.028	0.0	148
180 min Winter	27.756	0.0	194
240 min Winter	22.156	0.0	244
360 min Winter	16.076	0.0	360
480 min Winter	12.780	0.0	478
600 min Winter	10.684	0.0	594
720 min Winter	9.222	0.0	710
960 min Winter	7.299	0.0	940
1440 min Winter	5.224	0.0	1384
2160 min Winter	3.720	0.0	1992
2880 min Winter	2.925	0.0	2248
4320 min Winter	2.089	0.0	3160
5760 min Winter	1.656	0.0	4088
7200 min Winter	1.397	0.0	4976
8640 min Winter	1.224	0.0	5872
10080 min Winter	1.099	0.0	6664

Calibro Consultants Ltd		Page 3
Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 100+45%	
Date 30/03/2026	Designed by PG	
File 26-254 - Soakaway.SRCX	Checked by CF	
XP Solutions	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 415600 162905 SU 15600 62905	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Green Roof

Area (m³)	45	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.000818	24 28 0.000246	48 52 0.000074	72 76 0.000022	96 100 0.000007					
4 8 0.000670	28 32 0.000202	52 56 0.000061	76 80 0.000018	100 104 0.000006					
8 12 0.000548	32 36 0.000165	56 60 0.000050	80 84 0.000015	104 108 0.000005					
12 16 0.000449	36 40 0.000135	60 64 0.000041	84 88 0.000012	108 112 0.000004					
16 20 0.000367	40 44 0.000111	64 68 0.000033	88 92 0.000010	112 116 0.000003					
20 24 0.000301	44 48 0.000091	68 72 0.000027	92 96 0.000008	116 120 0.000002					

Time Area Diagram

Total Area (ha) 0.014

Time (mins)	Area
From: To: (ha)	
0 4 0.014	

Calibro Consultants Ltd		Page 4
Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 100+45%	
Date 30/03/2026 File 26-254 - Soakaway.SRCX	Designed by PG Checked by CF	
XP Solutions	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.02300 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.02300

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	19.5	19.5	1.000	19.5	38.5

Calibro Consultants Ltd		Page 1
Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
Date 30/03/2026	Designed by PG	
File 26-254 - Soakaway_1 in 30.SRCX	Checked by CF	
XP Solutions	Source Control 2020.1	

Summary of Results for 100 year Return Period

Half Drain Time : 1637 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.234	0.234	0.1	4.3	O K
30 min Summer	0.320	0.320	0.1	5.9	O K
60 min Summer	0.414	0.414	0.1	7.7	O K
120 min Summer	0.486	0.486	0.1	9.0	O K
180 min Summer	0.528	0.528	0.1	9.8	O K
240 min Summer	0.557	0.557	0.1	10.3	O K
360 min Summer	0.592	0.592	0.1	11.0	O K
480 min Summer	0.613	0.613	0.1	11.3	O K
600 min Summer	0.624	0.624	0.1	11.6	O K
720 min Summer	0.631	0.631	0.1	11.7	O K
960 min Summer	0.633	0.633	0.1	11.7	O K
1440 min Summer	0.617	0.617	0.1	11.4	O K
2160 min Summer	0.586	0.586	0.1	10.9	O K
2880 min Summer	0.558	0.558	0.1	10.3	O K
4320 min Summer	0.509	0.509	0.1	9.4	O K
5760 min Summer	0.470	0.470	0.1	8.7	O K
7200 min Summer	0.440	0.440	0.1	8.2	O K
8640 min Summer	0.415	0.415	0.1	7.7	O K
10080 min Summer	0.394	0.394	0.1	7.3	O K
15 min Winter	0.234	0.234	0.1	4.3	O K
30 min Winter	0.320	0.320	0.1	5.9	O K
60 min Winter	0.414	0.414	0.1	7.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	103.868	0.0	66
30 min Summer	69.620	0.0	79
60 min Summer	44.624	0.0	100
120 min Summer	26.226	0.0	142
180 min Summer	19.142	0.0	190
240 min Summer	15.280	0.0	244
360 min Summer	11.087	0.0	364
480 min Summer	8.814	0.0	482
600 min Summer	7.369	0.0	602
720 min Summer	6.360	0.0	722
960 min Summer	5.034	0.0	960
1440 min Summer	3.603	0.0	1312
2160 min Summer	2.566	0.0	1664
2880 min Summer	2.017	0.0	2044
4320 min Summer	1.441	0.0	2856
5760 min Summer	1.142	0.0	3688
7200 min Summer	0.964	0.0	4536
8640 min Summer	0.844	0.0	5280
10080 min Summer	0.758	0.0	6144
15 min Winter	103.868	0.0	66
30 min Winter	69.620	0.0	79
60 min Winter	44.624	0.0	100

Calibro Consultants Ltd		Page 2
Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
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File 26-254 - Soakaway_1 in 30.SRCX	Checked by CF	
XP Solutions		Source Control 2020.1

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
120 min Winter	0.486	0.486	0.1	9.0	O K
180 min Winter	0.529	0.529	0.1	9.8	O K
240 min Winter	0.558	0.558	0.1	10.3	O K
360 min Winter	0.593	0.593	0.1	11.0	O K
480 min Winter	0.614	0.614	0.1	11.4	O K
600 min Winter	0.627	0.627	0.1	11.6	O K
720 min Winter	0.634	0.634	0.1	11.7	O K
960 min Winter	0.638	0.638	0.1	11.8	O K
1440 min Winter	0.623	0.623	0.1	11.5	O K
2160 min Winter	0.586	0.586	0.1	10.9	O K
2880 min Winter	0.554	0.554	0.1	10.3	O K
4320 min Winter	0.490	0.490	0.1	9.1	O K
5760 min Winter	0.435	0.435	0.1	8.1	O K
7200 min Winter	0.391	0.391	0.1	7.2	O K
8640 min Winter	0.354	0.354	0.1	6.5	O K
10080 min Winter	0.321	0.321	0.1	5.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
120 min Winter	26.226	0.0	142
180 min Winter	19.142	0.0	190
240 min Winter	15.280	0.0	242
360 min Winter	11.087	0.0	360
480 min Winter	8.814	0.0	476
600 min Winter	7.369	0.0	592
720 min Winter	6.360	0.0	706
960 min Winter	5.034	0.0	932
1440 min Winter	3.603	0.0	1364
2160 min Winter	2.566	0.0	1708
2880 min Winter	2.017	0.0	2164
4320 min Winter	1.441	0.0	3072
5760 min Winter	1.142	0.0	3960
7200 min Winter	0.964	0.0	4824
8640 min Winter	0.844	0.0	5624
10080 min Winter	0.758	0.0	6456

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
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XP Solutions	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 415600 162905 SU 15600 62905	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Green Roof

Area (m³)	45	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.000818	24 28	0.000246	48 52	0.000074	72 76	0.000022	96 100	0.000007
4 8	0.000670	28 32	0.000202	52 56	0.000061	76 80	0.000018	100 104	0.000006
8 12	0.000548	32 36	0.000165	56 60	0.000050	80 84	0.000015	104 108	0.000005
12 16	0.000449	36 40	0.000135	60 64	0.000041	84 88	0.000012	108 112	0.000004
16 20	0.000367	40 44	0.000111	64 68	0.000033	88 92	0.000010	112 116	0.000003
20 24	0.000301	44 48	0.000091	68 72	0.000027	92 96	0.000008	116 120	0.000002

Time Area Diagram

Total Area (ha) 0.014

Time (mins)	Area
From: To:	(ha)
0 4	0.014

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
Date 30/03/2026	Designed by PG	
File 26-254 - Soakaway_1 in 30.SRCX	Checked by CF	
XP Solutions	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 3.0

Infiltration Coefficient Base (m/hr) 0.02300 Porosity 0.95

Infiltration Coefficient Side (m/hr) 0.02300

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	19.5	19.5	1.000	19.5	38.5

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
Date 30/03/2026	Designed by PG	
File 26-254 - Soakaway_1 in 30_FoS 1...	Checked by CF	
XP Solutions		Source Control 2020.1

Summary of Results for 100 year Return Period

Half Drain Time : 740 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.225	0.225	0.1	4.2	O K
30 min Summer	0.309	0.309	0.1	5.7	O K
60 min Summer	0.401	0.401	0.1	7.4	O K
120 min Summer	0.467	0.467	0.1	8.6	O K
180 min Summer	0.502	0.502	0.1	9.3	O K
240 min Summer	0.522	0.522	0.1	9.7	O K
360 min Summer	0.540	0.540	0.1	10.0	O K
480 min Summer	0.543	0.543	0.1	10.1	O K
600 min Summer	0.538	0.538	0.1	10.0	O K
720 min Summer	0.532	0.532	0.1	9.9	O K
960 min Summer	0.518	0.518	0.1	9.6	O K
1440 min Summer	0.486	0.486	0.1	9.0	O K
2160 min Summer	0.438	0.438	0.1	8.1	O K
2880 min Summer	0.397	0.397	0.1	7.3	O K
4320 min Summer	0.326	0.326	0.1	6.0	O K
5760 min Summer	0.270	0.270	0.1	5.0	O K
7200 min Summer	0.227	0.227	0.1	4.2	O K
8640 min Summer	0.192	0.192	0.1	3.6	O K
10080 min Summer	0.164	0.164	0.1	3.0	O K
15 min Winter	0.225	0.225	0.1	4.2	O K
30 min Winter	0.309	0.309	0.1	5.7	O K
60 min Winter	0.401	0.401	0.1	7.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	103.868	0.0	53
30 min Summer	69.620	0.0	65
60 min Summer	44.624	0.0	86
120 min Summer	26.226	0.0	130
180 min Summer	19.142	0.0	184
240 min Summer	15.280	0.0	242
360 min Summer	11.087	0.0	362
480 min Summer	8.814	0.0	480
600 min Summer	7.369	0.0	584
720 min Summer	6.360	0.0	628
960 min Summer	5.034	0.0	752
1440 min Summer	3.603	0.0	1010
2160 min Summer	2.566	0.0	1424
2880 min Summer	2.017	0.0	1824
4320 min Summer	1.441	0.0	2636
5760 min Summer	1.142	0.0	3400
7200 min Summer	0.964	0.0	4176
8640 min Summer	0.844	0.0	4848
10080 min Summer	0.758	0.0	5576
15 min Winter	103.868	0.0	53
30 min Winter	69.620	0.0	66
60 min Winter	44.624	0.0	86

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
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File 26-254 - Soakaway_1 in 30_FoS 1...	Checked by CF	
XP Solutions		Source Control 2020.1

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
120 min Winter	0.467	0.467	0.1	8.7	O K
180 min Winter	0.503	0.503	0.1	9.3	O K
240 min Winter	0.523	0.523	0.1	9.7	O K
360 min Winter	0.542	0.542	0.1	10.0	O K
480 min Winter	0.547	0.547	0.1	10.1	O K
600 min Winter	0.544	0.544	0.1	10.1	O K
720 min Winter	0.536	0.536	0.1	9.9	O K
960 min Winter	0.518	0.518	0.1	9.6	O K
1440 min Winter	0.479	0.479	0.1	8.9	O K
2160 min Winter	0.417	0.417	0.1	7.7	O K
2880 min Winter	0.360	0.360	0.1	6.7	O K
4320 min Winter	0.265	0.265	0.1	4.9	O K
5760 min Winter	0.191	0.191	0.1	3.5	O K
7200 min Winter	0.136	0.136	0.1	2.5	O K
8640 min Winter	0.095	0.095	0.1	1.8	O K
10080 min Winter	0.066	0.066	0.1	1.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
120 min Winter	26.226	0.0	130
180 min Winter	19.142	0.0	182
240 min Winter	15.280	0.0	240
360 min Winter	11.087	0.0	354
480 min Winter	8.814	0.0	466
600 min Winter	7.369	0.0	574
720 min Winter	6.360	0.0	678
960 min Winter	5.034	0.0	770
1440 min Winter	3.603	0.0	1072
2160 min Winter	2.566	0.0	1524
2880 min Winter	2.017	0.0	1960
4320 min Winter	1.441	0.0	2768
5760 min Winter	1.142	0.0	3520
7200 min Winter	0.964	0.0	4256
8640 min Winter	0.844	0.0	4928
10080 min Winter	0.758	0.0	5544

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File 26-254 - Soakaway_1 in 30_FoS 1...	Checked by CF	
XP Solutions	Source Control 2020.1	

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 415600 162905 SU 15600 62905	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Green Roof

Area (m³)	45	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.000818	24 28 0.000246	48 52 0.000074	72 76 0.000022	96 100 0.000007					
4 8 0.000670	28 32 0.000202	52 56 0.000061	76 80 0.000018	100 104 0.000006					
8 12 0.000548	32 36 0.000165	56 60 0.000050	80 84 0.000015	104 108 0.000005					
12 16 0.000449	36 40 0.000135	60 64 0.000041	84 88 0.000012	108 112 0.000004					
16 20 0.000367	40 44 0.000111	64 68 0.000033	88 92 0.000010	112 116 0.000003					
20 24 0.000301	44 48 0.000091	68 72 0.000027	92 96 0.000008	116 120 0.000002					

Time Area Diagram

Total Area (ha) 0.014

Time (mins)	Area
From: To: (ha)	
0 4 0.014	

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Whitefriars Bristol BS1 2NT	Astra Cottage, Oare Soakaway 1 in 30	
Date 30/03/2026	Designed by PG	
File 26-254 - Soakaway_1 in 30_FoS 1...	Checked by CF	
XP Solutions	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 1.5

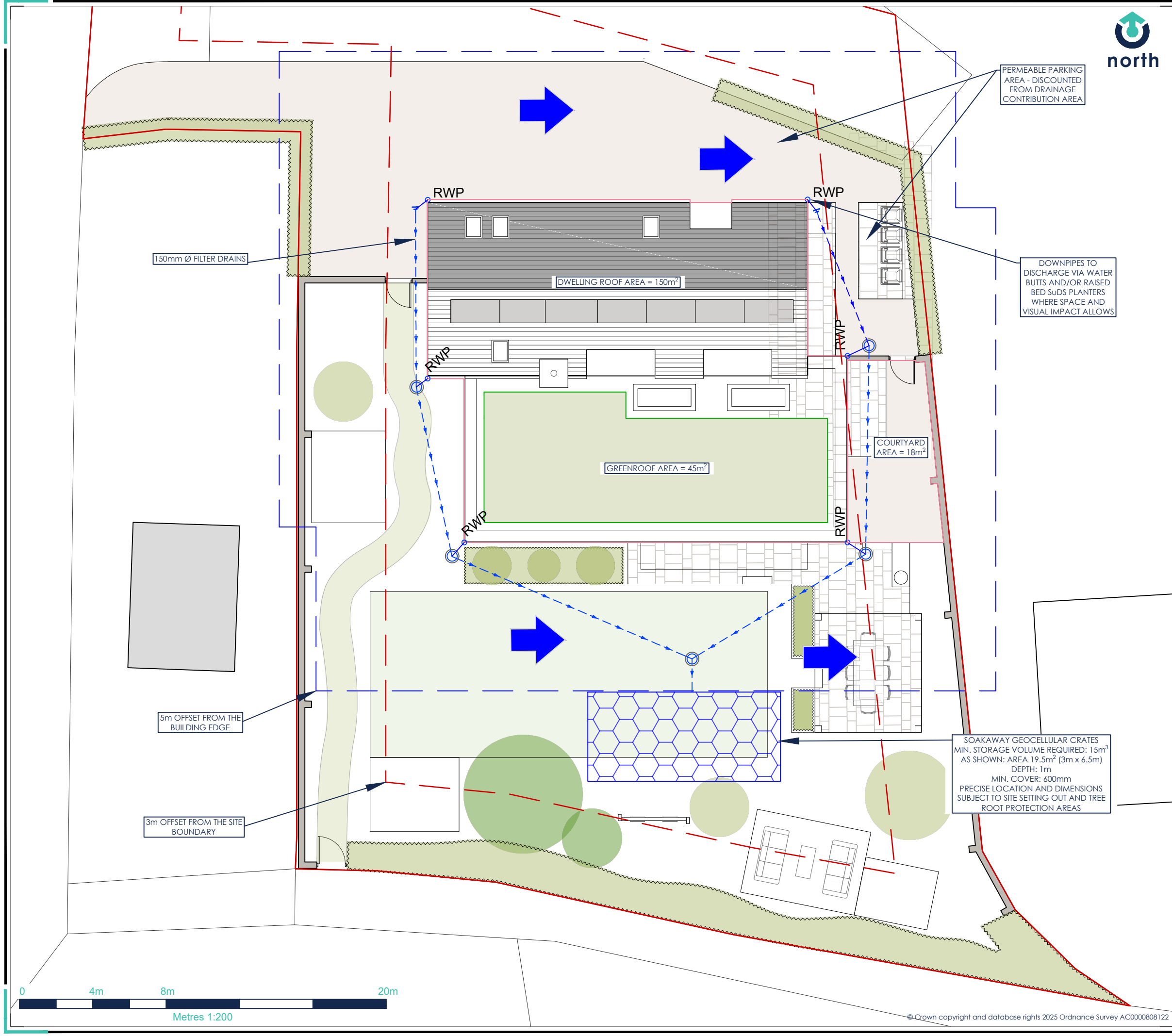
Infiltration Coefficient Base (m/hr) 0.02300 Porosity 0.95

Infiltration Coefficient Side (m/hr) 0.02300

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	19.5	19.5	1.000	19.5	38.5

APPENDIX E

Drainage Strategy



Base drawing provided by:
MILTON ARCHITECTS

Drawing No:
2514 / 3_101 P2

Dated:
January 2026

Received:
March 2026

- LEGEND**
- PROPOSED FILTER DRAINS
 - AREA DRAINING TO SOAKAWAY
 - AREA OF GREENROOF
 - RAINWATER DOWNPIPES (RWP)
 - RODDING EYE
 - INSPECTION CHAMBER/CATCH PIT
 - EXCEEDANCE FLOW ROUTE

- NOTES:**
- ALL PROPOSED DRAINAGE FEATURES, DIAMETERS AND LEVELS SUBJECT TO DETAILED DESIGN AND SITE SETTING OUT
 - NOT SUITABLE FOR CONSTRUCTION
 - DO NOT SCALE FROM THIS DRAWING
 - PRODUCTS TO BE INSTALLED FOLLOWING MANUFACTURERS REQUIREMENTS
 - FILTER DRAIN PERFORATED PIPE TO BE WRAPPED IN PERMEABLE TEXTILE.
 - FILTER DRAIN TRENCH TO BE WRAPPED IN IMPERMEABLE MEMBRANE TO PROTECT BUILDING FOUNDATIONS
 - SUDS PLANTERS AND WATER BUTTS NOT SHOWN AS THEY ARE SUBJECT TO VISUAL AND ACCESS IMPACT ASSESSMENT BASED ON FINAL SITE DESIGN

00	FIRST ISSUE	IF	WW	01-01-25
REV:	DESCRIPTION:	BY:	CHK:	DATE:
STATUS:		FOR PLANNING		
CLIENT:		SRI & DAN GORE		
SITE:		ASTRA COTTAGE, OARE		
TITLE:		DRAINAGE STRATEGY		



SCALE:		DATE:		DRAWN:		CHECKED:
1:200 @ A3		31/03/2026		PG		CB
PROJECT:	COMPANY:	TYPE:	DRAWING NO:	SHEET NO:	REVISION:	
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