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35 BROUGHTON STREET

WHITEBOX ARCHITECTS LIMITED ON BEHALF OF MR WHAID AHMED

GRS0310-1314

06/04/2010



GEOTECHNICAL AND GEOENVIRONMENTAL
DESK STUDY REPORT

This report has been prepared for the sole benefit, use and information of Whitebox Architects Limited on behalf of Mr Whaid Ahmed and the liability of Geoenvironmental Risk Solutions Ltd, its Directors and Employees in respect of the information contained in the report will not extend to any third party unless prior written permission is granted.

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EXECUTIVE SUMMARY

Mr Whaid Ahmed proposes to develop a site at 35 Broughton Street, Manchester, M8 8LZ.

The development is likely to involve the extension of the existing building on site and creation of two individual self contained retail/warehouse units within this larger building.

The historical plans show the site to be farmland until 1882-1883 when Clay Pits are formed. These Clay pits are in filled by 1908 and the site is left undeveloped. Around 1968-1975 the current building was constructed.

The published geology indicated the site to be directly underlain by Boulder Clay with the bedrock comprising of Middle to Upper Coal Measures.

The Coal Mining Report indicates that the site is not at risk from past, present or possible future coal workings, adjacent or subjacent to the site.

A preliminary qualitative risk assessment has been conducted based on the historical and current uses of the site and surrounding area. The assessment concludes that the risk to the development in terms of soil contamination is low and ground gas is low to moderate.

Although an intrusive ground investigation has not been requested at this stage, the following is a guide to the most cost effective investigation should it be decided to conduct a survey. A day of mini percussive borehole investigation with suitable sampling, in-situ and laboratory testing and ground gas/water installations and monitoring is recommended.

1 INTRODUCTION

1.1 GENERAL

Mr Whaid Ahmed proposes to develop a site at 35 Broughton Street, Manchester, M8 8LZ.

The development is likely to involve the extension of the existing building on site and creation of two individual self contained retail/warehouse units within this larger building.

Geoenvironmental Risk Solutions Ltd (GRS) has been appointed as geotechnical and geoenvironmental consultants for the project by Whitebox Architects acting on behalf of Mr Whaid Ahmed.

This report forms the Phase 1 Desk Study and comprises a review of available historical, geological, geoenvironmental and geotechnical data together with information gained from a walkover survey of the site.

This report has been carried out with reference to and in line with British Standard BS 10175:2001 Investigation of Potentially Contaminated Sites – Code of Practice.

Although every effort has been made to provide a comprehensive review of the site, GRS cannot accept responsibility for any omissions or errors in data obtained from third parties.

1.2 DATA SOURCES

This desk study report has been prepared using both site specific and generic data sources all of which are listed below combined with previous experience of projects in the area.

Landmark Envirocheck Report 25/03/2010

British Geological Survey map sheet no 85 Manchester

Coal Mining Search Report, The Coal Authority 29/03/210

Site Walkover, GRS 26/03/2010

Environment Agency Online Flood Map

2.1 SITE LOCATION AND DESCRIPTION

The site is located at 35 Broughton Street, Manchester M8 8LZ at approximate national grid reference NGR: 388100, 414190. A site location plan is presented as Figure 1 in Appendix A.

The site comprises a rectangular piece of land of approximately 0.06 Ha in area, which fronts onto Broughton Street. Approximately two thirds of the site is taken up by the retail warehouse. The retail warehouse has two stories with a flat roof. The rear two thirds of the building is a single storey with a sloped roof. The building currently houses a clothing and lingerie shop named 'Bare Essentials'. The eastern third of the site is taken up by a lane, covered by concrete. This provides a side entrance to the store area of the shop. The site is surrounded by brick walls and main access through a gated entrance or the shop doors onto Broughton Street. The site is surrounded by a number of retail warehouse and light factory units.

Photographs of the site taken during the walkover survey are presented in Appendix E.

2.2 SITE HISTORY

2.2.1 GENERAL

The site history is based on the available historical plans contained within the Envirocheck Report supplied by the Landmark Information Group Ltd (LIG) which are listed below. The historical plans are presented in Appendix B.

Date	Scale	Complete/ Incomplete (C/I)
1892-1893	1:2500	C
1908	1:2500	C
1922-1933	1:2500	C
1949-1952	1:1250	I
1951-1953	1:2500	C
1952-1963	1:1250	I
1953-1965	1:1250	I
1958-1975	1:1250	I
1959	1:1250	I
1966	1:1250	I
1968-1975	1:1250	I
1978-1989	1:1250	C
1988	1:1250	I
1989	1:1250	I
1992	1:1250	C
1993-1996	1:1250	C
1996	1:1250	I
1996	1:1250	I

Date	Scale	Complete/ Incomplete (C/I)
1848	1:10560	C
1882	1:10560	I
1894	1:10560	C
1909	1:10560	C
1923	1:10560	C
1931-1932	1:10560	C
1938	1:10560	C
1956	1:10000	C
1966-1968	1:10000	I
1972-1979	1:10000	I
1975 (RMM)	1:25000	C
1980-1986	1:10000	C
1985-1987	1:10000	I
1989	1:10000	I
1990-1994	1:10000	I
1999	1:10000	C
2006	1:10000	C
2009	1:10000	C

2.2.2 PREVIOUS LAND USE

1848

The site and its immediate surrounds comprise of open fields. A stream runs generally north-south to the immediate east of the site. The general area is a mix of rural and built up parts, with Manchester centre to the south. The settlement of Stocks is marked beyond 400m east of the site. A number of Dye Works are marked approximately 900m east of the site. A Railway is shown to run generally northeast-southwest approximately 800m southeast of the site, serving Victoria Station about 900m to the south. A Gas Works is shown approximately 900m to the southeast. The area of Strangeways is marked around 800m to the south of the site, which includes Strangeways Park, c.400m south, A Print Works c.700m south, a Work House c.800m south adjacent to Victoria station. A number of Dye Works are shown along the River Irwell, the closest being approximately 700m southwest of the site. A Chemical Works is marked 900m to the southwest. The settlement of Cheetwood is marked approximately 300m west of the site. A Brick Field is marked around 500m west of the site. Two Print Works and a Dye Works are marked approximately 800m northwest of the site.

1882

The map is incomplete.

1892-1893

The site is now marked as part of an area of Old Clay Pits and Clay Pits, extending approximately 300m north, 200m east, 200m south and 100m west of the site. Broughton Street is now shown, running generally west – east adjacent to the sites northern boundary. A Brick Works and Kilns are marked approximately 50m north of the site, across Broughton Street. These are the closest of a number of Brickworks and Kilns shown in the wider area. These are served by a Tramway that extends to other parts of the Clay Pits. A Gardens, later known as Cheetham Park, is marked c.200m north of the site. The stream that ran adjacent to the east of the site, has a changed course and now terminates in a pond within the Clay Pits approximately 130m west of the site. A Tramway runs up a road later known as Cheetham Hill Road around 250m to the east southeast. The Knowsley Saw Mill is marked approximately 150m southeast of the site. A Railway Ticket Manufactory, Laboratory and Drug Mills and an Art Metal Works is marked c.200m south of the site, with the Derby Brewery shown approximately 300m to the south.

1894

The site and its immediate surrounds have not changed. There has been general development across the wider area, including Brickworks, Breweries, Mills and Metal Works. A railway branch runs from the northeast into Victoria station approximately 600m to the southeast. A prison marked as Her Majesties Prison is shown beyond 250m south of the site. Victoria Station has expanded. An Oil Works is marked approximately 700m southwest of the site. Timber Yards are marked approximately 700 and 1000m west of the site. The Broughton Grove Print Works has Expanded and is now known as Broughton Grove Works.

1908

The site is no longer marked as a Clay Pit. The Brick Works to the north of the site have expanded. The Globe Works (Cabinet), is marked approximately 150m to the southeast of the site, others are marked but this is the closest cabinet makers to the site. The Victoria Carriage Works are marked c.300m southeast of the site. An Ice Works is marked c.200m south of the site. An Electricity Substation is marked c.250m to the southwest.

1909

The site and immediate surrounding have not changed. The wider area has undergone general development. A Jews Hospital is marked approximately 350m north of the site. A Tramway Car Shed (Main Campus) is marked c.800m northwest of the site. The Collyhurst Finishing Works are marked c.950m east of the site. Iron Works is marked c.700m southwest and southeast of the site. The Broughton Grove Works are no longer marked, but a much smaller Lower Grove Works is shown approximately 800m to the northwest.

1922-1933

There has been no change to the site. An Ice Palace is now shown c.70m south of the site, (across the road from the Ice Works). A Preserve Works is marked c.250m northwest of the site. A Tramway is now marked c.300m northwest of the site.

1923

The site has not changed. There has been little general development across the wider area. A Hide Dressing Works is marked c.800m northwest of the site, at the former Lower Grove Works.

1931-1932

The site remains unchanged. There has been general development across the area. The Brick Works to the north of the site has undergone some development. A Technical Institute is marked c.700m northeast of the site. There has been development to the south of the site, a number of large buildings are marked, now covering most of the southern area of the original clay pits, these are named in later maps. A Printing Works is marked approximately 230m southwest of the site. The Hide Dressing Works are now marked as the Lower Grove Works again.

1938

The site has not changed. The Hospital c.350m north of the site has expanded.

1949-1952

The map is incomplete. The site has not changed. The Brick Works north of the site has undergone some development. A PO Engineering Works and a Nursing Home with adjoining Mortuary is noted c.300m north of the site. A Refuse Heap is marked to the northeast of the Brick Works site, approximately 200m northwest of the studied site. A Sawmill is shown 300m to the east of the site. Some of the buildings south and east of the site are now marked, which comprise the following; Adjacent to the southern boundary of the site Aquatite Mills (Garment Rainproofing) is shown. A Dairy is marked adjacent to the Ice works c.120m south of the site. A Corset Factory is shown c.200m south of the site. A Factory (Rain proofing) is marked c.300m to the south. The Empire Cap Works, a Works (Clothing) and a Waterproofing Works are marked around 120m southwest of the site. A Factory (Shoes) is shown adjacent to the Richmond Printing Works, both approximately 200m southwest of the site. The Premier Works (Garment Waterproofing) is marked approximately 200m west southwest of the site. Works comprising (Clothing) and (Meat Canning) are marked c.120m west of the site. A Garment Waterproofing Works are marked c.200m west of the site. The Atlantic Works (Colour Printing) is marked c.250m to the west. A Weighing Machine Repair Works is marked c.180m to the west northwest. The Cabinet Works that are marked c.200m west northwest are now known as the Waterloo Cabinet Works. There are some large buildings that are marked as Manchester Regional Hospital Board Headquarters and The North Western Electricity Board (Area Board Headquarters) between 100 to 200m northwest of the site. The Preserve Works are now marked as the Britannia Preserve Works, and a Clothing Works are marked around 300m to the northwest.

1951-1953

The site and its immediate surrounding areas have not changed. However, the area southeast of the site is now shown. Therefore, the following is additional to the previous map. A Shaft is marked 100m to the east of the site. A Saw Mill is marked c.150m east of the site. A Tobacco Factory is marked c.200m to the southwest of the site. A Printing Works is marked approximately 300m southwest of the site. A Chemical Works and Printing Works are marked around 100m to the south of the site. The Sarlor House (Clothing) is shown approximately 150m to the south. The Drug Works and Laboratory is now marked as Research Laboratories. An Optical Factory is marked approximately 250m to the south.

1952-1963

The map is incomplete. The Brickworks north of the site have undergone development. A Depot is marked approximately 270m north of the site. The Nursing Home and Mortuary c.300m north of the site are now marked as the Manchester Victoria Memorial Jewish Hospital. The Refuse Heap and Clay Pits up to 300m northeast of the site are no longer marked, some small un-named buildings are scattered across this area. A Depot is shown about 300m northeast of the site. The Sawmill c.250m east northeast of the site is no longer marked. An Engineering Works is marked approximately 200m southeast of the site. The Printing, Preserve and Clothing Works around 300m northwest of the site are now marked just as Works.

1953-1956

The map is incomplete. The Engineering Works approximately 200m southwest of the site are marked as Electrical.

1956

The site has not changed. There has been minor development across the area. Brick Works 500 to 1000m northeast of the site are marked as Disused. The Tramway Car Shed approximately 700m northeast of the site is now marked as an Omnibus Depot. The HM Prison 500m to the southwest of the site is now shown with buildings. The Brickworks known as Fairy Lane between 500 to 800m northwest and the Lower Grove Works are no longer marked.

1958-1975

The map is incomplete. The Brick Works north of the site are no longer shown, in its place Warehouses and The Britain Works are marked approximately 110m north and a Printing Works 150m north of the site. A Car Breakers Yard is also marked between 150 and 250m northeast of the site. A Moto Repair Works and Scrap Metal Yard is marked approximately 250m to the west of the site.

1959

The map is incomplete. There has been no change southeast of the site.

1966

The map is incomplete. There has been no change southeast of the site.

1966-1968

The map is incomplete. There has been some development across the area. A Garage and adjacent Works are marked approximately 400m east from the site.

1968-1975

The map is incomplete. The site is now shown to be occupied in its present configuration, by a rectangular building marked as number 35 with side access to the east of the site. A Warehouse and Depot are shown to the adjacent east to southeast areas. The Saw Mill that was approximately 200m east is now marked as a Warehouse. A Factory is marked approximately 180m to the south southeast. The (Tobacco) Factory is now shown as a Warehouse. The Aquatite Mill (Garment Reproofing) is now shown as a Printing Works. The Works (Clothing) of approximately 150m to the southwest is now shown as an Electrical Engineering Works. A Motor Repair Works is marked approximately 220m southwest of the site. Paper Works now encompass the former sites of Meat Canning, Clothing and Garment Waterproofing and Rain Proofing Works around 100m to the west.

1972-1979

The map is incomplete. The site has not changed. There has been little development across the wider area. The River Irwell's course has been changed.

1975 (Russian Military Map)

There does not appear to be any change to the site or surrounding area.

1978-1989

The site and surrounding area does not appear to have changed.

1980-1986

There has not been any change to the site or surrounding area. Minor development has taken place in the wider area.

1985-1987

The map is incomplete. The site has not changed. There has been little redevelopment across the southern area of the site surroundings.

1988

The map is incomplete. The surrounding area has not changed.

1989

The map is incomplete. There has been no change to the site. There has been little change to the shown surrounding area.

1989

The map is incomplete. There has been little change to the shown surrounding area.

1990-1994

The map is incomplete. There has been minor development in the surrounding area. The size of Victoria Station has been reduced.

1992

There has been no changed to the site or the surrounding area. The majority of industrial/commercial premises in the area are now marked as either a Works, a Factory or a Warehouse.

1993-1996

The site has not changed. There has been some redevelopment in the area. The Car Breakers Yard 200m to the northeast has been developed. The Dairy around 120m south of the site has expanded and a Warehouse has been built approximately 200m to the northwest.

1996

The map is incomplete. There has been no change to the shown surrounding area.

1996

The map is incomplete. There has been some development approximately 220m to the north of the site in part of the area that was previously occupied by the Jewish Hospital.

1999

There has been no change to the site. There has been some redevelopment of the wider area. The Sherborne Trading Estate is marked around 250m north of the site.

2006

The site has not changed. There has been general infilling development to the north of the site. Large buildings later known as Manchester Fort are marked around 500m to the northwest of the site.

2009

There has been no change to the site. There has been redevelopment across the general area.

2.2.3 RECENT SITE HISTORY

The site is covered by the building shown on the map and comprises of a retail premises with adjoining side entrance and lane, which is gated and covered by hardstanding.

2.3 PROPOSED DEVELOPMENT

The client is proposing to extend the current retail warehouse building across the side entrance lane and create two separate compartments for retail units.

3.1 GENERAL

The site is located in a generally industrial setting with the predominant land use being relatively high density industrial / commercial premises. The following statutory information is presented in detail in Appendix C.

The 250m radius search is considered as the most pertinent to the proposed development.

3.2 CONTEMPORARY TRADE DIRECTORY ENTRIES

A search encompassing a 250m radius around the site boundary revealed a limited amount of trade entries which could cause a contaminative constraint to the development of the site.

The registered contemporary trade entries are listed in the table below with a brief description of the processes or activity.

Table 3.2 - Contemporary Trade Entries within 250m of the Development

Business Name	Distance from Site (m)	Direction	Status	Activity
First Impressions	10	E	Active	Lingerie and Hosiery Manufacturers and Wholesalers
Vick Trading Ltd	14	W	Inactive	Leisure and Sportswear Manufacturers
Vellector Ltd	14	W	Inactive	Glass fibre – Materials and Tools
Pak Nylon	34	SE	Active	Lingerie and Hosiery Manufacturers and Wholesalers
Baixin Traiding	57	SE	Inactive	Electrical Goods Sales, Manufacturers and Wholesalers
H2F	102	NW	Inactive	Toiletries
Xited UK Ltd	40	NW	Active	Lingerie and Hosiery Manufacturers and Wholesalers
Kashvip (Manchester)	67	NW	Inactive	Hosiery Manufacturers and Wholesalers
Elegant Collection	49	N	Inactive	Clothing and Fabrics Manufacturers.
Lasani Apparels Ltd	62	E	Active	Clothing and Fabrics Manufacturers.
Sabah International Leatherwear Ltd	107	W	Inactive	Leather Merchants and Wholesalers
Mia Fashions	107	W	Active	Clothing and Fabrics Manufacturers and Wholesalers
Sabah International Leatherwear	107	W	Active	Leather Garments and Products
Samson Hosiery Ltd	136	W	Active	Lingerie and Hosiery Manufacturers and Wholesalers
Hain Celestial	136	W	Active	Food Products Manufacturers
Small Talk	107	S	Inactive	Children's and Baby wear Manufacturers and Wholesalers.
Elopak Ltd	111	S	Inactive	Bottle Manufacturers and Suppliers.
Gessy Fasion	146	S	Active	Bags, Belts and Accessories, Manufacturers and Suppliers.
Barlinda Leathergoods (Handbags and purses) ltd	113	N	Inactive	Leather Garments and Products

J A Harrison and Co (Manchester) Ltd	121	N	Active	Seal and Joint Manufacturers
Longslow Food Group	113	E	Inactive	Dairies
Longslow Dairies (NorthWest)	113	E	Inactive	Dairies
Little Giants Ltd	130	E	Inactive	Children and Babywear Manufacturers and Wholesalers
Jack 'N' Jill Ltd	130	E	Active	Children and Babywear Manufacturers and Wholesalers
Samuel Simpson and Co Ltd	130	E	Active	Soft Furnishings Manufacturers
Influence Apparel	124	SE	Inactive	Clothing and Fabrics Manufacturers
Arctic Clothing Ltd	124	SE	Inactive	Textile Manufacturing
Nsi Electrical World Ltd	124	SE	Inactive	Electrical Goods Sales, Manufacturers and Wholesalers
2nd Chance	137	W	Inactive	Classic Car Specialists
E C Contract Division Ltd	155	W	Inactive	Clothing and Fabric Manufacturers
Cameo Shop Fitting Ltd	158	W	Inactive	Shop Fittings Manufacturers
Fabuline	164	E	Inactive	Clothing and Fabrics Manufacturers
2 C D Designs	170	W	Inactive	Lingerie Manufacturers and Wholesalers
Cross	171	N	Active	Clothing and Fabrics Manufacturers
Fortune Textiles Ltd	183	NE	Active	Textile Manufacturing
Finlays'S Foods	191	N	Inactive	Food Products Manufacturers
A N Fashions	202	N	Active	Clothing and Fabrics Manufacturers
Mucharski Bags	198	SE	Inactive	Bags Belts and Accessories Manufacturers and Suppliers
Hasan Hangers Ltd	220	SE	Inactive	Packaging Materials Manufacturers and Suppliers
Zafer Hosiery Co	240	SE	Inactive	Hosiery Manufacturers and Wholesalers
Sk and Associates	240	SE	Inactive	Clothing and Fabrics Manufactures
Mode Handbag	240	SE	Active	Bags Belts and Accessories Manufacturers and Wholesalers
Shoes World	240	SE	Inactive	Footwear Manufacturers and Wholesalers
Breifco Wholesale	213	E	Active	Lingerie and Hosiery Manufacturers and Wholesalers
M and S Textiles	238	SE	Active	Clothing and Fabrics Manufacturers
Heidrun (UK) Ltd	242	SE	Inactive	Container Manufacturers
Evitrend Ltd	229	S	Inactive	Knitwear Manufacturers and Wholesalers
Lex Knitwear Ltd	229	S	Active	Clothing and Fabrics Manufacturers
Saba	229	S	Active	Printers
Freedia Fabrics	229	S	Active	Clothing and Fabrics Manufacturers
R and Q Ltd	229	S	Active	Clothing and Fabrics Manufacturers
Fine Shape (Clothing) Ltd	230	S	Inactive	Clothing and Fabrics Manufacturers
Victory Trading (UK) Ltd	230	S	Active	Clothing and Fabrics Manufacturers
Top Trade Ltd	232	SW	Active	Toiletries
Wicked Nights	243	SW	Active	Lingerie and Hosiery Manufacturers and Wholesalers
Arien Refrigeration Service	245	E	Active	Refrigerators and Freezers Servicing and Repair

Some of the above listed trade entries may be considered to pose a risk to the site. These risks are discussed within the preliminary risk assessment in section 9.

Numerous trade entries exist outside the 250m radius but are unlikely to pose a constraint to the proposed site developments.

3.3 DISCHARGE CONSENTS

There are no discharge consents that are recorded within the 250m radius. This will not affect the proposed development.

3.4 POLLUTION INCIDENTS TO CONTROLLED WATERS

There are no pollution incidents to controlled waters listed within the 250m radius around the site. This is not expected to pose a constraint to the development.

3.5 WASTE

3.5.1 HISTORICAL LANDFILL SITES

There are three recorded Historic Landfill Sites within 250m of the development. These are summarised in the table below.

Table 3.5.1 Historical Landfill Sites,

Licence holder	Name	Distance from Site (m)	Input dates	Specified Waste Type.
Not Supplied	Elizabeth Street	39	Not Supplied	Not Supplied
Not Supplied	Land at Fairy Lane	467	Not Supplied	Deposited Waste included, Commercial and Household Waste.
Manchester City Council	Queens Road Tip – Land to south of Queens Road and north of Collingham Street	488	31/12/1955 13/12/1970	Deposited Waste Included Inert, Industrial, Commercial, Household and Special Waste, and Liquid Sludge

The above listed Historic Landfill Sites may be considered to pose a risk to the site. These risks are discussed within the preliminary risk assessment in section 9.

Numerous Historical Landfill Sites exist outside the 250m radius but are unlikely to pose a constraint to the proposed site development.

3.5.2 LICENCED WASTE MANAGEMENT SITES

There is one recorded Licensed Waste Management site within 250m of the development. It is summarised in the table below.

Table 3.5.2 Licensed Waste Management Sites,

Operator Name	Site Category	Distance from Site (m)	Licence Issued	Licence Status.
Kains Steel Drums	Material Recycling Treatment Facilities	302	17/11/1998	Surrendered

The above Licensed Waste Management Facility may be considered to pose a risk to the site. These risks are discussed within the preliminary risk assessment in section 9.

Numerous Licensed waste Management Sites exist outside the 250m radius but are unlikely to pose a constraint to the proposed site developments.

3.5.3 WASTE TREATMENT OR DISPOSAL SITES

There is one Registered Waste Treatment or Disposal Site within 250m of the development. This is summarised in the table below.

Table 3.5.3 Registered Waste Treatment or Disposal Sites

Licence holder / location	Type of Waste/ Waste Source Restrictions	Distance from Site (m)	Dates of operation	Last Reported Status.
T Kain t/a Kain Steel Drums	Various/ No Known Source Restrictions	281	17/11/1998 present	Operational

The Registered Waste Treatment Site may be considered to pose a risk to the site. These risks are discussed within the preliminary risk assessment in section 9.

Numerous Registered Waste Treatment Sites exist outside the 250m radius but are unlikely to pose a constraint to the proposed site developments.

3.6 SENSITIVE LAND USES

There is an area of Nitrate Venerable Zone at 0m at the site. This is not considered to pose a constraint to the development.

3.7 HYDROGEOLOGY

3.7.1 GEOLOGICAL CLASSIFICATION

The site lies above a Major Aquifer as defined by the Environment Agency (EA). The EA define a Major Aquifer as a highly permeable formation, usually with a known or probably presence of significant fracturing.

They may be highly productive and able to support large abstractions for public water supply and other purposes.

Likely risks to protected waters are presented in Table 9.2 in Section 9 of this report.

3.7.2 SOIL CLASSIFICATION

Further to the above definition the soils beneath the site have been defined as having a high leaching potential, that is they are considered to have a high potential for contaminants to be leached from them by the presence of a percolating liquid i.e. water.

This worst case vulnerability classification (H) is reserved for restored mineral workings and urban areas until proved otherwise by a site investigation and subsequent laboratory testing.

3.8 HYDROLOGY

The closest body of water lies at approximately 418m to the southwest of the site and comprises of the River Irwell. The river is not considered to pose a constraint to the development.

3.9 FLOODING

Flooding has become a major issue during the past few years, with a number of large flood events impacting many towns and villages. The EA is the main source of consultation regarding the impact that flooding would have to the development, whether issuing standing advice for proposed developments or by direct and ongoing consultation throughout the planning process. The EA produces flood maps for the whole country by looking at historical and possible sources and paths of fluvial and marine causes of flooding. These maps however, do not cover the potential of flooding to occur by any other sources e.g. groundwater, surface runoff, snowmelt, service failure.

A preliminary assessment of the fluvial and tidal risk of flooding on site indicates that the site (based on EA Flood Maps and Envirocheck Data) is in an area of Low likelihood of being affected by a flood event. That is to say that there is less than 0.1% (1 in 1000) chance of flooding from rivers or seas in any single year.

3.10 RADON

Based on the available information the site does not lie within an area where radon protection measures would be required. This could be easily confirmed by testing of existing structures in the vicinity.

3.11 JAPANESE KNOTWEED

No evidence of Japanese Knotweed was noted at the time of the site walkover survey.

4 GEOLOGY

Published geological data has been studied using BGS Sheet 85 Manchester Drift Map together with experience gained on other projects in this area of Manchester.

4.1 PUBLISHED DATA

4.1.1 SUPERFICIAL DEPOSITS

The likely superficial deposits would comprise of Glacial Boulder Clay directly underlying the site.

4.1.2 BEDROCK

It is likely that the bedrock will comprise Upper to Middle Carboniferous Coal Measures

5 COAL MINING

A Coal and Brine Report has been obtained by GRS from the Coal Authority, see Appendix D. The report states that the site is not in the zone of influence from any past or present workings, and is not in an area where the coal authority is determining to grant a licence for abstraction.

6. PREVIOUS GROUND INVESTIGATIONS

No details of previous investigations were available to GRS at the time of writing this report.

7 REVIEW OF POTENTIAL SOURCES OF CONTAMINATION

As part of the risk assessment process it is necessary to identify potential sources of contamination and chemicals of concern based on the historical uses of the site.

As well as potential contamination from past and present uses, there is the risk of ground gas generation from both natural and anthropogenic sources.

The potential sources are reviewed in the tables below, which have been compiled with reference to the Environment Agencies Industry Profiles where available. The contaminating agents and their toxicological effects to humans are discussed in section 8 of this report.

Table 7.1 - Review of Potentially Contaminative Land Uses on and Immediately surrounding the site

Industry/ Process	On/Off Site Past/Present	Distance From Site (m)	Contaminating Agents	Causes
Clothes Retailer	On site Present	0	Asbestos	Old building techniques and materials.
Clothes Manufacturer	On site and off site Past and Present	0	Asbestos, Dyes, Inks, Solvents, Fuels, Lubricating oils.	Material and substances used in the process of clothing manufacture.
Clay Pits (with associated tramways) and Backfill	On site and off site Past	0	Various, including but possibly not limited to: Inorganic, Organic and Metallic Compounds. Natural and anthropogenic ground gasses.	Quarrying activities, unknown backfilled materials, decomposing rubbish.
Brick works	Off site Past	20m	Fuels, Oils, Metals,	Brick manufacturing activities.
Glass fibre materials and tools	Off site, Past	14m	Fuels, Metals, Plastics, Solvents	Materials and substances used for making glass fibre
Clothing Water-proofing	Off site, Past	20m	Fuels, Oils, Metals, Solvents, Plastics	Materials and substances used for waterproofing materials.
Electrical goods manufacture and retail	Off site, Past	57m	Fuel, Oils, Solvents, Metals.	Materials and substances used for the manufacture of electrics, electrical components and their products.

Table 7.2 - Summary of Potentially Contaminative Land Uses in extended surrounding area

Industry/ Process	Off Site Past/Present	Contaminating Agents
Clothing Manufacture, including leather	Off site, Past and Present	Dyes, Solvents, Fuels, Oils.
Food Products Manufacturing	Off site, Present	Fuels, Oils, Solvents, Plastics, Metals,
Seal and Joint Manufacturers	Off site, Present	Metals, Oils, Solvents, Fuels,
Printers	Off site, Present	Metals, Oils, Solvents, Inks, Dyes,
Refrigeration Servicing and Repair	Off site, Present	Metals, Oils, Solvents, Refrigeration Gasses.
Footwear Manufacturers	Off site, Past	Metals, Plastics, Rubber, Dyes, Fuels, Solvents,
Bottle Manufacturers	Off site, Past	Metals, Plastics, Solvents, Fuels,
Dairies	Off site, Past	Fuels, Oils, Solvents, Refrigeration Gasses,
Packaging Materials Manufacture	Off site, Past,	Fuels, Oils, Plastics, Metals, Dyes, Solvents,

Without site specific information it is impossible to determine to any degree of accuracy the risk to the site from ground gas. However a tentative assessment would place the site at low to moderate risk given the fact that the site is located on Past worked Clay Pits that have been infilled.

8 SUMMARY OF POTENTIAL CONTAMINANTS AND THEIR CHARACTERISTICS

The various contaminants and their potential effects are summarised in the table below.

Table 8 - Summary of Contaminants and their Typical Characteristics.

Contaminants	Typical Effects	Mobility
Metals: i.e. Arsenic, Lead, Zinc, Copper, Nickel, and Boron.	Most are known to be toxic to humans in sufficient quantities. Exposure through ingestion or dermal contact can result in a variety of effects such as kidney, liver, lung and brain damage. Some are carcinogenic. Others are toxic to plants and can inhibit their growth.	Generally poor mobility, however this can vary due to soil pH. They may be present as additives within more mobile phases such as liquids.
Inorganic Compounds: Acids, Alkalis, Cyanides, Sulphate compounds.	Causes skin irritation. Sulphate and chloride compounds can cause the deterioration of concrete.	Variable, largely dependent upon solubility.
Organic Compounds: Polyaromatic Hydrocarbons (PAH), Fuels, Oils, Solvents, and Phenols.	A wide range of human health effects including brain damage and cancer. Damage to concrete and underground services. Flammability and or explosion risk.	The lighter compounds are typically highly mobile in both liquid and vapour form. Heavier compounds such as tars are less mobile. Chlorinated solvents are generally heavier than water and can migrate downwards through aquifers.
Ground gases (Natural and Anthropogenic): Methane, Carbon Dioxide, Oxygen depletion and Hydrogen Sulphide.	Explosion, asphyxiation and toxicity.	Highly mobile in solution or in gaseous phase.
Asbestos	Exposure through inhalation can result in cancer of the lung, mesothelioma and asbestosis.	Asbestos is not soluble or biodegradable. Chrysotile (white asbestos) is the only form that can be attacked by acid.

This is a preliminary qualitative assessment and should be augmented by sampling and testing to confirm the assumptions below and should be amended/developed to take into account any significant changes caused by the proposed end use e.g. landscaping etc, and any further information as it becomes available.

9.1 CURRENT LEGISLATION

The current UK framework (Contaminated Land Exposure Assessment (CLEA)) for the assessment of potentially contaminated land as set out by the Department of the Environment, Farming and Rural Affairs (DEFRA) is based on the pollutant linkage or Source-Pathways-Receptor scenario.

In order for land to be legally classified as contaminated under Part IIa of the Environmental Protection Act (EPA) 1990 all three of the elements pollutant linkage must be present.

Generic land uses have been published under the CLEA guidance and are divided into the following categories.

Residential

Allotments

Commercial / Industrial

Each of these generic land uses has a prescribed set of pathways and assumptions associated with them which effectively characterise the land in terms of the way it is used. Further to this a set of Soil Guideline Values (SGV's) for a limited number of contaminants have been developed and published by DEFRA. It should be noted that CLEA is concerned with *human health only*.

9.2 PRELIMINARY QUALITATIVE RISK ASSESSMENT

For the purposes of this qualitative assessment, the land use of **Commercial/Industrial** best fits the proposed development and as such will be used for the assessment of any potential risks to human health.

In order to assess a potential site it is a requirement of the CLEA model that a preliminary conceptual model of the site is prepared which clearly identifies the likely sources, pathways and receptor elements.

The preliminary conceptual model in terms of pollutant linkages is presented in Table 9.2 below.

The overall assessment of the materials present on site indicates that there is an overall **Low risk**.

Based on the assumptions within Table 9.2, materials on or below the site should be assessed in terms of concentrations of potential contaminants of concern considered in Table 7. Any site investigation performed should be adequately designed to address these issues.

Table 9.2 - Pollutant Linkages within the Preliminary Conceptual Model

Source	Pathway	Receptor	Likelihood of risk
Soil	Dermal Contact with outdoor soil	Builders/Contractors	Low
Soil	Outdoor inhalation of fugitive dust	Builders/Contractors	Low
Soil	Outdoor ingestion of soil	Builders/Contractors	Low
Soil	Outdoor inhalation of soil vapours	End Users/Builders/Contractors	Low
Soil	Indoor inhalation of soil vapours	End Users	Low
Soil	Leaching	Groundwater	Low
Soil	Soil Pore Migration	Buildings/Sub Surface Structures	Low
Groundwater	Contact	Construction and Maintenance Workers	Low
Groundwater	Migration	Buildings/Sub Surface Structures	Low
Ground Gas	Migration through ground	End Users/Builders/Contractors	Low-Moderate

10 SUMMARY OF AVAILABLE INFORMATION

Item No.	Item Title	Item Description	Comments
1	The Site	The site comprises a rectangle fronting onto Broughton Street with a building taking up the western three quarters of the site and a side entrance to the east, covered by hard standing. The site is surrounded by light industrial and commercial premises.	Information based on site visit and available maps.
2	History	The site remains open fields until 1882-1883 when it becomes part of a complex of Clay Pits, which are filled in by 1908. Although the surrounding area becomes built up the site remains un-marked until 1968-1975 when the current building is constructed.	Taken from historical ordnance survey plans and a site visit.
3	Geology	The site in underlain by Boulder Clay and Middle to Upper Coal Measures.	Information from British Geological Survey (BGS).
4	Mining	The site is not at risk from past, present or possible future coal workings adjacent or subjacent to the site.	Information from Coal Authority Report (29/03/2010)
5	Ground Conditions	It is indicated that the drift deposits which overly the bedrock comprise of Boulder Clay. Above these deposits an unknown thickness of Made Ground is anticipated, created by infill of the historical Clay Pits. From the walkover survey, it is known that the surface of the site entrance is covered by a substantial thickness of hard standing.	Further ground investigation may be required to establish site specific ground conditions.
6	Groundwater	The strata beneath the site are indicated as a Major Aquifer.	A ground investigation can be undertaken to establish groundwater regimes if required.
7	Landfill	The site is located on and adjacent to historically worked Clay Pits which have been backfilled prior to the construction of the current buildings on site.	Contamination and Ground Gas may be present or have migrated onto the site.
8	Contamination	The site has been given an overall Low contamination risk.	Further survey may be useful with a small scale site investigation to rule out any potential contamination.
9	Geotechnical Constraints	Site Specific Geotechnical data is likely to be required to facilitate specific foundation design.	Further survey may be useful with a small scale site investigation to establish geotechnical design parameters.
10	Geoenvironmental Constraints	Based on the site history, the preliminary risk assessment indicated that the site is at Low risk of contamination and Low-Moderate risk from ground gas.	Further survey may be useful with a small scale site investigation to rule out the presence of any potential contamination and ground gas.
11	Proposed Foundations	It is likely that traditional pad and strip foundations will be suitable for the proposed building extension.	Further survey may be useful with a small scale site investigation to establish site specific parameters.

12	Proposed Ground Investigation	Although the conceptual ground model has shown that the site is at minimal risk from ground related problems, a small scale site investigation may be useful to determine site specific parameters to discount any ground related risks.	If required the SI should consist of mini-percussive boreholes. Gas and Groundwater standpipes can be installed to establish ground gas and groundwater levels if needed. If it is considered that an SI is required then geotechnical and chemical testing on selected soil and water samples should be carried out.

11.1 GEOTECHNICAL CONSTRAINTS

11.1.1 SUBSURFACE CONCRETE

There is the potential that soil or groundwater contamination on site could damage subsurface concrete. Suitable testing should be undertaken to allow the adequate design of any subsurface concrete.

11.1.2 FOUNDATIONS

It is likely that traditional pad and strip footings will be sufficient for the proposed development of the extension to the existing retail unit. However foundations for any new structures on site will require site specific parameters and if required then a site investigation can be carried to obtain the relevant data.

11.1.3 SERVICES

Services are likely to exist on site and may or may not be live. A suitably qualified utility tracing contractor should be employed to further delineate the location of the services, which may require protection or diversion to accommodate the extension.

11.2 GEOENVIRONMENTAL CONSTRAINTS

11.2.1 CONTAMINATED SOILS

There is the potential for contaminated material to be present on site. The overall risk of this potential contamination is considered to be Low. As the development comprises an extension to an existing commercial/industrial premises it is unlikely that any contamination, if present, will affect the end users of the site as it has been covered by the original building and hardstanding for over 40 years and is proposed to be covered by the new extension. However, a suitably designed site investigation can be carried out should an assessment of the quality of the soils and therefore the potential risks to the development and construction workers is deemed appropriate.

11.2.2 WASTE DISPOSAL

Should it be necessary to remove any material from the site Waste Acceptance Criteria (WAC) testing should be carried out prior to removal in order to classify the materials for disposal at a suitably licensed landfill site.

It should be noted that WAC testing can take up 10 days to perform and sufficient time should be allowed in order to prevent delays to the construction program.

12 DESIGN ASSUMPTIONS - RISK MATRIX

Item Description	Comments	Risk	Recommendations
Foundations	Ground conditions probably comprise made ground over Glacial Boulder Clay and Carboniferous Coal Measures	2	An investigation specific to the development would provide useful data for foundation design.
Ground Slab Build Up	Ground bearing slab may be feasible.	2	The quality of near surface deposits can be assessed by means of a small scale site investigation.
Mining	Shallow old mine workings are not considered to pose a constraint to the development.	1	None.
Contamination	There is a Low risk of contamination.	2	A ground Investigation could be conducted to rule out the possibility of any ground contamination.
Ground Gas	The risk from ground gas is considered to be Low to Moderate.	2	Ground gas installations and monitoring can be carried out for further assessment of this risk.
Pavement Build Up	Paved areas are unlikely to be required.	1	None.
Slopes	Steep slopes are not part of the development.	1	None.
Cut and Fill	Minor cut and fill may be required to level the site.	2	If this is the case then soil specific parameters are likely to be required.
Retaining Walls	Retaining walls are not considered to be part of this development.	1	None.
Flooding	The site is not at risk of fluvial or marine flooding, even during extreme flood events.	1	None.
Drainage	Published data suggests that soakaways are unlikely to be feasible at this site.	1	None.
Radon	Less than 1% of homes are above the action level.	1	None.

1. The recommendations are based on available information on 06/04/2010.
2. A full site investigation has to be carried out before design scheme.
3. The risks are on a scale of 1 to 5.
4. Risks rated 1 & 2 no action. Risks rated 3 & 4 can be downgraded with further information which is due to become available. Those rated 5 need costs allocating.

13 SITE INVESTIGATION RECOMMENDATIONS

13.1 GENERAL

As the development is an extension for which the local authority have not requested an intrusive site investigation at this stage. However, for design purposes it may be useful to undertake a small scale investigation to discount potential ground related risks and provide site specific information for foundation design.

13.2 PROPOSED INVESTIGATION

The details of the small scale intrusive site investigation should be decided and agreed with client once the proposed site layout has been finalised. However the following information is considered to be a guide to the likely methods and quantities of the investigation if it is decided to proceed with one.

13.2.1 MINI-PERCUSSIVE BOREHOLES

Mini-percussive boreholes are a relatively quick and economic method of investigating shallow ground conditions. The mini-percussive boreholes can be used to establish geotechnical soil parameters as well as the ground gas and groundwater regime. Standard Penetration Tests (SPTs) can be obtained from mini-percussive boreholes, which give an indication of relative density in granular soil and indicative strength/cohesion of cohesive soils.

An estimate of the required borehole density for a site of this size would be around three to four mini-percussive boreholes. It is therefore recommended that one day of mini-percussive investigation should be carried out at this site if required.

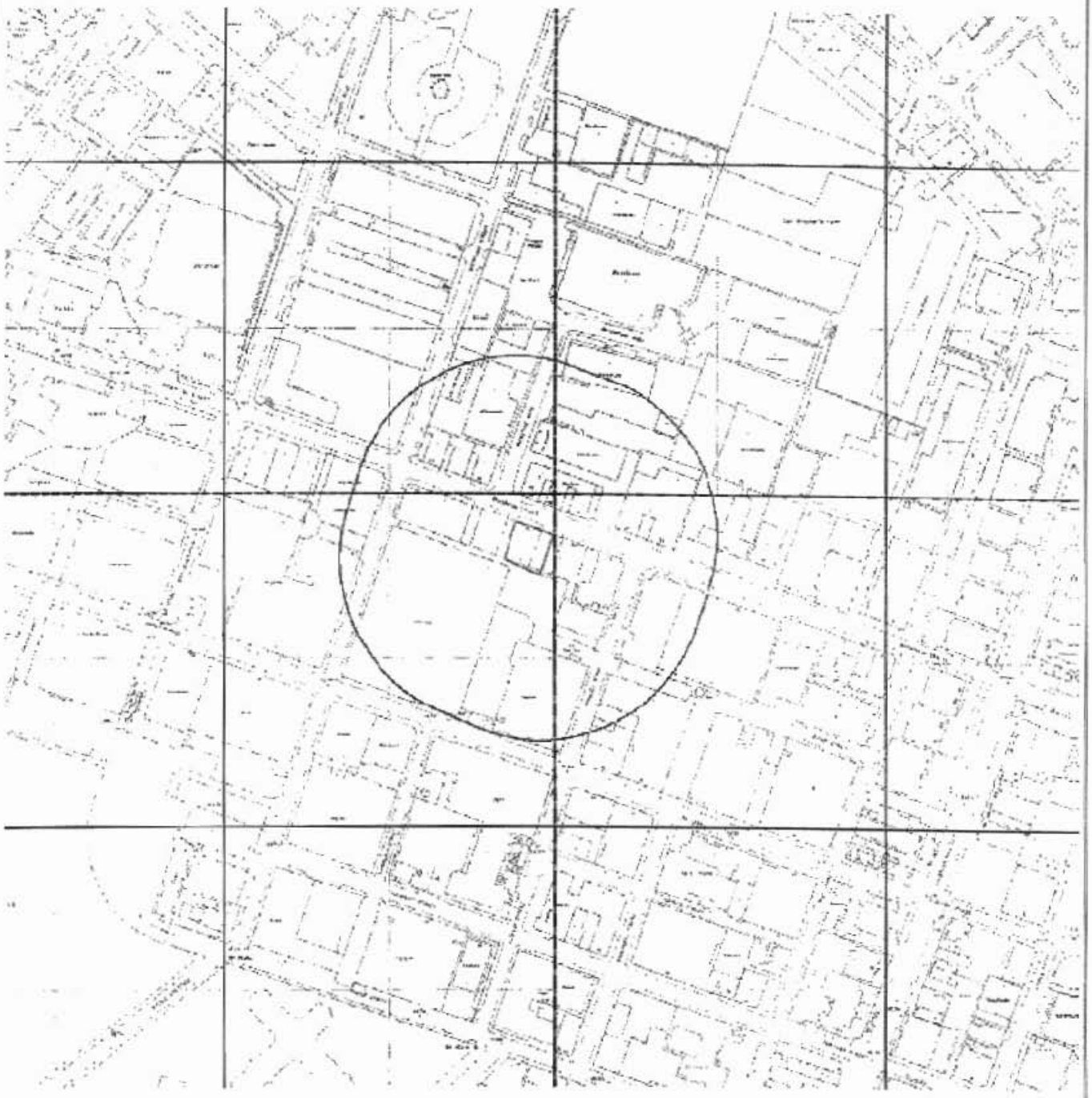
13.2.2 GROUND GAS/ GROUNDWATER INSTALLATIONS

Standpipe installations will allow the monitoring of any ground gas present and of any ground water regime beneath the site. Ground gas has been highlighted as a potential risk to the site from migration from on site and nearby historic made ground and landfill, and waste disposal and treatment sites. In order to assess the risk from ground Gas and to assess the Groundwater regime beneath the site, it is recommended that two installations are formed on the site. The installations should then be monitored at least four times over an appropriate time scale.

13.2.3 LABORATORY TESTING

Based on the preliminary risk assessment of contamination in section 7 of this report, geoenvironmental laboratory testing should be carried out on samples collected from the intrusive investigation. They should comprise, as a minimum, screening for a generic suite of contaminates including, but not limited to: As, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn, Boron- Hot water soluble, water soluble sulphate, free sulphur, pH total and free cyanide, Thiocyanate, sulphide, phenol-Monohydritic, TPH and total PAH. Asbestos has also been highlighted as potentially being present on site, therefore provision should be made if any suspect material of fibrous nature is revealed during the intrusive investigation. Further detailed testing may be specified based on the outcome of the initial test results.

The site is possibly underlain by made ground and Boulder Clays. Geotechnical testing should therefore comprise of sufficient testing on samples for at least, moisture content and Atterberg Limit testing. If any granular strata are encountered then sufficient samples should be obtained for particle size distribution (PSD) testing as a minimum and any compaction related testing as required.



Title	Appendix A Figure 1 Site Location Plan
Client	Mr Whaid Ahmed represented by Whitebox Architects Ltd
Site	35 Broughton Street, Manchester
Job Number	GRS0310-1314
Comments	Site outlined in pink

GEOENVIRONMENTAL RISK SOLUTIONS

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



BH	Beer House	P	Pillar, Police Post
BP, BS	Boundary Post or Stone	PO	Post Office
Co, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
EIP	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Trough
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Meeting Post	WPt, WT	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

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



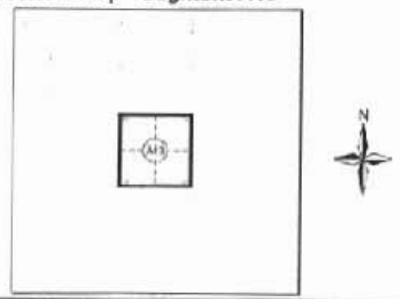
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Pyg Sta	Pumping Station
Disntd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Pyg Sta	Sewage Pumping Station
EIP	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Fibre Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Trank
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governor	Wd Pp	Wind Pump
GP	Guide Post	WPt, WT	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

Geoenvironmental Risk Solutions

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1892 - 1899	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1922 - 1939	4
Ordnance Survey Plan	1:1,250	1949 - 1952	5
Ordnance Survey Plan	1:2,500	1951 - 1953	6
Ordnance Survey Plan	1:1,250	1952 - 1953	7
Ordnance Survey Plan	1:2,500	1953 - 1965	8
Ordnance Survey Plan	1:1,250	1953 - 1975	9
Ordnance Survey Plan	1:2,500	1953	10
Ordnance Survey Plan	1:2,500	1955	11
Ordnance Survey Plan	1:1,250	1956 - 1975	12
Additional SIMs	1:1,250	1978 - 1985	13
Additional SIMs	1:1,250	1988	14
Ordnance Survey Plan	1:1,250	1989	15
Large-Scale National Grid Data	1:1,250	1992	16
Large-Scale National Grid Data	1:1,250	1993 - 1998	17
Large-Scale National Grid Data	1:1,250	1996	18
Large-Scale National Grid Data	1:1,250	1998	19

Historical Map - Segment A13

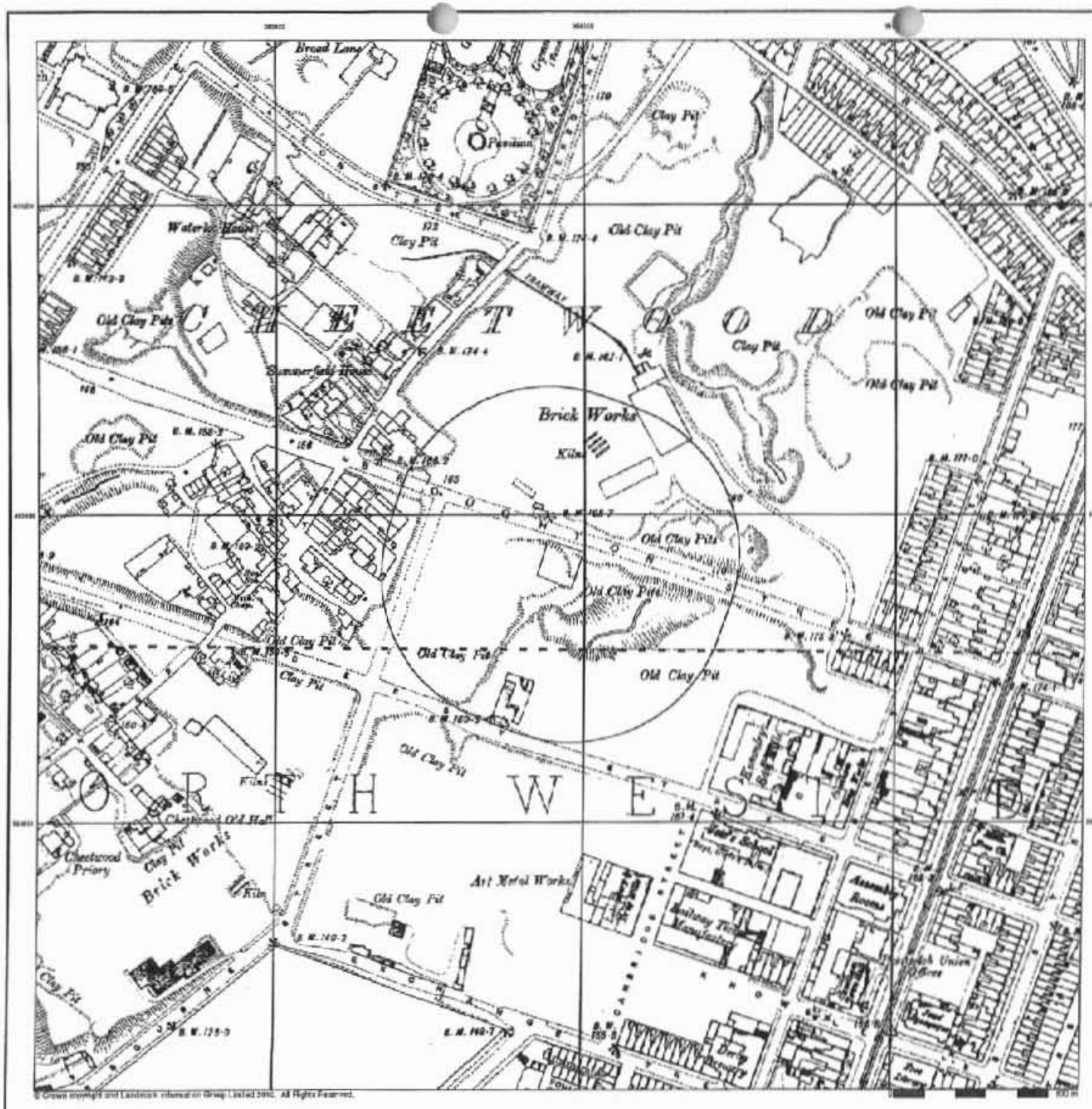


Order Details

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Customer Ref: GRS0310-1314
National Grid Reference: 385980, 396970
Slice: A
Site Area (Ha): 0.06
Search Buffer (m): 100

Site Details

35 Broughton Street, MANCHESTER, M8 8LZ



GEOENVIRONMENTAL RISK SOLUTIONS

Lancashire And Furness

Published 1892 - 1893

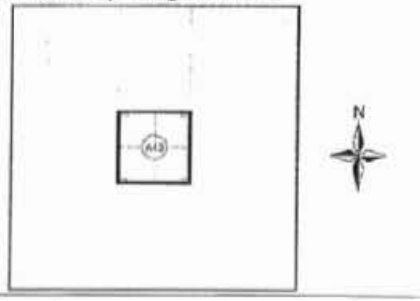
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1843's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1890 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 1939, 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)



Historical Map - Segment A13



Order Details

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National Grid Reference:	383980, 399370
Slice:	A
Site Area (Ha):	0.36
Search Buffer (m):	100

Site Details

35 Broughton Street, MANCHESTER, M8 8LZ



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GEOENVIRONMENTAL RISK SOLUTIONS

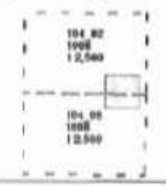
Lancashire And Furness

Published 1908

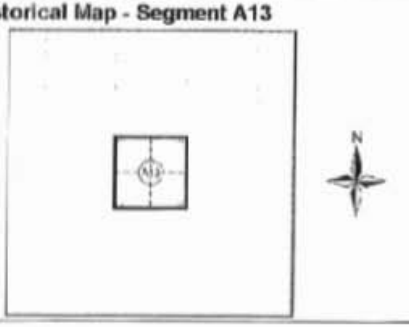
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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Customer Ref:	GRS0310-1314
National Grid Reference:	383980, 399070
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

35 Stoughton Street, MANCHESTER, M8 8LZ



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GEOENVIRONMENTAL RISK SOLUTIONS

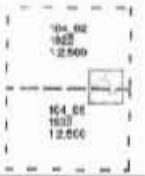
Lancashire And Furness

Published 1922 - 1933

Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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National Grid Reference:	383980, 398970
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

35 Broughton Street, MANCHESTER, M8 8JZ


CHEETWOOD
Clay Pit
Boiler House
Engine House
Brick Works
Pump House
Pond
Sewer
Engine Mill
(Cement Rotocrushing)
Cement Waterproofing Works
Atlantic Works
Boiler House
Engine House
Boiler Shop
Engine Shop
Boiler Gallery
Electric Cap Works
Dock
Ice Works
Ice Pulveriser
Cement Factory
Cement Warehouse
Cement Packing Works
Cement Waterproofing Works
Chemical Cement Works
Chemical Cement Works
Chemical Cement


COLLEGIATE CHURCH WARD
CHEETHAM
Broughton Street Brick Works
Clay Pit
Refuse Heap
Pump House
Pond
Carmel Waterproofing Works
Dyehouse
Sawmill
Sawmills
Chemical Works
Engine & Boiler Works
Warehouse
Ramp
Yard
Tanks
Offices
Stables
Public Conveniences
Electricity Sub Station
Gas Governor
Tramway
Railway
Bridge
Culvert
Pipe
Shaft
Tank
Weir
Sluice
Boundary Stone
Trough
Fence
Wall
Hedge
Trees
Scrub
Rough Land
Allotments
Gardens
Orchard
Nursery
Glasshouse
Cricket Ground
Bowling Green
Golf Course
Racecourse
Sports Ground
Swimming Pool
Tennis Court
Recreation Ground
Public Park
Cemetery
Church
Chapel
Vicarage
Presbytery
Convent
Monastery
Mission Room
Sunday School
Institute
Public Library
Museum
Art Gallery
Theatre
Cinema
Concert Hall
Music Hall
Assembly Rooms
Public House
Hotel
Restaurant
Cafe
Club House
Working Men's Club
Temperance Hotel
Lodging House
Boarding House
Guest House
Youth Hostel
Caravan Park
Camping Ground
Picnic Site
Viewpoint
Beacon
Triangulation Pillar
Benchmark
Spot Height
Contour
Cliff
Quarry
Pit
Mine
Shaft
Adit
Level
Tip
Spoil Heap
Refuse Heap
Clay Pit
Sand Pit
Gravel Pit
Chalk Pit
Lime Kiln
Brick Kiln
Pottery
Glass Works
Iron Works
Steel Works
Foundry
Forge
Smithy
Engineering Works
Boiler House
Chimney
Engine House
Pump House
Water Tower
Gasholder
Gas Works
Electricity Works
Power Station
Transformer
Pylon
Telegraph Pole
Telephone Kiosk
Post Box
Pillar Box
Letter Box
Milestone
Milepost
Signpost
Guide Post
Boundary Post
Boundary Marker



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GEOENVIRONMENTAL RISK SOLUTIONS

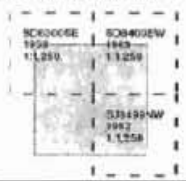
Ordnance Survey Plan

Published 1952 - 1963

Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13



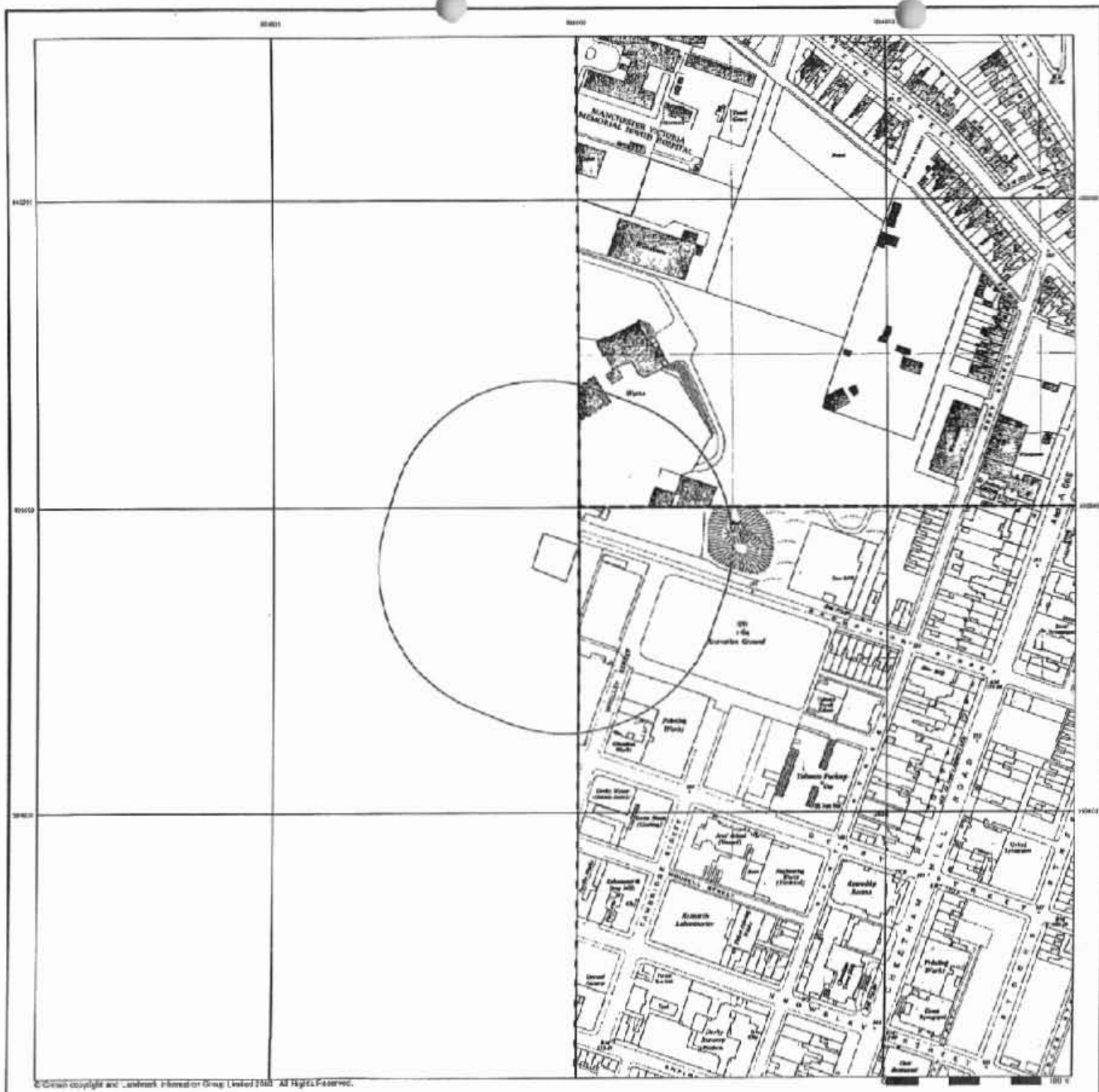
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Customer Ref:	GRS0310-1314
National Grid Reference:	383980, 399970
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

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Salvation Army Hall
Assembly Rooms
Public Hall
Public Library
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Institute
Drill Hall
Gas Works
Gas Holder
Sewage Works
Pumping Station
Tramway Depot
Tramway Pumping Station
Electricity Sub Station
Telephone Exchange
Telephone Call Box
Post Office
Post Box
Fire Station
Police Station
Church
Chapel
Mission Hall
Sunday School
Cemetery
Graves
Tennis Court
Bowling Green
Recreation Ground
Allotments
Refuse Tip
Quarry
Sand Pit
Clay Pit
Gravel Pit
Coal Mine
Shaft
Adit
Level
Slope
Pylon
Boundary Stone
Milestone
Milepost
Fingerpost
Guide Post
Weir
Sluice
Lock
Pier
Jetty
Slipway
Boathouse
Lighthouse
Beacon
Buoy
Mooring
Anchorage
Dock
Basin
Canal
Tunnel
Aqueduct
Viaduct
Bridge
Ford
Ferry
Footbridge
Stepping Stones
Causeway
Embankment
Cutting
Retaining Wall
Steps
Ramp
Kerb
Island
Peninsula
Spit
Cliff
Scree
Rock
Boulder
Outcrop
Scarp
Escarpment
Ridge
Valley
Hill
Mountain
Peak
Summit
Col
Saddle
Plateau
Moor
Heath
Marsh
Swamp
Bog
Fen
Reed Bed
Scrub
Wood
Coppice
Orchard
Vineyard
Hedge
Wall
Fence
Gate
Stile
Cattle Grid
Sheep Dip
Shelter
Hut
Barn
Stable
Cowshed
Pigsty
Dovecote
Granary
Silo
Windmill
Windpump
Water Tower
Chimney
Kiln
Oast House
Lime Kiln
Brick Kiln
Pottery
Glass Works
Factory
Warehouse
Office
Shop
Market
Inn
Public House
Hotel
Restaurant
Cafe
Tea Room
Youth Hostel
Camping Site
Caravan Site
Picnic Site
Viewpoint
Information Centre
Museum
Art Gallery
Theatre
Cinema
Concert Hall
Library
Reading Room
Town Hall
Guildhall
Law Court
Prison
Police Station
Fire Station
Ambulance Station
Coastguard Station
Lifeboat Station
Rescue Station
Mountain Rescue Post
Cave Rescue Post
Cliff Rescue Post
Beach Rescue Post
Lifeguard Station
Bathing Station
Boating Station
Sailing Club
Yacht Club
Rowing Club
Canoe Club
Swimming Pool
Lido
Sports Ground
Golf Course
Golf Club House
Golf Driving Range
Golf Practice Ground
Golf Tee
Golf Green
Golf Bunker
Golf Hazard
Golf Water Hazard
Golf Out of Bounds
Golf Fairway
Golf Rough
Golf Semi-Rough
Golf Fringe
Golf Apron
Golf Path
Golf Cart Track
Golf Cart Park
Golf Cart Shed
Golf Cart Repair Shop
Golf Cart Wash
Golf Cart Fuel
Golf Cart Charging Point
Golf Cart Battery Exchange
Golf Cart Battery Charging
Golf Cart Battery Storage
Golf Cart Battery Disposal
Golf Cart Battery Recycling
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Golf Cart Battery Repair
Golf Cart Battery Replacement



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GEOENVIRONMENTAL RISK SOLUTIONS

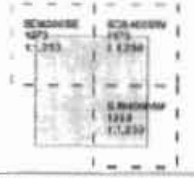
Ordnance Survey Plan

Published 1958 - 1975

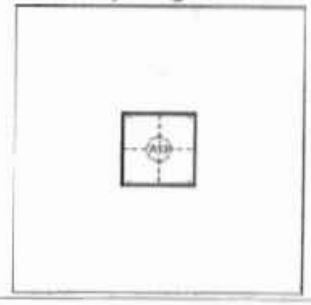
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale accepted for England, Wales and Scotland in the 1880's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1890 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 1939, 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)



Historical Map - Segment A13

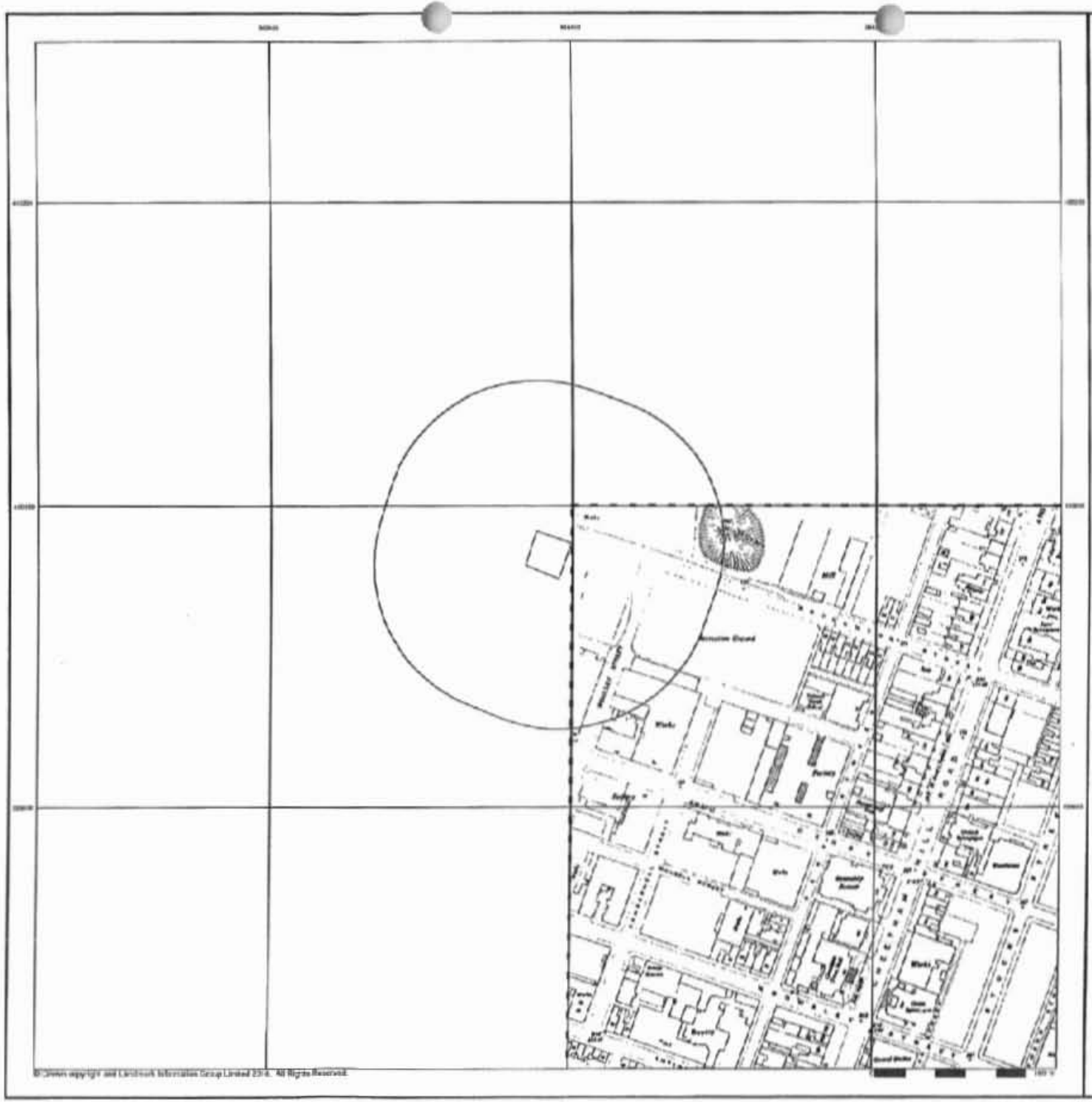


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Search Buffer (m):	100

Site Details

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GEOENVIRONMENTAL RISK SOLUTIONS

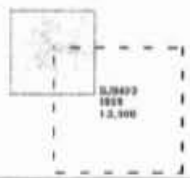
Ordnance Survey Plan

Published 1959

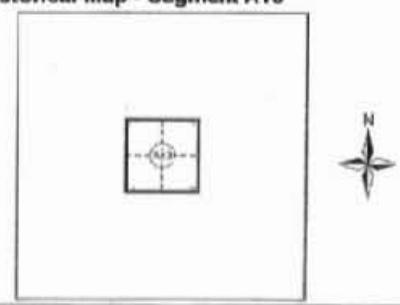
Source map scale - 1:2,500

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 1893 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 1939, 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)



Historical Map - Segment A13

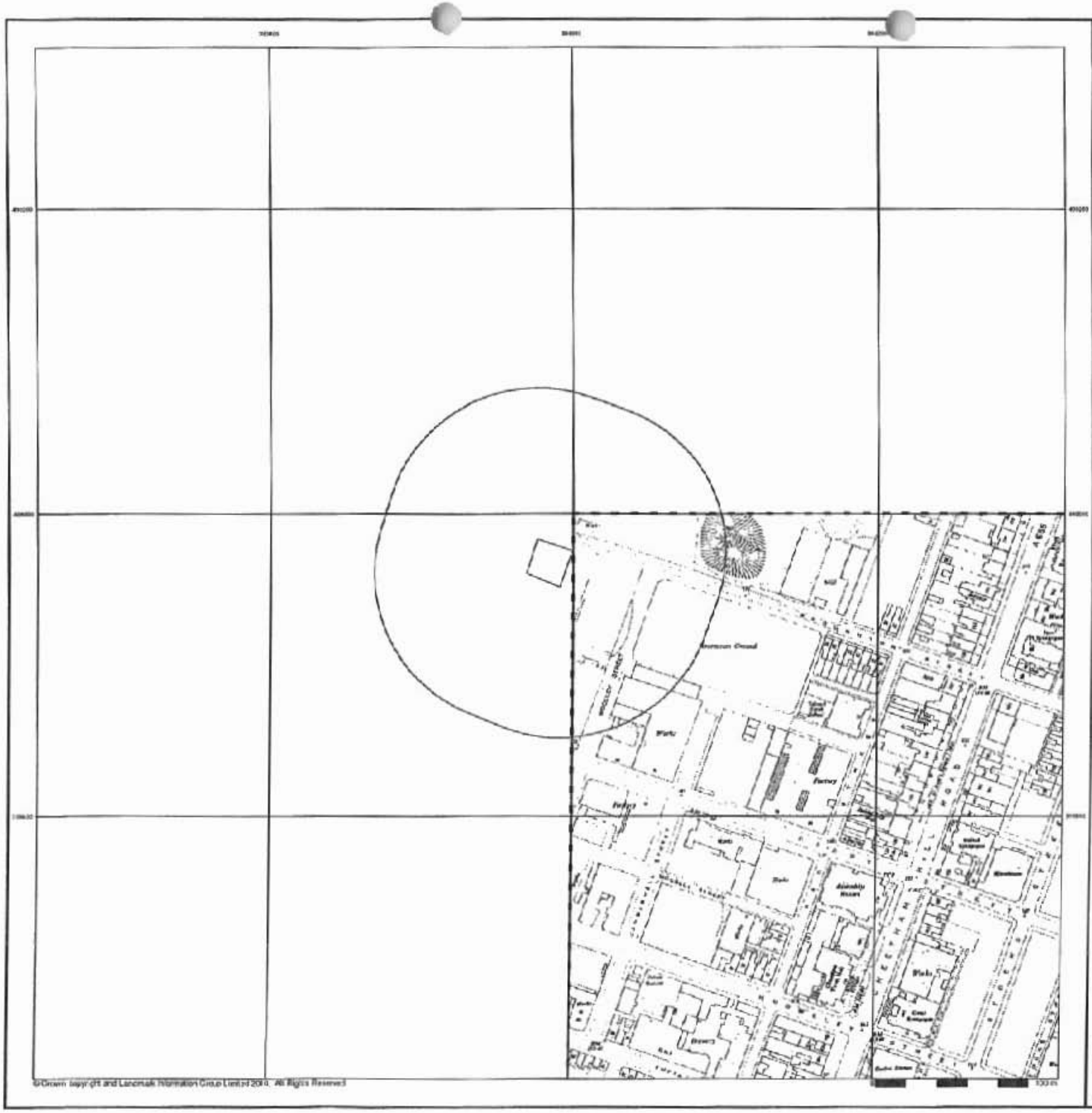


Order Details

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Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

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GEOENVIRONMENTAL RISK SOLUTIONS

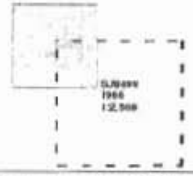
Ordnance Survey Plan

Published 1966

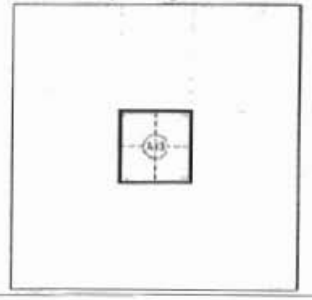
Source map scale - 1:2,500

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 1866 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 1936, 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)



Historical Map - Segment A13



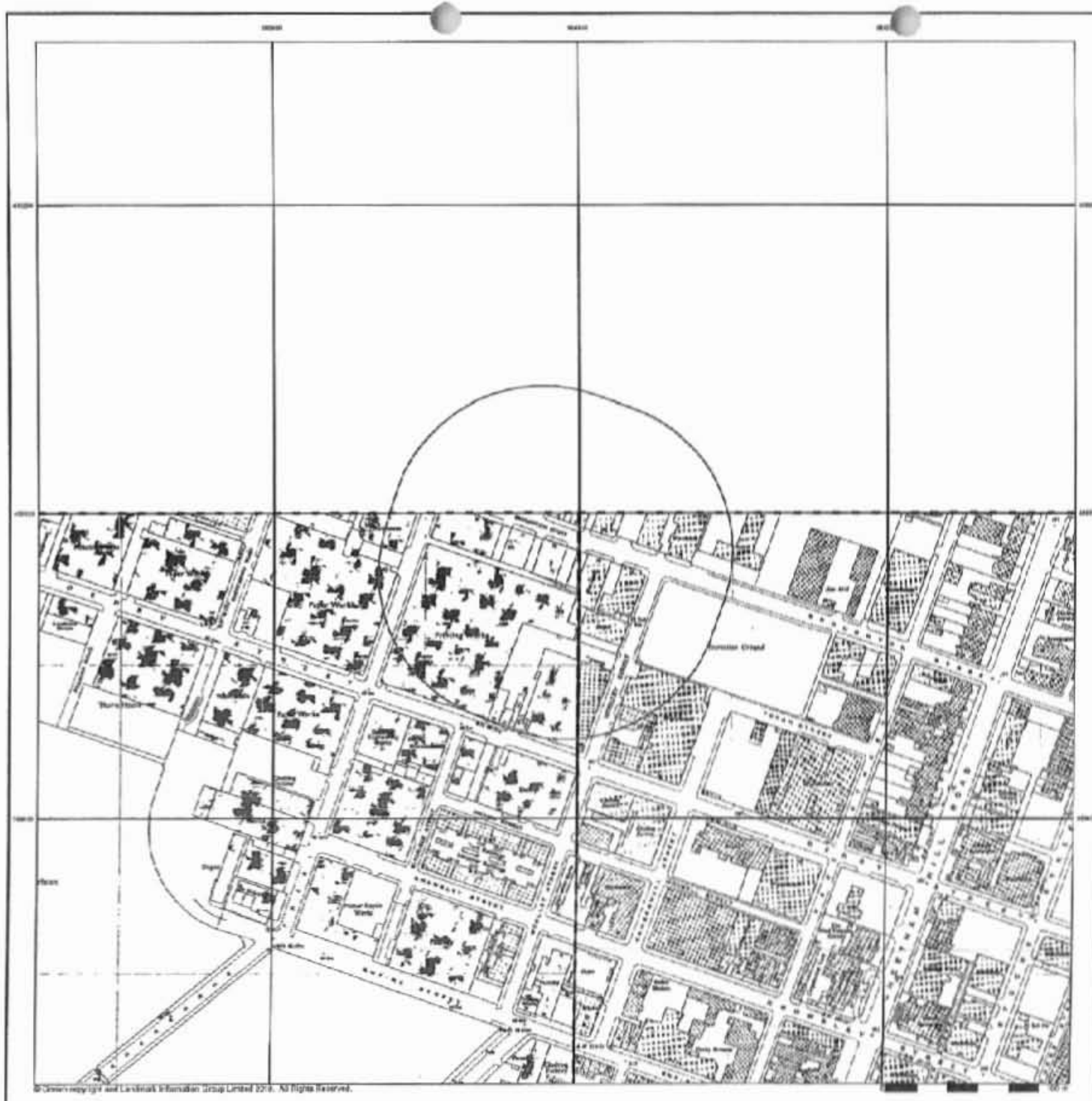
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Search Buffer (m):	100

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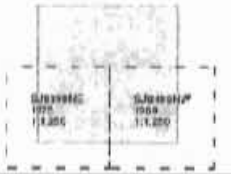
Ordnance Survey Plan

Published 1968 - 1975

Source map scale - 1:1,250

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 1856 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 1939, 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)



Historical Map - Segment A13



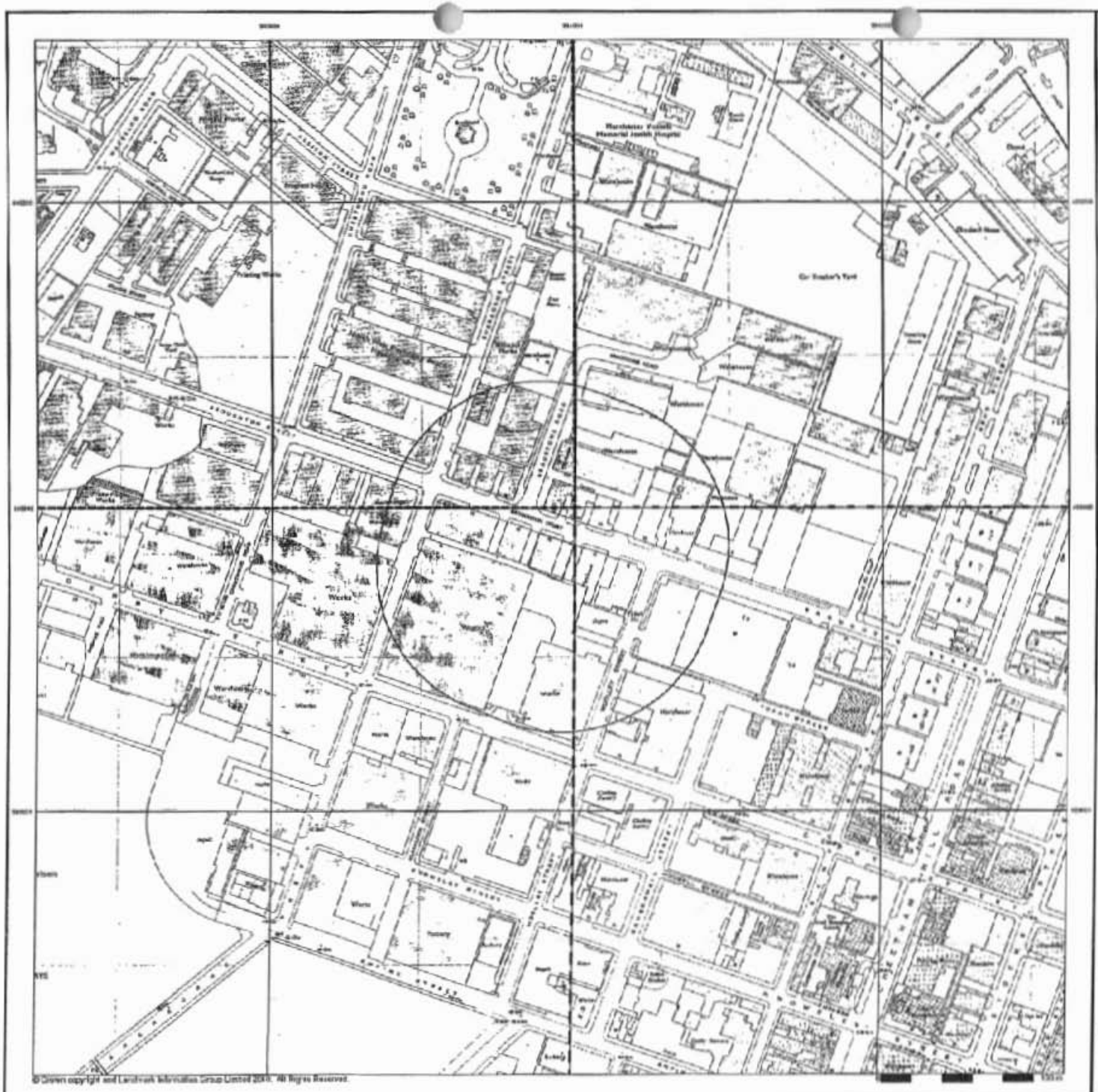
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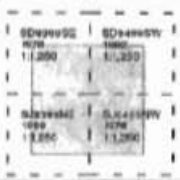
Additional SIMs

Published 1978 - 1989

Source map scale - 1:1,250

The SIM cards (Ordnance Surveys Survey of Information on Microfilm) are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and landuse. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

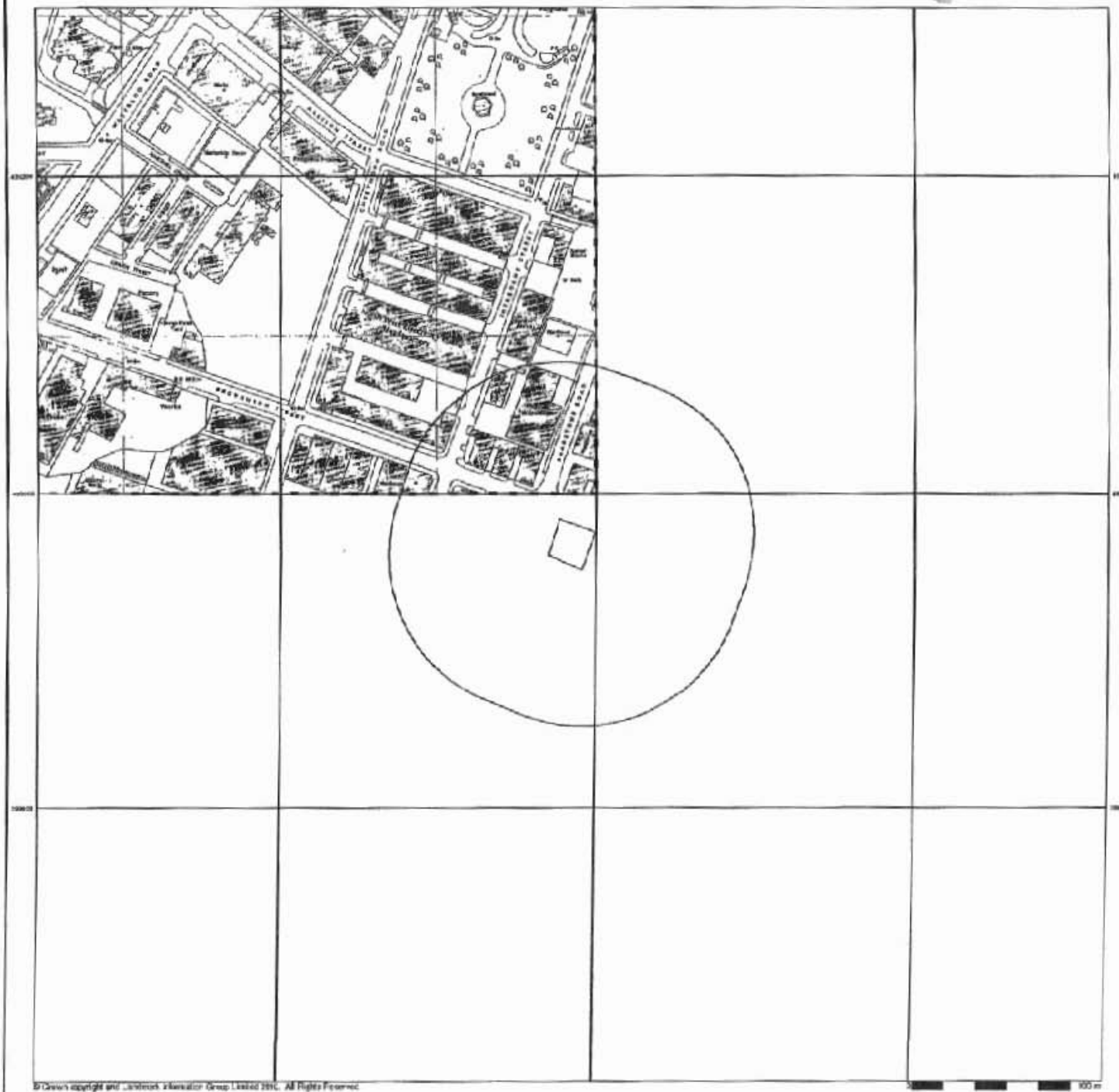


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Search Buffer (m):	100

Site Details

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GEOENVIRONMENTAL RISK SOLUTIONS

Additional SIMs

Published 1988

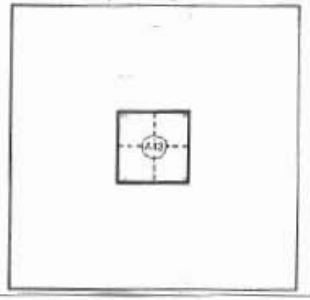
Source map scale - 1:1,250

The SIM cards (Ordnance Surveys Survey of Information on Microfilm) are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



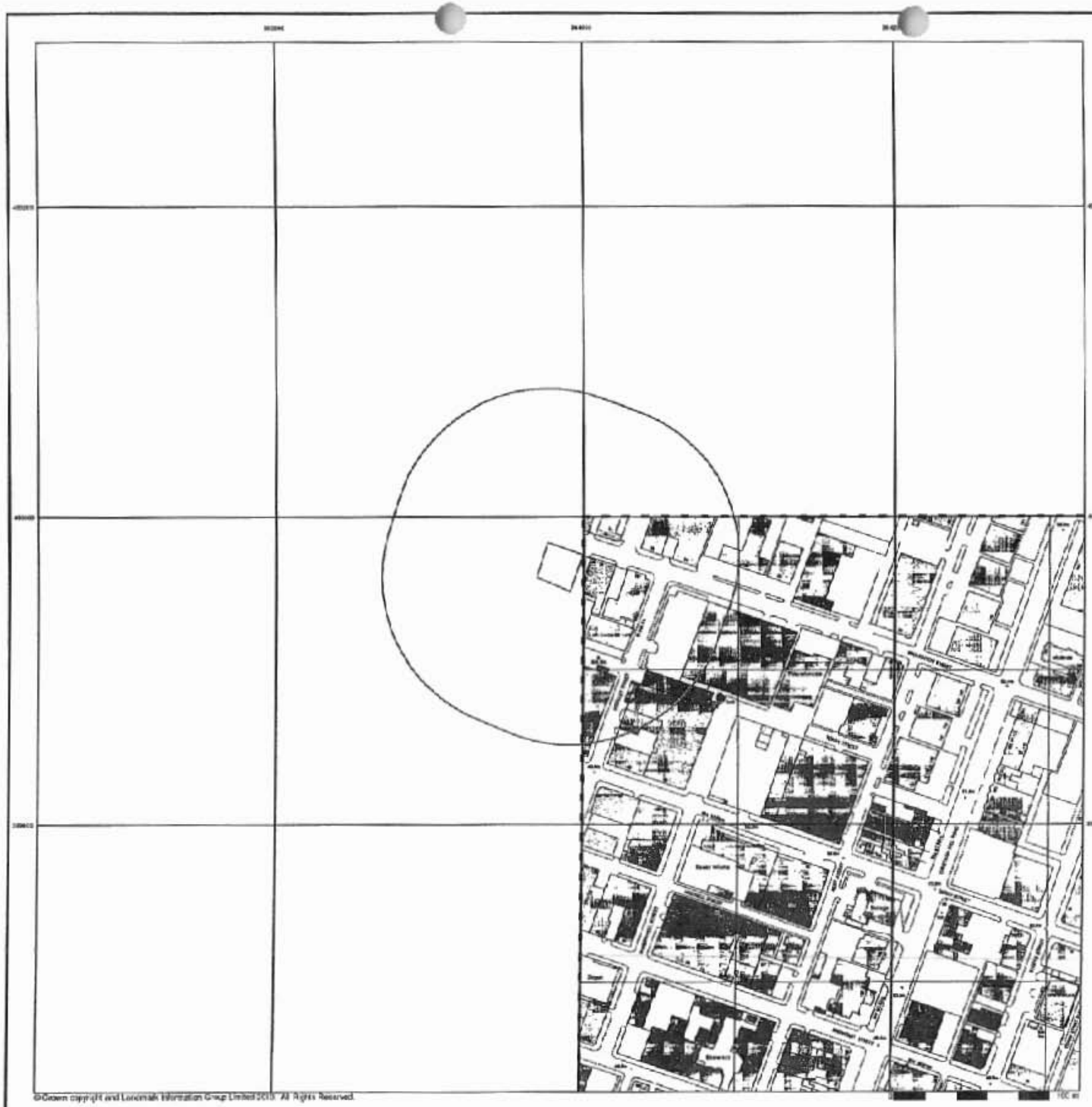
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Search Buffer (m):	100

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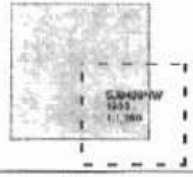
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GEOENVIRONMENTAL RISK SOLUTIONS

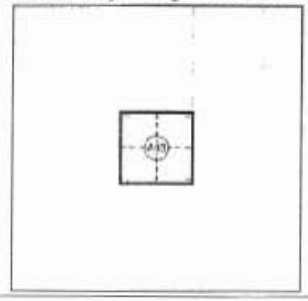
Ordnance Survey Plan
Published 1989
Source map scale - 1:1,250

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 1899 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)



Historical Map - Segment A13



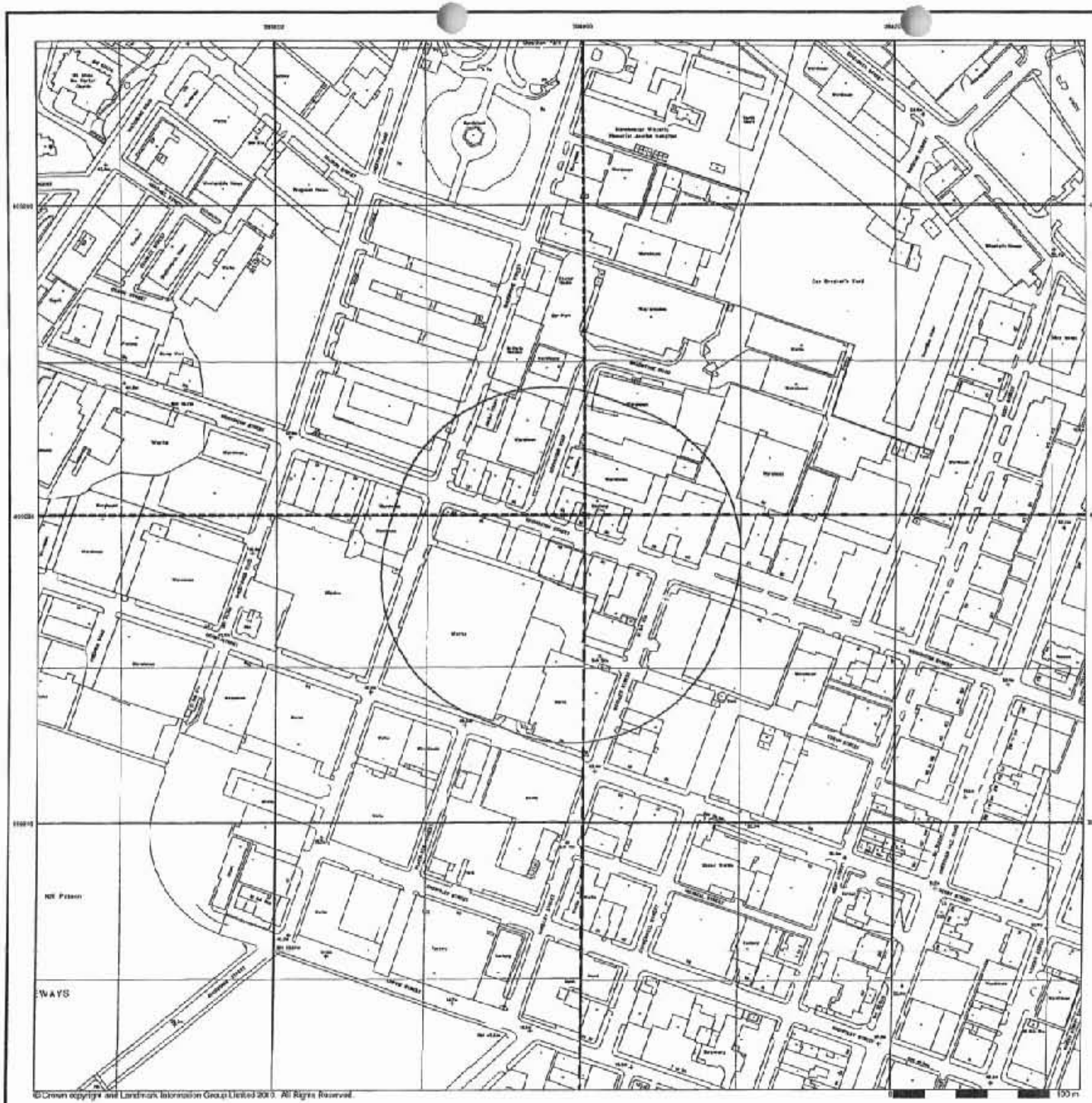
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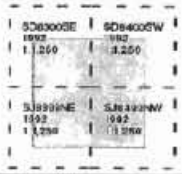
Large-Scale National Grid Data

Published 1992

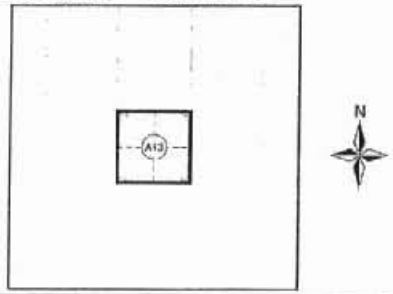
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



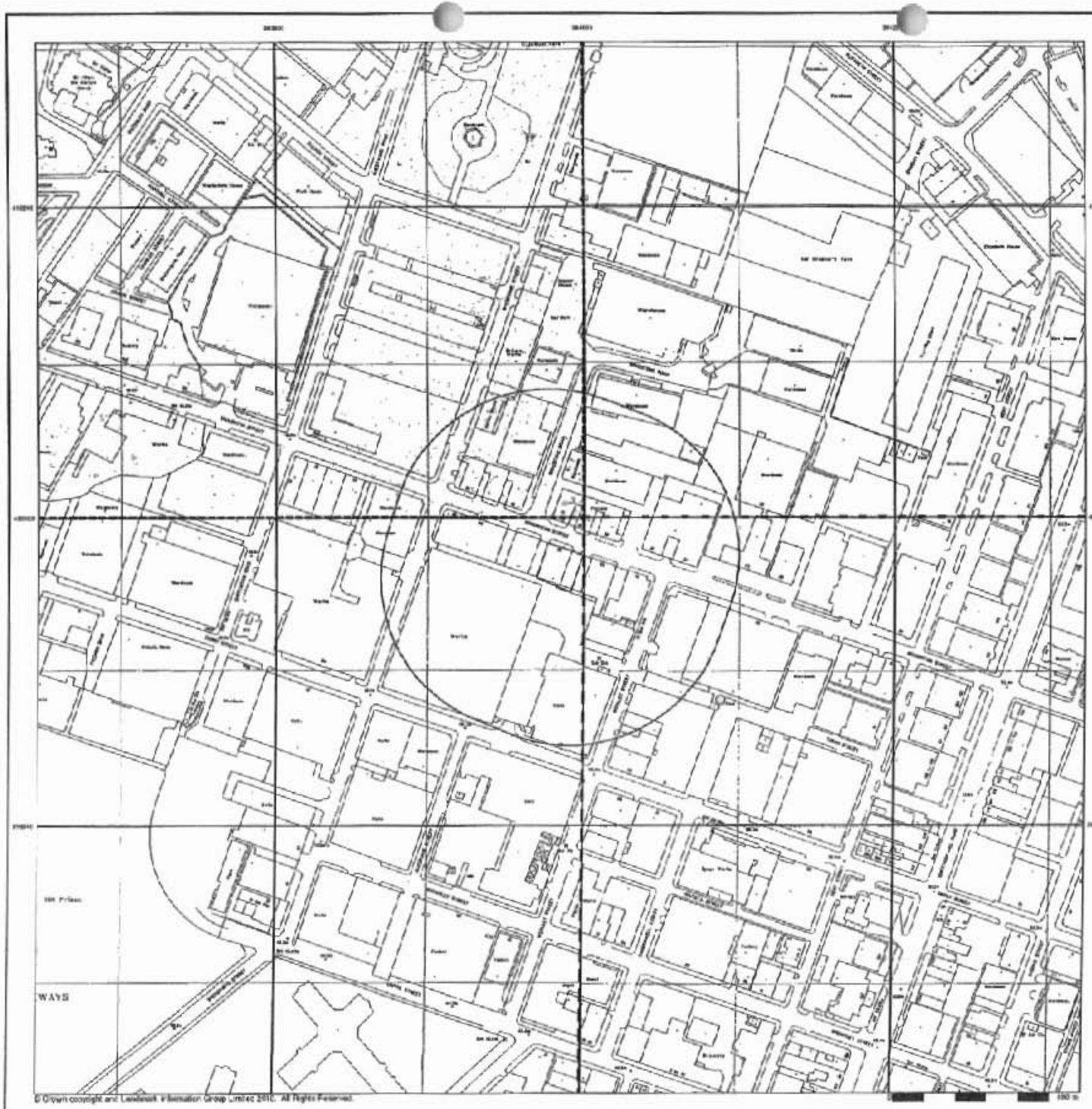
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Slice:	A
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Search Buffer (m):	100

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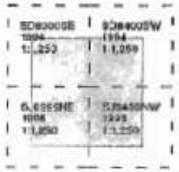
Large-Scale National Grid Data

Published 1993 - 1996

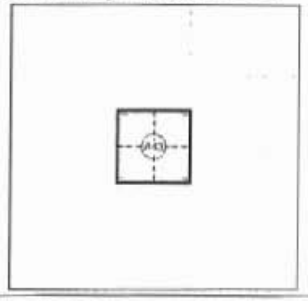
Source map scale - 1:1,250

"Large Scale National Grid Data" superseded SIM cards (Ordnance Survey's "Survey of Information on Microfilm") in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

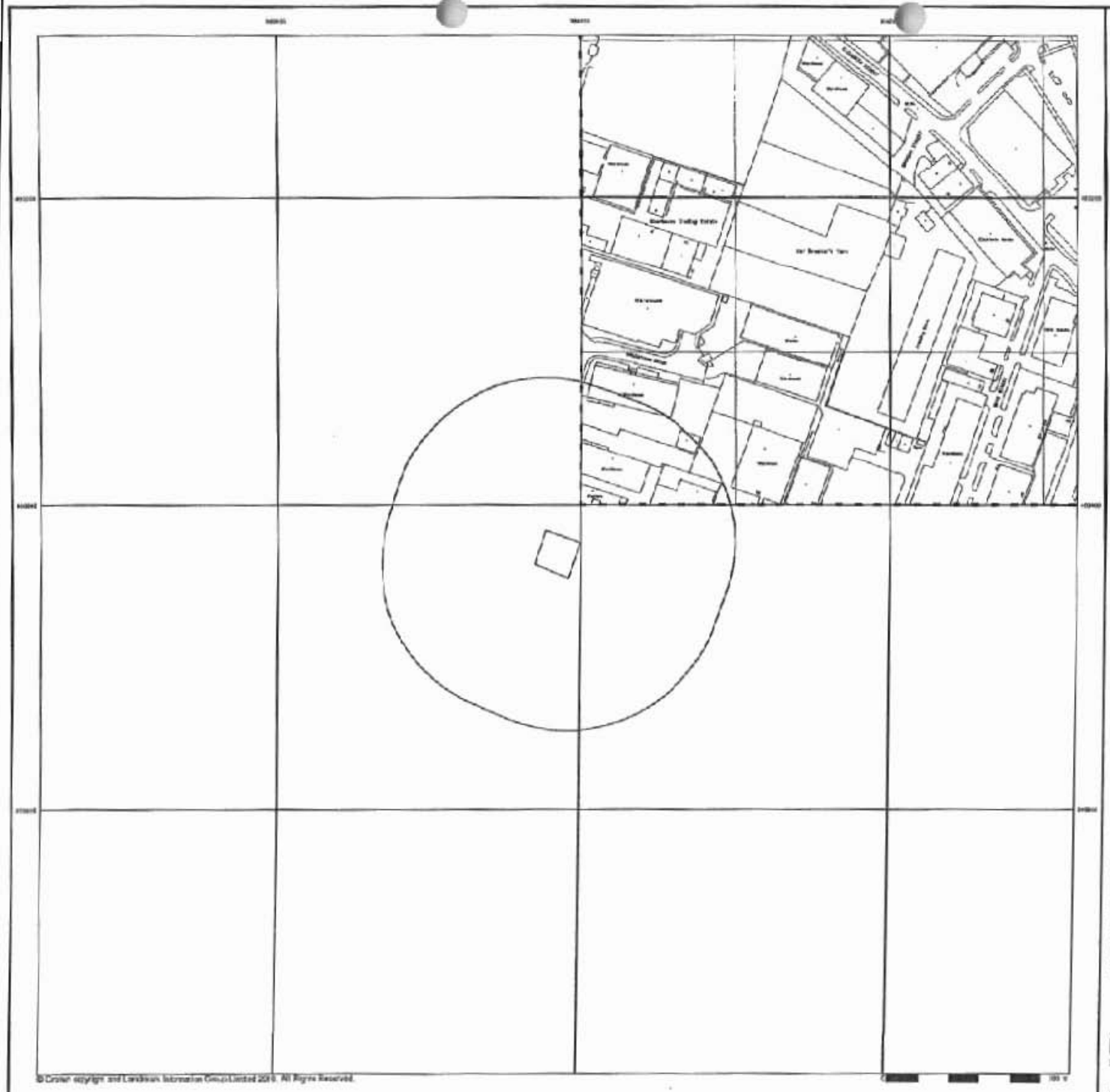


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Slice:	A
Site Area (Ha)	0.06
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Site Details

35 Broughton Street, MANCHESTER, M8 8LZ



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GEOENVIRONMENTAL RISK SOLUTIONS

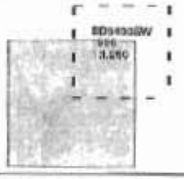
Large-Scale National Grid Data

Published 1996

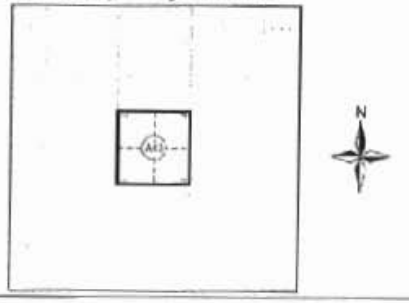
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'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

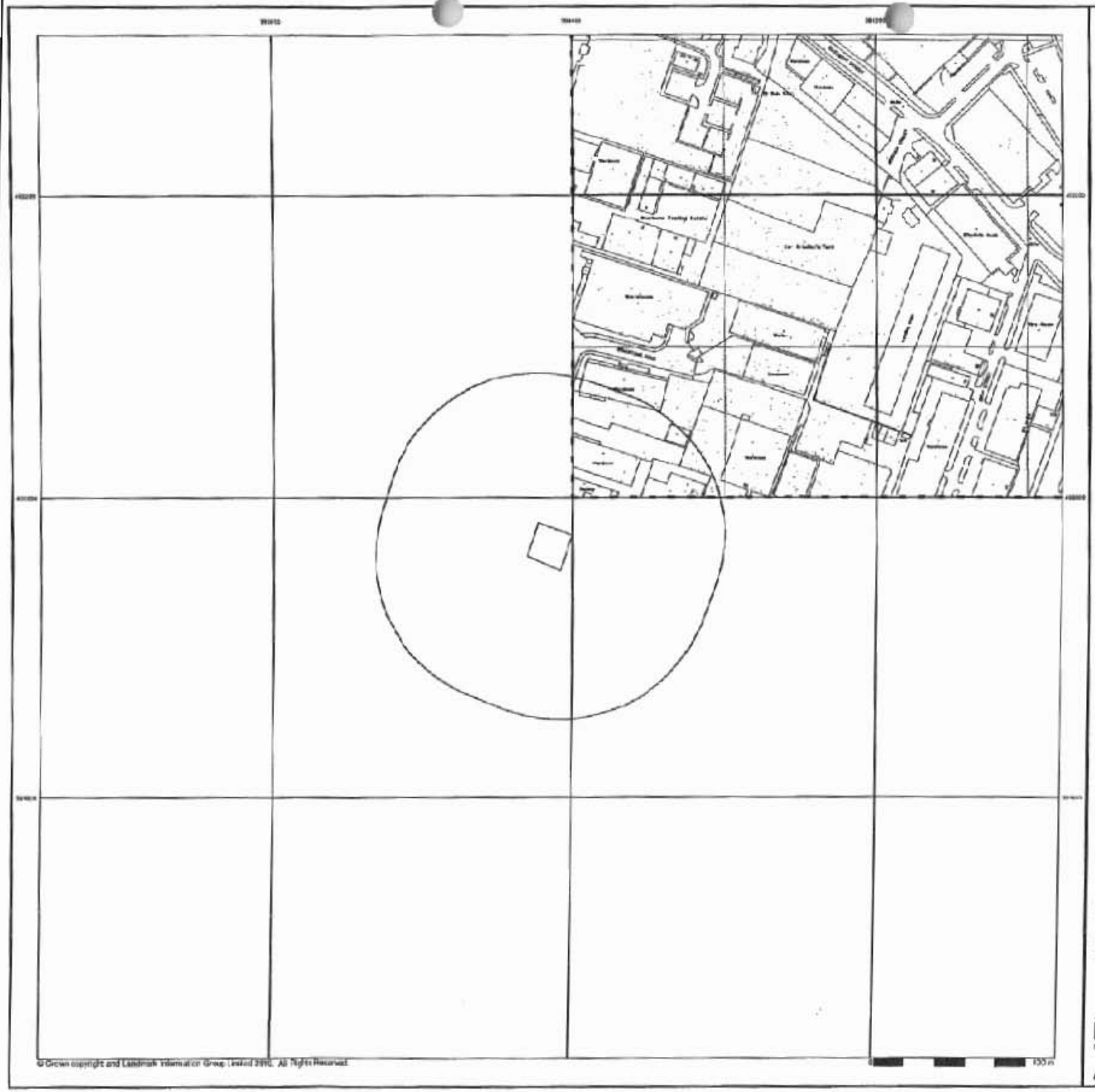


Order Details

Order Number:	30672861_1_1
Customer Ref:	GRS0310-1314
National Grid Reference:	383980, 399970
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

35 Broughton Street, MANCHESTER, M8 8LZ

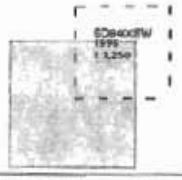


GEOENVIRONMENTAL RISK SOLUTIONS

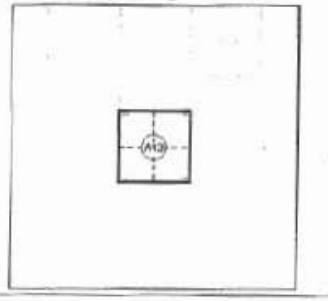
Large-Scale National Grid Data
Published 1996
Source map scale - 1:1,250

"Large Scale National Grid Data superseded SIM cards (Ordnance Survey's "Survey of Information on Microfilm") in 1992, and continued to be produced until 1999. These maps were the forerunners of digital mapping and we provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	30072961_1_1
Customer Ref:	GRS0310-1314
National Grid Reference:	383980, 399970
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	100

Site Details

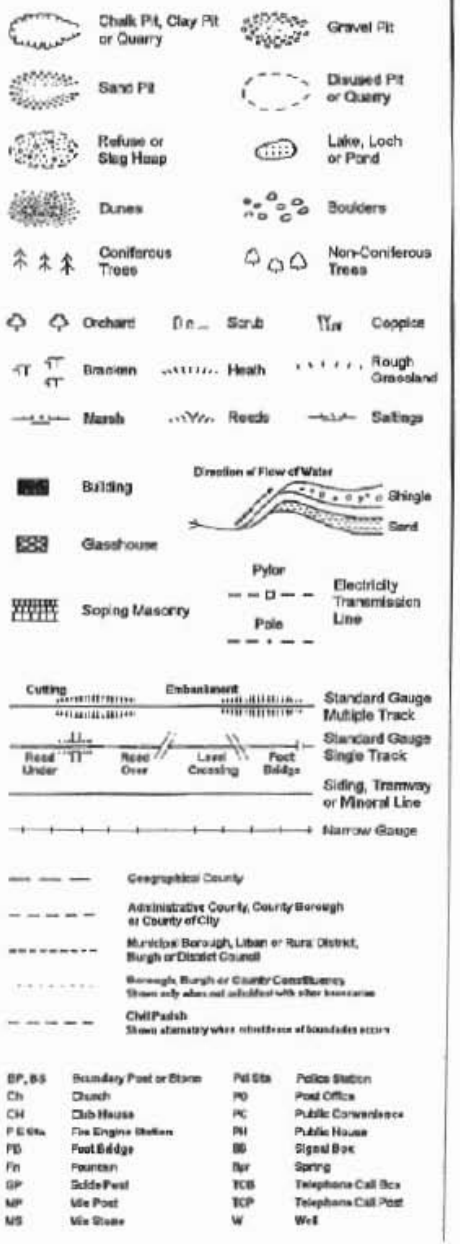
55 Broughton Street MANCHESTER, M8 8LZ

Historical Mapping Legends

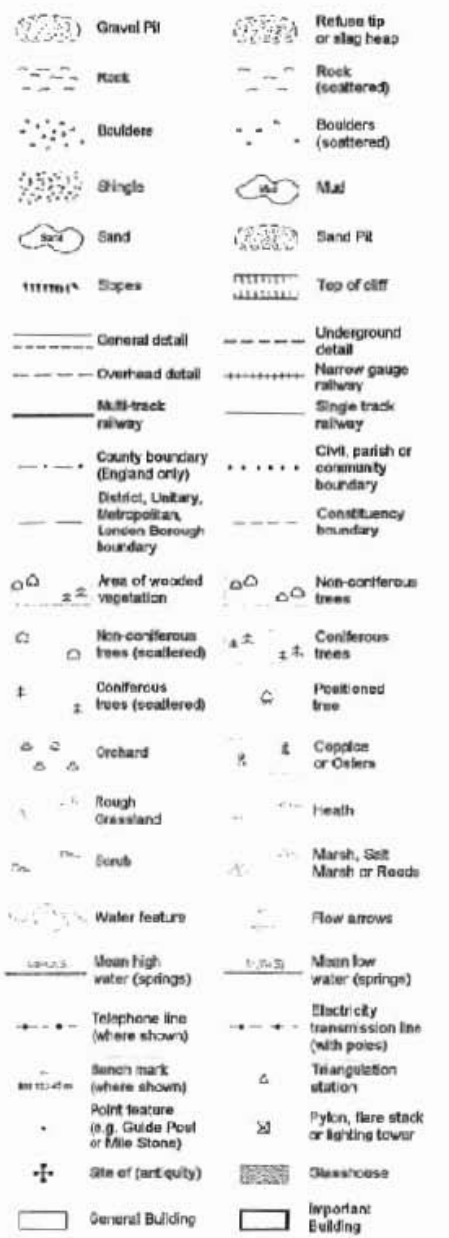
Ordnance Survey County Series 1:10,560



Ordnance Survey Plan 1:10,000



1:10,000 Raster Mapping

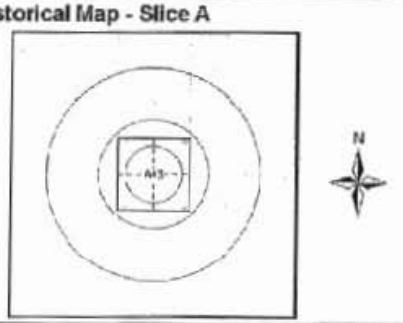


GEOENVIRONMENTAL RISK SOLUTIONS

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1848	3
Cheshire	1:10,560	1882	4
Lancashire And Furness	1:10,560	1894	5
Lancashire And Furness	1:10,560	1900	6
Lancashire And Furness	1:10,560	1923	7
Lancashire And Furness	1:10,560	1931 - 1932	8
Lancashire And Furness	1:10,560	1938	9
Ordnance Survey Plan	1:10,000	1956	10
Ordnance Survey Plan	1:10,000	1966 - 1968	11
Ordnance Survey Plan	1:10,000	1972 - 1979	12
Manchester	1:25,000	1976	13
Ordnance Survey Plan	1:10,000	1986 - 1990	14
Ordnance Survey Plan	1:10,000	1985 - 1987	15
Ordnance Survey Plan	1:10,000	1988	16
Ordnance Survey Plan	1:10,000	1990 - 1994	17
10K Raster Mapping	1:10,000	1999	18
10K Raster Mapping	1:10,000	2006	19
10K Raster Mapping	1:10,000	2009	20

Historical Map - Slice A



Order Details

Order Number:	30672881_1_1
Customer Ref:	GRS0310.1314
National Grid Reference:	383980, 399970
Slice:	A
Site Area (Ha):	0.06
Search Buffer (m):	1000

Site Details

35 Broughton Street, MANCHESTER, M8 8LZ

Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings

Military and Industrial Buildings

Military and Communication Areas

Subway Entrance

Fireproof Building

Prominent Fireproof Building

Non-fireproof Building

Non-fireproof Building (non-dwelling)

Factory, mill, and flour mill, with chimneys

Factory, mill, and flour mill, without chimneys

Power Station, drawn to scale

Hydroelectric Power Station

Radio Station, drawn to scale

Telephone Station, drawn to scale

Abandoned Open-pit Mine or Quarry

Open-pit Salt Mine

Pit

Oil Deposit or Well

Oil Seepage

Tailings Pile

Fuel Storage Tanks

Natural Gas Tank

Bench Mark

Drill Hole

Buried Mound

Triangulation Point on Burial Mound

Single-track Railroad

Double-track Railroad and Station Building

Coniferous Forest

Deciduous Forest

Mixed Forest

Lawns

Citrus Orchard

Wet Ground

Scattered Vegetation

243,6 — Values for prominent elevations

Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of riverbed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet

For reference and phonetic interpretation of map text

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (-)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings

Military and Industrial Buildings

Military and Communication Areas

Subway Entrance

Partly Demolished Buildings

Demolished Buildings

Built-Up Area with Fireproof Buildings Predominant

Built-Up Area with Non-Fireproof Buildings Predominant

Individual Fireproof Building

Prominent Industrial Building

Individual Dwelling, Fireproof

Ruins of an Individual Dwelling

Factory or Mill Chimney

Factory or Mill with Chimney

Factory or Mill without Chimney

Mine or Open Pit Mine

Operating Shaft or Mine

Non-Operating Shaft or Mine

Salt Mine

Tailings Pile

Pit

Stone Quarry

Gas Pump or Service Station

Fuel Storage or Natural Gas Tank

Oil or Natural Gas Derrick

Small Hydroelectric Power Station

Power Station

Transformer Station

Cemetery

Burial Mound (height in metres)

Triangulation Point on Burial Mound

Triangulation Point

Bench Mark

Bench Mark (monumented)

Telegraph Office

Telephone Station

Radio Station

Radio Tower

Airfield or Seaplane Base

Landing Strip

Telegraph/Telephone Lines

Main Highway

Highway under Construction

Improved Dirt Road (former truck road)

Double-track Railroad with First Class Station

Dismantled Railroad

Railroad Under Construction

Shore Embankment

Riverbed Ditch with Embankment

Water Gauge

Direction and velocity of current

Water Level Mark

Well

Water Reservoir or Rain Water Pit

Spring

Isobath with value

Heavy (Index) Contour Line

Contour Line and Value

Half Contour Line

Spot Elevation Value

Coniferous

Deciduous

Mixed

Scrub

Key to Numbers on Mapping

SD80_Manchester

No.	Description
16	Depot (Bus)

SJ89_Manchester

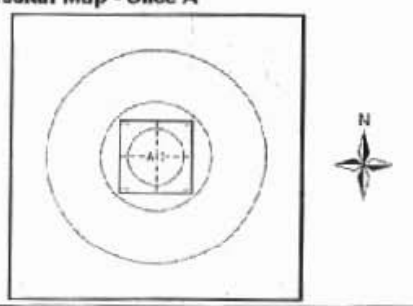
No.	Description
93	Factory (Metal Work)
157	Police Station/Headquarters
211	Council/Government Buildings/Courts
216	Prisons
249	Power Station (Electric)

GEOENVIRONMENTAL RISK SOLUTIONS

Historical Mapping & Photography included:

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Lancashire And Furness	1:10,560	1848	3
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Lancashire And Furness	1:10,560	1931 - 1932	8
Lancashire And Furness	1:10,560	1938	9
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Ordnance Survey Plan	1:10,000	1966 - 1968	11
Ordnance Survey Plan	1:10,000	1972 - 1978	12
Manchester	1:25,000	1975	13
Ordnance Survey Plan	1:10,000	1980 - 1986	14
Ordnance Survey Plan	1:10,000	1985 - 1987	15
Ordnance Survey Plan	1:10,000	1989	16
Ordnance Survey Plan	1:10,000	1990 - 1994	17
10K Raster Mapping	1:10,000	1999	18
10K Raster Mapping	1:10,000	2006	19
10K Raster Mapping	1:10,000	2009	20

Russian Map - Slice A



Order Details

Order Number: 30872861_1_1
Customer Ref: GRS0310-1314
National Grid Reference: 383980, 399970
Slice: A
Site Area (Ha): 0.06
Search Buffer (m): 1000

Site Details

35 Broughton Street, MANCHESTER, M8 8LZ

Landmark
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Web www.envirocheck.co.uk