



**PHASE I SITE ASSESSMENT
BRUNSWICK STREET,
MANCHESTER,
M13 9SU**

**REC REFERENCE: 102867P1R0
REPORT PREPARED FOR: BRUNSWICK LIVING LTD
DECEMBER 2016**





QUALITY ASSURANCE

Issue/revision	Detail		
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EXECUTIVE SUMMARY	
Site Address	Brunswick Street, Manchester, M13 9SU (nearest postcode)
Grid Reference	E: 385243, N: 397072
Site Area	0.36 ha
Current Site Use	The subject site is rectangular in shape with plan dimensions of approximately 30m by 15m, and is currently an undeveloped disused parcel of land with an advertising hoarding located in the south east corner.
Adjacent Site Uses	The site is immediately adjacent to a small Tesco and petrol station/ garage to the north, with a local school and its associated facilities to the north west and Ardwick Green Park located to the north east. Immediately to the west of the site area is a car park and directly adjacent associated residential apartments with The Vallance medical centre beyond. The south of the site is bordered by Brunswick Street.
Environmental Setting	Geology: Superficial deposits of Glacial Till Diamicton overlying solid deposits of the Chester Pebble Beds Formation Hydrogeology: The site is underlain by a Secondary undifferentiated aquifer (superficial deposits), overlying a Principal aquifer (solid deposits). There are 0 No. potable and 7 No. groundwater abstractions within 2km of the site. Hydrology: No surface water features are located within 250m of the site. No surface water abstraction licenses are located within 1km of the site. Sensitive Land Uses - Residential properties, a local primary school, health care facilities and a local park are within close proximity.
Site History	There is relatively little recorded on-site historical development; circa 1851 the subject site comprised part of 2 No. courtyards / area of gardens for local large residential houses. From the period of circa. 1889 to 1908 the site area appears to be undeveloped land subsequent to the demolition of the initial associated residences. Circa. 1908 to 2002 the site was occupied by a single building used as a Sunday School, Hope Mission Hall, which changed use circa. 1932 becoming a Club. Since its demolition circa. 2002 the land has remained undeveloped.
Landfill Sites & Ground Gases	The Environment Agency hold records of a single landfill within 1km of the site, Palmerston Street Landfill located approximately 770m to the north east of the site. The site is registered as first receiving waste on 1st September 1986 and last on 31st December 1987. Waste types received are inert waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones and industrial from factory or industrial process, excluding waste from mines, quarries and agricultural wastes. Made Ground deposits pose a potential ground gas source.
Radon	BRE211 Radon: Guidance on protective measures for new buildings (2015 Edition), Map 13, Northern Welsh Marches and Liverpool indicates that no radon protective measures are required in the construction of new dwellings.
Coal Mining / Land Stability	The Coal Authority Report indicates that the site is in falls within a coal mining area but is confirmed but to not be affected by past mine workings and as such a Coal Mining Risk Assessment (CMRA) Report is not required for the site.
Initial Conceptual Site Model (CSM)	Human Health The potential for on-site contamination is considered to be low to moderate, based on the following rationale: ▶ Shallow and localised deposits of made ground are anticipated on site; ▶ Potential contamination from the directly adjacent petrol station/ garage; The risk associated from the potential migration of hazardous ground gases from shallow worked non-coal mining areas is considered to be low. The overall risk associated with off-site sources is considered low to moderate on the basis that there are superficial deposits on site and the surrounding area comprise Glacial Till, which would offer limited protection from the potential migration of hazardous materials and or ground gases from an off-site source. Controlled Waters



	Groundwater The site has been shown to be underlain by Glacial Till. Typically these materials have a relatively low permeability. The underlying Chester Pebble Beds (solid geology) is considered by the EA to be a Principal Aquifer. With consideration to the above points, and the contaminated sources identified, it is considered that the risk of contamination to the underlying groundwater is moderate. Surface Waters No surface water features are located within 250m of the site and therefore, it is considered that the risk of contamination to surface water receptors is low. The site is identified as being in close proximity to a River and Coastal Zone 2 floodplain (located 6m southwest) and a Zone 3 floodplain (located 50m southwest). It is therefore considered that the risk of contamination to surface water receptors is low. Additional on-site Contamination Japanese Knotweed, an invasive plant species, was observed on-site. The legislation covering Japanese Knotweed; Wildlife and Countryside Act 1981 and the Environmental Protection Act 1990 regulates and limits the growing of, removal and waste of Japanese Knotweed as controlled waste which requires a license. Section 33 of the EPA states that it is an offence to deposit, treat, keep or dispose of controlled waste without a licence. Treatment of the Japanese Knotweed is underway, with two visits completed during November 2015 and September 2016. With consideration of all the above point the overall Environmental Risk is considered to be low to moderate.
Preliminary Geotechnical Assessment	Ground Conditions The site is underlain by Glacial Till (diamicton) overlying the Chester Pebble Beds (sandstone). Geological hazards are recorded as being present in the form of shrink-swell clay, landslides and running sands, with all being assigned a very low hazard risk rating.
Development Constraints	Developmental constraints are identified on site as follows: ▶ Japanese Knotweed has been identified on site; ▶ The site currently provides pedestrian only access; ▶ Potential hazards cause by various fly-tipped materials on site; ▶ Made ground associated with the construction / demolition of the previously existing building; ▶ The site is located directly adjacent to a local petrol station / garage (to the north of the site area); ▶ The potential for groundwater Clearwater flooding to occur; ▶ Shrink-swell clay, landslides and running sands have been identified as potential problems with a very low hazard rating; and, ▶ An assessment of the underlying clay maybe required for shrink-swell susceptibility due to the presence of mature trees.
Recommendations	It is the recommended that a Phase II intrusive investigation be carried out to confirm the observations of this report with a view to monitoring of potential ground gases, identify potential contaminants deemed hazardous for human health and geotechnical testing of the clay to confirm shrink-swell potential.



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APPENDICES

Appendix I	Limitations
Appendix II	Glossary
Appendix III	Drawings
	Drawing No 102867-001 – Site Location Plan
Appendix IV	Photographs
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Appendix VI	Coal Authority CON29M Report



1.0 INTRODUCTION

1.1 Background

Resource and Environmental Consultants Ltd (REC) has been commissioned by Brunswick Living Ltd to undertake a Phase I Site Assessment at the site on Brunswick Street, Manchester, M13 9SU. A site location plan (Drawing No. 102867-001) is contained in Appendix III.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.2 Proposed Development

REC has been provided with a preliminary layout plan comprising 1 No. high-rise 5 storey residential apartment building with 16 private residences, private and communal ground level gardens, a roof terrace with communal gardens and 1 No. ground level commercial unit.

1.3 Objectives

The objectives of the desk based study are to:

- ▶ Review historical plans, geology, hydrogeology, site sensitivity, flood-plain issues, mining records and any local authority information available in order to complete a Desk Study in line with Environment Agency (EA) document Model Procedures for the Management of Contaminated Land (Contaminated Land Report 11 (CLR11));
- ▶ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and,
- ▶ Provide a factual and interpretative report relating to the desk study and provide preliminary recommendations on any potential development issues.

1.4 Sources of Information

Background information was sought from the following sources:

- ▶ Groundsure Database Search;
- ▶ Historical mapping dated 1851 to 2014. A selection of historical maps are reproduced in Appendix V;
- ▶ On-line planning records held by Manchester City Council;
- ▶ Consultations with representatives of Manchester City Council;
- ▶ Environment Agency Groundwater Vulnerability Map (www.environment-agency.gov.uk/wiyby);
- ▶ Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2015); and,
- ▶ British Geological Survey Map (Sheet 085, 1:50,000 Manchester, Solid & Drift edition).

1.5 Risk Classification

REC Ltd has utilised the available data to classify the site on the basis of its likely contaminated land liability and potential for geotechnical constraints in relation to the property development. The risk



classification definitions are summarised below:

Risk	Definition
Low	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
Low-Moderate	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of a future redevelopment of the site etc.
Moderate	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the site will likely require further site investigation.
Moderate-High	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment including intrusive ground investigations.
High	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine to level of risk and associated liability.

1.6 Limitations

The limitations of this report are presented in Appendix I.



2.0 SITE SETTING

2.1 Site Details

Site Address	Brunswick Street, Manchester, M13 9SU (nearest postcode)
National Grid Reference	E: 385243, N: 397072
Site Area	0.36 ha

The subject site is located on Brunswick Street near the junction of Wadeson Road and Beamish Close to the north east, in a mixed residential, commercial and industrial area in Manchester. The site is immediately adjacent to residential properties and a local petrol station.

A site location plan (Drawing No. 102867-001) is presented in Appendix III.

2.2 Current Site Use

Site Walkover Brief

A site walkover was undertaken on 14th December 2016. The following site description comprises the site's current layout / features based on the REC Engineer's observations at the time of the site walkover. The walkover is primarily used to identify potential sources of soil and water contamination present at the site. The walkover is not a professional assessment of any potential future remedial, demolition or decommissioning works required and advice on such matters should be sought by the appropriate specialist contractors.

A selection of site photographs are presented in Appendix IV.

Site Description

The subject site is regular in shape with maximum plan dimensions of approximately 30m by 12m, and is currently an unused parcel of land. There is advertising hoarding across the south east corner of the site, no other structures such as buildings being present.

The perimeter of the site is fully enclosed, allowing no vehicular access and pedestrian access only upon removal of 4 No. wooden slats of the approximately 3m tall wooden fence along the south east facing boundary. The North West facing boundary comprises a wooden fence, supported by concrete posts, standing approximately 2m in height. The boundary to the north east is delineated by a brick wall, approximately 3m high with barbed wire running along the top. The south west boundary is defined by iron railings set into a small brick wall, standing at approximately 2m combined height.

Ground cover is gravel overlain by leaf litter with both being found across the full extent of the site area. Dense woody vegetation is found throughout the majority of the site area, consisting of various types of vegetation including some small trees, poplar (found throughout the site area), and rowan. Large established trees of pine, sycamore and beach were also found located towards and along the North West boundary fence.

Japanese Knotweed, an invasive plant species, was observed along the north east and south west facing boundaries of the site and sporadically around the centre during the site visit (please note this



walkover did not comprise a full invasive plant species survey or an ecology survey is to be reported separately).

The site slopes very gently down towards the south west with additional localised variations and depressions resulting in generally undulating uneven ground.

Fly-tipped materials and litter are present across the site area, with the bulk of the materials being confined to the outer edges along the boundary fence lines of the adjacent properties. Items identified include bricks, plastic pipes, wooden beams, traffic cones, child's pushchair, and general litter such as metal cans, plastic bags.

Hazardous Materials Storage

No above ground storage tanks (AST) or Underground Storage Tanks (USTs) were observed at the site.

Polychlorinated Biphenyls (PCBs)

No equipment that may potentially contain PCBs was observed at the site; however, an electricity control box was found to be located at the base of the wall in the south west corner of the site. The box is external to the site and acts to control the security gate for the adjacent car park of the associated residential apartment block.

Asbestos Containing Materials (ACMs)

No potential ACMs were observed at the site.

Waste Storage

No potentially hazardous waste streams are currently generated at the property.

The site is considered to represent a low risk in its current unused state.

2.3 Surrounding Area

The surrounding land uses are summarised below:

Direction	Land Use
North	Directly adjacent a small Tesco store and associated small car park, with a petrol station beyond. A local school and associated facilities such as playing fields is located to the north west, with Ardwick Green Park located to the north east.
East	Car park for the adjacent Tesco store and petrol station.
South	Brunswick Street with a site currently under development beyond (suspected residential development).
West	Car park directly adjacent and associated residential apartments, with The Vallance medical centre beyond.



3.0 SITE HISTORY

3.1 On-Site Historical Development

A review of historical mapping pertinent to the site are summarised in Table 3.1 below. In addition, historical site features are presented in Appendix III.

Table 3.1 Summary of Potentially Contaminative Historical Land Uses

Dates	Historical Land Use
(circa.) 1851 to (circa.) 1888	The subject site appears to be part of the courtyards / area of gardens for local large residential houses. None of the existing site boundaries are present and the boundary line of the courtyards bisects the site north east to south west.
1889 to (circa.) 1908	Undeveloped land.
1908 to 2002	The boundary line is now almost entirely defined by a building, the Mission Room (renamed the Hope Hall circa. 1932), confirmed by local residents as being a Sunday School. The former Sunday School/ Mission Hall changes use to a Club (circa 1984), confirmed as having been a Bingo Hall and Snooker Club by a long standing local resident.
(circa.) 2002 to present day	The former Club has now been demolished and the site area appears as an undeveloped piece of land with possible presence of hardstanding.

There is relatively little recorded on-site historical development; the site appears to comprise part of courtyards/ gardens mid to late 1800's, later becoming an area of undeveloped land early 1900's when a Sunday School Mission Hall was constructed. This building then remains with a change of use to a Club (in the 1980's), until its demolition circa. 2002. The area has stood as an area of undeveloped land since this time.

3.2 Off-Site Historical Development

A review of potentially contaminative uses identified on historical Ordnance Survey maps within influencing distance of the site is summarised below in Table 3.2 below.

Table 3.2 Summary of Potentially Contaminative Off-Site Historical Land Uses

Surrounding Feature	Dates	Distance	Direction
Union Drainage Works Becomes the Packing Case Works circa. 1932, becomes Polygon Mills circa. 1922.	1880's to 1940's	250m	South
Ardwick Green South Tramway. Extending only north west to south east from circa. 1980's to 1907. Additions to the network appear from 1908, extending throughout the area in a range from north west around to the south west. These additions were later removed sometime between 1922 and 1948, leaving the original line extending north west to south east along what is now the A6.	1880's to 1969	50m	North West to South East
Cooperage	(circa.) 1908 to 1960's	230m	South



Surrounding Feature	Dates	Distance	Direction
Tyre Works Appears on maps as Tyre Warehouse from 1948, renamed as Warehouse from 1960, renames as Depot from 1984 onwards.	(circa.) 1922 to Present	220m	North West
Electricity Sub Station	(circa.) 1922 to 1970's	190m	South
Electricity Stores Appears as Depot from 1969.	(circa.) 1922 to 1970's	190m	South
Clothing Works	(circa.) 1948 to 2009	18m	South East
Clothing Works	(circa.) 1948 to 1992	140m	North
Dolphin Street Works Specialised in waterproofing garments.	(circa.) 1948 to Present	170m	North West
Laundry	1948 to Present	230m	North
Engineering Works	1948 to 1970	230m	North East
Methylated Spirt Works	1948 to 1968	250m	East
Engineering Works Renamed Clothing Works from 1969. Appears as Warehouse from 1992	1953 to Present	130m	East
Warehouse	1953 to Present	170m	East
Garage Petrol station sharing the full extent of the north east facing boundary.	1960 to Present	Directly Adjacent	North
Garage	1960 to (circa.) 1967	150m	North West
Depot	1969 to (circa.)1983	210m	East

The available records highlight several off-site potentially contaminative sources with a 250m radius of the site area. The most pertinent potentially contaminative sources are the directly adjacent garage (still present), the previous clothing works (18m south east) now under redevelopment and the historic Ardwick Green South Tramway.

3.3 Planning History

REC has undertaken a review of on-line planning records held by Manchester City Council and no environmentally pertinent information has been obtained.



4.0 GEO-ENVIRONMENTAL SETTING

4.1 Geology & Hydrogeology

The British Geological Survey (BGS) map for the site, (Sheet 085, 1:50,000, Manchester, Solid & Drift edition) indicates that the site is underlain by the following geological sequence:

Geological Unit	Classification	Description	Aquifer Classification
Superficial	Devensian Till	Diamicton	Secondary (undifferentiated)
Bedrock	Chester Pebble Beds Formation	Sandstone	Principal

The geological mapping records indicate the site is underlain by Glacial Till (clay) over bedrock, predominantly comprising sandstone of the Chester Pebble Beds.

The Groundwater Vulnerability mapping shows that the site has been preliminarily classified as having a high leaching potential. This has been provided as a conservative assessment due to being located in an urban environment where the soils are assumed to be highly permeable in the absence of site-specific information.

The Groundsure report contains 0 No. records of potable water abstractions and 7 No. records of groundwater abstractions within a 2km radius of the site, with the closest being 454m north of the site area.

4.2 Natural Geological Hazards

GIS modelling data held by the BGS has determined the following risks at the site from natural geological hazards:

Hazard	Hazard Risk Rating
Shrink-Swell Clay	Very Low
Landslides	Very Low
Ground Dissolution	Negligible
Compressible Ground	Negligible
Collapsible Deposits	Negligible
Running Sand	Very Low

Based upon the preliminary desk-based information, the BGS considers that no special actions or ground investigations are required to address any of the above naturally occurring hazards and there are no increased construction costs or financial risks anticipated.

4.3 Coal Mining

A Coal Authority CON29M Report was obtained for the purposes of this report. The CON29M report indicates that the site falls within a coal mining area but is confirmed as not being affected by past mine workings. The report is reproduced as Appendix VI.



4.4 Hydrology

The nearest recorded surface water course is the River Medlock (a Primary River) located 470m north of the site, with an associated culvert located approximately 480m north. An underground river is also identified as being 150m south east of the site.

No surface water abstraction licenses are held within 1km of the site.

4.5 Flood Risk

4.5.1 Surface Water Flooding

The site is not located within a currently defined flood risk zone. However, a River and Coastal Zone 2 floodplain is identified 6m southwest and a Zone 3 floodplain identified 50m southwest. A Risk of flooding from Rivers and the Sea (RoFRaS) is identified 6m southwest (low risk), and 38m southwest (medium risk)

4.5.2 Groundwater Flooding

The BGS has identified the surface of the site as being susceptible from Clearwater flooding, where Groundwater flooding may be associated with shallow unconsolidated sedimentary aquifers which overlie unconfined aquifers. The BGS note that the highest susceptibility to groundwater flooding is of limited potential and advise '*... this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.*' However, the BGS have allocated a low confidence rating to this assessment.

The assessment of flood risk is outside the scope of this report and REC therefore recommends that a flood risk assessment, which includes the potential from Clearwater flooding, is undertaken.

4.6 Radon Risk Potential

BRE211 Radon: Guidance on protective measures for new buildings (2015 Edition), Map 13, Northern Welsh Marches and Liverpool indicates that no radon protective measures are required in the construction of new dwellings.

4.7 Industrial Land Uses

The site is situated within a mixed residential and industrial area and as such there 18 No. records of current potentially contaminative industrial land uses within a 250m radius of the site. These are recorded as follows:

- ▶ 1 No. of Petrol and Fuel Stations 9m north;
- ▶ 2 No. of Vehicle Repair and Testing within 241m, where the closest is 146m east;
- ▶ 3 No. of Container and Storage within 243m, where the closest is 151m east;
- ▶ 5 No. of Clothing, Components and Accessories within 248m of the site, where the closest is 179m east;



- ▶ 1 No. of Vehicle Hire and Rental 188m east;
- ▶ 5 No. of Textiles, Fabrics, Silk and Machinery within 235m, where the closest is 190m south east;
- ▶ 2 No. of Electrical Features (both of are Electricity Sub Stations) within 249m, with the closest being 222m south east; and,
- ▶ 1 No. of General Construction Supplies 241m north west.

4.8 Sensitive Land Uses

As the site is situated within a mixed residential and industrial area consideration should be given to the following local sensitive land uses as follows:

- ▶ Residential properties immediately adjacent to the south west;
- ▶ Medlock Primary School and Ardwick Children's Centre approximately 41m north west;
- ▶ 'The Vallance' health care centre approximately 40m south west;
- ▶ Ardwick Green Park approximately 60m north; and,
- ▶ Areas of residential housing approximately 34m south, 160m north and 120m west.

4.9 Site Sensitivity Assessment

The site is considered to be located within a **high** sensitivity setting in regard of human health on the basis that the site is adjacent to a number of residential dwellings with private gardens, a school and health care facilities are within close proximity.

The site is considered to be located within a **low** sensitivity setting in regard of controlled waters on the basis that the site is recorded to be underlain by low permeability glacial clay which would reduce the migration of mobile contaminants into the underlying Primary Aquifer, 7 No. groundwater abstractions located within 1km of the site and no recorded surface water features within influencing distance of the site.

4.10 Geotechnical Assessment

The following potential geotechnical constraints have been identified:

- ▶ Mature trees are present on the site and therefore an assessment of the underlying clay maybe required for shrink and swell susceptibility; and,
- ▶ There is a potential for groundwater flooding to occur at the surface of the site.



5.0 REGULATORY INFORMATION

5.1 Landfill Sites and Waste Treatment Sites

Regulatory enquiries have been made, however at the time of issuing this report no response had been received. Amendments shall be made according as relevant information is provided.

5.2 Pollution Incidents

Regulatory enquiries have been made, however at the time of issuing this report no response had been received. Amendments shall be made according as relevant information is provided.

5.3 Regulatory Database

The following information has been obtained from a commercially available environmental database. The summary table only includes records not otherwise detailed in the report.

Table 5.1 Summary of Regulatory Activities

Activity	0-249m	250-500m	Details
Contaminated Land Register Entries and Notices	0	0	N/A
Authorised industrial processes (IPC/IPPC/LAPPC).	0	0	N/A
Fuel Stations Entries	1	0	Existing Esso petrol station, 12m northeast.
Licensed radioactive substances	0	0	N/A
Enforcements, prohibitions or prosecutions	2	3	Tesco Express (Esso), 10m northeast. Ardwick Green Serv Stn, 55m northeast. Chartrange Ltd, 296 northeast. Arwick Spares, 416m north. Tj Strafford, 440 north.
Discharge Consents	0	0	N/A
Consents issued under the Planning (Hazardous Substances) Act 1990	0	0	N/A
Control of Major Accident Hazard (COMAH) sites	0	0	N/A



6.0 INITIAL CONCEPTUAL SITE MODEL (CSM)

6.1 Initial CSM

In accordance with Environment Agency, CLR 11 (2004) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), REC Ltd have developed an initial CSM to identify potential contamination sources, migration pathways and receptors within the study area.

6.2 Contaminant Sources

On-site Potential Sources

Potential sources of Made Ground deposits have been identified on-site which may give rise to heavy metals, sulphates, polycyclic aromatic hydrocarbons, asbestos and hydrocarbons, along with the potential for the generation of hazardous ground gases such as methane and carbon dioxide. The following Made Ground deposits have been identified;

- ▶ Made Ground associated with the construction and demolition of the former building on site.

Japanese Knotweed was observed on-site. This is classified as an invasive plant species and as such the treatment of it is covered under current government legislation; Wildlife and Countryside Act 1981 and the Environmental Protection Act 1990 regulates and limits the growing of, removal and waste of Japanese Knotweed as controlled waste which requires a license. The Japanese Knotweed is currently undergoing treatment with two visits completed on November 2015 and September 2016 by Japanese Knotweed Control (JKC) Ltd.

Off-site Potential Sources

Potential off-site sources of contamination have been identified within influencing distance of the site, and these include;

- ▶ The directly adjacent petrol station dating back to the 1960's;
- ▶ A previous clothing works opposite to the south east (18m) present until circa. 2009, now currently under redevelopment;
- ▶ The historic Ardwick Green South Tramway, present and redeveloped from the 1880's, to 1969;
- ▶ 2 No. additional areas of Works relating to the manufacture of clothing at distances of 140m to 170m north to north west;
- ▶ 3 No. warehouses and or engineering works) 130 to 203m north east to east;
- ▶ A garage and previous tyre works 150 and 220m north west;
- ▶ 1 No. depot of unspecified type 210m east;
- ▶ 1 No. laundry 230m north;
- ▶ 1 No. methylated spirits works 250m east; and
- ▶ An electricity substation and associated stores/ depot 190m south.

The available records highlight several off-site potentially contaminative sources with a 250m radius of the site area. The most pertinent potentially contaminative sources are the directly adjacent garage (still present), the previous clothing works (18m south east) now under redevelopment and



the historic.

6.3 Potential Pathways

Receptors may be potentially at risk from the identified potential sources of contamination via the following pathways:

- ▶ Migration of mobile contaminants on or off site via services, sewers and manmade conduits;
- ▶ Migration of mobile contaminants and gases through permeable bands within Glacial Till;
- ▶ Direct contact, ingestion and inhalation of contaminants on site;
- ▶ Migration of contaminated dusts during earthworks;
- ▶ Migration of mobile contaminants into groundwater and transport into surface waters;
- ▶ Migration of hazardous gases via permeable strata and mine workings; and,
- ▶ Uptake of toxins/phytotoxins by plants.

6.4 Potential Receptors

The following potential receptors have been identified:

Human Health

- ▶ Site investigation and construction workers during the redevelopment of the site from hazardous short term exposure;
- ▶ Future users of the site and buildings (residents); and,
- ▶ Adjacent residents due to off-site migration of gases or contaminated dust.

Controlled Waters

- ▶ Groundwater (Principal Aquifer);
- ▶ Perched Groundwater; and,
- ▶ Underground river.

6.5 Preliminary Risk Assessment

Human Health

The potential for on-site contamination is considered to be **moderate**, based on the following rationale:

- ▶ Localised deposits of Made Ground are anticipated, in the vicinity of the former buildings; and,
- ▶ There is potential for migrated localised hydrocarbon contamination from the directly adjacent petrol station / garage through leakage / spillages.

The risk associated from the potential migration of hazardous ground gases is considered to be **low**.

The overall risk associated with off-site sources is considered **moderate**. Whilst the site area lies directly adjacent to a petrol station / garage the superficial deposits on site and the surrounding area



comprise low permeability Glacial Till, which would limit the potential migration of hazardous ground gases from an off-site source.

Controlled Waters

Groundwater

The site has been shown to be underlain by Glacial Till. Typically these materials have a relatively low permeability. The underlying Chester Pebble Beds (solid geology) is considered by the EA to be a Principal Aquifer. With consideration to the above points, and the contaminated sources identified, it is considered that the risk of contamination to the underlying groundwater is **moderate**.

Surface Waters

No surface water features are located within 250m of the site and therefore, it is considered that the risk of contamination to surface water receptors is **low**.

Buildings, Foundations and Services

Future redevelopment of the site will include the construction of new foundations. Elevated sulphate concentrations could affect the integrity of buried concrete structures. Services may be affected by the presence of aggressive contaminants which may corrode or penetrate services, such as water supply pipes which are susceptible to penetration by hydrocarbons and can then affect the quality of the water supply.



7.0 CONCLUSIONS & RECOMMENDATIONS

Current Environmental Risk
The site comprises undeveloped land with a large advertising hoarding in the south east corner. A number of possible contaminants and potential sources of ground gas have been identified from various sources of information, most pertinently the adjacent petrol station / garage. The site is currently unused, with no public access. Therefore, the current environmental risk is considered to be low-moderate .
Environmental Sensitivity
Geology: Glacial Till (diamicton) overlying the Chester Pebble Beds Formation (sandstone). Aquifers: The site is underlain by Glacial Till and Secondary (undifferentiated) aquifer within the superficial geology, overlying a Principal aquifer within bedrock geology. There are 0 No. records of potable water abstractions and 7 No. records of groundwater abstractions within a 2 km radius of the site, with the closest being 454m north of the site area. Sensitive Land Uses: The site is located in an area which is mixed residential and industrial with local sensitive land uses. These includes: ▶ Residential properties immediately adjacent to the south west; ▶ Medlock Primary School and Ardwick Children's Centre approximately 41m north west; ▶ 'The Vallance' health care centre approximately 40m south west; ▶ Ardwick Green Park approximately 60m north; and, ▶ Areas of residential housing approximately 34m south, 160m north and 120m west.
Radon Risk
BRE211 Radon: Guidance on protective measures for new buildings (2015 Edition), Map 13, Northern Welsh Marches and Liverpool indicates that no radon protective measures are required in the construction of new dwellings.
Preliminary Geotechnical Assessment
Ground Conditions The site is underlain by Glacial Till (diamicton) overlying the Chester Pebble Beds (sandstone). Geological hazards are recorded as being present in the form of shrink-swell clay, landslides and running sands but are all classified as a very low hazard risk rating.
Initial Conceptual Site Model (CSM)
Human Health The potential for on-site contamination is considered to be low to moderate, based on the following rationale: ▶ Shallow and localised deposits of made ground are anticipated on site; ▶ Potential contamination from the directly adjacent petrol station/ garage; The risk associated from the potential migration of hazardous ground gases from shallow worked non-coal mining areas is considered to be low. The overall risk associated with off-site sources is considered low to moderate on the basis that there are superficial deposits on site and the surrounding area comprise Glacial Till, which would offer limited protection from the potential migration of hazardous materials and or ground gases from an off-site source. Controlled Waters Groundwater The site has been shown to be underlain by Glacial Till. Typically these materials have a relatively low permeability. The underlying Chester Pebble Beds (solid geology) is considered by the EA to be a Principal Aquifer. With consideration to the above points, and the contaminated sources identified, it is considered that the risk of contamination to the underlying groundwater is moderate. Surface Waters No surface water features are located within 250m of the site and therefore, it is considered that the risk of contamination to surface water receptors is low. The site is identified as being in close proximity to a River and Coastal Zone 2 floodplain (located 6m southwest) and a Zone 3 floodplain (located 50m southwest). It is therefore considered that the risk of contamination to surface water receptors is low.

**Additional on-site Contamination**

Japanese Knotweed, an invasive plant species, was observed on-site. The legislation covering Japanese Knotweed; Wildlife and Countryside Act 1981 and the Environmental Protection Act 1990 regulates and limits the growing of, removal and waste of Japanese Knotweed as controlled waste which requires a license. Section 33 of the EPA states that it is an offence to deposit, treat, keep or dispose of controlled waste without a licence. Treatment of the Japanese Knotweed is underway, with two visits completed during November 2015 and September 2016.

Overall Environmental Risk Rating**Low to
moderate****Recommendations**

It is recommended that a Phase II intrusive investigation be carried out to confirm the observations of this report with a view to monitoring of potential ground gases, identify potential contaminants deemed hazardous for human health and geotechnical testing of the clay to confirm shrink-swell potential.

END OF REPORT



Phase I Site Assessment
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Manchester
December 2016
102867p1r0

APPENDIX I LIMITATIONS

APPENDIX I LIMITATIONS





1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. In addition to the above REC Ltd note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.
7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.
11. REC cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.
12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.





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APPENDIX II GLOSSARY

APPENDIX II

GLOSSARY





TERMS

AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

UNITS

m	Metres
km	Kilometres
%	Percent
%v/v	Percent volume in air
mb	Milli Bars (atmospheric pressure)
l/hr	Litres per hour
µg/l	Micrograms per Litre (parts per billion)
ppb	Parts Per Billion
mg/kg	Milligrams per kilogram (parts per million)
ppm	Parts Per Million
mg/m ³	Milligram per metre cubed
m bgl	Metres Below Ground Level



m bcl	Metre Below Cover Level
mAOD	Metres Above Ordnance Datum (sea level)
kN/m ²	Kilo Newtons per metre squared
µm	Micro metre





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APPENDIX III DRAWINGS

APPENDIX III DRAWINGS

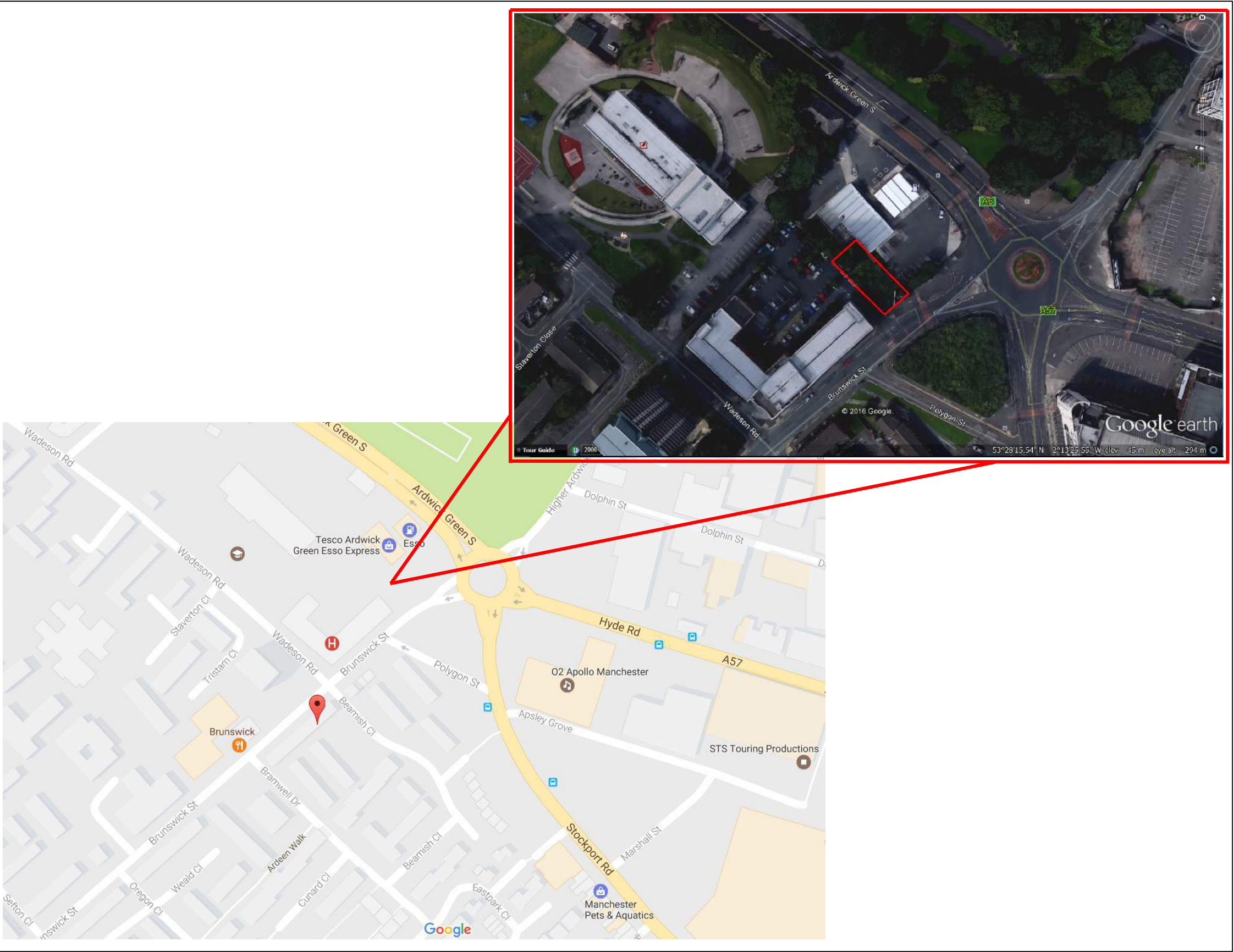


KEY:



Site Area

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				Drawn By: CH		
				Approved by: CW		



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APPENDIX IV PHOTOGRAPHS

APPENDIX IV PHOTOGRAPHS





PLATE 1 – BOUNDARY FENCE FACING NORTH WEST, LOOKING NORTHWEST (LHS)
PLATE 2 - BOUNDARY WALL FACING NORTH EAST, LOOKING NORTH EAST. JAPANESE KNOTWEED
CAN BEE SEEN IN THE FOREGROUND OF THE PHOTO (RHS)





PLATE 3 – BOUNDARY FENCE FACING SOUTH WEST, LOOKING SOUTH EAST. SHOWING AD HOARDING WITHIN SITE AREA AND ELECTRIC CONTROL BOX FOR GET OF CAR PARK



PLATE 4 – BOUNDARY FENCE FACING SOUTH WEST, LOOKING SOUTH EAST. SHOWING JAPANESE KNOTWEED IN THE FOREGROUND OF THE PHOTO WHICH HAS BEEN CUT





PLATE 5 – LARGE MATURE TREES TO REAR OF SITE (LHS)

PLATE 6 - JAPANESE KNOTWEED SHOWN BY THE NORTH EAST FACING BOUNDARY WALL (RHS)





PLATE 7 – GRAVEL GROUND COVER (LHS)
PLATE 8 - FLY-TIPPED WASTE (RHS).



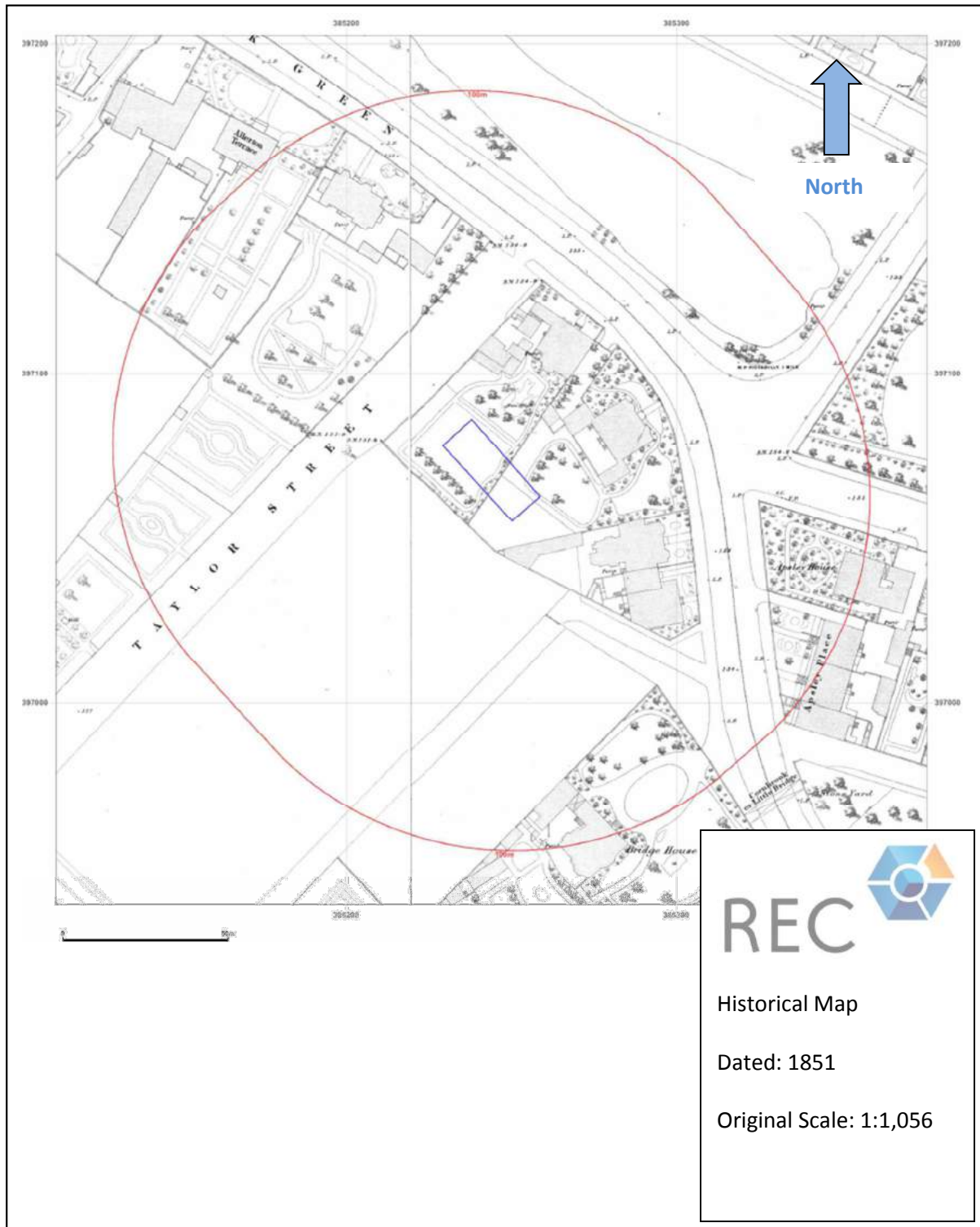


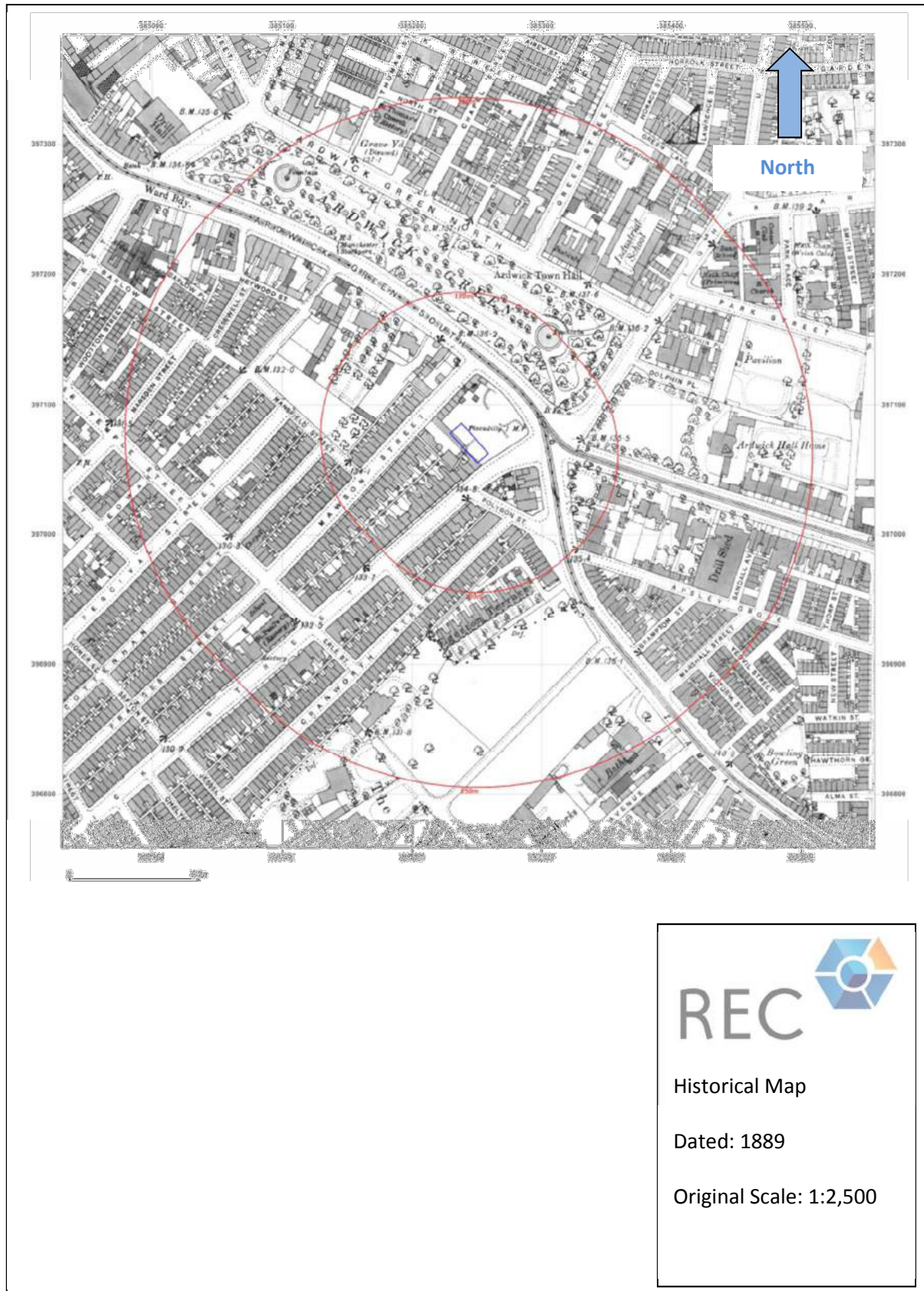
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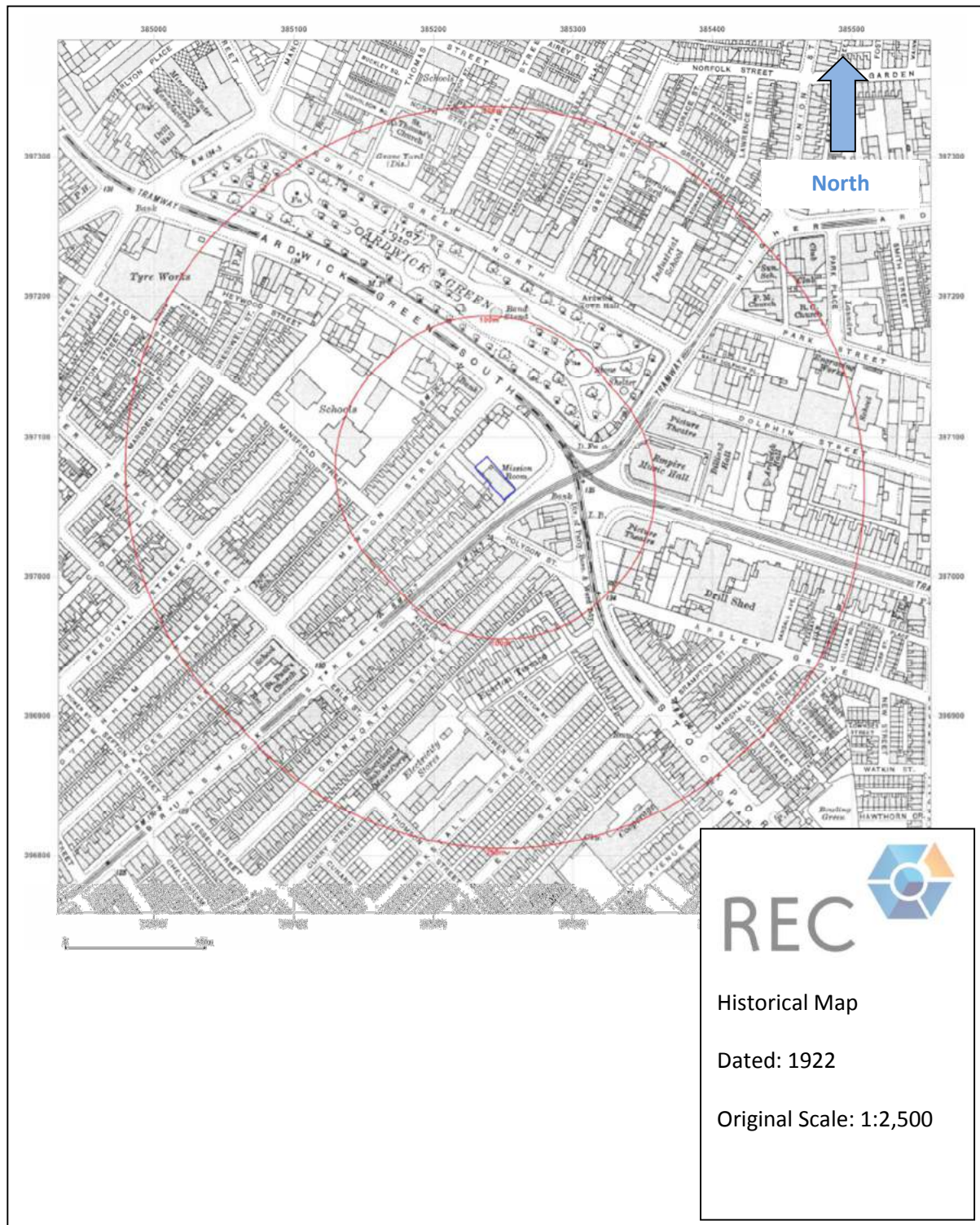
APPENDIX V HISTORICAL MAPS

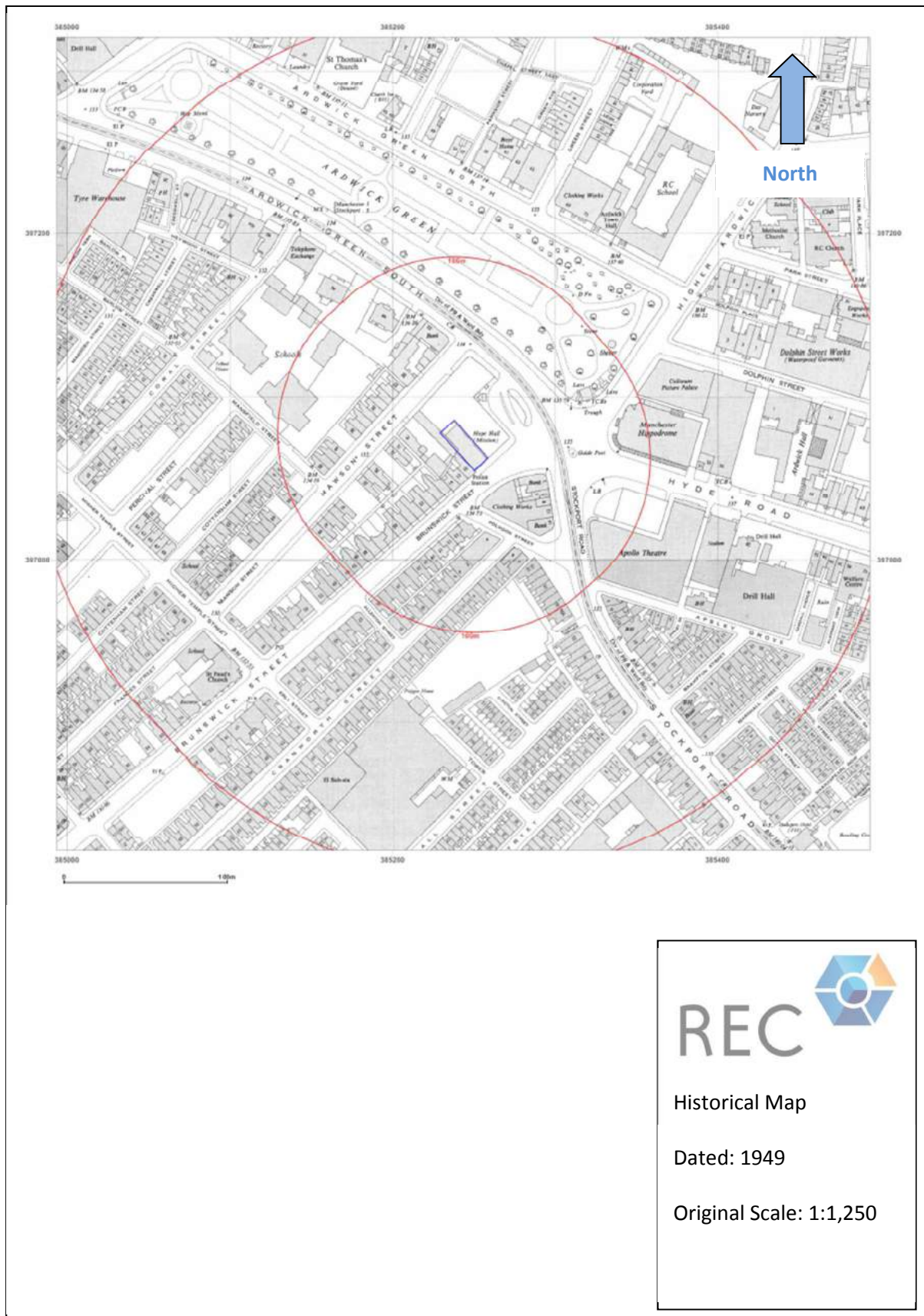
APPENDIX V HISTORICAL MAPS











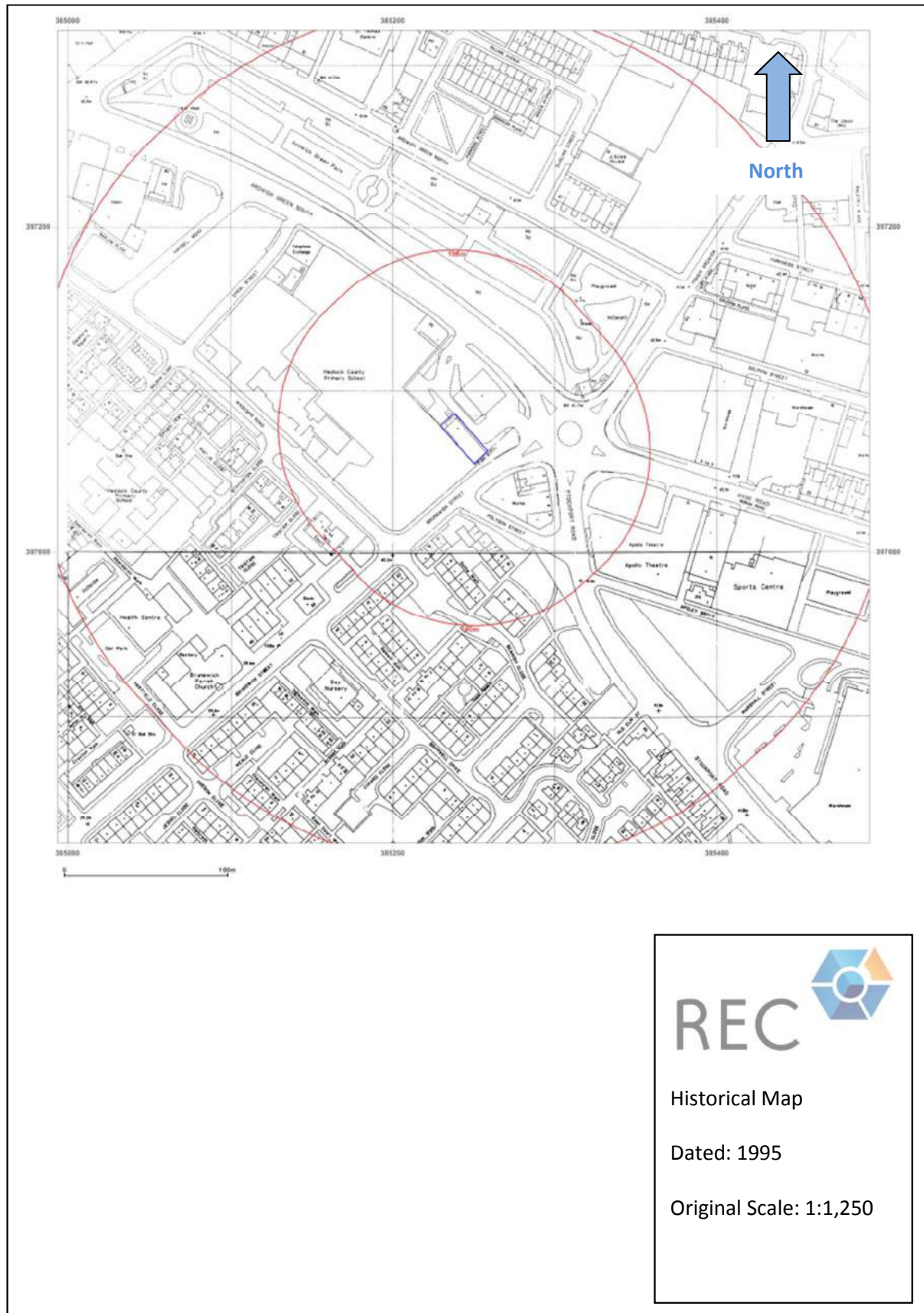
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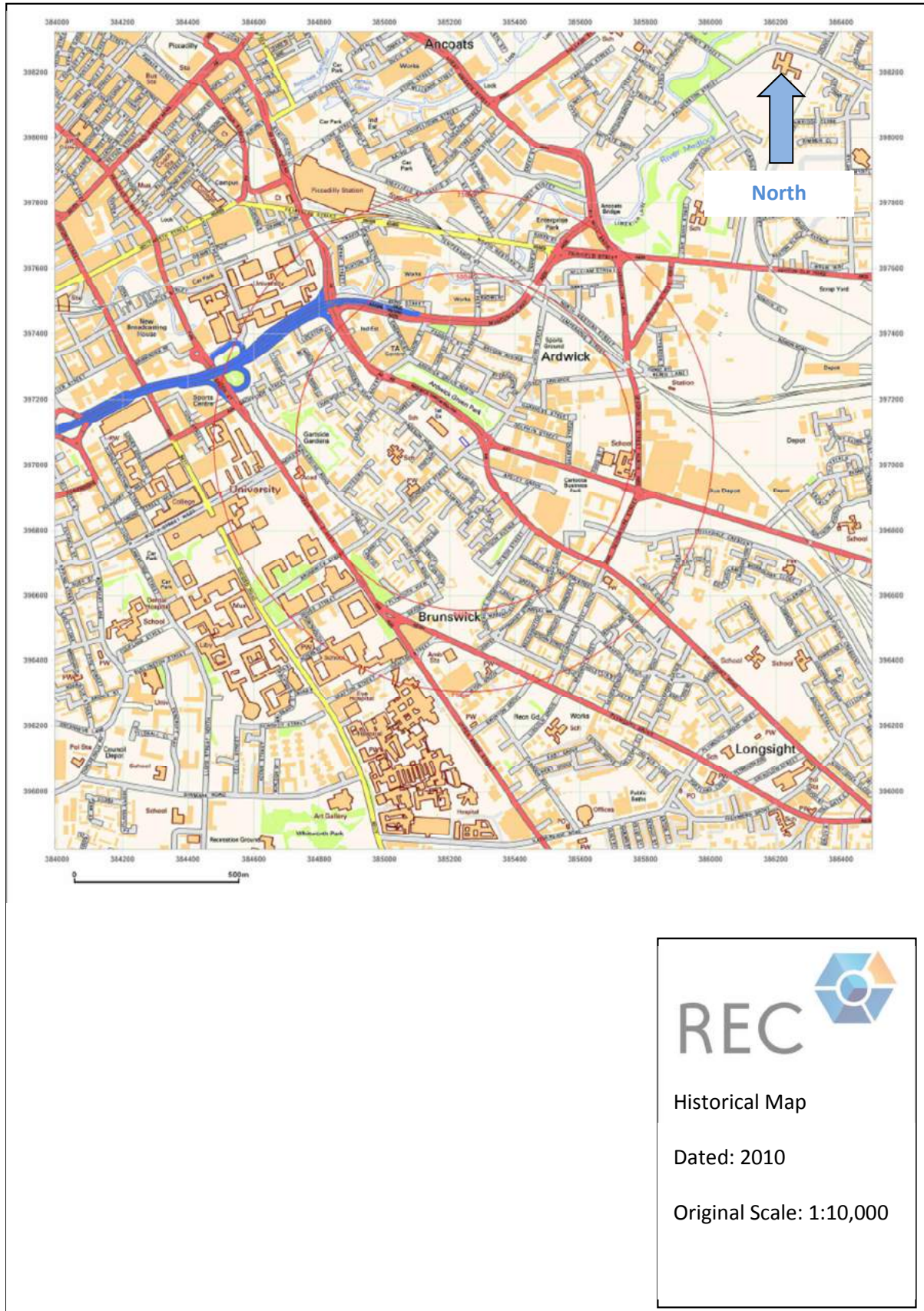
Historical Map

Dated: 1949

Original Scale: 1:1,250









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APPENDIX VI COAL AUTHORITY CON29M REPORT

APPENDIX VI

COAL AUTHORITY CON29M REPORT





The Coal
Authority

Resolving the **impacts** of mining

CON29M Non-Residential Mining Report

39, BRUNSWICK STREET, MANCHESTER,
GREATER MANCHESTER
M13 9SU



Date of enquiry:	16 December 2016
Date enquiry received:	16 December 2016
Issue date:	16 December 2016

Our reference:	51001309565001
Your reference:	GS-3530041



CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

GROUNDSURE LIMITED

Enquiry address

39, BRUNSWICK STREET, MANCHESTER,, GREATER MANCHESTER, M13 9SU

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
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NG18 4RG

www.groundstability.com

 /company/the-coal-authority
 /thecoalauthority
 /coalauthority



Approximate position of property



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Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	No
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is not within a surface area that could be affected by past underground mining.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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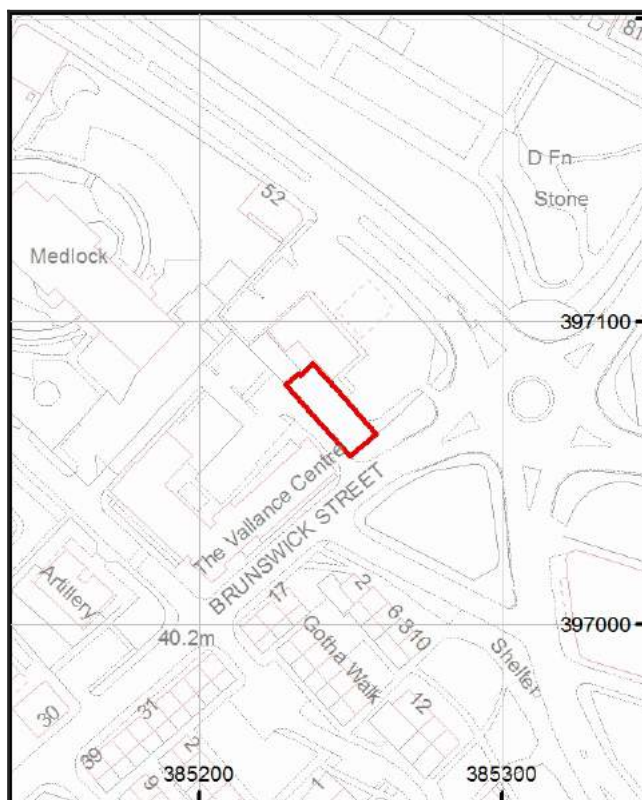
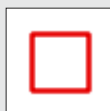
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Enquiry boundary

Key

Approximate position of enquiry boundary shown



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