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CHURCHILL RETIREMENT LIVING

FORMER GREENFINCH P.H., LAPWING LANE, WEST DIDSBURY, M20 3ZA

SUPPLEMENTARY GROUND INVESTIGATION REPORT

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1. INTRODUCTION

A residential development is proposed at the site of the former Greenfinch Public House, Lapwing Lane, West Didsbury, M20 3ZA. The site is currently occupied by a disused car park and was until recently occupied by a public house. The proposed development comprises an apartment block, up to three-storeys in height, together with car parking, and managed landscaping areas. Residents of the development will be of retirement age.

Soiltechnics Limited prepared a Ground Investigation Report, as listed in the References, in August 2023 for the proposed development. Subsequent supplementary ground investigation work has been designed on the basis of the information provided in the Ground Investigation Report.

Crossfield Consulting Limited has been commissioned by Churchill Retirement Living to undertake a supplementary investigation of the site to identify potential constraints to redevelopment relating to the ground conditions and including a risk-based environmental assessment and recommendations for remediation works, recommendations regarding ground stability/support, and recommendations for foundations, road pavement design and general construction advice in the context of the above development proposals.

This report presents the information obtained from a supplementary ground investigation. Sections 2 to 5 of the report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007.

A risk-based assessment of potential contamination is included in Section 7 of the report. This assessment makes reference to the desk study, ground investigation information and a Conceptual Site Model. It is considered that the report complies with National Planning Policy Framework and is in general accordance with guidance published by the Environment Agency and NHBC. The ground investigation to inform the risk assessment of potential contamination is a supplementary investigation, as defined in Environment Agency Land Contamination Risk Management (LCRM) (2020) and BS 10175:2011+A2:2017.

The report also includes a geotechnical assessment and the salient information, assessments and recommendations are presented in Sections 9 to 14 of the report, together with the associated Figures and Appendices.

The report has been prepared under the direction and supervision of a Chartered Geologist and Registered Specialist in Land Condition (SiLC). It is considered that the report is suitable for submission in support of a planning application and the report is appropriate to assist in an appraisal of development solutions and costs, together with the preparation of engineering designs for the development. The report also complies with the published guidance relating to the requirements of a Building Control authority.

2. THE SITE

2.1 Location

The site is located at the intersection of Lapwing Lane and Palatine Road (the B5167) in a predominantly residential/commercial area in West Didsbury, approximately 6 km south of Manchester City Centre, as shown on Figure 1. The National Grid Reference for the site is SJ 8432 9208.

2.2 Site Description

This site description is based on observations made during a supplementary ground investigation undertaken in May 2024. A site plan and topographical survey is presented as Figure 2.

The site is irregular in shape with an approximate area of 0.32 ha. The site is generally flat and level although a small area near the southwestern boundary of the site is raised by approximately 1 m above the majority of the site.

The majority of the site comprises a concrete surfaced car park with areas of soft landscaping, including mature trees, around the margins. An area of limestone gravel surfacing is present in the eastern section of the site. A line of concrete blocks separates the northern area of the site from the southern area, reducing the risk of public entry.

A small access road, bordered by a hedge along its northwestern edge, runs from the northern corner of the site into the southern part and also allows access into a gravel surfaced car park in use by the property east of the site that occupies the northern part of the site.

A small area along the eastern boundary of the site is asphalt surfaced. A line of lampposts is present along the southwestern boundary and the site is bounded by wooden fencing around the northwestern and southwestern boundaries, and by a low wall topped with metal bar fencing around its southeastern boundary.

Surface drains are present across the central area of the site. The raised area in the eastern corner of the site is vegetated including two mature trees, one of which is a willow.

2.3 Site History

The site history is summarised from information presented in the Phase 1 Contaminated Land Assessment, dated January 2021, by Geosmart Information Limited (Report ref:74223R1) presented as Appendix K within the Ground Investigation Report by Soiltechnics Limited (2023), as referenced and data available on the internet.

The first available map edition, dated 1893, shows the site to comprise a detached residential property with associated glasshouses and landscaped grounds. It is understood that the property was subsequently used as a doctor's surgery and residential care home before being converted into a public house in 1997. The property was demolished in the period between 2021 and 2024.

Historically, the area surrounding the site has included a town/corporation yard adjacent to the northwest, a railway line adjacent to the east, an electrical substation approximately 10 m north, and a garage approximately 135 m northeast. The railway line was dismantled by 1992 and remained in a dismantled state until its redevelopment into a tramline. Information obtained from an online search in the public domain indicates that construction of this part of Manchester's tram network began in 2011 and that the line has been running since 2013.

3. PUBLISHED GEOLOGY

Geological map data, published by the British Geological Survey (BGS), online and in print, on the 1:63,360 scale Sheet No. 98 (Stockport), the 1:50,000 scale Sheet No. 98 (Stockport), and in the related Memoirs indicate that the site is underlain by superficial deposits of Glaciofluvial Sheet Deposits, generally comprising sands and gravels. Underlying the superficial deposits, solid strata of the Wilmslow Sandstone Formation are indicated, generally comprising reddish brown to red fine to medium grained cross-bedded sandstones with sporadic siltstones.

4. DESK STUDY ENQUIRIES

4.1 Review of Previous Environmental and Geological Database Information

Desk study information is summarised from information presented with the Phase 1 Contaminated Land Assessment, dated January 2021, by Geosmart Information Limited (Report ref:74223R1) presented as Appendix K within the Ground Investigation Report by Soiltechnics Limited (2023), as referenced.

The site is not indicated to be within 250 m of any active or historical landfill sites and no active industrial land uses are listed within 100 m of the site.

Hydrological information indicates that the site is not within a Flood Zone 2 or 3, as defined by the Environment Agency.

Hydrogeological information indicates that superficial strata at the site are a Secondary A aquifer and that solid strata at the site are a Principal aquifer. The site is not within a groundwater source protection zone.

Geological information indicates that the potential hazard for ground subsidence is listed as 'negligible' to 'very low' regarding collapsible deposits, compressible deposits, ground dissolution of soluble rocks, landslides, running sands, and shrink/swell clays.

It is indicated that the site is not within an area where radon precautions are required in new buildings.

4.2 Previous Ground Investigation Information

Two phases of ground investigation have been undertaken at the site in April 2021 and October 2022 by Soiltechnics Limited and reported in a Ground Investigation Report, dated August 2023. This report has been provided by the Client for review and relevant factual information from the Soiltechnics investigation is reproduced and presented in Appendix I. The information includes exploratory hole records, an exploratory hole location plan, soakaway testing records, analytical laboratory test data, and geotechnical laboratory test data.

Eleven trial pits were undertaken across the site during the Soiltechnics ground investigations. The trial pits extended to between 0.7 m and 3.2 m depth. Typically, Made Ground was recorded to depths of between 0.6 m and 0.9 m and comprised asphalt surfacing over grey or brown sandy gravel of limestone to gravelly sands with brick and concrete. Locally, within two trial pits in the northeast of the site (TP 105 and TP106), Made Ground materials included timber, glass, and metal, and was recorded to a depth of at least 1.2 m within TP 105, within the area of the former Greenfinch P.H. building.

Where trial pits were progressed below Made Ground, natural strata were generally recorded as loose brown or light grey slightly clayey gravelly sand.

A water strike was recorded at 3.1 m depth, rising to 3.07 m depth in 10 minutes, within TP01 in the western corner of the site.

Infiltration testing was undertaken within six of the trial pits. Testing was repeated once within two of the pits (TP04 and TP104), twice in two of the pits (TP02 and TP101), and thrice in two of the pits (TP102 and TP103). Two of the tests (with TP02 and TP103) recorded insufficient infiltration over the course of 90 minutes and were terminated. Completed tests recorded infiltration rates between 6.4×10^{-6} m/s and 1.8×10^{-5} m/s with an average of 9.5×10^{-6} m/s.

Analytical laboratory testing was undertaken on 8 No. samples of the Made Ground. One sample was recorded to contain elevated arsenic concentrations and four samples were recorded to contain elevated concentrations of certain polyaromatic hydrocarbons (PAHs) and total petroleum hydrocarbon (TPH) fraction C_8-C_{10} exceeding the relevant reference values for the residential end use. No site-specific assessment criteria were generated for the site as part of the Soiltechnics investigation. No asbestos was recorded within any of the samples tested.

Waste acceptance criteria testing was undertaken on 1 No. sample of Made Ground and was assessed to be classified as 'non-hazardous' waste.

Laboratory testing recorded relatively low water-soluble sulphate concentrations.

5. GROUND CONDITIONS AND GEOLOGICAL MODEL

5.1 Ground Investigation

Details of the rationale and scope of the supplementary ground investigation and laboratory testing, together with exploratory hole logs, monitoring, in situ and laboratory test results, are given in Appendix II. Based on all phases of ground investigation completed to date, the following ground conditions have been identified below the site.

5.2 Buried Foundations and Services

Buried services and foundations were not encountered during the ground investigation. Buried services and foundations should be anticipated beneath the site associated with the former buildings.

5.3 Strata Encountered

Made Ground
Concrete surfacing is present across the majority of the site in areas occupied by the former car park of the Greenfinch P.H., to typical depths of approximately 0.1 m. Concrete surfacing is generally underlain by a limestone gravel sub-base to depths of between 0.3 m to 0.4 m, typically 0.3 m. Locally, in the west of the site, concrete is present to 0.05 m and is underlain by a thin layer (0.05 m thick) of asphalt between the concrete and the limestone sub-base.

Locally, within the area of the recently demolished Greenfinch P.H., and in the southeast of the site, concrete surfacing is absent and limestone gravel surfacing is present to approximate depths of between 0.1 m and 0.2 m.

Within the eastern corner of the site, a small area of asphalt surfacing is present to a depth of 0.12 m, associated with a former children's play area. Elsewhere in the eastern corner of the site, surfacing is absent.

Across the site and below the concrete/asphalt surfacing, Made Ground is present to approximate depths of between 0.6 m and 1.5 m, typically 0.6 m to 0.7 m and deeper within the northeastern part of the site in the area of the former public house building. Made Ground materials generally comprise brown clayey gravelly sands with brick, concrete, and ashy fragments. Locally, within the area of deeper Made Ground, timber, glass, metal, and plastic materials are also present.

Glaciofluvial Sheet Deposits
Beneath the Made Ground materials, superficial strata of the Glaciofluvial Sheet Deposits are present. These generally comprise medium dense light brown to grey silty slightly gravelly sands to depths of between 2.2 m and 2.9 m, and typically approximately 2.5 m depths.

Standard Penetration Tests (SPTs) undertaken in the silty sands recorded 'N' values of between 11 and 18 at 1.0 m depth and between 11 and 17 at 2.0 m depth.

Below these, loose to medium dense dark brown silty gravelly sands are generally present to depths of between 2.9 m and 3.3 m, typically approximately 3.2 m. However, locally, within the southwest of the site, these extended to 4.0 m, the maximum depth investigated in this area.

SPTs undertaken in the silty gravelly sands recorded 'N' values of between 9 and 12 at 3.0 m depth.

Underlying the dark brown silty gravelly sands, firm to stiff consistency (high strength) slightly gravelly slightly sandy silty clays are present. The dynamic sampling exploratory holes terminated within the clay strata at depths between 3.9 m and 5.0 m, typically 4.0 m.

SPTs undertaken in the clay strata recorded 'N' values of between 7 and 15 at 3.0 m depth, increasing to between 37 and greater than 50 at 4.0 m depth.

5.4 Groundwater

During the ground investigations, groundwater has been encountered consistently at approximately 3 m depth.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

6. PROPOSED DEVELOPMENT

The proposed development includes the following buildings and other structures:

- Block of apartments up to three storeys
- Car parking
- Areas of managed soft landscaping
- Associated services

The proposed development includes the following buildings and other structures, as shown on Figure 3. Residents of the development will be of retirement age.

7. ASSESSMENT OF POTENTIAL CONTAMINATION AND GROUND GASES

7.1 Assessment Criteria

Assessment of potential contamination and ground gases has been undertaken using a risk assessment-based approach, as recommended within the Environmental Protection Act (1990) (and subsequent amendments), Environment Agency LCRM (2020), CLEA Model (2004-2009), BS 10175:2011+A2:2017, CIRIA C552 (2001) and NHBC R&D Report 66 (2008). This approach considers the likely source of contamination, given the history and location of the site, and the possible migration pathways by which these potentially hazardous substances may

reach likely receptors, such as end users of the site, controlled waters or the wider environment, in the context of the proposed development.

Part IIA of the Environmental Protection Act (1990) states that

'Contaminated Land is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

(a) significant harm is being caused or there is a significant possibility of such harm being caused; or
(b) significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused;'

All risk assessments carried out as part of this investigation have been carried out with respect to the definition of 'contaminated land' within Part IIA of the Environmental Protection Act (1990) and have considered the site both before and on completion of the development. The basis of the risk assessment is the Conceptual Site Model, which is derived from the desk study and initial information and identifies potential contaminant linkages that could affect receptors relevant to the site and the wider environment. The Conceptual Site Model is presented in Table 1.

Based on the model, a ground investigation was designed to obtain relevant information to assess further the identified contaminant linkages. Where relevant, this included the recovery of representative samples and subsequent analytical laboratory testing. The rationale for the sampling and testing is set out in Appendix I. The results of the analytical testing are presented in Appendix I and summarised, together with data from the Soiltechnics Ground Investigation Report (2023), in Table 2. On the basis of the conceptual site model and the results of the analytical laboratory testing (together with any quantitative risk assessment, if applicable, as presented in Appendix III), an assessment of the identified contaminant linkages is presented in Table 3.

7.2 Potential Sources of Contamination

Based on the available information, no industrial processes have occurred on the site since its development in 1893. The site has formerly been used as a residential property, doctor's surgery and was most recently occupied by a public house. It is considered that a potential source of contaminants associated with its residential use may remain relating to discarded ash from domestic heating and potential small-scale bonfires that may have occurred producing limited quantities of ashy materials which, if present, may contain heavy metals and polyaromatic hydrocarbons (PAHs).

The site is currently occupied by a disused car park and areas of recently demolished buildings. Made Ground materials have been recorded across the site. Made Ground and demolition materials may be associated with potential contaminants such as toxic or phytotoxic metals, PAHs, petroleum hydrocarbons, and asbestos containing materials (ACMs).

There is the potential for limited volumes of oil or fuel from leaks/drips from vehicles into the ground during the site's use as a car park.

With regard to potential off-site sources of contamination, a town/corporation yard was formerly located adjacent to the site to the northwest and a historical railway line was situated immediately east of the site. The railway line has since been converted into a tramline.

The former railway line may be a source of limited quantities of PAHs, toxic and phytotoxic metals, and sulphates, as outline in the Department of the Environment (1996) *Industry Profile – Railway Land*. These substances are generally of low mobility and would now be expected to be in a degraded condition following

the long period since redevelopment of the railway line into the tramline. As the tramline is electrified, it is considered not to be a significant source of mobile contaminants.

The historical 'town/corporation' yard is considered likely to have been utilised as a car park for the adjacent town hall and green. Therefore, although there is potential for limited quantities of oil or fuel from leaks/drips from vehicles into the ground to have been generated within this area, it is considered that these would have been of significantly limited volume and in a significantly degraded condition at the present day so as to present a negligible source of contamination to the site.

Based on the available information, representative soil samples were recovered from the Made Ground materials encountered beneath the site and tested for the potential contaminants identified above. The test results, together with laboratory testing results presented in the previous Soiltechnics Ground Investigation Report (2023), are summarised in Table 2 and are presented against generic assessment criteria (GAC) and Category 4 Screening Levels (C4SL), relevant to the protection of human health in a residential development with managed landscaping development. As can be seen from Table 2, the majority of the potential contaminant concentrations are recorded below the GAC (negligible risk to human health) and C4SL (low but acceptable risk to human health) and therefore, do not represent an unacceptable risk to end users. However, arsenic, TPH fraction C_8-C_{10}, and certain PAH concentrations have been recorded above the assessment criteria. Asbestos fibres and ACM have not been detected within any of the samples tested. Additional comments relevant to human health risk assessment are provided in Section 7.3.1.

Based on appropriate laboratory test data, risks to construction materials are assessed in Section 7.3.2.

No significant concentrations of potentially phytotoxic chemicals have been recorded. However, as the site is currently largely devoid of topsoil, a suitable thickness of topsoil is likely to be required to provide a growing medium in proposed soft landscaping areas. Further comment is provided in Section 7.3.3.

No significant concentrations of mobile potential contaminants have been identified. On this basis, it is considered that there is no valid contaminant source at the site in relation to controlled waters and no further risk assessment is required.

No putrescible material has been identified at the site and no significant thicknesses of Made Ground have been recorded. There are no recorded landfills within influencing distance and the site is not within an area where precautions against the ingress of radon gas are required in new dwellings. Therefore, it is considered that there are no sources of hazardous ground gases at the site and ground gas protection is not required for the proposed development.

7.3 Contaminant Linkages – Solids and Liquids

Based on the Conceptual Site Model, consideration is given below to identified contaminant linkages and a risk evaluation is undertaken of each possible source-pathway-receptor linkage that may occur at the site. The risk evaluation considers the potential consequences and probability of occurrence in accordance with CIRIA C552 (2001). Where risks are identified as 'negligible', then by implication such risks are within normally accepted levels for the proposed development, and the further reduction of such risks by remediation works is considered unnecessary. Where risks are identified that are 'low' as defined in CIRIA C552 (2001), or worse, then consideration is given to the management of the identified risks, with appropriate recommended actions that may include engineering solutions/remediation works as described in the following sections.

7.3.1 Human Health

Potential contaminants associated with the site history have generally been identified at concentrations below relevant GAC and C4SL values and no asbestos fibres or ACM were detected in the samples. However, a possible contaminant linkage to site end users has been identified and relates to dermal contact and the ingestion and inhalation of materials impacted by arsenic, TPH fraction C_8-C_{10}, and certain PAHs (benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene), which have been detected on site at concentrations elevated above the GAC and/or C4SL values for the proposed development type.

7.3.1.1 End Users

With respect to end users, an effective barrier, in the form of the proposed building footprint and hardstanding from road pavements and car parking areas, will be in place across the majority of the site area. These areas will provide a barrier between end users and the ground across the majority of the site. However, the proposed development also includes areas of managed soft landscaping. Within these locations, there are potential exposure pathways, following development. It is understood that residents will not be permitted to dig or cultivate the managed soft landscaped areas. However, root activity and earth work activity could mix the existing ground with topsoil materials, thereby returning impacted soils to the near surface, if limited thicknesses of topsoil are placed.

The GAC values are conservative with respect to the proposed development as they consider young children as the critical receptor. Such a receptor is not applicable to this development as the long-term receptor will be people of retirement age. On this basis, a site-specific risk assessment, using the Contaminated Land Exposure Assessment (CLEA) Model (version 1.071), has been undertaken with respect to the elevated concentration of substances. Based on the proposed end use, the CLEA model has been assessed using dust-related oral, dermal and inhalation pathways for residents of retirement age. The full CLEA results and parameters used are presented in Appendix III.

With respect to the relevant exposure pathways, the maximum recorded concentration of arsenic, TPH fraction C_8-C_{10}, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(ah)anthracene are below the SSAC for the proposed development. On this basis, a contaminant linkage is indicated not to be present for the proposed residential development.

7.3.1.2 Groundworkers

Groundworkers involved in the construction of the new development may be exposed to potential contaminants identified above. However, it is extremely unlikely that the recorded ground conditions represent a short-term exposure risk. Notwithstanding this, it is recommended that appropriate personal protective equipment (PPE) be worn, and high levels of personal hygiene be maintained by groundworkers. To minimise soils at the site becoming airborne, and potentially migrating off site during construction, it is recommended that appropriate soil dampening equipment be maintain on site during dry periods to minimise dust generation.

7.3.2 Durability of Buried Structures and Services

In view of the low soluble sulphate content and somewhat alkaline soil conditions, there are no special precautions required for the protection of good quality buried foundation concrete. Based on guidance within *BRE Special Digest 1* (2005), the specified DC Class of concrete for buried structures and foundations should be suitable for an ACEC site classification of AC-1.

The site has not been associated with past fuel and/or chemical storage and there are no such storage facilities in close proximity. Therefore, the site would not be considered to be 'brownfield' under the definition provided

by UKWIR (2010) with respect to the assessment of ground for water supply pipes. Based on the guidance provided by UKWIR, conventional plastic materials can be used for potable water supply pipes without any requirements for specific testing.

It should be noted that individual water companies may have in-house requirements for the assessment of ground conditions for potable water supply pipes and these requirements may be in addition to, or may contradict, the guidance provided by UKWIR. Therefore, it is recommended that the relevant water supply company be consulted prior to finalising the potable water supply design.

7.3.3 Landscape Areas

No significant concentrations of potentially phytotoxic chemicals have been recorded. However, as the site is currently largely devoid of topsoil, a suitable thickness of topsoil is likely to be required to provide a growing medium in proposed soft landscaping areas.

For any topsoil imported to site, it should be of appropriate quality. Topsoil sourced from a brownfield site or from a topsoil recycling facility should be the subject of appropriate analytical testing to confirm that the imported soils do not themselves represent a risk to end users of the development or to the wider environment. In compliance with published procedures, details of topsoil to be imported should be received and confirmed prior to soil import; such materials should be confirmed/documented as not waste materials.

7.4 Recommended Remedial Works

On the basis of the foregoing information and risk assessment, it is evident that there are no valid contaminant linkages such that remediation works should not be necessary for the proposed development.

7.5 Construction Management/Best Practice

In compliance with normal good practice in the redevelopment of brownfield land, consideration should be given to the following:

- Soils should be kept damp during groundworks to minimise the potential for dust generation and aerial migration to neighbouring properties and the public.
- Groundworkers should wear appropriate PPE.
- A suitable thickness of topsoil will be required to provide a growing medium in proposed areas of managed soft landscaping. In compliance with published NHBC policies, topsoil sourced from a brownfield site or from a topsoil recycling facility should be the subject of appropriate analytical testing to confirm that the imported soils do not themselves represent a risk to end users of the development or to the wider environment and details of topsoil to be imported should be received and confirmed prior to soil import; such materials should also be confirmed/documented as not waste materials.

7.6 Potential Liabilities

Based on the available data and risk assessment, it is considered that there should be no significant environmental liabilities associated with the ground conditions and site ownership. Provided the work outlined in Section 7.5 is undertaken, there should be no such liabilities following completion of the development.

8. ASSESSMENT OF MINING, QUARRYING AND OVERALL GROUND STABILITY

The site is not located in, or in close proximity to, an area of known underground mining, other past mineral extraction or quarrying activities, such that associated ground stability risks should not constrain the proposed development.

9. GEOTECHNICAL ASSESSMENT

9.1 Assessment of Foundation Solutions

It is understood that the proposed development comprises a three-storey apartment block with associated car parking and managed landscaping areas.

Ground conditions beneath the site are indicated to comprise Made Ground of concrete surfacing with a limestone gravel sub-base to approximate depths of 0.3 m, over clayey gravelly sands to depths of between 0.6 m and 1.5 m, typically 0.6 m to 0.7 m. Underlying the Made Ground, Glaciofluvial Sheet Deposits are present. These generally comprise medium dense silty sands to typical depths of approximately 2.5 m. Underlying the silty sands, loose to medium dense silty gravelly sands are present to typical depths of approximately 3.2 m, beneath which firm to stiff consistency (high strength) clay strata are present.

Groundwater was encountered during ground investigations across the site at approximately 3 m depth.

Based on the available information from the ground investigations, it is considered that the medium dense silty sands of the Glaciofluvial Sheet Deposits should be suitable to support the proposed development on strip/trench fill foundations. The foundations should extend through Made Ground and into the natural strata (potential for founding depths may be in the order of 1.0 m across the majority of the site and potentially deeper than 1.5 m in the area formerly occupied by the Greenfinch P.H. building).

9.2 Recommended Foundation Design Parameters

9.2.1 Strip/Trench Fill Foundations

On the basis of the foregoing assessment, it is considered that strip/trench fill foundations within the silty sands of the Glaciofluvial Sheet Deposits provides a foundation solution that should be compatible with the proposed structure. On the basis of the ground conditions and structures described in the report, the recommended parameters for the foundation design are as follows:

Foundation Strata:	Medium dense silty sands (Glaciofluvial Sheet Deposits)
Foundation Depth:	Minimum 0.6 m, deepened through Made Ground and through lower strength/lower density materials. (Typical foundation depths of 1.0 m to 1.5 m anticipated)
Foundation Width/Size:	Up to 3 m
Nett Allowable Bearing Pressure:	150 kN/m^2

It is considered that total settlement of foundations designed on the above basis should be less than the normal serviceability limit state for this development (i.e. total settlements of 25 mm).

The clayey horizons at the site were encountered at sufficient depths so as not to affect foundations within influencing distance of trees, as defined in NHBC Standards (2024).

Based on guidance published within BRE Special Digest 1 (2005), the specified DC Class of concrete for buried structures and foundations should be suitable for an ACEC site classification of AC-1, as outlined in Section 7.3.2.

9.3 Floor Slab Recommendations

In view of the disturbance of shallow soils likely to be caused by site clearance works and the area of deep Made Ground in the area of the former Greenfinch P.H. building, it is recommended that allowance be made for a suspended floor slab for the proposed building.

9.4 General Construction Advice

All formations should be cleaned, and subsequently inspected by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Care should be taken to ensure that any existing services encountered are carefully and satisfactorily blocked to prevent water seeping through the drains and into any excavations.

The locations of any trial pits undertaken as part of this investigation should be accurately surveyed in order that their precise locations are known and that appropriate precautions can be taken when building over or near to these locations.

10. TEMPORARY WORKS

Conventional plant is considered appropriate for shallow excavation works at this site. Hydraulic breakers are likely to be required for clearance of the current concrete surfacing, and if buried structures are encountered.

On the basis of the current data, shallow excavations should remain stable in the short term. However, instability may occur in deeper excavations and/or excavations left open for an extended period of time, particularly during inclement weather and within Made Ground. Support should be provided, or the sides battered back, in compliance with the relevant risk assessment for any excavations requiring man entry.

Groundwater has been encountered during ground investigations at approximately 3 m depth below current site levels across the site, and it is recommended that excavations be kept above groundwater, where possible. Based on recent observations it is consider that sump pumping should be appropriate to control perched water entries at shallow depth. If excavations below 3 m depth are anticipated, it is recommended that specialist advice be sought with respect to dewatering.

11. ASSESSMENT OF SOAKAWAY DRAINAGE

On the basis of relatively low infiltration rates of 9.55 x 10^{-6} m/s presented within the Ground Investigation Report by Soiltechnics (2023), and the presence of relatively shallow groundwater above practically impermeable clays beneath the site, it is considered unlikely that soakaways will be feasible for the proposed development, as based on the current data and guidance published in BRE DG365 (2016). Therefore, it is recommended that an alternative drainage solution should be identified.

12. ROAD PAVEMENTS

Based on the predominantly coarse-grained nature of the shallow soils beneath the site a preliminary design equilibrium CBR of 5% may be considered for the design of road pavements. Due to the silty nature of the near-surface materials, it would be prudent to assume that the shallow soils may be frost susceptible.

13. ASSESSMENT OF MATERIALS FOR WASTE DISPOSAL

There is no requirement to remove soils from site and, therefore, development levels should be set such that soils can be retained and reused on site where possible. Providing development levels are set to accommodate soil arisings (for example, from foundation excavations), such materials would not be classified as waste if retained and re-used on site. However, if materials are excess to requirements, they should be taken to an appropriately permitted waste facility.

If material is identified for removal to a waste facility, it will be necessary to provide a description of the material and laboratory test data to the receiving facility. This information is included in Appendix I. It should be noted that additional testing, either for classification purposes or for waste acceptance criteria (WAC) testing to confirm acceptability of the waste may be required (as noted below).

The available analytical laboratory test data has been used to provide preliminary waste disposal advice. It should be noted that these test results may not specifically relate to materials that are, or will be, scheduled for removal from site. However, the results are appropriate for preliminary guidance and costing purposes.

A preliminary assessment of potential waste classification for materials on site has been undertaken in accordance with the Environment Agency's document Guidance on the Classification and Assessment of Waste WM3 (2015). The assessment indicates that the following preliminary waste classification advice would be appropriate.

- Asphalt surfacing should be taken to a recycling facility. Such materials are unlikely to meet WAC for disposal at landfill.
- Laboratory testing to date indicates that the Made Ground materials at the site may be generally classified as 'non-hazardous' waste.
- Natural strata, providing they have not been impacted by potential contaminants associated with the site usages, would be classified as 'inert' waste without any requirement for laboratory testing.

Waste requires pre-treatment prior to disposal at landfill and this may take the form of physical or chemical treatment to reduce hazards and/or waste volumes. The segregation and screening of waste soils into separate, and appropriately classified, waste streams would satisfy the pre-treatment criteria by ensuring that volumes of each waste category are minimised. Segregation of waste streams is also important to prevent materials being classified within a worse-case category and, therefore, incurring higher disposal costs. Mixing of different waste streams to dilute hazardous properties is not permitted.

It should be noted that the above assessment is provided in accordance with current waste disposal and environmental permitting legislation and guidance documents. However, individual landfills and other waste disposal facilities may have variances in their permit that differs from standard guidance. Waste facilities may also make decisions with respect to accepting waste on a commercial basis. Therefore, landfills or other waste facilities should be approached to confirm that they will accept waste materials prior to finalising waste disposal proposals.

14. RECOMMENDED SUPERVISION AND MONITORING

In compliance with the requirements in BS EN 1997-1:2004 and BE EN 1997-2:2007, construction and workmanship of the engineering solutions recommended in this report shall be supervised. In particular, issues listed in Section 9.4 General Construction Advice shall be considered in the implementation of the works and design of any necessary temporary works set out in Section 10.

In relation to the foundation solution(s) and ground floor slab recommendations in Section 9, the following supervision and monitoring is recommended.

- Inspections of formation strata in excavations for strip/trench fill footings

15. SUMMARY

A residential development is proposed at the site of the former Greenfinch Public House, Lapwing Lane, West Didsbury, M20 3ZA. The site is currently occupied by a disused car park and was until recently occupied by a public house. The proposed development comprises an apartment block, up to three-storeys in height, together with car parking, and managed landscaping areas. Residents of the development will be of retirement age.

Ground conditions at the site comprise Made Ground to typical depths of 0.6 m to 0.7 m, with deeper areas, to approximately 1.5 m depth, situated in the area of the former Greenfinch P.H. building. Underlying this, Glaciofluvial Sheet Deposits are present generally comprising medium dense silty sands to approximately 2.5 m depth. Beneath the silty sands, loose to medium dense gravelly sands are present to approximately 3.2 m depth and these are underlain by high strength clay strata, as proven to 5.0 m depth. Groundwater has been identified at approximately 3.0 m depth.

A ground investigation was designed from the desk study information to provide a risk assessment of relevant contaminant linkages. Although the ground investigation identified concentrations of arsenic, TPH fraction C_8-C_{10}, and certain PAHs above GAC/C4SL values, it is shown that these substances remain below site specific assessment criteria (SSAC) as applicable to the development. No other substances are indicated at elevated concentrations. Hence, from the current data, it is indicated that no valid contaminant linkages are present in relation to soils on site, and so no remedial works are necessary in this regard. The site is largely devoid of topsoil for the proposed development therefore it will be necessary to import suitable topsoil to form a growing medium in managed soft landscaping areas.

On the basis of the available information, it is considered that the ground conditions beneath the site do not represent an unacceptable risk to controlled waters. Likewise, it is considered that there is no valid contaminant linkage in relation to ground gases.

Based on the recorded ground conditions, it is considered feasible to support the proposed development on strip/trench fill foundations that extend through Made Ground to a suitable level within the medium dense silty

sands of the Glaciofluvial Sheet Deposits. It is recommended allowance be made for a suspended ground floor slab for the proposed building.

On the basis of the relatively low infiltration rates recorded together with the presence of relatively shallow groundwater above practically impermeable clay strata beneath the site, a soakaway drainage solution is indicated not to be feasible from the current data and with reference to published guidance. Therefore, it is recommended that an alternative drainage solution be identified for the proposed development.

REFERENCES

Site Specific

Soiltechnics Limited (2023) *Proposed Retirement Living Development, The Greenfinch, Didsbury - Ground Investigation Report* Report No STV6154-G01 Revision A

Technical

BRE (2016) *DG365 – Soakaway Design* IHS

BRE (2005) *Special Digest 1 – Concrete in aggressive ground,* CRC Ltd

BSI (2017) *BS 10175:2011+A2:2017 Code of Practice for Investigation of Potentially Contaminated Sites* British Standards Institution

BSI (2004) *BS EN1997-1:2004 Eurocode 7: Geotechnical Design – Part 1: General Rules* British Standards Institution

BSI (2007) *BS EN1997-2:2007 Eurocode 7: Geotechnical Design – Part 2: Ground Investigation and Testing* British Standards Institution

CIRIA (2001) *CIRIA C552 – Contaminated Land Risk Assessment: A Guide to Good Practice* Construction Industry Research Association

DoE (1990) *The Environmental Protection Act* Department of The Environment HMSO

DoE (1996) *DoE Industry Profiles: Railway Land* Department of the Environment HMSO

Environment Agency (2009) *Updated Technical Background to the CLEA Model Science Report SC050021/SR3* EA

Environment Agency (2010) *Guiding Principles for Land Contamination – GPLC1 to 3* EA

Environment Agency (2018, updated January 2021) Waste Classification: *Guidance on the Classification and Assessment of Waste (1st Edition v1.1.GB) – Technical Guidance WM3* EA

Environment Agency (October 2020, Updated July 2024) *Land Contamination Risk Management (LCRM)* EA

NHBC and Environment Agency (2008) *Guidance for the Safe Development of Housing on Land Affected by Contamination R&D Publication 66: 2008*

NHBC (2024) *Standards* National House Building Council

UKWIR (2010) *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites Report Ref. No. 10/WM/03/21* UK Water Industry Research

GENERAL NOTES

1. The report is limited to the site boundaries and is specific to the development proposals as identified by the Client (or Client's advisor) and confirmed within this report. The report should not be used in a different context. Where the report is identified as a site appraisal, further geoenvironmental assessment, and detailed investigations, will be required prior to finalisation of ground related assessment and designs. Other reports may recommend additional investigation or other works that would be considered essential prior to the preparation of final assessments and associated designs.

2. This report has been prepared by Crossfield Consulting Limited with all reasonable skill, care and diligence within the terms of the Appointment/Proposal Terms and Conditions (as applicable) and with the resources agreed with the Client. Responsibility for any matters outside the agreed scope is not accepted.

3. Where any data supplied by the Client or by other external sources, including previous site investigation data, has been used it has been assumed that the information is correct unless otherwise stated. No responsibility can be accepted by Crossfield Consulting Limited for inaccuracies within the data supplied by others.

4. Any borehole data from the British Geological Survey sources are included on the following basis: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".

5. Any assessments made in this report are based on the ground conditions indicated by the factual records included and/or referenced in the report, namely, trial pits and/or boreholes, together with the results of any field or laboratory testing undertaken and, where appropriate, other relevant site data/desk study information which may have been obtained for the site. Variations in ground conditions may occur between exploratory hole locations and there may be special conditions appertaining to the site that have not been revealed by the investigation and that have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.

6. Exploratory hole locations provided in the report are generally established by tape measurement (or similar measurement) from existing features or boundaries. Ground levels stated in the report are based on site survey plans as provided. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically included in the agreed scope of services.

7. Unless stated otherwise, no consultations with regulatory authorities, funders or other third parties have been carried out; hence, definitive assurance that such third parties will accept the findings of this report cannot be provided.

8. This report is only valid when used in its entirety. Any information or advice should not be relied upon if removed from the report or not considered in the context of the whole document. Crossfield Consulting Limited cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared.

9. The report is provided for the sole use by the Client or its assignees and is confidential to the Client's professional advisers. No responsibility whatsoever for the contents of this report will be accepted to any person other than the Client or its assignees.

10. The Client cannot place reliance on the report until full payment has been made for the report and all associated works.

11. New information, improved methods, changes in published guidance, codes of practice, policies and legislation can occur at any time and may necessitate an alteration to the report in whole, or in part, after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Crossfield Consulting Limited for re-assessment and, if necessary, re-appraisal.

TABLES

CONCEPTUAL SITE MODEL

	Potential Contaminant Source	Potential Contaminants	Potential Pathway	Receptors and Assessed Contaminant Linkage
On-Site Solid	Leaks from vehicles within former car parking area Made Ground materials may include demolition-derived or ashy materials. Bonfires and discarded ash from domestic heating Demolition of historical buildings	Toxic metals Phytotoxic metals Polyaromatic hydrocarbons Petroleum hydrocarbons Asbestos fibres/ACM	Dermal and oral exposure pathways (including air-borne migration) are present during construction phase but will generally not be present following development due to building and hardstanding effective barriers. The indicated exposure pathways may also be present in private gardens after development. Managed soft landscaping areas after development represent possible dust exposure pathways. Certain organic compounds can readily penetrate plastic construction materials ***Release into Liquid Phase*** Metal solubility generally low at typical soil temperature and pH. Low possibility of metal uptake by plants. Polyaromatic hydrocarbons and degraded petroleum hydrocarbons are typically of low solubility and mobility. ***Release into Vapour Phase*** Not applicable – no potential source	**Human Health** *End Users:* Possible contaminant linkage *Groundworkers:* Possible contaminant linkage *Neighbouring Properties/General Public:* Possible contaminant linkage ***Buried Structures & Services*** *Buried concrete:* No contaminant linkage *Potable water pipes:* No contaminant linkage *Other buried structures:* No contaminant linkage **Landscape Areas** Possible contaminant linkage
Off-Site Solid	Former railway line and former town/corporation yard Croft have been redeveloped. Therefore, potential source of mobile contamination is unlikely based on available information.	Not applicable – no realistic source		
On-Site Liquid	No evidence of potential source based on Desk Study information.	Not applicable – no potential source	Not applicable – no potential source ***Release into Vapour Phase*** Not applicable – no potential source	
Off-Site Liquid	No evidence of potential source based on Desk Study information.	Not applicable – no potential source		
On Site Liquid	No evidence of potential source based on Desk Study information.	Not applicable – no potential source	Not applicable – no potential source	**Controlled Waters** *Groundwater:* Superficial Secondary A aquifer, Bedrock Principal aquifer, no source protection zone: No contaminant linkage *Surface Water*: Small unnamed watercourse approximately 466 m southeast: No contaminant linkage
Ground Gases	No historical or active landfills within 250 m of the site. There is no reason to expect deep Made Ground or putrescible materials beneath the site. The site is not in a radon affected area	N/A - No evidence of potential source	N/A	**Human Health** *End Users:* No contaminant linkage *Construction Workers:* No contaminant linkage

NOTES

1. The above conceptual model is based on CIRIA C552 (2001) and BS 10175:2011+A2:2017, BS EN ISO 21365:2020 and Environment Agency Land Contamination Risk Management (LCRM) (2020).
2. The Conceptual Site Model is prepared from available desk study information. Where a site walkover or ground investigation identifies information that was not known at the desk study stage, such information is used to modify the Model.
3. Where a contaminant linkage is identified, any subsequent ground investigation is designed to obtain relevant information to assess the contaminant linkage. See Table 3 for a summary of contaminant linkage assessments.

SUMMARY OF ANALYTICAL TEST DATA: SOILS
RISKS TO HUMAN HEALTH

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Residential Without Plant Uptake		Category 4 Screening Level (mg/kg) Residential Without Plant Uptake	
			Min	Max	Value	No>GAC	Value	No>C4SL
Arsenic	mg/kg	13	4	55	40[1]	2	40[3]	2
Cadmium	mg/kg	13	<0.2	0.7	85[1]	0	149[3]	0
Chromium (Total) [4]	mg/kg	13	6	17	910[1]	0	-	-
Chromium (VI)	mg/kg	13	<0.5	<2	6[1]	0	21[3]	0
Lead	mg/kg	13	12	165	-	-	310[3]	0
Inorganic Mercury	mg/kg	13	<0.3	<1	56[1]	0	-	-
Nickel	mg/kg	13	5.6	16	180[1]	0	-	-
Selenium	mg/kg	13	<1.0	<3	430[1]	0	-	-
Copper	mg/kg	13	8.9	54	7100[1]	0	-	-
Zinc	mg/kg	13	14	130	40,000[1]	0	-	-
Boron	mg/kg	13	<0.2	1.1	11,000[1]	0		
Phenols	mg/kg	13	<1.0	<2	690[1]	0	-	-
pH	-	19	7.7	9.1	-	-	-	-
Total Organic Carbon	%	13	0.9	13.0	-	-	-	-
Petroleum Hydrocarbons								
Aliphatics $C_5 – C_6$	mg/kg	10	<0.01	<1.0	78[1]	0	-	-
Aliphatics $C_6 – C_8$	mg/kg	10	<0.01	1.3[5]	230[1]	0	-	-
Aliphatics $C_8 – C_{10}$	mg/kg	10	<0.05	130[5]	65[1]	1	-	-
Aliphatics $C_{10} – C_{12}$	mg/kg	10	<1.0	250[5]	330[1]	0		
Aliphatics $C_{12} – C_{16}$	mg/kg	10	<2.0	190[5]	2400[1]	0	-	-
Aliphatics $C_{16} – C_{35}$	mg/kg	10	<2.0	90	92,000[1]	0	-	-
							-	-
Aromatics $C_6 – C_7$	mg/kg	10	<0.01	<1.0	690[1]	0	-	-
Aromatics $C_7 – C_8$	mg/kg	10	<0.01	1.3	1800[1]	0	-	-
Aromatics $C_8 – C_{10}$	mg/kg	10	<0.05	130[5]	110[1]	1	-	-
Aromatics $C_{10} – C_{12}$	mg/kg	10	<1.0	250[5]	590[1]	0		
Aromatics $C_{12} – C_{16}$	mg/kg	10	<2.0	190[5]	2300[1]	0	-	-
Aromatics $C_{16} – C_{21}$	mg/kg	10	<1.0	110	1900[1]	0	-	-
Aromatics $C_{21} – C_{35}$	mg/kg	10	<1.0	120	1900[1]	0	-	-
VOCs								
Benzene	mg/kg	7	<0.002	<0.005	0.70[1]	0	1.6[3]	0
Toluene	mg/kg	7	<0.005	<0.005	1900[1]	0	-	-
Ethylbenzene	mg/kg	7	<0.002	<0.005	190[1]	0	-	-
Xylene	mg/kg	7	<0.002	<0.005	180[1]	0	-	-
MTBE	mg/kg	7	<0.005	<0.005	120[2]	0	-	-

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Residential Without Plant Uptake		Category 4 Screening Level (mg/kg) Residential Without Plant Uptake	
			Min	Max	Value	No>GAC	Value	No>C4SL
PAHs								
Naphthalene	mg/kg	13	<0.05	1.1	5.6[1]	0	-	-
Acenaphthylene	mg/kg	13	<0.05	1.0	4600[1]	0	-	-
Acenaphthene	mg/kg	13	<0.05	2.3	4700[1]	0	-	-
Fluorene	mg/kg	13	<0.05	2.2	1600[1]	0	-	-
Phenanthrene	mg/kg	13	<0.05	21	1500[1]	0	-	-
Anthracene	mg/kg	13	<0.05	4.3	35,000[1]	0	-	-
Fluoranthene	mg/kg	13	<0.05	22	1600[1]	0	-	-
Pyrene	mg/kg	13	<0.05	23	3800[1]	0	-	-
Benz(a)anthracene	mg/kg	13	<0.05	11	14[1]	0	-	-
Chrysene	mg/kg	13	<0.05	13	31[1]	0	-	-
Benzo(b)fluoranthene	mg/kg	13	<0.05	11	4.0[1]	5	-	-
Benzo(k)fluoranthene	mg/kg	13	<0.05	5.6	110[1]	0	-	-
Benzo(a)pyrene	mg/kg	13	<0.05	12	3.2[1]	5	5.3[3]	4
Indeno(123cd)pyrene	mg/kg	13	<0.05	7.2	46[1]	0	-	-
Dibenzo(ah)anthracene	mg/kg	13	<0.05	2.2	0.32[1]	5	-	-
Benzo(ghi)perylene	mg/kg	13	<0.05	8.3	360[1]	0	-	-

NOTES

1. Suitable for Use Level (S4UL) published by LQM/CIEH, 2015 – Residential Without Plant Uptake landuse. S4UL assumptions comprise 2.5% soil organic matter, soil pH of 7 and sandy loam soil type. S4ULs are copyright © Land Quality Management Limited reproduced with permission; Publication Number S4UL3133.
2. Soil GAC for Human Health Risk Assessment produced by CL:AIRE (2010) – Residential Without Plant Uptake. Assumption of 2.5% soil organic matter.
3. Category 4 Screening Level (C4SL), Department for Environment Food and Rural Affairs (March 2014) – calculated for 2.5% SOM using the CLEA Model v1.071
4. In the absence of desk study or historical map evidence indicating a potential source of chromium (VI) usage at or in the near vicinity of the site (and confirmed by laboratory testing), total chromium concentrations have been compared to the GAC for chromium (III).
5. Total Petroleum Hydrocarbon concentration – worst case assumption that all aromatic or aliphatic GAC relevant to that organic range.
6. For determinands that exceed the GAC and C4SL, site specific assessment criteria are derived in Appendix III

ASSESSMENT OF CONTAMINANT LINKAGES

NOTES:
1. Contaminant linkage validity assessed following qualitative or semi-quantitative risk assessment.
2. Contaminant linkage assessed following detailed quantitative risk assessment or assuming the recommended remediation or mitigation measures are in place.

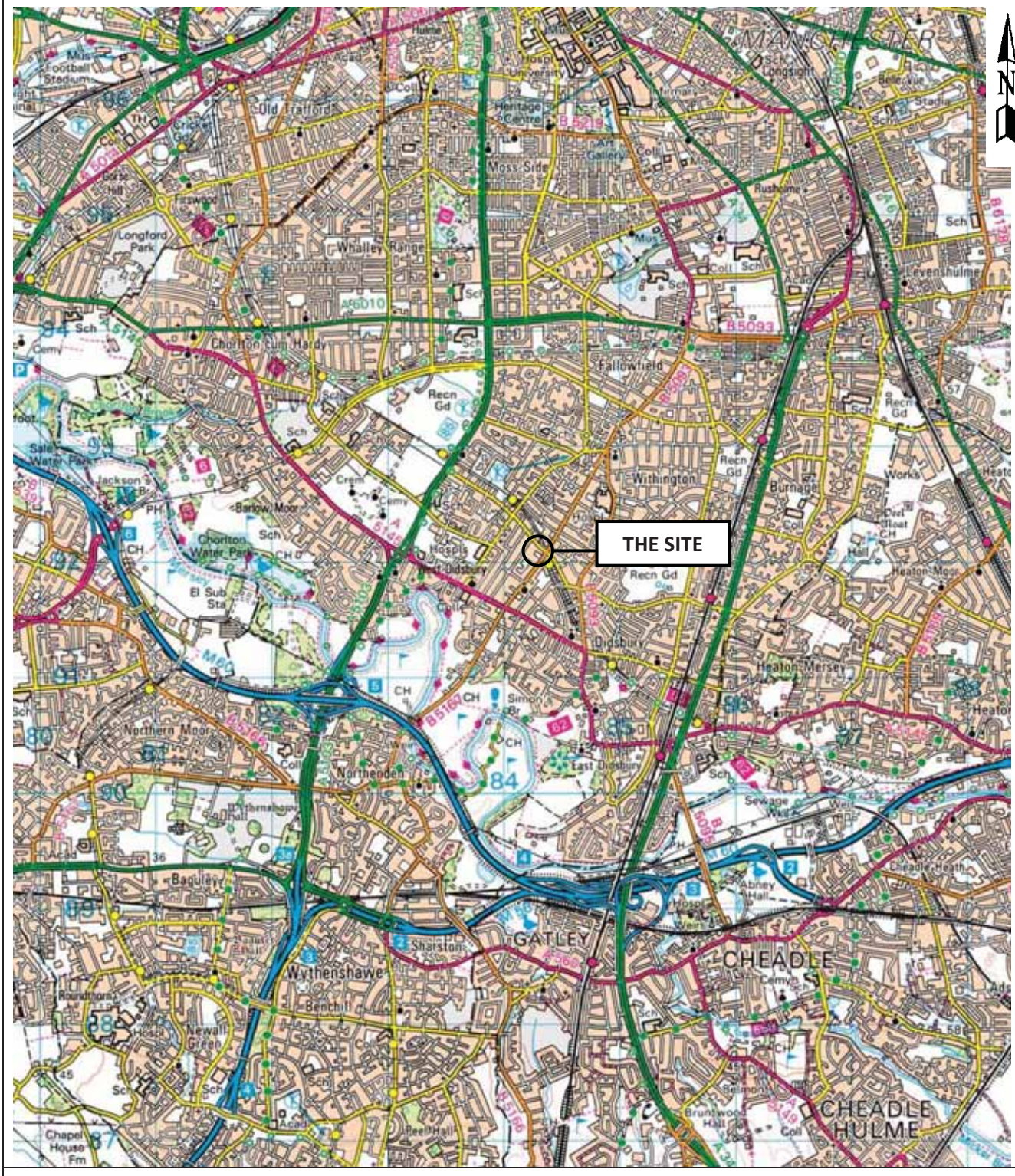
Probability (P)	Consequence (C)			
	Severe	Medium	Mild	Minor
High likelihood (HL)	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
Likely (L)	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
Low likelihood (LL)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
Unlikely (UL)	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

All terminology in accordance with the definitions provided in CIRIA C552 (2001)

Contaminant Linkage			Assessment of Contaminant Linkage following Ground Investigation	Contaminant Linkage Valid? [1]	Risk Rating			Quantitative Risk Assessment	Recommended Remediation/Mitigation (See Section 7 for further details)	Recommended Work Verified?	Contaminant Linkage Valid? [2]
Source	**Pathway**	**Receptor**			**C**	**P**	**Risk**				
Toxic metals, PAHs, TPHs Asbestos	Dermal contact Ingestion Inhalation (NB dust exposure only in managed landscaping areas)	End users	Concentrations of arsenic, C_8 -C_{10} TPH fractions, benzo(b)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene identified above the GAC and C4SL No asbestos detected	Yes No	Med n/a	LL n/a	Med/Low n/a	Yes, site specific assessment criteria using CLEA Model V1.07 which confirms all concentrations to be below the SSAC values for the proposed development.	None required	Not applicable	No
Toxic metals, PAHs, TPHs Asbestos	Dermal contact, Ingestion, Inhalation	Construction workers	All tests below concentrations considered to be a short-termed (acute) risk. No further assessment required. No asbestos detected	No No	n/a n/a	n/a n/a	n/a n/a	Not applicable	Not required but standard personal protective equipment is recommended as good practice. Conventional dust control and soil dampening to be used during construction.	Not applicable	No
Toxic metals, PAHs, TPHs Asbestos	Dermal contact, Ingestion, Inhalation (Dust)	Neighbours/general public	Concentrations of arsenic, C_8 -C_{10} TPH fractions, benzo(b)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene identified above the GAC and C4SL No asbestos detected	Yes No	Med n/a	UL n/a	Low n/a	Not applicable	Conventional dust control and soil dampening to be used during construction.	To be confirmed during construction phase.	No
Phytotoxic metals	Plant uptake	Landscape/garden plantings	No phytotoxic metals indicated at concentrations considered a risk to healthy plant growth based on BS 3882.2015	No	n/a	n/a	n/a	Not applicable	Much of the site is currently devoid of topsoil, such that, a thickness of imported topsoil will be required to act as a growing medium for the proposed plants within garden and landscaping areas.	Not applicable	No

FIGURES

FIGURE 1

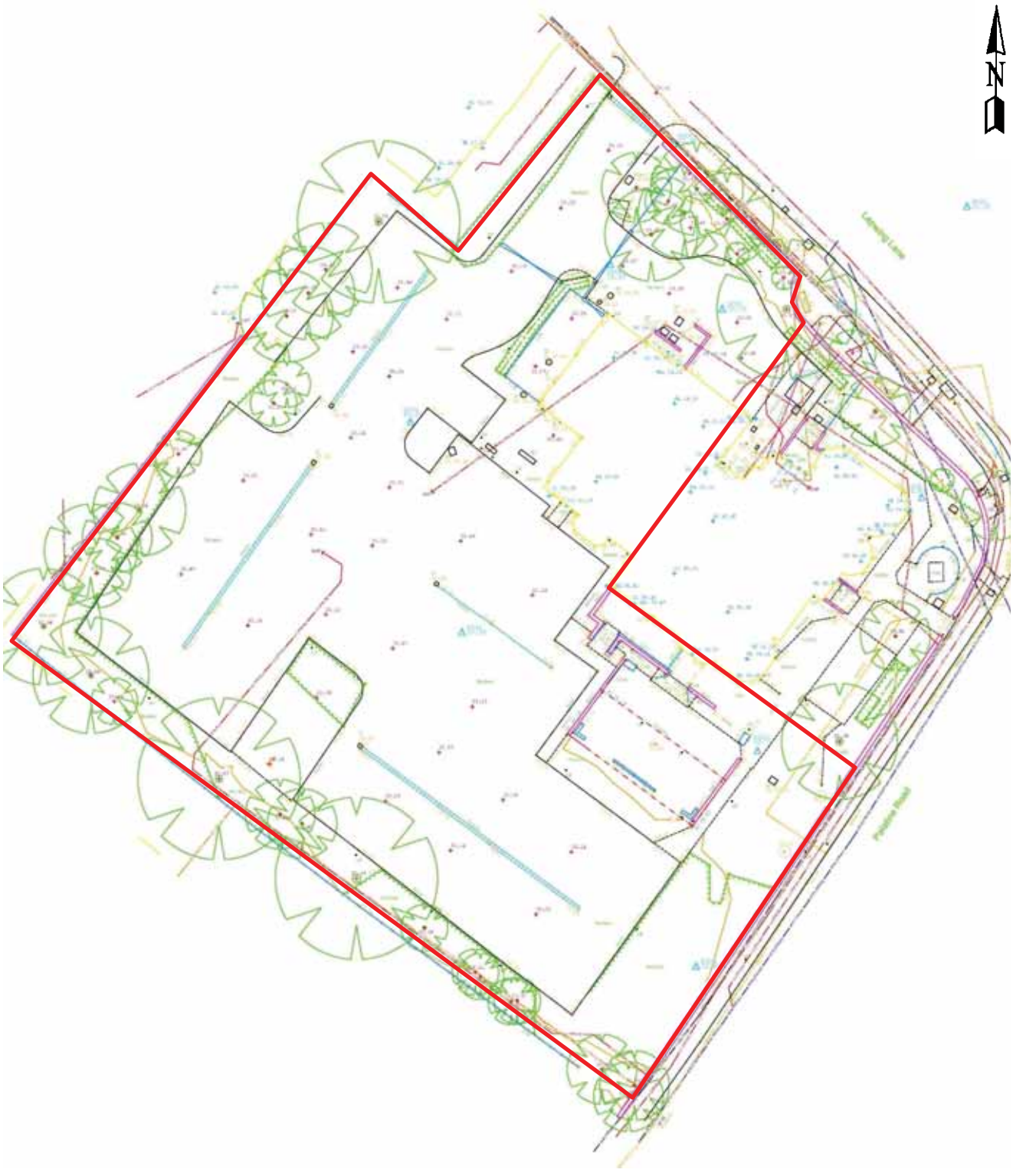


SITE LOCATION PLAN

Scale 1: 50,000

Reproduced from the 2022 1:50,000 Ordnance Survey map with the permission of Ordnance Survey.
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FIGURE 2



SITE PLAN AND TOPOGRAPHICAL SURVEY

Scale 1: 500

Reproduced from the topographical survey by Geospatial (undated) provided by the Client

FIGURE 3



PROPOSED DEVELOPMENT PLAN

Scale 1:500

Reproduced from Site Plan dated April 2024 by Planning Issues Dwg No. 50013DB/PL02

APPENDIX I

APPENDIX I –PREVIOUS GROUND INVESTIGATION INFORMATION

Soiltechnics Limited Ground Investigation Report – August 2023

A ground investigation was undertaken at the site in April 2021 and October 2022 by Soiltechnics Limited and reported in a Ground Investigation Report, dated August 2023. This report has been provided by the Client for review and factual information from the report is reproduced in this Appendix and is included within the assessments.

Included in this Appendix are the following:

- Trial Pit records: TP01 to TP05 (undertaken April 2021) and TP101 to TP106 (undertaken October 2022)
- Soakaway test records
- Exploratory Hole Plan
- DETS Limited Analytical laboratory test reports – Report No. 21-05199
- Eurofins Chemtest Limites Analytical laboratory test reports - Report No. 22-39822-1
- i2 Analytical geotechnical laboratory test report – Report No. 21-69911

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Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.

Sampling		
From (m) To (m)	Records depth of sampling	
Type	D	Disturbed sample
	B	Bulk disturbed sample
	ES	Environmental sample
	W	Water sample
	U	Undisturbed thick-walled sample 100mm diameter sampler
	UT	Undisturbed thin walled sample 100mm diameter sampler
	UTF	Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

▼ Water level observed after specified delay in drilling

▽ Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASHPALT. (MADE GROUND)	0.12								
[Medium dense] light grey to brown slightly sandy GRAVEL of medium to coarse angular to subrounded limestone. (MADE GROUND)							0.30		ES
							0.60		ES
[Loose] light grey to brown gravelly slightly clayey SAND. Gravel is medium rounded to subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.70								
...at 1m depth, clay pipe.							1.00		B
							1.70		B
							2.50		B
TRIAL PIT TERMINATED AT 3.20m	3.20								

Notes Collapse of trial pit sides at 3.2m due to water ingress, trial pit terminated.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.60m	**Date(s)** 16/04/2021
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations Groundwater encountered at 3.1m depth, filling trial pit to 3.07m in 10 minutes.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP01**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASHPALT.	0.11						0.20		ES
(MADE GROUND)									
[Medium dense] light grey slightly sandy GRAVEL of fine to coarse angular limestone.							0.40		ES
(MADE GROUND)									
[Loose] light grey to brown gravelly slightly clayey SAND. Gravel is medium rounded to subrounded sandstone.	0.60						0.80		B
(GLACIOFLUVIAL SHEET DEPOSITS)									
...at 1m depth, clay pipe.							1.20		B
							1.60		B
TRIAL PIT TERMINATED AT 1.80m	1.80								

Notes Trial pit sides remained upright and stable upon completion. Trail pit terminated to perform Infiltration testing.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 16/04/2021
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP02**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASHPALT.	0.12								
(MADE GROUND)									
[Medium dense] light grey slightly sandy GRAVEL of fine to coarse angular limestone.	0.40								
(MADE GROUND)									
[Medium dense] dark grey slightly clayey gravelly SAND. Gravel is fine to medium angular brick and concrete.	0.60								
(MADE GROUND)									
[Loose] brown gravelly slightly clayey SAND. Gravel is medium rounded to subrounded sandstone.							0.90		B
(GLACIOFLUVIAL SHEET DEPOSITS)							1.60		B
							2.10		B
TRIAL PIT TERMINATED AT 2.50m	2.50								

Notes Collapse of trial pit sides between 1.8-2.5m depth on completion, widening trial pit by 1.1m each side. Trail pit terminated due to extensive collapsing.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.30m	**Date(s)** 16/04/2021
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP03**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASHPALT.	0.12								
(MADE GROUND)							0.20		ES
[Medium dense] dark brown to light grey slightly sandy GRAVEL of medium to coarse angular to subrounded limestone.									
(MADE GROUND)							0.50		ES
[Loose] light grey to brown gravelly slightly clayey SAND. Gravel is medium rounded to subrounded sandstone.	0.60								
(GLACIOFLUVIAL SHEET DEPOSITS)							0.80		B
							1.30		B
							1.80		B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Collapse of trial pit sides at 2m depth after filling with water widening trial pit by 0.5m on the east side and 0.4m on the west side. Infiltration testing performed.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.50m	**Date(s)** 16/04/2021
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP04**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASHPALT.	0.12								
(MADE GROUND)							0.20		ES
[Medium dense] brown very sandy GRAVEL of fine to coarse angular brick and limestone with occasional half brick.							0.30		ES
(MADE GROUND)							0.50		D
[Loose] light brown gravelly slightly clayey SAND. Gravel is medium rounded to subrounded sandstone.	0.60								
(GLACIOFLUVIAL SHEET DEPOSITS)							1.00		B
							1.80		B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Collapse of trial pit sides at 2m depth widening trial pit by 1m on the east side and 0.6m on the west side filling pit to 1.2m depth. Trail pit terminated due to extensive collapsing.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.20m	**Date(s)** 16/04/2021
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP05**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASPHALT. (ASPHALT)	0.12								
Light grey to brown sandy medium to coarse angular to subrounded GRAVEL of limestone and brick. (MADE GROUND)									
Light grey to brown gravelly SAND. Gravel is medium rounded to subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.80						1.00	2.00	B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.10m	**Date(s)** 06/10/2022
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP101**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASPHALT. (ASPHALT)	0.12								
Light grey to brown sandy medium to coarse angular to subrounded GRAVEL of limestone and brick. (MADE GROUND)									
Light grey to brown gravelly SAND. Gravel is medium rounded to subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.70						1.00	2.00	B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.10m	**Date(s)** 06/10/2022
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP102**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASPHALT. (ASPHALT)	0.12								
Light grey to brown sandy medium to coarse angular to subrounded GRAVEL of limestone and brick with cobbles of brick. (MADE GROUND)									
Light grey to brown gravelly SAND. Gravel is medium rounded to subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.90						1.00	2.00	B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.10m	**Date(s)** 06/10/2022
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP103**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
ASPHALT. (ASPHALT)	0.12								
Light grey to brown sandy medium to coarse angular to subrounded GRAVEL of limestone and brick. (MADE GROUND)									
Light grey to brown gravelly SAND. Gravel is medium rounded to subrounded sandstone. (GLACIOFLUVIAL SHEET DEPOSITS)	0.60						1.00	2.00	B
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.10m	**Date(s)** 07/10/2022
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP104**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Dark brown to brown very gravelly SAND. Gravel is fine to coarse angular brick, concrete, timber, glass and metal. (MADE GROUND)							0.30		ES
							0.70		ES
							1.10		ES
TRIAL PIT TERMINATED AT 1.20m	1.20								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.10m	**Date(s)** 07/10/2022
	Method Machine excavator	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP105**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass over dark brown slightly clayey SAND with rootlets. (MADE GROUND - TOPSOIL)	0.30						0.40		ES
Dark brown to brown very gravelly SAND. Gravel is fine to coarse angular brick, concrete, timber, glass and timber. (MADE GROUND)	0.70								
TRIAL PIT TERMINATED AT 0.70m									

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.40m x 0.40m	**Date(s)** 07/10/2022
	Method Hand excavated	**Logged by** TO	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision**
	Co-ordinates -	**Checked by** SCD	**TP106**

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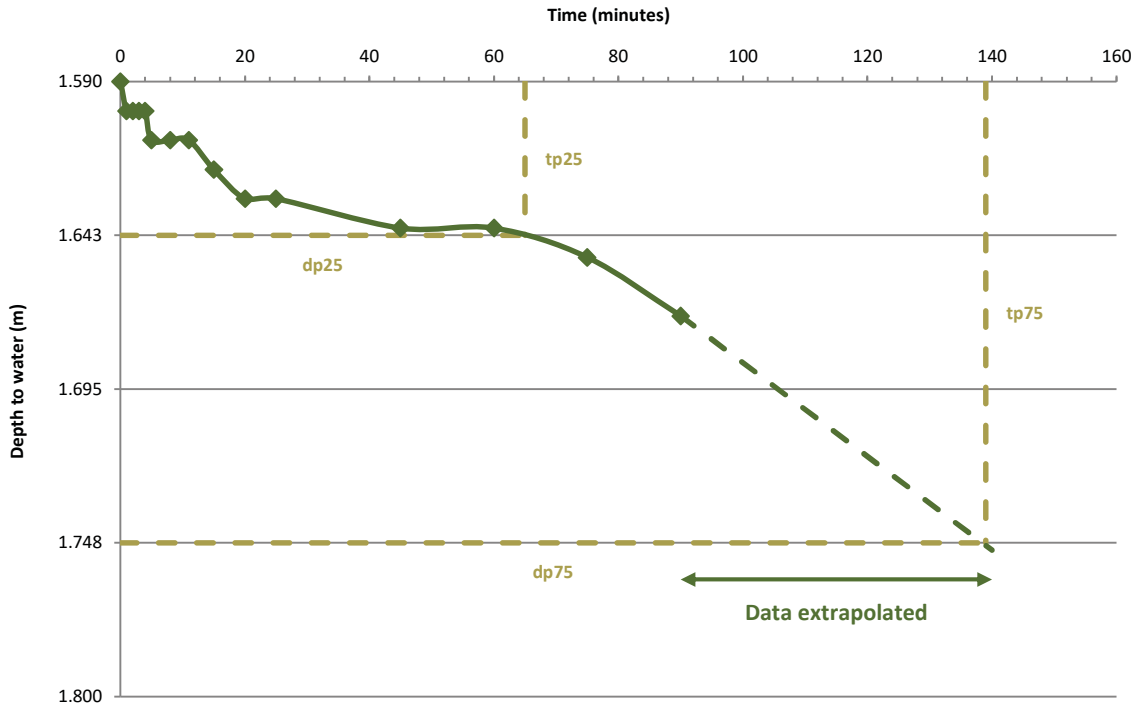
Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP02	1	16/04/2021	0.70m x 2.00m

Depth at start of test (m)	Groundwater observations (at time of excavation)
1.8	No groundwater encountered.

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

V_{p75-25}	*Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth*	0.147m³ m^3
a_{p50}	*Internal surface area up to 50% effective depth and including the base*	1.967m² m^2
$t_{p75} - t_{p25}$	*Time for the water level to fall from 75% to 25% effective depth*	4440 s



f	***Soil infiltration rate***	**1.68E-05 m/s**

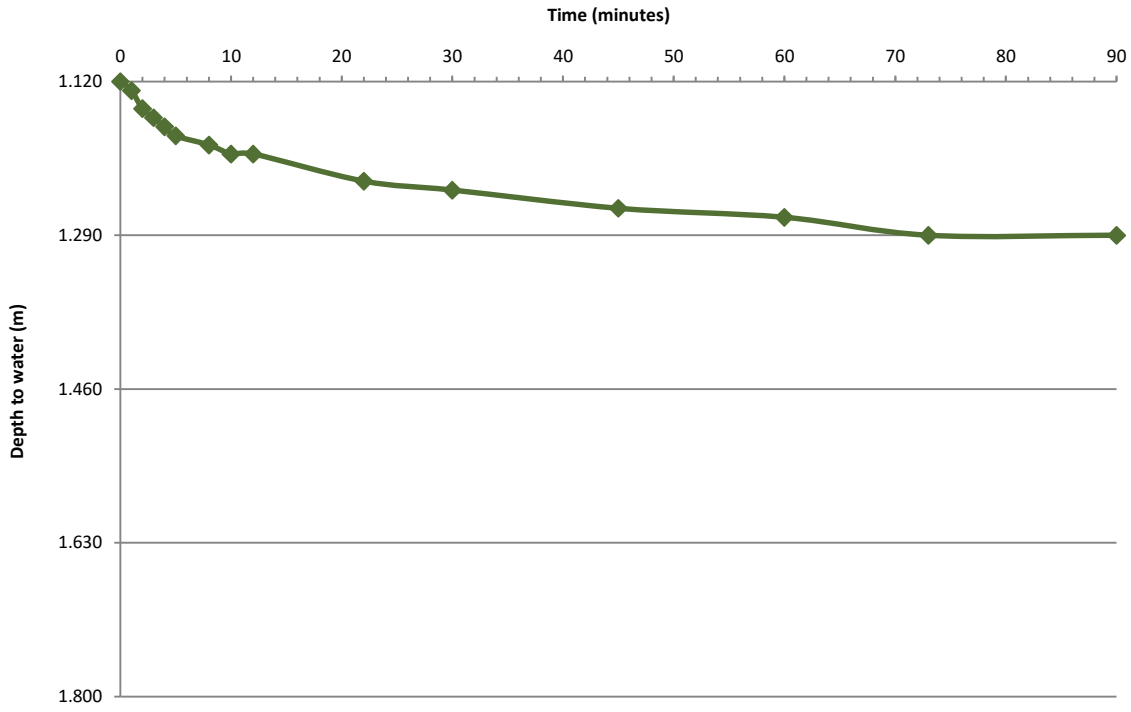
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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP02	2	16/04/2021	0.70m x 2.00m

Depth at start of test (m)	Groundwater observations (at time of excavation)
1.8	No groundwater encountered.

Insufficient infiltration over 90 minutes of monitoring therefore unable to calculate soil infiltration rate.



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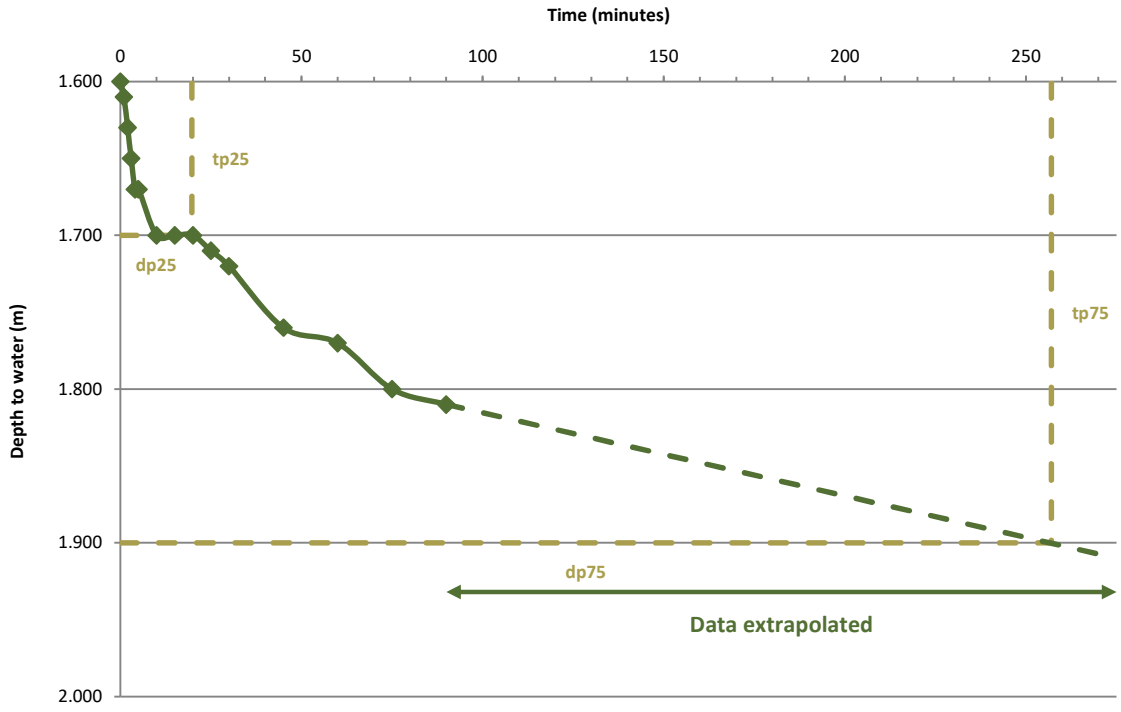
Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP04	1	16/04/2021	0.70m x 2.50m

Depth at start of test (m)	Groundwater observations (at time of excavation)
2	No groundwater encountered.

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

V_{p75-25}	*Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth*	0.35m³ m^3
a_{p50}	*Internal surface area up to 50% effective depth and including the base*	3.03m² m^2
$t_{p75} - t_{p25}$	*Time for the water level to fall from 75% to 25% effective depth*	14235 s



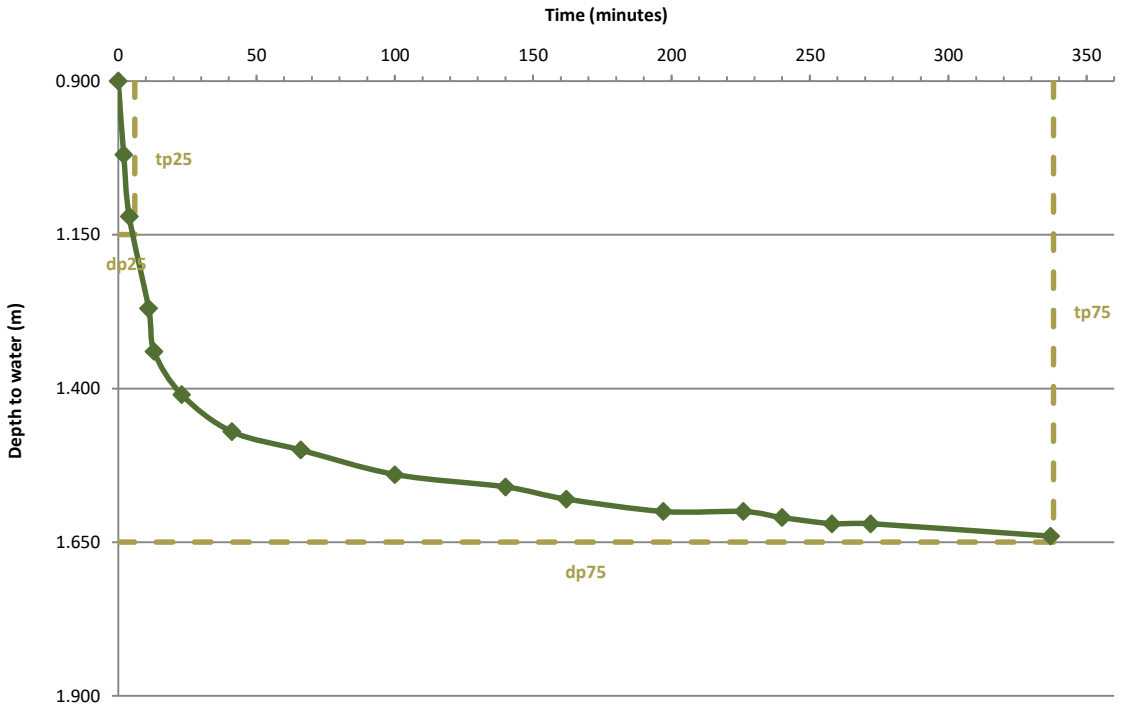
f	***Soil infiltration rate***	**8.11E-06 m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP101	1	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.9	No groundwater encountered. Pit silted to 1.9m depth



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

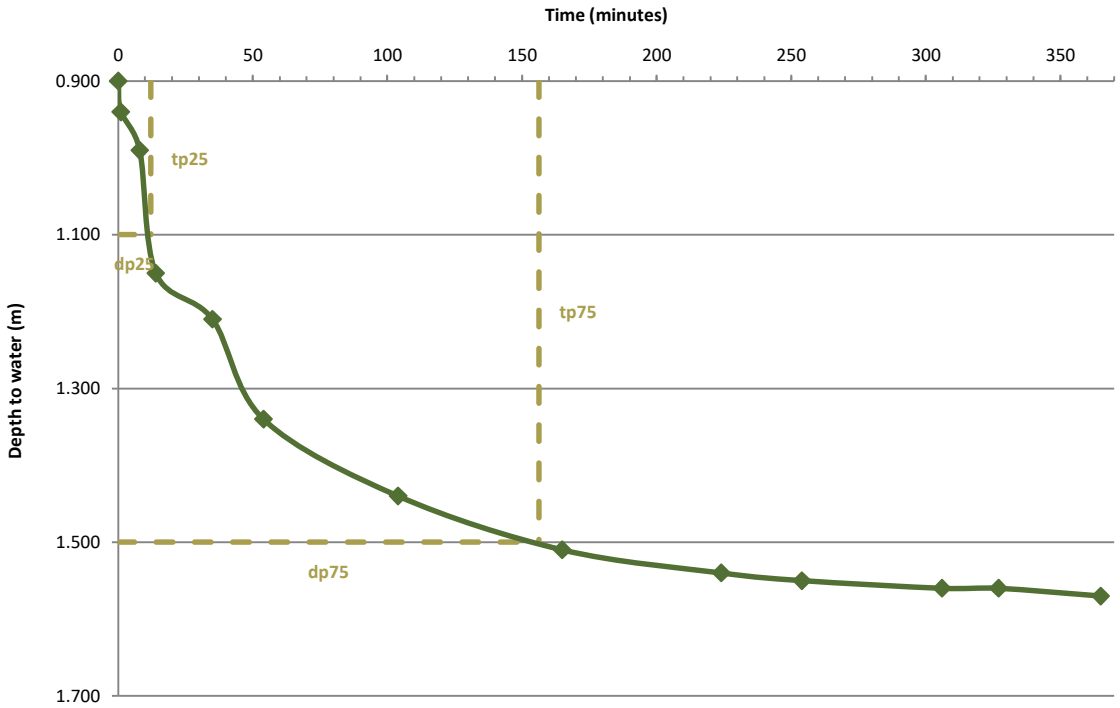
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.735**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**19920**	**s**
f Soil infiltration rate	**8.64E-06**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP101	2	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.9	No groundwater encountered. Pit silted/collpased to 1.7m prior to 2nd cycle commencing



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

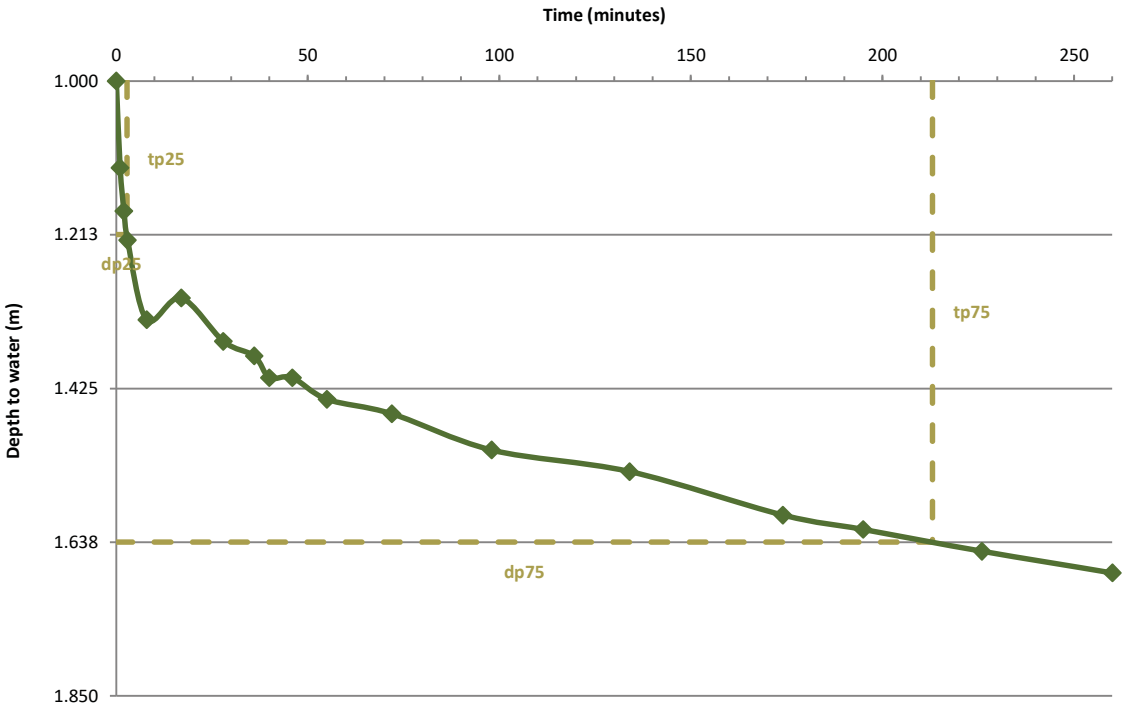
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.588**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**8650**	**s**
f Soil infiltration rate	**1.83E-05**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP102	1	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
1	No groundwater encountered. Pit collpased slightly at start of test to 1.85m depth



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

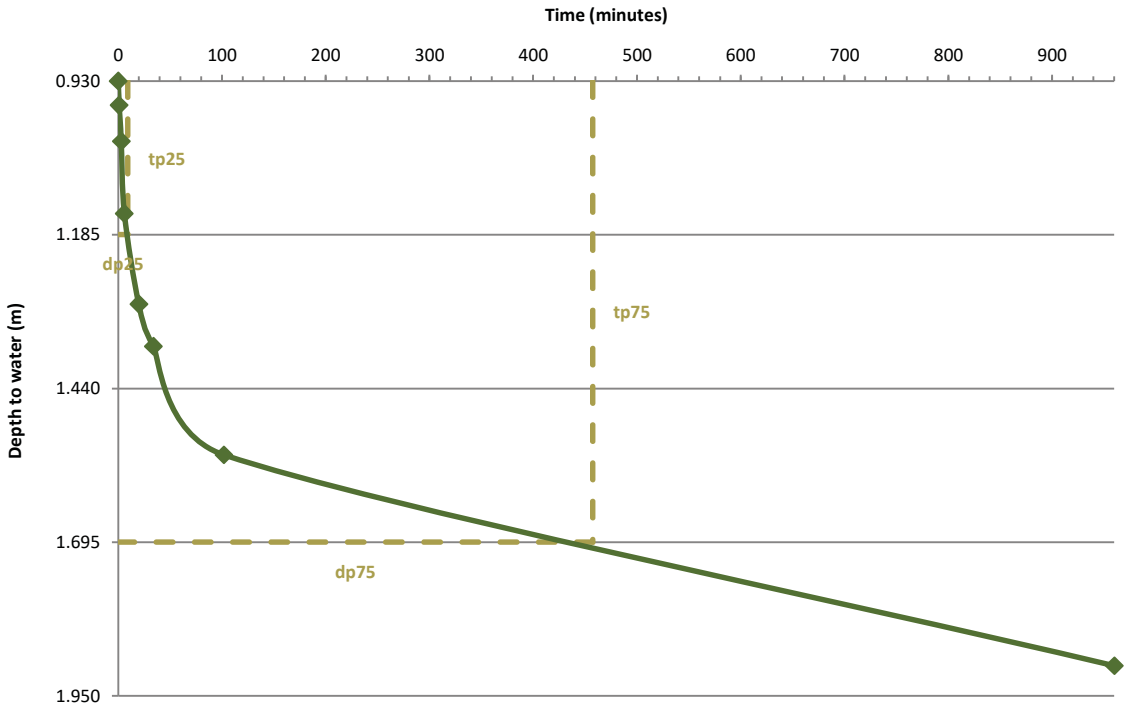
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.62475**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**12616**	**s**
f Soil infiltration rate	**1.29E-05**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP102	2	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.93	No groundwater encountered. Pit re-excavated to 1.95m depth for 2nd cycle



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

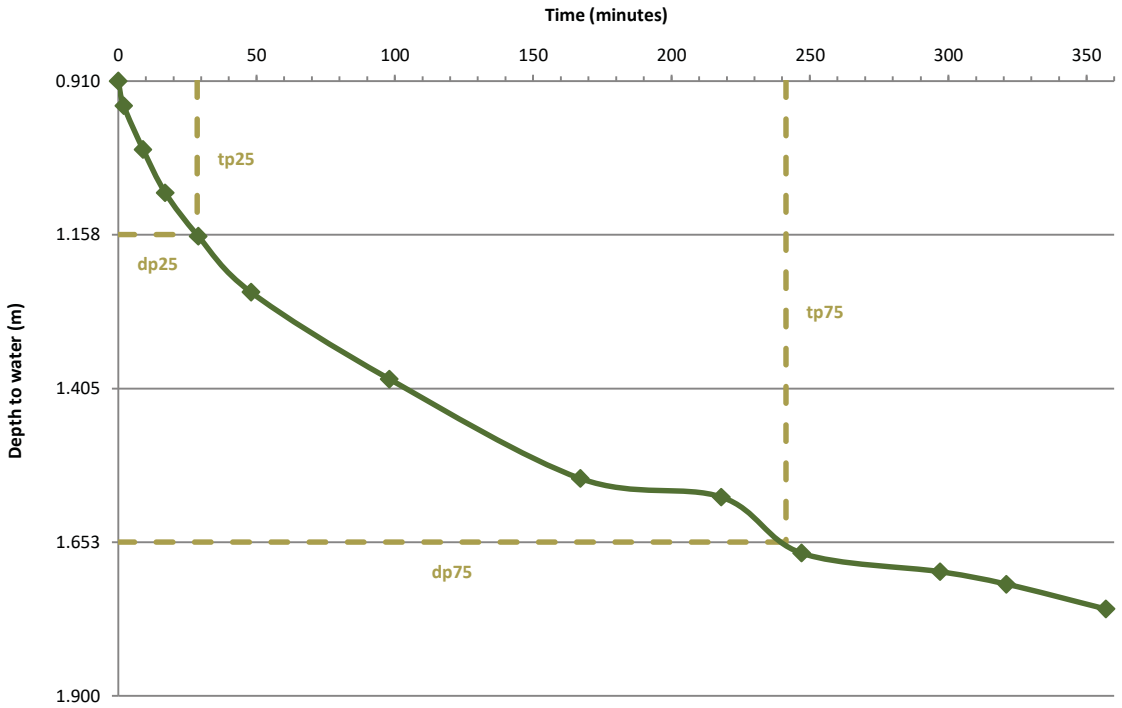
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.7497**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**26891**	**s**
f Soil infiltration rate	**6.44E-06**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP102	3	07/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.91	No groundwater encountered. Pit silted to 1.9m at start of 3rd cycle on day 2



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

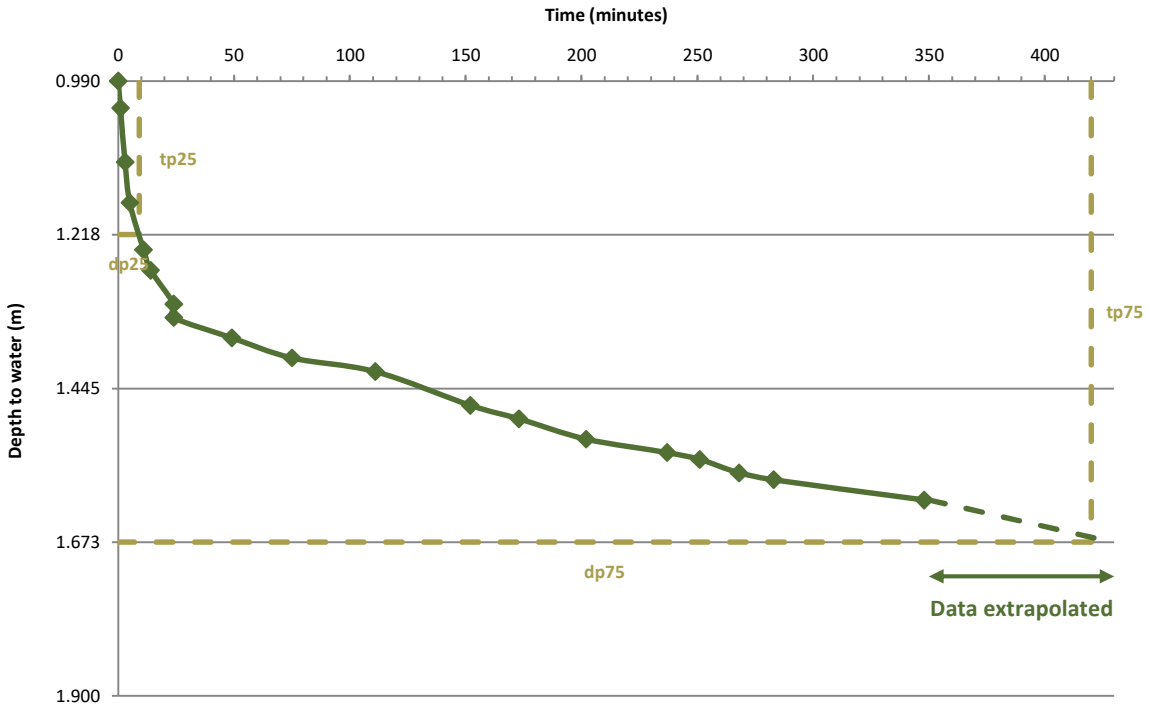
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.72765**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**12767**	**s**
f Soil infiltration rate	**1.34E-05**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP103	1	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.99	No groundwater encountered. Pit partially collpased to 1.9m during test



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

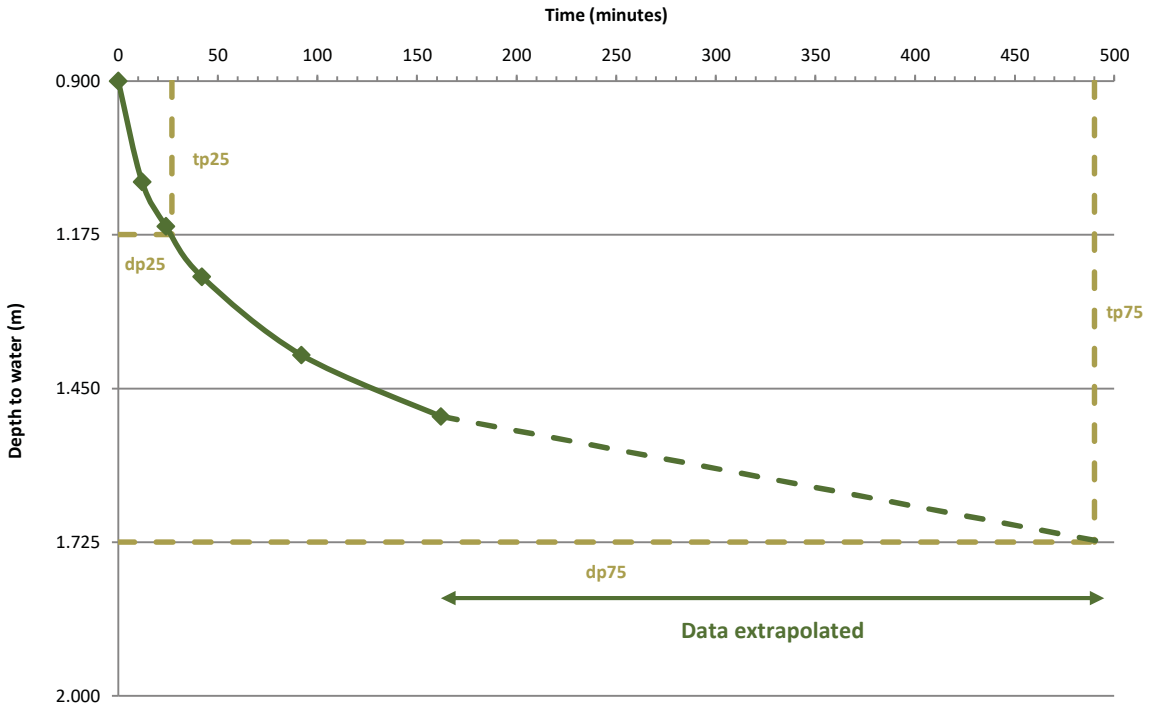
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.66885**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**24656**	**s**
f Soil infiltration rate	**6.75E-06**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP103	2	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.9	No groundwater encountered. After 200mins the pit sides collpased, significantly affecting the test. Data extrapolated from last measurement prior to collapse



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

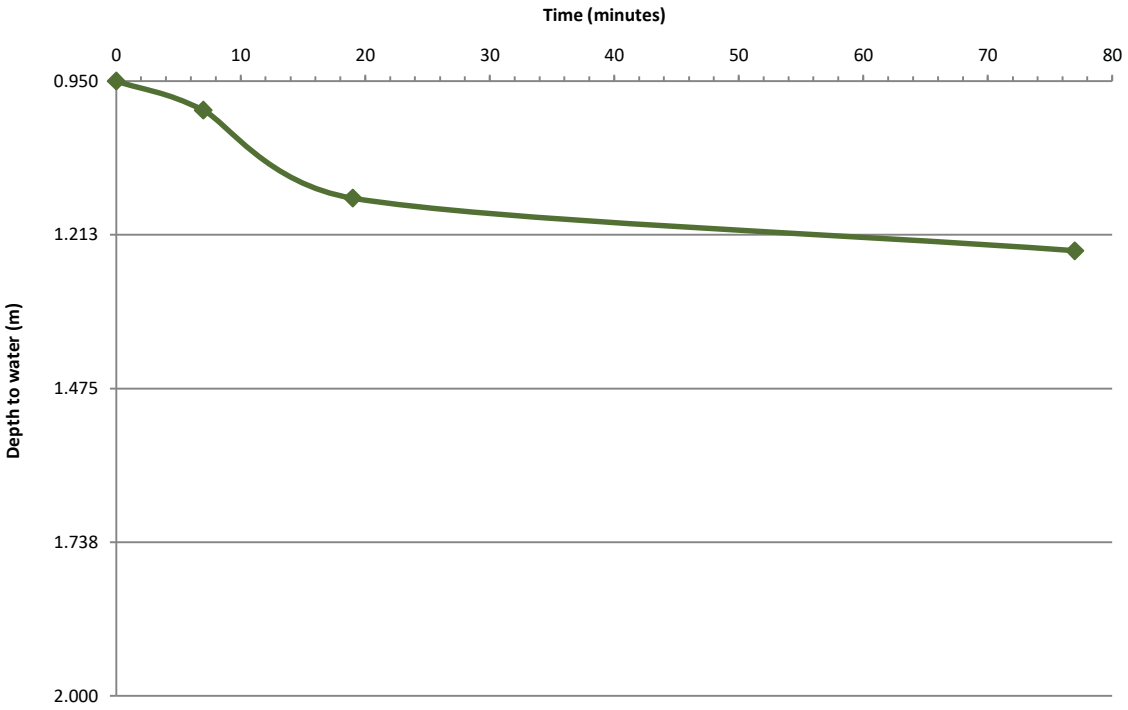
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.8085**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**5**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**27780**	**s**
f Soil infiltration rate	**6.40E-06**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP103	3	06/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.95	No groundwater encountered.



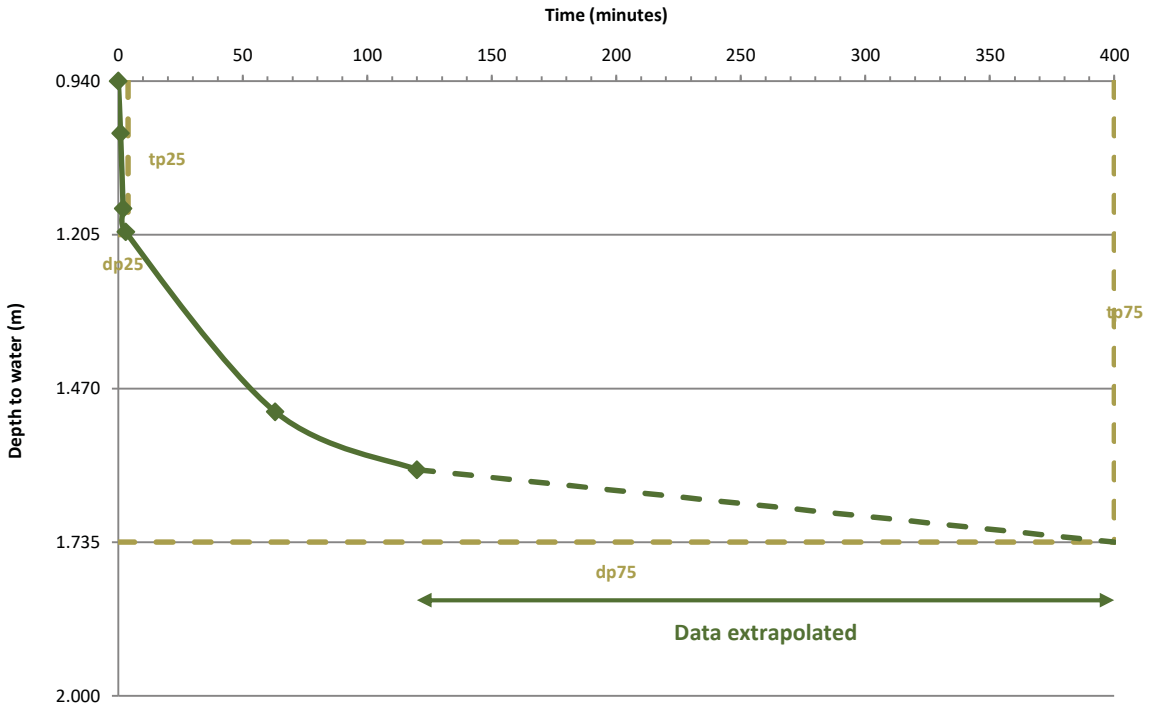
Insufficient infiltration over 77 minutes of monitoring therefore unable to calculate soil infiltration rate.

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP104	1	07/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.91	No groundwater encountered. Significant period of inclement weather after 120mins. Test terminated and data extrapolated from last measurement prior to event



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

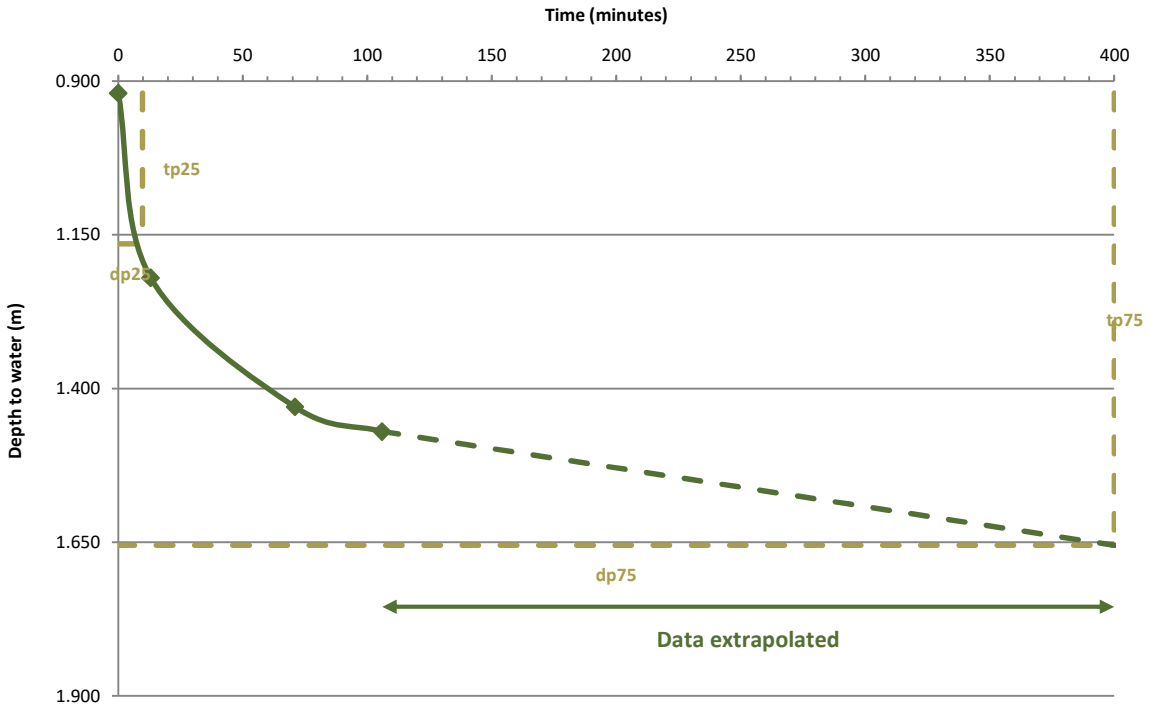
V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.7791**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**23762**	**s**
f Soil infiltration rate	**7.39E-06**	**m/s**

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Soil infiltration test (following BRE Digest 365 2016)

Location	Cycle	Test date	Dimensions (m)
TP104	2	07/10/2022	0.70m x 2.10m

Depth at start of test (m)	Groundwater observations (at time of excavation)
0.92	No groundwater encountered.



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

V_{p75-25} Effective storage volume of water between 75% (dp75) and 25% (dp25) effective depth	**0.7203**	**m^3**
a_{p50} Internal surface area up to 50% effective depth and including the base	**4**	**m^2**
$t_{p75} - t_{p25}$ Time for the water level to fall from 75% to 25% effective depth	**23412**	**s**
f Soil infiltration rate	**7.30E-06**	**m/s**

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[redacted]

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Analytical Report Number : 21-69972

Project / Site name:	Greenfinch, Didsbury	**Samples received on:**	20/04/2021
Your job number:	STT5335	**Samples instructed on/ Analysis started on:**	20/04/2021
Your order number:	POR10032	**Analysis completed by:**	07/05/2021
Report Issue Number:	1	**Report issued on:**	07/05/2021
Samples Analysed:	4 soil samples		

Signed: [redacted]

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 21-69972
Project / Site name: Greenfinch, Didsbury
Your Order No: POR10032

Lab Sample Number				1844221	1844222	1844223	1844224
Sample Reference				TP01	TP02	TP02	TP02
Sample Number				1	2	3	4
Depth (m)				0.30	0.40	0.80	1.20
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	2.7	0.80	3.2	3.3
Total mass of sample received	kg	0.001	NONE	0.50	0.70	1.0	0.90

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	8.7	7.6	7.5
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.021	0.022	0.017	0.014
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	20.5	21.5	17.2	13.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.9	5.2	6.1	4.3
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	11	< 5.0	5.5	5.8
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.3	< 2.5	2.8	2.9

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 21-69972
Project / Site name: Greenfinch, Didsbury

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1844221	TP01	1	0.3	Brown sandy loam with gravel and vegetation.
1844222	TP02	2	0.4	Brown sand with gravel.
1844223	TP02	3	0.8	Brown sandy loam with gravel.
1844224	TP02	4	1.2	Brown sandy loam with gravel.

Analytical Report Number : 21-69972
Project / Site name: Greenfinch, Didsbury

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Sample Deviation Report

Analytical Report Number : 21-69972
Project / Site name: Greenfinch, Didsbury

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP01	1	S	1844221	a	None Supplied	None Supplied	None Supplied
TP02	2	S	1844222	a	None Supplied	None Supplied	None Supplied
TP02	3	S	1844223	a	None Supplied	None Supplied	None Supplied
TP02	4	S	1844224	a	None Supplied	None Supplied	None Supplied

Key: **a** - No sampling date **b** - Incorrect container
c - Holding time **d** - Headspace **e** - Temperature

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DETS Report No: 21-05199

Site Reference:	Greenfinch, Didsbury
Project / Job Ref:	STT5335
Order No:	POR010031
Sample Receipt Date:	22/04/2021
Sample Scheduled Date:	22/04/2021
Report Issue Number:	1
Reporting Date:	28/04/2021

[redacted]

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

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Soil Analysis Certificate						
DETS Report No: 21-05199	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP010.602	TP020.201	TP040.201	TP040.502	TP050.302
Project / Job Ref: STT5335	**Additional Refs**	TP01	TP02	TP04	TP04	TP05
Order No: POR010031	**Depth (m)**	0.60	0.20	0.20	0.50	0.30
Reporting Date: 28/04/2021	**DETS Sample No**	539007	539008	539009	539010	539011

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.5	8.9	8.2	8.6	8.8
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Organic Matter	%	< 0.1	MCERTS	6.0	1.1	3.8	3.1	4.1
Loss on Ignition @ 450°C	%	< 0.01	NONE	5.70	1.50	8.30	5.50	1.40
Arsenic (As)	mg/kg	< 2	MCERTS	21	6	47	21	4
Beryllium (Be)	mg/kg	< 0.5	MCERTS	0.8	< 0.5	1.4	1	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	NONE	0.2	0.7	0.3	0.6	0.6
Chromium (Cr)	mg/kg	< 2	MCERTS	10	6	10	9	6
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	39	14	34	30	12
Lead (Pb)	mg/kg	< 3	MCERTS	142	50	165	123	152
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	11	8	16	14	10
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 1	MCERTS	17	6	21	13	7
Zinc (Zn)	mg/kg	< 3	MCERTS	80	57	71	76	56
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-05199	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP010.602	TP020.201	TP040.201	TP040.502	TP050.302
Project / Job Ref: STT5335	**Additional Refs**	TP01	TP02	TP04	TP04	TP05
Order No: POR010031	**Depth (m)**	0.60	0.20	0.20	0.50	0.30
Reporting Date: 28/04/2021	**DETS Sample No**	539007	539008	539009	539010	539011

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	0.20	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	1.16	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	0.69	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	8.43	< 0.1	0.87	0.28	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	1.84	< 0.1	0.20	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	9.71	< 0.1	0.98	0.31	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	10.30	< 0.1	1.03	0.48	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	4.44	< 0.1	0.37	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	3.99	< 0.1	0.47	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	4.53	< 0.1	0.42	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	1.59	< 0.1	0.17	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	4.38	< 0.1	0.35	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	2.09	< 0.1	0.16	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.51	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	2.18	< 0.1	0.16	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	56	< 1.6	5.2	< 1.6	< 1.6

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 21-05199	**Date Sampled**	None Supplied	None Supplied			
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP010.602	TP050.302			
Project / Job Ref: STT5335	**Additional Refs**	TP01	TP05			
Order No: POR010031	**Depth (m)**	0.60	0.30			
Reporting Date: 28/04/2021	**DETS Sample No**	539007	539011			

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	3	< 2			
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	8	< 3			
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	18	6			
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	80	145			
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	109	150			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	8	< 2			
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	25	< 3			
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	47	90			
Aromatic (C5 - C35)	mg/kg	< 21	NONE	80	90			
Total >C5 - C35	mg/kg	< 42	NONE	189	240			

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 21-05199	**Date Sampled**	None Supplied	None Supplied			
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP010.602	TP050.302			
Project / Job Ref: STT5335	**Additional Refs**	TP01	TP05			
Order No: POR010031	**Depth (m)**	0.60	0.30			
Reporting Date: 28/04/2021	**DETS Sample No**	539007	539011			

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2			
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
MTBE	ug/kg	< 5	MCERTS	< 5	< 5			

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UKAS TESTING 4480

Leachate Analysis Certificate						
DETS Report No: 21-05199	**Date Sampled**	None Supplied				
Soiltechnics Ltd	**Time Sampled**	None Supplied				
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP050.503				
Project / Job Ref: STT5335	**Additional Refs**	TP05				
Order No: POR010031	**Depth (m)**	0.50				
Reporting Date: 28/04/2021	**DETS Sample No**	539012				

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	9.1				
Total Cyanide	ug/l	< 5	NONE	< 5				
Complex Cyanide	ug/l	< 5	NONE	< 5				
Free Cyanide	ug/l	< 5	NONE	< 5				
Sulphate as SO_4	mg/l	< 1	ISO17025	< 1				
Ammoniacal Nitrogen as NH_4	ug/l	< 50	NONE	94				
Nitrate as NO_3	mg/l	< 0.5	ISO17025	< 0.5				
Antimony	ug/l	< 5	ISO17025	< 5				
Arsenic	ug/l	< 5	ISO17025	< 5				
Boron	ug/l	< 5	ISO17025	< 5				
Cadmium	ug/l	< 0.4	ISO17025	< 0.4				
Chromium	ug/l	< 5	ISO17025	< 5				
Chromium (hexavalent)	ug/l	< 20	NONE	< 20				
Chromium III	ug/l	< 20	NONE	< 20				
Copper	ug/l	< 5	ISO17025	< 5				
Iron	ug/l	< 5	ISO17025	57				
Lead	ug/l	< 5	ISO17025	< 5				
Mercury	ug/l	< 0.05	ISO17025	< 0.05				
Nickel	ug/l	< 5	ISO17025	< 5				
Selenium	ug/l	< 5	ISO17025	< 5				
Zinc	ug/l	< 2	ISO17025	< 2				
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10				

Subcontracted analysis (S)

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Leachate Analysis Certificate - Speciated PAH						
DETS Report No: 21-05199	**Date Sampled**	None Supplied				
Soiltechnics Ltd	**Time Sampled**	None Supplied				
Site Reference: Greenfinch, Didsbury	**TP / BH No**	TP050.503				
Project / Job Ref: STT5335	**Additional Refs**	TP05				
Order No: POR010031	**Depth (m)**	0.50				
Reporting Date: 28/04/2021	**DETS Sample No**	539012				

Determinand	**Unit**	**RL**	**Accreditation**					
Naphthalene	ug/l	< 0.01	NONE	0.09				
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01				
Acenaphthene	ug/l	< 0.01	NONE	0.06				
Fluorene	ug/l	< 0.01	NONE	0.13				
Phenanthrene	ug/l	< 0.01	NONE	0.36				
Anthracene	ug/l	< 0.01	NONE	0.06				
Fluoranthene	ug/l	< 0.01	NONE	0.13				
Pyrene	ug/l	< 0.01	NONE	0.08				
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01				
Chrysene	ug/l	< 0.01	NONE	< 0.01				
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01				
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01				
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01				
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01				
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008				
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.91				

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4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

DETS Report No: 21-05199		**Date Sampled**	None Supplied	**Landfill Waste Acceptance Criteria Limits**		
Soiltechnics Ltd		**Time Sampled**	None Supplied	**Inert Waste Landfill**	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Site Reference: Greenfinch, Didsbury		**TP / BH No**	WAC01.601			
Project / Job Ref: STT5335		**Additional Refs**	WAC01			
Order No: POR010031		**Depth (m)**	0.00			
Reporting Date: 28/04/2021		**DETS Sample No**	539013			
Determinand	**Unit**	**MDL**				
TOC[MU]	%	< 0.1	< 0.1	3%	5%	6%
Loss on Ignition	%	< 0.01	0.90	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	841	**500**	--	--
Total PAH[MU]	mg/kg	< 1.7	16.2	100	--	--
pH[MU]	pH Units	N/a	8.7	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	2.3	--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	0.02	0.05		0.5	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	< 0.005	< 0.005		< 0.20	0.5	10	70
Copper[U]	< 0.01	0.03		< 0.5	2	50	100
Mercury[U]	< 0.0005	< 0.0005		< 0.005	0.01	0.2	2
Molybdenum[U]	0.010	0.004		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	< 0.005	< 0.005		< 0.05	0.06	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.05	0.1	0.5	7
Zinc[U]	< 0.005	0.006		< 0.2	4	50	200
Chloride[U]	4	22		203	800	15000	25000
Fluoride[U]	0.8	< 0.5		< 1	10	150	500
Sulphate[U]	6	13		123	1000	20000	50000
TDS	79	56		586	4000	60000	100000
Phenol Index	0.01	< 0.01		< 0.5	1	-	-
DOC	8.2	22.4		208	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.18						
Dry Matter (%)	99.4						
Moisture (%)	0.6						
Stage 1							
Volume Eluate L2 (litres)	0.35						
Filtered Eluate VE1 (litres)	0.20						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

DETS Ltd
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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 21-05199	
Soiltechnics Ltd	
Site Reference: Greenfinch, Didsbury	
Project / Job Ref: STT5335	
Order No: POR010031	
Reporting Date: 28/04/2021	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 539007	TP010.602	TP01	0.60	10.4	Black sandy clay with concrete
^ 539008	TP020.201	TP02	0.20	0.6	Brown gravel with stones and concrete
^ 539009	TP040.201	TP04	0.20	10.4	Brown loamy sand with stones and concrete
^ 539010	TP040.502	TP04	0.50	6.7	Brown loamy sand with stones and vegetation
^ 539011	TP050.302	TP05	0.30	2.3	Brown sandy gravel with stones and concrete
^ 539013	WAC01.601	WAC01	0.00	0.6	Brown sandy gravel with stones and concrete

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
^ no sampling date provided; unable to confirm if samples are within acceptable holding times

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4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 21-05199
Soiltechnics Ltd
Site Reference: Greenfinch, Didsbury
Project / Job Ref: STT5335
Order No: POR010031
Reporting Date: 28/04/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

DETS Ltd
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UKAS TESTING
4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 21-05199
Soiltechnics Ltd
Site Reference: Greenfinch, Didsbury
Project / Job Ref: STT5335
Order No: POR010031
Reporting Date: 28/04/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

Parameter	Matrix Type	Suite Reference	Expanded Uncertainity Measurement	Unit
TOC	Soil	BS EN 12457	20.0	%
Loss on Ignition	Soil	BS EN 12457	35.0	%
BTEX	Soil	BS EN 12457	14.0	%
Sum of PCBs	Soil	BS EN 12457	23.0	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	11.6	%
pH	Soil	BS EN 12457	0.28	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Arsenic	Leachate	BS EN 12457	18.7	%
Barium	Leachate	BS EN 12457	11.6	%
Cadmium	Leachate	BS EN 12457	20.3	%
Chromium	Leachate	BS EN 12457	18.3	%
Copper	Leachate	BS EN 12457	24.3	%
Mercury	Leachate	BS EN 12457	23.7	%
Molybdenum	Leachate	BS EN 12457	14.7	%
Nickel	Leachate	BS EN 12457	16.1	%
Lead	Leachate	BS EN 12457	15.7	%
Antimony	Leachate	BS EN 12457	17.9	%
Selenium	Leachate	BS EN 12457	22.0	%
Zinc	Leachate	BS EN 12457	17.4	%
Chloride	Leachate	BS EN 12457	15.3	%
Fluoride	Leachate	BS EN 12457	16.4	%
Sulphate	Leachate	BS EN 12457	20.6	%
TDS	Leachate	BS EN 12457	12.0	%
Phenol Index	Leachate	BS EN 12457	14.0	%
DOC	Leachate	BS EN 12457	10.0	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	35.0	%
pH	Soil	BS 3882: 2015	0.14	Units
Carbonate	Soil	BS 3882: 2015	16.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	14.9	%
Copper	Soil	BS 3882: 2015	16.0	%
Nickel	Soil	BS 3882: 2015	17.7	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%

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Final Report

Report No.:	22-39822-1
Initial Date of Issue:	25-Oct-2022
Client	Soiltechnics Limited
Client Address:	1st Floor Unit 9 Westpoint Enterprise Park Clarence Avenue Trafford Park Manchester M17 1QS
Contact(s):	Admin
Project	STT5335 Greenfinch, Didsbury
Quotation No.:	Q22-29188
Order No.:	
No. of Samples:	3
Turnaround (Wkdays):	5
Date Approved:	25-Oct-2022
Approved By:	[redacted]
Details:	Stuart Henderson, Technical Manager

Date Received:	17-Oct-2022
Date Instructed:	18-Oct-2022
Results Due:	24-Oct-2022

Results - Soil

Project: STT5335 Greenfinch, Didsbury

Client: Soiltechnics Limited				**Chemtest Job No.:**	22-39822	22-39822	22-39822
Quotation No.: Q22-29188				**Chemtest Sample ID.:**	1527327	1527328	1527329
Order No.:				Client Sample Ref.:	1	2	1
				Client Sample ID.:	TP1050.301	TP1050.702	TP1060.401
				Sample Location:	TP105	TP105	TP106
				Sample Type:	SOIL	SOIL	SOIL
				Top Depth (m):	0.30	0.70	0.40
				Date Sampled:	07-Oct-2022	07-Oct-2022	07-Oct-2022
				Asbestos Lab:	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	22	18
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones and Roots	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand
pH	M	2010		4.0	8.0	8.2	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	1.1	0.84
Cyanide (Complex)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	6.9	6.7	6.1
Beryllium	U	2455	mg/kg	0.5	< 0.5	< 0.5	< 0.5
Cadmium	M	2455	mg/kg	0.10	0.11	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	4.2	6.3	4.7
Copper	M	2455	mg/kg	0.50	17	10	6.9
Mercury	M	2455	mg/kg	0.05	0.18	0.08	0.06
Nickel	M	2455	mg/kg	0.50	4.3	4.6	3.0
Lead	M	2455	mg/kg	0.50	80	33	24
Selenium	M	2455	mg/kg	0.25	0.26	0.29	0.25
Vanadium	U	2455	mg/kg	0.5	6.7	13	9.0
Zinc	M	2455	mg/kg	0.50	48	24	18
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
LOI	M	2610	%	0.10	11	3.7	4.2
Organic Matter	M	2625	%	0.40	13	2.7	2.6
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0	1.3	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0	130	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0	250	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	< 1.0	190	< 1.0
TPH >C16-C21	N	2670	mg/kg	1.0	< 1.0	1.6	< 1.0
TPH >C21-C35	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total TPH >C5-C35	N	2670	mg/kg	10	< 10	570	< 10
Naphthalene	M	2800	mg/kg	0.10	0.56	0.74	1.1

Results - Soil

Project: STT5335 Greenfinch, Didsbury

Client: Soiltechnics Limited			**Chemtest Job No.:**		22-39822	22-39822	22-39822
Quotation No.: Q22-29188			**Chemtest Sample ID.:**		1527327	1527328	1527329
Order No.:			Client Sample Ref.:		1	2	1
			Client Sample ID.:		TP1050.301	TP1050.702	TP1060.401
			Sample Location:		TP105	TP105	TP106
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.30	0.70	0.40
			Date Sampled:		07-Oct-2022	07-Oct-2022	07-Oct-2022
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Acenaphthylene	N	2800	mg/kg	0.10	0.32	1.0	0.47
Acenaphthene	M	2800	mg/kg	0.10	0.64	1.3	2.3
Fluorene	M	2800	mg/kg	0.10	0.55	1.2	2.2
Phenanthrene	M	2800	mg/kg	0.10	6.1	12	13
Anthracene	M	2800	mg/kg	0.10	1.5	2.8	2.6
Fluoranthene	M	2800	mg/kg	0.10	11	17	17
Pyrene	M	2800	mg/kg	0.10	11	17	15
Benzo[a]anthracene	M	2800	mg/kg	0.10	5.4	7.5	8.6
Chrysene	M	2800	mg/kg	0.10	6.2	8.2	9.3
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	6.4	8.4	10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	2.2	3.1	3.4
Benzo[a]pyrene	M	2800	mg/kg	0.10	5.8	7.4	7.7
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	3.0	4.3	4.7
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.73	1.1	0.59
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	3.3	4.2	4.6
Total Of 16 PAH's	N	2800	mg/kg	2.0	65	97	100
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

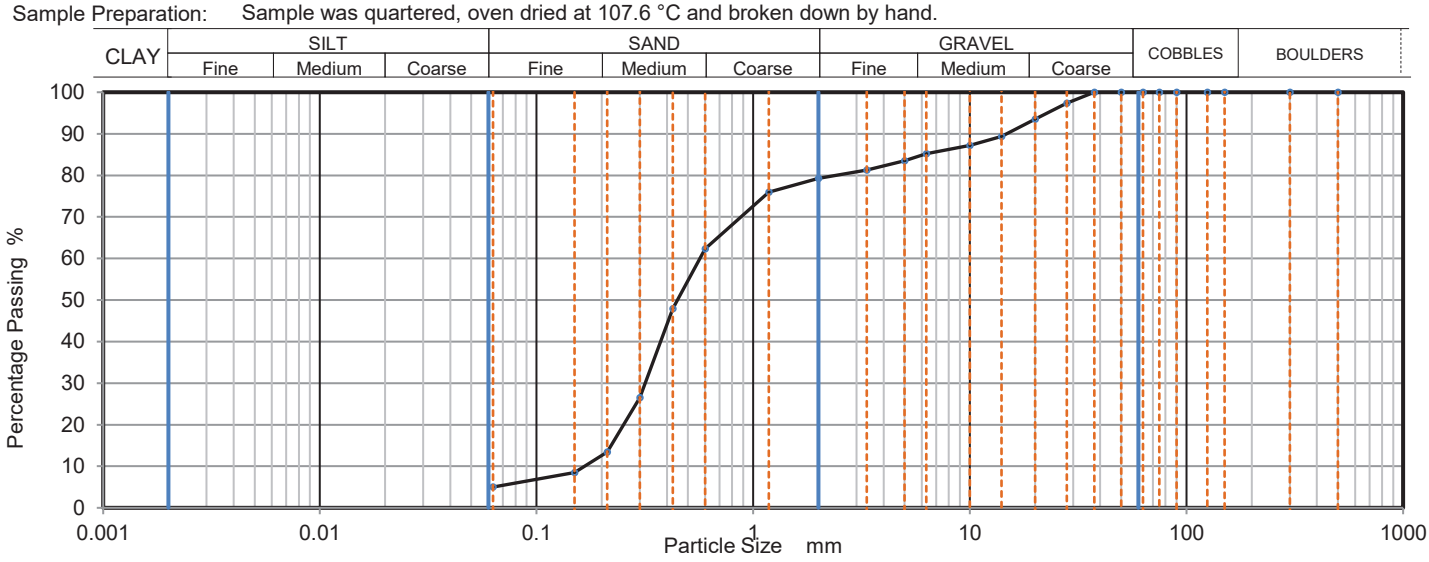
4041

Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	07/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1843894	Depth Top [m]:	1.00
Hole No.:	TP01	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	B
Sample Description:	Brownish grey slightly clayey gravelly SAND		
Sample Preparation:	Sample was quartered, oven dried at 107.6 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	94		
14	89		
10	87		
6.3	85		
5	84		
3.35	81		
2	79		
1.18	76		
0.6	62		
0.425	48		
0.3	27		
0.212	13		
0.15	9		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	21
Sand	73
Fines <0.063mm	6

Grading Analysis		
D100	mm	37.5
D60	mm	0.568
D30	mm	0.317
D10	mm	0.167
Uniformity Coefficient		3.4
Curvature Coefficient		1.1

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/05/2021

GF 100.20

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

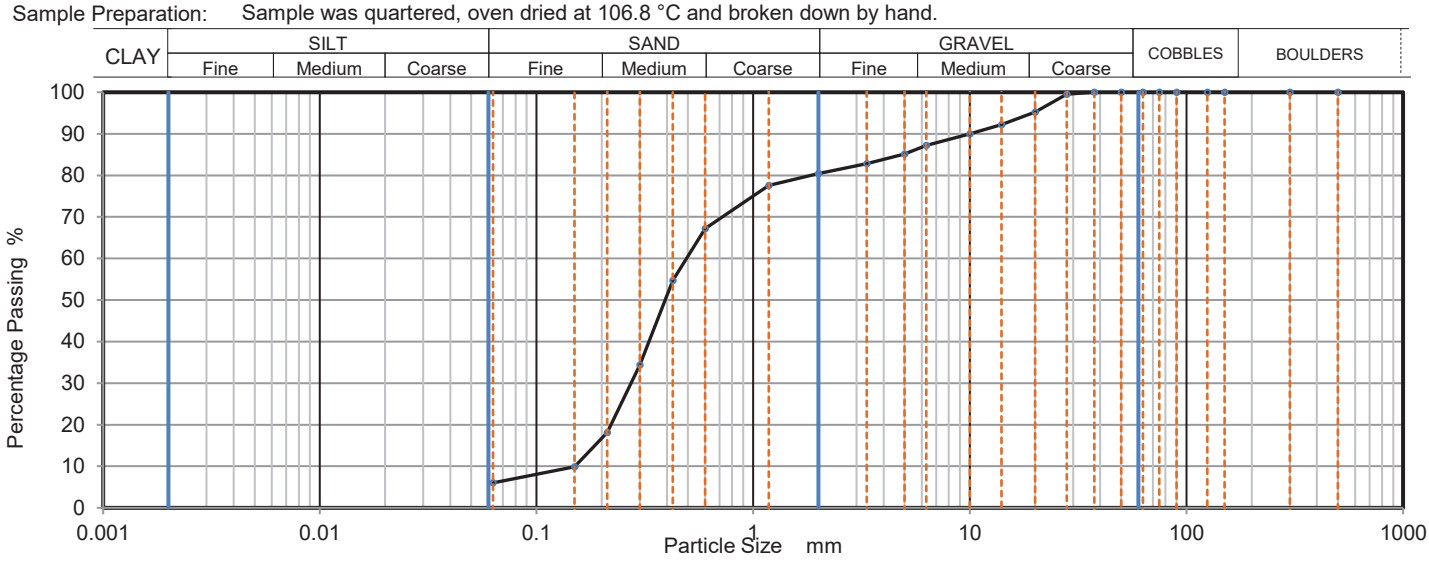
4041

Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	07/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1843895	Depth Top [m]:	2.50
Hole No.:	TP01	Depth Base [m]:	Not Given
Sample Reference:	5	Sample Type:	B
Sample Description:	Brown slightly clayey gravelly SAND		
Sample Preparation:	Sample was quartered, oven dried at 106.8 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	92		
10	90		
6.3	87		
5	85		
3.35	83		
2	80		
1.18	78		
0.6	67		
0.425	55		
0.3	34		
0.212	18		
0.15	10		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	20
Sand	74
Fines <0.063mm	6

Grading Analysis		
D100	mm	37.5
D60	mm	0.492
D30	mm	0.273
D10	mm	0.151
Uniformity Coefficient		3.3
Curvature Coefficient		1

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/05/2021

GF 100.20

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

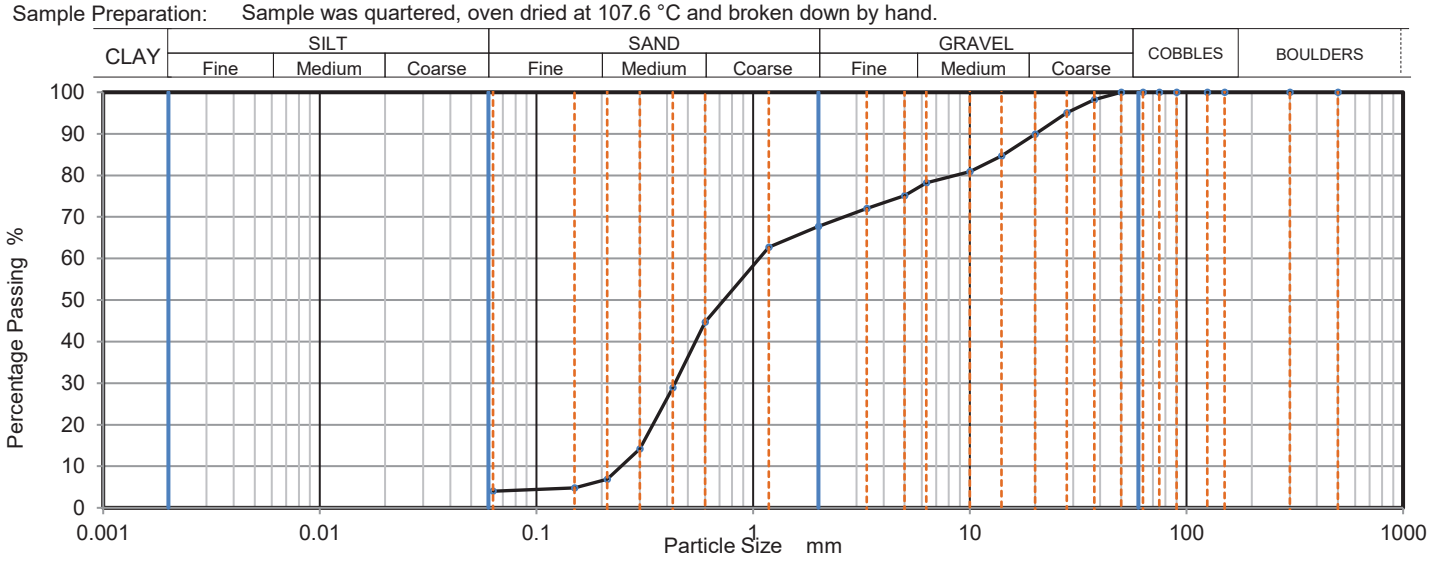
4041

Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	07/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1843898	Depth Top [m]:	1.30
Hole No.:	TP04	Depth Base [m]:	Not Given
Sample Reference:	4	Sample Type:	B
Sample Description:	Brownish grey slightly clayey gravelly SAND		
Sample Preparation:	Sample was quartered, oven dried at 107.6 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	95		
20	90		
14	85		
10	81		
6.3	78		
5	75		
3.35	72		
2	68		
1.18	63		
0.6	45		
0.425	29		
0.3	14		
0.212	7		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Very coarse	0
Gravel	32
Sand	64
Fines <0.063mm	4

Grading Analysis		
D100	mm	50
D60	mm	1.07
D30	mm	0.435
D10	mm	0.246
Uniformity Coefficient		4.3
Curvature Coefficient		0.72

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/05/2021

GF 100.20

TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

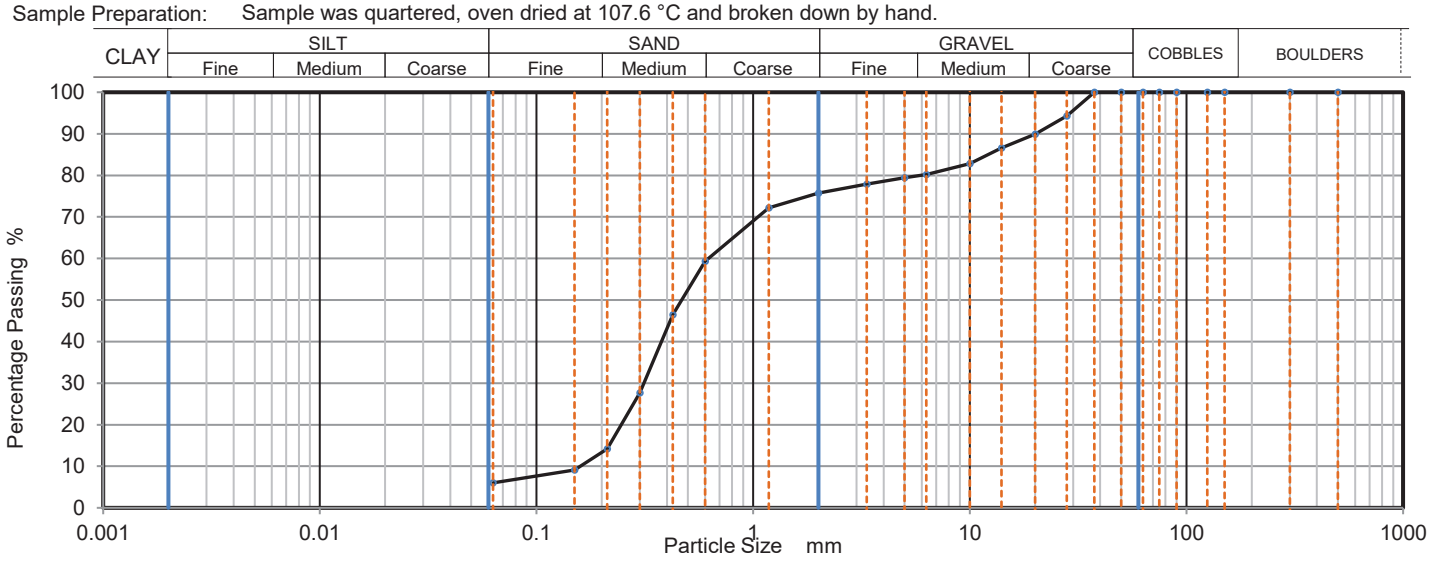
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Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	07/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1843899	Depth Top [m]:	1.80
Hole No.:	TP05	Depth Base [m]:	Not Given
Sample Reference:	5	Sample Type:	B
Sample Description:	Brownish grey slightly clayey gravelly SAND		
Sample Preparation:	Sample was quartered, oven dried at 107.6 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	90		
14	87		
10	83		
6.3	80		
5	79		
3.35	78		
2	76		
1.18	72		
0.6	59		
0.425	47		
0.3	28		
0.212	14		
0.15	9		
0.063	7		

Sample Proportions	% dry mass
Very coarse	0
Gravel	24
Sand	69
Fines <0.063mm	7

Grading Analysis		
D100	mm	37.5
D60	mm	0.622
D30	mm	0.313
D10	mm	0.159
Uniformity Coefficient		3.9
Curvature Coefficient		0.99

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/05/2021

GF 100.20

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	12/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

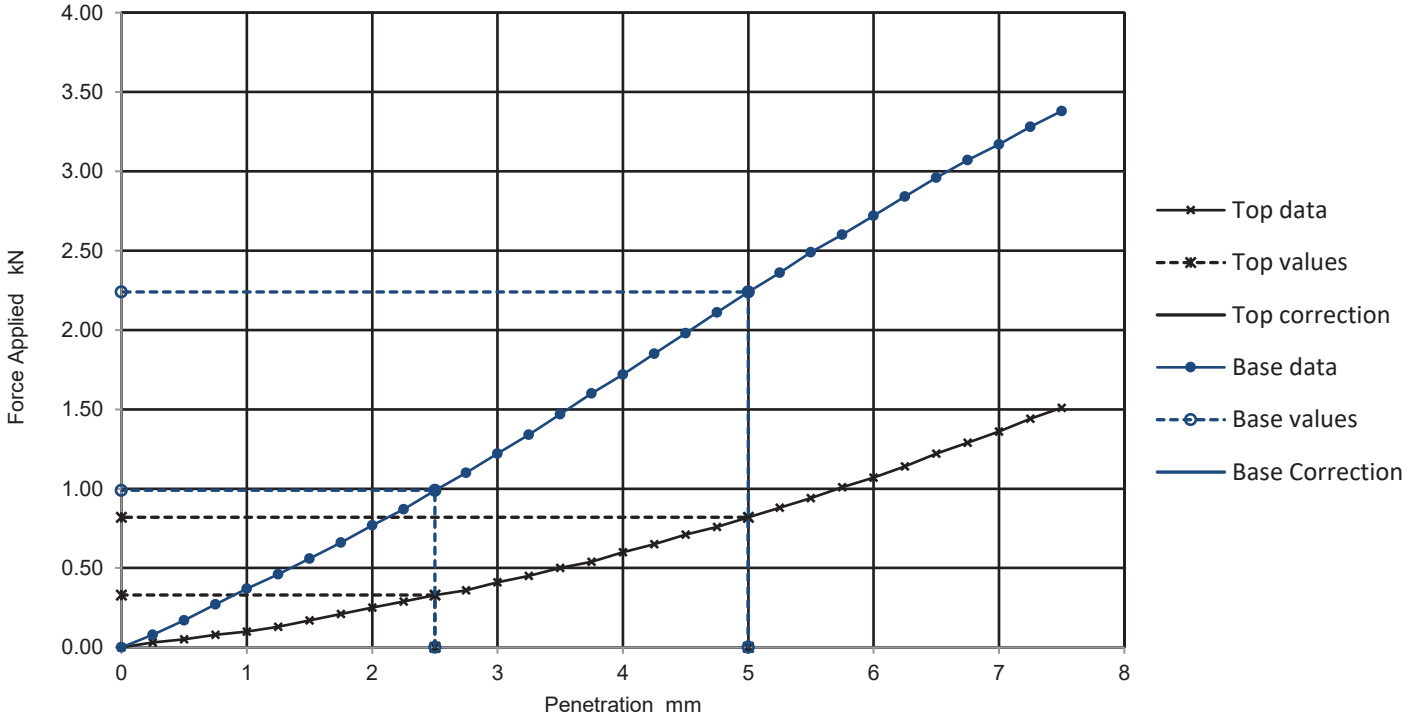
Laboratory Reference:	1843896	Depth Top [m]:	0.80
Hole No.:	TP02	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	B
Sample Description:	Yellowish brown SAND		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.80	Mg/m3	Surcharge applied	8 kg
	Dry density	1.72	Mg/m3		4.9 kPa
	Moisture content	4.4	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	2.5	4.1	4.1		4.4
BASE	No	7.5	11.0	11.0		4.2

Remarks:

Test/ Specimen specific remarks:

Signed: [redacted]

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Date Reported: 13/05/2021

GF 108.15

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client:	Soiltechnics Limited	Client Reference:	STT5335
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	21-69911
		Date Sampled:	Not Given
		Date Received:	20/04/2021
Contact:	Alexa Band	Date Tested:	12/05/2021
Site Address:	Greenfinch, Didsbury	Sampled By:	Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

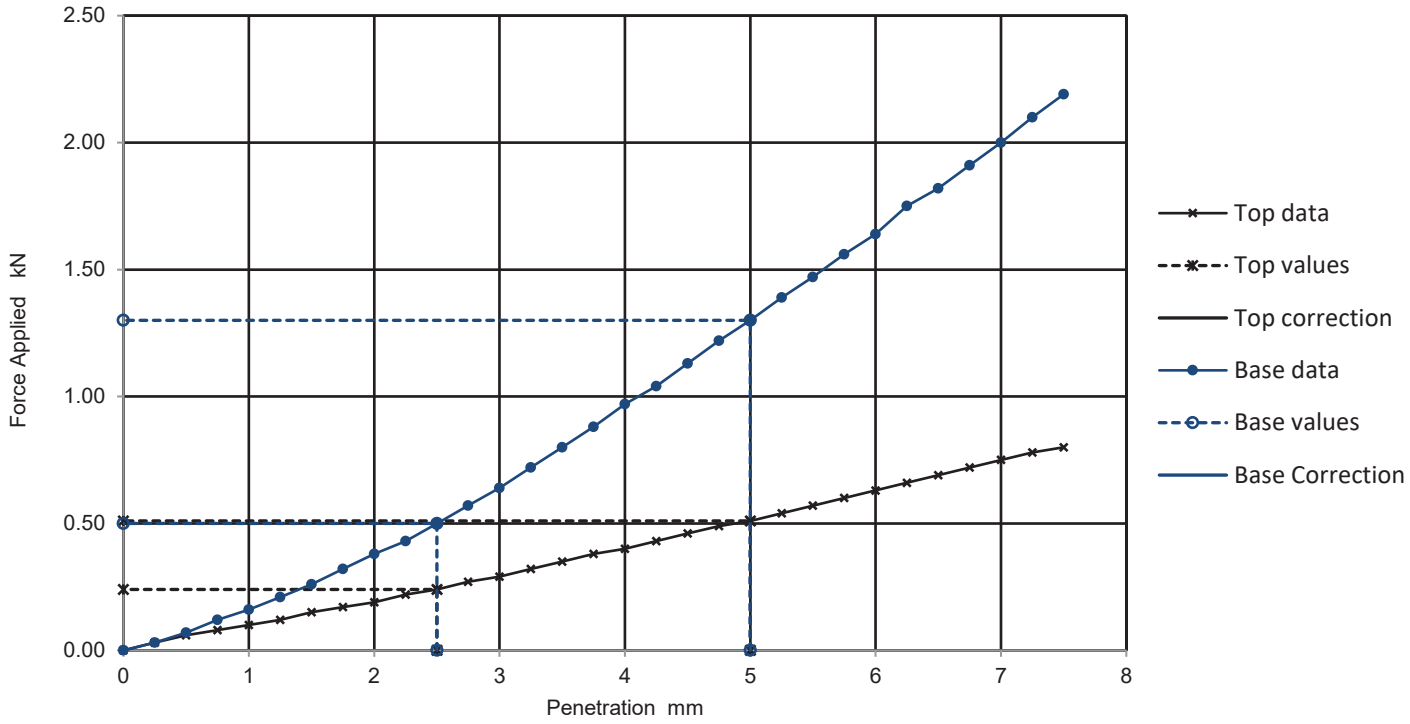
Laboratory Reference:	1843897	Depth Top [m]:	0.80
Hole No.:	TP04	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	B
Sample Description:	Brownish grey gravelly SAND		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	11 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.90	Mg/m3	Surcharge applied	8 kg
	Dry density	1.82	Mg/m3		4.9 kPa
	Moisture content	4.6	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	1.8	2.6	2.6		4.5
BASE	No	3.8	6.5	6.5		3.9

Remarks:

Test/ Specimen specific remarks:

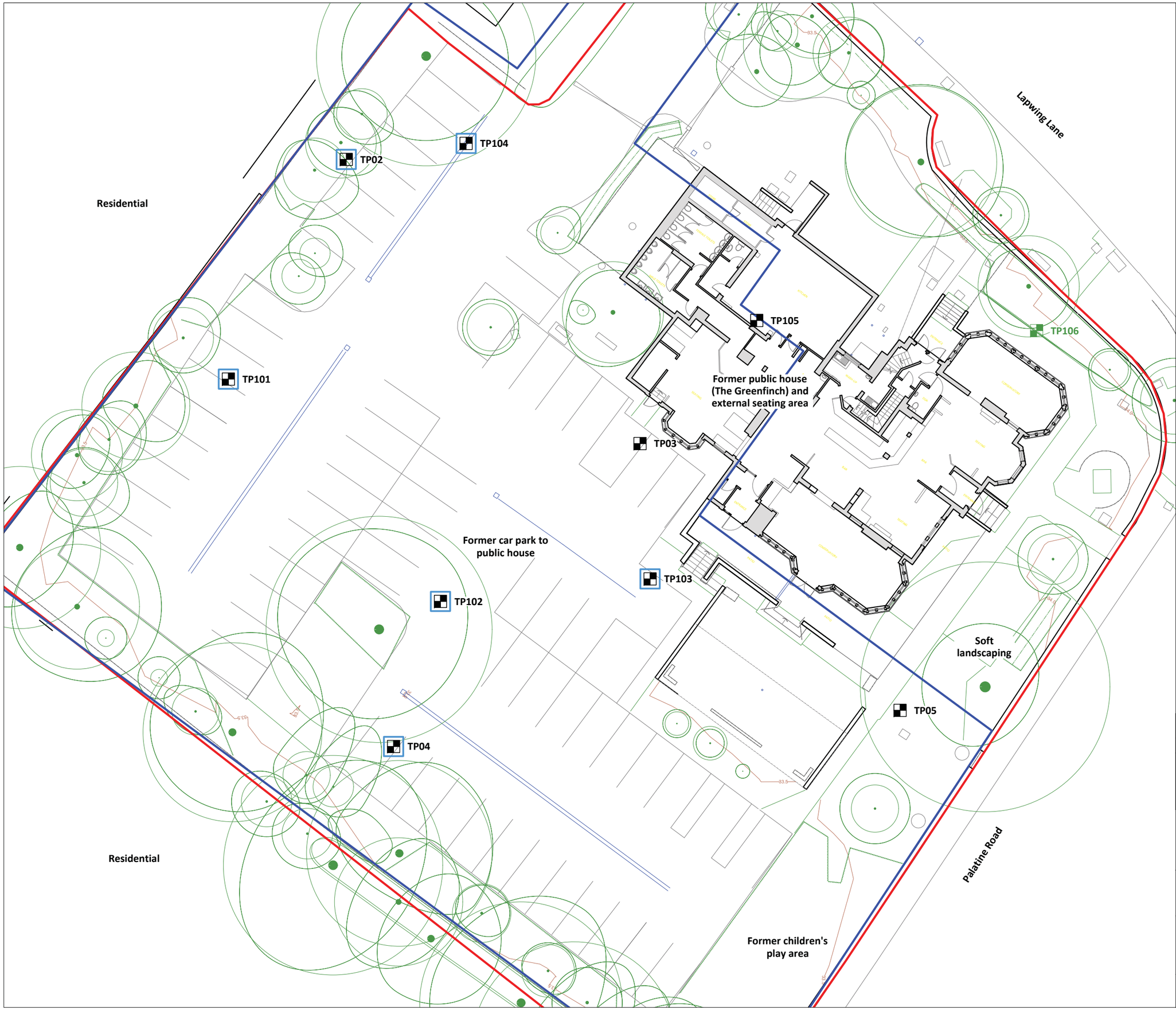
Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. Th
report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 13/05/2021

GF 108.15



Key

- TP — Hand excavated trial pit
- TP — Machine excavated trial pit
- Infiltration testing performed
- Search area boundary
- Boundary under consideration

Notes

1. Base drawing provided by Client
2. Exploratory locations are approximate

REV	DESCRIPTION	PRODUCED BY	CHECKED BY	REVIEWED BY	DATE
B	Second issue - additional trial pit and soakaway tests	KD	TO	SCD	18.10.2022
A	First issue	KD	SCD	SCD	02.06.2021

soiltechnics
environmental ▪ geotechnical ▪ building fabric

PROJECT
Greenfinch, Didsbury

TITLE
Exploratory hole plan (current layout)

PROJECT NO.	SCALE AT A3	DRAWING NO.
STV6154	1:250	02

APPENDIX II

APPENDIX II – SUPPLEMENTARY GROUND INVESTIGATION

Introduction

This Appendix, together with Sections 2 to 5 of the report (and the equivalent information in the Ground Investigation Report dated August 2023 by Soiltechnics Limited, as referenced*)*, forms the Ground Investigation Report for the development described in the report, in compliance with the requirements of BS 5930:2015+A1:2020, BS EN1997-1:2004(2007) and BS EN1997-2:2007(2007).

The site operations were carried out on 1st May 2024 under the supervision of a geotechnical/geoenvironmental engineer from Crossfield Consulting Limited. The scope and rationale for the design of the investigation is presented in Table II-1.

The ground investigation was designed and supervised by qualified and experienced geotechnical/geoenvironmental specialists from Crossfield Consulting Limited. Where appropriate, and as outlined below, specialist drilling/sampling equipment was procured together with trained and experienced operators. Unless otherwise indicated, sampling and logging remained the responsibility of trained staff from Crossfield Consulting Limited and field records were prepared on site, during or immediately following drilling/sampling or in situ measurements/tests. The results of in situ tests are presented on the relevant record sheets in this Appendix.

An exploratory hole location plan is presented as Figure II-1.

Trial Pits

Two trial pits, denoted as TP1 to TP2, were excavated by a JCB 3CX excavator on 1st May 2024. The trial pit records from the investigation are presented in this Appendix and these records include the descriptions and depths of the strata encountered, together with sample depths, groundwater observations and other pertinent comments.

Dynamic Sampling

Five dynamic sampling boreholes, denoted as DS1 to DS5, were sunk by LTS Drilling Limited, on 1st May 2024 to between 3.9 m and 5.0 m depth. Dynamic/driven open-tube soil sampling/boring was undertaken using a Premier Compact rig. Using a 1.0 m long thick-walled open-tube sampler (with plastic liner), Category A and B samples were recovered (sample disturbance being influenced by the specific soils encountered). Where appropriate, small disturbed sub-samples were recovered from the materials recovered in the open-tube sampler.

Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of coarse-grained strata and an indication of strength within fine-grained strata. The SPTs were carried out in accordance with BS EN ISO 22476-3:2005(2007).

The records from the investigation are presented in this Appendix. These records include the descriptions and depths of the strata encountered, together with sample depths, in situ test results (uncorrected values), groundwater observations, details of installations/backfill within exploratory holes and other pertinent comments.

Soil Samples

All samples for analytical testing were collected in appropriate containers, stored in cool boxes (where appropriate) and sent to the testing laboratory overnight. The sample containers, storage and handling procedures were all compatible with the relevant recommendations of the UKAS accredited testing laboratory for the specific testing proposed.

Samples designated for geotechnical testing were collected, stored and transported in accordance with the published requirements for the specific tests scheduled, such that moisture content and soil structure integrity was maintained, as necessary for the test requirements.

Analytical Laboratory Testing
The rationale for the analytical testing is set out in Table II-2.

Selected samples of the soils encountered were submitted for screening analysis of the following determinands:

- Arsenic (Total)
- Chromium (Total and Hexavalent)
- Lead (Total)
- Nickel (Total)
- Selenium (Total)
- Cyanide (Total)
- Sulphate (Water soluble)
- pH
- Asbestos (Fibre & ACM Screen)
- Cadmium (Total)
- Copper (Total)
- Mercury (Total)
- Zinc (Total)
- Boron (Water soluble)
- Sulphide (Total)
- Phenols (Total-monohydric)
- Total Organic Carbon
- Asbestos (Quantification)

Note: Total determinands are based on an aqua-regia extract.

Selected samples of the soils encountered were submitted for analysis of the following determinands:

- Total Petroleum Hydrocarbons – aromatic/aliphatic split and carbon number banding, using GC-FID techniques
- BTEX and MTBE – using GC-MS techniques
- Polyaromatic Hydrocarbons – using GC-MS techniques

The analyses were carried out by i2 Analytical, a UKAS accredited laboratory, and the results are presented in this Appendix. Soil testing was undertaken in accordance with the Environment Agency's Monitoring Certification Scheme (MCERTS).

Geotechnical Laboratory Testing
The rationale for the geotechnical laboratory testing is set out in the Table II-3.

Selected samples of the soils encountered were submitted for analysis for the following tests:
- pH value
- Water soluble sulphate

The analyses were carried out by i2 Analytical, a UKAS accredited laboratory, and the results are presented in this Appendix.

TABLE II-1

RATIONALE FOR THE DESIGN OF THE SUPPLEMENTARY GROUND INVESTIGATION

The scope of the supplementary ground investigation was designed with reference to the published geology and ground conditions indicated in the Soiltechnics Limited 2023 ground investigation information, presented in Appendix I.

In compliance with the guidance published in BS EN 1997-2:2007, the ground investigation was designed to verify the preliminary ground model, established from the desk study and previous ground investigation information and to characterise the ground conditions within influencing distance of the proposed structures. In this regard, the exploratory holes were targeted within relevant areas of the site to provide information on the strata profile down to competent materials. With reference to the desk study information and the support requirements of the proposed development, it is evident that adequate support is provided by the strata that continue below the depths of the exploratory holes.

In compliance with the guidance published in BS 10175:2011+A2:2017, BS 5930:2015+A1:2020 and Environment Agency LCRM (2020), the layout of the exploratory holes and sampling regime also considers the Conceptual Site Model and potential contaminant linkages, such that the spatial arrangement of the investigation provides the necessary information to support a risk assessment of the identified potential contaminant linkages.

Exploratory Hole and Technique	**Rationale for Hole Location**	**Depth (m)**	**Sampling/In Situ Testing and Monitoring**
TP1 – 2	Exploratory hole locations were chosen to provide additional data on the stratigraphy, soil properties, and groundwater levels together with information regarding excavation stability across the site	Up to approximately 2.8 m	Representative soil samples were obtained for analytical and geotechnical testing.
DS1-5	Exploratory hole locations were chosen to provide additional data on the stratigraphy, soil properties, groundwater levels, and soil density across the site	Up to 5.0 m	Representative soil samples were obtained for analytical and geotechnical testing. Standard Penetration Tests (SPTs) were undertaken at 1 m depth intervals.

Key

TP *X* Machine dug trial pit
DS *X* Dynamic Sample Borehole

TABLE II-2

RATIONALE FOR THE ANALYTICAL TESTING SUITE

Exploratory Hole and Samples	Selection Criteria	Analytical Tests
TP1-0.2 m DS2-0.6 m DS3-0.4 m DS4-0.45 m DS5-0.5 m	Representative Made Ground samples recovered to assess the presence and concentrations of potential contaminants.	Metals and metalloids, cyanide (total), pH, phenol, sulphate (water and acid soluble), sulphide, sulphur (total) and TOC. Petroleum Hydrocarbons Polyaromatic Hydrocarbons Asbestos ID (fibre and ACM screen) with quantification, where applicable

TABLE II-3

RATIONALE FOR THE GEOTECHNICAL TESTING SUITE

Exploratory Hole and Sample	Selection Criteria	Geotechnical Tests
DS3-0.8 m DS4-1.0 m DS2-1.2 m TP2-1.3 m DS1-1.5 m	Representative samples recovered to undertake testing to aid concrete design classification.	pH and water-soluble sulphate

TRIAL PIT RECORDS

KEY

	J	Disturbed Jar Sample	Category B Samples
	G	Soil Sample in Glass Container	
	g	Soil Sample in Glass Vial	
	B	Disturbed Bulk Sample	
	C	"Undisturbed" CBR Mould Sample (denoted Category A: OS-TK/W in BS EN 22475-1:2006)	
	W	Water Sample	
FVT	c_{fv}	Undrained Shear Strength (from hand vane shear vane test)	
	c_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)	
	c_{fv} *	Undrained Shear Strength from Hand Vane Shear Strength Test on block sample dug from pit by excavator	

Notes:

1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004, BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc.) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14)
5. Undrained shear strength (low, medium, high etc.) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc.) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Former Greenfinch P.H., West Didsbury	**Hole Ref.**	**TP1**
Date	01/05/2024	**Sheet**	1 of 1
		Job No.	CCL03767
Bearing:	Southwest	**Shoring**	None used
		Ground Level	33.1 m OD
Plant	JCB 3CX	**Stability**	Collapse in face A and C from surface at approximately 2.0 m bgl
		Co-ordinates	
Trial Pit	A	**Logged by**	CP
Plan	B	**Checked by**	
	C	**Water**	Wet strata at 2.5 m bgl.

Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
1.50		(2)		1.50
2.50		(3)		2.50
2.80		(4)		2.80
		End of Hole		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.0-0.1	Limestone Gravel Surfacing MADE GROUND
0.20	JGg		2	0.1-1.5	Brown clayey gravelly fine to coarse sand. Gravels consist of angular to subangular limestone, brick and concrete with black ashy and coal fragments. Cobbles of brick and limestone. Contains plastic and wooden planks. MADE GROUND
1.80	JGg		3	1.5-2.5	Grey to yellowish brown fine to coarse silty SAND with occasional gravels. Gravels consist of fine to medium subrounded to rounded sandstone. GLACIOFLUVIAL SHEET DEPOSITS
2.60	JGg		4	2.5-2.8	Brown silty gravelly fine to coarse SAND. Gravels consist of fine to coarse subrounded to rounded sandstone. GLACIOFLUVIAL SHEET DEPOSITS

Remarks

Collapse in Made Ground and Glaciofluvial Sheet Deposits. Hole collapse before the depth to brown gravelly sands or wet strata could be taken.

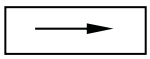
Ground level estimated from topographical survey

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Former Greenfinch P.H., West Didsbury	**Hole Ref.**	**TP2**
Date	01/05/2024	**Sheet**	1 of 1
		Job No.	CCL03767
Bearing:	Southwest	**Shoring**	None used
Plant	JCB 3CX	**Stability**	Stable throughout excavation
Trial Pit	A	**Ground Level**	33.45 m OD
Plan	 B	**Co-ordinates**	
	C	**Logged by**	CP
		Checked by	
Water	No water encountered		Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.60		(2)		0.60
1.40		(3)		1.40
		End of Hole		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0-0.2	Grey angular to subangular fine to coarse gravel consisting of limestone surfacing MADE GROUND
			2	0.2-0.6	Dark brown clayey gravelly fine to coarse SAND with cobbles of brick. Gravels consist of subangular fine to coarse limestone and brick fragments and ashy fragments MADE GROUND
1.30	JGg		3	0.6-1.4	Grey slightly gravelly silty fine to coarse SAND. Gravels consist of subrounded to rounded fine to medium sandstone. GLACIOFLUVIAL SHEET DEPOSITS

Remarks

Ground level estimated from topographical survey

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

DYNAMIC SAMPLE RECORDS

KEY

Sampling

	J	Disturbed Jar Sample
	G	Jar Sample in Glass Container
	g	Soil Sample in Glass Vial
	W	Water Sample
	IC	Nett sample recovery ratio (ratio of length of recovered sample to length of sample run)

In Situ Measurements

FVT	c_{fv}	Undrained Shear Strength (from hand vane shear vane test)
	c_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)
	c_{fv} *	Hand Vane Shear Strength Test (on Category A: OS-TK/W soil sample recovered in window sampler)
	S	Standard Penetration Test (SPT: split spoon sampler)
	SPT(C)	SPT carried out with a 60° cone
	'N'	'N' Value from SPT test
	N_{10}	Dynamic Probe Test: Number of blows to drive 100 mm
DPH	N_{H10}	Dynamic Probe Test: Heavy (30 kg mass & 500 mm fall)
DPSH-A	N_{SHA10}	Dynamic Probe Test: Super-Heavy A (63.5 kg mass & 500 mm fall)
DPSH-B	N_{SHB10}	Dynamic Probe Test: Super-Heavy B (63.5 kg mass & 750 mm fall)
	$\frac{x}{y\ mm}$	x Blows per y Driving Distance (for non-standard SPT or DP driving distance)
	T	Torque (max) required to turn rods (unit: Nm, unless otherwise shown)

Notes:

1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14).
5. Undrained shear strength (low, medium, high etc) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Dynamic Sample Record Sheet

Project:	Former Greenfinch P.H., West Didsbury	**Hole Ref.**	**DS1**
Date:	01/05/2024	**Sheet**	1 of 1
		Job No.	CCL03767

Contractor	Dynamic Sampling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m dynamic sampling		
Boring Diameter	100 mm		

Ground Level. 33.0 m OD
Co-ordinates
Logged by: CP — Logged on site during drilling operations
Checked by: AMH

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Concrete surfacing (MADE GROUND)	0.05			32.95
					Black asphalt (MADE GROUND)	0.10			32.90
0.20	JGg				Creamy grey sandy angular to subangular fine to coarse gravel of limestone (MADE GROUND)	0.30			32.7
						0.40			
					Dark brown clayey slightly gravelly fine to coarse sand. Gravels consist of subangular to subrounded fine ashy fragments (MADE GROUND)	0.60			33.0
					Orangish brown clayey slightly gravelly fine to coarse sand. Gravels consist of subangular to subrounded fine ashy fragments (MADE				33.0
1.00 - 1.45	SPT(C)	-	Dry	N = 12	Medium dense grey silty slightly gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS				
0.70	JGg								
						1.40			31.6
1.50	J				Medium dense light brown silty gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS	1.50			31.5
2.00 - 2.45	SPT(C)	-	Dry	N = 17	Medium dense light brown silty fine to coarse SAND with occasional rounded fine to medium gravel of sandstone GLACIOFLUVIAL SHEET DEPOSITS				
						2.20			30.8
					Medium dense dark brown silty slightly gravelly fine to coarse SAND. Gravels consist of subrounded to rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS				
						2.90			30.1
3.00 - 3.45	SPT(C)	-	3.00	N = 7	Firm to stiff consistency dark brown slightly sandy slightly gravelly silty CLAY. Gravels consist of subangular fine sandstone GLACIOFLUVIAL SHEET DEPOSITS				
3.00	J								
4.00 - 4.15	SPT(C)	-	3.00	N = 50/265 mm		4.00			29.0
					End of Hole				

Core Recovery

Depth	Recovery
0.00-1.00	100%
1.00-2.00	100%
2.00-3.00	80%
3.00-4.00	100%

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
4.00	3.00		

Additional Tests

Test type	Test Depth	Test Value

Remarks

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Dynamic Sample Record Sheet

Project:	Former Greenfinch P.H., West Didsbury	**Hole Ref.**	**DS2**
Date:	01/05/2024	**Sheet**	1 of 1
		Job No.	CCL03767
Contractor	Dynamic Sampling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m dynamic sampling	**Ground Level.**	33.1 m OD
Boring Diameter	100 mm	**Co-ordinates**	
		Logged by:	CP
		Checked by:	

Logged on site during drilling operations

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Concrete surfacing (MADE GROUND)	0.10			33.0
0.10	Jg*				Light grey sandy angular fine to coarse gravel. Gravels consist of limestone sub-base (MADE GROUND)	0.30			32.8
					Dark brown and orange brown clayey slightly gravelly sand. Gravels consist of subangular fine to medium concrete, brick and ashy fragments (MADE GROUND)	0.50			32.6
					Orange brown clayey slightly gravelly fine to coarse sand. Gravels consist of subangular sandstone, brick and ashy fragments (MADE GROUND)	0.65			
0.60	JGg				Medium dense grey silty slightly gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone				33.10
1.00 - 1.45	SPT(C)	-	Dry	N = 15	GLACIOFLUVIAL SHEET DEPOSITS	1.80			31.3
2.00 - 2.45	SPT(C)	-	Dry	N = 15	Medium dense brown silty fine to coarse SAND with occasional gravels. Gravels consist of rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS				
2.70	J					2.90			30.2
3.00 - 3.45	SPT(C)	-	3.00	N = 12	Medium dense brown silty gravelly fine to coarse SAND. Gravels consist of subangular to rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS	3.30			29.8
					Firm to stiff consistency dark brown slightly sandy slightly gravelly silty CLAY. Gravels consist of subangular fine sandstone GLACIOFLUVIAL SHEET DEPOSITS				
3.80	JJ								
3.9 - 4.13	SPT(C)	-	3.00	N = 50/125 mm		3.90			29.2
					End of Borehole				

Core Recovery		Groundwater				Additional Tests		
Depth	Recovery	Hole Depth	Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value
0.00-1.00	100%	3.90	3.00					
1.00-2.00	100%							
2.00-3.00	50%							
3.00-4.00	100%							

Remarks

* Insufficient material for 3 jars.

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

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GEOTECHNICAL ENVIRONMENTAL

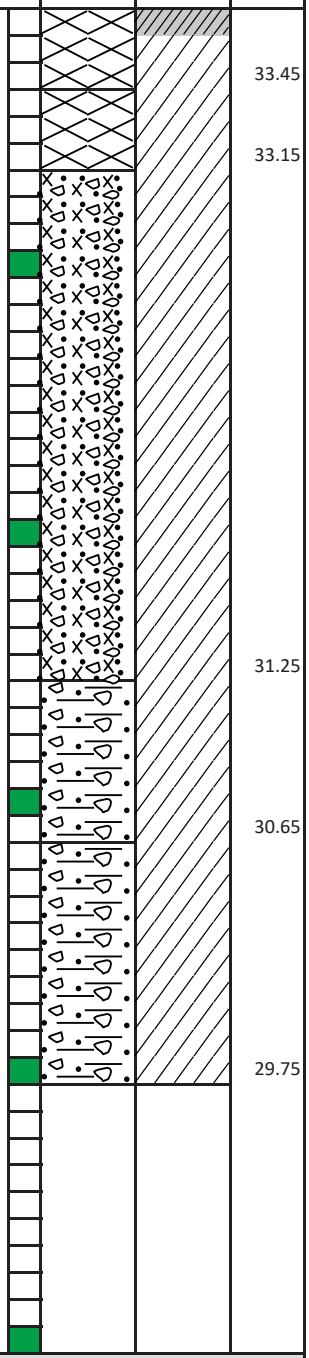
Dynamic Sample Record Sheet

Project:	Former Greenfinch P.H., West Didsbury
Date:	01/05/2024
Hole Ref.	DS3
Sheet	1 of 1
Job No.	CCL03767

Contractor	Dynamic Sampling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m dynamic sampling		
Boring Diameter	100 mm		

Ground Level. 33.75 m OD
Co-ordinates
Logged by: CP — Logged on site during drilling operations
Checked by: AHM

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Backfill	Level O.D.
					Dark brown clayey gravelly fine to coarse sand with rootlets. Gravels consist of subangular fine to coarse brick, concrete and ashy fragments MADE GROUND	0.30		33.45
0.40	JGg				Yellowish brown silty slightly gravelly fine to coarse sand. Gravels consist of subangular fine sandstone and rare brick and ash fragments MADE GROUND	0.60		33.15
0.80	Jgg				Medium dense grey silty gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS			
1.00 - 1.45	SPT(C)	-	Dry	N = 11				
2.00 - 2.45	SPT(C)	-	Dry	N = 14				
					Medium dense brown silty gravelly fine to coarse SAND. Gravels consist of subangular to rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS	2.50		31.25
3.00 - 3.45	SPT(C)	-	Dry	N = 10				
					Firm to stiff consistency dark brown slightly gravelly slightly sandy CLAY. Gravels consist of subangular to subrounded fine sandstone GLACIOFLUVIAL SHEET DEPOSITS	3.10		30.65
3.50	JJ							
4.00 - 4.30	SPT(C)	-	Dry	N = 50 / 210 mm		4.00		29.75
					End of Borehole			



Core Recovery

Depth	Recovery
0.00-1.00	100%
1.00-2.00	100%
2.00-3.00	40%
3.00-4.00	100%

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
4.00	3.00		

Additional Tests

Test type	Test Depth	Test Value

Remarks

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Dynamic Sample Record Sheet

Project:	Former Greenfinch P.H., West Didsbury
Date:	01/05/2024
Hole Ref.	**DS4**
Sheet	1 of 1
Job No.	CCL03767

Contractor	Dynamic Sampling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m dynamic sampling		
Boring Diameter	100 mm		

Ground Level. 33.0 m OD
Co-ordinates
Logged by: CP — Logged on site during drilling operations
Checked by: AMM

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Concrete surfacing				
					MADE GROUND	0.15			32.85
					Grey sandy angular to subangular fine to coarse gravel of limestone				
					MADE GROUND	0.40			32.6
0.45	JGg				Dark brown clayey slightly gravelly fine to coarse sand. Gravels consist of angular to subangular fine to coarse limestone, brick and ashy fragments	0.50			32.5
					MADE GROUND				
					Yellowish brown silty slightly gravelly fine to coarse sand. Gravels consist of subangular fine sandstone and rare ashy fragments	0.80			32.2
1.00 - 1.45	SPT(C)	-	Dry	N = 13	MADE GROUND				
1.00	JGg				Medium dense grey silty slightly gravelly fine to coarse SAND. Gravels consist of rounded fine to coarse sandstone				
					GILACIOFLUVIAL SHEET DEPOSITS				
2.00 -2.45	SPT(C)	-	Dry	N = 11					
						2.30			30.7
2.50	J				Medium dense dark brown silty slightly gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone				
					GILACIOFLUVIAL SHEET DEPOSITS	2.70			30.3
					Medium dense brown silty slightly gravelly fine to coarse SAND. Gravels consist of subrounded to rounded fine to medium sandstone				
3.00 -3.45	SPT(C)	-	3.00	N = 9	GILACIOFLUVIAL SHEET DEPOSITS				
4.00 -4.45	SPT(C)	-	3.00	N = 40		4.00			29.0
					End of Borehole				
4.45 -4.75	SPT(C)*	-	3.00	N = 50/170 mm					

Core Recovery

Depth	Recovery
0.00-1.00	100%
1.00-2.00	100%
2.00-3.00	100%
3.00-4.00	100%

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
4.00	3.00		

Additional Tests

Test type	Test Depth	Test Value

Remarks

*SPT carried out directly after previous test with no sample recovered for logging

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Dynamic Sample Record Sheet

Project:	Former Greenfinch P.H., West Didsbury	**Hole Ref.**	**DS5**
Date:	01/05/2024	**Sheet**	1 of 1
		Job No.	CCL03767
Contractor	Dynamic Sampling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m dynamic sampling	**Ground Level.**	33.25 m OD
Boring Diameter	100 mm	**Co-ordinates**	
		Logged by:	CP — Logged on site during drilling operations
		Checked by:	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Backfill	Level O.D.
					Concrete surfacing (MADE GROUND)	0.10		33.15
					Grey sandy angular fine to coarse gravel of limestone MADE GROUND	0.30		32.95
0.50	JGg				Brown clayey gravelly fine to coarse sand with occasional plant fragement and cobbles of brick. Gravels consist of subangular fine to coarse limestone, brick and ashy fragments MADE GROUND	0.70		32.55
0.90	JGg				Medium dense grey silty fine to coarse SAND with rootlets and occasional gravels of rounded fine to medium sandstone			
1.00 - 1.45	SPT(C)	-	Dry	N = 18	GLACIOFLUVIAL SHEET DEPOSITS			
1.20	JGg							
2.00 - 2.45	SPT(C)	-	Dry	N = 15		2.30		30.95
					Medium dense brown silty gravelly fine to coarse SAND. Gravels consist of subrounded to rounded fine to coarse sandstone GLACIOFLUVIAL SHEET DEPOSITS			
3.00 - 3.45	SPT(C)	-	3.00	N = 15		3.20		30.05
3.40	JGg				Firm to stiff consistency dark brown sandy silty CLAY GLACIOFLUVIAL SHEET DEPOSITS	3.80		29.45
4.00 - 4.45	SPT(C)	-	3.00	N = 37	Firm consistency dark brown slightly gravelly slightly sandy silty CLAY. Gravels consist of rounded fine to medium sandstone	4.00		29.25
4.00	JGg				GLACIOFLUVIAL SHEET DEPOSITS			
					Brown silty slightly gravelly fine to coarse SAND. Gravels consist of rounded fine to medium sandstone GLACIOFLUVIAL SHEET DEPOSITS			
4.90	JGg				Stiff consistency dark brown slightly sandy slightly gravelly silty CLAY. Gravels consist of subrounded to rounded fine to medium sandstone	4.80		28.45
5.00 - 5.45	SPT(C)	-	3.00	N = 50 / 210mm	GLACIOFLUVIAL SHEET DEPOSITS			
					End of Borehole	5.00		28.25

Core Recovery

Depth	Recovery
0.00-1.00	100%
1.00-2.00	100%
2.00-3.00	100%
3.00-4.00	90%
4.00-5.00	100%

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
5.00	3.00		

Additional Tests

Test type	Test Depth	Test Value

Remarks

Notes

1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

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WD18 8YS

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Analytical Report Number : 24-017819

Project / Site name:	Former Greenflinch P.H. Lapwing Lane, Didsbury	**Samples received on:**	03/05/2024
Your job number:	CCL03767	**Samples instructed on/ Analysis started on:**	03/05/2024
Your order number:	PO13400	**Analysis completed by:**	11/05/2024
Report Issue Number:	1	**Report issued on:**	14/05/2024
Samples Analysed:	10 soil samples		

[redacted]

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury
Your Order No: PO13400

Lab Sample Number				189366	189367	189368	189369	189370
Sample Reference				TP1	DS2	DS3	DS4	DS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.60	0.40	0.45	0.50
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	18	13	14	12
Total mass of sample received	kg	0.1	NONE	0.7	0.8	0.9	0.8	0.8
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	PDO	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	9.1	7.9	8.1	7.7	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	3200	190	140	180	220
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1500	20	15	16	19
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.759	0.01	0.0073	0.00788	0.0097
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	759	10	7.3	7.88	9.7
Sulphide	mg/kg	1	MCERTS	8	< 1.0	< 1.0	2.3	1.9
Total Sulphur	mg/kg	50	MCERTS	1300	81	100	160	160
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.3	0.9	0.9	1.7	1.4
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	0.07	0.06
Acenaphthylene	mg/kg	0.05	MCERTS	0.82	< 0.05	< 0.05	0.08	0.06
Acenaphthene	mg/kg	0.05	MCERTS	2	< 0.05	< 0.05	0.17	0.15
Fluorene	mg/kg	0.05	MCERTS	1.9	< 0.05	< 0.05	0.17	0.17
Phenanthrene	mg/kg	0.05	MCERTS	21	< 0.05	0.39	1.8	2.2
Anthracene	mg/kg	0.05	MCERTS	4.3	< 0.05	0.07	0.34	0.45
Fluoranthene	mg/kg	0.05	MCERTS	22	< 0.05	0.61	1.8	2.4
Pyrene	mg/kg	0.05	MCERTS	23	< 0.05	0.69	2.1	2.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	< 0.05	0.36	1.4	1.5
Chrysene	mg/kg	0.05	MCERTS	13	< 0.05	0.45	1.6	1.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	11	< 0.05	0.43	1.4	1.5
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	5.6	< 0.05	0.17	0.65	0.68
Benzo(a)pyrene	mg/kg	0.05	MCERTS	12	< 0.05	0.46	1.6	1.6
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	7.2	< 0.05	0.17	0.71	0.74
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	0.22	0.23
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	8.3	< 0.05	0.21	0.88	0.85
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	146	< 0.80	4.01	14.9	17.2

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Analytical Report Number: 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury
Your Order No: PO13400

Lab Sample Number				189366	189367	189368	189369	189370
Sample Reference				TP1	DS2	DS3	DS4	DS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.60	0.40	0.45	0.50
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	55	10	14	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.3	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	17	15	14	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	8.9	54	25	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	92	12	29	69	69
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	0.4	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	5.6	11	13	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	14	31	48	33
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL	mg/kg	1	MCERTS	2	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL	mg/kg	2	MCERTS	3.7	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL	mg/kg	8	MCERTS	28	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL	mg/kg	10	NONE	34	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	1.3	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	18	< 2.0	< 2.0	< 2.0	3.8
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	110	< 10	< 10	< 10	10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	120	< 10	11	< 10	15
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	250	< 10	11	< 10	29
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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

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Analytical Report Number: 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury
Your Order No: PO13400

Lab Sample Number				189371	189372	189373	189374	189375
Sample Reference				DS3	DS4	DS2	TP2	DS1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.00	1.20	1.30	1.50
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.7	7.1	4.4	7.6	3
Total mass of sample received	kg	0.1	NONE	0.9	0.8	0.5	0.9	0.5
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	-	-	-	-	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	8.3	8.3	8.7	7.7	8.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	9.3	5.4	14	6.7	13
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.00463	0.00271	0.00718	0.00333	0.00628
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	4.63	2.71	7.18	3.33	6.28
Sulphide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	-	-	-

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Analytical Report Number: 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury
Your Order No: PO13400

Lab Sample Number				189371	189372	189373	189374	189375
Sample Reference				DS3	DS4	DS2	TP2	DS1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.00	1.20	1.30	1.50
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	-	-	-	-	-
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	-	-	-	-	-
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	-	-	-	-	-
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	-	-	-	-
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	-	-	-	-
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	-	-	-
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	-	-	-
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	-	-	-	-
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	-	-	-	-	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	-	-	-	-	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	-	-	-	-	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-	-	-	-	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-	-	-	-	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	-	-	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	-	-	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	-	-	-	-
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	5	MCERTS	-	-	-	-	-
o-Xylene	µg/kg	5	MCERTS	-	-	-	-	-

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

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Analytical Report Number : 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
189366	TP1	None Supplied	0.2	Brown loam and sand with gravel and vegetation
189367	DS2	None Supplied	0.6	Brown sandy clay with gravel
189368	DS3	None Supplied	0.4	Brown loam and clay with gravel and vegetation
189369	DS4	None Supplied	0.45	Brown clay and loam with gravel and vegetation
189370	DS5	None Supplied	0.5	Brown loam and clay with gravel and vegetation
189371	DS3	None Supplied	0.8	Brown sand with gravel
189372	DS4	None Supplied	1	Brown sand with gravel
189373	DS2	None Supplied	1.2	Brown sand with gravel
189374	TP2	None Supplied	1.3	Brown sand with gravel
189375	DS1	None Supplied	1.5	Brown sand with gravel

Analytical Report Number : 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS

Analytical Report Number : 24-017819
Project / Site name: Former Greenflinch P.H. Lapwing Lane, Didsbury

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

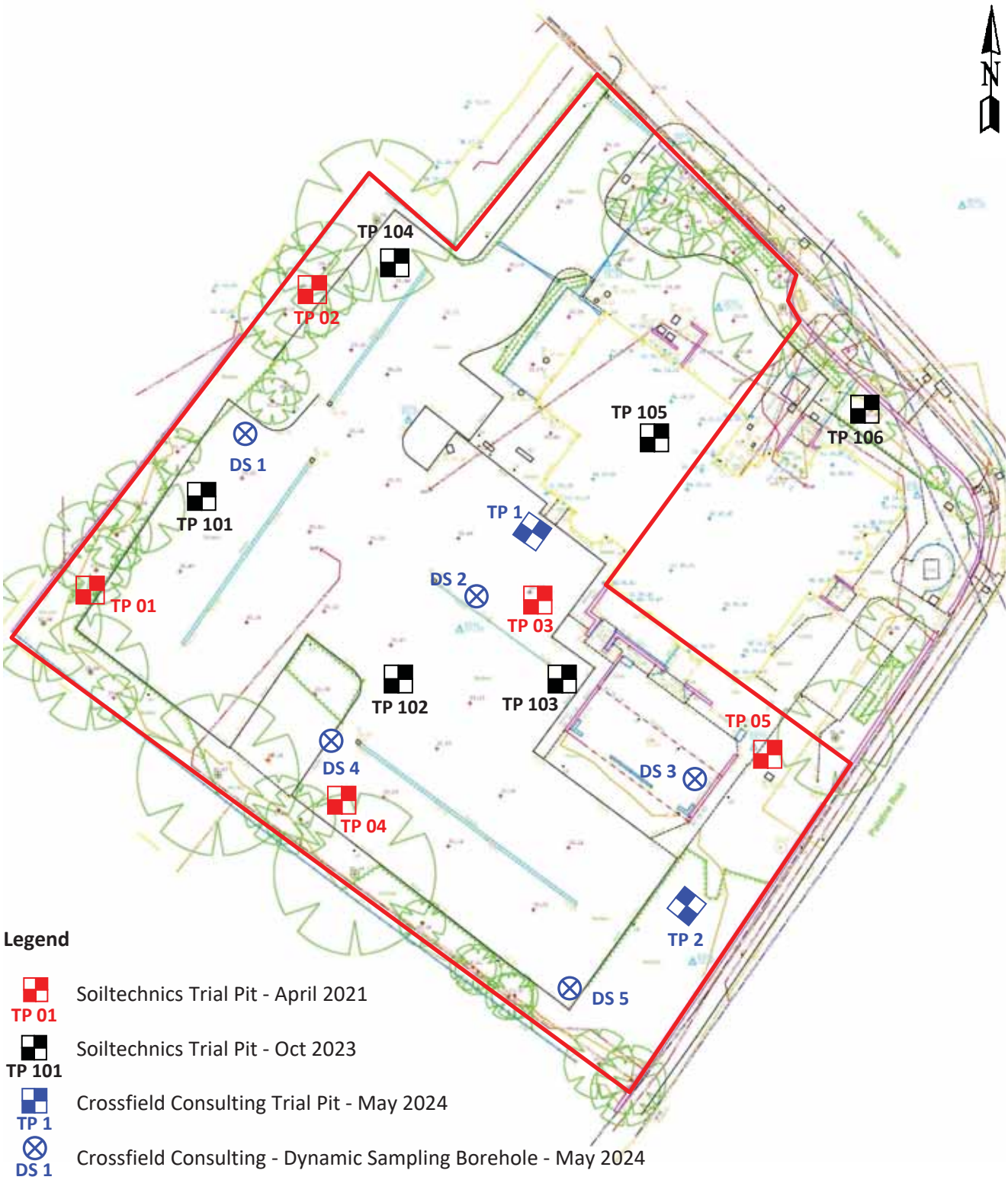
For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

FIGURE II-1



EXPLORATORY HOLE LOCATION PLAN

Scale 1: 500

Reproduced from the topographical survey by Geospatial (undated) provided by the Client

APPENDIX III

APPENDIX III – QUANTITATIVE RISK ASSESSMENT: HUMAN HEALTH

Contaminated Land Exposure Assessment Model v1.071

A site-specific risk assessment, with respect to human health considerations, has been undertaken due to the concentrations of certain contaminants (arsenic, certain TPH fractions and PAHs) recorded at levels above the generic assessment criteria (GAC).

The model has been set up on the basis that the proposed development comprises apartments, for residents of retirement age. The development will have managed landscaping such that there will be no private gardens and residents will not be permitted to cultivate the ground. The contaminant linkages considered are compatible with the published criteria for a residential development without plant uptake. It is noted that the risk assessment model presumes that the soil associated with the substance will be exposed at the surface following completion of the development. However, as the soft landscaped areas will comprise entirely grassed and mulched ornamental planting areas, which will be tended by landscaping contractors as part of a maintenance agreement, it is considered that there will be no exposure route relating to home grown produce or long-term direct dermal soil contact. The CLEA model has been set up for an age class of 18, which is appropriate for end users of retirement age as the critical risk receptor. The soil organic matter and pH parameters have been determined from average site data.

The model parameters, exposure route analysis and the summary of results for the relevant compounds are presented in this Appendix. The output data are summarised as follows:

Substance	Maximum Concentration (mg/kg)	Concentration Range (mg/kg)	Site Specific Assessment Criteria (SSAC) (mg/kg)	Maximum Concentration Exceeds SSAC? [1]	No. of Samples that Exceed SSAC
Arsenic	55	4 to 55	410	No	0
Benzo(b)fluoranthene	11	<0.05 to 11	30	No	0
Benzo(a)pyrene	12	<0.05 to 12	24	No	0
Dibenzo(a,h)anthracene	2.2	<0.05 to 2.2	2.4	No	0
Aliphatic C_8-C_{10}	130	<0.05 to 130	250	No	0
Aromatic C_8-C_{10}	130	<0.05 to 130	440	No	0

Notes

1. Where the maximum concentration does not exceed the SSAC, risks to end users are considered to be negligible and, therefore, no further assessment is required. For compounds with a maximum concentration above the SSAC, further consideration of risks or remediation may be required. See Section 7.

CLEA Software Version 1.071

Report generated	15-May-24
Report title	CCL03767 Former Greenfinch P.H., Lapwing Lane, Didsbury
Created by	CP at Crossfield Consulting Limited

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Arsenic (S4UL)	4.11E+02	4.81E+02	NR	1.00	0.85	NR	NR	No	No	No	0	0	0	0	0	0
2	Benzo(b)fluoranthene (S4UL)	4.79E+01	8.12E+01	3.01E+01	0.63	0.37	1.00	4.03E-01 (vap)	No	No	No	0	0	0	0	0	0
3	Benzo(a)pyrene (S4UL)	3.81E+01	6.57E+01	2.41E+01	0.63	0.37	1.00	1.82E+00 (vap)	No	No	No	0	0	0	0	0	0
4	Dibenzo(ah)anthracene (S4UL)	3.81E+00	6.53E+00	2.41E+00	0.63	0.37	1.00	7.86E-03 (vap)	No	No	No	0	0	0	0	0	0
5	Aliphatic C8-C10 (S4UL)	6.34E+04	2.50E+02	2.50E+02	0.00	1.00	1.00	1.52E+02 (vap)	Yes	Yes	No	0	0	0	0	0	0
6	Aromatic C8-C10 (S4UL)	2.54E+04	4.45E+02	4.43E+02	0.01	0.99	1.00	1.21E+03 (vap)	Yes	Yes	No	0	0	0	0	0	0
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Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Arsenic (S4UL)	99.9	0.1	0.0	100.0	4.11E+02	NR	2.05E+02	1.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
2	Benzo(b)fluoranthene (S4UL)	100.0	0.0	0.0	100.0	3.01E+01	5.08E-05	1.51E+01	1.28E-08	0.00E+00	9.56E-08	1.72E-07	0.00E+00	NA	NA	NA	NA	NA	NA
3	Benzo(a)pyrene (S4UL)	100.0	0.0	0.0	100.0	2.41E+01	2.84E-05	1.21E+01	1.03E-08	0.00E+00	6.03E-08	1.25E-07	0.00E+00	NA	NA	NA	NA	NA	NA
4	Dibenzo(ah)anthracene (S4UL)	100.0	0.0	0.0	100.0	2.41E+00	6.01E-06	1.20E+00	1.02E-09	0.00E+00	6.35E-09	9.98E-09	0.00E+00	NA	NA	NA	NA	NA	NA
5	Aliphatic C8-C10 (S4UL)	98.4	0.1	1.6	100.0	2.50E+02	2.91E+04	1.25E+02	1.06E-07	0.00E+00	8.85E-01	6.99E-04	0.00E+00	NA	NA	NA	NA	NA	NA
6	Aromatic C8-C10 (S4UL)	98.2	1.6	0.2	100.0	4.43E+02	5.98E+03	2.21E+02	1.88E-07	0.00E+00	1.83E-01	4.23E-04	0.00E+00	NA	NA	NA	NA	NA	NA
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Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic (S4UL)	2.90E-04	0.00E+00	1.03E-05	1.71E-06	0.00E+00	0.00E+00	0.00E+00	96.56	0.00	3.44	0.00	0.00	0.00	0.00	0.00
2	Benzo(b)fluoranthene (S4UL)	2.13E-05	0.00E+00	3.28E-06	1.25E-07	1.56E-08	0.00E+00	0.00E+00	86.15	0.00	13.28	0.51	0.06	0.00	0.00	0.00
3	Benzo(a)pyrene (S4UL)	1.70E-05	0.00E+00	2.62E-06	1.00E-07	9.87E-09	0.00E+00	0.00E+00	86.16	0.00	13.28	0.51	0.05	0.00	0.00	0.00
4	Dibenzo(ah)anthracene (S4UL)	1.70E-06	0.00E+00	2.62E-07	1.00E-08	1.04E-09	0.00E+00	0.00E+00	86.16	0.00	13.28	0.51	0.05	0.00	0.00	0.00
5	Aliphatic C8-C10 (S4UL)	1.76E-04	0.00E+00	2.09E-05	1.04E-06	1.45E-01	1.40E+95	1.40E+95	0.06	0.00	0.01	0.00	49.93	0.00	0.07	49.93
6	Aromatic C8-C10 (S4UL)	3.12E-04	0.00E+00	3.70E-05	1.84E-06	2.99E-02	1.40E+95	1.40E+95	0.52	0.00	0.06	0.00	49.42	0.00	0.58	49.42
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			Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)	Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}\ DW$)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Arsenic (S4UL)	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1
2	Benzo(b)fluoranthene (S4UL)	ID	0.039	ID	0.00038	NR	NR	2.05E-06	4.36E-06	3.62E-10	5.02	6.08	0.13	0.5	1	1	1
3	Benzo(a)pyrene (S4UL)	ID	0.031	ID	0.0003	NR	NR	1.76E-06	4.38E-06	3.67E-10	5.11	6.18	0.13	0.5	1	1	1
4	Dibenzo(ah)anthracene (S4UL)	ID	0.0031	ID	0.00003	NR	NR	5.40E-06	4.08E-07	3.40E-10	5.27	6.38	0.13	0.5	1	1	1
5	Aliphatic C8-C10 (S4UL)	TDI	100	TDI	290	9.9E+99	9.9E+99	4.15E+01	1.00E-05	1.00E-09	4.48	5.22	0.1	0.5	10	1	1
6	Aromatic C8-C10 (S4UL)	TDI	40	TDI	60	9.9E+99	9.9E+99	2.53E-01	1.00E-05	1.00E-09	3.2	3.69	0.1	0.5	10	1	1
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		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic (S4UL)	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 dw	0.00033 fw	0.0002 fw	0.0011 fw
2	Benzo(b)fluoranthene (S4UL)	1.21E+03	6.34E-09	2.00E-03	model	model	model	model	model	model
3	Benzo(a)pyrene (S4UL)	1.49E+03	2.00E-08	3.80E-03	model	model	model	model	model	model
4	Dibenzo(ah)anthracene (S4UL)	2.16E+03	1.66E-10	6.00E-04	model	model	model	model	model	model
5	Aliphatic C8-C10 (S4UL)	3.50E+02	3.20E+02	4.27E-01	model	model	model	model	model	model
6	Aromatic C8-C10 (S4UL)	1.84E+01	3.20E+02	6.46E+01	model	model	model	model	model	model
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CLEA Software Version 1.071

Report generated	15/05/2024
Report title	CCL03767 Former Greenfinch P.H., Lapwing Lane, Didsbury
Created by	CP at Crossfield Consulting Limited

BASIC SETTINGS

Land Use	Residential without produce					
Building	Apartment - Large					
Receptor	Female (res)	Start age class	18	End age class	18	Exposure Duration 10 years
Soil	Silty clay loam					

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✖	Dermal contact with soil	✖	Inhalation of soil dust	✓
Soil attached to homegrown produce	✖			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential without produce **Receptor** Female (res)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	180	0	180	180	365	365	23.0	1.0	0.06	1.00	0.10	5.60	0.7	8.5	0.32	0.26	3.43E-01
2	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10	9.80	0.8	13.3	0.33	0.26	4.84E-01
3	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10	12.70	0.9	12.7	0.32	0.25	5.82E-01
4	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10	15.10	0.9	12.2	0.35	0.28	6.36E-01
5	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10	16.90	1.0	12.2	0.35	0.28	7.04E-01
6	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10	19.70	1.1	12.2	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.4	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.4	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.4	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.4	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.4	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	13.4	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	13.4	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	13.4	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	13.4	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	13.4	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	14.8	0.33	0.27	1.78E+00
18	**365**	**365**	**365**	**170**	**365**	**365**	**16.0**	**1.0**	**0.06**	**0.30**	**0.05**	70.90	1.6	**17.4**	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1							7.12E+00	**1.07E+01**	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2							6.85E+00	**3.30E+00**	5.46E+00	3.96E+00	5.40E-01	1.20E+01
3							6.85E+00	**3.30E+00**	5.46E+00	3.96E+00	5.40E-01	1.20E+01
4							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
5							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
6							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
7							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
8							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
9							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
10							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
11							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
12							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
13							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
14							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
15							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
16							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
17							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00
18							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00

Top 2 applied? No

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Apartment - Large

Soil Silty clay loam

Building footprint (m^2)	8.00E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	2.50E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	2.56E+03
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	**1.60E-01**
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	**3.70E-01**
Residual soil water content ($cm^3\ cm^{-3}$)	**1.50E-01**
Saturated hydraulic conductivity ($cm\ s^{-1}$)	**2.37E-03**
van Genuchten shape parameter *m* (dimensionless)	**3.10E-01**
Bulk density ($g\ cm^{-3}$)	**1.20E+00**
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	8.00E+00
Soil Organic Matter content (%)	2.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	1.16E-02
Effective total fluid saturation (unitless)	5.79E-01
Intrinsic soil permeability (cm^2)	3.16E-08
Relative soil air permeability (unitless)	5.78E-01
Effective air permeability (cm^2)	1.83E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	2.50E+01
Building ventilation rate ($cm^3\ s^{-1}$)	2.78E+04
Averaging time surface emissions (yr)	10
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($m^2\ m^{-2}$)	0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
		Average	High		
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None