
Job Title

Didsbury Point

Report Type

Flood Risk Assessment and Drainage
Strategy

Prepared for

Southway Housing Trust

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Flood Risk Assessment and Drainage Strategy

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1. Introduction

1.1 Project Background

Civic Engineers has been appointed by Southway Housing Trust to prepare a Flood Risk Assessment and Drainage Strategy in support of a detailed planning application for a proposed development on land adjacent to The Boulevard in West Didsbury, Manchester. The site is centred around an approximate National Grid Reference of 383542, 392570. The nearest postcode to the site is M20 2EY.

The red line planning application boundary for the site is indicated on Figure 1 below.

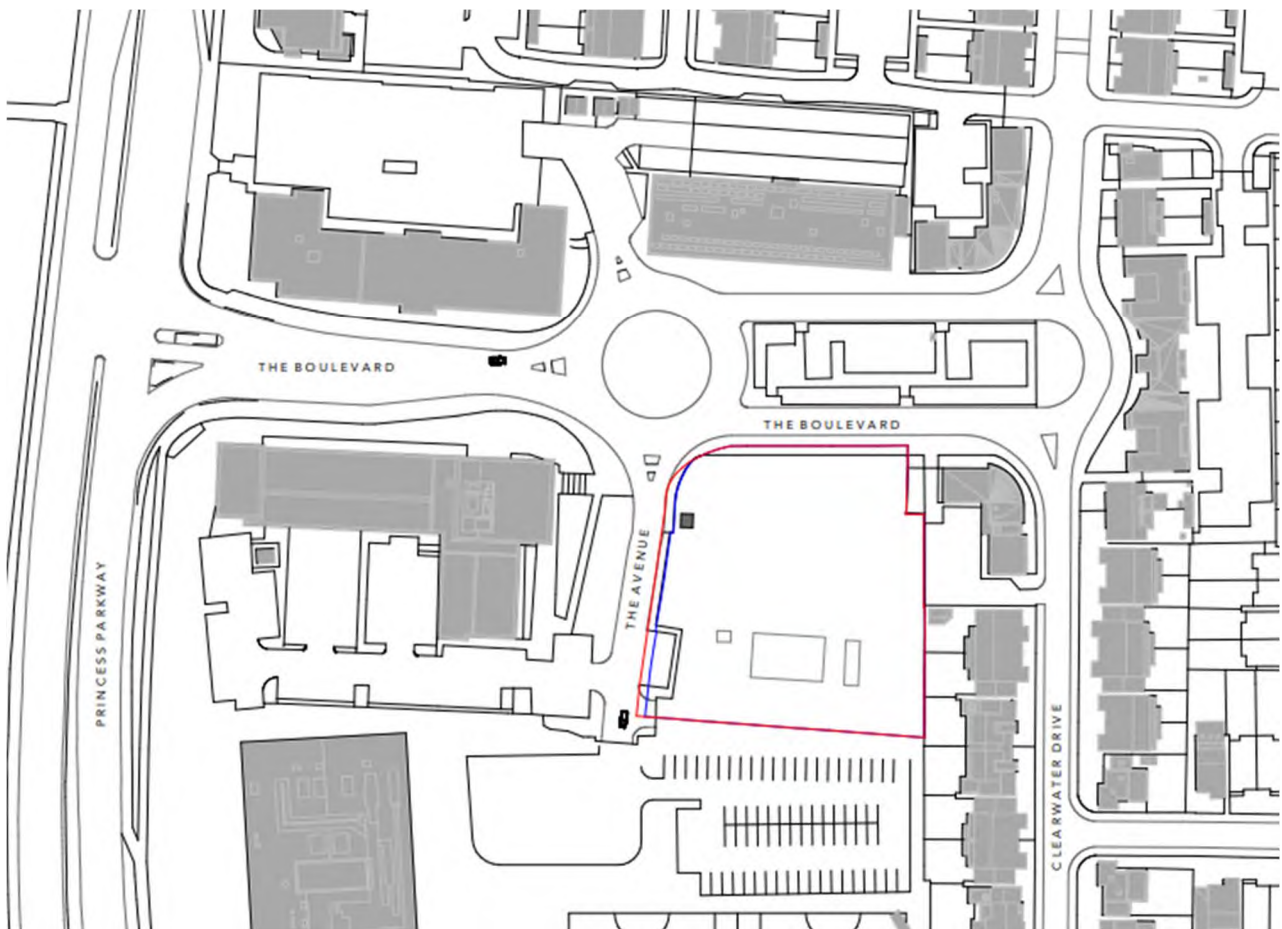


Figure 1: Site location plan

This report provides information on the nature of flood risk at the site and outlines an overarching drainage strategy to serve the proposed development in line with national and local policy and guidance regarding development and flood risk.

Proposals contained in or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained within this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following issue of this report, Civic Engineers reserves the right to re-validate the findings and conclusions by undertaking further investigations at no cost to Civic Engineers.

1.2 Scope and Objectives

This assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance, to the National Planning Policy Framework (NPPF) and information published by Manchester City Council under their remit as Lead Local Flood Authority (LLFA).

Following scrutiny of the UK Governments Long Term Flood Risk information it has been identified that the existing site lies within an area classified to be in Flood Zone 1. This means the land has been assessed as having a less than 1 in 1,000 annual probability of river flooding (0.1%). The development site lies in an area classed as a Critical Drainage Area (CDA) and therefore a Flood Risk Assessment is required.

In July 2021 the Government made changes to the National Planning Policy Framework which made Sustainable Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments. A Detailed Drainage Strategy is therefore included as part of this report as the site is considered to be 'major' development by the Town and Country Planning Order 2015.

The assessment:

- Investigates all potential risks of flooding to the site;
- Considers the impact the development may have elsewhere with regards to flooding;
- Considers proposals to mitigate any potential risk of flooding determined to be present; and
- Proposes an overarching drainage strategy to mitigate flood risk from the site and to comply with the requirements of the NPPF.

This report reviews the following information:

- Environment Agency flood maps for rivers and coastal flooding
- UK Government Long Term Flood Risk information for surface water flooding and reservoir flooding
- Manchester City Council Level 2 Strategic Flood Risk Assessment (SFRA)
- Public sewer records
- British Geological Survey (BGS) online survey / borehole data: and
- Topographical survey

1.3 Development Proposals

The proposal comprises a multi-storey residential development and a medical facility with associated car parking and hard and soft landscaping.

The site covers an area of 0.35ha.

The proposed site plan is included in Appendix A.

2. Section 2

2.1 Current and Historic Use

The site is located just off Princess Parkway in West Didsbury and lies circa 5.7km south of Manchester City Centre. The site is bounded by The Boulevard to the north, The Avenue to the west, car parking associated with Didsbury High School to the south and Clearwater Drive to the east.

The site was formerly part of the old Withington Community Hospital before its closure in 2002. The hospital was later demolished in 2003.

The site is currently undeveloped and is mainly covered by vegetation with part of the southern area being covered with degraded tarmac. There are two buildings on the site, one is an electricity sub-station and the other is a portacabin used for storage.

2.2 Existing Watercourses and Waterbodies

The nearest watercourses to the site are the River Mersey which lies circa 764km to the south and Red Lion Brook which lies circa 920km to the north.

2.3 Existing Drainage

Plans provided by United Utilities (UU) which show the sewer network in the vicinity of the site are included in Appendix B of this report.

The records indicate the following sewer infrastructure in the vicinity of the site:

- A 150mm diameter foul water public sewer runs along The Avenue in a northerly direction to The Boulevard where it turns and runs in an easterly direction along The Boulevard.
- The 150mm diameter sewer which runs along The Boulevard connects into a 225mm diameter foul water public sewer which runs in a south westerly direction along Clearwater Drive.
- A 450mm diameter surface water public sewer runs to the north along The Avenue where it connects into a 675mm diameter surface water sewer at the junction with The Boulevard.
- The 675mm diameter sewer then runs along The Boulevard to the east to connect into an 825mm diameter surface water sewer located in Clearwater Drive. This 825mm diameter sewer runs in a south westerly direction along Clearwater Drive.

A CCTV survey of the sewer network in the vicinity of the site was undertaken by Layer Surveys Ltd in February 2021 and a copy of the report is contained in Appendix B.

The survey confirmed the line and level of the 150mm diameter foul water public sewers in The Avenue and The Boulevard, the 450mm diameter surface water public sewer in The Avenue and the 675mm diameter surface water public sewer in The Boulevard.

2.4 Topography

A topographical survey was undertaken by Survey Systems during August 2019 and updated in November 2021. A copy of the survey drawing is included in Appendix C.

The site is generally flat with levels ranging from 31.0m AOD in the north west to 32.9m AOD in the south west.

2.5 Geology

A Phase 2 Ground Investigation Report was prepared by Groundtech Consulting in May 2021. The investigation included percussive and rotary cored boreholes and trial pits. From the investigation carried out the following summary was made:

Made ground comprising clayey gravelly topsoil was encountered across the site to a maximum depth of 0.2m below ground level (bgl). This was underlain by made ground comprising varying gravel and sand that included brick and concrete fragments throughout to depths of 3.5m bgl. Former foundations and redundant utilities were encountered in one trial pit in the north of the site to a depth of between 0.8m and 1.5m bgl.

The made ground was underlain by natural deposits generally comprising firm to stiff Clay containing sand and gravel bands from a depth of 1.2m bgl to a maximum depth of 19.5m bgl.

Sandstone bedrock was encountered between 23.0m and 24.4m bgl.

Groundwater was encountered across the site between 1.9m and 2.2m bgl.

The Environment Agency identifies the site bedrock as a Principal Aquifer and the superficial drift as a Secondary Aquifer. The groundwater vulnerability is classed as medium and the site does not lie in a source protection zone.

The Phase 2 Ground Investigation Report prepared by Groundtech Consulting is contained in Appendix D.

3. Relevant Policy and Guidance

3.1 National Planning Policy Framework

In July 2021 the Ministry of Housing, Communities and Local Government revised the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance which provides guidance on how flood risk should be assessed during the planning and development process.

The NPPF refers to the Flood Zones which are shown on the Environment Agency Flood Map ([link](#)), and establishes the range of uses which are appropriate, or compatible, land uses for each Flood Zone.

The Flood Zones can be summarised as follows:

Zone 1: Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any one year. (<0.1%)

Zone 2: Medium Probability. This zone comprises land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.

Zone 3a: High Probability. This zone comprises land assessed as having 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Zone 3b: Functional Flood Plain. This zone comprises land where water has to flow or be stored in times of flood. Strategic Flood Risk Assessments should identify this zone.

Annex 3 of the NPPF (2021) defines the type and nature of different development classifications in the context of their flood risk vulnerability. The following extract outlines the NPPF Flood Risk Vulnerability Classifications.

HIGHLY VULNERABLE

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)

MORE VULNERABLE

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

LESS VULNERABLE

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
- Car parks.

WATER-COMPATIBLE DEVELOPMENT

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

The flood risk vulnerability and flood zone 'compatibility' has been summarised in Table 1 below.

Flood Risk Vulnerability Classification (see Table 2)		Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone (See Table 1)	Zone 1	√	√	√	√	√
	Zone 2	√	Exception Test Required	√	√	√
	Zone 3a	Exception Test Required	×	Exception Test Required	√	√
	Zone 3b (functional floodplain)	Exception Test Required	×	×	×	√
√ Development is appropriate		× Development should not be permitted.				

Table 1: Flood Risk Vulnerability and flood zone compatibility from NPPF Technical Guide.

3.2 Site Specific NPPF Flood Risk Categorisation

To assess the NPPF flood risk classification for the site, reference was made to the Government web based 'Flood Map for Planning', which is used to inform planning of a sites Flood Zone(s) and the probability of flooding from rivers or the sea. The Government web based 'Long Term Flood Risk Assessment for Locations in England' was also used to identify the flood risks from rivers and seas, surface water and reservoirs. The Flood Map for Planning and surrounding area is shown as figure 2 in section 4.1.

3.3 Site Specific Flood Zone Compatibility

The proposals for the development fall within two categories:

- Residential
- Medical facility

Both categories are classed as more vulnerable in the Flood Risk Vulnerability Classification (Table 1).

3.4 Strategic Flood Risk Assessment (SFRA) and Manchester Core Strategy Development Plan

The Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA has identified that Didsbury lies in a Critical Drainage Area (CDA). The SFRA advises the following in relation to CDAs:

In these areas, a detailed FRA is advised for all developments over 0.5 hectares regardless of which Flood Zone the site falls within. This should demonstrate that new development is not at risk from flooding from existing drainage systems or potential overland flow routes. It should also demonstrate that the development will not adversely affect existing flooding conditions by the use of appropriate mitigation measures. The FRA should define and address the constraints that will govern the design of the drainage system and layout of the development site.

The SFRA also provides the following guidance relating to CDAs:

- *Development should aim to deliver Greenfield run-off on Greenfield sites up to a 1 in 100 year storm event, considering climate change*
- *Development should be designed so that there is no flooding to the development in a 1 in 30 year event and so that there is no property flooding in a 1 in 100 year plus climate change event.*

Where possible, this should be achieved through the implementation of SUDS. Source control should be considered first.

The Manchester Core Strategy Development Plan advised the following in relation to flood risk;

- *In line with the risk based sequential approach contained within PPS25, development should be directed away from sites at greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).*
- *In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including change of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.*
- *All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.*

It should be noted that the comments above refer to Planning Policy Statement 25 (PPS25), which was current at the time of writing the Manchester Core Strategy Development Plan. This document was withdrawn in March 2014 and was replaced by the NPPF Planning Practice Guidance.

4. Flood Risk Assessment

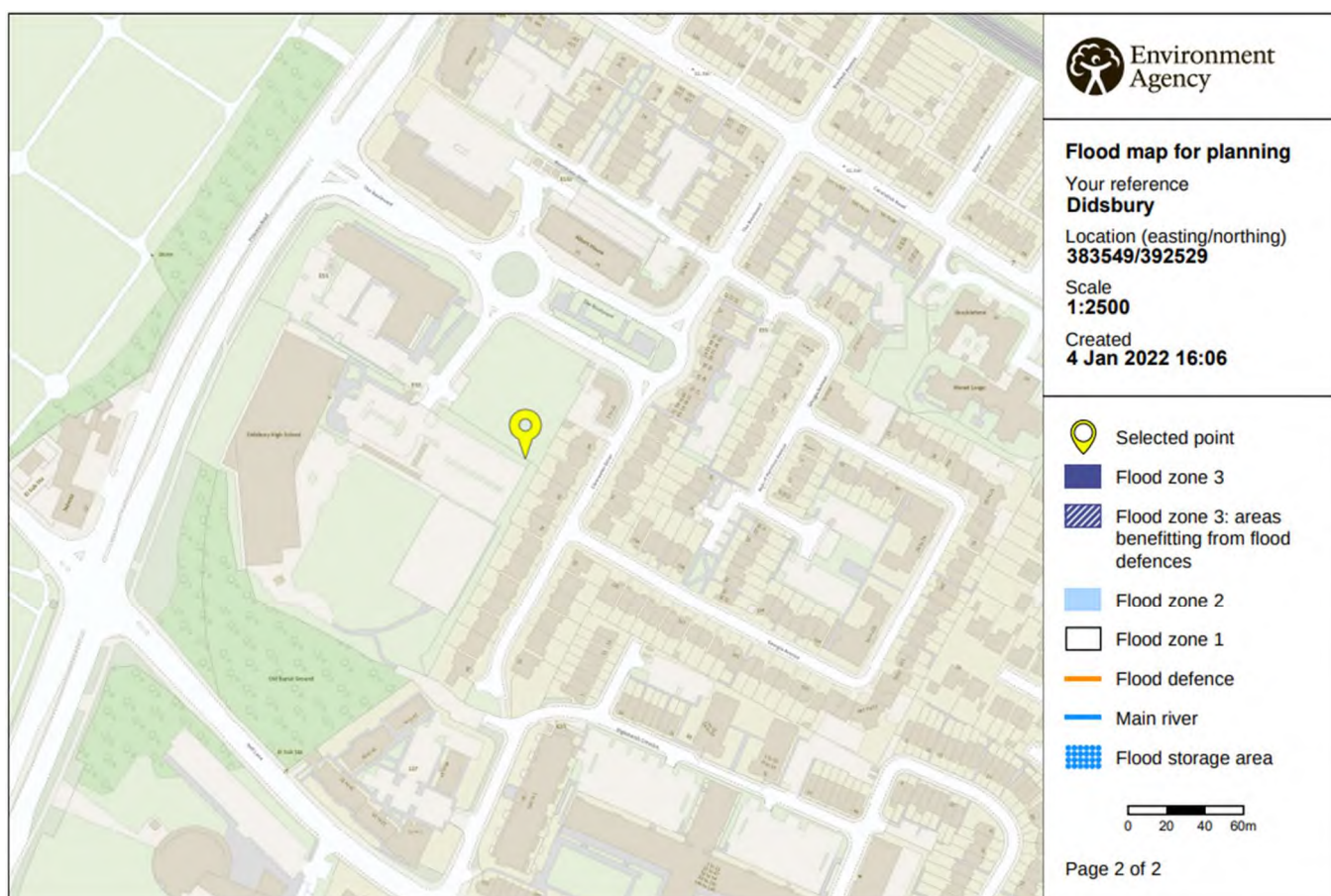
The potential sources of flooding to the development have been assessed and are discussed below.

4.1 Tidal/Fluvial Flooding (Rivers and Streams)

From the Government flooding from rivers and seas maps for planning:

- Where a site is located in a dark blue shaded zone, this indicates that the site is within Flood Zone 3 where there is a chance of flooding of 1 in 100 (1%) or greater.
- Where a site is located in a light blue shaded zone; this indicates that the site is within Flood Zone 2 where there is a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).
- Where a site is located in a white (unshaded) area, it is generally deemed to be classified as Flood Zone 1 where there is a chance of flooding of less than 1 in 1000 (0.1%).

From the 'Flood Map for Planning', shown below in Figure 2, it can be seen that the proposed site and the surrounding area are entirely located within an area classified as Flood Zone 1 (low risk of flooding from rivers or sea). For Flood Zone 1 all development is deemed to be appropriate and neither the sequential nor the exception test is required (refer to Table 1 in section 3.1, taken from Annex 3 of the NPPF).



• Figure 2: Flood Map for Planning created 04/01/22

4.2 Reservoir Flooding

From the UK Government's Flood Risk from Reservoir Flooding (extent of flooding) map shown in Figure 3 below, the site is indicated as being in an area at low risk from flooding.

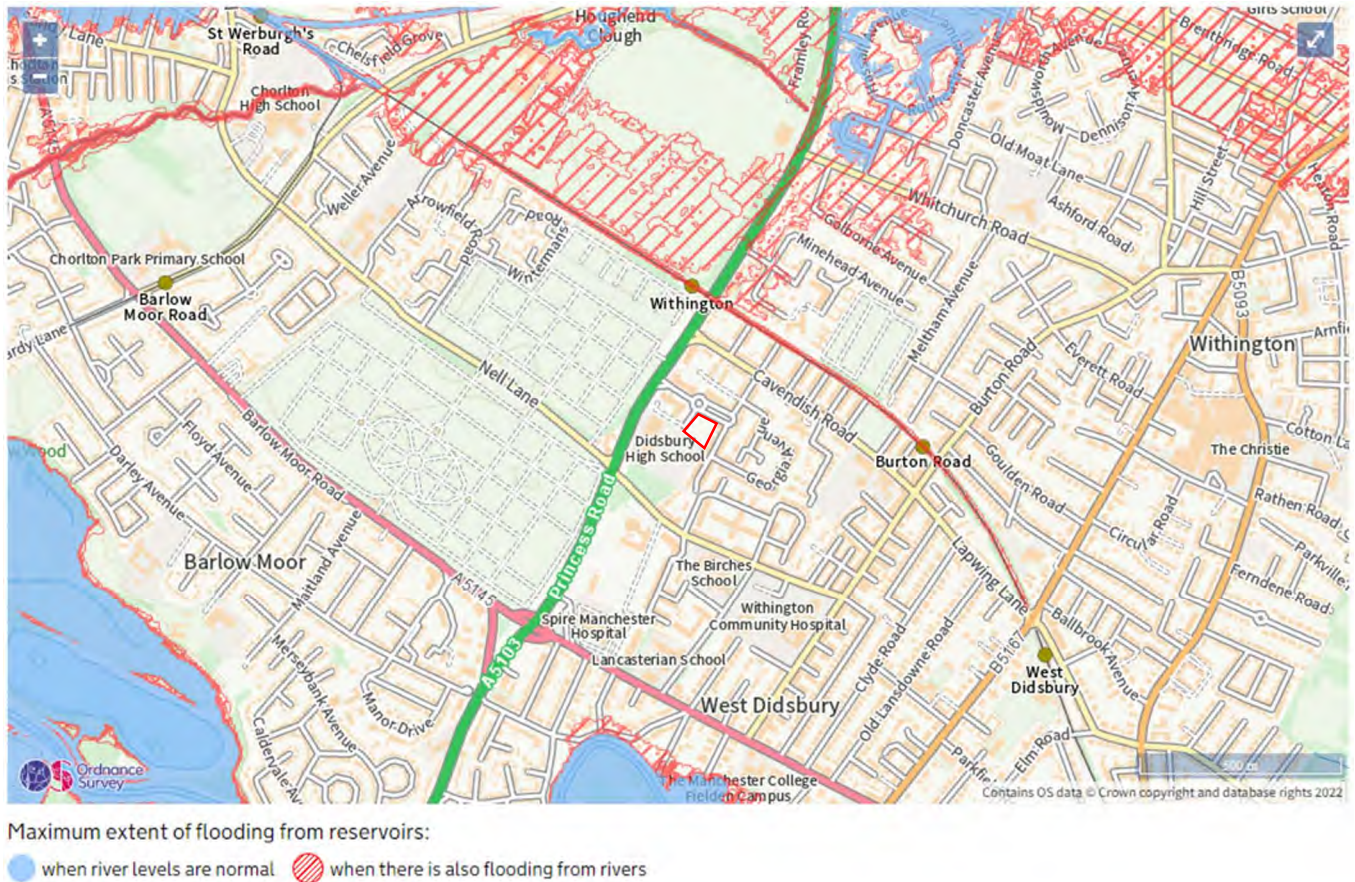


Figure 3: Extents of Flooding from Reservoirs

4.3 Canal Flooding

The nearest canal to the proposed development is the Bridgewater Canal which is approximately 4km west of the proposed site.

As canals are a controlled water body, and do not pose a direct flood risk, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.

Given the information above, it is considered that there is a very low risk of canal flooding to the site.

4.4 Groundwater Flooding

The Manchester City Council SFRA indicates that the site does not lie in an area at risk of groundwater flooding. Furthermore, as noted in section 2.5, groundwater was encountered at depths of 1.9m and 2.2m bgl, it is therefore considered that the risk of flooding from groundwater is low.

4.5 Public Sewers, Highway Drainage Flooding and Infrastructure Failure

There are various public sewers within the vicinity of the site, however no records of flooding from the public sewers have been identified.

4.6 Surface Water Flooding to the Site

Surface water flooding can be caused when rainwater, during extreme rainfall events, does not drain away through the normal drainage system or soak into the ground. Surcharging sewers can result in overland flows which, if originating at a higher elevation than a development site, can potentially pose a flood risk.

Surface water flooding is dependant primarily on topography which dictates either the flow path of overland flow which is not contained within public sewers, or areas in which ponding may occur. Surface water flooding is more difficult to predict than the risk of flooding from rivers or sea as it is dependent on the amount of rain which will fall in a very localised area, the specific topography of that area and the capacity and functionality of the drainage network within that area.

From the UK Government's Flood Risk from Surface Water (extent of flooding) map;

- Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding where there is a chance of flooding of greater than 1 in 30 (3.3%).
- Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding where there is a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%).
- Where a site is located in a light blue shaded zone; this indicates that the site is at low risk of flooding where there is a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).
- Where a site is located in a white (unshaded) area; this indicates that the site is at very low risk of flooding where there is a chance of flooding of less than 1 in 1000 (0.1%).

The extent of flooding to the site from surface water is indicated in Figure 4 and it shows that much of the site is located in an area classified as being at 'Very Low' risk of flooding from surface water, with a localised area of 'Low' risk of flooding identified to the north west of the site adjacent to The Boulevard.

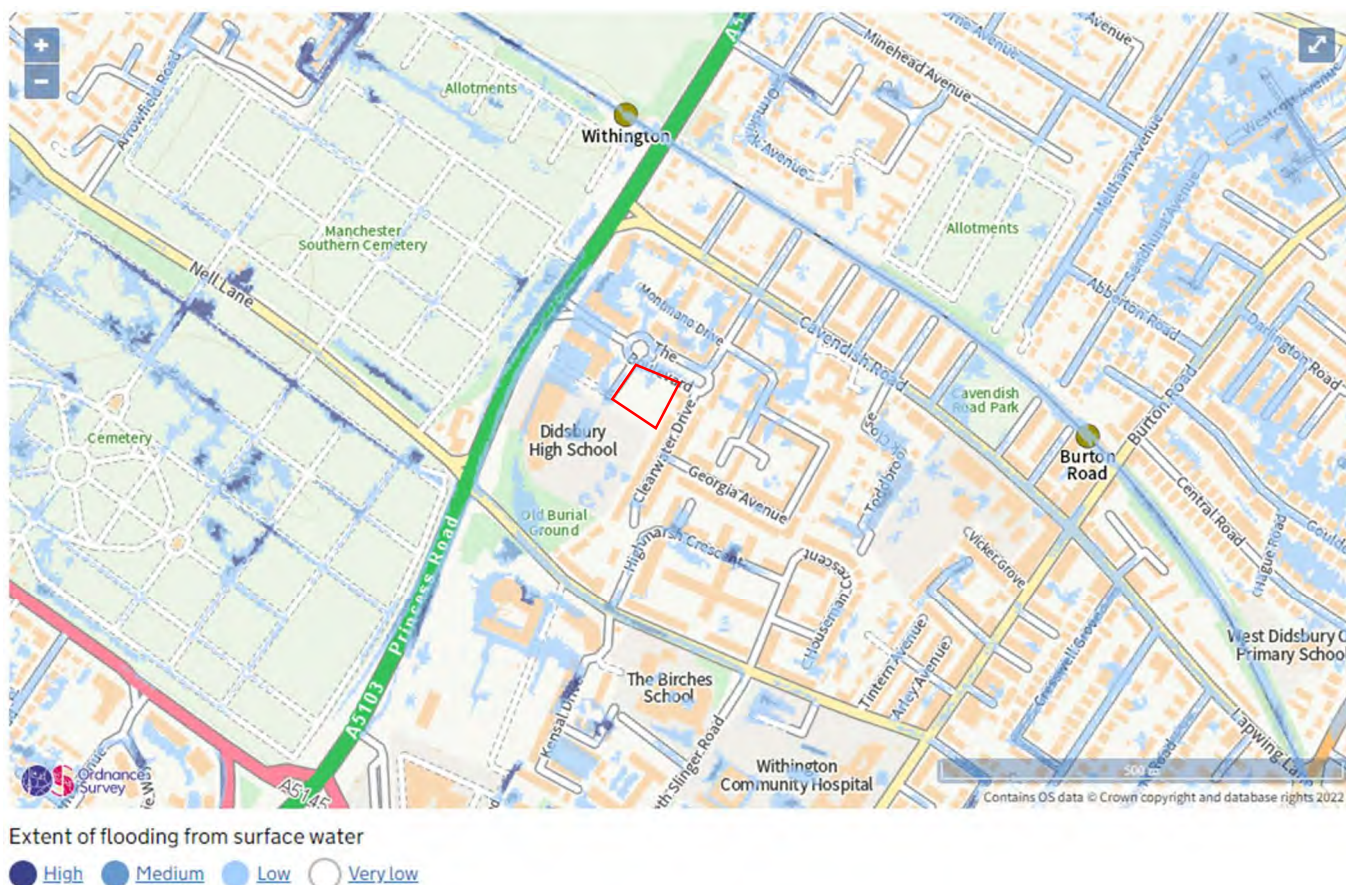


Figure 4: Surface Water Flood Risk Map

4.7 Surface Water Flooding from the Site

Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. The proposed surface water drainage network shall be designed to not flood during the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.

A detailed assessment of the proposed surface flows is carried out within the drainage strategy within Section 5 of this report.

4.8 Historic Flooding

Historical flood events are noted within the SFRA which puts the Didsbury area into a Critical Drainage Area based on the significant areas of surface water flooding and historical flooding events.

There are no records specifically indicating that the Didsbury Point development area has flooded.

4.9 Summary of Flood Risk

From the evidence collated, the risk to the development from flooding can be summarised as follows:

- Fluvial (rivers and streams) & Tidal – Low Risk

- Reservoir – Low Risk
- Canal – Very low risk
- Groundwater – Low Risk
- Public Sewers – Low Risk
- Surface Water – Low Risk
- Historic – No events noted as specifically affecting the proposed development site.

5. Surface Water Management Strategy

5.1 Existing Site Drainage

The site was previously occupied by Withington Community Hospital until 2003 when the hospital buildings were demolished. The site has been undeveloped since and is now covered mostly by vegetation with small areas of broken tarmac to the south of the site. The site is currently classed as greenfield.

5.2 Drainage Hierarchy Points of Discharge

For new development the NPPF Planning Practice Guidance Paragraph 080 states that:

"Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer."

Infiltration Potential Sustainable Drainage Systems (SuDS) Features to be Considered

Due to the depth of made ground encountered on site (encountered at depths up to 3.5m bgl from site investigation) and relatively high groundwater (encountered at depths 1.9m to 2.2m bgl), infiltration is not a feasible option for surface water drainage. Furthermore, the proposed development occupies the majority of the site and as such it will not be possible to meet the requirement of Building Regulations Part H, which states that infiltration drainage devices should not be built within 5m of a building or road.

Water Body

The nearest watercourses to the site are the River Mersey which lies circa 764km to the south and Red Lion Brook which lies circa 920km to the north. Discharge of surface water from the site to watercourses is therefore not feasible due to the distance from the site.

Surface Water Sewer

There are surface water public sewers located in The Avenue and The Boulevard. Any connection to the public sewer network would be subject to a formal agreement with the sewerage provider under Section 106 of the Water Industry Act 1991.

Combined Sewer

There are no combined water public sewers near to the site.

Summary

The surface water discharge options are summarised below in Table 4.

Surface Water Disposal Method	Potential	Description
Infiltration	X	Made ground is present due to historic use and site layout does not allow for infiltration.
Water Body	X	There are no waterbodies within the vicinity of the site.
Surface Water Sewer	✓	There is a public surface water sewers adjacent to the site
Combined Water Sewer	X	There are no combined public sewers within the vicinity of the site. This connection would be the least sustainable and there is an alternative higher in the NPPF Drainage Hierarchy.

Table 4: Summary of Surface Water Disposal

5.3 Existing Site/Pre-development Runoff

The site is considered as greenfield and as such greenfield run-off rates have been calculated for the site using Microdrainage software. The greenfield run-off rate has been calculated to be 3.4l/s. In order to avoid throttle sizes becoming too small and thus creating a risk of blockages, a greenfield run-off flow rate of 5l/s will be applied.

5.4 Proposed Surface Water Drainage Design

It is proposed to discharge surface water to the existing 675mm diameter public surface water sewer in The Boulevard at a rate restricted to 5l/s.

Based on the nature of the development, a lifespan in excess of 60 years is anticipated. The potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, the design has considered an allowance of 40% climate change on peak rainfall intensity for all calculations.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Table 5: (Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments

The drainage strategy is to collect surface water from the roof and external areas and direct it to a new below ground drainage network prior to it being discharged to the existing 675mm diameter public surface water sewer in The Boulevard. The discharge rate will be restricted to 5l/s by the use of a vortex flow control device and attenuation will be provided by the use of a geocellular attenuation tank to be located below the car park. Raingardens are also proposed to provide additional attenuation. The run-off from the car park will pass through a Class 1 Bypass Separator to remove pollutants prior to discharge to the surface water sewer. The surface water drainage proposals are shown on the Drainage Strategy drawing in Appendix E. Hydraulic calculations for the proposed surface water drainage network are included in Appendix F.

United Utilities have confirmed their acceptance in principle that surface water may discharge into this sewer at a rate restricted to 5l/s, subject to agreement with the LLFA, if discharge to ground via infiltration or to a waterbody are discounted. A copy of their correspondence can be found in Appendix G.

The SuDS Manual describes the four pillars of SuDS design as Water Quality, Water Quantity, Amenity and Biodiversity as illustrated in Figure 6 below.

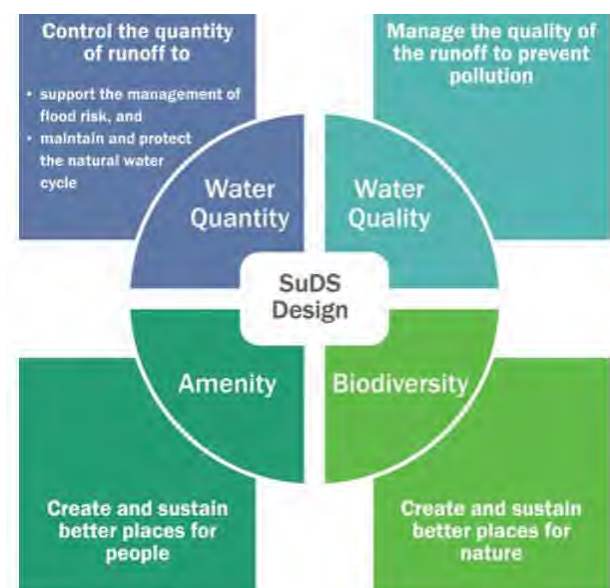


Figure 6: Sustainable Development Objectives (Representation of Figure 2.1 of The SuDS Manual)

Various SuDS methods have been summarised in the table below to assess and establish which are most feasible for the proposed post development site.

SuDS Method	Feasibility, Given Site and Project
Green & Blue Roofs	The typical pitched roof used in residential development is not a desirable foundation for green and blue roofs. Green and Blue roofs do however provide other environmental and cost benefits (reductions in insulation and heating costs) and should still be considered where practicable
Basins and Ponds – Above Ground storage	Basins and ponds increase biodiversity and amenity of the area; provide attenuation; and improve water quality. This method does however occupy large areas of developable land and requires suitable offsets from buildings. Due to the urban location of the site, basins and ponds are not a feasible option.
Rain Gardens & Tree Pits	Raingardens are currently proposed within the site which can potentially provide additional surface water storage for surface water runoff.
Filter Strips and Swales	Filter strips and swales can be used adjacent highways to reduce and treat runoff. Due to the urban nature of the site swales and filter strips are not proposed in this instance.
Store water for later use	Rainwater harvesting is not a viable option due to the rainfall yield on the roof area being significantly less than the water demand for the residential units. However, water butts may be used for communal use.
Infiltration Devices	Due to the depth of made ground encountered on the site and the proposed site layout, infiltration is not a feasible option for surface water drainage.
Permeable surfaces	Permeable surfaces, often used in car parking areas, allow rainwater to infiltrate through the surface into an underlying storage layer. The car park on the Didsbury Point site is 2 tiered with parking at ground level and first floor level and is therefore not suitable for permeable paving.
Vortex Control and Tanked Attenuation systems	Vortex flow control devices are to be used to restrict the surface water flow from the site to proposed runoff rates. Tanked attenuation systems provide high storage capacity and can be incorporated under car parking and landscaping areas.

Table 6: SuDS Suitability Assessment

6. Proposed Foul Water Drainage

The proposal for the discharge of foul water from the site is to provide a new below ground foul water drainage network which will convey foul flows to the existing 150mm diameter foul water public sewer in The Boulevard.

United Utilities have confirmed that in principle, they will accept the discharge of foul water from the site into the sewer in The Boulevard at an unrestricted rate.

Any connection to the public sewer is subject to formal agreement with United Utilities under Section 106 of the Water Industry Act 1991.

The foul drainage proposals are shown on the Drainage Strategy drawing in Appendix F.

7. Conclusions

The proposed development site is currently undeveloped and is classed as greenfield. As such greenfield run-off rates for surface water discharge will apply.

The development is located within Flood Zone 1, which is characterised by low probability of a flood occurring. Residential developments, such as this one, are classified as 'more vulnerable' by the NPPF, however as it is within Flood Zone 1 the development is deemed appropriate and neither the sequential nor the exception test is required.

From evidence collated, the flood risk proposed to the development has been summarised as low.

The site lies in a Critical Drainage Area as identified by the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA.

United Utilities asset records show existing foul and surface water sewers in the vicinity of the site.

Surface water from the site will discharge into the existing surface water sewer network at a rate restricted to 5L/s. This has been agreed in principle with United Utilities. Flows will be conveyed across site in a traditional piped system to an underground geocellular storage system before being discharged into the public surface water sewer in The Boulevard. Rain gardens will provide some additional storage. A vortex flow control will be used to restrict the flow. A Class 1 bypass separator will be provided to treat the surface water from the car park prior to discharge to the public sewer.

Foul drainage from the site is proposed to discharge into the existing public foul sewer in The Avenue, adjacent to the site at an unrestricted rate as agreed in principle with United Utilities.

Both the foul and surface water connections will be subject to formal agreement with United Utilities under S106 of the Water Industry Act 1991.

Manchester

Carver's Warehouse
77 Dale Street
Manchester M1 2HG
+44 (0)161 228 6757

London

Reeds Wharf
33 Mill Street
London SE1 2AX
+44 (0)20 7253 2977

Leeds

Unit 02/01 Tower Works
Globe Road
Leeds LS11 5QG
+44 (0)113 2025 130

Glasgow

Gresham Chambers
45 West Nile Street
Glasgow G1 2PT
+44 (0)141 370 1829

Appendix A – Proposed Site Plan



Note:
Do Not Scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

Planning Application Boundary

Existing Trees

Existing Trees to be removed

Proposed Trees

P7	13/12/21	AP	Stage 3 Issue
P6	04/11/21	JL	Updated spot coordinates
P5	01/11/21	MR	Spot Coordinates to building corners
P4	06/10/21	JL	Revised Red line boundary
P3	17/09/21	JL	GA issue to Engie for preliminary PCSA review. Reduction in massing & apartments. MHCC at level 01 removed.
P2	16/03/21	AP	Ground Floor Plant/Amenity spaces updated. MHCC Bin and Bike Stores indicated.
P1	15/02/21	AP	Rev to PCT & Parking
Rev	Date	Ints	Details

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Project Title Didsbury Point
Client Southway Housing
Location West Didsbury, Manchester

Drawing ref Proposed Site Plan

Date 13/12/2021 18:12:39 Scale As indicated
Checker Checker Orig Paper Size A1

Job No: 8845 Status PRELIMINARY

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8845-BA-Z1-GF-DR-A- (04)001- P7

Appendix B – Existing Site Drainage Plan and CCTV Survey



**Extract from
Map of Public Sewers**

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available.

The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

United Utilities Water Limited 2014
The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown and United Utilities copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

LEGEND

Water Course	--->---	Abandoned	---
Overflow Pipe	--->---	Public Sewer	--->---
Sludge Main	--->---	Private Sewer	--->---
Highway Drain	--->---	Section 104	--->---
		Rising Main	--->---
Combined	--->---	Foul	--->---
Surface Water	--->---	Abandoned	---

DIDSBURY POINT

Printed By : Property Searches Date: 18/03/2016

DO NOT SCALE

Approximate Scale: 1:1250

United Utilities
helping life flow smoothly



LAYER SURVEYS LTD

SEE THE COMPLETE PICTURE

LAYER SURVEYS
MEADOWCROFT BUSINESS PARK
PRESTON PR4 4BA
Tel: 01772611634
Fax: 01772611634
Email: darren@layersurveys.co.uk

Project-information

Project name :
ONE DIDSBURY POINT

Project Number :

Contact :

Date :
01-Feb-21

Client: **CIVIC ENGINEERS LTD**
Contact Name: **RACHAEL McCLENAN**
Department: **N/A**
Road: **77 DALE STREET**
Town: **MANCHESTER**
County: **GTR MANCHESTER**
Telephone: **07751 932464**
Fax: **07751 932464**
Mobile: **07751 932464**
E-mail: **rachael@civicengineers.com**

Site: **ONE DIDSBURY POINT**
Contact Name: **RACHAEL McCLENAN**
Department: **N/A**
Road: **THE AVENUE**
Town: **DIDSBURY**
County: **GTR MANCHESTER**
Telephone: **0161 2286757**
Fax: **0161 2286757**
Mobile: **07921 299371**
E-mail: **rachael@civicengineers.com**

Contractor **LAYER SURVEYS**
Contact Name: **DARREN WEBSTER**
Department: **DIRECTOR**
Road: **MEADOWCROFT BUSINESS PARK**
Town: **PRESTON PR4 4BA**
County: **LANCASHIRE**
Telephone: **01772611634**
Fax: **01772611634**
Mobile: **07341953636**
E-mail: **darren@layersurveys.co.uk**



Inspection report

Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 1	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5602 (U/S) 5502	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	5502 5602 2.48
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 22.14 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 450 mm Concrete 		

Comment :

1:180 Position

Observation

Depth: 2.48

5602

0.00

Water level, 5% of the vertical dimension

5.32

Junction, at 12 o'clock, diameter 150mm

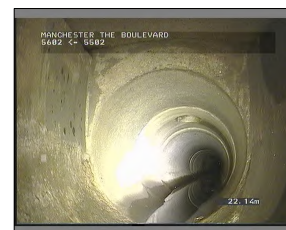
22.14

Finish node type, manhole reference number: 5502

5502



5.32 m



22.14 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 1	PLR Suffix : X
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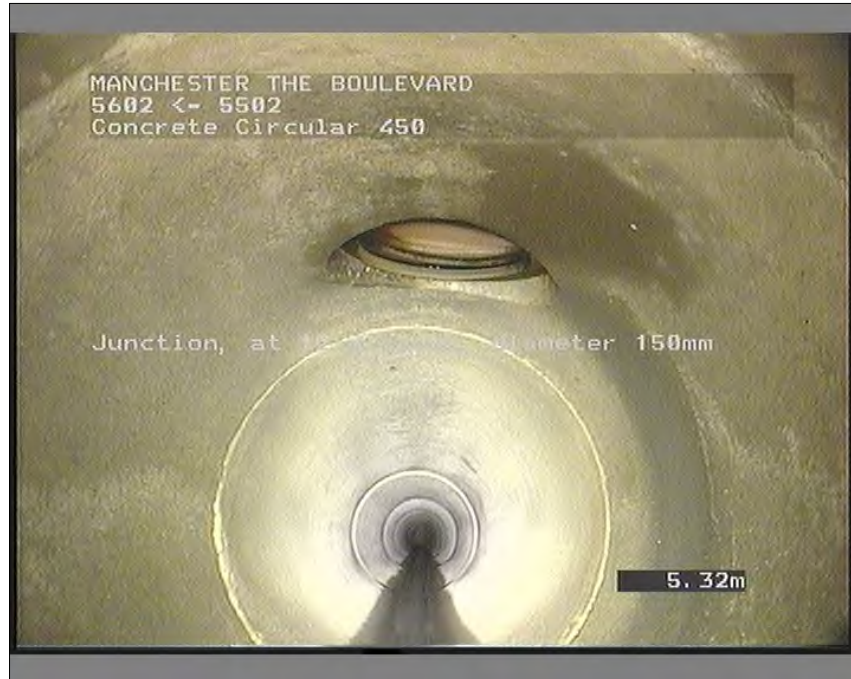


Photo: 1_1_3_A.JPG
 5.32m, Junction, at 12 o'clock, diameter 150mm



Photo: 1_1_4_A.JPG
 22.14m, Finish node type, manhole reference number: 5502



Inspection report

Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 2	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

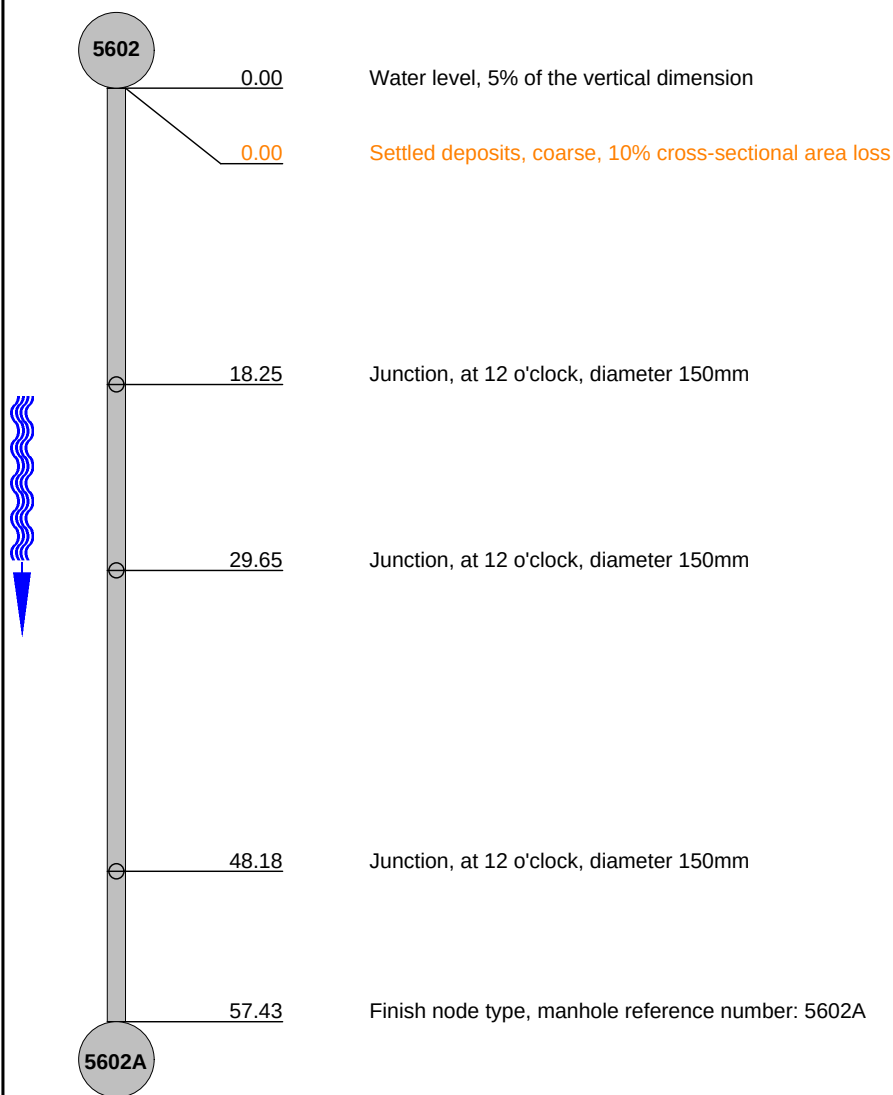
Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5602 (D/S) 5602A	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	5602 2.48 5602A
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 57.43 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 625 mm Concrete 		

Comment :

1:465 Position

Depth: 2.48

Observation



0 m



18.25 m



29.65 m



48.18 m



57.43 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	0.03	2	3



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 2	PLR Suffix : X
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Photo: 3_3_6_A.JPG

0m, Settled deposits, coarse, 10% cross-sectional area loss

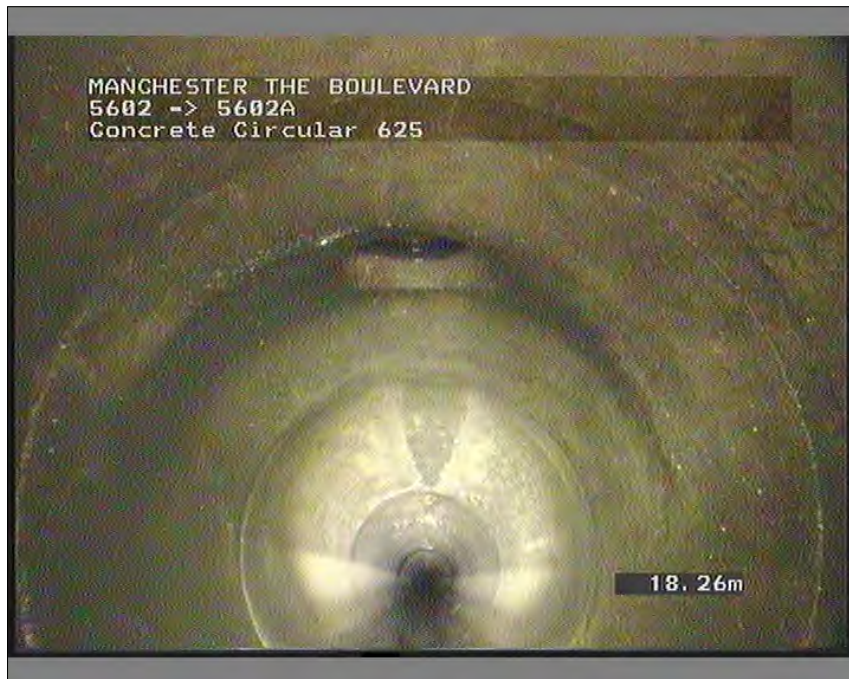


Photo: 3_3_7_A.JPG

18.25m, Junction, at 12 o'clock, diameter 150mm



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 2	PLR Suffix : X
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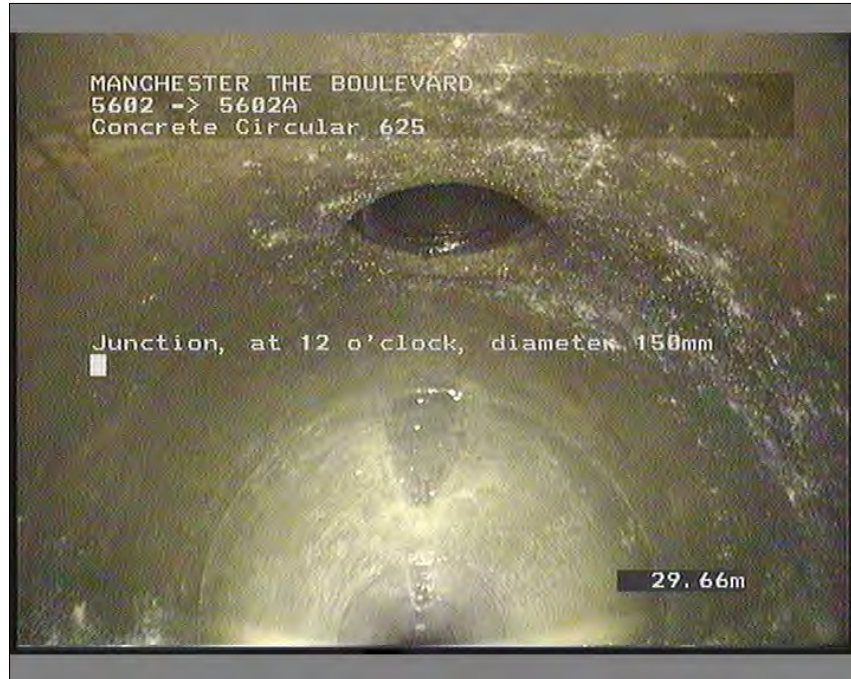


Photo: 3_3_8_A.JPG
 29.65m, Junction, at 12 o'clock, diameter 150mm



Photo: 3_3_9_A.JPG
 48.18m, Junction, at 12 o'clock, diameter 150mm



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 2	PLR Suffix : X
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Photo: 3_3_10_A.JPG

57.43m, Finish node type, manhole reference number: 5602A



Inspection report

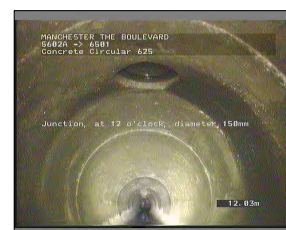
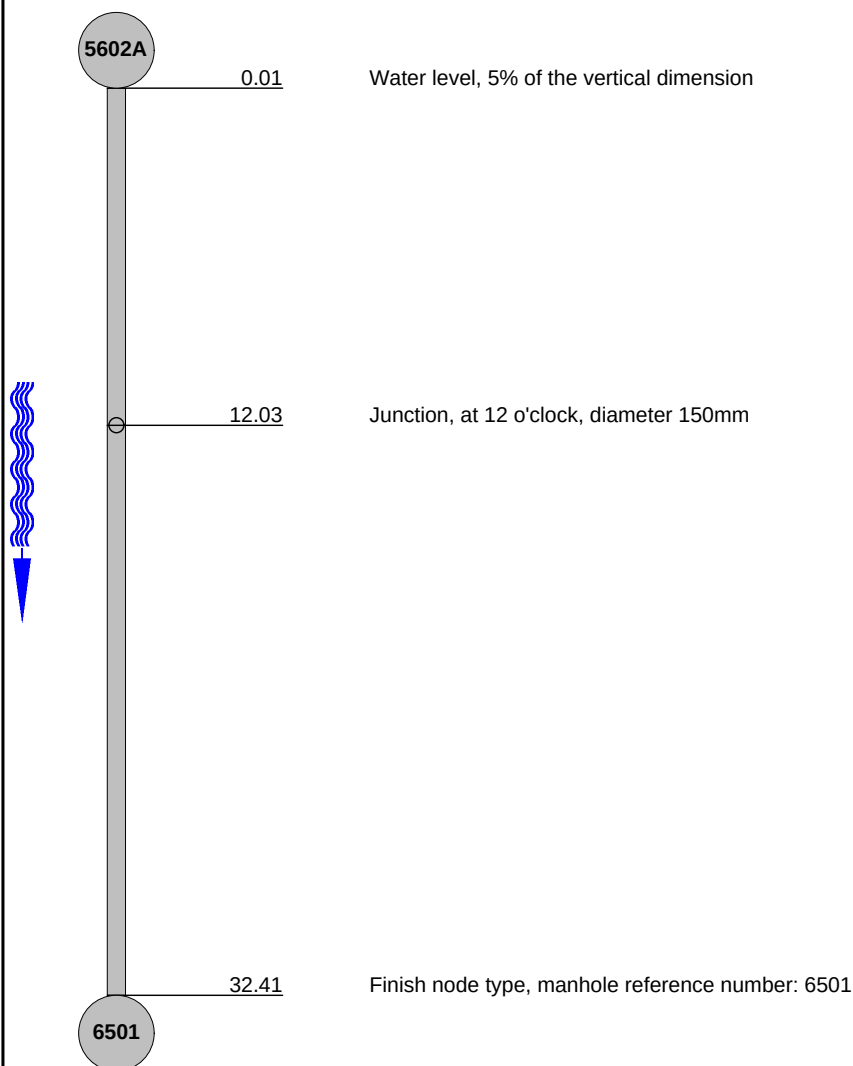
Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 3	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5602A (D/S) 6501	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	5602A 6501
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 32.41 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 625 mm Concrete 		

Comment :

1:270 Position

Observation



12.03 m



32.41 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 3	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------

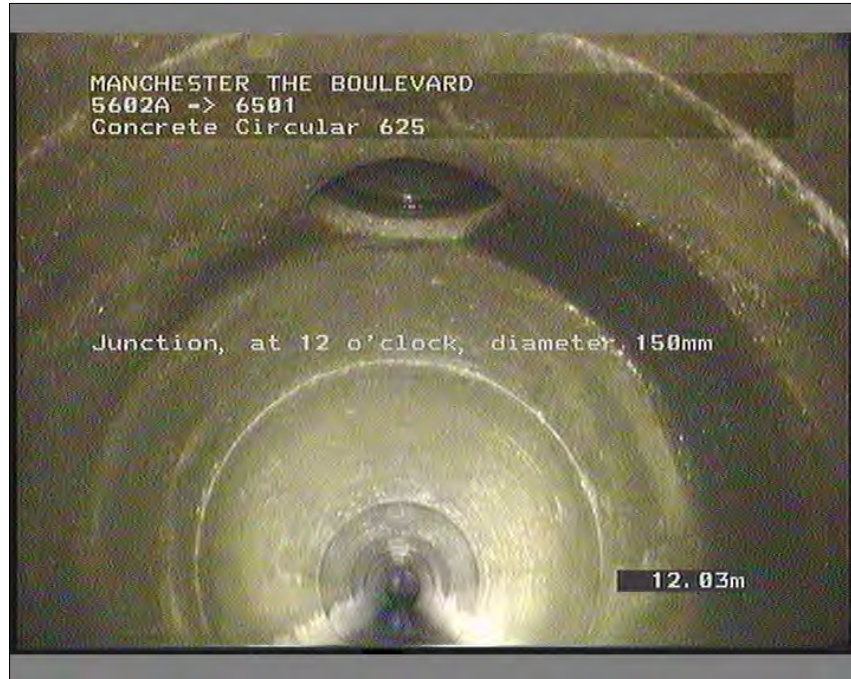


Photo: 4_4_12_A.JPG
 12.03m, Junction, at 12 o'clock, diameter 150mm



Photo: 4_4_13_A.JPG
 32.41m, Finish node type, manhole reference number: 6501



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LAYER SURVEYS
MEADOWCROFT BUSINESS PARK
Street : PRESTON PR4 4BA
Tel: 01772611634
Fax: 01772611634
Email: darren@layersurveys.co.uk

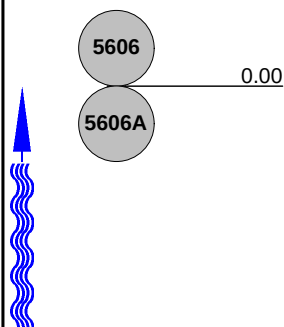
Inspection report

Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 4	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5606 (U/S) 5606A	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	5606A 5606
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 0.00 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 150 mm Vitrified clay		

Comment :

1:50 **Position** **Observation**



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade



Inspection report

Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 5	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

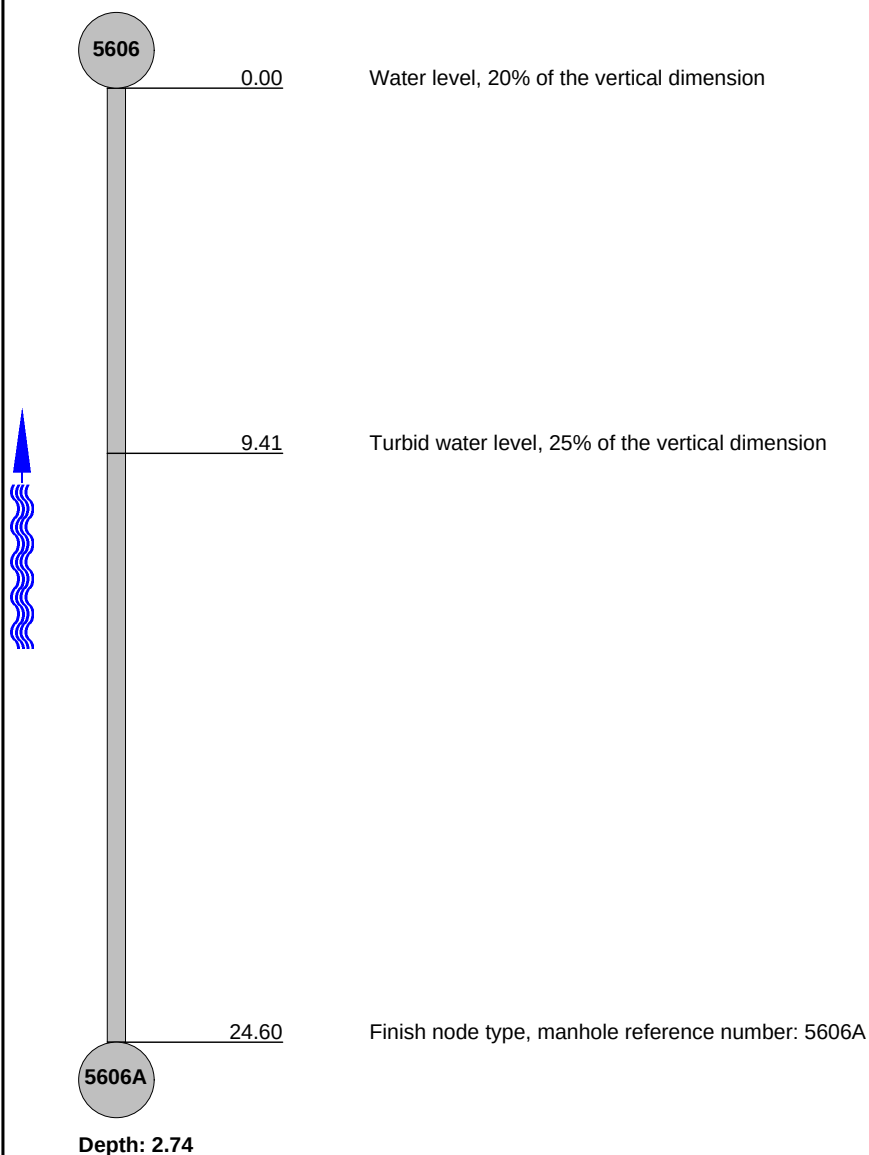
Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5606 (U/S) 5606A	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	5606A 2.74 5606 2.43
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 24.60 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 150 mm Vitrified clay 		

Comment :

1:195 Position

Depth: 2.43

Observation



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 5	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------

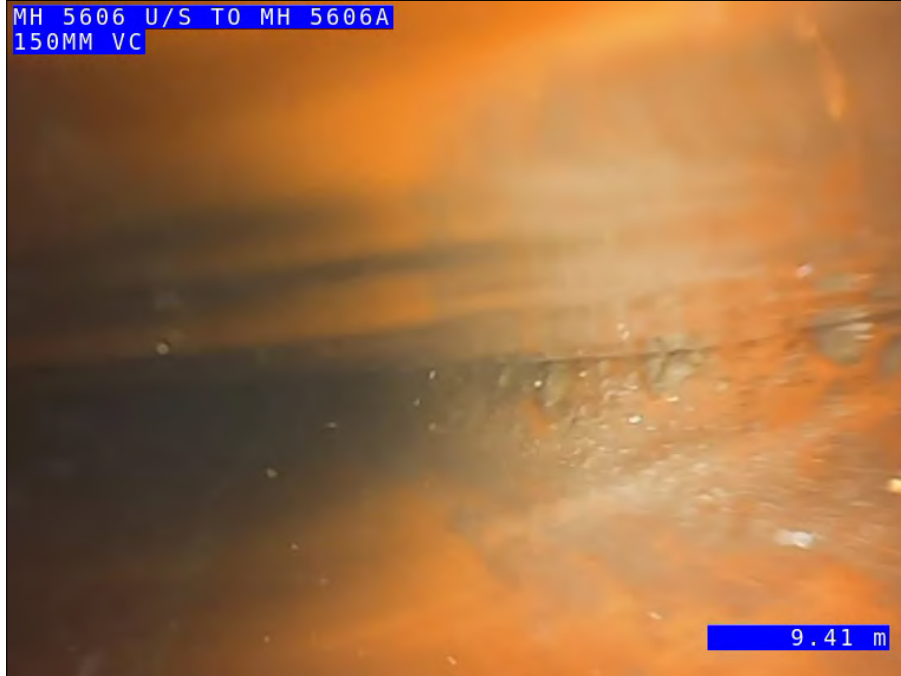


Photo: 6_6_16_A.jpg
 9.41m, Turbid water level, 25% of the vertical dimension



Photo: 6_6_17_A.jpg
 24.6m, Finish node type, manhole reference number: 5606A



Inspection report

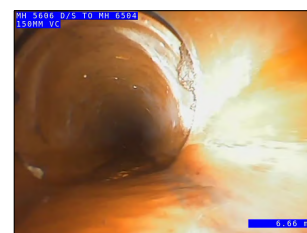
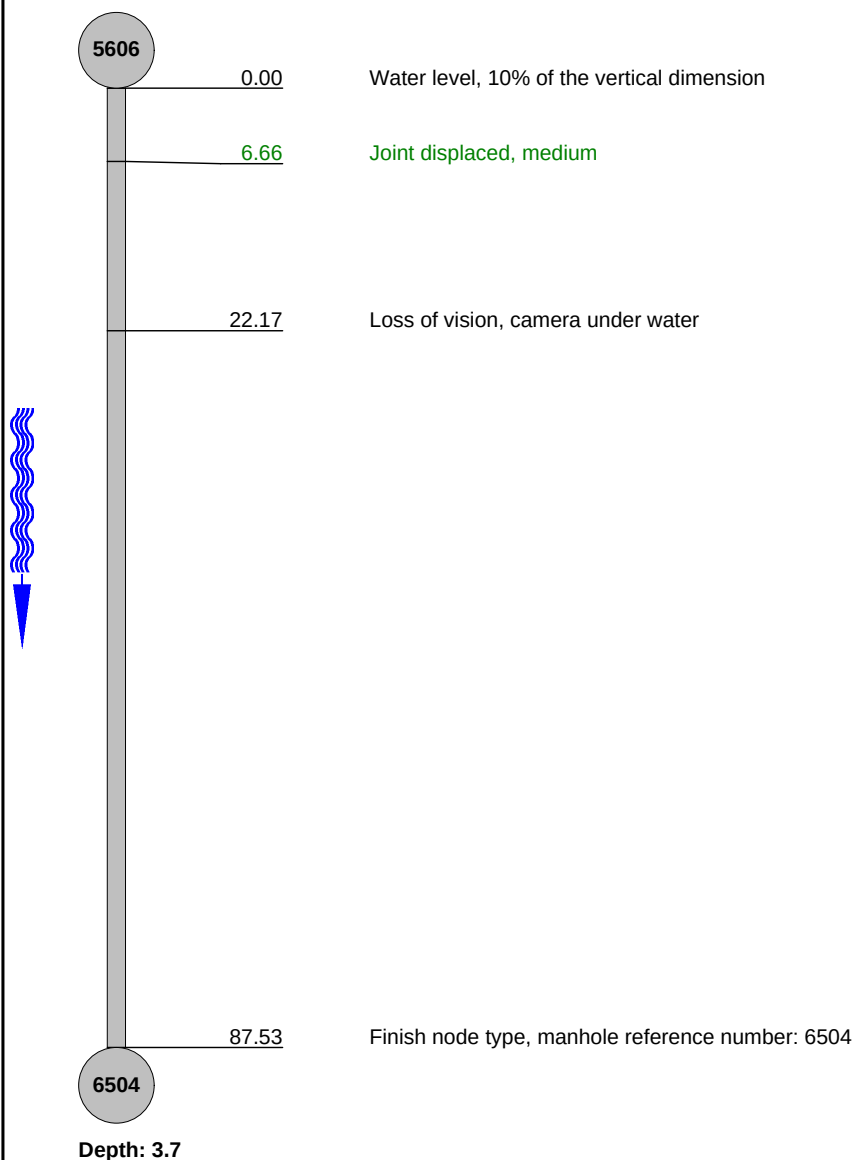
Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 6	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5606 (D/S) 6504	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	5606 2.43 6504 3.7
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 87.53 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 150 mm Vitrified clay 		

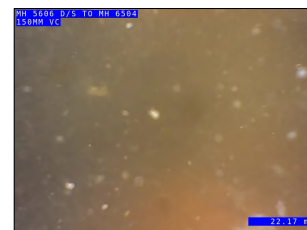
Comment :

1:690 Position
Depth: 2.43

Observation



6.66 m



22.17 m



87.53 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	1	0.01	1	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 6	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------

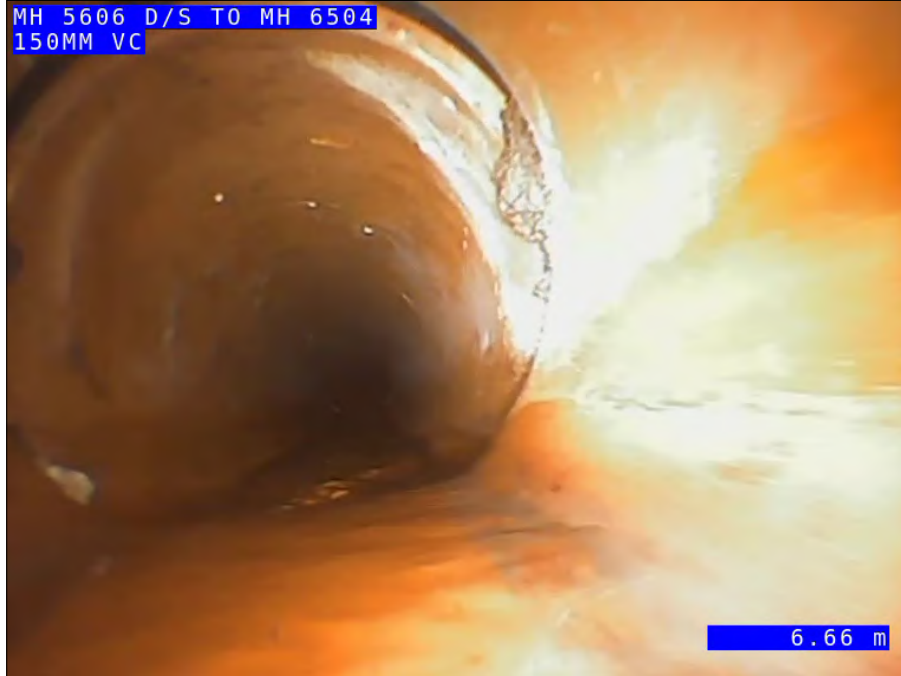


Photo: 7_7_19_A.jpg
 6.66m, Joint displaced, medium

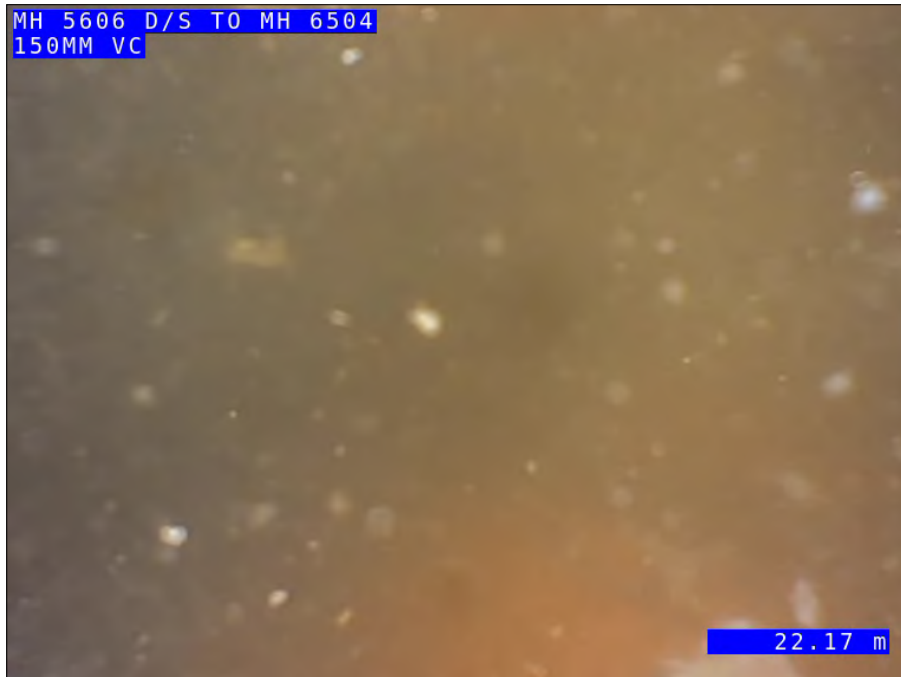


Photo: 7_7_20_A.jpg
 22.17m, Loss of vision, camera under water



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 6	PLR Suffix : X
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Photo: 7_7_21_A.jpg

87.53m, Finish node type, manhole reference number: 6504



Inspection report

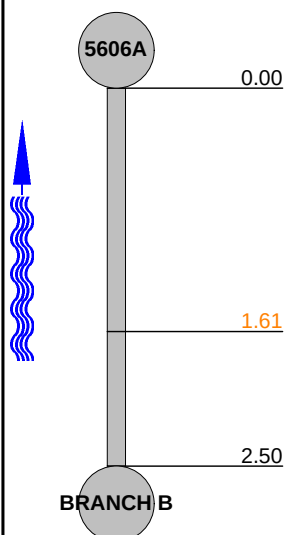
Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 7	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5606A (U/S) BRANCH B	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	BRANCH B 5606A 2.74
Use: Year laid : Purpose : Total length :	Foul Sample survey to determine asset condition 2.50 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 150 mm Vitrified clay		

Comment :

1:50 Position
Depth: 2.74

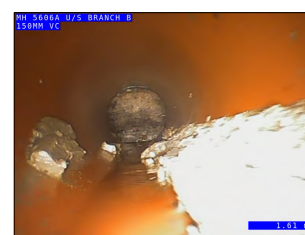
Observation



Water level, 5% of the vertical dimension

Attached deposits, other, from 3 to 5 o'clock, 10% cross-sectional area loss

Finish node type, other special chamber reference number: BRANCH B



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	1	2	0.8	2	3



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 7	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------



Photo: 8_8_24_A.jpg

1.61m, Attached deposits, other, from 3 to 5 o'clock, 10% cross-sectional area loss



Photo: 8_8_25_A.jpg

2.5m, Finish node type, other special chamber reference number: BRANCH B



Inspection report

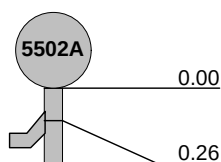
Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 8	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5502A (U/S) BRANCH B	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	BRANCH B 5502A 2.24
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 6.01 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 225 mm Vitrified clay 		

Comment :

1:60 **Position**
Depth: 2.24

Observation



Water level, 0% of the vertical dimension

Junction, at 2 o'clock, diameter 225mm

Finish node type, other special chamber reference number: BRANCH B



0.26 m



6.01 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 8	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------

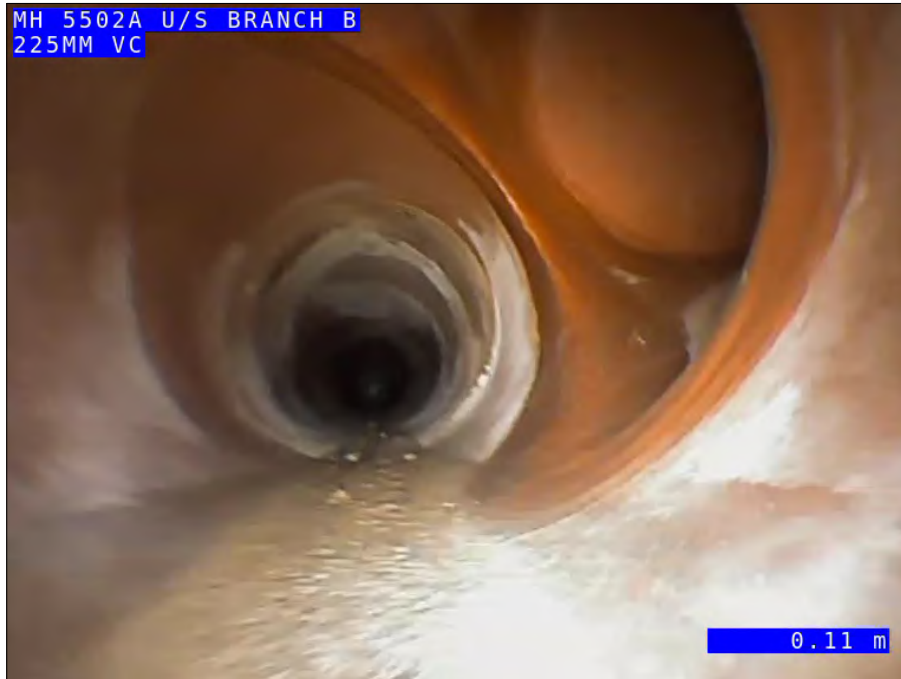


Photo: 9_9_27_A.jpg
 0.26m, Junction, at 2 o'clock, diameter 225mm



Photo: 9_9_28_A.jpg
 6.01m, Finish node type, other special chamber reference number: BRANCH B



Inspection report

Date : 01-Feb-21	Job number :	Section Type :	Operator : LEE MORTON	Section number : 9	PLR SUFFIX: X
Weather no rain or snow	Vehicle : AE 19 KCU	Camera : camera 2	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	MANCHESTER THE BOULEVARD Road 5602A (U/S) BRANCH B	Location details: Catchment: Pipe Shape : Pipe Length	 Circular 	U/S MH : U/S Depth : D/S MH : D/S Depth :	BRANCH B 5602A 3.02
Use: Year laid : Purpose : Total length :	Surface water Sample survey to determine asset condition 9.46 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 300 mm Vitrified clay		

Comment :

1:75 Position
Depth: 3.02

Observation

5602A

0.00

Water level, 20% of the vertical dimension

2.89

Loss of vision, camera under water

9.46

BRANCH B

Finish node type, other special chamber reference number: BRANCH B



0 m



2.89 m



9.46 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1



Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 9	PLR Suffix : X
------------------------------	--------------------------------	----------------------------	------------------------------	--------------------------

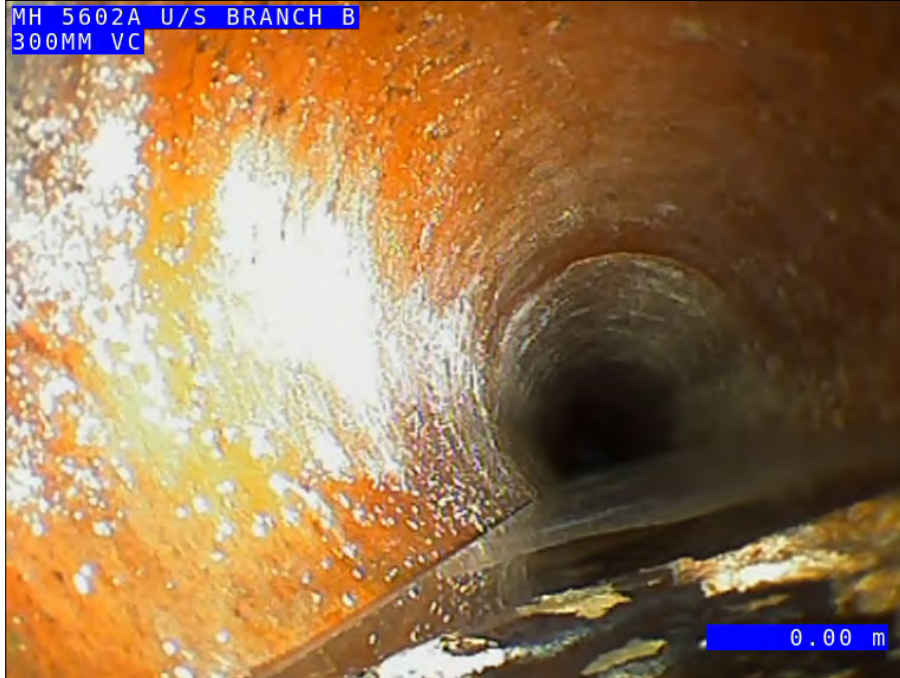


Photo: 10_10_29_A.jpg
 0m, Water level, 20% of the vertical dimension

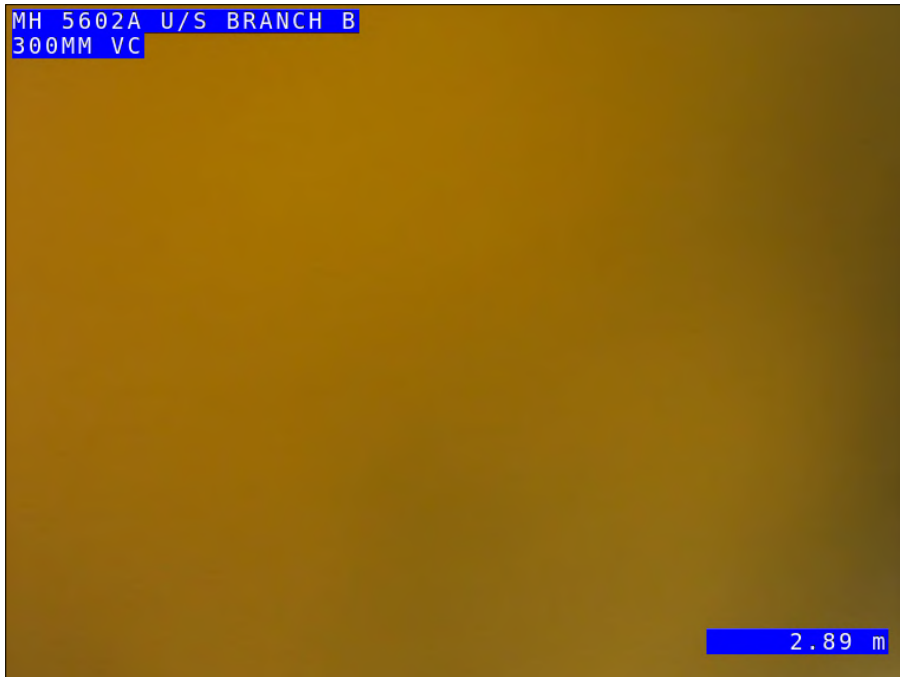


Photo: 10_10_30_A.jpg
 2.89m, Loss of vision, camera under water



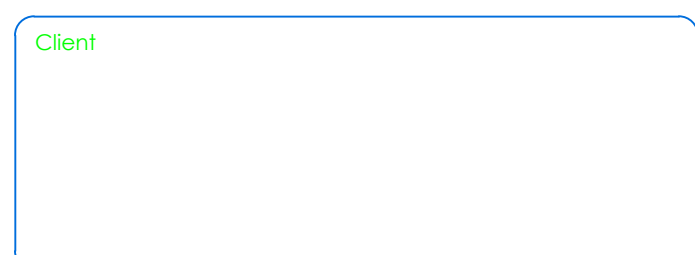
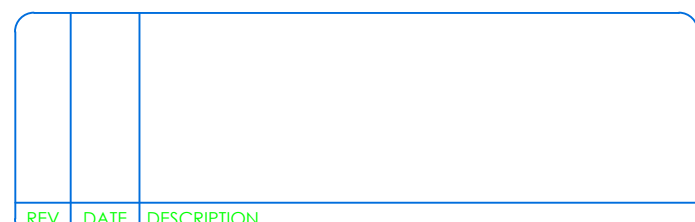
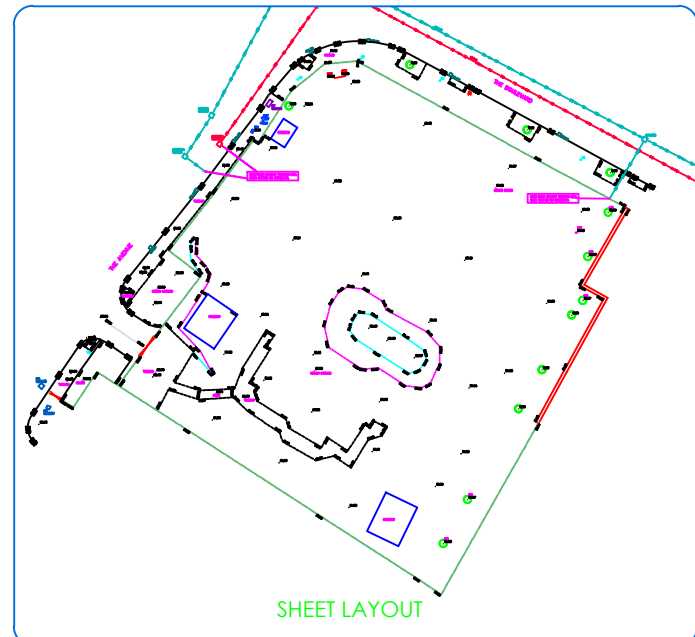
Inspection pictures

Place : MANCHESTER	Road : THE BOULEVARD	Date : 01-Feb-21	Section number : 9	PLR Suffix : X
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Photo: 10_10_31_A.jpg

9.46m, Finish node type, other special chamber reference number: BRANCH B



Surveyed R.B		Drawn M.B		Checked D.W		
Scale 1:	Date Jul 20	Drawing Ref. Lay 510		No. 01	Size A0	Rev 01

Appendix C – Topographical Survey



Topographical Survey Legend			
Symbol	Description	Symbol	Description
...	...	...	...

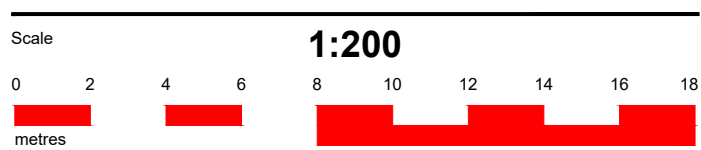
Survey Station Coordinates			
Stn	Easting	Northing	Level
RP01	383521.86	392916.88	31.36
RP02	383515.09	392969.59	31.79
RP03	383512.10	392960.41	32.26
RP04	383570.09	392989.77	31.36
RP0A	383540.69	392941.41	31.71
RP0A	383585.69	392981.72	31.47
JL01	383553.42	392940.92	31.82
JL02	383568.41	392960.15	31.70

Please note:
Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 connected orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.

1 Three added to eastern boundary.
Rev No: Details
Date: 29/11/20
www.surveysystems.co.uk

Levels are related to OSGB15
Value: n/a

Coordinates are related to National Grid (GPS)



The accuracy of this survey is commensurate with the drawing scale specified within the title block. Copyright in this drawing remains with Survey Systems Ltd. Do not scale from this drawing, work to figured dimensions. Check all dimensions on-site. In the event of any discrepancy, please refer queries to Survey Systems Ltd.

Client: Bullness

Title:

**Topographical Survey
Didsbury Point
Land at Clearwater Drive
Manchester M20 2ED**

Surveyed: RP-01
Date: August 2019
Drawn: AG-RP
Sheet: 1
Drawing No: SSL:19581:200:1:1:Rev1



Appendix D – Ground Investigation Survey



GROUNDTECH
CONSULTING

Job title: Didsbury Point

Report type: Geo-Environmental Appraisal

Prepared for: Southway Housing

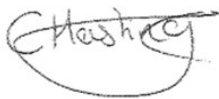
Date: May 2021



Document Control Form

PROJECT	DIDSBURY POINT
REPORT NAME	GEO-ENVIRONMENTAL APPRAISAL
REPORT REFERENCE	GRO-20064-2216
STATUS	FINAL
ISSUE DATE	10 MAY 2021
REVISION	
CLIENT	SOUTHWAY HOUSING
CLIENT CONTACT	-

For and Behalf of Groundtech Consulting

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REVIEWED	James Doyle BSc (Hons) CGeol FGS



SUMMARY

Site Details

Site Location

The site is located circa 3.54 miles south of Manchester City Centre and is approximately centred on National Grid Reference 383534, 392594. Access to the site is gained off The Boulevard to the north west.

Site Area

The site is roughly square and circa 0.27 hectares in area, the site is generally topographically level. The site is mainly occupied with vegetation, part of the southern area is covered with degraded tarmac. There are two buildings on site, one is associated with an electricity substation and the other is owned by the local council and used for the storage of gardening and landscaping equipment.

Ground Model

Made Ground Soils

Made Ground comprising clayey gravelly topsoil was encountered across the site to a maximum depth of 0.2m bgl. This was underlain by varying gravel and sand that included brick and concrete fragments throughout to depths of 3.5m bgl. Former foundations and redundant utilities were encountered within TPO4 to depth of between 0.8m and 1.5m bgl.

Natural Soils

Natural deposits generally comprised firm to stiff Clay containing sand and gravel bands. This was encountered from 1.2m to a maximum depth of 19.5m bgl.

Bedrock

Bedrock was encountered between 23.0m and 24.4m bgl and consisted of Sandstone.

Groundwater

Groundwater was encountered across the site between 1.9m and 2.2m bgl.

Ground Engineering Assessment

Foundations

The most suitable solution for the proposed nine-storey development is considered to be pile foundations transferring loads through the underlying Made Ground and natural strata to the very weak Sandstone which has been encountered at depth of 23.0m and 24.4m bgl.

Highways

CBR values of between 3.9% and >39.9% have been achieved across the site at a depth of 0.35m bgl.

SuDS

The use of SuDS drainage within the natural ground is not considered to be a feasible as poor drainage rates have been calculated.

Constraints

The main constraint at the site is the presence of the former foundations and utilities located within TPO4 to depths of up to 1.5m bgl. In addition, surface water was observed within the central area of the site, potentially associated with a former pond.

GQRA and Revised (PL) Assessment

Human Health

Elevated concentrations of speciated Polycyclic Aromatic Hydrocarbons (PAHs) have been recorded in BH2 and BH4 within granular Made Ground soils. No other elevated CoC were recorded, and no asbestos was detected. The risk to human health is considered to be Moderate. A cover system should be placed in soft landscaping areas to reduce the risk to an acceptable level.



Controlled Waters

Significant mobile contamination was not encountered and the risk to controlled waters is considered to be Low.

Permanent Ground Gas

Preliminary gas monitoring results place the site in CS1 and gas protection measures are not likely to be required. The risk is Low at present and will be confirmed upon the completion of the monitoring. The site is not in an area requiring radon measures.

Final Appraisal

The following further work is considered necessary to progress the site to construction phase:

- *Completion of gas monitoring programme.*
 - *Issue gas assessment.*
 - *Design of remedial specification.*
 - *Tree survey by qualified arboriculturist.*
 - *Detailed foundation design.*
 - *Confirmation of remedial recommendations made with the Local Authority.*
-

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<i>Plan Reference</i>	<i>Revision</i>	<i>Title</i>
<i>GRO-20064-P01</i>	-	<i>Project Location Plan</i>
<i>GRO-20064-P02</i>	-	<i>Exploratory Hole Location Plan</i>
<i>GRO-20064-P03</i>	-	<i>Illustrative Revised CSM</i>



1.0 INTRODUCTION

1.1 Project Objectives

Groundtech Consulting Limited have been instructed by Civic Engineers to undertake a Ground Investigation for a site at Didsbury Point.

A main investigation was undertaken in accordance with BS 5930:2015, BS 10175:2017, BS 8576:2013 and Eurocode 7.

1.2 Proposed Development

The proposed development is residential end use comprising a multi storey residential building up to nine storeys in height with associated hardsurfacing and soft landscaping on the ground level.

The proposed development plan is currently unavailable.

1.3 Limitations

The assessment has been prepared for the exclusive use of the client. No third parties may rely on or reproduce the contents of the report without the written permission of Groundtech Consulting Limited. If any unauthorised third party comes into possession of the report, they rely on it at their own risk and Groundtech Consulting Limited will not be obliged to provide a duty of care.

2.0 SITE SETTING

2.1 Location

The site is located circa 3.5 miles south of Manchester City Centre, as shown on the Project Location Plan *GRO-20064-P01* and is approximately centred on National Grid Reference 383534, 392594.



Access to the site is gained off The Boulevard to the north west.

2.2 Site Description

The site is roughly square in shape and circa 0.27 hectares in area. The topography is generally level, however there is a large, stockpiled mound in the middle of the site which has remnants of concrete and rebar throughout, this is assumed to be associated with the former hospital on site that was demolished.

The site is predominantly occupied by waste land which is overgrown with long grass and was waterlogged in the central part where a possible former pond was located. Tall grass and moss plants are present in the waterlogged area.

There are two buildings on site, the first is a white metal storage unit located in the south western area and owned by the local council. It is used for the storage of gardening and landscaping tools and equipment. The second structure is an electricity substation which is located in the northern section and consists of a small, rectangular breeze block building.

The south western part of the site is covered with degraded tarmac surfacing with the remnants of tarmac surfaced pathways present.

Vegetation at the site consists of mature and semi-mature trees along the northern and eastern boundaries of the site. Shrubs and long grass are situated throughout the site in the north eastern part and some areas of less dense immature trees are located along the eastern boundary.



Boundary Features and Surrounding Areas

The site boundary is formed by a mixture of wooden fencing and brick walls.

The site is surrounded by following features/land uses:

- *North* - *Commercial and residential land use.*
- *East* - *Residential land use.*
- *South* - *Car parking associated with a school followed by residential land use.*
- *West* - *Didsbury High School.*

Site photographs are presented in *Appendix 2*.

3.0 SUMMARY OF PREVIOUS INVESTIGATION

A Geo-environmental Appraisal Report was carried out by Clancy Consulting in April of 2016 ref. 20/0867/001. The report covered the site and pertained to the development of a commercial two storey office building with associated car parking and soft landscaping.

Site Conditions

The site comprised an area of approximately 0.35ha and was occupied by undeveloped open land with the remains of buried floor slabs being exposed in various locations. The site was occupied by an area of rough ground/undeveloped land however signs of previous development are evident in certain areas of the site. A small electricity substation and water tap are present in the north east of the site.

The site was surrounded by a mixture of residential properties, apartment blocks and commercial properties.

Historical Site Use

The site was located in an area of open undeveloped land until 1922/23 where the hospital located adjacent had expanded onto the eastern side of the site, this was then demolished in 1934. Withington Hospital was developed in the 1970s and occupied most of the east and west areas of the site. This was finally demolished in 2006 where the site remained as undeveloped land.

Geology

Geological maps indicate that the superficial deposits beneath the site comprise Glaciofluvial Sheet Deposits (clay or sand and gravel) with solid strata comprising Sherwood Sandstone Formation. Boreholes located on site indicate cohesive strata with bands of Sand to depths of around 23m where Sandstone bedrock was recorded.

Hydrogeology

According to the Environmental Agency Groundwater Vulnerability Map (Sheet 17 Manchester) the Sandstone bedrock is classified as a Principal Aquifer, and the overlying superficial deposits are a Secondary A Aquifer.

Scope of Works

The following scope of works was carried out by Clancy Consulting.

- 9 No. Windowless Sample Boreholes (WS1 to WS7A) were advanced to depths of between 0.15m and 4.0m bgl.

Ground Model

Made Ground was encountered across the site within all locations to a maximum depth of 4.0m bgl. None of these boreholes succeeded in reaching natural strata. Made Ground was generally granular in nature consisting of slightly silty gravelly fine to coarse sand and gravel of brick, sandstone, concrete with wood fragments, metal, plastic and glass. This was underlain with dark grey medium to coarse sand with occasional fine to medium subrounded gravel of quartzite and sandstone with occasional coal and brick fragments.

Foundations

A piled foundation solution was recommended with the possibility of a ground improvement or a vibro-pile solution as 4.0m of granular Made Ground had been encountered.



Contamination

Chemical testing undertaken at the site did not identify any elevated inorganic or organic contaminants when compared to SSV's for a commercial end use.

In addition, no asbestos was detected in any of the samples tested.

Ground Gas

Previous investigations undertaken by GRM Development Solutions on an adjacent site in September 2010 encountered methane concentrations up to 0.5% v/v, and carbon dioxide concentrations of up to 5.1% v/v, with maximum flow rates of 0.9l/hr. The gas concentrations would be borderline CS1 to CS2 conditions and some form of gas protection may be required.



4.0 SCOPE OF INVESTIGATION AND RATIONALE

4.1 Project Objectives

The aim of the fieldwork was to:

Determine the stratification beneath the site.
Maintain a watching brief for visual and olfactory evidence of contamination.
Obtain samples using methodology in current guidance for contamination analysis.
Identify realistic pollution linkages to groundwater.
Obtain relevant geotechnical parameters for preliminary foundation design to address both ULS and SLS conditions.
Determine the infiltration rates of the underlying soils.
Determine the modulus of subgrade reaction to inform pavement and slab design.
Trial pitting to identify obstructions, composition of surfacing and geometrics of foundations to the perimeter wall.
Determine if targeted supplementary investigation in areas of concern is required and for remedial design.
Install monitoring standpipes for gas and groundwater monitoring.
Assess the identified pollution linkages in the CSM.

4.2 Scope of Works

The following scope of works was completed between the 1st February and 9th February 2021:

- *Five cable percussive boreholes (BH01 to BH05) were advanced to depths of between 5.0m bgl and 27.5m bgl. Rotary coring was followed on for 6.0m within the two deeper cable percussive boreholes (BH01 and BH02) to depths of 33.0m and 28.0m bgl respectively.*
- *Four trial pits (TP02 to TP05) were excavated to depths of between 2.1m and 2.7m bgl.*
- *Two soil percolation tests (TP03 and IP3) were conducted at depths of 1.5m and 0.9m bgl respectively.*
- *Six plate load tests (PLT01 to PLT06) were carried out at depths of 0.35m bgl within the trial pit locations prior to deeper excavation.*
- *Two foundation pits (TP01 and TP06) were excavated to depths of between 0.16m and 0.55m bgl.*

The exploratory hole locations are presented on Groundtech Consulting Plan GRO-20064-P02 and the exploratory hole logs are in Appendix 3.

The exploratory holes were positioned to establish the stratification beneath the site, and target any areas of concern as summarised in the table below:

Location	Target Rationale
BH01 and BH02	Determine stratification of superficial and bedrock deposits beneath the site.
BH03 and BH05 TP04 and TP05	Determine stratification beneath the site.

TP01 and TP06	Determine the geometrics of foundations of existing substation and perimeter wall.
TP02	Determine build-up of tarmac surfaced area.
TP03 and IP3	Determine soil percolation rates for the site.
PLT01 to PLT06	Determine CBR values across the site.

The exploratory holes were logged by a suitably experienced geo-environmental engineer in general accordance with the following current guidance:

- BS 5930 'Code of Practice for Site Investigations' 2015.
- BS EN 14688-1:2002 'Geotechnical Investigation and Testing – Identification and classification of soil'.
- BS EN ISO 14689:2002 'Geotechnical investigation and testing – Identification and classification of rock'.

4.3 Soil Sampling

During the intrusive investigation, representative samples were taken at regular intervals, changes of strata and where evidence of contamination existed. Laboratory analysis was scheduled on the samples obtained.

The samples obtained are summarised in the table below:

Soil Sample	Number
Environmental Sample	47
Disturbed Sample	22
Bulk Sample	32
Undisturbed U100 Sample	10

The samples have been obtained in accordance with current environmental and geotechnical guidance. The sampling plan has been designed to obtain samples from all required strata using the correct methodology.

Disturbed samples of soil for geo-environmental testing were placed in the correct sampling containers as required by the laboratory in accordance with their MCERTS and UKAS Accreditation. Transportation was arranged in a timely manner and the samples were at the correct temperature.

The sample locations and depths are recorded on the exploratory logs.

4.4 Geo-Environmental Testing

To inform the Generic Quantitative Risk Assessment, the following geo-environmental testing was scheduled to assess the risk from contamination on the site. The testing is based on the potential sources identified in the Ground Investigation.

Contaminants of Concern	Matrix	Number
Arsenic, Cadmium, Chromium (total and hex), Copper, Nickel, Mercury, Lead, Zinc, Selenium, Speciated Polycyclic Aromatic Hydrocarbons, Organic Matter, Sulphate and pH.	Soil	6
Asbestos Screening	Soil	6



The Geo-Environmental Laboratory Testing Results are presented in *Appendix 4*.

Representative disturbed samples were obtained for all soil types encountered. Selected samples were scheduled for testing at an approved laboratory in accordance with BS 1377 'Method of Test for Soils for Civil Engineering Purposes' 1990. The following tests were scheduled:

British Standard	Test Method	Number
<i>Part 2</i>	<i>Water Content</i>	<i>6</i>
<i>Part 2</i>	<i>Plasticity Index Analysis</i>	<i>6</i>
<i>Part 3</i>	<i>pH Value</i>	<i>6</i>
<i>Part 3</i>	<i>Water Soluble Sulphate Content</i>	<i>6</i>
<i>Part 7</i>	<i>Quick Undrained Triaxial</i>	<i>8</i>
<i>ISRM Suggested Methods</i>	<i>Unconfined Compressive Strength</i>	<i>3</i>
<i>ISRM Suggested Methods</i>	<i>Point Load Test Results</i>	<i>10</i>

The Geotechnical Laboratory Testing Results are presented in *Appendix 5*.

4.5 Gas and Groundwater Monitoring

Gas and groundwater monitoring installations were constructed in the boreholes. The standpipes consisted of high-density polyethylene (HDPE) pipe - a bentonite seal was placed around the plain pipe and a clean gravel pack was placed around the slotted pipe. A summary of the installation construction is presented in the table below:

Location	Depth (m)	Response Zone (m bgl)	Targeted Strata	Reason
<i>BH01</i>	<i>12.00</i>	<i>4.00 – 12.00</i>	<i>Natural Clay</i>	<i>Ground Gas</i>
<i>BH02</i>	<i>12.00</i>	<i>4.00 – 12.00</i>	<i>Natural Clay</i>	<i>Ground Gas</i>
<i>BH03</i>	<i>5.00</i>	<i>1.00 – 5.00</i>	<i>Made Ground</i>	<i>Ground Gas</i>
<i>BH04</i>	<i>5.00</i>	<i>1.00 – 5.00</i>	<i>Made Ground</i>	<i>Ground Gas</i>
<i>BH05</i>	<i>5.00</i>	<i>1.00 – 5.00</i>	<i>Made Ground</i>	<i>Ground Gas</i>

Permanent gas and flow rate monitoring was carried out using a GFM 436 infrared gas monitor with integral electronic flow analyser. The measurements taken are listed below:

- *Oxygen (O₂), carbon dioxide (CO₂) and methane (CH₄) as the percentage volume in air (%v/v).*
- *Hydrogen sulphide (H₂S) and carbon monoxide (CO) as the percentage volume in air (%v/v).*
- *Lower Explosive Limit (%LEL) of methane.*
- *Atmospheric and borehole pressure, including pressure trend.*
- *Flow measurements (l/hr).*
- *Weather and ground surface conditions.*

Both peak and steady state conditions were monitored to understand the behaviour of the permanent ground gas, the steady state conditions were recorded by allowing the gas monitor to run for a minimum of 3 minutes.

Interim permanent gas and groundwater monitoring results are presented in *Appendix 6*.



5.2 Natural Ground

Three main natural stratification encountered during the investigation and are described below:

- *Medium dense to very dense grey brown and orange brown gravelly Sand was encountered within BH01, TP02, TP03 and TP05 to a maximum depth of 4.0m bgl.*
- *Firm to stiff sandy gravelly Clay was encountered in BH01 and BH02 from 4.0m to a maximum depth of 19.5m bgl.*
- *Gravel and sand bands were encountered within BH01 and BH02 - between depths of 11.0m to 12.0m bgl and 17.0m to 19.2m bgl within BH01 and between depths of 2.0m to 4.0m within BH02.*

5.3 Bedrock

Residual bedrock comprising very dense red brown Sand was encountered within BH01 from 22.2m bgl to a maximum depth of 24.4m bgl.

Bedrock was encountered during the investigation from depths of between 23.0m and 24.4m bgl and consisted of an extremely weak red Sandstone.

5.4 Groundwater

Perched Groundwater was encountered across the site between depths of 1.9m to 2.2m bgl within granular Made Ground deposits.

5.5 Watching Brief

A watching brief was maintained during the Ground Investigation for visual and olfactory evidence of contamination. No evidence of contamination was encountered during the site investigation.

5.6 Excavation Stability

Evidence of collapse was noted during excavation of the trial pits within the sand strata encountered across the site between 1.1m and 2.2m bgl. The Made Ground strata generally remained relatively stable during the excavation of the trial pits.

5.7 Excavation Progress

Slow progress whilst drilling the boreholes was experienced during the advancement through the Made Ground due to the density of sands and gravels to depths of up to 3.5m bgl. Slow progress was also experienced during the drilling of bedrock strata at depths of between 23.0m and 33.0m bgl.

Concrete obstructions were observed within TP04 which are related to the former buildings located on site.



6.0 GROUND ENGINEERING

6.1 Geotechnical Testing Results

Comparison of water content and the value of 0.4 times the Liquid Limit in accordance with BRE Digest 412 'Desiccation in Clay Soils' suggests significant desiccation has taken place when 0.4 times the Liquid Limit is greater than the actual water measured water content. This is a rudimentary method but also a good guide.

Results of the Plasticity Index analysis and the volume change potential of the Clay is summarised in the table below:

Reference	Depth (m bgl)	Modified PI	Volume Change Potential	Significantly Desiccated Y/N
BH01	5.00	19.8	Low	N
BH01	8.00	36.0	Medium	N
BH01	12.50	16.3	Low	N
BH02	8.00	35.0	Medium	N
BH02	11.00	14.1	Low	N
BH02	18.50	39.2	Medium	Y

Quick undrained triaxial testing was carried out on four samples of natural undisturbed Clay and the results of the triaxial testing are summarised in the table below:

Reference	Depth (m)	Undrained Shear Strength (kN/m ²)	Relative Strength
BH01	5.00	114	High
BH01	8.00	57	Medium
BH01	12.50	223	Very High
BH02	8.00	51	Medium
BH02	11.00	59	Medium
BH02	18.50	98	High

Unconfined Compressive Strength (UCS) testing was undertaken on three samples of Sandstone. The results are summarised in the table below:

Reference	Depth (m)	Load Failure (kN)	UCS (MPa)
BH01	28.36 – 28.50	8.20	1.50
BH02	28.32 – 28.44	17.50	3.10
BH02	28.86 – 29.00	8.70	1.50

Point load testing (axial and diametral) was also undertaken on recovered Sandstone core and the results are summarised in the table below:

Reference	Depth (m)	Axial or Diametral Test	Load Failure (kN)	I (MPa)
BH01	27.75	Axial	0.24	0.08
BH01	28.90	Axial	0.39	0.13
BH01	29.80	Axial	0.15	0.05
BH01	31.10	Axial	0.35	0.14



BH01	32.70	Axial	0.66	0.26
BH02	24.80	Axial	0.17	0.06
BH02	25.50	Axial	0.45	0.16
BH02	26.20	Axial	0.44	0.17
BH02	27.50	Axial	0.58	0.21
BH02	28.70	Axial	0.16	0.05
BH01	27.75	Diametral	0.23	0.04
BH01	28.90	Diametral	0.30	0.05
BH01	29.80	Diametral	0.21	0.04
BH01	31.10	Diametral	0.07	0.01
BH01	32.70	Diametral	0.28	0.05
BH02	24.80	Diametral	0.08	0.01
BH02	25.50	Diametral	0.18	0.03
BH02	26.20	Diametral	0.17	0.03
BH02	27.50	Diametral	0.18	0.03
BH02	28.70	Diametral	0.08	0.01

6.2 Assessment Background

The ground engineering investigation has been undertaken to formulate an accurate ground model in order to undertake preliminary foundation design. The ground model has been constructed with a moderate to high level of confidence.

The proposed development is residential end use comprising the construction of a multi storey residential building up to nine storeys in height with associated car parking and soft landscaping at ground floor level. It is proposed to construct the new building in the central part of the site. At this stage, the loadings associated with the proposed building are not available and the following recommendations are based on existing site levels.

Boreholes advanced within the proposed footprint of the residential building (BH01, BH02) indicate that Made Ground is present to a maximum depth of 3.5m bgl which is predominantly underlain by medium dense Sand and firm to stiff Clay. These strata were interbedded throughout the boreholes until bedrock was encountered at 24.4m bgl within BH01 and 23.0m bgl in BH02. The bedrock consisted of red Sandstone. Rotary coring was undertaken in both locations to a maximum depth of 33.5m bgl.

During the Ground Investigation, groundwater was encountered at depths of between 1.9m to 2.2m bgl.

As part of the enabling works, the reworked topsoil material should be stripped and stockpiled separately. It is envisaged that the majority of the topsoil will be removed offsite as minimal soft landscaping is proposed as part of the proposed development.

The main limitations associated with the proposed development are the presence of deep Made Ground with concrete obstructions along with former utilities and foundations associated with the previous hospital buildings on site. These were encountered within TP04 and are assumed to extend across the whole footprint of the hospital formerly on site and will require grubbing up during the construction phase.

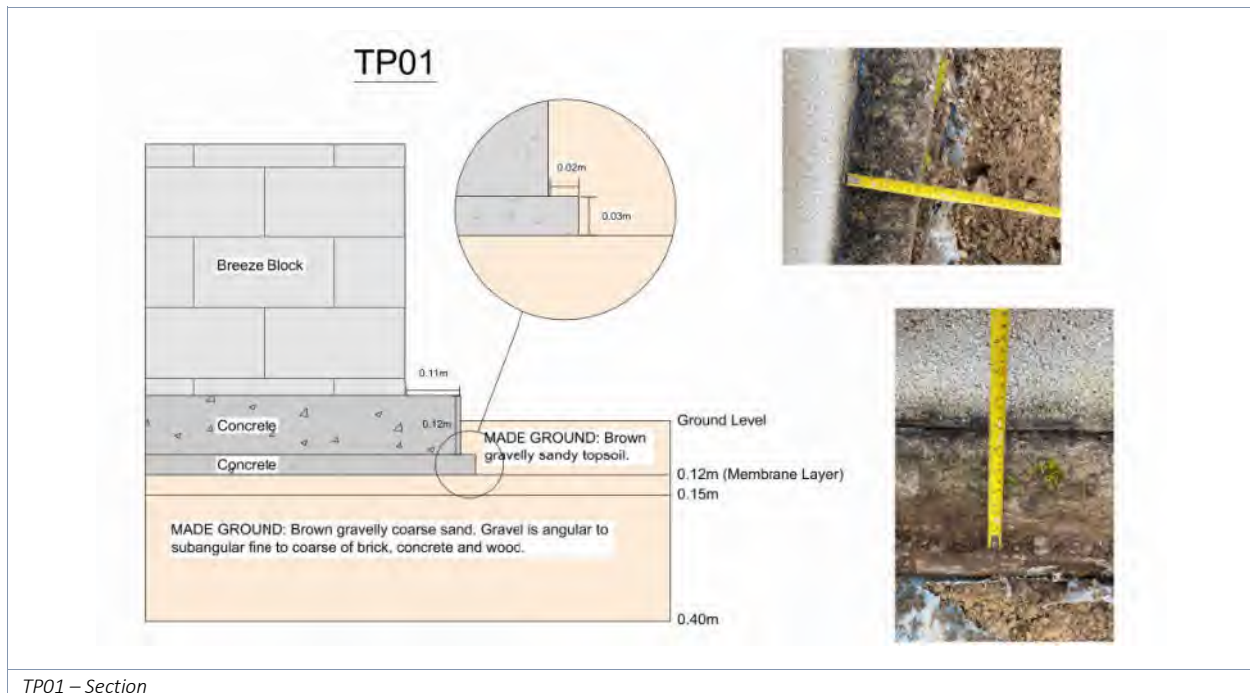
Another limitation associated with the site is the amount of surface water encountered especially within the central part of the site.

6.3 Trial Pit Assessment

During the Ground Investigation a number of parameters had been set for the Trial Pitting, this was done to make sure that different factors associated with the site were investigated properly. Justification and follow on explanation of each Trial Pit and how these were properly assessed is detailed below:

TP01

Hand excavated trial pit to assess the foundations associated with the electricity substation located on site, shallow foundations were encountered comprising of concrete footings shown below:



The second layer of concrete beneath the substation is prefabricated and likely to be a raft on the Made Ground.

TP02

This trial pit was used to identify and to understand the tarmacked area of the site, Tarmac was encountered to a maximum depth of 0.2m bgl and was observed as a degraded tarmac recovered as a gravel. This was then followed by a light grey sub-base material to a maximum depth of 0.4m bgl. Finally, the subbase was underlain with a Geo-membrane layer that separated the road construction in this area with the Made Ground encountered throughout the rest of the site.

TP03, TP04 and TP05

These trial pits were excavated in order to gain a further understanding of the build-up of strata present beneath the site and also to determine the location of any obstructions present.

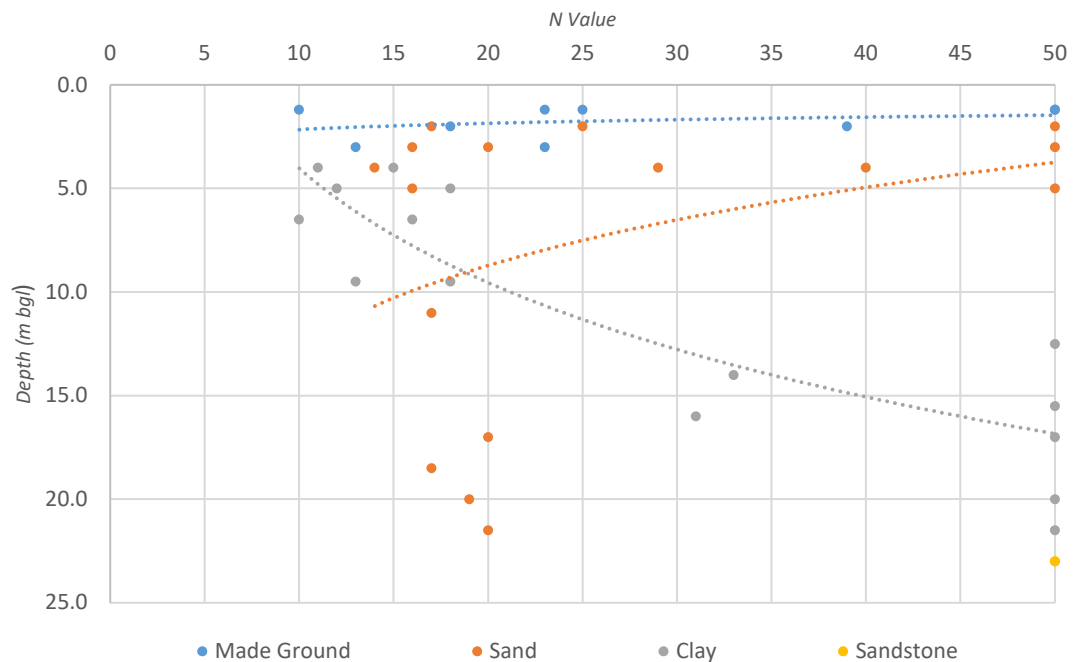
TP03 - this trial pit was excavated in the central south eastern area of the site. Made Ground was encountered to a maximum depth of 1.1m bgl and was underlain with natural Sand deposits of grey and orange to a maximum depth of 2.1m bgl. A soil percolation test was conducted within this location between depths of 1.5m and 2.1m bgl to determine soil infiltration rates within the underlying natural strata.

TP05 - this trial pit was excavated within the central north eastern area of the site. Made Ground was encountered to a maximum depth of 1.2m bgl and was underlain with natural grey orange Sand deposits to a maximum depth of 2.2m bgl.

Hand excavated trial pit to assess the foundations associated with the wall located on site, shallow foundations were encountered comprising of concrete footings shown below:



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Depth v SPT Chart

Characterisation of the geotechnical parameters above has been undertaken to select a characteristic value, which is a cautious estimate of the value affecting the occurrence of the limit state. The characteristic values for Ultimate Limit State (ULS) conditions selected are presented in the table below:

Stratum	Parameter	Selected Characteristic Value
Medium strength Clay	Undrained Shear strength (C_u)	55kPa
High strength Clay	Undrained Shear strength (C_u)	106kPa
Very High Strength Clay	Undrained Shear strength (C_u)	223kPa
Sand and Gravel	Drained angle of friction (ϕ')	32°
Residual Sandstone	Drained angle of friction (ϕ')	30°
Sandstone	Unconfined Compressive Strength	1.5MPa

6.5 Preliminary Foundation Design

The proposed development is nine storeys in height and is expected to generate large column loads, therefore traditional shallow foundations will not be a suitable option for the apartment block. At this stage, the loadings of the proposed structure are unknown and designs will need to be confirmed once they are provided.

Loads will be transferred to the piles from ground beams, pile caps and floor slabs of the superstructure. Transverse loading on the piles and the requirement for reinforcement should be taken into consideration in the detailed design to satisfy Equilibrium Limit State conditions.

The most suitable solution for the proposed seven-storey development is considered to be piled foundations transferring loads through the underlying Made Ground and natural Clay and Sand strata to the very weak Sandstone which has been encountered between 23.0m and 24.4m bgl. When permanent and variable actions are available, the utilisation factor can be confirmed or otherwise in accordance with EC7.

Piled Solution – Design by Calculation

- Made Ground to 3.5m
- Sandy Gravel to 4.5m
- Medium to high strength Clay to 11.0m
- Medium dense Sand to 12.0m
- Very high strength Clay to 17.0m
- Dense to Very dense Sand to 24.4m
- Very weak Sandstone to 25.5m

The depth of rock socket has been taken as 2m into the residual bedrock. The extent of the socket will depend on the competency of the bedrock and consistency across the development area. The end bearing resistance will depend on the drilling technique and magnitude of disruption of the Sandstone which may reduce the base resistance.

An appropriate working platform should be constructed in accordance with BR470 guidance.

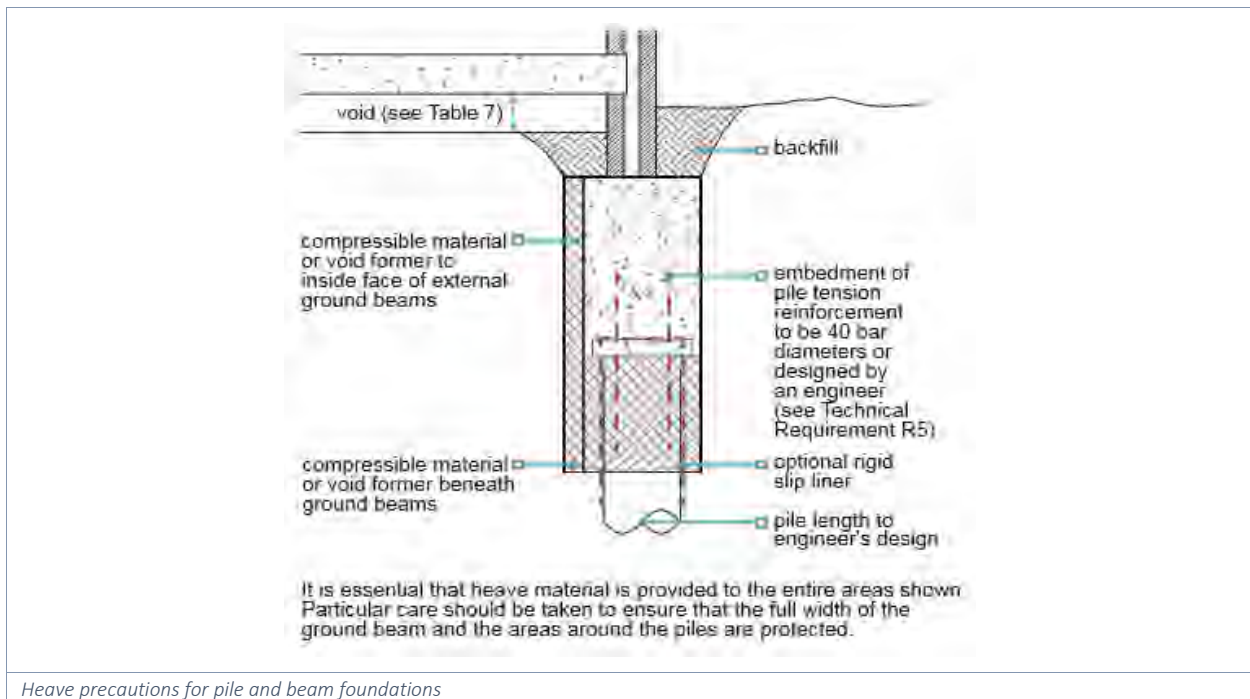
The piling type, length, depth of reinforcement and design should be discussed with a specialist piling contractor. They can then undertake the detailed design including drawings and specifications to provide fitness for purpose design.

If the ground conditions encountered during the construction phase differ significantly to the conditions encountered during the Ground Investigation, work should cease and Groundtech Consulting contacted for further advice.

$$Q_{\text{H}} = \alpha Q_{\text{D}} = 1$$

All foundations should be deepened below roots of greater than 5mm diameter during excavations for footings. The clay is of a low to medium volume change potential.

Where heave precautions are deemed necessary, the pile installation design will need to accommodate the following precautions in the design.



Floor slab design should take into consideration the presence of deep Made Ground to 3.5m bgl. A suspended floor slab is considered to be suitable for the proposed development that is compatible with the proposed piled foundations. The slab loadings are not available at this stage.



6.10 Highway Design

Plate load testing was undertaken across the site in order to obtain a representative CBR value of the underlying strata at proposed formation levels for access roads and car parking. The full results are presented in *Appendix 7*, a summary of the results is below:

Location	Depth (m bgl)	Strata	CBR Value (%)
TP01	0.35	MG: Gravel	11.3
TP02	0.35	MG: Clayey gravelly sand	9.6
TP03	0.35	MG: Clayey sand	>39.9
TP04	0.35	MG: Sandy clay	>39.9
TP05	0.35	MG: Gravelly sandy clay	>39.9
TP06	0.35	MG: Gravelly sandy clay	3.9

Plate load testing was undertaken in the vicinity of proposed access roads and car parking areas across the development. All results have achieved the required design value of 5% for highway and pavement construction excluding TP06 which achieved a CBR value of 3.9%. As a minimum, the subgrade should be proof rolled prior to construction.

The soils are considered to be frost susceptible due to the fines content and highway construction should be a minimum thickness of 450mm to mitigate the risk.

6.11 Sustainable Urban Drainage System (SuDS)

SuDS testing was undertaken in two locations on the site in general accordance with BRE Digest 365 'Soakaways' (2016). A summary of the soil percolation test results is given below, and the full results are presented in *Appendix 8*.

Location	Test No.	Dimensions of Pit Before Test	Behaviour During Test	Dimensions of Pit After Test	Soil Infiltration Rate (m/sec)
IP3	1	1200 (L) x 800 (W) x 1600 (D)	Pit sides stable	1200 (L) x 800 (W) x 1600 (D)	1.14×10^{-6}
IP3	2	1200 (L) x 800 (W) x 1600 (D)	Pit sides stable	1200 (L) x 800 (W) x 1600 (D)	2.41×10^{-6}
IP3	3	1200 (L) x 800 (W) x 1600 (D)	Pit sides stable	1200 (L) x 800 (W) x 1600 (D)	3.28×10^{-6}
TP03	1	1300 (L) x 700 (W) x 2100 (D)	Pit sides stable	1300 (L) x 700 (W) x 2100 (D)	3.21×10^{-6}
TP03	2	1300 (L) x 700 (W) x 2100 (D)	Pit sides stable	1300 (L) x 700 (W) x 2100 (D)	3.10×10^{-6}
TP03	3	1300 (L) x 700 (W) x 2100 (D)	Pit sides stable	1300 (L) x 700 (W) x 2100 (D)	1.92×10^{-6}

Three soil percolation tests were carried out at both positions IP3 and TP03 at a depth of 1.6m bgl and 2.1m bgl respectively. The calculated soil infiltration rates ranged between 1.14×10^{-6} m/s and 3.28×10^{-6} m/s which indicate poor drainage conditions are present within the underlying soils.

The use of SuDS drainage within the natural ground is not considered to be a feasible option at these locations and depths on the site.



7.0 LAND QUALITY

7.1 Geo-Environmental Testing Results - Soils

Samples of Made Ground have been tested for a range of relevant Contaminants of Concern. In accordance with CLR11 (DEFRA & EA, 2004), a Generic Quantitative Risk Assessment (GQRA) has been undertaken to determine the significance of the concentrations as derived through Geo-Environmental analysis.

The GQRA process comprises the comparison of the actual concentrations measured on site with Generic Assessment Criteria (GACs) for the protection of human health.

The GACs used for the assessment of soil concentrations have been derived using the CLEA model. The GACs used and their ranking of importance are listed below:

- *Soil Guideline Values (SGVs) which demonstrate minimal risk.*
- *LQM/CIEH S4ULs which use the same toxicological data as the SGVs but different exposure criteria.*
- *C4SLs which demonstrate low risk.*

In deriving the GACs for use on Brownfield sites, we have assumed a 1% Soil Organic Matter unless the results indicate otherwise.

The proposed development comprises a multi-storey residential building up to nine storeys in height, with associated car parking and soft landscaping at ground floor level. We have therefore undertaken the GQRA on the basis that the proposed development site falls under the Residential (without Plant Uptake) land-use scenario as defined in SR3 (EA, 2009b).

The strata or sources of contamination targeted by the laboratory testing scheduled is summarised in the table below:

Strata	Number of Samples Tested	Locations
<i>Granular Made Ground (Population 1)</i>	<i>6</i>	<i>BH02, BH04, BH05, TP02, TP04, IP3.</i>

A summary of the Geo-Environmental Testing results is presented below and the GQRA screening values are presented in *Appendix 9*:

Contaminant	Metals		Exceedances	Locations
	Range (mg/kg)	Screening Value		
<i>Arsenic</i>	<i>2.4 – 13.6</i>	<i>40</i>	-	-
<i>Cadmium</i>	<i>0.2 – 8.4</i>	<i>85</i>	-	-
<i>Chromium</i>	<i>18.3 – 59.4</i>	<i>910</i>	-	-
<i>Hexavalent Chromium</i>	<i><0.3</i>	<i>21</i>	-	-
<i>Copper</i>	<i>10 – 72</i>	<i>7100</i>	-	-
<i>Lead</i>	<i>21 – 123</i>	<i>310</i>	-	-
<i>Mercury</i>	<i>0.1 – 0.4</i>	<i>1.2</i>	-	-
<i>Nickel</i>	<i>5.2 – 23.3</i>	<i>180</i>	-	-
<i>Selenium</i>	<i><1 – 1</i>	<i>430</i>	-	-

Zinc	27 - 320	40000	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)				
Contaminant	Range (mg/kg)	Screening Value	Exceedances	Locations
Naphthalene	<0.04 – 1.35	2.3	-	-
Acenaphthylene	<0.03 – 0.42	2900	-	-
Acenaphthene	<0.05 – 2.15	3000	-	-
Fluorene	<0.04 – 2.12	2800	-	-
Phenanthrene	0.29 – 15.23	1300	-	-
Anthracene	0.08 – 6.77	31000	-	-
Fluoranthene	0.63 – 26.37	1500	-	-
Pyrene	0.59 – 21.94	3700	-	-
Benzo(a)anthracene	0.37 – 10.07	11	-	-
Chrysene	0.33 – 9.39	30	-	-
Benzo(a)pyrene	0.34 – 9.04	3.2	2	BH2, BH4
Indeno(123cd)pyrene	0.22 – 5.43	45	-	-
Dibenzo(ah)anthracene	0.04 – 0.98	0.31	2	BH2, BH4
Benzo(ghi)perylene	0.23 – 5.43	360	-	-
Benzo(b)fluoranthene	0.43 – 11.52	3.9	2	BH2, BH4
Benzo(k)fluoranthene	0.17 – 4.48	110	-	-
Others				
Organic Matter	1.0 – 8.0%			
Asbestos Screen				
Position	Depth (m bgl)	Result		
BH2	0.50	None Detected		
BH4	0.50	None Detected		
BH5	0.50	None Detected		
TP02	0.50	None Detected		
TP04	1.80	None Detected		
IP3	0.50	None Detected		

7.2 Statistical Analysis

Statistical analysis for the elevated Polycyclic Aromatic Hydrocarbons (PAHs) concentrations in the Made Ground population was undertaken using CL:AIRE 'Guidance on Comparing Soil Contamination Data with a Critical Concentration'. Analysis was carried out on the granular Made Ground based on the observations and descriptions during the Ground Investigation. The aim of the statistical analysis was to reject the Null Hypothesis - 'the true mean concentration is equal to or greater than the critical concentration' with a level of confidence greater than 95%. The results of the statistical analysis are presented in *Appendix 10*.

Benzo(a)pyrene

Elevated benzo(a)pyrene was detected in the BH02 and BH04 within the granular Made Ground. For benzo(a)pyrene, the following statistical analysis was carried out:

- Granular Made Ground - an upper confidence limit of 6.8mg/kg was calculated which is higher than the critical concentration of 3.2mg/kg, the Null Hypothesis was not rejected and **remediation measures are required**.



Dibenzo(ah)anthracene

Elevated dibenzo(ah)pyrene was present in the BH02 and BH04 within the granular Made Ground. For dibenzo(ah)pyrene, the following statistical analysis was carried out:

- *Granular Made Ground - an upper confidence limit of 0.73mg/kg was calculated which is higher than the critical concentration of 0.31mg/kg, the Null Hypothesis was not rejected and remediation measures are required.*

Benzo(b)fluoranthene

Elevated benzo(b)fluoranthene was detected in the BH02 and BH04 within the granular Made Ground. For benzo(b)fluoranthene, the following statistical analysis was carried out:

- *Granular Made Ground - an upper confidence limit of 8.48mg/kg was calculated which is higher than the critical concentration of 3.9mg/kg, the Null Hypothesis was not rejected and remediation measures are required.*

7.3 Tier I Generic Quantitative Risk Assessment - Soils

Made Ground was encountered across the entire site to a maximum depth of 3.5m bgl and consisted of inert materials and former building rubble associated with a former hospital that was located onsite. No significant visual or olfactory evidence of contamination was noted within the soils that were recovered at the site however, former foundations along with redundant utilities was encountered within TP04.

Metals

Testing undertaken across the site indicated that all metal concentrations encountered were below the screening value for residential land use without plant uptake.

Polycyclic Aromatic Hydrocarbons (PAHs)

Testing indicates that all speciated PAH concentrations were generally encountered below the screening value for the residential end use without plant uptake except for Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene. Elevated concentrations were recorded in BH02 at 0.5m and BH04 at 0.5m bgl within Made Ground comprising gravelly sand. These locations were present in the central and southern areas.

Benzo(a)pyrene was found at elevated concentrations of 7.9mg/kg and 9.04mg/kg when compared to the screening value of 3.2mg/kg. Benzo(b)fluoranthene was elevated at levels of 9.46mg/kg and 11.52mg/kg compared to the screening value of 3.9mg/kg. Dibenzo(ah)anthracene was indicated to be elevated at concentrations of 0.79mg/kg and 0.98mg/kg when compared to the screening value of 0.31mg/kg. The statistical analysis results also confirm remedial action is required.

The elevated speciated PAH concentrations are likely to be associated with the general Made Ground and the former use of the site as a hospital.

Asbestos

No asbestos was detected within the Made Ground soils that were screened.



7.4 Permanent Ground Gases

Made Ground has been recorded beneath the site to a maximum depth of 3.5m bgl and Glaciofluvial deposits are present to a depth of between 23.0m and 24.0m bgl. No significant quantities of organic material have been noted within the Glaciofluvial deposits.

Two gas monitoring visits has been undertaken to date and a further two are scheduled.

No concentrations of methane (CH₄) have been recorded within the standpipes however, detectable levels of carbon dioxide (CO₂) were recorded within the standpipes up to a maximum concentration of 3.8% v/v together with associated slightly depleted oxygen (O₂) concentrations (minimum of 9.5% v/v). The carbon dioxide concentration of 3.8% v/v was recorded in BH05.

The maximum positive gas flow rate is considered to be 0.1l/hr as no positive flow rates have been encountered. The atmospheric pressure ranged between 1027mb and 1033mb and the monitoring was carried out during periods of falling and steady barometric pressure.

Groundwater was encountered within all the standpipes at depths of between 1.9m and 2.44m bgl.

Characterisation of the Gas Screening Value (GSV)

In accordance with CIRIA Report C665, November 2007 it is felt that an adequate risk assessment can be undertaken based on the following limiting factors:

- *The proposed development has been considered as **low sensitivity** based on the site being a proposed Residential Development (Table 5.5 – Typical/Idealised frequency and period of monitoring, after Wilson et al, 2005).*
- *The risk associated with the generation potential of a source is considered as **very low**, (assessment based on the environmental setting).*
- *Relatively low positive flow rates have been recorded (Table 8.5 – Modified Wilson & Card classification). For this site, one of the monitoring visits undertaken to date was carried out during a falling atmospheric pressure trend.*

Based upon the results recorded, in accordance with CIRIA Report C665, the risk to the site from ground gases has been assessed by converting the results to gas screening values (GSVs), calculated by multiplying the typical maximum gas concentrations with the recorded maximum positive flow rates. In addition, individual “hazardous gas flow rates” (Q_{hg}) have been derived for each monitoring point. As no levels of methane have been recorded, a GSV for carbon dioxide only has been calculated.

$$GSV (l/hr) = \text{max borehole flow rate (l/hr)} \times \text{max gas concentration (\%)}$$

For this assessment, the maximum recorded concentration of carbon dioxide of 3.8%v/v has been used together with a maximum gas flow rate of 0.1l/hr to calculate the GSV. This is worst case scenario.

$$Carbon\ Dioxide\ GSV = 0.038\ (3.8\%) \times 0.1 = 0.0038\ l/hr$$

In order to assess the ground gas regime beneath the site and the need to incorporate ground gas precautions, guidance was taken from CIRIA C665 ‘Assessing risks posed by hazardous ground gases to



buildings'. Based on the site being developed for a commercial end use, the Wilson and Card method has been used to carry out the assessment.

When considering the preliminary results in accordance with CIRIA C665 (Section A Development and Table 8.5 – Modified Wilson and Card Classification) it can be seen that the interim GSV values place the site within Characteristic Situation 1.

Characteristic Situation 1

The proposed development is classified as a Building Type C in accordance with BS 8485:2015 and the site falls in CS1 in accordance with Table 2 of the above guidance, gas protection measures are not required. The recommendations will be confirmed or otherwise on completion of the monitoring.

Radon

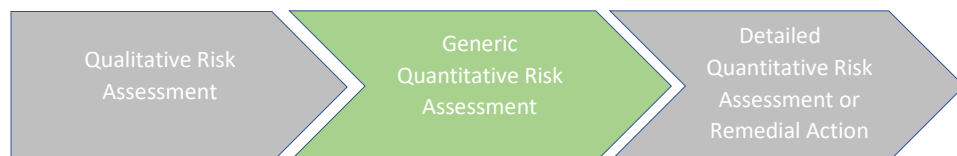
The site is an are not requiring radon precautions.

7.5 Revised Pollution Linkage Assessment

The CSM has been revised to inform the following pollution linkage assessment. Using Source-Pathway-Receptor assessment criteria that is applicable in the UK, the risk assessment has been devised to determine if a plausible pollution linkage exists between the identified contaminants and receptors. The risk classification has been estimated in accordance with the CIRIA C552 assessment criteria and an Illustrative Revised CSM is presented on Groundtech Consulting Plan *GRO-20064-P03*.



Human Health Pollution Linkage Assessment



- The table below represents the second stage in the land quality risk assessment process - **the Generic Quantitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose of each stage of risk assessment is to establish if there is a requirement for additional stages of assessment in order to have sufficient confidence to support a risk characterisation or remedial action.

Conceptual Site Model					Generic Quantitative Risk Assessment	
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	Rationale and Action
PL1	Contaminated Soils	Ingestion of soil and dust. Dermal contact with soil.	Likely	Medium	Moderate	<i>Pollution Linkage 1 refers to proposed site users coming into contact with contaminated soils on the site.</i> <i>The site is currently formed by waste land and has previously been occupied by the Withington Community Hospital.</i> <i>Made Ground is present beneath the site to a maximum depth of 3.5m bgl mainly due to the presence of the former hospital. Speciated PAH contamination was detected within the granular Made Ground soils. No other elevated CoC were recorded, and no asbestos was detected.</i> <i>Depending on the age of the electricity substation located in the northwest of the site, PCBs may have been used as a cooling agent within the transformers, however due to the relative immobility of PCBs and the small volume used they are unlikely to have impacted the site.</i>



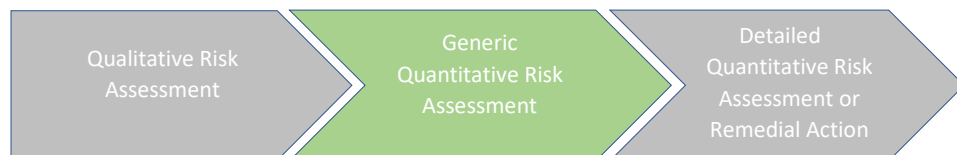
Conceptual Site Model					Generic Quantitative Risk Assessment	
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	Rationale and Action
						The proposed development is for a nine storey residential building to be constructed at the site with associated car parking and soft landscaping. As the Made Ground is contaminated with PAHs, a viable pollution linkage is considered to exist in soft landscaped areas only.
PL2	Contaminated Soils	Inhalation of vapour.	Unlikely	Medium to Severe	Low	Volatile vapours migrating into confined spaces within the proposed development is not a potential linkage. No significant sources of volatiles have been encountered and the risk is considered to be low.
PL3	Contaminated Soils	Inhalation of soil dust by adjacent site users.	Unlikely	Medium	Low	Pollution Linkage 3 relates to contamination on the subject site affecting adjacent site users. Significant mobile contamination has not been encountered therefore a plausible pollution linkage is not considered to exist.
PL4	Contaminated Soils	Attacking potable water supply pipe.	Likely	Medium	Moderate	Pollution Linkage 4 refers to the possible contaminants permeating potable water pipes and consumption by the future site end users of the tainted water supply. Made Ground is present at installation depth of proposed water pipes which is contaminated with PAHs. As potable water pipes are to be included as part of the proposed development, a pollution linkage is considered to exist and a local water company risk assessment is required prior to construction to advise on the level of protection required for the potable water supply.



Conceptual Site Model					Generic Quantitative Risk Assessment	
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	Rationale and Action
PL5	Ground Gas	Migration and accumulation of ground gas in internal spaces.	Unlikely	Medium to Severe	Low	Made Ground is present beneath the site to a maximum depth of 3.5m bgl due to the historic land use as a hospital. Initial gas monitoring indicates that no methane is present beneath the site and a maximum carbon dioxide concentration of 3.8% v/v has been recorded. The interim results place the site in CS1 and gas protection measures are not required. This will be confirmed or otherwise on completion of the monitoring. The site is not within an area requiring radon precautions within foundations.



Controlled Waters Pollution Linkage Assessment



- The table below represents the second stage in the land quality risk assessment process – **Generic Quantitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose of each stage of risk assessment is to establish if there is a requirement for additional stages of assessment in order to have sufficient confidence to support a risk characterisation or remedial action.

Conceptual Site Model					Generic Quantitative Risk Assessment	
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	Rationale
PL6	Contaminated Soils	Impaction of groundwater from soil contamination (diffuse and point). Impaction of groundwater from groundwater plume.	Unlikely	Medium	Low	Deep Made Ground has been encountered to a maximum depth of 3.5m bgl, however significant mobile contamination has not been encountered. Geological maps indicate that the site is underlain by Glaciofluvial Clay, Sand and Gravel. The bedrock underlying the site is the Wilmslow Sandstone Formation. Due to the thickness of the superficial deposits in excess of 20m, a pollution linkage is not currently considered to exist between potentially contaminated Made Ground and the Principal Bedrock Aquifer. Furthermore, the proposed development will be predominantly covered with hardsurfacing and a new drainage system installed. This will considerably reduce infiltration and leaching of potential contaminants. Therefore, no pollution linkage is considered to exist.



Conceptual Site Model					Generic Quantitative Risk Assessment	
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	Rationale
PL7	Contaminated Soils	Migration of soil and groundwater contamination impacting surface waters.	Unlikely	Medium	Low	Pollution Linkage 7 refers to the impaction of River Mersey 820m south of the site from contaminated soils and groundwater. Significant mobile contamination has not been encountered and there is a significant attenuation distance. A plausible pollution linkage is not considered to exist.

- *All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.*
- *Hand-washing and boot-washing facilities should be provided.*
- *Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.*
- *Good practices relating to personal hygiene should be adopted on the site.*
- *The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.*

7.9 Waste Classification by Assessment

We have reviewed the testing results and inputted them into the HazWasteOnline model which allows users to code and classify waste as defined in the EWC (European Waste Catalogue 2002) based on EC Regulation 1272/2008 on the Classification, labelling and packaging of substances and mixtures (CLP) and latest Environment Agency guidance (WM3 “Guidance on the classification and assessment of waste (1st edition 2015)-Technical Guidance”).

This is a useful tool as waste producers have the legal responsibility to classify any waste they produce.

Twelve samples were tested to assess whether they contained any contaminants in the hazardous range when screened against assessment criteria within WM3. The results are in the Waste Classification Report presented in *Appendix 11*.

Based on the HazWasteOnline assessment tool, the Made Ground soils have been classified as Non-Hazardous. No asbestos was detected and does not affect the classification by assessment.

Total testing was not undertaken on the natural soils and are assumed to be Non-Hazardous.

7.10 Waste Acceptance Criteria (WAC) Results

The Landfill Directive (Directive 1999/31/EC on the landfilling of waste) led to the establishment of a methodology for classifying wastes. Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. There are three different WAC, these are for:

- *Inert waste*
- *Non-hazardous waste*
- *Hazardous waste*

Wastes should first be classified based on their total concentrations as detailed in the previous section. WAC testing is then required if the end disposal route is a landfill.

Waste Acceptance Criteria (WAC) testing was outside the scope of this investigation and the guidance given below is general.

The possibility of automatic inert classification of the natural soils should be explored in accordance with Section 4.3 of the EA guidance document. The Council Decision includes a list of wastes in Section 2.1.1 of the document that are assumed to be inert and therefore acceptable at a landfill for inert waste without testing, this is the case if:

- *They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source) and*
- *There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other their disposal in other classes of landfill.*

If any organic contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

Materials should be segregated and where necessary sufficient time is allowed to further classify the material properly, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is recommended that where possible, the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

Soils will be generated during the enabling works and CFA piling, the reuse of soils on the site this should be done in accordance with the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE CoP). Any re-use scheme should be designed to minimise disposal costs.

After a cut and fill balance plan/volume calculation has been carried out, a U1 and T5 exemption could be registered. This will allow the use of the following soils without a waste permit or under Dow CoP MMP:

- *1,000 tonnes (c.600m³) of non-hazardous soil*
- *5,000 tonnes (c.3,000m³) of natural sand and gravels.*
- *50,000 tonnes (c.25,000m³) of bituminous material to be used in roadways.*
- *5,000 tonnes (c.3,000m³) of crushed concrete / stone.*



8.0 FINAL APPRAISAL

8.1 Land Quality

The site formerly consisted of the old Withington Community Hospital which was constructed in the 1800s. Made Ground was encountered during the Ground Investigation to a maximum depth of 3.5m bgl and consisted of reworked topsoil and sand, no visual or olfactory of contamination was encountered. Former foundations, slabs and redundant utilities associated with the hospital were encountered within TP04 in the northern part of the site and are likely elsewhere beneath the site.

Elevated concentrations of speciated Polycyclic Aromatic Hydrocarbons (PAHs) have been recorded in BH2 and BH4 within granular Made Ground soils. No other elevated CoC were recorded, and no asbestos was detected. The risk to human health is considered to be *Moderate*. A cover system should be placed in soft landscaping areas to reduce the risk to an acceptable level.

Significant mobile contamination was not encountered and the risk to controlled waters is considered to be *Low*.

Preliminary gas monitoring results place the site in CS1 and gas protection measures are not likely to be required. The risk is *Low* at present and will be confirmed upon the completion of the monitoring. The site is not in an area requiring radon measures.

Based on the HazWasteOnline assessment tool, the Made Ground soils have been classified as Non-Hazardous for waste disposal purposes.

8.2 Ground Engineering

The most suitable solution for the proposed nine-storey development is considered to be pile foundations transferring loads through the underlying Made Ground and natural strata to the very weak Sandstone which has been encountered at depth of 23.0m and 24.4m bgl.

The use of SuDS drainage within the natural ground is not considered to be a feasible as poor drainage rates have been calculated.

8.3 Further Work

The following further work is considered necessary to progress the site to construction phase:

Completion of gas monitoring programme.

Issue gas assessment.

Design of remedial specification.

Tree survey by qualified arboriculturist.

Detailed Foundation design.

Confirmation of remedial recommendations made with the Local Authority.



9.0 RELEVANT INDUSTRY REFERENCES

- British Standards Institution. *Investigation of Potentially Contaminated sites - code of practice*. BS 10175:2017.
- British Standards Institution '*Code of Practice for Site Investigations*' BS 5930:2015
- British Standards Institution "*Geotechnical investigation and testing – Identification and classification of soil*" BS EN ISO 14688:2002.
- British Standards Institution "*Geotechnical investigation and testing – Identification and classification of rock*" BS EN ISO 14689:2002.
- BRE Report BR211 '*Radon – Guidance on protective measures for new buildings*' 2015 Edition.
- BRE Special Digest 1: "*Concrete in Aggressive Ground*" 3rd Ed 2005.
- CIRIA 552 "*Contaminated Land Risk Assessment – A guide to good practice*" 2001.
- CIRIA C665 "*Assessing Risks Posed by Hazardous Ground Gases to Buildings*" 2007.
- Wilson & Card "*Proposed method classifying gassing sites*" Ground Engineering 1999.
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- BS 8576:2013 '*Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)*'
- BS 8485:2015 '*Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings*'
- The Hazardous Waste (England) Regulations 2005.
- Environment Agency Hazardous Waste: "*Guidance on the classification and assessment of waste*" WM3 ver. 1 May 2015.
- The National Planning Policy Framework (NPPF) March 2012
- DETR. Circular 02/2000 Contaminated Land.
- Environment Agency, 2009 'Using Soil Guideline Values'.
- Environment Agency, 2009 'Updated Technical Background to the CLEA model'.
- Environment Agency, 2009 'Human health toxicological assessment of contaminants in soil'.
- Department of the Environment, 1994, CLR Report No 1 'A framework for assessing the impact of contaminated land on groundwater and surface water'.
- Department of the Environment, 1994, CLR Report No 2 'Guidance on Preliminary Site Inspection of Contaminated Land'.
- Department of the Environment, 1994, CLR Report No 3 'Documentary research on Industrial Sites'.
- Department of the Environment, 1994, CLR Report No 4 'Sampling Strategies for Contaminated Land'.
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- Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R. C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.
- CL:AIRE, 2014 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination'.
- Water Framework Directive.
- Environmental Quality Standards.



UK Drinking Water Standards: Water Supply (Water Quality) Regulations 1989 (SI 1989/1147) and Water Supply (Water Quality) Regulations

UKWIR Report 10/WM/03/21 2010 “Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites”

Health & Safety Executive, 1991. ‘Protection of Workers & the General Public during the Development of Contaminated Land’.

Environment Agency & NHBC, 2000. R&D Publication 66. Guidance for the Safe Development of Housing on Land Affected by Contamination.

Environment Agency “Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3”

CL:AIRE “*The Definition of Waste: Development Industry Code of Practice*” Version 2 March 2011.

CIRIA “*Asbestos in soil and made ground: a guide to understanding and managing risks*” C733 2014

Control of Asbestos Regulations (CAR) 2012

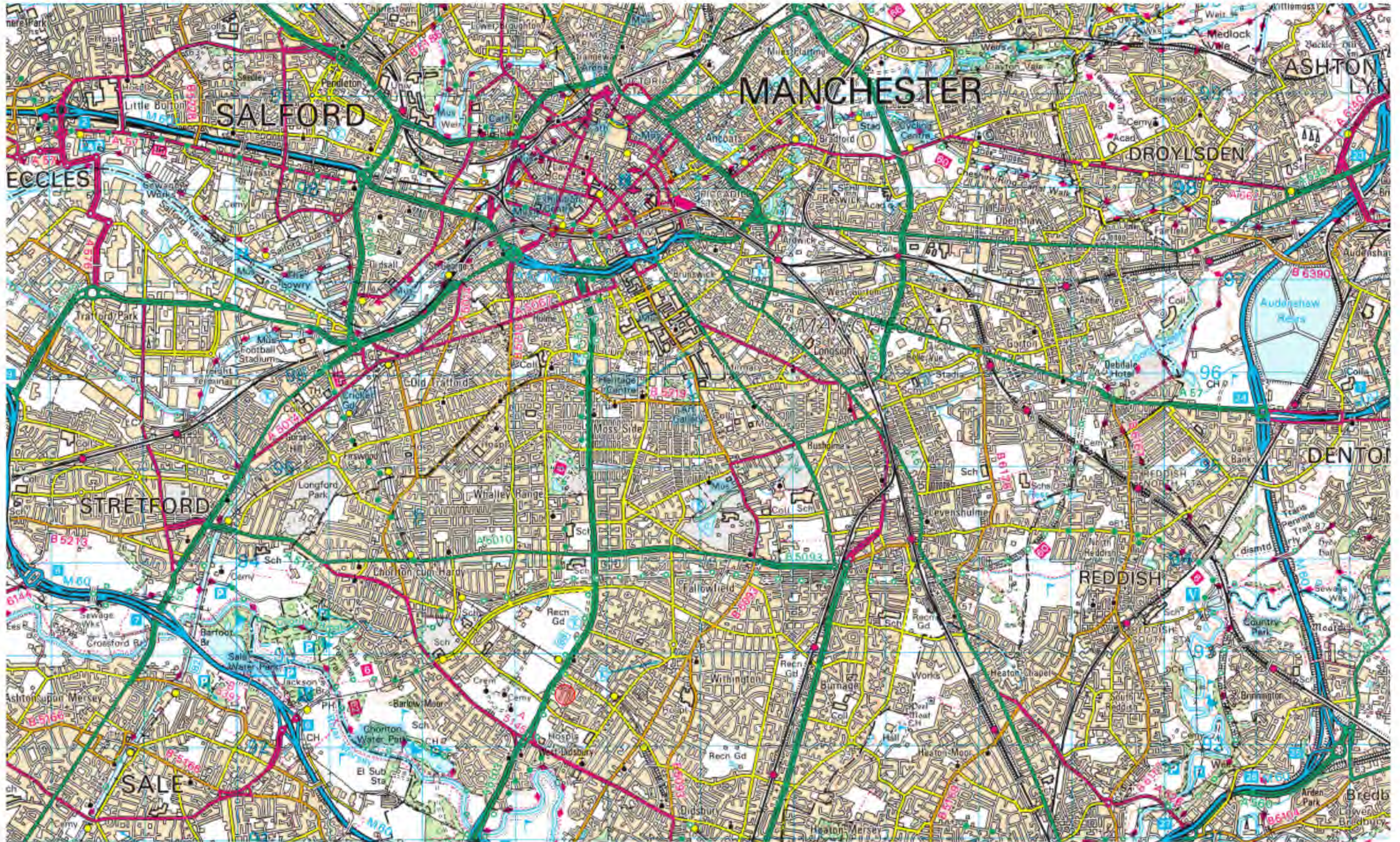
Harris, M R, Herbert, S. M, Smith, M A ‘Remedial Treatment for Contaminated Land’ (twelve volumes), special publications 101-112, CIRIA 1996.

Department of the Environment. 1995. Industry Profiles - 48 separate publications available from The Stationery Office, London

Environment Agency. R&D Publication 20. Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources. 1999.

Specification for Highways Works – Series 600 Earthworks November 2016.

APPENDIX 1 - Plans



CLIENT
SOUTHWAY HOUSING
PROJECT TITLE
DIDSBURY POINT
PLAN TITLE
PROJECT LOCATION PLAN

DATE
APRIL 2021
SCALE
NTS
PLAN NUMBER
GRO-20064-P01

Rev.
Details
Date

Status
Preliminary
Draft
Issued
For Comment
Approved

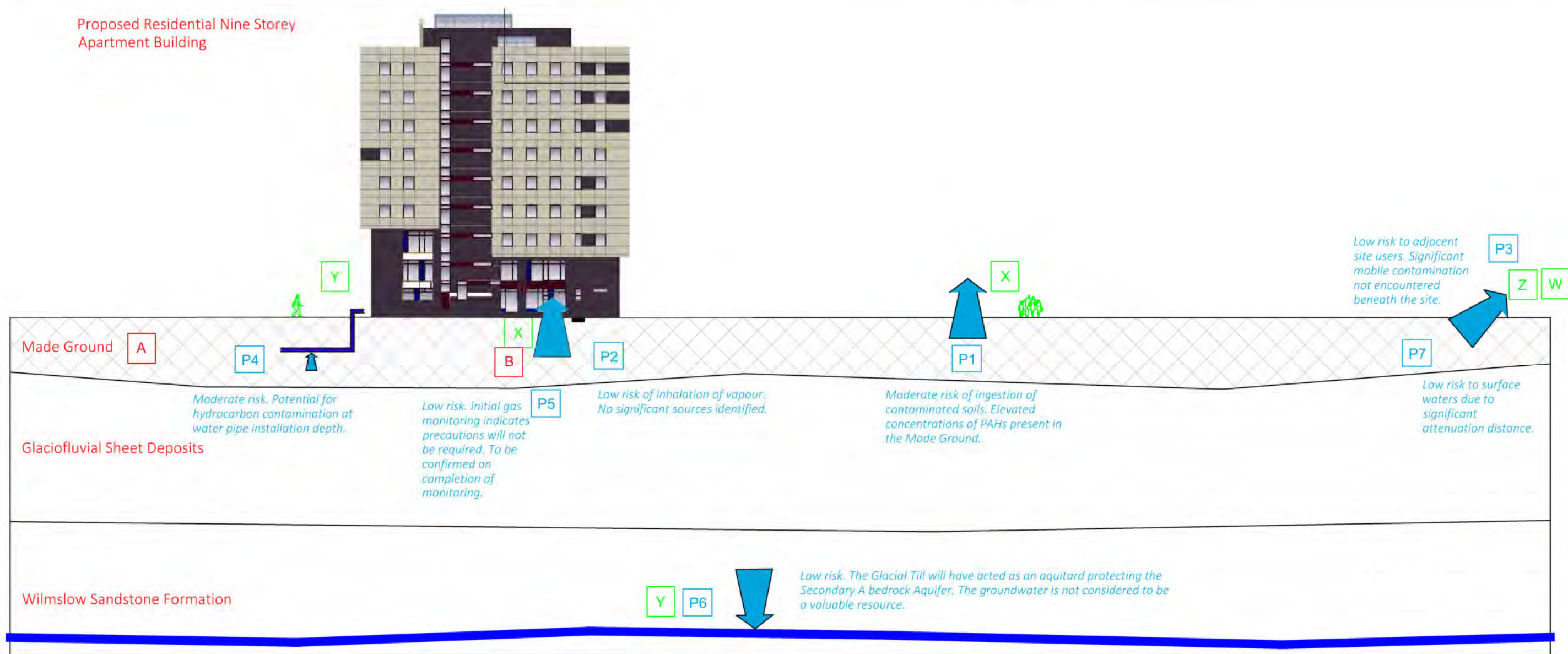
Notes
 SITE LOCATION



SOURCES
A. Contaminated soils / Made Ground.
B. Ground gas.

POLLUTION LINKAGES
P1. Ingestion of soil and dust.
P2. Inhalation of vapour.
P3. Inhalation of soil dust by adjacent site users.
P4. Attacking of potable water supply pipe.
P5. Migration and accumulation of ground gas in internal places.
P6. Impaction of groundwater from soil contamination.
P7. Migration of soil and groundwater contamination impacting surface waters.

RECEPTORS
W. River Mersey c. 820m south of the site.
X. Site end users.
Y. Groundwater within the underlying Secondary A Superficial and Princial bedrock Aquifers.
Z. Adjacent site users.



GROUNDTECH CONSULTING G	CLIENT	DATE				Status		Notes
	SOUTHWAY HOUSING	APRIL 2021				Preliminary		
	PROJECT TITLE	SCALE				Draft		
	DIDSBURY POINT	NTS				Issued		
	PLAN TITLE	PLAN NUMBER				For Comment		
	ILLUSTRATIVE REVISED CSM	GRO-20064-P03	Rev.	Details	Date	Approved		G

APPENDIX 2 - Site Photographs



Photograph 1 – Central and eastern areas



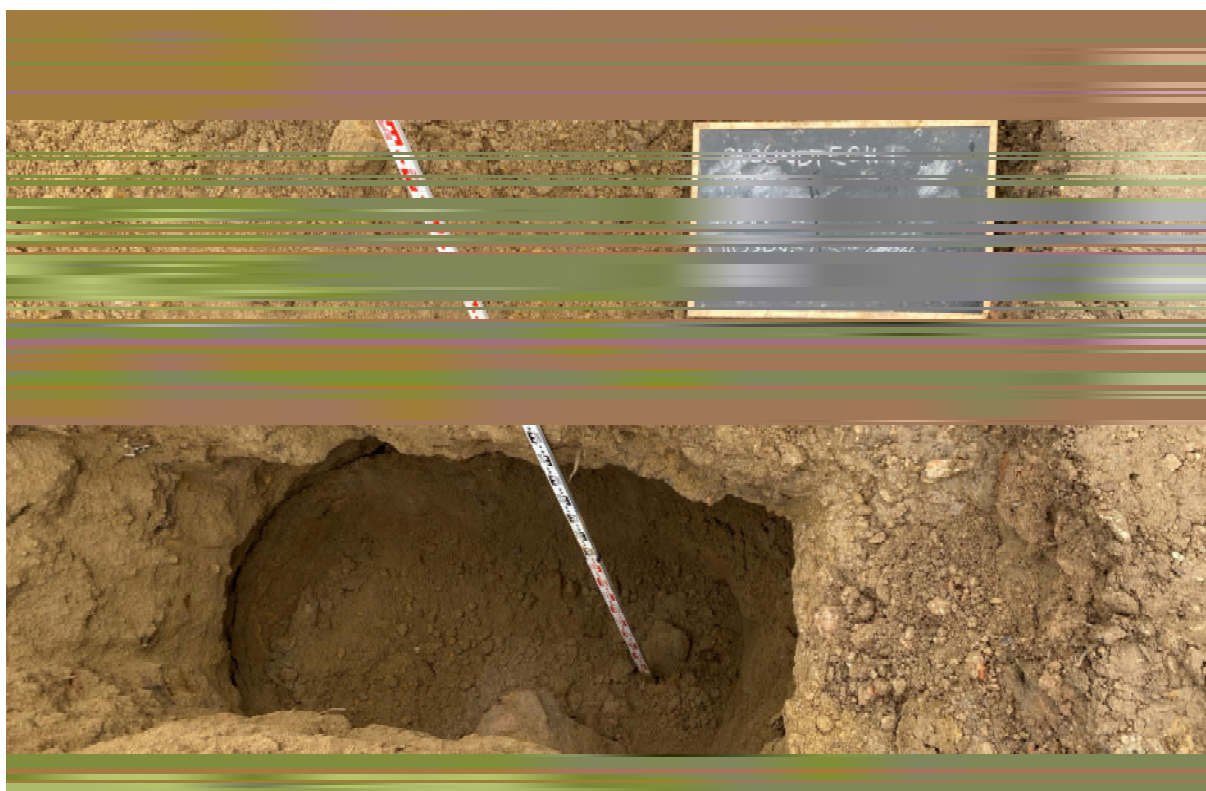
Photograph 2 – Former substation in the west



Photograph 3 – Northern site area



Photograph 4 - TP02



Photograph 5 – TP03



Photograph 6 – TP04

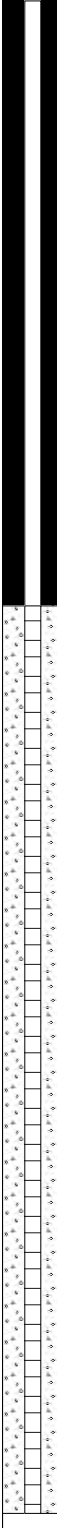


Photograph 7 – IP3

APPENDIX 3 - Exploratory Hole Logs

Rotary Core Log

Project Name: DIDSBUY POINT				Client: SOUTHWAY HOUSING				Date: 01/02/2021 - 03/02/2021			
Location: MANCHESTER				Contractor:							
Project No. : GRO-20064				Crew Name:				Drilling Equipment:			
Borehole Number BH01		Hole Type CP+RC		Level		Logged By CJH		Scale 1:50		Page Number Sheet 1 of 4	

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
		0.20	ES					0.10			MADE GROUND: Grass over brown sandy gravelly topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete, rubber and glass.	1
		0.50	ES									
		1.00	ES								MADE GROUND: Brown grey very gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete, plastic and wood.	1
		1.20 - 1.65	D				N=50 (22.22/50 for 270mm)					
		2.00	D				(18)	2.00			MADE GROUND: Brown grey slightly clayey gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of brick and concrete.	2
		2.00 - 2.45	ES									
		3.00	D				(13)					3
		3.00 - 3.45	ES									
		4.00	D				(15)	4.00			Brown grey sandy subrounded to rounded fine to coarse GRAVEL of mixed lithologies.	4
		4.00 - 4.45	ES								Firm high strength brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mixed lithologies.	4
	5.00 - 5.45	U									5	
	5.50	D									6	
	6.50 - 6.95	D				(10)					7	
	8.00 - 8.45	U						8.00			Firm to stiff medium strength brown CLAY.	8
	8.50	D									9	
	9.50 - 9.95	D				(13)					10	

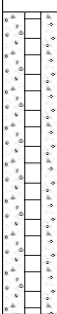
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

Remarks															
1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 3.50m bgl. 4. Sandstone bedrock encountered at 24.40m bgl. 5. Cable percussive drilling terminated at 24.40m bgl. 6. Rotary core follow on to 33.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).															



Rotary Core Log

Project Name: DIDSBURY POINT			Client: SOUTHWAY HOUSING			Date: 01/02/2021 - 03/02/2021		
Location: MANCHESTER			Contractor:					
Project No. : GRO-20064			Crew Name:			Drilling Equipment:		
Borehole Number BH01		Hole Type CP+RC		Level		Logged By CJH		Page Number Sheet 2 of 4

Well	Water	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		10.50	D				10.50			Firm to stiff medium strength brown CLAY.	
		11.00 - 11.45	D				11.00			Firm to stiff red brown sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mixed lithologies.	11
										Medium dense brown clayey gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	
		12.50 - 12.95	U				12.00			Firm to stiff very high strength brown slightly sandy CLAY.	12
											13
		14.00 - 14.45	D								14
											15
		15.50 - 15.95	U								
		16.00 - 16.45	D								16
		17.00 - 17.45	D				17.00			Very dense brown very clayey gravelly SAND. Gravel is subangular to rounded fine to coarse of mixed lithologies.	17
		18.50 - 18.95	D								18
		19.20	D				19.20			Stiff brown slightly sandy CLAY.	19
		19.50	D				19.50			Dense brown clayey gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	
			D								20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 3.50m bgl. 4. Sandstone bedrock encountered at 24.40m bgl. 5. Cable percussive drilling terminated at 24.40m bgl. 6. Rotary core follow on to 33.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).



Rotary Core Log

Project Name: DIDSBUY POINT			Client: SOUTHWAY HOUSING			Date: 01/02/2021 - 03/02/2021		
Location: MANCHESTER			Contractor:					
Project No. : GRO-20064			Crew Name:			Drilling Equipment:		
Borehole Number BH01		Hole Type CP+RC		Level		Logged By CJH		Page Number Sheet 3 of 4

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
		20.00 - 20.45									Dense brown clayey gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	21
		21.50 - 21.95	D				N=50 (10,15/50 for 270mm)	22.20				22
		22.50	D								Very dense red brown slightly gravelly SAND. Gravel is angular to subrounded fine to coarse of sandstone. <i>Becoming cobbly between 22.20m bgl and 23.00m bgl.</i>	23
		23.00 - 23.45	D				N=50 (6,7/50 for 295mm)					24
		23.50	D									25
								24.40			Extremely weak red brown SANDSTONE residually weathered recovered as gravelly sand. Gravel is angular to subrounded fine to coarse of mixed lithologies.	26
												27
												28
												29
												30
			NR					27.50			NO RECOVERY.	
		27.50 - 29.00	9	51	51	16		27.91			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	
		29.00 - 30.50	NR	85	85	0		29.00			NO RECOVERY.	
			14					29.48			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 3.50m bgl. 4. Sandstone bedrock encountered at 24.40m bgl. 5. Cable percussive drilling terminated at 24.40m bgl. 6. Rotary core follow on to 33.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).



Rotary Core Log

Project Name: DIDSBURY POINT			Client: SOUTHWAY HOUSING			Date: 01/02/2021 - 03/02/2021		
Location: MANCHESTER			Contractor:					
Project No. : GRO-20064			Crew Name:			Drilling Equipment:		
Borehole Number BH01		Hole Type CP+RC		Level		Logged By CJH		Page Number Sheet 4 of 4

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
								30.50			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities. NO RECOVERY.	
			NR					30.99				
		30.50 - 32.00	15	67	67	14		32.00			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	31
		32.00 - 33.50	NR	24	22	0		33.13			NO RECOVERY.	32
			3 3					33.50			Extremely weak red SANDSTONE extremely weathered with horizontal smooth to rough planar discontinuities. <i>Between 33.29 and 33.33m bgl recovered as sandy angular to subrounded fine to coarse gravel.</i>	33
											End of Borehole at 33.500m	34
												35
												36
												37
												38
												39
												40

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

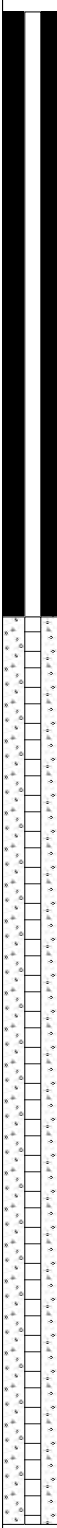
Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 3.50m bgl. 4. Sandstone bedrock encountered at 24.40m bgl. 5. Cable percussive drilling terminated at 24.40m bgl. 6. Rotary core follow on to 33.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).



Rotary Core Log

Project Name: DIDSBURY POINT			Client: SOUTHWAY HOUSING			Date: 03/02/2021 - 05/02/2021		
Location: MANCHESTER			Contractor:					
Project No. : GRO-20064			Crew Name:			Drilling Equipment:		
Borehole Number BH02		Hole Type CP+RC		Level		Logged By CJH		Page Number Sheet 1 of 3

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
		0.10									MADE GROUND: Grass over brown sandy gravelly topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete, rubber and glass.	
		0.50	ES									
		1.00	ES								MADE GROUND: Brown grey very gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete.	1
		1.20 - 1.65	D				(10)				MADE GROUND: Brown grey sandy angular to subangular fine to coarse gravel of mixed lithologies including brick and concrete.	
		2.00	D				(20)				Medium dense brown gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	2
		2.00 - 2.45	ES									
		3.00	D				(14)					
		3.00 - 3.45	ES									
		4.00 - 4.45	D				(11)	4.00			Firm brown slightly sandy silty CLAY with occasional sand and gravel bands present.	4
		4.50	D									
		5.00 - 5.45	B									
		5.00 - 5.50	U									
		5.50 - 5.95	D				(12)					
		6.00	D									
		6.50 - 6.95	D				(16)					
		8.00 - 8.95	U								Medium strength at 8.0m bgl.	8
		8.50	D									
		9.50 - 9.95	D				(18)					
												10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

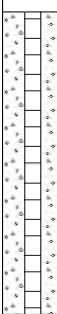
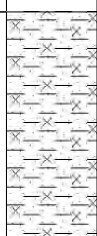
Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 1.5m bgl. 4. Sandstone bedrock encountered at 23.00m bgl. 5. Cable percussive drilling terminated at 23.50m bgl. 6. Rotary core follow on to 29.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).



Rotary Core Log

Project Name: DIDSBURY POINT				Client: SOUTHWAY HOUSING				Date: 03/02/2021 - 05/02/2021			
Location: MANCHESTER				Contractor:							
Project No. : GRO-20064				Crew Name:				Drilling Equipment:			
Borehole Number BH02		Hole Type CP+RC		Level		Logged By CJH		Scale 1:50		Page Number Sheet 2 of 3	

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
		11.00 - 11.45	U								Firm brown slightly sandy silty CLAY with occasional sand and gravel bands present.	11
		11.50	D					11.50			Medium strength at 11.0m bgl.	
		12.00	D								Firm to stiff brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse of mixed lithologies with occasional sand and gravel bands.	12
		12.50 - 12.95	D				N=50 (8,12/50 for 215mm)					13
		13.50	D									
		14.00 - 14.45	B									14
		14.00 - 14.50	D				(53)					
		14.50 - 14.95	D									15
		15.00	D									
		15.50 - 15.95	D				N=50 (5,9/50 for 225mm)					16
		16.50	D									
		17.00 - 17.45	D				N=50 (8,12/50 for 265mm)					17
		18.00	D									18
		18.50 - 18.95	U					18.50			Stiff high strength brown slightly sandy CLAY.	19
		19.00	D					19.50			Stiff red brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of mixed lithologies.	20
			D									

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

Remarks															
1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 1.5m bgl. 4. Sandstone bedrock encountered at 23.00m bgl. 5. Cable percussive drilling terminated at 23.50m bgl. 6. Rotary core follow on to 29.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).															

Rotary Core Log

Project Name: DIDSBUY POINT				Client: SOUTHWAY HOUSING				Date: 03/02/2021 - 05/02/2021			
Location: MANCHESTER				Contractor:							
Project No. : GRO-20064				Crew Name:				Drilling Equipment:			
Borehole Number BH02		Hole Type CP+RC		Level		Logged By CJH		Scale 1:50		Page Number Sheet 3 of 3	

Well	Water	Depth (m)	Type /FI	Coring			Diameter Recovery (SPT)	Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD						
		20.00 - 20.45					N=50 (7,12/50 for 280mm)				Stiff red brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of mixed lithologies.	21
		21.50 - 21.95	D				N=50 (9,15/50 for 265mm)					22
		23.00 - 23.45	D				N=50 (10,15/50 for 280mm)	23.00			Extremely weak red brown SANDSTONE residually weathered recovered as gravelly sand. Gravel is angular to subrounded fine to coarse of mixed lithologies.	23
		23.50 - 25.00	NR					23.50			NO RECOVERY.	
			7	67	28	0	23.99			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	24	
		25.00	D					25.00			NO RECOVERY.	25
		25.00 - 26.50	NR								Extremely weak red SANDSTONE extremely weathered with horizontal smooth to rough planar discontinuities.	
			11	82	73	0			From 25.20m and 25.29m bgl recovered as firm grey sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone between. From 25.85 to 25.89m bgl firm grey sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone.	26		
		26.00	D					26.50			NO RECOVERY.	
		27.00	NR								Extremely weak red SANDSTONE residually weathered recovered as sandy angular to subangular fine to coarse gravel.	
			NI	72	56	13	26.99			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	27	
		26.50 - 28.00	12					27.26				
28.00 - 29.50	NR						28.00			NO RECOVERY.	28	
	18	83	83	30	28.25			Extremely weak red SANDSTONE distinctly weathered with horizontal smooth to rough planar discontinuities.	29			
							29.50			End of Borehole at 29.500m	30	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	Depth Top	Depth Base	Type	Colour	Min (%)	Max (%)

Remarks															
1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater seepage from Made Ground at 1.5m bgl. 4. Sandstone bedrock encountered at 23.00m bgl. 5. Cable percussive drilling terminated at 23.50m bgl. 6. Rotary core follow on to 29.5m bgl. 7. Monitoring standpipe installed to 12.00m bgl (4.00m plain, 8.00m slotted).															



Borehole Log

Borehole No.

BH03

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -

Hole Type
CP

Location: MANCHESTER

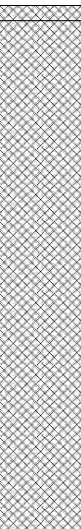
Level:

Scale
1:50

Client: SOUTHWAY HOUSING

Dates: 04/02/2021 - 04/02/2021

Logged By
CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10			MADE GROUND: Grass over brown sandy gravelly topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete, rubber and glass. MADE GROUND: Brown grey very gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete.	1
		0.50	ES						
		0.50	ES						
		1.00	ES						
		1.20		N=50 (5,10/50 for 227mm)					
		2.00	ES					Brown clayey gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	2
		2.00		N=39 (3,4/5,10,10,14)					
		3.00	B						3
		3.00		N=23 (5,3/5,5,6,7)	3.50				
		4.00	B						4
		4.00		N=25 (4,5/4,5,6,10)	4.30			Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mixed lithologies.	
		5.00	B		5.00				5
		5.00		N=18 (3,4/4,5,4,5)				End of borehole at 5.00 m	
									6
									7
									8
									9
									10

Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater encountered at 2.00m bgl rising to 1.80m bgl after 20 minutes. 4. Monitoring standpipe installed to 5.00m bgl (4.00m plain, 1.00m slotted).



Borehole Log

Borehole No.

BH04

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -

Hole Type
CP

Location: MANCHESTER

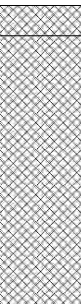
Level:

Scale
1:50

Client: SOUTHWAY HOUSING

Dates: 04/02/2021 - 05/02/2021

Logged By
CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			MADE GROUND: Brown grey very gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete.	
		1.00 1.20	ES	N=23 (3,4/4,6,6,7)				MADE GROUND: Brown clayey gravelly fine to coarse sand. Gravel is rounded to subrounded fine to coarse of mixed lithologies including brick.	1
		2.00 2.00	ES	N=20 (1,1/4,4,7,5)	2.00			Medium dense brown gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	2
		3.00 3.00	D	N=17 (1,1/3,4,4,6)					3
		4.00 4.00	D	N=16 (1,3/4,3,4,5)					4
		5.00 5.00	D	N=29 (4,5/7,6,6,10)	5.00			End of borehole at 5.00 m	5
									6
									7
									8
									9
									10

Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater encountered at 2.50m bgl rising to 2.10m bgl after 20 minutes. 4. Monitoring standpipe installed to 5.00m bgl (2.00m plain, 3.00m slotted).



Borehole Log

Borehole No.

BH05

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -

Hole Type
CP

Location: MANCHESTER

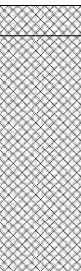
Level:

Scale
1:50

Client: SOUTHWAY HOUSING

Dates: 05/02/2021 - 05/02/2021

Logged By
CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	ES		0.20			MADE GROUND: Brown grey very gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, concrete.	1
		1.00	ES					MADE GROUND: Brown clayey gravelly fine to coarse sand. Gravel is rounded to subrounded fine to coarse of mixed lithologies including brick.	
		1.20		N=25 (3,4/4,7,9,5)					
		2.00	ES		1.80			Medium dense brown gravelly fine to coarse SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	2
		2.00		N=17 (2,3/5,4,5,3)					
		3.00	D						3
		3.00		N=20 (3,3/3,5,6,6)					
		4.00	D						4
		4.00		N=17 (3,4/5,4,4,4)					
		5.00	D		5.00			End of borehole at 5.00 m	5
		5.00		N=19 (3,3/4,4,5,6)					6
									7
									8
									9
									10

Remarks

1. Location cleared using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater encountered at 2.50m bgl rising to 2.20m bgl after 20 minutes. 4. Monitoring standpipe installed to 5.00m bgl (1.00m plain, 4.00m slotted).



Trial Pit Log

Trialpit No
IP3
Sheet 1 of 1

Project Name: DIDSBURY POINT	Project No. GRO-20064	Co-ords: - Level:	Date 04/02/2021
Location: MANCHESTER	Dimensions (m): Depth 1.60		Scale 1:25 Logged CJH
Client: SOUTHWAY HOUSING		1.2	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20 0.20	B ES		0.30			MADE GROUND: Brown gravelly sandy slightly clayey topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including plastic, brick, concrete and wood.	
	0.50 0.50	B ES		0.60			MADE GROUND: Grey slightly sandy angular to subangular fine to coarse gravel of mixed lithologies.	
	0.90 1.00	B ES		1.10			MADE GROUND: Brown grey gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete.	1
	1.50 1.60	B ES		1.60			MADE GROUND: Light grey brown gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete.	
							End of pit at 1.60 m	2
								3
								4
								5

Remarks: 1. Location cleared using handheld CAT scanner. 2. Trial pit excavated to 1.60m bgl. 3. Soil percolation test conducted 4. No groundwater encountered. 5. Trial pit backfilled with arisings.

Stability:



Trial Pit Log

Trialpit No

PLT01

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -
Level:

Date
03/02/2021

Location: MANCHESTER

Dimensions (m):

1.3

Depth
0.35

0.7

Scale
1:25

Logged
CJH

Client: SOUTHWAY HOUSING

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	B					
	0.10	ES		0.20			MADE GROUND: Brown gravelly sandy slightly clayey topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including plastic, brick, concrete and wood.
	0.30	B					
	0.30	ES		0.35			MADE GROUND: Grey slightly sandy angular to subangular fine to coarse gravel of mixed lithologies. End of pit at 0.35 m

1

2

3

4

5

Remarks: 1. Location cleared using handheld CAT scanner. 2. Plate load CBR test conducted at 0.35m bgl. 3. No groundwater encountered. 4. Trial pit backfilled with arisings.

Stability:





Trial Pit Log

Trialpit No

TP02

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -
Level:

Date
03/02/2021

Location: MANCHESTER

Dimensions (m): 1.5
Depth 2.70

Scale
1:25

Logged
CJH

Client: SOUTHWAY HOUSING

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
							MADE GROUND: Degraded tarmac gravel.	1	
	0.20 0.30	ES B		0.20			MADE GROUND: Light grey slightly sandy angular to subangular fine to coarse gravel of mixed lithologies.		
	0.50 0.50	B ES		0.40 0.42			MADE GROUND: Geo-membrane. MADE GROUND: Orange brown slightly clayey gravelly sand. Gravel is angular to subangular fine to coarse of brick, concrete, plastic and wood.	1	
	1.00	ES		0.80			MADE GROUND: Brown grey gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete.		
	1.40 1.40	B D		1.50				2	
	2.00	ES					Orange slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of mixed lithologies.		
	2.20	ES					2		
	2.50 2.50	B D				2.70			3
									5

Remarks: 1. Location cleared using handheld CAT scanner. 2. Plate load CBR test conducted at 0.35m bgl. 3. Trial pit excavated to 2.70m bgl. 4. Groundwater encountered at 2.20m bgl. 5. Trial pit walls unstable due to collapse from sand strata. 6. Trial pit backfilled with arisings.

Stability:



Trial Pit Log

Trialpit No

TP03

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -
Level:

Date
04/02/2021

Location: MANCHESTER

Dimensions (m):

1.3

Depth
2.10

0.7

Scale
1:25

Logged
CJH

Client: SOUTHWAY HOUSING

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
▼	0.10	B		0.20			MADE GROUND: Brown gravelly sandy slightly clayey topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including plastic, brick, concrete and wood.	1	
	0.20	ES							
	0.30	B					MADE GROUND: Orange brown slightly clayey gravelly sand. Gravel is angular to subangular fine to coarse of brick, concrete, plastic and wood.		
	0.50	ES			0.60			MADE GROUND: Grey brown slightly clayey gravelly sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick.	
	1.00	B							
	1.00	D							
	1.00	ES			1.10			Grey brown slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of mixed lithologies.	
	1.50	B							
	2.00	ES							
	2.10	B			2.10			Orange slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of mixed lithologies.	2
	2.10	D							
	2.10	ES							
End of pit at 2.10 m							3		
								4	
								5	

Remarks: 1. Location cleared using handheld CAT scanner. 2. Plate load CBR test conducted at 0.35m bgl. 3. Trial pit excavated to 2.10m bgl. 4. Groundwater encountered at 1.90m bgl. 5. Trial pit walls unstable due to collapse from sand strata. 6. Soil percolation test conducted between 1.50m bgl and 2.10m bgl within natural sand strata. 7. Trial pit backfilled with arisings.

Stability:



Trial Pit Log

Trialpit No

TP04

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -
Level:

Date
04/02/2021

Location: MANCHESTER

Dimensions (m):

1.4

Scale
1:25

Client: SOUTHWAY HOUSING

Depth
2.10

0.8

Logged
CJH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼	0.10	B		0.15			MADE GROUND: Brown gravelly sandy slightly clayey topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including plastic, brick, concrete and wood.	1
	0.20	B						
	0.20	ES						
	0.50	B		0.80			MADE GROUND: Orange brown sandy cobbly angular to subangular fine to coarse gravel of brick, concrete, plastic and wood.	
	0.50	ES						
	1.00	B				MADE GROUND: Brown cobbly gravelly fine to coarse sand. Gravel is angular to subangular of brick, concrete, wood, glass and metal. Large pieces of concrete and adjoined brick foundation associated with former slab of hospital building between 0.8m bgl and 1.5m bgl.	2	
	1.00	ES						
	2.00	B		2.10				3
	2.00	ES						
End of pit at 2.10 m							4	
							5	

Remarks: 1. Location cleared using handheld CAT scanner. 2. Plate load CBR test conducted at 0.35m bgl. 3. Trial pit excavated to 2.10m bgl. 4. Groundwater encountered at 2.00m bgl. 5. Trial pit terminated due to presence of metal and plastic pipe associated with former hospital building. 6. Trial pit backfilled with arisings.

Stability:



Trial Pit Log

Trialpit No

TP05

Sheet 1 of 1

Project Name: DIDSBURY POINT

Project No.
GRO-20064

Co-ords: -
Level:

Date
04/02/2021

Location: MANCHESTER

Dimensions (m):

1.6

Scale
1:25

Client: SOUTHWAY HOUSING

Depth
2.20

0.6

Logged
CJH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	B					MADE GROUND: Brown gravelly sandy slightly clayey topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including plastic, brick, concrete and wood.	
	0.20	ES		0.20				
	0.50	B					MADE GROUND: Grey brown slightly clayey gravelly sand with abundant concrete cobbles and boulders. Gravel is angular to subangular fine to coarse of mixed lithologies including brick.	
	0.50	ES		0.70				
	0.90	B					MADE GROUND: Grey gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete.	
	1.00	ES		1.20				1
	1.50	B					Grey slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of mixed lithologies.	
	1.50	D		1.70				
	2.00	ES					Orange slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of mixed lithologies.	2
	2.20	B		2.20				
	2.20	D					End of pit at 2.20 m	
								3
								4
								5

Remarks: 1. Location cleared using handheld CAT scanner. 2. Plate load CBR test conducted at 0.35m bgl. 3. Trial pit excavated to 2.20m bgl. 4. Groundwater encountered at 2.10m bgl. 5. Trial pit walls unstable due to collapse from sand strata. 6. Trial pit backfilled with arisings.

Stability:



APPENDIX 4 - Geo-Environmental Testing Results

Groundtech Consulting Limited
PO Box 499
Manchester
M28 8EE

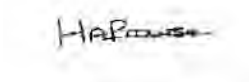


Attention :	Connor Hastings
Date :	24th February, 2021
Your reference :	20064
Our reference :	Test Report 21/1759 Batch 1
Location :	Didsbury Point
Date samples received :	9th February, 2021
Status :	Final report
Issue :	1

Forty six samples were received for analysis on 9th February, 2021 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Groundtech Consulting Limited
Reference: 20064
Location: Didsbury Point
Contact: Connor Hastings
EMT Job No: 21/1759

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	21-23	35-37	44-46	61-63	94	122-124					Please see attached notes for all abbreviations and acronyms		
Sample ID	BH2	BH4	BH5	TP02	TP04	IP3							
Depth	0.50	0.50	0.50	0.50	1.80	0.50							
COC No / misc													
Containers	V J T	V J	V J	V J T	T	V J T							
Sample Date	03/02/2021	04/02/2021	05/02/2021	03/02/2021	04/02/2021	04/02/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	09/02/2021	09/02/2021	09/02/2021	09/02/2021	09/02/2021	09/02/2021							
Arsenic #	3.1	4.3	4.9	13.6	8.3	2.4					<0.5	mg/kg	TM30/PM15
Cadmium #	0.6	0.3	0.2	8.4	0.2	1.3					<0.1	mg/kg	TM30/PM15
Chromium #	21.8	45.4	53.7	44.3	59.4	18.3					<0.5	mg/kg	TM30/PM15
Copper #	10	19	14	72	21	12					<1	mg/kg	TM30/PM15
Lead #	63	29	21	123	46	33					<5	mg/kg	TM30/PM15
Mercury #	0.4	0.2	0.1	0.4	0.4	0.4					<0.1	mg/kg	TM30/PM15
Nickel #	5.9	11.3	14.2	23.3	13.5	5.2					<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	1	<1	<1					<1	mg/kg	TM30/PM15
Zinc #	27	58	39	320	57	57					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.06	1.35 _{AA}	<0.04	0.85 _{AA}	0.06	<0.04					<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.42	<0.30 _{AA}	<0.03	<0.30 _{AA}	0.06	<0.03					<0.03	mg/kg	TM4/PM8
Acenaphthene #	2.15	1.73 _{AA}	<0.05	0.84 _{AA}	0.70	<0.05					<0.05	mg/kg	TM4/PM8
Fluorene #	2.12	1.34 _{AA}	<0.04	0.54 _{AA}	0.29	<0.04					<0.04	mg/kg	TM4/PM8
Phenanthrene #	15.23	9.01 _{AA}	0.41	4.58 _{AA}	3.01	0.29					<0.03	mg/kg	TM4/PM8
Anthracene #	6.77	3.10 _{AA}	0.11	0.97 _{AA}	0.78	0.08					<0.04	mg/kg	TM4/PM8
Fluoranthene #	>>26.37	13.71 _{AA}	0.83	5.86 _{AA}	3.33	0.63					<0.03	mg/kg	TM4/PM8
Pyrene #	>>21.94	11.83 _{AA}	0.76	5.64 _{AA}	2.79	0.59					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	10.07	5.59 _{AA}	0.40	3.50 _{AA}	1.04	0.37					<0.06	mg/kg	TM4/PM8
Chrysene #	9.39	5.83 _{AA}	0.39	3.29 _{AA}	1.02	0.33					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	16.00	13.14 _{AA}	0.74	5.28 _{AA}	1.70	0.60					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	9.04	7.90 _{AA}	0.42	2.87 _{AA}	0.99	0.34					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	5.19	5.43 _{AA}	0.28	1.71 _{AA}	0.61	0.22					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.98	0.79 _{AA}	0.06	<0.40 _{AA}	0.12	0.04					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	5.13	5.43 _{AA}	0.28	2.03 _{AA}	0.57	0.23					<0.04	mg/kg	TM4/PM8
PAH 16 Total	130.9	86.2 _{AA}	4.7	38.0 _{AA}	17.1	3.7					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	11.52	9.46 _{AA}	0.53	3.80 _{AA}	1.22	0.43					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	4.48	3.68 _{AA}	0.21	1.48 _{AA}	0.48	0.17					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	94 _{AA}	91	90 _{AA}	94	94					<0	%	TM4/PM8
Natural Moisture Content	8.1	15.5	17.1	19.5	16.7	9.0					<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0521	0.1008	0.1078	0.2323	0.2507	0.0137					<0.0015	g/l	TM38/PM20
Organic Matter	1.0	1.4	1.9	8.0	2.0	0.7					<0.2	%	TM21/PM24
pH #	8.94	8.56	8.66	8.82	11.22	9.02					<0.01	pH units	TM73/PM11

Client Name: Groundtech Consulting Limited
Reference: 20064
Location: Didsbury Point
Contact: Connor Hastings

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/1759	1	BH2	0.50	23	22/02/2021	General Description (Bulk Analysis)	soil/stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD
21/1759	1	BH4	0.50	37	22/02/2021	General Description (Bulk Analysis)	soil/stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD
21/1759	1	BH5	0.50	46	22/02/2021	General Description (Bulk Analysis)	Soil/Stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD
21/1759	1	TP02	0.50	63	22/02/2021	General Description (Bulk Analysis)	soil/stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD
21/1759	1	TP04	1.80	94	22/02/2021	General Description (Bulk Analysis)	Soil/Stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD
21/1759	1	IP3	0.50	124	22/02/2021	General Description (Bulk Analysis)	Soil/Stones
					22/02/2021	Asbestos Fibres	NAD
					22/02/2021	Asbestos ACM	NAD
					22/02/2021	Asbestos Type	NAD
					22/02/2021	Asbestos Level Screen	NAD

Client Name: Groundtech Consulting Limited **Matrix : Solid**

Reference: 20064

Location: Didsbury Point

Contact: Connor Hastings

Matrix : Solid

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/1759

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

AA	x10 Dilution
----	--------------

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics extracted.
#2	EU_Total but with fatty acids extracted.
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/1759

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

Groundtech Consulting Limited
PO Box 499
Manchester
M28 8EE

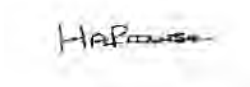


Attention :	Connor Hastings
Date :	1st March, 2021
Your reference :	20064
Our reference :	Test Report 21/1759 Batch 2
Location :	Didsbury Point
Date samples received :	23rd February, 2021
Status :	Final report
Issue :	1

Six samples were received for analysis on 23rd February, 2021 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Groundtech Consulting Limited
Reference: 20064
Location: Didsbury Point
Contact: Connor Hastings
EMT Job No: 21/1759

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Groundtech Consulting Limited

Reference: 20064

Location: Didsbury Point

Contact: Connor Hastings

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/1759

SOILS

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.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics extracted.
#2	EU_Total but with fatty acids extracted.
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/1759

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

APPENDIX 5 – Geotechnical Testing Results



LABORATORY REPORT



4043

Contract Number: PSL21/1438

Report Date: 11 March 2021
Client's Reference: 20120-1583
Client Name: Groundtech Consulting
PO Box 499
Manchester
M28 4EE

For the attention of: Richard Wyatt

Contract Title: Didsbury Point
Date Received: 16/2/2021
Date Commenced: 16/2/2021
Date Completed: 11/3/2021

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

L Knight
(Senior Technician)

R Berriman
(Quality Manager)

S Eyre
(Senior Technician)

S Royle
(Laboratory Manager)

T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



4043

PSL

Professional Soils Laboratory

Didsbury Point

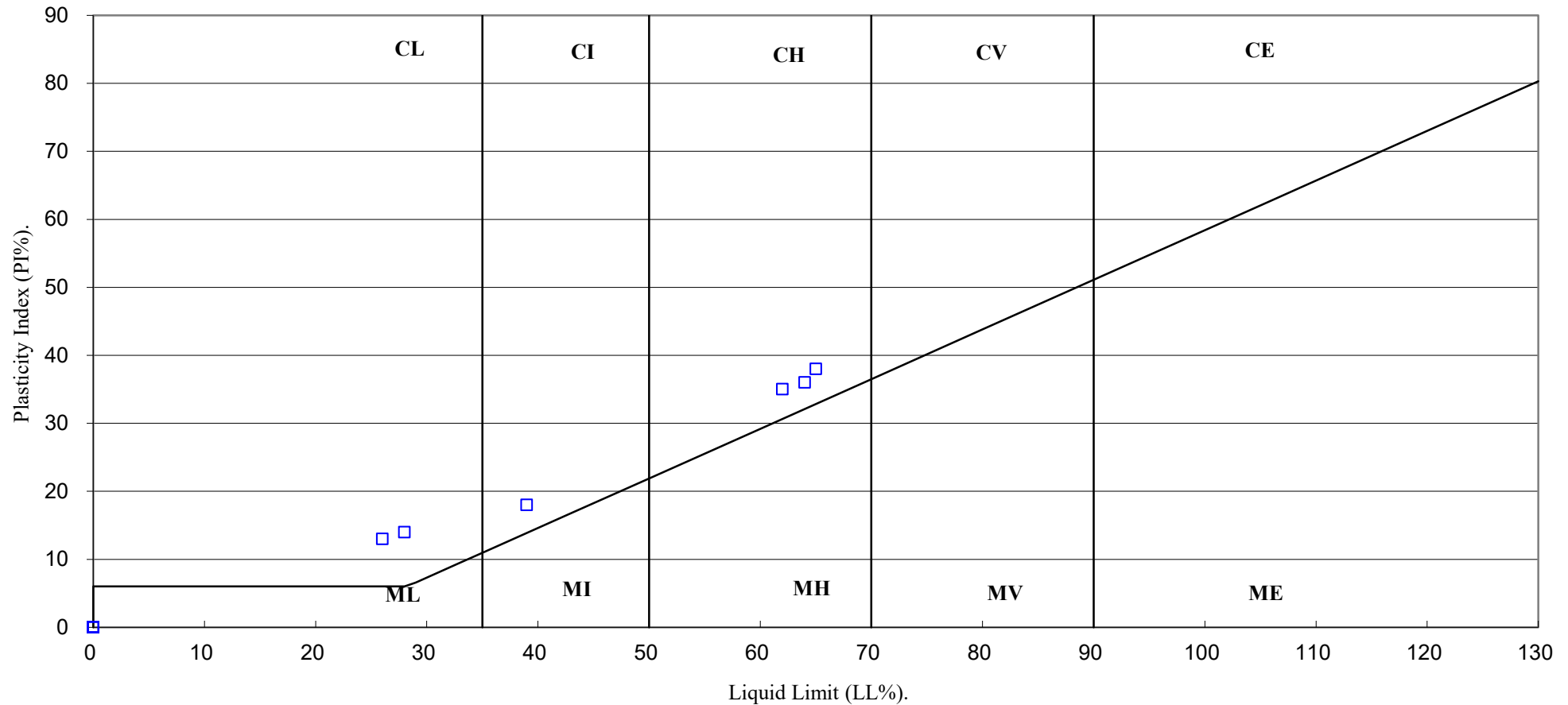
Contract No:

PSL21/1438

Client Ref:

GRO-20064

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

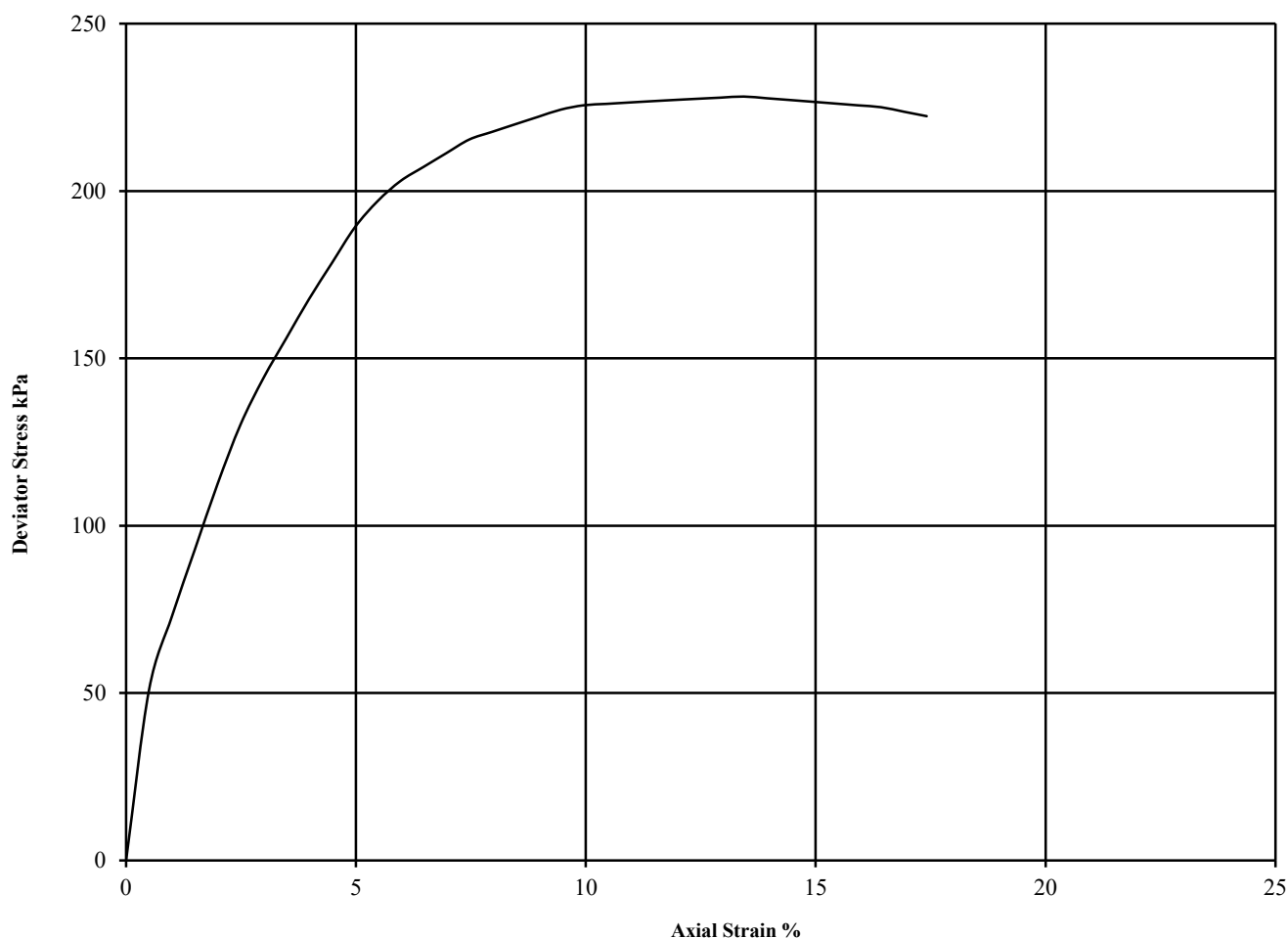
Hole Number: BH01

Top Depth (m): 5.00

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	22	2.05	1.68	100	228	114	13.4	Plastic	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

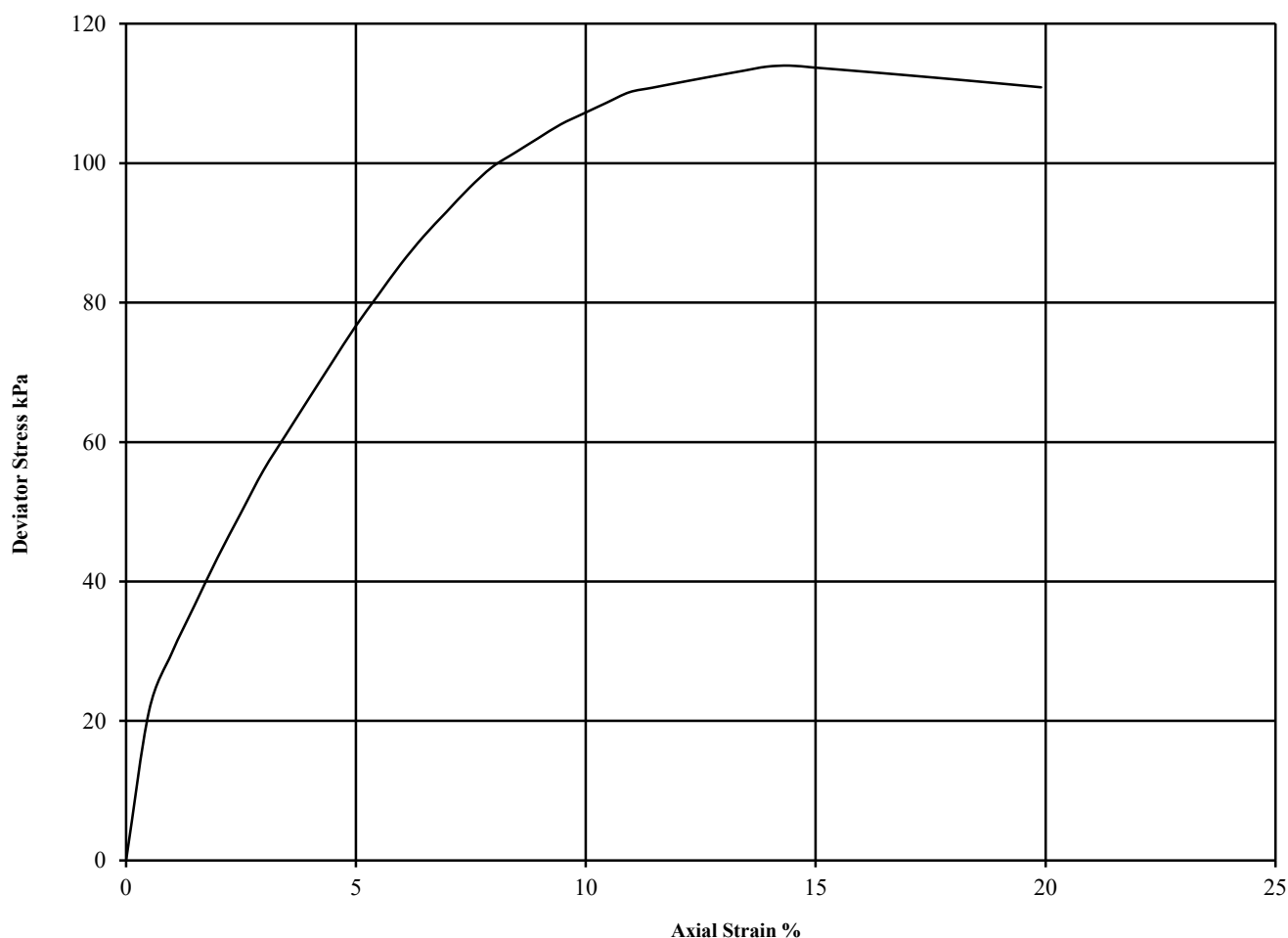
Hole Number: BH01

Top Depth (m): 8.00

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	32	1.92	1.45	160	114	57	14.4	Plastic	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

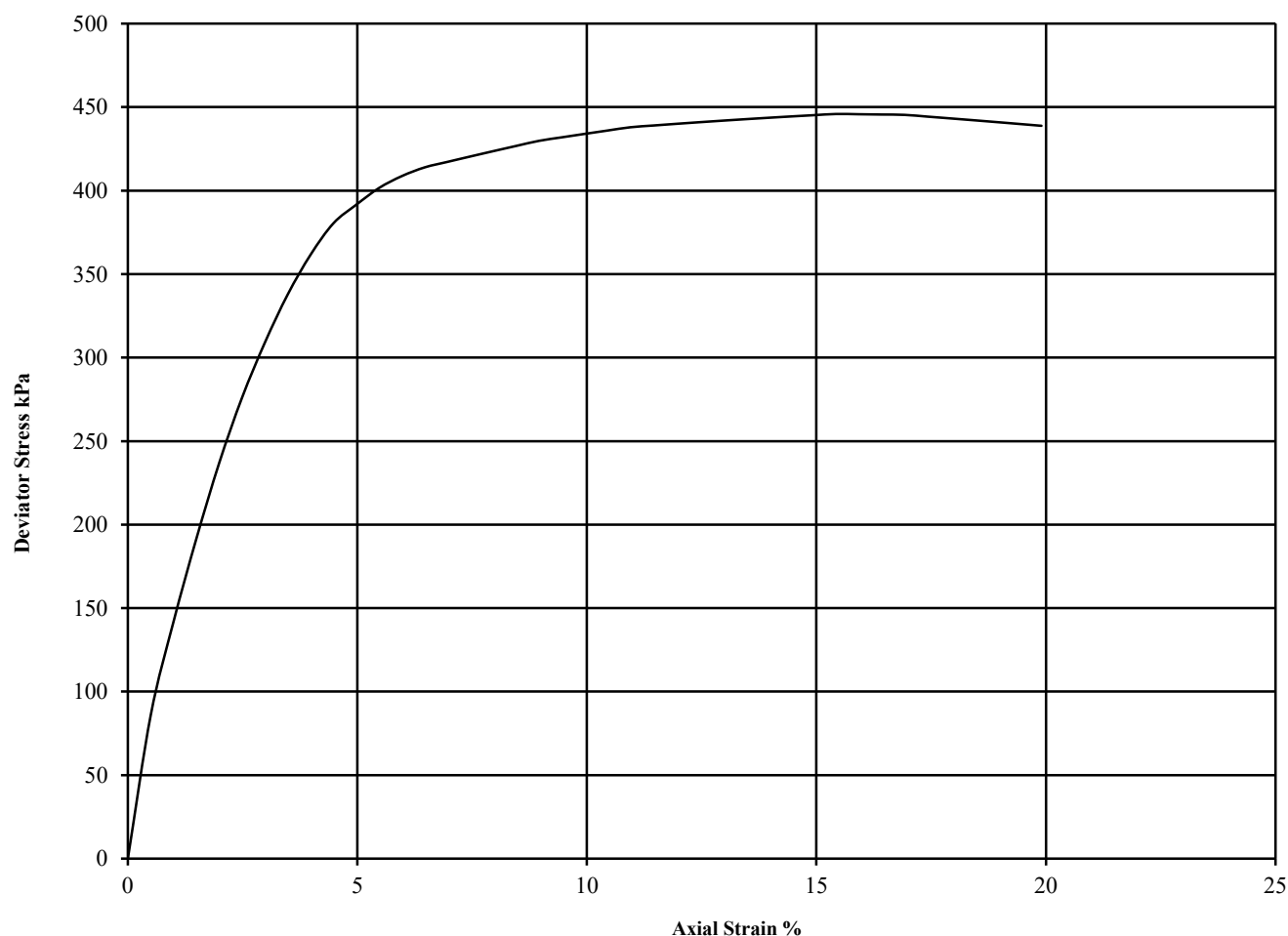
Hole Number: BH01

Top Depth (m): 12.50

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	12	2.24	2.00	250	446	223	15.4	Intermediate	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

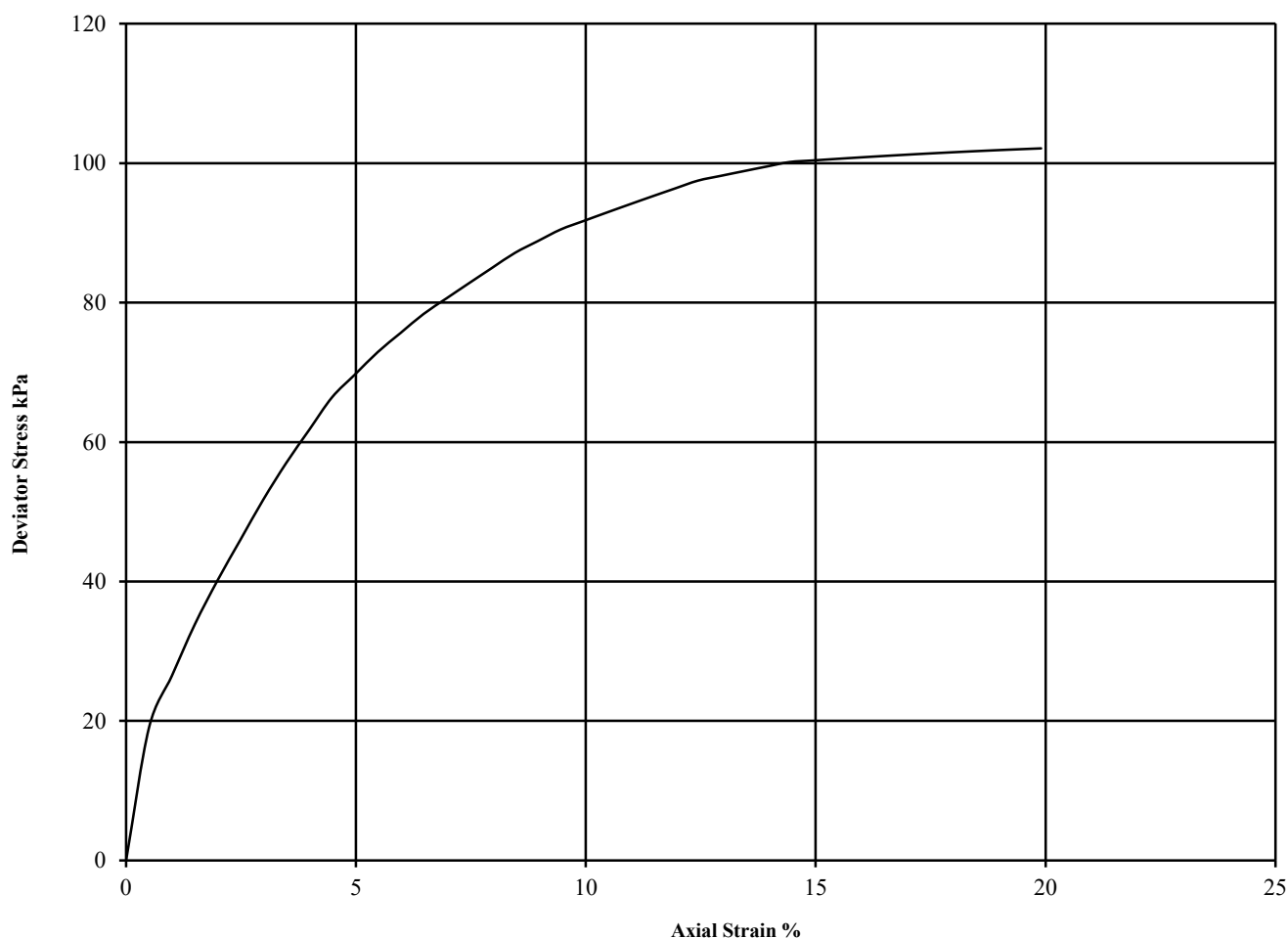
Hole Number: BH02

Top Depth (m): 8.00

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.33 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	29	1.96	1.52	160	102	51	19.9	Plastic	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

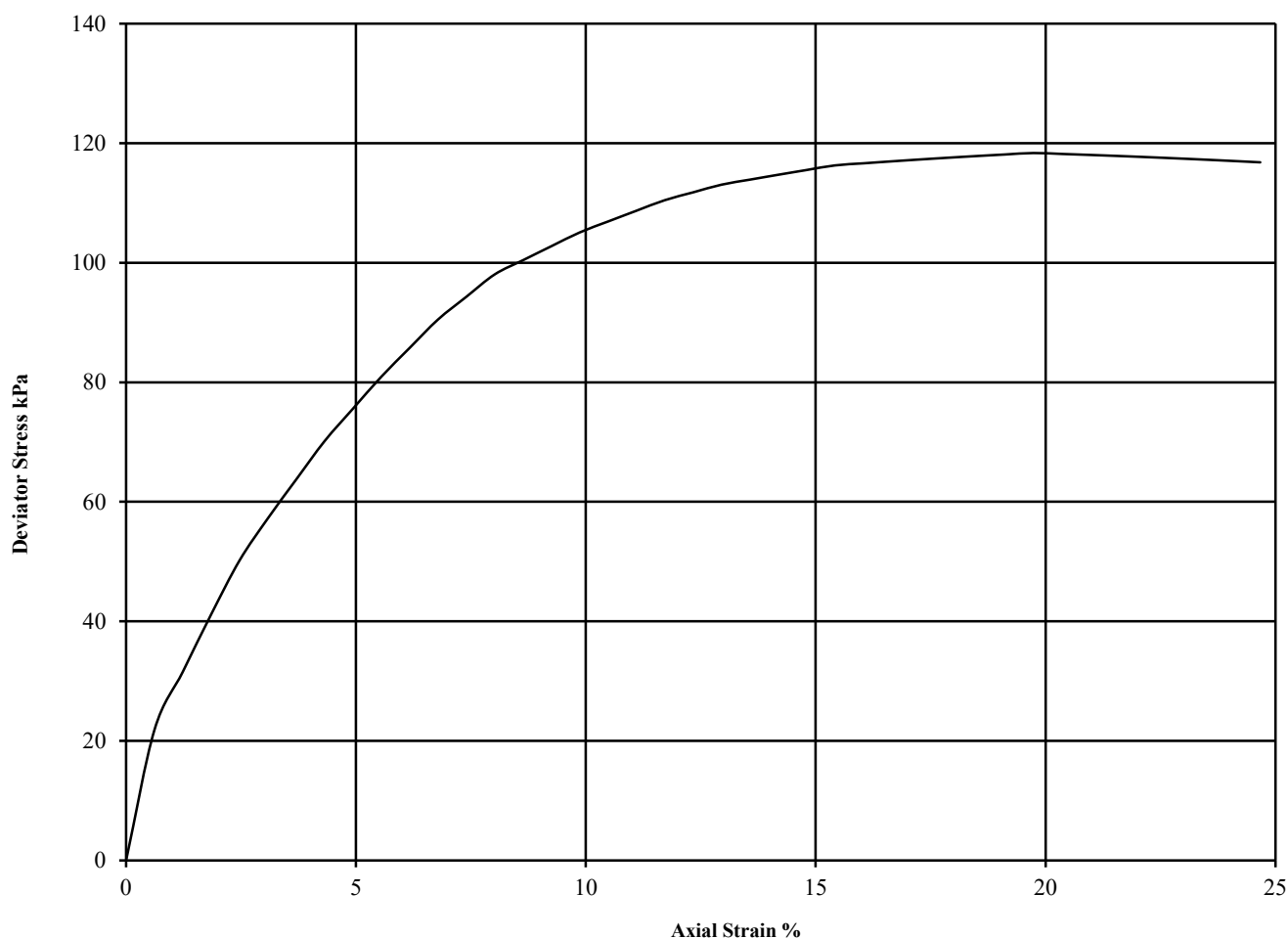
Hole Number: BH02

Top Depth (m): 11.00

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		167	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.33 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	13	2.11	1.87	220	118	59	19.7	Plastic	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

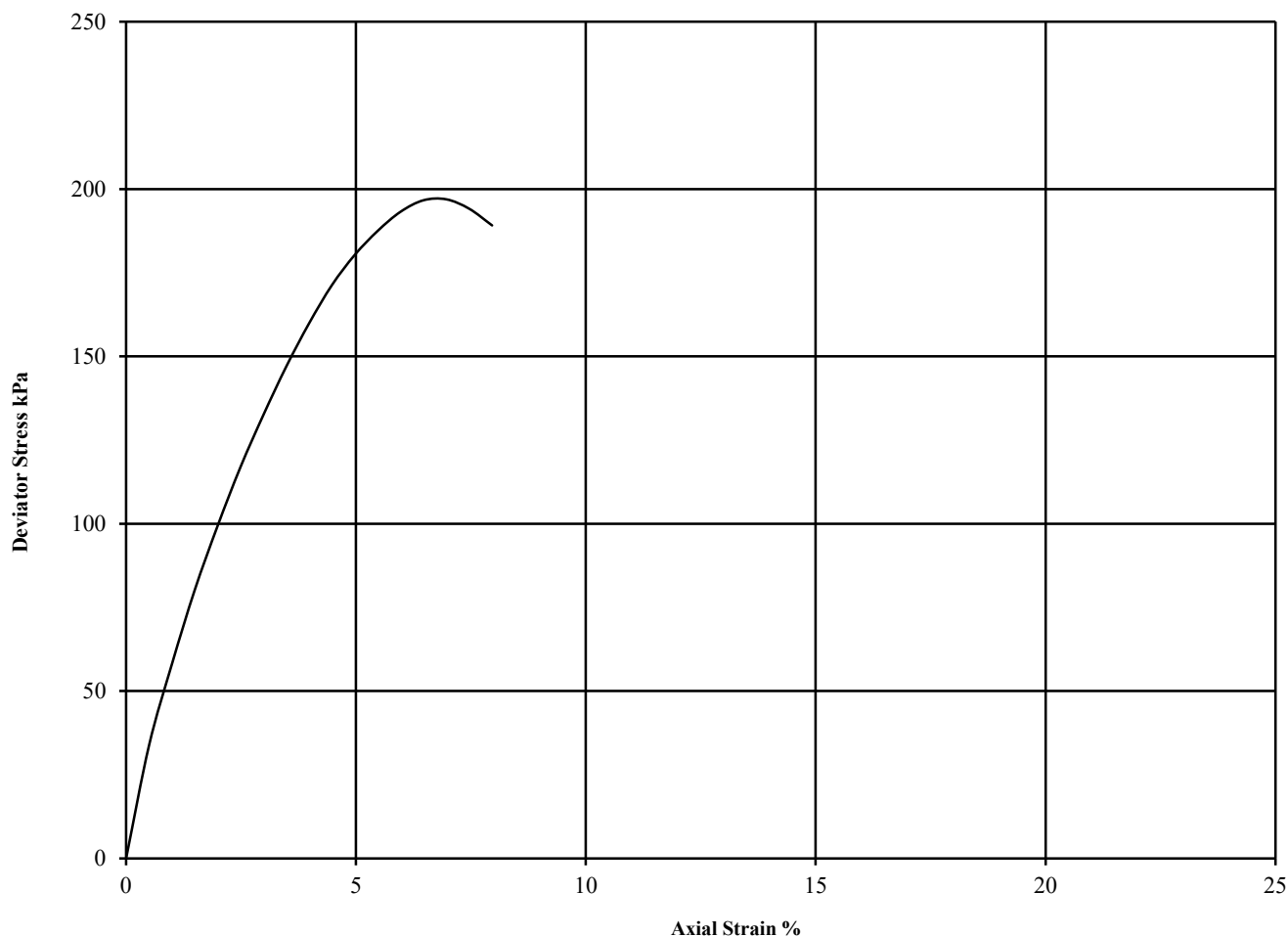
Hole Number: BH02

Top Depth (m): 18.50

Sample Number:

Base Depth (m):

Sample Type U



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.36 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	23	2.02	1.65	370	197	98	7.0	Brittle	



4043

PSL
Professional Soils Laboratory

Didsbury Point

Contract No:

PSL21/1438

Client Ref:

GRO-20064



LABORATORY REPORT



4043

Contract Number: PSL21/2135

Report Date: 24 March 2021
Client's Reference: GRO-20064
Client Name: Groundtech Consulting
First Floor
Lloyd House
Orford Court
Greenfold Way
WN7 3XJ

For the attention of: Connor Hastings

Contract Title: Didsbury Point
Date Received: 15/3/2021
Date Commenced: 15/3/2021
Date Completed: 24/3/2021

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Senior Technician)


S Eyre
(Senior Technician)

H Daniels
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
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awatkins@prosoils.co.uk

Page 1 of

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

[illegible]

Didsbury Point

Contract No:

PSL21/2135

Client Ref:

GRO-20064

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

[illegible]

***Note** All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular



Didsbury Point

Contract No:

PSL21/2135

Client Ref:

GRO-20064

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_c^2	D_c (mm)	Failure Load		I_s (MPa)	Corr Fac F	I_{s50} (MPa)	Failure Type	Remarks
				Par / Perp	L	D			(Mpa)	(kN)					
BH01	27.75		D	Par	-	84	7056	84.00	-	0.23	0.033	1.263	0.04	Valid	
BH01	28.90		D	Par	-	84	7056	84.00	-	0.30	0.043	1.263	0.05	Valid	
BH01	29.80		D	Par	-	84	7056	84.00	-	0.21	0.030	1.263	0.04	Valid	
BH01	31.10		D	Par	-	85	7225	85.00	-	0.07	0.010	1.270	0.01	Valid	
BH01	32.70		D	Par	-	85	7225	85.00	-	0.28	0.039	1.270	0.05	Valid	
BH02	24.80		D	Par	-	84	7056	84.00	-	0.08	0.011	1.263	0.01	Valid	
BH02	25.50		D	Par	-	85	7225	85.00	-	0.18	0.025	1.270	0.03	Valid	
BH02	26.20		D	Par	-	85	7225	85.00	-	0.17	0.024	1.270	0.03	Valid	
BH02	27.50		D	Par	-	85	7225	85.00	-	0.18	0.025	1.270	0.03	Valid	
BH02	28.70		D	Par	-	85	7225	85.00	-	0.08	0.011	1.270	0.01	Valid	

***Note** All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random



Didsbury Point

Contract No:

PSL21/2135

Client Ref:

GRO-20064

APPENDIX 6 – Interim Ground Gas Results

GROUNDTECH
CONSULTING

Pressure Trend:	Rising	Weather:	Sunny			Equipment:	GFM 436
Ambient:	O ₂ (%v/v)	CH ₄ (%v/v)	CO ₂ (%v/v)	LEL	H ₂ S (ppm)	CO (ppm)	
Start	20.5	0.0	0.0	0.0	0.0	0.0	
Finish	20.6	0.0	0.0	0.0	0.0	0.0	

Notes: BH02 monitoring pipe fallen.

GROUNDTECH
CONSULTING

Pressure Trend:	Steady	Weather:	Clear			Equipment:	GFM 436
Ambient:	O ₂ (%v/v)	CH ₄ (%v/v)	CO ₂ (%v/v)	LEL	H ₂ S (ppm)	CO (ppm)	
Start	20.5	0.0	0.0	0.0	0.0	0.0	
Finish	20.5	0.0	0.0	0.0	0.0	0.0	

Notes: BH02 monitoring pipe fallen.

APPENDIX 7 – Plate Load Test Results



LABORATORY REPORT



4043

Contract Number: PSL21/1039

Report Date: 04 February 2021

Client's Reference:

Client Name: Groundtech Consulting
First Floor
Lloyd House
Orford Court
Greenfold Way
WN7 3XJ

For the attention of: Connor Hastings

Contract Title: Didsbury Park, Manchester

Date Received: 3/2/2021

Date Commenced: 3/2/2021

Date Completed: 4/2/2021

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Senior Technician)

S Eyre
(Senior Technician)


T Watkins
(Senior Technician)

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Page 1 of

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP1

Depth (m): 0.35

Plate Area (m²): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

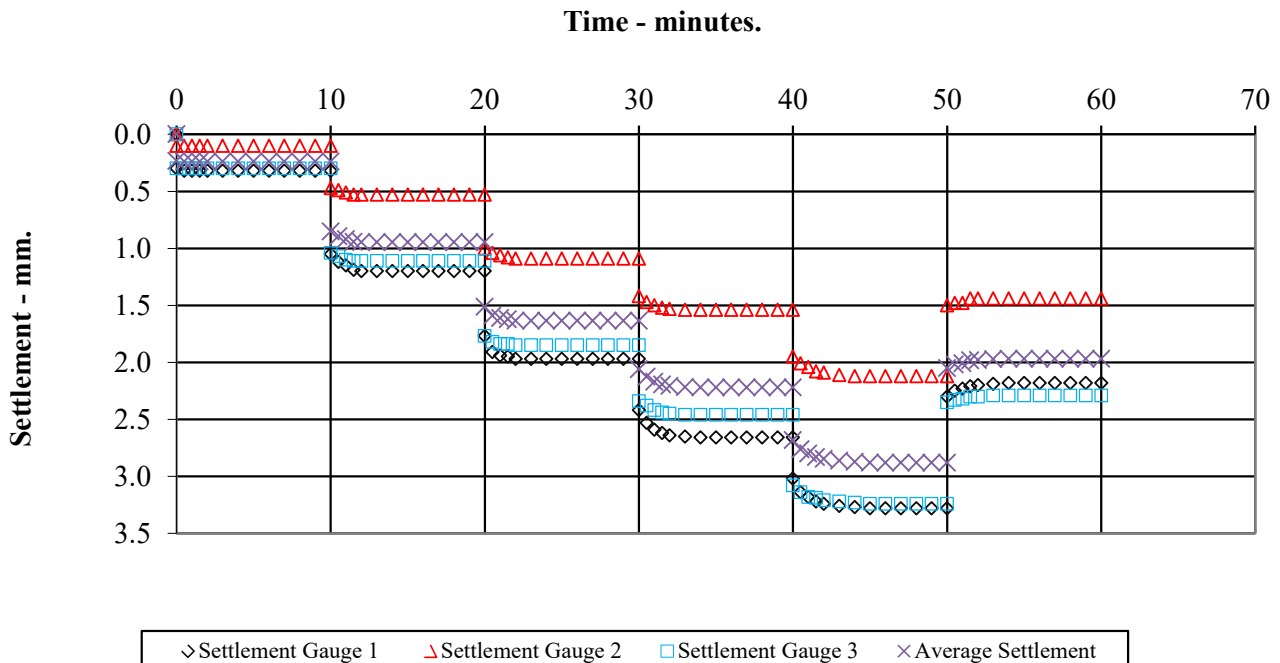
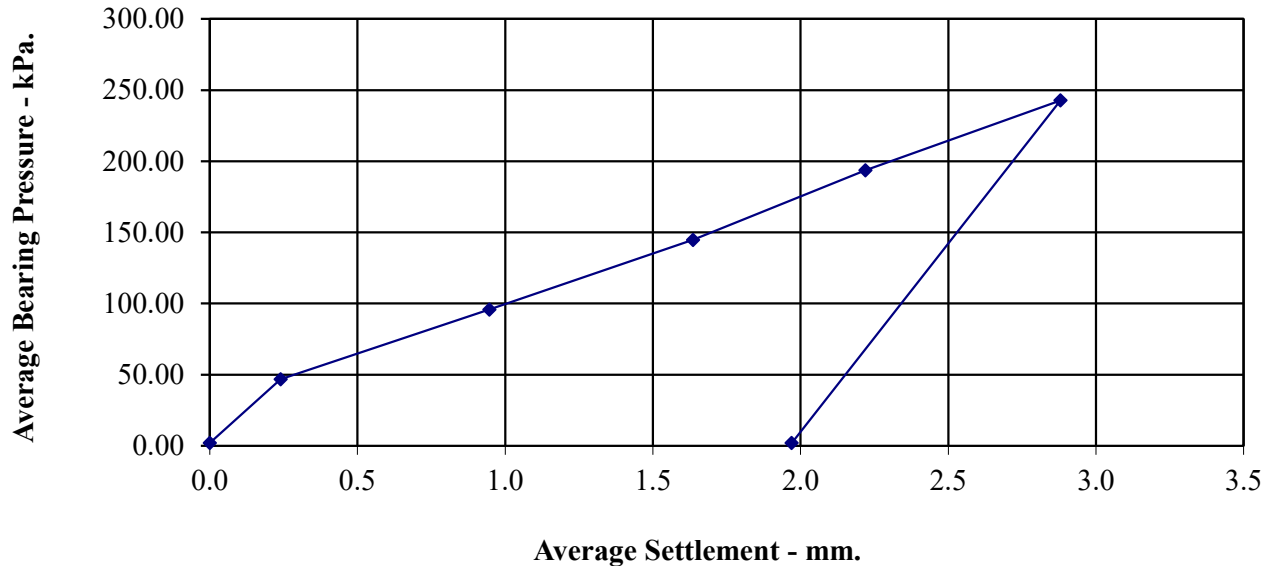
242.67

Maximum Deformation (mm):

2.88

Description:

Type 1 Sub Base



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP1	
Depth (m)	0.35	
Description	Type 1 Sub Base	
Maximum Deflection	2.88	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	117	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	59.0	kN/m ² /mm
CBR Value	11.3	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP2

Depth (m): 0.35

Plate Area (m2): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

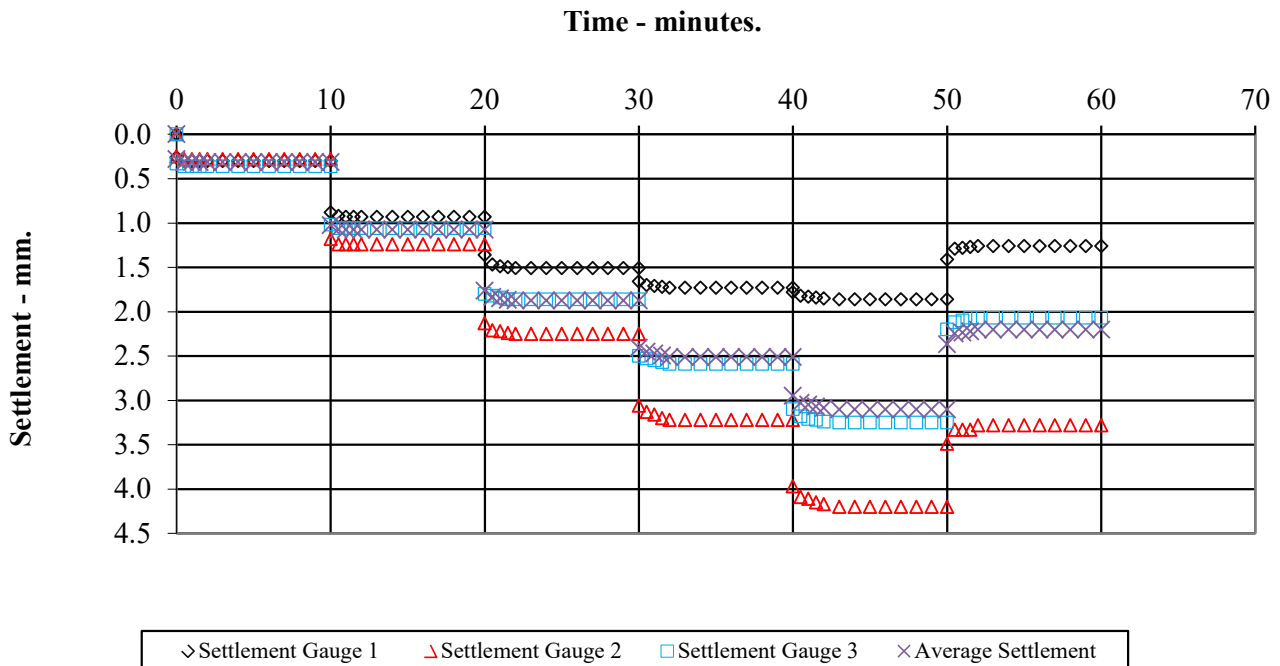
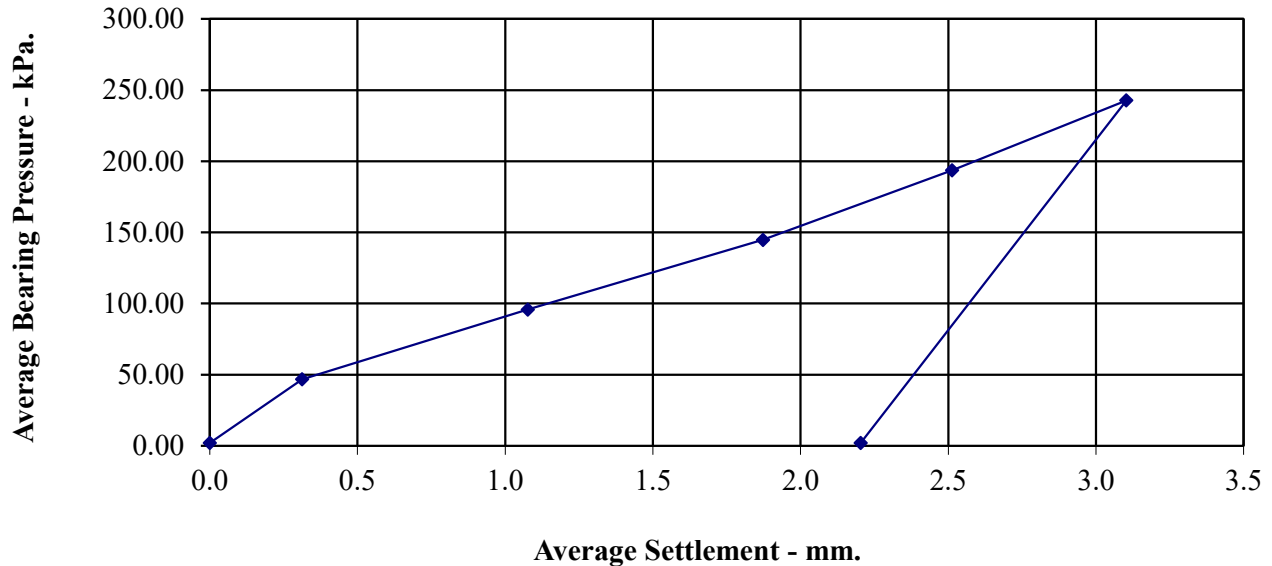
242.67

Maximum Deformation (mm):

3.10

Description:

Brown sandy clayey GRAVEL.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP2	
Depth (m)	0.35	
Description	Brown sandy clayey GRAVEL.	
Maximum Deflection	3.10	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	106	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	53.6	kN/m ² /mm
CBR Value	9.6	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP3

Depth (m): 0.35

Plate Area (m²): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

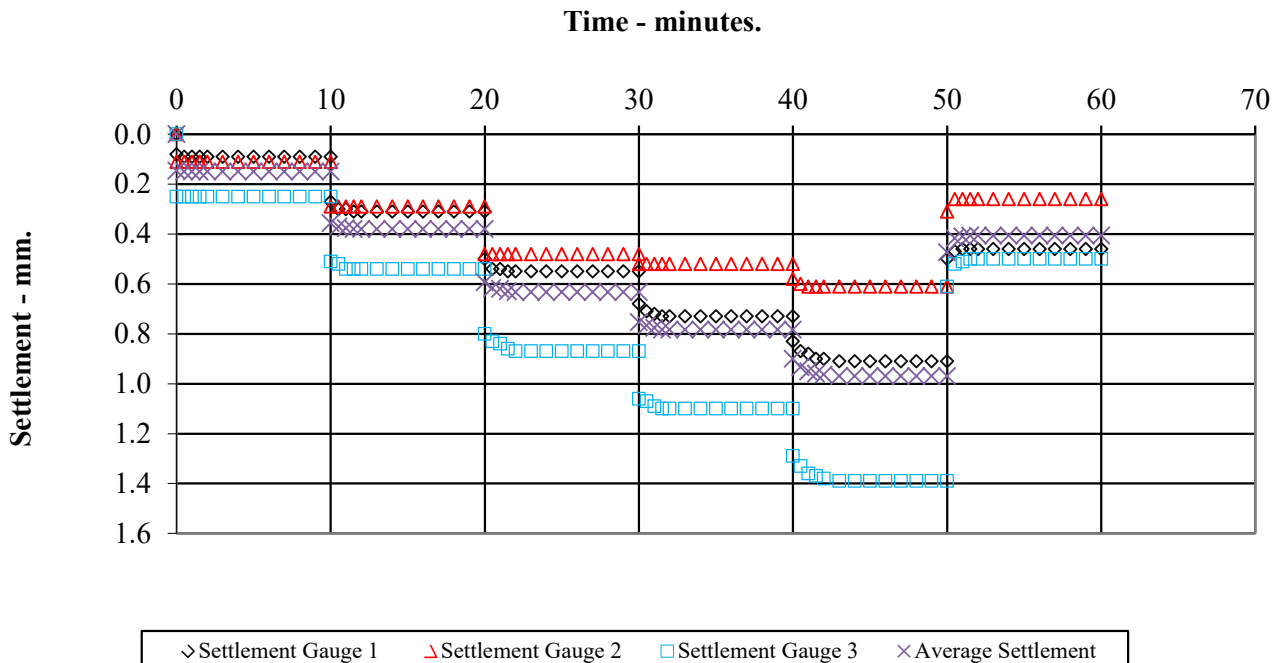
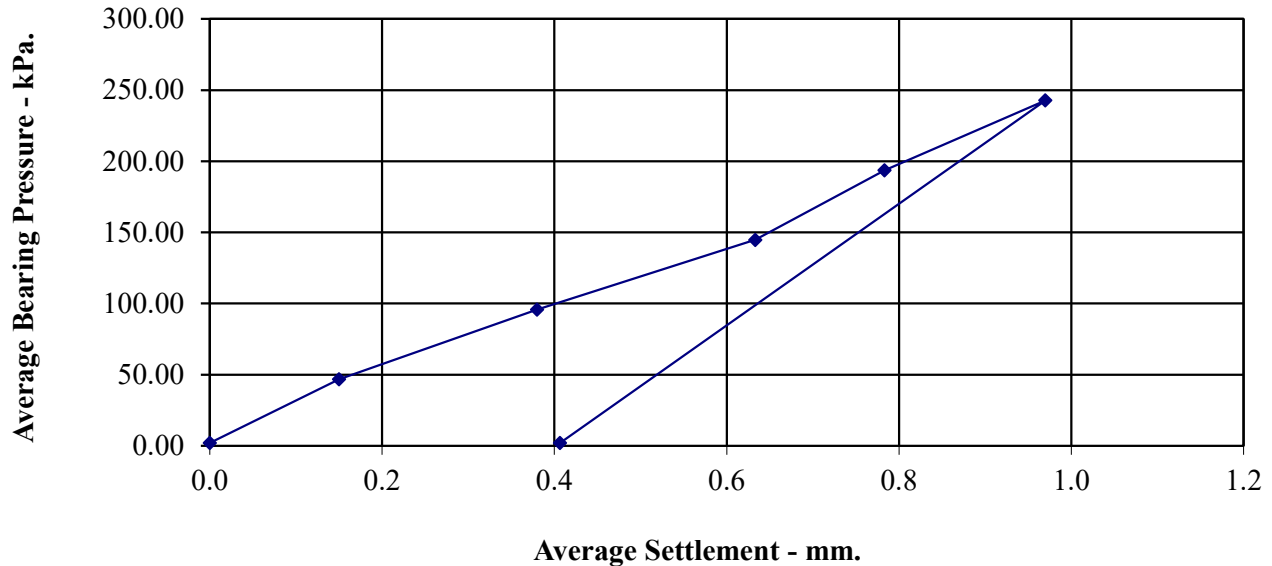
242.67

Maximum Deformation (mm):

0.97

Description:

Brown slightly clayey SAND.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP3	
Depth (m)	0.35	
Description	Brown slightly clayey SAND.	
Maximum Deflection	0.97	mm
Deflection required for CBR value	1.25	mm
Load at 0.97mm	243	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	> 122.1	kN/m ² /mm
CBR Value	> 39.9	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP4

Depth (m): 0.35

Plate Area (m2): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

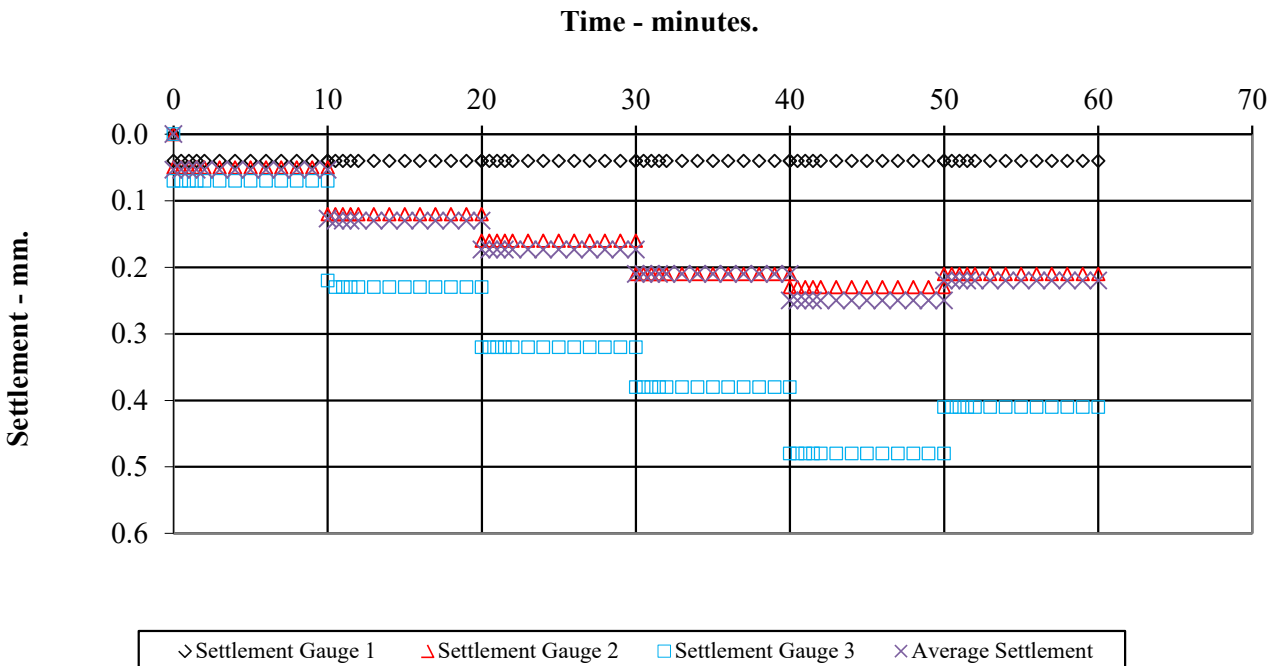
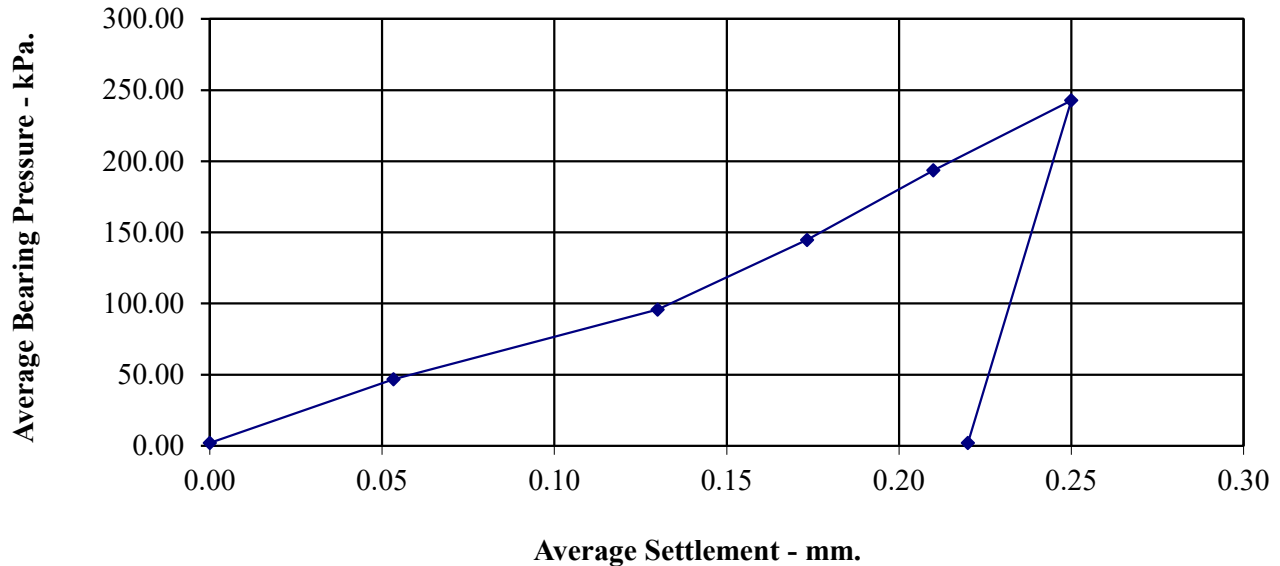
242.67

Maximum Deformation (mm):

0.25

Description:

Brown gravelly sandy CLAY.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP4	
Depth (m)	0.35	
Description	Brown gravelly sandy CLAY.	
Maximum Deflection	0.25	mm
Deflection required for CBR value	1.25	mm
Load at 0.25mm	243	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	> 122.1	kN/m ² /mm
CBR Value	> 39.9	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP5

Depth (m): 0.35

Plate Area (m2): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

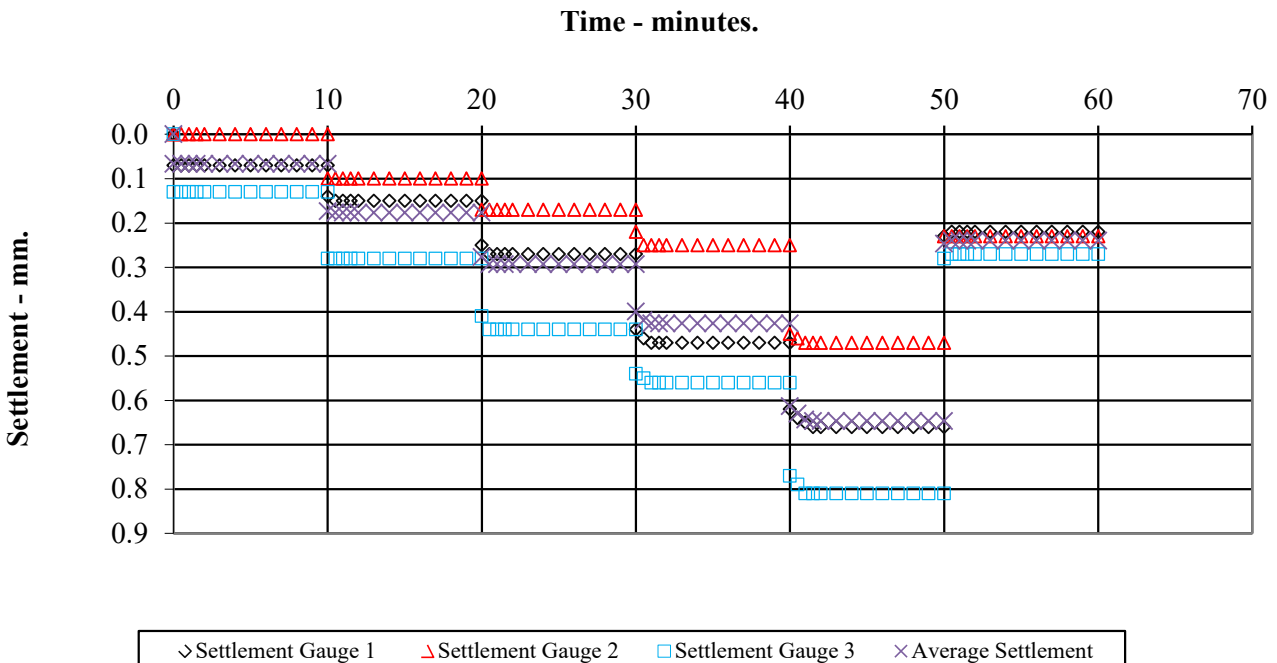
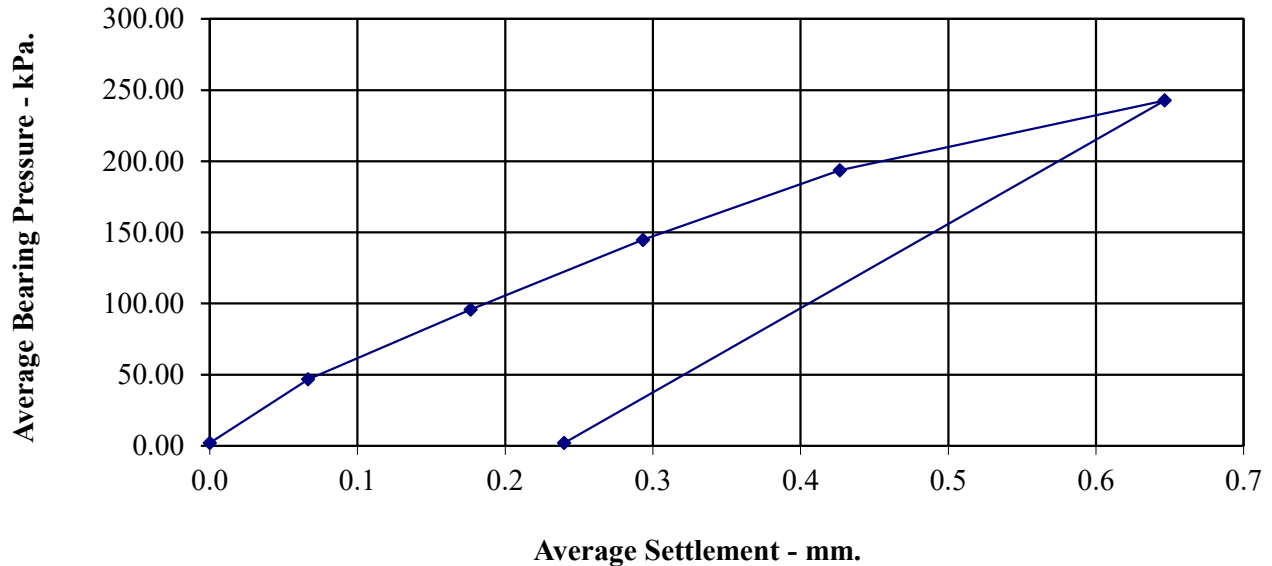
242.67

Maximum Deformation (mm):

0.65

Description:

Brown gravelly sandy CLAY.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP5	
Depth (m)	0.35	
Description	Brown gravelly sandy CLAY.	
Maximum Deflection	0.65	mm
Deflection required for CBR value	1.25	mm
Load at 0.65mm	243	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	> 122.1	kN/m ² /mm
CBR Value	> 39.9	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 03-Feb-21

Test Position: TP6

Depth (m): 0.35

Plate Area (m²): 0.1625971

Type of Kentledge: Wheeled

Maximum Applied Pressure (kPa):

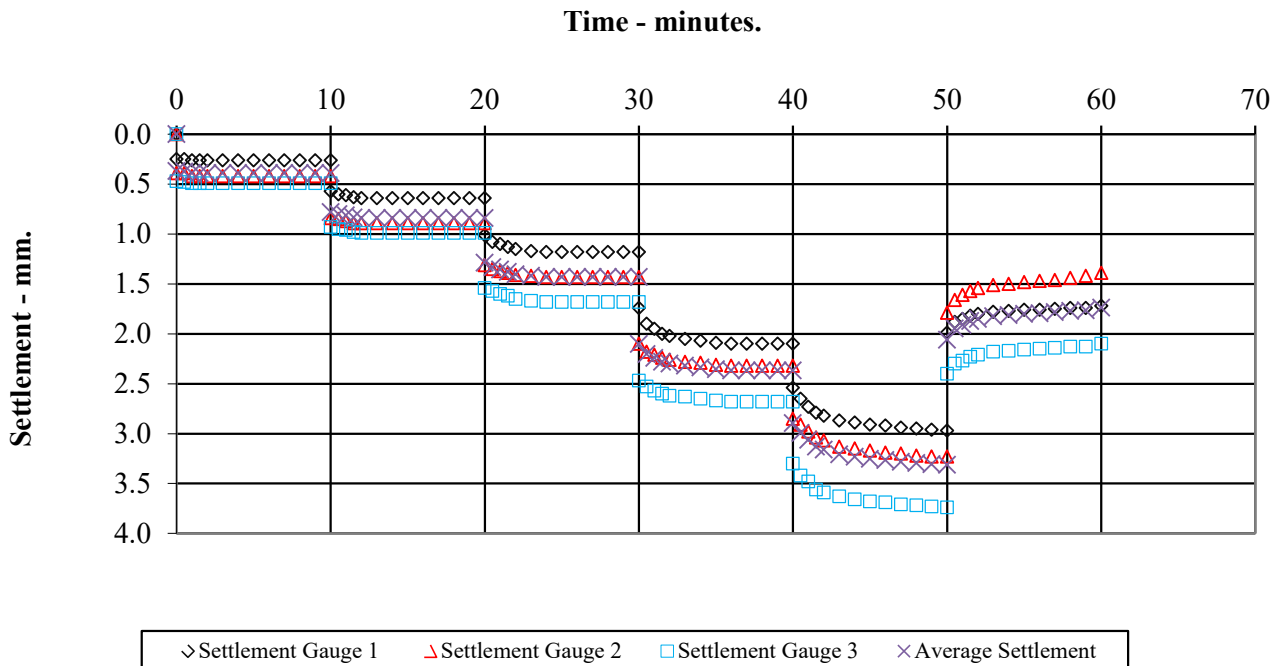
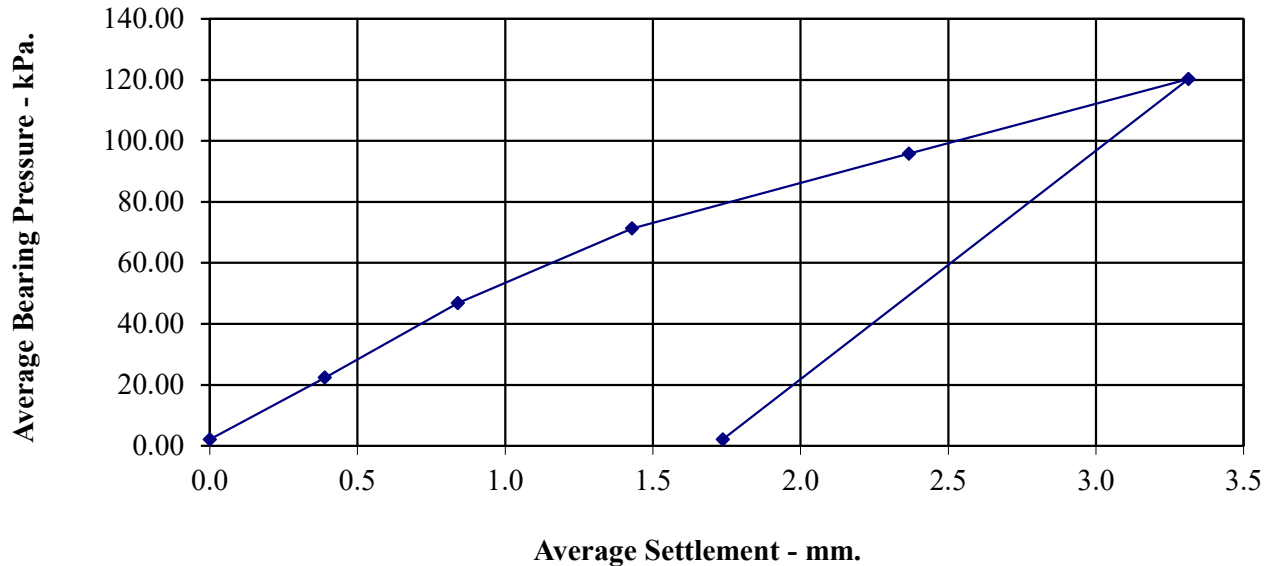
120.28

Maximum Deformation (mm):

3.31

Description:

Brown gravelly sandy CLAY.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4

Incorporating IAN 73/06

Date of Test	3-Feb-21	
Test Position	TP6	
Depth (m)	0.35	
Description	Brown gravelly sandy CLAY.	
Maximum Deflection	3.31	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	64	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	32.1	kN/m ² /mm
CBR Value	3.9	%



Didsbury Park, Manchester

Contract No:

PSL21/1039

Client Ref:

APPENDIX 8 - Soil Percolation Testing Results

SOIL PERCOLATION TEST



Sheet 1 of 2

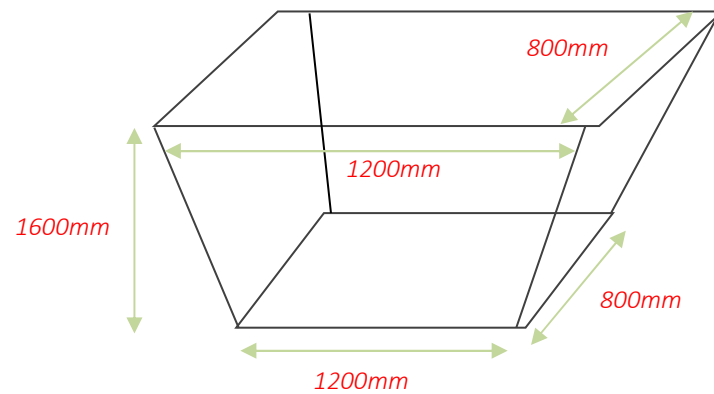
Date of Test: 04/02/2021

POSITION: IP3
TEST 1

Weather: Overcast

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Pit Depth (mm):	1600
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

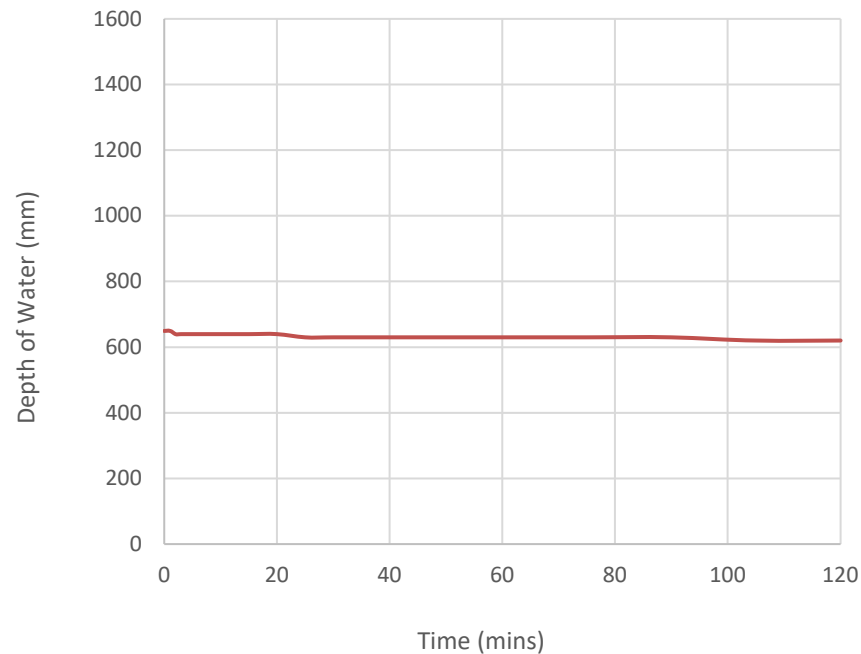
Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	950
1	950
2	960
3	960
5	960
10	960
15	960
20	960
25	970
30	970
40	970
50	970
60	970
75	970
90	970
105	980
120	980

SOIL PERCOLATION TEST

POSITION: IP3
TEST 1

Depth vs Time



Volume of Pit (m ³)	1.536
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.624

Compliance Check:

Water Level at 75% effective depth (mm)	487.5
Water Level at 25% effective depth (mm)	162.5

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	650
Water Level 2	620
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.0288

Discharge Area (m ²)	3.5
----------------------------------	-----

Soil Infiltration Rate (m/min)	6.857E-05
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	1.14E-06
--------------------------------	----------

SOIL PERCOLATION TEST



Sheet 1 of 2

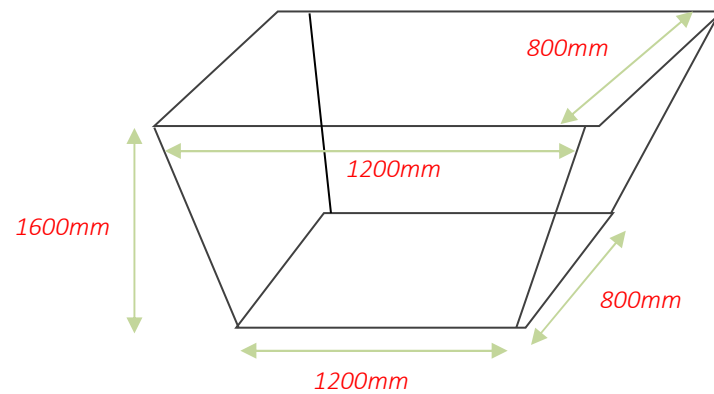
Date of Test: 04/02/2021

POSITION: IP3
TEST 2

Weather: Overcast

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Test Data

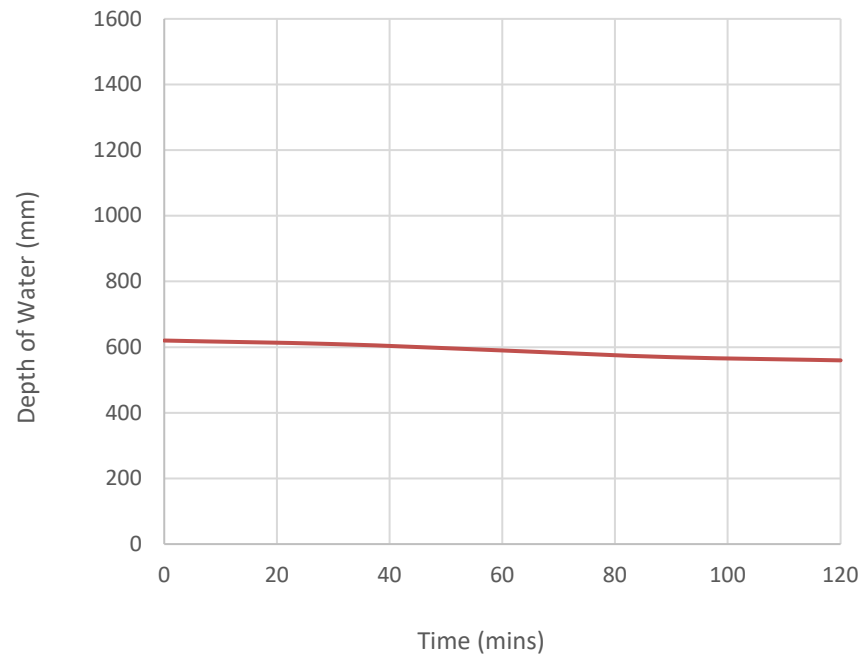
Time Elapsed (mins)	Depth to Water Level (mm)
0	980
30	990
60	1010
90	1030
120	1040

Pit Depth (mm):	1600
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

SOIL PERCOLATION TEST

POSITION: IP3
TEST 2

Depth vs Time



Volume of Pit (m ³)	1.536
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.5952

Compliance Check:

Water Level at 75% effective depth (mm)	465
Water Level at 25% effective depth (mm)	155

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	620
Water Level 2	560
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.0576

Discharge Area (m ²)	3.32
----------------------------------	------

Soil Infiltration Rate (m/min)	0.0001446
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	2.41E-06
--------------------------------	----------

SOIL PERCOLATION TEST



Sheet 1 of 2

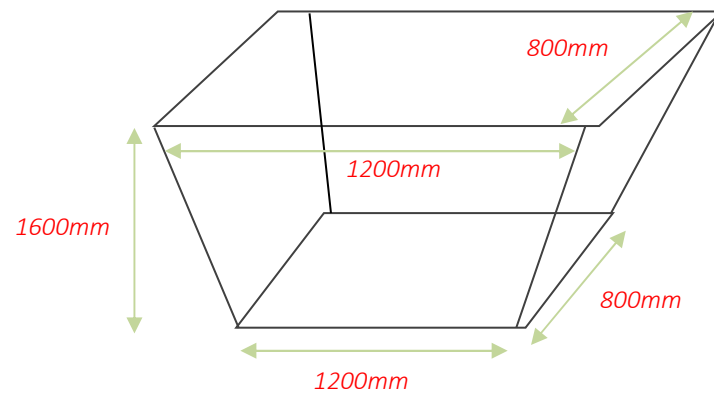
Date of Test: 04/02/2021

POSITION: IP3
TEST 3

Weather: Very cold

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Test Data

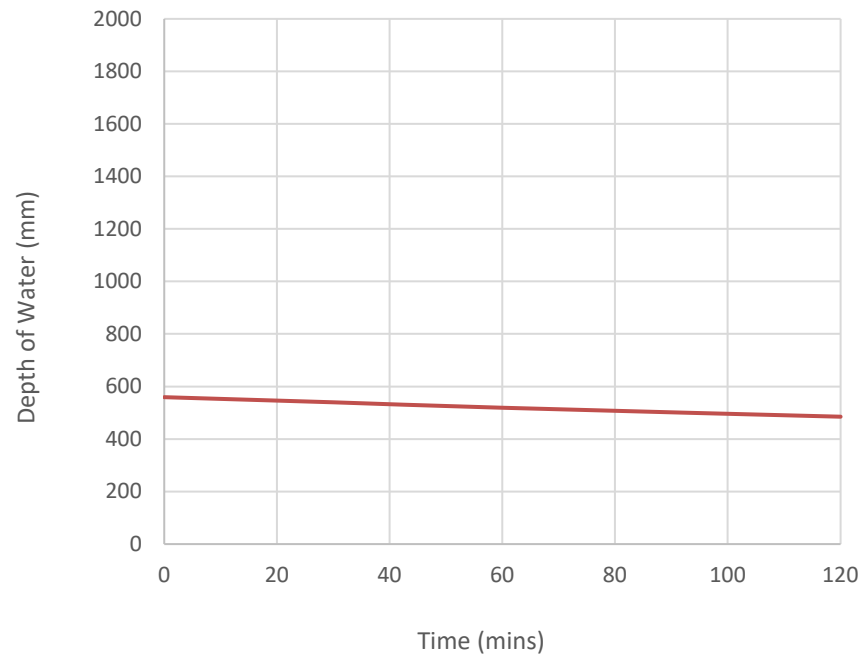
Time Elapsed (mins)	Depth to Water Level (mm)
0	1040
30	1060
60	1080
120	1115

Pit Depth (mm):	1600
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

SOIL PERCOLATION TEST

POSITION: IP3
TEST 3

Depth vs Time



Volume of Pit (m ³)	1.536
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.5376

Compliance Check:

Water Level at 75% effective depth (mm)	420
Water Level at 25% effective depth (mm)	140

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	560
Water Level 2	485
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.072

Discharge Area (m ²)	3.05
----------------------------------	------

Soil Infiltration Rate (m/min)	0.0001967
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	3.28E-06
--------------------------------	----------

SOIL PERCOLATION TEST



Sheet 1 of 2

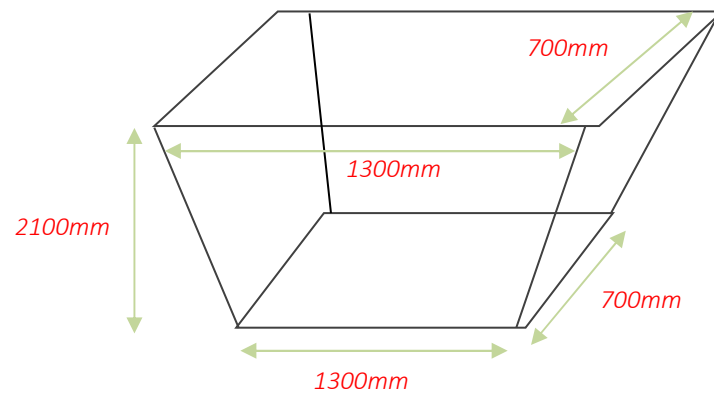
Date of Test: 04/02/2021

POSITION: TP03
TEST 1

Weather: Overcast

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Pit Depth (mm):	2100
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

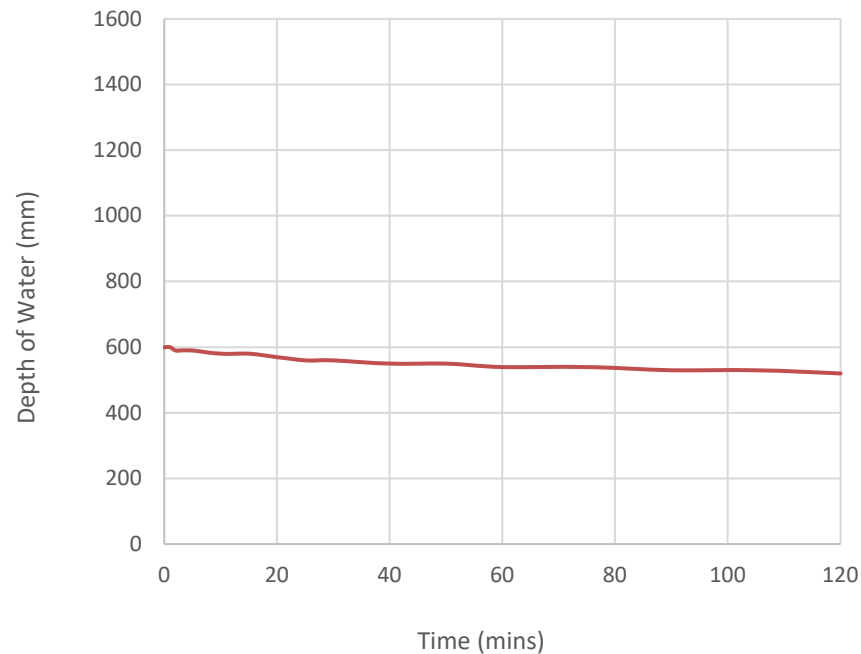
Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	1500
1	1500
2	1510
3	1510
5	1510
10	1520
15	1520
20	1530
25	1540
30	1540
40	1550
50	1550
60	1560
75	1560
90	1570
105	1570
120	1580

SOIL PERCOLATION TEST

POSITION: TP03
TEST 1

Depth vs Time



Volume of Pit (m ³)	1.911
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.546

Compliance Check:

Water Level at 75% effective depth (mm)	450
Water Level at 25% effective depth (mm)	150

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	600
Water Level 2	520
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.0728

Discharge Area (m ²)	3.15
----------------------------------	------

Soil Infiltration Rate (m/min)	0.0001926
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	3.21E-06
--------------------------------	----------

SOIL PERCOLATION TEST



Sheet 1 of 2

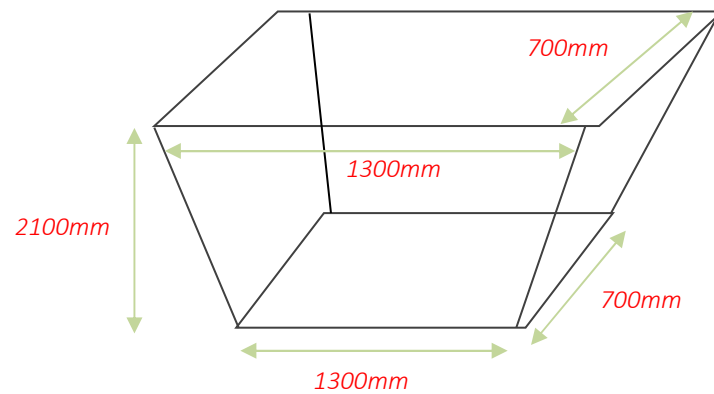
Date of Test: 04/02/2021

POSITION: TP03
TEST 2

Weather: Overcast

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Test Data

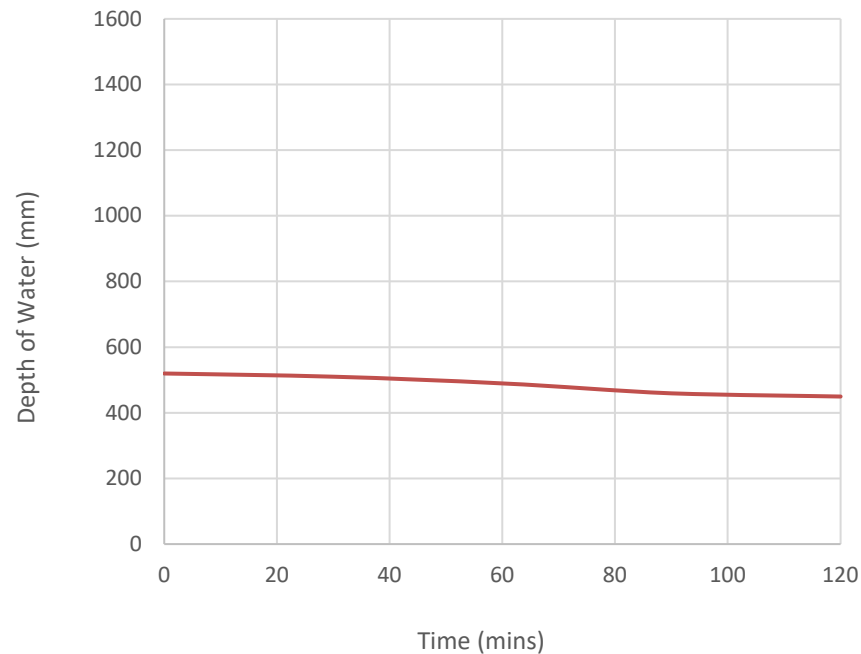
Time Elapsed (mins)	Depth to Water Level (mm)
0	1580
30	1590
60	1610
90	1640
120	1650

Pit Depth (mm):	2100
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

SOIL PERCOLATION TEST

POSITION: TP03
TEST 2

Depth vs Time



Volume of Pit (m ³)	1.911
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.4732

Compliance Check:

Water Level at 75% effective depth (mm)	390
Water Level at 25% effective depth (mm)	130

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	520
Water Level 2	450
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.0637

Discharge Area (m ²)	2.85
----------------------------------	------

Soil Infiltration Rate (m/min)	0.0001863
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	3.10E-06
--------------------------------	----------

SOIL PERCOLATION TEST



Sheet 1 of 2

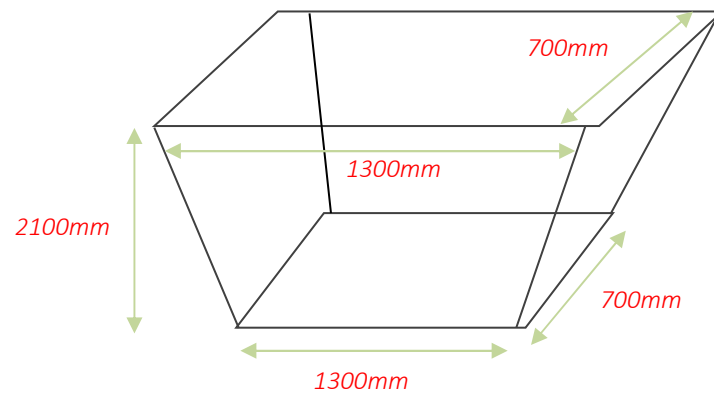
Date of Test: 04/02/2021

POSITION: TP03
TEST 3

Weather: Overcast

Engineer: C. Hastings
Checked: R Wyatt

Trial Pit Measurements



Test Data

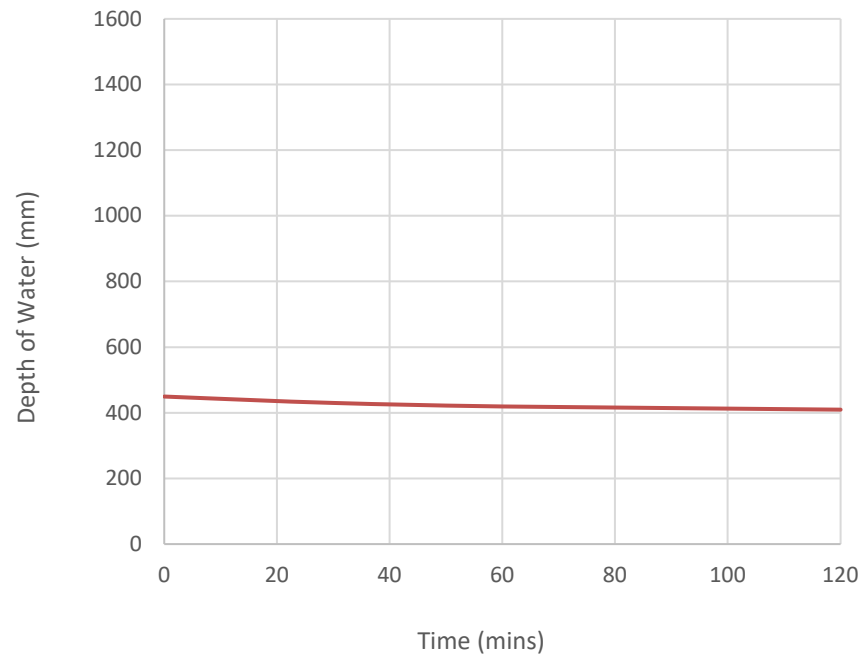
Time Elapsed (mins)	Depth to Water Level (mm)
0	1650
30	1670
60	1680
120	1690

Pit Depth (mm):	2100
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

SOIL PERCOLATION TEST

POSITION: TP03
TEST 3

Depth vs Time



Volume of Pit (m ³)	1.911
Void Ratio of Infill	1
Volume of Infill (m ³)	N/A
Volume of Water in Pit (m ³)	0.4095

Compliance Check:

Water Level at 75% effective depth (mm)	337.5
Water Level at 25% effective depth (mm)	112.5

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	450
Water Level 2	410
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m ³)	0.0364

Discharge Area (m ²)	2.63
----------------------------------	------

Soil Infiltration Rate (m/min)	0.0001153
--------------------------------	-----------

Soil Infiltration Rate (m/sec)	1.92E-06
--------------------------------	----------

APPENDIX 9 – QRA Screening Values



Proposed End Use	Unit	Residential with Plant Uptake				Commercial		Source
SOM	%	1	2.5	6	1	2.5	6	
Arsenic	mg/kg	32	32	32	640	640	640	SGVs
Beryllium	mg/kg	1.7	1.7	1.7	12	12	12	LQM S4ULs
Boron (water soluble)	mg/kg	290	290	290	240000	240000	240000	LQM S4ULs
Cadmium	mg/kg	10	10	10	230	230	230	SGVs
Chromium (Total)	mg/kg	910	910	910	8600	8600	8600	LQM S4ULs
Chromium (VI)	mg/kg	21	21	21	49	49	49	DEFRA C4SLs
Copper	mg/kg	2400	2400	2400	68000	68000	68000	LQM S4ULs
Lead	mg/kg	200	200	200	2300	2300	2300	DEFRA C4SLs
Organic Mercury	mg/kg	1.2	1.2	1.2	26	26	26	LQM S4ULs
Nickel	mg/kg	130	130	130	1800	1800	1800	SGVs
Selenium	mg/kg	350	350	350	13000	13000	13000	SGVs
Vanadium	mg/kg	410	410	410	9000	9000	9000	LQM S4ULs
Zinc	mg/kg	3700	3700	3700	730000	730000	730000	LQM S4ULs
Aliphatic EC 5 - 6	mg/kg	42	78	160	3200 (304) ^{sol}	5900 (558) ^{sol}	12000 (1150) ^{sol}	LQM S4ULs
Aliphatic EC 6 - 8	mg/kg	100	230	530	7800 (144) ^{sol}	17000 (322) ^{sol}	40000 (736) ^{sol}	LQM S4ULs
Aliphatic EC 8 - 10	mg/kg	27	65	150	2000 (78) ^{sol}	4800 (190) ^{sol}	11000 (451) ^{vap}	LQM S4ULs
Aliphatic EC 10 - 12	mg/kg	130 (48) ^{vap}	330 (118) ^{vap}	760 (283) ^{vap}	9700 (48) ^{sol}	23000 (118) ^{vap}	47000 (283) ^{vap}	LQM S4ULs
Aliphatic EC 12 - 16	mg/kg	1100 (24) ^{sol}	2400 (59) ^{sol}	4300 (142) ^{sol}	59000 (24) ^{sol}	82000 (59) ^{sol}	90000 (142) ^{sol}	LQM S4ULs
Aliphatic EC 16 - 35	mg/kg	65000 (8.48) ^{f, sol}	92000 (21) ^{f, sol}	110000 ^f	1600000 ^f	1700000 ^f	1800000 ^f	LQM S4ULs
Aliphatic EC 35 - 44	mg/kg	65000 (8.48) ^{f, sol}	92000 (21) ^{f, sol}	110000 ^f	1600000 ^f	1700000 ^f	1800000 ^f	LQM S4ULs
Aromatic EC 5 - 7	mg/kg	70	140	300	26000 (1220) ^{sol}	46000 (2260) ^{sol}	86000 (4710) ^{sol}	LQM S4ULs
Aromatic EC 7 - 8	mg/kg	130	290	660	56000 (869) ^{vap}	110000 (1920) ^{vap}	180000 (4360) ^{vap}	LQM S4ULs
Aromatic EC 8 - 10	mg/kg	34	83	190	3500 (613) ^{vap}	8100 (1500) ^{vap}	17000 (3580) ^{vap}	LQM S4ULs
Aromatic EC 10 - 12	mg/kg	74	180	380	16000 (364) ^{sol}	28000 (899) ^{sol}	34000 (2150) ^{sol}	LQM S4ULs
Aromatic EC 12 - 16	mg/kg	140	330	660	36000 (169) ^{sol}	37000	38000	LQM S4ULs
Aromatic EC 16 - 21	mg/kg	260 ^f	540 ^f	930 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Aromatic EC 21 - 35	mg/kg	1100 ^f	1500 ^f	1700 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Aromatic EC 35 - 44	mg/kg	1100 ^f	1500 ^f	1700 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Benzene	mg/kg	0.33	0.33	0.33	95	95	95	SGVs
Toluene	mg/kg	610	610	610	4400	4400	4400	SGVs
Ethyl Benzene	mg/kg	350	350	350	2800	2800	2800	SGVs
Xylene - o	mg/kg	250	250	250	2600	2600	2600	SGVs
Xylene - m	mg/kg	240	240	240	3500	3500	3500	SGVs
Xylene - p	mg/kg	230	230	230	3200	3200	3200	SGVs
MTBE (methyl tert-butyl)	mg/kg	49	84	160	7900	13000	24000	CL:AIRE 2010
Acenaphthene	mg/kg	210	510	1100	84000 (57) ^{sol}	97000 (141) ^{sol}	100000	LQM S4ULs
Acenaphthylene	mg/kg	170	420	920	83000 (86.1) ^{sol}	97000 (212) ^{sol}	100000	LQM S4ULs
Anthracene	mg/kg	2400	5400	11000	520000	540000	540000	LQM S4ULs
Benz(a)anthracene	mg/kg	7.2	11	13	170	170	180	LQM S4ULs
Benzo(a)pyrene	mg/kg	2.2	2.7	5*	35	35	77*	DEFRA C4SL*/LQM
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	44	44	45	LQM S4ULs
Benzo(ghi)perylene	mg/kg	320	340	350	3900	4000	4000	LQM S4ULs
Benzo(k)fluoranthene	mg/kg	77	93	100	1200	1200	1200	LQM S4ULs
Chrysene	mg/kg	15	22	27	350	350	350	LQM S4ULs
Dibenz(ah)anthracene	mg/kg	0.24	0.28	0.3	3.5	3.6	3.6	LQM S4ULs
Fluoranthene	mg/kg	280	560	890	23000	23000	23000	LQM S4ULs
Fluorene	mg/kg	170	400	860	63000 (30.9) ^{sol}	68000	71000	LQM S4ULs
Indeno(123-cd)pyrene	mg/kg	27	36	41	500	510	510	LQM S4ULs
Naphthalene	mg/kg	2.3 ^f	5.6 ^f	13 ^f	190 ^f (76.4) ^{sol}	460 ^f (183) ^{sol}	1100 ^f (432) ^{sol}	LQM S4ULs
Phenanthrene	mg/kg	95	220	440	22000	22000	23000	LQM S4ULs
Pyrene	mg/kg	620	1200	2000	54000	54000	54000	LQM S4ULs



Proposed End Use	Unit	Residential with Plant Uptake			Commercial			Source
SOM	%	1	2.5	6	1	2.5	6	
Phenol	mg/kg	420	420	420	3200	3200	3200	SGVs
Chlorophenols	mg/kg	0.87 ^g	2	4.5	3500	4000	4300	LQM S4ULs
Pentachlorophenol	mg/kg	0.22	0.52	1.2	400	400	400	LQM S4ULs
Carbon disulphide	mg/kg	0.14	0.29	0.62	11	22	47	LQM S4ULs
Hexachlorobutadiene	mg/kg	0.29	0.7	1.6	31	66	120	LQM S4ULs
1,1,1,2 Tetrachloroethane	mg/kg	1.6	3.4	7.5	270	550	1100	LQM S4ULs
1,1,1 Trichloroethane	mg/kg	8.8	18	39	660	1300	3000	LQM S4ULs
Trichloroethene	mg/kg	0.016	0.034	0.075	1.2	2.6	5.7	LQM S4ULs
Tetrachloromethane	mg/kg	0.026	0.056	0.13	2.9	6.3	14	LQM S4ULs
1,2-Dichloroethane	mg/kg	0.0071	0.011	0.019	0.67	0.97	1.7	LQM S4ULs
Chloroethene (Vinyl)	mg/kg	0.00064	0.00087	0.0014	0.059	0.077	0.12	LQM S4ULs
Trichloromethane	mg/kg	0.91	1.7	3.4	99	170	350	LQM S4ULs
Tetrachloroethene	mg/kg	0.18	0.39	0.9	19	42	95	LQM S4ULs
Hexachlorobenzene	mg/kg	1.8 (0.2) ^{vop}	3.3 (0.5) ^{vop}	4.9	110 (0.2) ^{vop}	120	120	LQM S4ULs
Pentachlorobenzene	mg/kg	5.8	12	22	640 (43) ^{sol}	770 (107) ^{sol}	830	LQM S4ULs
1,2,4,5-Tetrachlorobenzene	mg/kg	0.33	0.77	1.6	42 (19.7) ^{sol}	72 (49.1) ^{sol}	96	LQM S4ULs
1,2,3,5-Tetrachlorobenzene	mg/kg	0.66	1.69	3.7	49 (39.4) ^{vop}	120 (98.1) ^{vop}	240 (235) ^{vop}	LQM S4ULs
1,2,3,4-Tetrachlorobenzene	mg/kg	15	36	78	1700 (122) ^{vop}	3080 (304) ^{vop}	4400 (728) ^{vop}	LQM S4ULs
1,3,5-Trichlorobenzene	mg/kg	0.33	0.81	1.9	23	55	130	LQM S4ULs
1,2,4-Trichlorobenzene	mg/kg	2.6	6.4	15	220	530	1300	LQM S4ULs
1,2,3-Trichlorobenzene	mg/kg	1.5	3.6	8.6	102	250	590	LQM S4ULs
1,4-dichlorobenzene	mg/kg	61 ^f	150 ^f	350 ^f	4400 ^f (224) ^{vop}	10000 ^f (540) ^{vop}	25000 ^f (1280) ^{vop}	LQM S4ULs
1,3-dichlorobenzene	mg/kg	0.4	1	2.3	30	73	170	LQM S4ULs
1,2-Dichlorobenzene	mg/kg	23	55	130	2000 (571) ^{sol}	4800 (1370) ^{sol}	11000 (3240) ^{sol}	LQM S4ULs
Chlorobenzene	mg/kg	0.46	1	2.4	56	130	290	LQM S4ULs
Gamma-	mg/kg	0.06	0.14	0.33	67	69	70	LQM S4ULs
Beta-	mg/kg	0.085	0.2	0.46	65	65	65	LQM S4ULs
Alpaha -	mg/kg	0.23	0.55	1.2	170	180	180	LQM S4ULs
Beta -Endosulfan	mg/kg	7	17	39	6300 (0.00007)	7800 (0.0002)	8700	LQM S4ULs
Alpha-Endosulfan	mg/kg	7.4	18	41	5600 (0.003) ^{vop}	7400 (0.007) ^{vop}	8400 (0.016) ^{vop}	LQM S4ULs
Dichlorvos	mg/kg	0.032	0.066	0.14	140	140	140	LQM S4ULs
Atrazine	mg/kg	3.3	7.6	17.4	9300	9400	9400	LQM S4ULs
Dieldrin	mg/kg	0.97	2	3.5	170	170	170	LQM S4ULs
Aldrin	mg/kg	5.7	6.6	7.1	170	170	170	LQM S4ULs
HMX	mg/kg	5.7	13	26	110000	110000	110000	LQM S4ULs
2,4,6-Trinitrotoulene	mg/kg	1.6	3.7	8.1	1000	1000	1000	LQM S4ULs
RDX	mg/kg	120	250	540	210000	210000	210000	LQM S4ULs

^{sol} S4UL exceeds the solubility saturation limit (which is presented in brackets)

^{vop} S4ULs presented exceeds the vapour saturation limit, which is presented in brackets

^f For naphthalene, the S4UL is based on a comparison of inhalation exposure with the TDI_{inhal} for localised affects

^f S4UL based on comparison of inhalation exposure with inhalation TDI for localised effects

^{dir} S4ULs based on a threshold protective direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustration only)

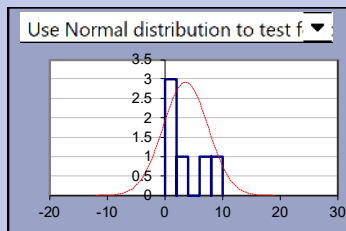
APPENDIX 10 - Statistical Analysis

Test Results

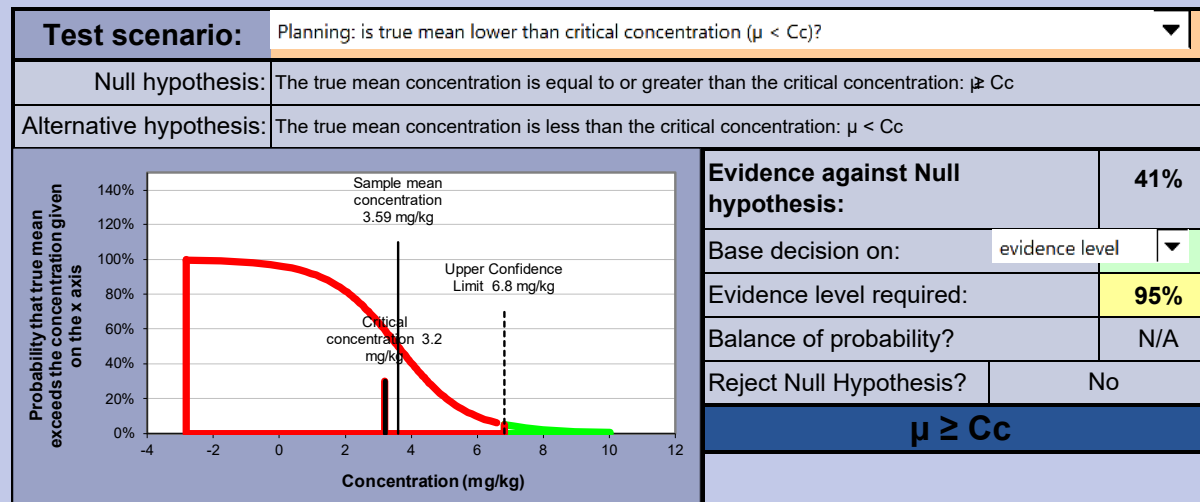
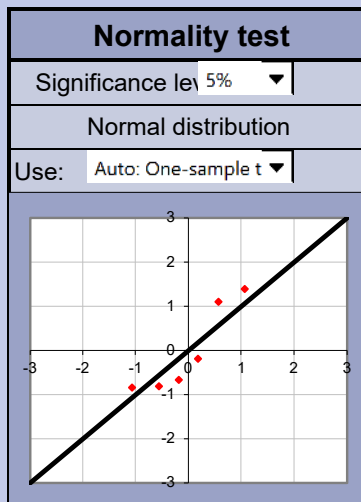
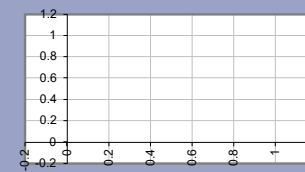
Client/client ref: Civic Engineers Site ref: Didsbury Point
Project ref: 20064 Data description:

Date: 01-Apr-2021
User details: RW

Dataset	Benzo(a)pyrene (mg/kg)
Sample mean, $\bar{x}$ (mg/kg)	3.5933
Sample standard deviation, s	3.903
Sample size, n	6
Critical concentration, C_c (mg/kg)	3.2



Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0



[Back to data](#)

[Back to summary](#)

[Go to outlier test](#)

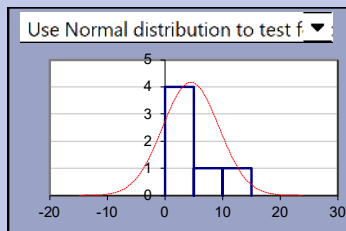
[Go to normality test](#)

Test Results

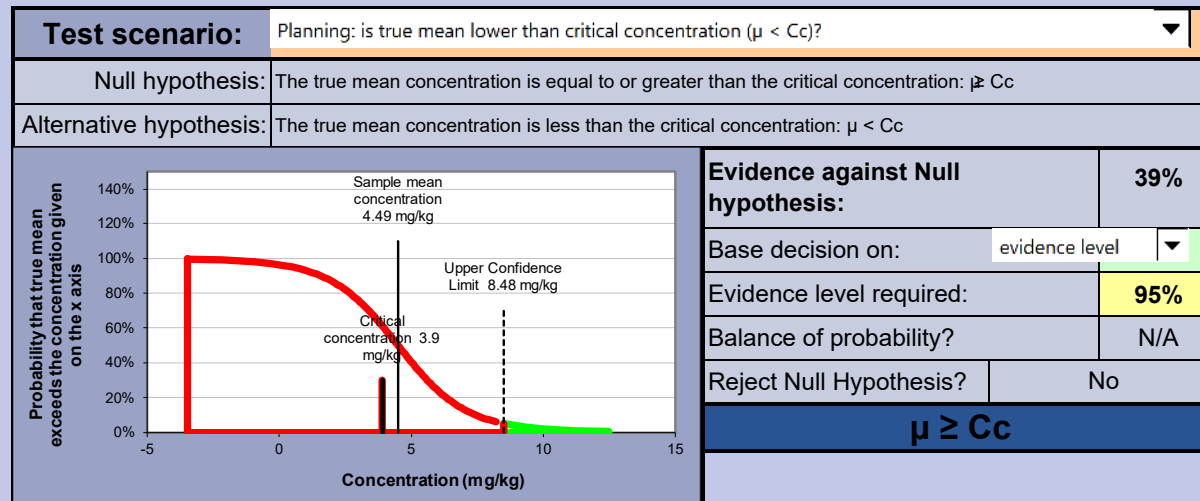
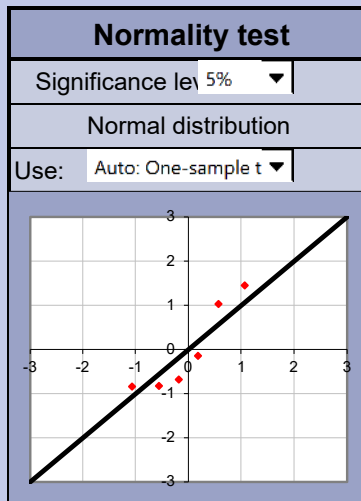
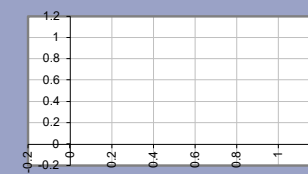
Client/client ref: Civic Engineers Site ref: Didsbury Point
Project ref: 20064 Data description:

Date: 01-Apr-2021
User details: RW

Dataset	Benzo(b)fluoranthene (mg/kg)
Sample mean, $\bar{x}$ (mg/kg)	4.4933
Sample standard deviation, s	4.8468
Sample size, n	6
Critical concentration, C_c (mg/kg)	3.9



Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0



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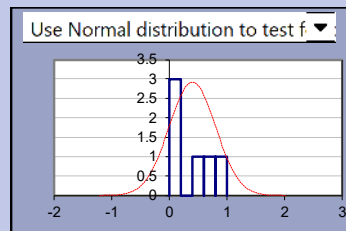
[Go to normality test](#)

Test Results

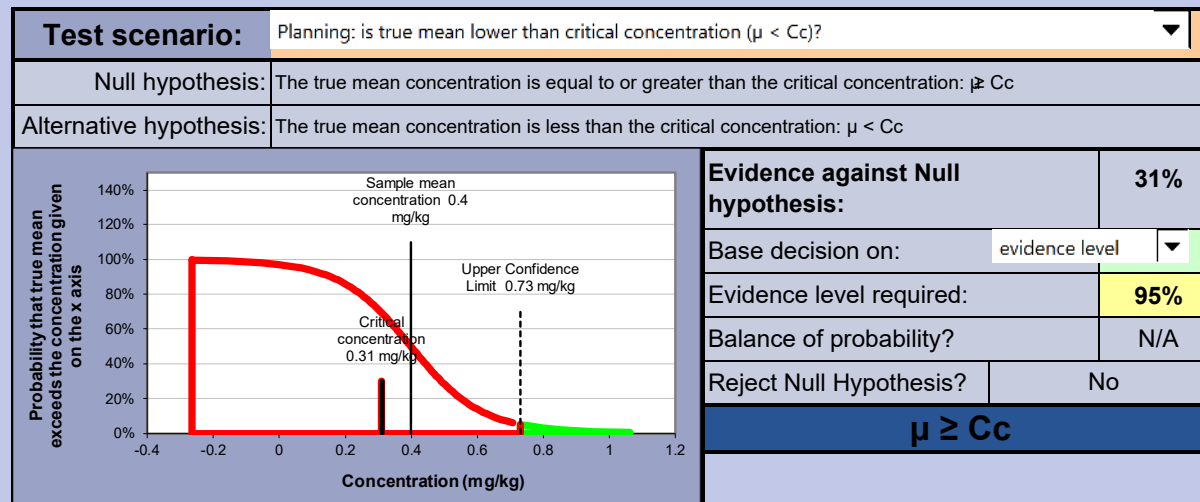
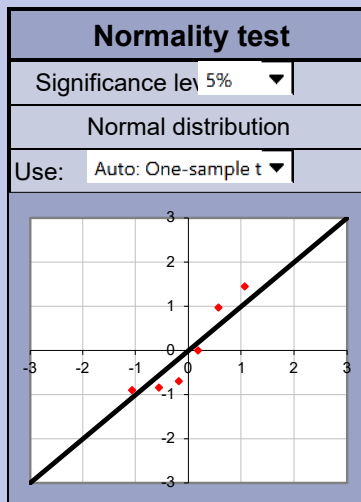
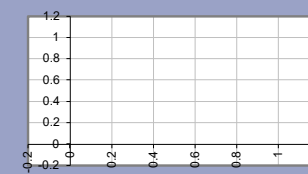
Client/client ref: Civic Engineers Site ref: Didsbury Point
Project ref: 20064 Data description:

Date: 01-Apr-2021
User details: RW

Dataset	Dibenzo(ah)anthracene (mg/kg)
Sample mean, $\bar{x}$ (mg/kg)	0.3983
Sample standard deviation, s	0.403
Sample size, n	6
Critical concentration, C_c (mg/kg)	0.31



Outliers & non-detects	
Outliers present?	NO
Significance level	5%
Outliers removed?	0
Non-detects	0



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Go to outlier test

Go to normality test

APPENDIX 11 - HazWasteOnline Classification Report

Waste Classification Report



MU4NR-4UFUN-DKQKF

Job name

EMT-21-1759-Batch-1-File-1

Description/Comments

Project

GRO-20064

Site

Didsbury Point

Related Documents

#	Name	Description
1	EMT-21-1759-Batch-1-File-1.hwol	.hwol file used to create the Job

Waste Stream Template

Waste Stream template not used when importing the .hwol file

Classified by

Name:	Company:	HazWasteOnline™ Training Record:	
Sam Flaherty	Groundtech Consulting Limited	Course	Date
Date:	PO Box 499	Hazardous Waste Classification	-
09 Apr 2021 15:57 GMT	Manchester	Advanced Hazardous Waste Classification	-
Telephone:	M28 8EE		
0800 1613730			

Report

Created by: Sam Flaherty
Created date: 09 Apr 2021 15:57 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	BH2-03/02/2021-0.50m		Non Hazardous		2
2	BH4-04/02/2021-0.50m		Non Hazardous		4
3	BH5-05/02/2021-0.50m		Non Hazardous		6
4	TP02-03/02/2021-0.50m		Non Hazardous		8
5	TP04-04/02/2021-1.80m		Non Hazardous		10
6	IP3-04/02/2021-0.50m		Non Hazardous		12

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	14
Appendix B: Rationale for selection of metal species	15
Appendix C: Version	16

Classification of sample: BH2-03/02/2021-0.50m

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

Sample details

Sample Name:	LoW Code:
BH2-03/02/2021-0.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
8.1%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.1% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number										
1		arsenic { arsenic }			1	3.1	mg/kg		2.868	mg/kg	0.000287 %		✓	
		033-001-00-X	231-148-6	7440-38-2										
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.6	mg/kg		0.555	mg/kg	0.0000555 %		✓	
		048-001-00-5												
3		copper { dicopper oxide ; copper (I) oxide }			1	10	mg/kg	1.126	10.415	mg/kg	0.00104 %		✓	
		029-002-00-X	215-270-7	1317-39-1										
4		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	63	mg/kg		58.279	mg/kg	0.00583 %		✓	
		082-001-00-6												
5		mercury { mercury }			7	0.4	mg/kg		0.37	mg/kg	0.000037 %		✓	
		080-001-00-0	231-106-7	7439-97-6										
6		nickel { nickel }			7	5.9	mg/kg		5.458	mg/kg	0.000546 %		✓	
		028-002-00-7	231-111-4	7440-02-0										
7		selenium { selenium }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD	
		034-001-00-2	231-957-4	7782-49-2										
8		zinc { zinc oxide }				27	mg/kg	1.245	31.089	mg/kg	0.00311 %		✓	
		030-013-00-7	215-222-5	1314-13-2										
9		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0										
10		naphthalene				0.06	mg/kg		0.0555	mg/kg	0.00000555 %		✓	
		601-052-00-2	202-049-5	91-20-3										
11		acenaphthylene				0.42	mg/kg		0.389	mg/kg	0.0000389 %		✓	
			205-917-1	208-96-8										
12		acenaphthene				2.15	mg/kg		1.989	mg/kg	0.000199 %		✓	
			201-469-6	83-32-9										
13		fluorene				2.12	mg/kg		1.961	mg/kg	0.000196 %		✓	
			201-695-5	86-73-7										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		15.23 mg/kg		14.089 mg/kg	0.00141 %	✓	
15	anthracene	204-371-1	120-12-7		6.77 mg/kg		6.263 mg/kg	0.000626 %	✓	
16	fluoranthene	205-912-4	206-44-0		26.37 mg/kg		24.394 mg/kg	0.00244 %	✓	
17	pyrene	204-927-3	129-00-0		21.94 mg/kg		20.296 mg/kg	0.00203 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		10.07 mg/kg		9.315 mg/kg	0.000932 %	✓	
19	chrysene	601-048-00-0	205-923-4		9.39 mg/kg		8.686 mg/kg	0.000869 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		9.04 mg/kg		8.363 mg/kg	0.000836 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		5.19 mg/kg		4.801 mg/kg	0.00048 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.98 mg/kg		0.907 mg/kg	0.0000907 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		5.13 mg/kg		4.746 mg/kg	0.000475 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		11.52 mg/kg		10.657 mg/kg	0.00107 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		4.48 mg/kg		4.144 mg/kg	0.000414 %	✓	
26	pH		PH		8.94 pH		8.94 pH	8.94 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		21.8 mg/kg	1.462	29.474 mg/kg	0.00295 %	✓	
Total:								0.0261 %		

Key

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

Classification of sample: BH4-04/02/2021-0.50m

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

Sample details

Sample Name:	LoW Code:
BH4-04/02/2021-0.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
15.5%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic }				4.3	mg/kg		3.723	mg/kg	0.000372 %	✓	
		033-001-00-X	231-148-6	7440-38-2									
2		cadmium {  cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.3	mg/kg		0.26	mg/kg	0.000026 %	✓	
		048-001-00-5											
3		copper { dicopper oxide ; copper (I) oxide }				19	mg/kg	1.126	18.521	mg/kg	0.00185 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
4		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	29	mg/kg		25.108	mg/kg	0.00251 %	✓	
		082-001-00-6											
5		mercury { mercury }				0.2	mg/kg		0.173	mg/kg	0.0000173 %	✓	
		080-001-00-0	231-106-7	7439-97-6									
6		nickel { nickel }			7	11.3	mg/kg		9.784	mg/kg	0.000978 %	✓	
		028-002-00-7	231-111-4	7440-02-0									
7		selenium { selenium }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		034-001-00-2	231-957-4	7782-49-2									
8		zinc { zinc oxide }				58	mg/kg	1.245	62.505	mg/kg	0.00625 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
9		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
10		naphthalene				1.35	mg/kg		1.169	mg/kg	0.000117 %	✓	
		601-052-00-2	202-049-5	91-20-3									
11		acenaphthylene				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
			205-917-1	208-96-8									
12		acenaphthene				1.73	mg/kg		1.498	mg/kg	0.00015 %	✓	
			201-469-6	83-32-9									
13		fluorene				1.34	mg/kg		1.16	mg/kg	0.000116 %	✓	
			201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		9.01 mg/kg		7.801 mg/kg	0.00078 %	✓	
15	anthracene	204-371-1	120-12-7		3.1 mg/kg		2.684 mg/kg	0.000268 %	✓	
16	fluoranthene	205-912-4	206-44-0		13.71 mg/kg		11.87 mg/kg	0.00119 %	✓	
17	pyrene	204-927-3	129-00-0		11.83 mg/kg		10.242 mg/kg	0.00102 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		5.59 mg/kg		4.84 mg/kg	0.000484 %	✓	
19	chrysene	601-048-00-0	205-923-4		5.83 mg/kg		5.048 mg/kg	0.000505 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		7.9 mg/kg		6.84 mg/kg	0.000684 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		5.43 mg/kg		4.701 mg/kg	0.00047 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.79 mg/kg		0.684 mg/kg	0.0000684 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		5.43 mg/kg		4.701 mg/kg	0.00047 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		9.46 mg/kg		8.19 mg/kg	0.000819 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		3.68 mg/kg		3.186 mg/kg	0.000319 %	✓	
26	pH		PH		8.56 pH		8.56 pH	8.56 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		45.4 mg/kg	1.462	57.45 mg/kg	0.00574 %	✓	
Total:								0.0254 %		

Key

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

Classification of sample: BH5-05/02/2021-0.50m

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

Sample details

Sample Name:	LoW Code:
BH5-05/02/2021-0.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
17.1%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number										
1	 arsenic { arsenic }			1	4.9	mg/kg		4.184	mg/kg	0.000418 %		✓	
	033-001-00-X	231-148-6	7440-38-2										
2	 cadmium {  cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }												
	048-001-00-5												
3	 copper { dicopper oxide ; copper (I) oxide }			1	14	mg/kg	1.126	13.461	mg/kg	0.00135 %		✓	
	029-002-00-X	215-270-7	1317-39-1										
4	 lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }												
	082-001-00-6												
5	 mercury { mercury }			7	0.1	mg/kg		0.0854	mg/kg	0.00000854 %		✓	
	080-001-00-0	231-106-7	7439-97-6										
6	 nickel { nickel }												
	028-002-00-7	231-111-4	7440-02-0										
7	 selenium { selenium }				<1	mg/kg		<1	mg/kg	<0.0001 %			<LOD
	034-001-00-2	231-957-4	7782-49-2										
8	 zinc { zinc oxide }												
	030-013-00-7	215-222-5	1314-13-2										
9	 chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %			<LOD
	024-001-00-0	215-607-8	1333-82-0										
10	naphthalene												
	601-052-00-2	202-049-5	91-20-3										
11	 acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8										
12	 acenaphthene												
		201-469-6	83-32-9										
13	 fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		0.41 mg/kg		0.35 mg/kg	0.000035 %	✓	
15	anthracene	204-371-1	120-12-7		0.11 mg/kg		0.0939 mg/kg	0.0000939 %	✓	
16	fluoranthene	205-912-4	206-44-0		0.83 mg/kg		0.709 mg/kg	0.0000709 %	✓	
17	pyrene	204-927-3	129-00-0		0.76 mg/kg		0.649 mg/kg	0.0000649 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.4 mg/kg		0.342 mg/kg	0.0000342 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.39 mg/kg		0.333 mg/kg	0.0000333 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.42 mg/kg		0.359 mg/kg	0.0000359 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.28 mg/kg		0.239 mg/kg	0.0000239 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.06 mg/kg		0.0512 mg/kg	0.00000512 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		0.28 mg/kg		0.239 mg/kg	0.0000239 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.53 mg/kg		0.453 mg/kg	0.0000453 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.21 mg/kg		0.179 mg/kg	0.0000179 %	✓	
26	pH				8.66 pH		8.66 pH	8.66 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		53.7 mg/kg	1.462	67.024 mg/kg	0.0067 %	✓	
Total:								0.0162 %		

Key

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

Classification of sample: TP02-03/02/2021-0.50m

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

Sample details

Sample Name:	LoW Code:
TP02-03/02/2021-0.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
19.5%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number										
1		arsenic { arsenic }			1	13.6	mg/kg		11.381	mg/kg	0.00114 %	✓		
		033-001-00-X	231-148-6	7440-38-2										
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	8.4	mg/kg		7.029	mg/kg	0.000703 %	✓		
		048-001-00-5												
3		copper { dicopper oxide ; copper (I) oxide }			1	72	mg/kg	1.126	67.836	mg/kg	0.00678 %	✓		
		029-002-00-X	215-270-7	1317-39-1										
4		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	123	mg/kg		102.929	mg/kg	0.0103 %	✓		
		082-001-00-6												
5		mercury { mercury }			7	0.4	mg/kg		0.335	mg/kg	0.0000335 %	✓		
		080-001-00-0	231-106-7	7439-97-6										
6		nickel { nickel }			7	23.3	mg/kg		19.498	mg/kg	0.00195 %	✓		
		028-002-00-7	231-111-4	7440-02-0										
7		selenium { selenium }			7	1	mg/kg		0.837	mg/kg	0.0000837 %	✓		
		034-001-00-2	231-957-4	7782-49-2										
8		zinc { zinc oxide }			7	320	mg/kg	1.245	333.313	mg/kg	0.0333 %	✓		
		030-013-00-7	215-222-5	1314-13-2										
9		chromium in chromium(VI) compounds { chromium(VI) oxide }			7	<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0										
10		naphthalene			7	0.85	mg/kg		0.711	mg/kg	0.0000711 %	✓		
		601-052-00-2	202-049-5	91-20-3										
11		acenaphthylene			7	<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD	
			205-917-1	208-96-8										
12		acenaphthene			7	0.84	mg/kg		0.703	mg/kg	0.0000703 %	✓		
			201-469-6	83-32-9										
13		fluorene			7	0.54	mg/kg		0.452	mg/kg	0.0000452 %	✓		
			201-695-5	86-73-7										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		4.58 mg/kg		3.833 mg/kg	0.000383 %	✓	
15	anthracene	204-371-1	120-12-7		0.97 mg/kg		0.812 mg/kg	0.0000812 %	✓	
16	fluoranthene	205-912-4	206-44-0		5.86 mg/kg		4.904 mg/kg	0.00049 %	✓	
17	pyrene	204-927-3	129-00-0		5.64 mg/kg		4.72 mg/kg	0.000472 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		3.5 mg/kg		2.929 mg/kg	0.000293 %	✓	
19	chrysene	601-048-00-0	205-923-4		3.29 mg/kg		2.753 mg/kg	0.000275 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		2.87 mg/kg		2.402 mg/kg	0.00024 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		1.71 mg/kg		1.431 mg/kg	0.000143 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.4 mg/kg		<0.4 mg/kg	<0.00004 %		<LOD
23	benzo[ghi]perylene	205-883-8	191-24-2		2.03 mg/kg		1.699 mg/kg	0.00017 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		3.8 mg/kg		3.18 mg/kg	0.000318 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		1.48 mg/kg		1.238 mg/kg	0.000124 %	✓	
26	pH		PH		8.82 pH		8.82 pH	8.82 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		44.3 mg/kg	1.462	54.182 mg/kg	0.00542 %	✓	
Total:								0.063 %		

Key

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

Classification of sample: TP04-04/02/2021-1.80m

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

Sample details

Sample Name:	LoW Code:
TP04-04/02/2021-1.80m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
16.7%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		8.3 mg/kg		7.112 mg/kg	0.000711 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	0.2 mg/kg		0.171 mg/kg	0.0000171 %	✓	
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21 mg/kg	1.126	20.26 mg/kg	0.00203 %	✓	
4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	46 mg/kg		39.417 mg/kg	0.00394 %	✓	
5	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.4 mg/kg		0.343 mg/kg	0.0000343 %	✓	
6	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	13.5 mg/kg		11.568 mg/kg	0.00116 %	✓	
7	selenium { selenium }	034-001-00-2	231-957-4	7782-49-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
8	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		57 mg/kg	1.245	60.796 mg/kg	0.00608 %	✓	
9	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
10	naphthalene	601-052-00-2	202-049-5	91-20-3		0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓	
11	acenaphthylene		205-917-1	208-96-8		0.06 mg/kg		0.0514 mg/kg	0.00000514 %	✓	
12	acenaphthene		201-469-6	83-32-9		0.7 mg/kg		0.6 mg/kg	0.00006 %	✓	
13	fluorene		201-695-5	86-73-7		0.29 mg/kg		0.249 mg/kg	0.0000249 %	✓	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		3.01 mg/kg		2.579 mg/kg	0.000258 %	✓	
15	anthracene	204-371-1	120-12-7		0.78 mg/kg		0.668 mg/kg	0.0000668 %	✓	
16	fluoranthene	205-912-4	206-44-0		3.33 mg/kg		2.853 mg/kg	0.000285 %	✓	
17	pyrene	204-927-3	129-00-0		2.79 mg/kg		2.391 mg/kg	0.000239 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		1.04 mg/kg		0.891 mg/kg	0.0000891 %	✓	
19	chrysene	601-048-00-0	205-923-4		1.02 mg/kg		0.874 mg/kg	0.0000874 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.99 mg/kg		0.848 mg/kg	0.0000848 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.61 mg/kg		0.523 mg/kg	0.0000523 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.12 mg/kg		0.103 mg/kg	0.0000103 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		0.57 mg/kg		0.488 mg/kg	0.0000488 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.22 mg/kg		1.045 mg/kg	0.000105 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.48 mg/kg		0.411 mg/kg	0.0000411 %	✓	
26	pH		PH		11.22 pH		11.22 pH	11.22 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		59.4 mg/kg	1.462	74.393 mg/kg	0.00744 %	✓	
Total:								0.023 %		

Key

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

Classification of sample: IP3-04/02/2021-0.50m

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

Sample details

Sample Name:	LoW Code:
IP3-04/02/2021-0.50m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
9%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		2.4 mg/kg		2.202 mg/kg	0.00022 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	1.3 mg/kg		1.193 mg/kg	0.000119 %	✓	
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12 mg/kg	1.126	12.395 mg/kg	0.00124 %	✓	
4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	33 mg/kg		30.275 mg/kg	0.00303 %	✓	
5	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.4 mg/kg		0.367 mg/kg	0.0000367 %	✓	
6	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	5.2 mg/kg		4.771 mg/kg	0.000477 %	✓	
7	selenium { selenium }	034-001-00-2	231-957-4	7782-49-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
8	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		57 mg/kg	1.245	65.091 mg/kg	0.00651 %	✓	
9	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		0.29 mg/kg		0.266 mg/kg	0.0000266 %	✓	
15	anthracene	204-371-1	120-12-7		0.08 mg/kg		0.0734 mg/kg	0.00000734 %	✓	
16	fluoranthene	205-912-4	206-44-0		0.63 mg/kg		0.578 mg/kg	0.0000578 %	✓	
17	pyrene	204-927-3	129-00-0		0.59 mg/kg		0.541 mg/kg	0.0000541 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.37 mg/kg		0.339 mg/kg	0.0000339 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.33 mg/kg		0.303 mg/kg	0.0000303 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.34 mg/kg		0.312 mg/kg	0.0000312 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.22 mg/kg		0.202 mg/kg	0.0000202 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.04 mg/kg		0.0367 mg/kg	0.00000367 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		0.23 mg/kg		0.211 mg/kg	0.0000211 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.43 mg/kg		0.394 mg/kg	0.0000394 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.17 mg/kg		0.156 mg/kg	0.0000156 %	✓	
26	pH		PH		9.02 pH		9.02 pH	9.02 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		18.3 mg/kg	1.462	24.538 mg/kg	0.00245 %	✓	
Total:								0.0146 %		

Key

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

Appendix A: Classifier defined and non CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

cadmium compounds, with the exception of cadmium sulposelenide ($x\text{CdS.yCdSe}$), reaction mass of cadmium sulphide with zinc sulphide ($x\text{CdS.yZnS}$), reaction mass of cadmium sulphide with mercury sulphide ($x\text{CdS.yHgS}$), and those specified elsewhere in this Annex

CLP index number: 048-001-00-5

Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

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

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

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

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

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

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

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

▪ **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Arsenic results not speciated.

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Cadmium results not speciated.

copper {dicopper oxide; copper (I) oxide}

Copper results not speciated.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Lead results not speciated.

mercury {mercury}

Mercury results not speciated.

nickel {nickel}

Nickel results not speciated.

selenium {selenium}

Selenium results not speciated.

zinc {zinc oxide}

Zinc results not speciated.

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

Chromium(VI) compounds not speciated.

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

Chromium (III) compounds not speciated.

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2021.77.4714.9046 (18 Mar 2021)

HazWasteOnline Database: 2021.77.4714.9046 (18 Mar 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

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

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

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Waste Classification Report



89ALX-6JPGB-X64GC

Job name

EMT-21-1759-Batch-2-File-1

Description/Comments

Project

GRO-20064

Site

Didsbury Point

Related Documents

#	Name	Description
1	EMT-21-1759-Batch-2-File-1.HWOL	.hwol file used to create the Job

Waste Stream Template

Waste Stream template not used when importing the .hwol file

Classified by

Name:	Company:	HazWasteOnline™ Training Record:	
Sam Flaherty	Groundtech Consulting Limited	Course	Date
Date:	PO Box 499	Hazardous Waste Classification	-
09 Apr 2021 15:58 GMT	Manchester	Advanced Hazardous Waste Classification	-
Telephone:	M28 8EE		
0800 1613730			

Report

Created by: Sam Flaherty
Created date: 09 Apr 2021 15:58 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	BH01-09/02/2021-8.50m		Non Hazardous		2
2	BH01-09/02/2021-19.20m		Non Hazardous		3
3	BH01-09/02/2021-22.50m		Non Hazardous		4
4	BH02-09/02/2021-4.50m		Non Hazardous		5
5	BH02-09/02/2021-11.50m		Non Hazardous		6
6	BH02-09/02/2021-18.50m		Non Hazardous		7

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	8
Appendix B: Rationale for selection of metal species	8
Appendix C: Version	8

Classification of sample: BH01-09/02/2021-8.50m



Non Hazardous Waste

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

Sample details

Sample Name:	LoW Code:
BH01-09/02/2021-8.50m	Chapter:
	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	● pH				8.34 pH		8.34 pH	8.34 pH		
			PH							
Total:								0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH01-09/02/2021-19.20m

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

Sample details

Sample Name: **BH01-09/02/2021-19.20m** LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				8.26 pH		8.26	pH	8.26 pH		
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH01-09/02/2021-22.50m



Non Hazardous Waste

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

Sample details

Sample Name:	LoW Code:
BH01-09/02/2021-22.50m	Chapter:
	Entry:
	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	● pH				8.86 pH		8.86 pH	8.86 pH		
Total:								0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH02-09/02/2021-4.50m

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

Sample details

Sample Name: **BH02-09/02/2021-4.50m** LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				8.31 pH		8.31	pH	8.31 pH		
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH02-09/02/2021-11.50m

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

Sample details

Sample Name: **BH02-09/02/2021-11.50m** LoW Code: Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	● pH				10.99 pH		10.99 pH	10.99 pH		
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH02-09/02/2021-18.50m

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

Sample details

Sample Name: **BH02-09/02/2021-18.50m** LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	● pH				8.42 pH		8.42	pH	8.42 pH		
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Appendix A: Classifier defined and non CLP determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

Appendix B: Rationale for selection of metal species

None used in this classification

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2021.77.4714.9046 (18 Mar 2021)

HazWasteOnline Database: 2021.77.4714.9046 (18 Mar 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

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

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

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX 12 - Relevant Legislative Background

Legislative Background

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act;
- The Contaminated Land (England) Regulations 2000;
- The DETR circular 02/2000 Environmental Protection Act 1990: Part IIA Contaminated Land.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

- 1) Significant harm is being caused or there is a significant possibility of such harm being caused;
- 2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

- **Source** - substances that are potential contaminants or pollutants that may cause harm;
- **Pathway** - a potential route by which contaminants can move from the source to the receptor;
- **Receptor** - a receptor that may be harmed, for example the water environment, humans and water.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the SPR approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents

This report has been prepared in accordance with the list of guidance below however the list is not exhaustive:

- CLR11 – Model Procedures;
- Contamination and Environmental Matters - Their implications for Property Professionals (2nd Edition RICS Nov 2003);
- Brownfields – Managing the development of previously developed land – A client's guide, CIRIA 2002;
- DEFRA and Environment Agency publications CLR7 – 10, supported by the TOX guides and SGV guides, dated March 2002;
- DETR Circular 02/2000, Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990;
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002;

Relevant Legislative Documents

The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environment Act (1995);
- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012);
- The Environment Protection Act (1990);
- The Contaminated Land (England) Act (2000);
- Contaminated Land (England) Regulations (2012);
- The Water Resources Act (1991);
- The Pollution Prevention and Control (England and Wales) Regulations (2000);
- The Landfill Regulations (England and Wales) Regulations (2002);
- The Landfill (England and Wales) (Amendment) Regulations (2004);
- Health and Safety at Work Act;

APPENDIX 13 - Limitations

Limitations

This contract was completed by Groundtech Consulting on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with due skill and care, taking into consideration the project brief provided, project objectives, agreed scope of works, prevailing site conditions and budget allocation.

Other than that defined in the paragraph above, Groundtech Consulting provides no other accountability or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted industry practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Groundtech Consulting. A third party who relies on this report, does so at their own and sole risk and no liability to such parties is provided by Groundtech Consulting.

It is the understanding of Groundtech Consulting that this report is to be used for the intended purpose as set out in the introduction. The purpose was instrumental in determining the scope and level of the services provided. Should the purpose of the report or the proposed end use of the site change, this report will no longer be directly applicable, and its validity readdressed. No reliance upon the report in the revised situation should be assumed by the client without the permission of Groundtech Consulting.

The report was written in 2021, later changes in legislation, statutory requirements and industry best practices have not been considered and this should be allowed for. Ground conditions can also change and should be investigated if there is any significant delay in acting on the findings of this report. The period of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions in this report should not be relied upon in the future without the written confirmation from Groundtech Consulting that it is safe to do so.

The observations and conclusions outlined in this report are based exclusively on the services that were provided as set out in the agreement between the client and Groundtech Consulting.

Groundtech Consulting are not liable for the existence of any condition, the discovery of which would require additional investigation outside the agreed scope of works or core competency. The services provided are based upon Groundtech Consulting observations of existing physical conditions at the site gained from site reconnaissance together with interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and Groundtech Consulting assume the information to be correct.

No responsibility can be accepted for errors for third party information presented in this report. Groundtech Consulting were not authorised to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Groundtech Consulting are not liable for any inaccurate information, misrepresentation of data or conclusions, which may inform the scope of investigation undertaken by Groundtech Consulting and forms the contract with the client.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable due to its heterogeneous properties and as investigation exploratory locations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report, particularly between exploratory holes. The extent of the limited area depends on the soil and groundwater conditions, together with other constraints such as the position of any existing structures and underground utilities. Geo-Environmental testing was carried out for a limited number of parameters [as stipulated in the contract] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.



The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The groundwater level often has not had time to reach equilibrium and a monitoring period is required. Furthermore, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawings provided in this report are not meant to be an accurate base plan, but are preliminary and used to present the general relative locations of features on, and surrounding, the site.



Appendix E – Drainage Strategy Plan

HEALTH & SAFETY: The works shall be carried out by specialist competent and experienced contractors. All operatives shall have received full and appropriate training with appropriate qualifications for the operations they are required to undertake. All work shall be carried out in accordance with the relevant Health & Safety Regulations.

Drainage Notes

Any discrepancies shall be reported to the engineer for action prior to construction.

All drainage works shall be carried out in accordance with the requirements of the local authority and in conjunction with all relevant British Standards, Codes of Practice and the Design and Construction Guidance as appropriate.

All drainage shall comply with the typical drainage construction details and the requirements of BS EN 752.

Access covers and frames shall comply with the loadings specified and to BS EN 124 and kitemarked or if recessed covers are specified then in accordance with FACTA association equivalent. Allow for recess manhole covers to accept landscape architect finishes to all landscaped areas (total 9No. covers)

The proposed building outlines shown on this drawing are for information only. Refer to Architects plans for setting out information and details.

For setting out dimensions of SS's, SVP's, RWP's, Floor Gully & other drainage 'pop up' locations, refer to Architects or Mechanical & Electrical Engineers drawings. Location of external channel drains and gully locations / requirements to be confirmed by architect.

SVP locations for residential units are assumed based on the first floor drop positions. All SVP and RWP positions to be confirmed by others prior to construction. Further co-ordination between below ground drainage and drop positions will be required.

All SVPs to be roddable from above ground.

All pipework to be: Foul TBC and Surface Water 150mm unless otherwise stated.

All drainage pipework shall be laid soffit to soffit unless noted otherwise.

All underslab drainage shall be laid at gradients of 1:80 min. for foul pipework and 1:100 min. for surface water unless noted otherwise. All underslab drainage shall be clear of foundations unless shown otherwise. Use of long radius bends is acceptable provided they are kept to a minimum and used where unavoidable.

All surface water drop down positions shall have a bend set at invert level no greater than 1.3m below finish floor level.

At least one soil pipe at the head of each foul run shall be vented to the atmosphere. All rainwater downpipes shall be accessible above ground for rodding purposes.

Cover levels shown on this drawing are approximate and shall be adjusted to suit levels on site by Contractor. Covers shall be orientated to suit pavement finishes where appropriate.

All private drainage pipework for foul and surface water systems have been designed on the basis of UPVC to BS EN 1401-1, unless noted otherwise.

Concrete encasement of the pipework shall be required where the vertical clearance between two pipes crossing is less than 300mm.

All drainage connecting to the public sewer network shall not commence until receipt of the approval from the drainage authority and shall comply with requirements using vitrified clay pipework to BS EN 295 with plain sleeved or socketed flexible joints subject to approval.

Where drainage works are carried out in the public highway the relevant necessary approvals and road opening notices shall be obtained from the highway authority and utility companies.

Prior to construction the flow control manufacturer's drawing and hydraulic table shall be provided to the engineer for approval

Prior to construction the attenuation tank manufacturer's drawings shall be provided to the engineer for approval

Prior to construction the petrol separator manufacturer's drawings shall be provided to the engineer for approval

Upon completion all new drainage installation together with any existing drainage retained shall be jetted and CCTV surveyed upon completion. Contractor to ensure that the drainage system is fully operational, free of excess debris/silt and all identified faults rectified. A copy of the survey shall be provided to the Project Manager.



Standard Notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
4. All discrepancies should be reported to the C.A. prior to the commencement of the works.

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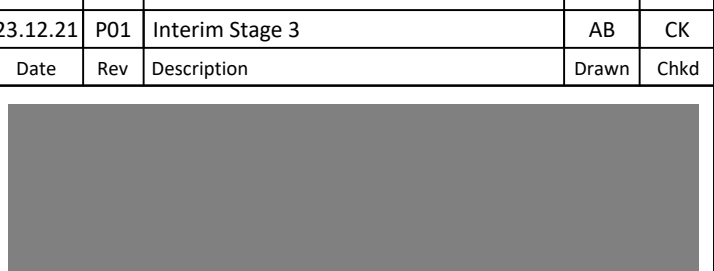
Notes and Keys

- Notes
1. This drawing has been based on the following:
 - 8845-BA-Z1-GF-DR-A(04)010 Ground Floor GA provided by Buttress on 14/12/2021
 - DPO-RYD-00-00-DR-5600-S2-P1 Room Loaded Information North and
 - DPO-RYD-00-00-DR-5601-S2-P1 Room Loaded Information South provided by Ryder on 14/12/2021.
 - RWP dropdown positions (SK)010 - Drainage - Level 00 provided by Buttress on 18/11/2021
 - Locations of existing manholes and sewers are based on Sewer Records by United Utilities and CCTV Survey provided by Layer Surveys on 09/02/2021

KEY

- Existing United Utilities Foul Water Sewer
- Existing United Utilities Surface Water Sewer
- Proposed Residential Foul Drainage
- Proposed MHCC Foul Drainage
- Proposed Combined Residential and MHCC Foul Drainage
- Proposed Surface Water Drainage
- Proposed Residential Foul PPIC
- Proposed MHCC Foul PPIC
- Proposed Combined Residential and MHCC Foul PPIC
- Proposed Combined Residential and MHCC Foul Manhole
- Proposed Surface Water PPIC
- Proposed Surface Water Manhole
- ▨ Proposed Surface Attenuation Tank
- Proposed Surface Water Drainage Channel
- Proposed Filter Drain
- BD ● Proposed Backdrop
- ✕ Proposed SVP MHCC
- ✕ Proposed SVP Residential
- ✕ Proposed RWP

23.12.21	P01	Interim Stage 3	AB	CK
Date	Rev	Description	Drawn	Chkd



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Project

DIDSBURY POINT

Title

PROPOSED DRAINAGE GA

Status					
STAGE 3					
Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1215	1:200	30.11.21	CD	AB	----
Drawing Number					Revision
1215-CIV-XX-ZZ-DR-C-3000					P01

Appendix F – Surface Water Drainage Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.016	4.00	31.450	450		383523.627	392579.187	0.980
JN1	0.014	4.00	31.290			383528.406	392586.933	0.911
2	0.030	4.00	31.180	450		383532.831	392594.140	0.936
3			31.150	450		383537.302	392599.881	0.957
JN2	0.006	4.00	31.290			383545.901	392595.141	1.173
JN3	0.039	4.00	31.290			383550.200	392592.763	1.211
JN4			31.290			383552.354	392591.572	1.230
JN5	0.001	4.00	31.440			383566.879	392583.491	1.508
JN6	0.005	4.00	31.440			383568.411	392582.641	1.521
4			31.440	450		383573.669	392579.804	1.567
JN7	0.031	4.00	31.440			383572.560	392577.391	1.659
JN8			31.290			383571.430	392574.964	1.601
JN9	0.006	4.00	31.290			383567.971	392567.559	1.958
TANK_OUT		4.00	31.500			383565.107	392562.086	2.200
11			31.440	1200		383567.284	392565.999	2.194
12			31.500	600		383571.490	392563.775	2.282
13			31.470	600		383581.089	392580.827	2.332
14			31.370	1200		383582.473	392584.779	2.483
5	0.050	4.00	31.270	450		383526.171	392550.645	0.820
JN10	0.015	4.00	31.300			383535.718	392545.577	0.922
6			31.500	450		383542.312	392541.961	1.172
JN11	0.020	4.00	31.500			383550.865	392557.795	1.351
7	0.012	4.00	31.500	450		383555.439	392566.258	1.447
TANK_IN			31.500			383561.860	392562.769	2.170
8	0.074	4.00	31.500	450		383543.085	392538.164	0.910
9			31.500	450		383558.617	392567.415	2.060
PI			31.500	1550	1300	383560.890	392566.104	2.130
10			31.500	1200		383562.703	392565.127	2.150

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	JN1	9.102	0.600	30.470	30.379	0.091	100.0	100	4.20	50.0
1.001	JN1	2	8.457	0.600	30.379	30.294	0.085	100.0	100	4.38	50.0
1.002	2	3	7.277	0.600	30.244	30.193	0.051	142.7	150	4.53	50.0
1.003	3	JN2	9.819	0.600	30.193	30.117	0.076	129.2	150	4.71	50.0
1.004	JN2	JN3	4.913	0.600	30.117	30.079	0.038	129.3	150	4.80	50.0
1.005	JN3	JN4	2.461	0.600	30.079	30.060	0.019	129.5	150	4.85	50.0
1.006	JN4	JN5	16.622	0.600	30.060	29.932	0.128	129.9	150	5.16	50.0
1.007	JN5	JN6	1.752	0.600	29.932	29.919	0.013	130.0	150	5.20	50.0
1.008	JN6	4	5.975	0.600	29.919	29.873	0.046	130.0	150	5.31	50.0
1.009	4	JN7	2.656	0.600	29.873	29.781	0.092	29.0	150	5.33	50.0
1.010	JN7	JN8	2.677	0.600	29.781	29.689	0.092	29.0	150	5.36	50.0
1.011	JN8	JN9	8.173	0.600	29.689	29.407	0.282	29.0	150	5.43	50.0
1.012	JN9	11	1.705	0.600	29.332	29.321	0.011	155.0	225	5.46	50.0
2.000	TANK_OUT	11	4.483	0.600	29.300	29.270	0.030	149.4	300	4.06	50.0
1.013	11	12	4.758	0.600	29.246	29.218	0.028	168.0	300	5.52	50.0
1.014	12	13	19.568	0.600	29.218	29.138	0.080	244.6	300	5.85	50.0
1.015	13	14	4.187	0.600	29.138	28.887	0.251	16.7	300	5.87	50.0
3.000	5	JN10	10.809	0.600	30.450	30.378	0.072	150.0	150	4.22	50.0
3.001	JN10	6	7.520	0.600	30.378	30.328	0.050	150.0	150	4.37	50.0
3.002	6	JN11	17.996	0.600	30.328	30.149	0.179	100.5	150	4.67	50.0
3.003	JN11	7	9.620	0.600	30.149	30.053	0.096	100.2	150	4.83	50.0
3.004	7	TANK_IN	7.308	0.600	30.053	29.980	0.073	100.1	150	4.95	50.0
4.000	8	9	33.119	0.600	30.590	29.515	1.075	30.8	150	4.30	50.0
4.001	9	PI	2.624	0.600	29.440	29.420	0.020	131.2	225	4.34	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.769	6.0	2.2	0.880	0.811	0.016	0.0	42	0.708
1.001	0.769	6.0	4.1	0.811	0.786	0.030	0.0	60	0.823
1.002	0.839	14.8	8.2	0.786	0.807	0.060	0.0	79	0.859
1.003	0.882	15.6	8.2	0.807	1.023	0.060	0.0	77	0.892
1.004	0.882	15.6	9.0	1.023	1.061	0.066	0.0	82	0.913
1.005	0.881	15.6	14.4	1.061	1.080	0.106	0.0	114	0.998
1.006	0.880	15.6	14.4	1.080	1.358	0.106	0.0	114	0.997
1.007	0.880	15.5	14.5	1.358	1.371	0.107	0.0	115	0.997
1.008	0.880	15.5	15.2	1.371	1.417	0.112	0.0	120	1.000
1.009	1.876	33.2	15.2	1.417	1.509	0.112	0.0	71	1.835
1.010	1.876	33.2	19.5	1.509	1.451	0.144	0.0	83	1.952
1.011	1.876	33.2	19.5	1.451	1.733	0.144	0.0	83	1.952
1.012	1.048	41.7	20.2	1.733	1.894	0.149	0.0	110	1.039
2.000	1.284	90.7	0.0	1.900	1.870	0.000	0.0	0	0.000
1.013	1.210	85.5	30.3	1.894	1.982	0.224	0.0	123	1.110
1.014	1.001	70.7	30.3	1.982	2.032	0.224	0.0	137	0.962
1.015	3.867	273.4	30.3	2.032	2.183	0.224	0.0	67	2.581
3.000	0.818	14.5	6.8	0.670	0.772	0.050	0.0	72	0.806
3.001	0.818	14.5	8.8	0.772	1.022	0.065	0.0	85	0.858
3.002	1.002	17.7	8.8	1.022	1.201	0.065	0.0	75	1.000
3.003	1.004	17.7	11.5	1.201	1.297	0.085	0.0	88	1.067
3.004	1.004	17.7	13.1	1.297	1.370	0.097	0.0	96	1.098
4.000	1.820	32.2	10.1	0.760	1.835	0.074	0.0	58	1.614
4.001	1.140	45.3	10.1	1.835	1.855	0.074	0.0	72	0.919

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.002	PI	10	2.059	0.600	29.370	29.350	0.020	103.0	225	4.37	50.0
4.003	10	11	4.663	0.600	29.350	29.321	0.029	160.8	225	4.44	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.002	1.288	51.2	10.1	1.905	1.925	0.074	0.0	67	1.004
4.003	1.028	40.9	10.1	1.925	1.894	0.074	0.0	76	0.855

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	9.102	100.0	100	Circular	31.450	30.470	0.880	31.290	30.379	0.811
1.001	8.457	100.0	100	Circular	31.290	30.379	0.811	31.180	30.294	0.786
1.002	7.277	142.7	150	Circular	31.180	30.244	0.786	31.150	30.193	0.807
1.003	9.819	129.2	150	Circular	31.150	30.193	0.807	31.290	30.117	1.023
1.004	4.913	129.3	150	Circular	31.290	30.117	1.023	31.290	30.079	1.061
1.005	2.461	129.5	150	Circular	31.290	30.079	1.061	31.290	30.060	1.080
1.006	16.622	129.9	150	Circular	31.290	30.060	1.080	31.440	29.932	1.358
1.007	1.752	130.0	150	Circular	31.440	29.932	1.358	31.440	29.919	1.371
1.008	5.975	130.0	150	Circular	31.440	29.919	1.371	31.440	29.873	1.417
1.009	2.656	29.0	150	Circular	31.440	29.873	1.417	31.440	29.781	1.509
1.010	2.677	29.0	150	Circular	31.440	29.781	1.509	31.290	29.689	1.451
1.011	8.173	29.0	150	Circular	31.290	29.689	1.451	31.290	29.407	1.733
1.012	1.705	155.0	225	Circular	31.290	29.332	1.733	31.440	29.321	1.894
2.000	4.483	149.4	300	Circular	31.500	29.300	1.900	31.440	29.270	1.870
1.013	4.758	168.0	300	Circular	31.440	29.246	1.894	31.500	29.218	1.982
1.014	19.568	244.6	300	Circular	31.500	29.218	1.982	31.470	29.138	2.032
1.015	4.187	16.7	300	Circular	31.470	29.138	2.032	31.370	28.887	2.183
3.000	10.809	150.0	150	Circular	31.270	30.450	0.670	31.300	30.378	0.772

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
1.000	1	450		Manhole	Adoptable	JN1			Junction	
1.001	JN1			Junction		2	450		Manhole	Adoptable
1.002	2	450		Manhole	Adoptable	3	450		Manhole	Adoptable
1.003	3	450		Manhole	Adoptable	JN2			Junction	
1.004	JN2			Junction		JN3			Junction	
1.005	JN3			Junction		JN4			Junction	
1.006	JN4			Junction		JN5			Junction	
1.007	JN5			Junction		JN6			Junction	
1.008	JN6			Junction		4	450		Manhole	Adoptable
1.009	4	450		Manhole	Adoptable	JN7			Junction	
1.010	JN7			Junction		JN8			Junction	
1.011	JN8			Junction		JN9			Junction	
1.012	JN9			Junction		11	1200		Manhole	Adoptable
2.000	TANK_OUT			Junction		11	1200		Manhole	Adoptable
1.013	11	1200		Manhole	Adoptable	12	600		Manhole	Adoptable
1.014	12	600		Manhole	Adoptable	13	600		Manhole	Adoptable
1.015	13	600		Manhole	Adoptable	14	1200		Manhole	Adoptable
3.000	5	450		Manhole	Adoptable	JN10			Junction	

Pipeline Schedule

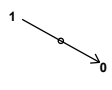
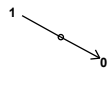
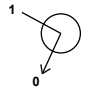
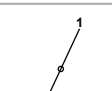
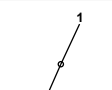
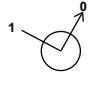
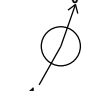
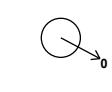
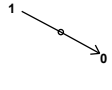
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.001	7.520	150.0	150	Circular	31.300	30.378	0.772	31.500	30.328	1.022
3.002	17.996	100.5	150	Circular	31.500	30.328	1.022	31.500	30.149	1.201
3.003	9.620	100.2	150	Circular	31.500	30.149	1.201	31.500	30.053	1.297
3.004	7.308	100.1	150	Circular	31.500	30.053	1.297	31.500	29.980	1.370
4.000	33.119	30.8	150	Circular	31.500	30.590	0.760	31.500	29.515	1.835
4.001	2.624	131.2	225	Circular	31.500	29.440	1.835	31.500	29.420	1.855
4.002	2.059	103.0	225	Circular	31.500	29.370	1.905	31.500	29.350	1.925
4.003	4.663	160.8	225	Circular	31.500	29.350	1.925	31.440	29.321	1.894

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
3.001	JN10			Junction		6	450		Manhole	Adoptable
3.002	6	450		Manhole	Adoptable	JN11			Junction	
3.003	JN11			Junction		7	450		Manhole	Adoptable
3.004	7	450		Manhole	Adoptable	TANK_IN			Junction	
4.000	8	450		Manhole	Adoptable	9	450		Manhole	Adoptable
4.001	9	450		Manhole	Adoptable	PI	1550	1300	Manhole	Adoptable
4.002	PI	1550	1300	Manhole	Adoptable	10	1200		Manhole	Adoptable
4.003	10	1200		Manhole	Adoptable	11	1200		Manhole	Adoptable

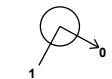
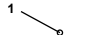
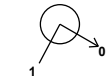
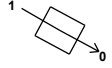
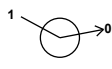
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
1	383523.627	392579.187	31.450	0.980	450			0	1.000	30.470	100
JN1	383528.406	392586.933	31.290	0.911				1	1.000	30.379	100
								0	1.001	30.379	100
2	383532.831	392594.140	31.180	0.936	450			1	1.001	30.294	100
								0	1.002	30.244	150
3	383537.302	392599.881	31.150	0.957	450			1	1.002	30.193	150
								0	1.003	30.193	150
JN2	383545.901	392595.141	31.290	1.173				1	1.003	30.117	150
								0	1.004	30.117	150
JN3	383550.200	392592.763	31.290	1.211				1	1.004	30.079	150
								0	1.005	30.079	150
JN4	383552.354	392591.572	31.290	1.230				1	1.005	30.060	150
								0	1.006	30.060	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
JN5	383566.879	392583.491	31.440	1.508				1 1.006	29.932	150
								0 1.007	29.932	150
JN6	383568.411	392582.641	31.440	1.521				1 1.007	29.919	150
								0 1.008	29.919	150
4	383573.669	392579.804	31.440	1.567	450			1 1.008	29.873	150
								0 1.009	29.873	150
JN7	383572.560	392577.391	31.440	1.659				1 1.009	29.781	150
								0 1.010	29.781	150
JN8	383571.430	392574.964	31.290	1.601				1 1.010	29.689	150
								0 1.011	29.689	150
JN9	383567.971	392567.559	31.290	1.958				1 1.011	29.407	150
								0 1.012	29.332	225
TANK_OUT	383565.107	392562.086	31.500	2.200						
								0 2.000	29.300	300
11	383567.284	392565.999	31.440	2.194	1200			1 4.003	29.321	225
								2 2.000	29.270	300
								3 1.012	29.321	225
								0 1.013	29.246	300
12	383571.490	392563.775	31.500	2.282	600			1 1.013	29.218	300
								0 1.014	29.218	300
13	383581.089	392580.827	31.470	2.332	600			1 1.014	29.138	300
								0 1.015	29.138	300
14	383582.473	392584.779	31.370	2.483	1200			1 1.015	28.887	300
5	383526.171	392550.645	31.270	0.820	450					
								0 3.000	30.450	150
JN10	383535.718	392545.577	31.300	0.922				1 3.000	30.378	150
								0 3.001	30.378	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
6	383542.312	392541.961	31.500	1.172	450			1 3.001	30.328	150
								0 3.002	30.328	150
JN11	383550.865	392557.795	31.500	1.351				1 3.002	30.149	150
								0 3.003	30.149	150
7	383555.439	392566.258	31.500	1.447	450			1 3.003	30.053	150
								0 3.004	30.053	150
TANK_IN	383561.860	392562.769	31.500	2.170				1 3.004	29.980	150
8	383543.085	392538.164	31.500	0.910	450			0 4.000	30.590	150
								1 4.000	29.515	150
9	383558.617	392567.415	31.500	2.060	450			0 4.001	29.440	225
PI	383560.890	392566.104	31.500	2.130	1550	1300		1 4.001	29.420	225
								0 4.002	29.370	225
10	383562.703	392565.127	31.500	2.150	1200			1 4.002	29.350	225
								0 4.003	29.350	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	2880
M5-60 (mm)	17.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Check Discharge Rate(s)	x
Summer CV	0.750	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	40	0	0

Node 11 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	29.246	Product Number	CTL-SHE-0098-5000-1500-5000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node TANK OUT Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	30.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	29.300	Main Channel Slope (1:X)	1000.0
Safety Factor	2.0	Time to half empty (mins)	208	Main Channel n	0.011

Inlets

TANK_IN

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	90.0	0.0	1.200	90.0	0.0	1.201	0.0	0.0

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	6

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	19.0	0.0	0.350	19.0	0.0	0.351	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	30.517	0.047	2.7	0.0232	0.0000	OK
15 minute summer	JN1	10	30.449	0.070	4.9	0.0208	0.0000	OK
15 minute summer	2	10	30.342	0.098	9.9	0.0794	0.0000	OK
15 minute summer	3	10	30.284	0.091	9.8	0.0145	0.0000	OK
15 minute summer	JN2	10	30.221	0.104	10.7	0.0108	0.0000	OK
15 minute summer	JN3	10	30.209	0.130	16.9	0.0848	0.0000	OK
15 minute summer	JN4	11	30.189	0.129	16.6	0.0000	0.0000	OK
15 minute summer	JN5	11	30.061	0.129	16.5	0.0019	0.0000	OK
15 minute summer	JN6	11	30.047	0.128	17.4	0.0089	0.0000	OK
15 minute summer	4	11	29.962	0.089	17.4	0.0141	0.0000	OK
15 minute summer	JN7	11	29.870	0.089	21.7	0.0334	0.0000	OK
15 minute summer	JN8	11	29.778	0.089	21.7	0.0000	0.0000	OK
60 minute summer	JN9	50	29.523	0.191	14.7	0.0111	0.0000	OK
60 minute summer	TANK_OUT	50	29.523	0.223	16.8	0.0000	0.0000	OK
60 minute summer	11	50	29.523	0.277	21.5	0.3128	0.0000	OK
60 minute summer	12	50	29.273	0.055	4.6	0.0155	0.0000	OK
60 minute summer	13	51	29.167	0.029	4.6	0.0082	0.0000	OK
60 minute summer	14	51	28.914	0.027	4.6	0.0000	0.0000	OK
15 minute summer	5	10	30.534	0.084	8.2	0.1169	0.0000	OK
15 minute summer	JN10	10	30.475	0.097	10.6	0.0309	0.0000	OK
15 minute summer	6	10	30.413	0.085	10.6	0.0135	0.0000	OK
15 minute summer	JN11	10	30.255	0.106	13.9	0.0316	0.0000	OK
15 minute summer	7	10	30.167	0.114	15.6	0.0368	0.0000	OK
60 minute summer	TANK_IN	50	29.523	0.193	14.9	0.0000	0.0000	OK
15 minute summer	8	10	30.655	0.065	12.1	0.1168	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	JN1	2.7	0.574	0.447	0.0431	
15 minute summer	JN1	1.001	2	4.9	0.844	0.805	0.0487	
15 minute summer	2	1.002	3	9.8	0.839	0.663	0.0852	
15 minute summer	3	1.003	JN2	9.7	0.805	0.625	0.1187	
15 minute summer	JN2	1.004	JN3	10.5	0.726	0.672	0.0717	
15 minute summer	JN3	1.005	JN4	16.6	1.044	1.068	0.0398	
15 minute summer	JN4	1.006	JN5	16.3	1.020	1.051	0.2683	
15 minute summer	JN5	1.007	JN6	16.7	1.038	1.073	0.0281	
15 minute summer	JN6	1.008	4	17.4	1.282	1.123	0.0801	
15 minute summer	4	1.009	JN7	17.5	1.623	0.527	0.0288	
15 minute summer	JN7	1.010	JN8	21.7	2.006	0.655	0.0290	
15 minute summer	JN8	1.011	JN9	21.8	2.012	0.658	0.0886	
60 minute summer	JN9	1.012	11	14.5	0.765	0.349	0.0626	
60 minute summer	TANK_OUT	2.000	11	-16.8	-0.520	-0.185	0.2675	
60 minute summer	11	Hydro-Brake®	12	4.6				
60 minute summer	12	1.014	13	4.6	0.784	0.066	0.1194	
60 minute summer	13	1.015	14	4.6	1.412	0.017	0.0138	32.9
15 minute summer	5	3.000	JN10	8.2	0.736	0.567	0.1203	
15 minute summer	JN10	3.001	6	10.6	0.946	0.733	0.0841	
15 minute summer	6	3.002	JN11	10.6	0.893	0.597	0.2126	
15 minute summer	JN11	3.003	7	13.7	0.989	0.771	0.1330	
15 minute summer	7	3.004	TANK_IN	15.2	1.104	0.859	0.1013	
60 minute summer	TANK_IN	Flow through pond	TANK_OUT	-5.6	0.074	-0.001	18.6793	
15 minute summer	8	4.000	9	12.1	1.671	0.376	0.2394	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	9	10	29.530	0.090	12.1	0.0144	0.0000	OK
60 minute summer	PI	50	29.523	0.153	7.3	0.3075	0.0000	OK
60 minute summer	10	50	29.523	0.173	7.2	0.1952	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	9	4.001	PI	12.1	0.887	0.266	0.0357	
60 minute summer	PI	4.002	10	7.2	0.610	0.140	0.0632	
60 minute summer	10	4.003	11	6.9	0.532	0.169	0.1637	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	31.078	0.608	7.1	0.3007	0.0000	SURCHARGED
15 minute summer	JN1	12	31.024	0.645	10.0	0.1909	0.0000	FLOOD RISK
15 minute summer	2	12	30.861	0.616	20.7	1.4164	0.0000	SURCHARGED
15 minute summer	3	12	30.804	0.611	14.8	0.0972	0.0000	SURCHARGED
15 minute summer	JN2	12	30.739	0.622	16.1	0.0647	0.0000	SURCHARGED
15 minute summer	JN3	12	30.702	0.623	28.3	0.4063	0.0000	SURCHARGED
15 minute summer	JN4	12	30.655	0.595	26.6	0.0000	0.0000	SURCHARGED
15 minute summer	JN5	12	30.325	0.393	25.4	0.0059	0.0000	SURCHARGED
15 minute summer	JN6	12	30.289	0.370	26.3	0.0259	0.0000	SURCHARGED
30 minute summer	4	20	30.139	0.266	24.4	0.0422	0.0000	SURCHARGED
120 minute summer	JN7	120	30.077	0.296	23.6	0.1115	0.0000	SURCHARGED
120 minute summer	JN8	120	30.076	0.387	23.5	0.0000	0.0000	SURCHARGED
120 minute summer	JN9	122	30.075	0.743	24.1	0.0431	0.0000	SURCHARGED
120 minute summer	TANK_OUT	122	30.075	0.775	28.4	0.0000	0.0000	SURCHARGED
120 minute summer	11	122	30.075	0.829	33.9	0.9375	0.0000	SURCHARGED
60 minute summer	12	34	29.274	0.056	4.9	0.0159	0.0000	OK
30 minute summer	13	114	29.168	0.030	4.9	0.0084	0.0000	OK
30 minute summer	14	114	28.915	0.028	4.9	0.0000	0.0000	OK
15 minute summer	5	11	31.169	0.719	21.7	0.9963	0.0000	FLOOD RISK
15 minute summer	JN10	11	31.054	0.676	23.5	0.2149	0.0000	FLOOD RISK
15 minute summer	6	11	30.922	0.594	21.1	0.0944	0.0000	SURCHARGED
15 minute summer	JN11	11	30.656	0.507	27.2	0.1511	0.0000	SURCHARGED
15 minute summer	7	11	30.390	0.337	31.0	0.1093	0.0000	SURCHARGED
120 minute summer	TANK_IN	122	30.075	0.745	22.6	0.0000	0.0000	OK
15 minute summer	8	10	30.716	0.126	32.0	0.2261	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	JN1	4.7	0.611	0.779	0.0712	
15 minute summer	JN1	1.001	2	8.3	1.063	1.377	0.0662	
15 minute summer	2	1.002	3	14.8	0.871	0.997	0.1281	
15 minute summer	3	1.003	JN2	15.6	0.884	0.998	0.1729	
15 minute summer	JN2	1.004	JN3	17.2	0.975	1.101	0.0865	
15 minute summer	JN3	1.005	JN4	26.6	1.512	1.709	0.0433	
15 minute summer	JN4	1.006	JN5	24.9	1.416	1.603	0.2926	
15 minute summer	JN5	1.007	JN6	24.5	1.394	1.579	0.0308	
15 minute summer	JN6	1.008	4	25.8	1.467	1.661	0.1052	
30 minute summer	4	1.009	JN7	24.3	1.498	0.733	0.0468	
120 minute summer	JN7	1.010	JN8	23.5	1.943	0.709	0.0471	
120 minute summer	JN8	1.011	JN9	23.1	1.624	0.697	0.1439	
120 minute summer	JN9	1.012	11	23.6	0.593	0.566	0.0678	
120 minute summer	TANK_OUT	2.000	11	-28.4	0.410	-0.313	0.3157	
120 minute summer	11	Hydro-Brake®	12	4.9				
60 minute summer	12	1.014	13	4.9	0.796	0.069	0.1237	
30 minute summer	13	1.015	14	4.9	1.432	0.018	0.0143	70.1
15 minute summer	5	3.000	JN10	17.2	0.977	1.190	0.1903	
15 minute summer	JN10	3.001	6	21.1	1.198	1.459	0.1324	
15 minute summer	6	3.002	JN11	20.9	1.187	1.180	0.3168	
15 minute summer	JN11	3.003	7	26.8	1.522	1.511	0.1694	
15 minute summer	7	3.004	TANK_IN	30.8	1.752	1.738	0.1274	
120 minute summer	TANK_IN	Flow through pond	TANK_OUT	-6.1	0.073	-0.001	68.3902	
15 minute summer	8	4.000	9	32.1	2.004	0.997	0.5534	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	9	122	30.075	0.635	12.9	0.1010	0.0000	SURCHARGED
120 minute summer	PI	122	30.075	0.705	11.9	1.4204	0.0000	SURCHARGED
120 minute summer	10	122	30.075	0.725	10.9	0.8199	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	9	4.001	PI	11.9	0.711	0.262	0.1044	
120 minute summer	PI	4.002	10	10.9	0.532	0.212	0.0819	
120 minute summer	10	4.003	11	10.3	0.468	0.252	0.1855	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	31.418	0.948	9.1	0.4694	0.0000	FLOOD RISK
15 minute summer	JN1	12	31.290	0.911	12.9	0.2899	0.0000	FLOOD RISK
15 minute summer	2	12	31.180	0.936	26.3	2.7579	0.0391	FLOOD
15 minute summer	3	12	31.100	0.907	15.9	0.1442	0.0000	FLOOD RISK
15 minute summer	JN2	12	31.011	0.894	17.0	0.0930	0.0000	FLOOD RISK
15 minute summer	JN3	12	30.965	0.886	31.8	0.5777	0.0000	SURCHARGED
15 minute summer	JN4	12	30.905	0.845	28.5	0.0000	0.0000	SURCHARGED
30 minute summer	JN5	21	30.543	0.611	25.3	0.0092	0.0000	SURCHARGED
30 minute summer	JN6	21	30.506	0.587	26.3	0.0411	0.0000	SURCHARGED
180 minute summer	4	180	30.385	0.512	16.0	0.0814	0.0000	SURCHARGED
180 minute summer	JN7	176	30.385	0.604	20.4	0.2277	0.0000	SURCHARGED
180 minute summer	JN8	180	30.384	0.695	20.3	0.0000	0.0000	SURCHARGED
180 minute summer	JN9	180	30.384	1.052	20.7	0.0610	0.0000	SURCHARGED
180 minute summer	TANK_OUT	180	30.382	1.082	25.4	0.0000	0.0000	SURCHARGED
180 minute summer	11	180	30.382	1.136	30.7	1.2844	0.0000	SURCHARGED
30 minute summer	12	193	29.274	0.056	4.9	0.0159	0.0000	OK
30 minute summer	13	193	29.168	0.030	4.9	0.0084	0.0000	OK
30 minute summer	14	193	28.915	0.028	4.9	0.0000	0.0000	OK
15 minute summer	5	10	31.270	0.820	27.9	1.1357	1.3524	FLOOD
15 minute summer	JN10	11	31.198	0.820	27.1	0.2608	0.0000	FLOOD RISK
15 minute summer	6	11	31.079	0.751	22.0	0.1194	0.0000	SURCHARGED
15 minute summer	JN11	11	30.810	0.661	31.3	0.1968	0.0000	SURCHARGED
15 minute summer	7	11	30.480	0.427	35.8	0.1384	0.0000	SURCHARGED
180 minute summer	TANK_IN	180	30.382	1.052	21.4	0.0000	0.0000	OK
15 minute summer	8	11	31.190	0.600	41.3	1.0749	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	JN1	5.7	0.724	0.938	0.0712	
15 minute summer	JN1	1.001	2	9.9	1.267	1.642	0.0662	
15 minute summer	2	1.002	3	15.9	0.902	1.070	0.1281	
15 minute summer	3	1.003	JN2	16.3	0.927	1.046	0.1729	
15 minute summer	JN2	1.004	JN3	17.9	1.016	1.148	0.0865	
15 minute summer	JN3	1.005	JN4	28.5	1.617	1.828	0.0433	
15 minute summer	JN4	1.006	JN5	26.0	1.479	1.674	0.2926	
30 minute summer	JN5	1.007	JN6	25.1	1.427	1.616	0.0308	
30 minute summer	JN6	1.008	4	26.2	1.486	1.683	0.1052	
180 minute summer	4	1.009	JN7	15.7	1.485	0.475	0.0468	
180 minute summer	JN7	1.010	JN8	20.3	1.796	0.612	0.0471	
180 minute summer	JN8	1.011	JN9	19.7	1.392	0.593	0.1439	
180 minute summer	JN9	1.012	11	20.2	0.570	0.485	0.0678	
180 minute summer	TANK_OUT	2.000	11	-25.4	0.393	-0.279	0.3157	
180 minute summer	11	Hydro-Brake®	12	4.9				
30 minute summer	12	1.014	13	4.9	0.796	0.069	0.1237	
30 minute summer	13	1.015	14	4.9	1.432	0.018	0.0143	91.0
15 minute summer	5	3.000	JN10	19.0	1.081	1.316	0.1903	
15 minute summer	JN10	3.001	6	22.0	1.250	1.522	0.1324	
15 minute summer	6	3.002	JN11	21.6	1.226	1.219	0.3168	
15 minute summer	JN11	3.003	7	29.9	1.699	1.686	0.1694	
15 minute summer	7	3.004	TANK_IN	35.7	2.028	2.012	0.1274	
180 minute summer	TANK_IN	Flow through pond	TANK_OUT	8.3	0.067	0.002	96.0314	
15 minute summer	8	4.000	9	35.1	1.995	1.092	0.5831	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	9	176	30.383	0.943	12.9	0.1499	0.0000	SURCHARGED
180 minute summer	PI	180	30.383	1.013	11.9	2.0409	0.0000	SURCHARGED
180 minute summer	10	180	30.383	1.033	11.0	1.1687	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute summer	9	4.001	PI	11.9	0.617	0.263	0.1044	
180 minute summer	PI	4.002	10	11.0	0.506	0.215	0.0819	
180 minute summer	10	4.003	11	10.5	0.455	0.256	0.1855	

Appendix G – United Utilities Correspondence

Ann Bacon

From: Perry, Graham <Graham.Perry@uuplc.co.uk>
Sent: 05 October 2021 17:34
To: Ann Bacon
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for : The Boulevard West Didsbury Manchester M29 2EY
UU reference Number : 4200043776

Categories: Filed by Newforma

Pre Development Enquiry for: he Boulevard West Didsbury Manchester M29 2EY UU reference Number : 4200043776

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 150mm diameter public foul water sewer within The Boulevard located to the north of your proposed development at an unrestricted rate. This can be a direct connection or indirect connection if you are the owner of the tails left out in the side road that are covered under a Section 104 agreement

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. into the ground (infiltration);
2. to a surface waterbody;
3. to a surface water sewer or highway drain;
4. to a combined sewer.

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 675mm diameter public surface water sewer within The Boulevard located north of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5 /s which is based on a site area less than 1 HA

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Graham Perry



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Developer Services
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