



Supplementary Requirements for Surface Water Drainage Proposals

Any proposed surface water scheme must consider sustainable drainage principles.

SuDS Selection

The following destinations must be considered for surface runoff in order of preference:

1. Discharge into the ground (infiltration).
2. Controlled discharge to a surface water body.
3. Controlled discharge to a surface water sewer.

Surface water must not be discharged into the foul sewer system. Infiltration structures include soakaways, basins, swales and permeable paving. Open Suds features are encouraged. Structures that span individual property boundaries are discouraged. Discharge to surface water bodies and surface water sewers must be restricted to an agreed rate.

SuDS selection hierarchy based on:

CIRIA C753 - The SuDS Manual

BS8582:2013 – Code of Practice for Surface Water Management for Development Sites

Approved Document H of the Building Regulations

For additional guidance, please refer to the 'West Sussex County Council (Lead Local Flood Authority) Policy For The Management of Surface Water'

https://www.westsussex.gov.uk/media/12230/ws_llfa_policy_for_management_of_surface_water.pdf

Infiltration Drainage Design

Any infiltration drainage design must include adequate winter groundwater monitoring data to determine the highest winter groundwater table. Residential developments of ten properties or more will require ground water monitoring to be carried out between October and March inclusive. The extent of monitoring required for smaller developments will be subject to agreement with the Council's Engineers but will need to capture likely peak groundwater levels during the winter period. This is likely to be during January/February but is dependent on the weather, etc up to that point.

Adequate freeboard must be provided between the base of the soakaway structure and the highest recorded groundwater level identified in that location.

Infiltration rates for soakage structures are to be based on percolation tests undertaken at an agreed time during the winter period and at the location and depth of the proposed structures. The percolation test depth is also dependent on the peak groundwater levels recorded at that location, ensuring that the test depth does not exceed the depth to the peak

groundwater level recorded. The percolation tests must be carried out in accordance with BRE 365, CIRIA R156 or a similar approved method. For the purpose of design, the percolation rate must be applied to the sides of the infiltration structure only and the rate for the base must be zero, unless otherwise agreed. In respect to infiltration basins or permeable pavements, the percolation rate is generally applied to the base only.

There must be provision to ensure that there is capacity in the system to contain the 1 in 100 year storm event plus 40% on stored volumes/rainfall intensity, as an allowance for climate change and cater for the 1 in 10 year storm event plus climate change between the invert of the lowest entry pipe into the infiltration structure and the base. The infiltration structure should also drain 50% of its total volume in 24 hours or less for both the 1 in 10 (plus 40%) and 1 in 100 year (plus 40%) storm events, in order to provide spare capacity for subsequent storms.

Restricted Discharge

Discharge to a watercourse or surface water sewer must be restricted to the estimated mean greenfield runoff rate (Q_{bar}) for all design storm events, using the impermeable area (and including other permeable areas that are positively drained) of the site to be developed as the basis for the calculations, rather than the entire greenfield site area. For brownfield sites, the above criteria also applies, but if this cannot be achieved, then a minimum 50% reduction in existing peak runoff rate should be considered. Flow restriction is to be achieved using a suitable controlled outflow with a minimum outflow of 2 l/s, unless otherwise agreed, with satisfactory blockage mitigation measures specified. Greenfield runoff rates can be derived from IH124 or a similar approved method. Any storage design must be submitted with winter groundwater monitoring data where applicable to ensure there will be no detrimental effect on the structure or storage.

Flow Exceedance Routes

The drainage design should show flow routes through the proposed development, demonstrating where surface water will be conveyed for three types of flow:

1. Low flow routes

Regular flow from source control features such as permeable pavements should travel in low flow channels through the development in a controlled way contributing to landscape quality.

2. Overflows

In the event of local blockages or surcharge a simple overflow arrangement should allow water to bypass the obstruction and return to the management train sequence until conditions return to normal.

3. Exceedance routes

When SuDS are overwhelmed by exceptional rainfall, then exceedance routes are required to protect people and property. These provide unobstructed overland flow routes from the

development and should be considered for all drainage schemes. Exceedance routes should also be protected from future changes in land use.

Culverting a Watercourse

Culverting (piping) a watercourse is not advised unless there is no alternative. The resulting reduction in storage volume, flow capacity and habitat potential would be unacceptable. Culverted watercourses are also more difficult to maintain due to the limited accessibility.

Land Drainage Consent must be sought from the Lead Local Flood Authority (West Sussex County Council), or its agent (Arun District Council – land.drainage@arun.gov.uk), prior to starting any works (temporary or permanent) that affect the flow of water in the watercourse. Such works may include culverting, channel diversion, discharge of flows, connections, headwalls and the installation of trash screens.

Please also refer to the 'culvert policy' and consent application form available on the West Sussex County Council website; <https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/dealing-with-flooding/flood-risk-management/ordinary-watercourse-land-drainage-consent/>

The development layout must take account of any existing watercourses (open or culverted) to ensure that future access for maintenance is not restricted.

See also:

Land Drainage Act 1991 (amended 1994)

Maintenance and Management

Ditches and watercourses (including culverts) should retain a three metre easement with access that allows for its future maintenance.

Details of the maintenance and management of the SuDS system are to be set out in writing in a site specific maintenance manual. This manual shall include details of the financial management and arrangements for the replacement of components at the end of the manufacturers recommended design life. This document is then to be submitted as part of the planning process.

References

The Building Regulations 2000
Drainage and waste disposal
Approved document H
ISBN: 1-859462-08-1

Building Research Establishment,
Soakaway Design – Digest 365 (BRE 365)
ISBN: 978 1 84806 918 6, 2016

Centre for Ecology and Hydrology
Flood Estimation for Small Catchments - IH Report 124
Marshall, D.C.W. & Bayliss, A.C.
ISBN: 0948540621, 1994

Version Dated; 3rd August 2021

CIRIA
C753 The SUDs Manual
Woods-Ballard, B.; Kellagher, R. et al
ISBN: 978-0-86017-760-9, 2015

CIRIA
R156 Infiltration Drainage – Manual of Good Practice
Bettess, R.
ISBN: 0 86017 457 3

British Standards Institution
BS8582:2013 – Code of Practice for Surface Water Management for Development Sites
ISBN: 978 0 580 76700 5



Surface Water Drainage Proposal Checklist

During the planning process, applicants are often required to submit surface water drainage proposals for appraisal by the Local Planning Authority's (LPA's) Drainage Engineers. This 'Surface Water Drainage Proposal Checklist' has been designed to clearly define the expectations and requirements that proposals, submitted to LPA's within West Sussex, need to satisfy.

It is recommended that applicants take time, at the outset of the planning process, to familiarise themselves with the requirements set out in this checklist.

The expectation is that applicants will include a completed checklist in the supporting documentation they submit to the LPA, during the planning process.

Applicants should be aware that:

- It is in an applicant's interest to provide all the information requested by the checklist, to enable the LPA's Engineers to quickly and efficiently appraise their proposals.
- The omission of information may lead to delays in the planning process.

However, if this checklist requests information that an applicant does not consider to be relevant to their application:

- In the first instance the applicant should discuss this with the LPA's Drainage Engineer. (The Planning Officer dealing with the application will be able to provide applicants with the appraising Engineer's contact details).
- Alternatively, the applicant can provide an explanation as to why they have omitted certain information in the 'Additional Information' section at the end of the checklist, quoting the relevant 'requirement number'. However, be aware; the decision whether or not certain information is required ultimately lies with the appraising Engineer (hence the above advice to consult them before omitting information).

The Town and Country Planning Regulations now require pre-commencement conditions to have the prior agreement of the applicant regarding their wording and use. Therefore, to avoid pre-commencement conditions relating to surface water drainage, applicants will need to submit proposals that provide the information requested in this checklist, and also align with the requirements of the following documents:

- The West Sussex Policy for the Management of Surface Water
- Any supplementary planning guidance issued by the respective LPA.

If surface water drainage conditions have been applied to a planning permission; this document will also help applicants prepare a 'Discharge of Conditions' application'.

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Surface Water Drainage Proposal Checklist

Ground Investigation Results				
No.	Requirement	Results/Information Provided?		
1	Winter groundwater monitoring results Please refer to guidance note 'a' below.	Yes		No
2	Period of winter groundwater monitoring Note 'a'	From	DD/MM/YYYY	
		To	DD/MM/YYYY	
3	Maximum recorded groundwater level Note 'a'	mAOD		
		mBGL		
4	Winter infiltration test results Notes 'b' and 'c'	Yes		No
5	Date of winter infiltration testing Note 'b'	DD/MM/YYYY		
6	Details of the location and depth of the infiltration testing Notes 'b' and 'c'	Yes		No
7	Minimum infiltration rate Note 'd'	m/s		

Guidance Notes

- a. Groundwater monitoring should be undertaken during the winter period (October to March inclusive) to enable the peak annual groundwater levels to be established. The duration of monitoring required for smaller developments (e.g. those consisting of less than 10 properties) can be discussed with the LPA's Engineers as; for some locations, a shorter duration may be acceptable. However, unless dispensation is agreed in advance with the LPA's Engineers, a full winter season of monitoring should be undertaken. Groundwater on sites near the coast may be influenced by tidal conditions and therefore this consideration needs to be factored into the monitoring programme.
- b. Infiltration testing should be undertaken during the wet winter months (typically January or February) and in line with BRE365 or a similar approved method, such as CIRIA R156. Infiltration testing needs to be carried out at the locations and depths of proposed infiltration structures, this must also be at a depth above the maximum recorded groundwater level in the vicinity of the test pit. Tests must be repeated 3 times consecutively, to replicate saturated ground conditions.
- c. Deep-bore Soakaways: Where it is not possible to undertake conventional BRE365 or CIRIA R156 testing due to depth; advice should be sought from the Council's engineers. Please note that; deep-bore soakaways are generally resisted unless there is no alternative. Evidence of the Environment Agency's agreement with the principle of using deep-bore methods to drain the site must be provided within the submission.
- d. The minimum infiltration rate obtained at the location and depth of the proposed infiltration structures should be used to inform the design of the infiltration structures. Please use the 'additional information' section at the end of this checklist if multiple infiltration structures are proposed, which utilise different minimum rates.

Proposed Method of Surface Water Disposal

8	Infiltration on-site, via soakaway structures.	Yes		No	
9	If on-site infiltration is not to be used, has justification for this decision been provided? Note 'e'	Yes		No	
10	Attenuation (on-site) with a restricted discharge to a watercourse on, or adjacent to, the site.	Yes		No	
11	Attenuation (on-site) with a restricted discharge to a surface water sewer on, or adjacent to, the site.	Yes		No	
12	Attenuation (on-site) with a restricted discharge to a foul water or combined sewer on, or adjacent to, the site.	Yes		No	

Guidance Note

- e. If on-site infiltration is deemed unviable; evidence supporting the move to the next step(s) of the drainage hierarchy must be provided, to the satisfaction of the LPA's Engineer.

Drainage Design: Supporting Calculations

	No.	Requirement	Provided?			
Infiltration Structures	13	Calculations demonstrating the 1 in 10 year event, plus climate change allowance (CCA), can be accommodated below the lowest incoming pipe within each structure. Notes 'f' and 'g'.	Yes		No	
	14	Calculations demonstrating the 1 in 100 year event, plus CCA can be accommodated on-site. Notes 'f' and 'g'.	Yes		No	
	15	Lowest base level of any infiltration structure	mAOD mBGL			
	16	Half-drain time for 10 year event (plus CCA)	Yes		No	
			Hours			
	17	Half-drain time for 100 year event (plus CCA)	Yes		No	
			Hours			
	18	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons.	Yes		No	
Attenuation / Restricted Discharge	19	Pre-development run-off rate calculations Note 'h'	Yes		No	
			l/s			
	20	Proposed discharge rate Note 'h'	l/s			
	21	Calculations demonstrating the 1 in 100 year event, plus CCA can be accommodated on-site. Note 'g' and 'h'	Yes		No	
	22	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons.	Yes		No	
	23	If the proposed scheme incorporates any impermeable lined attenuation features; calculations are required to demonstrate that appropriate resistance to floatation (due to groundwater levels) is catered for in the design.	Yes		No	
	24	Is a discharge into, or an alteration to, an ordinary watercourse is proposed? (If so, Ordinary Watercourse/ Land Drainage Consent will be required). Note 'i'	Yes		No	
	25	If discharging to a watercourse, piped system or the sea, has the proposed drainage network been modelled against predicted top water levels for the 1 in 100 year storm event, plus CCA, within the existing system? Note 'j'	Yes		No	

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Guidance Notes

- f. The appropriate factor of safety from the table below must be applied to calculations to ensure the design is fully in accordance with CIRIA R156/CIRIA C753. This is applicable to infiltration systems, utilising the base area.

Factor of Safety Table						
Size of Area to be Drained	Consequences of failure					
	No damage or inconvenience		Minor inconvenience, e.g. surface water on car park		Damage to buildings, structures or roads.	
	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75
<100 m ²	1.5	2	2	3	10	13
100m ² to 1000m ²	1.5	2	3	4	10	13
>1000m ²	1.5	2	5	6.5	10	13

- g. Climate change allowance on peak rainfall intensities or stored volumes must take into account the lifetime of the development.
- h. Calculations of Qbar are to be based upon the area to be positively drained. It is advised that agreement is sought with the LPA's Engineer, at an early stage, regarding the area to be considered for this calculation. Unless otherwise agreed; the minimum acceptable discharge rate is 2l/s when using formal flow control devices. For lower flow rates; evidence must be provided that adequate measures are in place to protect the flow control device from blockage. **For Greenfield sites;** run-off must be restricted to the Greenfield Qbar runoff rate during all events up to and including the 1 in 100 year rainfall event, including climate change allowance. **For Brownfield sites;** infiltration should be investigated as the first option, but where evidence can be provided that this is unviable, off-site flows from all events should also be restricted to Greenfield Qbar. If that is not possible; flow should be restricted to as close to Qbar as is achievable, with a minimum requirement of 50% betterment. Applicants are expected to provide fully detailed plans of the site's existing surface water drainage arrangements, including impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc., to prove the extent of the existing positively drained areas and their associated points of discharge.
- i. Ordinary Watercourse/Land Drainage Consent will need to be sought, ideally in parallel with planning permission, if the proposals incorporate discharge into, culverting or altering a watercourse.
- j. Modelling is required to ensure that the effects of surcharged outfalls are taken into account.

Plans/Drawings/Diagrams					
No.	Requirement	Provided?			
26	Plan detailing the location of groundwater monitoring and infiltration testing	Yes	☐	No	☐
27	Detailed drainage layout plan Note 'k'	Yes	☐	No	☐
28	Construction detail plans Note 'l'	Yes	☐	No	☐
29	Exceedance flow route plans Note 'm'	Yes	☐	No	☐
30	Impermeable area plan	Yes	☐	No	☐
31	If ground levels are being raised $\geq 300\text{mm}$ above existing levels and is unavoidable, have fully detailed plans been provided, together with drainage proposals, to address any potential drainage related issues.	Yes	☐	No	☐

Guidance Notes

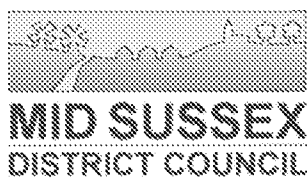
- k. Drainage layout plans should include:
- All surface water drainage pipes labelled with: diameters, pipe materials, gradients and invert levels.
 - All infiltrating and attenuating structures (including permeable paving) labelled with: dimensions, invert/base and cover levels.
 - All manholes labelled with: a reference number, cover levels, invert levels, cover loading grade.
 - All silt traps clearly labelled with sump depths.
 - Control structures with discharge rates, hydraulic head and invert levels.
 - Proposed/existing levels of any areas subject to ground raising, together with suitable measures/detailed drawings for the associated management of surface water runoff. **Please note that ground raising should be avoided unless there are exceptional circumstances.** In any instances where this is envisaged early consultation with the Council Engineer is recommended.
- l. Site specific construction detail plans should be supplied. The following elements must be included (where applicable): infiltrating structures; attenuating structures; manholes; catch-pits/silt traps; flow control devices; permeable paving; headwalls; channel drains; gullies; pipe bedding and surround, etc.
- m. Unless specifically requested by the Council's drainage Engineers 'Exceedance Flow Route Plans' are only required for developments of more than 10 residential properties or more than 0.5ha of commercial development.



The space below can be used to provide an explanation for any required information that has been omitted in the submission of this form or to raise specific queries seeking clarification. Please enter the appropriate line entry number to which the comments relate in the box at the left-hand side of the form.

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West Sussex LLFA Culvert Policy



Culvert¹ Policy – intended for use by Council officers, landowners and developers.

This document is an explanation of the agreed West Sussex County Council (LLFA) and District and Borough Council policy regarding the culverting of ordinary watercourses, and a guide to good practice and design principles.

Culverting of a watercourse, or the alteration of an existing ordinary watercourse, requires land drainage consent under Section 23 of the Land Drainage Act 1991 (and as amended). The District and Borough Councils under powers from the LLFA are responsible for processing ordinary watercourse consent applications.

The Environment Agency now regulates permits for works in / around watercourses designated as 'Main River' under the Environmental Permitting Regulations 2010 (EPR2010).

The following works require consent from District and Borough Authorities:

- Construction of any mill dam, weir or other similar obstruction to the flow of any ordinary watercourse or raising or otherwise altering any such obstruction;
- Installation of a culvert in any ordinary watercourse;
- Alteration of a culvert in a manner that would be likely to affect the flow of an ordinary watercourse;
- Installation of a structure within the watercourse that would be likely to affect the flow of said watercourse;
- Removal of a culvert within an ordinary watercourse;
- Diversion or filling of any ordinary watercourse;

The above list should not be considered exhaustive. If you are not sure if the work you are proposing requires a consent / permit please contact your local District or Borough Authority, EA office or Lead Local Flood Authority (LLFA).

1.0 Local Authority Policy

Watercourses fulfil many roles in today's environment. They provide drainage for developed and agricultural land and are vital water resources. They are important features of the landscape and provide habitats for a wide variety of wildlife. It is therefore important that watercourses and their associated habitats are protected and enhanced for the benefit of future generations. A watercourse includes all; rivers, streams, ditches, drains, cuts, dykes, culverts, sluices,

1. A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction from one side to the other side. Typically embedded so as to be surrounded by concrete, granular material, soil etc., a culvert may be made from a pipe, reinforced concrete or other material.

sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages through which water flows.

West Sussex Local Authorities are in general opposed to the culverting of watercourses because of the potential for adverse effect on flood risk and ecology. The Competent Authority will therefore adopt a precautionary principle and only approve an application to culvert an ordinary watercourse if there is no reasonably practicable alternative or if the potential negative impact of culverting would be so minor that they would not justify a more costly alternative.

However, a culvert will not be considered until alternatives have been considered, for example:

- Clear span bridges;
- Revision of the site layout to incorporate an open watercourse that can be easily maintained; or
- Diverting the watercourse without loss of its hydraulic flow characteristics.

In all cases and where it is appropriate to do so, compensation in full is to be provided for any loss in storage capacity or habitat.

2.0 Deculverting Policy

There are many benefits to deculverting, which include; the provision of valuable wetland habitat, increased storage capacity, educational opportunities, reduction of maintenance costs and ease of inspection

Deculverting requires consent as the removal of a culvert which previously constrained flow could increase the downstream flood risk; modelling should therefore be employed (where necessary) to ensure there is no adverse flood risk as a consequence of a particular activity. Some culverts may be formally listed or scheduled for their historic importance, therefore careful consideration is required. Appropriate ecological surveys should be provided in support of any deculverting activity.

The removal of culverts is actively encouraged by the council when:

- Removing the culvert is physically possible, and no ecological or historical damage will result;
- Flood risk may be reduced and a more natural flow regime restored; or
- The local environment would be enhanced significantly.

3.0 Impacts of Culverting

The Council's general opposition to culverting is a result of the legal requirements of the Water Framework Directive (2003) that the quality of a watercourse should not be reduced. Therefore, opposition is based on the detrimental effects that are likely to arise; these may include:

- Loss of environmental features; the continuity of the watercourse corridor is broken, causing an adverse impact on the ecological value of the watercourse, loss of habitat and inhibiting the migration of some species.
- Increased likelihood of blockages; the culvert itself or screens have an increased risk of blockage and require frequent maintenance.
- Loss of floodwater storage; open channels generally provide more storage capacity than culverts.
- Impact of flooding; increased overland flooding as a result of a culvert exceeding its capacity.
- Greater difficulties in providing for drainage connections; it is more difficult to provide for the addition of connections within a culvert; outfalls within culverts are prone to blockage.
- Difficulties in the repair, maintenance and replacement of culverts; the landowner or owner of the culvert is responsible for the condition and maintenance of a culvert. They must therefore ensure they are in good condition and free from obstructions. Failure to do so could result in the liability for any damage caused by flooding. Access into culverts is restricted and in some cases is classified as a confined space which requires trained operatives and specialist equipment.
- Development above or near a culvert; the presence of a watercourse is concealed by a culvert; this can lead to inappropriate land use above or near them, and could lead to structural failures, difficulties in future access for maintenance, etc.
- Culverts in urban areas are susceptible to pollution as a result of misconnected foul sewers, overflows from blocked sewers or discharge of contaminated surface water.
- Increase in erosion to the banks and beds of a watercourse where adjacent to a culvert entrance.

4.0 Culvert Design Requirements

Where culverting is unavoidable it is necessary to seek land drainage consent from the relevant District or Borough Council. It needs to be shown that steps have been taken to reduce the risk of flooding and to reduce or mitigate environmental degradation. Detailed guidance on the design of culverts can be found in Culvert Design and Operation Guide (CIRIA C689).

1. A detailed design will need to be submitted with your formal application for consent. Hydraulic calculations are to be submitted and include an allowance for climate change over the life time of the activity or development.
2. The environmental implications of all options of the works should be considered in order to determine the least environmentally damaging solution supported with evidence.
3. Culvert length should be kept as short as possible and diameter as large as possible. Depending on local circumstances, we require a minimum culvert diameter of 450mm or as agreed with the local authority depending on watercourse size and flow.
4. The design of the culvert should consider any impact on flood flow. They must not increase flood risk to property. Consideration should also be given to the alternative flow paths in the event of a culvert becoming obstructed.
5. The shape of the culvert and the materials used should be chosen to satisfy hydraulic requirements and have a design life exceeding that of the structure.
6. Pipes should be of a consistent cross-section within the culvert length unless adequate hydraulic transitions are incorporated into the design, this will be necessary when extending an existing culvert.
7. Appropriate inlet and outlet structures should be provided to ensure a smooth hydraulic transition and avoid erosion. Headwall arrangements at the upstream and downstream ends of a culvert should be suitably keyed into the bed and banks of the watercourse, and should be appropriate to the local environment.
8. Where there are safety concerns, headwalls will need to be fitted with safe guarding measures ie. handrails, etc.
9. Details should be stated of future maintenance and clearance arrangements, including access considerations. The responsibility for the maintenance of a culvert lies with the landowner or the person or management company who owns the culvert.
10. Sharp bends should be avoided and suitable access chambers provided at each change of direction in the culvert.
11. Inlet and outlet screens may be required to prevent debris entering the culvert and causing clogging, or where there is a danger to public safety. Screens need to be sized and designed to reduce the risk of blocking and provision made for clearing and maintenance, including allowance for a removable front section (fitted with a padlock); wing walls should be sufficiently high to prevent bank erosion in the event of a blockage; flat screens should be avoided as these are prone to blockage. Further guidance can be found in the Environment Agency Trash Screen and Security Screen Guide, 2009

<https://www.gov.uk/government/publications/trash-and-security-screen-guide-2009>

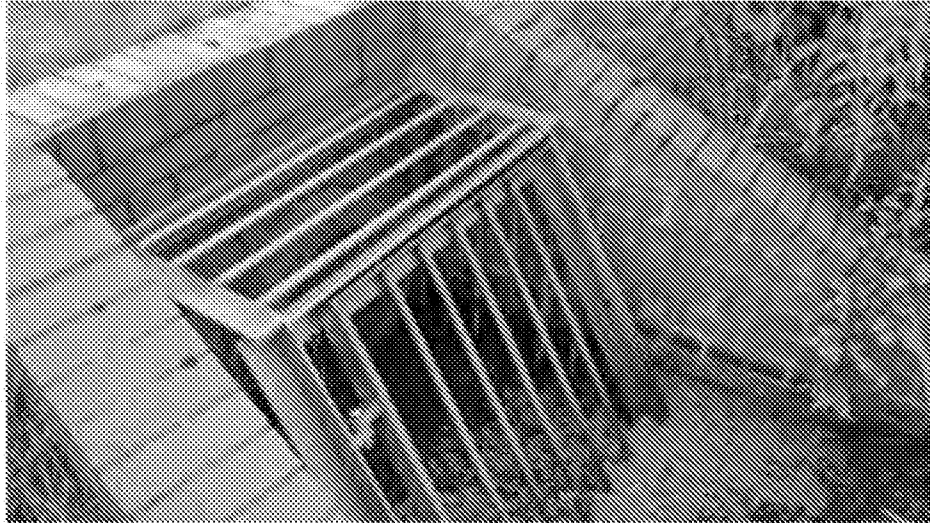


Figure 1-Culvert with Wingwalls and Trash Screen

12. Most culverts should be set so that the inlet/outlet is at the true bed level.
13. Applications with multiple small diameter culverts will generally be refused, only in exceptional circumstances where site constraints prevent a single pipe or box-culvert option being practical, will they be considered. This is a result of multiple culverts being more prone to blockage at the inlet.
14. Syphons are generally not acceptable.
15. Where watercourses are subject to severe erosion and siltation problems, consideration should therefore be given to the provision of silt traps upstream of the culvert.
16. Services (for example sewers, gas pipes, water mains, etc.) should not impinge into the cross-section of the culvert.
17. Vehicular loading needs to be considered where the culvert is located in trafficked areas and therefore suitable protection may be required.

5.0 Environmental Considerations

Each application for consent will be considered on its own benefits / disbenefits. Mitigation to reduce the impact to the natural environment will be taken into consideration when determining an application for culverting.

5.1 Environmental Mitigation:

- Increase the culvert diameter to slightly greater than that needed to accommodate the design flow and position the invert level at the true bed

level of the watercourse. This enables more natural bed features to form over time.

- Provide ledges above the water level in large culverts to allow for the passage of mammals. Or make provision for appropriately located animal underpasses close to the culvert.



Figure 2- Culvert with Ledges for Mammal Passage

- The invert level should not pose an obstruction to fish passage.
- Propose suitable environmental enhancements, for example opening up a length of previously culverted watercourse elsewhere on site, enhancing other lengths of watercourse, creation of ponds/marshy areas/ bays.
- Construct headwalls and wingwalls in 'soft-engineering' or natural materials in keeping with the natural channel without reducing the design life of the structure.

6.0 Consent Procedure

Advice should be sought as early as possible on any proposal, allowing sufficient time before the intended start date, so as to minimise any delays. The consent application form and details on how to apply and pay the appropriate fee are available on the West Sussex LLFA website;

<https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/dealing-with-flooding/flood-risk-management/ordinary-watercourse-land-drainage-consent>.

As part of the consent procedure we will consult where appropriate with the Environment Agency, Highway Authorities and Natural England.

7.0 Planning Application and Building Control Considerations

- The requirement for ordinary watercourse land drainage consent is independent of the need for planning permission and the granting of planning permission does not imply or guarantee that Land Drainage consent will be granted.
- Consideration must be given to any relevant planning conditions.
- Buildings and structure must not be sited within 5 metres from the outer edge of new or existing culverts/ watercourses.
- Any works must comply with the local council land drainage byelaws, if present.

A representative from the Council will inspect the culvert on completion of works to ensure that it has been installed as per the approved design.

8.0 Enforcement

When unconsented works are identified by a District or Borough Council, and they constitute a contravention of the Land Drainage Act (1991), enforcement action will be pursued. This will include site investigations and informal contact with the land owner to try to resolve the issue. If the obstruction is not removed or there is a failure to submit a consent application within the set period a legal notice will be issued. If the notice is not complied with, then the due legal process will be initiated. This could result in the Council carrying out work by default and recovering all associated costs including an administrative on-cost.

Appendix 8

Southern Water Pre-development capacity check



from

**Southern
Water**

Alistair Aitken
Stone House Business Centre
Market Place
Chipping Norton
Oxfordshire
OX7 5NH

Your ref

Our ref

15874

Date

12 July 2024

Contact

Tel

Dear Mr Aitken,

Level 1 Capacity Check Enquiry: Land at Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex, PO20 3SU.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of 1.17 l/s for the above development at manhole reference SU93047102. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at manhole reference Lidsey WTW which is located approximately 1.2 km to southwest of the proposed development site. Rights are not issued for a direct connection to Wastewater Treatment Works (WTW). Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the "New Connections Services Charging Arrangements". We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base

Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX
southernwater.co.uk

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366870

our charges. Please read through our new charging arrangement documents available at the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

Alternatively, New Appointees and Variations (NAV's), also known as 'inset' companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAV's are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: [REDACTED]

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

Please get in touch via the Get Connected customer dashboard if you have any queries.

Yours sincerely,

Future Growth Planning Team
Developer Services

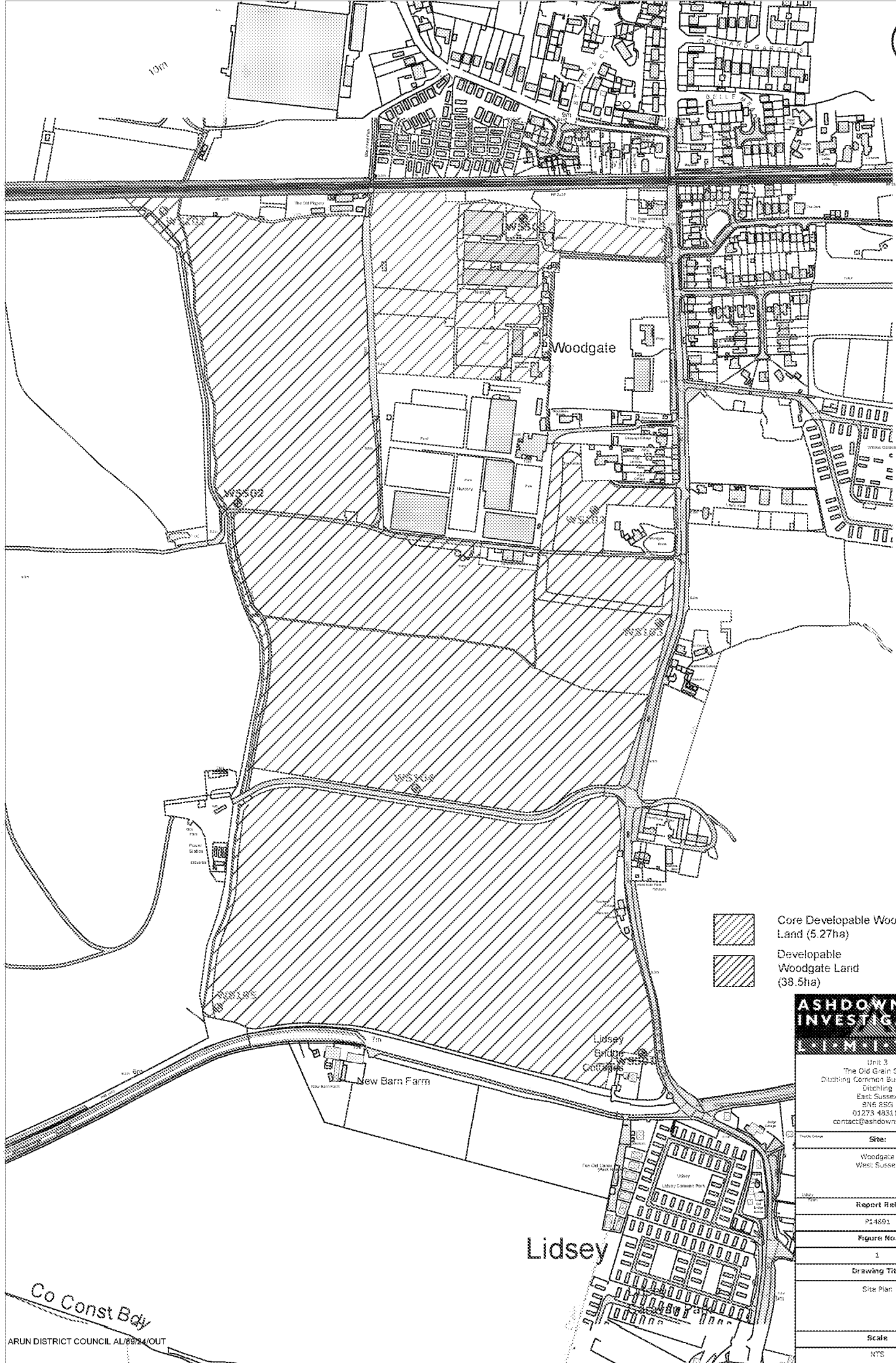
[REDACTED]

Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2368670

Appendix 9

Site Investigation Information WS101, WS102, WS502, WS503, WS622, WS711

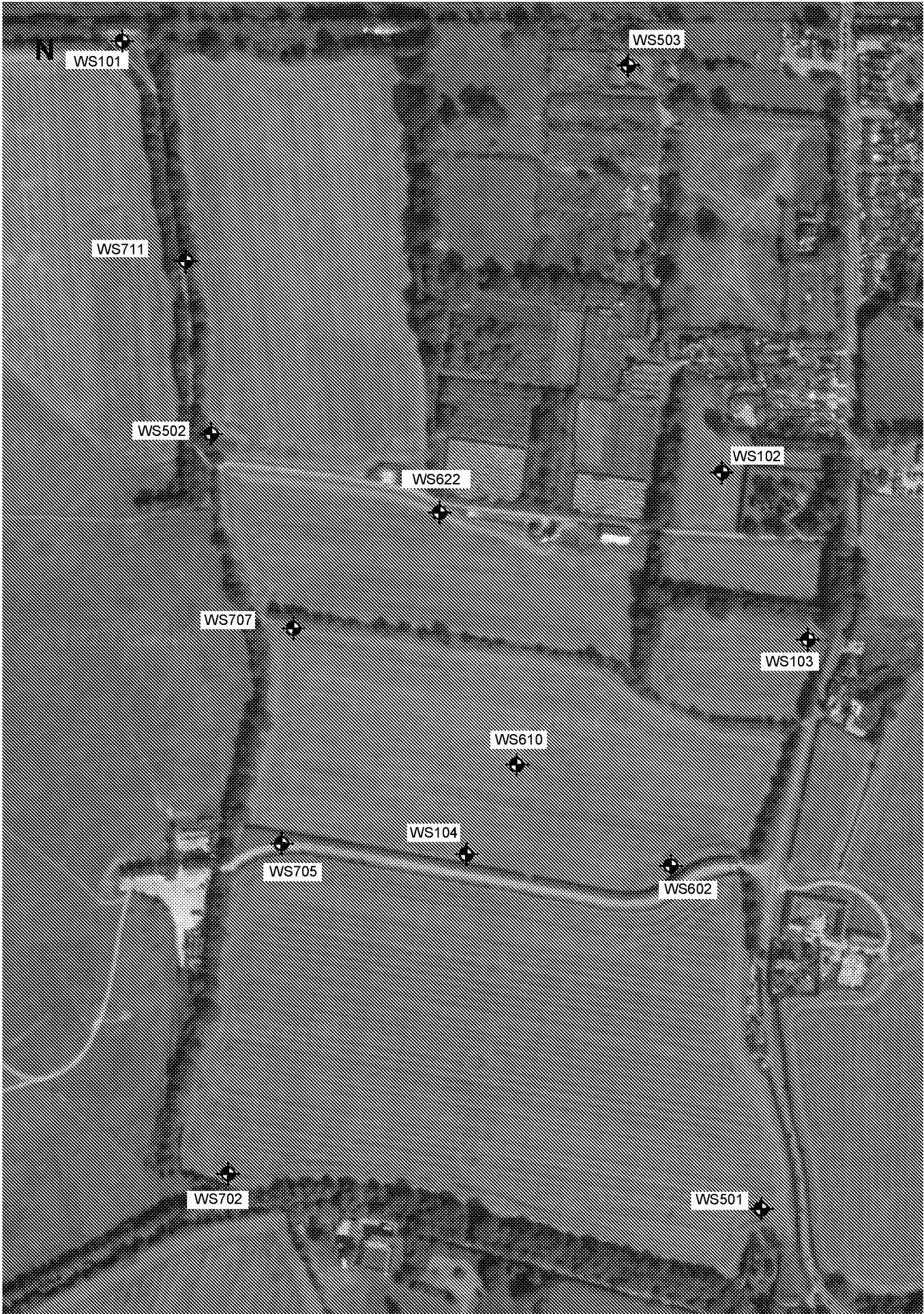


-  Core Developable Woodgate Land (5.27ha)
-  Developable Woodgate Land (38.5ha)

ASHDOWN SITE INVESTIGATION
L I M I T E D

Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
01273 483119
contact@ashdownsi.co.uk

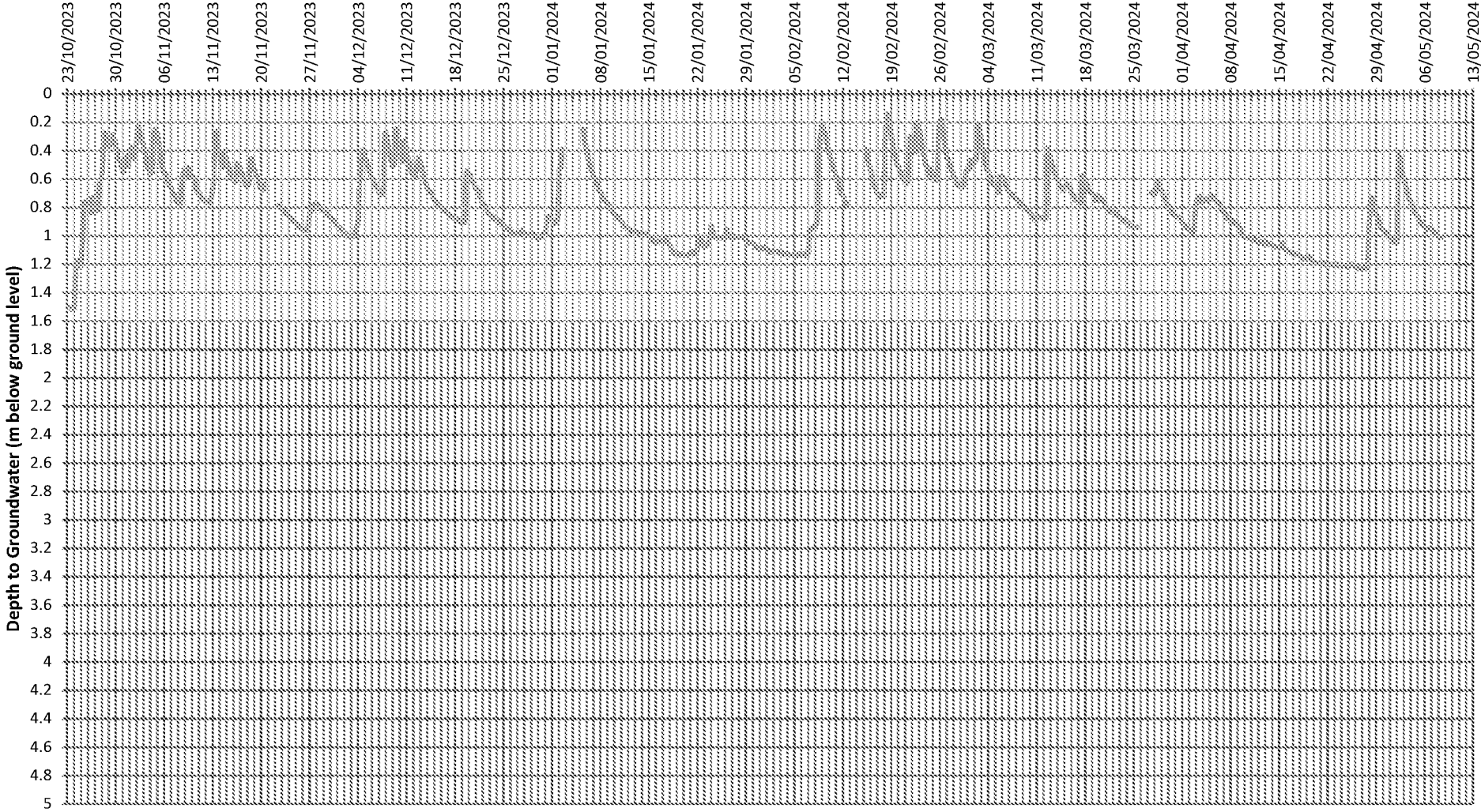
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Report Ref:	P14891
Figure No.	1
Drawing Title	Site Plan
Scale	NTS



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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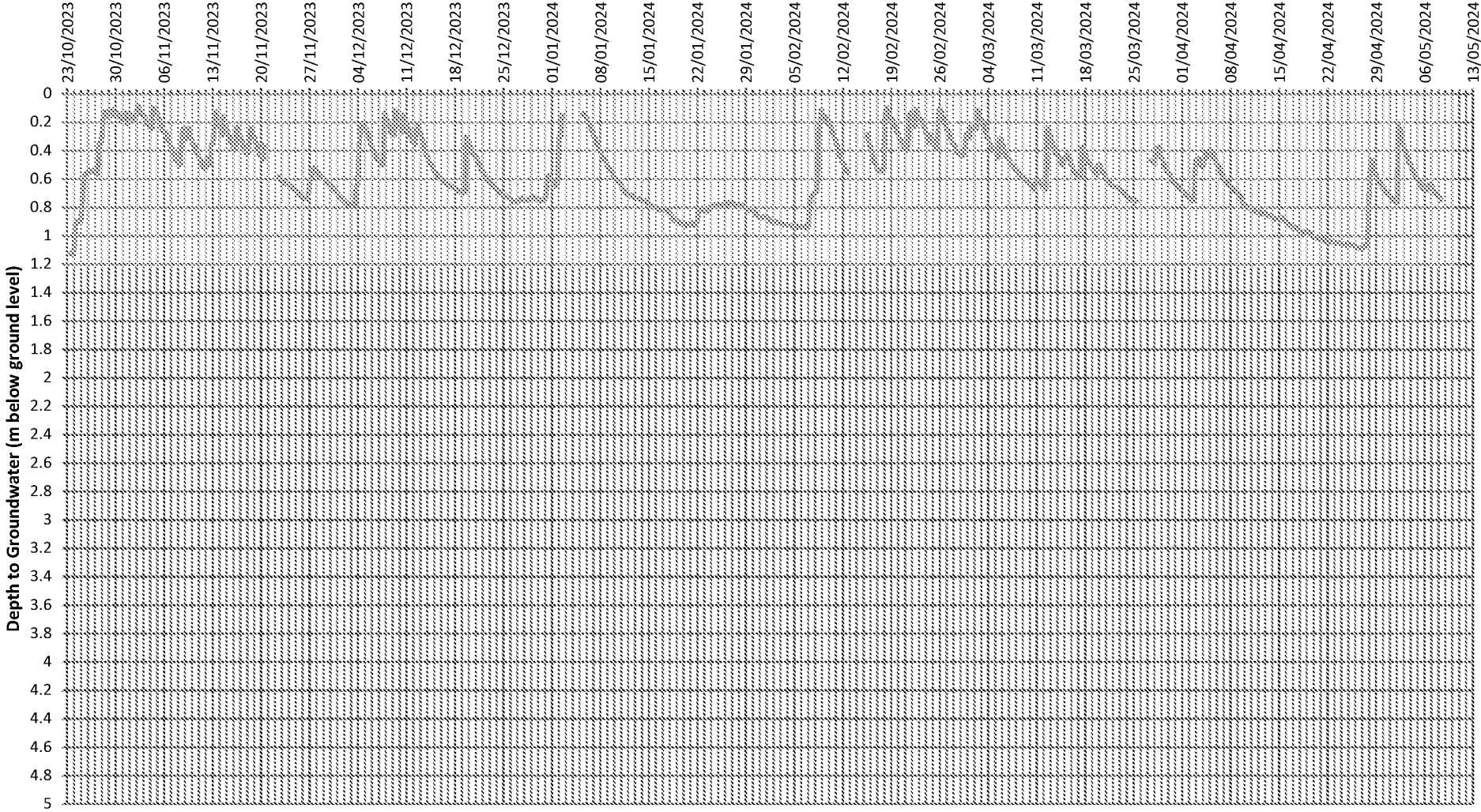
Groundwater Monitoring Results - WS101



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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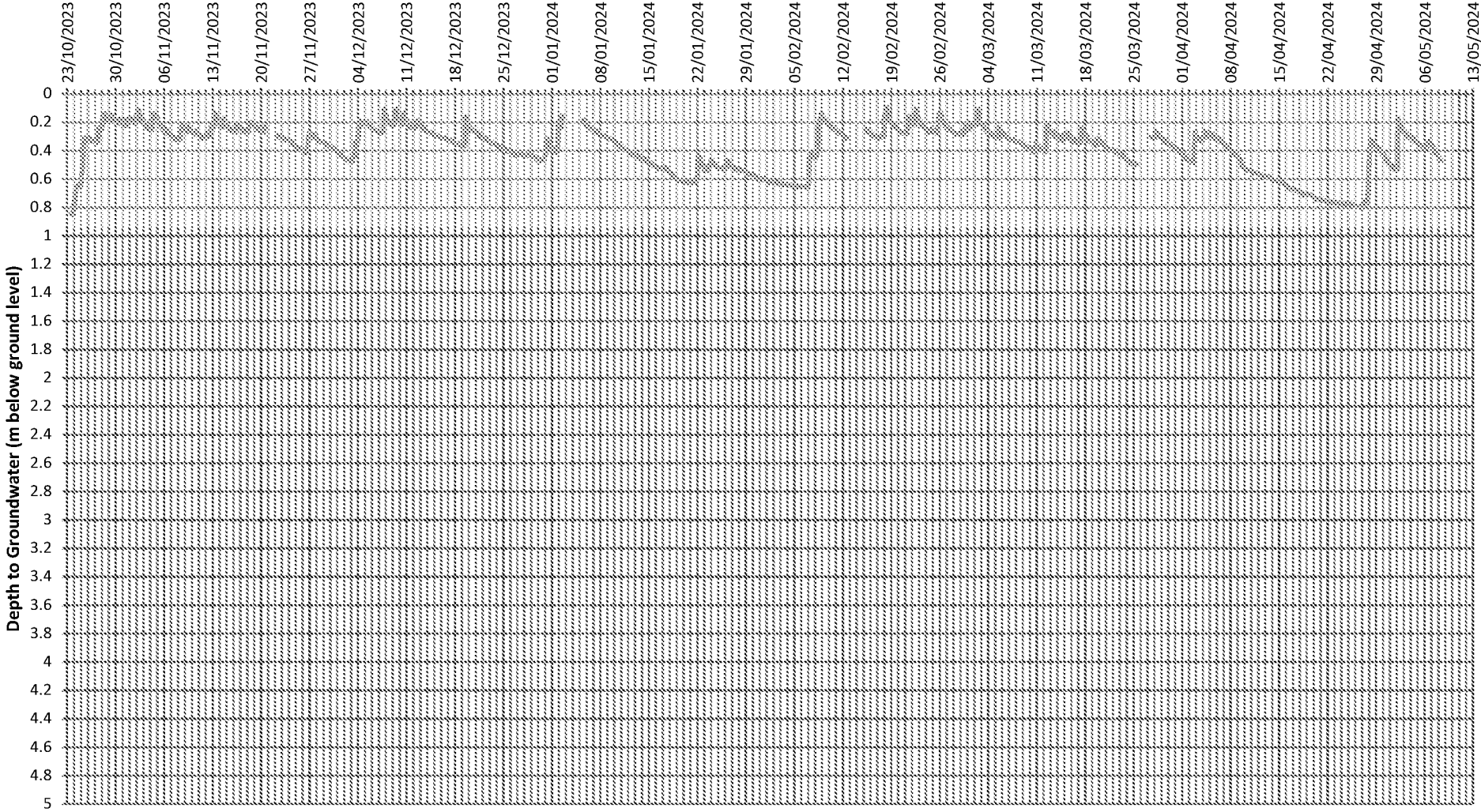
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Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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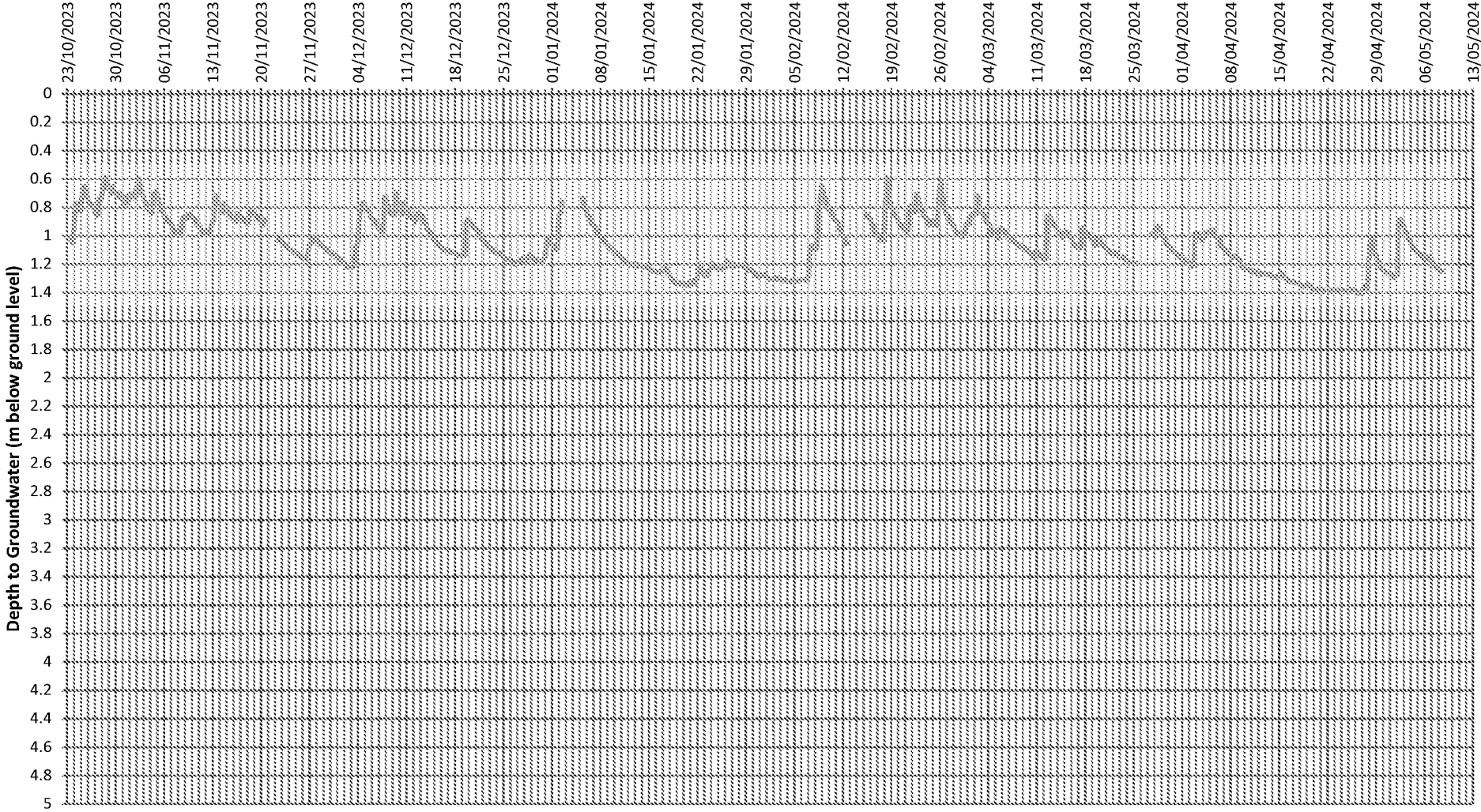
Groundwater Monitoring Results - WS103



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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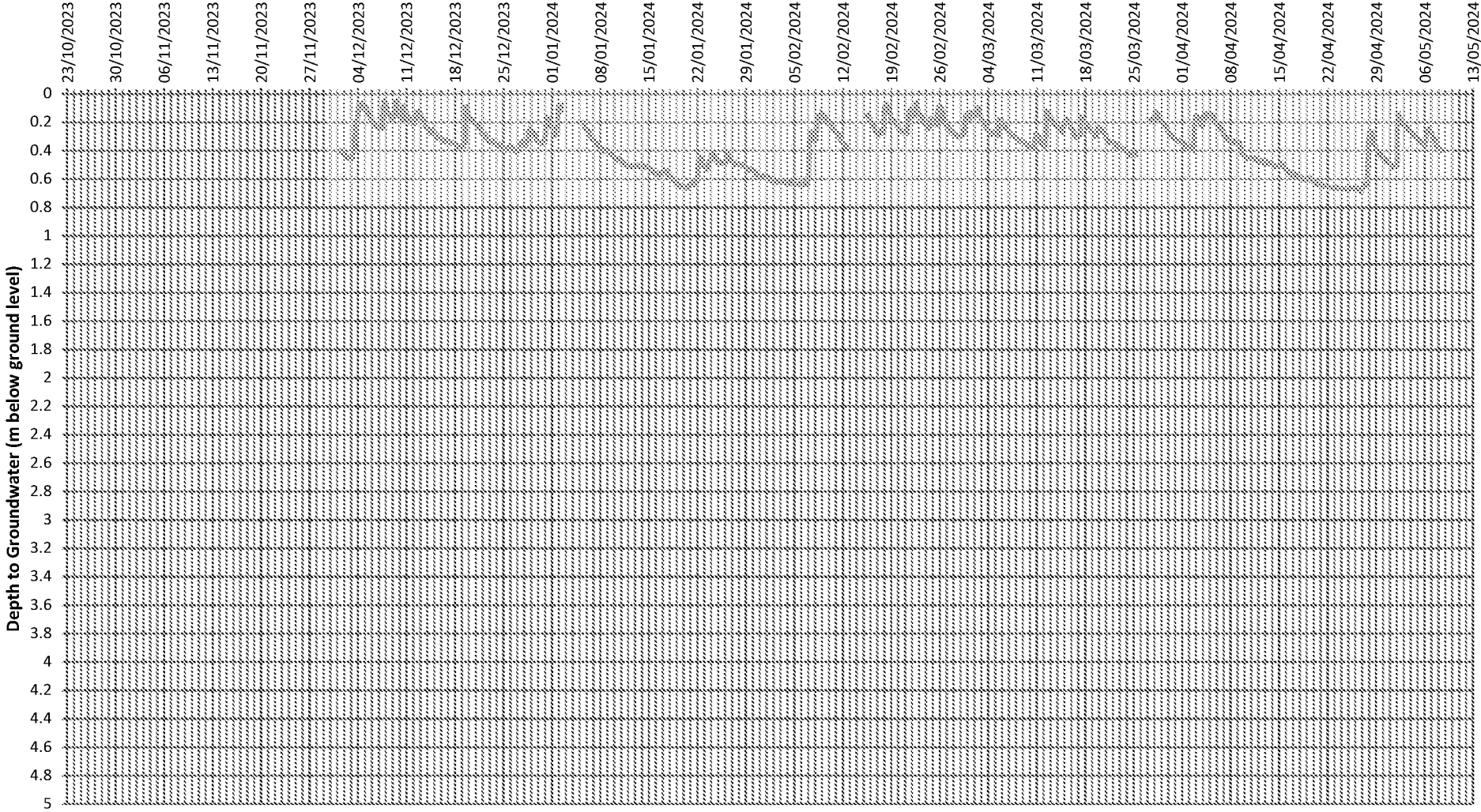
Groundwater Monitoring Results - WS104



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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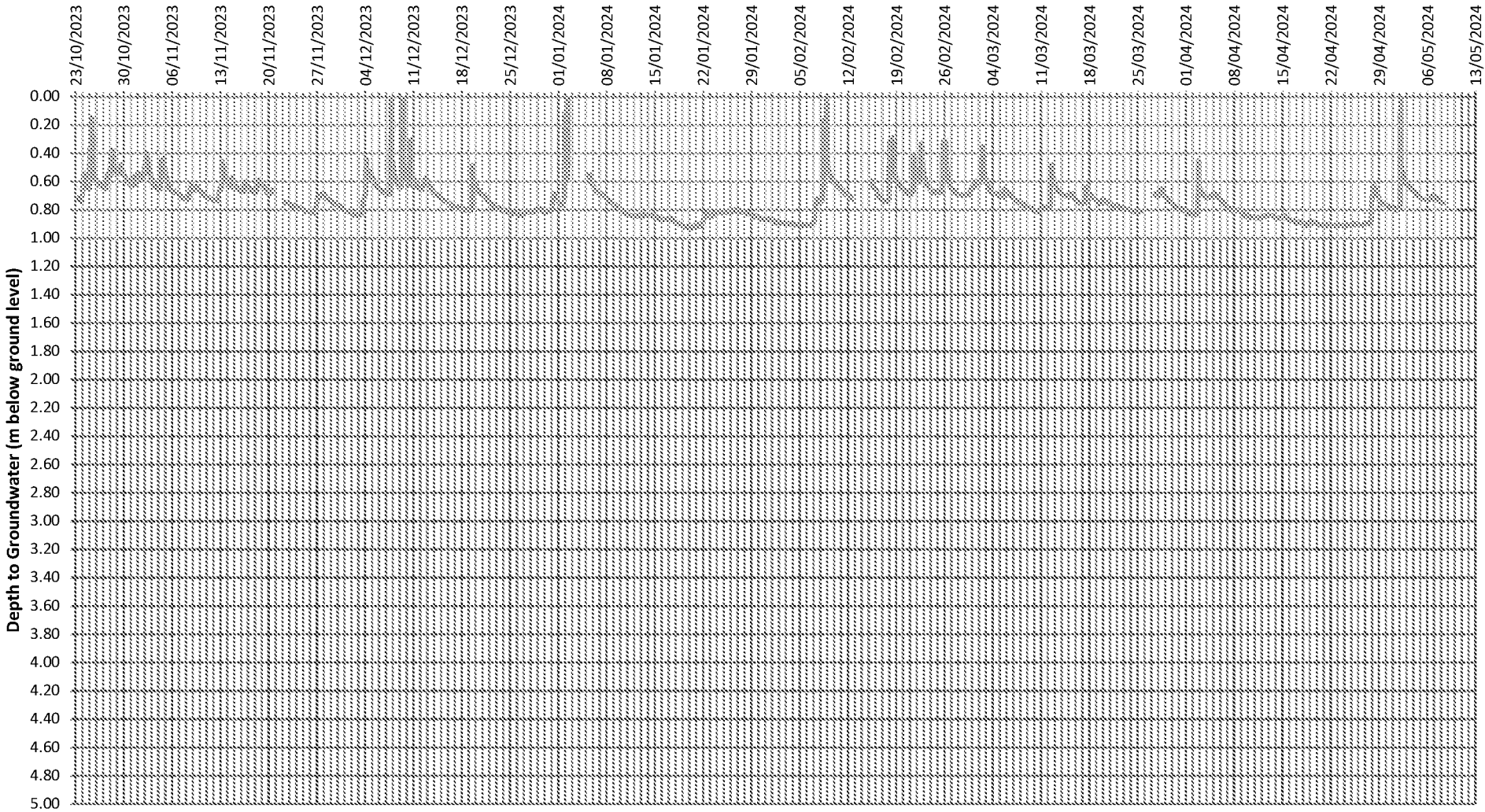
Groundwater Monitoring Results - WS501



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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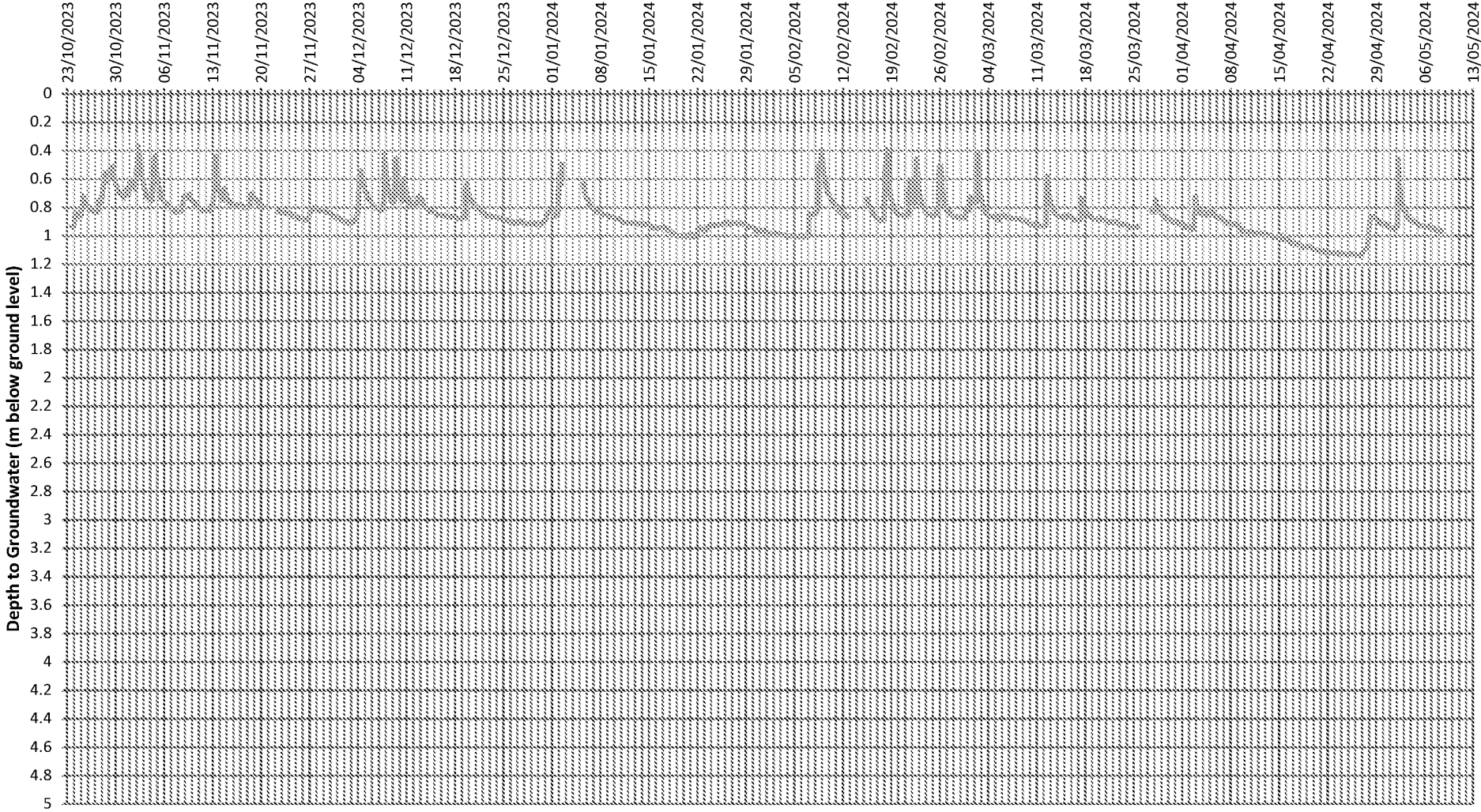
Groundwater Monitoring Results - WS502



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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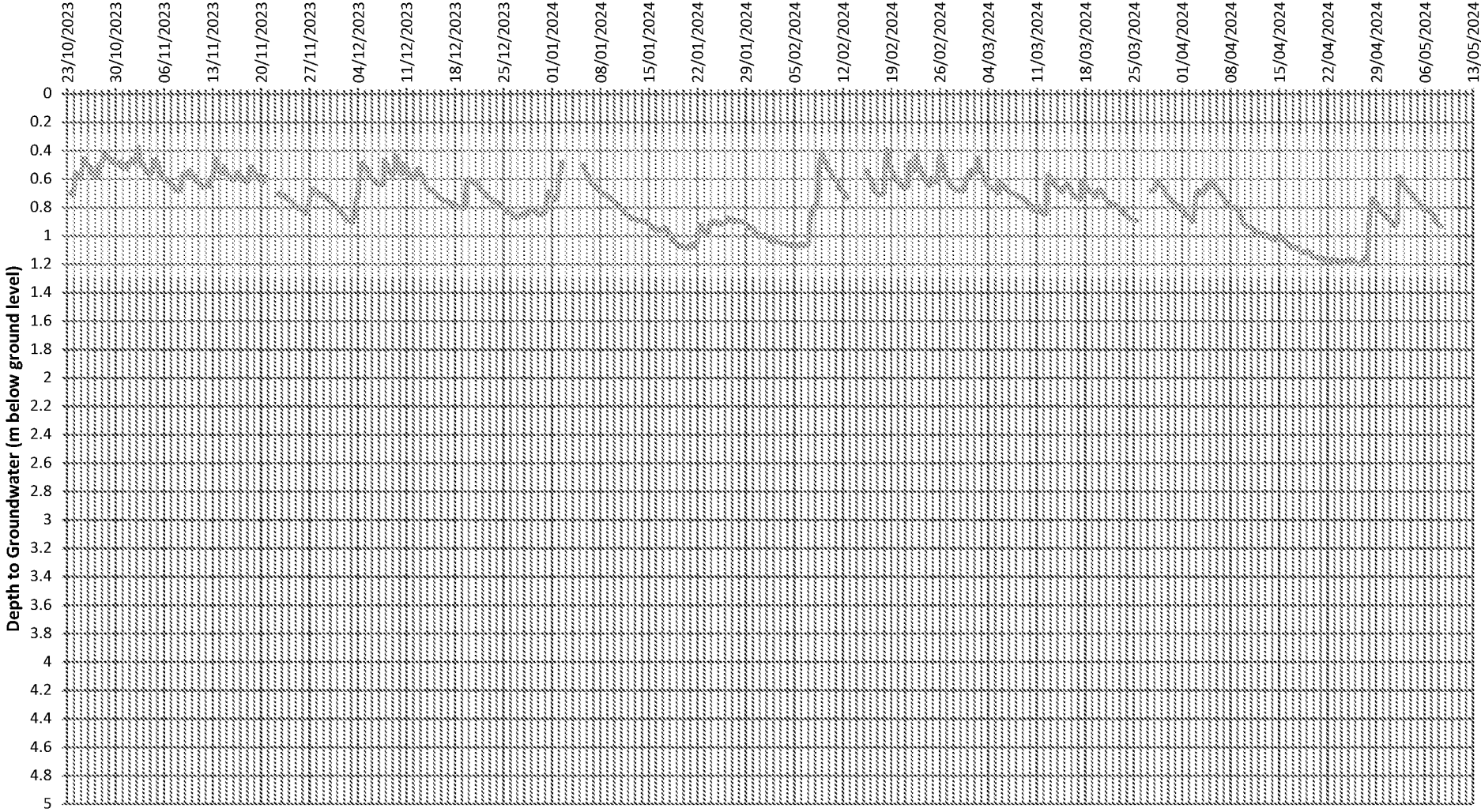
Groundwater Monitoring Results - WS503



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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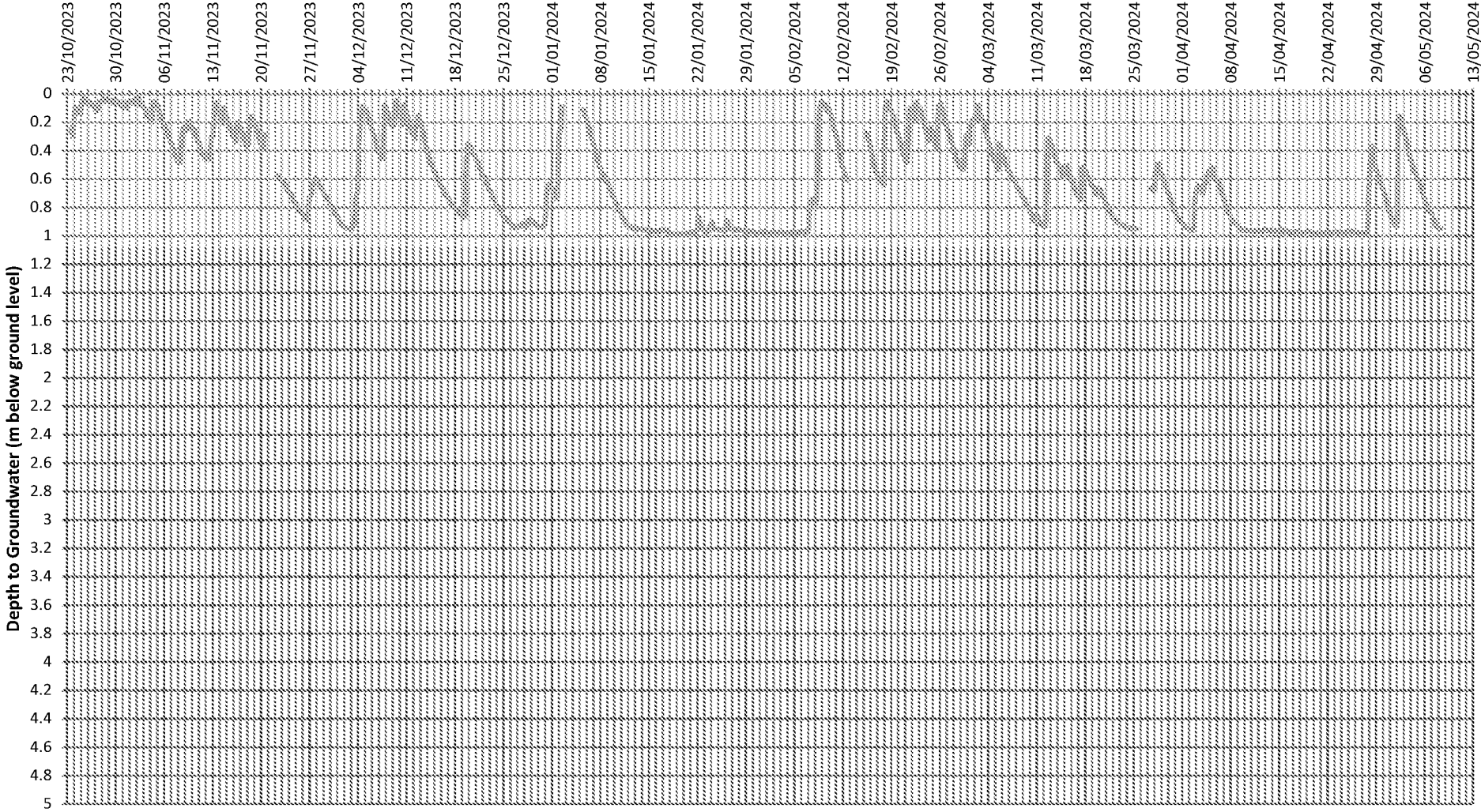
Groundwater Monitoring Results - WS602



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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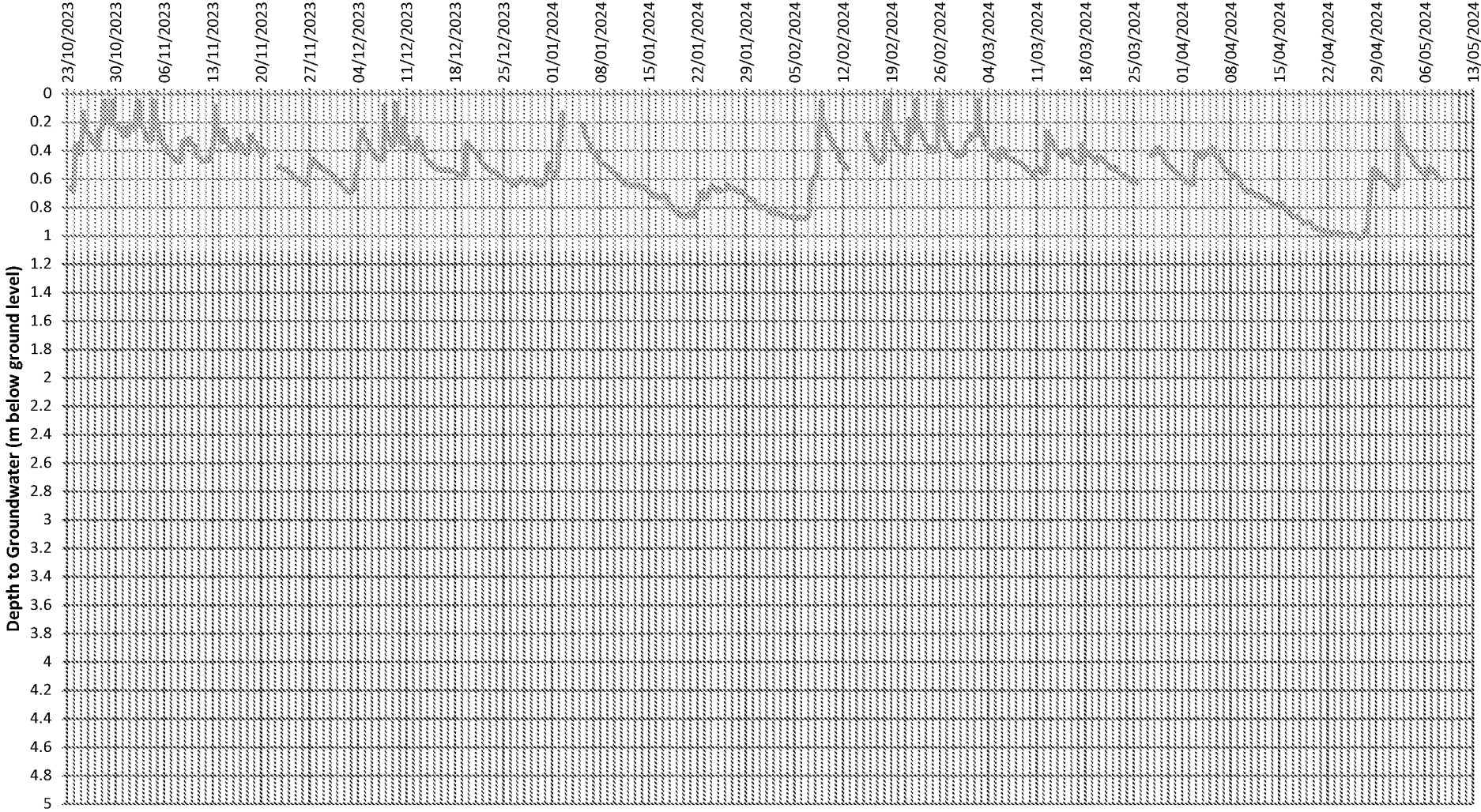
Groundwater Monitoring Results - WS610



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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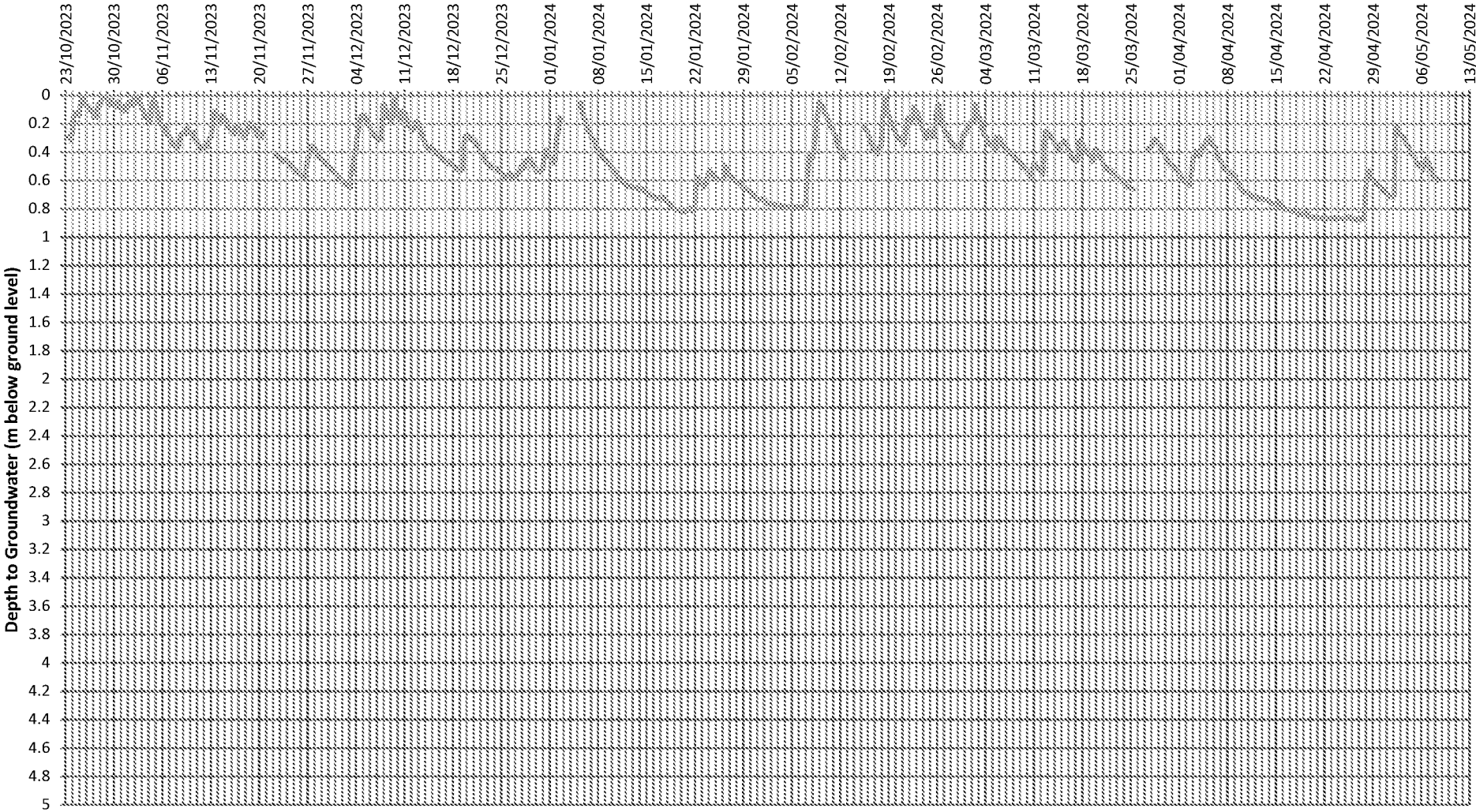
Groundwater Monitoring Results - WS622



Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex	Project No. P16339
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Groundwater Monitoring Results - WS702

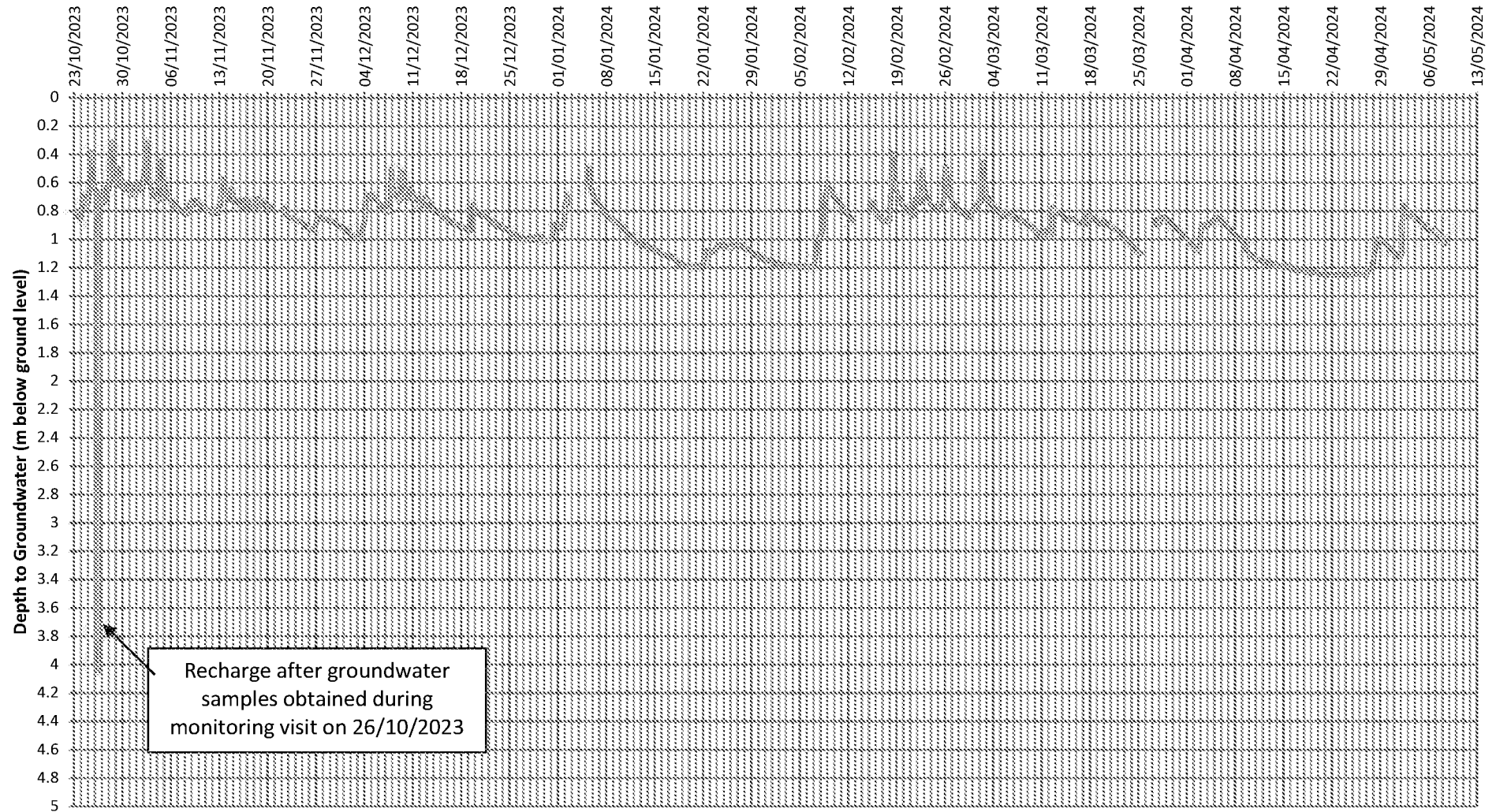


Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex

Project No. P16339

Groundwater Monitoring Results - WS705

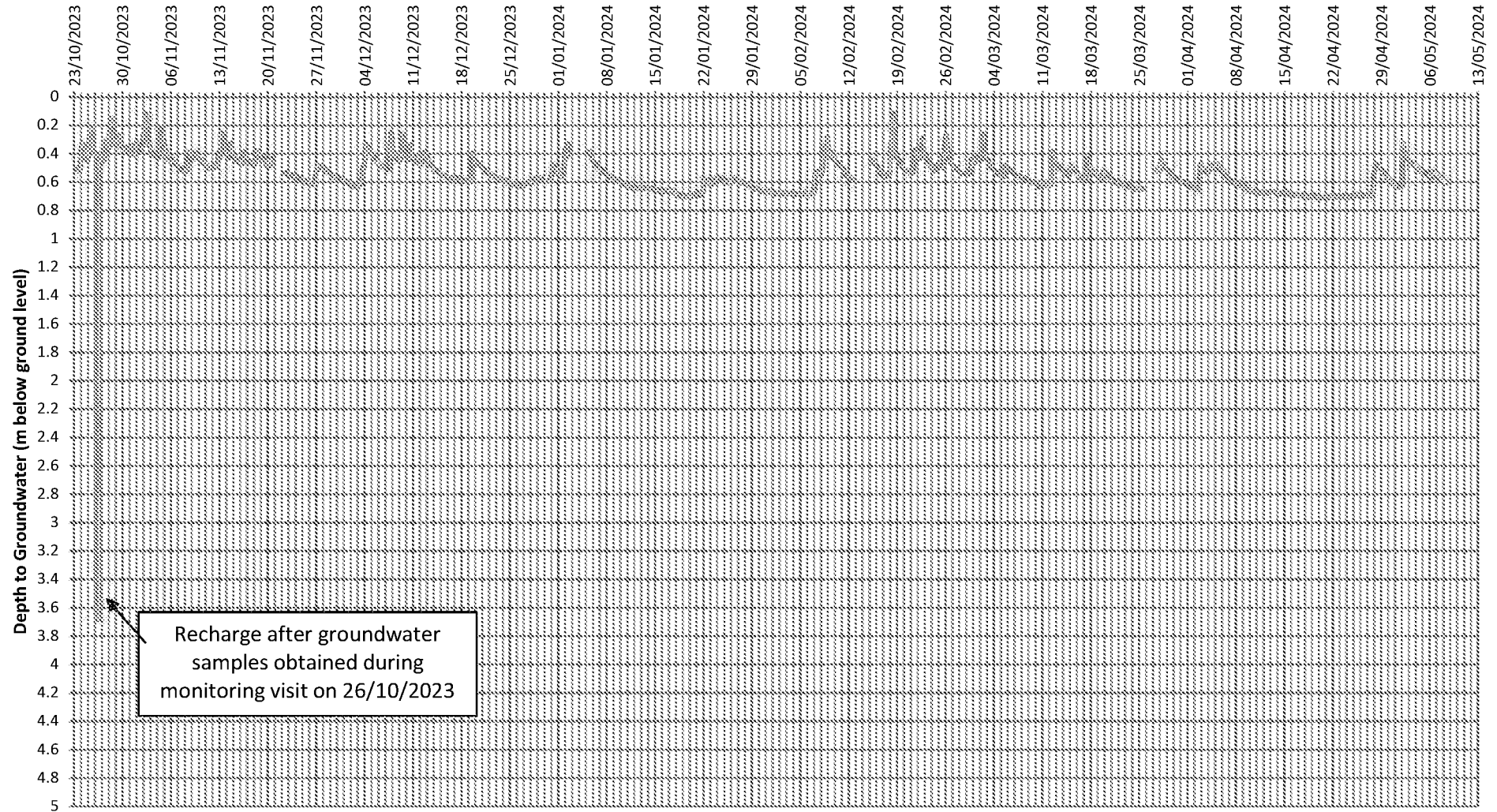


Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex

Project No. P16339

Groundwater Monitoring Results - WS707

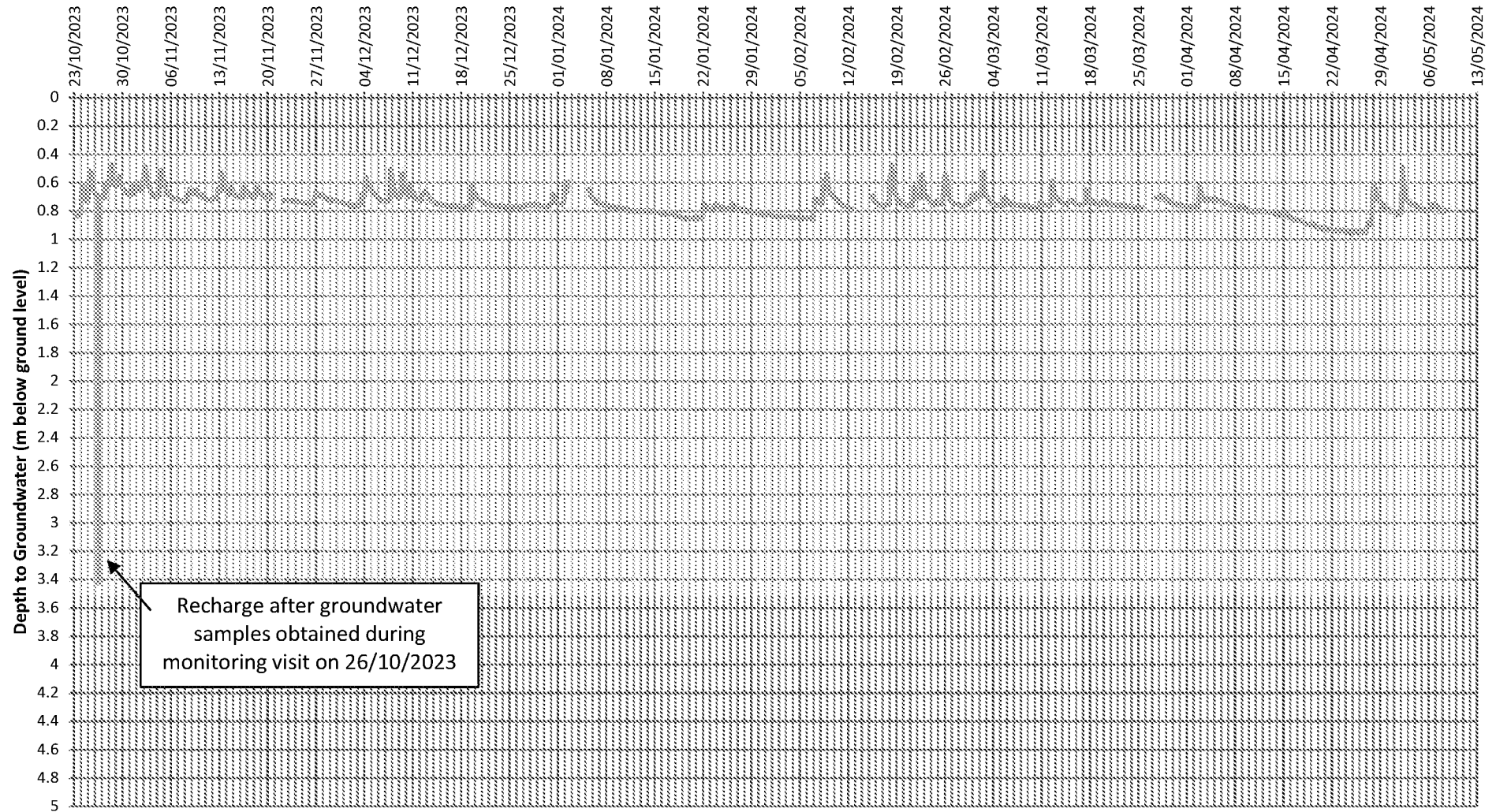


Ashdown Site Investigation Limited

Site: Woodgate Nurseries, Lidsey Road, Woodgate, West Sussex

Project No. P16339

Groundwater Monitoring Results - WS711



Explanatory Notes

Symbols and abbreviations on Exploratory Hole Records

Samples

- U 'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
- Pi Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
- D Disturbed Sample
- R Root Sample
- B Bulk Disturbed Sample
- W Water Sample
- ES Environmental Suite (on older records may be referenced J T)

In Situ Testing

- S Standard penetration test (SPT): Using the split spoon sampler.
- C Standard Penetration Test (SPT): Using a solid cone instead of the sampler – conducted usually in coarse grained soils or weak rocks.
- V Shear Vane Test: Undrained shear strength (cohesion) (kN/m²) shown within the Vane/Pen Test and N Value column.
- H Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m²) shown within the Vane/Pen Test and N Value column.
- P Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

- CP Cable Percussion Borehole
- RC Rotary Cored Borehole
- WLS Dynamic Sampler Borehole using windowless sampler tubes
- WS Dynamic Sampler Borehole using window sampler tubes
- TP Trial Pit excavated using mechanic excavator
- HDP Trial Pit excavated using hand tools

Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

In Situ Strength Testing

Standard penetration testing (SPT) carried out in accordance with BS EN ISO 22476-3:2005.

Continuous dynamic probe testing conducted using a super heavy DPSH-B (As defined by BS EN ISO 22476-2:2005) probing geometry. The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

Perth penetrometer tests carried out in accordance with Australian Standard AS 1289:6.3.3-1997, Method of Testing Soils for Engineering Purposes; no equivalent European or British Standard having been published to date.

Undrained shear strength determinations made in-situ using a Geonor hand shear vane or a hand penetrometer.

Testing to determine the in-situ California Bearing Ratio (CBR) of soils conducted at shallow depths using a hand-held Transport Research Laboratory (TRL) cone penetrometer.

End Date: 26/09/2023

Sheet 1 of 1

Remarks Groundwater: Groundwater recorded at 2.02m depth on completion of borehole. Stability: Borehole collapsed to 2.90m depth on completion. Notes: Borehole drilled to 3.00m depth but collapsed to 2.05m depth so redrilled to 3.70m depth. Standpipe installed to 2.90m depth; 2.90m to 0.90m slotted pipe with gravel surround; 0.90m to ground level plain pipe with bentonite seal; completed with end cap and upstanding security cover.	Excavation Method: WLS
	Borehole Diameter: Various
	Made By: GRD



Site Name: Land West of Lidsey Road (A29), Woodgate, West Sussex

Job Number: P16305

Start Date: 29/09/2023

End Date: 29/09/2023

Borehole Number: **WS610**

Sheet 1 of 1

Standpipe		Samples and In Situ Testing		Dynamic Probe		Legend		Depth		Stratum Description	
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	0	5	10	15	20	25	30	
ES	0.20										SUBSOIL: Brown slightly gravelly silty clay. Gravel is subangular to subrounded fine to coarse flint with rare brick and plastic.
ES	0.40										Orange brown gravelly sandy CLAY with occasional iron staining and rare organic material. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
H	0.60		125								Firm to stiff orange brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subangular fine to coarse flint. (River Terrace Deposits)
H	0.90		50								with a band of very gravelly sandy silty clay between 0.95m and 1.10m depth.
D	0.95										becoming stiff light grey and orange mottled below 1.20m depth.
H	1.20		150								
D	1.40										
H	1.50		150								
H	1.75		175								
D	1.90										Medium dense orange brown silty fine to medium SAND. (River Terrace Deposits)
D	2.40										
D	2.90										becoming very gravelly (flint) below 2.85m depth.
H	3.40		75								Firm to stiff dark grey CLAY. (River Terrace Deposits)
H	3.90		75								
											End of borehole at 4.00m

Remarks

Groundwater: Groundwater recorded at 1.04m depth on completion of borehole.

Stability: Borehole stable on completion.

Notes: Standpipe installed to 4.00m depth; 4.00m to 2.00m slotted pipe with gravel surround; 2.00m to ground level plain pipe with bentonite seal; completed with end cap and upstanding security cover.

Excavation Method: WLS

Borehole Diameter: Various

Made By: GRD

ASHDOWN SITE INVESTIGATION		Site Name: Land West of Lidsey Road (A29), Woodgate, West Sussex								
		Job Number: P16305								
		Start Date: 05/10/2023				Borehole Number: WS622			Sheet 1 of 1	
		End Date: 05/10/2023								
		Samples and In Situ Testing		Dynamic Probe						
Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	051015202530	Legend	Depth	Stratum Description		
	ES	0.05					0.00	Topsoil.		
	ES	0.20					0.10	SUBSOIL: Dark brown gravelly silty clay with rootlets. Gravel is subangular to subrounded fine to coarse flint, chalk and ironstone.		
	H	0.40		150			0.35	Stiff light brown and orange brown mottled slightly gravelly slightly sandy silty CLAY with iron staining. Gravel is subangular fine flint. (River Terrace Deposits)		
	D	0.80								
	H	0.80		110						
	V	1.00		100						
	H	1.15		110						
								becoming firm and grey below 1.30m depth.		
	H	1.50		50			1.55	Medium dense orange brown and light brown silty fine to medium SAND. (River Terrace Deposits)		
	D	1.70								
	D	2.30								
								becoming loose to medium dense between 2.60m and 3.00m depth.		
	D	2.90	3.10							
								becoming dense below 3.70m depth.		
	D	3.90					4.00	becoming very dense and gravelly below 3.90m depth. Gravel is subangular to subrounded fine to coarse flint		
								End of borehole at 4.00m		
Remarks Groundwater: Groundwater recorded at 1.85m depth on completion of borehole. Stability: Borehole cased to full depth and when casing pulled standpipe also pulled out of borehole to 3.00m. Notes: Standpipe installed to 3.00m depth; 1.00m to 3.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.								Excavation Method: WLS		
								Borehole Diameter: Various		
								Made By: GRD		

ASHDOWN SITE INVESTIGATION	Site Name: Land south of Woodgate and west of Lidsey Road/A29, West Sussex										
	Job Number: P16306										
	Start Date: 06/10/2023					Borehole Number: WS702					
	End Date: 06/10/2023										
Sheet 1 of 1											
Samples and In Situ TestingDynamic Probe StandpipeSample/ Test TypeDepth From (m)Depth To (m)Test Result051015202530LegendDepthStratum Description											
	ES	0.15								0.00	SUBSOIL: Dark brown slightly gravelly silty clay with occasional iron staining. Gravel is subangular to subrounded fine to medium flint.
	ES	0.45								0.40	Stiff grey brown, light brown and occasionally orange brown slightly gravelly silty CLAY with occasional iron staining. Gravel is subangular to subrounded fine flint. (River Terrace Deposits)
	H	0.60		85							
	D	0.80									
	H	0.85		75							
	D	1.20									becoming slightly sandy between 1.10m and 1.40m depth.
	H	1.70		50							with no gravel recorded below 1.40m depth.
	D	1.80									
V	2.00		80							2.00	End of borehole at 2.00m
Remarks Groundwater: Borehole dry on completion. Stability: Borehole stable on completion. Notes: Standpipe installed to 2.00m depth; 2.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and upstanding security cover.											Excavation Method: WLS
											Borehole Diameter: Various
											Made By: GRD

End Date: 06/10/2023

Sheet 1 of 1



ASHDOWN SITE INVESTIGATION		Site Name: Land south of Woodgate and west of Lidsey Road/A29, West Sussex			
LIMITED		Job Number: P16306			
		Start Date: 06/10/2023		Borehole Number: WS707	Sheet 1 of 1
		End Date: 06/10/2023			
Samples and In Situ Testing Dynamic Probe Legend Depth Stratum Description					
Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	
				0 5 10 15 20 25 30	



Appendix 10

Plans provided by Arun District Council

Arun District Council Maps



Mapping produced by Arun District Council

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Production Date: 26 March 2024

Scale: 1:1000 @ A3

www.arun.gov.uk



Arun District Council Maps



Mapping produced by Arun District Council

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Production Date: 26 March 2024

10 m
50 ft

Scale: 1:1000 @ A3

www.arun.gov.uk



- This drawing is to be read in conjunction with all other Bright Plan Civils drawings, and with all relevant Architects and Engineers drawings. Any discrepancies between the drawings found are to be reported immediately to the Engineer.
- Bright Plan Civils accept no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
- Do not scale work to figured dimensions only. All dimensions are in millimetres unless noted otherwise and all levels are in metres from the topographic survey datum.
- Any information given regarding existing underground services is for information only. It is not to be relied upon without the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site and for any necessary remedial work and taking due care whilst undertaking the works.
- All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
- The electronic information from this drawing can not be used for any other purpose without the written consent of Bright Plan Civils. Bright Plan Civils logos and company information must be removed from copies if information is re-used.
- The main contractor is responsible for the design of all works and for ensuring that the works are carried out in a safe and sound manner and that the works do not cause any damage to the maintenance and safety of existing buildings at all times.
- The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
- The contractor must comply with all current legislation relating to health & safety.
- All workers engaged in the works shall be fully conversant with the manufacturers recommendations and instructions and if there are discrepancies between that information and the details on any Bright Plan Civils drawings, the manufacturers instructions must be used.

RESIDUAL HAZARDS

In addition to the hazards normally associated with the type of work detailed on this drawing, note the following:

- Buried services: Contractor to refer to record drawings and use CAT to locate existing services.
- Working in the traffic: Contractor to ensure traffic management is designed, erected and maintained to protect the workforce and the public.
- Working adjacent to existing watercourse: Contractor to ensure existing watercourse is protected from construction debris and damage and to protect the workforce if required.

It is assumed that all works will be carried out by a competent contractor and that the works will be carried out in a safe and sound manner and that the works do not cause any damage to the maintenance and safety of existing buildings at all times.

C 029 & note regarding culvert installing added 13/04/2021
A Revised to add comments 27/02/2021
Rev. Amendments Date

Transport Planning and Infrastructure Design Consultants
2 West Bank, North Lane, Coggeshall, West Sussex PO20 3AT
www.bpcpltd.co.uk

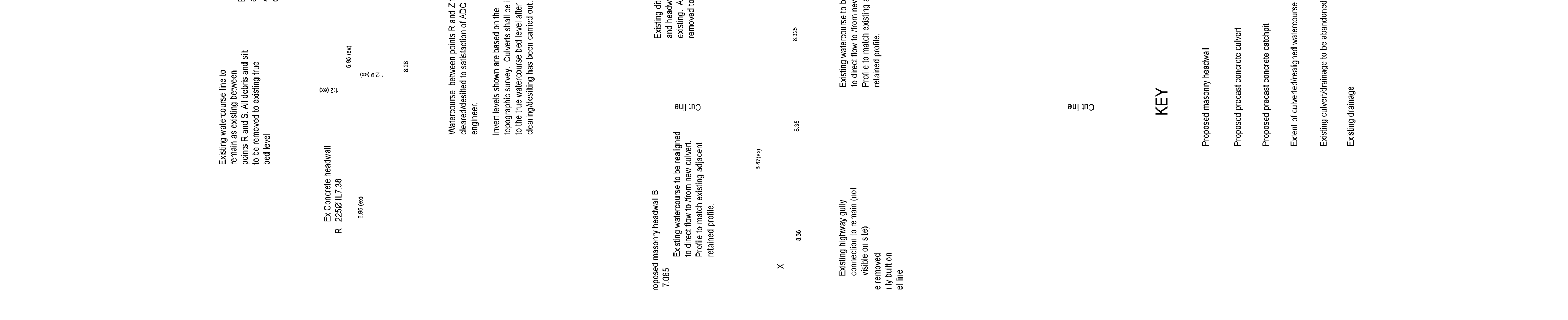
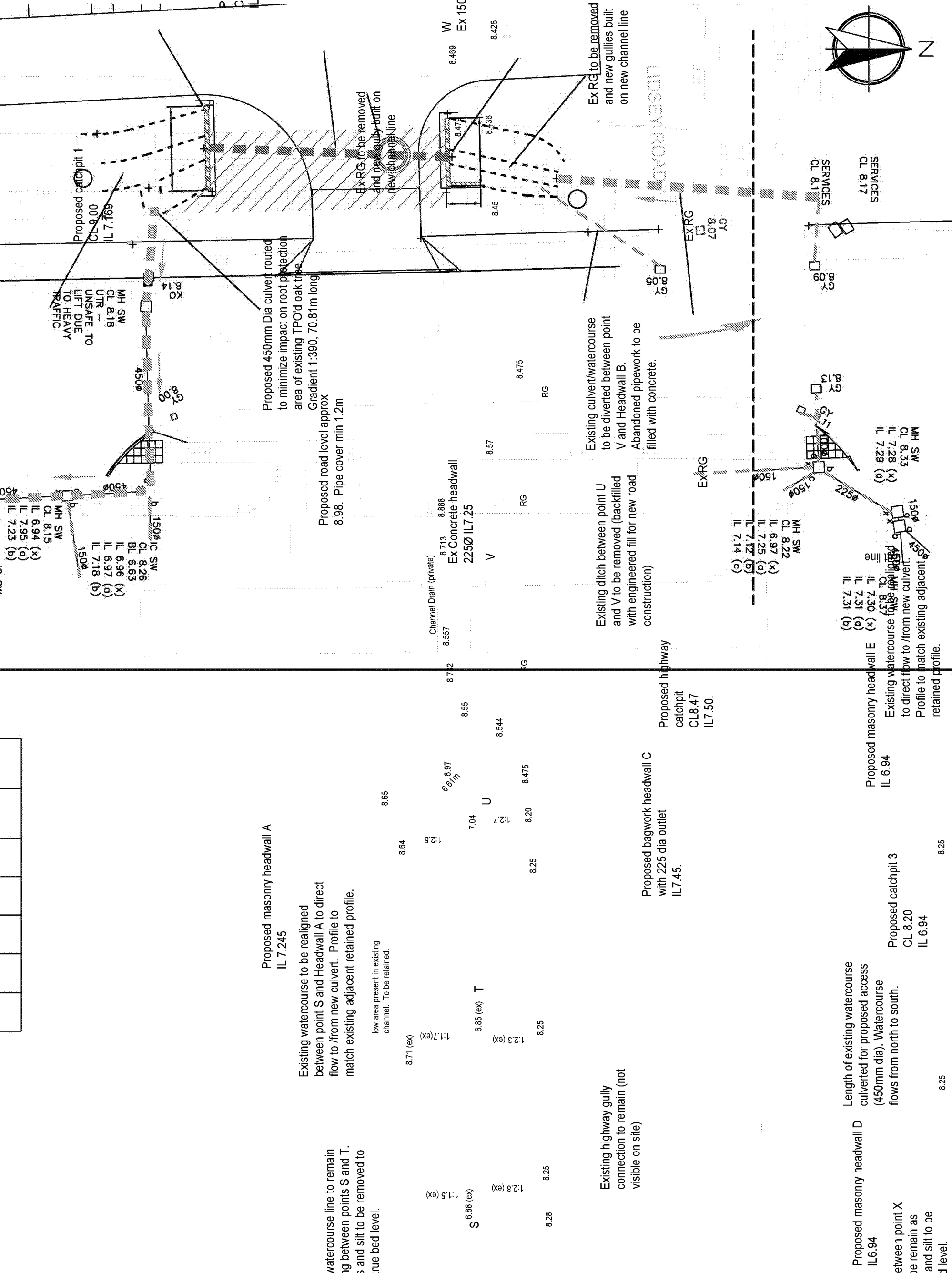
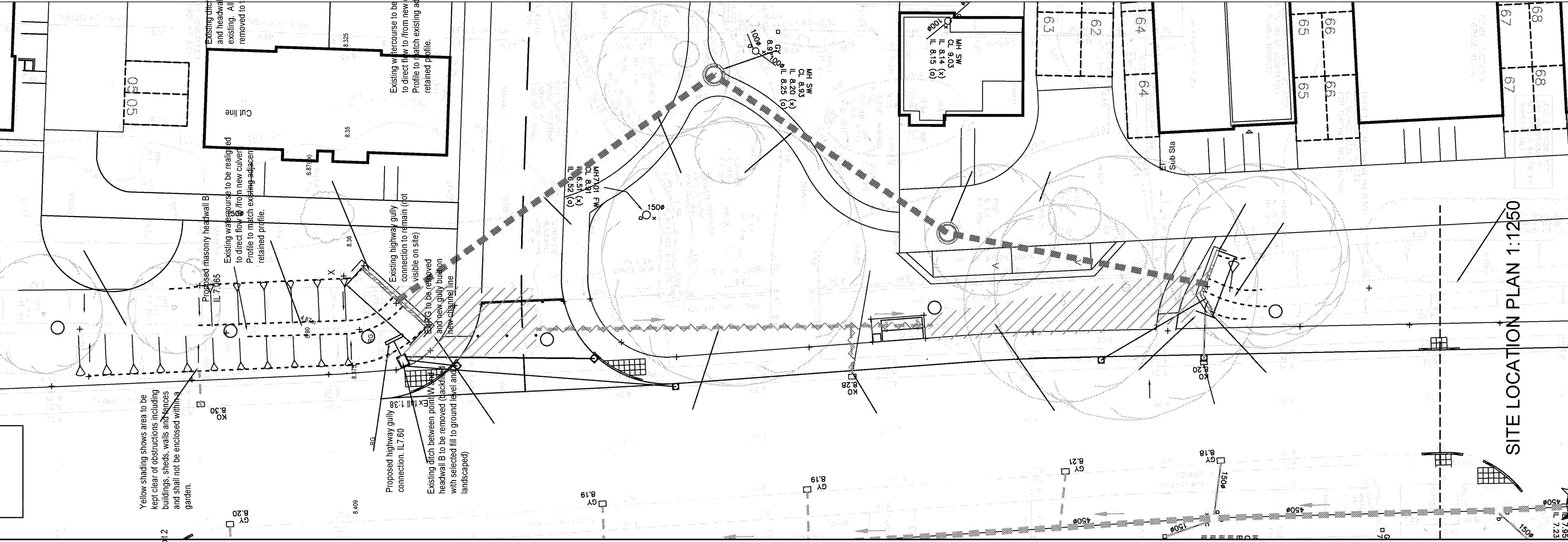
Drawing Status
FOR APPROVAL

Client
Thakeham Client Limited

Project
Land at Lidsey Road,
Woodgate, West Sussex

Drawing Title
Existing Watercourse Alterations
General Arrangement and Levels

Scale
1:200
Date
Apr 2020
Drawn By
LDF
Checked By
MJA
Rev.
D1757-17-30



Appendix 11

Correspondence with The EA concerning surface water flood risk