

FINAL

Netherdown (Herts) Ltd.

Phase II

Ground Investigation Report

Lordship Farm

Waterloo Lane

Holwell

Hertfordshire

SG5 3SS

Report No: 24-12-15

February 2026

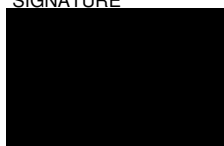
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Client Name Netherdown (Herts) Ltd.

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EXECUTIVE SUMMARY

Site Location	Lordship Farm, Waterloo Lane, Holwell, Hertfordshire, SG5 3SS.
OS Grid Reference	516338, 232922.
Development Proposals	It is understood the proposed development will include the redevelopment of the site including the refurbishment of the grade listed building at the east of the site into two residential units (unit 1 and Unit 2). The proposed development will also include the demolition of the surrounding barns followed by the construction of four residential dwellings (Units 3 – 6). The cart shed along the southern boundary of the site will be demolished followed by the construction of an internal car park. The proposed development will include private gardens, soft landscaping areas and an access road and pavements.
Published Geology	Reference to the British Geological Survey website and Sheet 221; Hitchin; 1995; indicates that the site is directly located on superficial deposits including Glaciofluvial Deposits (Undifferentiated) and Glaciolacustrine Deposits, underlain by Cretaceous bedrock known as the West Melbury Marly Chalk Formation.
Site History	Historical information indicates the site has been developed since at least the 1880s when the site is recorded as Lordship Farm comprising numerous agricultural buildings. The site has remained an agricultural land-use with agricultural barns recorded during the walkover survey.
Ground Conditions Encountered	The site is underlain by Made Ground soils of varying depth. The Made Ground soils underlying the existing courtyard were encountered the deepest down to a maximum depth of 1.80m bgl. The surrounding areas of the site were underlain by Made Ground down to a maximum depth of 0.60m bgl. The Made Ground soils were underlain by Glaciofluvial Deposits down to a proven depth of 2.60m bgl comprising variable layers of cohesive and granular soils. Granular layers were encountered as very loose to loose sand. Cohesive layers were encountered as soft, very silty, sandy, gravelly clay. Laboratory testing has proven the cohesive layers are of low shrinkability, in accordance with NHBC guidelines. The Glaciofluvial Deposits were underlain by Glaciolacustrine Deposits down to the base of the borehole in excess of 13.50m bgl. The unit comprised alternating layers of medium dense to dense silt, firm to stiff silty clay and hard grey silty clay. Laboratory tests undertaken on representative samples revealed layers of non-shrinkable soils and low shrinkage soil, in accordance with NHBC guidelines. The significant thickness of the superficial soils is interpreted to relate to a major buried channel complex deposited during the glacial period with fluctuating ice margins in the Hitchin area.
Groundwater Encountered	Groundwater was encountered as strikes at depths ranging between 1.70m and 12.80m bgl with standing water levels recorded within BH1 at depths of 3.00m bgl and 9.80m bgl. Groundwater monitoring undertaken within BH1 recorded standing groundwater levels ranging between 2.10m and 2.40m bgl.
Sulphate Attack on Underground Concrete	The following design sulphate class and aggressive chemical environment classification should be applied: Made Ground: DS-1/AC-1 Glaciofluvial Deposit: DS-1/AC-1 Glaciolacustrine Deposits: DS-4/AC-4
Foundations	Both shallow and deep foundation options have been considered as part of the proposed development, see section 6.3 for further details.
Contamination	Given the findings of the desk study, walkover survey, intrusive investigation and laboratory testing it is considered that there is a risk to end users from two marginally elevated levels of lead and arsenic proven to be hotspots. Therefore, remedial measures will be required in any proposed soft landscaping situated within the zones of impacted Made Ground soils shown on the Remedial Plan in Appendix A.
Waste Soil Classification	Currently, the waste soil on site is recommended to be classified as follows: • Made Ground (17 05 04) – Non-Hazardous • Natural Soil: 17 05 04 – Inert
Recommendations	We recommend a watching brief should be undertaken during the construction phase, and if during development any previously undiscovered contamination (including visual or olfactory evidence) is found then site management should be immediately informed and inspection by a suitably qualified person should be undertaken.

This executive summary must be read in conjunction with the full report text.

1 FACTUAL

1.1 INTRODUCTION

Geo-Integrity Ltd were commissioned by Netherdown (Herts) Ltd dated 12th of December 2024 to undertake a Phase II Ground Investigation Report for Lordship Farm, Waterloo Lane, Holwell, Hertfordshire, SG5 3SS in order to inform the design and construction of the proposed development.

This report describes desk-based searches of geological, environmental and historical information, the fieldwork and laboratory testing undertaken and provides an interpretative section of the geotechnical data from this investigation to inform the proposed development.

The site is located at National Grid Reference 516338, 232922.

The objectives of this Phase II Geotechnical Interpretative Report are: -

- To undertake a site walkover to identify any geotechnical hazards on the site.
- To gather historical, geological and environmental information.
- Briefly summarise the site development proposals and site setting.
- To describe and report the fieldwork undertaken at the site.
- To describe and report the geotechnical and chemical laboratory work undertaken on selected samples.
- To provide an interpretation of the results of this investigation with regard to the geotechnical and waste implications of the proposed development.

The investigation was performed in accordance with the general requirements of BS 5930:2015, BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork took place across three days on the 16th and 17th and 20th of January 2025.

1.2 SOURCES OF INFORMATION

The following sources of information have been used to compile this report: -

- Extracts of freely available historical Ordnance Survey (OS) maps covering the period from the 1880s to 1960s, which are presented in the Appendices.
- The British Geological Survey (BGS) and Environment Agency (EA) websites.
- A site reconnaissance visit was undertaken on the 16th of February 2025.
- Information from various internet sites on site history and environmental setting.

It should be noted that the information provided in the desk study is obtained from independent third-party sources. It is provided in good faith, but no guarantee can be provided as to its accuracy. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

1.3 DEVELOPMENT PROPOSALS

It is understood the proposed development will include the redevelopment of the site including the refurbishment of the grade listed building at the east of the site into two residential units (Unit 1 and Unit 2). The proposed development will also include the demolition of the surrounding barns followed by the construction of four residential dwellings (Units 3 – 6). The cart shed along the southern boundary of the site will be demolished followed by the construction of an internal car park. The proposed development will include private gardens, soft landscaping areas and an access road and pavements.

2 PHASE I DESK STUDY

2.1 WALKOVER SURVEY

A site walkover survey was undertaken on the 16th of February 2025. Site location and layout plans are included in Appendix A, along with a selection of photographs taken during the survey.

The site is located within a rural village named Holwell situated within the Hertfordshire countryside, north of Hitchin.

The investigation area is irregular in shape covering an area of approximately 1 acre. The site comprises of dilapidated agricultural buildings, hardstanding and some areas of soft landscaping. A steel and timber-frame cart shed is located along the southern boundary comprising a corrugated cement roof. Immediately west of the cart shed was a larger steel framed barn comprising corrugated cement cladding and roof, and a concrete floor slab with vents likely used for storing produce. The cart shed is located topographically higher than the adjacent barn with a retaining wall observed. A grade listed building is located along the eastern boundary of brick and timber construction. Extensions are located adjacent to the grade listed building to the west and north of brick, timber and steel construction with a corrugated cement roof. A central courtyard separates the cart shed from the agricultural buildings to the north. The courtyard comprises partly of concrete slabs and engineered fill. Other features noted during the walkover survey includes a water tank situated in the central courtyard, fly-tipped waste along the western boundary including

a car exhaust, scrap metal and concrete blocks, and an empty oil barrel immediately east of the cart shed.

The site was bounded by heras fencing and surrounded by undeveloped fields to the north-west and south and a stately home to the east.

The topography of the site is generally flat lying, however the barn at the south-west corner of the site was topographically lower than the remaining site area as shown on the site photographs. It is considered engineered fill is present underlying the cart shed and courtyard.

The walkover survey recorded no mature trees or bushes on site, however mature trees were located adjacent to the eastern boundary within the grounds of the adjacent residence.

The walkover survey was undertaken to identify potential sources of contamination. The walkover survey identified the likelihood of Made Ground soils including areas of hardstanding and potential engineered fill underlying the courtyard and cart shed. Given the unknown origin of Made Ground soils they may contain a range of contaminants dependent on the source, these may include heavy metals, hydrocarbons and may potentially contain asbestos.

The existing agricultural buildings comprise corrugated cement roofs which may be asbestos containing material. Therefore, there is a potential risk of asbestos.

In addition, an empty oil barrel was located in the south-east corner of the site which could be a potential source of hydrocarbons. Given the previous land-use has been agricultural, it is possible machinery and fuel/oil was stored on site which may have leaked hydrocarbons into the underlying soils.

2.2 GEOLOGY

2.2.1 Published Geology

Reference to the British Geological Survey website and Sheet 221; Hitchin; 1995; indicates that the site is directly located on superficial deposits including Glaciofluvial Deposits (Undifferentiated) and Glaciolacustrine Deposits, underlain by Cretaceous bedrock known as the West Melbury Marly Chalk Formation.

The investigation area is located in close proximity to surrounding superficial deposits including Head Deposits 40m south-west of the site and Glacial Till located 80m east of the site.

The margin of a buried (superficial deposit-filled) valley is located 130m east of the site with the buried valley trending north-south along the River Purnell.

March 2025

Report No: 24-12-15

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Information obtained from a paper referenced “*Middle Pleistocene glacigenic sediments at Holwell, Hertfordshire: a record of a fluctuating Anglian ice margin*” indicates the Anglian glacigenic sediments exposed at Holwell Quarry (located <500m south of the site) comprise the top of a much thicker succession of drift filling the north-west flank of a major buried channel complex in the Hitchin and Stevenage Gap. Therefore, thick sequences of glacial deposits are expected to underlie the investigation area. The previous paper records variable lithofacies including glaciofluvial outwash (i.e. sands and gravels), and laminated diamiction (i.e. clays and silts with suspended gravels).

2.2.2 Superficial Deposits

Head Deposits are generally described by the BGS as a poorly sorted and poorly stratified, angular rock debris and/or clayey-hillwash deposited by solifluction, generally comprising unsorted gravel, sand and clay with lenses of silt clay or peat. The thickness of this material is typically encountered less than 1m in thickness, however it is not likely to be present underlying the site.

Glaciofluvial Deposits are generally described by the BGS as a sand and gravel deposited by meltwater streams and therefore predominantly comprise mostly coarse-grained sediments with some finer-grained layers. The thickness of this material is typically encountered between 1m and 5m, dependent on the depositional environment. Given the proximity to the buried channel glacial deposits may however be substantially thicker.

Glaciolacustrine Deposits are generally described by the BGS as deposits laid down in glacial lakes composed of coarse-grained bedload and suspended fine-grained material transported by meltwater flowing into lakes bordering the glacier. Deposits include sands, silts and clays locally rich in organic matter. Given the proximity to the buried channel glacial deposits may however be substantially thicker.

Glacial Till is generally described by the BGS as an unsorted, unstratified drift, generally over consolidated, glacial deposit. It generally consists of a heterogeneous mixture of clay, sand and gravel with boulders which can vary in size and shape. The thickness can be variable between 1m and 5m in the site area. Given the proximity to the buried channel glacial deposits may however be substantially thicker.

2.2.3 Bedrock

The **West Melbury Marly Chalk Formation** is generally described by the BGS as an off-white to pale brown fine to medium-grained limestone. The thickness in the site area is typically between

45m and 80m. However, given the proximity to the buried channel it is likely that the thickness is significantly reduced.

The **Gault Formation** is generally described by the BGS as pale to dark grey, blue-grey clay, glauconitic in part, with a sandy base. The typical thickness in the site area is between 48m and 75m.

2.2.4 Historical Borehole Data

The British Geological Survey holds records of exploratory holes, historically put down across the United Kingdom during historical investigation. There are no nearby historical boreholes recorded within similar geology.

2.2.5 Solution Features

Chalk, as a calcium-carbonate rich rock, is highly susceptible to dissolution by water containing carbon dioxide. This dissolution can create three common types of features within the chalk, grouped together under the generic term 'dissolution features'. These features include:

- *Sinkholes*: Depressions at the ground surface caused by the collapse of overlying chalk or superficial deposits into underground voids created by dissolution. Shape and size dependent on underlying void feature
- *Solution pipes*: A feature in the surface of the Chalk caused by increased dissolution in an area of closely spaced discontinuities. These features may, or may not, have a ground surface expression. Up to 20 metres in diameter, though commonly much smaller
- *Swallow Holes*: A void within the surface of the Chalk where a stream is 'swallowed' by the Chalk to flow underground. Often occur at the junction of impermeable strata and Chalk. Infilled ancient swallow holes do exist where streams used to flow and may not have any surface expression. Up to 14m in diameter, though commonly a few metres.

2.2.6 Natural Cavities Risk Assessment

A natural cavities risk assessment has been undertaken following the paper written by Clive Edmonds in 2001, "Predicting natural cavities in chalk". This gives a score to various factors including type of chalk, topography, groundwater level, strata overlying the chalk, and periglacial and glacial history. The score for this site was 75, which means there is predicted to be a very low subsidence hazard (with a 0.5% occurrence).

Therefore, it is considered unlikely the proposed development will be affected by solution features given the significant thickness of the overlying superficial soils and the very low subsidence risk posed by the underlying Grey Chalk Subgroup.

2.3 HISTORY OF THE SITE

The history of the site has been established by the review of old freely available historical Ordnance Survey (OS) maps going back to between the 1830s and 1880s up to the 1960s.

2.3.1 Historical OS Maps

Historical OS maps dated between 1888 and 1915 shows the site is located at the southern end of the village of Holwell and comprises a number of agricultural buildings forming the Lordship Farm. The site is surrounded by undeveloped fields on all sides, Holwell to the north comprising residential dwellings, a church and school. Maps also show two gravel pits <200m south of the site and an old chalk pit located 400m south-west of the site.

Maps dated between 1937 and 1965 show some changes to the site with the removal of agricultural buildings. There are no significant changes recorded to the surrounding area.

2.3.2 Freely Available Satellite Imagery

Freely available satellite imagery records the site from 2002 to 2025. Satellite imagery shows the site comprises a similar layout to that seen during the walkover survey and reviewed historical maps. No significant changes are noted between 2002 and 2025.

2.4 UNEXPLODED ORDNANCE AND BOMB SITES

Reference to the site-specific unexploded bomb risk map (UXO) produced by Zetica indicates that the site is located in an area where there is a low risk of unexploded ordnance. Low-risk regions are those with a bombing density of up to 15 bombs per 1000 acres or less.

Care is however required when assessing the risk for specific sites where the risk may be higher because of local wartime activity, such as munitions factories, pivotal infrastructure, airfields, and dummy airfields, many of which were removed from historical maps in the interest of national security.

2.5 HYDROLOGY

The nearest surface water is recorded as a moat located <200m south-west of the site. Immediately north of the moat a tributary stream flows north-east into the River Purnell.

2.6 HYDROGEOLOGY

Reference to the Environment Agency website indicates that the site is located on the following Aquifers:

- Secondary A Aquifer - associated with the Glaciofluvial Deposits and Glaciolacustrine Deposits
- Secondary Undifferentiated Aquifer – associated with the Glacial Till
- Principal Aquifer - associated with the underlying West Melbury Marly Chalk Formation
- Unproductive Strata – associated with the underlying Gault Formation

The aquifer designation data is based on geological mapping provided by the British Geological Survey. The maps are divided into two different types of aquifer designation:

Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sand and gravels.

Bedrock - solid permeable formations e.g., sandstone, chalk and limestone.

For each type, there are four designations: - Principal, Secondary A, Secondary B and Unproductive Strata, ranked by importance.

The site is located outside of any source protection zones.

A Source Protection Zone (SPZ) is a designated area around a well or abstraction borehole.

2.7 WASTE TREATMENT AND LANDFILL SITES

2.7.1 Landfills

There is one historical landfill site recorded within 500m of the site. The historic landfill is located 450m south-east of the site named Pit at Holwell, first inputted in 1959 and last inputted in 1980, operated by Hitchin Rural Council. This pit is related to the Holwell Quarry discussed in section 2.2.1.

There is also one record of an authorised landfill within 500m of the site. The authorised landfill is located 440m south of the site named Bedford Road, the license was issued in 2016, accepting inert waste and operated by Biffa Waste Services Ltd.

2.8 HISTORICAL SITE USAGE

Historical information indicates the site has been undeveloped since at least the 1880s when the site is recorded as Lordship Farm comprising numerous agricultural buildings. The site has remained an agricultural land-use with agricultural barns recorded during the walkover survey.

2.9 WORKED OUT GROUND/MADE GROUND

The BGS information indicates there are two areas of Infilled Ground located 460m and 1000m south of the site. In addition, the walkover survey indicated the likelihood of engineered fill underlying the courtyard and cart shed.

The historical OS maps also identified two gravel pits <200m south of the site and an old chalk pit located 400m south-west of the site.

2.10 GROUND GASES

2.10.1 Radon

Information obtained from the BGS and the National Geoscience Information Service indicates that the site lies within an area where less than 1% of homes exceed the action level of 200Bq/m³ for radon gas. Therefore, no radon protection measures will be required in the construction of new dwellings.

2.10.2 Landfill Gases

In accordance with BS8576:2013, the site has been provisionally assessed for the risk of ground gases. This has been done with reference to “A pragmatic approach to ground gas risk assessment for the 21st Century” Card and Wilson, 2011.

- A credible source or pathway for landfill gas migration from two off-site landfills has been identified situated within 500m of the site.
- The site has not been a registered landfill.
- The Made Ground is not expected to be 5m deep or an average of 3m in thickness. However, Made Ground soils should be expected underlying the courtyard and the cart shed
- The site is recorded to be directly located on a carbonate rich rock that can produce only low levels of carbon dioxide.
- Radon protection measures are not recommended for this site.

- The site does not significantly lie on a potential naturally organic soil or humic or degradable Made Ground soil.

As such, it is considered that there is a potential risk of ground gases at this site associated with off-site landfills. The landfills are located a significant distance away from the site >400m, however landfill gas can travel significant distances in certain geologies. Given the site and surrounding area is underlain by glacial deposits known to comprise variable layers of both cohesive and granular soils there is a risk landfill gas could permeate through granular layers. Therefore, it is recommended gas monitoring is undertaken to determine the gas regime.

2.11 POTENTIAL GEOTECHNICAL HAZARDS

Published geological records indicate the site is underlain by a thick succession of glacial deposits comprising layers of glaciofluvial outwash sand and gravels and glaciolacustrine deposits comprising layers of finer grained material. The thick succession of glacial sediment is likely underlain by the West Melbury Marly Chalk Formation, underlain by the Gault Formation.

The information gathered from the BGS indicates the site is likely underlain by both Glaciofluvial Deposits and Glaciolacustrine Deposits which may comprise layers of cohesive soils. Therefore, the effects of any trees or hedgerows, within desiccation influencing distance of the development (as described in the NHBC Standards, Chapter 4.2), should also be considered during design and construction. Where such vegetation is within influence of new buildings, then foundations will need to extend to depths where soils are moisture/volume stable and appropriate precautionary foundation and floor slab design measures adopted in accordance with the NHBC Building Near Trees protocol.

The granular layers within glacial deposits can allow significant perched water levels which may cause instability when excavated also known as running sand.

In addition, given the heterogeneous nature of the superficial soils foundations crossing both granular and cohesive soils may encounter differential settlement and therefore may require suitable reinforcing.

3 INITIAL GEO-ENVIRONMENTAL CONCEPTUAL SITE MODEL

In accordance with the Environment Agency guidance LCRM *Land Contamination: Risk Management*, (EA, 2019) this desk study and site reconnaissance report constitutes a preliminary risk assessment in order to establish the potential presence of pollutant linkages. The diagram below illustrates the potential linkages.

Historical information indicates the site has been developed since at least the 1880s when the site is recorded as Lordship Farm comprising numerous agricultural buildings. The site has remained an agricultural land-use with agricultural barns recorded during the walkover survey.

The walkover survey identified the likelihood of Made Ground soils including areas of hardstanding and potential engineered fill underlying the courtyard and cart shed. Given the unknown origin of Made Ground soils they may contain a range of contaminants dependent on the source, these may include heavy metals, hydrocarbons and may potentially contain asbestos.

The existing agricultural buildings comprise corrugated cement roofs which may be asbestos containing material. Therefore, there is a potential risk of asbestos.

In addition, an empty oil barrel was located in the south-east corner of the site which could be a potential source of hydrocarbons. Given the previous land-use has been entirely agricultural, it is possible machinery and fuel/oil was stored on site which may have leaked hydrocarbons into the underlying soils.

The desk study information also identified two off-site landfills located <500m south of the site which are considered potential sources of ground gas.

Therefore, currently, it is considered that the following potential source/pathway/receptors may be present at and around the site;

Potential Source	Potential Pathway	Potential Receptor	Considered Risk
Historic agricultural land-use including agricultural buildings, storing of machinery, fuel/oil, introduction of Made Ground soils (Potential contaminants including heavy metals, hydrocarbons and asbestos)	Ingestion, inhalation, or absorption from direct contact with soil.	End Users	Low to Moderate Risk
	Leaching through the ground	Controlled Waters	Low to Moderate Risk
	Possible contact during the work phase	Construction Workers	Low to Moderate Risk
Corrugated cement sheets (possible ACM)	Inhalation	End User and Construction Workers	Moderate Risk
Ground Gas from off-site landfills	Inhalation	End Users	Low to Moderate Risk
Surrounding land-uses (undeveloped fields, residential dwelling, gravel pits)	Leaching through the ground	Controlled Waters	Low Risk
	Ingestion, inhalation, or absorption from direct contact with soil	End User	Low Risk
	Possible contact during the work phase	Construction Workers	Low Risk

4 PHASE II INTRUSIVE INVESTIGATION

4.1 SITE WORK AND SAMPLING STRATEGY

The fieldwork was undertaken in accordance with BS 5930:2015, BS EN 1997-2 (2007) and BS EN ISO 22475-1 (2006), with the exploratory locations being selected by the client. The exploratory hole locations can be seen in the Appendices.

The fieldwork was undertaken across three days on the 16th, 17th and 20th of January 2024 and consisted of one deep cable percussive borehole (BH1), four machine-excavated soakaway pits (SA1 – SA4), five machine excavated trial pits (TP1 – TP5), six TRL DCP (equivalent CBR) Tests (CBR1 – CBR6). Trial pits and soakaway pits were excavated using a JCB 3CX and a mobile water bowser was used for undertaking infiltration tests in accordance with BRE365 guidelines.

Exploratory Hole	Location Reasoning
BH1	To understand the deep ground conditions, collect samples, and aid piled foundation design. To install a standpipe for gas monitoring to assess the sites gas regime
SA1 – SA4	To undertake infiltration tests to BRE365 guidelines to understand the drainage properties of the underlying soils.
TP1 – TP5	To provide a suitable coverage of the site and target potential sources of contamination identified within the desk study, to log the near surface ground conditions and collect samples to aid foundation design and a geo-environmental assessment
CBR1 – CBR6	To obtain design CBR values to aid road/pavement design

Disturbed samples were taken at selected depths down to the base of the exploratory holes for subsequent laboratory testing and inspection. On completion, all exploratory holes were carefully

backfilled with arisings in thin layers, ensuring that the excavated material was replaced in the same order as it had been removed.

4.2 GROUND CONDITIONS

4.2.1 Summary

The site and laboratory test work revealed that the general succession of strata can be represented by Made Ground and Topsoil, overlying the Glaciofluvial Deposits, overlying Glaciolacustrine Deposits. Descriptions of the strata encountered are given on the exploratory hole records and are summarised below. Further information is provided on the exploratory hole logs within the Appendices.

4.2.2 Made Ground

Encountered within each of the exploratory holes except SA2 from ground level down to depths ranging between 0.30m (118.83mOD) and 1.80m bgl. The material was highly variable both laterally and vertically across the site.

Within the courtyard area the exploratory holes TP1, BH1, TP5 and SA1 recorded the deepest Made Ground soils down to depths ranging between 0.80m and 1.80m bgl encountered as layers of loose, brown, red, black, clayey, silty gravel, concrete fill (concrete boulders), and soft green, brown, black, slightly organic, silty gravelly clay. Gravels were encountered as fine to coarse, brick, concrete, metal, flint, chalk and ash.

The remaining exploratory holes generally encountered loose, dark brown, organic, slightly gravelly silt down to shallow depths ranging between 0.30m and 0.60m bgl. Gravels were encountered as predominantly fine to coarse chalk and flint with rare brick.

4.2.3 Topsoil

Encountered locally within SA2 from ground level down to a depth of 0.35m bgl. The material was encountered as loose, dark brown, clayey organic silt.

4.2.4 Glaciofluvial Deposit

Encountered within each of the exploratory holes from depths ranging between 0.30m and 1.80m bgl down to a proven depth of 2.60m bgl (within BH1). The material was variable comprising layers of loose, brown, clayey, silty sand and soft to firm, brown, very silty, sandy slightly gravelly clay. Gravels were encountered as fine to coarse flint and chalk.

Laboratory tests undertaken on representative cohesive samples revealed a moisture content range of 24% to 26% and a modified plasticity index of 11% to 13% indicating a low shrinkable soil in accordance with NHBC guidelines.

Laboratory tests undertaken on representative granular samples revealed a moisture content range of 24% to 26% and a modified plasticity index of 9% indicating a non-shrinkable soil in accordance with NHBC guidelines.

Particle size distribution tests undertaken on representative granular samples recorded the following grain size percentages: Fines: - 17% - 65%; Sand: - 33% to 50%; Gravel: - 3% to 36%. The results indicate a significant proportion of fine-grained material and given the Atterberg tests undertaken on representative granular soils recorded <10% plasticity index the finer grained material is likely dominated by silt within these granular layers.

A single SPT test was undertaken within this material within BH1 recording an N value of 10.

4.2.5 Glaciolacustrine Deposits

Encountered within BH1 underlying the Glaciofluvial Deposit at a depth of 2.60m down to the base of the boreholes in excess of 13.50m bgl. The unit comprised alternating layers of medium dense to dense silt, firm to stiff silty clay and hard grey silty clay.

Laboratory tests undertaken on representative samples revealed a moisture content range of 21% to 25% and a modified plasticity index of 6% to 16% indicating layers of non-shrinkable soils and low shrinkage soil, in accordance with NHBC guidelines.

SPT tests undertaken within this material recorded 'N' values ranging between 16 and >50, increasing with depth.

4.2.6 Sulphate and pH Tests

Water soluble sulphate and pH tests were carried out on one sample of Made Ground taken at a depth of 0.30m bgl, one sample recovered from the Glaciofluvial Deposit at a depth of 2.00m bgl, and three samples from the Glaciolacustrine Deposits at depths ranging between 4.90m and 12.50m bgl. The samples retrieved from the Glaciolacustrine Deposit were also tested for acid soluble sulphate and total sulphur. These recorded values as shown in the table below:

Parameter	Range
Soluble Sulphate (mg/l)	54 - 450
pH Units	8.2 – 9.6
Acid Soluble Sulphate	0.06 – 0.22
Total Sulphur	0.14 – 0.89

4.2.7 Groundwater

Groundwater was encountered within four exploratory holes including BH1, SA2, TP2, and TP5. Water strikes were encountered at depths ranging between 1.70m and 12.80m bgl with standing water levels recorded within BH1 at depths of 3.00m bgl and 9.80m bgl.

Groundwater monitoring was undertaken on four occasions between 22/01/2025 and 11/02/2025 within BH1 and recorded standing groundwater levels ranging between 2.10m and 2.40m bgl.

4.2.8 California Bearing Ratio Tests

Six TRL DCP (equivalent CBR) tests (CBR1 – CBR2) were undertaken from depths ranging between 0.40m and 0.70m bgl within the near surface soils comprising Made Ground and Glaciofluvial Deposits. CBR values ranged between 5% and 63%.

4.2.9 Gas Monitoring

Four gas monitoring visits were undertaken between 22/01/2025 and 11/02/2025 within the standpipe installed within BH1. Methane was recorded below detection limits in all visits; carbon dioxide was recorded at a maximum concentration of 0.5% with an oxygen level of 12.9%. Peak flow was recorded at 2.9l/h and atmospheric pressure was recorded between 975mb to 1031mb.

4.2.10 Infiltration Testing

Infiltration testing was carried out in four locations across the site (SA1 – SA4).

- SA1 was excavated down to a depth of 1.48m bgl within the granular soils of the Glaciofluvial Deposit situated within the existing courtyard.
- SA2 as excavated down to a depth of 1.80m bgl within the cohesive soils of the Glaciofluvial Deposit situated along the western boundary.

- SA3 was excavated down to a depth of 0.74m bgl within the cohesive soils of the Glaciofluvial Deposit situated along the western boundary.
- SA4 was excavated down to a depth of 1.48m bgl within the granular soils of the Glaciofluvial Deposit situated at the north-east corner of the site.

The general methods set out in BRE 365 Digest were followed. The infiltration rates are provided in the table below. The graphs are shown in Appendix B.

Trial Pit	Infiltration Rates (m/s)			
	Test 1	Test 2	Test 3	Average
SA1	2.07×10^{-5}	2.11×10^{-5}	2.04×10^{-5}	2.07×10^{-5}
SA2	Insufficient drop in water level	-	-	-
SA3	Insufficient drop in water level	-	-	-
SA4	2.51×10^{-5}	3.23×10^{-5}	3.01×10^{-5}	2.91×10^{-5}

5 GEO-ENVIRONMENTAL TESTING

Geo-environmental laboratory testing was scheduled by Geo-Integrity on five soil samples recovered during the fieldwork. The testing was carried out at an MCERTS and UKAS-accredited laboratory. The results are presented in the Appendices.

Five soil samples were tested for a varied suite containing the following

- Metals and inorganic substances
- Speciated Polyaromatic Hydrocarbons (PAH)
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Total Petroleum Hydrocarbons (TPH), with eight band split
- The four Made Ground samples were tested for the presence of asbestos

In addition, a representative sample of Made Ground taken at depths ranging between 1.00m and 1.50m bgl was tested for a suite of hydrocarbons, volatile organic compounds (VOCs), and Semi-volatile organic compounds (SVOCs) as part of the UKWIR Suite to assess whether barrier pipe is required for underground water pipes.

WAC testing was also undertaken on a representative Made Ground sample recovered from TP1 for waste classification of the underlying soils.

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6 GEOTECHNICAL INTERPRETIVE SECTION

6.1 GENERAL GROUND CONDITIONS INTERPRETATION

The exploratory fieldwork undertaken during this investigation has identified the site is underlain by Made Ground soils of varying depth. The Made Ground soils underlying the existing courtyard were encountered the deepest down to a maximum depth of 1.80m bgl. These soils comprised of crushed brick and concrete gravel with boulders of concrete. The surrounding areas of the site were underlain by a much thinner layer of Made Ground down to a maximum depth of 0.60m bgl comprising clayey, gravelly silt.

The Made Ground soils were underlain by Glaciofluvial Deposits down to a proven depth of 2.60m bgl comprising variable layers of cohesive and granular soils. Granular layers were encountered as very loose to loose sand. Cohesive layers were encountered as soft, very silty, sandy, gravelly clay. Laboratory testing has proven the cohesive layers are of low shrinkability, in accordance with NHBC guidelines. The Glaciofluvial Deposits were variable across the site, however dominated by silt and sand with local layers of soft clay. Whilst excavating the granular layers of the Glaciofluvial Deposits they appeared to be loose, unconsolidated and locally saturated with running sand observed within TP2. Laboratory testing has proven this material is non-shrinkable, however with a significantly high percentage of fine-grained soils (i.e. clay and silt). Given the plasticity results were recorded to be below 10% (i.e. non-shrinkable) it is considered the fines proportion is dominated by silt.

The Glaciofluvial Deposits were underlain by Glaciolacustrine Deposits down to the base of the borehole in excess of 13.50m bgl. The unit comprised alternating layers of medium dense to dense silt, firm to stiff silty clay and hard grey silty clay. Laboratory tests undertaken on representative samples revealed layers of non-shrinkable soils and low shrinkage soil, in accordance with NHBC guidelines.

The significant thickness of the superficial soils is interpreted to relate to a major buried channel complex deposited during the glacial period with fluctuating ice margins in the Hitchin area.

Groundwater was encountered as strikes at depths ranging between 1.70m and 12.80m bgl with standing water levels recorded within BH1 at depths of 3.00m bgl and 9.80m bgl. Groundwater monitoring was undertaken on four occasions between 22/01/2025 and 11/02/2025 within BH1 and recorded standing groundwater levels ranging between 2.10m and 2.40m bgl.

Given there are local layers of low shrinkable cohesive soils associated with the near surface Glaciofluvial Deposits beneath the site, the effects of any trees or hedgerows within desiccation influencing distance of the development (as described in the NHBC Standards, Chapter 4.2) should also be considered during design and construction. Where such vegetation is within influence of new buildings, then foundations will need to extend to depths where soils are moisture/volume stable and appropriate precautionary foundation and floor slab design measures adopted in accordance with the NHBC Building Near Trees protocol. The laboratory testing undertaken as part of this investigation recorded no evidence of desiccated soil with moisture contents generally above the index properties (PL+2% and LLx0.4), in line with the method of assessing desiccation proposed by Richard Driscoll (Driscoll R. (1983) "Influence of Vegetation on Clay Soils" Geotechnique. Vol. 33).

6.2 EXCAVATIONS

Conventional plant should be sufficient for the excavation of the underlying soils at the site. However, given the granular nature of the near surface soils combined with the shallow groundwater levels excavations are likely to be unstable in the short term. Running sand was encountered within TP2 at a depth of 1.80m bgl and trial pit collapse was recorded at 1.00m bgl.

Shoring should be made available for excavations, and it is important to remember that entry into excavations is strictly prohibited without it. It is considered excavating below 1.00m bgl will be problematic locally across the site due to the loose nature of the superficial soils and shallow groundwater levels which may affect the proposed foundation design.

In the areas where the existing buildings will be demolished, foundations will need grubbing out during the construction phase. In addition, the Made Ground soils underlying the courtyard comprised significant obstructions including boulders of concrete fill which may require specialist breaking equipment to remove.

6.3 FOUNDATIONS

The proposed development will include the construction of five residential units (Units 2-6) and the restoration of an existing grade listed building (Unit 1). Given the ground conditions encountered during this investigation, it is considered excavating shallow foundations may be problematic due to the loose, unconsolidated nature of the near surface granular soils combined with shallow groundwater levels. It should be understood that trenches excavated below 1.00m bgl may be unstable in the short term with running sand and collapsing soils encountered within TP2. TP2 was

located at the south-west corner of the site and topographically the lowest point, and as a result the groundwater was recorded at a shallower depth, compared to the rest of the site. As such, it is considered that the unstable nature of these soils is likely a direct result of the shallow groundwater levels in this area. Trial pits were generally stable down to 1.50m to 2.00m bgl elsewhere across the site.

6.3.1 Shallow Strip Foundations

The Made Ground and Topsoil are considered unsuitable as a bearing stratum due to their variability, and potential for unacceptable total and differential settlement under applied foundation loadings.

Shallow foundations within the Glaciofluvial Deposit at a depth of 1.00m bgl or 0.20m into the stratum, whichever is the deeper (may be as deep as 2.00m bgl given the locally thick Made Ground soils) may be suitable. At this depth, an estimation of the net allowable bearing pressure is considered to be 70kPa which could be adopted for foundations not exceeding 1m in width. This allows for a factor of safety of three against shear failure and for settlements generally not to exceed 25mm taking place over a number of years.

Settlement calculations were based on a soft low shrinkage soil (locally encountered within the near surface Glaciofluvial Deposits) down to depths in excess of 2.70m bgl as seen within TP5. Given the glacial soils have been proven to vary laterally and vertically, it is not practical to assume an entirely non-shrinkable soil exists down to the base of the zone of influence of shallow foundations.

Foundations should be suitably reinforced to combat differential settlement given the fact that foundations will cross both cohesive and granular soils.

6.3.2 Piled Foundations

Piles would extend through the Made Ground/Topsoil, and soft/loose upper soils of the Glaciofluvial Deposits and terminate within the underlying Glaciolacustrine Deposits.

The advice of specialist piling contractors should be sought to formulate a suitable piling technique and type for the ground conditions encountered at this site, before commencement of the works. The following comments regarding pile design are therefore for general guidance only.

It is anticipated that a bored, cast in situ or driven pile systems are appropriate on this site given the ground conditions. Consideration will need to be given as the vibrations from driven piles could

negatively impact adjacent structures and the fact that boulders of concrete were locally encountered within the Made Ground soils. Due to the presence of shallow groundwater, volumes of concrete must be accurately measured as necking may occur, and the pile should be cased during boring to aid in preventing groundwater influence.

The working loads below are an estimation based on bored piles, and have been based on the skin friction and base resistance within the competent soils of the Glaciolacustrine Deposits below 3m bgl. The resistance from the Made Ground and soft/loose soils of the Glaciofluvial Deposits were removed as part of the calculations. An overall FoS of 3 has been applied.

Depth of pile (m bgl)	Assumed founding stratum	Working load (kN) for piles of the following diameters	
		Pile diameter 300 mm	Pile diameter 450 mm
5.00	Glaciolacustrine Deposits	45	80
7.50	Glaciolacustrine Deposits	110	185
10.00	Glaciolacustrine Deposits	160	250

6.4 FLOOR SLAB DESIGN

Floor slabs would need to be suspended on the site, due to locally deepened Made Ground, very soft/loose natural soils being present at near surface and due to piles likely being utilised. The advice of the NHBC Standards should be followed.

6.5 SULPHATE ATTACK ON UNDERGROUND CONCRETE

Water soluble sulphate and pH tests were carried out on one sample of Made Ground, one sample recovered from the Glaciofluvial Deposit, and three samples from the Glaciolacustrine Deposit to indicate the aggressivity of the ground in relation to buried concrete, as set out in the Building Research Establishment (BRE) Special Digest 1 (2005) Concrete in Aggressive Ground, Part 1: Assessing the aggressive chemical environment.

Therefore, in accordance with the BRE Special Digest, these results have been given in the table below, in relation to strata type and required Design Sulphate Class and site Aggressive Chemical Environment Classification (ACEC).

Strata	Design Sulphate Class	Aggressive Chemical Environment Classification
Made Ground	DS-1	AC-1
Glaciofluvial Deposits	DS-1	AC-1
Glaciolacustrine Deposits	DS-4	AC-4

The classification of DS-4 and AC-4 has been restricted from a classification of DS-5/AC-5 respectively in accordance with Fig-C5 of the BRE Special Digest.

6.6 ACCESS ROADS AND PARKING

TRL DCP (Equivalent CBR) tests were undertaken within the near surface soils in areas of the proposed driveway and revealed an equivalent CBR value ranging between 5% and 63%.

Made Ground has been proven across the site, and given the unknown origin of the soil, its variability and the likelihood and proven possibility for soft spots, we recommend that any areas of soft or deleterious material should be excavated, replaced with a properly compacted coarse-grained fill and proof rolled prior to construction. In addition, to avoid uneven and excessive settlement in hard-standing areas it is recommended that the following precautions are taken: -

- Heavy proof-rolling of the exposed sub-grade strata
- Excavation of soft spots encountered and replacement with well compacted granular material
- The usage of a geo-textile separator layer above the sub-grade
- A 5% design CBR value is considered in-line with the Highways Department document HD 25-94 Road foundations and results of the CBR tests undertaken during this investigation

The soils on site are likely to be frost susceptible. Road and pavement construction on frost susceptible soils are required to be 450mm deep to extend below the frost zone.

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6.7 INFILTRATION MEASURES

Appropriately designed sustainable drainage systems (SuDS) are more sustainable than using piped drainage to local sewer systems. However, infiltration measures close to buildings may result in the undermining of foundations and softening of soils leading to instability. Attenuation measures should be located at suitable distances from foundations and infrastructure.

The granular soils of the Glaciofluvial Deposits encountered within SA1 and SA4 enabled three repeat tests as stipulated within BRE365 guidance. Average infiltration rates obtained within SA1 and SA2 were calculated to be $2.07 \times 10^{-5} \text{m/s}$ and $2.91 \times 10^{-5} \text{m/s}$, respectively.

The cohesive soils of the Glaciofluvial Deposits encountered within SA3 and SA4 did not complete a single test indicating these layers of cohesive soils are effectively impermeable and not suitable for conventional soakaways.

Therefore, conventional soakaways may be viable if located in the granular soils of the Glaciofluvial Deposits as seen within SA1 and SA4 at a depth of 1.50m bgl. Standing groundwater levels were recorded at a shallowest depth of 2.10m bgl. The LLFA typically require a suitable distance between the base of the soakaway and the underlying groundwater, therefore it is recommended the LLFA are consulted to agree the suitability of conventional soakaways.

6.8 GAS PROTECTION

The risk of ground gases impacting the site was assessed by reference to the paper “A pragmatic approach to ground gas risk assessment for the 21st Century” Card and Wilson, 2011.

Four confirmatory monitoring visits undertaken at the site, recorded no methane gas above detectable limits, and carbon dioxide levels at a maximum of 0.5%. A peak flow rate of 2.9l/h was also recorded. Therefore, the worst-case gas screening value (GSV) is 0.014. Based on the conditions measured during the monitoring visits carried out to date, in accordance with BS8485:2015 and CIRIA C665, 2007 this would be considered as a Characteristic Situation 1 (CS1) and therefore no gas protection measures are required for the proposed development.

The site is located in an area where less than 1% of homes exceed the action level of 200Bq/m^3 for radon gas, and therefore no radon protection measures are necessary in the construction of new dwellings or extensions.

Full details of gas concentrations and gas flow data recorded during the monitoring visits are given in the Appendices.

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7 GEO-ENVIRONMENTAL INTERPRETATIVE SECTION

7.1 RISKS TO HUMAN HEALTH

7.1.1 Introduction

Environment Agency guidance LCRM *Land Contamination: Risk Management*, (EA, 2019), states that human health risk assessment should be undertaken by a tiered approach using the source-pathway-receptor principle. A desk study constitutes the first tier, and this has been undertaken as part of this investigation. The conclusions of this phase were that: -

“Historical information indicates the site has been developed since at least the 1880s when the site is recorded as Lordship Farm comprising numerous agricultural buildings. The site has remained an agricultural land-use with agricultural barns recorded during the walkover survey.

The walkover survey identified the likelihood of Made Ground soils including areas of hardstanding and potential engineered fill underlying the courtyard and cart shed. Given the unknown origin of Made Ground soils they may contain a range of contaminants dependent on the source, these may include heavy metals, hydrocarbons and may potentially contain asbestos.

The existing agricultural buildings comprise corrugated cement roofs which may be asbestos containing material. Therefore, there is a potential risk of asbestos.

In addition, an empty oil barrel was located in the south-east corner of the site which could be a potential source of hydrocarbons. Given the previous land-use has been entirely agricultural it is possible machinery and fuel/oil was stored on site which may have leaked hydrocarbons into the underlying soils.

The desk study information also identified two off-site landfills located <500m south of the site which are considered potential sources of ground gas.”

Results are analysed under the second tier, known as a Generic Quantitative Risk Assessment (GQRA), which uses generic guideline values to compare site chemical data against, and the final tier would be a Detailed Quantitative Risk Assessment (DQRA), which use data derived from the ground investigation to assess risks to identified receptors.

The assessment included in this report comprises a GQRA, which is undertaken by comparing soil contaminant concentrations from this investigation with conservative Generic Assessment Criteria (GAC). GAC for various land use and exposure scenarios have been selected from the following sources:

- CL:AIRE Category 4 Screening Levels (C4SL);
- LQM Suitable for Use Levels (S4UL);
- CL:AIRE/EIC/AGS GAC

The GAC have been derived using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model, for a range of land uses and exposure scenarios, including:

- Residential with the consumption of home-grown produce;
- Residential without the consumption of home-grown produce;
- Commercial;
- Allotments;
- Public Open Space near residential housing (POS_{resi}); and
- Public Open Space public park scenario (POS_{park})

Given the proposed development is to construct residential dwellings and private gardens a “Residential with the home-grown produce” land-use scenario has been selected, for this assessment.

7.2 RESULTS OF CONFIRMATORY CHEMICAL TESTING

Five soil samples were screened as part of this investigation.

Made Ground soil samples:

- TP1 at a depth of 0.30m bgl
- TP3 at a depth of 0.30m bgl
- TP5 at a depth of 0.30m bgl
- SA4 at a depth of 0.20m bgl

Natural soil samples:

- TP1 at a depth of 2.00m bgl

The above soil samples were screened against the relevant GAC for a “Residential with the consumption of home-grown produce” land-use scenario as described above and recorded elevated levels of arsenic, lead and polycyclic aromatic hydrocarbons including benzo[b]fluoranthene and dibenz(a,h)anthracene.

7.2.1 Asbestos

Screening for the presence of asbestos did not reveal any asbestos containing material (ACM) or fibres in the four Made Ground samples tested.

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7.2.2 Arsenic

A single sample (SA4) recovered from the Made Ground soils identified a marginally elevated level of arsenic at 53mg/kg with the relevant GAC being 37mg/kg.

SA4 was located at the north-east corner of the site. The surrounding Made Ground soil samples taken from TP1, TP3 and TP5 tested for arsenic recorded levels below the relevant GAC. Therefore, it is considered that a hotspot of arsenic contamination has been identified surrounding SA4.

7.2.3 Lead

A single sample (TP5) recovered from the Made Ground soils identified a marginally elevated level of lead at 360mg/kg with the relevant GAC being 200mg/kg.

TP5 was located at the south-east corner of the site. The surrounding Made Ground soil samples taken from TP1, TP3 and SA4 tested for lead recorded levels below the relevant GAC. Therefore, it is considered that a hotspot of lead contamination has been identified surrounding TP5.

7.2.4 Polyaromatic Hydrocarbons

Elevated concentrations of polyaromatic hydrocarbons were encountered within two Made Ground samples taken from TP1 and TP5 including benzo[b]fluoranthene and dibenz(a,h)anthracene.

- Benzo(b)fluoranthene was recorded at 2.8mg/kg and 3.5mg/kg within TP1 and TP5, respectively, with the relevant GAC being 2.6mg/kg
- Dibenz(a,h)anthracene was recorded at 0.57mg/kg and 0.52mg/kg within TP1 and TP5, respectively, with the relevant GAC being 0.24mg/kg.

Due to the conservative approach to calculating the S4ULs we have decided to use the C4SLs for BaP as a surrogate marker for the PAH mixture encountered on site. In order to do this the three criteria below need to be met:-

- The SM (BaP) must be present in all soil samples.
- The profile of the different PAH relative to BaP should be similar in all samples.
- The PAH profile in the soil samples should be similar to that used in the pivotal toxicity study on which HBGV was based i.e. the Culp study.

This was the case within all samples where PAHs were encountered and the soil concentration of BaP in all cases was less than the relevant C4SL of 5mg/kg. Therefore, it is considered that the risk to end users of the site was below the C4SL level which is defined as “there is no risk that land

poses a significant possibility of significant harm”, therefore in line with DEFRA authorised guidance, we consider that the PAHs do not cause a risk to end users across the site. The BaP Surrogate Marker calculation sheets are included in Appendix C.

7.3 RISK TO END USERS

Given the findings of the desk study, walkover survey, the findings of the previous investigation, and the laboratory testing undertaken as part of this investigation it is considered that there is a potential risk to the end users due to two hotspots of Made Ground soils impacted by marginally elevated levels of arsenic and lead. The contaminated hotspots were encountered at the north-east and south-east corner of the site covering the proposed residential units 1 and 2 as shown on the hotspot plan in Appendix A. Therefore, mitigation measures will be required in the proposed soft landscaping areas covering units 1 and 2.

In addition, the corrugated cement sheets forming the majority of the existing buildings may contain asbestos. Therefore, it is recommended that an asbestos specialist is consulted to organise the safe removal where asbestos is present.

We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

7.4 REDUCING THE RISK TO END USERS

7.4.1 *Clean Cover Layer*

To break the exposure pathways to site users, it is considered that the pathway between the zoned contaminated Made Ground soils and the end users needs to be broken. These areas can be seen on the Remedial Plan within Appendix A.

As such a cover system could be engineered within areas of soft landscaping. It is considered that any disturbance or intermixing of soils is unlikely to exceed 600mm depth from earthworm activity, double digging and root depth as stated in “Cover Systems for Land Regeneration” prepared by RSK ENSR Ltd. Therefore, a cover system would require a 600mm layer of clean cover, consisting of at least 150mm of topsoil 450mm of clean imported clay and a geotextile dig barrier at the base. **This cover system is not required in areas of hardstanding (driveways, paving areas and under the building), where this will break the pathway between contaminated soils and site users.**

During the development, it is recommended that this process of placing the cover layer is tightly monitored and recorded (soil tests, photographs, depth measurements etc) as a verification report will be required to prove its existence to Local Authorities or financing organisations (mortgage companies etc).

7.5 REDUCING THE RISK TO CONSTRUCTION WORKERS

To reduce the risk to as low as reasonably practicable for the construction workers it is recommended that high standards of personal hygiene should be maintained amongst the site personnel at all times. All personnel coming into contact with the soil, ground workers in particular, should be instructed to use gloves when on site to avoid dermal contact and restrict inadvertent hand-to-mouth ingestion. Washing facilities should be provided for the site staff to use and should be used prior to eating or smoking. Reference should be made to the HSE Document, “Protection of Workers and the General Public during Development of Contaminated Land”.

It is also recommended that a watching brief for undiscovered contamination is included in the Works Method Statement. Given the long human history of the site, it is always possible that some previous undiscovered contamination may be encountered. If this is the case, the area should be isolated, and contact be made to a suitably qualified professional for further advice. This is particularly important if the contamination is possibly ACM or liquid based.

7.6 POST REMEDIATION VERIFICATION

Any remedial measures undertaken at the site will require independent verification once completed to satisfy the relevant regulatory authorities and other interested parties, including future owners of the site, banks, insurers, and mortgage companies. This usually involves a small validation investigation to confirm that the recommended work has been successful.

7.7 RISK TO CONTROLLED WATERS

The information obtained from the phase I desk study and the intrusive ground investigation identified the following:

- The site is underlain by a Secondary Aquifer associated with the Glaciofluvial Deposits and the Glaciolacustrine Deposits. The superficial soils are likely underlain by the Grey Chalk Subgroup, a Principal Aquifer) and the underlying Gault Formation, considered an Unproductive Aquifer
- The site is not located within a groundwater source protection zone

- The nearest surface water is recorded as a moat located <200m south-west of the site. Immediately north of the moat a tributary stream flows north-east into the River Purnell.
- The chemical testing identified marginally elevated levels of lead and arsenic within two near surface soil samples when compared to the strictest GAC for a residential land use. However, the leachate analysis, part of the WAC test, undertaken on a representative Made Ground soils sample recorded a leached arsenic concentration of 0.08mg/kg and lead at below detectable limits (<0.035mg/kg) indicating the heavy metals are insoluble and unlikely to pose a significant risk to Controlled Waters
- Background levels of long chain hydrocarbons were encountered; however, these were all recorded below the strictest GAC criteria for a residential land-use

Given the findings from the desk study and the chemical testing of near-surface soils undertaken as part of this investigation, there is not considered to be a significant risk of significant harm to controlled waters from the site or the proposed development.

The Environment Agency is the regulatory body charged with protection of controlled waters and may be a consultee in the planning process. We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

7.8 RISK TO UNDERGROUND WATER SUPPLY PIPES

Based upon the guidance document from the UK Water Industry Research (UK WIR), 'Contaminated Land Assessment Guidance', February 2014, and the results of the samples tested from the site it is considered that conventional PE water pipes would not be suitable at this due to background levels of hydrocarbons within the Made Ground soils. Therefore, where water pipes cross the Made Ground soils it is recommended barrier pipe is used. Where water pipes cross natural soils conventional PE water pipes will be suitable.

This should be confirmed with the local water company as not all authorities use this guidance.

8 WASTE DISPOSAL CLASSIFICATION

8.1 INTRODUCTION

Excavation for foundations or services will produce waste soil and possibly other waste streams. As a waste producer, you have a duty of care under section 34 of the Environmental Protection Act 1990 to ensure, amongst other things that these wastes are: -

- Correctly stored
- Correctly classify
- Handed only to an authorised person
- Disposed of properly.

To aid with these obligations we have used HazWasteOnline to undertake the Hazard Assessment Screen as part of this investigation, to establish whether the sampled soils should be considered as either hazardous or non-hazardous waste. This classification process is in line with the Environment Agency's guidance WM3 "Guidance on the classification and assessment of waste", Version 1.2, 2021.

8.2 RESULTS OF HAZARD ASSESSMENT

The four Made Ground soil samples and one natural soil sample analysed for the human health risk assessment, listed in section 7.2, have been classified using HazWasteOnline.

The full results of the HazWasteOnline analyses can be seen in the Appendices.

The HazWasteOnline classification summary sheet from this investigation provides a waste classification of non-hazardous waste for each soil sample tested.

8.2.1 Waste Acceptance Criteria (WAC) Testing Results

To further classify the waste soil for landfill disposal, Waste Acceptance Criteria (WAC) testing has been carried out on a representative/worst case sample of Made Ground taken from TP1 at a depth of 0.30m bgl. This second stage of classification is used to determine whether the samples are inert or non-hazardous waste.

The results show that the sample exceeds a single limit value set for inert waste associated with Mineral Oil (>C10 to C40). The Mineral Oil was recorded at 1400mg/kg with the limit value being 500mg/kg. Therefore, the Made Ground soils on site should be considered as Non-Hazardous waste.

Additionally, it is considered that the underlying natural soils beneath the site qualify in accordance with EU Council Decision 2003/33/EC para. 2.1.1. “Uncontaminated soil can be classified as inert without testing”.

As such, given the testing results, currently, the underlying soils from the site are considered to be classified as follows: -

Strata	Description of Material	Recommended Classification	List of Waste code	Recommended Landfill Tax Rate
Made Ground	Naturally occurring soils and stones with man made materials including brick, concrete, metal	Non-Hazardous	17 05 04	Standard Rate
Natural Soil	Naturally occurring soils and stones (subsoil)	Inert	17 05 04	Lower Rate

Analytical results relevant to the materials being disposed of should be provided to the landfill operators or waste management contractors to confirm whether it meets their license agreements and to confirm tipping costs.

All wastes removed from the site should be consigned, transported and disposed of in full accordance with all relevant UK legislation.

8.3 RE-USE OF MATERIAL ON SITE

Currently, if surplus arisings are ‘fit for re-use’ on the site and have not been treated, its re-use is allowed within the planning law. If it needs treating prior to re-use, exemptions can be sought from the Environment Agency to allow this activity.

Based upon the samples tested, the underlying Made Ground soil is currently considered unsuitable for re-use on a residential site. The underlying natural soils are however suitable for reuse. This analysis is, however, dependent on the agreement of the Local Authority.

9 RECOMMENDATIONS

We recommend a watching brief should be undertaken during the construction phase, and if during development any previously undiscovered contamination (including visual or olfactory evidence) is found then site management should be immediately informed and inspection by a suitably qualified person should be undertaken.

Currently, remedial measures will be required in any proposed soft landscaping areas situated within the zone of impacted Made Ground soils as shown on the Remedial Plan in Appendix A. Further testing of arsenic and lead within the near surface Made Ground soils within this zone may also be practicable to reduce the area requiring remediation.

Where water pipes cross the Made Ground soils it is recommended barrier pipe is used to protect against background levels of hydrocarbons.

In addition, the corrugated cement sheets forming the majority of the existing buildings may contain asbestos. Therefore, it is recommended an asbestos specialist is consulted to organise the safe removal where asbestos is present.

10 REFERENCES

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BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2 : 2007 : Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

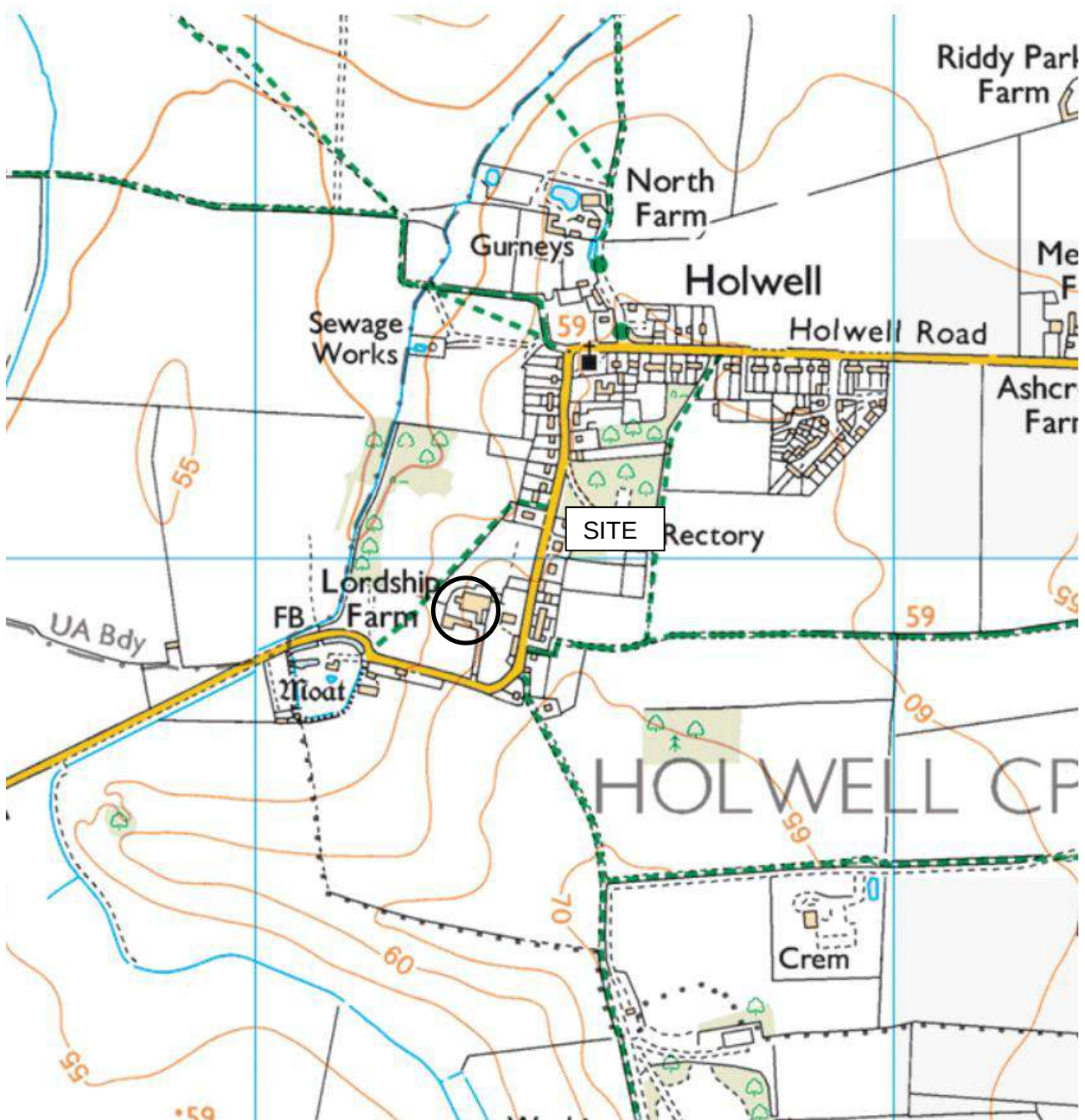
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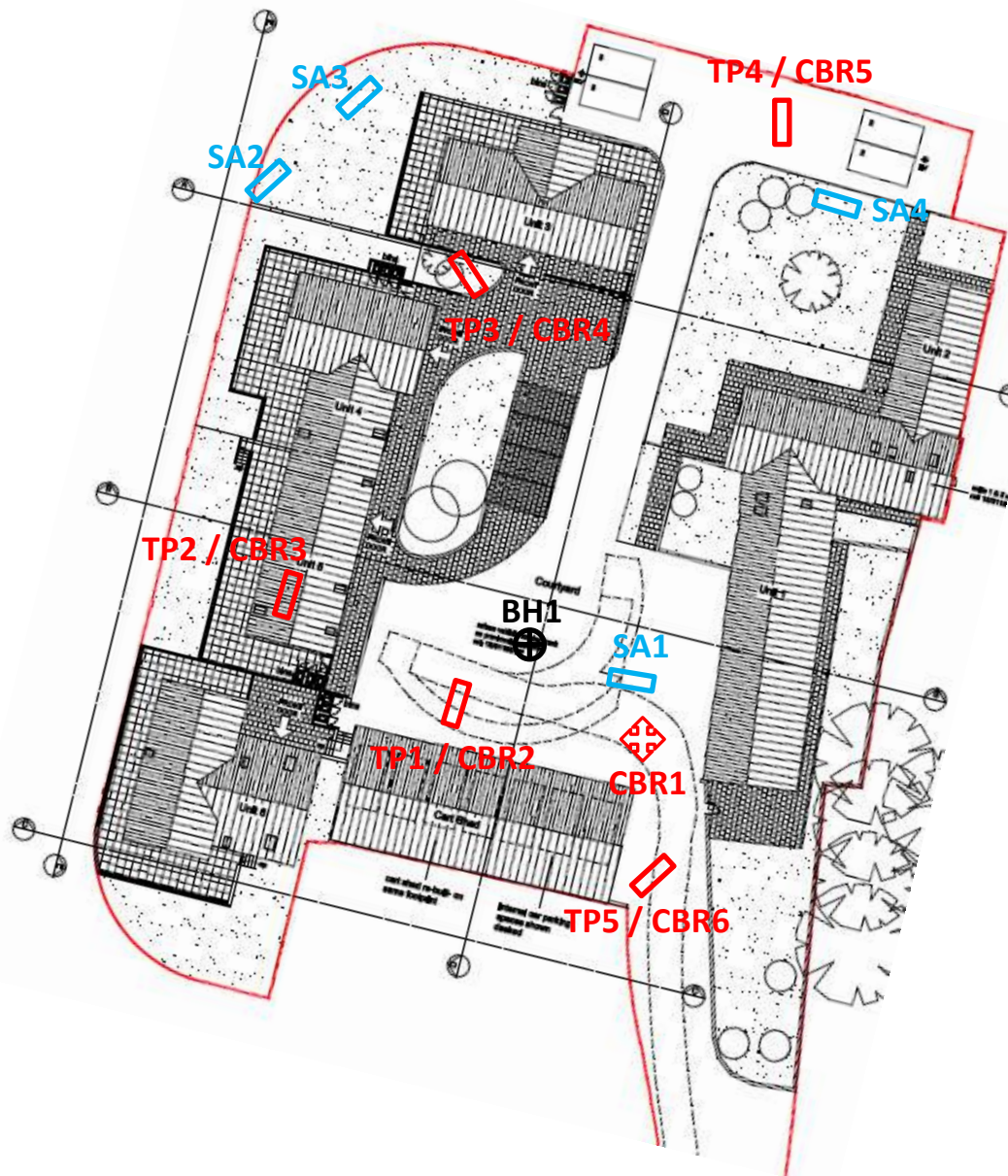
BS EN ISO 14688-2:2004+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution.
Investigation of Potentially Contaminated Sites – Code of Practice, BS10175, 2011.

Environment Agency, "Waste Sampling and Testing for Disposal to Landfill" March 2013

G Card and S Wilson, An Alternative Approach for Ground Gas Risk Assessment, 2011.

APPENDIX A





Key

-  Cable Percussive Borehole
-  Trial Pit / CBR Test
-  Soakaway Pit
-  CBR Test



4 Church Street
Maids Moreton
MK18 1QE

Tel:- 01280 816409
Mob:- 07858 367 125
www. geo-integrity.co.uk

**Exploratory Hole
Location Plan - Proposed**

**SITE:- Lordship Farm,
Waterloo Lane, Holwell**

JOB NO.:- 24-12-15

**CLIENT:- Netherdown
(Herts) Ltd**

**Drawn
HF**

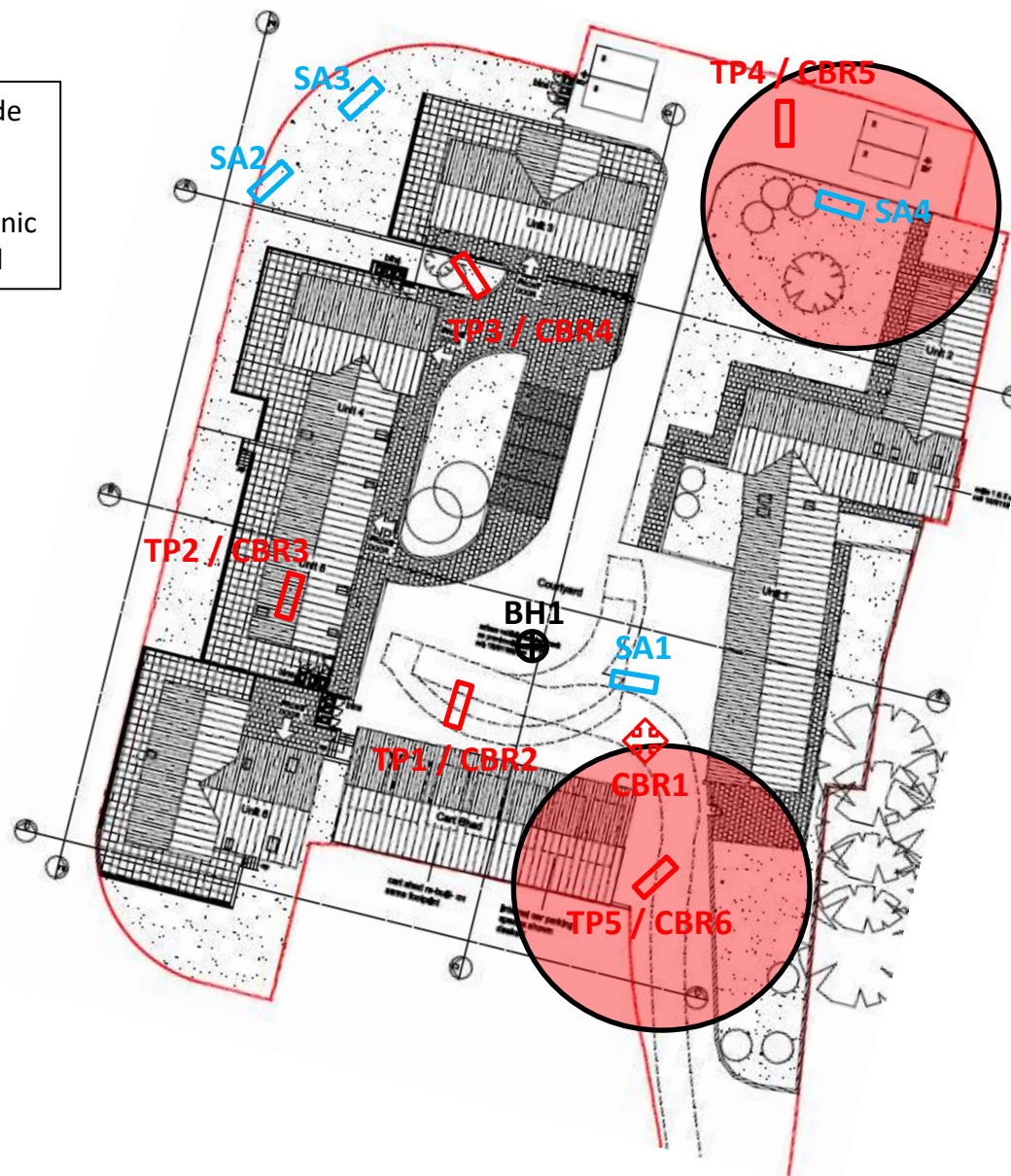
**Checked
LA**

**Scale: Not To Scale, for
indicative purposes only**

Local impacted Made
Ground soils:

SA4 – Elevated Arsenic

TP5 – Elevated Lead



Key

-  Cable Percussive Borehole
-  Trial Pit / CBR Test
-  Soakaway Pit
-  CBR Test



4 Church Street
Maids Moreton
MK18 1QE

Tel:- 01280 816409
Mob:- 07858 367 125
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**Exploratory Hole
Location Plan - Proposed**

SITE:- Hotspot Plan

JOB NO.:- 24-12-15

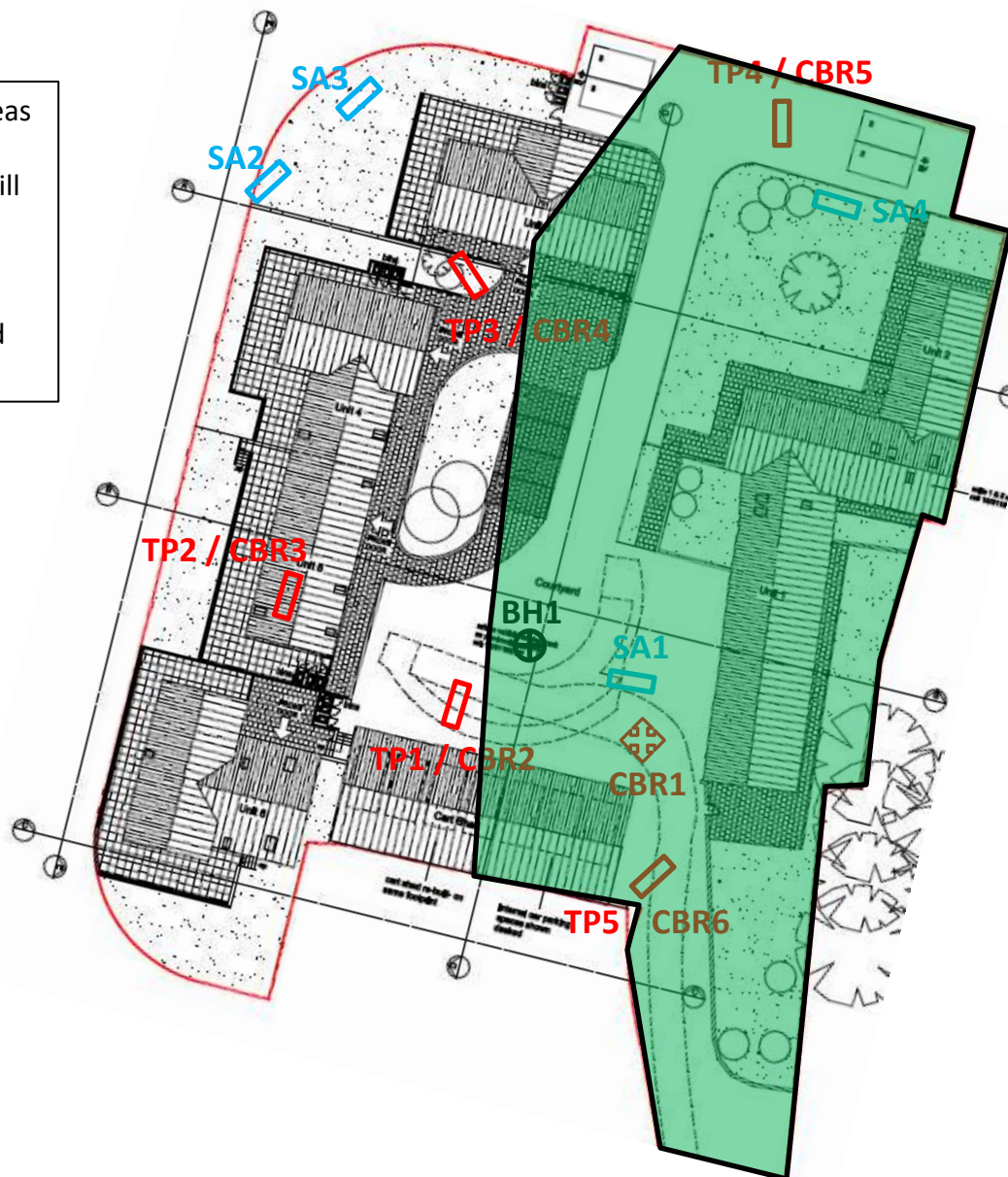
**CLIENT:- Netherdown
(Herts) Ltd**

Drawn
HF

Checked
LA

**Scale: Not To Scale, for
indicative purposes only**

Soft landscaping areas within the area highlighted green will require mitigation measures due to localised elevated levels of arsenic and lead.



Key

-  Cable Percussive Borehole
-  Trial Pit / CBR Test
-  Soakaway Pit
-  CBR Test



4 Church Street
Maids Moreton
MK18 1QE

Tel:- 01280 816409
Mob:- 07858 367 125
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Remedial Plan

SITE:- Lordship Farm,
Waterloo Lane, Holwell

JOB NO.:- 24-12-15

CLIENT:- Netherdown
(Herts) Ltd

Drawn
HF

Checked
LA

Scale: Not To Scale, for
indicative purposes only



Site entrance



Entrance to courtyard, cart shed on left, grade listed building on the right

February 2025

SITE PHOTOGRAPHS

24-12-15



Above groundwater tank and SA1 – granular soils



Cart shed

February 2025

SITE PHOTOGRAPHS

24-12-15



Cart shed on left, adjacent barn on the right (retaining wall at the centre)



Made-up levels, retaining wall at the right

February 2025

SITE PHOTOGRAPHS

24-12-15



SA2 and SA3 (west side of the site)



SA2 – Cohesive soils

February 2025

SITE PHOTOGRAPHS

24-12-15



SA4 – Granular soils (north-east corner of the site)



Existing barns adjacent to SA4

February 2025

SITE PHOTOGRAPHS

24-12-15



TP1 (Concrete fill at base)



TP1 (deepened Made Ground)

February 2025

SITE PHOTOGRAPHS

24-12-15



TP1 (concrete fill)



TP1 – Natural granular soils (Glaciofluvial Deposits)



TP2



TP2 – collapsing sides and running sand

February 2025

SITE PHOTOGRAPHS

24-12-15



TP3



TP3 – variable natural soils (layers of granular and cohesive soil)

February 2025

SITE PHOTOGRAPHS

24-12-15



TP4



TP4 – Granular soil



TP5



TP5 – Deepened Made Ground and water strike

February 2025

SITE PHOTOGRAPHS

24-12-15

APPENDIX B



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01280 816409

Site
Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

Borehole
Number
BH1

Machine : Fraste
Method : Cable Percussion

Casing Diameter

Ground Level (mOD)

Client
Netherdown (Herts) Ltd.

Job
Number
24-12-15

Location (Handheld GPS)
516336 E 232914 N

Dates
20/01/2025

Engineer
Lee Ashworth

Sheet
1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
1.20-1.65 1.20	SPT(C) N=8 D			6,4/2,2,2,2		(0.25) 0.23	MADE GROUND - Tarmac and concrete			
1.80 2.00-2.45 2.00	D SPT(C) N=10 D	1.80		2,2/3,3,2,2		(1.55) 1.80	MADE GROUND Loose brown black clayey silty sandy GRAVEL with occasional boulders size fragments of concrete and metals. Gravel is fine to coarse sub-angular to sub-rounded brick flint concrete metal and ash			
2.60	D					(0.80) 2.60	GLACIOFLUVIAL DEPOSITS Medium dense fine brown slightly clayey very silty SAND			
3.00-3.45 3.00	SPT N=16 D	1.60		7,4/4,4,4,4		(0.40) 3.00	GLACIOLACUSTRINE DEPOSITS Medium dense clayey SILT			
4.00-4.45 4.00	SPT N=20 D	3.00		4,4/4,4,6,6			GLACIOLACUSTRINE DEPOSITS Firm to stiff brown silty CLAY			
4.90 4.90-5.35	D SPT N=22	4.60	3.80	Medium(1) at 4.30m, rose to 3.00m in 20 mins, sealed at 8.40m. 4,4/4,6,6,6		(4.50)				
6.00	D									
6.50-6.95 6.50	SPT N=30 D	6.30	5.60	6,6/6,8,8,8						
7.50	D					7.50	GLACIOLACUSTRINE DEPOSITS Dense grey clayey SILT			
8.00-8.45 8.00	SPT N=30 D	7.80	7.60	4,6/6,6,8,10						
9.00	D					(3.00)				
9.50 9.50-10.00 10.00-10.45 10.00	U B SPT N=61 D	8.60		75 blows 10,10/10,15,15,21		10.50	GLACIOLACUSTRINE DEPOSITS Hard grey CLAY with rare stoney seams			
11.00	D									
11.40-11.85 11.50	SPT N=56 D	8.60		10,12/12,13,26,5		(3.00)				
12.50	D									
13.00	D			Fast(2) at 12.80m, rose to 9.80m in 20 mins.						
13.00-13.45	SPT N=50	8.60	9.80	10,10/10,12,12,16		13.50	Complete at 13.50m			

Remarks

Scale (approx)

1:75

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HF

Figure No.

24-12-15.BH1



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01280 816409

Site
Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

Trial Pit Number
TP1

Machine : JCB 3CX Method : Trial Pit		Dimensions		Ground Level (mOD)		Client Netherdown (Herts) Ltd.		Job Number 24-12-15	
		Location (Handheld GPS) 516327 E 232909 N		Dates 16/01/2025		Engineer Lee Ashworth		Sheet 1/1	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D				(0.40)	MADE GROUND - Loose dark brown black clayey silty sandy GRAVEL. Gravel is fine to coarse brick, ash, concrete and tarmac		
					0.40 (0.30)	MADE GROUND - Loose light brown red clayey silty sandy GRAVEL. Gravel is brick, concrete, flint and chalk with cobbles of brick rubble		
					0.70 (0.40)	MADE GROUND - Concrete fill		
1.50	D				1.10 (0.70)	MADE GROUND - Soft green brown black organic silty slightly gravelly CLAY. Gravel is fine to coarse brick		
					1.80	GLACIOFLUVIAL DEPOSIT Loose yellow orange brown clayey silty SAND with local lenses of silty sandy clay		
2.00	D				(0.60)			
					2.40	Complete at 2.40m		

Plan					Remarks			
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					Scale (approx) 1:20		Logged By HF	Figure No. 24-12-15.TP1



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01280 816409

Site
Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

Trial Pit
Number
TP2

Machine : JCB 3CX
Method : Trial Pit

Dimensions

Ground Level (mOD)

Client
Netherdown (Herts) Ltd.

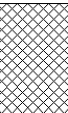
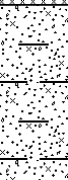
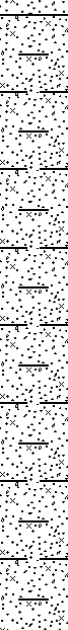
Job
Number
24-12-15

Location (Handheld GPS)
516311 E 232918 N

Dates
16/01/2025

Engineer
Lee Ashworth

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D				(0.30) 0.30 (0.50)	MADE GROUND - Loose dark brown silty sandy GRAVEL. Gravel is fine to coarse subangular flint, tarmac, brick and concrete GLACIOFLUVIAL DEPOSIT Loose yellow brown silty slightly clayey gravelly SAND. Gravel is fine to medium flint and chalk	 	
1.00	D				0.80	GLACIOFLUVIAL DEPOSIT Very loose saturated yellow grey brown clayey silty slightly gravelly SAND. Gravel is fine to medium flint and chalk		
1.50	D				(1.70)			
2.50	D		Water strike(1) at 2.50m.		2.50	Complete at 2.50m		▽1

Plan

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Remarks

Trial pit collapse below 1.00m
Running sand observed at 1.80m

Scale (approx)

1:20

Logged By

HF

Figure No.

24-12-15.TP2

Site

Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

**Trial Pit
Number**
TP3

Machine : JCB 3CX

Method : Trial Pit

Dimensions

Location (Handheld GPS)

516329 E 232944 N

Ground Level (mOD)

Dates

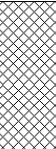
16/01/2025

Client

Netherdown (Herts) Ltd.

Job Number
24-12-15

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.60	D					MADE GROUND - Loose dark brown organic clayey slightly gravelly SILT		
					(0.40)			
					0.40	GLACIOFLUVIAL DEPOSIT Loose brown clayey silty gravelly SAND. Gravel is fine to coarse subangular to subrounded chalk and flint		
1.20	D				(0.40)			
					0.80	GLACIOFLUVIAL DEPOSIT Loose/soft dark grey clayey slightly gravelly SILT. Gravel is chalk		
					(0.60)			
2.00	D				1.40	GLACIOFLUVIAL DEPOSIT Loose orange brown clayey silty SAND AND GRAVEL. Gravel is fine to coarse subangular to subrounded chalk and flint		
					(0.50)			
					1.90	GLACIOFLUVIAL DEPOSIT Loose yellow brown SAND AND GRAVEL with rare horizons of clay		
2.50	D				(0.60)			
					2.50	Complete at 2.50m		

Plan

Remarks

Scale (approx)

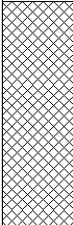
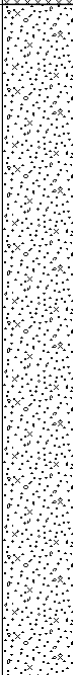
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Figure No.

24-12-15.TP3

 www.geo-integrity.co.uk info@geo-integrity.co.uk 01280 816409					Site Lordship Farm, Waterloo Lane, Holwell, SG5 3SS		Trial Pit Number TP4			
Machine : TP4 Method : Trial Pit		Dimensions		Ground Level (mOD)		Client Netherdown (Herts) Ltd.		Job Number 24-12-15		
		Location (Handheld GPS) 516355 E 232955 N		Dates 16/01/2025		Engineer Lee Ashworth		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
1.50	D				(0.60)	MADE GROUND - Loose dark brown organic slightly gravelly SILT. Gravel is brick				
					0.60	GLACIOFLUVIAL DEPOSIT (Loose to medium dense) yellow orange brown slightly silty gravelly fine to medium SAND. Gravel				
					(1.80)					
2.00	D									
2.50	D				2.40 (0.10) 2.50	GLACIOFLUVIAL DEPOSIT Loose layers of weathered siltstone with loose SAND AND GRAVEL				
						Complete at 2.50m				
Plan • • • • • • • • • •					Remarks					
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					Scale (approx) 1:20		Logged By HF		Figure No. 24-12-15.TP4	



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01280 816409

Site
Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

Trial Pit
Number
TP5

Machine : JCB 3CX
Method : Trial Pit

Dimensions

Ground Level (mOD)

Client
Netherdown (Herts) Ltd.

Job
Number
24-12-15

Location (Handheld GPS)
516348 E 232894 N

Dates
16/01/2025

Engineer
Lee Ashworth

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D				(0.40)	MADE GROUND - Loose dark brown organic gravelly SILT. Gravek is brick, tarmac, concrete and ash		
1.00	D				0.40 (0.90)	MADE GROUND - Loose brown clayey silty GRAVEL with boulders of concrete 1m in width. Gravel is brick, concrete, flint and chalk		
2.00	D				1.30 (1.40)	GLACIOFLUVIAL DEPOSIT Very soft brown silty sandy slightly gravelly CLAY. Gravel is fine to medium chalk and flint		
2.50	D		Water strike(1) at 2.60m.		2.70	Complete at 2.70m		▽1

Plan

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Remarks

Scale (approx)

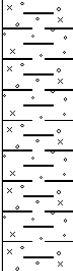
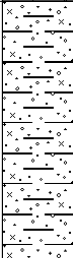
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Logged By

HF

Figure No.

24-12-15.TP5

 www.geo-integrity.co.uk info@geo-integrity.co.uk 01280 816409						Site Lordship Farm, Waterloo Lane, Holwell, SG5 3SS		Trial Pit Number SA2	
Machine : JCB 3CX Method : Trial Pit		Dimensions 1.30m x 0.40m x 1.80m		Ground Level (mOD)		Client Netherdown (Herts) Ltd.		Job Number 24-12-15	
		Location (Handheld GPS) 516309 E 232956 N		Dates 16/01/2025		Engineer Lee Ashworth		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.80	D				(0.35)	TOPSOIL - Loose dark brown clayey organic SILT			
					0.35	GLACIOFLUVIAL DEPOSIT Soft light brown beige orange silty slightly gravelly CLAY. Gravel is fine to coarse subangular flint and chalk. Partings of cream silt and orange sand			
1.40	D				(0.75)				
					1.10	GLACIOFLUVIAL DEPOSIT Soft to firm brown beige silty sandy gravelly CLAY. Gravel is coarse rounded flint and chalk with rare cobbles of flint			
			Water strike(1) at 1.70m.		1.80	Complete at 1.80m			
Plan • • • • • • • • • •						Remarks • • • • • • • • • •			
						Scale (approx) 1:20		Logged By HF	
						Figure No. 24-12-15.SA2			



Lordship Farm, Waterloo Lane, Holwell, SG5 3SS

**Trial Pit
Number**
SA3

Method : Trial Pit

1.00m x 0.40m x 0.74m

Ground Level (mOD)

Netherdown (Herts) Ltd.

**Job
Number**
24-12-15

516321 E 232961 N

16/01/2025

Lee Ashworth

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

0.20

D

(0.30)

0.30

(0.44)

074

MADE GROUND - Loose dark brown slightly gravelly organic SILT. Gravel is fine to coarse brick

GLACIOFLUVIAL DEPOSIT Soft to firm brown silty sandy slightly gravelly CLAY. Gravel is fine to coarse

Complete at 0.74m

Plan

Remarks

Scale (approx)

1:20

Logged By

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Figure No.

24-12-15.SA3

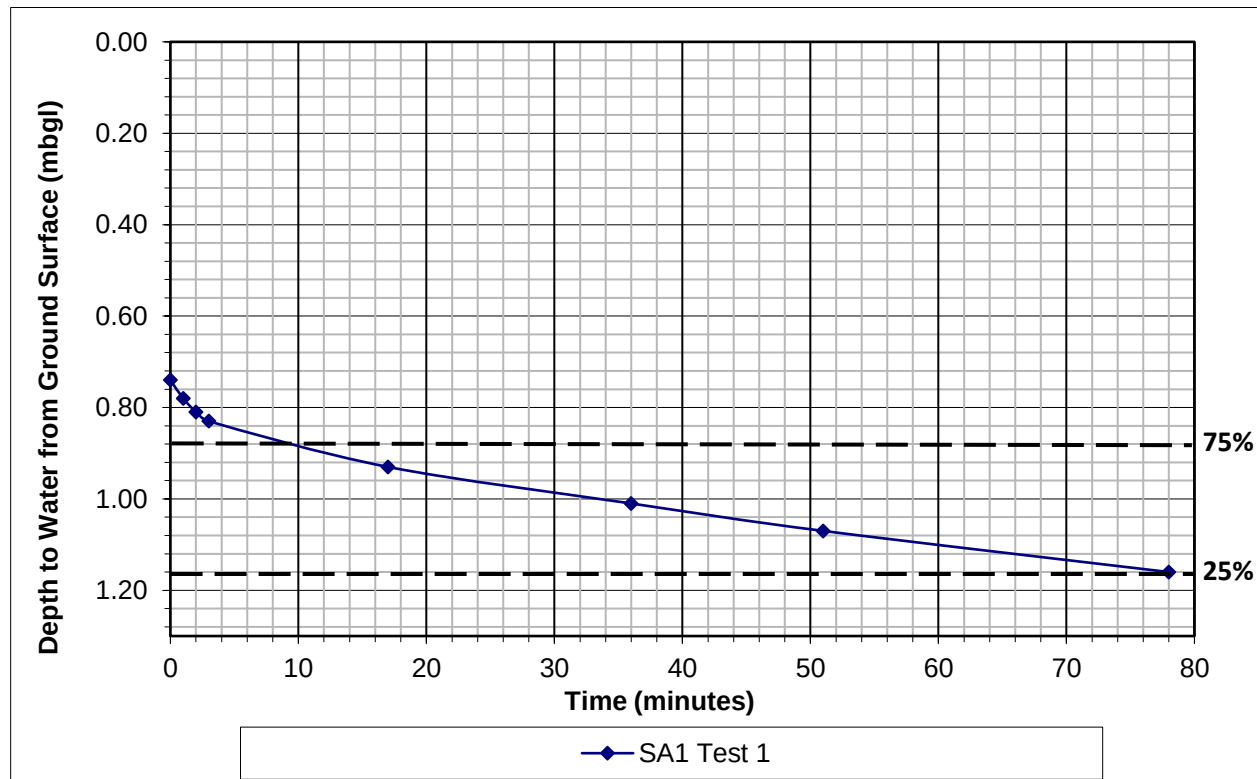
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA1

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.74	78	1.16		
1	0.78				
2	0.81				
3	0.83				
17	0.93				
36	1.01				
51	1.07				

Soil Infiltration Rate
 2.07×10^{-5} m/s



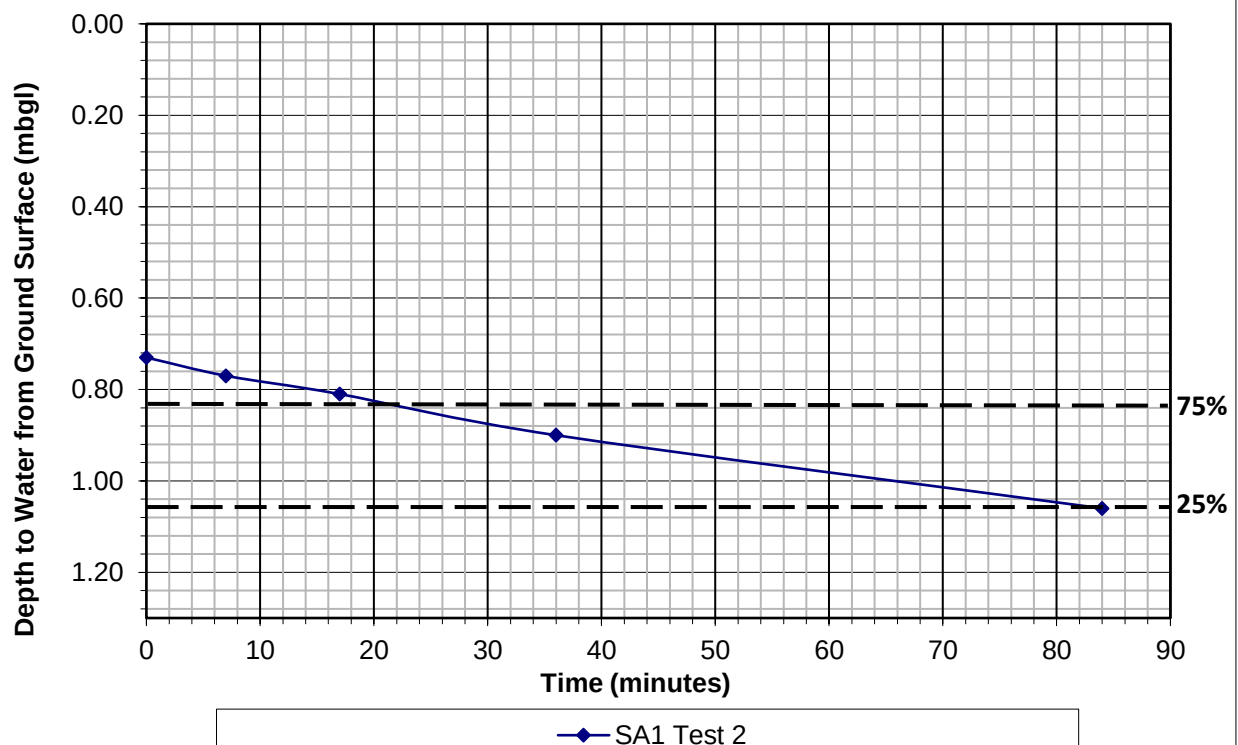
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA1

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.73				
7	0.77				
17	0.81				
36	0.90				
84	1.06				

Soil Infiltration Rate
 2.11×10^{-5} m/s



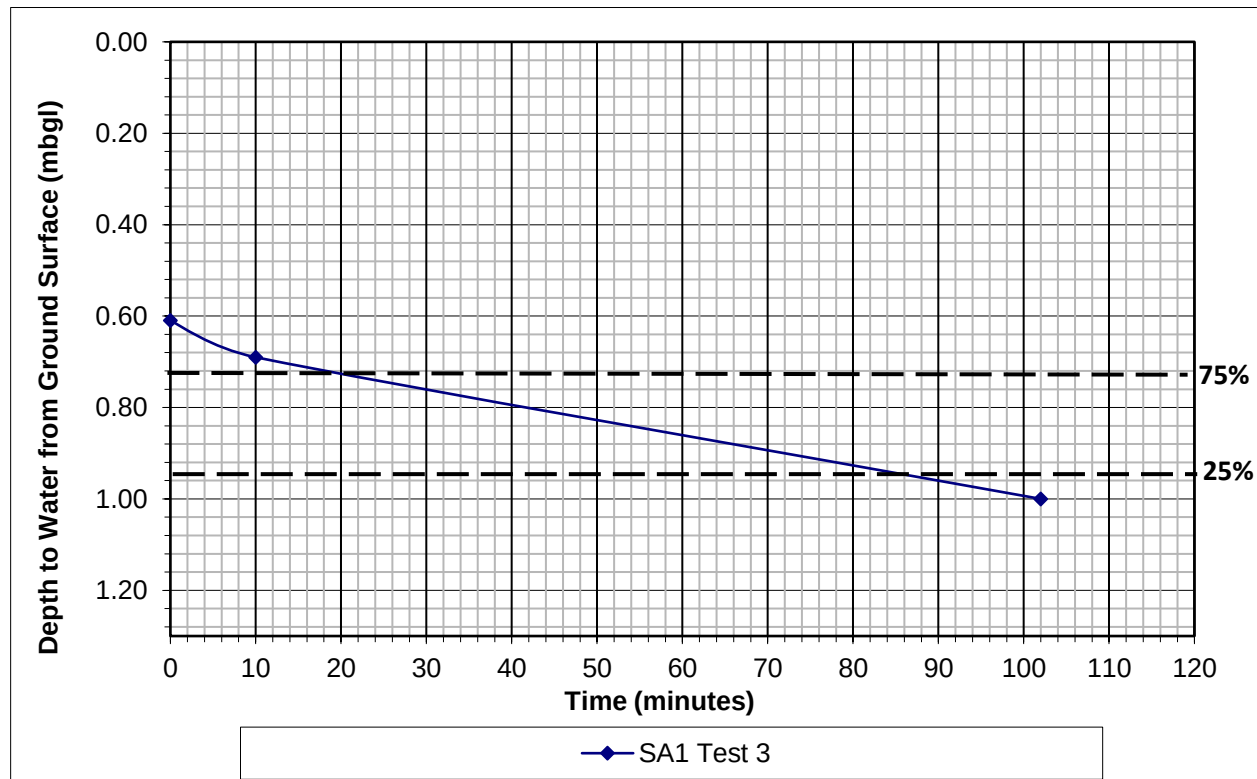
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA1

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.61				
10	0.69				
102	1.00				

Soil Infiltration Rate
 2.04×10^{-5} m/s



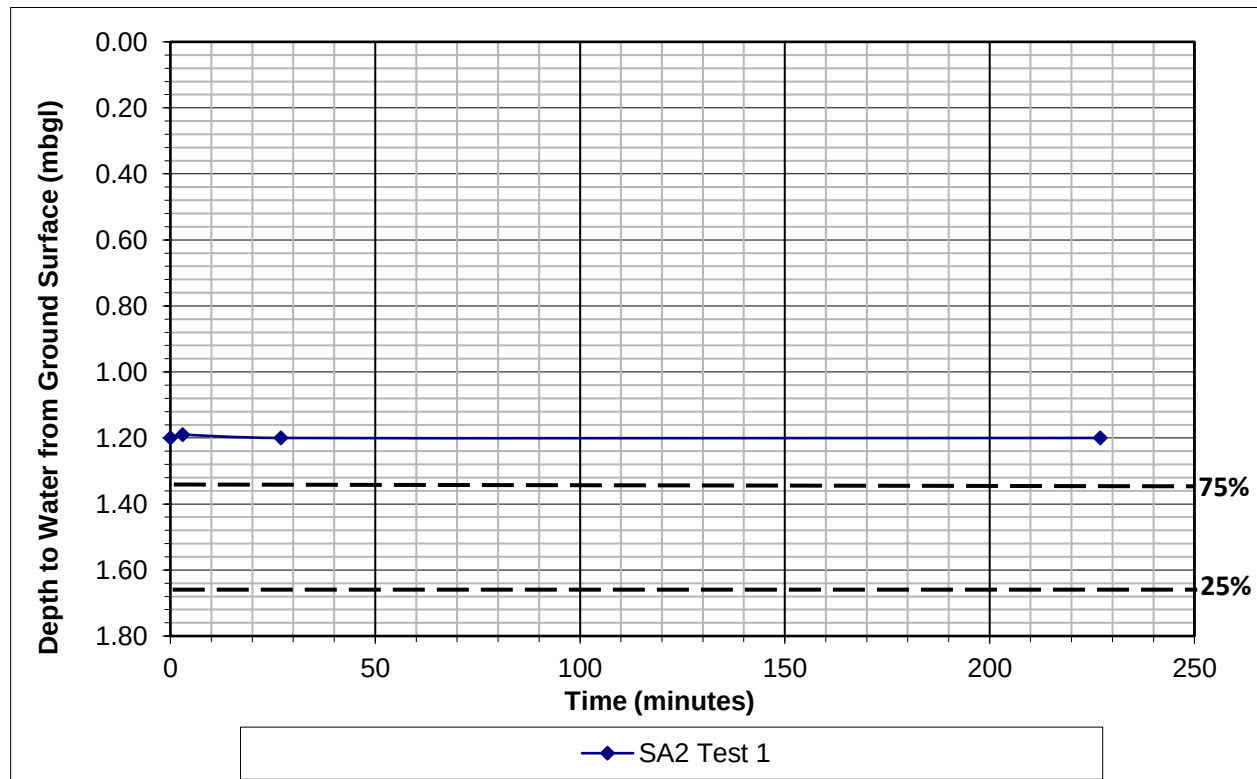
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.40m x 1.30m x 1.80m (width x length x depth)	Test Location:	SA2

Test Response Zone Description - : Glaciofluvial Deposit (Clay)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	1.20				
3	1.19				
27	1.20				
227	1.20				

Unable to Calculate Soil Infiltration Rate
Insufficient Drop in Water Levels



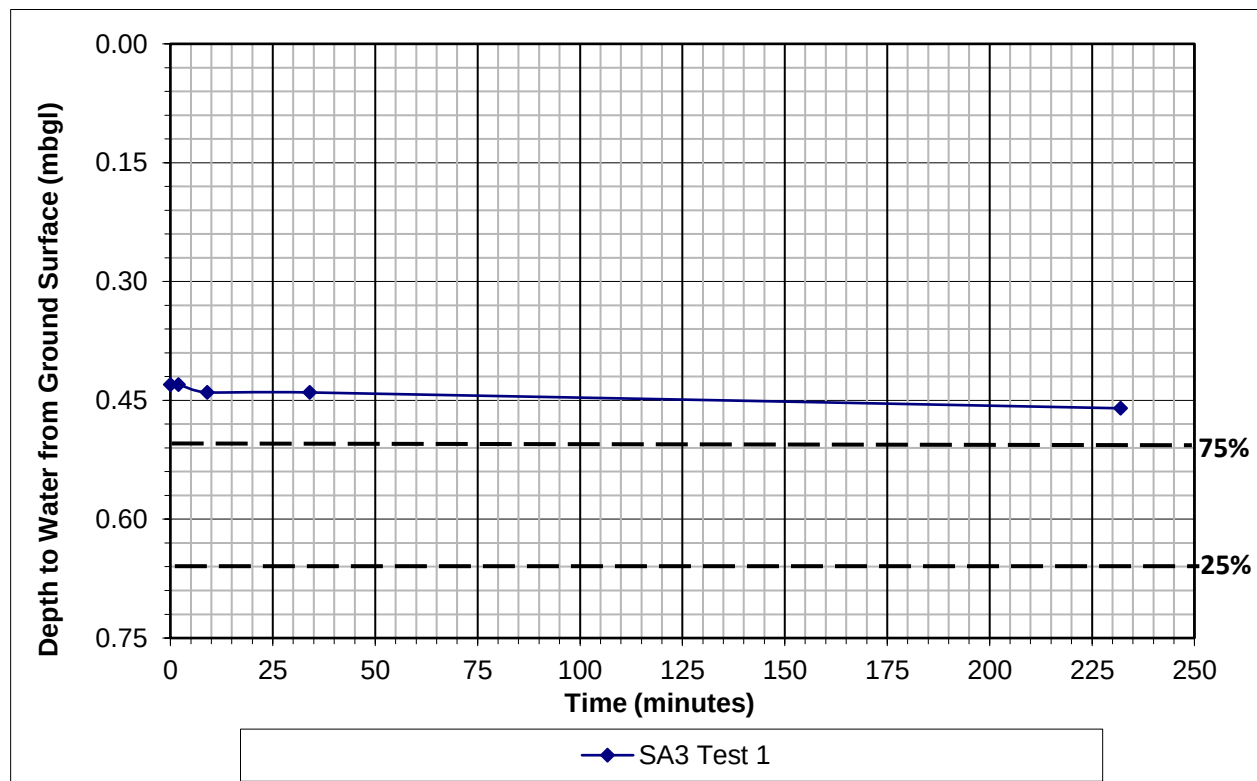
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.40m x 1.00m x 0.74m (width x length x depth)	Test Location:	SA3

Test Response Zone Description - : Glaciofluvial Deposit (Clay)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.43				
2	0.43				
9	0.44				
34	0.44				
232	0.46				

Unable to Calculate Soil Infiltration Rate
 Insufficient drop in water levels



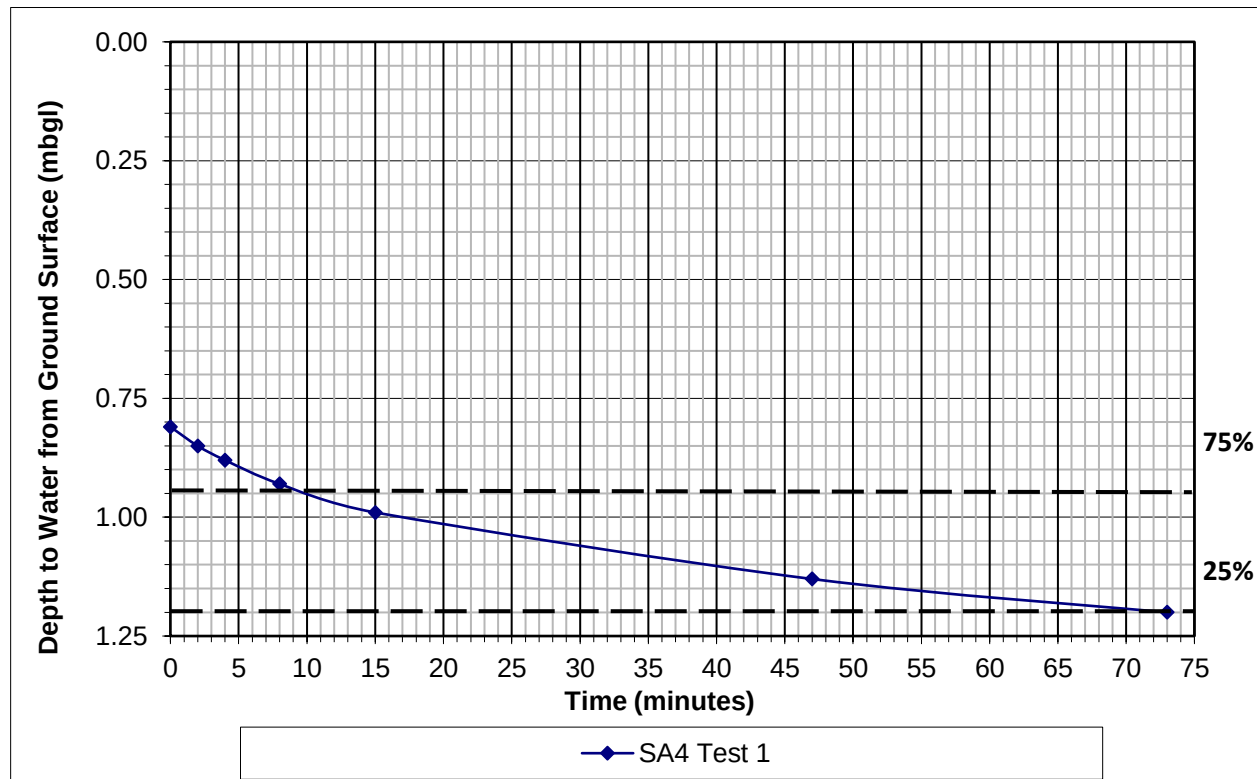
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA4

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.74	78	1.16		
1	0.78				
2	0.81				
3	0.83				
17	0.93				
36	1.01				
51	1.07				

Soil Infiltration Rate
 2.51×10^{-5} m/s



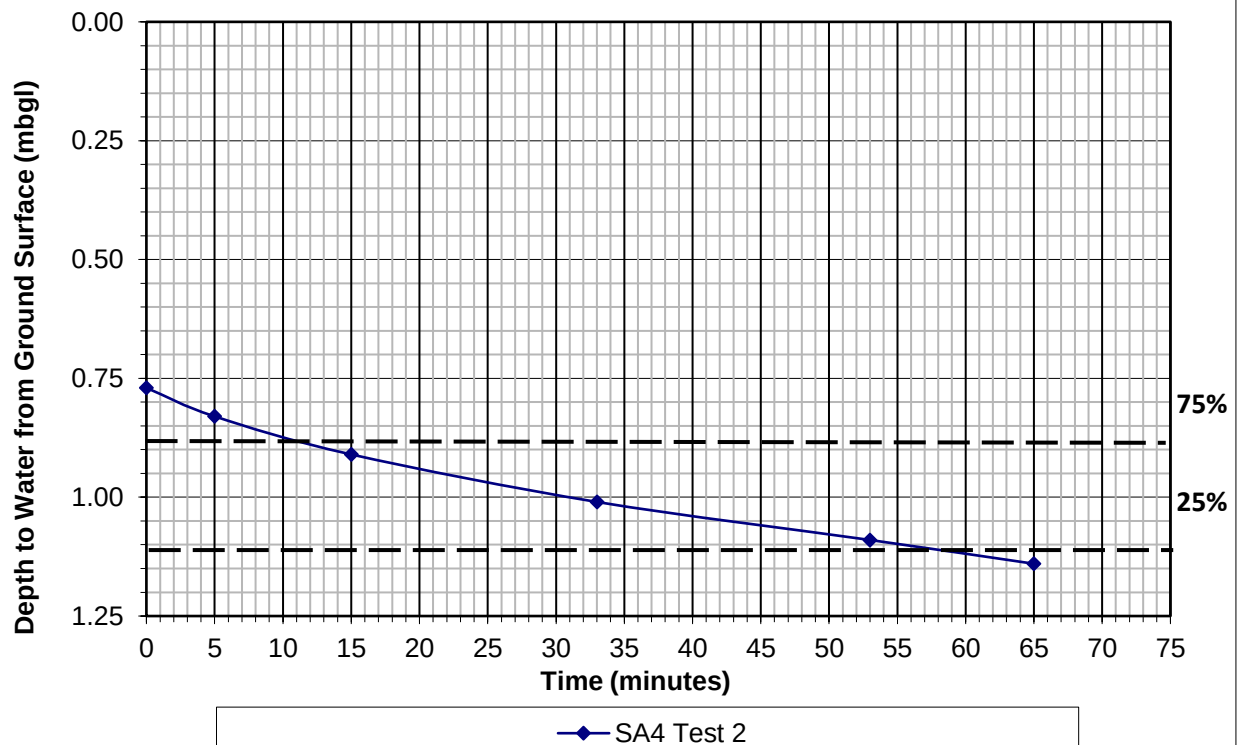
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA4

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.73				
7	0.77				
17	0.81				
36	0.90				
84	1.06				

Soil Infiltration Rate
 3.23×10^{-5} m/s



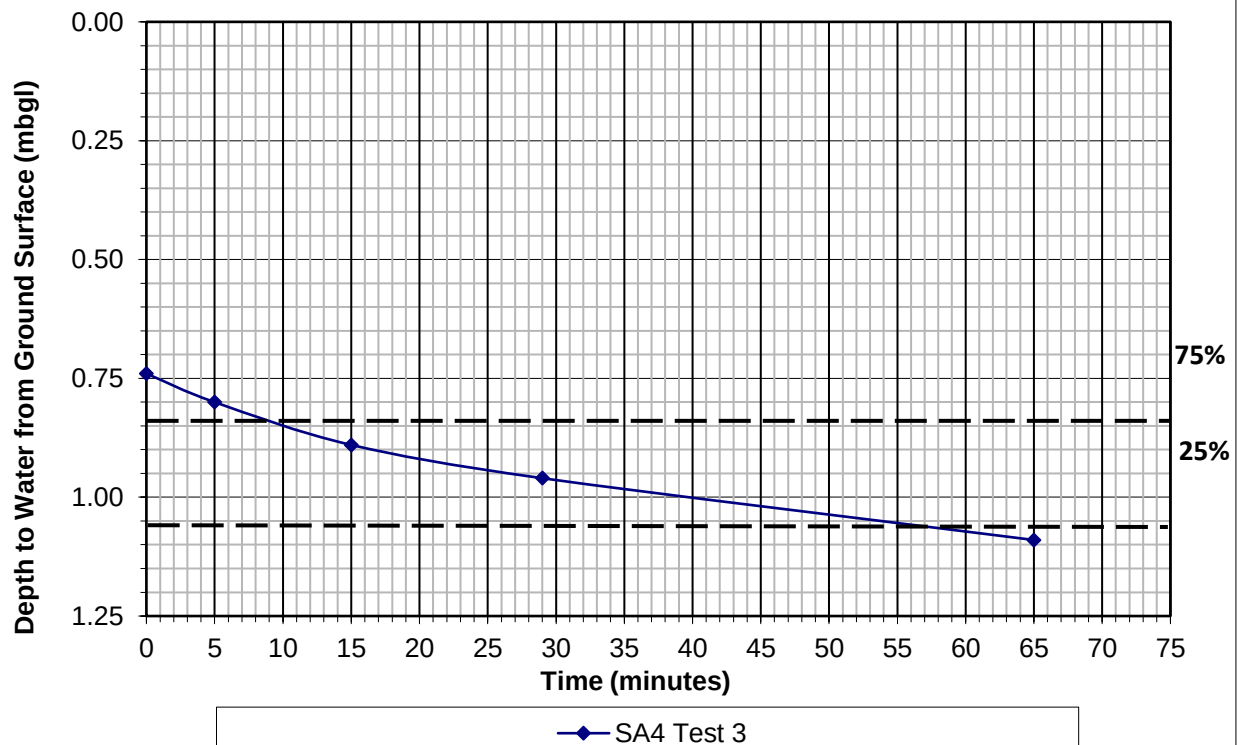
Trial Pit Infiltration Testing to BRE Digest 365

Client:	Netherdown (Herts) Ltd	Report No:	24-12-15
Site:	Lordship Farm, Waterloo Lane	Date Tested:	16/01/2025
Dimensions:	0.30m x 1.40m x 1.48m (width x length x depth)	Test Location:	SA4

Test Response Zone Description - : Glaciofluvial Deposit (Sand)

Time	Depth BGL	Time	Depth BGL	Time	Depth BGL
0	0.61				
10	0.69				
102	1.00				

Soil Infiltration Rate
 3.01×10^{-5} m/s





TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

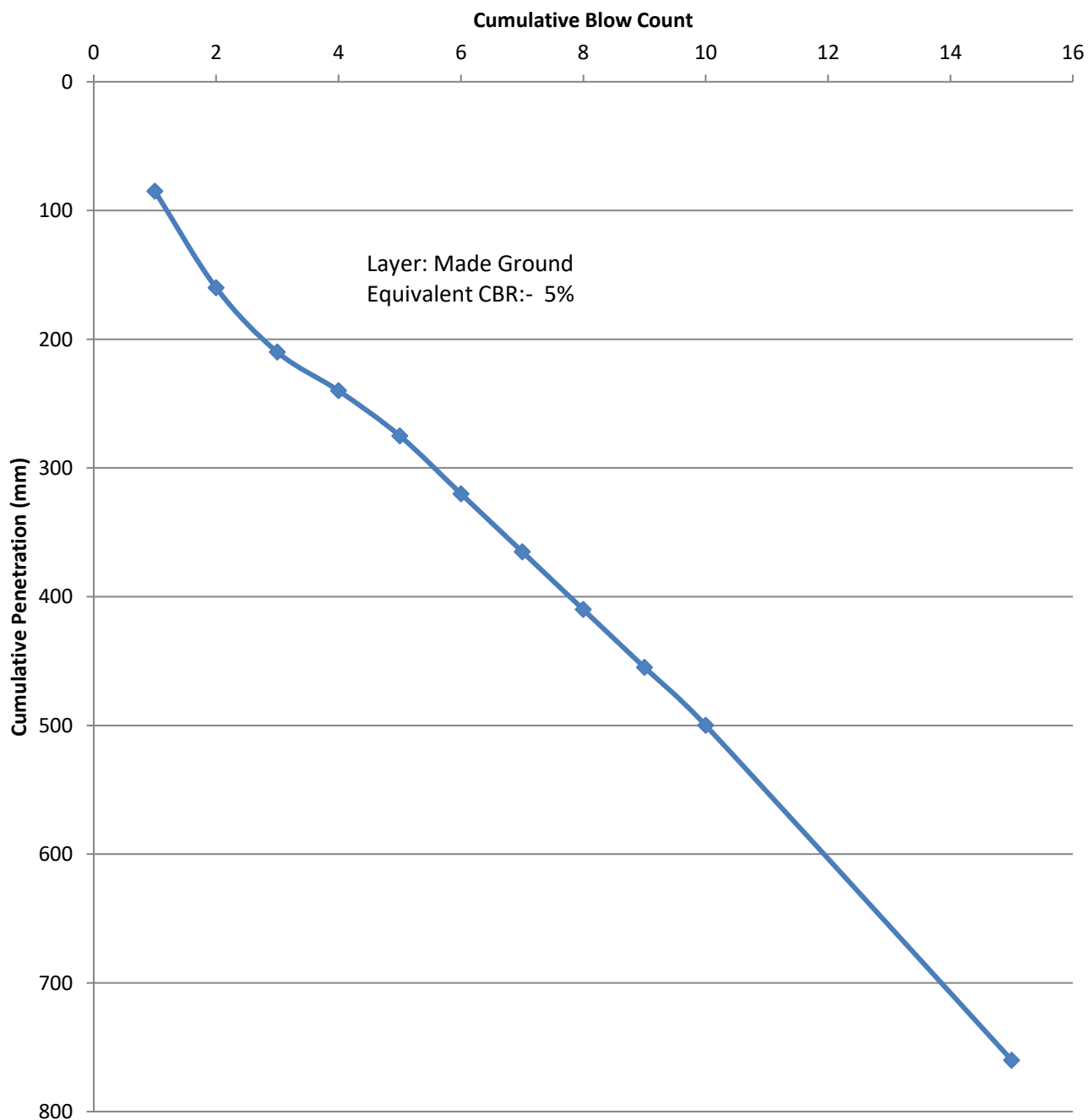
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 5%

Position:- CBR1

Depth below ground level at start of test:- 0.40m

Cumulative Blows Vs Penetration (mm)



TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

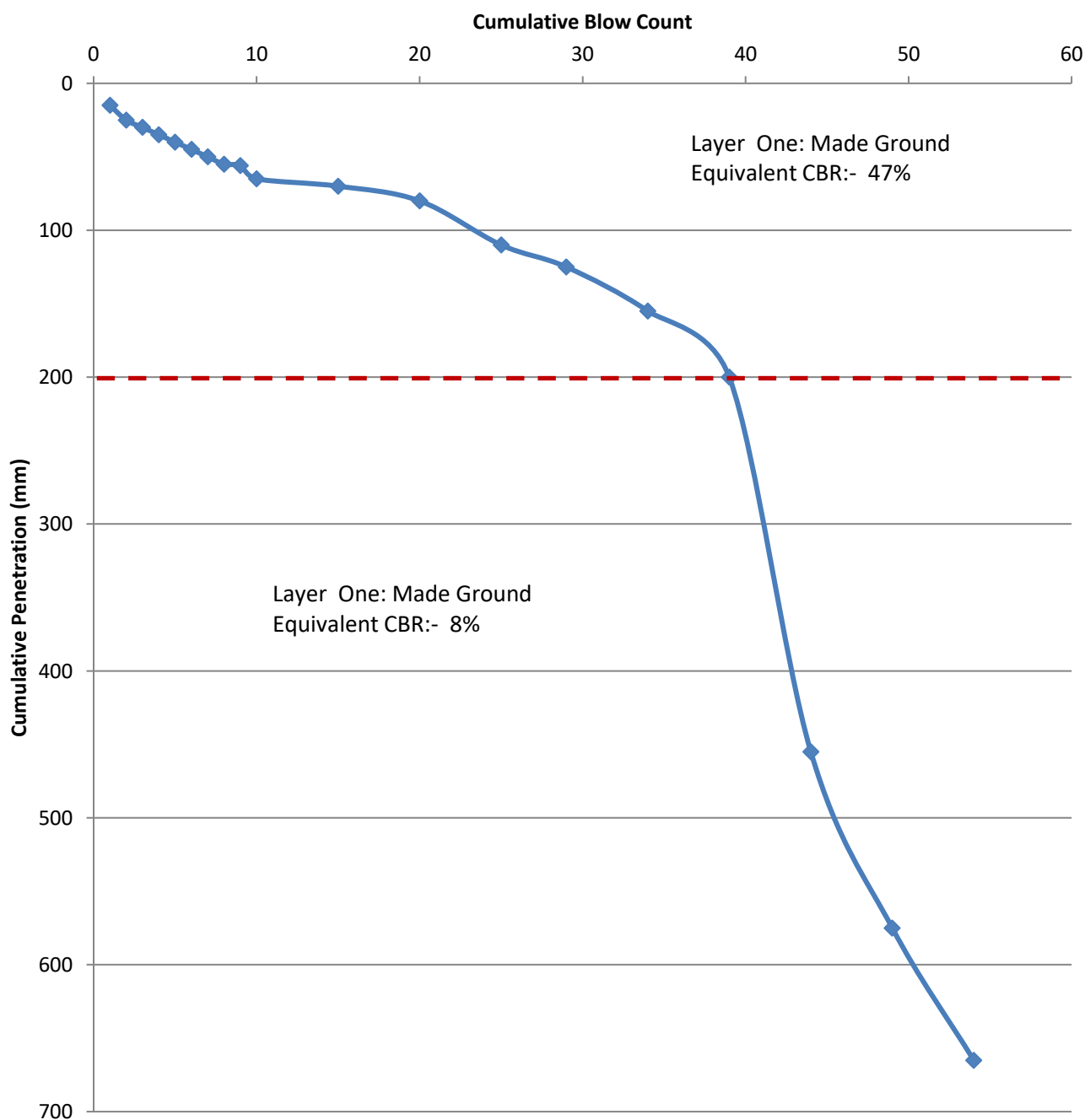
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 47%/8%

Position:- CBR2

Depth below ground level at start of test:- 0.40m

Cumulative Blows Vs Penetration (mm)





TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

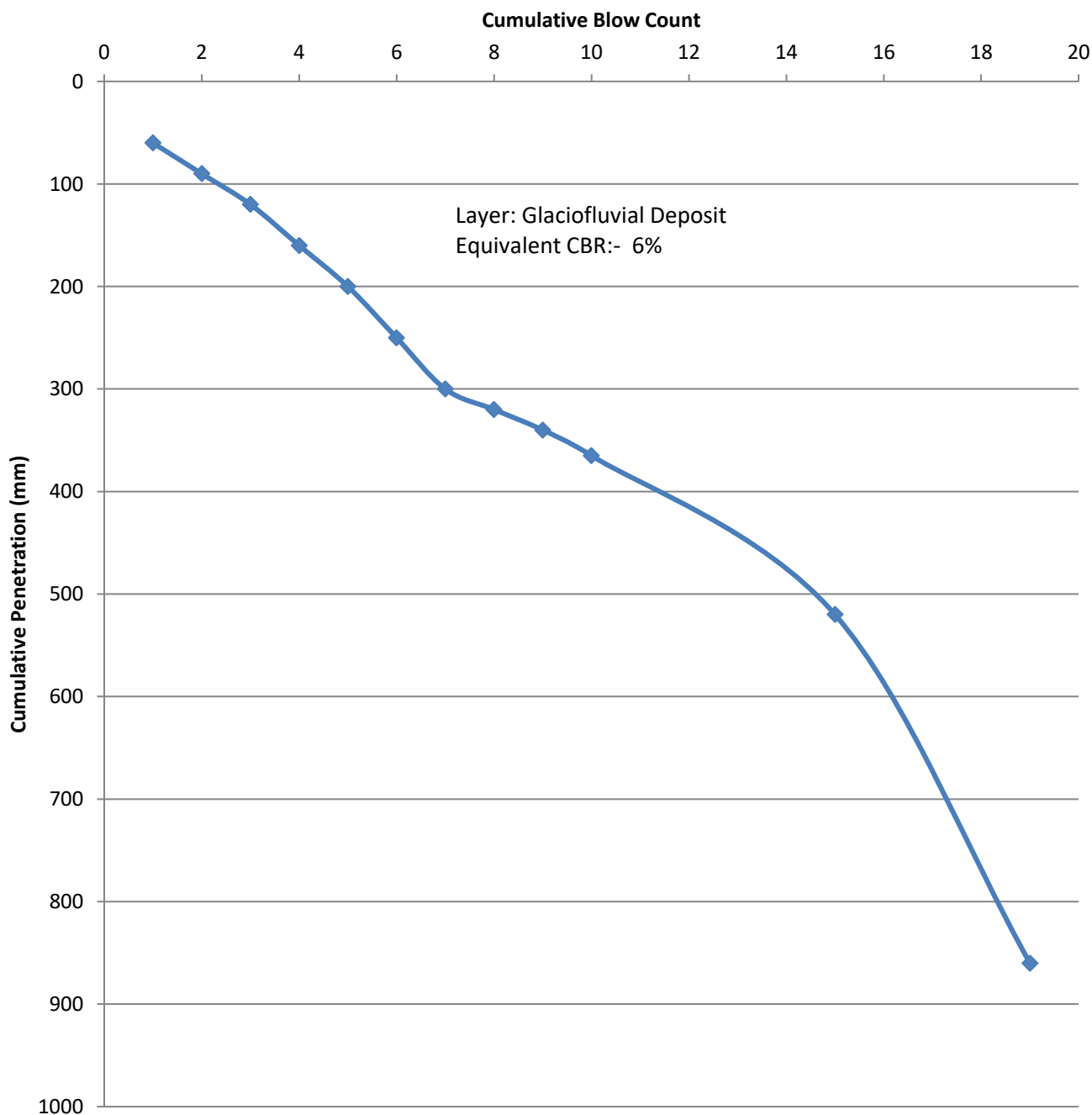
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 6%

Position:- CBR3

Depth below ground level at start of test:- 0.70m

Cumulative Blows Vs Penetration (mm)





TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

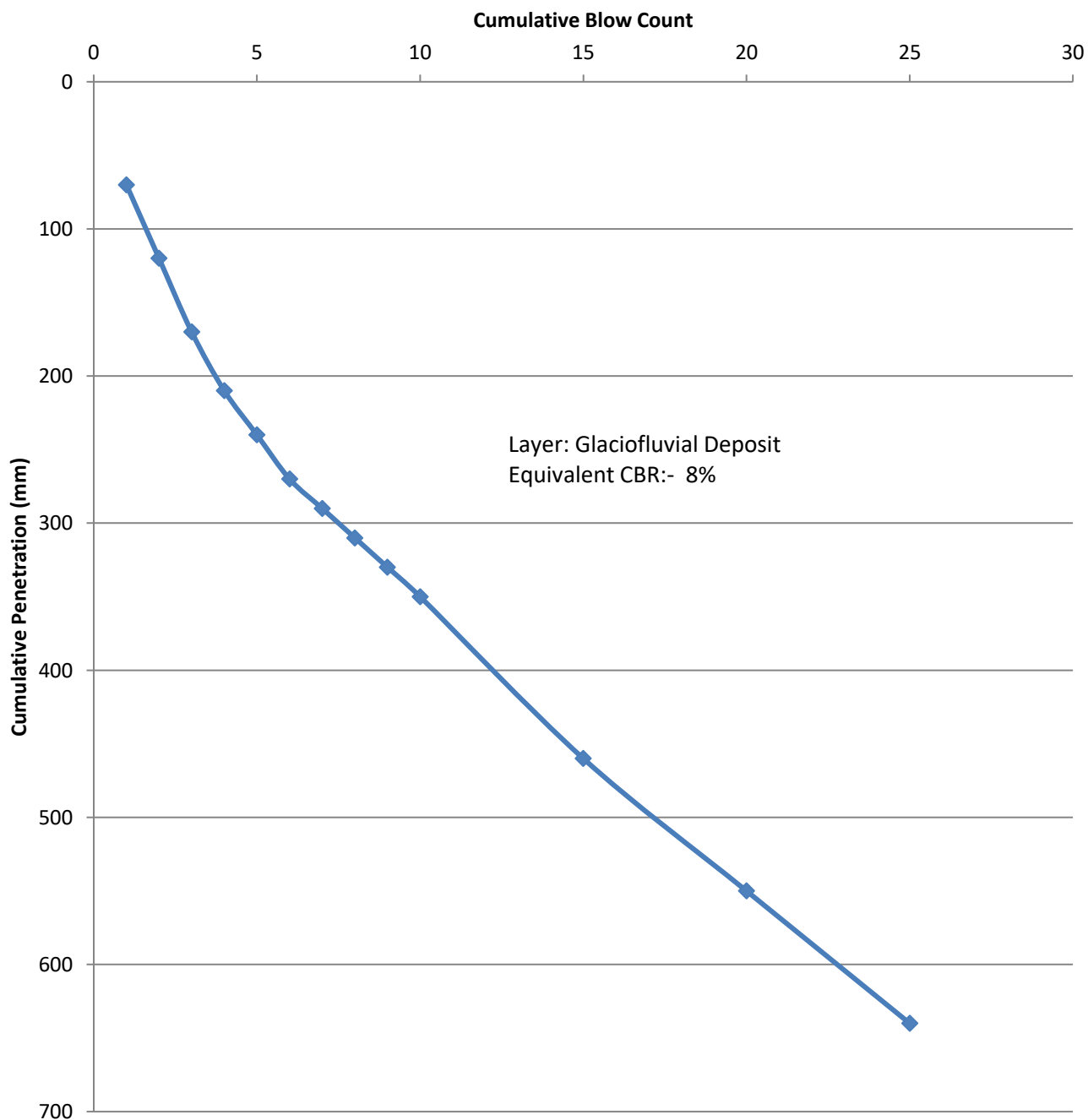
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 8%

Position:- CBR4

Depth below ground level at start of test:- 0.45m

Cumulative Blows Vs Penetration (mm)





TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

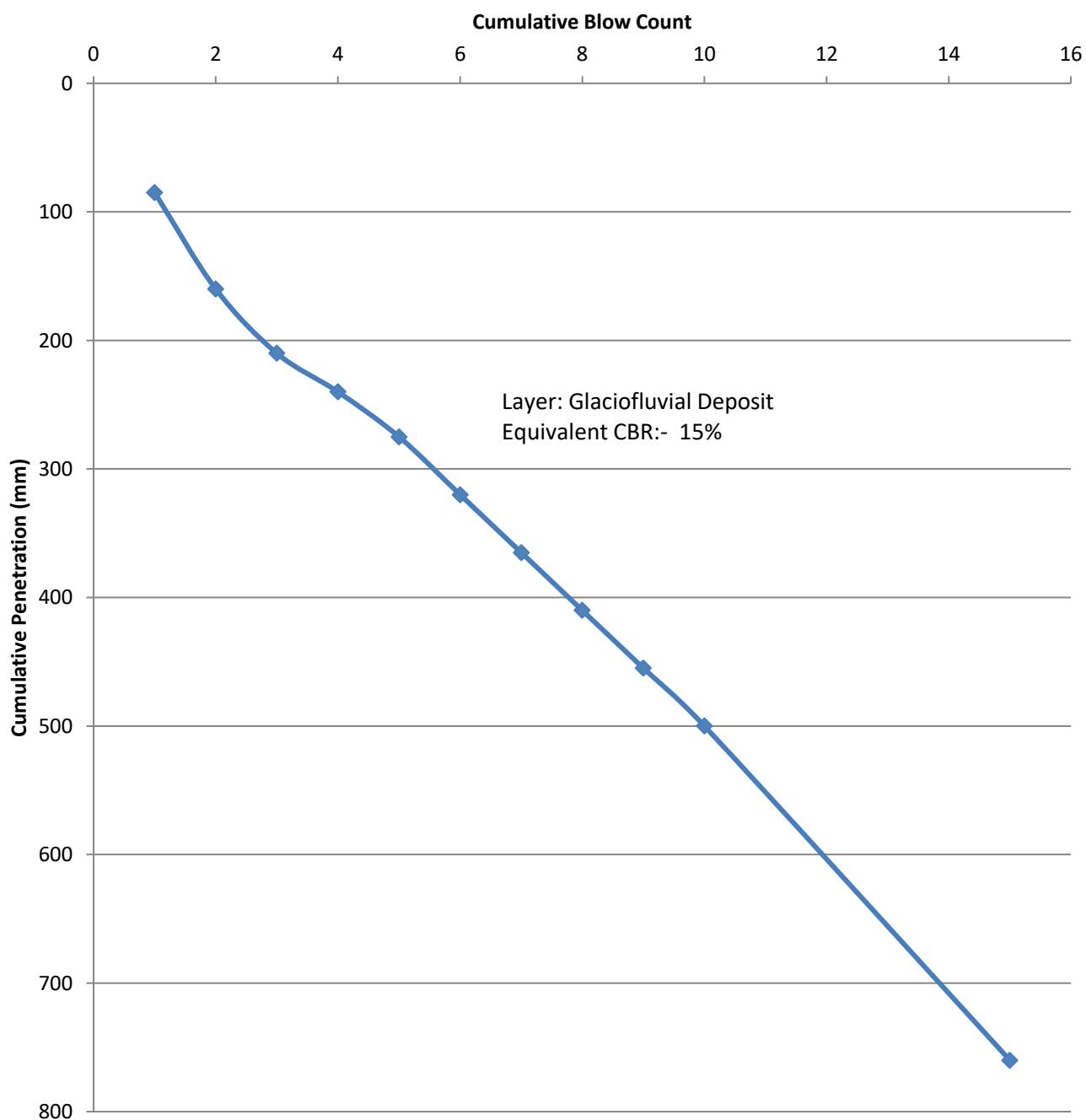
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 15%

Position:- CBR5

Depth below ground level at start of test:- 0.50m

Cumulative Blows Vs Penetration (mm)



TRL DYNAMIC CONE PENETROMETER RECORD

Job No:- 24-12-15

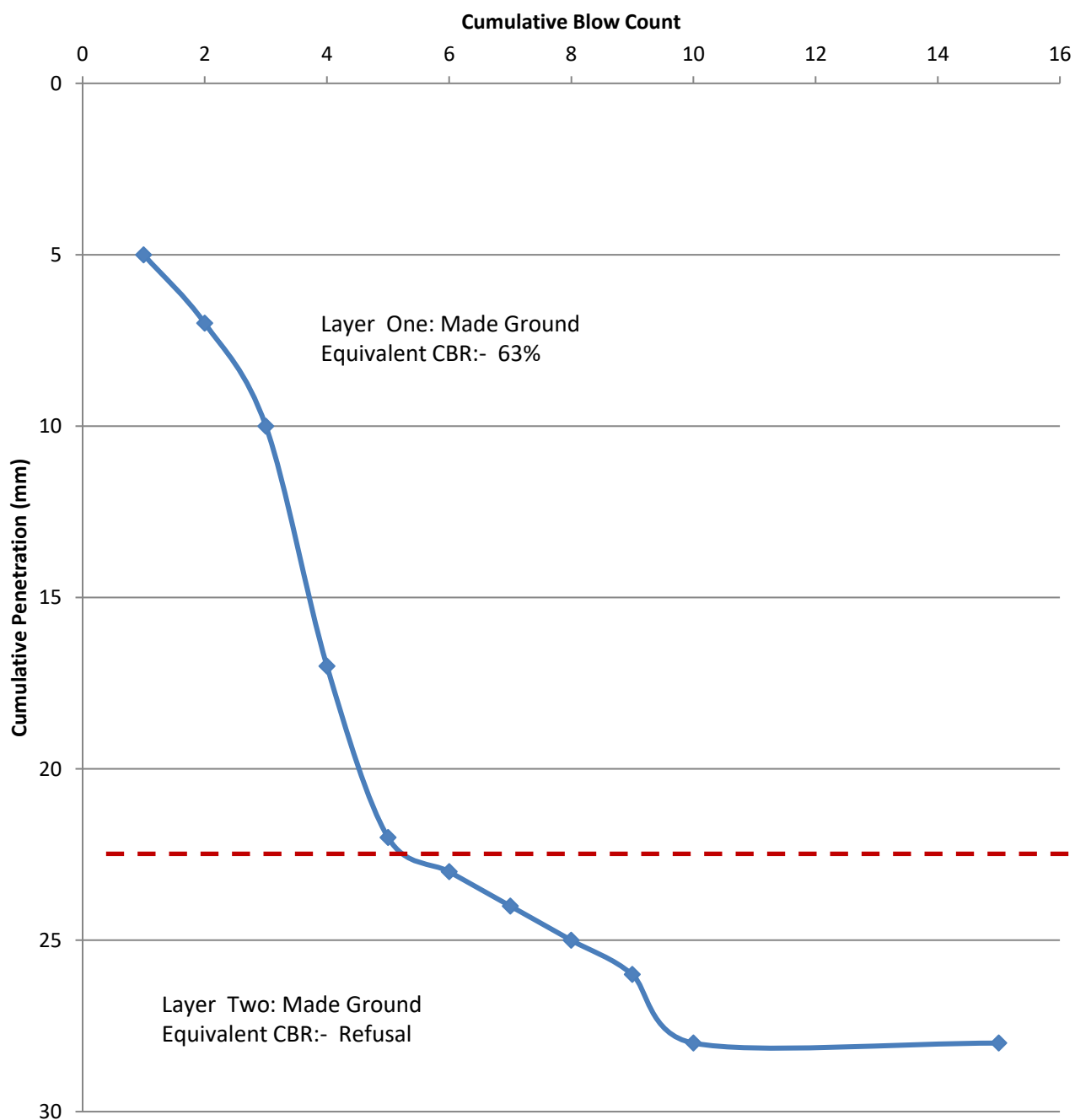
Job Name:- Lordship Farm, Waterloo Lane, Holwell

Equivalent CBR:- 63%/Refusal

Position:- CBR6

Depth below ground level at start of test:- 0.40m

Cumulative Blows Vs Penetration (mm)





Date	Job No.	BH	CH4(%)	LEL(%)	CO2(%)	O2(%)	H2S (ppm)	CO (ppm)	Hex(%)	PIDCf()	PkFlw (lh)	AP (mbar)	GW (m bgl)	Pmp (s)	Bal(%)
22/01/25	24-12-15	BH1	0	0	0	12.9	0	0	0	1	0	996	2.4	63	87.1
27/01/25	24-12-15	BH1	0	0	0	-	0	0	0	1	2.4	975	2.2	60	-
05/02/25	24-12-15	BH1	0	0	0.5	-	0	0	0	1	2.7	1031	2.32	61	-
11/02/25	24-12-15	BH1	0	0	0.2	-	0	0	0	1	2.9	1012	2.1	60	-

APPENDIX C

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060

Email: lab@listersgeotechnics.co.uk

PROJECT INFORMATION		SAMPLE INFORMATION		
Site Location:-	Lordship Farm, Waterllo Lane, Holwell SG3 3SS	Laboratory Tests Undertaken:-		
		TEST TYPE	TEST METHOD	TESTED
Client Reference:-	Geo Integrity	Natural Moisture Contents (MC%)	(BS 1377:Part 2:1990 Clause 3.2)	✓
		Liquid Limits (%)	(BS 1377:Part 2:1990 Clause 4.3)	✓
		Plastic Limits (%)	(BS 1377:Part 2:1990 Clause 5.3)	✓
		Plasticity Index (%)	(BS 1377:Part 2:1990 Clause 5.4)	✓
		Saturated Moisture Content (%)	(BS1377 : Part 2 : 1990, clause 3.3)	
		PSD - Wet Sieving	(BS 1377:Part 2:1990 Clause 9.2)	✓
		Engineering Sample Descriptions	(BS 5930 : Section 6)	
		Passing 425/63 (µm)	-	✓
		Hydrometer	(BS 1377:Part 2:1990 Clause 9.5)	
		Loss on Ignition (%)	-	
		Soil Suctions (kPa)	BRE Digest IP 4/93, 1993	
		Bulk Density (Mg/m ³)	(BS 1377:Part 2:1990 Clause 7.2)	
		Strength Tests	(BS 1377:Part 7:1990 Clause 8 & 9)	
		Soluble Sulphate Content (SO ₄ g/l)	(BS 1377:Part 3:1990 Clause 5.3)	
Date Samples Received:-	31 January 2025	pH value	(BS 1377:Part 3:1990 Clause 9.4)	
		California Bearing Ratios (CBR)	(BS 1377:Part 4:1990 Clause 7)	
		Compaction Tests	(BS 1377:Part 4:1990 Clauses 3.0-3.6)	
		The results relate only to the samples tested		
This test-report may not be reproduced, except with full and written approval of GROUNDTECH LABORATORIES		Laboratory testing in accord with BS EN ISO/IEC 17025-2000 and Quality Management in accord with ISO 9001		
Signed on behalf of GroundTech Laboratories:- _____ Technical Signatory			Quality Assured to ISO 9001	
GEOTECHNICAL LABORATORY TEST RESULTS			Report No:	25.01.027

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD
Telephone: 01327 860947/860060 Fax: 01327 860430

Email: groundtech@listersgeotechnics.co.uk

Quality Assured
to ISO 9001

SAMPLES				CLASSIFICATION TESTS							CLASSIFICATION TESTS							STRENGTH TESTS					CHEMICAL TESTS	
Test Location	Sample Type	Sample Depth -m	Test Type	WC %	LL %	PL %	PI %	Passing 425 μm %	Modified PI %	Class	Passing 63 μm %	WC/ LL	PL+ 2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m³	Test Type	Cell Pressure kN/m²	Deviator Stress kN/m²	Apparent Cohesion kN/m²	φ	pH Value	Soluble Sulphate Content SO4 g/l
BH 01	D	4.00	PI/63	22	34	18	16	100	16	CL	87	0.65	20	0.25										
	D	7.50	PI/63	25	30	24	6	100	6	ML	98	0.83	26	0.17										
	D	10.00	PI/63	21	28	22	6	100	6	ML	99	0.75	24	-0.17										
	D	13.00	PI/63	22	33	20	13	100	13	CL	98	0.67	22	0.15										
TP 02	D	1.00	PSD																					
	D	2.50	PI/63	26	26	17	9	99	9	CL	89	1.00	19	1.00										
TP 03	D	1.20	PI/63	24	37	24	13	82	11	CI	65	0.65	26	0.00										
	D	2.00	PI/63	24	33	23	10	94	9	CL	86	0.73	25	0.10										
TP 04	D	1.30	PSD																					
	D	2.50	PSD																					
TP 05	D	2.00	PI/63	26	33	18	15	85	13	CL	57	0.79	20	0.53										
Symbols:				U	Undisturbed Sample					R	Remoulded			PI	Plasticity Index			T	Triaxial Undrained			L	100mm specimen	
				D	Disturbed Sample					63	Passing 63μm			F	Filter Paper Suction Tests			M	Multistage Triaxial			S	38mm specimen	
				B	Bulk Sample					H	Hydrometer			CC	Continuous Core			HP	Hand Penetrometer					
				W	Water Sample					PSD	Wet Sieving							V	Vane Test					
LABORATORY TEST RESULTS																				Project Reference 25.01.027				

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

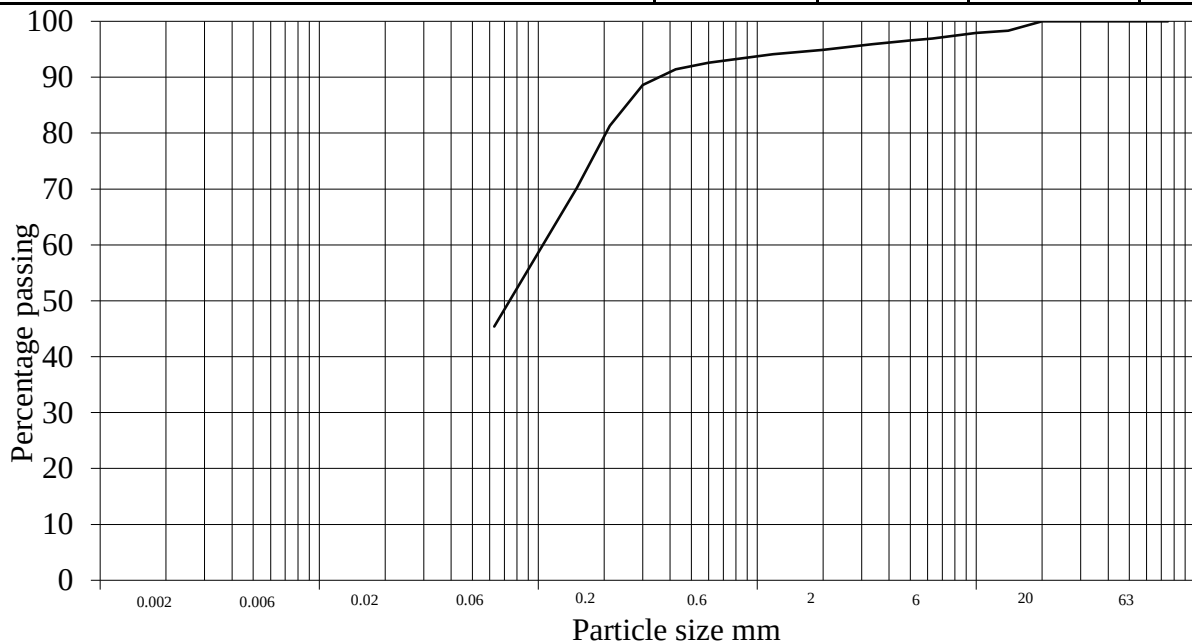
Telephone: 01327 860947/860060

Fax: 01327 860430

Email: groundtech@listersgeotechnics.co.uk

**Quality
Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site:	Lordship Farm, Waterloo Lane, Holwell, SG5 3SS	75mm	100.00		
		63mm	100.00		
Test Location:	TP 02	50mm	100.00		
		37.5mm	100.00		
Sample Depth:	1.00m	26.5mm	100.00		
		20mm	100.00		
Hydrometer No.:		14mm	98.30		
		10mm	97.90		
SG Gs:		6.3mm	96.90		
		5mm	96.60		
Water Visc. (N):		3.5mm	95.90		
		2mm	94.90		
Dry Mass of Soil after pretreatment (g):		1.18mm	94.10		
		600µm	92.60		
		425µm	91.40		
		300µm	88.60		
		212µm	81.30		
		150µm	70.20		
		63µm	45.40		



CLAY	SILT			SAND			GRAVEL			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
45%				50%			5%			0%

PARTICLE SIZE DISTRIBUTION

Project Reference
25.01.027

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

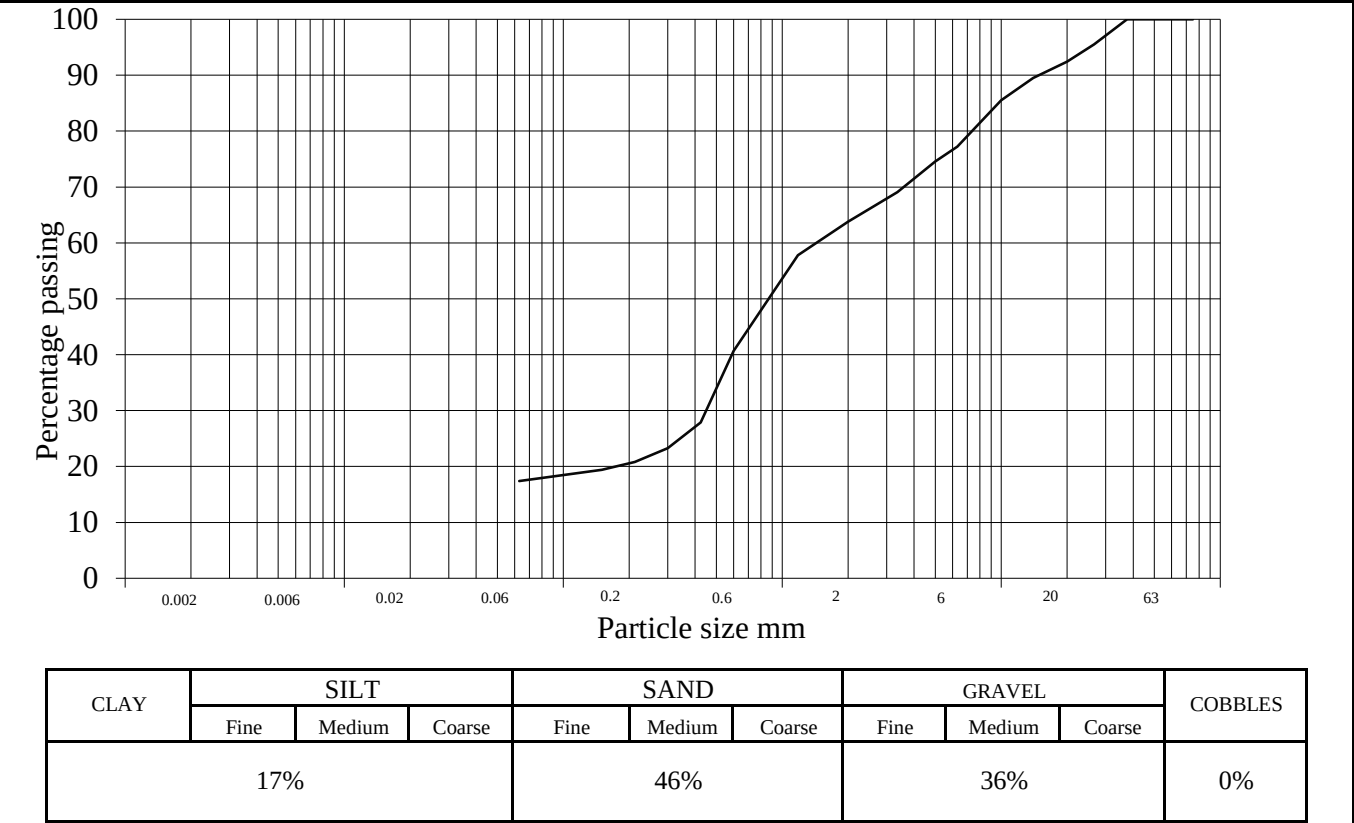
Telephone: 01327 860947/860060

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Email: groundtech@listersgeotechnics.co.uk

**Quality
Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site:	Lordship Farm, Waterloo Lane, Holwell, SG5 3SS	75mm	100.00		
		63mm	100.00		
Test Location:	TP 04	50mm	100.00		
		37.5mm	100.00		
Sample Depth:	1.30m	26.5mm	95.50		
		20mm	92.40		
Hydrometer No.:		14mm	89.50		
		10mm	85.50		
SG Gs:		6.3mm	77.20		
		5mm	74.60		
Water Visc. (N):		3.5mm	69.10		
		2mm	63.80		
Dry Mass of Soil after pretreatment (g):		1.18mm	57.80		
		600µm	40.70		
		425µm	27.90		
		300µm	23.30		
		212µm	20.80		
		150µm	19.40		
		63µm	17.40		



GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

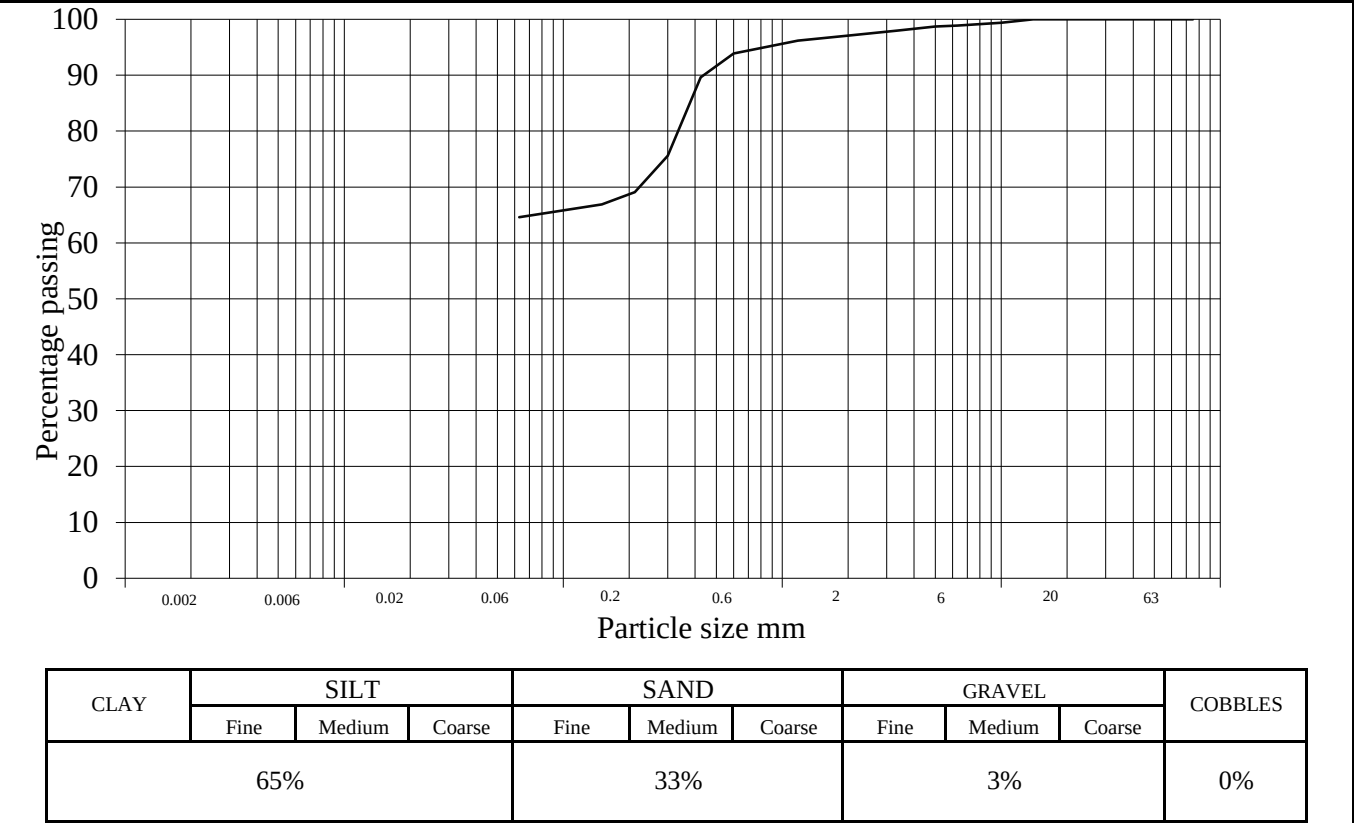
Telephone: 01327 860947/860060

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Email: groundtech@listersgeotechnics.co.uk

**Quality
Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site:	Lordship Farm, Waterloo Lane, Holwell, SG5 3SS	75mm	100.00		
		63mm	100.00		
Test Location:	TP 04	50mm	100.00		
		37.5mm	100.00		
Sample Depth:	2.50m	26.5mm	100.00		
		20mm	100.00		
Hydrometer No.:		14mm	100.00		
		10mm	99.40		
SG Gs:		6.3mm	98.90		
		5mm	98.70		
Water Visc. (N):		3.5mm	98.00		
		2mm	97.10		
Dry Mass of Soil after pretreatment (g):		1.18mm	96.20		
		600µm	93.90		
		425µm	89.60		
		300µm	75.60		
		212µm	69.10		
		150µm	66.90		
		63µm	64.60		





Geo-Integrity
4 Church Street
Buckingham
MK18 1QE

7 - 11 Harding Street
Leicester
LE1 4DH

Analytical Test Report: L25/00582/GIN - 25-55683

Your Project Reference: **Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15**

Your Order Number: Q24-00626/1 Samples Received / Instructed: 21/01/2025 / 22/01/2025

Report Issue Number: 1 Sample Tested: 22/01 to 31/01/2025

Samples Analysed: 6 sample(s) Report issued: 31/01/2025

Signed

James Gane
Analytical Services Manager
CTS

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and other than the asbestos test(s) these results are not covered by our accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

This report shall not be reproduced except in full

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

UKAS accreditation on waters only covers the Ground water and Surface water matrices

Date of Issue: 21.01.2025

Issued by: J. Gane

Issue No: 4

Rev No: 23



7 - 11 Harding Street
Leicester
LE1 4DH

L25/00582/GIN - 25-55683

Project Reference - Lordship Farm, Waterloo
Lane, Holwell, SG5 3SS 24-12-15

Analytical Test Results - Solid

Lab Reference			439279	439280	439281	439282	439283
Client Sample ID			-	-	-	-	-
Client Sample Location			TP3	SA4	TP1	TP5	TP1
Client Sample Type			-	-	-	-	-
Client Sample Number			-	-	-	-	-
Depth - Top (m)			0.30	0.20	0.30	0.30	2.00
Depth - Bottom (m)			0.30	0.20	0.30	0.30	2.00
Date of Sampling			16/01/2025	16/01/2025	16/01/2025	16/01/2025	16/01/2025
Time of Sampling			-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Clay	Clay
Determinant	Units	Accreditation					
Arsenic	(mg/kg)	MCERTS	11	53	20	24	21
Cadmium	(mg/kg)	MCERTS	1.1	3.2	1.9	2.7	1.5
Chromium (Total)	(mg/kg)	UKAS	< 1.0	< 1.0	4.7	10	2.0
Copper	(mg/kg)	MCERTS	18	40	39	140	22
Lead	(mg/kg)	MCERTS	10	140	54	360	14
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	20	48	28	33	27
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	75	210	200	310	92
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.20	< 0.20	< 0.20	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.20	0.23	0.32	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.20	0.29	0.44	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	0.68	0.68	1.6	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	1.3	4.6	2.8	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	< 0.02	1.4	4.5	3.5	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	1.7	6.1	3.0	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	0.40	1.3	1.1	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02	0.84	1.0	1.9	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.20	0.57	0.52	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.07	1.1	0.97	2.3	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.20	< 0.20	< 0.20	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	0.93	4.1	2.4	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.20	< 0.20	< 0.20	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.05	0.28	0.37	0.67	< 0.02
Pyrene	(mg/kg)	MCERTS	0.05	1.2	1.1	2.5	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.47	11	26	24	< 0.32
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	-



L25/00582/GIN - 25-55683

Project Reference - Lordship Farm, Waterloo
Lane, Holwell, SG5 3SS 24-12-15

Analytical Test Results - Chemical Analysis

7 - 11 Harding Street
Leicester
LE1 4DH

Lab Reference			439281	439283
Client Sample ID			-	-
Client Sample Location			TP1	TP1
Client Sample Type			-	-
Client Sample Number			-	-
Depth - Top (m)			0.30	2.00
Depth - Bottom (m)			0.30	2.00
Date of Sampling			16/01/2025	16/01/2025
Time of Sampling			-	-
Sample Matrix			Sand	Clay
Determinant	Units	Accreditation		
Water soluble sulphate (as SO ₄)	(mg/l)	u	220	74
pH Value	pH Units	MCERTS	9.6	8.7



7 - 11 Harding Street
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L25/00582/GIN - 25-55683

Project Reference - Lordship Farm, Waterloo
Lane, Holwell, SG5 3SS 24-12-15

Analytical Test Results - VPH / EPH

Lab Reference	439279	439280	439281	439282	439283	439284
Client Sample ID	-	-	-	-	-	-
Client Sample Location	TP3	SA4	TP1	TP5	TP1	TP1
Client Sample Type	-	-	-	-	-	-
Client Sample Number	-	-	-	-	-	-
Depth - Top (m)	0.30	0.20	0.30	0.30	2.00	1.00
Depth - Bottom (m)	0.30	0.20	0.30	0.30	2.00	1.50
Date of Sampling	16/01/2025	16/01/2025	16/01/2025	16/01/2025	16/01/2025	16/01/2025
Time of Sampling	-	-	-	-	-	-
Sample Matrix	Sand	Sand	Sand	Clay	Clay	Clay
Determinant	Units	Accreditation				
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01	-
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01	-
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01	-
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	-
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01	-
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01	-
Total >C ₅ to C ₄₀ [EH_2D+HS_1D_TOTAL]	(mg/kg)	MCERTS	32	120	290	400
Total TPH >C ₅ to C ₆ [HS_MS_1D_TOTAL]	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₆ to C ₇ [HS_MS_1D_TOTAL]	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₇ to C ₈ [HS_MS_1D_TOTAL]	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C ₈ to C ₁₀ [EH_2D_TOTAL]	(mg/kg)	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Total TPH >C ₁₀ to C ₁₂ [EH_2D_TOTAL]	(mg/kg)	MCERTS	< 5.0	< 5.0	7.1	< 5.0
Total TPH >C ₁₂ to C ₁₆ [EH_2D_TOTAL]	(mg/kg)	MCERTS	< 5.0	< 5.0	26	< 5.0
Total TPH >C ₁₆ to C ₂₁ [EH_2D_TOTAL]	(mg/kg)	MCERTS	< 5.0	16	62	< 5.0
Total TPH >C ₂₁ to C ₃₅ [EH_2D_TOTAL]	(mg/kg)	MCERTS	20	64	120	190
Total TPH >C ₃₅ to C ₄₄ [EH_2D_TOTAL]	(mg/kg)	u	17	58	140	96



L25/00582/GIN - 25-55683

Project Reference - Lordship Farm, Waterloo Lane

Analytical Test Results - VOC

7 - 11 Harding Street
Leicester
LE1 4DH

Lab Reference	439284
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Client Sample ID	-
Client Sample Location	TP1
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	1.00
Depth - Bottom (m)	1.50
Date of Sampling	16/01/2025
Time of Sampling	-
Sample Matrix	Clay

Determinant	Units	Accreditation	
Benzene	(mg/kg)	MCERTS	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01
Dichlorodifluoromethane	(mg/kg)	UKAS	< 0.05
Chloromethane	(mg/kg)	UKAS	< 0.02
Vinyl Chloride	(mg/kg)	MCERTS	< 0.02
Bromomethane	(mg/kg)	u	< 0.05
Chloroethane	(mg/kg)	MCERTS	< 0.01
Trichlorofluoromethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethylene	(mg/kg)	MCERTS	< 0.01
Dichloromethane	(mg/kg)	u	< 0.10
MTBE	(mg/kg)	MCERTS	< 0.01
trans-1,2-dichloroethylene	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethane	(mg/kg)	MCERTS	< 0.01
2,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
cis-1,2-dichloroethylene	(mg/kg)	MCERTS	< 0.01
Bromochloromethane	(mg/kg)	MCERTS	< 0.05
Chloroform	(mg/kg)	MCERTS	< 0.01
1,1,1-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloropropene	(mg/kg)	MCERTS	< 0.01
Carbon Tetrachloride	(mg/kg)	MCERTS	< 0.01
1,2-dichloroethane	(mg/kg)	MCERTS	< 0.02
Trichloroethylene	(mg/kg)	MCERTS	< 0.01
1,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Dibromomethane	(mg/kg)	MCERTS	< 0.02
Bromodichloromethane	(mg/kg)	MCERTS	< 0.01
cis-1,2-dichloropropylene	(mg/kg)	MCERTS	< 0.01
trans-1,3-dichloropropylene	(mg/kg)	MCERTS	< 0.01
1,1,2-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,3-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Tetrachloroethylene	(mg/kg)	MCERTS	< 0.01
Chlorodibromomethane	(mg/kg)	MCERTS	< 0.01
1,2-Dibromoethane	(mg/kg)	MCERTS	< 0.01
Chlorobenzene	(mg/kg)	MCERTS	< 0.01
1,1,1,2-tetrachloroethane	(mg/kg)	MCERTS	< 0.01
Styrene	(mg/kg)	UKAS	< 0.01
Isopropylbenzene	(mg/kg)	MCERTS	< 0.01
Bromoform	(mg/kg)	MCERTS	< 0.05
1,1,2,2-Tetrachloroethane	(mg/kg)	MCERTS	< 0.01
1,2,3-Trichloropropane	(mg/kg)	MCERTS	< 0.02
n-Propylbenzene	(mg/kg)	MCERTS	< 0.01
Bromobenzene	(mg/kg)	MCERTS	< 0.01
1,3,5-Trimethylbenzene	(mg/kg)	UKAS	< 0.01
2-chlorotoluene	(mg/kg)	MCERTS	< 0.01
4-chlorotoluene	(mg/kg)	MCERTS	< 0.01
tert-butylbenzene	(mg/kg)	UKAS	< 0.01
1,2,4-trimethylbenzene	(mg/kg)	UKAS	< 0.01
sec-Butylbenzene	(mg/kg)	UKAS	< 0.01
4-Isopropyltoluene (P-Cymene)	(mg/kg)	UKAS	< 0.01
1,3-Dichlorobenzene	(mg/kg)	u	< 0.01
1,4-Dichlorobenzene	(mg/kg)	u	< 0.01
n-Butylbenzene	(mg/kg)	UKAS	< 0.01
1,2-Dichlorobenzene	(mg/kg)	MCERTS	< 0.01
1,2-Dibromo-3-chloropropane	(mg/kg)	u	< 0.05
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.05
Hexachlorobutadiene	(mg/kg)	u	< 0.05
Naphthalene	(mg/kg)	u	< 0.05
1,2,3-Trichlorobenzene	(mg/kg)	u	< 0.05

L25/00582/GIN - 25-55683
Project Reference - Lordship Farm, Waterloo Lane
Analytical Test Results - SVOC

Lab Reference		439284	
Client Sample ID		-	
Client Sample Location		TP1	
Client Sample Type		-	
Client Sample Number		-	
Depth - Top (m)		1.00	
Depth - Bottom (m)		1.50	
Date of Sampling		16/01/2025	
Time of Sampling		-	
Sample Matrix		Clay	
Determinant	Units	Accreditation	
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.2
1,2-Dichlorobenzene	(mg/kg)	u	< 0.1
1,3-Dichlorobenzene	(mg/kg)	u	< 0.1
1,4-Dichlorobenzene	(mg/kg)	u	< 0.2
1-Chloronaphthalene	(mg/kg)	u	< 0.1
2,3,4,6-Tetrachlorophenol	(mg/kg)	u	< 0.6
2,4,5-Trichlorophenol	(mg/kg)	u	< 0.2
2,4,6-Trichlorophenol	(mg/kg)	u	< 0.3
2,4-Dichlorophenol	(mg/kg)	u	< 0.2
2,4-Dimethylphenol	(mg/kg)	u	< 0.2
2,4-Dinitrophenol	(mg/kg)	u	< 2.0
2,6-Dichlorophenol	(mg/kg)	u	< 0.3
2,6-Dinitrotoluene	(mg/kg)	u	< 0.6
2-Chlorophenol	(mg/kg)	u	< 0.2
2-Methylnaphthalene	(mg/kg)	u	< 0.2
2-Methylphenol	(mg/kg)	u	< 0.2
2-Nitroaniline	(mg/kg)	u	< 0.4
2-Nitrophenol	(mg/kg)	u	< 0.6
3,3-Dichlorobenzidine	(mg/kg)	u	< 0.3
3/4-Methylphenol	(mg/kg)	u	< 0.2
3-Nitroaniline	(mg/kg)	u	< 0.6
4-Chlorophenyl phenyl ether	(mg/kg)	u	< 0.2
4,6-Dinitro-2-methylphenol	(mg/kg)	u	< 1.0
4-Bromophenyl phenyl ether	(mg/kg)	u	< 0.2
4-Chloro-3-methylphenol	(mg/kg)	u	< 0.2
4-Chloroaniline	(mg/kg)	u	< 0.2
4-Nitroaniline	(mg/kg)	u	< 0.3
4-Nitrophenol	(mg/kg)	u	< 0.6
Acenaphthene	(mg/kg)	u	< 0.1
Acenaphthylene	(mg/kg)	u	< 0.1
Aniline	(mg/kg)	u	< 0.2
Anthracene	(mg/kg)	u	< 0.1
Azobenzene	(mg/kg)	u	< 0.2
Benz[a]anthracene	(mg/kg)	u	< 0.1
Benzo[ghi]perylene	(mg/kg)	u	< 0.1
Benzo[a]pyrene	(mg/kg)	u	< 0.2
Benzo[b]fluoranthene	(mg/kg)	u	< 0.1
Benzo[k]fluoranthene	(mg/kg)	u	< 0.1
Benzyl Alcohol	(mg/kg)	u	< 0.3
Benzyl butyl phthalate	(mg/kg)	u	< 0.2
Bis(2-chloroethoxy)methane	(mg/kg)	u	< 0.1
Bis(2-chloroethyl)ether	(mg/kg)	u	< 0.2
Bis(2-chloroisopropyl)ether	(mg/kg)	u	< 0.2
Bis(2-ethylhexyl) phthalate	(mg/kg)	u	< 0.2
Chrysene	(mg/kg)	u	< 0.1
Dibenz[a,h]anthracene	(mg/kg)	u	< 0.2
Dibenzofuran	(mg/kg)	u	< 0.1
Dibutyl phthalate	(mg/kg)	u	< 0.1
Diethyl Phthalate	(mg/kg)	u	< 0.2
Dimethyl phthalate	(mg/kg)	u	< 0.2
Di-n-octyl phthalate	(mg/kg)	u	< 0.2
Diphenylamine	(mg/kg)	u	< 0.1
Fluoranthene	(mg/kg)	u	0.2
Fluorene	(mg/kg)	u	< 0.1
Hexachlorobenzene	(mg/kg)	u	< 0.3
Hexachlorobutadiene	(mg/kg)	u	< 0.3
Hexachlorocyclopentadiene	(mg/kg)	u	< 1.0
Hexachloroethane	(mg/kg)	u	< 0.2
Indeno[1,2,3-cd]pyrene	(mg/kg)	u	< 0.2
Isophorone	(mg/kg)	u	< 0.2
Methyl Methanesulfonate	(mg/kg)	u	< 0.3
Naphthalene	(mg/kg)	u	< 0.1
NitroBenzene	(mg/kg)	u	< 0.3
N-Nitrosodimethylamine	(mg/kg)	u	< 0.2
Pentachlorophenol	(mg/kg)	u	< 1.0
Phenanthrene	(mg/kg)	u	0.2
Phenol	(mg/kg)	u	< 0.1
Pyrene	(mg/kg)	u	0.2



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L25/00582/GIN - 25-55683

Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

Certificate Of Analysis - WAC Suite

Lab Reference		439281
Client Sample ID	-	
Client Sample Location	TP1	
Client Sample Type	-	
Client Sample Number	-	
Depth - Top (m)	0.3	
Depth - Bottom (m)	0.3	
Date of Sampling	16/01/2025	
Time of Sampling	-	
Sample Description	Brown gravelly slightly clayey silty sand	
Sample Matrix	Sand	
Moisture Content (%)	14	
Stone content (%)	49	

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	2.4	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.0	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.06	6.00	-	-
PCB's (7 Congeners)	mg/kg	MCERTS	< 0.250	1.00	-	-
Mineral Oil (>C10 to C40) [EH_CU_1D_Tota	mg/kg	u	1400	500	-	-
PAH	mg/kg	u	27	100	-	-
pH	units	MCERTS	9.6	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	UKAS	0.08	0.50	2	25
Barium	mg/kg	UKAS	0.09	20	100	300
Cadmium	mg/kg	UKAS	< 0.0025	0.04	1	5
Chromium (total)	mg/kg	UKAS	0.02	0.5	10	70
Copper	mg/kg	UKAS	0.06	2.0	50	100
Mercury	mg/kg	UKAS	< 0.00050	0.01	0.2	2
Molybdenum	mg/kg	UKAS	< 0.010	0.5	10.0	30
Nickel	mg/kg	UKAS	< 0.075	0.4	10.0	40
Lead	mg/kg	UKAS	< 0.035	0.5	10.0	50
Antimony	mg/kg	UKAS	< 0.050	0.06	0.7	5
Selenium	mg/kg	UKAS	0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.25	4	50	200
Chloride	mg/kg	UKAS	< 1	800	15000	25000
Fluoride	mg/kg	u	5	10	150	500
Sulphate (as SO ₄)	mg/kg	UKAS	240	1000	20000	50000
Total Dissolved Solids	mg/kg	u	770	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	UKAS	38.0	500	800	1000



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Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
439279	-	TP3	-	-	Cream slightly gravelly very sandy silty clay	16	17	-
439280	-	SA4	-	-	Made Ground- brown slightly gravelly slightly clayey silty sand with occasional brick fragments	9.9	35	-
439281	-	TP1	-	-	Brown gravelly slightly clayey silty sand	14	49	49
439282	-	TP5	-	-	Dark grey slightly gravelly slightly sandy silty clay	12	61	-
439283	-	TP1	-	-	Cream slightly gravelly slightly sandy silty clay	17	6.0	100
439284	-	TP1	-	-	Grey slightly gravelly silty clay	31	< 0.1	-



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Sample Comments

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Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
439279	-	TP3	-	-	VPH/BTEX - Sample taken from container with head space.
439280	-	SA4	-	-	VPH/BTEX - Sample taken from container with head space. PAHAR - 1/10 dark colour extract
439281	-	TP1	-	-	VPH/BTEX - Sample taken from container with head space. PCB - 1/10 dark colour extract TPH - 1/10 dilution dark coloured extract
439282	-	TP5	-	-	VPH/BTEX - Sample taken from container with head space. TPH - 1/10 dilution dark coloured extract PAHAR - 1/10 dark colour extract
439283	-	TP1	-	-	VPH/BTEX - Sample taken from container with head space.
439284	-	TP1	-	-	VPH/BTEX - Sample taken from container with head space.



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Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
WACMETALS1	MS-CL-Metals in Waters by ICP-MS (WAC)	As received	MS-CL-Soil Leachate Preparation	Determination of dissolved metals in leachates via ICP-MS, expressed as quantity of analyte leached from the original material.
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
SVOCS	MS - CL - Semi VOC	As received	Passing 10mm test sieve	Determination of Semi volatile organic compounds in soil via GC-MS
TDSL	MS-CL-Conductivity in Water(TDS by Calc)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates (by calculation)
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TPHSC	MS - CL - TPH (GC-FID) Scrubbed	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID. Sample is subjected to a fluorocil cleanup (scrubbing stage) prior to analysis
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
GCGCS	MS - CL - TPH & EPH by GCGC	As received	Passing 10mm test sieve	Determination of TPH and EPH in soils via GCxGC-FID
CWGS	Calculation from VPH-S and EPH-S	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-GC-FID respectively
VOCS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of VOCs (inc BTEX) in soils via Headspace-GC-MS
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
LEACH-SS-P	MS-CL-Soil Leachate Preparation (SS)	As Received	All crushed to pass 4mm test sieve	Preparation of single stage soil leachates in accordance with MS-CL-Soil Leachate Preparation



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Analysis Methodologies

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Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
1377LOI	BS1377 LoI	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.



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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

W - No time of sampling provided for water sample

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
439279	-	TP3	-	-	MS - CL - VPH	R
439280	-	SA4	-	-	MS - CL - VPH	R
439281	-	TP1	-	-	MS - CL - pH in Soils	RX
439281	-	TP1	-	-	MS - CL - pH in Soils (WAC)	RX
439281	-	TP1	-	-	MS - CL - VPH	R
439282	-	TP5	-	-	MS - CL - VPH	R
439283	-	TP1	-	-	MS - CL - pH in Soils	RX
439283	-	TP1	-	-	MS - CL - VPH	R
439284	-	TP1	-	-	MS - CL - VOC and MBTEX	R
439284	-	TP1	-	-	MS - CL - VPH	R



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Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Benzo[a]anthracene	0.02	0.68	0.68	1.60	
Chrysene	0.02	0.84	1.00	1.90	
Benzo[b]fluoranthene	0.02	1.40	4.50	3.50	
Benzo[k]fluoranthene	0.02	0.40	1.30	1.10	
Indeno(1,2,3-c,d)Pyrene	0.02	0.93	4.10	2.40	
Dibenz(a,h)Anthracene	0.02	0.20	0.57	0.52	
Benzo[g,h,i]perylene	0.02	1.70	6.10	3.00	
Benzo[a]pyrene	0.02	1.30	4.60	2.80	

PAH/BaP ratio				Mean
1	0.523077	0.147826	0.571429	0.56
1	0.646154	0.217391	0.678571	0.64
1	1.076923	0.978261	1.25	1.08
1	0.307692	0.282609	0.392857	0.50
1	0.715385	0.891304	0.857143	0.87
1	0.153846	0.123913	0.185714	0.37
1	1.307692	1.326087	1.071429	1.18

Table 2.5: Profile of the genotoxic PAHs relative to BaP in the Culp study with order of magnitude upper and lower limits.

PAH	Mean ratio to BaP	Lower limit	Upper limit
Benzo[a]anthracene	1.24	0.12	12.43
Chrysene	1.19	0.12	11.81
Benzo[a]fluoranthene	1.08	0.11	10.85
Benzo[k]fluoranthene	0.37	0.04	3.72
Dibenz[a,h]anthracene	0.14	0.01	1.38
Indeno(1,2,3-cd)pyrene	0.73	0.07	7.27
Benzo[g,h,i]perylene	0.82	0.08	8.22

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)



955HR-YBRCU-M5Q5K

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

LORDSHIP FARM, WATERLOO LANE, HOLWELL, SG5 3SS

Description/Comments

Project

24-12-15

Site

LORDSHIP FARM, WATERLOO LANE, HOLWELL, SG5 3SS

Classified by

Name: **Fiona White**
Date: **25 Feb 2025 16:38 GMT**
Telephone: **01280 816409**
Company: **Geo-Integrity Limited**
Geo-Integrity
Unit 7
Towcester
NN12 8TA

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:

CERTIFIED

Course

Hazardous Waste Classification

Date

05 Oct 2023

Next 3 year Refresher due by Oct 2026

Purpose of classification

7 - Disposal of Waste

Address of the waste

LORDSHIP FARM, WATERLOO LANE, HOLWELL, SG5 3SS

Post Code SG5 3SS

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

redevelopment of existing agricultural development into residential

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

waste created during the excavation of soils

Description of the waste

Made ground and natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP3	0.3	Non Hazardous		3
2	SA4	0.2	Non Hazardous		5
3	TP1	0.3	Non Hazardous		7
4	TP5	0.3	Non Hazardous		9
5	TP1 (2)	2	Non Hazardous		11

Related documents

#	Name	Description
1	WM3 v1.2 2021 compliant	waste stream template used to create this Job

Report

Created by: Fiona White

Created date: 25 Feb 2025 16:38 GMT

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

Classification of sample: TP3

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

Sample details

Sample name:	LoW Code:
TP3	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% 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 trioxide }				11	mg/kg	1.32	14.524	mg/kg	0.00145 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfate }				1.1	mg/kg	1.855	2.04	mg/kg	0.000204 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				<1	mg/kg	1.462	<1.462	mg/kg	<0.000146 %		<LOD
		215-160-9	1308-38-9									
4	copper { copper sulphate pentahydrate }				18	mg/kg	3.929	70.723	mg/kg	0.00707 %	✓	
	029-023-00-4	231-847-6	7758-99-8									
5	mercury { mercury dichloride }				10	mg/kg	1.353	13.535	mg/kg	0.00135 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				<2.5	mg/kg	2.976	<7.441	mg/kg	<0.000744 %		<LOD
	028-035-00-7	238-766-5	14721-18-7									
7	lead { lead chromate }			1	20	mg/kg	1.56	31.196	mg/kg	0.002 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				75	mg/kg	2.774	208.061	mg/kg	0.0208 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
11	TPH (C6 to C40) petroleum group				32	mg/kg		32	mg/kg	0.0032 %	✓	
			TPH									
12	naphthalene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		205-917-1	208-96-8									
14	acenaphthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-469-6	83-32-9									
15	fluorene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-695-5	86-73-7									
16	phenanthrene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-581-5	85-01-8									

#	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							
17	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
19	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
20	benzo[a]anthracene	601-033-00-9	200-280-6		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
21	chrysene	601-048-00-0	205-923-4		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.07 mg/kg		0.07 mg/kg	0.000007 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
28	PAHs (total)				0.47 mg/kg		0.47 mg/kg	0.000047 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0384 %		

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: 500 mg/kg (0.05%) because: Non-flammable, long-chain hydrocarbons, no free phase liquids

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0032%)

Classification of sample: SA4

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

Sample details

Sample name:	LoW Code:
SA4	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% 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 trioxide }				53	mg/kg	1.32	69.977	mg/kg	0.007 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfate }				3.2	mg/kg	1.855	5.935	mg/kg	0.000593 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				<1	mg/kg	1.462	<1.462	mg/kg	<0.000146 %		<LOD
		215-160-9	1308-38-9									
4	copper { copper sulphate pentahydrate }				40	mg/kg	3.929	157.162	mg/kg	0.0157 %	✓	
	029-023-00-4	231-847-6	7758-99-8									
5	mercury { mercury dichloride }				140	mg/kg	1.353	189.488	mg/kg	0.0189 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				<2.5	mg/kg	2.976	<7.441	mg/kg	<0.000744 %		<LOD
	028-035-00-7	238-766-5	14721-18-7									
7	lead { lead chromate }			1	48	mg/kg	1.56	74.871	mg/kg	0.0048 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				210	mg/kg	2.774	582.571	mg/kg	0.0583 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
11	TPH (C6 to C40) petroleum group				120	mg/kg		120	mg/kg	0.012 %	✓	
			TPH									
12	naphthalene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		205-917-1	208-96-8									
14	acenaphthene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		201-469-6	83-32-9									
15	fluorene				0.68	mg/kg		0.68	mg/kg	0.000068 %	✓	
		201-695-5	86-73-7									
16	phenanthrene				1.3	mg/kg		1.3	mg/kg	0.00013 %	✓	
		201-581-5	85-01-8									

#	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							
17	anthracene	204-371-1	120-12-7		1.4 mg/kg		1.4 mg/kg	0.00014 %	✓	
18	fluoranthene	205-912-4	206-44-0		1.7 mg/kg		1.7 mg/kg	0.00017 %	✓	
19	pyrene	204-927-3	129-00-0		0.4 mg/kg		0.4 mg/kg	0.00004 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.84 mg/kg		0.84 mg/kg	0.000084 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.93 mg/kg		0.93 mg/kg	0.000093 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.28 mg/kg		0.28 mg/kg	0.000028 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		1.2 mg/kg		1.2 mg/kg	0.00012 %	✓	
28	PAHs (total)				11 mg/kg		11 mg/kg	0.0011 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	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]	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.122 %		

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: 500 mg/kg (0.05%) because: Non-flammable, long-chain hydrocarbons, no free phase liquids

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.012%)

Classification of sample: TP1

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

Sample details

Sample name:	LoW Code:
TP1	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% 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 trioxide }				20	mg/kg	1.32	26.407	mg/kg	0.00264 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfate }				1.9	mg/kg	1.855	3.524	mg/kg	0.000352 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				4.7	mg/kg	1.462	6.869	mg/kg	0.000687 %	✓	
		215-160-9	1308-38-9									
4	copper { copper sulphate pentahydrate }				39	mg/kg	3.929	153.233	mg/kg	0.0153 %	✓	
	029-023-00-4	231-847-6	7758-99-8									
5	mercury { mercury dichloride }				54	mg/kg	1.353	73.088	mg/kg	0.00731 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				<2.5	mg/kg	2.976	<7.441	mg/kg	<0.000744 %		<LOD
	028-035-00-7	238-766-5	14721-18-7									
7	lead { lead chromate }			1	28	mg/kg	1.56	43.675	mg/kg	0.0028 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				200	mg/kg	2.774	554.829	mg/kg	0.0555 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
11	TPH (C6 to C40) petroleum group				290	mg/kg		290	mg/kg	0.029 %	✓	
			TPH									
12	naphthalene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				0.23	mg/kg		0.23	mg/kg	0.000023 %	✓	
		205-917-1	208-96-8									
14	acenaphthene				0.29	mg/kg		0.29	mg/kg	0.000029 %	✓	
		201-469-6	83-32-9									
15	fluorene				0.68	mg/kg		0.68	mg/kg	0.000068 %	✓	
		201-695-5	86-73-7									
16	phenanthrene				4.6	mg/kg		4.6	mg/kg	0.00046 %	✓	
		201-581-5	85-01-8									

#	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							
17	anthracene	204-371-1	120-12-7		4.5 mg/kg		4.5 mg/kg	0.00045 %	✓	
18	fluoranthene	205-912-4	206-44-0		6.1 mg/kg		6.1 mg/kg	0.00061 %	✓	
19	pyrene	204-927-3	129-00-0		1.3 mg/kg		1.3 mg/kg	0.00013 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		1 mg/kg		1 mg/kg	0.0001 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.57 mg/kg		0.57 mg/kg	0.000057 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.97 mg/kg		0.97 mg/kg	0.000097 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		4.1 mg/kg		4.1 mg/kg	0.00041 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.37 mg/kg		0.37 mg/kg	0.000037 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
28	PAHs (total)				26 mg/kg		26 mg/kg	0.0026 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.121 %		

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: 500 mg/kg (0.05%) because: Non-flammable, long-chain hydrocarbons, no free phase liquids

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.029%)

Classification of sample: TP5

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

Sample details

Sample name:	LoW Code:
TP5	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% 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 trioxide }				24	mg/kg	1.32	31.688	mg/kg	0.00317 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfate }				2.7	mg/kg	1.855	5.007	mg/kg	0.000501 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10	mg/kg	1.462	14.616	mg/kg	0.00146 %	✓	
		215-160-9	1308-38-9									
4	copper { copper sulphate pentahydrate }				140	mg/kg	3.929	550.067	mg/kg	0.055 %	✓	
	029-023-00-4	231-847-6	7758-99-8									
5	mercury { mercury dichloride }				360	mg/kg	1.353	487.255	mg/kg	0.0487 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				<2.5	mg/kg	2.976	<7.441	mg/kg	<0.000744 %		<LOD
	028-035-00-7	238-766-5	14721-18-7									
7	lead { lead chromate }			1	33	mg/kg	1.56	51.474	mg/kg	0.0033 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				310	mg/kg	2.774	859.985	mg/kg	0.086 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
11	TPH (C6 to C40) petroleum group				400	mg/kg		400	mg/kg	0.04 %	✓	
			TPH									
12	naphthalene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				0.32	mg/kg		0.32	mg/kg	0.000032 %	✓	
		205-917-1	208-96-8									
14	acenaphthene				0.44	mg/kg		0.44	mg/kg	0.000044 %	✓	
		201-469-6	83-32-9									
15	fluorene				1.6	mg/kg		1.6	mg/kg	0.00016 %	✓	
		201-695-5	86-73-7									
16	phenanthrene				2.8	mg/kg		2.8	mg/kg	0.00028 %	✓	
		201-581-5	85-01-8									

#	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							
17	anthracene	204-371-1	120-12-7		3.5 mg/kg		3.5 mg/kg	0.00035 %	✓	
18	fluoranthene	205-912-4	206-44-0		3 mg/kg		3 mg/kg	0.0003 %	✓	
19	pyrene	204-927-3	129-00-0		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		1.9 mg/kg		1.9 mg/kg	0.00019 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.52 mg/kg		0.52 mg/kg	0.000052 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		2.3 mg/kg		2.3 mg/kg	0.00023 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		2.4 mg/kg		2.4 mg/kg	0.00024 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.67 mg/kg		0.67 mg/kg	0.000067 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		2.5 mg/kg		2.5 mg/kg	0.00025 %	✓	
28	PAHs (total)				24 mg/kg		24 mg/kg	0.0024 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.245 %		

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: 500 mg/kg (0.05%) because: Non-flammable, long-chain hydrocarbons, no free phase liquids

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.04%)

Classification of sample: TP1 (2)

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

Sample details

Sample name:	LoW Code:
TP1 (2)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% 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 trioxide }				21	mg/kg	1.32	27.727	mg/kg	0.00277 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium sulfate }				1.5	mg/kg	1.855	2.782	mg/kg	0.000278 %	✓	
	048-009-00-9	233-331-6	10124-36-4									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				2	mg/kg	1.462	2.923	mg/kg	0.000292 %	✓	
		215-160-9	1308-38-9									
4	copper { copper sulphate pentahydrate }				22	mg/kg	3.929	86.439	mg/kg	0.00864 %	✓	
	029-023-00-4	231-847-6	7758-99-8									
5	mercury { mercury dichloride }				14	mg/kg	1.353	18.949	mg/kg	0.00189 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
6	nickel { nickel chromate }				<2.5	mg/kg	2.976	<7.441	mg/kg	<0.000744 %		<LOD
	028-035-00-7	238-766-5	14721-18-7									
7	lead { lead chromate }			1	27	mg/kg	1.56	42.115	mg/kg	0.0027 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<8	mg/kg	1.405	<11.24	mg/kg	<0.00112 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				92	mg/kg	2.774	255.221	mg/kg	0.0255 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
11	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
12	naphthalene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		205-917-1	208-96-8									
14	acenaphthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-469-6	83-32-9									
15	fluorene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-695-5	86-73-7									
16	phenanthrene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		201-581-5	85-01-8									

#	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							
17	anthracene	204-371-1	120-12-7		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
18	fluoranthene	205-912-4	206-44-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
19	pyrene	204-927-3	129-00-0		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
28	PAHs (total)				<0.32 mg/kg		<0.32 mg/kg	<0.000032 %		<LOD
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
32	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]	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
Total:								0.0452 %		

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

Appendix A: Classifier defined and non GB MCL determinands

• **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

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

• **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

■ **PAHs (total)**

Description/Comments: Worst case scenario combining risk phrases and substance specific thresholds from benzo[a]pyrene (CLP# 601-032-00-3) and benzo[a]anthracene (CLP# 601-033-00-9)
Data source: 2008/1272/EC – Table 3.2 of Annex VI of regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures and 2009/790/EC Annex IV – Annex IV of regulation 2009/790/EC - 1st Adaptation to Technical Progress for European Regulation 1272/2008
Data source date: 16 Dec 2008
Hazard Statements: Skin Sens. 1; H317 , Carc. 1B; H350 , Carc. 1B; H350 >= 0.01 % , Muta. 1B; H340 , Aquatic Acute 1; H400 (M=100) , Aquatic Chronic 1; H410 (M=100) , Repr. 1B; H360FD

■ **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds

cadmium {cadmium sulfate}

Worst Case Species Selected

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

(enter justification for selecting this species)

copper {copper sulphate pentahydrate}

Worst Case Species Selected

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight

lead {lead chromate}

Worst Case Species Selected

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

(enter justification for selecting this species)

zinc {zinc chromate}

Worst Case Species Selected

chromium in chromium(VI) compounds {chromium(VI) oxide}

(enter justification for selecting this species)

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 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



Geo-Integrity
4 Church Street
Buckingham
MK18 1QE

7 - 11 Harding Street
Leicester
LE1 4DH

Analytical Test Report: L25/02028/GIN - 25-58320

Your Project Reference: **Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15**

Your Order Number: Q24/00626/1 Samples Received / Instructed: 21/02/2025 / 24/02/2025

Report Issue Number: 1 Sample Tested: 24/02 to 05/03/2025

Samples Analysed: 3 sample(s) Report issued: 05/03/2025

Signed

James Gane
Analytical Services Manager
CTS

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

This report shall not be reproduce except in full

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

UKAS accreditation on waters only covers the Ground water and Surface water matrices

Date of Issue: 27.02.25

Issued by: J. Gane

Issue No: 4

Rev No: 24



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LE1 4DH

L25/02028/GIN - 25-58320

Project Reference - Lordship Farm, Waterloo
Lane, Holwell, SG5 3SS 24-12-15

Analytical Test Results - Chemical Analysis

Lab Reference			457652	457653	457654
Client Sample ID			-	-	-
Client Sample Location			BH1	BH1	BH1
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			4.90	8.00	12.50
Depth - Bottom (m)			4.90	8.00	12.50
Date of Sampling			17/01/2025	17/01/2025	17/01/2025
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Water soluble sulphate (as SO ₄)	(mg/l)	u	54	450	420
Acid Soluble Sulphate	(%)	u	0.06	0.22	0.19
Total Sulphur	(%)	UKAS	0.14	0.72	0.89
pH Value	pH Units	MCERTS	8.5	8.2	8.5



L25/02028/GIN - 25-58320

Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
457652	-	BH1	-	-	Brown sandy clay	-	-	100
457653	-	BH1	-	-	Grey silty clay	-	-	100
457654	-	BH1	-	-	Grey silty clay	-	-	100



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Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
457652	-	BH1	-	-	
457653	-	BH1	-	-	
457654	-	BH1	-	-	



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L25/02028/GIN - 25-58320

Project Reference - Lordship Farm, Waterloo Lane, Holwell, SG5 3SS 24-12-15

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)



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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

W - No time of sampling provided for water sample

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
457652	-	BH1	-	-	BS1377 Total Sulphur Content by HTC	RX
457652	-	BH1	-	-	MS - CL - Anions by Aquakem (2:1Extract)	RX
457652	-	BH1	-	-	MS - CL - pH in Soils	RX
457653	-	BH1	-	-	BS1377 Total Sulphur Content by HTC	RX
457653	-	BH1	-	-	MS - CL - Anions by Aquakem (2:1Extract)	RX
457653	-	BH1	-	-	MS - CL - pH in Soils	RX
457654	-	BH1	-	-	BS1377 Total Sulphur Content by HTC	RX
457654	-	BH1	-	-	MS - CL - Anions by Aquakem (2:1Extract)	RX
457654	-	BH1	-	-	MS - CL - pH in Soils	RX

APPENDIX D

Natural Cavities Risk Assessment



Project Name : Lordship Farm, Waterloo Lane, Holwell

Project No : ,24-12-15

Client : Netherdown (Herts) Ltd.

This site has a Very Low Subsidence Hazard Category

Subsidence Hazard Components	Value
G1 - Chalk lithostratigraphic Factor	1
G2 - Post Cretaceous Cover Deposit Factor	18
H1 - Water Table Level Factor	1
H2 - Topographic Relief and Surface Drainage/Subsurface Infiltration Factor	3
GM1 - Former Surface Water Drainage Path Factor	0
GM2 - Glaciation Factor	5
SHR_N = (G1+G2+H1+GM1+GM2)*H2	SHR_N Value 75

SHR _N	Subsidence Hazard Category
<55	No Anticipated Subsidence Hazard
55 to 89	Very Low Subsidence Hazard
90 to 136	Low Subsidence Hazard
137 to 200	Moderately Low Subsidence Hazard
201 to 300	Moderate Subsidence Hazard
301 to 400	Moderately High Subsidence Hazard
401 to 600	High Subsidence Hazard
>600	Very High Subsidence Hazard

Regional Abbreviations used on Sheets 2 and 3

CH	Chiltern Hills
DPD	Dorset and Purbeck Downs
EA	East Anglia
END	East North Downs
L	Lincolnshire
WND	West North Downs
Y	Yorkshire

Notes:

Based on Edmonds C N : 2001 :
Predicting natural cavities in chalk
Geological Society, London, Engineering Special
Publications, Vol 18, pp 29-38

Project Lordship Farm, Waterloo Lane, Holwell
Project No. ,24-12-15
Carried out for Netherdown (Herts) Ltd.

Table

1
(Sheet 1 of 3)

Natural Cavities Risk Assessment

G1 - Chalk lithostratigraphic Factor

Upper Chalk
Middle Chalk
Lower Chalk

20		
2		
1	y	1
G1 Total		1

G2 - Post Cretaceous Cover Deposit Factor

Gc Tertiary cover deposit present with or without superficial Quaternary cover
Quaternary cover deposit only present
No cover and <200m from a Tertiary or Quaternary cover deposit margin
No cover and >200m from a Tertiary or Quaternary cover deposit margin

14		
6	y	6
2		
1		
G2-Gc Total		6

Gr Tertiary cover deposit present:

Reading Beds or Woolwich Beds (all regions)
Thanet Beds (WND, END regions)
Crag (EA region)

Thicker Tertiary sequences involving Thanet Beds overlain by Woolwich/Reading Beds and Blackheath Beds and disturbed Blackheath Beds (WND region)

Thicker Tertiary sequences involving Reading Beds overlain and overstepped by London Clay and Bagshot Beds (DPD region)

Quaternary cover deposit present:

Proto-Thames and Proto-Solent terrace gravels (CH and DPD regions)

Alluvial deposits (all regions) (only applicable to seasonal drainage directed across Chalk (Category 2) of topographic relief and surface drainage/subsurface infiltration factor (H₂))

Alluvial deposits (all regions) (any topographic relief and surface drainage/subsurface infiltration conditions except above)

Glacial deposits (CH, EA, L, Y regions)

Low level fluvial terrace gravels or valley gravel (all regions)

High level fluvial terrace gravels or plateau gravel (all regions)

Clay with flints (all regions)

Brickearth (all regions)

Solifluction deposits (all regions)

No cover (topsoil only) (all regions)

20		
15		
8		
4		
2		
20		
13		
1		
12	y	12
6		
6		
3		
1		
1		
0	y	0
G2-Gr Total		12

Gf Reading Beds feathering margin
Thanet Beds feathering margin
Crag feathering margin
Tertiary margins where thick Tertiary sequences occur (WND, DPD regions)
Quaternary deposits feathering margin
Exception to above for alluvial deposits where seasonal drainage is not directed across Chalk (Category 2) of topographic relief and surface drainage/subsurface infiltration factor (H₂)
No cover deposit (topsoil only)
No feathering margins

3		
4		
2		
1		
2		
0		
0		
0	y	0
G2-Gf Total		0

G2 Total 18

Notes:

Based on Edmonds C N : 2001 :
Predicting natural cavities in chalk
Geological Society, London, Engineering Special
Publications, Vol 18, pp 29-38

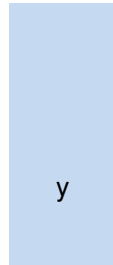
Project Lordship Farm, Waterloo Lane, Holwell
Project No. ,24-12-15
Carried out for Netherdown (Herts) Ltd.

Table

1
(Sheet 2 of 3)

Natural Cavities Risk Assessment

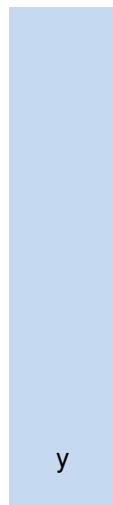
H1 - Water Table Level Factor

- | | | | | |
|---|--|----|---|---|
| a | No cover deposit present, water table below Chalk surface level | 10 |  | 1 |
| b | No cover deposit present, water table close to or at Chalk surface level | 1 | | |
| c | Cover deposit present, water table below Chalk/cover deposit interface | 10 | | |
| d | Cover deposit present, seasonal water table level fluctuation causes water table to rise above Chalk/cover deposit interface in wet season | 2 | | |
| e | Cover deposit present, water table normally at or above Chalk/cover interface | 1 | | |
| f | As above, but if artificial groundwater lowering to take place | 3 | | |
| g | Artesian groundwater conditions present in cover deposit overlying Chalk | 0 | | |

H1 Total **1**

H2 - Topographic Relief and Surface Drainage/Subsurface Infiltration Factor

Category 1 - Seasonal/permanent surface drainage and subsurface infiltration directed onto/into Chalk

- | | | | |
|--|----|--|---|
| Terrain Unit 1 - Hillside or valley side slope | 6 |  | 3 |
| Terrain Unit 2 - Minor channel to major valley floor | 10 | | |
| Terrain Unit 3 - Hilltop or flatter relief areas | 4 | | |

Category 2 - Seasonal surface drainage and subsurface infiltration directed towards/onto cover deposit from Chalk

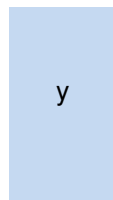
- | | |
|--|---|
| Terrain Unit 1 - Hillside or valley side slope | 1 |
| Terrain Unit 2 - Minor channel to major valley floor | 2 |
| Terrain Unit 3 - Hilltop or flatter relief areas | 1 |

Category 3 - Seasonal/permanent surface drainage and subsurface infiltration directed across Chalk (may be covered by topsoil and/or solifluction deposits or alluvium in floors of seasonal/permanent streams)

- | | |
|--|---|
| Terrain Unit 1 - Hillside or valley side slope | 1 |
| Terrain Unit 2 - Minor channel to major valley floor | 3 |
| Terrain Unit 3 - Hilltop or flatter relief areas | 1 |

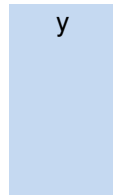
H2 Total **3**

GM1 - Former Surface Water Drainage Path Factor

- | | | | |
|--|----|---|---|
| Proto-Solent (DPD region) | 10 |  | 5 |
| Proto-Thames corridor (CH region) but not applicable to following: | 10 | | |
| where glacial deposits directly overlie Chalk | 0 | | |
| where surface drainage/subsurface infiltration is directed off the Chalk towards/onto Tertiary cover | 0 | | |
| Outside the above proto-river corridors | 0 | | |

GM1 Total

GM2 - Glaciation Factor

- | | | | |
|--|---|---|---|
| Glacial deposits directly overlie Chalk (CH, EA, L, Y regions) | 5 |  | 5 |
| Glacial deposits overlie Crag upon Chalk (EA region) | 3 | | |
| Glacial deposits overlie Reading Beds and/or proto-Thames terrace gravels upon Chalk (CH region) | 0 | | |
| Glacial deposits absent (CH, EA, L, Y regions) | 0 | | |
| Extra-glacial areas | 0 | | |

GM2 Total **5**

Notes:

Based on Edmonds C N : 2001 :
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Geological Society, London, Engineering Special
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Table

1
(Sheet 3 of 3)