DUFFY ASSOCIATES

STRUCTURAL AND CIVIL ENGINEERS

HILL HOUSE

Colden Lane, Old Alresford, SO24 9DY

CONDITION DISCHARGE REPORT

SURFACE WATER MANAGEMENT

FOUL WATER MANAGEMENT

Ref 2420

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SUMMARY

This report contains the details of a SUDS Drainage Strategy carried out by Duffy Associates Ltd to Discharge Condition 9 of Planning Permission 23/01673/FUL granted by Winchester City Council on 20.11.2023 for Hill House, Colden Lane, Old Alresford SO24 9DY.

Surface Water Management

Foul Water Management

(to meet Binding Rules 2024 & EA Permit requirements)

Conditions Discharge Report

Includes Soakage Test Report and GI Information
Binding Rules: Evidence of full compliance
EA Environmental Permit process underway

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1. SCOPE

This report has been prepared for Hill House and must not be relied upon by any other party without the explicit written permission of DA Ltd.

All parties to this report do not intend any of the terms of the Contracts (Right of Third Parties Act 1999) to apply to this report.

Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future or provide exact specifications / warranties for the products used.

2. INTRODUCTION

The information source used to undertake this FRA & SUDS / Drainage Strategy has been collected from the following sources:

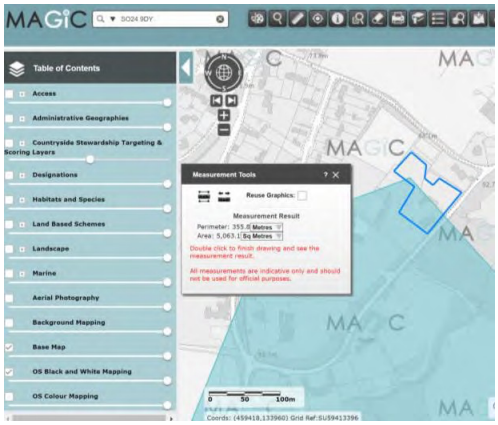
- British Geological Survey Website & iGeology App
- EA Website & Data
- Winchester Strategic Flood Risk Assessment (2015 / 2018);
- Winchester Council Website and Local Plan
- Hampshire as the Lead Local Flood Authority (LLFA) Surface Water Management Plan (SWMP)
- Internet mapping and searches

3. EXISTING SITE STATUS AND ENVIRONMENTAL SETTING

3.1. Site Location and Status

The site is currently occupied by the existing dwelling, annex, outbuildings and part hard / soft landscaping. The main new build area i.e. new landscaping and swimming pool included is c. 0.5,063ha (5,603.00m2).

As a precautionary approach to oversize the storage, the catchment areas for the SUDS are based on the footprint areas and the adjacent hardstanding can be seen in Appendix B:



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3.2. Geology

Based on the known geology of the area and from BGS mapping and surrounding adjacent boreholes:

- Bedrock: Seaford Chalk
- Superficial deposits: none present

No lost / underground rivers documented at the site or near the site nor identifiable by the local geology mapping.
Given size of the site, the geology and nature of the type of scheme, the SUDS strategy is determined to be an infiltration solution using also Source Control SUDS.
There will be no surcharging as all the flow can be stored to the 1in100year+40% and discharged at a lower rate than existing to the ground.

3.3. Ground Investigation & BRE 365 Testing

A site and drainage scheme specific ground investigation (GI) with BRE 365 Testing was designed and undertaken in February 2024.
See **Appendix A** for the full report (Southern Testing Laboratories Ltd, JT0572).
The GI was during groundwater flooding warnings in Alresford, due to a number of months / winter period of significant rainfall totals.
It is therefore considered to be an investigation undertaken to represent the appropriate worse case "winter" high groundwater level scenario.
In summary:
No groundwater was encountered in the investigation to a depth of 1.6m below ground level.
The soakage tests were designed by the drainage team and hence undertaken in the accessible areas that are representative of where the soakaways could be incorporated in the scheme.
The soakage tests indicated favourable conditions for infiltration such that soakaways have been designed as the discharge method for the surface water and the foul water via a new package treatment works.
The soakage tests and trial pitting indicate the soakaways can be shallow and founded in the chalk:

The infiltration rate from each trial hole is summarised in the table below. The soakage rate in this report in expressed as ℓ/m²/minute, which is a convenient rate to use. The BRE use a unit of m/sec, which is the value in l/m²/minute divided by 60,000.

Test ID	Test Depth (mbgl)	Test No.	Design Infiltration Rate	
			ℓ/m²/minute	m/sec
SA01	1.6	1	3.45	5.76×10^{-5}
		2	1.05	1.75×10^{-5}
		3	1.43	2.38×10^{-5}
SA02	1.5	1	21.28	3.55×10^{-4}
		2	14.80	2.47×10^{-4}
		3	14.04	2.34×10^{-4}
SA03	1.5	1	9.46	1.58×10^{-4}
		2	7.27	1.21×10^{-4}
		3	7.00	1.17×10^{-4}

Note: The Design Infiltration Rate is the lowest of the three tests

The infiltration rates obtained for this site suggest that the site is suitable for shallow soakaways within the Chalk stratum.

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3.4. Planning Stage Approval / Existing Drainage

The scheme is an approved replacement dwelling, annex and swimming pool with maximised porous and permeable areas.

The existing site is functioning in terms of drainage with connections to soakaway and a septic tank (septic tank to be replaced with new package treatment works as per new Binding Rules requirements).

There are no sewers.

There are existing manholes which will not be re-used for the new houses, instead a new scheme will be developed, which

- maximises porous and permeable areas
- provides the required source control for existing, proposed and greater than proposed impermeable areas

The SUDS designs are:

- Porous / Permeable areas
- Source Control informal storage SUDS Rain Garden Planters
- Source Control informal storage SUDS Permeable paving with perforated pipes and storage subbase
- Storage and Discharge Method:
    - Oversized SUDS cellular storage to store for 100% of the 1in100year+40%cc

This scheme will manage 100% of formal drainage surface water using SUDS and soakaways; the scheme has addressed the SUDS sequential approach and reduces flood risk posed from the infrastructure to surrounding properties by future-proofing: 100% accommodating for climate change.

4. PLANNING CONDITIONS: Surface Water SUDS Design

4.1. Area calculations

- Refer to **Appendix B** for the area calculations and catchment areas used for the SUDS.
- The scheme maximises porous and permeable areas
- Calculations assume 100% of the impermeable areas to demonstrate a full oversizing for future-proofing

The site has been previously developed and presently drains to soakaways.

4.2. SUDS Storage Calculations

Calculations are prepared based on the Micro Drainage software package to assess the size of structure required for the appropriate 100% amount of impermeable areas, climate change.

- Assume an overestimate of 100% of the impermeable scheme areas for the calculations
- Assume storage for the full 1in100year + 40%
    - (This is 40% for climate change allowance which is compliant)
- Assume 2.0 l/s as lowest possible discharge rate for the sizing of storage
- Soakaway is sized based on the infiltration rate from the site and scheme specific GI
    - Scheme uses hybrid discharge of low order infiltration using Source Control with discharge to 3 number soakaways based on the catchment areas of formal drainage shown in **Appendix B.**

The output calculations are provided in **Appendix B**

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4.3. Connections and Inverts

Appendix B shows the connections, cover levels and invert levels for the critical pipe runs, manholes and inspection chambers.

As per confirmation of the landscape and architects setting out site levels:

- Roof levels (gutters to rainwater downpipes) all new to be gravity drained
- Diverters can be used for RWP's to discharge over porous / permeable areas and thence to perforated pipes and communication to the relevant soakaways for discharge to ground based on the BRE365 Test results
- All connections, pipe materials / sizes / falls as per Building Regs (1in80 to 1in100 surface water / 1in60 to 1in80 for foul flows)

4.4. SUDS Specifications

Formal SUDS Type	Source Control	Dimensions	Storage Volume
Porous and Permeable Areas Maximised	YES	n/a	n/a
Permeable paving	YES	All hardstanding to be maximized for permeable paving	n/a
Permeable Paving with lined granular storage & French Drain Areas Type 3 No Fine Angular Subbase: shallow to retain higher invert	YES	Minimum amount (i.e. more will be incorporated) <u>Annex & Hardstanding</u> Outside of Root Protection Zones (See Appendix B) 57.75m2 (minimum to show worse case) Use 0.35m depth of granular storage = 20.213m3 Assume only 30% void space =6.06m3 (See cover and invert levels below)	6.06m3
Rain Garden Planters	YES	Main House (adjacent west elevation and on raised terrace to rear as per landscaping layout) Total length of 15m with 0.4m height void storage 20.0m height with 0.2m height void storage (planters on terrace need to be lower in height) Width of 0.4m minimum = 3.0m3 + 2.0m3 = 5.0m3	5.0m3
Storage & Discharge: Geocellular Storage Hybrid	YES where RWP's first discharge over porous/ permeable areas	RWP's with diverters to first discharge over permeable / porous areas where RWP's allow Soakaway 1: 40.05m3 Soakaway 2: 17.1m3 Soakaway 3: 5.4m3 = 62.55m3	62.55m3
		Total	73.61m3 > than the oversized storage & soakaway volumes required

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Why Lined Granular rather than just Geocellular?

This is a more sustainable form as the granular material can be reclaimed materials and also does not require more heavily engineered conveyance infrastructure.

Even though there are recycled plastic geocellular products on the market, these still require energy and emissions to produce.

Granular material is in lifecycle terms a much more sustainable approach.

All new permeable areas can be constructed to the EA guidance for permeable paving SUDS:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7728/pavingfrontgardens.pdf

But what about the void ratio of Granular vs Geocellular?

It is considered that given the actual volume of storage calculated has been significantly over calculated, this is appropriate to account for the lifetime silting up of the granular material.

The granular material is used to provide additional Source Control SUDS for future-proofing and to aid the drainage in the lower order storms from flooding paving areas. The smaller void ratio of the granular material has been accommodated.

- The scheme will also be attenuating for a larger amount of area that is existing unattenuated: immediate betterment:

Inverts of lowest storage for geocellular as evidence of suitable gravity connection:

- Cover level of 0.3m as a precaution
- Depth of cellular: 0.60m
- Invert of lowest SUDS discharge = 0.90m depth (0.3m + 0.60m)
- This provides sufficient fall given the short distance hence gravity drainage is confirmed
- This is still within a tolerable height above the lowest proven “no groundwater” in appropriate high winter groundwater conditions: to allow low order storms and high order storms to discharge via the formal soakaways

The SUDS drainage layout plan included within Appendix B shows locations, connections and dimensions for all the SUDS structures.

Note of SUDS Hierarchy for clarity

This SUDS approach has been approved on similar schemes based on the site-specific flood and geology conditions and scheme specifics.

With respect to other SUDS techniques, the proposed buildings at first floor and above require partly pitched roof areas and thus are not considered suitable for the use of a green / sedum roof; the flat roof area at the top of the main house is not accessible / too small and hence also not suitable for a sustainably designed sedum /green roof.

The flat roofs at first floor are amenity decks and these structures are not suitable for sedum / green roofs as they would require additional structural and foundation support in order to take the weight of surface water storage at height hence it is not considered commensurate with the scale and sensitivity of the scheme to incorporate a full formal green roof. The extra embodied carbon required would not be outweighed by the sustainability gain.

Whilst internal rainwater harvesting is not proposed, it is recommended that rainwater pipes are fitted with water butts wherever feasible. Whilst the use of water butts won’t reduce the design criteria of the receiving below ground drainage system, their use will reduce the time of entry and provide a supply of water for irrigation.

It will be necessary for the surface water drainage system to comply with the Environment Agency’s pollution prevention guidance:

- Roof run-off is classified as uncontaminated and, in accordance with EA pollution prevention guidance,

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will not require any treatment.

- Any surface water run-off draining through the permeable paving will receive an adequate level of filtration through the associated substrate.

4.5. Maintenance

With respect to maintenance, the proposed SUDS techniques should be maintained in accordance with the appropriate regimes set out within the SUDS manual and the manufacturers guidance and will be the responsibility of the owner / management company.

- **The specifications have been deliberately chosen to be low maintenance, resilient and easy to access inspect & clean.**

A SUDS maintenance schedule is included within **Appendix D**.

4.6. Foul Specification and Connections

To meet the Binding Rules and EA Permit requirements for discharging domestic foul flows in a Source Protection 1 area, the scheme has undertaken the appropriate BRE365 Soakage Testing and includes a package treatment works specification that meets the highest standards required and is future proofed.
To meet the Binding Rules / EA Permit at this stage, despite the package treatment discharging appropriate quality of water for discharging to a river, the scheme must necessarily incorporate a drainage field /infiltration tunnel. This has been appropriately specified and located within the scheme. See **Appendix B**.

4.7. Binding Rules: evidence of compliance

See the full government checklist guidance with site and scheme specific responses in **Appendix C**

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APPENDICES

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Appendix A: Ground Investigation & BRE 365 Testing

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Soakage Test Report

Project Name: Old Alresford

Location: Hill House, Colden Lane, Old Alresford SO24 9DY

Client: Duffy Associates

Project ID: JT0572

Report Date: 04 March 2024

Report Issue: 1

Author	R Jiagge BSc (Hons) MSc MIEnvSc CSci FGS/ CL:AIRE DoWCoP QP No.366	
Check / Review	S F Pratt BSc MSc CGeol FGS DIC	

For and on behalf of Southern Testing Laboratories Limited

DOCUMENT HISTORY AND STATUS

Issue No.	Date	Purpose or Status	Author	Check / Review
1	04/03/24	Issued to Client	RJ	SFP

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A INTRODUCTION

1 Authority

Our authority for carrying out this work is contained in ST Consult Project Order form completed by Clive Goodman on behalf of the client and dated 25th February 2024.

2 Location

The site is located approximately 1.50 km to the north of New Alresford railway station in Hampshire. The approximate National Grid Reference of the site is SU 59043 33916. The site location is indicated on Figure 1 within Appendix A.

3 Investigation Brief

In accordance with the Client's instructions, and our quotation, the following was included in our brief for this soakage investigation:

- Soakage testing in three machine excavated trial pits across the site using the BRE 365 method.
- Percolation test in a single trial pit using the BS6297 method.

4 Scope

This factual report presents our exploratory hole logs and test results only.

As with any site there may be differences in soil conditions between exploratory hole positions.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

The findings and opinions conveyed via this investigation report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd. believes are reliable. Nevertheless, Southern Testing Laboratories Ltd. cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The investigation was conducted and this report has been prepared for the sole internal use and reliance of Duffy Associates, the end client and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The recommendations contained in this report are made in respect of the particular context of the investigation as described in the report and may not be appropriate to alternative development schemes. This report should be considered in its entirety and Southern Testing Laboratories Ltd accepts no responsibility for and excludes liability in respect of any omission or alteration made by others, and any use of the report for any purpose other than that for which it was produced.

B SITE SETTING

5 General Site Description

The site is located on the western side of Colden Lane in Old Alresford, Hampshire. It is currently occupied by three buildings comprising a three-storey building and two other buildings (a single storey and two-storey brick built) nearer to the road (eastern boundary) with an extensive soft landscaping surrounding. A number of disused greenhouses were noted in the northern end of the site. A disused tennis court is located near the western end of the site.

The site is bound on all sides by private properties with large gardens. With the exception of the south eastern boundary which is formed of an approximately 2m high wall, the site boundaries on all sides were formed of hedgerows and trees of varying maturity.

6 Geological Records

No formal desk study has been carried out, but reference has been made to both online and published geological maps to put the site into context.

6.1 Geology

The British Geological Survey Map covering the site indicates that the site geology consists of bedrock geology of Seaford Chalk Formation. No superficial deposits are mapped on the site.

6.1.1 Seaford Chalk Formation

The Seaford Chalk Formation comprises a fairly homogeneous white chalk with regular and conspicuous flint bands. These flints are commonly laterally very continuous and traceable over large distances. Some of the flints can be very large. A few marl seams are present within the lower parts of the formation.

The White Chalk outcrop in particular is frequently highly fractured and highly permeable, and usually has good infiltration characteristics. On the other hand, Chalk Head, highly weathered Chalk and Chalk under a low permeability superficial cover may have very poor infiltration characteristics.

Chalk is slightly soluble in water and, while it has excellent bearing properties when unweathered, this solubility can lead to deep weathering and softening, and the upper layers of chalk often have an irregular boundary with overlying strata

The Chalk may be softened by solution to a depth of 5 to 15 metres and bearing capacities and engineering properties improve with depth. Where there is an outcrop of impermeable soil overlying the chalk there may be a dramatically increased solution effect due to concentrated surface water flow to the Chalk close to the outcrop boundary.

Solution features are common in the Chalk, and these can present significant difficulties to development on affected sites.

C FIELDWORK

7 Strategy and Method

The strategy adopted for the soakage testing comprised the following:

Activity / Method	Purpose	Max Depth Range (mbgl)	Installations / Notes
SA01-03 JCB 3CX	Trial pits to investigate the shallow ground conditions and allow for assessment of soakage potential using the BRE365 method.	1.5/1.6	BRE365 Soakage tests
PT01	Trial pit to investigate the shallow ground conditions and allow for assessment of percolation using the BS6297 method.	1.0	300mm x 300mm square pit excavated to 300mm deep at the base of a 700mm deep pit.

Exploratory hole locations were specified by the Client's Engineer as shown in Figure 2 in Appendix A.

In-situ test method descriptions employed are given in Appendix B together with the test results.

8 Weather Conditions

The fieldwork was carried out on 28th and 29th February 2024. The weather on 28th February was dry in the morning and becoming wet with slight rainfall from about midday for the rest of day. Overnight, there was a rainfall which continued into 29th February.

9 Soils as Found

The soils encountered are described in detail in the attached exploratory hole logs (Appendix A), but in general comprised a covering of topsoil over Head Deposits over Chalk. A summary is given below.

Depth to Base (m)	Thickness (m)	Soil Type	Description
0.1/0.35	0.1/0.35	Topsoil	Brown slightly sandy slightly gravelly CLAY and very clayey gravelly fine to coarse SAND with occasional rootlets. Gravel consists of flint and chalk.
0.6	0.6	Head Deposit	Soft brown slightly sandy slightly gravelly CLAY with rare roots. Gravel consists of fine to medium chalk. **[SA01 only]**
1.6	Not proven	Chalk	Recovered as Structureless Chalk composed of white and greyish white slightly clayey slightly silty sandy GRAVEL with gravel consisting of fine to coarse subrounded to subangular extremely weak chalk and flint cobble. ***White becoming greyish white gravelly clayey SILT recovered in SA01 from 1.45 to 1.6m bgl. .***

10 Groundwater Observations

No groundwater was encountered in any of the trial pits excavated.

D TEST RESULTS

11 Percolation Test Method after BS6297

A single trial pit, PT01 was excavated using a machine excavator to 0.7m bgl. This was further followed by a 300mm x 300mm square test hole excavated by hand to 300mm deep at the base of the machine excavated pit. The 300mm x 300mm square test hole was filled and allowed to drain away completely overnight. The following day, the test hole was refilled with water and the time taken for the water level to fall from 75% full (225mm) to 25% full (75mm) was recorded. The test was repeated two more times.

The percolation value Vp (time in seconds taken for the water level to drop 1mm) was calculated and presented in the table below.

PT01				
Water Level (mm)		Time (sec)		
		Test 1	Test 2	Test 3
225	75% Full	150	465	960
75	25% Full	1200	6350	3960
Vp (sec/mm)		7	39	20

Average Vp (sec/mm):	**22**

12 Soakage Test (after BRE Digest 365 2016)

The BRE paper DG365, Ref [22] describes a method for site testing to determine soil infiltration rates at the proposed site of a soakaway. The in-situ test method is described in Appendix B.

The soakage tests were carried out at three locations across the site, as shown on the attached site plan Figure 2, Appendix A. The full results of the soakage tests are presented within Appendix B.

The DG365 Ref [22], states that each pit should be allowed to drain three times to near empty, with filling on the same or consecutive days. The tests were undertaken strictly in accordance with BRE Digest 365.

For this site, the test to measure the soil infiltration rate was carried out in pits, which were excavated to depths between 1.5m and 1.6m below the existing ground level. The trial pits were filled with water and allowed to drain to empty or near empty, three times, on the same day or on consecutive day. The water levels were recorded against time. The time taken for the water level to fall from ¾ full to ¼ full was obtained and the soil infiltration rate was obtained from the following formula:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where: f = soil infiltration rate (in this case expressed in l/m²/minute)

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

a_{p50} = the internal surface area of the trial pit up to 50% effective depth and excluding the base area;

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

The infiltration rate from each trial hole is summarised in the table below. The soakage rate in this report in expressed as ℓ/m²/minute, which is a convenient rate to use. The BRE use a unit of m/sec, which is the value in l/m²/minute divided by 60,000.

Test ID	Test Depth (mbgl)	Test No.	Design Infiltration Rate	
			ℓ/m²/minute	m/sec
SA01	1.6	1	3.45	5.76×10^{-5}
		2	1.05	1.75×10^{-5}
		3	1.43	2.38×10^{-5}
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		2	14.80	2.47×10^{-4}
		3	14.04	2.34×10^{-4}
SA03	1.5	1	9.46	1.58×10^{-4}
		2	7.27	1.21×10^{-4}
		3	7.00	1.17×10^{-4}

Note: The Design Infiltration Rate is the lowest of the three tests

The infiltration rates obtained for this site suggest that the site is suitable for shallow soakaways within the Chalk stratum.

12.1 General Guidance on Design of Soakaways

Any soakaway scheme may require the approval of the Environment Agency, Building Control and, where applicable, the adopting Highways Authority.

Soakaways are used to store the immediate surface water run-off from hard surfaced areas, such as roof or carparks, and allow for efficient infiltration into the adjacent soil. They should be designed to discharge their stored water sufficiently quickly to provide the necessary capacity to receive run-off from a subsequent storm. The time taken for discharge depends upon the soakaway shape and size, and the surrounding soil's infiltration characteristics.

Groundwater levels can vary considerably from season to season and year to year, often rising in wet or winter weather, and falling in periods of drought. As such, a high groundwater table may affect the storage capacity of soakaways. In addition, it should be noted that an unsaturated zone may be required between the base of soakaways and the groundwater table, by the Environment Agency. Longer term monitoring may be required to establish actual groundwater levels as part of the planning approval process.

The design of soakaways can be square, circular (conventional) or trench excavations, and may be rubble filled, perforated precast concrete ring units, plastic cells or any similar structure that collects rainwater and run-off and allow discharge directly into the ground. Depending on the geological conditions, and depth at which suitable infiltration is achieved, soakaways can also be deep bored.

Long-term maintenance and inspection must be considered during the design and construction process. Maintenance of silt traps, gully pots and interceptors will improve the long-term performance of soakaways. The use of wet well chambers within the soakaway system can further assist in pollutant trapping and extending the operating life of soakaways.

Risk of pollution to the quality of groundwater must be considered as part of the design.

Generally, roof and surface run-off should not significantly impact on groundwater quality and subject to appropriate approvals from the Environment Agency could be discharged directly to soakaways. However, although again subject to approvals from the Environment Agency, paved surface run-off for larger trafficked areas should generally be passed through a suitable form of oil interception device prior to discharge to the soakaway.

Care must be taken to ensure that the discharge of large volumes of surface run-off into the soil does not disrupt the existing sub-surface drainage patterns. Similarly in areas of sloping topography, consideration should be given to the siting of soakaways to avoid potential discharge and or flooding of down slope areas.

Soakaways should not normally be constructed closer than 10m to buildings.

REFERENCES

[1] Building Research Establishment (BRE), “DG365 Soakaway Design,” 2016.

[2] BSI Standards, “BS 5930:2015+A1:2020 Code of practice for ground investigations,” 2020.

[3] BSI Standards, “BS 3882:2015 Specification for Topsoil,” 2015.

[4] CIRIA, “C574 Engineering in Chalk,” 2002.

[5] R. N. Mortimore, Logging the Chalk, 2014.

[6] NHBC, “NHBC Standards Plus,” [Online]. Available: http://www.nhbc.co.uk/Builders/ProductsandServices/TechZone/nhbcstandards/.

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APPENDIX A

Site Plans and Exploratory Hole Logs

A

Site:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	Project ID	JT0572
Figure 1	Site Location Plan	Date:	04/03/2024

Southern Testing ST Consult	Project Name:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	Project ID:	JT0572	Site Plan
	Location:	Colden Lane, Old Alresford, Hampshire, SO24 9DY	Engineer:	RJ	
	Client:	Duffy Associates Ltd	Scale:	1:1000	

Legend Key

Trial Pit Location

Southern Testing
Environmental & Geotechnical

ST Consult
Environmental & Geotechnical

Key to Exploratory Hole Logs, Plans and Sections

Backfill Symbols		Pipe Symbols		Principal Soil Types		Principal Rock Types		Drilling Records	
Arisings		Plain Pipe		Topsoil		Mudstone		Water Strike	
Concrete		Slotted Pipe		Made Ground		Claystone		Depth Water Rose	
Blacktop		Piezometer		Clay		Siltstone		Total Core Recovery (%) [TCR]	
Bentonite		Piezometer Tip		Silt		Sandstone		Solid Core Recovery (%) [SCR]	
Gravel Filter		Filter Tip		Sand		Limestone		Rock Quality Index (%) RQD]	
Sand Filter		Extensometer		Gravel		Chalk		Fracture Index (fractures / m) [FI]	
		Inclinometers		Peat					

All soil and rock descriptions are in general accordance with BS5930 2015, BS EN ISO 14688-1:2002+A1:2013 and BS EN ISO 14689-1:2003. Chalk descriptions are also based on CIRIA C574 and "Logging the Chalk – R.N. Mortimer 2015". The Geology Code is only provided where a positive identification of the sample strata has been made.

Location / Method Identifiers	
BH	Borehole (undefined)
CP	Cable Percussive
RC	Rotary Core
RO	Rotary Open Hole
ODC	Rotary Odex/Symmetrix drilling cased
CP+RC	Cable Percussive to Rotary Core
SNC	Sonic
CFA	Continuous Flight Auger
FA	Flight Auger
VC	Vibro Core
WLS+RC	Windowless (Dynamic) Sampler to Rotary Core
WLS	Windowless Sampler
WS	Window Sampler
HA	Hand Auger
C	Road / Pavement Core
IP	Inspection Pit (Hand Excavation)
TP	Trial Pit (Machine Excavated)
OP	Observation Pit (Supported Excavation Hand or Machine)

In-situ Test Location / Method	
DP	Dynamic Probe
CPT	Cone Penetration Test
CBR	In-situ CBR Test
DCP	CBR using Dynamic Cone Penetrometer
CBRT	CBR using TRL Probe
PB	Plate Bearing Test
SPT (S)	Standard Penetration Test (Split Barrel Sampler)
SPT (C)	Standard Penetration Test (Solid Cone)
N	SPT Result
-/-	Blows/Penetration (mm) after seating drive
-*/-	Total Blows / Penetration (mm)
( )	Extrapolated Value
PPT	Perth Penetration (In-House Method - Equivalent N Value)
HP / UCS	Strength from Hand Penetrometer (kN/m^2)
IVN	Strength from Hand Vane ((kN/m^2) P = peak, R = residual
PID	Photo Ionisation Detector (ppm)
MEXE	Mexi-Cone CBR (%)

Samples / Test Type	
B	Bulk Sample
BLK	Block Sample
C	Core Sample
CBRS	CBR Mould Sample
D	Small Disturbed Sample
ES	Environmental Sample (Soil)
EW	Environmental Sample (Water)
GS	Environmental Sample (Gas)

Samples / Test Type	
SPTLS	Standard Penetration Test Split Barrel Sample
TW	Thin Wall Push In Sample (e.g. Shelby Sampler)
U	Undisturbed Open Drive Sample (blows to take)
UT	Thin Wall Undisturbed Open Drive Sample (blows to take)
W	Water Sample (Geotechnical)
SP	Sample from Stockpile
P	Piston Sample
AMAL	Amalgamated Sample

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	SA01
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	28/02/2022 - 29/02/2024	JT0572	Mini-digger	Sheet 1 of 1

Project Name:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	**Remarks:**	**Co-ordinates:**	**Level (m AOD):** / **Logger:**
			E 459000 - N 133904	CJB
Location:	Colden Lane, Old Alresford, Hampshire, SO24 9DY	1) National Grid Reference inferred from Ordnance Survey mapping. 2) Elevation not stated. 3) Groundwater not encountered. 4) BRE 365 testing undertaken.		
Client:	Duffy Associates Ltd			

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.10)		0.10	TOPSOIL comprising: Soft brown silty sandy CLAY with occasional roots (~5mm wide) and rootlets and rare fine to medium subangular flint and chalk gravel.
				(0.50)		0.60	Soft brown slightly sandy slightly gravelly CLAY with rare (~3mm wide roots). Gravel consists of fine to medium subangular extremely weak chalk. [HEAD DEPOSITS]
				(0.85)		1.45	Structureless CHALK recovered as: White slightly sandy clayey silty GRAVEL. Gravel consists of fine to medium subangular extremely weak chalk [SEAFORD CHALK FORMATION CIRIA Grade Dc] below 0.7m bgl rare cobble size pockets of white clayey silty encountered.
				(0.15)		1.60	Structureless CHALK recovered as: White becoming greyish white gravelly clayey SILT. Gravel consists of fine to medium subangular extremely weak chalk. [SEAFORD CHALK FROMATION CIRIA Grade Dm] Pit terminated at 1.60m.

1

2

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.50	Stable.	
Length:	1.45		
Depth:	1.60		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	SA02
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	28/02/2022 - 29/02/2024	JT0572	Mini-digger	Sheet 1 of 1

Project Name:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	**Remarks:**	**Co-ordinates:**	**Level (m AOD):** / **Logger:**
			E 459027 - N 133962	CJB
Location:	Colden Lane, Old Alresford, Hampshire, SO24 9DY	1) National Grid Reference inferred from Ordnance Survey mapping. 2) Elevation not stated. 3) Groundwater not encountered. 4) BRE 365 testing undertaken.		
Client:	Duffy Associates Ltd			

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.35)			TOPSOIL comprising: Loose brown very clayey gravelly fine to coarse SAND. Gravel consists of fine to coarse subrounded to subangular flint.
						0.35	Structureless CHALK recovered as: Greyish white slightly clayey slightly silty sandy GRAVEL. Gravel consists of fine to coarse subrounded to subangular extremely weak chalk. [SEAFORD CHALK FORMATION - CIRIA Grade Dc]
				(1.20)			at 1.1m bgl frequent subangular chalk cobbles and rare subangular and angular-tabular medium to coarse nodular flint gravel/cobbles.
							below 1.3m bgl chalk gravel is very weak.
1.40	B					1.55	Pit terminated at 1.55m.

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	0.45	Stable.	
Length:	1.40		
Depth:	1.55		

Southern Testing ST Consult	Start - End Date:	Project ID:	Machine Type:	SA03
www.southerntesting.co.uk tel:01342 333100 www.stconsult.co.uk tel:01604 500020	28/02/2022 - 29/02/2024	JT0572	Mini-digger	Sheet 1 of 1

Project Name:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	**Remarks:**	**Co-ordinates:**	**Level (m AOD):** / **Logger:**
Location:	Colden Lane, Old Alresford, Hampshire, SO24 9DY		E 459072 - N 133956	CJB
Client:	Duffy Associates Ltd	1) National Grid Reference inferred from Ordnance Survey mapping. 2) Elevation not stated. 3) Groundwater not encountered. 4) BRE 365 testing undertaken.		

Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description
Depth (m)	Type	Results					
				(0.30)		0.30	TOPSOIL comprising: Soft brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel consists of fine to medium angular flint.
				(1.20)			Structureless CHALK recovered as: white clayey slightly sandy GRAVEL with rare light whitish brown staining. Gravel consists of fine to coarse subangular to angular extremely weak chalk. [SEAFORD CHALK FORMATION - CIRIA Grade Dc]
							below 0.8m bgl occasional subangular to angular flint and chalk cobbles.
							below 1.2m bgl frequent subrounded to subangular chalk cobbles.
1.40	B					1.50	Pit terminated at 1.50m.

1

2

Pit Dimension (m)		Pit Stability:	Water Strikes:
Width:	1.50	Stable.	
Length:	1.55		
Depth:	1.50		

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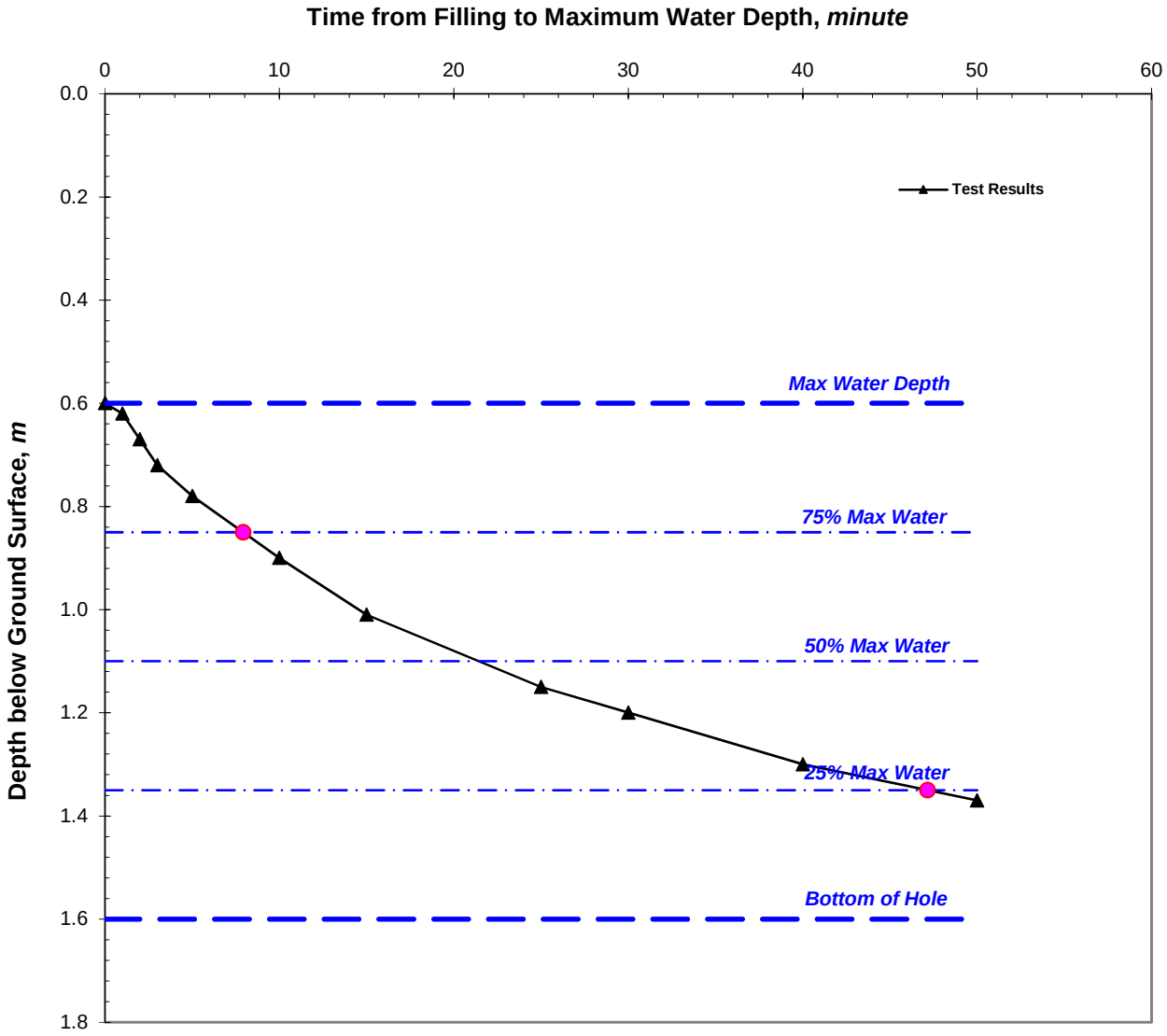
APPENDIX B

In-Situ Test Methods and Results

B

BRE Digest DG365 Soakage Test

Test Hole No: SA01
Test No: Test No 1 (Initial)



Pit Length, m	1.450	Depth to Water at Start of Test, *m*	0.600
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	0.770
Depth to Pit Base, m	1.600	Total Soakage Test Time, *min*	50.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.675
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	9.241
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**3.45**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**5.76E-05**

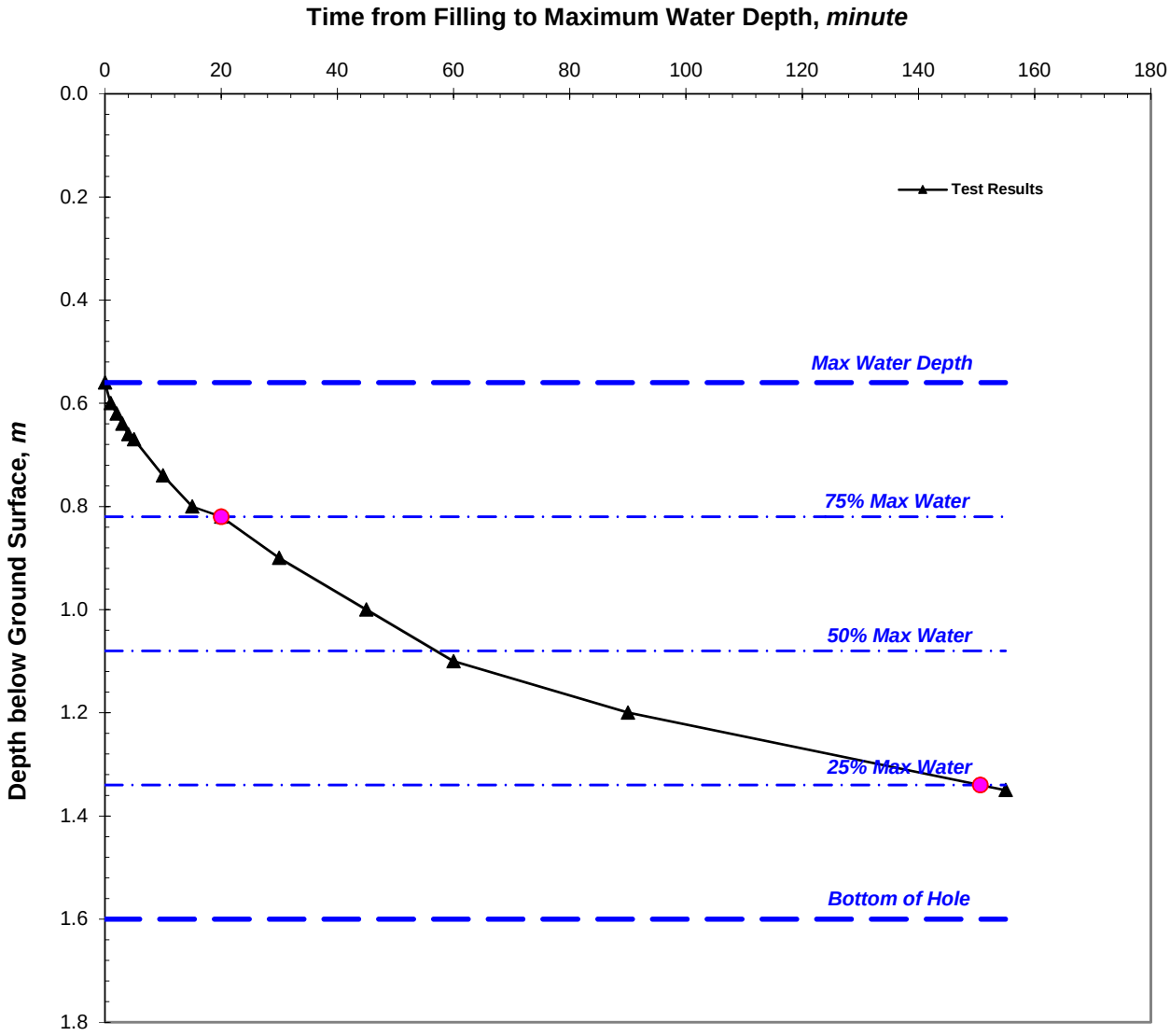
Comments:

Pit was nearly emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	28/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig.**	**S1**

BRE Digest DG365 Soakage Test

Test Hole No: SA01
Test No: Test No 2 (Repeated)



Pit Length, m	1.450	Depth to Water at Start of Test, *m*	0.560
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	0.790
Depth to Pit Base, m	1.600	Total Soakage Test Time, *min*	155.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.753
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	2.885
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**1.05**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**1.75E-05**

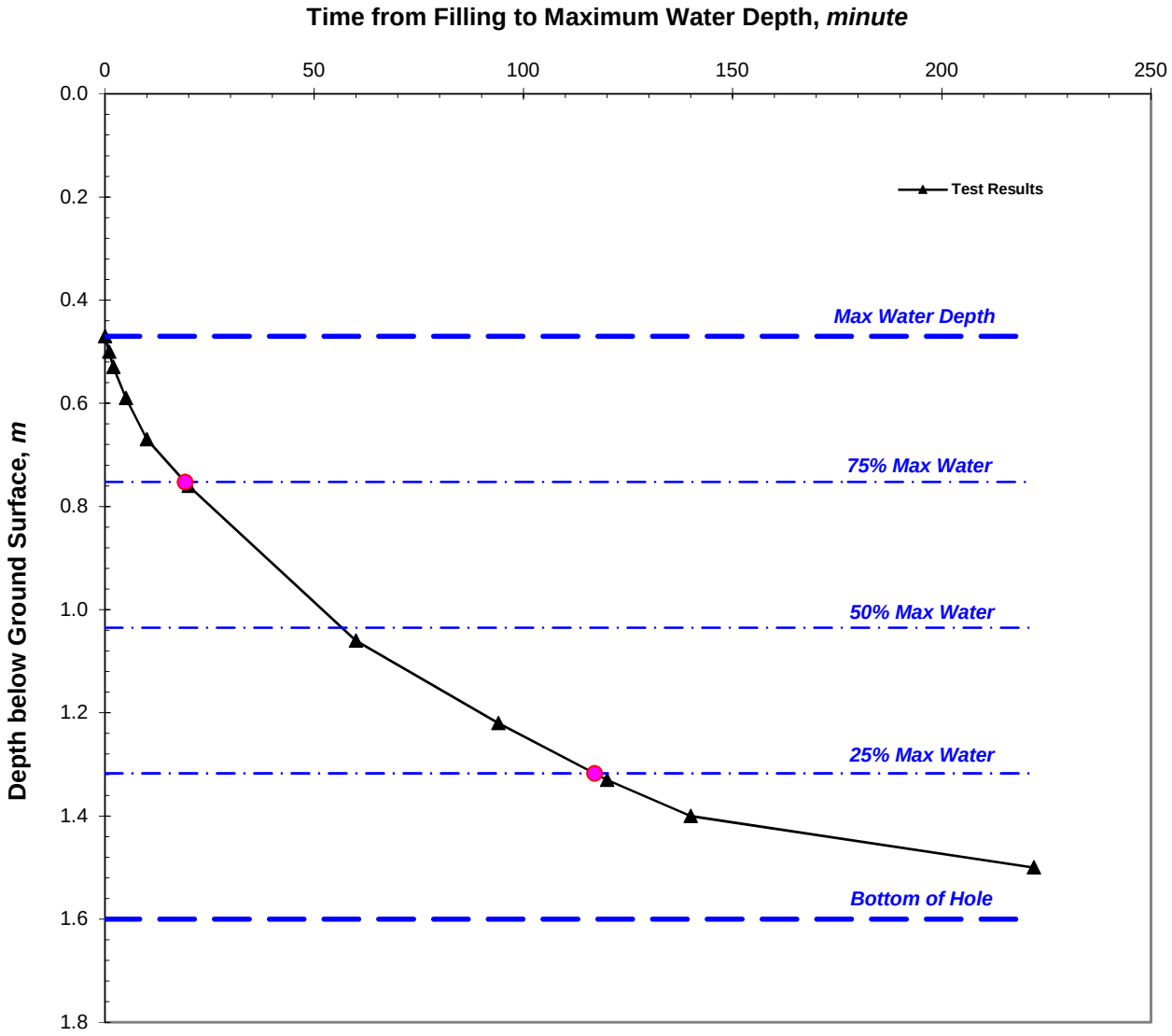
Comments:

Pit was nearly emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	28/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig. S2**	

BRE Digest DG365 Soakage Test

Test Hole No: SA01
Test No: Test No 3 (Repeated)



Pit Length, m	1.450	Depth to Water at Start of Test, *m*	0.470
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	1.030
Depth to Pit Base, m	1.600	Total Soakage Test Time, *min*	222.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.929
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	4.185
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**1.43**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**2.38E-05**

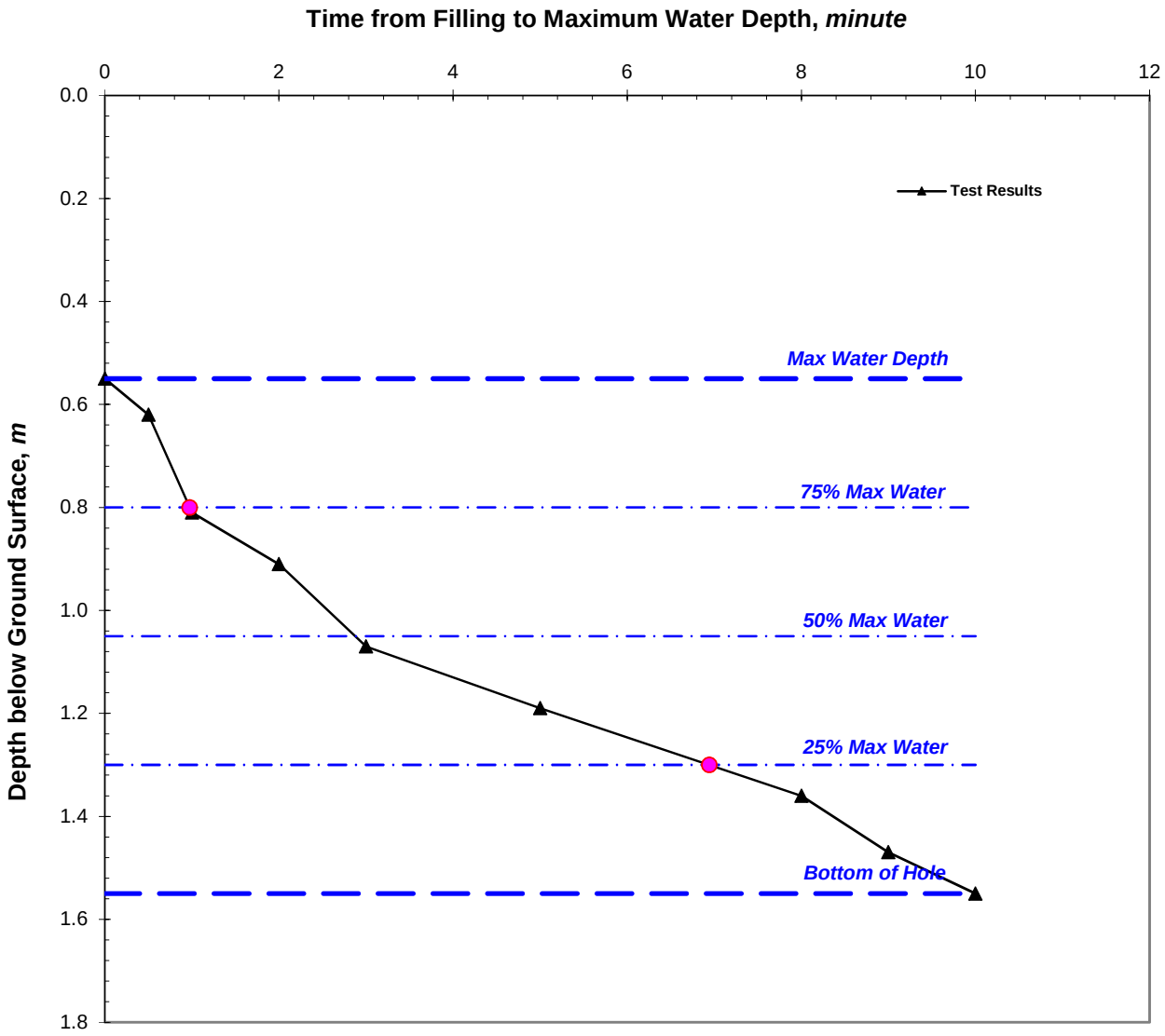
Comments:

Pit was nearly emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	29/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig. S3**	

BRE Digest DG365 Soakage Test

Test Hole No: SA02
Test No: Test No 1 (Initial)



Pit Length, m	1.400	Depth to Water at Start of Test, *m*	0.550
Pit Width, m	0.450	Max Water Dropdown during Test, *m*	1.000
Depth to Pit Base, m	1.550	Total Soakage Test Time, *min*	10.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.480
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	52.786
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**21.28**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**3.55E-04**

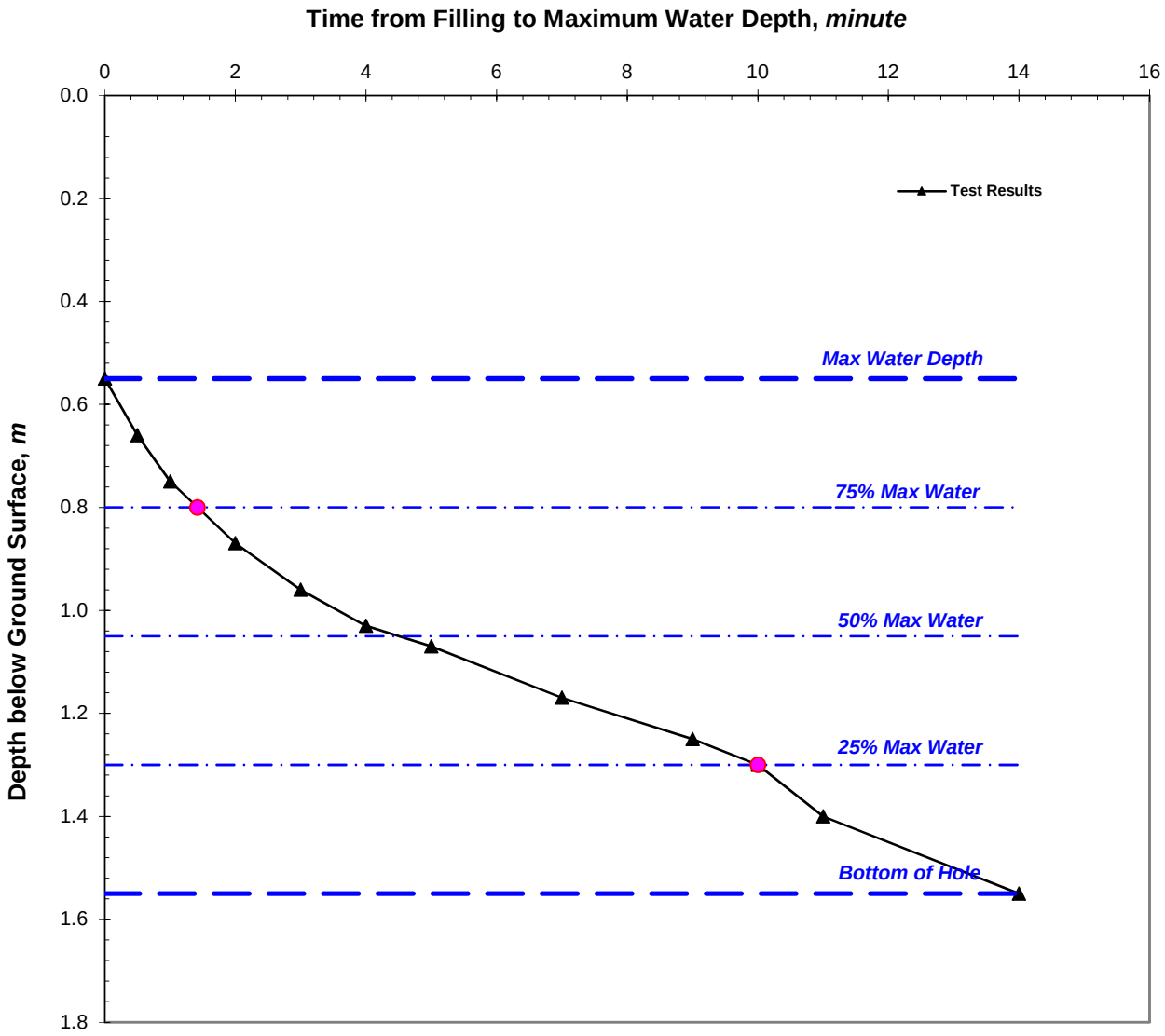
Comments:

Pit was emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	28/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig. S4**	

BRE Digest DG365 Soakage Test

Test Hole No: SA02
Test No: Test No 2 (Repeated)



Pit Length, m	1.400	Depth to Water at Start of Test, *m*	0.550
Pit Width, m	0.450	Max Water Dropdown during Test, *m*	1.000
Depth to Pit Base, m	1.550	Total Soakage Test Time, *min*	14.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.480
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	36.699
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**14.80**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**2.47E-04**

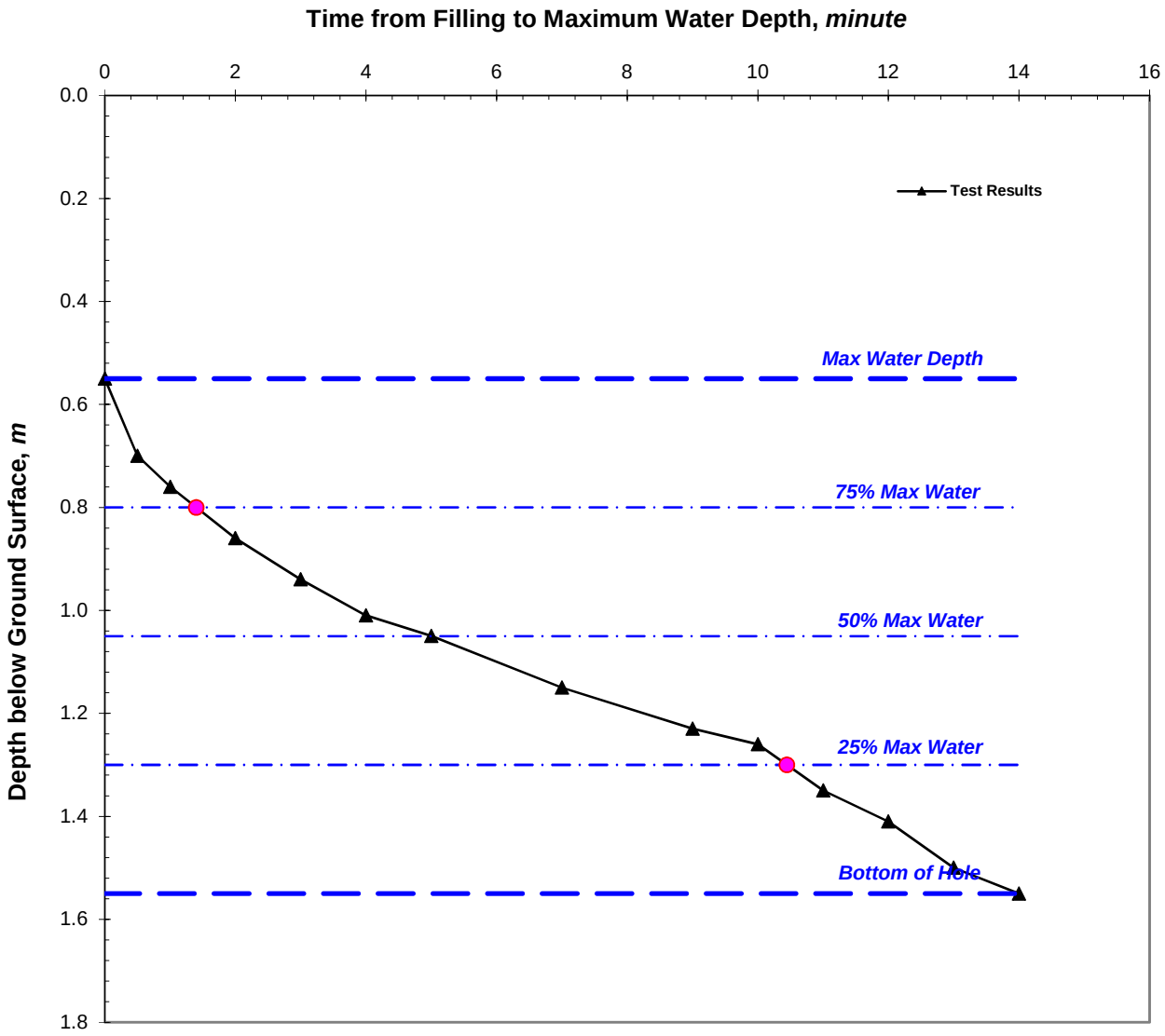
Comments:

Pit was emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	28/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig. S5**	

BRE Digest DG365 Soakage Test

Test Hole No: SA02
Test No: Test No 3 (Repeated)



Pit Length, m	1.400	Depth to Water at Start of Test, *m*	0.550
Pit Width, m	0.450	Max Water Dropdown during Test, *m*	1.000
Depth to Pit Base, m	1.550	Total Soakage Test Time, *min*	14.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.480
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	34.828
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**14.04**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**2.34E-04**

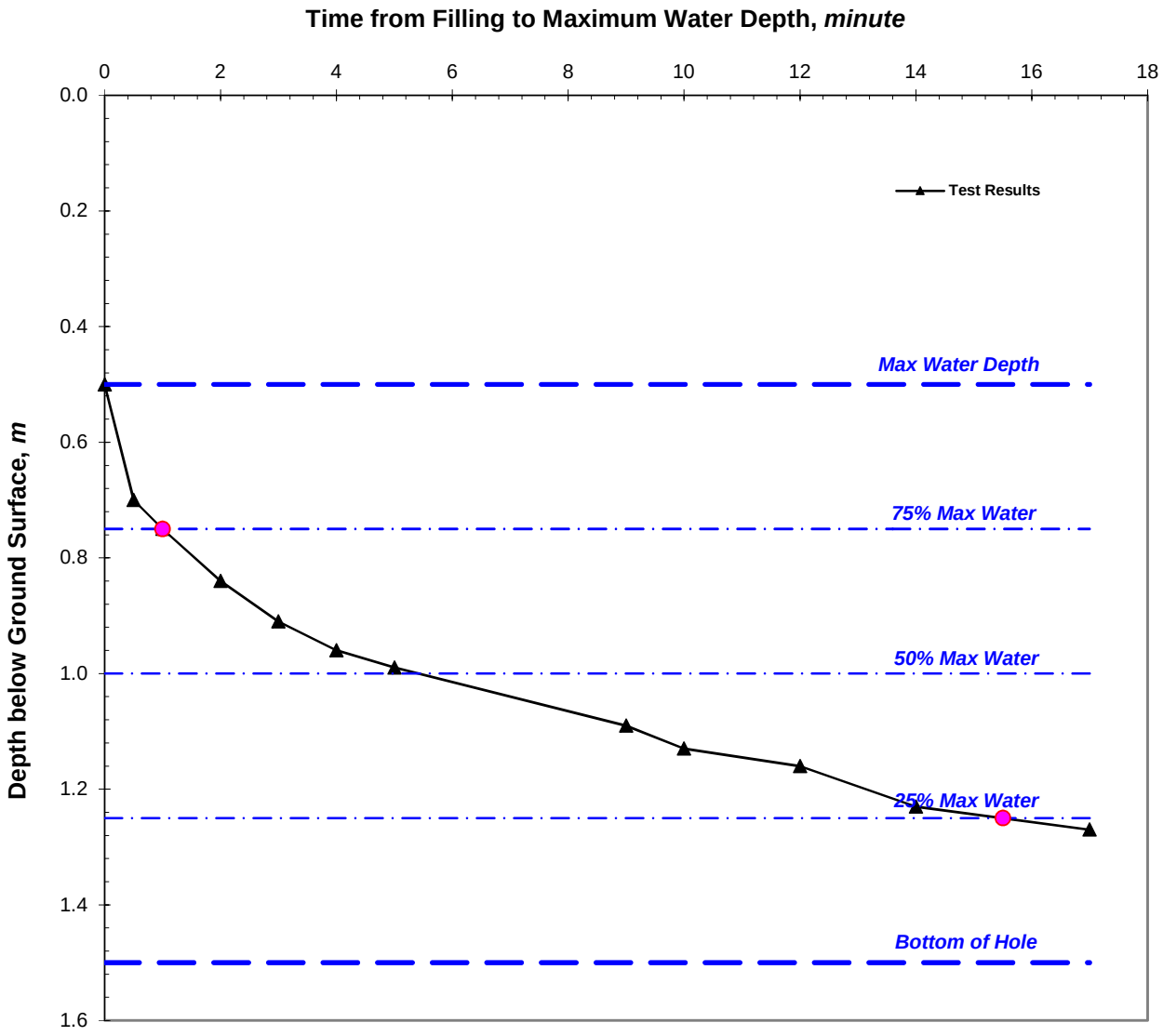
Comments:

Pit was emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	28/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig.**	**S6**

BRE Digest DG365 Soakage Test

Test Hole No: SA03
Test No: Test No 1 (Initial)



Pit Length, m	1.550	Depth to Water at Start of Test, *m*	0.500
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	0.770
Depth to Pit Base, m	1.500	Total Soakage Test Time, *min*	17.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.825
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	26.724
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**9.46**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**1.58E-04**

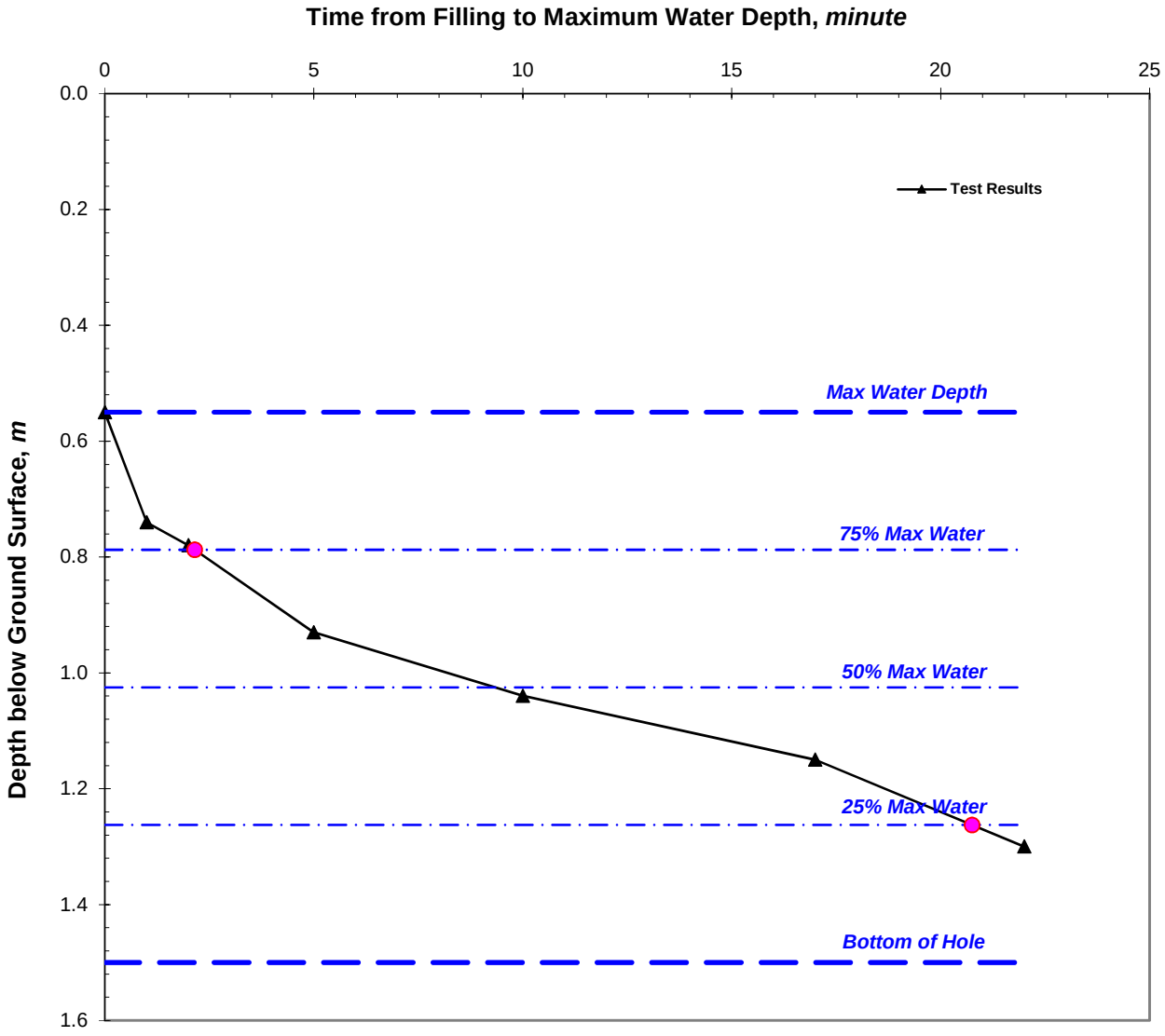
Comments:

Pit was nearly emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	29/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig.**	**S7**

BRE Digest DG365 Soakage Test

Test Hole No: SA03
Test No: Test No 2 (Repeated)



Pit Length, m	1.550	Depth to Water at Start of Test, *m*	0.550
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	0.750
Depth to Pit Base, m	1.500	Total Soakage Test Time, *min*	22.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.723
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	19.792
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**7.27**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**1.21E-04**

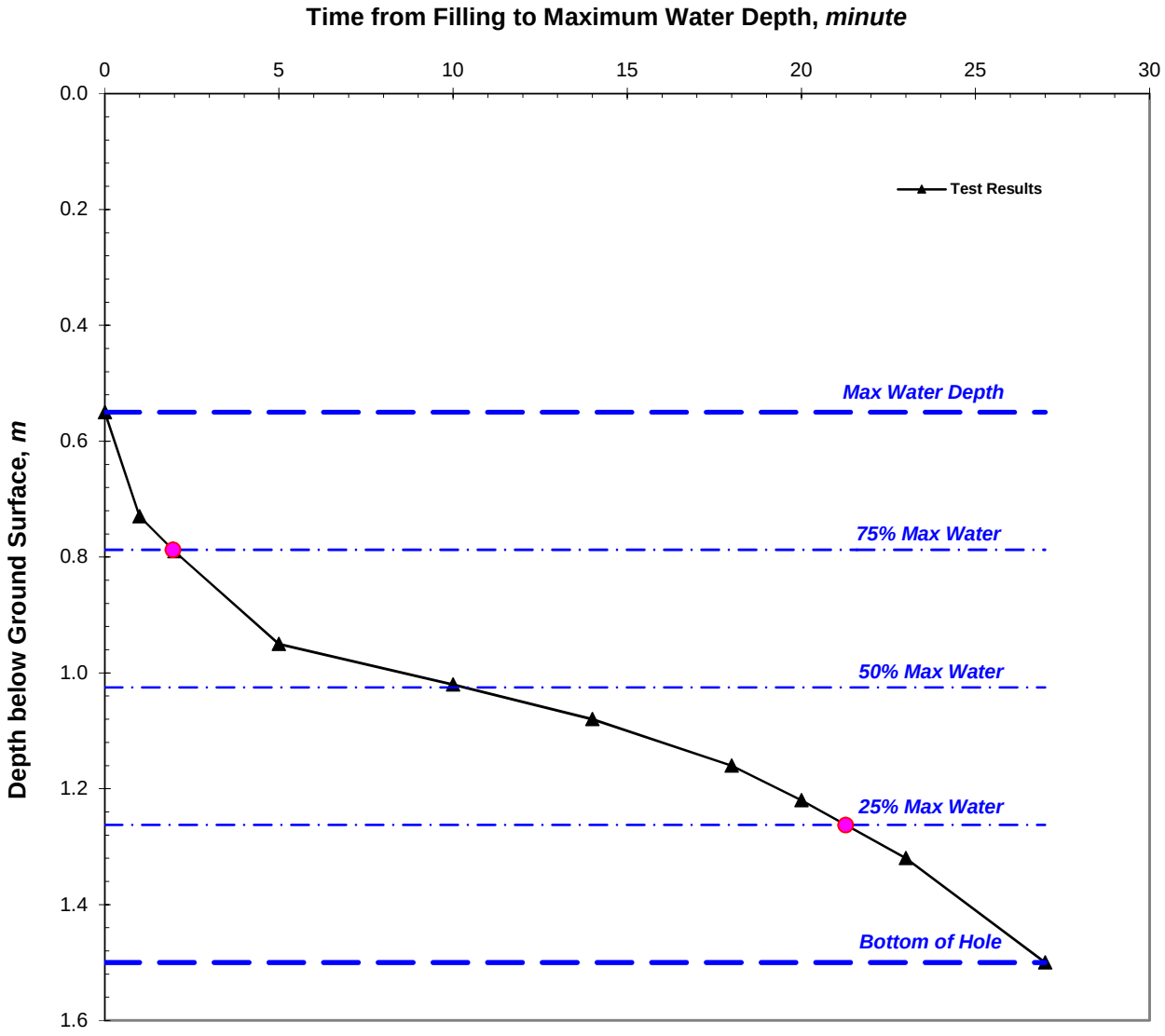
Comments:

Pit was nearly emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	29/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig.**	**S8**

BRE Digest DG365 Soakage Test

Test Hole No: SA03
Test No: Test No 3 (Repeated)



Pit Length, m	1.550	Depth to Water at Start of Test, *m*	0.550
Pit Width, m	0.500	Max Water Dropdown during Test, *m*	0.950
Depth to Pit Base, m	1.500	Total Soakage Test Time, *min*	27.0
Depth to Top of Permeable Soils, *m*		Mean Internal Discharge Area, m^2	2.723
Depth to Groundwater Surface, *m*		Discharge Rate, *litre/min*	19.057
Depth to Top of Granular Fill, *m*		Soakage Rate, *litre/m^2/min*	**7.00**
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, *m/sec*	**1.17E-04**

Comments:

Pit was emptied at finish of test.

Client:	Duffy Associates	**Job No:**	JT0572	**Test Date:**	29/Feb/2024		
Site:	Hill House, Colden Lane, Old Alresford	**Tested By:**	CJB	**Engineer:**	RJ	**Fig.**	**S9**

Soil and Rock Descriptions

All soil and rock descriptions are in general accordance with BS5930 Ref [4].

Anthropogenic soils ('made ground' or 'fill') describe materials which have been placed by man and can be divided into those composed of reworked natural soils and those composed of or containing man-made materials. 'Fill' is used to describe material placed in a controlled manner and 'made ground' is used to describe materials placed without strict engineering control.

The classification of materials such as topsoil is based on visual description only and should not be interpreted to mean that the material complies with criteria used in BS 3882 Ref [33].

Chalk descriptions are based on CIRIA C574 Ref [34] and Mortimore Ref [35].

The geology code is only provided on logs where a positive identification of the sample strata has been made.

Soakage Tests (after BRE DG365 2016)

The BRE DG365 Ref [22] paper on soakaway design allows for the design of trench soakaways as well as traditional square and circular soakaways.

The test to measure the soil infiltration rate is carried out in pits which are excavated to the full depth of the proposed soakaway. The trial pits are filled and allowed to drain to empty or near empty, three times, on the same day or on consecutive days. Water levels are recorded against time. Where the sides are unstable the pit should be filled with granular material to provide stability during the test.

Calculated soakage rates are expressed as l/m²/minute, which is a convenient rate to use. The BRE use a unit of m/sec, which is the value in l/m²/minute divided by 60,000.

Percolation Tests (EA PPG4 & Building Regulations Part H2)

The above test refers to small-scale soakage tests that can be performed in areas with restricted access e.g. occupied houses, or where disturbance is to be kept to a minimum. The aim is to measure the time it takes for a set quantity of water to drain from a standard sized excavation.

The procedure is essentially for design of septic tank discharge to subsurface irrigation systems and involves digging at least two holes 300mm square to a depth of at least 300mm below the proposed invert level of the infiltration pipe. The test holes should be pre-soaked overnight. The following day the holes are filled to a depth of at least 300mm and the time for the water to seep away from 75% full to 25% full is recorded. The time in seconds divided by 150 gives the percolation value, Vp. The test should be carried out at least three times and the average value taken.

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APPENDIX C

Photographs

C

View of the existing 3-storey building from south

View of the existing 3-storey building from south-east

View of the soft landscaping area to the south

View of the soft landscaping area to the south

View of the site access showing the other two buildings

View of the 2-storey building

View of the site from the west

View of the site from west

SA01

SA01 Arisings

SA02

SA02 Arisings

	
SA03	SA03 Arisngs
	
PT01	PT01 Arisings

BRE 365 in progress

Percolation test (BS6297) in progress

Percolation test (BS6297) in progress

Southern Testing
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ST Consult North West
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warrington@stconsult.co.uk

Location Plan

Site Address: **Hill House, Colden Lane, Old Alresford, SO24 9DY**

PlanningPortal

Date Produced: **11-Jul-2023**

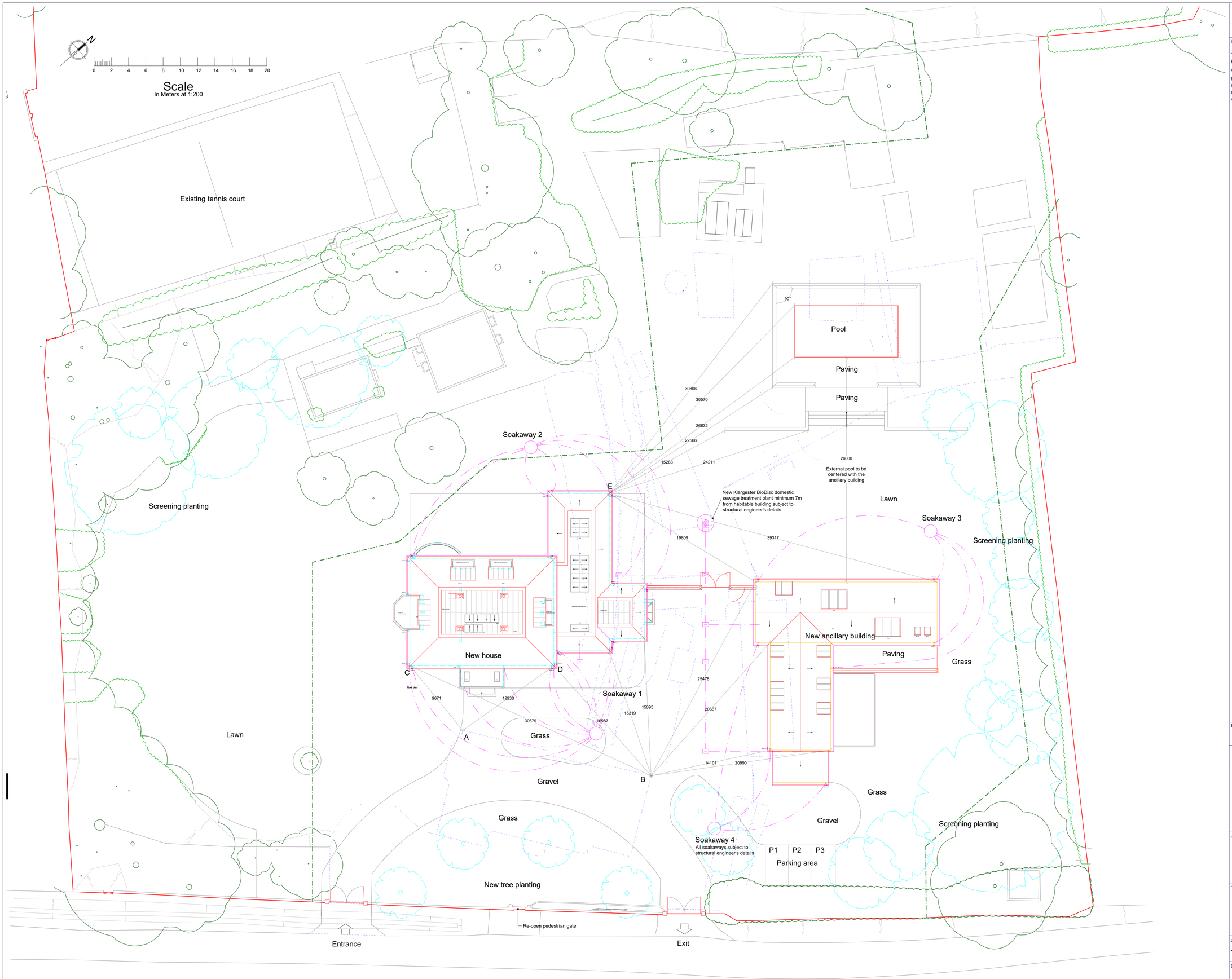
Scale: **1:1250 @A3**

Planning Portal Reference: **PP-12302766v1**

0 50

Metres

Powered By TerraQuest



Do not scale from drawing, use figured dimensions only. Subject to site survey and all necessary consents. All dimensions to be checked by user and any discrepancies, errors or omissions to be reported to the Architect before work commences. This drawing is to be read in conjunction with other relevant documents.

REV	DESCRIPTION	DATE	AUTH
A	Issued for review	100523	GA
B	Issued for planning	060723	GA
C	N/A		
D	Issued for planning	270723	LR
E	Issued for construction	101023	LR
F	Issued for client approval	271123	LR
G	Issued for client approval	221223	LR

KEY

- Boundary
- Area
- Elevation Section
- Finishes
- Groundline
- Landscaping
- New build
- Plan
- Engineer
- Below Hidden
- Overhead Hidden
- Removed
- Services existing runs
- Service fittings
- Services proposed runs
- Setting out
- Survey
- Text
- Viewport
- Tree protection fence
- Flat panel radiator
- S — Skirting radiator
- E — Heating element
- T — Towel radiator (wet)
- RC — Radiator in cabinet
- Storage heater
- 13 amp double socket
- 5 — 5 amp lighting socket
- Switched spur
- EC — Electric curtain spur
- EB — Electric blind spur
- DA — Door automation spur
- R — Razor socket
- RCD — External quality socket
- Lightswitch with dimmer
- 2 3 — Lightswitch dimmer 2-way 3-way
- T — Lightswitch with timer
- S — 5 amp lightswitch
- Pullcord lightswitch
- Overhead light
- Wall light 1800 height
- External wall light
- LED — LED light (directional) (wide angle)
- Star or pin light
- IR — Infra red sensor Light
- Extract fan/light combination
- Flue or duct
- Strip light
- Closet light and jamb switch
- SD — Smoke detector (wired, not battery)
- HD — Heat detector
- A — Alarm sensor
- PIR — PIR sensor
- A — Alarm panel
- A — External alarm box
- Alarm keypad
- G — Gate control panel
- W C — Speaker point wall or ceiling
- Remote control eye
- Cooker socket
- CCU/Fuseboard
- G W — Meters gas and electricity
- AV — Audio visual control panel
- iPod — iPod docking position
- AC — Air conditioning
- UF — Underfloor heating manifold
- T — Heating timer control panel
- BT — Telephone socket wired to services cb
- TV — CAT 5 cables x2 wired to services cbd
- TV — Television aerial socket wired to servic cbd to aerial feed from roof
- Sky — Sky socket wired to services cbd to dis feed from roof
- HL / LL — Dust 1500 TV Sky — TV position with socket and 50x50 duct up to 1500 height for cabling LL — HL
- HE — Standpipe
- tstat — Thermostat
- DB — Doorbell
- DB — Doorbell sounder
- T — Heating timer control panel
- Gulley
- Shower controls
- Insulation
- <2300 — Floor to ceiling height
- >2100 >900 — Cill and window head heights
- Up — Stair rise
- Joist run
- HL/LL — Service at high/low level
- New Planting

DRAWING ISSUE

Construction

LUKE ROSE
ARCHITECT
RIBA
Beck Cottage, Abbotts Ann
Hampshire SP11 7NW
tel: +44 (0) 1264 710163
email: info@lukerose.co.uk
www.lukerose.co.uk
Architecture | Construction | Design | Development

JOB

Hill House
Colden Lane
Old Alresford, SO24 9DY

TITLE

Existing and proposed site plan and setting out

SCALE	DATE	AUTHOR
1:200	Dec 23	LR

DRAWING NO	REV
22/388/100	G

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)

Grant of Planning Permission

Planning Application Reference: **23/01673/FUL**

Decision Date:- 20.11.2023

Winchester City Council **GRANTS** planning permission for **Replacement dwelling with new ancillary building, tennis court, swimming pool, vehicle access and associated landscaping** at **Hill House, Colden Lane, Old Alresford, Alresford, Hampshire, SO24 9DY,** subject to the following conditions:

01 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with the provisions of Section 91 (1) of the Town and Country Planning Act 1990 (as amended).

02 The materials to be used in the construction of the external surfaces of the development hereby approved must be as detailed in the materials section of the associated application forms.
Reason: To ensure a satisfactory visual relationship between the new development and the existing.

03 The development hereby approved shall be constructed in accordance with the following plans;

Existing Site Plan - 22/388/21 - Rev B
Revised Site Plan with residential curtilage defined (hatched) - 22/388/01 - Rev E
Proposed House Elevations - 22/388/03 - Rev D
Proposed House Floor and Roof Plans - 22/388/02 - Rev D
Existing and Proposed Boundary Walls and Gates - Rev D
Proposed Ancillary Building Elevations - 2/388/05 - Rev D
Proposed Ancillary Building Floor Plans Elevations - 2/388/04 - Rev D

Reason; For the avoidance of doubt, to ensure that the proposed development is carried out in accordance with the plans and documents from which the permission relates to comply with Section 91 of the Town and Country Planning Act 1990.

04 Development shall proceed in accordance with the measures set out in Section 6.0 'BRIEF ASSESSMENT OF LIKELY IMPACTS AND OPPORTUNITIES FOR MITIGATION' of the ECOLOGICAL ASSESSMENT/ BIODIVERISTY STATEMENT by ALUCO ECOLOGY LTD (July 2023), unless varied by a European Protected Species (EPS) licence or a Bat Mitigation Class Licence issued by Natural England. Thereafter, the replacement bat roost features shall be permanently maintained and retained in accordance with the approved details.

Reason: to ensure the favourable conservation status of bats and protection of other notable/protected species which may be present on site.

05 Prior to commencement of the development, a Sensitive Lighting Strategy for the operational phase of the development, designed to minimise impacts on nocturnal species, shall be submitted to and approved in writing by the local planning authority.

REASON: In order to minimise impacts of lighting on the ecological interests of the site.

06 Details of any external lighting of the site shall be submitted to, and approved in writing by the Local Planning Authority prior to the commencement of the development. The lighting scheme should be in accordance with Guidance Note 08/18 produced by the Bat Conservation Trust and Institute of Lighting Professionals. This information shall include a layout plan with beam orientation and a schedule of equipment in the design (luminaire type, mounting height, aiming angles and luminaire profiles). The lighting shall be installed, maintained and operated in accordance with the approved details unless the Local Planning Authority gives its written consent to the variation.

Reason; To protect the appearance of the area, the environment and protected species from
light pollution.

07 No development shall commence until details of both hard, and soft landscape works have been submitted to and approved in writing by the Local, Planning Authority and these works shall be carried out as approved. These details, shall include the following; planting plans and schedules of plants and replacement trees, noting species, planting, sizes and proposed numbers/densities where appropriate; detailed plans showing the height of the all hedge boundary treatments including all existing hedges to be retained; details of areas of hard surfacing; details of any means of enclosure (fencing/walling) and all boundary treatments. All hard and soft landscape works shall be carried out in accordance with the approved details. The works shall be carried out within the first planting season following the, commencement of development. If within a period of five years after planting any tree or plant is removed, dies or becomes, in the opinion of the Local Planning Authority, seriously damaged, defective or diseased another tree or plant of the same species and size as that originally approved shall be planted at the same place, within the next planting season, unless the Local Planning Authority gives its written consent to any variation. All boundary treatments and hard surfacing shall be installed prior to the occupation of the dwelling hereby permitted.

In the interests of visual amenity of the area and to ensure the provision, establishment and maintenance of a reasonable standard of landscape in accordance, with the approved designs

08 Details of measures to be taken to prevent mud from vehicles leaving the site,

during construction works being deposited on the public highway shall be submitted to, and approved in writing by the Local Planning Authority and fully implemented before, development commences. Such measures shall be retained for the duration of the, construction period. No lorry shall leave the site unless its wheels have been cleaned, sufficiently to prevent mud being carried onto the highway.

In the interests of highway safety

09 Detailed proposals for an adequate and sustainable drainage system for the disposal of foul and surface water shall be submitted to and approved in writing by the Local Planning Authority before the commencement of the development hereby permitted. The approved details shall be fully implemented before development commences. The surface water drainage must be acceptable to the LLFA (HCC).

Reason: To ensure satisfactory provision of foul and surface water drainage

10 Prior to the commencement of the development hereby permitted detailed information (in the form of SAP design stage data and a BRE water calculator) demonstrating that the dwelling shall meet Code 4 or equivalent standard for energy and water (as defined by the ENE1 and WAT 1 in the Code for Sustainable Homes) shall be submitted to and approved in writing by the Local Planning Authority. The development shall be built
in accordance with these findings.

Reason: To ensure a sustainable form of development consistent with the objectives of The National Planning Policy Framework 2012 and to accord with the requirements of Policy CP11 of the Winchester District Local Plan Part 1 - Joint Core Strategy

11 Prior to the occupation of the dwelling hereby permitted detailed information (in the form of SAP "as built" stage data and a BRE water calculator) demonstrating that the dwelling shall meet the Code 4 or equivalent standard for energy and water (as defined by the ENE1 and WAT 1 in the Code for Sustainable Homes) shall be submitted to and approved in writing by the Local Planning Authority. The development shall be occupied in accordance with these findings.

Reason: To ensure a sustainable form of development consistent with the objectives of The National Planning Policy Framework 2012 and to accord with the requirements of Policy CP11 of the Winchester District Local Plan Part 1 - Joint Core Strategy

12 Before the replacement dwelling hereby permitted is first occupied, the existing dwelling and the ancillary building to the north-west of the existing dwelling shown on approved plan 22/388/21 - Rev B) must be demolished.

Reason - With regard to the replacement dwelling - if the existing dwelling was not demolished, the development permitted would result in a new dwelling which would be inappropriate development in the countryside for which there would be no justification, and would be contrary to relevant local plan policies.

With regard to the existing ancillary building - if the building was retained following the construction of the replacement house and the new ancillary building, it would prevent the approved development being implemented in accordance with the approved plans

and would result in an excessive mass of development which would be detrimental to the character and appearance of the area.

13 No development, or works of site preparation or clearance, shall take place until details, including plans and cross sections of the existing and proposed ground levels of the development and the boundaries of the site and the height of the ground floor slab and damp proof course in relation thereto, have been submitted to and approved in writing by the Local Planning Authority.

Reason; To ensure a satisfactory relationship with neighbouring dwellings and in order to preserve the character of the area.

Julie Pinnock BA Hons MTP MRTPI
Service Lead - Built Environment

Notes To Accompany Planning Decision Notice

General Notes for Your Information:

1 1. This permission is granted for the following reasons:
The development is in accordance with the Policies and Proposals of the Development Plan set out below, and other material considerations do not have sufficient weight to justify a refusal of the application. In accordance with Section 38(6) of the Planning and Compulsory Purchase Act 2004, planning permission should therefore be granted.
2. The Local Planning Authority has taken account of the following development plan policies and proposals:-
Policies LPP1 Policy CP13, and LPP2 Policies DM3, DM15, DM16, DM17, DM23 and the Council's High Quality Places design guidance.
3. In accordance with paragraph 38 of the NPPF, Winchester City Council (WCC) take a positive and proactive approach to development proposals focused on solutions. WCC work with applicants/agents in a positive and proactive manner by;
-offering a pre-application advice service and,
-updating applications/agents of any issues that may arise in the processing of their application and where possible suggesting solutions.
4. During Construction, no materials should be burnt on site. Where allegations of statutory nuisance are substantiated by the Environmental Protection Team, an Abatement Notice may be served under The Environmental Protection Act 1990. The applicant is reminded that the emission of dark smoke through the burning of materials is a direct offence under The Clean Air Act 1993
5. All building works including demolition, construction and machinery or plant operation should only be carried out between the hours of 0800 and 1800 hrs Monday to Friday and 0800 and 1300 hrs Saturday and at no time on Sundays or recognised public holidays. Where allegations of noise from such works are substantiated by the Environmental Protection Team, a Notice limiting the hours of operation under The Control of Pollution Act 1974 may be served.

Community Infrastructure Levy

Please note that this application is subject to the payment of Community Infrastructure Levy (CIL).

A separate CIL Liability Notice will be produced which provides full details regarding CIL. Please refer to that notice for further information. As this is a CIL liable development you must advise Winchester City Council of your intention to commence work.

Rights of Appeal:

- The applicant or the applicant's representative has the right to appeal to the Secretary of State against any of the conditions applied to this permission under section 78 of the Town and Country Planning Act 1990.

- As this is a decision relating to a Planning Application , any appeal against the conditions must be made within 6 months from the date of this notice.

- If an enforcement notice is served relating to the same or substantially the same land development as in your application and if you want to appeal against your local planning authority's decision on your application, then you must do so within: 28 days of the date of service of the enforcement notice, or within 6 months of the date of this notice, whichever period expires earlier.
- The Secretary of State can allow a longer period for giving notice of an appeal, but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

- Appeals must be made using a form which you can get from the Secretary of State at:

  The Planning Inspectorate (England)
  Temple Quay House
  2 The Square
  Temple Quay
  Bristol
  BS1 6PN

  Or online at:

  https://www.gov.uk/appeal-planning-decision

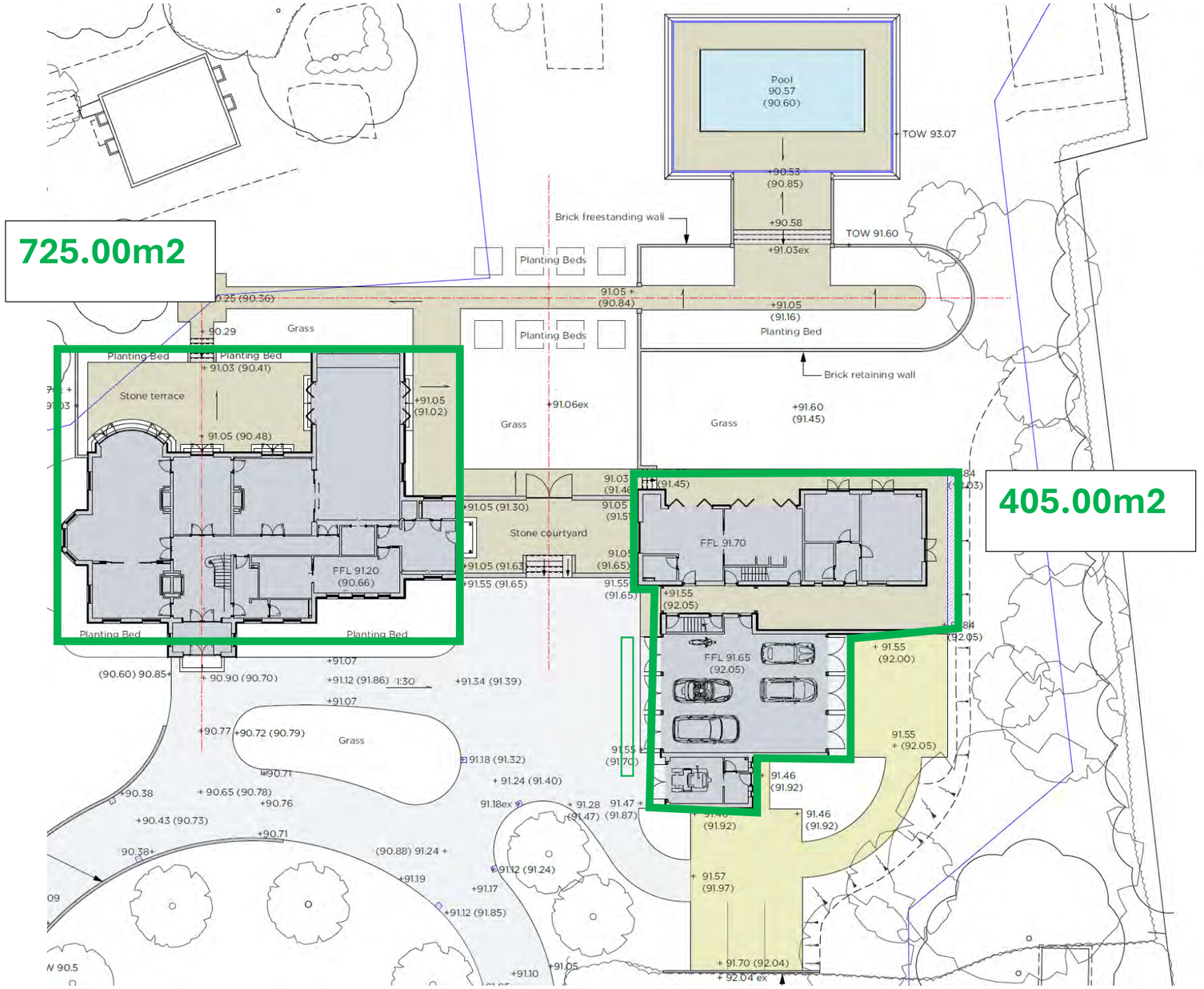
- The Secretary of State need not consider an appeal if it seems to the Secretary of State that the Local Planning Authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

- In practice, the Secretary of State does not refuse to consider appeals solely because the Local Planning Authority based their decision on a direction given by the Secretary of State.

Tel +44 (0) 207 042 8290
Email info@duffyassociates.co.uk
www.duffyassociates.co.uk
Registered in England 05638410

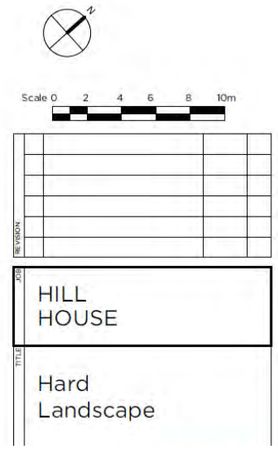
Appendix B: Output Calculation

Catchment Areas: “footprint” for SUDS Calculations



Swimming Pool

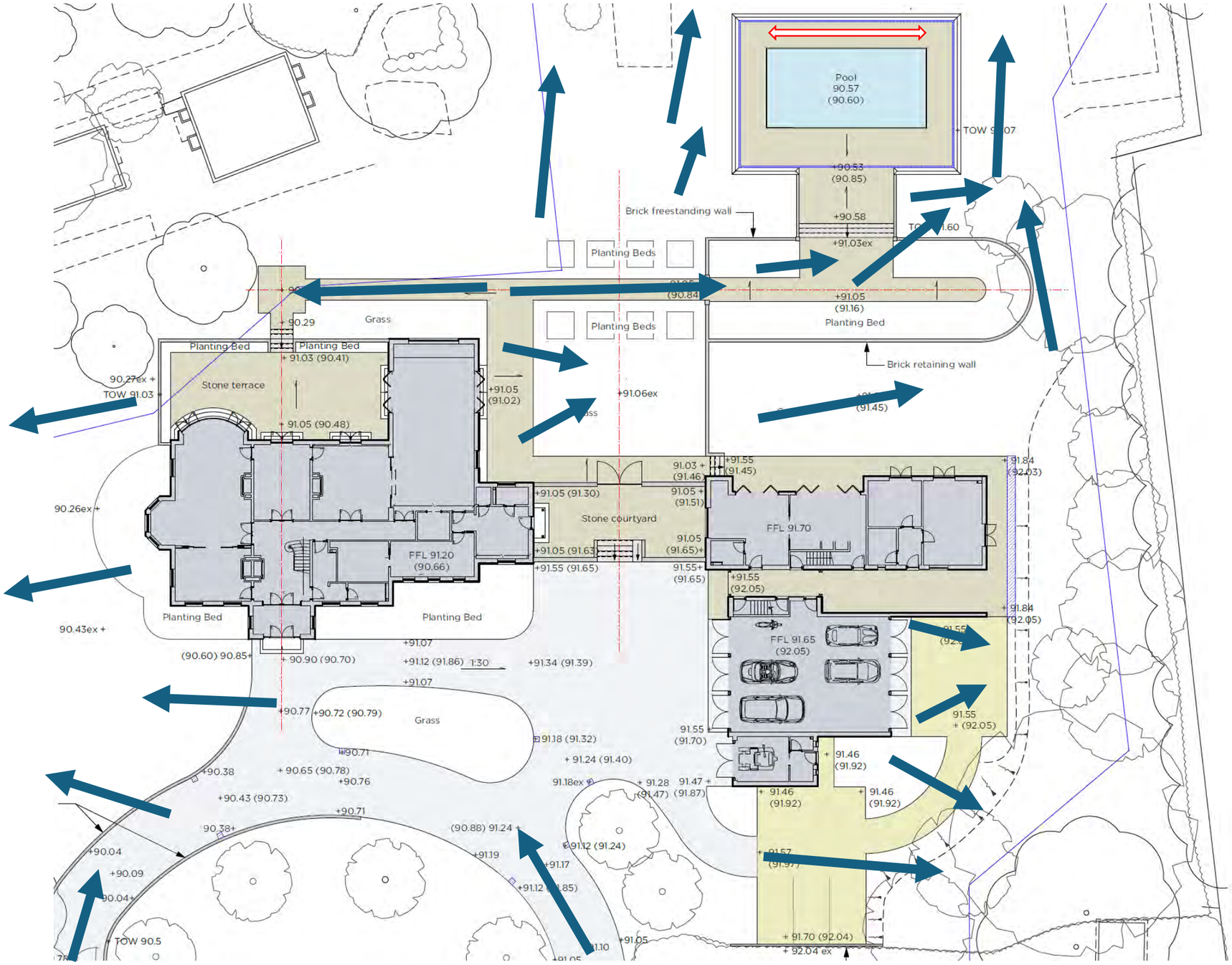
1. Backwash cannot go to package treatment: likely to surface / tanked OR use 100% recycled pool system
2. Informal perimeter drainage (French drain with gulleys to pick up from raised walls / pathways as per rest of site) see details



Hard landscaping layout for conditions stage

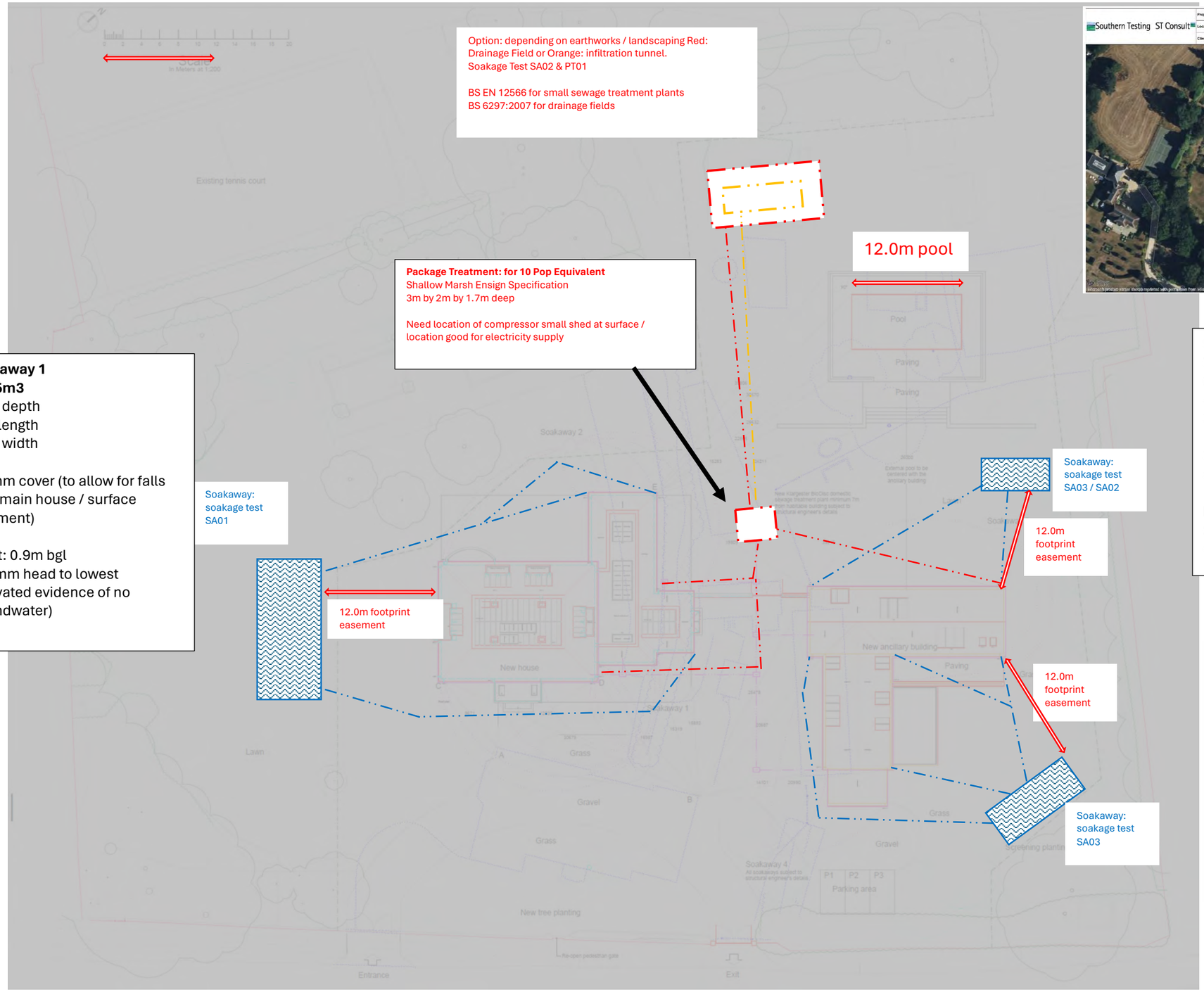
&

Exceedance Flow Routes: 100% directed to porous / permeable areas on site and to network and soakaway if formal drained area i.e. terrace / paving



Foul and Surface Water: GA

(IC's / detailed connections not shown: refer to detailed layouts below.



Soakaway 1
40.05m3
0.6m depth
15m length
4.5m width

300mm cover (to allow for falls from main house / surface treatment)

Invert: 0.9m bgl
(700mm head to lowest excavated evidence of no groundwater)

Soakaway 3
5.4m3
0.4m depth
4.5m length
3m width

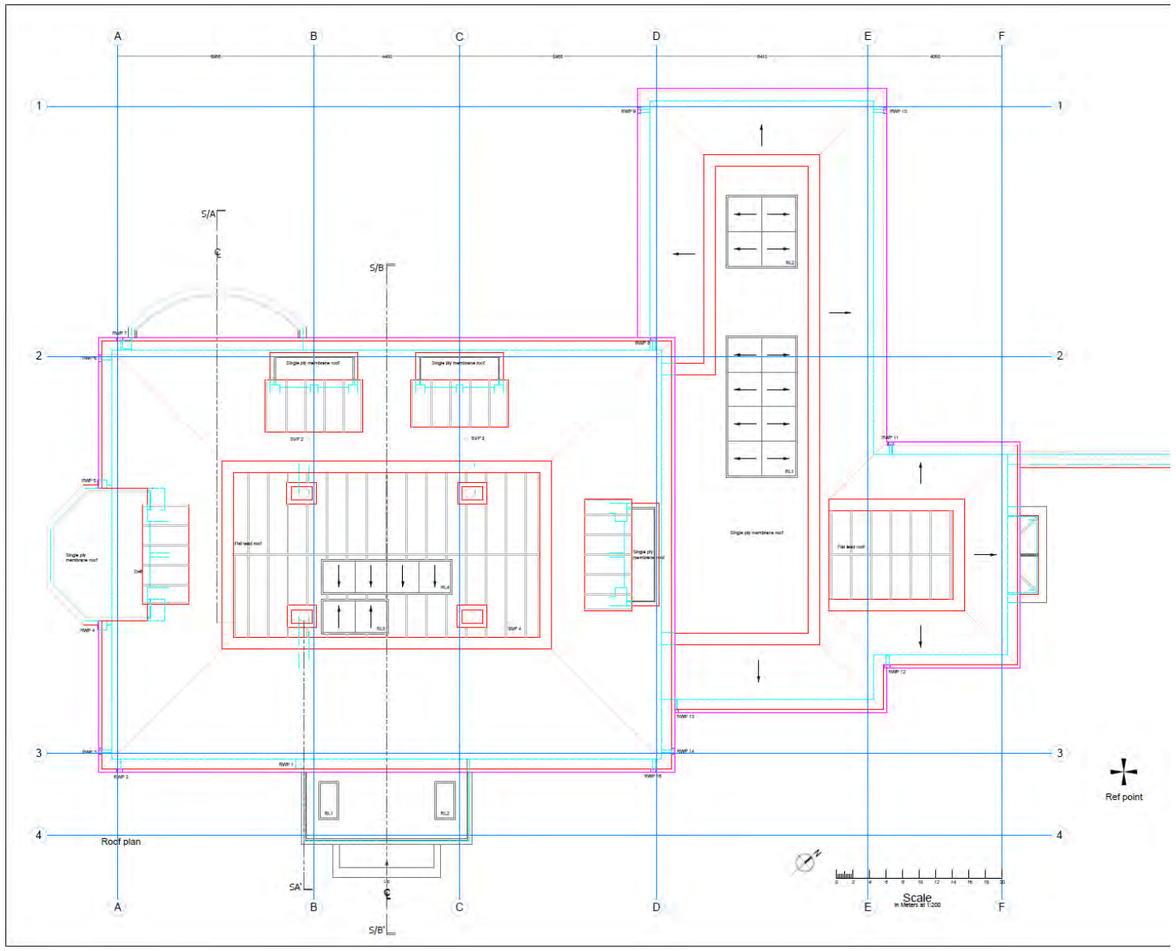
300mm cover (to allow for falls from annex / surface treatment)

Invert: 0.7m bgl
(900mm head to lowest excavated evidence of no groundwater)

Soakaway 2
17.1m3
0.4m depth
9.5m length
4.5m width

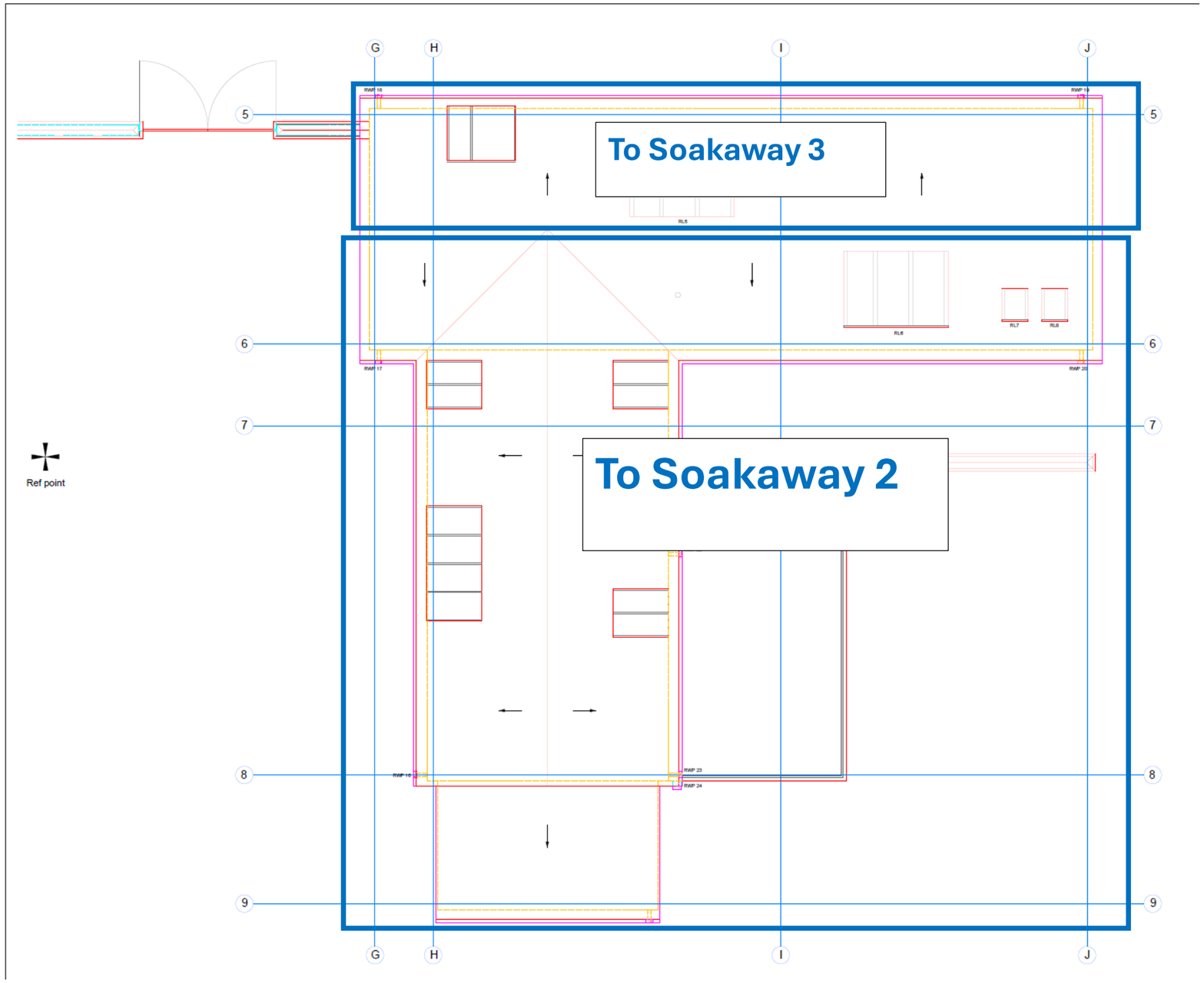
300mm cover (to allow for falls from annex / surface treatment)

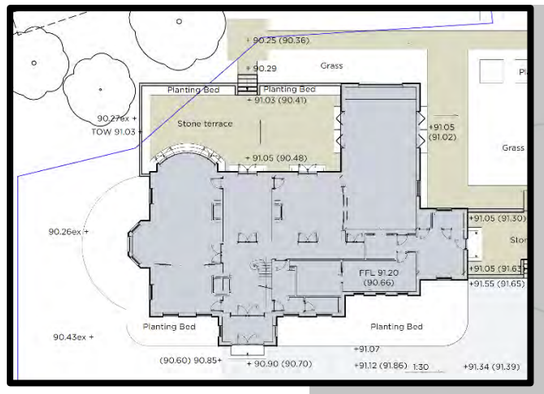
Invert: 0.7m bgl
(900mm head to lowest excavated evidence of no groundwater)

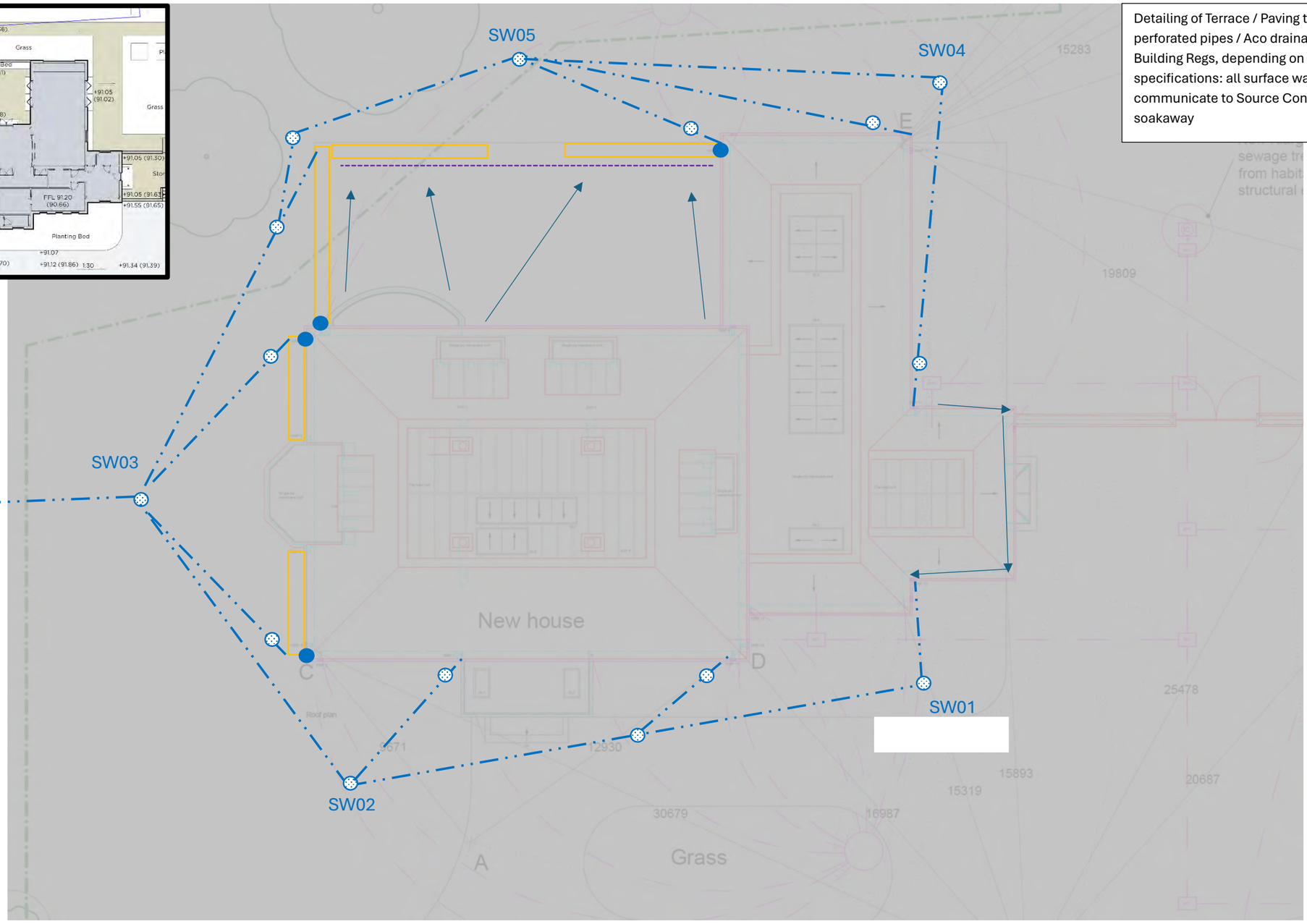


Main House

100% to Soakaway 1


G
H
I
J
5
6
7
8
9
To Soakaway 3
To Soakaway 2
Ref point
RWP 18
RWP 19
RWP 17
RWP 20
RWP 23
RWP 24
RL6
RL7
RL8



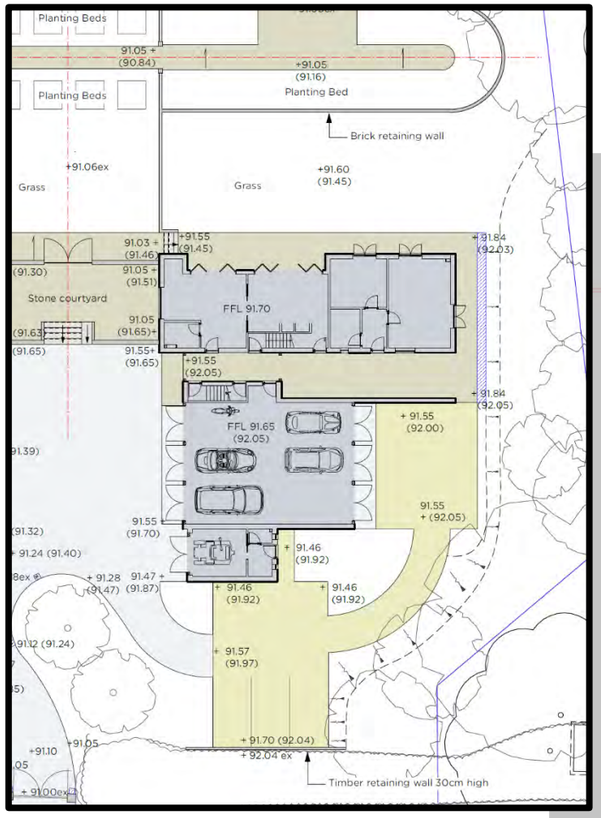


Detailing of Terrace / Paving to incorporate perforated pipes / Aco drainage to meet Building Regs, depending on final make-up specifications: all surface water to communicate to Source Control or direct to soakaway

To soakaway (Wavin specification see below and main report)

Key

- Surface Water Pipe runs (contractor to confirm exact runs on site / system check for all gradients / falls)
- Inspection Chamber / Manhole / Catch Pits
- Planters with integrated void storage
- Rainwater Downpipes with diverters (overflow to network and to soakaway)
- Deliberate gradient for guttering / paving where required to communicate to most efficient SW manhole
- Aco Drainage (to Building Regs detailing by engineer to match make-ups / on site)



Proposed steps adjacent to "RWP 18" connection to be detailed by contractor on site: assume intermediate spur connection to follow line of steps gradient

This garden area at level 91.6m is flush with footprint at 91.55 hence direct connection to IC's and to soakaway is feasible

Grave filled trench (French drain) to take adjacent slope from footprint and communicate to soakaway via catchpit

Decking assumed to drain to aco at entrance and thence to RWP and thence to soakaway

Detailing by engineer to Building Regs to fit in with make-up of final flat roof design (i.e. waterroofing etc)

To soakaway (Wavin specification see below and main report)

SW01

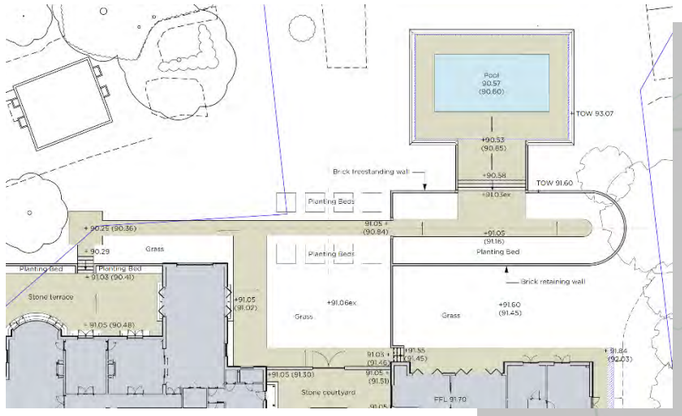
SW02

SW03

SW04

Key

- Surface Water Pipe runs (contractor to confirm exact runs on site / system check for all gradients / falls)
- Inspection Chamber / Manhole / Catch Pits (to Building Regs)
- Planters with integrated void storage
- Rainwater Downpipes with diverters (overflow to network and to soakaway)
- Deliberate gradient for guttering where required to communicate to most efficient SW manhole
- Aco Drainage (to Building Regs detailing by engineer to match make-ups / on site)
- Extra subbase of Type 3 Granular Angular with perforated pipes to aid local drainage and maximise "Source Control"



Drainage Field / infiltration tunnel location

All drainage / falls to be, as per landscaping setting out levels drawing, towards northeast away from the west as that is the location for the package treatment drain field / infiltration tunnel

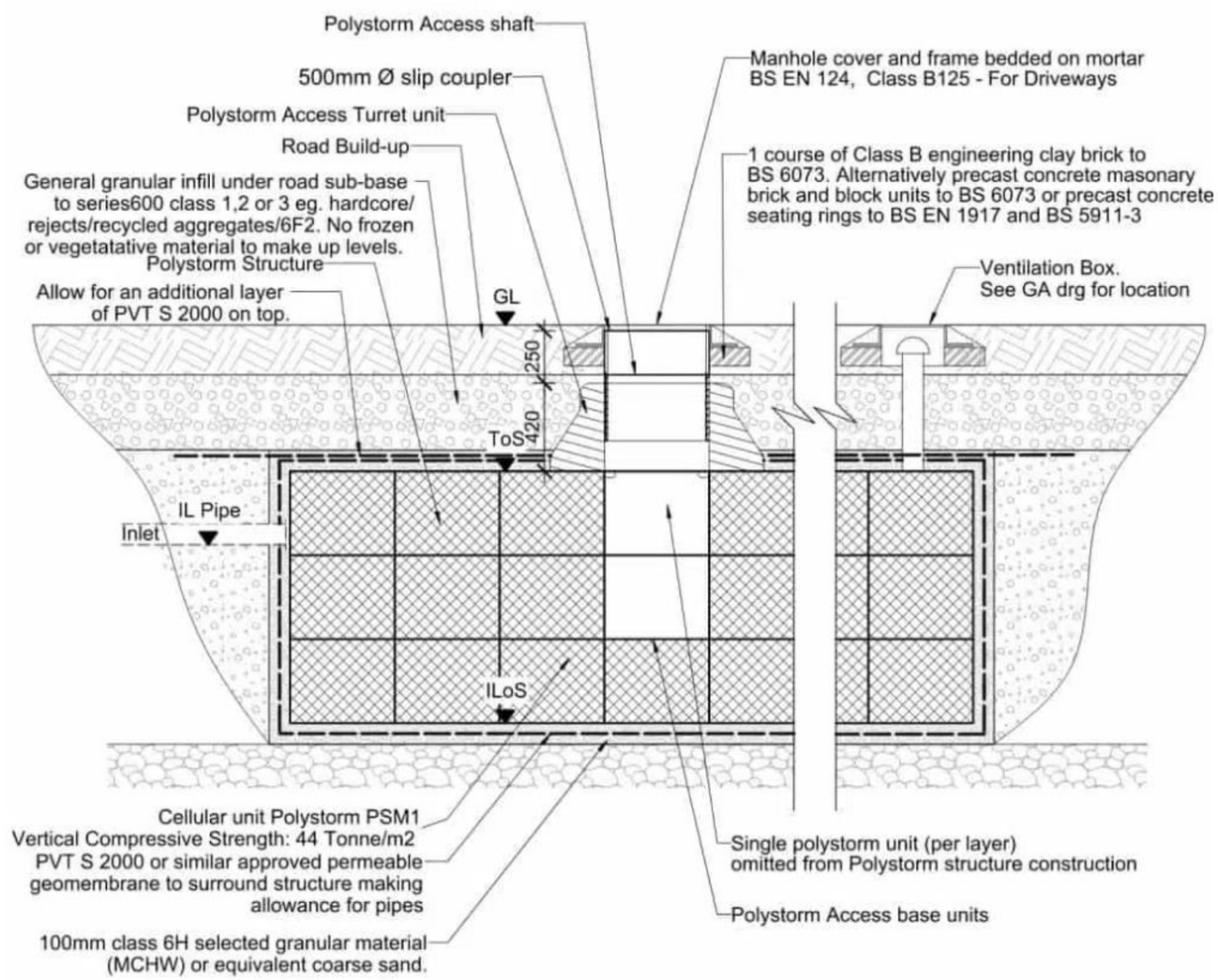
Pool & Retaining Structures

Engineer's to detail

Aco drainage / pipe runs to meet Building Regs

Informal discharge over adjacent porous area via diverters (blue filled circles) at from retaining structure

Indicative Make-Up: see Wavin specifications



Sensitivity Testing on Soakaway Sizing for additional future-proofing

Main House Catchment

Catchment Details		
Catchment Area	725	m²
Runoff Coefficient	0.85	
Design Storm Intensity	75	mm/hr
Design Storm Duration	60	mins

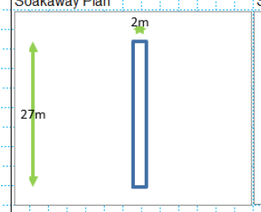
Ground Information

Infiltration Rate	0.2	m/hr
Factor of Safety	1.5	

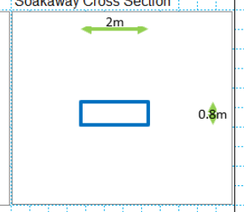
Soakaway Design

Soakaway Shape	Rectangular Trench/Pit	
Number of Soakaways	1	
Length	27	m
Width	2	m
Effective Depth	0.8	m
Void Percentage	95	%
Additional Outflow (If Any)	0	l/s
Base Infiltration Factor	0.5	

Soakaway Plan



Soakaway Cross Section



Storage Volume Required	39.53 m³	
Storage Area Provided	41.04 m³	Acceptable
Time for Emptying 50%	3.0 hours	Acceptable

Annex Catchment

Catchment Details		
Catchment Area	405	m²
Runoff Coefficient	0.85	
Design Storm Intensity	75	mm/hr
Design Storm Duration	60	mins

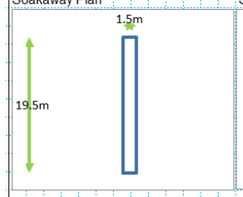
Ground Information

Infiltration Rate	0.2	m/hr
Factor of Safety	1.5	

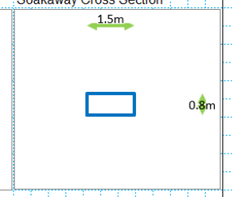
Soakaway Design

Soakaway Shape	Rectangular Trench/Pit	
Number of Soakaways	1	
Length	19.5	m
Width	1.5	m
Effective Depth	0.8	m
Void Percentage	95	%
Additional Outflow (If Any)	0	l/s
Base Infiltration Factor	0.5	

Soakaway Plan



Soakaway Cross Section



Storage Volume Required	21.63 m³	
Storage Area Provided	22.23 m³	Acceptable
Time for Emptying 50%	2.6 hours	Acceptable

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	George Locke
Site name:	Hill House, SO24 9DY
Site location:	Hill House, SO24 9DY

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	51.10191° N
Longitude:	1.15832° W
Reference:	4247313414
Date:	Mar 08 2024 18:18

Site characteristics

Total site area (ha):	0.0405
Significant public open space (ha):	0
Area positively drained (ha):	0.0405
Impermeable area (ha):	0.0405
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.04
Net impermable area for storage volume design (ha):	0.04
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	1
SPR:	0.1	0.1

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	94.08
FEH / FSR conversion factor:	1.12	1.12
SAAR (mm):	829	829
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.62	1.62
Growth curve factor 30 year:	2.3	2.3

Design criteria

Climate change allowance factor:	1.4		Growth curve factor 100 years:	3.19	3.19
Urban creep allowance factor:	1.1		Q_{BAR} for total site area (l/s):	0.01	0.01
Volume control approach	Use long term storage		Q_{BAR} for net site area (l/s):	0.01	0.01
Interception rainfall depth (mm):	5				
Minimum flow rate (l/s):	2				

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	2	2
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m^3):	9	9
Long term storage 1/100 years (m^3):	0	0
Total storage 1/100 years (m^3):	9	9

Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	George Locke
Site name:	Hill House, SO24 9DY
Site location:	Hill House, SO24 9DY

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	51.10191° N
Longitude:	1.15832° W
Reference:	396220324
Date:	Mar 08 2024 18:06

Site characteristics

Total site area (ha):	0.0725
Significant public open space (ha):	0
Area positively drained (ha):	0.0725
Impermeable area (ha):	0.0725
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.07
Net impermable area for storage volume design (ha):	0.07
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	1
SPR:	0.1	0.1

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	94.08
FEH / FSR conversion factor:	1.12	1.12
SAAR (mm):	829	829
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 10 year:	1.62	1.62
Growth curve factor 30 year:	2.3	2.3

Design criteria

Climate change allowance factor:	1.4		Growth curve factor 100 years:	3.19	3.19
Urban creep allowance factor:	1.1		Q_{BAR} for total site area (l/s):	0.01	0.01
Volume control approach	Use long term storage		Q_{BAR} for net site area (l/s):	0.01	0.01
Interception rainfall depth (mm):	5				
Minimum flow rate (l/s):	2				

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	2	2
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m^3):	33	33
Long term storage 1/100 years (m^3):	0	0
Total storage 1/100 years (m^3):	33	33

Southern Testing ST Consult	Project Name:	Hill House, Colden Lane, Old Alresford, Hampshire, SO24 9DY	Project ID:	JT0572	Site Plan
	Location:	Colden Lane, Old Alresford, Hampshire, SO24 9DY	Engineer:	RJ	
	Client:	Duffy Associates Ltd	Scale:	1:1000	

Legend Key

Trial Pit Location

RWP with direct connection to granular storage

Diverter to Rainwater Butt incorporated

Specification to be chosen by client / contractor to integrate with cycle storage area

Example Planters and Mechanisms for Connection

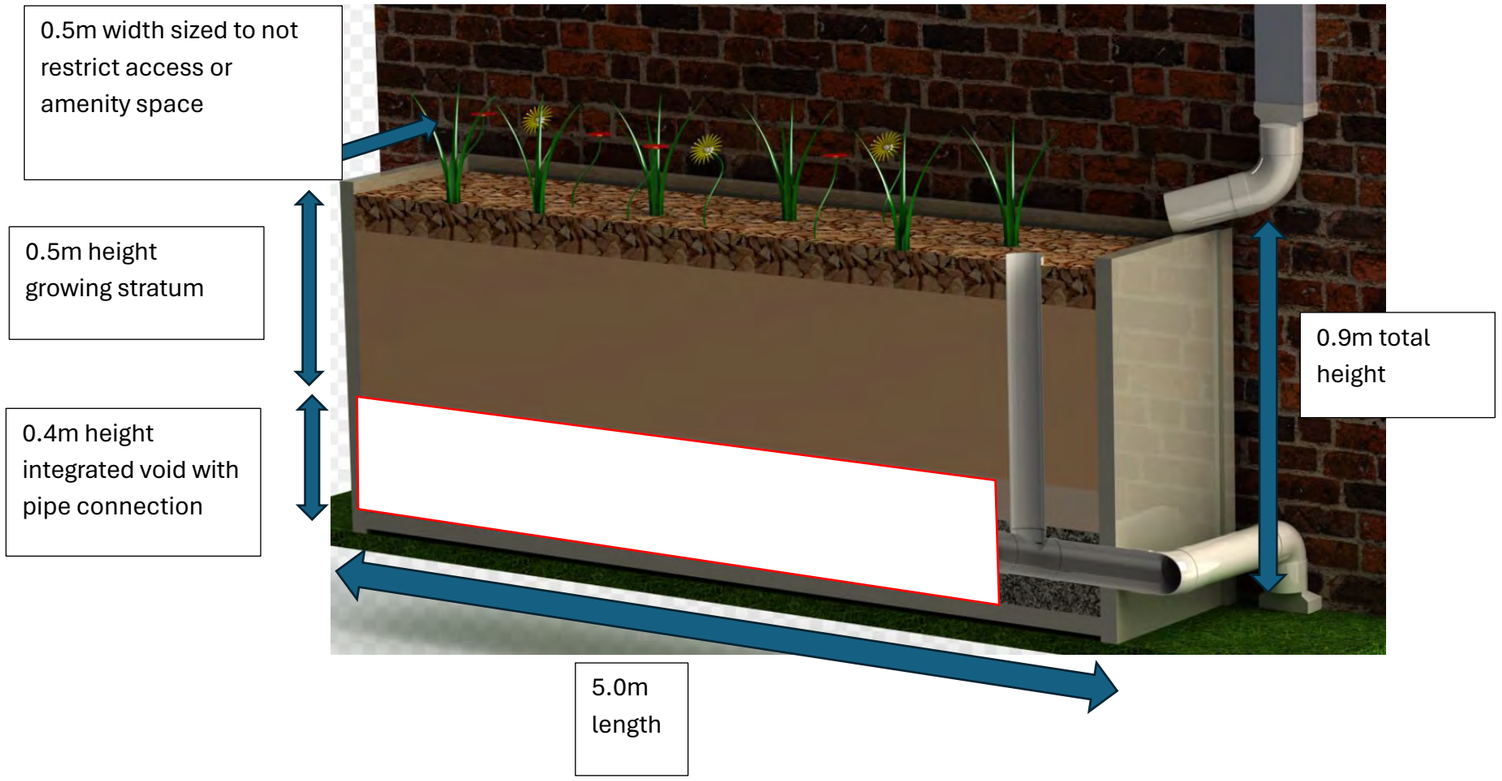
There are many off the shelf versions; client aesthetic requirements can confirm the exact specification; it is not necessary to commit to a type or design.

We include the exact

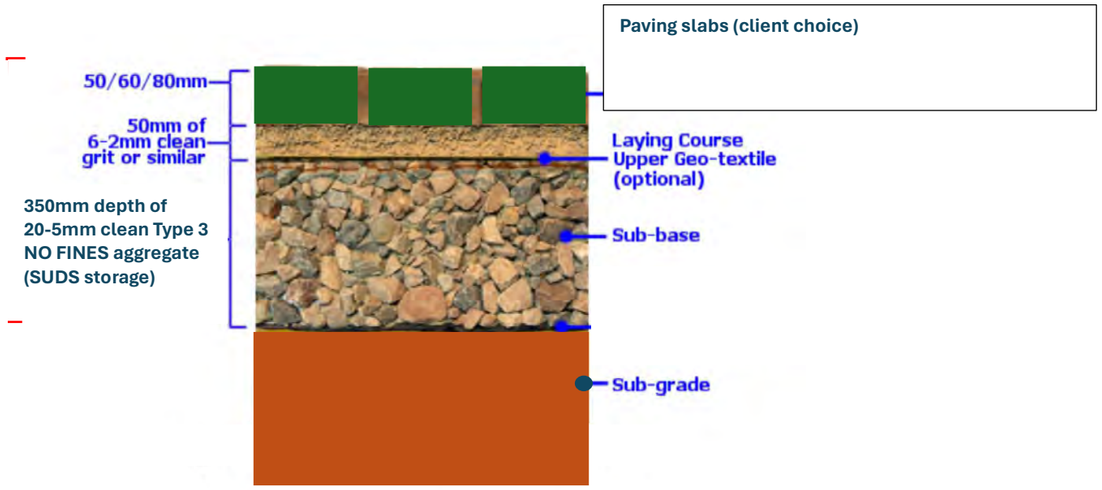
This is to demonstrate there are suitable specifications “off the shelf”.

Please see below for the site specific detailed Cross Sections

West Elevation Planters Cross Section



Patio Cross Section



Lowest invert therefore at c. 0.43m depth below ground level

Hence plenty of fall to allow gravity drainage from all areas to reach soakaways

Binding Rules Foul Discharge Check

	A	B	C	D	E	F	G	H	I	J	K
1	**Daily discharge calculator for domestic properties**									V2.0 July 2019	
2											
3	Use this calculator to work out how much effluent your septic tank or small sewage treatment plant will discharge a day when it's										
4	being used to treat the sewage from one or more houses or flats.										
5											
6	**Number of properties**	2	→	Enter the number of properties which are connected to the plant							
7											
8	**Number of bedrooms**	10	→	Enter the total number of bedrooms for all of the properties and press return							
11											
12	**Cubic metres a day**	1.95	→	**This is how much treated sewage your plant will discharge a day**							
13											
14											
15	For example, if you have 2 houses sharing a septic tank, one with 3 bedrooms and the other with 4, enter 2 for the number of properties,										
16	7 for the number of bedrooms, and this will give you a result of 1.65 cubic metres a day.										

Shallow Ensign:Ultra™

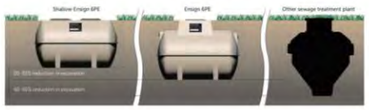
Advanced sewage treatment plant (6-35PE)

Enquiries

Shallow Ensign Ultra sewage treatment plants

Common sewage treatment plants on the market often exceed 2.3m high. Marsh Industries offer a range of Shallow Ensign Ultra sewage treatment plants from 4-35PE that are only 1.6m in height, meaning installation is not only possible, but easier and safer too.

*Shallow Ensign's are often favoured when hard rock site conditions mean deeper alternatives, involving costly and time-consuming excavation.



Operating principle | Benefits | Specifications | Optional extras | Resources

In addition to anaerobic digestion taking place in the primary settlement chamber [2] the Ensign:Ultra unit allows the clarified water to pass into a second 'aeration' chamber [3] where it is treated to remove the dissolved constituents. Here aerobic bacteria, supported by diffused air and mobile media, ensures full treatment is achieved before the treated effluent and 'sloughed off' bacteria flows to a final settlement chamber [10]. The final effluent is then discharged to the drainage field or watercourse via a Polylok filter.

KEY

1. Inlet
2. Primary settlement chamber
3. Aeration chamber
4. Compressor with alarm
5. Compressor housing (External or internal options)
6. RCD / Electrical connection
7. PVC pressure pipe for diffuser(s)
8. Bio-media
9. Stainless steel mesh
10. Final settlement chamber
11. Sludge return
12. Unique Polylok tertiary filter (Ensign:Ultra units)
13. Outlet
14. Access lid
15. Integral lifting eyes
16. Stabilising feet
17. Unique 'keying-in' lip

Infiltration tunnel 300

Video | Awards | Share

CONNECT TO BETTER

Product Details
AquaCell Eco

Application

AquaCell Eco is manufactured from specially reformulated, recycled material and has been specifically designed for shallow, non-trafficked, landscaped applications. AquaCell Eco is **NOT** suitable for locations subject to high water tables.

AquaCell Eco is typically suitable for installations to a maximum depth of 1.5 metres, to the base of the units from ground level, with a minimum cover depth of 0.3 metres, (Wavin's recommendation, is to allow a cover depth of 0.5 metres).

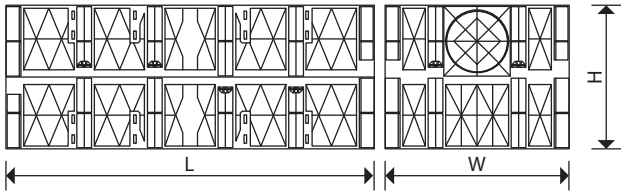
Any installation using AquaCell Eco must **NOT** be subjected to additional loading at any time. Trafficking by construction plant on site, including mechanical equipment, must be avoided.

If trafficking of the buried tank by construction plant or, other vehicles is unavoidable, the installation should be constructed using AquaCell Core units (see page 11).

The width of an AquaCell Eco installation should not exceed 12 metres to allow for mechanical backfilling without loading. There is no limit to the length of the installation.

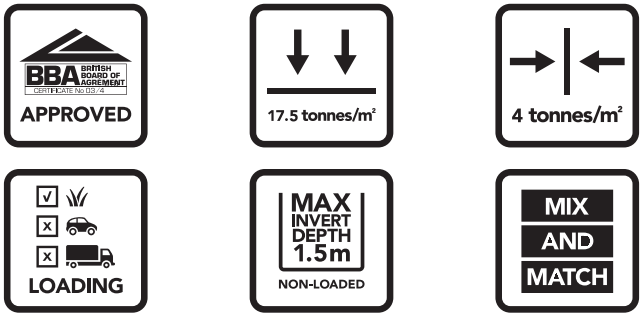
Features and benefits

- Manufactured from specially reformulated, recycled material
- Suitable for both soakaway and attenuation applications
- Proven vertical loading capacity of: 17.5 tonnes/m²
- Proven lateral loading capacity of: 4.0 tonnes/m²
- Integral "hand holds" for ease of carrying/handling
- Black in colour, for ease of identification
- BBA approved – Certificate No 03/4018



Material: Reformulated polypropylene

Nominal Size (mm)	Part Number	Dimensions (mm) W	H	L
160	6LB025	500	400	1000



Maximum installation depths (to base units) and minimum cover depths [1]

Typical soil type	Typical angle of shearing	Maximum depth of installation (m)	Minimum cover depth (m)
Stiff over-consolidated clay (e.g. London clay)	24°	0.95	0.30
Normally consolidated silty, sandy clay (e.g. alluvium, made ground)	26°	1.05	0.30
Loose sand and gravel	29°	1.2	0.30
Medium dense sand and gravel	33°	1.5	0.30
Dense sand and gravel	38°	1.9	0.30

(1) These values relate to installations where the groundwater is a minimum of one metre below the base of the excavation. AquaCell Eco units should not be used where groundwater is present.

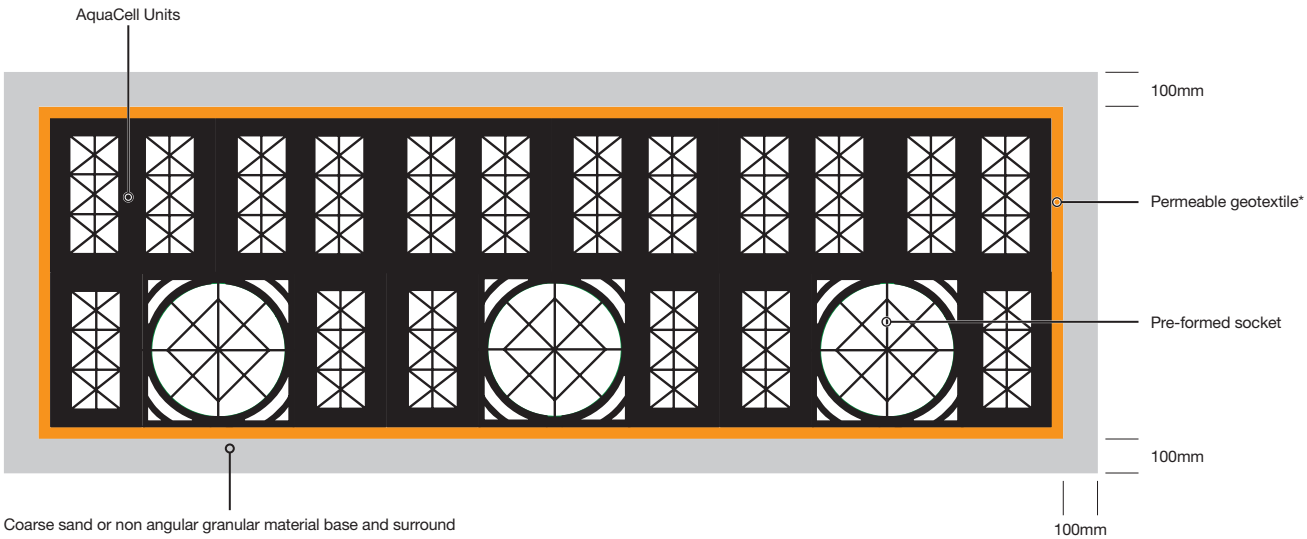
Source: BBA

Installation
AquaCell Units

Typical Soakaway Installation Method

Typical installation procedure

1. Excavate the trench to the required depth ensuring that the plan area is slightly greater than that of the AquaCell units.
2. Lay 100mm bed of coarse sand or non angular granular material, level and compact.
3. Lay the geotextile* over the base and up the sides of the trench.
4. Lay the AquaCell units parallel with each other. In multiple layer applications, wherever possible, continuous vertical joints should be avoided. AquaCell units can be laid in a 'brick bonded' formation (i.e. to overlap the joints below) – see page 18. For single layer applications use the AquaCell Clips and for multi layers use the AquaCell Clips and the AquaCell Shear Connectors (vertical rods).
5. Fix the Adaptors to the AquaCell units as required and connect pipework.
6. In order to prevent silt from entering the tank, clogging inlet pipework and reducing storage capacity, it is recommended that the Domestic Silt Trap (6LB300) or the standard Silt Trap (6LB600) is installed prior to the inlet pipework – see page 26 for installation guidelines.
7. Wrap and overlap the geotextile covering the entire AquaCell structure.
8. Lay 100mm of coarse sand or non angular granular material between the trench walls and the AquaCell structure and compact.
9. Lay 100mm of coarse sand or non angular granular material over the geotextile and compact.
10. Backfill with suitable material.
11. Rainwater from roof areas may discharge directly into the soakaway but rainwater from carparks must discharge through a catchpit manhole and/or a petrol interceptor.



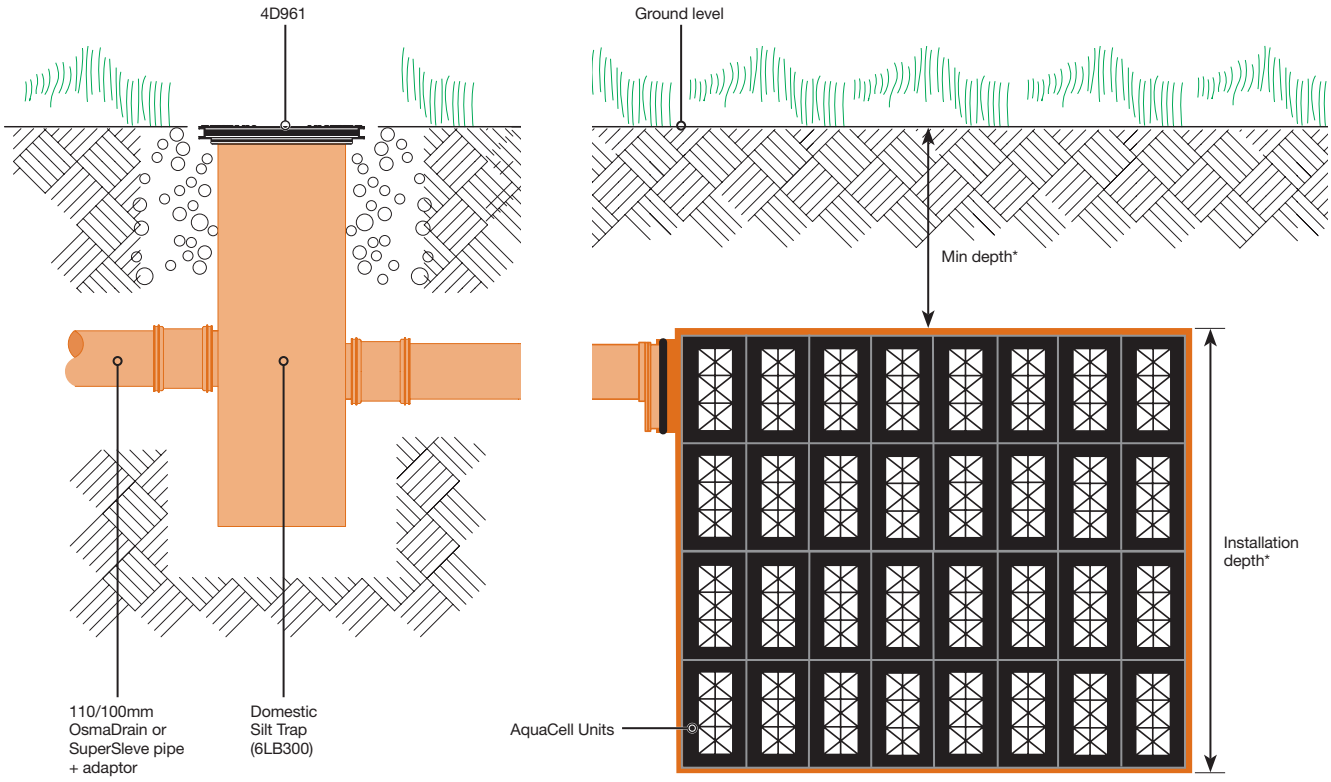
Example shows the use of AquaCell Eco. However, a soakaway can also be installed as shown using either of the other versions of AquaCell units (Prime, Core or Plus) as appropriate.

**The geotextile should be selected according to specific site conditions. Typically, however, a 300g non-woven material will be suitable. Specialist advice should be sought if surrounding soil characteristics exhibit a high degree of fines/low infiltration capacity and/or there is a high risk of damage from ground contaminants.*

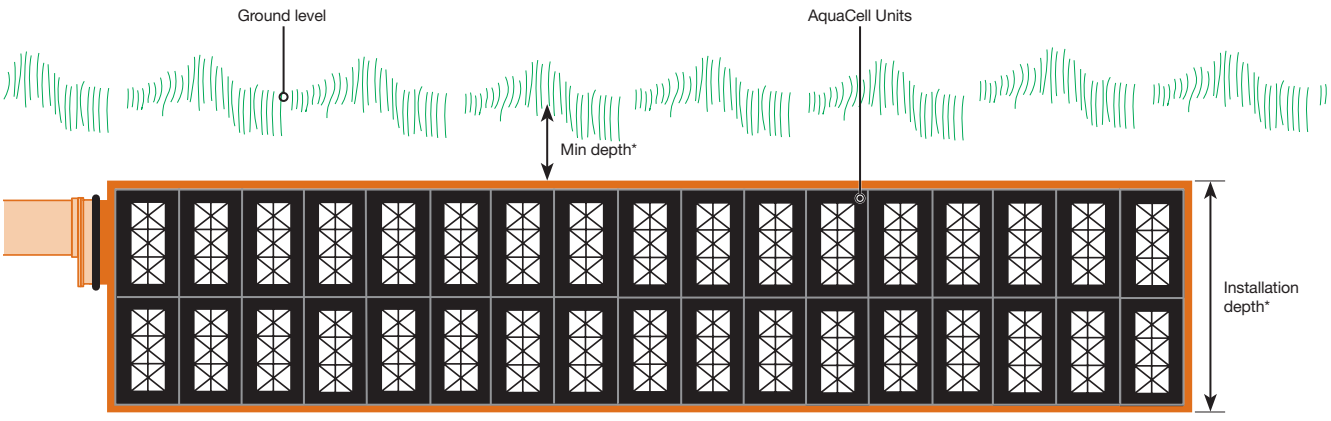
Typical Details
AquaCell Units

Soakaway – Non-Traffic Loading

Soakaway



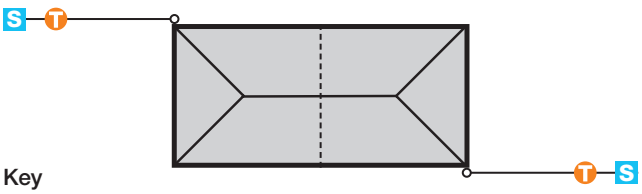
Trench soakaway



Notes

1. Soakaways should be sited at least 5m away from the building (Ref BS EN 752-4).
2. The exact size and shape of the soakaways are to be determined once all the necessary calculations have been produced.

*For information regarding cover depths and installation depths, see page 17.



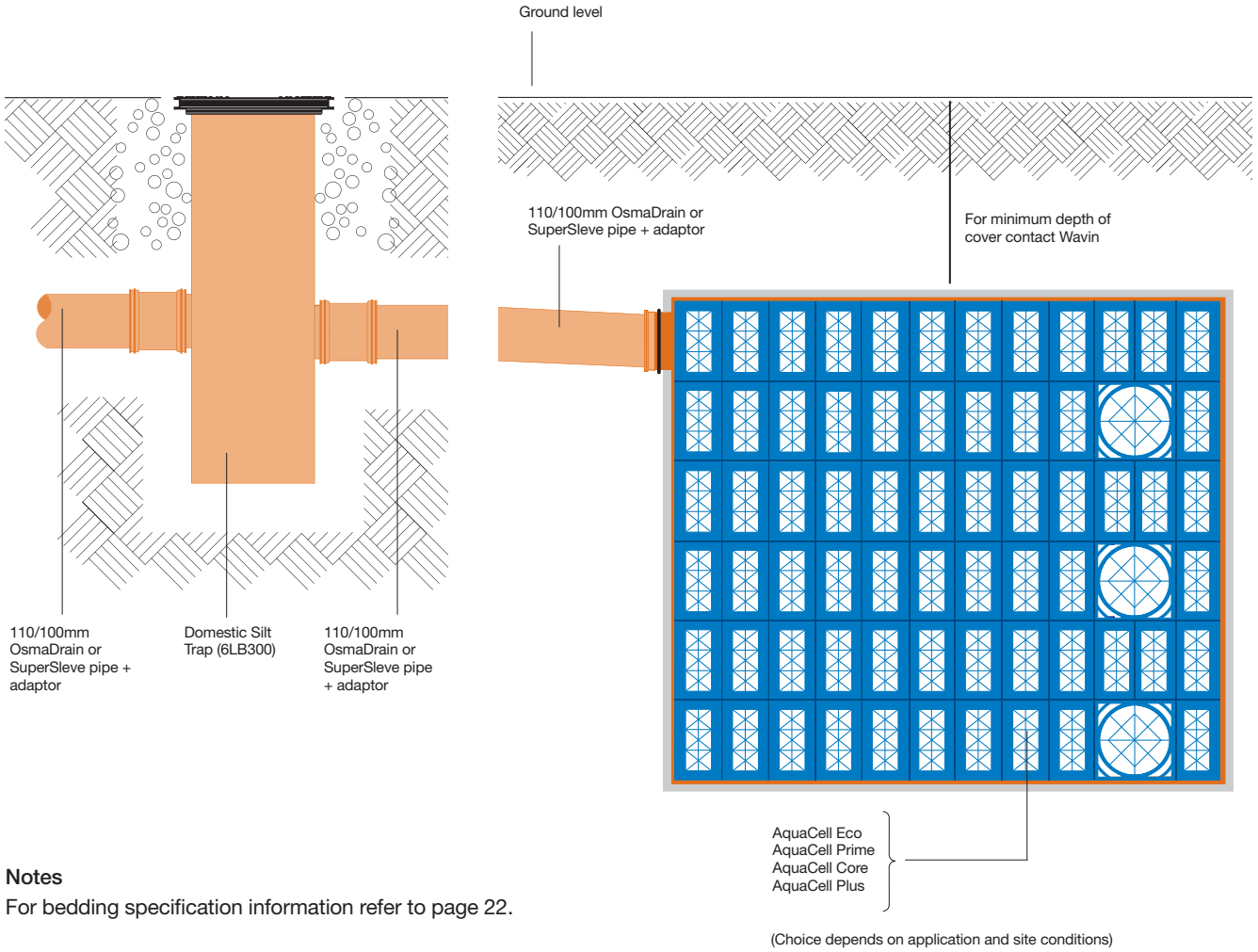
Key

S = AquaCell units soakaway (See note 2)

T = 250mm Dia Silt Trap

Typical Details
AquaCell Units

Soakaway or Storage Tank – With Silt Trap



Notes

For bedding specification information refer to page 22.

The silt trap can be used in conjunction with a soakaway (as shown) or a storage tank.

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www.duffyassociates.co.uk
Registered in England 05638410

Appendix C: Binding Rules: Evidence of full compliance

Hill House, Colden Lane, Old Alresford SO24 9DY
Binding Rules and EA Permit Addendum

Binding Rules / EA Permit for Hill House:

Site is in SPZ1 hence EA Permit required also.

Government "Small Discharge to Ground" (Published 16 June 2015; Last updated / 2 October 2023" (General binding rules: small sewage discharge to the ground - GOV.UK (www.gov.uk))

New discharges that started on or after 2 October 2023

You're in this category if, on or after the 2 October 2023, you:

- started a discharge from a septic tank or small sewage treatment plant
- changed a discharge from surface water to ground
- moved the location of the discharge to more than 10 metres away from the previous location
- increased a discharge to ground to more than 2 cubic metres (2,000 litres) a day to ground

If so, you must meet the:

- rules that apply to all discharges
- additional rules for discharges started
- additional rules for new discharges started on or after 2 October 2023

Rule 1: only discharge 2 cubic metres or less a day in volume

For sewage from a residential property, use the daily discharge calculator to work out how much you discharge a day.

For commercial properties (such as a hotel, restaurant or office) or holiday accommodation (such as a cottage or chalet), use British Water's Flows and Loads guidance. You will need to add all sources of flow together.

If you discharge more than 2 cubic metres (2,000 litres) a day to ground you must connect to the public foul sewer when it's reasonable to do so. You must apply for a permit if it's not.

Based on overestimate of 1 dwelling but 6 bedrooms (rather than actual 4, given the annex has a bathroom and will discharge) still only 1.2 cubic metres per day

Rule met

Rule 3: only discharge domestic sewage

The sewage must be domestic in nature. For example, from a toilet, bathroom, shower or kitchen of a house, flat or business (such as a pub, hotel or office).

Find out more about what the definition of domestic sewage includes.

Rule met

Rule 4: do not cause pollution of surface water or groundwater

The sewage must not cause pollution – find out how to check for pollution.

Rule met

Rule 5: use the correct treatment system

You must use a septic tank or a small sewage treatment plant to treat the sewage and then discharge the waste water to ground through a drainage field. You must not discharge effluent from a septic tank to a watercourse.

A septic tank is an underground tank where the solids sink to the bottom, forming a sludge, and the waste water flows out to a drainage field.

A small sewage treatment plant, also known as a package treatment plant, works in a similar way to a septic tank. But it uses mechanical parts to treat the waste water to a higher standard before it goes to a drainage field.

A drainage field, also known as an infiltration system, is a series of pipes with holes placed in trenches. These are arranged so that the waste water can trickle through the ground for further treatment.

The system you use must meet the relevant British Standard (see rule 9).

Discharges through drainage mounds can meet the general binding rules if:

- they are not in floodplains
- they are located, designed and constructed in line with the recommendations in British Standard BS 6297:2007

Rule to be met but see Rules below

Hill House, Colden Lane, Old Alresford SO24 9DY
Binding Rules and EA Permit Addendum

(Note: =the government guidance does not have a Rule 6 but everyone knows this is meant to be the “non standard system” they just forgot to add “Rule 6” before it.

Rule 7: make sure the discharge is not in a groundwater source protection zone 1

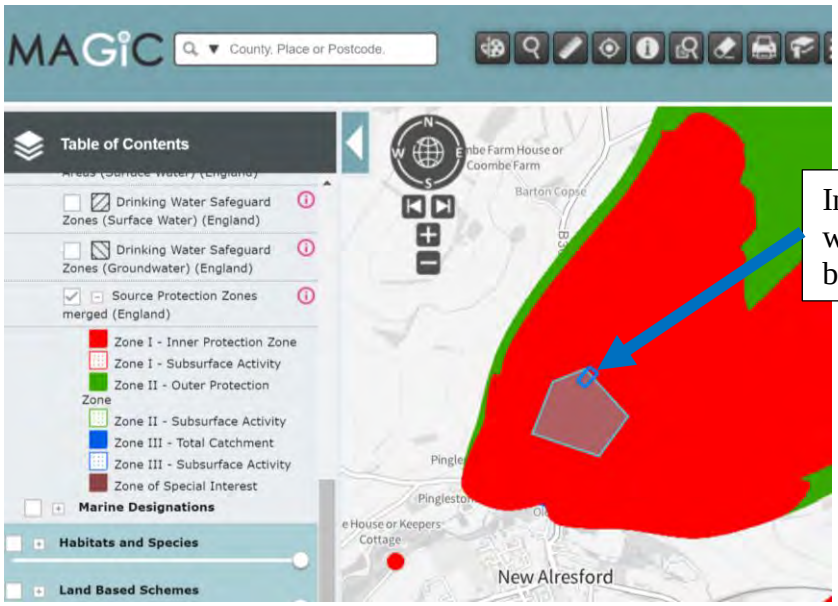
To prevent groundwater pollution you must check if the discharge point is in a groundwater source protection zone 1 (SPZ1).

A groundwater SPZ1 can be the area around a commercial water supply used for drinking water or food production. To check if your discharge is in the inner zone (zone 1) you can either:

- use Magic map – search for the discharge location, then select ‘Source Protection Zones merged (England)’ from the non-statutory land-based designations in the table of contents
- contact the Environment Agency to request a nature and heritage conservation screening if you cannot use Magic map

A groundwater SPZ1 can also be any area within 50 metres of a private water supply for human consumption. Ask your neighbours if they have one and, if so, how far their spring, well or borehole is from your drainage field.

We are in an SPZ1



SO

If an existing discharge or a new discharge to the ground is in a SPZ1

If the discharge point is in a SPZ1 (except SPZ1c) you must apply for a permit. A permit will include additional conditions to the general binding rules.

The Environment Agency will grant the permit if either:

- there's no evidence of pollution
- the risk of pollution is acceptable

If there's evidence of pollution or the risk of pollution is unacceptable, the Environment Agency will ask you to make changes to your system. They will either refuse to grant a permit or issue a permit with improvement conditions.

The Environment Agency regularly checks:

- surface and groundwater quality
- permit compliance

If the Environment Agency finds your system may be causing pollution to surface or groundwater they will contact you to discuss the issues. This may result in them reviewing or revoking your permit. Follow the guidance on how to comply with your permit.

Rule can only be complied with if we submit and secure EA Permit (included in our scope to provide this (additional requirements will be more details on the methodologies / groundwater evidence / maintenance / cross sections of the infiltration mound if used, etc,)

Rule 9: make sure your treatment system meets the right British Standard

Your system must meet the relevant British Standard that was in place at the time it was installed.

If different parts of your treatment system were installed at different times, each part must meet the relevant British Standard in place at the time of installation.

The current standards for new systems are:

- BS EN 12566 for septic tanks and small sewage treatment plants
- BS 6297:2007 for drainage fields

How to check if your treatment system met the British Standard

Your septic tank or treatment plant met the British Standard in place at the time of installation if:

- it has a CE mark
- the manual or other documentation that came with your tank or treatment plant has a certificate of compliance with a British Standard

- it's on British Water's list of approved equipment

You can also ask the company that installed your equipment to confirm that it met the British Standard in place at the time of installation.

If your treatment system was installed before 1983 you do not need to do anything to meet the British Standard. There was no British Standard in place before then. You must still meet the other general binding rules that apply to you.

Yes it will. Rule Met. Specialist contractor and confirmation of specification

Rule 10: make sure your treatment system is installed and operated correctly, and has enough capacity

Your treatment system must be large enough to handle the maximum amount of sewage it will need to treat.

If you install a new septic tank, small sewage treatment plant or drainage field (or installed one after 1 February 2006) you must check with the installer that it meets the sizing requirements in British Water's Flows and Loads guidance.

Your treatment system must be installed and operated in line with the manufacturer's specification. This is the instruction manual or technical set of requirements that comes with the equipment.

If the amount of sewage the system needs to treat increases

You must make sure the treatment system is still big enough. For example, this could be if you extend your property or connect to an another property. You must recalculate the maximum daily volume of your discharge.

If you discharge more than 2 cubic metres (2,000 litres) a day to ground you must connect to the public foul sewer when it's reasonable to do so. You must apply for a permit if it's not.

Rule met: we will appropriately oversize for resilience / include sensor for low usage also (to ensure system is always optimised)

Rule 11: get your treatment system regularly maintained

You should have your treatment system regularly maintained in line with the manufacturer's instructions. If these are not available, ask your local maintenance company for advice.

You must have your treatment system repaired or replaced if it is not in good working order. For example, this could be if it has:

- leaks
- cracks in tank walls or pipes
- blocked pipes
- signs that the waste water is not draining properly, like pools of water around the drainage point
- sewage smells
- a failed motor
- a failed pump
- a failed electrical supply

Anyone who carries out maintenance on your system must be competent. Competent people include those on British Water's list of accredited service engineers.

If you change your treatment system, check if it's now classed as a new discharge. To do this, see the section 'Work out which rules apply to you'.

Rule met: yes it will be maintained by specialist contractor / part of household maintenance and management plan

Rule 12: get your treatment system regularly emptied

You must get the sludge that builds up in your septic tank or sewage treatment plant removed (desludged) before it goes beyond the maximum capacity. You should do this at least once a year or in line with the manufacturer's instructions.

If you do not desludge your tank often enough, solids from the tank are likely to be carried into the drainage field or soakaway. This can cause damage and pollution, leading to potentially expensive and disruptive repairs.

The company you use to dispose of your waste sludge must be a registered waste carrier. You can find this out by either asking the:

- company to confirm this when you arrange to have your tank emptied
- tanker driver for a copy of the company's waste carrier certificate

Rule met: yes it will be maintained by specialist contractor / part of household maintenance and management plan

Rules 13 and 14 relate to if you sell your house / or decommission the system.

Additional rules for discharges started on or after 1 January 2015

Rule 15: check if you can connect to a nearby public foul sewer

If you connect to a public foul sewer:

- the general binding rules will not apply to you
- you will not need an environmental permit

To find out if there is a public foul sewer near your property, contact your local water company. Owners of neighbouring properties will also be able to tell you if their property is connected to a public sewer.

For a single domestic property

You cannot meet the general binding rules if there's a public foul sewer within 30 metres of any boundary of the premises that your system serves.

Provide mapping from Southern Water to demonstrate it is not feasible

Rule 16: get building regulations and planning approval

You must have building regulations approval if you have or are planning to install a new septic tank or small sewage treatment plant. You may also need planning permission.

Rule 18: make sure the discharge point is not in or near protected sites

You cannot meet the general binding rules if the discharge will be in an ancient woodland or in or within 50 metres of any:

- special areas of conservation
- special protection areas
- Ramsar wetland sites
- biological sites of special scientific interest (SSSI)

If you have or are planning to start a discharge to ground in or near a protected site, you must connect to the public foul sewer when it's reasonable to do so. You must apply for a permit if it's not.

Rule met: covered by Ecology report / EA Permit: use available Magic.gov.uk mapping

Site is an existing dwelling in any case hence default can be compliant.

Hill House, Colden Lane, Old Alresford SO24 9DY

Additional rules for new discharges started on or after 2 October 2023

Rule 22: make sure your new discharge does not use the same discharge point as any other discharge if the combined volume would exceed the general binding rule limit

A new discharge must not use the same outlet as any other discharge if the combined volume is greater than 2 cubic metres (2,000 litres) a day to ground. You must have a permit for the new discharge if the combined volume of the new and existing discharges is above this limit.

Rule will be met: careful design, only our house will use our system and also check neighbours discharge locations as part of our scope (see below)

Rule 23: make sure your new discharge is not within 50 metres of any other exempt small sewage discharge

Ask your neighbours if their foul drainage solution discharges under the general binding rules. If so, ask how far their discharge is from your discharge location.

You must have a permit for the new discharge if it's within 50 metres of any other system that discharges under the general binding rules.

Rule will be met: careful design and check neighbours as part of our scope; we are needing to do an EA Permit in any case given we are in SPZ1

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Appendix D: SUDS Maintenance Schedule

SUDS Maintenance Schedule

Installation	Maintenance Required	Frequency	Responsibility
Permeable Patio Area	Inspection, weeding, jetting etc	Annually or as per supplier's recommendations	Supplier (via a maintenance/service package) and Householder
Permeable Surfaces (incl. associated distribution pipework and sump chambers) Cellular Storage and pipe work / IC's	Inspection, debris removal and jetting	Typically, inspection is recommended annually or after a severe or significant storm event, with any jetting/cleaning being carried out as necessary. Wavin (or other manufacturer) maintenance and warranty requirements	Supplier (via a maintenance/service package) and Householder (gardener employed scope) Supplier (via a maintenance/service package)
Rain Garden Planters with integrated void	Inspection, debris removal and jetting of the void storage area General Upkeep of the planting strata / check incorporated void and membrane are intact	Manufacturer / Specification to provide regime Typically, inspection is recommended annually or after a severe or significant storm event, with any jetting/cleaning being carried out as necessary.	Householder (gardener employed scope)