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SUB SURFACE
Site Investigation Specialists,
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GEOLOGICAL AND MINING APPRAISAL

FOR
ARKADY INDUSTRIAL ESTATE,
BRISCOE LANE,
NEWTON HEATH,
GREATER MANCHESTER

PREPARED FOR
CASSEL & FLETCHER
CONSTRUCTION LIMITED

REPORT NO. 6921A
APRIL 2020

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GEOLOGICAL & MINING APPRAISAL FOR ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER

CLIENT: CASSEL & FLETCHER CONSTRUCTION LIMITED

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1. INTRODUCTION

This report has been prepared in accordance with Purchase Order No. SC-91-001 dated 20 February 2020, from the Client.

The brief for a coal mining risk assessment was set out in our estimate, ref. E3955 and dated 19 February 2020, and comprises a geological and mining appraisal together with our conclusions and recommendations.

1.1 Site Location and Description

The site is located to the north west of Briscoe Lane in the Newton Heath district of Greater Manchester, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is SD. 8689 9950 (E.386920m, N.399500m).

As shown on Figure 2, the 'L' shaped about 0.46 hectare site is bounded to the south east by Briscoe Lane with a cemetery beyond, to the south west by the premises of Anglo-European, to the north west by the premises of Mont Blanc Coldstore Company with a triangular railway junction beyond, to the east by derelict industrial premises and to the south east by the premises of Basic Welding Services (former Public House) with the junction of Briscoe Lane and Riverpark Road beyond.

At the time of writing this report aerial photographs of the site indicate that the southern part of the existing derelict fire damaged factory building is standing whilst the northern part has been demolished.

1.2 Proposed Development and Purpose of the Desk Study

We understand that it is proposed to demolish and remove the existing factory building and foundations and construct a 'L' shaped industrial building, as shown on Figure 3.

The purpose of the desk study is to determine the geological structure, including the depth and thickness of coal seams, to determine the potential for mineworkings in these horizons based upon the available information and to provide our conclusions and recommendations.

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2. DESK STUDY

2.1 Detailed Geological Appraisal

British Geological Survey (BGS) have published sheet, ref. SD.89.NE solid and drift edition at 1:10,000 or 1:10,560, but we do not have this sheet and the BGS are currently not posting out geological sheets. We have, however, obtained from BGS a GeoReport, ref. BGS_3081145/10906, which is appended.

Our desk study indicates that a previous ground investigation in the southern part of the site found Made Ground to 1.60 to 2.60 metres depth underlain by natural firm to stiff clays to 8.20 metres depth. The GeoReport indicates that the natural clays are cohesive glacial drift deposits (Diamicton Devensian Till).

Solid geological information given in our Desk Study Report, ref. 6921 dated March 2020, the GeoReport and the adjoining published geological sheet, ref SD.89.NW solid and drift edition at 1:10,560, has been combined to draft the geological plan at 1:10,000 scale and stratigraphical column at 1:5,000 scale. These are given as Figure 4.

Carboniferous Westphalian D Coal Measures (Ardwick Group) strata, normally comprising sandstones, siltstones and mudstones, are shown to be present beneath the site. This strata is indicated to be up to 28 metres thick but is thinning to zero at the north eastern site boundary. The previous ground investigation found sand/ sandstone at 8.20 metres depth.

The Carboniferous Westphalian D Coal Measures strata are shown on the geological plan to be overlying Westphalian B Coal Measures strata. This indicates that part of the Westphalian B and all of the Westphalian C Coal Measures strata have been lost to erosion at this boundary.

At the boundary of the Westphalian D and Westphalian B Coal Measures strata the Duckinfield Marine Band also crops out in a north west to south east direction.

Westphalian B Coal Measures strata normally comprise interbedded mudstones, siltstones and subordinate sandstones with occasional economically important mineral seams of coal.

The stratigraphically higher Newton Heath Sandstone is shown to crop out to the north east of the Duckinfield Marine Band in an area which is relatively flat and hence the Westphalian D Coal Measures strata are down dipping at an unknown gradient to the north east. The rock strata in the area of the site are apparently unaffected by geological faulting.

Our calculation, using the horizontal distance between the Duckinfield Marine Band and the Newton Heath Sandstone and the vertical intervals between these strata on the stratigraphical column, indicate that the strata down dip to the north east at 1 in 2.30 (25.8^{o}). The same calculation using the horizontal distance between the top and bottom of the Newton Heath Sandstone and the thickness of the Newton Heath Sandstone on the stratigraphical column, indicate that the strata generally down dip to the north east at 1 in 2.17 (27.4^{o}). Given these calculations the strata in the area of the site down dip to the north east at about 26.6^{o}.

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Six coal seams (in green) are shown to be cropping out in a north west to south east direction beneath the Westphalian D Coal Measures strata on the geological plan. The six coal seams underlying the Duckinfield Marine Band in the adjoining area are the 1.1 metre Bin Mine Coal, the 1.1 metre Shuttle Mine Coal, the 1.4 metre Crumbouke or Roger Mine Coal, the 1.5 metre Rams Mine Coal, the 0.7metre White Mine Coal and the 2.8 metre Doe Mine Coal. If the six coal seams (in green) are the above six coal seams the vertical intervals apparently vary significantly.

The nearest and shallowest coal seam beneath the site is cropping out beneath the Westphalian D Coal Measures strata about 150 metres to the south west of the centre of the site. For rock strata down dipping to the north east at 26.6^{o} the base of the coal seam would be at about 75 metres below the base of the Westphalian D Coal Measures strata.

The anticipated succession of strata at the centre of the site is as tabulated below. The approximate thicknesses and depths given are the best that can be determined from the above information.

TABLE 1 STRATIGRAPHICAL SUCCESSION

Strata	Maximum Unworked Thickness (m approx.)	Vertical Interval (m approx.)	Depth of Base below Surface (m approx.)
MADE GROUND	1.6 to 2.6		2
GLACIAL DRIFT DEPOSITS			8
WESTPHALIAN D COAL MEASURES	28		* 13
WESTPHALIAN B COAL MEASURES: measures		75	
Bin Mine Coal? measures with coal seams	1.1		88

* Thinning to zero at the north eastern site boundary, 5 metres assumed at the centre of the site.

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2.2 Detailed Mining Appraisal

The presence of mineral seams, including coal, which might have been mined beneath the site has been determined from the above geological appraisal and the Coal Authority Mining Report, ref. 51002229593001 and dated 21 February 2020, a copy of which is appended.

The Coal Authority indicates that according to their probably incomplete records the site surface could be affected by underground mineworkings in three seams of coal at between 280 to 620 metres depth; the last mineworkings being in 1964. In addition, the Coal Authority indicates that any ground movement from coal mining should have stopped by now.

It should be noted that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mines (Coal) Regulations Act of 1872, by which date much unrecorded mining had taken place and of those plans which were made it is likely that not all will have survived.

The Coal Authority also indicates that there is no current mining or proposals to mine coal beneath the site, although reserves of coal exist which could be mined in the future subject to feasibility, licences and planning consents. It should be noted that on 23 December 2015 all underground coal mining ceased in the UK.

The Coal Authority are not aware of any recorded abandoned mine entries within the site or within 20 metres of the site boundary.

In any old mining area such as this, where records are generally incomplete, the existence of unrecorded mine entries should not be discounted. However, from the anticipated geological and comparatively deep mining structure, it is our opinion that the possibility is relatively small and need not be given special attention.

2.3 Conclusions and Recommendations

Surface instability arises when the collapse of mineworkings migrates upwards through the roof strata and back to the surface or near surface level. There is considered to be a potential for this if there is less than ten times the unworked thickness of the coal seam in intact rock strata above the mined coal seam. In addition residual settlement of abandoned mineworkings is not possible to predict, and although the risk may be increased by the stresses imposed by a surface load, settlement can and does occur irrespective of ground surface loads.

The geological appraisal indicates that the site is underlain by a number of coal seams, the base of the shallowest coal seam (1. 1 metre thick Bin Mine Coal?) being at about 88 metres depth. The mining appraisal indicates that there are no records of mining in the shallowest coal seam although unrecorded mineworkings may be present.

Given the findings of the geological and mining appraisal we consider that the risk to surface stability is negligible and no further investigation is recommended. In addition no special precautions need to be taken for the proposed development.

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3.0 GENERAL

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Miss Anna Marsden at our Preston office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. 6921A
APRIL 2020

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For and on behalf of
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C. A. Marsden

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BGS GEOREPORT

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Geological Map Extracts

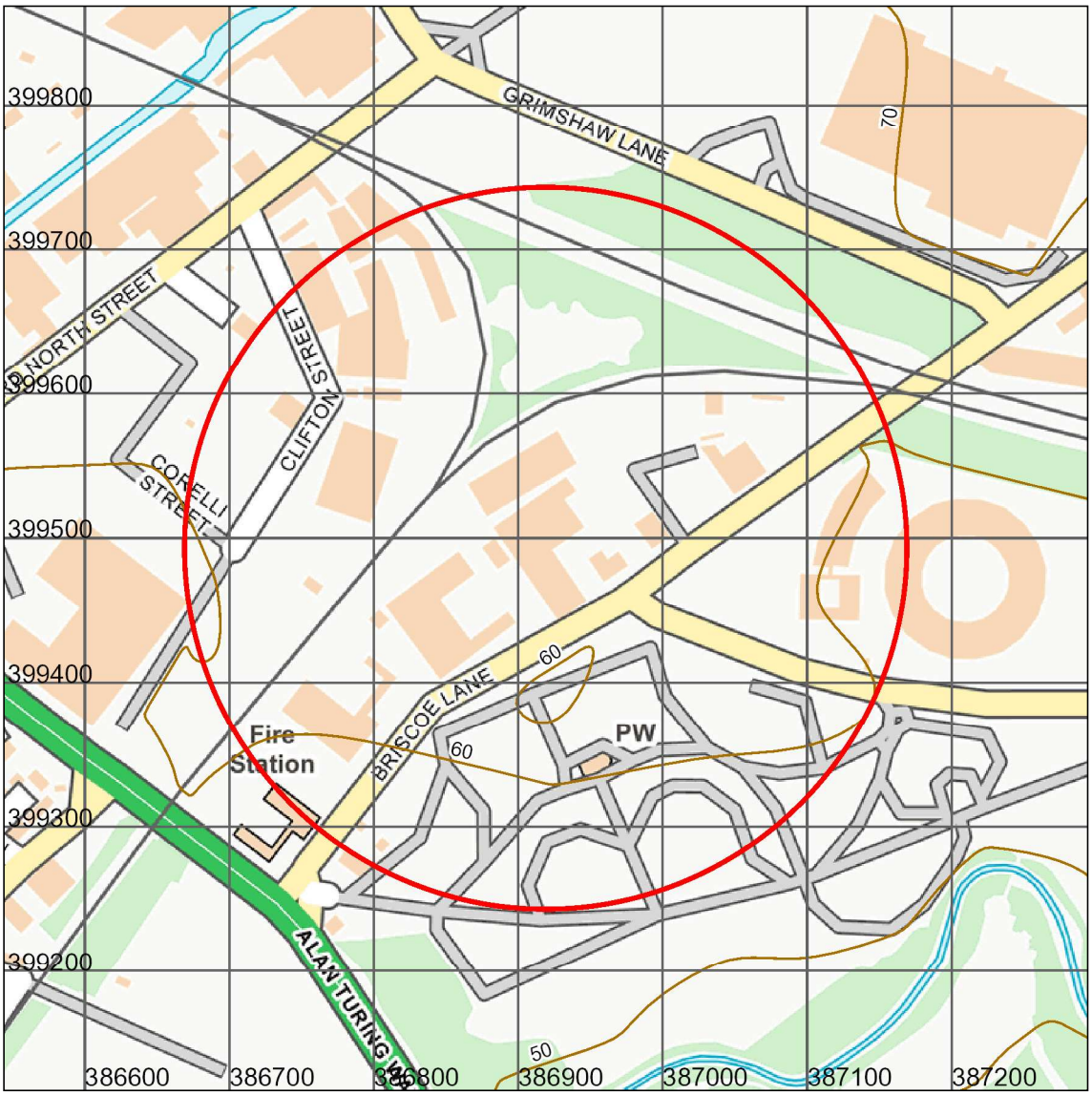
This report is designed for users carrying out preliminary site assessments who require geological maps for the area around their site, as well as for those who have a general interest in their local geology.

The report contains geological map extracts taken from the BGS Digital Geological Map of Great Britain at 1:10,000 scale (BGS Geology 10k) where available, otherwise at 1:50,000 scale (BGS Geology 50k). The various geological layers – artificial (man-made), landslip, superficial and solid (bedrock) geology - are displayed separately as 10 by 10cm extracts.

Report Id: ***BGS_308145/10906***

Client reference: 6921A

Search location



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Search location indicated in red

Area centred at: 386919,399493
Radius of site area: 250 metres

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Geological Map Extracts 1:10,000 Scale

This part of the report contains extracts of geological maps taken from the 1:10 000 scale BGS Digital Geological Map of Great Britain (BGS Geology 10k). The geological information in BGS Geology is divided into four themes: artificial ground, landslide deposits, superficial deposits and bedrock, shown here in separate maps. The fifth 'combined geology' map superimposes all four of these themes, to show the uppermost geological formations.

More information about BGS Geology 10k is available here http://www.bgs.ac.uk/products/digitalmaps/DiGMapGB_10.html and information on the BGS geological classification schemes here http://www.bgs.ac.uk/bgsrcs/. The maps are labelled with two-part computer codes that indicate the name of the geological unit and its composition. Descriptions of the units listed in the map keys may be available in the BGS Lexicon of Named Rock Units (http://www.bgs.ac.uk/lexicon/). If available, these descriptions can be found by searching against the first part of the computer code used on the maps. Please consult the legend and the codes on the map in areas of complex geology. If in doubt, please contact BGS Enquiries for clarification.

In the map legends the geological units are listed in order of their age, as defined in the BGS Lexicon, with the youngest first. However, where units are of the same defined age they are listed alphabetically and this may differ from the actual geological sequence.

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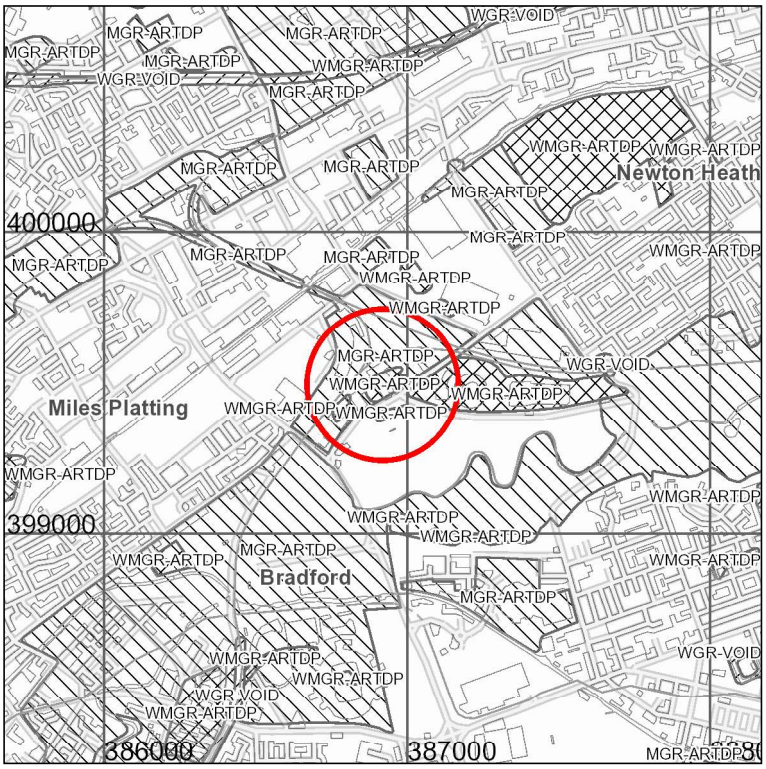
Artificial ground

This is ground at or near the surface that has been modified by man. It includes ground that has been deposited (Made Ground) or excavated (Worked Ground), or some combination of these: Landscaped Ground or Disturbed Ground.



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Search area indicated in red

Key to Artificial ground:

Map colour	Computer Code	Name of geological unit	Composition
	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

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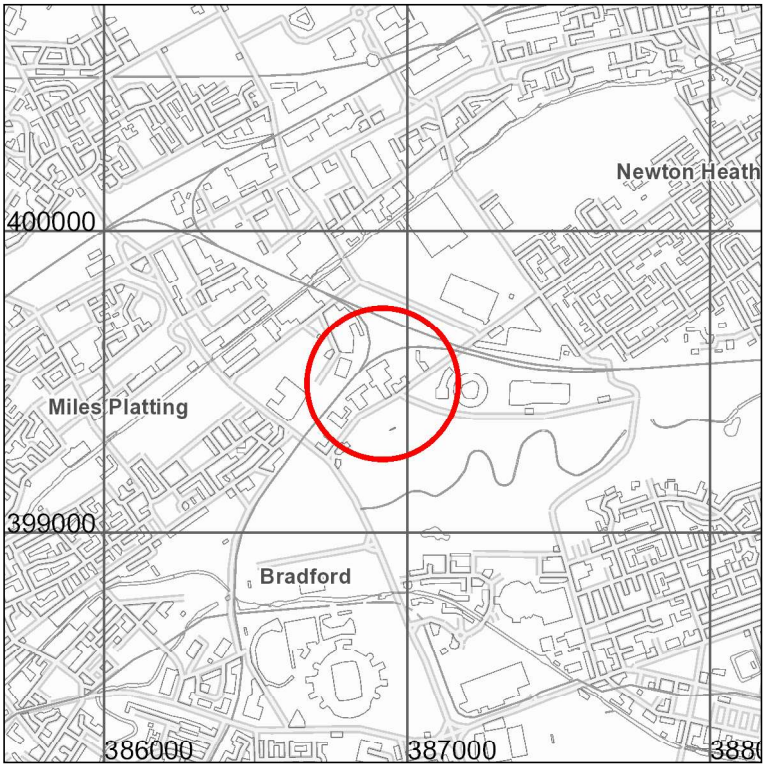
Landslide deposits

These are deposits formed by localised mass-movement of soils and rocks on slopes under the action of gravity. Landslides may occur within the bedrock, superficial deposits or artificial ground; and the landslide deposits may themselves be artificially modified.



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Scale: 1:25 000 (1cm = 250 m)
Search area indicated in red

Key to Landslide deposits:

No deposits found in the search area

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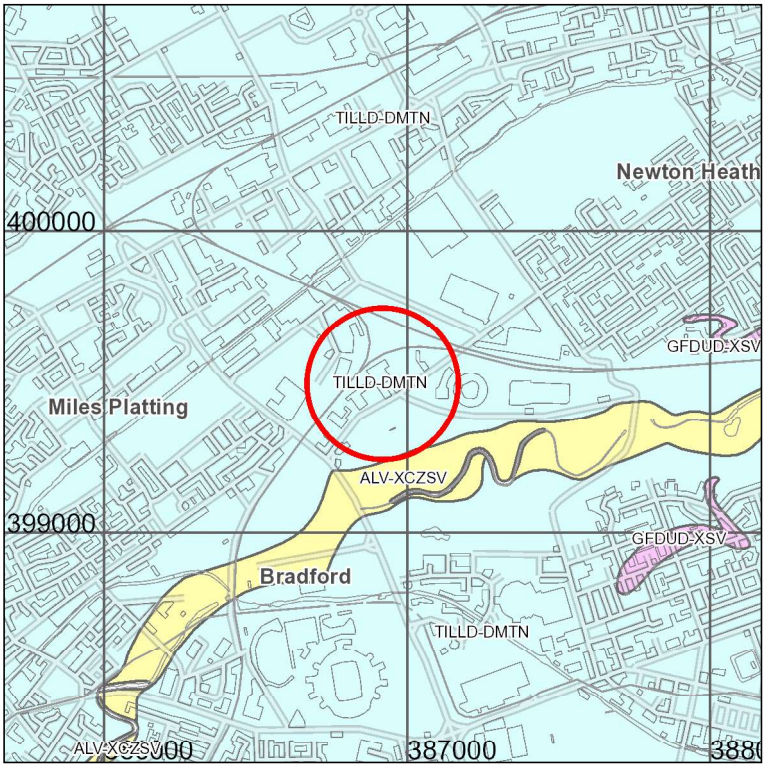
Superficial deposits

These are relatively young geological deposits, formerly known as 'Drift', which lie on the bedrock in many areas. They include deposits such as unconsolidated sands and gravels formed by rivers, and clayey tills formed by glacial action. They may be overlain by landslide deposits or by artificial deposits, or both.



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Scale: 1:25 000 (1cm = 250 m)
Search area indicated in red

Key to Superficial deposits:

Map colour	Computer Code	Name of geological unit	Composition
	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

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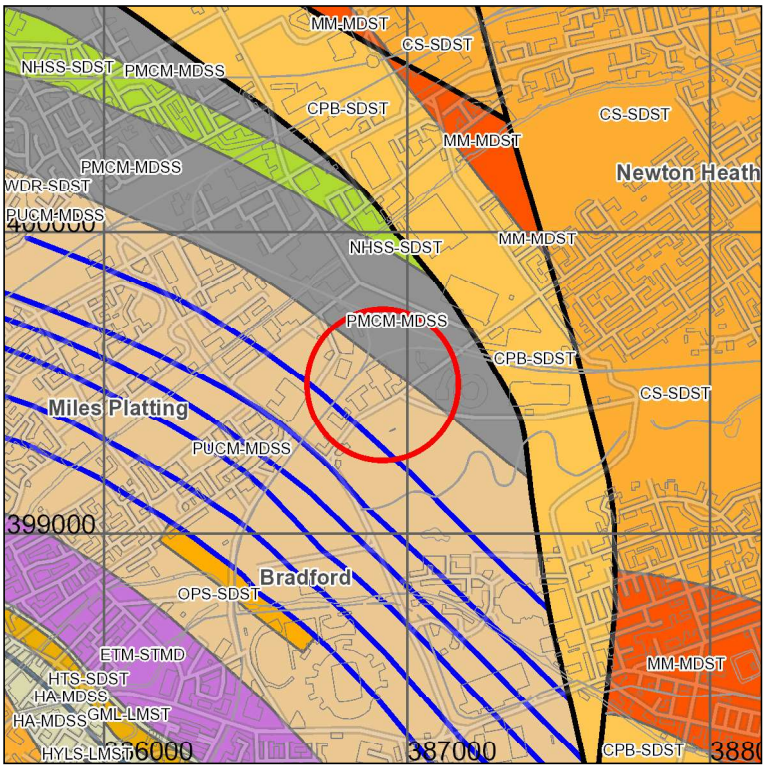
Bedrock

Bedrock forms the ground underlying the whole of an area, commonly overlain by superficial deposits, landslide deposits or artificial deposits, in any combination. The bedrock formations were formerly known as the 'Solid Geology'.



Search area indicated in red

Fault

Coal, ironstone or mineral vein

Note: Faults are shown for illustration and to aid interpretation of the map. Because these maps are generalised from more detailed versions not all such features are shown and their absence on the map face does not necessarily mean that none are present. Coals, ironstone beds and mineral veins occur only in certain rock types and regions of the UK; if present here, they will be described under 'bedrock' below.

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Scale: 1:25 000 (1cm = 250 m)

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Key to Bedrock geology:

Map colour	Computer Code	Name of geological unit	Rock type
	CPB-SDST	CHESTER PEBBLE BEDS FORMATION	SANDSTONE
	MM-MDST	MANCHESTER MARLS FORMATION	MUDSTONE
	CS-SDST	COLLYHURST SANDSTONE FORMATION	SANDSTONE
	GML-LMST	GREAT MINE LIMESTONE	LIMESTONE
	HA-MDSS	HALESOWEN FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
	HYLS-LMST	HALF YARD LIMESTONE	LIMESTONE
	HTS-SDST	HOLT TOWN SANDSTONE BED	SANDSTONE
	NHSS-SDST	NEWTON HEATH SANDSTONE	SANDSTONE
	OPS-SDST	OPENSHAW SANDSTONE	SANDSTONE
	PUCM-MDSS	PENNINE UPPER COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
	WDR-SDST	WORSLEY DELF ROCK	SANDSTONE
	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
	ETM-STMD	ETRURIA FORMATION	SANDSTONE AND MUDSTONE

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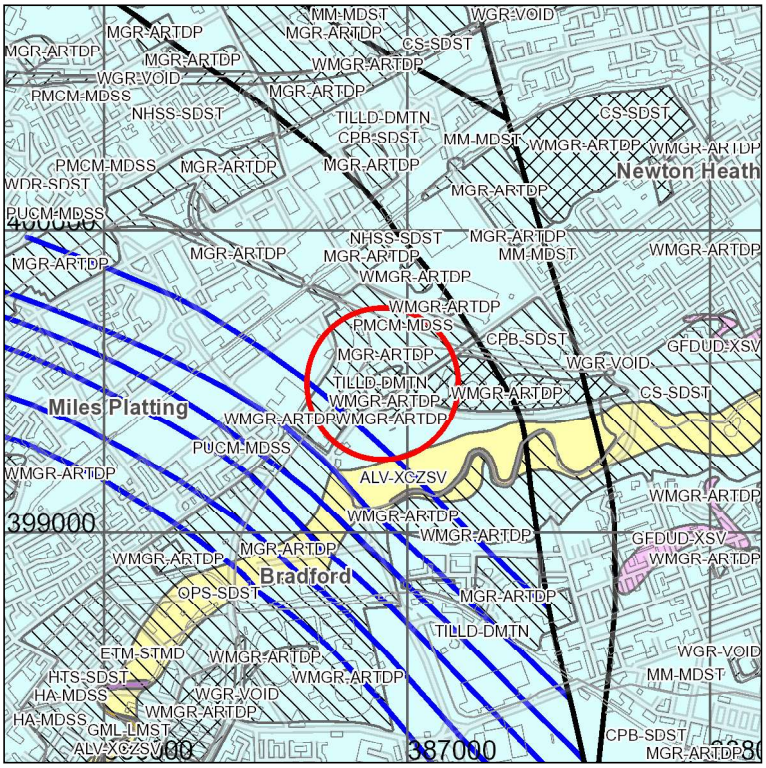
Combined 'Surface Geology' Map

This map shows all the geological themes from the previous four maps overlaid in order of age.



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Search area indicated in red

Please see the Keys to the Artificial, Landslide, Superficial and Bedrock geology maps.

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- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.
- Note that for some sites, the latest available records may be historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

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COAL AUTHORITY MINING REPORT

The Coal Authority

CON29M
coal mining report

ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, MANCHESTER M40 2XG

Known or potential coal mining risks

Past underground coal mining	Page 3
Future underground coal mining	Page 3
Withdrawal of support	Page 5

Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit www.groundstability.com

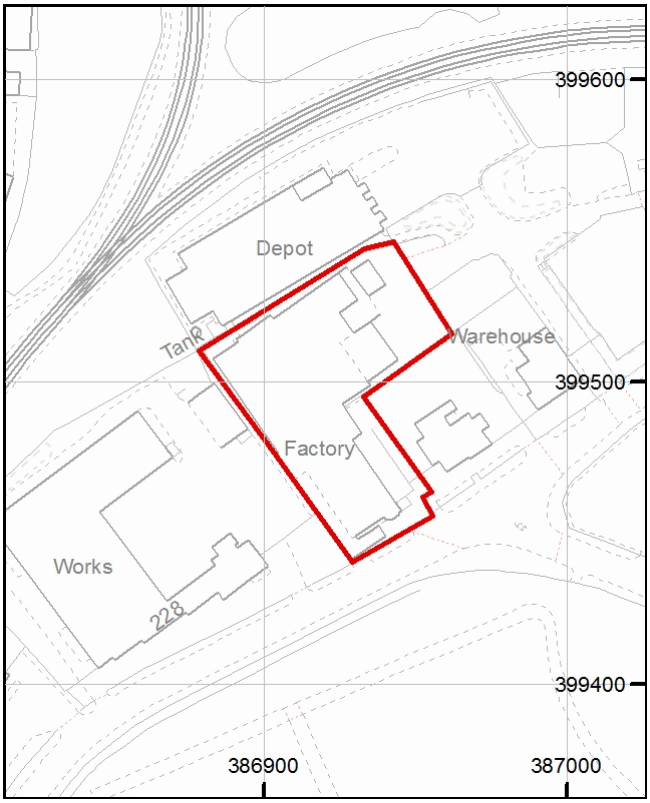
Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. It is unlikely that these features will impact on the stability of the enquiry boundary.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is **on the coalfield**

Map data

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This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

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1 Past underground coal mining

The property is in a surface area that could be affected by underground mining in 3 seams of coal at 280m to 620m depth, and last worked in 1964.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

2 Present underground coal mining

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

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

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

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

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

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

4 Mine entries

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

5 Coal mining geology

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

6 Past opencast coal mining

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

7 Present opencast coal mining

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

8 Future opencast coal mining

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

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

9 Coal mining subsidence

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

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

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

10 Mine gas

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

11 Hazards related to coal mining

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

12 Withdrawal of support

The property is in an area where a notice to withdraw support was given in 1955.

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

13 Working facilities order

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

14 Payments to owners of former copyhold land

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

Statutory cover

Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.
www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form

Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 01623 646 333. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary

Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

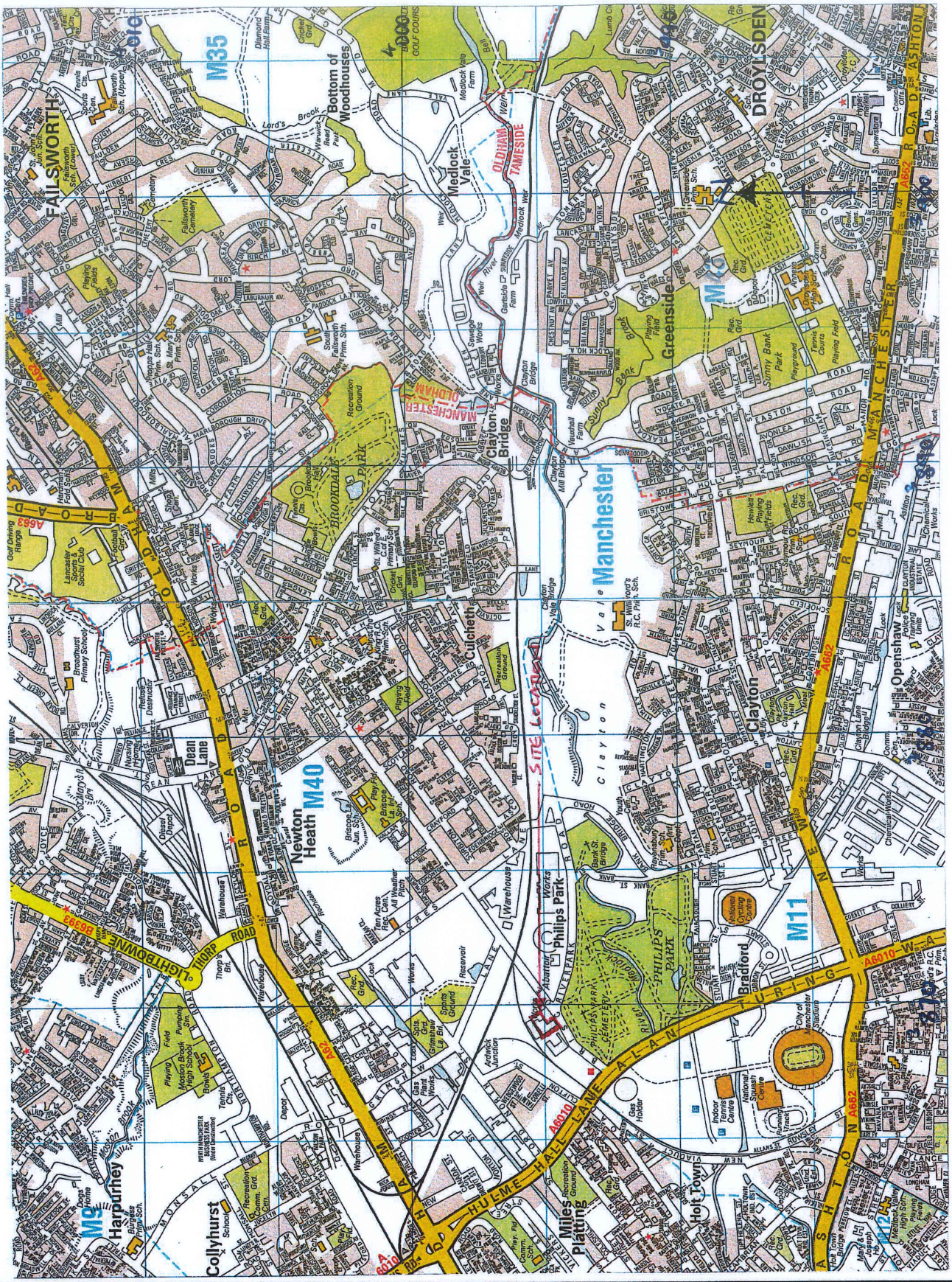
stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

FIGURES



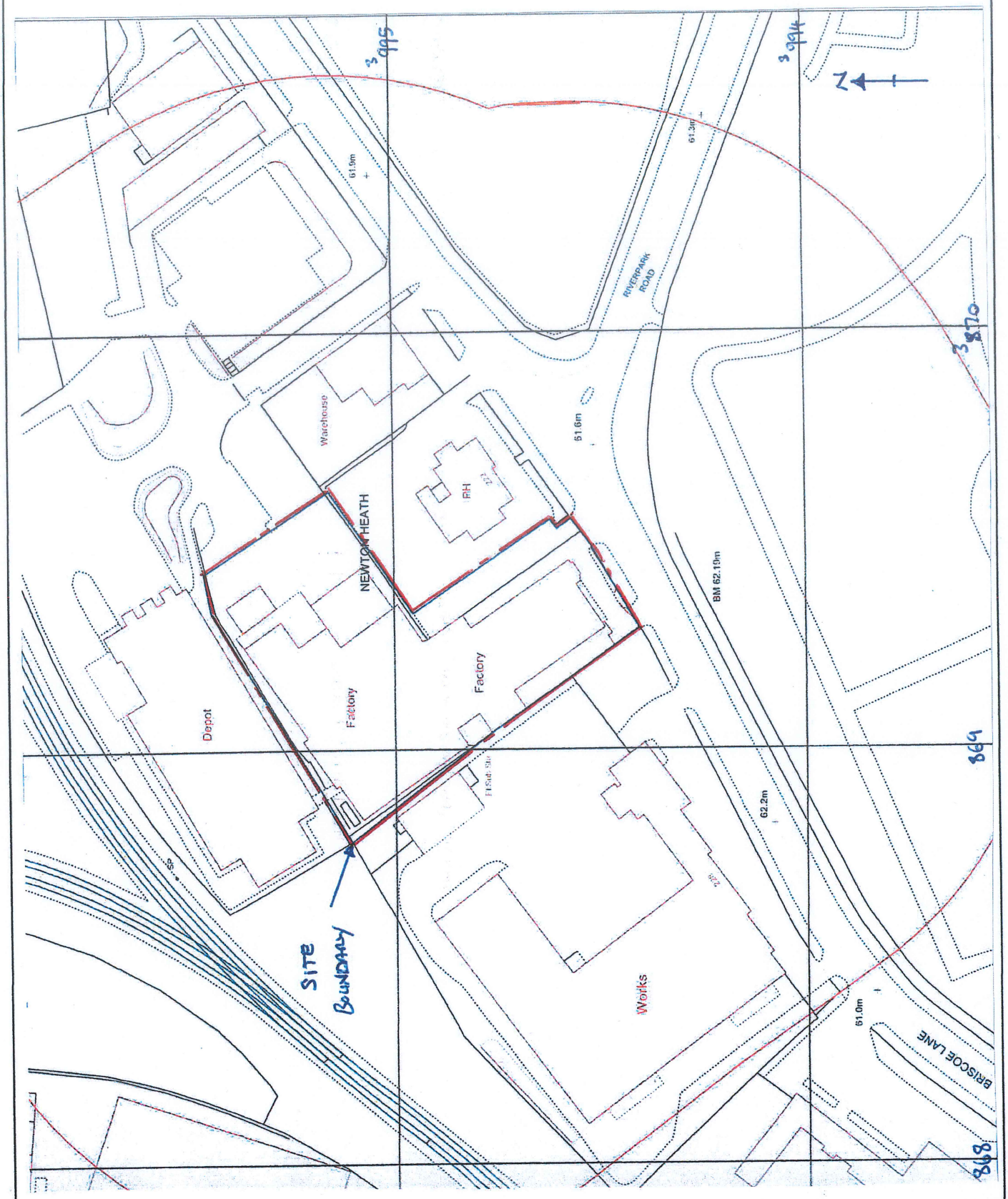
SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site Location Plan

Site	Date Drawn	Date Checked	Sheet	Job No.
ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	03-Apr-20		1 / 1	6921A
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CASSEL & FLETCHER CONSTRUCTION LIMITED	AJP		1:20,000	1

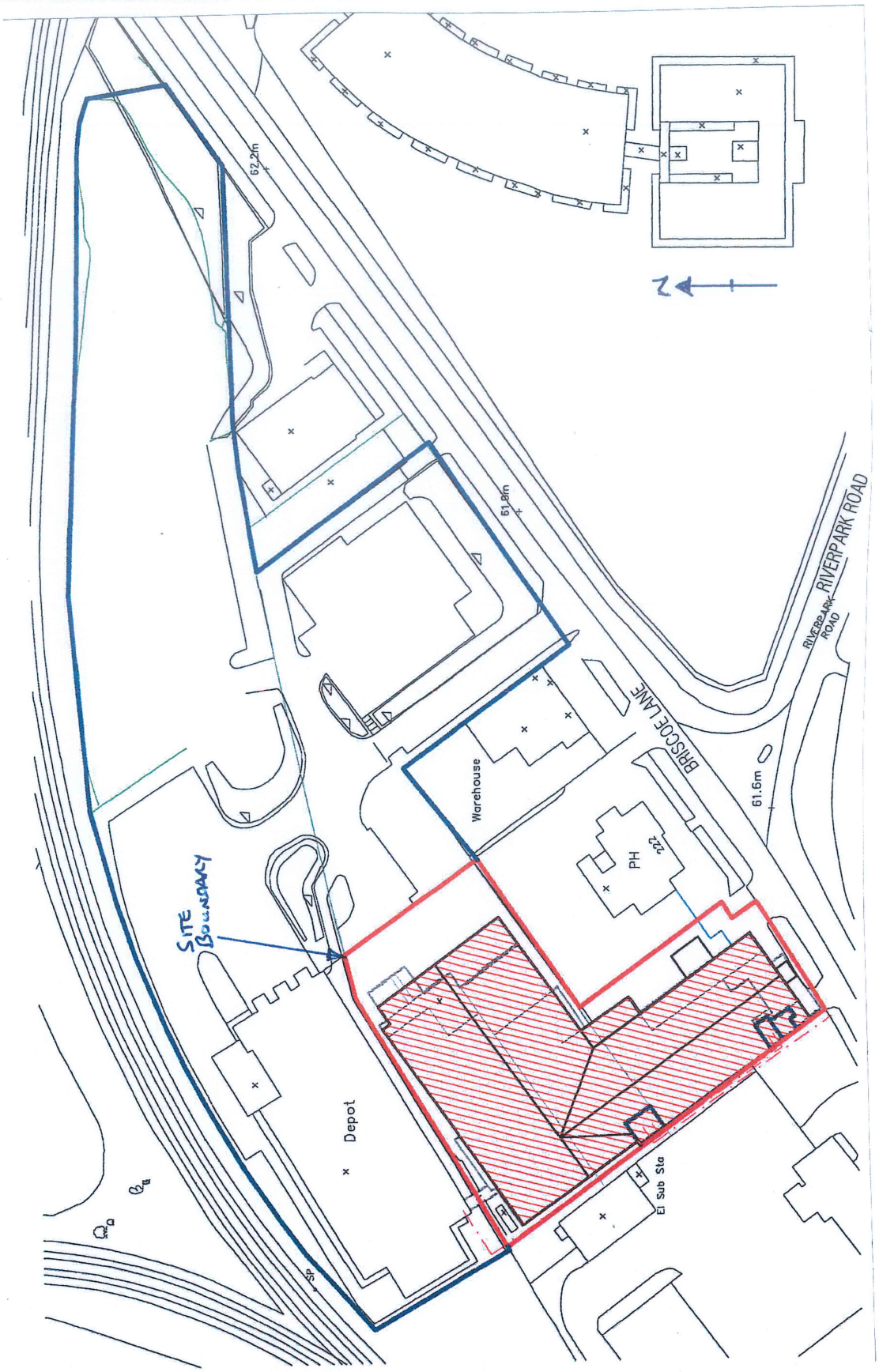


REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100033464)

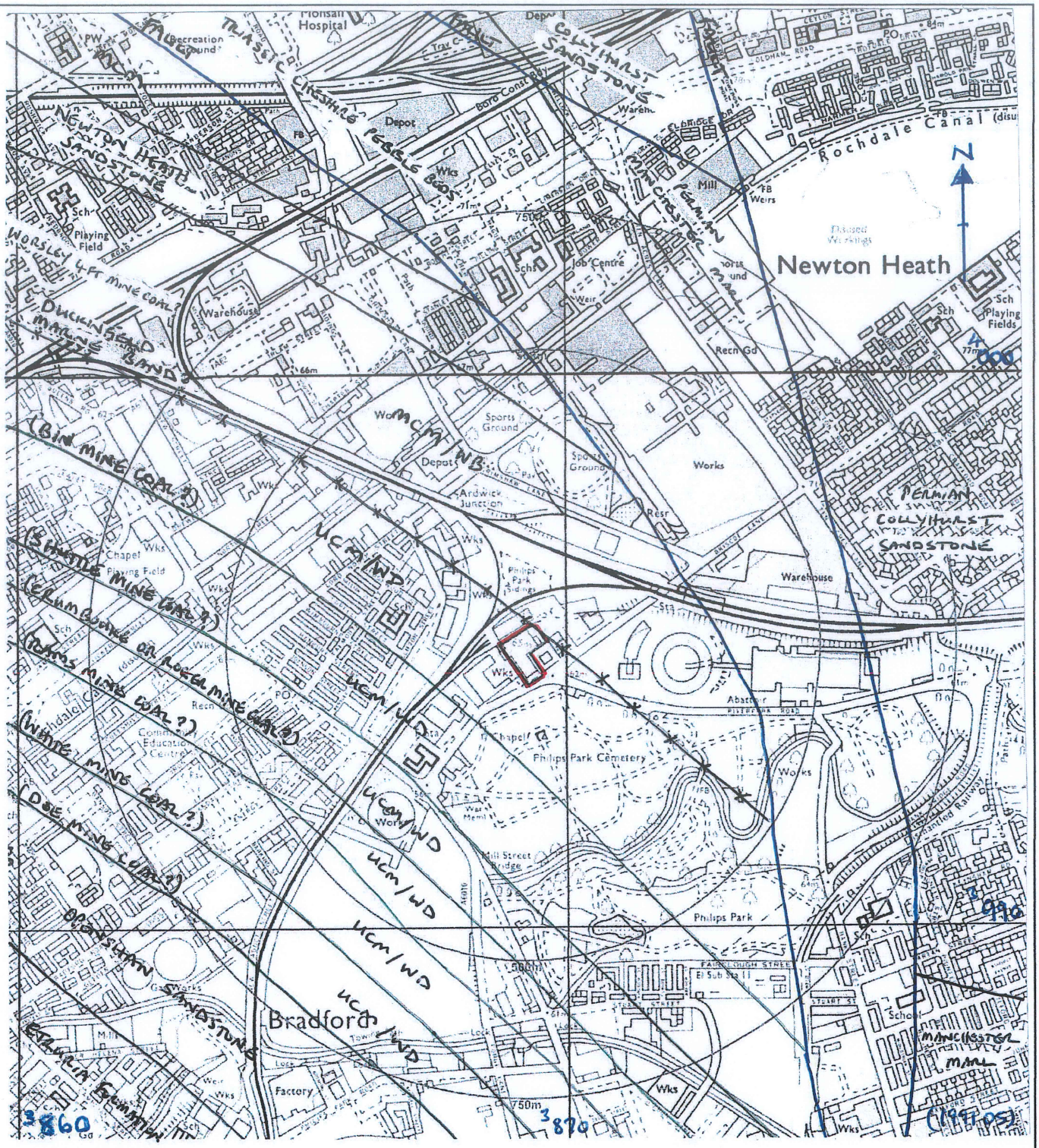
SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site Boundary Plan

Site	Date Drawn	Date Checked	Sheet	Job No.
ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	03-Apr-20		1 / 1	6921A
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CASSEL & FLETCHER CONSTRUCTION LIMITED	AJP		1:1,250	2



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Development Layout Plan			
Site ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	Date Drawn 03-Apr-20	Date Checked	Sheet 1 / 1	Job No. 6921A
Client CASSEL & FLETCHER CONSTRUCTION LIMITED	Drawn By AJP	Checked By	Scale 1:1,250	Figure No. 3



FAULT
STRATA BOUNDARY
MARINE BAND
COAL SEAM OVERLAIN BY UCM/WD

UCM UPPER COAL MEASURES
MCM MIDDLE COAL MEASURES
WD WESTPHALIAN D
WB WESTPHALIAN B
} CARBONIFEROUS COAL MEASURES

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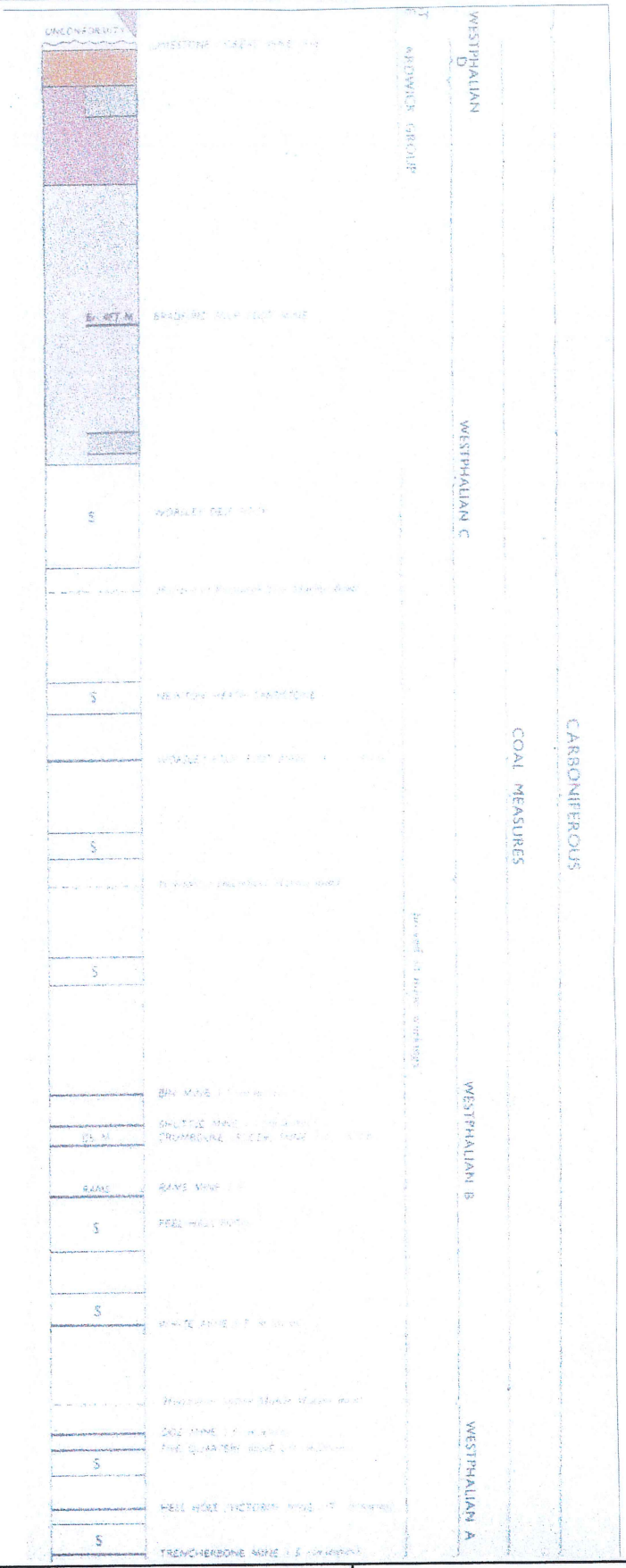
SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Geological Plan

Site	Date Drawn	Date Checked	Sheet	Job No.
ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	06-Apr-20		1 / 2	6921A
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CASSEL & FLETCHER CONSTRUCTION LIMITED	AJP		1:10,000	4



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Stratigraphical Column (Sheet SJ.89.NW, Adjoining Site Area)			
Site ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	Date Drawn 06-Apr-20	Date Checked	Sheet 2 / 2	Job No. 6921A
Client CASSEL & FLETCHER CONSTRUCTION LIMITED	Drawn By AJP	Checked By	Scale 1:5,000	Figure No. 4