



Civil Engineers & Transport Planners

Lindisfarne

Flood Risk Assessment

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Civil Engineers & Transport Planners

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1 INTRODUCTION

1.1 Scope

1.1.1 Lanmor Consulting Ltd have been commissioned to prepare a site-specific Flood Risk Assessment in support of the planning application for the site at Lindisfarne, Wargrave Road, Remenham, Wokingham, RG10 8PE.

1.1.2 This report describes the existing and proposed development, the implications of flooding and the impact the development will have on the flood plain in accordance with the governments guidance document; National Planning Policy Framework (NPPF) and its planning practice guidance.

This report will consider the following:

- Location of the site;
- Development Proposals;
- Existing information on extents and depths of flood events or on flood predictions;
- Sources of Flooding;
- The impact of flooding on site;
- Safe access and Egress from the site and;
- An assessment of the run-off likely to be generated.

1.1.3 This Flood Risk Assessment report has been prepared in accordance with the requirements of the NPPF and will demonstrate that the proposed development will be safe and will not increase the risk of flooding in the surrounding areas.

2 BASELINE PARAMETERS

2.1 Existing Site

- 2.1.1 The application site consists of a detached dwelling with access from Henley Road. The existing property has a footprint area of 255.15m² and is within a rural area, surrounded by mainly open with occasional dwellings. The site is located next to the Hennerton Backwater. Figure 2.1 below shows the location of the site. A copy of the topographical survey is included in Appendix A.

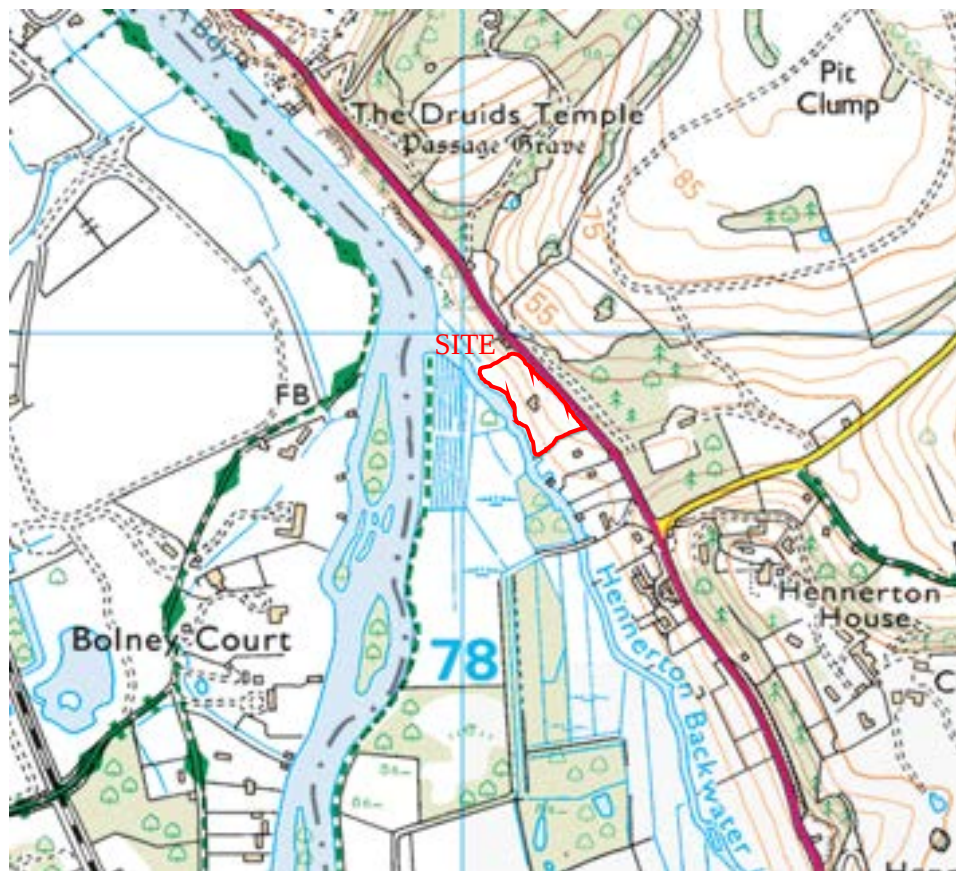


Figure 2.1 – Site Location

2.2 Geology

- 2.2.1 The British Geological Survey indicates that the site is on a Chalk Sedimentary bedrock formed between 93.9 and 72.1 million years ago during the Cretaceous period. It includes Lewes Nodular, Seaford and Newhaven Chalk Formation

2.3 Proposed Development

- 2.3.1 The application seeks to demolish the existing dwelling to erect a new detached dwelling with a swimming pool. The proposed site layout will be included in Appendix A as drawing 2662/03SK.

3 PLANNING POLICY

3.1 National Planning Policy Framework (2024)

3.1.1 Planning and Flood Risk (Paragraph 170 – 182)

170) *Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.*

171) *Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.*

172) *All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:*

- *applying the sequential test and then, if necessary, the exception test as set out below;*
- *safeguarding land from development that is required, or likely to be required, for current or future flood management;*
- *using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and*

- *where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.*
- 173) *A sequential risk-based approach should also be taken to individual applications in areas known to be at risk now or in future from any form of flooding, by following the steps set out below.*
- 174) *Within this context the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test.*
- 175) *The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).*
- 176) *Applications for some minor development and changes of use should also not be subject to the sequential test, nor the exception test set out below, but should still meet the requirements for site-specific flood risk assessments set out in footnote 63.*

- 177) *Having applied the sequential test, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.*
- 178) *The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:*
- *the development would provide wider sustainability benefits to the community that outweigh the flood risk; and*
 - *the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*
- 179) *Both Elements of the exception test should be satisfied for development to be allocated or permitted.*
- 180) *Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan-making stage, or if more recent information about existing or potential flood risk should be taken into account.*

- 181) *When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment 63 . Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*
- a) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
 - b) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
 - c) any residual risk can be safely managed; and*
 - d) safe access and escape routes are included where appropriate, as part of an agreed emergency plan*
- 182) *Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:*
- a) take account of advice from the Lead Local Flood Authority;*
 - b) have appropriate proposed minimum operational standards; and*
 - c) have maintenance arrangements in place to ensure an acceptable standard Planning Practice Guidance (2024)*

3.1.2 Flood risk is set out as a combination of the probability and the potential consequences of flooding. Areas at risk of flooding are those at risk of flooding from any source, now or in the future. Sources include rivers and the sea, direct rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems, reservoirs, canals and lakes and other artificial sources.

3.1.3 The guidance sets out the flood risk probability for fluvial flooding into 3 zones.

- *Zone 1: 'Low Probability': This comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year.*
- *Zone 2: 'Medium Probability' – This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.*
- *Zone 3a: 'High Probability' – This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding ($\geq 1\%$) or a 1 in 200 or greater annual probability of sea flooding ($\geq 0.5\%$) in any year.*
- *Zone 3b: 'The Functional Floodplain' – This zone comprises of land where water must flow or be stored in times of flood. The SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the EA) including water conveyance routes.*

3.2 Local Planning Policy

Wokingham Borough Development Plan (February 2014)

Policy CC09: Development and Flood Risk (from all sources)

- 1) All sources of flood risk, including historic flooding, must be taken into account at all stages and to the appropriate degree at all levels in the planning application process to avoid inappropriate development in areas at risk of flooding. Proposals must be consistent with the guidance in paragraphs 99-104 of the National Planning Policy Framework (NPPF); the Technical Guidance to the NPPF and demonstrate how they have used the Strategic Flood Risk Assessment (SFRA) to determine the suitability of the proposal.
- 2) Development proposals in Flood Zones 2 or 3 must take into account the vulnerability of proposed development.
- 3) Development must be guided to areas of lowest flood risk by applying the sequential approach taking into account flooding from all sources and shall ensure flood risk is not worsened for the application site and elsewhere, and ideally that betterment of existing conditions is achieved
 - a. Replacement of an existing single residential property. However, the replacement property should, where possible, be located on the part of the site at lowest risk
 - b. Conversions and change of use unless it involves a change to a more vulnerable class
 - c. Minor development, as defined in footnote 10 of the Technical Guidance Note to the NPPF.
- 4) In exceptional circumstances, new development in areas of flood risk will be supported where it can be demonstrated that:

- a. The development provides wider sustainability benefits to the community that outweigh flood risk
 - b. The development will:
 - i. Be safe for its lifetime, taking account of the vulnerability of its users
 - ii. Not increase flood risk in any form elsewhere and, where possible, will reduce flood risk overall
 - iii. Incorporate flood resilient and resistant measures into the design
 - c. Appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event.
- 5) Where required, suitable and appropriately detailed flood risk information will need to accompany a planning application. A Flood Risk Assessment (FRA) is required for:
- a. All proposals in areas of known historic flooding from all sources
 - b. Where there is evidence of a risk from all sources of flooding identified in the Strategic Flood Risk Assessment
 - c. Those proposals set out in footnote 20 to paragraph 103 of the NPPF.

Policy CC10 – Sustainable Drainage

- 1) All development proposals must ensure surface water arising from the proposed development including taking into account climate change is managed in a sustainable manner. This must be demonstrated through
 - a. A Flood Risk Assessment, or

b. Through a Surface Water Drainage Strategy.

2) All Development proposal must

- a. Reproduce greenfield runoff characteristics and return run-off rates and volumes back to the original greenfield levels, for greenfield sites and for brownfield sites both run-off rates and volumes be reduced to as near greenfield as practicably possible.
- b. Incorporate Sustainable Drainage Systems (SuDS), where practicable, which must be of an appropriate design to meet the long term needs of the development and which achieve wider social and environmental benefits
- c. Provide clear details of proposed SuDS including the adoption arrangements and how they will be maintained to the satisfaction of the Council [as the Lead Local Flood Authority (LLFA)]
- d. Not cause adverse impacts to the public sewerage network serving the development where discharging surface water to a public sewer

4 SOURCES OF FLOODING

4.1 Fluvial Flooding

4.1.1 Detailed flood information for the site was requested from the Environment Agency (EA). The most significant source of fluvial flooding to the development comes from Hennerton Backwater, located within immediate proximity of the development.

4.1.2 The EA's website "Flood Maps for Planning" was used to establish what flood zone the site is in. Figure 4.1 below shows the location of the site and its relationships to the flood zones, extracted from the EA website.

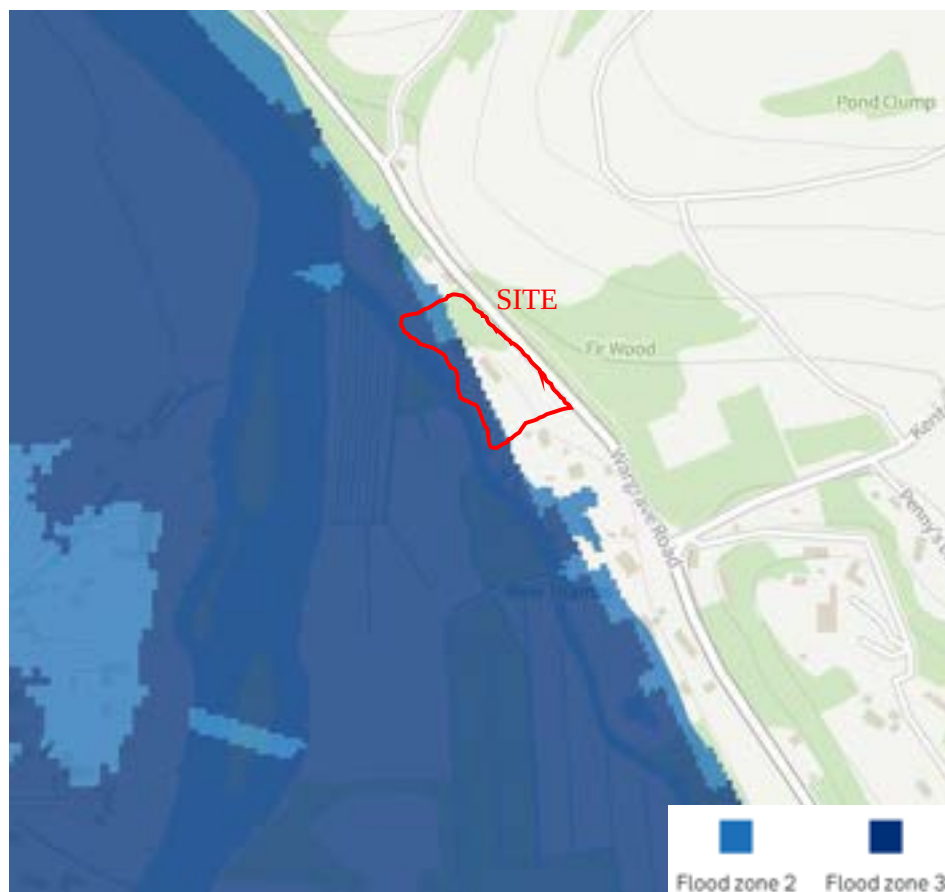


Figure 4.1 – EA Flood Map

4.1.3 As shown above in Figure 4.1, the part of the application site is within Flood Zone 2 and 3. However, the proposed dwelling will lie within Flood Zone 1. Hence, the annual probability of river flooding for the dwelling will be less than 0.1%.

4.2 Surface Water Flooding

4.2.1 The surface water flood mapping provided by the EA is the best available source of national information for surface water flooding. It is a starting point for understanding patterns and probability of surface water flooding. The EA accept that the mapping has limitations and state that *“these maps cannot definitely show that an area of land or property is, or is not, at risk of flooding and the maps are not suitable for use at an individual property level.”* Figure 4.2 below shows the risk areas and probability of surface water flooding in correlation to the application site.

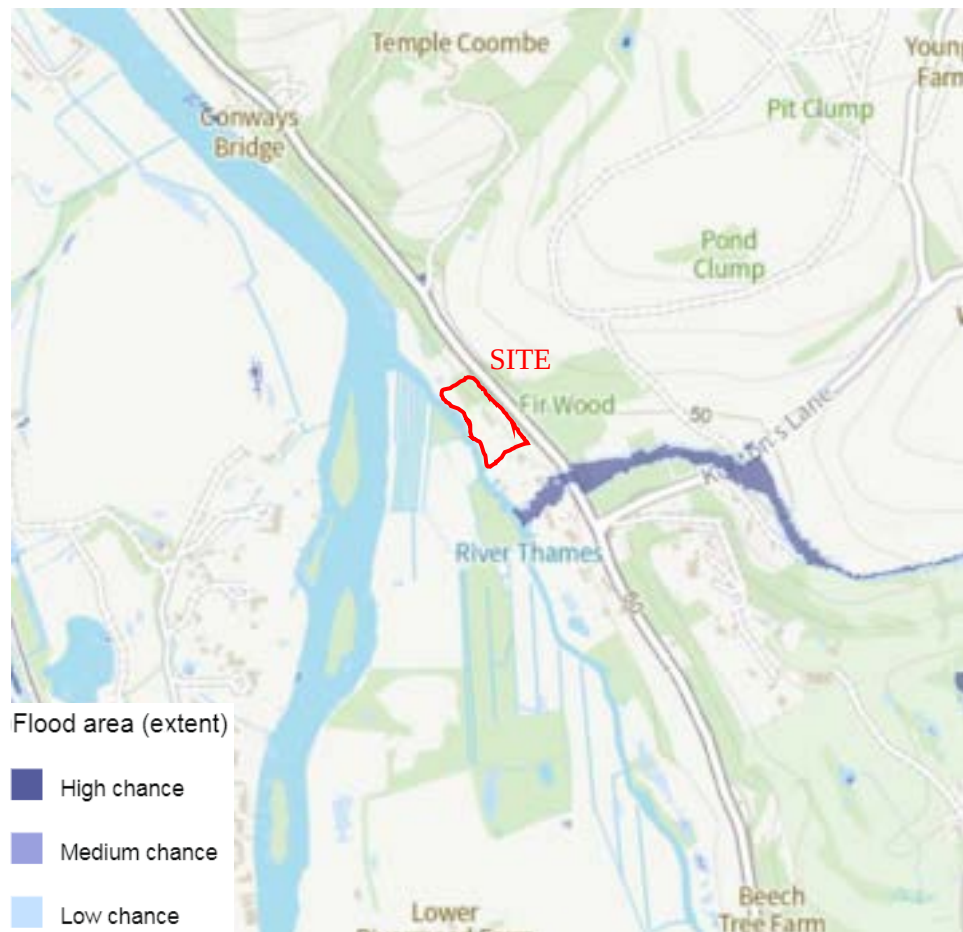


Figure 4.2 – Surface Water Flood Map

4.2.2 As shown above in Figure 4.2, the site is not at risk of Surface water flooding from an event with a probability of less than 0.1% or (1 in 100 years).

4.3 Historical Flooding

- 4.3.1 Records of historical flood events that affected the local area are included in Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (SFRA). Within the SFRA is an interactive map that show all types of flooding including historic flood events. Figure 4.3 below shows an extract of the interactive map with the EA Historic Flood outlines indicated.



Figure 4.3 – EA Historic Flood Map

- 4.3.2 As shown above in Figure 4.3, the application site has been flooded before. However, the extent of the flooding was confined to the western boundary of the site.

4.4 Groundwater Flooding

To assess the risk of groundwater flooding to the site, the SFRA interactive flood maps reviewed to establish probability of ground water flooding. Figure 4.4 below shows the development is in an area identified has a 25 – 50% probability of Groundwater Flooding.

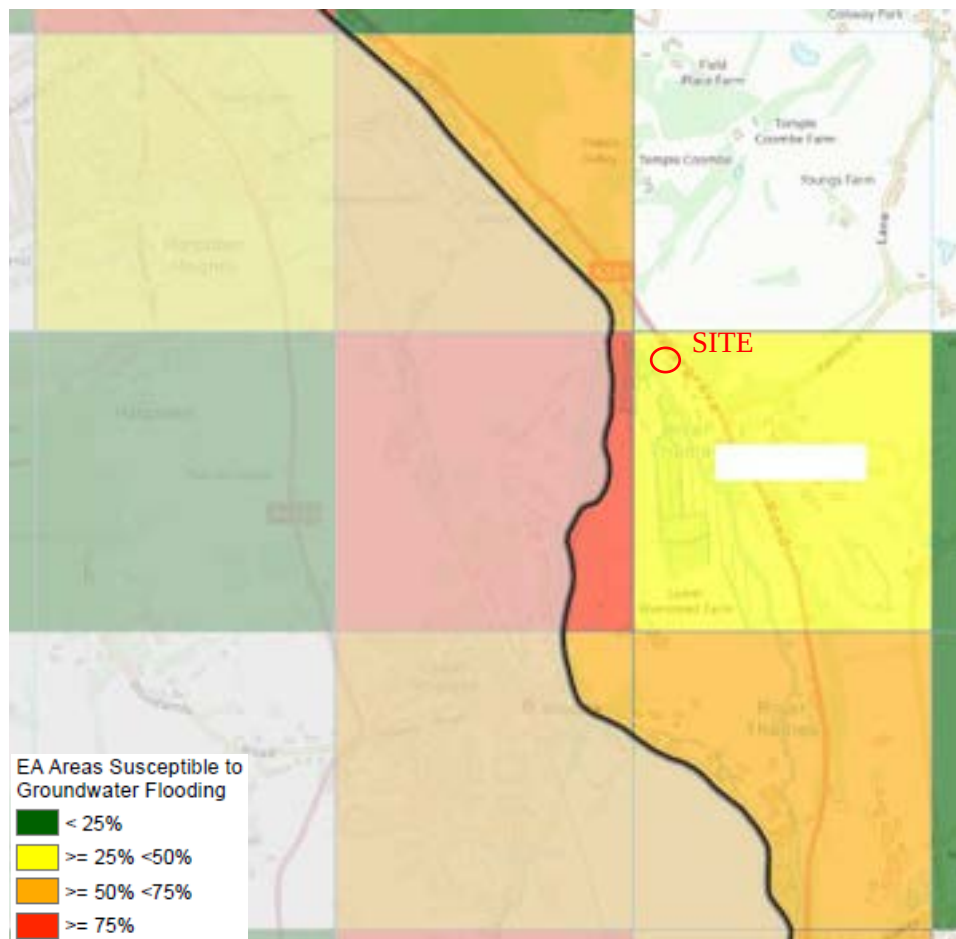


Figure 4.4 – Groundwater Flooding Map

4.5 Flooding from Sewer

- 4.5.1 Sewer Floods was also considered in the SFRA, recorded flood incidents by Thames Water from January 2000 – May 2022 are set out in Table 4.1 below.

Postcode	Number of recorded incidents 2022	Number of recorded incidents 2021	Number of recorded incidents 2020	Number of recorded incidents 2019	Number of recorded incidents from 2000-2019	Total flooding incidents
RG10 0	0	1	4	2	63	70
RG10 8	0	0	0	0	2	2
RG10 9	0	5	5	4	94	108
RG2 8	0	0	0	0	10	10
RG2 9	1	7	10	6	148	172
RG27 0	0	0	0	0	5	5
RG4 6	0	1	2	0	33	36
RG40 1	0	0	0	0	1	1
RG40 2	0	0	0	0	3	3
RG40 4	0	2	1	1	47	51

Table 4.1 – Sewer Flooding incidents (January 2000 – May 2022)

4.5.2 The application site is within Post Code RG10 8 and as shown above the total number of sewer flooding incidents is 2. In comparison to other surrounding areas, the probability of sewer flood on the development is low.

4.6 Flooding from reservoirs

4.6.1 The site would not be affected by a reservoir flood extent, however if a failure occurred when there was also fluvial flooding, the site could be affected but this would be limited to the very western side of the application site. Figure 4.5 below shows the potential extent of Reservoir Flooding.



Figure 4.5 – Reservoir Flood Extents

5 MODELED FLOOD LEVELS

5.1 Flood Probability

5.1.1 The principal source of flooding to the site is from Hennerton Backwater which is a tributary of the River Thames. Due to its proximity to the application site, the western boundary of the site could be subject to flooding. It is shown to be located in Flood Zone 3 with a small area to the north in Flood Zone 2.

5.1.2 Detailed flood modelling data has been obtained from the EA, consisting of Product 6 data. The flood data provided shows the estimated flood level and depth. Figure 5.1 below shows an extract from the product 6 model for a range of flood events for different return periods.

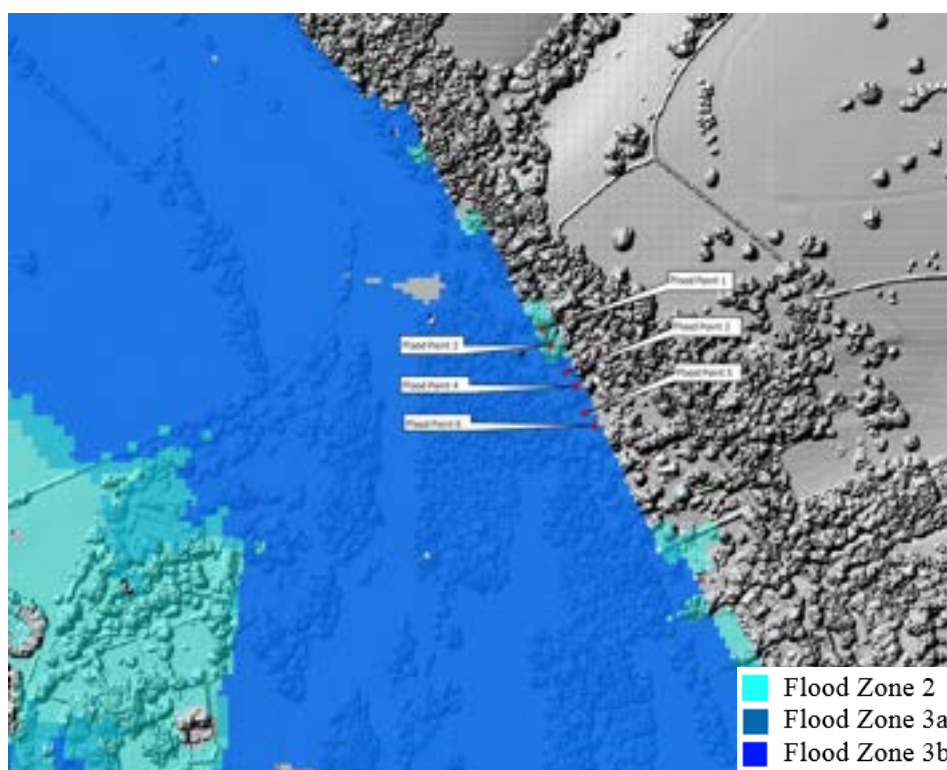


Figure 5.1 – Model Flood Extents

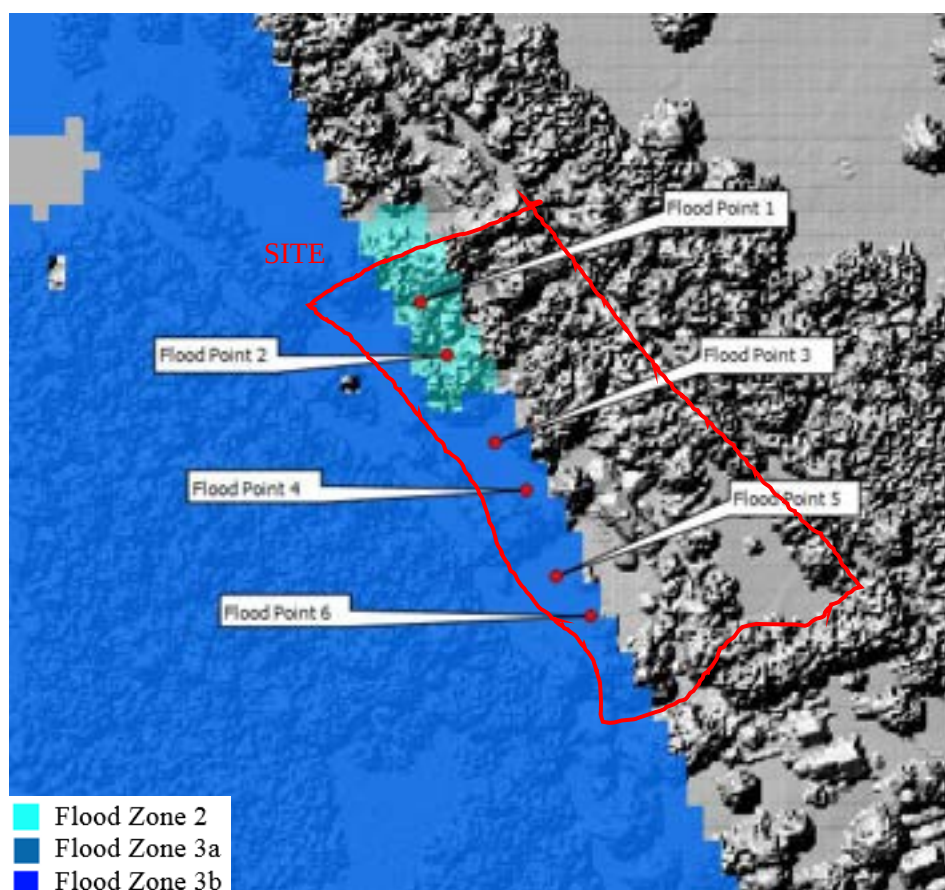


Figure 5.2 – Enlargement of Flood Extents

5.1.3 Figure 5.2 above shows the extent of flood zones 2, 3a and 3b across the site, together with the flood nodes extracted from the model data. The flood level for each node has been extracted for the 1 in 30, 1 in 100 and 1 in 1000 year events and are tabulated below.

NODE	Coordinates		Return Period			
	X	Y	1 in 30	1 in 100	1 in 100 + 35% CC	1 in 1000
Point 1	478061	180947	Nil	Nil	34.54	34.69
Point 2	478070	180932	Nil	Nil	34.54	34.69
Point 3	478083	180906	33.46	33.72	34.54	34.70
Point 4	478092	180892	33.46	33.72	34.54	34.70
Point 5	478101	180867	33.46	33.72	34.54	34.70
Point 6	478110	180857	33.46	33.72	34.54	34.70

Table 5.1 – Flood Levels

5.2 Climate Change

5.2.1 The EA have published guidance on climate change allowances to be applied to flood modelling for new developments. The allowance to be implemented is based on the management catchment area, flood zone and site vulnerability. The site is within the Thames and South Chilterns Management Catchment. The Department for Environment Food & Rural Affairs (Defra) Climate Change Allowances website provides the allowance to be allocated by catchment area.

5.2.2 The proposed dwelling itself is within Flood Zone 1, this means no climate change allowance is needed. However, given the dwelling is in close proximity to Flood Zone 2,3 and 3b, Climate change allowances have been considered. The proposed development will be used for residential purposes, which is considered a “more vulnerable” use. Based on the “Flood Risk Assessment: Climate Change Allowance” guidance, sites within Flood Zone 2 or 3 with a more vulnerable use class should use the central climate change allowance. The website provides climate change allowances for the Management Catchment area, including the central allowances that should be applied to the peak river flows.

5.2.3 Table 5.2 below sets out the allowances that should be applied to estimate the future flood levels.

Epoch	Change Allowances for Mole Management catchment		
	Central	Higher	Upper
2020	12%	17%	30%
2050	14%	22%	42%
2080	31%	43%	76%

Table 5.2 – Climate Change Allowances

5.2.4 The proposed development of a residential use has a life span of 100 years. As guidance from EA, developments with a lifetime between (2061 to 2100) should use Epoch 2080. Therefore, the climate change allowance of 31% should be factored in for assessing the site’s Flood Risk.

5.2.5 The EA has not prepared a model scenario for a 31% allowance, but they have prepared an option with a 35% allowance for climate change. Figure 5.3 below shows the extent of 1 in 100-year event with a 35% allowance in peak river flows, to take into account the potential impacts of climate change.

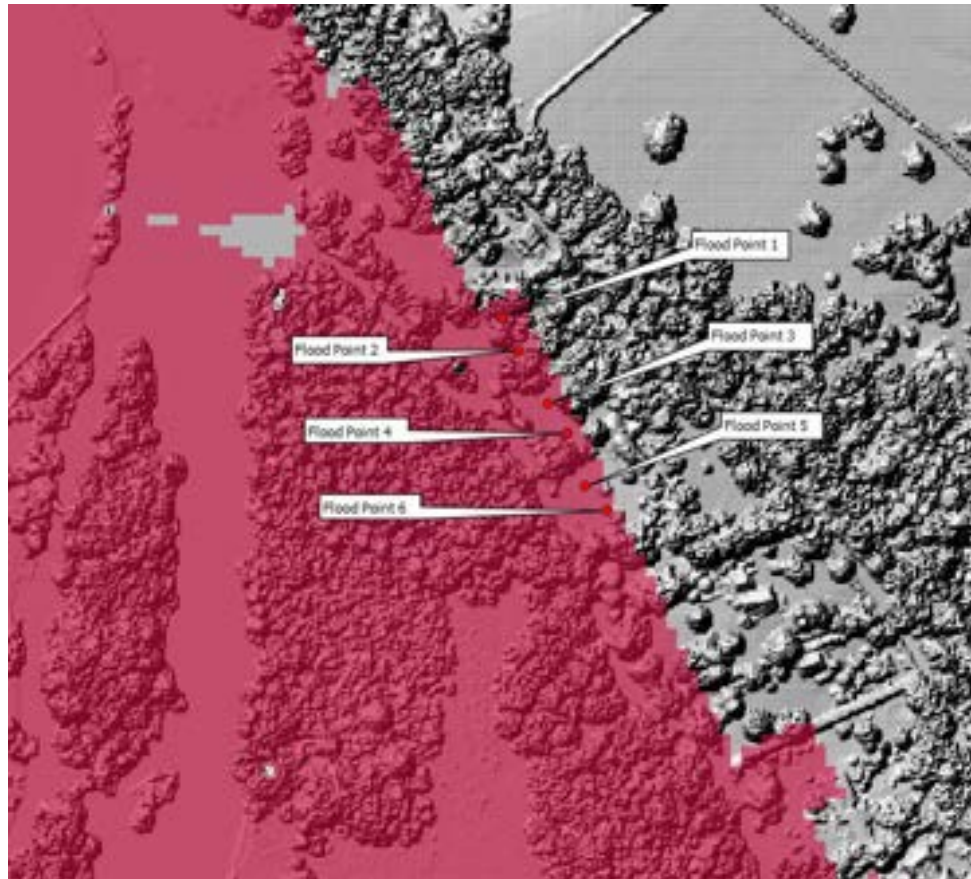


Figure 5.3 – Flood Extent 1 in 100 + 35% Allowance

5.2.6 Figure 5.3 above shows that the extent of a 1 in 100 years + 35% will only affect the western side of the application site. The proposed dwelling, swimming pool and the access will not be affected.

6 IMPACT OF FLOODING

6.1 Impact on Floodwaters

6.1.1 The nearest source of fluvial flooding to the site is from the Hennerton Backwater, located to the west of the site. The proposed application seeks permission to demolish the existing dwelling to construct 1 no. detached dwelling with a swimming pool.

6.1.2 The proposed development will result in a 10% increase in footprint area (26.67m²). However, Wokingham Borough Council stated within the Pre-Application, that *“the 10.4% increase is considered negligible in the context of the site as the proposals would concentrate the development more centrally within the site and thus reduces the footprint of development eastwards and across the site generally. Therefore, the footprint increase would not be considered materially larger”*.

6.2 Impact on Flood Volumes

6.2.1 As stated above, the proposed development will increase the footprint on site which is considered negligible. However, as parts of the site could be affected by the 1 in 100 year + 35% climate change allowance, the extent for the flood event was modelled. It shows that the proposed property will not be affected. Hence, there will be no restriction to the free flow of flood water or a loss of flood storage volumes as a result of the development. Drawing 251966-FRA-01 within Appendix C shows the proposed dwelling and modelled Flood Zone extents.

6.3 Impact on Development

6.3.1 This assessment has demonstrated that the proposed development will not be affected by flooding with a probability of 1.0% + 35% allowance for climate change. There is more than a 2m difference between the entrance of the development and the highest flood point level. Therefore, the development will not be subject to flooding.

6.4 Safe Access

- 6.4.1 The proposed development and access roads are not at risk of flooding from an extreme storm event so a safe and dry access can always be provided to and from the site for the 1.0% AEP + 35% probability event, via Wargrave road to Kenton's Lane.

7 SEQUENTIAL TEST

- 7.1.1 The principal of the sequential test is to assess locations and to prioritise development in areas at less risk of flooding. The NPPF suggests that Regional Planning Bodies and Local Planning Authorities should ensure their spatial strategies include a broad consideration of flood risk. Strategic Flood Risk Assessments (SFRA) refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account. They provide the basis for applying the sequential test.
- 7.1.2 The application seeks the removal of the existing dwelling to erect a new detached dwelling with a swimming pool. The application site is within flood zone 1 to 3 but the proposed dwelling is located within Flood Zone 1 and is not at risk of flooding from any source for an event with 1 in 100year + 35% probability.
- 7.1.3 Within the NPPF, Paragraph 175, it states that *“The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).”*
- 7.1.4 Furthermore, it states within the Local Plan (Policy CC09) that a sequential test will not be required if the following applies: *“Replacement of an existing single residential property. However, the replacement property should, where possible, be located on the part of the site at lowest risk.”*
- 7.1.5 The proposed development will replace an existing residential property. The proposed dwelling will not be at risk of flooding and the access to and from the site will also be free of flooding. Therefore, the sequential test doesn't need to be applied to this application.

8 DRAINAGE STRATEGY

8.1 Existing Drainage

- 8.1.1 Sewer records were obtained from Thames water and it shows that there are no public sewers within the vicinity of the site.

8.2 Proposed Drainage

Foul Water Drainage

- 8.2.1 The foul drainage from the proposed dwellings will be collected via a network of pipes. The effluent will be treated on site via a package treatment plant within the site before discharging to the watercourse (Hennerton Backwater). The discharge will be subject to an environmental permit from the EA to cover the volume of treated effluent to the watercourse.

Surface Water Drainage

- 8.2.2 Rainwater harvesting was also considered to reuse surface water runoff within the building. These systems require a separate network of pipework, tanks and pumps to store the rainwater and distribute it throughout the units. Rainwater harvesting is suitable for larger developments where uptake matches the runoff.
- 8.2.3 Also, if there were consecutive storms the harvesting tank would be full at the start of the storm and all the surface water runoff would discharge via the overflow, so the downstream SuDS feature (soakaway / attenuation tank) would need to be sized by ignoring the harvesting facility. Given that rainwater harvesting cannot be relied on to reduce the rate of runoff from the site and the additional cost for the necessary infrastructure to implement it, rainwater harvesting has therefore been discounted.

8.2.4 Next on the sustainable drainage hierarchy is the use of ground infiltration techniques such as soakaways and infiltration basins. BGS records indicate that the underlying bedrock consists of Lewes Nodular Chalk Formation, which consists primarily of chalk. An infiltration test was undertaken, and it noted that soakaways are not viable within the site, a copy of the soil investigation is included in Appendix B. The use of infiltration has therefore been discounted for disposal of runoff as the geology is not sufficiently permeable to allow this.

8.2.5 Next on the hierarchy is discharge to watercourse, there is a watercourse within the vicinity of the site. Therefore, surface water will be discharged to the watercourse.

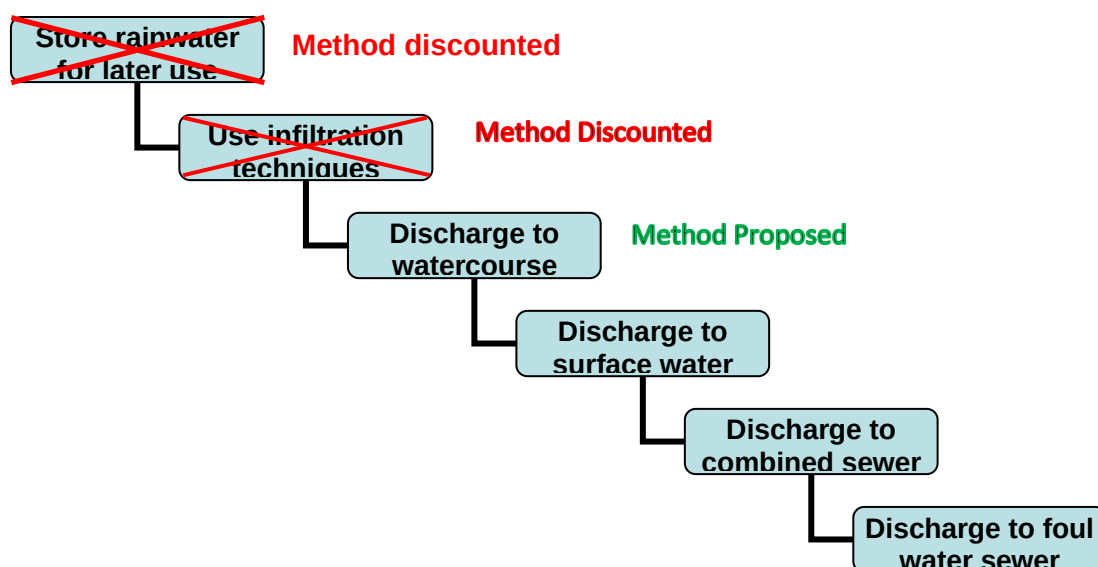


Figure 8.1 – SuDS Hierarchy

8.2.6 The proposed drainage strategy for the development will therefore use permeable paving for the access road which, this will provide storage of the surface water runoff to allow a restricted discharge to the attenuation tank that will also serve the building's roof and hard standings. The paving and tank will attenuate the runoff from the site to allow the discharge rate to the ditch to be reduced.

8.2.7 The site is considered a more vulnerable use with life expectancy of 100-years. The PPG guidance recommends the use of the upper end allowance in this circumstance. The site is located in the Thames and South Chilterns Management Catchment area, and a climate change allowance of 40% should be factored into the drainage design.

8.2.8 An assessment of the sites greenfield runoff rate has been undertaken to set the discharge rate from the site, a copy of the full calculations is included in Appendix D. The total area of the site is 847m², the green field runoff rate for the application site has been estimated for the different return periods and is tabulated below.

Return Period	Greenfield Rate	Proposed Rate
Q_{bar}	0.0 l/s	-
1 in 1	0.0 l/s	0.6 l/s
1 in 30	0.1 l/s	0.6 l/s
1 in 100	0.1 l/s	0.6 l/s
1 in 100 +40% CC	-	0.7 l/s

Table 8.1 – Existing & Proposed Discharge Rates

8.2.9 The proposed discharge rate from the development has been set at a maximum rate of 0.7 l/s for the 1 in 100-year event plus 40% allowance for climate change, reducing to 0.6 l/s for the 1 in 1-year event.

8.2.10 Permeable paving will be used on the driveways to collect the runoff and store it before discharge at a reduced rate, the discharge will cascade into the attenuation tank which will also collect the runoff from the roof of the building. The attenuation tank will be located in the rear garden and both the paving and tank have been designed to accommodate an event with a probability of 1.0%+40%CC.

8.2.11 The paving can only be used for storage as the testing proved infiltration was not possible. The paving has been designed to have a minimum subbase thickness of 300mm to accommodate the design storm. The attenuation tank has been designed to receive the runoff from the building and permeable paving, it has been designed at 3m x 12m x 0.8m deep to accommodate a 1 in 100 year+40% storm event.

- 8.2.12 The discharge from the tank will be restricted by a hydro brake to a rate of 0.7 l/s the minimum practical and a considerable reduction compared to the existing property.
- 8.2.13 Drawing 251966/DS/01 included in Appendix C, shows a drainage strategy for the development, this will be developed at detailed design stage once the rainwater downpipes etc have been detailed. The drainage has been designed to accommodate a 1 in 100-year +CC year event, the full calculations for each element of the SuDS is included in Appendix D.

9 MANAGING POLLUTION RISK FROM SURFACE WATER

9.1.1 As part of CIRIA Suds Manual C753, Section 26.7 provides information regarding methods for managing pollution risk from surface water runoff.

9.1.2 Part of the assessment is to determine which land use classification the proposed development falls under. Tables 26.1 of the CIRIA Report C753 sets the approaches to water quality risk management. For this site the simple Index Approach will be used as shown below.

TABLE 26.1 Approaches to water quality risk management			
Design method	Hazard characterisation	Risk reduction	
		For surface water	For groundwater
Simple index approach	Simple pollution hazard indices based on land use (eg Table 26.2 or equivalent)	Simple SuDS hazard mitigation indices (eg Table 26.3 or equivalent)	Simple SuDS hazard mitigation indices (eg Table 26.4 or equivalent)
Risk screening ¹	Factors characterising traffic density and extent of infiltration likely to occur (eg Table 26.5 or equivalent)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (eg Table 26.5 or equivalent)
Detailed risk assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in event mean discharge concentrations and total annual load reductions delivered by the system	

Table 9.1 – Approaches to Water Quality Risk Management

9.1.3 Table 26.2 C753 reproduces as Table 9.2 shows the potential hazard associated with different land uses the hazards indices. The development will consist of residential houses, it is concluded that the site should be classed within the sections shown in Table 9.2 below.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites, trunk roads and motorways ²	High	0.8 ²	0.8 ²	0.9 ²

Table 9.2 – CIRIA SuDS Manual C753 (Land Use Classifications)

- 9.1.4 The residential buildings roofs are considered to have a “very low” pollution hazard, generating 0.2 total suspended solids, 0.2 metals and 0.05 hydrocarbons. The access and parking area are considered to have a “low” pollution hazard, generating 0.5 total suspended solids, 0.4 metals and 0.4 hydrocarbons.
- 9.1.5 The proposed development will incorporate permeable paving for storage and disposal of runoff from the site. Suitable treatment measures offered by SuDS features are set out CIRIA report.
- 9.1.6 Table 26.3 of C753 reproduced below as Table 9.3 sets out the mitigation indices provided by SuDS features for discharge to surface waters.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ³	0.7 ³	0.7	0.6
Wetland	0.8 ²	0.8	0.8
Proprietary treatment systems ^{1,2}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 9.3 – CIRIA SuDS ManualC753 (Mitigation Indices to surface water)

- 9.1.7 The permeable paving will provide mitigation of 0.7 for total suspended solids, 0.6 for metals and 0.7 for hydrocarbons. These are all greater than the pollution hazard indices identified in Table 9.2 above.
- 9.1.8 The above assessment has demonstrated that the proposed SuDS features will provide a suitable level of treatment appropriate to the type of development proposed.

10 SURFACE WATER / SUDS MAINTENANCE

- 10.1.1 Regular inspection of the surface water drainage network for blockages and clearing unwanted debris/silt from the system should improve the performance of the surface water network and decrease the need for future repairs. In the event of blockages, high pressure water jets can be used to clear the gullies and pipes to ensure they are functioning correctly, this should be undertaken by certified trained professionals.
- 10.1.2 The level and frequency of maintenance required on site is dependent on the type of facility. The type of maintenance will fall into one of three categories “regular maintenance”, “occasional maintenance”, and “remedial maintenance”.
- 10.1.3 Regular Maintenance of the drainage and SuDS features will include, inspections, removal of litter/debris and sweeping of the surfaces. Occasional maintenance will include removal of sediment etc. and remedial maintenance may include structural repairs and infiltration reconditioning if required.
- 10.1.4 The drainage and SuDS elements after an initial inspection following construction should be inspected on a monthly basis for the first 12 months and after large storms, thereafter the following maintenance regime should be applied and adjusted if the 12-month monitoring process has identified any issues.
- 10.1.5 Following completion of the development, the freeholder of the property will be responsible for the maintenance of the drainage and SuDS features on site. they will be responsible for inspecting and maintain in line with the recommendations below.
- 10.1.6 The following maintenance regime is recommended for the SuDS features in the development and should be adjusted suit site requirements flowing the initial inspections if required.

Attenuation Tanks

10.1.7 For the attenuation tanks, the following maintenance will be required.

Attenuation Tank Maintenance Schedule		
	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Annually
	Remove debris from the catchment surface (where it may cause risk to performance).	Monthly
	For systems where rainfall infiltrates in the tank from above, check surface of filter for blockage by sediment, algae or other matter, remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures.	Annually or as required
Remedial Actions	Repair/rehabilitate inlets/outlets, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tanks for sediment build-up and remove if necessary	Every 5 years or as required

Table 10.1 – Attenuation Tank Maintenance

Permeable Paving

10.1.8 For permeable paving areas, the following maintenance is recommended.

Permeable Paving Maintenance Schedule		
	Required Action	Typical Frequency
Regular maintenance	Remove debris and leaves etc.	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds	As required- once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting etc	As required
	Rehabilitation of surface and upper substructure	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three-monthly, 48 hours after large storms in the first six months
	Inspect silt accumulation rates and establish appropriate frequencies for rehabilitation	Annually
	Monitor inspection chambers	Annually

Table 10.2 – Permeable Paving Maintenance Schedule

Inspection, Manhole, Catch pit Chambers and Pipes

- 10.1.9 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained.
- 10.1.10 Pipes are intended to be the main conveyance across the development. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 10.1.11 For the Inspection, Manhole, catch pit Chambers and Pipes, the following maintenance will be required.

Manhole / Pipe Maintenance Schedule		
	Required Action	Typical Frequency
Regular maintenance	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
	Remove sediment from structures.	Annually or as required
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required
	If continued poor performance jet and CCTV survey poorly performing runs.	As required
Monitoring	Inspect/check all inlets, outlets, to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of pipe manholes for sediment build-up and remove if necessary	Every 5 years or as required

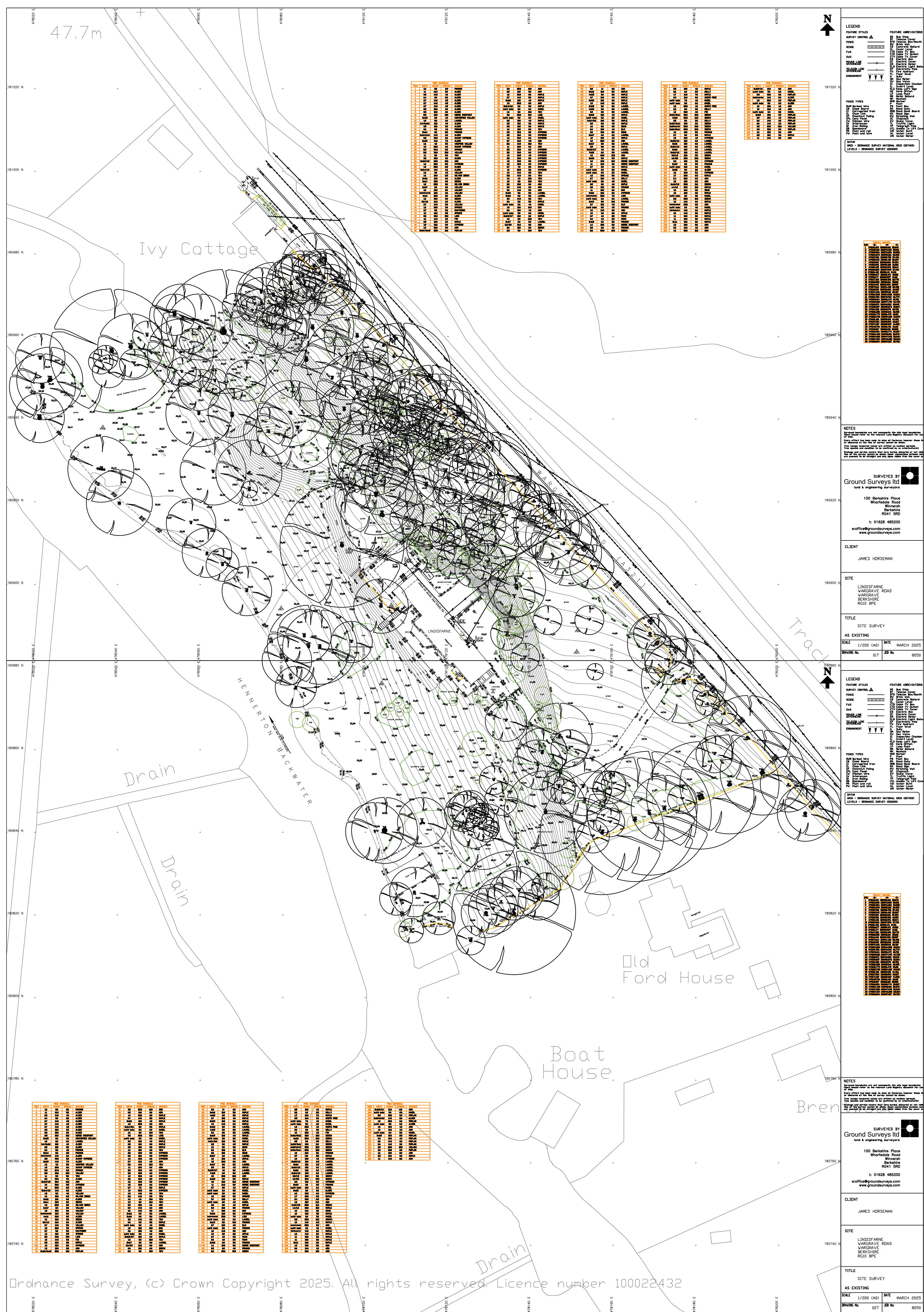
Table 10.3 – Manhole, Catch pit and Pipes Maintenance

11 SUMMARY & CONCLUSION

- 11.1.1 The proposed development seeks permission for the replacement of a single dwelling with a new dwelling and access. The application site is indicated to be within flood zones 1, 2 and 3. An assessment of the flood risk has identified that the proposed building will be located in an area at low risk of flooding (flood zone1).
- 11.1.2 When climate change allowances are considered, the property will still be free from flood waters for the 1 in 100-year event plus CC allowance. The proposed development is therefore considered to be at low risk of flooding from all sources and that it will not restrict the flow of flood waters or result in the loss of flood storage volumes. The property is located in flood zone 1 so meets the requirements of the sequential test to allocate development to low flood risk areas and it has been demonstrated that safe access can be provided at all times during an extreme flood event.
- 11.1.3 A drainage strategy has also been prepared for the development, which demonstrates that measures can be put in place to reduce the runoff from the site while ensuring the flood risk on site and surrounding area is not increased.
- 11.1.4 This report has demonstrated that the proposed development will not have any impact on the current flood risk in the area, and that drainage provisions can be provided without increasing the risk of flooding. Therefore, we see no reason why the application should be refused on the grounds of flood risk.

APPENDIX A

Topographical Survey



Drawing 2662/03SK – Proposed Site Layout

Notes

All dimensions and levels on site are to be checked prior to commencement of work.

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SCALE
0 5 10 15 20 25 30 40 50



SITE PLAN 1:500



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0100031673 Created using Plans by Emapcity

LOCATION PLAN 1:2500

Project	REPLACEMENT DWELLING LINDISFARNE HENLEY ROAD NARCGAVE BERKS
Client	MR & MRS J. HORSEMAN
Drawing	

SITE PLANS

Scale	1:500 @ A2	Date	APRIL 2025
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Job 2662 Dwg. 03SK

APPENDIX B

Soil Investigation

REPORT ON A SITE INVESTIGATION

Site

**LINDISFARNE,
HENLEY ROAD, WARGRAVE,
BERKSHIRE RG10 8PE**

Client

JAMES HORSEMAN

Report Ref

25/13185/GO

Issued

July 2025

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Approved by				
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Revision	Status	Date	Issued by	Revision Detail
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The following foreword should be read in conjunction with this report. Any variations on the general procedures outlined below are indicated in the text.

FOREWORD

The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

It should be appreciated that this report does not constitute a Geotechnical Design Report (GDR) as defined in Eurocode 7 and no aspect of this report constitutes a design. Specific sections of this report are generally in line with the guidance set out in Eurocode 7 for a Ground Investigation Report (GIR), as defined within BS EN 1997:-2 (2024). This provides guidance on the number and spacing of investigation positions, methods of investigation and sample quality class to be achieved which may not have been met by this investigation.

This Report is prepared for the specific purpose stated and in relation to the development proposals or usage indicated to Albury S.I. Limited at the time of preparation. The recommendations should not be used for adjacent schemes and may not be appropriate for alternative proposals.

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REPORT REF: 25/13185/GO
CONTRACT: HENLEY ROAD, WARGRAVE

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EXECUTIVE SUMMARY

This investigation has demonstrated that made ground overlies soils associated with the White Chalk Subgroup of Cretaceous age. It is suggested that a check of the Radon potential be ascertained from the BGS to establish whether protection measures are necessary.

Strip or spread foundations located at a minimum depth of 1.00m can be designed to apply a maximum increase in load of 150kPa. An increased thickness of made ground is present in the area beneath the north western part of the proposed structure, which will necessitate a nominal founding depth of 2.00m in order to locate foundations within competent chalk.

The results of the geochemical analysis have not recorded any elevated levels of contamination, which would pose a long-term risk to end-users of the site and remedial measures are not necessary.

1 INTRODUCTION

1.1 Scope

The client proposes to construct a replacement dwelling at Lindisfarne, Henley Road, Wargrave ("the site"). Accordingly, a site investigation has been undertaken in order to ascertain the nature and engineering properties of the soils underlying the proposed development site and to obtain data which will assist in the formulation of a safe and economical foundation solution. In addition, a geo-environmental appraisal of the site has also been carried out.

The programme of this investigation comprised the construction of eight boreholes using hand-held window sampling techniques. At five of the locations continuous dynamic probing (DPH) was completed using a lightweight rig. A trial pit was also constructed using a mechanical excavator to enable soakaway infiltration testing.

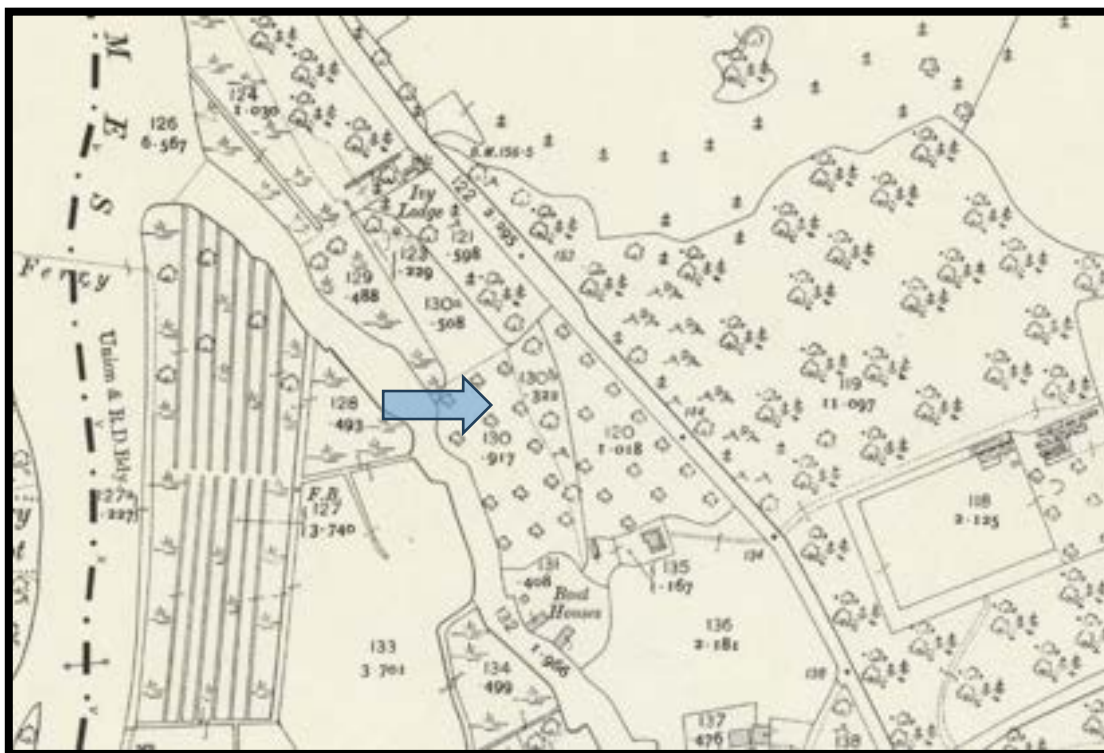
During this work samples were recovered for further examination and laboratory testing. In addition, a standpipe was installed to facilitate return groundwater level monitoring. This report describes the work undertaken, presents the information obtained and discusses the ground conditions with respect to foundation design, construction and potential contamination.

1.2 The Site

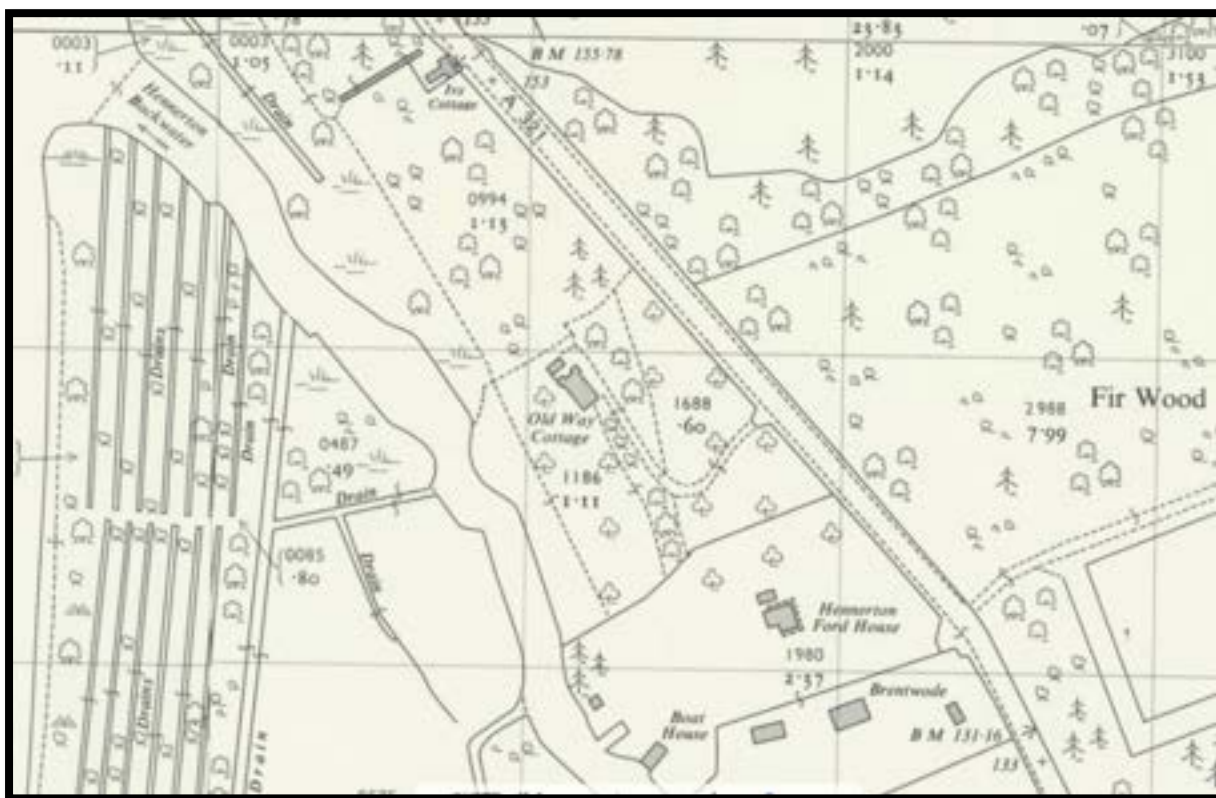
The site comprises a residential dwelling known as Lindisfarne, located at Ordnance Survey National Grid Reference 478121, 180887. Photographs which give a general impression of the site at the time of the fieldworks are included below.



A review of the readily available OS mapping reveals the existing property to be present by 1962 and was formerly known as Old Way Cottage. Historically, prior to this, the site formed part of a larger parcel of land indicated as Orchard until the construction of the existing dwelling sometime between 1938 and 1962.



Extract of OS mapping (1913)



2.2 Installations

Upon completion of borehole 4 a standpipe was installed in order to carry out long-term groundwater level monitoring. This comprised of plain pipe between ground level and 1.00m extended to a depth of 2.70m by slotted pipe with geosock filter surround.

3 GROUND CONDITIONS

3.1 Geology & Radon

A desk-based examination of the British Geological Survey (BGS) GeoIndex of superficial and bedrock mapping at 1:50,000 scale, indicates the site as being underlain by undifferentiated subdivisions of the White Chalk Subgroup of late Cretaceous age.

A search of the natural cavities database has been obtained from Envirocheck and the data forms Appendix 1. The risk from ground dissolution hazards being present is indicated as very low and the nearest natural cavities are recorded 975m south west of the site.

A review of the UK Radon maps indicate that the site is within an area where between 3 to 5% of properties are above the action level and a site-specific assessment should be undertaken to check the actual radon potential and whether protection measures are required.

3.2 Stratigraphy

Consideration of the exploratory records indicates that made ground varying from macadam, 80mm in thickness, over brown silty sand and gravel of crushed stone to grass at surface over greyish brown gravelly silty sand with roots, was generally proved to depths of between 0.18m and 0.80m. An increased thickness of made ground was encountered at borehole 4, consisting of off-white slightly gravelly silt/structureless chalk to 1.60m, with a horizon of dark brown gravelly silty sand between 1.60m and 1.90m, which is thought to represent a previous ground level.

Brown gravelly sandy to very sandy clay or clayey sand, was present beneath the made ground at boreholes 3 and 7, which extended to depths of 0.90m and 1.70m respectively. The geological origin of these cohesive soils is unclear, possibly representing localised Downwash.

Light brown very sandy silt with varying amounts of gravel of chalk and occasional flint, was noted beneath the made ground at boreholes 2 and 8. These soils, which extend to 1.50m and 2.20m, are thought to represent the heavily weathered profile of the chalk.

White chalk with occasional flints was exposed beneath the made ground, downwash and weathered chalk described above. The boreholes were concluded within the chalk at depths of 2.10m and 3.10m.

3.3 Groundwater

No groundwater strikes were encountered during the construction of the boreholes which remained dry throughout. However, a tentative short-term standing water level of 4.95m was observed within probe 4.

3.4 In Situ Testing

An infiltration soakaway test to BRE Digest 365 was attempted in trial pit SA1. Limited dissipation was observed and the test was abandoned after 270 minutes. The results are presented graphically in Appendix 2.

Dynamic probing was performed adjacent to positions 1, 4 and 5, with probing in the vicinity of boreholes 2 and 3 due to the constraints of the sloping site. Probes 2 and 2a were both terminated prematurely at 0.80m due to adverse rod deflection angle possibly due to the presence of flints. Blow counts ranging between 3 to 8 blows/100mm were recorded within probe 3 to 1.00m and probe 4 to 2.00m. Increased blow counts were recorded below these depths and at the remaining probes, reflecting the presence of competent chalk. The exception was a weaker horizon between 4.40-4.50m, where blow counts of 2 blows/100mm were recorded, possibly representing the presence of a natural fracture within the chalk. The probes were concluded at their target depths of 7.00m and 8.00m.

3.5 Monitoring

A return visit was made 24th July 2025 and the standpipe installed as part of the intrusive investigation long-term was monitored. On this occasion the instrument was observed to be dry.

4 LABORATORY TESTING

A programme of laboratory testing has been undertaken and the results are presented as Appendix 3 to this report. The geotechnical soil testing was undertaken by Albury S.I. Ltd, whilst representative samples were submitted for geochemical testing at the UKAS accredited laboratories operated by i2 Analytical Ltd. Each type of test is summarised below and the results obtained have been used to assist in the formulation of the discussion.

4.1 Index Properties

The liquid and plastic limits of samples of the clay soils have been determined. The results of this work indicate that the sample tested from borehole 3 at 1.50m is an inorganic clay of low plasticity and of low volume change potential. The remaining soils tested from borehole 8 are inorganic silts of low plasticity and are non-shrinkable.

4.2 Particle Size Distribution

A sample of the soils encountered within borehole 2 at 1.00m has been subjected to sieve and sedimentation analysis in order to determine the soils' particle size distribution. The results of this work are presented in the form of a grading curve.

4.3 Geochemical Testing

Selected samples of the made ground have been submitted to the UKAS accredited laboratories operated by i2 Analytical Ltd. The samples are screened for the presence of asbestos (ACM) and subjected to a broad suite of tests of common inorganic and organic priority contaminants including metals, PAH and petroleum hydrocarbons.

4.4 Chemical Testing – Sulphates & pH

Samples of the soils encountered at this site have been subjected to chemical analyses in order to determine their soluble and total sulphate contents with pH values. Under the conditions of this work low concentrations of soluble sulphate have been recorded in association with near neutral to slightly alkaline pH values. The results are summarised in tabular form below.

Table 1 - Summary of Chemical Tests

BH/TP No.	Sample		Concentration of Sulphates expressed as SO ₄		Total Sulphate as SO ₄ mg/kg	pH
	Depth m	Type	2:1 Water : Soil Extract mg/l	Groundwater mg/l		
2	0.10	MADE GROUND	8		1200	8.1
4	0.10	MADE GROUND	17		680	8.6
4	1.50	MADE GROUND	4		500	8.7
6	0.10	MADE GROUND	10		400	9.1
7	0.50	Gravelly sandy CLAY	10		600	8.5
8	1.50	Sandy SILT and GRAVEL	5		400	9

5 GEOTECHNICAL DISCUSSION

5.1 Foundations

The client proposes to construct a replacement two storey dwelling incorporating a swimming pool. The proposed layout is shown in Figure 2. At the time of the preparation of this report the anticipated structural loads were not known.

It cannot be recommended that major structural foundations be located within the made ground revealed by this investigation. Soils of this origin are frequently present in a weak and variable condition such that unacceptable settlement could occur even under the action of light loading intensities. Therefore, it will be necessary to continue foundation excavations through these undesirable materials where they are of less than 1.00m in thickness to this minimum depth in order to avoid that zone of soil which is subject to normal seasonal moisture variation or frost action.

The replacement dwelling will be situated on a sloping site, which falls away to the south west towards Hennerton Backwater. This investigation has shown that made ground extends to 1.90m beneath the north western part of the site in the area of borehole 4, likely to be associated with the formation of the existing level garden area. Soils of unclear origin have also been proven to 1.70m in the area of borehole 3, therefore, a nominal founding depth of 1.90m is recommended beneath the western part of the structure to ensure all foundations are located within the competent white chalk.

Interpretation of the probing data derived from this investigation indicates that strip or spread foundations constructed within the white chalk, at a minimum depth of 1.00m, can be designed to accept a maximum increase in load of 150kPa. At this loading intensity a factor of safety of 3 against general shear failure will be operative. Moreover, settlements should remain within tolerable limits for the type of structure proposed. These movements are likely to be sensibly complete during a normal construction period due to the free draining nature of the underlying soils.

5.2 Retaining Wall Parameters

The walls to the swimming pool structure should be designed to resist any earth pressures generated by the surrounding ground and surcharge loads, for example adjacent foundations. The earth pressures can be calculated using the following soil parameters which are quoted in terms of effective stress and, therefore, reflect the long term conditions.

Table 2 - Retaining Wall Design

Soil Parameter	Effective Cohesion c' kPa	Effective Angle of Friction ϕ'	Soil Density kg/cum
Made Ground	0	15	1750
Cohesive Downwash	0	20	1850
White Chalk	0	35	2000

5.3 Stability of Excavations

Excavations of less than 1.00m depth should not require temporary support to their sides. Where excavations are to be extended below this depth, then adequate temporary support or shoring should be provided in order to comply with current statutory safety regulations and to maintain the stability of the excavation sides.

5.4 Groundwater

The groundwater observations made at the time of the fieldworks suggest that significant engineering problems with respect to shallow depth excavations are unlikely. Should slight seepages be encountered or surface water run-off drain into excavations then these minor amounts should be removed by forming sumps from which the water can be pumped.

5.5 Drainage

The near surface drainage characteristics of the underlying chalk has been considered as part of this investigation. The attempted soakaway test did not dissipate, however further testing could be considered on the upper levels of the site. Where feasible no traditional soakaways should be located within 10.00m of the proposed building.

5.6 Pavement Design

Chalk is a frost susceptible material. Therefore, a minimum thickness of 450mm cover of non-frost susceptible material should be incorporated beneath access drives or paved areas where chalk is present near surface.

5.7 Ground Floor Slabs

The thickness of made ground revealed by this investigation, commonly in excess of 0.60m, infers that a system of fully suspended floor slabs should be incorporated within the proposed structure in accordance with NHBC criteria.

5.8 Buried Concrete

The information obtained from this investigation has been compared with the criteria proposed in BRE Special Digest 1, 2005 Edition, Concrete in Aggressive Ground. Using the information in Table C1 (natural ground) of this publication the Aggressive Chemical Environment for Concrete Classification (ACEC) is AC-1s, which coincides with a Design Sulphate Class DS-1. The ACEC Class above can be used to determine the Design Chemical Class for concrete for general cast-in-situ use as required in Part D of the Digest.

6 GROUND CONTAMINATION

6.1 Human Health

A generic assessment of the chronic or long-term risk to human health from soil contamination has been made using the available generic screening criteria. The screening values include the Category 4 Screening Levels [C4SLs] (DEFRA, 2014) and Suitable for Use Levels [S4ULs] (LQM/CIEH, 2014) derived using the CLEA software. It should be appreciated that these do not consider the short-term or acute risks, such as to construction workers or SI personnel.

The results have been compared against the GAC for the proposed land-use category Residential (with home grown produce) and appropriate SOM. A study of the data does not reveal any exceedances of the GAC for this land-use and remedial measures are not anticipated as part of the redevelopment.

An above ground heating oil tank was observed on the site, however this was of modern, plastic type. Nevertheless, it would be prudent to carefully inspect any excavations underlying this area as the development proceeds, photographic evidence retained. If obvious evidence of contamination is apparent then samples should be obtained for testing and impacted soils segregated for separate disposal.

6.2 Vegetation

The metals boron, copper, nickel and zinc are phytotoxic at certain levels, with their availability being dependent upon soil pH. These levels may not pose a significant long-term health risk to humans, but could be detrimental to plant growth or function. The results obtained suggest that the levels of these metals are not detrimental to plant growth or function.

6.3 Preliminary Waste Assessment

Given that no exceedances of human health soil guidance values were recorded, it is likely that material can be retained and re-used on site. Where excavated soils cannot be re-used or retained on site, then these surplus materials will require off-site disposal. It may be possible to divert the unwanted material to a soil treatment hub where it can be recycled. Where material cannot be re-used or recycled then disposal at a licensed landfill site can be considered. It will then be necessary to classify the spoil as inert, non-hazardous or hazardous. A discussion of the current regime for the classification and treatment of waste soils is included in Appendix 4.

An initial assessment of the geochemical results obtained from this investigation has been carried out to provide a preliminary classification of the surplus materials. The HazWaste Online tool determines whether waste soil should be classified as being non-hazardous or hazardous. The output from the HazWaste assessment is located in Appendix 4. Asbestos was not detected in any of the samples screened. Based on the output waste soil arisings from this site have been tentatively identified as being non-hazardous waste. The underlying natural soils are considered to be inert for disposal purposes.

This assessment is preliminary and based upon the information obtained from the investigation. Where made ground is excavated then these materials should be stockpiled and segregated. Further sampling, testing and characterisation to accurately classify waste soil arisings may be required. It should be appreciated that it is the responsibility of the waste producer to sufficiently characterise their waste. Moreover, the agreement of the waste acceptor should be sought.

REFERENCES

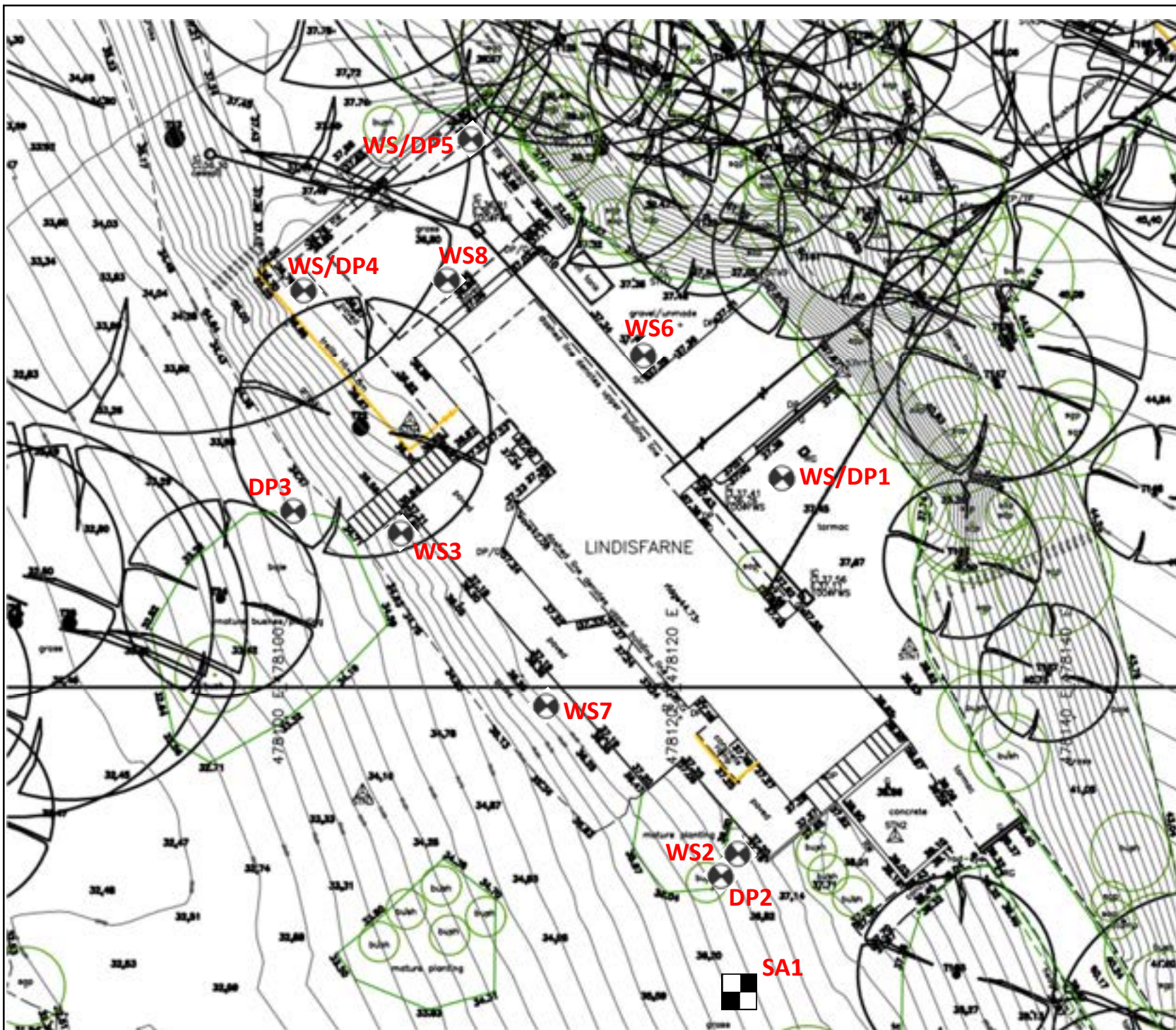
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LIST OF ABBREVIATIONS

AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
AST	-	Above-ground Storage Tank
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres Above Ordnance Datum
mBGL	-	Metres Below Ground Level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic Aromatic Hydrocarbons
PCB	-	Polychlorinated Biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SPZ	-	Source Protection Zone
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UST	-	Underground Storage Tank
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound

FIGURE 1

SITE LAYOUT PLAN



Legend:

-  Borehole Location
-  Trial Pit Location

Title: Site Plan

Dwg No: 25/13185/1

Drawn by: GO

Client: James Horseman

Contract: Henley Road,
Wargrave

Job Ref: 25/13185/GO

Scale: NTS

Revision: 0

Issue Date: 31/07/2025



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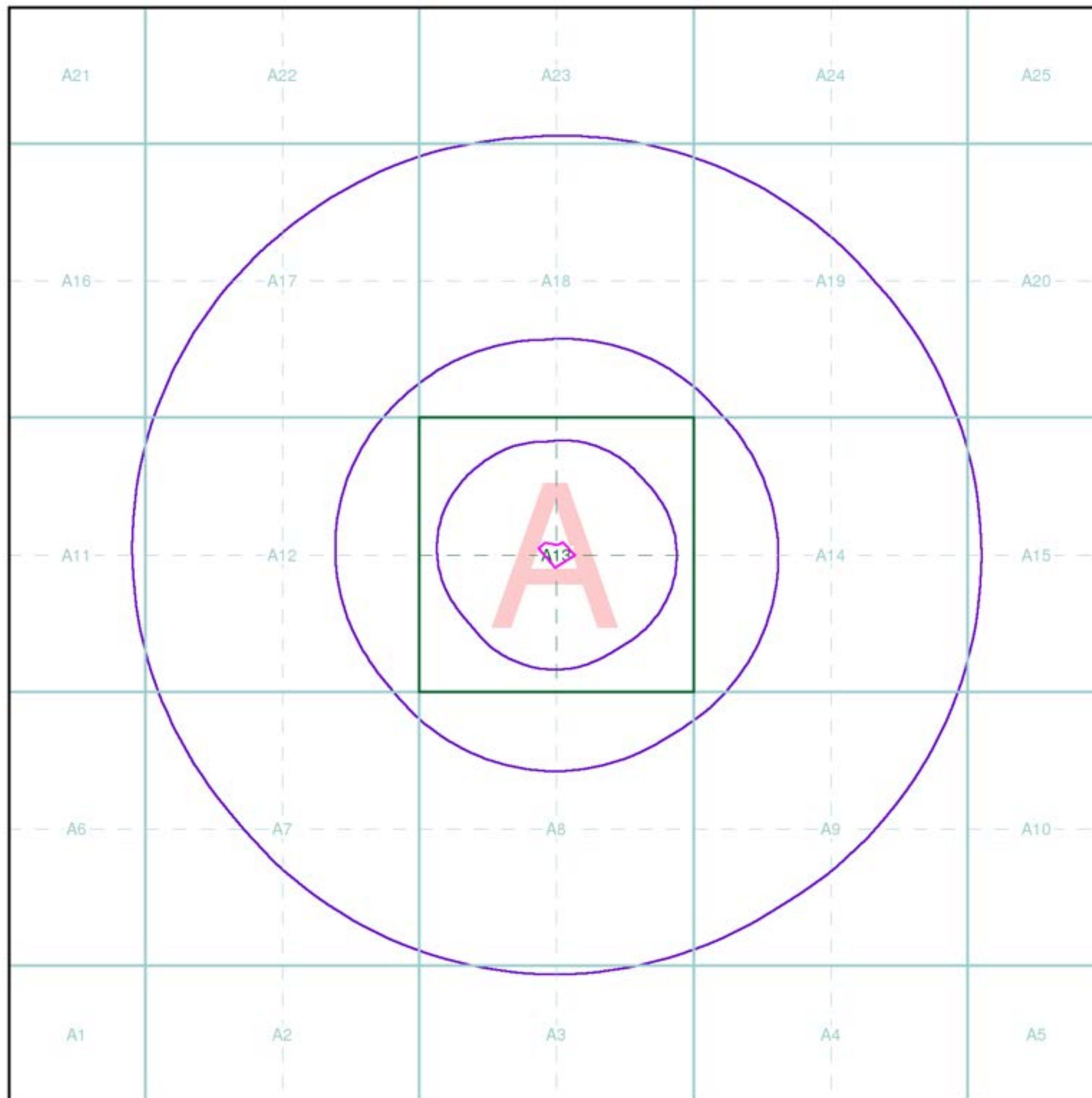
FIGURE 2

PROPOSED LAYOUT

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APPENDIX 1

ENVIROCHECK DATA



Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr G Owens, Albury Si Ltd, Miltons Yard, Petworth Road, Witley, Godalming, Surrey, GU8 5LH

Order Details

Order Number: 380860895_1_1
Customer Ref: 25/13185/GO
National Grid Reference: 478130, 180890
Site Area (Ha): 0.33
Search Buffer (m): 1000

Site Details

Lindisfarne, Henley Road, Wargrave, READING, RG10 8PE

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<http://www.landmarkinfo.co.uk/Terms/Show/515>



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Envirocheck[®] Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:

380860895_1_1

Customer Reference:

25/13185/GO

National Grid Reference:

478130, 180890

Slice:

A

Site Area (Ha):

0.33

Search Buffer (m):

1000

Site Details:

Lindisfarne, Henley Road

Wargrave

READING

RG10 8PE

Client Details:

Mr G Owens

Albury Si Ltd

Miltons Yard

Petworth Road

Witley

Godalming

Surrey

GU8 5LH

Report Section and Details	Page Number
Summary	-
The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected. For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).	
Mining and Natural Cavities Data	1
The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities. Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.	
Historical Land Use Information (1:2,500)	-
The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.	
Historical Land Use Information (1:10,000)	2
The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses. For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.	
Ground Stability Data (1:50,000)	3
The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.	
Historical Map List	4
The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.	
Data Currency	5
Data Suppliers	6
Useful Contacts	7

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The brine subsidence data relating to the Droitwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1			1	2
Coal Mining Affected Areas			n/a	n/a	n/a
Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities	pg 1				1
Non Coal Mining Areas of Great Britain	pg 1	Yes		n/a	n/a
Potential Mining Areas					
Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)				n/a	n/a
Subterranean Features (100m)				n/a	n/a
Historical Land Use Information (1:10,000)					
Air Shafts					
Disturbed Ground					
General Quarrying	pg 2			2	1
Heap, unknown constituents					
Mineral Railway					
Mining & quarrying general					
Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits	pg 2			1	1
Former Marshes					
Potentially Infilled Land (Non-Water)	pg 2			1	
Potentially Infilled Land (Water)	pg 2		1	2	7
Ground Stability Data (1:50,000)					
CBSCB Compensation District			n/a	n/a	n/a
Brine Pumping Related Features					
Brine Subsidence Solution Area					
Potential for Collapsible Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 3	Yes		n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Salt Mining Related Features					

Report Version v53.0

Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	BGS Recorded Mineral Sites Site Name: Temple Combe Location: Cockpole Green, Henley-On-Thames, Oxfordshire Source: British Geological Survey, National Geoscience Information Service Reference: 35986 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Cretaceous Geology: White Chalk Subgroup Commodity: Chalk Positional Accuracy: Located by supplier to within 10m	A18SW (N)	386	1	478122 181302
2	BGS Recorded Mineral Sites Site Name: Hennerton Chalk Quarry Location: Hennerton House, Wargrave, Maidenhead, Berkshire Source: British Geological Survey, National Geoscience Information Service Reference: 79050 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Cretaceous Geology: White Chalk Subgroup Commodity: Chalk Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	746	1	478558 180245
3	BGS Recorded Mineral Sites Site Name: Hennerton Farm Location: Hennerton Farm, Wargrave, Maidenhead, Berkshire Source: British Geological Survey, National Geoscience Information Service Reference: 79051 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Cretaceous Geology: White Chalk Subgroup Commodity: Chalk Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	858	1	478729 180230
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Natural Cavities Cavity Type: Solution Pipe x 8 Solid Geology Detail: Chalk Group Superficial Geology Detail: Taplow Gravel	A7NW (SW)	975	2	477300 180320
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	General Quarrying Use: Not Supplied Date of Mapping: 1900	A18SW (N)	376	2	478120 181292
5	General Quarrying Use: Not Supplied Date of Mapping: 1938	A18SW (NW)	431	2	477839 181258
6	General Quarrying Use: Not Supplied Date of Mapping: 1882 - 1900	A9NW (SE)	864	2	478735 180228
7	Quarrying of sand & clay, operation of sand & gravel pits Use: Not Supplied Date of Mapping: 1938	A13NW (NW)	266	2	477951 181135
8	Quarrying of sand & clay, operation of sand & gravel pits Use: Not Supplied Date of Mapping: 1882 - 1960	A9NW (SE)	713	2	478538 180271
9	Potentially Infilled Land (Non-Water) Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A18SW (N)	376	2	478120 181292
10	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A13SE (S)	196	2	478208 180676
11	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1927	A12SE (W)	337	2	477759 180807
12	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1900	A18SW (N)	406	2	478120 181322
13	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A18SW (N)	605	2	478012 181512
14	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A17SE (NW)	684	2	477652 181432
15	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A18NE (N)	734	2	478301 181633
16	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A7NE (SW)	781	2	477637 180243
17	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A7SE (SW)	864	2	477638 180138
18	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A12SW (W)	888	2	477241 180619
19	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1960	A19NW (NE)	974	2	478760 181669

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
20	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	17	1	478081 180864
21	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	17	1	478081 180864
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889
22	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889
23	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	17	1	478081 180864
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889
24	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	17	1	478081 180864
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889
25	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	17	1	478081 180864
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	1	478127 180889

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Berkshire	023_14	1875
Oxfordshire	054_14	1875
Berkshire	030_02	1879
Oxfordshire	054_14	1898
Oxfordshire	057_02	1898
Berkshire	030_02	1899
Berkshire	023_14	1913
Berkshire	030_02	1913
Berkshire	030_02	1932
Ordnance Survey Plan	SU7780	1962
Ordnance Survey Plan	SU7781	1962
Ordnance Survey Plan	SU7880	1962
Ordnance Survey Plan	SU7881	1962

The following mapping has been analysed for Historical Land Use Information (1:10,000):

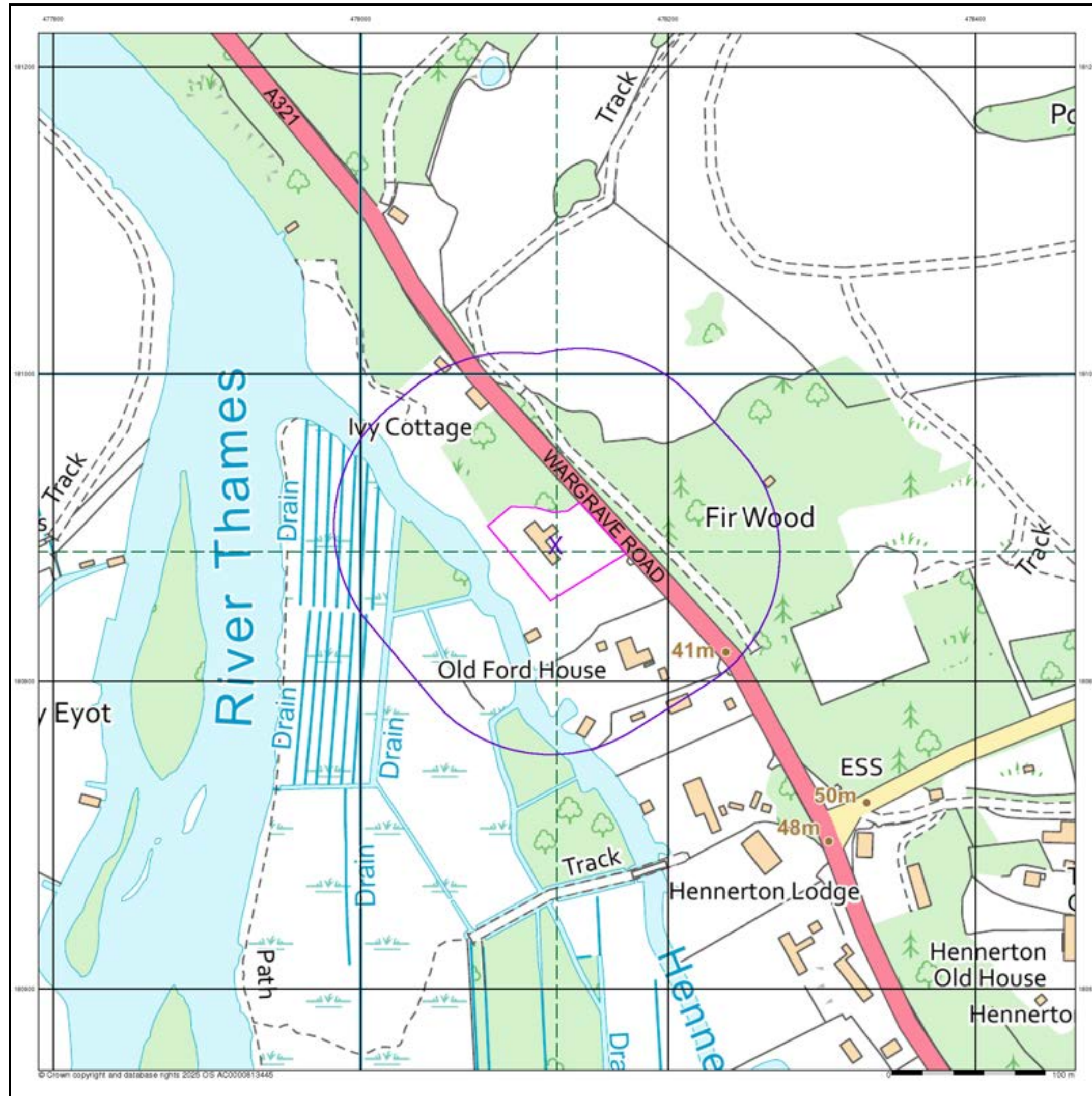
1:10,560	Mapsheet	Published Date
Berkshire	030_00	1882
Berkshire	023_00	1883
Buckinghamshire	051_00	1883
Berkshire	023_SW	1900
Berkshire	030_NW	1900
Buckinghamshire	051_SW	1900
Oxfordshire	057_NW	1900
Berkshire	023_SW	1914
Berkshire	030_NW	1914
Buckinghamshire	051_SW	1914
Oxfordshire	057_NW	1914
Berkshire	023_SW	1927
Oxfordshire	054_SW	1927
Berkshire	030_NW	1932
Buckinghamshire	051_SW	1938
Oxfordshire	054_SW	1938
Ordnance Survey Plan	SU77NE	1960
Ordnance Survey Plan	SU78SE	1960
1:10,000	Mapsheet	Published Date
Ordnance Survey Plan	SU78SE	1990
Ordnance Survey Plan	SU77NE	1994

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2025	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	February 2023	
Man Made Mining Cavities Stantec UK Ltd	December 2023	Bi-Annually
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Natural Cavities Stantec UK Ltd	December 2023	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	Version	Update Cycle
Subterranean Features Landmark Information Group Limited	July 2023	Bi-Annually
Ground Stability Data (1:50,000)	Version	Update Cycle
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Brine Subsidence Solution Area Johnson Poole & Bloomer	December 2020	

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
British Geological Survey	
The Coal Authority	
Ove Arup	
Stantec UK Ltd	
Wardell Armstrong	
Johnson Poole & Bloomer	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Landmark Information Group Limited Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6619 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
-	Landmark Information Group Limited Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6618 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk



Historical Land Use Information (1:2,500)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

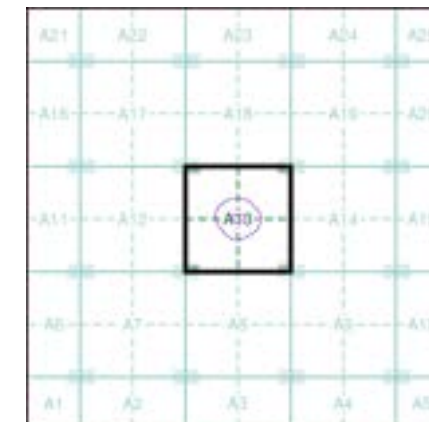
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	■
Extractive Industries Activity from 1893 - 1915	▲	—	■
Extractive Industries Activity from 1906 - 1937	▲	—	■
Extractive Industries Activity from 1924 - 1949	▲	—	■
Extractive Industries Activity from 1950 - 1980	▲	—	■

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	---	■

Mining and Ground Stability - Segment A13



Order Details

Order Number: 380860895_1_1
Customer Ref: 25/13185/GO
National Grid Reference: 478130, 180890
Slice: A
Site Area (Ha): 0.33
Plot Buffer (m): 100

Site Details

Lindisfarne, Henley Road, Wargrave, READING, RG10 8PE



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Historical Land Use Information (1:10,000)

General

- Specified Site Specified Buffer(s) Bearing Reference Point Map ID
Several of Type at Location

Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

	Point	Line	Polygon
Air Shafts			
Disturbed Ground			
General Quarrying			
Heap, unknown constituents			
Mineral Railway			
Mining and Quarrying General			
Mining of Coal & Lignite			
Quarrying of Sand and Clay, Operation of Sand and Gravel Pits			

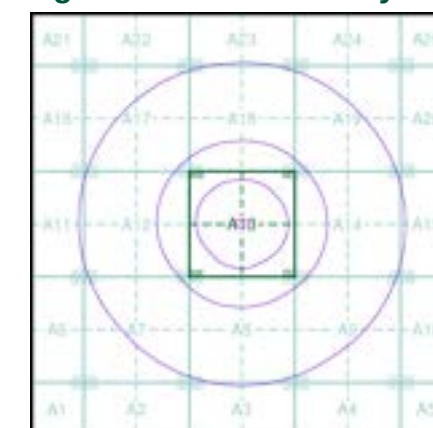
Historical Land Use

	Point	Line	Polygon
Potentially Infilled Land (Non-Water)			
Potentially Infilled Land (Water)			
Former Marsh			

Mining Data

- Potential Mining Area
BGS Recorded Mineral Site

Mining and Ground Stability - Slice A



Order Details

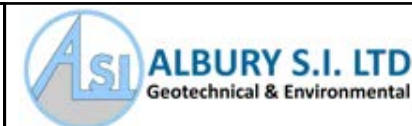
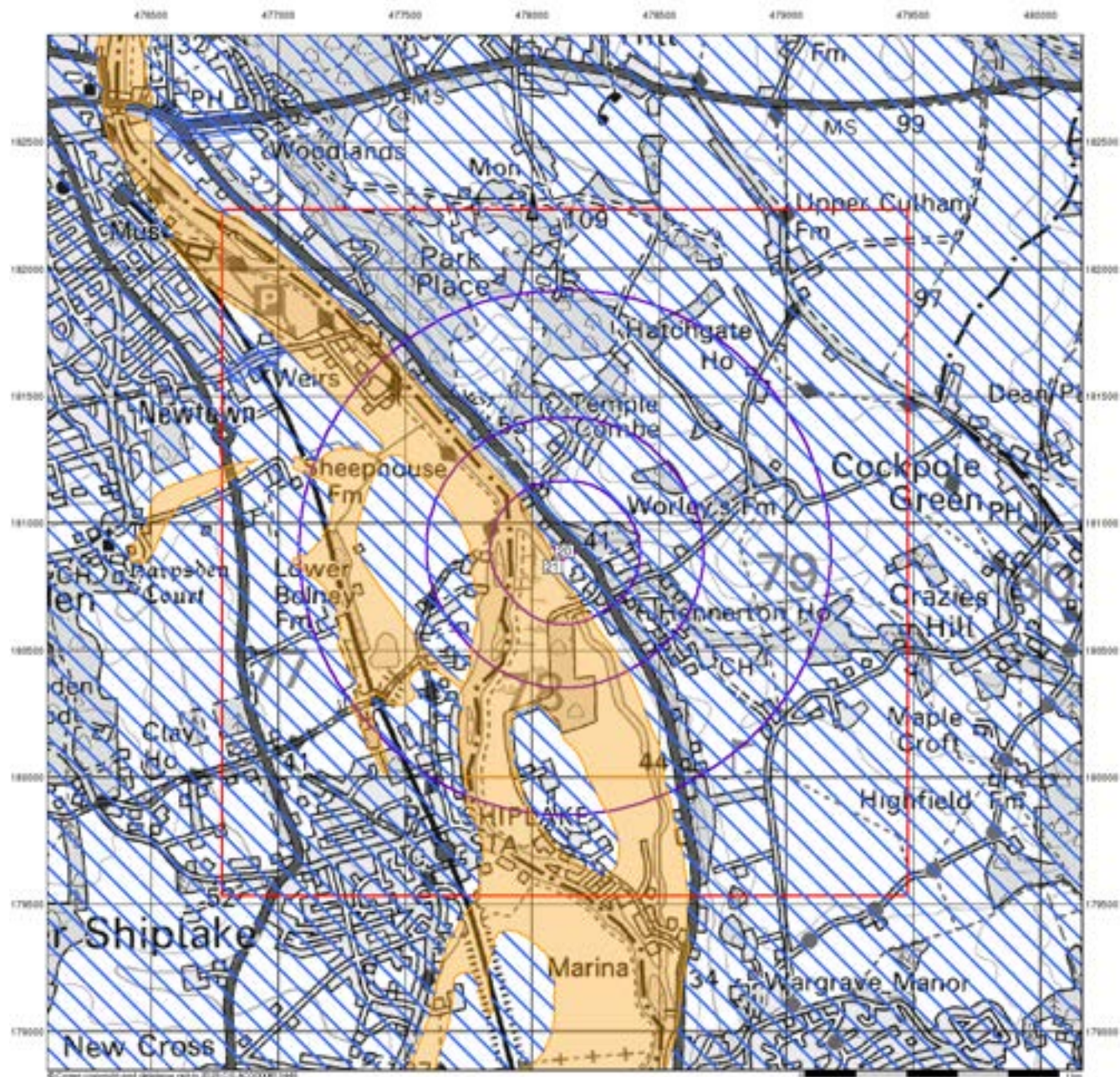
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Customer Ref: 25/13185/GO
National Grid Reference: 478130, 180890
Slice: A
Site Area (Ha): 0.33
Search Buffer (m): 1000

Site Details

Lindisfarne, Henley Road, Wargrave, READING, RG10 8PE



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Ground Stability Data (1:50,000)

General

- Specified Site
- Specified Buffer (m)
- Site
- Map ID
- Bearing Reference Point

Potential for Compressible Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Potential for Collapsible Ground Stability Hazards

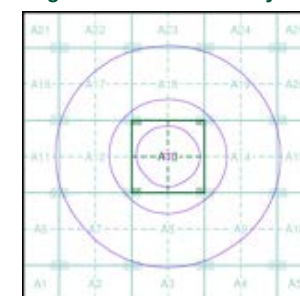
- High
- Moderate
- Low
- Very Low

Brine Pumping and Salt Mining

- Brine Pumping Related Feature
- Salt Mining Related Feature

- Point**
- Polygon**
- Point
- Polygon
- Point
- Polygon

Mining and Ground Stability - Slice A



Order Details

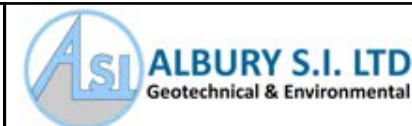
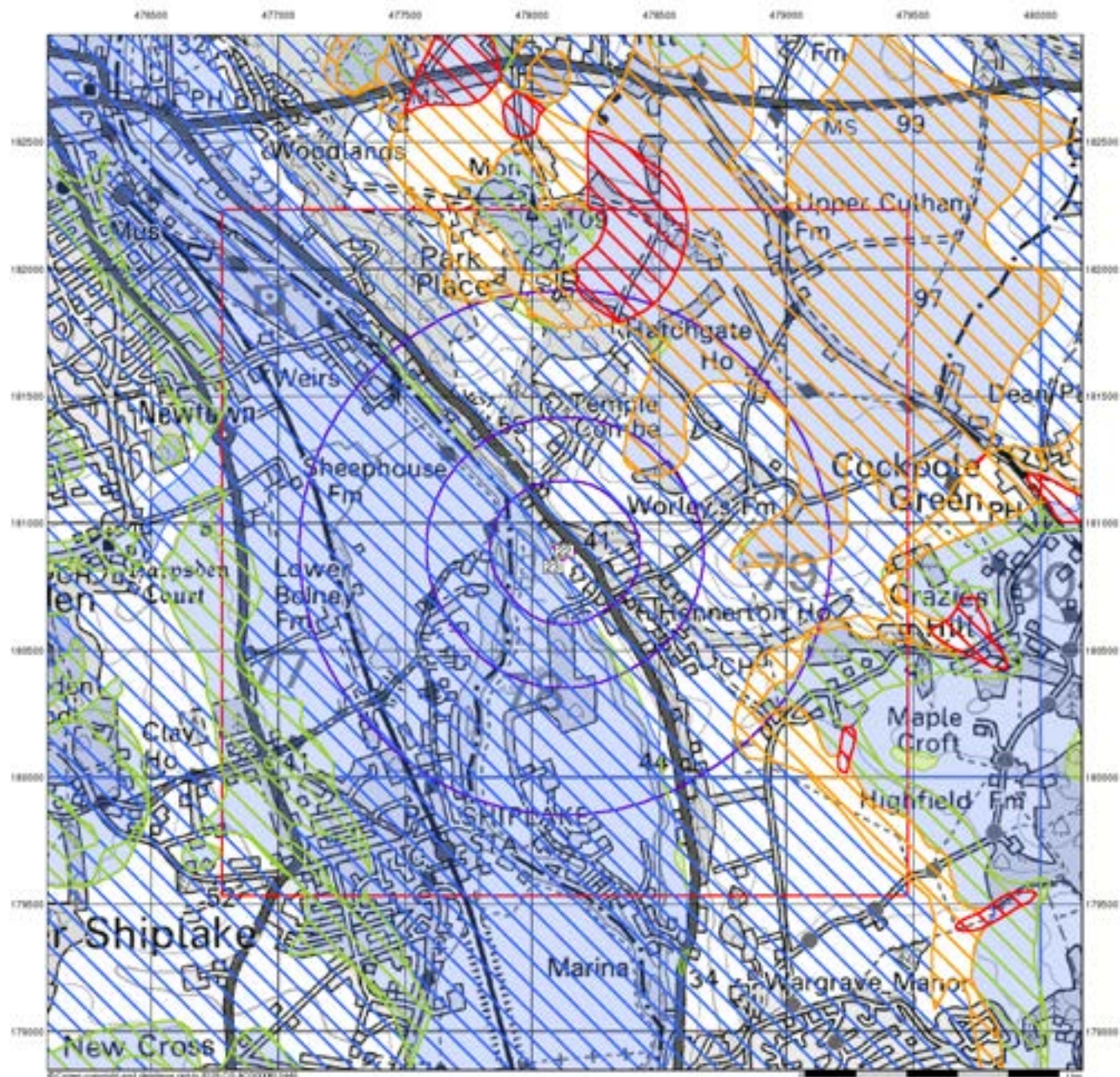
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 Customer Ref: 25/13185/GO
 National Grid Reference: 478130, 180890
 Slice: A
 Site Area (Ha): 0.33
 Search Buffer (m): 1000

Site Details

Lindisfame, Henley Road, Wargrave, READING, RG10 8PE



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Ground Stability Data (1:50,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Site
- Map ID

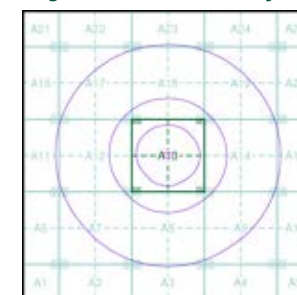
Potential for Landslide Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Potential for Ground Dissolution Stability Hazards

- High
- Moderate
- Low
- Very Low

Mining and Ground Stability - Slice A



Order Details

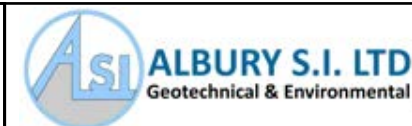
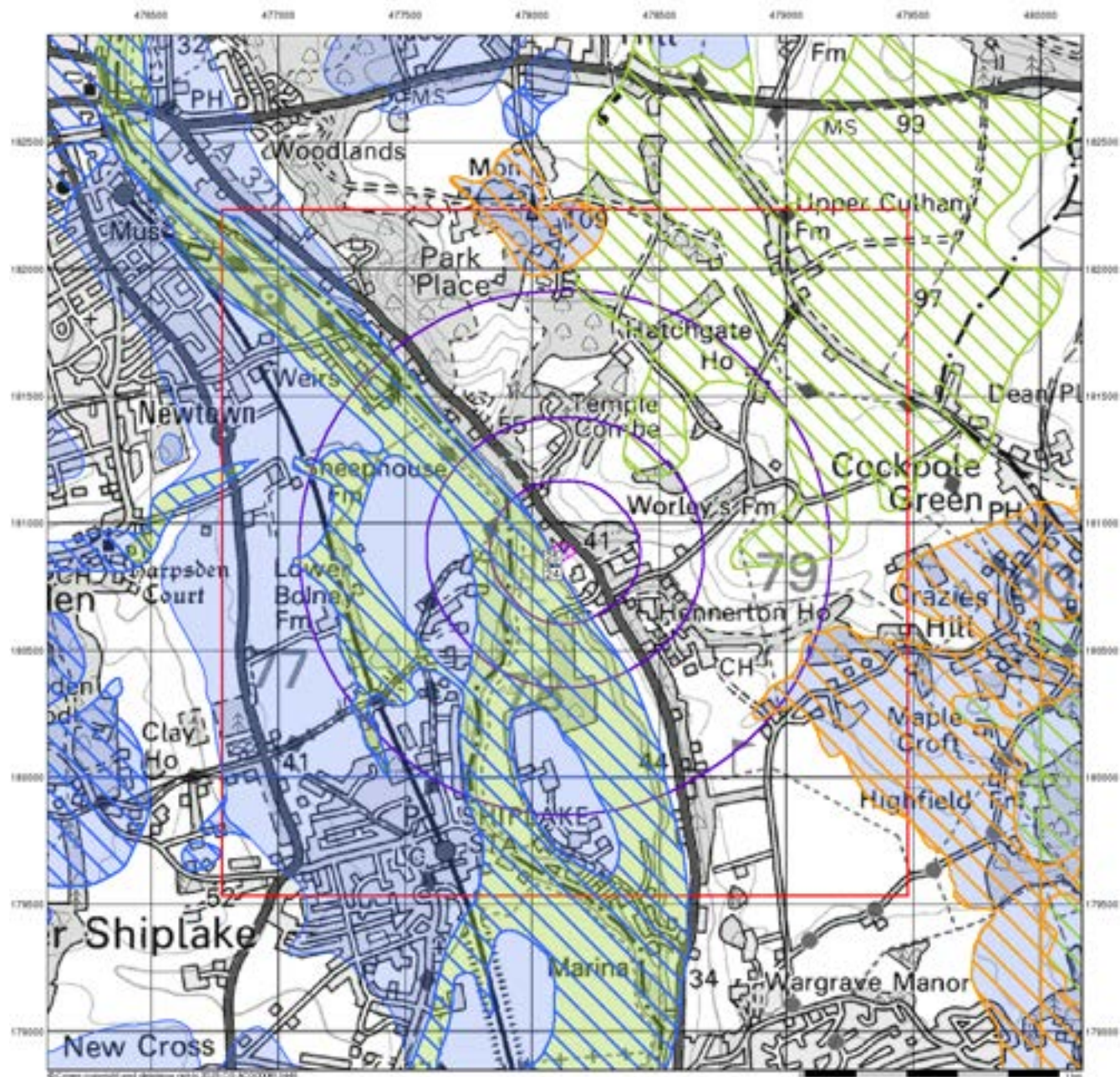
Order Number: 380860895_1_1
 Customer Ref: 25/13185/GO
 National Grid Reference: 478130, 180890
 Slice: A
 Site Area (Ha): 0.33
 Search Buffer (m): 1000

Site Details

Lindisfame, Henley Road, Wargrave, READING, RG10 8PE



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Ground Stability Data (1:50,000)

General

- Specified Site
- Site
- Specified Buffer(s)
- Map ID
- Bearing Reference Point

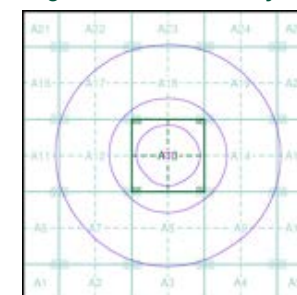
Potential for Running Sand Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number: 380860895_1_1
 Customer Ref: 25/13185/GO
 National Grid Reference: 478130, 180890
 Slice: A
 Site Area (Ha): 0.33
 Search Buffer (m): 1000

Site Details

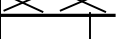
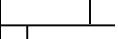
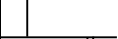
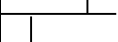
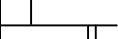
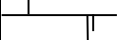
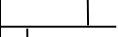
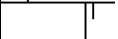
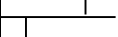
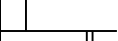
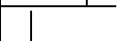
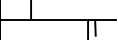
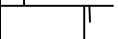
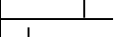
Lindisfame, Henley Road, Wargrave, READING, RG10 8PE

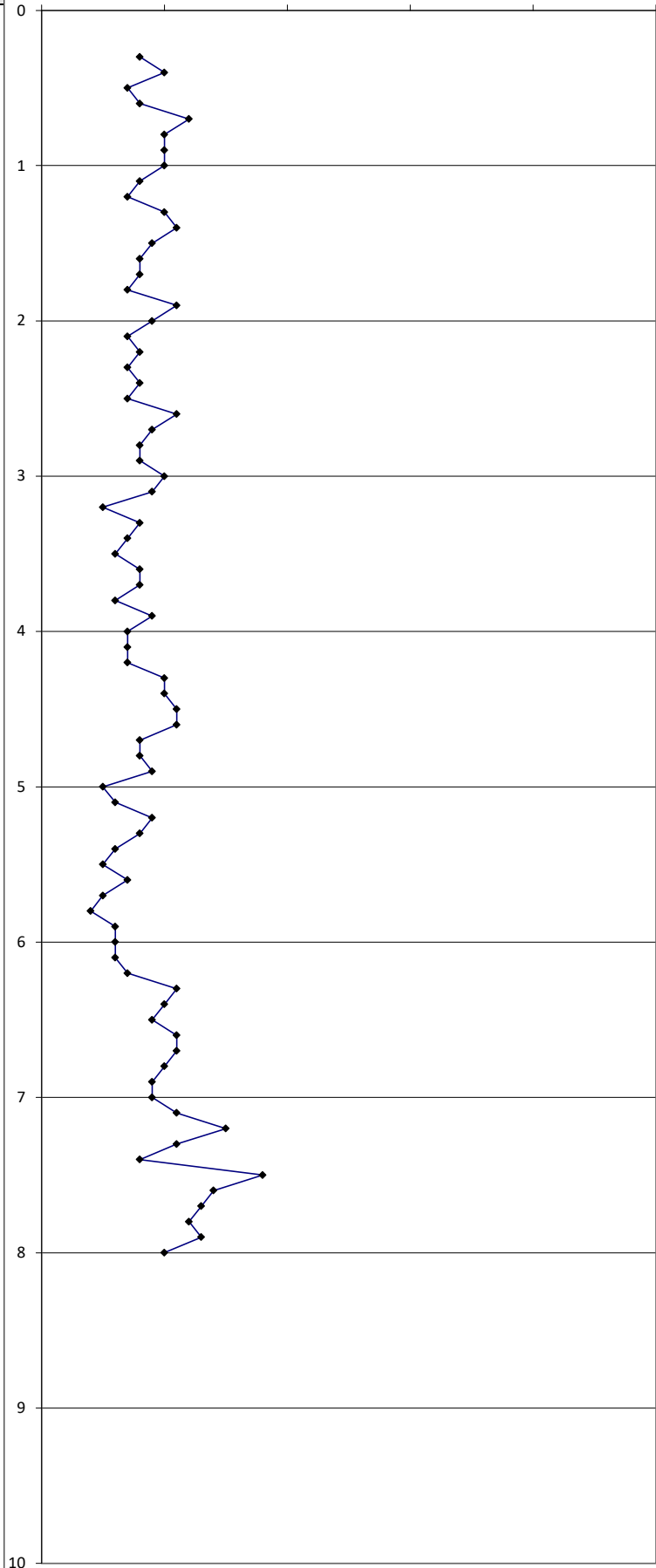


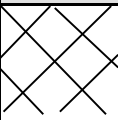
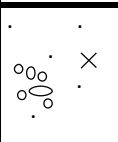
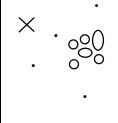
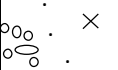
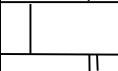
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

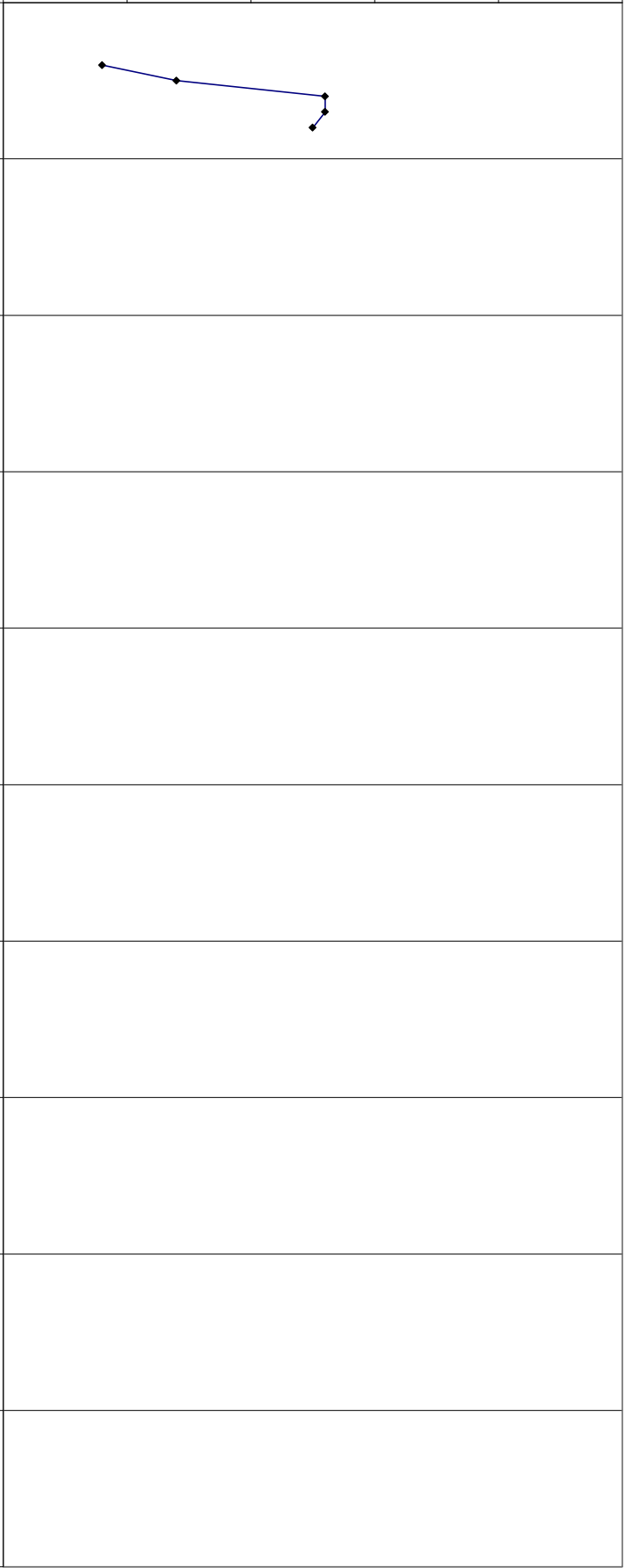
APPENDIX 2

EXPLORATORY RECORDS

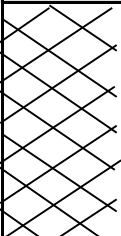
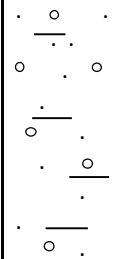
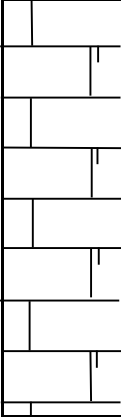
 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		1			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-3.10	
2				Moderate		Very hard			
Remarks DPH dynamic probe carried out adjacent to position									
Samples or tests			Shear Strength kPa	Depth		Legend	Strata Description		
Type	Depth, m								
D	0.10			0.08			MADE GROUND (macadam) MADE GROUND (brown silty SAND and GRAVEL of crushed stone)		
D	0.30			0.18					
D	0.50						White CHALK with occasional flints and orange-brown staining, becoming cream between 1.50-2.00m		
									
D	1.00								
									
D	1.50								
									
									
D	2.00								
									
D	2.50								
									
									
D	3.00			3.10			END OF BOREHOLE		
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		Report Ref	25/13185/GO	DYNAMIC PROBE	1	
Sheet 1 of 1		Client	James Horseman		Date	10/07/2025
DPH Dynamic Probe		Contract	Henley Road, Wargrave		Ground Level	
Sacrificial Tip						Torque, Nm
Depth, m	Blows / 100 mm	01020304050 				
GL						
1	8					0
2	7					5
3	8					10
4	12					20
5	10					20
6	8					10
7	7					30
8	10					30
9						
10						
Remarks						
Probing commenced from base of hand excavated starter pit						

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		2			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		1.80-3.10	
2				Moderate		Very hard		GL-1.80	
Remarks DPH dynamic probe carried out in vicinity of position									
Samples or tests			Shear Strength kPa	Depth		Legend	Strata Description		
Type	Depth, m								
D	0.10			0.40			Grass over MADE GROUND (greyish brown slightly gravelly silty SAND with roots. Gravel of flint and chalk fragments)		
D	0.30								
D	0.50								
D	1.00					Medium dense becoming very dense light brown gravelly very sandy SILT. Gravel of flint and chalk fragments			
D	1.50			1.50					
D	2.00								
D	2.50					White CHALK with occasional flints			
D	3.00			3.10					
									
						END OF BOREHOLE			

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		Report Ref	25/13185/GO	DYNAMIC PROBE	2	
Sheet 1 of 1		Client	James Horseman		Date	10/07/2025
DPH Dynamic Probe		Contract	Henley Road, Wargrave		Ground Level	
Sacrificial Tip						Torque, Nm
Depth, m	Blows / 100 mm	01020304050 				
GL		0				
1	14 26 26 25	1				0
2		2				
3		3				
4		4				
5		5				
6		6				
7		7				
8		8				
9		9				
10		10				
Remarks						
Probing commenced from base of hand excavated starter pit						
Probing terminated due to adverse rod angle deflection						

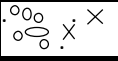
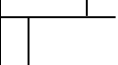
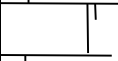
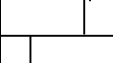
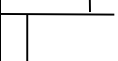
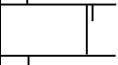
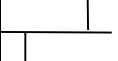
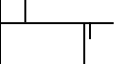
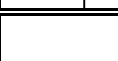
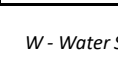
Remarks
Probing commenced from base of hand excavated starter pit
Probing terminated due to adverse rod angle deflection

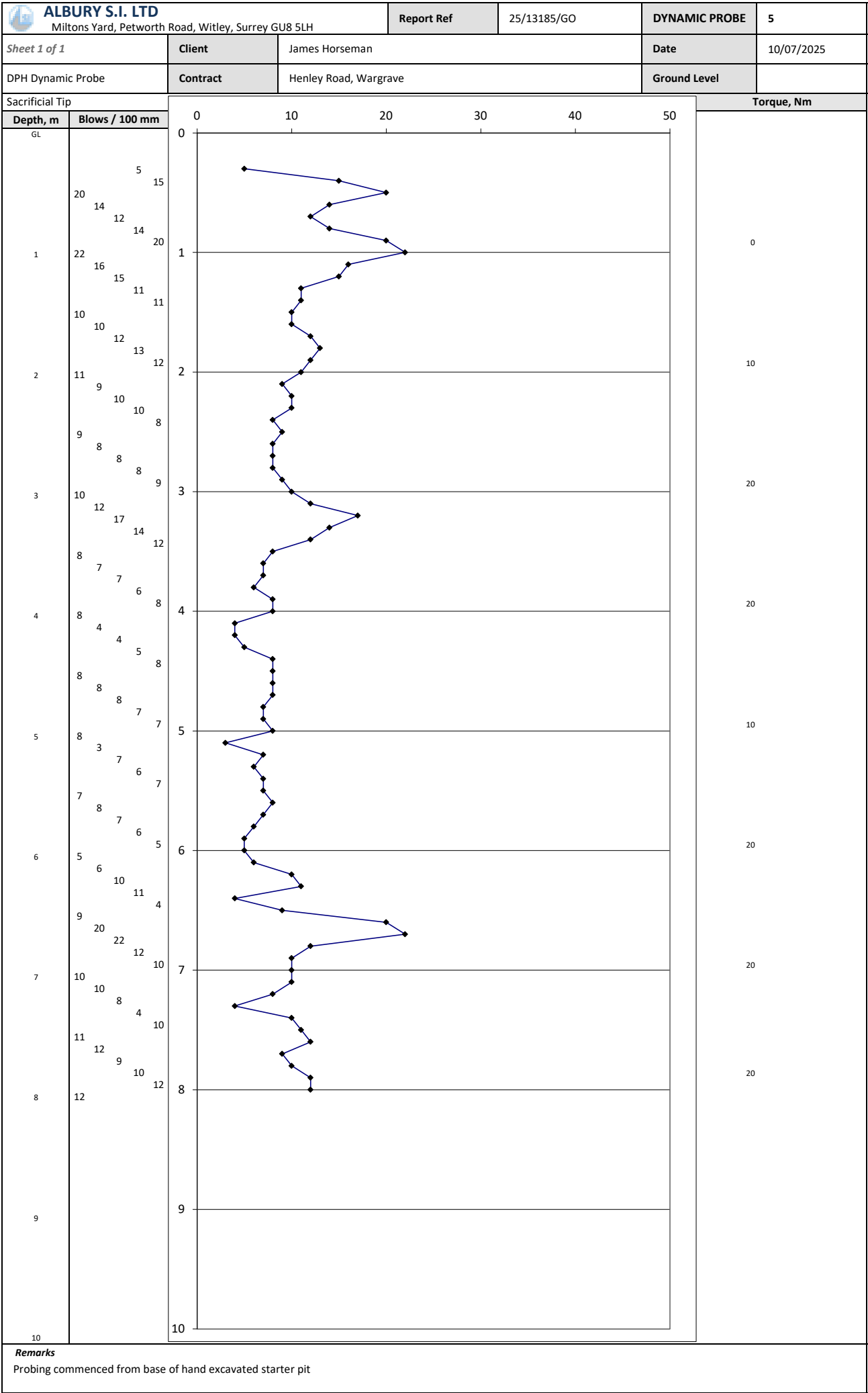
 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE	3	
Contract		Henley Road, Wargrave		Report Ref	25/13185/GO	
Client		James Horseman		Date	10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE		Ground Level		
Type of excavator		Window Sampler	Water level after completion, m		dry	
Water strikes, m		Dimensions, m		Ease of excavation, m		
1 none		Diameter	0.06	Very easy	Difficult GL-3.10	
2				Moderate	Very hard	
Remarks DPH dynamic probe carried out in vicinity of position						
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description
Type	Depth, m					
D	0.10		0.80		Grass over MADE GROUND (light greyish brown gravelly silty SAND with roots. Gravel of white chalk and scattered flint)	
D	0.30					
D	0.50					
D	1.00		1.70		Loose becoming medium dense to dense brown friable slightly gravelly clayey SAND/very sandy CLAY with occasional roots. Gravel of flint and chalk fragments	
D	1.50					
D	2.00		3.10		White CHALK with occasional flints	
D	2.50					
D	3.00					
END OF BOREHOLE						

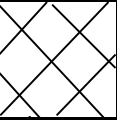
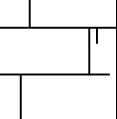
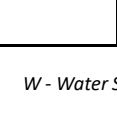
Remarks
Probing commenced from base of hand excavated starter pit

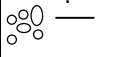
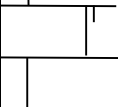
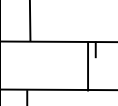
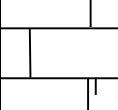
 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		4			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-3.10	
2				Moderate		Very hard			
Remarks Water level in adjacent probe hole 4.95m. Standpipe installed to 2.70m upon completion DPH dynamic probe performed adjacent to position									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10		0.15			MADE GROUND (grass over brown slightly gravelly silty SAND. Gravel of flint and chalk fragments) MADE GROUND (light grey slightly gravelly very silty SAND with occasional roots. Gravel of chalk fragments)			
D	0.30								
D	0.50								
			0.70			MADE GROUND (off-white slightly gravelly SILT/structureless CHALK. Gravel of occasional flints and some weak fragments of chalk)			
									
									
D	1.00		1.60			MADE GROUND (dark brown gravelly silty SAND with occasional roots. Gravel of chalk fragments)			
									
									
D	1.50		1.90			Off-white CHALK with occasional flints			
D	1.70								
									
D	2.00		3.10			END OF BOREHOLE			
									
									
									
									
									
D	2.50		3.10			END OF BOREHOLE			
									
									
									
									
									
			3.10			END OF BOREHOLE			
									
									
									

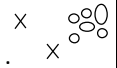
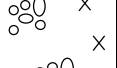
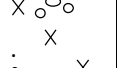
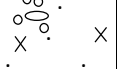
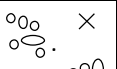
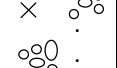
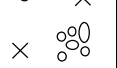
 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		Report Ref	25/13185/GO	DYNAMIC PROBE	4	
Sheet 1 of 1		Client	James Horseman		Date	10/07/2025
DPH Dynamic Probe		Contract	Henley Road, Wargrave		Ground Level	
Sacrificial Tip		0 10 20 30 40 50 0 1 2 3 4 5 6 7 8 9 10 0 1 2 3 4				

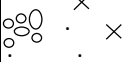
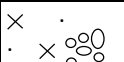
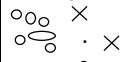
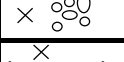
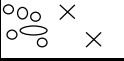
 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		5			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-3.10	
2				Moderate		Very hard			
Remarks DPH dynamic probe carried out adjacent to position									
Samples or tests			Shear Strength kPa	Depth		Legend	Strata Description		
Type	Depth, m								
D	0.10			0.20			Grass over MADE GROUND (brown gravelly silty SAND. Gravel of flint and chalk fragments) Off-white sandy SILT and GRAVEL of chalk fragments White CHALK		
D	0.30		0.40						
D	0.50								
									
									
D	1.00								
									
D	1.50								
									
D	2.00								
									
D	2.50								
									
D	3.00			3.10					
									
									
									
									
									
									
									
									
									
									
									



 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		6			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-2.10	
2				Moderate		Very hard			
Remarks									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10		0.40			Shingle over MADE GROUND (pale brown to off-white gravelly sandy SILT. Gravel of weak white chalk and occasional brick fragments, becoming less gravelly with depth) White CHALK with occasional flints			
D	0.30								
D	0.50								
D	1.00					END OF BOREHOLE			
D	1.50								
D	2.00								
			2.10						
									
									
									
									
									

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		BOREHOLE	7			
Contract		Henley Road, Wargrave	Report Ref	25/13185/GO		
Client		James Horseman	Date	10/07/2025		
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE	Ground Level			
Type of excavator		Window Sampler	Water level after completion, m		dry	
Water strikes, m		Dimensions, m		Ease of excavation, m		
1 none		Diameter	0.06	Very easy Difficult GL-3.10		
2				Moderate Very hard		
Remarks						
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description
Type	Depth, m					
D	0.10		0.40			Grass over MADE GROUND (brown gravelly silty SAND with some roots. Gravel of flint, chalk and brick fragments)
D	0.30					
D	0.50					
			0.90			Brown gravelly sandy CLAY. Gravel of medium to coarse flint
D	1.00					
D	1.50					White CHALK with occasional flints
D	2.00					
						END OF BOREHOLE
D	2.50					
D	3.00		3.10			END OF BOREHOLE

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				BOREHOLE		8			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		10/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Window Sampler		Water level after completion, m		dry			
Water strikes, m		Dimensions, m		Ease of excavation, m					
1 none		Diameter 0.06		Very easy		Difficult		GL-3.10	
2				Moderate		Very hard			
Remarks									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.15		0.10			MADE GROUND (macadam)			
D	0.30		0.25			MADE GROUND (brown very gravelly silty SAND. Gravel of chalk fragments with some brick and concrete fragments)			
D	0.50					Light brown very gravelly sandy SILT with white chalk fragments. Gravel of chalk and occasional flint			
D	1.00								
D	1.50		1.30			Light brown sandy SILT and GRAVEL of chalk and occasional flint			
D	2.00								
D	2.30		2.20			White CHALK with occasional flints			
D	2.50								
D	3.00		3.10			END OF BOREHOLE			

 ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				TRIAL PIT		SA1			
Contract		Henley Road, Wargrave				Report Ref		25/13185/GO	
Client		James Horseman				Date		24/07/2025	
Site Address		Lindisfarne, Henley Road, Wargrave, Berkshire RG10 8PE				Ground Level			
Type of excavator		Mechanical		Water level after completion, m		see test results			
Water strikes, m		Pit Dimensions, m		Ease of excavation, m					
1 none		Length	1.50	Very easy		Difficult			
2		Breadth	0.55	Moderate	GL - 1.30	Very hard		1.30-1.55	
Remarks No further excavation possible below 1.55m Infiltration test performed to BRE Digest 365									
Samples or tests		Shear Strength kPa	Depth		Legend	Strata Description			
Type	Depth, m								
D	0.10		0.25			MADE GROUND (brown slightly gravelly silty SAND. Gravel of flint with rare pottery fragments)			
D	0.30								
D	0.50		0.70			Brown gravelly very sandy SILT with occasional flint cobbles. Gravel of flint			
									
D	1.00		1.30			Pale brown sandy SILT and GRAVEL of white chalk and flint			
									
D	1.50		1.55			Pale brown sandy SILT and GRAVEL of white chalk and flint with occasional flint cobbles			
									
						END OF TRIAL PIT			

SOAKAWAY INFILTRATION TEST RESULTS



Contract	Henley Road, Wargrave
Report Ref	25/13185/G0
Test Location	SA1

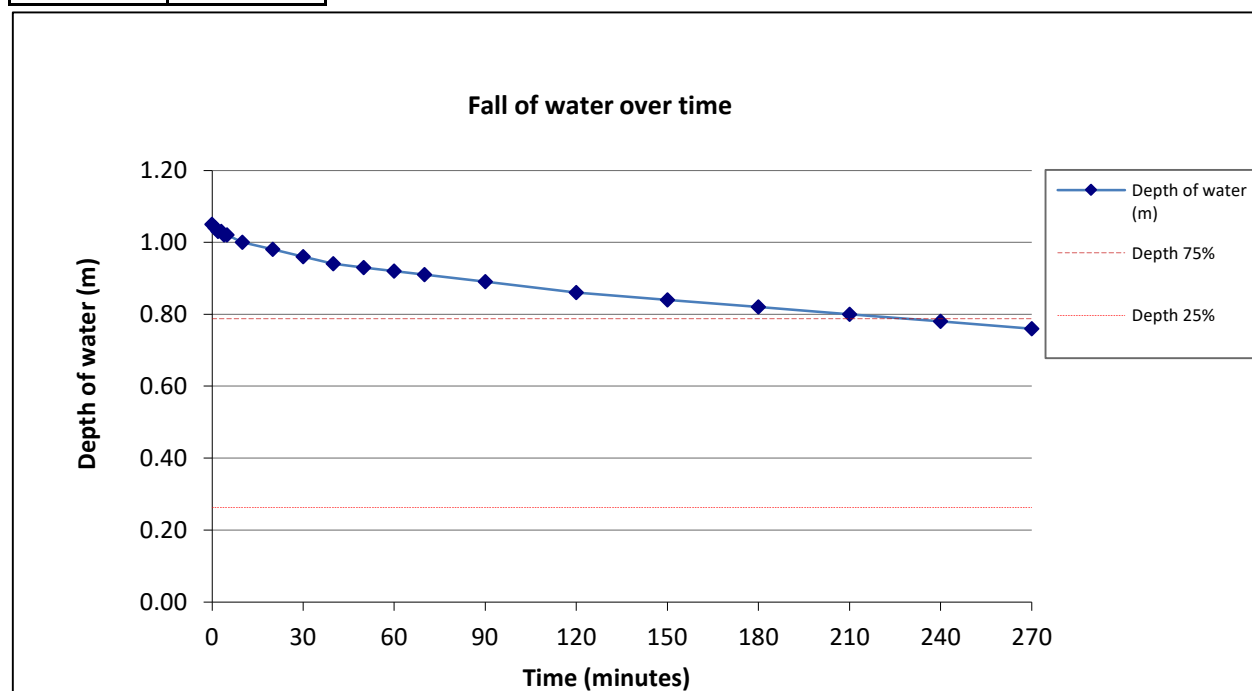
Time (mins)	Depth of Water (m)
0	1.05
10	1.00
20	0.98
30	0.96
40	0.94
50	0.93
90	0.89
120	0.86
150	0.84
180	0.82
210	0.80
240	0.78
270	0.76

Pit Dimensions (m)

Length	1.50
Width	0.55
Depth	1.55

Remarks:

1. Test undertaken in general accordance with BRE Digest 365
2. Trial pit was not filled with aggregate for test
3. Test abandoned due to slow rate of dissipation



V_{p75-25}	Effective depth storage volume of water in trial pit between 75% and 25% effective depth	
α_{p50}	Internal surface area of trial pit up to 50% effective depth and including base	
t_{p75-25}	Time for water level to fall from 75% to 25% effective depth	

Soil Infiltration Rate (m/sec) <i>f</i>	Test failed
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APPENDIX 3

LABORATORY TEST RESULTS

INDEX PROPERTIES AND WATER CONTENTS

BS 1377 : Part 2 and BS EN ISO 17892: Part 1 and Part 12: 5.3 and 6.1

Report Ref	25/13185/GO	Contract	Henley Road, Wargrave	Sheet 1 of 1
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BH No.	Sample		Water Content W %	Liquid Limit W _L %	Plastic Limit W _p %	Plasticity Index IP %	Passing 425 µm Sieve %	Modified Plasticity Index IP _c %	Atterberg Classification	NHBC Classification VCP	Sample Preparation	Remarks
	Depth m	Description										
3	1.50	Brown friable very sandy CLAY	14.9	30	18	12	86	10	CL	Low	S	
8	1.00	Light brown very gravelly sandy SILT with white chalk fragments	9.6	19	15	4	65	3	ML	Non-shrinkable	S	
	2.00	Light brown sandy SILT and GRAVEL of chalk	11.8	17	13	4	99	4	ML	Non-shrinkable	S	

Liquid Limit determined by one-point fall cone method using 80g 30° cone and correction factors after Clayton and Jukes (1978) unless otherwise stated above

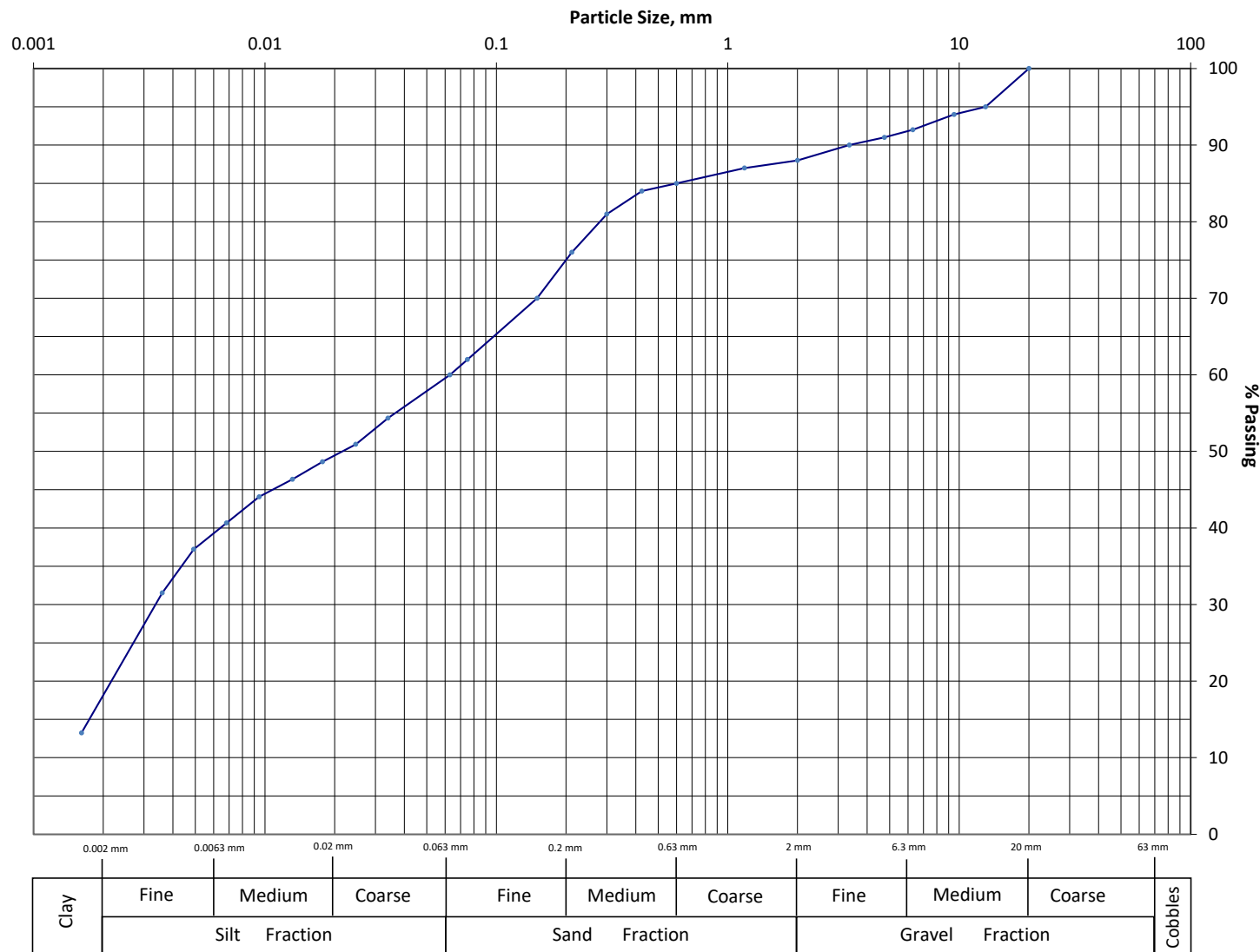
KEY: Soil Type: C - Clay M - Silt O - Organic NP - Non Plastic
 Plasticity: L - Low I - Intermediate H - High V - Very High E - Extremely High
 Sample Preparation: A - As Received H - Particles >425µm removed by hand picking S - Particles >425µm removed by washing and wet sieving with oven drying



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 : Part 4 : Clause 5.2 Wet Sieving & Clause 5.3 Sedimentation by Hydrometer



Sieve Aperture/ Particle Size (mm)	Percentage Passing
75	
63	
50	
37.5	
25	
20	100
13	95
9.5	94
6.3	92
4.75	91
3.35	90
2	88
1.18	87
0.6	85
0.425	84
0.3	81
0.212	76
0.15	70
0.075	62
0.063	60
0.034	54
0.025	51
0.018	49
0.013	46
0.009	44
0.0068	41
0.0049	37
0.0036	32
0.0016	13

Sample Proportions (%)	
Cobbles	0
Gravel	12
Sand	28
Silt & Clay	60

Notes
Particle Density 2.65 Mg/m ³ assumed
Sample subjected to H ₂ O ₂ pre-treatment

BH No.	2	Description	Light brown gravelly very sandy SILT. Gravel of flint and chalk fragments	Contract	Henley Road, Wargrave
Depth	1.00			Report Ref	25/13185/GO



ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH



Albury SI Ltd
Miltons Yard
Petworth Road
Witley
Surrey
GU8 5LH

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

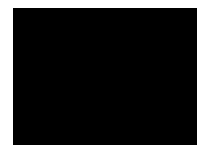
t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: george.owens@alburysl.co.uk

Analytical Report Number : 25-036846

Project / Site name:	Henley Road, Wargrave	Samples received on:	11/07/2025
Your job number:	25 13185 GO	Samples instructed on/ Analysis started on:	11/07/2025
Your order number:	15688	Analysis completed by:	18/07/2025
Report Issue Number:	1	Report issued on:	18/07/2025
Samples Analysed:	6 soil samples		

Signed:



Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-036846
Project / Site name: Henley Road, Wargrave
Your Order No: 15688

Lab Sample Number				612042	612043	612044	612045	612046
Sample Reference				2	4	4	6	7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.10	1.50	0.10	0.50
Date Sampled				10/07/2025	10/07/2025	10/07/2025	10/07/2025	10/07/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	< 0.1	39.2	14.9	68.7	< 0.1
Moisture Content	%	0.01	NONE	4	6.8	8.8	9.6	11
Total mass of sample received	kg	0.1	NONE	0.9	0.9	0.6	0.9	0.6

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	MMI	MMI	-	MMI	-
Analysis completed	N/A	N/A	N/A	17/07/2025	17/07/2025	-	17/07/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.1	8.6	8.7	9.1	8.5
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1200	680	500	400	600
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	16	34	8.3	19	20
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	7.79	16.8	-	9.49	-
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	-	4.15	-	9.85
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.6	1.8	-	0.5	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.3	-	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.06	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.07	0.59	-	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.49	-	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.23	-	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.29	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.31	-	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.16	-	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.28	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.13	-	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.16	-	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	2.99	-	< 0.80	-
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Analytical Report Number: 25-036846
Project / Site name: Henley Road, Wargrave
Your Order No: 15688

Lab Sample Number				612042	612043	612044	612045	612046
Sample Reference				2	4	4	6	7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.10	1.50	0.10	0.50
Date Sampled				10/07/2025	10/07/2025	10/07/2025	10/07/2025	10/07/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.5	6.4	-	4.2	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.39	-	0.09	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	1	-	0.3	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	-
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2	< 1.2	-	< 1.2	-
Chromium (III)	mg/kg	1	NONE	12	13	-	7.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	13	-	7.8	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.1	12	-	5.9	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	53	-	13	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	8.6	-	4.6	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7	1.3	-	1.5	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	19	-	5	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	69	-	22	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	-	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC40 EH_CU_1D_AL	mg/kg	10	NONE	< 10	< 10	-	< 10	-
TPHCWG - Aliphatic >EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	< 8.4	-	< 8.4	-
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	-	< 10	-
TPHCWG - Aliphatic >EC5 - EC44 EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	-	< 10	-

TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.02	MCERTS	< 0.020	< 0.020	-	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	-	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	12	-	< 10	-
TPHCWG - Aromatic >EC21 - EC40 EH_CU_1D_AR	mg/kg	10	NONE	< 10	14	-	< 10	-
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	< 8.4	-	< 8.4	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	12	-	< 10	-
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	12	-	< 10	-

TPH Total >EC6 - EC40 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	< 10	20	-	< 10	-
---	-------	----	------	------	----	---	------	---

Petroleum Range Organics (EC6 - EC10) HS_1D_TOTAL	mg/kg	1	ISO 17025	< 1.0	2.4	-	< 1.0	-
TPH (EC10 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	18	-	< 10	-

Analytical Report Number: 25-036846
Project / Site name: Henley Road, Wargrave
Your Order No: 15688

Lab Sample Number				612042	612043	612044	612045	612046
Sample Reference				2	4	4	6	7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.10	1.50	0.10	0.50
Date Sampled				10/07/2025	10/07/2025	10/07/2025	10/07/2025	10/07/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	-	< 5.0	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	-	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-036846
Project / Site name: Henley Road, Wargrave
Your Order No: 15688

Lab Sample Number				612047
Sample Reference				8
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				1.50
Date Sampled				10/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	9
Total mass of sample received	kg	0.1	NONE	0.6

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	-
Analysis completed	N/A	N/A	N/A	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	9
Total Sulphate as SO ₄	mg/kg	50	MCERTS	400
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	9.2
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	4.62
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
Fluorene	mg/kg	0.05	MCERTS	-
Phenanthrene	mg/kg	0.05	MCERTS	-
Anthracene	mg/kg	0.05	MCERTS	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-
-----------------------------	-------	-----	-----------	---

Analytical Report Number: 25-036846
Project / Site name: Henley Road, Wargrave
Your Order No: 15688

Lab Sample Number				612047
Sample Reference				8
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				1.50
Date Sampled				10/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	-
Chromium (III)	mg/kg	1	NONE	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.01	MCERTS	-
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.01	MCERTS	-
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.01	MCERTS	-
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-
TPHCWG - Aliphatic >EC21 - EC40 EH_CU_1D_AL	mg/kg	10	NONE	-
TPHCWG - Aliphatic >EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	-
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	-
TPHCWG - Aliphatic >EC5 - EC44 EH_CU+HS_1D_AL	mg/kg	10	NONE	-

TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	MCERTS	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	MCERTS	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.02	MCERTS	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-
TPHCWG - Aromatic >EC21 - EC40 EH_CU_1D_AR	mg/kg	10	NONE	-
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	-
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	-

TPH Total >EC6 - EC40 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-
---	-------	----	------	---

Petroleum Range Organics (EC6 - EC10) HS_1D_TOTAL	mg/kg	1	ISO 17025	-
TPH (EC10 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-

Analytical Report Number: 25-036846
 Project / Site name: Henley Road, Wargrave
 Your Order No: 15688

Lab Sample Number				612047
Sample Reference				8
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				1.50
Date Sampled				10/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-
Benzene	µg/kg	5	MCERTS	-
Toluene	µg/kg	5	MCERTS	-
Ethylbenzene	µg/kg	5	MCERTS	-
p & m-Xylene	µg/kg	8	MCERTS	-
o-Xylene	µg/kg	5	MCERTS	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-036846

Project / Site name: Henley Road, Wargrave

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
612042	2	None Supplied	0.1	Brown loam and sand with gravel and vegetation
612043	4	None Supplied	0.1	Brown loam and sand with stones and vegetation
612044	4	None Supplied	1.5	Beige chalk with gravel and stones ⁹
612045	6	None Supplied	0.1	Brown loam and sand with chalk and stones
612046	7	None Supplied	0.5	Brown clay and sand with gravel
612047	8	None Supplied	1.5	Light brown clay and sand with gravel and chalk

Analytical Report Number : 25-036846

Project / Site name: Henley Road, Wargrave

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil (low level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	NONE
Total petroleum hydrocarbons by HS-GC-MS in soil	Determination of total petroleum hydrocarbons in soil by HS-GC-MS	In-house method	L129-PL	W	ISO 17025

Analytical Report Number : 25-036846

Project / Site name: Henley Road, Wargrave

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

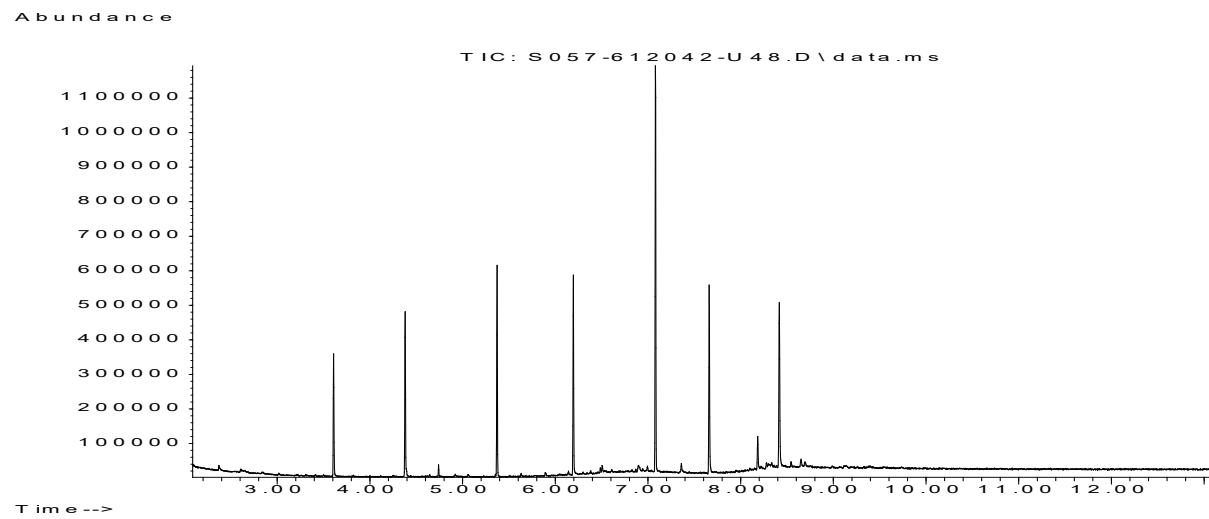
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

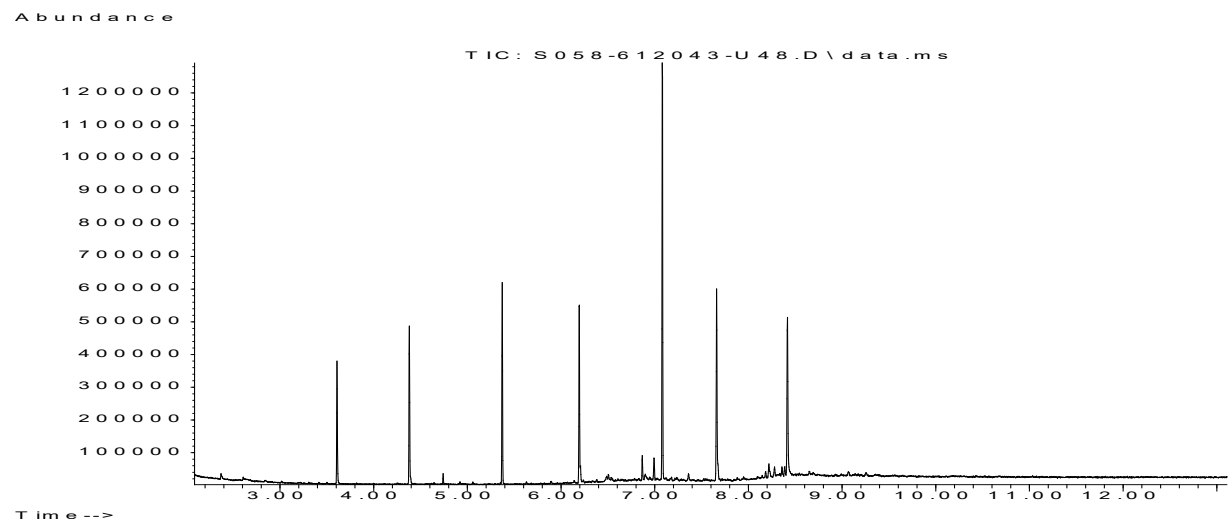
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

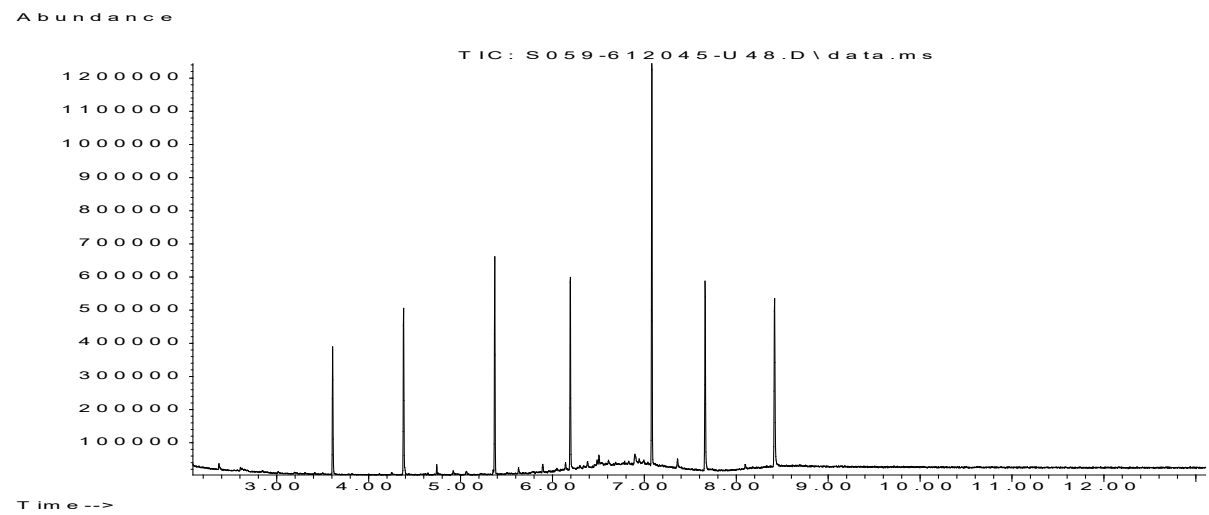
Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

*g - Unaccredited sample matrix.







APPENDIX 4

WASTE

WASTE CLASSIFICATION

The European Waste Framework Directive is implemented in the UK by the 2002 Landfill Regulations, together with a number of other acts and regulations. A key part of this process is to establish the hazardous properties of potential waste. The classification and definition of hazardous waste is interpreted within the Environment Agency guidance WM3 and all wastes require classifying in accordance with the European Waste Catalogue [EWC]. The EWC is a detailed list of typical industry waste types and each has a 6 digit code. Typically the appropriate EWC codes for excavated soil being disposed off site are:

- 17 05 03* soil and stones containing dangerous substances, or
- 17 05 04 soil and stones other than those mentioned in 17 05 03

If excavated soils are to be discarded or exported from site then they would be considered controlled waste and require classification. However, if soils can be re-used on site then they are not considered to be controlled waste. A Desk Study, soil descriptions, laboratory chemical analysis and risk assessment can all contribute to basic waste characterisation. Depending upon the chemical composition or levels of contaminants in the waste (e.g. metals, TPH, asbestos), soil and stones can either be hazardous or non-hazardous. Waste Acceptance Criteria [WAC] test results are used to determine the suitability of the waste intended for disposal against the acceptance criteria for a particular class of landfill site. WAC tests are not used for the classification of waste soils and are only required for inert or hazardous excavated material which is destined for landfill.

Wastes containing asbestos with a concentration of >0.10% weight/weight (w/w) are generally considered to be hazardous. While waste with <0.10% w/w of asbestos are considered non-hazardous. Where free fibres or fibrous asbestos is present at concentrations of >0.001% then these are considered to pose a risk to human health and are deemed hazardous waste. These waste materials also require a suitably licensed company to handle them.

Waste Treatment

It is a requirement of the 2002 Landfill Regulations that all wastes must undergo some form of pre-treatment prior to disposal at an appropriately licensed landfill. Treatment is defined using a 'three-point test' and can include physical, chemical, biological or thermal processes, which must change the characteristics of the waste in order to:

- reduce its volume, or
- reduce its hazardous nature, or
- facilitate its handling, or
- enhance its recovery.

The exceptions to this are:

- inert waste for which treatment is not technically feasible.
- it is waste other than inert waste and treatment would not reduce its quantity or its hazards to human health or the environment.

The waste producer should either treat their own waste or ensure that the waste will be treated by a subsequent handler. The waste producer should record the type and amount of pre-treatment undertaken prior to disposal.

Examples of treatment include mechanical segregation or sorting, composting, soil treatment hubs and incineration. This can include physical sorting of waste soil types into separate stockpiles at the producer site, e.g. topsoil, made ground and natural clay, sand or gravels.

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



F3BBQ-FIG93-B16BM

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Report is invalid if pages are removed.

Job name

25-036846_HWOL

Description/Comments

Project

25/13185/GO

Site

Henley Road, Wargrave

Classified by

Name: **George Owens**
 Date: **25 Jul 2025 10:26 GMT**
 Telephone: **01428 684 836**
 Company: **Albury SI Ltd**
Miltons Yard, Petworth Rd, Witley
Godalming
GU8 5LH

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course	Date
Hazardous Waste Classification	-

Purpose of classification

2 - Material Characterisation

Address of the waste

Lindisfarne, Henley Road, Wargrave

Post Code **Rg10 8PE**

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Demolition of residential dwelling and construction of replacement

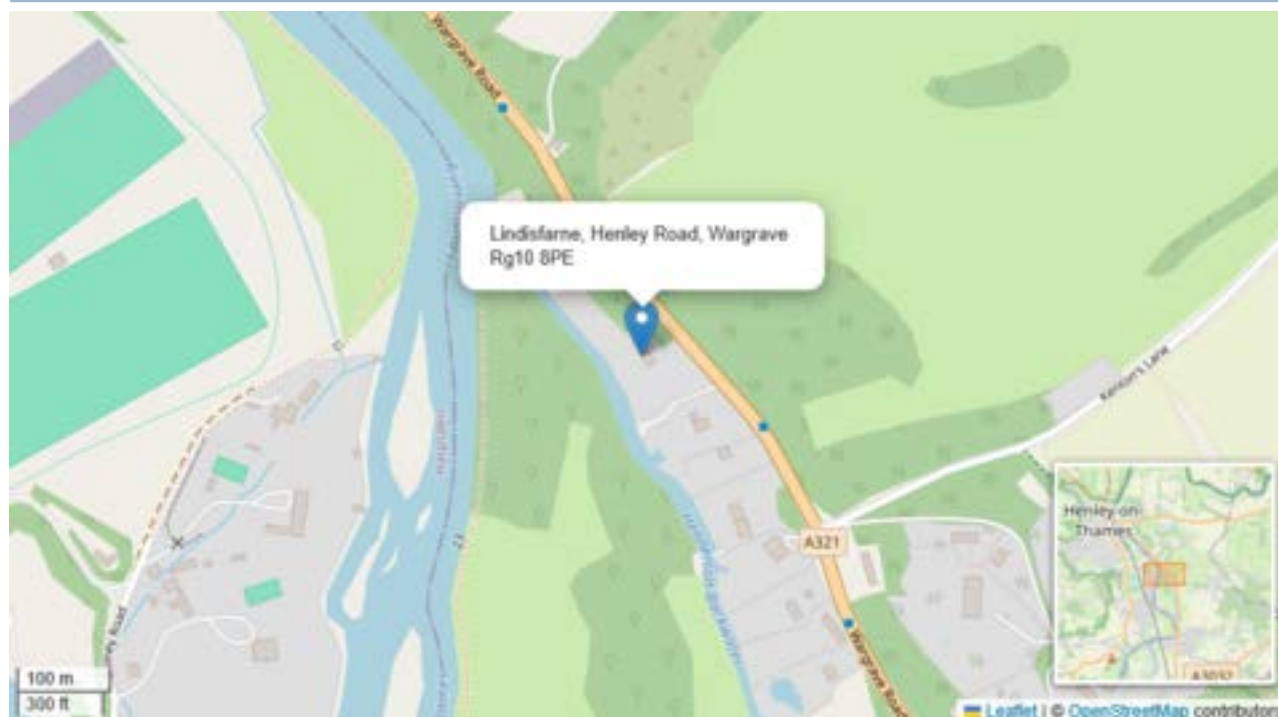
Description of the specific process, sub-process and/or activity that created the waste

Excavation of soils from foundation and pool arisings

Description of the waste

made ground and chalk

Waste Location



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	2--10072025-0.10		Non Hazardous		3
2	4--10072025-0.10		Non Hazardous		6
3	6--10072025-0.10		Non Hazardous		9

Related documents

#	Name	Description
1	25-036846_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
2	Example worst case waste stream template: 17 05 04 or 17 05 03 *	waste stream template used to create this Job

Report

Created by: George Owens

Created date: 25 Jul 2025 10:26 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	12
Appendix B: Rationale for selection of metal species	13
Appendix C: Version	14

Classification of sample: 2--10072025-0.10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
2--10072025-0.10	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
4% (wet weight correction)	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }				8.5	mg/kg	1.895	15.459	mg/kg	0.00155 %		
	033-005-00-1											
2	beryllium { beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex }				0.41	mg/kg	8.868	3.49	mg/kg	0.000349 %		
	004-002-00-2											
3	boron { boric acid; [1] boric acid; [2] }				1.6	mg/kg	5.719	8.785	mg/kg	0.000878 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium sulfate }				<0.2	mg/kg	1.855	<0.371	mg/kg	<0.0000371 %		<LOD
	048-009-00-9	233-331-6	10124-36-4									
5	chromium in Cr(III) compounds { chromium(III) oxide }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
6	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2	mg/kg	2.27	<2.724	mg/kg	<0.000272 %		<LOD
	024-017-00-8											
7	copper { copper sulphate pentahydrate }				9.1	mg/kg	3.929	34.324	mg/kg	0.00343 %		
	029-023-00-4	231-847-6	7758-99-8									
8	lead { lead chromate }			1	27	mg/kg	1.56	40.43	mg/kg	0.00259 %		
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dibromate }				10	mg/kg	5.358	51.44	mg/kg	0.00514 %		
	028-053-00-5	238-596-1	14550-87-9									
11	selenium { nickel selenate }				1.7	mg/kg	2.554	4.168	mg/kg	0.000417 %		
	028-031-00-5	239-125-2	15060-62-5									
12	vanadium { divanadium pentaoxide; vanadium pentoxide }				22	mg/kg	1.785	37.703	mg/kg	0.00377 %		
	023-001-00-8	215-239-8	1314-62-1									
13	zinc { zinc chromate }				40	mg/kg	2.774	106.527	mg/kg	0.0107 %		
	024-007-00-3	236-878-9	13530-65-9									
14	TPH (C6 to C40) petroleum group				10	mg/kg		9.6	mg/kg	0.00096 %		
			TPH									
15	confirm TPH has NOT arisen from diesel or petrol											

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
17	benzene 601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	toluene 601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
19	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
20	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %			<LOD
21	pH PH				8.1 pH		8.1 pH	8.1 pH			
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
24	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
25	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
26	phenanthrene 201-581-5	85-01-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	anthracene 204-371-1	120-12-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
28	fluoranthene 205-912-4	206-44-0			0.07 mg/kg		0.0672 mg/kg	0.00000672 %			
29	pyrene 204-927-3	129-00-0			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
34	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
36	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
Total:									0.0315 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 12500 mg/kg (1.25%) because: example given in WM3

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00096%)

Classification of sample: 4--10072025-0.10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
4--10072025-0.10	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
6.8% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 6.8% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }				6.4 mg/kg	1.895	11.3 mg/kg	0.00113 %			
	033-005-00-1										
2	beryllium { beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex }				0.39 mg/kg	8.868	3.223 mg/kg	0.000322 %			
	004-002-00-2										
3	boron { boric acid; [1] boric acid; [2] }				1 mg/kg	5.719	5.33 mg/kg	0.000533 %			
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium sulfate }				<0.2 mg/kg	1.855	<0.371 mg/kg	<0.0000371 %			<LOD
	048-009-00-9	233-331-6	10124-36-4								
5	chromium in Cr(III) compounds { chromium(III) oxide }				13 mg/kg	1.462	19 mg/kg	0.0019 %			
		215-160-9	1308-38-9								
6	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2 mg/kg	2.27	<2.724 mg/kg	<0.000272 %			<LOD
	024-017-00-8										
7	copper { copper sulphate pentahydrate }				12 mg/kg	3.929	43.943 mg/kg	0.00439 %			
	029-023-00-4	231-847-6	7758-99-8								
8	lead { lead chromate }			1	53 mg/kg	1.56	77.049 mg/kg	0.00494 %			
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dibromate }				8.6 mg/kg	5.358	42.948 mg/kg	0.00429 %			
	028-053-00-5	238-596-1	14550-87-9								
11	selenium { nickel selenate }				1.3 mg/kg	2.554	3.094 mg/kg	0.000309 %			
	028-031-00-5	239-125-2	15060-62-5								
12	vanadium { divanadium pentaoxide; vanadium pentoxide }				19 mg/kg	1.785	31.612 mg/kg	0.00316 %			
	023-001-00-8	215-239-8	1314-62-1								
13	zinc { zinc chromate }				69 mg/kg	2.774	178.4 mg/kg	0.0178 %			
	024-007-00-3	236-878-9	13530-65-9								
14	TPH (C6 to C40) petroleum group				10 mg/kg		9.32 mg/kg	0.000932 %			
			TPH								
15	confirm TPH has NOT arisen from diesel or petrol										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	benzene	601-020-00-8	200-753-7	71-43-2	<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	toluene	601-021-00-3	203-625-9	108-88-3	<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
19	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
20	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<LOD
21	pH		PH		8.6 pH		8.6 pH	8.6 pH		
22	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	acenaphthylene		205-917-1	208-96-8	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	acenaphthene		201-469-6	83-32-9	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
25	fluorene		201-695-5	86-73-7	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	phenanthrene		201-581-5	85-01-8	0.3 mg/kg		0.28 mg/kg	0.000028 %		
27	anthracene		204-371-1	120-12-7	0.06 mg/kg		0.0559 mg/kg	0.0000559 %		
28	fluoranthene		205-912-4	206-44-0	0.59 mg/kg		0.55 mg/kg	0.000055 %		
29	pyrene		204-927-3	129-00-0	0.49 mg/kg		0.457 mg/kg	0.0000457 %		
30	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.23 mg/kg		0.214 mg/kg	0.0000214 %		
31	chrysene	601-048-00-0	205-923-4	218-01-9	0.29 mg/kg		0.27 mg/kg	0.000027 %		
32	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.31 mg/kg		0.289 mg/kg	0.0000289 %		
33	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.16 mg/kg		0.149 mg/kg	0.0000149 %		
34	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.28 mg/kg		0.261 mg/kg	0.0000261 %		
35	indeno[123-cd]pyrene		205-893-2	193-39-5	0.13 mg/kg		0.121 mg/kg	0.0000121 %		
36	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
37	benzo[ghi]perylene		205-883-8	191-24-2	0.16 mg/kg		0.149 mg/kg	0.0000149 %		
Total:								0.04 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 12500 mg/kg (1.25%)
because: example given in WM3

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00093%)

Classification of sample: 6--10072025-0.10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
6--10072025-0.10	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
9.6% (wet weight correction)	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }				4.2	mg/kg	1.895	7.193	mg/kg	0.000719 %		
	033-005-00-1											
2	beryllium { beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex }				0.09	mg/kg	8.868	0.721	mg/kg	0.0000721 %		
	004-002-00-2											
3	boron { boric acid; [1] boric acid; [2] }				0.3	mg/kg	5.719	1.551	mg/kg	0.000155 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium sulfate }				<0.2	mg/kg	1.855	<0.371	mg/kg	<0.0000371 %		<LOD
	048-009-00-9	233-331-6	10124-36-4									
5	chromium in Cr(III) compounds { chromium(III) oxide }				7.8	mg/kg	1.462	11.4	mg/kg	0.00114 %		
		215-160-9	1308-38-9									
6	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.2	mg/kg	2.27	<2.724	mg/kg	<0.000272 %		<LOD
	024-017-00-8											
7	copper { copper sulphate pentahydrate }				5.9	mg/kg	3.929	20.956	mg/kg	0.0021 %		
	029-023-00-4	231-847-6	7758-99-8									
8	lead { lead chromate }			1	13	mg/kg	1.56	18.331	mg/kg	0.00118 %		
	082-004-00-2	231-846-0	7758-97-6									
9	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dibromate }				4.6	mg/kg	5.358	22.282	mg/kg	0.00223 %		
	028-053-00-5	238-596-1	14550-87-9									
11	selenium { nickel selenate }				1.5	mg/kg	2.554	3.463	mg/kg	0.000346 %		
	028-031-00-5	239-125-2	15060-62-5									
12	vanadium { divanadium pentaoxide; vanadium pentoxide }				5	mg/kg	1.785	8.069	mg/kg	0.000807 %		
	023-001-00-8	215-239-8	1314-62-1									
13	zinc { zinc chromate }				22	mg/kg	2.774	55.172	mg/kg	0.00552 %		
	024-007-00-3	236-878-9	13530-65-9									
14	TPH (C6 to C40) petroleum group				10	mg/kg		9.04	mg/kg	0.000904 %		
			TPH									
15	confirm TPH has NOT arisen from diesel or petrol											

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
17	benzene 601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
18	toluene 601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
19	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
20	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %			<LOD
21	pH PH				9.1 pH		9.1 pH	9.1 pH			
22	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
23	acenaphthylene 205-917-1	208-96-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
24	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
25	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
26	phenanthrene 201-581-5	85-01-8			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	anthracene 204-371-1	120-12-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
28	fluoranthene 205-912-4	206-44-0			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
29	pyrene 204-927-3	129-00-0			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
30	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
31	chrysene 601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
32	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
33	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
34	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
35	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
36	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
37	benzo[ghi]perylene 205-883-8	191-24-2			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
Total:									0.0152 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 12500 mg/kg (1.25%)
because: example given in WM3

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0009%)

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from ECHA's C&L inventory database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 30 Apr 2020

Hazard Statements: Acute Tox. 4; H302, Skin Sens. 1; H317, Eye Irrit. 2; H319

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Unknown Oil

Hazard statements taken from WM3 1st Edition 2015

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

■ confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic acid and its salts with the exception of those specified elsewhere in this Annex}

Worst case CLP species based on hazard statements/molecular weight and conversion factor for arsenic acid H₃AsO₄. (edit as required)

beryllium {beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex}

Worst case CLP species based on hazard statements/molecular weight and conversion factor for beryllium chloride. (edit as required)

boron {boric acid; [1] boric acid; [2]}

Reasonable worst case CLP species based on hazard statements/molecular weight and assuming water is or has been present. (edit as required)

cadmium {cadmium sulfate}

Worst case CLP species based on hazard statements/molecular weight. (edit as required)

chromium in Cr(III) compounds {chromium(III) oxide}

residential site

chromium in Cr(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {copper sulphate pentahydrate}

Worst case CLP species based on hazard statements/molecular weight. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Reasonable worst case CLP species based on hazard statements/molecular weight and assuming no evidence for the use of explosives. (edit as required)

nickel {nickel dibromate}

Worst case CLP species based on hazard statements/molecular weight. (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2025.203.6718.12184 (22 Jul 2025)

HazWasteOnline Database: 2025.203.6718.12184 (22 Jul 2025)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

GB MCL List v3.0 - version 3.0 of 11th January 2024

GB MCL List v4.0 - version 4.0 of 2nd March 2024

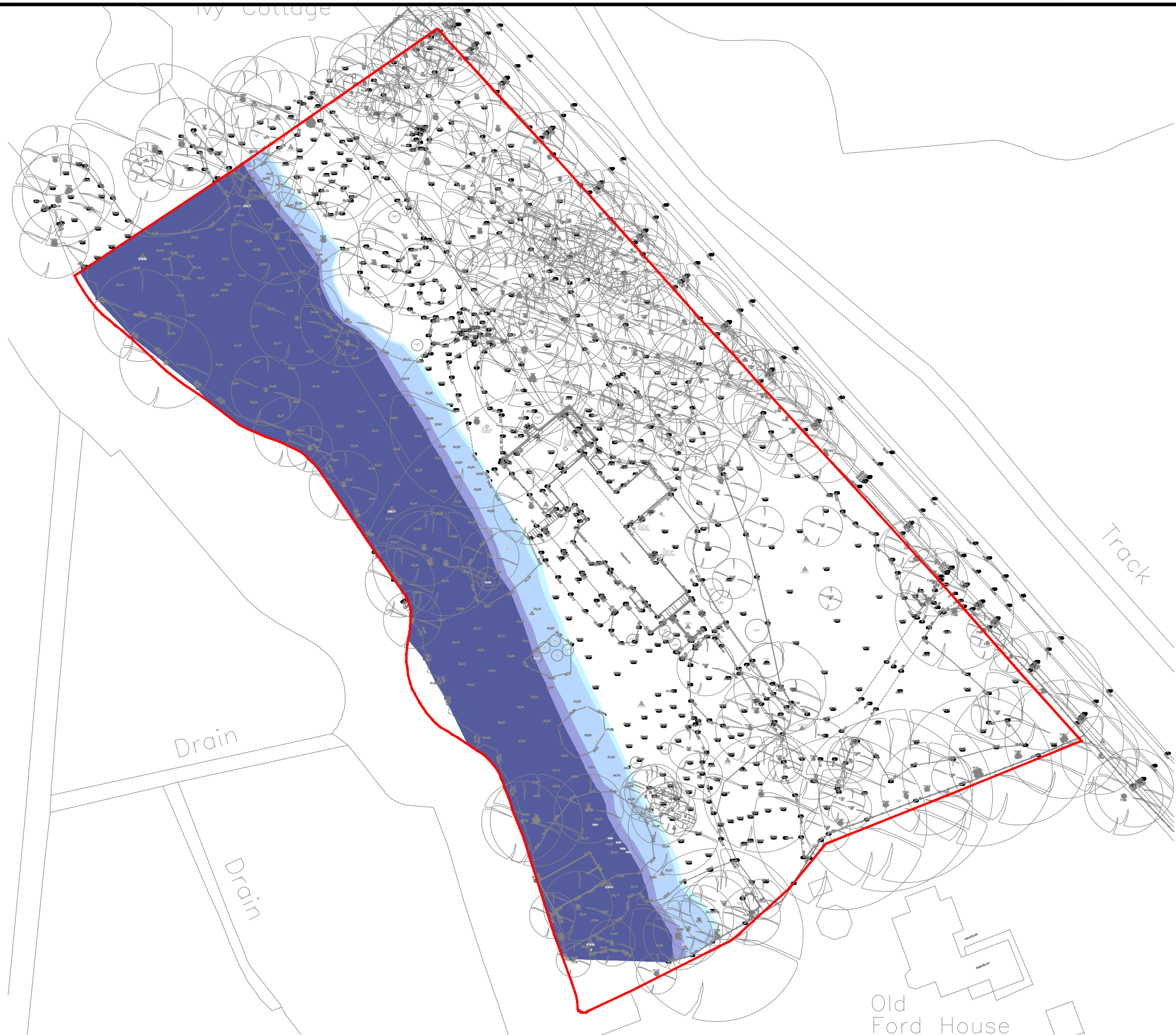
GB MCL List v5.0 - version 5.0 of 26th June 2024

GB MCL List v6.0 - version 6.0 of 15th February 2025

APPENDIX C

Drawing 251966/FRA/01 – Flood Extents

- Key
- Flood Zone 2
 - Flood Zone 3
 - Flood Zone 3a
 - Flood Zone 3b



Mr & Mrs J Horseman

Lindisfarne
Wokingham

Esisting Flood Zone Extents



Thorogood House, 34 Tolworth Close, Surbiton, Surrey, KT6 7EW
Telephone: 0208 339 7899 Fax: 0208 339 7898
E-mail: info@lanmor.co.uk
www.lanmor.co.uk

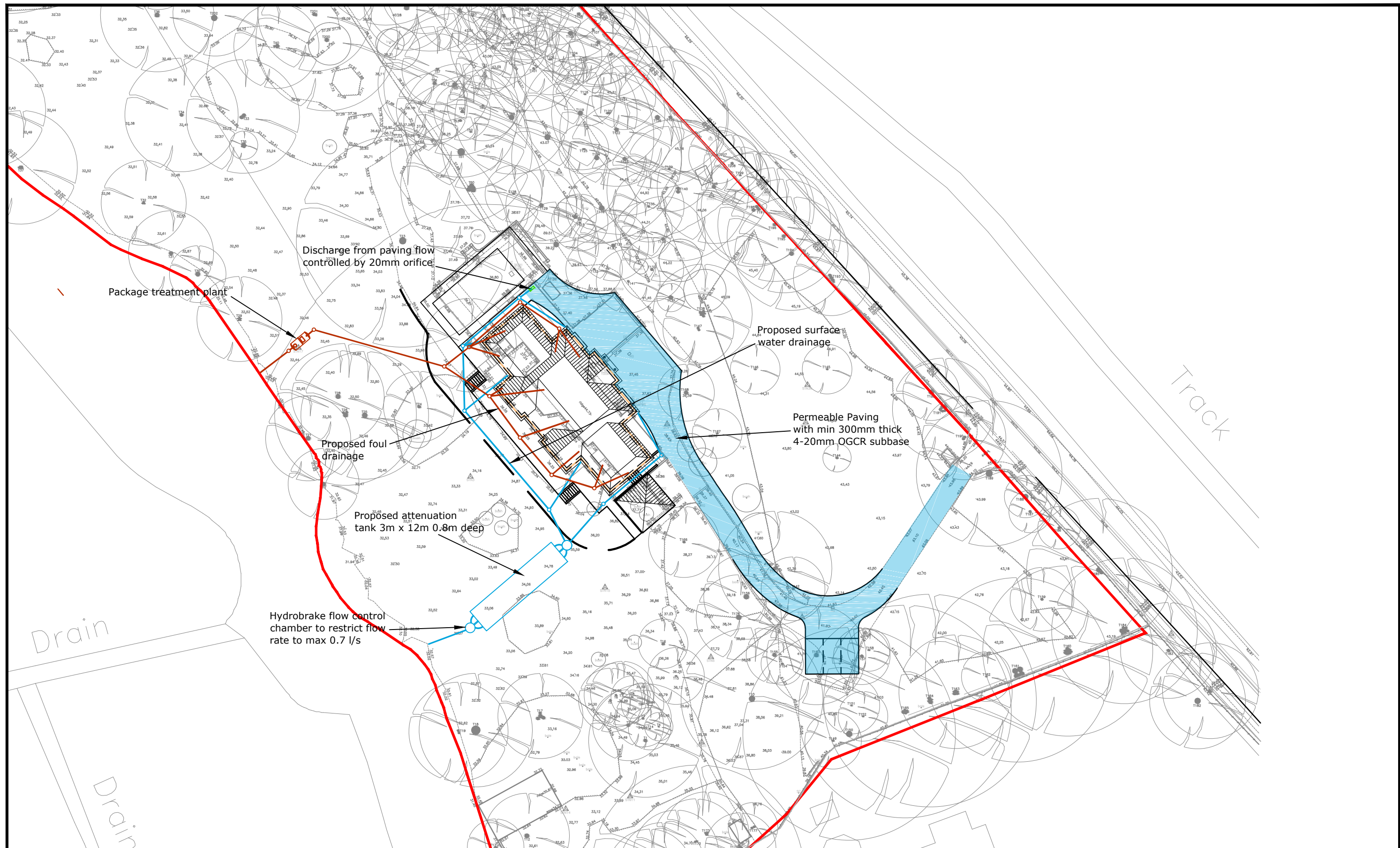
SCALE 1 : 750

DRAWN BY IN

PRJ No. 251966

DWG No. 251966-FRA-01

Drawing 251966/DS/01 – Drainage Strategy



Mr & Mrs J Horseman

Lindisfarne, Wargrave Road
Remenhem, Wokingham, RG10 8PE

Proposed Drainage Strategy

SCALE 1:500

DRAWN BY IN

PRJ No. 251966

DWG No. 251966/DS/01

LANMOR Consulting
Civil Engineers & Transport Planning

Thorogood House, 34 Tolworth Close, Surbiton, Surrey, KT6 7EW
Telephone: 0208 339 7899 Fax: 0208 339 7898
E-mail: info@lanmor.co.uk
www.lanmor.co.uk

APPENDIX D

Greenfield Runoff Calculations

Lanmor Consulting Ltd		Page 1
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 18/08/2025 15:25 File Greenfield Run.srcx	Designed by Irsyad Checked by	
XP Solutions Source Control 2015.1		
ICP SUDS Mean Annual Flood Input Return Period (years) 100 Soil 0.150 Area (ha) 0.085 Urban 0.000 SAAR (mm) 700 Region Number Region 6 Results 1/s QBAR Rural 0.0 QBAR Urban 0.0 Q100 years 0.1 Q1 year 0.0 Q30 years 0.1 Q100 years 0.1		
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Drainage Calculations

Lanmor Consulting Ltd		Page 3
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
Date 18/08/2025 File	Designed by IN Checked by KBL	
XP Solutions Source Control 2015.1		

Cascade Rainfall Details for Permeable Paving.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.048

Time (mins)	Area
From:	To: (ha)
0	4 0.048

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
Date 18/08/2025 File	Designed by IN Checked by KBL	
XP Solutions Source Control 2015.1		

Cascade Model Details for Permeable Paving.srcx

Storage is Online Cover Level (m) 37.030

Porous Car Park Structure

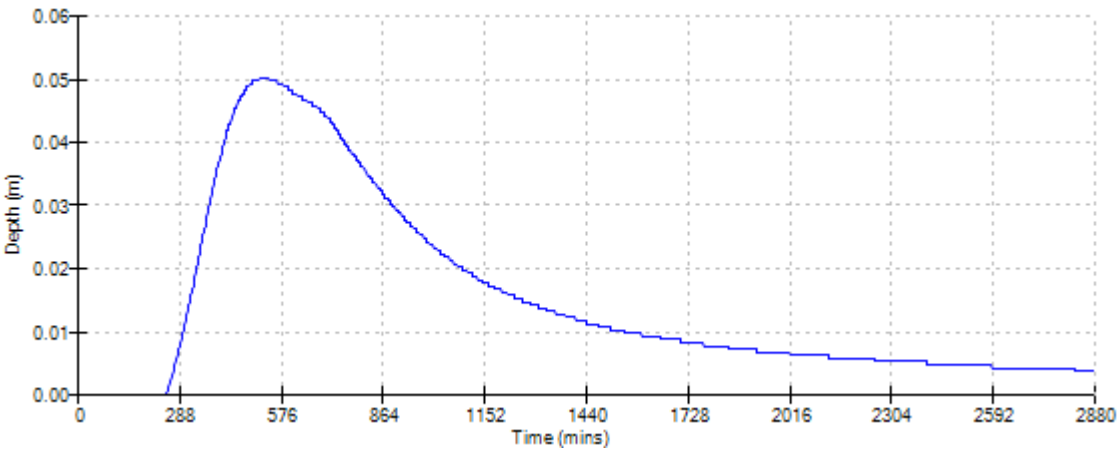
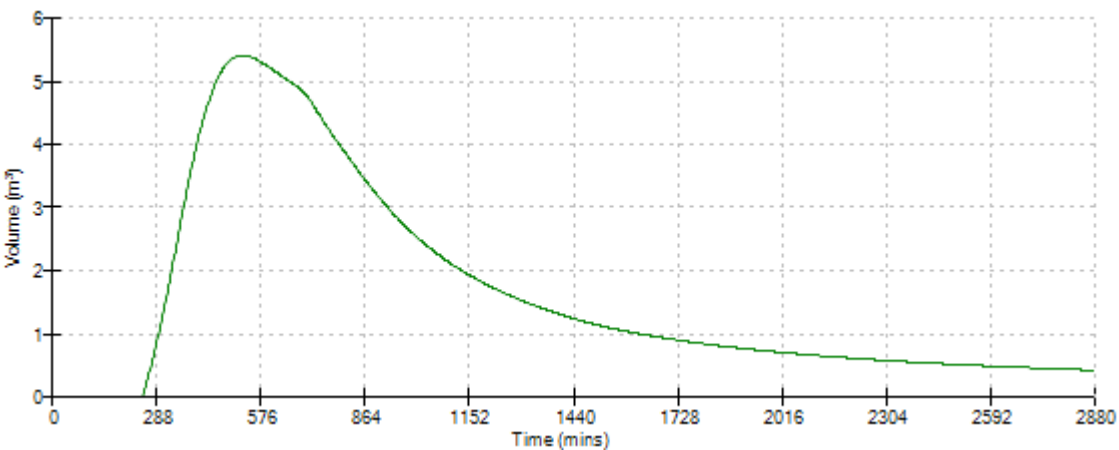
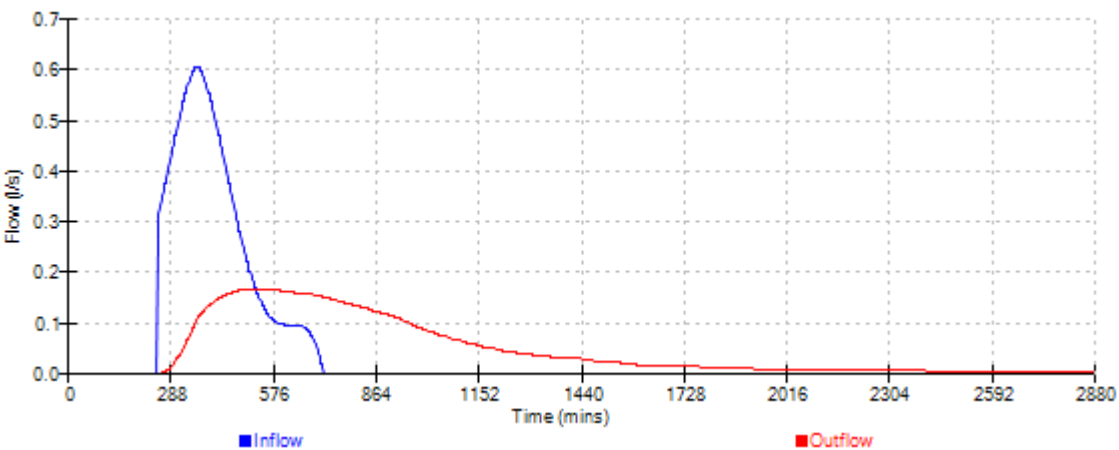
Infiltration Coefficient Base (m/hr) 0.00000	Width (m) 4.0
Membrane Percolation (mm/hr) 1000	Length (m) 90.0
Max Percolation (l/s) 100.0	Slope (1:X) 0.0
Safety Factor 2.0	Depression Storage (mm) 5
Porosity 0.30	Evaporation (mm/day) 3
Invert Level (m) 36.580	Cap Volume Depth (m) 0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 36.580

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Cascade Event: 720 min Winter for Permeable Paving.srcx



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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
Date 18/08/2025 File	Designed by IN Checked by KBL	
XP Solutions Source Control 2015.1		

Cascade Model Details for Attenuation Tank.srcx

Storage is Online Cover Level (m) 34.780

Cellular Storage Structure

Invert Level (m) 33.180 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	42.0	42.0	0.801	0.0	66.8
0.800	42.0	66.8			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0041-7000-0800-7000
Design Head (m) 0.800
Design Flow (l/s) 0.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 41
Invert Level (m) 33.180
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

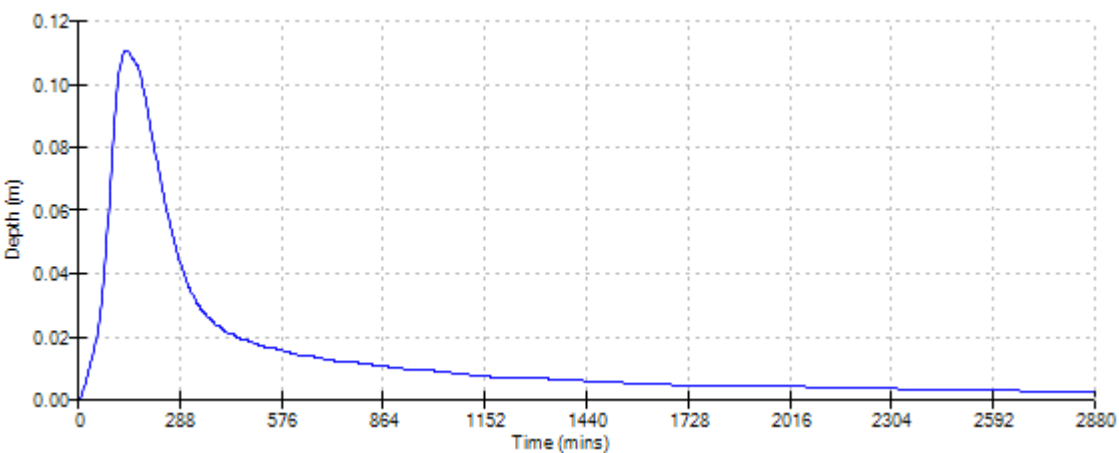
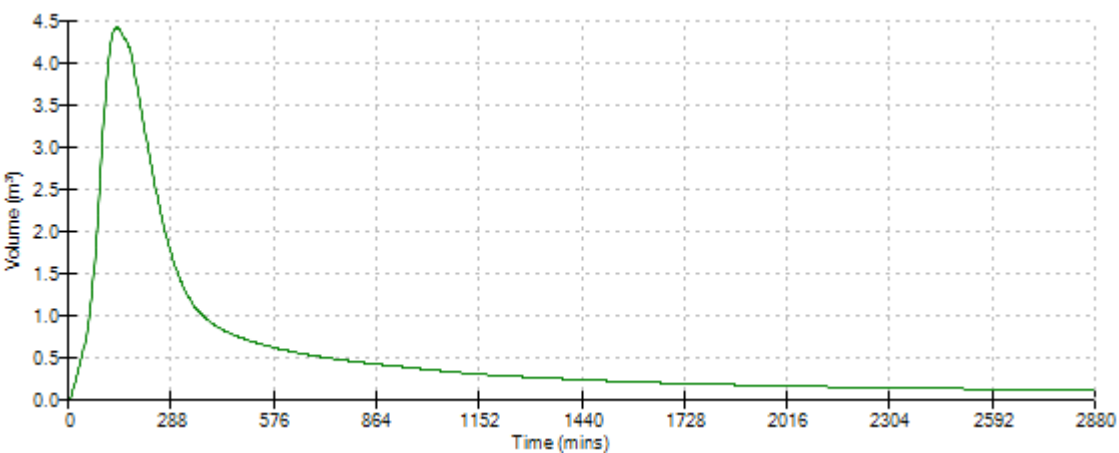
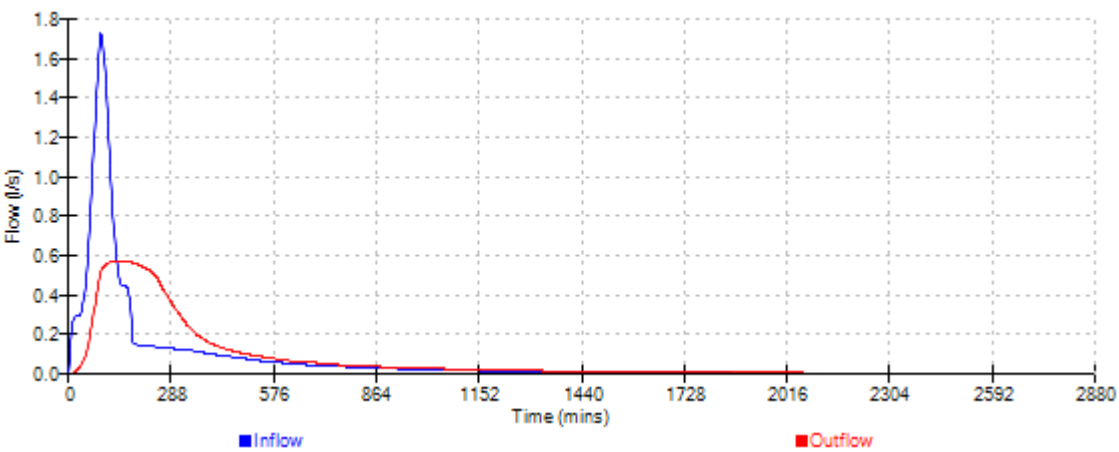
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	0.7
Flush-Flo™	0.180	0.6
Kick-Flo®	0.363	0.5
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	1.200	0.8	3.000	1.3	7.000	1.9
0.200	0.6	1.400	0.9	3.500	1.4	7.500	1.9
0.300	0.6	1.600	1.0	4.000	1.4	8.000	2.0
0.400	0.5	1.800	1.0	4.500	1.5	8.500	2.0
0.500	0.6	2.000	1.1	5.000	1.6	9.000	2.1
0.600	0.6	2.200	1.1	5.500	1.7	9.500	2.2
0.800	0.7	2.400	1.1	6.000	1.7		
1.000	0.8	2.600	1.2	6.500	1.8		

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Cascade Event: 180 min Winter for Attenuation Tank.srcx



Lanmor Consulting Ltd		Page 3
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
Date 18/08/2025 File	Designed by IN Checked by KBL	
XP Solutions Source Control 2015.1		

Cascade Rainfall Details for Permeable Paving.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

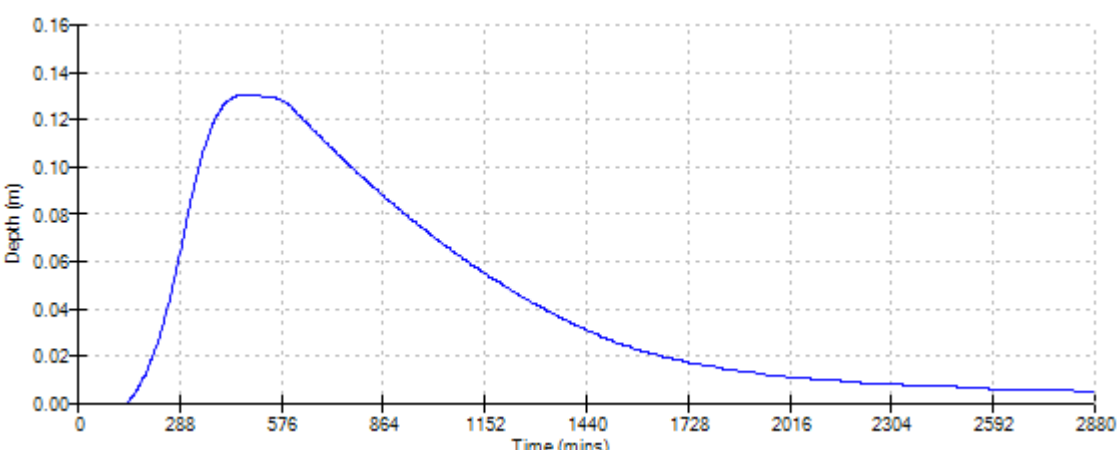
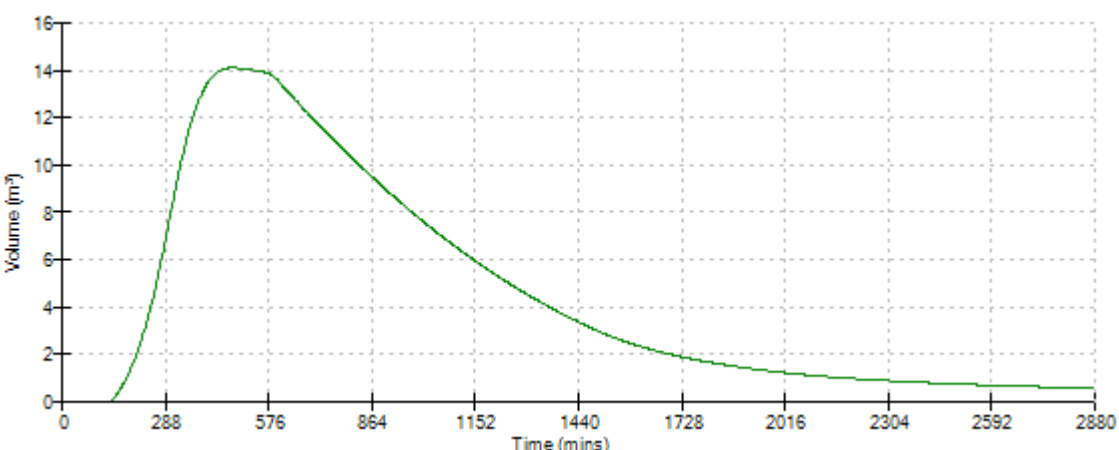
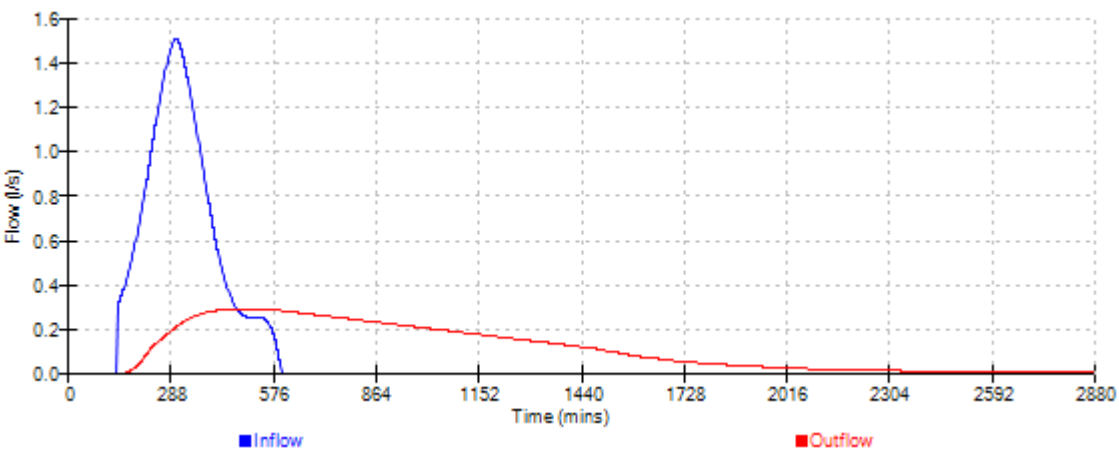
Total Area (ha) 0.048

Time (mins)	Area
From:	To: (ha)
0	4 0.048

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE																									
Date 18/08/2025 File	Designed by IN Checked by KBL																									
XP Solutions Source Control 2015.1																										
<u>Cascade Model Details for Permeable Paving.srcx</u> Storage is Online Cover Level (m) 37.030 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00000</td> <td>Width (m)</td> <td>4.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>1000</td> <td>Length (m)</td> <td>90.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>100.0</td> <td>Slope (1:X)</td> <td>0.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>5</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>3</td> </tr> <tr> <td>Invert Level (m)</td> <td>36.580</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table> <u>Orifice Outflow Control</u> Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 36.580			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.0	Membrane Percolation (mm/hr)	1000	Length (m)	90.0	Max Percolation (l/s)	100.0	Slope (1:X)	0.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	36.580	Cap Volume Depth (m)	0.300
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.0																							
Membrane Percolation (mm/hr)	1000	Length (m)	90.0																							
Max Percolation (l/s)	100.0	Slope (1:X)	0.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	36.580	Cap Volume Depth (m)	0.300																							
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Cascade Event: 600 min Winter for Permeable Paving.srcx



Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m ³)	Status
----------------	---------------------	---------------------	------------------------------	----------------------------------	-------------------------	------------------------------------	--------

8640 min	Summer	33.229	0.049	0.0	0.4	0.4	2.0	O K
10080 min	Summer	33.225	0.045	0.0	0.4	0.4	1.8	O K
15 min	Winter	33.363	0.183	0.0	0.6	0.6	7.3	O K
30 min	Winter	33.414	0.234	0.0	0.6	0.6	9.3	O K
60 min	Winter	33.462	0.282	0.0	0.6	0.6	11.2	O K
120 min	Winter	33.502	0.322	0.0	0.6	0.6	12.8	O K
180 min	Winter	33.518	0.338	0.0	0.6	0.6	13.5	O K
240 min	Winter	33.523	0.343	0.0	0.6	0.6	13.7	O K
360 min	Winter	33.522	0.342	0.0	0.6	0.6	13.6	O K
480 min	Winter	33.510	0.330	0.0	0.6	0.6	13.2	O K
600 min	Winter	33.495	0.315	0.0	0.6	0.6	12.6	O K
720 min	Winter	33.482	0.302	0.0	0.6	0.6	12.0	O K
960 min	Winter	33.455	0.275	0.0	0.6	0.6	11.0	O K
1440 min	Winter	33.403	0.223	0.0	0.6	0.6	8.9	O K
2160 min	Winter	33.336	0.156	0.0	0.6	0.6	6.2	O K
2880 min	Winter	33.290	0.110	0.0	0.6	0.6	4.4	O K
4320 min	Winter	33.244	0.064	0.0	0.5	0.5	2.6	O K
5760 min	Winter	33.232	0.052	0.0	0.4	0.4	2.1	O K
7200 min	Winter	33.225	0.045	0.0	0.4	0.4	1.8	O K
8640 min	Winter	33.220	0.040	0.0	0.3	0.3	1.6	O K
10080 min	Winter	33.216	0.036	0.0	0.3	0.3	1.4	O K

	Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
8640 min	Summer	0.656	0.0	59.4	4416
10080 min	Summer	0.580	0.0	60.4	5144
15 min	Winter	75.632	0.0	12.5	18
30 min	Winter	49.240	0.0	16.9	33
60 min	Winter	30.654	0.0	22.4	62
120 min	Winter	18.524	0.0	27.4	120
180 min	Winter	13.652	0.0	30.5	178
240 min	Winter	10.945	0.0	32.7	236
360 min	Winter	7.998	0.0	36.0	350
480 min	Winter	6.399	0.0	38.4	458
600 min	Winter	5.379	0.0	40.4	542
720 min	Winter	4.666	0.0	42.0	564
960 min	Winter	3.726	0.0	44.6	710
1440 min	Winter	2.711	0.0	48.4	994
2160 min	Winter	1.970	0.0	53.4	1364
2880 min	Winter	1.570	0.0	56.4	1728
4320 min	Winter	1.139	0.0	60.5	2336
5760 min	Winter	0.906	0.0	63.9	3056
7200 min	Winter	0.759	0.0	66.1	3800
8640 min	Winter	0.656	0.0	67.7	4568
10080 min	Winter	0.580	0.0	69.0	5336

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
Date 18/08/2025 File	Designed by IN Checked by KBL	
XP Solutions Source Control 2015.1		

Cascade Model Details for Attenuation Tank.srcx

Storage is Online Cover Level (m) 34.780

Cellular Storage Structure

Invert Level (m) 33.180 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	42.0	42.0	0.801	0.0	66.8
0.800	42.0	66.8			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0041-7000-0800-7000
Design Head (m) 0.800
Design Flow (l/s) 0.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 41
Invert Level (m) 33.180
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

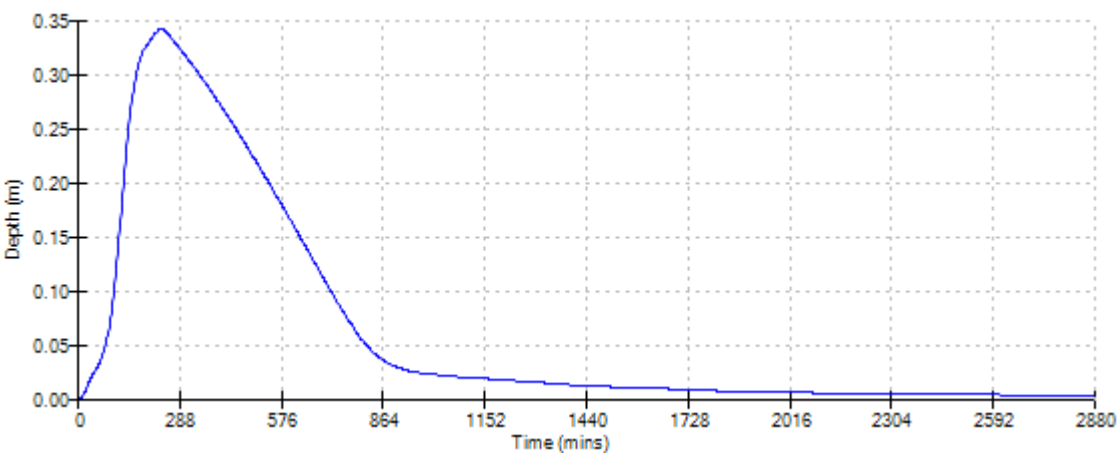
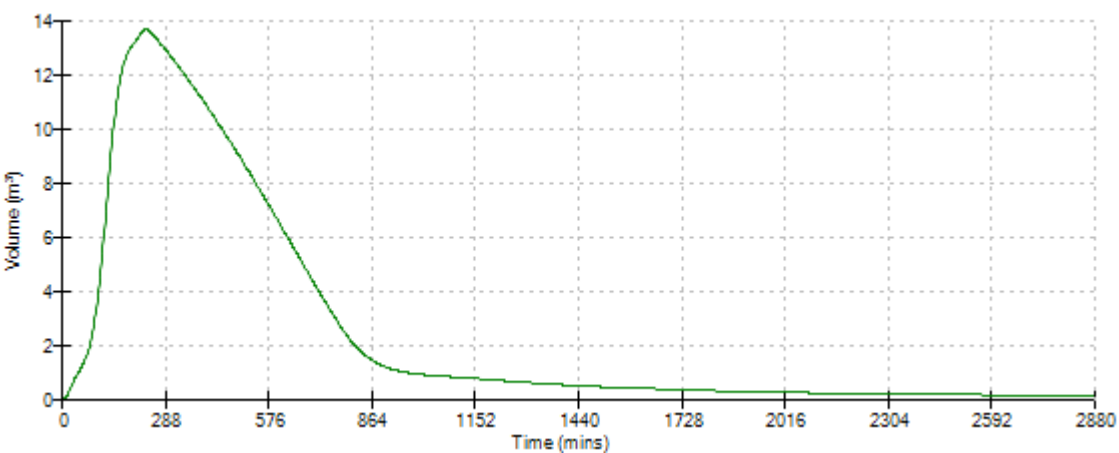
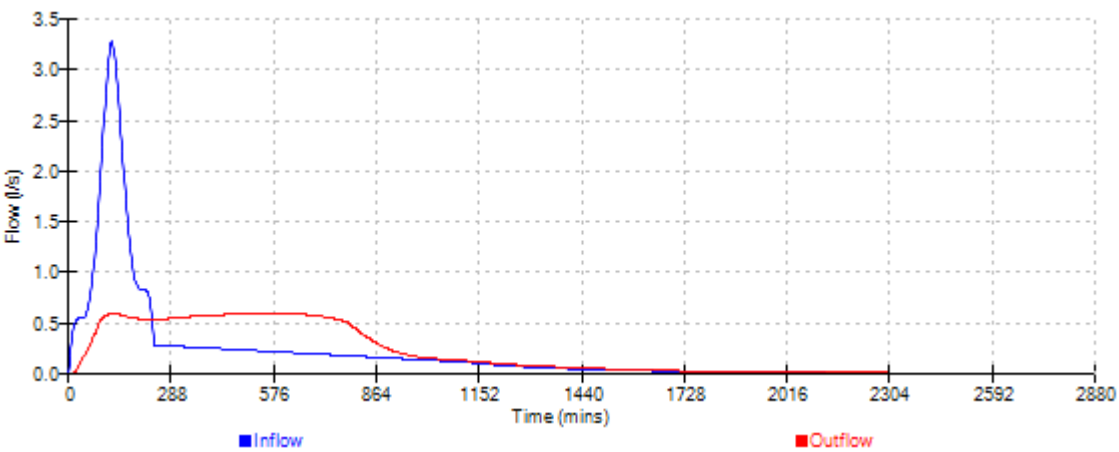
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	0.7
Flush-Flo™	0.180	0.6
Kick-Flo®	0.363	0.5
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	1.200	0.8	3.000	1.3	7.000	1.9
0.200	0.6	1.400	0.9	3.500	1.4	7.500	1.9
0.300	0.6	1.600	1.0	4.000	1.4	8.000	2.0
0.400	0.5	1.800	1.0	4.500	1.5	8.500	2.0
0.500	0.6	2.000	1.1	5.000	1.6	9.000	2.1
0.600	0.6	2.200	1.1	5.500	1.7	9.500	2.2
0.800	0.7	2.400	1.1	6.000	1.7		
1.000	0.8	2.600	1.2	6.500	1.8		

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Cascade Event: 240 min Winter for Attenuation Tank.srcx



Lanmor Consulting Ltd

Thorogood House
34 Tolworth Close
Surbition Surrey KT6 7EW

Date 18/08/2025
File

XP Solutions

Lindisfarne
Wargrave Road
Wokingham, RG10 8PE

Designed by IN
Checked by KBL

Source Control 2015.1

Page 2



Cascade Summary of Results for Permeable Paving.srcx

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
8640 min Summer	36.651	0.071	0.0	0.2	0.2	7.6	O K
10080 min Summer	36.643	0.063	0.0	0.2	0.2	6.8	O K
15 min Winter	36.654	0.074	0.0	0.2	0.2	8.0	O K
30 min Winter	36.681	0.101	0.0	0.3	0.3	10.9	O K
60 min Winter	36.708	0.128	0.0	0.3	0.3	13.9	O K
120 min Winter	36.733	0.153	0.0	0.3	0.3	16.5	Flood Risk
180 min Winter	36.745	0.165	0.0	0.3	0.3	17.8	Flood Risk
240 min Winter	36.751	0.171	0.0	0.3	0.3	18.5	Flood Risk
360 min Winter	36.756	0.176	0.0	0.3	0.3	19.0	Flood Risk
480 min Winter	36.757	0.177	0.0	0.3	0.3	19.2	Flood Risk
600 min Winter	36.756	0.176	0.0	0.3	0.3	19.0	Flood Risk
720 min Winter	36.756	0.176	0.0	0.3	0.3	19.0	Flood Risk
960 min Winter	36.753	0.173	0.0	0.3	0.3	18.7	Flood Risk
1440 min Winter	36.743	0.163	0.0	0.3	0.3	17.6	Flood Risk
2160 min Winter	36.727	0.147	0.0	0.3	0.3	15.8	O K
2880 min Winter	36.711	0.131	0.0	0.3	0.3	14.1	O K
4320 min Winter	36.684	0.104	0.0	0.3	0.3	11.3	O K
5760 min Winter	36.665	0.085	0.0	0.2	0.2	9.1	O K
7200 min Winter	36.650	0.070	0.0	0.2	0.2	7.5	O K
8640 min Winter	36.639	0.059	0.0	0.2	0.2	6.3	O K
10080 min Winter	36.630	0.050	0.0	0.2	0.2	5.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
8640 min Summer	0.803	0.0	33.1	4752
10080 min Summer	0.708	0.0	33.1	5448
15 min Winter	98.140	0.0	7.3	19
30 min Winter	64.441	0.0	10.2	33
60 min Winter	40.301	0.0	14.0	62
120 min Winter	24.345	0.0	17.3	120
180 min Winter	17.884	0.0	19.2	178
240 min Winter	14.282	0.0	20.5	236
360 min Winter	10.373	0.0	22.4	348
480 min Winter	8.266	0.0	23.9	452
600 min Winter	6.927	0.0	25.0	494
720 min Winter	5.992	0.0	25.9	564
960 min Winter	4.764	0.0	27.4	714
1440 min Winter	3.442	0.0	29.2	1022
2160 min Winter	2.483	0.0	32.4	1448
2880 min Winter	1.968	0.0	33.8	1872
4320 min Winter	1.415	0.0	35.6	2640
5760 min Winter	1.119	0.0	37.1	3400
7200 min Winter	0.933	0.0	37.8	4112
8640 min Winter	0.803	0.0	38.2	4848
10080 min Winter	0.708	0.0	38.4	5552

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
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XP Solutions Source Control 2015.1		

Cascade Rainfall Details for Permeable Paving.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.048

Time (mins)	Area
From:	To: (ha)
0	4 0.048

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
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XP Solutions Source Control 2015.1		

Cascade Model Details for Permeable Paving.srcx

Storage is Online Cover Level (m) 37.030

Porous Car Park Structure

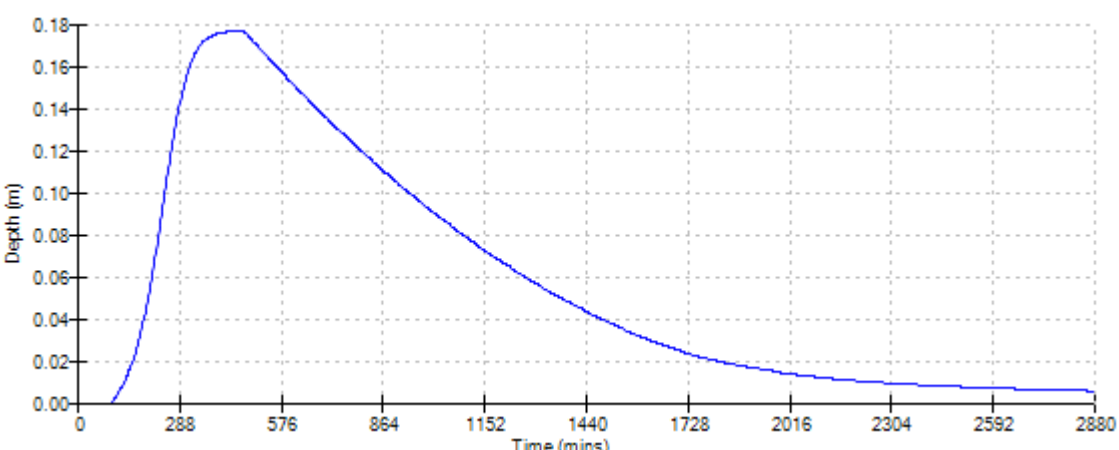
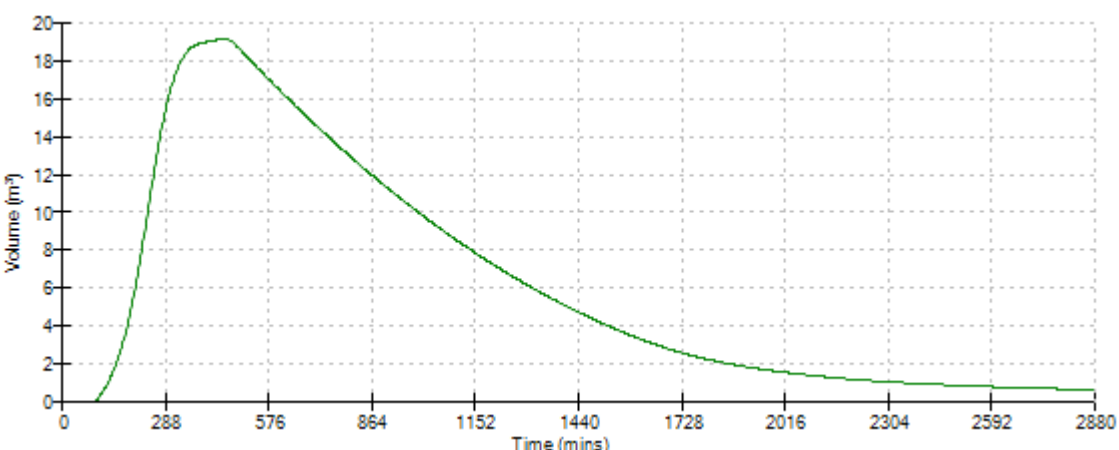
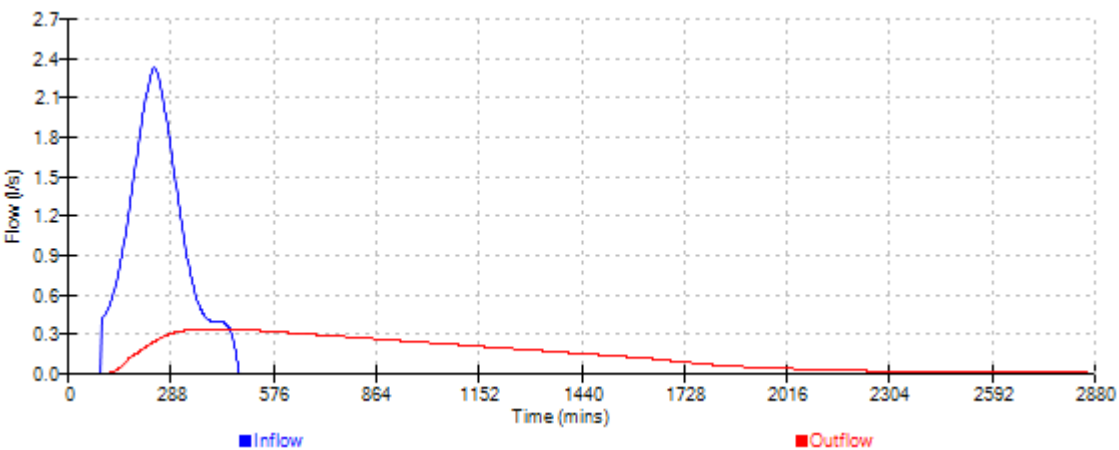
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.0
Membrane Percolation (mm/hr)	1000	Length (m)	90.0
Max Percolation (l/s)	100.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	36.580	Cap Volume Depth (m)	0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 36.580

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Cascade Event: 480 min Winter for Permeable Paving.srcx



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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE																																		
Date 18/08/2025 File	Designed by IN Checked by KBL																																		
XP Solutions Source Control 2015.1																																			
<u>Cascade Rainfall Details for Attenuation Tank.srcx</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.900</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+0</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.048 <table> <tr> <th align="left" colspan="3">Time (mins) Area</th> </tr> <tr> <th align="left">From:</th> <th align="left">To:</th> <th align="left">(ha)</th> </tr> <tr> <td>0</td> <td>4</td> <td>0.048</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.900	Shortest Storm (mins)	15	Ratio R	0.400	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins) Area			From:	To:	(ha)	0	4	0.048
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Cascade Model Details for Attenuation Tank.srcx

Storage is Online Cover Level (m) 34.780

Cellular Storage Structure

Invert Level (m) 33.180 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	42.0	42.0	0.801	0.0	66.8
0.800	42.0	66.8			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0041-7000-0800-7000
Design Head (m) 0.800
Design Flow (l/s) 0.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 41
Invert Level (m) 33.180
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

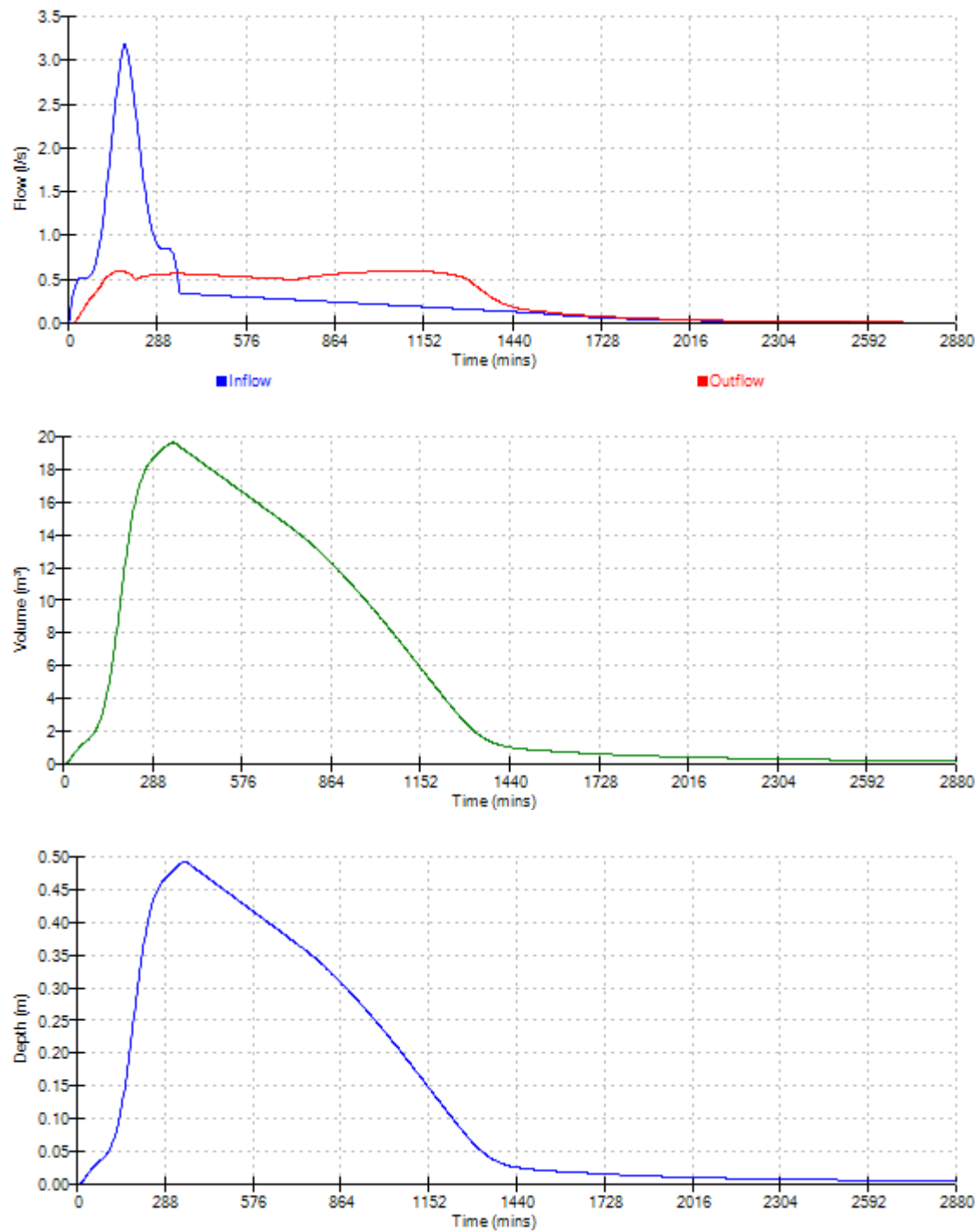
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	0.7
Flush-Flo™	0.180	0.6
Kick-Flo®	0.363	0.5
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	1.200	0.8	3.000	1.3	7.000	1.9
0.200	0.6	1.400	0.9	3.500	1.4	7.500	1.9
0.300	0.6	1.600	1.0	4.000	1.4	8.000	2.0
0.400	0.5	1.800	1.0	4.500	1.5	8.500	2.0
0.500	0.6	2.000	1.1	5.000	1.6	9.000	2.1
0.600	0.6	2.200	1.1	5.500	1.7	9.500	2.2
0.800	0.7	2.400	1.1	6.000	1.7		
1.000	0.8	2.600	1.2	6.500	1.8		

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Cascade Event: 360 min Winter for Attenuation Tank.srcx



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Cascade Rainfall Details for Permeable Paving.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.048

Time (mins)	Area
From:	To: (ha)
0	4 0.048

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Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW	Lindisfarne Wargrave Road Wokingham, RG10 8PE	
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Cascade Model Details for Permeable Paving.srcx

Storage is Online Cover Level (m) 37.030

Porous Car Park Structure

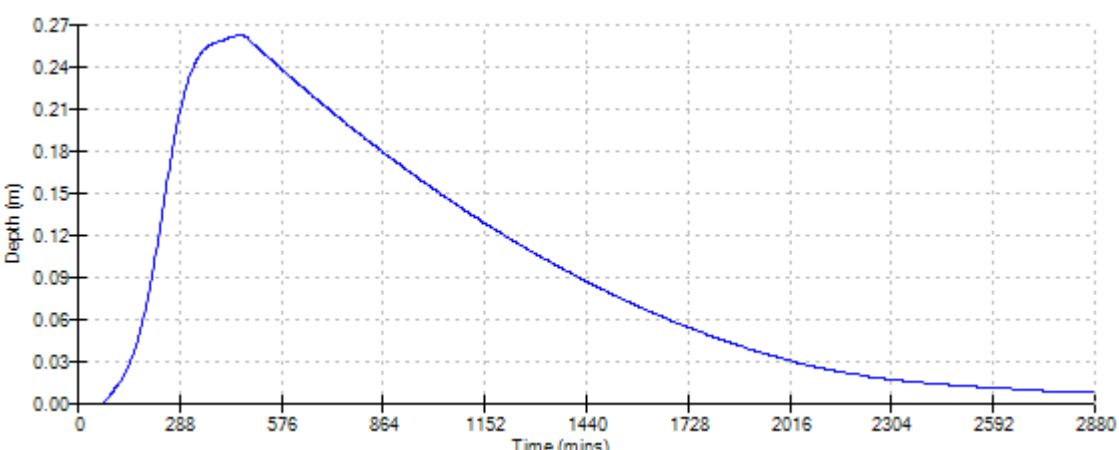
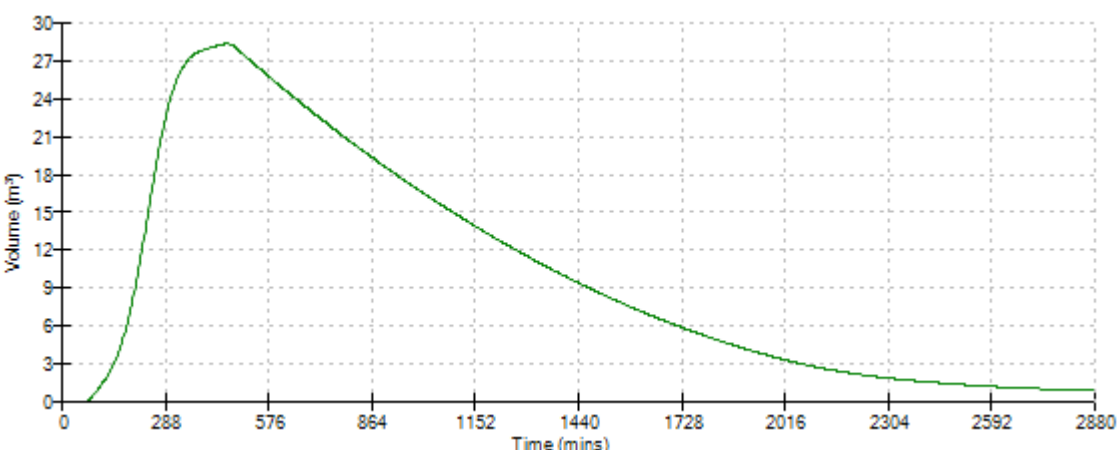
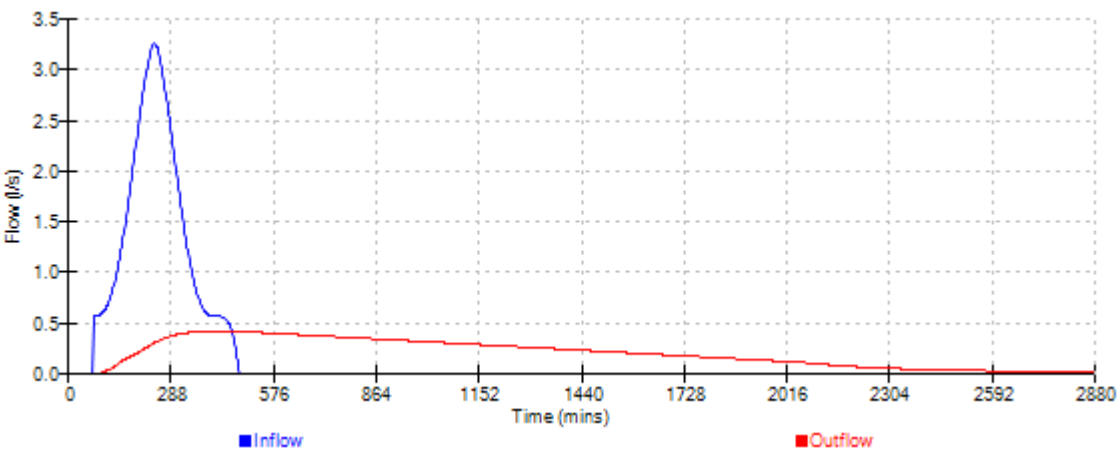
Infiltration Coefficient Base (m/hr) 0.00000	Width (m) 4.0
Membrane Percolation (mm/hr) 1000	Length (m) 90.0
Max Percolation (l/s) 100.0	Slope (1:X) 0.0
Safety Factor 2.0	Depression Storage (mm) 5
Porosity 0.30	Evaporation (mm/day) 3
Invert Level (m) 36.580	Cap Volume Depth (m) 0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 36.580

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Cascade Event: 480 min Winter for Permeable Paving.srcx



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Cascade Rainfall Details for Attenuation Tank.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.048

Time (mins)	Area
From:	To: (ha)
0	4 0.048

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Cascade Model Details for Attenuation Tank.srcx

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Invert Level (m) 33.180 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
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Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
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Hydro-Brake Optimum® Outflow Control

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Design Flow (l/s) 0.7
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 41
Invert Level (m) 33.180
Minimum Outlet Pipe Diameter (mm) 75
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	0.7
Flush-Flo™	0.180	0.6
Kick-Flo®	0.363	0.5
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	1.200	0.8	3.000	1.3	7.000	1.9
0.200	0.6	1.400	0.9	3.500	1.4	7.500	1.9
0.300	0.6	1.600	1.0	4.000	1.4	8.000	2.0
0.400	0.5	1.800	1.0	4.500	1.5	8.500	2.0
0.500	0.6	2.000	1.1	5.000	1.6	9.000	2.1
0.600	0.6	2.200	1.1	5.500	1.7	9.500	2.2
0.800	0.7	2.400	1.1	6.000	1.7		
1.000	0.8	2.600	1.2	6.500	1.8		

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Cascade Event: 600 min Winter for Attenuation Tank.srcx

