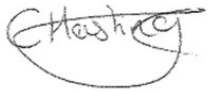


GROUNDTECH
CONSULTING

Job title:	50 Dundonald Road, Didsbury
Report type:	Geo-Environmental Appraisal
Prepared for:	JC Brennan Developments Ltd
Date:	06 September 2022

Document Control Form		
PROJECT	*50 DUNDONALD ROAD, DIDSBURY*	
REPORT NAME	*GEO-ENVIRONMENTAL APPRAISAL*	
REPORT REFERENCE	*GRO-22168-3756*	
STATUS	*FINAL*	
ISSUE DATE	*15 AUGUST 2022*	
REVISION	*06 SEPTEMBER 2022*	*1.1*
CLIENT	*JC BRENNAN DEVELOPMENTS LTD*	
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SUMMARY

Site Details		
Site Location		*The site is located circa 2.85 miles west of Stockport City Centre. The site is approximately centred on National Grid Reference 385045, 391014.*
Site Area		*The site is rectangular in shape and is approximately 0.11 hectares in area. The topography is level throughout, a slope is located along the south western boundary which leads down to the site to the adjacent Metrolink*
Preliminary Risk Assessment		
History		*The site formed part of a field until 1907 where a small building was constructed within the central area which has remained until recently.*
Geology/Hydrogeology		*The site is indicated to be underlain by Glaciofluvial Sand and Gravel, likely over Glacial Till. The Bedrock geology is indicated to be the Wilmslow Formation comprising Sandstone.* *The site does not lie within 500m of a Source Protection Zone. The nearest groundwater abstraction is located 1201m south west associated with spray irrigation, no potable abstractions are located within 2000 of the site.*
Environmental Setting		*River Mersey is located circa 971m south west of the site.* *There are no surface water abstractions within 2000m of the site.* *Radon levels are estimated to be less than 1% and radon precautions are not required.*
Pollution Linkage (PL) Assessment	Human Health	*Made Ground is anticipated beneath the site as it has been formerly developed. A moderate risk has been identified.*
	Controlled Waters	*Considered to be a Low risk to groundwater as a significant mobile contamination source has not been identified.*
	Permanent Ground Gas	*Low risk as no onsite sources of Ground Gas anticipated.*
Ground Model		
Made Ground Soils		*Made Ground was encountered beneath the site to a maximum depth of 0.9m bgl and comprised mainly of topsoil. This strata was underlain by brown gravelly sand and cobbles of brick within WS03 only.*
Natural Soils		*Natural soils at the site comprised grey brown very gravelly Sand, this was encountered within all locations from 0.3m to a maximum depth of 3.8m bgl. This strata typically became cobbly at 1.5m bgl.*
Bedrock		*Bedrock was not encountered during this investigation.*

Groundwater	*Groundwater strikes were observed within WS01 and WS02 at depths of 3.1m and 3.2m bgl respectively.*
Ground Engineering Assessment	
Foundations	*The most suitable foundations for the proposed residential developments are considered to be traditional unreinforced strip/trench foundations constructed within the medium dense to dense Sand.* *Preliminary foundation design has been undertaken by calculation, a safe allowable bearing pressure of 150kN/m^2 is provided for ultimate limit state design for a 0.6m wide strip foundation constructed within the medium dense to dense Sand.*
Highways	*CBR values of 5% are likely to be achieved in undisturbed natural granular soils for pavement design purposes, unless proven otherwise by in-situ testing at sub-base level by a specialist geotechnical engineer. As a minimum the subgrade should be proof rolled prior to construction.* *Where Made Ground is encountered at formation level, the CBR value should assumed to be less than 2.5%.*
SuDS	*Three fills were carried out at both positions SuDS1 and SuDS2 in accordance with BRE 365 at a depth of 2.2m and 2.4m bgl respectively within the underlying granular material. The calculated soil infiltration rates ranged between 1.00 x 10^{-4} m/s and 8.25 x 10^{-5} m/s which indicate good drainage conditions are present within the underlying soils.*
Constraints	*Loose sand deposits have been encountered within WS02 at 1.2m bgl and foundations will require deepening in this area.* *The preliminary slope stability assessment has recorded an ODF of above 1 and the slope is stable.*
GQRA and Revised (PL) Assessment	
Human Health	*Made Ground was encountered beneath the site to a maximum depth of 0.9m bgl and elevated concentrations of lead, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene have been recorded within Made Ground soils locally to WS03 at 0.3m bgl within the centre of the site, asbestos fibres were also detected within this location and SUDS2 at 0.1m bgl in the southern area of the site.* *A Moderate risk to human health is still considered to exist and remedial action is required where Made Ground exists at formation level in soft landscaping areas.*
Controlled Waters	*No mobile contamination has been encountered at the site, the risk to controlled waters is considered to be Low.*
Permanent Ground Gas	*At present, gas monitoring places the site in Green/CS1 classification and gas protection measures are currently not necessary. This classification will be confirmed upon completion of the gas monitoring when a full gas assessment will be issued.*
Final Appraisal	

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

- *Completion of gas monitoring programme.*

- *Issue gas assessment.*
- *Detailed foundation design.*
- *Confirmation of remedial recommendations with regulators.*

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Plans

Plan Reference	*Revision*	*Title*
GRO-22168-P01	-	*Project Location Plan*
GRO-22168-P02	-	*Preliminary Developments Constraints Plan*
GRO-22168-P03	-	*Illustrative Preliminary CSM*
GRO-22168-P04	-	*Exploratory Hole Location Plan*
GRO-22168-P05	-	*Generalised Ground Model*
GRO-22168-P06	-	*Revised Developments Constraints Plan*
GRO-22168-P07	-	*Revised Illustrative CSM*
GRO-22168-P08	-	*Slope stability outputs*

1.0 INTRODUCTION

1.1 Project Objectives

Groundtech Consulting Limited have been instructed by JC Brennan Developments LTD to undertake a Preliminary Risk Assessment for a site at 50 Dundonald Road in Didsbury.

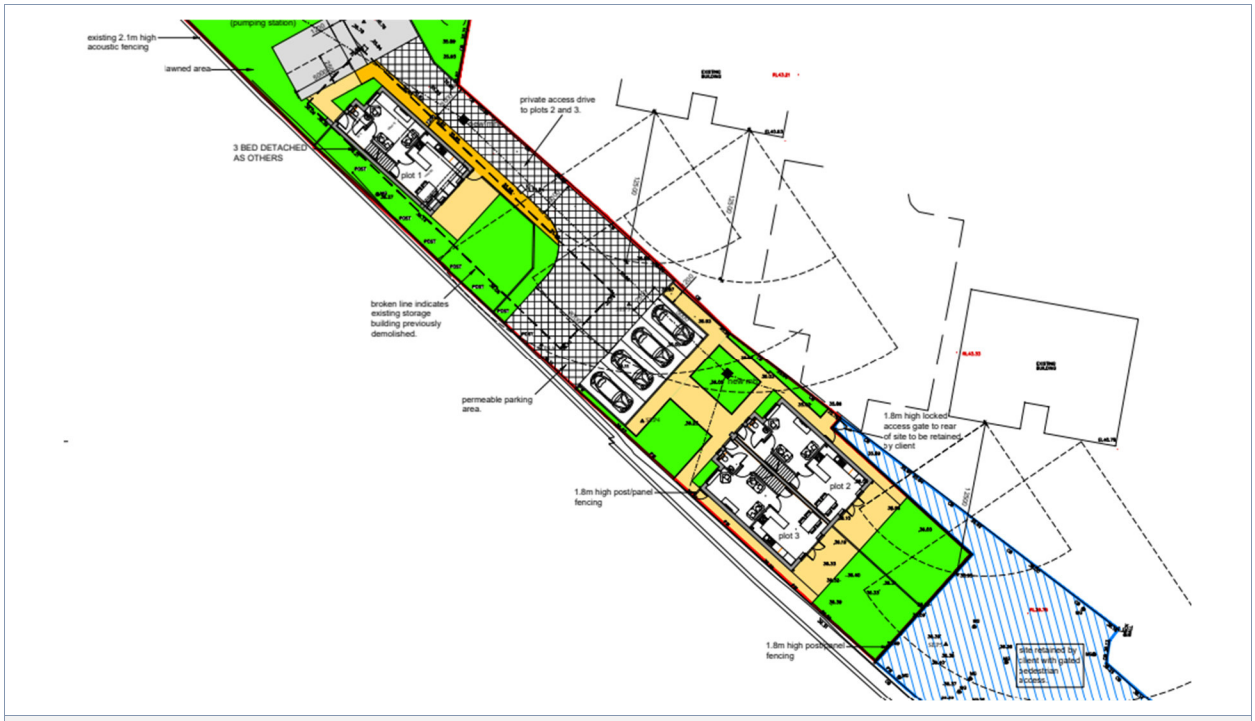
The objectives of the Preliminary Risk Assessment were to establish the sites environmental and geotechnical background in order to generate a Conceptual Site Model to identify any potential constraints and linkages which may affect the redevelopment of the site.

A main investigation was undertaken in accordance with BS 5930:2015, BS 10175:2017, BS 8576:2013 and Eurocode 7 to revise the CSM and quantify the level of risk identified in the PRA. The Appraisal has been prepared in accordance with current UK Legislation and to discharge Land Quality pre-commencement planning conditions.

The report has been undertaken to fulfil the requirements of a preliminary risk assessment in accordance with current LCRM risk assessment guidance.

1.2 Proposed Development

The proposed development is residential end use comprising the construction of three residential properties with associated gardens and hardstanding parking areas.



Proposed Development

1.3 Limitations

This Preliminary Risk Assessment is based on information obtained from a number of sources, and the information is assumed to be correct.

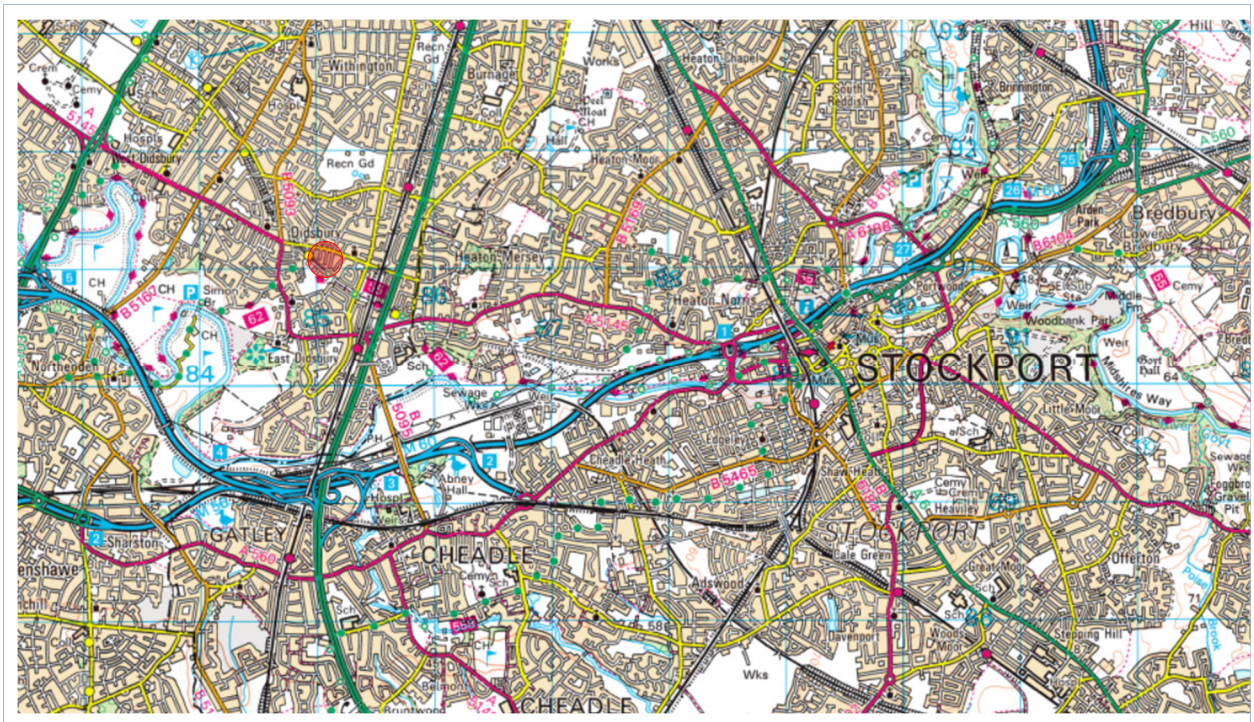
Other conditions may exist on the site that have not been taken into account in this assessment as they are outside the scope of works. Groundtech Consulting are not responsible for these circumstances that are not outlined in the report.

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 2.85 miles west of Stockport City Centre, as shown on the Project Location Plan *GRO-22168-P01*. The site is approximately centred on National Grid Reference 385045, 391014.



Project Location

Access to the site is gained off Dundonald Road to the north.

2.2 Site Description

The site is rectangular in shape and is circa 0.11 hectares in area. The topography is generally level, however there is a slope located along the southern boundary which leads down and connects the site to the adjacent Metrolink at a lower elevation.

The site is currently occupied by an area of soft landscaping adjacent to the Metrolink, topsoil is present centrally with dense vegetation and semi mature to mature trees located at the site boundaries. An area of stockpiled soils are present in the northern area of the site and are assumed to be the stripped soils from the site.

An area of hardstanding is located in the northern western area of the site associated with the site entrance, this also connects a residential property to the site which is located adjacent to the site to the north west.

No buildings are present on the site, evidence of footings and walls associated with a former building on the site are present at the surface centrally and a drain is located to the north of the suspected former building.

A small container and mini digger are located in the north western area of the site and area assumed to be associated with the enabling works that has been conducted at the site where the building has been demolished and removed off site and the majority of the topsoil's have been stripped and stockpiled.

Site Boundaries and Surrounding Area

The site is bounded by palisade fencing to the south which separates the site from the sloped area connecting to the Metrolink, dense vegetation to the east and less dense vegetation and wooden fencing to the north separating the site form the adjacent residential properties.

The site is surrounded by following features/land uses:

- *North* - *Residential Housing.*
- *East* - *Residential Housing.*
- *South* - *Metrolink followed by playing fields.*
- *West* - *Metrolink followed by residential housing.*

Site photographs are presented in *Appendix 2* and relevant features are recorded on the Preliminary Development Constraints Plan *GRO-22168-P02*.

3.0 ENVIRONMENTAL SETTING

3.1 Site History

Available historical maps have been obtained, a list of dates and scale are listed in the table below:

Scale	Date
1:1,250	*1963, 1974/75, 1980/85, 1988/92, 1992/94, 1992/95, 1994/95, 2003.*
1:2,500	*1872, 1881, 1894, 1898, 1907, 1910, 1922, 1934, 1955/57, 1956/58, 1956/59.*
1:10,000/10,560	*1849, 1898/93, 1897, 1911, 1923, 1934/38, 1938, 1954/55, 1965/67, 1976/81, 1983/88, 1989, 2001, 2010, 2022.*

The plans were examined and potential issues have been identified and summarised in the table below:

Date	Site	Surrounding Area
1849	*The site forms part of two fields with a tree line located in the southern area.*	***School Lane Farm** c.250m east.* ***Culvert** c.150m north west.*
1881	*The site still forms part of a field, the south western boundary is occupied by railway sidings.*	***Midland Railway** immediately south of the site.* ***Whitehall Farm** c.40m south east.* ***Glass Houses** c.140m north west.* ***Goods Shed** c.30m south west.*
1907	*A Buildings now occupies the central area of the site with an access road in the northern area.*	***Laundry** c.5m north.* ***Electrical Substation** c.200m north west.* ***Glass Houses** c.120m west.* ***Recreation Ground** c.180m south west.*
1922	*No Change.*	***Corporation Yard** c.220m south west.*
1934		***Allotment Gardens** c.210m north east.* ***Playing Fields** c.250m north.* ***Laundry** extended c.5m north.*
1955/57	*No Change.*	***Dairy** c.110m west.*
1956/59	*No Change.*	***Electrical Substation** c.240m north west.*
1974/75	*No Change.*	***Telephone Engineering Centre** c.40m west.*
1980/85	*No Change.*	***Depots** 20m to 30m south.*
2003	*No Change.*	***Depots** to the south replaced with residential properties.*

The historical plans are presented in *Appendix 3*.

3.2 Geology

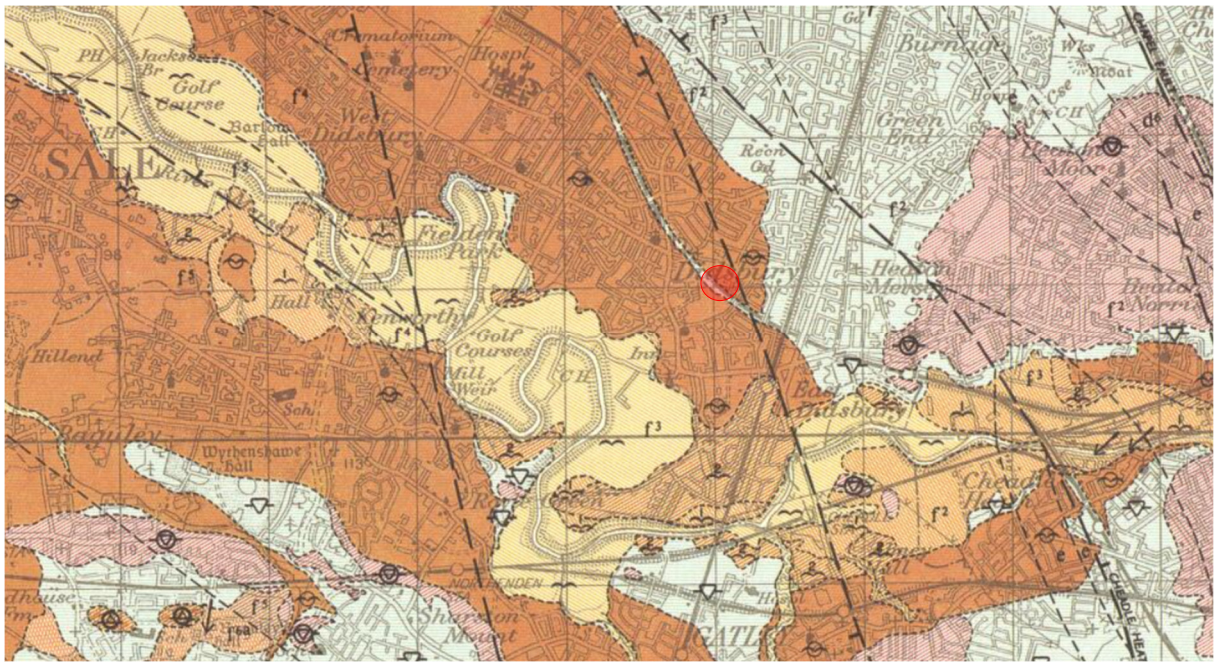
The following British Geological Survey (BGS) records and other available information were inspected to accurately determine the geology underlying the site:

- 1:*50,000 Scale Geological Sheet 98, Stockport - Solid and Drift Edition.*
- *BGS Records.*

Made Ground
Worked Ground is indicated to be present on site by the Groundsure Report.

Superficial Deposits

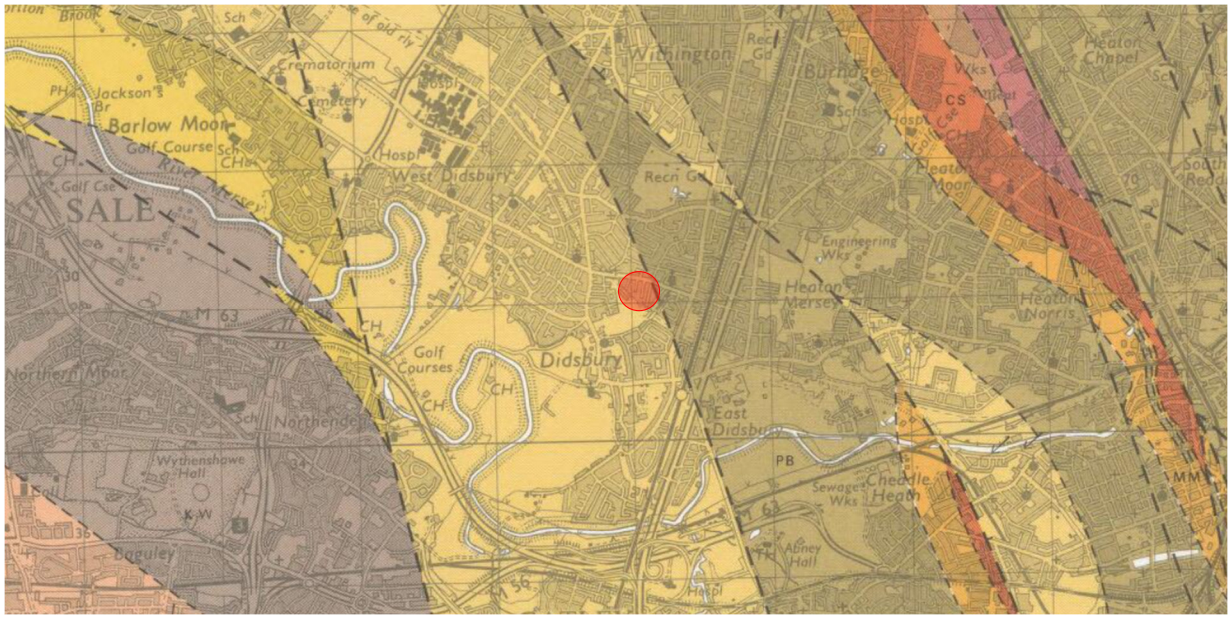
The site is indicated to be underlain by Glaciofluvial Sand and Gravel Deposits, Glacial Till is recorded along the south western boundary.



Geological Map – Superficial Deposits

Solid Geology

The bedrock geology is indicated to be the Wilmslow Sandstone Formation, this strata characteristically comprises Sandstone.



Geological Map – Solid Geology

No faults are shown on or within an influencing distance of the site, the nearest bedrock fault is indicated to be present 109m east.

BGS Records
The nearest BGS records are indicated to be circa 180m north west and the following ground conditions were encountered.

• *Made Ground*	*Ground level to 0.7m bgl.*
• *Brown silty very sandy clay*	*0.7m to 1.0m bgl.*
• *Firm to stiff brown silty very sandy clay*	*1.0m to 5.1m bgl*
• *Brown silty fine to coarse sand*	*5.1m to 5.3m bgl.*
• *Red brown silty fine to medium grained highly to moderately weathered sandstone*	*5.3m to 6.5m bgl.*

The BGS records are presented in *Appendix 4.*

3.3 Hydrogeology

The superficial deposits in this area are classified by the Environment Agency as a Secondary A Aquifer (Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers).

In the most northern portion of the site a Secondary Undifferentiated Aquifer is present (Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type).

The bedrock is classified as a Principal Aquifer (Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers).

The site does not lie within 500m of a Source Protection Zone, and no potable groundwater abstraction licences within 2000m of the site.

The nearest active groundwater abstraction is located 1201m south west associated with spray irrigation.

3.4 Hydrology

The nearest named watercourse is the River Mersey located circa 970m south west of the site.

Environment Agency information indicates that the site is outside a flood risk zone and is not at risk of flooding.

No surface water abstractions are located within 2000m of the site and no discharge consents are located within 500m of the site.

3.5 Environmental Consultations

A request has been submitted to the Contaminated Land Officer at Manchester City Council for information pertaining to the site this information will be forwarded on receipt.

An environmental consultation has been conducted through Groundsure, which accesses British Geological Survey and Environment Agency databases. The complete Groundsure Report can be found in *Appendix 5*, a summary of the more relevant points are presented in the table below.

Record	<250m	250 – 500m	Description
Authorised Processes	-	*2*	*Licensed Pollutant Release 305m west associated with dry cleaning and 326m west associated with unloading of petrol units.*
Pollution Incidents	-	-	-
Landfill and Waste Treatment	-	*5*	*Five waste exemptions located 466m north west associated with sorting and denaturing of controlled drugs. Two exemptions located 479m south west associated with screening of blended waste and use in construction. Two exemptions located 496m south west associated with treatment of waste.*
Discharge Consents	-	-	-
Petrol Filling Stations	-	*1*	*Shell garage located 352m west.*
Current industrial Uses	*4*	-	*Electrical substation located 46m east, ayres violins located 128m north east, Didsbury village Metrolink located 129m north west and a mast located 208m north west.*

3.6 Radon

Map 13 Northern Welsh Marches and Liverpool from BRE 211 and HPA were examined which defines areas which require radon protective measures. The probability is less than 1% and Didsbury is not an area requiring radon precautions in foundations in accordance with BRE Report 211 'Radon – Guidance on protective measures for new dwellings' 2015 Edition.

The radon data in the Groundsure report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland, the Groundsure report confirms the classification of less than 1% on the radon maps. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supersede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square.

3.7 Preliminary UXO Risk Assessment

A preliminary UXO search has been undertaken to explore the potential of unexploded ordinance at the site and the risk to site end users.

During WWII, the site was situated within the County Borough of Manchester. According to official Home Office bombing statistics, the area sustained an overall low density of bombing, with an average of 27.1 bombs dropped per 1,000 acres. No bombing incidents were recorded on or in close proximity to the site according to The University of Manchester Library Bomb Maps, with the closest bomb strikes being located approximately 600m to the north- east. This lack of bombing corroborates with the lack of on-site

damage (e.g. discoloured roofing, cratering) evident within available post-war imagery dated 1948. It is likely that the site would have been subject to regular access during the war, given the structures on site and the nearby roadway/railway. This would have increased the likelihood that evidence of UXO would have been spotted, reported and dealt with.

Given the findings of this preliminary report, the risk from unexploded ordnance on site is not considered to be above the 'background risk' for this area of the UK. It is therefore recommended that no further research be undertaken for this site. Whilst it would be possible to conduct a Detailed UXO Risk Assessment to analyse local bombing records, it is not thought likely that the acquisition of such records would significantly alter the findings of this report.

The Preliminary UXO risk assessment can be found within *Appendix 6*.

4.0 CONCEPTUAL SITE MODEL AND RISK ASSESSMENT

4.1 Introduction

The potential level of risk posed by contaminants in soil and/or groundwater will be influenced by the type and concentration of the contamination at source, the likelihood of exposure occurring, the potential pollution linkages and the likely chronic or acute effects on the receptors.

A contaminant is defined as a substance that has the potential to cause harm, a risk is considered to exist if such a substance is present at sufficient concentrations to cause harm and if a pathway is present a receptor could be exposed to the contaminant.

Section 4.0 compiles the information from the previous sections to assemble a Conceptual Site Model to inform the risk assessment process. The potential sources identified on the site and off the site that are within influencing distance are assessed to determine if pollution linkages exist and an unacceptable risk is posed to human health and controlled waters. The assessment has been carried out on a qualitative basis and aims to produce a complete and comprehensive Preliminary Conceptual Site Model, the potential pollution linkages are displayed on *GRO-22168-P03* Illustrative Preliminary CSM.

Three potential types of impacts exist for a site and all three need to be considered in the qualitative preliminary risk assessment:

- Impacts from sources on the subject site.
- Impacts to the surrounding area from the subject site.
- Impacts to the subject site from the surrounding area.

4.2 Potential Contamination Sources

Onsite Sources and Associated Contaminants of Concern (CoC)
From the information obtained during the preliminary risk assessment, potential sources of onsite contamination have been identified which may affect the redevelopment of the site for residential end use.

Made Ground is likely to be present within the footprint of the building in the central area and in the area of the former access road in the north eastern area. General Contaminants of Concern associated with the Made Ground may include metals, speciated Polycyclic Aromatic Hydrocarbons (PAHs), asbestos and permanent ground gases.

Offsite Sources and Associated Contaminants of Concern (CoC)
From the information obtained during the preliminary risk assessment there are a number of features which may affect the redevelopment of the site for residential end use, these are summarised below:

- *Midland Railway immediately south west of the site.*
- *Whitehall Farm c.40m south east.*
- *Laundry c.5m north.*
- *Electrical Substation c.200m north west.*
- *Depots 20m to 30m south.*
- *Corporation Yard 220m south.*

The electricity substation may be a source of PolyChlorinated Biphenyls (PCBs) used as cooling agents in transformers.

Heavy metals, Total Petroleum Hydrocarbons (TPH CWG0), Polychlorinated Biphenyls (PCBs), Speciated Polycyclic Aromatic Hydrocarbons (PAHs), pesticides, herbicides and asbestos could be associated with the railway land to the east.

The nearby farm could have been a potential source of hydrocarbons if any fuel or oil was stored on the site as well as herbicides pesticides and fertilisers.

The former Depot could be a source of general contamination and hydrocarbons.

The former laundry building is a potential source of general contaminations as well as solvents, detergents and Trichloroethylene (TCE).

4.3 Pollution Linkages

The definition of a pollution linkage is a medium which allows a contaminant to impact a receptor. Potential pollution linkages have been recognized for the residential development from the identified contamination sources that exist.

At this stage the contaminants identified above are considered to potentially pose an unacceptable risk human health and controlled waters through the following pollution linkages:

- *Direct soil and dust ingestion.*
- *Dermal contact with soil both indoors and outdoors.*
- *Indoor air inhalation from soil and vapour.*
- *Outdoor inhalation of soil and vapour.*
- *Migration and accumulation of ground gas into internal spaces.*
- *Impaction of groundwater from soil contamination (diffuse and point).*
- *Impaction of groundwater from groundwater plume.*
- *Migration of soil and groundwater contamination impacting surface waters.*

4.4 Receptors

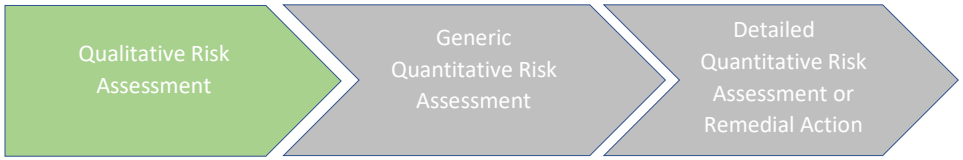
Receptors generally fall into the categories of human health or controlled waters within the river basin system. The recognized receptors are listed below:

- *Site end users.*
- *Potable water supply.*
- *Secondary A Superficial Aquifer.*
- *Underlying Principal Bedrock Aquifer.*

4.5 Preliminary Conceptual Site Model (CSM)

The factual information obtained from the consultations and summarised in Section 2.0 and 3.0 has been used to compile a Preliminary CSM. Using Source-Pathway-Receptor assessment criteria that is applicable in the UK, a risk assessment has been completed 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 outlined in *Appendix 7*.

Human Health Pollution Linkage Assessment



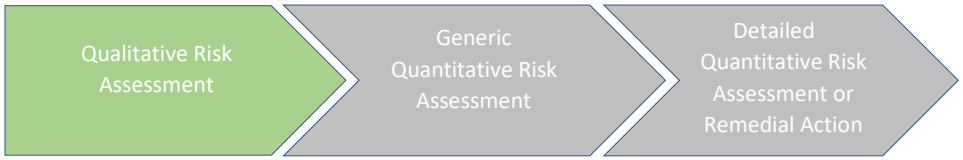
- The table below represents the first stage in the land quality risk assessment process - **the Qualitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose of each 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					*Qualitative 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.	Unlikely	Medium	Moderate	*Pollution Linkage 1 refers to proposed site users coming into contact with contaminated soils on the site.* *The site is currently unoccupied however a former unidentified building was located centrally to the site which has now been demolished.* *Several potential sources of contamination have been identified on the site and Contaminants of Concern may include metals, speciated PAHs, hydrocarbons and asbestos.* *A number of potential offsite sources of contamination have been identified within 250m. The railway line adjacent to the site is at lower level and therefore anticipated to not impact site. Significant mobile contamination is unlikely to have been associated with the nearby farm and allotment gardens. The former laundry building is a potential source of general contaminations as well as solvents, detergents and Trichloroethylene (TCE). The indicated glacial till to be present beneath the anticipated*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
						sand and gravel deposits Glacial Till in the general area will have restricted the migration of possible contaminants onto the site. *The proposed development is residential end use and is indicated to comprise three residential buildings with associated soft landscaping gardens and hardstanding driveways. Due to the potential for Made Ground, a minimal pollution linkage is considered to exist.*
PL2	Contaminated Soils	Inhalation of vapour.	Unlikely	Medium to Severe	Low	*This pollution linkage refers to volatile vapours migrating into confined spaces within the proposed development. No sources of volatile contamination has been identified at the site.* *A plausible pollution linkage is therefore not considered to exist.*
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. The anticipated Glacial Till beneath the sand and gravel deposits beneath the site is likely to have restricted the potential migration offsite of any possible mobile contaminants.* *Therefore, no pollution linkage is considered to exist.*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
PL4	Contaminated Soils	Attacking potable water supply pipe.	Unlikely	Medium	Low	*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 potentially present at installation depth which may be contaminated with a range of contaminants including organics such as hydrocarbons.* *Post Ground Investigation, a local water company risk assessment will be required prior to construction to advise on the level of protection required for the potable water supply.*
PL5	Ground Gas	Migration and accumulation of ground gas in internal spaces.	Unlikely	Medium to Severe	Low	*Made Ground is likely present beneath the site due to the presence of the building located centrally, however deep Made Ground is not anticipated. No sources of ground gases have been identified on site and therefore the risk is low.* *The site is not within an area requiring radon precautions within foundations.*

Controlled Waters Pollution Linkage Assessment



- The table below represents the first stage in the land quality risk assessment process – **Qualitative 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					*Qualitative 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	*Made Ground is likely present beneath the site in the vicinity of the former building located centrally to the site, likely contamination associated with this includes heavy metals, speciated PAHs and asbestos. Mobile contamination is not expected.* *Geological maps indicate that the site is predominantly underlain by Glacial Till (Secondary A Aquifer) which generally consists of sand and gravel. The bedrock underlying the site is the Wilmslow Sandstone Measures Formation (Principal Aquifer) which comprises Sandstone. Sand and gravel deposits are anticipated to be present beneath the site which are likely underlain by Glacial Till deposits which will have restricted the downward migration of any potential mobile contaminants to the underlying Principal Aquifer* *The site is not within 500m of a SPZ and is not considered a sensitive resource. In addition, there are no potable water or groundwater abstractions within 2000m.*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	*Rationale*
						Furthermore, the proposed development will have a new drainage system installed which will considerably reduce infiltration and leaching of potential contaminants, therefore no realistic pollution linkage is considered to exist.
PL7	Contaminated Soils	Migration of soil and groundwater contamination impacting surface waters.	Unlikely	Medium	Low	*Pollution Linkage 7 refers to the impaction of the River Mersey circa 971m to the west from contaminated soils and groundwater.* *Gross mobile contamination is not anticipated and significant distance is present to allow sufficient attenuation.* *A viable pollution linkage is not considered to exist.*

5.0 SCOPE OF INVESTIGATION AND RATIONALE

5.1 Project Objectives

The aim of the fieldwork was to:

Determine the stratification beneath the site.

Maintain 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.

Install monitoring standpipes for gas and groundwater monitoring.

Assess the identified pollution linkages in the CSM.

Assess the global stability of the site.

5.2 Scope of Works

The following scope of works was completed on the 14th of June 2022:

- *Seven Windowless sample boreholes (WS01 to WS06) were drilled to depths of 0.9m to 3.8m bgl using a Dando terrier windowless sampling rig.*
- *Two soil percolation tests (SuDS1 to SuDS2) were excavated to depths of 2.5m and 2.4m bgl respectively using a JCB 3CX.*

The exploratory hole locations are presented on Groundtech Plan *GRO-22168-P04* and the exploratory hole logs are presented in *Appendix 8.*

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
WS02, WS05, WS06, SuDS1, SuDS2	*Former Building*
WS01, WS03, WS03A, WS04	*General Coverage*
WS01, WS02, WS04, WS05	*Crest of slope*

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'.*

5.3 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	*9*
Disturbed Sample	*19*
Bulk Sample	-
Undisturbed U100 Sample	-

The samples have been obtained in accordance with current environmental and geotechnical guidance. The sampling plan has been designed 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.

5.4 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 PRA and observations during the Ground Investigation.

Contaminant of Concern	Matrix	Number
Arsenic, Cadmium, Chromium (total and hex), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons, phenols, cyanide, organic matter, sulphate and pH	*Soil*	*6*
Asbestos Screening	*Soil*	*6*
pH & Soluble Sulphate (2:1)	*Soil*	*4*

The Geo-Environmental Laboratory Testing Results are presented in *Appendix 9*.

5.5 Gas and Groundwater Monitoring/Sampling

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
WS01	*3.0*	*1.0 – 3.0*	*Sand*	*Ground Gas*
WS02	*3.8*	*1.0 – 3.8*	*Sand*	*Ground Gas*
WS03A	*2.0*	*1.0 – 2.0*	*Sand*	*Ground Gas*
WS04	*2.7*	*1.0 – 2.7*	*Sand*	*Ground Gas*

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

- *Oxygen (O_2), carbon dioxide (CO_2) and methane (CH_4) as the percentage volume in air (%v/v).*
- *Hydrogen sulphide (H_2S) 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.

Permanent gas and groundwater monitoring results are presented in *Appendix 10*.

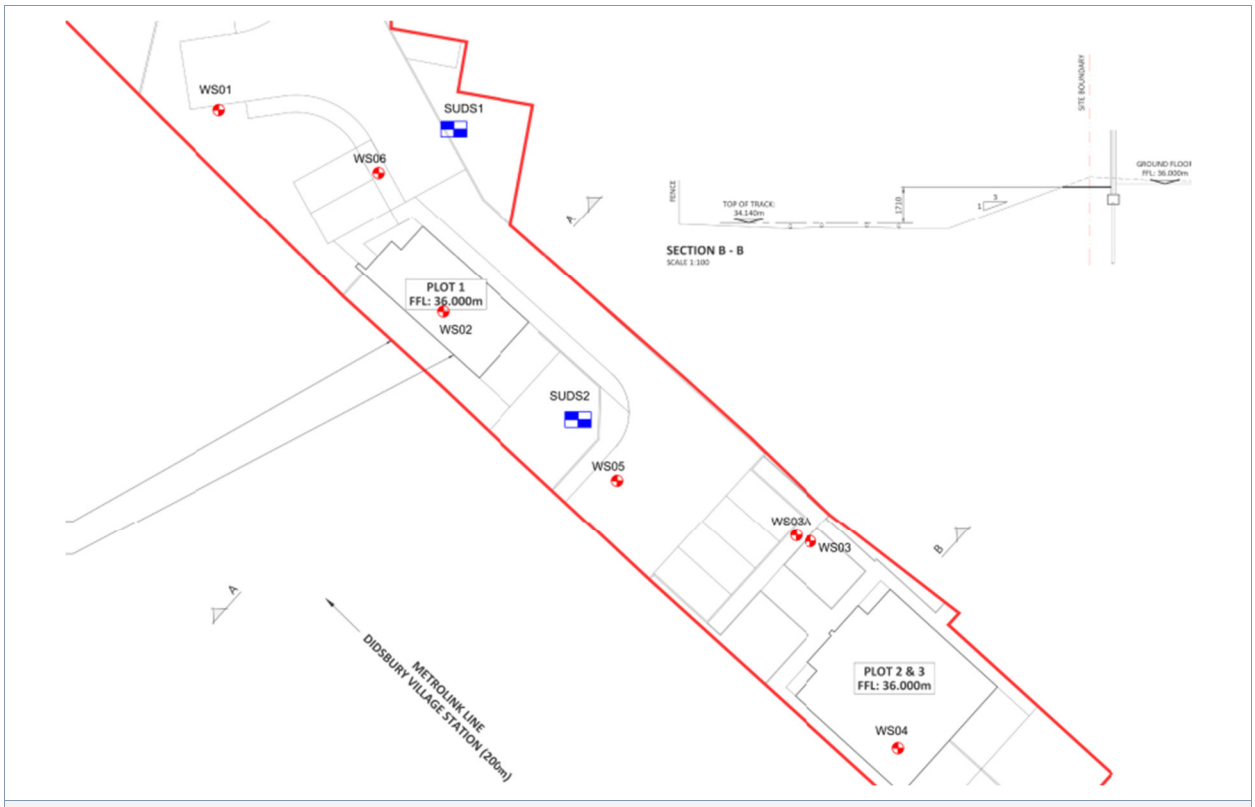
6.0 GROUND MODEL

6.1 Made Ground

Made Ground was encountered within all locations to a maximum depth of 0.9m bgl.

Surfacing of the site comprised a brown sandy gravelly topsoil within all locations, this was encountered from ground level to a maximum depth of 0.3m bgl.

This strata was underlain within WS03 by a brown gravelly sand with cobbles of brick and was encountered within WS03 from 0.2m bgl to a maximum depth of 0.7m bgl, this strata was underlain by cobbles of brick to 0.9m bgl.



Exploratory Hole Locations

6.2 Natural Ground

The natural strata encountered generally confirmed the published geological records. Grey brown very gravelly sand was encountered within all locations from 0.3m to a maximum depth of 3.8m bgl, this strata became very cobbly from 1.5m bgl.

6.3 Bedrock

Bedrock was not encountered during this investigation.

6.4 Groundwater

Groundwater strikes were observed within WS01 and WS02 at depths of 3.1m and 3.2m bgl respectively.

6.5 Watching Brief

A watching brief was maintained during the Ground Investigation for visual and olfactory evidence of contamination, no evidence of contamination was encountered.

6.6 Excavation Stability

Evidence of collapse was noted during excavation of the trial pits within natural granular deposits between depths of 1.5m and 2.5m bgl.

6.7 Excavation Progress

Slow progress while excavating the trial pit was not experienced, the windowless sample boreholes refused between 2.0m and 3.8m bgl with in the very dense Sand strata encountered.

7.0 GROUND ENGINEERING

7.1 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 ground model has evolved from the information obtained by the PRA.

The site is currently occupied by an area of soft landscaping adjacent to a Metrolink, topsoil is present centrally with dense vegetation and semi mature to mature trees located at the site boundaries. The southern boundary of the site is occupied by a palisade fence which separates the site from the Metrolink. Former footings and walls associated with the former building at the site are present at the surface centrally and a former drain is located to the north of the building which has been disturbed and was open during the Ground Investigation.

The proposed development is residential end use comprising the construction of three residential properties with associated hardstanding driveways and private gardens. At this stage loadings associated with the proposed development are not available and the following recommendations are based on existing site levels.

Some of the enabling works at the site have been carried out, a vegetation clearance and a strip of some of the topsoil materials had been undertaken at the time of the Ground Investigation associated with the demolition of the former building on site. As part of the final enabling works, the remainder of the topsoil will be stripped and stockpiled separately and vegetation will require removal and chipping. Trees that are not to be retained will also require removal prior to the construction phase.

If any invasive species are encountered at the site, these will need to be identified by a suitably trained ecologist and removed by a specialist contractor.

Ground Conditions

Boreholes advanced within the proposed footprint of the buildings indicate that Made Ground is present to a maximum depth of 0.7m bgl. The Made Ground is underlain by a medium dense to dense Sand which becomes very cobbly from 1.5m bgl.

During the Ground Investigation groundwater was encountered within WS01 and WS02 at depths of 3.1m and 3.2m respectively.

Limitations

The main limitation associated with the proposed development is the presence of former foundations within the ground associated with the previous building, these were encountered during the Ground Investigation and identified as a traditional strip footing. These will need to be grubbed up prior to the commencement of the development as well as any associated redundant utilities for the former building.

Another limitation at the site is the presence of the Metrolink which is located adjacently to the south, precautions should be in place to minimise the disturbance to the ground during the development of the site as not to impact the tracks of the Metrolink.

Connecting the Metrolink to the site is a slope circa 2m in height. The slope requires assessment to confirm it is stable post development, this is undertaken in Section 7.9. Temporary works design should also be implemented during the enabling works.

Geotechnical Parameters

The geotechnical test results have been evaluated to derive geotechnical parameters for the soils underlying the site. A '*Depth to SPT N value*' graph is presented on *GRO-22168-P05* to provide a generalised ground model for the site.

Characterization 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 the Ultimate Limit State (ULS) conditions selected are presented in the table below:

Stratum	Parameter	Selected Characteristic Value
Medium dense to dense Sand	*Drained angle of friction (ϕ')*	*32°*

7.2 Preliminary Foundation Design

The most suitable foundations for the proposed residential developments are considered to be traditional unreinforced strip/trench foundations constructed within the medium dense to dense Sand at a minimum depth of 0.6m below existing ground levels. The foundation excavations should extend deeper where historic substructure or Made Ground is encountered. WS02 in the north western area of the site encountered loose Sand at 1.2m bgl and foundations should be deepened in this area to medium dense Sand.

Groundwater was encountered at between 3.1m and 3.2 bgl during the Ground Investigation.

Design by Calculation

Preliminary foundation design has been undertaken by calculation, a safe allowable bearing pressure of 150kN/m^2 is provided for ultimate limit state design for a 0.6m wide strip foundation constructed within the medium dense to dense Sand.

The settlement in the natural granular deposits will be immediate and therefore will predominantly occur during the construction phase. Settlement criteria of 25mm will not be exceeded and Serviceability Limit State conditions will be satisfied.

Construction Recommendations

The recommendations in this appraisal are preliminary and the detailed design should be developed in advance and during the construction phase. If the ground conditions or groundwater regime 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.

During the construction phase, supervision by a suitably qualified geotechnical engineer should be on a continuous basis to check the design assumptions are correct and construction conforms to design in accordance with EC7. Supervision should include inspections, Control Ground Investigations and monitoring by a suitably qualified geotechnical engineer.

7.3 Building Near Trees

Trees and hedgerows have been identified around the proposed development area.

It is proposed to found within the medium dense to dense Sand and Gravel deposits. No effects of trees is anticipated due to the granular strata and heave precautions will not be required for foundations.

All foundations should be deepened below roots of greater than 5mm diameter during excavations for footings.

7.4 Floor Slabs

If required, ground bearing floor slabs may generally be adopted at the site provided that once finished levels have been established, less than 600mm of suitable, appropriately compacted granular material exists beneath the slab.

7.5 Construction

The trial pits indicate that instability of excavations is anticipated in the granular deposits at a depth of between 1.5m and 2.5m bgl. It is unlikely foundation excavations will extend to this depth, if instability does occur, additional volumes of concrete will be required due to the oversized excavations. Instability of the Made Ground is a possibility and should be considered in the groundworks method statements.

Tracked high specification plant is recommended to maintain the build programme. Breaking equipment will also be required locally to penetrate obstructions identified by the Ground Investigation.

7.6 Concrete Classification

Made Ground
Water soluble sulphate testing was undertaken on five samples of the Made Ground. The strata tested comprises Made Ground topsoil's which are to be stripped from the site during the enabling works, as these soils will not be in contact with proposed foundations the classification for this is not relevant.

Natural Strata
Water soluble sulphate testing was undertaken on three samples of the natural soils. The range of soluble sulphate (SO_4) recorded is 14mgl/l to 20mg/l. Associated pH values ranged between 7.8 and 8.4 indicating slightly alkaline conditions.

In a dataset where there are less than five results, the highest sulphate results should be taken together with the lowest pH values. The characteristic sulphate concentration is therefore 20mg/l and the pH value is 7.8.

The groundwater at the site is considered to be mobile as natural granular deposits have been encountered.

The results of laboratory pH and sulphate content indicate that ACEC Class AC-1 and sulphate class DS-1 conditions prevail in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005. The specific concrete mixes (the Design Concrete Class) to be used on site will be determined by the site specific concrete requirements in terms of the durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM) detailed in Part D of BRE Special Digest 1 with further guidance in Pt E and F.

7.7 Highway Design

CBR values greater than 5% are likely to be achieved in undisturbed natural soils for pavement design purposes, unless proven otherwise by in-situ testing at sub-base level by a specialist geotechnical engineer. As a minimum the subgrade should be proof rolled prior to construction. Where Made Ground is

encountered at formation level, a CBR value of less than 2.5% should be assumed unless proven otherwise by in-situ testing.

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

7.8 Sustainable Urban Drainage System (SuDS)

Soil infiltration testing was undertaken in two locations on the site in full 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 11*.

Location	Test No.	Dimensions of Pit Before Test	Behaviour During Test	Dimensions of Pit After Test	Soil Infiltration Rate (m/sec)
SuDS1	*1*	*1500 (L) x 450 (W) x 2200 (D)*	*Pit sides stable*	*1500 (L) x 450 (W) x 2100 (D)*	*7.19×10^{-5}*
SuDS1	*2*	*1500 (L) x 450 (W) x 2200 (D)*	*Pit sides stable*	*1500 (L) x 450 (W) x 2200 (D)*	*7.28×10^{-5}*
SuDS1	*3*	*1500 (L) x 450 (W) x 2200 (D)*	*Pit sides stable*	*1500 (L) x 450 (W) x 2200 (D)*	*8.14×10^{-5}*
SuDS2	*1*	*1900 (L) x 500 (W) x 2400 (D)*	*Pit sides stable*	*1900 (L) x 500 (W) x 2400 (D)*	*1.17×10^{-4}*
SuDS2	*2*	*1900 (L) x 500 (W) x 2400 (D)*	*Pit sides stable*	*1900 (L) x 500 (W) x 2400 (D)*	*1.18×10^{-4}*
SuDS2	*3*	*1900 (L) x 500 (W) x 2400 (D)*	*Pit sides stable*	*1900 (L) x 500 (W) x 2400 (D)*	*2.20×10^{-4}*

Three fills were carried out at both positions SuDS1 and SuDS2 at a depth of 2.2m and 2.4m bgl respectively within the underlying granular material. The calculated soil infiltration rates ranged between 1.17×10^{-4} m/s and 8.14×10^{-5} m/s which indicate good drainage conditions are present within the underlying soils.

The use of SuDS drainage within the natural ground is considered to be a feasible option at the site based on the results of testing at these locations and depths.

SuDS drainage should be located away from the crest of the slope which could potentially initiate instability, this should be considered in the drainage strategy.

7.9 Preliminary Slope Stability Assessment

A Slope Stability Appraisal has been undertaken using Oasys modelling software, both the graphical and tabular outputs are presented in *Appendix 12*.

Parameters

Parameters were obtained from a range of sources and are summarised in the table below:

Parameter	Value	Source
Angle of existing slope	*18 to 27°*	*Value taken from 2786 BCL 00 00 DR S 0001*
Groundwater level	*3.1m to 3.2m begl*	*Recorded in WS01, WS02*
Strata	-	*Exploratory hole logs and 2786 BCL 00 00 DR S 0001*

The preliminary stability appraisal has been undertaken using the above parameters.

Geotechnical Parameters

The parameters for the strata on the subject site have been obtained from the Groundtech Consulting Investigation. The parameters were obtained from correlation with the in-situ SPT values in granular material from the exploratory hole logs.

The following geotechnical parameters and properties were selected as being representative of the soils:

Strata	Friction angle ϕ' (°)	Unit weight γ (kNm^3)
Medium dense to dense Sand	*32*	*18*

Drained analysis has been carried out for long term stability, the model was run using a c' of 0kPa.

Slope Model Results (Rotational Failure)

The software model was run using the Bishop (circular failures) method to determine a range of Over Design Factors (ODF) which is the reciprocal of the Degree of Utilization for rotational failure. The results for Bishop Method are presented in the table below because these results were driving the stability.

Design Situation	Computation Method	Cohesion (c')	ODF
Section A	*Bishop*	*0*	*1.519*
Section B	*Bishop*	*0*	*1.585*

The Sand is generally heterogenous which is indicative of this type of strata, groundwater was observed at 3.1m and 3.2m bgl in WS01 and WS02.

The preliminary slope stability appraisal has been undertaken using Eurocode 7 Design Approach 1 Combination 2, this method generated lower Over Design Factors than Combination 1. An Over Design Factor of greater than 1 indicates the slope is stable.

Limitations

The following assumptions and exclusions have been made in the modelling of the slope stability, if the assumptions are varied in the design or construction the modelling results are not applicable and the slope should be remodelled:

- *Ground models are generated from available GI information, assessment applicable to geometrics and ground conditions in modelling sections.*
- *Based on existing slope with 150kPa for proposed building loads.*

Discussion

The slope stability results demonstrate the existing slope is stable as an Over Design Factor of in excess of 1 has been generated by the modelling.

Peak ϕ' values have been used in the appraisal as no previous failures have been identified. The internal angle of friction is in excess of the natural angle of repose which supports the modelling result that the slope is stable.

No further action is required with respect to stabilising the slope post development.

Suitable drainage should be installed as part of the development to prevent the internal angle of friction being reduced.

8.0 LAND QUALITY

8.1 Geo-Environmental Testing Results - Soils

Samples of Made Ground have been tested for a range of relevant determinants. In accordance with LCRM, 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 end-use for the site is a residential development comprising housing with private domestic gardens with associated driveways, pavements and access roads. We have therefore undertaken the GQRA on the basis that the proposed development site falls under the Residential (with 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
Made Ground Topsoil	*4*	*WS01, WS02, WS04, SUDS2*
Made Ground Sand	*1*	*WS03*

A summary of the Geo-Environmental Testing results is presented below and the GQRA screening values are presented in *Appendix 13*:

Metals				
Contaminant	Range (mg/kg)	Screening Values	Exceedances	Locations
Arsenic	*4.9 – 16*	*32*	-	-
Cadmium	*<0.2 – 1.9*	*10*	-	-
Chromium	*7.6 – 35*	*910*	-	-
Hexavalent Chromium	*<1.8*	*21*	-	-
Copper	*2.2 – 66*	*2400*	-	-
Lead	*7.9 – 350*	*200*	*1*	*WS03 @ 0.3*
Mercury	*<0.3 – 0.5*	*1.2*	-	-
Nickel	*5.2 – 35*	*130*	-	-
Selenium	*<1*	*350*	-	-
Zinc	*20 – 390*	*3700*	-	-

Polycyclic Aromatic Hydrocarbons (PAHs)				
Contaminant	Range (mg/kg)	Screening Values	Exceedances	Locations
Naphthalene	*<0.05*	*2.3*	-	-
Acenaphthylene	*<0.05 – 2.9*	*170*	-	-
Acenaphthene	*<0.05*	*210*	-	-
Fluorene	*<0.04 – 1.2*	*170*	-	-
Phenanthrene	*<0.05 – 16*	*95*	-	-
Anthracene	*<0.05 – 3.3*	*2400*	-	-
Fluoranthene	*<0.05 – 40*	*280*	-	-
Pyrene	*<0.05 – 29*	*620*	-	-
Benzo(a)anthracene	*<0.05 – 21*	*7.2*	*1*	*WS03 @ 0.3*
Chrysene	*<0.05 – 17*	*15*	*1*	*WS03 @ 0.3*
Benzo(b)fluoranthene	*<0.05 – 22*	*2.6*	*1*	*WS03 @ 0.3*
Benzo(k)fluoranthene	*<0.05 – 10*	*77*	-	-
Benzo(a)pyrene	*<0.05 – 19*	*2.2*	*1*	*WS03 @ 0.3*
Indeno(123cd)pyrene	*<0.05 – 8.6*	*27*	-	-
Dibenzo(ah)anthracene	*<0.05 – 2.3*	*0.24*	*1*	*WS03 @ 0.3*
Benzo(ghi)perylene	*<0.05 – 8.9*	*320*	-	-

TPH CWG - Aliphatics				
Contaminant	Range (mg/kg)	Screening Values	Exceedances	Locations
>C5-C6	*<0.001*	*42*	-	-
>C6-C8	*<0.001*	*100*	-	-
>C8-C10	*<0.001*	*27*	-	-
>C10-C12	*<1.0 – 14*	*130*	-	-
>C12-C16	*<2.0 – 37*	*1100*	-	-
>C16-C21	*<8.0 – 260*	*65000*	-	-
>C21-C35	*<8.0 – 390*	*65000*	-	-
Total aliphatics C5-35	*<10.0 – 690*			
TPH CWG – Aromatics				
Contaminant	Range (mg/)	Screening Values	Exceedances	Locations
>C5-EC7	*<0.001*	*70*	-	-
>EC7-EC8	*<0.001*	*130*	-	-
>EC8-EC10	*<0.001*	*34*	-	-
>EC10-EC12	*<1.00 – 18*	*74*	-	-
>EC12-EC16	*<2.00 – 31*	*140*	-	-
>EC16-EC21	*<10.00 – 140*	*260*	-	-
>EC21-EC35	*<10.00 – 520*	*1100*	-	-
Total aromatics C5-35	*<10.00 – 710*			
Total aliphatics and aromatics(C5-35)	*<38.00*			
MTBE	*<1.00 ug/kg*	*49*	-	-
Benzene	*<1.00 ug/kg*	*0.33*	-	-

Toluene	*<1.00 ug/kg*	*610*	-	-
Ethylbenzene	*<1.00 ug/kg*	*350*	-	-
m/p-Xylene	*<1.00 ug/kg*	*240*	-	-
o-Xylene	*<1.00 ug/kg*	*250*	-	-
Others				
Organic Matter		*2.2 – 6.6%*		
Asbestos Screen				
Position	Depth (m bgl)		Result	
WS03	*0.30*		*Amosite <0.001*	
SUDS2	*0.10*		*Amosite 0.001*	

Asbestos was not detected within the remaining four samples.

8.2 Tier I Generic Quantitative Risk Assessment - Soils

Made Ground was encountered across the site to a maximum depth of 0.9m bgl and generally consisted of reworked topsoil and sand. No visual or olfactory evidence of contamination was noted within the soils that were recovered.

Metals
Testing undertaken across the site indicated that all metal contamination was below the screening value for residential with plant uptake end use except for one lead concentration.

Lead was indicated to be slightly elevated at a concentration of 350mg/kg within WS03 at 0.3m bgl. This borehole was located within the central area of the site and contamination was encountered within a gravelly sandy topsoil. This elevated concentration of lead is anticipated to be associated with the former building located on the site.

Polycyclic Aromatic Hydrocarbon (PAHs)
Testing related to speciated PAHs at the site indicated that the majority were below the screening value for residential end use with plant uptake with the exception of Benzo(a)anthracene at 21mg/kg compared to a screening value of 7.2mg/kg, Chrysene at 17mg/kg compared to a screening value of 15mg/kg, Benzo(b)fluoranthene 22mg/kg compared to a screening value of 2.6mg/kg, Benzo(a)pyrene 19mg/kg compared to a screening value of 2.2mg.kg and finally Dibenzo(ah)anthracene at 2.3mg/kg compared to a screening value of 0.24mg/kg with in WS03 at 0.3m bgl.

The contamination encountered at the site is not considered to be associated with a fuel derived source and is likely associated with the Made Ground soils at the site which are sourced from the former works building or imported soils to the site.

Total Petroleum Hydrocarbons (TPH CWG)
All TPH CWG results have been recorded at concentrations below the relevant screening values for residential end use.

Asbestos
Asbestos was detected within two of the soil samples that was screened, Amosite was detected at less than 0.001mass% within WS03 at 0.3m and at 0.001%mass SUDS2 at 0.1m bgl. WS03 is located within the central area of the site and SUDS2 is located in the southern area of the site likely associated with the demolition of the former buildings on site.

The location of elevated Contaminants of Concern are presented on the Contamination Plan *GRO-22168-P06.*

8.3 Permanent Ground Gases

One gas monitoring visits has been undertaken to date on the 14th of July 2022.

No concentrations of methane (CH_4) have been recorded during within the boreholes. Detectable levels of carbon dioxide were recorded within the standpipes up to a maximum concentration of 4.8%v/v together with depleted oxygen concentrations of 16.2%v/v. No positive flow rates have been recorded within the standpipes.

The atmospheric pressure ranged between 1019mb and 1020mb during the monitoring visit which were carried out during a period of steady barometric pressure.

Depths at which groundwater was encountered is summarized in the table below.

Location	Response Zone	Groundwater Level (m bgl)
WS02	*1.0 – 3.8*	*3.17*

Characterisation of the Gas Screening Value (GSV)
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" (Qhg) have been derived for each monitoring point.

GSV (l/hr) = max borehole flow rate (l/hr) x max gas concentration (%)

For this assessment, the maximum recorded concentration of carbon dioxide of 4.8%v/v has been used along with a flow rate of 0.1l/hr as no positive flow was detected. A GSV for methane has not been calculated as no methane has been detected.

Carbon Dioxide GSV = 0.048 (4.8%) x 0.1 = 0.0048l/hr

Assessment
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 with low-rise housing, the Boyle and Witherington, 2006 method has been used to carry out the assessment. This is a risk-based approach that is designed to allow an identification of gas protection for a low-rise housing development by comparing the measured gas emission rates to generic 'traffic lights' scenarios. The traffic lights include 'typical maximum concentrations' and are provided for initial screening purposes and risk-based gas screening values for consideration in situations where the typical maximum concentrations are exceeded.

When considering the results, in accordance with CIRIA C665 (Situation B – Low-rise housing with a ventilated underfloor void (min 150mm) and Table 8.7 – NHBC Traffic light system for 150mm void) it can be seen that the GSV value for carbon dioxide is below the assessment GSV of 0.0048l/hr and falls within

the Green traffic light zone. If ground bearing floor slabs are utilised at the site the classification for Gas precautions falls within the CS1 category.

NHBC - Green Traffic Light/CS1

The proposed dwellings are classified as Building Type A in accordance with BS 8485:2015 and the site falls into the Green Traffic Light in accordance with Table 2 of the above guidance and as such, 0 points of protection are required for the proposed dwellings and no gas protection measures are deemed necessary based on the gas monitoring carried out to date. This will be confirmed upon completion of the gas monitoring programme.

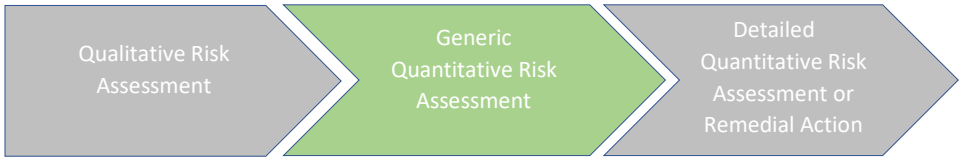
The site is not in an area affected by Radon.

The Interim Permanent Ground Gas Monitoring Results are presented in *Appendix 10.*

8.4 Revised Pollution Linkage Assessment

The CSM has been revised to inform the following pollution linkage assessment based on the Ground Investigation and laboratory testing. Using Source-Pathway-Receptor assessment criteria that is applicable in the UK, the risk assessment has been revised 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-22168-P07*.

Human Health Pollution Linkage Assessment



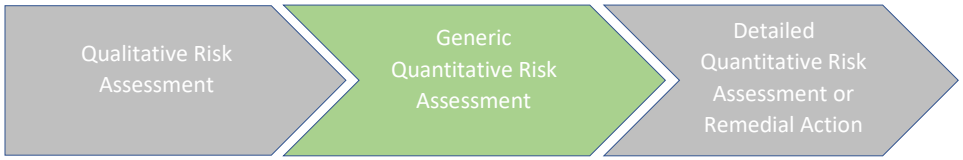
- The table below represents the second stage in the land quality risk assessment process - **the Generic Quantitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose 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	*Pollution Linkage 1 refers to proposed site users coming into contact with contaminated soils on the site.* *The site is currently unoccupied however a former unidentified building was located centrally to the site which has now been demolished.* *Made Ground was encountered beneath the site to a maximum depth of 0.9m bgl and elevated concentrations of lead, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene have been recorded within Made Ground soils locally to WS03 at 0.3m bgl within the centre of the site. Asbestos fibres were also detected within this location and SUDS2 at 0.1m bgl in the southern area of the site and will be stripped as part of the enabling works.* *The JWIG receptor tool has classified the risk to site end users from asbestos as Very Low.*

Conceptual Site Model						*Generic Quantitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
						No evidence of offsite impaction was noted from the adjacent Metrolink which is at a lower elevation. *The proposed development is residential end use and is indicated to comprise three residential buildings with associated soft landscaping gardens and hardstanding driveways. Topsoil will be stripped from the site removing the contamination encountered within in WS03 and the asbestos within SUDS2.* *As sources of contamination have been identified a pollution linkage is considered to exist.*
PL2	Contaminated Soils	Inhalation of vapour.	Unlikely	Medium to Severe	Low	*This pollution linkage refers to volatile vapours migrating into confined spaces within the proposed development. No sources of volatile contamination has been identified at the site.* *A plausible pollution linkage is therefore not considered to exist.*
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. No mobile contamination is present at the site and no pollution linkage has been identified.*

Conceptual Site Model						*Generic Quantitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
PL4	Contaminated Soils	Attacking potable water supply pipe.	Unlikely	Medium	Low	*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 beneath the site to a maximum depth of 0.9m bgl therefore new water supply pipes will likely be laid in natural soils.* *A viable pollution linkage has not been identified, the type of pipe should be confirmed by a UU Risk Assessment.*
PL5	Ground Gas	Migration and accumulation of ground gas in internal spaces.	Unlikely	Medium to Severe	Low	*Made Ground has been encountered at the site to a maximum depth of 0.9m bgl. A maximum concentration of carbon dioxide has been recorded at a level of 4.8% v/v and no methane has been detected.* *Based on the initial monitoring, the site is classified as Green traffic light/CS1 and gas protection measures are not necessary. This will be confirmed or otherwise on completion of the monitoring programme.* *The site is not in 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	Minor	Very Low	*Made Ground is present beneath the site to a maximum depth of 0.9m bgl across the site, however no significant gross contamination has been recorded.* *Made Ground topsoil underlain by granular soils have been encountered beneath the site to a maximum depth of 3.8m bgl, groundwater was encountered within this strata.* *The proposed development will include areas of hardstanding as well as private gardens and areas of soft landscaping and a new drainage system will be installed. This will reduce the infiltration and potential leaching of contaminants identified.* *As a source of mobile contamination has not been identified, no realistic pollution linkage is considered to exist.*
PL7	Contaminated Soils	Migration of soil and groundwater	Unlikely	Minor	Very Low	*Pollution Linkage 7 refers to the impaction of the River Mersey circ 971m to the west from contaminated soils and groundwater.*

Conceptual Site Model						*Generic Quantitative Risk Assessment*
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	*Rationale*
		contamination impacting surface waters.				*No source of mobile contamination has been encountered through the Ground Investigation or the laboratory testing, therefore a plausible pollution linkage does not exist.*

8.5 Outline Remedial Strategy

The Geo-environmental testing recorded elevated concentrations of lead and speciated PAHs in Made Ground soils locally to WS03 at 0.3m bgl within the centre of the site, asbestos fibres were also detected within this location and SUDS2 at 0.1m bgl in the southern area of the site.

Topsoil will be removed as part of the enabling works and is not suitable for reuse, this will remove the source. An option is when the topsoil has been stripped and stockpiled, additional testing is carried out to determine whether a proportion can be segregated and reused as part of the proposed development.

In areas of proposed gardens and soft landscaping an appropriate cover system consisting of 500mm of clean topsoil and granular subsoil overlying a 100mm hard dig layer or a contamination demarcation membrane should be installed where Made Ground is at formation level. Where natural soils are at formation level, a minimum thickness of 150mm of topsoil should be placed to act as a growing medium.

Significant mobile contamination has not been encountered and therefore remediation in relation to controlled waters is not required.

Ground gas monitoring indicates that the site falls within Green/CS1 and gas protection measures are not required at this stage, the site lies in an area not requiring radon precautions. The level of gas precautions will be confirmed by the full assessment.

A watching brief should be in place during ground works and construction. If previously unidentified contamination is encountered, work should cease in that area and Groundtech Consulting contacted for advice.

Regulatory compliance should be obtained pre-commencement to avoid delays during the construction phase which will have cost implications.

8.6 Asbestos in Soils

Asbestos fibres were detected in two of the five samples of Made Ground that were screened. A concentration of 0.001mass% was detected in WS03 at 0.3m and SUDS2 at 0.1m bgl. The asbestos was present in granular Made Ground topsoil at the site.

Asbestos encountered at the site is present within topsoil strata and will be removed from the site as part of the enabling works.

Where soils will be disturbed as part of the ground works, in accordance with the Joint Industry Working Group (JIWG) decision support tool for CAR2012 work categories, the combined hazard and exposure ranking is *Low*. The work is classified as non-licenced and CAR does not apply. However, it is recommended that EN149 type FFP3 disposable masks are worn, dust suppression takes place and localised/basic personal decontamination facilities are produced.

The JIWG tables are presented in *Appendix 14*. This should be used as an aid to classify risk and recommend the level of protection required, the final decision on how asbestos within the soils should be managed should be made by the contractor.

8.7 Health and Safety - Construction and Ground Workers

During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below:

PL Ref	Potential Source	Pollution Linkage	Likelihood	Severity	Level of Risk
PL8	*Made Ground*	*Ingestion, direct contact, inhalation of dusts.*	*Unlikely*	*Medium*	***Moderate to Low***
PL9	*Asbestos*	*Ingestion, direct contact, inhalation of dusts.*	*Unlikely*	*Medium*	***Low***

The risk from Made Ground and asbestos in soils should be communicated to groundworkers through inductions and information boards. General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- *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.*

8.8 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.

Five 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 15.*

Based on the assessment tool the Made Ground soils have been classified as *Non-Hazardous*. Total testing was not undertaken on the natural soils and are assumed to also be *Non-Hazardous*.

Asbestos was detected within two of the samples at trace levels and does not influence the classification by assessment.

8.9 Waste Acceptance Criteria (WAC) Results

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 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 that the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

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

9.0 FINAL APPRAISAL

9.1 Land Quality

The site historically contained a building and had remained this way until recently, the building located on site has now been demolished. Made Ground was recorded to a maximum depth of 0.9m bgl, no evidence of visual or olfactory evidence of contamination was encountered.

Elevated levels of lead and speciated PAHs have been recorded within Made Ground soils locally to WS03 in the centre of the site, asbestos fibres were also detected within this location and SuDS2 in the southern area of the site. Based on the site having a residential end use, the risk to site end users is considered to be *Moderate*. A cover system is required where Made Ground is present at formation level to mitigate the risk to an acceptable level.

Mobile contamination has not been encountered and the risk to controlled wasters is considered to be *Low*.

Interim ground gas monitoring indicates that the site falls within Green/CS1 and gas precaution measures are not required. The site is also in an area not requiring radon precautions and the risk from permanent ground gases is *Low*. The level of protection will be confirmed by the final gas assessment.

9.2 Ground Engineering

The most suitable foundations for the proposed development are considered to be traditional unreinforced strip/trench fill foundations in the medium dense to dense Sand deposits.

The use of SuDS drainage within the natural ground is considered feasible as good drainage conditions were encountered within the two percolation tests undertaken at the site SuDS drainage should be located away from the crest of the slope which could potentially initiate instability, this should be considered in the drainage strategy.

The remaining foundations associated with the former building on site will require grubbing up and removal prior to the commencement of the development.

The preliminary slope stability assessment has generated an ODF above 1 and the slope is stable.

9.3 Required Supplementary Investigation

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

Completion of gas monitoring programme.
Issue gas assessment.
Detailed foundation design
Confirmation of remedial recommendations with the regulators.

10.0 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.

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BS 8485:2015 '*Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings'*

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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.

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Specification for Highways Works – Series 600 Earthworks November 2016.

APPENDIX 1 - Plans

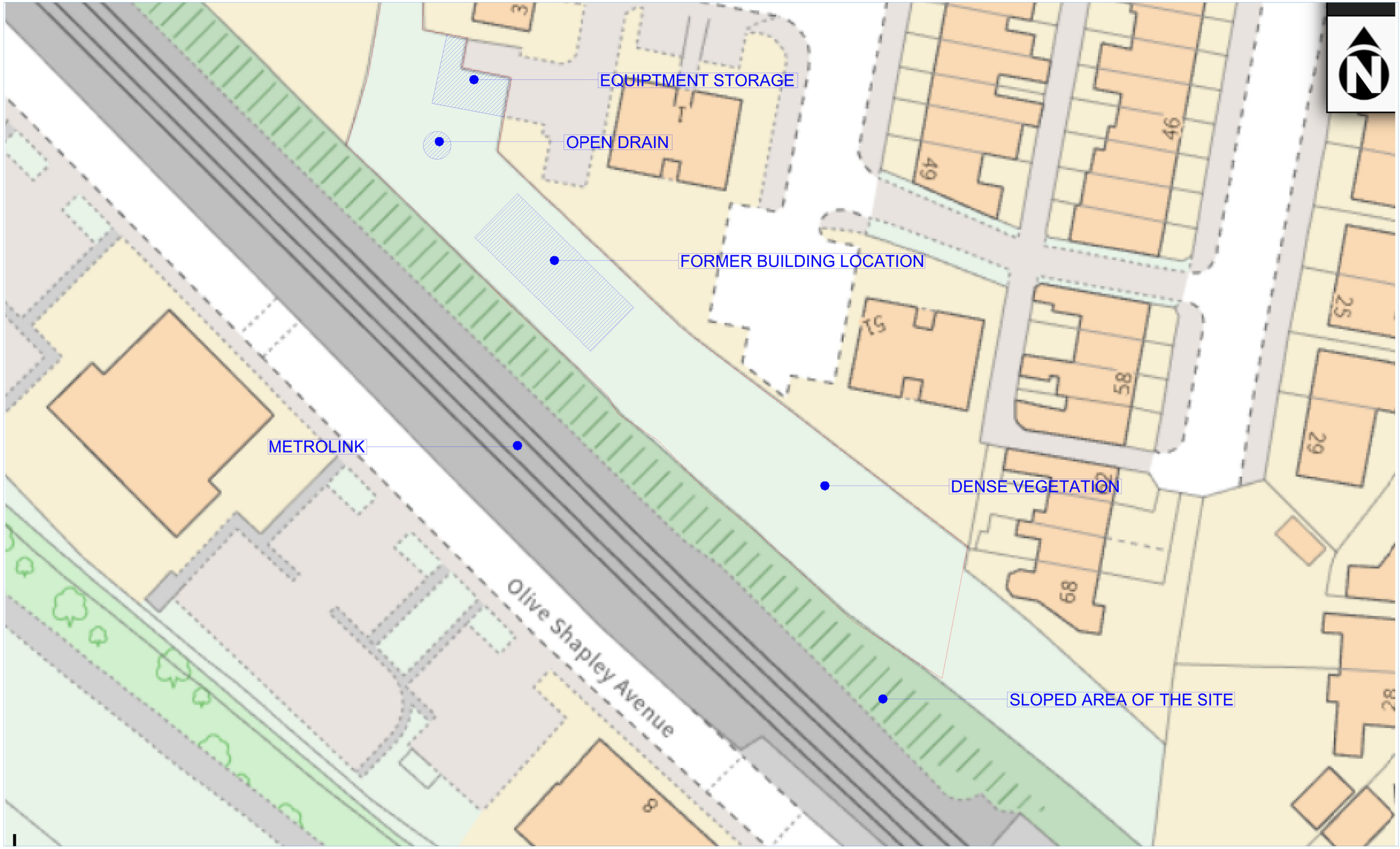


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	PLAN TITLE	PROJECT LOCATION PLAN	PLAN NUMBER	GRO-22168-P01			
					Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes

SITE LOCATION



GROUNDTECH CONSULTING

CLIENT	JC BRENNAN DEVELOPMENTS LTD
PROJECT TITLE	50 DUNDONALD ROAD, DIDSBURY
PLAN TITLE	PRELIMINARY DEVELOPMENT CONSTRAINTS PLAN
DATE	AUGUST 2022
SCALE	NTS
PLAN NUMBER	GRO-22168-P02

Rev.	Details	Date

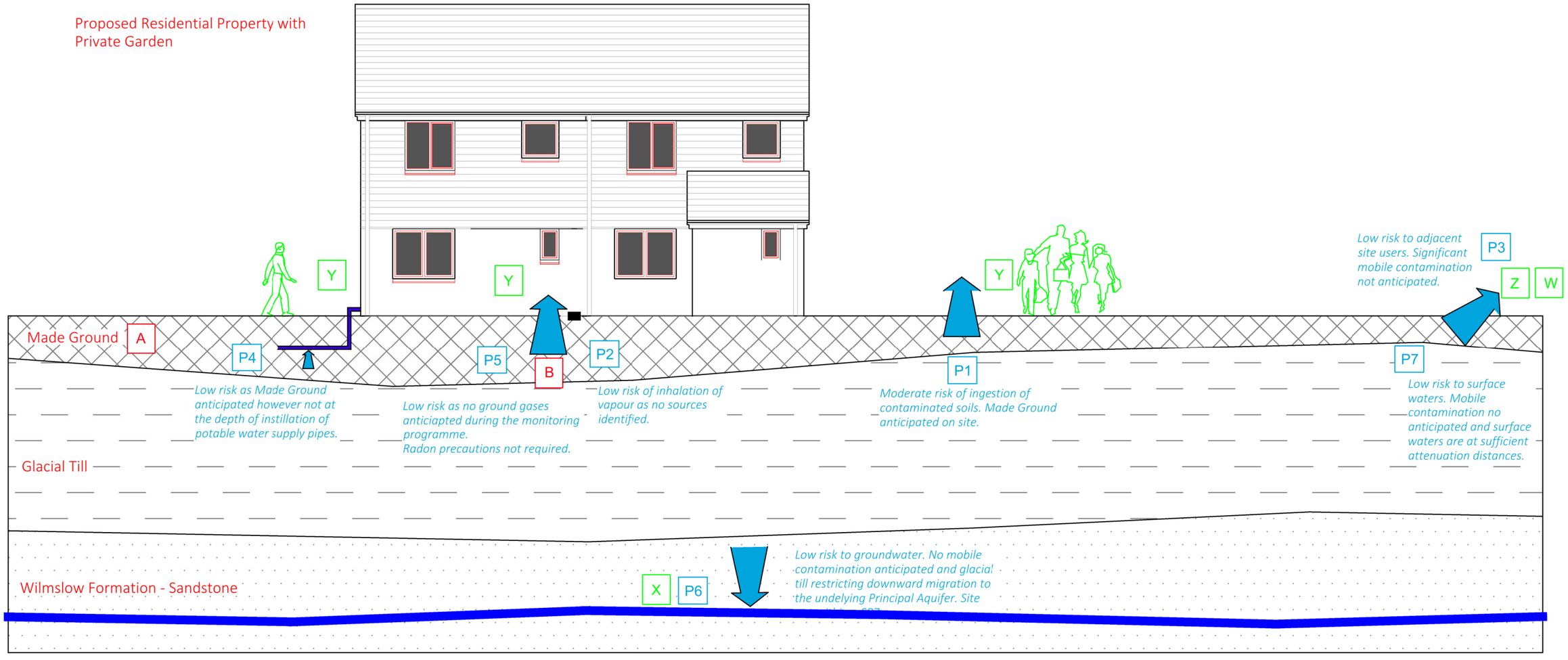
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Issued	●
For Comment	
Approved	

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SITE BOUNDARY

PRELIMINARY DEVELOPMENT CONSTRAINTS

SOURCES	POLLUTION LINKAGES	RECEPTORS
A. Contaminated soils / Made Ground. B. Ground gas.	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.	W. River Mersey c.971m south west. X. Groundwater within the underlying Secobdary A and Secondary Undifferentiated Superficial Aquifer and the Principal Bedrock Aquifer. Y. Site end users. Z. Adjacent site users.



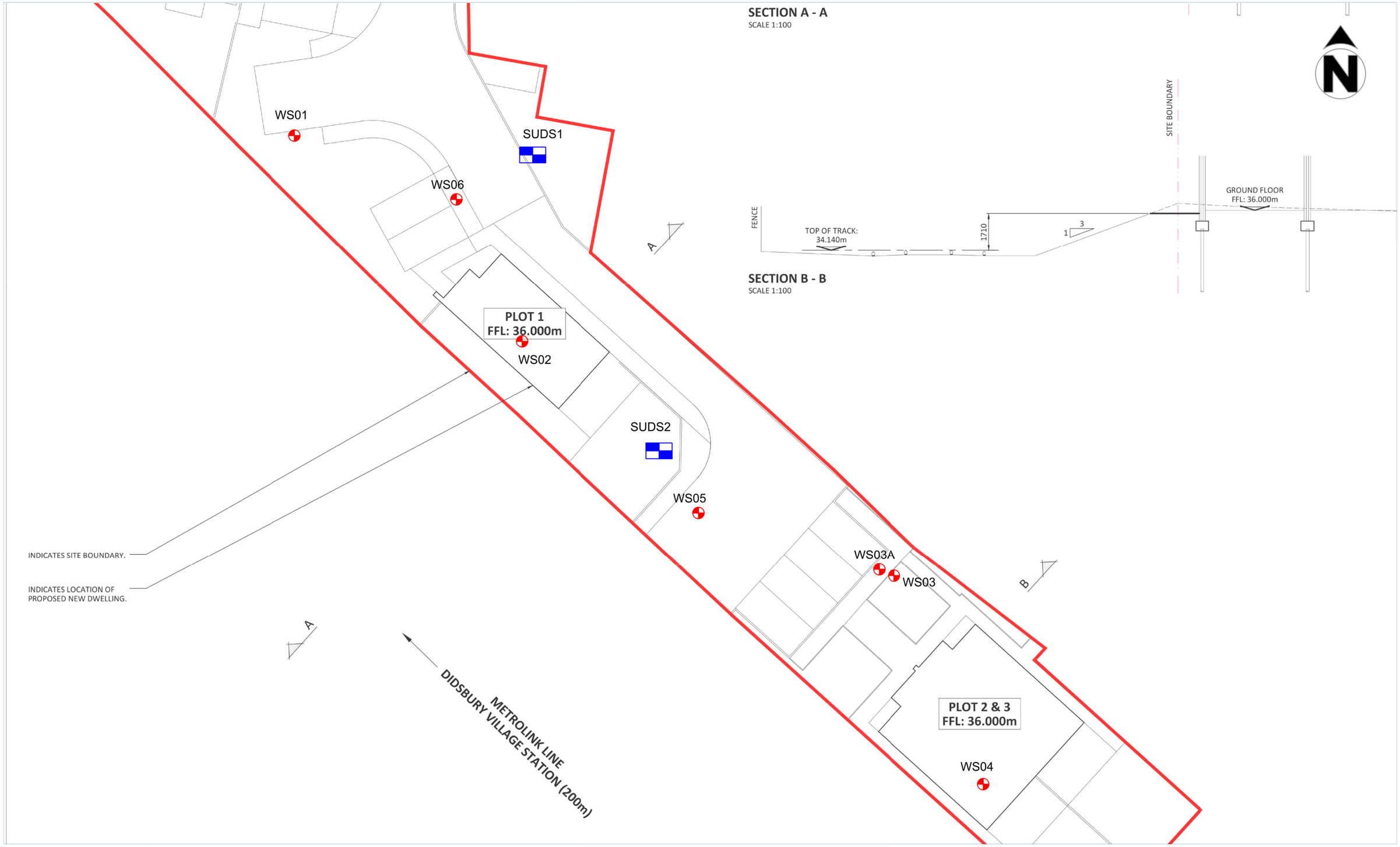
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CLIENT	JC BRENNAN DEVELOPMENTS LTD
PROJECT TITLE	50 DUNDONALD ROAD, DIDSBURY
PLAN TITLE	ILLUSTRATIVE PRELIMINARY CSM
DATE	AUGUST 2022
SCALE	NTS
PLAN NUMBER	GRO-22168-P03

Rev.	Details	Date

Status	
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Issued	●
For Comment	
Approved	

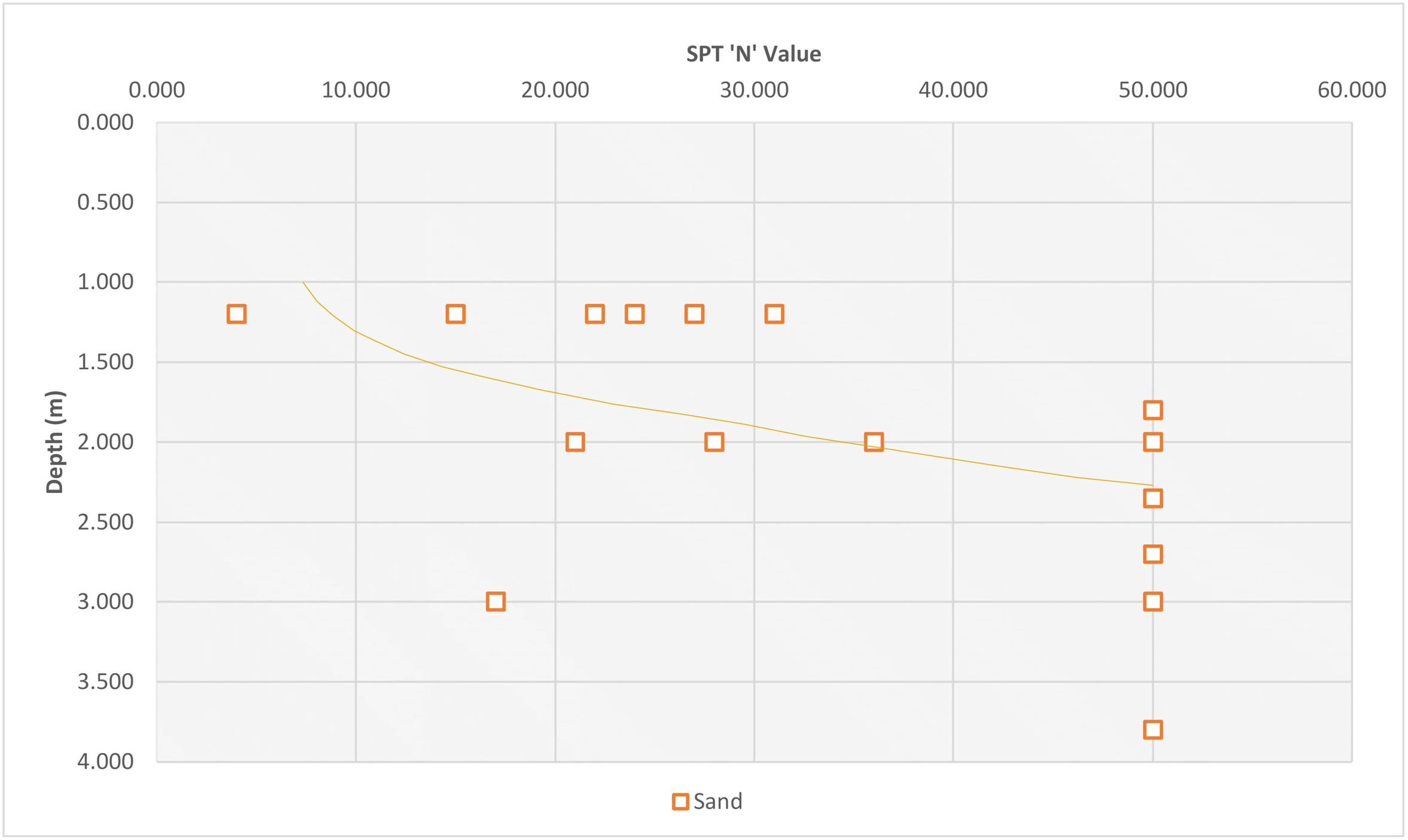
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SECTION A - A
SCALE 1:100

SECTION B - B
SCALE 1:100

GROUNDTECH CONSULTING	CLIENT: JC BRENNAN DEVELOPMENTS LTD	DATE: JUNE 2022			Status: Preliminary / Draft / Issued / For Comment / Approved
	PROJECT TITLE: 50 DUNDONALD ROAD	SCALE: NTS			Notes: PROPOSED WINDOWLESS SAMPLE BOREHOLE LOCATION; PROPOSED SOIL PERCOLATION TEST LOCATION
	PLAN TITLE: EXPLORATORY HOLE LOCATION PLAN	PLAN NUMBER: GRO-22168-P04	Rev.	Details / Date	



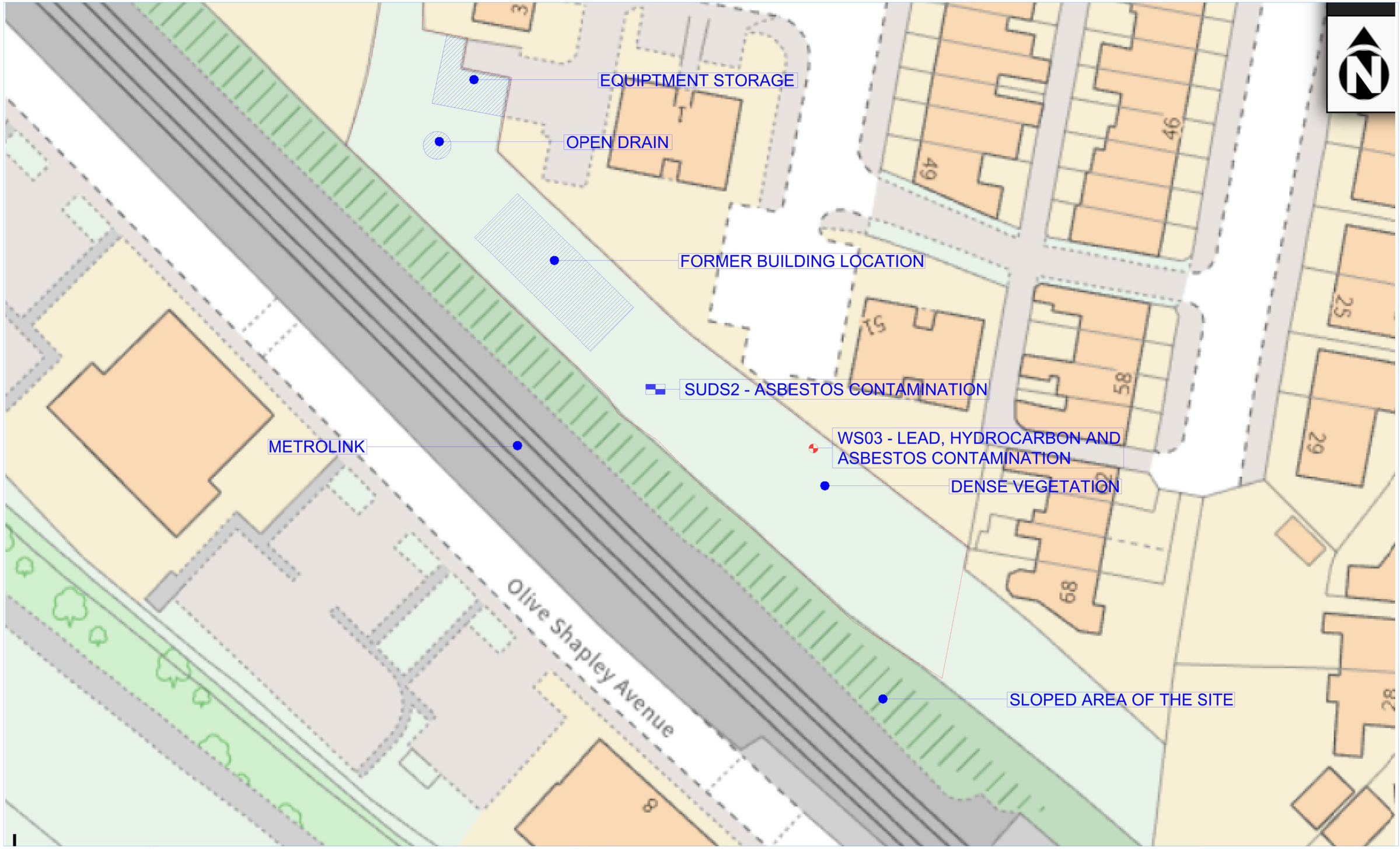
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CLIENT	JC BRENNAN DEVELOPMENTS LTD
PROJECT TITLE	50 DUNDONALD ROAD, DIDSBURY
PLAN TITLE	GENERALISED GROUND MODEL
DATE	AUGUST 2022
SCALE	NTS
PLAN NUMBER	GRO-22168-P05

Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes



GROUNDTECH CONSULTING

CLIENT	JC BRENNAN DEVELOPMENTS LTD
PROJECT TITLE	50 DUNDONALD ROAD, DIDSBURY
PLAN TITLE	REVISED DEVELOPMENT CONSTRAINTS PLAN
DATE	AUGUST 2022
SCALE	NTS
PLAN NUMBER	GRO-22168-P06

Rev.	Details	Date

Status	
Preliminary	
Draft	
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For Comment	
Approved	

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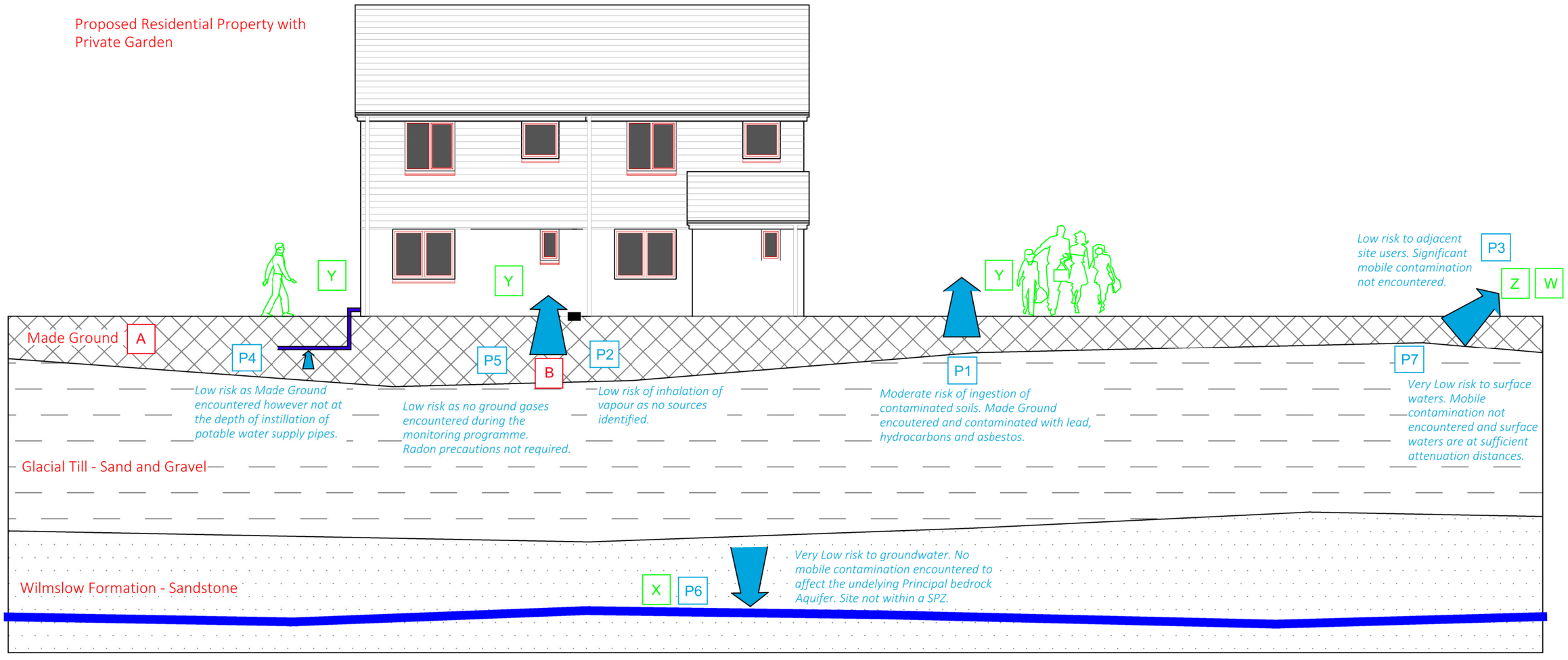
SITE BOUNDARY

DEVELOPMENT CONSTRAINTS

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.971m south west.
X. Groundwater within the underlying Secobdary A and Secondary Undifferentiated Superficial Aquifer and the Principal Bedrock Aquifer.
Y. Site end users.
Z. Adjacent site users.



GROUNDTECH CONSULTING

CLIENT	JC BRENNAN DEVELOPMENTS LTD
PROJECT TITLE	50 DUNDONALD ROAD, DIDSBURY
PLAN TITLE	ILLUSTRATIVE REVISED CSM
DATE	AUGUST 2022
SCALE	NTS
PLAN NUMBER	GRO-22168-P07

Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes

APPENDIX 2 - Site Photographs



Photograph 1 – SuDS1



Photograph 2 – SuDS2



Photograph 3 – South eastern Area of the Site



Photograph 4 – Central Area

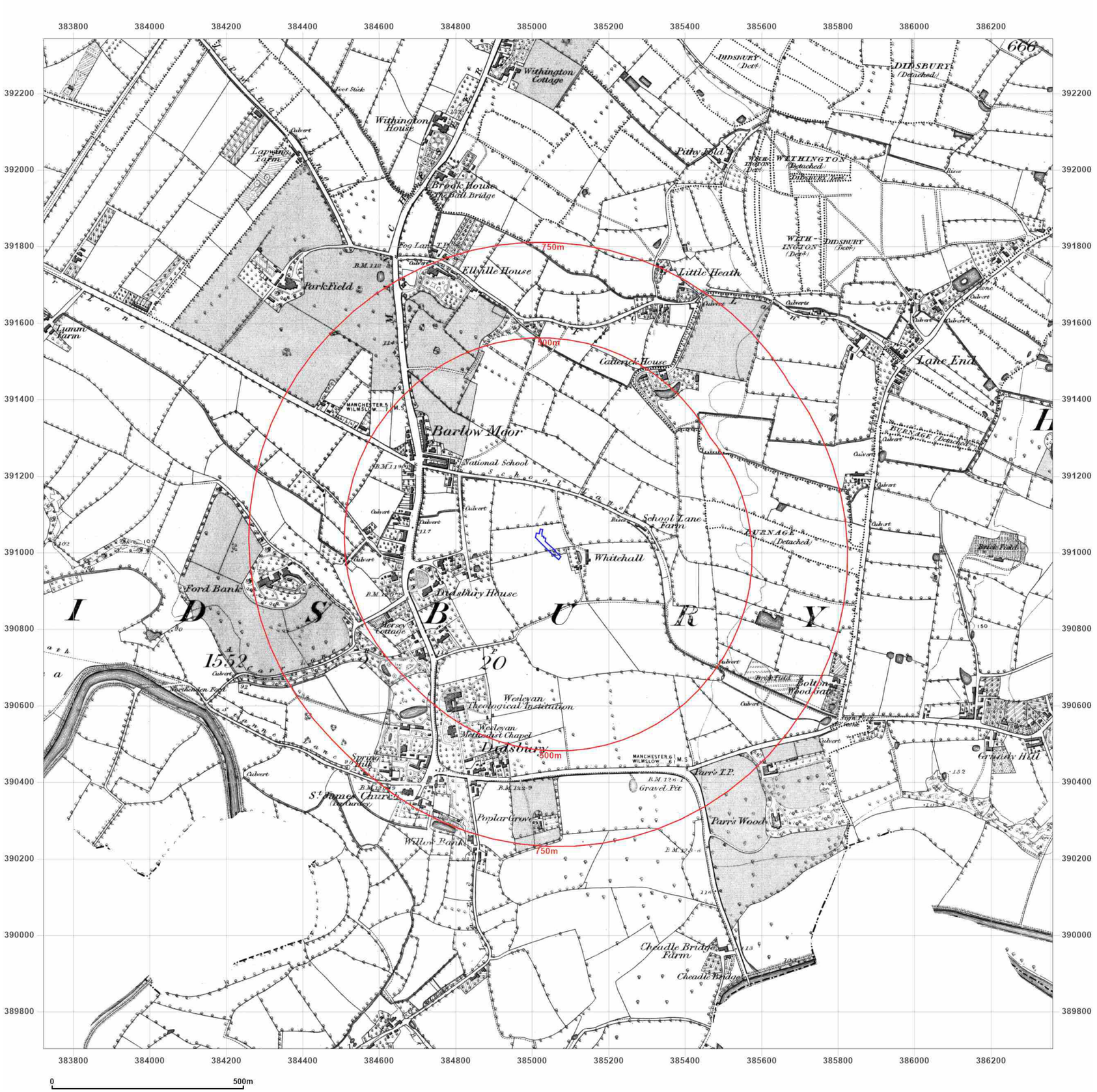


Photograph 5 – Site Entrance



Photograph 6 – Storage Area.

APPENDIX 3 - Historical Plans



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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

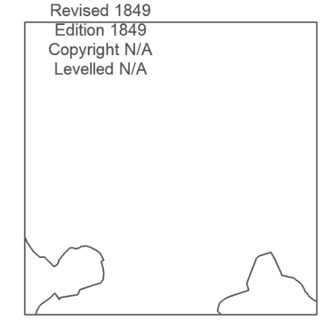
Map date: **1849**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1845
Revised 1849
Edition 1849
Copyright N/A
Levelled N/A



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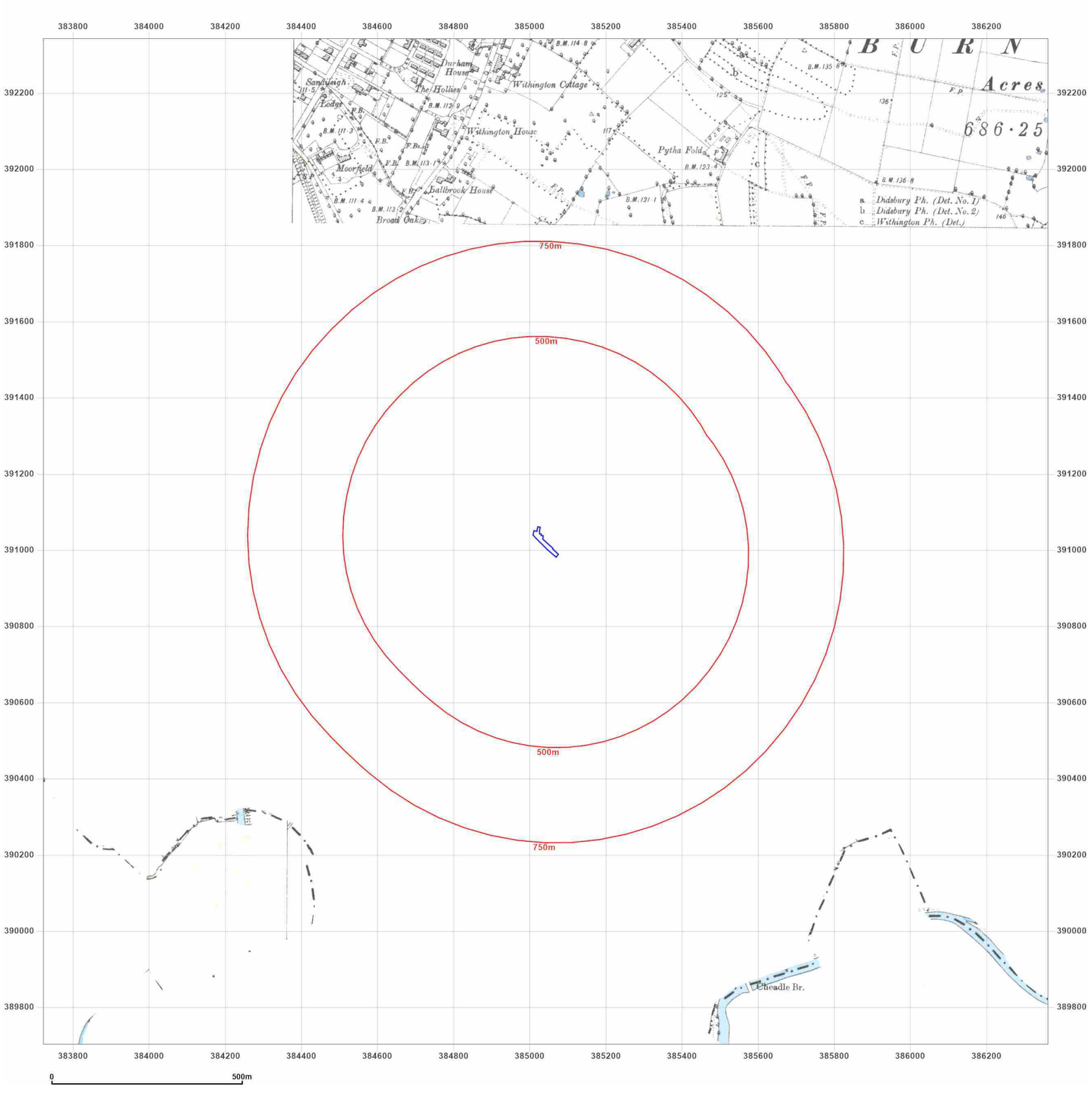
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

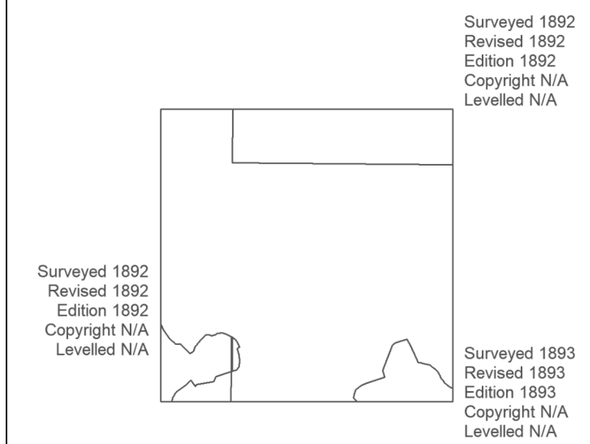
Map Name: County Series

Map date: **1892-1893**

Scale: 1:10,560

Printed at: 1:10,560

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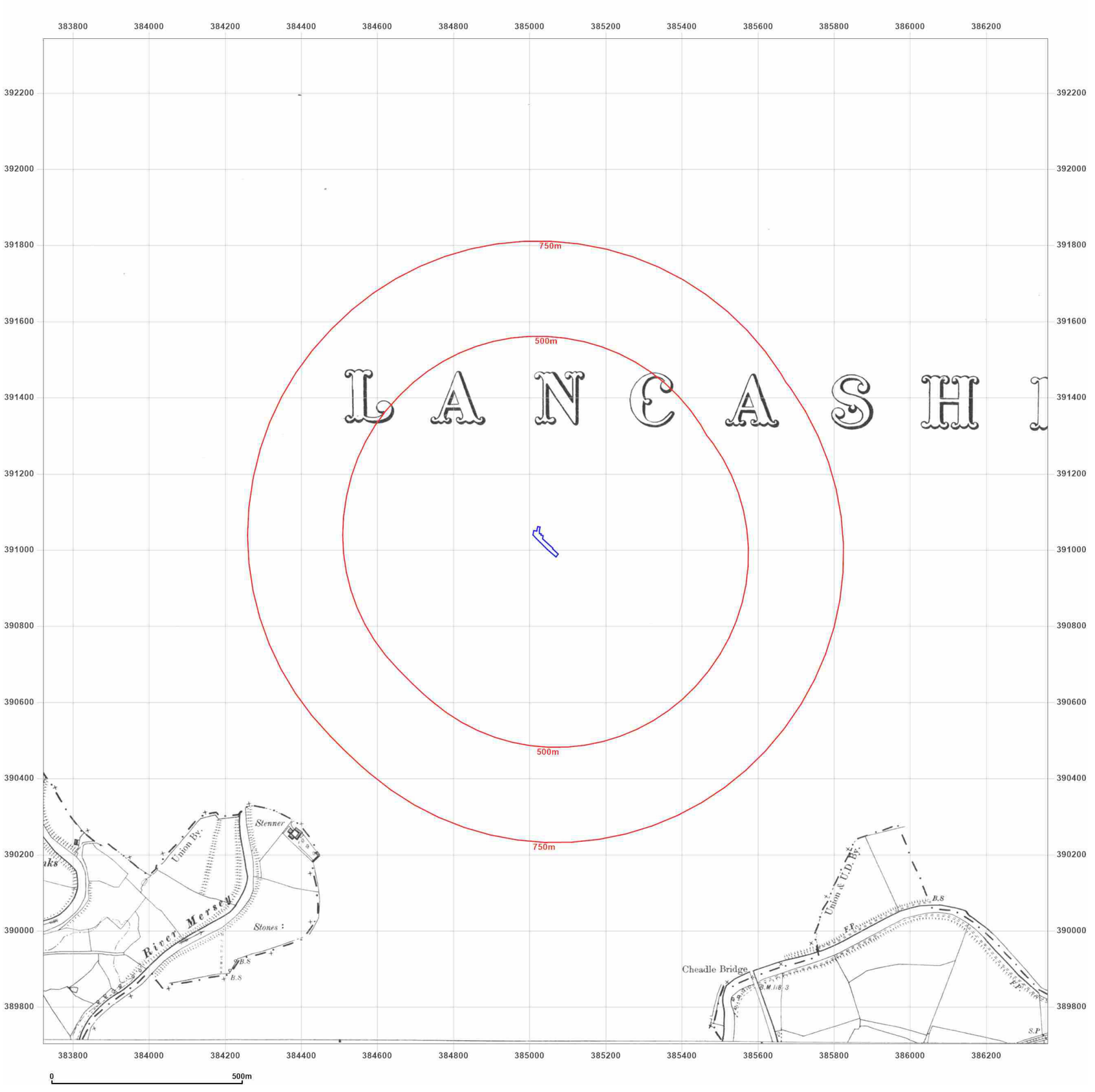
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1897**
Scale: 1:10,560
Printed at: 1:10,560

N
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Surveyed 1872
Revised 1897
Edition 1897
Copyright N/A
Levelled N/A

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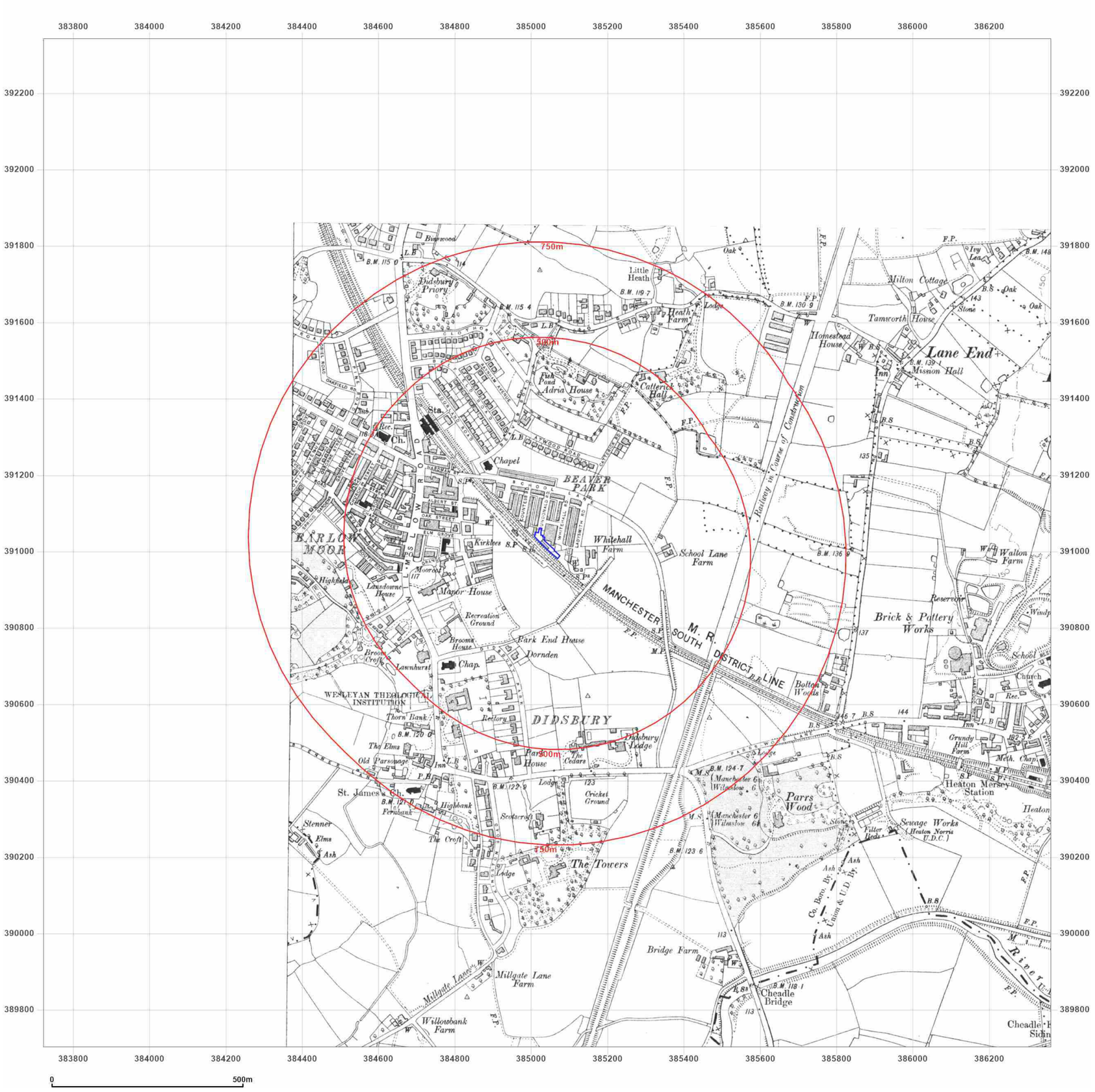
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Site Details:

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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

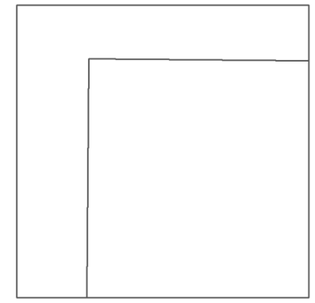
Map Name: County Series

Map date: **1911**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1844
Revised 1904
Edition 1911
Copyright N/A
Levelled N/A

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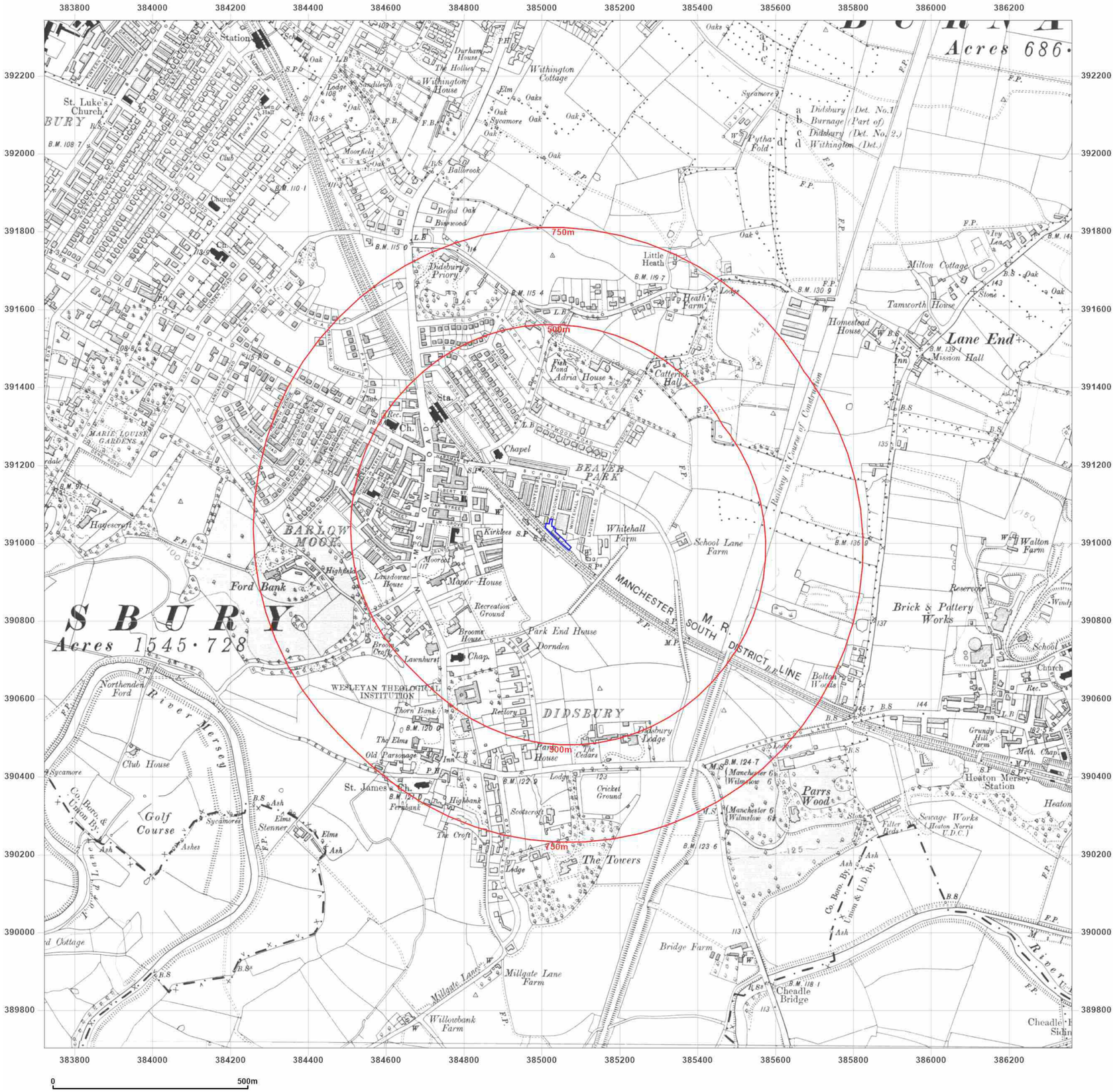
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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1911**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1872
Revised 1908
Edition 1911
Copyright N/A
Levelled N/A

Surveyed 1872
Revised 1908
Edition 1911
Copyright N/A
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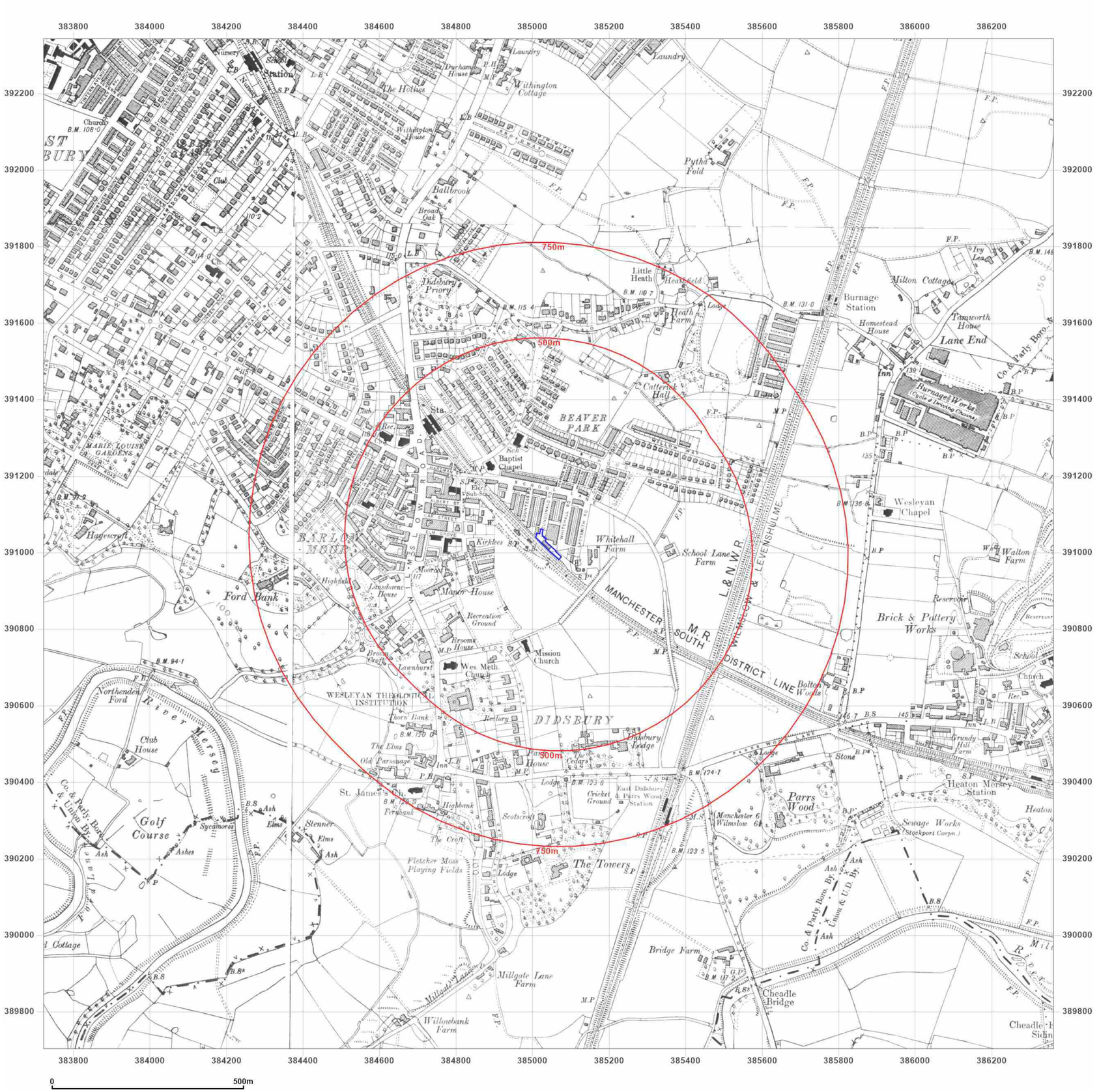
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

Surveyed 1844
Revised 1916
Edition 1923
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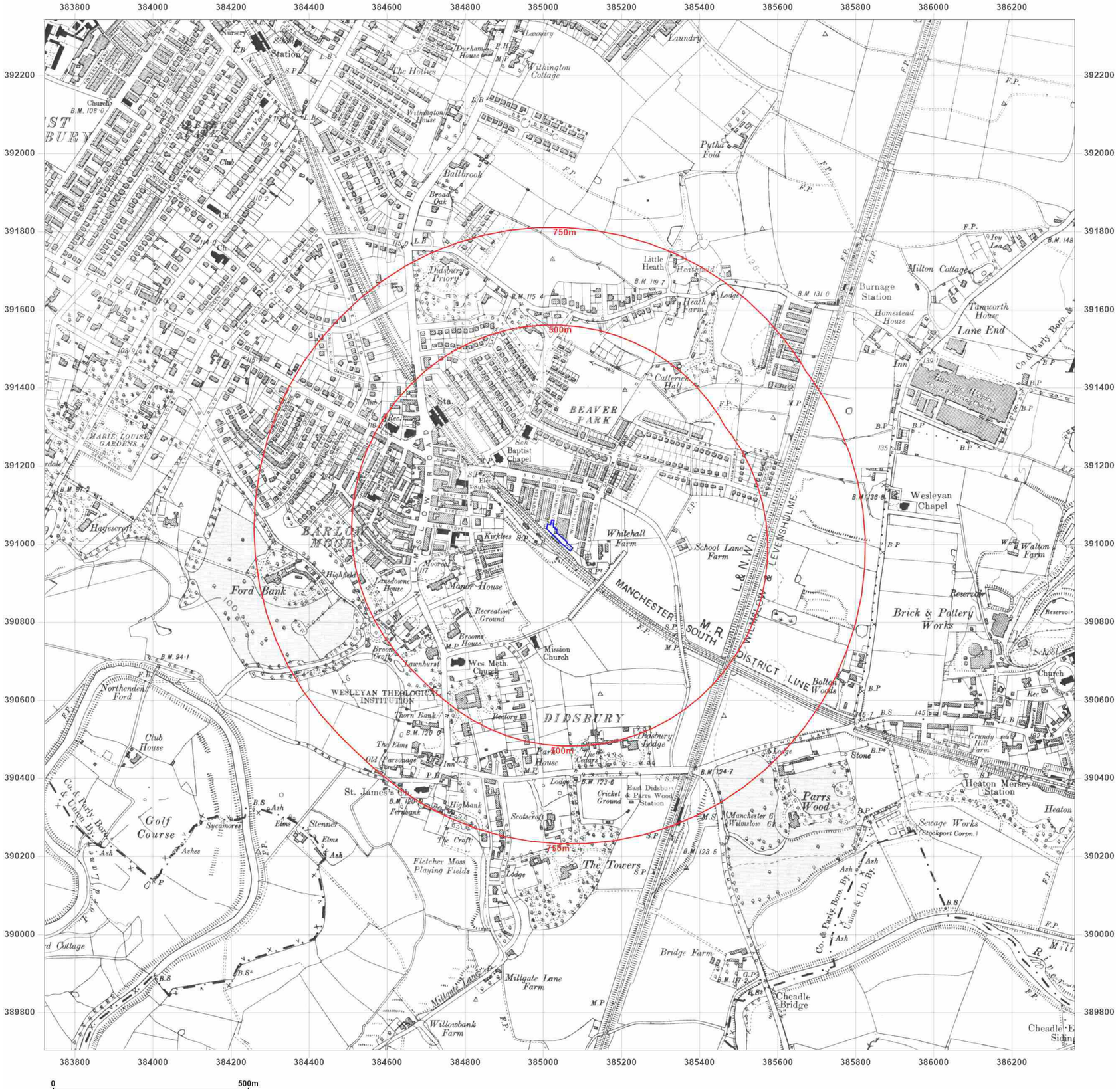
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Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

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Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1934-1938**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

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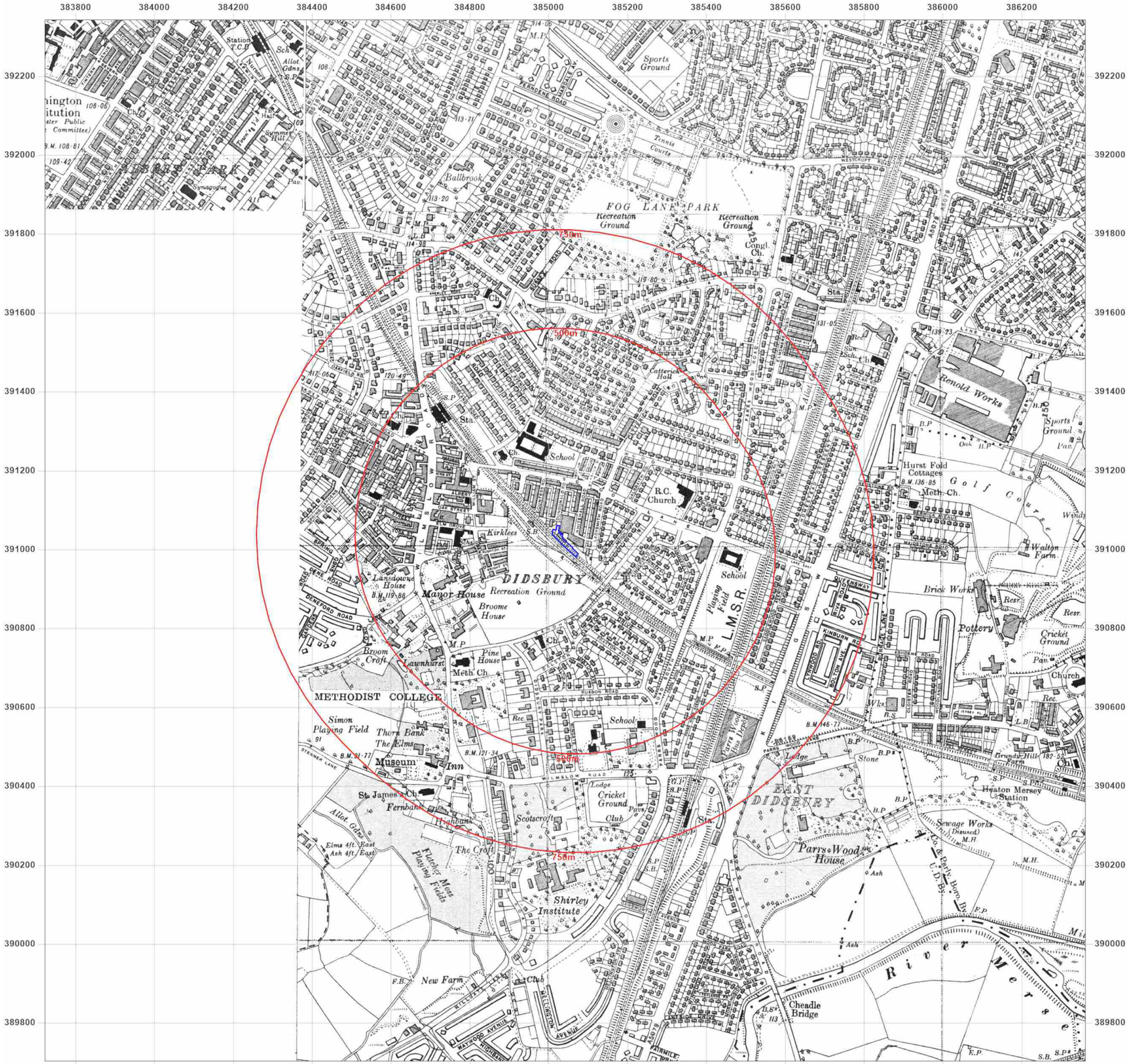
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Client Ref: EMS_787267_977195
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Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1938**

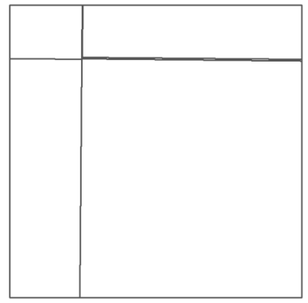
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Printed at: 1:10,560

N
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Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927



Surveyed 1872
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

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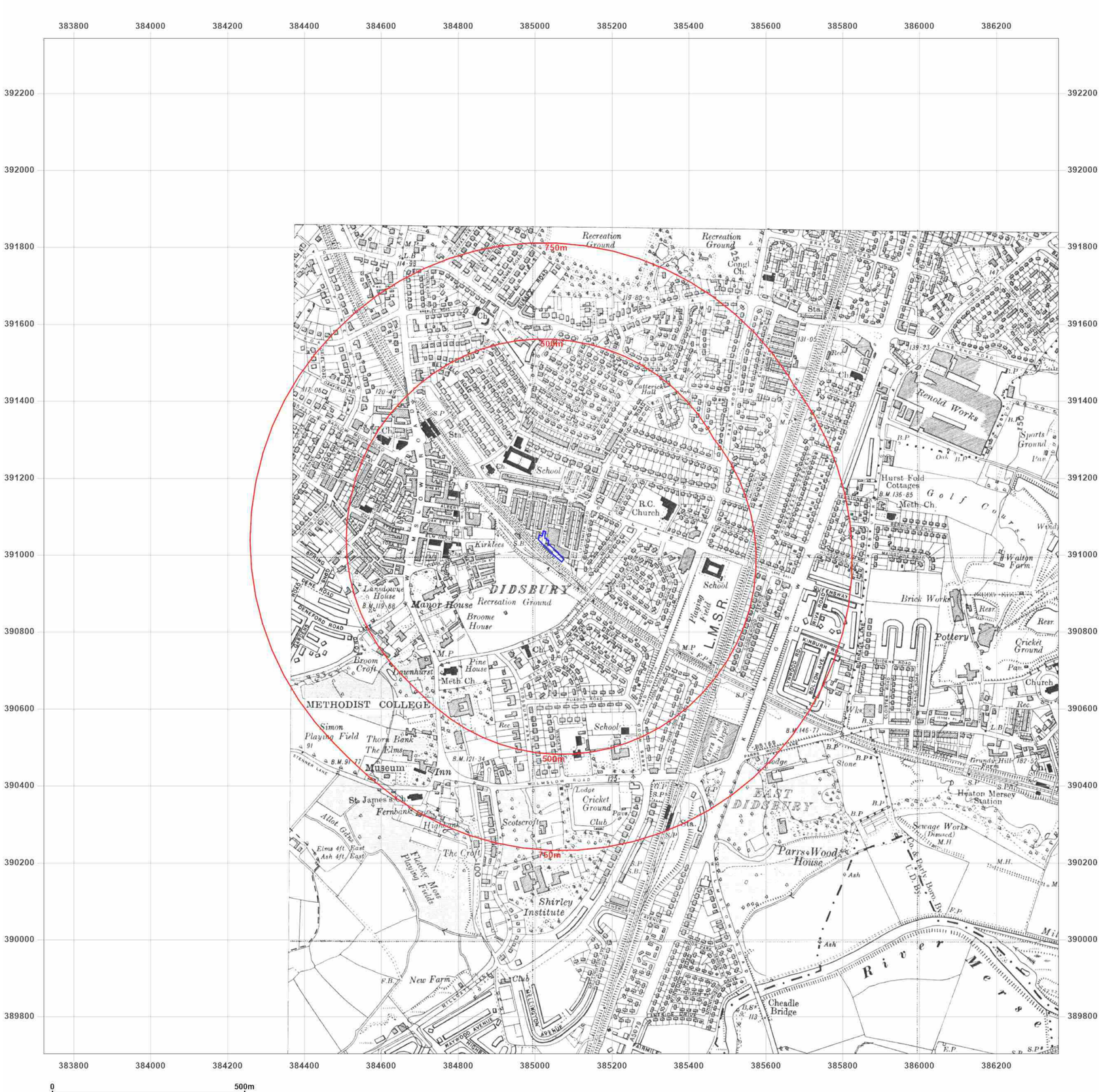
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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1844
Revised 1934
Edition 1938
Copyright N/A
Levelled 1927

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Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1872
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: Provisional

Map date: **1954-1955**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
Levelled N/A

Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
Levelled N/A

Surveyed 1949
Revised 1954
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1949
Revised 1953
Edition N/A
Copyright 1954
Levelled N/A

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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: Provisional
Map date: **1965-1967**
Scale: 1:10,560
Printed at: 1:10,560

N
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Surveyed 1966
Revised 1966
Edition N/A
Copyright 1966
Levelled N/A

Surveyed 1965
Revised 1965
Edition N/A
Copyright 1965
Levelled N/A

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1967
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
Copyright 1966
Levelled N/A

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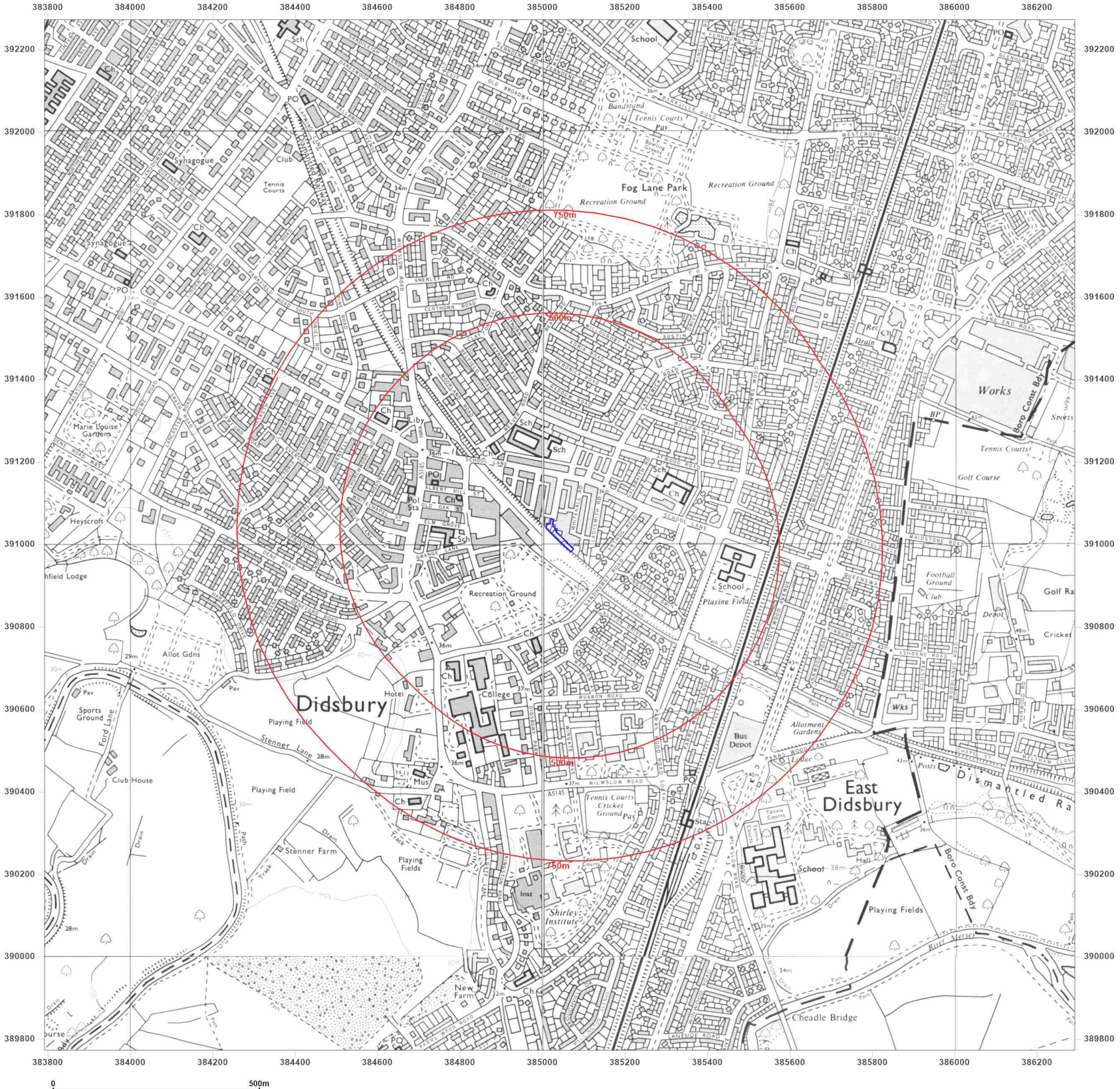
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Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1976-1981**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1977
Revised 1981
Edition N/A
Copyright 1981
Levelled 1976

Surveyed 1974
Revised 1975
Edition N/A
Copyright 1976
Levelled 1964

Surveyed 1975
Revised 1977
Edition N/A
Copyright 1977
Levelled 1964

Surveyed 1975
Revised 1978
Edition N/A
Copyright 1978
Levelled 1964

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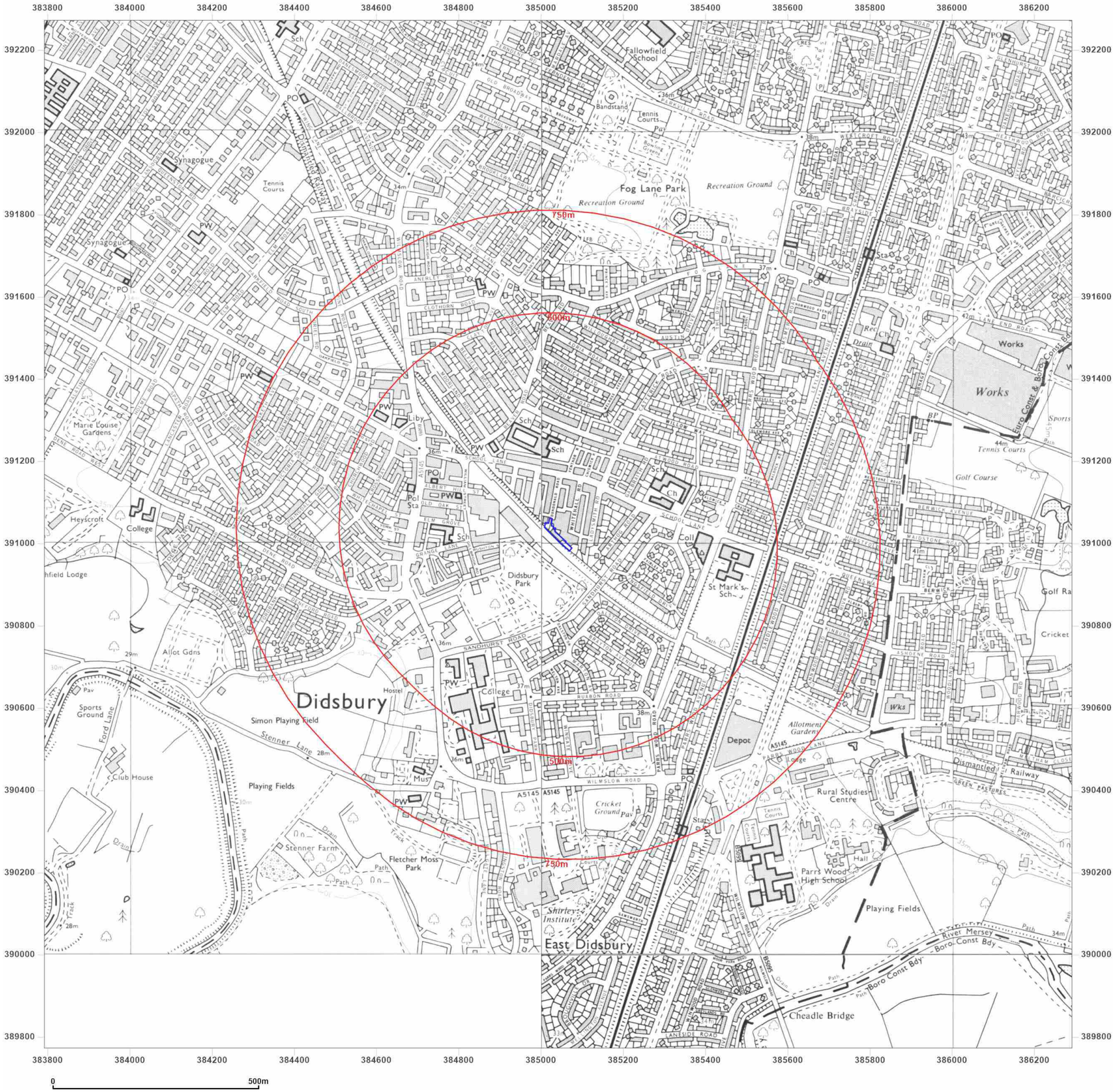
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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1983-1988**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1985
Revised 1988
Edition N/A
Copyright 1988
Levelled 1981

Surveyed 1981
Revised 1983
Edition N/A
Copyright 1983
Levelled 1981

Surveyed 1983
Revised 1983
Edition N/A
Copyright 1983
Levelled 1981

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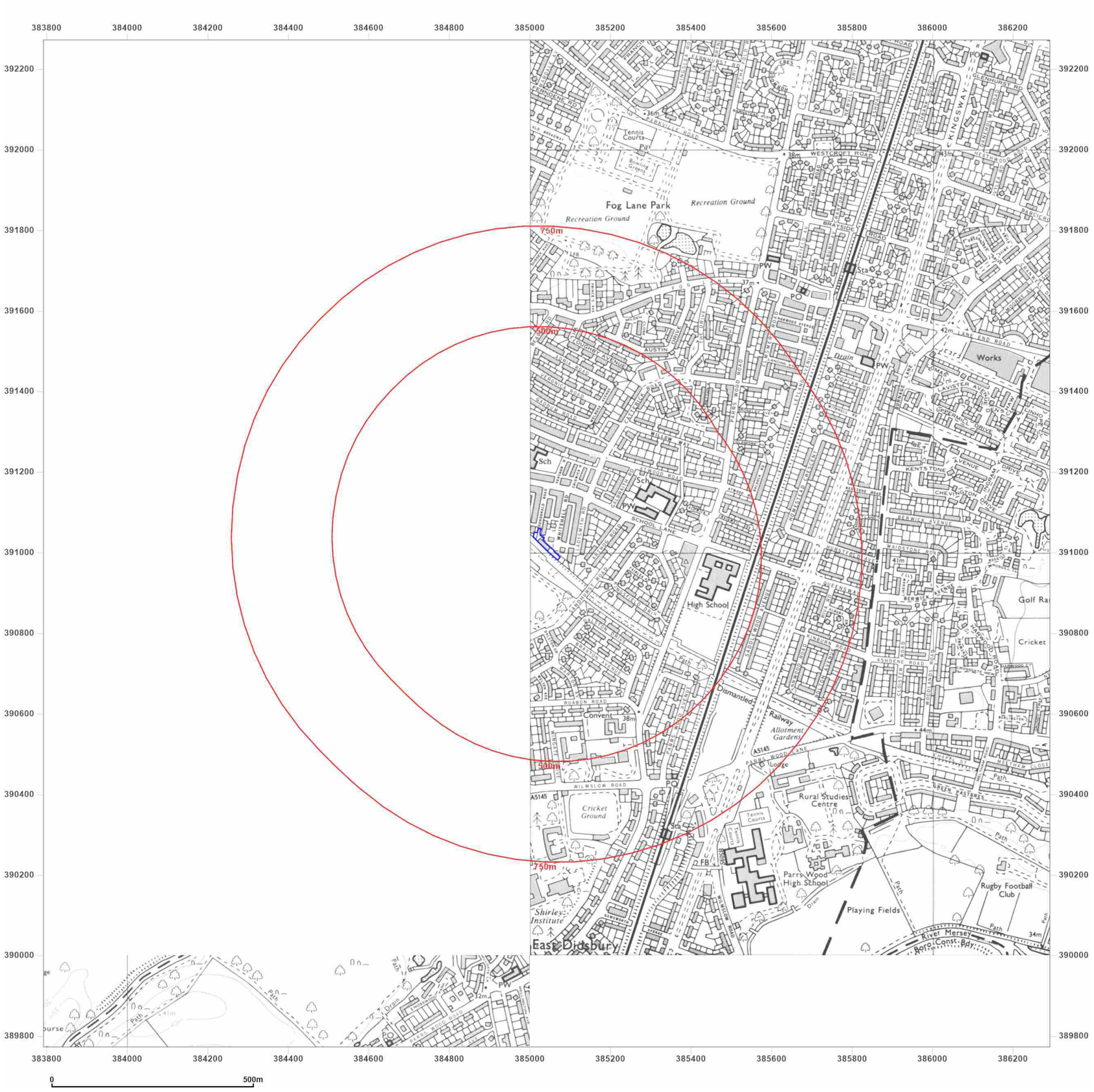
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1989**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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Surveyed 1986
Revised 1989
Edition N/A
Copyright 1989
Levelled 1981

Surveyed 1984
Revised 1989
Edition N/A
Copyright 1989
Levelled 1981

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **2001**
Scale: 1:10,000
Printed at: 1:10,000

N
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2001

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **2010**
Scale: 1:10,000
Printed at: 1:10,000

N
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2010

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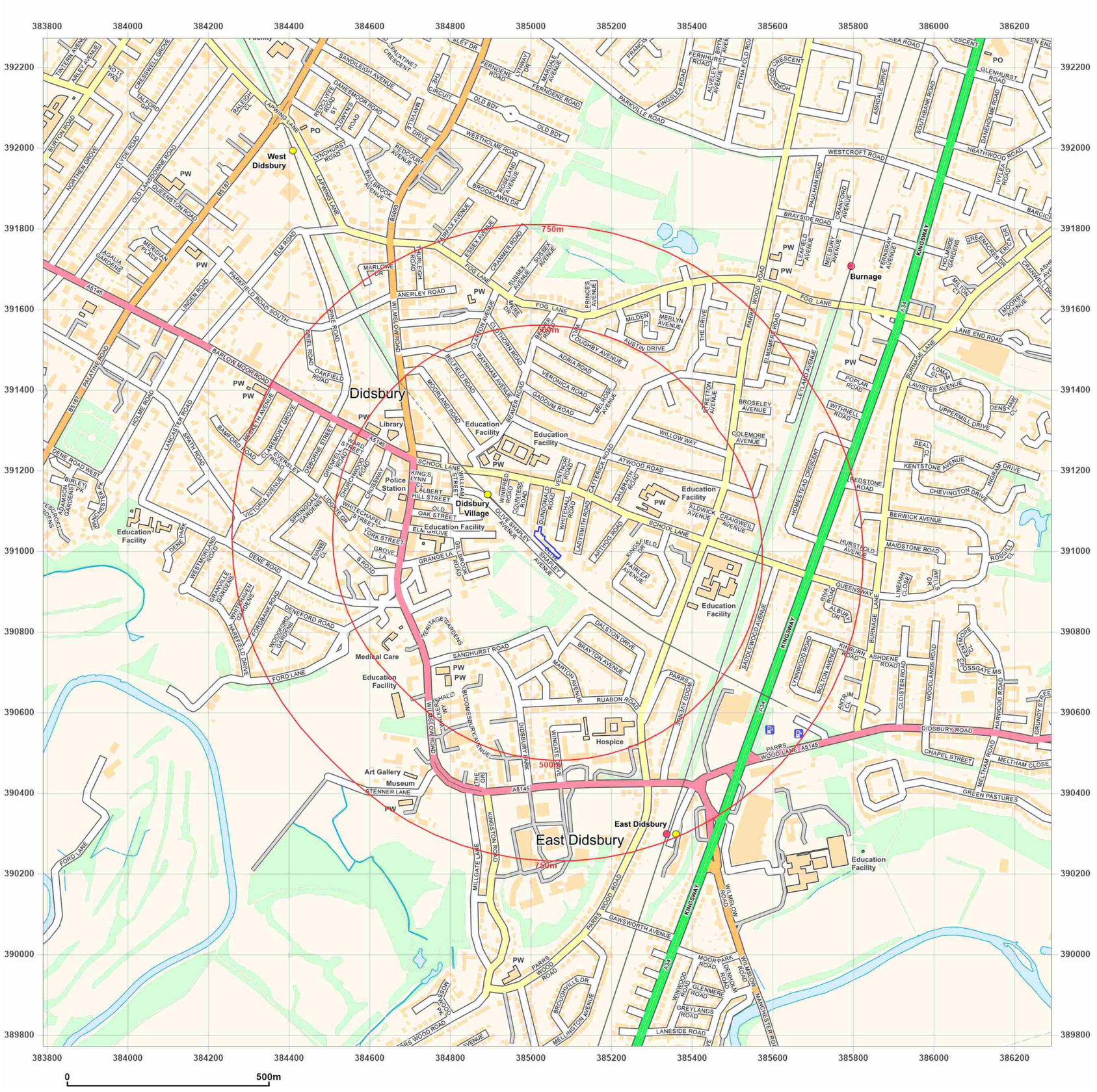
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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **2022**
Scale: 1:10,000
Printed at: 1:10,000

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2022

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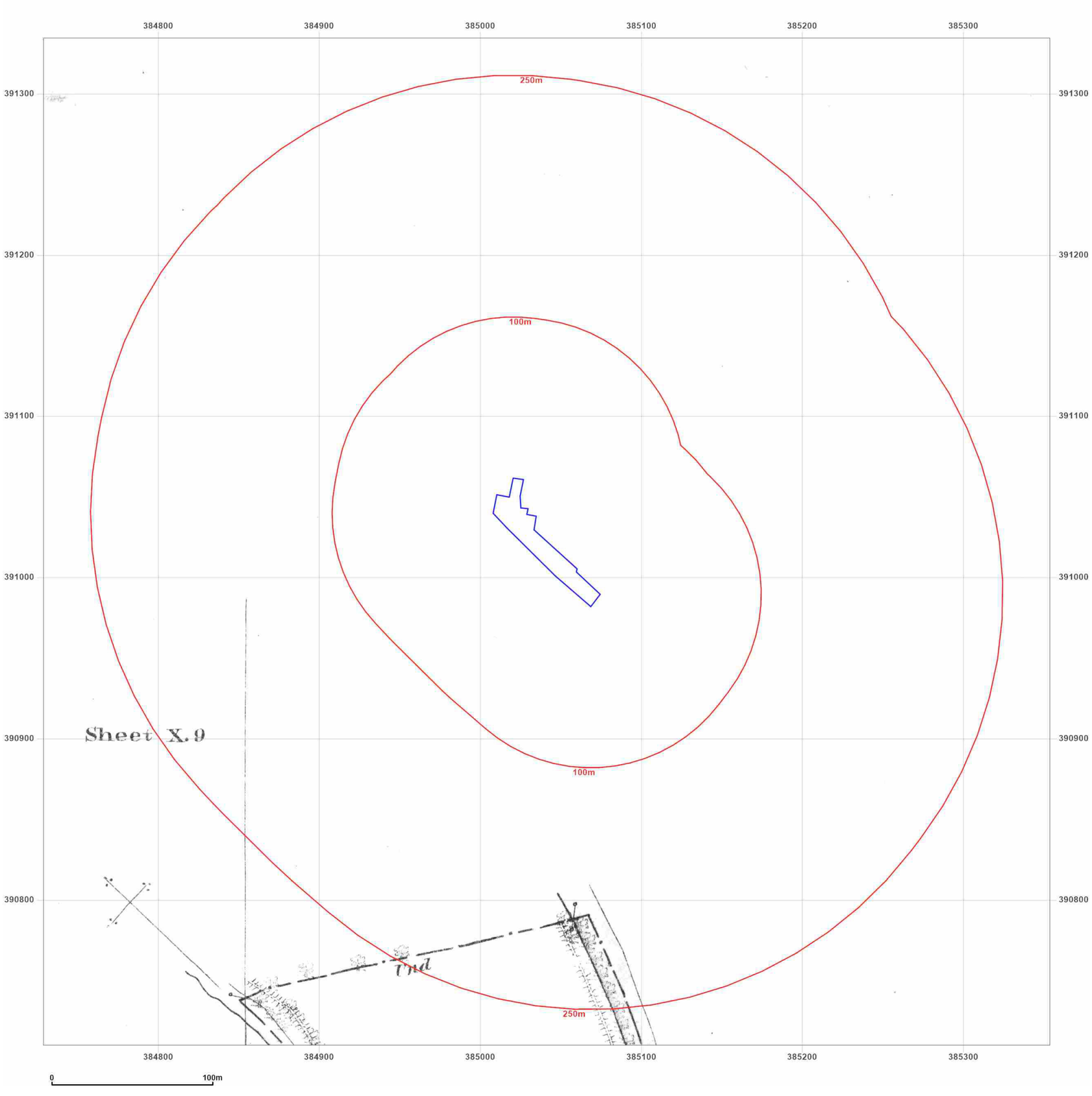
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Production date: 13 June 2022

Map legend available at:
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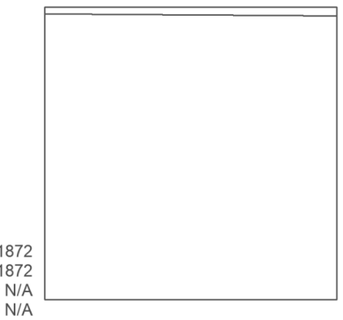
emapsite™

Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1872**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
Levelled N/A

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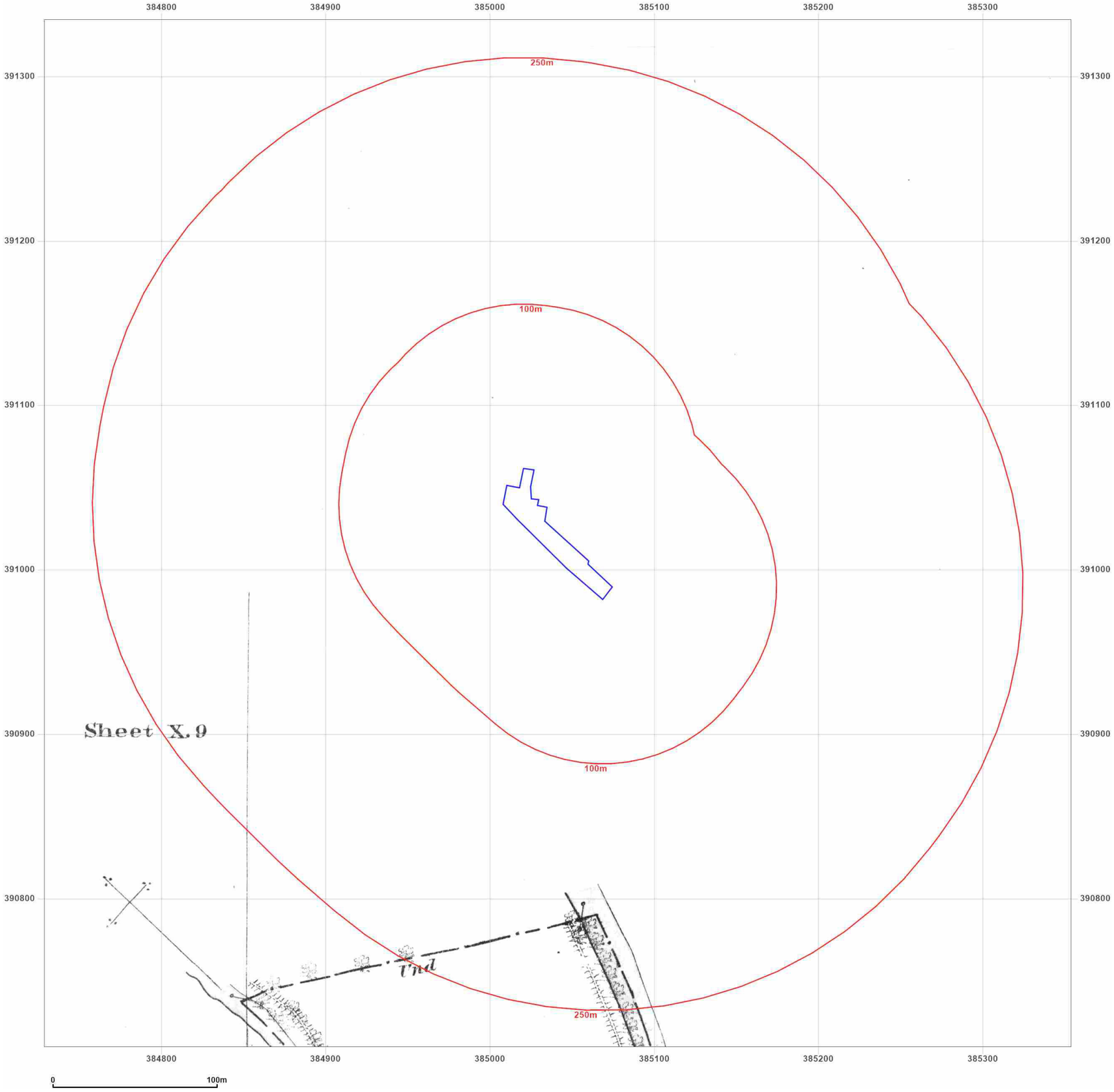
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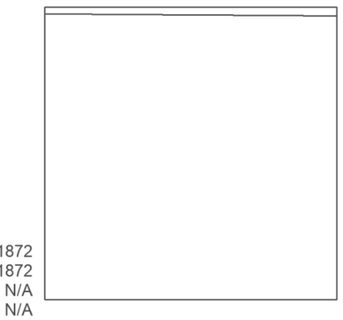
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1872**
Scale: 1:2,500
Printed at: 1:2,500

N
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S



Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
Levelled N/A

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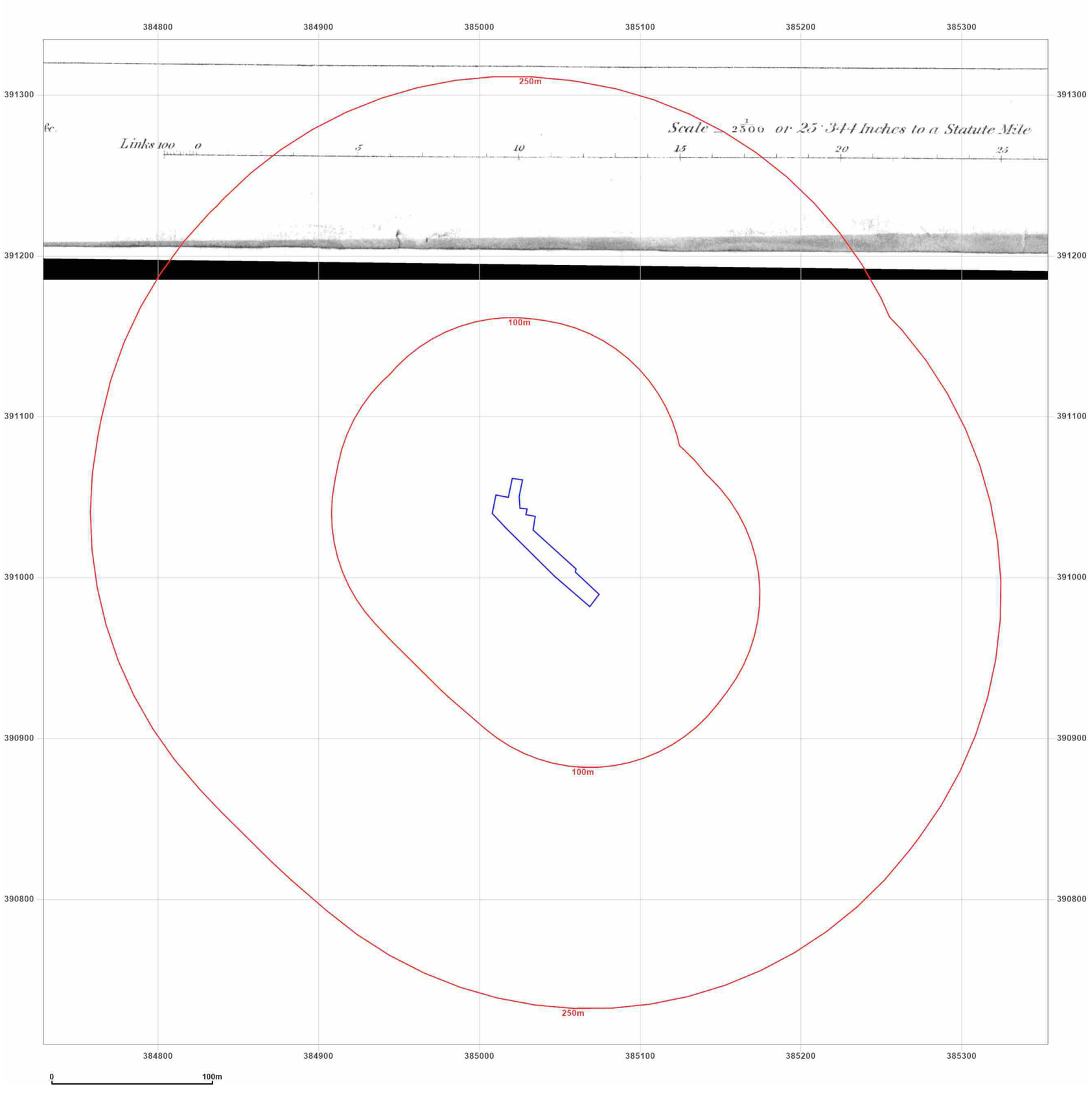
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Production date: 13 June 2022

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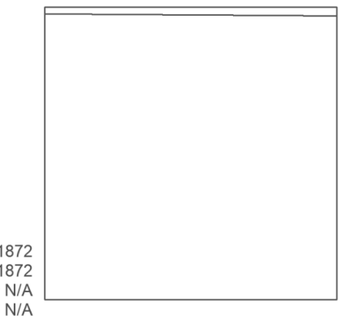
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1872**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
Levelled N/A

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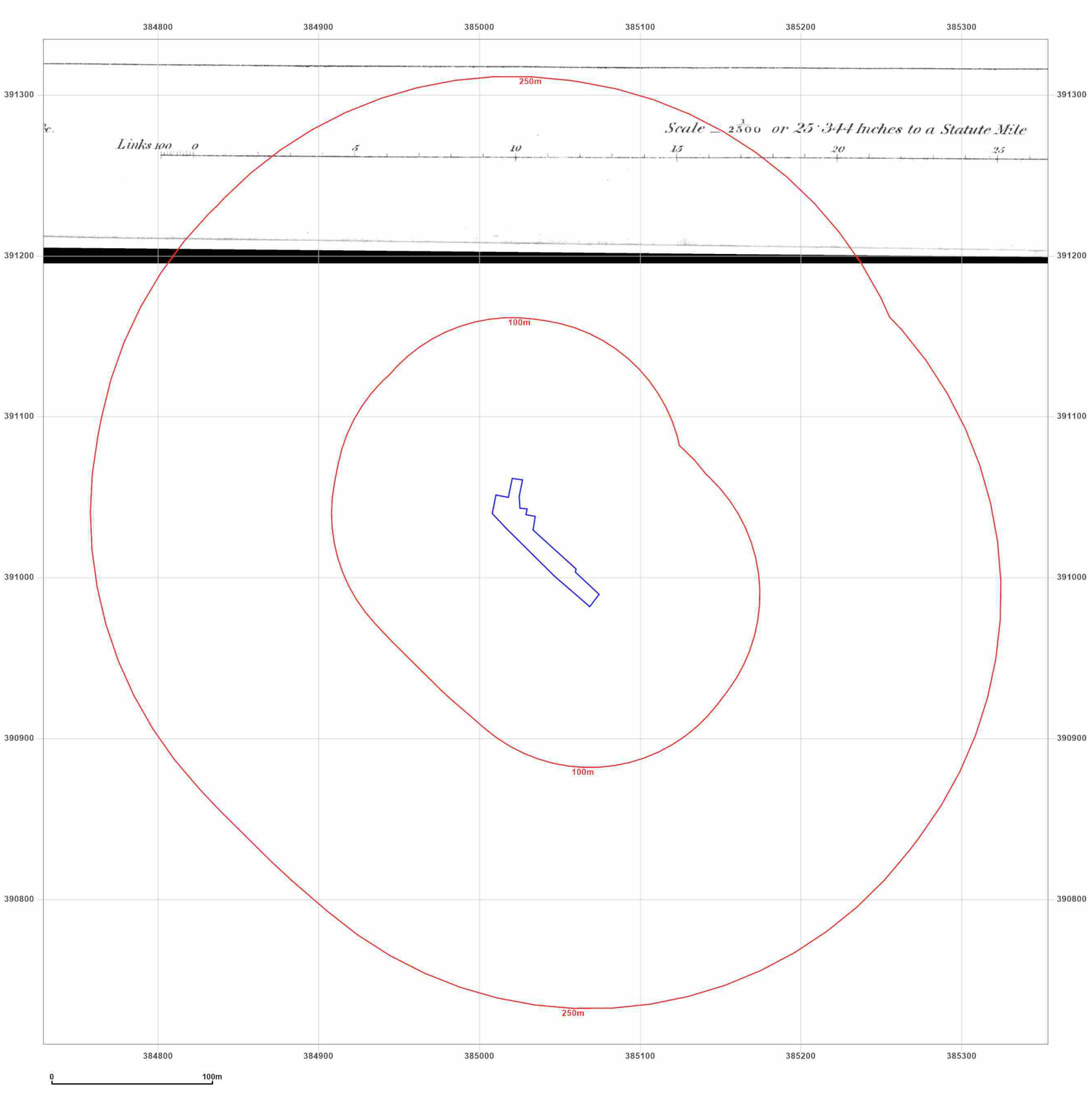
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1872**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1881**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1881
Revised N/A
Edition 1881
Copyright N/A
Levelled N/A

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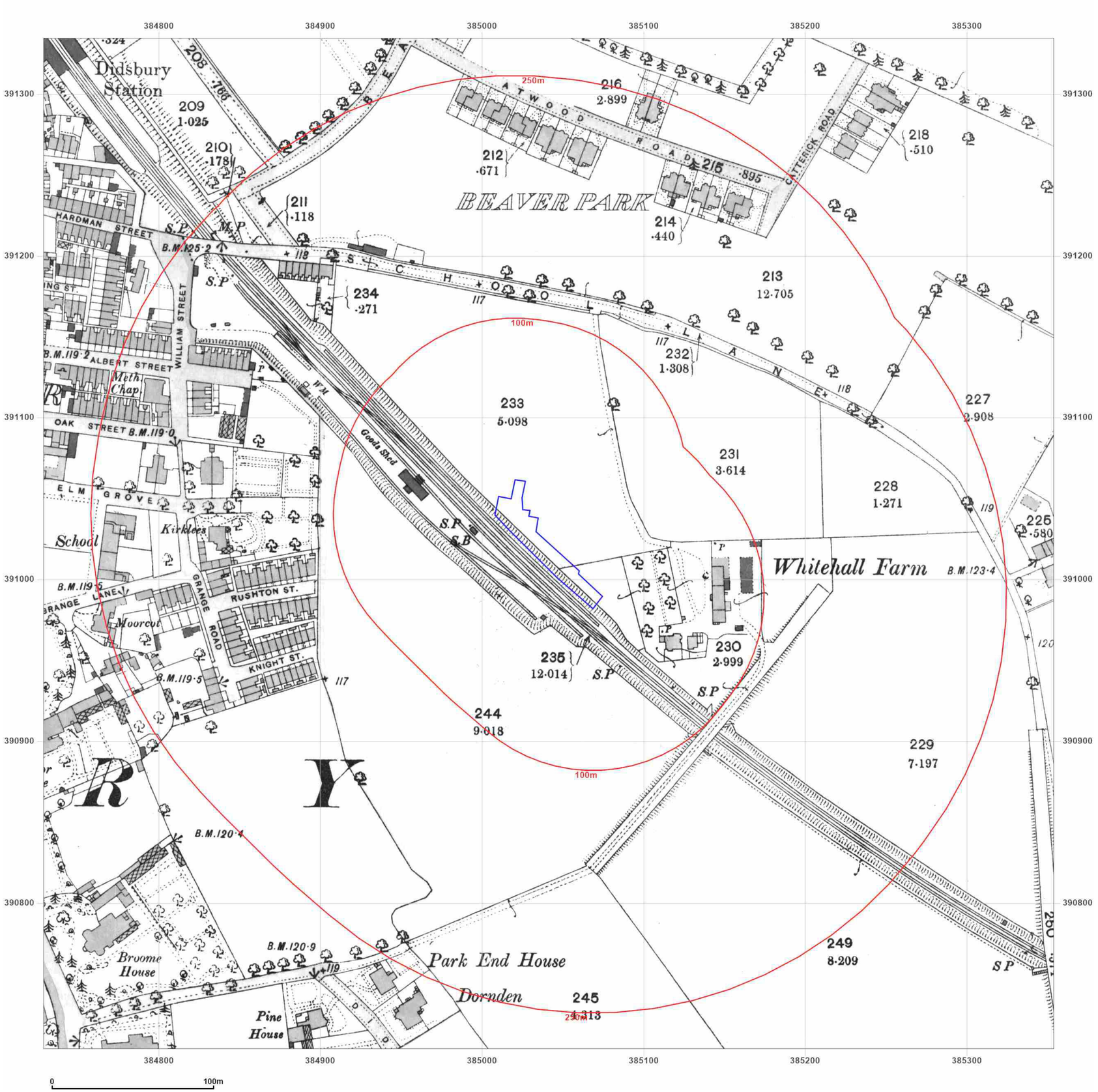
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1894**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1894
Revised N/A
Edition 1894
Copyright N/A
Levelled N/A

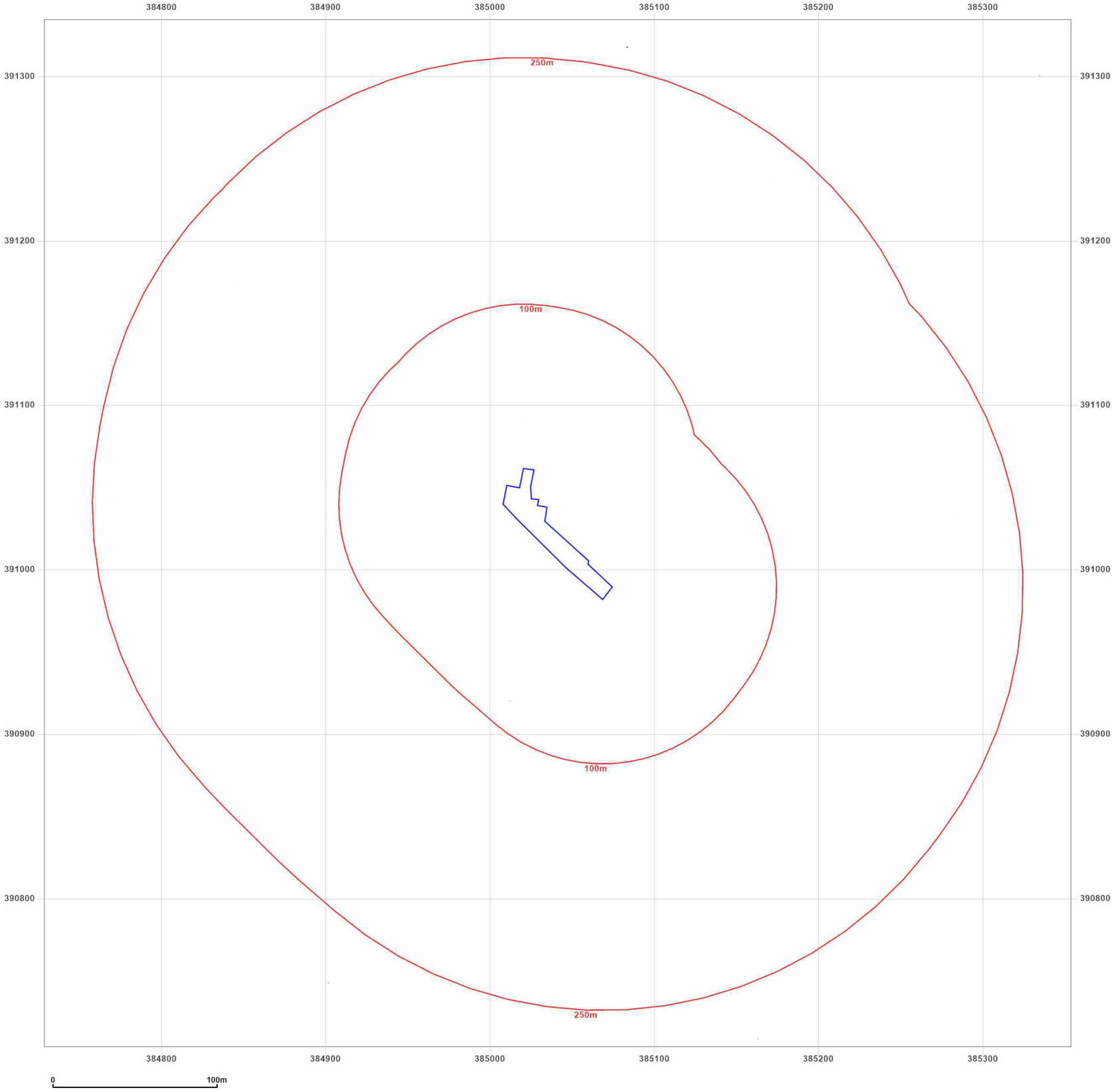
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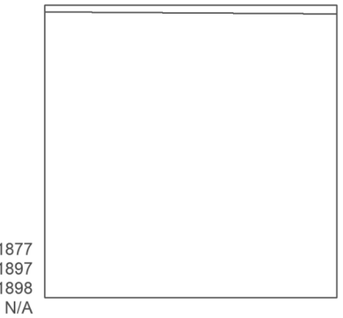
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1898**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1877
Revised 1897
Edition 1898
Copyright N/A
Levelled N/A

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1907**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1891
Revised 1905
Edition 1907
Copyright N/A
Levelled N/A

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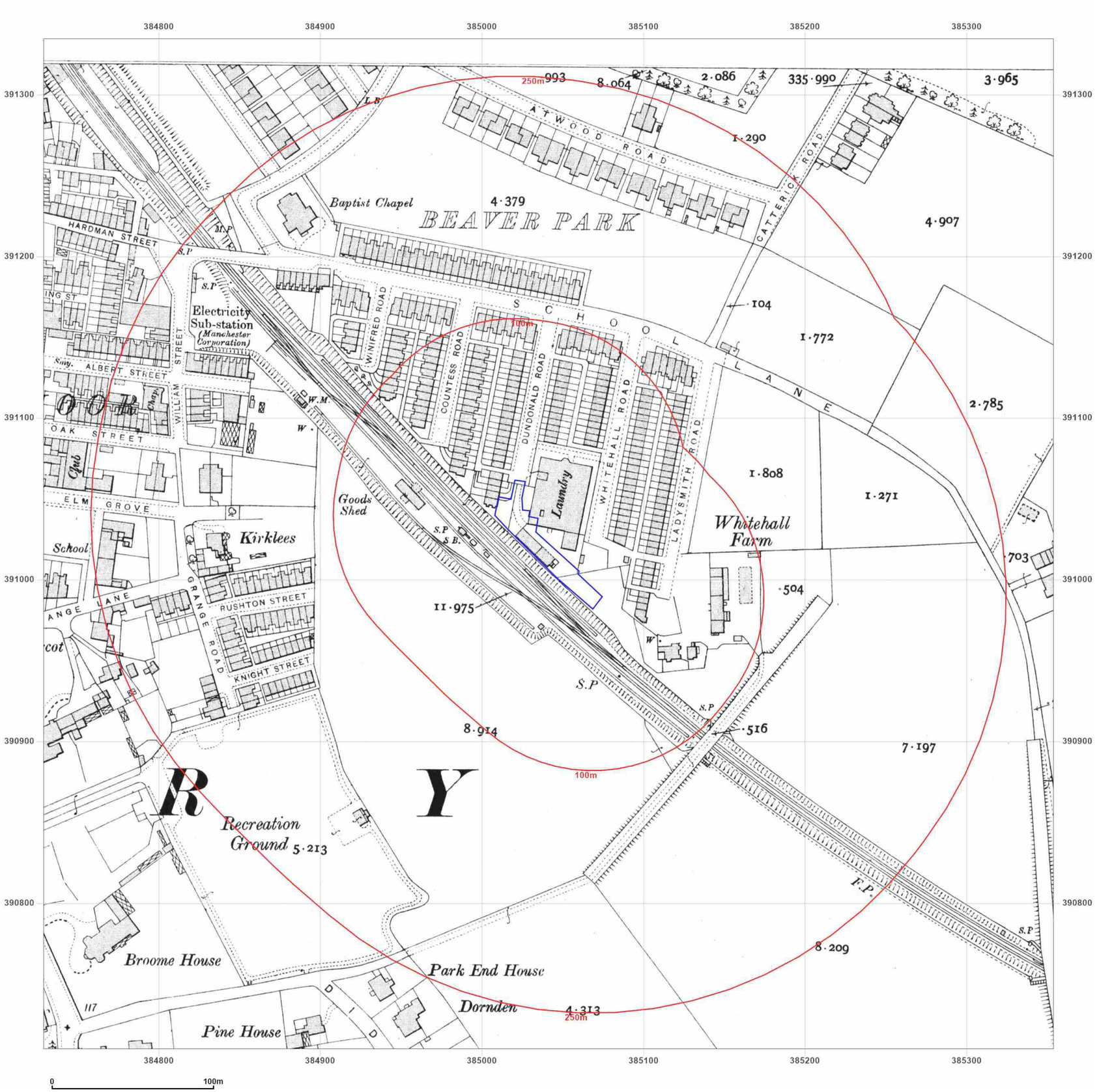
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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

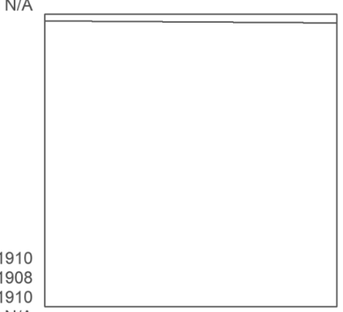
Map date: **1910**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1910
Revised 1908
Edition 1910
Copyright N/A
Levelled N/A



Surveyed 1910
Revised 1908
Edition 1910
Copyright N/A
Levelled N/A

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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series
Map date: **1922**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1922
Revised 1916
Edition 1922
Copyright N/A
Levelled 1915

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: County Series

Map date: **1934**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1873
Revised 1934
Edition N/A
Copyright N/A
Levelled 1927

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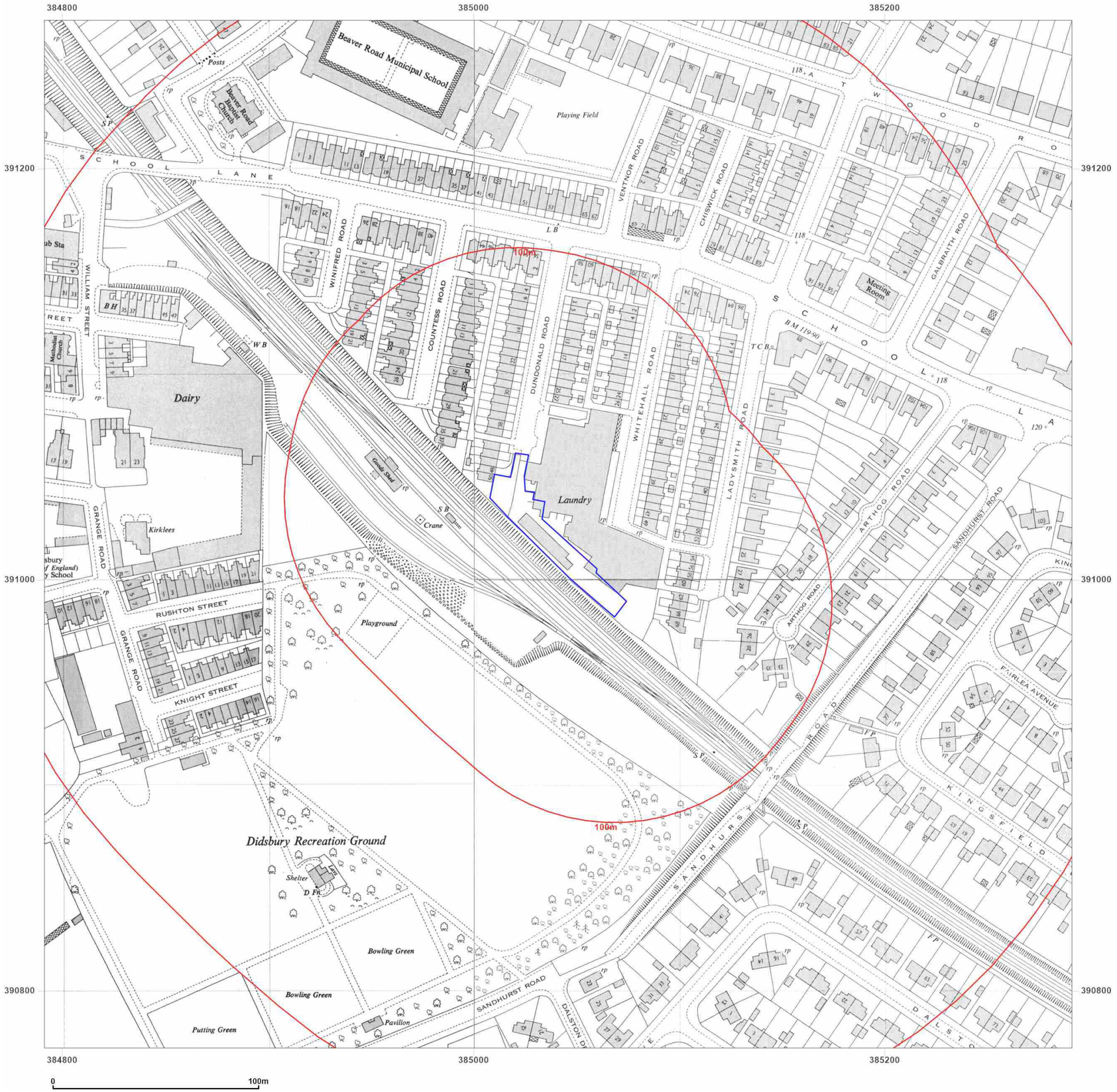
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1955-1957**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1955 Revised 1955 Edition N/A Copyright 1955 Levelled 1949	Surveyed 1957 Revised 1957 Edition N/A Copyright 1957 Levelled 1949
Surveyed 1955 Revised 1955 Edition N/A Copyright 1955 Levelled 1949	Surveyed 1957 Revised 1957 Edition N/A Copyright 1957 Levelled 1949

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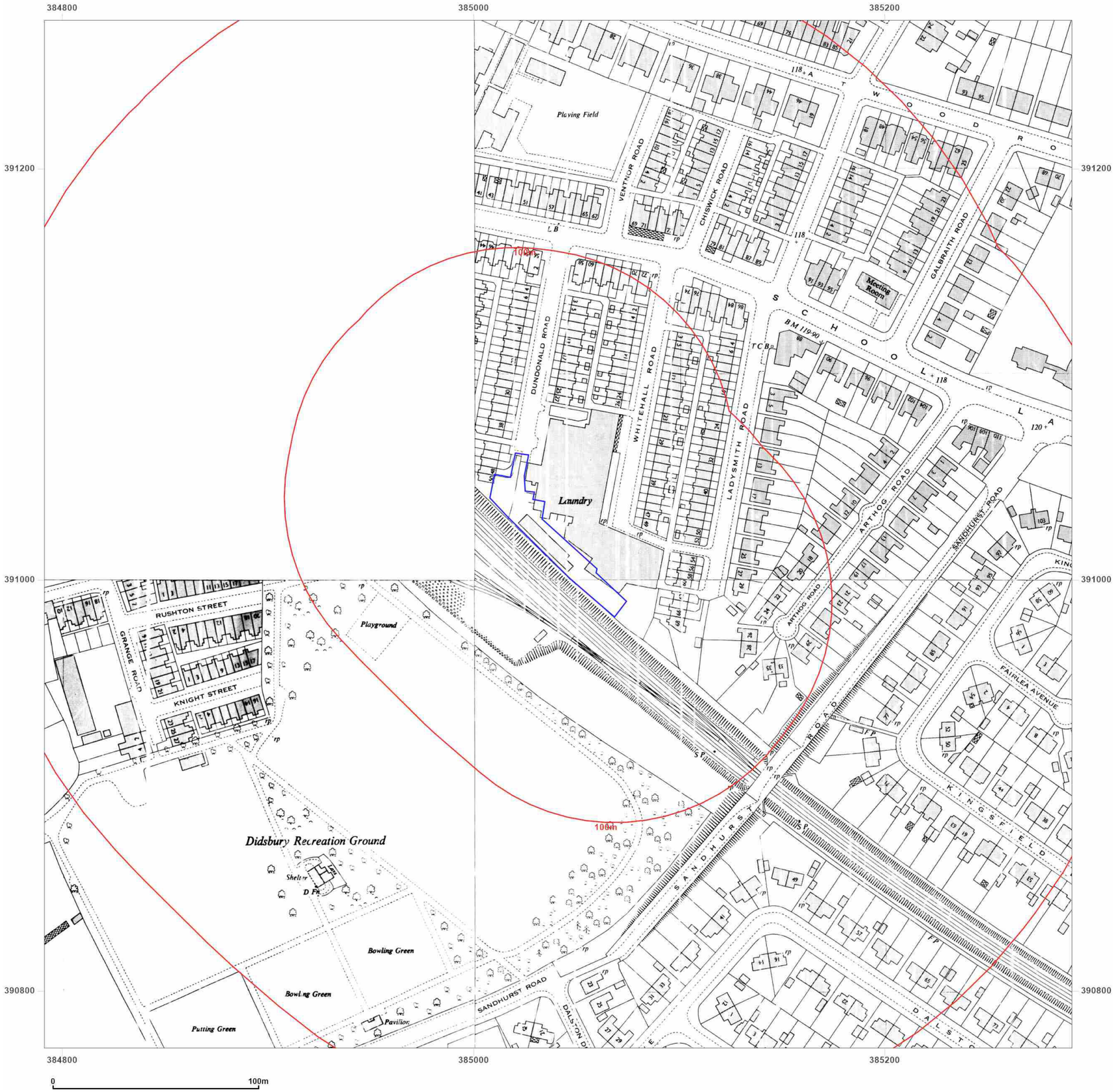
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1956-1958**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1956-1959**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1955 Revised 1955 Edition N/A Copyright 1956 Levelled 1949	Surveyed 1957 Revised 1957 Edition N/A Copyright 1959 Levelled 1949
Surveyed 1955 Revised 1955 Edition N/A Copyright 1956 Levelled 1949	Surveyed 1957 Revised 1957 Edition N/A Copyright 1959 Levelled 1949

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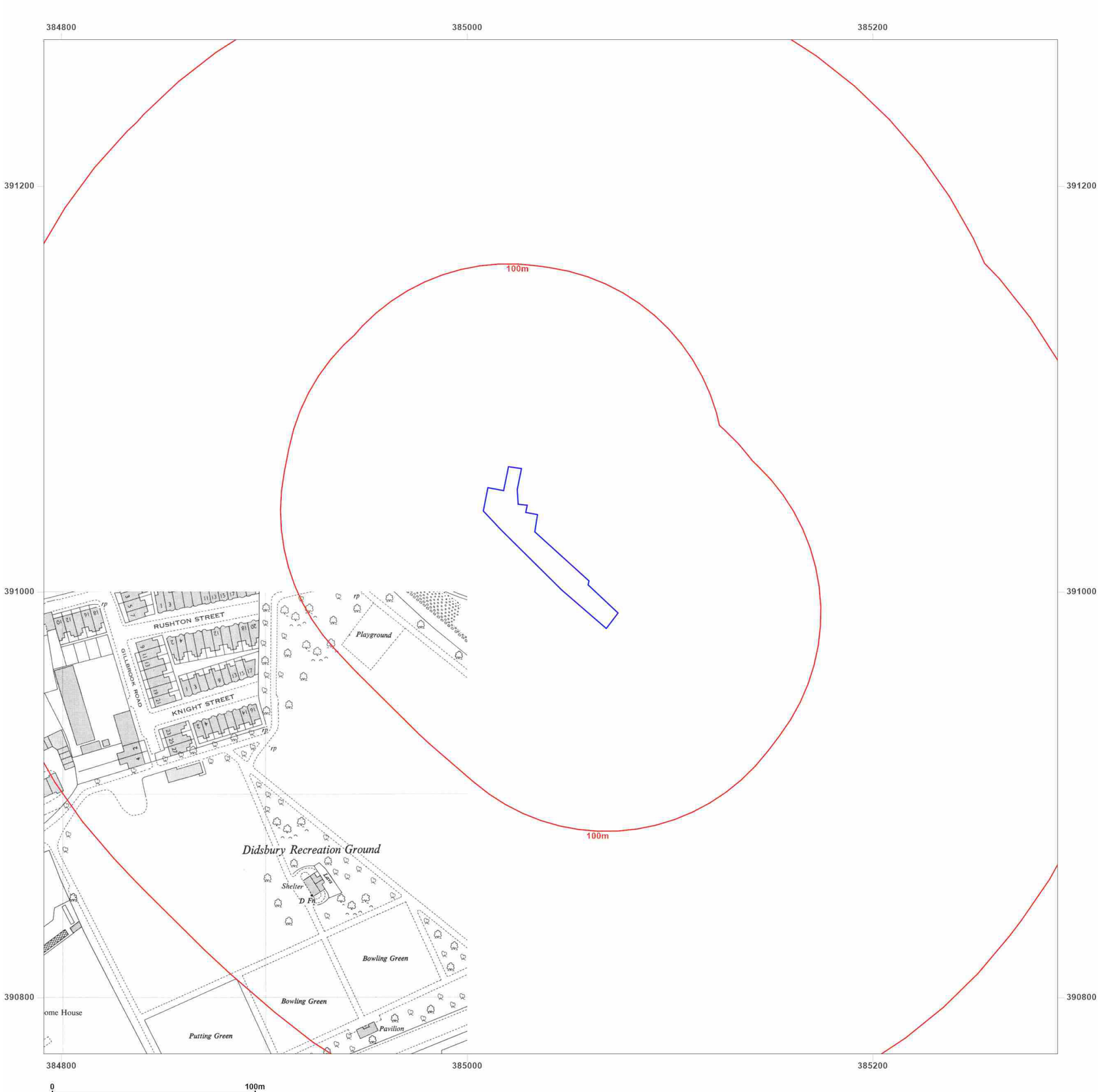
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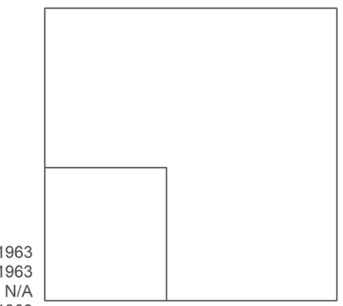
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **1963**
Scale: 1:1,250
Printed at: 1:2,000

N
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Surveyed 1963
Revised 1963
Edition N/A
Copyright 1963
Levelled 1958

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1974-1975**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
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Surveyed 1953
Revised 1974
Edition N/A
Copyright 1974
Levelled 1958

Surveyed 1957
Revised 1974
Edition N/A
Copyright 1974
Levelled 1958

Surveyed 1957
Revised 1974
Edition N/A
Copyright 1975
Levelled 1958

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **1980-1985**
Scale: 1:1,250
Printed at: 1:2,000

N
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Surveyed 1958
Revised 1985
Edition N/A
Copyright 1985
Levelled 1958

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1980
Levelled 1958

Surveyed 1958
Revised 1982
Edition N/A
Copyright 1982
Levelled 1958

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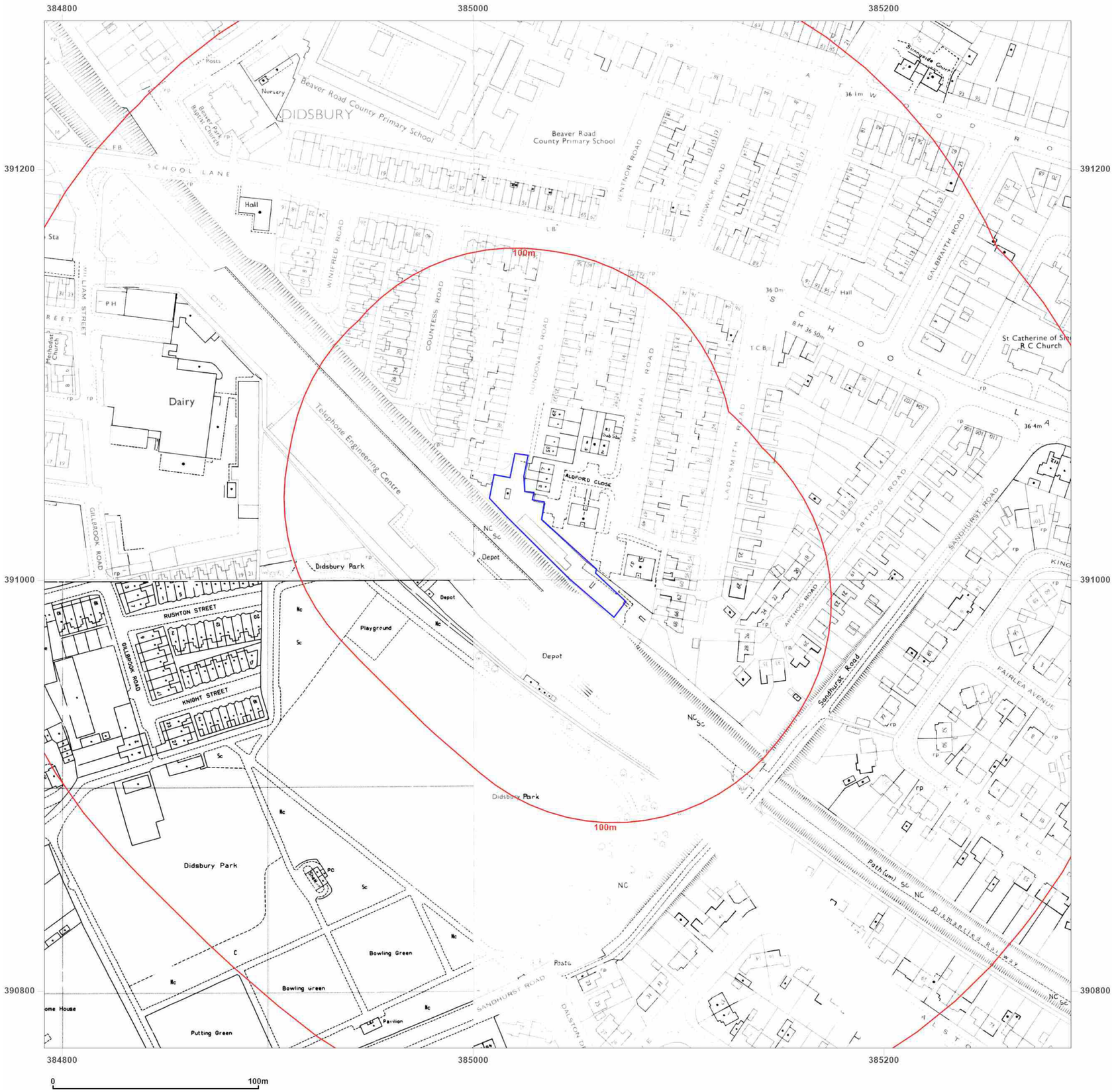
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **1988-1992**
Scale: 1:1,250
Printed at: 1:2,000

N
W E
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Surveyed 1958 Revised 1989 Edition N/A Copyright 1989 Levelled 1958	Surveyed 1958 Revised 1988 Edition N/A Copyright 1988 Levelled 1958
Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A	Surveyed 1958 Revised 1988 Edition N/A Copyright 1988 Levelled 1958

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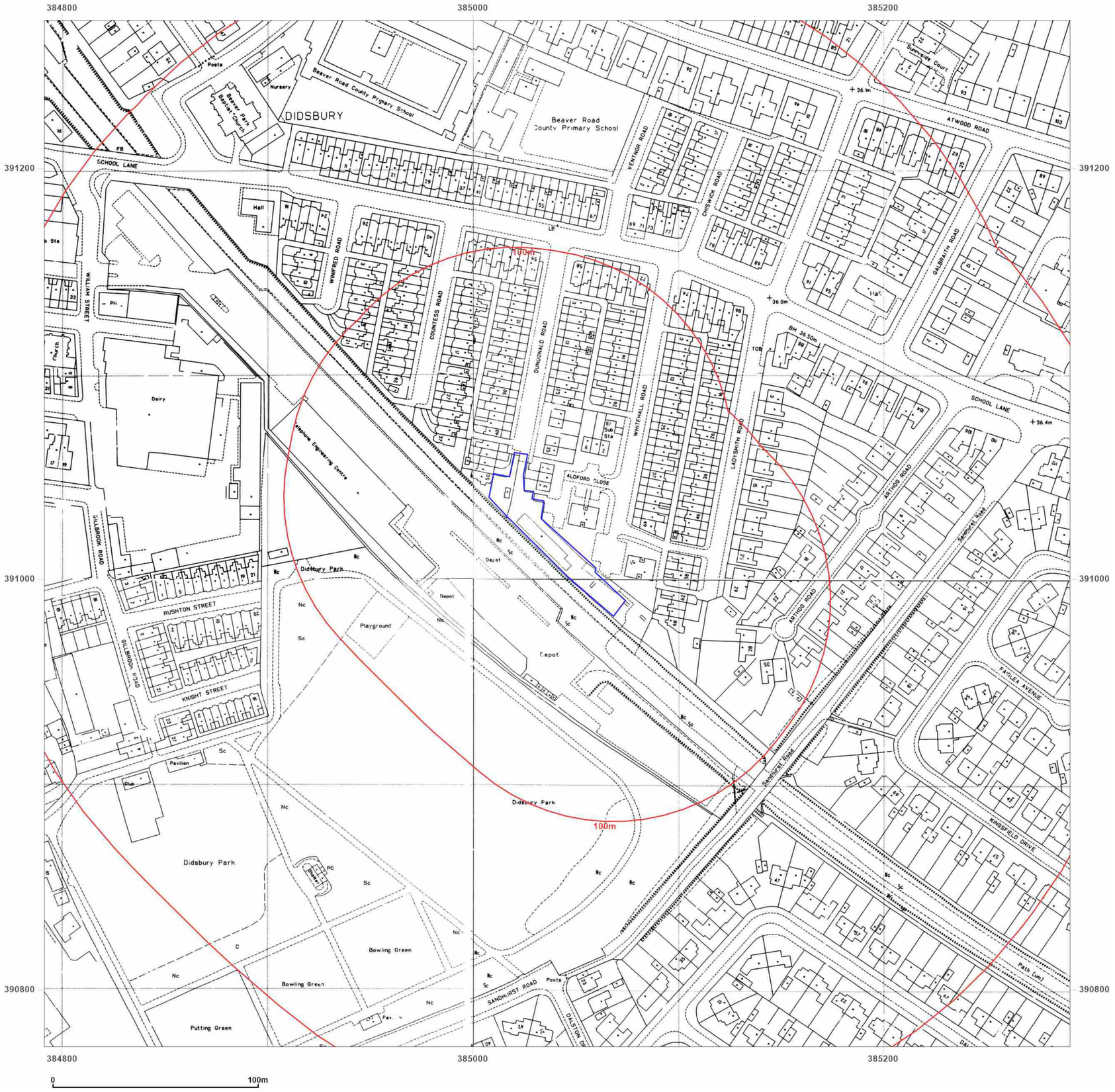
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1992-1994**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
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Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A	Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A
Surveyed 1994 Revised 1994 Edition N/A Copyright 1994 Levelled N/A	Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A

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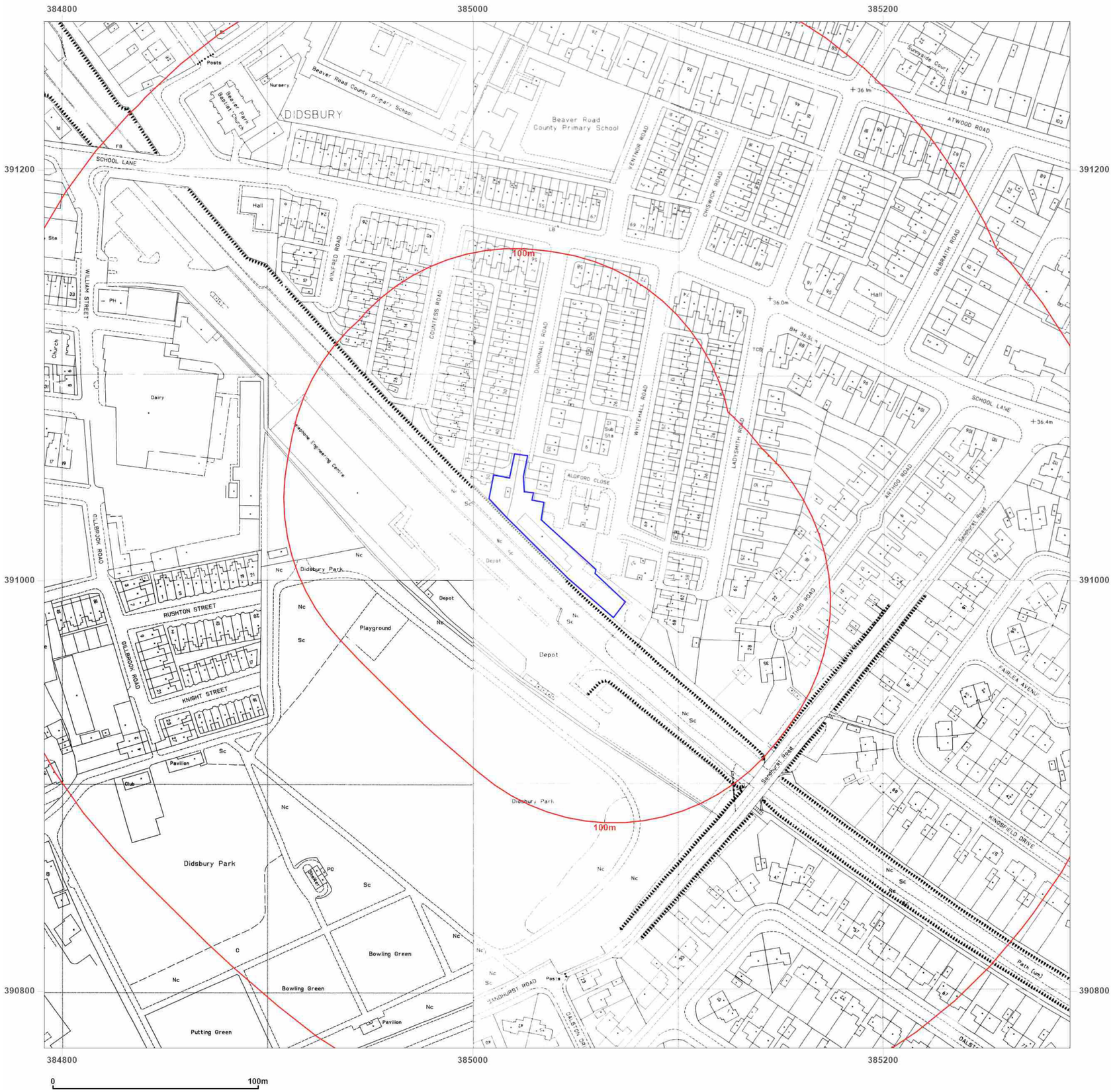
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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid
Map date: **1992-1995**
Scale: 1:1,250
Printed at: 1:2,000

N
W E
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Surveyed 1995 Revised 1995 Edition N/A Copyright 1995 Levelled N/A	Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A
Surveyed 1994 Revised 1994 Edition N/A Copyright 1994 Levelled N/A	Surveyed 1994 Revised 1994 Edition N/A Copyright 1994 Levelled N/A

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: National Grid

Map date: **1994-1995**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
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Surveyed 1995
Revised 1995
Edition N/A
Copyright 1995
Levelled N/A

Surveyed 1994
Revised 1994
Edition N/A
Copyright 1994
Levelled N/A

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Site Details:

Client Ref: EMS_787267_977195
Report Ref: EMS-787267_1015755
Grid Ref: 385041, 391022

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

N
W E
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2003

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Production date: 13 June 2022

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APPENDIX 4 - BGS Records

Norwest Holst Soil Engineering Ltd.

Borehole No. **4**

BOREHOLE LOG

Contract No. F6464
Location School Lane Bridge, Didsbury
Client Greater Manchester Council
Method of Boring Percussion
Diameter of Borehole 150mm

SJ89SW 103
8487 9119.

Sheet 1 of 1
Chainage
Ground Level m.A.O.D.
Date 15/5/85

Description of Strata	Legend	Depth Below G.L.(m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/ R.Q.D.%	Daily Progress
MADE GROUND - Silty clay		0.25					15/5
MADE GROUND - Sand and gravel (Hard core)		0.70					
Brown, silty, very sandy CLAY with much fine to medium gravel		1.00			1.10 (50)		
Firm to stiff, brown, silty, very sandy, CLAY, with some fine to coarse gravel and sand lenses ... Stiff from 3.00m					2.00 (48)		
					2.90 (60)		
					3.90 (70)		
		5.10			4.90 (100for350mm)		
Brown, silty, fine to coarse SAND with much fine to coarse gravel		5.30		150mm to 6.00m	5.50 S	89for 100mm	
Red brown, silty, fine to medium grained, highly to moderately weathered SANDSTONE, very weak		6.50					15/5
(End of Borehole)							

Type of Sample

- Is S.P.T.
- Undisturbed
- Ic. C.P.T.
- Vane
- O Jar
- Water
- Bulk
- Piezometer

Remarks (Observations of Ground Water etc.) (-) U100 blows

Inspection pit dug
Inflow at 5.10m (Casing at 5.00m)
SL after 20 minutes 3.00m (Casing at 5.00m)

Water levels are subject to seasonal or tidal variations and should not be taken as constant

British Geological Survey

APPENDIX 5 - Groundsure Report

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

Order Details

Date: 13/06/2022

Your ref: EMS_787267_977195

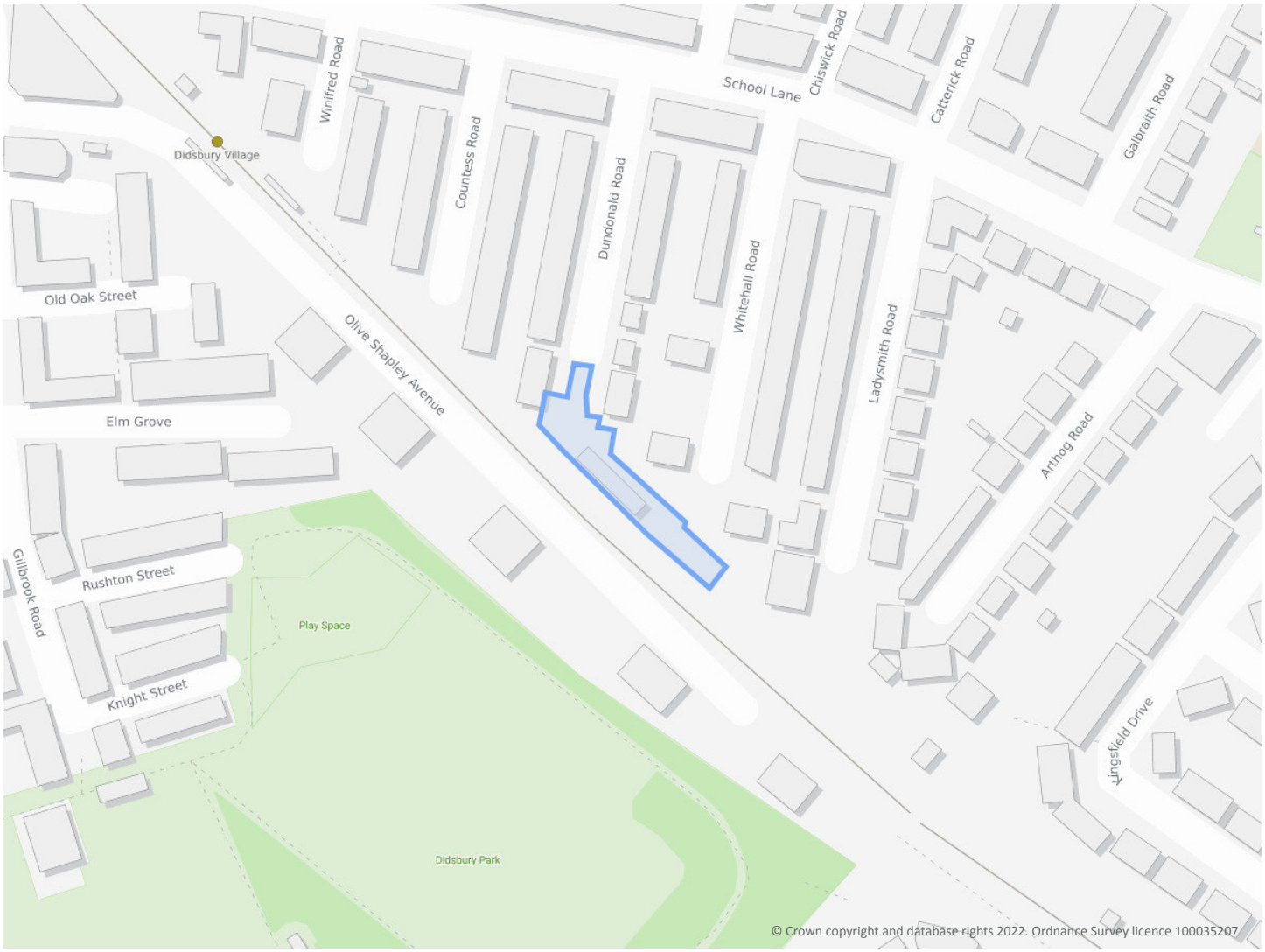
Our Ref: EMS-787267_1015756

Site Details

Location: 385036 391021

Area: 0.12 ha

Authority: Manchester City Council



Summary of findings p. 2

OS MasterMap site plan p.12

Aerial image p. 8

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Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	Historical industrial land uses	3	22	22	21	-
16	1.2	Historical tanks	0	0	4	8	-
17	1.3	Historical energy features	0	1	5	9	-
18	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	0	10	-
19	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
20	2.1	Historical industrial land uses	3	33	38	34	-
24	2.2	Historical tanks	0	0	4	8	-
25	2.3	Historical energy features	0	2	9	18	-
26	2.4	Historical petrol stations	0	0	0	0	-
27	2.5	Historical garages	0	0	0	14	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
28	3.1	Active or recent landfill	0	0	0	0	-
28	3.2	Historical landfill (BGS records)	0	0	0	0	-
29	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
29	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
29	3.5	Historical waste sites	0	0	0	0	-
29	3.6	Licensed waste sites	0	0	0	0	-
29	3.7	Waste exemptions	0	0	0	5	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
31	4.1	Recent industrial land uses	0	1	3	-	-
32	4.2	Current or recent petrol stations	0	0	0	1	-
32	4.3	Electricity cables	0	0	0	0	-
32	4.4	Gas pipelines	0	0	0	0	-
33	4.5	Sites determined as Contaminated Land	0	0	0	0	-

33	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
33	4.7	Regulated explosive sites	0	0	0	0	-
33	4.8	Hazardous substance storage/usage	0	0	0	0	-
33	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
34	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
34	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	0	0	2	-
34	4.12	Radioactive Substance Authorisations	0	0	0	0	-
34	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
35	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
35	4.15	Pollutant release to public sewer	0	0	0	0	-
35	**4.16**	**List 1 Dangerous Substances**	0	0	0	2	-
35	4.17	List 2 Dangerous Substances	0	0	0	0	-
36	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
36	4.19	Pollution inventory substances	0	0	0	0	-
36	4.20	Pollution inventory waste transfers	0	0	0	0	-
36	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
37	**5.1**	**Superficial aquifer**	Identified (within 500m)				
39	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
41	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
43	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
43	5.5	Groundwater vulnerability- local information	None (within 0m)				
44	**5.6**	**Groundwater abstractions**	0	0	0	0	5
46	5.7	Surface water abstractions	0	0	0	0	0
46	5.8	Potable abstractions	0	0	0	0	0
46	5.9	Source Protection Zones	0	0	0	0	-
47	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
48	6.1	Water Network (OS MasterMap)	0	0	0	-	-

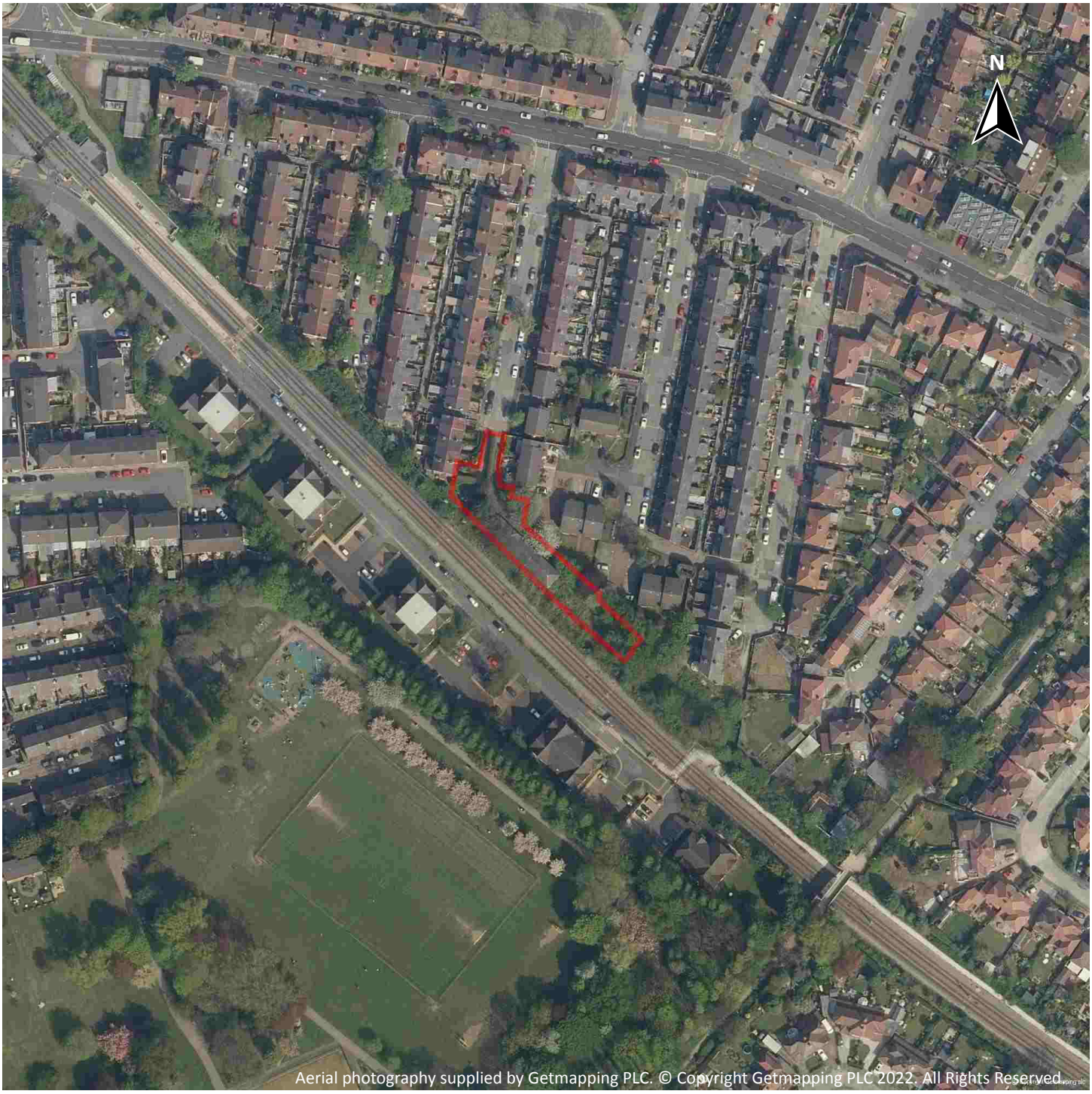
48	6.2	Surface water features	0	0	0	-	-
49	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
49	**6.4**	**WFD Surface water bodies**	0	0	0	-	-
50	**6.5**	**WFD Groundwater bodies**	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
51	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
51	7.2	Historical Flood Events	0	0	0	-	-
51	7.3	Flood Defences	0	0	0	-	-
52	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
52	7.5	Flood Storage Areas	0	0	0	-	-
53	7.6	Flood Zone 2	None (within 50m)				
53	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
54	**8.1**	**Surface water flooding**	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
56	**9.1**	**Groundwater flooding**	High (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
57	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
58	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
58	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
58	10.4	Special Protection Areas (SPA)	0	0	0	0	0
58	10.5	National Nature Reserves (NNR)	0	0	0	0	0
59	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	0	5
59	10.7	Designated Ancient Woodland	0	0	0	0	0
59	10.8	Biosphere Reserves	0	0	0	0	0
60	10.9	Forest Parks	0	0	0	0	0
60	10.10	Marine Conservation Zones	0	0	0	0	0
60	**10.11**	**Green Belt**	0	0	0	0	3
60	10.12	Proposed Ramsar sites	0	0	0	0	0

61	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
61	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
61	10.15	Nitrate Sensitive Areas	0	0	0	0	0
61	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
62	10.17	SSSI Impact Risk Zones	0	-	-	-	-
62	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
63	11.1	World Heritage Sites	0	0	0	-	-
64	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
64	11.3	National Parks	0	0	0	-	-
64	**11.4**	**Listed Buildings**	0	0	1	-	-
65	**11.5**	**Conservation Areas**	0	1	0	-	-
65	11.6	Scheduled Ancient Monuments	0	0	0	-	-
65	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
66	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
67	12.2	Open Access Land	0	0	0	-	-
67	12.3	Tree Felling Licences	0	0	0	-	-
67	12.4	Environmental Stewardship Schemes	0	0	0	-	-
67	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
68	**13.1**	**Priority Habitat Inventory**	0	1	6	-	-
69	13.2	Habitat Networks	0	0	0	-	-
69	13.3	Open Mosaic Habitat	0	0	0	-	-
69	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
70	**14.1**	**10k Availability**	Identified (within 500m)				
71	**14.2**	**Artificial and made ground (10k)**	1	1	0	5	-
73	**14.3**	**Superficial geology (10k)**	1	4	0	0	-

74	14.4	Landslip (10k)	0	0	0	0	-
75	14.5	Bedrock geology (10k)	1	1	1	1	-
76	14.6	Bedrock faults and other linear features (10k)	0	0	1	1	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
77	15.1	50k Availability	Identified (within 500m)				
78	15.2	Artificial and made ground (50k)	0	0	0	0	-
78	15.3	Artificial ground permeability (50k)	0	0	-	-	-
79	15.4	Superficial geology (50k)	2	0	0	0	-
80	15.5	Superficial permeability (50k)	Identified (within 50m)				
80	15.6	Landslip (50k)	0	0	0	0	-
80	15.7	Landslip permeability (50k)	None (within 50m)				
81	15.8	Bedrock geology (50k)	1	0	1	0	-
82	15.9	Bedrock permeability (50k)	Identified (within 50m)				
82	15.10	Bedrock faults and other linear features (50k)	0	0	1	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
83	16.1	BGS Boreholes	0	0	7	-	-
Page	Section	Natural ground subsidence					
85	17.1	Shrink swell clays	Very low (within 50m)				
87	17.2	Running sands	Very low (within 50m)				
89	17.3	Compressible deposits	Negligible (within 50m)				
90	17.4	Collapsible deposits	Very low (within 50m)				
91	17.5	Landslides	Very low (within 50m)				
93	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
95	18.1	Natural cavities	0	0	0	0	-
96	18.2	BritPits	0	0	0	0	-
96	18.3	Surface ground workings	1	8	32	-	-
98	18.4	Underground workings	0	0	0	0	0
98	18.5	Historical Mineral Planning Areas	0	0	0	0	-

98	18.6	Non-coal mining	0	0	0	0	0
98	18.7	Mining cavities	0	0	0	0	0
98	**18.8**	**JPB mining areas**	Identified (within 0m)				
99	18.9	Coal mining	None (within 0m)				
99	18.10	Brine areas	None (within 0m)				
99	18.11	Gypsum areas	None (within 0m)				
99	18.12	Tin mining	None (within 0m)				
100	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
101	**19.1**	**Radon**	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
102	**20.1**	**BGS Estimated Background Soil Chemistry**	3	11	-	-	-
103	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
103	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
104	21.1	Underground railways (London)	0	0	0	-	-
104	21.2	Underground railways (Non-London)	0	0	0	-	-
105	21.3	Railway tunnels	0	0	0	-	-
105	**21.4**	**Historical railway and tunnel features**	2	23	3	-	-
106	21.5	Royal Mail tunnels	0	0	0	-	-
106	21.6	Historical railways	0	0	0	-	-
107	**21.7**	**Railways**	0	3	3	-	-
107	21.8	Crossrail 1	0	0	0	0	-
107	21.9	Crossrail 2	0	0	0	0	-
107	21.10	HS2	0	0	0	0	-

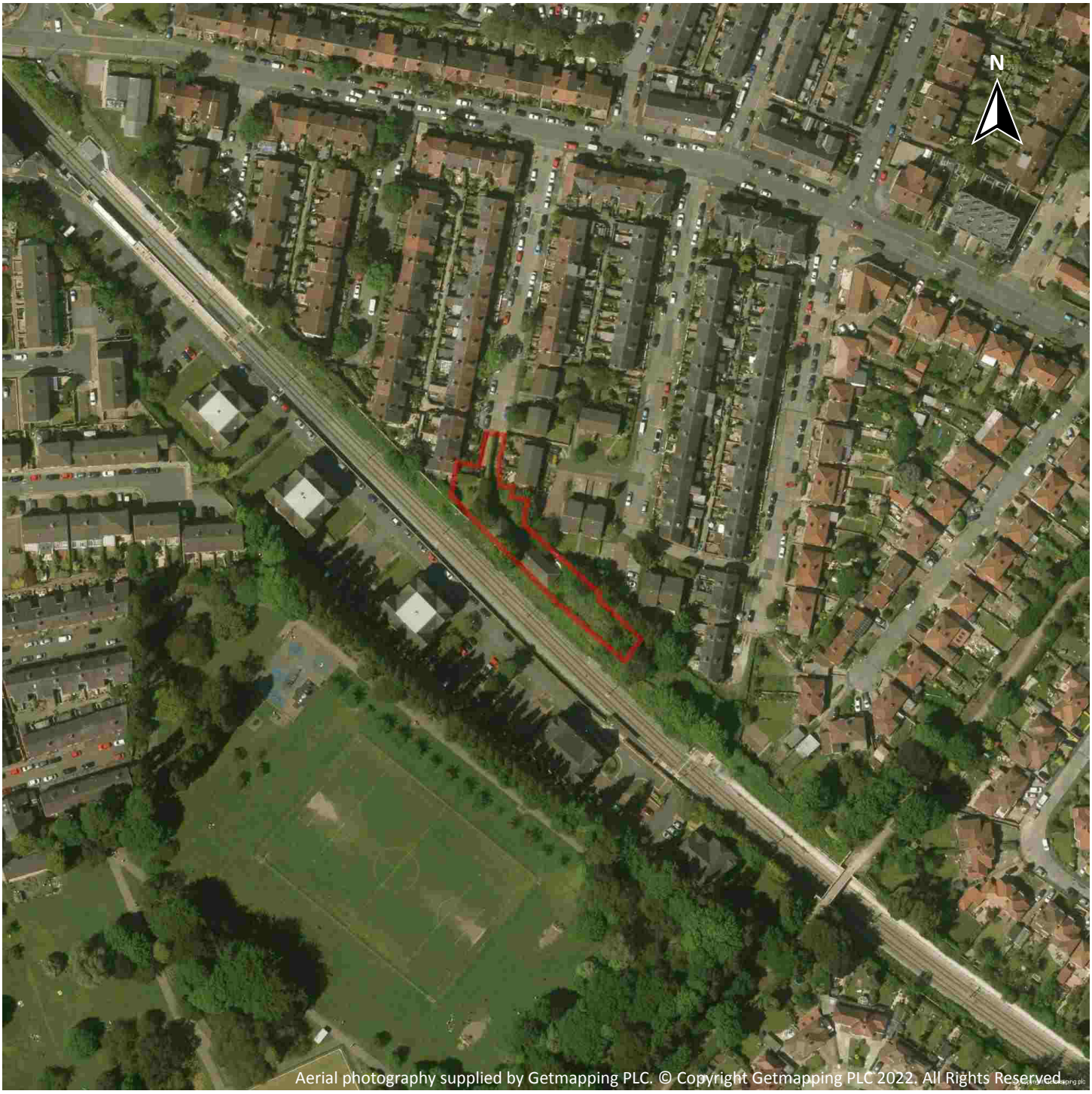
Recent aerial photograph



Capture Date: 22/04/2019

Site Area: 0.12ha

Recent site history - 2015 aerial photograph



Capture Date: 11/06/2015

Site Area: 0.12ha

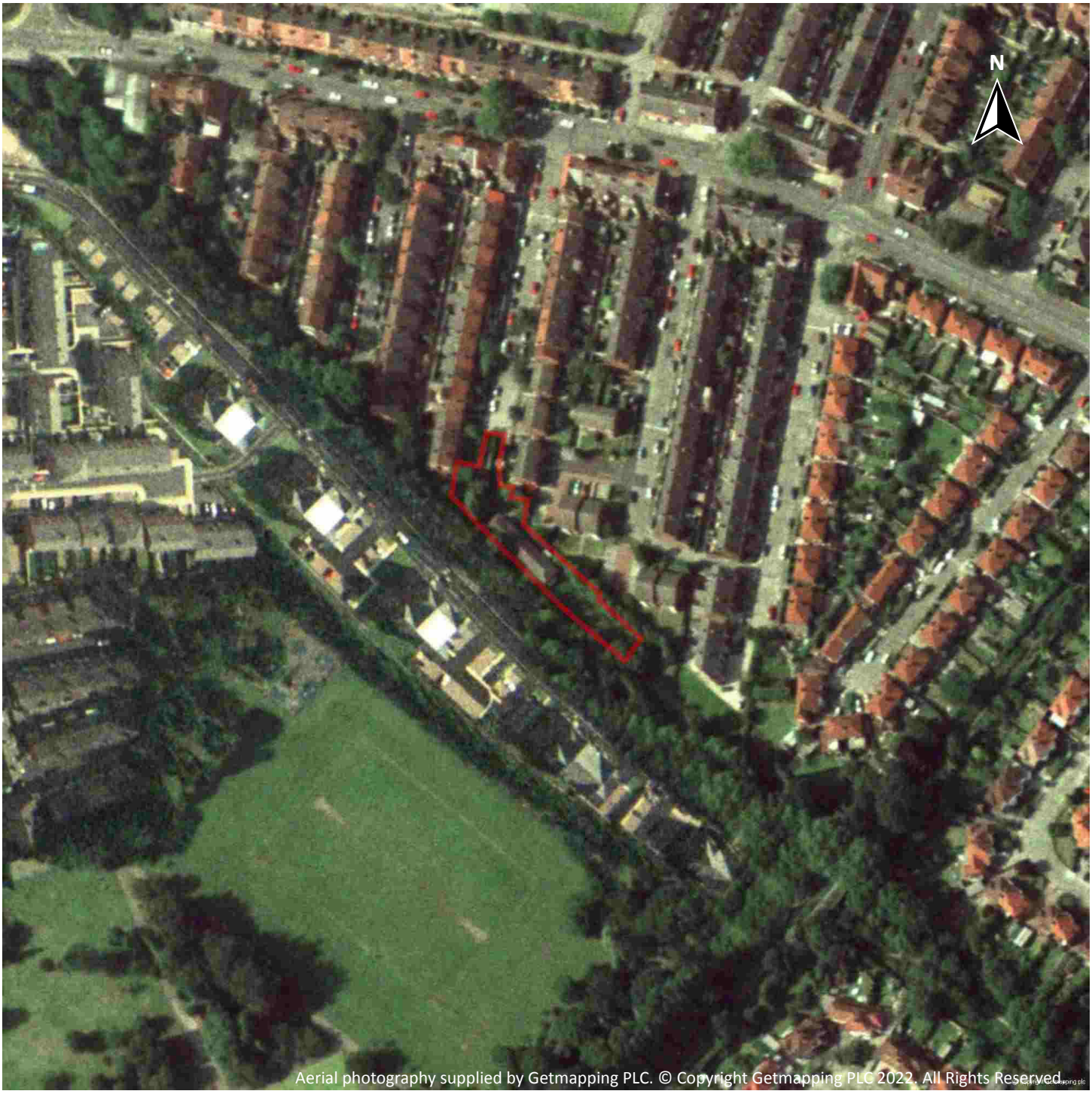
Recent site history - 2009 aerial photograph



Capture Date: 02/06/2009

Site Area: 0.12ha

Recent site history - 2000 aerial photograph



Capture Date: 27/06/2000

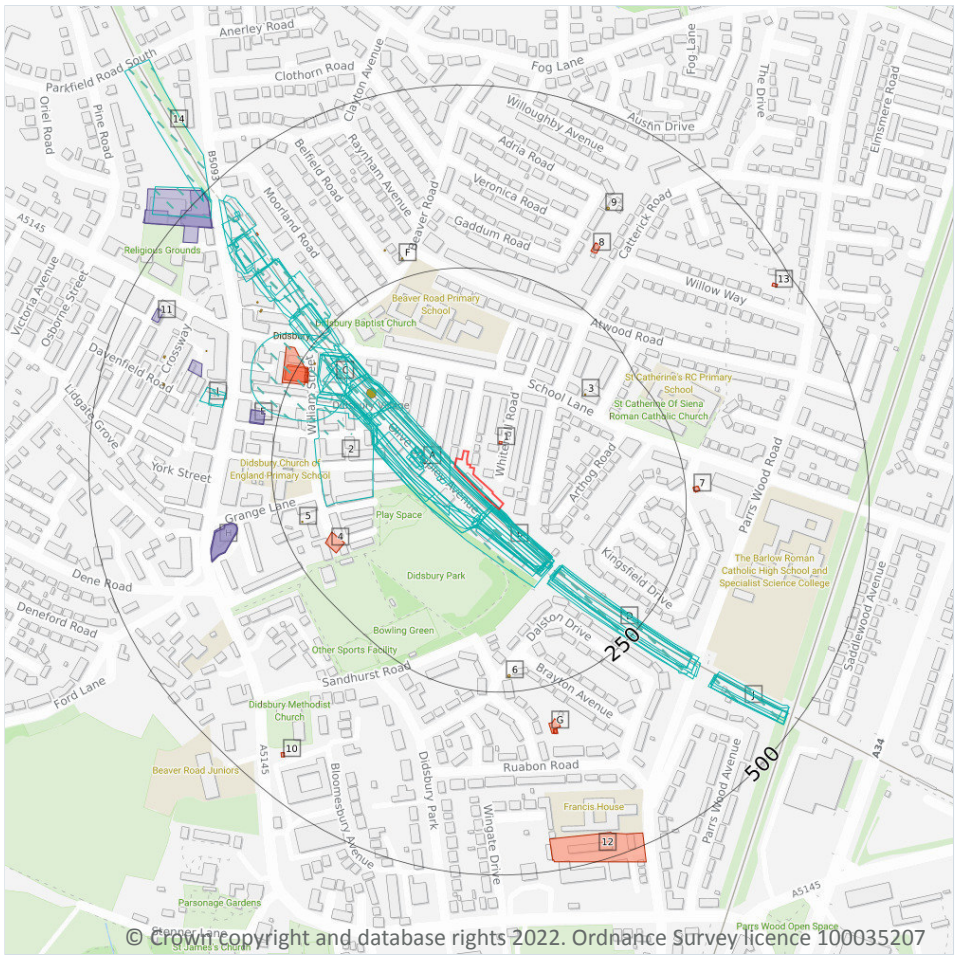
Site Area: 0.12ha

OS MasterMap site plan



Site Area: 0.12ha

1 Past land use



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Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	68

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Railway Sidings**	**1938**	**886861**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Railway Sidings**	**1923**	**904670**
A	**On site**	**Cuttings**	**1923 - 1934**	**955197**
B	1m SW	Cuttings	1965 - 1983	898907
B	2m SW	Cuttings	1955	850468
A	2m SW	Railway Sidings	1911	923859
A	3m SW	Railway Sidings	1911	903364
A	3m SW	Railway Sidings	1911	913195
A	5m SW	Railway Sidings	1934	851258
A	6m SW	Railway Sidings	1923	865868
B	6m SW	Cuttings	1938	930957
A	7m W	Railway Sidings	1955 - 1966	922909
A	7m SW	Cuttings	1893	877641
B	7m SW	Cuttings	1923	925757
A	9m SW	Railway Sidings	1938	902237
A	19m SW	Railway Sidings	1893	985227
A	21m SW	Railway Sidings	1938	874167
A	23m SW	Railway Building	1923	820242
A	25m SW	Railway Building	1923	855886
A	40m W	Railway Building	1955	904101
A	42m W	Railway Building	1978	933177
A	42m W	Railway Building	1923	948007
A	42m W	Railway Building	1938	938999
A	43m W	Railway Building	1911 - 1934	872465
A	48m W	Railway Building	1893	960758
C	109m NW	Cuttings	1911	916534
2	112m W	Dairy	1966	832223
D	113m SE	Cuttings	1938	970637
D	115m SE	Cuttings	1911	867187

ID	Location	Land use	Dates present	Group ID
D	116m SE	Cuttings	1911 - 1938	901548
C	116m NW	Cuttings	1911	870501
D	116m SE	Cuttings	1893	964764
D	116m SE	Cuttings	1983 - 1989	874536
D	116m SE	Cuttings	1955	895584
D	116m SE	Cuttings	1965 - 1974	913143
C	118m NW	Cuttings	1938	984167
C	127m NW	Railway Building	1923	820227
C	128m NW	Railway Building	1923	922291
C	134m NW	Railway Building	1934	920070
C	167m NW	Cuttings	1955	890302
C	169m NW	Electricity Substation	1923	837779
C	173m NW	Cuttings	1938	964039
C	174m NW	Electric Substation	1923	834488
C	221m NW	Cuttings	1923 - 1988	861919
C	243m NW	Cuttings	1893	897157
C	243m NW	Cuttings	1911	949924
C	246m NW	Cuttings	1911	899542
C	258m NW	Unspecified Heap	1938 - 1955	990002
C	291m NW	Railway Station	1938	942350
C	316m NW	Cuttings	1923 - 1938	958616
I	327m W	Police Station	1988	957780
I	327m W	Police Station	1966	974901
C	331m NW	Cuttings	1955	937255
C	366m NW	Railway Station	1911 - 1955	953879
C	367m NW	Railway Station	1893	971197
J	372m SE	Cuttings	1893	891369
J	372m SE	Cuttings	1938	882106

ID	Location	Land use	Dates present	Group ID
J	374m SE	Cuttings	1934	961038
J	374m SE	Cuttings	1955	915659
J	375m SE	Cuttings	1938	938160
C	380m NW	Railway Station	1966	971711
C	383m NW	Railway Building	1988	820226
C	415m NW	Cuttings	1955	880262
C	417m NW	Cuttings	1934	930613
C	441m NW	Railway Building	1923	820224
C	444m NW	Railway Building	1911	820225
C	469m NW	Nursery	1966	831882
14	486m NW	Cuttings	1938	888207

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**12**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
3	177m NE	Unspecified Tank	1894	116937
5	221m W	Unspecified Tank	1881	116934
6	227m S	Unspecified Tank	1894	116936
C	232m NW	Unspecified Tank	1881	116928
F	275m N	Unspecified Tank	1881	116927
F	293m N	Unspecified Tank	1881	116925
C	333m NW	Unspecified Tank	1881	116929

ID	Location	Land use	Dates present	Group ID
C	345m NW	Unspecified Tank	1881	116924
I	371m NW	Unspecified Tank	1881	116930
9	382m NE	Unspecified Tank	1894	116926
I	412m W	Unspecified Tank	1881	116931
I	421m W	Unspecified Tank	1881	116932

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**15**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
1	43m E	Electricity Substation	1985 - 1988	79260
4	183m SW	Electricity Substation	1907 - 1922	71780
C	227m NW	Electricity Substation	1955	79665
C	229m NW	Electricity Substation	1974 - 1999	77170
C	230m NW	Electricity Substation	1989	83503
C	230m NW	Electricity Substation	1907 - 1922	69869
7	260m E	Electricity Substation	1988 - 1992	72691
G	296m S	Electricity Substation	1975	83519
G	310m S	Electricity Substation	1982 - 1988	76756
G	310m S	Electricity Substation	1994	80059
8	321m NE	Electricity Substation	1974 - 1992	72686
C	407m NW	Electricity Substation	1999	62384
10	444m SW	Electricity Substation	1980 - 1994	71121

ID	Location	Land use	Dates present	Group ID
12	456m S	Electricity House	1975	63681
13	473m NE	Electricity Substation	1974 - 1992	74932

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	10

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
E	268m W	Garage	1955	22232
E	268m W	Garage	1955 - 1974	24332
H	308m W	Garage	1963	21810
H	309m W	Garage	1980	22072
H	309m W	Garage	1994	21688
I	366m W	Garage	1955 - 1974	27746
11	447m NW	Garage	1974 - 1989	26578
C	458m NW	Garage	1955	21836
C	459m NW	Garage	1955	21961

ID	Location	Land use	Dates present	Group ID
C	460m NW	Garage	1974	23463

This data is sourced from Ordnance Survey / Groundsure.

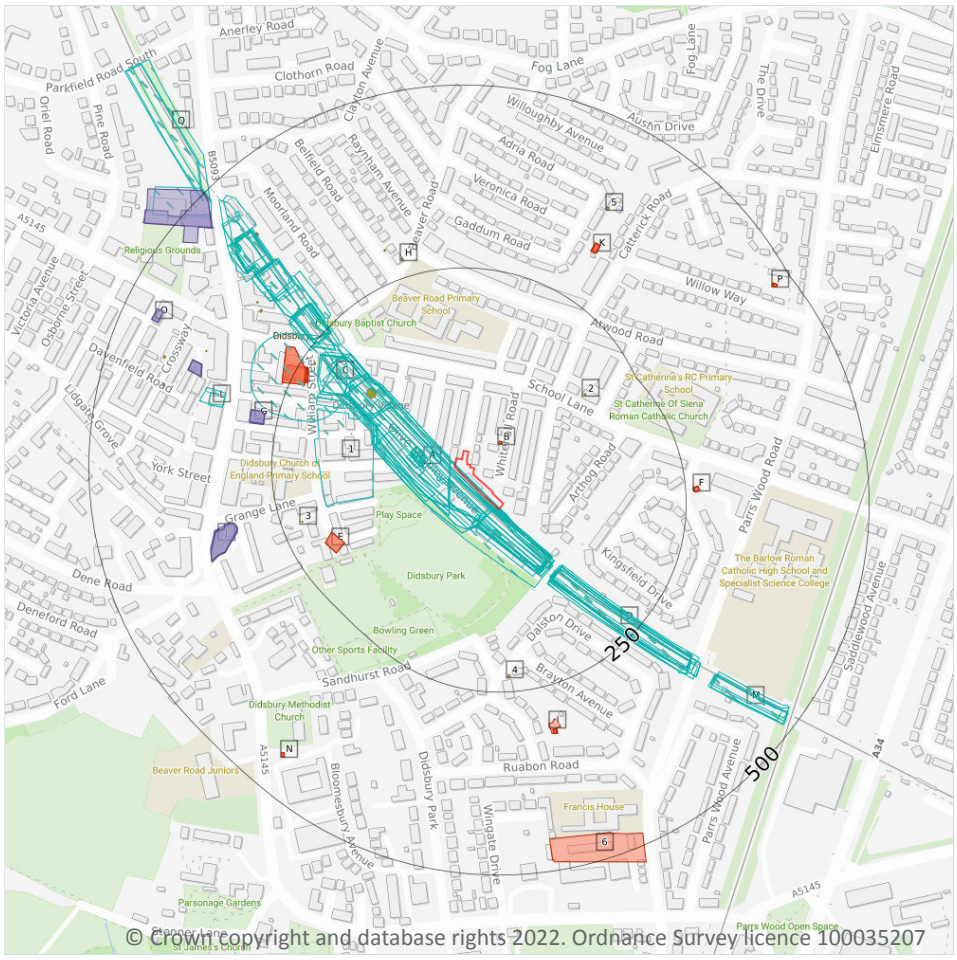
1.6 Historical military land

Records within 500m	**0**

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



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2.1 Historical industrial land uses

Records within 500m	108

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Railway Sidings**	**1938**	**886861**
A	**On site**	**Railway Sidings**	**1923**	**904670**
A	**On site**	**Cuttings**	**1923**	**955197**

ID	Location	Land Use	Date	Group ID
A	1m SW	Cuttings	1974	898907
A	1m SW	Cuttings	1983	898907
A	1m SW	Cuttings	1965	898907
A	2m SW	Cuttings	1955	850468
A	2m SW	Railway Sidings	1911	923859
A	3m SW	Railway Sidings	1911	903364
A	3m SW	Railway Sidings	1911	913195
A	5m SW	Railway Sidings	1934	851258
A	5m SW	Cuttings	1934	955197
A	6m SW	Railway Sidings	1923	865868
A	6m SW	Cuttings	1938	930957
A	7m W	Railway Sidings	1955	922909
A	7m W	Railway Sidings	1966	922909
A	7m SW	Cuttings	1893	877641
A	7m SW	Cuttings	1923	925757
A	9m SW	Railway Sidings	1938	902237
A	16m SW	Railway Sidings	1955	922909
A	16m SW	Railway Sidings	1965	922909
A	19m SW	Railway Sidings	1893	985227
A	21m SW	Railway Sidings	1938	874167
A	23m SW	Railway Building	1923	820242
A	24m SW	Railway Sidings	1938	874167
A	25m SW	Railway Building	1923	855886
A	32m SW	Railway Building	1923	855886
A	40m W	Railway Building	1955	904101
A	42m W	Railway Building	1978	933177
A	42m W	Railway Building	1923	948007
A	42m W	Railway Building	1938	938999

ID	Location	Land Use	Date	Group ID
A	43m W	Railway Building	1911	872465
A	43m W	Railway Building	1923	872465
A	43m W	Railway Building	1934	872465
A	43m W	Railway Building	1911	872465
A	48m W	Railway Building	1893	960758
C	109m NW	Cuttings	1911	916534
1	112m W	Dairy	1966	832223
D	113m SE	Cuttings	1938	970637
D	115m SE	Cuttings	1911	867187
D	116m SE	Cuttings	1923	901548
D	116m SE	Cuttings	1938	901548
D	116m SE	Cuttings	1923	901548
D	116m SE	Cuttings	1934	901548
D	116m SE	Cuttings	1911	901548
C	116m NW	Cuttings	1911	870501
D	116m SE	Cuttings	1938	901548
D	116m SE	Cuttings	1974	913143
D	116m SE	Cuttings	1983	874536
D	116m SE	Cuttings	1989	874536
D	116m SE	Cuttings	1955	895584
D	116m SE	Cuttings	1965	913143
D	116m SE	Cuttings	1893	964764
C	118m NW	Cuttings	1938	984167
C	127m NW	Railway Building	1923	820227
C	128m NW	Railway Building	1923	922291
C	134m NW	Railway Building	1934	920070
C	167m NW	Cuttings	1955	890302
C	169m NW	Electricity Substation	1923	837779

ID	Location	Land Use	Date	Group ID
C	173m NW	Cuttings	1938	964039
C	174m NW	Electric Substation	1923	834488
C	175m NW	Cuttings	1938	964039
C	221m NW	Cuttings	1938	861919
C	221m NW	Cuttings	1938	861919
C	223m NW	Cuttings	1938	861919
C	243m NW	Cuttings	1893	897157
C	243m NW	Cuttings	1923	861919
C	243m NW	Cuttings	1923	861919
C	243m NW	Cuttings	1934	861919
C	243m NW	Cuttings	1911	949924
C	243m NW	Cuttings	1978	861919
C	243m NW	Cuttings	1966	861919
C	243m NW	Cuttings	1988	861919
C	246m NW	Cuttings	1911	899542
C	258m NW	Unspecified Heap	1955	990002
C	260m NW	Unspecified Heap	1938	990002
C	291m NW	Railway Station	1938	942350
C	294m NW	Railway Station	1938	942350
C	316m NW	Cuttings	1923	958616
C	324m NW	Cuttings	1938	958616
C	326m NW	Cuttings	1934	958616
C	327m NW	Cuttings	1938	958616
L	327m W	Police Station	1966	974901
L	327m W	Police Station	1988	957780
C	331m NW	Cuttings	1955	937255
C	366m NW	Railway Station	1923	953879
C	366m NW	Railway Station	1934	953879

ID	Location	Land Use	Date	Group ID
C	366m NW	Railway Station	1911	953879
C	366m NW	Railway Station	1923	953879
C	367m NW	Railway Station	1893	971197
C	367m NW	Railway Station	1911	953879
C	368m NW	Railway Station	1938	953879
C	369m NW	Railway Station	1955	953879
M	372m SE	Cuttings	1893	891369
M	372m SE	Cuttings	1938	882106
M	374m SE	Cuttings	1934	961038
M	374m SE	Cuttings	1955	915659
M	375m SE	Cuttings	1938	938160
C	380m NW	Railway Station	1966	971711
C	383m NW	Railway Building	1988	820226
C	415m NW	Cuttings	1955	880262
C	417m NW	Cuttings	1934	930613
C	441m NW	Railway Building	1923	820224
C	444m NW	Railway Building	1911	820225
C	469m NW	Nursery	1966	831882
Q	486m NW	Cuttings	1938	888207
Q	494m NW	Cuttings	1938	888207
Q	494m NW	Cuttings	1938	888207

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**12**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
2	177m NE	Unspecified Tank	1894	116937
3	221m W	Unspecified Tank	1881	116934
4	227m S	Unspecified Tank	1894	116936
C	232m NW	Unspecified Tank	1881	116928
H	275m N	Unspecified Tank	1881	116927
H	293m N	Unspecified Tank	1881	116925
C	333m NW	Unspecified Tank	1881	116929
C	345m NW	Unspecified Tank	1881	116924
L	371m NW	Unspecified Tank	1881	116930
5	382m NE	Unspecified Tank	1894	116926
L	412m W	Unspecified Tank	1881	116931
L	421m W	Unspecified Tank	1881	116932

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**29**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
B	43m E	Electricity Substation	1985	79260
B	43m E	Electricity Substation	1988	79260
E	183m SW	Electricity Substation	1907	71780
E	183m SW	Electricity Substation	1922	71780
C	227m NW	Electricity Substation	1955	79665
C	229m NW	Electricity Substation	1974	77170
C	229m NW	Electricity Substation	1995	77170
C	229m NW	Electricity Substation	1999	77170

ID	Location	Land Use	Date	Group ID
C	230m NW	Electricity Substation	1989	83503
C	230m NW	Electricity Substation	1907	69869
C	230m NW	Electricity Substation	1922	69869
F	260m E	Electricity Substation	1988	72691
F	261m E	Electricity Substation	1992	72691
I	296m S	Electricity Substation	1975	83519
I	310m S	Electricity Substation	1994	80059
I	310m S	Electricity Substation	1988	76756
I	310m S	Electricity Substation	1982	76756
K	321m NE	Electricity Substation	1992	72686
K	321m NE	Electricity Substation	1985	72686
K	321m NE	Electricity Substation	1988	72686
K	322m NE	Electricity Substation	1974	72686
C	407m NW	Electricity Substation	1999	62384
N	444m SW	Electricity Substation	1994	71121
N	444m SW	Electricity Substation	1980	71121
6	456m S	Electricity House	1975	63681
P	473m NE	Electricity Substation	1985	74932
P	473m NE	Electricity Substation	1988	74932
P	473m NE	Electricity Substation	1974	74932
P	474m NE	Electricity Substation	1992	74932

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	14

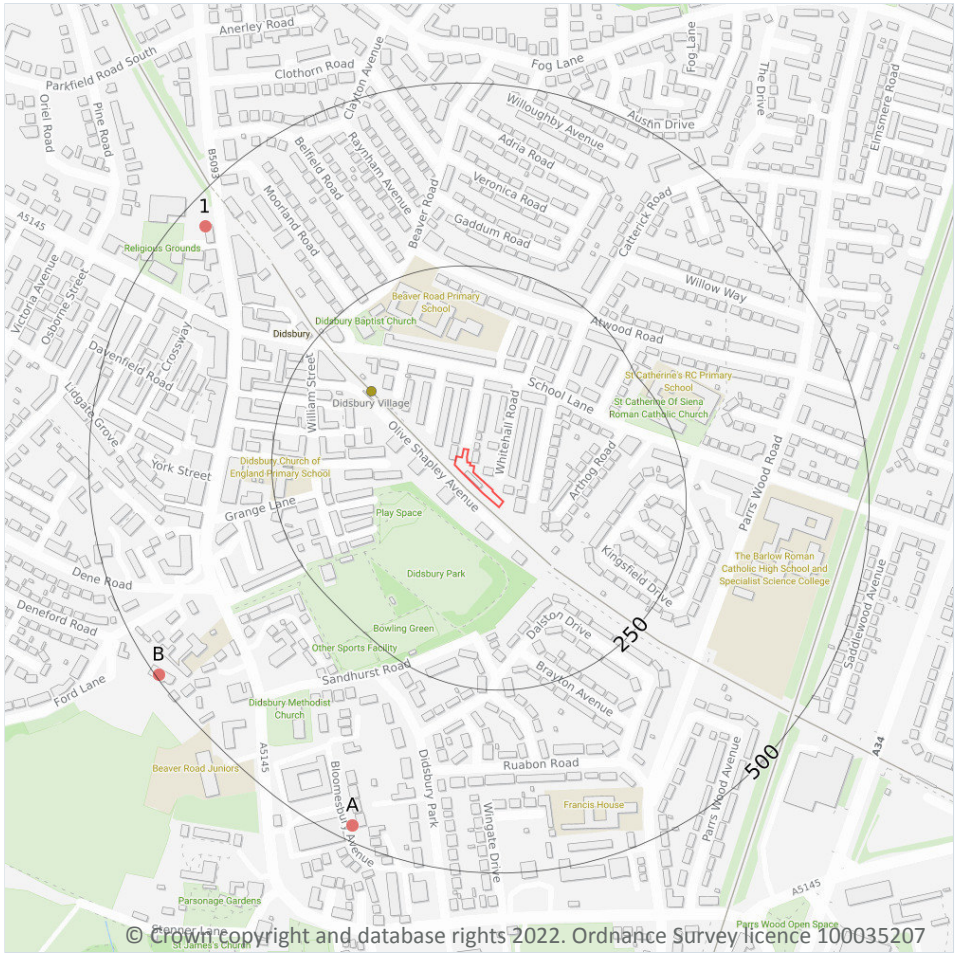
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 20**

ID	Location	Land Use	Date	Group ID
G	268m W	Garage	1955	22232
G	268m W	Garage	1955	24332
G	268m W	Garage	1974	24332
J	308m W	Garage	1963	21810
J	309m W	Garage	1980	22072
J	309m W	Garage	1994	21688
L	366m W	Garage	1955	27746
L	367m W	Garage	1955	27746
L	367m W	Garage	1974	27746
O	447m NW	Garage	1974	26578
O	448m NW	Garage	1989	26578
C	458m NW	Garage	1955	21836
C	459m NW	Garage	1955	21961
C	460m NW	Garage	1974	23463

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



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3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m	5

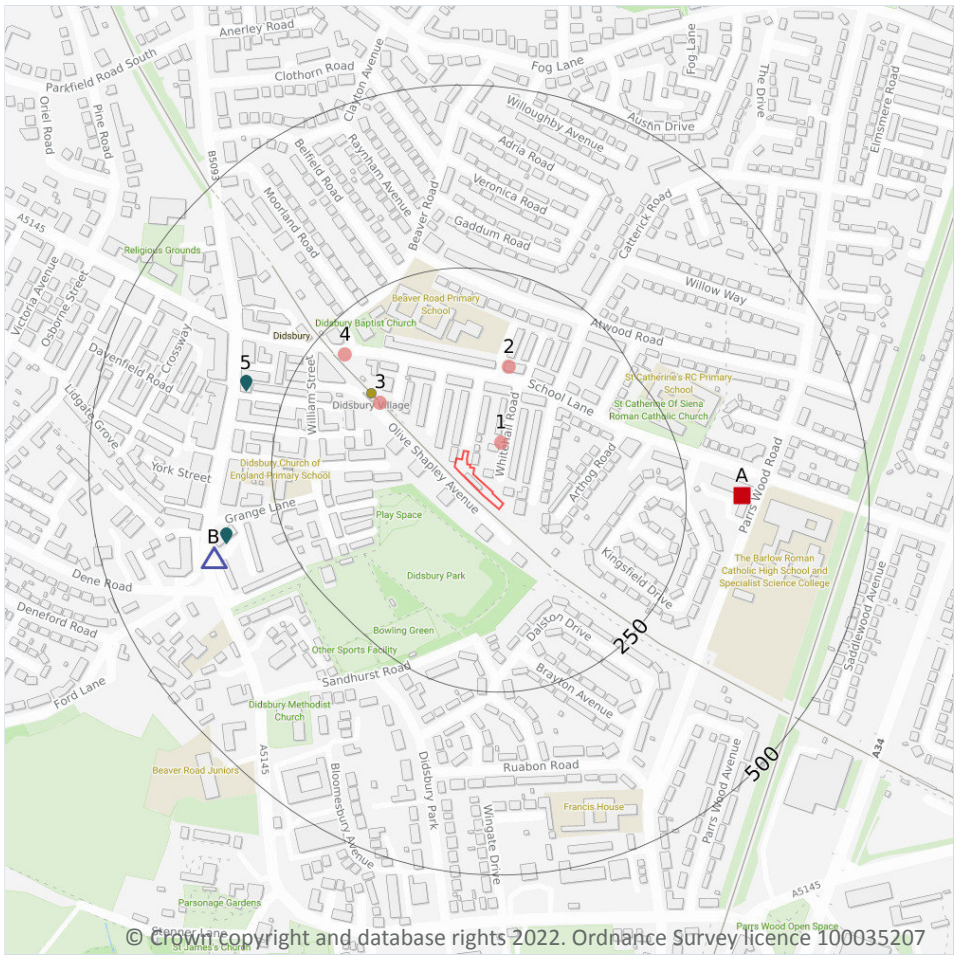
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 28**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	466m NW	676, Wilmslow Road, Didsbury, Manchester, M20 2DN	WEX156682	Treating waste exemption	Not on a Farm	Sorting and de-naturing of controlled drugs for disposal
A	479m SW	-	WEX085744	Treating waste exemption	Not on a farm	Screening and blending of waste
A	479m SW	-	WEX085744	Using waste exemption	Not on a farm	Use of waste in construction
B	496m SW	BROOMCROFT HALL, FORD LANE, DIDSBURY, MANCHESTER, M20 2RU	WEX167789	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	496m SW	BROOMCROFT HALL, FORD LANE, DIDSBURY, MANCHESTER, M20 2RU	WEX006505	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



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Site Outline

Search buffers in metres (m)

Recent industrial land uses

Current or recent petrol stations

Licensed pollutant release (Part A(2)/B)

List 1 Dangerous Substances

4.1 Recent industrial land uses

Records within 250m	4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Company	Address	Activity	Category
1	46m E	Electricity Sub Station	Greater Manchester, M20	Electrical Features	Infrastructure and Facilities
2	128m NE	Ayres Violins Ltd	69-71, School Lane, Manchester, Greater Manchester, M20 6WN	Musical Instruments	Consumer Products

ID	Location	Company	Address	Activity	Category
3	129m NW	Didsbury Village (Manchester Metrolink)	Greater Manchester, M20	Tram, Metro and Light Railway Stations and Stops	Public Transport, Stations and Infrastructure
4	208m NW	Mast	Greater Manchester, M20	Telecommunications Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	**1**

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Company	Address	LPG	Status
B	352m W	SHELL	761-765, Wilmslow Road, Didsbury, Manchester, Greater Manchester, M20 6RN	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	**0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	**0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	2

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Address	Details	
5	305m W	Johnsons Cleaners UK Ltd, 707-709 Wilmslow Road, Didsbury, Manchester, M20 6RE	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
B	326m W	Didsbury Service Station, 761-765 Wilmslow Road, Didsbury, M20 8RH	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	2

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 31**

ID	Location	Name	Status	Receiving Water	Authorised Substances
A	326m E	Kruger Tissue (manufacturing) Ltd	Not Active	River Sett, Manchester Ship Canal	Mercury (other), Cadmium, Hexachlorocyclohexane, Pentachlorophenol
A	326m E	Kruger Tissue (manufacturing) Ltd	Active	River Sett, Manchester Ship Canal	Mercury (other), Cadmium, Hexachlorocyclohexane, Pentachlorophenol

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	0

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

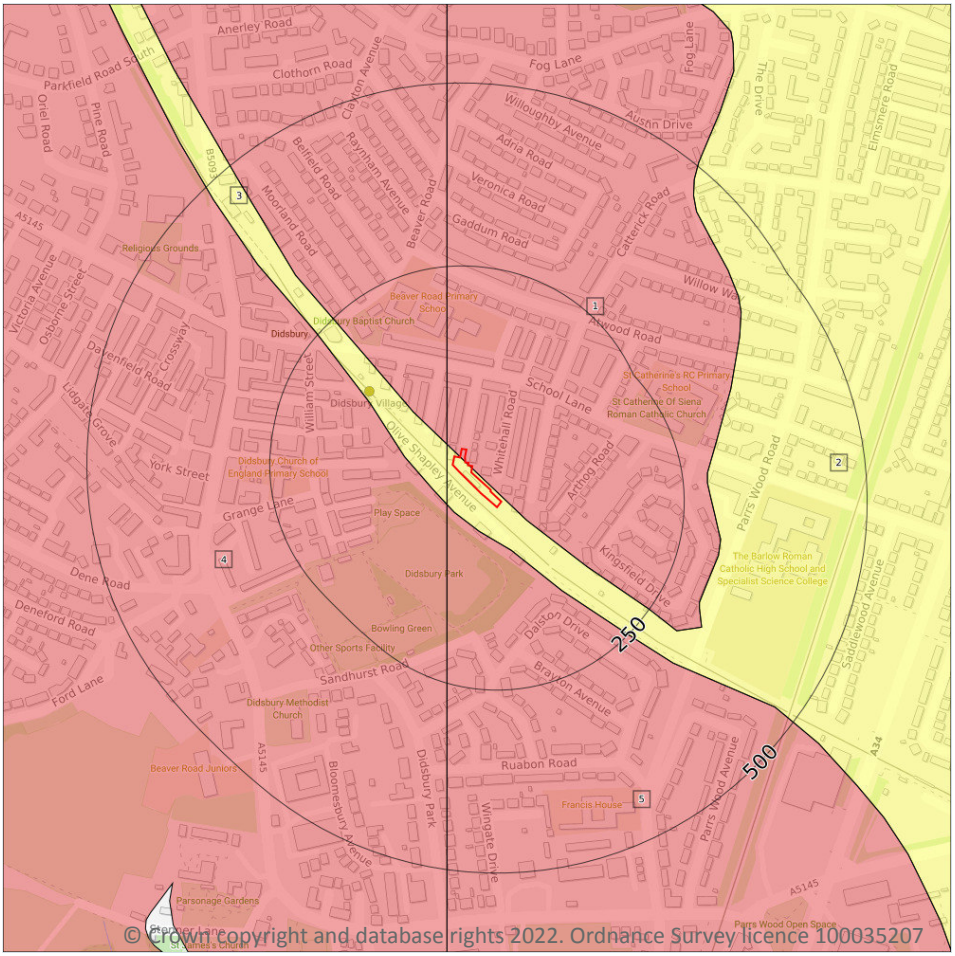
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



5.1 Superficial aquifer

Records within 500m	5

Aquifer status of groundwater held within superficial geology.

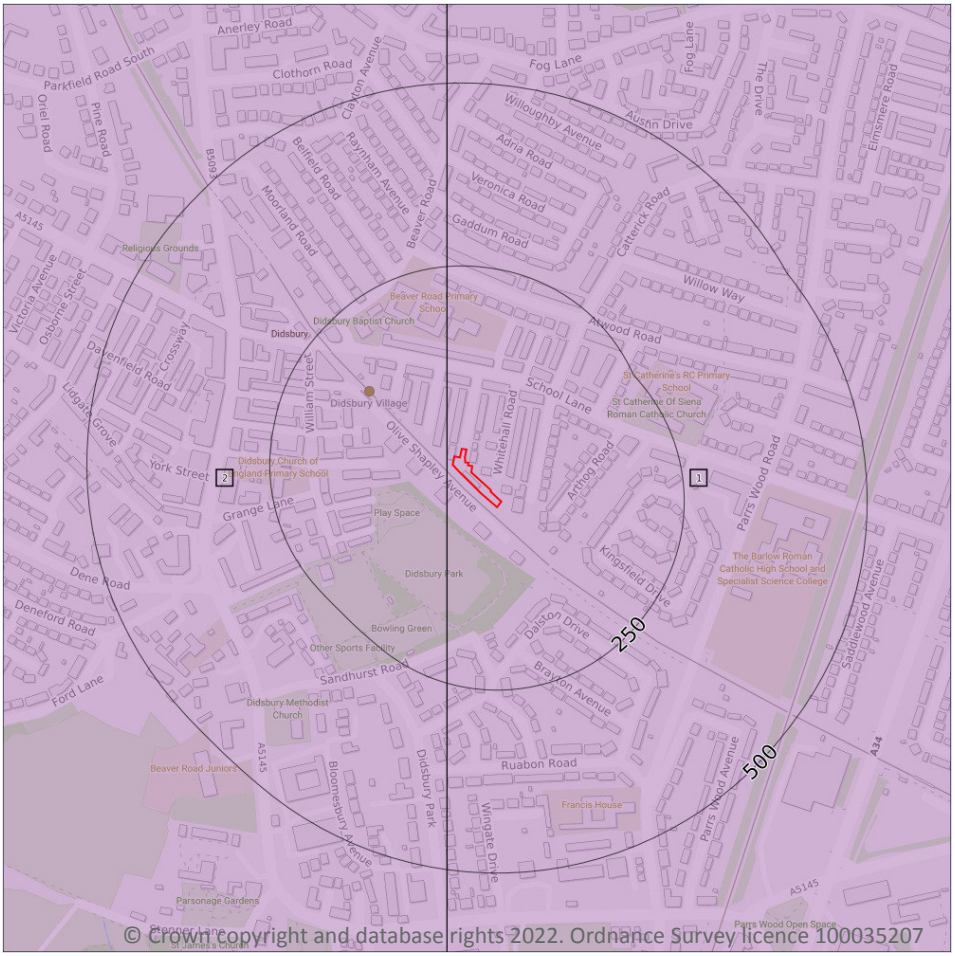
Features are displayed on the Hydrogeology map on **page 37**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	8m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	19m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	41m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	2

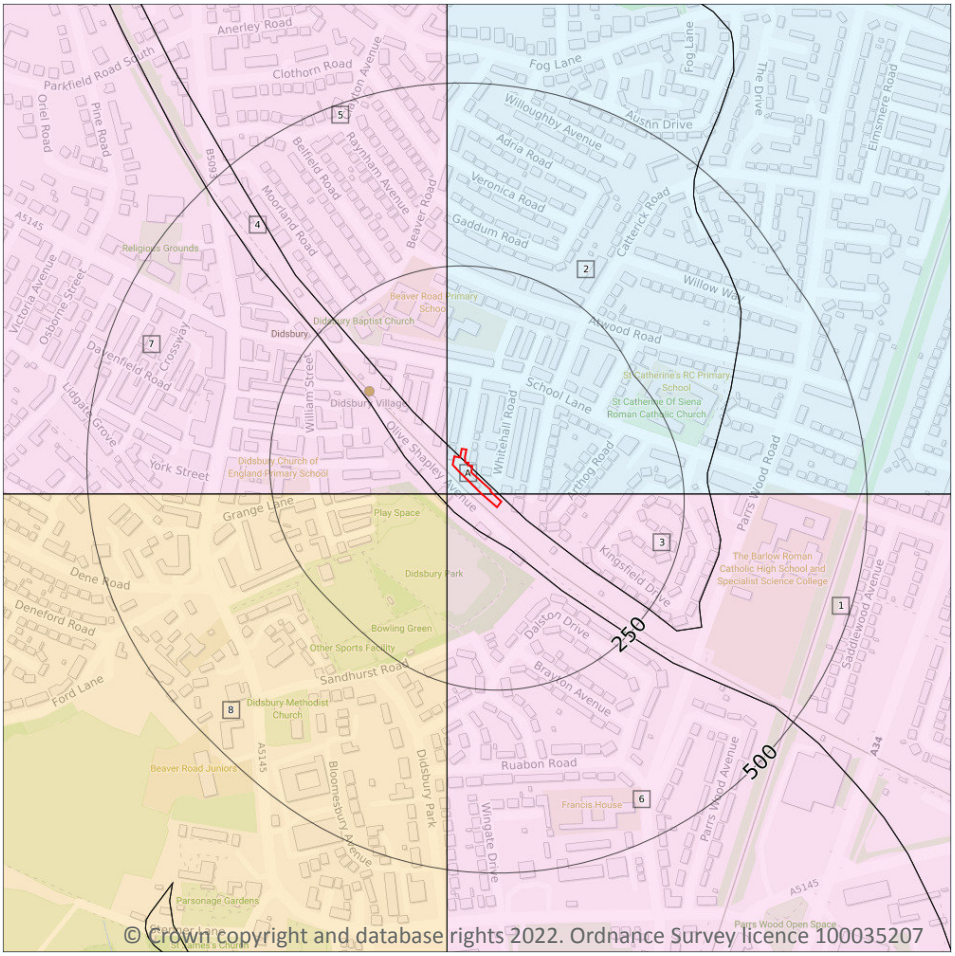
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 39**

ID	Location	Designation	Description
1	**On site**	**Principal**	**Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers**
2	8m W	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	10

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 41**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed**
2	**On site**	**Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed**
A	**On site**	**Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed**
3	5m NE	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed
4	7m W	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed
5	19m NW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed
A	33m SW	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Intergranular

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
6	40m SW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed
7	42m SW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Mixed
8	42m SW	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Principal Flow mechanism: Intergranular

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

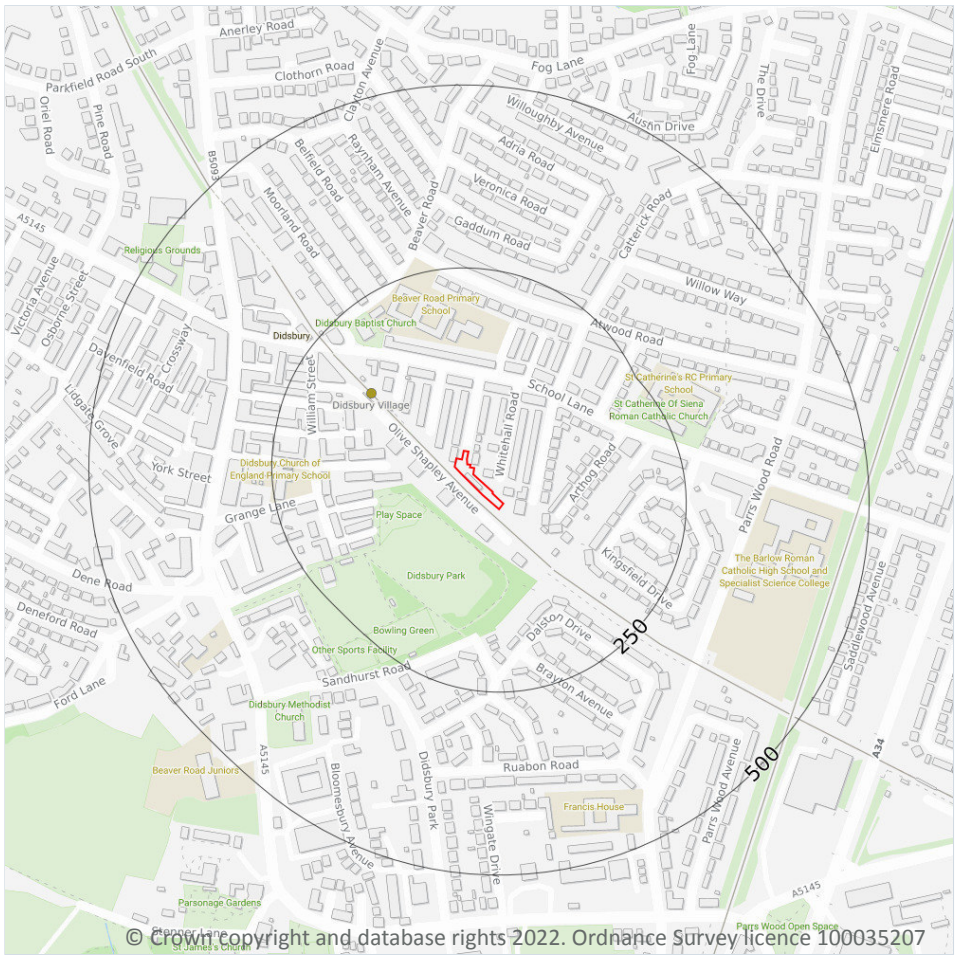
5.5 Groundwater vulnerability- local information

Records on site	0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



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- Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	5

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 44**

ID	Location	Details	
-	1201m SW	Status: Historical Licence No: 2569015006 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: "BOREHOLE AT DIDSBURY GOLF CLUB, NORTHENDEN, WYTHENSHAWE," Data Type: Point Name: DIDSBURY GOLF CLUB LTD Easting: 383950 Northing: 390470	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 22/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 24/12/1992 Version End Date: -
-	1201m SW	Status: Historical Licence No: 2569015006 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT DIDSBURY GOLF CLUB, NORTHENDEN, WYTHENSHAWE Data Type: Point Name: DIDSBURY GOLF CLUB LTD Easting: 383950 Northing: 390470	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 22/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 24/12/1992 Version End Date: -
-	1201m SW	Status: Active Licence No: 2569015006 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT DIDSBURY GOLF CLUB NORTHENDEN WYTHENSHAWE Data Type: Point Name: DIDSBURY GOLF CLUB LTD Easting: 383950 Northing: 390470	Annual Volume (m^3): 9,092 Max Daily Volume (m^3): 68.19 Original Application No: 1053 Original Start Date: 22/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1991m SE	Status: Historical Licence No: 2569013019 Details: Lake & Pond Throughflow Direct Source: Ground Water - North West Region Point: "A BOREHOLE AT HEATON MERSEY LODGE,VALE ROAD, STOCKPORT" Data Type: Point Name: SHAW Easting: 386880 Northing: 390150	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/12/1996 Expiry Date: - Issue No: 100 Version Start Date: 24/12/1996 Version End Date: -

ID	Location	Details	
-	1991m SE	Status: Historical Licence No: 2569013019 Details: Lake & Pond Throughflow Direct Source: Ground Water - North West Region Point: A BOREHOLE AT HEATON MERSEY LODGE,VALE ROAD, STOCKPORT Data Type: Point Name: SHAW Easting: 386880 Northing: 390150	Annual Volume (m^3): 4860 Max Daily Volume (m^3): 18 Original Application No: - Original Start Date: 24/12/1996 Expiry Date: - Issue No: 100 Version Start Date: 24/12/1996 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	0

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



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Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	0

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 48**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**Chorlton Brook (Princess Parkway to Mersey)**	**GB112069061040**	**Bollin Dean Mersey Upper**	**Mersey Upper**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 48**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2895m N	River	Chorlton Brook (Princess Parkway to Mersey)	GB112069061040	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 48**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	**On site**	**Manchester and East Cheshire Permo-Triassic Sandstone Aquifers**	**GB41201G101100**	**Poor**	**Poor**	**Poor**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

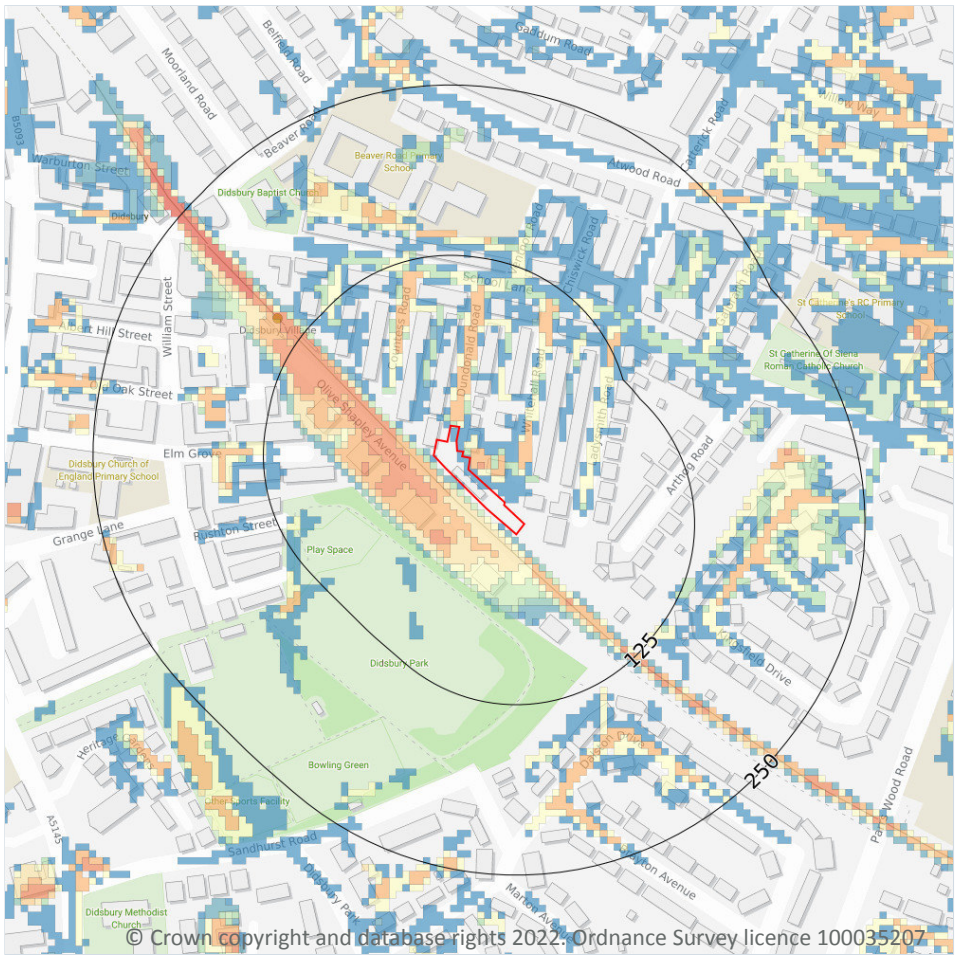
7.7 Flood Zone 3

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



8.1 Surface water flooding

Highest risk on site	**1 in 100 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 54**

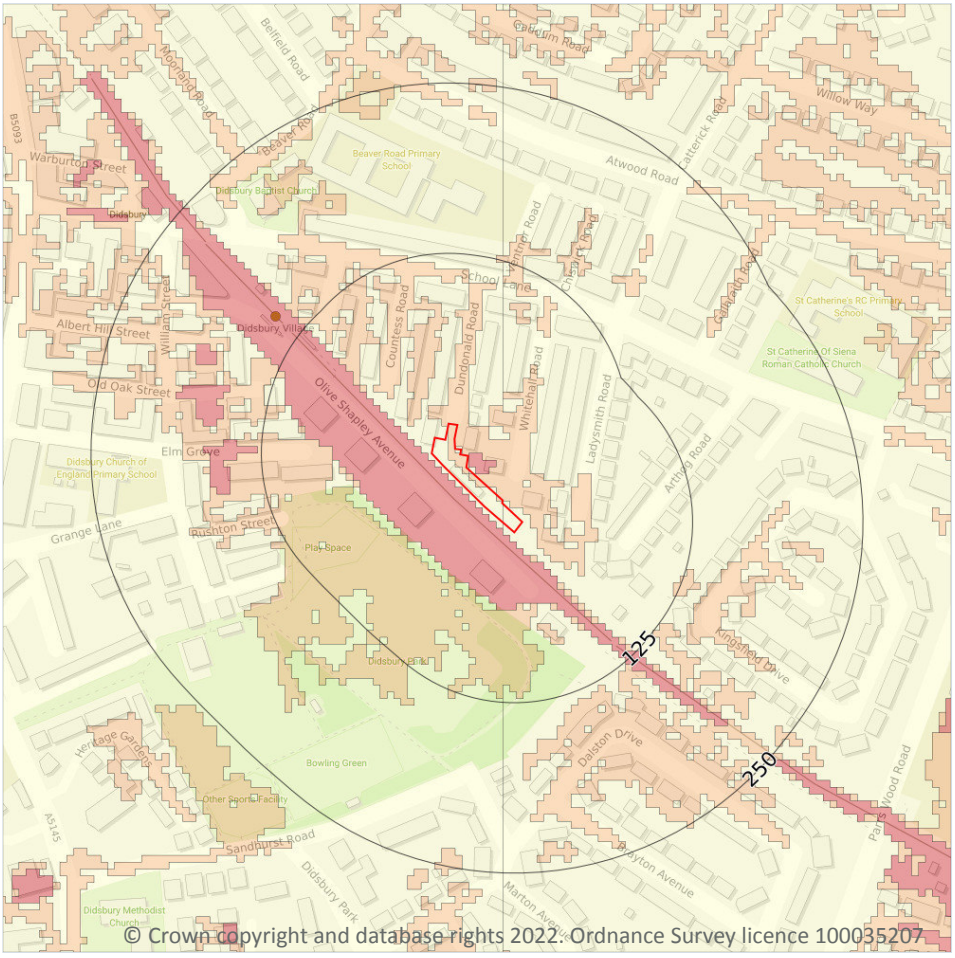
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

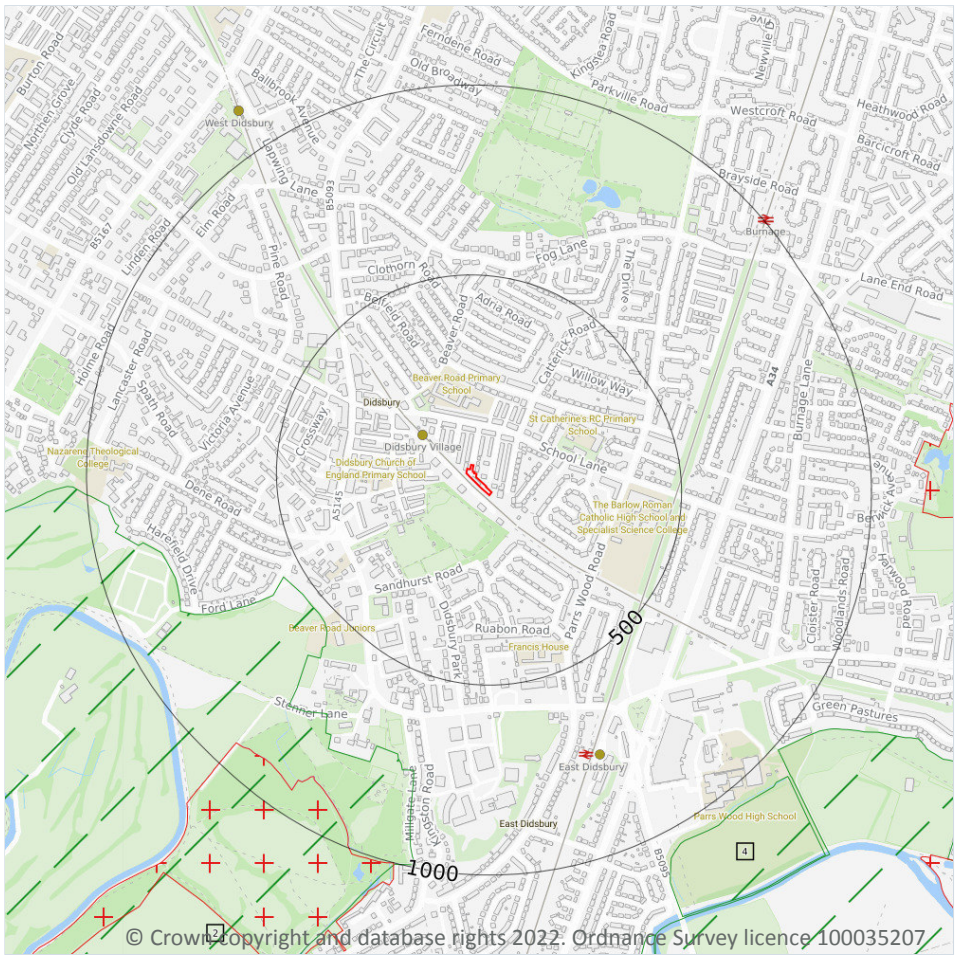
Highest risk on site	**Moderate-High**
Highest risk within 50m	**High**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 56**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Local Nature Reserves (LNR)

Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	5

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Data source
2	873m SW	Stenner Woods and Milgate Fields, Didsbury	Natural England
5	1116m E	Heaton Mersey Common	Natural England
6	1484m SE	Mersey Vale Nature Park	Natural England
-	1751m SE	Mersey Vale Nature Park	Natural England
-	1848m SE	Abney Hall	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	3

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Local Authority name
1	536m SW	Merseyside and Greater Manchester	Manchester
3	1014m SE	Merseyside and Greater Manchester	Stockport
4	1045m SE	Merseyside and Greater Manchester	Manchester

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m	0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site	0

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

This data is sourced from Natural England.

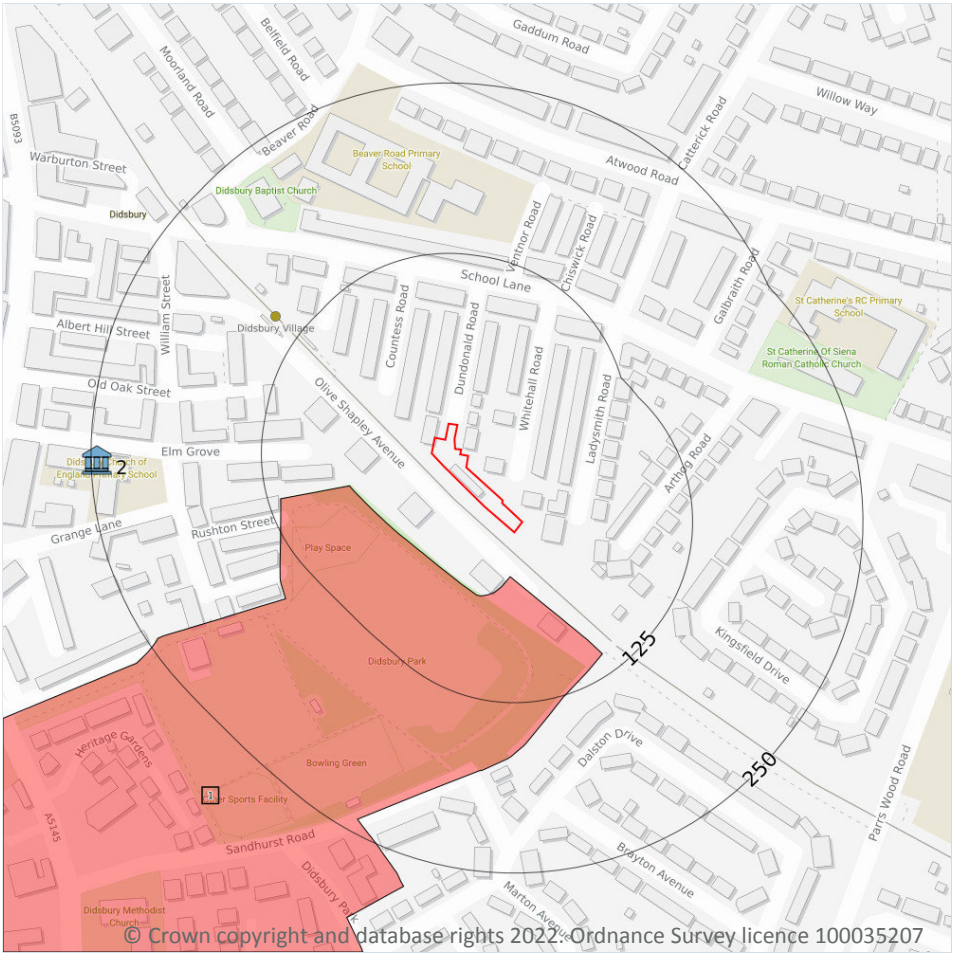
10.18 SSSI Units

Records within 2000m	0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



- Site Outline

Search buffers in metres (m)

- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	1

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 63**

ID	Location	Name	Grade	Reference Number	Listed date
2	246m W	Church of England Girls School, Didsbury, Manchester, M20	II	1217872	20/06/1988

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	1

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on **page 63**

ID	Location	Name	District	Date of designation
1	33m S	Didsbury St James	Manchester	01/11/1970

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

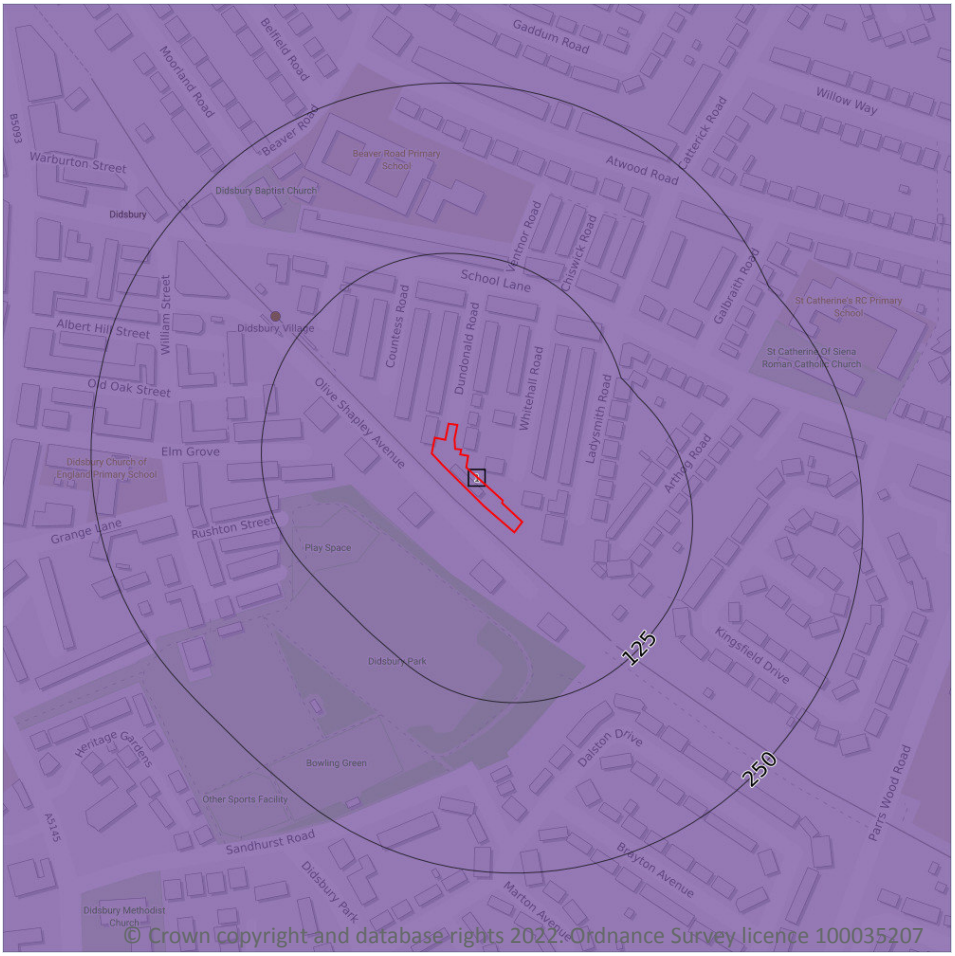
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 66**

ID	Location	Classification	Description
1	**On site**	**Urban**	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



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Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks

Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m	7

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 68**

ID	Location	Main Habitat	Other habitats
1	14m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	52m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	79m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	89m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
4	109m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	110m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
5	114m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

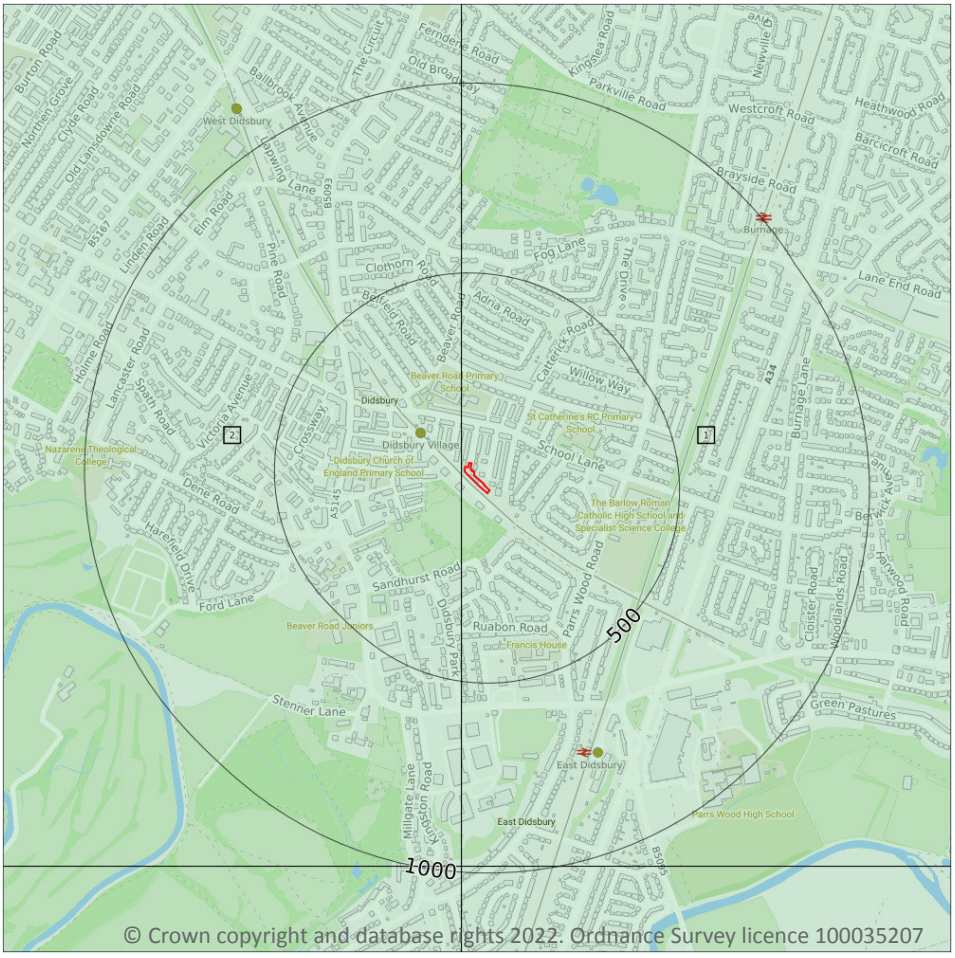
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 70**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**SJ89SE**
2	8m W	Full	Full	Full	No coverage	SJ89SW

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	7

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

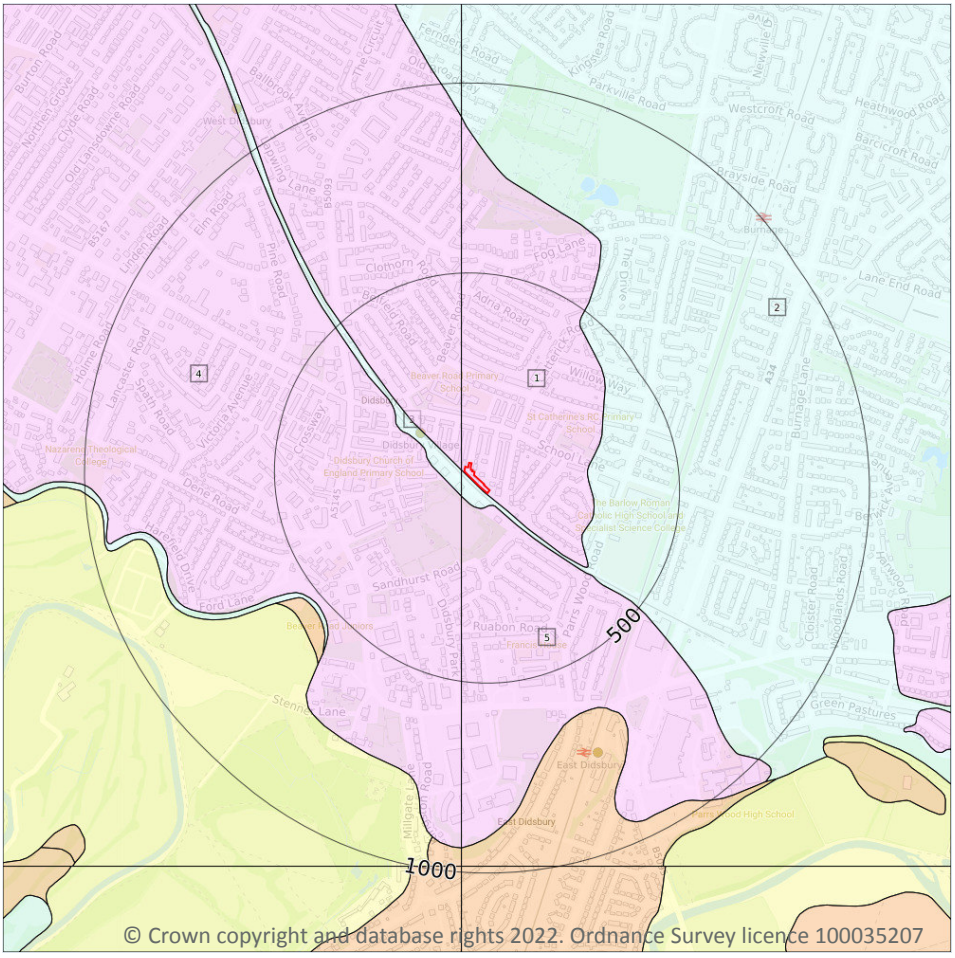
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 71**

ID	Location	LEX Code	Description	Rock description
A	**On site**	**WGR-VOID**	**Worked Ground (Undivided)**	**Void**
1	8m W	WGR-VOID	Worked Ground (Undivided)	Void
2	310m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	324m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
4	446m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	475m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	475m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	5

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 73**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**GFSDD-XSV**	**Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel**	**Sand And Gravel**
2	3m SW	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
3	8m W	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
4	8m W	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel

ID	Location	LEX Code	Description	Rock description
5	33m S	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **4**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 75**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**WLSF-SDST**	**Wilmslow Sandstone Formation - Sandstone**	**Early Triassic Epoch**
2	8m W	WLSF-SDST	Wilmslow Sandstone Formation - Sandstone	Early Triassic Epoch
3	109m E	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch
5	390m N	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	2

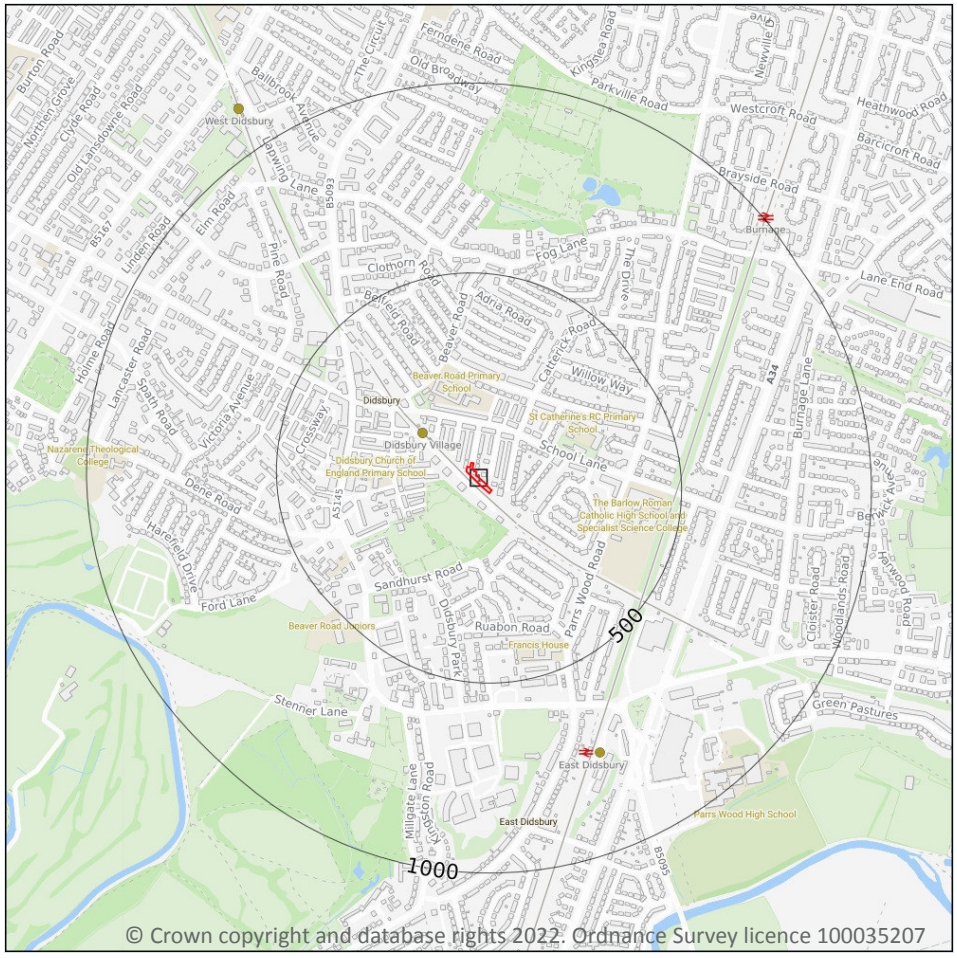
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 75**

ID	Location	Category	Description
4	109m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
6	390m N	FAULT	Normal fault, inferred; crossmarks on downthrow side

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 77**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW098_stockport_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m	0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

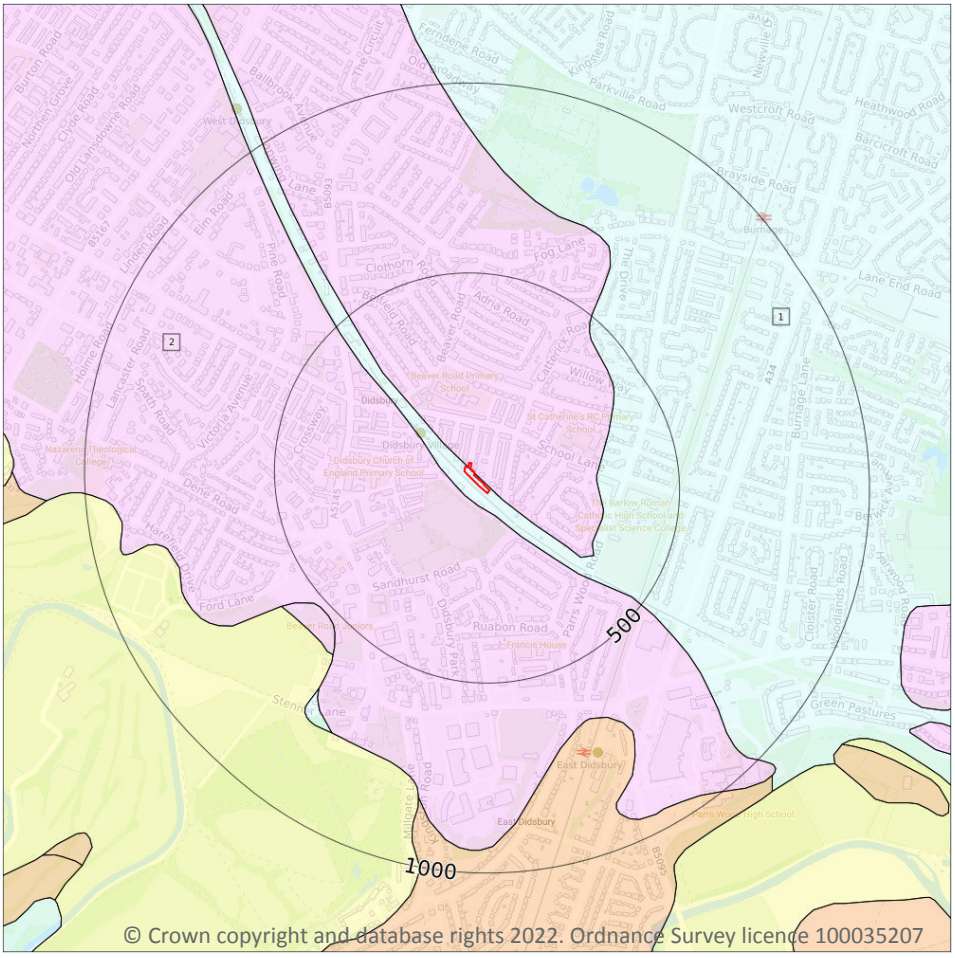
15.3 Artificial ground permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m	2

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 79**

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	On site	GFSDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	5

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**Very High**	**High**
On site	**Mixed**	**High**	**Low**
8m NW	Mixed	High	Low
19m NW	Intergranular	Very High	High
41m SE	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

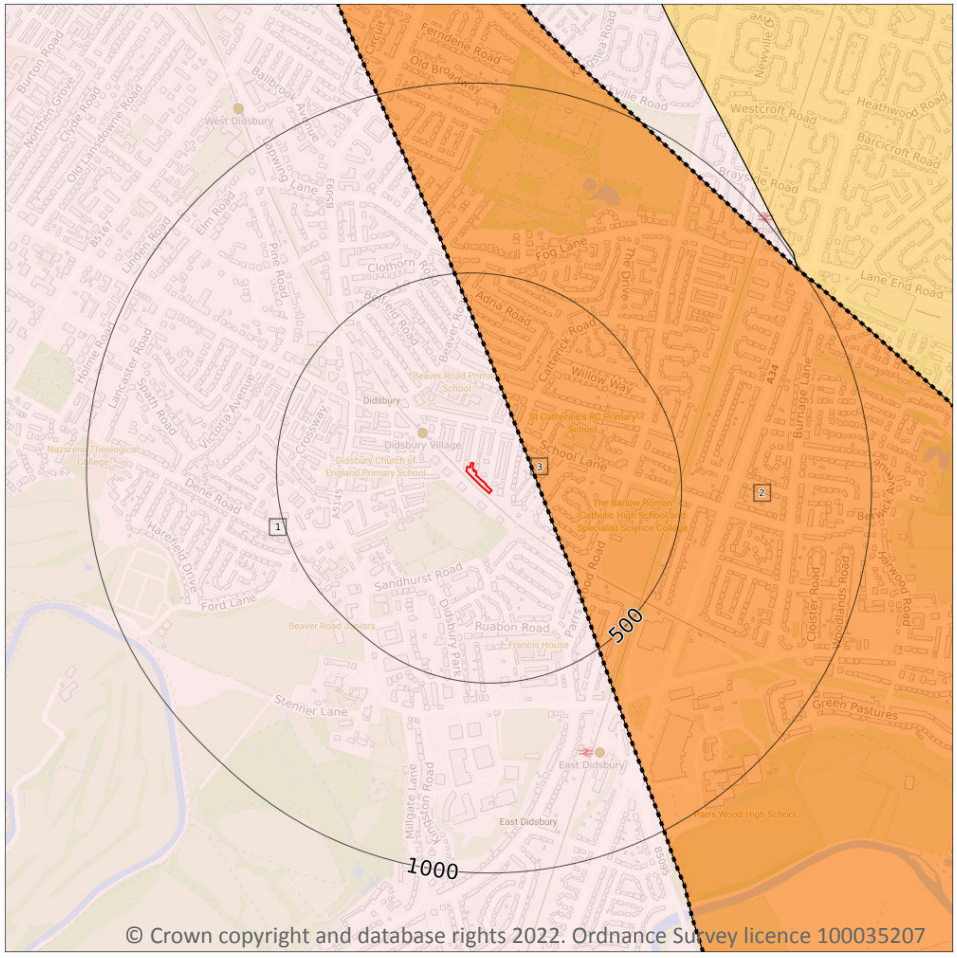
15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m	2

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 81**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**WLSF-SDST**	**WILMSLOW SANDSTONE FORMATION - SANDSTONE**	**-**
2	120m E	CHES-PESST	CHESTER FORMATION - SANDSTONE, PEBBLY (GRAVELLY)	OLENEKIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	2

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**High**	**High**
8m NW	Intergranular	High	High

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	1

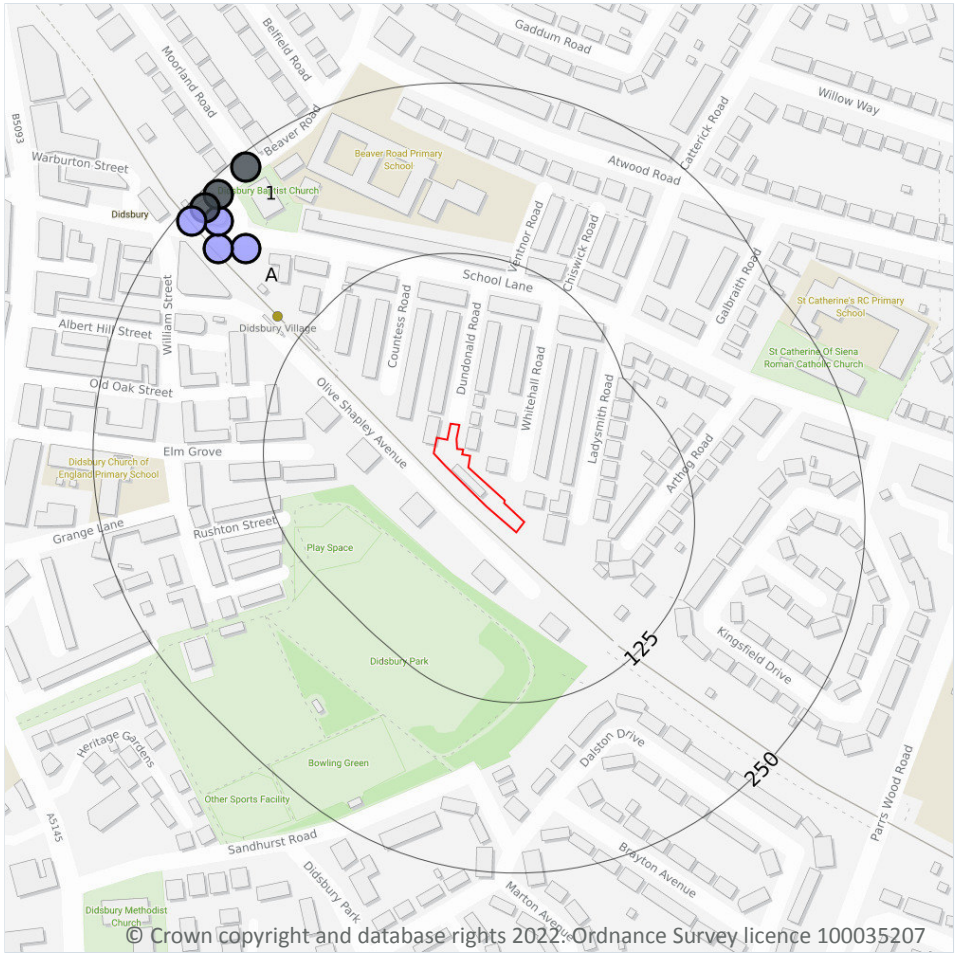
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 81**

ID	Location	Category	Description
3	120m E	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



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Site Outline

Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m **7**

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

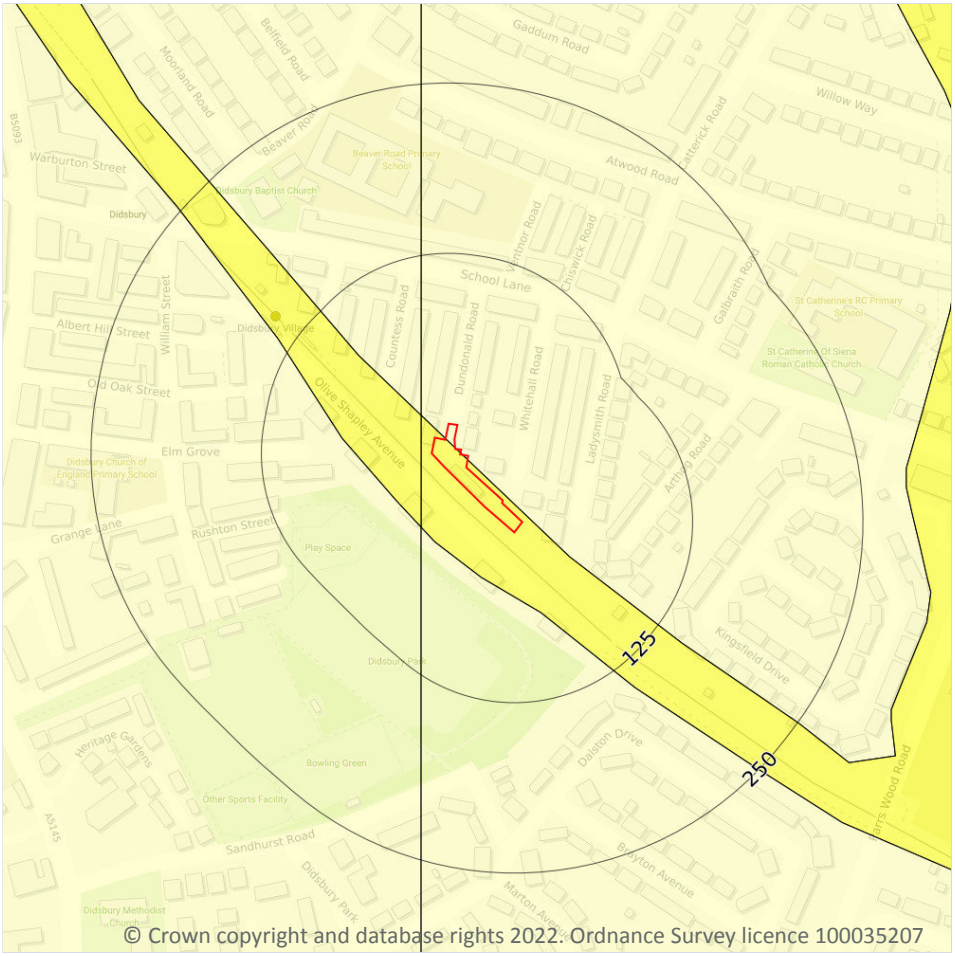
Features are displayed on the Boreholes map on **page 83**

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	197m NW	384870 391190	SCHOOL LANE BRIDGE DIDSBURY 4	6.5	N	864986
A	212m NW	384850 391190	SCHOOL LANE BRIDGE DIDSBURY 3	7.0	N	864985
A	225m NW	384850 391210	SCHOOL LANE BRIDGE DIDSBURY 2	6.5	N	864984

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	239m NW	384850 391230	DIDSBURY SHOPPING CENTRE 1	-	Y	N/A
A	240m NW	384840 391220	DIDSBURY SHOPPING CENTRE TP 1	-	Y	N/A
A	240m NW	384830 391210	SCHOOL LANE BRIDGE DIDSBURY 1	6.7	N	864983
1	241m NW	384870 391250	MOORLAND ROAD 1	-	Y	N/A

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	5

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

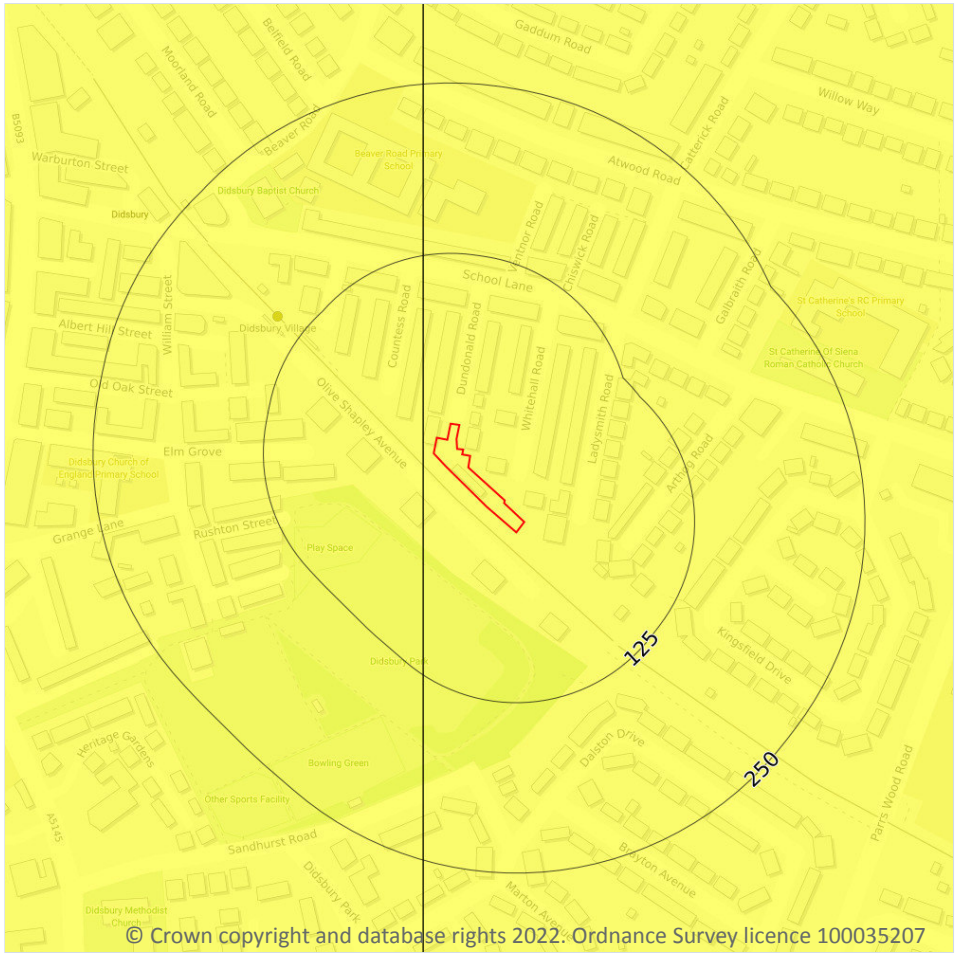
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 85**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
On site	**Very low**	**Ground conditions predominantly low plasticity.**
8m W	Very low	Ground conditions predominantly low plasticity.

Location	Hazard rating	Details
19m NW	Negligible	Ground conditions predominantly non-plastic.
41m SW	Negligible	Ground conditions predominantly non-plastic.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

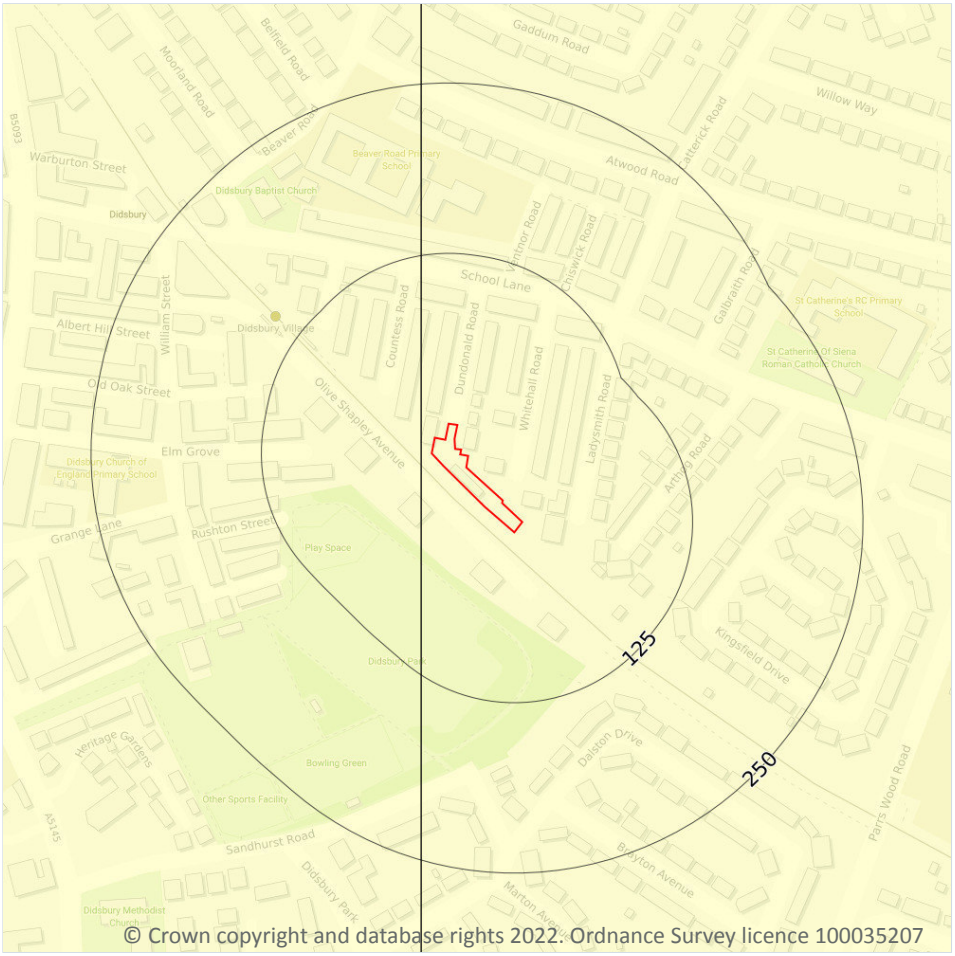
Features are displayed on the Natural ground subsidence - Running sands map on **page 87**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

Location	Hazard rating	Details
8m W	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	2

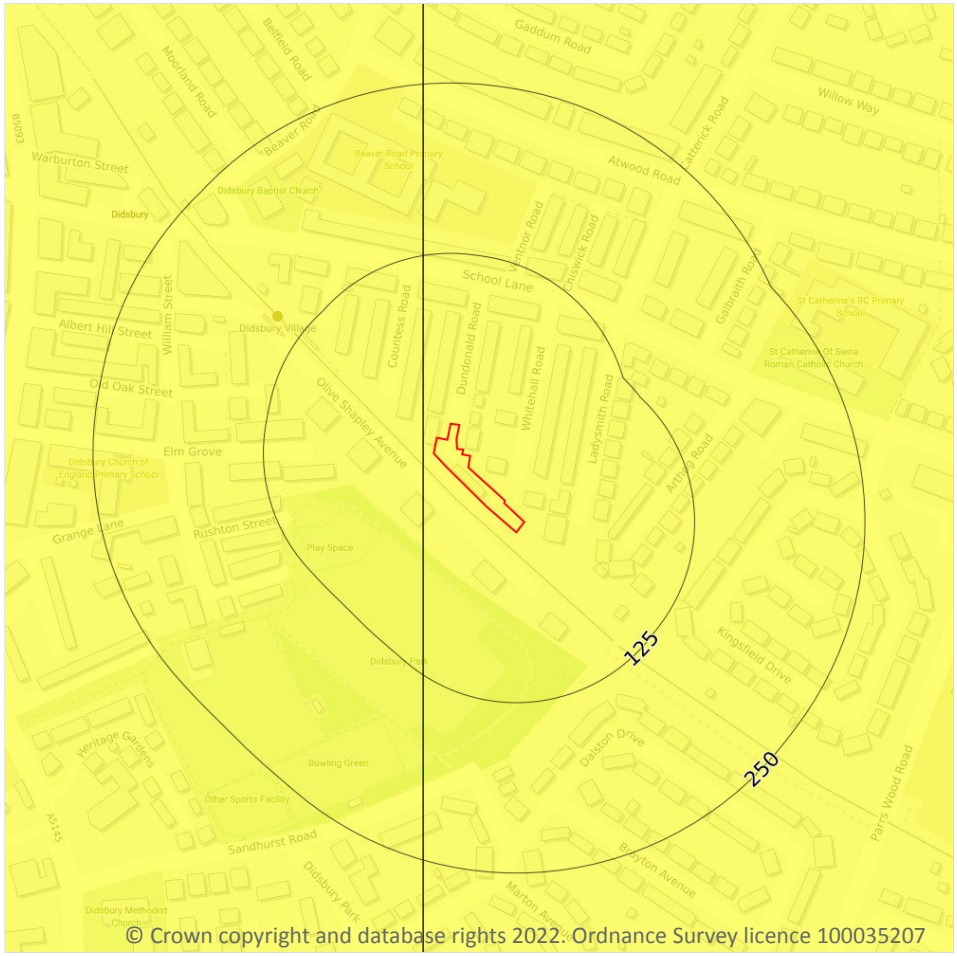
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 89**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
8m W	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	2

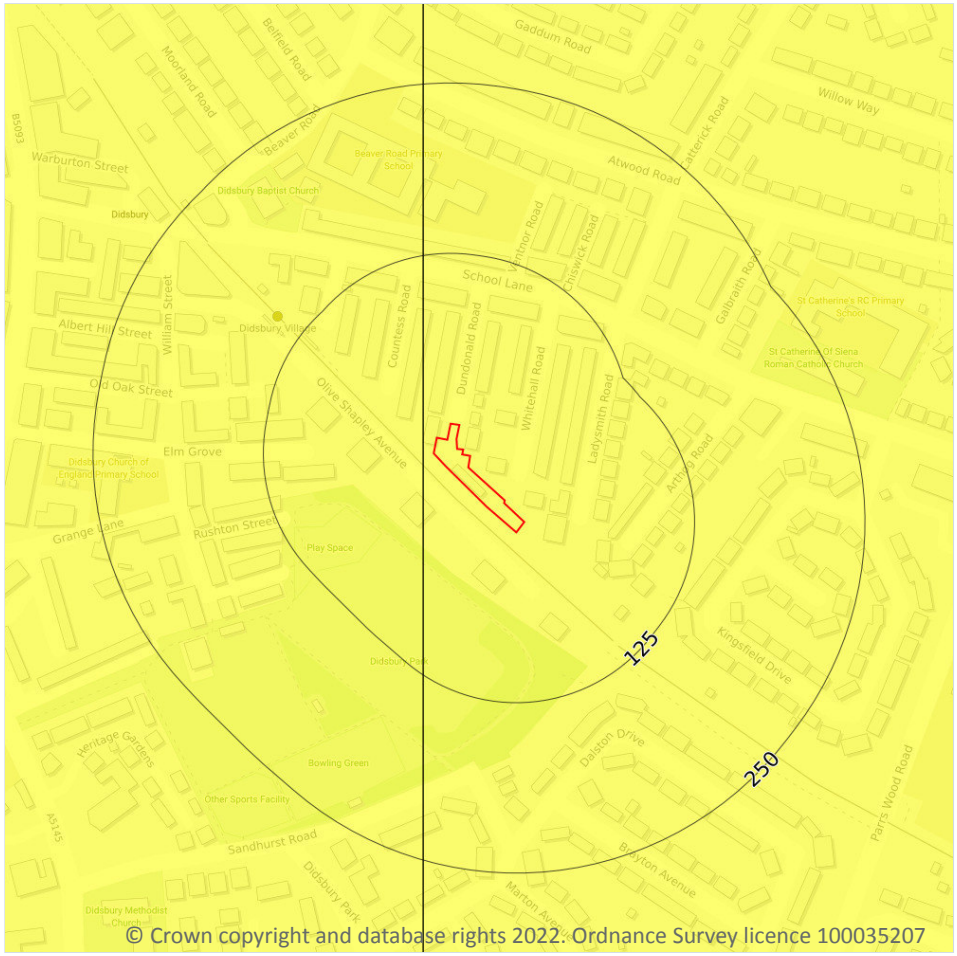
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 90**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**
8m W	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

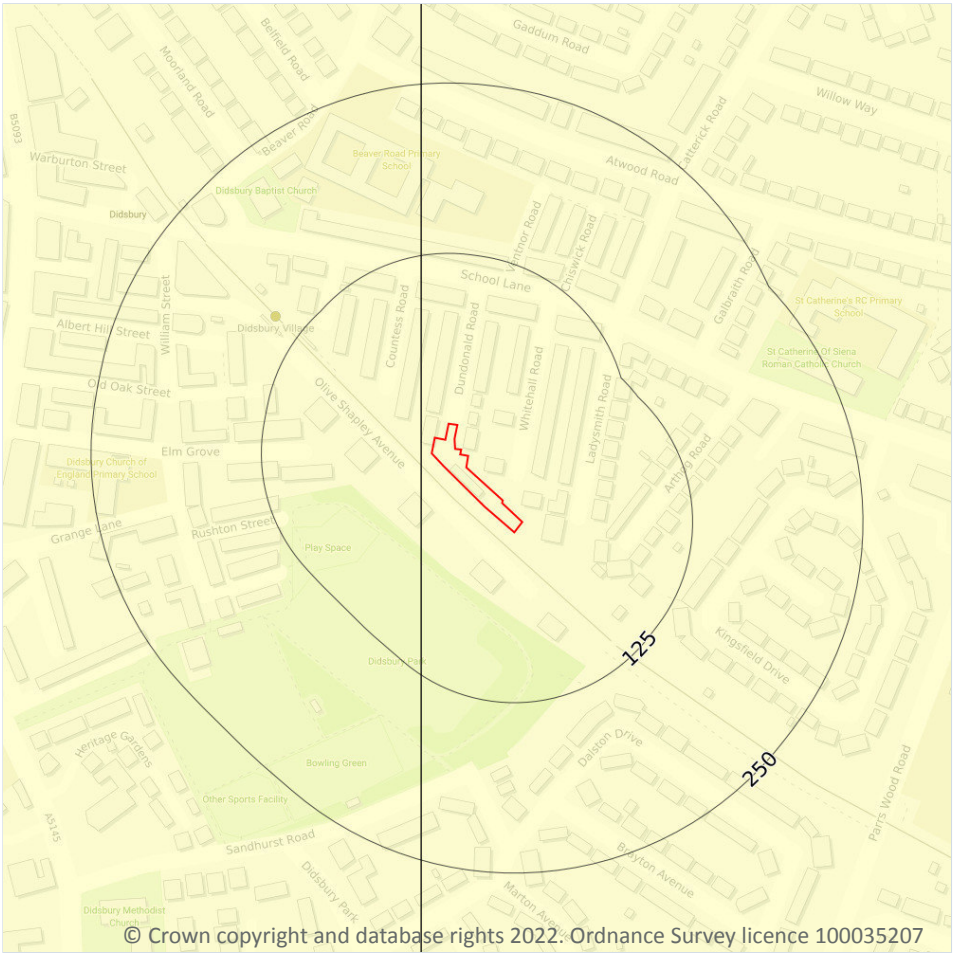
Features are displayed on the Natural ground subsidence - Landslides map on **page 91**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

Location	Hazard rating	Details
8m W	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m	2

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

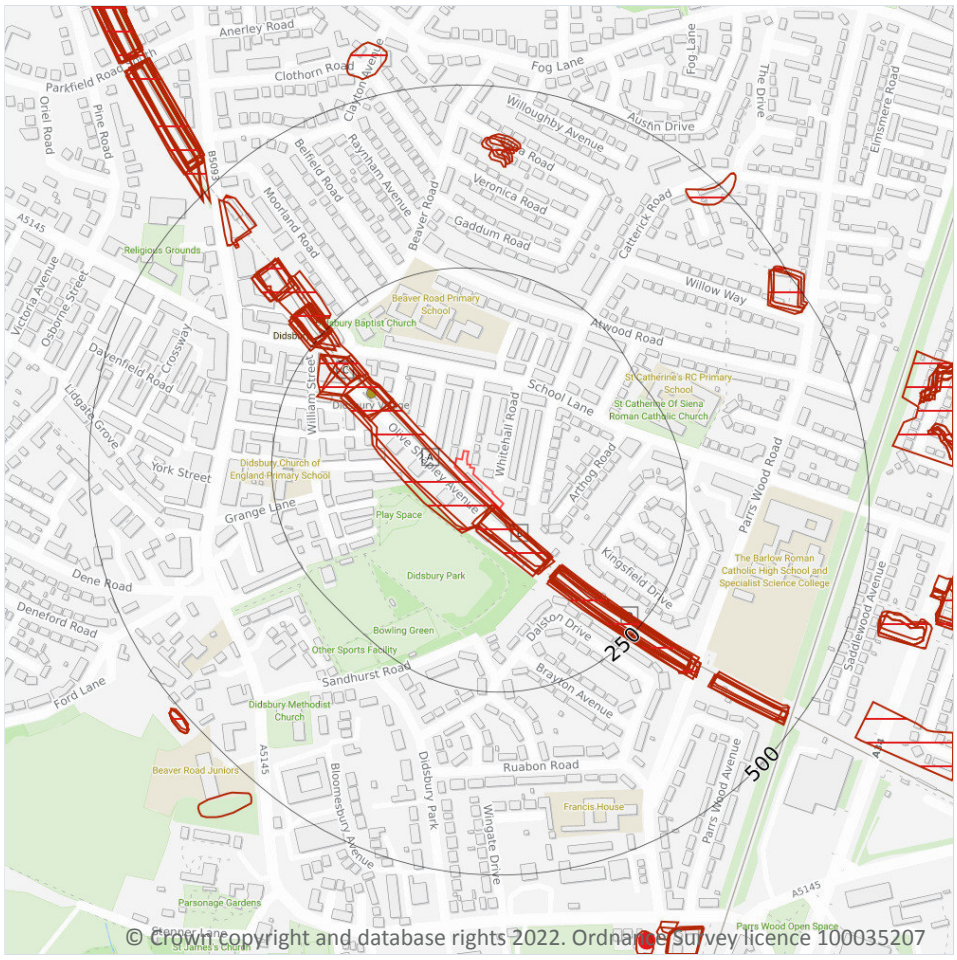
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 93**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

Location	Hazard rating	Details
8m W	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



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Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	41

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 95**

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Cuttings**	**1923**	**1:10560**
B	1m SW	Cuttings	1965	1:10560
B	1m SW	Cuttings	1974	1:10000
B	1m SW	Cuttings	1983	1:10000
B	2m SW	Cuttings	1955	1:10560
A	5m SW	Cuttings	1934	1:10560
B	6m SW	Cuttings	1938	1:10560
A	7m SW	Cuttings	1893	1:10560
B	7m SW	Cuttings	1923	1:10560
C	109m NW	Cuttings	1911	1:10560
D	113m SE	Cuttings	1938	1:10560
D	115m SE	Cuttings	1911	1:10560
D	116m SE	Cuttings	1923	1:10560
D	116m SE	Cuttings	1923	1:10560
D	116m SE	Cuttings	1934	1:10560
D	116m SE	Cuttings	1911	1:10560
D	116m SE	Cuttings	1938	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
C	116m NW	Cuttings	1911	1:10560
D	116m SE	Cuttings	1938	1:10560
D	116m SE	Cuttings	1955	1:10560
D	116m SE	Cuttings	1965	1:10560
D	116m SE	Cuttings	1893	1:10560
D	116m SE	Cuttings	1974	1:10000
D	116m SE	Cuttings	1983	1:10000
D	116m SE	Cuttings	1989	1:10000
C	118m NW	Cuttings	1938	1:10560
C	167m NW	Cuttings	1955	1:10560
C	173m NW	Cuttings	1938	1:10560
C	175m NW	Cuttings	1938	1:10560
C	221m NW	Cuttings	1938	1:10560
C	221m NW	Cuttings	1938	1:10560
C	223m NW	Cuttings	1938	1:10560
C	243m NW	Cuttings	1893	1:10560
C	243m NW	Cuttings	1923	1:10560
C	243m NW	Cuttings	1923	1:10560
C	243m NW	Cuttings	1934	1:10560
C	243m NW	Cuttings	1911	1:10560
C	243m NW	Cuttings	1966	1:10560
C	243m NW	Cuttings	1988	1:10000
C	243m NW	Cuttings	1978	1:10000
C	246m NW	Cuttings	1911	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	0

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	1

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

Location	Details
On site	**Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) may have information such as mining plans and maps held within their archive that have occurred within 1km of this property. Please note, the plans held by JPB may also relate to non-mining records. Further details and a quote for services (if appropriate) can be obtained by emailing this report to enquiries.gs@jpb.co.uk.**

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	**0**

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	**0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	**0**

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	**0**

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

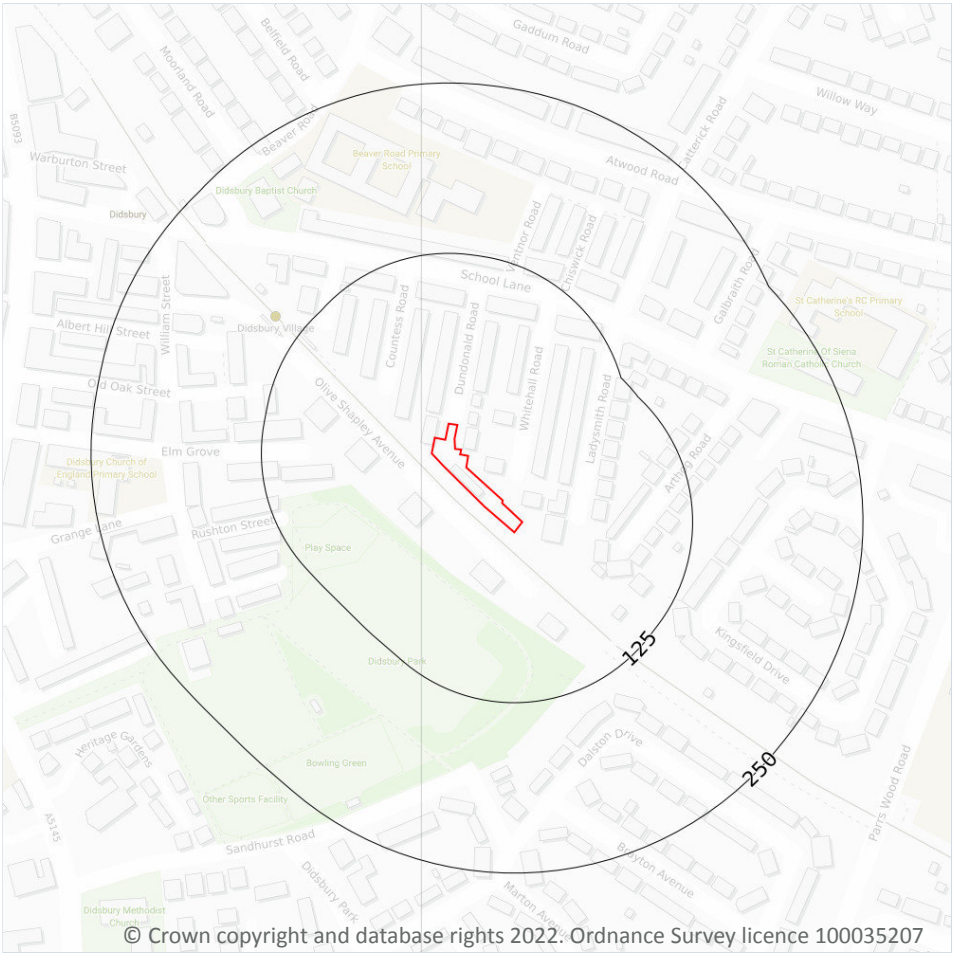
18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 101**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m	14

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**300 - 600 mg/kg**	**240 - 360 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**300 - 600 mg/kg**	**240 - 360 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**300 - 600 mg/kg**	**240 - 360 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
5m SE	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
8m W	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
8m NW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
19m N	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
19m NW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
33m SW	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
33m SW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
41m S	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
42m NW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
43m SW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
44m S	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

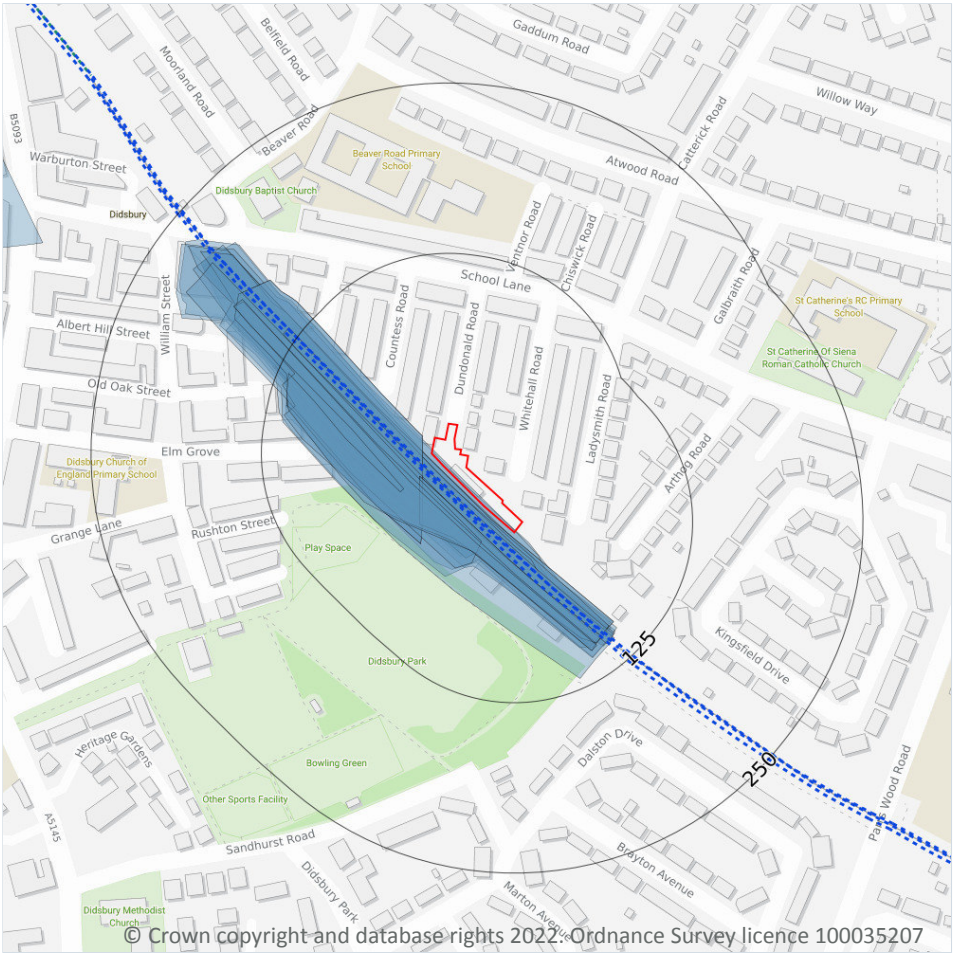
20.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)
- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	28

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 104**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1938**	**10560**
On site	**Railway Sidings**	**1923**	**10560**
2m SW	Railway Sidings	1911	10560
3m SW	Railway Sidings	1911	10560
5m SW	Railway Sidings	1934	10560
6m SW	Railway Sidings	1923	10560
7m W	Railway Sidings	1955	10560
7m W	Railway Sidings	1966	10560
7m SW	Railway Sidings	1957	2500
8m SW	Railway Sidings	1910	2500
8m SW	Railway Sidings	1955	2500
8m SW	Railway Sidings	1955	1250
9m SW	Railway Sidings	1938	10560
9m SW	Railway Sidings	1894	2500
10m SW	Railway Sidings	1922	2500
10m SW	Railway Sidings	1934	2500
10m SW	Railway Sidings	1907	2500

Location	Land Use	Year of mapping	Mapping scale
12m SW	Railway Sidings	1881	2500
16m SW	Railway Sidings	1955	10560
16m SW	Railway Sidings	1965	10560
19m SW	Railway Sidings	1893	10560
21m S	Railway Sidings	1957	1250
21m SW	Railway Sidings	1938	10560
24m SW	Railway Sidings	1938	10560
29m SW	Railway Sidings	1955	1250
51m SE	Railway Sidings	1957	1250
131m NW	Railway Sidings	1955	1250
194m NW	Railway Sidings	1893	500

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	6

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 104**

Location	Name	Type
9m SW		light_rail
11m SW	Not given	Multi Track
13m SW		light_rail
112m SE	Not given	Multi Track
221m NW	Not given	Multi Track
249m NW		light_rail

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b

(Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-jan-2020/.

APPENDIX 6 - Preliminary UXO Risk Assessment

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Preliminary UXO Risk Assessment

Client	Groundtech Consulting Limited
Project	50 Dundonald Road
Site Address	50 Dundonald Road, Didsbury, Manchester M20 6RU
Report Reference	PA15977-00
Date	23/06/2022
Originator	TE

Assessment Objective

This preliminary risk assessment is a qualitative screening exercise to assess the likely potential of encountering unexploded ordnance (UXO) at the 50 Dundonald Road, Didsbury site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

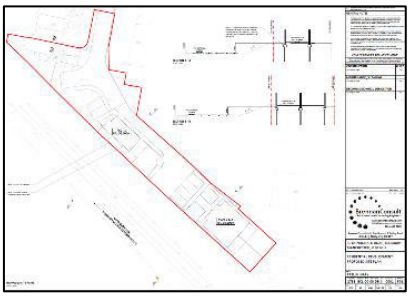
This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.

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Risk Assessment Considerations	
Site location and description/current use	The site is located in Didsbury, Manchester.  According to aerial imagery dated 2021, the site predominantly comprises undeveloped, hardstanding ground, with sections of vegetation throughout, and a detached residential property in the north-west of the site. The site is bordered to the north and east by residential properties and roadways, including Dundonald *Road*, *Aldford Close* and *Whitehall Road*, and is bordered to the south and west by an area of shrubbery and a railway line. The site is approximately centred on the OS grid reference: **SJ 85003 91051**.
Are there any indicators of current/historical military activity on/close to the site?	In-house records do not indicate that the site footprint had any current/former military use. No features such as WWII defensive positions, encampments or firing ranges are recorded to have been located at or in the immediate vicinity of the site. In addition, 1st Line Defence could find no evidence to suggest that items of explosive ordnance were ever produced, stored or disposed of within the site or its vicinity. The nearest Heavy Anti-Aircraft site was located approximately 2.9km to the east. The range of a fired projectile can be up to 15km. The risk from Anti-Aircraft projectiles is homogenous to the risk from German aerial delivered ordnance.
What was the pre- and post-WWII history of the site?	Pre-war OS mapping dated 1934 shows the site to be occupied by a residential structure within the north-west, a further, unnamed structure within the middle of the site, and part of a *Laundry* along the north-east site boundary. The site is bound by further residential structures and the rest of the *Laundry* to the north, with open ground to the east, and railway line to the south and west. Post-war OS mapping dated 1955 appears to suggest no significant change to the composition of the site or surroundings.
Was the area subject to bombing during WWII?	During WWII, the site was situated within the County Borough of Manchester, which sustained an overall low density of bombing, according to official Home Office bombing statistics. This comprised 712 high explosive (HE) bombs, 18 parachute mines, seven oil bombs and one V-1 flying bomb; a total of 738 incidents across 27,255 acres resulting in an average of 27.1 items of ordnance recorded per 1,000 acres. The University of Manchester Library Bomb Maps were consulted but no positive evidence could be found to suggest that the site itself was subject to bombing, with the nearest bombing incident recorded approximately 600m north-east of the site. Likewise, no references to bombing on or in the immediate site vicinity could be found in anecdotal/published resources.
Is there any evidence of bomb damage on/close to the site?	Low-resolution 1948 aerial imagery was available for examination on this occasion. No obvious indicators of bomb damage, such as cratering, scattered earth, or indentations in the ground were observable either on or in the immediate vicinity of the site.

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To what degree would the site have been subject to access?	As the site was occupied by a mixture of features, including a residential structure, a large unnamed structure, and part of a *Laundry*, with additional structures in the vicinity, it is considered likely the site was subject to regular access. Given the lack of nearby bombing/damage, this pre-existing access is considered likely to have been maintained throughout the war.
To what degree has the site been developed post-WWII?	The site and its surroundings have seen little development post-war, other than the structure within the middle of the site having been recently demolished and the *Laundry* structure to the north having been replaced by residential structures.
What is the nature and extent of the intrusive works proposed?	The nature and extent of works proposed was not available at the time of writing.

Summary and Conclusions

During WWII, the site was situated within the County Borough of Manchester. According to official Home Office bombing statistics, the area sustained an overall low density of bombing, with an average of 27.1 bombs dropped per 1,000 acres.

No bombing incidents were recorded on or in close proximity to the site according to The University of Manchester Library Bomb Maps, with the closest bomb strikes being located approximately 600m to the north- east. This lack of bombing corroborates with the lack of on-site damage (e.g. discoloured roofing, cratering) evident within available post-war imagery dated 1948. It is likely that the site would have been subject to regular access during the war, given the structures on site and the nearby roadway/railway. This would have increased the likelihood that evidence of UXO would have been spotted, reported and dealt with.

Recommendations

Given the findings of this preliminary report, the risk from unexploded ordnance on site is not considered to be above the 'background risk' for this area of the UK. It is therefore recommended that **no further research** be undertaken for this site. Whilst it would be possible to conduct a Detailed UXO Risk Assessment to analyse local bombing records, it is not thought likely that the acquisition of such records would significantly alter the findings of this report.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.

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It should be noted that although the risk from unexploded ordnance on this site has been assessed as low/minimal, this does not mean there is 'no' risk of encountering UXO. This preliminary report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing with historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified within this report. Our reports take a common-sense and practical approach to the assessment of UXO risk, and we strive to be reasonable and pragmatic in our conclusions. As referenced, it would be possible to undertake further research into this site, but based on the evidence to hand, this is not deemed strictly necessary, and no reasonably justifiable requirement for proactive on-site mitigation has been identified.

It should however be stressed that if any suspect items are encountered during the proposed works, 1st Line Defence should be contacted for advice/assistance, and to re-assess the risk as necessary. Furthermore, we would recommend that ground personnel are always made aware of the potential for encountering UXO, what to look out for and what to do in the unlikely event that a suspect item is encountered, and that a UXO Risk Management Plan is put together for the proposed works. We would be happy to provide a template and guidance for this – contact us on 01992 245020. Should the scope of works change or additional works be proposed, 1st Line Defence should be contacted to re-evaluate the risk.

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APPENDIX 7 - CIRIA Risk Assessment Methodology

Contaminated Land Risk Assessment

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification ⇨ Hazard Assessment ⇨ Risk Estimation ⇨ Risk Evaluation

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process.

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552:

- High likelihood: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;

- Likely: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

- Low likelihood: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term;

- Unlikely: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

The severity is also classified using a system based on CIRIA C552. The terms and definitions are:

- Severe: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse;

- Medium: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve;

- Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment;
  Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

- Minor: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.
  Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

- Very high: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required;

- High: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term;

- Moderate: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;

- Low: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild;

- Very Low: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX 8 - Exploratory Hole Logs

Borehole Log

GROUNDTECH CONSULTING

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

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385015.84 - 391034.51	Hole Type WS
Location: DIDSBURY		Level: 36.33	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	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					MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
					0.50	35.83		Medium dense grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.00	D					
		1.20		N=15 (1,2/2,4,4,5)				
		2.00	D					*Becoming dense and cobbly at 2.0m bgl.*
		2.00		N=36 (5,8/8,9,10,9)				
		3.00	D					*Becoming very dense at 3.0m bgl*
		3.00		N=50 (9,13/50 for 95mm)				
					3.45	32.88		End of borehole at 3.45 m

Remarks

1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater encountered at 3.20m bgl. 4. SPT refusal at 3.45m bgl. 5. Monitoring standpipe installed to 3.0m bgl (1m plain, 2m slotted).

Borehole Log

GROUNDTECH CONSULTING

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

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385033.47 - 391014.63	Hole Type WS
Location: DIDSBURY		Level: 36.07	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	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		0.30	35.77		MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
		1.00	D					Loose grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.20		N=4 (2,1/1,1,1,1)				
								Becoming cobbly at 1.5m bgl.
		2.00 2.00	D	N=21 (5,7/6,5,5,5)				*Becoming dense from 2.0m bgl.*
	▼	3.00 3.00	D	N=17 (5,5/5,5,4,3)				
								Becoming slightly clayey at 2.0m bgl.
		3.80 3.80	D	N=50 (5,6/50 for 250mm)	3.80	32.27		End of borehole at 3.80 m

Remarks

1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. Groundwater encountered at 3.10m bgl. 4. SPT refusal at 3.8m bgl. 5. Monitoring standpipe installed to 3.8m bgl (0.8m plain, 3m slotted).

GROUNDTECH CONSULTING

Borehole Log

Borehole No. **WS03**

Sheet 1 of 1

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385047.60 - 391009.78	Hole Type WS
Location: DIDSBURY		Level: 35.99	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2002 -	Logged By CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
					0.70	35.29		MADE GROUND: Brown orange gravelly sandy cobbles of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick. Sand is fine to coarse.
					0.90	35.09		End of borehole at 0.90 m

1
2
3
4
5

Remarks

1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 0.9m bgl. 3. No groundwater encountered. 4. Concrete obstruction encountered at 0.9m bgl. 5. Hole backfilled with arisings.

Borehole Log

GROUNDTECH CONSULTING

Borehole No. **WS03A** Sheet 1 of 1

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385046.59 - 391010.03	Hole Type WS
Location: DIDSBURY		Level: 35.97	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	Logged By CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES		0.50	35.47		MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
		1.00	D					Medium dense grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.20		N=24 (3,6/6,7,6,5)				
								Becoming cobbly at 1.7m bgl.
		2.00	D					*Becoming very dense at 2.0m bgl.*
		2.00		N=50 (6,9/50 for 230mm)				
					2.45	33.52		End of borehole at 2.45 m

1 2 3 4 5

Remarks

1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. No groundwater encountered. 4. SPT refusal at 2.45m bgl. 5. Monitoring standpipe installed to 2.0m bgl (1m plain, 2m slotted).

GROUNDTECH CONSULTING

Borehole Log

Borehole No. **WS04**

Sheet 1 of 1

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385060.92 - 390991.56	Hole Type WS
Location: DIDSBURY		Level: 36.25	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	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		0.40	35.85		MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
		1.00	D					Medium dense to dense grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.20		N=31 (3,4/6,9,8,8)				
		2.00	D					*Becoming cobbly at 2.0m bgl.*
		2.00		N=28 (6,5/3,9,6,10)				
		2.70		N=50 (8,11/50 for 230mm)	2.70	33.55		End of borehole at 2.70 m

1
2
3
4
5

Remarks

1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. No groundwater encountered. 4. SPT refusal at 2.70m bgl. 5. Monitoring standpipe installed to 2.7m bgl (0.7m plain, 2m slotted).

GROUNDTECH CONSULTING

Borehole Log

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

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385053.59 - 391001.53	Hole Type WS
Location: DIDSBURY		Level: 36.26	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	Logged By CJH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
					0.50	35.76		Medium dense grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.00	D					
		1.20		N=22 (1,2/3,6,7,6)				
								Becoming very dense and cobbly at 1.7m bgl.
		1.80		N=50 (6,9/50 for 230mm)	1.80	34.46		End of borehole at 1.80 m

Remarks
1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. No groundwater encountered. 4. SPT refusal at 1.7m bgl. 5. Hole backfilled with arisings.

Borehole Log

GROUNDTECH CONSULTING

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

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385023.71 - 391028.08	Hole Type WS
Location: DIDSBURY		Level: 36.20	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD		Dates: 14/06/2022 -	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		0.40	35.80		MADE GROUND: Brown gravelly sandy topsoil with moderate cobble content of brick. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete. Sand is fine to coarse.
		1.00	D					Medium dense grey brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mixed lithologies.
		1.20		N=27 (4,4/5,6,8,8)				
								Becoming cobbly at 2.0m bgl.
		2.35		N=50 (7,10/50 for 235mm)	2.35	33.85		*Becoming very dense at 2.3m bgl.* End of borehole at 2.35 m

1 2 3 4 5

Remarks
1. Location cleared of services using hand held CAT scanner. 2. Hand dug pit to 1.2m bgl. 3. No groundwater encountered. 4. SPT refusal at 2.35m bgl. 5. Hole backfilled with arisings.

GROUNDTECH CONSULTING

Trial Pit Log

Trialpit No
SUDS1
Sheet 1 of 1

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385025.23 - 391030.07 Level: 36.07	Date 14/06/2022
Location: DIDSBURY		Dimensions (m): 2 × 0.7 Depth 2.50	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD			Logged AW

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30	35.77		MADE GROUND: Brown sandy gravelly topsoil. Sand is fine to coarse. Gravel is angular to subagular fine to coarse of mixed lithologies including brick.
	1.00	D					Grey brown gravelly fine to medium SAND with moderate cobble content of mixed lithologies. Gravel is subangular to subrounded fine to coarse of mixed lithologies.
	2.00	D					
	2.50	D		2.50	33.57		End of pit at 2.50 m

1
2
3
4
5

Remarks: 1. Location cleared with hand held CAT. 2. Pit excavated to 2.5m bgl. 3. Soil pertcolation testing carried out. 4. Pit backfilled with arisings.

Stability: Unstable

GROUNDTECH CONSULTING

Trial Pit Log

Trialpit No
SUDS2
Sheet 1 of 1

Project Name: 50 DUNDONALD ROAD	Project No. GRO-22168	Co-ords: 385046.51 - 391003.27 Level: 36.27	Date 14/06/2022
Location: DIDSBURY	Dimensions (m): Depth 2.40	1.9 / 0.5	Scale 1:25
Client: JC BRENNAN DEVELOPMENTS LTD			Logged AW

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.30	35.97		MADE GROUND: Brown sandy gravelly topsoil. Sand is fine to coarse. Gravel is angular to subagular fine to coarse of mixed lithologies including brick.
	1.00	D					Grey brown gravelly fine to medium SAND with moderate cobble content of mixed lithologies. Gravel is subangular to subrounded fine to coarse of mixed lithologies.
	2.00	D		2.40	33.87		End of pit at 2.40 m

1
2
3
4
5

Remarks: 1. Location cleared with hand held CAT. 2. Pit excavated to 2.4m bgl. 3. Soil pertcolation testing carried out. 4. Pit backfilled with arisings.

Stability: Stable

APPENDIX 9 - Geo-Environmental Testing Results

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Analytical Report Number : 22-66462

Replaces Analytical Report Number: 22-66462, issue no. 2
Client sampling date amended.

Project / Site name:	50 Dundonald Road	**Samples received on:**	21/06/2022
Your job number:	GRO 22168	**Samples instructed on/ Analysis started on:**	21/06/2022
Your order number:		**Analysis completed by:**	12/07/2022
Report Issue Number:	3	**Report issued on:**	23/08/2022
Samples Analysed:	5 soil samples		

Signed:

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

Analytical Report Number: 22-66462
Project / Site name: 50 Dundonald Road

Lab Sample Number				2322694	2322695	2322696	2322697	2322698
Sample Reference				WS01	WS02	WS03	WS04	SUDS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.20	0.10
Date Sampled				15/06/2022	15/06/2022	15/06/2022	15/06/2022	15/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	14	9	13
Total mass of sample received	kg	0.001	NONE	0.8	0.6	0.6	0.6	0.6
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	0.001
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	5.5	6.6	7.4	7	7.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	68	29	76	160	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.034	0.014	0.038	0.079	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	34.2	14.4	38.1	78.8	52.6
Organic Matter (automated)	%	0.1	MCERTS	3.5	3.4	6.6	2.1	5.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.9	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.39	16	2.1	0.62
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.3	0.4	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.53	40	3.8	1.2
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.56	29	3.7	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.29	21	1.6	0.82
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.35	17	1.6	0.67
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	22	1.8	0.85
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	10	0.74	0.47
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	19	1.6	0.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	8.6	0.71	0.39
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.3	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	8.9	0.98	0.57
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	2.12	201	19	7.6

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-66462
Project / Site name: 50 Dundonald Road

Lab Sample Number				2322694	2322695	2322696	2322697	2322698
Sample Reference				WS01	WS02	WS03	WS04	SUDS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.20	0.10
Date Sampled				15/06/2022	15/06/2022	15/06/2022	15/06/2022	15/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.9	16	16	9.1	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	1	1.9	0.6	0.8
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.6	15	35	18	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	51	66	37	56
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	91	350	79	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3	< 0.3	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	5.2	21	23	35	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	20	300	390	170	310

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

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The results included within the report relate only to the sample(s) submitted for testing.

UKAS TESTING
4041

Analytical i2 Environmental Science

Analytical Report Number: 22-66462
Project / Site name: 50 Dundonald Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2322696	WS03	0.30	130	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
2322698	SUDS2	0.10	128	Loose Fibres	**Amosite**	0.001	**0.001**

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

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

Analytical Report Number : 22-66462
Project / Site name: 50 Dundonald Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2322694	WS01	None Supplied	0.2	Brown loam and sand with gravel and vegetation.
2322695	WS02	None Supplied	0.2	Brown loam and sand with gravel.
2322696	WS03	None Supplied	0.3	Brown loam and sand with gravel and vegetation.
2322697	WS04	None Supplied	0.2	Brown sandy loam with gravel and brick.
2322698	SUDS2	None Supplied	0.1	Brown sandy loam with gravel and brick.

Analytical Report Number : 22-66462
Project / Site name: 50 Dundonald Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

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Analytical Report Number : 22-66823

Replaces Analytical Report Number: 22-66823, issue no. 1
Client sampling date amended.

Project / Site name:	50 Dundonald Road	**Samples received on:**	21/06/2022
Your job number:	GRO-22168	**Samples instructed on/ Analysis started on:**	23/06/2022
Your order number:		**Analysis completed by:**	04/07/2022
Report Issue Number:	2	**Report issued on:**	23/08/2022
Samples Analysed:	4 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 22-66823
Project / Site name: 50 Dundonald Road

Lab Sample Number				2324758	2324854	2324855	2324856
Sample Reference				SUDS2	WS01	SUDS1	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	2.00	2.50	1.00
Date Sampled				15/06/2022	15/06/2022	15/06/2022	15/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	26	27	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	3.9	4.7	4	4.2
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.8	0.4
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	DSA	N/A	N/A	N/A
General Inorganics							
pH - Automated	pH Units	N/A	MCERTS	7.9	7.9	8.4	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.019	0.02	0.014
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.2	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	0.5	-	-	-
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	-	-

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Analytical Report Number: 22-66823
Project / Site name: 50 Dundonald Road

Lab Sample Number				2324758	2324854	2324855	2324856
Sample Reference				SUDS2	WS01	SUDS1	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	2.00	2.50	1.00
Date Sampled				15/06/2022	15/06/2022	15/06/2022	15/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.7	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.4	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.6	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	5.1	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-	-

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

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Analytical Report Number : 22-66823
Project / Site name: 50 Dundonald Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2324758	SUDS2	None Supplied	0.1	Brown sand with gravel and stones.
2324854	WS01	None Supplied	2	Brown sand with gravel and stones.
2324855	SUDS1	None Supplied	2.5	Light brown sand with gravel.
2324856	WS04	None Supplied	1	Brown sand with gravel and vegetation.

Analytical Report Number : 22-66823
Project / Site name: 50 Dundonald Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

Sample Deviation Report

Analytical Report Number : 22-66823
Project / Site name: 50 Dundonald Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SUDS2	None Supplied	S	2324758	bc	Monohydric phenols in soil	L080-PL	b
SUDS2	None Supplied	S	2324758	bc	Speciated EPA-16 PAHs in soil	L064-PL	b
SUDS2	None Supplied	S	2324758	bc	Total cyanide in soil	L080-PL	c

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

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Analytical Report Number : 22-75727

Replaces Analytical Report Number: 22-75727, issue no. 1
Client sampling date amended.

Project / Site name:	50 Dundonald Road	**Samples received on:**	03/08/2022
Your job number:	GRO-22168	**Samples instructed on/ Analysis started on:**	03/08/2022
Your order number:		**Analysis completed by:**	22/08/2022
Report Issue Number:	2	**Report issued on:**	23/08/2022
Samples Analysed:	2 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

Analytical Report Number: 22-75727
Project / Site name: 50 Dundonald Road

Lab Sample Number				2375739	2375740
Sample Reference				WS02	WS04
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				01/08/2022	01/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	2.3
Total mass of sample received	kg	0.001	NONE	0.7	0.7
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	9.4	8.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	38	36
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.018
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.9	18.1
Organic Matter (automated)	%	0.1	MCERTS	0.3	3.6
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.8	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.7
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	3.7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	2.2	5.3
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.9	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	8.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	27	97

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-75727
Project / Site name: 50 Dundonald Road

Lab Sample Number				2375739	2375740
Sample Reference				WS02	WS04
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				01/08/2022	01/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	14
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	37
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	260
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	390
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	690
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	18
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	31
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	140
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	520
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	710

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

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

Analytical Report Number : 22-75727
Project / Site name: 50 Dundonald Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2375739	WS02	None Supplied	0.2	Light brown sand.
2375740	WS04	None Supplied	0.2	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 22-75727
Project / Site name: 50 Dundonald Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

Analytical Report Number : 22-75727
Project / Site name: 50 Dundonald Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

APPENDIX 10 - Interim Permanent Gas Monitoring Results

PERMANENT GROUND GAS MONITORING FORM

GROUNDTECH CONSULTING

SITE NAME:	*50 DUNDONALD ROAD, DIDSBURY*				***ENGINEER:***	*William Sandiford Mitchell*						
CLIENT:	*BRENNAN CONSULT*				***DATE:***	*14/07/2022*						
JOB NO:	*GRO-22168*											
Pressure Trend:	*Steady*	***Weather:***	*Overcast*			***Equipment:***	*GFM 436*					

Ambient:	O_2 (%v/v)	CH_4 (%v/v)	CO_2 (%v/v)	LEL	H_2S (ppm)	CO (ppm)
Start	20.8	0.0	0.0	0.0	0.0	0.0
Finish	20.8	0.0	0.0	0.0	0.0	0.0

BH Ref.	Gas Flow Rate (l/hr)		Borehole Pressure (mb)	Methane (%v/v)			Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)		Carbon Monoxide (ppm)		Q_{hg} CO_2 (l/hr)	Q_{hg} CH_4 (l/hr)	Atmos Press (mb)	PID (ppm)	Sheen (Y/N)	LNAPL (Y/N)	DNAPL (Y/N)	Depth to Water (m bgl)
	Peak	Steady		Peak	Steady	LEL	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady								
WS01	0.0	0.0	0.00	0.0	0.0	0.0	4.3	4.8	16.9	16.2	0.0	0.0	0.0	0.0	0.0043	0.0000	1020	-	N	N/A	N/A	NGW
WS02	0.0	0.0	0.00	0.0	0.0	0.0	0.8	0.8	20.3	20.2	0.0	0.0	0.0	0.0	0.0008	0.0000	1019	-	N	N/A	N/A	3.17
WS03A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WS04	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000	0.0000	0	-	N	N/A	N/A	NGW

Notes:

APPENDIX 11 - Soil Percolation Testing Results

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

GROUNDTECH CONSULTING

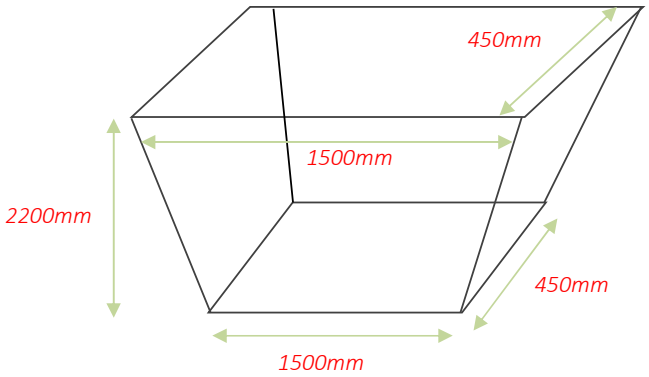
Date of Test: 14/06/2022

POSITION: SuDS1
TEST 1

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	1820
1	1840
2	1860
3	1880
5	1940
10	2040
15	2070
20	2090
30	2130
40	2180
50	2200

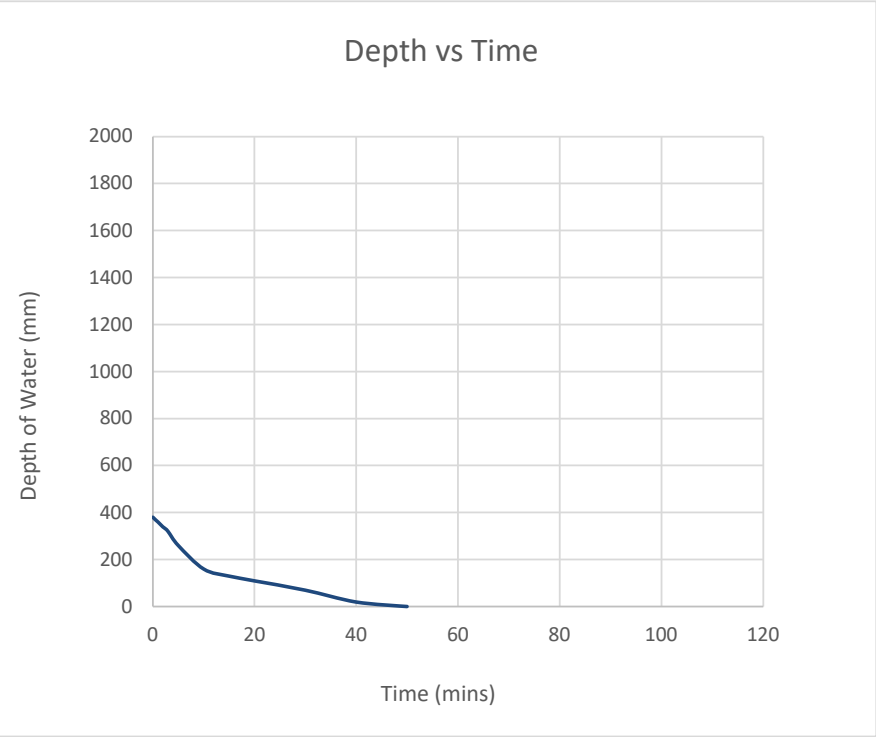
Pit Depth (mm):	2200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 1



Volume of Pit (m^3)	1.485
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.2565

Compliancy Check:

Water Level at 75% effective depth (mm)	285
Water Level at 25% effective depth (mm)	95

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	285
Water Level 2	95
Time to Drain from Level 1 to Level 2 (mins)	21
Volume of water discharged (m^3)	0.12825
Discharge Area (m^2)	1.416
Soil Infiltration Rate (m/min)	0.004313
Soil Infiltration Rate (m/sec)	***7.19E-05***

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

GROUNDTECH CONSULTING

Sheet 1 of 2

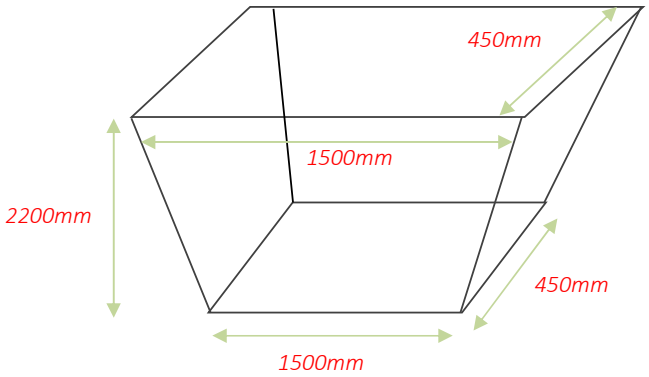
Date of Test: 14/06/2022

POSITION: SuDS1
TEST 2

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	1810
1	1830
2	1850
3	1880
5	1950
10	2030
15	2060
20	2080
30	2140
40	2160
45	2200

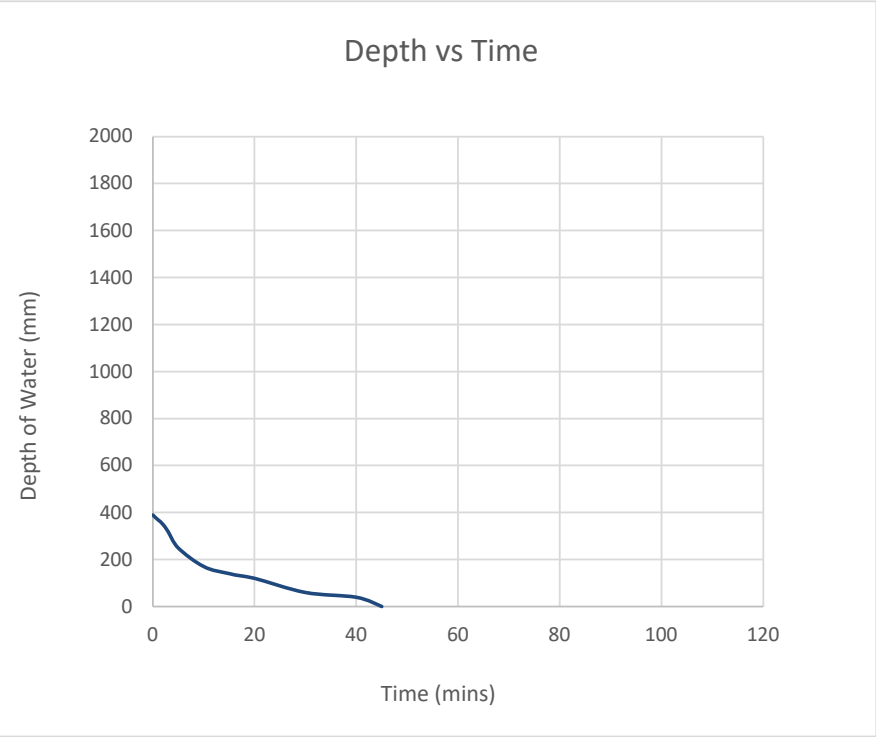
Pit Depth (mm):	2200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 2



Volume of Pit (m^3)	1.485
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.26325

Compliancy Check:

Water Level at 75% effective depth (mm)	292.5
Water Level at 25% effective depth (mm)	97.5

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	292.5
Water Level 2	97.5
Time to Drain from Level 1 to Level 2 (mins)	21
Volume of water discharged (m^3)	0.131625
Discharge Area (m^2)	1.4355
Soil Infiltration Rate (m/min)	0.0043663
Soil Infiltration Rate (m/sec)	***7.28E-05***

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

GROUNDTECH CONSULTING

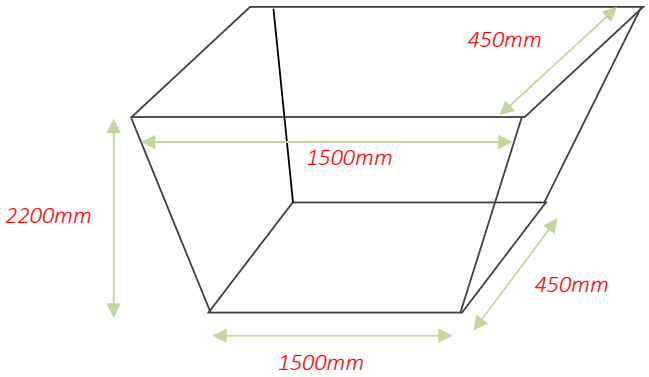
Date of Test: 14/06/2022

POSITION: SuDS1
TEST 3

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	1800
1	1820
2	1850
3	1870
5	1920
10	1990
15	2040
20	2070
30	2150
40	2190
42	2200

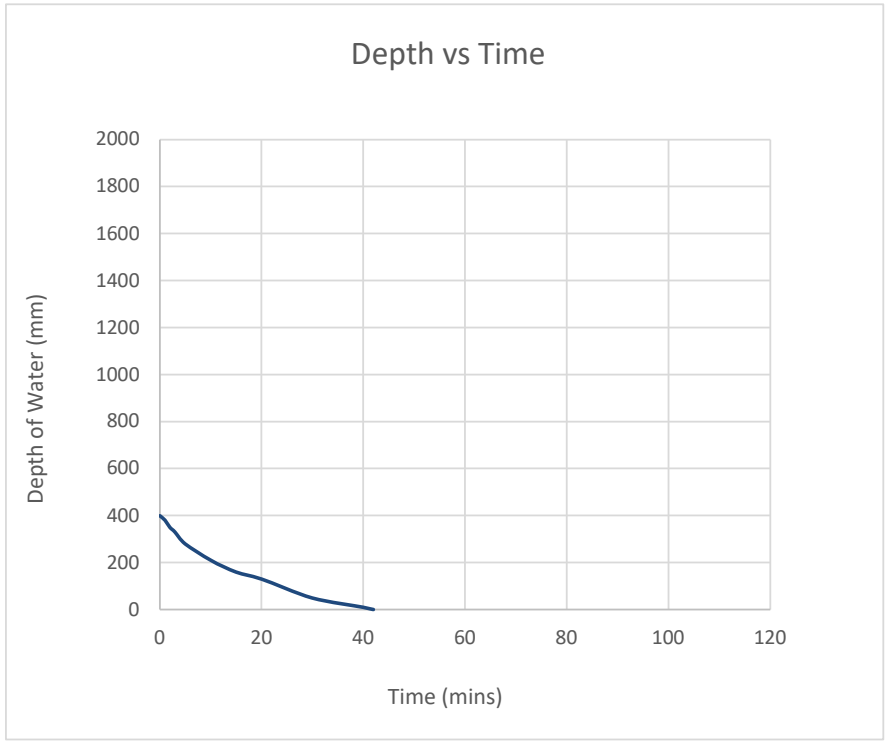
Pit Depth (mm):	2200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 3



Volume of Pit (m^3)	1.485
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.27

Compliancy Check:

Water Level at 75% effective depth (mm)	300
Water Level at 25% effective depth (mm)	100

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	300
Water Level 2	100
Time to Drain from Level 1 to Level 2 (mins)	19
Volume of water discharged (m^3)	0.135
Discharge Area (m^2)	1.455
Soil Infiltration Rate (m/min)	0.0048833
Soil Infiltration Rate (m/sec)	***8.14E-05***

DUNDONALD ROAD, DIDSBURY
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SOIL PERCOLATION TEST

Sheet 1 of 2

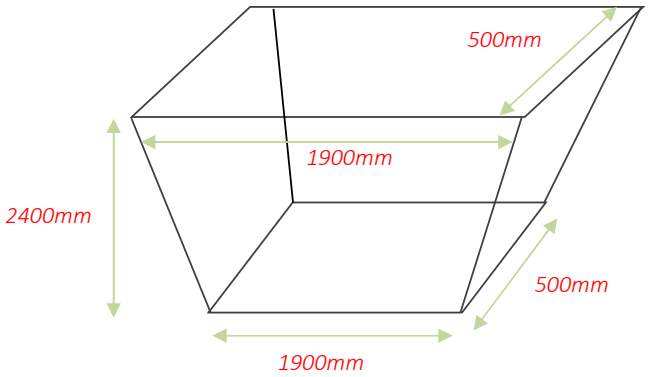
Date of Test: 14/06/2022

POSITION: SuDS2
TEST 1

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	2010
1	2040
2	2070
3	2120
5	2160
10	2220
15	2280
20	2340
30	2360
40	2360
50	2380
60	2400

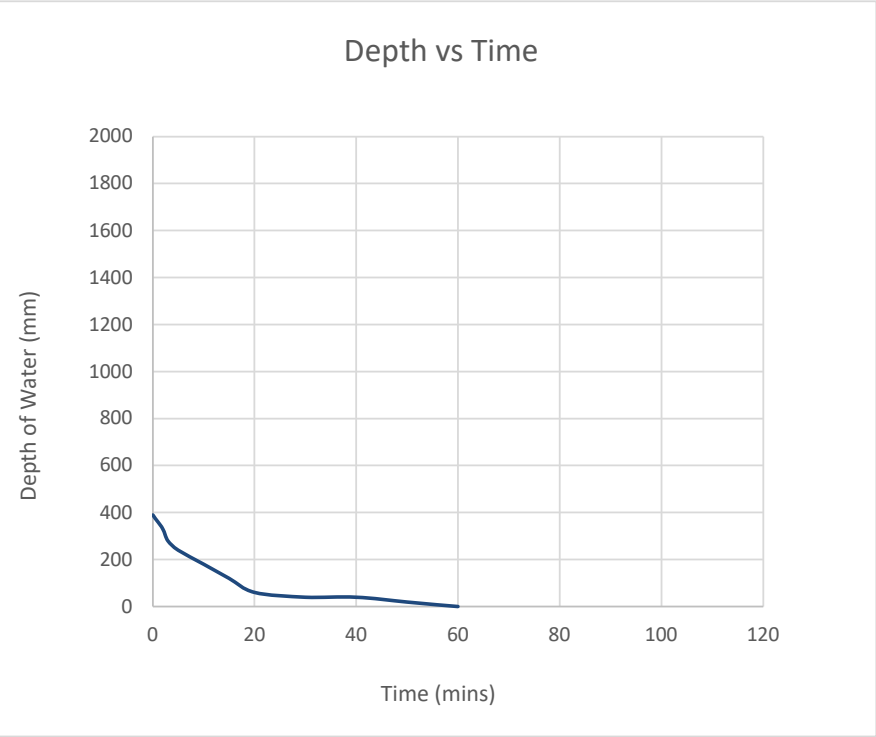
Pit Depth (mm):	2400
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 1



Volume of Pit (m^3)	2.28
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.3705

Compliancy Check:

Water Level at 75% effective depth (mm)	292.5
Water Level at 25% effective depth (mm)	97.5

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	292.5
Water Level 2	97.5
Time to Drain from Level 1 to Level 2 (mins)	14
Volume of water discharged (m^3)	0.18525

Discharge Area (m^2)	1.886
Soil Infiltration Rate (m/min)	0.007016
Soil Infiltration Rate (m/sec)	***1.17E-04***

DUNDONALD ROAD, DIDSBURY
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SOIL PERCOLATION TEST

GROUNDTECH CONSULTING

Sheet 1 of 2

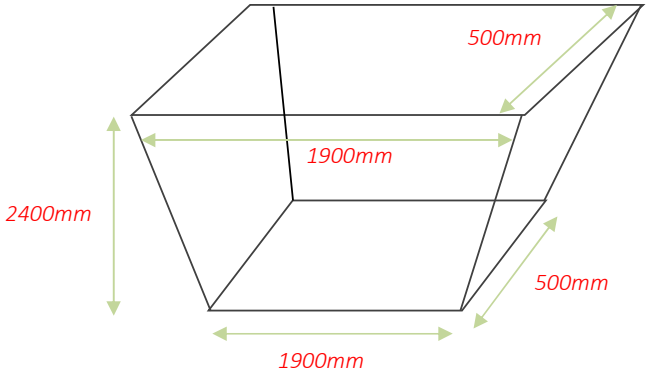
Date of Test: 14/06/2022

POSITION: SuDS2
TEST 2

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	2000
1	2020
2	2060
3	2110
5	2150
10	2230
15	2270
20	2360
30	2380
40	2390
50	2400

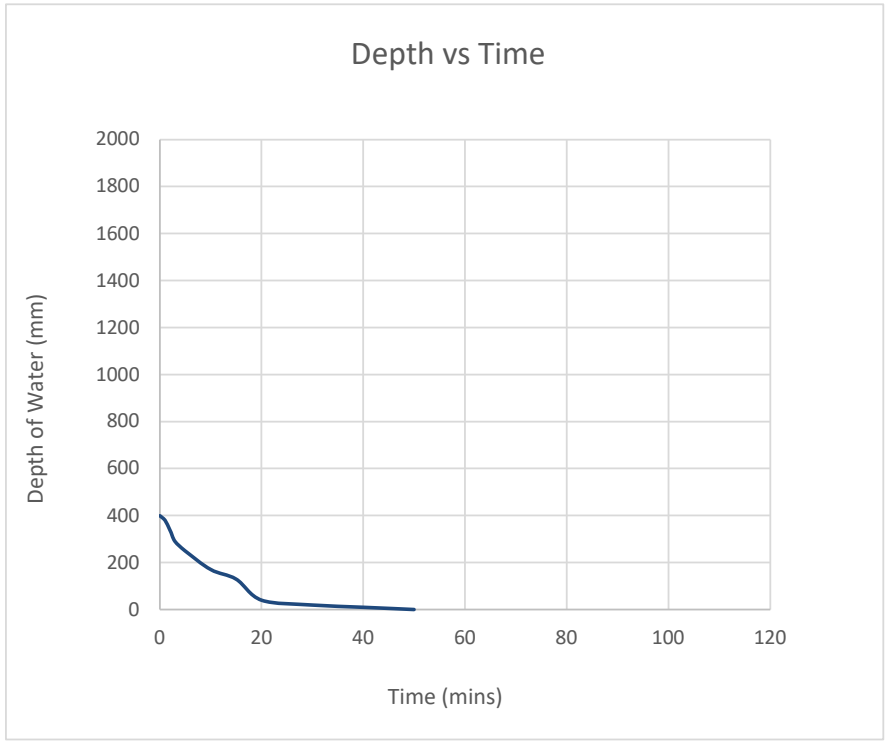
Pit Depth (mm):	2400
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 2



Volume of Pit (m^3)	2.28
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.38

Compliancy Check:

Water Level at 75% effective depth (mm)	300
Water Level at 25% effective depth (mm)	100

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	300
Water Level 2	100
Time to Drain from Level 1 to Level 2 (mins)	14
Volume of water discharged (m^3)	0.19
Discharge Area (m^2)	1.91
Soil Infiltration Rate (m/min)	0.0071055
Soil Infiltration Rate (m/sec)	***1.18E-04***

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SOIL PERCOLATION TEST

GROUNDTECH CONSULTING

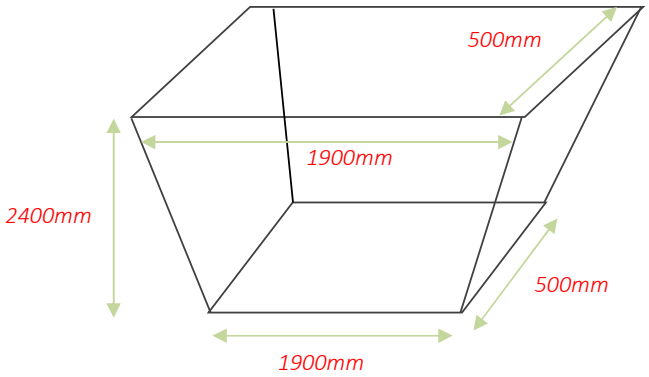
Date of Test: 14/06/2022

POSITION: SuDS2
TEST 3

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Test Data

Time Elapsed (mins)	Depth to Water Level (mm)
0	1990
1	2030
2	2050
3	2100
5	2160
10	2230
15	2270
20	2360
30	2380
40	2400

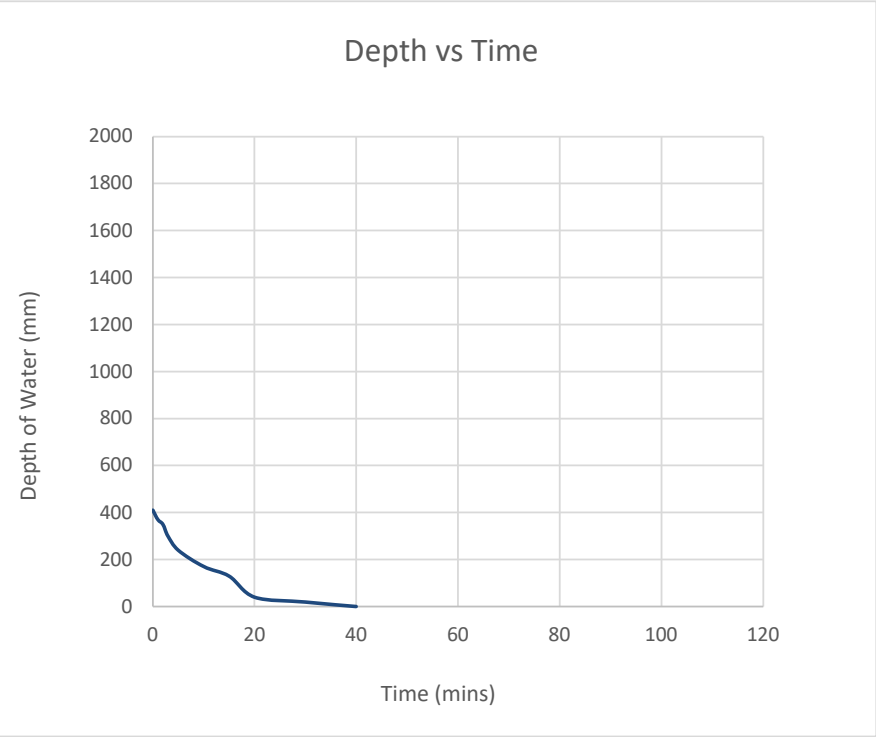
Pit Depth (mm):	2400
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

DUNDONALD ROAD, DIDSBURY
GRO-22168
JC BRENNAN DEVELOPMENT LTD

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 3



Volume of Pit (m^3)	2.28
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.3895

Compliancy Check:

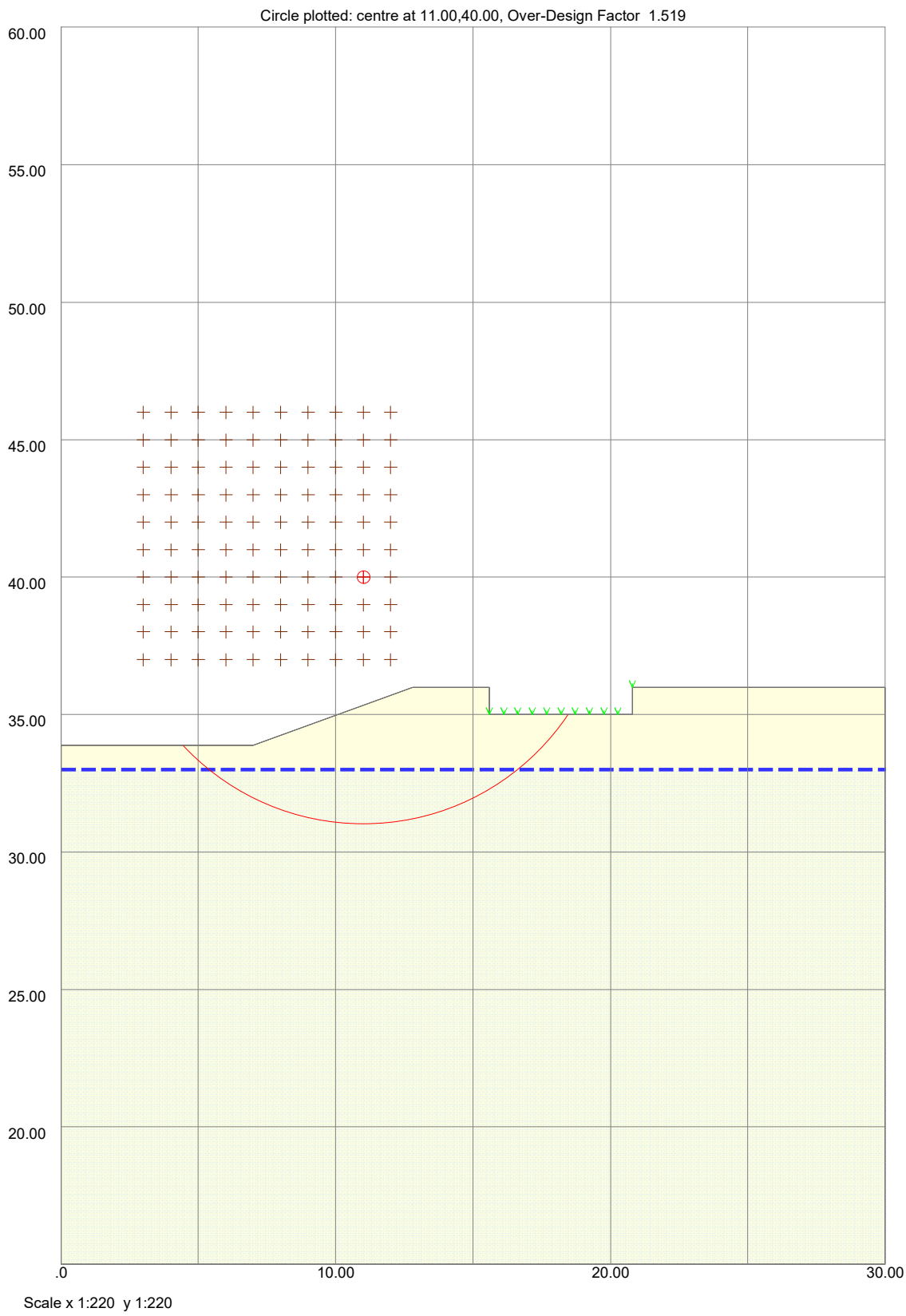
Water Level at 75% effective depth (mm)	307.5
Water Level at 25% effective depth (mm)	102.5

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	307.5
Water Level 2	102.5
Time to Drain from Level 1 to Level 2 (mins)	14
Volume of water discharged (m^3)	0.19475
Discharge Area (m^2)	1.934
Soil Infiltration Rate (m/min)	0.0071927
Soil Infiltration Rate (m/sec)	***1.20E-04***

APPENDIX 12 - Preliminary Slope Stability Assessment


Circle plotted: centre at 11.00,40.00, Over-Design Factor 1.519
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
.0
10.00
20.00
30.00
Scale x 1:220 y 1:220

General Parameters
Direction of slip: DOWNHILL
Minimum slip weight [kN/m] : 50.00000
Type of analysis : STATIC

Analysis Options
Partial Factor Analysis
Minimum number of slices: 25
Method: Bishop (Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NOT ACTIVE

Method Partial Factors
Current selection: BS EN 1997-1:2011 DA1-2
Factor on FAVOURABLE PERMANENT LOAD: 1.00000
Factor on UNFAVOURABLE PERMANENT LOAD: 1.00000
Factor on FAVOURABLE VARIABLE LOAD: 0.00000
Factor on UNFAVOURABLE VARIABLE LOAD: 1.30000
Factor on SOIL UNIT WEIGHT: 1.00000
Factor on DRAINED SOIL COHESION: 1.25000
Factor on UNDRAINED SOIL COHESION: 1.40000
Factor on SOIL FRICTION ANGLE: 1.25000
Factor on reinforcement pullout: 1.50000
Economic ramification of failure: 1.00000
Sliding along reinforcement: 1.50000

Material properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Sand	18.000	19.000	Drained - linear strength	32.000	0.0

Coordinates of top of soil strata

The units of the following coordinates are in m

Stratum	X -->						
	0.0	5.0000	7.0000	12.800	15.600	15.600	20.800
1	33.890	33.890	33.890	36.000	36.000	35.000	35.000
GW Profile 1	33.000	.	.	.	.	.	.

Stratum	X -->	
	20.800	24.900
1	36.000	36.000
GW Profile 1	. 33.000	

Piezometers

Stratum-linked data

No.	Material	Water table	Piezo Set/ Ru value
1	Sand	GW Profile 1	-

Surface Loads

No.	Limits of loaded area X1 [m]	X2 [m]	Distributed load Vert [kN/m²]	Horiz [kN/m²]	Permanent / Variable load	Favourable / UnFavourable load	Use in pull-out calc
1	15.600	20.800	150.00	0.0	Permanent	UnFavourable	No

Slip Surface Specification
Circle centre specification: GRID
Bottom left of grid: x = 3.00000 m y = 37.00000 m
Inclination of grid: 0.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 10 in x direction at 1.00000m spacing
10 in y direction at 1.00000m spacing
Initial radius of circle 7.00000 m
Incremented by 1.00000 m until all possible circles considered

RESULTS OF ANALYSIS
In the following tables, values in italics are factored values
using the currently selected Method Partial Factors.

Slip Centre x [m]	Slip Centre y [m]	Radius [m]	Slip Weight [kN/m]	Comment/ Over-Design Factor	Disturbing Moment [kNm/m]	Soil Strength Restoring Moment [kNm/m]	Reinforcement Restoring Moment [kNm/m]
3.0000	37.000	7.0000		Only 1 intersection			
3.0000	38.000	7.0000		Only 1 intersection			
3.0000	39.000	7.0000		Only 1 intersection			
3.0000	40.000	7.0000		Only 1 intersection			
3.0000	41.000	7.0000		Radius too small			
3.0000	41.000	8.0000		Only 1 intersection			
3.0000	42.000	7.0000		Radius too small			
3.0000	42.000	8.0000		Radius too small			
3.0000	42.000	9.0000		Only 1 intersection			
3.0000	43.000	7.0000		Radius too small			
3.0000	43.000	8.0000		Radius too small			
3.0000	43.000	9.0000		Radius too small			
3.0000	43.000	10.000		Only 1 intersection			
3.0000	44.000	7.0000		Radius too small			
3.0000	44.000	8.0000		Radius too small			
3.0000	44.000	9.0000		Radius too small			
3.0000	44.000	10.000		Radius too small			
3.0000	44.000	11.000		Only 1 intersection			
3.0000	45.000	7.0000		Radius too small			
3.0000	45.000	8.0000		Radius too small			
3.0000	45.000	9.0000		Radius too small			
3.0000	45.000	10.000		Radius too small			
3.0000	45.000	11.000		Radius too small			
3.0000	45.000	12.000		Only 1 intersection			
3.0000	46.000	7.0000		Radius too small			
3.0000	46.000	8.0000		Radius too small			
3.0000	46.000	9.0000		Radius too small			
3.0000	46.000	10.000		Radius too small			
3.0000	46.000	11.000		Radius too small			
3.0000	46.000	12.000		Radius too small			
3.0000	46.000	13.000		Only 1 intersection			
4.0000	37.000	7.0000		Only 1 intersection			
4.0000	38.000	7.0000		Only 1 intersection			
4.0000	39.000	7.0000		Only 1 intersection			
4.0000	40.000	7.0000	*75.235*		55.191 4.9092	*270.94*	*0.0*
4.0000	40.000	8.0000		Only 1 intersection			
4.0000	41.000	7.0000		Radius too small			
4.0000	41.000	8.0000	*82.975*		23.202 14.702	*341.13*	*0.0*
4.0000	41.000	9.0000		Only 1 intersection			
4.0000	42.000	7.0000		Radius too small			
4.0000	42.000	8.0000		Radius too small			
4.0000	42.000	9.0000	*91.543*		13.709 30.869	*423.19*	*0.0*
4.0000	42.000	10.000		Only 1 intersection			
4.0000	43.000	7.0000		Radius too small			
4.0000	43.000	8.0000		Radius too small			
4.0000	43.000	9.0000		Radius too small			
4.0000	43.000	10.000		Only 1 intersection			
4.0000	44.000	7.0000		Radius too small			
4.0000	44.000	8.0000		Radius too small			
4.0000	44.000	9.0000		Radius too small			
4.0000	44.000	10.000		Radius too small			
4.0000	44.000	11.000		Only 1 intersection			
4.0000	45.000	7.0000		Radius too small			
4.0000	45.000	8.0000		Radius too small			
4.0000	45.000	9.0000		Radius too small			
4.0000	45.000	10.000		Radius too small			
4.0000	45.000	11.000		Radius too small			
4.0000	45.000	12.000		Only 1 intersection			
4.0000	46.000	7.0000		Radius too small			
4.0000	46.000	8.0000		Radius too small			
4.0000	46.000	9.0000		Radius too small			
4.0000	46.000	10.000		Radius too small			
4.0000	46.000	11.000		Radius too small			
4.0000	46.000	12.000		Radius too small			
4.0000	46.000	13.000		Only 1 intersection			
5.0000	37.000	7.0000		Only 1 intersection			
5.0000	38.000	7.0000		Only 1 intersection			
5.0000	39.000	7.0000	*265.57*		5.1458 160.52	*826.01*	*0.0*
5.0000	39.000	8.0000		Only 1 intersection			
5.0000	40.000	7.0000	*87.866*		6.5639 48.717	*319.77*	*0.0*
5.0000	40.000	8.0000		Only 1 intersection			
5.0000	41.000	7.0000		Radius too small			
5.0000	41.000	8.0000	*99.827*		5.2674 78.579	*413.91*	*0.0*
5.0000	41.000	9.0000		Only 1 intersection			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
5.0000 42.000	7.0000		Radius too small			
5.0000 42.000	8.0000		Radius too small			
5.0000 42.000	9.0000	*112.63*	4.4571	117.50	*523.72*	*0.0*
5.0000 42.000	10.000		Only 1 intersection			
5.0000 43.000	7.0000		Radius too small			
5.0000 43.000	8.0000		Radius too small			
5.0000 43.000	9.0000		Radius too small			
5.0000 43.000	10.000	*126.25*	3.9060	166.48	*650.28*	*0.0*
5.0000 43.000	11.000		Only 1 intersection			
5.0000 44.000	7.0000		Radius too small			
5.0000 44.000	8.0000		Radius too small			
5.0000 44.000	9.0000		Radius too small			
5.0000 44.000	10.000		Radius too small			
5.0000 44.000	11.000	*140.76*	3.5118	226.40	*795.07*	*0.0*
5.0000 44.000	12.000		Only 1 intersection			
5.0000 45.000	7.0000		Radius too small			
5.0000 45.000	8.0000		Radius too small			
5.0000 45.000	9.0000		Radius too small			
5.0000 45.000	10.000		Radius too small			
5.0000 45.000	11.000		Radius too small			
5.0000 45.000	12.000	*156.08*	3.2218	297.59	*958.76*	*0.0*
5.0000 45.000	13.000		Only 1 intersection			
5.0000 46.000	7.0000		Radius too small			
5.0000 46.000	8.0000		Radius too small			
5.0000 46.000	9.0000		Radius too small			
5.0000 46.000	10.000		Radius too small			
5.0000 46.000	11.000		Radius too small			
5.0000 46.000	12.000		Radius too small			
5.0000 46.000	13.000	*171.07*	3.0543	371.50	*1134.7*	*0.0*
5.0000 46.000	14.000		Only 1 intersection			
6.0000 37.000	7.0000		Only 1 intersection			
6.0000 38.000	7.0000	*515.24*	3.7323	403.62	*1506.4*	*0.0*
6.0000 38.000	8.0000		Only 1 intersection			
6.0000 39.000	7.0000	*295.64*	3.4304	274.38	*941.24*	*0.0*
6.0000 39.000	8.0000		Only 1 intersection			
6.0000 40.000	7.0000	*111.30*	3.2254	125.69	*405.41*	*0.0*
6.0000 40.000	8.0000	*330.59*	3.1547	380.32	*1199.8*	*0.0*
6.0000 40.000	9.0000		Only 1 intersection			
6.0000 41.000	7.0000		Radius too small			
6.0000 41.000	8.0000	*127.55*	2.9528	178.75	*527.80*	*0.0*
6.0000 41.000	9.0000	*363.88*	3.0092	492.11	*1480.8*	*0.0*
6.0000 41.000	10.000		Only 1 intersection			
6.0000 42.000	7.0000		Radius too small			
6.0000 42.000	8.0000		Weight too small			
6.0000 42.000	9.0000	*144.62*	2.7490	243.63	*669.72*	*0.0*
6.0000 42.000	10.000	*395.16*	2.9494	603.87	*1781.1*	*0.0*
6.0000 42.000	11.000		Only 1 intersection			
6.0000 43.000	7.0000		Radius too small			
6.0000 43.000	8.0000		Radius too small			
6.0000 43.000	9.0000		Weight too small			
6.0000 43.000	10.000	*161.97*	2.6148	317.17	*829.33*	*0.0*
6.0000 43.000	11.000		Only 1 intersection			
6.0000 44.000	7.0000		Radius too small			
6.0000 44.000	8.0000		Radius too small			
6.0000 44.000	9.0000		Radius too small			
6.0000 44.000	10.000		Weight too small			
6.0000 44.000	11.000	*178.43*	2.5594	390.99	*1000.7*	*0.0*
6.0000 44.000	12.000		Only 1 intersection			
6.0000 45.000	7.0000		Radius too small			
6.0000 45.000	8.0000		Radius too small			
6.0000 45.000	9.0000		Radius too small			
6.0000 45.000	10.000		Radius too small			
6.0000 45.000	11.000		Weight too small			
6.0000 45.000	12.000	*194.08*	2.5460	464.74	*1183.2*	*0.0*
6.0000 45.000	13.000		Only 1 intersection			
6.0000 46.000	7.0000		Radius too small			
6.0000 46.000	8.0000		Radius too small			
6.0000 46.000	9.0000		Radius too small			
6.0000 46.000	10.000		Radius too small			
6.0000 46.000	11.000		Radius too small			
6.0000 46.000	12.000		Weight too small			
6.0000 46.000	13.000	*209.03*	2.5563	538.52	*1376.6*	*0.0*
6.0000 46.000	14.000		Only 1 intersection			
7.0000 37.000	7.0000	*794.29*	3.5596	629.32	*2240.1*	*0.0*
7.0000 37.000	8.0000		Only 1 intersection			
7.0000 38.000	7.0000	*553.18*	3.0955	532.51	*1648.4*	*0.0*
7.0000 38.000	8.0000	*874.72*	3.4303	816.96	*2802.4*	*0.0*
7.0000 38.000	9.0000		Only 1 intersection			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
7.0000 39.000	7.0000	*332.69*	2.7078	397.67	*1076.8*	*0.0*
7.0000 39.000	8.0000	*609.26*	3.0194	682.15	*2059.7*	*0.0*
7.0000 39.000	9.0000		Only 1 intersection			
7.0000 40.000	7.0000	*144.24*	2.3191	224.89	*521.54*	*0.0*
7.0000 40.000	8.0000	*368.57*	2.6587	509.41	*1354.4*	*0.0*
7.0000 40.000	9.0000	*661.27*	3.0026	831.86	*2497.8*	*0.0*
7.0000 40.000	10.000		Only 1 intersection			
7.0000 41.000	7.0000		Weight too small			
7.0000 41.000	8.0000	*164.06*	2.2545	298.61	*673.21*	*0.0*
7.0000 41.000	9.0000	*401.83*	2.6598	621.11	*1652.1*	*0.0*
7.0000 41.000	10.000		Only 1 intersection			
7.0000 42.000	7.0000		Radius too small			
7.0000 42.000	8.0000		Weight too small			
7.0000 42.000	9.0000	*182.53*	2.2500	372.42	*837.96*	*0.0*
7.0000 42.000	10.000	*433.14*	2.6875	732.96	*1969.8*	*0.0*
7.0000 42.000	11.000		Only 1 intersection			
7.0000 43.000	7.0000		Radius too small			
7.0000 43.000	8.0000		Radius too small			
7.0000 43.000	9.0000		Weight too small			
7.0000 43.000	10.000	*199.91*	2.2755	446.23	*1015.4*	*0.0*
7.0000 43.000	11.000	*462.71*	2.7303	844.75	*2306.4*	*0.0*
7.0000 43.000	12.000		Only 1 intersection			
7.0000 44.000	7.0000		Radius too small			
7.0000 44.000	8.0000		Radius too small			
7.0000 44.000	9.0000		Radius too small			
7.0000 44.000	10.000		Weight too small			
7.0000 44.000	11.000	*216.39*	2.3174	520.03	*1205.1*	*0.0*
7.0000 44.000	12.000	*488.23*	2.8280	934.68	*2643.3*	*0.0*
7.0000 44.000	13.000		Only 1 intersection			
7.0000 45.000	7.0000		Radius too small			
7.0000 45.000	8.0000		Radius too small			
7.0000 45.000	9.0000		Radius too small			
7.0000 45.000	10.000		Radius too small			
7.0000 45.000	11.000		Weight too small			
7.0000 45.000	12.000	*232.08*	2.3681	593.92	*1406.5*	*0.0*
7.0000 45.000	13.000	*509.42*	2.9858	996.15	*2974.3*	*0.0*
7.0000 45.000	14.000		Only 1 intersection			
7.0000 46.000	7.0000		Radius too small			
7.0000 46.000	8.0000		Radius too small			
7.0000 46.000	9.0000		Radius too small			
7.0000 46.000	10.000		Radius too small			
7.0000 46.000	11.000		Radius too small			
7.0000 46.000	12.000	*52.169*	1.5392	194.90	*299.99*	*0.0*
7.0000 46.000	13.000	*247.01*	2.4243	667.66	*1618.6*	*0.0*
7.0000 46.000	14.000		Only 1 intersection			
8.0000 37.000	7.0000	*832.31*	3.3014	720.63	*2379.1*	*0.0*
8.0000 37.000	8.0000	*1189.3*	3.3706	1125.7	*3794.2*	*0.0*
8.0000 37.000	9.0000		Only 1 intersection			
8.0000 38.000	7.0000	*591.19*	2.8627	623.64	*1785.3*	*0.0*
8.0000 38.000	8.0000	*911.19*	3.2872	896.45	*2946.8*	*0.0*
8.0000 38.000	9.0000		Only 1 intersection			
8.0000 39.000	7.0000	*370.67*	2.4789	488.74	*1211.5*	*0.0*
8.0000 39.000	8.0000	*647.24*	2.8629	773.21	*2213.6*	*0.0*
8.0000 39.000	9.0000	*972.37*	2.5247	1522.9	*3844.8*	*0.0*
8.0000 39.000	10.000		Only 1 intersection			
8.0000 40.000	7.0000	*182.20*	2.0694	315.95	*653.83*	*0.0*
8.0000 40.000	8.0000	*406.51*	2.5087	600.53	*1506.6*	*0.0*
8.0000 40.000	9.0000	*693.79*	2.9911	880.66	*2634.1*	*0.0*
8.0000 40.000	10.000	*1030.6*	2.0893	2365.1	*4941.4*	*0.0*
8.0000 40.000	11.000		Only 1 intersection			
8.0000 41.000	7.0000		Weight too small			
8.0000 41.000	8.0000	*202.06*	2.1131	389.82	*823.73*	*0.0*
8.0000 41.000	9.0000	*439.84*	2.5586	712.31	*1822.6*	*0.0*
8.0000 41.000	10.000	*731.35*	2.3973	1409.3	*3378.6*	*0.0*
8.0000 41.000	11.000		Only 1 intersection			
8.0000 42.000	7.0000		Radius too small			
8.0000 42.000	8.0000	*56.534*	1.5277	142.81	*218.18*	*0.0*
8.0000 42.000	9.0000	*220.53*	2.1723	463.60	*1007.1*	*0.0*
8.0000 42.000	10.000	*467.73*	2.6779	798.39	*2138.1*	*0.0*
8.0000 42.000	11.000	*767.57*	2.0543	2075.8	*4264.3*	*0.0*
8.0000 42.000	12.000		Only 1 intersection			
8.0000 43.000	7.0000		Radius too small			
8.0000 43.000	8.0000		Radius too small			
8.0000 43.000	9.0000	*65.093*	1.5830	178.80	*283.04*	*0.0*
8.0000 43.000	10.000	*237.91*	2.2392	537.42	*1203.4*	*0.0*
8.0000 43.000	11.000	*489.79*	2.8750	850.80	*2446.1*	*0.0*

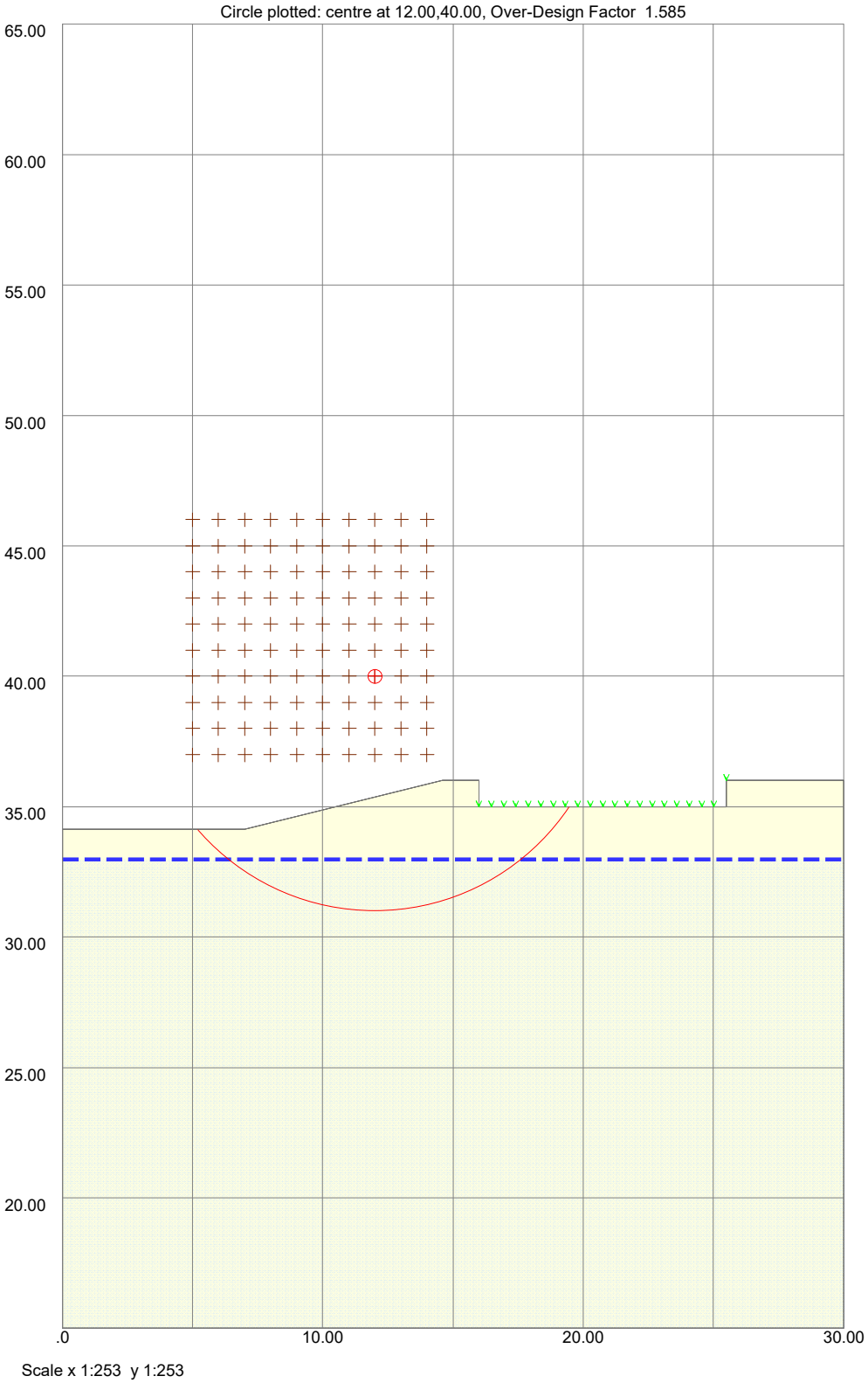
Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
8.0000 43.000	12.000	*801.66*	1.8979	2740.2	*5200.7*	*0.0*
8.0000 43.000	13.000		Only 1 intersection			
8.0000 44.000	7.0000		Radius too small			
8.0000 44.000	8.0000		Radius too small			
8.0000 44.000	9.0000		Radius too small			
8.0000 44.000	10.000	*73.145*	1.6488	214.76	*354.10*	*0.0*
8.0000 44.000	11.000	*254.37*	2.3101	611.22	*1412.0*	*0.0*
8.0000 44.000	12.000	*509.49*	2.3879	1287.0	*3073.2*	*0.0*
8.0000 44.000	13.000		Only 1 intersection			
8.0000 45.000	7.0000		Radius too small			
8.0000 45.000	8.0000		Radius too small			
8.0000 45.000	9.0000		Radius too small			
8.0000 45.000	10.000		Radius too small			
8.0000 45.000	11.000	*80.783*	1.7192	250.74	*431.08*	*0.0*
8.0000 45.000	12.000	*268.24*	2.4151	671.24	*1621.1*	*0.0*
8.0000 45.000	13.000	*528.52*	2.1239	1781.9	*3784.6*	*0.0*
8.0000 45.000	14.000		Only 1 intersection			
8.0000 46.000	7.0000		Radius too small			
8.0000 46.000	8.0000		Radius too small			
8.0000 46.000	9.0000		Radius too small			
8.0000 46.000	10.000		Radius too small			
8.0000 46.000	11.000		Radius too small			
8.0000 46.000	12.000	*88.065*	1.7916	286.73	*513.70*	*0.0*
8.0000 46.000	13.000	*279.65*	2.5493	717.29	*1828.6*	*0.0*
8.0000 46.000	14.000	*547.65*	1.9909	2282.8	*4544.8*	*0.0*
8.0000 46.000	15.000		Only 1 intersection			
9.0000 37.000	7.0000	*864.75*	3.0275	844.18	*2555.7*	*0.0*
9.0000 37.000	8.0000	*1208.1*	2.1646	2110.6	*4568.7*	*0.0*
9.0000 37.000	9.0000	*1612.4*	2.0060	3551.2	*7123.6*	*0.0*
9.0000 37.000	10.000		Only 1 intersection			
9.0000 38.000	7.0000	*628.32*	2.8547	671.34	*1916.5*	*0.0*
9.0000 38.000	8.0000	*931.47*	2.1272	1683.1	*3580.2*	*0.0*
9.0000 38.000	9.0000	*1293.3*	1.9001	3114.6	*5918.1*	*0.0*
9.0000 38.000	10.000		Only 1 intersection			
9.0000 39.000	7.0000	*408.62*	2.4867	541.86	*1347.5*	*0.0*
9.0000 39.000	8.0000	*672.22*	2.3577	1069.9	*2522.5*	*0.0*
9.0000 39.000	9.0000	*991.07*	1.8547	2508.6	*4652.8*	*0.0*
9.0000 39.000	10.000	*1372.4*	1.7810	4118.2	*7334.4*	*0.0*
9.0000 39.000	11.000		Only 1 intersection			
9.0000 40.000	7.0000	*220.19*	2.1384	369.12	*789.33*	*0.0*
9.0000 40.000	8.0000	*441.65*	2.5927	634.84	*1645.9*	*0.0*
9.0000 40.000	9.0000	*713.30*	1.9299	1738.4	*3354.9*	*0.0*
9.0000 40.000	10.000	*1047.9*	1.7334	3341.7	*5792.7*	*0.0*
9.0000 40.000	11.000		Only 1 intersection			
9.0000 41.000	7.0000	*82.016*	1.7157	164.24	*281.79*	*0.0*
9.0000 41.000	8.0000	*240.02*	2.2079	442.94	*977.99*	*0.0*
9.0000 41.000	9.0000	*465.82*	2.5395	791.61	*2010.3*	*0.0*
9.0000 41.000	10.000	*752.01*	1.7624	2407.5	*4242.9*	*0.0*
9.0000 41.000	11.000	*1102.4*	1.6758	4180.1	*7005.1*	*0.0*
9.0000 41.000	12.000		Only 1 intersection			
9.0000 42.000	7.0000		Weight too small			
9.0000 42.000	8.0000	*91.297*	1.7909	200.08	*358.33*	*0.0*
9.0000 42.000	9.0000	*258.10*	2.2918	514.12	*1178.3*	*0.0*
9.0000 42.000	10.000	*488.31*	2.0576	1288.7	*2651.6*	*0.0*
9.0000 42.000	11.000	*788.79*	1.6869	3077.6	*5191.4*	*0.0*
9.0000 42.000	12.000	*1154.2*	1.6518	5018.2	*8288.8*	*0.0*
9.0000 42.000	13.000		Only 1 intersection			
9.0000 43.000	7.0000		Radius too small			
9.0000 43.000	8.0000		Weight too small			
9.0000 43.000	9.0000	*99.952*	1.8712	235.94	*441.49*	*0.0*
9.0000 43.000	10.000	*271.90*	2.4380	563.89	*1374.8*	*0.0*
9.0000 43.000	11.000	*509.45*	1.8692	1785.4	*3337.1*	*0.0*
9.0000 43.000	12.000	*821.16*	1.6577	3732.2	*6186.8*	*0.0*
9.0000 43.000	13.000		Only 1 intersection			
9.0000 44.000	7.0000		Radius too small			
9.0000 44.000	8.0000		Radius too small			
9.0000 44.000	9.0000		Weight too small			
9.0000 44.000	10.000	*108.09*	1.9530	271.82	*530.87*	*0.0*
9.0000 44.000	11.000	*282.99*	2.6162	600.38	*1570.7*	*0.0*
9.0000 44.000	12.000	*529.45*	1.7862	2281.4	*4075.2*	*0.0*
9.0000 44.000	13.000	*854.29*	1.6488	4400.7	*7256.1*	*0.0*
9.0000 44.000	14.000		Only 1 intersection			
9.0000 45.000	7.0000		Radius too small			
9.0000 45.000	8.0000		Radius too small			
9.0000 45.000	9.0000		Radius too small			
9.0000 45.000	10.000		Weight too small			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Moment	Restoring	Reinforcement Restoring
9.0000 45.000	11.000	*115.80*	2.0348	307.70		*626.12*	*0.0*
9.0000 45.000	12.000	*291.83*	2.7242	658.72		*1794.5*	*0.0*
9.0000 45.000	13.000	*548.25*	1.7477	2775.4		*4850.6*	*0.0*
9.0000 45.000	14.000	*886.01*	1.6544	5069.1		*8386.4*	*0.0*
9.0000 45.000	15.000		Weight too small				
9.0000 45.000	15.000		Radius too large				
9.0000 46.000	7.0000		Radius too small				
9.0000 46.000	8.0000		Radius too small				
9.0000 46.000	9.0000		Radius too small				
9.0000 46.000	10.000		Radius too small				
9.0000 46.000	11.000		Weight too small				
9.0000 46.000	12.000	*123.09*	2.1170	343.24		*726.65*	*0.0*
9.0000 46.000	13.000	*300.78*	2.3123	987.32		*2283.0*	*0.0*
9.0000 46.000	14.000	*567.64*	1.7355	3277.7		*5688.4*	*0.0*
9.0000 46.000	15.000	*915.34*	1.6696	5730.4		*9567.7*	*0.0*
9.0000 46.000	16.000		Weight too small				
9.0000 46.000	16.000		Radius too large				
10.000 37.000	7.0000	*883.34*	1.9417	1659.1		*3221.5*	*0.0*
10.000 37.000	8.0000	*1227.2*	1.8084	2930.2		*5299.0*	*0.0*
10.000 37.000	9.0000	*1631.3*	1.8127	4371.0		*7923.2*	*0.0*
10.000 37.000	10.000	*2096.3*	1.8630	5985.1		*11150.*	*0.0*
10.000 37.000	11.000		Only 1 intersection				
10.000 38.000	7.0000	*648.50*	1.9600	1227.9		*2406.6*	*0.0*
10.000 38.000	8.0000	*949.33*	1.7205	2494.0		*4291.0*	*0.0*
10.000 38.000	9.0000	*1312.2*	1.7041	3934.3		*6704.3*	*0.0*
10.000 38.000	10.000	*1736.7*	1.7486	5548.7		*9702.5*	*0.0*
10.000 38.000	11.000		Slip too small to split into minimum no. of slices				
10.000 39.000	7.0000	*436.40*	2.4600	620.71		*1526.9*	*0.0*
10.000 39.000	8.0000	*692.03*	1.7078	1892.5		*3232.0*	*0.0*
10.000 39.000	9.0000	*1010.9*	1.6291	3332.1		*5428.5*	*0.0*
10.000 39.000	10.000	*1392.3*	1.6565	4943.0		*8188.0*	*0.0*
10.000 39.000	11.000	*1834.5*	1.7196	6721.7		*11558.*	*0.0*
10.000 39.000	12.000		Only 1 intersection				
10.000 40.000	7.0000	*257.52*	2.4373	380.67		*927.82*	*0.0*
10.000 40.000	8.0000	*461.61*	1.9070	1115.9		*2128.0*	*0.0*
10.000 40.000	9.0000	*732.10*	1.6107	2555.9		*4116.7*	*0.0*
10.000 40.000	10.000	*1067.9*	1.5925	4166.3		*6635.0*	*0.0*
10.000 40.000	11.000	*1467.6*	1.6384	5951.0		*9750.4*	*0.0*
10.000 40.000	12.000		Only 1 intersection				
10.000 41.000	7.0000	*114.41*	2.0914	191.15		*399.77*	*0.0*
10.000 41.000	8.0000	*271.99*	2.6240	423.68		*1111.7*	*0.0*
10.000 41.000	9.0000	*485.46*	1.7229	1613.1		*2779.2*	*0.0*
10.000 41.000	10.000	*770.68*	1.5726	3224.2		*5070.4*	*0.0*
10.000 41.000	11.000	*1122.4*	1.5824	5005.1		*7919.8*	*0.0*
10.000 41.000	12.000	*1537.8*	1.6377	6953.9		*11388.*	*0.0*
10.000 41.000	12.000		Slip too small to split into minimum no. of slices				
10.000 41.000	13.000		Only 1 intersection				
10.000 42.000	7.0000		Weight too small				
10.000 42.000	8.0000	*123.97*	2.1812	226.49		*494.02*	*0.0*
10.000 42.000	9.0000	*283.05*	2.6664	500.51		*1334.5*	*0.0*
10.000 42.000	10.000	*507.71*	1.6507	2109.8		*3482.5*	*0.0*
10.000 42.000	11.000	*806.42*	1.5652	3888.7		*6086.4*	*0.0*
10.000 42.000	12.000	*1174.0*	1.5879	5843.5		*9278.9*	*0.0*
10.000 42.000	13.000		Only 1 intersection				
10.000 43.000	7.0000		Radius too small				
10.000 43.000	8.0000		Weight too small				
10.000 43.000	9.0000	*132.75*	2.2750	261.28		*594.41*	*0.0*
10.000 43.000	10.000	*293.03*	2.1562	827.29		*1783.8*	*0.0*
10.000 43.000	11.000	*529.88*	1.6256	2611.7		*4245.6*	*0.0*
10.000 43.000	12.000	*841.07*	1.5738	4557.2		*7172.4*	*0.0*
10.000 43.000	13.000	*1222.1*	1.6037	6676.0		*10706.*	*0.0*
10.000 43.000	13.000		Weight too small				
10.000 43.000	14.000		Only 1 intersection				
10.000 44.000	7.0000		Radius too small				
10.000 44.000	8.0000		Radius too small				
10.000 44.000	9.0000		Weight too small				
10.000 44.000	10.000	*139.59*	2.4088	288.16		*694.11*	*0.0*
10.000 44.000	11.000	*302.85*	1.9644	1155.9		*2270.5*	*0.0*
10.000 44.000	12.000	*549.74*	1.6270	3107.7		*5056.2*	*0.0*
10.000 44.000	13.000	*874.27*	1.5927	5225.8		*8323.0*	*0.0*
10.000 44.000	14.000	*1269.5*	1.6253	7514.8		*12214.*	*0.0*
10.000 44.000	14.000		Weight too small				
10.000 44.000	15.000		Only 1 intersection				
10.000 45.000	7.0000		Radius too small				
10.000 45.000	8.0000		Radius too small				
10.000 45.000	9.0000		Radius too small				

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
10.000	45.000	10.000	Weight too small			
10.000	45.000	11.000	*144.88*	2.5679	308.62	*792.50*	*0.0*
10.000	45.000	12.000	*311.74*	1.8843	1482.3	*2793.1*	*0.0*
10.000	45.000	13.000	*570.23*	1.6435	3611.0	*5934.7*	*0.0*
10.000	45.000	14.000	*906.01*	1.6179	5894.2	*9536.3*	*0.0*
10.000	45.000	15.000	Only 1 intersection			
10.000	46.000	7.0000	Radius too small			
10.000	46.000	8.0000	Radius too small			
10.000	46.000	9.0000	Radius too small			
10.000	46.000	10.000	Radius too small			
10.000	46.000	11.000	Weight too small			
10.000	46.000	12.000	*149.25*	2.7377	325.40	*890.83*	*0.0*
10.000	46.000	13.000	*320.72*	1.8534	1811.0	*3356.5*	*0.0*
10.000	46.000	14.000	*588.07*	1.6663	4105.0	*6840.3*	*0.0*
10.000	46.000	15.000	*935.30*	1.6474	6557.0	*10802.*	*0.0*
10.000	46.000	15.000	Weight too small			
10.000	46.000	16.000	Only 1 intersection			
11.000	37.000	7.0000	*903.10*	1.6699	2311.5	*3859.8*	*0.0*
11.000	37.000	8.0000	*1247.1*	1.6764	3583.9	*6008.1*	*0.0*
11.000	37.000	9.0000	*1651.2*	1.7325	5025.8	*8707.3*	*0.0*
11.000	37.000	10.000	*2114.8*	1.8095	6636.0	*12008.*	*0.0*
11.000	37.000	10.000	Weight too small			
11.000	37.000	11.000	*2662.9*	2.1364	7085.6	*15138.*	*0.0*
11.000	37.000	12.000	Only 1 intersection			
11.000	38.000	7.0000	*667.26*	1.6150	1875.3	*3028.6*	*0.0*
11.000	38.000	8.0000	*969.09*	1.5850	3147.8	*4989.3*	*0.0*
11.000	38.000	9.0000	*1332.1*	1.6321	4589.0	*7489.5*	*0.0*
11.000	38.000	10.000	*1755.3*	1.7024	6199.5	*10554.*	*0.0*
11.000	38.000	11.000	*2256.5*	1.9699	6953.8	*13698.*	*0.0*
11.000	38.000	12.000	Only 1 intersection			
11.000	39.000	7.0000	*455.68*	1.6893	1270.5	*2146.3*	*0.0*
11.000	39.000	8.0000	*710.86*	1.5410	2541.5	*3916.4*	*0.0*
11.000	39.000	9.0000	*1029.9*	1.5546	3983.0	*6191.8*	*0.0*
11.000	39.000	10.000	*1412.2*	1.6142	5598.0	*9036.3*	*0.0*
11.000	39.000	11.000	*1868.0*	1.7798	6843.3	*12180.*	*0.0*
11.000	39.000	12.000	*2393.4*	2.1015	7299.3	*15339.*	*0.0*
11.000	39.000	13.000	Only 1 intersection			
11.000	40.000	7.0000	*279.85*	2.3575	499.80	*1178.3*	*0.0*
11.000	40.000	8.0000	*481.20*	1.5892	1768.0	*2809.7*	*0.0*
11.000	40.000	9.0000	*752.01*	1.5191	3209.8	*4876.1*	*0.0*
11.000	40.000	10.000	*1087.7*	1.5507	4821.6	*7476.7*	*0.0*
11.000	40.000	11.000	*1486.2*	1.6163	6601.7	*10671.*	*0.0*
11.000	40.000	11.000	Weight too small			
11.000	40.000	12.000	*1972.0*	1.9266	7086.6	*13653.*	*0.0*
11.000	40.000	13.000	Only 1 intersection			
11.000	41.000	7.0000	*142.66*	2.7041	186.87	*505.33*	*0.0*
11.000	41.000	8.0000	*291.76*	1.9593	825.44	*1617.3*	*0.0*
11.000	41.000	9.0000	*506.46*	1.5578	2271.4	*3538.3*	*0.0*
11.000	41.000	10.000	*789.72*	1.5232	3875.2	*5902.5*	*0.0*
11.000	41.000	11.000	*1142.3*	1.5619	5660.1	*8840.7*	*0.0*
11.000	41.000	12.000	*1576.7*	1.7311	6907.0	*11957.*	*0.0*
11.000	41.000	13.000	*2078.1*	2.0451	7398.9	*15132.*	*0.0*
11.000	41.000	14.000	Only 1 intersection			
11.000	42.000	7.0000	Weight too small			
11.000	42.000	8.0000	*149.31*	2.9391	204.90	*602.23*	*0.0*
11.000	42.000	9.0000	*302.59*	1.8202	1151.9	*2096.7*	*0.0*
11.000	42.000	10.000	*529.17*	1.5604	2770.1	*4322.3*	*0.0*
11.000	42.000	11.000	*826.33*	1.5413	4543.8	*7003.5*	*0.0*
11.000	42.000	12.000	*1192.7*	1.5824	6493.8	*10276.*	*0.0*
11.000	42.000	12.000	Weight too small			
11.000	42.000	13.000	*1655.4*	1.8587	7132.7	*13258.*	*0.0*
11.000	42.000	14.000	Only 1 intersection			
11.000	43.000	7.0000	Radius too small			
11.000	43.000	8.0000	Weight too small			
11.000	43.000	9.0000	*154.36*	3.2053	218.03	*698.85*	*0.0*
11.000	43.000	10.000	*312.96*	1.7696	1480.5	*2619.8*	*0.0*
11.000	43.000	11.000	*552.65*	1.5786	3277.9	*5174.5*	*0.0*
11.000	43.000	12.000	*861.03*	1.5679	5212.3	*8172.6*	*0.0*
11.000	43.000	13.000	*1260.9*	1.6743	6850.4	*11469.*	*0.0*
11.000	43.000	14.000	*1727.0*	1.9955	7322.5	*14612.*	*0.0*
11.000	43.000	15.000	Only 1 intersection			
11.000	44.000	7.0000	Radius too small			
11.000	44.000	8.0000	Radius too small			
11.000	44.000	9.0000	Weight too small			
11.000	44.000	10.000	*158.33*	3.4887	227.97	*795.34*	*0.0*
11.000	44.000	11.000	*322.32*	1.7614	1807.4	*3183.5*	*0.0*

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
11.000 44.000	12.000	*569.27*	1.6097	3759.7	*6052.0*	*0.0*
11.000 44.000	13.000	*894.21*	1.5997	5881.2	*9407.9*	*0.0*
11.000 44.000	13.000		Weight too small			
11.000 44.000	14.000	*1318.0*	1.7916	7044.7	*12621.*	*0.0*
11.000 44.000	15.000		Only 1 intersection			
11.000 45.000	7.0000		Radius too small			
11.000 45.000	8.0000		Radius too small			
11.000 45.000	9.0000		Radius too small			
11.000 45.000	10.000		Weight too small			
11.000 45.000	11.000	*161.32*	3.7924	234.84	*890.59*	*0.0*
11.000 45.000	12.000	*331.71*	1.7747	2136.1	*3791.1*	*0.0*
11.000 45.000	13.000	*587.95*	1.6447	4255.0	*6998.1*	*0.0*
11.000 45.000	14.000	*924.58*	1.6346	6544.9	*10699.*	*0.0*
11.000 45.000	14.000		Weight too small			
11.000 45.000	15.000	*1370.6*	1.9122	7218.5	*13803.*	*0.0*
11.000 45.000	16.000		Only 1 intersection			
11.000 46.000	7.0000		Radius too small			
11.000 46.000	8.0000		Radius too small			
11.000 46.000	9.0000		Radius too small			
11.000 46.000	10.000		Radius too small			
11.000 46.000	11.000		Weight too small			
11.000 46.000	12.000	*164.32*	3.0551	380.65	*1162.9*	*0.0*
11.000 46.000	13.000	*340.67*	1.8007	2464.9	*4438.6*	*0.0*
11.000 46.000	14.000	*606.79*	1.6844	4753.7	*8007.1*	*0.0*
11.000 46.000	15.000	*976.38*	1.7220	6831.2	*11763.*	*0.0*
11.000 46.000	16.000	*1423.6*	2.0259	7413.1	*15018.*	*0.0*
11.000 46.000	17.000		Only 1 intersection			
12.000 37.000	7.0000	*922.26*	1.6065	2793.2	*4487.4*	*0.0*
12.000 37.000	8.0000	*1266.1*	1.6508	4066.0	*6712.2*	*0.0*
12.000 37.000	9.0000	*1671.0*	1.7224	5511.2	*9492.4*	*0.0*
12.000 37.000	9.0000		Weight too small			
12.000 37.000	10.000	*2157.7*	2.0437	5942.4	*12145.*	*0.0*
12.000 37.000	11.000	*2701.9*	2.4051	6348.5	*15269.*	*0.0*
12.000 37.000	12.000	*3306.1*	2.7870	6795.3	*18939.*	*0.0*
12.000 37.000	13.000		Radius too large			
12.000 38.000	7.0000	*687.10*	1.5476	2358.6	*3650.2*	*0.0*
12.000 38.000	8.0000	*988.94*	1.5667	3632.0	*5690.4*	*0.0*
12.000 38.000	9.0000	*1352.0*	1.6281	5074.7	*8262.2*	*0.0*
12.000 38.000	10.000	*1792.1*	1.8752	5824.9	*10923.*	*0.0*
12.000 38.000	11.000	*2299.2*	2.2082	6252.1	*13806.*	*0.0*
12.000 38.000	12.000	*2864.0*	2.5725	6697.3	*17228.*	*0.0*
12.000 38.000	13.000		Only 1 intersection			
12.000 39.000	7.0000	*475.02*	1.5736	1753.2	*2758.7*	*0.0*
12.000 39.000	8.0000	*730.69*	1.5241	3025.7	*4611.4*	*0.0*
12.000 39.000	9.0000	*1049.8*	1.5601	4467.9	*6970.3*	*0.0*
12.000 39.000	10.000	*1443.1*	1.6970	5698.3	*9670.0*	*0.0*
12.000 39.000	11.000	*1908.0*	2.0173	6117.5	*12341.*	*0.0*
12.000 39.000	12.000	*2432.3*	2.3648	6561.6	*15517.*	*0.0*
12.000 39.000	13.000	*3014.2*	2.7342	7031.3	*19225.*	*0.0*
12.000 39.000	14.000		Radius too large			
12.000 40.000	7.0000	*294.97*	1.7660	1000.1	*1766.1*	*0.0*
12.000 40.000	8.0000	*501.00*	1.5540	2251.2	*3498.4*	*0.0*
12.000 40.000	9.0000	*771.90*	1.5295	3694.1	*5650.2*	*0.0*
12.000 40.000	10.000	*1107.6*	1.5708	5306.7	*8335.5*	*0.0*
12.000 40.000	10.000		Weight too small			
12.000 40.000	11.000	*1531.0*	1.8394	5928.7	*10905.*	*0.0*
12.000 40.000	12.000	*2014.5*	2.1666	6381.6	*13826.*	*0.0*
12.000 40.000	13.000	*2555.8*	2.5169	6859.2	*17264.*	*0.0*
12.000 40.000	14.000		Radius too large			
12.000 41.000	7.0000	*155.54*	4.6744	119.50	*558.58*	*0.0*
12.000 41.000	8.0000	*308.01*	1.7277	1321.4	*2283.0*	*0.0*
12.000 41.000	9.0000	*524.55*	1.5648	2748.0	*4300.2*	*0.0*
12.000 41.000	10.000	*809.62*	1.5501	4360.4	*6759.0*	*0.0*
12.000 41.000	11.000	*1177.3*	1.6617	5723.6	*9511.0*	*0.0*
12.000 41.000	12.000	*1615.9*	1.9743	6171.9	*12185.*	*0.0*
12.000 41.000	13.000	*2116.3*	2.3090	6653.6	*15363.*	*0.0*
12.000 41.000	14.000		Radius too large			
12.000 42.000	7.0000	*52.099*	3.3818	54.024	*182.70*	*0.0*
12.000 42.000	8.0000	*160.02*	2.9745	274.26	*815.79*	*0.0*
12.000 42.000	9.0000	*320.21*	1.7313	1645.3	*2848.4*	*0.0*
12.000 42.000	10.000	*547.23*	1.5913	3246.8	*5166.5*	*0.0*
12.000 42.000	11.000	*846.20*	1.5796	5029.3	*7944.1*	*0.0*
12.000 42.000	11.000		Weight too small			
12.000 42.000	12.000	*1239.4*	1.7948	5913.2	*10613.*	*0.0*
12.000 42.000	13.000	*1695.4*	2.1099	6405.0	*13514.*	*0.0*

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Moment	Restoring	Reinforcement Restoring
12.000 42.000	14.000	*2210.6*	2.4491	6912.1		*16928.*	*0.0*
12.000 42.000	15.000		Radius too large				
12.000 43.000	7.0000		Radius too small				
12.000 43.000	8.0000	*54.879*	3.6201	60.694		*219.72*	*0.0*
12.000 43.000	9.0000	*164.04*	2.5593	429.35		*1098.8*	*0.0*
12.000 43.000	10.000	*330.98*	1.7558	1968.9		*3457.0*	*0.0*
12.000 43.000	11.000	*568.68*	1.6266	3745.4		*6092.4*	*0.0*
12.000 43.000	12.000	*894.50*	1.6235	5628.4		*9137.8*	*0.0*
12.000 43.000	13.000	*1298.9*	1.9245	6106.6		*11752.*	*0.0*
12.000 43.000	14.000	*1770.9*	2.2451	6631.7		*14889.*	*0.0*
12.000 43.000	15.000		Only 1 intersection				
12.000 44.000	7.0000		Radius too small				
12.000 44.000	8.0000		Radius too small				
12.000 44.000	9.0000	*56.961*	3.9092	65.597		*256.43*	*0.0*
12.000 44.000	10.000	*167.95*	2.4085	585.54		*1410.3*	*0.0*
12.000 44.000	11.000	*341.44*	1.7913	2295.0		*4111.1*	*0.0*
12.000 44.000	12.000	*588.30*	1.6670	4241.5		*7070.7*	*0.0*
12.000 44.000	12.000		Weight too small				
12.000 44.000	13.000	*935.02*	1.7478	5777.5		*10098.*	*0.0*
12.000 44.000	14.000	*1352.1*	2.0613	6266.4		*12917.*	*0.0*
12.000 44.000	15.000	*1841.1*	2.3750	6852.1		*16273.*	*0.0*
12.000 44.000	16.000		Radius too large				
12.000 45.000	7.0000		Radius too small				
12.000 45.000	8.0000		Radius too small				
12.000 45.000	9.0000		Radius too small				
12.000 45.000	10.000	*58.621*	4.2199	69.464		*293.13*	*0.0*
12.000 45.000	11.000	*171.59*	2.3568	742.04		*1748.8*	*0.0*
12.000 45.000	12.000	*351.25*	1.8334	2621.8		*4806.9*	*0.0*
12.000 45.000	13.000	*607.89*	1.7104	4740.3		*8108.0*	*0.0*
12.000 45.000	13.000		Weight too small				
12.000 45.000	14.000	*975.67*	1.8703	5932.1		*11095.*	*0.0*
12.000 45.000	15.000	*1411.1*	2.1765	6494.8		*14136.*	*0.0*
12.000 45.000	16.000		Only 1 intersection				
12.000 46.000	7.0000		Radius too small				
12.000 46.000	8.0000		Radius too small				
12.000 46.000	9.0000		Radius too small				
12.000 46.000	10.000		Radius too small				
12.000 46.000	11.000	*59.966*	4.5443	72.570		*329.78*	*0.0*
12.000 46.000	12.000	*174.71*	2.3522	897.86		*2111.9*	*0.0*
12.000 46.000	13.000	*360.48*	1.8790	2949.5		*5542.1*	*0.0*
12.000 46.000	14.000	*626.71*	1.7566	5239.1		*9202.9*	*0.0*
12.000 46.000	14.000		Weight too small				
12.000 46.000	15.000	*1015.2*	1.9894	6092.1		*12120.*	*0.0*
12.000 46.000	16.000	*1463.4*	2.3002	6683.1		*15373.*	*0.0*
12.000 46.000	17.000		Only 1 intersection				


Circle plotted: centre at 12.00,40.00, Over-Design Factor 1.585
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
.0
10.00
20.00
30.00
Scale x 1:253 y 1:253

General Parameters
Direction of slip: DOWNHILL
Minimum slip weight [kN/m] : 100.00000
Type of analysis : STATIC

Analysis Options
Partial Factor Analysis
Minimum number of slices: 25
Method: Bishop (Variably inclined interslice forces)
Maximum number of iterations: 300
Reinforcement: NOT ACTIVE

Method Partial Factors
Current selection: BS EN 1997-1:2011 DA1-2
Factor on FAVOURABLE PERMANENT LOAD: 1.00000
Factor on UNFAVOURABLE PERMANENT LOAD: 1.00000
Factor on FAVOURABLE VARIABLE LOAD: 0.00000
Factor on UNFAVOURABLE VARIABLE LOAD: 1.30000
Factor on SOIL UNIT WEIGHT: 1.00000
Factor on DRAINED SOIL COHESION: 1.25000
Factor on UNDRAINED SOIL COHESION: 1.40000
Factor on SOIL FRICTION ANGLE: 1.25000
Factor on reinforcement pullout: 1.50000
Economic ramification of failure: 1.00000
Sliding along reinforcement: 1.50000

Material properties

No	Description	Unit Weight Above GWL [kN/m3]	Unit Weight Below GWL [kN/m3]	Shear Strength Parameters Condition	Phi or Phi0 [°]	c or c0' [kN/m²]
1	Sand	18.000	19.000	Drained - linear strength	32.000	0.0

Coordinates of top of soil strata

The units of the following coordinates are in m

Stratum	X -->						
	0.0	5.0000	7.0000	14.600	16.000	16.000	25.500
1	34.140	34.140	34.140	36.000	36.000	35.000	35.000
GW Profile 1	33.000	.	.	.	.	.	.

Stratum	X -->	
	25.500	28.000
1	36.000	36.000
GW Profile 1	. 33.000	

Piezometers

Stratum-linked data

No.	Material	Water table	Piezo Set/ Ru value
1	Sand	GW Profile 1	-

Surface Loads

No.	Limits of loaded area X1 [m]	X2 [m]	Distributed load Vert [kN/m²]	Horiz [kN/m²]	Permanent / Variable load	Favourable / UnFavourable load	Use in pull-out calc
1	16.000	25.500	150.00	0.0	Permanent	UnFavourable	No

Slip Surface Specification
Circle centre specification: GRID
Bottom left of grid: x = 5.00000 m y = 37.00000 m
Inclination of grid: 0.00000 deg
(positive anticlockwise direction about bottom left of grid)
Centres on grid: 10 in x direction at 1.00000m spacing
10 in y direction at 1.00000m spacing
Initial radius of circle 7.00000 m
Incremented by 1.00000 m until all possible circles considered

RESULTS OF ANALYSIS
In the following tables, values in italics are factored values
using the currently selected Method Partial Factors.

Slip Centre x [m]	Slip Centre y [m]	Radius [m]	Slip Weight [kN/m]	Comment/ Over-Design Factor	Disturbing Moment [kNm/m]	Soil Strength Restoring Moment [kNm/m]	Reinforcement Restoring Moment [kNm/m]
5.0000	37.000	7.0000		Only 1 intersection			
5.0000	38.000	7.0000		Only 1 intersection			
5.0000	39.000	7.0000		Only 1 intersection			
5.0000	40.000	7.0000	*117.45*	11.030	38.903	*429.09*	*0.0*
5.0000	40.000	8.0000		Only 1 intersection			
5.0000	41.000	7.0000		Weight too small			
5.0000	41.000	8.0000	*129.47*	9.2335	58.305	*538.36*	*0.0*
5.0000	41.000	9.0000		Only 1 intersection			
5.0000	42.000	7.0000		Radius too small			
5.0000	42.000	8.0000		Weight too small			
5.0000	42.000	9.0000	*141.52*	8.0345	82.123	*659.82*	*0.0*
5.0000	42.000	10.000		Only 1 intersection			
5.0000	43.000	7.0000		Radius too small			
5.0000	43.000	8.0000		Radius too small			
5.0000	43.000	9.0000		Weight too small			
5.0000	43.000	10.000	*153.63*	7.1824	110.50	*793.64*	*0.0*
5.0000	43.000	11.000		Only 1 intersection			
5.0000	44.000	7.0000		Radius too small			
5.0000	44.000	8.0000		Radius too small			
5.0000	44.000	9.0000		Radius too small			
5.0000	44.000	10.000		Weight too small			
5.0000	44.000	11.000	*165.92*	6.5427	143.75	*940.50*	*0.0*
5.0000	44.000	12.000		Only 1 intersection			
5.0000	45.000	7.0000		Radius too small			
5.0000	45.000	8.0000		Radius too small			
5.0000	45.000	9.0000		Radius too small			
5.0000	45.000	10.000		Radius too small			
5.0000	45.000	11.000		Weight too small			
5.0000	45.000	12.000		Only 1 intersection			
5.0000	46.000	7.0000		Radius too small			
5.0000	46.000	8.0000		Radius too small			
5.0000	46.000	9.0000		Radius too small			
5.0000	46.000	10.000		Radius too small			
5.0000	46.000	11.000		Radius too small			
5.0000	46.000	12.000		Weight too small			
5.0000	46.000	12.000		Weight too small			
5.0000	46.000	13.000		Only 1 intersection			
6.0000	37.000	7.0000		Only 1 intersection			
6.0000	38.000	7.0000	*537.07*	5.9691	267.44	*1596.4*	*0.0*
6.0000	38.000	8.0000		Only 1 intersection			
6.0000	39.000	7.0000	*317.34*	5.6681	181.31	*1027.7*	*0.0*
6.0000	39.000	8.0000		Only 1 intersection			
6.0000	40.000	7.0000	*132.21*	5.6585	85.662	*484.72*	*0.0*
6.0000	40.000	8.0000	*349.12*	5.2164	246.36	*1285.1*	*0.0*
6.0000	40.000	9.0000		Only 1 intersection			
6.0000	41.000	7.0000		Weight too small			
6.0000	41.000	8.0000	*146.60*	5.2143	117.18	*610.99*	*0.0*
6.0000	41.000	9.0000	*380.07*	4.8796	321.28	*1567.7*	*0.0*
6.0000	41.000	10.000		Only 1 intersection			
6.0000	42.000	7.0000		Radius too small			
6.0000	42.000	8.0000		Weight too small			
6.0000	42.000	9.0000	*160.94*	4.8777	154.04	*751.36*	*0.0*
6.0000	42.000	10.000		Only 1 intersection			
6.0000	43.000	7.0000		Radius too small			
6.0000	43.000	8.0000		Radius too small			
6.0000	43.000	9.0000		Weight too small			
6.0000	43.000	10.000	*175.36*	4.6125	196.49	*906.32*	*0.0*
6.0000	43.000	11.000		Only 1 intersection			
6.0000	44.000	7.0000		Radius too small			
6.0000	44.000	8.0000		Radius too small			
6.0000	44.000	9.0000		Radius too small			
6.0000	44.000	10.000		Weight too small			
6.0000	44.000	11.000	*189.87*	4.3969	244.75	*1076.1*	*0.0*
6.0000	44.000	12.000		Only 1 intersection			
6.0000	45.000	7.0000		Radius too small			
6.0000	45.000	8.0000		Radius too small			
6.0000	45.000	9.0000		Radius too small			
6.0000	45.000	10.000		Radius too small			
6.0000	45.000	11.000		Weight too small			
6.0000	45.000	12.000	*204.52*	4.2164	299.11	*1261.2*	*0.0*
6.0000	45.000	13.000		Only 1 intersection			
6.0000	46.000	7.0000		Radius too small			
6.0000	46.000	8.0000		Radius too small			
6.0000	46.000	9.0000		Radius too small			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
6.0000 46.000	10.000		Radius too small			
6.0000 46.000	11.000		Radius too small			
6.0000 46.000	12.000		Weight too small			
6.0000 46.000	13.000	*219.32*	4.0645	359.64	*1461.7*	*0.0*
6.0000 46.000	14.000		Only 1 intersection			
7.0000 37.000	7.0000	*806.75*	5.2674	437.30	*2303.5*	*0.0*
7.0000 37.000	8.0000		Only 1 intersection			
7.0000 38.000	7.0000	*563.84*	4.7021	362.07	*1702.5*	*0.0*
7.0000 38.000	8.0000		Only 1 intersection			
7.0000 39.000	7.0000	*341.81*	4.2889	261.44	*1121.3*	*0.0*
7.0000 39.000	8.0000	*620.35*	4.3832	485.47	*2127.9*	*0.0*
7.0000 39.000	9.0000		Only 1 intersection			
7.0000 40.000	7.0000	*152.75*	3.8940	143.73	*559.69*	*0.0*
7.0000 40.000	8.0000	*376.49*	4.0651	345.10	*1402.9*	*0.0*
7.0000 40.000	9.0000	*674.36*	4.1676	621.01	*2588.1*	*0.0*
7.0000 40.000	10.000		Only 1 intersection			
7.0000 41.000	7.0000		Weight too small			
7.0000 41.000	8.0000	*169.61*	3.7412	188.71	*706.01*	*0.0*
7.0000 41.000	9.0000	*410.23*	3.8940	439.65	*1712.0*	*0.0*
7.0000 41.000	10.000		Only 1 intersection			
7.0000 42.000	7.0000		Radius too small			
7.0000 42.000	8.0000		Weight too small			
7.0000 42.000	9.0000	*186.36*	3.6179	240.08	*868.58*	*0.0*
7.0000 42.000	10.000	*443.04*	3.7744	542.16	*2046.3*	*0.0*
7.0000 42.000	11.000		Only 1 intersection			
7.0000 43.000	7.0000		Radius too small			
7.0000 43.000	8.0000		Radius too small			
7.0000 43.000	9.0000		Weight too small			
7.0000 43.000	10.000	*203.17*	3.5161	298.05	*1048.0*	*0.0*
7.0000 43.000	11.000	*474.08*	3.7217	644.87	*2400.0*	*0.0*
7.0000 43.000	12.000		Only 1 intersection			
7.0000 44.000	7.0000		Radius too small			
7.0000 44.000	8.0000		Radius too small			
7.0000 44.000	9.0000		Radius too small			
7.0000 44.000	10.000		Weight too small			
7.0000 44.000	11.000	*220.02*	3.4290	362.85	*1244.2*	*0.0*
7.0000 44.000	12.000	*503.54*	3.7089	747.43	*2772.1*	*0.0*
7.0000 44.000	13.000		Only 1 intersection			
7.0000 45.000	7.0000		Radius too small			
7.0000 45.000	8.0000		Radius too small			
7.0000 45.000	9.0000		Radius too small			
7.0000 45.000	10.000		Radius too small			
7.0000 45.000	11.000		Weight too small			
7.0000 45.000	12.000	*236.61*	3.3686	432.02	*1455.3*	*0.0*
7.0000 45.000	13.000		Only 1 intersection			
7.0000 46.000	7.0000		Radius too small			
7.0000 46.000	8.0000		Radius too small			
7.0000 46.000	9.0000		Radius too small			
7.0000 46.000	10.000		Radius too small			
7.0000 46.000	11.000		Radius too small			
7.0000 46.000	12.000		Weight too small			
7.0000 46.000	13.000	*252.51*	3.3476	501.26	*1678.0*	*0.0*
7.0000 46.000	14.000		Only 1 intersection			
8.0000 37.000	7.0000	*839.16*	4.4977	540.44	*2430.7*	*0.0*
8.0000 37.000	8.0000	*1207.2*	4.8159	791.24	*3810.5*	*0.0*
8.0000 37.000	9.0000		Only 1 intersection			
8.0000 38.000	7.0000	*595.43*	3.9722	459.29	*1824.4*	*0.0*
8.0000 38.000	8.0000	*922.33*	4.2739	709.95	*3034.2*	*0.0*
8.0000 38.000	9.0000		Only 1 intersection			
8.0000 39.000	7.0000	*371.36*	3.5643	345.67	*1232.1*	*0.0*
8.0000 39.000	8.0000	*653.72*	3.8147	595.41	*2271.3*	*0.0*
8.0000 39.000	9.0000	*991.55*	4.1064	893.31	*3668.3*	*0.0*
8.0000 39.000	10.000		Only 1 intersection			
8.0000 40.000	7.0000	*178.87*	3.1428	208.03	*653.79*	*0.0*
8.0000 40.000	8.0000	*408.77*	3.4410	447.28	*1539.1*	*0.0*
8.0000 40.000	9.0000	*707.57*	3.7631	729.00	*2743.3*	*0.0*
8.0000 40.000	10.000		Only 1 intersection			
8.0000 41.000	7.0000		Weight too small			
8.0000 41.000	8.0000	*198.30*	3.0750	267.74	*823.30*	*0.0*
8.0000 41.000	9.0000	*443.67*	3.3967	549.84	*1867.6*	*0.0*
8.0000 41.000	10.000		Only 1 intersection			
8.0000 41.000	11.000		Only 1 intersection			
8.0000 42.000	7.0000		Radius too small			
8.0000 42.000	8.0000		Weight too small			
8.0000 42.000	9.0000	*217.56*	3.0202	334.79	*1011.1*	*0.0*
8.0000 42.000	10.000	*476.50*	3.3974	652.54	*2217.0*	*0.0*
8.0000 42.000	10.000		Only 1 intersection			

Slip Centre	Radius	Slip Weight	Comment/ Overs Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
8.0000 42.000	11.000	*786.79*	2.8386	1441.2	*4091.1*	*0.0*
8.0000 42.000	12.000		Only 1 intersection			
8.0000 43.000	7.0000		Radius too small			
8.0000 43.000	8.0000		Radius too small			
8.0000 43.000	9.0000		Weight too small			
8.0000 43.000	10.000	*235.99*	3.0036	404.01	*1213.5*	*0.0*
8.0000 43.000	11.000	*503.52*	3.5406	722.65	*2558.6*	*0.0*
8.0000 43.000	12.000		Only 1 intersection			
8.0000 44.000	7.0000		Radius too small			
8.0000 44.000	8.0000		Radius too small			
8.0000 44.000	9.0000		Radius too small			
8.0000 44.000	10.000		Weight too small			
8.0000 44.000	11.000	*253.48*	3.0188	473.25	*1428.6*	*0.0*
8.0000 44.000	12.000	*524.99*	3.8071	759.29	*2890.7*	*0.0*
8.0000 44.000	13.000		Only 1 intersection			
8.0000 45.000	7.0000		Radius too small			
8.0000 45.000	8.0000		Radius too small			
8.0000 45.000	9.0000		Radius too small			
8.0000 45.000	10.000		Radius too small			
8.0000 45.000	11.000		Weight too small			
8.0000 45.000	12.000	*270.12*	3.0520	542.57	*1655.9*	*0.0*
8.0000 45.000	13.000	*545.69*	3.0326	1172.3	*3555.1*	*0.0*
8.0000 45.000	14.000		Only 1 intersection			
8.0000 46.000	7.0000		Radius too small			
8.0000 46.000	8.0000		Radius too small			
8.0000 46.000	9.0000		Radius too small			
8.0000 46.000	10.000		Radius too small			
8.0000 46.000	11.000		Radius too small			
8.0000 46.000	12.000		Weight too small			
8.0000 46.000	13.000	*284.59*	3.1394	600.36	*1884.8*	*0.0*
8.0000 46.000	14.000	*565.78*	2.6004	1661.9	*4321.6*	*0.0*
8.0000 46.000	15.000		Only 1 intersection			
9.0000 37.000	7.0000	*872.74*	4.1423	617.49	*2557.8*	*0.0*
9.0000 37.000	8.0000	*1224.8*	2.8086	1575.6	*4425.2*	*0.0*
9.0000 37.000	9.0000	*1631.4*	2.3659	2961.1	*7005.8*	*0.0*
9.0000 37.000	10.000		Only 1 intersection			
9.0000 38.000	7.0000	*628.90*	3.6364	536.15	*1949.7*	*0.0*
9.0000 38.000	8.0000	*943.19*	2.9779	1145.3	*3410.6*	*0.0*
9.0000 38.000	9.0000	*1310.2*	2.2799	2540.4	*5791.8*	*0.0*
9.0000 38.000	10.000		Only 1 intersection			
9.0000 39.000	7.0000	*404.64*	3.2151	421.49	*1355.1*	*0.0*
9.0000 39.000	8.0000	*682.05*	3.7438	635.33	*2378.5*	*0.0*
9.0000 39.000	9.0000	*1007.0*	2.3000	1962.5	*4513.6*	*0.0*
9.0000 39.000	10.000	*1393.0*	2.0526	3525.9	*7237.2*	*0.0*
9.0000 39.000	11.000		Only 1 intersection			
9.0000 40.000	7.0000	*210.36*	2.8094	273.27	*767.73*	*0.0*
9.0000 40.000	8.0000	*442.23*	3.2003	524.17	*1677.5*	*0.0*
9.0000 40.000	9.0000	*724.49*	2.6248	1209.9	*3175.8*	*0.0*
9.0000 40.000	10.000	*1065.7*	2.0437	2774.3	*5669.8*	*0.0*
9.0000 40.000	11.000		Only 1 intersection			
9.0000 41.000	7.0000		Weight too small			
9.0000 41.000	8.0000	*231.41*	2.7988	342.53	*958.68*	*0.0*
9.0000 41.000	9.0000	*472.43*	3.3622	592.98	*1993.7*	*0.0*
9.0000 41.000	10.000	*765.00*	2.1857	1864.6	*4075.3*	*0.0*
9.0000 41.000	11.000	*1122.3*	1.9186	3594.5	*6896.4*	*0.0*
9.0000 41.000	12.000		Only 1 intersection			
9.0000 42.000	7.0000		Radius too small			
9.0000 42.000	8.0000		Weight too small			
9.0000 42.000	9.0000	*251.03*	2.8258	411.80	*1163.6*	*0.0*
9.0000 42.000	10.000	*496.56*	3.0997	781.54	*2422.5*	*0.0*
9.0000 42.000	11.000	*803.31*	1.9965	2519.1	*5029.2*	*0.0*
9.0000 42.000	12.000		Only 1 intersection			
9.0000 43.000	7.0000		Radius too small			
9.0000 43.000	8.0000		Radius too small			
9.0000 43.000	9.0000		Weight too small			
9.0000 43.000	10.000	*268.89*	2.8912	476.89	*1378.8*	*0.0*
9.0000 43.000	11.000	*519.47*	2.4501	1271.0	*3114.2*	*0.0*
9.0000 43.000	12.000	*839.48*	1.9038	3172.5	*6039.9*	*0.0*
9.0000 43.000	13.000		Only 1 intersection			
9.0000 44.000	7.0000		Radius too small			
9.0000 44.000	8.0000		Radius too small			
9.0000 44.000	9.0000		Radius too small			
9.0000 44.000	10.000		Weight too small			
9.0000 44.000	11.000	*283.11*	3.0428	522.74	*1590.6*	*0.0*
9.0000 44.000	12.000	*540.28*	2.1911	1753.8	*3842.7*	*0.0*
9.0000 44.000	13.000	*876.93*	1.8536	3845.6	*7128.3*	*0.0*
9.0000 44.000	14.000		Only 1 intersection			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
9.0000 45.000	7.0000		Radius too small			
9.0000 45.000	8.0000		Radius too small			
9.0000 45.000	9.0000		Radius too small			
9.0000 45.000	10.000		Radius too small			
9.0000 45.000	11.000		Weight too small			
9.0000 45.000	12.000	*294.88*	3.2388	556.44	*1802.2*	*0.0*
9.0000 45.000	13.000	*561.17*	2.0608	2243.5	*4623.4*	*0.0*
9.0000 45.000	14.000	*906.90*	1.8400	4477.5	*8238.4*	*0.0*
9.0000 45.000	15.000		Only 1 intersection			
9.0000 46.000	7.0000		Radius too small			
9.0000 46.000	8.0000		Radius too small			
9.0000 46.000	9.0000		Radius too small			
9.0000 46.000	10.000		Radius too small			
9.0000 46.000	11.000		Radius too small			
9.0000 46.000	12.000	*104.72*	2.2979	270.81	*622.30*	*0.0*
9.0000 46.000	13.000	*304.96*	3.4632	581.79	*2014.8*	*0.0*
9.0000 46.000	14.000	*581.24*	1.9946	2733.1	*5451.5*	*0.0*
9.0000 46.000	15.000		Only 1 intersection			
10.000 37.000	7.0000	*889.02*	2.4909	1227.0	*3056.3*	*0.0*
10.000 37.000	8.0000	*1238.0*	2.0941	2465.0	*5162.1*	*0.0*
10.000 37.000	9.0000	*1646.7*	2.0209	3866.5	*7813.9*	*0.0*
10.000 37.000	10.000	*2116.4*	2.0359	5438.2	*11072.*	*0.0*
10.000 37.000	11.000		Only 1 intersection			
10.000 38.000	7.0000	*650.69*	2.7510	807.26	*2220.8*	*0.0*
10.000 38.000	8.0000	*957.96*	2.0265	2044.5	*4143.1*	*0.0*
10.000 38.000	9.0000	*1325.7*	1.9139	3445.5	*6594.3*	*0.0*
10.000 38.000	10.000	*1755.2*	1.9167	5017.7	*9617.6*	*0.0*
10.000 38.000	11.000		Only 1 intersection			
10.000 39.000	7.0000	*435.00*	3.2778	446.21	*1462.6*	*0.0*
10.000 39.000	8.0000	*696.36*	2.0965	1457.5	*3055.7*	*0.0*
10.000 39.000	9.0000	*1021.0*	1.8494	2859.2	*5287.8*	*0.0*
10.000 39.000	10.000	*1408.5*	1.8244	4431.8	*8085.4*	*0.0*
10.000 39.000	11.000	*1855.0*	1.8657	6158.3	*11489.*	*0.0*
10.000 39.000	12.000		Only 1 intersection			
10.000 40.000	7.0000	*243.87*	2.8104	316.84	*890.45*	*0.0*
10.000 40.000	8.0000	*462.62*	2.6947	710.43	*1914.4*	*0.0*
10.000 40.000	9.0000	*739.65*	1.8690	2112.9	*3949.0*	*0.0*
10.000 40.000	10.000	*1081.2*	1.7681	3679.7	*6506.1*	*0.0*
10.000 40.000	11.000	*1486.3*	1.7833	5417.5	*9661.2*	*0.0*
10.000 40.000	12.000		Only 1 intersection			
10.000 41.000	7.0000		Weight too small			
10.000 41.000	8.0000	*263.59*	2.8846	378.19	*1090.9*	*0.0*
10.000 41.000	9.0000	*487.78*	2.1420	1196.4	*2562.7*	*0.0*
10.000 41.000	10.000	*779.27*	1.7729	2762.8	*4898.2*	*0.0*
10.000 41.000	11.000	*1137.9*	1.7323	4500.4	*7796.1*	*0.0*
10.000 41.000	12.000	*1558.1*	1.7686	6392.7	*11306.*	*0.0*
10.000 41.000	13.000		Only 1 intersection			
10.000 42.000	7.0000		Weight too small			
10.000 42.000	8.0000	*103.74*	2.3589	176.50	*416.35*	*0.0*
10.000 42.000	9.0000	*278.23*	3.0909	416.38	*1287.0*	*0.0*
10.000 42.000	10.000	*511.94*	1.9343	1685.9	*3261.2*	*0.0*
10.000 42.000	11.000	*817.67*	1.7310	3417.7	*5916.1*	*0.0*
10.000 42.000	12.000	*1191.7*	1.7215	5320.9	*9160.1*	*0.0*
10.000 42.000	13.000		Only 1 intersection			
10.000 43.000	7.0000		Radius too small			
10.000 43.000	8.0000		Weight too small			
10.000 43.000	9.0000	*112.80*	2.4007	211.58	*507.94*	*0.0*
10.000 43.000	10.000		Only 1 intersection			
10.000 43.000	11.000	*533.85*	1.8462	2169.7	*4005.7*	*0.0*
10.000 43.000	12.000	*854.19*	1.7183	4072.9	*6998.4*	*0.0*
10.000 43.000	13.000	*1240.8*	1.7299	6130.3	*10605.*	*0.0*
10.000 43.000	14.000		Only 1 intersection			
10.000 44.000	7.0000		Radius too small			
10.000 44.000	8.0000		Radius too small			
10.000 44.000	9.0000		Weight too small			
10.000 44.000	10.000	*121.28*	2.4549	246.74	*605.73*	*0.0*
10.000 44.000	10.000		Only 1 intersection			
10.000 44.000	11.000	*300.09*	2.5640	762.27	*1954.4*	*0.0*
10.000 44.000	12.000	*556.30*	1.8098	2662.5	*4818.5*	*0.0*
10.000 44.000	13.000	*888.97*	1.7226	4727.9	*8144.4*	*0.0*
10.000 44.000	14.000	*1290.1*	1.7399	6951.2	*12095.*	*0.0*
10.000 44.000	15.000		Only 1 intersection			
10.000 45.000	7.0000		Radius too small			
10.000 45.000	8.0000		Radius too small			
10.000 45.000	9.0000		Radius too small			
10.000 45.000	10.000		Weight too small			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
10.000 45.000	11.000	*128.14*	2.5577	274.93	*703.17*	*0.0*
10.000 45.000	12.000	*310.43*	2.2666	1086.4	*2462.5*	*0.0*
10.000 45.000	13.000	*576.28*	1.7982	3147.3	*5659.5*	*0.0*
10.000 45.000	14.000	*922.39*	1.7375	5383.3	*9353.3*	*0.0*
10.000 45.000	15.000		Only 1 intersection			
10.000 46.000	7.0000		Radius too small			
10.000 46.000	8.0000		Radius too small			
10.000 46.000	9.0000		Radius too small			
10.000 46.000	10.000		Radius too small			
10.000 46.000	11.000		Weight too small			
10.000 46.000	12.000	*133.71*	2.6888	297.53	*800.00*	*0.0*
10.000 46.000	13.000	*320.34*	2.1317	1410.6	*3007.0*	*0.0*
10.000 46.000	14.000	*597.18*	1.8040	3641.9	*6569.9*	*0.0*
10.000 46.000	15.000	*952.35*	1.7602	6026.9	*10608.*	*0.0*
10.000 46.000	16.000		Only 1 intersection			
11.000 37.000	7.0000	*903.89*	1.8828	1962.8	*3695.5*	*0.0*
11.000 37.000	8.0000	*1252.4*	1.8322	3199.3	*5861.9*	*0.0*
11.000 37.000	9.0000	*1662.1*	1.8638	4606.5	*8585.5*	*0.0*
11.000 37.000	10.000	*2131.8*	1.9298	6178.3	*11923.*	*0.0*
11.000 37.000	11.000	*2659.3*	2.0104	7907.8	*15898.*	*0.0*
11.000 37.000	12.000		Only 1 intersection			
11.000 38.000	7.0000	*667.47*	1.8412	1551.9	*2857.3*	*0.0*
11.000 38.000	8.0000	*972.27*	1.7384	2778.6	*4830.3*	*0.0*
11.000 38.000	9.0000	*1341.2*	1.7556	4185.5	*7348.0*	*0.0*
11.000 38.000	10.000	*1770.7*	1.8155	5758.3	*10454.*	*0.0*
11.000 38.000	11.000	*2258.5*	1.8952	7487.1	*14189.*	*0.0*
11.000 38.000	12.000		Only 1 intersection			
11.000 39.000	7.0000	*450.42*	2.0234	959.19	*1940.8*	*0.0*
11.000 39.000	8.0000	*711.96*	1.7007	2197.3	*3737.1*	*0.0*
11.000 39.000	9.0000	*1036.5*	1.6777	3599.3	*6038.6*	*0.0*
11.000 39.000	10.000	*1423.9*	1.7232	5172.0	*8912.1*	*0.0*
11.000 39.000	11.000	*1870.4*	1.7963	6900.5	*12395.*	*0.0*
11.000 39.000	12.000	*2379.8*	1.8809	8804.4	*16560.*	*0.0*
11.000 39.000	13.000		Only 1 intersection			
11.000 40.000	7.0000	*269.29*	3.4463	285.33	*983.35*	*0.0*
11.000 40.000	8.0000	*477.08*	1.7936	1444.6	*2591.0*	*0.0*
11.000 40.000	9.0000	*754.20*	1.6459	2847.6	*4686.8*	*0.0*
11.000 40.000	10.000	*1096.7*	1.6571	4419.8	*7324.0*	*0.0*
11.000 40.000	11.000	*1499.6*	1.7154	6149.0	*10548.*	*0.0*
11.000 40.000	12.000	*1966.6*	1.7926	8052.2	*14434.*	*0.0*
11.000 40.000	13.000		Only 1 intersection			
11.000 41.000	7.0000	*122.49*	2.6176	166.29	*435.28*	*0.0*
11.000 41.000	8.0000	*281.78*	2.5354	531.72	*1348.1*	*0.0*
11.000 41.000	9.0000	*503.66*	1.7052	1937.5	*3303.8*	*0.0*
11.000 41.000	10.000	*794.71*	1.6297	3503.0	*5708.9*	*0.0*
11.000 41.000	11.000	*1153.3*	1.6575	5240.5	*8686.3*	*0.0*
11.000 41.000	12.000	*1573.5*	1.7209	7135.0	*12279.*	*0.0*
11.000 41.000	13.000		Only 1 intersection			
11.000 42.000	7.0000		Weight too small			
11.000 42.000	8.0000	*131.54*	2.7332	194.56	*531.77*	*0.0*
11.000 42.000	9.0000	*293.26*	2.1163	852.93	*1805.0*	*0.0*
11.000 42.000	10.000	*527.63*	1.6777	2425.9	*4070.0*	*0.0*
11.000 42.000	11.000	*833.12*	1.6357	4157.9	*6801.0*	*0.0*
11.000 42.000	12.000	*1205.0*	1.6712	6052.2	*10115.*	*0.0*
11.000 42.000	13.000	*1643.6*	1.7353	8121.1	*14093.*	*0.0*
11.000 42.000	14.000		Only 1 intersection			
11.000 43.000	7.0000		Radius too small			
11.000 43.000	8.0000		Weight too small			
11.000 43.000	9.0000	*138.21*	2.9246	214.28	*626.69*	*0.0*
11.000 43.000	10.000	*304.68*	1.9579	1177.1	*2304.7*	*0.0*
11.000 43.000	11.000	*549.67*	1.6795	2911.6	*4890.2*	*0.0*
11.000 43.000	12.000	*869.65*	1.6540	4813.3	*7961.0*	*0.0*
11.000 43.000	13.000	*1256.3*	1.6922	6872.9	*11630.*	*0.0*
11.000 43.000	14.000	*1711.0*	1.7558	9107.5	*15991.*	*0.0*
11.000 43.000	15.000		Only 1 intersection			
11.000 44.000	7.0000		Radius too small			
11.000 44.000	8.0000		Radius too small			
11.000 44.000	9.0000		Weight too small			
11.000 44.000	10.000	*143.15*	3.1599	227.81	*719.86*	*0.0*
11.000 44.000	11.000	*315.54*	1.8957	1501.3	*2846.0*	*0.0*
11.000 44.000	12.000	*573.46*	1.6952	3410.4	*5781.4*	*0.0*
11.000 44.000	13.000	*904.49*	1.6801	5468.2	*9187.2*	*0.0*
11.000 44.000	14.000	*1305.6*	1.7185	7693.4	*13221.*	*0.0*
11.000 44.000	15.000		Only 1 intersection			
11.000 45.000	7.0000		Radius too small			

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
11.000	45.000	8.0000	Radius too small			
11.000	45.000	9.0000	Radius too small			
11.000	45.000	10.000	Weight too small			
11.000	45.000	11.000	*147.32*	3.4041	239.09	*813.90*	*0.0*
11.000	45.000	12.000	*325.89*	1.8780	1825.6	*3428.5*	*0.0*
11.000	45.000	13.000	*592.11*	1.7255	3889.3	*6711.1*	*0.0*
11.000	45.000	14.000	*935.71*	1.7113	6114.3	*10463.*	*0.0*
11.000	45.000	15.000	*1352.8*	1.7483	8513.9	*14885.*	*0.0*
11.000	45.000	16.000	Only 1 intersection			
11.000	46.000	7.0000	Radius too small			
11.000	46.000	8.0000	Radius too small			
11.000	46.000	9.0000	Radius too small			
11.000	46.000	10.000	Radius too small			
11.000	46.000	11.000	Weight too small			
11.000	46.000	12.000	*150.77*	3.6591	248.14	*907.97*	*0.0*
11.000	46.000	13.000	*335.79*	1.8845	2149.8	*4051.3*	*0.0*
11.000	46.000	14.000	*612.14*	1.7579	4378.9	*7697.8*	*0.0*
11.000	46.000	15.000	*967.82*	1.7454	6769.4	*11816.*	*0.0*
11.000	46.000	16.000	*1398.4*	1.7803	9334.8	*16619.*	*0.0*
11.000	46.000	17.000	Only 1 intersection			
12.000	37.000	7.0000	*919.27*	1.6984	2536.3	*4307.7*	*0.0*
12.000	37.000	8.0000	*1267.7*	1.7356	3774.2	*6550.5*	*0.0*
12.000	37.000	9.0000	*1677.6*	1.8034	5181.3	*9343.8*	*0.0*
12.000	37.000	10.000	*2145.1*	1.8895	6746.7	*12748.*	*0.0*
12.000	37.000	11.000	*2674.8*	1.9814	8484.6	*16811.*	*0.0*
12.000	37.000	12.000	*3264.4*	2.0788	10389.	*21597.*	*0.0*
12.000	37.000	13.000	Only 1 intersection			
12.000	38.000	7.0000	*680.87*	1.6347	2115.7	*3458.5*	*0.0*
12.000	38.000	8.0000	*987.69*	1.6419	3353.2	*5505.4*	*0.0*
12.000	38.000	9.0000	*1356.5*	1.7013	4760.6	*8099.2*	*0.0*
12.000	38.000	10.000	*1784.0*	1.7823	6325.9	*11274.*	*0.0*
12.000	38.000	11.000	*2273.9*	1.8725	8064.1	*15100.*	*0.0*
12.000	38.000	12.000	*2824.0*	1.9684	9968.1	*19621.*	*0.0*
12.000	38.000	13.000	Only 1 intersection			
12.000	39.000	7.0000	*466.46*	1.6569	1534.4	*2542.4*	*0.0*
12.000	39.000	8.0000	*726.28*	1.5898	2767.4	*4399.7*	*0.0*
12.000	39.000	9.0000	*1051.9*	1.6253	4174.1	*6784.3*	*0.0*
12.000	39.000	10.000	*1439.4*	1.6946	5746.4	*9738.0*	*0.0*
12.000	39.000	11.000	*1885.9*	1.7790	7477.5	*13302.*	*0.0*
12.000	39.000	12.000	*2395.3*	1.8704	9381.5	*17547.*	*0.0*
12.000	39.000	13.000	Only 1 intersection			
12.000	40.000	7.0000	*282.00*	1.9209	790.09	*1517.7*	*0.0*
12.000	40.000	8.0000	*494.70*	1.6087	2026.5	*3260.1*	*0.0*
12.000	40.000	9.0000	*769.60*	1.5854	3422.4	*5425.9*	*0.0*
12.000	40.000	10.000	*1112.0*	1.6305	4994.9	*8144.0*	*0.0*
12.000	40.000	11.000	*1515.2*	1.7025	6726.0	*11451.*	*0.0*
12.000	40.000	12.000	*1982.1*	1.7868	8629.3	*15419.*	*0.0*
12.000	40.000	13.000	*2510.6*	1.8777	10699.	*20090.*	*0.0*
12.000	40.000	14.000	Only 1 intersection			
12.000	41.000	7.0000	*140.48*	3.6434	137.77	*501.97*	*0.0*
12.000	41.000	8.0000	*295.34*	1.8106	1107.9	*2006.1*	*0.0*
12.000	41.000	9.0000	*518.64*	1.6088	2509.0	*4036.7*	*0.0*
12.000	41.000	10.000	*810.19*	1.6003	4077.6	*6525.6*	*0.0*
12.000	41.000	11.000	*1168.8*	1.6482	5815.5	*9585.4*	*0.0*
12.000	41.000	12.000	*1589.0*	1.7219	7712.0	*13279.*	*0.0*
12.000	41.000	13.000	*2073.7*	1.8022	9781.5	*17628.*	*0.0*
12.000	41.000	14.000	Only 1 intersection			
12.000	42.000	7.0000	Weight too small			
12.000	42.000	8.0000	*145.64*	4.0891	144.79	*592.07*	*0.0*
12.000	42.000	9.0000	*308.10*	1.7768	1429.3	*2539.6*	*0.0*
12.000	42.000	10.000	*541.83*	1.6284	2995.1	*4877.2*	*0.0*
12.000	42.000	11.000	*848.61*	1.6265	4732.5	*7697.4*	*0.0*
12.000	42.000	12.000	*1220.6*	1.6737	6629.0	*11095.*	*0.0*
12.000	42.000	13.000	*1659.1*	1.7424	8698.2	*15156.*	*0.0*
12.000	42.000	14.000	*2161.4*	1.8228	10933.	*19929.*	*0.0*
12.000	42.000	15.000	Weight too small			
12.000	42.000	15.000	Radius too large			
12.000	43.000	7.0000	Radius too small			
12.000	43.000	8.0000	Weight too small			
12.000	43.000	9.0000	*149.88*	3.4059	225.24	*767.13*	*0.0*
12.000	43.000	10.000	*319.95*	1.7790	1751.8	*3116.4*	*0.0*
12.000	43.000	11.000	*564.78*	1.6594	3484.6	*5782.2*	*0.0*
12.000	43.000	12.000	*885.11*	1.6591	5387.9	*8939.3*	*0.0*
12.000	43.000	13.000	*1271.8*	1.7038	7449.5	*12693.*	*0.0*
12.000	43.000	14.000	*1726.3*	1.7694	9684.8	*17136.*	*0.0*

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
12.000 43.000	15.000		Only 1 intersection			
12.000 44.000	7.0000		Radius too small			
12.000 44.000	8.0000		Radius too small			
12.000 44.000	9.0000		Weight too small			
12.000 44.000	10.000	*153.45*	2.7465	379.71	*1042.9*	*0.0*
12.000 44.000	11.000	*330.96*	1.8023	2075.2	*3740.2*	*0.0*
12.000 44.000	12.000	*586.64*	1.6971	3974.4	*6744.9*	*0.0*
12.000 44.000	13.000	*919.91*	1.6959	6043.1	*10248.*	*0.0*
12.000 44.000	14.000	*1321.1*	1.7371	8270.5	*14367.*	*0.0*
12.000 44.000	15.000	*1791.0*	1.7993	10671.	*19200.*	*0.0*
12.000 44.000	16.000		Weight too small			
12.000 44.000	16.000		Radius too large			
12.000 45.000	7.0000		Radius too small			
12.000 45.000	8.0000		Radius too small			
12.000 45.000	9.0000		Radius too small			
12.000 45.000	10.000		Weight too small			
12.000 45.000	11.000	*157.15*	2.5107	535.98	*1345.7*	*0.0*
12.000 45.000	12.000	*341.36*	1.8358	2399.3	*4404.6*	*0.0*
12.000 45.000	13.000	*607.55*	1.7389	4464.1	*7762.6*	*0.0*
12.000 45.000	14.000	*951.14*	1.7348	6691.4	*11608.*	*0.0*
12.000 45.000	15.000	*1368.2*	1.7724	9091.0	*16113.*	*0.0*
12.000 45.000	16.000	*1853.0*	1.8310	11657.	*21344.*	*0.0*
12.000 45.000	17.000		Only 1 intersection			
12.000 46.000	7.0000		Radius too small			
12.000 46.000	8.0000		Radius too small			
12.000 46.000	9.0000		Radius too small			
12.000 46.000	10.000		Radius too small			
12.000 46.000	11.000		Weight too small			
12.000 46.000	12.000	*160.64*	2.4177	692.47	*1674.2*	*0.0*
12.000 46.000	13.000	*350.19*	1.8761	2719.8	*5102.5*	*0.0*
12.000 46.000	14.000	*627.61*	1.7847	4953.8	*8840.9*	*0.0*
12.000 46.000	15.000	*983.22*	1.7755	7346.5	*13044.*	*0.0*
12.000 46.000	16.000	*1413.9*	1.8092	9911.8	*17932.*	*0.0*
12.000 46.000	17.000		Weight too small			
12.000 46.000	17.000		Radius too large			
13.000 37.000	7.0000	*933.63*	1.6693	2942.1	*4911.1*	*0.0*
13.000 37.000	8.0000	*1283.3*	1.7282	4183.4	*7229.6*	*0.0*
13.000 37.000	9.0000	*1693.0*	1.8078	5590.9	*10107.*	*0.0*
13.000 37.000	10.000	*2160.5*	1.8976	7158.8	*13584.*	*0.0*
13.000 37.000	11.000	*2690.3*	1.9932	8897.3	*17734.*	*0.0*
13.000 37.000	12.000	*3279.9*	2.0926	10801.	*22601.*	*0.0*
13.000 37.000	13.000	*3937.4*	2.2652	12321.	*27910.*	*0.0*
13.000 37.000	14.000		Only 1 intersection			
13.000 38.000	7.0000	*696.25*	1.6058	2524.2	*4053.3*	*0.0*
13.000 38.000	8.0000	*1003.1*	1.6440	3762.4	*6185.4*	*0.0*
13.000 38.000	9.0000	*1372.0*	1.7139	5169.6	*8860.4*	*0.0*
13.000 38.000	10.000	*1799.3*	1.7990	6737.6	*12121.*	*0.0*
13.000 38.000	11.000	*2289.4*	1.8901	8476.0	*16020.*	*0.0*
13.000 38.000	12.000	*2839.5*	1.9871	10379.	*20625.*	*0.0*
13.000 38.000	13.000	*3455.9*	2.1092	12251.	*25839.*	*0.0*
13.000 38.000	14.000		Only 1 intersection			
13.000 39.000	7.0000	*478.96*	1.6022	1947.0	*3119.4*	*0.0*
13.000 39.000	8.0000	*741.79*	1.5981	3176.4	*5076.3*	*0.0*
13.000 39.000	9.0000	*1067.3*	1.6457	4583.3	*7542.5*	*0.0*
13.000 39.000	10.000	*1454.7*	1.7181	6156.2	*10577.*	*0.0*
13.000 39.000	11.000	*1901.3*	1.8027	7889.3	*14222.*	*0.0*
13.000 39.000	12.000	*2410.7*	1.8943	9792.9	*18551.*	*0.0*
13.000 39.000	13.000	*2980.6*	1.9897	11862.	*23602.*	*0.0*
13.000 39.000	13.000		Weight too small			
13.000 39.000	14.000		Only 1 intersection			
13.000 40.000	7.0000	*291.32*	1.6955	1222.8	*2073.4*	*0.0*
13.000 40.000	8.0000	*507.74*	1.6164	2430.6	*3928.8*	*0.0*
13.000 40.000	9.0000	*785.09*	1.6131	3831.7	*6181.1*	*0.0*
13.000 40.000	10.000	*1127.5*	1.6622	5404.1	*8982.8*	*0.0*
13.000 40.000	11.000	*1530.6*	1.7333	7137.7	*12372.*	*0.0*
13.000 40.000	12.000	*1997.7*	1.8164	9041.3	*16422.*	*0.0*
13.000 40.000	13.000	*2526.1*	1.9059	11111.	*21176.*	*0.0*
13.000 40.000	14.000	*3131.8*	2.0981	12455.	*26133.*	*0.0*
13.000 40.000	15.000		Only 1 intersection			
13.000 41.000	7.0000	*145.75*	2.2918	366.81	*840.66*	*0.0*
13.000 41.000	8.0000	*306.35*	1.7177	1538.4	*2642.5*	*0.0*
13.000 41.000	9.0000	*532.97*	1.6413	2914.9	*4784.2*	*0.0*
13.000 41.000	10.000	*825.61*	1.6408	4487.0	*7362.2*	*0.0*
13.000 41.000	11.000	*1184.2*	1.6878	6224.8	*10506.*	*0.0*
13.000 41.000	12.000	*1604.4*	1.7580	8123.7	*14281.*	*0.0*

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
13.000 41.000	13.000	*2089.2*	1.8360	10193.	*18714.*	*0.0*
13.000 41.000	14.000	*2646.6*	1.9363	12283.	*23784.*	*0.0*
13.000 41.000	15.000		Only 1 intersection			
13.000 42.000	7.0000		Weight too small			
13.000 42.000	8.0000	*151.11*	2.1813	520.15	*1134.6*	*0.0*
13.000 42.000	9.0000	*320.08*	1.7595	1855.4	*3264.6*	*0.0*
13.000 42.000	10.000	*557.28*	1.6777	3404.4	*5711.4*	*0.0*
13.000 42.000	11.000	*864.04*	1.6757	5142.3	*8616.9*	*0.0*
13.000 42.000	12.000	*1236.0*	1.7184	7040.6	*12098.*	*0.0*
13.000 42.000	13.000	*1674.6*	1.7830	9110.2	*16243.*	*0.0*
13.000 42.000	14.000	*2176.7*	1.8597	11345.	*21099.*	*0.0*
13.000 42.000	14.000		Weight too small			
13.000 42.000	15.000	*2764.0*	2.0671	12555.	*25953.*	*0.0*
13.000 42.000	16.000		Only 1 intersection			
13.000 43.000	7.0000		Radius too small			
13.000 43.000	8.0000		Weight too small			
13.000 43.000	9.0000	*155.56*	2.1664	672.89	*1457.7*	*0.0*
13.000 43.000	10.000	*332.76*	1.8079	2173.9	*3930.1*	*0.0*
13.000 43.000	11.000	*580.25*	1.7204	3894.1	*6699.6*	*0.0*
13.000 43.000	12.000	*900.52*	1.7150	5797.5	*9942.5*	*0.0*
13.000 43.000	13.000	*1287.3*	1.7529	7861.2	*13780.*	*0.0*
13.000 43.000	14.000	*1741.8*	1.8133	10096.	*18308.*	*0.0*
13.000 43.000	15.000	*2273.1*	1.9058	12297.	*23435.*	*0.0*
13.000 43.000	16.000		Only 1 intersection			
13.000 44.000	7.0000		Radius too small			
13.000 44.000	8.0000		Radius too small			
13.000 44.000	9.0000		Weight too small			
13.000 44.000	10.000	*160.06*	2.1910	827.17	*1812.3*	*0.0*
13.000 44.000	11.000	*344.56*	1.8600	2493.5	*4638.0*	*0.0*
13.000 44.000	12.000	*602.12*	1.7671	4383.6	*7746.1*	*0.0*
13.000 44.000	13.000	*933.15*	1.7559	6447.7	*11322.*	*0.0*
13.000 44.000	14.000	*1336.4*	1.7897	8682.2	*15538.*	*0.0*
13.000 44.000	15.000	*1806.3*	1.8457	11083.	*20456.*	*0.0*
13.000 44.000	15.000		Weight too small			
13.000 44.000	16.000	*2364.1*	2.0271	12535.	*25410.*	*0.0*
13.000 44.000	17.000		Only 1 intersection			
13.000 45.000	7.0000		Radius too small			
13.000 45.000	8.0000		Radius too small			
13.000 45.000	9.0000		Radius too small			
13.000 45.000	10.000		Weight too small			
13.000 45.000	11.000	*164.23*	2.2358	981.82	*2195.2*	*0.0*
13.000 45.000	12.000	*354.56*	1.9155	2811.3	*5384.9*	*0.0*
13.000 45.000	13.000	*623.03*	1.8156	4873.4	*8848.3*	*0.0*
13.000 45.000	14.000	*966.68*	1.7994	7102.6	*12780.*	*0.0*
13.000 45.000	15.000	*1383.7*	1.8280	9502.5	*17370.*	*0.0*
13.000 45.000	16.000	*1868.5*	1.8797	12068.	*22685.*	*0.0*
13.000 45.000	16.000		Weight too small			
13.000 45.000	17.000		Only 1 intersection			
13.000 46.000	7.0000		Radius too small			
13.000 46.000	8.0000		Radius too small			
13.000 46.000	9.0000		Radius too small			
13.000 46.000	10.000		Radius too small			
13.000 46.000	11.000		Weight too small			
13.000 46.000	12.000	*168.13*	2.2915	1136.8	*2605.0*	*0.0*
13.000 46.000	13.000	*364.98*	1.9720	3132.8	*6177.8*	*0.0*
13.000 46.000	14.000	*643.10*	1.8665	5363.2	*10010.*	*0.0*
13.000 46.000	15.000	*998.75*	1.8434	7757.7	*14301.*	*0.0*
13.000 46.000	16.000	*1429.2*	1.8670	10323.	*19273.*	*0.0*
13.000 46.000	17.000	*1948.5*	1.9753	12429.	*24550.*	*0.0*
13.000 46.000	18.000		Only 1 intersection			
14.000 37.000	7.0000	*948.30*	1.7337	3191.0	*5532.1*	*0.0*
14.000 37.000	8.0000	*1298.6*	1.7912	4427.3	*7930.4*	*0.0*
14.000 37.000	9.0000	*1708.4*	1.8668	5834.5	*10892.*	*0.0*
14.000 37.000	10.000	*2176.0*	1.9511	7404.6	*14447.*	*0.0*
14.000 37.000	11.000	*2705.8*	2.0434	9142.6	*18682.*	*0.0*
14.000 37.000	12.000	*3303.8*	2.2081	10569.	*23338.*	*0.0*
14.000 37.000	13.000	*3974.3*	2.5396	11017.	*27980.*	*0.0*
14.000 37.000	14.000	*4702.7*	2.8987	11480.	*33278.*	*0.0*
14.000 37.000	15.000		Radius too large			
14.000 38.000	7.0000	*708.03*	1.6732	2781.5	*4654.0*	*0.0*
14.000 38.000	8.0000	*1018.4*	1.7188	4006.7	*6886.5*	*0.0*
14.000 38.000	9.0000	*1387.5*	1.7812	5413.7	*9642.7*	*0.0*
14.000 38.000	10.000	*1814.7*	1.8593	6983.9	*12985.*	*0.0*
14.000 38.000	11.000	*2304.7*	1.9452	8722.1	*16966.*	*0.0*
14.000 38.000	12.000	*2861.2*	2.0543	10495.	*21559.*	*0.0*
14.000 38.000	13.000	*3491.9*	2.3723	10937.	*25947.*	*0.0*

Slip Centre		Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Moment	Restoring	Reinforcement Restoring
14.000	38.000	14.000	*4181.6*	2.7153	11400.		*30955.*	*0.0*
14.000	38.000	15.000		Radius too large				
14.000	39.000	7.0000	*489.10*	1.6658	2221.1		*3699.8*	*0.0*
14.000	39.000	8.0000	*756.41*	1.6872	3425.8		*5780.1*	*0.0*
14.000	39.000	9.0000	*1082.7*	1.7246	4827.6		*8325.5*	*0.0*
14.000	39.000	10.000	*1468.1*	1.7885	6397.6		*11442.*	*0.0*
14.000	39.000	11.000	*1916.6*	1.8647	8135.4		*15170.*	*0.0*
14.000	39.000	12.000	*2426.2*	1.9514	10039.		*19590.*	*0.0*
14.000	39.000	12.000		Slip too small to split into minimum no. of slices				
14.000	39.000	13.000	*3018.6*	2.2082	10822.		*23897.*	*0.0*
14.000	39.000	14.000	*3668.8*	2.5359	11285.		*28618.*	*0.0*
14.000	39.000	15.000		Radius too large				
14.000	40.000	7.0000	*297.88*	1.7334	1514.5		*2625.3*	*0.0*
14.000	40.000	8.0000	*518.39*	1.7058	2694.5		*4596.4*	*0.0*
14.000	40.000	9.0000	*800.45*	1.7086	4076.0		*6964.3*	*0.0*
14.000	40.000	10.000	*1142.9*	1.7458	5648.4		*9860.9*	*0.0*
14.000	40.000	11.000	*1546.0*	1.8041	7383.6		*13321.*	*0.0*
14.000	40.000	12.000	*2013.1*	1.8794	9287.4		*17455.*	*0.0*
14.000	40.000	13.000	*2556.3*	2.0535	10649.		*21867.*	*0.0*
14.000	40.000	14.000	*3167.7*	2.3601	11138.		*26288.*	*0.0*
14.000	40.000	15.000		Only 1 intersection				
14.000	41.000	7.0000	*147.20*	2.0186	675.19		*1363.0*	*0.0*
14.000	41.000	8.0000	*314.10*	1.7978	1824.6		*3280.2*	*0.0*
14.000	41.000	9.0000	*546.07*	1.7481	3173.5		*5547.5*	*0.0*
14.000	41.000	10.000	*841.16*	1.7394	4730.8		*8228.8*	*0.0*
14.000	41.000	11.000	*1197.5*	1.7700	6466.1		*11445.*	*0.0*
14.000	41.000	12.000	*1619.8*	1.8298	8369.8		*15315.*	*0.0*
14.000	41.000	13.000	*2113.0*	1.8935	10479.		*19841.*	*0.0*
14.000	41.000	14.000	*2676.0*	2.2061	10892.		*24030.*	*0.0*
14.000	41.000	15.000		Only 1 intersection				
14.000	42.000	7.0000		Weight too small				
14.000	42.000	8.0000	*153.31*	2.1018	825.95		*1736.0*	*0.0*
14.000	42.000	9.0000	*328.85*	1.8674	2136.7		*3989.9*	*0.0*
14.000	42.000	10.000	*571.59*	1.7963	3655.6		*6566.6*	*0.0*
14.000	42.000	11.000	*879.55*	1.7763	5386.1		*9567.4*	*0.0*
14.000	42.000	12.000	*1251.3*	1.8022	7287.0		*13132.*	*0.0*
14.000	42.000	13.000	*1690.0*	1.8556	9356.5		*17362.*	*0.0*
14.000	42.000	13.000		Slip too small to split into minimum no. of slices				
14.000	42.000	14.000	*2211.7*	2.0303	10715.		*21754.*	*0.0*
14.000	42.000	15.000	*2798.8*	2.3310	11230.		*26176.*	*0.0*
14.000	42.000	16.000		Only 1 intersection				
14.000	43.000	7.0000		Radius too small				
14.000	43.000	8.0000		Weight too small				
14.000	43.000	9.0000	*158.86*	2.1910	977.37		*2141.5*	*0.0*
14.000	43.000	10.000	*342.46*	1.9340	2450.4		*4739.1*	*0.0*
14.000	43.000	11.000	*595.32*	1.8461	4140.6		*7643.9*	*0.0*
14.000	43.000	12.000	*916.04*	1.8170	6041.3		*10977.*	*0.0*
14.000	43.000	13.000	*1302.7*	1.8377	8107.4		*14899.*	*0.0*
14.000	43.000	14.000	*1757.2*	1.8866	10342.		*19511.*	*0.0*
14.000	43.000	14.000		Weight too small				
14.000	43.000	15.000	*2305.5*	2.1652	10945.		*23699.*	*0.0*
14.000	43.000	16.000		Only 1 intersection				
14.000	44.000	7.0000		Radius too small				
14.000	44.000	8.0000		Radius too small				
14.000	44.000	9.0000		Weight too small				
14.000	44.000	10.000	*163.95*	2.2819	1129.4		*2577.3*	*0.0*
14.000	44.000	11.000	*354.04*	2.0014	2763.9		*5531.7*	*0.0*
14.000	44.000	12.000	*617.54*	1.8963	4628.1		*8776.3*	*0.0*
14.000	44.000	13.000	*948.64*	1.8586	6693.4		*12440.*	*0.0*
14.000	44.000	14.000	*1351.9*	1.8752	8928.2		*16742.*	*0.0*
14.000	44.000	15.000	*1842.8*	1.9918	10694.		*21301.*	*0.0*
14.000	44.000	16.000	*2400.0*	2.2894	11219.		*25685.*	*0.0*
14.000	44.000	17.000		Only 1 intersection				
14.000	45.000	7.0000		Radius too small				
14.000	45.000	8.0000		Radius too small				
14.000	45.000	9.0000		Radius too small				
14.000	45.000	10.000		Weight too small				
14.000	45.000	11.000	*168.65*	2.3727	1282.0		*3041.8*	*0.0*
14.000	45.000	12.000	*365.90*	2.0688	3080.2		*6372.4*	*0.0*
14.000	45.000	13.000	*638.53*	1.9468	5117.3		*9962.5*	*0.0*
14.000	45.000	14.000	*982.08*	1.9027	7348.7		*13982.*	*0.0*
14.000	45.000	15.000	*1399.2*	1.9139	9749.1		*18658.*	*0.0*
14.000	45.000	15.000		Weight too small				
14.000	45.000	16.000	*1912.6*	2.1210	10878.		*23073.*	*0.0*
14.000	45.000	17.000		Only 1 intersection				

Slip Centre	Radius	Slip Weight	Comment/ Over Design	Disturbing Moment	Soil Strength Restoring Moment	Reinforcement Restoring
14.000 46.000	7.0000		Radius too small			
14.000 46.000	8.0000		Radius too small			
14.000 46.000	9.0000		Radius too small			
14.000 46.000	10.000		Radius too small			
14.000 46.000	11.000		Weight too small			
14.000 46.000	12.000	*172.41*	2.4616	1433.9	*3529.8*	*0.0*
14.000 46.000	13.000	*377.01*	2.1348	3397.6	*7253.4*	*0.0*
14.000 46.000	14.000	*658.62*	1.9988	5607.1	*11208.*	*0.0*
14.000 46.000	15.000	*1014.3*	1.9474	8004.0	*15587.*	*0.0*
14.000 46.000	16.000	*1459.3*	1.9549	10535.	*20595.*	*0.0*
14.000 46.000	17.000	*1982.4*	2.2434	11091.	*24882.*	*0.0*
14.000 46.000	18.000		Only 1 intersection			

APPENDIX 13 - Generic Screening Values (Residential End Use)

Generic Assessment Criteria (GAC)

GROUNDTECH CONSULTING

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	980	980	980	LQM S4ULs
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)	180000 (4360)	LQM S4ULs
Aromatic EC 8 - 10	mg/kg	34	83	190	3500 (613) vap	8100 (1500) vap	17000 (3580)	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 ether)	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 SAULs
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

Generic Assessment Criteria (GAC)

GROUNDTECH CONSULTING

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*
Tetrachoromethane (Carbon Tetrachloride)	*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 chloride)	*mg/kg*	*0.00064*	*0.00087*	*0.0014*	*0.059*	*0.077*	*0.12*	*LQM S4ULs*
Trichloromethane (Chloroform)	*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)* [vap]	*3.3 (0.5)* [vap]	*4.9*	*110 (0.2)* [vap]	*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)* [vap]	*120 (98.1)* [vap]	*240 (235)* [vap]	*LQM S4ULs*
1,2,3,4-Tetrachlorobenzene	*mg/kg*	*15*	*36*	*78*	*1700 (122)* [vap]	*3080 (304)* [vap]	*4400 (728)* [vap]	*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)* [vap]	*10000* [f] *(540)*	*25000* [f] *(1280)*	*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-Hexachlorocyclohexane	*mg/kg*	*0.06*	*0.14*	*0.33*	*67*	*69*	*70*	*LQM S4ULs*
Beta-Hexachlorocyclohexane	*mg/kg*	*0.085*	*0.2*	*0.46*	*65*	*65*	*65*	*LQM S4ULs*
Alpha -Hexachlorocyclohexane	*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)* [vap]	*7400 (0.007)* [vap]	*8400 (0.016)* [vap]	*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)

[vap] 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 protecive direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustation only

APPENDIX 14 - JIWG Receptor Decision Tool

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	GRO-22168
Site Name	50 Dundonald Road
Client	Brennan Consult
Run by	CJH
Date	05-Aug-22
Scenario details	

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Loose fibrous asbestos debris	3
Extent of degradation of ACMs at outset of work	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Very Low quantities - <0.001 to 0.01 %wt/wt	1
Sub-total		**12**

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking — **Medium**

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

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Stage 2

Exposure Factors

			Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.001 fibres/ml		0
Anticipated duration of exposure to asbestos	< 2 hours in a 7 day period for all persons involved (e.g. Short Duration Work)		1
Activity type and effect on deterioration of ACMs during work	Sampling, manual or mechanical (significant deterioration expected)		2
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand		2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium		3
Sub-total			**8**
Exposure ranking			Low
Combined hazard and exposure ranking		**20**	Low

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Stage 3

Risk Assessment Outputs

Probable Licensing Status	Non-Licensed Work
RPE*	EN149 type FFP3 disposable
Dust Suppression**	Manual/localised dust suppression
Hygiene/Decontamination***	Localised and basic personal decontamination facilities

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.
**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)
***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

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JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Decision Support Tool for Receptor Risk Ranking

Stage 1

Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not firmly linked in a matrix	2
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly amosite (and possible trace tremolite/anthophyllite) with/without chrysotile (no crocidolite)	3
Sub-total		10
Hazard ranking		Low

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It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

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Version 2, February 2017

Stage 2

Emission Factors		Score
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Very Low quantities - 0.001 to 0.01 %wt/wt	1
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Low	2
Activity type and effect on deterioration of ACMs	Minimal disturbance, no deterioration expected	1
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		6
Exposure ranking		Low

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Stage 3

Pathway and Receptor Sensitivity		Score	
Receptor category	Public open space or building	No score required	
Age of Receptor	Young adult (>16 and <24)	2	
Duration of exposure/site occupancy	< 1 hour in any single day (e.g. frequent but short exposure event)	1	
Receptor ranking		3	Low
Combined hazard, exposure and receptor ranking			Low
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D	
Pathway ranking		4D	Medium
Overall ranking			Low

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Project Reference	GRO-21251

Site Name	Crossley Road, Heaton Chapel
Client	Francis Bradshaw Partnership

Run by	Connor Hastings
Date	13-Sep-21
Reviewed by	RW

Characterisation of scenario being evaluated	

Interpretation of scenario ranking by DST	

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APPENDIX 15 - Waste Classification Report

Waste Classification Report

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

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

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

OQX3S-S54QH-8M1PC

Job name

22-66462_HWOL_Results[2]

Description/Comments

Project

Site

Classified by

Name:
Bradley Massey
Date:
04 Aug 2022 15:20 GMT
Telephone:
01618 201368

Company:
Groundtech Consulting Limited
First Floor, Lloyd House, Orford Court,
Greenfold Way
Leigh
WN7 3XJ

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

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	-

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01---0.20		Non Hazardous		2
2	WS02---0.20		Non Hazardous		4
3	WS03---0.30		Non Hazardous		6
4	WS04---0.20		Non Hazardous		8
5	SUDS2---0.10		Non Hazardous		10

Related documents

#	Name	Description
1	22-66462_HWOL_Results.hwol[3]	i2 Analytical .hwol[3] file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Bradley Massey

Created date: 04 Aug 2022 15:20 GMT

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

Classification of sample: WS01---0.20

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

Sample details

Sample name:
WS01---0.20
Moisture content:
12%
(wet weight correction)

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: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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 trioxide }	033-003-00-0	215-481-4	1327-53-3		4.9 mg/kg	1.32	5.693 mg/kg	0.000569 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7.6 mg/kg	1.462	11.108 mg/kg	0.00111 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13 mg/kg	1.126	12.88 mg/kg	0.00129 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17 mg/kg	1.56	23.335 mg/kg	0.0015 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		5.2 mg/kg	2.976	13.619 mg/kg	0.00136 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		20 mg/kg	2.774	48.825 mg/kg	0.00488 %	✓	
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
12	pH			PH		5.5 pH		5.5 pH	5.5 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
18		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
29		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
										Total:	0.0118 %		

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 Deteminand - 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: WS02---0.20

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

Sample details

Sample name:
WS02---0.20
Moisture content:
13%
(wet weight correction)

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: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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 trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	18.379 mg/kg	0.00184 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1 mg/kg	1.142	0.994 mg/kg	0.0000994 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		51 mg/kg	1.126	49.956 mg/kg	0.005 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	91 mg/kg	1.56	123.491 mg/kg	0.00792 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.3 mg/kg	1.353	0.353 mg/kg	0.0000353 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21 mg/kg	2.976	54.376 mg/kg	0.00544 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		300 mg/kg	2.774	724.052 mg/kg	0.0724 %	✓	
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
12	pH			PH		6.6 pH		6.6 pH	6.6 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				0.39	mg/kg		0.339	mg/kg	0.0000339 %	✓	
			201-581-5	85-01-8									
18		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				0.53	mg/kg		0.461	mg/kg	0.0000461 %	✓	
			205-912-4	206-44-0									
20		pyrene				0.56	mg/kg		0.487	mg/kg	0.0000487 %	✓	
			204-927-3	129-00-0									
21		benzo[a]anthracene				0.29	mg/kg		0.252	mg/kg	0.0000252 %	✓	
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				0.35	mg/kg		0.305	mg/kg	0.0000305 %	✓	
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
29		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
										Total:	0.0961 %		

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 Deteminand - 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: WS03---0.30

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

Sample details

Sample name:
WS03---0.30
Moisture content:
14%
(wet weight correction)

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: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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 trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	18.168 mg/kg	0.00182 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.9 mg/kg	1.142	1.867 mg/kg	0.000187 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		35 mg/kg	1.462	51.154 mg/kg	0.00512 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		66 mg/kg	1.126	63.905 mg/kg	0.00639 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	350 mg/kg	1.56	469.504 mg/kg	0.0301 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23 mg/kg	2.976	58.871 mg/kg	0.00589 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		390 mg/kg	2.774	930.449 mg/kg	0.093 %	✓	
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				1.2 mg/kg	1.884	2.261 mg/kg	0.000226 %		
12	pH			PH		7.4 pH		7.4 pH	7.4 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		2.9 mg/kg		2.494 mg/kg	0.000249 %	✓	
15	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		fluorene				1.2	mg/kg		1.032	mg/kg	0.000103 %	✓	
			201-695-5	86-73-7									
17		phenanthrene				16	mg/kg		13.76	mg/kg	0.00138 %	✓	
			201-581-5	85-01-8									
18		anthracene				3.3	mg/kg		2.838	mg/kg	0.000284 %	✓	
			204-371-1	120-12-7									
19		fluoranthene				40	mg/kg		34.4	mg/kg	0.00344 %	✓	
			205-912-4	206-44-0									
20		pyrene				29	mg/kg		24.94	mg/kg	0.00249 %	✓	
			204-927-3	129-00-0									
21		benzo[a]anthracene				21	mg/kg		18.06	mg/kg	0.00181 %	✓	
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				17	mg/kg		14.62	mg/kg	0.00146 %	✓	
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				22	mg/kg		18.92	mg/kg	0.00189 %	✓	
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				10	mg/kg		8.6	mg/kg	0.00086 %	✓	
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				19	mg/kg		16.34	mg/kg	0.00163 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				8.6	mg/kg		7.396	mg/kg	0.00074 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				2.3	mg/kg		1.978	mg/kg	0.000198 %	✓	
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				8.9	mg/kg		7.654	mg/kg	0.000765 %	✓	
			205-883-8	191-24-2									
29		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
										Total:	0.161 %		

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 Deteminand - 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: WS04---0.20

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

Sample details

Sample name:
WS04---0.20
Moisture content:
9%
(wet weight correction)

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: 9% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU 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 trioxide }	033-003-00-0	215-481-4	1327-53-3		9.1 mg/kg	1.32	10.934 mg/kg	0.00109 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6 mg/kg	1.142	0.624 mg/kg	0.0000624 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37 mg/kg	1.126	37.909 mg/kg	0.00379 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	79 mg/kg	1.56	112.135 mg/kg	0.00719 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.5 mg/kg	1.353	0.616 mg/kg	0.0000616 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35 mg/kg	2.976	94.794 mg/kg	0.00948 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		170 mg/kg	2.774	429.16 mg/kg	0.0429 %	✓	
11	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
12	pH			PH		7 pH		7 pH	7pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				2.1	mg/kg		1.911	mg/kg	0.000191 %	✓	
			201-581-5	85-01-8									
18		anthracene				0.4	mg/kg		0.364	mg/kg	0.0000364 %	✓	
			204-371-1	120-12-7									
19		fluoranthene				3.8	mg/kg		3.458	mg/kg	0.000346 %	✓	
			205-912-4	206-44-0									
20		pyrene				3.7	mg/kg		3.367	mg/kg	0.000337 %	✓	
			204-927-3	129-00-0									
21		benzo[a]anthracene				1.6	mg/kg		1.456	mg/kg	0.000146 %	✓	
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				1.6	mg/kg		1.456	mg/kg	0.000146 %	✓	
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				1.8	mg/kg		1.638	mg/kg	0.000164 %	✓	
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				0.74	mg/kg		0.673	mg/kg	0.0000673 %	✓	
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				1.6	mg/kg		1.456	mg/kg	0.000146 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				0.71	mg/kg		0.646	mg/kg	0.0000646 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				0.98	mg/kg		0.892	mg/kg	0.0000892 %	✓	
			205-883-8	191-24-2									
29		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
										Total:	0.0699 %		

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 Deteminand - 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: SUDS2---0.10

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

Sample details

Sample name:
SUDS2---0.10
Moisture content:
13%
(wet weight correction)

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: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU 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 trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	13.784	mg/kg	0.00138 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8	mg/kg	1.142	0.795	mg/kg	0.0000795 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		56	mg/kg	1.126	54.853	mg/kg	0.00549 %	✓	
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	130	mg/kg	1.56	176.415	mg/kg	0.0113 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23	mg/kg	2.976	59.555	mg/kg	0.00596 %	✓	
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		310	mg/kg	2.774	748.187	mg/kg	0.0748 %	✓	
11		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
12		pH			PH		7.3	pH		7.3	pH	7.3 pH		
13		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
14		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
15		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				0.62	mg/kg		0.539	mg/kg	0.0000539 %	✓	
			201-581-5	85-01-8									
18		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
			205-912-4	206-44-0									
20		pyrene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
			204-927-3	129-00-0									
21		benzo[a]anthracene				0.82	mg/kg		0.713	mg/kg	0.0000713 %	✓	
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				0.67	mg/kg		0.583	mg/kg	0.0000583 %	✓	
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				0.85	mg/kg		0.74	mg/kg	0.000074 %	✓	
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				0.47	mg/kg		0.409	mg/kg	0.0000409 %	✓	
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				0.8	mg/kg		0.696	mg/kg	0.0000696 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				0.39	mg/kg		0.339	mg/kg	0.0000339 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				0.57	mg/kg		0.496	mg/kg	0.0000496 %	✓	
			205-883-8	191-24-2									
29		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
										Total:	0.103 %		

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 Deteminand - 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 EU CLP determinands

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

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

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

EU CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

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

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

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

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

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

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

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

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

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

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

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

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

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2022.192.5237.9831 (11 Jul 2022)
HazWasteOnline Database: 2022.192.5237.9831 (11 Jul 2022)

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
17th ATP - Regulation (EU) 2021/849 of 11 March 2021

APPENDIX 16 - Contaminated Land Legislative Background

APPENDIX 17 - 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:

- LCRM – 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 18 - Limitations

Limitations

This report (Report) forms part of the Services and if applicable Additional Services undertaken by Groundtech Consulting Ltd pursuant to a written contract (Agreement) which contains detailed provisions including express limitations of the liability of Groundtech Consulting Ltd.

This Report was prepared using reasonable skill and care as stated in the Agreement for the purpose including intended end use stated by the Client (Purpose) and the liability of Groundtech Consulting Ltd in respect of the form and content of this Report is no greater than its liability under the Agreement. All records, measurements notes, or any other data (Data) obtained by or for the benefit of the Consultant were obtained at a specific point in time and it may not be assumed by the Client or any person relying on this Report that the Data will remain unaffected by the passage of time, the seasons, weather conditions, changes in the water table or the carrying out and completion of works at the Site.

Unless otherwise agreed this Report has been prepared exclusively for the use and reliance of the Client and may not be relied upon, by any other party except as provided for in the Agreement. A third party who relies on this Report, does so at their own and sole risk and Groundtech Consulting Ltd has no liability to such parties.

Groundtech Consulting Ltd that this Report is to be used for the Purpose. The Purpose was instrumental in determining the scope and of the Services provided. If the Purpose should change, the Client may not be able to rely on the Report without the separate agreement of Groundtech Consulting Ltd.

Since the Report was written, 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 (see below) 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 written confirmation from Groundtech Consulting Ltd 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 Ltd.

Groundtech Consulting Ltd is 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 Report is based upon Groundtech Consulting Ltd's 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 Ltd have relied upon such information assuming it to be correct.

Groundtech Consulting Ltd accepts no responsibility for errors or inaccuracies in third party information presented in this Report. Groundtech Consulting Ltd was 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 or Additional Services. Groundtech Consulting Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, which may inform the scope of investigation undertaken by Groundtech Consulting Ltd 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 may also vary due to the ground's heterogeneous properties and because 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. If so stipulated in the Agreement, geo-environmental testing was carried out for a limited number of parameters based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

Any 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 groundwater levels may occur at other times of the year which are higher than were recorded during this investigation.

Any site drawings provided in this Report are preliminary and used to present the general relative locations of features on, and surrounding, the Site.

