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4 December 2025
Our reference: 1924061 L01 (02)

BDW Homes
Via email

For the attention of Mr K McGuire

Dear Sirs

Re: Tars Farm, Barnham – Attenuation Pond Investigations

1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by BDW Homes to provide an outline specification for the construction of the 2 attenuation ponds and a swale at the above site, based upon additional site investigation information and laboratory testing.

The specification contains details of the procedures to be adopted for excavation and the controlled placement on site, however, it should be noted that responsibility for the correct implementation of the strategy lies with the Principal Contractor. RSK cannot be held responsible for any works that are completed outside of the agreed procedures involving either direct supervision by RSK, or inspection and verification of the works by a representative from RSK, or if differing ground conditions are not notified to RSK.

The comments given in this report and the opinions expressed are based on the ground/material conditions encountered during the site work and on the results of tests undertaken in the laboratory. However, there may be conditions pertaining to the site/material that have not been disclosed and therefore could not be taken into account. In particular, it should be noted that there are inherent limitations associated with soil sampling due to variable soil conditions/composition. As with all interpretive reports, the limitations stated in the data should be recognised.

This report is subject to the RSK service constraints given in **Appendix A**.

1.1 Project Background

The following studies/investigations have been undertaken to date over the whole of the development site:

- LEAP ground investigation for Gleeson Strategic Land (ref LP2356 dated November 2020)
- Wilson and Bailey borehole investigations (ref J202433 dated November 2024 and April 2025)

To summarise the history of the site, the site was formerly used agricultural land.

2 AIMS AND OBJECTIVES

The following aspects are covered in this document relating to the construction of the two attenuations ponds/swale upon the site:

- Outline requirements for excavation and methodology for the classification, placement/compaction and verification of materials to facilitate the construction of a puddled clay liner from insitu and ex situ natural clay.

3 SITE INVESTIGATION

3.1 Site Investigation (LEAP 2021) – report previously submitted

The site investigation comprised excavation of trial pits and sinking of probeholes at 63 locations with monitoring installations in 11 of the probeholes.

During the investigation in October 2020, seepages were recorded and these are listed with associated comments within the report in Section 11.1.1. Those pertinent to the area of the attenuation basins and swale (TP1-12 and WS2 and 3) did not record any seepages within the top 3-4m.

Subsequent monitoring (Oct 2020-March 2021) concluded, in Section 15 of the report, that "on the basis of the results shallow perched groundwater should be anticipated within the sandy deposits". LEAP site investigation report can be found in **Appendix H.**

3.2 Borehole Investigation (Wilson and Bailey 2024-2025)

Deep borehole investigation (CP1-2, CP101, 102 and 102a)) were carried out in November 2024 and April 2025 for bridge pile design in the NE of the site, with a further borehole (CP3) in the northern half for residential pile design. The results and site plan are given in Appendix G.

Strikes (seepages) were recorded mainly within the top 2m with those at deeper depths being at variable depths even in close vicinity.

3.3 Site Works and Ground Conditions (RSK 2025)

A site visit was carried out on 4/9/25 and the following was carried out:

- 6 trial pits (TP1-TP6) were excavated at the positions shown on the attached sketch plan to the base of the proposed attenuation ponds (based upon the excavator's GPS system)
- The detailed trial pit records are attached
- The ground conditions within each were consistent with just some variability in the depth of the various strata – a summary is given below:

Trial Pit Number	Topsoil thickness	Intermixed sand and gravel and clay	Weathered stiff to very stiff London Clay	Comments
1	0.25	0.25-2.00	2.00->3.75	V slight seepage of perched groundwater 2.00m
2	0.25	0.25-1.30	1.30->2.50	No groundwater
3	0.3	0.30-1.80	1.80->2.50	No groundwater
4	0.25 removed	0.25-1.50	1.50->4.25	V slight seepage of perched groundwater 1.90m
5	0.25	0.25-1.00/1.50	1.00/1.50->2.50	No groundwater
6	0.25	0.25-0.80/1.60	0.80/1.60->2.50	No groundwater

The sides of all the trial pits remained stable during excavation with no indication of any instability. There was no evidence of any groundwater within the London Clay.

For the purposes of the design it is considered that the permeability of weathered London Clay may be taken as typically ranging from 10^{-9}m/s to 10^{-10}m/s – i.e. very low permeability, based upon information available from research of historical data.

Confirmatory laboratory testing of the site won clay has been carried out and the results of this are available in **Appendix F** which confirm a permeability rate below this.

3.4 Summary of investigations

Based upon the evidence from the investigations (detailed in Sections 3.1-3.3) it is considered that perched water can be present within the overlying sands and gravels, however this is seasonally affected as its source is due to rainfall. It has been recorded at variable depths/in isolated lenses or even absent.

Within the London Clay, which has been proven to be at least 20-30m thick beneath the site, it is considered both from the site specific evidence and on a regional basis, there is no groundwater table as such. It is acknowledged there can be discrete, small and isolated pockets of perched water within the London Clay but can be discounted within the basin and swale design in our opinion.

4. BASIN AND SWALE DESIGN

Based upon inspection of the trial pits and the regrade levels it is considered that the proposed attenuation ponds and swale are able to be excavated/constructed without the requirement for a liner but by utilising the in situ weathered London Clay for all of the base and the sides.

Over much of the plan area of the two ponds/swale the proposed regrade will mean that the top 1.5m to 2m will be removed. This will enable the London Clay to be puddled on both the base and sides. Should any overlying intermixed clay and sands/gravels be present within the upper part of the sides, then this should be excavated for a horizontal distance of 5m and be replaced with excavated London Clay. All clay whether in situ or placed should be compacted/puddled using a sheepsfoot roller in line with the SHW (Specification for Highway Works) guidance for a Class 2A (wet cohesive) material. Details of the basin and swale construction are shown on MJA Consulting drawing 6838-213 P3 **Appendix E**.

On the northern edge of the attenuation ponds it is proposed to install 2m deep gravel filled drains/distribution trenches (temporarily during the construction period), set back 5m from the edge, to act as a cut off for any surface/perched water that may be present within the overlying clay and sands/gravels. The extent and design of these drains is shown on the MJA drawing 6838-228-P2 **Appendix E.**

Based upon the above, the clay when puddled will effectively be a minimum of 5m thick both on the sides and bases.

During autumn and winter the saturation of the intermixed layer will increase and therefore the timing of the earthworks (i.e.undertake a regrade/removal of this material) should be considered to reduce difficulties with trafficability/logistics.

5 MATERIAL TESTING AND CLASSIFICATION

The fill materials to be used for construction purposes shall be subject to the testing requirements set out in **Appendix B** to determine initial material classification, confirm acceptability criteria, and determine the relevant placement / compaction methodology for the determined classification, in accordance with Department of Transport's manual of Contract Documents for Highway Works, Volume 1 (MCHW1), Specification for Highway Works (SHW) Series 600, Amendment May 2018.

Only excavated London Clay will be re-used on site as part of the proposed attenuation pond/swale construction works.

Based on the findings of the existing ground investigation, there is a layer of intermixed clay and sand/gravel overlying the London Clay. This material does not fall within any classification criteria (as defined by the SHW) but could be used as general fill in other soft landscaped areas of the site as it will be removed during the regrade works for the attenuation pond/swale construction.

The London Clay material will fall within the classification criteria for Class 2A wet cohesive material (from the SHW).

There is a suite of laboratory testing / testing frequency (detailed within **Appendix B**) that will require completing by the contractor to achieve the required performance characteristics following placement and compaction.

6 EXCAVATION SPECIFICATION

Segregation of the overlying intermixed clay and sands/gravels from the London Clay is very important to ensure that backfilling/puddle clay formation can be carried out with consistent London Clay material, as specified.

7 BACKFILL SPECIFICATION

The specification is an **End Product Specification** for *Works* comprising the controlled placement of excavated cut material/arisings at the subject site.

7.1 Classification of proposed reinstatement materials

Suitable representative samples of materials to be used in the earthworks shall be tested to confirm soil classification and compaction properties to determine suitability for use. Classification and acceptability testing is required as per the detail and frequencies summarised in **Appendix B** (full details in SHW 600)**.**

7.2 Preparation of the excavations/ sub formations to receive reinstatement materials

For the all of the bases and the vast majority of the sides, the formation will be into the insitu London Clay. Where the overlying clay and sands/gravels are still present after regrade at the crest of the sides/banks, this material will be removed for a horizontal distance of 5m and replaced with excavated London Clay.

To facilitate uniform compaction and provide a robust tie-in to materials in the adjacent ground profiles, and to enable adequate accessibility for placement / compaction plant within the excavation footprints, it will be necessary to appropriately bench the sides of the excavation to match the depths of compacting layers of filling within the top 1.5m below final ground level post. Where, during the progress of the work, the difference in level between adjacent areas of filling exceeds 600mm, benches should be cut having a minimum width of 600mm and a height equivalent to the depth of a layer of compacted filling. New filling will be spread and compacted to ensure maximum continuity with the previous filling.

The formations to excavations will need to be appropriately prepared in advance of receiving fill material for compaction. The formations shall be free of any standing water/ice accumulation which may have entered the excavations. In the event of that deterioration of the sub formation surfaces has occurred due to the presence of standing water/ice, or isolated soft spots be identified (Cu <50kN/m^2), they should be scraped/ removed from the excavation bases to provide a competent sub formation surface. The sub formation shall then be proof rolled and compacted to provide a compact base. The sub formation surface must not be frozen.

7.3 Perform placement/ compaction earthworks

Use appropriate plant and vibratory compaction techniques to move, place and compact suitable Fill materials to be placed and compacted in layers up to the specified formation levels in accordance with the requirements of Table 6/1 of the SHW, as amended, following results of classification/ performance testing.

Table 6/1 is provided in **Appendix C**.

Method compaction shall be undertaken using the plant and methods detailed within Table 6/4 of the SHW, appropriate to the compaction method requirements listed in Table 6/1 for the class of material.

A full extract of Table 6/4 is provided in **Appendix D**.

<u>Considerations for placement of cohesive fill</u>

1) Where the cohesive clay fill is too wet for placement, recourse to drying out if feasible naturally will need to be taken or the drier as dug clay is used

7.4 Verification testing

End Product compliance tests shall be performed by the Contractor at the frequency outlined in **Appendix B**.

The following programme of monitoring and quality control testing should be conducted during the construction works:

All soils

Inspect the formation soils.

Regular visits throughout the earthworks programme to monitor compliance with the specification.

Placed cohesive material (Class 2a)

Undertake compaction tests of the cohesive fill to determine the optimum wet density and moisture content.

Compaction shall be carried out by the Contractor to achieve air voids content no greater than 10% and a minimum of 95% compaction of the maximum dry density based on 2.5kg compaction subject to the prior approval of the Employer's Representative (the Geotechnical Engineer). The results of all acceptability and quality control testing will be compiled within a verification report upon completion of the earthworks, however, interim reporting of test results will also be required

In general, all earthworks should be carried out in line with industry standard good practice and in accordance with BS 6031: 2009 Code of Practice for Earthworks and Highways Agency Manual of Contract Documents for Highways Works. A watching brief at key stages of the earthworks should be carried out by the Geotechnical Engineer, who should also compile/issue the verification report.

We trust that this information is sufficient to your present needs. However, should you have any questions please contact the undersigned.

Yours sincerely

For RSK Environment Ltd

[redacted]

Director

Enclosed:	Appendix A	RSK service constraints
	Appendix B	Testing to be carried out by the contractor
	Appendix C	Table 6/1 – Classification and compaction requirements
	Appendix D	Table 6/4 – Method compaction for Earthworks Materials: Plant and Methods
	Appendix E	Record of Trial Pits and Site Plan. Also MJA Consulting Drainage Drawings
	Appendix F	Laboratory Results
	Appendix G	Wilson Bailey Borehole Investigation
	Appendix H	LEAP Site Investigation Report

APPENDIX A
SERVICE CONSTRAINTS

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SERVICE CONSTRAINTS

1. Service Constraints

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

2. Service Constraints where the Report provides an intrusive assessment of ground conditions:

2.1 The intrusive environmental ground investigation aspects of the Services are a limited sampling of soil from the site, at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this Report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent

of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope agreed between the Client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species (not tested) are not present.

2.2 The comments given in this Report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development, site usage, timescales or the Client's specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an indicative assessment of ground conditions on site. There may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

2.3 Where the Services include Investigation of an exploratory nature or relating to physical ground works, any costings and prices provided in the Report are estimated and provided for guidance purposes only. The actual cost and time quantities shall be remeasured and shall be dependent upon the ground or other conditions, constraints present, and number and depth of the investigation locations, which shall influence the number of samples and tests required, and the quantities of soil being classified.

2.4 Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works. However, this Report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

2.5 Unless stated otherwise, only preliminary geotechnical recommendations are presented in this Report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed. Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this Report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7, although this is subject to the restrictions imposed on the investigation, as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this Report will not meet the requirements of a Geotechnical Design Report (GDR) and should therefore be used for preliminary guidance only.

3. Service Constraints where the Report relates to Surface Water Management:

3.1 The Surface Water Management Inspection (SWMI) Report, documents provided, observations, actions, and recommendations, with respect to the management of potential pollution issues to surface waters, made during the site Inspection visit, are those present at the time of the visit, and may not represent those recorded by others on the same day.

3.2 The comments given in this Report and the opinions expressed are based on the weather, ground and ground water conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the inspection and therefore could not be taken into account. In addition, groundwater levels and flows, may vary from those Reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

3.3 RSK places a degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this Report was prepared.

3.4 This Report is a live document, to be continually reviewed and updated as the development progresses or other changes occur on site. RSK can only maintain the currency of this Report through the Client requesting support with supplementary site visits or attendance at meetings ahead of key stages of the development in relation to surface water management. Our risk rating assesses a number of risk factors in line with the source-pathway- receptor model and is therefore subject to constant change.

3.5 Standard design drawings are indicative. Material types, dimensions and construction details will need to be adjusted by the Client to suit the specific conditions / flows on Site.

3.6 The full responsibly for implementing the site-specific protection and maintenance measures to protect the surface water system as stated in this Report, remains with the Client and their site management team. Additional control measures may be required to achieve the objectives set out in the Surface Water Management Plan to be implemented and financed by the Client.

4. Service Constraints where the Report relates to Waste Management:

4.1 In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if re-used on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not necessarily become waste until the criteria above are met. Excavation arisings from the development may therefore be classified as waste if surplus to requirements and/or unsuitable for re-use.

4.2 It is the duty of the waste producer, to ensure that all waste is accurately classified prior to waste disposal. Technical Guidance WM3 (EA, 2018) sets out in its Appendix D requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. Unless otherwise stated, the waste assessment presented in this Report should be considered as preliminary and further testing and assessment of the waste under the provisions of a Waste Sampling Plan may be required to obtain the necessary level of data required for basic characterisation of the waste in support of disposal.

4.3 Unless stated otherwise in the Report, information relating to historical operations at the site was not reviewed as part of the assessment by RSK. In addition, unless otherwise stated in the Services, RSK was not present during the collection of the samples nor had any input on the chemical testing suite. Therefore, the waste assessment and classification detailed in this Report are based solely on any information that were provided to RSK (e.g., laboratory chemical data, exploratory hole records) and were completed without prejudice for our Client.

4.4 RSK's assumes that any ground investigation data, chemical testing results etc., that were provided by the Client to inform the waste assessment and supporting review were carried out in accordance with current best practice and relevant guidance/ standards, where applicable. Thus, the

comments given in this Report and the opinions expressed are based solely on the information provided by the Client. However, it is noted that there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account as part of the RSK assessment.

5. Service Constraints for Construction Environmental Management Plan Reports:

5.1 This Report should be considered in the light of any changes in legislation, statutory requirement or industry practices that may have occurred subsequent to the date of issue.

5.2 The measures and comments outlined in this Report and any opinions expressed are based on the plans provided at the time and discussions with relevant parties. However, there may be conditions pertaining to the site that have not been disclosed by investigations and therefore could not be taken into account.

5.3 This CEMP is a live document and is subject to change throughout the project, as and when necessary, to ensure management of environmental aspects remains relevant, and to ensure continued compliance with legislation and commitments as they may change. RSK understands that this CEMP will be reviewed by the Client every six months and updated as and when necessary.

5.4 It is the full responsibility of the Principal Contractor/ Client to ensure that their works do not contravene legal requirements, and adherence to this CEMP alone cannot be a full defence regarding legal action against the Principal Contractor.

6. Service Constraints where the Report relates to Ground Gas Membrane Verification:

6.1 This Report is limited to the verification of the gas resistant membrane/vapour membrane/ radon barrier after installation and no inspections were undertaken of the substrate (i.e. prepared ground). The Report therefore does not constitute as a full verification of ground gas protection system.

6.2 The comments given in this Report and the opinions expressed, are based on the condition of the ground gas membrane as encountered at the time of inspection by suitably qualified personnel. RSK cannot accept liability for any subsequent change to the status of the gas membrane by follow-on trades or other construction activity.

6.3 Where not designed by RSK, the verification of protection measures is carried out with reference to the gas protection design provided by the Client. RSK assume the scope of gas protection measures as determined by third parties to be correct and to have achieved any required approval from authorities.

6.4 The Ground Gas Design Report/Remediation Strategy and Verification Plan contains details of the procedures to be adopted for inspection and validation of the works. However, it should be noted that responsibility for the correct implementation of the strategy lies with the appointed contractor. RSK cannot be held responsible for any remedial works that are carried out without the agreed procedures involving either direct supervision by RSK, or inspection and validation of the works by a representative from RSK.

7. Service Constraints for Environmental Due Diligence (EDD)Reports:

7.1 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the site, therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information.

7.2 This Report describes the results of the EDD exercise. The scope of this EDD Report, where appropriate, covers legal or regulatory compliance with respect to UK or international regulations associated with environmental matters.

7.3 As with any EDD exercise, there is a certain degree of dependence upon information provided by the target company. The EDD does not include a site walkover / visit or liaison with site representatives unless identified in the Services. Therefore, the assessment is based on the available desk study information. Also, there is a certain degree of dependence upon oral information provided by site representatives, which is not readily verifiable through visual inspection, or supported by any available written documentation. RSK shall not be held responsible for conditions or consequences arising from relevant facts that were not fully disclosed by facility or site representatives at the time this EDD exercise was performed.

7.4 This Report, including all supporting data and notes (collectively referred to hereinafter as "information"), was prepared or collected by RSK for the benefit of its Client.

7.5 The comments given in this Report and the opinions expressed are based on the information obtained and reviewed as part of the desk-based assessment and the site inspection visit. However, there may be conditions pertaining to the Site that have not been disclosed by the assessment and therefore could not be taken into account. Furthermore, no intrusive investigations, monitoring or sampling have been undertaken to confirm the environmental status of the Site therefore any comments relating to ground conditions and subsurface contamination are based solely on a review of desk-based information and observations collected during the site inspection visit.

8. Service Constraints for Ground source heat energy Reports:

8.1 It is understood that this is a desktop survey only and that there are no requirements for a site walkover, service utility survey, or provision of service plans. These services can be provided upon request if required.

8.2 At a later stage, it is possible that a thermal response test (TRT) will need to be completed, for which a test borehole will have to be drilled, and these would be costed at the time. RSK can provide all aspects of subsequent site work for a GSHP system if required.

9. Service Constraints for Water Abstraction Borehole Reports:

9.1 The Report aims principally to only identify and assess the suitability of the site for a water abstraction borehole. This Report should be considered in the light of any changes in legislation, statutory requirements, and industry practices, that have occurred subsequent to the date of the Report.

9.2 Unless stated in the Report, the opinions expressed in this Report including all comments and recommendations provided are on the basis of the information obtained from a desk-based assessment.

APPENDIX B
TESTING TO BE CARRIED OUT BY THE CONTRACTOR

TESTING TO BE CARRIED OUT BY THE CONTRACTOR

Cl	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comment
Series 600			Tests Shall be undertaken in accordance with the minimum requirements laid out below.			
601, 631 to 633, 635 to, 637, 640	Class	General Description	Acceptable material			
	2A	General cohesive fill (excavated London Clay) 2A	Grading) / uniformity coefficient BS 1377:Pt 2:1990	***Minimum of 3 per source*** plus 1 per 500 m^3		
			Compaction & Optimum mc 2.5kg Hammer Method BS1377:Pt 4:1990	***Minimum of 3 per source*** plus 1 per 1000 m^3		
			Particle Density BS 1377:Pt 2:1990	***Minimum of 3 per source*** plus 1 per 1000 m^3		
601	Material for off-site disposal (if appropriate)		Waste acceptance criteria tests	**As required to meet licensed treatment or Landfill facility requirements**. Contractor to determine frequency with receiving landfill	MCERTS	
	Fill layers		NDT tests	Minimum 3 No. tests on every second placed layers	UKAS: ISO/IEC 17025	To ensure compaction achieved to criteria
			Shear Strength tests (hand vane)	Minimum 3 per finished formation surface		To prove Cu≥50 kN/m2

APPENDIX C
CLASSIFICATION AND COMPACTION REQUIREMENTS

Refer to Table 6/1 Acceptable Earthworks Materials: Classification and Compaction Requirements (refer to Specification for Highway Works Series 600 for Clauses and Further Tables)

Material to be used is Site Derived Class 2A (wet cohesive Material) – excavated London Clay

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
GENERAL GRANULAR FILL	1	A	–	Well graded granular material	General Fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties (i), (ii) and (iv) in next column, shall not apply to chalk). Recycled aggregate. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates); A (construction and demolition recycling industries); B1 (municipal incinerator bottom ash (MIBA)); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) E (non ferrous steel industry – except E2 molybdenum slag) G (mining and quarry industry)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	1	A	–
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
							(v) IDD of chalk	Clause 634	–	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
GENERAL GRANULAR FILL	1	B	–	Uniformly graded granular material	General Fill	Any material, or combination of materials, other than chalk. Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except chalk); A (construction and demolition recycling industries); B1 (municipal incinerator bottom ash (MIBA)); C1 (coal fly ash) C4 (coal bottom ash) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) E (non ferrous steel industry – except E2 molybdenum slag) F (foundry industry) G (mining and quarry industry) H1 (dredge spoil sand)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	1	B	–
							(ii) uniformity coefficient	See Note 5	–	10				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
	1	C	–	Coarse granular material	General Fill	Any material, or combination of materials, other than material designated as Class 3 in the Contract. (Properties (i) and (ii) in next column, shall not apply to chalk). Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) G (mining and quarry industry)	(i) grading	BS 1377: Part 2 or BS EN 13242	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	1	C	–
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) Los Angeles coefficient	Clause 635	–	50				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Acceptable Limits Within: Upper				
GENERAL COHESIVE FILL	2	A	–	Wet cohesive material	General Fill	Any material, or combination of materials, other than chalk.	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 1 except for materials with liquid limit greater than 50, determined by BS 1377: Part 2, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used.	2	A	–
							(ii) plastic limit (PL)	BS 1377: Part 2	–	–				
							(iii) mc	BS 1377: Part 2 See Note 4	PL -4%	App 6/1				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
							(v) Undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1				
	2	B	–	Dry cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	B	–
							(ii) plastic limit (PL)	BS 1377: Part 2	–	–				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	PL -4%				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
							(v) undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1				
	2	C	–	Stony cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	2	C	–
							(ii) plastic limit (PL)	BS 1377: part 2	–	–				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iv) MCV	Clause 632	App 6/1	–				
							(v) Undrained shear strength of remoulded material	Clause 633	App 6/1	–				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Acceptable Limits Within: Upper			
GENERAL COHESIVE FILL	2	D	–	Silty cohesive material	General Fill	Any material, or combination of materials, other than chalk	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	2	D	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) undrained shear strength of remoulded material	Clause 633	App 6/1	App 6/1				
	2	E	–	Reclaimed pulverised fuel ash cohesive material	General Fill	Reclaimed material from lagoon or stockpile containing not more than 20% furnace bottom ash	(i) mc	BS 1377: Part 2 See Note 4	To enable compaction to Clause 612		End product 95% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method)	2	E	–
							(ii) bulk density	BS 1377: Part 9	App 6/1	App 6/1				
GEN CHALK FILL	3	–	–	Chalk	General Fill	Chalk and associated materials all designated as Class 3 in the Contract	(i) mc	BS 1377: Part 2 See Note 4	–	App 6/1	Tab 6/4 Method 4, or Method 1 if required in App 6/1. All types of vibratory rollers of Categories over 1800 kg shall not be used	3	–	–
							(ii) IDD	Clause 634	App 6/1	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
LANDSCAPE FILL	4	–	–	Various	Fill to landscape areas	See App 6/1	(i) grading	BS 1377: Part 2	App 6/1	App 6/1	See Clause 620 and App 6/1	4	–	–
							(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
TOPSOIL	5	A	–	Topsoil, or turf, existing on site	Topsoiling	Topsoil or turf designated as Class 5A in the Contract	(i) grading	Clause 618	–	Clause 618	–	5	A	–
	5	B	–	Imported topsoil	Topsoiling	General purpose grade complying with BS 3882	–	–	–	–	–	5	B	–

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	A	–	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil or any combination thereof. (Properties (i) and (ii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	No compaction	6	A	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity	See Note 5	10	–				
							(iii) SMC of chalk index	Clause 634	–	20%				
							(iv) plasticity index	BS 1377: Part 2	Non-plastic					
	6	B	–	Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Properties (ii) and (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 5	6	B	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iii) Los Angeles coefficient	Clause 635	–	50				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	C	–	Selected uniformly graded granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. (Property (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale) G3 (pre-selected all-in from quarrying/mining)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	C	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	–	10				
							(iii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iv) Los Angeles coefficient	Clause 635	–	50				
							(v) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	D	–	Selected uniformly graded granular material	Starter layer below pulverised fuel ash	Natural gravel, natural sand, crushed gravel, crushed rock other than argillaceous rock, crushed concrete, chalk, well burnt colliery spoil, slag or any combination thereof. Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 4	6	D	–
								BS EN 933-2 Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	–	10				
							(iii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	E	–	Selected granular material (Class 9A)	For stabilisation with cement to form capping	Any material, or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Properties (i), (ii) and (iii) in next column, shall not apply to chalk.) Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9, and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A (construction and demolition recycling industries); D2 (air cooled blast furnace slag) G (mining and quarry industry – except G2 (black coal shale))	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Not applicable	6	E	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1				
							(iii) liquid limit	BS 1377: Part 2	–	45				
							(iv) plasticity index	BS 1377: Part 2	–	20				
							(v) organic matter	BS 1377: Part 3	–	App 6/1				
							(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/l as SO_4				
							(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO_4				
							(viii) SMC of chalk	Clause 634	–	20%				
	6	F	1	Selected granular material (fine grading)	Capping	Any material, or combination of materials – including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil, argillaceous rock and chalk. Property (vi) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less. Where material in this Class is imported onto site it shall be classified as Class 6F4 and comply with the requirements for that material.	(i) grading	BS 1377: Part 2 (On site materials only)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6	6	F	1
							(ii) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–				
							(iii) mc	BS 1377: Part 2 See Note 4	Optimum mc - 2%	Optimum mc				
							(iv) Los Angeles coefficient	Clause 635	–	60				
							(v) Class Ra (asphalt) content	Clause 710	–	50%				
							(vi) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	F	2	Selected granular material (coarse grading)	Capping	Any material, or combination of materials - including recycled aggregates with not more than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. Property (i) in the next column shall not apply to chalk. Property (vi) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less. Where material in this Class is imported onto site it shall be classified as Class 6F5 and comply with the requirements for that material.	(i) grading	BS 1377: Part 2 (On site materials only)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6	6	F	2
							(ii) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–					
							(iii) mc	BS 1377: Part 2 See Note 4	Optimum mc - 2%	Optimum mc				
							(iv) Los Angeles coefficient	Clause 635	–	50				
							(v) Class Ra (asphalt) content	Clause 710	–	50%				
							(vi) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%				
	6	F	3	Selected granular material	Capping	Any material, or combination of materials with not less than 50% by mass of recycled bituminous planings and granulated asphalt, but excluding materials contaminated with tar and tar-bitumen binders, unburnt colliery spoil and argillaceous rock. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from the following source codes, see Notes 8, 9 and 10: A1 (reclaimed asphalt) A4 (mixed recycled aggregate) Aggregates from source code A4 shall contain at least 50% of constituents in Class Ra (bituminous materials).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 6 Maximum Compacted layer thickness shall be 200 mm	6	F	3
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) optimum mc	Clause 613	–	–				
							(iii) mc	Clause 613 See Note 4	Optimum mc -2%	Optimum mc				
							(iv) Class Ra (asphalt) content	Clause 710	50%	–				
							(v) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	10%				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	F	4	Selected granular material (fine grading) – imported on to the Site	Capping	Unbound mixture complying with BS EN 13285 containing aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7) A2 (crushed concrete) A3 (crushed bricks, masonry) A4 (mixed recycled aggregate) B1 (municipal incinerator bottom ash (MIBA)) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry – except G2 (black coal shale)) Aggregates from source code A4 shall contain not more than 50% of constituents in Class Ra (bituminous materials). Property (x) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less.	(i) Size designation and overall grading category	BS EN 13285 – 0/31.5 and G_E	Tab 6/5	Tab 6/5	Tab 6/4 Method 6	6	F	4
							(ii) Maximum fines and oversize categories	BS EN 13285 – UF_{15} and OC_{75}	Tab 6/5	Tab 6/5				
							(iii) Los Angeles coefficient	BS EN 13242 – LA_{60}	–	60				
							(iv) Volume stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	–	–				
							(v) Volume stability of steel (BOF) and EAF) slag	BS EN 13242 – V_5	–	–				
							(vi) Other aggregate requirements	BS EN 13242 – $Category_{NR}$ (no requirement)	–	–				
							(vii) Laboratory dry density and optimum water content	BS EN 13285, Clause 5.3 – declared values	–	–				
							(viii) Water content	BS EN 1097-5	Optimum wc – -2%	Optimum wc				
							(ix) Class Ra (asphalt) content	Clause 710	–	50%				
							(x) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	F	5	Selected granular material (coarse grading) – imported on to the Site	Capping	Unbound mixture complying with BS EN 13285 containing aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7) A2 (crushed concrete) A3 (crushed bricks, masonry) A4 (mixed recycled aggregate) B1 (municipal incinerator bottom ash (MIBA)) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry – except G2 (black coal shale)) Aggregates from source code A4 shall contain not more than 50% of constituents in Class Ra (bituminous materials). Property (x) in the next column shall not apply if the Class Ra (asphalt) content of any recycled aggregate is 20% or less.	(i) Size designation and overall grading category	BS EN 13285 – 0/80 and G_E	Tab 6/5	Tab 6/5	Tab 6/4 Method 6	6	F	5
							(ii) Maximum fines and oversize categories	BS EN 13285 – UF_{12} and OC_{75}	Tab 6/5	Tab 6/5				
							(iii) Los Angeles coefficient	BS EN 13242 – LA_{50}	–	50				
							(iv) Volume stability of blast furnace slag	BS EN 13242 – free from dicalcium silicate and iron disintegration	–	–				
							(v) Volume stability of steel (BOF) and EAF) slag	BS EN 13242 – V_5	–	–				
							(vi) Other aggregate requirements	BS EN 13242 – Category NR (no requirement)	–	–				
							(vii) Laboratory dry density and optimum water content	BS EN 13285, Clause 5.3 – declared values	–	–				
							(viii) Water content	BS EN 1097-5	Optimum wc – -2%	Optimum wc				
							(ix) Class Ra (asphalt) content	Clause 710	–	50%				
							(x) bitumen content	BS EN 12697-1 or BS EN 12697-39	–	2.0%				
	6	G	–	Selected granular material	Gabion filling	Natural gravel, crushed rock, crushed concrete or any combination thereof. None of these constituents shall include any argillaceous rock. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	None	6	G	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) Los Angeles coefficient	Clause 635	–	50				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	H	–	Selected granular material	Drainage layer to reinforced soil and anchored earth structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, chalk, well burnt colliery spoil or any structures combination thereof. None of these constituents shall include any argillaceous rock. (Properties (vi), (vii), (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) (Properties (ii) and (v) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	H	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2	Non-plastic					
							(iii) Los Angeles coefficient	Clause 635	–	50				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(vii) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(viii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(ix) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(x) resistivity	Clause 637	Tab 6/3	–				
							(xi) redox potential	Clause 638	Tab 6/3	–				
							(xii) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xiii) microbial activity index	Table 6/3	–	Tab 6/3				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	I	–	Selected well graded granular material	Fill to reinforced soil and anchored earth structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof except that chalk shall not be combined with any other constituent. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (v) in next column shall not apply to chalk.) (Properties (viii), (ix), (x), (xi), (xii), (xiii) and (xiv) only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	6	I	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) SMC of chalk	Clause 634	–	20%				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) effective angle of friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) coefficient of friction and adhesion (fill/ elements)	Clause 639	App 6/1	–				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				
							(xiv) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xv) microbial activity index	Table 6/3	–	Tab 6/3				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	J	–	Selected uniformly graded granular material	Fill to reinforced soil and anchored earth	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof, except that chalk shall not be combined with any other constituent. None of these constituents shall include any argillaceous rock. (Properties (viii), (ix), (x), (xi), (xii), (xiii) and (xiv) in next column only apply when metallic reinforcing or anchor elements, facing units or fastenings are used.) (Properties (i), (ii) and (v) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	Tab 6/4 Method 3	6	J	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	10				
							(iii) SMC of chalk	Clause 634	–	20%				
							(iv) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(v) MCV	Clause 632	App 6/1	App 6/1				
							(vi) effective angle of friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) coefficient of friction and adhesion (fill/ elements)	Clause 639	App 6/1	–				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				
							(xiv) organic content	BS 1377: Part 3	–	Tab 6/3				
							(xv) microbial activity index	Table 6/3	–	Tab 6/3				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	K	–	Selected granular material	Lower bedding for corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto which is not 'as dug' site it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes,)see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 90% of maximum dry density of BS 1377: Part 4 (Vibrating hammer method)	6	K	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) plasticity index	BS 1377: Part 2	–	6				
							(iv) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–				
							(v) mc	BS 1377: Part 2 See Note 4	Optimum mc -2%	Optimum mc +1%				
							(vi) MCV	Clause 632	App 6/1	App 6/1				
							(vii) Los Angeles coefficient	Clause 635	–	40				
							(viii) resistivity	Clause 637	2000 ohm cm	–				
							(ix) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO_4				
							(x) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO_4				
							(xi) chloride ion content	BS EN 1744-1	–	0.025%				
							(xii) pH value	BS 1377: Part 3	6	9				
							(xiii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	L	–	Selected uniformly graded granular material	Upper bedding for corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2		6	L	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) resistivity	Clause 637	2000 ohm cm	–				
							(iii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/l as SO_4				
							(iv) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO_4				
							(v) chloride ion content	BS EN 1744-1	–	0.025%				
							(vi) pH value	BS 1377: Part 3	6	9				
							(vii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	M	–	Selected granular material	Surround to corrugated steel buried structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 90% of maximum dry density of BS 1377: Part 4 (Vibrating hammer method) unless otherwise stated in App 6/1	6	M	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) plasticity index	BS 1377: Part 2	–	6				
							(iv) optimum mc	BS 1377: Part 4 (vibrating hammer method)	–	–				
							(v) mc	BS 1377: Part 2 See Note 4	Optimum mc -2%	Optimum mc +1%				
							(vi) MCV	Clause 632	App 6/1	App 6/1				
							(vii) Los Angeles coefficient	Clause 635	–	40				
							(viii) resistivity	Clause 637	2000 ohm cm	–				
							(ix) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/l as SO_4				
							(x) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO_4				
							(xi) chloride ion content	BS EN 1744-1	–	0.025%				
							(xii) pH value	BS 1377: Part 3	6	9				
							(xiii) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	N	–	Selected well graded granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	N	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	10	–				
							(iii) Los Angeles coefficient	Clause 635	–	40				
							(iv) undrained shear parameters (c and φ)	Clause 633	App 6/1	–				
							(v) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vi) permeability	Clause 640	App 6/1	–				
							(vii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(viii) MCV	Clause 632	App 6/1	App 6/1				
							(ix) slope stability test (where required in App 6/6)	Clause 610	App 6/6					

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	P	–	Selected granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (ix) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	P	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) IDD of chalk	Clause 634	–	App 6/1				
							(iv) Los Angeles coefficient	Clause 635	–	60				
							(v) undrained shear parameters (c and φ)	Clause 633	App 6/1	–				
							(vi) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(vii) permeability	Clause 640	App 6/1	–				
							(viii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(ix) MCV	Clause 632	App 6/1	App 6/1				
							(x) slope stability test (where required in App 6/6)	Clause 610	App 6/6					

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Acceptable Limits Within: Upper				
SELECTED GRANULAR FILL	6	Q	–	Selected granular material	Fill to structures	Natural gravel, natural sand, crushed gravel, crushed rock, crushed concrete, slag, chalk, well burnt colliery spoil or any combination thereof. None of these constituents shall include any argillaceous rock. (Properties (i), (ii) and (ix) in next column shall not apply to chalk.) Recycled aggregate except recycled asphalt. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except shale, siltstone or slate, see Note 7); A2 (crushed concrete) A3 (crushed bricks, masonry) D2 (air cooled blast furnace slag) G1 (red coal shale).	As for Class 1A, 1B or 1C with the addition of the following:				End product 95% of maximum dry density of BS 1377: Part 4 (vibrating hammer method)	6	Q	–
							(i) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/ l as SO_4				
							(ii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO_4				
							(iii) chloride ion content	BS EN 1744-1	–	0.025%				
							(iv) pH value	BS 1377: Part 3	6	9				
							(v) sulfide and hydrogen sulfide	Standard textbook of qualitative inorganic analysis	–	Rapid blackening of lead acetate paper				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED GRANULAR FILL	6	R	–	Selected granular material	For stabilisation with lime and cement to form capping (Class 9F)	Any material, or combination of materials, other than unburnt colliery spoil and argillaceous rock. (Properties (i), (ii) and (iii) in next column, shall not apply to chalk.)	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2		6	R	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	–				
							(iii) liquid limit	BS 1377: Part 2	–	45				
							(iv) plasticity index	BS 1377: Part 2	–	20				
							(v) organic matter	BS 1377: Part 3	–	App 6/1				
							(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/l as SO_4				
							(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO_4				
							(viii) IDD of chalk	Clause 634	–	App 6/1				
	6	S	–	Selected well graded granular material	Filter layer below subbase	Crushed rock or sand. Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates – except chalk, shale, siltstone or slate, see Note 7).	(i) grading	BS 1377: Part 2 (On-site)	Tab 6/2	Tab 6/2	–	6	S	–
								BS EN 933-2 (Imported onto site)	Tab 6/5	Tab 6/5				
							(ii) plasticity index	BS 1377: Part 2	–	Non-plastic				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED COHESIVE FILL	7	A	–	Selected cohesive material	Fill to structures	Any material or combination of materials, other than argillaceous rock and materials designated as Class 3 in the Contract. If chalk is used it shall form 100% of constituents. (Properties (i) and (iii) shall not apply to chalk.) (Properties (vii) and (viii) may be increased to 54% and 31% respectively for Lias Clay only and subject to the requirements of contract specific Appendix 6/6)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	End product: 100% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method) or a dry density corresponding to 5% air voids at field mc whichever is lower	7	A	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) undrained shear parameters (c and φ)	Clause 633	App 6/1	App 6/1				
							(v) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	App 6/1				
							(vi) IDD of chalk	Clause 634	App 6/1	App 6/1				
							(vii) liquid limit	BS 1377: Part 2	–	45				
							(viii) plasticity index	BS 1377: Part 2	–	25				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Acceptable Limits Within: Upper			
SELECTED COHESIVE FILL	7	B	–	Selected conditioned pulverised fuel ash cohesive material	Fill to structures and to reinforced soil	Conditioned material direct from power station dust collection system and to which a controlled quantity of water has been added	(i) mc	BS 1377: Part 2 See Note 4	To enable compaction to Clause 612		End product: 95% of maximum dry density of BS 1377 : Part 4 (2.5 kg rammer method)	7	B –
							(ii) bulk density	BS 1377: Part 9	App 6/1	App 6/1			
							(iii) undrained shear parameters (c and φ)	Clause 633	App 6/1	–			
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–			
							(v) coefficient of friction and adhesion (fill/ elements)	Clause 639	App 6/1	–			
							(vi) permeability	Clause 640	App 6/1	–			
							(vii) slope stability test (where required in App 6/6)	Clause 610	App 6/6				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED COHESIVE FILL	7	C	–	Selected wet cohesive material	Fill to reinforced soil	Any material, or combination of materials, other than unburnt colliery spoil, argillaceous rock and chalk. (Properties (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing elements, facing units or fastenings are used)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 1	7	C	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(v) coefficient of friction and adhesion (fill/ elements)	Clause 639	App 6/1	–				
							(vi) liquid limit	BS 1377: Part 2	–	45				
							(vii) plasticity index	BS 1377: Part 2	–	25				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED COHESIVE FILL	7	D	–	Selected stony cohesive material	Fill to reinforced soil	Any material, or combination of materials, other than unburnt colliery spoil, argillaceous rock and chalk. (Properties (vi), (vii), (viii), (ix), (x), (xi) and (xii) in next column only apply when metallic reinforcing elements, facing units or fastenings are used)	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Tab 6/4 Method 2	7	D	–
							(ii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iii) MCV	Clause 632	App 6/1	App 6/1				
							(iv) effective angle of internal friction (φ') and effective cohesion (c')	Clause 636	App 6/1	–				
							(v) coefficient of friction and adhesion (fill/ elements)	Clause 639	App 6/1	–				
							(vi) liquid limit	BS 1377: Part 2	–	45				
							(vii) plasticity index	BS 1377: Part 2	–	25				
							(viii) pH value	BS 1377: Part 3	Tab 6/3	Tab 6/3				
							(ix) chloride ion content	BS EN 1744-1	–	Tab 6/3				
							(x) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	Tab 6/3				
							(xi) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	Tab 6/3				
							(xii) resistivity	Clause 637	Tab 6/3	–				
							(xiii) redox potential	Clause 638	Tab 6/3	–				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Acceptable Limits Within: Upper				
SELECTED COHESIVE FILL	7	E	–	Selected cohesive material	For stabilisation with lime to form capping (Class 9D)	Any material, or combination of materials, other than unburnt colliery spoil	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	E	–
							(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1				
							(iii) MCV	Clause 632	App 6/1	–				
							(iv) plasticity index	BS 1377: Part 2	10	–				
							(v) organic matter	BS 1377: Part 3	–	App 6/1				
							(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1				
							(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1				
							(viii) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1				
	7	F	–	Selected silty cohesive material	For stabilisation with cement to form capping (Class 9B)	Any material, or combination of materials, other than chalk, unburnt colliery spoil and argillaceous rock	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	F	–
							(ii) uniformity coefficient	See Note 5	5	–				
							(iii) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1				
							(iv) MCV	Clause 632	App 6/1	App 6/1				
							(v) liquid limit	BS 1377: Part 2	–	45				
							(vi) plasticity index	BS 1377: Part 2	–	20				
							(vii) organic matter	BS 1377: Part 3	–	App 6/1				
							(viii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1				
							(ix) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1				
							(x) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
SELECTED COHESIVE FILL	7	G	–	Selected conditioned pulverised fuel ash cohesive material	For stabilisation with cement to form capping (Class 9C)	Conditioned material direct from power station dust collection system and to which a controlled quantity of water has been added	(i) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1		7	G	–
							(ii) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	3000 mg/l as SO_4				
							(iii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.6% as SO_4				
							(iv) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	1.2% as SO_4				
	7	H	–	Wet, dry, stony or silty cohesive material and chalk	Overlying fill for corrugated steel buried structures	As Class 2A, 2B, 2C, 2D general cohesive fill material or Class 3 chalk fill material, except that argillaceous rock, slag, PFA or any combination thereof shall not be used	As for Class 2A, 2B, 2C, 2D or 3 with the addition of the following					7	H	–
							(i) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	300 mg/l as SO_4				
							(ii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	0.06% as SO_4				
							(iii) chloride ion content	BS EN 1744-1	–	0.025%				
							(iv) pH value	BS 1377: Part 3	6	9				
	7	I	–	Selected cohesive material	For stabilisation with lime and cement to form capping (Class 9E)	Any material, or combination of materials, other than unburnt colliery spoil	(i) grading	BS 1377: Part 2	Tab 6/2	Tab 6/2	Not applicable	7	I	–
							(ii) mc	BS 1377: Part 2 See Note 4	–	App 6/1				
							(iii) MCV	Clause 632	App 6/1	–				
							(iv) plasticity index	BS 1377: Part 2	10	–				
							(v) organic matter	BS 1377: Part 3	–	App 6/1				
							(vi) water soluble (WS) sulfate content	BS EN 1744-1 clause 10	–	App 6/1				
							(vii) oxidisable sulfides (OS) content	BS EN 1744-1 clause 13	–	App 6/1				
							(viii) total potential sulfate (TS) content	BS EN 1744-1 clause 11	–	App 6/1				

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)				Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within:					
									Lower	Upper				
MISC FILL	8	–	–	Class 1, Class 2 or Class 3 material	Lower trench fill	Any material; except no stones or lumps of clay shall be retained on the 40mm test sieve. Recycled aggregate Where material is imported onto site which is not 'as dug' it shall be aggregate conforming to BS EN 13242 from one or more of the following source codes, see Notes 8, 9 and 10: P (natural aggregates); A (construction and demolition recycling industries) B1 (municipal incinerator bottom ash (MIBA)) D2 (air cooled blast furnace slag) D3 (basic oxygen furnace slag) D4 (electric arc furnace slag (EAF C)) G (mining and quarry industry).	(i) mc	BS 1377: Part 2 See Note 4	App 6/1	App 6/1	Tab 6/4	8	–	–
							(ii) MCV	Clause 632	App 6/1	App 6/1				
STABILISED MATERIALS	9	A	–	Cement stabilised well graded granular material	Capping	Class 6E with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	60%	–	Tab 6/4 Method 6	9	A	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iii) mc	BS EN 13286-2	App 6/1	App 6/1				
	9	B	–	Cement stabilised silty cohesive material	Capping	Class 7F with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	App 6/1	–	Tab 6/4 Method 7	9	B	–
							(ii) MCV immediately before compaction	Clause 632	App 6/1	12				
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iv) mc	BS EN 13286-2	App 6/1	App 6/1				
	9	C	–	Cement stabilised conditioned pulverised fuel ash cohesive material	Capping	Class 7G with addition of cement according to Clause 614	(i) pulverisation	BS EN 13286-48	60%	–	End product 95% of maximum dry density BS EN 13286-47 (2.5 kg rammer method)	9	C	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–				
							(iii) mc	BS EN 13286-2	To enable compaction to Clause 612					

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TABLE 6/1: (02/16) Acceptable Earthworks Materials: Classification and Compaction Requirements (See footnotes) (continued)

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and contract specific Appendix 6/1)	Material Properties Required for Acceptability (In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631)			Compaction Requirements in Clause 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable Limits Within: Lower	Upper			
STABILISED MATERIALS	9	D	–	Lime stabilised cohesive material	Capping	Class 7E with addition of lime according to Clause 615	(i) pulverisation	BS EN 13286-48	30%	–	Tab 6/4 Method 7	9	D	–
							(ii) MCV immediately before compaction	Clause 632	App 6/1	App 6/1			
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–			
							(iv) mc	BS EN 13286-2	App 6/1	App 6/1			
	9	E	–	Lime and cement stabilised cohesive material	Capping	Class 7I with addition of lime and cement according to Clause 643	(i) pulverisation	BS EN 13286-48	30%	–	Tab 6/4 Method 7	9	E	–
							(ii) MCV immediately before completion	Clause 632	App 6/1	App 6/1			
							(iii) bearing ratio	BS EN 13286-47	App 6/1	–			
							(iv) mc	BS EN 13286-2	App 6/1	App 6/1			
	9	F	–	Lime and cement stabilised well graded granular material	Capping	Class 6R with addition of lime and cement according to Clause 643	(i) pulverisation	BS EN 13286-48	60%	–	Tab 6/4 Method 6	9	F	–
							(ii) bearing ratio	BS EN 13286-47	App 6/1	–			
							(iii) mc	BS EN 13286-2 See Note 4	App 6/1	App 6/1			

Footnotes to Table 6/1

1	(02/16) App = contract specific Appendix
2	(02/16) Tab = Table
3	(02/16) Where in the Acceptable Limits column reference is made to App 6/1, only those properties having limits ascribed to them in contract specific Appendix 6/1 shall apply. Where contract specific Appendix 6/1 gives limits for other properties not listed in this Table such limits shall also apply.
4	(02/16) Where BS 1377: Part 2 is specified for mc, this shall mean BS 1377: Part 2 where the material is a soil or BS EN 1097-5 where the material is required to conform to a harmonised European Standard.
5	(02/16) Uniformity coefficient is defined as the ratio of the particle diameters D_{60} to D_{10} on the particle-size distribution curve, where: D_{60} = particle diameter at which 60% of the soil by weight is finer D_{10} = particle diameter at which 10% of the soil by weight is finer
6.	(02/16) The limiting values for Class U1B material are given in contract specific Appendix 6/14 and contract specific Appendix 6/15.
7	(02/16) For works in Wales see sub-Clause 601.21W.
8	(02/16) Where material source codes are referenced these are as listed in Table 6/7.
9	(02/16) Where materials are required to be aggregates conforming to BS EN 13242 materials certificated as being compliant with BS EN 13285 are acceptable for use provided that they meet all the specification requirements and the Declaration of Performance for constituent parts to BS EN 13242 are provided to the Overseeing Organisation.
10	(02/16) Materials shall comply with the current Environmental Regulations at the time of use. Reference shall be made to Annex ZA (informative) of BS EN 13242.

APPENDIX D
TABLE 6/4 – METHOD COMPACTION FOR EARTHWORKS MATERIALS: PLANT AND METHODS

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TABLE 6/4: (02/16) Method Compaction for Earthworks Materials: Plant and Methods (Method 1 to Method 6) (This Table is to be read in conjunction with sub-Clause 612.10)

Type of Compaction Plant	Ref No.	Category	Method 1		Method 2		Method 3		Method 4		Method 5		Method 6		
			D	N#	D	N#	D	N#	D	N	D	N	N for D = 110 mm	N for D = 150 mm	N for D = 250 mm
Smoothed wheeled roller (or vibratory roller operating without vibration)	1	Mass per metre width of roll: over 2100 kg up to 2700 kg	125	8	125	10	125	10*	175	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 2700 kg up to 5400 kg	125	6	125	8	125	8*	200	4	unsuitable		16	unsuitable	unsuitable
	3	over 5400 kg	150	4	150	8	unsuitable		300	4	unsuitable		8	16	unsuitable
Grid roller		Mass per metre width of roll:													
	1	over 2700 kg up to 5400 kg	150	10	unsuitable		150	10	250	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 5400 kg up to 8000 kg	150	8	125	12	unsuitable		325	4	unsuitable		20	unsuitable	unsuitable
	3	over 8000 kg	150	4	150	12	unsuitable		400	4	unsuitable		12	20	unsuitable
Deadweight tamping roller		Mass per metre width of roll:													
	1	over 4000 kg up to 6000 kg	225	4	150	12	250	4	350	4	unsuitable		12	20	unsuitable
	2	over 6000 kg	300	5	200	12	300	3	400	4	unsuitable		8	12	20
Pneumatic-tyred roller		Mass per wheel:													
	1	over 1000 kg up to 1500 kg	125	6	unsuitable		150	10*	240	4	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1500 kg up to 2000 kg	150	5	unsuitable		unsuitable		300	4	unsuitable		unsuitable	unsuitable	unsuitable
	3	over 2000 kg up to 2500 kg	175	4	125	12	unsuitable		350	4	unsuitable		unsuitable	unsuitable	unsuitable
	4	over 2500 kg up to 4000 kg	225	4	125	10	unsuitable		400	4	unsuitable		unsuitable	unsuitable	unsuitable
	5	over 4000 kg up to 6000 kg	300	4	125	10	unsuitable		unsuitable		unsuitable		12	unsuitable	unsuitable
	6	over 6000 kg up to 8000 kg	350	4	150	8	unsuitable		unsuitable		unsuitable		12	unsuitable	unsuitable
	7	over 8000 kg up to 12000 kg	400	4	150	8	unsuitable		unsuitable		unsuitable		10	16	unsuitable
	8	over 12000 kg	450	4	175	6	unsuitable		unsuitable		unsuitable		8	12	unsuitable
Vibratory tamping roller		Mass per metre width of a vibrating roll:													
	1	over 700 kg up to 1300 kg	100	12	100	12	150	12	100	10	unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1300 kg up to 1800 kg	125	12	125	12	175	12*	175	8	unsuitable		12	unsuitable	unsuitable
	3	over 1800 kg up to 2300 kg	150	12	150	12	200	12*	unsuitable		unsuitable		8	12	unsuitable
	4	over 2300 kg up to 2900 kg	150	9	150	9	250	12*	unsuitable		400	5	6	10	unsuitable
	5	over 2900 kg up to 3600 kg	200	9	200	9	275	12*	unsuitable		500	6	6	10	unsuitable
	6	over 3600 kg up to 4300 kg	225	9	225	9	300	12*	unsuitable		600	6	4	8	unsuitable
	7	over 4300 kg up to 5000 kg	250	9	250	9	300	9*	unsuitable		700	6	3	7	12
	8	over 5000 kg	275	9	275	9	300	7*	unsuitable		800	6	3	6	10

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TABLE 6/4: (02/16) **Method Compaction for Earthworks Materials: Plant and Methods (Method 1 to Method 6) (This Table is to be read in conjunction with sub-Clause 612.10) (Continued)**

Type of Compaction Plant	Ref No.	Category	Method 1		Method 2		Method 3		Method 4		Method 5		Method 6		
			D	N#	D	N#	D	N#	Δ	N	D	N	N for D = 110 mm	N for D = 150 mm	N for D = 250 mm
Vibratory roller		Mass per metre width of vibratory roll:													
	1	over 270 kg up to 450 kg	unsuitable		75	16	150	16	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 450 kg up to 700 kg	unsuitable		75	12	150	12	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	3	over 700 kg up to 1300 kg	100	12	125	10	150	6	125	10	unsuitable		16	unsuitable	unsuitable
	4	over 1300 kg up to 1800 kg	125	8	150	8	200	10*	175	4	unsuitable		6	16	unsuitable
	5	over 1800 kg up to 2300 kg	150	4	150	4	225	12*	unsuitable		unsuitable		4	6	12
	6	over 2300 kg up to 2900 kg	175	4	175	4	250	10*	unsuitable		400	5	3	5	11
	7	over 2900 kg up to 3600 kg	200	4	200	4	275	8*	unsuitable		500	5	3	5	10
	8	over 3600 kg up to 4300 kg	225	4	225	4	300	8*	unsuitable		600	5	2	4	8
	9	over 4300 kg up to 5000 kg	250	4	250	4	300	6*	unsuitable		700	5	2	4	7
	10	over 5000 kg	275	4	275	4	300	4*	unsuitable		800	5	2	3	6
Vibrating plate compactor		Mass per m^2 of base plate:													
	1	over 880 kg up to 1100 kg	unsuitable		unsuitable		75	6	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 1100 kg up to 1200 kg	unsuitable		75	10	100	6	75	10	unsuitable		unsuitable	unsuitable	unsuitable
	3	over 1200 kg up to 1400 kg	unsuitable		75	6	150	6	150	8	unsuitable		unsuitable	unsuitable	unsuitable
	4	over 1400 kg up to 1800 kg	100	6	125	6	150	4	unsuitable		unsuitable		8	unsuitable	unsuitable
	5	over 1800 kg up to 2100 kg	150	6	150	5	200	4	unsuitable		unsuitable		5	8	unsuitable
	6	over 2100 kg	200	6	200	5	250	4	unsuitable		unsuitable		3	6	12
Vibro-tamper		Mass:													
	1	over 50 kg up to 65 kg	100	3	100	3	150	3	125	3	unsuitable		4	8	unsuitable
	2	over 65 kg up to 75 kg	125	3	125	3	200	3	150	3	unsuitable		3	6	12
	3	over 75 kg up to 100 kg	150	3	150	3	225	3	175	3	unsuitable		2	4	10
	4	over 100 kg	225	3	200	3	225	3	250	3	unsuitable		2	4	10
Power rammer		Mass:													
	1	100 kg up to 500 kg	150	4	150	6	unsuitable		200	4	unsuitable		5	8	unsuitable
	2	over 500 kg	275	8	275	12	unsuitable		400	4	unsuitable		5	8	14
Dropping-weight compactor		Mass of rammer over 500 kg weight drop:													
	1	over 1 m up to 2 m	600	4	600	8	450	8	unsuitable		unsuitable		unsuitable	unsuitable	unsuitable
	2	over 2 m	600	2	600	8	unsuitable		unsuitable		unsuitable		unsuitable	unsuitable	unsuitable

TABLE 6/4: (02/16) Method Compaction for Earthworks Materials: Plant and Methods (Method 7) (This Table is to be read in conjunction with sub-Clause 612.10) (Continued)

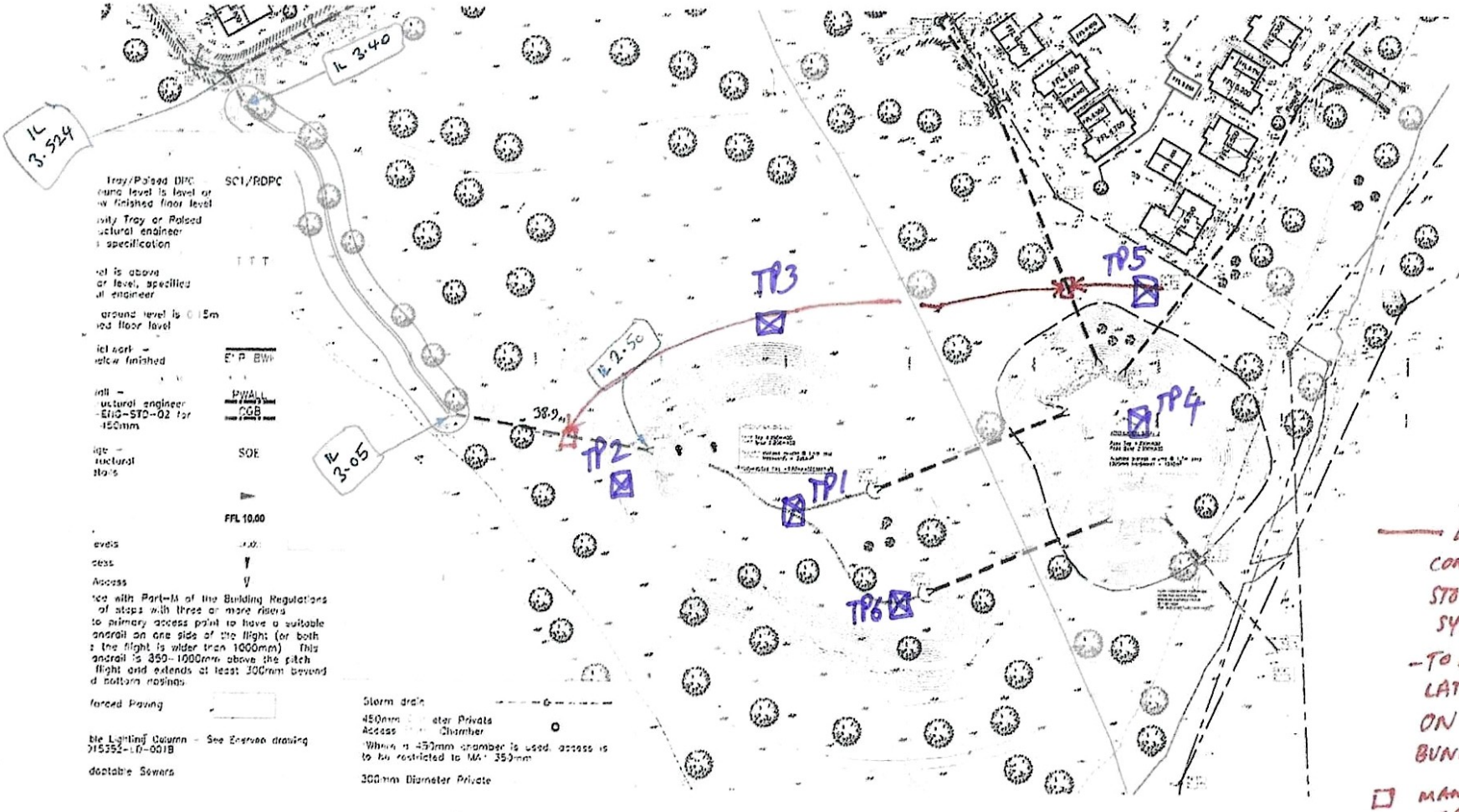
Type of Compaction Plant	Ref~ No.	Category	Method 7	
			N for D = 150 mm	N for D = 250mm
Smooth wheeled roller (or vibratory roller operating without vibration)		Mass per metre width of roll:		
	1	over 2100 kg up to 2700 kg	unsuitable	unsuitable
	2	over 2700 kg up to 5400 kg	unsuitable	unsuitable
	3	over 5400 kg	12	unsuitable
Grid roller		Mass per metre width of roll:		
	1	over 2700 kg up to 5400 kg	unsuitable	unsuitable
	2	over 5400 kg up to 8000 kg	16	unsuitable
	3	over 8000 kg	8	unsuitable
Deadweight tamping roller		Mass per metre width of roll:		
	1	over 4000 kg up to 6000 kg	4	8
	2	over 6000 kg	3	6
Pneumatic-tyred roller		Mass per wheel:		
	1	over 1000 kg up to 1500 kg	unsuitable	unsuitable
	2	over 1500 kg up to 2000 kg	12	unsuitable
	3	over 2000 kg up to 2500 kg	6	unsuitable
	4	over 2500 kg up to 4000 kg	5	unsuitable
	5	over 4000 kg up to 6000 kg	4	16
	6	over 6000 kg up to 8000 kg	unsuitable	8
	7	over 8000 kg up to 12000 kg	unsuitable	4
	8	over 12000 kg	unsuitable	4
Vibratory tamping roller		Mass per metre width of vibrating roll:		
	1	over 700 kg up to 1300 kg	unsuitable	unsuitable
	2	over 1300 kg up to 1800 kg	unsuitable	unsuitable
	3	over 1800 kg up to 2300 kg	16	unsuitable
	4	over 2300 kg up to 2900 kg	12	unsuitable
	5	over 2900 kg up to 3600 kg	10	unsuitable
	6	over 3600 kg up to 4300 kg	8	16
	7	over 4300 kg up to 5000 kg	7	14
	8	over 5000 kg	6	12
Vibratory roller		Mass per metre width of vibrating roll:		
	1	over 270 kg up to 450 kg	unsuitable	unsuitable
	2	over 450 kg up to 700 kg	unsuitable	unsuitable
	3	over 700 kg up to 1300 kg	unsuitable	unsuitable
	4	over 1300 kg up to 1800 kg	unsuitable	unsuitable
	5	over 1800 kg up to 2300 kg	12	unsuitable
	6	over 2300 kg up to 2900 kg	10	unsuitable
	7	over 2900 kg up to 3600 kg	10	unsuitable
	8	over 3600 kg up to 4300 kg	8	unsuitable
	9	over 4300 kg up to 5000 kg	8	unsuitable
	10	over 5000 kg	6	12
Vibratory plate compactor		Mass per m^2 of base plate:		
	1	over 880 kg up to 1100 kg	unsuitable	unsuitable
	2	over 1100 kg up to 1200 kg	unsuitable	unsuitable
	3	over 1200 kg up to 1400 kg	unsuitable	unsuitable
	4	over 1400 kg up to 1800 kg	10	unsuitable
	5	over 1800 kg up to 2100 kg	8	unsuitable
	6	over 2100 kg	6	unsuitable
Vibro-tamper		Mass:		
	1	over 50 kg up to 65 kg	unsuitable	unsuitable
	2	over 65 kg up to 75 kg	unsuitable	unsuitable
	3	over 75 kg up to 100 kg	unsuitable	unsuitable
	4	over 100 kg	8	unsuitable
Power rammer		Mass:		
	1	100 kg up to 500 kg	8	unsuitable
	2	over 500 kg	6	10
Dropping weight compactor		Mass of rammer over 500 kg height drop:		
	1	over 1 m up to 2 m	unsuitable	unsuitable
	2	over 2 m	unsuitable	unsuitable

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APPENDIX E
RECORD OF TRIAL PITS AND SITE PLAN.
ALSO MJA CONSULTING DRAINAGE DRAWINGS

.250
1:5 = 1:395



TRIAL PIT LOCATION (EXCAVATED 4/9/25)

≈ 2m DEEP LAND DRAIN (BASE @ IL 2.50m) CONNECTED INTO STORM DRAIN SYSTEM
- TO REDUCE BUILD UP LATERAL PRESSURE (VIA PERCHED WATER) ON ATTENUATION BUND SLOPES

MANHOLE CHAMBER CONNECTION

1:794

RECORD OF TRIAL PITS

Date of Investigation: 4 September 2025

TRIAL PIT 1

Ground level-0.25m	Brown silty TOPSOIL
0.25m-2.00m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~25%) within a firm grey to brown grey silty CLAY matrix
2.00m-3.75m	Stiff to very stiff mottled dark brown grey and dark grey silty CLAY
	END OF TRIAL PIT

Remarks
Base of trial pit at 2.30m AOD. Groundwater was not encountered however there was very slight seepage at the base of the sand and gravel. The sides of the trial pit remained stable during excavation.

TRIAL PIT 2 (excavated to base of pond dig level)

Ground level-0.25m	Brown silty TOPSOIL
0.25m-1.30m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~25%) within a firm grey to brown grey silty CLAY matrix
1.30m-2.50m	Stiff to very stiff mottled dark brown grey and dark grey occasionally yellow brown silty CLAY
	END OF TRIAL PIT

Remarks
Groundwater was not encountered and the sides of the trial pit remained stable during excavation.

TRIAL PIT 3 (excavated to base of pond dig level)

Ground level-0.30m	Brown silty TOPSOIL
0.30m-1.80m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~25%) within a soft to firm grey to brown grey silty CLAY matrix – becoming firm to stiff below 1.50m
1.80m-2.50m	Stiff to very stiff mottled dark brown grey and dark grey occasionally yellow brown silty CLAY
	END OF TRIAL PIT

Remarks
Groundwater was not encountered and the sides of the trial pit remained stable during excavation.

TRIAL PIT 4 (excavated to base of pond dig level)

Ground level-0.25m	Brown silty TOPSOIL (already stripped)
0.25m-1.50m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~25-30%) within a firm grey to brown grey silty CLAY matrix
1.50m-4.25m	Stiff to very stiff mottled dark brown grey and dark grey silty CLAY – with occasional claystone/mudstone nodules below 1.75m – becoming light grey with weathered mudstone fragments below 1.90m
	END OF TRIAL PIT

Remarks
Base of trial pit at 1.85m AOD. Groundwater was not encountered, however there was a very slight seepage within the sand and gravel. The sides of the trial pit remained stable during excavation.

TRIAL PIT 5 (excavated to base of pond dig level)

Ground level-0.25m	Brown silty TOPSOIL
0.25m-1.00m/1.50m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~20-30%) within a firm grey to brown grey silty CLAY matrix
1.00m/1.50m-2.50m	Stiff to very stiff mottled dark brown grey and dark grey silty CLAY
	END OF TRIAL PIT

Remarks
Base of trial pit at 3.85m AOD. Groundwater was not encountered and the sides of the trial pit remained stable during excavation.

TRIAL PIT 6 (excavated to base of pond dig level)

Ground level-0.25m	Brown silty TOPSOIL
0.25m-0.80m/1.60m	Intermixed orange brown and dark yellow brown SAND and GRAVEL pockets (~20-30%) within a firm grey to brown grey silty CLAY matrix
0.80m/1.60m-2.50m	Stiff to very stiff mottled dark brown grey and dark grey silty CLAY
	END OF TRIAL PIT

Remarks
Groundwater was not encountered and the sides of the trial pit remained stable during excavation.

APPENDIX F
LABORATORY RESULTS

DETERMINATION OF CONSTANT HEAD PERMEABILITY IN A HYDRAULIC CONSOLIDATION CELL

In accordance with BS1377 Part 2 Clause 21

Trial Pit: **TP4** Sample Ref: Sample Type: **B** Depth (m): **2.50**

Description: **Greyish brown CLAY** Sample Condition: **Reconstituted**

Specimen Preparation : **Recompacted at optimum moisture content (32%) to maximum dry density (1.42 Mg/m^3)**

SPECIMEN DETAILS		INITIAL	FINAL
Mass	g	150.94	165.30
Height	mm	20.75	20.22
Diameter	mm	70.00	70.00
Water Content	%	32.4	45.3
Particle Density	Mg/m^3	2.65$_{(assumed)}$	2.65$_{(assumed)}$
Bulk Density	Mg/m^3	1.89	2.12
Dry Density	Mg/m^3	1.43	1.46
Void Ratio		0.8561	0.8127
Degree of Saturation	%	100	100

SATURATION		INITIAL	FINAL
B-Value		0.57	1.00
Method		Incremental	Incremental
Cell Pressure	kPa	50	300
Back Pressure	kPa	23	301
Porewater Pressure	kPa	15	219
Volume Change	cm^3	-	0.00
Duration	days	-	4

CONSOLIDATION		
Free or Equal Strain		Equal Strain
Cell Pressure	kPa	400
Back Pressure	kPa	350
Porewater Pressure	kPa	321
Initial Volume	cm^3	80.05
Final Volume	cm^3	77.82
Volume Change	cm^3	2.22
Void Ratio		0.8127
Duration	days	2

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Contract: **Barnham**	Job No: **585315**	

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | GrfcText L - CONSTANT HEAD PERMEABILITY - 1 - A4P | 585315-BARNHAM-RSK-1924061.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Bristol Lab: 1a Princess Street, Bedminster, Bristol, BS3 4AG. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 03/12/25 - 12:56 | AF3 |

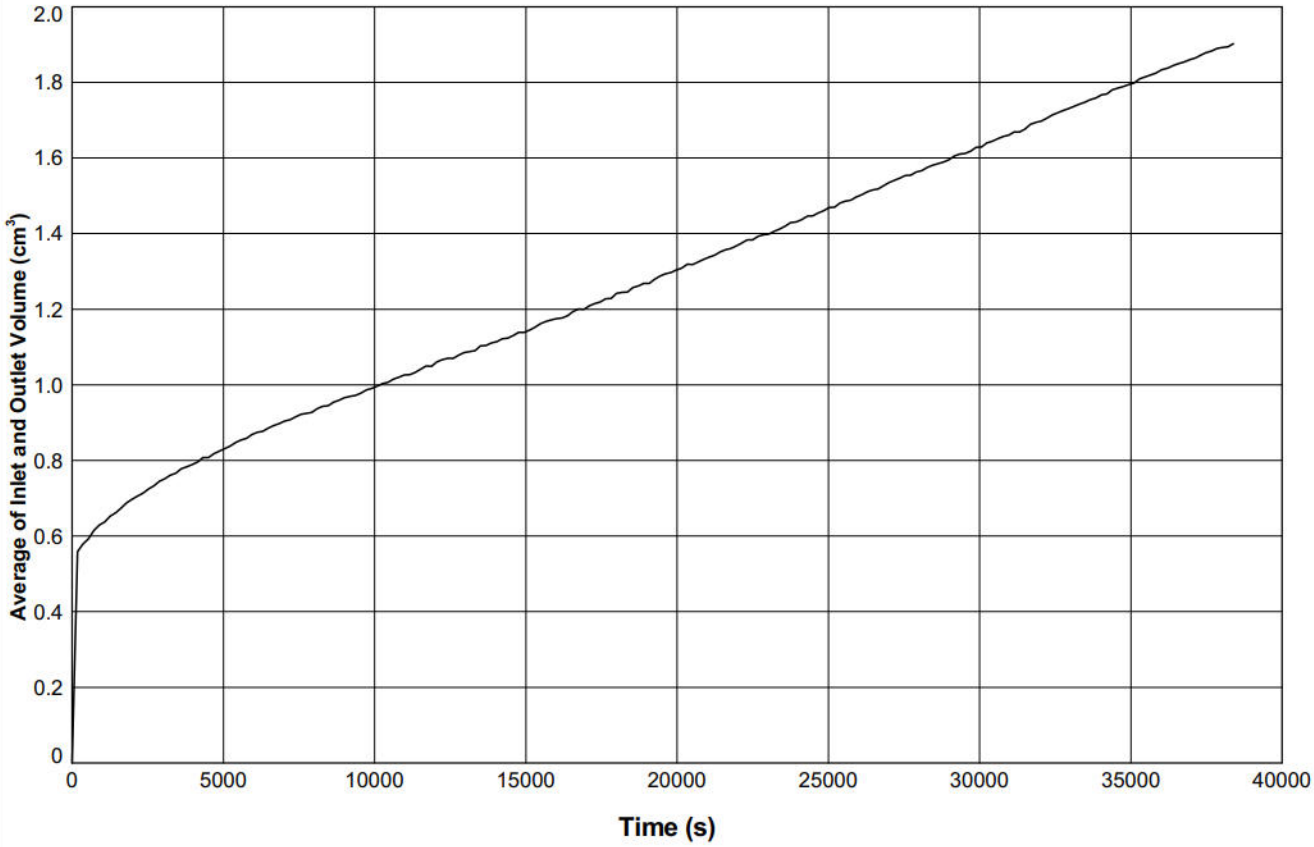
DETERMINATION OF CONSTANT HEAD PERMEABILITY IN A HYDRAULIC CONSOLIDATION CELL

In accordance with BS1377 Part 2 Clause 21

Trial Pit: **TP4** Sample Ref: Sample Type: **B** Depth (m): **2.50**

Description: **Greyish brown CLAY** Sample Condition: **Reconstituted**

PERMEABILITY		
Orientation		Vertical
Drainage		1-way
Cell Pressure	kPa	400
Back Pressure	kPa	335
Porewater Pressure	kPa	338
Constant Hydraulic Gradient	kPa	30
Coefficient of Permeability at 20°C	m/s	8.03×10^{-11}
Duration	days	1



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SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

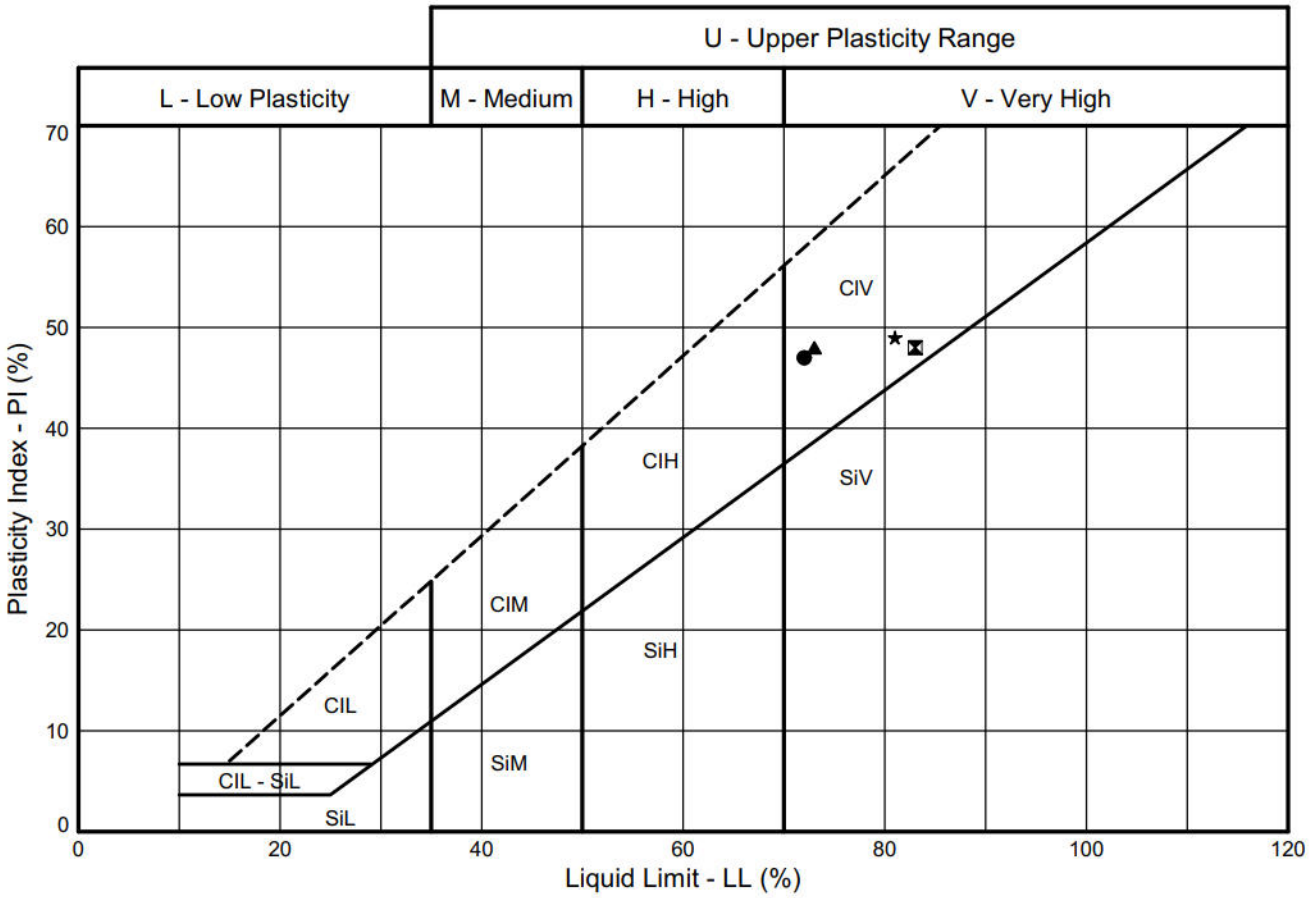
Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP1		B	3.00	32.3	72	25	47	100	Grey slightly sandy CLAY
TP2		D	1.50	33.2	83	35	48	100	Brown mottled grey slightly sandy CLAY
TP4		B	1.50	33.2	73	25	48	99	Grey slightly gravelly CLAY
TP5		D	1.50	29.2	81	32	49	98	Brown slightly sandy CLAY

SYMBOLS: * denotes BS 1377

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PI vs LL CHART

According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A2:2022



Sample Identification				Test Method #	Preparation Method +	WC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	TP1	B	3.00	5.3.14/5.5/6.5	5.2.1	32.3	72	25	47	100	B	
⊠	TP2	D	1.50	5.3.14/5.5/6.5	5.2.7	33.2	83	35	48	100	H	
▲	TP4	B	1.50	5.3.14/5.5/6.5	5.2.1	33.2	73	25	48	99	B	
★	TP5	D	1.50	5.3.14/5.5/6.5	5.2.1	29.2	81	32	49	98	H	

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A2:2022
5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method (factors are from Table 1, BS 1377-2:2022);
5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index
Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014+A1:2022
+ Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A2:2022
5.2.1 - Natural State and 5.2.7 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT)

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[redacted]	SHARON CAIRNS	20/10/25

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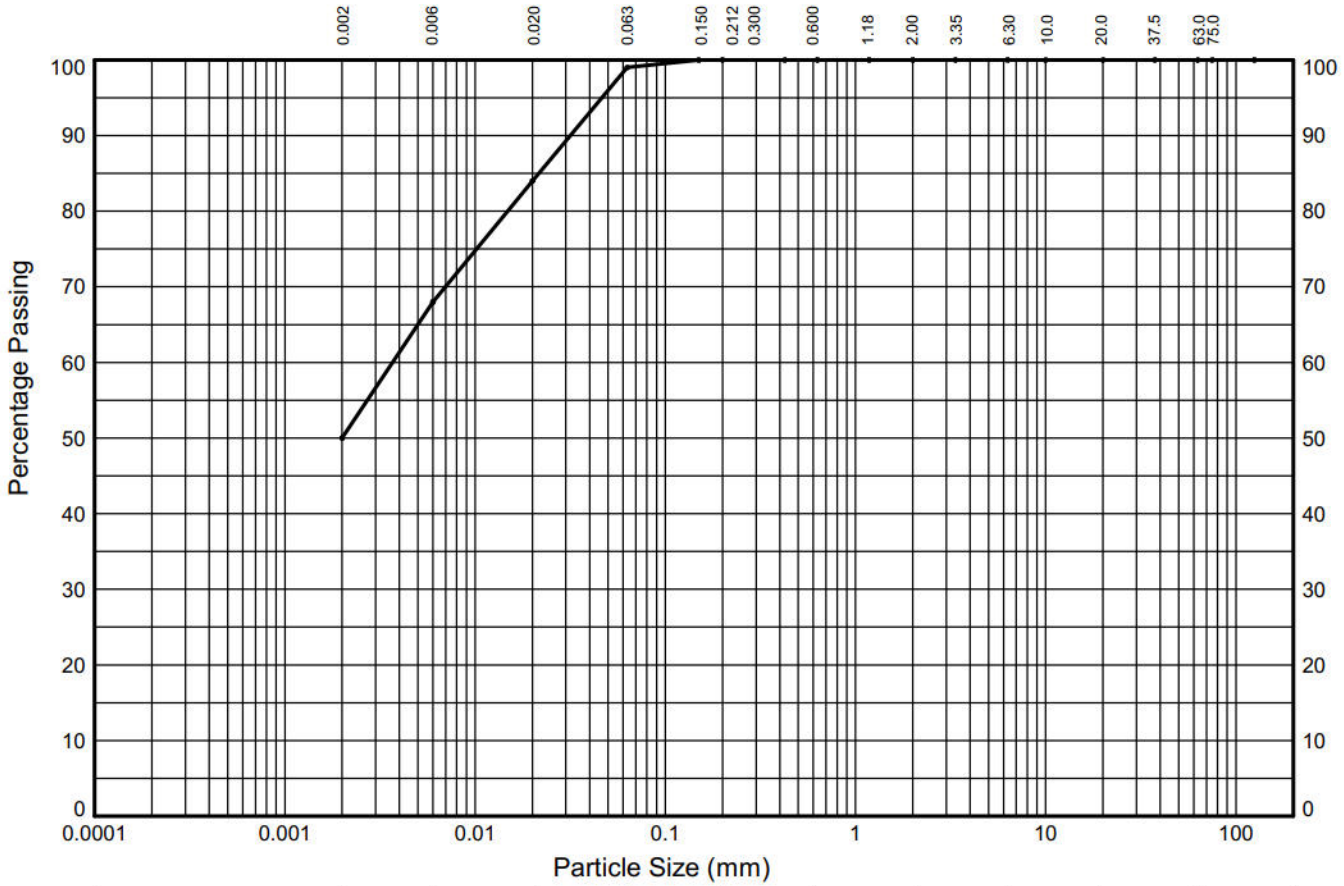
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Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 262323, Fax: 01442 262683, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 20/10/25 - 09:33 | SC1 |

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

Trial Pit: **TP1** Sample Ref: Sample Type: **B** Depth (m): **3.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	18%	16%	15%	1%	0%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
50%	49%			1%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.630	**100**
0.425	**100**
0.200	**100**
0.150	**100**
0.063	**99**

Particle Diameter (mm)	Percent Passing (%)
0.02	**84**
0.006	**68**
0.002	**50**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**NA**
D_{50} (mm)	**0.002**
D_{60} (mm)	**0.004**
D_{85} (mm)	**0.022**
D_{90} (mm)	**0.032**
C_U	**NA**
C_C	**NA**

Soil Description:

Grey slightly sandy CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

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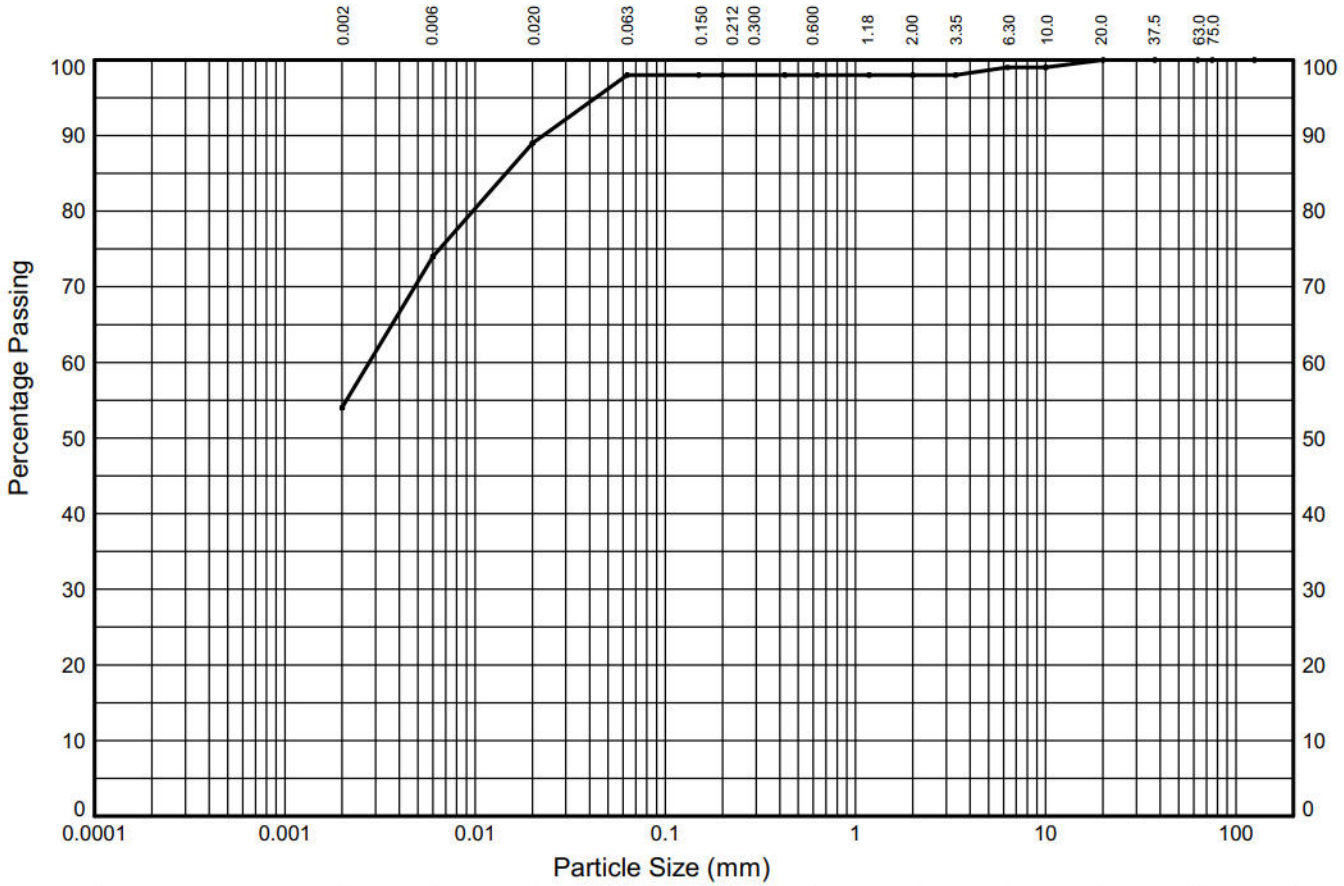
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[redacted]	FRANCESCA BENNETT	17/10/25
Contract: **Barnham**	Contract Ref: **585315**	

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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

Trial Pit: **TP4** Sample Ref: Sample Type: **B** Depth (m): **1.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	20%	15%	9%	0%	0%	0%	1%	1%	0%	
	SILT			SAND			GRAVEL			
54%	44%			0%			2%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**99**
6.30	**99**
3.35	**98**
2.00	**98**
1.18	**98**
0.630	**98**
0.425	**98**
0.200	**98**
0.150	**98**
0.063	**98**

Particle Diameter (mm)	Percent Passing (%)
0.02	**89**
0.006	**74**
0.002	**54**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**NA**
D_{50} (mm)	**NA**
D_{60} (mm)	**0.003**
D_{85} (mm)	**0.015**
D_{90} (mm)	**0.023**
C_U	**NA**
C_C	**NA**

Soil Description:

Grey slightly gravelly CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

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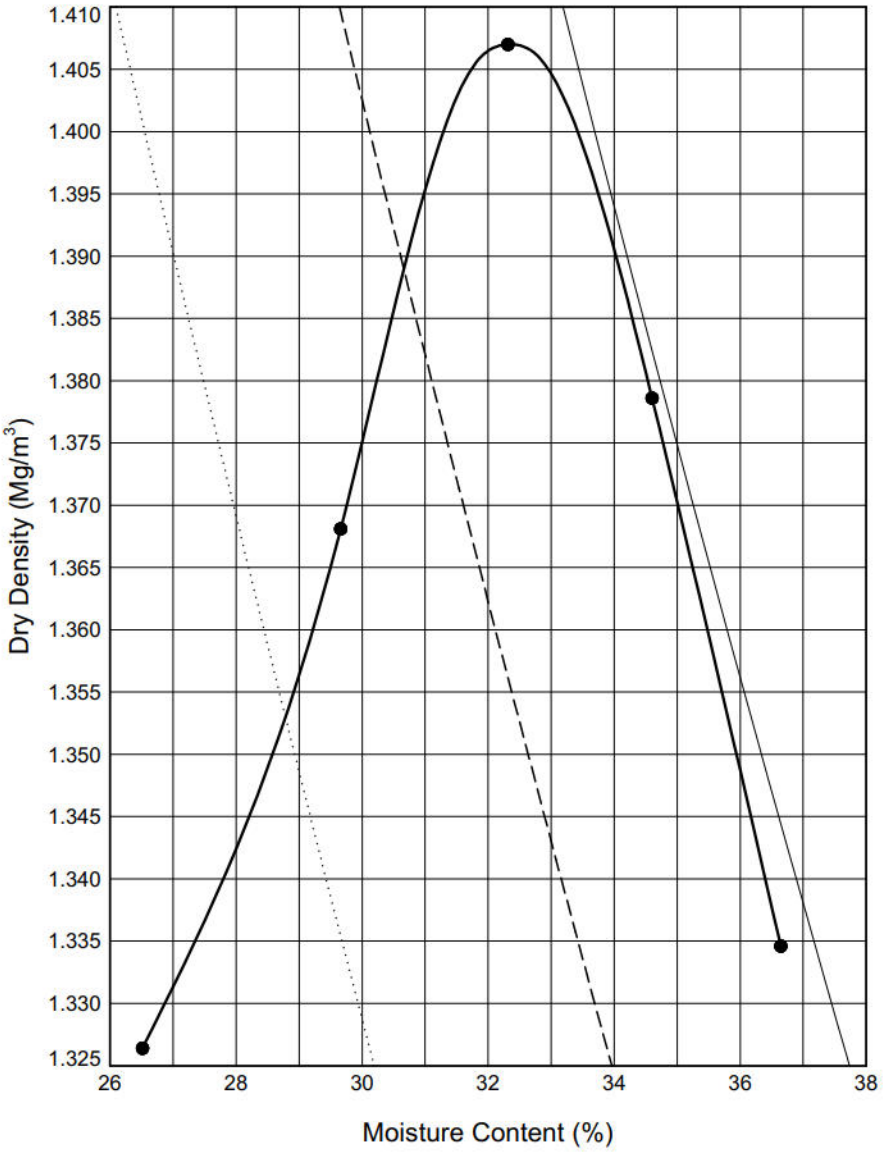
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP TEST

In accordance with clauses 11.3,11.4,11.5,11.6,11.7 of BS1377:Part 2:2022

Trial Pit: **TP1** Sample Ref: Sample Type: **B** Depth (m): **3.00**



Initial Sample Conditions			Test Details			Test Results		
Initial Moisture Content (%)	:	**32**	Compaction Type	:	**Light**	Maximum Dry Density (Mg/m³)	:	**1.41**
% Retained on 37.5mm BS Sieve	:	**0**	Mass of Rammer (kg):		**2.5**	Optimum Moisture Content (%)	:	**32**
% Retained on 20.0mm BS Sieve	:	**0**	Type of Mould	:	**1 LITRE**	Method Used: **Clause 11.3**		
Particle Density - assumed (Mg/m³)	:	**2.65**				Remarks:		
Size of Soil Pieces	:	**<20mm**	Separate samples were used.					

Sample Description	Key to Air Voids Lines		
Grey slightly sandy CLAY	——— 0%	– – – – 5%	····· 10%

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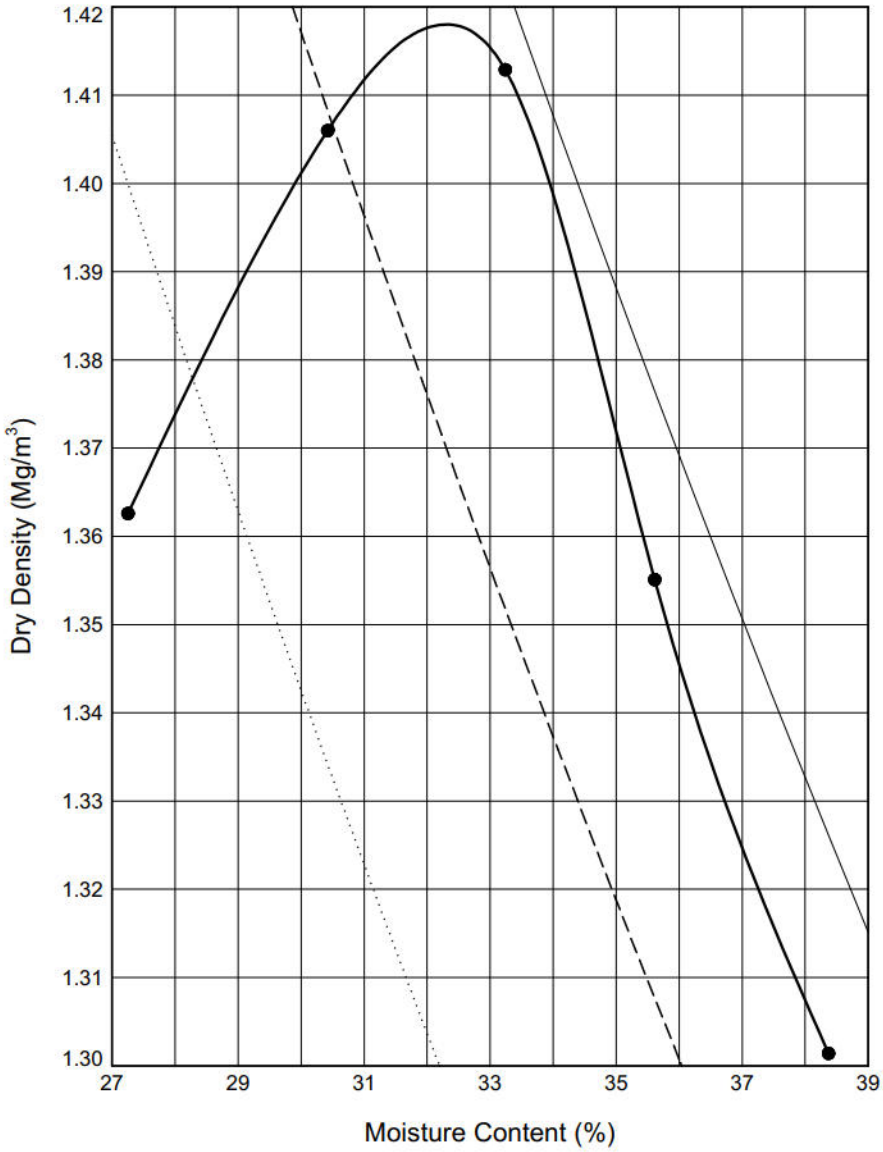
AGS

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP TEST

In accordance with clauses 11.3,11.4,11.5,11.6,11.7 of BS1377:Part 2:2022

Trial Pit: **TP4** Sample Ref: Sample Type: **B** Depth (m): **1.50**



Initial Sample Conditions			Test Details		Test Results		
Initial Moisture Content (%)	:	**33**	Compaction Type	: **Light**	Maximum Dry Density (Mg/m³)	:	**1.42**
% Retained on 37.5mm BS Sieve	:	**0**	Mass of Rammer (kg):	**2.5**	Optimum Moisture Content (%)	:	**32**
% Retained on 20.0mm BS Sieve	:	**0**	Type of Mould	: **1 LITRE**	Method Used: **Clause 11.3**		
Particle Density - assumed (Mg/m³)	:	**2.70**			Remarks:		
Size of Soil Pieces	:	**<20mm**	Separate samples were used.				

Sample Description	Key to Air Voids Lines		
Grey slightly gravelly CLAY	——— 0%	– – – – 5%	····· 10%

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Contract	Contract Ref:
Barnham	**585315**

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APPENDIX G
WILSON AND BAILEY BOREHOLE INVESTIGATION

WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 26/11/2024-28/12/2024	**Engineer** DPB	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	Soft gravelly CLAY		
							Orange-brown and grey silty sandy CLAY with roots and gravel		
0.50	B1					(0.60)			
						0.80	Gravelly CLAY		
1.00	B2								
						(1.10)			
1.50-1.95	SPT N=5			2,2/1,1,1,2					
1.50	D3								
						1.90	Grey silty sandy CLAY		
2.50-2.95	SPT N=11			3,1/2,2,3,4					
2.50	D4								
3.50	U5								
3.95	D6								
						(4.60)			
4.50-4.95	SPT N=18			2,3/3,4,4,7					
4.50	D7								
5.50	D8								
6.00	U9								
6.45	D10					6.50	Grey silty sandy CLAY		
7.00	D11								
7.50-7.95	SPT N=31			2,4/5,7,8,11					
7.50	D12								
8.50	D13								
9.00	U14								
9.30	D15								

Remarks
1 hour hand digging inspection pit. Water seepage at 0.80m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP1

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 26/11/2024-28/12/2024	**Engineer** DPB	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00	D16								
10.50-10.95	SPT N=36			3,5/7,9,9,11					
10.50	D17								
11.50	D18								
12.00	U19								
12.40	D20								
13.00	D21					(13.50)			
13.50-13.95	SPT N=43			4,6/8,10,11,14					
13.50	D22								
14.50	D23								
15.00	U24								
15.45	D25								
16.00	D26								
16.50-16.95	SPT N=44			5,6/8,10,12,14					
16.50	D27								
17.50	D28								
18.00-18.45	SPT N=50			5,7/9,13,15,13					
18.00	D29								
19.00	D30								
19.50-19.95	SPT N=50			6,8/11,16,23					
19.50	D31					20.00			

Remarks
1 hour hand digging inspection pit. Water seepage at 0.80m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP1

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 29/11/2024-03/12/2024	**Engineer** DPB	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	TOPSOIL		
							Orange-brown silty sandy CLAY with some gravel		
0.50	B1					(0.90)			
1.00	B2					1.10			
1.20-1.65 1.20	SPT N=5 D3			1,1/1,1,1,2			Orange-brown and grey silty sandy CLAY		
2.00	U4								
2.45	D5					(2.70)			
3.00-3.45 3.00	SPT N=27 D6			2,4/5,7,7,8					
						3.80	Grey silty sandy CLAY		
4.00	U7								
4.45	D8								
5.00-5.45 5.00	SPT N=20 D9			2,3/4,4,6,6					▼1
6.00	D10								
6.50	U11			Water strike(1) at 6.40m, rose to 5.20m in 20 mins.					▽1
6.95	D12					(6.70)			
7.50	D13								
8.00-8.45 8.00	SPT N=32 D14			3,5/6,7,8,11					
9.00	D15								
9.50	U16								

Remarks
2 hours day works moving rig in soft ground conditions. 1 hour day works hand digging inspection pit. Water strike at 6.40m rose to 5.20m after 20 mins. Water seepage at 2.50m & 3.80m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP2

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 29/11/2024-03/12/2024	**Engineer** DPB	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.95	D17								
10.50	D18					10.50	Grey silty sandy CLAY		
11.00-11.45 11.00	SPT N=40 D19			3,6/8,8,11,13					
12.00	D20								
12.50	U21								
12.95	D22								
13.50	D23								
14.00-14.45 14.00	SPT N=43 D24			3,6/8,10,11,14					
15.00	D25					(9.50)			
15.50	U26								
15.95	D27								
16.50	D28								
17.00-17.45 17.00	SPT N=46 D29			5,6/7,11,13,15					
18.00	D30								
18.50-18.95 18.50	SPT N=53 D31			5,7/10,12,13,18					
19.50-19.95 19.50	SPT N=50 D32			6,9/13,17,20		20.00			

Remarks
2 hours day works moving rig in soft ground conditions. 1 hour day works hand digging inspection pit. Water strike at 6.40m rose to 5.20m after 20 mins. Water seepage at 2.50m & 3.80m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP2

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 03/12/2024-05/12/2024	**Engineer** DPB	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL		
						0.30	Saturated orange SAND wth gravel - slightly silty		
0.50	B1								
						(0.90)			
1.00	B2								
						1.20			
1.20-1.65	SPT N=4			1,2/1,1,1,1		1.30	Orange sandy GRAVEL		
1.20	D3						Grey silty CLAY		
2.00-2.45	SPT N=11			3,3/3,3,2,3					
2.00	D4								
						(2.30)			
3.00	U5								
3.45	D6					3.60	Grey silty sandy CLAY		
4.00-4.45	SPT N=13			4,2/3,3,3,4					
4.00	D7								
4.00	D8								
5.00	U9								
5.45	D10								
6.00	D11								
6.50-6.95	SPT N=24			2,3/4,4,7,9					
6.50	D12								
7.50	D13								
8.00	U14								
8.45	D15								
9.00	D16								
9.50-9.95	SPT N=36			5,6/7,9,9,11					
9.50	D17								

Remarks
1 hour day works moving positions. 1 hour day works had digging inspection pit. 1 hour chiseling 3.60m to 4.00m. 2 hours day works getting rig off site. Water seeoage at 1.30m. Claystone band at 3.60m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP3

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 03/12/2024-05/12/2024	**Engineer** DPB	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00	U19								
11.45	D20					(16.40)			
12.00	D21								
12.50-12.95	SPT N=50			4,7/10,12,15,13					
12.50	D22								
13.50	D23								
14.00	U24								
14.45	D25								
15.00	D26								
15.50-15.95	SPT N=50			4,9/11,15,18,6					
15.50	D27								
16.50	D28								
17.00-17.45	SPT N=50			5,9/12,15,16,7					
17.00	D29								
18.00	D30								
18.50-18.95	SPT N=28			5,11/16,2,10					
18.50	D31								
19.50-19.95	SPT N=50			6,14/21,29					
19.50	D32					20.00			

Remarks
1 hour day works moving positions. 1 hour day works had digging inspection pit. 1 hour chiseling 3.60m to 4.00m. 2 hours day works getting rig off site. Water seeoage at 1.30m. Claystone band at 3.60m.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP3

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 09/04/2025-11/04/2025	**Engineer** DPB	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	MADE GROUND (clay fill)		
						0.30			
						(0.20)	Firm orange-brown grey silty CLAY with rootlets		
0.50	B1					0.50			
						(0.30)	Firm orange-brown and grey silty CLAY with occasional roots and gravel		
				Water strike(1) at 0.80m.		0.80			∇_1
						(0.30)	Firm very gravelly silty brown and grey CLAY		
1.00	B2					1.10			
1.20-1.65	SPT N=9			4,5/3,3,2,1			Sandy GRAVEL		
1.20	D3					(0.70)			
						1.80			
2.00-2.45	SPT N=8			1,1/1,2,2,3			Soft becoming firm grey silty sandy CLAY		
2.00	D4								
3.00	U5								
3.45	D6					(3.70)			
4.00-4.45	SPT N=16			2,3/3,4,4,5					
4.00	D7								
5.00	U8								∇_2
				Water strike(2) at 5.20m.					
5.45	D9					5.50	Firm becoming stiff grey silty sandy CLAY with occasional shell fragments		
6.00	D10								
6.50-6.95	SPT N=29			2,4/5,6,8,10					
6.50	D11								
7.50	D12								
8.00	U13								
8.45	D14								
9.00	D15								
						(7.50)			
9.50-9.95	SPT N=36			4,4/8,9,9,10					
9.50	D16								

Remarks
1.5 hours day works locating borehole locations. 1 hour day works digging inspection pit. Groundwater seepage at 0.80m with no rise. Water strike at 5.20m rose to 2.30m after 20 min.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP101

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 09/04/2025-11/04/2025	**Engineer** DPB	**Sheet** 2/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D17								
11.00	U18								
11.45	D19								
12.00	D20								
12.50-12.95	SPT N=46			3,7/9,10,11,16					
12.50	D21								
						13.00	Grey silty sandy CLAY		
13.50	D22								
14.00	U23								
14.40	D24								
15.00	D25								
15.50-15.95	SPT N=39			3,7/9,9,9,12					
15.50	D26								
16.50	D27								
17.00	U28								
17.40	D29								
18.00	D30								
18.50-18.95	SPT N=51			3,7/9,12,14,16					
18.50	D31								
19.50	D32								

Remarks
1.5 hours day works locating borehole locations. 1 hour day works digging inspection pit. Groundwater seepage at 0.80m with no rise. Water strike at 5.20m rose to 2.30m after 20 min.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP101

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 09/04/2025-11/04/2025	**Engineer** DPB	**Sheet** 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.00	U33								
20.45	D34								
21.00	D35								
21.50-21.95	SPT N=50			5,9/13,13,14,10		(17.00)			
21.50	D36								
22.50	D37								
23.00	U38								
23.45	D39								
24.00	D40								
24.50-24.95	SPT N=50			5,8/12,13,13,12					
24.50	D41								
25.50	D42								
26.00	U43								
26.45	D44								
27.00	D45								
27.50-27.95	SPT N=50			4,8/14,14,18,4					
27.50	D46								
28.50	D47								
29.00	U48								
29.45	D49								
29.50-29.95	SPT N=50			6,10/15,21,14					
29.50	D50					30.00			

Remarks
1.5 hours day works locating borehole locations. 1 hour day works digging inspection pit. Groundwater seepage at 0.80m with no rise. Water strike at 5.20m rose to 2.30m after 20 min.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP101

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GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP102

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 14/04/2025	**Engineer** DPB	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	MADE GROUND (brown clay with gravel)		
						0.30			
0.50	B1					(0.50)	Soft orange-brown and grey silty sandy CLAY with occasional gravel		
				Water strike(1) at 0.80m.		0.80			∇_1
1.00	B2						Firm very gravelly silty sandy CLAY		
1.20-1.65 1.20	SPT N=6 D3			1,0/1,1,2,2		(1.20)			
				Water strike(2) at 1.90m.					∇_2
2.00	U4					2.00	Firm grey silty sandy CLAY		
2.45	D5								
						(1.70)			
3.00-3.45 3.00	SPT N=14 D6			1,2/3,3,3,5					
						3.70			
3.70	B7					(0.30)	Possible obstruction		
4.00	D8					4.00	Complete at 4.00m		

Remarks
1 hour day works hand digging inspection pit. 2 hours chiselling 3.70m to 4.00m. Groundwater seepage at 0.80 no rise. Groundwater seepage at 1.90m no rise.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP102

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GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP102A

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 14/04/2025-16/04/2025	**Engineer** DPB	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.40)	MADE GROUND (clay fill)		
						0.40			
0.50	B1					(0.70)	Soft orange-brown and grey silty sandy CLAY with some gravel		
1.00	B2					1.10			
1.20-1.65 1.20	SPT N=4 D3			1,0/1,1,1,1		(0.80)	Firm pale grey silty sandy CLAY		
2.00	U4			Water strike(1) at 1.90m.		1.90			▽1
						(0.60)	Firm becoming stiff grey silty sandy CLAY		
2.45	D5					2.50	Soft grey silty sandy CLAY		
3.00-3.45 3.00	SPT N=15 D6			1,2/3,3,4,5					
4.00	U7								
4.45	D8								
5.00-8.45 5.00	SPT N=27 D9			2,2/5,6,7,9					
6.00	D10								
6.50	U11								
6.95	D12								
7.50	D13								
8.00-8.45 8.00	SPT N=31 D14			2,4/5,6,9,11		(12.00)			
9.00	D15								
9.50	U16								

Remarks
1 hour day works hand digging inspection pit. Groundwater seepageat 1.90m no rise.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP102A

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP102A

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433

Location	Dates	Engineer	Sheet
	14/04/2025-16/04/2025	DPB	2/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.95	D17								
10.50	D18								
11.00-11.45	SPT N=37			6,7/7,9,10,11					
11.00	D19								
12.00	D20								
12.50	U21								
12.95	D22								
13.50	D23								
14.00-14.45	SPT N=49			4,7/9,11,12,17					
14.00	D24								
						14.50			
						(0.19)	CLAYSTONE band		
						14.70	Stiff grey silty sandy CLAY		
15.00	D25						Grey silty sandy CLAY		
15.50	U26								
15.95	D27								
16.50	D28								
17.00-17.45	SPT N=40			3,5/6,8,11,15					
17.00	D29								
						(5.50)			
18.00	D30								
18.50	U31								
18.95	D32								
19.50	D33								
20.00-20.45	SPT N=50			5,5/11,39					

Remarks
1 hour day works hand digging inspection pit. Groundwater seepageat 1.90m no rise.

Scale (approx)	Logged By
1:50	

Figure No.
J202433.CP102A

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WILSON BAILEY
GEOTECHNICAL & ENVIROMENTAL

Site	Borehole Number
Barnham	CP102A

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			BDW Southampton	J202433
	Location	**Dates** 14/04/2025-16/04/2025	**Engineer** DPB	**Sheet** 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.00	D34					20.20			
						20.21	CLAYSTONE band		
							Stiff grey silty sandy CLAY		
21.00	D35								
21.50	U36								
21.95	D37								
22.50	D38								
23.00-23.45 23.00	SPT N=48 D39			4,7/10,12,12,14					
24.00	D40								
24.50	U41								
24.95	D42					(9.79)			
25.50	D43								
26.00-26.45 26.00	SPT N=51 D44			4,8/10,13,13,15					
27.00	D45								
27.50	U46								
27.95	D47								
28.50	D48								
29.00-29.45 29.00	SPT N=50 D49			5,9/14,19,17					
29.50	U50								
29.95	D51					30.00			

Remarks
1 hour day works hand digging inspection pit. Groundwater seepageat 1.90m no rise.

Scale (approx)	Logged By
1:50	

Figure No. J202433.CP102A

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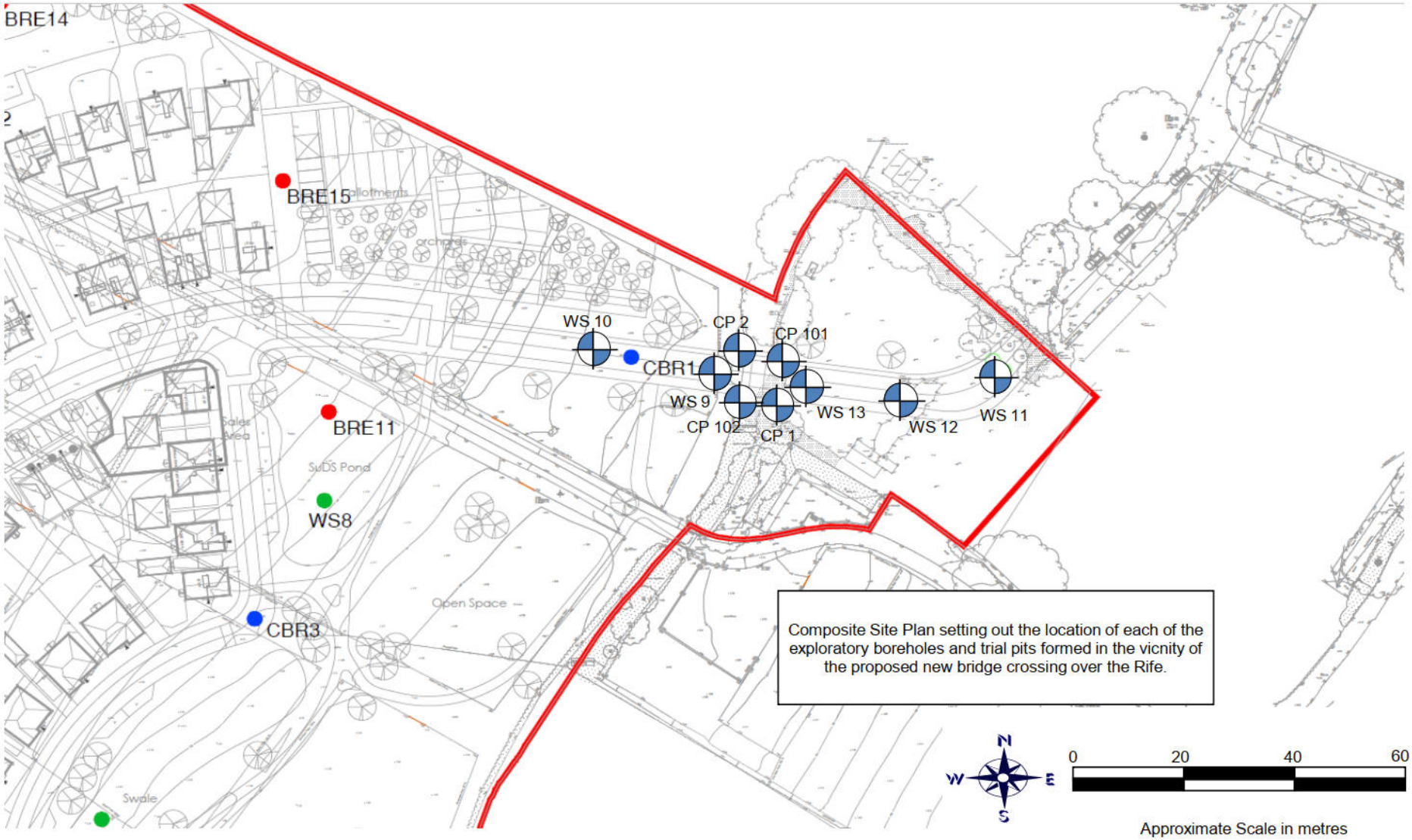
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Northdown Farmhouse
Donhead St Mary
Wiltshire
SP7 9DD

Site Plan

Site Tars Farm, Barnham - Bridge Area

Client BDW Southampton



Site Plan - Bridge Area

APPENDIX H
LEAP SITE INVESTIGATION REPORT

Phase II Site Investigation Report

at
Tars Farm, Greenbank,
Church Lane, Bognor Regis,
PO22 0DG

for Gleeson Strategic Land

Report Reference : LP2356

Report Date : 16th April 2021

Leap Environmental Ltd
Head Office
The Atrium, Curtis Road,
Dorking, Surrey, RH4 1XA

Registered in England No 6552502

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EXECUTIVE SUMMARY

The site generally comprises open grassed fields, divided into paddocks for horses. Stables and barn buildings are located in the central portion of the site, and also near the site entrance in the north east. The site covers approximately 14.6Ha, and is situated to the west of Church Lane, Barnham, West Sussex. Based on preliminary drawings, it is proposed to redevelop the site into low rise housing and public open space.

The site has a history of use as farmland from the late 19th century. The desk study identified limited sources of potential contamination associated with the site, including residual herbicide / pesticide presence from agricultural use, and possible asbestos containing materials within the existing derelict farm buildings. Potential offsite sources of contamination are limited to a railway station and railway track adjacent north and west to the site boundary.

The desk study also identified several geotechnical hazards that can create a risk to structures on site, including high groundwater table, slope stability, running sands, compressible ground, aggressive ground conditions for concrete, and potential for shrinking and swelling clays.

The site is mapped as being underlain by superficial River Terrace Deposits and Raised Beach Deposits in the central and northern areas of the site, and Raised Marine Deposits along the eastern site boundary. These are underlain by the London Clay Formation, which is also mapped as outcropping in the southern area of the site. The Lambeth Group and the White Chalk Subgroup are mapped 40m and 120m south of site, respectively.

Trial holes were undertaken across the site, including trial pits and windowless boreholes. It was found that ground conditions comprise topsoil over clayey/silty/sandy/gravelly superficial deposits to a maximum of 3.8mbgl over London Clay to the full depth of investigation, where encountered (maximum 4mbgl). Made ground or reworked clay was encountered in localised spots around the site to a maximum depth of 1mbgl, and is thought to be associated with construction of nearby buildings, small-scale excavations, and placement of services. Shallow perched groundwater was encountered within the superficial deposits as well as the London Clay soils at depths between 0.8 and 4m below ground level. During winter groundwater monitoring of the wells, it was found that water levels ranged from 2.34mBGL up to ground level (particularly in the wells, which were at a lower elevations such as WS4 along the eastern boundary)

An allowable bearing capacity of 100kPa is recommended for the firm to stiff clays/medium dense soils below about 1m. These will require deepening near trees to NHBC HIGH VCP precautions. Piled foundations may be the preferred option if foundations extend below the water table in the more granular soils, particularly if they are to be pulled during the wet winter months, or after bouts of prolonged wet weather.

Suspended floor slabs are recommended.

Soil sulphates in the superficial soils fall within BRE design class DS-1 and the site conditions fall within the ACEC class AC-1. In the London Clay, results fall within design class DS-4 and ACEC class AC-4, though it is possible that this may be reduced with further testing.

3No. trial pits, spaced out to cover the top, middle, and bottom of the site, were used for BRE365 soakage tests. Soakage rates in the order of 10^{-7} m/s were recorded in the tests, and shallow groundwater levels were recorded in the monitoring wells. At this stage it is considered unlikely that conventional soakaways will work on site.

CBR testing was beyond the scope of works. At this stage an estimated CBR of 2-3% should be used for the plastic clays and for the chalky head and silts a CBR of 1%. Allowance should be made for a frost susceptible sub-grade. Further confirmatory testing may be required along any adopted roads.

Overall the site slopes gently to the south east and south west, with slopes steepening towards the stream along the south east boundary and towards the south west boundary. It is recommended that a topographical survey of the site is obtained to undertake a preliminary slope stability assessment.

A geo-environmental risk assessment has been carried out. The site was separated into two zones based on the preliminary layout provided by the client; Residential Zone and Public Open Space Zone. These were analysed for contamination separately, using assessment criteria for the proposed end use. Contamination testing of the soils found that, based on the current layout, there are no contaminant exceedances on site. However it should be noted that new analyses will be required, should the proposed layout change. Additional investigation is recommended to be undertaken within the building footprints on site post demolition.

As with any redevelopment site, there is always the risk of hitherto undetected contamination, and further investigations should be carried out prior to redevelopment.

Much of the natural soils on site will be expected to be classified as non-hazardous waste, and may be classified as inert with additional testing, subject to the requirements of the receiving landfill.

Signed :	 Kleri Tantele MSc FGS
Checked :	 Martin Weil BSc MA C.WEM
Countersigned :	 Georgina Donbroski BEng MSc DIC CEng MICE Ground Engineering Professional
Date :	20 April 2021
Revision:	2

A INTRODUCTION

1 Authority

Leap Environmental Ltd (hereafter referred to as LEAP) has been appointed by Gleeson Strategic Land to undertake a Phase II intrusive Site Investigation of a site referred to as Tars Farm Barnham. The instruction was given in an email dated 29th September 2020 and signed by Kirsty Miller of Gleeson Strategic Land.

2 Objective

LEAP understands that it is proposed to redevelop the site with low rise housing associated roads, and public open space including swales and retention ponds as per the illustrative site layout (ref: 1311.03) provided in Appendix B.

The proposed development is currently at pre-purchase phase and has been assessed in accordance with BS EN 1997[1], as being a Geotechnical Category 1 structure.

The objectives of this report are to:

- Provide information on the geotechnical and environmental quality of the ground present on the site;
- Assess the potential health and other environmental risks posed by the site to the proposed development and to other specifically identified receptors; and
- Assess the potential for offsite contamination to adversely affect the proposed development.

3 Previous Studies

The site has been the subject of a previous investigation by LEAP. The reader is referred to this earlier report which should be read in conjunction with this report.

- Phase I Desk Study and Site Reconnaissance at Tars Farm, Barnham, for Gleeson Strategic Land, by LEAP, Issued 19th August 2020, ref. LP2292

[1] BS EN 1997-1(2004)+A1:2013 Eurocode 7:Geotechnical Design: General Rules

4 Scope of Works

This report describes a two-stage process whereby the site is investigated and risks are assessed based on information obtained from the previous report, as well as new results from this investigation. The terms geotechnical and geoenvironmental are referred to throughout the report.

Geoenvironmental refers principally to the chemical nature of the ground and the degree of soil, water and/or land gas contamination and the impact that contamination may have on current or future development and also on the wider environment.

Geotechnical refers to all other aspects of the ground conditions and the impact they may have on the physical construction of existing or future development, principally foundations, slope stability, drainage, pavement and road design and groundwater control.

The investigation comprises two phases of work.

4.1 General Site Information

The first part of this report presents the results of LEAP's previous desk study and site reconnaissance. The following publicly accessible sources of information[2] have also been reviewed:

- BGS '*Geology of Britain'* online viewer accessed on 7th October 2020.
- Unexploded WWII aerial delivered bomb (UXB) regional risk maps produced by Zetica

4.2 Intrusive Investigation Scope

The Phase II work comprises intrusive investigation, onsite monitoring and laboratory analysis. The results of this and the previous investigation report are used to validate the initial site conceptual model. This phase of site investigation comprised the following tasks:

- 11 No. 4m deep windowless boreholes drilled with a tracked rig;
- Groundwater monitoring wells in each borehole to depths between 2.6m and 4mbgl;
- 50 No. 0.8 - 3.3m deep machine excavated trial pits;

[2] The report contains British Geological Survey materials ©UKRI 2020 and public sector information licensed under the Open Government Licence v3.0.

- 2No hand excavated pits to 0.25m;
- BRE365 soakage tests in three of the trial pits;
- *In-situ* geotechnical testing including Standard Penetrometer Tests in the boreholes and field vane tests and perth penetrometer tests in the trial pits;
- Geotechnical Laboratory Testing including Atterberg Limit Tests, Particle Size Distribution Tests and BRE SD1 Suite B Sulphate Tests; and
- Chemical Laboratory tests including 55 No. LEAP standard soil suite tests, 6 No. Pesticide screens and 6 No. Herbicide screens.
- 6No. monthly winter groundwater monitoring visits in the 11No. windowless holes from 30th October 2020 to 26th March 2021.

The intrusive works were completed by contractors who have been scrutinised and are on LEAP's approved contractor list. The windowless sampling and soakage testing were carried out by Oakland Site Investigation Limited, and the machine excavated trial pits were carried out by BPH Ltd. Both were supervised by LEAP.

Selected samples of soil were scheduled for laboratory testing for a wide range of potential contaminants including metals, polyaromatic hydrocarbons, asbestos, and pesticides. The laboratory testing has been carried out by The Environmental Laboratory Ltd at its laboratories in East Sussex.

Selected soil samples have been classified by laboratory analysis for geotechnical design purposes. The laboratory testing has been carried out by Geolabs Ltd at its laboratories in Watford.

The final stage in the geoenvironmental assessment comprises a quantitative risk assessment and revision of the preliminary Conceptual Site Model. Preliminary recommendations for remediation have been provided, based on various development assumptions which are detailed in the following section and in the text of this report. The risk assessment has been carried out in accordance with UK industry standards and in particular in accordance with CLR11[3] and BS10175:2011+A2:2017.

The final stage of the geotechnical assessment is the provision of preliminary soil parameters for use in geotechnical design, and broad recommendations for appropriate foundation options. It is intended that the Geotechnical Information section of this report will fulfil the

[3] Environment Agency, 2004. Model Procedures for the management of land contamination. Contaminated Land Report 11.

general requirements of the Ground Investigation Report as set out in Section 6 of Eurocode7[4].

5 Limitations

This report has been prepared by Leap Environmental Ltd on the basis of information received from a variety of sources which Leap Environmental Ltd believes to be accurate. Nevertheless, Leap Environmental Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

Leap Environmental Ltd has used all reasonable skill, care and diligence in the design and execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed.

The conclusions reached in this report are necessarily restricted to those which can be determined from the information consulted and may be subject to amendment in the light of additional information becoming available. These conclusions may not be appropriate for alternative schemes.

This report is confidential to the Client, and Leap Environmental Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Leap Environmental Ltd beforehand. Any such party relies upon the report at their own risk.

Full details of the limitations are provided in Appendix A.

[4] BS EN 1997 Eurocode 7- Geotechnical Design- Part 1:General rules (2004) Part 2: Ground Investigation and Testing (2007)

B BACKGROUND INFORMATION

6 Environmental Setting

6.1 Site Location and Description

The site is located at Tars Farm, Barnham, Bognor Regis, West Sussex PO22 0DG as shown in Figure 1.

The approximate National Grid Reference of the site is 495680, 104080. The site lies at an estimated elevation of between ~8m (in the northern corner) and ~1m (along the southeastern boundary) Above Ordnance Datum (mAOD).

6.1.1 General Description and Boundaries

Walkover surveys have been carried out as part of LEAP's desk study of the subject site (report ref. LP2292), as well as alongside the recent site works.

The site comprises an irregular shaped parcel of land, approximately two thirds of which is divided into paddocks used for horses. The remaining western third is not in use and comprises a grassed field. A mix of existing and derelict buildings are located in the northern central portion of the site. The existing barns are used for several purposes including storage. Newly constructed stables are located adjacent to the barns and ~80 m northwest of Tars Farm House. A small stream aligned northeast to southwest forms the eastern boundary of the site.

The vast majority of the site is grass covered, with the exception of the area around the barns and the driveway through the northern part of the site, which are covered in compacted granular material. Some rutting of the hard standing was noted. Standing water was noted in these on days when it rained.

The northeastern portion of the site is generally level, but slopes gently towards the stream on the eastern boundary. The western side of the site slopes more steeply towards the south and west boundaries.

A drainage channel, approximately 1m deep, is present on site, aligned to the southwest from the central barn buildings for ~160 m, after which it junctions to the east for ~120 m connecting to the adjacent stream. The drain was dry at the time of the site works.

The site is bounded by open fields, residential properties and Barnham Rail station to the north, fields and residential properties to the east and south, a railway track bounds the site immediately to the west, beyond are open fields. A stream, Lidsey Rife, runs alongside the south eastern boundary of the site in a relatively deep channel, about 2-3m below adjacent site level. The banks of the stream were noted to be relatively steep. Water was free running

at the time of the investigation. The site access traverses the stream at the north eastern end of the site.

Table 1: General Site Information

Information	Details
Geology	The site is underlain by River Terrace Deposits in the northern quarter, Raised Beach Deposits in the middle, and Raised Marine Deposits along the southeastern boundary. These overlie the London Clay Formation. The London Clay is mapped to outcrop on the southern and part of the western portions of the site. The Lambeth Group Formation is mapped ~40m south of the site
BGS Boreholes	Borehole ref. SU90SE50 located ~15m onsite from the northern boundary recorded topsoil to 0.3m over clay to 2.1m over gravel to 3.65m over London Clay to the full depth (22.86mbgl). Standing water was recorded at 5.5mbgl.
Hydrogeology	The superficial deposits are classed as a Secondary A aquifer. London Clay is classed as Unproductive strata. Groundwater flow is expected to be in a southerly direction, with water table levels ranging from 0 - 8m AOD
Surface Water	A stream is located just within the site and extends along the eastern site boundary. A drainage channel, approximately 1m deep, is also present on site. This extends southwest from the central barn buildings for around 160m, then junctions off towards the stream on the eastern boundary
Flooding	Flood zones 2 and 3 are mapped along the eastern and southern boundaries. The flood zone risk extends to a maximum of 75m onto site in the northeastern quadrant. The site is also susceptible to groundwater flooding, and parts are at risk from surface water flooding.
Designated Environmentally Sensitive Sites	Site is located within a nitrate vulnerable zone

7 Site Usage

7.1 Current Land Use

The site is currently used mainly for horse riding and grazing horses. The buildings on the north east part of the site are residential and currently occupied.

7.2 Unexploded Ordnance (UXO)

The risks from unexploded ordnance have been assessed in accordance with CIRIA guidance[5]. A non-UXO specialist preliminary screening assessment has been carried out. The risks have

[5] CIRIA C681 2009. Unexploded ordnance (UXO) - A guide for the construction industry

been assessed by considering firstly the likelihood of military activities on, or in the vicinity of the site as determined from the desk study and historical review. Secondly the risk of UXO has been assessed by reference to the unexploded WWII aerial delivered bomb (UXB) regional risk maps produced by Zetica.

The Zetica risk maps indicate a low risk. Hence the overall risk of UXO is rated as low.

7.3 Radon

According to the Envirocheck report database search, the site is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level. However, no special protective measures are required in the construction of buildings on this site, in respect of radon gas.

8 Previous Investigations

The site has been the subject of 1No. report undertaken by LEAP, the findings of which are summarised below.

8.1 Phase I Desk Study and Site Reconnaissance at Tars Farm, Barnham, for Gleeson Strategic Land by LEAP, Issued 19th August 2020, ref. LP2292

The Phase I investigation was undertaken in August 2020. This comprised a desk study and walkover of the site. It should be noted that the red line boundary on the north east corner of the site has changed slightly between the desk study and current Phase II investigation. It previously included the buildings that are currently being resided in by the landowners, whereas it now encompasses a small parcel of land north of the eastern stables instead.

Based on a walkover of the site completed as part of this investigation, the site at the time was mainly undeveloped and was separated into several open paddocks. Farm buildings were located in the north and north east of the site.

A review of historical maps provided for the site found that the majority of the site consisted of open fields, presumably used as agricultural land, from the late 19th century. The desk study listed the following as potential sources of contamination:

- Residual pesticides/herbicides from agricultural use
- Possible asbestos containing materials within the existing derelict buildings
- Possible made ground (containing heavy metals, PAHs, and asbestos) associated with buildings on the site

- (Offsite source) Possible made ground from the railway station and railway track adjacent to the northern and northwestern site boundaries
- (Offsite source) Possible migration of land gas from a historical landfill 414m south of the site boundary.

The desk study rated the risk of each possible contaminant based on its potential to cause harm to future site users, construction workers, as well as nearby water features and groundwater.

The risk from PAHs was considered low as no visible evidence of contamination was noted on site, and any compounds present are expected to be very localised and in small quantities. The risk from heavy metals was considered low to moderate due to the limited potential for made ground on site. The risk posed by herbicides and pesticides was considered very low due to the minor severity of the consequences of exposure. The risk from asbestos was classed as moderate because of the severe health effects associated with inhalation of the contaminant. It was noted that, because the closest historical landfill was over 400m away and down hydraulic gradient of the site, land gas was unlikely to present a significant risk.

Surface water and groundwater was not expected to be at risk from any of the above contaminants due to the localised nature of any potential contamination.

The following geotechnical hazards were identified by the desk study:

- Potential for high groundwater table; unstable excavations, landslides, and running sands;
- Potential for bearing capacity failure and excessive settlement;
- Potential for aggressive ground conditions for concrete;
- Potential for shrinking/swelling clay

It was recommended in the report that an extensive intrusive investigation be undertaken in order to validate/update the conceptual site model with respect to geoenvironmental and geotechnical risk assessments.

C PHASE II - INTRUSIVE INVESTIGATION

9 Investigation Rationale

A total of 63 trial holes were excavated across the site. These included 50 No. machine excavated trial pits to depths between 0.8 to 3.3mbgl, 2No. hand dug pits to 0.25m, and 11No. windowless sampler boreholes to 4m.

The trial holes were located to give general coverage, taking into consideration the proposed development and the potential geoenvironmental and geotechnical risks/hazards highlighted by the CSM in accordance with BS10175.

The trial holes have been located in accordance with the recommendations for the spacing and depth of investigation given in EC7 Part 2 Annex B.

The trial hole spacing was consistent with the recommended density of 25 to 50m for an exploratory investigation after BS10175 Section 7.7.

Groundwater monitoring wells have been installed in trial holes WS1-WS11.

The investigation rationale for the trial holes is summarised below:

Table 2 Rationale for Investigation Locations

Trial Hole/Test Location	Rationale	Proposed Depth (mbGL)	Notes
WS01-11	Provide information on geotechnical and geoenvironmental quality of the ground, as well as provide locations for gas/groundwater monitoring wells	4	WS05 collapsed to 2.6m, WS09 to 3m, and WS10 to 3m
TP01,03-09,11 14, 18-19, 21-30, 32-33, 35-46, 47A-50	Provide information on geotechnical and geoenvironmental quality of the ground, as well as samples for environmental and geotechnical testing	2-3	TP47A was excavated as a replacement for TP47 due to presence of a land drain at 0.8m
TP02, 10, 17, 20, 31, 34A, 47	Provide information on the geoenvironmental quality of the ground and obtain samples for contamination testing.	~1	TP34A was excavated as a replacement for TP34 which was terminated at 0.4m due to suspected service
HP1 - 2	Provide topsoil samples for environmental testing	0.25	HP1 and 2 were excavated as replacements for TP15 and 16,

			respectively, due to the potential presence of buried services.

The site investigation locations are shown on Figure 2, Appendix B.

10 Site Work

10.1 Date and Weather Conditions

The intrusive investigations were undertaken from the 19th to the 23rd October 2020. At the time of the investigations, the weather was variable, from sunny and dry to brief intervals of drizzle and heavy rain.

Rainfall across the UK was 142% of average in October 2020, 77% of average in September 2020, and 135% of average in August 2020.

10.2 Site Work Methods

10.2.1 Windowless Sampler

The Windowless sampling rig consists of a tracked barrow with a sampling unit mounted on the top. When in the required position, the mast was raised to a height allowing a mechanised drop weight to fall repeatedly onto an anvil, and drive attached sample tubes or probe rods into the ground to produce reasonably intact continuous samples, which were then extracted using the integrated hydraulic ram.

To reduce any tendency of the tubes to stick in the ground, a succession of smaller diameters may be used to obtain full depth. Excavated soils were placed aside for inspection and sampling.

On completion all trial holes were installed with a groundwater monitoring well.

10.2.2 Trial Pitting

Trial pits were dug by a backhoe excavator. The trial pits had a target depth of between 1 and 3mbgl and were typically roughly 0.45m wide by 2m long. Trial pit logs are included as Appendix D. Spoil was replaced in reverse order. Trial pits were left mounded to allow for future settlement.

10.2.3 Hand Pitting

The pits were excavated using hand tools. The pits had a target depth of roughly 0.25mbgl. The logs are included within Appendix D.

10.2.4 Soil Logging and Sampling

Soil samples were recovered from the boreholes and trial pits for field screening, logging and sampling.

Boreholes were logged in general accordance with the requirements of BS 5930:[6] and BS EN ISO 14688[7]. Borehole logs are presented in Appendix D.

Visual and olfactory evidence of contamination was noted if encountered. These observations were used to aid scheduling of samples for chemical laboratory analyses, and are included on the borehole logs in Appendix D.

Samples were collected by hand (using dedicated nitrile gloves for each sampling location). Samples were placed into laboratory supplied sampling containers, specific to the type of analyses required.

All sample containers were sealed and labelled with a unique location identity, depth and date of sampling.

10.2.5 Monitoring Well Installation

11 No. monitoring wells were installed during this investigation within the windowless sample boreholes. The monitoring wells were constructed of 50mm diameter HDPE pipe. The response zone was typically targeted to intercept the groundwater surface and was surrounded by washed filter gravel. The plain zone was surrounded with bentonite to provide a seal. The monitoring wells were finished with bungs with gas taps and raised steel covers. Monitoring well installations are shown on the borehole logs and summarised in the following table.

Table 3: Borehole installation details

Borehole	Type G-gas W-water V-vapour	Plain Well Screen (mbgl) and ID (mm)	Slotted Well Screen (mbgl)	Bentonite Seal (mbgl)	Comments
WS1	W	GL - 1	1 – 4	GL - 1	-
WS2	W	GL – 1	1 – 4	GL – 1	-
WS3	W	GL - 1	1 – 4	GL - 1	-
WS4	W	GL - 1	1 – 4	GL - 1	-
WS5	W	GL – 1	1 – 2.6	GL – 1	Hole collapsed to 2.6m
WS6	W	GL - 1	1 – 4	GL - 1	-
WS7	W	GL - 1	1 – 4	GL - 1	-

[6] BS5930:2015+A1:2020 Code of Practice for Ground Investigation

[7] BS EN ISO 14688 Parts 1-2 (2018) Geotechnical Investigation and Testing. Identification and classification of soil

WS8	W	GL – 1	1 – 4	GL – 1	-
WS9	W	GL - 1	1 - 3	GL - 1	Hole collapsed to 3m
WS10	W	GL – 1	1 – 3	GL – 1	Hole collapsed to 3m
WS11	W	GL - 1	1 4	GL - 1	-

10.3 Field Tests

10.3.1 Standard Penetration Tests

Standard penetration tests were undertaken in the boreholes at 1m centres. Uncorrected blow counts, 'N values', are recorded on the borehole logs in Appendix D.

10.3.2 Field Vane Test

In-situ field vane tests were undertaken in cohesive soils in the trial pits in accordance with BS EN ISO 22476-9 (Draft). The results are recorded on the trial pits logs in Appendix D.

10.3.3 Hand Penetrometer Test

Hand-held penetrometer tests were undertaken on cohesive soils in the arisings in accordance with BS EN ISO 22476-9 (Draft). The results are recorded in kPa on the trial pits logs in Appendix D.

10.3.4 BRE365 Soakage Tests

3No. soakage tests have been carried out in trial pits TP03, TP28, and TP49 in general accordance with BRE Digest 365[8]. However, given the time restrictions, it was only possible to fill and test each location twice.

10.4 Groundwater Monitoring

10.4.1 Groundwater monitoring

6No. groundwater monitoring visits have been completed, spanning the period from 30th October 2020 to 26th March 2021. Groundwater monitoring wells were inspected for the presence and depth of water using an electronic dip meter. Results are presented in Section 11.

[8] Building Research Establishment DG365 Digest Soakaway Design (2016)

10.5 Laboratory Analysis

10.5.1 Chemical Soil Analysis

Selected samples of soil have been subjected to laboratory testing. Sampling techniques and storage have been undertaken as per BS 10175:2011+A2:2017 Code of Practice for Investigation of Potentially Contaminated Sites. The laboratory testing has been carried out by The Environmental Laboratory Ltd at its laboratories in East Sussex. Where available, the tests procedures are UKAS and MCERTS accredited.

The following analyses were completed on selected samples:-

- LEAP standard Soil suite (metals, speciated PAHs, asbestos)
- Pesticide Tests (organochlorine, organophosphorus, and triazene compounds)
- Herbicide screens

The full laboratory test results are presented in Appendix F.

10.5.2 Geotechnical Laboratory Testing

Selected samples of the soils have been classified by laboratory analysis for geotechnical design purposes. The laboratory testing has been carried out by Geolabs Ltd at its laboratories in Watford, in accordance with BS1377[9] and BS EN ISO17892[10]. The sampling technique, type, storage and transport and the number of laboratory tests have been undertaken where possible in accordance with BS EN 1997-2:2007 and BS EN ISO 22475[11].

The following laboratory tests have been undertaken:-

Table 4 Geotechnical Laboratory Testing

Test	Number of tests	
	Superficial Deposits	London Clay
Moisture Content	12	8
Atterberg Limit Test	12	8
Particle Size Distribution Test	8	-
Sulphate Determination	3	7
pH	3	7

[9] BS1377 Parts 1-9:1990 Methods of test for Soils for Civil Engineering Purposes

[10] BS EN ISO 17892 Parts 1-12 Geotechnical Investigation and Testing. Laboratory testing of soil

[11] BS EN ISO 22475 Parts1-3 Geotechnical Investigation and Testing. Sampling methods and groundwater measurements

11 Ground Conditions

The ground conditions are described in detail in the logs attached in Appendix D. In summary the soil conditions were as follows:

Table 5: Summary of soils encountered

Depth From (m)	Depth To (m)	Soil Type	Description
GL	0.1 / 0.5	**TOPSOIL**	Brown to dark brown silty clayey occasionally sandy or gravelly TOPSOIL with abundant rootlets.
0.1/0.4	0.35 / 1	**MADE GROUND/REWORKED CLAY**	MADE/REWORKED GROUND composed of varying mixtures of clay, silt, sand and gravel. Gravel includes flint, brick, and occasional ceramic tile fragments. Made ground was found in TP12, TP19, TP33, TP34a, and TP50 and reworked clay was logged in WS3 only
GL/2.4	0.5 / 3.8	**SILTY/SANDY/GRAVELLY CLAY**	Firm to stiff brown to reddish brown clays with varying mixtures of silt, sand, and gravel. Gravel is fine to cobble-sized angular to rounded flint and occasional fine to cobble sized chalk.
0.5/1.1	0.8/2	**CHALK HEAD**	Off-white and orange silt/clay/gravel. The gravel is fine to medium sub-rounded to sub-angular chalk and fine to coarse sub-rounded to angular flint. Present in TP43, 44, 45, 47, and 47a only.
0.3/2	0.9/3.8	**GRAVELLY/SILTY SAND**	Loose to dense reddish brown fine to coarse occasionally gravelly occasionally slightly clayey SAND. Gravel is fine to medium rounded to angular flint. Present in the following trial holes: TP06, 08, 21, 23, 24, 25, 26, 27, 28, 29, 37, 38, 42, 43, 44, 47a, 48, 49, 50 WS01, 02, 05, 08, 09, 10, 11.
0.7/2.4	1.5/2.6	**CLAYEY/SILTY/SANDY GRAVELS**	Loose to dense gravel with varying amounts of clay, silt, and sand. Gravel is fine to cobble-sized rounded to angular flint. Present in the following trial holes: TP17, 31, 32, 39, 40, 50 WS4
0.25/3.8	4*	**SILTY/SANDY CLAY**	Firm to stiff occasionally silty and/or sandy reddish brown mottled blue grey CLAY (becoming blue-grey with depth) with occasional selenite crystals. Often fissured at depth. LONDON CLAY

*Full depth of investigation

Made ground was encountered beneath the topsoil in TP12, TP19, TP33, TP34a, and TP50. It is thought that the made ground is associated with either construction of nearby buildings, or localised excavations such as buried services. The made ground generally comprised varying mixtures of clay, silt, sand and gravel. The gravel included flint, brick, and occasional ceramic tile fragments. In most cases the made ground extended to a depth of around 0.4m, with the exception of TP34a in which it extended to 1mbgl. This may be due to the construction of the nearby sewer.

Reworked clay was logged in WS3 in the southeast of the site only. This was described as slightly silty reworked clay with frequent fine chalk gravel.

The superficial geology, namely River Terrace Deposits, Raised Marine and Raised Beach Deposits all exhibit similar physical characteristics, as such differentiation between each of these units has not been described in this report.

The site can be broadly divided into 3 areas based on differences in the ground conditions encountered:

- The northern, central and north west (and one small pocket towards the southern corner of the site). Trial holes in these areas encountered significant amounts of sands /gravelly sands with frequent water seepages. The gravelly sands in most cases are beneath the silt/sandy/gravelly clays and directly overlie the London Clay.
- Parts of the eastern and north eastern boundary, along the stream. Areas of gravel were encountered in some trial holes that were close to the stream
- The remainder of the site (i.e. the majority of the southern, central southern, and eastern parts. The general sequence of soils in these areas consisted of topsoil over silt/sandy/gravelly clay over London Clay. In TP04, 10, 13, and WS3, no superficial deposits were recorded.

In Trial pits 43, 44, 45, 47, and 47a, chalk head was encountered in the form of varying mixtures of clay/silt/sand and gravel. The gravel consisted of chalk and flint. All trial pits in which this layer was found were located towards the northern end of the site.

Although most of the gravels were found very close to the eastern stream, gravel was also found towards the north east of the site in TP39, 40, and 50.

Loose sands were encountered in WS01 (from 1.2mbgl), WS05 (from 1.2mbgl), and WS08 (from 1mbgl). Loose gravel was encountered in WS04, located near the stream, from 0.8mbgl.

In many cases, where the sands/gravelly sands are present, they are slightly clayey or silty, or sometimes contain lenses of more clayey soil. This is typical of the River Terrace Deposits.

Obstructions were encountered in 2 of the pits. Cobble-sized blocks of chalk were encountered in TP34 at 0.4m, indicating a possible service. A replacement pit, TP34a, was therefore excavated roughly 2m south of the original pit. Similarly, TP47a was excavated 2m north of TP47 due to the presence of a clay land drain encountered at 0.8mbgl in the latter pit.

Two potential sub-horizontal shear surfaces were noted; one in TP06 at 2.9mbgl, and one in TP41 at 2.3m. Both of these were located towards the western side of the site, on the steeper slope.

Stiff friable clays, possibly indicative of desiccation, were encountered in TP10, 43, and 50 from 0.25m, 0.3m, and 1mbgl, respectively.

11.1.1 Groundwater

Groundwater strikes were recorded in the following trial holes:-

Table 6: Groundwater Strikes and Collapses

Trial Hole	Date of water strike	Depth to Groundwater strike (mbGL)	Comments	Collapse
WS04	22/10/20	0.8	Seepage at boundary between gravel and clay	Collapse in gravels
WS07	21/10/20	4	Slight seepage at base of borehole within clay	-
WS08	21/10/20	1	Seepage within sand	Collapse at 1m
WS09	21/10/20	2	Seepage within sand	Collapse within sand
WS10	22/10/20	1.5	Seepage within sand	Collapse to 3m
WS11	22/10/20	4	Seepage at base of pit within clay	-
TP03	21/10/20	-	-	Collapse within sand lens from 1.2m
TP07	23/10/20	-	-	Collapse within gravelly clay at 1.5m
TP09	19/10/20	2.3	Arisings within gravelly sandy clay layer were wet from 2.3m	-
TP17	22/10/20	1.1	Fast seepages within gravel	Collapse on all sides within gravel
TP25	19/10/20	1.9	Seepage on east side within clay	-
TP26	21/10/20	2.1	Seepages recorded within clay	Collapse within sand to 1.8m
TP30	23/10/20	3	Seepage at base of pit within clay	-

TP31	22/10/20	1	Fast seepage from all sides within gravel. Pit filled to 1.3m after 5 minutes	Collapse within gravel
TP32	20/10/20	1.5 - 2	Fast seepages near base of pit within gravel. Pit flooded to 1.85m after 10 minutes	Collapse within gravel near pit base
TP35	22/10/20	2.5	Seepage at base of pit within clay	Minor collapse at 2.5m within sandy clay
TP36	22/10/20	1.9	Clay arisings were slightly wet below 1.9m	-
TP38	20/10/20	1.4, 2.1	Multiple seepages at 1.4m within sand, fast seepage at 2.1m within clay	Collapse within sand to 1.8m
TP40	22/10/20	2.1	Slow seepage within gravel	Collapse within gravel to 3.2m
TP42	22/10/20	2.6	Fast seepage within gravelly sand	Collapse within gravelly sand to 2.7m
TP43	21/10/20	-	-	Collapse within sandy layers to 2.5m
TP44	20/10/20	-	-	Collapse within sand to 2.8m
TP46	20/10/20	1.3	Arisings were wet from 1.3m	-
TP47a	20/10/20	1.2, 1.9	Seepage at 1.2m and fast seepage at 1.9, both within gravelly sands.	Collapse within sand to 1.9m
TP48	20/10/20	1.6	Multiple seepages within sand	Collapse to 2m
TP49	21/10/20	-	-	Collapse within sand
TP50	21/10/20	2.1	Multiple seepages within sand	Collapse within sand from 1.8m

In total six groundwater monitoring rounds have been completed at monthly intervals from October 2020 to March 2021 the results presented in Appendix H and summarised as follows:-

Table 7: Groundwater Monitoring Results

Well location	Depth to groundwater (mbgl)					
	30/10/20	27/11/20	18/12/20	29/01/21	26/02/21	26/03/21
WS01	2.30	1.16	0.80	0.64	0.53	0.6
WS02	2.34	0.86	0.20	0.06	0.37	0.77

WS03	1.95	1.54	1.00	0.86	0.94	1.33
WS04	0.08	0.65	0.00	Field flooded – groundwater at surface	0.33	0.75
WS05	0.98	Cover could not be opened	1.50	0.52	1.20	0.75
WS06	0.96	1.36	0.90	0.90	0.99	1.20
WS07	1.76	1.00	0.60	0.28 – water rose to GL shortly after bung was removed	0.40	0.87
WS08	0.63	0.78	0.40	0.07	0.07	0.55
WS09	0.89	1.03	0.60	0.17	0.56	0.85
WS10	1.90	1.21	0.80	0.18	0.41	0.75
WS11	2.08	1.31	0.50	0.27	0.91	1.05

It should be noted that groundwater monitoring was undertaken during the winter and early spring and so it is likely that the groundwater levels recorded are close to or at their highest expected levels.

D GEOTECHNICAL INFORMATION

12 Strata Encountered

12.1 Topsoil

The vast majority of the site was covered in grass over brown clayey/silty/sandy/gravelly topsoil with abundant rootlets. This is with the exception of WS08, located amongst the barn buildings, which was not grass-topped.

12.2 Made Ground

Made ground was encountered in TP12, TP19, TP33, TP34a, TP50, and WS3 down to a maximum depth of 1m, though most often it extended to around 0.4mbgl. The made ground locations did not display an obvious pattern of occurrence and so it is thought that its presence is due to localised excavations such as buried services, except in areas where it was found near buildings; in these cases construction of the building is the most probably cause of the made ground. The made ground generally comprised brown silty sandy gravelly clays, with the gravel comprising of flint, brick, and occasional ceramic tile fragments. However the soil in WS3 between 0.3 and 1mbgl was logged as reworked clay with fine chalk gravel.

Made ground or fill is by nature highly variable in both composition and bearing capacity, and can be subject to large differential settlements when loaded. It is therefore generally unsuitable for use as a bearing stratum. In addition, made ground may contain contaminated and/or putrescible material. It can therefore be potential source of contamination and landfill gas[12].

No investigations have been carried out within the current building footprints and therefore areas of deep made ground cannot be ruled out.

12.3 Silty/Sandy/Gravelly Clays

The vast majority of the site is underlain by superficial deposits comprising silty/sandy/gravelly clays. The clays are firm to stiff brown to reddish brown and contain varying mixtures of silt, sand, and gravel. The gravel is generally fine to cobble-sized angular to rounded flint and occasional fine to cobble sized chalk. The results of the geotechnical testing are summarised in Table 9 below.

Table 8: Summary of Particle Size Distribution tests for silty/sandy/gravelly clays

Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Cobbles (%)

[12] Where deleterious or deeper (+1m) made ground is encountered

20.2	70	8.3	1.5	0

A single particle size distribution test was undertaken on a sample from TP50 at 1m. This was found to comprise a slightly gravelly slightly sandy clayey silt.

Table 9: Summary of Geotechnical Test Results for Silty/Sandy/Gravelly Clays

Test	Range
SPT 'N value'	6 - 27
Undrained Shear Strength (kPa) measured with shear vane	50 - 120
Unconfined Compressive Strength (kPa) measured with hand penetrometer	110 - 370
Moisture Content (%)	16.8 - 30.8
Liquid Limit (%)	32 - 73
Plastic Limit (%)	17 - 29
Plasticity Index (%)	15 - 44
Water-soluble Sulphates (g/l)	<0.01
Total Acid Soluble Sulphate as SO4 (%)	<0.01 – 0.023
Total Sulphur (%)	<0.01 – 0.015
pH	8.5 – 8.7

Stroud (1974)[13] found that a good correlation exists between the undrained shear strength of over-consolidated clays and their corresponding SPT blow count N value, where:

$$C_u = f_1 \times N$$

f_1= factor between 4-6 relating to the plasticity of the clay.

Using Stroud's factor f_1 = 4.5 for the soils encountered, the corresponding undrained shear strengths vary from 27 to 122 kPa, indicative of soft to stiff clays.

Hand-held shear vanes were undertaken in the shallow soils within the trial pits, where possible. Undrained shear strength results ranged from 50 to 120kPa, showing a reasonable correlation with results derived using a pocket penetrometer (55-185 kPa), which is indicative of firm to very stiff soils.

[13] Stroud M A "The Standard Penetration Test in Insensitive Clays and Soft Rocks" Proceedings of European Symposium on Penetration Testing, Stockholm 1974

The Atterberg Limit testing found that the weathered soils exhibit a range of plasticity, from low to very high. An A-line plot summarising the plasticity of the soils is attached in Appendix B.

12.4 Chalk Head

Chalk Head was encountered in Trial pits 43, 44, 45, 47, and 47a beneath the silty sandy gravelly clays to a maximum depth of 2mbgl. This comprised off-white and pale orange silt/clay/gravel. The gravel comprised fine to medium sub-rounded to sub-angular chalk and fine to coarse sub-rounded to angular flint. A perth penetrometer test within this layer in TP43 indicates the soil was loose.

No laboratory testing was undertaken on this stratum, due to its extremely limited lateral and vertical extent.

12.5 Gravelly/Silty Sands

Sands, which were occasionally gravelly and/or clayey were encountered across the majority of the central, northern, and western parts of the site to a maximum depth of 3.8m. In most cases these were found beneath the silty/sandy/gravelly clays, though on rare occasions were directly beneath the topsoil.

This soil comprised loose to dense reddish brown fine to coarse occasionally gravelly occasionally slightly clayey sand. The gravel comprised fine to medium rounded to angular flint.

The results of the geotechnical testing are summarised in the tables below.

Table 10: Summary of Particle Size Distribution tests for gravelly/silty sand

Silt and Clay (%)	Sand (%)	Gravel (%)	Cobbles (%)
6.7 - 62.1	22.4 – 75.2	13.2 – 42.3	0 – 4.9

7 No. particle size distribution tests were undertaken in the gravelly/silty sands. These comprised varying mixtures of clay, silt, sand, gravel, and occasional cobbles but in most cases consisted of gravelly silty slightly clayey sands.

Table 11: Summary of Geotechnical Test Results for gravelly/silty sand

Test	Range
SPT 'N value'	6 - 47

The SPT and perth penetrometer 'N values' that were recorded indicate that the sandy soils range in strength from loose to dense. However most results were in the range of approximately 10 – 19, indicating medium dense soils in most areas.

12.6 Clayey/Silty/Sandy Gravel

Gravel was encountered in TP17, 31, 32, 39, 40, 50, and WS4. Most of these were located near the eastern stream, and the gravel layer in them ranged from depths between 0.7 – 2mbgl. TP39, 40, and 50 are located towards the north west of the site, and the gravel was generally deeper, ranging between depths of 1.7 and 2.6mbgl.

The gravel was loose to very dense (N=7 - 58) and contained varying amounts of clay, silt, and sand. The gravel was fine to cobble-sized rounded to angular flint. The loose gravel was found in WS04, which is located close to the stream on the eastern side of the site.

No lab testing was undertaken on this layer due to its limited extent under the footprint of the proposed buildings.

12.7 Clay (London Clay)

The London Clay was encountered beneath the majority of the site, in most cases underlying superficial deposits. Trial holes where the London Clay was encountered without superficial deposits include TP04, 10, 13, and WS3.

The clay was firm to stiff, reddish brown mottled blue grey and occasionally silty and/or sandy. The clay generally became dark blueish grey with depth and was often fissured. Occasional selenite crystals were noted.

Table 12: Summary of Geotechnical Test Results for London Clay

Test	Range
SPT 'N value'	5 - 27
Undrained Shear Strength (kPa) measured with shear vane	60 - 120
Uniaxial Compressive Strength (kPa) measured with hand penetrometer	110 – 400+
Moisture Content (%)	13.9 - 34.6
Liquid Limit (%)	42 - 78
Plastic Limit (%)	19 - 28
Plasticity Index (%)	22 - 50
Total Acid Soluble Sulphate as SO4 (%)	<0.01 – 0.14
Water-soluble Sulphates (g/l)	<0.01 – 0.58
Total Sulphur (%)	<0.01 – 0.48
pH	8 – 8.7

The SPT 'N values' recorded ranged from 5 to 27.

Using Stroud's factor f_1 = 4.5 for the soils encountered, the corresponding undrained shear strengths vary from 23 to 122 kPa, indicative of soft to stiff clays. This is generally similar with the undrained shear strengths derived from the hand penetrometer results (~55 – 200+kPa) which indicate firm to very stiff soils.

The Atterberg Limit testing found that the soils exhibit a range of plasticity, from moderate to very high. An A-line plot summarising the plasticity of the soils is attached in Appendix B.

E GEOTECHNICAL APPRAISAL

The foregoing geotechnical appraisal does not constitute a Geotechnical Design Report in accordance with BSEN1997. The following recommendations are for preliminary design purposes only.

For the detailed design, the short-term and long-term design situations must be considered. Where relevant, the following limit states should be considered:-

- Loss of equilibrium of the structure or the ground, considered as a rigid body, in which the strengths of structural material and the ground are significant in providing resistance (EQU)
- Internal failure or excessive deformation of the structure or structural elements in which the strength of structural materials is significant in providing resistance (STR)
- Failure or excessive deformation of the ground, in which the strength of soil or rock is significant in providing resistance (GEO)
- Loss of equilibrium of the structure or the ground due to uplift by water pressure or other vertical actions (UPL)
- Hydraulic heave, internal erosion and piping in the ground caused by hydraulic gradients (HYD)

The following factors should also be considered.

- Overall stability and ground movements
- Nature and size of the proposed construction including the design life
- Conditions with regards to the surroundings (e.g. neighbouring structures, traffic, utilities, vegetation, contamination etc.)
- Ground and groundwater conditions
- Influence of the environment.

13 Swelling and Shrinkage

Based on the laboratory test results in Section D, both the superficial clay soils and the London Clay at depth had an overall classification of NHBC **HIGH** Volume Change Potential (VCP), whilst the superficial sands and gravels may be classified as non-shrinkable.

Foundations will therefore require deepening in accordance with NHBC Chapter 4.2 where clay soils are encountered near trees. Foundation depths should be calculated based on the mature height of the tree, however, the existing height is relevant for trees which are to be removed. Deepening may be terminated where granular soils are encountered at depth, subject to the depth of any underlying clays with reference to the NHBC Standard 4.2.9.

14 Sulphates

The potential for high levels of sulphates within the natural soils on site has been identified due to the underlying London Clay. In particular, construction activities that may substantially disturb previously unweathered strata and expose sulfur minerals such as pyrite to air, water and bacteria can result in the relatively rapid oxidation of such minerals producing high levels of sulphates. In accordance with the BRE[14] methodology, 3 No. samples of the superficial deposits and 5 No. of the London Clay were therefore tested for water and acid soluble sulphate, total potential sulphate (TPS) and pH. The results of the superficial soils were analysed separately to those of the London Clay.

Based on the results of the testing, oxidisable sulphides (OS) in the superficial deposits are generally <0.3%, indicating significant volumes of pyrite are not present. These soils are therefore classified as Design Sulphate Class DS-1 and assuming mobile groundwater, the ACEC class is AC-1.

Based on the results of the testing within London Clay soils, oxidisable sulphides (OS) are >0.3%, for 2 of the 5 samples tested indicating pyrite is present. Using highest sulphate class calculated from both the water soluble sulphate, and TPS, the soils are classified as Design Sulphate Class DS-4 and assuming mobile groundwater, the ACEC class is AC-4.

Based on the above results, concrete footings that are located completely within the superficial soils may be subject to DS-1, ACEC AC-1 conditions. For footings which extend into the London Clay, at this stage DS-4 class should be assumed, however it is possible that the classification may be decreased to a lower Design Sulfate Class with further testing.

15 Groundwater

The groundwater monitoring results/observations are given in Section C.

On the basis of these results, shallow perched groundwater should be anticipated within the sandy deposits from around 4mBGL up to ground level, particularly on the parts of the site with lower elevations.

Excavations below the water table in the granular soils located in the northern and central site areas would be unstable and running sands should be anticipated. Excavations in the southern area of the site in the clay soils may be stable in the short term.

[14] Building Research Establishment Special Digest 1: 2005. Concrete in aggressive ground. Part 1: Assessing the aggressive chemical environment.

As a minimum allowance should be made for pumping of excavations in the southern site area, where clay soils predominate, and a contingency plan should be in place for locations where excavation sides become unstable due to groundwater ingress. Foundation trenches should not be left open and poured as soon as possible after excavation to avoid collapse. In the central and northern site areas, excavations below the water table will require dewatering. Where foundations are programmed to be pulled during the wet winter months, or after bouts of prolonged wet weather, it may be prudent to consider piled foundations, particularly if deep made ground is encountered beneath the current buildings or if deepening near trees is required.

16 Soakage Potential

16.1 Test Results

3 No. soakage tests were undertaken in trial pits TP03, TP28, and TP49 in accordance with BRE365[15]. Given the time restrictions, it was only possible to fill and test each pit twice. The results are attached in Appendix G and are summarised below:

Table 13: Summary of soakage tests

Test Location	Base depth (m)	Minimum soakage rate recorded		Comments
		m/s	Litre/m2/min	
TP03	2.5	3.31×10^{-7}	0.019871	Water level fell to 75% - 50% max water depth. Result not compliant with BRE365 requirement
TP28	2.5	5.85×10^{-7}	0.03508	Water level fell to 75% - 50% max water depth. Result not compliant with BRE365 requirement
TP49	2.1	8.18×10^{-7}	0.049109	Water level fell to 50% - 25% max water depth. Result not compliant with BRE365 requirement

16.2 Recommendations

Based on the above results, the soils encountered are of very low permeability. In addition, high groundwater levels encountered within the granular soils would restrict storage capacity. On that basis the site is unlikely to be suitable for conventional soakaways, and allowance should be made for surface water to be piped off site at this stage.

[15] Building Research Establishment DG365: 2016. Digest Soakaway Design

17 Bearing Capacity and Foundations

17.1 Shallow Foundations

All loads should be transferred beneath any topsoil, made ground, loose, soft, low strength, desiccated or disturbed soils and transferred onto the firm clays / medium dense sandy soils at depth. For low rise housing, based on local experience and BS8103[16] Table 8, an allowable bearing capacity of 100kPa is recommended for shallow foundations, minimum width 600mm, on the firm clays and medium dense gravelly sands below about 1m. However, foundations will require deepening in the clay soils near trees to NHBC HIGH VCP precautions.

Where foundations are stepped or span different soil types, allowance should be made for nominal reinforcement.

Piled foundations may be the preferred option where foundations are deepened near trees, or where excavations in granular soils are required below the water table.

17.1.1 Construction Supervision

Foundation excavations should be inspected by a suitably qualified engineer prior to pouring concrete to ensure competent soils, in this case the firm clays and/or medium dense sands are encountered at formation level.

18 Floor Slabs

With reference to NHBC Standard 5.2, suspended floor slabs are recommended:-

- Where the depth of fill exceeds 600mm
- Where foundations are deepened below 1.5m in accordance with NHBC Standards Chapter 4.2
- Where soil may be subject to swelling
- Where desiccated soils are encountered
- Where vibratory ground improvement techniques have been used
- Where foundations have been piled.

Suspended floor slabs are therefore recommended on site.

BS8103-1:2011 Structural design of low-rise buildings. Code of practice for stability, site investigations, foundations, precast concrete floors and ground floor slabs for housing

19 Roads

CBR testing was beyond the scope of works. However, as a preliminary guide, IAN 73 06[17] and LR1132[18] indicate an estimated CBR value for the plastic clays of 2-3% assuming a high groundwater table, and for the chalky head and silts a CBR of 1%. It should be noted that only one shallow sample (<1m) was tested for its particle size distribution; the combined silt and clay content of this was relatively low (8.1%). However the deeper samples that were tested generally returned higher silt contents in the range of 12.2 – 70%. In the absence of shallow geotechnical tests across the site, allowance should also be made for a frost susceptible subgrade, particularly in the areas where chalk head was encountered (i.e. in the northern portion of the site).

Further confirmatory testing may be required if the proposed roads are to be adopted.

Made ground was encountered in localised areas around the site. Made ground soils can be highly variable. Where such soils are encountered at formation level, over excavation to, say 1m below ground level, proof rolling and then controlled back filling to formation level with a suitable granular fill is recommended.

20 Excavations

Excavations in made ground and loose superficial soils are likely to be unstable and subject to collapse. Close lateral support will be required in all excavations where man entry is required.

Excavations in the silty clays should be stable in the short term. However, excavations below the water table at about 1m below ground level, will be unstable in the made ground and the granular soils. Running sands and piping in excavation bases should also be anticipated. Excavations extending below the water table will require dewatering.

Appropriate Health and Safety precautions must be adhered to where man entry into excavations is required. Even stiff clay soils at shallow depth can collapse, particularly following wet weather. Alternative foundation methods may need to be adopted where trench footings cannot be safely or satisfactorily constructed.

[17] Interim Advice Note 73/06 Rev 1 Design guidance for road pavement foundations (Draft HD25) (2009)

[18] TRRL Laboratory Report 1132 The structural design of bitumous roads. Powell, Potter Mayhew and Nunn (1984)

21 Filling

The preliminary recommendations contained within this report assume that ground levels are to remain at a similar level across the site for the proposed development, and that no significant changes in level are proposed. In the event that ground levels are to be raised, this may induce significant settlement, particularly across the areas of loose sands and soft clays, which could adversely affect foundation design, drainage etc. Where significant changes in ground levels are proposed then further investigation will be required to assess the impact of such earthworks on the above recommendations.

22 Slope Stability

Naturally occurring slopes form through geological and erosional processes and as such often exist in a state of stability, but near failure. That is to say that most slopes exhibit a Factor of Safety (FoS) near, or slightly greater than 1. Slopes on stiff overconsolidated clays such as the London Clay can be close to a factor of safety of 1 at 5-7°, and shallower if pre-existing shear surfaces are present. Shear surfaces were encountered in trial pits TP06 at 2.9mbgl, and TP41 at 2.3m.

At this stage, it is assumed that no significant level changes are proposed. However, it is noted that to date the topographic survey has not been made available for the site. Shear surfaces have been identified in two trial pits, and the stream along the south eastern boundary forms a 2-3m cut at the toe of the slope. As a minimum it is recommended that the potential for slope instability is reviewed once the topographic survey is available.

General recommendations for developing on slopes include the following:

- Care must be taken to ensure that any cut and fill operations do not destabilise the slope. As a general principal, loading at the crest and cutting at the toe would have such an effect.
- Retaining walls should be avoided if possible, kept to a maximum height of 900mm where necessary, and include adequate drainage. Retaining structures over 900mm in height will require global stability checks and detailed design.
- Filling of subfloor voids should be avoided
- Drainage of the site will be crucial.
- All drains should be laid at twice the normal fall to accommodate any local ground movement.
- Where houses include partial basements, allowance should be made for the design of the walls as retaining structures.

- Vegetation will have stabilising effect and should be maintained for as long as possible.
- Introduction of water into the slope must be avoided. Soakaways should be kept remote from slopes and services at the slope crest should be designed accordingly, with, for example, clay breaks in the surround.
- Excavations across the slope should be avoided if possible. Where necessary, they should be kept to short lengths, say 5m, and backfilled immediately.

23 Settlement

Based on the allowable bearing capacity given in Section 17, settlements should be within typical tolerable limits for the low rise development proposed.

If soft clays are encountered at formation level or below, significant settlement should be anticipated and serviceable limit state analyses will be required. For Geotechnical Category 2 and 3 structures, detailed settlement analyses are usually required.

At this stage it is assumed that ground levels will remain at the current level for the proposed development. If significant level raises are proposed, this may induce significant settlement in the natural soils and detailed settlement analyses will be required.

Where foundations are stepped or span different soil types, differential settlement should be anticipated and allowance should be made for nominal reinforcement.

24 Heave and Uplift

In accordance with NHBC Standards Chapter 4.2, precautions against heave should be used where foundations are within the influence of trees and the resulting foundation depth is greater than 1.5m. Compressible material must be provided against the inside faces of all external wall foundations greater than 1.5m in depth. For pier and beam foundations, additional voids are required below ring beams.

Heave may also occur where shrinkable soils are unloaded, in say, basement excavations. To avoid uplift pressures, voids or buffer zones should be left beneath floor slabs. As a preliminary guide, allowance should be made for a 300mm void for highly shrinkable clays, reducing for lower plasticity soils. This should be confirmed at the detailed design stage.

For piled foundations, the effect of uplift induced by heave must be included in the pile design. Piles should be reinforced for the length of pile governed by the heave design, and allowance should be made for the inclusion of void former or similar on the underside of ground beams.

F GEO-ENVIRONMENTAL APPRAISAL

25 Conceptual Site Model

The preliminary conceptual site model has identified a number of potential contaminant linkages.

On-site sources of contamination likely to impact the site include herbicides/pesticides/heavy metals from previous farming activities, asbestos from demolished buildings constructed pre-2000, and PAHs, heavy metals, and asbestos from made ground around the buildings on site.

The onsite sources are considered to pose a low risk to human receptors, with the exception of asbestos which poses a moderate risk. All sources are considered to pose a low risk to controlled waters.

The risk to all receptors from the offsite sources (i.e. made ground from the railway line) is considered to be low.

The risk to a future development from land gases is considered to be low, due to thin made ground encountered (no greater than 1.0 m) and lack of deleterious material where made ground was present.

26 Testing Strategy

26.1 Soil Sampling

Trial hole locations were non-targeted to provide even coverage. The trial hole spacing was consistent with the recommended density of 25 to 50m for an exploratory investigation after BS10175 Section 7.7.

Samples have been tested for the presence of the identified contaminants of concern (heavy metals, PAH compounds, asbestos, pesticides/herbicides).

27 Assessment Criteria

27.1 Human Health Assessment Criteria

The generic quantitative risk assessment (GQRA) for human health compares the analytical results from the current investigation to Generic Assessment Criteria (GAC). These were selected using the following rationale and assumptions.

Defra and the EA have published a limited number of Soil Guideline Values (SGVs)[19] that represent minimal chronic risk to human health. CL:AIRE has published a limited number of Category Four Screening Levels (C4SLs)[20] which represent a low but still strongly precautionary level of chronic risk to human health. Both the SGVs and C4SLs have both been derived for a Soil Organic Matter (SOM) content of 6%, which is not always representative of the low SOM that are encountered within Made Ground on brownfield sites.

LQM responded to the demand for a more comprehensive set of screening values for a wider range of SOM and produced Suitable for Use Levels (S4ULs)[21] which are a hybrid of SGVs and C4SLs. The S4ULs have been endorsed by the Chartered Institute of Environmental Health (CIEH).

LEAP uses C4SLs where they are available as generic assessment criteria to quantitatively assess the potential chronic risks to human health. Where C4SLs are not available, the S4ULs are used. It is noted that S4ULs are not equivalent to C4SLs in all their exposure assumptions but are generally more conservative in their assumptions. For benzene and benzo(a)pyrene), LEAP has calculated equivalent C4SLs for 1% and 2.5% SOM. This does not affect the inorganic contaminants.

In accordance with current Public Health England (PHE) guidance[22], the assessment of PAHs has been carried out using a surrogate marker approach, whereby the assessment of risk from benzo(a)pyrene also captures potential risks from other carcinogenic PAHs that may be present. The alternative S4ULs for PAHs using the Toxic Equivalent Factor (TEF) approach have not been used because this approach is likely to under predict the true carcinogenicity of PAHs and is not advocated by PHE. The threshold PAHs have been assessed similarly, by using naphthalene as a marker compound due to its high volatility relative to other PAHs.

Total chromium has been assessed against the S4UL for trivalent chromium.

Theoretical soil saturations have not been considered in the evaluation of organic compounds and as such, some of the S4ULs for the less sensitive exposure scenarios are lower than their more sensitive equivalents.

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[19] Environment Agency Science Report SC050021 series.

[20] CL:AIRE Final Project Report. SP1010 – Development of Category 4 Screening Levels for assessment of land affected by contamination. CL:AIRE, December 2013

[21] The LQM/CIEH S4ULs for Human Health Risk Assessment, Nathaniel P et al, 2015. Copyright Land Quality Management Ltd, reproduced with permission: Publication Number S4UL3509

[22] HPA Contaminated Land Information Sheet. Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs). Public Health England, 2017.

Sets of GACs have been generated for SOMs of 1%, 2.5% and 6%. In this case, TOC in the shallow soil samples that were analysed ranged from 0.2 to 5.8%. Using the conversion of SOM = TOC x 1.72, this equates to a SOM range of 0.3 to 10%. Due to the large range of SOM values, it is deemed appropriate to analyse the TOC of topsoil and subsoil separately; the average derived SOM value in the subsoil is 2.01% whereas that of the topsoil is 4.3%. Therefore 2.5% SOM was considered to be appropriate for both topsoil and subsoil to maintain conservatism.

For some contaminants of concern, direct contact will be the dominant pathway for exposure. In order to support with development options, human exposure to all unsaturated soils, irrespective of depth, was assumed possible for the purpose of this assessment. This will maximise the information available to the design team on the suitability of all unsaturated material and can support with their materials management options.

28 Analytical Test Results – Soils

The indicative masterplan layout includes residential dwellings with private gardens and areas of public open space including swales, attenuation ponds and landscaped areas. Based on the current master plan the site has been zoned into two distinct land uses namely residential with private gardens and public open space near residential land. The zonation is shown in Figure 2 Appendix B. The soil analytical results have then been screened against appropriate generic assessment criteria, dependent on which zone they fall within. Should the masterplan layout change then the below assessment will require updating.

28.1 Metals and Non Metals

28.1.1 Residential Zone

No metal or non-metal concentrations were recorded above generic assessment criteria (where published) for the samples tested within the residential zone.

28.1.2 Public Open Space (POS) Zone

When screened against the C4SLs or S4Uls for POS Residential, no metal or non-metal exceedances were recorded in the samples tested within the public open space zone.

28.2 Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs are widespread within made ground and the urban environment generally. They are one of the most common contaminants in made ground and the one that most commonly drives remediation. Benzo(a)Pyrene is a particular problem, being very commonly found in association with tarmac, clinker and any burnt products and also being highly toxic to human health. The assessment criterion for BaP is close to levels that are found naturally in many

topsoils and this makes it very difficult for any population of soils to pass the CIEH statistics with a 100% evidence level.

28.2.1 Residential Zone

No PAH exceedances were recorded in the samples tested within the residential zone.

28.2.2 Public Open Space Zone

The mean Soil Organic Matter of the population has been used to determine an appropriate Tier 1 GAC for each population. When screened against the C4SLs or S4UIs for POS Residential, no PAH exceedances were recorded in the samples tested within the public open space zone.

28.3 Pesticides

6No. samples were screened for Organophosphorus and Organochlorine pesticides.

6No. samples were screened for herbicides.

The results of the pesticide and herbicide screens were all below the analytical limits of detection.

28.4 Asbestos

55No asbestos identification tests were undertaken across the site. No asbestos was detected in any of the tested samples.

29 Risk Assessment

29.1 Human Health

The works carried out to date have indicated that there are no contaminant exceedances of the GAC for either of the two zones (residential and POS). However it should be emphasized that if the proposed layout changes, new analyses will be required based on the new zonation of the site.

Whilst the assessment has not found any significant contamination, access into some areas, including those that may be impacted by on site sources, has not been possible and there remains the possibility that as yet unidentified contamination may be present, particularly beneath currently existing structures such as the barns in the central northern portion of the site.

29.2 Controlled Waters

29.2.1 Groundwater

The site is located above a secondary A aquifer, the River Terrace, Raised Beach, and Raised Marine superficial deposits.

Specific laboratory testing has not been carried out as part of this investigation to enable a detailed quantitative risk assessment in respect of groundwater. The measured levels of potential contaminants within the made ground soils are generally low.

Concentrations of potential contaminants of concern recorded in on site soils are generally low and mean average concentrations in soil samples tested by Leap are analogous to normal background concentrations in the UK i.e. in general site soils do not appear to pose an additional burden to controlled waters receptors than that which may be expected from normal UK soils.

Table 14: Normal background concentrations vs mean average concentrations

PCoC	Normal background concentrations (mg/kg)	Mean average concentration (mg/kg)
Arsenic	**32**	10.8
Cadmium	**1**	0.5
Copper	**62**	21.8
Mercury	**0.5**	0.5
Nickel	**42**	19.2
Lead	**180**	37.4
Benzo(a)pyrene	**0.5**	0.6^

^ eight soil samples recorded benzo(a)pyrene above NBC.

29.2.2 Surface Water

There is a stream running alongside site's eastern boundary. Based on the recorded concentrations of contaminants the site is not considered to pose a risk to surface water receptors.

30 Waste Disposal

It is anticipated that the proposed development will generate waste soils and materials will need to be removed from site as part of the construction process.

Where soils are to be disposed off-site, it is the duty of the waste producer, to ensure that all waste is disposed of appropriately and that any that is sent to landfill is sent to an appropriately

licensed one. All waste sent to landfill must be classified and must be pre-treated. There are various forms of pre-treatment that are acceptable. In this case it could include "reduction in volume", which could be achieved by segregating the Made Ground and re-using part of it on site.

Where made ground soil is to be re-used on site then it is recommended that this is carried out under the CL:AIRE Definition of Waste Industry Code of Practice (DoWCoP) for re-use of soils[23].

Waste Classification testing was beyond the scope of the works. However, based on the results of the investigations to date, the soils on site would be classified as non-hazardous, and may be classified as inert with additional testing, subject to the requirements of the receiving landfill.

Further testing and inspection of soils will be required to confirm waste classification of material leaving the site.

It is strongly advised that detailed discussions be held with remediation/groundworks contractors and that receiving landfill sites are identified in advance of commencing any waste removal.

31 Recommendations for Remediation

Based on the findings to date, remedial works within the current proposed residential areas are not indicated as necessary. However, access into some areas of the site was restricted due to buildings and services. It is recommended that once the structures have been demolished and hard standing removed, formation inspections and further intrusive investigations be undertaken. The central part of the site should be targeted, where barn and stable buildings are currently present.

Following the additional investigation a remediation strategy to mitigate risks to the proposed development from identified contamination should be prepared.

32 Validation of Remediation

A final remediation method statement will be required to be prepared once the final site designs are complete. This method statement should be submitted to the appropriate regulatory authorities. The local authority should be advised of the intended build programme in order that they can phase the sign off of planning conditions as required.

[23] The Definition of Waste: Development Industry Code of Practice. Version 2 2011. CL:AIRE

Provision should also be made for dealing with any localised hotspots of contamination which may come to light during construction. Any such soils should be inspected by the validation engineers and appropriate remedial action taken as necessary.

APPENDIX A – Limitations

Limitations

LIMITATIONS

This report is confidential to the Client, and Leap Environmental Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Leap Environmental Ltd beforehand. Any such party relies upon the report at their own risk. Unless explicitly agreed otherwise in writing, this report has been prepared under LEAP's standard terms and conditions, as included in the quotation for this works.

This report has been prepared by Leap Environmental Ltd on the basis of information received from a variety of sources which Leap Environmental Ltd believes to be accurate. Nevertheless, Leap Environmental Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

Leap Environmental Ltd has used all reasonable skill, care and diligence in the design and execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed. LEAP cannot be held responsible for any disclosures or changes in regulation that are provided post production of this report, and will not automatically update the report.

The conclusions reached in this report are necessarily restricted to those which can be determined from the information consulted, and may be subject to amendment in the light of additional information becoming available. These conclusions may not be appropriate for alternative schemes.

The extent of the exploratory holes, laboratory testing and monitoring undertaken may have been restricted due to a number of factors including accessibility, the presence of buried or overhead services, current development and site usage, timescales or clients specification. The exploratory holes only assess a small proportion of the site area with respect to the site as a whole, and as such may only provide an overall assessment of ground conditions on site. The presence of hotspots of undisclosed contamination or exceptional and unforeseen ground conditions cannot be discounted.

Eurocode 7 gives guidance on the type of sampling, sample quality, number and spacing of intrusive investigations, and number of laboratory tests required. It is intended that the Geotechnical Information section of this report will fulfil the general requirements of the Ground Investigation Report as set out in section 6 of Eurocode7[24], although this is subject to the restrictions imposed on the investigation as listed above. For geotechnical design, Eurocode 7 requires the Geotechnical Design Report to address both the geotechnical and

[24] BS EN 1997 Eurocode 7- Geotechnical Design - Part 1: General Rules (2004) and Part 2: Ground Investigation and Testing (2007)

structural aspects of the geotechnical design for both the limit and serviceability states. The Geotechnical Appraisal section of this report will not meet the requirements of a Geotechnical Design Report (GDR), and should therefore be used for preliminary guidance only.

The presence of asbestos may be noted during the site walkover survey, intrusive investigations and/or from the results of contamination testing. However, this report does not constitute an asbestos survey. On this basis, the presence of asbestos on site cannot be discounted and a full asbestos survey should be undertaken.

APPENDIX B – Figures

Figures

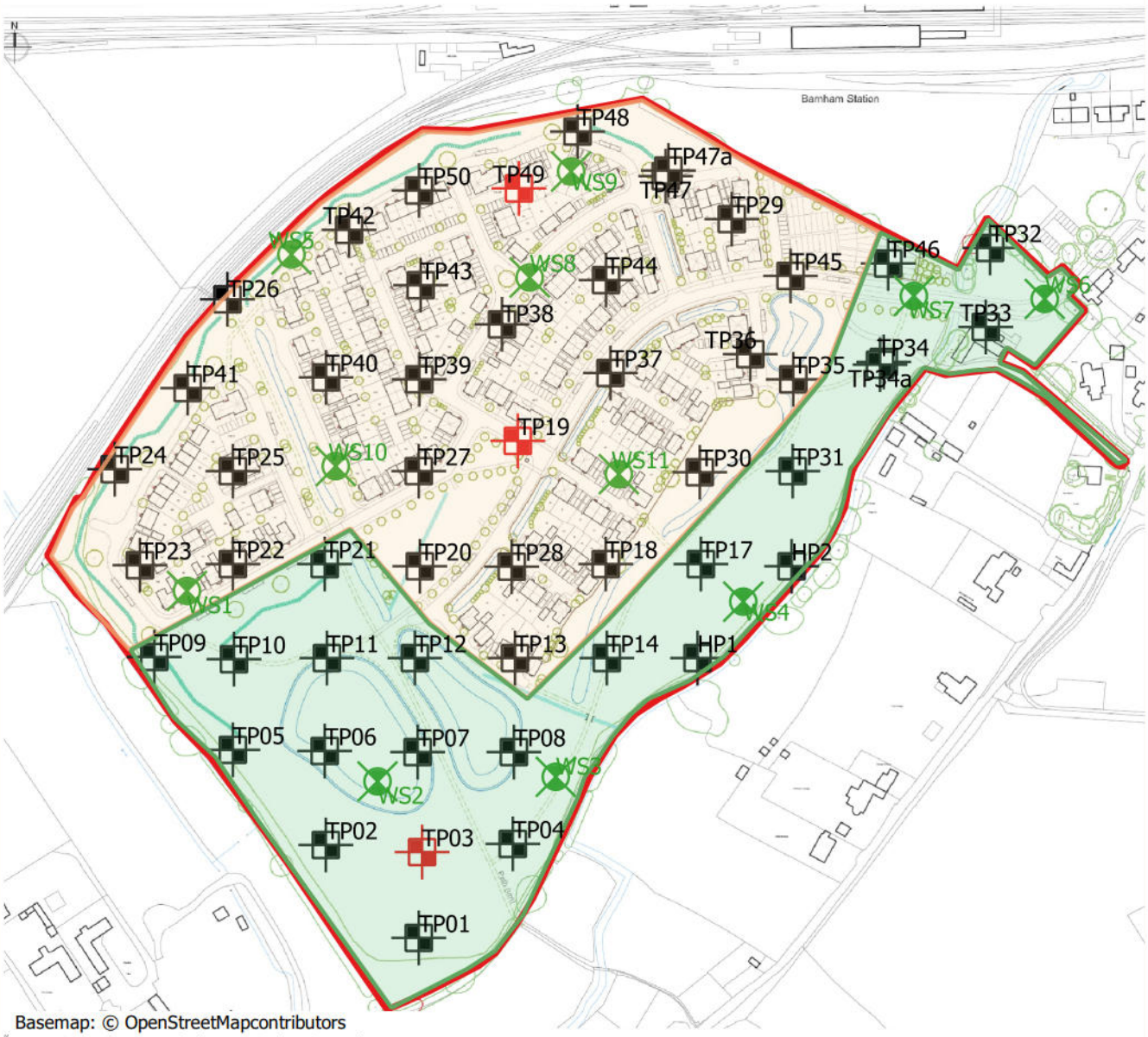


100 m
300 ft

Site Boundary

Basemap: © OpenStreetMap contributors

leap environmental	Client:	Gleeson Strategic Land	Date:	29th October 2020	Project ID:	LP2356
	Project:	Tars Farm, Barnham	Title:	Site Location Plan	Fig. No.	1

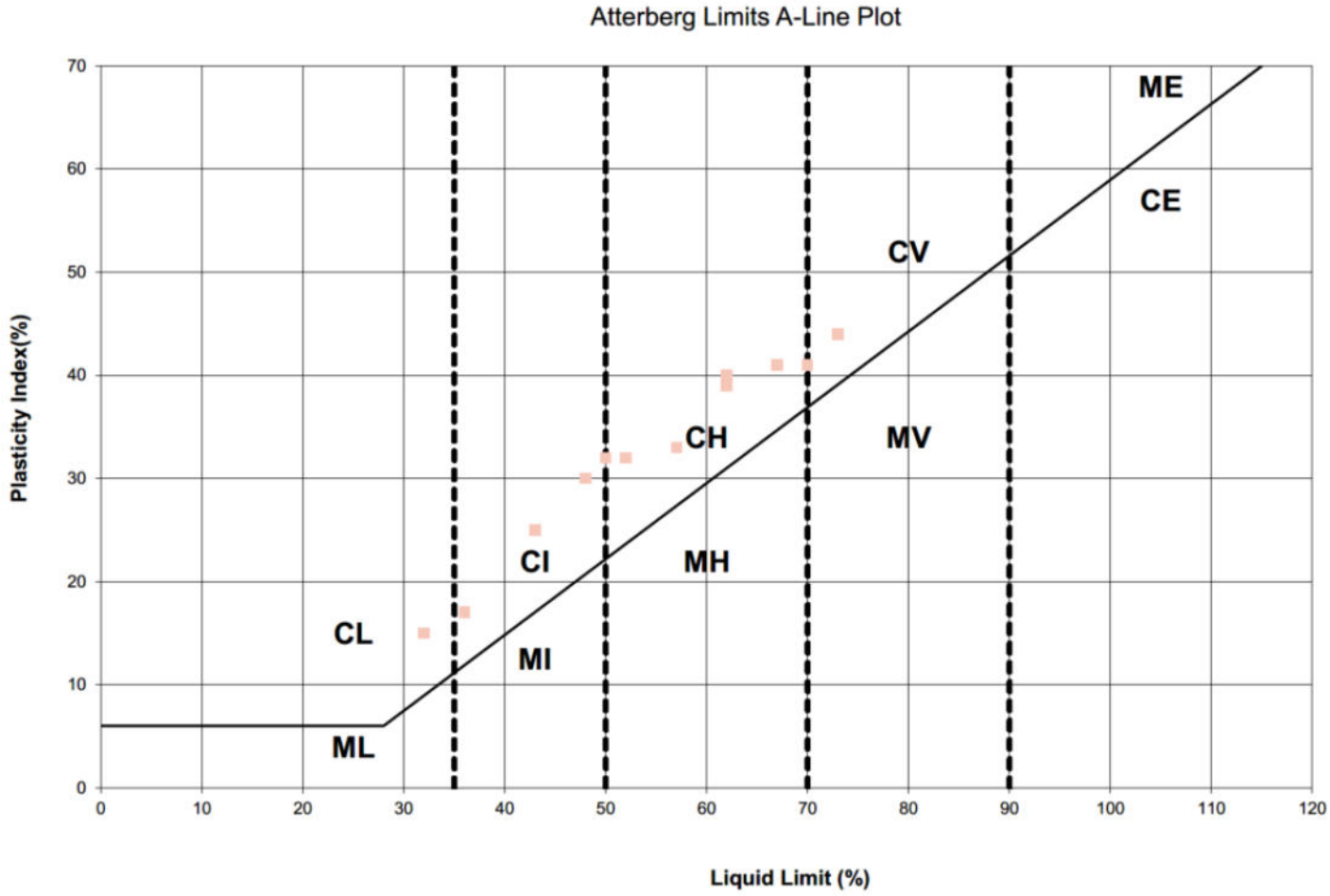


Basemap: © OpenStreetMapcontributors
Note 1: Exploratory holes are indicative only
Note 2: Exploratory holes shown are not to scale
Note 3: Elevations not shown

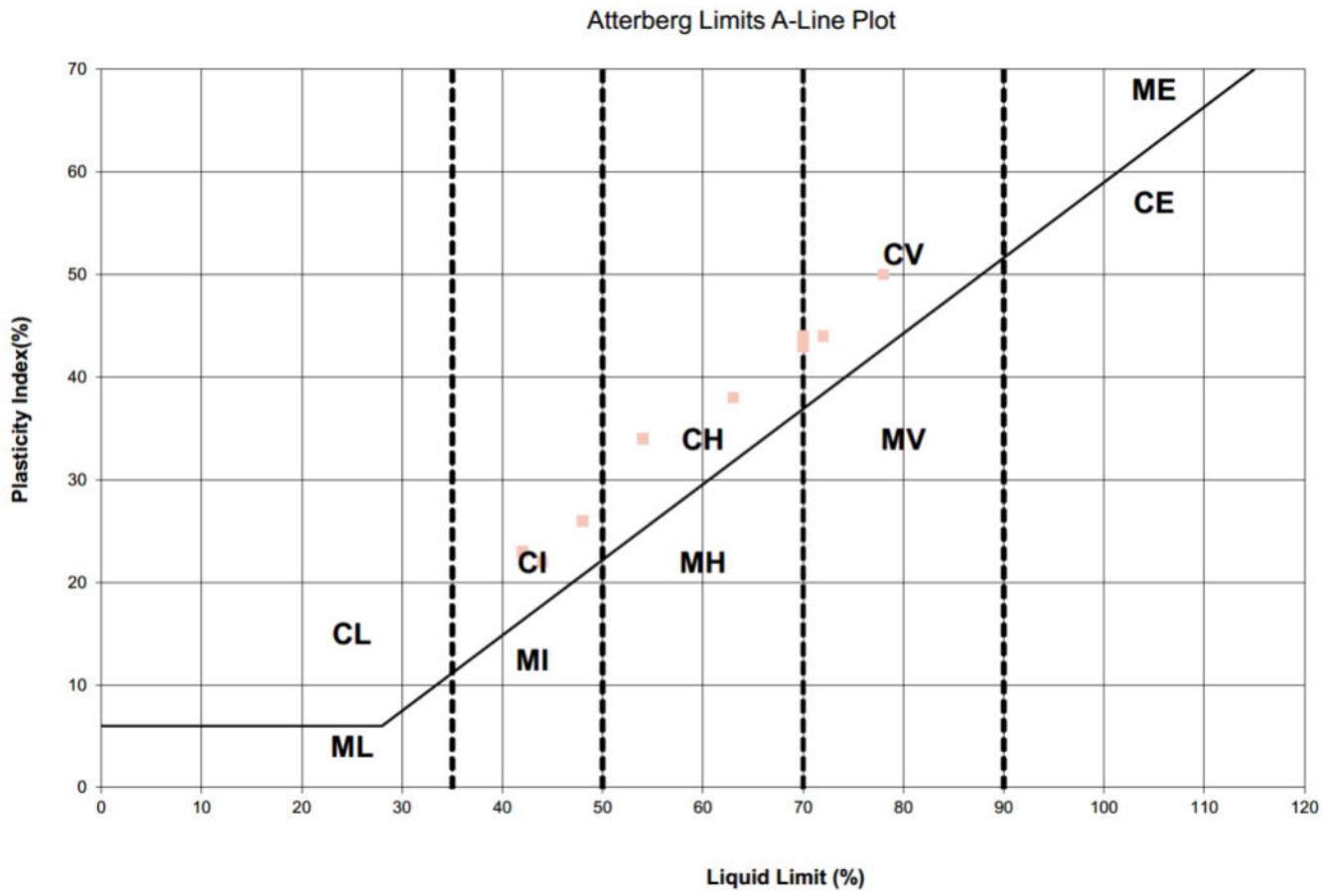
0 50 100 150 200 m

Window sampler locations
Infiltration test locations
Public Open Space Zone
Trial pit locations
Site boundary
Residential Zone

leap environmental	Client:	Gleeson Strategic Land	Title:	Proposed Exploratory Hole Locations	Project ID:	LP2356
	Project:	Tars Farm, Barnham	Date:	20/11/20	Figure No.	2



leap environmental	Client:	Gleeson Strategic Land	Date:	4th December 2020	Project ID:	LP2356
	Project:	Tars Farm, Barnham	Title:	A Line Plot (superficial deposits)	Fig. No.	3



leap environmental	Client:	Gleeson Strategic Land	Date:	4th December 2020	Project ID:	LP2356
	Project:	Tars Farm, Barnham	Title:	A Line Plot (London Clay)	Fig. No.	4

Site

LAND AT TARS FARM, BARNHAM

Drawing

Illustrative site layout plan **DRAFT**

Scale

1:2000@A3

Date

16.09.20

Drawing ref 1311.**03**

0 10 20 30 40 100m

1:2000@A3

KEY

Site boundary

Ordinance Survey (c) Crown Copyright 2020. All rights reserved. Licence number 100022432

This drawing is for planning purposes only

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richards
urban design

APPENDIX C – Site Photographs

Site Photographs



Plate 1: View of southwestern site boundary, facing south



Plate 2: View from horse paddocks, facing south west



Plate 3: View of barns and derelict buildings, facing north west



Plate 4: View from horse paddocks, facing east



Plate 5: TP09 arisings



Plate 6: TP23 arisings



Plate 7: TP47 (right) and TP47a (left) after backfill



Plate 8: TP47 land drain strike



Plate 9: Land drain repair



Plate 10: TP06 possible shear surface



Plate 11: TP01 arisings



Plate 12: TP01



Plate 13: TP04 arisings



Plate 14: TP26 arisings



Plate 15: TP50 collapse and seepages



Plate 16: TP49 soakage pit before gravel fill



Plate 17: TP33



Plate 18: TP33 arisings



Plate 19: TP44 collapse



Plate 20: TP47a collapse and seepage



Plate 21: WS3 arisings and installation

APPENDIX D – Trial Hole and Borehole Logs

Trial Hole and
Borehole Logs

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Trial Pit Log

Trialpit No
HP1
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495749 - 104014 Level: 2.08	Date 23/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 0.25		Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.20 0.25	1.88 1.83		Grass over brown silty slightly clayey slightly gravelly TOPSOIL. Gravel is fine subrounded flint and fine subrounded chalk. Frequent rootlets Greyish brown slightly silty slightly gravelly CLAY with occasional rootlets. Gravel is fine sub-rounded flint and fine sub-rounded chalk. End of pit at 0.25 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
HP2
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495799 - 104063 Level: 2.45
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 0.25	Date 23/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.24	2.20		Grass over brown silty gravelly slightly clayey TOPSOIL. Gravel is fine-medium subrounded-subangular flint. Abundant rootlets
				0.25	2.19		Brown slightly silty slightly gravelly CLAY. Occasional rootlets. Gravel is fine angular-subangular flint End of pit at 0.25 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP01
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495599 - 103863 Level: 4.31
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.10	Date 23/10/2020
Client:	Gleeson Strategic Land		Scale 1:25 Logged KT

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES		0.20	4.11		Grass over brown silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is fine-medium subrounded to angular flint
	0.30	ES					Firm brown red mottled brownish grey sandy slightly gravelly CLAY. Laminated. Gravel is rare fine-coarse subrounded-angular flint
				0.80	3.51		Firm reddish brown mottled grey sandy silty CLAY
	1.20	D	HVP=70				
	2.00	D					*Coarse ironstone fragments at 2m*
				2.10	2.21		*Hand Pen at 2.1m = 250kPa* End of pit at 2.10 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP02
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495550 - 103913 Level: 4.35	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 1.10	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over brown slightly silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is subrounded medium to coarse flint and fine angular-subangular chalk.
	0.30	ES		0.40	3.94		Stiff brown slightly silty slightly gravelly CLAY. Gravel is fine angular-subangular chalk.
							Gravel content reduces with depth
	1.00	D	HVP=90				*Hand Pen at 1m = 200kPa*
				1.10	3.24		End of pit at 1.10 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP03
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495601 - 103909 Level: 5.70
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.50	Date 21/10/2020 Scale 1:25 Logged HG
Client:	Gleeson Strategic Land		

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	5.50		Grass over dark brown silty sandy slightly gravelly TOPSOIL. Gravel is sub-angular to sub-rounded fine to medium flint with abundant rootlets
	0.30	ES					Firm brown orange slightly sandy gravelly CLAY. Gravel is angular-subangular fine-coarse flint with rare cobbles of fine chalk.
	1.10	D	HVP=80				*Sand lense causing pit collapse from 1.2m*
				1.40	4.30		Stiff brown-blue slightly sandy CLAY.
	2.10	D					*Hand Pen at 2m = 220kPa*
				2.50	3.20		End of pit at 2.50 m

1
2
3
4
5

Remarks: Trial pit remained dry. Walls collapsed in sand to 2.1m

Stability:

AGS

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Trial Pit Log

Trialpit No
TP04
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495650 - 103914 Level: 4.18	Date 23/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.80	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown silty sandy slightly gravelly TOPSOIL. Gravel is fine subangular chalk.
	0.30	ES		0.30	3.88		Firm becoming stiff blue grey mottled orange brown slightly silty slightly sandy CLAY. Rare fine subrounded chalk gravel.
	1.00	D	HVP=80				*Hand Pen at 1.5m = 230kPa*
							Fissured at 2m
							Abundant iron staining at 2.2m
	2.80	D		2.80	1.38		End of pit at 2.80 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP05
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495500 - 103964 Level: 3.94	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.40	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES		0.20	3.74		Grass over dark brown clayey slightly silty sandy slightly gravelly TOPSOIL. Gravel is subrounded-rounded fine-medium pebbles of flint with abundant rootlets.
	0.35	ES					Dark brown orange silty sandy slightly gravelly CLAY. Gravel is subangular-subrounded fine-coarse pebbles of flint and chalk. Occasional cobbles.
	1.10	D	HVP=100	1.00	2.94		Stiff blue-grey mottled orange fissured silty CLAY.
	2.40	D		2.40	1.54		End of pit at 2.40 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP06
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495549 - 103964 Level: 6.06	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over brown silty slightly gravelly slightly clayey TOPSOIL. Gravel is medium subrounded flint
	0.30	B		0.35	5.71		Stiff brown slightly silty slightly gravelly CLAY with occasional rootlets. Gravel is medium subrounded-subangular flints
	1.00	D					*Hand Pen at 1m = 370kPa*
				1.10	4.96		Medium dense reddish brown slightly clayey slightly gravelly SAND. Gravel is fine subrounded flint.
			N=13				
	1.70	D					
				1.80	4.26		Stiff purplish brown mottled grey slightly silty CLAY. Fissured
							Hand Pen at 2m = 220kPa
							Possible sub-horizontal shear surface at 2.9m
	3.00	D		3.00	3.06		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP07
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495599 - 103963 Level: 6.39	Date 23/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.90	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30	6.08		Grass over dark brown silty sandy slightly gravelly TOPSOIL. Gravel is fine-coarse subrounded flint and fine subangular chalk
	0.50	ES					Firm brown orange sandy gravelly CLAY. Gravel is fine-coarse subrounded-rounded flint and fine subangular chalk
	1.40	D	HVP=100	1.40	4.99		Stiff blue-grey mottled orange brown slightly silty slightly sandy slightly gravelly CLAY. Gravel is very fine-fine chalk and fine-coarse subrounded-subangular flint. Rare cobbles of flint.
							Pit collapse in gravelly clay
	2.00	D					*Iron staining and fissures at 2m*
	2.90	D		2.90	3.48		End of pit at 2.90 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP08
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495650 - 103963 Level: 5.26	Date 23/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.95	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	5.11		Grass over brown silty sandy slightly gravelly TOPSOIL with frequent rootlets. Gravel is fine-medium subrounded-angular flint
	0.40	ES					Firm reddish brown mottled brown slightly silty slightly gravelly CLAY. Gravel is fine-medium subrounded-angular flint
							Hand Pen at 0.5m = 150kPa
				0.90	4.36		Medium dense reddish brown gravelly medium-coarse SAND. Gravel is fine-medium subrounded-rounded chalk and fine cobble sized flint
	1.20	B	N=16				
				1.40	3.86		Stiff reddish brown mottled grey slightly silty slightly gravelly CLAY. Gravel is fine-medium subrounded-subangular flint.
	1.50	D					*Hand Pen at 1.5m = 210kPa*
							Gravel content reduces with depth
							Hand Pen at 2m = 220kPa
				2.80	2.46		Stiff blue grey mottled reddish brown silty CLAY
	2.95	D		2.95	2.31		*Hand Pen at 2.95m = 280kPa*
							End of pit at 2.95 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP09
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495458 - 104014 Level: 4.22	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.50	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown clayey slightly silty sandy slightly gravelly TOPSOIL. Gravel is subangular-subrounded fine to medium flint with abundant rootlets.
	0.25	ES		0.30	3.92		Firm dark brown orange slightly silty gravelly CLAY. Gravel is subangular-angular cobbles flint.
				0.75	3.47		Stiff brown orange slightly gravelly slightly sandy CLAY. Gravel is fine-coarse subangular-angular flint and rare cobbles.
	1.00	D	HVP=110				*Sand content reduces with depth*
				1.30	2.92		Stiff blue-grey mottled orange silty slightly gravelly slight sandy CLAY. Rare gravel of flint.
							Arisings were wet from 2.3m
	2.50	D		2.50	1.72		End of pit at 2.50 m

Remarks: Trial pit remained stable. Arisings were slightly wet from 2.3mbgl.

Stability: Stable

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Trial Pit Log

Trialpit No
TP10
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495500 - 104013 Level: 6.00	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 1.20		Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.25	5.75		Grass over brown silty sandy slightly clayey TOPSOIL with frequent rootlets
	0.30	ES					Stiff reddish brown mottled greyish brown slightly silty slightly sandy desiccated CLAY.
	1.10	ES	HVP=120	1.20	4.80		*Hand Pen at 1m exceeds 400kPa* End of pit at 1.20 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP11
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495550 - 104014 Level: 6.72	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.60	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.15	6.57		Grass over brown silty clayey TOPSOIL with abundant rootlets
	0.20	ES					Firm reddish brown mottled greyish brown silty gravelly CLAY. Gravel is fine-cobbles surrounded-subangular flint. Occasional pockets of reddish brown sands
	0.60	D		0.80	5.92		Stiff brown silty CLAY.
	1.00	D	HVP=60				
	2.00	D					*Occasional iron staining at 2m*
							Hand Pen at 2.5m = 230kPa
				2.60	4.12		End of pit at 2.60 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP12
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495597 - 104014 Level: 6.60
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.20	Date 23/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	6.40		Grass over brown silty slightly gravelly TOPSOIL with abundant rootlets. Gravel is fine subrounded flint
	0.30	ES		0.35	6.25		Silty gravelly clayey MADE GROUND. Gravel is fine-coarse angular-subrounded flint, rare medium subrounded chalk and rare medium brick.
							Stiff reddish brown sandy gravelly CLAY. Gravel is fine-coarse rounded-angular flint. Occasional pockets of reddish brown medium sand
							Gravel content reduces with depth
	1.10	D	HVP=90				
							Hand Pen at 1.5m = 300kPa
	2.00	D					
							Hand Pen at 2.5m = 250kPa
				3.10	3.50		
	3.20	D		3.20	3.40		Stiff dark grey fissured silty CLAY. Iron staining within fissures
							Hand Pen at 3.15m = 300kPa
							End of pit at 3.20 m

1 2 3 4 5

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP13
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495651 - 104014 Level: 6.02	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.30		Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES					Grass over dark brown silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is fine to coarse subrounded to rounded flint.
	0.40	ES					
				0.50	5.52		Firm brown orange slightly sandy slightly silty CLAY. Occasional Ironstone
				1.00	5.02		Stiff grey-blue mottled orange slightly sandy CLAY. Abundant ironstone. Rare pockets of sands. Fissured.
	1.20	D					*Hand Pen at 1.2m = 420kPa*
							Possible selenite crystals at 1.4m
	2.40	D					*Possible selenite crystals at 2.4m*
							Fissured at 2.5m
							Very fissured at 2.7m
				2.90	3.12		Very stiff grey-blue silty sandy CLAY. Iron staining in fissures
	3.00	D					
				3.30	2.72		End of pit at 3.30 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP14
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495700 - 104014 Level: 3.20
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.30	Date 22/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	3.00		Grass over brown silty sandy slightly gravelly TOPSOIL. Gravel is fine-coarse subrounded-angular flint
	0.40	ES					Firm becoming stiff brown silty slightly sandy gravelly CLAY. Gravel is fine-cobble sized subangular-rounded flint
	1.20	D	HVP=70				*Becomes less gravelly below 1.2m*
							Pockets of reddish brown medium sand at 1.5m
							Hand Pen at 2m = 200kPa
	2.30	D		2.30	0.90		*Hand Pen at 2.3m = 240kPa*
							End of pit at 2.30 m

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Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP17
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495751 - 104064 Level: 2.17	Date 22/10/2020
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 1.60		Scale 1:25
Client:	Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES					Grass over dark brown silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is medium-coarse subrounded flint with occasional fine chalk.
	0.30	ES		0.40	1.76		Firm dark brown mottled orange slightly gravelly sandy CLAY
	1.00	D	N=59	0.90	1.26		Stiff grey brown clayey slightly sandy GRAVEL. Gravel is fine-coarse subrounded-subangular pebbles
							Seepage at 1.1m
	1.60	D		1.50 1.60	0.66 0.56		Stiff blue-grey slightly silty slightly gravelly CLAY *Hand Pen at 1.5m = 260kPa* End of pit at 1.60 m

Remarks: Trial pit collapsing on all walls with seepages at around 1.1m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP18
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495700 - 104064 Level: 4.80	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.10	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES		0.20	4.60		Grass over brown silty sandy slightly gravelly TOPSOIL with abundant rootlets.
	0.50	ES		0.60	4.20		Firm brown silty sandy gravelly CLAY. Gravel is fine-coarse angular-rounded flint
	1.00	D	HVP=80				Firm becoming stiff reddish brown mottled greyish brown slightly sandy silty CLAY *Hand Pen at 1m = 130kPa*
	2.00	D					*Hand Pen at 1.7m = 210kPa*
	3.00	D					*Hand Pen at 2.5m = 270kPa* *Hand Pen at 3m = 300kPa*
				3.10	1.70		End of pit at 3.10 m

1 2 3 4 5

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP19
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495652 - 104062 Level: 6.52	Date 21/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05	ES		0.10	6.42		Grass over brown silty sandy slightly gravelly TOPSOIL. Gravel is fine-medium subrounded-subangular flint. Frequent rootlets
	0.30	ES		0.40	6.12		Firm brown silty sandy gravelly clayey MADE GROUND. Gravel is fine-coarse subrounded-angular flint and rare fragmented brick
	1.00	D	HVP=120				Stiff reddish brown mottled greyish brown slightly gravelly sandy silty CLAY. Occasional rootlets. Gravel is fine to cobble sized rounded-angular flint *Hand Pen at 1m = 280kPa*
	2.10	D		1.40	5.12		Firm becoming stiff reddish brown mottled brownish grey slightly silty slightly sandy CLAY *Iron staining at 2.1m*
	2.60	D					*Hand Pen at 2.6m = 280kPa* *Fissured below 2.7m*
				3.00	3.52		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP20
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495600 - 104063 Level: 6.93
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 1.30	Date 21/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	6.73		Grass over dark brown silty sandy TOPSOIL with abundant roots
	0.30	ES					Stiff brown orange sandy slightly gravelly CLAY. Gravel is fine-medium subrounded chalk occasional coarse flint and ironstone fragments
			HVP=70				*Hand Pen at 1m = 230kPa*
	1.30	D		1.30	5.63		End of pit at 1.30 m

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Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP21
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495549 - 104064 Level: 6.95	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown clayey sandy slightly gravelly TOPSOIL with abundant rootlets
	0.30	ES		0.30	6.65		Firm brown orange clayey gravelly SAND. Gravel is fine to medium flint and rare subrounded cobbles.
	0.80	B					
	1.00	D	HVP=60	1.00	5.95		Firm dark brown orange slightly gravelly CLAY. Gravel is subangular-subrounded fine to coarse flint. Pockets of coarse sands. Rare coarse cobbles of flint.
	2.00	D					
	2.30	B					
				2.40	4.55		Firm dark grey mottled orange blueish slightly sandy CLAY.
	2.80	B					
				3.00	3.95		End of pit at 3.00 m

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Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP22
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495500 - 104064 Level: 6.83
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.00	Date 19/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	6.63		Grass over brown silty slightly clayey TOPSOIL with abundant rootlets
	0.30	ES					Firm reddish brown sandy silty gravelly CLAY. Gravel is fine to cobble-sized angular to sub-rounded flint.
	1.00 1.00	B D	HVP=80	0.90	5.93		Firm becoming stiff reddish brown slightly silty slightly sandy CLAY.
							Hand Pen at 1.5m = 150kPa
	2.00	B					
	3.00	D		3.00	3.83		*Hand Pen at 3m = 190kPa*
							End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP23
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495450 - 104063 Level: 5.70	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.10	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over brown silty sandy slightly clayey TOPSOIL with frequent rootlets
	0.30	ES		0.25	5.45		Firm brown silty slightly gravelly CLAY. Gravel is fine-medium subrounded flint and medium-coarse subrounded-rounded chalk
				0.45	5.25		Firm reddish brown mottled brown slightly silty CLAY
	1.00	D	HVP=100				
			N=18	1.40	4.30		Medium dense reddish brown silty medium SAND.
	1.50	D					
	2.30	B		2.30	3.40		Firm becoming stiff reddish brown mottled greyish brown slightly silty sandy CLAY
							Hand Pen at 2.3m = 140kPa
							Hand Pen at 2.9m = 210kPa
				3.00	2.70		Stiff dark purplish grey slightly silty sandy CLAY
	3.10	D		3.10	2.60		End of pit at 3.10 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP24
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495436 - 104115 Level: 6.14	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.50	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	5.94		Grass over dark brown silty sandy slightly gravelly TOPSOIL. Gravel is subrounded to rounded medium to coarse flint with abundant rootlets.
	0.30	ES					Medium dense dark brown orange clayey slightly silty slightly gravelly SAND. Gravel is subrounded-rounded medium to coarse flint and chalk.
	0.60	B					
	1.50	D	HVP=100	1.40	4.74		Stiff blue-grey mottled orange sandy slightly gravelly CLAY. Gravel is subrounded-rounded medium to cobble sized flint.
							Hand Pen at 1.5m = 200kPa
							Hand Pen at 2m = 230kPa
	2.50	D		2.50	3.64		End of pit at 2.50 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP25
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495500 - 104114 Level: 7.07
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.00	Date 19/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	6.87		Grass over brown silty sandy clayey TOPSOIL with abundant rootlets
	0.30	ES					Firm reddish brown gravelly CLAY. Gravel is medium-coarse subrounded-rounded flint
				0.60	6.47		Medium dense reddish brown slightly gravelly medium to coarse-grained SAND. Gravel is fine-medium subrounded-subangular flint
	0.80	D		0.90	6.17		Firm brown slightly gravelly silty CLAY. Gravel is medium subrounded flint
	1.00	D	HVP=50				
	1.20	D					
				1.50	5.57		Stiff grey brown mottled reddish brown CLAY. Fissured towards base
							Seepage on east side at 1.9m
							Hand Pen at 2m = 180kPa
	3.00	D		3.00	4.07		*Hand Pen at 3m = 260kPa*
							End of pit at 3.00 m

Remarks: Trial pit remained stable with seepage at 1.9m

Stability: Stable

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Trial Pit Log

Trialpit No
TP26
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495497 - 104206 Level: 7.62	Date 21/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	7.47		Grass over brown silty gravelly slightly clayey TOPSOIL. Gravel is fine-medium subrounded-subangular flint. Abundant rootlets
	0.40	ES					Firm reddish brown mottled brown sandy silty CLAY with occasional rootlets and fine ironstone nodules
				0.70	6.92		Medium dense reddish brown medium SAND
	1.10	B	N=13				
				1.50	6.12		Medium dense reddish brown gravelly SAND. Gravel is fine-cobble sized rounded to angular flint.
				1.70	5.92		Firm blue grey mottled reddish brown slightly silty CLAY
							Hand Pen at 1.8m = 120kPa
	2.00	D					*Hand Pen at 2m = 250kPa*
				2.10	5.52		Stiff blueish grey silty CLAY
							Seepage at 2.1m
	3.00	D		3.00	4.62		End of pit at 3.00 m

Remarks: Seepages recorded at around 2m. Trial pit collapsed within sand to 1.8m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP27
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495599 - 104114 Level: 7.24	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.00		Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	7.09		Grass over brown silty slightly clayey slight gravelly TOPSOIL. Gravel is fine subrounded-rounded flint.
							Firm brown silty sandy gravelly CLAY. Gravel is fine subrounded chalk and fine-medium rounded-subrounded flint
	1.00	B		1.10	6.14		
			N=10				Medium dense reddish brown gravelly SAND. Gravel is fine-cobble sized rounded-subrounded flint. Occasional pockets of very sandy clay.
	1.70	B					
				2.50	4.74		Medium dense dark grey silty very clayey SAND.
	2.70	D					
				3.00	4.24		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP28
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495652 - 104130 Level: 7.08	Date 21/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.50		Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.10	6.98		Grass over brown silty slightly clayey slightly gravelly TOPSOIL. Gravel is fine subrounded flint. Frequent rootlets
	0.30	ES					Firm brown silty slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is fine subrounded flint
				0.70	6.38		Medium dense orangish brown slightly gravelly medium SAND. Gravel is fine to cobble sized subangular flint
	1.00	B					
	1.10	D					
				1.30	5.78		Firm becoming stiff orangish brown mottled greyish brown sandy CLAY.
							Sand content reduces with depth
							Hand Pen at 1.7m = 110kPa
	2.50	D		2.50	4.58		*Hand Pen at 2.5m = 200kPa*
							End of pit at 2.50 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP29
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495767 - 104249 Level: 6.84	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown clayey sandy slightly gravelly TOPSOIL with abundant rootlets.
	0.30	ES		0.40	6.44		
	1.00	B	N=14				Medium dense brown orange slightly gravelly SAND. Gravel is fine-coarse flint with rare cobbles.
	1.60	D		1.50	5.34		Stiff blue-grey slightly gravelly CLAY. Gravel is rare fine subangular chalk. *Hand Pen at 1.6m = 220kPa*
	3.00	D		3.00	3.84		End of pit at 3.00 m

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Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP30
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495750 - 104113 Level: 3.50	Date 23/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES					Grass over dark brown silty sandy slightly gravellyTOPSOIL with abundant rootlets. Gravel is rare medium subangular flint.
				0.30	3.20		
	0.40	ES					Firm brown slightly silty sandy slightly gravelly CLAY. Gravel is fine subangular chalk.
				1.20	2.30		
	1.30	D					Firm blue-grey mottled orange slightly sandy slightly gravelly CLAY. Gravel is fine-medium subangular chalk.
	1.30	ES	HVP=70				*Iron staining at 1.3m*
							Wood fragments at 1.9m
	2.00	D		2.00	1.50		Firm blue-grey sandy CLAY.
							Hand Pen at 2m = 120kPa
							Ironstone noted at 2.9m
				3.00	0.50		End of pit at 3.00 m

Remarks: Trial pit remained stable with seepage at 3m

Stability: Stable

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Trial Pit Log

Trialpit No
TP31
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495800 - 104114 Level: 2.25	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 1.60	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	2.10		Grass over brown silty sandy slightly gravelly TOPSOIL. Gravel is fine-coarse subrounded-subangular flint. Abundant rootlets
	0.60	ES		0.70	1.55		Firm brown sandy silty gravelly CLAY. Gravel is fine-coarse rounded-angular flint
	1.10	B		1.60	0.65		Brown clayey sandy GRAVEL. Gravel is fine-cobble sized angular-rounded flint
							End of pit at 1.60 m

Remarks: Trial pit collapse within gravel with seepage

Stability: Unstable

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Trial Pit Log

Trialpit No
TP32
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495906 - 104234 Level: 2.70
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.00	Date 20/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.15	2.55		Grass over dark brown silty sandy TOPSOIL with abundant rootlets.
	0.20	ES					Firm brown slightly sandy CLAY. Occasional rootlets.
			HVP=50	1.00	1.70		Firm grey mottled orange slightly sandy silty CLAY.
				1.50	1.20		Grey clayey slightly silty slightly sandy GRAVEL. Gravel is fine-coarse subangular-subrounded flint. Pockets of slightly sandy slightly gravelly clay.
	2.00	B		2.00	0.70		End of pit at 2.00 m

Remarks: Water level to 1.9m after 5 mins and to 1.85m after 10 minutes. Pit walls collapsed near the base.

Stability:

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Trial Pit Log

Trialpit No
TP33
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495903 - 104191 Level: 2.99	Date 21/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES					Grass over brown silty sandy gravelly TOPSOIL with abundant rootlets
	0.20	ES		0.15	2.84		Dark greyish brown very silty sandy gravelly slightly clayey MADE GROUND. Gravel is fine-cobble sized brick, fine-medium subrounded-angular flint and occasional ceramic tiles
				0.47	2.52		Firm brown slightly silty gravelly CLAY. Gravel is fine-medium subangular-subrounded flint.
	1.00	D					*Too gravelly for hand pen at 1m*
				1.25	1.74		Firm blue grey mottled reddish brown slightly silty CLAY
			HVP=60				
	2.20	D					*Hand Pen at 2.2m = 140kPa*
				2.30	0.69		Stiff blue grey mottled reddish brown silty sandy CLAY
	3.00	D					*Hand Pen at 3m = 280kPa*
				3.00	-0.01		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP34
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495849 - 104172 Level: 2.48	Date 20/10/2020
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 0.40		Scale 1:25
Client:	Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.40	2.08		Grass over dark brown silty sandy TOPSOIL with abundant rootlets. End of pit at 0.40 m

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Remarks: Trial pit terminated at depth due to suspected service. TP34a was dug as a replacement and was located 2m south

Stability: Stable

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Trial Pit Log

Trialpit No
TP34a
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495847 - 104171 Level: 2.48	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 1.20	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown silty sandy TOPSOIL with abundant rootlets.
	0.30	ES					
				0.40	2.08		Dark brown silty sandy CLAY.
				0.60	1.88		Black brown clayey silty slightly sandy gravelly MADE GROUND. Gravel is brick fragments fine angular chalk, flint, rootlets common.
	0.70	ES					
				1.00	1.48		Firm grey mottled orange slightly sandy, gravelly CLAY. Gravel is fine-coarse pebbles of flint.
				1.20	1.28		*Too gravelly for shear vane and hand pen at 1m*
							End of pit at 1.20 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP35
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495800 - 104163 Level: 3.42	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.10	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.40	3.02		Grass over dark brown silty sandy TOPSOIL with abundant rootlets
	0.60	ES					Firm brown mottled orange sandy slightly gravelly CLAY. Gravel is medium-coarse subangular flint
	1.10	D	HVP=60	1.40	2.02		Firm blue-grey slightly silty slightly sandy CLAY. Clay is wet and soft in places. Mottled orange occasionally and fissured
	2.50	D					*Seepage and some collapse at 2.5m*
				3.10	0.32		End of pit at 3.10 m

Remarks: Trial pit seepage at 2.5 and 3.1m with minor collapse

Stability: Stable

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Trial Pit Log

Trialpit No
TP36
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495777 - 104177 Level: 5.05	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.10		Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.01	ES					Grass over dark brown silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is medium-coarse subrounded flint
	0.30	ES		0.40	4.65		Firm brown slightly sandy CLAY. Occasional rootlets.
				0.90	4.15		Stiff brown slightly sandy gravelly CLAY. Gravel is medium-coarse subangular-angular flint.
							Hand Pen at 1m = 220kPa
	1.10	D	HVP=80	1.20	3.85		Stiff blue-grey mottled brown slightly sandy CLAY. Rare pockets of orange sands
							Occasional ironstone at 1.8m
							Clay is slightly wet below 1.9m
							Hand Pen at 2m = 210kPa
	2.50	D					
				3.10	1.95		End of pit at 3.10 m

1 2 3 4 5

Remarks: Trial pit remained stable. Arisings were slightly wet from 1.9mbgl.

Stability: Stable

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Trial Pit Log

Trialpit No
TP37
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495702 - 104166 Level: 6.80	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.30	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.20	6.60		Grass over brown silty sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is fine subangular flint
	0.50	ES		0.70	6.10		Firm brown silty slightly gravelly CLAY with occasional rootlets. Gravel is fine-medium subrounded-angular flint
	1.20	B	N=16	1.30	5.50		Medium dense reddish brown gravelly medium SAND. Gravel is fine-coarse subrounded-rounded flint. Occasional pockets of slightly sandy CLAY
	2.30	D					Firm greyish brown mottled reddish brown sandy CLAY *Hand Pen at 2.3m = 120kPa* *Iron staining at 2.5m*
	3.20	D		3.00 3.30	3.80 3.50		Stiff dark grey silty sandy CLAY. *Hand Pen at 3.2m = 290kPa* End of pit at 3.30 m

1 2 3 4 5

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP38
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495644 - 104193 Level: 6.92
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.50	Date 20/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.15	6.77		Grass over brown clayey slightly silty TOPSOIL with occasional rootlets
	0.20	ES					Firm brown slightly silty CLAY
				0.70	6.22		Dense reddish brown medium SAND
			N=32				
	1.30	B		1.40	5.52		Reddish brown mottled brownish grey slightly clayey gravelly medium SAND. Gravel is fine-cobble sized subangular-rounded flint
							Seepages at 1.4m
	2.00	B		2.10	4.82		Stiff grey slightly silty CLAY
							Fast seepage at 2.1m
							Hand Pen at 2.4m = 230kPa
				2.50	4.42		End of pit at 2.50 m

Remarks: Trial pit collapse to 1.8m with seepages at 1.4m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP39
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495600 - 104163 Level: 7.58	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.70		Scale 1:25
Client: Gleeson Strategic Land			Logged ADC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	7.38		Grass over brown clayey silty TOPSOIL
	1.00	B		1.70	5.88		Firm-stiff orange brown silty CLAY with occasional rootlets.
	2.20	B		2.50	5.08		Orange brown slightly clayey silty slightly sandy GRAVEL. Gravel is fine-coarse flint.
	2.70	D		2.70	4.88		Grey slightly silty CLAY. Finely laminated End of pit at 2.70 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP40
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495550 - 104164 Level: 7.52
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.20	Date 22/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	7.32		Grass over dark brown silty sandy TOPSOIL with abundant rootlets
							Firm brown slightly silty slightly sandy slightly gravelly CLAY. Gravel is fine chalk. With occasional ironstone
	1.00	D	N=15				*Hand Pen at 1.3m = 110kPa*
				1.80	5.72		Brown orange clayey sandy GRAVEL.
	2.00	B					*Seepage at 2.1m*
				2.30	5.22		Stiff blue-grey silty CLAY.
							Hand Pen at 2.3m = 240kPa
							Fissured at 2.6m
	3.00	D					*Laminated at 3m*
				3.20	4.32		End of pit at 3.20 m

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Remarks: Trial pit collapsing in gravel at 3.2m with seepages at 2.1m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP41
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495475 - 104158 Level: 6.99	Date 19/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.01	ES		0.20	6.79		Grass over dark brown silty sandy slightly gravelly TOPSOIL. Gravel is subrounded-rounded medium to coarse flint with abundant rootlets.
	0.30	ES					Firm dark brown orange silty sandy slightly gravelly CLAY. Gravel is angular-subangular fine to medium chalk and subrounded to rounded fine to cobble sized flint
	1.00	B	N=27	1.20	5.79		Stiff dark brown with some blue-grey slightly silty sandy slightly gravelly CLAY. Gravel is fine-medium, subrounded-subangular chalk and flint. Occasional coarse subrounded chalk.
	1.50	D	HVP=90				*Possible sub-horizontal shear surface at 2.3m*
							Hand Pen at 2.5m = 210kPa
	3.00	B		3.00	3.99		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP42
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495562 - 104243 Level: 8.31	Date 22/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.00	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.10	8.21		Grass over brown silty slightly gravelly TOPSOIL with abundant rootlets. Gravel is fine subrounded flint
	0.40	ES					Firm brown slightly sandy slightly gravelly CLAY/SILT. Gravel is rare fine subangular flint.
	1.20	B	N=11				
				1.40	6.91		Medium dense reddish brown mottled greyish brown slightly gravelly SAND with occasional pockets of sandy clay. Gravel is subrounded fine flint
				2.30	6.01		Reddish brown gravelly SAND. Gravel is fine-cobble sized flint
	2.50	B					*Fast seepage at 2.6m*
				2.90	5.41		Stiff dark grey slightly silty CLAY
	3.00	B		3.00	5.31		*Hand Pen at 2.9m = 240kPa*
							End of pit at 3.00 m

Remarks: Trial pit collapse in sand to 2.7m with seepages

Stability: Unstable

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Trial Pit Log

Trialpit No
TP43
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495600 - 104214 Level: 8.00
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.60	Date 21/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES					Grass over dark brown silty sandy TOPSOIL with abundant rootlets
	0.20	ES		0.30	7.70		
							Firm dark brown orange sandy slightly gravelly CLAY. Clay is friable in parts
			N=8				
				1.10	6.90		Loose off white orange clayey sandy GRAVEL. Gravel is very fine-medium subrounded chalk and occasional coarse flint.
				1.90	6.10		
	2.00	D					Dark brown orange slightly clayey gravelly SAND. Gravel is fine-medium subangular-subrounded flint and occasional fine chalk subrounded.
				2.40	5.60		Blue-grey mottled orange slightly gravelly CLAY with pockets of sand. Gravel is fine-medium flint with occasional coarse pebbles.
	2.60	D		2.60	5.40		End of pit at 2.60 m

Remarks: Trial pit collapsing in sandy layers to 2.5m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP44
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495700 - 104216 Level: 7.09	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.80	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	6.94		Grass over brown silty sandy clayey slightly gravelly TOPSOIL. Abundant rootlets
	0.20	ES					Firm brown slightly silty gravelly CLAY. Occasional rootlets. Gravel is fine-medium subrounded-rounded flint.
				0.50	6.58		Off white slightly clayey gravelly SILT. Gravel is fine subrounded-angular flint and fine subrounded chalk.
				0.80	6.28		Medium dense reddish brown mottled brown medium SAND
	1.00	B	N=14				
				1.20	5.88		Medium dense reddish brown silty gravelly SAND. Gravel is fine-cobble sized subangular-rounded flint
				1.90	5.18		Stiff blue-grey silty CLAY
	2.00	D					*Hand Pen at 2.4m = 250kPa*
				2.80	4.28		End of pit at 2.80 m

Remarks: Trial pit collapsed to 2.8m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP45
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495799 - 104219 Level: 5.68	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 3.00		Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	5.48		Grass over dark brown silty sandy slightly gravelly TOPSOIL with abundant rootlets.
	0.30	ES					Brown orange sandy slightly gravelly CLAY
				0.70	4.98		Off white orange silty clayey GRAVEL. Gravel is subangular fine-coarse flint and fine sub-rounded chalk.
			HVP=70	1.10	4.58		Stiff fissured blue-grey CLAY.
	1.20	D					*Hand Pen at 2m = 300kPa*
							Lignite noted at 2.2m
				2.80	2.88		Stiff dark blue-grey silty slightly sandy CLAY.
	3.00	D		3.00	2.68		End of pit at 3.00 m

Remarks: Trial pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP46
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495851 - 104225 Level: 3.29	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 3.20	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	3.09		Grass over brown clayey silty TOPSOIL with abundant rootlets
	0.30	ES					Firm reddish brown mottled greyish brown gravelly slightly silty CLAY. Gravel is fine-cobble angular-rounded flint
	1.00	D		1.20	2.09		Firm reddish brown mottled greyish brown slightly silty slightly sandy CLAY.
							Soil slightly wet below 1.3m
			HVP=70				
							Hand Pen at 2m = 130kPa
	2.10	D					
	3.00	D					*Hand Pen at 3m = 180kPa*
				3.10	0.19		Stiff dark grey slightly silty CLAY
				3.20	0.09		End of pit at 3.20 m

Remarks: Trial pit remained stable. Arisings were wet from 1.3mbgl

Stability: Stable

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Trial Pit Log

Trialpit No
TP47
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495732 - 104272 Level: 7.48	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 0.80		Scale 1:25
Client: Gleeson Strategic Land			Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30	7.18		Grass over dark brown clayey sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is subangular-angular fine-medium flint.
	0.50	ES		0.70	6.78		Firm dark brown orange sandy slightly gravelly CLAY. Gravel is fine subrounded flint
				0.80	6.68		Off-white grey silty slightly clayey gravel. Gravel is fine to medium sub-rounded to sub-angular chalk and occasional coarse flint End of pit at 0.80 m

Remarks: Trial pit terminated at 0.8m due to presence of land drain. Pit remained dry and stable

Stability: Stable

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Trial Pit Log

Trialpit No
TP47a
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495733 - 104275 Level: 7.48
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.30	Date 20/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	7.18		Grass over dark brown clayey sandy slightly gravelly TOPSOIL with abundant rootlets. Gravel is subangular-angular fine-medium flint.
				0.70	6.78		Firm dark brown orange sandy slight gravelly CLAY. Gravel is fine subrounded flint
				1.00	6.48		Off-white grey silty slightly clayey GRAVEL. Gravel is fine to medium sub-rounded to sub-angular chalk and occasional coarse flint
	1.20	D	N=47				Dense brown orange slightly clayey slightly gravelly SAND. Gravel is medium-coarse subangular-subrounded flint. Gravel increases with depth.
				1.50	5.98		Brown orange gravelly SAND. Gravel is fine-coarse cobbles of flint and angular fine-medium chalk.
	2.10	D		2.00	5.48		Stiff fissured blue-grey CLAY.
				2.30	5.18		End of pit at 2.30 m

Remarks: Trial pit collapsed to 1.9m with minor seepages at 1.2m and 1.9m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP48
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495685 - 104296 Level: 8.12	Date 20/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Dimensions (m): Depth 2.15	Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.05	ES		0.10	8.02		Grass over brown sandy silty TOPSOIL. Occasional rootlets
	0.20	ES		0.30	7.82		Greyish brown slightly gravelly slightly clayey SILT. Occasional rootlets
	1.00	D	HVP=50				Firm brown sightly gravelly slightly silty CLAY. Gravel is fine subangular-subrounded flint *Hand Pen at 1m = 170kPa*
				1.40	6.72		Reddish brown medium SAND. Grains are subrounded-rounded *Seepage at 1.6m*
	2.10	B		2.00 2.15	6.12 5.97		Brown gravelly SAND. Gravel is fine-coarse angular-rounded flint End of pit at 2.15 m

Remarks: Trial pit collapsed on north and south sides to 2m with seepages at 1.6m

Stability: Unstable

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Trial Pit Log

Trialpit No
TP49
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords: 495653 - 104266 Level: 8.02
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.10	Date 21/10/2020 Scale 1:25
Client:	Gleeson Strategic Land		Logged HG

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20	7.82		Grass over dark brown silty sandy TOPSOIL with abundant rootlets
	0.30	ES					Firm brown orange slightly silty sandy CLAY.
	1.00	B	N=6	1.40	6.62		Medium dense brown orange slightly clayey SAND.
	2.00	B		2.10	5.92		End of pit at 2.10 m

Remarks: Trial pit collapsing on northern and southern walls

Stability: Unstable

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Trial Pit Log

Trialpit No
TP50
Sheet 1 of 1

Project Name: Tars Farm, Barnham	Project No. LP2356	Co-ords: 495600 - 104264 Level: 8.53	Date 21/10/2020
Location: Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK	Dimensions (m): Depth 2.60		Scale 1:25
Client: Gleeson Strategic Land			Logged KT

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.15	8.38		Grass over brown silty slightly gravelly slightly clayey TOPSOIL. Gravel is fine subangular flint
	0.20	ES					Brown slightly silty gravelly clayey MADE GROUND. Gravel is fine-medium subrounded flint, ceramic tiles and rare brick fragments
				0.40	8.13		Firm brown slightly silty sandy slightly gravelly CLAY. Gravel is fine subangular-subrounded flint
	1.00	B	N=11				*Too friable for hand pen at 1m* *Ironstone fragments noted at 1.2m*
				1.50	7.03		Medium dense reddish brown mottled greyish brown medium SAND. Grains are rounded-subrounded flint.
	2.20	B					*Seepages at 2.1m*
				2.40	6.13		Clayey silty sandy GRAVEL. Gravel is fine to cobble size sub-angular to sub-rounded flint
	2.60	B		2.60	5.93		End of pit at 2.60 m

Remarks: Trial pit collapsed within sand from 1.8m. Pit collapsed to 2.5m. Seepages were noted at 2.1m in multiple places around the pit

Stability: Unstable

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Borehole Log

Borehole No. **WS01**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495475 - 104050	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	6.28	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.20	6.08		Grass over brown sandy TOPSOIL
		1.00	ES					Firm orange brown sandy silty CLAY with abundant fine-coarse and occasional cobbles of flint and occasional iron staining
		1.00		N=8 (1,2/3,1,2,2)				
		1.30	D		1.20	5.08		Loose orange brown clayey SAND with occasional fine-coarse gravel of subrounded flint
					1.50	4.78		Firm to stiff orange brown and grey mottled CLAY
		2.00	D					
		2.00		N=6 (2,2/1,2,1,2)				
		3.00		N=9 (2,2/1,2,3,3)				
		3.50	D					
					3.80	2.48		Stiff blue grey sandy CLAY.
W		4.00		N=12 (2,2/3,2,4,3)	4.00	2.28		End of borehole at 4.00 m

Remarks
Borehole remained dry and stable.

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Borehole Log

Borehole No. **WS02**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495577 - 103947	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	6.20	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40	ES		0.45	5.75		Grass over pale brown slightly silty slightly sandy CLAY with fine-coarse subrounded flint and rare flint cobbles
								Stiff orange brown mottled grey CLAY with frequent medium-coarse rounded flints
								Hand pen at 0.8m =260kPa
		1.00		N=19 (2,3/4,5,4,6)	0.90	5.30		Medium dense orange brown clayey SAND with occasional fine-coarse gravel of subrounded flint
		1.50	D		1.20	5.00		Firm orange brown gravely sandy CLAY. Gravel is fine-coarse subrounded-subangular flint
		2.00		N=11 (1,2/2,3,3,3)	2.05	4.15		Stiff becoming very stiff grey mottled brownish orange silty CLAY with very fine selenite crystals throughout. Laminated and fissured
								Hand pen at 2.3m =240kPa
		2.60	D					
								Hand pen at 2.7m =270kPa
		3.00		N=11 (2,3/2,3,3,3)				
		3.50	D					*Hand pen at 3.5m =330kPa*
W		4.00		N=12 (2,2/2,3,3,4)	4.00	2.20		End of borehole at 4.00 m

Remarks
Borehole remained dry and stable.

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Borehole Log

Borehole No. **WS03**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495673 - 103950	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	3.67	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	ES					Grass over brown slightly silty slightly sandy TOPSOIL with occasional fine chalk gravel
					0.30	3.37		Firm-stiff slightly silty reworked CLAY with grey brown frequent fine chalk gravel
		1.00		N=7 (2,2/2,1,2,2)	1.00	2.67		Stiff orange brown slightly silty slightly sandy CLAY
		1.20	D					
					1.50	2.17		Stiff grey mottled brown laminated fissured silty CLAY with occasional fine selenite crystals
								Hand pen at 1.5m =370kPa
		2.00		N=8 (1,1/2,2,2,2)				
		2.30	D					
								Hand pen at 2.5m =200kPa
		3.00		N=10 (2,2/2,2,3,3)				
								Hand pen at 3.5m =260kPa
		3.90	D					
W		4.00		N=5 (1,2/1,1,2,1)	4.00	-0.33		End of borehole at 4.00 m

Remarks
Borehole remained dry and stable.

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Borehole Log

Borehole No. **WS04**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495773 - 104044	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	2.11	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.35	ES		0.40	1.71		Grass over brown slightly sandy clayey silty TOPSOIL with occasional medium-coarse subrounded flint
	▼	0.70	D		0.80	1.31		Firm grey slightly silty sandy CLAY with frequent fine-coarse subrounded-rounded flint
		1.00	D					Loose pale grey slightly sandy clayey GRAVEL. Gravel is fine-coarse subangular flint
		1.00		N=7 (1,1/2,2,1,2)				
								Hand pen at 1.5 =140kPa
		1.70	D		1.60	0.51		Firm becoming stiff mottled grey and orange brown slightly silty CLAY. Finely laminated with occasional very fine selenite crystals
		2.00		N=7 (2,2/1,2,2,2)				
		2.50	D					*Hand pen at 2.5 =150kPa*
		3.00		N=11 (2,2/2,3,3,3)				
		3.80	D					*Hand pen at 3.8m =400kPa*
W		4.00		N=12 (2,2/3,3,3,3)	4.00	-1.89		End of borehole at 4.00 m

Remarks
Borehole remained dry and collapsing in gravels

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Borehole Log

Borehole No. **WS05**
Sheet 1 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495531 - 104230	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	8.16	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.25	7.91		Grass over brown sandy TOPSOIL
		1.00		N=9 (3,2/1,3,2,3)				Firm orange brown silty sandy CLAY.
		1.50	D		1.20	6.96		Loose orange brown silty clayey fine-coarse SAND
		1.50	ES					
		2.00		N=7 (3,1/2,2,2,1)				
					2.40	5.76		Firm orange brown silty sandy CLAY with abundant fine-coarse gravel subangular flint
		3.00		N=9 (2,1/1,2,3,3)				
					3.80	4.36		Firm blue grey silty CLAY with occasional selenite
		4.00	D		4.00	4.16		Continued on next sheet

Remarks
Borehole remained dry and colpased to 2.6m

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Borehole Log

Borehole No.
WS05
Sheet 2 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495531 - 104230	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	8.16	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		4.00		N=8 (1,3/1,2,3,2)				End of borehole at 4.00 m

5
6
7
8

Remarks
Borehole remained dry and colpased to 2.6m

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Borehole Log

Borehole No. **WS06**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495935 - 104206	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	3.46	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.40	3.06		Grass over brown sandy TOPSOIL
		1.00		N=6 (2,1/2,2,1,1)				Soft pale brown silty sandy CLAY with occasional fine-coarse gravel of subrounded-subangular flints with abundant flint gravel
		1.80	D		1.50	1.96		Firm orange brown mottled grey silty CLAY
		2.00		N=7 (0,0/2,2,2,1)				
		3.00	D		2.50	0.96		Firm-stiff blue grey silty CLAY with occasional rootlets. Occasional shell fragments and sandy horizons
		3.00		N=7 (1,1/1,1,2,3)				
W		4.00		N=14 (2,2/3,3,3,5)	4.00	-0.54		End of borehole at 4.00 m

Remarks
Borehole remained dry and stable.

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Borehole Log

Borehole No. **WS07**
Sheet 1 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495865 - 104208	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	2.67	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	2.37		Grass over brown sandy TOPSOIL
		0.40	ES					Soft orange brown silty CLAY
		1.00	D		0.80	1.87		Firm orange brown silty sandy CLAY with abundant fine-coarse gravel and occasional cobbles of flint becoming clayey gravel
		1.00		N=6 (3,2/1,1,2,2)				
		1.30	D		1.20	1.47		Firm becoming stiff mottled orange brown grey blue silty CLAY with some rootlets
								Becoming stiff below 1.5m
		2.00		N=10 (2,1/2,2,2,4)	1.80	0.87		Stiff blue grey slightly sandy CLAY with rare shelly fragments
		2.50	D		2.20	0.47		Stiff blue grey silty CLAY with rare shell fragments
		3.00		N=10 (2,2/2,2,3,3)				
W		4.00	D		4.00	-1.33		Continued on next sheet

Remarks
Borehole had seepage at 4m and was stable

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Borehole Log

Borehole No.
WS07
Sheet 2 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495865 - 104208	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	2.67	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		4.00		N=16 (2,2/3,4,4,5)				End of borehole at 4.00 m

5
6
7
8

Remarks
Borehole had seepage at 4m and was stable

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Borehole Log

Borehole No.
WS08
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495659 - 104218	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	7.34	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES					TOPSOIL
					0.20	7.14		Firm orange brown silty CLAY
					0.50	6.84		Firm pale orange brown silty sandy CLAY with abundant fine-medium gravel of subangular flint
	▼	1.00		N=17 (2,3/3,3,6,5)	0.90	6.44		Medium dense pale orange brown SAND with fine gravel horizon
					1.80	5.54		Loose orange brown fine-medium SAND with rare fine-coarse gravel subangular flint
		2.00	D					
		2.00	ES					
		2.00		N=8 (3,2/3,2,2,1)				
								Coarse flint gravel at 2.8m
		3.00		N=9 (1,1/2,2,2,3)	3.00	4.34		Firm blue grey silty CLAY with occasional selenite
		3.50	D					
W		4.00		N=11 (2,1/2,2,4,3)	4.00	3.34		End of borehole at 4.00 m

Remarks
Borehole had seepage and unstable at 1m

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Borehole Log

Borehole No. **WS09**
Sheet 1 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495681 - 104275	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	7.89	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES					Grass over brown sandy TOPSOIL	
					0.20	7.69		Firm orange brown sandy CLAY with abundant fine-coarse gravel of subangular flint	
		0.50	ES						
		1.00		N=8 (0,0/1,2,3,2)					1
		1.40	D						
					1.50	6.39		Medium dense orange brown fine-medium SAND	
		2.00 2.00	D	N=12 (3,2/3,2,3,4)					2
					2.40	5.49		Orange brown slightly clayey SAND with abundant fine-coarse gravel of subangular-subrounded flint	
W		3.00 3.00	D	N=7 (2,1/2,2,1,2)	3.00	4.89		Loose orange brown fine-medium SAND with some fine-medium gravel of subangular - subrounded flint	3
								Fine to medium subangular flint at 3.5m	
					3.80	4.09		Firm dark blue grey very silty CLAY with occasional shell fragments and selenite crystals	
		4.00	D		4.00	3.89		Continued on next sheet	4

Remarks
Borehole had seepage at 2m and collapsing within sands

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Borehole Log

Borehole No.
WS09
Sheet 2 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495681 - 104275	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	7.89	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	21/10/2020 - 21/10/2020	Logged By SSC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		4.00		N=10 (2,2/2,3,2,3)				End of borehole at 4.00 m

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Remarks
Borehole had seepage at 2m and collapsing within sands

AGS

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Borehole Log

Borehole No. **WS10**
Sheet 1 of 1

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495555 - 104117	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	7.30	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Grass over brown slightly silty slightly sandy clayey TOPSOIL
		0.50	ES		0.45	6.85		Firm-stiff pale orangish brown slightly silty slightly sandy CLAY with frequent fine subrounded flint
		1.00		N=6 (2,1/1,2,1,2)				
		1.20	ES					
	▼				1.35	5.95		Medium dense orange brown fine slightly silty SAND with occasional fine-medium subangular flint gravel becoming gravelly with depth and sand becomes medium grained
		1.80	D					
		2.00		N=11 (4,3/3,3,3,2)				
					2.50	4.80		Stiff brownish grey flint laminated fissured silty CLAY
		2.70	D					*Hand pen at 2.7m =220kPa*
(W)		3.00		N=6 (3,2/1,2,1,2)				
		3.80	D					
		4.00		N=27 (4,5/6,6,7,8)	4.00	3.30		End of borehole at 4.00 m

Remarks
Borehole remained dry and collapsed to 3m

AGS

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Borehole Log

Borehole No. **WS11**
Sheet 1 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495707 - 104112	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	5.99	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.35	5.64		Grass over brown to orange brown clayey silty TOPSOIL with frequent medium-coarse subrounded flint
		0.90	D					Orangish brown slightly silty slightly gravelly SAND. Gravel is medium-coarse subrounded flint gravel
		1.00		N=7 (1,1/2,2,1,2)	1.10	4.88		Stiff mottled grey and orange brown slightly silty fine sandy CLAY.
								Hand pen at 1.2m =210kPa
		1.70	D					*Hand pen at 1.7m =240kPa*
		2.00		N=7 (2,2/1,2,2,2)				
								Hand pen at 2.2m =250kPa
		2.40	D					
								Sand contact reduces at 2.5m
								Hand pen at 2.9m =260kPa
		3.00		N=11 (2,2/2,3,3,3)				*Fissures are unconsolidated at 3m*
								Very fine selenite crystals at 3m
		3.70	D					
W		4.00		N=12 (2,2/3,3,3,3)	4.00	1.98		Continued on next sheet

Remarks
Borehole remained dry and stable.

AGS

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Borehole Log

Borehole No.
WS11
Sheet 2 of 2

Project Name:	Tars Farm, Barnham	Project No. LP2356	Co-ords:	495707 - 104112	Hole Type WS
Location:	Greenbank, Church Ln, Barnham, Bognor Regis PO22 0DG, UK		Level:	5.99	Scale 1:20
Client:	Gleeson Strategic Land		Dates:	22/10/2020 - 22/10/2020	Logged By ADC

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								End of borehole at 4.00 m

5
6
7
8

Remarks
Borehole remained dry and stable.

AGS

APPENDIX E – Chemical Laboratory Test Results

Chemical Laboratory
Test Results and
Screening Tables

LP2356 Tars Farm Barnham																		
Residential With Home Grown Produce				Sample Location:	TP13	TP18	TP27	TP35	TP36	TP37	TP39	TP50	WS10	WS11	TP30	TP42	TP22	TP23
				Depth (m):	0.05	0.5	0.1	0.1	0.3	0.05	0.1	0.1	0.5	0.3	0.05	0.4	0.3	0.1
Determinand	Units	LOD	Resi with HGP	Source														
Miscellaneous																		
pH	pH units	0.1	n.v.	-	6.40	7.50	6.30	6.20	6.90	6.40	6.4	6.3	7.1	5.8	6.1	7.3	6.7	6
Total Organic Carbon	%	0.01	n.v.	-	4.3	0.43	1.6	3	1.9	2.3	1.1	1.7	0.57	2.3	2.9	0.43	0.53	2.6
Calculated SOM	%				7.40	0.74	2.75	5.16	3.27	3.96	1.89	2.92	0.98	3.96	4.99	0.74	0.91	4.47
Metals																		
Arsenic	mg/kg	1	37	C4SL	10.9	10.9	8.6	12.7	8.9	11.7	8.8	9.4	8.8	11.2	8.1	11.8	8.5	9.5
Cadmium	mg/kg	0.5	22	C4SL	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
Chromium	mg/kg	5	910	S4UL	52.3	35.8	27.6	33.5	35.5	31.1	24.4	27.8	27.5	34.2	26.4	32.8	30.3	29.9
Copper	mg/kg	5	2,400	S4UL	29.4	18.8	13.6	30.9	16.5	19.5	16.6	20.1	13.2	16.2	18.1	18.7	12.5	17
Lead	mg/kg	5	200	C4SL	36.2	15	22.4	25.9	27.3	44.4	21.6	30.2	12.8	84.8	29	13.6	14.6	26
Mercury	mg/kg	0.5	40	S4UL	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
Nickel	mg/kg	5	130	S4UL	46.9	33.7	13.7	15.5	15.3	16.3	13.3	14.1	14.8	17.6	12.1	28.4	16.4	14.9
Selenium	mg/kg	1	250	S4UL	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Zinc	mg/kg	5	3,700	S4UL	143	57.3	53.9	88.1	60.9	76.6	50.5	60.2	48.2	61.4	63.2	52.1	50.9	50.8
Asbestos																		
Asbestos Identification	-	-	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Asbestos Quantification	%	0.001	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Polycyclic Aromatic Hydrocarbons (USEPA 16)																		
Benzo(a)pyrene	mg/kg	0.1	5.0	C4SL	*<0.1*	*<0.1*	*<0.1*	0.1	*<0.1*	0.1	*<0.1*	*<0.1*	*<0.1*	*<0.1*	0.2	*<0.1*	*<0.1*	0.30
Naphthalene	mg/kg	0.1	5.6	S4UL	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*

Residential With Home Grown Produce			Sample Location:		TP24	TP25	TP29	TP41	TP44	TP45	TP47	TP48	TP38	TP19	TP20	TP26	TP28	TP43	TP49	TP50	WS5	WS8
			Depth (m):		0.3	0.3	0.3	0.3	0.1	0.3	0.5	0.05	0.2	0.05	0.3	0.1	0.3	0.3	0.3	0.2	0.2	0.2
Determinand	**Units**	**LOD**	**Resi with HGP**	**Source**																		
Miscellaneous																						
pH	pH units	0.1	n.v.	-	6.2	6.7	6.8	7	6.8	7.2	7.9	7.1	7.9	6.4	6.6	7	6.8	6.4	6.4	6.7	6.8	8.9
Total Organic Carbon	%	0.01	n.v.	-	1.6	1.3	2.4	1.2	3.2	2.2	0.5	2.2	0.47	2.3	1.6	1.6	1.1	0.73	1.7	1.4	1.7	0.17
Calculated SOM	%				2.75	2.24	4.13	2.06	5.50	3.78	0.86	3.78	0.81	3.96	2.75	2.75	1.89	1.26	2.92	2.41	2.92	0.29
Metals																						
Arsenic	mg/kg	1	37	C4SL	14	8.9	13	9.7	10.3	12.8	9.4	8.7	14.6	9.1	9.7	9.7	8.5	8.3	8.5	9.6	10.4	17.5
Cadmium	mg/kg	0.5	22	C4SL	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.6	*<0.5*	0.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
Chromium	mg/kg	5	910	S4UL	34.5	27	33	33.4	32.4	34.7	26.1	27.1	44.4	32.8	30.7	29.2	29.2	26.6	25.8	26.6	30.5	26.4
Copper	mg/kg	5	2,400	S4UL	20.5	15.9	43.4	19.5	25.4	30.4	19.3	30.1	22	17.2	20.4	25.2	19.7	17.6	20	23.6	29	10.3
Lead	mg/kg	5	200	C4SL	37	28.5	34	24.5	28.9	34.4	13	32.8	19.2	22.2	22	31	22	13.9	23.5	25.4	24.3	14.9
Mercury	mg/kg	0.5	40	S4UL	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
Nickel	mg/kg	5	130	S4UL	19.6	14.1	19.9	17.2	16.2	23.9	28	15.3	53.5	15.3	16.7	14.9	18.6	15.7	14.1	15.5	14.4	16.1
Selenium	mg/kg	1	250	S4UL	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*	*<1*
Zinc	mg/kg	5	3,700	S4UL	89.1	54.3	80.9	60.9	97.4	84.2	46.8	66.8	78.3	60.2	67.7	59.8	58.1	52.2	63.3	62	62.6	33.3
Asbestos																						
Asbestos Identification	-	-	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Asbestos Quantification	%	0.001	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Polycyclic Aromatic Hydrocarbons (USEPA 16)																						
Benzo(a)pyrene	mg/kg	0.1	5.0	C4SL	*<0.1*	*<0.1*	0.90	*<0.1*	0.40	1.90	*<0.1*	0.20	*<0.1*	0.10	*<0.1*	*<0.1*	*<0.1*	*<0.1*	0.10	*<0.1*	*<0.1*	*<0.1*
Naphthalene	mg/kg	0.1	5.6	S4UL	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*

LP2356 Tars Farm Barnham

Public Open Space			Sample Location:		TP14	TP17	TP31	WS4	HP15	HP16	TP1	TP4	TP7	TP8	TP12	TP02	TP05	TP06	TP09	TP10	TP21	TP32	TP33	TP34a	TP46	TP3	WS6
			Depth (m):		0.4	0.2	0.1	0.35	0.2	0.2	0.3	0.1	0.5	0.1	0.1	0.3	0.1	0.3	0.1	0.3	0.05	0.2	0.2	0.3	0.1	0.3	0.3
Determinand	**Units**	**LOD**	**Public Open Space**	**Source**																							
Miscellaneous																											
pH	pH units	0.1	n.v.	-	6.9	7.30	5.80	7.1	7.5	7.6	7.3	6.3	8	6.2	6.2	7.5	6.3	6.7	6.5	6.7	5.9	6.3	7.6	7.3	6.8	7.5	7.1
Total Organic Carbon	%	0.01	n.v.	-	1.3	1.5	4.4	3.2	5.4	5.8	0.51	3.3	0.35	3.5	2.8	1.3	2.2	1.4	1.3	1.1	2.9	2.2	2.9	1.6	2.9	1.2	3.2
Calculated SOM	%				2.24	2.58	7.57	5.50	9.29	9.98	0.88	5.68	0.60	6.02	4.82	2.24	3.78	2.41	2.24	1.89	4.99	3.78	4.99	2.75	4.99	2.06	5.50
Metals																											
Arsenic	mg/kg	1	79	C4SL	9.7	7.1	11.9	11	9	10	17.7	10.9	14.5	10.2	8.7	11.7	9.5	9.1	9.6	8.5	8.7	8.5	22.1	9.8	11.9	11.4	19.1
Cadmium	mg/kg	0.5	220	C4SL	<0.5	0.9	<0.5	0.5	1.1	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	5	1500	S4UL	30.1	46.1	29.3	33.6	29.3	28.6	33.1	29.8	33.2	27.5	24.1	39.4	38.5	31.5	34.3	41.4	39	19.9	36.3	33.2	33.7	29.1	25.9
Copper	mg/kg	5	12,000	S4UL	14.4	15.9	23.4	29.7	55.2	58	16.4	15.4	15.6	13.6	12.3	19.2	16.4	16.3	17.9	16	15.4	22.8	42	19.9	27.5	17.8	29.8
Lead	mg/kg	5	630	C4SL	21.1	23.2	26	37.9	130	142	17.1	27.5	16.1	31.3	104	22.2	30.1	20.1	31.5	17.2	41.4	39.4	212	26.3	34.3	19.1	133
Mercury	mg/kg	0.5	120	S4UL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	mg/kg	5	230	S4UL	17.8	29.3	15.5	18.8	23.6	24.3	15.8	14.4	31.1	15.4	12.9	24.2	16.2	14.8	14.5	16.3	16.5	13	26.8	18.6	17.9	16.9	17.9
Selenium	mg/kg	1	1100	S4UL	<1	1.1	<1	<1	<1	1.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg	5	81,000	S4UL	50.4	78	97.8	105	341	360	48	54.7	52.8	56.7	49.4	56.4	61.2	47.4	57.4	46.7	65	179	417	76.3	101	47.2	267
Asbestos																											
Asbestos Identification	-	-	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Asbestos Quantification	%	0.001	Presence		NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Polycyclic Aromatic Hydrocarbons (USEPA 16)																											
Benzo(a)pyrene	mg/kg	0.1	10.0	C4SL	<0.1	<0.1	0.1	4	8.9	7.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.30	1.10	<0.1	3.10	<0.1	0.60
Naphthalene	mg/kg	0.1	4900	S4UL	<0.1	<0.1	<0.1	0.2	0.2	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.10	<0.1	<0.1

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UKAS TESTING 2683

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	20-30590
Issue:	1
Date of Issue:	03/11/2020
Contact:	Martin Weil
Customer Details:	Leap Environmental Ltd The Atrium Curtis Road Dorking SurrevRH4 1X4
Quotation No:	Q14-00063
Order No:	LPO-2765
Customer Reference:	LP2356
Date Received:	26/10/2020
Date Approved:	03/11/2020
Details:	Tars Farm Barnham
Approved by:	[redacted]

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 20-30590, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
218509	TP13 0.05	22/10/2020	28/10/2020	Silty loam	
218510	TP13 0.40	22/10/2020	28/10/2020		
218511	TP14 0.40	22/10/2020	28/10/2020	Silty loam	
218512	TP17 0.20	22/10/2020	28/10/2020	Silty clayey loam	
218513	TP18 0.05	22/10/2020	28/10/2020		
218514	TP18 0.50	22/10/2020	28/10/2020	Silty loam	
218515	TP27 0.10	22/10/2020	28/10/2020	Silty loam	
218516	TP31 0.10	22/10/2020	28/10/2020	Silty loam	
218517	TP31 0.60	22/10/2020	28/10/2020		
218518	TP35 0.10	22/10/2020	28/10/2020	Silty loam	
218519	TP35 0.60	22/10/2020	28/10/2020		
218520	TP36 0.10	22/10/2020	28/10/2020	Silty loam	
218521	TP36 0.30	22/10/2020	28/10/2020	Silty loam	
218522	TP37 0.05	22/10/2020	28/10/2020	Silty loam	
218523	TP37 0.50	22/10/2020	28/10/2020		
218524	TP39 0.10	22/10/2020	28/10/2020	Silty loam	
218525	TP40 0.10	22/10/2020	28/10/2020	Silty loam	
218526	TP50 0.10	21/10/2020	28/10/2020	Silty loam	
218527	TP50 0.20	21/10/2020	28/10/2020		
218528	WS2 0.40	22/10/2020	28/10/2020		
218529	WS3 0.50	22/10/2020	28/10/2020		
218530	WS4 0.35	22/10/2020	28/10/2020	Silty loam	
218531	WS10 0.50	22/10/2020	28/10/2020	Silty loam	
218532	WS11 0.30	22/10/2020	28/10/2020	Silty loam	
218533	HP15 0.20	23/10/2020	28/10/2020	Silty loam	
218534	HP16 0.20	23/10/2020	28/10/2020	Silty loam	
218535	TP1 0.10	23/10/2020	28/10/2020		
218536	TP1 0.30	23/10/2020	28/10/2020	Silty clayey loam	
218537	TP4 0.10	23/10/2020	28/10/2020	Silty loam	
218538	TP4 0.30	23/10/2020	28/10/2020		
218539	TP7 0.10	23/10/2020	28/10/2020		
218540	TP7 0.50	23/10/2020	28/10/2020	Silty loam	
218541	TP8 0.10	23/10/2020	28/10/2020	Silty loam	
218542	TP8 0.40	23/10/2020	28/10/2020		
218543	TP12 0.10	23/10/2020	28/10/2020	Silty loam	
218544	TP12 0.30	23/10/2020	28/10/2020		
218545	TP30 0.05	23/10/2020	28/10/2020	Silty loam	
218546	TP30 0.40	23/10/2020	28/10/2020		
218547	TP42 0.05	23/10/2020	28/10/2020		
218548	TP42 0.40	23/10/2020	28/10/2020	Silty loam	

Results Summary

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				ELAB Reference	218509	218511	218512	218514	218515
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP13	TP14	TP17	TP18	TP27
				Sample Depth (m)	0.05	0.40	0.20	0.50	0.10
				Sampling Date	22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0		None	None	None	None	None
Metals									
Arsenic	M	mg/kg	1		10.9	9.7	7.1	10.9	8.6
Cadmium	M	mg/kg	0.5		< 0.5	< 0.5	0.9	< 0.5	< 0.5
Chromium	M	mg/kg	5		52.3	30.1	46.1	35.8	27.6
Copper	M	mg/kg	5		29.4	14.4	15.9	18.8	13.6
Lead	M	mg/kg	5		36.2	21.1	23.2	15.0	22.4
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		46.9	17.8	29.3	33.7	13.7
Selenium	M	mg/kg	1		< 1.0	< 1.0	1.1	< 1.0	< 1.0
Zinc	M	mg/kg	5		143	50.4	78.0	57.3	53.9
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1		6.4	6.9	7.3	7.5	6.3
Total Organic Carbon	N	%	0.01		4.3	1.3	1.5	0.43	1.6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		0.4	< 0.4	< 0.4	< 0.4	< 0.4

Results Summary

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ELAB Reference				218509	218511	218512	218514	218515
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP13	TP14	TP17	TP18	TP27
Sample Depth (m)				0.05	0.40	0.20	0.50	0.10
Sampling Date				22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t

Results Summary

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	ELAB Reference	218516	218518	218520	218521	218522
	Customer Reference					
	Sample ID					
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP31	TP35	TP36	TP36	TP37
	Sample Depth (m)	0.10	0.10	0.10	0.30	0.05
	Sampling Date	22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Determinand	**Codes** / **Units** / **LOD**					
Soil sample preparation parameters						
Material removed	N / % / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Description of Inert material removed	N / / 0	None	None	n/t	None	None
Metals						
Arsenic	M / mg/kg / 1	11.9	12.7	n/t	8.9	11.7
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Chromium	M / mg/kg / 5	29.3	33.5	n/t	35.5	31.1
Copper	M / mg/kg / 5	23.4	30.9	n/t	16.5	19.5
Lead	M / mg/kg / 5	26.0	25.9	n/t	27.3	44.4
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	n/t	< 0.5	< 0.5
Nickel	M / mg/kg / 5	15.5	15.5	n/t	15.3	16.3
Selenium	M / mg/kg / 1	< 1.0	< 1.0	n/t	< 1.0	< 1.0
Zinc	M / mg/kg / 5	97.8	88.1	n/t	60.9	76.6
Inorganics						
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	n/t	< 0.8	< 0.8
Miscellaneous						
pH	M / pH units / 0.1	5.8	6.2	n/t	6.9	6.4
Total Organic Carbon	N / % / 0.01	4.4	3.0	n/t	1.9	2.3
Polyaromatic hydrocarbons						
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.2	0.2	n/t	0.2	0.3
Pyrene	M / mg/kg / 0.1	0.2	0.2	n/t	0.2	0.3
Benzo(a)anthracene	M / mg/kg / 0.1	0.1	0.1	n/t	0.1	0.2
Chrysene	M / mg/kg / 0.1	0.2	0.1	n/t	0.1	0.2
Benzo(b)fluoranthene	M / mg/kg / 0.1	0.3	0.3	n/t	0.2	0.2
Benzo(k)fluoranthene	M / mg/kg / 0.1	0.2	0.2	n/t	0.2	0.1
Benzo(a)pyrene	M / mg/kg / 0.1	0.1	0.1	n/t	< 0.1	0.1
Indeno(1,2,3-cd)pyrene	M / mg/kg / 0.1	0.1	< 0.1	n/t	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	n/t	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	0.1	0.1	n/t	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.8	1.5	n/t	1.2	1.7

Results Summary

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ELAB Reference				218516	218518	218520	218521	218522
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP31	TP35	TP36	TP36	TP37
Sample Depth (m)				0.10	0.10	0.10	0.30	0.05
Sampling Date				22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	< 100	n/t	n/t

Results Summary

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	ELAB Reference	218524	218525	218526	218530	218531
	Customer Reference					
	Sample ID					
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP39	TP40	TP50	WS4	WS10
	Sample Depth (m)	0.10	0.10	0.10	0.35	0.50
	Sampling Date	22/10/2020	22/10/2020	21/10/2020	22/10/2020	22/10/2020
Determinand	**Codes** / **Units** / **LOD**					
Soil sample preparation parameters						
Material removed	N / % / 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N / / 0	None	n/t	None	None	None
Metals						
Arsenic	M / mg/kg / 1	8.8	n/t	9.4	11.0	8.8
Cadmium	M / mg/kg / 0.5	< 0.5	n/t	< 0.5	0.5	< 0.5
Chromium	M / mg/kg / 5	24.4	n/t	27.8	33.6	27.5
Copper	M / mg/kg / 5	16.6	n/t	20.1	29.7	13.2
Lead	M / mg/kg / 5	21.6	n/t	30.2	37.9	12.8
Mercury	M / mg/kg / 0.5	< 0.5	n/t	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	13.3	n/t	14.1	18.8	14.8
Selenium	M / mg/kg / 1	< 1.0	n/t	< 1.0	< 1.0	< 1.0
Zinc	M / mg/kg / 5	50.5	n/t	60.2	105	48.2
Inorganics						
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8
Miscellaneous						
pH	M / pH units / 0.1	6.4	n/t	6.3	7.1	7.1
Total Organic Carbon	N / % / 0.01	1.1	n/t	1.7	3.2	0.57
Polyaromatic hydrocarbons						
Naphthalene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	0.2	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	0.7	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	1.0	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	0.6	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	n/t	0.2	4.7	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	n/t	0.1	4.2	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	3.4	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	3.8	< 0.1
Benzo(b)fluoranthene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	3.5	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	3.9	< 0.1
Benzo(a)pyrene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	4.0	< 0.1
Indeno(1,2,3-cd)pyrene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	2.9	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	0.7	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	n/t	< 0.1	2.4	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	n/t	0.9	36.2	< 0.4

Results Summary

Report No.: 20-30590, issue number 1

ELAB Reference				218524	218525	218526	218530	218531
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP39	TP40	TP50	WS4	WS10
Sample Depth (m)				0.10	0.10	0.10	0.35	0.50
Sampling Date				22/10/2020	22/10/2020	21/10/2020	22/10/2020	22/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	< 100	n/t	n/t	n/t

Results Summary

Report No.: 20-30590, issue number 1

				ELAB Reference	218532	218533	218534	218536	218537
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS11	HP15	HP16	TP1	TP4
				Sample Depth (m)	0.30	0.20	0.20	0.30	0.10
				Sampling Date	22/10/2020	23/10/2020	23/10/2020	23/10/2020	23/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0		None	None	None	None	None
Metals									
Arsenic	M	mg/kg	1		11.2	9.0	10.0	17.7	10.9
Cadmium	M	mg/kg	0.5		< 0.5	1.1	1.1	< 0.5	< 0.5
Chromium	M	mg/kg	5		34.2	29.3	28.6	33.1	29.8
Copper	M	mg/kg	5		16.2	55.2	58.0	16.4	15.4
Lead	M	mg/kg	5		84.8	130	142	17.1	27.5
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		17.6	23.6	24.3	15.8	14.4
Selenium	M	mg/kg	1		< 1.0	< 1.0	1.1	< 1.0	< 1.0
Zinc	M	mg/kg	5		61.4	341	360	48.0	54.7
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1		5.8	7.5	7.6	7.3	6.3
Total Organic Carbon	N	%	0.01		2.3	5.4	5.8	0.51	3.3
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1		< 0.1	0.2	0.3	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	0.7	0.7	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	0.2	0.4	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	0.2	0.4	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	3.2	4.8	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	1.0	1.4	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		< 0.1	11.8	12.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		< 0.1	10.9	10.6	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	7.3	7.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	8.5	7.7	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	9.0	7.5	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	8.1	7.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	8.9	7.8	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	8.8	7.0	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	2.0	1.4	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	8.1	6.4	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		< 0.4	88.9	82.7	< 0.4	< 0.4

Results Summary

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				ELAB Reference	218532	218533	218534	218536	218537
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	WS11	HP15	HP16	TP1	TP4
				Sample Depth (m)	0.30	0.20	0.20	0.30	0.10
				Sampling Date	22/10/2020	23/10/2020	23/10/2020	23/10/2020	23/10/2020
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	

Results Summary

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	ELAB Reference	218540	218541	218543	218545	218548
	Customer Reference					
	Sample ID					
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP7	TP8	TP12	TP30	TP42
	Sample Depth (m)	0.50	0.10	0.10	0.05	0.40
	Sampling Date	23/10/2020	23/10/2020	23/10/2020	23/10/2020	23/10/2020
Determinand	**Codes** / **Units** / **LOD**					
Soil sample preparation parameters						
Material removed	N / % / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N / / 0	None	None	None	None	None
Metals						
Arsenic	M / mg/kg / 1	14.5	10.2	8.7	8.1	11.8
Cadmium	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	33.2	27.5	24.1	26.4	32.8
Copper	M / mg/kg / 5	15.6	13.6	12.3	18.1	18.7
Lead	M / mg/kg / 5	16.1	31.3	104	29.0	13.6
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	31.1	15.4	12.9	12.1	28.4
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M / mg/kg / 5	52.8	56.7	49.4	63.2	52.1
Inorganics						
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous						
pH	M / pH units / 0.1	8.0	6.2	6.2	6.1	7.3
Total Organic Carbon	N / % / 0.01	0.35	3.5	2.8	2.9	0.43
Polyaromatic hydrocarbons						
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Chrysene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Benzo(b)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Benzo(a)pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Indeno(1,2,3-cd)pyrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	< 0.4	< 0.4	< 0.4	2.4	< 0.4

Tests marked N are not UKAS accredited.

Results Summary

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ELAB Reference				218540	218541	218543	218545	218548
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP7	TP8	TP12	TP30	TP42
Sample Depth (m)				0.50	0.10	0.10	0.05	0.40
Sampling Date				23/10/2020	23/10/2020	23/10/2020	23/10/2020	23/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t

Results Summary

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			ELAB Reference	218520	218525
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	TP36	TP40
			Sample Depth (m)	0.10	0.10
			Sampling Date	22/10/2020	22/10/2020
Determinand	**Codes**	**Units**	**LOD**		
SVOCTIC					
Acid Herbicide Screen	N	mg/kg	0.01	None Detected	None Detected

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: [redacted]

Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
218509	0.05	TP13	Brown Sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218511	0.40	TP14	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218512	0.20	TP17	Brown Soil	No asbestos detected	n/t	n/t	n/t	n/t
218514	0.50	TP18	Brown Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218515	0.10	TP27	Brown Sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218516	0.10	TP31	Brown Sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218518	0.10	TP35	Brown sandy Soil,Stones,Root	No asbestos detected	n/t	n/t	n/t	n/t
218521	0.30	TP36	Brown Sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218522	0.05	TP37	Brown Sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218524	0.10	TP39	Brown Sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218526	0.10	TP50	Brown sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218530	0.35	WS4	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218531	0.50	WS10	Brown sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218532	0.30	WS11	Brown Sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218533	0.20	HP15	Brown Sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218534	0.20	HP16	Brown Sandy Soil	No asbestos detected	n/t	n/t	n/t	n/t
218536	0.30	TP1	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218537	0.10	TP4	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218540	0.50	TP7	Brown sandy Soil,Stones	No asbestos detected	n/t	n/t	n/t	n/t
218541	0.10	TP8	Brown sandy Soil,Root	No asbestos detected	n/t	n/t	n/t	n/t
218543	0.10	TP12	Brown Soil, Stones, Plant	No asbestos detected	n/t	n/t	n/t	n/t
218545	0.05	TP30	Brown Soil, Stones, Plant	No asbestos detected	n/t	n/t	n/t	n/t
218548	0.40	TP42	Brown Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

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Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	29/10/2020	110	Colorimetry
pH	M	Air dried sample	30/10/2020	113	Electromeric
PAH (GC-FID)	M	As submitted sample	29/10/2020	133	GC-FID
SVOC in solids	N	As submitted sample	29/10/2020	167	GC-MS
Organochlorine Pesticides in solids	M	As submitted sample	29/10/2020	173	GC-MS
Organophosphorus Pesticides in solids	N	As submitted sample	29/10/2020	173	GC-MS
Total organic carbon/Total sulphur	N	Air dried sample	30/10/2020	210	IR
Asbestos identification	U	Air dried sample	03/11/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	29/10/2020	300	ICPMS

Tests marked N are not UKAS accredited

Report Information

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Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
[redacted]
[redacted]
[redacted]

UKAS TESTING 2683

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	20-30539
Issue:	1
Date of Issue:	30/10/2020
Contact:	Martin Weil
Customer Details:	Leap Environmental Ltd The Atrium Curtis Road Dorking SurrevRH4 1X4
Quotation No:	Q14-00063
Order No:	LPO2748
Customer Reference:	LP2356
Date Received:	23/10/2020
Date Approved:	30/10/2020
Details:	Tars Farm Barnham
Approved by:	[redacted]

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 20-30539, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
218167	TP02 0.30	19/10/2020	23/10/2020	Silty loam	
218168	TP05 0.10	19/10/2020	23/10/2020	Silty loam	
218169	TP05 0.35	19/10/2020	23/10/2020		
218170	TP06 0.10	19/10/2020	23/10/2020		
218171	TP06 0.30	19/10/2020	23/10/2020	Silty loam	
218172	TP09 0.10	19/10/2020	23/10/2020	Silty loam	
218173	TP09 0.25	19/10/2020	23/10/2020		
218174	TP10 0.10	19/10/2020	23/10/2020		
218175	TP10 0.30	19/10/2020	23/10/2020	Silty loam	
218176	TP21 0.05	19/10/2020	23/10/2020	Silty loam	
218177	TP21 0.10	19/10/2020	23/10/2020		
218178	TP21 0.30	19/10/2020	23/10/2020		
218179	TP22 0.10	19/10/2020	23/10/2020		
218180	TP22 0.30	19/10/2020	23/10/2020	Silty loam	
218181	TP23 0.10	19/10/2020	23/10/2020	Silty loam	
218182	TP23 0.30	19/10/2020	23/10/2020		
218183	TP24 0.10	19/10/2020	23/10/2020		
218184	TP24 0.30	19/10/2020	23/10/2020	Silty loam	
218185	TP25 0.10	19/10/2020	23/10/2020		
218186	TP25 0.30	19/10/2020	23/10/2020	Silty loam	
218187	TP29 0.10	20/10/2020	23/10/2020	Silty loam	
218188	TP29 0.30	20/10/2020	23/10/2020	Silty loam	
218189	TP32 0.05	20/10/2020	23/10/2020		
218190	TP32 0.20	20/10/2020	23/10/2020	Silty loam	
218191	TP33 0.05	20/10/2020	23/10/2020		
218192	TP33 0.20	20/10/2020	23/10/2020	Silty loam	
218193	TP34a 0.10	20/10/2020	23/10/2020		
218194	TP34a 0.30	20/10/2020	23/10/2020	Silty loam	
218195	TP34 0.70	20/10/2020	23/10/2020		
218196	TP41 0.10	19/10/2020	23/10/2020		
218197	TP41 0.30	19/10/2020	23/10/2020	Silty loam	
218198	TP44 0.10	20/10/2020	23/10/2020	Silty loam	
218199	TP44 0.20	20/10/2020	23/10/2020		
218200	TP45 0.10	20/10/2020	23/10/2020		
218201	TP45 0.30	20/10/2020	23/10/2020	Silty loam	
218202	TP46 0.10	20/10/2020	23/10/2020	Silty loam	
218203	TP46 0.30	20/10/2020	23/10/2020		
218204	TP47 0.10	20/10/2020	23/10/2020		
218205	TP47 0.50	20/10/2020	23/10/2020	Silty loam	
218206	TP48 0.05	20/10/2020	23/10/2020	Silty loam	
218207	TP48 0.20	20/10/2020	23/10/2020		
218208	TP38 0.05	20/10/2020	23/10/2020		
218209	TP38 0.20	20/10/2020	23/10/2020	Silty loam	
218210	TP3 0.10	21/10/2020	23/10/2020		
218211	TP3 0.30	21/10/2020	23/10/2020	Silty loam	
218212	TP19 0.05	21/10/2020	23/10/2020	Silty loam	
218213	TP19 0.30	21/10/2020	23/10/2020		
218214	TP20 0.10	21/10/2020	23/10/2020		
218215	TP20 0.30	21/10/2020	23/10/2020	Silty loam	
218216	TP26 0.10	21/10/2020	23/10/2020	Silty loam	
218217	TP26 0.40	21/10/2020	23/10/2020		
218218	TP28 0.05	21/10/2020	23/10/2020		
218219	TP28 0.30	21/10/2020	23/10/2020	Silty loam	
218220	TP43 0.10	21/10/2020	23/10/2020		
218221	TP43 0.30	21/10/2020	23/10/2020	Silty loam	
218222	TP49 0.10	21/10/2020	23/10/2020		
218223	TP49 0.30	21/10/2020	23/10/2020	Silty loam	
218224	TP50 0.10	21/10/2020	23/10/2020		
218225	TP50 0.20	21/10/2020	23/10/2020	Silty loam	
218226	WS1 0.20	21/10/2020	23/10/2020		
218227	WS1 1.00	21/10/2020	23/10/2020		
218228	WS5 0.20	21/10/2020	23/10/2020	Silty loam	
218229	WS5 1.50	21/10/2020	23/10/2020		
218230	WS6 0.30	21/10/2020	23/10/2020	Silty loam	

Sample Summary

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Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
218231	WS7 0.20	21/10/2020	23/10/2020		
218232	WS7 0.40	21/10/2020	23/10/2020		
218233	WS8 0.10	21/10/2020	23/10/2020		
218234	WS8 0.20	21/10/2020	23/10/2020	Sand	
218235	WS9 0.10	21/10/2020	23/10/2020		
218236	WS9 0.50	21/10/2020	23/10/2020		
218237	TP2 0.10	19/10/2020	23/10/2020		
218238	TP21 0.20	19/10/2020	23/10/2020		

Results Summary

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				ELAB Reference	218167	218168	218171	218172	218175
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP02	TP05	TP06	TP09	TP10
				Sample Depth (m)	0.30	0.10	0.30	0.10	0.30
				Sampling Date	19/10/2020	19/10/2020	19/10/2020	19/10/2020	19/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0		None	None	None	None	None
Metals									
Arsenic	M	mg/kg	1		11.7	9.5	9.1	9.6	8.5
Cadmium	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		39.4	38.5	31.5	34.3	41.4
Copper	M	mg/kg	5		19.2	16.4	16.3	17.9	16.0
Lead	M	mg/kg	5		22.2	30.1	20.1	31.5	17.2
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		24.2	16.2	14.8	14.5	16.3
Selenium	M	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5		56.4	61.2	47.4	57.4	46.7
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1		7.5	6.3	6.7	6.5	6.7
Total Organic Carbon	N	%	0.01		1.3	2.2	1.4	1.3	1.1
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		0.2	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		0.5	< 0.4	< 0.4	< 0.4	< 0.4

Results Summary

Report No.: 20-30539, issue number 1

ELAB Reference				218167	218168	218171	218172	218175
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP02	TP05	TP06	TP09	TP10
Sample Depth (m)				0.30	0.10	0.30	0.10	0.30
Sampling Date				19/10/2020	19/10/2020	19/10/2020	19/10/2020	19/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t

Results Summary

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			ELAB Reference	218176	218180	218181	218184	218186
			Customer Reference					
			Sample ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP21	TP22	TP23	TP24	TP25
			Sample Depth (m)	0.05	0.30	0.10	0.30	0.30
			Sampling Date	19/10/2020	19/10/2020	19/10/2020	19/10/2020	19/10/2020
Determinand	**Codes**	**Units**	**LOD**					
Soil sample preparation parameters								
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None
Metals								
Arsenic	M	mg/kg	1	8.7	8.5	9.5	14.0	8.9
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	39.0	30.3	29.9	34.5	27.0
Copper	M	mg/kg	5	15.4	12.5	17.0	20.5	15.9
Lead	M	mg/kg	5	41.4	14.6	26.0	37.0	28.5
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	16.5	16.4	14.9	19.6	14.1
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	65.0	50.9	50.8	89.1	54.3
Inorganics								
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous								
pH	M	pH units	0.1	5.9	6.7	6.0	6.2	6.7
Total Organic Carbon	N	%	0.01	2.9	0.53	2.6	1.6	1.3
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.1	< 0.1	0.2	< 0.1	0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.6	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	2.7	< 0.4	0.4

Results Summary

Report No.: 20-30539, issue number 1

ELAB Reference				218176	218180	218181	218184	218186
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP21	TP22	TP23	TP24	TP25
Sample Depth (m)				0.05	0.30	0.10	0.30	0.30
Sampling Date				19/10/2020	19/10/2020	19/10/2020	19/10/2020	19/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 20-30539, issue number 1

				ELAB Reference	218187	218188	218190	218192	218194
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP29	TP29	TP32	TP33	TP34a
				Sample Depth (m)	0.10	0.30	0.20	0.20	0.30
				Sampling Date	20/10/2020	20/10/2020	20/10/2020	20/10/2020	20/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1	n/t	18.4	14.6	< 0.1	11.5
Description of Inert material removed	N		0	n/t	Stones	Stones	None	Stones
Metals									
Arsenic	M	mg/kg	1	n/t	13.0	8.5	22.1	9.8
Cadmium	M	mg/kg	0.5	n/t	< 0.5	< 0.5	0.5	< 0.5
Chromium	M	mg/kg	5	n/t	33.0	19.9	36.3	33.2
Copper	M	mg/kg	5	n/t	43.4	22.8	42.0	19.9
Lead	M	mg/kg	5	n/t	34.0	39.4	212	26.3
Mercury	M	mg/kg	0.5	n/t	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	n/t	19.9	13.0	26.8	18.6
Selenium	M	mg/kg	1	n/t	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	n/t	80.9	179	417	76.3
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	n/t	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1	n/t	6.8	6.3	7.6	7.3
Total Organic Carbon	N	%	0.01	n/t	2.4	2.2	2.9	1.6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	n/t	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	n/t	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	n/t	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	n/t	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	n/t	0.5	0.2	0.5	< 0.1
Anthracene	M	mg/kg	0.1	n/t	0.1	< 0.1	0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	n/t	1.2	0.5	1.7	< 0.1
Pyrene	M	mg/kg	0.1	n/t	1.0	0.5	1.6	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	n/t	0.8	0.2	0.9	< 0.1
Chrysene	M	mg/kg	0.1	n/t	0.8	0.3	1.0	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	n/t	0.8	0.3	1.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	n/t	1.0	0.4	1.2	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	n/t	0.9	0.3	1.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	n/t	0.6	0.2	0.9	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	n/t	0.1	< 0.1	0.2	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	n/t	0.5	0.2	0.8	< 0.1
Total PAH(16)	M	mg/kg	0.4	n/t	8.4	3.1	11.5	< 0.4

Results Summary

Report No.: 20-30539, issue number 1

				ELAB Reference	218187	218188	218190	218192	218194
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP29	TP29	TP32	TP33	TP34a
				Sample Depth (m)	0.10	0.30	0.20	0.20	0.30
				Sampling Date	20/10/2020	20/10/2020	20/10/2020	20/10/2020	20/10/2020
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	< 10	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	< 100	n/t	n/t	n/t	n/t

Results Summary

Report No.: 20-30539, issue number 1

				ELAB Reference	218197	218198	218201	218202	218205
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP41	TP44	TP45	TP46	TP47
				Sample Depth (m)	0.30	0.10	0.30	0.10	0.50
				Sampling Date	19/10/2020	20/10/2020	20/10/2020	20/10/2020	20/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1		25.8	< 0.1	28.2	22.6	< 0.1
Description of Inert material removed	N		0		Stones	None	Stones	Stones	None
Metals									
Arsenic	M	mg/kg	1		9.7	10.3	12.8	11.9	^ 9.4
Cadmium	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	^ 0.6
Chromium	M	mg/kg	5		33.4	32.4	34.7	33.7	^ 26.1
Copper	M	mg/kg	5		19.5	25.4	30.4	27.5	^ 19.3
Lead	M	mg/kg	5		24.5	28.9	34.4	34.3	^ 13.0
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	^ < 0.5
Nickel	M	mg/kg	5		17.2	16.2	23.9	17.9	^ 28.0
Selenium	M	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	^ < 1.0
Zinc	M	mg/kg	5		60.9	97.4	84.2	101	^ 46.8
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1		7.0	6.8	7.2	6.8	^ 7.9
Total Organic Carbon	N	%	0.01		1.2	3.2	2.2	2.9	0.50
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1	^ < 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.3	^ < 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	^ < 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	0.4	0.5	0.7	^ < 0.1
Anthracene	M	mg/kg	0.1		< 0.1	0.1	0.3	0.3	^ < 0.1
Fluoranthene	M	mg/kg	0.1		< 0.1	0.9	2.0	3.2	^ < 0.1
Pyrene	M	mg/kg	0.1		< 0.1	0.7	1.9	3.1	^ < 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	0.5	1.5	2.5	^ < 0.1
Chrysene	M	mg/kg	0.1		< 0.1	0.5	1.7	2.9	^ < 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	0.4	1.8	3.0	^ < 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	0.5	1.8	2.9	^ < 0.1
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	0.4	1.9	3.1	^ < 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	0.3	1.6	2.5	^ < 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	0.4	0.6	^ < 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	0.2	1.4	2.2	^ < 0.1
Total PAH(16)	M	mg/kg	0.4		< 0.4	5.0	17.2	27.4	^ < 0.4

Results Summary

Report No.: 20-30539, issue number 1

				ELAB Reference	218197	218198	218201	218202	218205
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP41	TP44	TP45	TP46	TP47
				Sample Depth (m)	0.30	0.10	0.30	0.10	0.50
				Sampling Date	19/10/2020	20/10/2020	20/10/2020	20/10/2020	20/10/2020
Determinand	**Codes**	**Units**	**LOD**						
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	
OrganoPhosphorus Pesticides									
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t	

Results Summary

Report No.: 20-30539, issue number 1

	ELAB Reference	218206	218209	218211	218212	218215
	Customer Reference					
	Sample ID					
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	TP48	TP38	TP3	TP19	TP20
	Sample Depth (m)	0.05	0.20	0.30	0.05	0.30
	Sampling Date	20/10/2020	20/10/2020	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes** / **Units** / **LOD**					
Soil sample preparation parameters						
Material removed	N / % / 0.1	< 0.1	22.4	43.3	9.6	16.6
Description of Inert material removed	N / / 0	None	Stones	Stones	Stones	Stones
Metals						
Arsenic	M / mg/kg / 1	8.7	14.6	11.4	9.1	9.7
Cadmium	M / mg/kg / 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5
Chromium	M / mg/kg / 5	27.1	44.4	29.1	32.8	30.7
Copper	M / mg/kg / 5	30.1	22.0	17.8	17.2	20.4
Lead	M / mg/kg / 5	32.8	19.2	19.1	22.2	22.0
Mercury	M / mg/kg / 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M / mg/kg / 5	15.3	53.5	16.9	15.3	16.7
Selenium	M / mg/kg / 1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M / mg/kg / 5	66.8	78.3	47.2	60.2	67.7
Inorganics						
Hexavalent Chromium	N / mg/kg / 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous						
pH	M / pH units / 0.1	7.1	7.9	7.5	6.4	6.6
Total Organic Carbon	N / % / 0.01	2.2	0.47	1.2	2.3	1.6
Polyaromatic hydrocarbons						
Naphthalene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M / mg/kg / 0.1	0.3	< 0.1	< 0.1	0.2	< 0.1
Pyrene	M / mg/kg / 0.1	0.3	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	M / mg/kg / 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Chrysene	M / mg/kg / 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Benzo(b)fluoranthene	M / mg/kg / 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Benzo(k)fluoranthene	M / mg/kg / 0.1	0.3	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)pyrene	M / mg/kg / 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M / mg/kg / 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M / mg/kg / 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M / mg/kg / 0.4	1.9	< 0.4	< 0.4	1.1	< 0.4

Tests marked N are not UKAS accredited.

Results Summary

Report No.: 20-30539, issue number 1

ELAB Reference				218206	218209	218211	218212	218215
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP48	TP38	TP3	TP19	TP20
Sample Depth (m)				0.05	0.20	0.30	0.05	0.30
Sampling Date				20/10/2020	20/10/2020	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	< 10	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	< 100	n/t

Results Summary

Report No.: 20-30539, issue number 1

				ELAB Reference	218216	218219	218221	218223	218225
				Customer Reference					
				Sample ID					
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP26	TP28	TP43	TP49	TP50
				Sample Depth (m)	0.10	0.30	0.30	0.30	0.20
				Sampling Date	21/10/2020	21/10/2020	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**						
Soil sample preparation parameters									
Material removed	N	%	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0		Nonje	Nonje	Nonje	Nonje	Nonje
Metals									
Arsenic	M	mg/kg	1		9.7	8.5	8.3	8.5	9.6
Cadmium	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5		29.2	29.2	26.6	25.8	26.6
Copper	M	mg/kg	5		25.2	19.7	17.6	20.0	23.6
Lead	M	mg/kg	5		31.0	22.0	13.9	23.5	25.4
Mercury	M	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5		14.9	18.6	15.7	14.1	15.5
Selenium	M	mg/kg	1		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5		59.8	58.1	52.2	63.3	62.0
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous									
pH	M	pH units	0.1		7.0	6.8	6.4	6.4	6.7
Total Organic Carbon	N	%	0.01		1.6	1.1	0.73	1.7	1.4
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1	< 0.1
Phenanthrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.2	< 0.1
Anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	0.1	0.3	0.1
Pyrene	M	mg/kg	0.1		< 0.1	< 0.1	0.1	0.3	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1	< 0.1
Chrysene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4		< 0.4	< 0.4	0.4	1.9	0.4

Results Summary

Report No.: 20-30539, issue number 1

ELAB Reference				218216	218219	218221	218223	218225
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP26	TP28	TP43	TP49	TP50
Sample Depth (m)				0.10	0.30	0.30	0.30	0.20
Sampling Date				21/10/2020	21/10/2020	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**					
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t
OrganoPhosphorus Pesticides								
Acephate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Chlorpyrifos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dichlorvos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Dimethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Ethion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Malathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Mathidathion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Methamidophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Omethoate	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Profenofos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Pyrazophos	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tokuthion	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	n/t	n/t	n/t

Results Summary

Report No.: 20-30539, issue number 1

			ELAB Reference	218228	218230	218234
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	WS5	WS6	WS8
			Sample Depth (m)	0.20	0.30	0.20
			Sampling Date	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**			
Soil sample preparation parameters						
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	Nonje	Nonje	Nonje
Metals						
Arsenic	M	mg/kg	1	10.4	19.1	17.5
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	30.5	25.9	26.4
Copper	M	mg/kg	5	29.0	29.8	10.3
Lead	M	mg/kg	5	24.3	133	14.9
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	14.4	17.9	16.1
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	62.6	267	33.3
Inorganics						
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Miscellaneous						
pH	M	pH units	0.1	6.8	7.1	8.9
Total Organic Carbon	N	%	0.01	1.7	3.2	0.17
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	0.2	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	0.2	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	1.0	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	0.8	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.7	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.5	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	0.6	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.4	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	6.6	< 0.4

Results Summary

Report No.: 20-30539, issue number 1

			ELAB Reference	218228	218230	218234
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	WS5	WS6	WS8
			Sample Depth (m)	0.20	0.30	0.20
			Sampling Date	21/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**			
OrganoChlorine Pesticides						
alpha-HCH	M	ug/kg	10	n/t	n/t	< 10
beta_HCH	M	ug/kg	10	n/t	n/t	< 10
gamma-HCH	M	ug/kg	10	n/t	n/t	< 10
delta-HCH	N	ug/kg	10	n/t	n/t	< 10
Heptachlor	N	ug/kg	10	n/t	n/t	< 10
Aldrin	M	ug/kg	10	n/t	n/t	< 10
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	< 10
trans-Chlordane	N	ug/kg	10	n/t	n/t	< 10
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	< 10
p,p-DDE	M	ug/kg	10	n/t	n/t	< 10
Dieldrin	M	ug/kg	10	n/t	n/t	< 10
Endrin	N	ug/kg	10	n/t	n/t	< 10
p,p-DDD	M	ug/kg	10	n/t	n/t	< 10
Endosulfan II	N	ug/kg	10	n/t	n/t	< 10
Endrin aldehyde	N	ug/kg	10	n/t	n/t	< 10
p,p-DDT	M	ug/kg	10	n/t	n/t	< 10
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	< 10
Methoxychlor	N	ug/kg	10	n/t	n/t	< 10
Endrin ketone	N	ug/kg	10	n/t	n/t	< 10
OrganoPhosphorus Pesticides						
Acephate	N	ug/kg	100	n/t	n/t	< 100
Aziniphos-methyl	N	ug/kg	100	n/t	n/t	< 100
Chlorpyrifos	N	ug/kg	100	n/t	n/t	< 100
Demeton-s-methyl	N	ug/kg	100	n/t	n/t	< 100
Dichlorvos	N	ug/kg	100	n/t	n/t	< 100
Dimethoate	N	ug/kg	100	n/t	n/t	< 100
Ethion	N	ug/kg	100	n/t	n/t	< 100
Malathion	N	ug/kg	100	n/t	n/t	< 100
Mathidathion	N	ug/kg	100	n/t	n/t	< 100
Methamidophos	N	ug/kg	100	n/t	n/t	< 100
Omethoate	N	ug/kg	100	n/t	n/t	< 100
Pirimifos-methyl	N	ug/kg	100	n/t	n/t	< 100
Profenofos	N	ug/kg	100	n/t	n/t	< 100
Pyrazophos	N	ug/kg	100	n/t	n/t	< 100
Tokuthion	N	ug/kg	100	n/t	n/t	< 100
Tolclofos-methyl	N	ug/kg	100	n/t	n/t	< 100

Results Summary

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			ELAB Reference	218172	218187	218212	218234
			Customer Reference				
			Sample ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP09	TP29	TP19	WS8
			Sample Depth (m)	0.10	0.10	0.05	0.20
			Sampling Date	19/10/2020	20/10/2020	21/10/2020	21/10/2020
Determinand	**Codes**	**Units**	**LOD**				
SVOCTIC							
Herbicide Screen	N	mg/kg	0.01	None Detected	None Detected	None Detected	None Detected
TIC							

Tests marked N are not UKAS accredited.

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: [redacted]

Results Summary

Report No.: 20-30539, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
218167	0.30	TP02	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218168	0.10	TP05	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218171	0.30	TP06	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218172	0.10	TP09	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218175	0.30	TP10	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218176	0.05	TP21	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218180	0.30	TP22	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218181	0.10	TP23	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218184	0.30	TP24	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218186	0.30	TP25	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218188	0.30	TP29	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218190	0.20	TP32	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218192	0.20	TP33	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218194	0.30	TP34a	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218197	0.30	TP41	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218198	0.10	TP44	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218201	0.30	TP45	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218202	0.10	TP46	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218205	0.50	TP47	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218206	0.05	TP48	Brown soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
218209	0.20	TP38	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218211	0.30	TP3	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218212	0.05	TP19	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218215	0.30	TP20	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218216	0.10	TP26	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218219	0.30	TP28	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218221	0.30	TP43	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218223	0.30	TP49	Brown Soil, Stones, Clinker, Plant Material	No asbestos detected	n/t	n/t	n/t	n/t
218225	0.20	TP50	Brown Soil, Stones, Clinker, Plant Material	No asbestos detected	n/t	n/t	n/t	n/t
218228	0.20	WS5	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: [redacted]

Results Summary

Report No.: 20-30539, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
218230	0.30	WS6	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
218234	0.20	WS8	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 20-30539, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	27/10/2020	110	Colorimetry
pH	M	Air dried sample	28/10/2020	113	Electromeric
PAH (GC-FID)	M	As submitted sample	27/10/2020	133	GC-FID
SVOC in solids	N	As submitted sample	27/10/2020	167	GC-MS
Organochlorine Pesticides in solids	M	As submitted sample	27/10/2020	173	GC-MS
Organophosphorus Pesticides in solids	N	As submitted sample	27/10/2020	173	GC-MS
Total organic carbon/Total sulphur	N	Air dried sample	28/10/2020	210	IR
Asbestos identification	U	Air dried sample	29/10/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	27/10/2020	300	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 20-30539, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

APPENDIX F – Geotechnical Laboratory Test Results

Geotechnical Laboratory
Test Results

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
TP06	1.00		D	Brown mottled orangish brown silty CLAY with rare gravel.	21.7	70	29	41	98										
TP06	1.70		B	Orangish brown and grey sandy silty CLAY with rare gravel.															Particle Size Distribution
TP08	1.20		B	Orangish brown and grey gravelly clayey silty SAND.															Particle Size Distribution
TP08	1.50		D	Brown mottled grey and orangish brown silty CLAY and covered in orangish brown fine sand with rare gravel.	29.6	73	29	44	99										
TP12	1.10		D	Brown mottled orangish brown and light grey silty CLAY with rare gravel.	23.2	57	24	33	99										
TP13	1.20		D	Brown mottled greyish brown and orangish brown silty CLAY with rare gravel.	23.3	70	27	43	99										
TP13	2.40		D																Chemical
TP18	1.00		D	Brown mottled light grey and orangish brown silty CLAY with rare gravel.	27.4	63	25	38	99										
TP19	2.10		D																Chemical
TP22	1.00		D	Orangish brown mottled light grey and dark brown silty CLAY with rare rootlets.	13.9	48	22	26	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

[redacted]

S Burke - Senior Technician
04/12/2020

Project Number:

GEO / 32085

Project Name:

TARS FARM, BARNHAM
LP2356

GEOLABS®

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
TP23	1.00		D	Orangish brown and brown silty CLAY with rare rootlets.	24.5	62	22	40	99										
TP23	1.50		D	Orangish brown mottled grey clayey silty SAND and GRAVEL.															Particle Size Distribution
TP23	2.30		B	Orangish brown and light grey silty CLAY.	29.1	44	22	22	99										
TP24	0.50		B	Orangish brown slightly silty very gravelly SAND with one cobble.															Particle Size Distribution
TP25	1.20		D	Orangish brown and brown mottled grey silty CLAY with rare gravel.	29.3	67	26	41	98										Chemical
TP26	2.00		D	Brown silty CLAY covered in orangish brown fine sand with rare gravel.	32.7	72	28	44	99										
TP27	2.70		D	Greyish brown silty CLAY.	21.8	42	19	23	99										
TP29	1.10		B	Orangish brown silty gravelly SAND.															Particle Size Distribution
TP33	1.00		D	Greyish brown and orangish brown silty CLAY with rare gravel.	22.5	52	20	32	71										
TP36	1.10		D	Brown and orangish brown mottled light grey silty CLAY.	24.4	50	18	32	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

[redacted]

S Burke - Senior Technician
04/12/2020

Project Number:

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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
TP40	1.00		D	Orangish brown mottled dark brown silty CLAY with rare gravel.	26.4	48	18	30	99										
TP41	1.00		B	Orangish brown and brown silty CLAY with rare gravel and rare rootlets.	18.1	43	18	25	81										
TP42	1.20		B	Orangish brown mottled dark brown silty CLAY with rare gravel.	21.1	32	17	15	89										
TP42	2.50		B	Orangish brown mottled grey gravelly sandy silty CLAY.															Particle Size Distribution Chemical
TP43	2.60		D	Brown silty CLAY covered in orangish brown silty clay with rare gravel.	30.8	62	23	39	99										
TP44	2.00		D	Brown silty CLAY covered in orangish brown silty clay with rare gravel.	34.6	70	26	44	99										
TP45	1.20		D	Brown mottled light grey silty CLAY covered in orangish brown silty clay with rare gravel.	30.3	78	28	50	99										
TP45	3.00		D																Chemical
TP47	1.10		B	Yellowish brown gravelly silty SAND.															Particle Size Distribution
TP49	1.00		B	Orangish brown mottled dark brown silty CLAY with rare gravel.	16.8	36	19	17	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

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S Burke - Senior Technician
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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
TP50	1.00		B	Orangish brown and grey sandy clayey SILT.															Particle Size Distribution
WS01	2.00		D																Chemical
WS06	1.80		D	Brown mottled orangish brown and light grey silty CLAY.	30.9	54	20	34	99										
WS08	3.50		D																Chemical
WS10	1.80		D																Chemical
WS11	1.70		D	Brown and orangish brown silty CLAY.	25.3	54	20	34	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

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S Burke - Senior Technician
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Project Number:

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Project Name:

TARS FARM, BARNHAM
LP2356

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1131 - Chemical Test Summary - 32085.XLSM

SUMMARY OF CHEMICAL TESTS ON SOIL

Location	Depth m	Sample Ref	Sample Type	pH Value	Total Acid Soluble Sulphate as SO4 %	Water Soluble Sulphate as SO4 2:1 Water:Soil Extract g/l	Total Sulphur %	Water Soluble Chloride g/l	Water Soluble Nitrate g/l	Magnesium g/l	Organic Content %	Mass Loss on Ignition %	Carbonate Content %
TP13	2.40		D	8.7	0.022	< 0.010	0.017	-	-	-	-	-	-
TP19	2.10		D	8.5	0.010	< 0.010	0.012	-	-	-	-	-	-
TP25	1.20		D	8.5	0.023	< 0.010	0.011	-	-	-	-	-	-
TP42	2.50		BB	8.5	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-
TP45	3.00		D	8.0	0.14	0.58	0.48	-	-	-	-	-	-
WS01	2.00		D	8.1	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-
WS08	3.50		D	8.5	0.064	0.059	0.41	-	-	-	-	-	-
WS10	1.80		D	8.7	0.014	< 0.010	0.015	-	-	-	-	-	-

Tested by Chemtest Ltd : MCERTS / UKAS No 2183

Checked and Approved by:

[redacted]

S Burke - Senior Technician
27/11/2020

Project Number:

GEO / 32085

Project Name:

TARS FARM, BARNHAM
LP2356

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BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

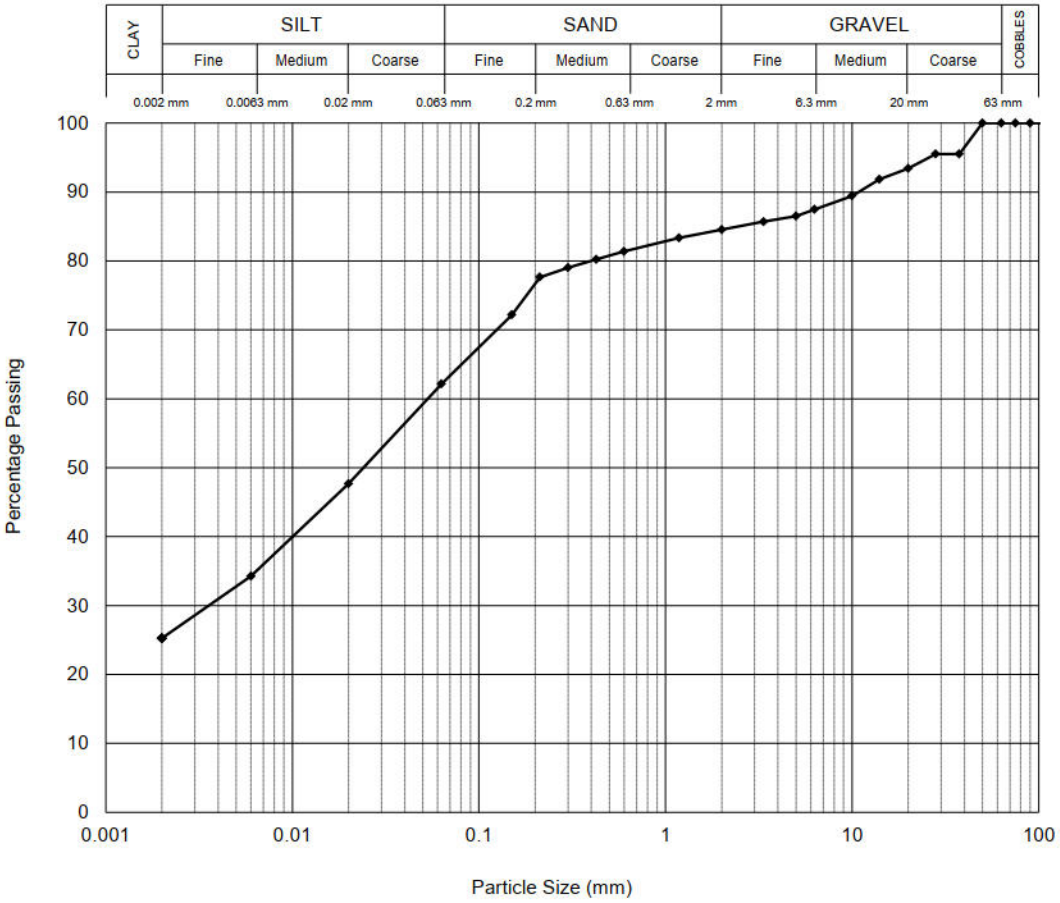
Location	TP06
Depth (m)	1.70
Sample Type	B

Description

Orangish brown and grey sandy silty CLAY with rare gravel.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	96
28.0 mm	96
20.0 mm	93
14.0 mm	92
10.0 mm	89
6.30 mm	88
5.00 mm	87
3.35 mm	86
2.00 mm	85
1.18 mm	83
600 µm	81
425 µm	80
300 µm	79
212 µm	78
150 µm	72
63 µm	62



Sedimentation	
No Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	48
6 µm	34
2 µm	25
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0.0
Gravel	15.5
Sand	22.4
Silt	36.9
Clay	25.2

Processed by CC
Checked and Approved by

[redacted]

S Burke - Senior Technician
27/11/2020

Project Number:

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Project Name:

TARS FARM, BARNHAM
LP2356

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UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

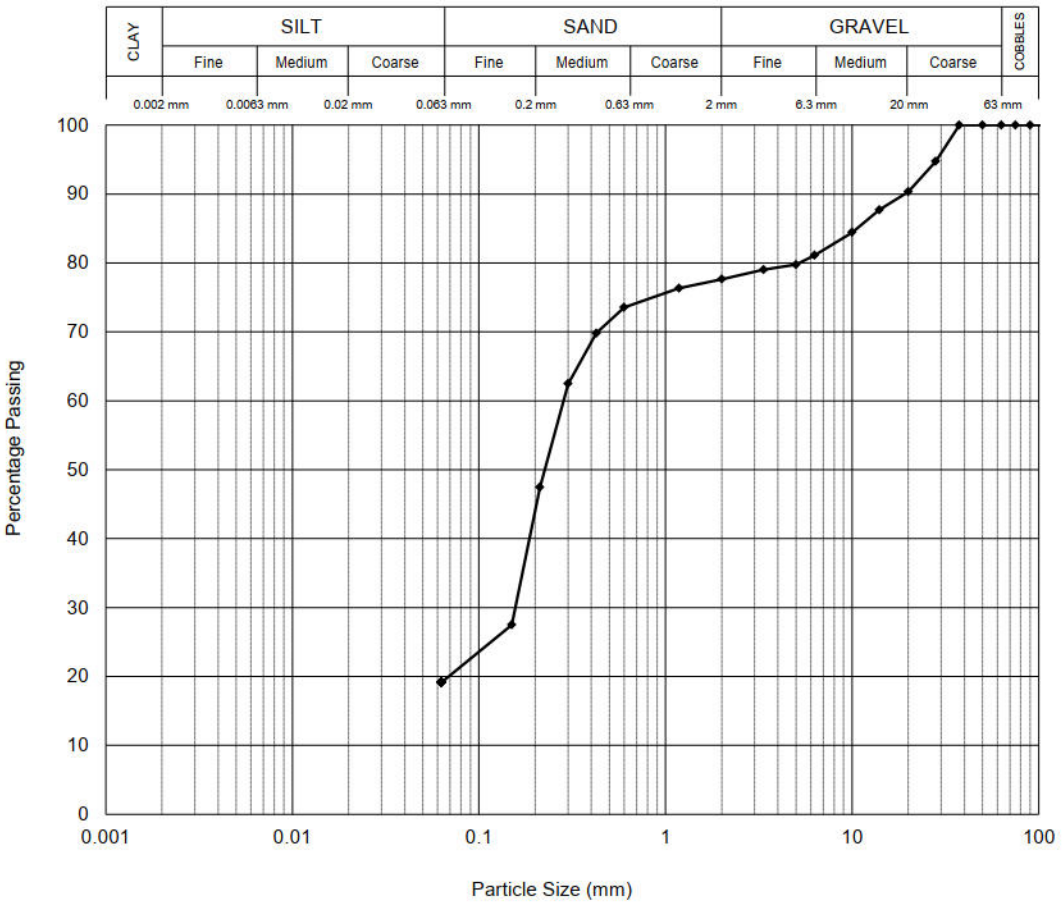
Location	TP08
Depth (m)	1.20
Sample Type	B

Description

Orangish brown and grey gravelly clayey silty SAND.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	95
20.0 mm	90
14.0 mm	88
10.0 mm	84
6.30 mm	81
5.00 mm	80
3.35 mm	79
2.00 mm	78
1.18 mm	76
600 µm	74
425 µm	70
300 µm	62
212 µm	47
150 µm	27
63 µm	19



Particle Proportions	
Cobbles	0.0
Gravel	22.3
Sand	58.5
Silt & Clay	19.2

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BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

Location	TP23
Depth (m)	1.50
Sample Type	D

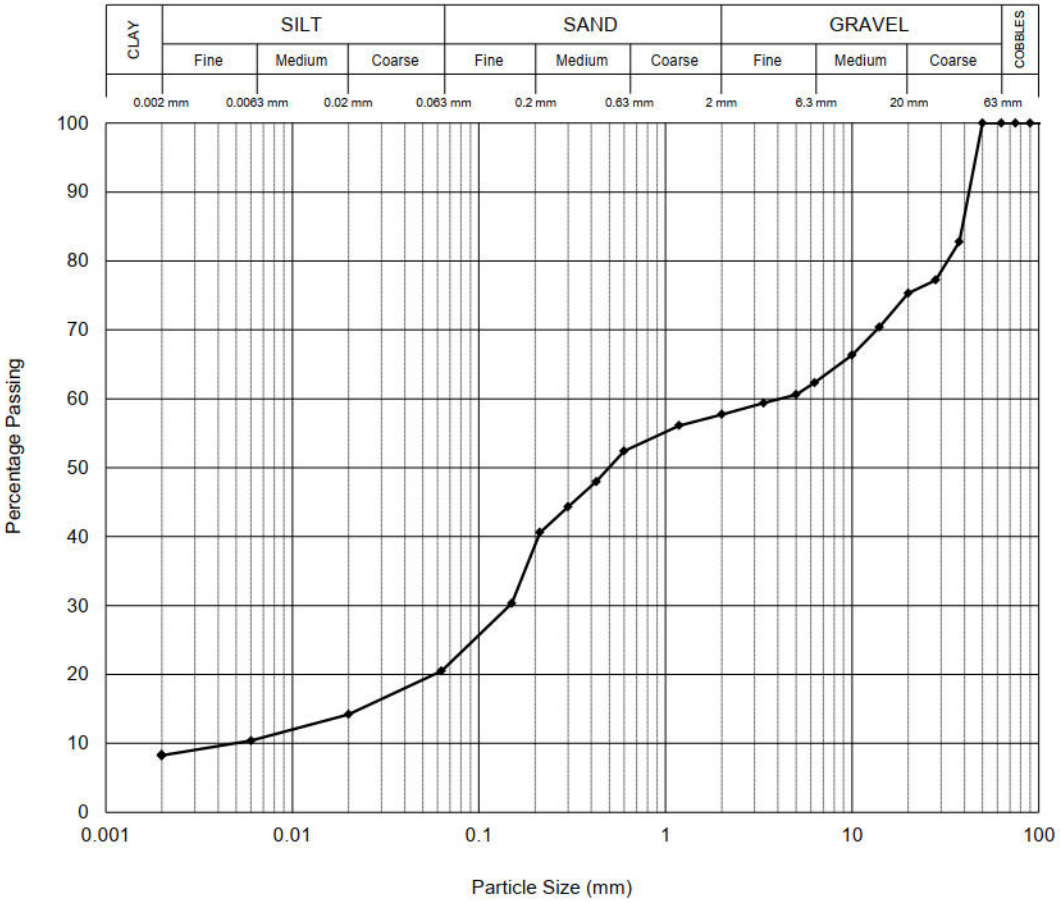
Description

Orangish brown mottled grey clayey silty SAND and GRAVEL.

Remarks Insuffcient sample supplied to comply with BS EN ISO 17892-4 : 2016 minimum mass requirements

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	83
28.0 mm	77
20.0 mm	75
14.0 mm	70
10.0 mm	66
6.30 mm	62
5.00 mm	61
3.35 mm	59
2.00 mm	58
1.18 mm	56
600 µm	52
425 µm	48
300 µm	44
212 µm	41
150 µm	30
63 µm	21



Sedimentation	
No Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	14
6 µm	10
2 µm	8
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0.0
Gravel	42.3
Sand	37.2
Silt	12.2
Clay	8.3

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PARTICLE SIZE DISTRIBUTION

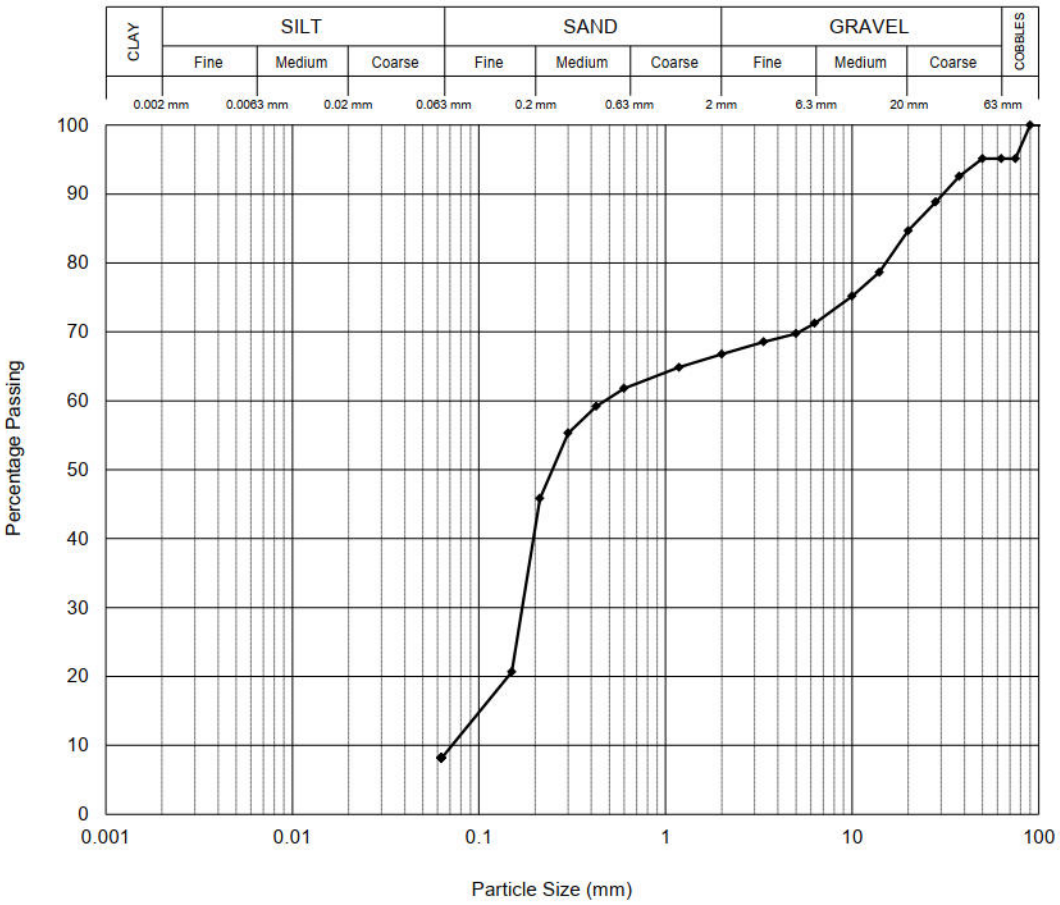
Location	TP24
Depth (m)	0.50
Sample Type	B

Description

Orangish brown slightly silty very gravelly SAND with one cobble.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	95
63.0 mm	95
50.0 mm	95
37.5 mm	93
28.0 mm	89
20.0 mm	85
14.0 mm	79
10.0 mm	75
6.30 mm	71
5.00 mm	70
3.35 mm	69
2.00 mm	67
1.18 mm	65
600 µm	62
425 µm	59
300 µm	55
212 µm	46
150 µm	21
63 µm	8



Particle Proportions	
Cobbles	4.9
Gravel	28.4
Sand	58.6
Silt & Clay	8.1

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BS EN ISO 17892-4 : 2016

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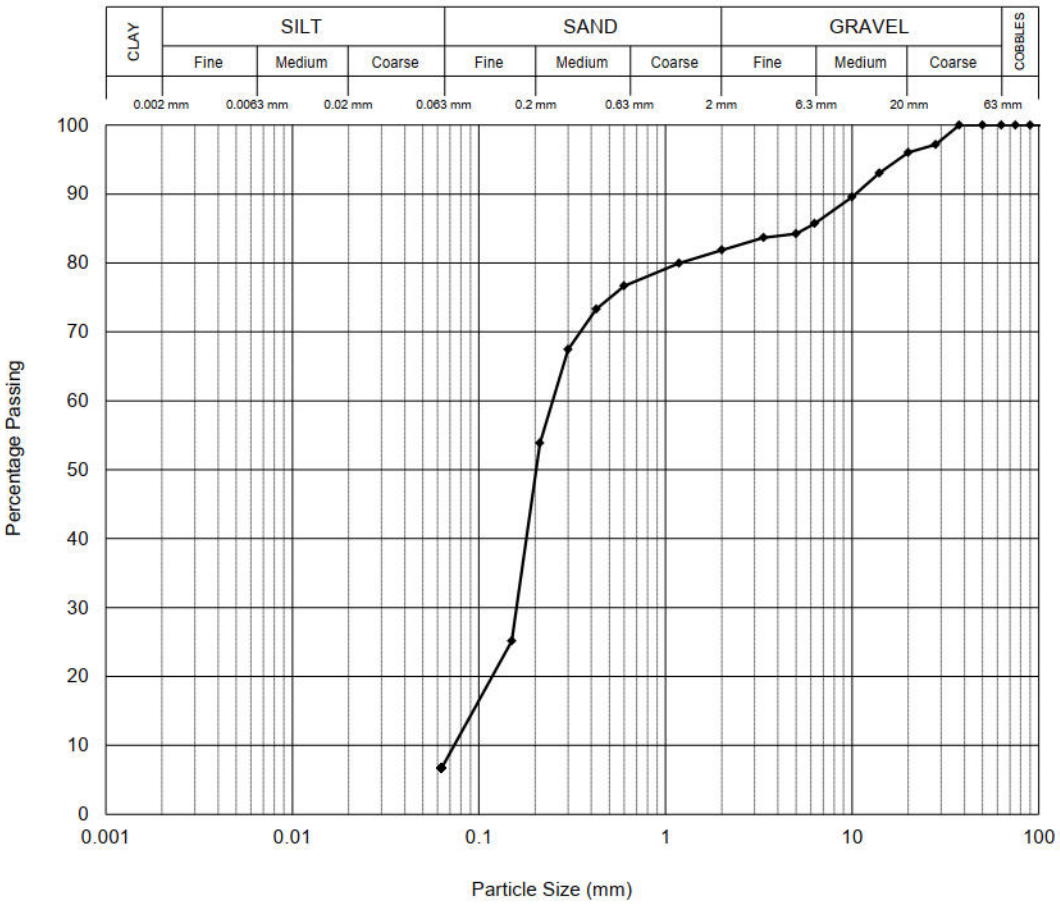
Location	TP29
Depth (m)	1.10
Sample Type	B

Description

Orangish brown silty gravelly SAND.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	97
20.0 mm	96
14.0 mm	93
10.0 mm	90
6.30 mm	86
5.00 mm	84
3.35 mm	84
2.00 mm	82
1.18 mm	80
600 µm	77
425 µm	73
300 µm	67
212 µm	54
150 µm	25
63 µm	7



Particle Proportions	
Cobbles	0.0
Gravel	18.1
Sand	75.2
Silt & Clay	6.7

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BS EN ISO 17892-4 : 2016

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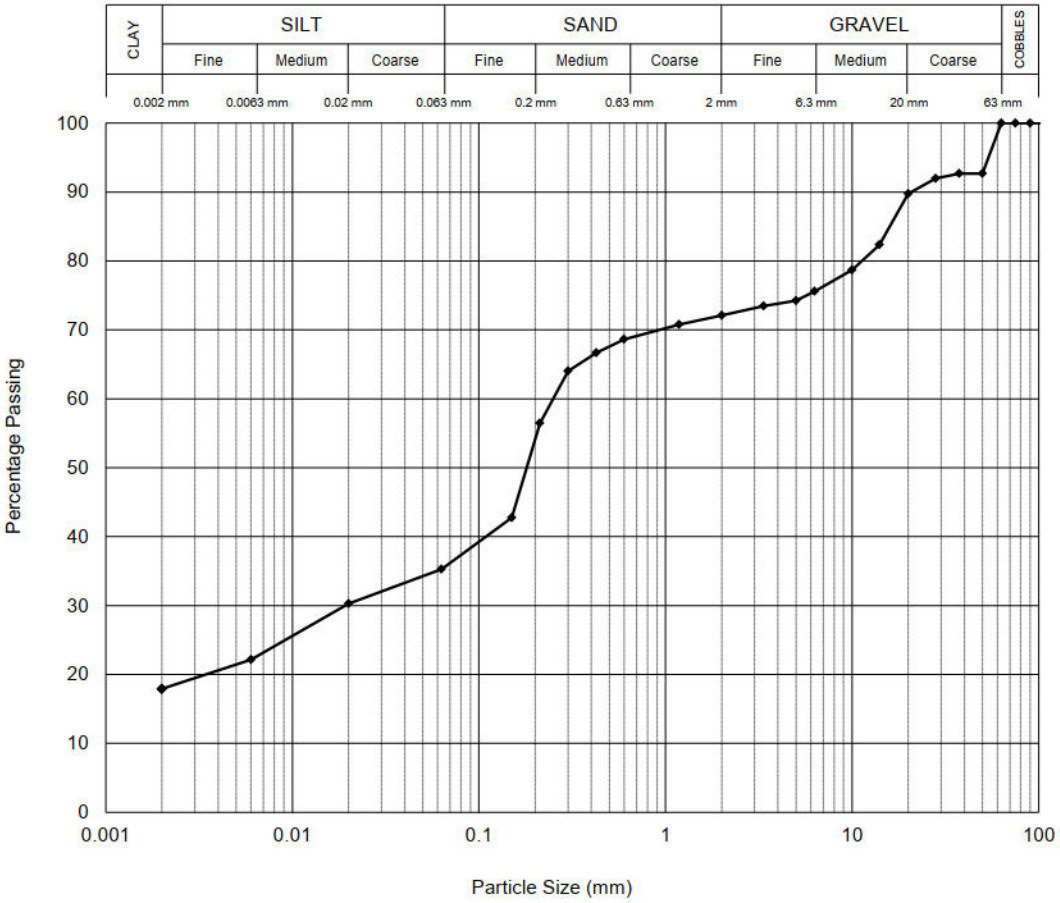
Location	TP42
Depth (m)	2.50
Sample Type	B

Description

Orangish brown mottled grey gravelly sandy silty CLAY.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	93
37.5 mm	93
28.0 mm	92
20.0 mm	90
14.0 mm	82
10.0 mm	79
6.30 mm	76
5.00 mm	74
3.35 mm	73
2.00 mm	72
1.18 mm	71
600 µm	69
425 µm	67
300 µm	64
212 µm	56
150 µm	43
63 µm	35



Sedimentation	
No Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	30
6 µm	22
2 µm	18
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0.0
Gravel	27.9
Sand	36.8
Silt	17.4
Clay	17.9

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BS EN ISO 17892-4 : 2016

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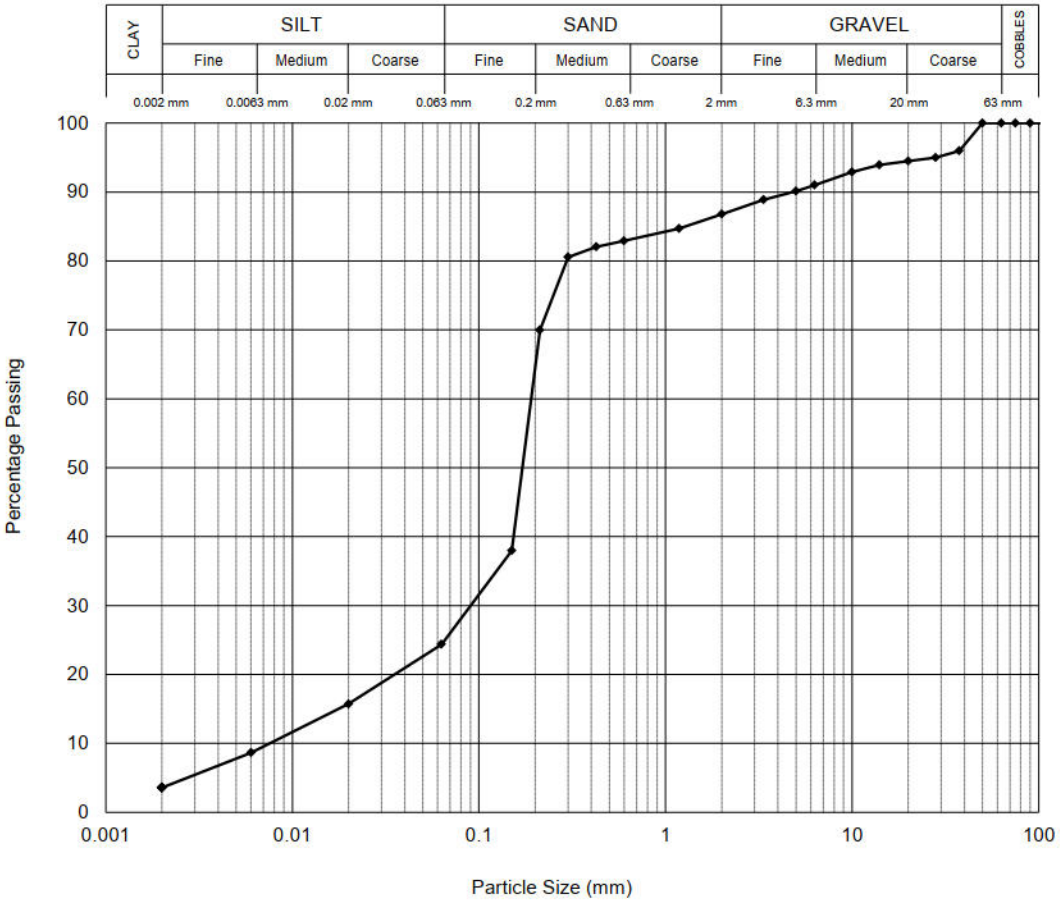
Location	TP47
Depth (m)	1.10
Sample Type	B

Description

Yellowish brown gravelly silty SAND.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	96
28.0 mm	95
20.0 mm	94
14.0 mm	94
10.0 mm	93
6.30 mm	91
5.00 mm	90
3.35 mm	89
2.00 mm	87
1.18 mm	85
600 µm	83
425 µm	82
300 µm	81
212 µm	70
150 µm	38
63 µm	24



Sedimentation	
No Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	16
6 µm	9
2 µm	4
Particle Density 2.70(A) Mg/m³	

Particle Proportions	
Cobbles	0.0
Gravel	13.2
Sand	62.4
Silt	20.8
Clay	3.6

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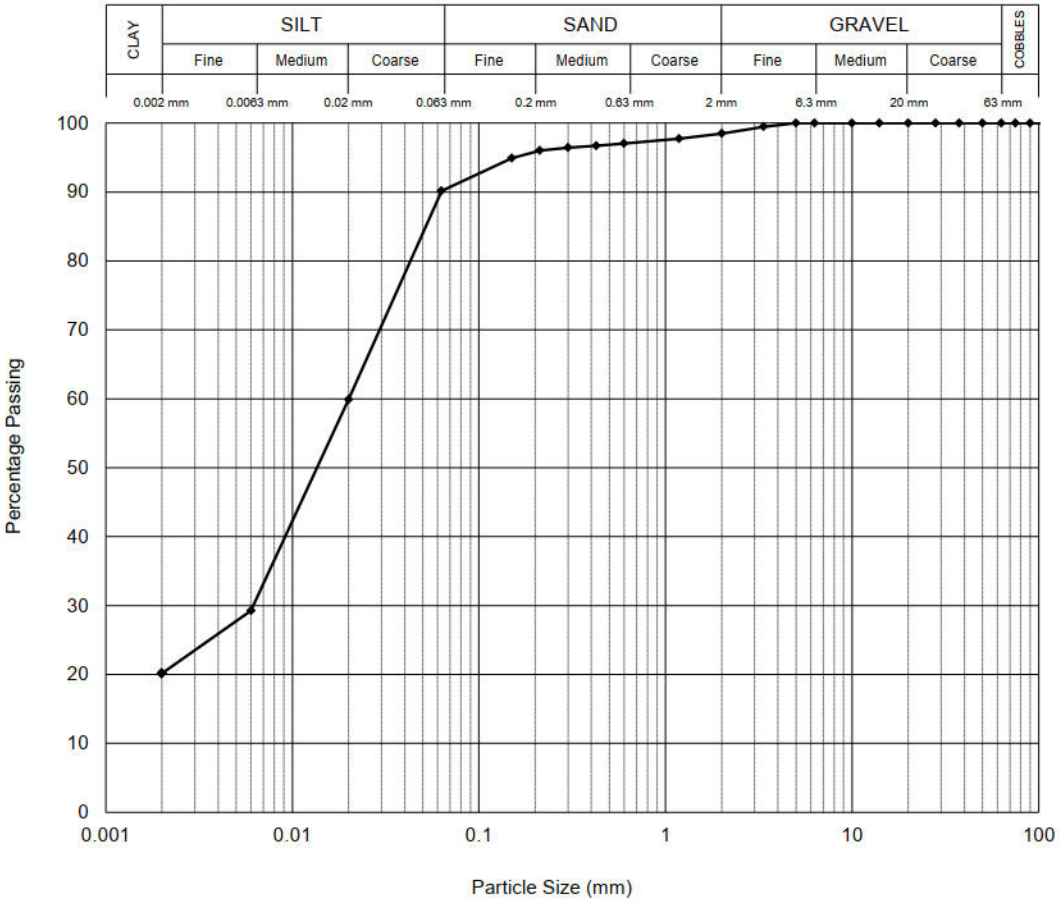
Location	TP50
Depth (m)	1.00
Sample Type	B

Description

Orangish brown and grey sandy clayey SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	99
2.00 mm	99
1.18 mm	98
600 µm	97
425 µm	97
300 µm	96
212 µm	96
150 µm	95
63 µm	90



Sedimentation	
No Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	60
6 µm	29
2 µm	20

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0.0
Gravel	1.5
Sand	8.3
Silt	70.0
Clay	20.2

Processed by CC
Checked and Approved by

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S Burke - Senior Technician
27/11/2020

Project Number:

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Project Name:

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UKAS TESTING 1982

APPENDIX G – Soakage Test Results

Soakage Test Results

Results of BRE Digest 365 Soakage Tests

Site : Tars Farm Barnham
Client : Gleeson Strategic Land
O S Reference

Tested By :
Test Date : 05/11/2020

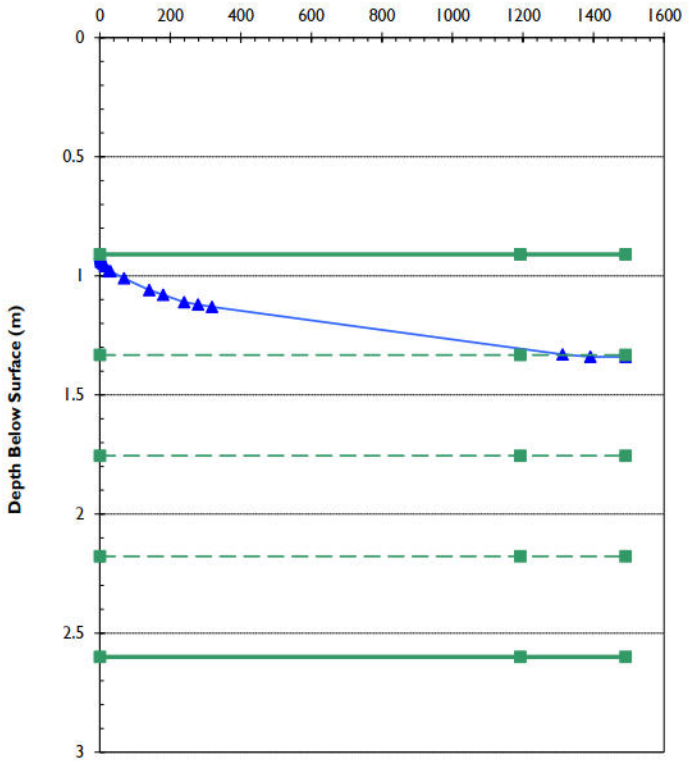
Hole Number	Test Number	Hole Depth m	Test Soakage Rate litre/m2/min	Design Soakage Rate litre/m2/min	Design Soakage Rate m/sec	End Water Level
TP03	No 1	2.6	0.02	0.02	3.31184E-07	Pit was not emptied; Non compliant value was calculated.
TP03	No 2	2.6	0.03			Pit was not emptied; Non compliant value was calculated.
TP28	No 1	2.5	0.04	0.04	5.84667E-07	Pit was not emptied; Non compliant value was calculated.
TP28	No 2	2.5	0.08			Pit was not emptied; Non compliant value was calculated.
TP49	No 1	1.86	0.05	0.05	8.18476E-07	Pit was not emptied; Non compliant value was calculated.
TP49	No 2	1.86	0.33			Pit was not emptied; Non compliant value was calculated.
Mean Value of All Calculated Soakage Rates :				0.03	litre/m2/min	
				5.781E-07	m/sec	

BRE Digest 365 - Soakage Test

nitial)

Test Hole No:	TP03
Test No:	Test No 1

leap environmental



Pit Length (m)	2
Pit Width (m)	0.45
Depth to Pit Base (m)	2.6
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	0.91
Max Water Dropdown during Test (m)	0.43
Total Soakage Test Time (min)	1491
Mean Internal Discharge Area (m2)	7.337375
Discharge Rate (litre/min)	0.145801
Soakage Rate (litre/m2/min)	0.019871
BRE Soil Infiltration Rate (m/sec)	3.31E-07

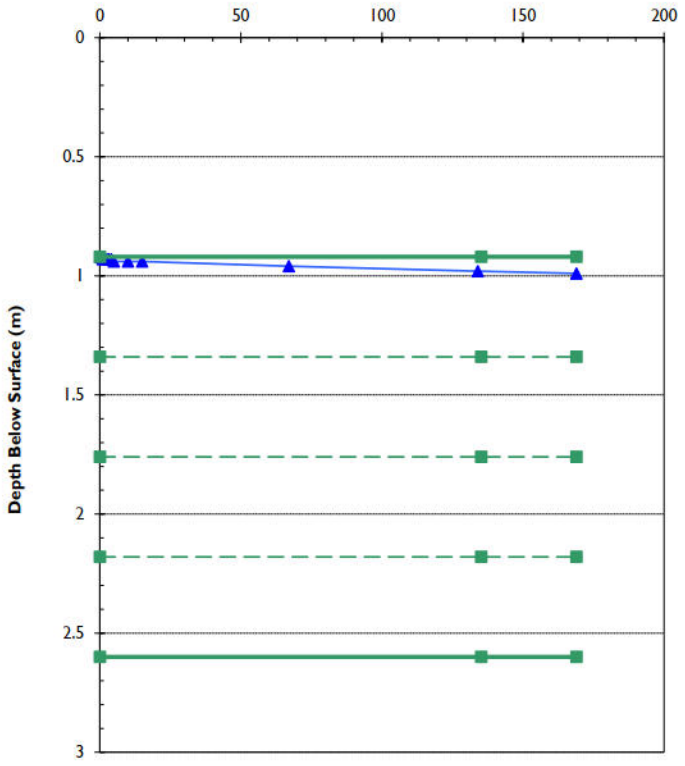
Comments:
Water level fell to 75% -- 50% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

BRE Digest 365 - Soakage Test

Repeated)

Test Hole No:	TP03
Test No:	Test No 2



Pit Length (m)	2
Pit Width (m)	0.45
Depth to Pit Base (m)	2.6
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	0.92
Max Water Dropdown during Test (m)	0.07
Total Soakage Test Time (min)	169
Mean Internal Discharge Area (m2)	8.831875
Discharge Rate (litre/min)	0.261954
Soakage Rate (litre/m2/min)	0.02966
BRE Soil Infiltration Rate (m/sec)	4.94E-07

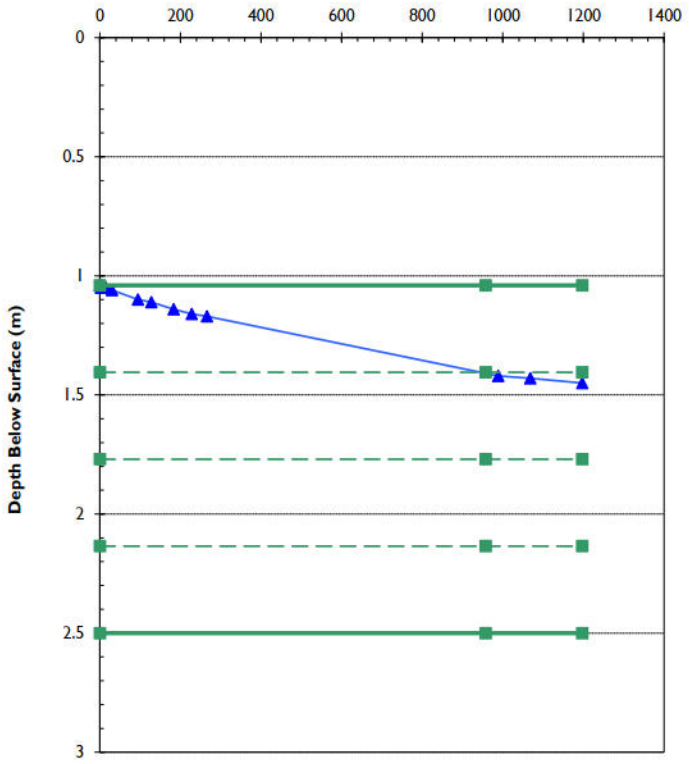
Comments:
Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

BRE Digest 365 - Soakage Test

nitial)

Test Hole No:	TP28
Test No:	Test No 1



Pit Length (m)	2
Pit Width (m)	0.45
Depth to Pit Base (m)	2.5
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	1.04
Max Water Dropdown during Test (m)	0.41
Total Soakage Test Time (min)	1197
Mean Internal Discharge Area (m2)	6.296125
Discharge Rate (litre/min)	0.220868
Soakage Rate (litre/m2/min)	0.03508
BRE Soil Infiltration Rate (m/sec)	5.85E-07

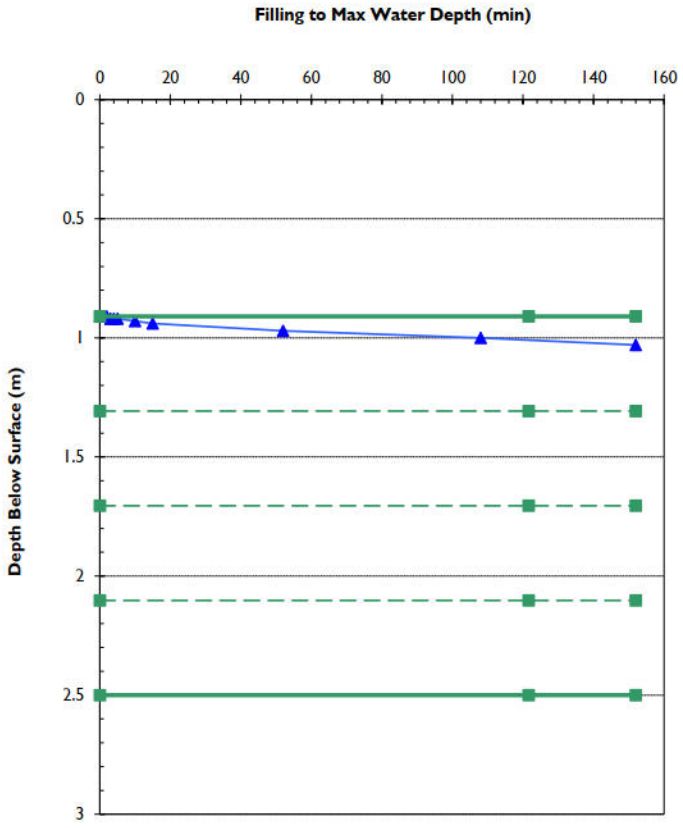
Comments:
Water level fell to 75% -- 50% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

BRE Digest 365 - Soakage Test

Repeated)

Test Hole No:	TP28
Test No:	Test No 2



Pit Length (m)	2
Pit Width (m)	0.45
Depth to Pit Base (m)	2.5
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	0.91
Max Water Dropdown during Test (m)	0.12
Total Soakage Test Time (min)	152
Mean Internal Discharge Area (m2)	8.1765
Discharge Rate (litre/min)	0.613636
Soakage Rate (litre/m2/min)	0.075049
BRE Soil Infiltration Rate (m/sec)	1.25E-06

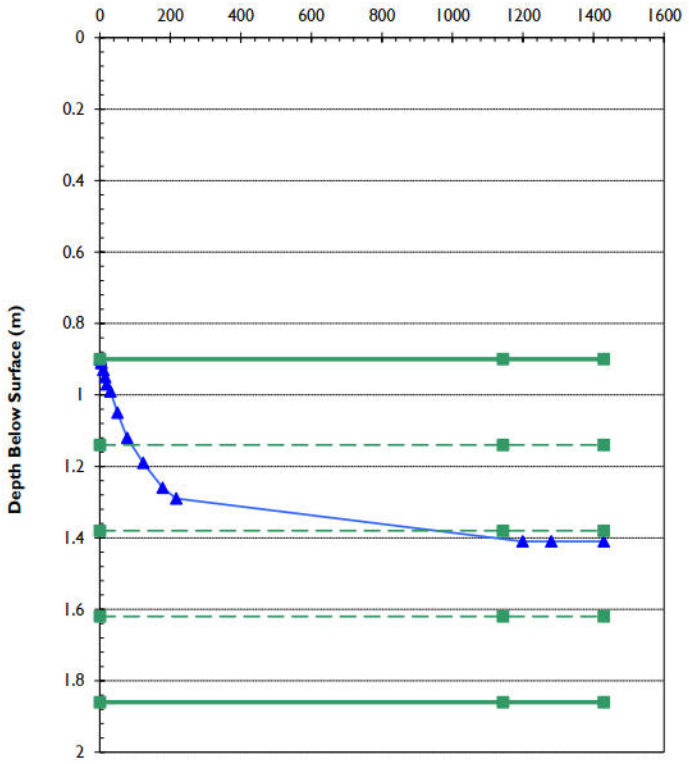
Comments:
Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

BRE Digest 365 - Soakage Test

nitial)

Test Hole No:	TP49
Test No:	Test No 1



Pit Length (m)	2.3
Pit Width (m)	0.45
Depth to Pit Base (m)	1.86
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	0.9
Max Water Dropdown during Test (m)	0.51
Total Soakage Test Time (min)	1429
Mean Internal Discharge Area (m2)	4.2525
Discharge Rate (litre/min)	0.208834
Soakage Rate (litre/m2/min)	0.049109
BRE Soil Infiltration Rate (m/sec)	8.18E-07

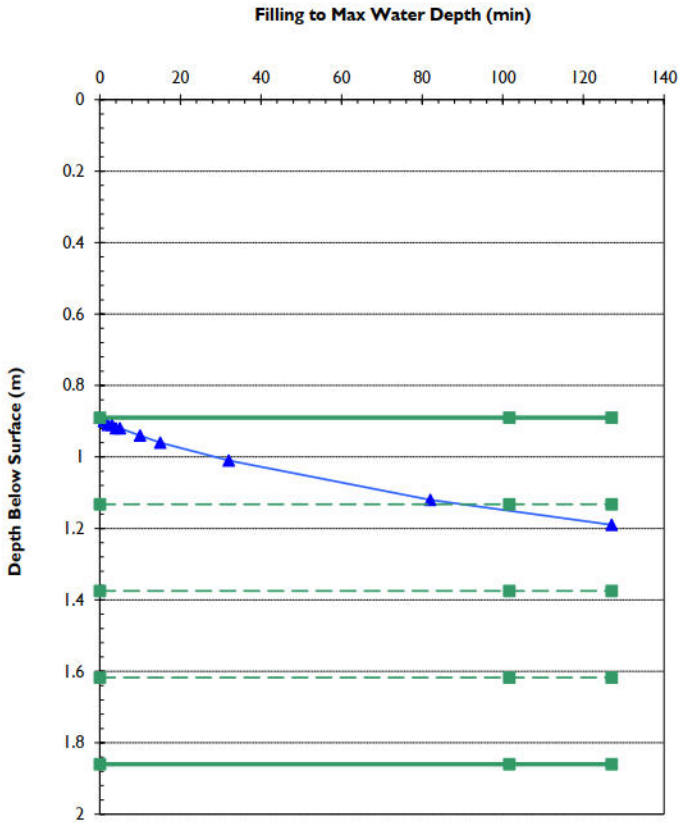
Comments:
Water level fell to 50% -- 25% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

BRE Digest 365 - Soakage Test

Test Hole No:	TP49
Test No:	Test No 2

Repeated)



Pit Length (m)	2.3
Pit Width (m)	0.45
Depth to Pit Base (m)	1.86
Depth to Top of Permeable Soils (m)	
Depth to Groundwater Surface (m)	
Depth to Top of Granular Fill (m)	
Voids Assumed for Granular Fill (%)	

Depth of Water at Start of Test (m)	0.89
Max Water Dropdown during Test (m)	0.3
Total Soakage Test Time (min)	127
Mean Internal Discharge Area (m2)	4.92625
Discharge Rate (litre/min)	1.642067
Soakage Rate (litre/m2/min)	0.33333
BRE Soil Infiltration Rate (m/sec)	5.56E-06

Comments:
Water level fell to 75% -- 50% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client:	Gleeson Strategic Land
Site:	Tars Farm Barnham
Tested By:	
Test Date:	10/11/20

APPENDIX H – Groundwater Monitoring Results

Groundwater Monitoring Results

Groundwater Monitoring Record

Tars Farm, Barnham LP2356

			Location:					
			WS1	WS2	WS3	WS4	WS5	WS6
Engineer(s):	HG/SH/OA	Measured Borehole Depth (m)	**3.90**	**3.90**	**4.00**	**4.10**	**2.60**	**3.70**
Date:	30/10/2020	Water Level (m bgl)	2.30	2.34	1.95	0.08	0.98	0.96
	27/11/2020	Water Level (m bgl)	1.16	0.86	1.54	0.65	Well cover stuck	1.36
	18/12/2020	Water Level (m bgl)	0.80	0.20	1.00	0.00	1.50	0.90
	29/01/2021	Water Level (m bgl)	0.64	0.06	0.86	0.00	0.52	0.90
	26/02/2021	Water Level (m bgl)	0.53	0.37	0.94	0.33	1.20	0.99
	26/03/2021	Water Level (m bgl)	0.60	0.77	1.33	0.75	0.75	1.20

Groundwater Monitoring Record

Tars Farm, Barnham LP2356

			Location:				
			WS7	WS8	WS9	WS10	WS11
Engineer:	HG/SH/OA	Measured Borehole Depth (m)	**3.70**	**2.60**	**1.90**	**2.90**	**4.00**
Date:	30/10/2020	Water Level (m bgl)	1.76	0.63	0.89	1.90	2.08
	27/11/2020	Water Level (m bgl)	1.00	0.78	1.03	1.21	1.31
	18/12/2020	Water Level (m bgl)	0.60	0.40	0.60	0.80	0.50
	29/01/2021	Water Level (m bgl)	0.28 (rising to 0 after bung removed)	0.07	0.17	0.18	0.27
	26/02/2021	Water Level (m bgl)	0.40	0.07	0.56	0.41	0.91
	26/03/2021	Water Level (m bgl)	0.87	0.55	0.85	0.75	1.05