

Phase 1: Desk Study

68-70 Oldham Street & 61 Spear Street, Manchester

Cumming Group

Job No. S220723

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PHASE 1 DESK STUDY

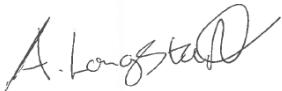
68-70 OLDHAM STREET & 61 SPEAR STREET, MANCHESTER

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Revision	Date	Prepared By	Signed
Final	August 2022	A Longstaff Engineering Geologist	
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		Approved By	
		R Woods Principal Geotechnical Engineer	

1 EXECUTIVE SUMMARY

Site Address	68-70 Oldham Street & 61 Spear Street, Manchester, M4 1LE.
Site Description	The site is currently an abandoned commercial goods site, is L shaped and is flat in topography. Access to the site is via the main road to the north of the site which trends northeast – southwest. Further access to the site can be gained via the south along a back-alley trending northeast – southwest. A building site is noted adjacent to the site to the northwest perimeter of the site. Services can be found both at the front and the back of the site and appear to be feeding into the site
Site History <i>On Site</i>	The earliest maps (1848) show that the site was a building in the northwest section of the site of unknown purposes. The southeast of the site is noted as a road trending northeast southwest. 1892-93 the northwest section of the site is developed into a public house and multiple smaller complexes, development to the southeast section of the site is also noted. 1922-33 the public house is no longer noted on site and instead a series of small buildings of unknown purpose are noted. 1948 development of the north section of the building noted. 1963-71 further development to the east and the southeast corner of the property is noted. 1980 further development to the southeast section of the site noted.
<i>Offsite</i>	From the earliest mapping the area around the site was predominantly commercial and residential buildings. 1948 the building adjacent to the northeast of the site is noted as an employment exchange. 1951 the building connected to the north section of the site is noted to be developed into a public house. The building previously noted as an employment exchange adjacent to the north of the site now noted as a government building.
Proposed End Use	The proposed development is outlined to be multistorey and commercial in nature.
Environmental Setting <i>Landfill & Waste</i>	There is 1no Landfill or facility handling or managing waste within 500m of the site.
<i>Regulated Industries</i>	There are 260no contemporary trade directory entries within 500m of the site. There are 2 fuel station entries within 500m of the site.
<i>Geology</i>	The solid geology beneath the site is likely to mostly comprise Chester Formation of sandstone and gravels. The drift deposits on site are likely to comprise of silty, sandy and gravelly Glacial Till.
<i>Hydrogeology</i>	Using the Environment Agency's Policy and Practice for the Protection of Groundwater, the solid geology beneath the site is classified as a Principal Aquifer. The overlying drift is classified as a Secondary Aquifer – Undifferentiated.
	The site does not lie within a source protection zone.
	There is 24no Ground Water Abstractions located within 1km of the site.
<i>Hydrology</i>	The nearest surface water feature is The Rochdale Canal located 309m southeast of the site.
<i>Flooding</i>	The Envirocheck Report states the site is not at risk of Flooding from Rivers and the Seas without defences, and there are no flood defences, flood water storage areas or areas benefiting from flood defences and flood storage present within 250m of the site.
<i>Radon Gas</i>	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protection measures are necessary for new buildings or extensions on the site.
Preliminary Mining Assessment	The site is not located within a Development High Risk Area however it is located in a coal mining report area. A report for the site has been obtained.
Preliminary Geotechnical Assessment	Given the expected ground conditions noted in the sections above, piling is anticipated at present for the new development.
Preliminary Contamination Assessment	The desk study has shown that the site may have been exposed to some contamination, with construction/demolition waste and possibly oils or fuel from vehicle spills the most likely source local to the structures. Asbestos may also be present on the site from previous/existing building materials used on-site.
Potential Sources of Ground Gas	Made ground is expected on site, therefore ground gas assessment is recommended due to the nature of the development.
Phase Two Recommendations	• A series of cable percussive boreholes with insitu testing and samples. • A series of follow on and rotary boreholes. • Gas monitoring comprising six visits over three months. • A series of machine dug trial pits for sampling, insitu soakaways and CBRs. • Geotechnical testing. • Chemical testing.

2 INTRODUCTION AND SCOPE OF INVESTIGATION

Solmek were instructed by Cumming Group to undertake a desk study on a parcel of land at 68-70 Oldham Street & 61 Spear Street, Manchester M4 1LE. The proposed development is outlined to be multistorey commercial.

The following steps may be required in the investigation and remediation of potentially contaminated land:

- Phase 1: Desk Study
- Phase 2: Intrusive Investigation
- Phase 3: Remediation Statement
- Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages. This report represents Phase 1 of the site investigation.

The purpose of this Phase 1 Desk Study is to evaluate likely ground conditions and significant environmental issues at the site, and to plan the scope of subsequent phases of investigation.

This report may be regarded as a Preliminary Risk Assessment in accordance with respect to the Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*.

This Phase 1 Desk Study has been undertaken with due regard to current contaminated land guidance issued by the Royal Institution of Chartered Surveyors (RICS) together with BS 10175:2011+A1:2013, *Investigation of Potentially Contaminated Land - Code of Practice* and relevant sections of BS 5930: 2015, *Code of Practice for Ground Investigations*.

The objectives of the investigation are as follows:

- Determine the land use history of the site from an inspection of available Historical Maps
- Determine the environmental setting of the site from available sources
- Determine whether past mining may have had an influence on the site
- Determine whether the site has previously been used for purposes that may have given rise to significant ground contamination
- Provide recommendations for further investigation.

3 SITE WALKOVER AND DESCRIPTION

3.1 General

The centre of the site is located at OS Grid Ref 384603, 398573 and covers an area of approximately 0.07Ha. The area is located at 68-70 Oldham Street & 61 Spear Street, Manchester, M4 1LE.

The preliminary site inspection was undertaken on the 26th July 2022 and site photographs are presented in Appendix A.

3.2 Site Description

The desk study area is located on a parcel of land in the Northeast of Manchester City Centre.

The site is irregularly shaped and has a mostly flat and even topography. The site is currently disused and derelict with several buildings present which have now fallen into disrepair.

The main building on the site is a disused multistorey commercial building spanning the north-western perimeter of the site (Figure 9) and has potential for asbestos containing materials within its structure (cladding & roofing, insulation). A long rectangular brick building (Figure 11) connects to the south of the main structure and extends out to the southwest.

A construction site is present to the northeast of the site (Figure 9). Surrounding the site area are several office, residential and commercial buildings some of which connect to the northwest section of the site. The south site access is secure with gated access due to construction in the area, however a footpath is still accessible.

3.3 Off Site Features

Residential, commercial and office buildings are noted around the site perimeter along with associated roads. Multiple services such as gas pipes, electrical wires, water access points, drains and telecoms wires are noted along the northwest and south of the site and are inferred to supply the building.

4 SITE HISTORY

4.1 Map Descriptions

In order to determine the history of the site, previous editions of Historical Maps and Ordnance Survey Plans were inspected. The Historical Maps are presented in Appendix B.

Table 1 presents a summary of the history of the area which includes plots from 1848 to 2022. The summary focuses on the historical land uses and changes relevant to the site and the proposed end use. Measurements are taken from the nearest boundary of the site and all distances quoted are approximate.

TABLE 1: SUMMARY OF SITE HISTORY

OS Map Edition	On-site Features	Off-site Features
1848 1:10,560	Property of unknown purpose located on the northeast and southeast of the site.	Access roads on the northwest, northeast and southeast of the site. Attached building to the southwest side of the northern section of the site is street of unknown buildings trending northeast to southwest. Immediately northeast of the site is another small street containing unknown buildings trending northeast - southwest. Immediately south of the site is a street of unknown buildings trending northeast – southwest. 'London Road Train Station' is noted 650m south of the site. 'Manchester Victoria Station' noted 750m northeast of the site along with railway trending northeast - southwest. Main road noted 60m northeast of the site trending northwest southeast. Tramway noted running throughout the main road. 'Oldham Road' noted 60m northeast of the site trending northeast – southwest. 'The River Irwell' noted 600m west of the site trending north south. Un-named linear feature suspected to be a canal noted 500m southeast of the site trending northeast southwest. Second un-named linear feature noted 520m southeast of the site trending northeast southwest, suspected to be another canal. Third linear feature noted 750m north of the site trending northeast southwest, suspected to be a canal.
1892-93 1:2,500 & 1894-96 1:10,560	Development of a public house noted on the northeast section of the site. Multiple small complexes developed on the southeast section of the site.	A club noted immediately to the southeast of the site. Two public houses noted 100m west of the site. Post Office noted 70m south of the site. Hotel noted adjacent to the northwest perimeter of the site. Public house noted 35m north of the site. Moth Chapel noted 90m east of the site. Smithfield Market noted 115m northwest of the site. Wholesale Fish Market noted 200m northwest of the site. Urinals noted 120m northeast of the site on the main road. Ironworks noted 1000m south of the site.

1908 1:2,50 & 1909 1:10,560	No significant change.	Development to the tramway noted. Sawmill noted 300m southeast of the site. School noted 250m north of the site. Goods station noted 500m northeast of the site. Gasworks noted 750m north of the site.
1922-33 1:2,500 & 1923 1:10,560 & 1931-33 1:10,560	Public house no longer noted on site. Instead, a series of small buildings of unknown purpose are noted.	Large post office noted 100m southeast of the site. Library noted 350m southwest of the site. Tram works noted 750m north of the site. Fire station noted 750m south of the site.
1938 1:10,560	No significant change.	Ironworks noted 800m north of the site. Rubber works noted 800m north of the site.
1948 1:1,250	Development of the north section of the building noted.	Printworks noted 30m south of the site. Printworks noted 125m northeast of the site. Machine tool works noted 220m southeast of the site. Electrical substation noted 200m east of the site. Police station noted 110m south of the site.
1951 1:2,500 & 1951-54 1:2,500	No significant change.	Three garages noted 250m northeast of the site along Oldham Road. Large garage noted 200m southeast of the site.
1955 1:2,500 & 1956 1:10,000	No significant change.	Two large warehouses noted 120m west of the site. Two car parks noted 500m southwest of the site. Further development to the Victoria station railway noted. Third linear feature noted in 1848 map now noted as The River Irk.
1963-71 1:1,250 & 1965 1:2,500 & 1969 1:2,500	Further development to the east and the southeast corner of the property is noted	Street immediately adjacent to the northeast of the site now noted as government offices. Large garage to the southeast now noted as three separate garages. Two builders' yards noted 150m southeast of the site
1980-81 1:10,000 & 1980-85 1:1,250 & 1986 1:1,250 & 1985-87 1:10,000	Further development to the southeast section of the site noted	Bus station noted 450m southwest of the site. Rochdale canal noted 400m southeast of the site trending northeast southwest. Multistorey carpark noted 130m west of the site. Large car park noted in place of the Smithfield Market 115m northwest of the site.
1992 1:1,250 & 1993-1994 1:10,000	No significant change.	Telephone communication box 65m north of the site. Cannon street bus station Construction noted 450m west of the site. Fire station noted 500m northeast of the site. Gasworks first noted in the 1909 map now noted as a depot. Electrical substation noted in 1948 map no longer noted.
1999 1:10,000	No significant change.	Shopping centre constructed in place of Cannon Street bus station 500m west of the site. Second linear feature noted in 1848 map trending northeast southwest now noted as Ashton Canal.
2022 1:10,000	No significant change.	Construction of Shudehill Coach Station noted 400m northwest of the site.

4.2 Potential Contamination Sources Identified via Historical Plans

Contamination from historical land uses within a 250m radius of the site have been identified:

Made ground from materials used to infill depressions and form a level area for access or building. This may include brick, concrete, timber, ash, slag, coal and metals.

Construction/demolition waste from construction and demolition immediately around the site over the documented history. This may include brick, concrete, timber, asbestos and metals.

Roads/Parking Areas may have utilised coal tar, which can result in high levels of PAHs and Phenols and may require disposal as hazardous waste. In addition, historically road construction used ash as a sub-base material, which could be a further source of PAHs.

Railway Contamination based on proximity to current and historic railway features isolated to the southern and south-eastern portion of the site. This may include ash, clinker, heavy metals and asbestos.

Electrical substation may have produced contaminants including Polychlorinated Biphenyls (PCBs), which were often blended with carrier fluids such as chlorobenzenes and mineral oil prior to distribution.

Garages/Filling Station contaminants may include metals or organic pollutants from petroleum, diesel, oils and lubricants or metal contamination from car repairs.

5 ENVIRONMENTAL SETTING

5.1 Information Sources

The environmental setting of the site was determined through reference to the following:

- Envirocheck Report (including historical map extracts)
- British Geological Survey (BGS): 1:50 000 geological map series sheet 85 Manchester Solid and Drift Edition (2010 & 2011)
- BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings

5.2 Landfill and Waste

The Envirocheck Report indicates that there are no Registered Landfill Sites located within 500m of the site.

The Envirocheck Report indicates that there are no BGS Recorded Landfill Sites located within 500m of the site.

The Envirocheck Report indicates that there are no Historic Landfill Sites located within 500m of the site.

The Envirocheck report indicates that there are no Local Authority Recorded Landfill sites located within 500m of the site.

The Envirocheck Report indicates that there are no Waste Treatment, Transfer and Disposal Sites entries located within 500m of the site.

The Envirocheck Report indicates that there is one Licenced Waste Management Facility located within 500m of the site. This is located 313m northeast of the site and is noted as 'Surrendered'.

5.3 Regulated Industries

The Envirocheck Report indicates that there are 260 Contemporary Trade Directory Entries located within 500m of the site. The closest is located 34m west of the site and was classified as a 'Record, Tape & CD Manufacturer'. This is noted to be 'Inactive'.

The Envirocheck Report indicates that there are two Recorded Fuel Sites located within 500m of the site. The closest is located 93m east of the site and is noted to be 'Obsolete'.

The Envirocheck Report indicates that there are no records of Integrated Pollution controls located within 500m of the site.

The Envirocheck Report indicates that there are no records of Integrated Pollution Prevention and Control entries located within 500m of the site.

The Envirocheck Report indicates that there are two Local Authority Pollution Prevention and Control sites or enforcements located within 500m of the site. The closest is located 178m northeast of the site and is noted as 'air pollution control', however authorisation has been 'Revoked'.

The Envirocheck Report indicates that there is one records of Registered Radioactive Substances located within 500m of the site. It is located 458m north of the site and is described as 'Authorisation under RSA in respect of a registration under S7 when Technetium 99M is used being ≤ 10 gigabecquerels' for 'Brooke Edgley Specialist Technical Services Ltd'. Its current status is 'Authorisation either revoked or cancelled'.

The Envirocheck Report indicates that there are no records of Planning Hazardous Substance Consents and Enforcements located within 500m of the site.

The Envirocheck Report indicates that there are no records of Control of Major Accident Hazard (COMAH) sites located within 500m of the site.

The Envirocheck Report indicates that there are no records of Notification of Installations Handling Hazardous Substances (NIHHS) located within 500m of the site.

The Envirocheck Report indicates that there are no Substantiated Pollution Incidents located within 500m of the site.

The Envirocheck Report indicates that there are no Sites Determined as Contaminated Land under Part 2A EPA 1990 entries located within 500m of the site.

5.4 Geology

The site is shown to be underlain by solid geology of The Chester Formation most likely comprising of interbedded sandstones and 'horizontally-bedded conglomerate with subordinate lenticular beds of trough cross-bedded pebbly sand and sand' (Figure 4).

The drift deposits on site are likely to comprise of silty, sandy and gravelly Glacial Till with occasional sandy and gravelly lenses (Figure 3).

There are two faults within 500m of the site. The nearest fault is the Ardwick fault is located approximately 100m west of the site with a downthrow to the northeast (Figure 5).

TABLE 2: SUMMARY OF HISTORIC BOREHOLES

Borehole No	Description
SJ89NW29	MADE GROUND to a depth of 1.07mbgl. Dark brown/brown Gravelly sandy and silty CLAYS to a depth of 18.59mbgl. Red SAND to a depth of 19.20mbgl. Red SANDSTONE to a depth of 25.91mbgl.
SJ89NW1461	MADE GROUND to a depth of 1.25mbgl. Firm/Stiff/Very Stiff Brown silty and sandy CLAYS with grey fissures and stone inclusions to a depth of 9.00mbgl.

Historic borehole log sheets can be found in Appendix A Figures 6, 7 and 8.

5.5 Mining & Quarrying

The site is within a Coal Mining Affected Area as defined by the Coal Authority, as a result a coal mining search report was required to assess the risks posed by historic and possible future coal mining to any current or future developments on the site.

The coal mining search report conducted by David Bellis Consulting Surveyors dated 2nd August 2022 is presented in Appendix D.

The report highlights that the site is not situated within the boundary of a former opencast coal mining site. Neither is the site located within 200m of a currently operating opencast coal mine or 800m of a future opencast coal mine.

The report follows on to state that they have no knowledge of any shafts or adits within 20m of the site or the boundary of the site. Also there are no tips or lagoons in the vicinity of the site.

The Envirocheck Report indicates that there are no BGS recorded Mineral Sites located within 1km of the site.

The site is not within 1km of a Non-Coal mining area of Great Britain, a Man-Made Mining Cavity, a Natural Cavity or a Brine Compensation area.

5.6 Geological Hazards and Instability

The Envirocheck report presents the maximum hazard ratings of ground stability hazards located on site as follows:

- Negligible hazard is posed by Ground Dissolution Stability Hazards
- Negligible hazard is posed by Compressible Ground Stability Hazards
- Very low hazard is posed by Landslides, Running sand and Collapsible Ground Stability Hazards
- Very low hazard is posed by Shrinking or Swelling Clay Stability Hazards

5.7 Hydrogeology

Using the Environment Agency's Policy and Practice for the Protection of Groundwater the solid geology beneath the site is classified as a Principal Aquifer. The overlying drift is classified as Secondary Aquifer – Undifferentiated.

The groundwater vulnerability is categorised as Secondary Superficial Aquifer – Low Vulnerability.

The site does not lie within a Source Protection Zone.

The Envirocheck Report indicates that there are 24 Water Abstractions located within 1km of the site. The closest is located 738m southwest of the site and is described as 'Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss)' Abstracted from a 'Single point' from a 'Groundwater source' for 'British Telecommunications Plc'. It is noted to have gained 'A permit start date on the 1st April 2007'.

5.8 Hydrology

The nearest surface water feature is The Rochdale Canal located 309m southeast of the site.

The Envirocheck Report states there are no Licensed Discharge Consents entries within 500m of the site.

The Envirocheck Report states there are no Records of Water Industry Act Referrals (potentially harmful discharges to the public sewer) located within 500m of the site.

5.9 Flooding

The Envirocheck Report states the site is not at risk of Flooding or Extreme Flooding from Rivers and the Seas without defences.

The Envirocheck Report indicates that there are no flood defences, flood water storage areas or areas benefiting from flood defences and flood storage present within 250m of the site.

The Envirocheck Report states that there is Limited Potential for Groundwater Flooding onsite, however it is noted that the land 451m northeast has a potential for groundwater flooding to occur.

5.10 Sensitive Land Use

The site is within the boundaries of a Nitrate Vulnerable Zone.

The site does not lie within 2km of any other form of Designated Environmentally Sensitive Sites or Protected

Areas.

5.11 Radon Gas

The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

In accordance with the procedure described in BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings, no radon protection measures are necessary for new buildings or extensions on the site.

6 CONCEPTUAL SITE MODEL

6.1 General

Based on the information presented in the preceding Sections, and in accordance with the LCRM guidance noted in Section 1, a Preliminary Conceptual Site Model has been produced.

The main features of the model are discussed in the following sections together with preliminary recommendations where appropriate.

6.2 Likely Ground Conditions

It is expected that, based on available information, ground conditions are likely to be made ground comprising of hardstanding materials. The surface deposits are likely to be underlain by further fill materials, likely to consist of construction/demolition waste. The drift deposits on site are likely to comprise of boulder clay deposits overlying an interbedded sandstone bedrock.

6.3 Potential Buried Obstructions

Based on the site history, buried obstructions are likely comprising of relict foundations, cobbles, bricks, past utilities and stone blocks.

6.4 Mining Assessment

The site is within a Coal Mining Reporting Area as defined by the Coal Authority.

The general guidance and good practice for assessing if a seam is within influencing distance to the surface is if rock cover (not including made ground and drift) is greater than 10x the worked thickness of the coal seam, then generally no void migration will reach the interface of the rock and drift deposits/made ground and thus no instability via a crown hole tyre collapse will occur.

From the Coal Mining Report, no seams are identified within or near to the site.

Given the absence of shallow coal seams within influencing distance to the surface, and the sites location outside of a Development High Risk Area, no further investigation into historical coal mining is considered necessary.

6.5 Preliminary Geotechnical Assessment

Given the expected ground conditions noted in the sections above and the proposed multi-story nature of the development, piling is anticipated at present for the new development. Where loose made ground or soft/loose natural deposits are encountered, foundations will need to be taken through the made ground/disturbed ground into underlying natural strata of adequate bearing capacity.

If the existing structure is to be converted, the foundations should be assessed so as to ascertain their current condition and suitability of providing adequate bearing capacity. The foundations will require exposing and sampling of underlying soil to ascertain whether deeper foundations may be required. Additionally, small percussive boreholes would be prudent should foundations need underpinning.

The above suggestions should be regarded as tentative until Phase 2 intrusive works are undertaken and

information is available regarding design loads and development layout.

6.6 Preliminary Contamination Assessment

The desk study has shown that the site is likely to have been exposed to some contamination, with construction/demolition waste and possibly oils or fuel from vehicle spills the most likely source local to the structures. Asbestos may also be present on the site from previous building cladding and roofing.

In view of the current and future site use, chemical contamination testing is considered necessary. The following chemical testing suite should be considered for selected soil samples:

TABLE 3: POTENTIAL PRIORITY CONTAMINANTS

Inorganic Contaminants	Organic Contaminants
Antimony, Arsenic, Boron, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc, Selenium, Free Cyanide, Soluble Sulphate, pH, Asbestos	Phenol, Organic Matter, speciated PAH, TPH CWG.

It should be noted that the above potential contaminants are considered to be commonly associated with the specified past land uses of the site, and adjacent land use. Risk assessment should be undertaken for contamination identified during intrusive investigation.

Potential pathways which link the potential contaminants to end users of the site and controlled waters (receptors) include the following:

- Ingestion of soil (outdoors) / dust (indoors)
- Skin contact with soil (outdoors) / dust (indoors)
- Inhalation of dust (outdoors and indoors)
- Contamination via buried water pipes
- Surface water run-off, including via existing drainage infrastructure
- Downward infiltration of leachable contaminants to groundwater

6.7 Potential Sources of Ground Gas

Ground gases such as carbon dioxide and methane can be classed as a form of contamination. Potential sources of ground gases include:

- Made Ground
- Quarries, Infilled Clay Pits & Infilled Ponds
- Underlying Natural Strata (alluvium, peat and chalk)
- Petrol re-fuelling sites (which also includes Volatile Organic Compounds)
- Landfill (on and off-site)
- Coal measures

Based on historical map evidence and consideration of the sites environmental setting the table below shows a preliminary comparison of *consequence* against *probability* where ground gas is considered a potential threat to human health.

TABLE 4: POTENTIAL GROUND GAS POLLUTION LINKAGES

Potential Sources	Potential Pathway	Receptor
Made ground (CO ₂ , CO and CH ₄).	Ingress and Accumulation into buildings from vertical and horizontal migration	Future users of site are likely to include adults and children. Construction workers (in particular utility workers).
Preliminary Comparison of Consequence versus Probability		
	Classification	Justification
Probability <i>(Based on Table 8.1, CIRIA C665, 2007)</i>	LOW LIKELIHOOD	Ground gas from made ground.
		No landfills located within 500m radius of the site.
		No coal mining in area.
Consequence <i>(Based on Table 8.2, CIRIA C665, 2007)</i>	MILD	Commercial development.
	Risk	Details
Consequence vs. Probability <i>(Based on Table 8.3, CIRIA C665, 2007)</i>	LOW RISK	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. <i>(Based on Table 8.4, CIRIA C665, 2007)</i>

Given the conditions noted above a ground gas assessment is considered necessary for the site to observe standing groundwater levels and to allow measurements to be made of hazardous gases and/or contamination levels in groundwater. Monitoring should be undertaken following site works on a minimum of six occasions over three months.

6.8 Risk Assessment for Contaminated Land

As part of this Phase 1 Desk Study, a preliminary conceptual model and risk assessment is produced. This assessment should be revised following the Phase 2 Site Investigation outlining a qualitative risk assessment. Should there be unacceptable risks to the various receptors/end-users following the Phase 2 works, then a remediation strategy may be required to outline measures to satisfy Part 2A of the Environmental Protection Act (1990). The above measures are in line with Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn Contaminated Land Report 11 – *Model Procedures for the Management of Land Contamination* (2004).

The results of the chemical contamination testing as part of the Phase 2 investigation should be compared to a current Land Quality Management (LQM) – Suitable 4 Use Levels (S4UL) December 2014.

6.9 Conceptual Site Model

The conceptual model collates the salient aspects of the site to form a model which should enable comparison after fieldwork and testing. This model identifies the potential pollution linkages that may influence the proposed development and geotechnical considerations.

The risk ratings are based on the current potential liabilities and likely potential future liabilities. The risks posed by the geotechnical and contamination aspects of the site will be revised following site works, and any mitigating action required added.

The Preliminary Conceptual Model has been undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, which is then used to produce the Preliminary Conceptual Model. Full details of the tables used to assess consequence, likelihood and risk classification are presented in Appendix E.

TABLE 5: PRELIMINARY CONCEPTUAL MODEL

Source	Pathway	Receptor	Risk Rating	Comments
Asphyxiating or explosive ground gases - Made ground - Not in Radon Affected Area	Ground gas migration Inhalation	Future site users Transient adult workers, general public and infants.	Moderate /Low	Gas monitoring recommended. Six visits over three months proposed.
		Users during development Construction workers	Low	
Areas of contamination - Potential contaminants in made ground - Potential demolition/construction waste	- Inhalation - Dust ingestion - Dermal contact	Future site users Transient adult workers, general public and infants.	Low	Mitigated by proposed structure hard standing – no gardens proposed.
		Users during development Construction workers	Moderate /Low	Contamination testing required to determine risks posed during construction. Consideration to be given to Health and Safety Executive Guidance. <i>Protection of Workers and the General Public During the Development of Contaminated Land.</i>
	- Inhalation - Dust ingestion	Users of surrounding sites Transient adult workers, general public and infants.	Moderate /Low	Potential low risk during construction from dust generation. Contamination testing required to quantify the risks.
		Solid geology Principal Aquifer	Moderate	High sensitivity aquifer containing well cemented gravelly sandstones but located beneath low vulnerability drift deposits
	Leaching of mobilised contaminants	Drift geology Secondary aquifer - undifferentiated	Low	Low vulnerability aquifer unlikely to contain significant groundwater
		Surface water features Canal 309m southeast	Low	Very limited potential for contamination from site to reach surface water, either via surface run-off or groundwater movement.
	- Drainage - Lateral migration - Accumulation of contaminated sediment	Vegetation None on site or proposed	Very Low	No potential for Vegetation impact as no vegetation is present or proposed.
Areas of contamination above service fabric or BRE Special Digest 1 thresholds	Direct contact	Construction Materials Concrete	Moderate	pH and sulphates to be assessed during Site Investigation
	Direct contact	Construction Materials Service Fabric	Moderate	Consideration to be given to Pipe Material Table (Appendix E) during Site Investigation

7 PROPOSED PHASE TWO INTRUSIVE WORKS

A Phase 2 Site Investigation should be undertaken to verify the assumptions made in the Preliminary Conceptual Site Model and to provide data for foundation design. Any site investigation work is likely to be post-demolition of the current structure on site.

An outline ground investigation strategy is summarised below, based on the preliminary conceptual site model and information obtained during the desk study.

It is recommended that any site investigation works are undertaken following the demolition of the existing structures.

7.1 Site Investigation Rationale

The Conceptual Model highlights that there is potential for contamination on the site. Therefore, an intrusive investigation should be undertaken with the sampling strategies outlined within BS10175:2011 +A1:2013 and CLR4:1994. These strategies can be considered as:

- Non targeted (BS10175) – If no obvious hotspots or potential sources of contamination have been outlined in the desk study, it would be recommended to utilise a stratified random pattern of sampling locations.
- Targeted (CLR4) – If a possible hotspot is suspected on the site, it is recommended to adopt a targeted approach to sample the immediate vicinity of the hotspot. Highly focussed sampling consisting of several samples within the area of the hotspot may be necessary to delineate the extent of the hotspot.

These strategies can be employed either separately or in conjunction and any site investigation should be individually tailored to each site.

The density of sampling required is defined within BS10175 which notes that the density required is dependent on a number of factors including confidence and robustness required, and contaminants, pathways and receptors present.

7.2 Site Specific Sampling Rationale

The analysis of historical maps and the Conceptual Model did not highlight any defined hotspots on the site. Therefore, a non-targeted approach should be utilised, with sample locations arranged evenly across the site in a defined pattern, in order to provide maximum site coverage.

7.3 Proposed Methods of Investigation

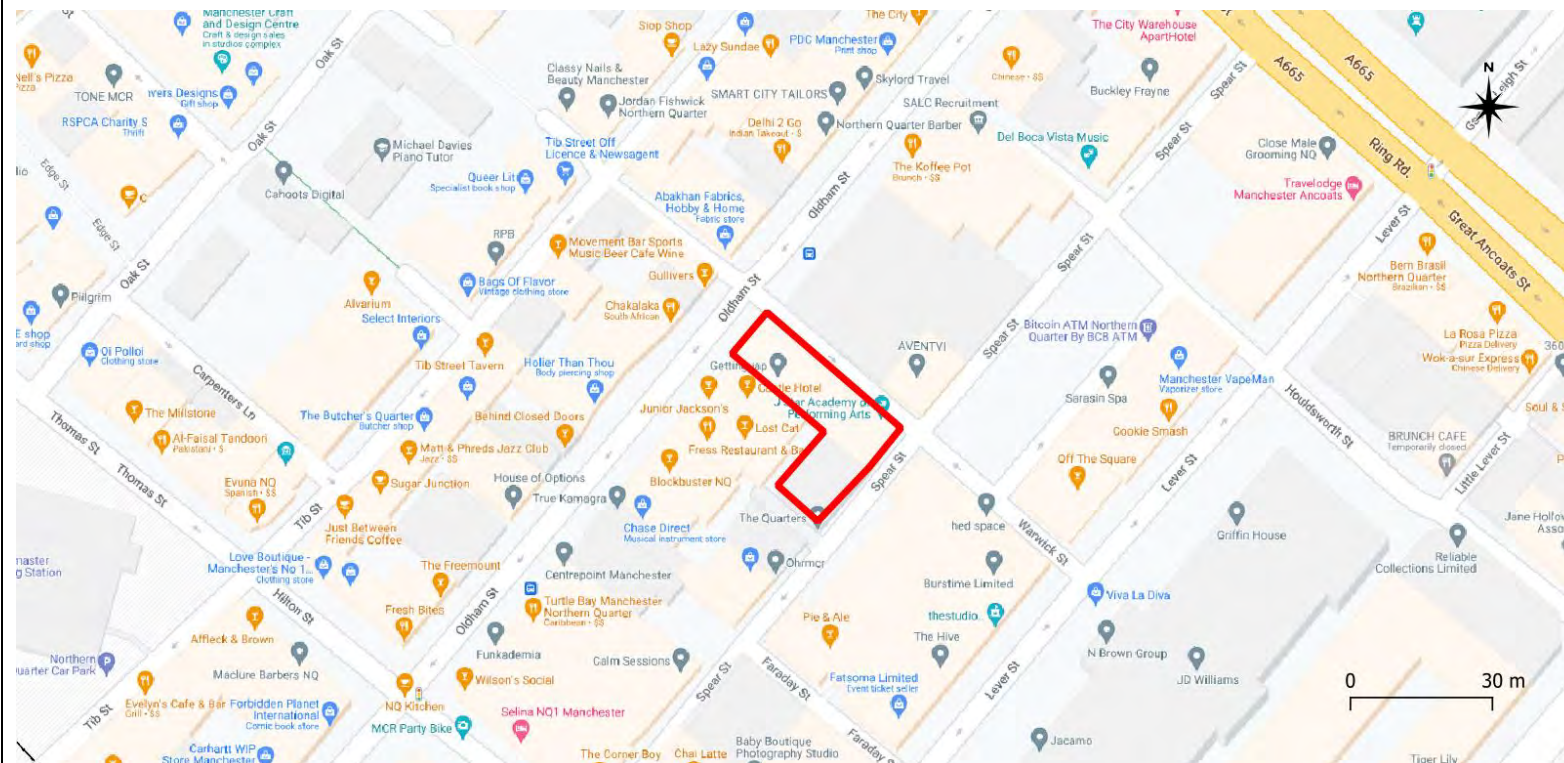
The methods of investigation outlined within Table 6 are considered necessary to address the risks outlined within the Conceptual Model. The locations of these investigation positions will be set out in line with the proposed sampling methodology outlined in Section 7.2.

TABLE 6: SITE INVESTIGATION RECOMMENDATIONS

Proposed method of investigation	Purpose	Comments
Hand dug trial pits	Hand dug trial pits to 1.20mbgl to ensure positions are clear of underground services.	To be undertaken prior to the drilling of all boreholes and following CAT scanning and service plan inspection.
A series of cable percussive boreholes to rockhead depth expected between 15-20mbgl.	• To determine shallow ground conditions. • To provide information for pile design. • To collect soil samples for geotechnical and chemical testing. • To observe soils profile, localised variations in materials and presence of groundwater.	• Ensure positions are CAT scanned and service plans inspected prior to any excavation. • Hand vanes to be taken in cohesive deposits. • SPT samples in granular strata and rock head. • Disturbed and jar samples to be undertaken for chemical testing.
Trial pitting to ca. 3.00mbgl	• To assess the shallow ground conditions and obtain samples for chemical testing. • To undertake insitu hand shear vanes. • To undertake soakaway tests and insitu CBR testing.	• Ensure positions are CAT scanned and service plans inspected prior to investigation.
Gas/groundwater monitoring wells	To observe standing groundwater levels and to allow measurements to be made of hazardous gases and/or contamination levels in groundwater.	Monitoring to be undertaken following site works on a minimum of six occasions over three months.
Provisional - A series of follow on rotary cored boreholes drilled ca. 6.00-7.50m into the rock	To provide further information for potential pile design	Ensure positions are CAT scanned and service plans inspected prior to excavation.
Chemical testing	To allow the potential risks identified within the conceptual model to be addressed.	Chemical soils and leachates testing to cover potential priority contaminants from Table 2.
Geotechnical testing	To confirm material properties and to provide concrete classification of materials.	Tests may include sulphate analysis, pH, moisture content, Atterberg limit determination, particle size distribution tests and triaxial testing. Further tests may be required depending on the materials encountered.

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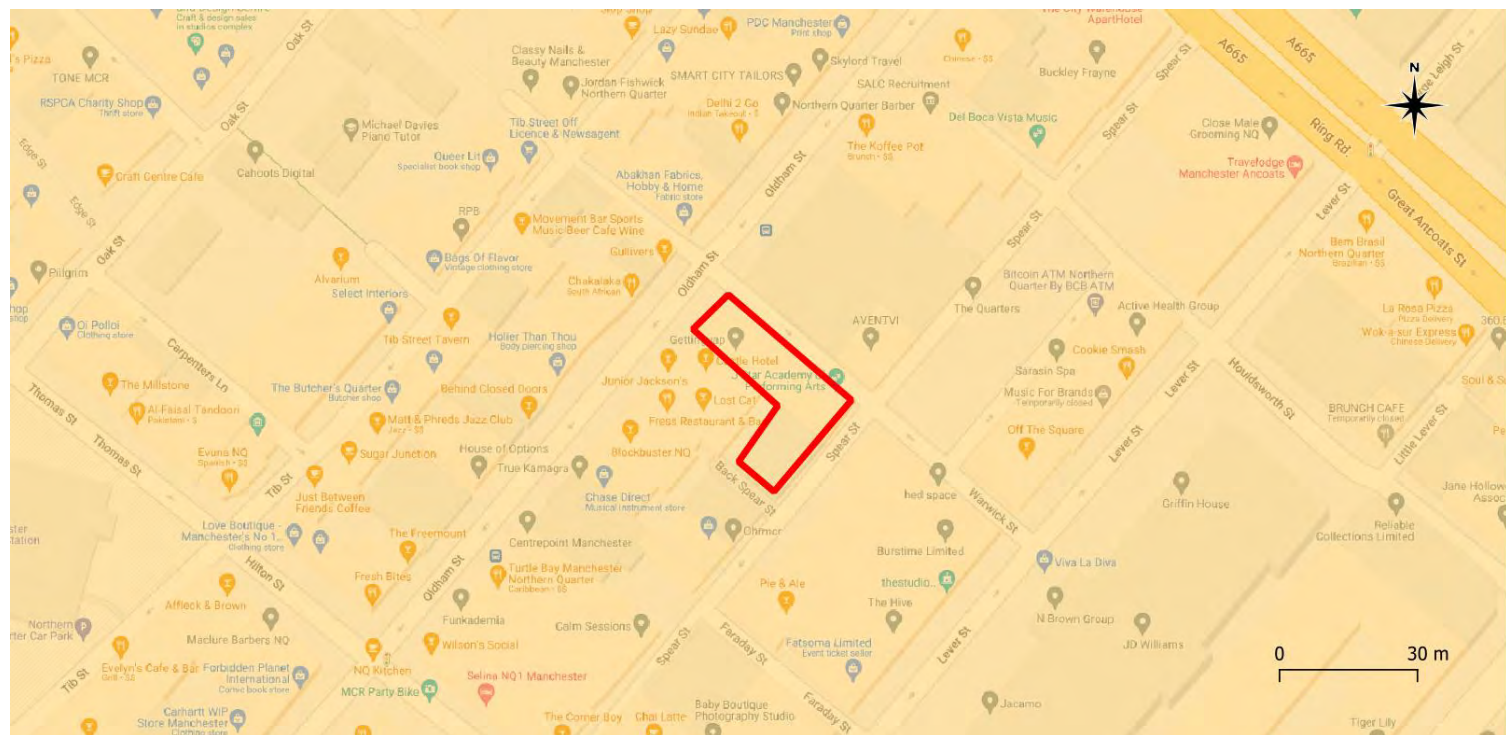
Appendix A



Title
Site Location Map
Project
68-70 Oldham Street & 61 Spear Street, Manchester
Client
Cumming Group
Date
August 2022
Fig No.
Figure 1
Scale
Scale on map
Key
Site Boundary N
Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com 



Title	Drift Geology Map
Project	68-70 Oldham Street & 61 Spear Street, Manchester
Client	Cumming Group
Date	August 2022
Fig No.	Figure 3
Scale	Scale on map
Key	Site Boundary Glacial Till
Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com	
	



Title
Solid Geology Map
Project
68-70 Oldham Street & 61 Spear Street, Manchester
Client
Cumming Group
Date
August 2022
Fig No.
Figure 4
Scale
Scale on map
Key
Site Boundary Chester Formation – Gravelly Sandstone

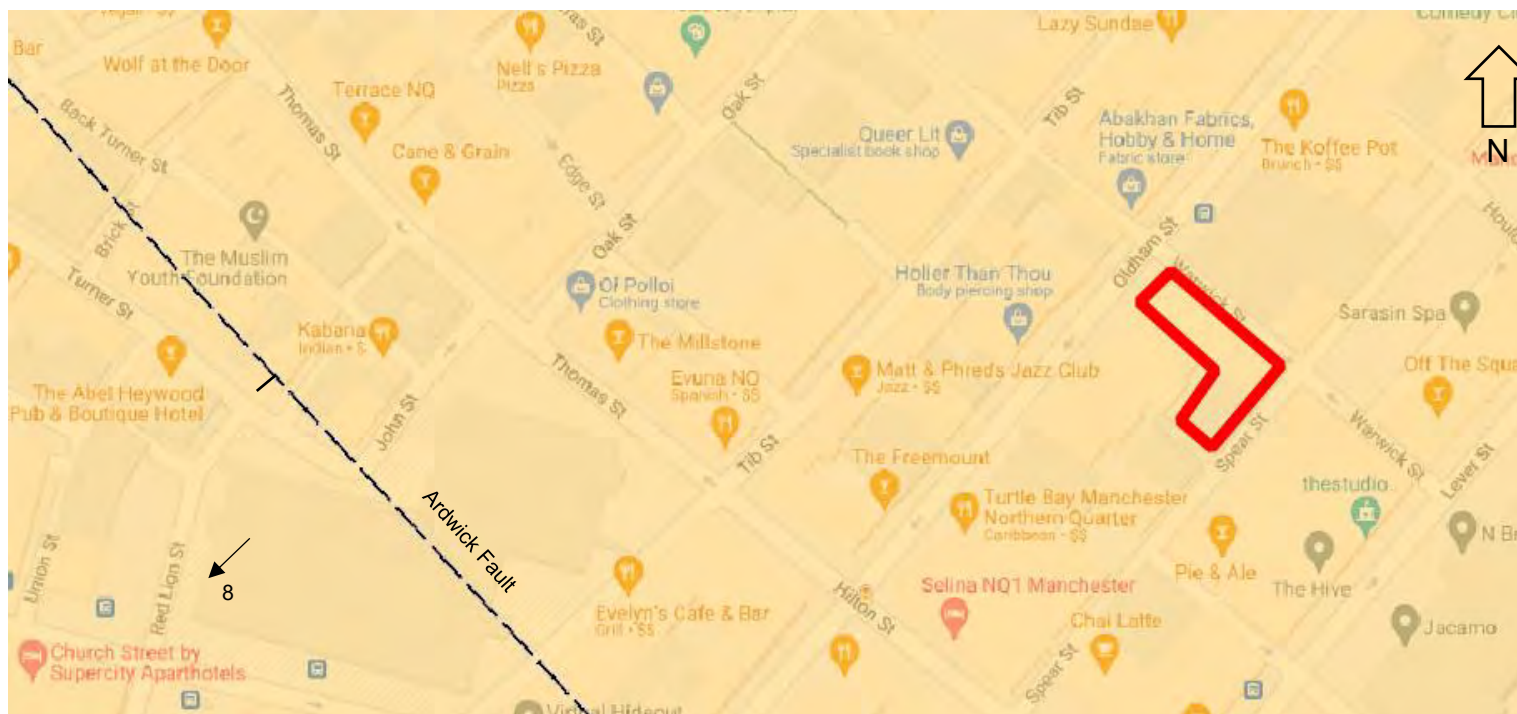


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Title
Linear features Map
Project
68-70 Oldham Street & 61 Spear Street, Manchester
Client
Cumming Group
Date
August 2022
Fig No.
Figure 5
Scale
Scale on map
Key
Site Boundary Chester Formation – Gravelly Sandstone Fault line and throw direction Bedrock dip direction and associated dip angle N
Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com


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37
SJ89NW29BORE or SHAFT *Spear Shaft C. in G. Ancoats St.*County *Lancs.*6-in. Map *104N.E.W.*GSM *608**between Spear St. & Oldham St.**Rockdale Rd. sewer, Manchester*Surface level O.D. *160.48. 48.9m* One-inch Map *85.*Communicated *Manchester Corporation*Date of sinking *1926* Borer *Messrs. Nuttall*

Specimens

Description.	THICKNESS.		DEPTH.	
	Feet.	Inches.	Feet.	Inches.
British Geological Survey	Memo		Memo.	
made ground	1.07	3 6	1.07	3 6
brown silty clay	6.86	22 6	7.93	26 -
dark brown clay with a few stones	4.88	16 -	12.80	42 -
Sandy clay with thin ribbons	5.79	19 -	18.59	61 -
Red sand	0.61	2 -	19.20	63 -
Red sandstone	6.71	22 -	25.91	95 -

(B12288) Ws. 13119—0014 5000 9/27 Gp. 160 O.A.

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com  SOLMEK
SJ88NW29	August 2022	
Project	Figure No.	
68-70 Oldham Street & 61 Spear Street, Manchester	6	
Client		
Cumming Group		

1461

REFERENCES

THE

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

Trial hole excavated to 1.50m
Borehole backfilled on completion, no final overnight standing
water level observed

7/c 5931

Solmek Ltd.
12 Yarm Road
Stockton-on-Tees
TS18 3NA



MANCHESTER CITY COUNCIL
CITY ENGINEER AND SURVEYORS DEPARTMENT

858900

1461

SITE INVESTIGATION FOR <u>Main Drainage</u>					DATE COMMENCED <u>28.3.83</u>				
LOCATION <u>Great Ancoats St. REF: 83/6</u>					BORING METHOD <u>Cable Percussive</u>				
BOREHOLE No. <u>1</u>					BORING DIAMETER <u>150mm</u>				
BRID REFERENCE <u>British Geological Survey</u>					SCALE: <u>1:50 British Geological Survey</u>				

DATE	CASING DEPTH (m)	WATER LEVEL MORNING & EVENING	DEPTH OF STRATA BELOW GL	Reduced Level	DESCRIPTION	No. and Type of Sample	SAMPLE DEPTH PENETRATION		No. of Blows	Legend
							From	To		
28.3.83	7.50		9.00		Firm to stiff brown sandy CLAY with stone inclusions with grey fissures	U6	6.50	6.95		
						D8	7.00			
						U7	7.50	7.95		
						D9	8.00			
						U8	8.50	8.95		

WATER OBSERVATIONS DURING BORING				WATER LEVEL IN CASED/UNCASED BOREHOLE ON COMPLETION		
DEPTH OF WATER ENTRY (m)	ESTIMATED SEEPAGE	STANDING LEVEL (m)	DEPTH OF CASING WHEN SEALED (m)	DATE	WATER LEVEL	DEPTH OF CASING
				REMARKS:--		

SAMPLE TEST KEY D – DISTURBED SAMPLE B – BULK SAMPLE U – UNDISTURBED SAMPLE
 P – SPT SAMPLE W – WATER SAMPLE

NOTE: WHERE FULL 0.3 PENETRATION HAS NOT BEEN ACHIEVED, THE NUMBER OF BLOWS FOR THE QUOTED PENETRATION IS GIVEN (NOT N – VALUE)

ALL DEPTHS AND REDUCED LEVELS IN (m) UNLESS OTHERWISE STATED

REMARKS: Trial hole excavated to 1.5m. Borehole backfilled on completion.

Nº 6 5931

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com  SOLMEK
SJ88NW1461 B	August 2022	
Project	Figure No.	
68-70 Oldham Street & 61 Spear Street, Manchester	8	
Client		
Cumming Group		



Photo 1: Photo taken at the north corner looking south east across site.



Photo 2: Photo taken looking south across site.

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com  SOLMEK
Site Walkover Photos	August 2022	
Project	Figure No.	
68-70 Oldham Street & 61 Spear Street, Manchester	9	
Client		
Cumming Group		

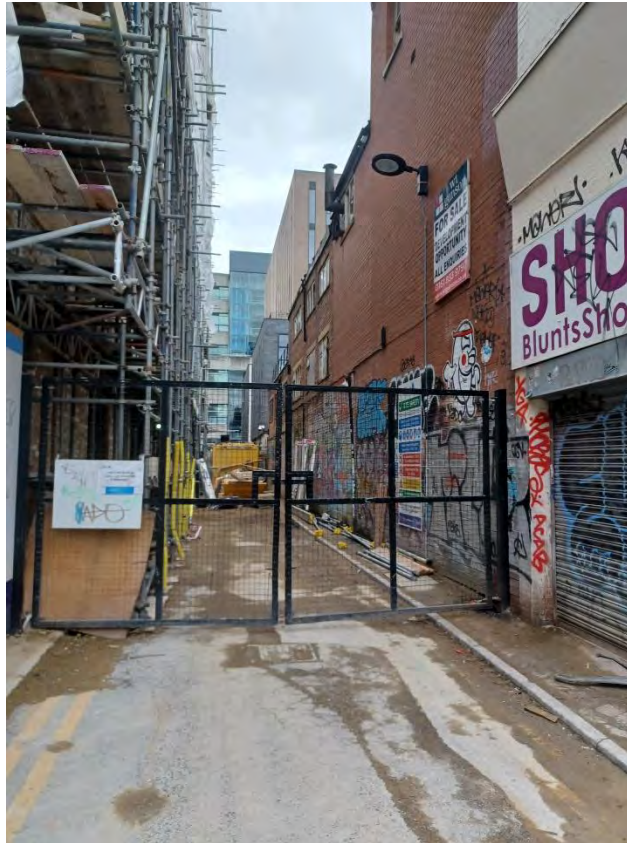


Photo 3: Photo taken at the north corner looking south east across site.



Photo 4: Photo taken east access road looking south west across site.

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com  SOLMEK
Site Walkover Photos	August 2022	
Project	Figure No.	
68-70 Oldham Street & 61 Spear Street, Manchester	10	
Client		
Cumming Group		



Photo 5: Photo taken at the east corner looking north west across site.



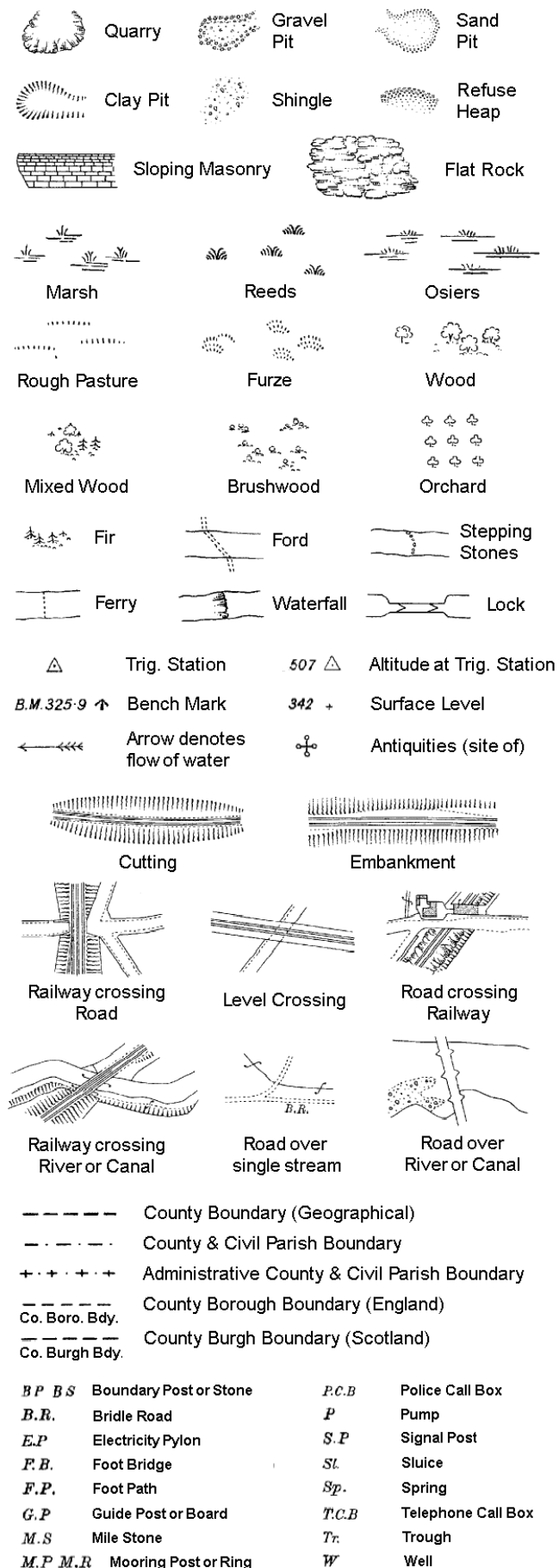
Photo 6: Photo taken at the south corner looking North across site.

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com  SOLMEK
Site Walkover Photos	August 2022	
Project	Figure No.	
68-70 Oldham Street & 61 Spear Street, Manchester	11	
Client		
Cumming Group		

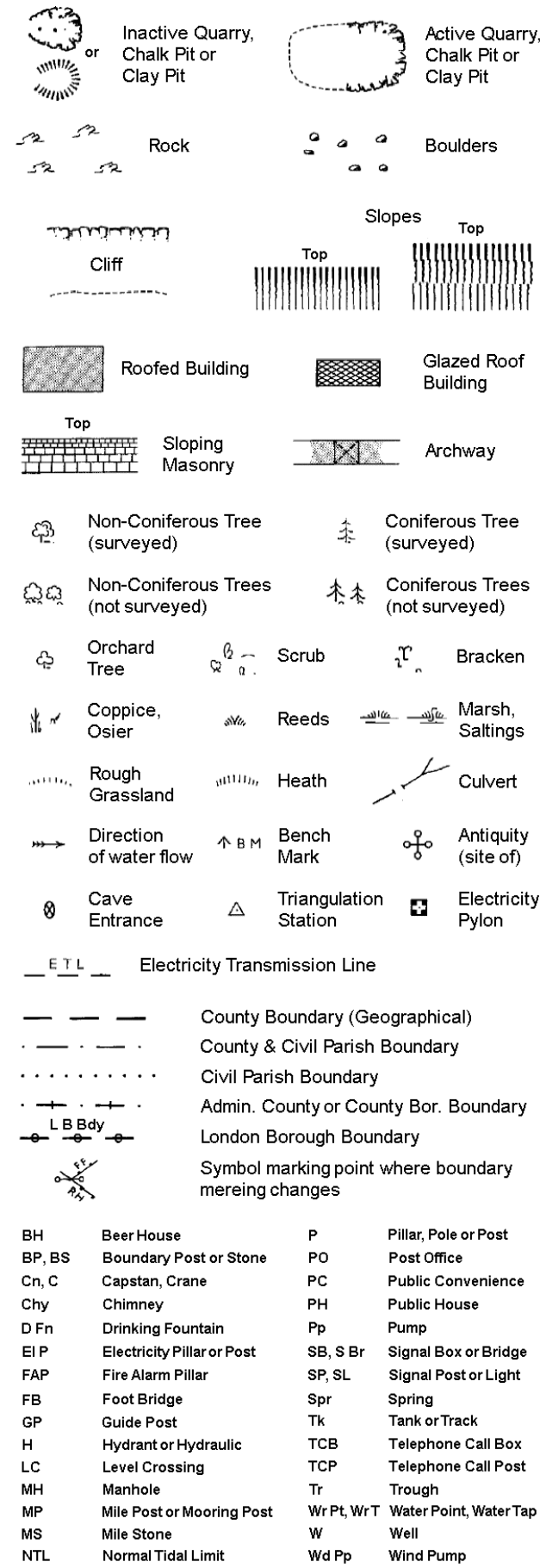
Appendix B

Historical Mapping Legends

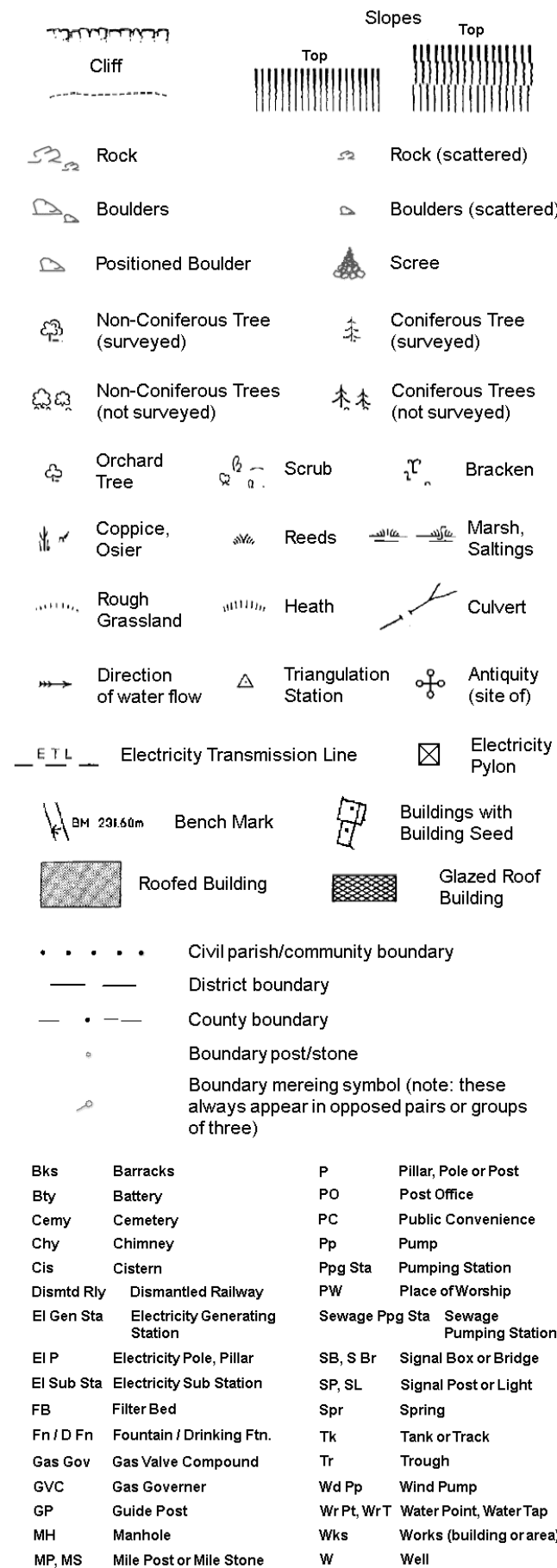
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



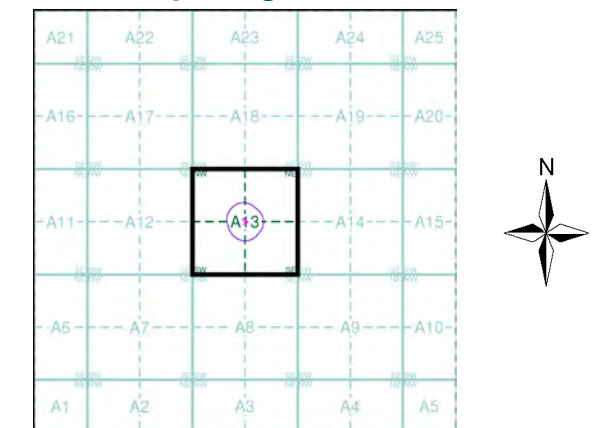
Large-Scale National Grid Data 1:2,500 and 1:1,250



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1892 - 1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1922 - 1933	4
Ordnance Survey Plan	1:1,250	1948	5
Ordnance Survey Plan	1:2,500	1951	6
Ordnance Survey Plan	1:1,250	1951 - 1954	7
Ordnance Survey Plan	1:2,500	1955	8
Ordnance Survey Plan	1:1,250	1963 - 1971	9
Ordnance Survey Plan	1:2,500	1965	10
Ordnance Survey Plan	1:2,500	1969	11
Additional SIMs	1:1,250	1980 - 1985	12
Ordnance Survey Plan	1:1,250	1986	13
Additional SIMs	1:1,250	1988 - 1990	14
Large-Scale National Grid Data	1:1,250	1992	15
Large-Scale National Grid Data	1:1,250	1995	16
Large-Scale National Grid Data	1:1,250	1996	17

Historical Map - Segment A13



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

68-70, Oldham Street, MANCHESTER, M4 1LF



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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	•285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		Administrative County, County Borough or County of City
	Municipal Borough, Urban or Rural District, Burgh or District Council		Borough, Burgh or County Constituency
	Civil Parish		
	BP, BS Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		Well

1:10,000 Raster Mapping

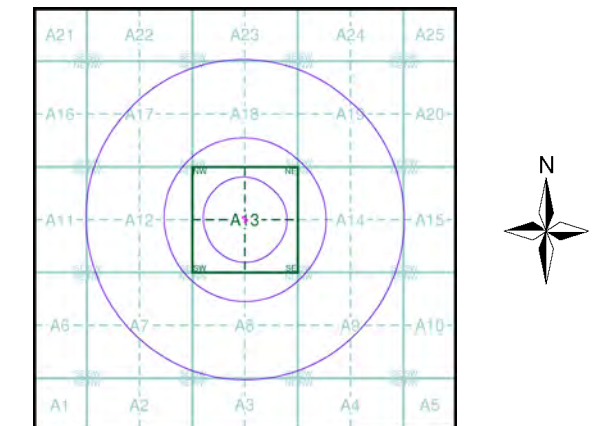
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1848	2
Cheshire	1:10,560	1882	3
Lancashire And Furness	1:10,560	1894 - 1896	4
Lancashire And Furness	1:10,560	1909	5
Lancashire And Furness	1:10,560	1923	6
Lancashire And Furness	1:10,560	1931 - 1933	7
Lancashire And Furness	1:10,560	1938	8
Ordnance Survey Plan	1:10,000	1956	9
Ordnance Survey Plan	1:10,000	1968	10
Ordnance Survey Plan	1:10,000	1972	11
Ordnance Survey Plan	1:10,000	1980 - 1981	12
Ordnance Survey Plan	1:10,000	1985 - 1987	13
Ordnance Survey Plan	1:10,000	1989	14
Ordnance Survey Plan	1:10,000	1993 - 1994	15
10K Raster Mapping	1:10,000	1999	16
Street View	Variable		17

Historical Map - Slice A



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

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Lancashire And Furness

Published 1848

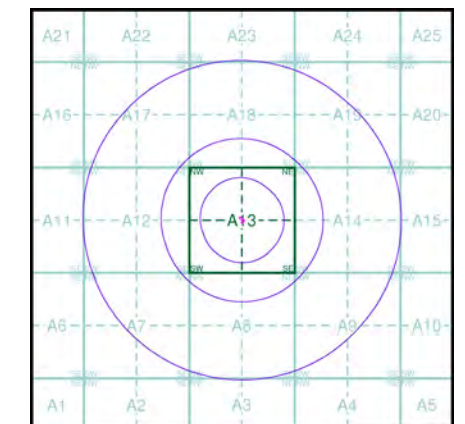
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

10400
1848
1:10,560

Historical Map - Slice A



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

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Lancashire And Furness

Published 1892 - 1893

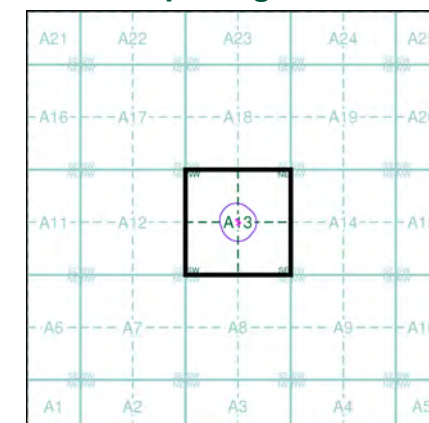
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

104_06 1892 1:2,500	104_07 1893 1:2,500
	104_11 1893 1:2,500

Historical Map - Segment A13



Order Details

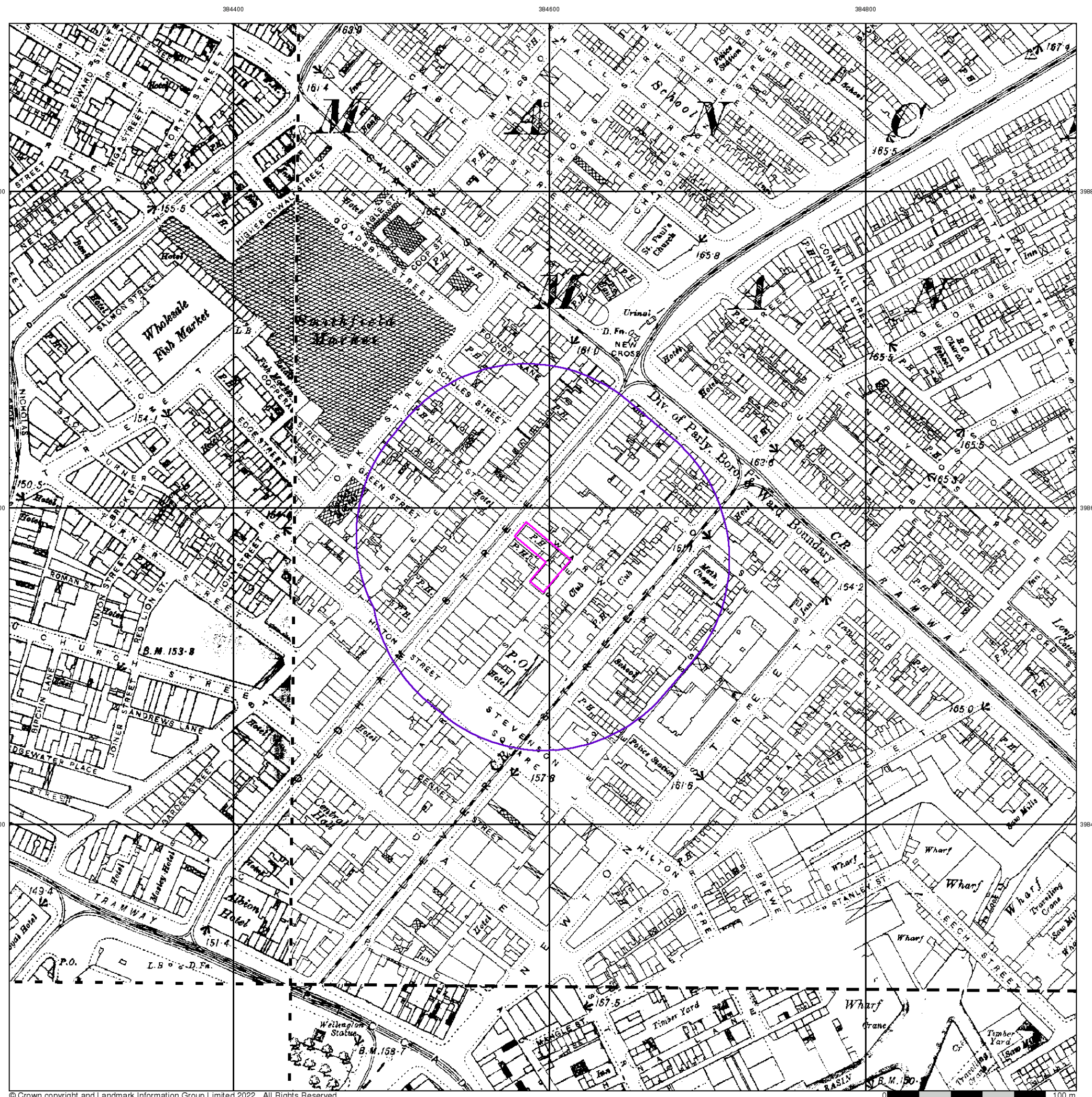
Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

68-70, Oldham Street, MANCHESTER, M4 1LF



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Lancashire And Furness

Published 1894 - 1896

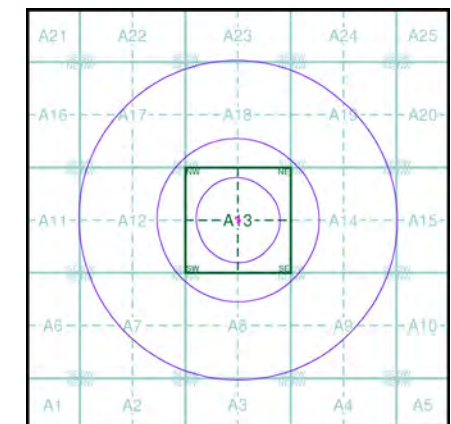
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

104NW 1894 1:10,560	104NE 1894 1:10,560
104SW 1896 1:10,560	104SE 1894 1:10,560

Historical Map - Slice A



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

68-70, Oldham Street, MANCHESTER, M4 1LF



Tel: 0844 844 9952
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Web: www.envirocheck.co.uk



Lancashire And Furness

Published 1908

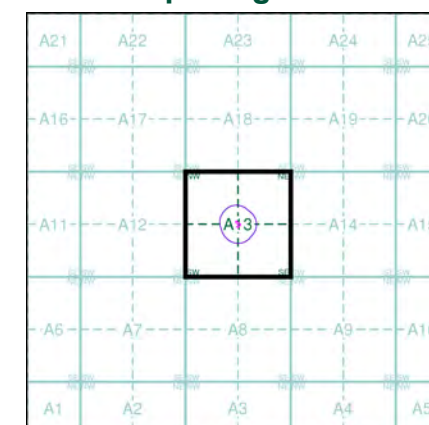
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

104_06 1908 1:2,500	104_07 1908 1:2,500
104_10 1908 1:2,500	104_11 1908 1:2,500

Historical Map - Segment A13



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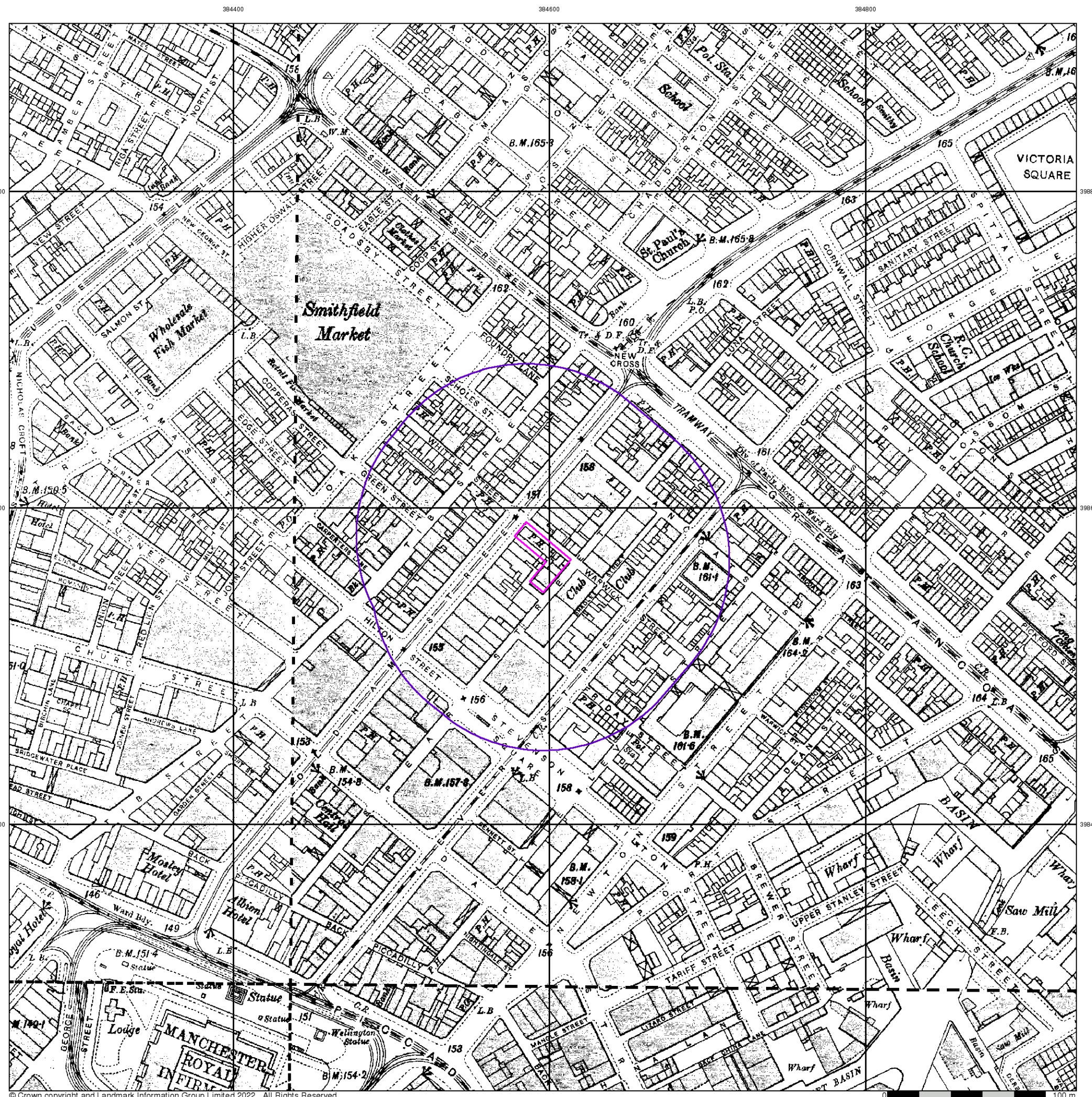
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Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

68-70, Oldham Street, MANCHESTER, M4 1LF



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Fax: 0844 844 9951
Web: www.envirocheck.co.uk





Lancashire And Furness

Published 1909

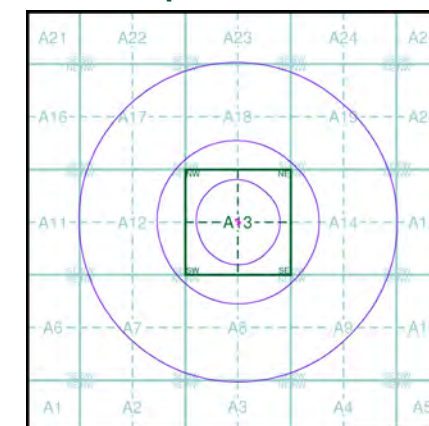
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

104NW 1909 1:10,560	104NE 1909 1:10,560
104SW 1909 1:10,560	104SE 1909 1:10,560

Historical Map - Slice A



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 1000

Site Details

68-70, Oldham Street, MANCHESTER, M4 1LF



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Lancashire And Furness

Published 1922 - 1933

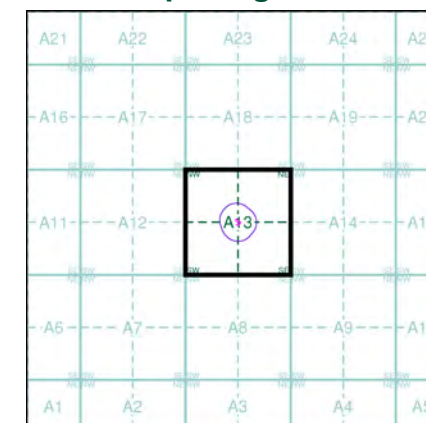
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

104_06 1933 1:2,500	104_07 1922 1:2,500
104_10 1932 1:2,500	104_11 1932 1:2,500

Historical Map - Segment A13



Order Details

Order Number: 299164604_1_1
Customer Ref: S220723
National Grid Reference: 384590, 398570
Slice: A
Site Area (Ha): 0.07
Search Buffer (m): 100

Site Details

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