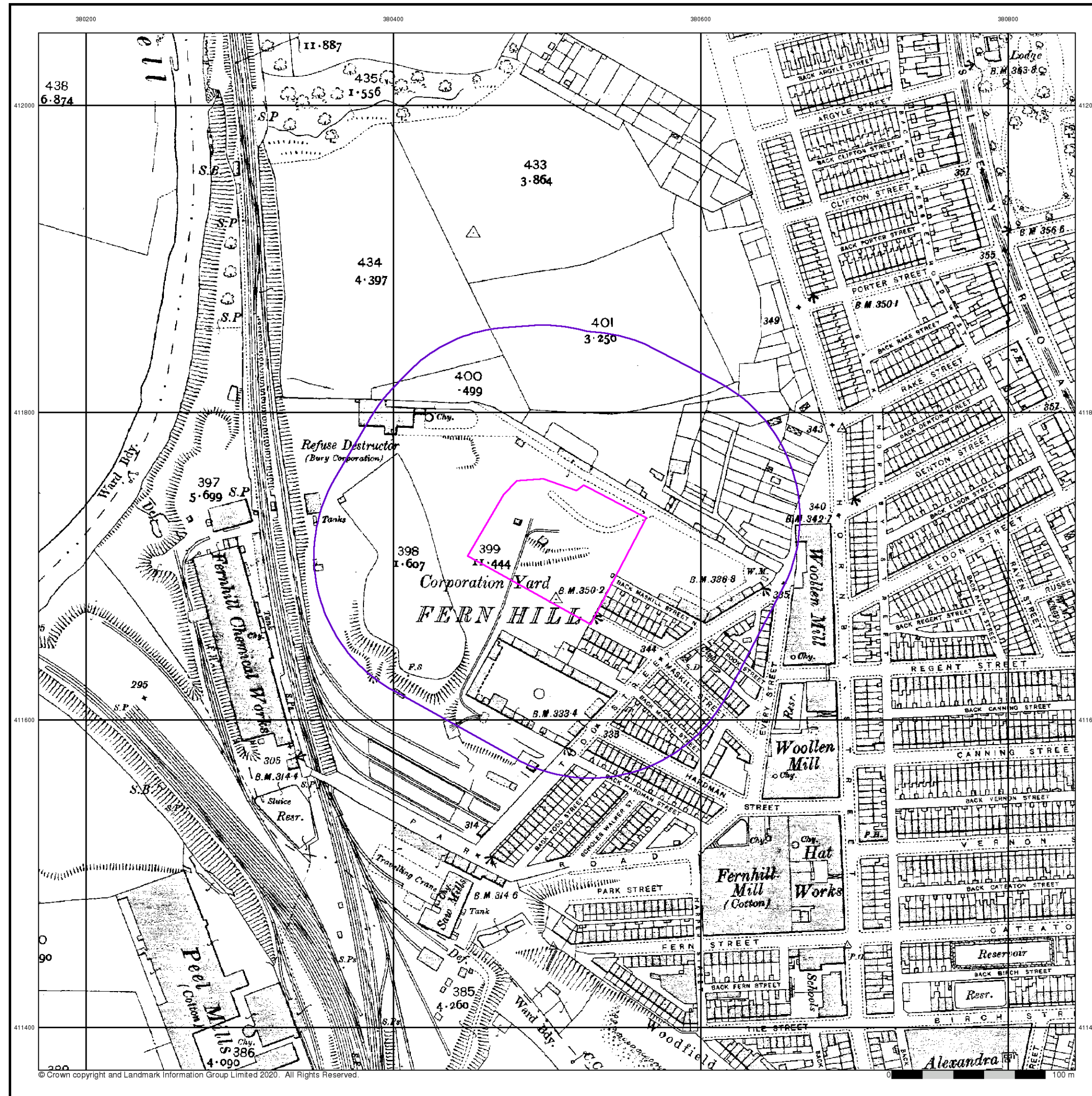




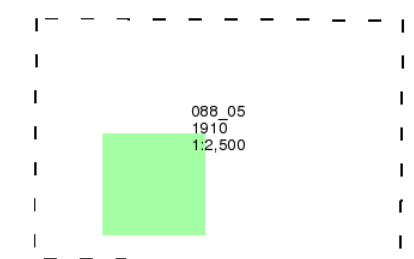
Lancashire And Furness

Published 1910

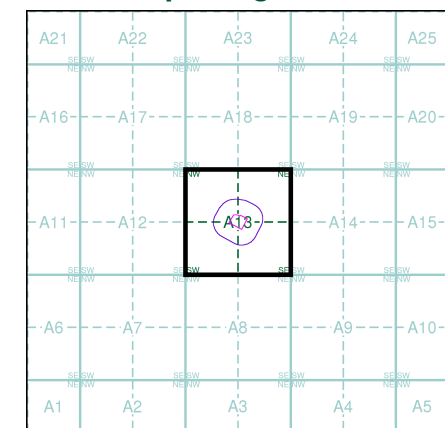
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720



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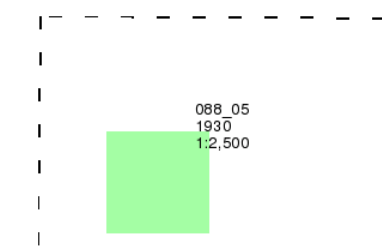
Lancashire And Furness

Published 1930

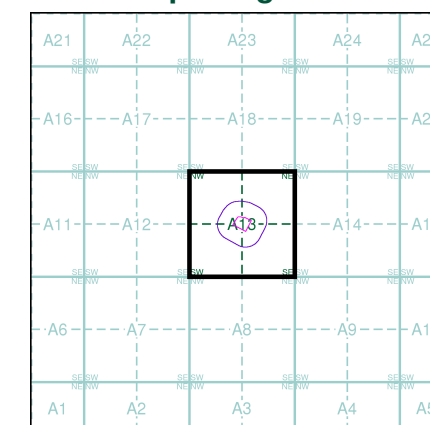
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

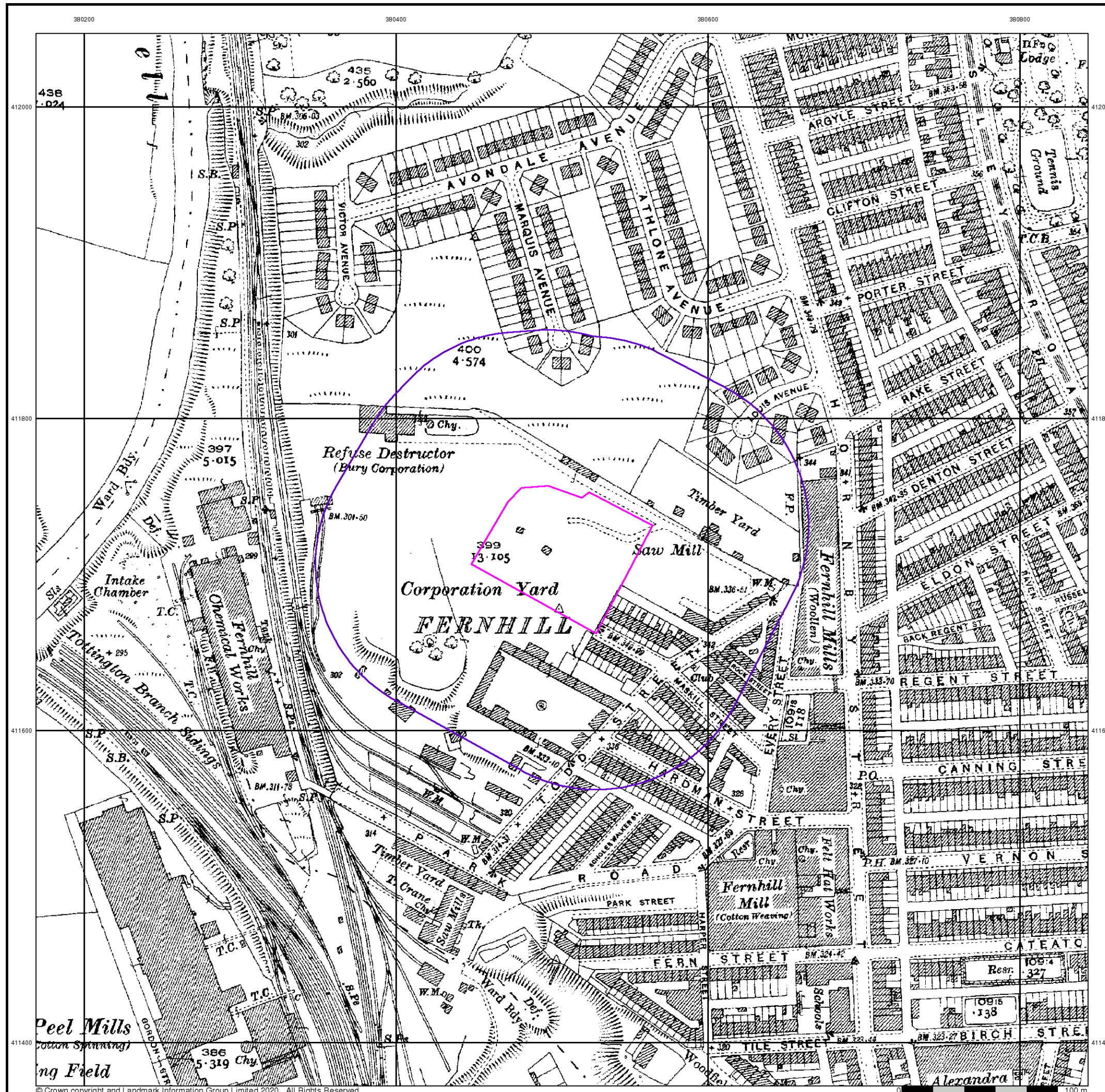
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720

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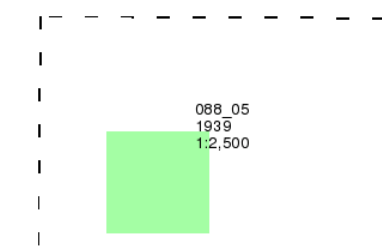
Lancashire And Furness

Published 1939

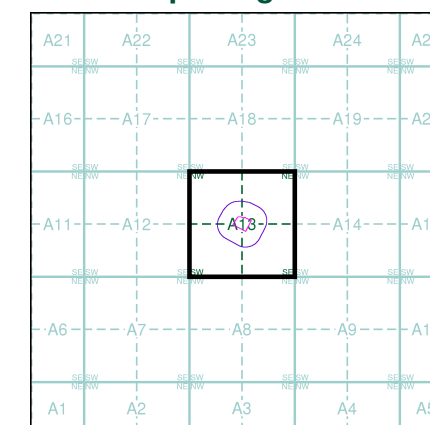
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

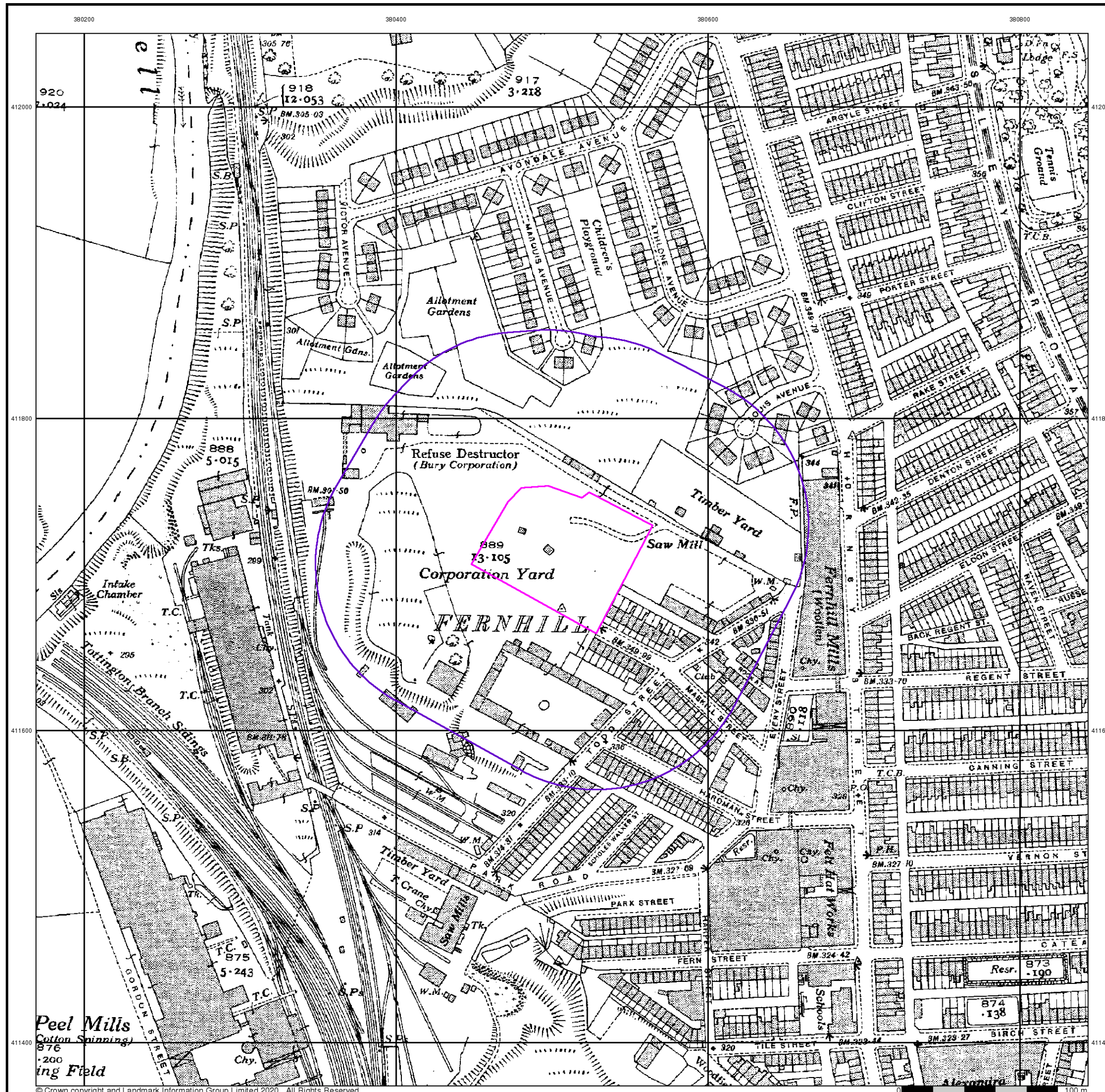
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720

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Ordnance Survey Plan

Published 1959 - 1960

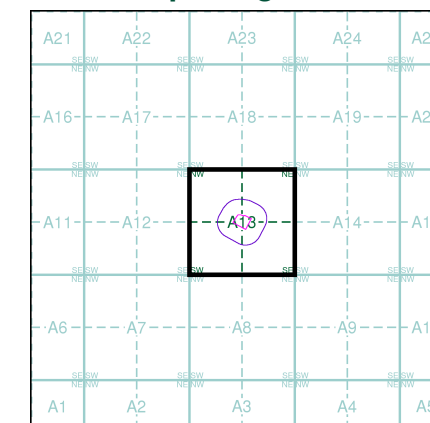
Source map scale - 1:1,250

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 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SD8012SV	SD8012SE
1960	1960
1:1,250	1:1,250
SD8011NV	SD8011NE
1959	1959
1:1,250	1:1,250
SD8011SW	SD8011SE
1959	1959
1:1,250	1:1,250

Historical Map - Segment A13



Order Details

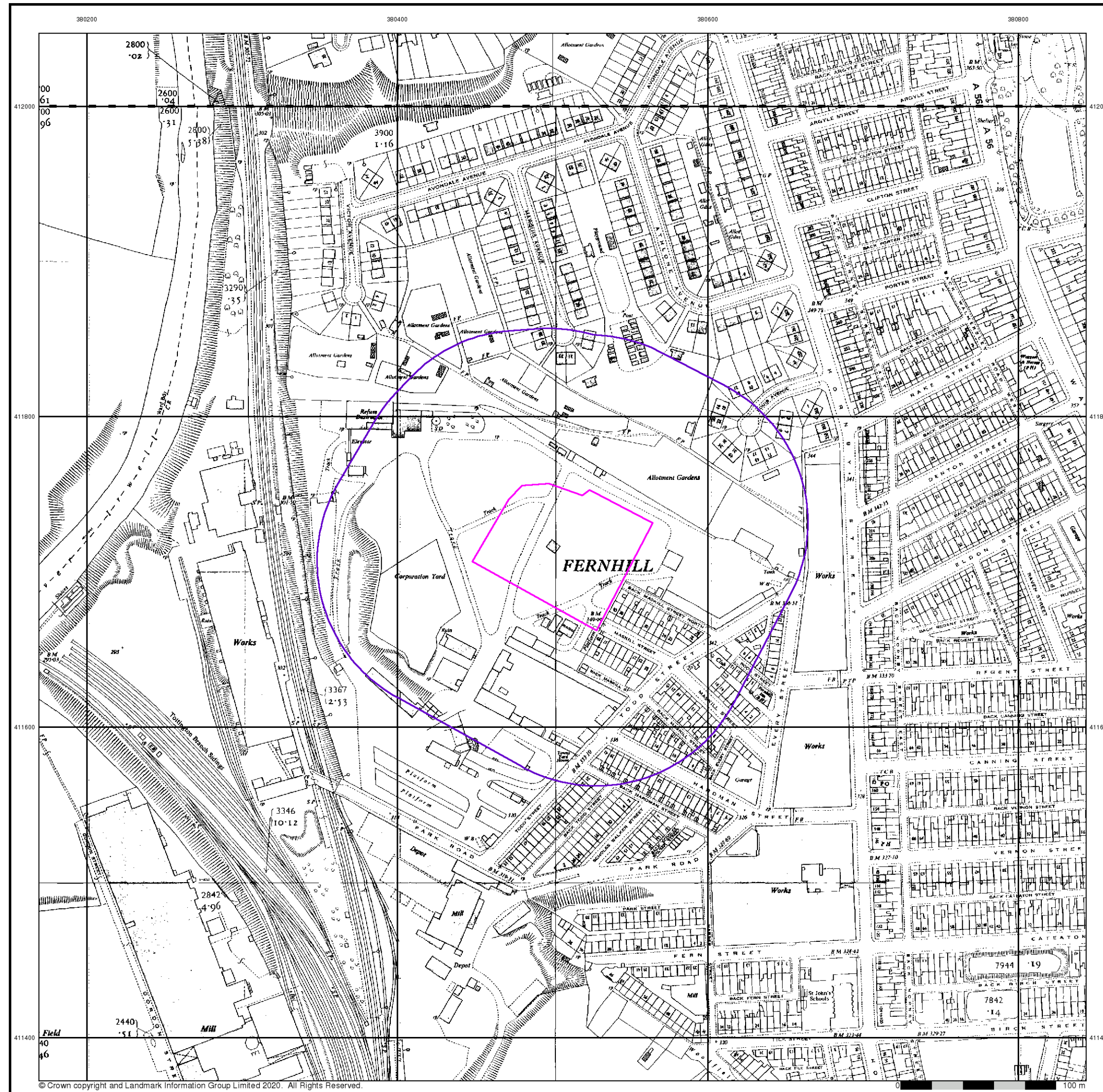
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720

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Ordnance Survey Plan

Published 1960 - 1961

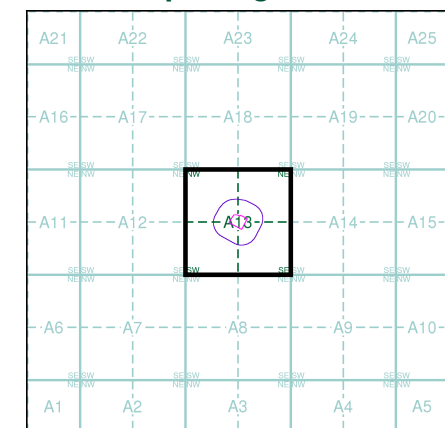
Source map scale - 1:2,500

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

Map Name(s) and Date(s)

SD8012
1961
1:2,500
SD8011
1960
1:2,500

Historical Map - Segment A13



Order Details

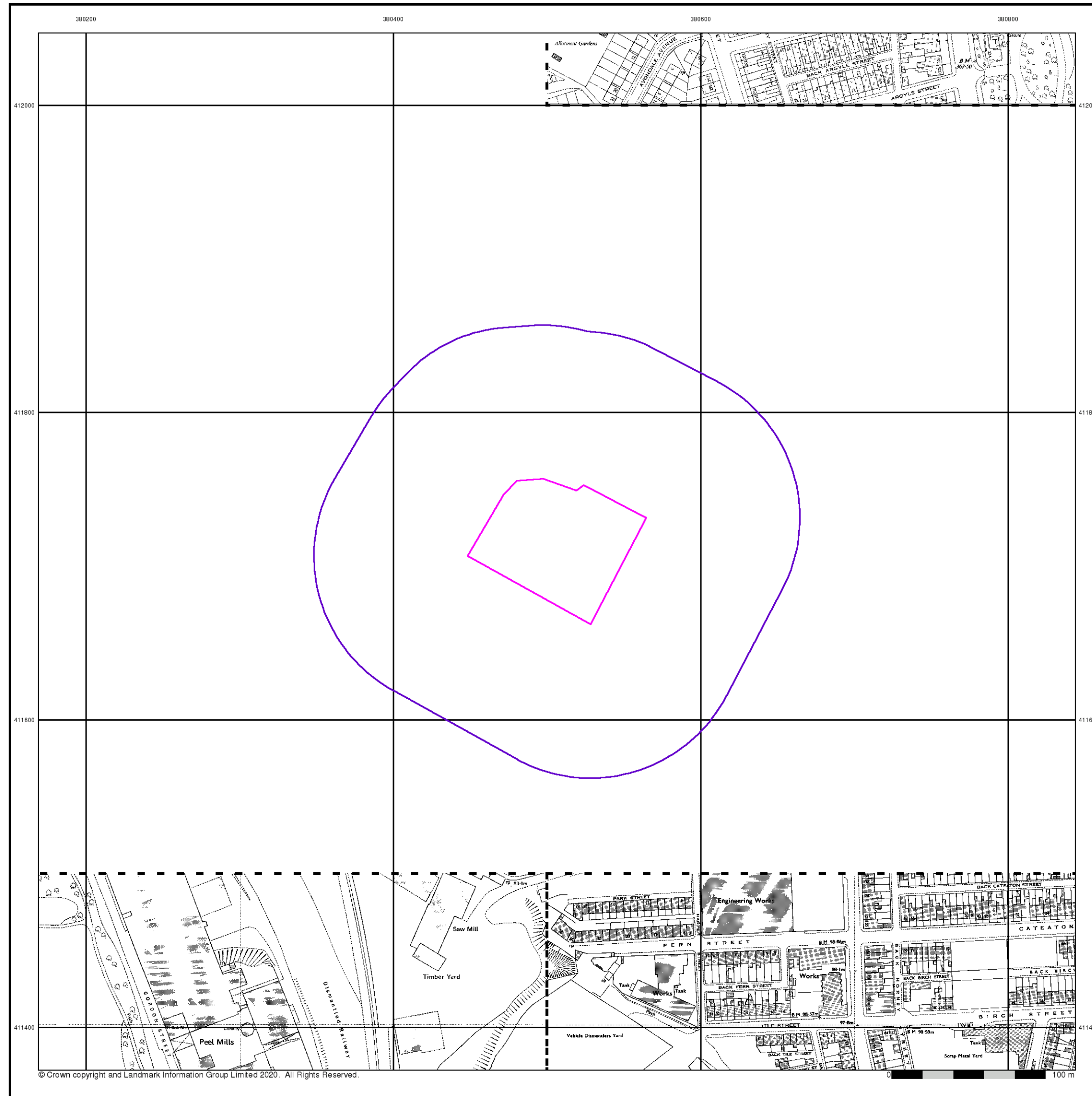
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720



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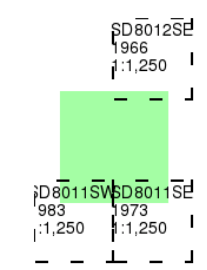
Ordnance Survey Plan

Published 1966 - 1983

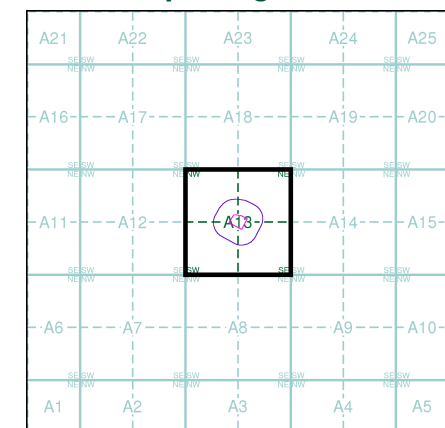
Source map scale - 1:1,250

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 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

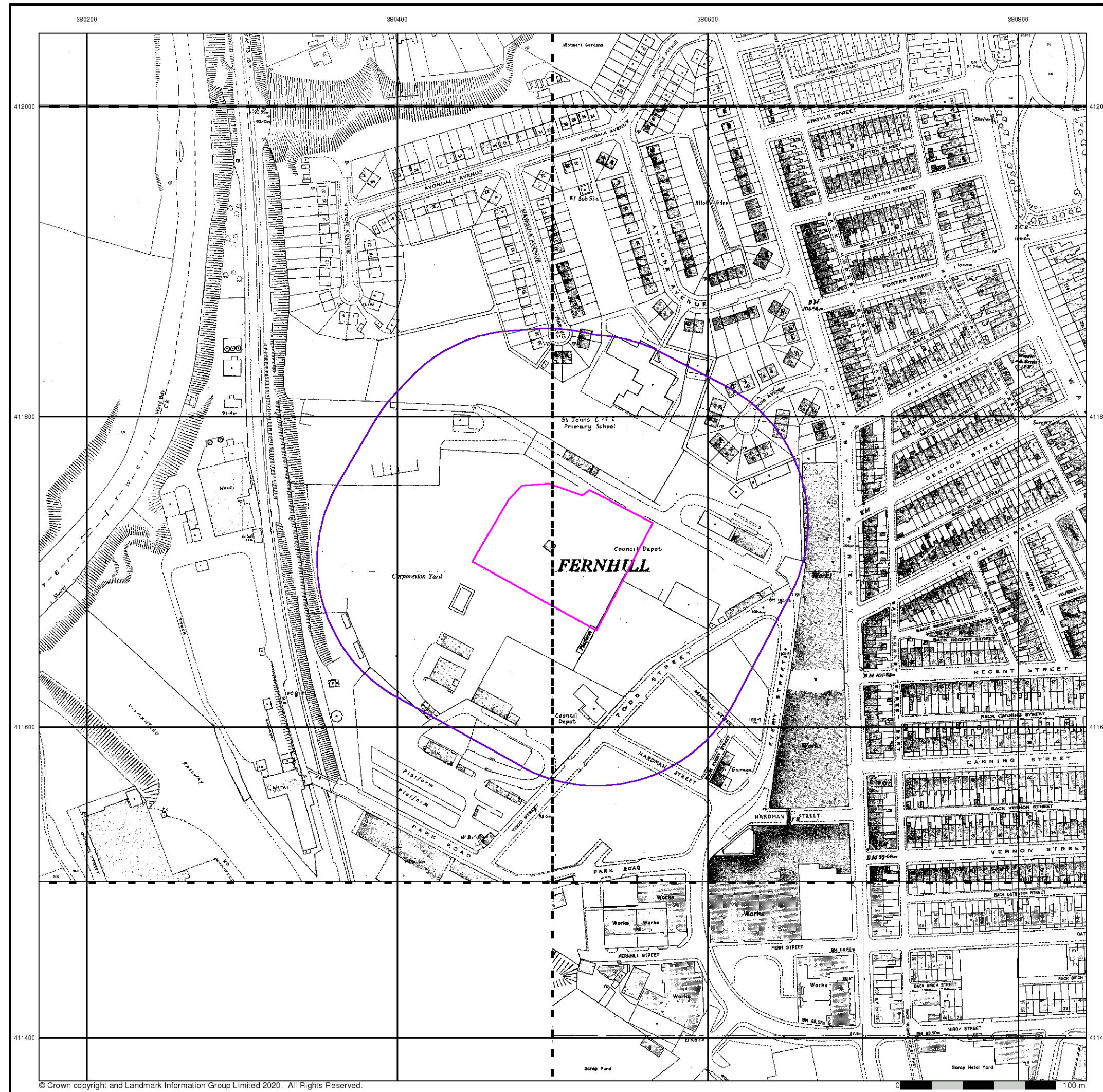
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720



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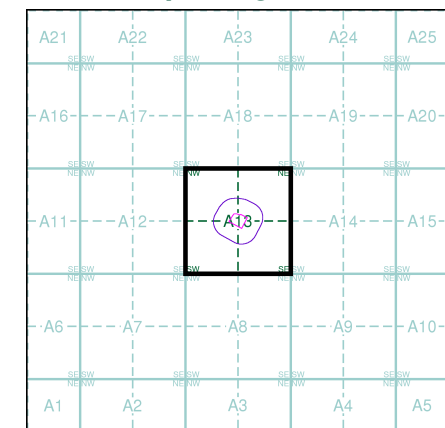
Additional SIMs
Published 1978 - 1991
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's '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)

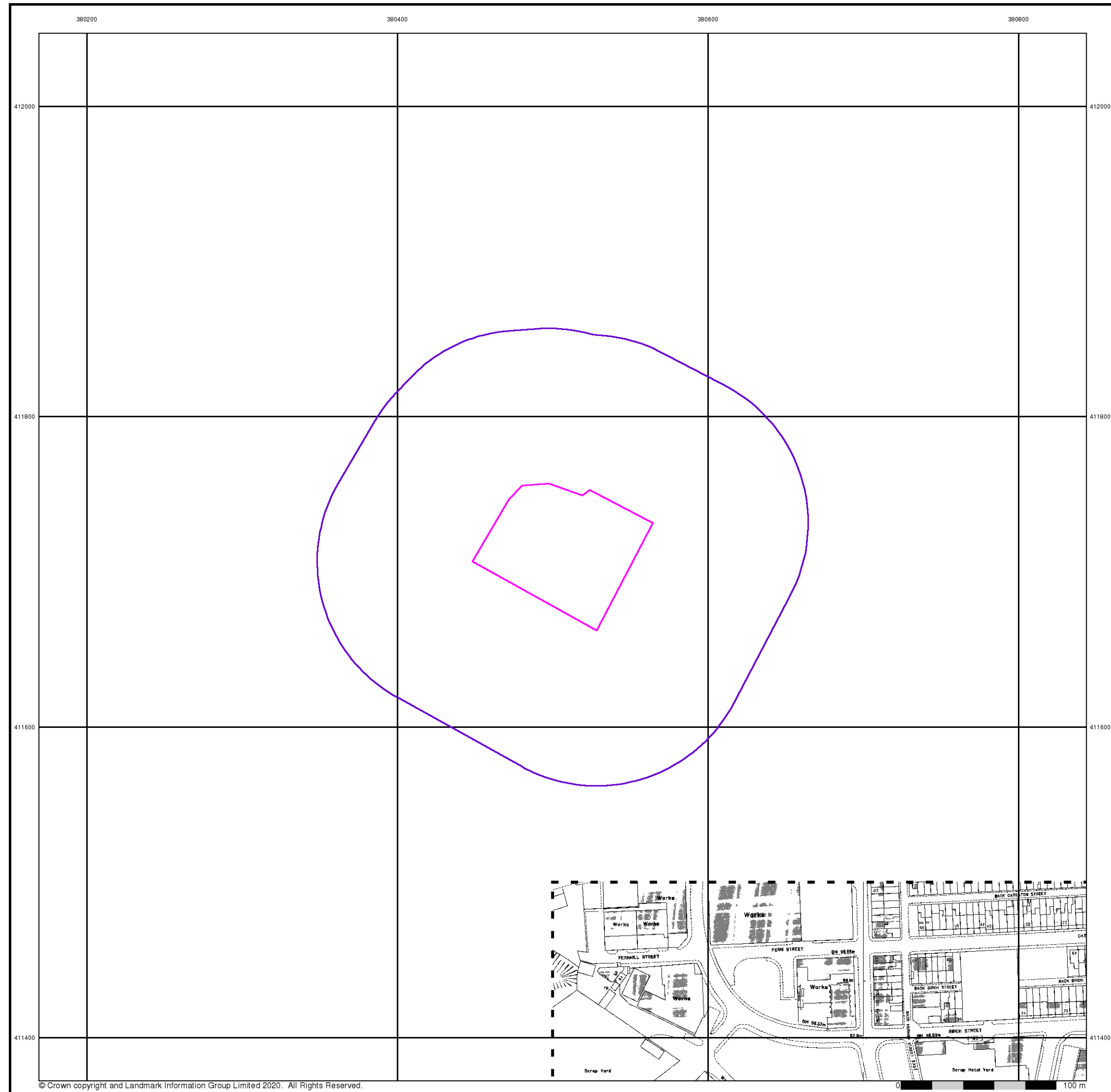
SD8012SV	SD8012SE
1978	1991
1:1,250	1:1,250
SD8011NV	SD8011NE
1982	1984
1:1,250	1:1,250
SD8011SE	
1985	
1:1,250	

Historical Map - Segment A13



Order Details
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details
Site at 380490, 411720





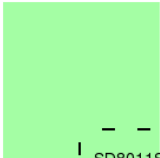
Ordnance Survey Plan

Published 1985

Source map scale - 1:1,250

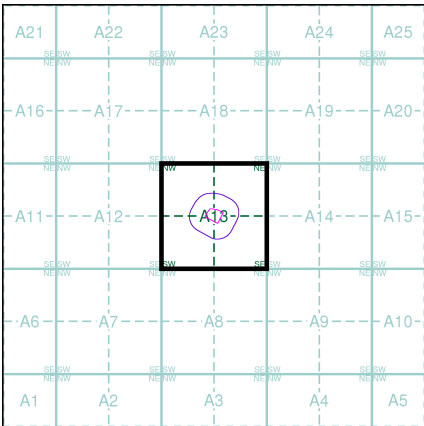
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain.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

Map Name(s) and Date(s)



SD8011SE
1985
1:1,250

Historical Map - Segment A13



Order Details

Order Number:	269841542_1_1
Customer Ref:	11542
National Grid Reference:	380510, 411710
Slice:	A
Site Area (Ha):	0.65
Search Buffer (m):	100

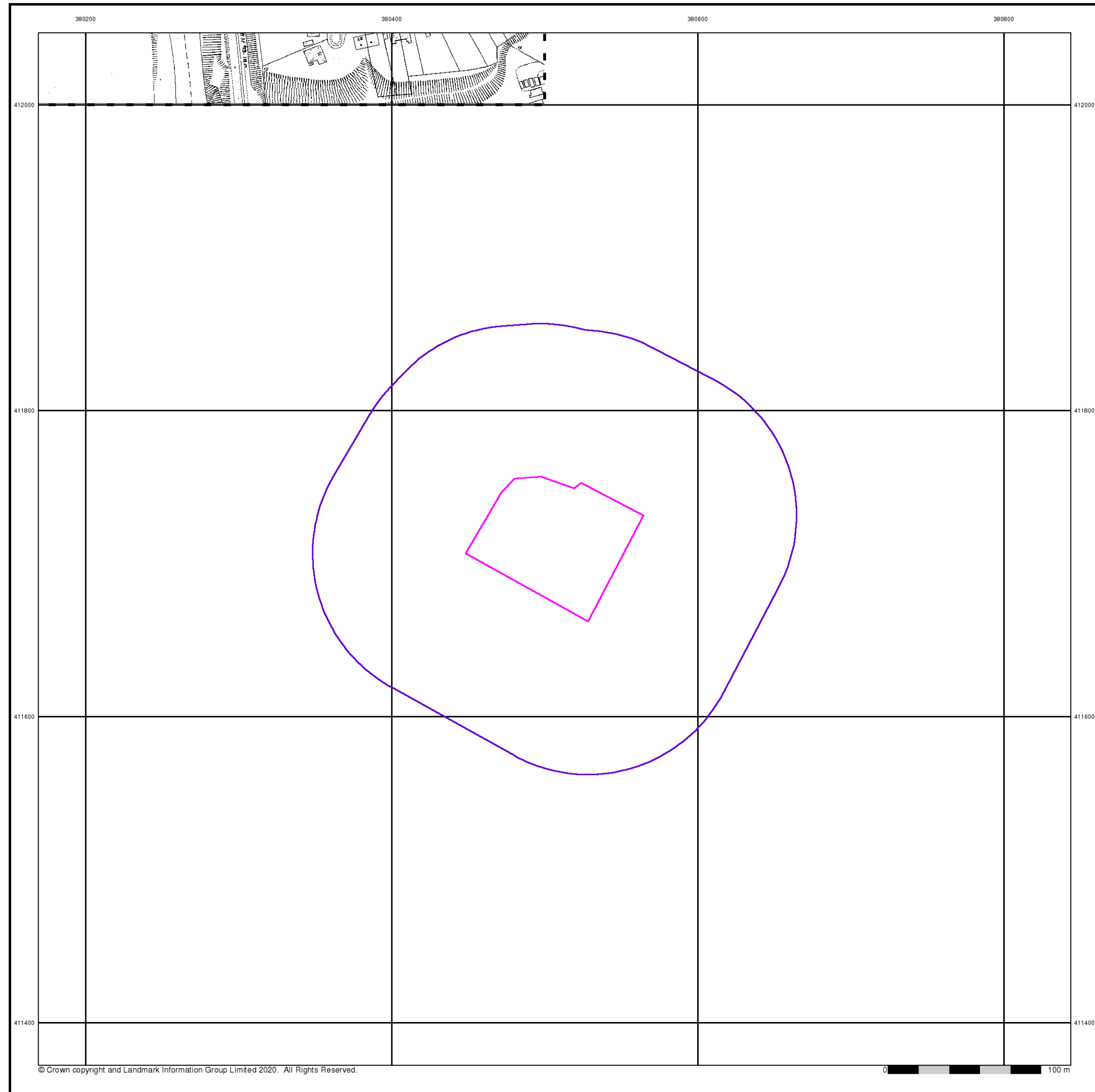
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Additional SIMs

Published 1987

Source map scale - 1:1,250

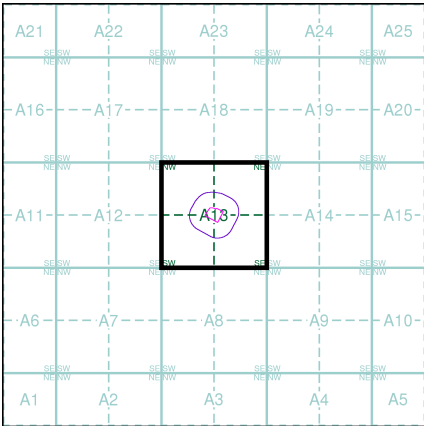
The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)

SD8012SW
1987
1:1,250



Historical Map - Segment A13



Order Details

Order Number:	269841542_1_1
Customer Ref:	11542
National Grid Reference:	380510, 411710
Slice:	A
Site Area (Ha):	0.65
Search Buffer (m):	100

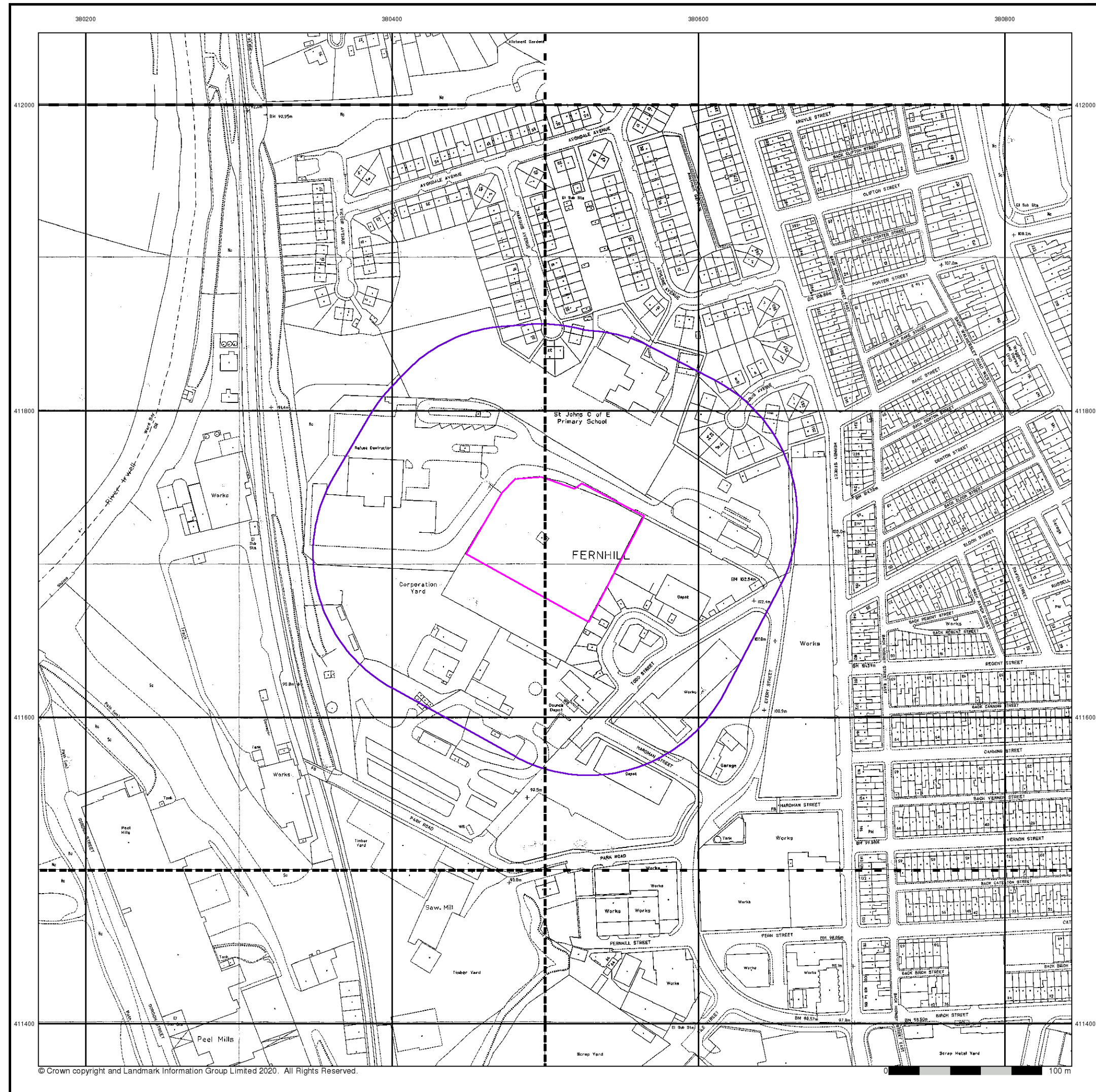
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Large-Scale National Grid Data

Published 1992

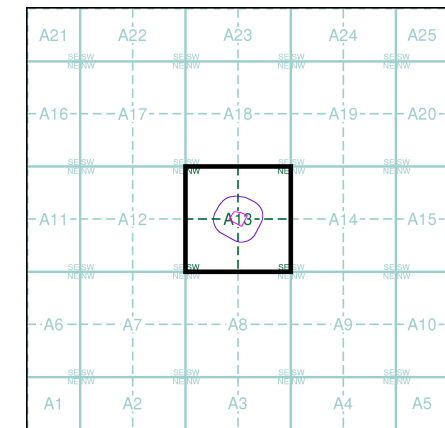
Source map scale - 1:1,250

'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)

ID8012SW	992	1:1,250
ID8011NW	992	1:1,250
ID8011NE	992	1:1,250
ID8011SW	992	1:1,250
ID8011SE	992	1:1,250

Historical Map - Segment A13



Order Details

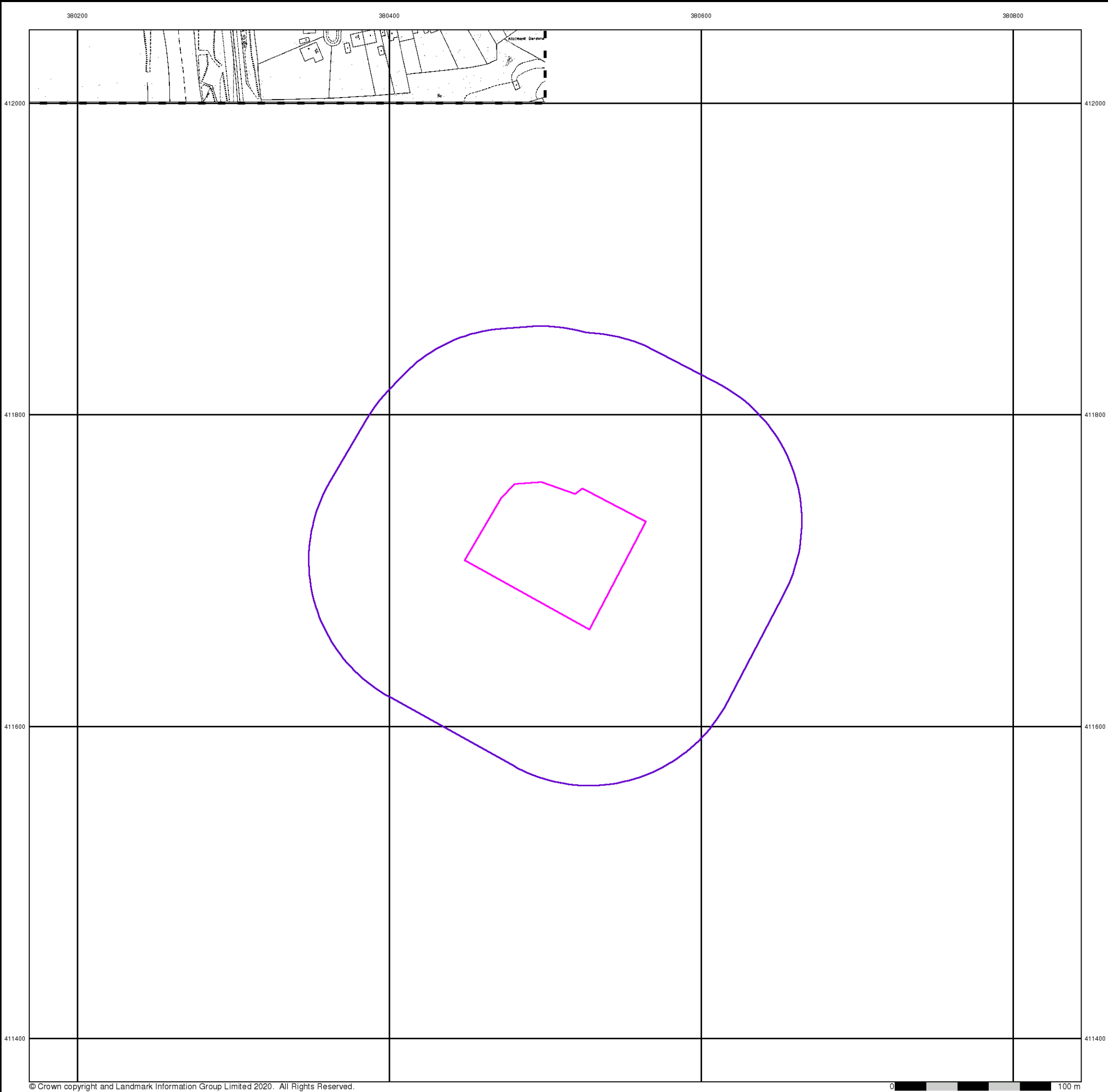
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720



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Large-Scale National Grid Data

Published 1993

Source map scale - 1:1,250

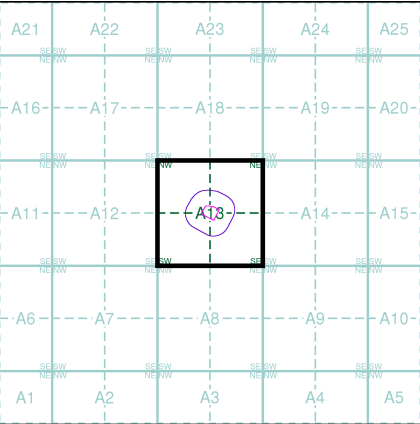
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)

SD8012SW
1993
1:1,250



Historical Map - Segment A13



Order Details

Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720

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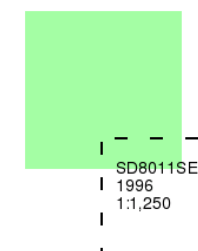
Large-Scale National Grid Data

Published 1996

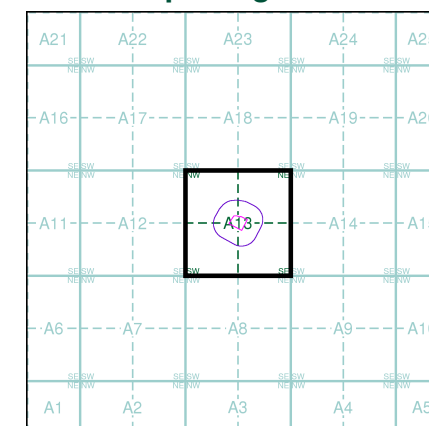
Source map scale - 1:1,250

'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 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

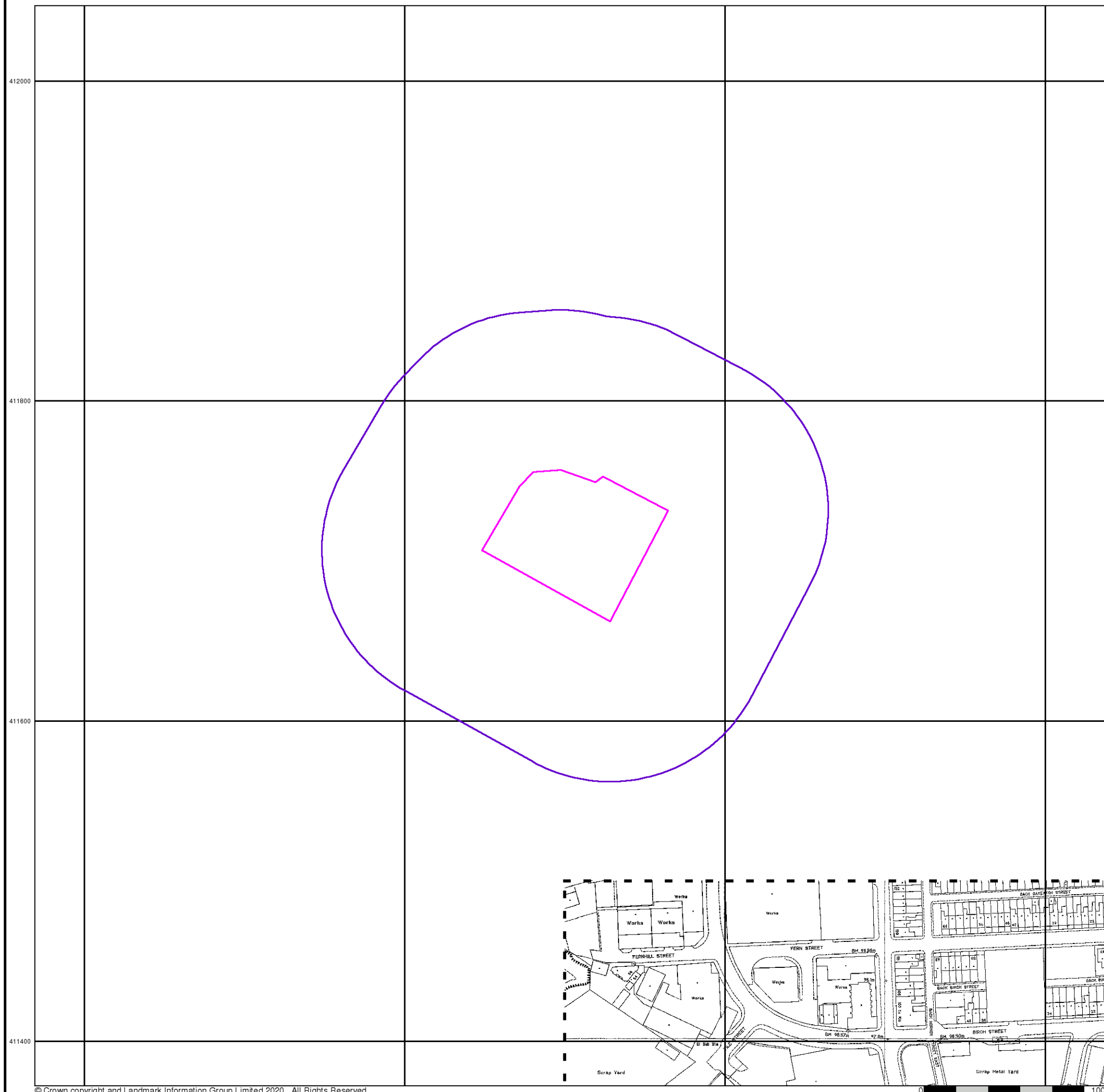
Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411710
Slice: A
Site Area (Ha): 0.65
Search Buffer (m): 100

Site Details

Site at 380490, 411720

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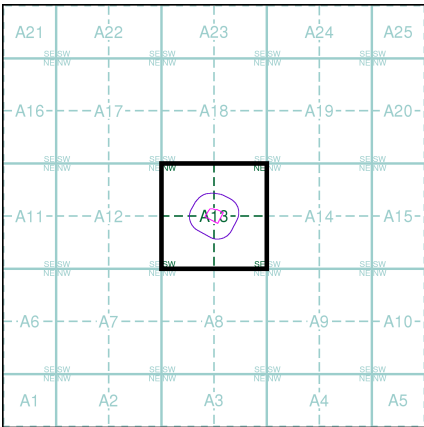


Historical Aerial Photography

Published 2001

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number:	269841542_1_1
Customer Ref:	11542
National Grid Reference:	380510, 411710
Slice:	A
Site Area (Ha):	0.65
Search Buffer (m):	100

Site Details

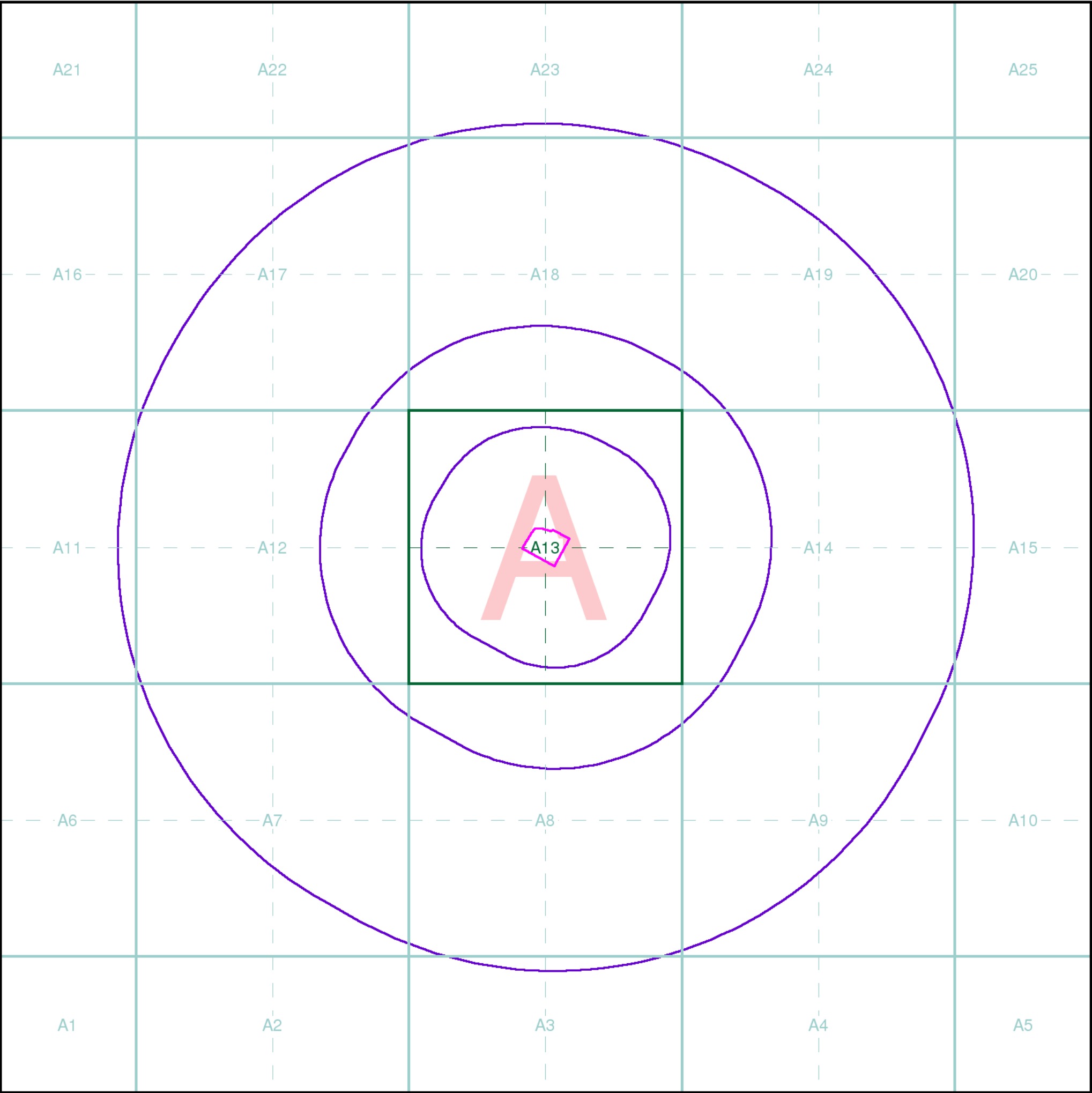
Site at 380490, 411720



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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms J Saddington, RSK Environment Ltd, Four Ways House, 57 Hilton Street, Manchester, M1 2EJ

Order Details

Order Number: 269841542_1_1
Customer Ref: 11542
National Grid Reference: 380510, 411720
Site Area (Ha): 0.65
Search Buffer (m): 1000

Site Details

Site at 380490, 411720

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<http://www.landmarkinfo.co.uk/Terms/Show/515>



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APPENDIX E

COAL AUTHORITY REPORT



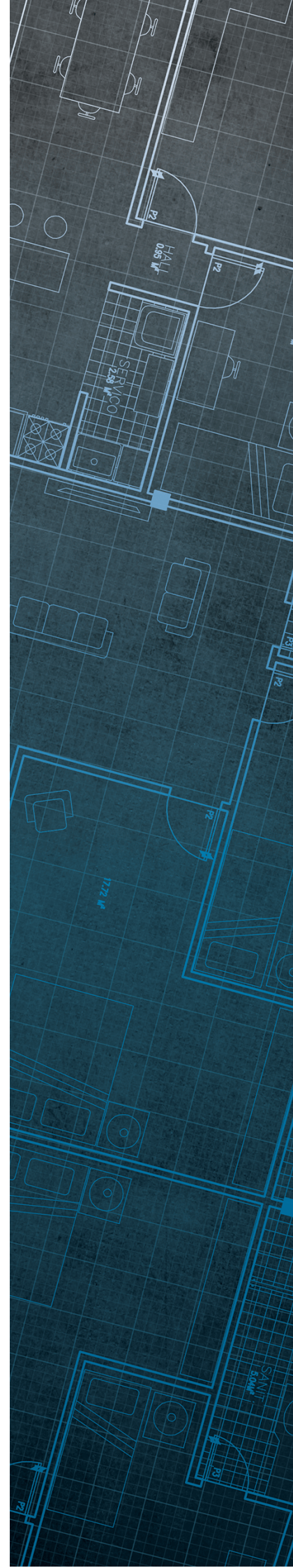
The Coal
Authority

Consultants Coal Mining Report

Site At 380490, 411720
Lancashire

Date of enquiry:	16 June 2021
Date enquiry received:	16 June 2021
Issue date:	16 June 2021

Our reference:	71007891158001
Your reference:	



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

R S K LTD

Enquiry address

Site At 380490, 411720
Lancashire

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

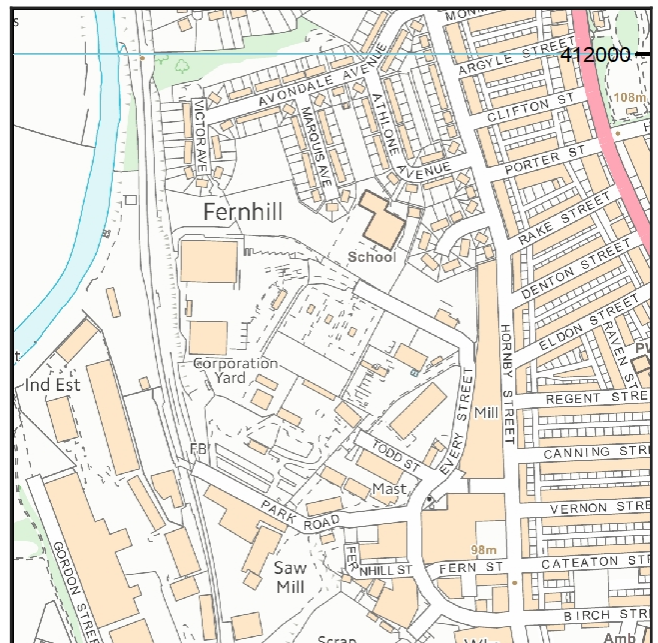
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ARLEY	Coal	6DMG	49	Beneath Property	3.1	South-East	130	1900
unnamed	ARLEY	Coal	3XNU	49	Beneath Property	3.1	South-East	120	1846

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	380411-001	380548 411598	Our records indicate that this shaft was located in 1975 and was found to be filled.	Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

0	NW227	16820
PO0		

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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

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

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.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

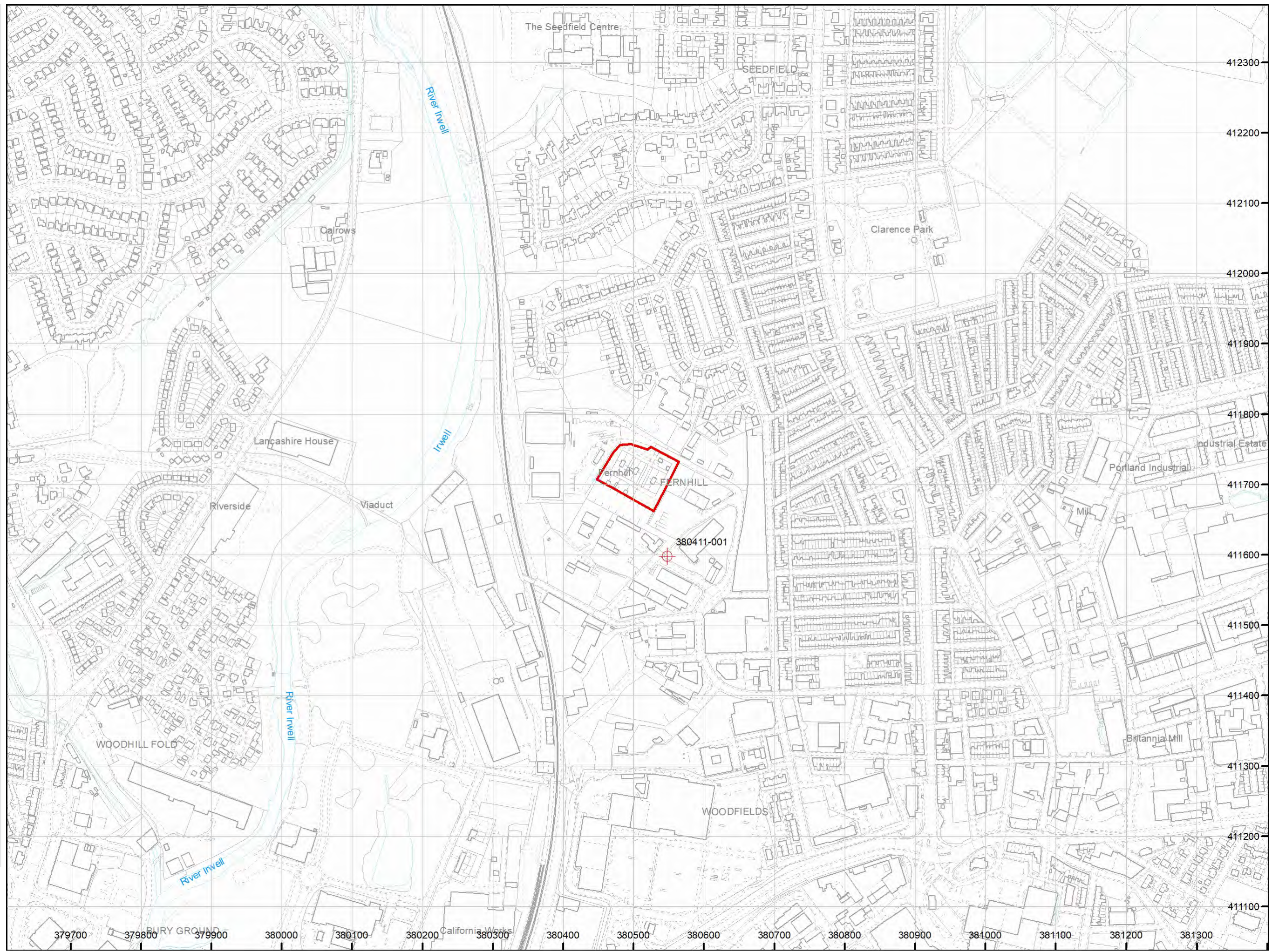
The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown 

Disused mine shaft 

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APPENDIX F

TECHNICAL BACKGROUND

H1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

H2 Site Investigation Methodology

Ground gas monitoring

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, while hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

Low flow groundwater sampling

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved low-flow purging and sampling methodology.

The low-flow method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling. Drawdown levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging and sampling, with stabilisation indicating that purging is complete and sampling can begin. As the flow rate used for purging, in most cases, is the same or only slightly higher than the flow rate used for sampling, and because purging and sampling are conducted as one continuous operation in the field, the process is referred to as low-flow purging and sampling.

Reuse of suitable materials

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the

re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on-sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.

APPENDIX G

EXPLORATORY HOLE RECORDS



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH01
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Progress	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.15-0.20 0.15-0.20 0.30-0.40 0.30-0.40	1 2 3 4	ES B ES B	T+V+J		MADE GROUND: Black ASPHALT. (MADE GROUND)	0.10	
						MADE GROUND: Greyish brown slightly silty sandy subangular to subrounded fine to coarse GRAVEL of limestone and sandstone. Sand is fine to coarse. (MADE GROUND)	0.25	
						MADE GROUND: Dark grey and black clayey very gravelly fine to coarse SAND with slight hydrocarbon odour. Gravel is subangular to subrounded fine to coarse sandstone and limestone and infrequent clinker and asphalt. (MADE GROUND)	0.50	
	0.70-1.00 0.70-1.00	5 6	ES B	T+V+J		POSSIBLE MADE GROUND: Loose to medium dense light brown gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone. (POSSIBLE MADE GROUND)	(0.60)	
						Loose to medium dense light brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	1.10	
	1.20-1.65 1.20-2.00 1.20-2.60 1.30-1.50	1 1 8 7	SPT U B ES	N=9 114 blows 100% recovery T+V+J				
	2.00-2.45 2.00-3.00	2 2	SPT U	N=13 222 blows 100% recovery			(2.20)	
	3.00-3.45 3.00-4.00	3 3	SPT(c) U	N=19 244 blows 100% recovery			3.30	
	3.00 - 4.00 (98mm dia) 85% rec					Light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine sandstone and coal fragments.	(0.55)	
	4.00-4.45 4.00-5.00	4 4	SPT(c) U	N=17 261 blows 100% recovery		Medium dense light brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	(0.90)	

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)				
09/03/21	09:40	0.00	0.00			1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. Water strike at 3.20 m depth. 4. Water strike at 4.50 m depth. 5. 50mm diameter gas monitoring well (complete with flush protective cover) installed to 6.00 m depth on completion. Response zone 1.00 m to 5.00 m depth.			
09/03/21	12:35	6.00	6.00						
						All dimensions in metres	Scale:	1:25	
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	CAPCSL	Logged By:	JSilverwood
						Checked By:	NR	AGS	



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH01
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---		Sheet: 2 of 2

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
4.00 - 5.00 (98mm dia) 80% rec								4.75	
	5.00-5.45 5.00-6.00	5 5	SPT(c) U	N=21 270 blows 100% recovery			Medium dense thinly laminated light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.70) 5.45	
5.00 - 6.00 (98mm dia) 100% rec							Medium dense light orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	(1.00) 6.45	
	6.00-6.45	6	SPT(c)	N=20			Window sample hole terminated at 6.45 m depth.		

Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						</



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH02
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---		Sheet: 1 of 2

Progress	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.20-0.30	1	ES	T+V+J		MADE GROUND: Black ASPHALT. (MADE GROUND)	0.20	
	0.40-1.30	2	ES	T+V+J		MADE GROUND: Greyish brown sandy slightly silty subangular to angular fine to coarse GRAVEL of limestone, sandstone and siltstone. Sand is fine to coarse. (MADE GROUND)	0.35	
	0.40-1.30	3	B			MADE GROUND: Dark brown very gravelly silty fine to coarse SAND with slight hydrocarbon odour, occasional wood fragments and medium cobble content. Gravel is angular to subangular fine to coarse asphalt, glass, tar, sandstone and limestone. Cobbles are angular to subangular up to 120mm of sandstone road cobbles. (MADE GROUND)	(1.00)	
	1.00 - 1.20 (85mm dia) 100% rec							
	1.20-1.27	1	SPT _(NR)	/25,50 for 20mm			1.35	
	1.55-2.00	4	ES	T+V+J		MADE GROUND: Dark brown and black sandy gravelly CLAY with slight hydrocarbon odour and low cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse asphalt, glass, tar, sandstone and limestone. Cobbles are angular to subangular up to 120mm of sandstone road cobbles. (MADE GROUND)	1.45	
	1.70-4.00	5	B					
	2.00-2.45	2	SPT	N=2		MADE GROUND: Very loose to loose dark brown slightly silty angular to subangular fine to coarse SAND AND GRAVEL of ash, clinker, steel fragments, ceramics, sandstone, carbonaceous mudstone and coal fragments. (MADE GROUND)		
	2.00 - 3.00 (75mm dia) 90% rec							
	3.00-3.45	3	SPT	N=4			(3.95)	
	3.00 - 4.00 (75mm dia) 85% rec							
	4.00-4.45	4	SPT	N=5				
	4.00 - 5.00 (65mm dia) 90% rec							

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. No groundwater encountered. 4. 50mm diameter gas monitoring well (complete with flush protective cover) installed to 5.40 m depth on completion. Response zone 2.40 m to 5.40 m depth.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Dando Terrier		Drilled By:	PBD
						Logged By:	JSilverwood
						Checked By:	NR
							AGS



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH02
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---		Sheet: 2 of 2

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
4.00 - 5.00 (65mm dia) 90% rec							MADE GROUND: Very loose to loose dark brown slightly silty angular to subangular fine to coarse SAND AND GRAVEL of ash, clinker, steel fragments, ceramics, sandstone, carbonaceous mudstone and coal fragments. (MADE GROUND) <i>(stratum copied from 1.45m from previous sheet)</i>		
	5.00-5.45	5	SPT	N=6				5.40	
5.00 - 6.00 (65mm dia) 90% rec							Medium dense light orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone and coal fragments.	(1.05)	
	5.80-6.00	6	ES	T+V+J					
	6.00-6.45	6	SPT	N=20				6.45	
Window sample hole terminated at 6.45 m depth.									

Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						</



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH03
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Progress		Samples / Tests			Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
</								



WINDOW SAMPLE LOG

Contract: Every Street, Bury		Client: Bury Council		Window Sample: BH03
Contract Ref: 11542	Start: 09.03.21 End: 09.03.21	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
4.00 - 5.00 (98mm dia) 90% rec								4.75	
5.00-5.45 5.00-6.00		5 5	SPT(c) U	N=20 291 blows 100% recovery			Medium dense thinly laminated light brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.95)	
5.00 - 6.00 (98mm dia) 85% rec								5.70	
	6.00-6.45	6	SPT	N=15			Medium dense thinly laminated orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal.	(0.75)	
								6.45	
							Window sample hole terminated at 6.45 m depth.		

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						installed to 6.00 m depth on completion. Response zone 1.55 m to 6.00 m depth.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Archway Competitor		Drilled By:	CAPCSL
						Logged By:	JSilverwood
						Checked By:	NR
							AGS

WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH04
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---		Sheet: 1 of 2

Progress		Samples / Tests			Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
1.20 - 2.00 (85mm dia) 95% rec 2.00 - 3.00 (75mm dia) 80% rec 3.00 - 4.00 (65mm dia) 75% rec 4.00 - 5.00 (65mm dia) 45% rec	0.20-0.35	1	ES	T+V+J			MADE GROUND: Black ASPHALT.	0.15	
	0.80-1.00	2	ES	T+V+J			MADE GROUND: Firm to stiff orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse brick fragments, coal, carbonaceous mudstone, coal and limestone.	(0.55)	
	1.20-1.65	1	SPT	N=6			Soft to firm slightly organic dark brown slightly gravelly sandy silty CLAY with slight natural organic odour. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse coal, carbonaceous mudstone and sandstone. . . . between 1.45 m depth and 1.60m depth, very thinly laminated and with occasional to frequent plant remains.	0.70	
	1.25-1.55	3	ES	T+V+J				(0.50)	
	1.25-1.55	4	D					1.20	
	1.70-2.00	5	D				Brown gravelly slightly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.58)	
	2.00-2.45	2	SPT	N=8			Medium dense orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	2.20	
	2.70-3.00	6	D					(1.70)	
	3.00-3.45	3	SPT	N=12				3.90	
	4.00-4.45	4	SPT	N=16			Medium dense brown gravelly slightly silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments. No recovery.	4.00	
								(0.55)	NRDST

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. Water seepage at 4.60 m depth. 4. On completion, window sample hole backfilled with bentonite.			
Method Used: Tracked window sampling						All dimensions in metres		Scale: 1:25	
Plant Used: Dando Terrier			Drilled By: PBD		Logged By: JSilverwood		Checked By: NR		



WINDOW SAMPLE LOG

Contract: Every Street, Bury		Client: Bury Council		Window Sample: BH04
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2

Progress		Samples / Tests			Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	4.60-4.85	7	D				Medium dense brown very sandy silty CLAY. Sand is fine to coarse.	4.55 (0.40)	
	5.00-5.45	5	SPT	N=22			Medium dense orangish brown very thinly laminated sandy SILT. Sand is fine to coarse. Medium dense orangish brown very sandy SILT. Sand is fine to coarse. ... at 5.50 m depth, sand becoming fine to medium and very thinly laminated.	4.95 5.00 (1.45)	
	6.00-6.45	6	SPT	N=24				6.45	
							Window sample hole terminated at 6.45 m depth.		

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						All dimensions in metres Scale: 1:25	
Method Used: Tracked window sampling	Plant Used: Dando Terrier		Drilled By: PBD		Logged By: JSilverwood	Checked By: NR	

GINT LIBRARY_V10_01.GLB LibVersion: v8.07 | Log WINDOW SAMPLE LOG - A4P | 11542 EVERY STREET, BURY.GPJ - v10_01.
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WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH05
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Progress	Samples / Tests				Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
	0.15-0.60	1	ES	T+V+J		MADE GROUND: Reddish black ASPHALT. (MADE GROUND)	0.10	
	0.15-0.60	2	B			MADE GROUND: Greyish brown sandy slightly silty subangular to angular fine to coarse GRAVEL of limestone, sandstone and siltstone. Sand is fine to coarse. (MADE GROUND)	(0.70)	
	0.90-1.20	3	ES	T+V+J		MADE GROUND: Soft brown and black slightly sandy gravelly CLAY with slight hydrocarbon odour. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick fragments, tar, sandstone and limestone. (MADE GROUND)	0.80	
	1.20-1.65	1	SPT	N=4				
	1.40-1.75	4	ES	T+V+J		POSSIBLE MADE GROUND: Very soft slightly organic greyish brown orange and black sandy gravelly CLAY with slight natural organic odour and occasional plant remains. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone, coal fragments and possible fine brick fragments. (POSSIBLE MADE GROUND)	(0.55)	
	1.40-1.75	5	D			... at 1.45 m depth, possible fine brick fragments.	1.35	
	1.95-2.05	6	ES	T+V+J		Soft organic very thinly laminated light brown and dark brown slightly sandy slightly gravelly peaty CLAY with moderate natural organic odour and occasional plant remains. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments. No recovery.	(0.45)	
	2.00-2.45	2	SPT	N=6			(0.30)	
	2.75-2.95	7	D			Soft to firm organic very thinly laminated light brown and dark brown slightly sandy slightly gravelly peaty CLAY with moderate natural organic odour and occasional plant remains. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	2.10	
	3.00-3.45	3	SPT	N=6		Soft brown sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.60)	
	4.00-4.45	4	SPT	N=4		Very loose brown slightly gravelly very sandy SILT. Gravel is subangular to subrounded fine to medium sandstone and coal fragments.	2.70	
	4.00-6.00	8	B				(0.30)	
							3.00	
							(0.50)	
							3.50	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. Water strike at 2.50 m depth. 4. Water strike at 4.00 m depth. 5. Water strike at 4.90 m depth. 6. 50mm diameter gas monitoring well (complete with flush protective cover)	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling		Plant Used:	Dando Terrier		Drilled By:	PBD
						Logged By:	JSilverwood
						Checked By:	NR



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH05
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---	Sheet: 2 of 2	

Progress		Samples / Tests			Water Backfill & Instru- mentation	Description of Strata	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
4.00 - 5.00 (65mm dia) 50% rec 5.00 - 6.00 (65mm dia) 30% rec	5.00-5.45	5	SPT	N=12		Very loose brown slightly gravelly very sandy SILT. Gravel is subangular to subrounded fine to medium sandstone and coal fragments. <i>(stratum copied from 3.50m from previous sheet)</i> . . . at 5.00 m depth, becoming medium dense. . . . from 5.90 m depth, becoming gravelly.	(2.95)	
	6.00-6.45	6	SPT	N=14		Window sample hole terminated at 6.45 m depth.	6.45	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						installed to 2.50 m depth on completion. Response zone 0.50 m to 2.50 m depth.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling			Plant Used:	Dando Terrier		
				Drilled By:	PBD		
				Logged By:	JSilverwood		
				Checked By:	NR		



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH06
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 2	

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results				
						MADE GROUND: Black ASPHALT. (MADE GROUND)	0.20	
	0.25-0.35	1	ES	T+V+J		MADE GROUND: Greyish brown sandy slightly silty subangular to angular fine to coarse GRAVEL of limestone, sandstone and siltstone. Sand is fine to coarse. (MADE GROUND)	0.40	
	0.60-1.30	2	ES	T+V+J		MADE GROUND: Friable dark brown and black sandy gravelly CLAY with slight hydrocarbon odour and low cobble content. Gravel is angular to subangular fine to coarse asphalt, tar, clinker, coal, sandstone and limestone. Cobbles are angular to subangular up to 120mm of sandstone road cobbles. (MADE GROUND)	(1.45)	
	1.20-1.65	1	SPT	N=9			1.85	
	1.40-1.70	3	D				1.90	
	2.00-2.45	2	SPT	N=7		MADE GROUND: Red very angular to angular fine to coarse fragments of BRICK. (MADE GROUND)	2.00	
	2.30-2.50	5	ES	T+V+J		Orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(0.30)	NRDST
	2.60-2.80	4	D			No recovery. Soft to firm orangish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	2.30	
	3.00-3.45	3	SPT	N=10			3.40	
	3.50-3.80	6	D			Medium dense orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone and coal fragments.	(1.00)	
	4.00-4.45	4	SPT	N=14			4.40	
						Description on next sheet		

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20 m depth. 3. No groundwater encountered. 4. 50mm diameter gas monitoring well (complete with flush protective cover) installed to 2.00 m depth on completion. Response zone 0.50 m to 2.00 m depth.		
All dimensions in metres						Scale:	1:25	
Method Used:	Tracked window sampling			Plant Used:	Dando Terrier	Drilled By:	PBD	Logged By: JSilverwood Checked By: NR



WINDOW SAMPLE LOG

Contract: Every Street, Bury			Client: Bury Council		Window Sample: BH06
Contract Ref: 11542	Start: 16.04.21 End: 16.04.21	Ground Level: ---	Co-ordinates: ---		Sheet: 2 of 2

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
4.00 - 5.00 (65mm dia) 90% rec 5.00 - 6.00 (65mm dia) 95% rec	4.50-5.00	7	D				Medium dense orangish brown very thinly laminated fine to coarse SAND. (stratum copied from 4.40m from previous sheet)	(0.70)	
	5.00-5.45	5	SPT	N=22			Soft to firm high strength thinly laminated sandy clayey SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sandstone and coal.	5.10	
	5.50-6.00	8	D					(1.35)	
	6.00-6.45	6	SPT	N=22			Window sample hole terminated at 6.45 m depth.	6.45	

Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						</

APPENDIX H

GROUND GAS MONITORING DATA

Exploratory position ID	Date	Device	Serial number	Atmospheric pressure (mb)	Weather	Air Temp (°C)	Ground condtions
Monitoring round 1							
BH1	5/7/2021	GA5000	G502481	1002	sunny	10	dry
BH3	5/7/2021	GA5000	G502481	1003	sunny	10	dry
BH6	5/7/2021	GA5000	G502481	1003	sunny	10	dry
BH2	5/7/2021	GA5000	G502481	1003	sunny	10	dry
Monitoring round 2							
BH3	5/13/2021	GA5000	G503221	996	SUN	10	DAMP
BH1	5/13/2021	GA5000	G503221	996	SUN	10	DRY
BH6	5/13/2021	GA5000	G503221	996	SUN	10	DRY
BH2	5/13/2021	GA5000	G503221	997	SUN	10	DRY
Monitoring round 3							
BH5	5/21/2021	GA5000	G502481	974	Cloudy	10	Dry
BH1	5/21/2021	GA5000	G502481	974	Cloudy	10	Dry
BH3	5/21/2021	GA5000	G502481	974	Cloudy	10	Dry
BH6	5/21/2021	GA5000	G502481	974	Cloudy	10	Dry
BH2	5/21/2021	GA5000	G502481	974	Cloudy	10	Dry
Monitoring round 4							
BH5	5/28/2021	GA5000	G502481	1011	Cloudy	13	Dry
BH1	5/28/2021	GA5000	G502481	1011	Cloudy	13	Dry
BH3	5/28/2021	GA5000	G502481	1011	Cloudy	13	Dry
BH6	5/28/2021	GA5000	G502481	1012	Cloudy	13	Dry
BH2	5/28/2021	GA5000	G502481	1012	Cloudy	13	Dry
Monitoring round 5							
BH3	6/4/2021	GA5000	G502481	1012	Sunny	18	Dry
BH6	6/4/2021	GA5000	G502481	1012	Sunny	18	Dry
BH1	6/4/2021	GA5000	G502481	1012	Sunny	18	Dry
BH5	6/4/2021	GA5000	G502481	1012	Sunny	18	Dry
BH2	6/4/2021	GA5000	G502481	1012	Sunny	18	Dry
Monitoring round 6							
BH5	6/18/2021	GA5000	G502481	1006	Cloudy	18	Dry
BH1	6/18/2021	GA5000	G502481	1006	Cloudy	18	Dry
BH3	6/18/2021	GA5000	G502481	1006	Cloudy	18	Dry
BH6	6/18/2021	GA5000	G502481	1006	Cloudy	18	Dry
BH2	6/18/2021	GA5000	G502481	1007	Cloudy	18	Dry

Calculations of borehole hazardous gas flow rate in accordance with BS8485

Project No.: 11542
Client: Bury Council
Site: Every Street, Bury

In accordance with BS8485 Section 6.3.1 the data presented below are calculations of borehole hazardous gas flow rates (Q_{hg}).

The Q_{hg} can then be used, along with a robust conceptual site model and review of the data collected, to designate a site characteristic (or zone) gas screening value (GSV).

GSVs are used to characterise the potential risk and inform mitigation measures where appropriate.

The assessment below presents calculated Q_{hg} values and compares them directly to Characteristic Situations as presented in BS8485 Table 2.

The ultimate site characteristic GSV (for the site or for individual zones) to inform risk assessment and mitigation measures is detailed in the body of the report, and may be different to the individual calculations below.

The calculations below use peak concentrations and steady state flow to calculate the Q_{hg} .

Characteristic Situation	Hazard potential	GSV
1	Very Low	<0.07
2	Low	<0.7
3	Moderate	<3.5
4	Moderate to High	<15
5	High	<70
6	Very High	>=70

British Standard Institution (BSI) (2019), 'BS 8485:2015+A1:2019. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

KEY	
Q_{hg}	Borehole hazardous gas flow rate (steady state flow * (peak concentration / 100))
GSV	Gas Screening Value
	GSV / Q_{hg} indicates very low hazard potential
	GSV / Q_{hg} indicates low to moderate hazard potential
	GSV / Q_{hg} indicates moderate or greater hazard potential
	Data exceeds either 1% CH ₄ , 5% CO ₂ or 70 L/hr flow (see BS8485 Table 2)

SUMMARY OF Q_{hg} VALUES PER BOREHOLE, PER MONITORING ROUND

BH NO.	DATE	CH ₄ peak	CH ₄ SS	CO ₂ peak	CO ₂ SS	O ₂ min	Flow SS	Baro	Q_{hg}		CS No.
		%v/v	%v/v	%v/v	%v/v	%v/v	l/hr	mbar	CH ₄	CO ₂	
BH1	13/05/2021	0	0	2.2	2.2	10.8	-0.1	996	0.00	0.00	CS1
	21/05/2021	0	0	2.4	2.4	12.1	0	974	0.00	0.00	CS1
	28/05/2021	0	0	1.6	1.5	12.8	0	1011	0.00	0.00	CS1
	18/06/2021	0	0	1	1	17.3	0	1006	0.00	0.00	CS1
	07/05/2021	0	0	1.1	1.1	16.8	0.2	1002	0.00	0.00	CS1
	04/06/2021	0	0	3	3	8.9	-0.1	1012	0.00	0.00	CS1
BH2	13/05/2021	0	0	2.6	2.3	15.8	0	997	0.00	0.00	CS1
	21/05/2021	0	0	7.4	7.3	7.5	0	974	0.00	0.00	CS1
	28/05/2021	0	0	1.7	1.5	17	0	1012	0.00	0.00	CS1
	18/06/2021	0	0	2.5	2.5	16.9	0	1007	0.00	0.00	CS1
	07/05/2021	0	0	1.6	1.6	17.3	-0.1	1003	0.00	0.00	CS1
	04/06/2021	0	0	4.1	4.1	13.6	0	1012	0.00	0.00	CS1
BH3	13/05/2021	0.1	0	1.4	1.4	13	0	996	0.00	0.00	CS1
	21/05/2021	0	0	2.7	2.7	4	0	974	0.00	0.00	CS1
	28/05/2021	0	0	1.4	1.4	11.4	0	1011	0.00	0.00	CS1
	18/06/2021	0	0	1.3	1.3	16	0	1006	0.00	0.00	CS1
	07/05/2021	0	0	1.1	1.1	17.1	0	1003	0.00	0.00	CS1
	04/06/2021	0	0	2.9	2.9	1.4	0	1012	0.00	0.00	CS1
BH5	21/05/2021	0	0	0.4	0.4	18.3	0	974	0.00	0.00	CS1
	28/05/2021	0	0	0.6	0.6	19.9	0	1011	0.00	0.00	CS1
	18/06/2021	0.1	0	1.9	1.9	18.8	0	1006	0.00	0.00	CS1
	04/06/2021	0	0	2.1	2.1	18.2	0.1	1012	0.00	0.00	CS1
BH6	13/05/2021	0	0	3.5	3.5	13	0	996	0.00	0.00	CS1
	21/05/2021	0	0	3.5	3.4	7.6	0.1	974	0.00	0.00	CS1
	28/05/2021	0	0	3.8	3.6	13.7	0	1012	0.00	0.00	CS1
	18/06/2021	0	0	1	1	19.6	0	1006	0.00	0.00	CS1
	07/05/2021	0	0	2.6	2.6	15.8	-0.1	1003	0.00	0.00	CS1
	04/06/2021	0	0	2.6	2.6	16	0	1012	0.00	0.00	CS1

WORST-CASE Q_{hg} VALUES PER BOREHOLE

BH NO.	DATE	Maximum CH ₄		Maximum CO ₂		Min O ₂	Max SS Flow	Baro	Maximum Q_{hg}		CS No.
		CH ₄ peak	CH ₄ SS	CO ₂ peak	CO ₂ SS				CH ₄	CO ₂	
BH1		0	0	3	3	8.9	0.2		0.00	0.01	CS1
BH2		0	0	7.4	7.3	7.5	0		0.00	0.00	CS1
BH3		0.1	0	2.9	2.9	1.4	0		0.00	0.00	CS1
BH5		0.1	0	2.1	2.1	18.2	0.1		0.00	0.00	CS1
BH6		0	0	3.8	3.6	7.6	0.1		0.00	0.00	CS1

WORST-CASE Q_{hg} CHECK FOR SITE (BS8485 Section 6.3.7.4)

BH NO.	DATE	Maximum CH ₄		Maximum CO ₂		Min O ₂	Max SS Flow	Baro	Maximum Q_{hg}		CS No.
		CH ₄ peak	CH ₄ SS	CO ₂ peak	CO ₂ SS				CH ₄	CO ₂	
ALL		0.1	0	7.4	7.3	1.4	0.2		0.00	0.01	CS1