GEOENVIRONMENTAL DESK STUDY REPORT

Barugh Green Road Roundabout
Barnsley West

Reference	**4848-JPG-ZZ-XX-RP-G-0602-S2-P01**
Date	**December 2019**
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JPG. Drawing no. 4848-JPG-XX-00-DR-G-1151-S2-P01. Barugh Green Road Roundabout, Barnsley West. Conceptual Ground Model. Dated December 2019.

Fore Consulting. General Arrangement – Link Road. Barnsley West. Job/Dwg No: 9014 – 100-SK-1000. Dated 2 October 2019 for Strata Sterling Barnsley West Ltd.

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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

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This report has been prepared for the sole use and reliance of the above named parties. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Rev	Date	Revision Details	Status	Author(S)	Approved
P01	05.12.2019	First Issue	Information	JAM	JBW

EXECUTIVE SUMMARY

Site Address	**Barugh Green Road Roundabout, Barnsley West**
NGR	Approximate National Grid Reference 431567, 407938.
Current Site Use & Proposed Development	The site generally consists of arable and grazing land in the south and Barugh Green Road and Cannon Way in the north, which is divided by an overgrown ditch with barbwire fence. Claycliffe Business Park lies to the north, with the Metro Trading Estate to the north east. The arable and grazing land extends beyond the southern boundary. It is proposed to redevelop the site with a new roundabout which will provide access to the larger proposed Barnsley West development site.
Site History	The earliest available map shows Barugh Green Road trending approximately east to west through the northern half of the site. Open fields and a field boundary make up the remaining area of the site. The surrounding land has also been used predominantly for agricultural use with a long legacy of coal mining activity in the area. Historical contaminative industries near the site also include a chemical works and Barugh Coke & By-Product Works, located approximately 300m north east of the site and a bleach works, located approximately 500m to the south east.
Site Setting	**Geology** – An area of infilled ground, associated with a historical opencast coal site (OCCS) is indicated in the southern half of the site. No superficial deposits are recorded on the site. The underlying bedrock geology comprises Pennine Middle Coal Measures strata of mudstone, siltstone, sandstone and coal seams. **Mining** – The site is partially underlain by a backfilled opencast, namely the Craven I opencast. There is also the potential for parts of the site to be at risk from unrecorded coal workings in the shallow seams, in particular below highwalls. There are no recorded mine entries on the site or within 20m of the site boundary. However, there is the potential for unrecorded mine entries including bell pits on the site. **Hydrogeology** – The bedrock geology is classified as a Secondary A Aquifer. **Hydrology** – There are two 'Inland Rivers' on the site, relating to field drainage. **Flooding** – The site does not lie within a Zone 2 or Zone 3 floodplain. **Landfill** – There are five records of Environment Agency historical landfill sites within 500m of the site. **Radon Risks** – The site is located in a radon affected area as between 1% and 3% of properties are above the action level.
Previous Investigation	JPG carried out a desk study report and a preliminary phase ground investigation report for the overall development area.
Environmental Risk Assessment	On the basis of the proposed end use and known history of the site, the following potential pollutant linkages may be present: • Highway construction workers and future highway maintenance workers could come into contact with soils containing elevated concentrations of potential contaminants, elevated calorific value and hazardous gases/soil vapours. • The underlying Secondary A Aquifer and surface water features on and adjacent to the site could become contaminated due to the leaching and migration of potential contaminants from the made ground. • Buildings and services could be affected by potential contaminants in the made ground. • Highway construction workers, future highway maintenance workers and services could be affected by potentially combustible coal-rich made ground/coal seams. These linkages are based on current site conditions and do not consider exposure pathways following any remediation of the site. In lieu of any chemical testing, ground contamination information, or implementation of mitigation measures, the site should be considered to be a low with respect to contamination.
Preliminary Engineering Assessment	**Mining** - It will be necessary to carry out a mining investigation to confirm the nature and thickness of the made ground within the OCCS, in order to assess the soil parameters and settlement characteristics. In addition, rotary boreholes are required to investigate the condition, depth and thickness of the shallow coal seams outwith the opencasts and also below the opencasts where the shallow coal seams may be within influencing depth of the surface. **Roads, Pavements and Hardstanding Surfaces** - It is likely that earthworks/ground improvement will be carried out as part of the redevelopment works. This may result in changes to the sub-grade materials. The works should be designed to achieve a suitable CBR value for the proposed highway construction. Where roads/highways straddle highwalls associated with the former opencasts, special mitigation measures, e.g. geogrids, may be required. **Groundwater** - It may be expected that shallow perched groundwater will be encountered within the made ground and natural strata. The presence of groundwater will need to be assessed as part of any ground investigation. The potential for inundation settlement due to possible rising groundwater levels will also need to be taken into consideration.

	Obstructions - The presence of obstructions including large boulders within the underlying opencast backfill should be anticipated. Also, substructures and other manmade obstructions should be anticipated in the previously developed parts of the site, especially within the existing road and pavement. **Earthworks** - Some form of earthworks and ground improvement are likely to be required in order to achieve a consistent formation. Depending on the thickness and properties of the made ground within the opencasts, the following treatment methods may be appropriate. • Removal of the full thickness of made ground and replacement with engineered fill. • Deep dynamic compaction of made ground. • Surcharging. Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks. An assessment of the suitability of the colliery spoil materials and also natural 'cut' soils for re-use in earthworks will be required. **Chemical Attack on Buried Concrete** - Samples of any made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for any buried concrete.
Further Work Required	It is recommended that a ground investigation is carried out in order to further assess the potential environmental and geotechnical constraints to development. The scope of works below is designed to provide a preliminary overview of the site and target significant potential constraints to development. • Trial pits in order to assess the shallow ground conditions at the site and confirm the composition, extent, depth and nature of the made ground and underlying natural strata. • Trial pits across the site in order to obtain samples to submit for geotechnical testing in order to assess the suitability of the material for re-use in earthworks. • Rotary openhole boreholes within the backfilled opencast sites in order to confirm the depth to competent bedrock. • Rotary openhole boreholes outwith the boundaries of the opencasts in order to investigate underground coal workings at shallow depth. In addition, where shallow coal seams are present below the base of the opencast, further boreholes will be required. • Chemical analysis of soil and water samples in order to determine the concentration so potential contamination on the site. • Geotechnical testing to classify materials and inform foundation design and chemical testing to determine the Aggressive Chemical Environmental for Concrete Classification. • Ground gas and groundwater monitoring wells are installed within selected boreholes in order to assess the levels of groundwater within and outside of the backfilled opencast, to provide an indication of whether groundwater rebound has been completed. Gas monitoring will also be carried out on six occasions in order to assess the potential presence of hazardous ground gases on the site.
This sheet is intended as a summary only of the assessment of the site in relation to ground condition. It does not provide a definitive engineering analysis.	

1.0 INTRODUCTION

1.1 Instruction

JPG (Leeds) Limited (JPG) has been instructed by Strata Sterling Barnsley West Limited to carry out a geoenvironmental desk study for a proposed roundabout on Barugh Green Road.

1.2 Objectives

The main objective of the geoenvironmental desk study is to identify potential geotechnical and environmental issues that may represent constraints to the proposed development of the site.

1.3 Scope of Works

The scope of works for the desk study included the following:

- Site inspection and description.
- Review of contemporary and historical Ordnance Survey publications.
- Obtain a Coal Authority Mining Report and Consultants Report and any abandonment plans.
- Consultations with regulatory authorities, where appropriate.
- Review of geological publications (including hydrology, hydrogeology and soil survey publications, where appropriate).
- Review of the radon status of the site.
- An environmental database search.
- Review of any previous reports provided.
- Outline environmental risk assessment.
- Preliminary recommendations with respect to mining and pavement design.
- Recommendations for further work, where appropriate; and
- Presentation of the findings in a tabular non-technical summary.

1.4 Location

The site is located approximately 3.3km to the north west of Barnsley town centre. The approximate centre of the site is located at NGR 431567, 407938.

The site is located approximately 1km to the east of the M1 motorway, on the A635 Barugh Green Road. The site includes the junction between Cannon Way and Barugh Green Road. A site location plan is presented as Figure 1 in Appendix A.

1.5 Site Description and Topography

The site is irregular in shape and occupies an area of approximately 0.58 hectares. Ground levels are approximately 90m AOD in the south generally falling to approximately 85m AOD in the north. Barugh Green Road falls gently from the west to the east.

The site generally consists of arable and grazing land in the south and Barugh Green Road and Cannon Way in the north. An overgrown ditch with barbwire fence separates Barugh Green Road from the farmland.

Claycliffe Business Park lies to the north of the site, with the Metro Trading Estate to the north east. Residential properties and Tudor Rose Nurseries are present to the south east. The arable and grazing land extends beyond the southern boundary. Residential housing is located beyond the south-western boundary.

An aerial photograph of the site is provided as Figure 2 in Appendix A and selected photographs of the site are provided in Appendix B.

1.6 Development Proposals

It is proposed to redevelop the site with a new roundabout. The development will provide access to the larger proposed Barnsley West development site.

A drawing of the proposed development has been provided, which is referenced below and a copy is contained in Appendix A.

- Fore Consulting. General Arrangement – Link Road. Barnsley West. Job/Dwg No: 9014 – 100-SK-1000. Dated 2 October 2019 for Strata Sterling Barnsley West Ltd.

1.7 Limitations

The general limitations to the nature of the investigation are outlined in Appendix G.

2.0 SITE HISTORY

Historical maps for the site were obtained from GroundSure (GS). These have been reviewed in order to establish any former uses of the site and identify any potentially contaminative historical uses or potential geotechnical constraints to the proposed development.

A summary of the relevant map information is presented in Table 2.1 and copies of large-scale maps are contained in Appendix C.

Table 2.1 – Summary of Relevant Historical Map Information

Date(s) & Scale	Feature
1850 1:10,560	**The earliest available map shows the existing road on the site, later referred to as Barugh Green Road (c.1938), trending approximately east to west through the northern half of the site. Open fields and a field boundary make up the remaining area of the site.** The surrounding land comprises open fields with the village of Barugh Green to the west and Barugh to the north west. Clay Cliff House is shown approximately 300m east of the site. Clay Cliff Quarry, shown as a sandstone quarry, is shown approximately 350m north east of the site. Red Brook Bleach Works is shown approximately 500m south east of the site.
1893 1:2,500	**No significant changes are shown on the site.** Buildings assumed to be residential and a pump are shown immediately beyond the eastern boundary of the site. A smaller building is shown approximately 100m west of the site.
1904 1:10,560 **1906 1:2,500**	**No significant changes are shown on the site.** The bleach works to the south east is now annotated as Redbrook Linen Works. A gasometer and filter tank are also shown within the works.
1929 1:10,560	**No significant changes are shown on the site.** The gasometer and filter tank located approximately 300m to the south east of the site are no longer shown. A chemical works and Barugh Coke & By-Product Works, with associated tanks, pits and railway sidings, are shown approximately 300m north east of the site. Three areas of allotment gardens are shown between 250m and 400m west and south west of the site.
1938 1:10,560	**No significant changes are shown on or adjacent to the site.**
1948 1:10,560	**No significant changes are shown on the site.** More buildings, assumed to be residential, are shown adjacent to the western boundary of the site.
1956 1:10,560	**No significant changes are shown on or adjacent to the site.**
1961 1:2,500 **1966 1:10,560**	**A drain, trending north east to south west, is shown to cut through the southern corner of the site.** The chemical works and Barugh Coke & By-Product Works, along with the associated tanks, are no longer shown. The pits appear to have been infilled. Clay Cliff House is no longer shown to the east of the site. An unnamed works is shown approximately 100m north west of the site. Opencast workings are indicated to the south of the site.
1969–70 1:2,500 **1973 1:10,000**	**No significant changes are shown on the site.** The works approximately 100m north west of the site is now referred to as Electric Motor Works. A small engineering works is shown approximately 100m east of the site. The pits formerly associated with the chemical works and Barugh Coke & By-Product Works are referred to as disused tips. Smaller works and a depot are shown in the area of the former coke and by-product works. The allotment gardens to the west of the site have been replaced by residential housing.
1982 1:10,000 **1987-91 1:2,500**	**No significant changes are shown on the site.** The works 100m east of the site has increased in size. Further works and depots have been developed in the area of the former coke and by-product works.
1991-95 1:2,500 **1993 1:10,000**	**No significant changes are shown on the site.** An unnamed building is shown approximately 200m north of the site. A garage is shown approximately 300m east of the site. The depots and works to the north east are now referred to as an industrial estate, later referred to as South Yorkshire (Redbrook) Industrial Estate.
2001 1:10,000	**No significant changes are shown on the site.** The electric motor works 100m north west of the site is now referred to as Metro Trading Centre. Claycliffe Business Park is shown to the north of the site.
2010 & 2019 1:10,000	**No significant changes are shown on the site.** Claycliffe Business Park has expanded.

3.0 SITE SETTING

3.1 Geology

The GS Report and the following geological publications have been consulted:

- British Geological Survey (BGS), Sheet 87, Barnsley, 1:50,000 scale, Solid and Drift Edition, published 2008.
- BGS, Sheet SE30NW, Barnsley 1:10,000 scale, dated 2005.
- BGS, The Pennine Lower and Middle Coal Measures formations of the Barnsley district, Internal Report IR/06/135, dated 2006.

An area of infilled ground, associated with a historical opencast coal site (OCCS), is indicated in the southern half of the site. This area of infilled ground extends to the south and is associated with the former opencast site referred to as Craven I. Smaller areas of infilled ground are located 220m north west and 268m north of the site. A larger area of infilled ground associated with another former opencast site, Craven II, is located approximately 289m south east of the site. Made ground, associated with Barugh Coke & By-Products Work, is located approximately 310m east of the site. The 1:10,000 scale geological map refers to the made ground, 310m east of the site as 'Industrial refuse and quarry debris on colliery waste'.

No superficial deposits are recorded on the site.

The bedrock geology comprises Pennine Middle Coal Measures strata of mudstone, siltstone, sandstone and coal seams. The overall dip of the solid geology is indicated to be between 3 and 5 degrees to the northeast.

A fault, trending north east to south west with downthrown strata on the south-eastern side, is shown on the west of the site. Sandstone of the Haigh Moor Rock is shown to encroach onto the site on the upthrown side of this fault. The dip of the Haigh Moor Rock is indicated to be 4 degrees.

A conceptual ground model has been prepared for the site. This is presented as Drawing no. 4848-JPG-XX-00-DR-G-1151-S2-P01 in Appendix A.

Historical borehole records in the vicinity of the site have been obtained from the BGS Geoindex Onshore website. A summary of the borehole records is provided below. Copies of the borehole logs are presented in Appendix E. Borehole locations are included on Drawing no. 4848-JPG-XX-00-DR-G-1151-S2-P01.

Barugh Green, Barnsley TP38
On site
Borehole Reference: SE30NW315
Depth: 2.30m bgl
NGR: 431600, 407960

Depth (m bgl)	Geology
0 – 0.30	Topsoil
0.30 – 1.00	Sandy CLAY.
1.00 – 1.80	Shaley SANDSTONE. Water seepage at 1.50m bgl.
1.80 – 2.30	SHALE/MUDSTONE.

Barugh Green, Barnsley TP39
On site
Borehole Reference: SE30NW316
Depth: 2.30m bgl
NGR: 431650, 407950

Depth (m bgl)	Geology
0 – 0.30	Topsoil
0.30 – 2.00	Sandy CLAY.
2.00 – 2.30	Shaley SANDSTONE.

Barugh Green, Barnsley TP37
On site
Borehole Reference: SE30NW314
Depth: 1.10m bgl
NGR: 431550, 407970

Depth (m bgl)	Geology
0 – 0.40	Topsoil
0.40 – 0.85	Sandy CLAY with sandstone fragments.
0.85 – 1.10	Shaley SANDSTONE.

Barugh Green, Barnsley TP36
3m north of the site.
Borehole Reference: SE30NW313
Depth: .2.50m bgl
NGR: 431500, 407980

Depth (m bgl)	Geology
0 – 0.30	Topsoil
0.30 – 0.90	Sandy CLAY.
0.90 – 1.50	Grey CLAY.
1.50 – 1.80	SHALE/MUDSTONE with ironstone fragments.
1.80 – 2.10	COAL. Coal dips slightly to the east.
2.10 – 2.50	Fireclay/Shale.

3.2 Coal Mining

The following coal seams outcrop on the site or are anticipated to be present at shallow depth below the site (youngest to oldest):

- Thin Coal (thickness = 0.38m – recorded on abandonment plan).
- Swallow Wood Coal (recorded thickness = 0.30m to 1.15m – based on 1:10,000 geological map).
- Top Haigh Moor (recorded thickness = 0.69m to 1.19m – based on 1:10,000 geological map).
- Low Haigh Moor (recorded thickness = 0.43m to 1.02m – based on 1:10,000 geological map).

A Mining Report and Consultants Report have been obtained from the Coal Authority (CA). These are presented in Appendix D and pertinent information is detailed below.

- The property is in a surface area that could be affected by underground mining in five seams of coal at 120m to 320m depth, and last worked in 1979. Any movement in the ground due to coal mining activity should have stopped.

The shallowest recorded underground coal workings are in the Flockton Thick coal seam, the depth to which is recorded in the Coal Authority Consultants Coal Mining report as 116m and has an extraction thickness of 0.71m.

It is considered that the recorded underground coal workings pose no risk to the surface stability of the site, based on recorded depth to workings and extracted thickness of the coal seams.

The Coal Authority Consultants Coal Mining report states that there is no risk to the surface stability of the site from probable unrecorded shallow workings. However, due to the presence of the Thin, Swallow Wood, the Top Haigh Moor and Low Haigh Moor coal seams, which are anticipated to be at shallow depth beneath the site, unrecorded shallow workings cannot be discounted at this stage.

The next named coal seam below the Low Haigh Moor is the Lidget. Based on the coal seam separation, the Lidget coal seam is not considered to pose a risk to the surface stability of the site.

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

However, there is the potential for unrecorded mine entries including bell pits on the site.

- The property is within the boundary of an opencast site from which coal has been removed by opencast methods.

Coal mining abandonment plans showing the location of recorded opencast and underground workings on and beneath the site have been obtained from the Coal Authority.

A summary of the abandonment plan detailing the former opencast mining on the site is provided in Table 3.2.2 below.

Table 3.2.2 – Summary of Abandonment Plans Showing Opencast Workings on the Site.

Map Reference	Drawing Number	Seams Worked & Details
NE498 1 'Craven I & II'	OE/COMP/03/311	Craven 1 Coal seams extracted: • Thin seam (localised) • Swallow Wood Coaling commenced: 10 July 1950 Coaling completed: 20 November 1951 Completion of resoiling: July 1952 No old workings encountered in coal seams Lowest point of excavation: 68.29m AOD; maximum thickness of made ground is approximately 13m.

The recorded extent of the OCCS highwall below the south of the site is shown on Drawing no. 4848-JPG-XX-00-DR-G-1151-S2-P01 in Appendix A.

3.3 Other Mining

The GS report refers to the underground abstraction of bedded iron ore on a small scale. The GS report states: '*Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered*'.

Reference to *Sections of Strata of the Coal Measures of Yorkshire* (3rd edition, 1950) confirms the presence of iron rich strata below the Swallow Wood, and the possibility that ironstone was historically worked by underground means cannot be entirely discounted at this stage.

The ground investigation will need to take into consideration the potential for underground ironstone workings.

3.4 Hydrogeology

The bedrock geology below the site is classified as a Secondary A Aquifer. These are described as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifer'.

There are no active recorded groundwater abstraction licences within 1km of the site.

The site does not lie within 500m of an Environment Agency Groundwater Source Protection Zone.

3.5 Hydrology

The site is located within the Don and Rother catchment area. There are two 'Inland Rivers' on the site, relating to field drainage.

There are no active licenced discharge consents to surface water within 500m of the site.

There are no recorded surface water abstraction licences within 2km of the site.

Information on the EA website and presented in the GS report indicates that the site does not lie within a Zone 2 or Zone 3 floodplain. The risk of the site flooding from Rivers and the Sea (RoFRaS) is indicated to be very low.

The GS report indicates that there is the potential for groundwater flooding at the surface due to the underlying geology. The BGS confidence level in their assessment is high, but the actual susceptibility and the risk of groundwater flooding occurring at the site should be assessed based on site specific information.

3.6 Pollution Incidents

There are two recorded Environment Agency Recorded Pollution Incidents within 500m of the site. These are summarised in Table 3.6 below.

Table 3.6 – Summary of Environment Agency Recorded Pollution Incidents with Significant Impacts

Distance & Direction	Incident Date	Incident Identification	Pollutant	Impacts
148m N	21-MAY-2003	159730	Organic Chemicals/Products (Phenols and Creosote)	Land impact: Category 3 (minor)
465m N	11-MAR-2002	63127	Specific waste materials	Land & air impact: Category 3 (minor)

3.7 Landfills and Waste

The GS report includes information on active and former landfill sites supplied by the Environment Agency, Landmark, Local Authority and the BGS.

There are five records of Environment Agency historic landfill sites within 500m of the site. A summary of these is provided in Table 3.7.1 below.

Table 3.7.1 - Summary of Historical Environment Agency Landfill Sites

Distance & Direction	Site Address	Site Reference	Operator	Waste Type	Licence Issue
50m N	Cannon Way, Barugh Green Road, Barugh	4400/B45	F Booker Builders/ Contractors Ltd	Inert	16-MAR-1995
152m N	Metro Trading Centre, Off Barugh Green Road, Baraugh Green, Barnsley	WD20 B559, 4400/B559, 20B559(51)	R and J Masters	Inert, Commercial	23-JUL-1987
372m E	South Yorkshire Industrial Estate, Redbrook, Barnsley	4400/B392, 20B392(87), WD20 B392	Northern Properties Limited	Inert, Commercial	02-SEP-1983
459m NE	Tipping of Builders Waste opposite Whaley Road, Whaley Road, Barugh	WD24 B378, 4400/B375, 20B375(84), WD20 B375	Longden Homes	Inert, Commercial	14-APR-1983
463m NE	Whaley Road, Claycliffe Industrial Estate, Barugh Green road, Barugh	4400/B502, 20B502(81), WD20 B502	Amco Limited	Inert, Commercial	24-MAR-1986

There are two records of landfills from Local Authority and historical mapping records within 500m of the site. These are detailed in Table 3.7.2 below.

Table 3.7.2 - Summary of Local Authority and Historical Mapping

Distance & Direction	National Grid Reference	Site Reference	Source
382m NE	431847, 408308	Refuse Tip	1970 mapping
483m NE	431907, 408460	Refuse Tip	1970 mapping

There is one record of a waste treatment, transfer or disposal site taken from historical mapping within 500m of the site. A summary of the records is provided in Table 3.7.3 below.

Table 3.7.3 - Records of waste treatment, transfer or disposal sites within 500m

Distance & Direction	Type of Site	Grid Ref	Source
464m NE	Ground Workings and Refuse Heap	432107, 408320	1961 Map

There are no EA licensed waste treatment, waste transfer or waste disposal sites within 500m of the site.

3.8 Environmental Permits, Incidents and Registers

There are six active Part A (2) or Part B permitted activities (potential to cause air pollution) within 500m of the site.

There are no records of any historic Integrated Pollution Control (IPC) authorisations within 500m of the site.

There are no recorded historical Part A(1) and Integrated Pollution Prevention Control (IPPC) authorised activities within 500m of the site.

There are no records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the site.

There is no recorded Red List Discharge Consent (potentially harmful discharges to controlled waters) within 500m of the site.

There are no active List 1 Dangerous Substances Inventory Sites and List 2 Dangerous Substances Inventory Site within 500m of the site.

There are no Category 3 or 4 Radioactive Substances Licences within 500m of the site.

There are no recorded Control of Major Accidents Hazard (COMAH) or Notification of Installations Handling Hazardous Substances (NIHHS) or sites within 500m of the site.

There are no sites determined as Contaminated Land under Part IIA EPA 1990 within 500m of the site.

There is one record of a petrol filling station within 500m of the site. These are summarised in Table 3.8.1 below.

Table 3.8.1 - Summary of Petrol & Fuel Sites

Distance & Direction	National Grid Reference	Operator	Site Address	Status
276m E	431958, 407912	-	Claycliffe Road, A365, Redbrook	Obsolete

There are no electricity substations located on the site. The closest electricity substation is located approximately 33m to the east.

There are seven records of historical garage and motor vehicle repair premises within 500m of the site, the closest of which is located approximately 225m to the east and relates to a garage.

3.9 Current Land Use

There are 36 records of potentially contaminative sites within 250m of the site, none of which are located on the site itself.

3.10 Radon Risks

The site is located in a radon affected area as defined by the Health Protection Agency, as between 1% and 3% of properties are above the action level.

3.11 Previous Reports

JPG carried out a desk study report for the overall Barnsley West development site. This is referenced below.

- JPG. Geoenvironmental Desk Study Report. Barnsley West. Report ref. JBW/DS/4848.v2. Dated July 2019.

JPG subsequently undertook a preliminary phase ground investigation for the overall development area. This is referenced below.

- JPG. Geoenvironmental Ground Investigation. Barnsley West. Report ref. 4848-JPG-SW-XX-RP-G-0603-S2-P01. Dated July 2019.

As part of the above investigation BH101 and TP101 were carried out in the vicinity of the roundabout. The strata encountered in these exploratory holes is summarised below. The borehole location is shown on Drawing no. 4848-JPG-XX-00-DR-G-1151-S2-P01 in Appendix A.

BH101
NGR 431503.18, 407852.92
Ground level 91.68m AOD

Depth (m bgl)	Proven Ground Conditions
0.00 – 0.20	Topsoil.
0.20 – 10.00	Brown grey COLLIERY SPOIL with coal.
10.00 – 10.50	Black grey mudstone.
10.50 – 11.50	Grey sandstone.
11.50 – 12.50	Grey mudstone.
12.50 – 15.00	Hard grey sandstone.
29.20 – 29.50	Coal.
29.50 – 30.30	Grey mudstone.
30.30 – 33.50	Grey brown sandstone.
33.50 – 37.50	Grey mudstone.
37.50 – 40.00	Grey sandstone.

TP101
NGR 431465.29, 407779.61
Ground level 95.94m AOD

Depth (m bgl)	Proven Ground Conditions
0.00 – 0.20	Reworked topsoil.
0.20 – 0.50	Firm gravelly clay (Reworked natural).
0.50 – 3.00	Firm to stiff slightly sandy slightly gravelly clay (Colliery Spoil).

In addition to the above JPG reports, A Coal Mining Risk Assessment and Coal Recovery Report for the proposed residential land in the north of the overall development site was subsequently prepared by JPG in August 2019 under reference 4848-JPG-Z1-XX-RP-G-1101-S2-P01. The majority of the proposed roundabout falls within the proposed employment land area.

4.0 ENVIRONMENTAL RISK ASSESSMENT

4.1 Introduction

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. Within the context of current UK legislation i.e. Part 2A of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995, the interpretation of a "significant risk" is termed to be one where:

- Significant harm is being caused, or there is a significant possibility of such harm being caused, (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or
- Pollution of controlled waters is being caused.

The potential for harm to occur requires three conditions to be satisfied:

- Presence of substances (potential contaminants/pollutants) that may cause harm (Sources).
- The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora (Receptors).
- The existence of a linkage between the Source and the Receptor (The Pathway).

In order to assess the contamination risk at the site, the above rationale has been applied and is discussed in the context of Contamination Sources and Potential Pollutant Linkages.

4.2 Potential Sources

Based on the findings of the desk study, it is evident that the site has been used for agricultural purposes with a public highway in the north. Opencast coal workings extend below the south.

Based on the above, the following potentially contaminative sources may be present on the site:

- Made ground associated with backfilled opencast mine workings.
- Made ground associated with existing highway.
- Potential leaks and/or spills of organic contamination associated with Barugh Green Road.
- Hazardous gases/soil vapours associated with the made ground and adjacent areas of infilled land (backfilled OCCSs).

Potential contaminants which could be present beneath the site, or which could have migrated onto the site from potential sources beyond the site are listed below:

- Metals, metalloids and their compounds.
- Inorganic compounds.
- Asbestos.
- Organic compounds including hydrocarbons (petrol/diesel/oils) and Polycyclic Aromatic Hydrocarbons (PAH).
- Calorific value associated with coal-rich made ground/coal seams.
- Hazardous Gases/Soil vapours.

4.3 Potential Pathways

Based on the available information and the proposed redevelopment of the site for a commercial land use, the following potential exposure pathways will require consideration, both during the development works and on completion of the highway construction:

- Ingestion and dermal contact with contaminated soil and groundwater.
- Inhalation of hazardous gases/soil vapours.
- Leaching/migration of contaminants from soil into surface water and groundwater via surface drainage/wash and groundwater flow.
- Permeation of water supply pipes and other services by organic and aggressive contaminants.
- Combustion of soils with elevated calorific value in the presence of a heat source.

4.4 Potential Receptors

The potential receptors considered are:

- Highway construction workers and future highway maintenance workers involved in excavations, e.g. foundations or where services are being installed or repaired following development.
- The underlying bedrock strata, i.e. Secondary A Aquifer.
- Nearby surface water features, i.e. streams/drainage channels on and adjacent to the site; and
- Buildings and services.

4.5 Pollutant Linkage Assessment

A potential pollutant linkage assessment has been completed and is summarised in the Conceptual Site Model which is presented as Figure 3 in Appendix A. This is based on the proposed development of the site for a new highway construction.

On the basis of the proposed end use and known history of the site, the following potential pollutant linkages may be present:

- Highway construction workers and future highway maintenance workers could come into contact with soils containing elevated concentrations of potential contaminants, elevated calorific value and hazardous gases/soil vapours.
- The underlying Secondary A Aquifer and surface water features on and adjacent to the site could become contaminated due to the leaching and migration of potential contaminants from the made ground.
- Buildings and services could be affected by potential contaminants in the made ground.
- Highway construction workers, future highway maintenance workers and services could be affected by potentially combustible coal-rich made ground/coal seams.

These are based on current site conditions and do not consider exposure pathways following any remediation of the site. If the site can be shown to pose no "significant harm" or pollution to controlled waters, then the site can be considered to be uncontaminated.

4.6 Risk Classification

Based on the potential pollutant linkages anticipated to be present on the site, the site can be considered to be **low risk** with respect to contamination. This designation will be largely dependent on the nature of any made ground or hazardous gases present on or adjacent to the site.

In order to fully assess and classify the risks to human health, groundwater, surface water and services, a Phase 2 Ground Investigation, including chemical testing of soils and leachate and ground gas monitoring will be required.

5.0 PRELIMINARY ENGINEERING ASSESSMENT

5.1 Development Proposals

It is proposed to develop the site with a new roundabout. The roundabout will provide access to the larger proposed Barnsley West development site. A drawing of the proposed development has been provided, which is referenced below and a copy is contained in Appendix A.

- Fore Consulting. General Arrangement – Link Road. Barnsley West. Job/Dwg No: 9014 – 100-SK-1000. Dated 2 October 2019 for Strata Sterling Barnsley West Ltd.

5.2 Mining

Based on the findings of the desk study, the site is partly underlain by the backfilled Craven I OCCS. There is also the potential for parts of the site to be at risk from unrecorded coal workings in the shallow seams, in particular below highwalls.

It will be necessary to carry out a mining investigation to confirm the nature and thickness of the made ground within the OCCS, in order to assess the soil parameters and settlement characteristics. In addition, rotary boreholes are required to investigate the condition, depth and thickness of the shallow coal seams outwith the opencasts and also below the opencasts where the shallow coal seams may be within influencing depth of the surface.

There is also a risk of unrecorded mine entries (mineshafts, adits and/or bell pits) below the site.

A roundabout-specific Coal Mining Risk Assessment and Coal Recovery Report, referenced 4848-JPG-XX-XX-RP-G-0607-S2-P01 and dated December 2019, has been prepared for the site under separate cover.

5.3 Roads, Pavements and Hardstanding Surfaces

It is likely that earthworks/ground improvement will be carried out as part of the redevelopment works. This may result in changes to the sub-grade materials. The works should be designed to achieve a suitable CBR value for the proposed highway construction.

Where roads/highways straddle highwalls associated with the former OCCSs, special mitigation measures, e.g. geogrids, may be required.

5.4 Groundwater

It may be expected that shallow perched groundwater will be encountered within the made ground and natural strata. The presence of groundwater will need to be assessed as part of any ground investigation.

The potential for inundation settlement due to possible rising groundwater levels, following the cessation of deep coal mining, will also need to be taken into consideration.

5.5 Obstructions

The presence of obstructions including large boulders within the underlying opencast backfill should be anticipated.

In addition, substructures and other manmade obstructions should be expected in the previously developed parts of the site, especially within the existing road and pavement.

5.6 Earthworks

Some form of earthworks and ground improvement are likely to be required in order to achieve a consistent formation with regard to the future development on the site.

Depending on the thickness and properties of the made ground in the OCCSs, the following treatment methods may be appropriate.

- Removal of the full or partial thickness of made ground and replacement with engineered fill.
- Deep dynamic compaction of made ground.
- Surcharging.

Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks.

In addition, the advice of a specialist contractor will be required to confirm that ground conditions are suitable for earthworks/ground improvement and that adequate bearing values and tolerable settlements can be achieved.

An assessment of the suitability of the colliery spoil materials and also natural soils for re-use in earthworks will be required.

5.7 Chemical Attack on Buried Ground

Samples of any made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for buried concrete.

6.0 FURTHER INVESTIGATIONS

It is recommended that a ground investigation is carried out in order to further assess the potential environmental and geotechnical constraints to development.

The scope of works below is designed to provide a preliminary overview of the site and target significant potential constraints to development.

- Trial pits in order to assess the shallow ground conditions at the site and confirm the composition, extent, depth and nature of the made ground and underlying natural strata.
- Trial pits across the site in order to obtain samples to submit for geotechnical testing in order to assess the suitability of the material for re-use in earthworks.
- Rotary openhole boreholes within the backfilled opencast sites in order to confirm the depth to competent bedrock.
- Rotary openhole boreholes outwith the boundaries of the opencasts in order to investigate underground coal workings at shallow depth. In addition, where shallow coal seams are present below the base of the opencast, further boreholes will be required.
- Chemical analysis of soil and water samples in order to determine the concentration so potential contamination on the site.
- Geotechnical testing to classify materials and inform foundation design and chemical testing to determine the Aggressive Chemical Environmental for Concrete Classification.
- Ground gas and groundwater monitoring wells are installed within selected boreholes in order to assess the levels of groundwater within and outside of the backfilled opencast, to provide an indication of whether groundwater rebound has been completed. Gas monitoring will also be carried out on six occasions in order to assess the potential presence of hazardous ground gases on the site.



J Morley
B.Sc. (Hons.), M.Sc., F.G.S
For and on behalf of JPG (Leeds) Limited

December 2019

Appendix A Figures and Drawings

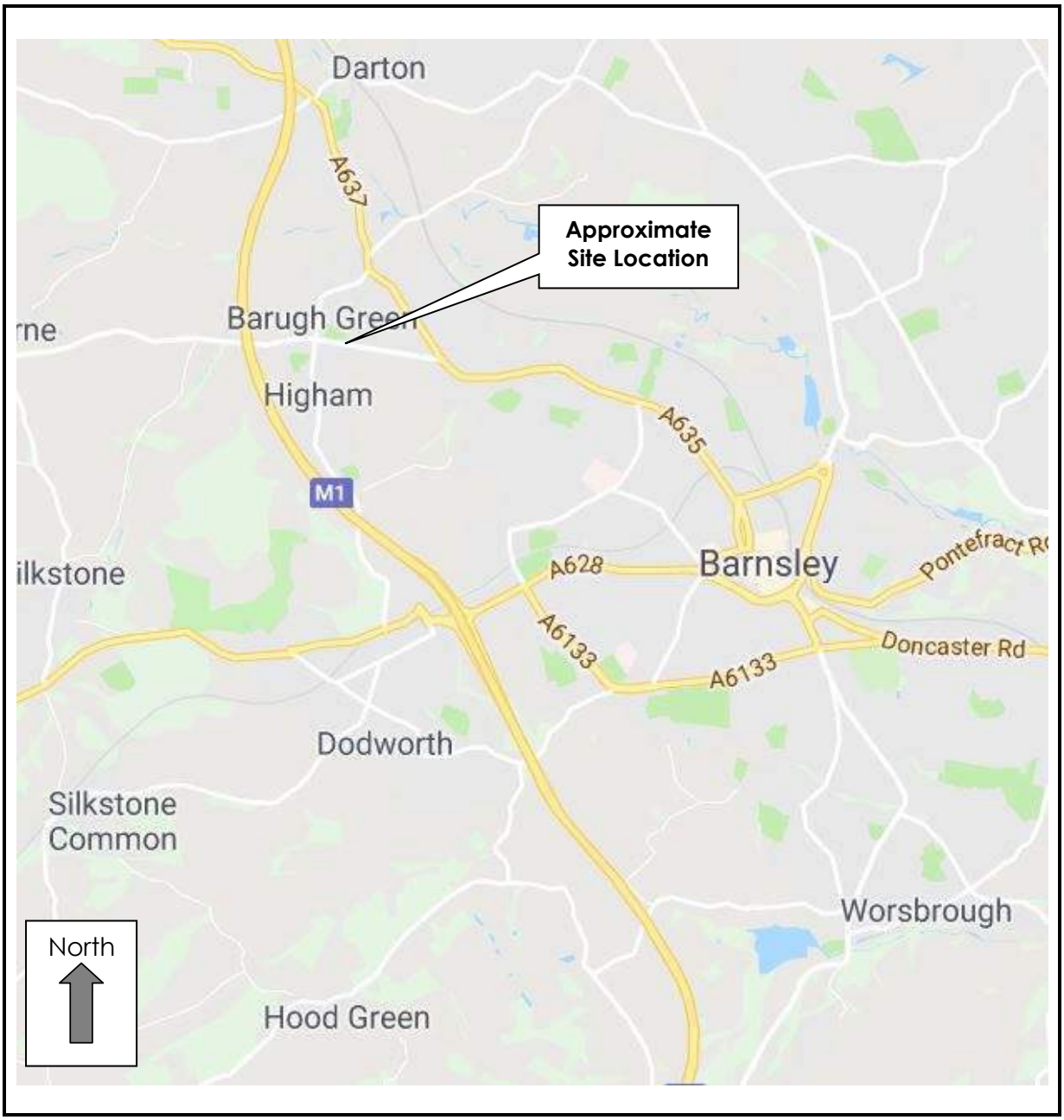


Figure 1 – Site Location Plan	
Site	**Barugh Green Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

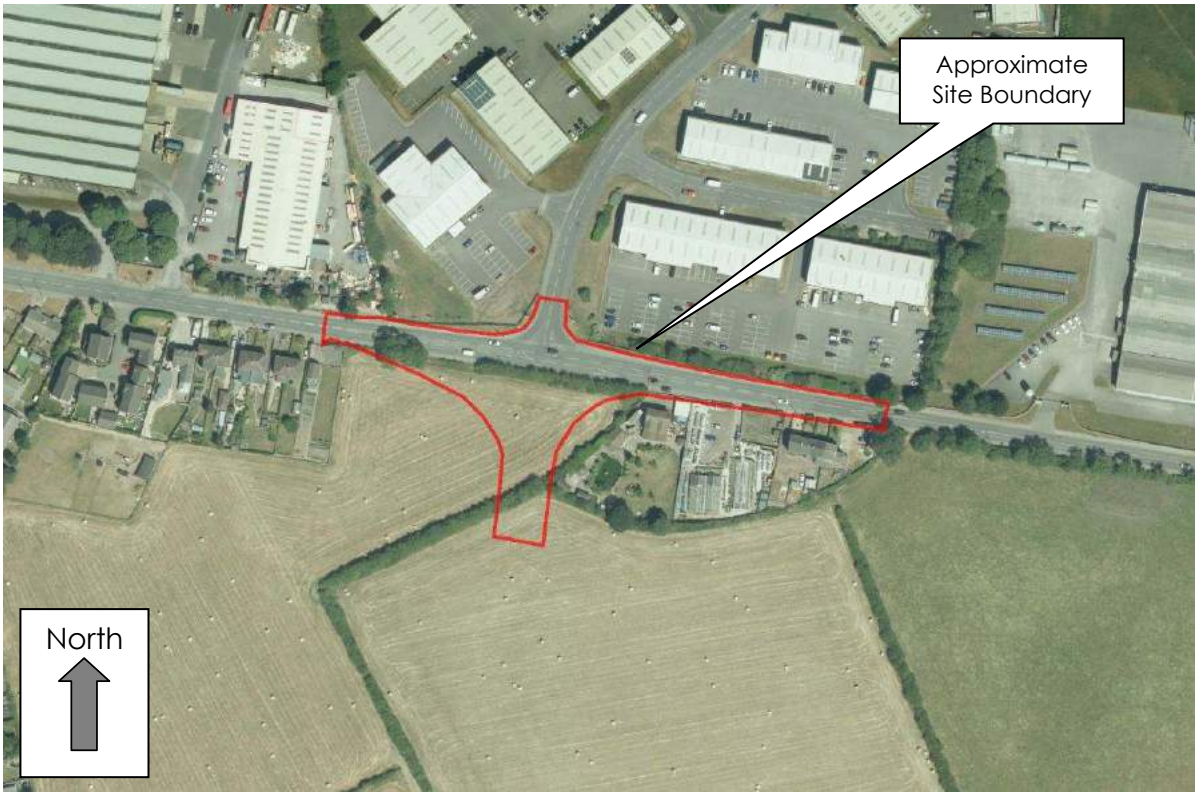


Figure 2 – Aerial Photograph	
Site	**Barugh Green Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

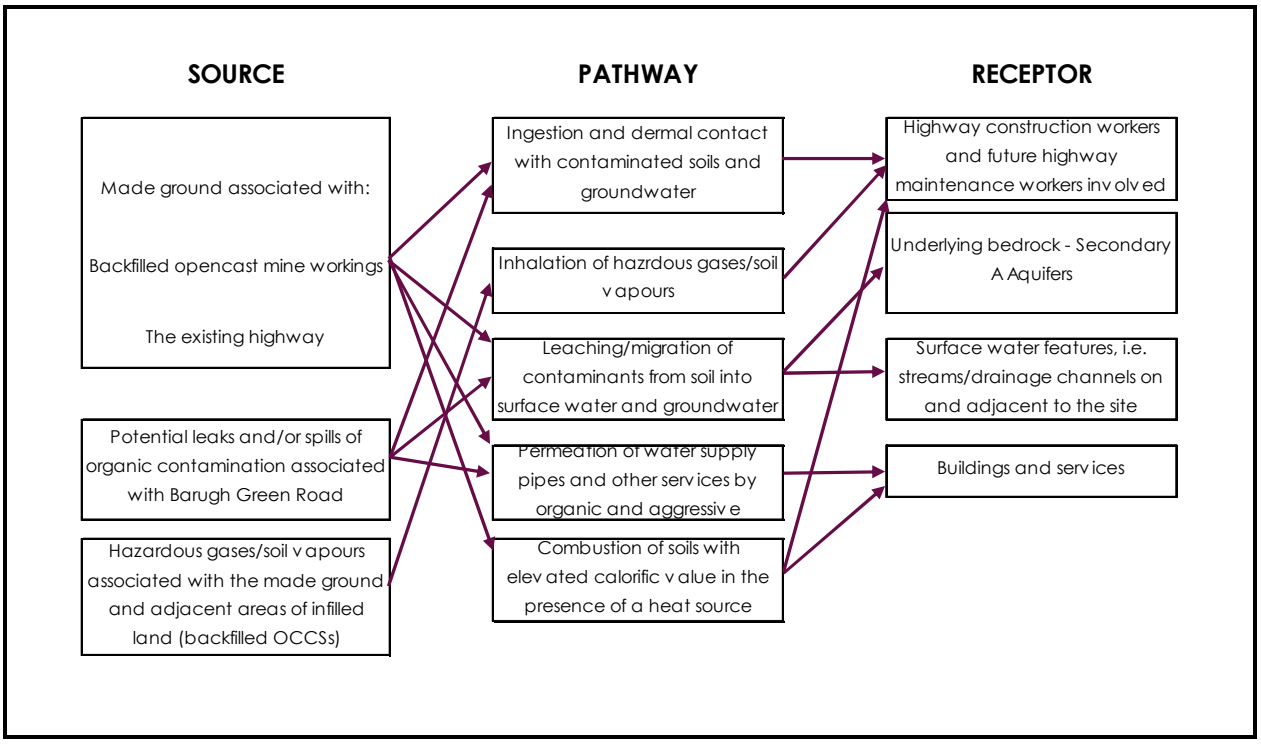


Figure 3 – Conceptual Site Model	
Site	**Barugh Green Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

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NOTES

JPG 2019 Site Investigation

BH121 — Rotary Borehole Location

TP108 — Trial Pit Location

Site Investigation Locations Surveyed Using Leica Geosystems, GNSS Rover

BGS Information

SE30NW262 — Borehole/ Trial Pit Location

Locations Are Approximate

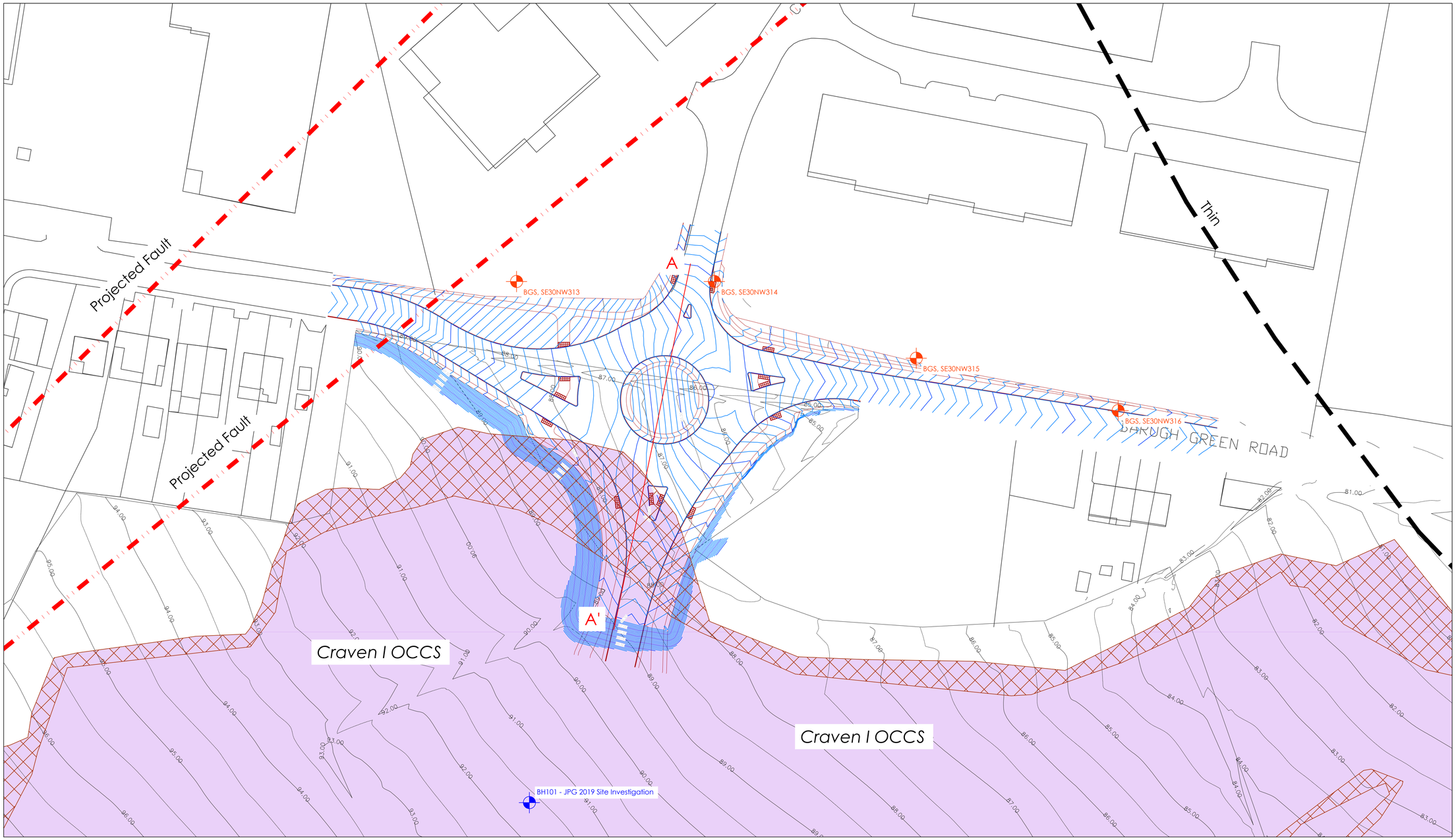
Projected Fault

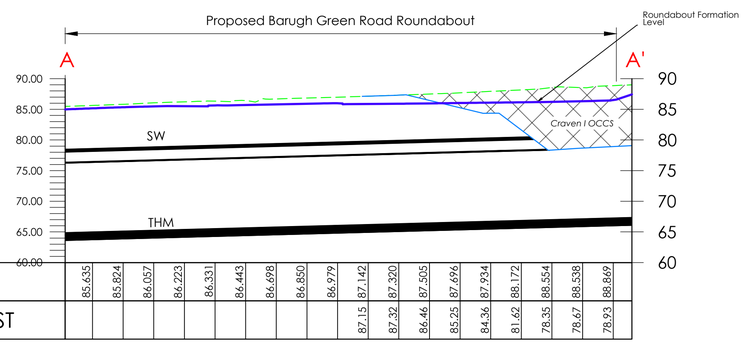
Projected Coal Seam Outcrop

Formation Levels.

Possible Craven I OCCS Backfill Material.

Projected Highwall As Taken From Abandonment Plans.





EXISTING LEVELS	85.635	85.824	86.057	86.223	86.331	86.443	86.698	86.850	86.979	87.142	87.320	87.505	87.696	87.934	88.172	88.554	88.538	88.869
BASE OF OPENCAST										87.15	87.32	86.46	85.25	84.36	81.62	78.35	78.67	78.93

SECTION A-A'
SCALE 1:500

Projected Coal Seams And Opencast Profile Have Been Established Using Historic Opencast Abandonment Plan 'OE/COMP/O3/311, Craven I & II', BGS Information & JPG 2019 Site Investigation Findings. True Thickness And Level Of Projected Coal Seams In This Area To Be Confirmed With Further Site Investigation.

Opencast Backfill Material.

REV	DESCRIPTION	DATE	BY
P01	FIRST ISSUE.	04.12.19	OLT

Project
BARNSLEY WEST

Drawing Title
BARUGH GREEN ROAD
ROUNDABOUT
CONCEPTUAL GROUND MODEL

INFORMATION ISSUE

Architect
BOND BRYAN

JPG
www.jpg.group
Leeds London Birmingham 0113 263 1155

JPG Project Ref	Scale at A1	Date	Checked	Drawn
4848	1:500	DEC'19	JBW	OLT

4848 - JPG - XX - 00 - DR - G - 1151 | S2 | P01

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GENERAL NOTES

a. THE TOPOGRAPHICAL SURVEY IS BASED ON INFORMATION PRODUCED BY HAYCOCK & TODD, JOB NO. S7970, FILE NAME S7970-3D-BARNSLEY WEST.DWG. THE INFORMATION USED IN PREPARATION OF THIS AND ALL OTHER FORE INFRASTRUCTURE DESIGNS AND DRAWINGS IS NOT WARRANTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL SURVEY INFORMATION PROVIDED AND REPORT ANY ANOMALIES TO FORE INFRASTRUCTURE.

DESIGN NOTES

1. ALL DESIGN AND WORKS TO COMPLY WITH CURRENT VERSION OF THE FOLLOWING DOCUMENTS:
   - DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB);
   - SPECIFICATION FOR HIGHWAY WORKS (SHW);
   - MANUAL FOR STREETS (MFS); AND
   - BARNSLEY METROPOLITAN BOROUGH COUNCIL (BMBC) DESIGN GUIDE AND SPECIFICATION.

north

BARUGH GREEN ROAD ROUNDABOUT GEOMETRICAL LAYOUT SUBJECT TO BARNSLEY COUNCIL APPROVAL

ROUNDABOUT GEOMETRICAL LAYOUT SUBJECT TO TRAFFIC ANALYSIS AND ARCHITECT LAYOUT REQUIREMENTS

ROUNDABOUT GEOMETRICAL LAYOUT SUBJECT TO TRAFFIC ANALYSIS AND ARCHITECT LAYOUT REQUIREMENTS

HIGHAM COMMON ROAD ROUNDABOUT GEOMETRICAL LAYOUT SUBJECT TO BARNSLEY COUNCIL APPROVAL

REV	DESCRIPTION	DATE	BY

Client:
STRATA STERLING BARNSLEY WEST LTD

Project
BARNSLEY WEST

Drawing Title
GENERAL ARRANGEMENT - LINK ROAD

FOR COMMENT

Fore Consulting Limited
2nd Floor, Queens House
34 Wellington Street
Leeds
LS1 2DE
0113 2460204
enquiries@foreconsulting.co.uk
www.foreconsulting.co.uk

Drawn by	Checked by	Issue Date	Scale	Format
ML	PI	02.10.2019	1:2000	A1

Job Number	Drawing Number	Revision
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Appendix B Site Photographs

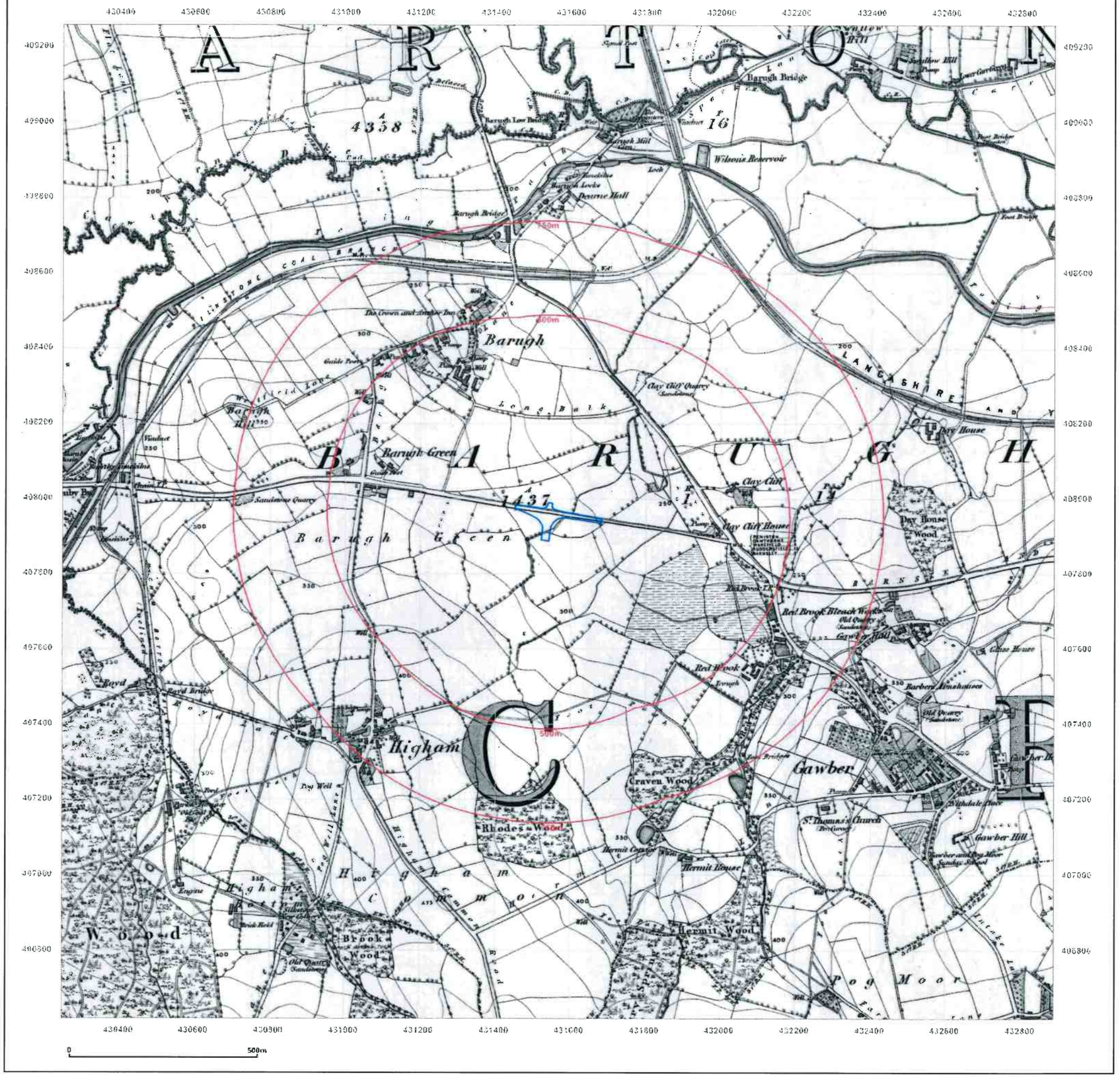


Photograph 1: View from Barugh Green Road Towards the Arable/Grazing Land to the South.



Photograph 2: View to the South West.

Appendix C Historical Maps



Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: County Series
Map date: 1850
Scale: 1:10,560
Printed at: 1:10,560

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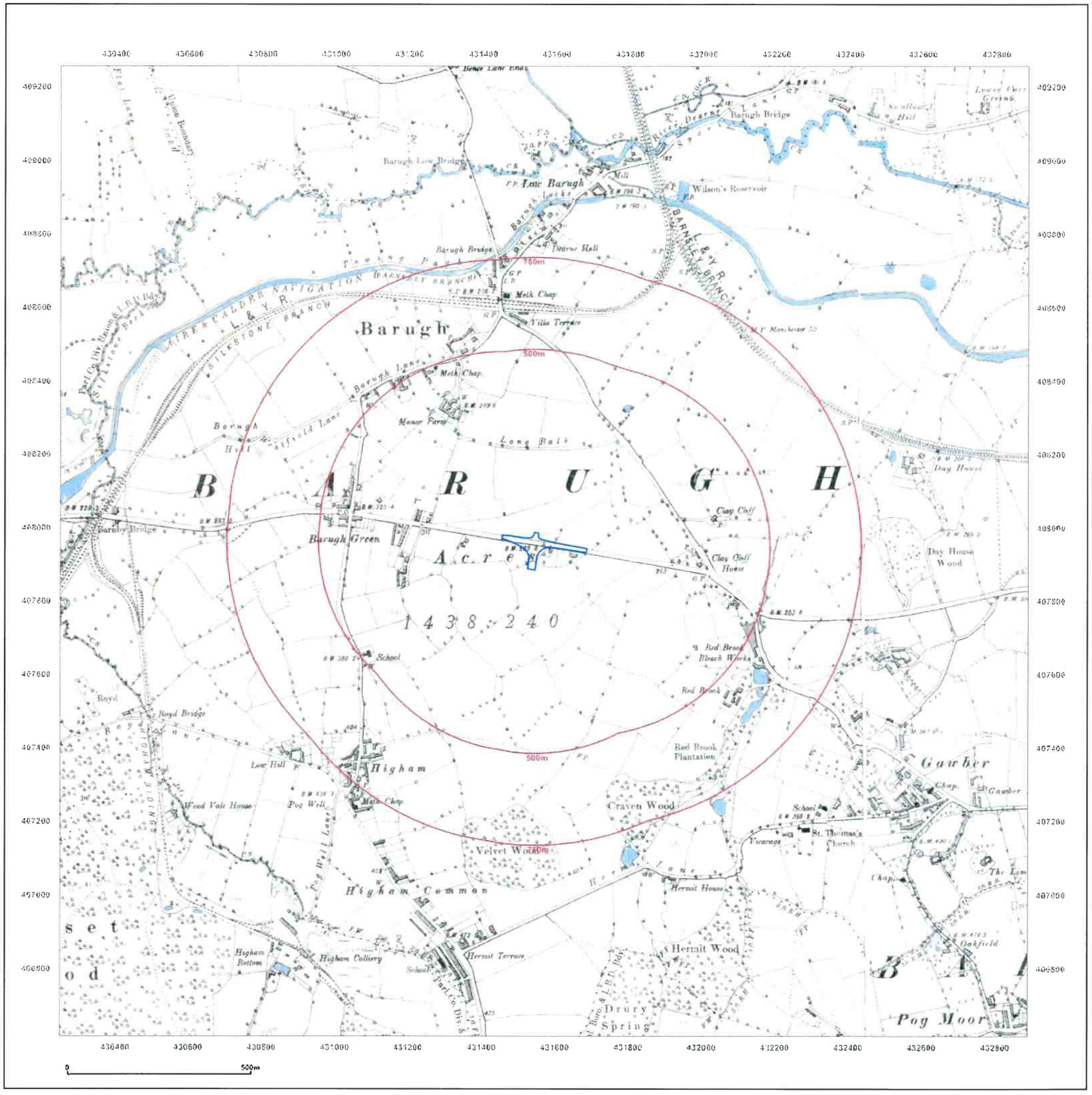
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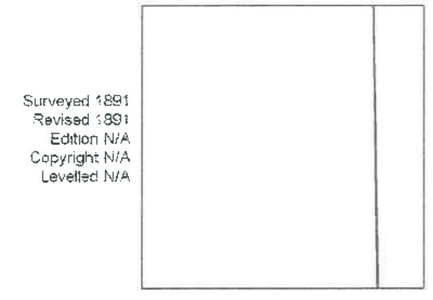
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Grid Ref: 431567, 407938

Map Name: County Series
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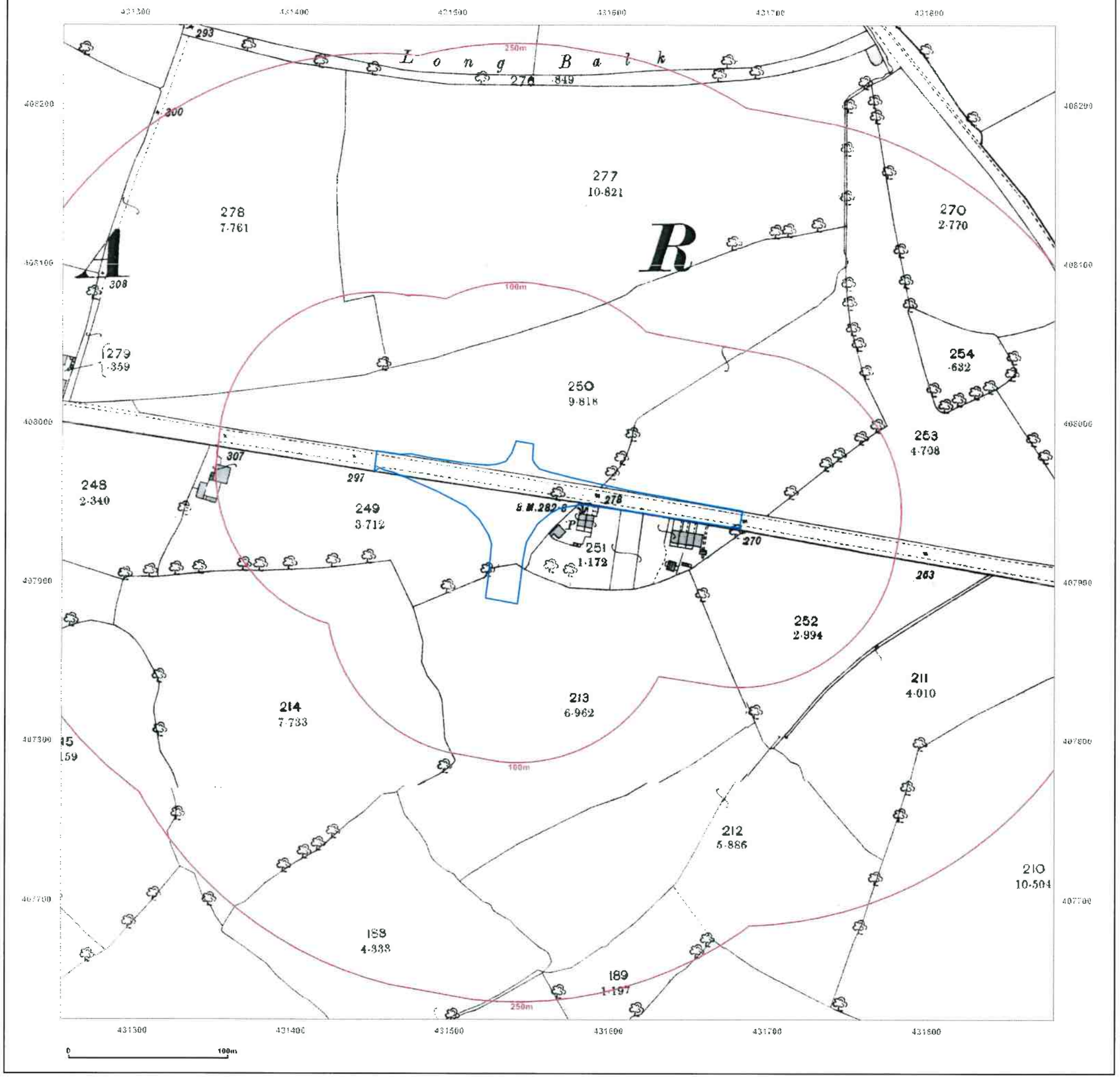
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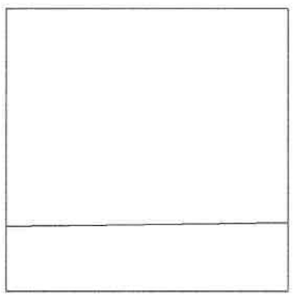
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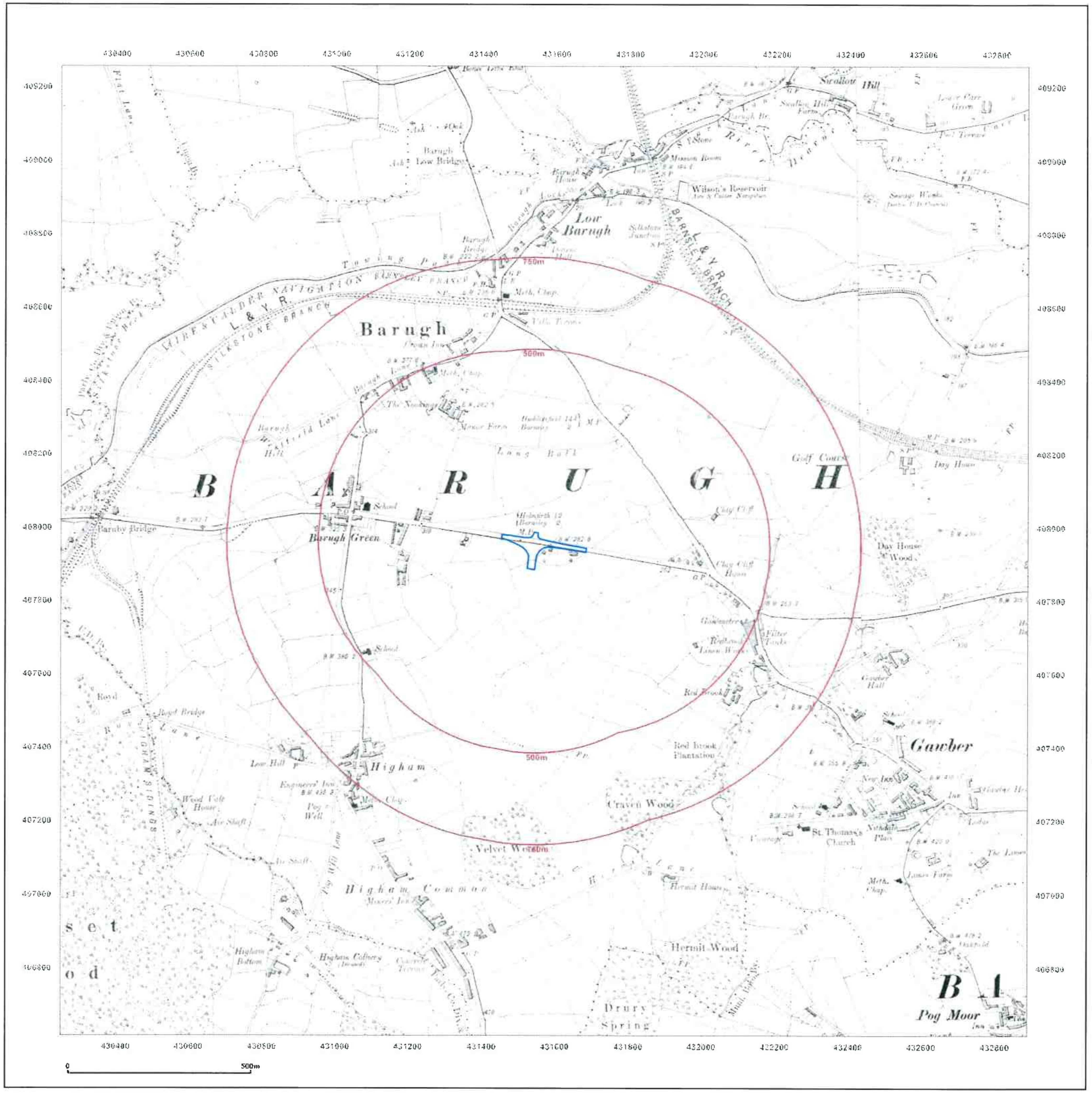
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Site Details:

Barugh Green Road Roundabout

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Map Name: County Series

Map date: 1904

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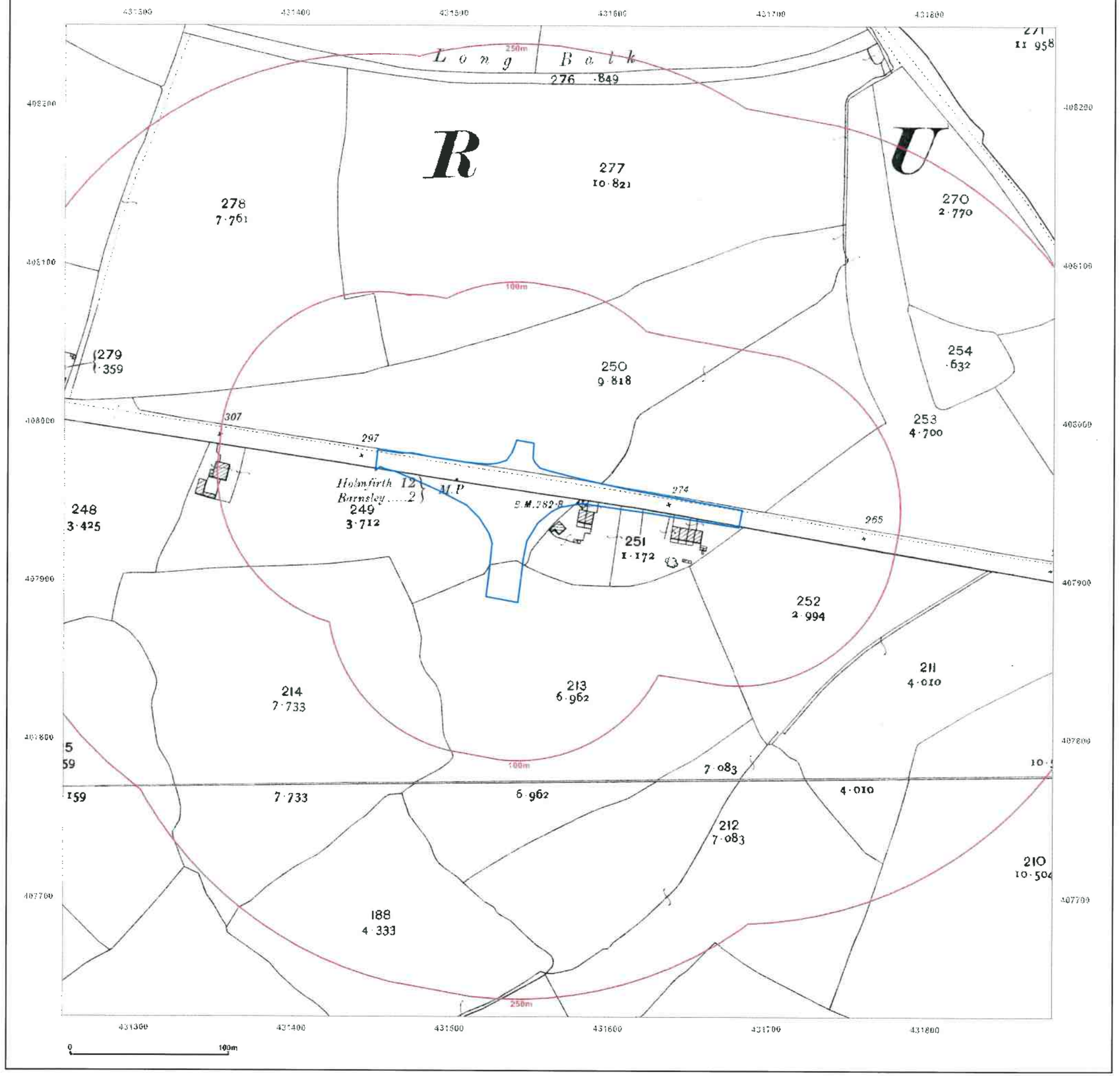
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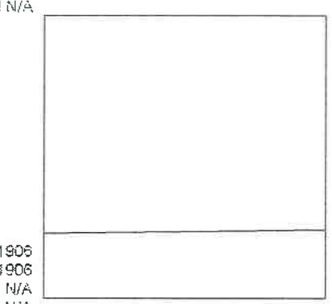
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Map Name: County Series
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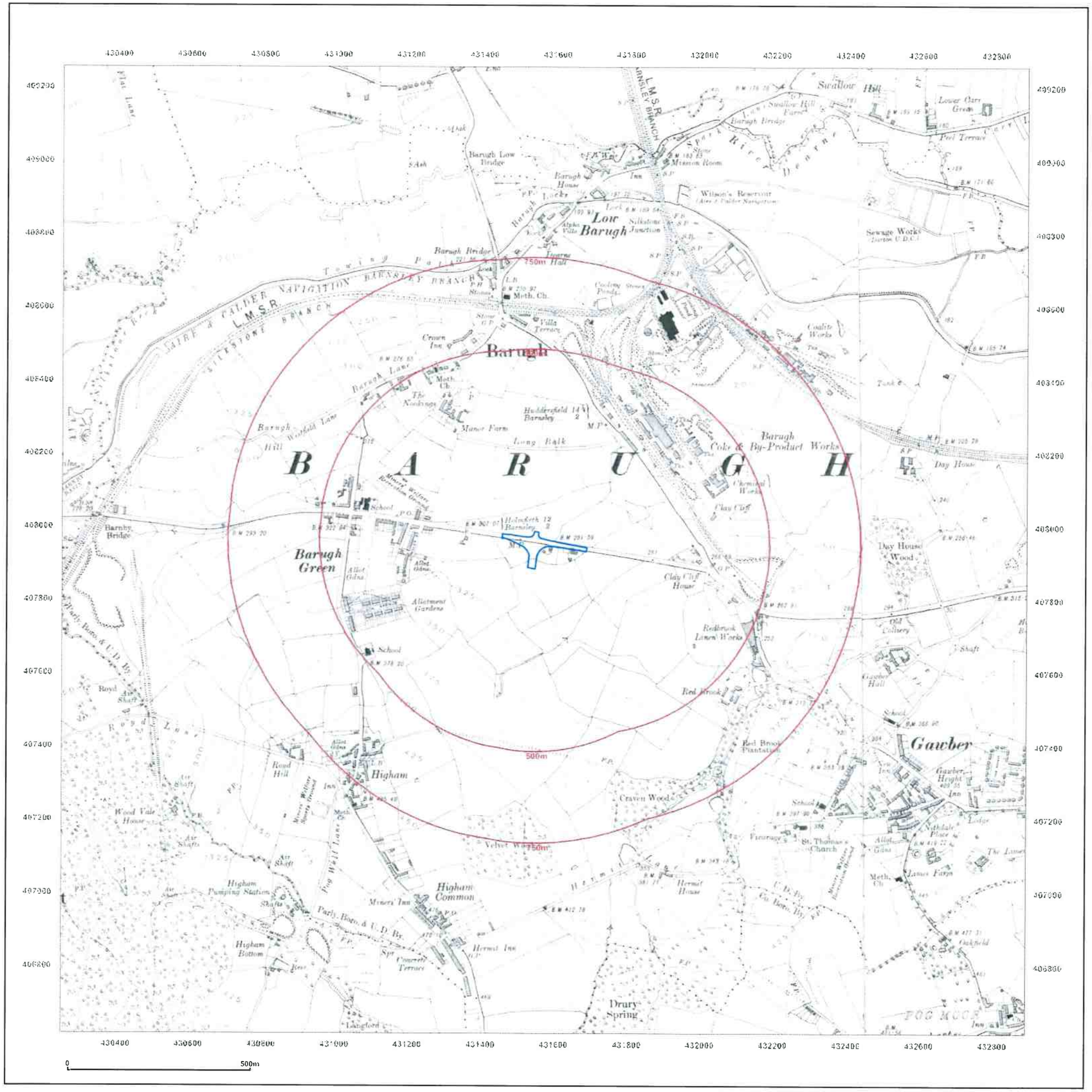
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Site Details:

Barugh Green Road Roundabout

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Grid Ref: 431567, 407938

Map Name: County Series
Map date: 1929
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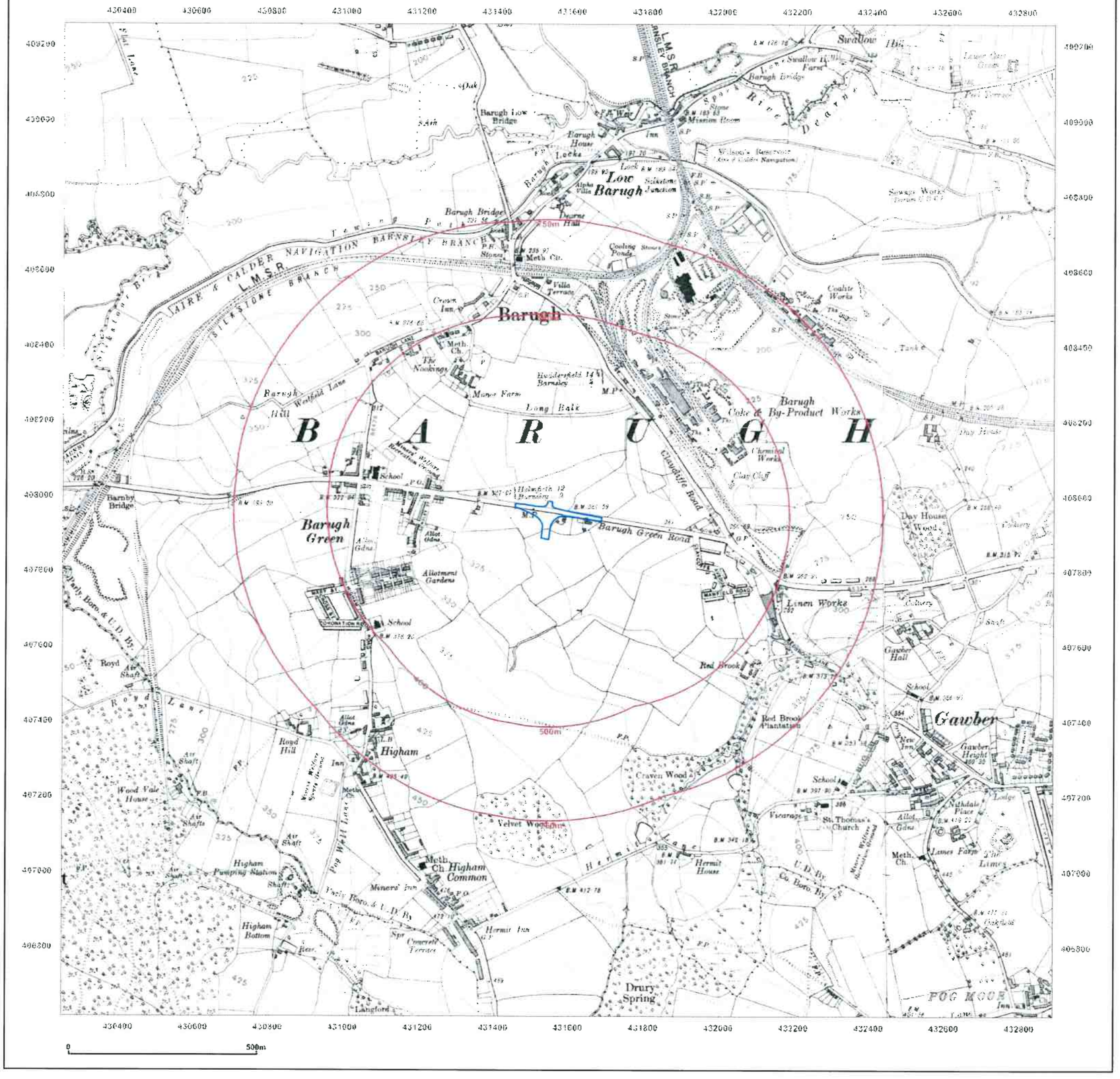
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: County Series
Map date: 1938
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Surveyed 1851
Revised 1938
Edition 1938
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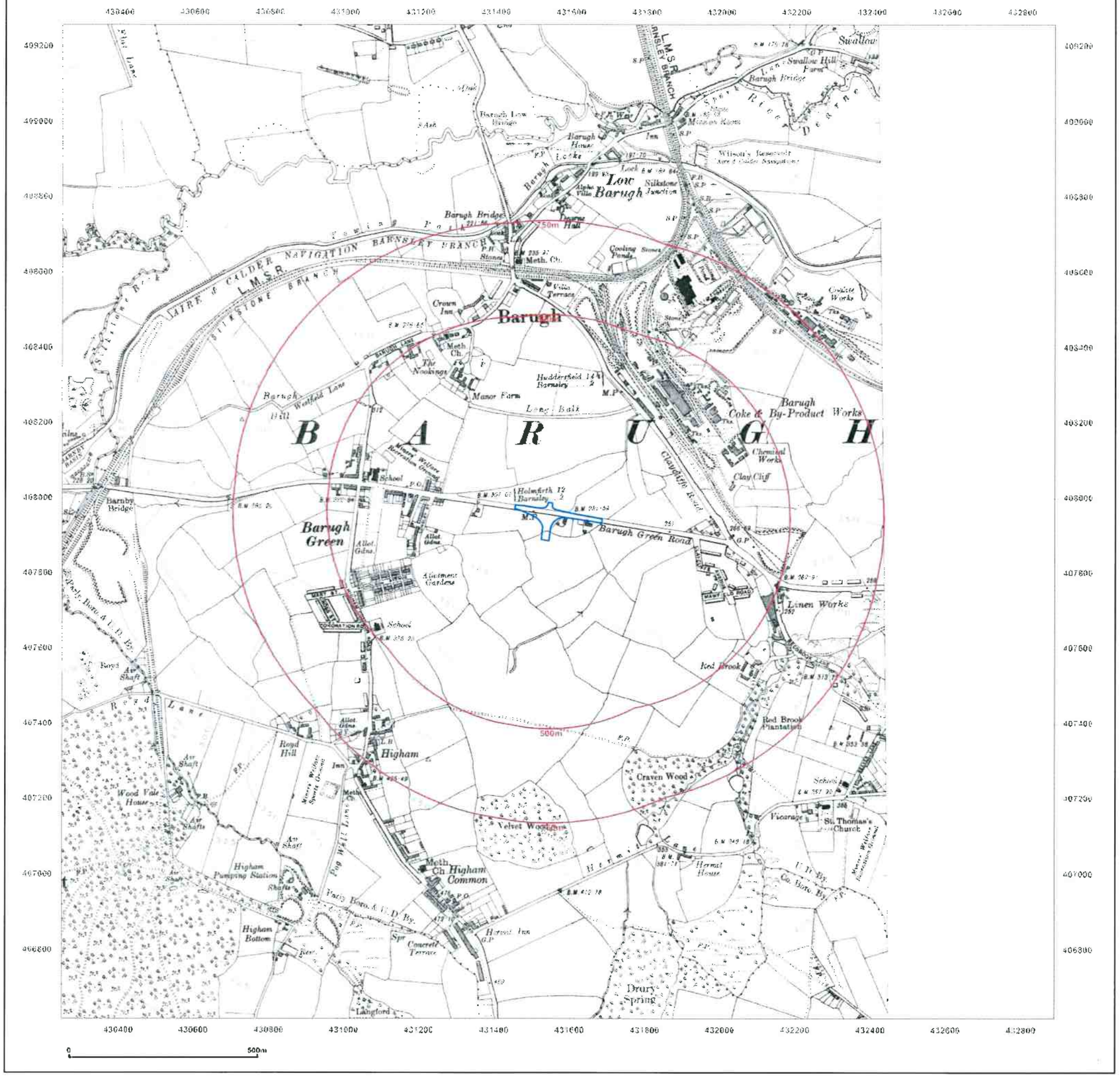
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Site Details:

Barugh Green Road Roundabout

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Map Name: County Series
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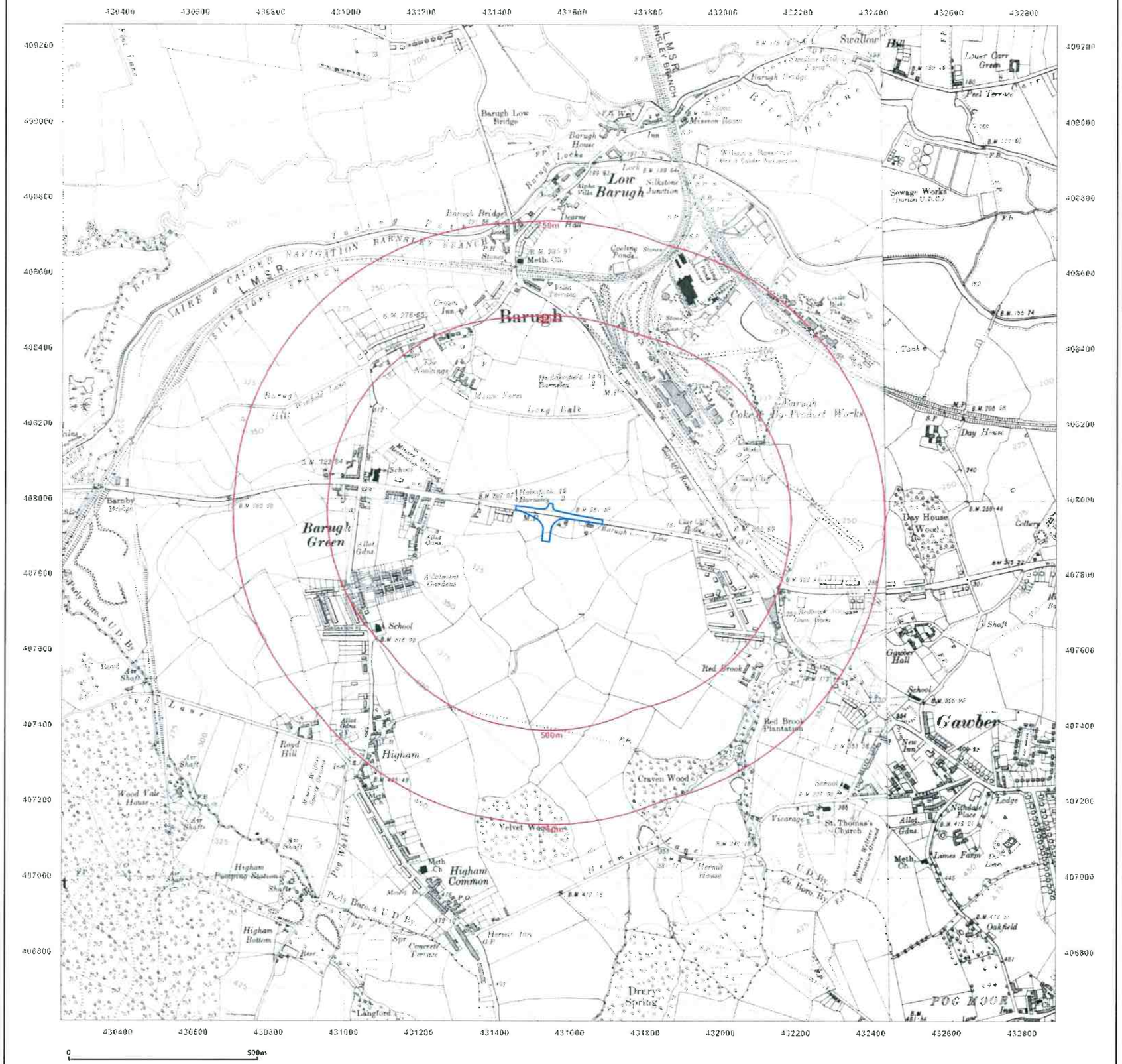
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: County Series
Map date: **1948**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1851
Revised 1948
Edition 1948
Copyright N/A
Levelled N/A

Surveyed 1851
Revised 1948
Edition 1948
Copyright N/A
Levelled 1929

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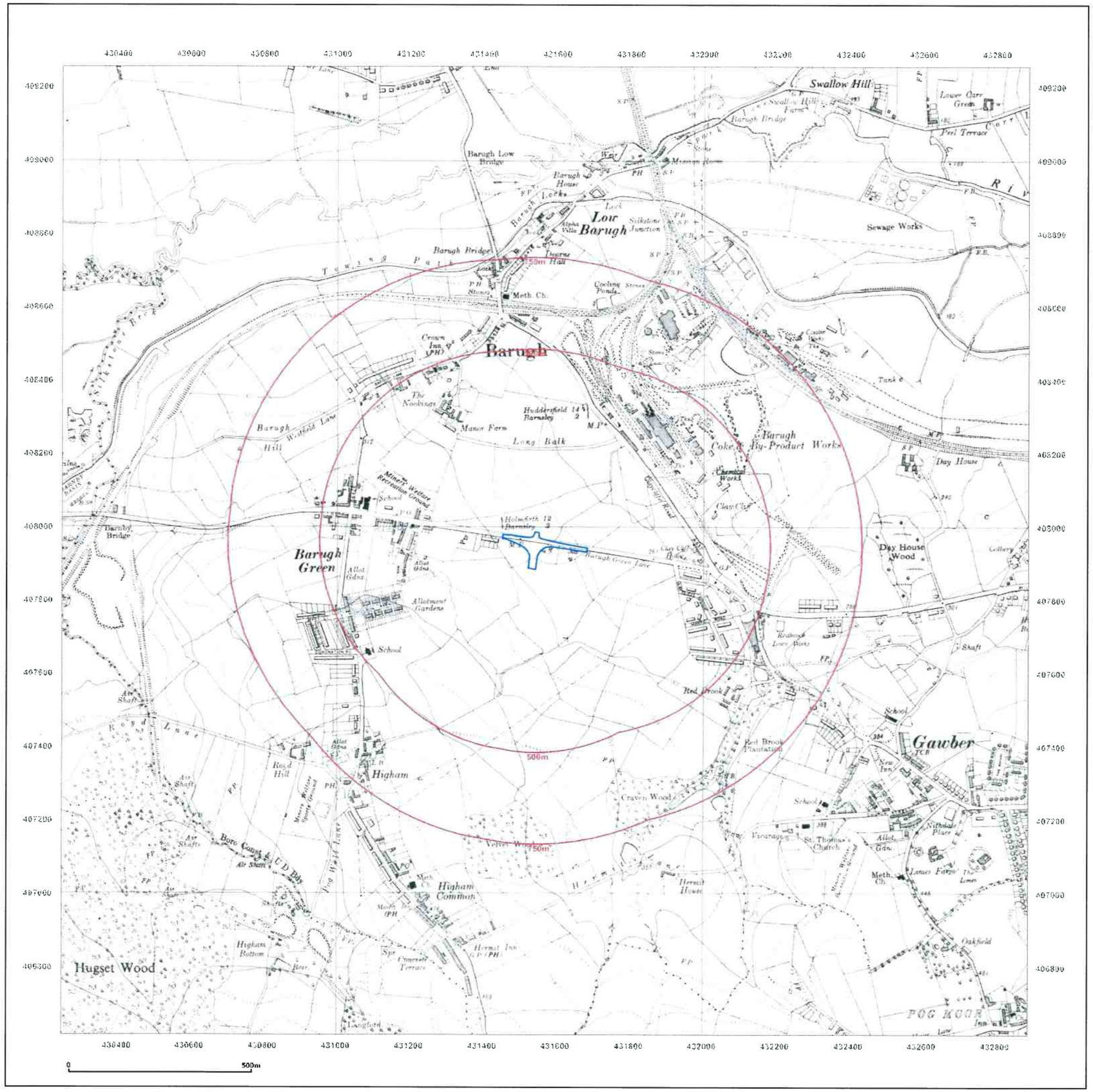
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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: Provisional
Map date: 1956
Scale: 1:10,560
Printed at: 1:10,560

N
W E
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Surveyed N/A
Revised 1955
Edition N/A
Copyright 1956
Levelled N/A

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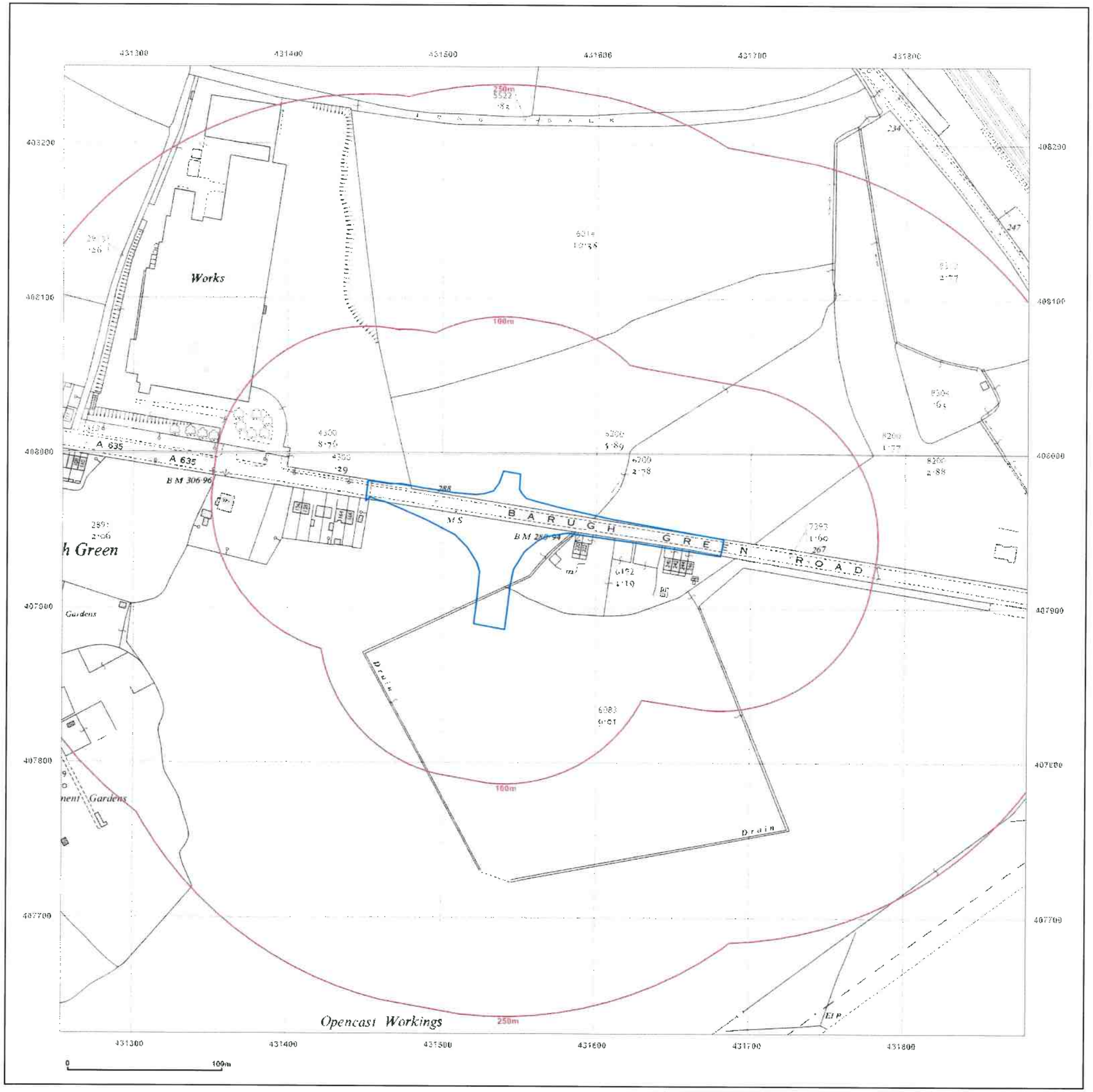
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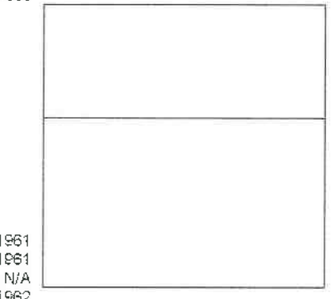
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Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1961
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1961
Revised 1961
Edition N/A
Copyright 1962
Levelled 1959



Surveyed 1961
Revised 1961
Edition N/A
Copyright 1962
Levelled 1959

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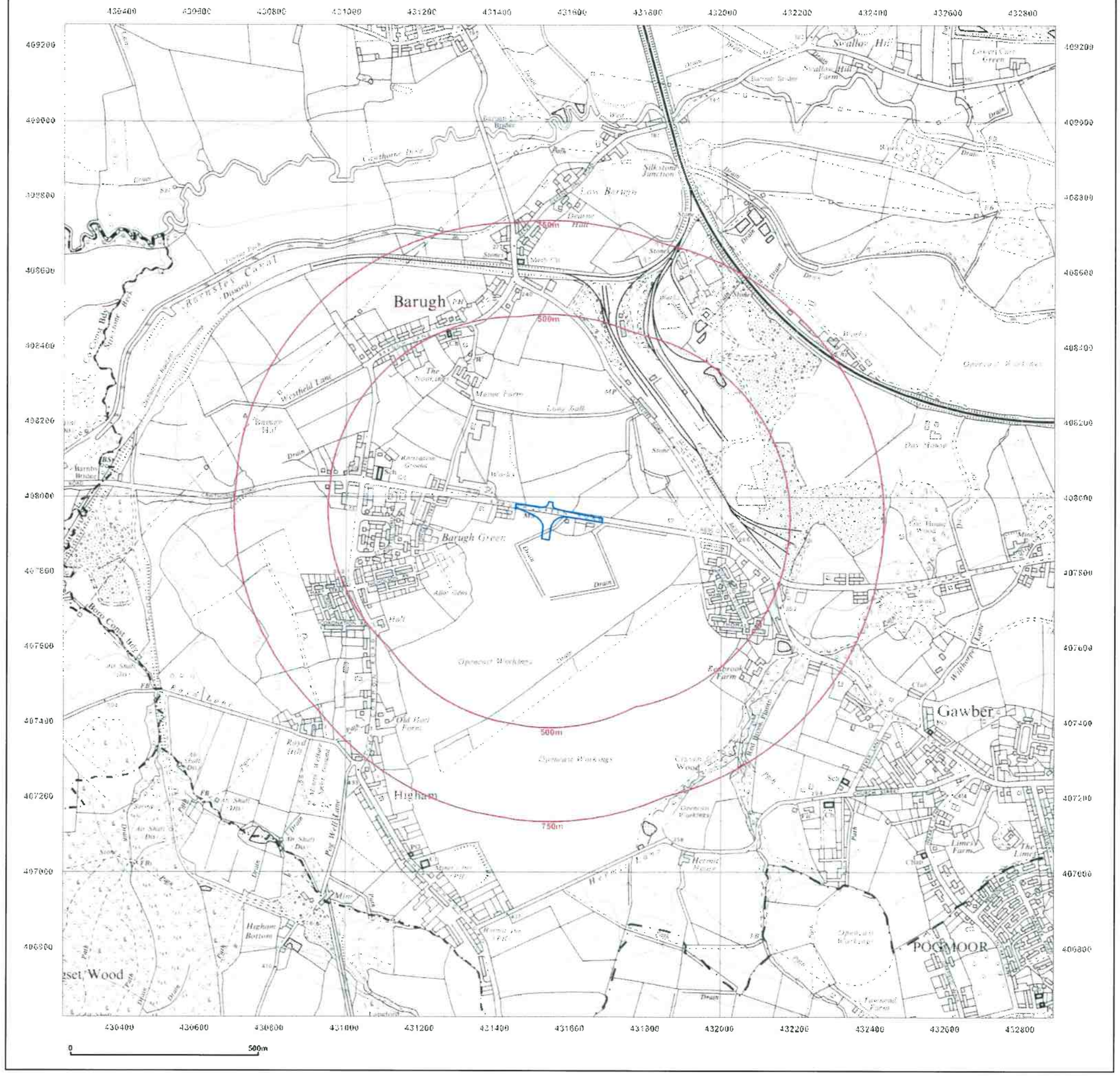
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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: Provisional
Map date: 1966
Scale: 1:10,560
Printed at: 1:10,560

N
W E
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Surveyed 1966
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

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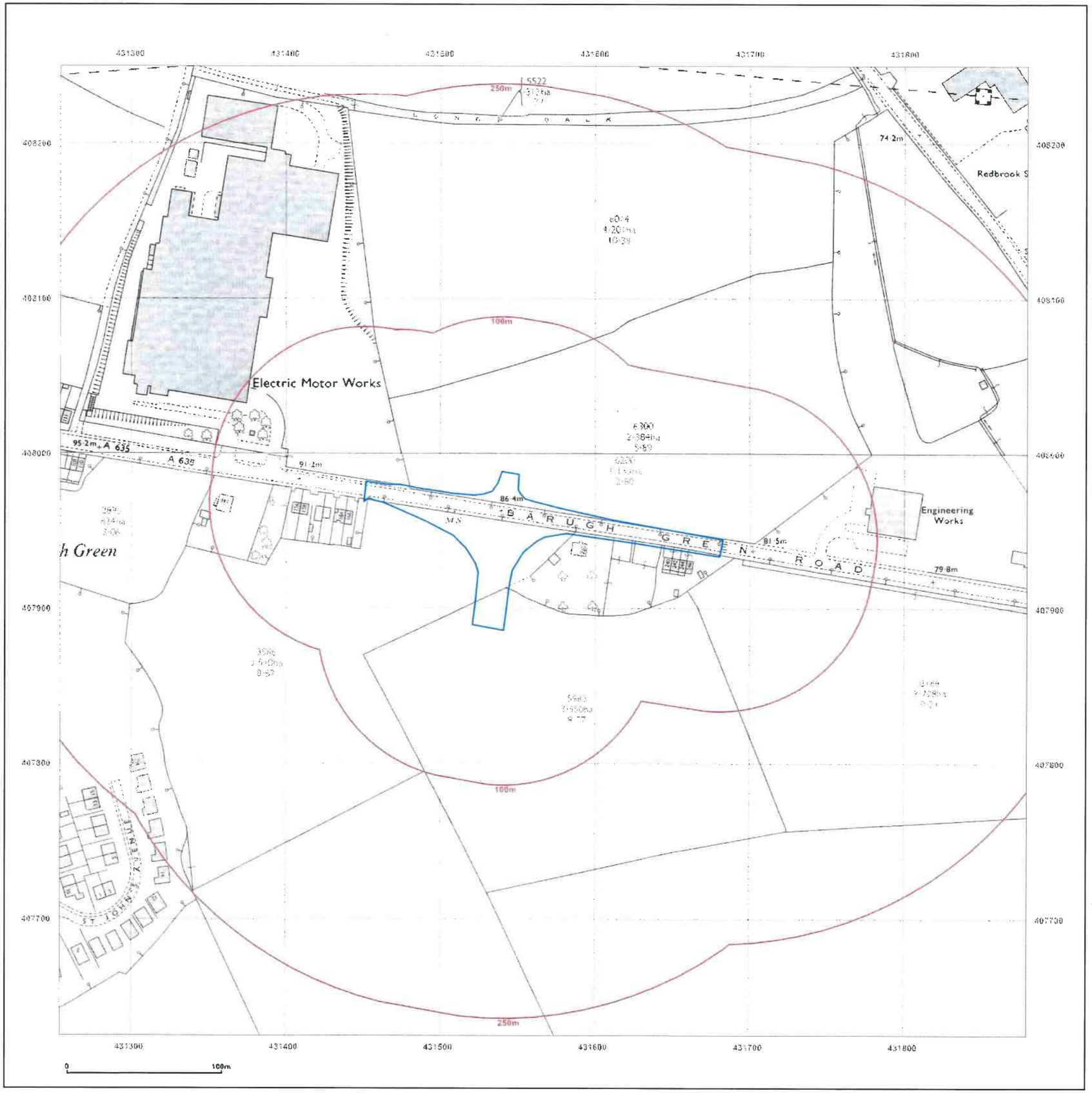
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Map legend available at:
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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: **1969-1970**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1970
Revised 1970
Edition N/A
Copyright 1971
Levelled 1963

Surveyed 1969
Revised 1969
Edition N/A
Copyright 1970
Levelled 1963

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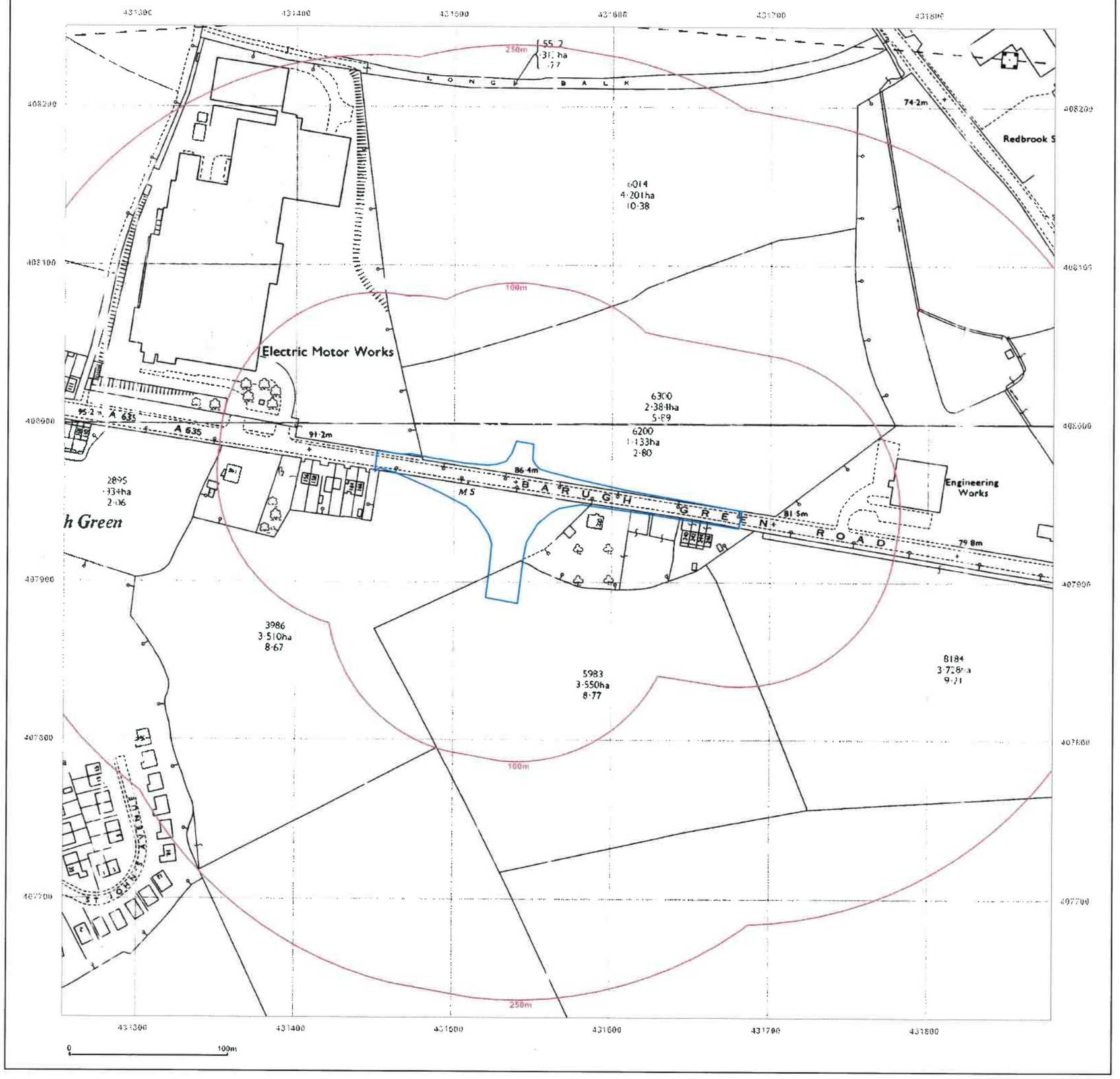
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1970-1971
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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

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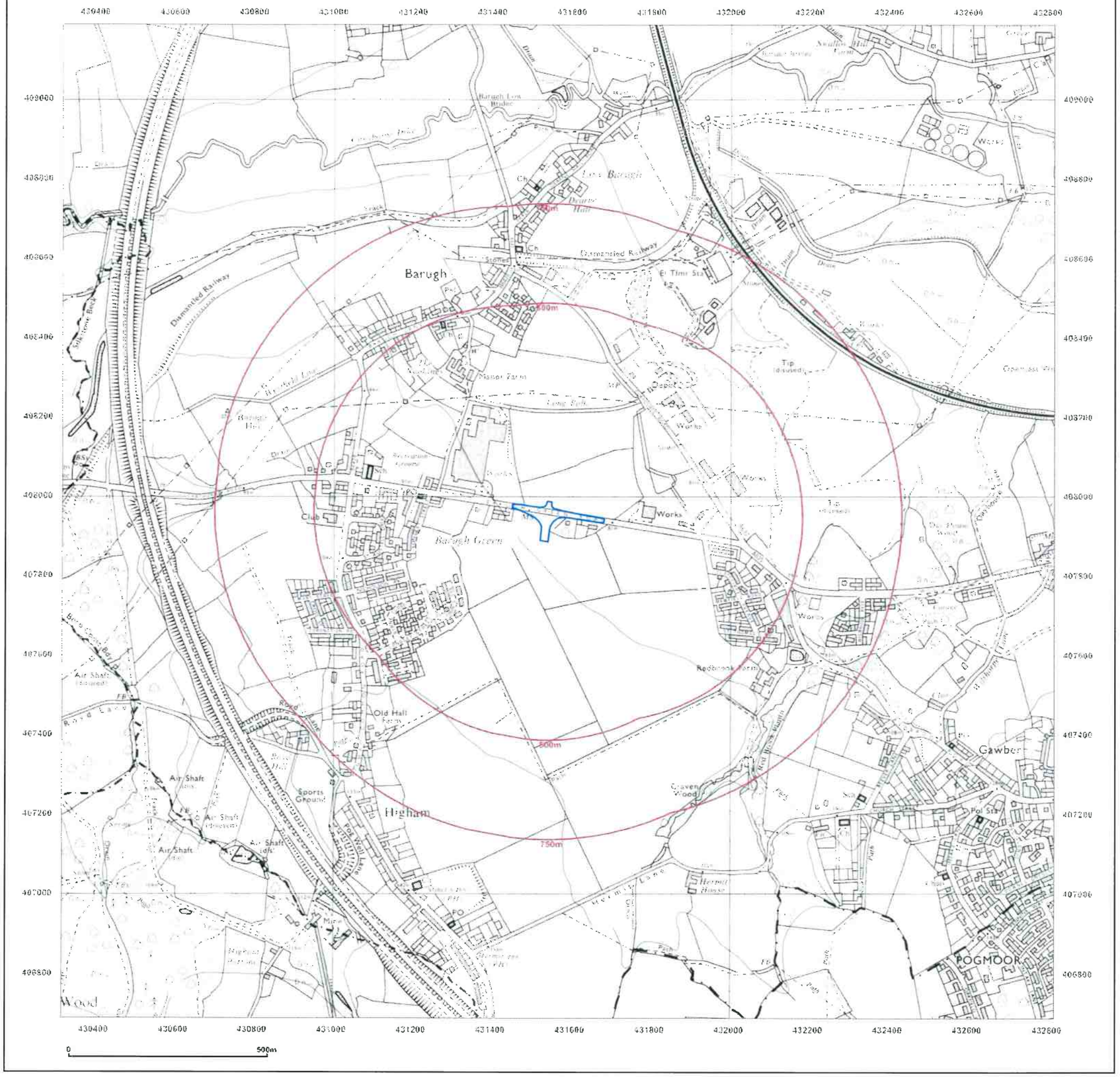
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1973
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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Surveyed 1973
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1976
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1976
Revised 1976
Edition N/A
Copyright 1977
Levelled 1963

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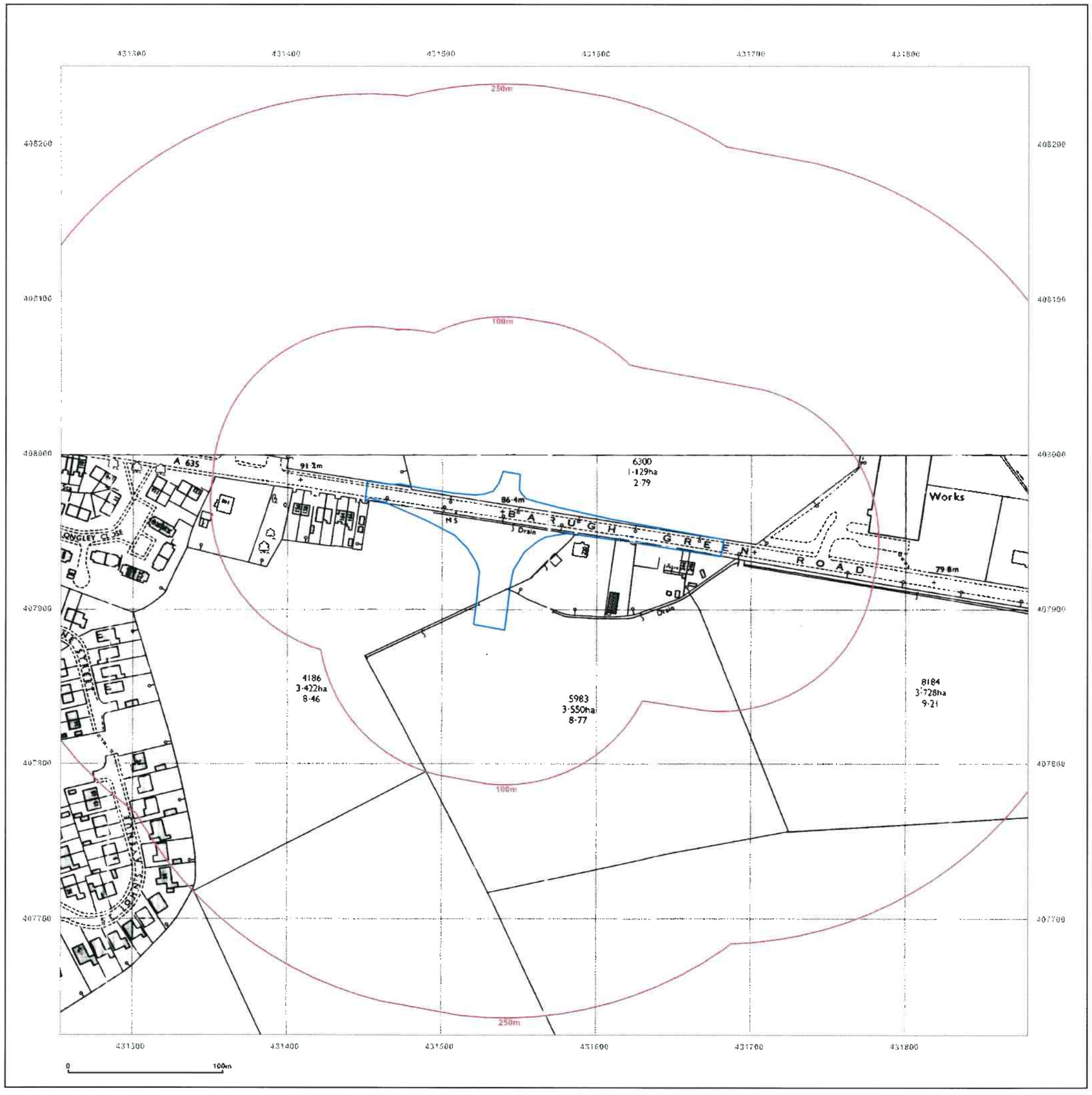
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1977
Scale: 1:2,500
Printed at: 1:2,500

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

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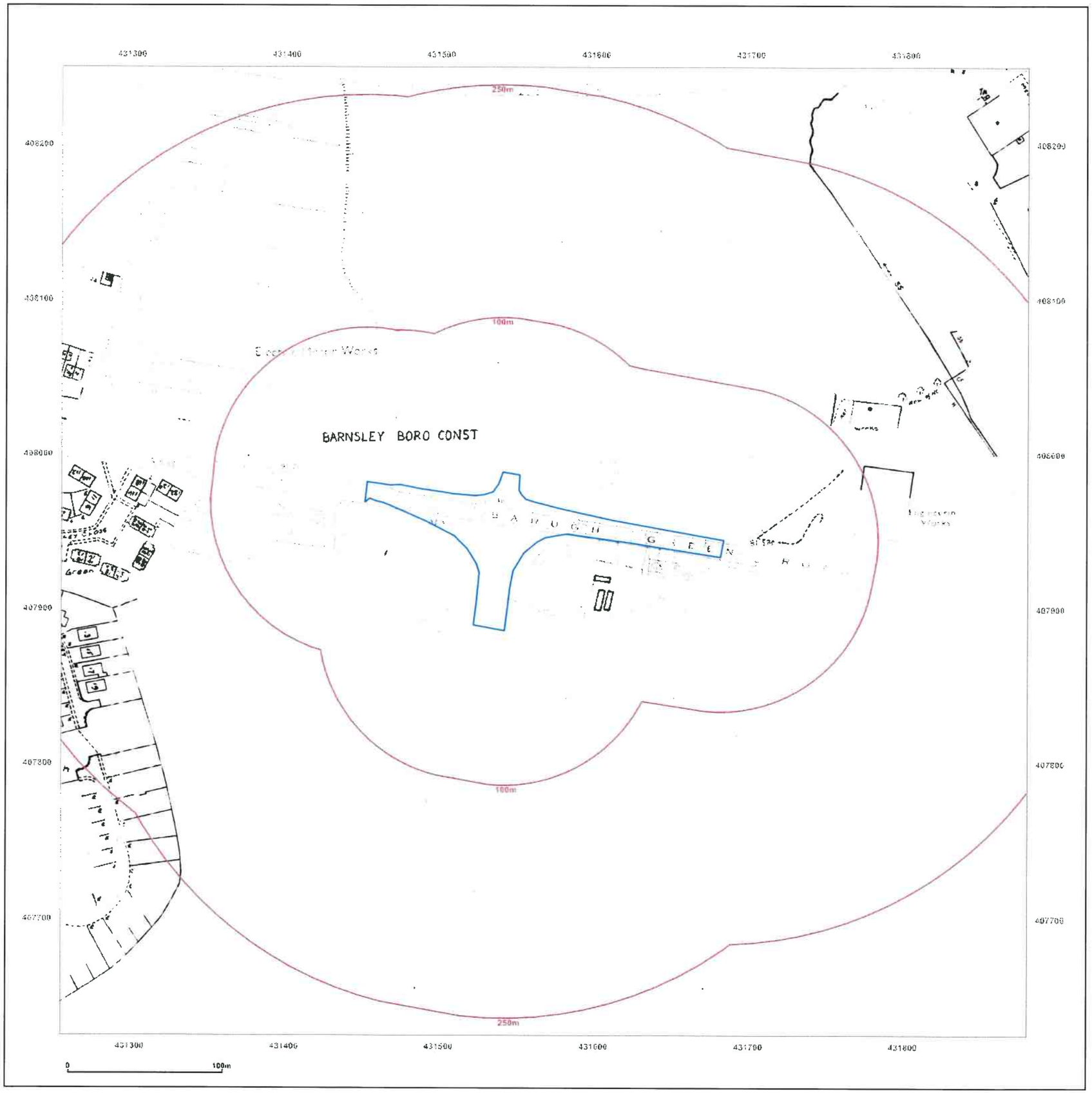
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1973-1978
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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

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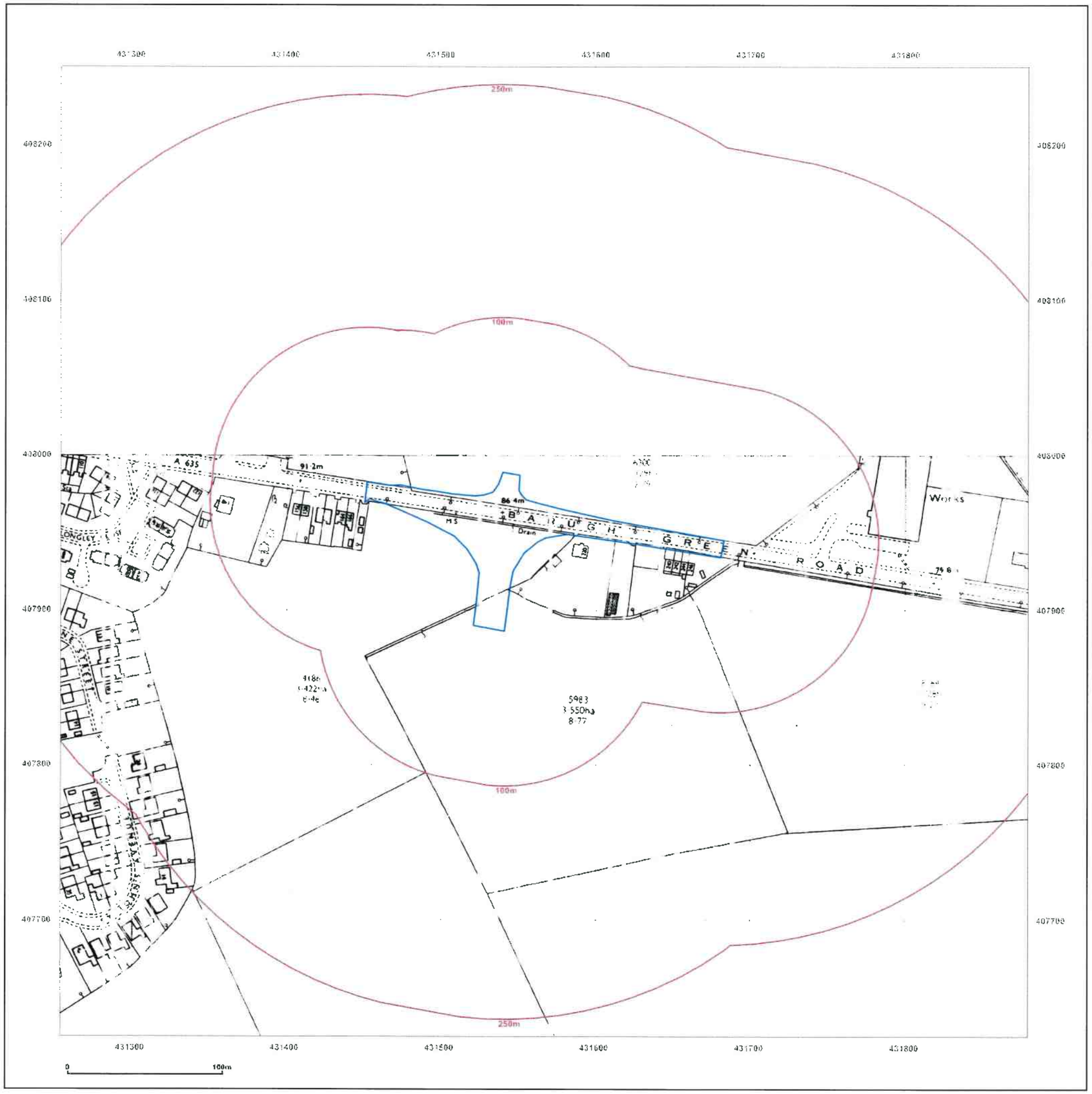
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1978
Scale: 1:2,500
Printed at: 1:2,500

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

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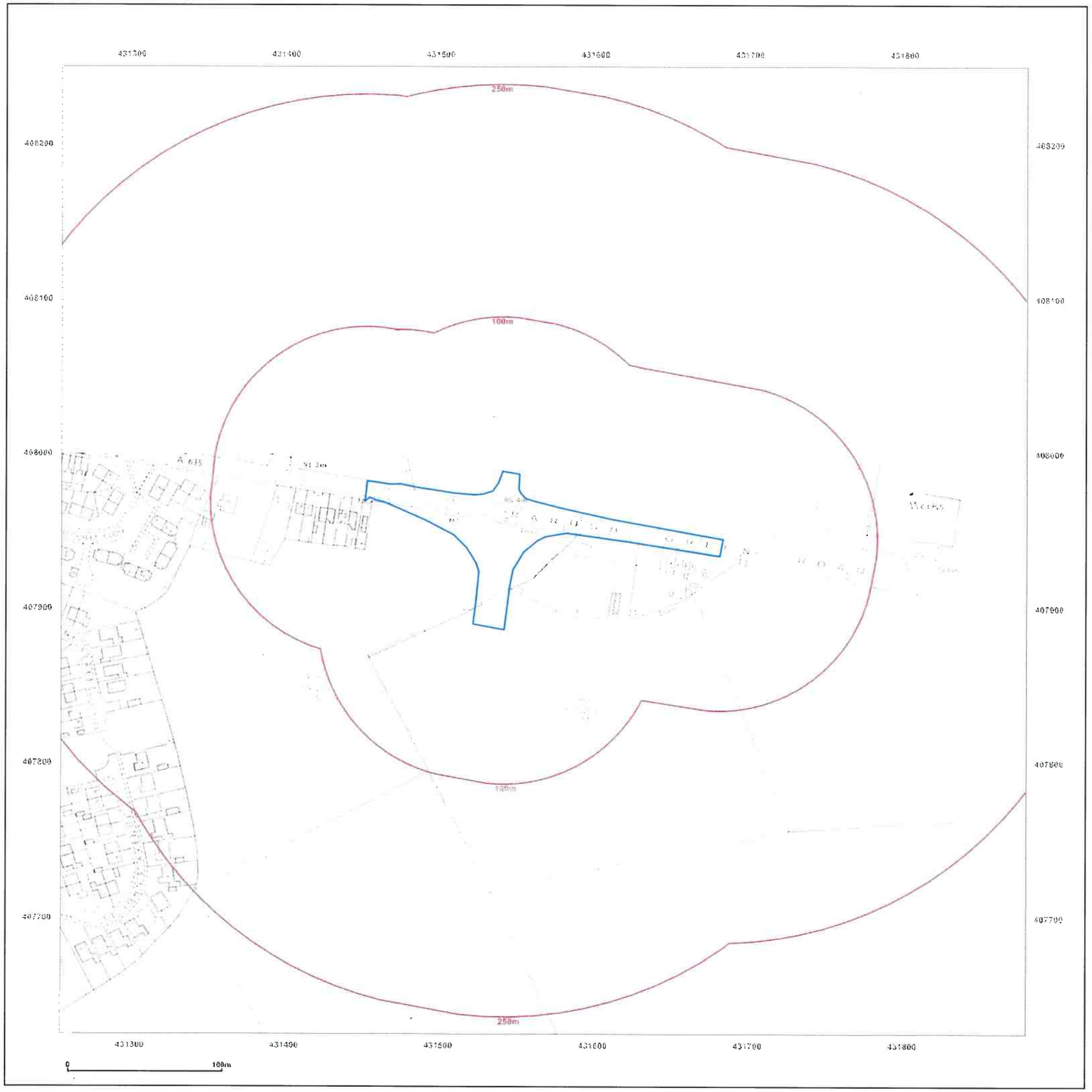
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1980
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1980
Levelled 1963

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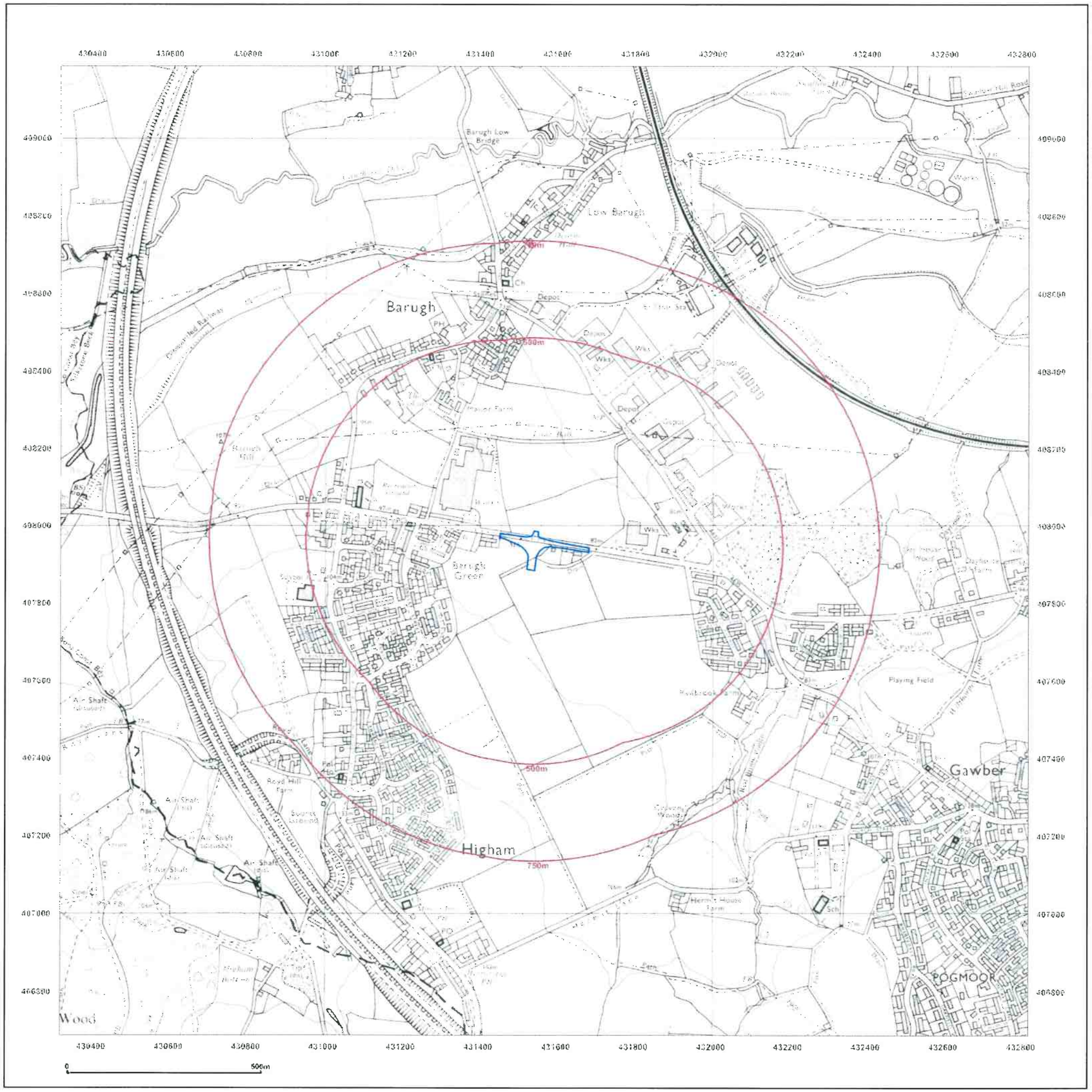
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1982
Scale: 1:10,000
Printed at: 1:10,000

N
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Surveyed 1982
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1990
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1963
Revised 1990
Edition N/A
Copyright 1990
Levelled 1963

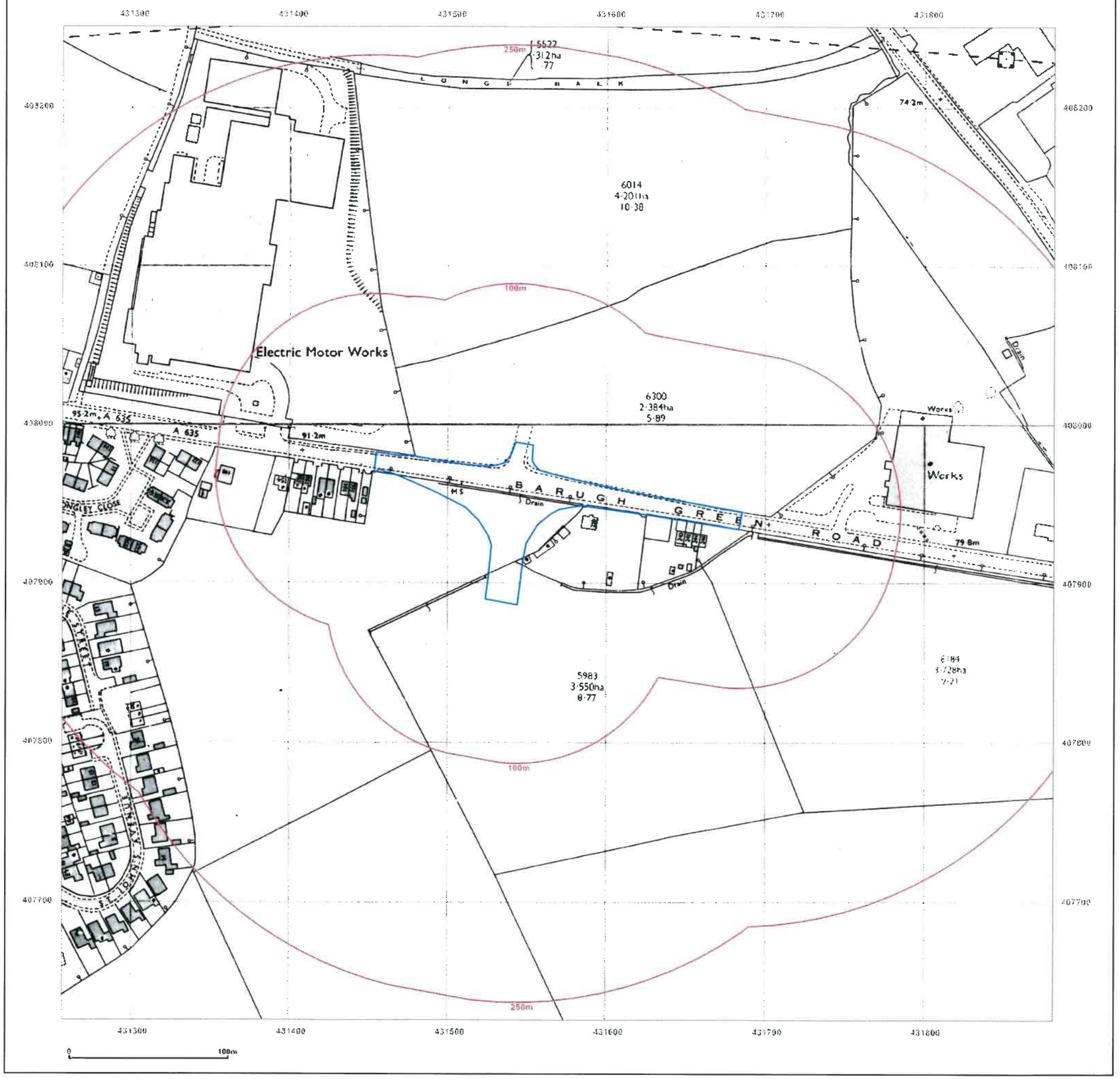
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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1987-1991
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1963
Revised 1987
Edition N/A
Copyright 1987
Levelled 1963

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1991
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1963
Revised 1991
Edition N/A
Copyright 1991
Levelled 1963

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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1989-1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1963
Revised 1989
Editon N/A
Copyright 1989
Levelled 1963

Surveyed N/A
Revised N/A
Editon N/A
Copyright 1993
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

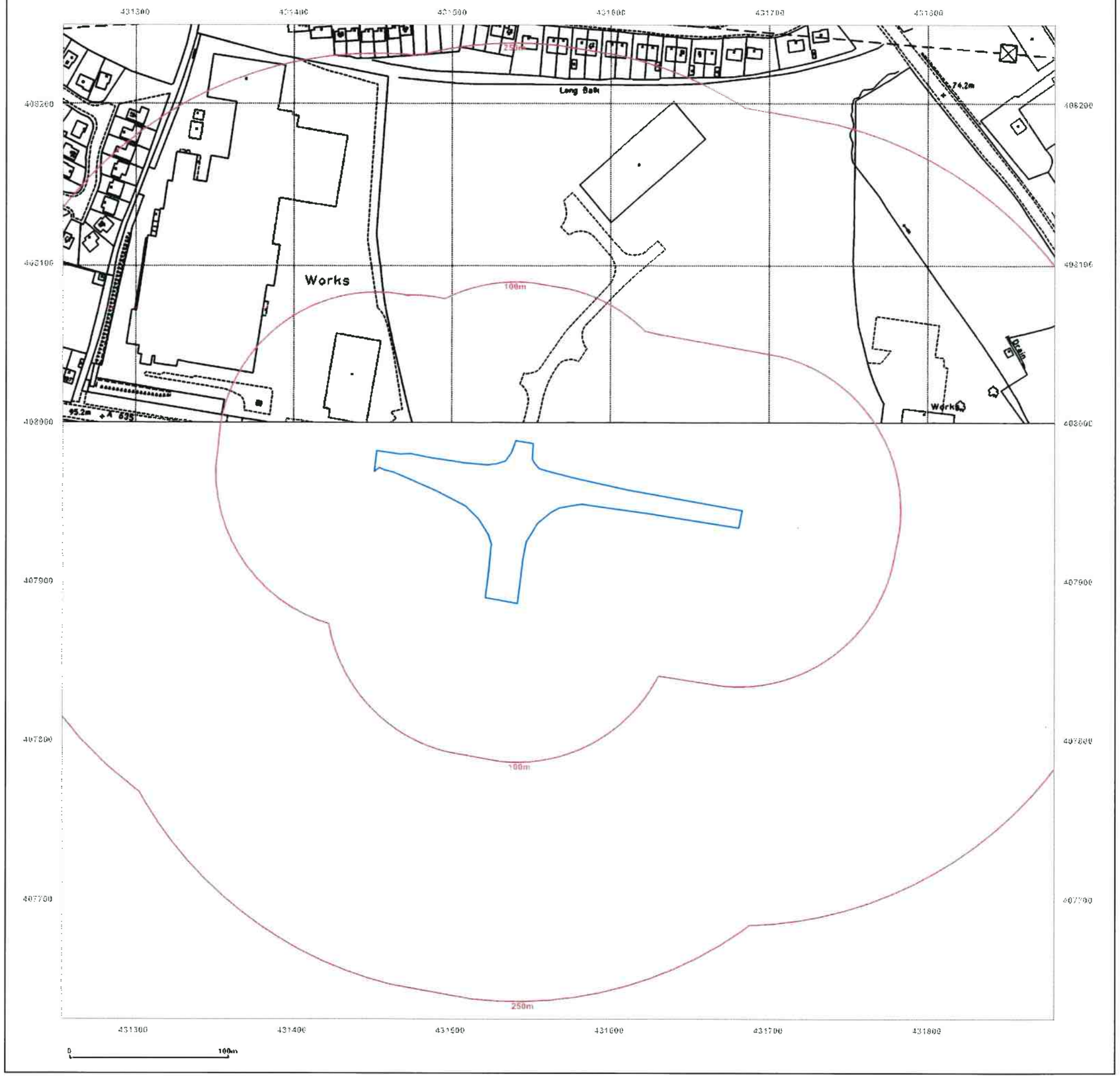
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1993
Revised 1993
Edition N/A
Copyright 1993
Levelled N/A

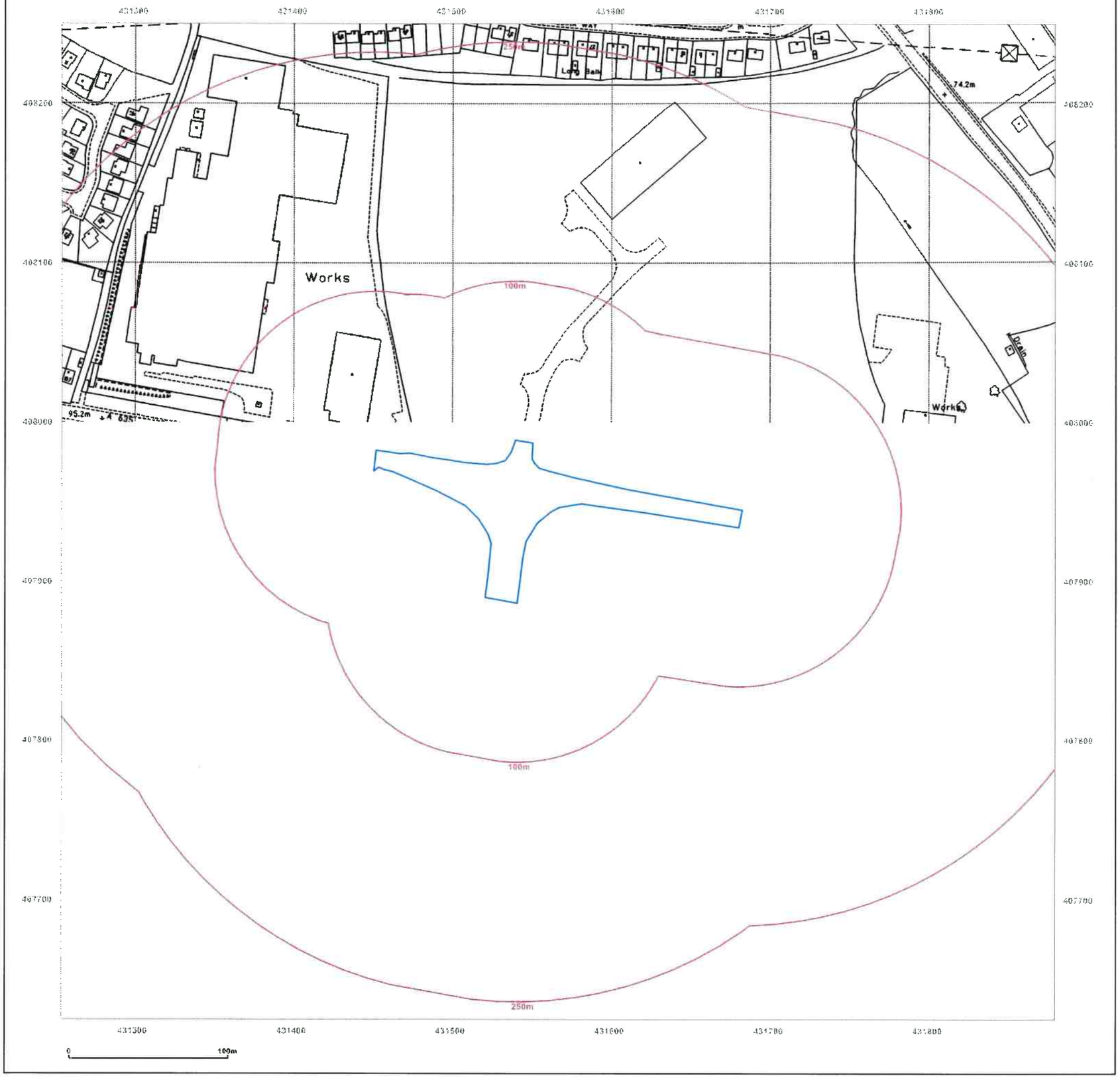
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1993
Revised 1993
Edition N/A
Copyright 1993
Levelled N/A

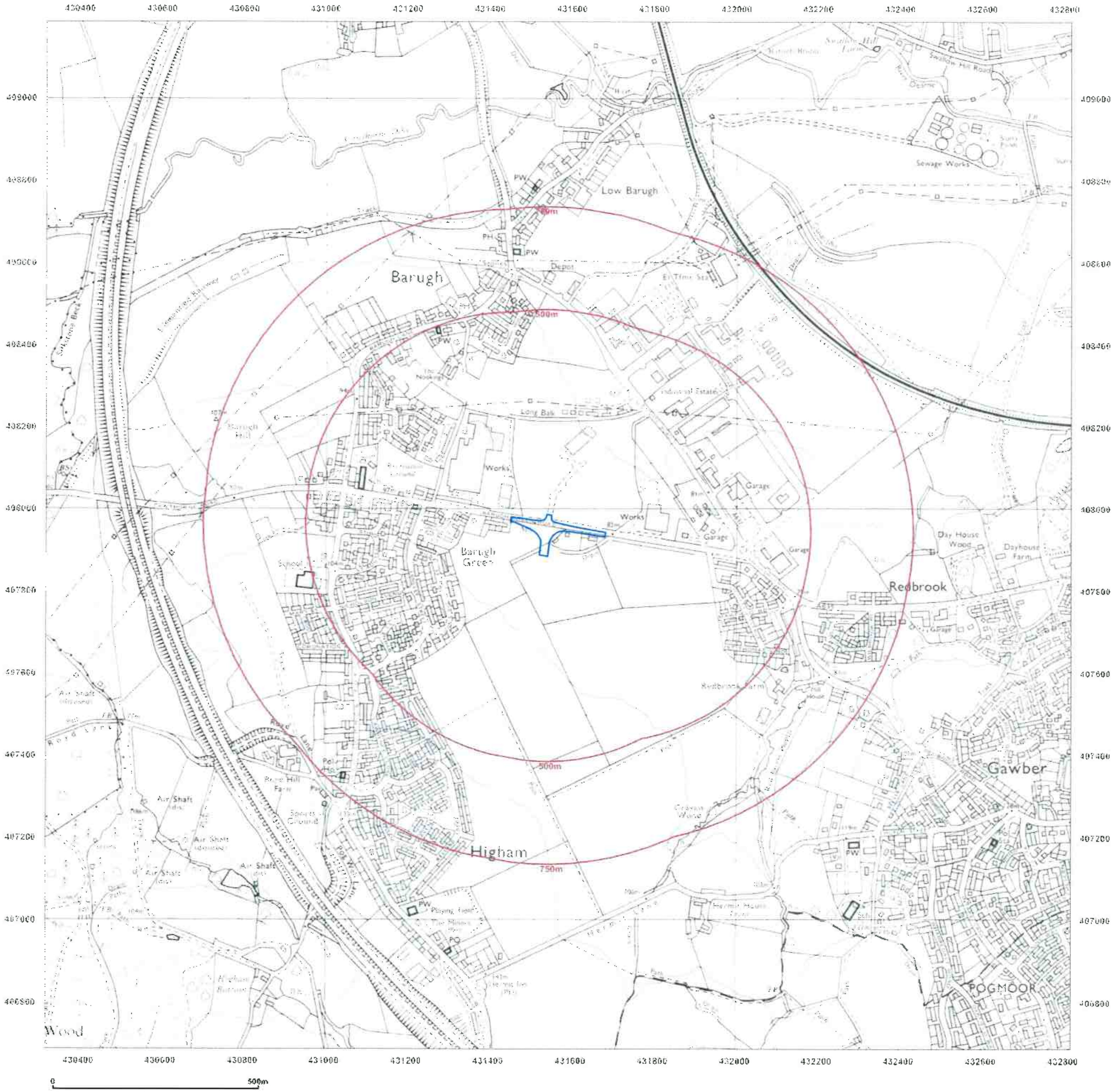
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid

Map date: 1993

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1992
Revised 1993
Edition N/A
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Site Details:

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Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 1995
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

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

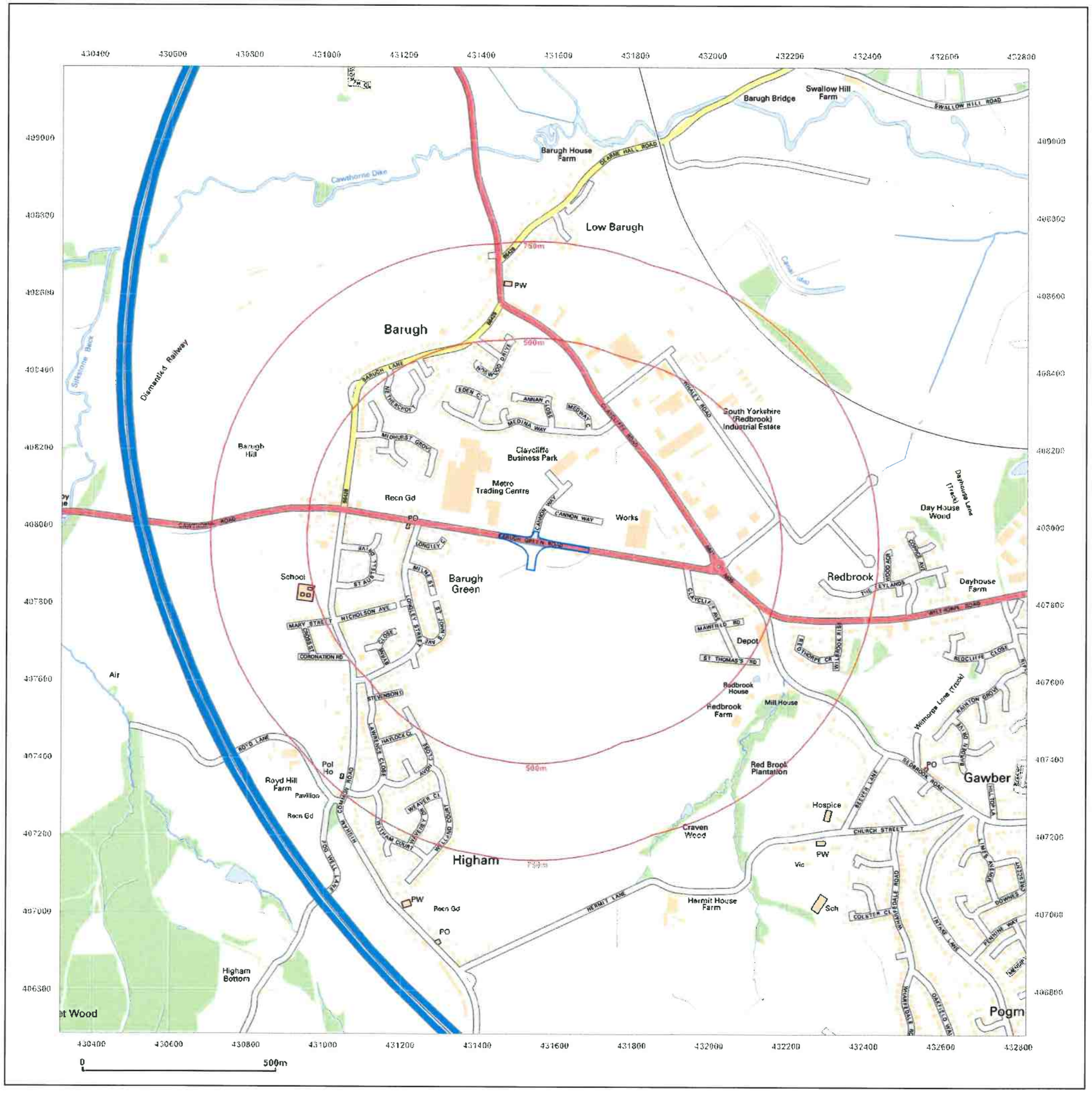
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Production date: 06 November 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 2001
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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2001

Groundsure INSIGHTS

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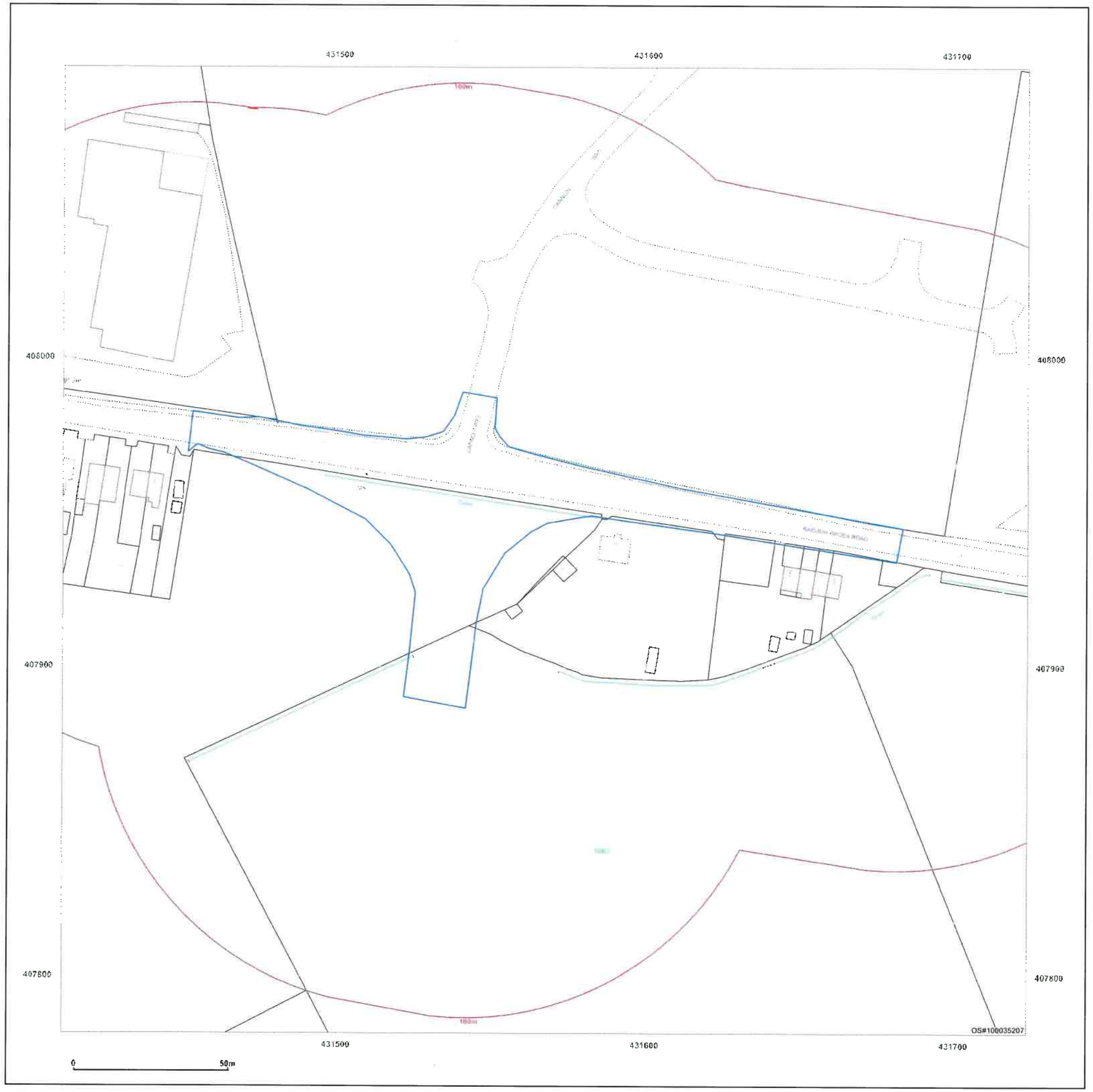
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Production date: 06 November 2019

Map legend available at:
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Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: LandLine
Map date: 2003
Scale: 1:1,250
Printed at: 1:1,250

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W E
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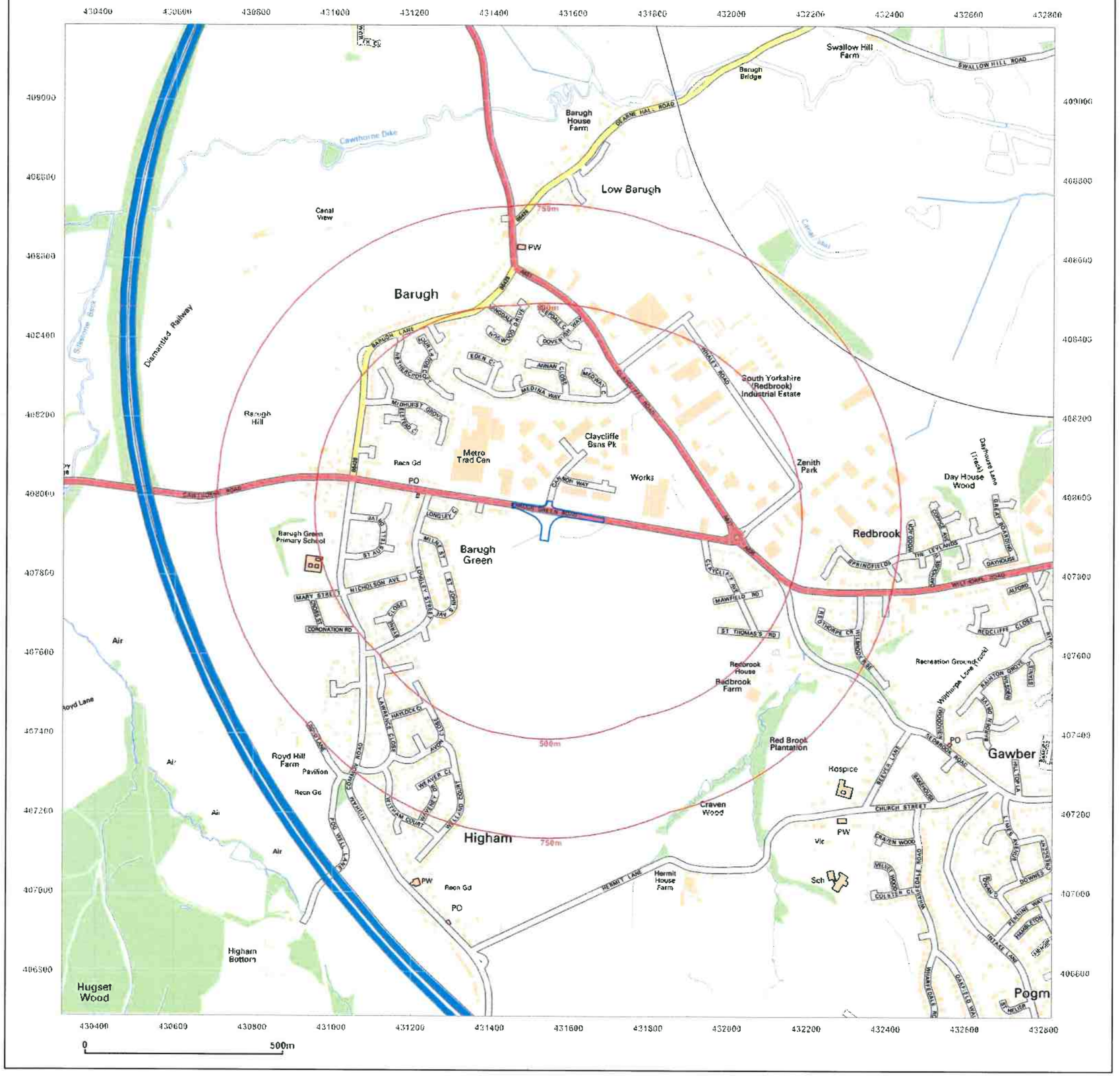
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Map legend available at:
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JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 2010
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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2010

Groundsure INSIGHTS

Produced by
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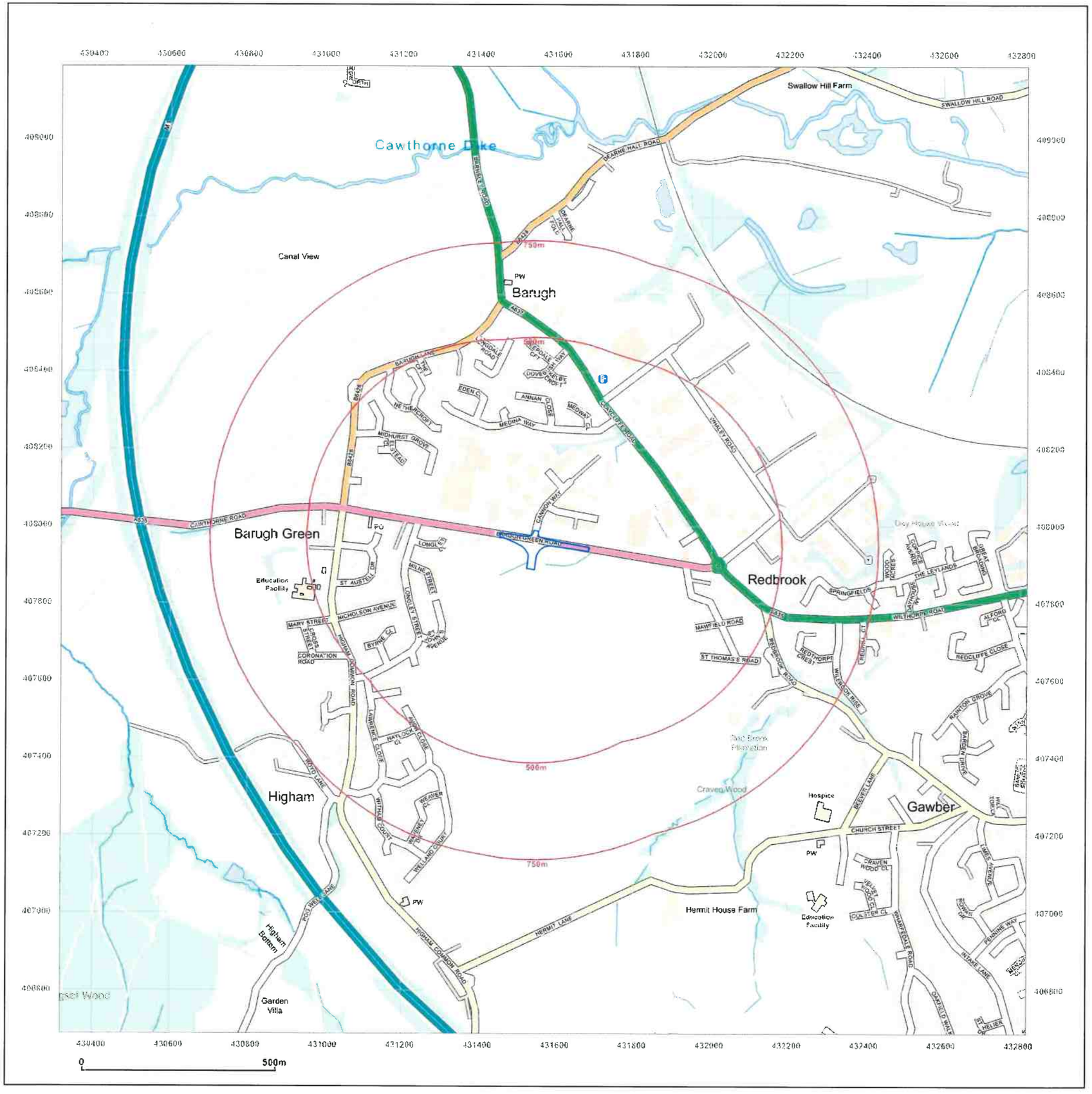
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Production date: 06 November 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



JPG

Site Details:

Barugh Green Road Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839288-44915-061119HIS
Grid Ref: 431567, 407938

Map Name: National Grid
Map date: 2019
Scale: 1:10,000
Printed at: 1:10,000

N
W E
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2019

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Production date: 06 November 2019

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Appendix D Coal Authority Mining Reports

The Coal Authority

CON29M
coal mining report

BARUGH GREEN ROAD, BARUGH GREEN, BARNSLEY, S75 1JY

Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4
Past opencast coal mining	Page 5
Withdrawal of support	Page 6

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

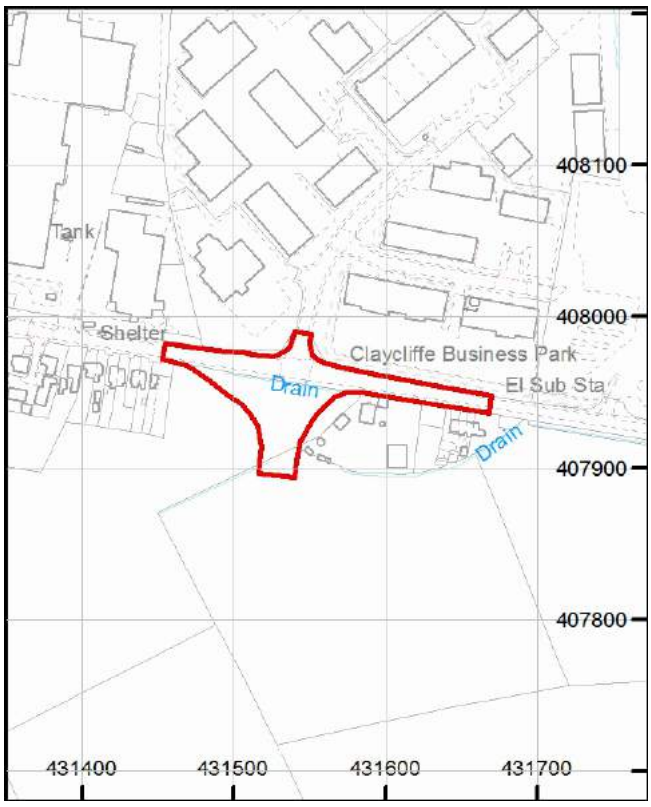
Professional opinion

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. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see page 3 for further details on Future development.

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.

Professional opinion

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on 0345 762 6848 or email cmra@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.

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

1 Past underground coal mining

The property is in a surface area that could be affected by underground mining in 5 seams of coal at 120m to 320m depth, and last worked in 1979.

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 within the boundary of an opencast site from which coal has been removed by opencast methods.

The property is within the boundary of an opencast site from which coal has been removed by opencast methods.

The property is 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 notices to withdraw support were given in 1956, 1977 and 1987.

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

The Coal Authority

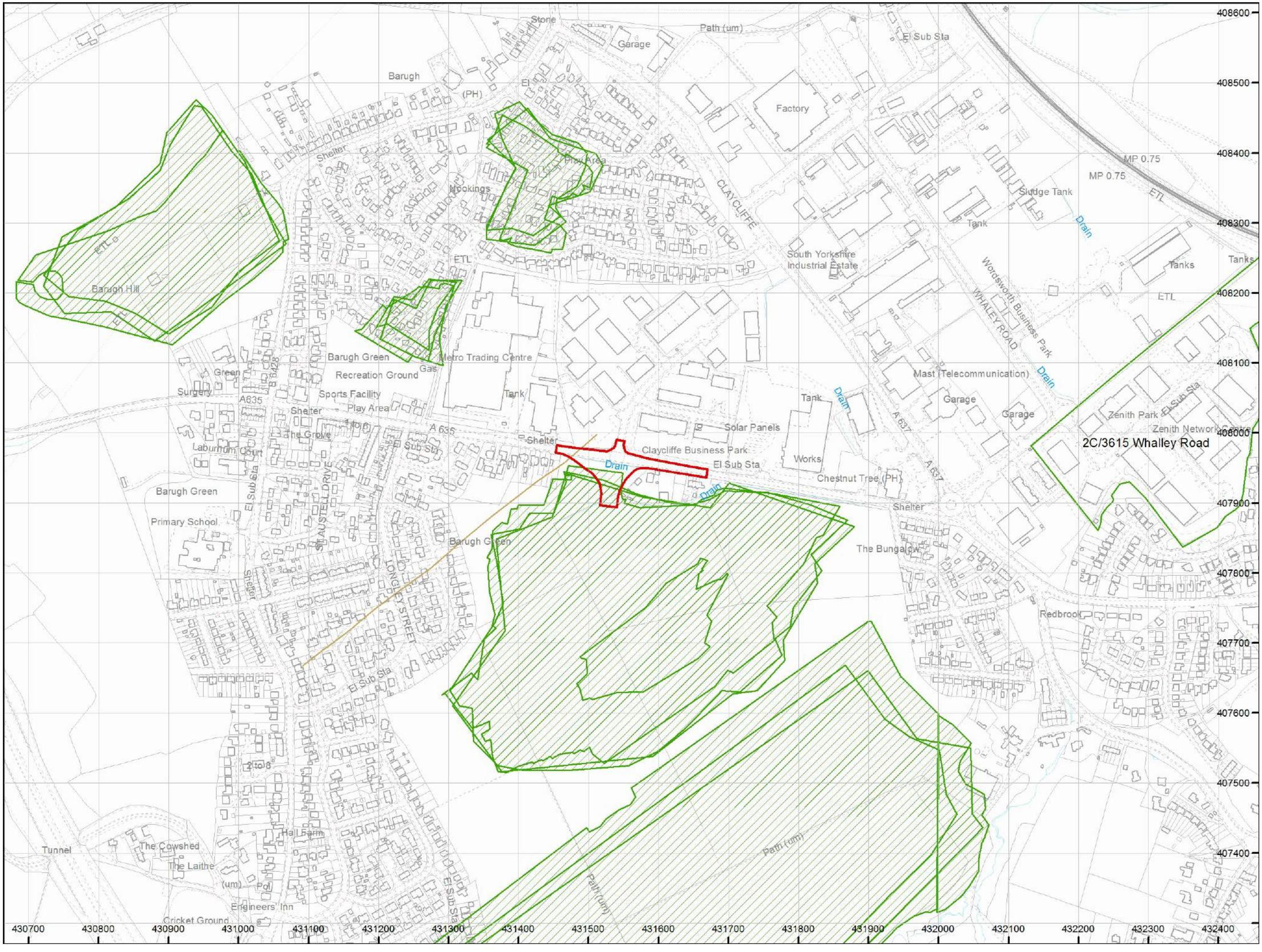
Summary of findings

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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
- Geological faults
- Opencast mine licence area
- Unlicensed opencast site



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

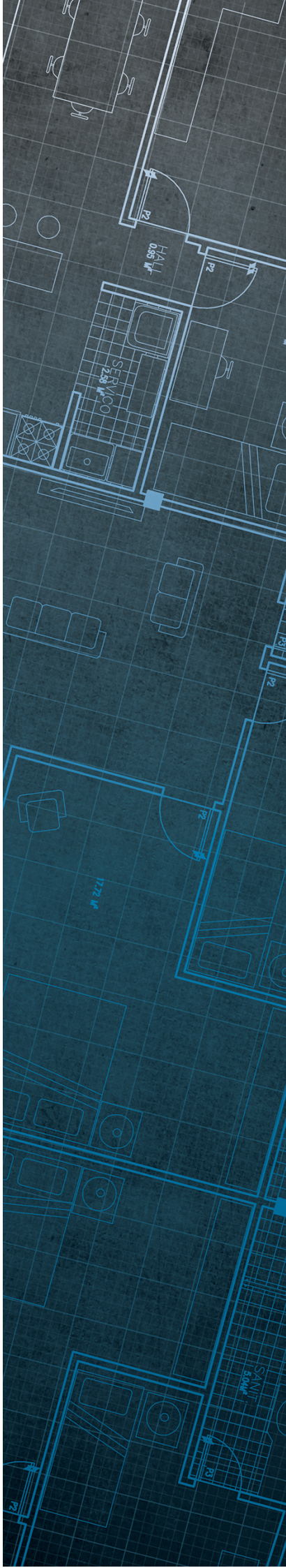
The Coal Authority

Consultants

Coal Mining Report

Barugh Green Road
Barugh Green
Barnsley
S75 1JY

Date of enquiry:	**8 November 2019**
Date enquiry received:	**8 November 2019**
Issue date:	**8 November 2019**
Our reference:	**51002193987002**
Your reference:	**4848_Barugh Green Rd**



Consultants

Coal Mining Report

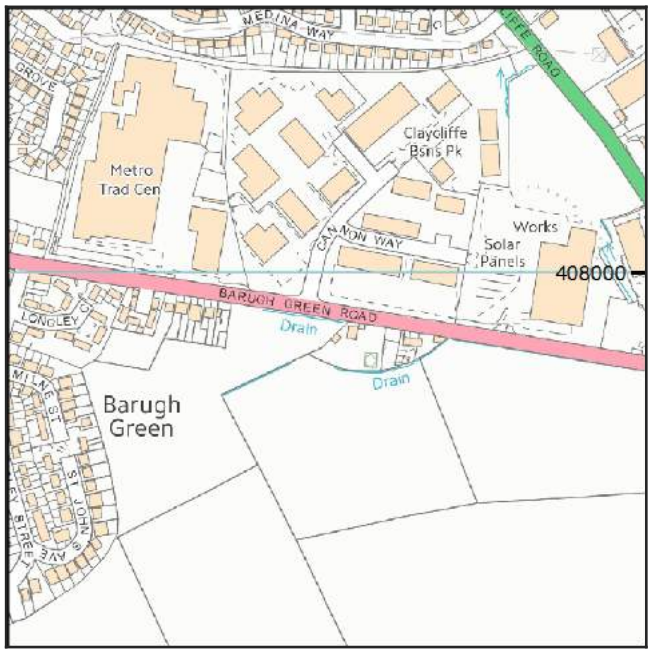
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

JPG (LEEDS) LIMITED

Enquiry address

Barugh Green Road
Barugh Green
Barnsley
S75 1JY



Approximate position of property

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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

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
DODWORTH	FLOCKTON THICK	Coal	6NJR	116	Beneath Property	3.8	North-East	71	1959
DODWORTH	FLOCKTON THICK	Coal	6NFT	126	North	4.2	North-East	56	1960
DODWORTH	TOP FENTON	Coal	6NDR	139	West	3.3	East	81	1958
DODWORTH	FENTON	Coal	6NNT	141	North	3.4	North-East	91	1958
DODWORTH	TOP FENTON	Coal	6NER	142	Beneath Property	3.1	North	86	1958
STANHOPE SILKSTONE	SILKSTONE	Coal	6NDS	245	Beneath Property	4.4	North-East	107	1928
STANHOPE SILKSTONE	SILKSTONE	Coal	6NCV	245	North	3.9	North-East	107	1928
unnamed	SILKSTONE	Coal	6NFS	252	South	4.7	North-East	107	1928
DODWORTH	SILKSTONE	Coal	6NGS	264	Beneath Property	4.0	North-East	105	1979
DODWORTH	SILKSTONE	Coal	6NDW	274	North-East	3.0	North-East	100	1978
WOOLLEY	WHINMOOR	Coal	6NLS	309	South-East	4.3	North-East	107	1978
WOOLLEY	WHINMOOR	Coal	6NEV	321	North-East	4.8	North-East	115	1978

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

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Abandoned mine plan catalogue numbers

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

NE3	7196	NE584
NE919	NE1034	NE498
NE124	7197	NE762

Our records show we have more plans than those shown above which could affect the enquiry boundary.

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

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

Please refer to the “Summary of findings” map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

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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.

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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 in an area where notices to withdraw support were given in 1956, 1977 and 1987.

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.

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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.

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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.

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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.

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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.

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Appendix E Historical Boreholes

SOUTH YORKSHIRE MINING ADVISORY SERVICE

SE30NW - 313
3150 0798

BOREHOLE RECORD

TRIAL PIT No. 36

SITE Barugh Green Road/Claycliffe Road, Barugh Green, Barnsley.

LENGTH 3m

ORDNANCE DATUM LEVEL

WIDTH 0.91

STANDING WATER LEVEL

DATE COMMENCED 9/11/1987

DATE COMPLETED

DEPTH From m	DEPTH To m	Description of Strata	Thickness	Remarks
0	0.30	Top Soil	0.30	
0.30	0.90	Sandy Clay	0.60	
0.90	1.50	Grey Clay	0.90	
1.50	1.80	Shale/Mudstone with Ironstone Fragments	0.30	
1.80	2.10	Coal	0.30	Coal dips slightly to the east
2.10	2.50	Fireclay/Shale	0.40	

DATE

20/11/1987

MINING ENGINEER

P. Cairns

SOUTH YORKSHIRE MINING ADVISORY SERVICE

British Geological Survey British Geological Survey British Geological Survey

SE30NW - 314
3155 0797

BOREHOLE RECORD

TRIAL PIT No. 37

SITE Barugh Green Road/Claycliffe Road, Barugh Green, Barnsley

LENGTH 3m

ORDNANCE DATUM LEVEL

WIDTH 0.91m

STANDING WATER LEVEL

DATE COMMENCED 9.11.1987

DATE COMPLETED 9.11.1987

DEPTH From m	DEPTH To m	Description of Strata	Thickness	Remarks
0	0.40	Top Soil	0.40	
0.40	0.85	Sandy Clay with Sandstone Fragments	0.45	
0.85	1.10	Sandstone	0.25	

British Geological Survey British Geological Survey British Geological Survey

DATE

20/11/1987

MINING ENGINEER

P. Cairns.

SOUTH YORKSHIRE MINING ADVISORY SERVICE

SE30NW-315
3160 0796

BOREHOLE RECORD

TRIAL PIT No. 38

SITE Barugh Green Road/Claycliffe Road, Barugh Green, Barnsley.

LENGTH 3m ORDNANCE DATUM LEVEL

WIDTH 0.91m STANDING WATER LEVEL

DATE COMMENCED 6.11.1987 DATE COMPLETED 6.11.1987

DEPTH From	DEPTH To	Description of Strata	Thickness	Remarks
m	m			
0	0.30	Top Soil	0.30	
0.30	1.00	Sandy Clay	0.70	
1.00	1.80	Shaley Sandstone	0.80	Water Seepage at 1.5m
1.80				
	2.30	Shale/Mudstone Wet	0.50	

DATE 18.11.1987

MINING ENGINEER P. Cairns

British Geological Survey

SOUTH YORKSHIRE MINING ADVISORY SERVICE

SE30NW -316

3165 0795

BOREHOLE RECORD

TRIAL PIT No. 39

SITE Barugh Green Road/Claycliffe Road, Barugh Green, Barnsley.

LENGTH 3m

ORDNANCE DATUM LEVEL

WIDTH 0.91m

STANDING WATER LEVEL

DATE COMMENCED 6/11/1987

DATE COMPLETED 6/11/1987

DEPTH From m	DEPTH To m	Description of Strata	Thickness	Remarks
0	0.30	Top Soil	0.30	
0.30	2.00	Sandy Clay	1.70	
2.00	2.30	Shaley Sandstone	0.30	

DATE 18/11/1987

MINING ENGINEER P. Cairns

Appendix F Notes on Limitations

General

JPG (Leeds) Ltd have prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from JPG (Leeds) Ltd; a charge may be levied against such approval.

JPG (Leeds) Ltd accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
b) this document to any third party with whom an agreement has not been executed.

Phase I Desk Study Reports
The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JPG (Leeds) Ltd reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Geo-Environmental Investigations
The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics and ground and groundwater conditions to allow a reasonable assessment of the environmental risks together with engineering and development implications. The objectives of the investigation have been Ltd to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather-related effects.

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

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