GEOENVIRONMENTAL DESK STUDY REPORT

Higham Common Road Roundabout
Barnsley West

Reference	**4848-JPG-ZZ-XX-RP-G-0602-S2-P01**
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JPG. Higham Common Road Roundabout, Conceptual Ground Model. Barnsley West. Dwg no. 4848-JPG-XX-00-DR-G-1150-S2-P01. Dated December 2019.

Fore Consulting. General Arrangement – Link Road. Barnsley West. Job/Dwg No: 9014 – 100-SK-1000. Dated 02 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
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EXECUTIVE SUMMARY

Site Address	**Higham Common Road Roundabout, Barnsley West**
NGR	Approximate National Grid Reference 431413, 406749
Current Site Use & Proposed Development	The site generally consists of arable and grazing land in the east and Higham Common Road in the west. The road and the farmland are separated by a barbed wire fence and a row of mature trees. It is proposed to develop the site with a new roundabout. The roundabout will provide access into the larger proposed Barnsley West development site.
Site History	The earliest available map shows the site to comprise open fields and a field boundary. Higham Common Road cuts through the southern and western corner of the site. By c. 1961, Higham Common Road is shown to cut through more of the site along the western boundary. The surrounding land predominantly comprised open fields with Brook Wood, Langford Wood (later referred to as Velvet Wood), Rhodes Wood and Drury Spring shown approximately 250m to the west, north and east of the site respectively. A large area of opencast workings was shown approximately 100m north of the site. By c.1973, the area of opencast workings is shown as open fields and field boundaries.
Site Setting	**Geology** – A large area of 'worked ground', associated with the M1 motorway, is indicated adjacent to the southern corner of the site. Large areas of infilled ground, associated with historical opencast coal sites (OCCSs), are indicated approximately 128m, 259m, 276m and 383m towards the north east and east. The underlying bedrock geology comprises Pennine Middle Coal Measures strata of mudstone, siltstone, sandstone and coal seams. Typically, the Top Haigh Moor coal seam is shown to outcrop approximately 10m to the west of Higham Common Road. Based on strata dip and topography, the Top Haigh Moor coal seam will be present at shallow depth below the site. The Top Haigh Moor coal seam is underlain by the Low Haigh Moor coal seam with a recorded seam separation of approximately 8m. **Mining** – The site is not within the boundary of an opencast site from which coal has been removed by opencast methods. There is also the potential for the site to be at risk from unrecorded coal workings in the shallow seams. There are no recorded mine entries on the site or within 20m of the site boundary. **Hydrogeology** – The bedrock geology is classified as a Secondary A Aquifer. **Hydrology** – There is one active licenced discharge consent to surface water within 500m of the site. **Flooding** – The site does not lie within a Zone 2 or Zone 3 floodplain. **Landfill** – There is one record of an Environment Agency historical landfill site within 500m of the site. **Radon Risks** – The site is located in a radon affected area as defined by the Health Protection Agency, with 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 could become contaminated due to the leaching and migration of potential contaminants from the made ground. • 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 risk with respect to contamination.
Preliminary Engineering Assessment	**Mining** - It will be necessary to carry out a mining investigation (rotary boreholes) to investigate the condition, depth and thickness of the shallow coal seams beneath the site. There is also a risk of unrecorded mine entries (mineshafts, adits and/or bell pits) below the site. **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. **Groundwater** - It may be expected that shallow perched groundwater will be encountered within the made ground or shallow natural strata. The presence of groundwater will need to be assessed as part of any ground investigation. **Obstructions** - Substructures and other manmade obstructions should be expected in the

	previously developed parts of the site, especially within the existing road and pavement constructions. **Earthworks** - Some form of earthworks is likely to be required in order to achieve a consistent formation with regard to the future roundabout construction on the site. 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 buried concrete. **Slope Stability** - The GS report indicates a low risk of landslide instability locally on the southern boundary of the site. The affected area appears to be associated with the area of the cutting adjacent to the bridge abutment. It is proposed to raise ground levels in the southern corner of the site. Consideration should be given to the slope stability and potential changes in hydrology and hydrogeology.
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. It is recommended that the investigation is carried out in a phased approach. 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 use in earthworks. • Rotary openhole boreholes in order to investigate unrecorded underground coal workings at shallow depth. • Chemical analysis of soil and leachate samples in order to determine the concentrations of potential contamination on the site. • Geotechnical testing to classify materials and inform pavement design and chemical testing to determine the Aggressive Chemical Environmental for Concrete Classification. • Monitoring wells to be installed within selected boreholes in order to assess the groundwater regime. Groundwater to be carried out on four occasions in order to assess groundwater levels.
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 at Higham Common 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 3km to the west of Barnsley town centre. The approximate centre of the site is located at NGR 431413, 406749. It is to the north east of the M1 motorway, along Higham Common 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 0.48 hectares. Ground levels are approximately 145m AOD in the south generally falling to approximately 143m AOD in the north. Higham Common Road falls gently from the south to the north.

The site generally consists of arable and grazing land in the east and Higham Common Road in the west. The road and the farmland are separated by a barbed wire fence and a row of mature trees.

Arable and grazing farmland, residential housing and a restaurant is located to the north of the site. The eastern boundary is formed by more arable and grazing farmland. The M1 motorway is located to the south. Residential properties are located to the west.

A large manure stockpile is located to the south east of the site.

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 develop the site with a new roundabout. The roundabout will provide access into 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 02 October 2019 for Strata Sterling Barnsley West Ltd.

1.7 Limitations

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

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 relevant plans 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 site to comprise open fields and a field boundary. Higham Common Road cuts through the southern and western corner of the site.** The surrounding land predominantly comprised open fields with Brook Wood, Langford Wood (later referred to as Velvet Wood), Rhodes Wood and Drury Spring shown approximately 250m to the west, north and east of the site respectively. Hermit House and Hermit Cottage are shown approximately 500m north east of the site. Silkstone New Quarry, with an associated railway and reservoir and an old sandstone quarry are shown approximately 500m west of the site. A large pond is shown adjacent to Hermit Cottage, approximately 500m north east of the site.
1890-91 1:10,560 **1893 1:2,500**	**No significant changes are shown on the site.** Higham Common is now shown immediately beyond the western boundary of the site. Silkstone New Colliery is now referred to as Higham Colliery. Three small ponds are shown approximately 100m, 200m and 250m south of the site. Hermit Cottage is no longer shown.
1904 1:10,560 **1906 1:2,500**	**No significant changes are shown on the site.** Allotment gardens are shown approximately 200m north west of the site. Higham Colliery is now referred as disused.
1929 1:10,560	**No significant changes are shown on the site.** Higham Pumping Station, a shaft and two pits are shown in the area of the former Higham Colliery, approximately 500m 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 or adjacent to the site.**
1956 1:10,560	**No significant changes are shown on the site** Higham Pumping Station is no longer shown.
1961 1:2,500 **1966 1:10,560**	**Higham Common Road is now shown to cut through more of the site along the western boundary.** The allotment gardens approximately 200m north west of the site are no longer shown. An area of raised land is shown approximately 150m north of the site. A large area of land, approximately 100m to the north, is now shown to be opencast workings. The three small ponds to the south of the site are no longer shown. A long linear feature (referred to as a conveyor on later plans) is now shown approximately 400m west of the site connecting Old Silkstone Colliery and a 'mine' shown in the area of the disused Higham Colliery.
1969–70 1:2,500 **1973 1:10,000**	**No significant changes are shown on the site.** The raised area of land to the north of the site is now referred to as a playing field. The large area referred as opencast workings is now shown as open fields and field boundaries. A large spoil heap (assumed to be associated with Old Silkstone Colliery) is shown approximately 150m south west of the site. The M1 motorway (shown as a cutting) is shown adjacent the southern corner of the site, Higham Common Road is shown as a bridge over the M1 motorway. The large pond approximately 500m north east of the site is no longer shown.
1982 1:10,000 **1977-82 1:2,500**	**No significant changes are shown on or adjacent to the site.**
1991 1:2,500 **1993 1:10,000**	**No significant changes are shown on the site.** The large spoil heap approximately 150m south west of the site is now referred to as disused workings.
2003 1:1,250	**No significant changes are shown on or adjacent to the site.**
2010 & 2019 1:10,000	**No significant changes are shown on or adjacent to the site.**

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.

A large area of 'worked ground', associated with the M1 motorway, is indicated adjacent to the southern corner of the site. Large areas of infilled ground, associated with historical opencast coal sites (OCCSs), are indicated approximately 128m, 259m, 276m and 383m towards the north east and east. These areas of infilled ground are associated with the former opencast sites referred to as Craven II and Hunters Cottage & Extensions. A large area of made ground, associated with the Old Silkstone Colliery, is located approximately 167m to the south west of the site.

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 approximately 5 degrees to the north east.

Typically, the Top Haigh Moor coal seam is shown to outcrop approximately 10m to the west of Higham Common Road. Based on strata dip and topography, the Top Haigh Moor coal seam will be present at shallow depth below the site. The Top Haigh Moor coal seam has a recorded thickness of between 0.69m and 1.19m (based on the generalised vertical section included on the 1:10,000 scale map). The Top Haigh Moor coal seam is underlain by the Low Haigh Moor coal seam with a recorded seam separation of approximately 8m. The Low Haigh Moor coal seam has a recorded thickness of between 0.43m and 1.02m.

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. The borehole locations are shown on JPG drawing no. 4848-JPG-XX-00-DR-G-1150-S2-P01, presented in Appendix A.

Higham Lane BH2
2m west of the site.
Borehole Reference: SE30NW262
Depth: 1.22m bgl
NGR: 431380, 406770

Depth (m bgl)	Proven Ground Conditions
0 – 0.30	Topsoil
0.30 – 1.22	Firm brown and grey silty CLAY.

M1 Aston-Leeds Motorway B187
13m west of the site.
Borehole Reference: SE30NW346
Depth: 18.29m bgl
NGR: 431374, 406653

Depth (m bgl)	Proven Ground Conditions
0 – 0.30	Topsoil
0.30 – 1.52	Stiff mottled grey and brown silty CLAY.
1.52 – 2.13	COAL *(presumed Top Haigh Moor coal seam)*.
2.13 – 3.66	Sift broken slightly silty MUDSTONE with coal traces at base.
3.66 – 6.40	Moderately hard mid-grey silty MUDSTONE with plant debris.
6.40 – 8.72	Hard mainly massive pale grey very silty MUDSTONE with abundant wispy carbonaceous and siltstone laminations.
8.72 – 9.75	Moderately hard dark grey slightly silty MUDSTONE.
9.75 – 10.10	COAL *(presumed top leaf of Low Haigh Moor coal seam)*.
10.10 – 10.67	Soft shaley slightly silty MUDSTONE with coal traces.
10.67 – 10.94	COAL *(presumed bottom leaf of Low Haigh Moor coal seam)*.
10.94 – 12.20	Moderately hard mid-grey silty MUDSTONE with roots and plant debris.
12.20 – 13.11	Hard massive pale grey SILTSTONE.
13.11 – 13.90	Moderately hard silty MUDSTONE.
13.90 – 16.34	Hard pale grey coarse SILTSTONE with carbonaceous micaceous and silty mudstone laminations. Becoming more abundant with depth. Mainly massive with occasional open ironstained vertical joints.
16.34 – 18.29	Hard mid-grey mainly massive silty MUDSTONE with occasional ironstone bands.

A conceptual ground model (JPG drawing no. 4848-JPG-XX-00-DR-G-1150-S2-P01) has been prepared for the site and is presented in Appendix A.

3.2 Coal Mining

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

- Top Haigh Moor (recorded thickness = 0.69m to 1.19m).
- Low Haigh Moor (recorded thickness = 0.43m to 1.02m).

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 90m to 280m depth, and last worked in 1966. 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 93m and has an extraction thickness of 0.61m.

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

- *The Coal Authority Consultants Coal Mining report also states that there is a risk to the surface stability of the site from possible unrecorded shallow workings.*

It is considered that the above comment relates to the presence of the Top Haigh Moor and Low Haigh Moor coal seams at shallow depth below the site. The next named coal seam below the Low Haigh Moor is the Lidget coal seam. 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.

There remains the potential for unrecorded mine entries including bell pits on the site.

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

The Top Haigh Moor Coal seam was extracted by opencast methods within the Hunters Cottage OCCS approximately 276m east of the site.

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'.

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 no 'Inland Rivers' or 'Lakes, lochs or reservoirs' on the site.

There is one active licenced discharge consent to surface water within 500m of the site. This is summarised in Table 3.5 below.

Table 3.5 – Summary of Active Licenced Discharge Consents to Surface Water

Distance & Direction	Permit Number	Address	Effluent Type	Receiving Water	Effective Date
198m, SW	WRA7173	Dodworth Colliery Tip, Outlets A&B, Dodworth, Barnsley, S. Yorkshire	Trade discharges – process effluent	Tributary of Silkstone Beck	15-Jun-2001

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 not the potential for groundwater flooding at the surface due to the underlying geology.

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
204m W	06-Apr-2018	1603339	Contaminated water – mine water	Water impact: Category 2 (significant)
331m S	20-Feb-2013	1088231	Contaminated water – Chemically contaminated run-off	Water impact: Category 2 (significant)

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 is one record of an Environment Agency historical landfill site 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
145m N	Football pitch to rear of Mines Public House, Higham Common Road, Higham	4400/(156)	Mr J Cooper	Commercial	-

There are no records of BGS/DoE landfill sites within 500m of the site.

There are no records of landfills from Local Authority and historical mapping records within 500m of the site.

There are two records 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 3.7.2 below.

Table 3.7.2 - Records of waste treatment, transfer or disposal sites within 500m

Distance & Direction	Type of Site	Grid Ref	Source
459m W	Ground workings and refuse heaps	430879, 406977	1893 Map
462m W	Ground workings and refuse heaps	430830, 406978	1906 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 no 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 are no records of a petrol filling station within 500m of the site.

There are no electricity substations located on the site.

There are no records of historical garage and motor vehicle repair premises within 500m of the site.

3.9 Current Land Use

There are no records of potentially contaminative sites within 250m of the site.

3.10 Radon Risks

The site is located in a radon affected area as defined by the Health Protection Agency, with 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 BH121 and TP108 were carried out in the vicinity of the roundabout. The strata encountered in these exploratory holes is summarised below. The exploratory hole positions are shown on JPG drawing no. 4848-JPG-XX-00-DR-G-1150-S2-P01 presented in Appendix A.

BH121
NGR 431417.07, 406718.02
Ground level 144.67m AOD

Depth (m bgl)	Proven Ground Conditions
0.00 – 0.20	Topsoil.
0.20 – 0.50	Brown clay fill.
0.50 – 3.40	Grey mudstone.
3.40 – 6.30	Brown grey mudstone.
6.30 – 8.00	COAL with interbedded mudstone (Top Haigh Moor).
8.00 -14.60	Grey mudstone.
14.60 – 15.00	COAL (Low Haigh Moor - top leaf).
15.00 – 16.00	Grey mudstone.
16.00 – 16.50	COAL (Low Haigh Moor - bottom leaf).
16.50 – 17.40	Mudstone.
17.40 – 21.00	Grey sandstone.
21.00 – 24.40	Grey mudstone.
24.40 – 26.40	Grey sandstone.
26.40 – 29.20	Grey mudstone.
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.

TP108
NGR 431410.64, 406707.87
Ground level 144.79m AOD

Depth (m bgl)	Proven Ground Conditions
0.00 – 0.10	Reworked topsoil.
0.10 – 0.40	Reworked natural.
0.40 – 0.55	Reworked natural.
0.55 – 2.80	Reworked natural.
2.80 – 3.40	Firm slightly sandy slightly gravelly clay.

In addition to the above JPG reports, A Coal Mining Risk Assessment and Coal Recovery Report for the proposed employment land in the south of the development site was subsequently prepared by JPG in August 2019 under reference 4848-JPG-Z2-XX-RP-G-1102-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 and more recently as part of a public highway. In addition, evidence of coal mining is noted in the area and this might affect the site itself.

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

- Made ground associated with Higham Common Road.
- Coal-rich made ground (either shallow coal seams or colliery discard).
- Potential leaks and/or spills of organic contamination associated with vehicles using Higham Common Road.
- Hazardous gases/soil vapours associated with the made ground and adjacent areas of infilled land (backfilled opencasts).

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 groundwater and/or surface water 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.
- 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 could become contaminated due to the leaching and migration of potential contaminants from the made ground.
- 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 **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, additional 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 into 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 02 October 2019 for Strata Sterling Barnsley West Ltd.

5.2 Mining

Based on the findings of the desk study, the site is underlain by shallow coal seams, in particular the Top Haigh Moor and Low Haigh Moor (potentially present in two leaves). There is the potential for the site to be at risk from unrecorded coal workings in these shallow seams.

It will be necessary to carry out a mining investigation (rotary boreholes) to investigate the condition, depth and thickness of the shallow coal seams beneath the site.

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.

5.4 Groundwater

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

5.5 Obstructions

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

5.6 Earthworks

Some form of earthworks is likely to be required in order to achieve a consistent formation with regard to the future roundabout construction on the site.

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 natural soils and made ground for re-use in the earthworks will be required.

5.7 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 buried concrete.

5.8 Slope Stability

The GS report indicates a low risk of landslide instability locally on the southern boundary of the site. The affected area appears to be associated with the area of the cutting adjacent to the bridge abutment. Low risk is defined as: 'Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability is changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems.' The remainder of the site is shown to be at very low risk in relation to landslides.

It is proposed to raise ground levels in the southern corner of the site. Consideration should be given to the slope stability and potential changes in hydrology and hydrogeology.

6.0 FURTHER INVESTIGATIONS

It is recommended that the following ground investigation is carried out in order to assess the potential environmental and geotechnical constraints to the proposed roundabout.

- 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 use in earthworks.
- Rotary openhole boreholes in order to investigate unrecorded underground coal workings at shallow depth.
- Chemical analysis of soil and leachate samples in order to determine the concentrations of potential contamination on the site.
- Geotechnical testing to classify materials and inform pavement design and chemical testing to determine the Aggressive Chemical Environmental for Concrete Classification.
- Monitoring wells to be installed within selected boreholes in order to assess the groundwater regime. Groundwater to be carried out on four occasions in order to assess groundwater levels.



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

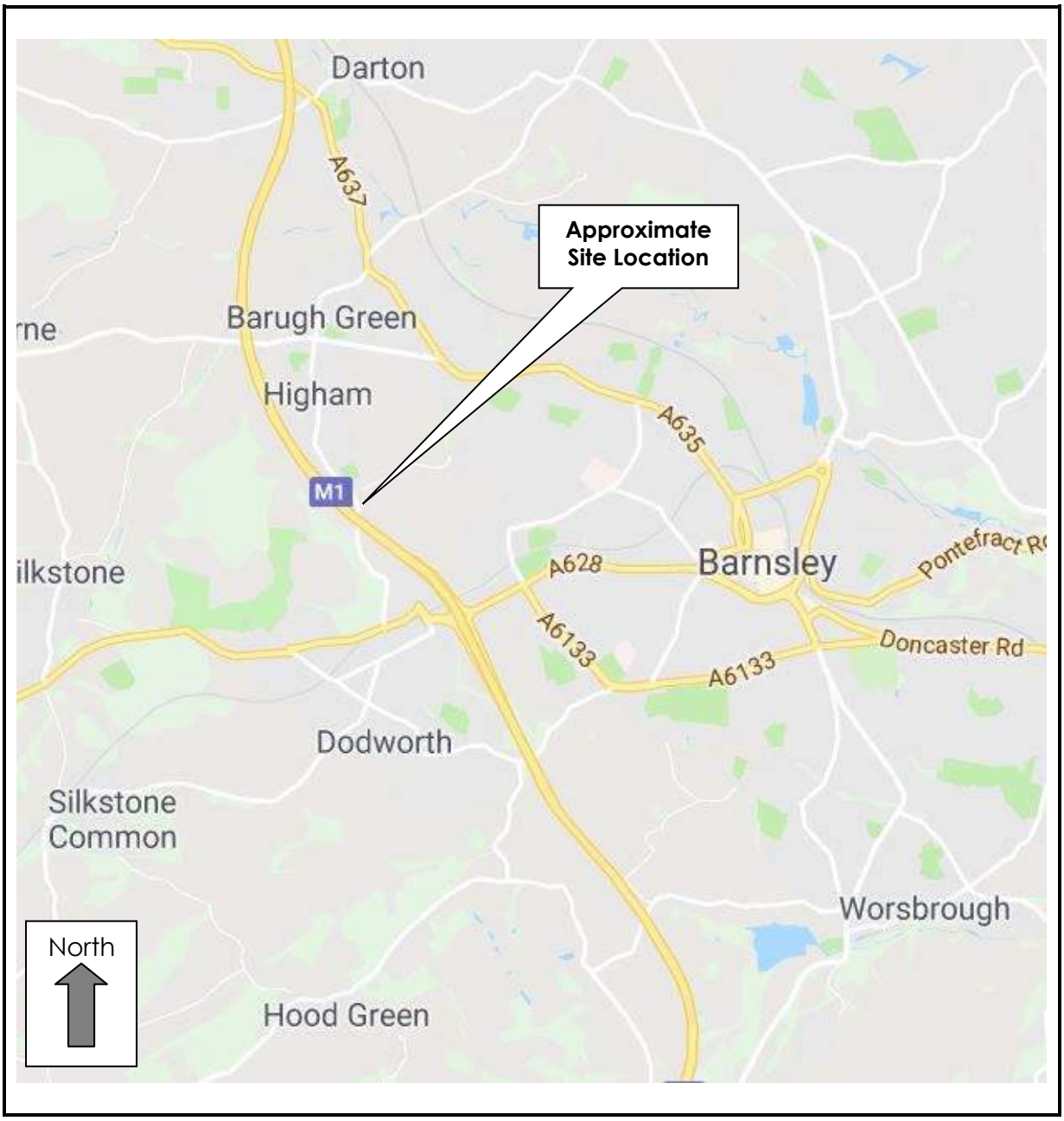


Figure 1 – Site Location Plan	
Site	**Higham Common Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

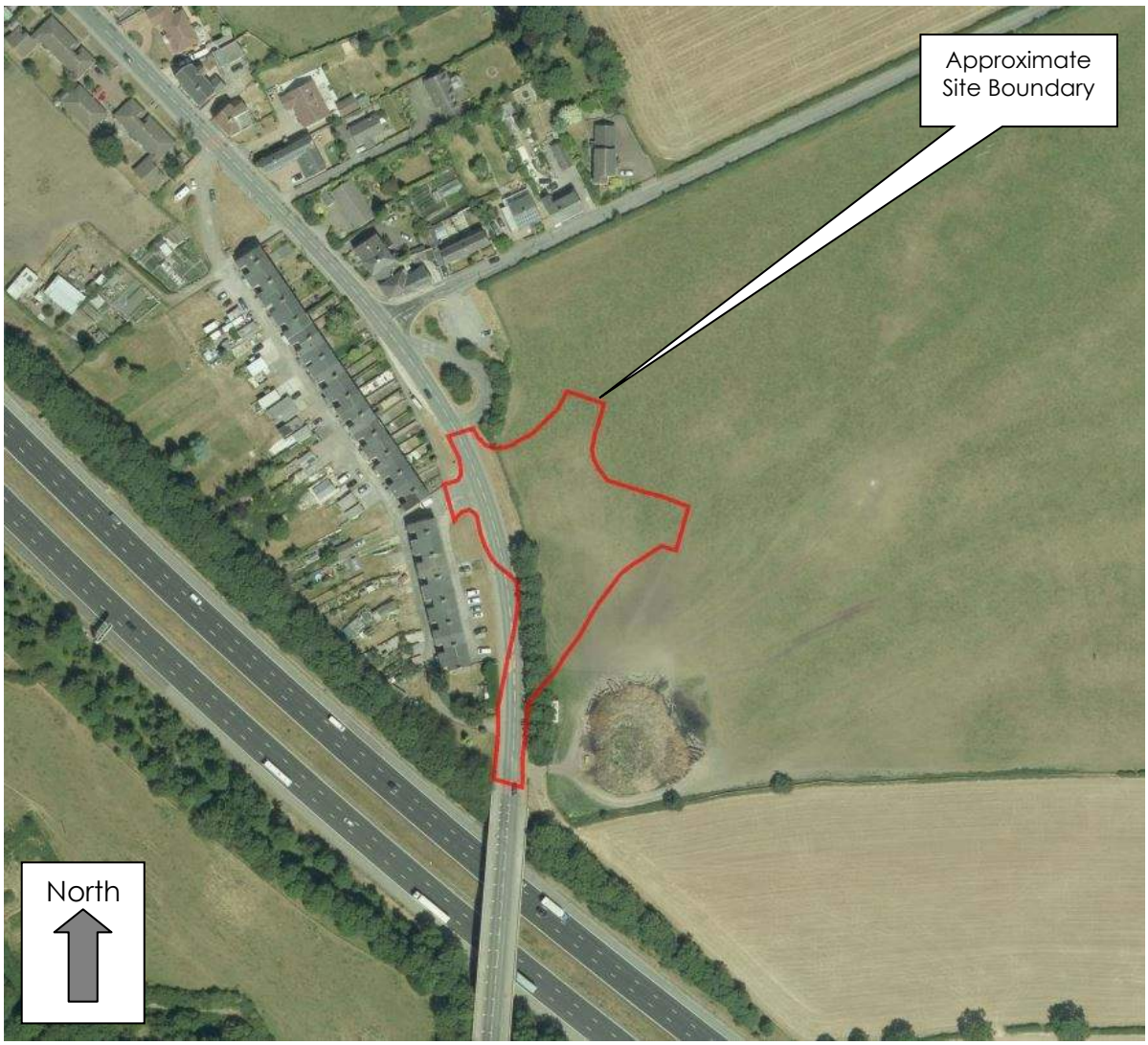


Figure 2 – Aerial Photograph	
Site	**Higham Common Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

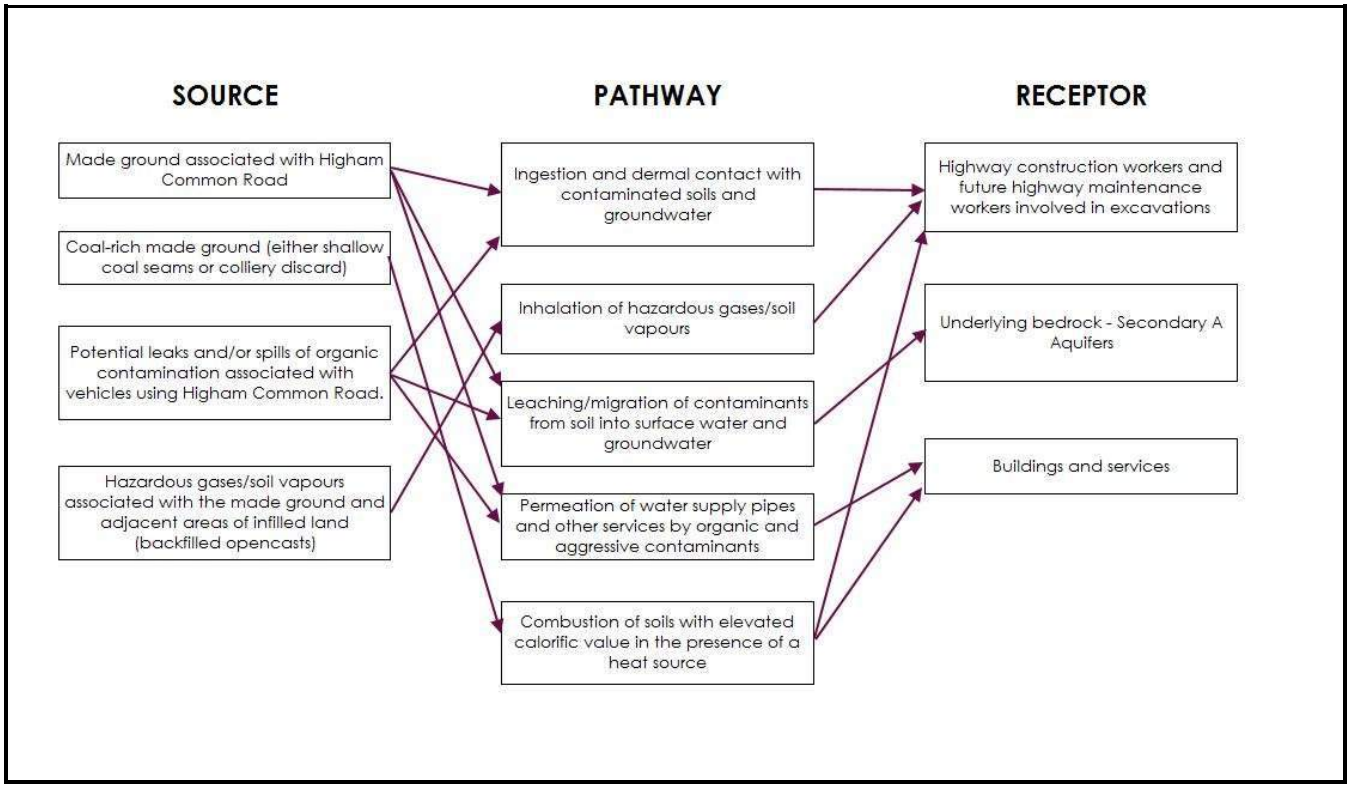


Figure 3 – Conceptual Site Model	
Site	**Higham Common Road Roundabout - Barnsley West**
Client	**Strata Sterling Barnsley West Ltd**
Job Number	**4848**
Scale	**NTS**

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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

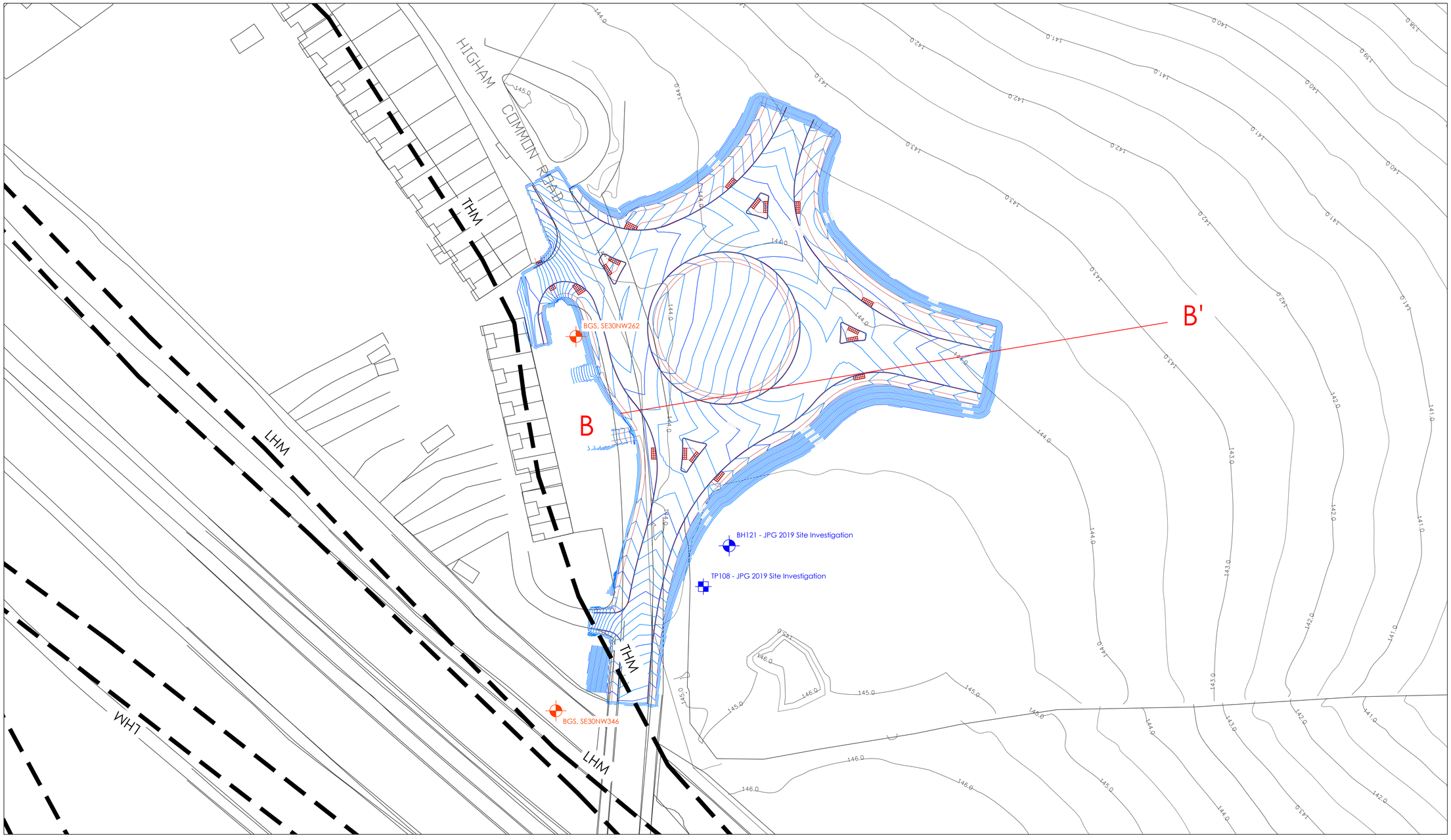
SE30NW262 — Borehole/ Trial Pit Location

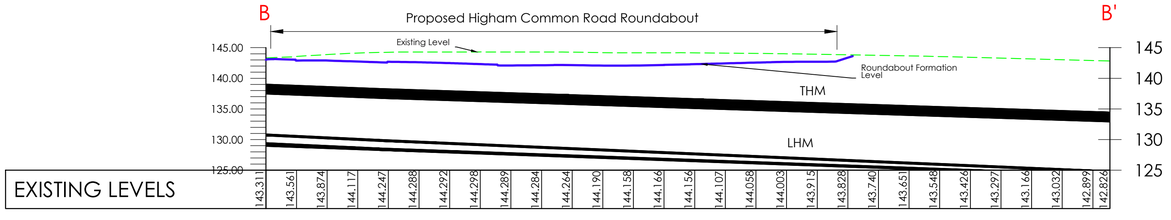
Locations Are Approximate

Projected Fault

Projected Coal Seam Outcrop

Formation Levels.





EXISTING LEVELS

SECTION B-B'
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.

REV	DESCRIPTION	DATE	BY
P01	FIRST ISSUE.	04.12.19	OLT

Project
BARNSLEY WEST

Drawing Title
HIGHAM COMMON ROAD
ROUNDABOUT
CONCEPTUAL GROUND MODEL

INFORMATION ISSUE

Architect
BOND BRYAN

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

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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

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

Job Number	Drawing Number	Revision
9014	100-SK-1000	-

Appendix B Site Photographs

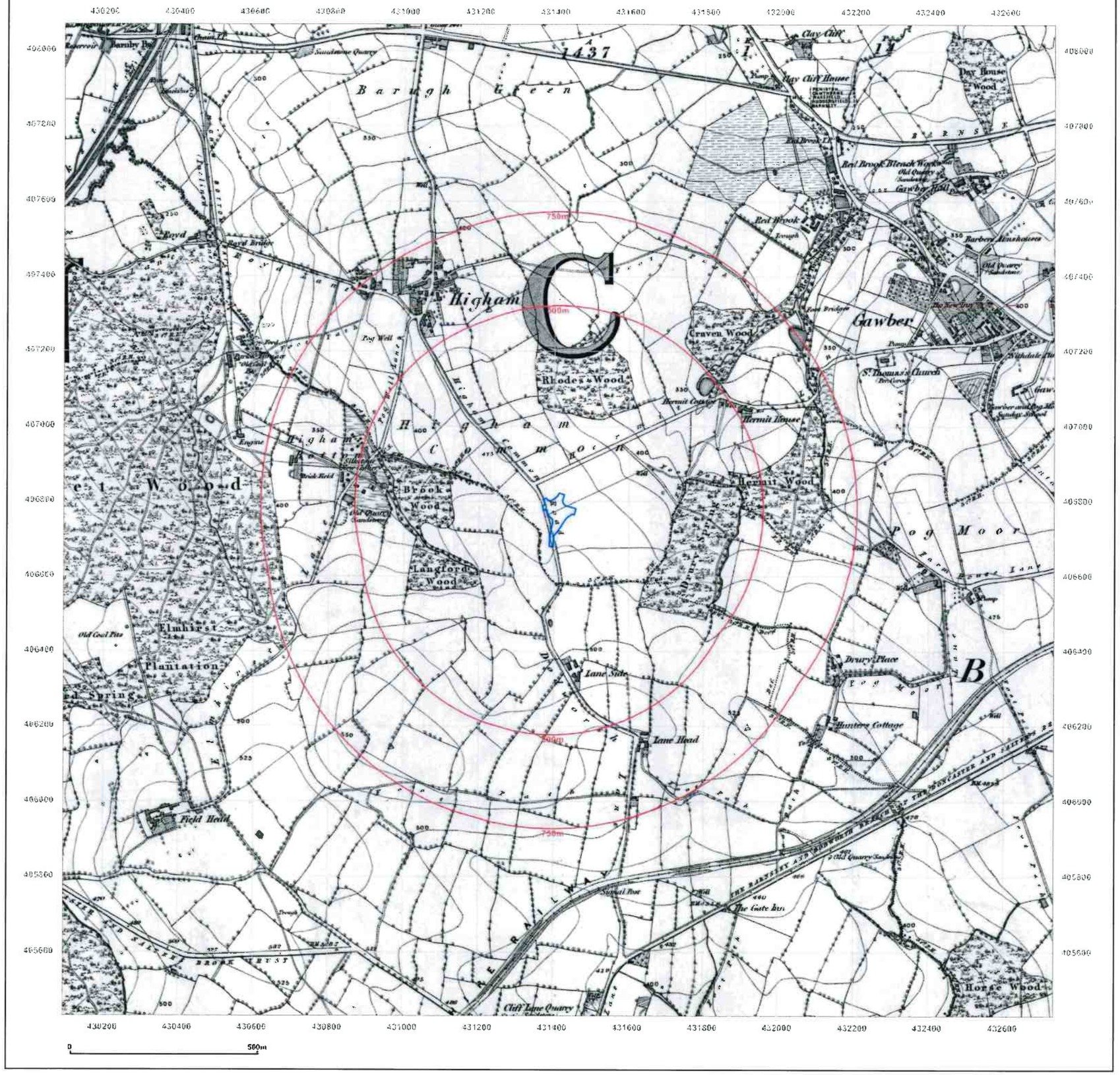


Photograph 1: View from Hermit Lane towards the M1 motorway.



Photograph 2: View to the south east.

Appendix C Historical Maps



JPG

Site Details:

Higham Common Road
Roundabout

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Grid Ref: 431413, 406749

Map Name: County Series
Map date: 1850
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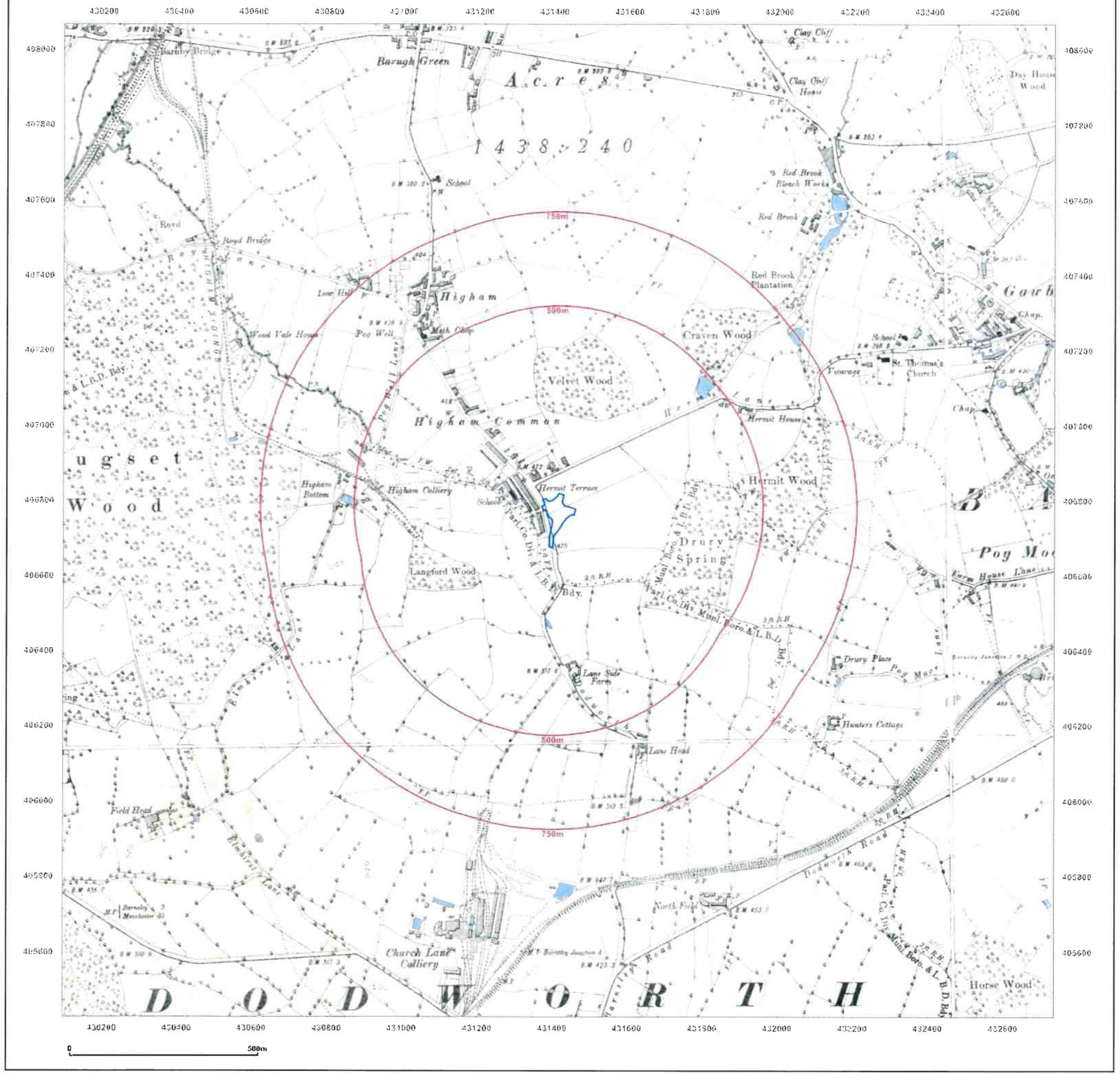
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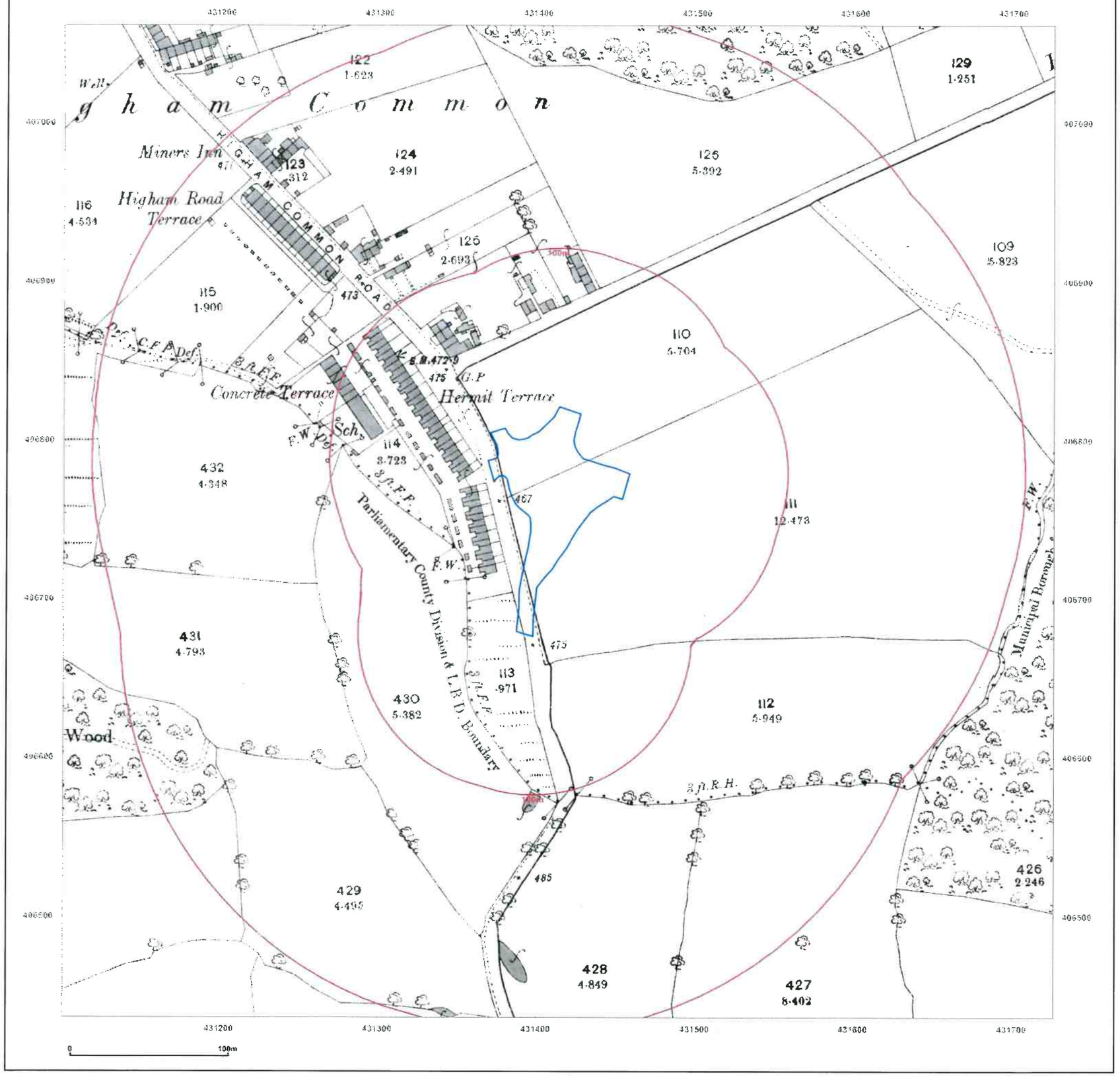
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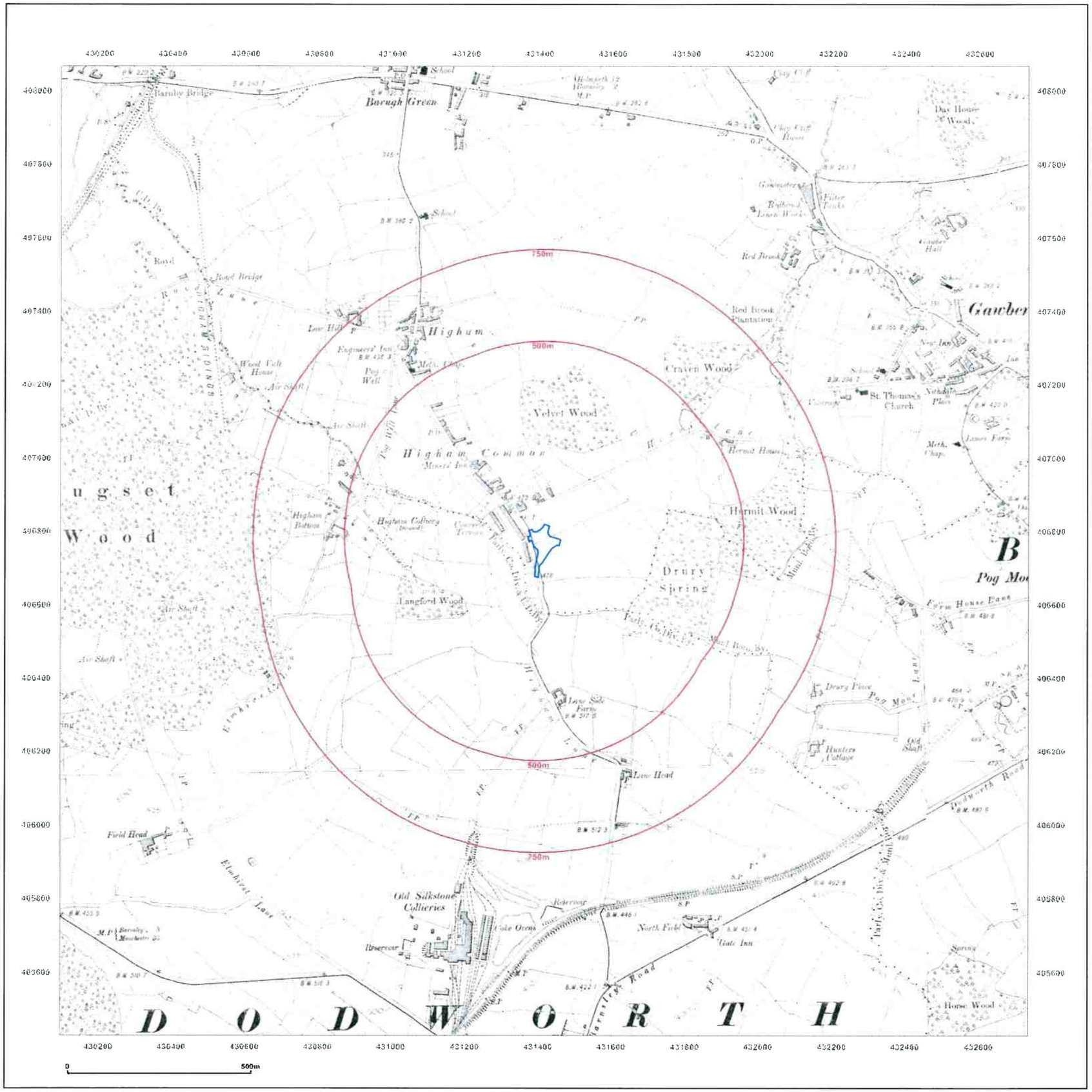
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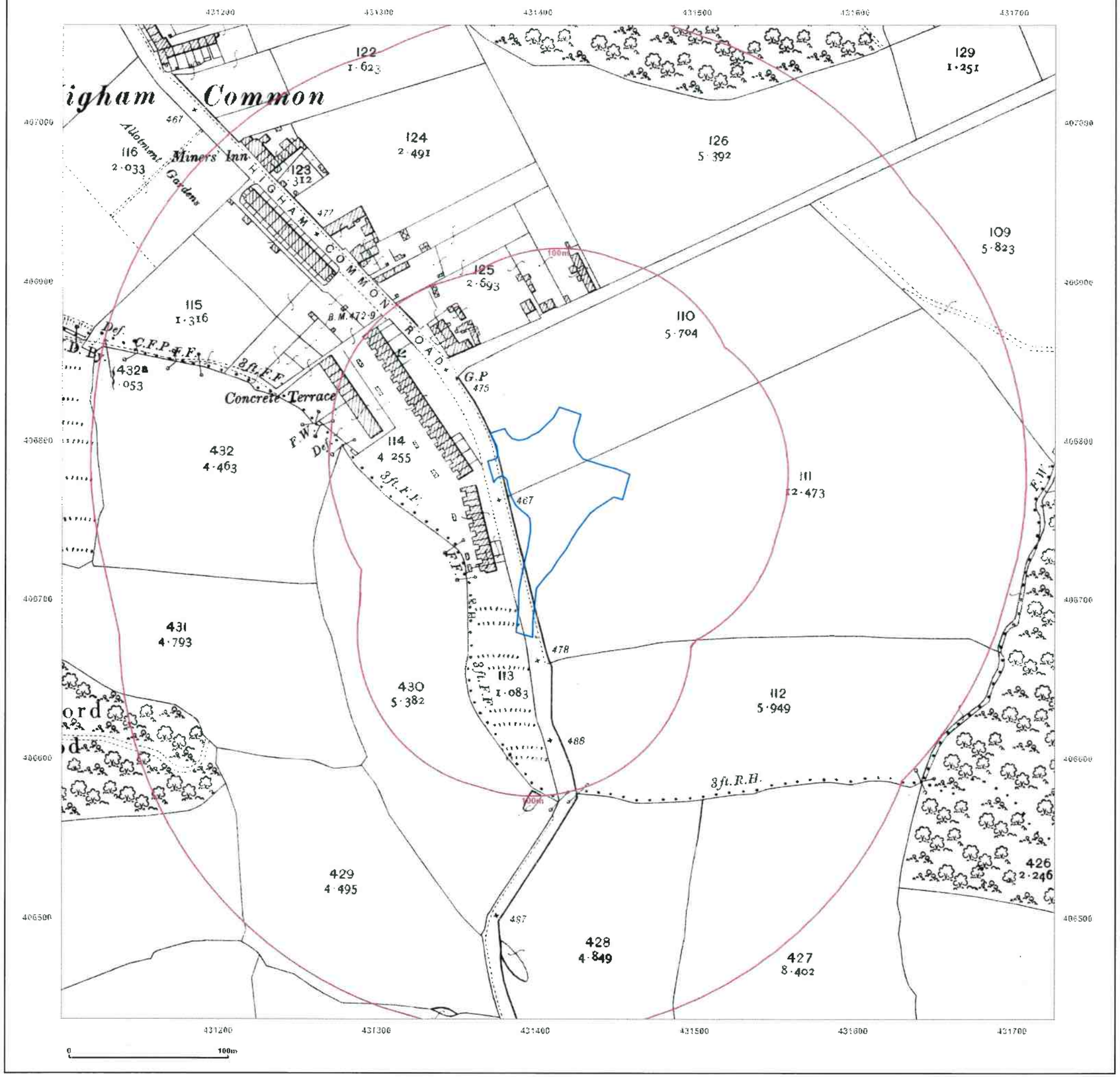
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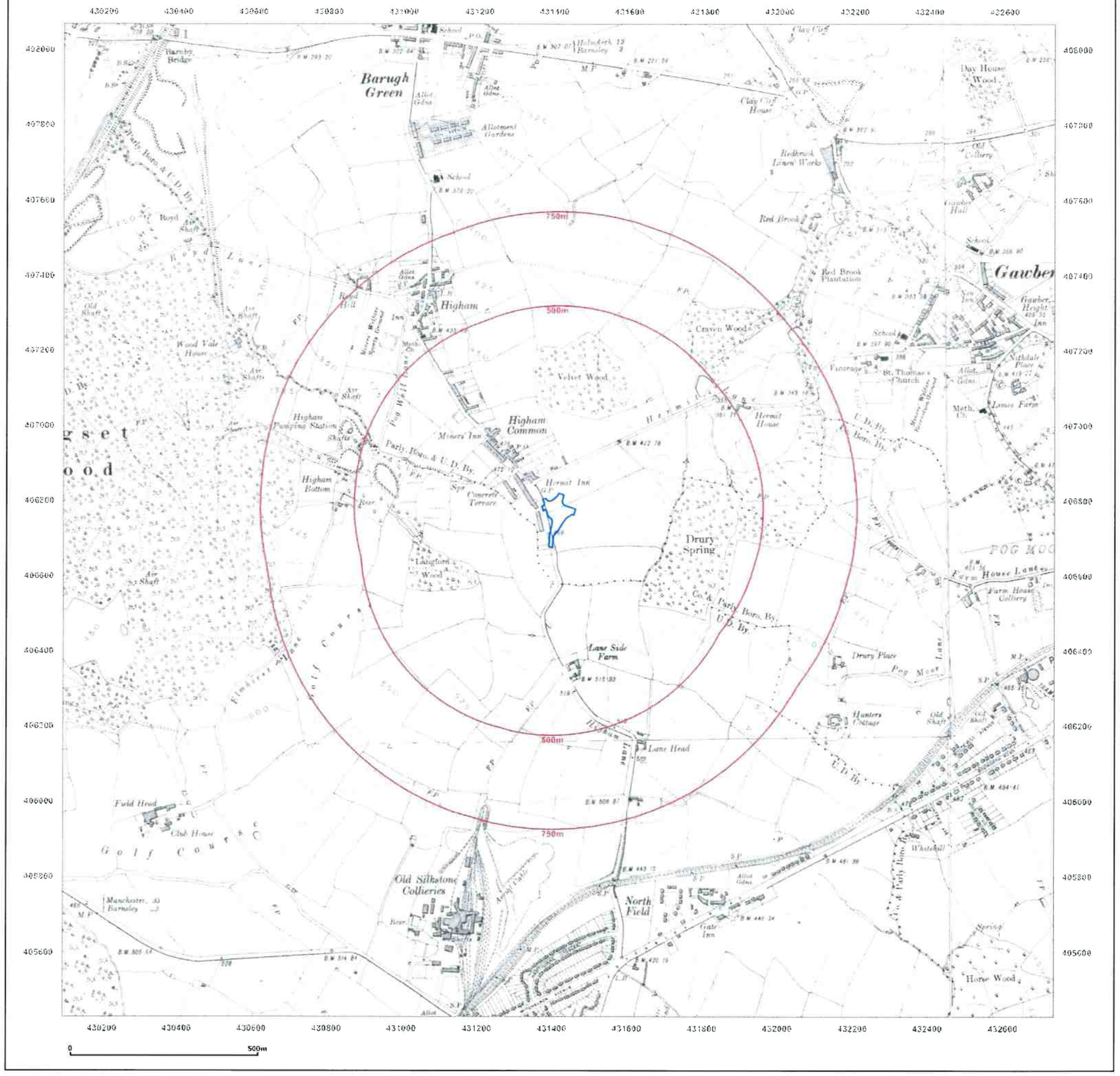
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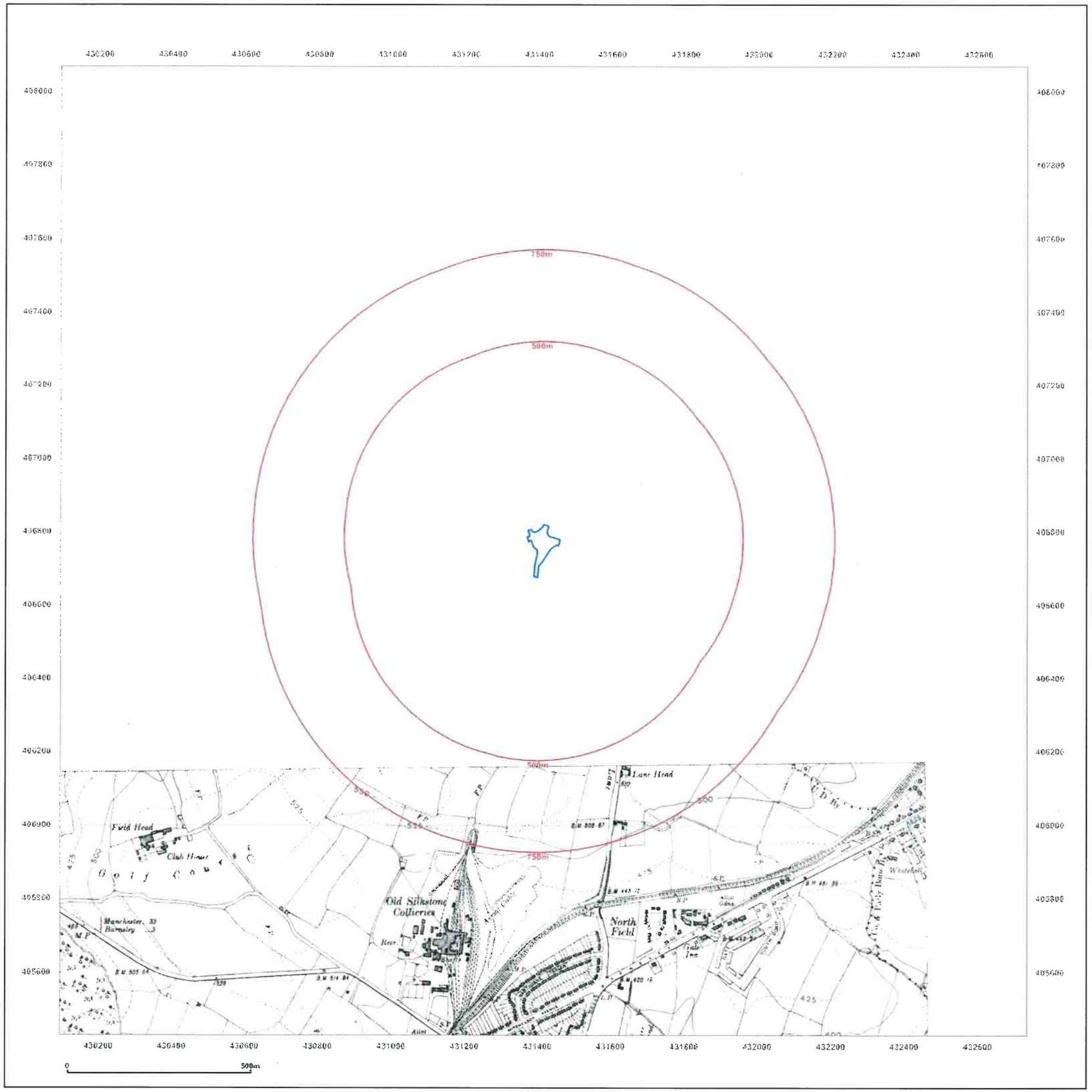
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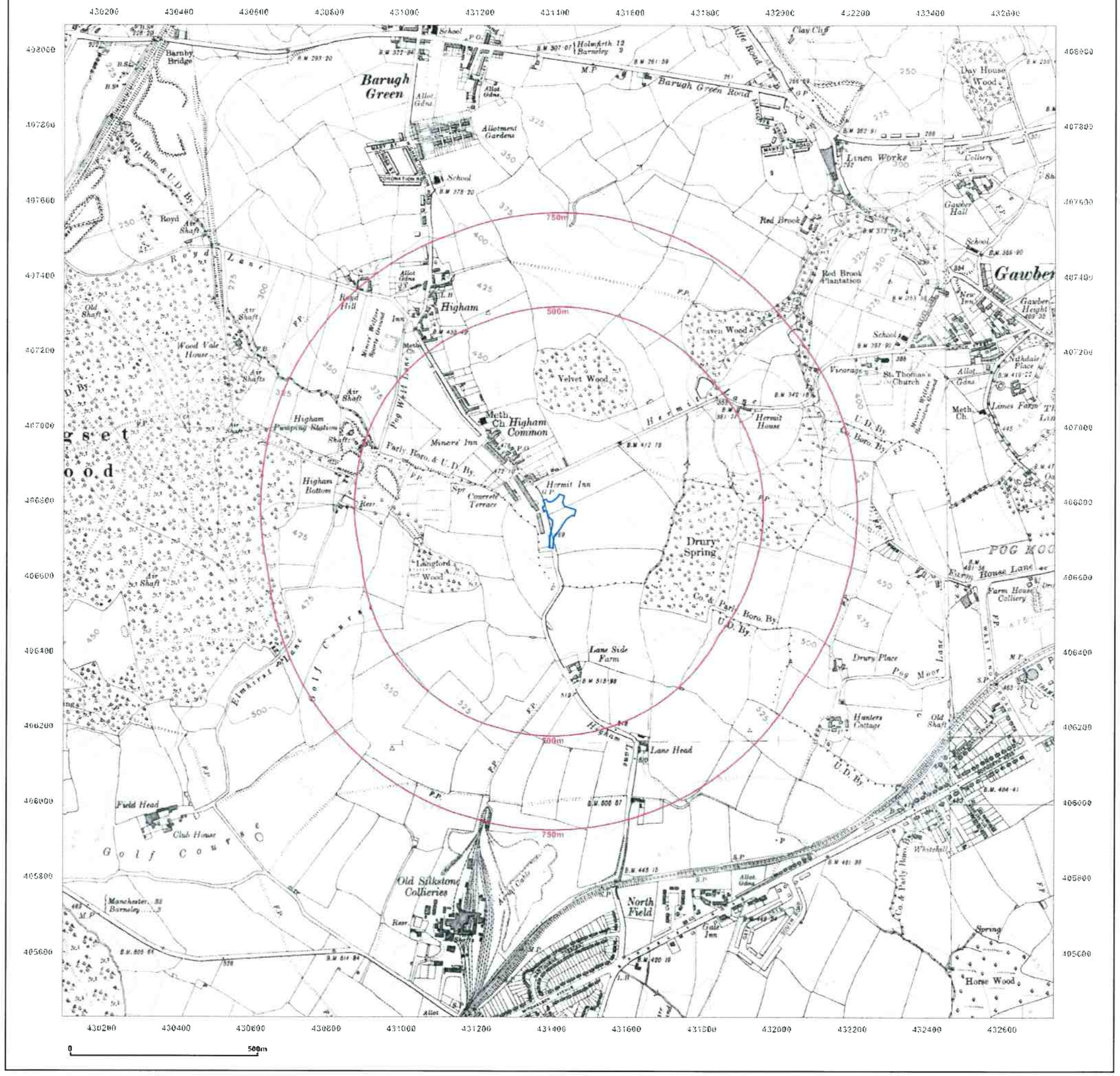
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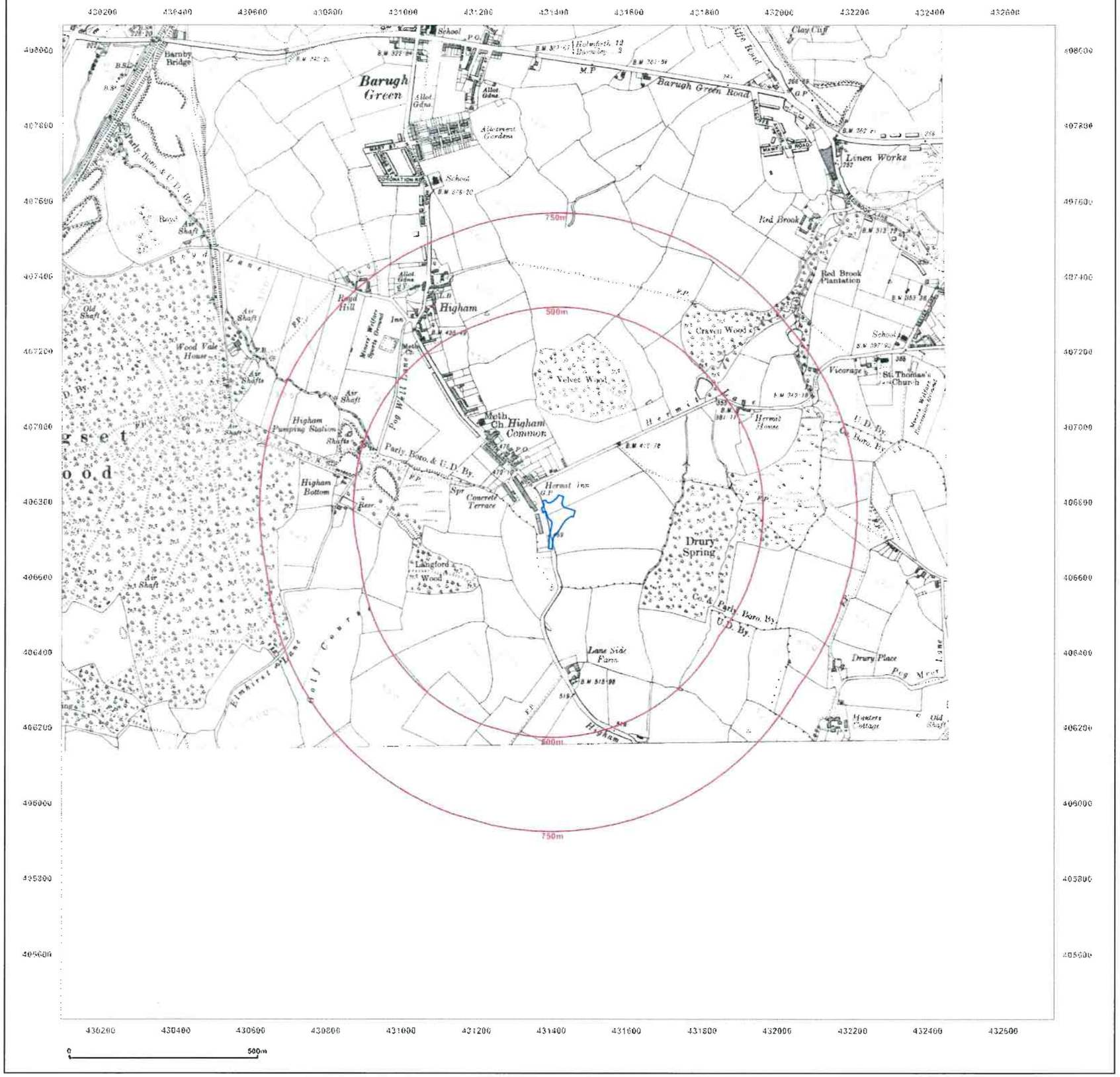
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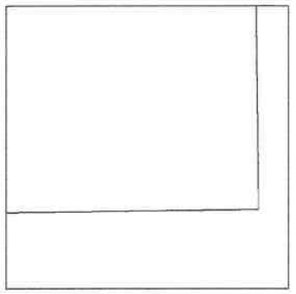
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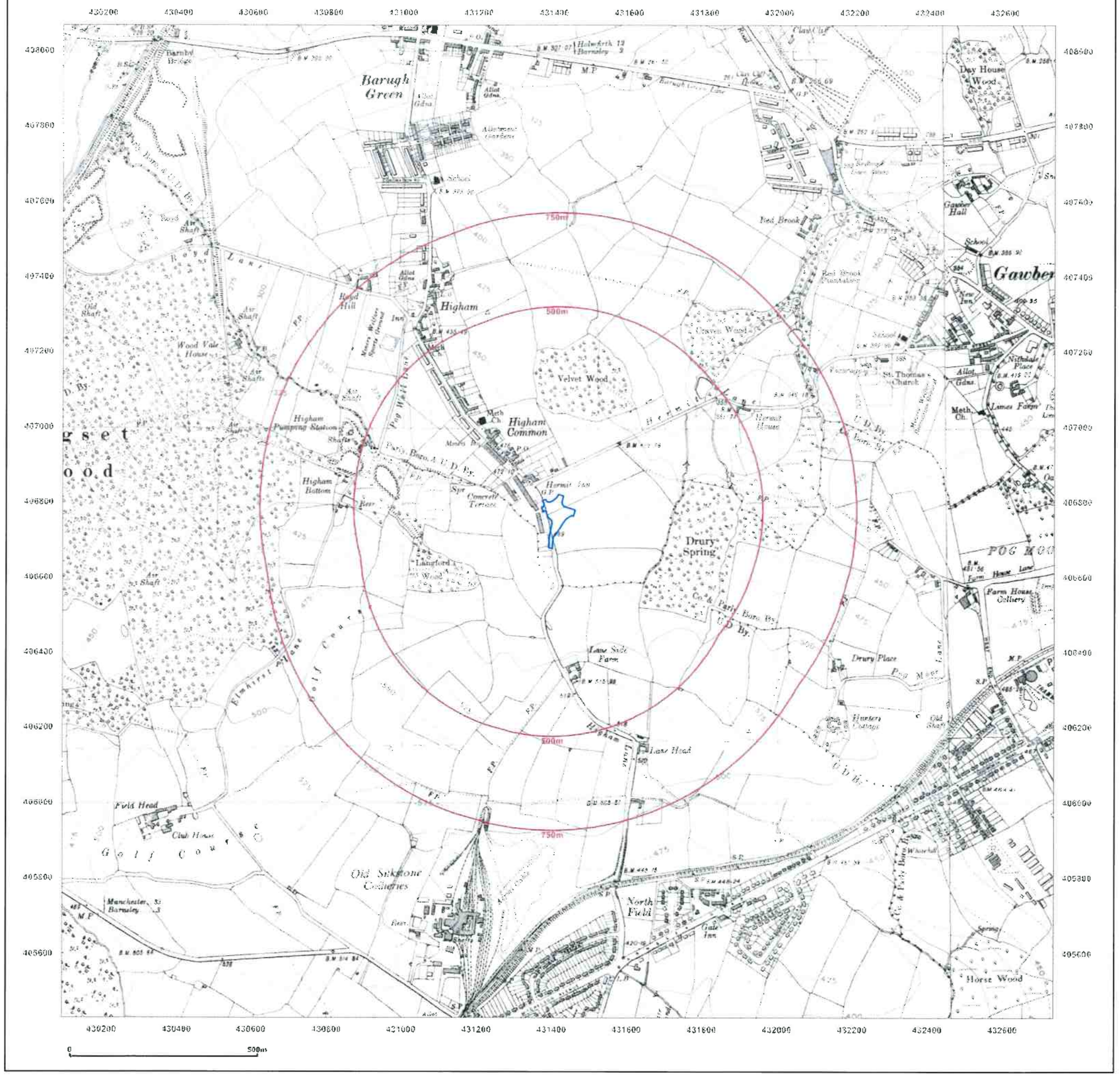
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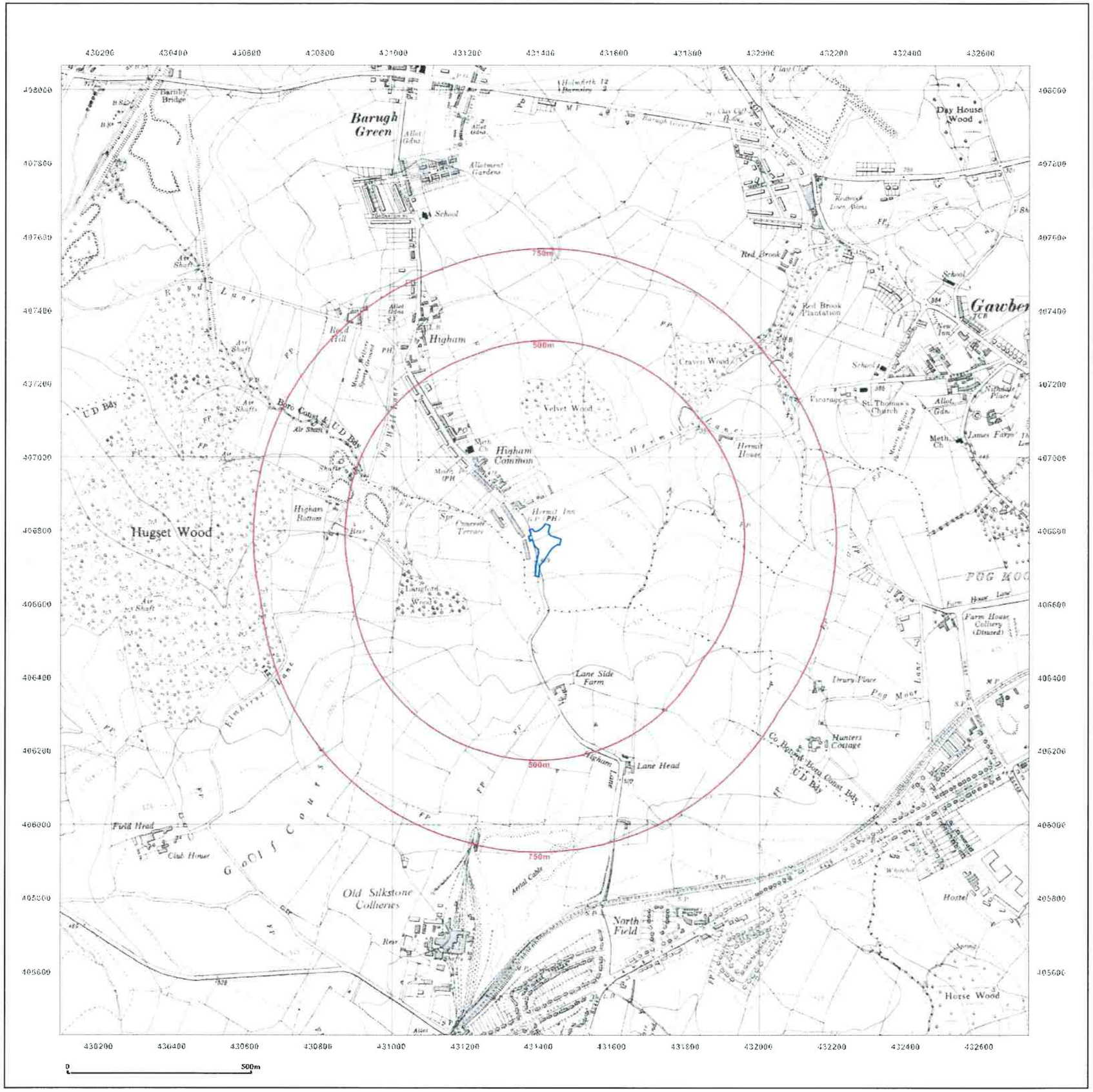
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Site Details:

Higham Common Road
Roundabout

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Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

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

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Surveyed N/A
Revised 1955
Edition N/A
Copyright 1956
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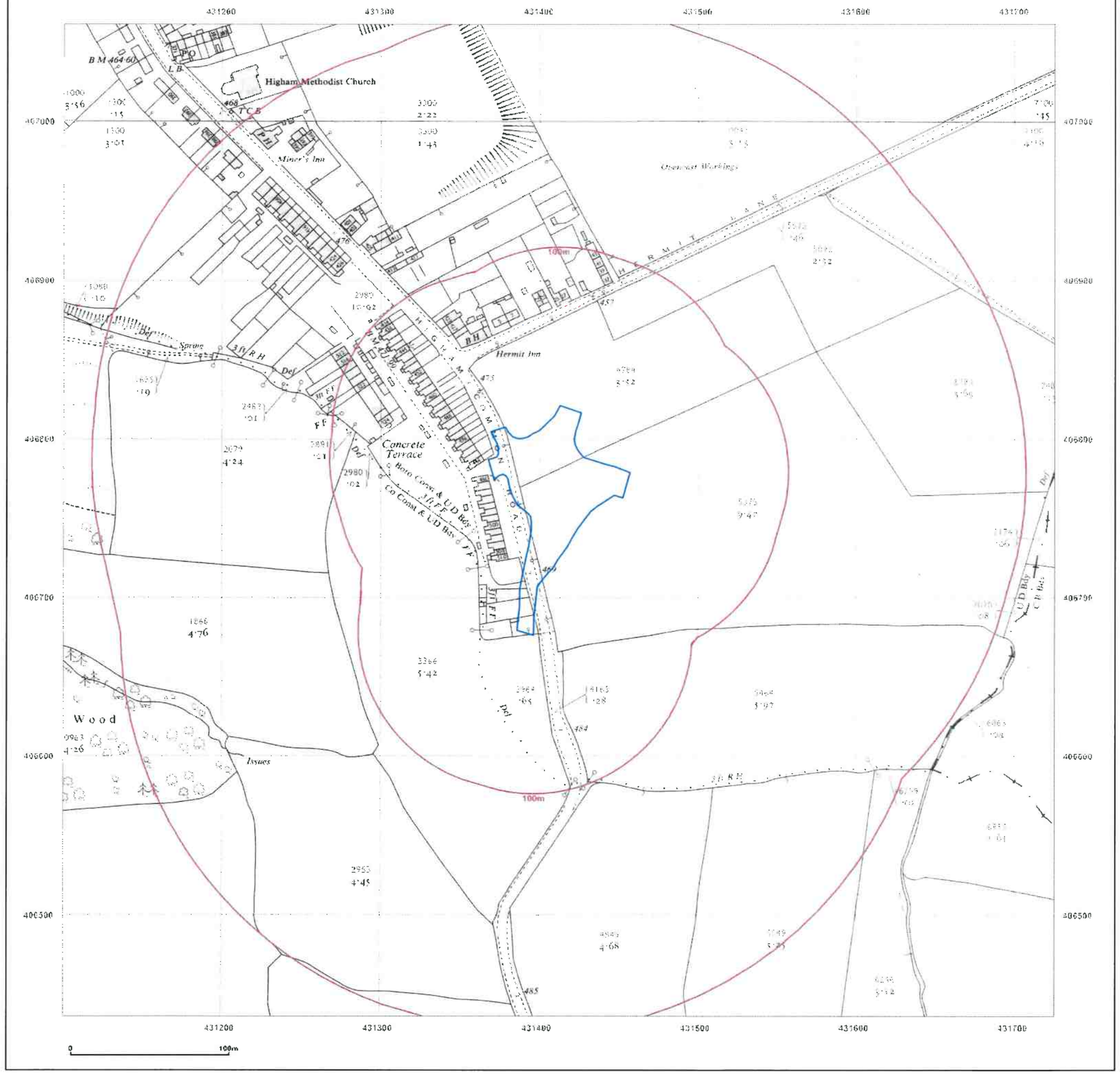
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Scale: 1:2,500
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Edition N/A
Copyright 1962
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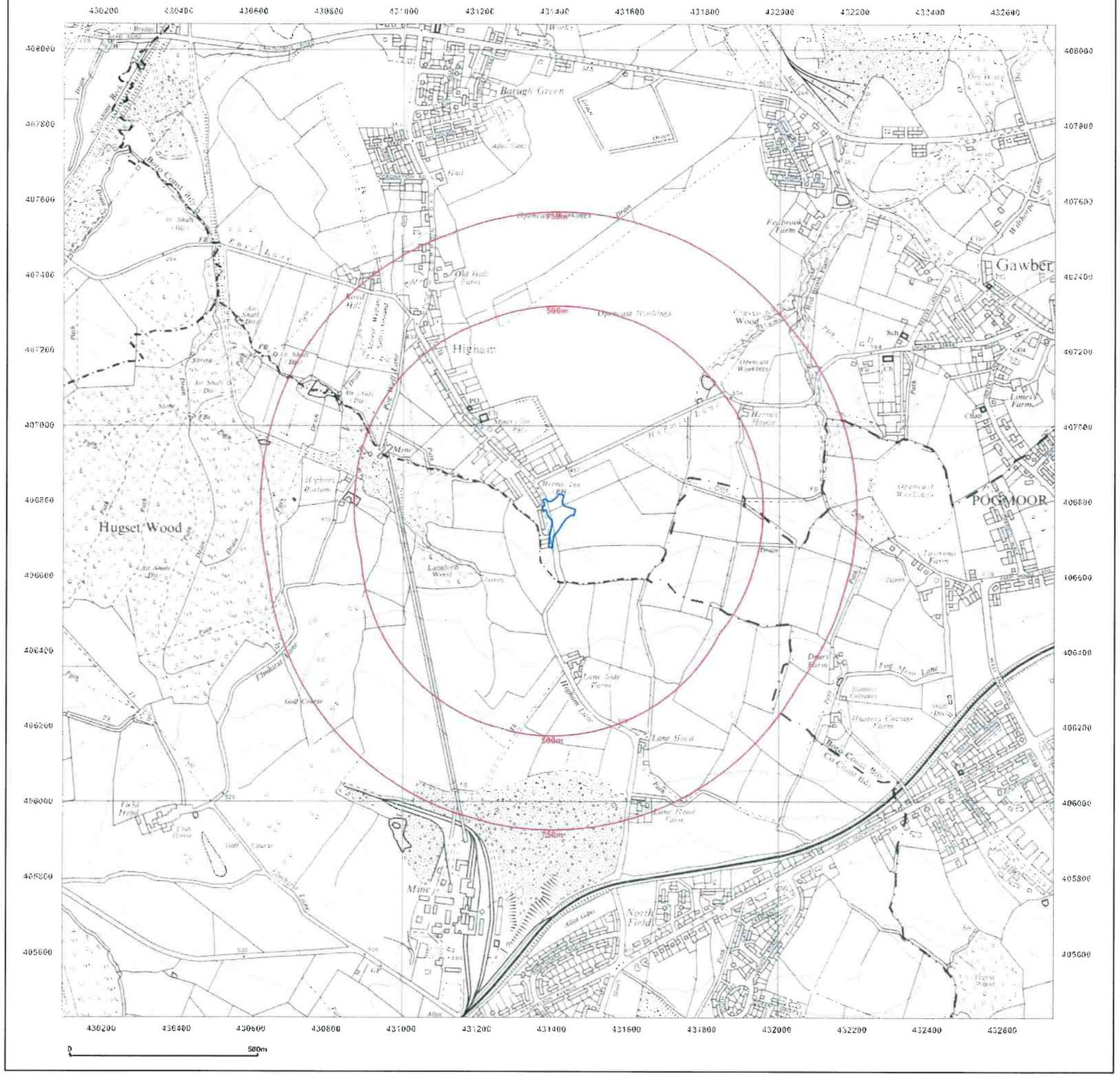
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Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

Map Name: Provisional
Map date: 1966
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Revised 1966
Edition N/A
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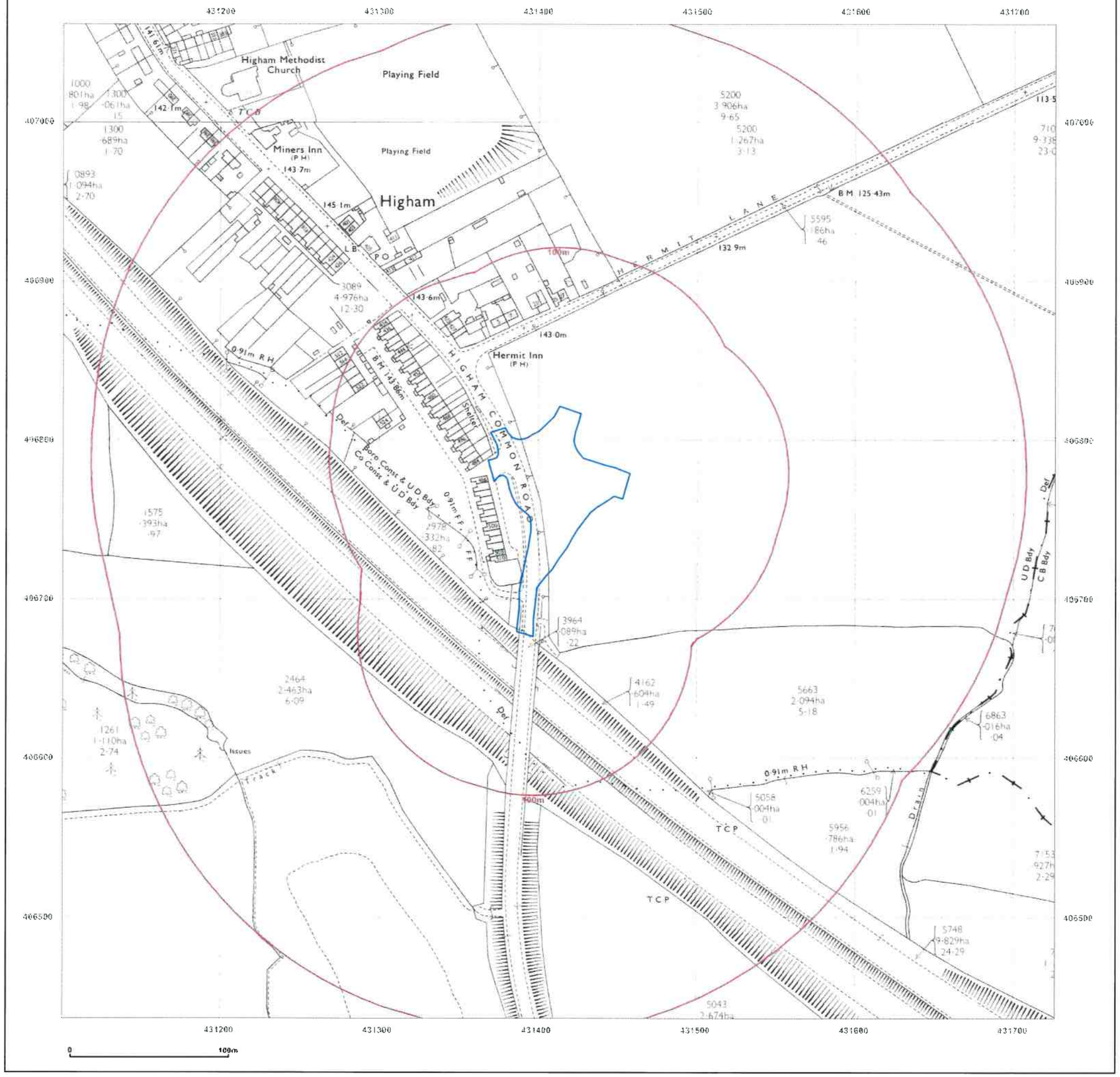
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Roundabout

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Map Name: National Grid
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Scale: 1:2,500
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Surveyed 1969
Revised 1969
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Surveyed 1970
Revised 1970
Edition N/A
Copyright 1971
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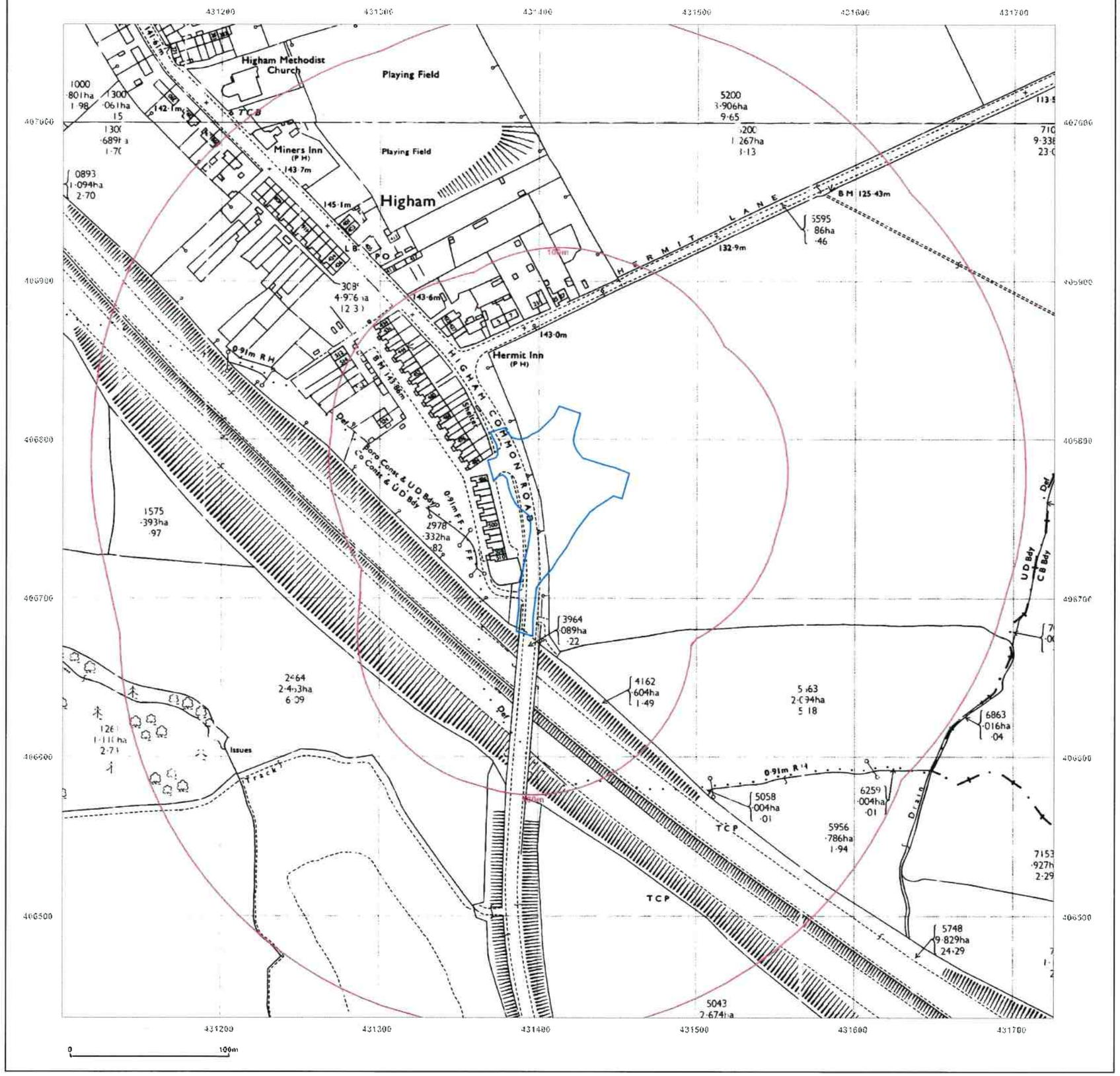
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Higham Common Road
Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

Map Name: National Grid
Map date: 1970-1971
Scale: 1:2,500
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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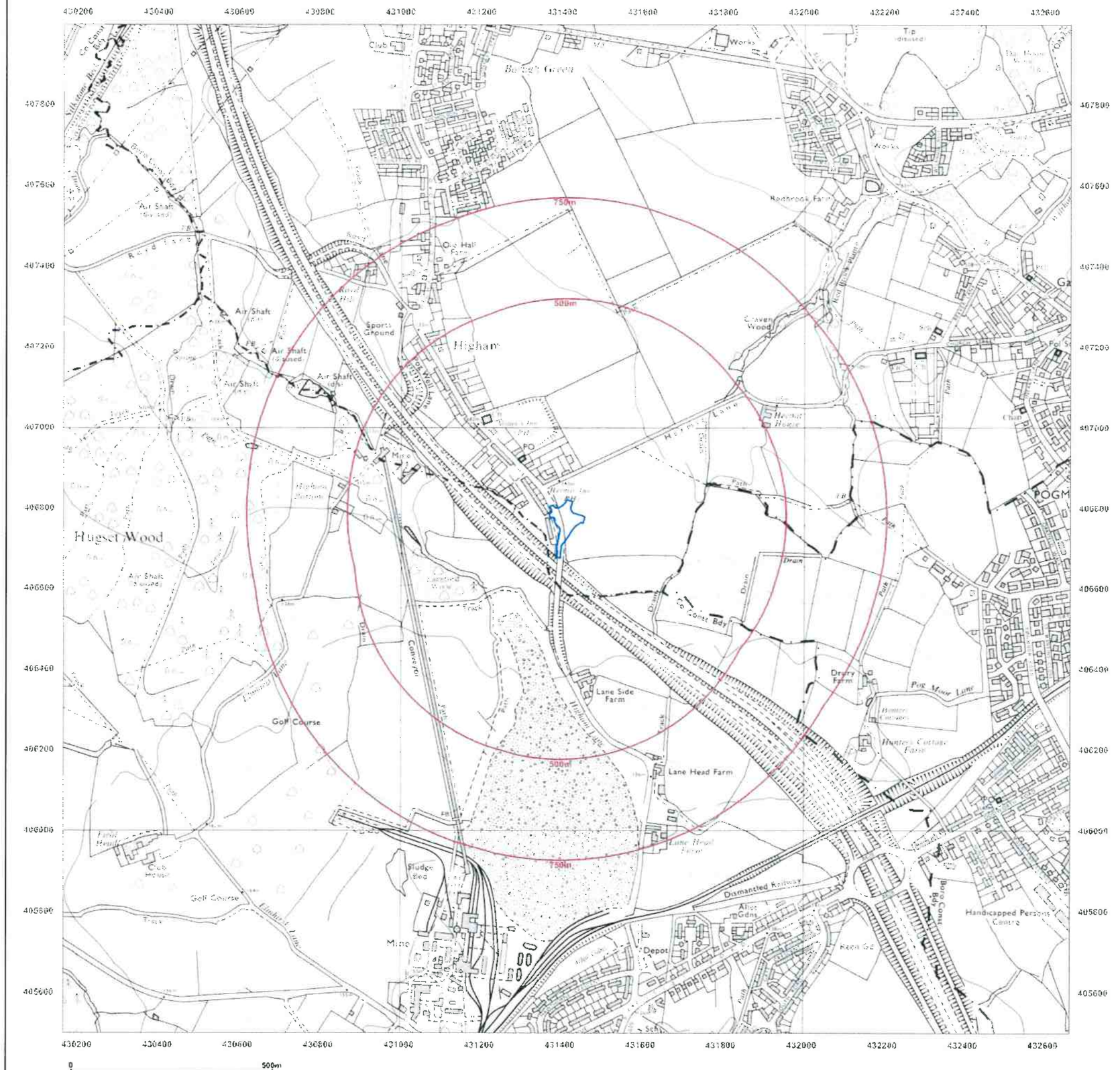
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Map Name: National Grid
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Scale: 1:10,000
Printed at: 1:10,000

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Revised 1973
Edition N/A
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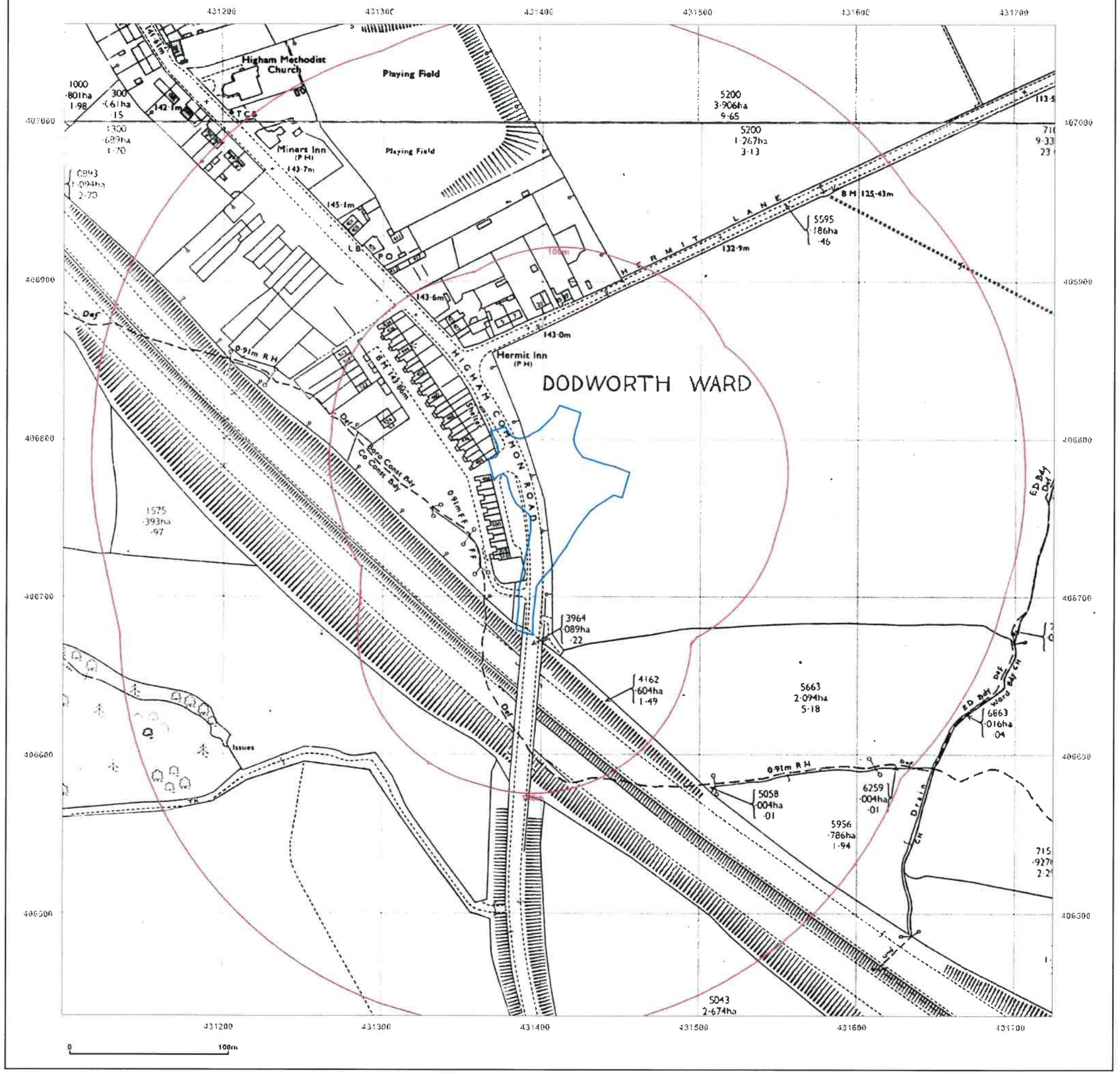
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JPG

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Roundabout

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Grid Ref: 431413, 406749

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

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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 1982
Levelled 1963

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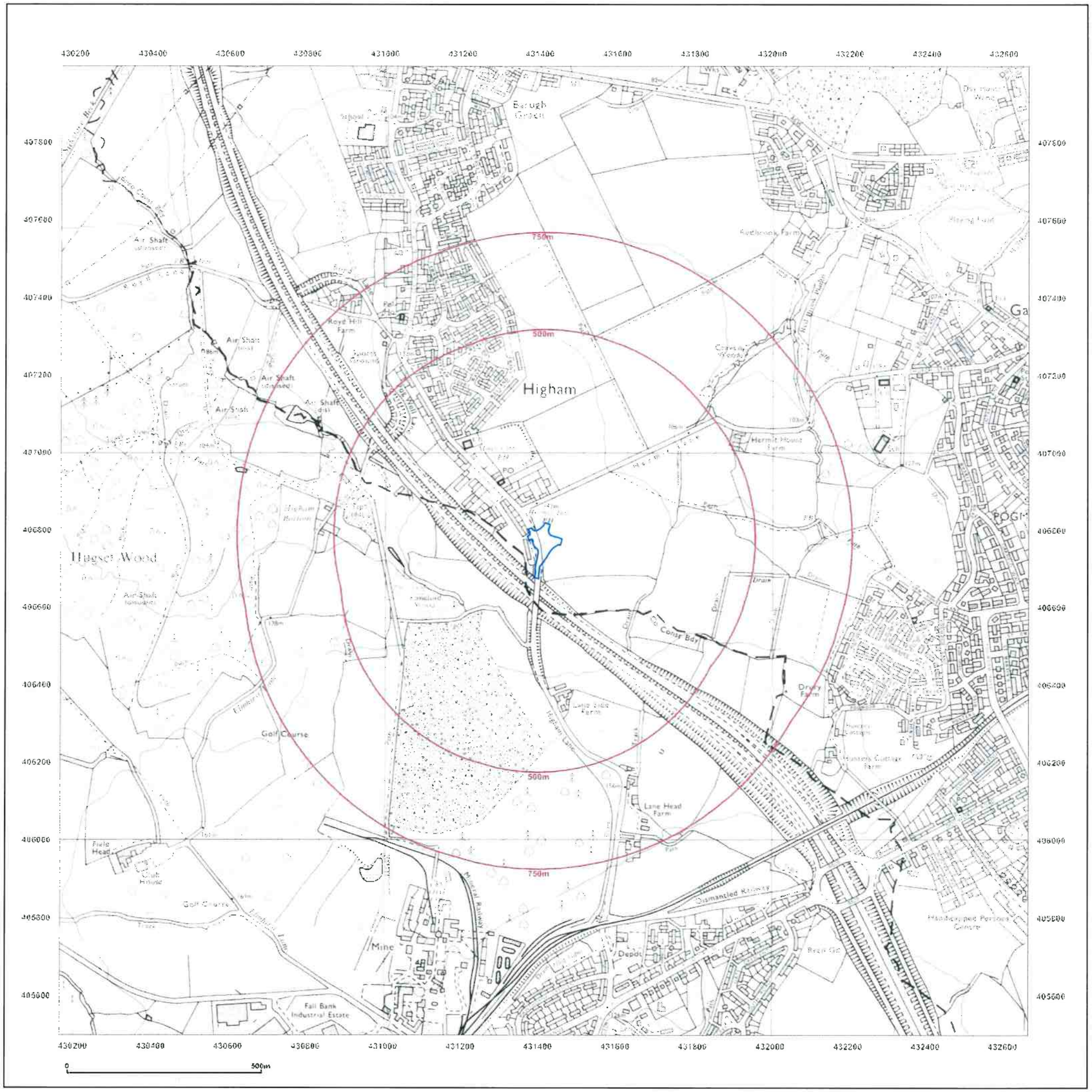
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Site Details:

Higham Common Road
Roundabout

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Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

Map Name: National Grid
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Printed at: 1:10,000

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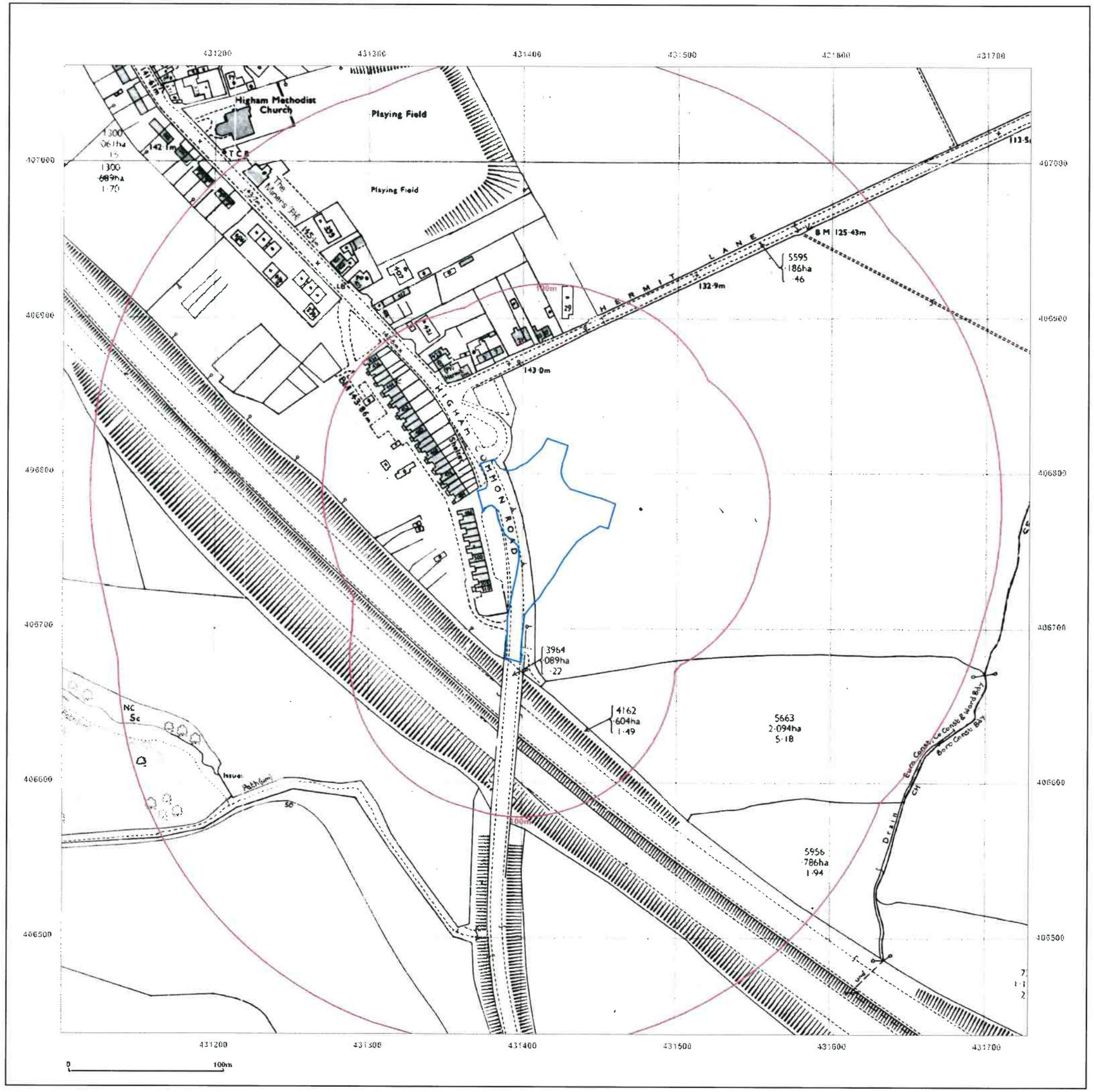
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JPG

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Higham Common Road
Roundabout

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Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

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

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

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

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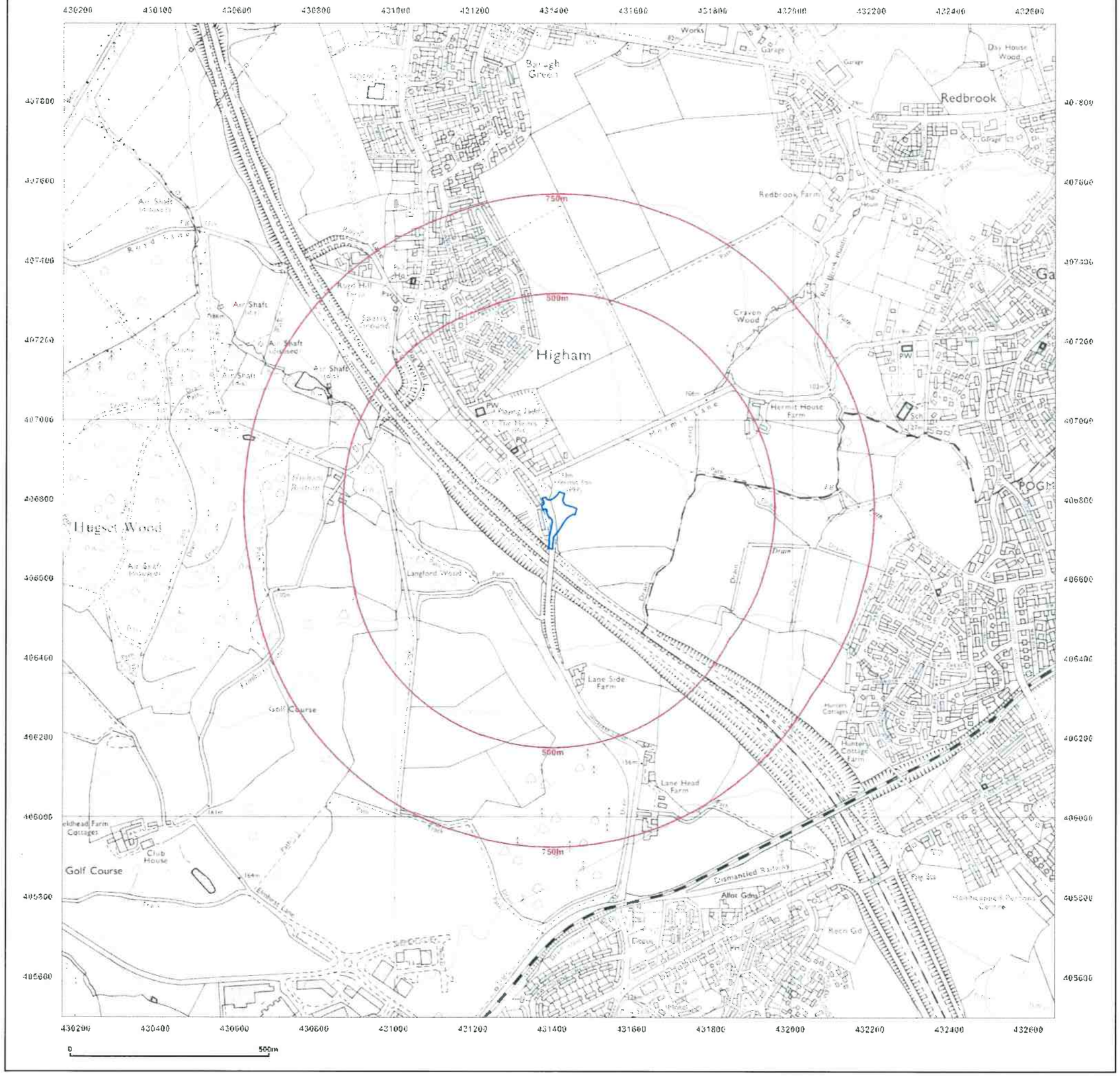
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JPG

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Higham Common Road
Roundabout

Client Ref: 44915
Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

Map Name: National Grid
Map date: 1993
Scale: 1:10,000
Printed at: 1:10,000

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Surveyed 1992
Revised 1993
Edition N/A
Copyright N/A
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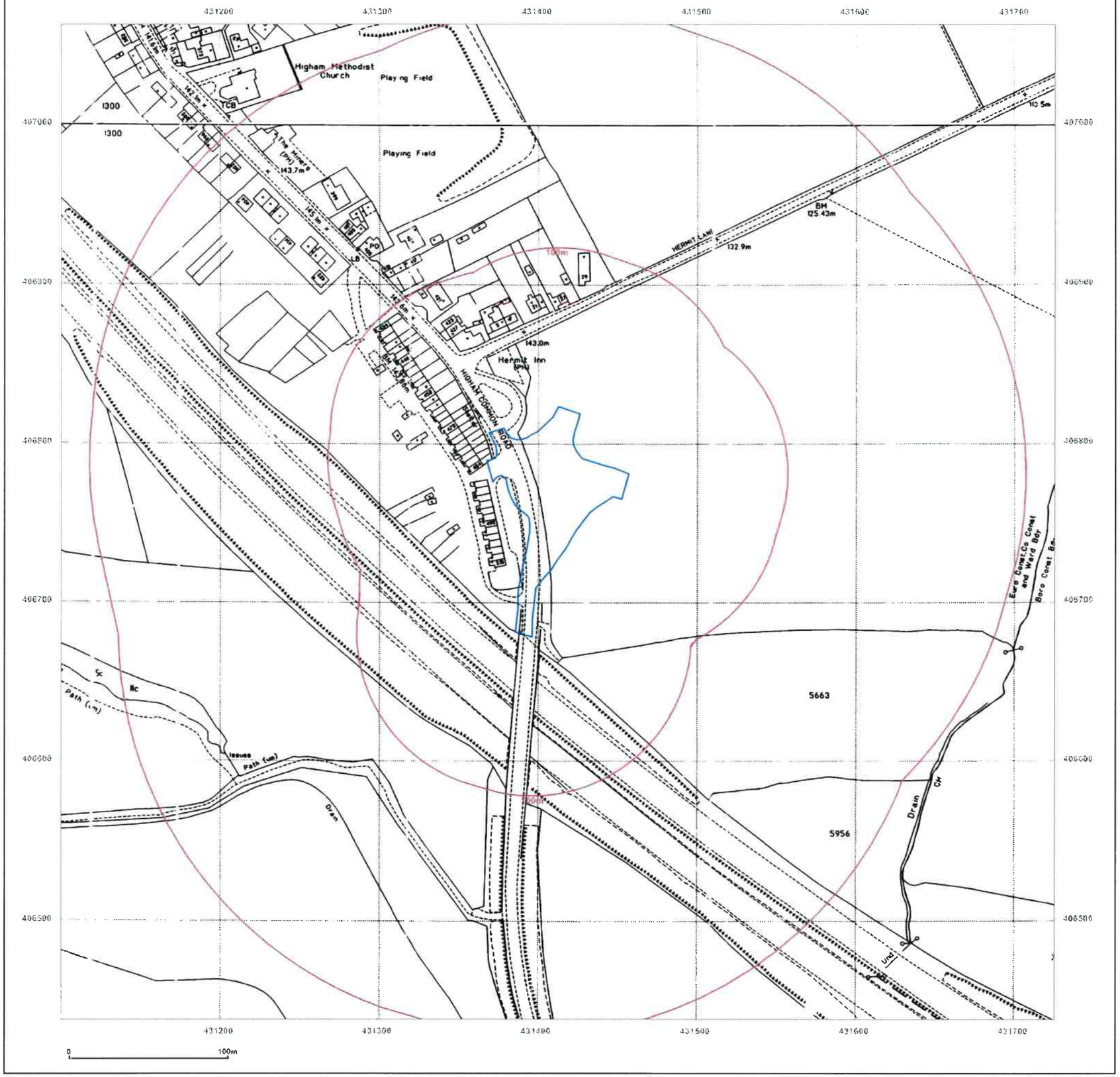
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JPG

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Roundabout

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Grid Ref: 431413, 406749

Map Name: National Grid
Map date: 1993
Scale: 1:2,500
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
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Surveyed N/A
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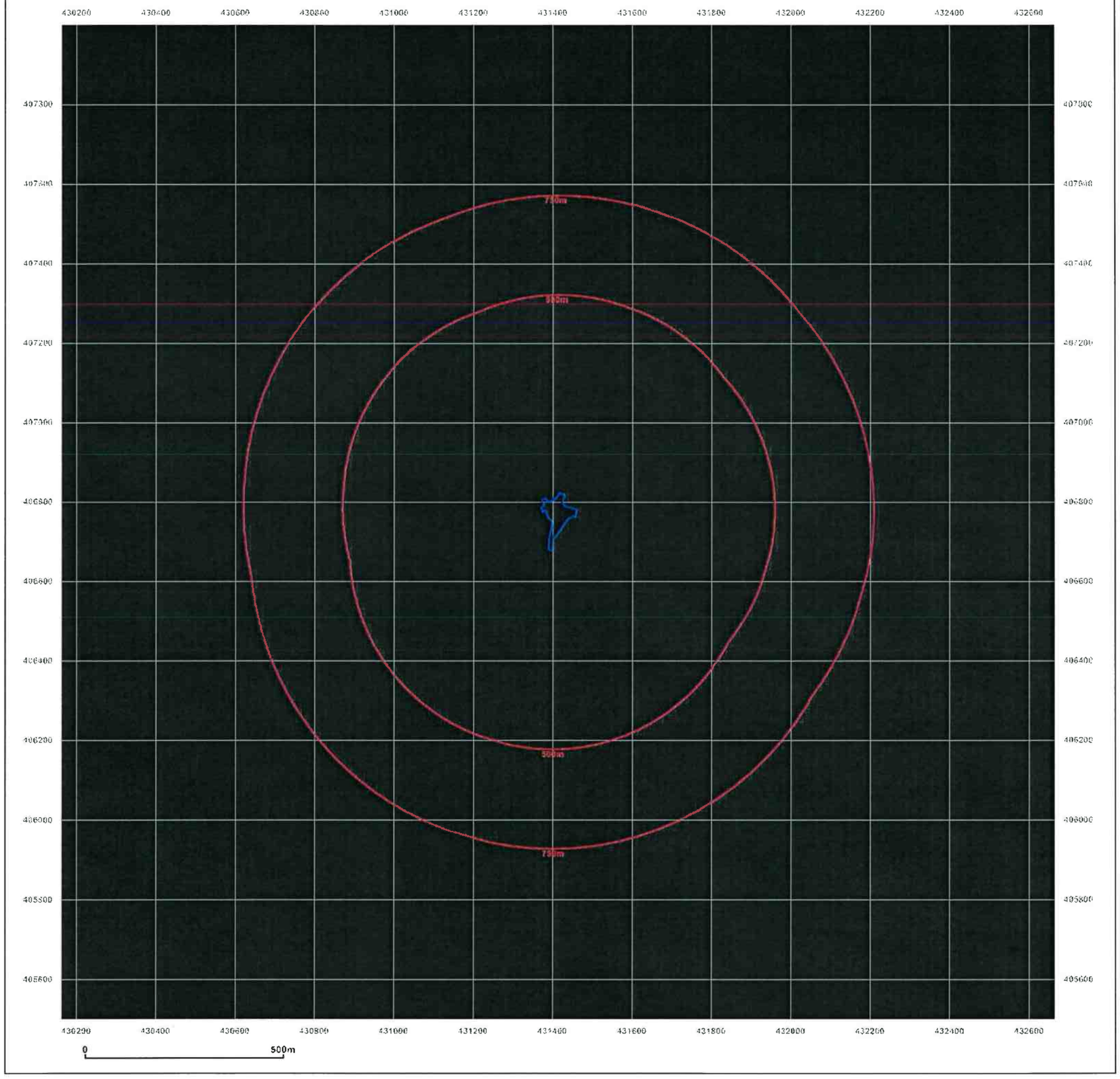
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Roundabout

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Report Ref: CMAPS-JPG-839294-44915-061119HIS
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Map Name: National Grid

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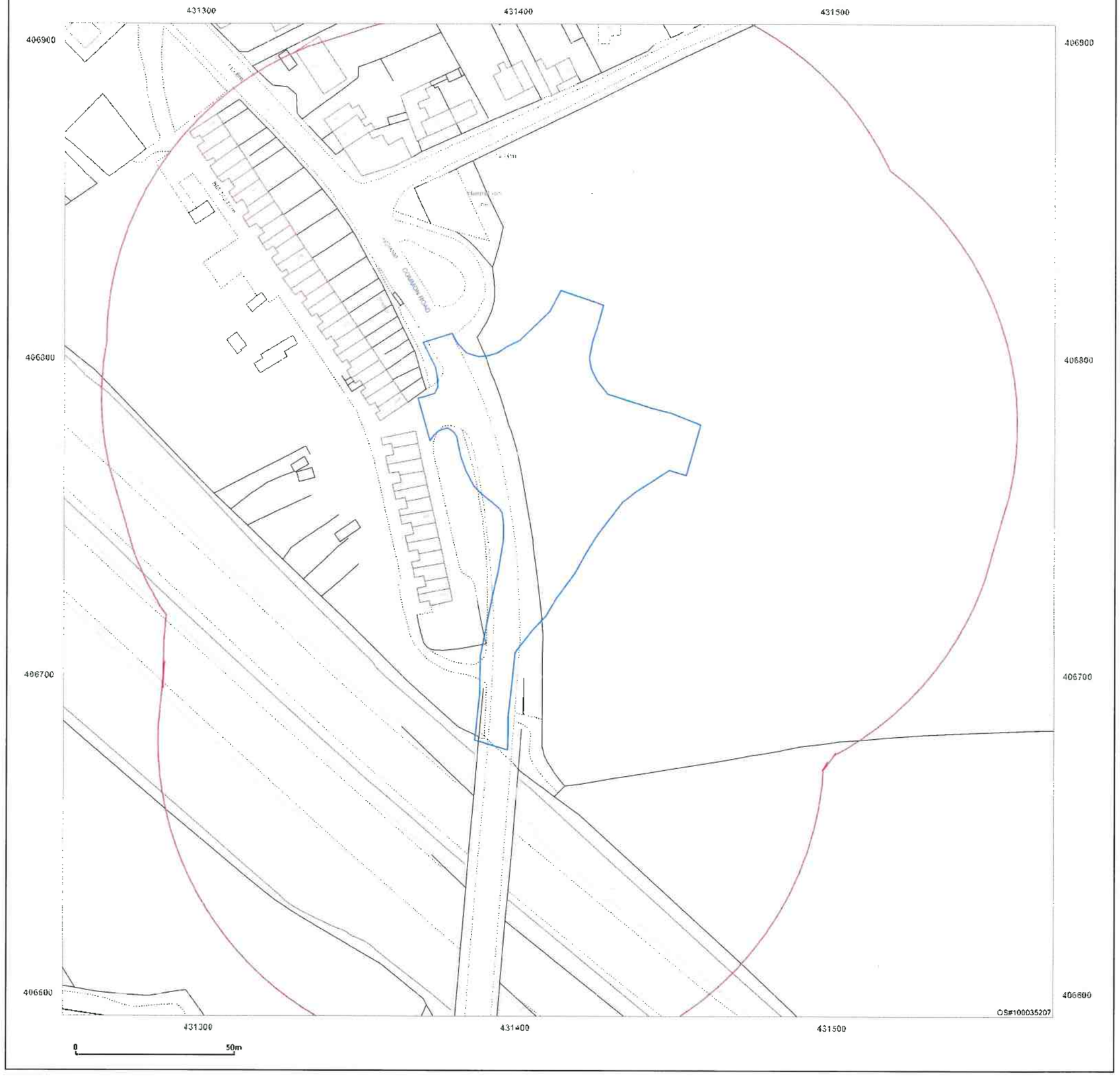
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Roundabout

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Grid Ref: 431413, 406749

Map Name: LandLine
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Printed at: 1:1,250

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Site Details:

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Roundabout

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Report Ref: CMAPS-JPG-839294-44915-061119HIS
Grid Ref: 431413, 406749

Map Name: National Grid
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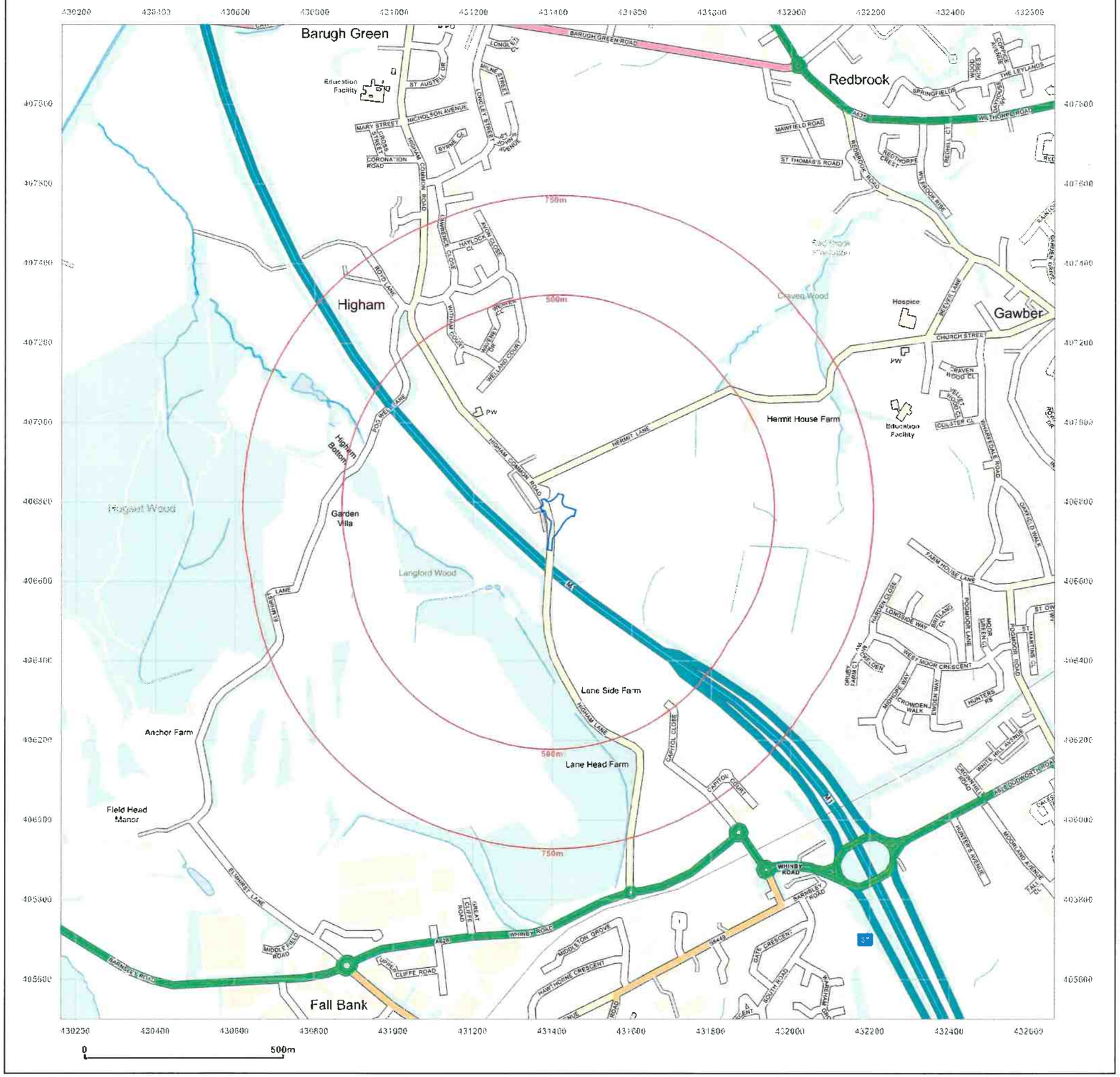
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JPG

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Roundabout

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Grid Ref: 431413, 406749

Map Name: National Grid
Map date: 2019
Scale: 1:10,000
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Appendix D Coal Authority Mining Reports

The Coal Authority

CON29M
coal mining report

HIGHAM COMMON ROAD, HIGHAM, BARNSLEY, S75 1PW

Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4
Mine entries	Page 5

Further action

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

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

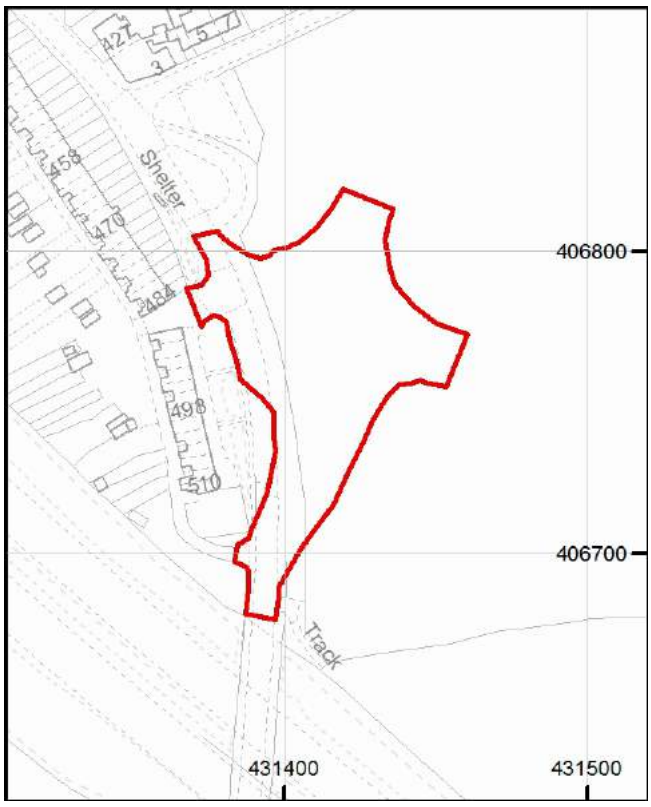
Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. 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.

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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 90m to 280m depth, and last worked in 1966.

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

In addition the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

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.

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

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

6 Past opencast coal mining

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

7 Present opencast coal mining

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

8 Future opencast coal mining

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

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

9 Coal mining subsidence

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

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

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

10 Mine gas

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

11 Hazards related to coal mining

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

12 Withdrawal of support

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

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

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

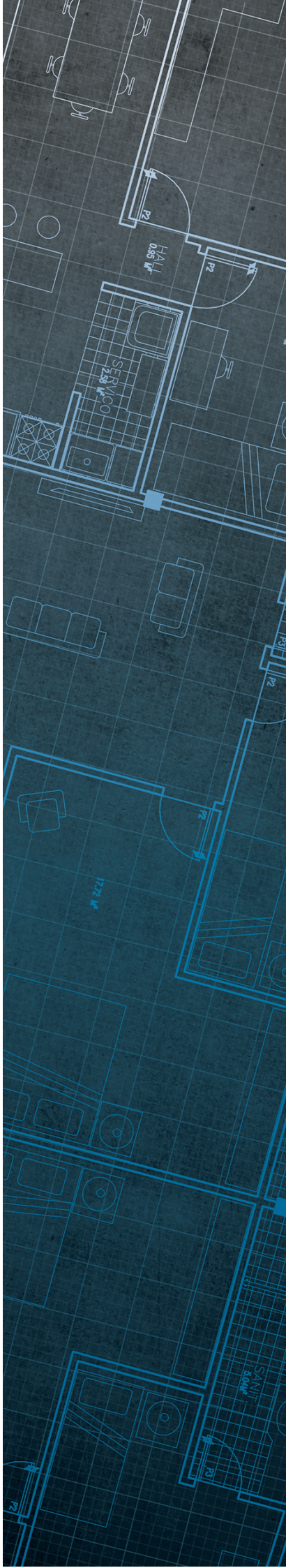
The Coal Authority

Consultants

Coal Mining Report

Higham Common Road
Higham
Barnsley
S75 1PW

Date of enquiry:	**8 November 2019**
Date enquiry received:	**8 November 2019**
Issue date:	**8 November 2019**
Our reference:	**51002193991002**
Your reference:	**4848_Higham Common Rd**



Consultants

Coal Mining Report

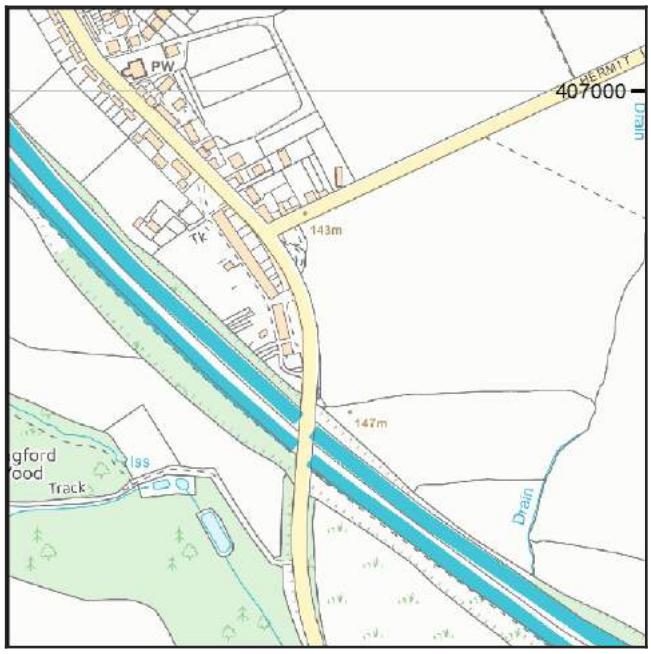
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

JPG (LEEDS) LIMITED

Enquiry address

Higham Common Road
Higham
Barnsley
S75 1PW



Approximate position of property

Map data

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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
DODWORTH	FLOCKTON THICK	Coal	64CW	93	Beneath Property	3.9	North-East	61	1910
DODWORTH	TOP FENTON	Coal	64CR	134	South-East	3.9	North-East	74	1916
unnamed	TOP FENTON	Coal	64CQ	159	North-East	3.4	North-East	74	1930
DODWORTH	PARKGATE	Coal	64CV	161	Beneath Property	2.2	North-East	137	1913
DODWORTH HIGHAM	SILKSTONE	Coal	64D3	244	Beneath Property	4.1	North-East	147	1891
unnamed	SILKSTONE	Coal	64D2	260	North-East	3.4	North-East	147	1927
WOOLLEY/REDBROOK	WHINMOOR	Coal	64D9	281	Beneath Property	4.1	North-East	107	1966

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

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

NE565	NE1050	NE584
NE1034	SCC9	NE498
NEST39	M711	9170

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.

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Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
TOP HAIGH MOOR	Coal	Yes	Within	N/A	320

Geological faults, fissures and breaklines

No faults, fissures or breaklines 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 not in an area where a notice to withdraw support has been given.

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

Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

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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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The Coal Authority

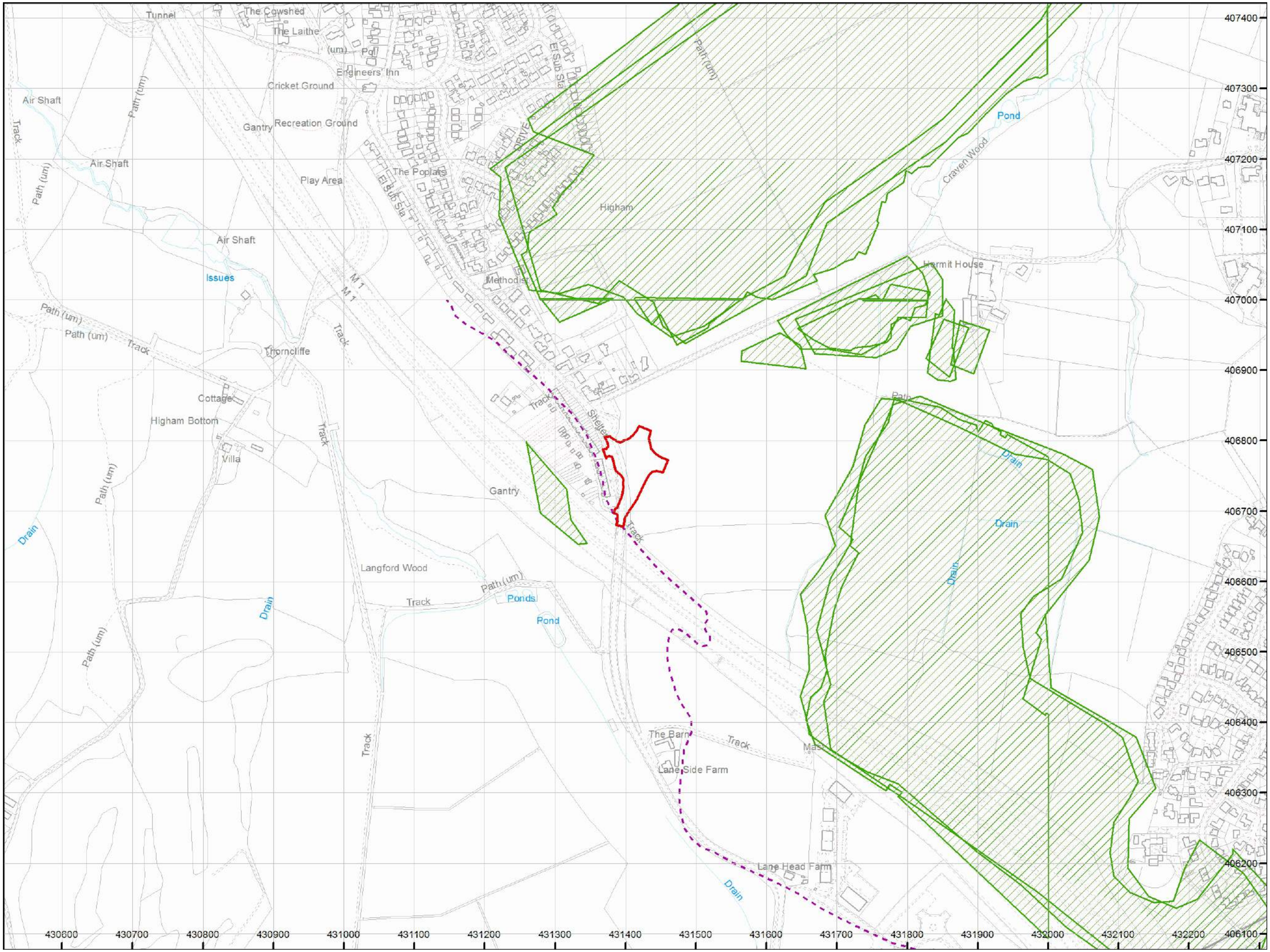
Summary of findings

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Map data

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
- Outcrop (Conjectured)
- Unlicensed opencast site



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Appendix E Historical Boreholes

SE 30NW 261 – 264

Welham Lane C.563

APPENDIX 1

BOREHOLE No. AND LOCATION	DEPTH From	DEPTH To	SOIL DESCRIPTION	SAMPLES Depth	SAMPLES Test and Result
1. 3131 0688 SE30NW/ 261	0	3"	Patched area - road surface dressed Fine cold asphalt and coated macadam		
	3"	8"	Crushed stone		
	8"	2'0"	Firm to stiff light brown and dark grey friable silty clay	1'4"-2'0"	Fm 23 LL 51 PI 26 CBR R 1.5 DD 94 m 23
2. 3138 0677 SE30NW/ 262	0	1'0"	Topsoil		
	1'0"	4'0"	Firm brown and grey silty clay	2'0"-3'0"	Fm 36 LL 64 PI 24 CBR R 1 DD 83 m 36
				4'0"	Fm 32 LL 60 PI 31
			Hole dry		
3. On south edge of pond 3138 0644 SE30NW/ 263	0	9"	Topsoil		
	9"	2'0"	Firm brown sandy clay with sandstone fragments		
	2'0"	5'6"	Stiff friable brown and grey silty clay	3'0"	Fm 33 LL 58 PI 27 CBR R 1 DD 88 m 33
				4'6"	Fm 24 LL 59 PI 34
	5'6"	12'0"	Stiff friable grey silty clay with fragments of mudstone and ironstone from 8'0"	7'0"	Fm 16 LL 51 PI 23
				8'6"	Fm 16
				11'0"	Fm 15 LL 44 PI 20
			Hole dry		
4. 3142 0636 SE30NW/ 264			Surface badly crazed and out of shape		
	0	2"	Surface dressed coated stone		
	2"	7"	Crushed stone		
	7"	1'6"	Firm light brown clay with hard broken sandstone		
	1'6"	3'0"	Firm to stiff dark grey friable silty clay with bands of black carbonaceous shaly clay	1'6"-3'0"	Fm 21 LL 54 PI 30

5/0

Location No. 3983 SE30NW 346 31374 06676

LOG FOR BOREHOLE B187

Sheet No.

ASTON – SHEFFIELD – LEEDS MOTORWAY
DODWORTH TO LEEDS

WEST RIDING OF YORKSHIRE COUNTY COUNCIL

Type of Boring: (a) Shell and auger (b) Medium core drill

Diameter: (a) 6" to 9'6" (b) 4" to 20' & 2½"Core

Date: Oct. – Nov. 1962.

Chainage: 921 + 60

Ground Level: 472.6 ft. above N.D. 144.02

Cut: 15 ft. Fill: – ft.

HIGHAM COMMON

Description	Legend	Sample	Depth	m %	Test Results & Notes
Ground Level			0' 0"		
		1	1'-0"		
Dark grey silty TOPSOIL		2		32	
Stiff mottled grey and brown silty CLAY		3		14	CH C = 2020 ϕ = 7 d = 134
			5'-0"		
		4		44	MH C = 290 ϕ = 6 d . 103
COAL			7'-0"		SO_3 = 0.03
		5		13	↕ N = 69
Soft, broken slightly silty MUDSTONE, with coal traces at base			12'-0"		
Moderately hard, mid-grey silty MUDSTONE with plant debris.		6			
			21'-0"		
		7			
Hard, mainly massive, pale grey very silty MUDSTONE with abundant wispy carbonaceous and siltstone laminations.		8			
Moderately hard dark grey, slightly silty MUDSTONE.			28'-6"		
			32'-0"		
COAL			33'-0"		
Soft, shaley slightly silty MUDSTONE, with coaly traces.		9	35'-0"		
COAL			35'-9"		
Moderately hard, mid-grey, silty MUDSTONE, with roots and plant debris.		10			
			40'-0"		
Hard, massive, pale grey SILTSTONE.		11			
			43'-0"		
Moderately hard silty MUDSTONE.					

CONTINUED ON SHEET NO. 2.

Location No. 3983 SE30NW 3146

LOG FOR BOREHOLE B187
Sheet No. 2

ASTON – SHEFFIELD – LEEDS MOTORWAY
DODWORTH TO LEEDS

Description	Legend	Sample	Depth	m °o	Test Results & Notes
Continued from Sheet No. 1					
Hard, pale grey coarse SILTSTONE, with carbonaceous, micaceous and silty mudstone laminations, becoming more abundant with depth; mainly massive, with occasional open ironstained vertical joints.		12	45'6"		
		13	53'6"		
Hard, mid-grey, mainly massive, silty MUDSTONE, with occasional ironstone bands					
Mussel band			60'0"		
			18.29		
END OF BOREHOLE					

OBSERVATION OF WATER LEVELS IN BOREHOLE.

Date	Time	Depth of BH	Depth of Casing	Depth to Water
13/11	08.00	10'6"	10'0"	DRY
14/11	08.00	35'0"	12'0"	24'0"

Water added to assist drilling.

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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