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SITE INVESTIGATION REPORT

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1. INTRODUCTION

It is proposed to redevelop a site at Altrincham Road, Baguley. Currently, the site comprises part of a car park for a Tesco store. The proposed development comprises a single-storey drive-thru restaurant together with associated car parking and soft landscaping.

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

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

A risk-based assessment of potential contamination is included in Section 7 of the report. This assessment makes reference to the desk study, ground investigation information and a Conceptual Site Model. It is considered that the report complies with National Planning Policy Framework and is in general accordance with guidance published by the Environment Agency.

The report also includes information required to form a Geotechnical Design Report as defined in BS EN 1997-1:2004, and the salient information, assessments and recommendations are presented in Sections 9 to 14 of the report, together with the associated Figures and Appendices.

It is considered that the report is suitable for submission in support of a planning application and the report is appropriate to assist in an appraisal of development solutions and costs, together with the preparation of engineering designs for the development. The report also complies with the published guidance relating to the requirements of a Building Control authority.

2. THE SITE

2.1 Location

The site is located approximately 2.5 km to the northeast of Altrincham town centre, as shown on Figure 1. The National Grid Reference for the site is SJ 8023 8932. The site is bounded by an access road along the western boundary originating from Altrincham Road located to the north of the site. The car park extends to the east and south of the site, as shown on Figure 2. A petrol filling station is present to the south of the access road.

2.2 Site Description

The site description is based on the site plan, presented as Figure 2, aerial images from online imaging services, and observations made at the time of the ground investigation in March 2021.

The site is an irregularly shaped plot of land with an area of approximately 0.22 ha. The site comprises predominantly bituminous surfacing and is bounded to the north and west by small hedgerows. Semi-mature trees are present within the site. A hand car wash facility is present in the southwestern part of the site. The site and surrounding area are relatively flat and level.

2.3 Site History

The site history has been researched with reference to old editions of the County Series and National Grid Ordnance Survey Plans obtained from Emapsite. Extracts from a selection of these plans are presented in Appendix I. The plans and information from Emapsite indicate that the following development has taken place on and around the site.

The County Series map edition of 1876 indicates the site was undeveloped and comprised two fields, one an agricultural field and the other appearing to consist of an orchard. In the surrounding area, residential properties are present to the north, east and south from approximately 40 m. A road is located approximately 20 m to the north of the site, with another road 50 m to the south. A railway, identified as the Cheshire Lines Railway, is located approximately 180 m to the south of the site. By 1922, the road to the north of the site is identified as Stockport Road.

By the 1958 map edition, there are no significant changes to the site but in the surrounding area, a high school was constructed approximately 100 m to the northeast. Additional houses were constructed around the site and the formerly identified Stockport Road to the north of the site had been renamed Altrincham Road.

In the 1966 map edition, the houses around the site had been demolished and a warehouse constructed 80 m to the east of the site. The site likely comprised a car park or access way within the warehouse grounds and a depot is located partially within the southwestern part of the site. Additional houses were constructed approximately 250 m to the west of the site. By 1977, more houses had been constructed to the southwest of the site. Industrial buildings are shown approximately 120 m to the west of the site.

The 1987 map edition indicates that the warehouse and associated grounds were demolished and replaced with the current site layout with the superstore and car park present on site and a petrol filling station to the south of the site. An access road into the store grounds is present adjacent to the western boundary of the site, originating from Altrincham Road. Playing fields are present approximately 50 m to the west of the site.

By the 2001 map edition, there have been no further significant changes to the site or surrounding area. There have been no significant changes to the site or surrounding area to the present day.

3. PUBLISHED GEOLOGY

Geological map data published by the British Geological Survey (BGS) online and in print, on 1:50,000 scale Sheet No. 098 (Stockport) and indicates that the site is underlain by superficial glaciofluvial strata comprising sand and gravel. The solid strata underlying the site comprises the Bollin Mudstone Member, which consists of mudstones with siltstones.

4. DESK STUDY ENQUIRIES

Enquiries were made to the Groundsure Environmental and Geological Databases and the British Geological Survey regarding the site and surrounding area. Information obtained from these enquiries is presented in Appendix II and summarised below.

The Groundsure Environmental Database indicates that there are no active or historical landfills or active waste handling facilities recorded within 250 m of the site. There are four waste exemptions listed within 250 m of the site. These all apply to a waste treatment plant located approximately 154 m to the southeast of the site.

There are eight records of 'industrial' land uses within 250 m of the site. The closest of these relates to the fuel filling station located 32 m to the southwest of the site. The remainder of these are associated with electrical features and a gas feature, located from 70 m to the southeast of the site up to 190 m northwest of the site. There are no records of licensed discharges to controlled waters and there are no recorded pollution incidents within 250 m of the site.

Hydrogeological information indicates that the superficial strata underlying the site are classified as 'Secondary A' aquifer strata. The bedrock strata underlying the site are classified as 'Secondary B' aquifer strata. There are no active groundwater abstractions recorded within 500 m of the site. The site is not located within a groundwater Source Protection Zone.

Hydrological information indicates that there are no surface water features located within 250 m of the site. The site is not located on a Zone 2 or a Zone 3 floodplain.

The Groundsure Geological Database indicates that the risks associated with geohazards beneath the site are considered to be very low to negligible.

A record of a borehole located 88 m to the east has been obtained from the British Geological Survey. The borehole record indicates Made Ground to 1.5 m, underlain by superficial deposits comprising medium dense sand to 3.8 m. The underlying solid deposits indicate Keuper Marl to a depth of at least 6.0 m. Historical groundwater levels (1988) are recorded to be at approximately 3.0 m below ground level.

There are no records of underground workings within 1 km of the site and there are no records of non-coal mining or mining cavities within the same search radius. The site is not within a coal mining reporting area. There is one record of an unspecified surface ground working located 160 m to the southwest of the site.

With reference to the radon information within the Groundsure report (based on BGS/Public Health England data), it is indicated that the site is not within an area where radon precautions would be required in new buildings.

5. GROUND CONDITIONS AND GEOLOGICAL MODEL

5.1 Ground Investigation

Details of the rationale and scope of the ground investigation and laboratory testing, together with exploratory hole logs, monitoring, in situ and laboratory test results, are given in Appendix III. The investigation has identified the presence of the following, below the site.

5.2 Buried Foundations and Services

Buried foundations or other such obstructions were not encountered during the ground investigation. Given the site history, and based on the available information, buried obstructions may be present in the western part of the site, associated with the former depot structure. Underground services are indicated to be present within the site, including drains.

5.3 Strata Encountered

Made Ground
Beneath the bituminous surfacing, which is typically 0.1 to 0.14 m thick, Made Ground comprising a dense sandy gravel, with brick and concrete fragments, is present to a depth of approximately 0.7 m. The results of two

Dynamic Cone Penetrometer (DCP) tests gave correlated CBR values of typically between 30 and 120 within the shallow Made Ground to a maximum depth of 500 mm.

Four lightweight deflectometer (LWD) tests carried out immediately below the bituminous surfacing layer gave Surface Modulus Values of between 143 MN/m^2 and 309 MN/m^2 across the site.

Superficial Deposits
Below the Made Ground deposits, superficial glaciofluvial strata are present, comprising loose to medium dense sands to a depth of 4.9 m.

Standard Penetration Tests (SPTs) undertaken within the superficial strata recorded 'N' values of between 16 and 27 at 1.0 m depth, decreasing to an 'N' value of approximately 9 at 4.0 m depth.

Bollin Mudstone Member
Underlying the superficial deposits, strata of the Bollin Mudstone Member are present. The strata comprise stiff to very stiff clays with mudstone lithorelics to depths of at least 5.0 m.

Standard Penetration Tests (SPTs) undertaken within the Bollin Mudstone Member recorded 'N' values of 19 in one location and in excess of 50 in another.

5.4 Groundwater

The superficial deposits were recorded to be wet from approximately 3.0 m within each hole. Standing water was measured at approximately 1.9 m following completion of the holes.

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

6. PROPOSED DEVELOPMENT

The proposed development, as shown on Figure 3, is indicated to comprise the following:

- A single-storey restaurant building together with a 'drive-thru' facility
- Car parking and areas of associated hardstanding
- Areas of managed soft landscaping

7. ASSESSMENT OF POTENTIAL CONTAMINATION AND GROUND GASES

7.1 Assessment Criteria

Assessment of potential contamination and ground gases has been undertaken using a risk assessment based approach, as recommended within the Environmental Protection Act (1990), Environment Agency Land Contamination Risk Management (LCRM) (2020), CLEA Model (2004-2009), BS 10175: 2011+A2:2017, CIRIA C552 (2001). This approach considers the likely source of contamination, given the history and location of the site, and the possible migration pathways by which these potentially hazardous substances may reach likely receptors, such as end users of the site, controlled waters or the wider environment, in the context of the proposed development.

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

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

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

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

Based on the model, a ground investigation was designed to obtain relevant information to assess further the identified pollutant linkages. Where relevant this included the recovery of representative samples and subsequent analytical laboratory testing. The rationale for the sampling and testing is set out in Appendix III. The results of the analytical testing are presented in Appendix III and summarised in Table 2. On the basis of the conceptual site model and the results of the analytical laboratory testing, an assessment of the identified pollutant linkages is presented in Table 3.

7.2 Potential Sources of Contamination

According to the available information, the site remained undeveloped until a depot/car park was constructed on the site in the mid 1960s. This was then replaced with the current car park in the late 1980s. It is possible that materials were imported to site as part of the road pavement construction. Depending on the source of the materials, they may have been associated with metals and polyaromatic hydrocarbons (PAHs) if the imported soils included ashy materials, and possibly asbestos (either fibres or asbestos containing materials (ACM)) if associated with demolition rubble. There is also a very limited potential that leaks of fuels or oils from poorly maintained vehicles could have entered the shallow soils.

To the south of the site there is a fuel station. Whilst there is potential for petroleum hydrocarbons to leak and leach into the surrounding ground, the facility is of modern design and hence the risk of a significant pollution incident occurring is considered to be very low.

No other potential off-site sources of mobile contaminants that could impact the proposed development have been identified.

Based on the above information, appropriate and representative soil samples were recovered from the site and tested for potential contaminants that are indicated above. The results of the soil testing are summarised on Table 2 and presented against generic assessment criteria (GAC (minimal risk to human health)) relevant to the protection of human health for commercial usage and Category 4 Screening Levels (C4SL) that represent low but acceptable risk to human health. As can be seen from Table 2, all of the test results are below the GAC or C4SL. However, asbestos was detected in one location. Further assessment regarding risks to human health is given in Section 7.3.1.

The risk and implications to buried concrete and potable water supply pipe materials are discussed in Section 7.3.2.

No significant concentrations of mobile potential contaminants have been identified. On this basis, it is considered that there is no valid contaminant source present at the site in relation to controlled waters and further risk assessment is not required.

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

7.3 Pollutant Linkages – Solids and Liquids

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

7.3.1 Human Health

The available analytical test data has identified that all of the contaminants are recorded below the relevant GAC. However, asbestos fibres in very low concentrations (<0.001%) have been detected within the near-surface materials at one location. At the recorded concentrations and matrix moisture content there is no realistic potential for asbestos fibres to become airborne. Therefore, it is considered that the risk from the recorded asbestos is negligible with respect to end users' health. Notwithstanding this, it is considered that, following completion of the development, the majority of the site will be covered by buildings and areas of hardstanding that will ensure there is an effective barrier between end users and the existing ground. It is also understood that limited areas of managed soft landscaping are proposed. There is unlikely to be sufficient suitable existing topsoil at the site, such that it may be necessary to import suitable topsoil. This topsoil will also form a layer between end users and the existing ground. All imported soils should be verified as suitable for placement and use in the proposed commercial development. Therefore, following development, there should be no unacceptable risks to end-users of the site with respect to shallow soils.

Groundworkers involved in the construction of the new development are unlikely to be exposed to short term (acute) risks. However, in line with good practice, it is recommended that appropriate personal protective equipment (PPE) be worn and high levels of personal hygiene be maintained by groundworkers. To minimise soils at the site becoming airborne and moving beyond the site boundaries during earth moving operations, it is recommended that appropriate soil dampening equipment be maintained on site during dry periods to minimise dust generation.

7.3.2 Durability of Buried Structures and Services

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

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

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

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

7.3.3 Landscape and Garden Areas

No elevated levels of phytotoxic chemicals have been identified. Therefore, there should be no deleterious effects on such plantings associated with the existing ground.

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

7.4 Recommended Remedial Works

On the basis of the findings of this investigation, it is considered that there is no requirement for remedial works in order for the development to commence and there should be no requirement for construction-stage remediation to mitigate against possible future risks. Notwithstanding this, it is recommended that the following construction-related procedures be implemented, in line with good practice, during the development of the site.

- Soils should be kept damp during groundworks undertaken in dry weather to minimise the potential for aerial migration of dust to neighbouring properties and the public.
- Topsoil/subsoil materials should be imported to site to provide a healthy growing medium for plantings. Documentation, including test data, should be provided that demonstrates the imported soils are not an unacceptable risk to human health or the wider environment.

7.5 Potential Liabilities

Based on the available data, it is considered that there should be no environmental liabilities associated with site ownership and there should be no such liabilities following completion of the development.

8. ASSESSMENT OF MINING, QUARRYING AND OVERALL GROUND STABILITY

The site is not within an area of recorded underground mining. There are no quarries recorded at, or within the immediate vicinity of, the site. Therefore, the proposed development should not be constrained by ground stability issues associated with mining or quarrying activities.

With reference to published information provided by the British Geological Survey, and in the context of the low sensitivity of the proposed structure to very minor background seismic events recorded in the UK, it is considered that the foundation solution should not be constrained by potential ground vibrations from natural sources and that more detailed assessment is not necessary.

9. FOUNDATION RECOMMENDATIONS

9.1 Design Approach

In compliance with the requirements of the National Annex of BS EN 1997-1:2004 the geotechnical design assessment is based on Design Approach 1 (as defined in BS EN 1997-1:2004). As the structural loads for the proposed building are well defined, uncertainty and risks of potential unfavourable conditions (or deviations from characteristic values) are primarily associated with the ground conditions.

Consideration is given to the assessment of ultimate limit state (ULS) conditions, where full collapse or failure conditions are considered, and relevant design information is presented in Appendix IV in this regard. In addition, the assessment considers serviceability limit states (SLS), to ensure that the recommended design parameters are compatible with an acceptably low risk of serviceability criteria being exceeded during the standard design life of the structure. It is noted that the SLS has a greater influence on the design parameters in comparison to ULS conditions and this is considered in the following assessment.

9.2 Proposed Structural Loadings and Serviceability Criteria

Details of imposed foundation loads (i.e. actions imposed by the building structure) and serviceability limit values are not currently available for the proposed structures. The geotechnical assessment presented in the report has considered generic values for the proposed development type, which is considered appropriate for the appraisal of engineering solutions and preliminary design, and these are listed below:

Preliminary Values, for appraisal purposes:

Maximum Imposed Load on Foundations: 50 kN (column load)

Serviceability Limit Values

Maximum Total Settlement: 25 mm

Maximum Differential Settlement: 15 mm

If the imposed load differs significantly to that above, further assessment is likely to be required.

9.3 Geotechnical Category of Proposed Structures

In view of the nature of the proposed structure(s), comprising a single-storey food and drink retail unit (likely to be of steel frame construction with lightweight cladding), and with reference to the indicated ground conditions, as outlined in Section 5, it is considered that the development is compatible with Geotechnical Category 2, as defined in BS EN 1997-1:2004, and the necessary information relating to the Ground Investigation and Geotechnical Design Reports has been obtained and assessed on this basis.

9.4 Assessment of Foundation Solutions

With reference to the recorded ground conditions and corresponding Geological Model presented in Section 5, characteristic values relating to the geotechnical properties of the strata within influencing distance of the proposed structures are presented in Appendix IV. Salient elements of the geotechnical model are outlined below.

Ground conditions beneath the proposed unit are indicated to consist of Made Ground to a depth of approximately 0.7 m. The Made Ground comprises a thin upper layer of bituminous tarmac, overlying dense sandy gravel to a depth of 0.7 m. The natural strata below the Made Ground comprises medium dense, decreasing to loose, sand (superficial deposits) to a depth of 4.9 m, overlying very stiff clay (Bollin Mudstone Member). Shallow groundwater is present at approximately 1.9 m.

Based on the recorded ground conditions and the anticipated lightly loaded proposed building, it is considered that strip/trench fill or pad footings taken into the medium dense sand (superficial deposits) should be feasible for the proposed development. Alternatively, the building could also be supported on a flat-slab raft foundation, placed at shallow depth within the Made Ground.

9.5 Recommended Foundation Design Parameters

9.5.1 Pad or Strip/Trench Fill Footings

On the basis of the ground conditions and structures described in the report, the recommended parameters for the foundation design are as follows:

Foundation Strata :	Loose to medium dense sand (Superficial deposits)
Foundation Depth :	Minimum 0.6 m, deepened through Made Ground and softened materials, as required.
Foundation Width/Size:	Up to 3 m max
Nett Allowable Bearing Pressure:	100 kN/m^2

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

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

9.5.2 Raft Foundation

On the basis of the foregoing assessment and the details presented in Appendix IV, it is considered that a flat raft foundation provides an alternative foundation solution for the proposed structure. On the basis of the ground conditions and structures described in the report, the recommended parameters for the foundation design are as follows:

Foundation Strata :	Dense sandy gravel (Made Ground) – proof rolled as below (refer to Section 9.7)
Treatment of Foundation Strata :	Formation strata are to be proof-rolled with a heavy vibratory roller (minimum 2500 kg per metre width) prior to placement of a compacted granular sub-base and construction of the raft foundation
Foundation Depth or depth of perimeter thickenings:	Minimum 0.6 m below final ground level
Foundation Stiffness:	The raft foundation should be designed to accommodate the potential minor differential settlements that may be associated with the Made Ground
Nett Allowable Bearing Pressure:	50 kN/m^2 (below entire raft footprint)

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

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

9.6 Floor Slab Recommendations

If pad or strip/trench fill footings are constructed, it should be possible to construct ground bearing floor slabs for the proposed development, providing they are founded competent Made Ground material and the formation strata are proof-rolled prior to placement of a compacted granular sub-base. Alternatively, suspended floor slabs may be used.

The floor slab will form an integral part of the raft foundation.

9.7 General Construction Advice

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

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

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

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

10. TEMPORARY WORKS

Conventional plant is considered appropriate for shallow excavation works at this site. However, the use of hydraulic breakers may be required to break up any foundations or shallow concrete, if present.

Shallow excavations may remain stable in the short term. However, instability may occur in excavations that are left open for extended periods of time, particularly if water is encountered. Support should be provided, or the sides battered back, in any excavations requiring man entry.

Shallow excavations are likely to encounter groundwater. It is considered that pumping from a sump is likely to be a suitable dewatering technique within shallow excavations if perched water is encountered.

11. ASSESSMENT OF SOAKAWAY DRAINAGE

Due to the presence of shallow groundwater and relatively deep Made Ground, it is considered that soakaway drainage will not provide a suitable solution for the proposed development. Therefore, it is recommended that an alternative surface water drainage solution be identified.

12. ROAD PAVEMENTS

Based on the testing carried out for the soils present at the site, as shown in Appendix III, and the guidance of IAN73/06 and TRRL Report LR1132, it is considered that an equilibrium design value of 10% may be used for road pavement design. It is considered that the shallow soils should be regarded as frost susceptible.

13. ASSESSMENT OF MATERIALS FOR WASTE DISPOSAL

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

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

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

HazWasteOnline™ has been used to assess materials on site in accordance with the Environment Agency's document *Guidance on the Classification and Assessment of Waste WM3* (2015). Additional assessment is made by direct reference to WM3. The assessment indicates that the following preliminary waste classification advice would be appropriate.

- Bituminous surfacing should be taken to a recycling facility. Such materials are unlikely to meet WAC for disposal at landfill.

- Based on the testing to date, the Made Ground materials are likely to be classified as 'inert' waste for disposal at landfill.
- Natural strata, providing they have not been impacted by potential contaminants associated with the site usages, would be classified as "inert" waste without any requirement for laboratory testing (as detailed in published guidance).

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

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

14. RECOMMENDED SUPERVISION AND MONITORING

In compliance with the requirements in BS EN 1997-1:2004 and BE EN 1997-2:2007, construction and workmanship of the engineering solutions recommended in this report shall be supervised. In particular, issues listed in Section 9.7 General Construction Advice shall be considered in the implementation of the works and design of any necessary temporary works set out in Section 10.

In relation to the foundation solution(s) and ground floor slab recommendations in Section 9.6, the following supervision and monitoring is recommended.

- Inspections of formation strata in spread foundation excavations (if applicable)
- Inspections of formation strata before and after proof-rolling to verify compatibility with the raft foundation design (if applicable)

15. SUMMARY

It is proposed to redevelop a site at Altrincham Road, Baguley. Currently, the site comprises part of a car park for a Tesco store. The proposed development comprises a single-storey drive-thru restaurant together with associated car parking and soft landscaping.

Ground conditions at the site comprise Made Ground to depths of 0.7 m, comprising sandy gravel. Below the Made Ground, superficial deposits are present comprising medium dense to loose sands to depths of 4.9 m. Underlying the superficial deposits is strata of the Bollin Mudstone Member, comprising very stiff (very high strength) clays to depths of at least 5.0 m. Groundwater was recorded at a depth of 1.9 m.

The ground investigation has not identified potentially contaminated materials beneath the site such that it is considered that there are no unacceptable risks to end users of the site. The identified conditions do not represent a risk to controlled waters. The proposed development should not be constrained by issues relating to ground gases. Notwithstanding this, as there is currently limited to no topsoil present at the site, it is

recommended that allowance be made to import suitable topsoil/subsoil materials to provide a healthy growing medium for plantings in any soft landscaping areas.

Based on the recorded ground conditions and the anticipated lightly loaded proposed building, it is considered that strip/trench fill or pad footings taken into medium dense superficial deposits should be feasible for the proposed development. Alternatively, the building could also be supported on a flat-slab raft foundation.

Due to the presence of relatively deep Made Ground, and shallow groundwater, it is considered that soakaway drainage is unlikely to be feasible and an alternative drainage solution should be identified.

REFERENCES

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GENERAL NOTES

1. This report is provided in the context of the stated development proposals and should not be used in a different context.

2. The accuracy of map extracts cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.

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

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

5. Exploratory hole locations provided in the report are generally established by tape measurement from existing features or boundaries. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically requested.

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

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

8. New information, improved practices and legislation may necessitate an alteration to the report in whole, or in part, after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Crossfield Consulting Limited for re-assessment and, if necessary, re-appraisal.

TABLES

TABLE 1

CONCEPTUAL SITE MODEL

Potential Contaminant Source	Potential Pathway	Receptors and Assessed Pollutant Linkage
Solids *Toxic metals:* Potential source associated with Made Ground materials present on site *Phytotoxic metals:* Potential source associated with Made Ground materials present on site *Petroleum hydrocarbons:* Limited potential source from leaks from poorly maintained vehicles but not a significant source *PAHs:* Potential source associated with Made Ground materials present on site	***Movement of Solids*** Direct dermal contact, ingestion of soil and inhalation of dust are all viable pathways during construction. New building and hardstanding will provide an effective barrier to negate dermal, ingestion and inhalation pathways following development. Dust exposure pathways may be present in areas of soft landscaping (public open space) ***Release into Liquid Phase*** Low possibility of metal uptake by plants. Polyaromatic hydrocarbons are typically of low solubility. Therefore, negligible potential for release into liquid/aqueous phase. ***Release into Vapour Phase*** Not applicable	***Human Health*** *End Users:* Pollutant linkage possible *Construction Workers:* Pollutant linkage possible *Adjacent Properties:* Pollutant linkage possible ***Buried Structures & Services*** *Plastic pipes for potable water:* No pollutant linkage *Buried concrete:* No pollutant linkage *Other structures and services:* No pollutant linkage ***Landscape Areas*** Possible pollutant linkage
Liquids No potential source identified	***Movement of Liquids*** Not applicable	***Controlled Waters*** *Groundwater:* 'Secondary A' and 'Secondary B' aquifer strata present below the site – No pollutant linkage *Surface Water*: Not applicable
Gases *Landfill gas:* No potential source identified *Made Ground gases:* No potential source identified *Radon gas:* No significant source	***Movement of Gases*** Not applicable	***Human Health*** No pollutant linkage identified

NOTES

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

SUMMARY OF ANALYTICAL TEST DATA: SOILS
RISKS TO HUMAN HEALTH

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
Arsenic	mg/kg	3	5.0	7.2	640[1]	0	640[4]	0
Cadmium	mg/kg	3	0.8	2.8	190[1]	0	410[4]	0
Chromium (Total) [5]	mg/kg	3	9.2	10	8600[1]	0	-	-
Chromium (VI)	mg/kg	3	<4.0	<4.0	33[1]	0	49[4]	0
Lead	mg/kg	3	86	330	1200[2]	0	2330[4]	0
Inorganic Mercury	mg/kg	3	<0.3	<0.3	1100[1]	0	-	-
Nickel	mg/kg	3	9.1	9.9	980[1]	0	-	-
Selenium	mg/kg	3	<1.0	<1.0	12,000[1]	0	-	-
Copper	mg/kg	3	18	31	68,000[1]	0	-	-
Zinc	mg/kg	3	67	150	730,000[1]	0	-	-
Petroleum Hydrocarbons								
PRO $C_6 – C_{10}$	mg/kg	3	<0.1	2.1	2000[6]	0	-	-
DRO $C_{10} – C_{25}$	mg/kg	3	11	120	9700[6]	0	-	-
MRO $C_{25} – C_{40}$	mg/kg	3	37	170	28,000[6]	0	-	-
VOCs								
Benzene	mg/kg	3	<1.0	<1.0	27[1]	0	27[4]	0
Toluene	mg/kg	3	<1.0	<1.0	56,000[1]	0	-	-
Ethylbenzene	mg/kg	3	<1.0	<1.0	5700[1]	0	-	-
Xylene	mg/kg	3	<1.0	<1.0	5900[1]	0	-	-
MTBE	mg/kg	3	<1.0	<1.0	7900[3]	0	-	-

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
PAHs								
Naphthalene	mg/kg	3	<0.05	<0.05	190[1]	0	-	-
Acenaphthylene	mg/kg	3	<0.05	<0.05	83,000[1]	0	-	-
Acenaphthene	mg/kg	3	<0.05	<0.05	84,000[1]	0	-	-
Fluorene	mg/kg	3	<0.05	<0.05	63,000[1]	0	-	-
Phenanthrene	mg/kg	3	<0.05	0.69	22,000[1]	0	-	-
Anthracene	mg/kg	3	<0.05	<0.05	520,000[1]	0	-	-
Fluoranthene	mg/kg	3	<0.05	3.4	23,000[1]	0	-	-
Pyrene	mg/kg	3	<0.05	3.2	54,000[1]	0	-	-
Benz(a)anthracene	mg/kg	3	<0.05	1.5	170[1]	0	-	-
Chrysene	mg/kg	3	<0.05	1.5	350[1]	0	-	-
Benzo(b)fluoranthene	mg/kg	3	<0.05	2.0	44[1]	0	-	-
Benzo(k)fluoranthene	mg/kg	3	<0.05	0.78	1200[1]	0	-	-
Benzo(a)pyrene	mg/kg	3	<0.05	1.9	35[1]	0	76[4]	0
Indeno(123cd)pyrene	mg/kg	3	<0.05	1.0	500[1]	0	-	-
Dibenzo(ah)anthracene	mg/kg	3	<0.05	<0.05	3.5[1]	0	-	-
Benzo(ghi)perylene	mg/kg	3	<0.05	1.3	3900[1]	0	-	-

NOTES

1. Suitable for Use Level (S4UL) published by LQM/CIEH, 2015 – Commercial landuse. S4UL assumptions comprise 1% soil organic matter, soil pH of 7 and sandy loam soil type. Where S4UL presented by LQM is greater than 100%, the S4UL for this assessment has been capped at 1,000,000 mg/kg. S4ULs are copyright © Land Quality Management Limited reproduced with permission; Publication Number S4UL3133.
2. Generic assessment criteria (GAC) for lead calculated using CLEA Software version 1.06 (Environment Agency, 2009) with a lead intake based on a target blood level of 3.5 μg/dL. Other model assumptions comprise 1% soil organic matter, soil pH of 7 and sandy loam soil type.
3. Soil GAC for Human Health Risk Assessment produced by CL:AIRE (2010) – Commercial. Assumption of 1% soil organic matter.
4. Category 4 Screening Level (C4SL), Department for Environment Food and Rural Affairs (March 2014) – calculated for 1% SOM using the CLEA Model v1.071
5. In the absence of desk study or historical map evidence indicating a potential source of chromium (VI) usage at or in the near vicinity of the site, total chromium concentrations have been compared to the GAC for chromium (III).
6. PRO: petrol range organics. DRO: diesel range organics. MRO: mineral oil range organics. GAC presented against these organic ranges is the lowest of the aromatic or aliphatic GAC relevant to that organic range. Aromatic and aliphatic fraction GAC values are presented for reference.

ASSESSMENT OF POLLUTANT LINKAGES

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

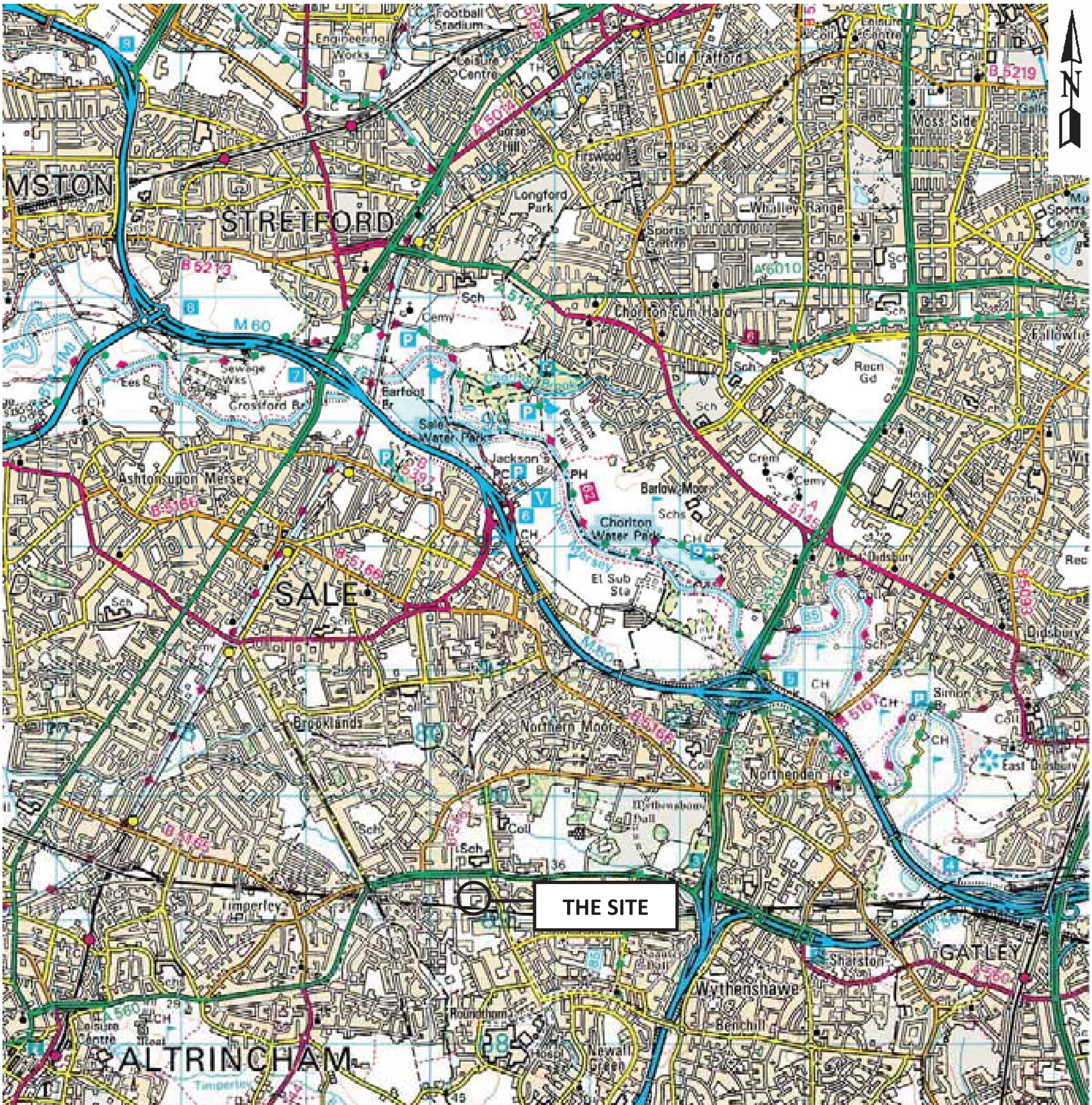
Probability (P)	Consequence (C)			
	Severe	Medium	Mild	Minor
High likelihood (HL)	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
Likely (L)	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
Low likelihood (LL)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
Unlikely (UL)	Moderate/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

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

Pollutant Linkage			Assessment of Pollutant Linkage following Ground Investigation	Pollutant Linkage Valid? [1]	Risk Rating			Quantitative Risk Assessment	Recommended Remediation / Mitigation (See Section 7 for further details)	Recommended Work Verified?	Pollutant Linkage Valid? [2]
Source	Pathway	Receptor			C	P	Risk				
Toxic Metals PAHs TPH	Dermal contact (dust), ingestion (dust) and inhalation (dust)	Site End Users	All contaminants below GAC or C4SL.	No	n/a	n/a	n/a	Not applicable	Not applicable	Not applicable	No
Asbestos			Trace loose fibres (chrysotile) detected within the shallow Made Ground at one location (<0.001%). Very low concentrations recorded are considered not to be associated with airborne fibres.	No	n/a	n/a	n/a	Not applicable	Not applicable		
Toxic Metals PAHs TPH	Dermal contact (dust), ingestion (dust) and inhalation (dust)	Construction Workers	All potential contaminants identified in concentrations below short-term (acute) exposure limits	No	n/a	n/a	n/a	Not applicable	Not required but standard personal protective equipment is recommended as good practice.	Not applicable	No
Asbestos			Trace loose fibres (chrysotile) detected within the shallow Made Ground at one location (<0.001%). Very low concentrations recorded are considered not to be associated with airborne fibres.	No	n/a	n/a	n/a	Not applicable	Soil dampening equipment to be used to minimise potential for airborne migration of fugitive dust and airborne fibres. Where ACMs are encountered, additional risk assessment is recommended.		
Toxic Metals PAHs TPH	Dermal contact (dust), ingestion (dust) and inhalation (dust)	Neighbouring properties and public	All contaminants below GAC or C4SL.	No	n/a	n/a	n/a	Not applicable	Soils should be kept damp in dry weather to minimise the potential for aerial migration of dust from the site.	Not applicable	No
Asbestos			Trace loose fibres (chrysotile) detected within the shallow Made Ground at one location (<0.001%). Very low concentrations recorded are considered not to be associated with airborne fibres.	No	n/a	n/a	n/a	Not applicable			
Phytotoxic Metals	Uptake by plant roots	Landscaped plantings	No significant concentrations of phytotoxic metals recorded, based on guideline values for topsoil in BS 3882:2015.	No	n/a	n/a	n/a	Not applicable	Not applicable	Not applicable	No

FIGURES

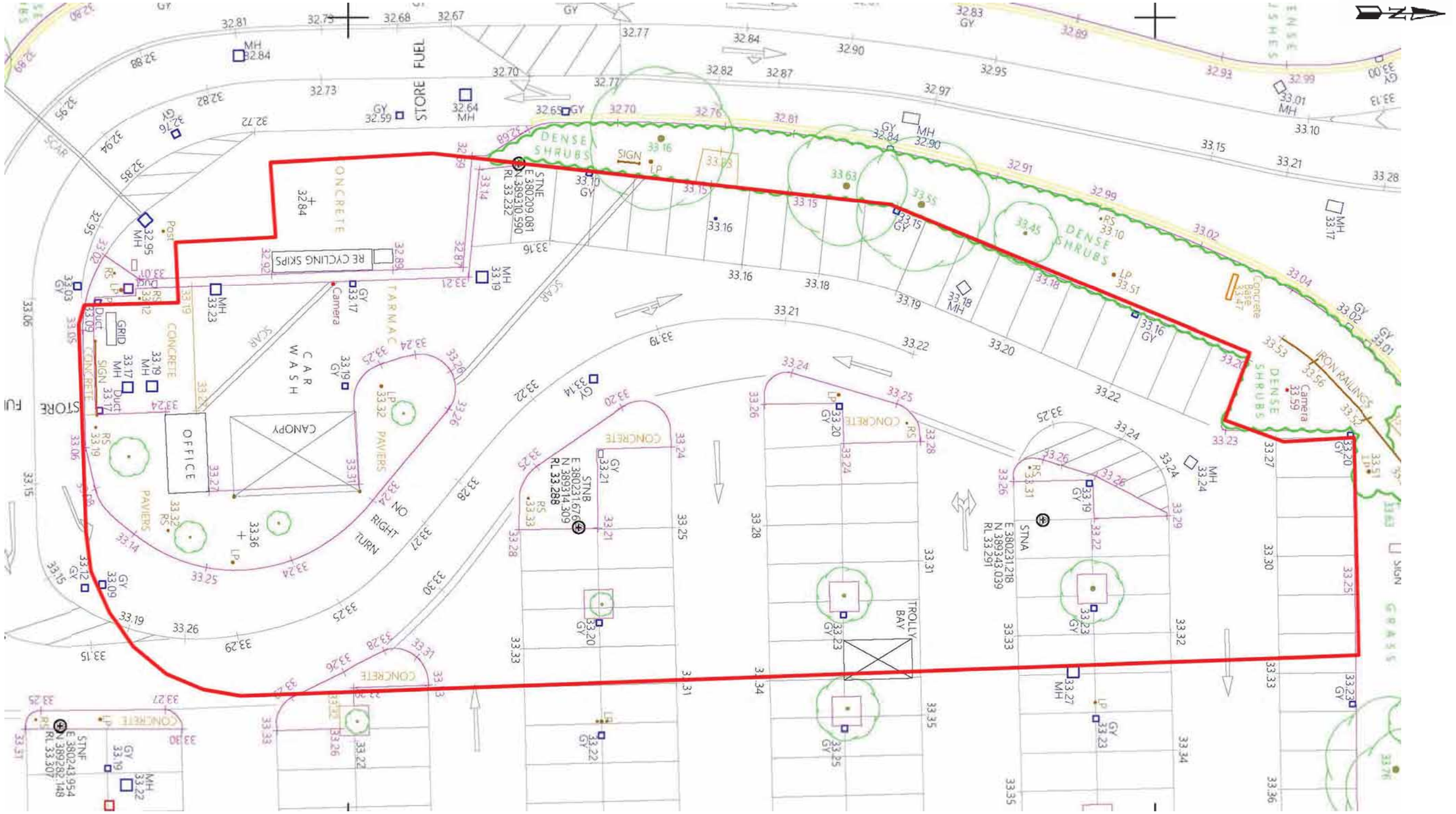
FIGURE 1



SITE LOCATION PLAN

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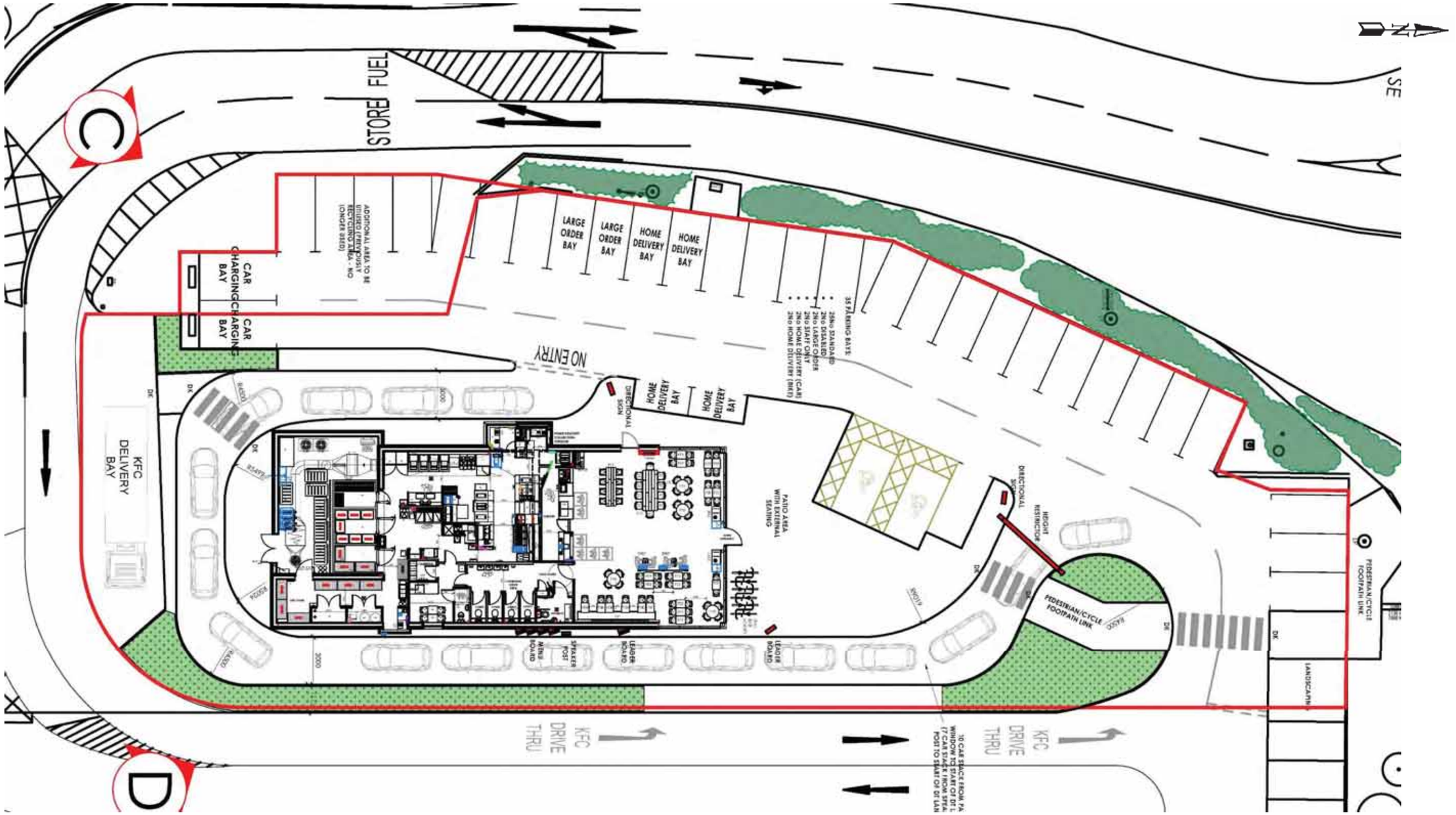
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SITE PLAN
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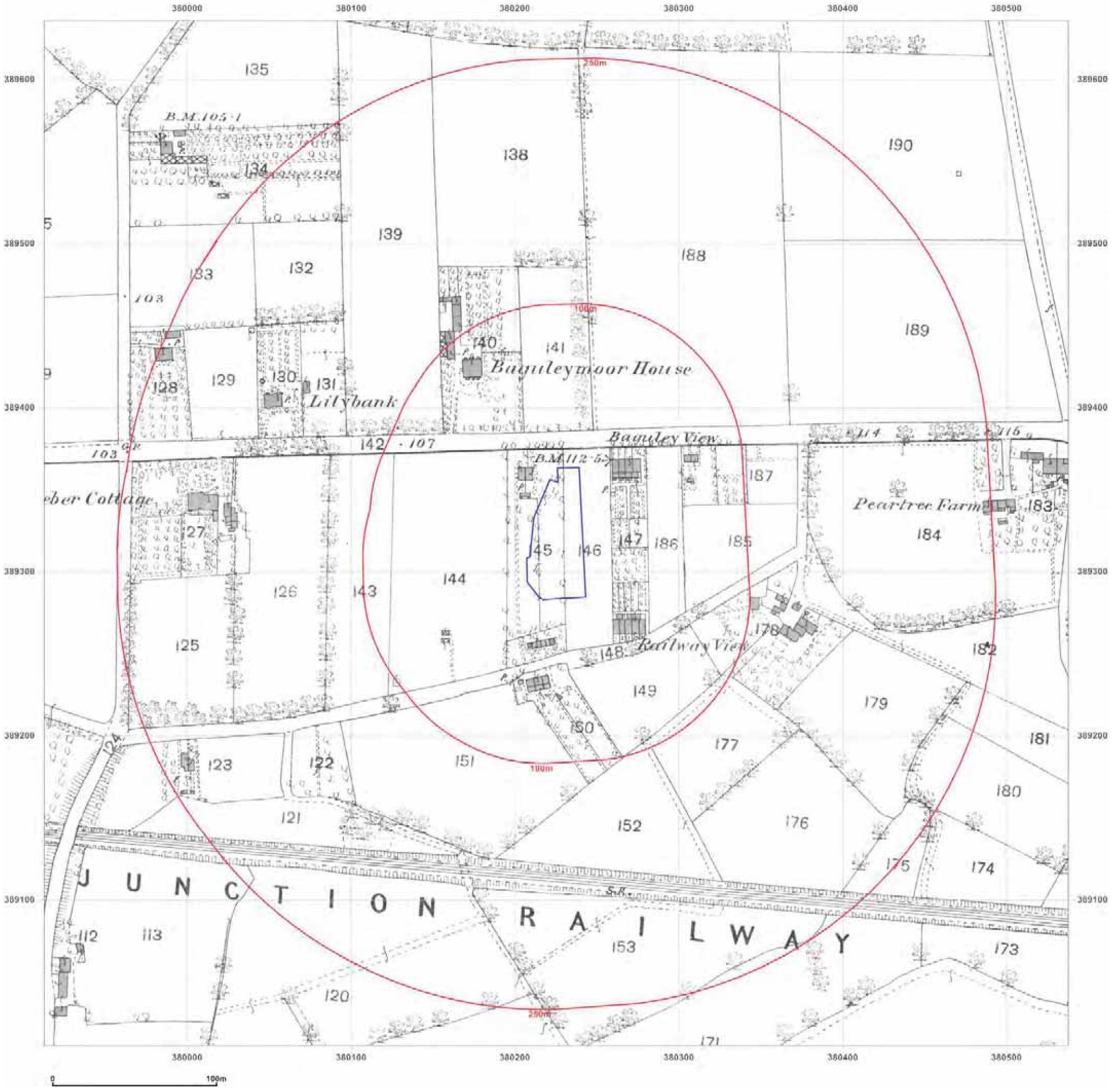
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PROPOSED DEVELOPMENT PLAN
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APPENDIX I



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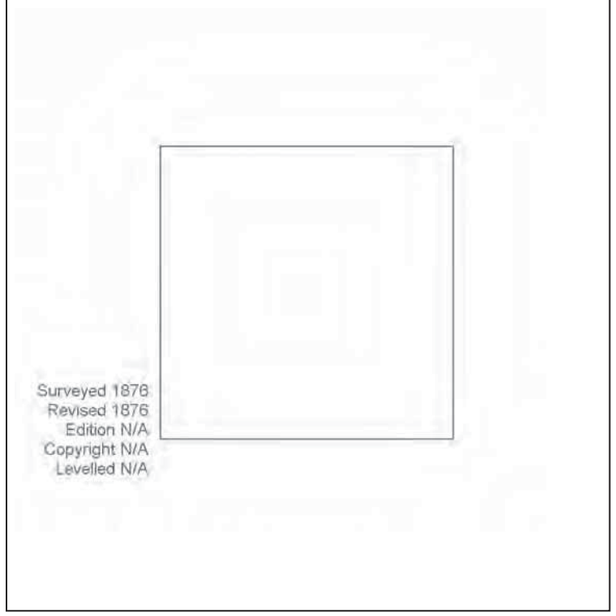
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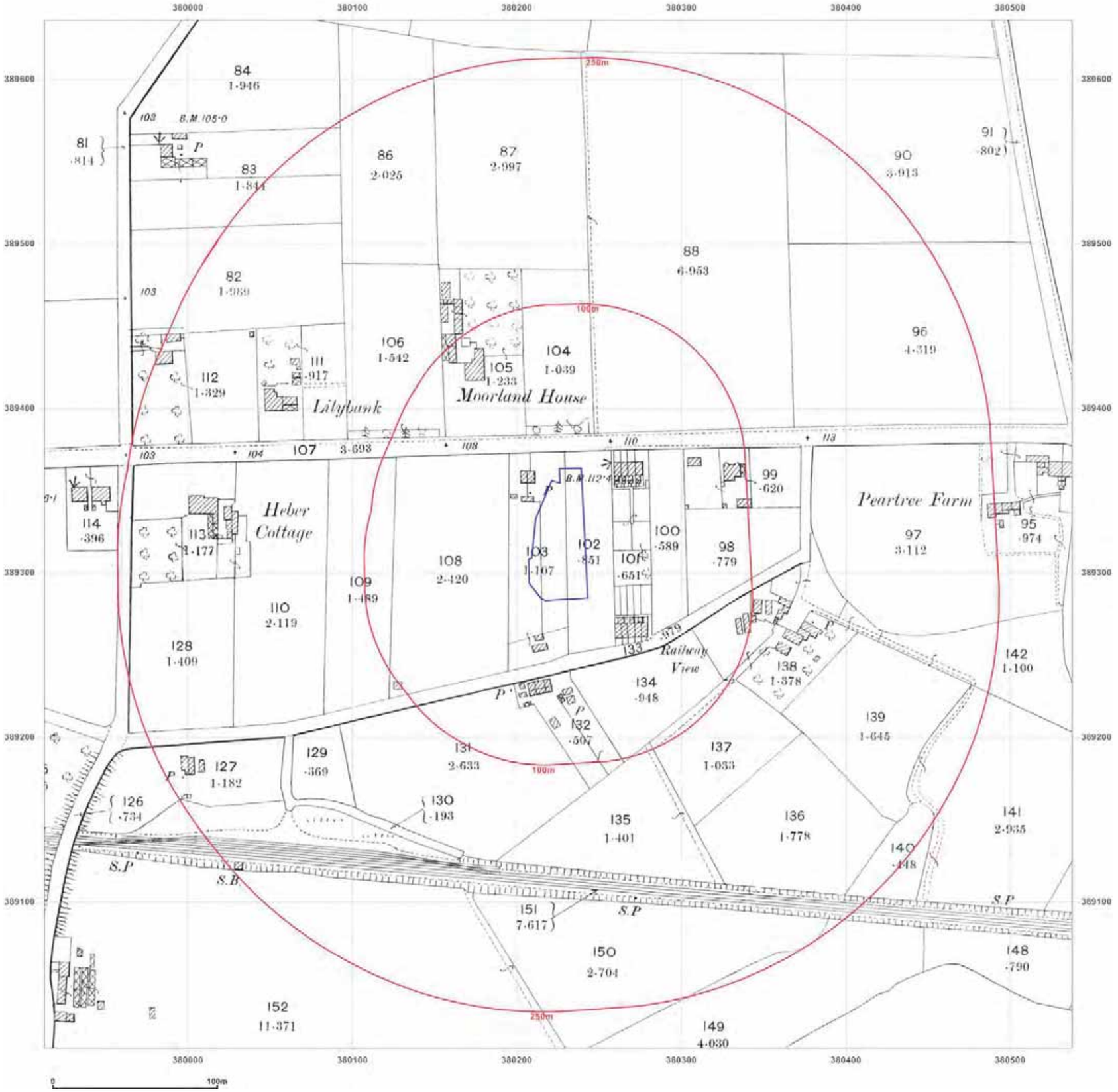
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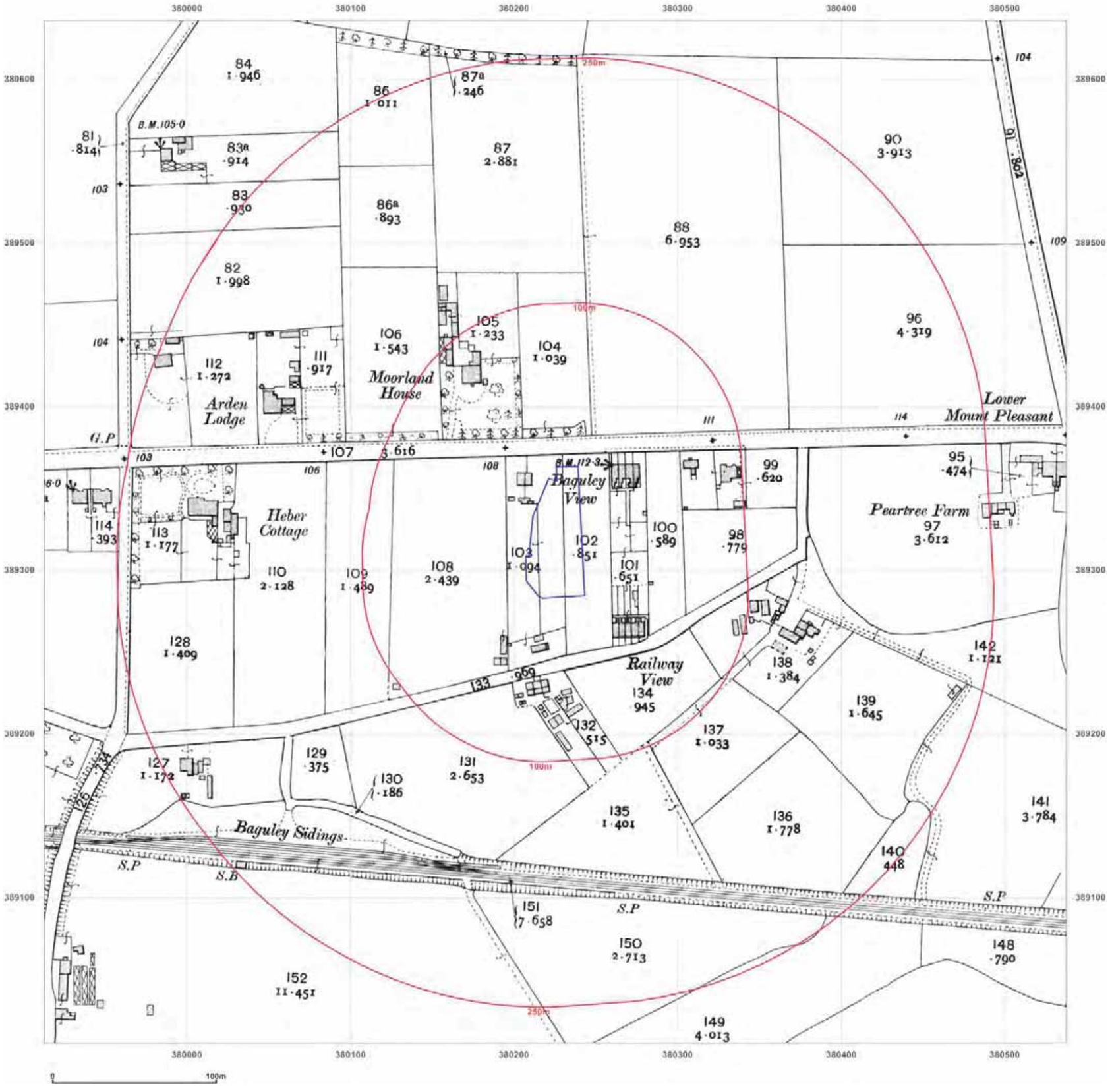
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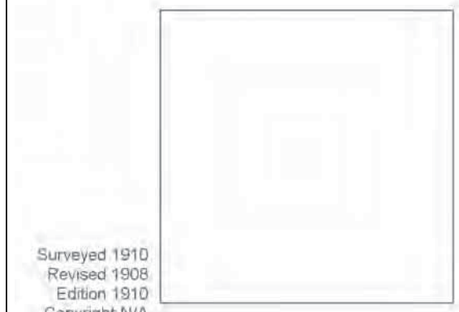
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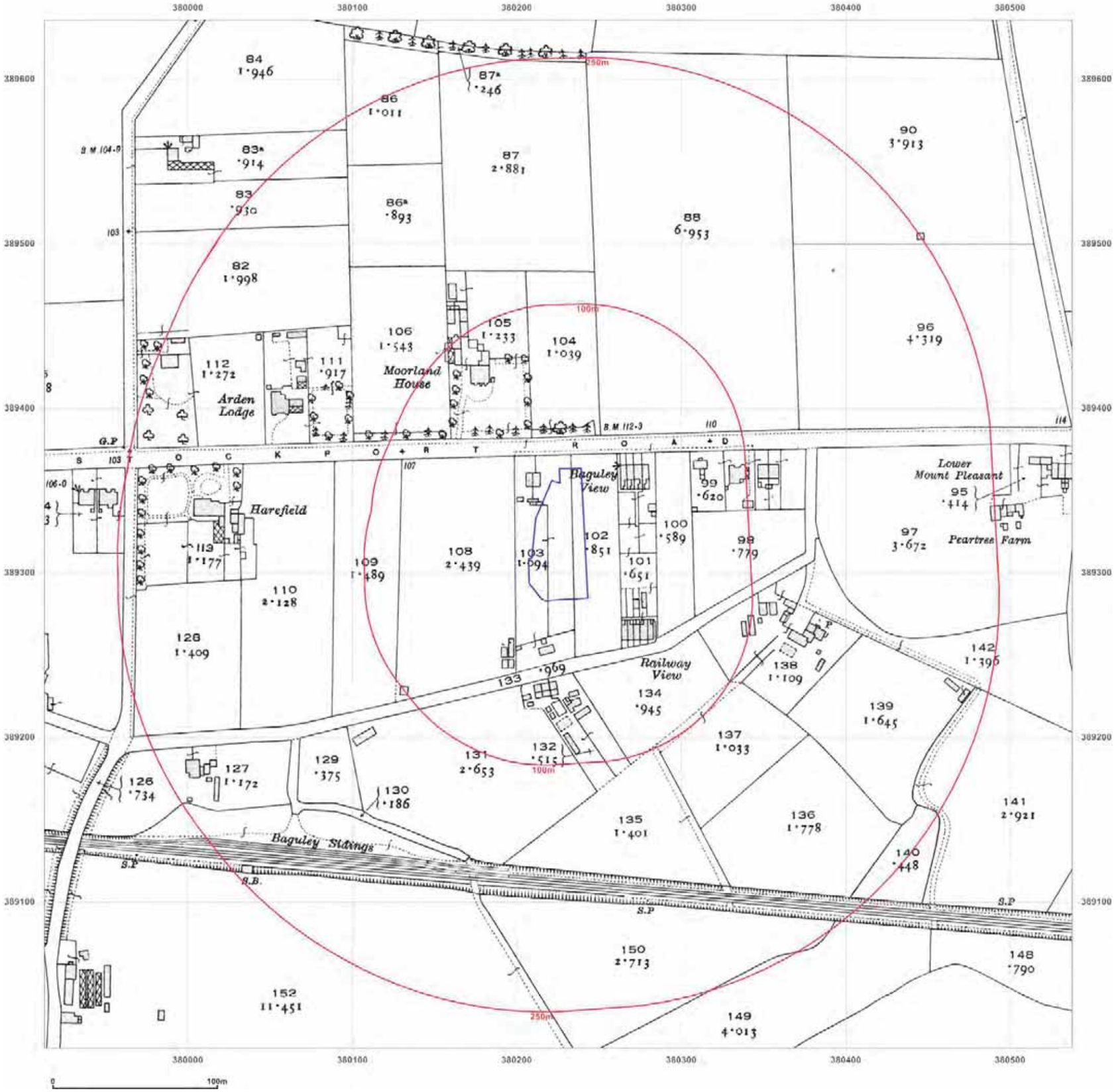
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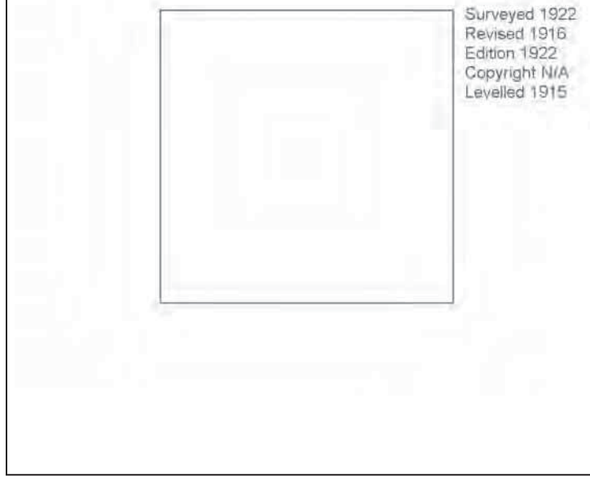
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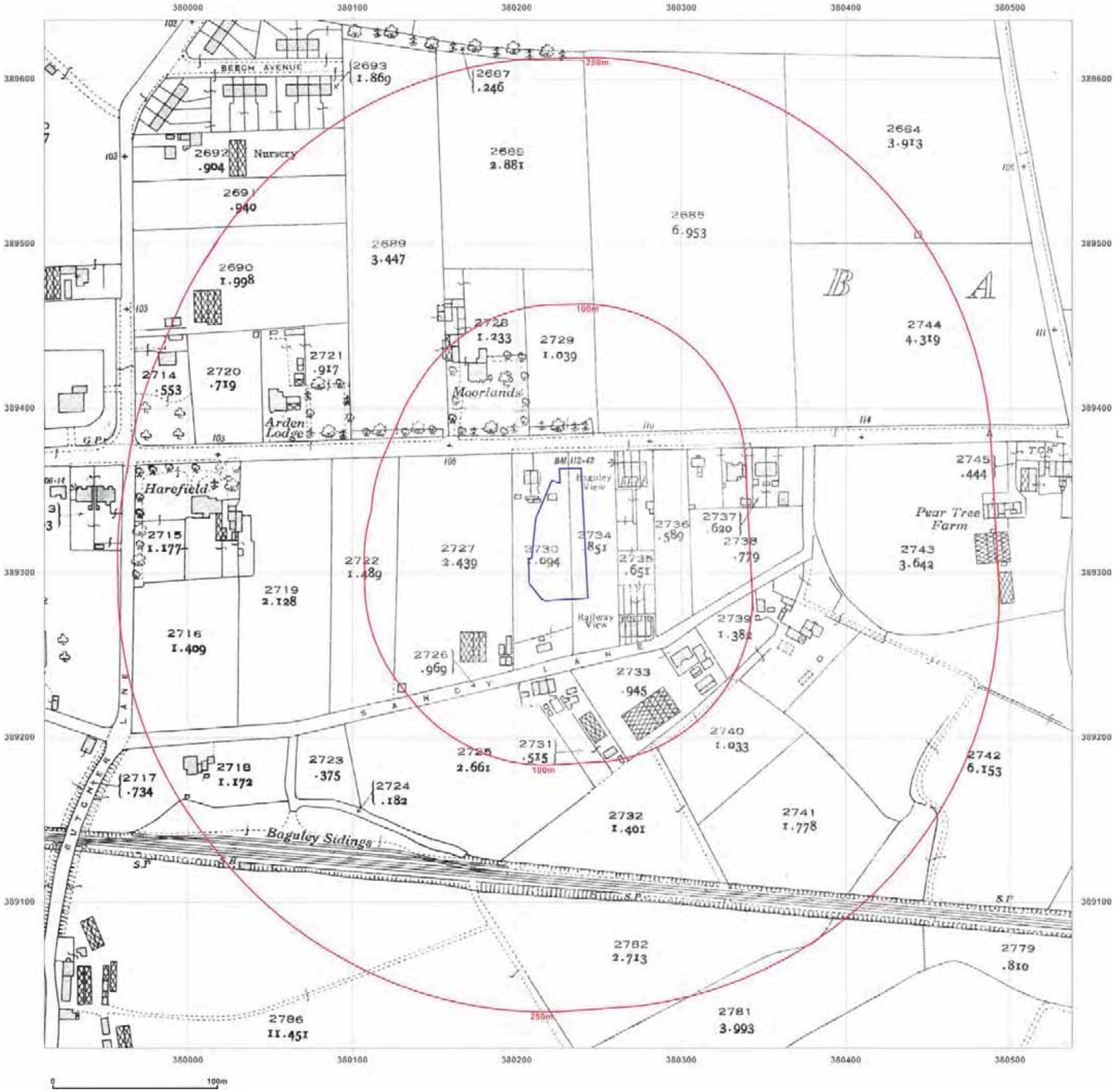
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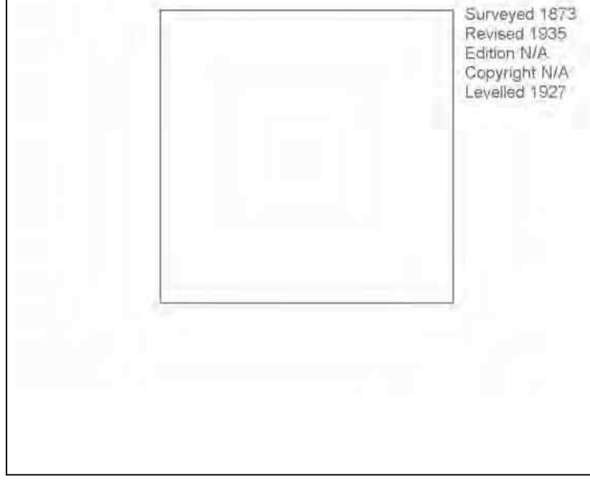
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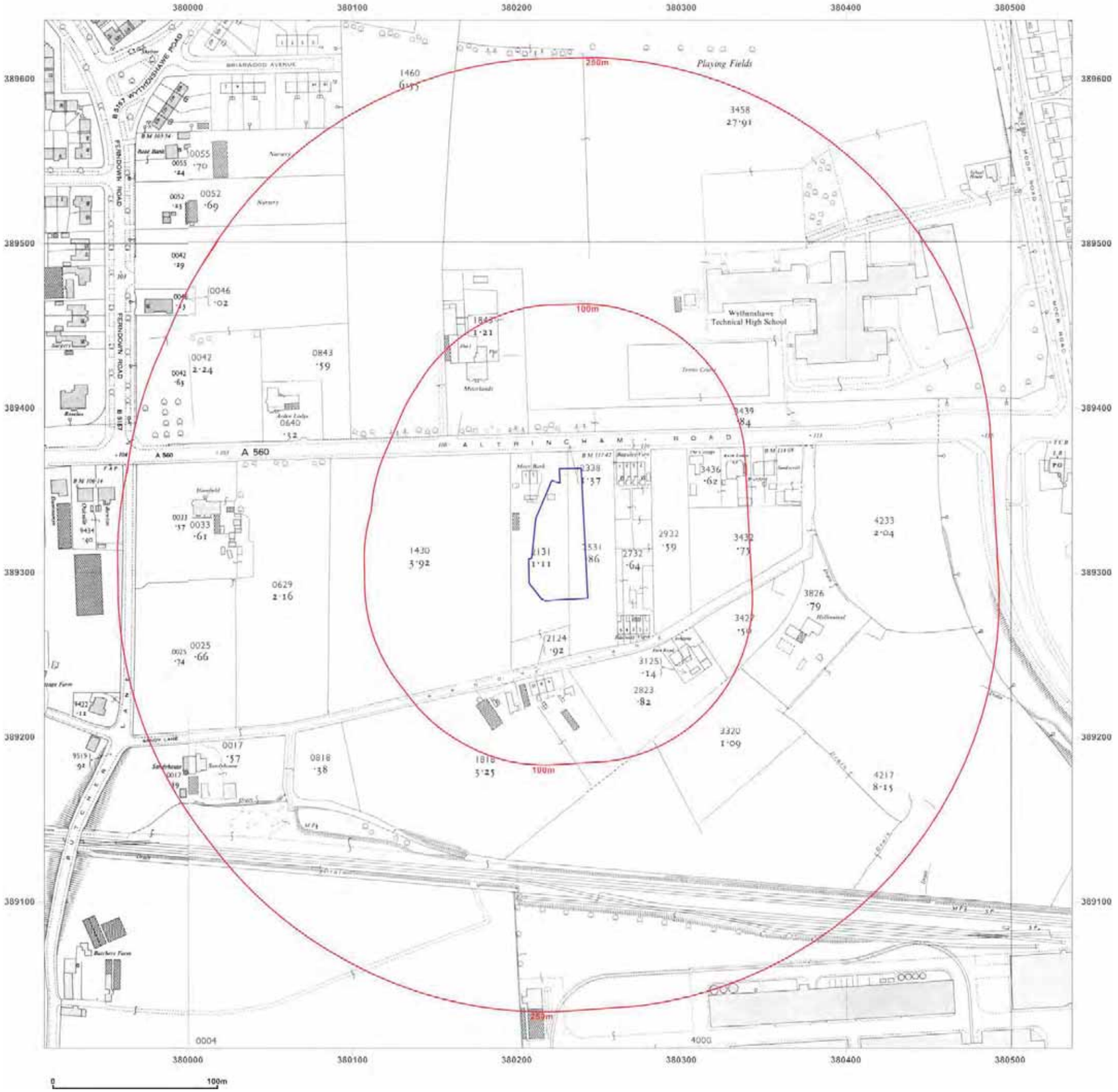
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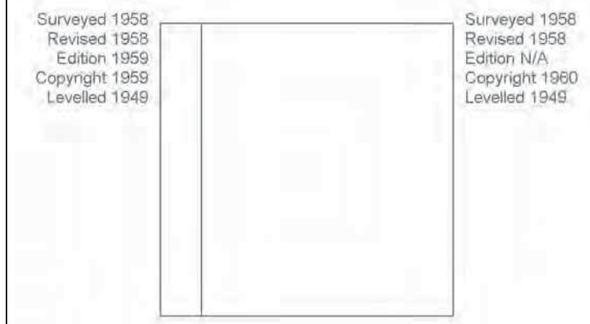
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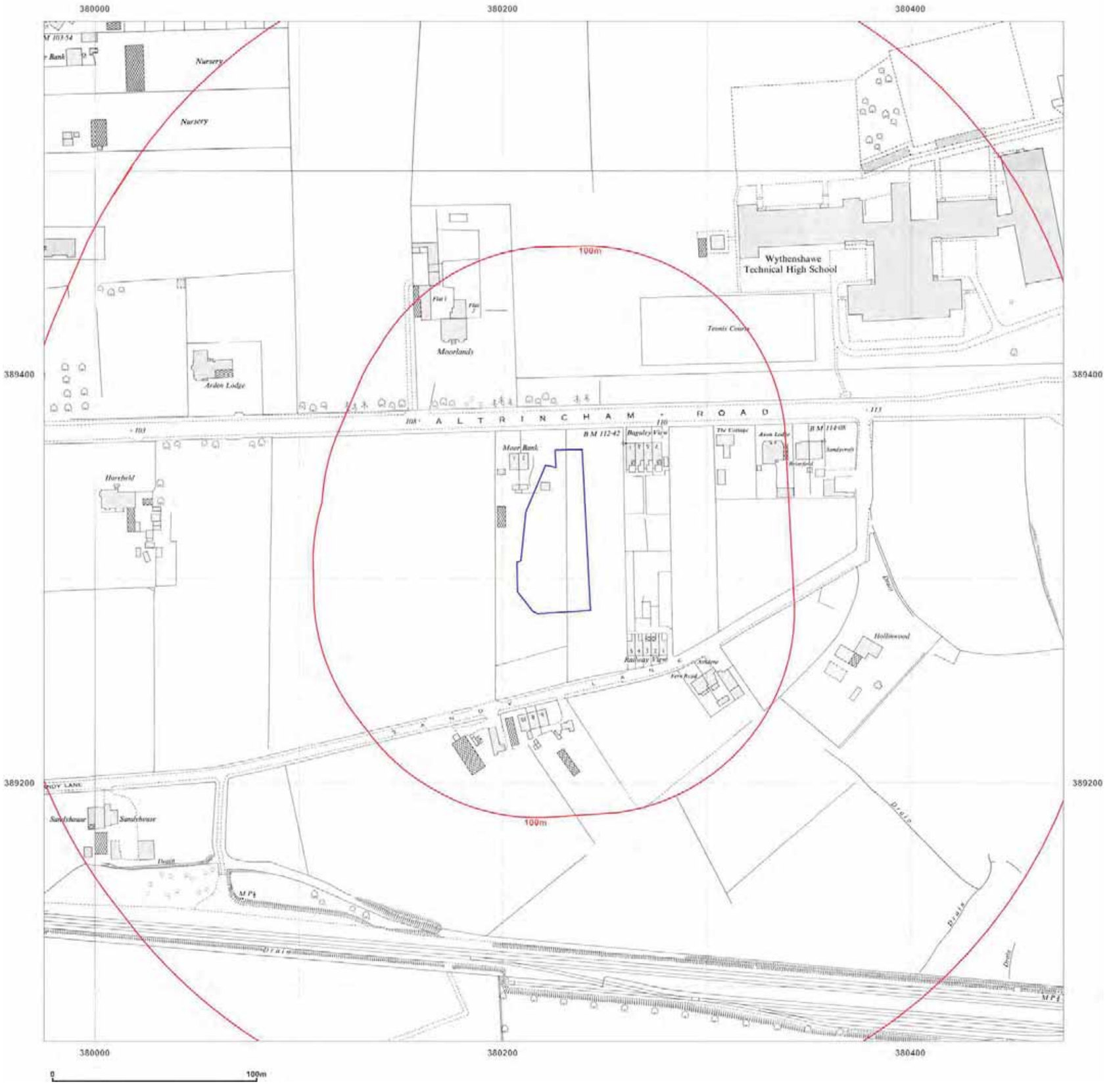
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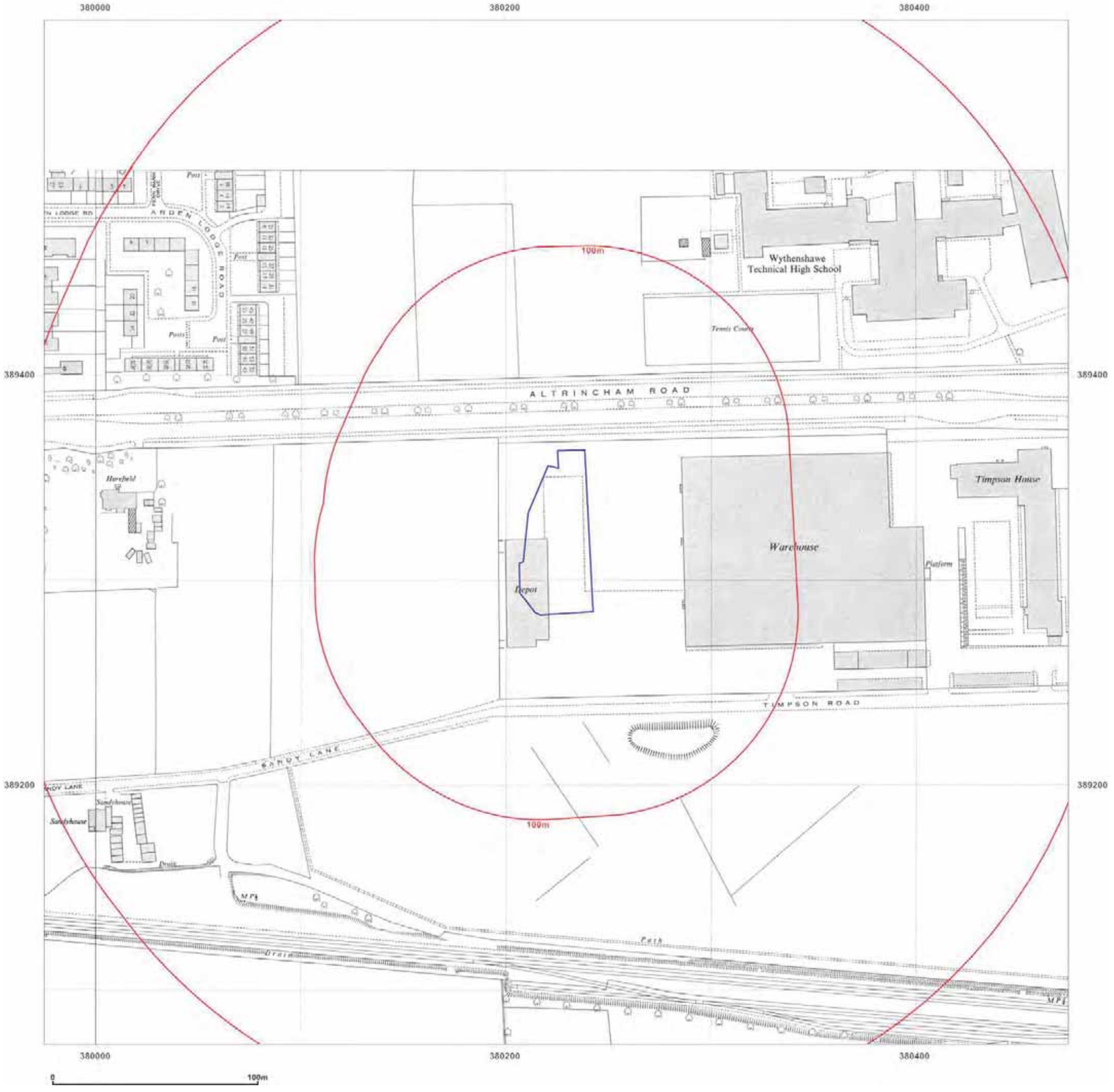
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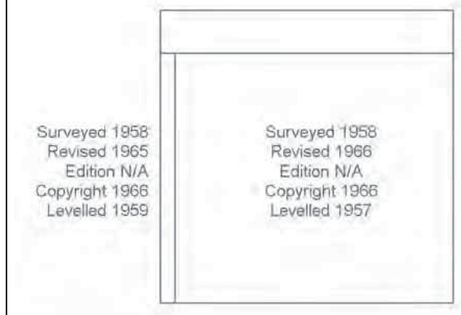
Map Name: National Grid

Map date: **1966**

Scale: 1:1,250

Printed at: 1:2,000

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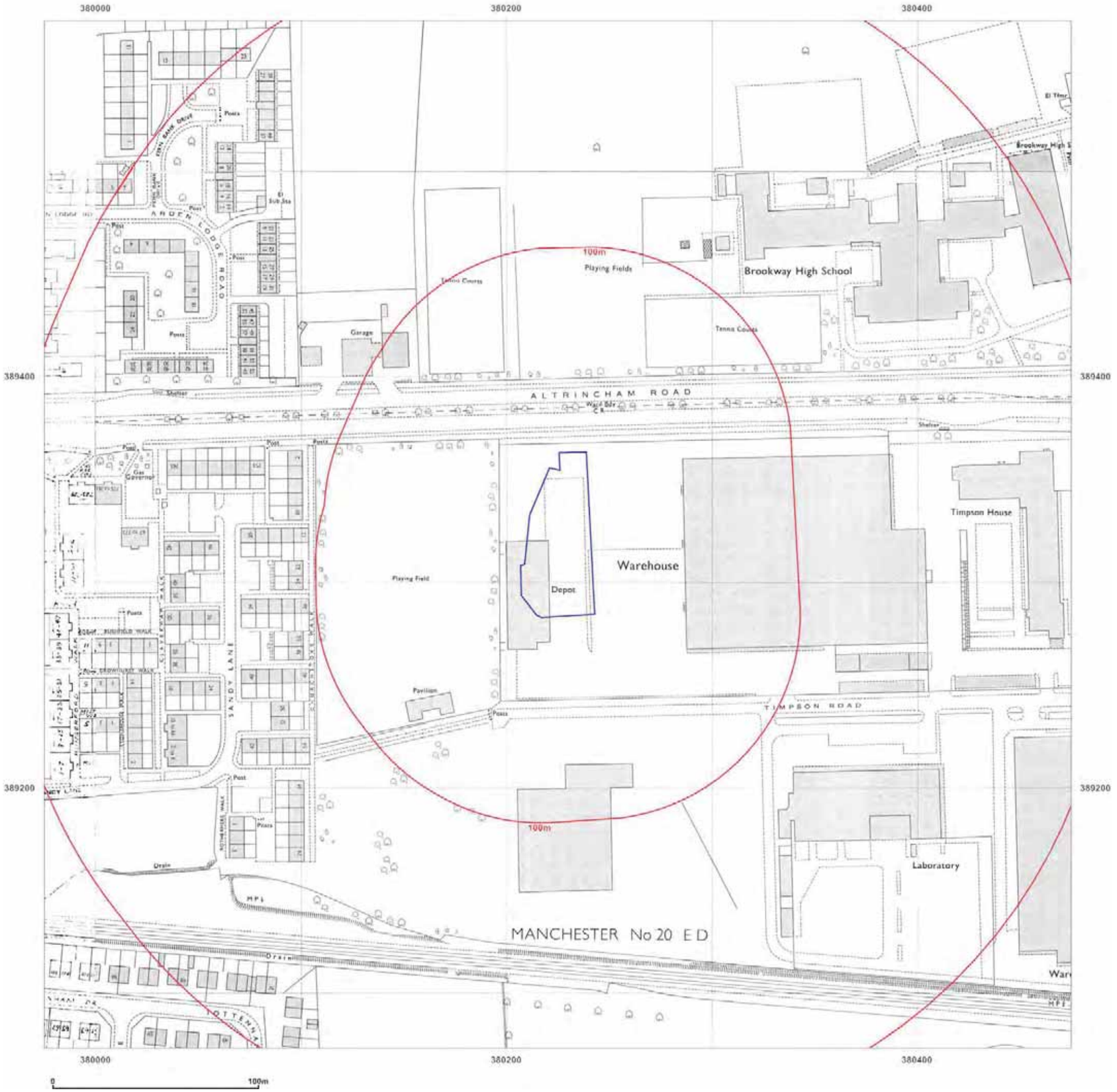
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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

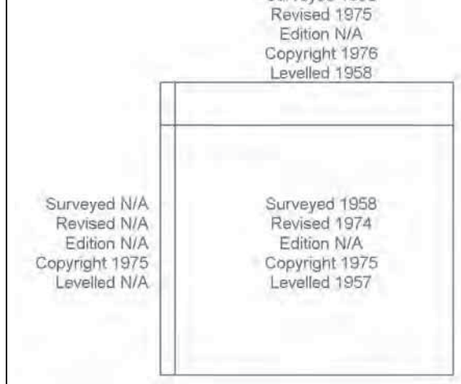
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Map date: **1975-1976**

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Printed at: 1:2,000

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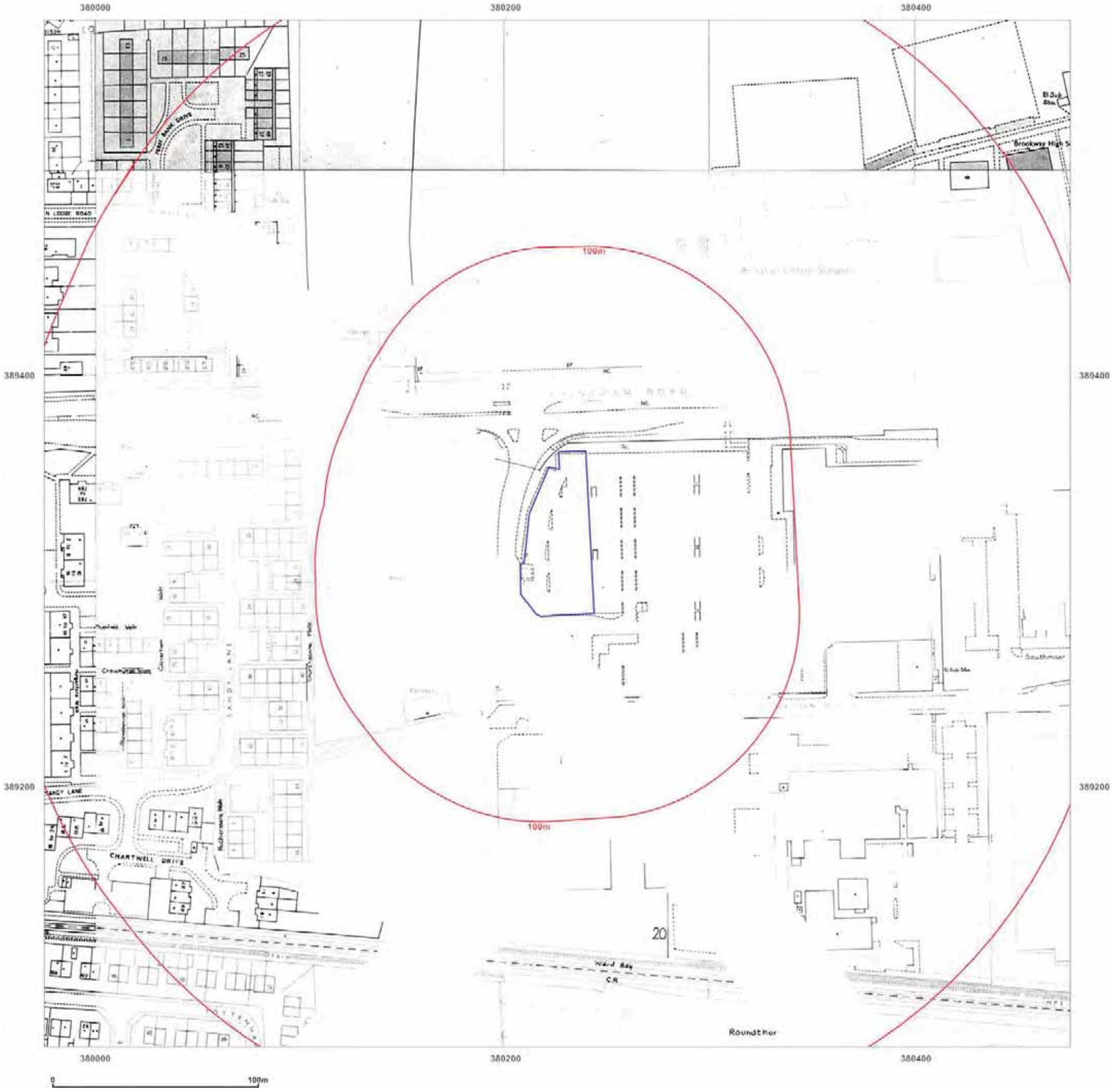
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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

Map Name: National Grid

Map date: **1987-1992**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1958
Revised 1987
Edition N/A
Copyright 1987
Levelled 1958

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1957
Revised 1990
Edition N/A
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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

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

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
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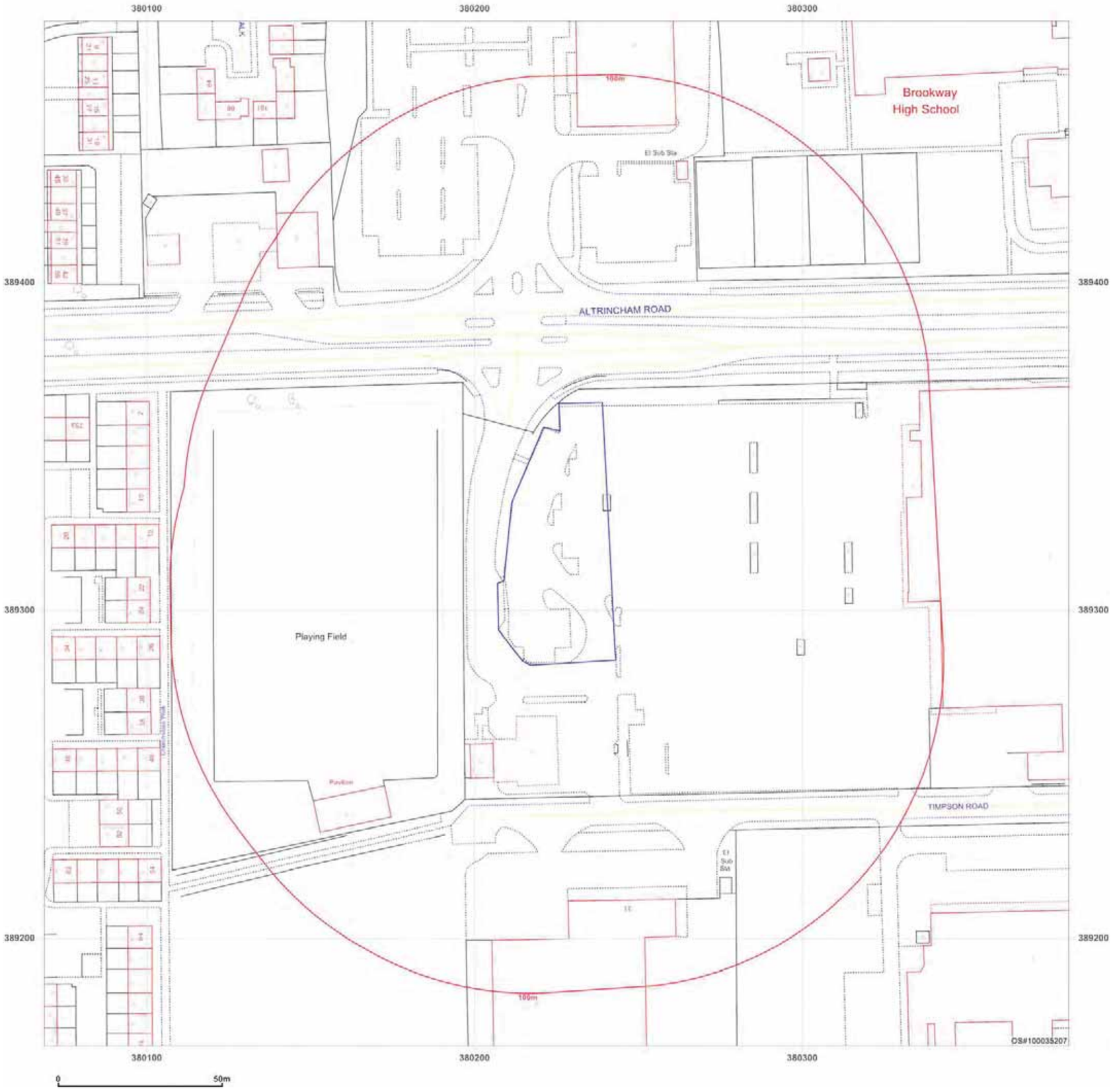
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Production date: 13 January 2021

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Site Details:

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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
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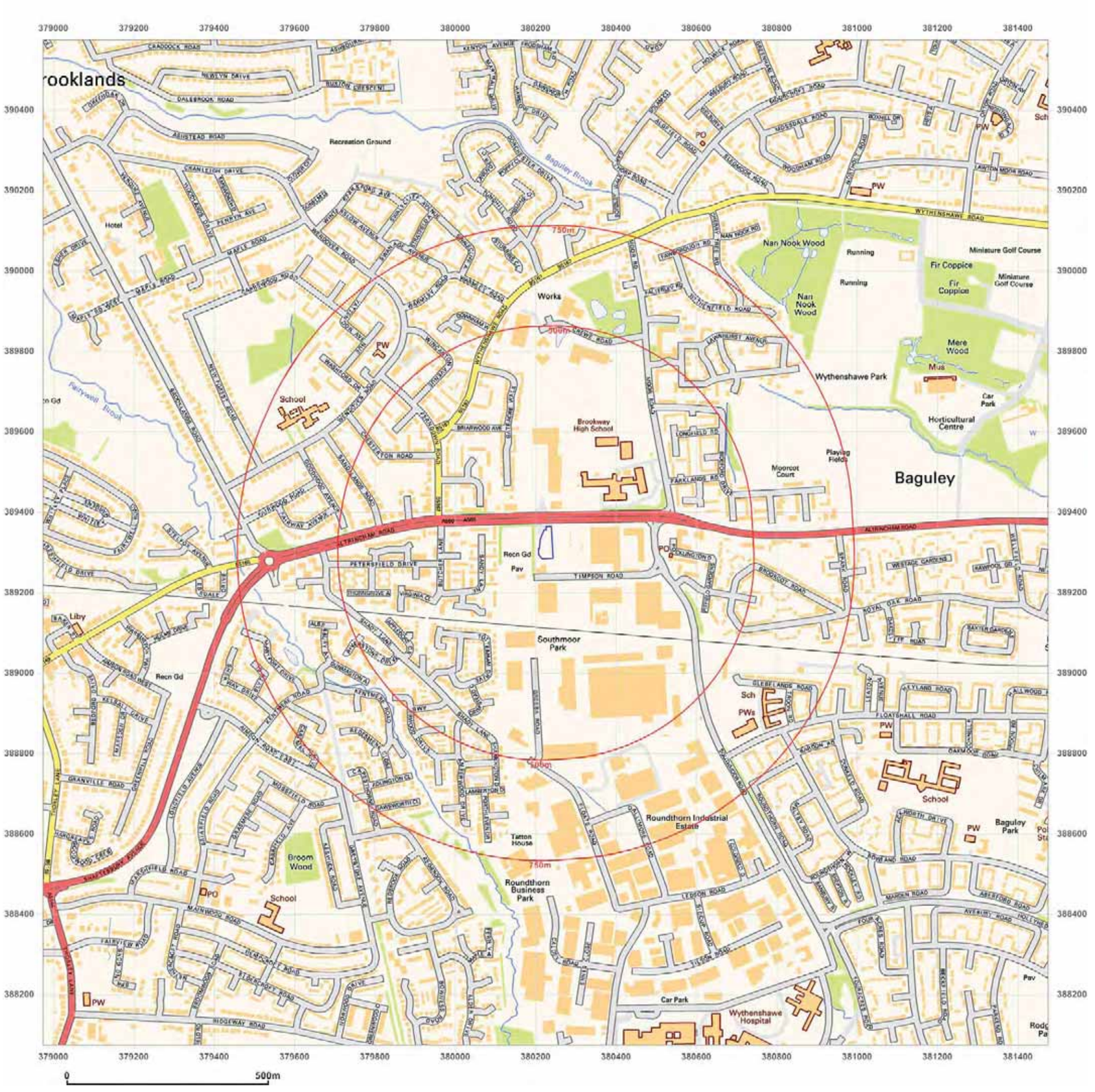
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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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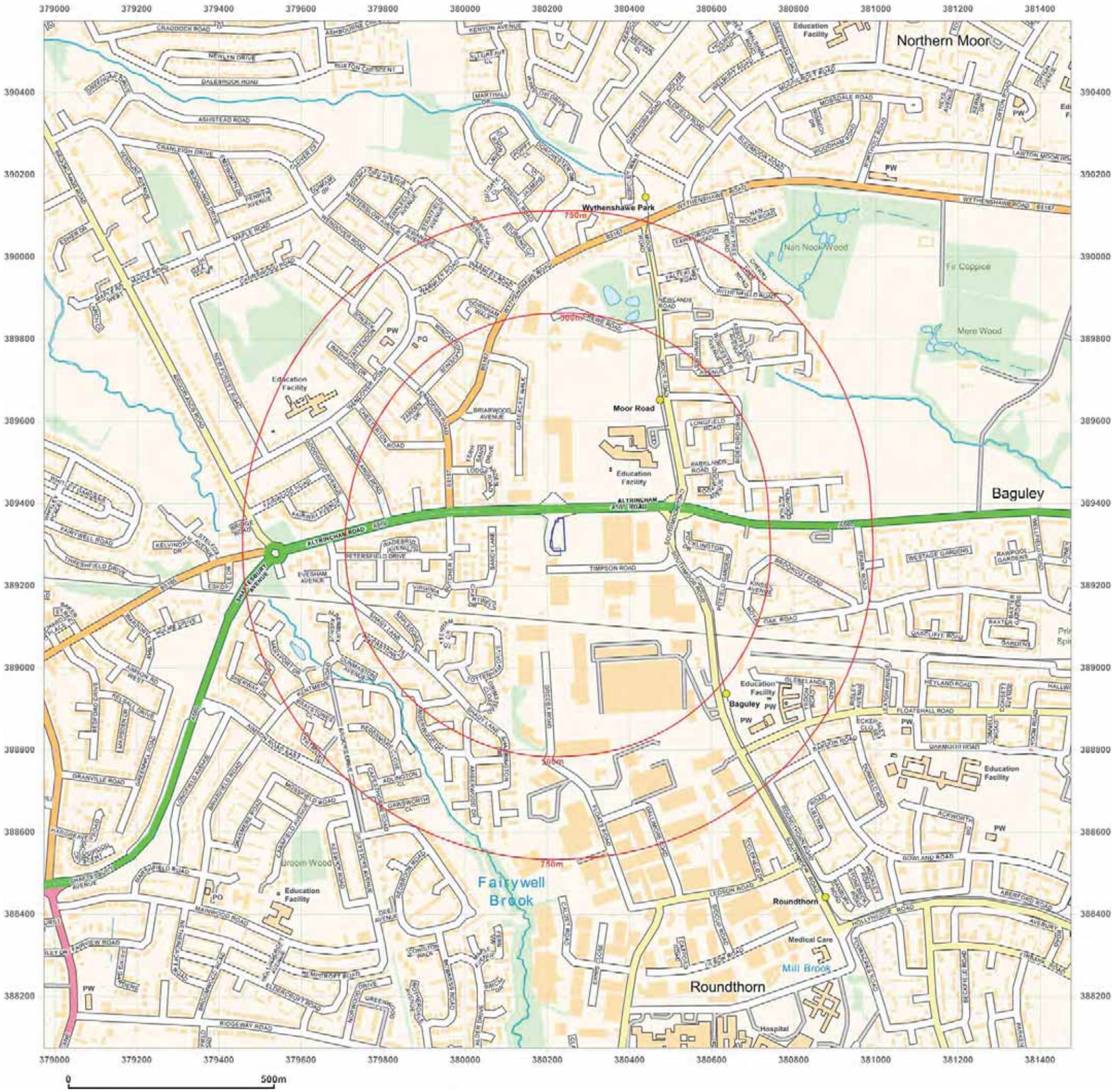
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Site Details:

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Client Ref: EMS_661273_872354
Report Ref: EMS-661273_872354
Grid Ref: 380225, 389323

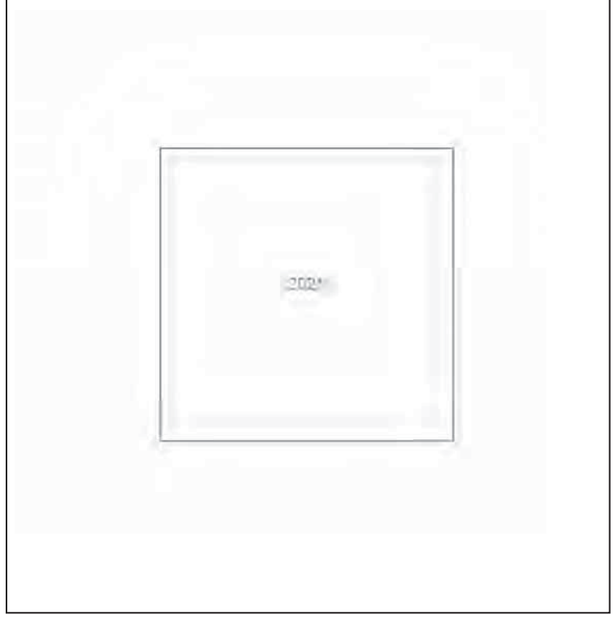
Map Name: National Grid

Map date: **2021**

Scale: 1:10,000

Printed at: 1:10,000

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Production date: 13 January 2021

Map legend available at:
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APPENDIX II

APPENDIX II – DESK STUDY INFORMATION

Groundsure Enviro+Geo Insight Databases

An Enviro+Geo Insight Report has been obtained from Groundsure regarding the site and surrounding area. This includes reference to databases from a variety of sources and include sentries that cover Environment Agency permits, waste sites, hazardous substances, geological data, industrial landuse, groundwater vulnerability, source protection zones and floodplains.

Also included is reference to databases that cover geological data, including information regarding mining/mineral extraction, natural cavities and landslips.

A report is included in this Appendix for a search radius of up to 1 km around the site and this report includes a summary table of the search results.

British Geological Survey

Records of Wells and Exploratory Holes close to the site, held by the British Geological Survey National Geological Records Centre, are presented in this Appendix. The locations of these holes are identified within a plan provided in this Appendix. The records are reproduced under the Open Government Licence, available for viewing at http://www.nationalarchives.gov.uk/doc/open-government-licence.

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

CCL03397 - Manchester, Tesco Car Park, Altrincham Road, Baguley, Manchester, M23 9TJ,

Order Details

Date: 13/01/2021

Your ref: EMS_661273_872355

Our Ref: EMS-661273_872355

Client: emapsite

Site Details

Location: 380226 389318

Area: 0.22 ha

Authority: Manchester City Council



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Summary of findings p. 2

OS MasterMap site plan p.12

Aerial image p. 8

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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	2	0	17	23	-
15	1.2	Historical tanks	0	0	4	9	-
16	1.3	Historical energy features	0	0	7	16	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	2	1	-
18	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
19	2.1	Historical industrial land uses	2	0	23	34	-
22	2.2	Historical tanks	0	0	9	10	-
23	2.3	Historical energy features	0	0	13	21	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	3	2	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
26	3.1	Active or recent landfill	0	0	0	0	-
26	3.2	Historical landfill (BGS records)	0	0	0	0	-
27	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
27	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
27	3.5	Historical waste sites	0	0	1	0	-
28	3.6	Licensed waste sites	0	0	0	0	-
28	3.7	Waste exemptions	0	0	4	2	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
29	4.1	Recent industrial land uses	0	1	7	-	-
30	4.2	Current or recent petrol stations	0	1	1	1	-
30	4.3	Electricity cables	0	0	0	0	-
31	4.4	Gas pipelines	0	0	0	0	-
31	4.5	Sites determined as Contaminated Land	0	0	0	0	-

31	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
31	4.7	Regulated explosive sites	0	0	0	0	-
31	4.8	Hazardous substance storage/usage	0	0	0	0	-
32	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
32	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
32	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	1	1	2	-
33	**4.12**	**Radioactive Substance Authorisations**	0	0	8	1	-
34	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
34	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
34	4.15	Pollutant release to public sewer	0	0	0	0	-
34	4.16	List 1 Dangerous Substances	0	0	0	0	-
35	4.17	List 2 Dangerous Substances	0	0	0	0	-
35	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
35	4.19	Pollution inventory substances	0	0	0	0	-
35	4.20	Pollution inventory waste transfers	0	0	0	0	-
35	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
36	**5.1**	**Superficial aquifer**	Identified (within 500m)				
38	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
40	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
41	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
41	5.5	Groundwater vulnerability- local information	None (within 0m)				
42	5.6	Groundwater abstractions	0	0	0	0	0
42	5.7	Surface water abstractions	0	0	0	0	0
42	5.8	Potable abstractions	0	0	0	0	0
42	5.9	Source Protection Zones	0	0	0	0	-
43	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
44	6.1	Water Network (OS MasterMap)	0	0	0	-	-

44	6.2	Surface water features	0	0	0	-	-
45	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
45	**6.4**	**WFD Surface water bodies**	0	0	0	-	-
46	**6.5**	**WFD Groundwater bodies**	2	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
47	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
47	7.2	Historical Flood Events	0	0	0	-	-
47	7.3	Flood Defences	0	0	0	-	-
47	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
48	7.5	Flood Storage Areas	0	0	0	-	-
49	7.6	Flood Zone 2	None (within 50m)				
49	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
50	**8.1**	**Surface water flooding**	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding					
52	**9.1**	**Groundwater flooding**	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
53	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
54	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
54	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
54	10.4	Special Protection Areas (SPA)	0	0	0	0	0
54	10.5	National Nature Reserves (NNR)	0	0	0	0	0
55	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	0	1
55	10.7	Designated Ancient Woodland	0	0	0	0	0
55	10.8	Biosphere Reserves	0	0	0	0	0
55	10.9	Forest Parks	0	0	0	0	0
56	10.10	Marine Conservation Zones	0	0	0	0	0
56	**10.11**	**Green Belt**	0	0	0	0	3
56	10.12	Proposed Ramsar sites	0	0	0	0	0

56	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
57	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
57	10.15	Nitrate Sensitive Areas	0	0	0	0	0
57	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
58	**10.17**	**SSSI Impact Risk Zones**	2	-	-	-	-
59	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
60	11.1	World Heritage Sites	0	0	0	-	-
60	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
60	11.3	National Parks	0	0	0	-	-
60	11.4	Listed Buildings	0	0	0	-	-
61	11.5	Conservation Areas	0	0	0	-	-
61	11.6	Scheduled Ancient Monuments	0	0	0	-	-
61	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
62	**12.1**	**Agricultural Land Classification**	Grade 3 (within 250m)				
63	12.2	Open Access Land	0	0	0	-	-
63	12.3	Tree Felling Licences	0	0	0	-	-
63	12.4	Environmental Stewardship Schemes	0	0	0	-	-
63	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
64	13.1	Priority Habitat Inventory	0	0	0	-	-
64	13.2	Habitat Networks	0	0	0	-	-
64	13.3	Open Mosaic Habitat	0	0	0	-	-
64	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
65	**14.1**	**10k Availability**	Identified (within 500m)				
66	14.2	Artificial and made ground (10k)	0	0	0	0	-
67	**14.3**	**Superficial geology (10k)**	2	0	2	1	-

68	14.4	Landslip (10k)	0	0	0	0	-
69	**14.5**	**Bedrock geology (10k)**	1	0	1	0	-
70	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
71	**15.1**	**50k Availability**	Identified (within 500m)				
72	15.2	Artificial and made ground (50k)	0	0	0	0	-
72	15.3	Artificial ground permeability (50k)	0	0	-	-	-
73	**15.4**	**Superficial geology (50k)**	1	1	1	0	-
74	**15.5**	**Superficial permeability (50k)**	Identified (within 50m)				
74	15.6	Landslip (50k)	0	0	0	0	-
74	15.7	Landslip permeability (50k)	None (within 50m)				
75	**15.8**	**Bedrock geology (50k)**	1	0	0	1	-
76	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
76	**15.10**	**Bedrock faults and other linear features (50k)**	0	0	0	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
77	**16.1**	**BGS Boreholes**	0	0	15	-	-
Page	Section	Natural ground subsidence					
79	**17.1**	**Shrink swell clays**	Negligible (within 50m)				
80	**17.2**	**Running sands**	Very low (within 50m)				
81	**17.3**	**Compressible deposits**	Negligible (within 50m)				
82	**17.4**	**Collapsible deposits**	Very low (within 50m)				
83	**17.5**	**Landslides**	Very low (within 50m)				
84	**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
85	18.1	Natural cavities	0	0	0	0	-
86	18.2	BritPits	0	0	0	0	-
86	**18.3**	**Surface ground workings**	0	0	1	-	-
86	18.4	Underground workings	0	0	0	0	0
86	18.5	Historical Mineral Planning Areas	0	0	0	0	-

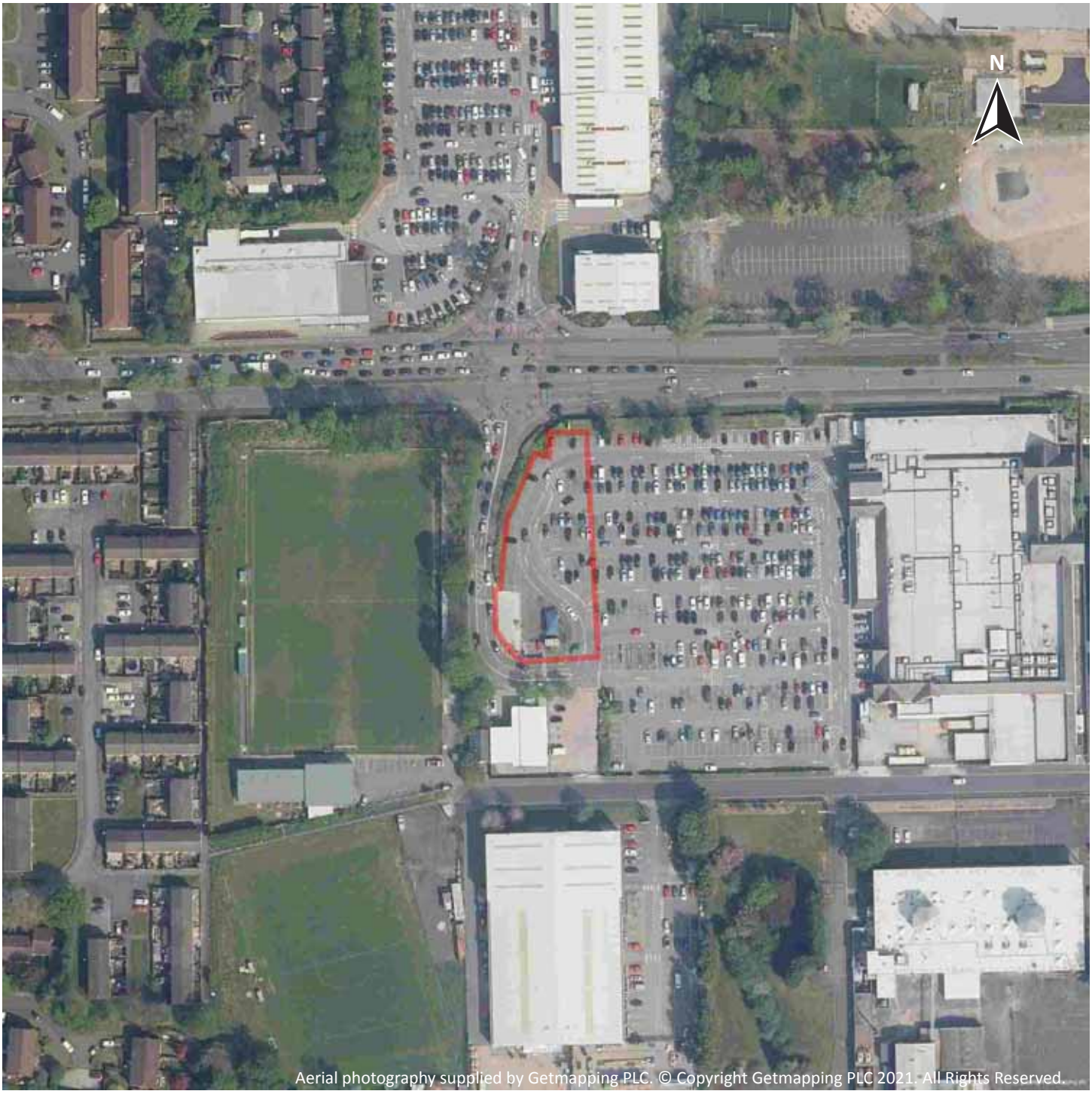
87	18.6	Non-coal mining	0	0	0	0	0
87	18.7	Mining cavities	0	0	0	0	0
87	18.8	JPB mining areas	None (within 0m)				
87	18.9	Coal mining	None (within 0m)				
87	18.10	Brine areas	None (within 0m)				
88	18.11	Gypsum areas	None (within 0m)				
88	18.12	Tin mining	None (within 0m)				
88	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
89	**19.1**	**Radon**	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
90	**20.1**	**BGS Estimated Background Soil Chemistry**	1	1	-	-	-
90	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
90	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
91	21.1	Underground railways (London)	0	0	0	-	-
91	21.2	Underground railways (Non-London)	0	0	0	-	-
92	21.3	Railway tunnels	0	0	0	-	-
92	**21.4**	**Historical railway and tunnel features**	0	0	22	-	-
93	21.5	Royal Mail tunnels	0	0	0	-	-
93	21.6	Historical railways	0	0	0	-	-
93	**21.7**	**Railways**	0	0	3	-	-
94	21.8	Crossrail 1	0	0	0	0	-
94	21.9	Crossrail 2	0	0	0	0	-
94	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 22/04/2019

Site Area: 0.22ha

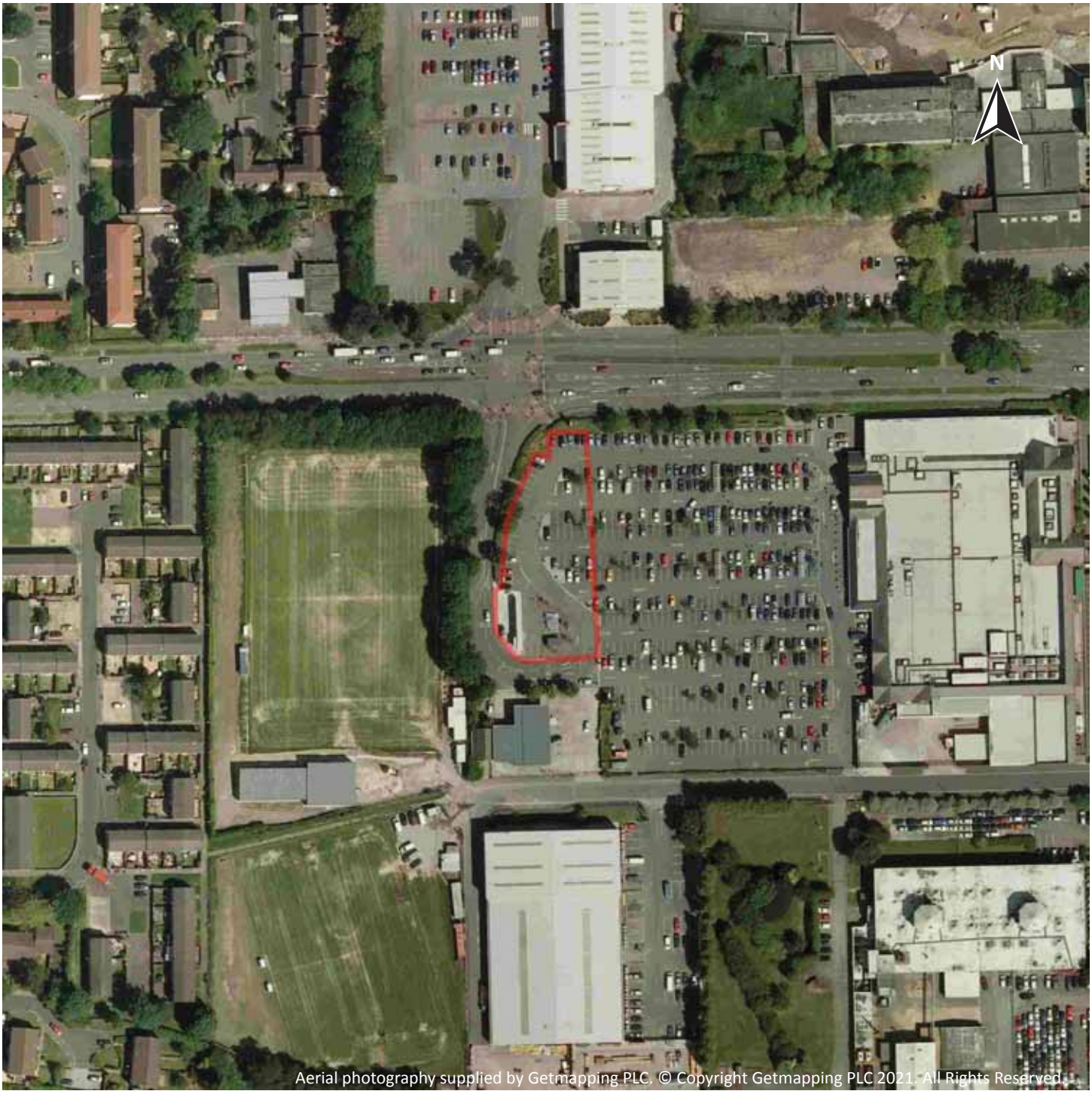
Recent site history - 2016 aerial photograph



Capture Date: 21/04/2016

Site Area: 0.22ha

Recent site history - 2009 aerial photograph



Capture Date: 02/06/2009

Site Area: 0.22ha

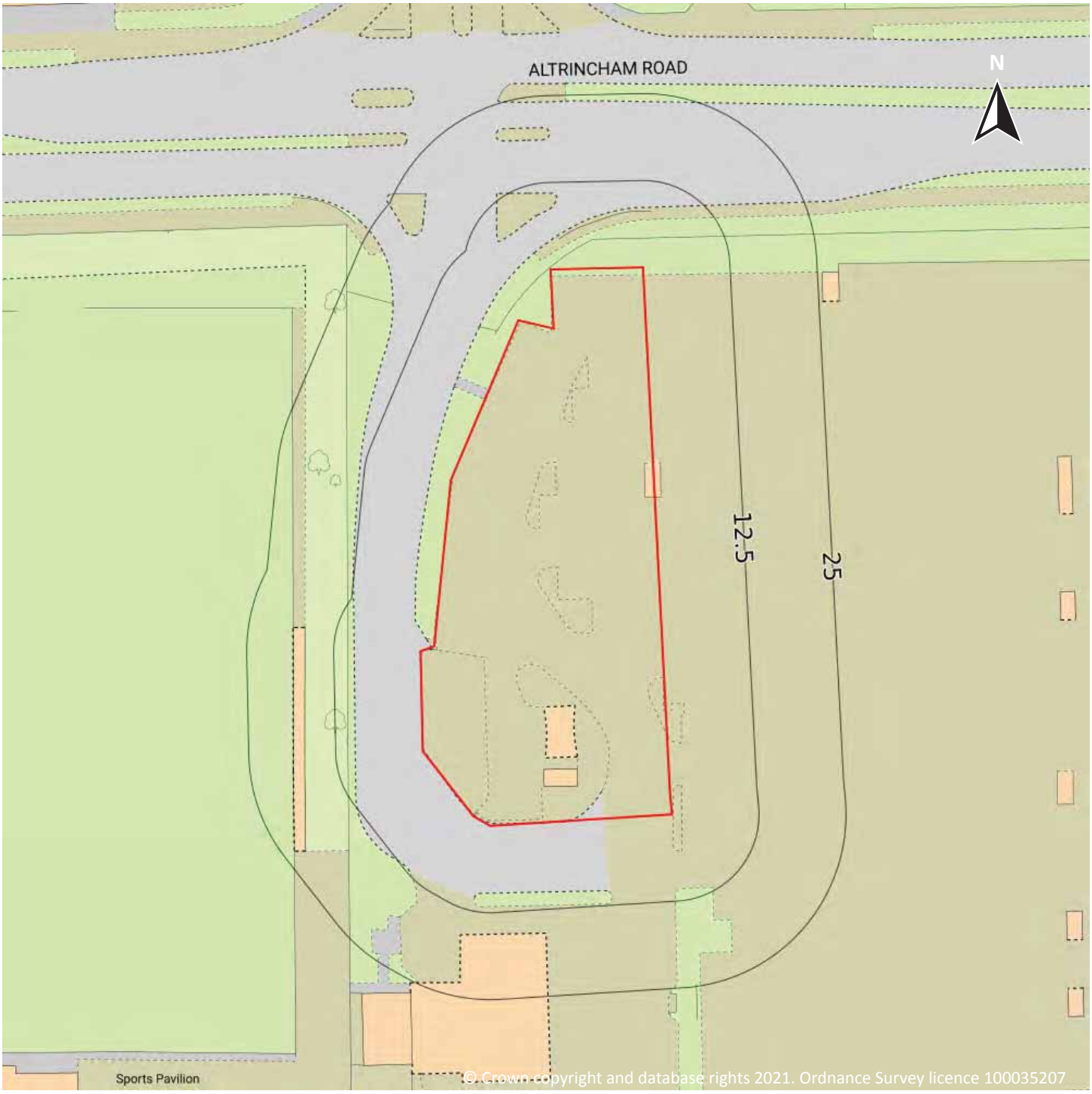
Recent site history - 2000 aerial photograph



Capture Date: 27/06/2000

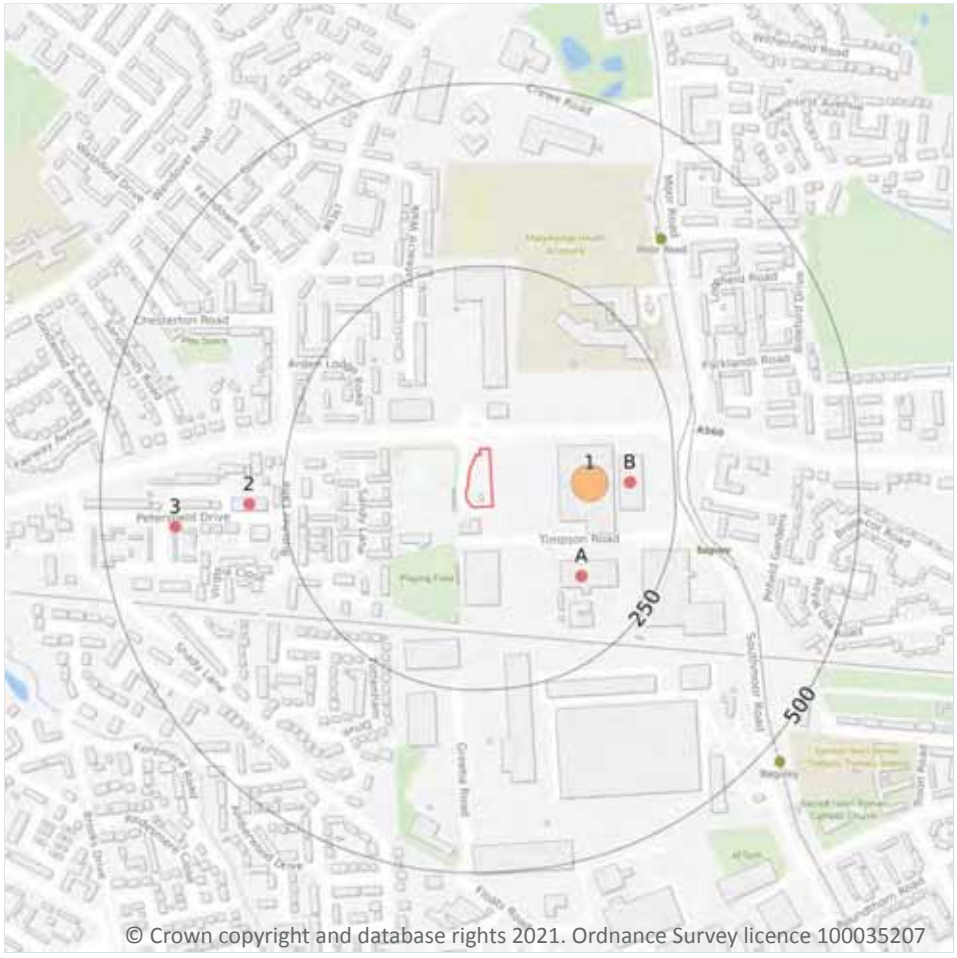
Site Area: 0.22ha

OS MasterMap site plan



Site Area: 0.22ha

3 Waste and landfill



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Site Outline

Search buffers in metres (m)

Historical waste sites

Waste exemptions

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	1

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

Features are displayed on the Waste and landfill map on **page 26**

ID	Location	Address	Further Details	Date
1	109m E	Site Address: Tesco Stores Ltd, Altrincham Road, MANCHESTER, Greater Manchester, M23 9TJ	Type of Site: Recycling Facilities Planning application reference: 084201/FO/2007/S2 Description: Scheme comprises relocation of recycling facilities including reinstatement of parking spaces. An application (ref: 084201/FO/2007/S2) for detailed planning permission was granted by Manchester C.C. Planning decision obtained Data source: Historic Planning Application Data Type: Point	-

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	6

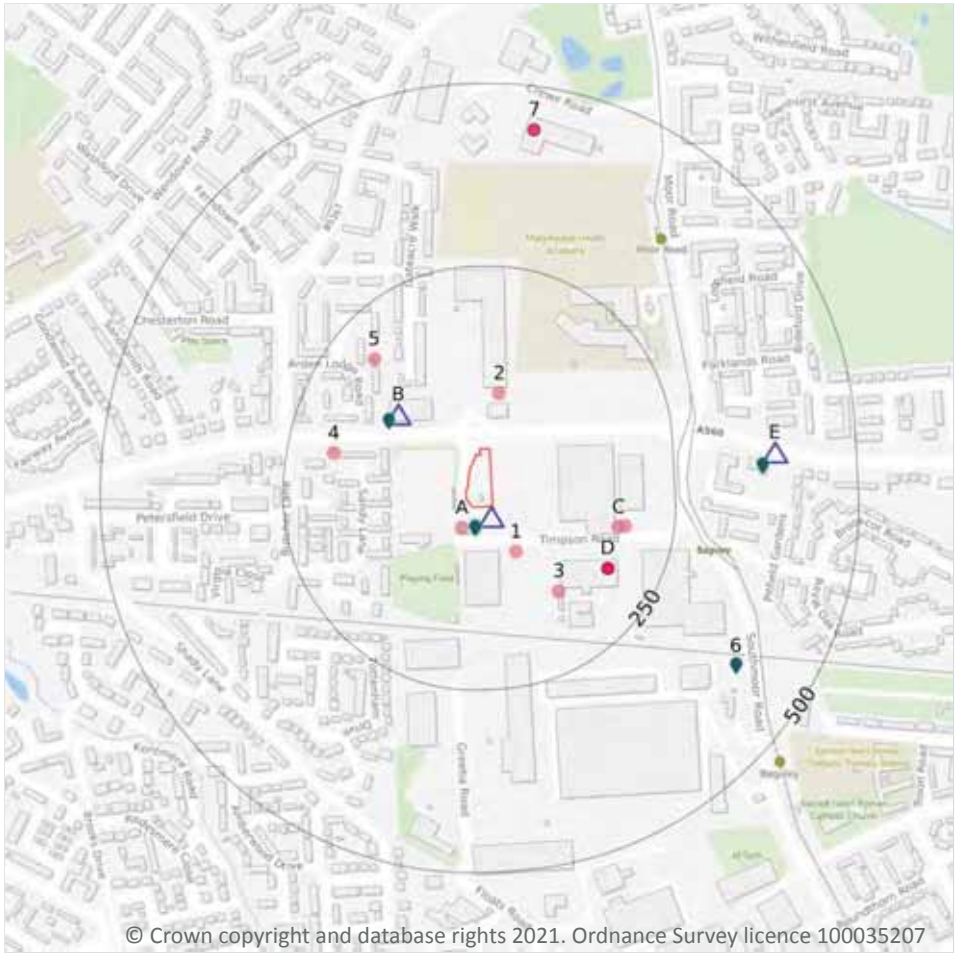
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 26**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	154m SE	EDF Energy Wythenshawe Laboratories Timpson Road MANCHESTER M23 9LL	EPR/KF0203MN/A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	154m SE	EDF Energy Wythenshawe Laboratories Timpson Road MANCHESTER M23 9LL	EPR/KF0203MN/A001	Using waste exemption	Non-Agricultural Waste Only	Use of mulch
B	189m E	EDF ENERGY, Timpson Road, Wythenshawe, Manchester, M23 9LL	WEX241325	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	189m E	EDF ENERGY, Timpson Road, Wythenshawe, Manchester, M23 9LL	WEX241325	Using waste exemption	Not on a farm	Use of mulch
2	297m W	37, PETERSFIELD DRIVE, MANCHESTER, M23 9PS	WEX156646	Treating waste exemption	Not on a Farm	Sorting and de-naturing of controlled drugs for disposal
3	400m W	Baguley Pharmacy, 37 Petersfield Drive, Baguley , Manchester, M23 9PS	WEX130221	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

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

4 Current industrial land use



Site Outline

Search buffers in metres (m)

Recent industrial land uses

Current or recent petrol stations

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

Radioactive Substance Authorisations

4.1 Recent industrial land uses

Records within 250m	8

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Company	Address	Activity	Category
A	32m SW	Tesco Petrol Station	Altrincham Road Baguley Manchester, Manchester, Greater Manchester, M23 9TJ	Petrol and Fuel Stations	Road and Rail
1	70m SE	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
2	77m N	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities

ID	Location	Company	Address	Activity	Category
3	147m SE	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
C	174m E	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
C	183m E	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities
4	187m W	Gas Governor Station	Greater Manchester, M23	Gas Features	Infrastructure and Facilities
5	190m NW	Electricity Sub Station	Greater Manchester, M23	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	**3**

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Company	Address	LPG	Status
A	15m S	TESCO EXTRA	Altrincham Road, Baguley, Manchester, Greater Manchester, M23 9TJ	No	Open
B	120m NW	TOTAL	Altrincham Road, Wythenshawe, Manchester, Greater Manchester, M23 9LD	Not Applicable	Obsolete
E	388m E	SHELL	Altrincham Road, Baguley, Manchester, Greater Manchester, M23 9AA	Yes	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.

4.9 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	4

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 29**

ID	Location	Address	Details	
A	29m S	Tesco Petrol Station Baguley, Altrincham Road, Wythenshawe, M23 9TJ	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
B	128m NW	Total, Altrincham Rd, M23 9LD	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
E	370m E	Shell UK Oil Ltd, Altrincham Road, Baguley, M23 9AA	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
6	397m SE	Dresser Rand UK Ltd, Southmoor Road, Wythenshawe, M23 9LH	Process: Coating Processes Status: Historical 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	**9**

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

Features are displayed on the Current industrial land use map on **page 29**

ID	Location	Address	Details	
D	178m SE	Magnox Electric Ltd, Technology Division, Timpson Road, Manchester, Greater Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AC9742 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
D	178m SE	Magnox Electric Ltd, Technology Division, Timpson Road, Manchester, Greater Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AC9769 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
D	178m SE	Magnox Electric Ltd, Technology Division, Timpson Road, Manchester, Greater Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AC9777 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
D	178m SE	Magnox Electric Ltd, Technology Division, Timpson Road, Manchester, Greater Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Keeping And Use Of Mobile Radioactive Sources (was Rsa60 Section 3) Permission number: AC9831 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
D	178m SE	Magnox Electric Ltd, Timpson Road, Wythenshawe, Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AK1258 Date of approval: 27/10/1992	Effective from: 27/11/1992 Last date of update: 01/01/2015 Status: Revoked/cancelled
D	178m SE	Magnox Electric Ltd, Timpson Road, Wythenshawe, Manchester, M23 9LL	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AK1258 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Superseded By Variation
D	178m SE	Serco Assurance, Timpson Road, Wythenshawe, Manchester, M23 9LL	Operator: Serco Assurance Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BS7293 Date of approval: 29/08/2002	Effective from: 26/09/2002 Last date of update: 01/01/2015 Status: Superseded By Variation

ID	Location	Address	Details	
D	178m SE	Serco Assurance, Timpson Road, Wythenshawe, Manchester, M23 9LL	Operator: Serco Assurance Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BS7293 Date of approval: 19/05/2003	Effective from: 19/05/2003 Last date of update: 01/01/2015 Status: Revoked/cancelled
7	440m N	Gv Instruments Ltd, Crewe Road,wythenshawe, Manchester, Greater Manchester, M23 9BE	Operator: Gv Instruments Ltd Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: BY0747 Date of approval: 08/09/2004	Effective from: 08/09/2004 Last date of update: 01/01/2015 Status: Revoked/cancelled

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	0

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.

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.

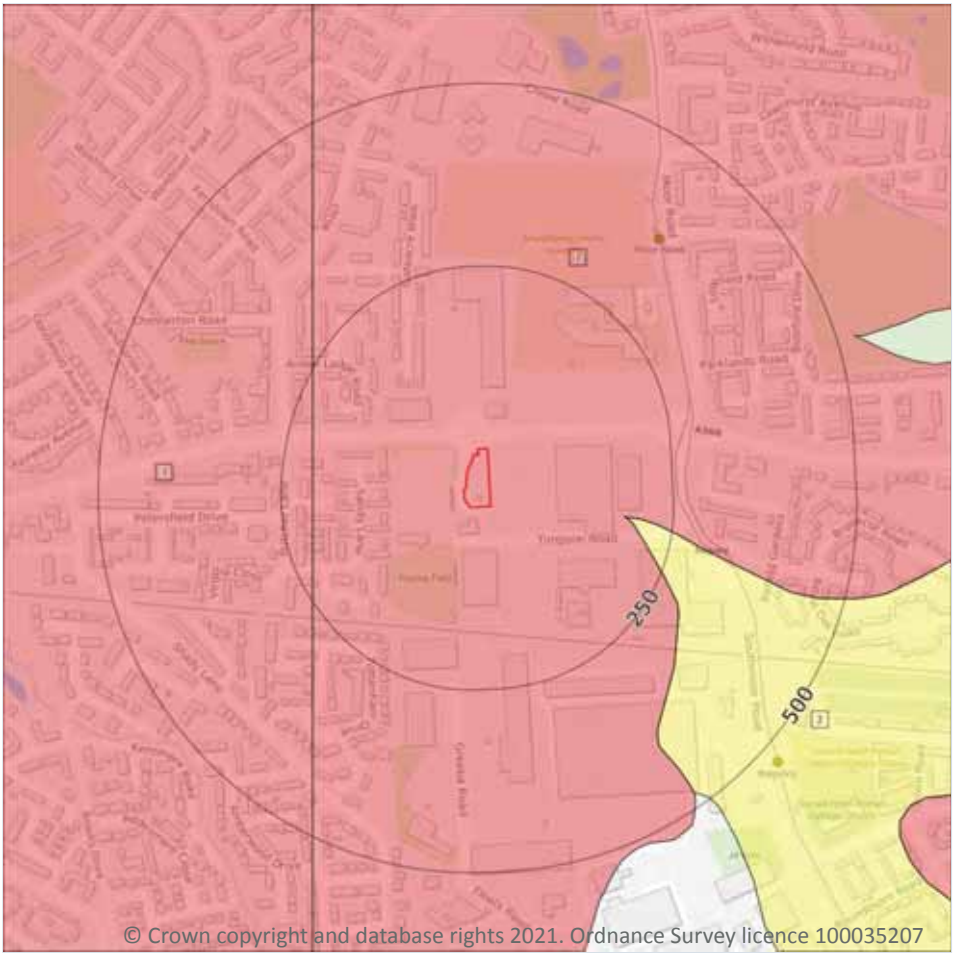
4.21 Pollution inventory radioactive waste

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



Site Outline

Search buffers in metres (m)

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

5.1 Superficial aquifer

Records within 500m	3

Aquifer status of groundwater held within superficial geology.

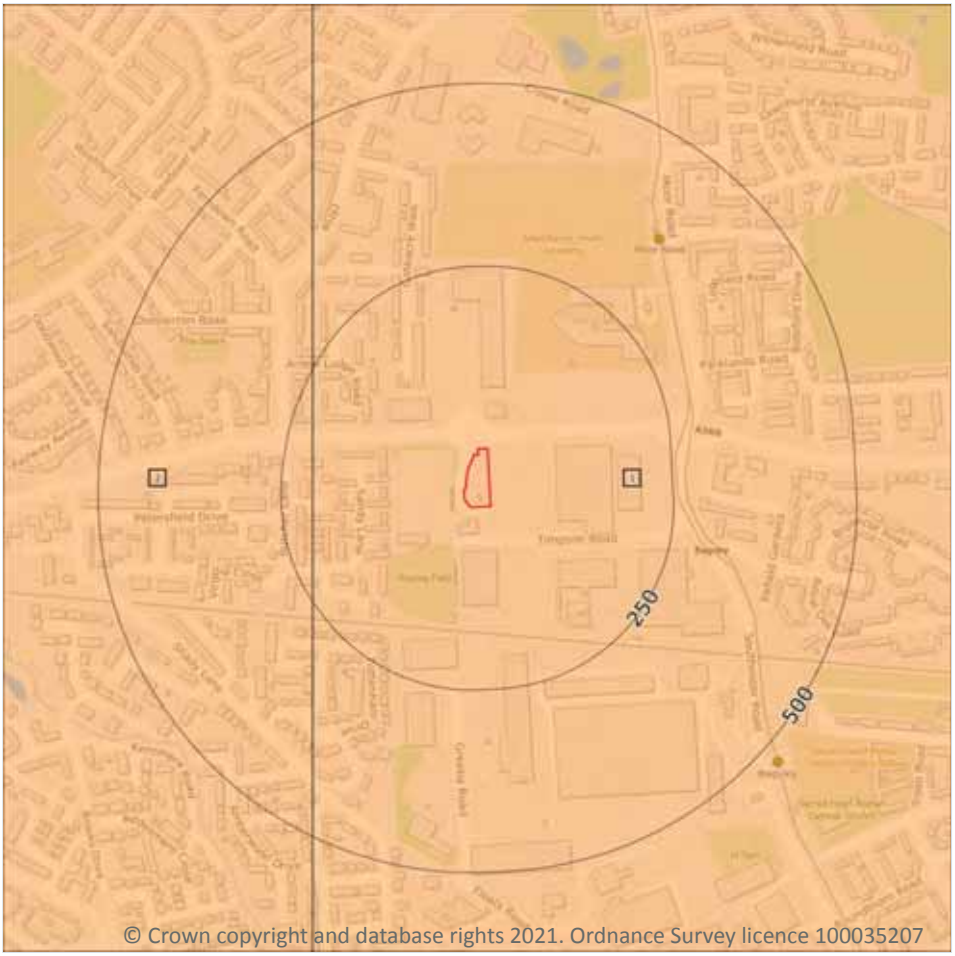
Features are displayed on the Hydrogeology map on **page 36**

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	185m E	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	207m W	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

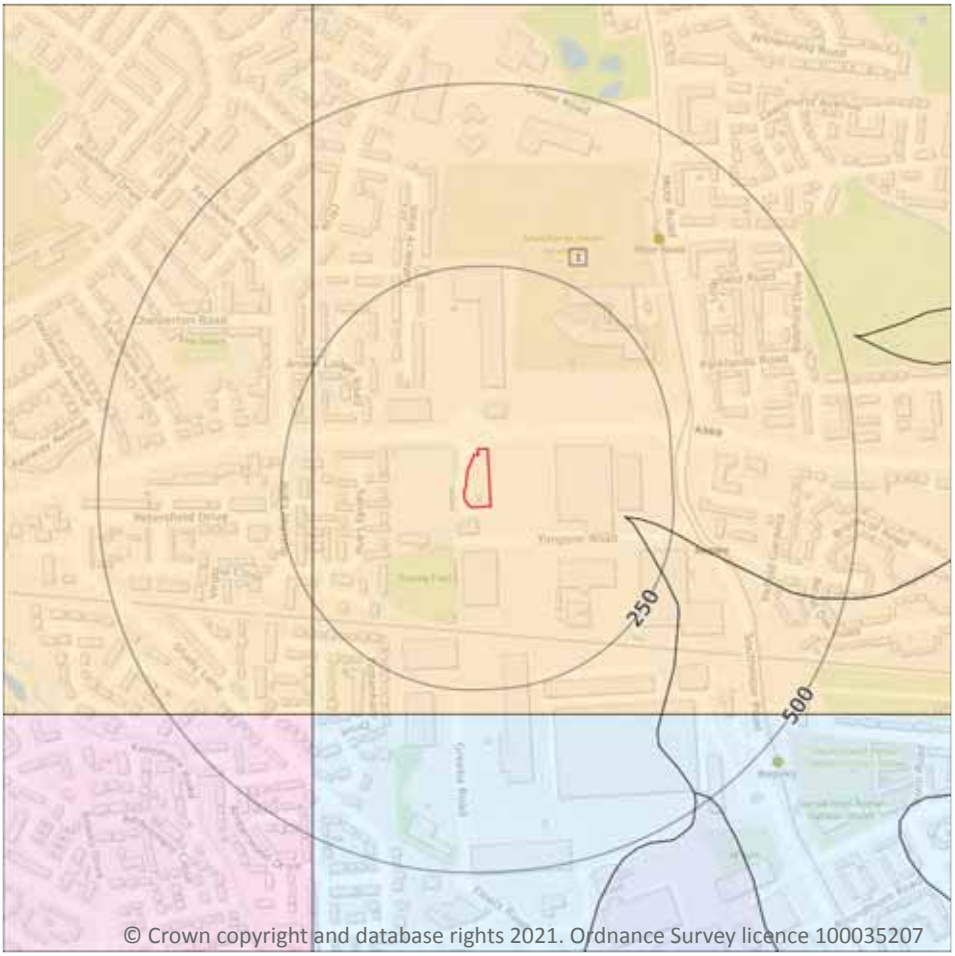
Records within 500m	2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 38**

ID	Location	Designation	Description
1	**On site**	**Secondary B**	**Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers**
2	207m W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers

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	1

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 40**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**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: 3-10m Patchiness value: >90% Recharge potential: High**	**Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures**

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

5.6 Groundwater abstractions

Records within 2000m	0

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.

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



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 44**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	**On site**	**River WB catchment**	**Sinderland Brook (Fairywell Bk and Baguley Bk)**	**GB112069061270**	**Bollin, Dean, Upper Mersey**	**Upper Mersey**

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 44**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	515m SW	River	Sinderland Brook (Fairywell Bk and Baguley Bk)	GB112069061270	Moderate	Good	Moderate	2016

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

6.5 WFD Groundwater bodies

Records on site	2

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 44**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	**On site**	**Weaver and Dane Quaternary Sand and Gravel Aquifers**	**GB41202G991700**	**Poor**	**Poor**	**Good**	**2015**
A	**On site**	**Weaver and Dane Quaternary Sand and Gravel Aquifers**	**GB41202G991700**	**Poor**	**Poor**	**Good**	**2016**

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.

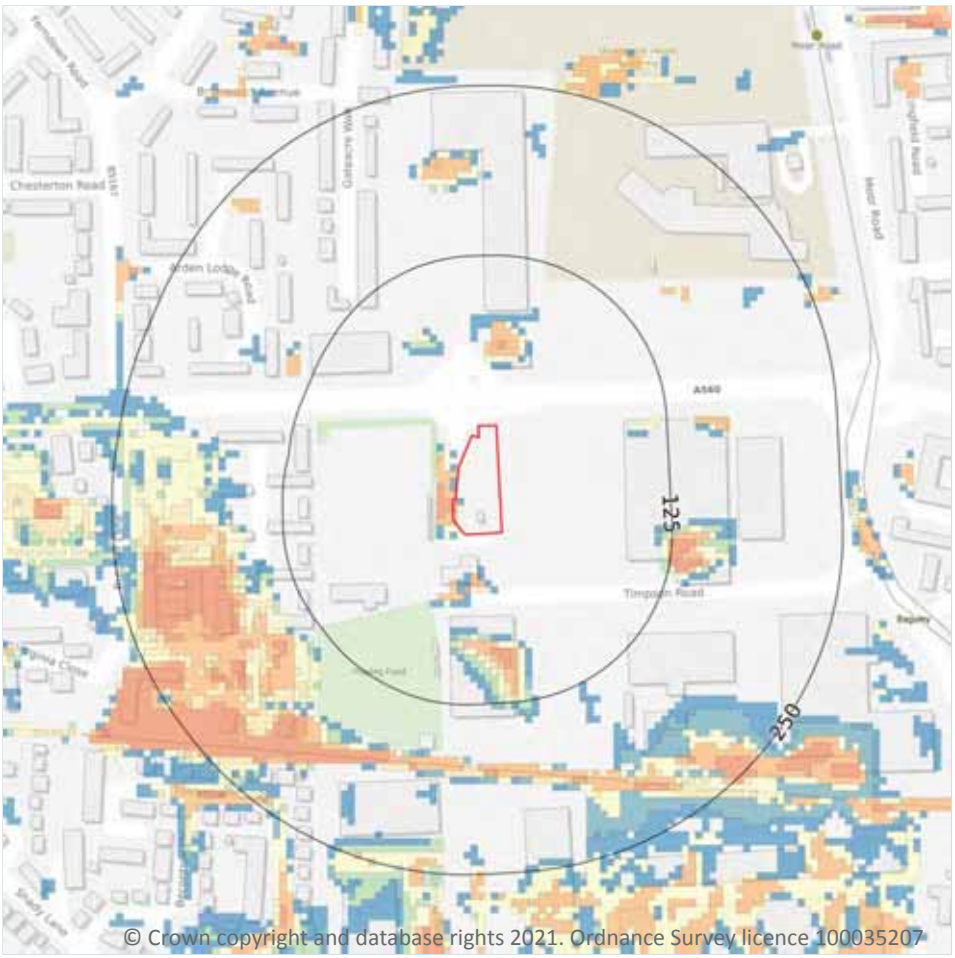
7.7 Flood Zone 3

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



Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

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

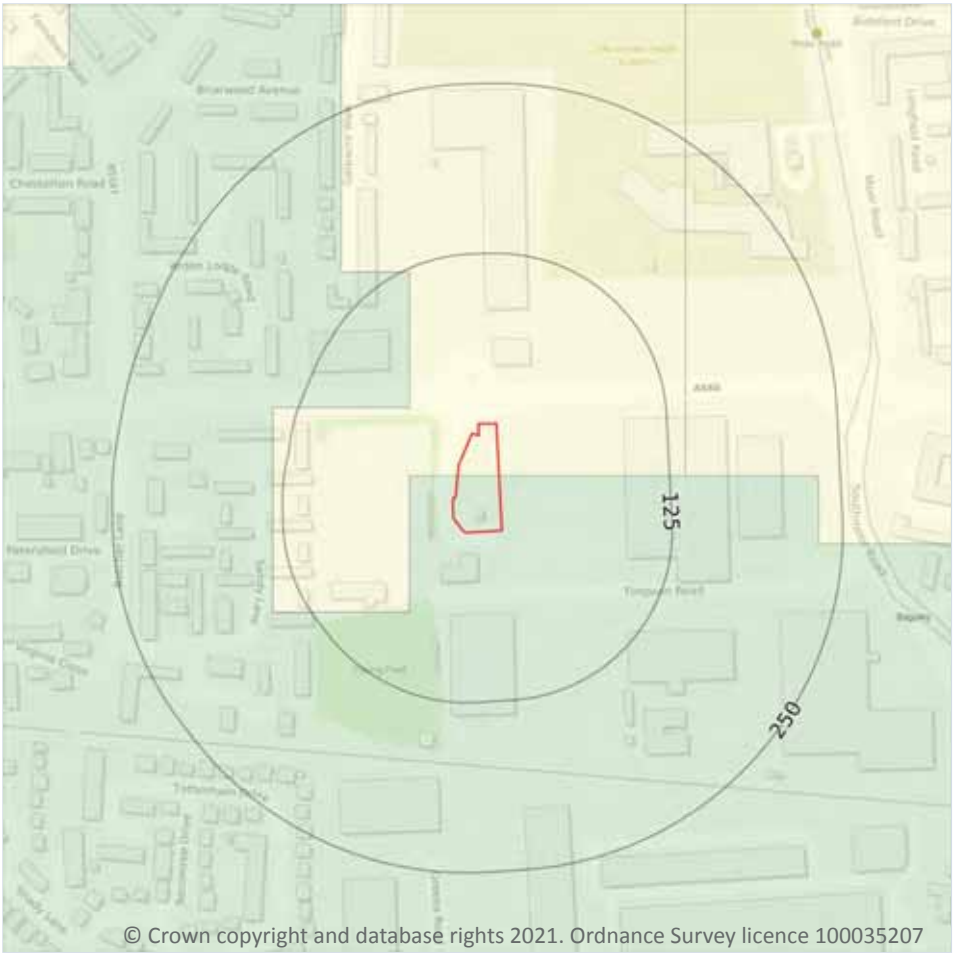
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.3m and 1.0m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



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Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

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

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 52**

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.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

Not recorded

Favourable

Unfavourable - Recovering

Unfavourable - No change

Unfavourable - Declining

Partially destroyed

Destroyed

10.17 SSSI Impact Risk Zones

Records on site	2

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.

Features are displayed on the SSSI Impact Zones and Units map on **page 58**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Oil & gas exploration/extraction. Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m². Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion**
2	On site	**Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Oil & gas exploration/extraction. Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t. Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion**

This data is sourced from Natural England.

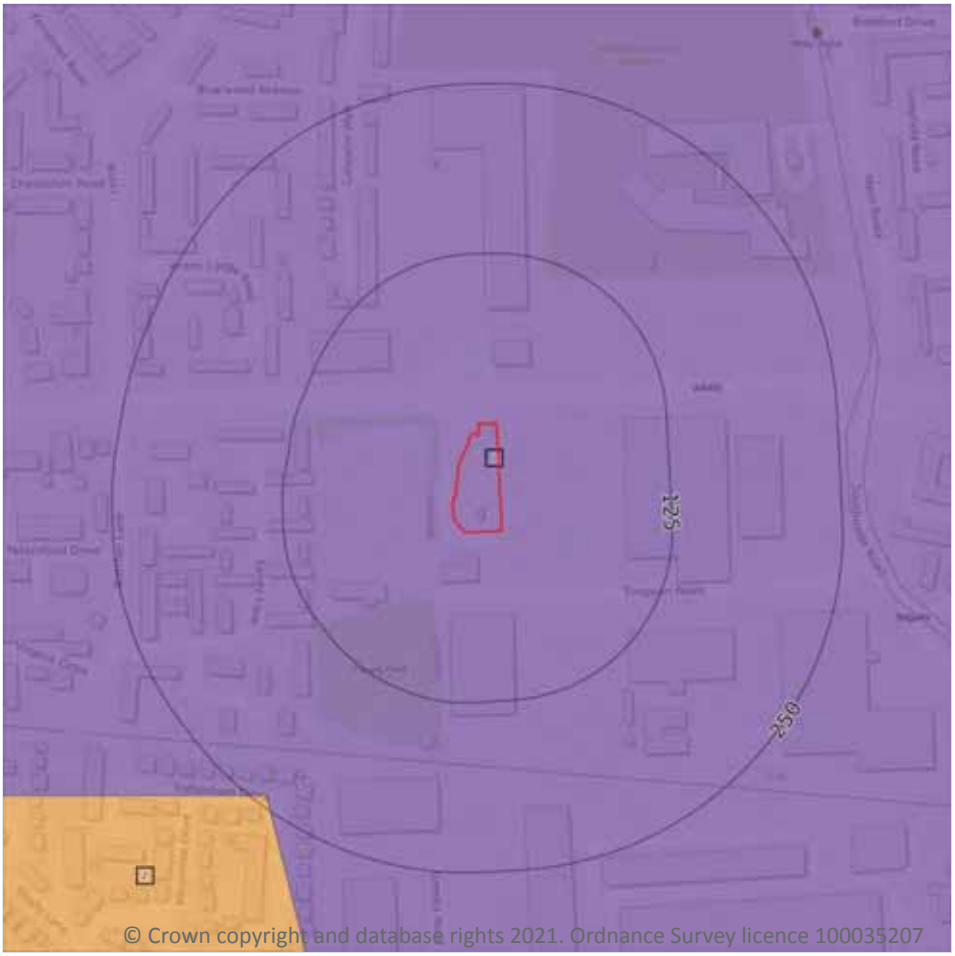
10.18 SSSI Units

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.

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	2

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 62**

ID	Location	Classification	Description
1	**On site**	**Urban**	**-**
2	242m SW	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

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.

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

13.1 Priority Habitat Inventory

Records within 250m	0

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

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.

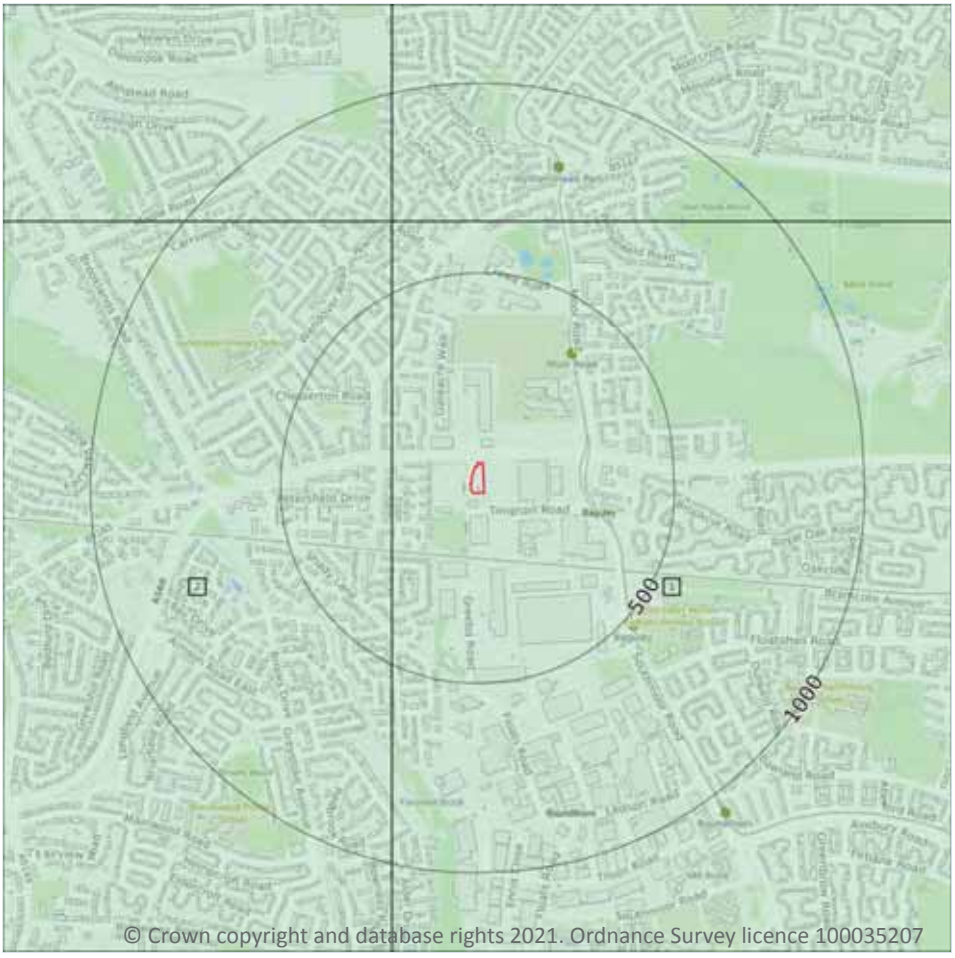
13.4 Limestone Pavement Orders

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

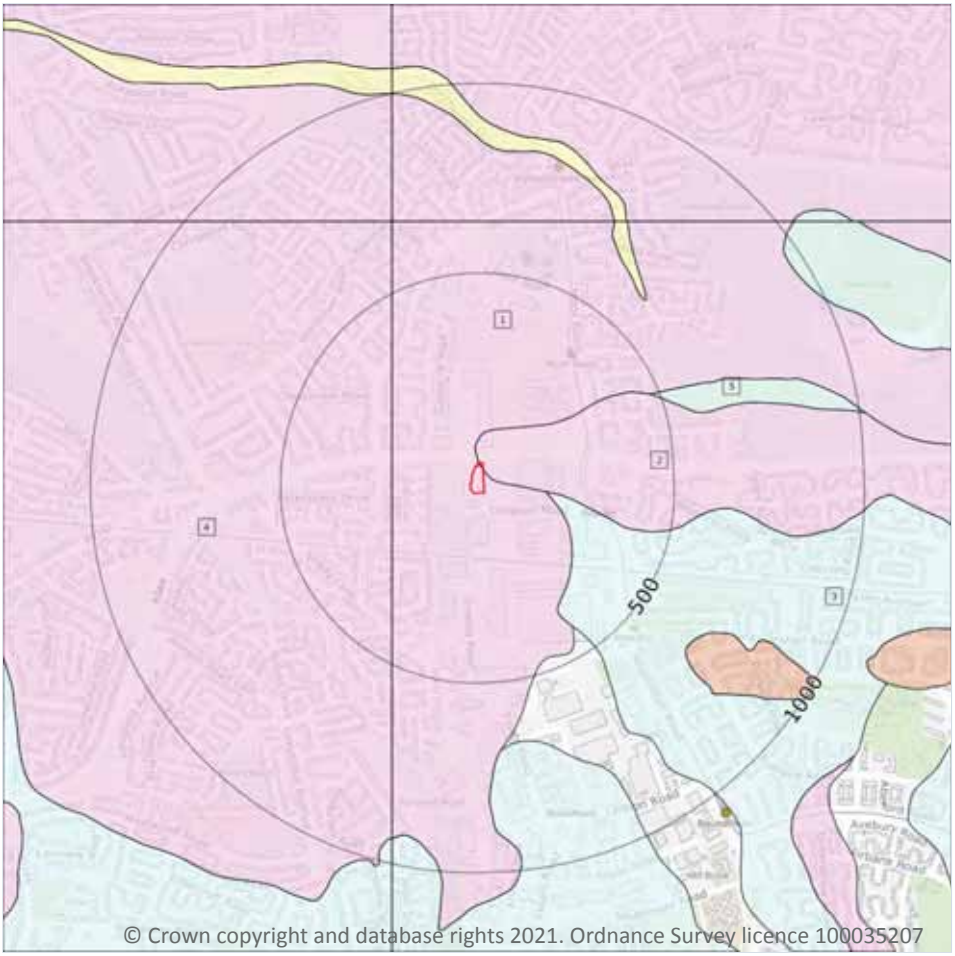
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 65**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**No coverage**	**Full**	**Full**	**No coverage**	**SJ88NW**
2	207m W	No coverage	Full	Full	No coverage	SJ78NE

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)

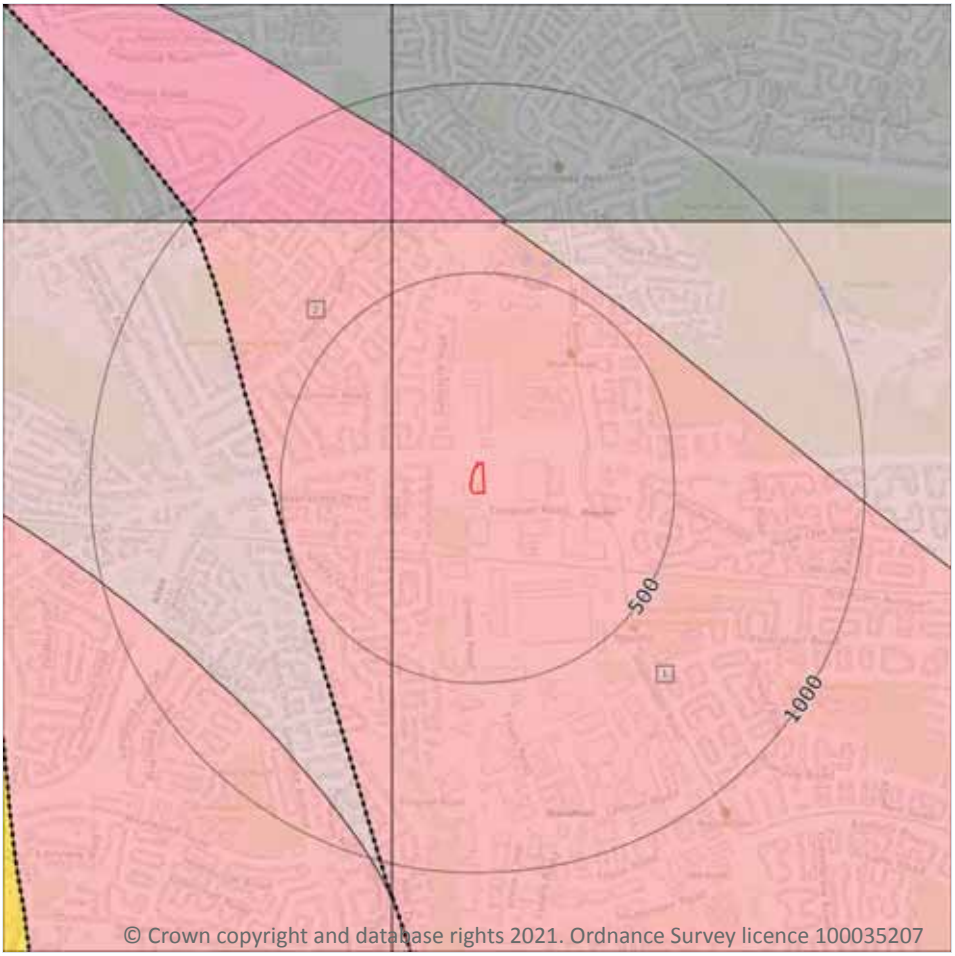
Records within 500m	5

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 67**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**GFSDD-XSV**	**Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel**	**Sand And Gravel**
2	**On site**	**GFDUD-XSV**	**Glaciofluvial Deposits, Devensian - Sand And Gravel**	**Sand And Gravel**
3	162m E	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
4	207m W	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel

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	2

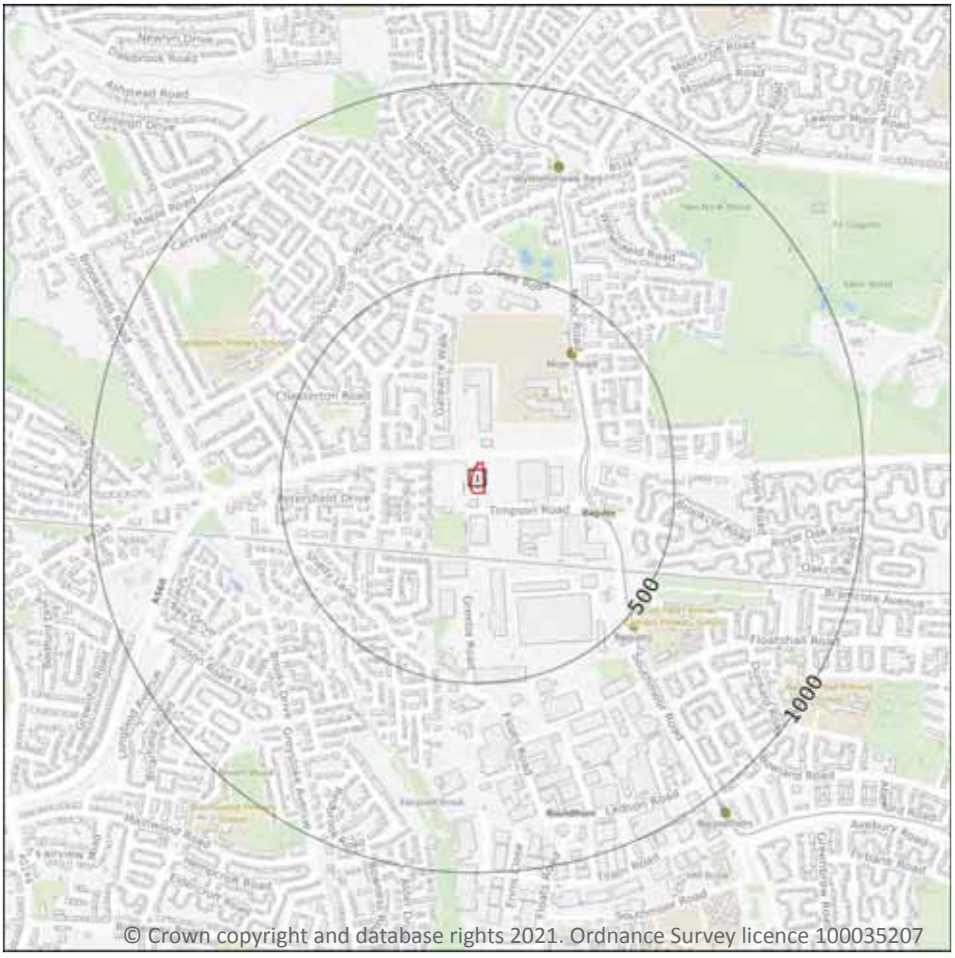
Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 69**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**BOM-MDST**	**Bollin Mudstone Member - Mudstone**	**Anisian Age**
2	207m W	BOM-MDST	Bollin Mudstone Member - Mudstone	Anisian Age

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

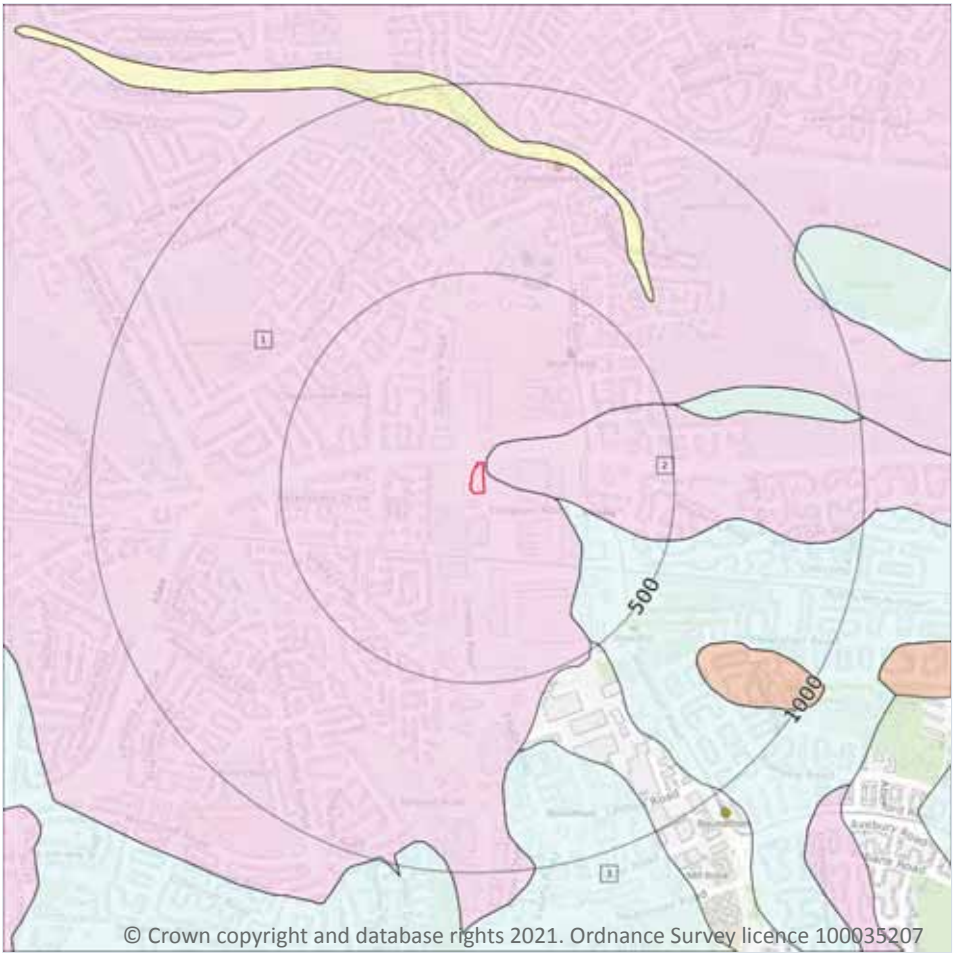
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 71**

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 - Superficial



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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	3

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 73**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**GFSDD-XSV**	**GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN**	**SAND AND GRAVEL**
2	9m E	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
3	185m E	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

This data is sourced from the British Geological Survey.

15.5 Superficial 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 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**
9m E	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.

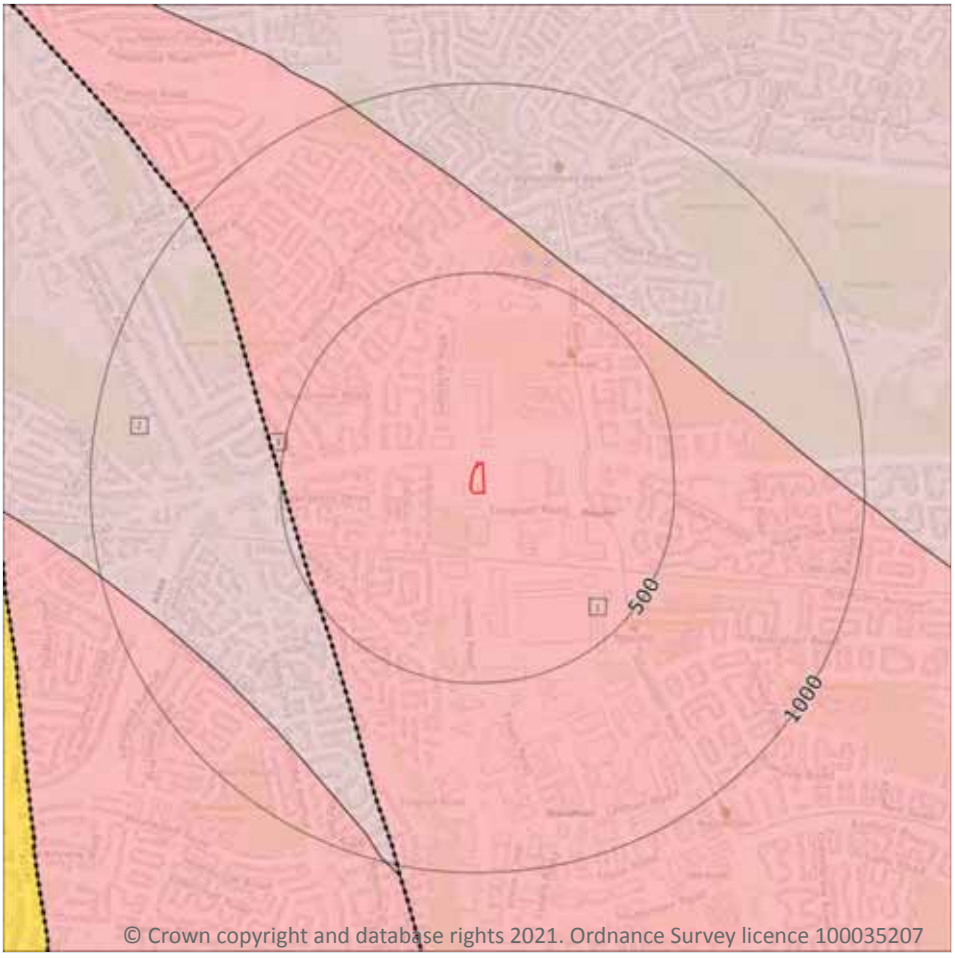
15.7 Landslip permeability (50k)

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



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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 75**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**BOM-MDST**	**BOLLIN MUDSTONE MEMBER - MUDSTONE**	**ANISIAN**
2	473m W	TPSF-SIMS	TARPORLEY SILTSTONE FORMATION - SILTSTONE, MUDSTONE AND SANDSTONE	OLENEKIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	1

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	**Fracture**	**Low**	**Low**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	1

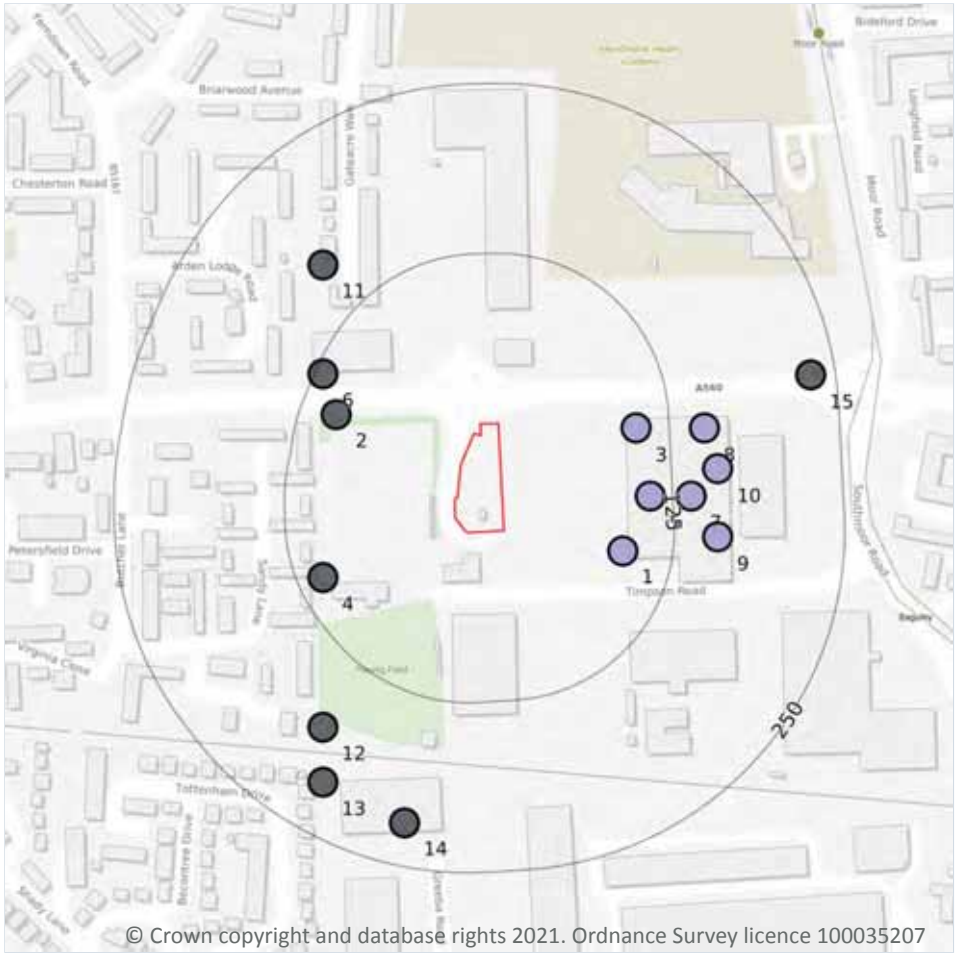
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 75**

ID	Location	Category	Description
3	473m W	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



16.1 BGS Boreholes

Records within 250m	15

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.

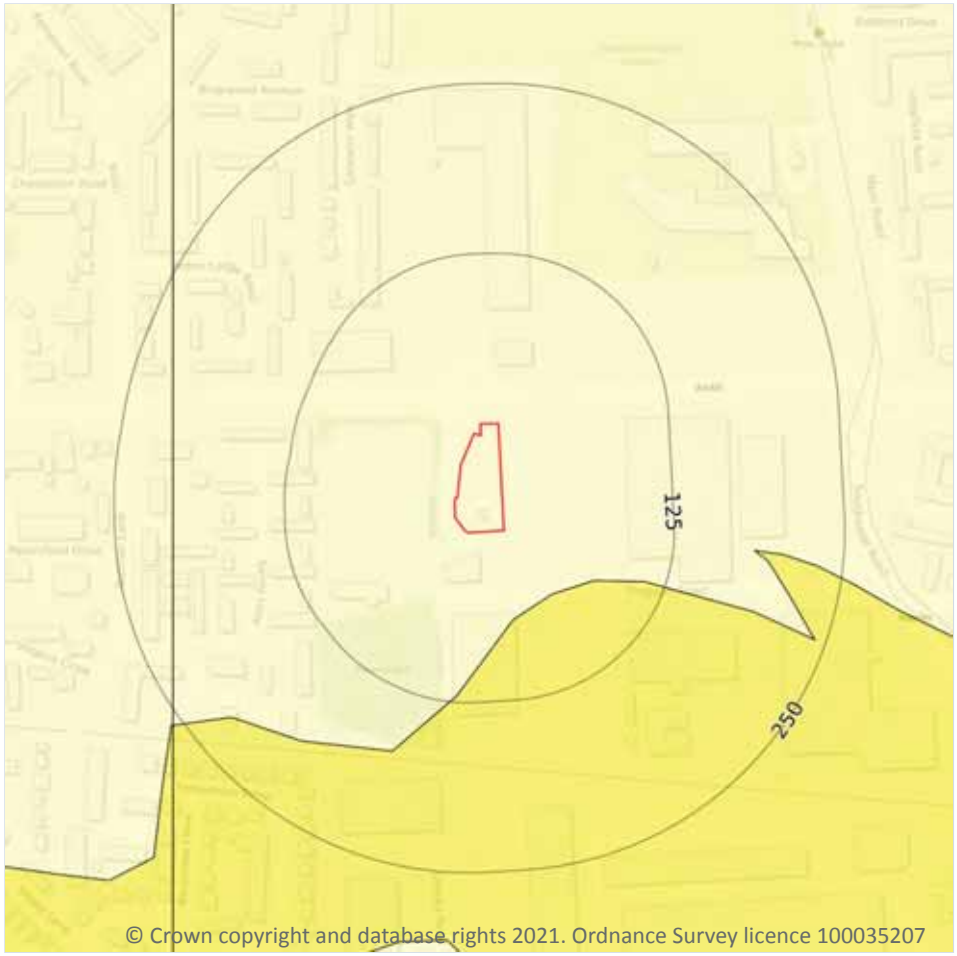
Features are displayed on the Boreholes map on **page 77**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	88m E	380330 389270	CHAM ROAD BAGULEY 7	6.0	N	15617820
2	99m W	380120 389370	WESTERN PARKWAY SW. SWR 29	-	Y	N/A
3	101m E	380340 389360	CHAM ROAD BAGULEY 1	5.0	N	15617814

ID	Location	Grid reference	Name	Length	Confidential	Web link
4	107m SW	380110 389250	WESTERN PARKWAY SW. SWR 30	-	Y	N/A
5	108m E	380350 389310	CHAM ROAD BAGULEY 6	5.1	N	15617819
6	119m NW	380110 389400	WESTERN PARKWAY SW. SWR 28A	-	Y	N/A
7	138m E	380380 389310	CHAM ROAD BAGULEY 4	5.0	N	15617817
8	151m E	380390 389360	CHAM ROAD BAGULEY 2	4.0	N	15617815
9	157m E	380400 389280	CHAM ROAD BAGULEY 5	4.2	N	15617818
10	159m E	380400 389330	CHAM ROAD BAGULEY 3	4.6	N	15617816
11	164m NW	380110 389480	WESTERN PARKWAY SW. SWR 28	-	Y	N/A
12	178m SW	380110 389140	WESTERN PARKWAY SW. SWR 31	-	Y	N/A
13	212m SW	380110 389100	WESTERN PARKWAY SW. SWR 32	-	Y	N/A
14	218m S	380170 389070	GREEBA ROAD WYTHENSHAWE 1	-	Y	N/A
15	232m E	380468 389399	Metrolink 3B - Nonaccelerated Airport BH4305	-	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	1

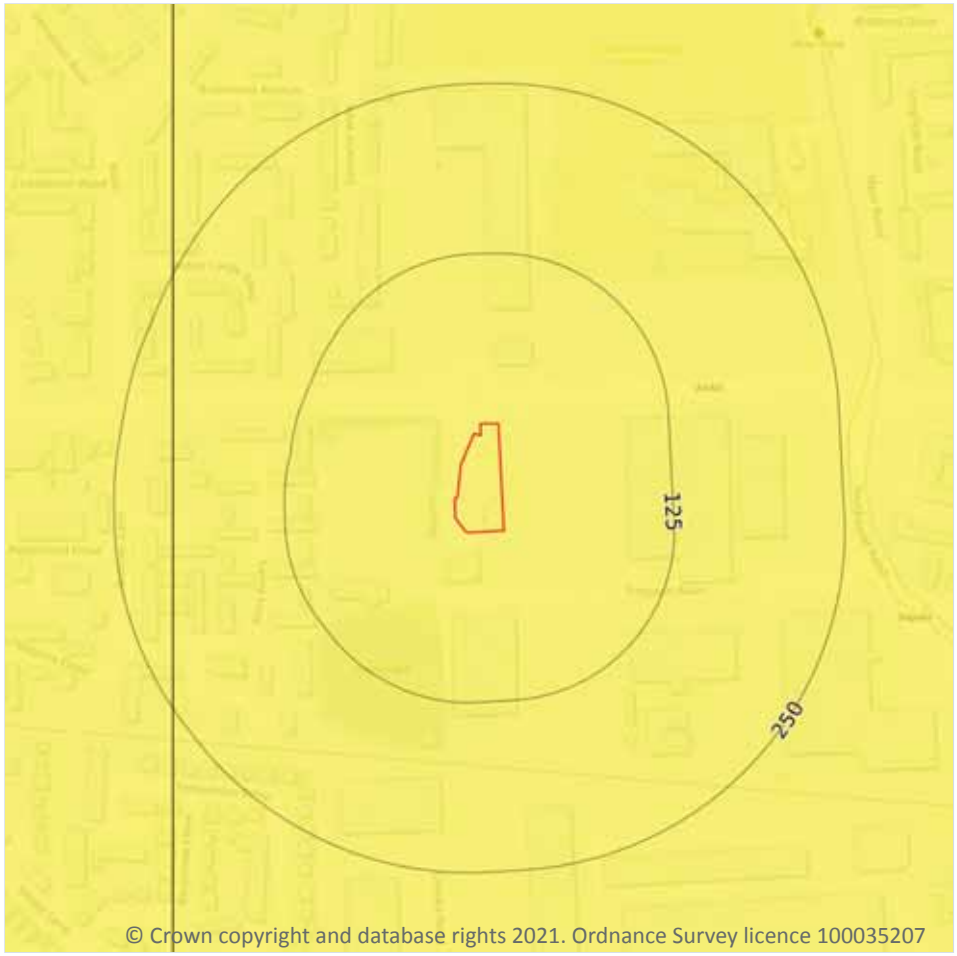
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 79**

Location	Hazard rating	Details
On site	**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	1

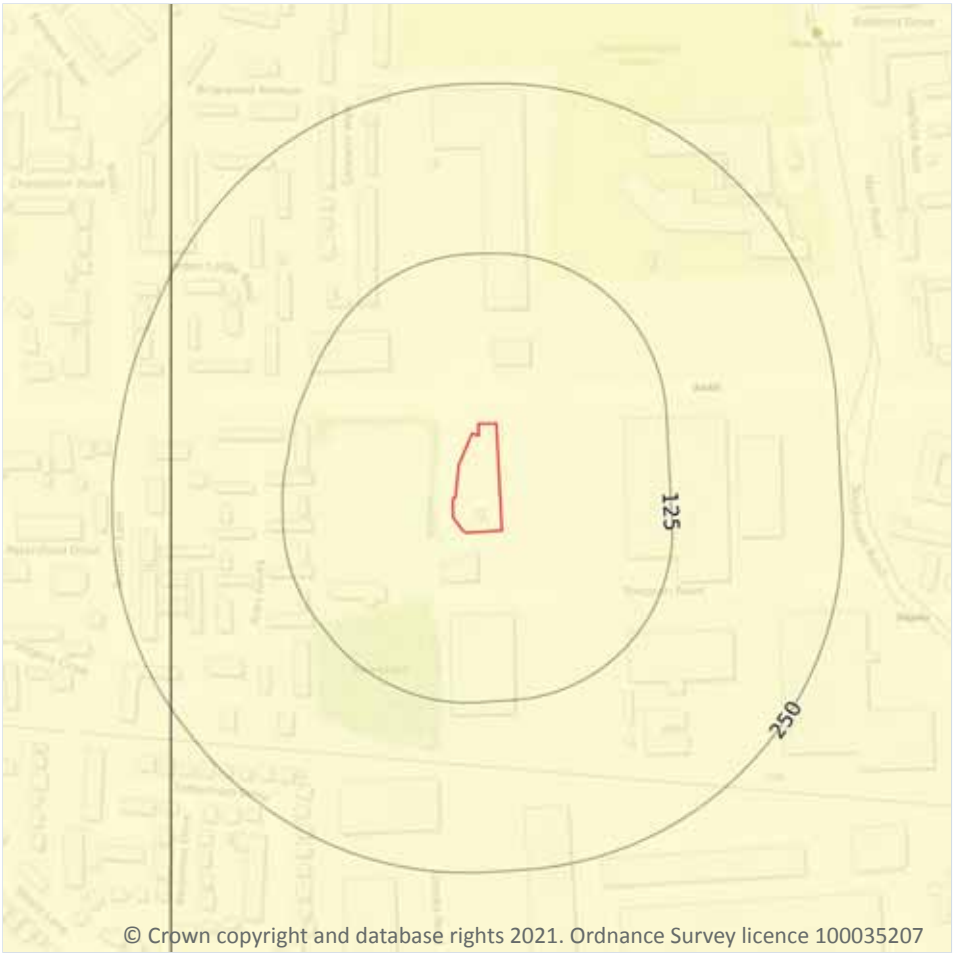
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 80**

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.**

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	1

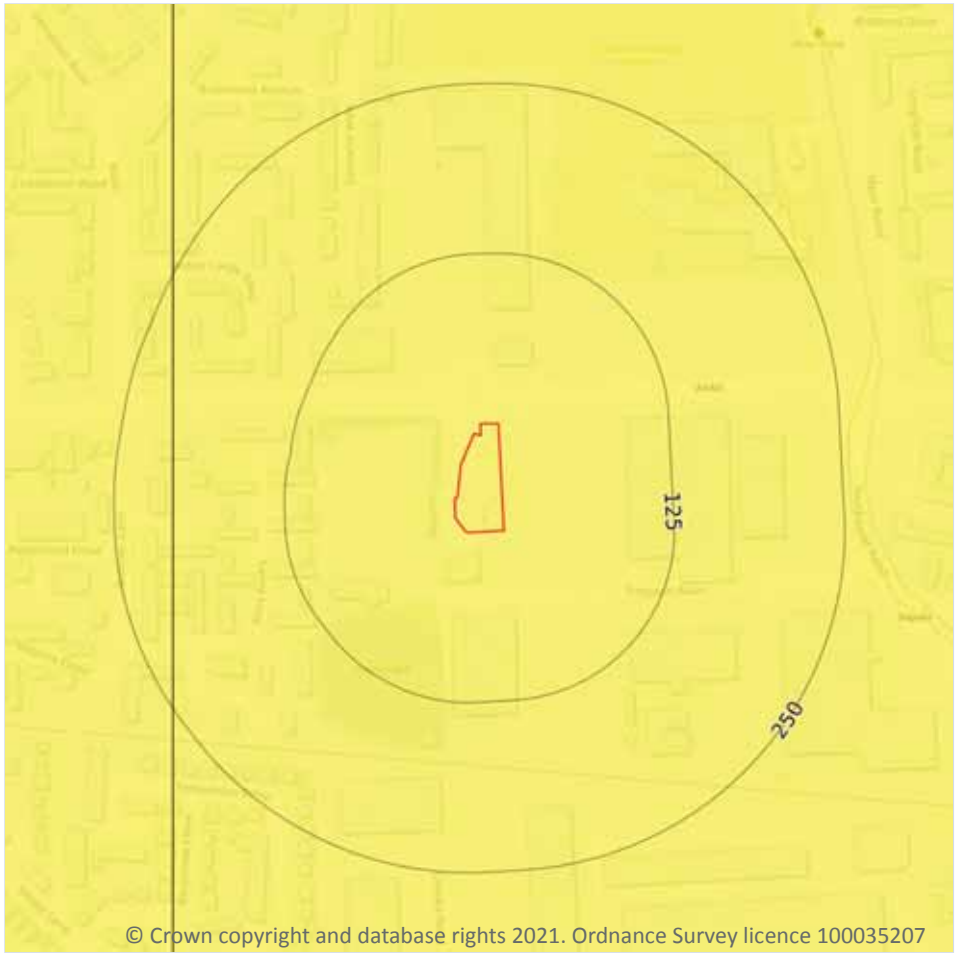
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 81**

Location	Hazard rating	Details
On site	**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	1

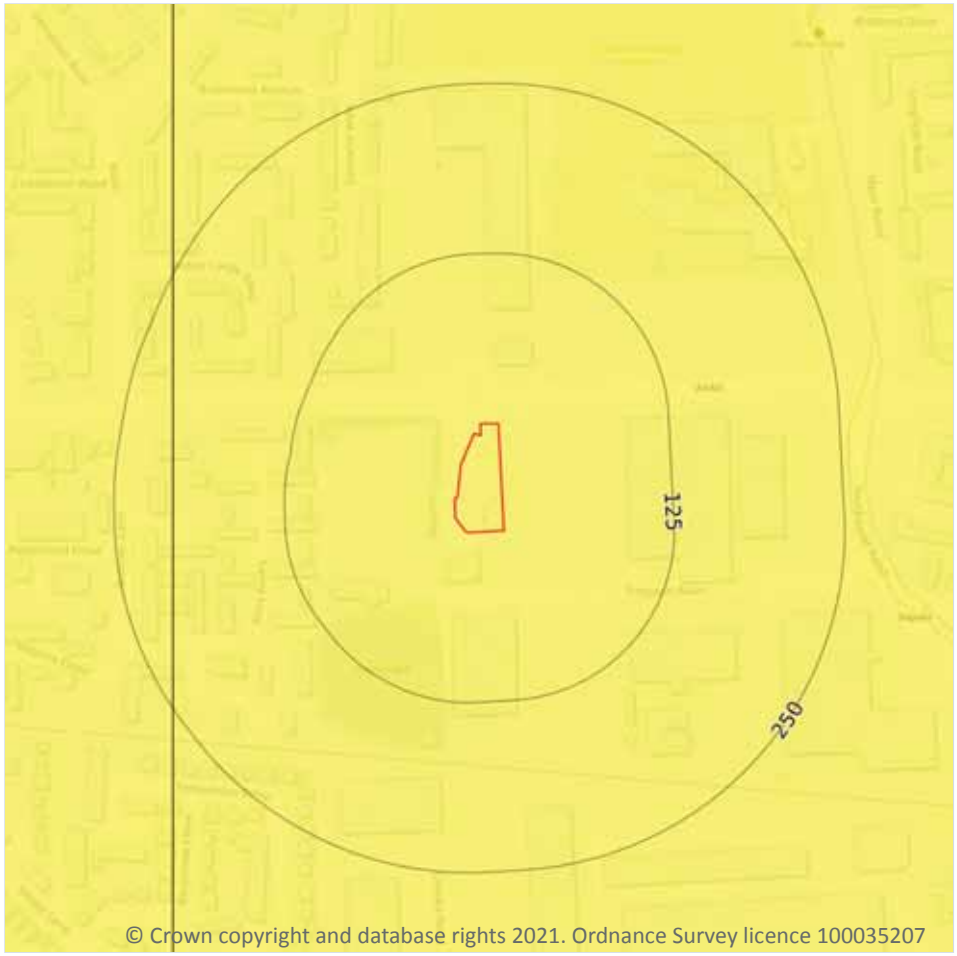
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 82**

Location	Hazard rating	Details
On site	**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	1

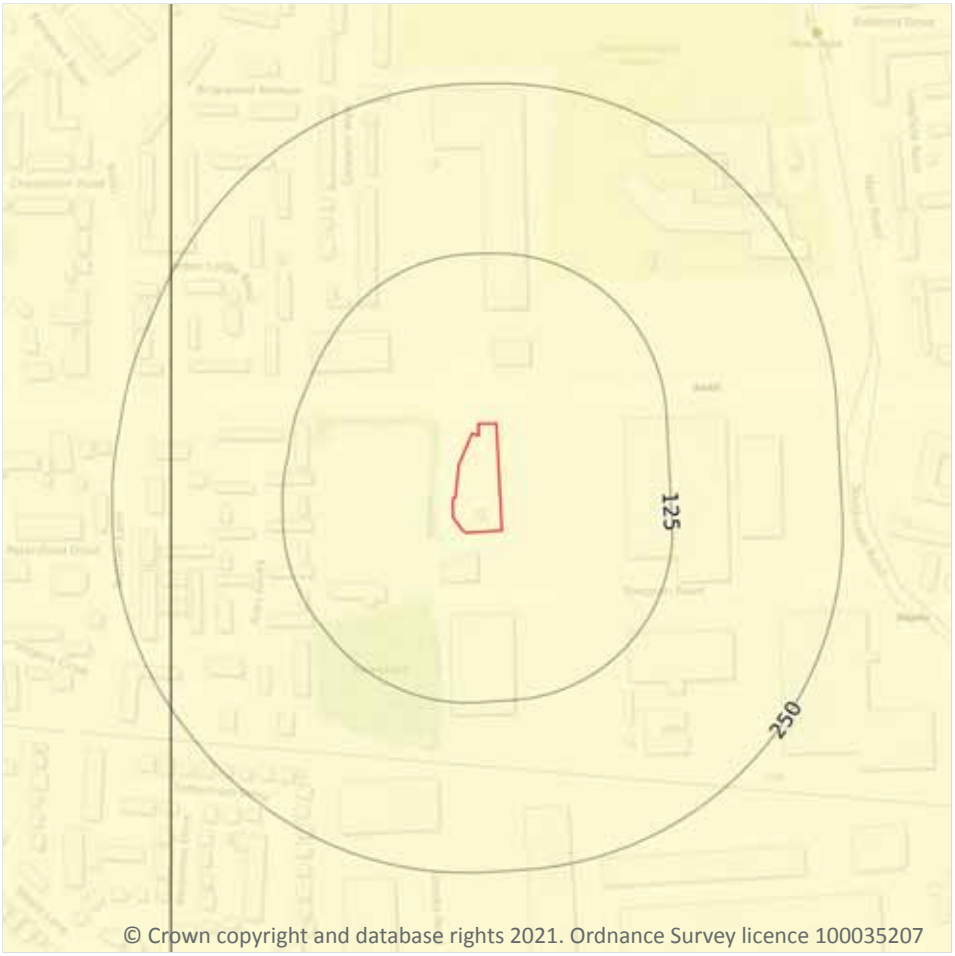
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 83**

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.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



Site Outline

Search buffers in metres (m)

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

17.6 Ground dissolution of soluble rocks

Records within 50m	1

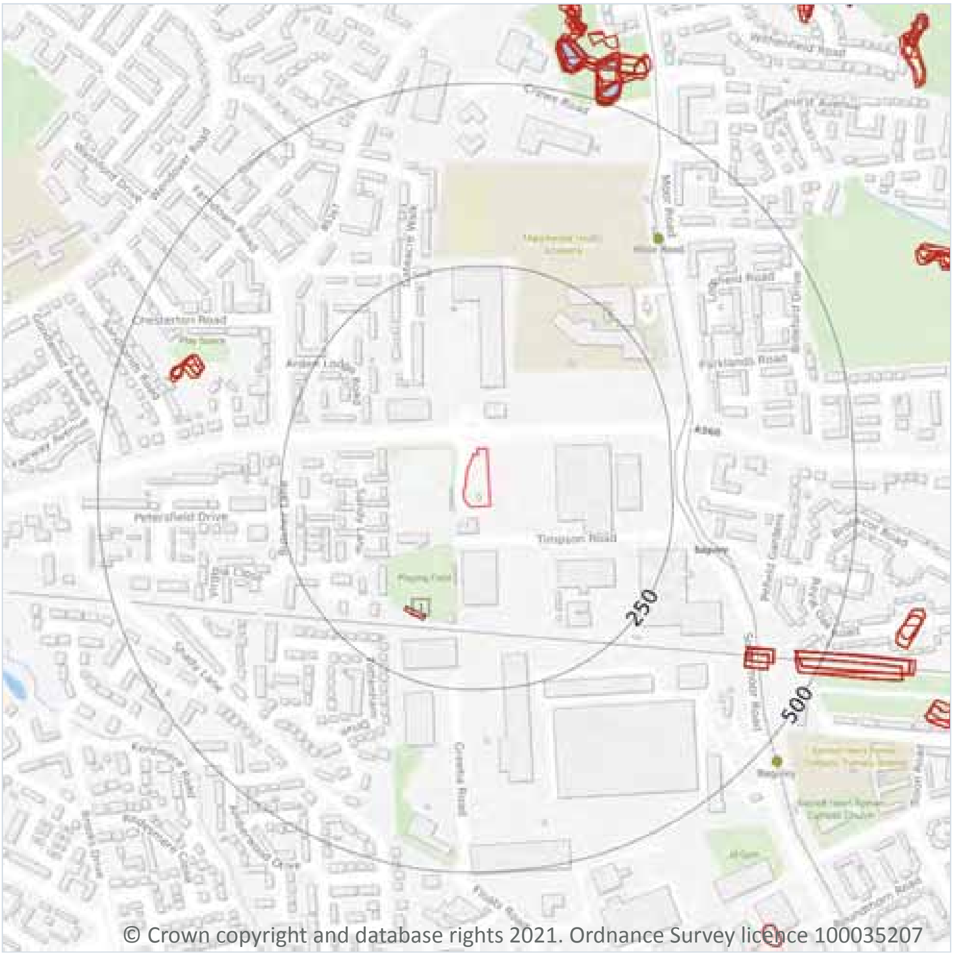
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 84**

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.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



- 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 Peter Brett Associates (PBA).

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	1

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 85**

ID	Location	Land Use	Year of mapping	Mapping scale
1	160m SW	Unspecified Ground Workings	1967	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.

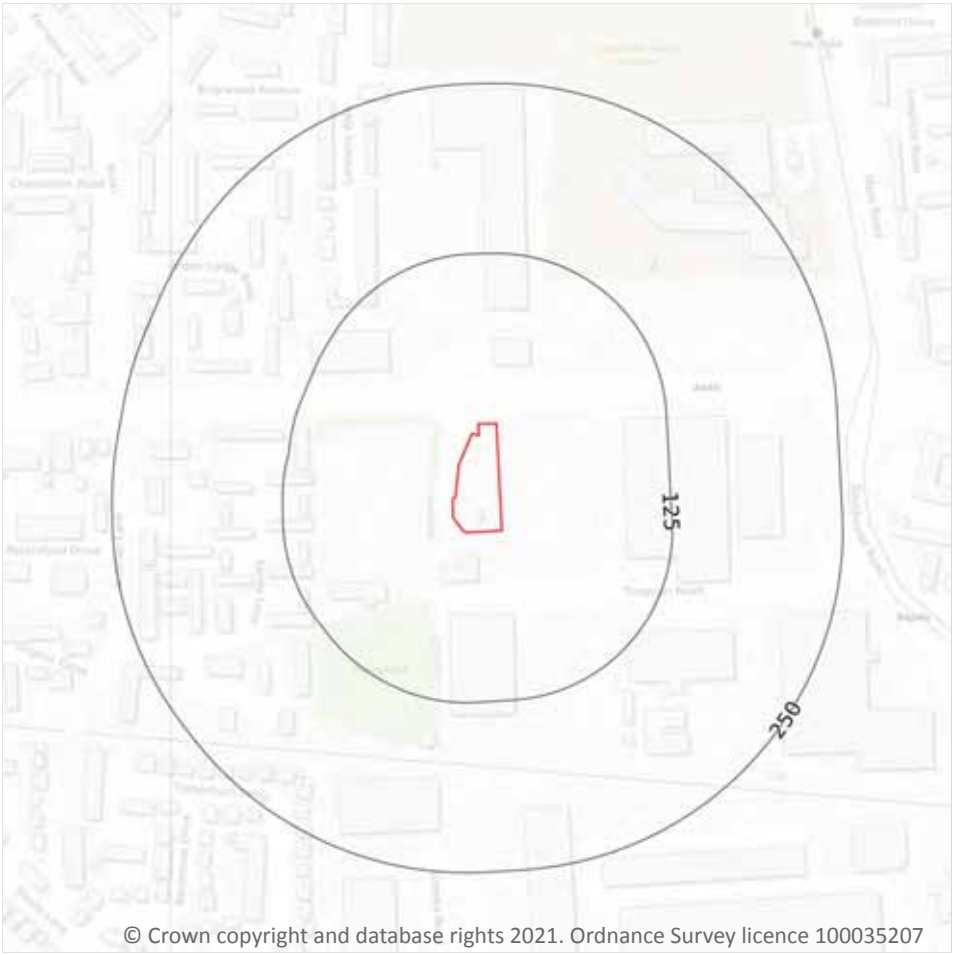
18.5 Historical Mineral Planning Areas

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.

19 Radon



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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 89**

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	2

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 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 mg/kg**
9m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 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.

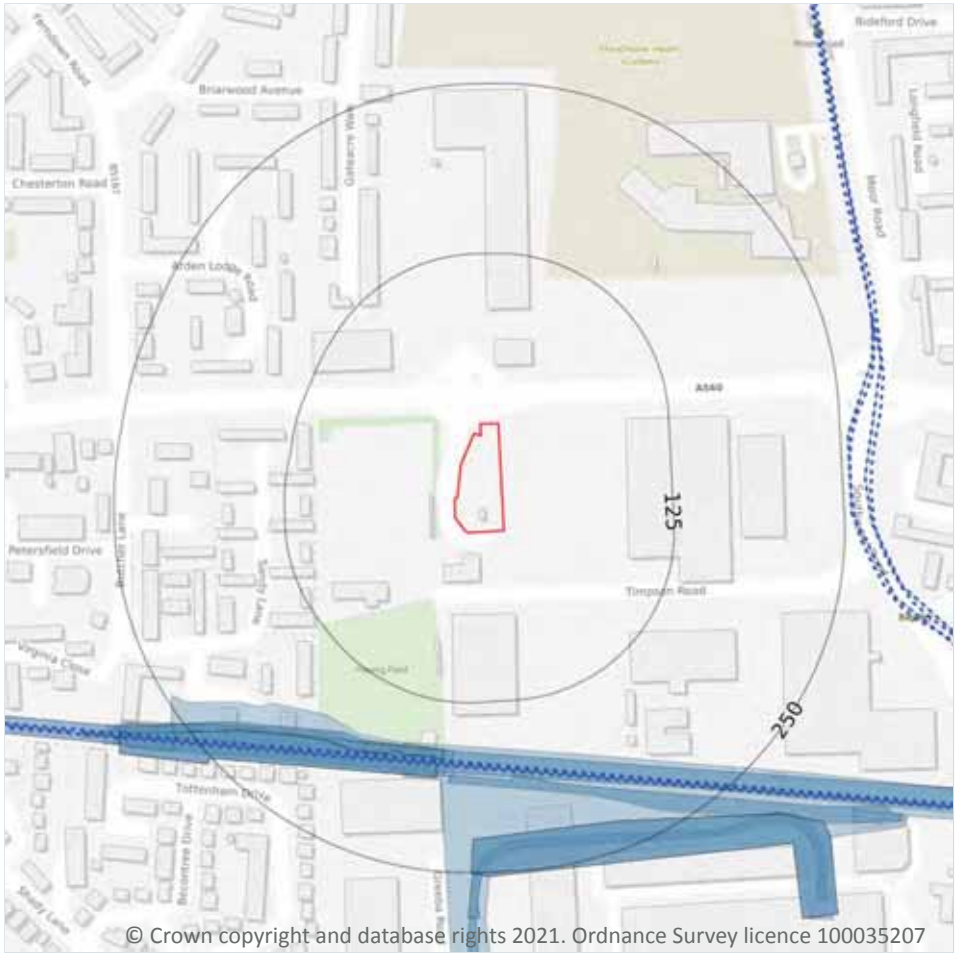
20.3 BGS Measured Urban Soil Chemistry

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	22

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 91**

Location	Land Use	Year of mapping	Mapping scale
157m S	Railway Sidings	1967	10560
160m S	Railway Sidings	1938	10560
161m S	Railway Sidings	1907	10560
161m S	Railway Sidings	1954	10560
161m S	Railway	1922	-
161m S	Railway	1935	-
163m S	Railway Sidings	1898	2500
163m S	Railway Sidings	1910	2500
166m S	Railway Sidings	1938	10560
166m S	Railway Sidings	1916	10560
166m S	Railway Sidings	1905	10560
166m S	Railway Sidings	1923	10560
171m S	Railway Sidings	1922	2500
171m S	Railway Sidings	1935	2500
179m S	Railway Sidings	1958	2500
179m S	Railway Sidings	1959	1250
222m S	Railway Sidings	1995	10000

Location	Land Use	Year of mapping	Mapping scale
222m S	Railway Sidings	1975	10000
222m S	Railway Sidings	1989	10000
227m S	Railway Sidings	1975	1250
227m S	Railway Sidings	1966	1250
228m S	Railway Sidings	1990	1250

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	3

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 91**

Location	Name	Type
168m S	-	rail
170m S	Not given	Multi Track
172m S	-	rail

This data is sourced from Ordnance Survey and OpenStreetMap.

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 15617820 BGS Reference: SJ88NW1158
British National Grid (27700): 380330, 389270

Norwest Holst Soil Engineering Ltd.

Borehole No. 7

BOREHOLE LOG

Contract No. F8108
Location. Altrincham Road, Baguley
Client. Curtins
Method of Boring. Percussion
Diameter of Borehole. 150mm

Sheet. 1 of 1
Chainage.
Ground Level. m.A.O.D.
Date. 28/9/88

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
REINFORCED CONCRETE		0.40					
MADE GROUND: Grey silty sand		1.20			1.00	22	
MADE GROUND: Brick rubble, sand and stones.		1.50					
		2.00			2.00	19	
Medium dense dark brown SAND							
Medium dense light brown medium SAND, becoming loose		3.80			3.00	6**	
Completely weathered brown clayey KEUPER MARL		4.30			4.20	49	
Weathered red/brown KEUPER MARL		6.00			5.10	50 for 75mm*	
					6.00	50 for 15mm*	

Type of Sample

Is S.P.T. ■ Undisturbed
Ic. C.P.T. × Vane
O Jar Δ Water
● Bulk ▮ Piezometer

Remarks (Observations of Ground Water etc.) * Seating blows only

Water struck at 3.00m, level rose after 20 mins to 4.00m
Sealed by casing at 4.00m
** possibly disturbed due to groundwater conditions

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

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Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL

APPENDIX III

APPENDIX III – GROUND INVESTIGATION

Introduction

This Appendix, together with Sections 2 to 5 of the report, forms the Ground Investigation Report for the development described in the report, in compliance with the requirements of BS 5930:2015+A1:2020, BS EN1997-1:2004(2007) and BS EN1997-2:2007(2007).

The site operations were carried out between 9th and 10th March 2021 under the supervision of a geotechnical/geoenvironmental engineer from Crossfield Consulting Limited. The scope and rationale for the design of the investigation is presented in Table III-1.

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

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

Windowless Sampling

Five windowless sampling boreholes, denoted as WS1 to WS5, were sunk by Regional Drilling Limited, on 10th March 2021 to between 1 m and 5 m depth. Dynamic/driven open-tube soil sampling/boring was undertaken using a Premier Compact rig. Using a 1.0 m long thick-walled open-tube sampler (with plastic liner), Category A and B samples were recovered (sample disturbance being influenced by the specific soils encountered). Where appropriate, small disturbed sub-samples were recovered from the materials recovered in the open-tube sampler.

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

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

Dynamic Cone Penetration Tests

Two dynamic cone penetration (DCP) tests were undertaken beneath the bituminous surfacing layer at WS4 to WS5. Details of the bituminous surfacing layer and the DCP test records are presented in this Appendix.

Lightweight Deflectometer Tests

Four lightweight deflectometer (LWD) tests were undertaken beneath the bituminous surfacing later at LWD1 to LWD4 on 9th March 2021. Details of the bituminous surfacing layer and the LWD test records are presented in this Appendix.

Soil Samples

All samples for analytical testing were collected in appropriate containers, stored in cool boxes (where appropriate) and sent to the testing laboratory overnight. The sample containers, storage and handling

procedures were all compatible with the relevant recommendations of the UKAS accredited testing laboratory for the specific testing proposed.

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

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

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

- Asbestos (Fibre & ACM Screen)
- Asbestos (Quantification)

Selected samples were submitted for Waste Classification and Acceptance Criteria Tests (WAC) to BS EN 12457-3:

Solid Tests

Arsenic (Total)	Copper (Total)	TPH bands (C_6-C_{10}/C_{10}-C_{25}/C_{25}-C_{40})
Cadmium (Total)	Nickel (Total)	BTEX *
Lead (Total)	Zinc (Total)	PCB # - Total (7 Congeners)
Chromium (Total)	Cyanide (total)	PAH - (WAC 17) Δ
Mercury (Total)	Total Organic Carbon (TOC)	Acid Neutralisation Capacity
Selenium (Total)	Loss on Ignition @ 450°C	pH

* BTEX: Benzene, Toluene, Ethylbenzene, Xylenes
# PCB: Polychlorinated biphenyl (congener Nos. 28, 52, 101, 118, 138, 153, 180)
Δ PAH: Polyaromatic Hydrocarbons (17No. compounds from WAC criteria)

Eluate Tests

Arsenic (dissolved)	Molybdenum (dissolved)	Chloride
Barium (dissolved)	Nickel (dissolved)	Fluoride
Cadmium (dissolved)	Lead (dissolved)	Sulphate as SO_4
Chromium (dissolved)	Antimony (dissolved)	Dissolved Solids
Copper (dissolved)	Selenium (dissolved)	Phenols - Total (monohydric)
Mercury (dissolved)	Zinc (dissolved)	Total Organic Carbon (TOC)

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

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

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

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

TABLE III-1

RATIONALE FOR THE DESIGN OF THE GROUND INVESTIGATION

The scope of the ground investigation was designed with reference to the published geology and ground conditions indicated in the desk study information.

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

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

Exploratory Hole and Technique	Rationale for Hole Location	Depth (m)	Sampling/In Situ Testing and Monitoring
WS1-WS5	Exploratory holes located to provide coverage of the site to assess ground conditions for potential foundation solutions and potential contamination of soils.	Up to 5.0 m	Representative samples of shallow soils recovered to assess for potential asbestos contamination and to aid waste classification. Samples of potential founding strata recovered for geotechnical testing. Standard Penetration Tests (SPTs) were carried out at regular intervals to provide data on the strength within fine grained strata.
WS4-WS5	Exploratory holes located in proposed access road to assess pavement construction and near-surface ground conditions for the movement of HGVs associated with the site.	1.0 m	DCP tests undertaken to determine CBR values in shallow soils.
LWD1-LWD4	Exploratory holes located in proposed access road to assess pavement construction and near-surface ground conditions for the movement of HGVs associated with the site.	0.15 m	LWD tests undertaken to aid pavement design in shallow soils.

Key

WS *X*	Windowless Sample Borehole	DCP	Dynamic Cone Penetration
LWD	Lightweight Deflectometer Test		

TABLE III-2

RATIONALE FOR THE ANALYTICAL TESTING SUITE

Exploratory Hole and Samples	Selection Criteria	Analytical Tests
WS1 0.3 m WS2 0.4 m WS3 0.3 m	Representative samples of Made Ground to assess waste classification and landfill acceptance	Solid Tests: Screening tests for metals and metalloids, cyanides, loss on ignition, ANC, pH and TOC. Petroleum Hydrocarbons, PCBs (7 congeners), BTEX (total), PAHs (WAC 17) WAC Leachate Suite: Two-stage Eluate test: (BS EN 12457-3) Dissolved As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn, Cl, F, SO4, Dissolved Solids, Phenols (monohydric), total organic carbon
WS1 0.3 m WS2 0.4 m WS3 0.3 m WS4 0.6 m WS5 0.5 m	Representative samples of Made Ground to assess contamination and aid with waste classification	Asbestos screen and ID

TABLE III-3

RATIONALE FOR THE GEOTECHNICAL TESTING SUITE

Exploratory Hole and Sample	Selection Criteria	Geotechnical Tests
WS1 0.8 m WS2 1.6m WS2 2.3 m WS3 1.1 m WS3 1.9 m	Representative samples of potential founding strata recovered to undertake testing to aid concrete design classification.	pH Water soluble sulphate

WINDOWLESS SAMPLE RECORDS

KEY

Sampling

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

In Situ Measurements

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

Notes:

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

BOREHOLE & DRILLHOLE RECORDS - LEGENDS KEY SHEET

Legend - Strata Encountered in Exploratory Hole

Soil	Rock		
	Sedimentary	Igneous	Metamorphic
Made Ground	Mudstone	Fine-grained	Fine-grained
Clay	Shale	Medium-grained	Medium-grained
Silt	Siltstone	Coarse-grained	Coarse-grained
Sand	Sandstone		
Gravel	Limestone		
Peat/Topsoil	Chalk		
Organic Sand	Coal		
Organic Clay	Conglomerate		

Legend - Backfill to Borehole and Standpipe Installations

Backfill	Installations
Soil arisings	Concrete Cover Over Standpipe
Bentonite	Plain Standpipe - Bentonite Surround
Cement-based Grout	Perforated Standpipe - Geotextile and Granular Filter Surround
Gravel	Perforated Standpipe End Geotextile and Granular Filter Surround

Notes:

1. A combination of the strata symbols are indicative of mixed soil types.

2. The response zone of a standpipe refers to the section of perforated pipe within a granular surround, where substances may freely enter the standpipe from the surrounding strata.

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Windowless Sample Record Sheet

Project:	Tesco Car Park, Altrincham Road, Baguley, Manchester	**Hole Ref.**	**WS1**
Date:	10/03/2021	**Sheet**	1 of 1
		Job No.	CCL03397
Contractor	Regional Drilling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m windowless sampling	**Ground Level.**	33.20 m OD
Boring Diameter	100 mm	**Co-ordinates**	
		Logged by:	DJ — Logged on site during drilling operations
		Checked by:	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Tarmac surfacing (MADE GROUND)	0.14			33.06
0.30	JGg				Brown sandy gravel. Gravel is medium and angular of rock and cement (MADE GROUND)	0.70			32.50
0.80	J				Dark grey SILT (GLACIOFLUVIAL DEPOSITS)	0.90			32.30
1.00-1.45	S	1.00	Dry	N=27	Medium dense black mottled orange fine SAND (GLACIOFLUVIAL DEPOSITS) …Light brown sand from 1.2 m				
2.00-2.45	S	1.00	Dry	N=11	…Loose to medium dense medium sand from 2.0 m				
3.00-3.45	S	1.00	3.00	N=11					
					…Grey from 3.8 m				
4.00-4.45	S	1.00	3.00	N=9	…Light brown from 4.0 m				
4.90	J			N=50	Very stiff consistency reddish brown CLAY with mudstone	4.90			28.30
5.00-5.45	S	1.00	3.00	105 mm	lithorelics (BOLLIN MUDSTONE MEMBER)	5.00			28.20

Core Recovery

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

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
	3.00		

Additional Tests

Test type	Test Depth	Test Value

Remarks

Ground level data from site plan presented as Figure 2

Notes

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

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Windowless Sample Record Sheet

Project:	Tesco Car Park, Altrincham Road, Baguley, Manchester	**Hole Ref.**	**WS2**
Date:	10/03/2021	**Sheet**	1 of 1
		Job No.	CCL03397
Contractor	Regional Drilling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 5.0 m windowless sampling	**Ground Level.**	33.20 m OD
Boring Diameter	100 mm	**Co-ordinates**	
		Logged by:	DJ — Logged on site during drilling operations
		Checked by:	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Tarmac surfacing (MADE GROUND)	0.14			33.06
0.40	JGg				Light grey sandy gravel. Gravel is fine to medium and angular of brick fragments, clinker, porcelain and cement (MADE GROUND)	0.70			32.50
0.90	J				Medium dense orangish brown fine SAND (GLACIOFLUVIAL DEPOSITS)				
1.00-1.45	S	1.00	Dry	N=16	…Light brown medium sand from 1.0 m				
1.60	J								
2.00-2.45	S	1.00	Dry	N=13					
2.30	J								
3.00-3.45	S	1.00	Dry	N=5	…Loose sand from 3.0 m				
3.90	J				…Grey colour from 3.8 m				
4.00-4.45	S	1.00	3.30	N=8					
5.00-5.45	S	1.00	3.30	N=19	Stiff consistency reddish brown CLAY with rare medium gravel of limestone (BOLLIN MUDSTONE MEMBER)	4.90 5.00			28.30 28.20

Core Recovery

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

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations
	3.30	1.90	

Additional Tests

Test type	Test Depth	Test Value

Remarks

Ground level data from site plan presented as Figure 2

Notes

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

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GEOTECHNICAL ENVIRONMENTAL

Windowless Sample Record Sheet

Project:	Tesco Car Park, Altrincham Road, Baguley, Manchester	**Hole Ref.**	**WS3**
Date:	10/03/2021	**Sheet**	1 of 1
		Job No.	CCL03397
Contractor	Regional Drilling Ltd	**Equipment**	Premier Compact 110
Method	0.0 m to 3.0 m windowless sampling	**Ground Level.**	33.20 m OD
Boring Diameter	100 mm	**Co-ordinates**	
		Logged by:	DJ — Logged on site during drilling operations
		Checked by:	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Tarmac surfacing	0.10			33.10
0.30	JGg				Grey sandy gravel. Gravel is fine to medium and angular of cement and porcelain fragments (MADE GROUND)				
						0.90			32.30
1.00-1.45	S	1.00	Dry	N=19	Medium dense yellowish brown fine SAND. (GLACIOFLUVIAL DEPOSITS)				
1.10	J				…Medium sand from 1.2 m				
1.90	J								
2.00-2.45	S	1.00	Dry	N=12	…Dark brown sand from 2.0 m				
3.00-3.45	S	1.00	2.00	N=9		3.00			30.20
					Base of hole				

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

Remarks

Ground level data from site plan presented as Figure 2

Notes

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

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Windowless Sample Record Sheet

Project:	Tesco Car Park, Altrincham Road, Baguley, Manchester	**Hole Ref.**	**WS4**
Date:	10/03/2021	**Sheet**	1 of 1
		Job No.	CCL03397
Contractor	Regional Drilling Ltd	**Equipment**	Premier Compact 110
Ground Level.	33.30 m OD		
Method	0.0 m to 1.0 m windowless sampling	**Co-ordinates**	
Boring Diameter	100 mm	**Logged by:**	DJ — Logged on site during drilling operations
		Checked by:	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Tarmac surfacing	0.11			33.19
					Grey sandy gravel. Gravel is fine and angular of cement fragments (MADE GROUND)	0.50			32.80
0.60	J				Brown gravelly fine sand. Gravel is fine to medium and subangular of brick fragments (MADE GROUND)	0.90			32.40
					Fine light brown SAND (GLACIOFLUVIAL DEPOSITS)	1.00			32.30
					Base of hole				

Core Recovery

Depth	Recovery
0.00-1.00	100%

Groundwater

Hole Depth	Strike Depth	Water Depth	Observations

Additional Tests

Test type	Test Depth	Test Value

Remarks

Ground level data from site plan presented as Figure 2

Notes

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

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Windowless Sample Record Sheet

Project:	Tesco Car Park, Altrincham Road, Baguley, Manchester	**Hole Ref.**	**WS5**
Date:	10/03/2021	**Sheet**	1 of 1
		Job No.	CCL03397
Contractor	Regional Drilling Ltd	**Ground Level.**	33.20 m OD
Equipment	Premier Compact 110	**Co-ordinates**	
Method	0.0 m to 1.0 m windowless sampling	**Logged by:**	DJ
Boring Diameter	100 mm	**Checked by:**	

Logged on site during drilling operations

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Tarmac surfacing	0.14			33.06
					Light brown sandy gravel. Gravel is fine to medium and angular of cement fragments (MADE GROUND)	0.30			32.90
0.50	J				Black gravelly sand. Gravel is fine and angular of brick fragments and roots (MADE GROUND)	0.70			32.50
					Reddish brown SAND (GLACIOFLUVIAL DEPOSITS)	1.00			32.20
					Base of hole				

Core Recovery		Groundwater				Additional Tests		
Depth	Recovery	Hole Depth	Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value
0.00-1.00	100%							

Remarks

Ground level data from site plan presented as Figure 2

Notes

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



Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	DART300
Test Date:	16/09/2020
Report Date:	16/09/2020
File Name:	DART300.spt
Test Operator:	AP

Instrumented Rod Data

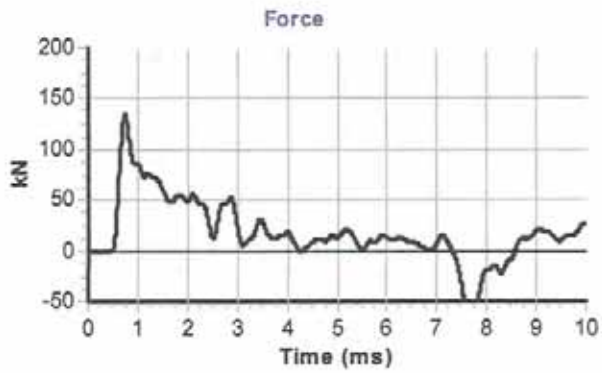
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	62902

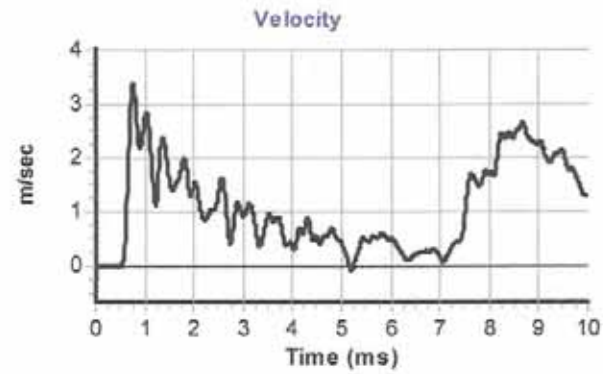
Hammer Information

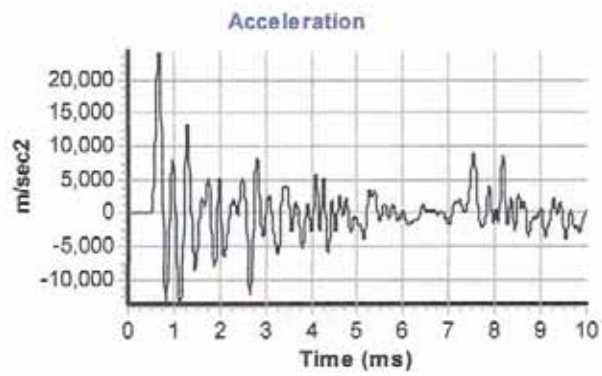
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

Comments / Location

Regional drilling hammer tested at Dynamic samplings yard.









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	297

Energy Ratio E_r (%): **63**

Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

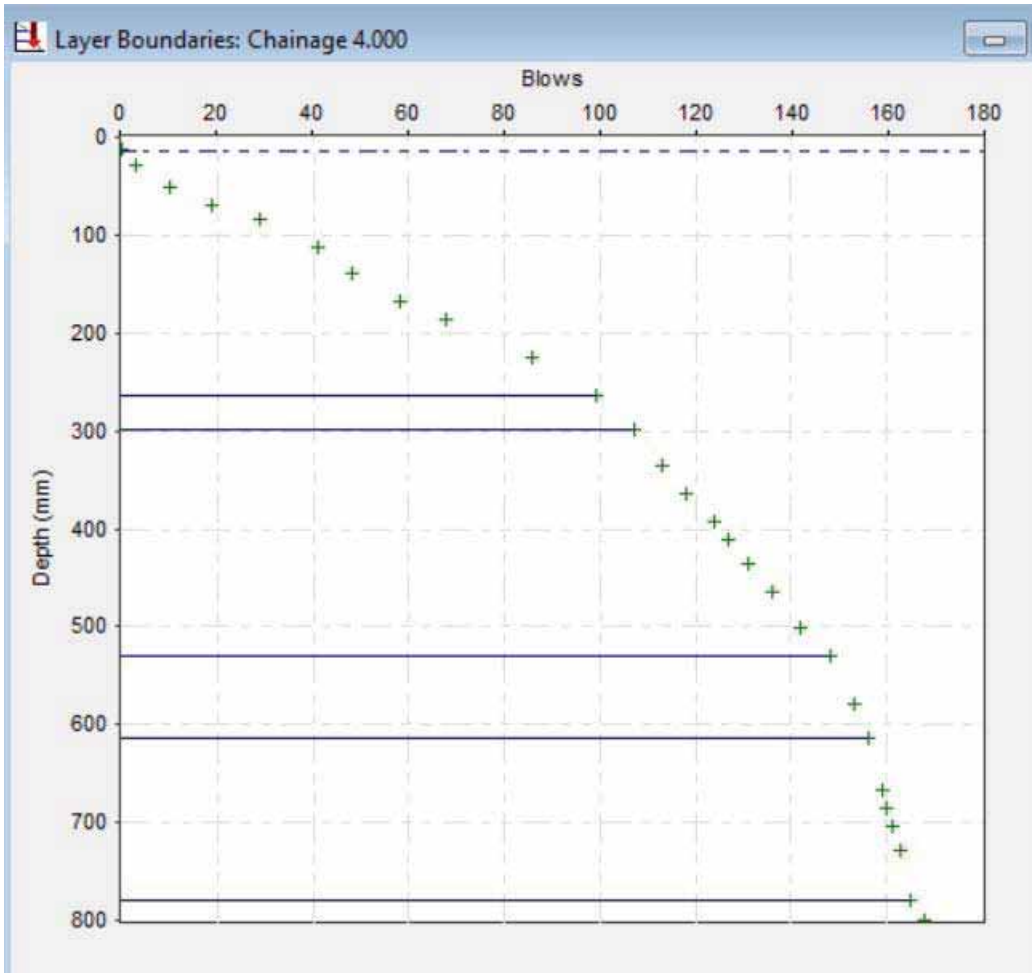
SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

Project: Altrincham Road, Baguley	Date: 10/03/2021
Location: WS4	Soil Type: Made Ground

NO. of Blows (1)	Accumulative penetration (2)	Penetration per blow set (3)	Penetration per blow (4)	Hammer Blow factor (5)	CBR % (7)	DCP Index (6)
0	0	-	-	-	-	-
3	16	16	5.30	1	52	5.30
7	39	23	3.29	1	86	3.29
9	56	17	1.89	1	154	1.89
10	71	15	1.50	1	197	1.50
12	99	28	2.33	1	124	2.33
7	126	27	3.86	1	72	3.86
10	155	29	2.90	1	98	2.90
10	173	18	1.80	1	162	1.80
18	212	39	2.17	1	133	2.17
13	251	39	3.00	1	95	3.00
8	286	35	4.38	1	63	4.38
6	322	36	6.00	1	45	6.00
5	351	29	5.80	1	47	5.80
6	380	29	4.83	1	57	4.83
3	398	18	6.00	1	45	6.00
4	422	24	6.00	1	45	6.00
5	451	29	2.80	1	102	2.80
6	489	38	6.33	1	43	6.33
6	516	27	4.50	1	62	4.50
5	567	51	10.2	1	26	10.2
3	601	34	11.3	1	23	11.3
3	654	53	17.7	1	14	17.7
1	672	18	18.0	1	14	18.0
1	691	19	19.0	1	13	19.0
2	716	25	12.5	1	21	12.5
2	766	50	25.0	1	10	25.0
3	801	35	11.7	1	22	11.7

1. Number of blows between readings
2. Accumulative cone penetration after each set of hammer blows
3. Difference in accumulative penetration (2) at start and end of hammer blow set
4. (3) divided by (1)
5. Enter 1 for 8 kg hammer. Enter 2 for 4.6 kg hammer
6. (4) X (6)
7. From CBR VS DCP correlation

CBR Values DCP WS4



Upper layers

No.	Position	Type	Thickness (mm)	Depth (mm)	Strength coefficient
1	Surface	Thin bituminous seal	14	14	0.20

Test layers

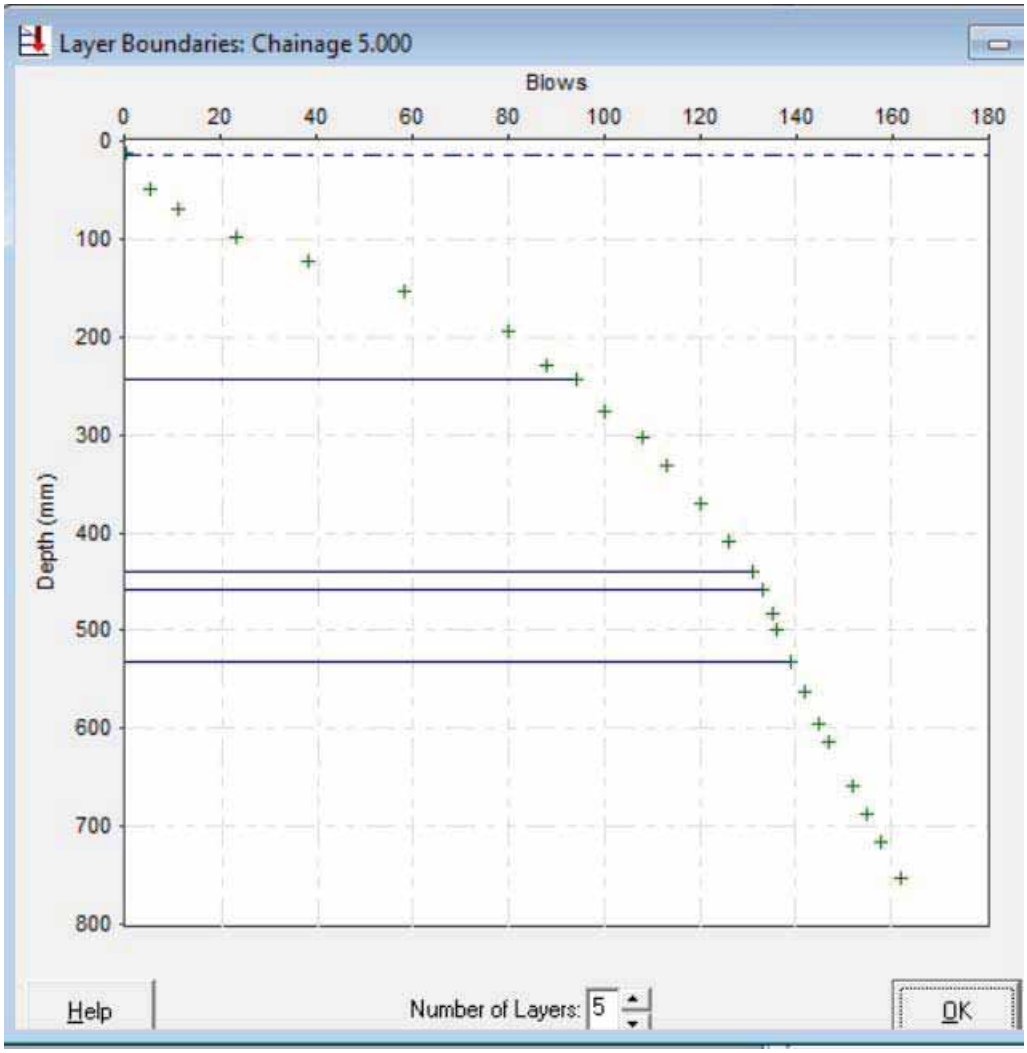
No.	CBR (%)	Thickness (mm)	Depth (mm)	Position	Strength coeff.
1	117	250	264	Base	
2	63	35	299		
3	49	230	529		
4	25	85	614		
5	14	165	779		
6	39	21	800		

Project: Altrincham Road, Baguley	Date: 10/03/2021
Location: WS5	Soil Type: Made Ground

NO. of Blows (1)	Accumulative penetration (2)	Penetration per blow set (3)	Penetration per blow (4)	Hammer Blow factor (5)	CBR % (7)	DCP Index (6)
0	0	-	-	-	-	-
5	37	37	7.40	1	36	7.40
6	56	19	3.16	1	90	3.16
12	85	29	2.42	1	119	2.42
15	110	25	1.67	1	176	1.67
20	140	30	1.50	1	197	1.50
22	182	42	1.91	1	152	1.91
8	206	24	3.00	1	95	3.00
6	234	28	4.67	1	59	4.67
6	263	29	4.83	1	57	4.83
8	289	26	3.25	1	87	3.25
5	318	29	5.80	1	47	5.80
7	358	40	5.71	1	48	5.71
6	396	38	6.33	1	43	6.33
5	426	30	6.00	1	45	6.00
2	445	19	9.50	1	28	9.50
2	469	24	12.0	1	22	12.0
1	486	17	17.0	1	15	17.0
3	519	33	11.0	1	24	11.0
3	550	31	10.3	1	26	10.3
3	582	32	10.7	1	25	10.7
2	600	18	9.00	1	30	9.00
5	645	45	9.00	1	30	9.00
3	674	29	9.67	1	27	9.67
3	703	29	9.67	1	27	9.67
4	739	36	9.00	1	30	9.00

1. Number of blows between readings
2. Accumulative cone penetration after each set of hammer blows
3. Difference in accumulative penetration (2) at start and end of hammer blow set
4. (3) divided by (1)
5. Enter 1 for 8 kg hammer. Enter 2 for 4.6 kg hammer
6. (4) X (6)
7. From CBR VS DCP correlation

CBR Values DCP WS5



Upper layers

No.	Position	Type	Thickness (mm)	Depth (mm)	Strength coefficient
1	Surface	Thin bituminous seal	14	14	0.20

Test layers

No.	CBR (%)	Thickness (mm)	Depth (mm)	Position	Strength coeff.
1	123	229	243	Base	
2	52	196	439		
3	28	19	458		
4	21	74	532		
5	28	220	752		

LABORATORY TEST CERTIFICATE
MATERIALS LABORATORY

Certificate No: 5085/21 Rev 1

To : Daniel Joel

Client : Crossfield Consulting
The Granary, White Hall Farm
Long Itchington
Warwickshire, CV47 9PU

Date: 12/03/2021

Dear Sirs,

FIELD & LABORATORY TESTING

Introduction

We refer to site testing undertaken at Tesco Car Park, Altrincham Road, Baguley.

Tested By : R. Brunskill

Sample Reference : N/A

Description : See attached certificates

Date Sampled : N/A

Date Tested : 9th March 2021

Source : N/A

Weather : Dry

Test Results;

Please see attached

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This report should not be reproduced except in full without the written approval of the laboratory
All remaining samples for this project will be disposed of 28 days after issue of this test certificate
When a statement of conformity is requested for a test result against limits set out in a standard or specification (e.g. BS EN ISO, SHW) that already considers measurement uncertainty, MATtest Midlands decision rule is to follow conformity requirements of the applicable standard or specification.
Results reported only relate to the items tested/ received.

Remarks; Amended to correct missing CBR valus

Approved for Issue: JPullar

John Pullar
Position: Technical Manager

Issuing Office:

☑ **Head Office & Central**
Unit 5 Draycott Mills, Off Market Street, Draycott, Derby, DE72 3NB

☐ **North West**
Unit 15 Park Court, Sherdley Business Park, St. Helens, Merseyside, WA9 5GZ

Tel: 03333 202521 Web: www.mattestlaboratories.co.uk

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MATtest Midlands Limited
Materials Testing & Consultancy

Foundation Report

See Start Spreadsheet for Importing data
Do not alter formulas in Foundation class or Contact Pressure
Do not alter any cell below row 11 on this Spreadsheet

Contact Pressure Check		
Good Class 2	100	KPa
Acceptable C	90	KPa
Fail Class 2	<90	KPa

Deflection Check (µm)	
Good	150
Acceptable	100
Too Low	<100

Temperature Check C	
Good	5
Acceptable	4 to 5
Too Low	<4

Deflection Change During Testing	
Good	10%
Fair	10 to 15%
Poor	15%
Error	<0

Foundation Classes to IAN 73/06		
Foundation Class 2A (Unbound, Slow) Mean	80	MPa
Foundation Class 2A (Unbound, Slow) Min	50	MPa
Foundation Class 2A (Unbound, Slow) Fail	<50	MPa

Foundation Class	2A	User Selection

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1A is Slow Setting and Unbound, 1B is Fast Setting, 2A is Slow Setting or Unbound and 2B Fast Setting

3A is Slow Setting, 3B is Fast Setting, 4A is Slow Setting and 4B Fast Setting

Client:		**Crossfield Consulting**									**Project No:**		**5085-21**		These three columns will only work correctly if six drops are used in the sequence: 3 Full Height, 1 medium, 1 low and 1 Full Height			Please note the converted CBR values below are for indication purposes only.		
Client reference:		**Tesco Car Park,**									**Date:**		**09/03/2021**							
Point No.	**Chainage**	**Latitude**	**Longitude**	**Drop No.**	**Force (kN)**	**Plate Radius (mm)**	**Stress (kPa)**	**Sensor1 Central Deflection Raw (µm)**	**Sensor1 Central Deflection Normalised (µm)**	**Poisson's Ratio ratio**	**Pulse time (ms)**	**Sensor1 Central Surface Modulus (Raw) (MPa)**	**Temp C**	**Pavement Description**		**Remarks**	**Deflection Change from First Measurement Normalised**	**Coefficient of Variation**	**Characteristic Surface Modulus (Design) (MPa)**	**Average of first three**	**Rolling Average of Five Points**	**Converted CBR Value**
1	0+0000	2−17'55.01"W	53−24'0.72"N	1	8.3	150	117	141	121	0.35	16	218	8	subbase		hole 1						
				2	8.4	150	118	143	121	0.35	16	218	8				0%					
				3	8.5	150	120	148	123	0.35	15	214	8				-2%	1%	215	216.3		50.4
				4	5.4	150	77	97	126	0.35	17	209	8									
				5	3.8	150	53	65	123	0.35	19	214	8									
				6	8.4	150	118	154	130	0.35	16	203	8				-8%	3%	207			
2	0+0000	2−17'54.95"W	53−24'1.71"N	1	8.4	150	118	110	93	0.35	16	284	8	subbase		hole 2						
				2	8.5	150	120	85	71	0.35	16	370	8				23%					
				3	8.7	150	122	87	71	0.35	16	370	8				23%	15%	309	341.1		102.7
				4	6.0	150	85	72	85	0.35	18	311	8									
				5	4.0	150	56	47	83	0.35	19	316	8									
				6	8.7	150	122	103	84	0.35	16	312	8				9%	11%	304			
3	0+0000	2−17'54.83"W	53−24'1.63"N	1	7.9	150	112	228	204	0.35	16	129	8	subbase		hole 3						
				2	8.1	150	115	170	148	0.35	16	178	8				28%					
				3	8.6	150	121	180	149	0.35	16	177	8				27%	17%	143	161.3		31.9
				4	8.7	150	124	179	145	0.35	16	182	8									
				5	8.6	150	122	175	144	0.35	16	183	8									
				6	5.5	150	77	113	146	0.35	18	180	8				28%	12%	165			
4	0+0000	2−17'54.80"W	53−24'1.64"N	1	8.5	150	120	139	116	0.35	16	227	8	subbase		hole 4						
				2	8.6	150	121	136	112	0.35	16	235	8				3%					
				3	8.6	150	122	136	111	0.35	16	237	8				4%	2%	230	233.0		56.6
				4	5.7	150	80	95	118	0.35	17	224	8									
				5	4.1	150	58	70	121	0.35	19	218	8									
				6	8.6	150	121	143	118	0.35	16	224	8				-2%	3%	222		245.1	

Daniel Joel
Crossfield Consulting Ltd
The Granary
White Hall Farm
Leamington Road
Long Itchington
Warwickshire
CV47 9PU

e: dj@crossfield-consulting.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-62164

Project / Site name:	Altrincham Road, Baguley	**Samples received on:**	11/03/2021
Your job number:	CCL03397	**Samples instructed on/ Analysis started on:**	11/03/2021
Your order number:	PO11847	**Analysis completed by:**	22/03/2021
Report Issue Number:	1	**Report issued on:**	22/03/2021
Samples Analysed:	10 soil samples		

Signed:

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

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

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

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

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

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

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

Analytical Report Number: 21-62164
Project / Site name: Altrincham Road, Baguley
Your Order No: PO11847

Lab Sample Number				1800609	1800610	1800611	1800612	1800613
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.40	0.30	0.60	0.50
Date Sampled				10/03/2021	10/03/2021	10/03/2021	10/03/2021	10/03/2021
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	-	-
Moisture Content	%	0.01	NONE	4.8	6.8	3.9	-	-
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	-	-
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Manual	pH Units	N/A	MCERTS	8.4	8.8	8.4	-	-
pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.2	0.6	< 0.1	-	-
Loss on Ignition @ 450oC	%	0.2	MCERTS	1.7	2.2	1.1	-	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	19	21	15	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.69	< 0.05	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	3.4	< 0.05	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	3.2	< 0.05	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.0	< 0.05	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.78	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.9	< 0.05	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	-	-
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	-	-
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.85	17.2	< 0.85	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	5.0	5.0	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.7	0.8	2.8	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.5	9.2	10	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	31	18	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	330	86	320	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.6	9.9	9.1	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	67	150	-	-

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

Analytical Report Number: 21-62164
Project / Site name: Altrincham Road, Baguley
Your Order No: PO11847

Lab Sample Number				1800609	1800610	1800611	1800612	1800613
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.40	0.30	0.60	0.50
Date Sampled				10/03/2021	10/03/2021	10/03/2021	10/03/2021	10/03/2021
Time Taken				None Supplied	None Supplied	None Supplied	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	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	2.1	0.7	-	-
TPH (C10 - C25)	mg/kg	10	MCERTS	120	22	11	-	-
TPH (C25 - C40)	mg/kg	10	MCERTS	48	170	37	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007	< 0.007	-	-

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.

Analytical Report Number: 21-62164
Project / Site name: Altrincham Road, Baguley
Your Order No: PO11847

Lab Sample Number				1800614	1800615	1800616	1800617	1800618
Sample Reference				WS1	WS2	WS2	WS3	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.60	2.30	1.10	1.90
Date Sampled				10/03/2021	10/03/2021	10/03/2021	10/03/2021	10/03/2021
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	30	2.8	15	3.2	10
Total mass of sample received	kg	0.001	NONE	0.70	0.70	0.70	1.0	0.70
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Manual	pH Units	N/A	MCERTS	-	-	-	-	-
pH - Automated	pH Units	N/A	MCERTS	8.6	8.1	7.5	7.4	7.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.059	0.0092	0.0064	0.014	0.0048
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-
Loss on Ignition @ 450oC	%	0.2	MCERTS	-	-	-	-	-
Acid Neutralisation Capacity	+/- mol/kg	-999	NONE	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Coronene	mg/kg	0.05	NONE	-	-	-	-	-
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	-	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-

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Analytical Report Number: 21-62164
Project / Site name: Altrincham Road, Baguley
Your Order No: PO11847

Lab Sample Number				1800614	1800615	1800616	1800617	1800618
Sample Reference				WS1	WS2	WS2	WS3	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.60	2.30	1.10	1.90
Date Sampled				10/03/2021	10/03/2021	10/03/2021	10/03/2021	10/03/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH (C10 - C25)	mg/kg	10	MCERTS	-	-	-	-	-
TPH (C25 - C40)	mg/kg	10	MCERTS	-	-	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

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

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Analytical Report Number: 21-62164
Project / Site name: Altrincham Road, Baguley
Your Order No: PO11847

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
1800610	WS2	0.40	261	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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

Analytical Report Number : 21-62164
Project / Site name: Altrincham Road, Baguley

* 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 *
1800609	WS1	None Supplied	0.3	Brown gravelly clay.
1800610	WS2	None Supplied	0.4	Brown gravelly clay.
1800611	WS3	None Supplied	0.3	Brown gravelly clay.
1800614	WS1	None Supplied	0.8	Grey sand.
1800615	WS2	None Supplied	1.6	Light brown sand.
1800616	WS2	None Supplied	2.3	Brown sand.
1800617	WS3	None Supplied	1.1	Brown sand.
1800618	WS3	None Supplied	1.9	Brown sand.

Analytical Report Number : 21-62164
Project / Site name: Altrincham Road, Baguley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 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. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-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
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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
Total organic carbon (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
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH Oils (Soils)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS

Analytical Report Number : 21-62164
Project / Site name: Altrincham Road, Baguley

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
DRO (Soil)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	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
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

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.

UKAS TESTING
4041

Environmental Science

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Analytical Report Number : 21-62169

Project / Site name:	Altrincham Road, Baguley	**Samples received on:**	11/03/2021
Your job number:	CCL03397	**Samples instructed on/ Analysis started on:**	11/03/2021
Your order number:	PO11847	**Analysis completed by:**	22/03/2021
Report Issue Number:	1	**Report issued on:**	22/03/2021
Samples Analysed:	3 wac multi samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-62169**						
					Client:	**CROSSFCLTD**	
Location	**Altrincham Road, Baguley**						
Lab Reference (Sample Number)	1800659				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	10/03/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS1						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	-				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	-				6000	--	--
Sum of PCBs (mg/kg) **	-				1	--	--
Mineral Oil (mg/kg) #	-				500	--	--
Total PAH (WAC-17) (mg/kg)	-				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.013	0.013		0.13	0.5	2	25
Barium *	0.22	0.32		3.1	20	100	300
Cadmium *	< 0.0005	< 0.0005		0.0027	0.04	1	5
Chromium *	< 0.0010	0.0018		0.017	0.5	10	70
Copper *	0.0066	0.0068		0.068	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.036	0.0053		0.095	0.5	10	30
Nickel *	0.0024	0.0043		0.040	0.4	10	40
Lead *	< 0.0050	0.014		0.13	0.5	10	50
Antimony *	0.013	< 0.0050		0.051	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.0086	0.0128		0.12	4	50	200
Chloride *	48	4.5		100	800	15000	25000
Fluoride	1.7	0.51		6.7	10	150	500
Sulphate *	14	7.1		81	1000	20000	50000
TDS*	160	54		680	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	9.0	5.2		57	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	95						
Moisture (%)	4.8						
Stage 1							
Volume Eluate L2 (litres)	0.34						
Filtered Eluate VE1 (litres)	0.24						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Report No:	**21-62169**						
					Client:	**CROSSFCLTD**	
Location	**Altrincham Road, Baguley**						
Lab Reference (Sample Number)	1800660				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	10/03/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS2						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	-				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	-				6000	--	--
Sum of PCBs (mg/kg) **	-				1	--	--
Mineral Oil (mg/kg) #	-				500	--	--
Total PAH (WAC-17) (mg/kg)	-				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.032	0.011		0.14	0.5	2	25
Barium *	0.040	0.011		0.15	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.020	0.0053		0.073	0.5	10	70
Copper *	0.026	0.0080		0.10	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.0060	< 0.0030		< 0.020	0.5	10	30
Nickel *	0.0070	0.0028		0.034	0.4	10	40
Lead *	0.037	0.0095		0.13	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.040	0.0118		0.16	4	50	200
Chloride *	26	4.6		76	800	15000	25000
Fluoride	0.64	0.17		2.4	10	150	500
Sulphate *	28	8.1		110	1000	20000	50000
TDS*	160	67		800	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	15	6.4		76	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	93						
Moisture (%)	6.8						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.24						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Waste Acceptance Criteria Analytical Results

Report No:	**21-62169**						
					Client:	**CROSSFCLTD**	
Location	**Altrincham Road, Baguley**						
Lab Reference (Sample Number)	1800661				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	10/03/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS3						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	-				3%	5%	6%
Loss on Ignition (%) **	-				--	--	10%
BTEX (µg/kg) **	-				6000	--	--
Sum of PCBs (mg/kg) **	-				1	--	--
Mineral Oil (mg/kg) #	-				500	--	--
Total PAH (WAC-17) (mg/kg)	-				100	--	--
pH (units)**	-				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.22	0.32		3.1	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.0015	< 0.0010		0.0069	0.5	10	70
Copper *	0.0047	< 0.0030		0.024	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.0080	< 0.0030		< 0.020	0.5	10	30
Nickel *	0.0025	0.0023		0.023	0.4	10	40
Lead *	0.012	< 0.0050		0.056	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.017	0.0656		0.59	4	50	200
Chloride *	26	< 4.0		65	800	15000	25000
Fluoride	0.83	0.49		5.4	10	150	500
Sulphate *	17	5.0		66	1000	20000	50000
TDS*	100	41		490	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	5.4	4.6		47	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	96						
Moisture (%)	3.9						
Stage 1							
Volume Eluate L2 (litres)	0.34						
Filtered Eluate VE1 (litres)	0.23						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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

Analytical Report Number : 21-62169
Project / Site name: Altrincham Road, Baguley

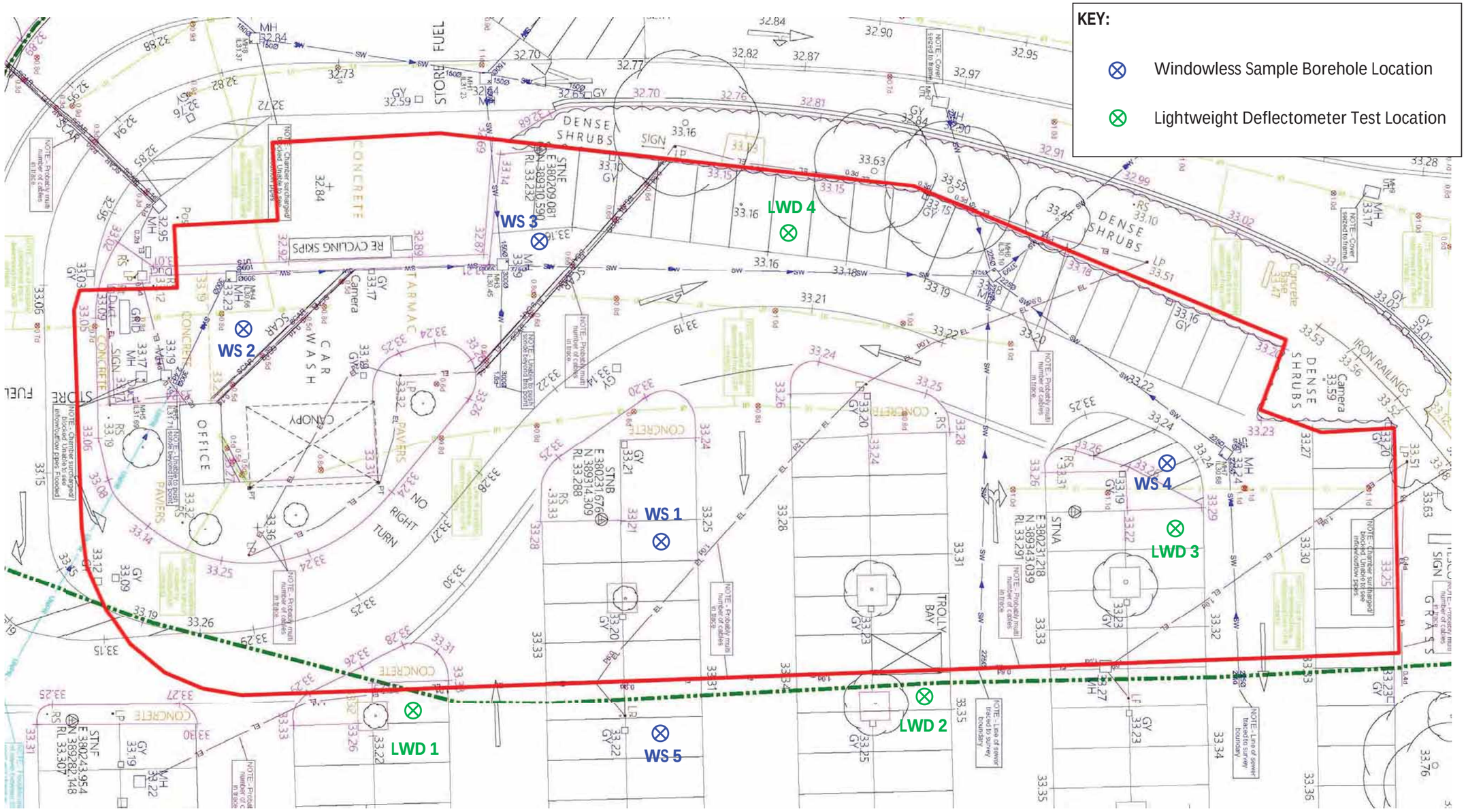
Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Preparation WAC leachate		In-house method	L043-PL	W	NONE
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W	ISO 17025
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031-PL	W	NONE
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W	NONE
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025

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



EXPLORATORY HOLE LOCATION PLAN

Scale 1 :250

Reproduced from the topographical survey by CTE Surveying, dated January 2021

APPENDIX IV

APPENDIX IV – BASIS OF GEOTECHNICAL ASSESSMENT FOR FOUNDATIONS

Geotechnical Design Category of Structure: 2

Design Working Life: Standard building structure (50 years)

Design Approach: 1

1. Geotechnical Model

On the basis of the ground investigation data, the following model of the ground conditions is considered appropriate for foundation design purposes:

Depth (m)	General Description of Strata (and classification)	Parameter	Characteristic Value & Units	Remarks
0.00 to 0.70	Made Ground	γ	17 kN/m^3	Based on site descriptions
0.70 to 2.00	Medium dense sand (Glaciofluvial strata)	N γ ø	19 20 kN/m^3 35°	Based on site data Based on site descriptions From Peck Hanson & Thornburn (1974)
2.00 to 4.90	Loose sand (Glaciofluvial strata)	N γ ø	8 18 kN/m^3 30°	Based on site data Based on site descriptions From Peck Hanson & Thornburn (1974)
4.90 to >5.00	High strength clay (Bollin Mudstone Member)	N γ c_u $ø_u$	>50 21 kN/m^3 200 kN/m^2 0°	Based on site data Based on site descriptions Based on site descriptions

Characteristic Depth to Groundwater (or groundwater level): 1.90 m

Reference should be made to Sections 7 – 8 of the report for an assessment of overall ground stability, seismic risk, combined failure of the structure/ground, excessive settlements and potential soil-volume changes (including heave).

2. Imposed Actions from Proposed Structure

The following are generic values, based on the development proposed, as described in the report. In compliance with BS EN 1997-1:2004, final designs should include consideration of the calculated imposed loads.

Imposed Load on Foundations: 50 kN/m run (1 storey – column load)

Serviceability Limit Values (associated with above action)

Maximum Total Settlement: 25 mm

Maximum Differential Settlement: 15 mm

3. Geometry of Proposed Foundation

Footing Width (assumed for assessment): Approximately 30.0 m by 12.0 m for raft foundation based on current proposed development footprint

Footing Depth (assumed for assessment): Minimum 0.6 m

4. Shallow Foundations

In assessing the allowable bearing pressures below structural foundations, a number of methods are used, as outlined below.

4.1. Coarse Grained Soils

Where foundations are to be placed on these soils, the allowable bearing pressure is estimated using the method of Terzaghi and Peck, as modified by Meyerhof (1965). Using this method, total settlements are assumed to be not greater than 25 mm (and a detailed serviceability limit calculation is not necessary).