



Newstead Road, Athersley, Barnsley  
Phase1 Desk Study  
Leeds & Yorkshire Housing Association  
S130805/DS

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## PHASE 1 DESK STUDY

### Newstead Road, Athersley, Barnsley

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| Revision | Date        | Prepared By                                                                         | Checked By                                                                            |
|----------|-------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Final    | August 2013 | R Freer<br>Geotechnical Engineer                                                    | S Fisk<br>Geotechnical Engineer                                                       |
|          |             |  |  |

## 1 EXECUTIVE SUMMARY

|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Address</b>                                         | Newstead Road, Athersley, Barnsley                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Site Description</b>                                     | The desk study area comprises an area of maintained grassland with evidence of made ground including brick rubble and tarmac. Access is gained to the site from the west off Newstead Road with a tarmac car park area running along the western boundary. A mast is present on site surrounded by metal fencing.                                                                                            |
| <b>Site History</b><br>On Site                              | Buildings present on site from the 1990's until 2013 including a Recreation Centre.                                                                                                                                                                                                                                                                                                                          |
| Off Site                                                    | The area became developed with the residential area of Athersley being constructed in the 1950's.                                                                                                                                                                                                                                                                                                            |
| <b>Proposed End Use</b>                                     | A new Residential Development site.                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Environmental Setting</b><br><i>Landfill &amp; Waste</i> | A Local Authority recorded Landfill site is located 344m west of the site.                                                                                                                                                                                                                                                                                                                                   |
| <i>Geology</i>                                              | The underlying geology comprises drift deposits of Glacial Till, which overlays solid geology of the Upper Carboniferous formation. The Swinton Pottery Coal seam and Houghton Marine Band appear to sub crop under the site, with the area younging in a north easterly direction.                                                                                                                          |
| <i>Mining</i>                                               | Shallowest known worked seam is the Kents Thick at 143m depth with a section of 0.71m. Mining report highlights possible ancient shallow unrecorded workings.                                                                                                                                                                                                                                                |
| <i>Hydrogeology</i>                                         | The solid geology is classified as a <b>Secondary A Aquifer</b> by the Environment Agency.                                                                                                                                                                                                                                                                                                                   |
| <i>Hydrology</i>                                            | The nearest surface water feature is a drain located 403m north east of the site.                                                                                                                                                                                                                                                                                                                            |
| <i>Flooding</i>                                             | The site has not previously been affected by flooding.                                                                                                                                                                                                                                                                                                                                                       |
| <i>Radon Gas</i>                                            | No radon protection measures are required for new buildings on site.                                                                                                                                                                                                                                                                                                                                         |
| <b>Preliminary Geotechnical Assessment</b>                  | Made ground is expected and comprise construction waste. Drift deposits of Glacial Till are shown in the geological plans.<br><br>The expected ground conditions would likely give rise to the use of strip foundations; however the potential for ancient shallow unrecorded coal workings means that rotary boreholes are required and the results of these would influence the foundation option on site. |
| <b>Preliminary Contamination Assessment</b>                 | The desk study has shown that the site is unlikely to have been exposed to anything other than minimal contamination, with construction waste such as brick rubble the most likely source. Limited chemical contamination analysis considered necessary.                                                                                                                                                     |
| <b>Potential Sources of Ground Gas</b>                      | Underlying coal measures and made ground. Ground gas assessment is recommended.                                                                                                                                                                                                                                                                                                                              |
| <b>Environmental Protection Act 1990</b>                    | For the site to be designated as contaminated under Part 2A of the EPA 1990, a proven source-pathway-receptor linkage has to be present. No such linkage has yet been proven; however on site investigation works are proposed.                                                                                                                                                                              |
| <b>Risk Assessment</b>                                      | Based on the information contained in this report, it is the opinion of Solmek that the site represents a <b>MODERATE</b> environmental risk.                                                                                                                                                                                                                                                                |
| <b>Phase Two Recommendations</b>                            | Small percussive boreholes to 6m depth with insitu testing and samples taken for geotechnical and limited contamination testing.<br>Ground gas pipes installed in the small percussive boreholes. ( Minimum 3no)<br>Machine dug trial pits.<br>Open hole rotary boreholes to 20m depth. (Minimum 3no)                                                                                                        |

## 2 INTRODUCTION AND SCOPE OF INVESTIGATION

Solmek were instructed by AcanthusWSM Architects Ltd on behalf of Leeds & Yorkshire Housing Association to undertake a desk study on a parcel of land at Newstead Road, Athersley, Barnsley. The site is outlined for a residential development site.

The following steps may be required in the investigation and remediation of potentially contaminated land:

- Phase 1: Desk Study
- Phase 2: Intrusive Investigation
- Phase 3: Remediation Statement
- Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages. This report represents Phase 1 of the site investigation.

The purpose of this Phase 1 Desk Study is to evaluate likely ground conditions and significant environmental issues at the site, and to plan the scope of subsequent phases of investigation.

This report may be regarded as a Preliminary Risk Assessment in accordance with the Environment Agency's guidance document *Model Procedures for the Management of Land Contamination* (CLR 11, 2004).

This Phase 1 Desk Study has been undertaken with due regard to current contaminated land guidance issued by the Royal Institution of Chartered Surveyors (RICS) together with BS 10175: 2001, "*Code of Practice for the Investigation of Potentially Contaminated Land*" and relevant sections of BS 5930: 1999, "*Code of Practice for Site Investigations*".

The objectives of the investigation were as follows:

- To determine the land use history of the site from an inspection of available Ordnance Survey (OS) plans
- To determine the environmental setting of the site from available sources
- To determine whether past mining may have had an influence on the site
- To determine whether the site has previously been used for purposes that may have given rise to significant ground contamination
- To provide recommendations for further investigation.

## 3 SITE WALKOVER AND DESCRIPTION

### 3.1 General

The centre of the site is located at OS Grid Ref 434510, 409890 and covers an area of approximately 0.73Ha. The site is situated within a residential area of north Barnsley off Newstead Road.

The preliminary site inspection was undertaken on the 6<sup>th</sup> August 2013 and site photographs are presented in Appendix A.

### 3.2 Site Features

The site currently comprises a public open space made up of maintained grassland. Within the grassland are signs of made ground including brick rubble and tarmac. Along the western edge of the site is an access off Newstead Road, which leads to a tarmac area running parallel with the western boundary. Within the tarmac area are a number of surface water drains along a curbed edge of the tarmac. There are also a number of street lights situated on the eastern boundary of the tarmac. A variety of semi mature deciduous trees including sycamore and maple are situated along the western boundary of the site. Situated north of the access off Newstead Road is a telegraph pole with cables extending west away from the site to the neighbouring residential properties. A mast is present towards the south of the site surrounded by a steel fence of approximately 6' in height. The area has a gentle slope from west to east with the proposed development site being situated on a plateau of possible made ground. To the north

east of the site are a number of manholes suggesting services beneath the development area. The northern boundary of the site is bordered by Allotments separated by a steel fence of approximately 6'. Along this steel fence are a variety of mature poorly maintained bushes extending into the site.

### 3.3 Off Site Features

The site is set within a residential area of north Barnsley with the surrounding houses consisting of semi-detached properties of brick and tile construction. The site is bordered by Allotments to the north separated by a steel fence and hedge row. To the east the site runs into an area of maintained grassland and Laxton Road beyond. Situated to the south of the site is a Library building and children's play area. The western boundary is bordered by Newstead Road from which access is gained to the site.

## 4 SITE HISTORY

In order to determine the history of the site, previous editions of Historical Maps and Ordnance Survey Plans were inspected. The Historical Map Extracts are presented in Appendix B.

Table 1 presents a summary of the history of the area which includes plots from 1854 to 2013. The summary focuses on the historical land uses and changes relevant to the site and the proposed end use. Measurements are taken from the centre of the site and all distances quoted are approximate.

**TABLE 1: SUMMARY OF SITE HISTORY**

| OS Map Edition          | On-site Features                                                                                                  | Off-site Features                                                                                                                                                                                                                                                                                                              |
|-------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1854 – 1855<br>1:10,560 | The site is situated within the south of North Royds Woods a densely wooded area containing non-coniferous trees. | North Royds Woods is a large wooded area surrounded by agricultural land.                                                                                                                                                                                                                                                      |
| 1893<br>1:2,500         | No significant change noted to the site.                                                                          | Barnsley Coal Railway Extension is present approx. 350m to the west of the site running south west to north east.                                                                                                                                                                                                              |
| 1894<br>1:10,560        | No significant change noted to the site.                                                                          | The Wharnccliffe Woodmoor Colliery Branch railway is present approx. 500m north of the site joining the Barnsley Coal Railway Branch. Staincross Station is present approx. 400m south west of the site.                                                                                                                       |
| 1906<br>1:2,500         | No significant change noted to the site.                                                                          | No significant change noted.                                                                                                                                                                                                                                                                                                   |
| 1907<br>1:10,560        | No significant change noted to the site.                                                                          | No significant change noted.                                                                                                                                                                                                                                                                                                   |
| 1918<br>1:2,500         | No significant change noted to the site.                                                                          | No significant change noted.                                                                                                                                                                                                                                                                                                   |
| 1932<br>1:10,560        | The trees of North Royds Wood have been removed leaving rough grassland on the site.                              | North Royds Wood has been removed leaving rough grassland.                                                                                                                                                                                                                                                                     |
| 1938<br>1:10,560        | No significant change noted to the site.                                                                          | Development has increased in the area with residential properties appearing to the south west at Staincross Station and 500m to the south around the area of 'Hill Top'. Development has also increased to the west in the areas of 'Upper Carr Green' and 'Blacker'.                                                          |
| 1938 – 1948<br>1:10,560 | No significant change noted to the site.                                                                          | Residential development has increased to the south of the area around 'New Lodge'.                                                                                                                                                                                                                                             |
| 1955 – 1956<br>1:10,000 | The site is no longer noted as Grassland.                                                                         | Residential development has increased over 1km to the south east in the area of 'Athersley Estate South'.                                                                                                                                                                                                                      |
| 1959<br>1:1,250         | No significant change noted to the site.                                                                          | The surrounding area has become densely populated with residential properties. 'Edward Sheerien Secondary School' is present approx. 150m west of the site. A large unidentified structure is neighbouring the site on the northern boundary. The immediate east and south remain undeveloped with residential housing beyond. |
| 1960 – 1962<br>1:2,500  | No significant change noted to the site.                                                                          | No significant change noted.                                                                                                                                                                                                                                                                                                   |
| 1965 – 1966<br>1:10,000 | No significant change noted to the site.                                                                          | No significant change noted.                                                                                                                                                                                                                                                                                                   |

|                         |                                                                                                                                                                                                           |                                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1980 – 1984<br>1:10,000 | No significant change noted to the site.                                                                                                                                                                  | A library has been noted approx. 100m south east of the site. The railways to the west and north have been noted as Dismantled. |
| 1990 – 1993<br>1:10,000 | A building is present on site with access from the west off Newstead Road.                                                                                                                                | Structure to the north labelled as a school.                                                                                    |
| 1993<br>1:1,250         | The school has been demolished and a 'recreation centre' is now shown centrally on site. Areas of hardstanding are visible to the west and a recreation ground is shown on the southern part of the site. | The Structure to the north of the site is noted as 'Athersley North Infants School'.                                            |
| 2006<br>1:10,000        | No significant change noted to the site.                                                                                                                                                                  | The Infant School to the north of the site has been removed.                                                                    |
| 2013<br>1:10,000        | No significant change noted to the site.                                                                                                                                                                  | No significant change noted.                                                                                                    |

## Potential contamination sources identified via historical plans

According to the Historical Maps, the site currently consists of a Recreational Centre and Playground. Apart from the existing development and previous school, no other previous land uses have been identified. Minimal contamination from historical land uses are identified with construction waste the most likely source; however this is expected to be negligible.

## 5 ENVIRONMENTAL SETTING

### 5.1 Information Sources

The environmental setting of the site was determined through reference to the following:

- Landmark Envirocheck Report (including historical map extracts)
- British Geological Survey (BGS) 1: 10,000 scale sheet SE30NW Barnsley
- BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings

### 5.2 Landfill and Waste

The Envirocheck Report indicates there is a Local Authority Recorded Landfill Site located 344m west however limited information is available for the site. The Envirocheck Report also highlights a Historical Landfill site located 333m west with the waste specified as deposited waste including inert, industrial and commercial waste with the last known input was in December 1994.

### 5.3 Regulated industry

The Envirocheck Report indicates that there are three active Contemporary Trade Directory Entries within 500m of the site with the nearest being positioned 368m south west classified as a Printers. The remaining two are noted as a MOT Testing Centre 471m west and a Dry Cleaners 459m south. A Rubber & Plastic Products Manufacturer has been noted 450m west of the site however this is listed as Inactive.

There is one Fuel Station entry within the Envirocheck report, listed as obsolete and located 441m west of the site.

### 5.4 Geology

The site is shown to be underlain by drift comprising Glacial Till deposits of the Middle Pleistocene formation, overlying Duckmantian deposits of the Upper Carboniferous formation. A fault is shown on BGS Geological maps approximately 100m north west of the site running from south west to north east downthrown to the south east. A second fault within close proximity to the site is shown approximately 180m to the south east of the site also running from south west to north east, downthrown to the north west. A fault within the Kent's Thick Coal measure has been noted on BGS Geological maps to run through the site from North east to south west downthrown 7 metres to the south east.

The Swinton Pottery Coal seam and Haughton Marine Band appear to sub-crop under the site, with the

area younging in a north easterly direction. As a result of the direction of younging, the Newhill Coal seam which sub crops south west is conjectured to dip beneath the site.

## 5.5 Mining & Quarrying

A coal mining search report for the site was sourced from David Bellis Consulting Surveyors dated, 21<sup>st</sup> August 2013 and is presented in Appendix D.

The mining report indicated three worked coal seams below the site. The shallowest seam is named Kents Thick which was extracted up to 1913 subjacent to the site at a depth of 143m with a section of 71cm.

The mining report highlights that there are possible ancient shallow coal mining workings within the likely zone of influence of the site for which no accurate plans or records exist.

The report states that there are no known shafts or adits within 20m of the property.

The report highlights that the site is not in the boundary of a former opencast coal mining site. The site is also not located within 200m of an operating opencast coal mine or 800m of a future opencast coal mine.

## 5.6 Geological Hazards and Instability

The BGS indicate the risk of Shrinking or Swelling of clay is low, as identified by the Envirocheck report.

The BGS also indicate the potential for Collapsible Ground, Landslides or Running Sands as very low and no hazard of Compressible Ground or Ground Dissolution.

## 5.7 Hydrogeology

Using the Environment Agency's Policy and Practice for the Protection of Groundwater the solid geology beneath the site is classified as a **Secondary A Aquifer**. The overlying drift is classified as **Unproductive Strata**.

The site does not lie within a source protection zone.

The Envirocheck Report indicates there are no licensed groundwater abstractions located within 1000m of the site.

## 5.8 Hydrology

The nearest surface water feature is a Drain located 403m north east of the site.

The Envirocheck Report indicates there are no licensed surface water abstractions within 1000m of the site.

There are two Discharge Consents located within 500m of the site, as highlighted in the Envirocheck Report. Both are listed as Storm Overflows for the Sewage Network located 425m and 434m south. A further three are located within 1000m of the site all relating to Sewage Storm Overflows.

There are no recorded pollution incidents to Controlled Waters within 500m of the site. However a Category 2- Significant Incident occurred 543m east of the site in 1991 with an unknown pollutant. A Category 3- Minor incident is highlighted within the Envirocheck report as occurring 773m west of the site also occurring in 1991 with the pollutant given as Oils- Diesel into a freshwater stream.

## 5.9 Flooding

The site is not recorded as being situated within a zone of flooding.

## 5.10 Sensitive Land Use

The site is located within a Nitrate Vulnerable Zone.

## **5.11 Radon Gas**

In accordance with the procedure described in BRE Publication BR211 *Radon: Guidance on Protective Measures for New Dwellings*, no radon protection measures are required for new buildings on the site.

## **6 CONCEPTUAL SITE MODEL**

### **6.1 General**

Based on the information presented in the preceding Sections, and in accordance with the CLR11 guidance noted in Section 1, a Preliminary Conceptual Site Model has been produced.

The main features of the model are discussed in the following sections together with preliminary recommendations where appropriate.

### **6.2 Likely Ground Conditions**

It is expected that, based on available information, ground conditions are likely to comprise made ground, including possible cobbles and boulders containing construction/demolition waste such as brick and concrete. Due to the former buildings on site, made ground associated with this will be underlain by drift deposits comprising Glacial Till, overlying mudstone/sandstone deposits of the Upper Carboniferous Formation.

### **6.3 Potential Buried Obstructions**

Potential obstructions comprising boulders, relict foundations and construction waste could be present within the made ground.

### **6.4 Preliminary Geotechnical Assessment**

Given the expected ground conditions noted above, the use of traditional strip footings for the new structure is anticipated at present. Where loose made ground or soft/loose natural deposits are encountered, foundations will need to be taken through the made ground/disturbed ground into underlying natural strata of adequate bearing capacity.

It should be noted that the above predicted foundation options are based on the site being unaffected by potential shallow coal mine workings. The regulatory bodies may require further information to the nature of the possible ancient shallow unrecorded coal working beneath the site. Solmek recommend rotary open hole drilling to determine the presence or otherwise of worked coal seams. Should any shallow seam be proven the foundations will need reassessing based on guidance within CIRIA SP32 – *Construction over abandoned mine workings*.

The above suggestions should be regarded as tentative until Phase 2 intrusive works are undertaken and information is available regarding unrecorded coal workings, design loads and development layout.

### **6.5 Mining Assessment**

After analysis of the Mining report and from BGS geological data, it is believed settlement is likely to have completed within the known worked coal seams highlighted in the report, which includes the Kents Thick seam. However due to the mining report highlighting possible ancient shallow coal mining works, likely to relate to the Swinton Pottery Coal seam and Houghton Marine Band which appear to sub crop under the site and the Newhill Coal which is conjectured to dip beneath the site, it is recommended that Rotary borehole drilling is undertaken to determine the depths and extent of possible mining within these seams. It is recommended that a minimum of 3no boreholes are spread across the site to a depth of at least 20m to establish the extent of the shallow coal seams present and to ascertain if any voided or collapsed ground is present.

### **6.6 Preliminary Contamination Assessment**

The desk study has shown that the site is unlikely to have exposed to anything other than minimal

contamination, with construction waste such as brick rubble the most likely source.

In view of the current site uses, limited chemical contamination testing is considered necessary. The following chemical testing suite should be considered for selected soil samples:

**TABLE 2: POTENTIAL PRIORITY CONTAMINANTS**

| Inorganic Contaminants                                                                                                 | Organic Contaminants |
|------------------------------------------------------------------------------------------------------------------------|----------------------|
| Arsenic, Boron, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc, Selenium, Free Cyanide, Soluble Sulphate, pH, asbestos | Phenol               |

It should be noted that the above potential contaminants are considered to be commonly associated with the specified past land uses of the site, and adjacent land use. Risk assessment should be undertaken for contamination identified during intrusive investigation.

Potential pathways which link the potential contaminants to end users of the site and controlled waters (receptors) include the following:

- Ingestion of soil (outdoors) / dust (indoors)
- Skin contact with soil (outdoors) / dust (indoors)
- Inhalation of dust (outdoors and indoors)
- contamination via buried water pipes
- Surface water run-off, including via existing drainage infrastructure
- Downward infiltration of leachable contaminants to groundwater

## 6.7 Potential Sources of Ground Gas

Ground gases such as carbon dioxide and methane can be classed as a form of contamination. Potential sources of ground gases include:

- Made Ground
- Quarries, Infilled Clay Pits & Infilled Ponds
- Underlying Natural Strata (alluvium, peat and chalk)
- Petrol re-fuelling sites (which also includes Volatile Organic Compounds)
- Landfill (on and off-site)
- Coal measures

Based on historical map evidence and consideration of the sites environmental setting the table below shows a preliminary comparison of *consequence* against *probability* where ground gas is considered a potential threat to human health.

**TABLE 3: POTENTIAL GROUND GAS POLLUTION LINKAGES**

| Potential Sources                                                                           | Potential Pathway                                                              | Receptor                                                                                                                     |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Hazardous mine gases from Coal Measures strata (CO <sub>2</sub> , CO and CH <sub>4</sub> ). | Ingress and Accumulation into buildings from vertical and horizontal migration | Future users of site are likely to include adults and children.<br><br>Construction workers (in particular utility workers). |
| Thin made ground possible (CO <sub>2</sub> , CO and CH <sub>4</sub> ).                      | Ingress and Accumulation into buildings from vertical and horizontal migration |                                                                                                                              |
| Preliminary Comparison of Consequence verses Probability                                    |                                                                                |                                                                                                                              |
|                                                                                             | Classification                                                                 | Justification                                                                                                                |
| Probability<br><br>(Based on Table 8.1, CIRIA C665, 2007)                                   | LIKELY                                                                         | Coal mining area                                                                                                             |
|                                                                                             |                                                                                | Possible ground gas from made ground present on site.                                                                        |

|                                                                              |                              |                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Consequence</b><br>(Based on Table 8.2, CIRIA C665, 2007)                 | MEDIUM                       | New residential development.                                                                                                                                                                                                                         |
| <b>Consequence vs. Probability</b><br>(Based on Table 8.3, CIRIA C665, 2007) | <b>Risk</b><br>MODERATE RISK | <b>Details</b><br>It is possible that harm could arise to a designated receptor from an identified hazard. Investigation is required to clarify the risk and remedial works may be required in the long term. (Based on Table 8.4, CIRIA C665, 2007) |

## 6.8 Risk Assessment for Contaminated Land

As part of this Phase 1 Desk Study, a preliminary conceptual model and risk assessment is produced. This assessment should be revised following the Phase 2 Site Investigation outlining a qualitative risk assessment. Should there be unacceptable risks to the various receptors/end-users following the Phase 2 works, then a remediation strategy may be required to outline measures to satisfy Part 2A of the Environmental Protection Act (1990). The above measures are inline with CLR11 – Model Procedures.

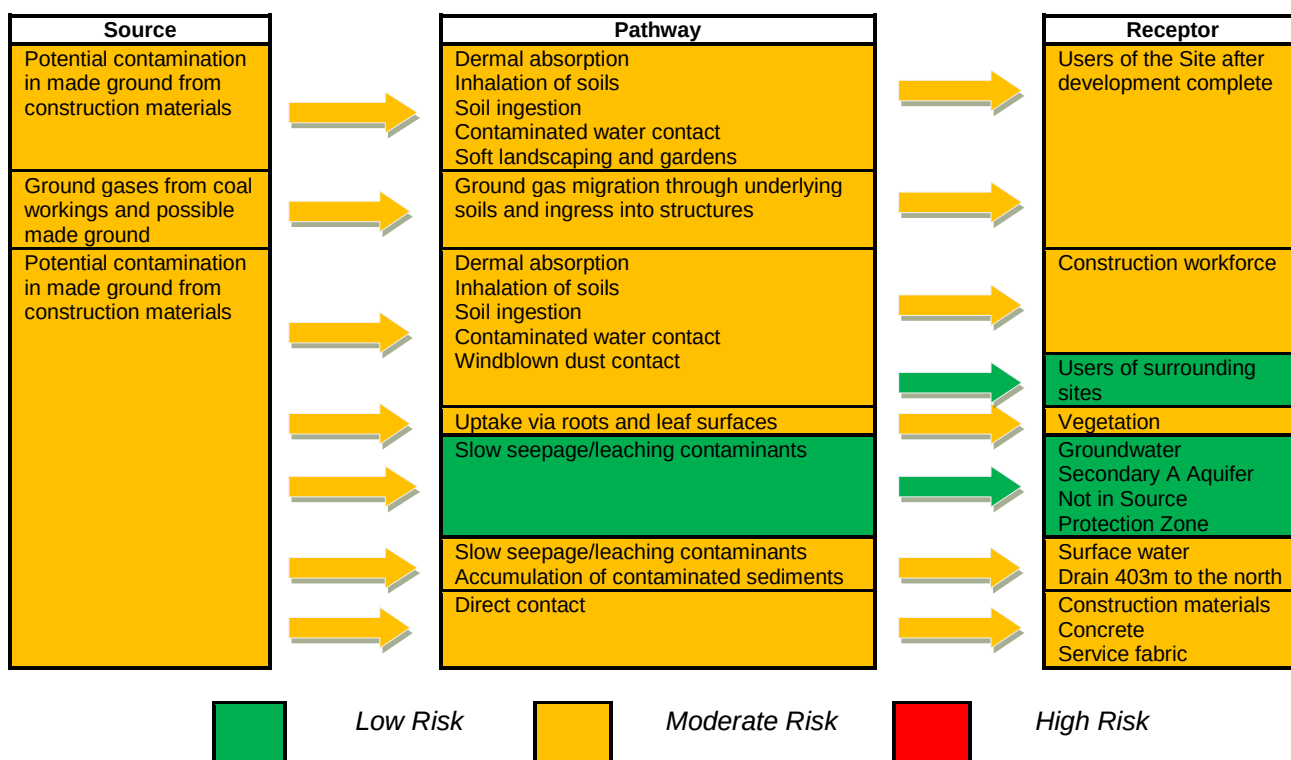
The results of the chemical contamination testing as part of the Phase 2 investigation should be compared to a series of Generic Assessment Criteria (GAC) for a residential development with plant up-take based on the current CLEA model.

## 6.9 Conceptual Site Model

The conceptual model collates the salient aspects of the site to form a model which should enable comparison after fieldwork and testing. This model identifies the potential pollution linkages that may influence the proposed development and geotechnical considerations.

The risk ratings are based on the current potential liabilities and likely potential future liabilities. The risks posed by the geotechnical and contamination aspects of the site will be revised following site works, and any mitigating action required added.

TABLE 4: PRELIMINARY CONCEPTUAL MODEL



## 7 PROPOSED PHASE TWO INTRUSIVE WORKS

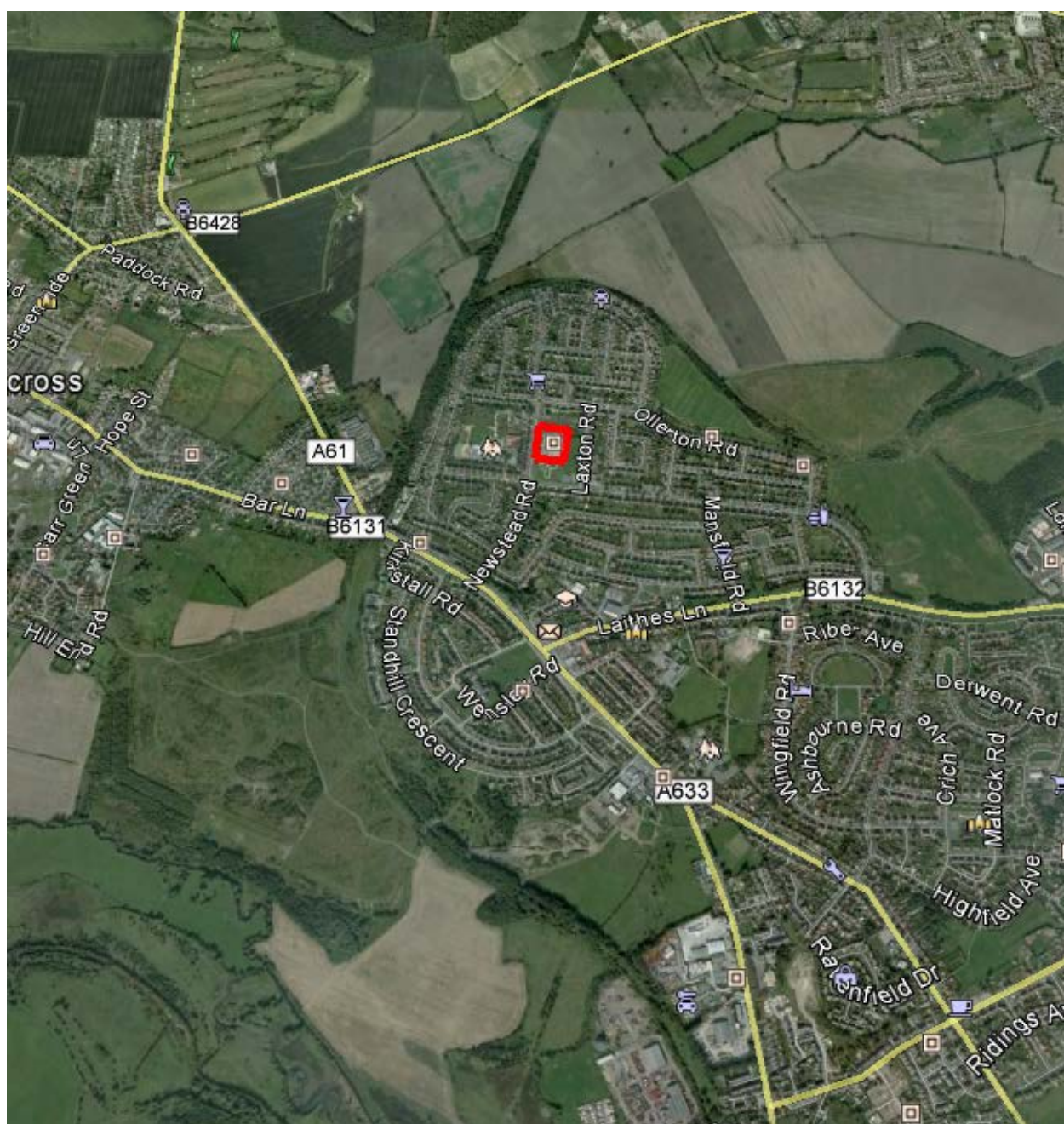
A Phase 2 Site Investigation should be undertaken to verify the assumptions made in the Preliminary Conceptual Site Model and to provide data for foundation design.

An outline ground investigation strategy is summarised below, based on the preliminary conceptual site model and information obtained during the desk study.

**TABLE 5: SITE INVESTIGATION RECOMMENDATIONS**

| Proposed method of investigation                       | Purpose                                                                                                                                                                                                                                                                                                                                              | Comments                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hand dug trial pits                                    | Hand dug trial pits to 1.2m to ensure positions are clear of underground services.                                                                                                                                                                                                                                                                   | To be undertaken prior to the drilling of all boreholes.                                                                                                                                                                                                                                                   |
| Window sampling boreholes to a maximum depth of 6m bgl | To determine shallow ground conditions.<br>To collect soil samples for geotechnical and chemical testing.<br>To observe soils profile, localised variations in materials and presence of groundwater.                                                                                                                                                | Ensure positions are CAT scanned and service plans inspected prior to excavation.<br>Hand vanes to be taken in cohesive deposits.<br>Bulk samples to be taken for earthworks testing.<br>SPT samples in granular strata and rock head.<br>Disturbed and jar samples to be undertaken for chemical testing. |
| Rotary boreholes to 20m bgl (Min 3no)                  | To determine ground conditions at depth and ascertain the depth of rock head if encountered to allow foundation design.<br>To determine the extent of shallow unrecorded coal workings beneath the site.                                                                                                                                             | Ensure positions are CAT scanned and service plans inspected prior to excavation.                                                                                                                                                                                                                          |
| Machine dug trial pits                                 | To determine shallow ground conditions.<br>To collect soil samples for geotechnical and chemical testing.<br>To observe soil profiles, localised variations in material and presence of groundwater.<br>To undertake percolation testing and determine the permeability characteristics of the underlying strata.<br>To undertake in-situ CBR tests. | Ensure positions are CAT scanned and service plans inspected prior to excavation.<br>Hand vanes to be taken in cohesive deposits. Disturbed and jar samples to be undertaken for chemical and geotechnical testing.                                                                                        |
| Gas/groundwater monitoring wells                       | To observe standing groundwater levels and to allow measurements to be made of hazardous gases and contamination levels in groundwater.                                                                                                                                                                                                              | Monitoring to be undertaken following site works on a minimum of four occasions.                                                                                                                                                                                                                           |
| Chemical testing                                       | To allow the potential risks identified within the conceptual model to be addressed.                                                                                                                                                                                                                                                                 | Chemical soils testing to include metals and asbestos.                                                                                                                                                                                                                                                     |
| Geotechnical Testing                                   | To confirm material properties.<br>To provide information for earthworks design,<br>To provide concrete classification of materials.                                                                                                                                                                                                                 | Tests to include sulphate and pH, moisture content, atterberg tests, triaxial, consolidation, compaction, particle size distribution and sedimentation tests.<br>Further tests may be required depending on the materials encountered e.g. organic matter content.                                         |

## **APPENDIX A: Figures & Plates**



|                       |                                       |              |              |
|-----------------------|---------------------------------------|--------------|--------------|
| <b>Title</b>          | Site Location Map                     |              |              |
| <b>Project</b>        | Newstead Road, Athersley, Barnsley    |              |              |
| <b>Client</b>         | Leeds & Yorkshire Housing Association |              |              |
| <b>Drawing Number</b> | Figure 1                              | <b>Scale</b> | Not to scale |
| <b>Date</b>           | August 2013                           |              |              |

|                       |                                       |              |              |
|-----------------------|---------------------------------------|--------------|--------------|
| <b>Title</b>          | Site Location Plan                    |              |              |
| <b>Project</b>        | Newstead Road, Athersley, Barnsley    |              |              |
| <b>Client</b>         | Leeds & Yorkshire Housing Association |              |              |
| <b>Drawing Number</b> | Figure 2                              | <b>Scale</b> | Not to scale |
| <b>Date</b>           | August 2013                           |              |              |



**Plate 1: View looking south east from the north west corner.**



**Plate 2: View looking south from the north west corner.**

|                    |                                       |
|--------------------|---------------------------------------|
| <b>Client:</b>     | Leeds & Yorkshire Housing Association |
| <b>Project:</b>    | Newstead Road, Athersley, Barnsley    |
| <b>Title:</b>      | Plates 1 & 2                          |
| <b>Drawing No:</b> | Figure 3                              |
| <b>Date</b>        | August 2013                           |



**Plate 3: View looking south from the north.**



**Plate 4: View looking north west from the south east.**

|                    |                                       |
|--------------------|---------------------------------------|
| <b>Client:</b>     | Leeds & Yorkshire Housing Association |
| <b>Project:</b>    | Newstead Road, Athersley, Barnsley    |
| <b>Title:</b>      | Plates 3 & 4                          |
| <b>Drawing No:</b> | Figure 4                              |
| <b>Date</b>        | August 2013                           |



**Plate 5: View looking south along the western boundary. .**



**Plate 6: View looking East from the south west.**

|                    |                                       |
|--------------------|---------------------------------------|
| <b>Client:</b>     | Leeds & Yorkshire Housing Association |
| <b>Project:</b>    | Newstead Road, Athersley, Barnsley    |
| <b>Title:</b>      | Plates 5 & 6                          |
| <b>Drawing No:</b> | Figure 5                              |
| <b>Date</b>        | August 2013                           |

## **APPENDIX B:**

### **Historical Map Extracts**

# Historical Mapping Legends

## Ordnance Survey County Series 1:10,560

|  |                                               |  |                             |  |               |
|--|-----------------------------------------------|--|-----------------------------|--|---------------|
|  | Gravel Pit                                    |  | Sand Pit                    |  | Other Pits    |
|  | Quarry                                        |  | Shingle                     |  | Orchard       |
|  | Osiers                                        |  | Reeds                       |  | Marsh         |
|  | Mixed Wood                                    |  | Deciduous                   |  | Brushwood     |
|  | Fir                                           |  | Furze                       |  | Rough Pasture |
|  | Arrow denotes flow of water                   |  | Trigonometrical Station     |  |               |
|  | Site of Antiquities                           |  | Bench Mark                  |  |               |
|  | Pump, Guide Post, Signal Post                 |  | Well, Spring, Boundary Post |  |               |
|  | 285 Surface Level                             |  |                             |  |               |
|  | Sketched Contour                              |  | Instrumental Contour        |  |               |
|  | Main Roads                                    |  | Minor Roads                 |  |               |
|  | Sunken Road                                   |  | Raised Road                 |  |               |
|  | Road over Railway                             |  | Railway over River          |  |               |
|  | Railway over Road                             |  | Level Crossing              |  |               |
|  | Road over River or Canal                      |  | Road over Stream            |  |               |
|  | Road over Stream                              |  |                             |  |               |
|  | County Boundary (Geographical)                |  |                             |  |               |
|  | County & Civil Parish Boundary                |  |                             |  |               |
|  | Administrative County & Civil Parish Boundary |  |                             |  |               |
|  | County Borough Boundary (England)             |  |                             |  |               |
|  | County Burgh Boundary (Scotland)              |  |                             |  |               |
|  | Rural District Boundary                       |  |                             |  |               |
|  | Civil Parish Boundary                         |  |                             |  |               |

## Ordnance Survey Plan 1:10,000

|  |                                                                       |  |                                                         |
|--|-----------------------------------------------------------------------|--|---------------------------------------------------------|
|  | Chalk Pit, Clay Pit or Quarry                                         |  | Gravel Pit                                              |
|  | Sand Pit                                                              |  | Disused Pit or Quarry                                   |
|  | Refuse or Slag Heap                                                   |  | Lake, Loch or Pond                                      |
|  | Dunes                                                                 |  | Boulders                                                |
|  | Coniferous Trees                                                      |  | Non-Coniferous Trees                                    |
|  | Orchard                                                               |  | Scrub                                                   |
|  | Bracken                                                               |  | Heath                                                   |
|  | Marsh                                                                 |  | Reeds                                                   |
|  | Building                                                              |  | Glasshouse                                              |
|  | Sloping Masonry                                                       |  | Pylon                                                   |
|  | Cutting                                                               |  | Embankment                                              |
|  | Road Under                                                            |  | Road Over                                               |
|  | Level Crossing                                                        |  | Foot Bridge                                             |
|  | Standard Gauge Multiple Track                                         |  | Standard Gauge Single Track                             |
|  | Siding, Tramway or Mineral Line                                       |  | Narrow Gauge                                            |
|  | Geographical County                                                   |  | Administrative County, County Borough or County of City |
|  | Municipal Borough, Urban or Rural District, Burgh or District Council |  | Borough, Burgh or County Constituency                   |
|  | Civil Parish                                                          |  |                                                         |
|  | Boundary Post or Stone                                                |  | Police Station                                          |
|  | Church                                                                |  | Post Office                                             |
|  | Club House                                                            |  | Public Convenience                                      |
|  | Fire Engine Station                                                   |  | Public House                                            |
|  | Foot Bridge                                                           |  | Signal Box                                              |
|  | Fountain                                                              |  | Spring                                                  |
|  | Guide Post                                                            |  | Telephone Call Box                                      |
|  | Mile Post                                                             |  | Telephone Call Post                                     |
|  | Mile Stone                                                            |  | Well                                                    |

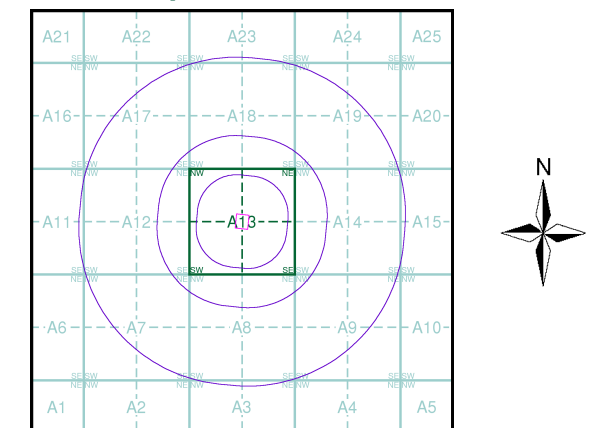
## 1:10,000 Raster Mapping

|  |                                                          |  |                                            |
|--|----------------------------------------------------------|--|--------------------------------------------|
|  | Gravel Pit                                               |  | Refuse tip or slag heap                    |
|  | Rock                                                     |  | Rock (scattered)                           |
|  | Boulders                                                 |  | Boulders (scattered)                       |
|  | Shingle                                                  |  | Mud                                        |
|  | Sand                                                     |  | Sand Pit                                   |
|  | Slopes                                                   |  | Top of cliff                               |
|  | General detail                                           |  | Underground detail                         |
|  | Overhead detail                                          |  | Narrow gauge railway                       |
|  | Multi-track railway                                      |  | Single track railway                       |
|  | County boundary (England only)                           |  | Civil, parish or community boundary        |
|  | District, Unitary, Metropolitan, London Borough boundary |  | Constituency boundary                      |
|  | Area of wooded vegetation                                |  | Non-coniferous trees                       |
|  | Non-coniferous trees (scattered)                         |  | Coniferous trees                           |
|  | Coniferous trees (scattered)                             |  | Positioned tree                            |
|  | Orchard                                                  |  | Coppice or Osiers                          |
|  | Rough Grassland                                          |  | Heath                                      |
|  | Scrub                                                    |  | Marsh, Salt Marsh or Reeds                 |
|  | Water feature                                            |  | Flow arrows                                |
|  | Mean high water (springs)                                |  | Mean low water (springs)                   |
|  | Telephone line (where shown)                             |  | Electricity transmission line (with poles) |
|  | Bench mark (where shown)                                 |  | Triangulation station                      |
|  | Point feature (e.g. Guide Post or Mile Stone)            |  | Pylon, flare stack or lighting tower       |
|  | Site of (antiquity)                                      |  | Glasshouse                                 |
|  | General Building                                         |  | Important Building                         |

## Historical Mapping & Photography included:

| Mapping Type         | Scale    | Date        | Pg |
|----------------------|----------|-------------|----|
| Yorkshire            | 1:10,560 | 1854 - 1855 | 2  |
| Yorkshire            | 1:10,560 | 1894        | 3  |
| Yorkshire            | 1:10,560 | 1907        | 4  |
| Yorkshire            | 1:10,560 | 1932        | 5  |
| Yorkshire            | 1:10,560 | 1938        | 6  |
| Yorkshire            | 1:10,560 | 1938 - 1948 | 7  |
| Yorkshire            | 1:10,560 | 1948        | 8  |
| Ordnance Survey Plan | 1:10,000 | 1955 - 1956 | 9  |
| Ordnance Survey Plan | 1:10,000 | 1965 - 1966 | 10 |
| Ordnance Survey Plan | 1:10,000 | 1973 - 1974 | 11 |
| Ordnance Survey Plan | 1:10,000 | 1980 - 1984 | 12 |
| Ordnance Survey Plan | 1:10,000 | 1990 - 1993 | 13 |
| 10K Raster Mapping   | 1:10,000 | 2006        | 14 |
| 10K Raster Mapping   | 1:10,000 | 2013        | 15 |

## Historical Map - Slice A



## Order Details

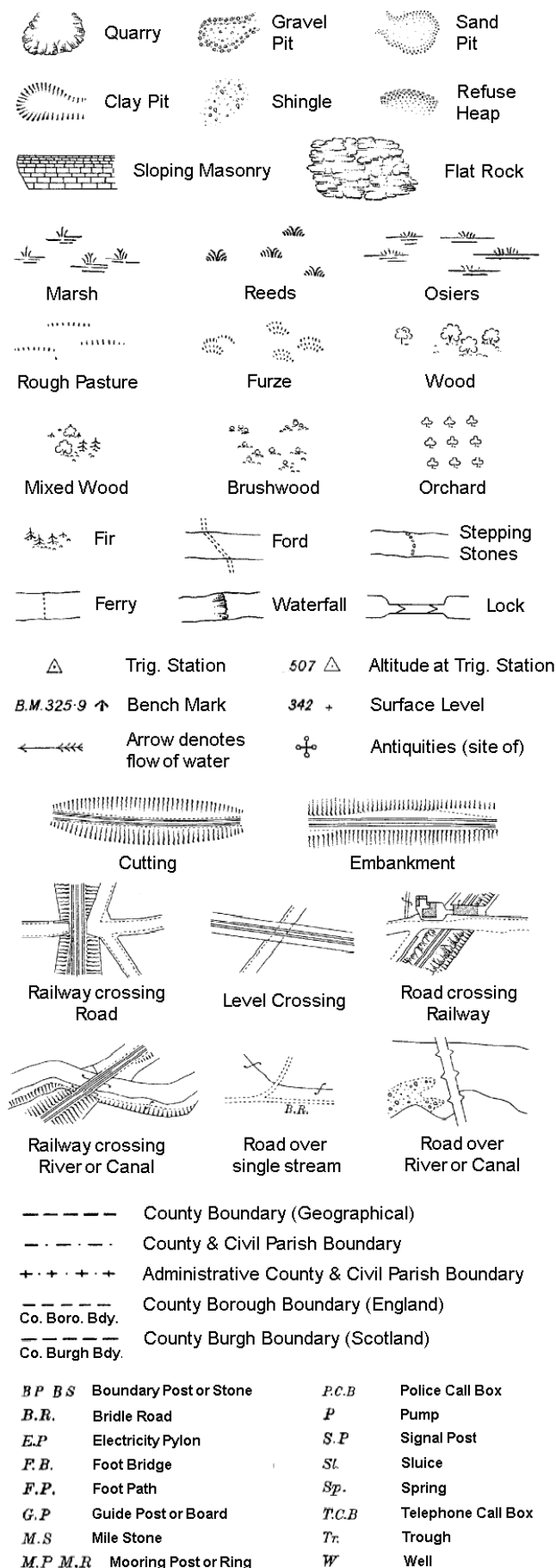
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 National Grid Reference: 434510, 409890  
 Slice: A  
 Site Area (Ha): 0.73  
 Search Buffer (m): 1000

## Site Details

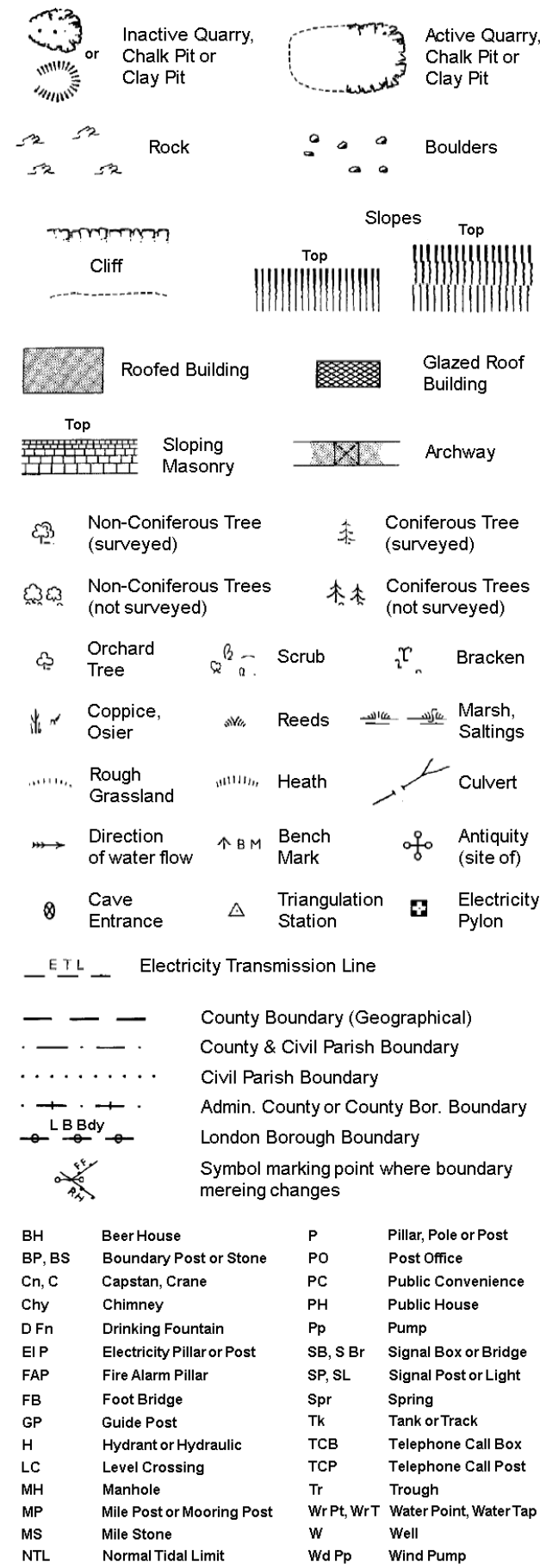
24, Laxton Road, Barnsley, S71 3DH

# Historical Mapping Legends

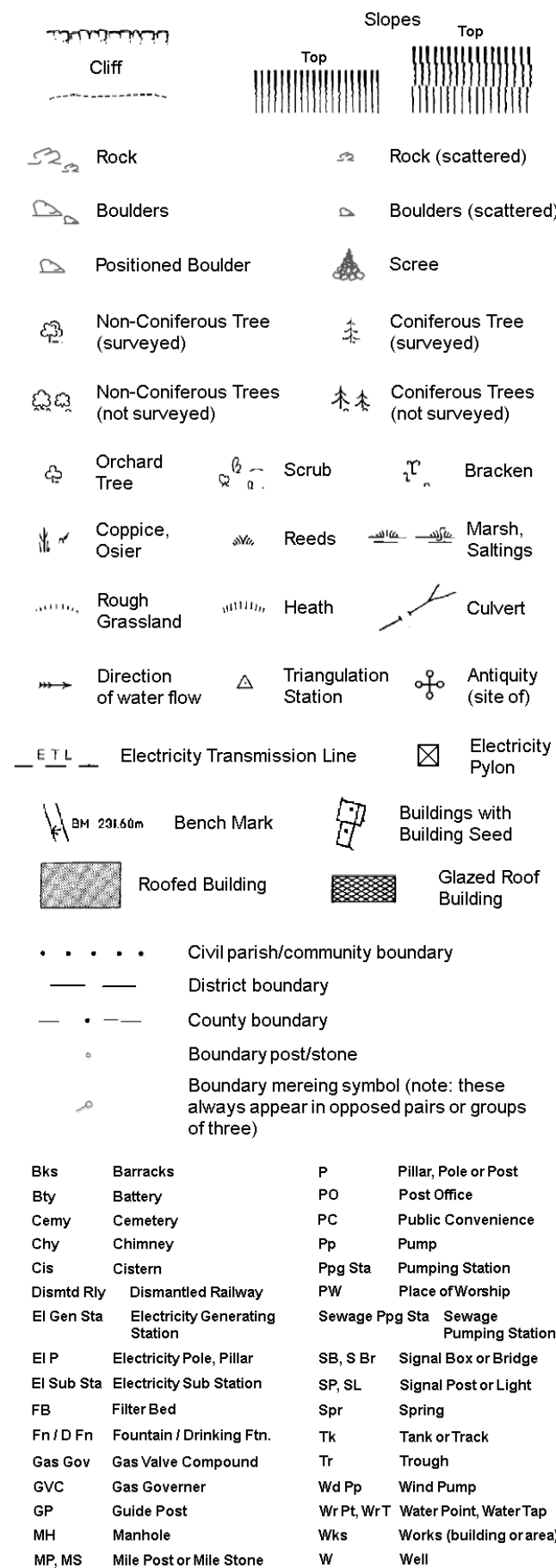
## Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



## Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



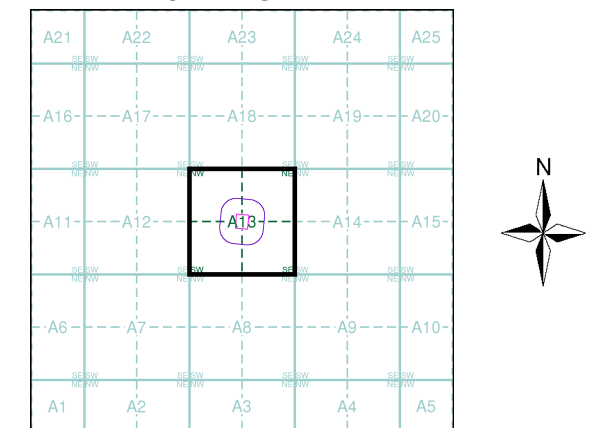
## Large-Scale National Grid Data 1:2,500 and 1:1,250



## Historical Mapping & Photography included:

| Mapping Type                             | Scale   | Date        | Pg |
|------------------------------------------|---------|-------------|----|
| Yorkshire                                | 1:2,500 | 1893        | 2  |
| Yorkshire                                | 1:2,500 | 1906        | 3  |
| Yorkshire                                | 1:2,500 | 1918        | 4  |
| Ordnance Survey Plan                     | 1:1,250 | 1959        | 5  |
| Additional SIMs                          | 1:1,250 | 1959 - 1991 | 6  |
| Ordnance Survey Plan                     | 1:2,500 | 1960 - 1962 | 7  |
| Ordnance Survey Plan                     | 1:1,250 | 1970        | 8  |
| Supply of Unpublished Survey Information | 1:1,250 | 1976        | 9  |
| Additional SIMs                          | 1:1,250 | 1991        | 10 |
| Large-Scale National Grid Data           | 1:1,250 | 1993        | 11 |
| Large-Scale National Grid Data           | 1:1,250 | 1994        | 12 |
| Large-Scale National Grid Data           | 1:1,250 | 1995        | 13 |

## Historical Map - Segment A13



## Order Details

Order Number: 48145389\_1\_1  
Customer Ref: S130805  
National Grid Reference: 434510, 409890  
Slice: A  
Site Area (Ha): 0.73  
Search Buffer (m): 100

## Site Details

24, Laxton Road, Barnsley, S71 3DH



Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: www.envirocheck.co.uk

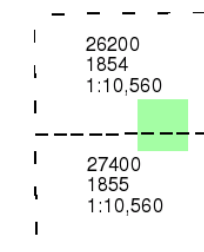
## Yorkshire

Published 1854 - 1855

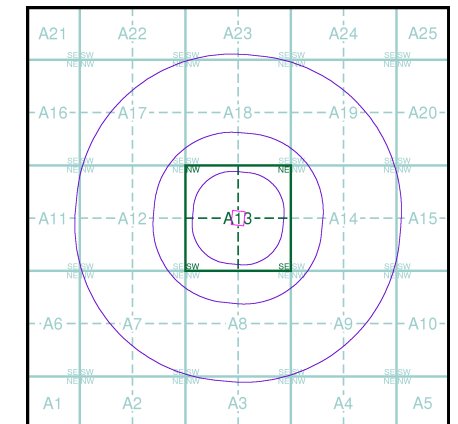
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

### Map Name(s) and Date(s)



### Historical Map - Slice A

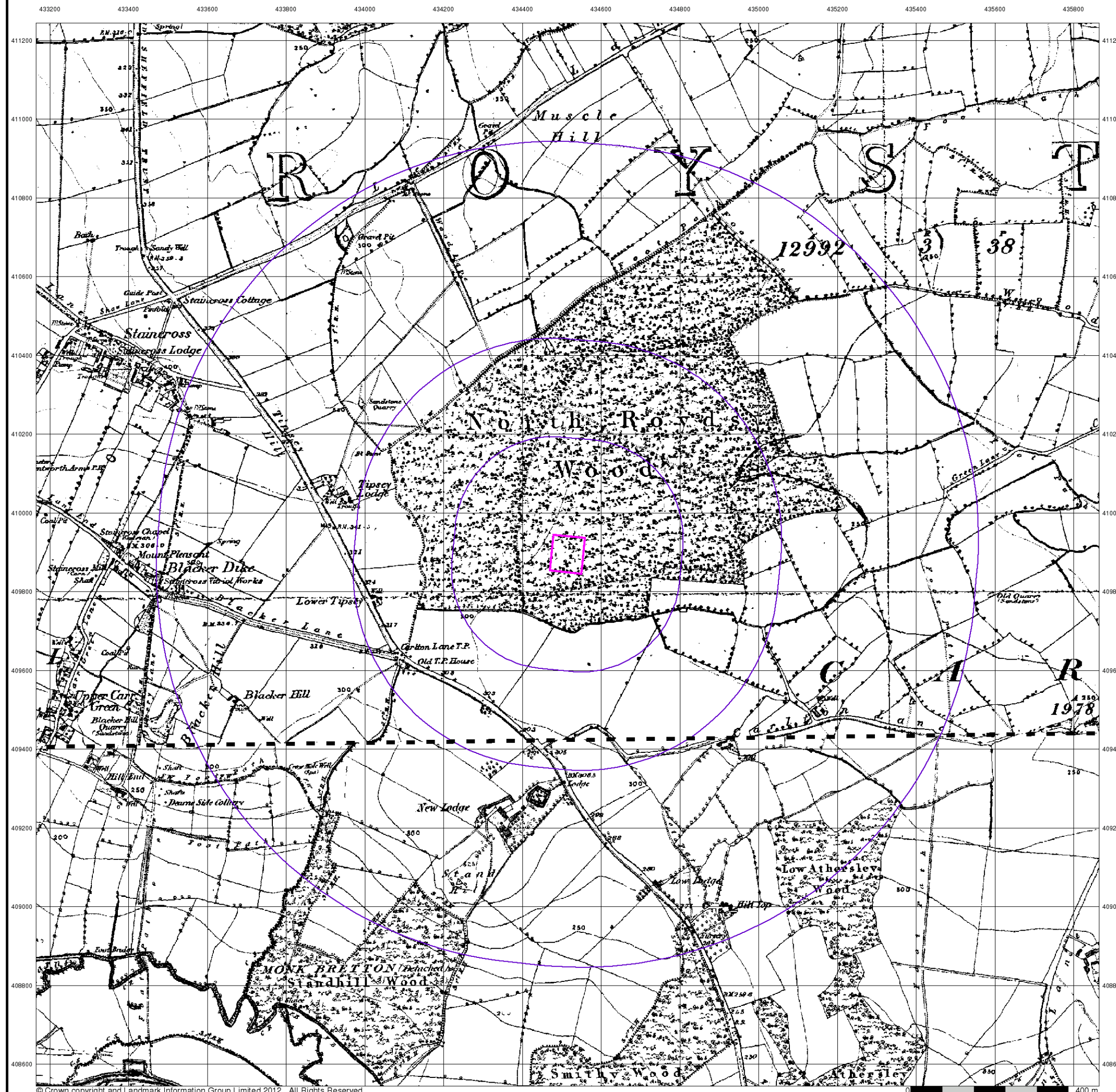


### Order Details

Order Number: 48145389\_1\_1  
 Customer Ref: S130805  
 National Grid Reference: 434510, 409890  
 Slice: A  
 Site Area (Ha): 0.73  
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### Site Details

24, Laxton Road, Barnsley, S71 3DH



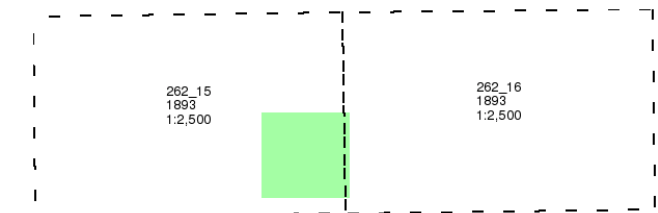
Yorkshire

Published 1893

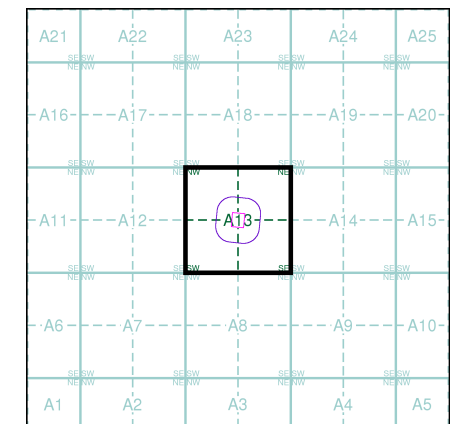
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13

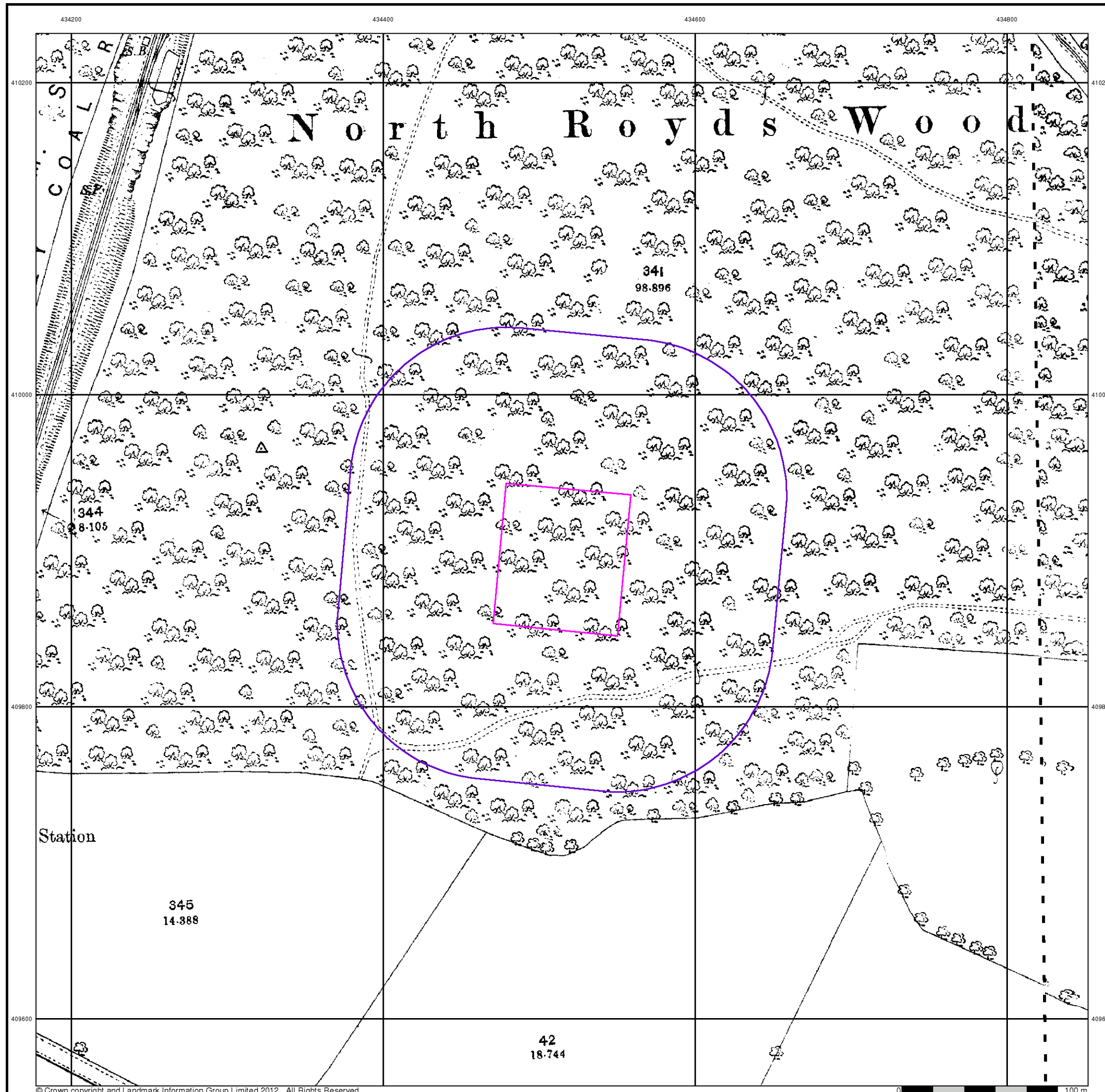


### Order Details

Order Number: 48145389\_1\_1  
 Customer Ref: S130805  
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 Slice: A  
 Site Area (Ha): 0.73  
 Search Buffer (m): 100

### Site Details

24, Laxton Road, Barnsley, S71 3DH



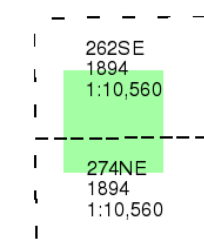
## Yorkshire

Published 1894

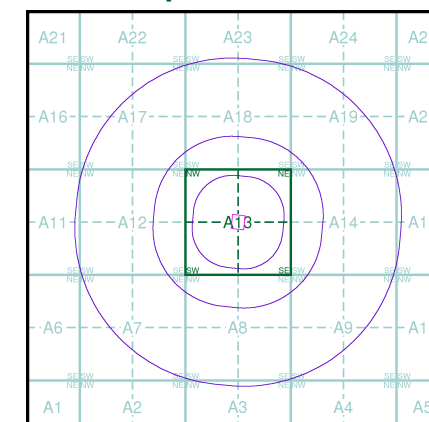
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

### Map Name(s) and Date(s)



### Historical Map - Slice A

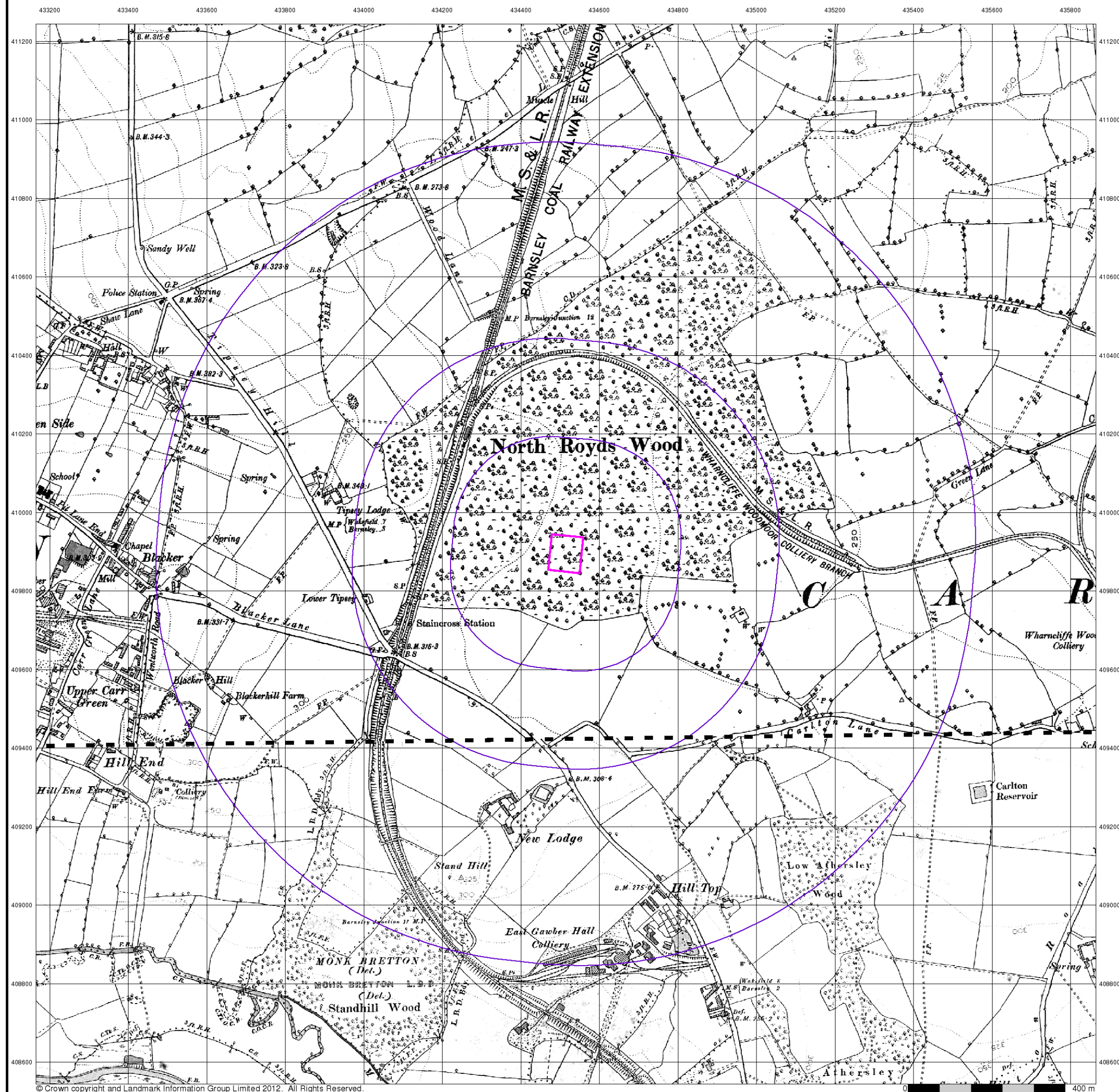


### Order Details

Order Number: 48145389\_1\_1  
 Customer Ref: S130805  
 National Grid Reference: 434510, 409890  
 Slice: A  
 Site Area (Ha): 0.73  
 Search Buffer (m): 1000

### Site Details

24, Laxton Road, Barnsley, S71 3DH



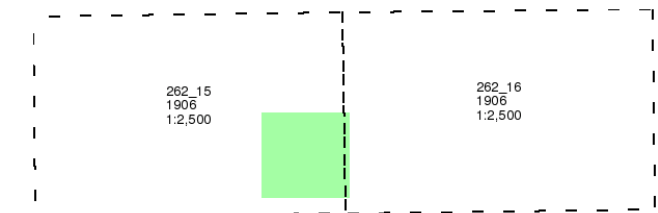
## Yorkshire

Published 1906

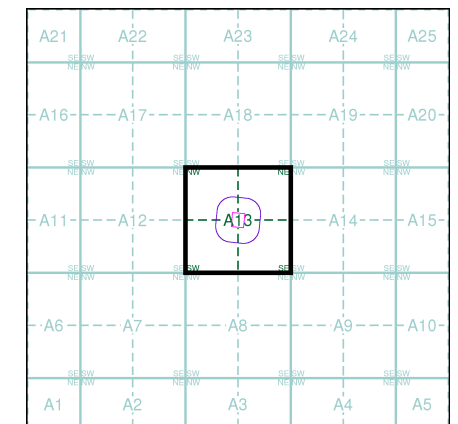
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13

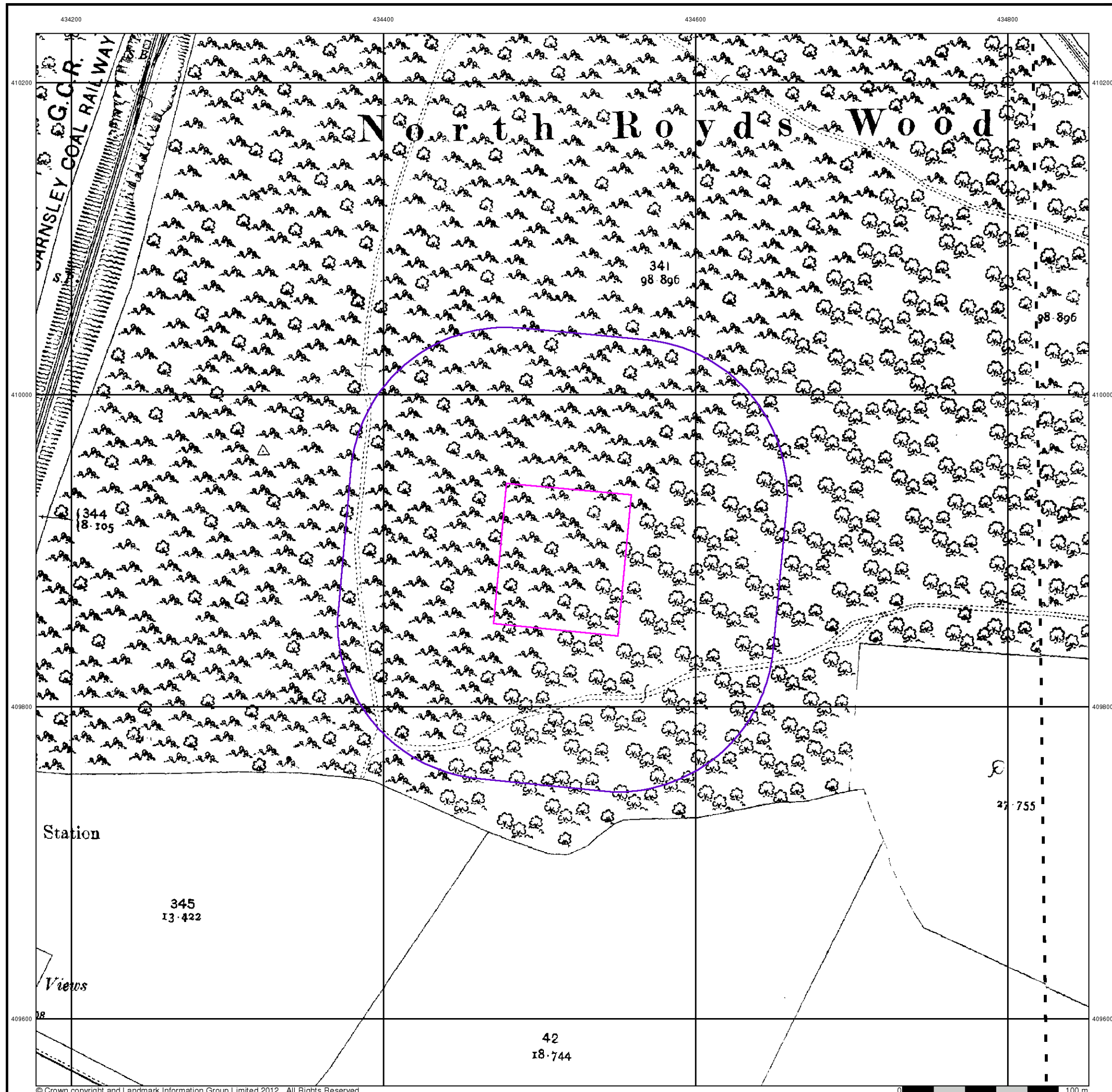


### Order Details

Order Number: 48145389\_1\_1  
Customer Ref: S130805  
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Slice: A  
Site Area (Ha): 0.73  
Search Buffer (m): 100

### Site Details

24, Laxton Road, Barnsley, S71 3DH



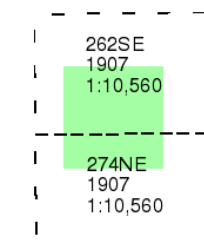
## Yorkshire

Published 1907

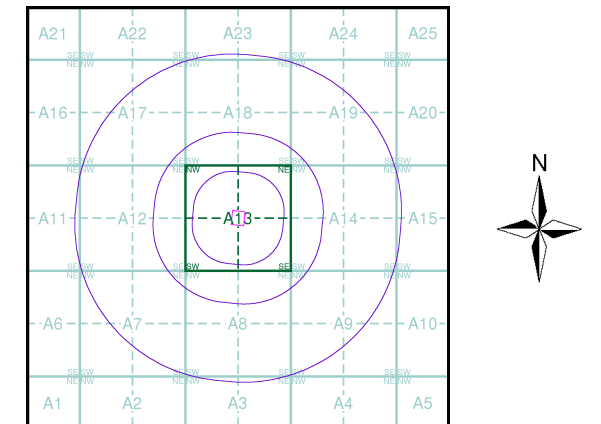
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

### Map Name(s) and Date(s)



### Historical Map - Slice A

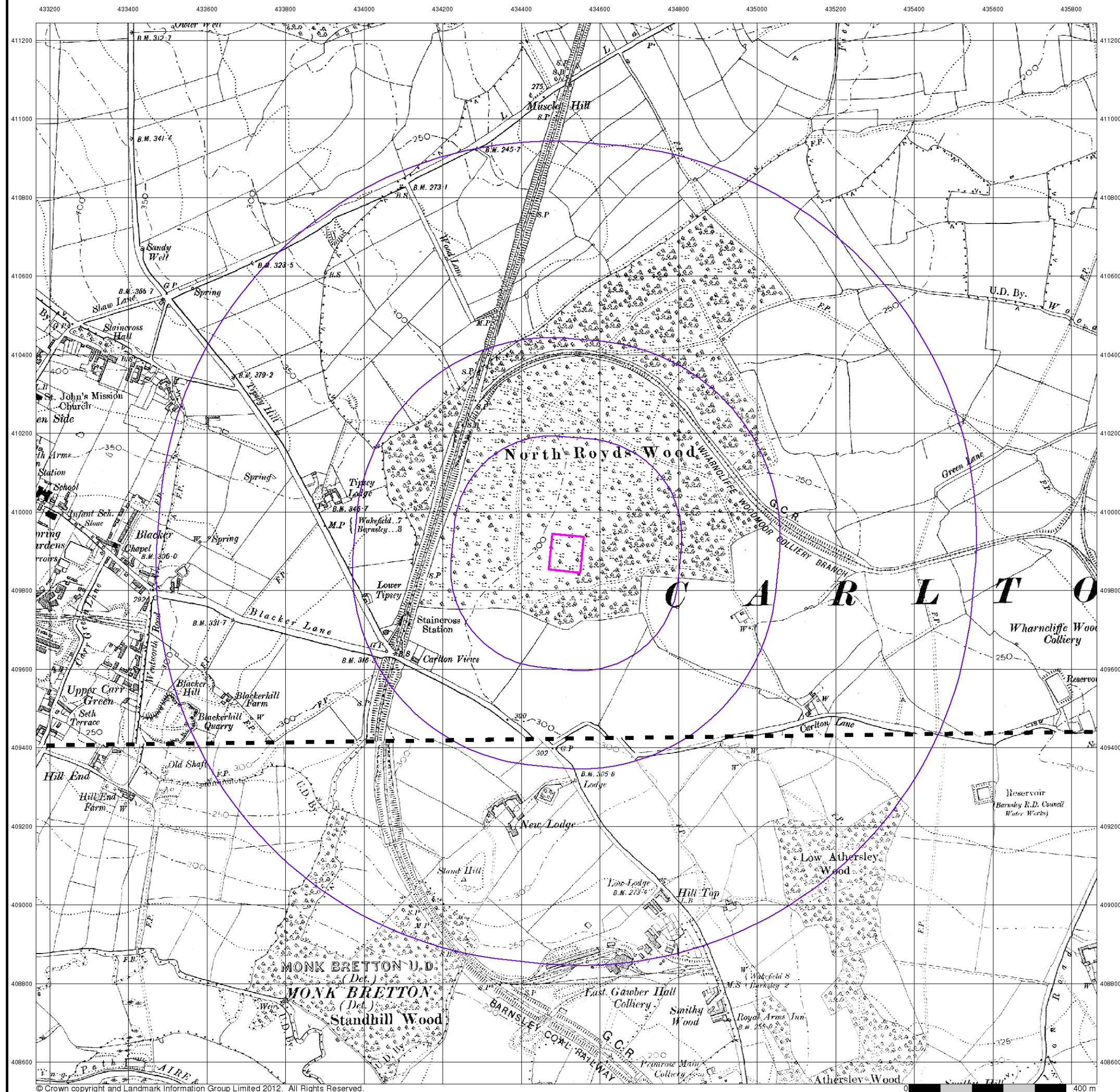


### Order Details

Order Number: 48145389\_1\_1  
Customer Ref: S130805  
National Grid Reference: 434510, 409890  
Slice: A  
Site Area (Ha): 0.73  
Search Buffer (m): 1000

### Site Details

24, Laxton Road, Barnsley, S71 3DH



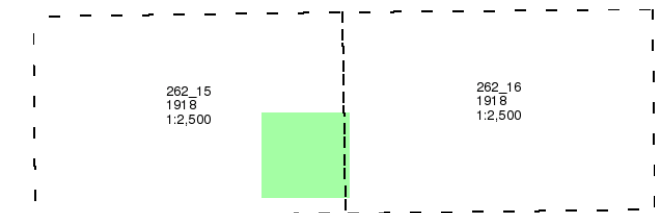
Yorkshire

Published 1918

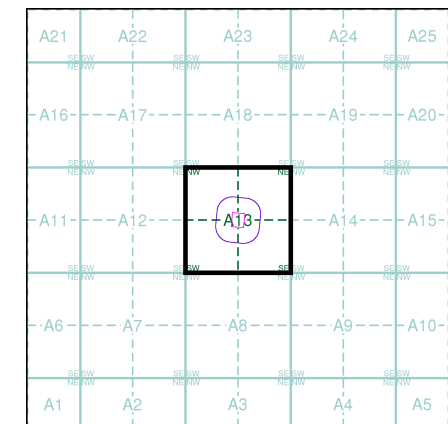
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13

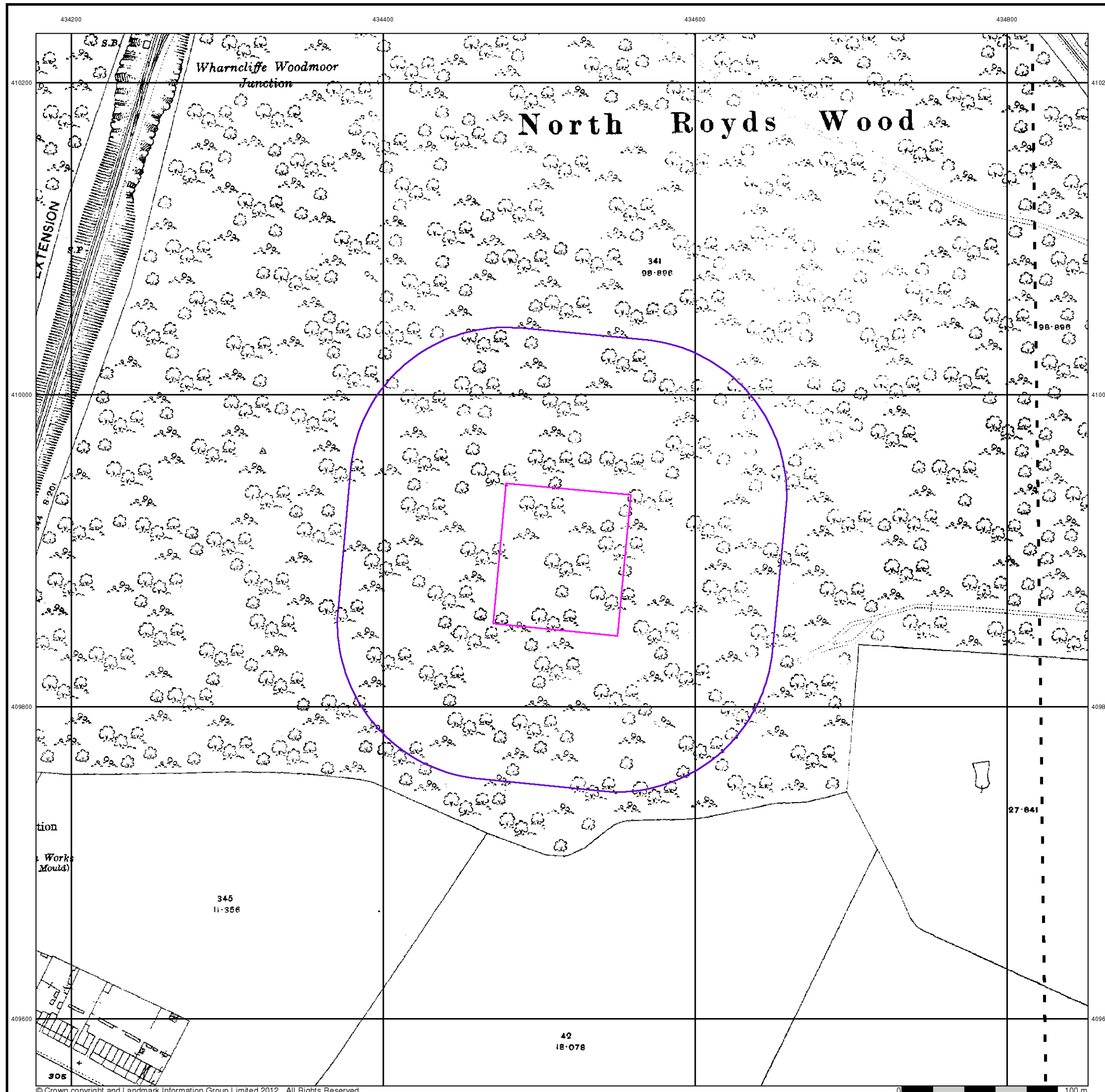


### Order Details

Order Number: 48145389\_1\_1  
 Customer Ref: S130805  
 National Grid Reference: 434510, 409890  
 Slice: A  
 Site Area (Ha): 0.73  
 Search Buffer (m): 100

### Site Details

24, Laxton Road, Barnsley, S71 3DH



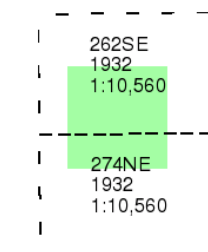
## Yorkshire

Published 1932

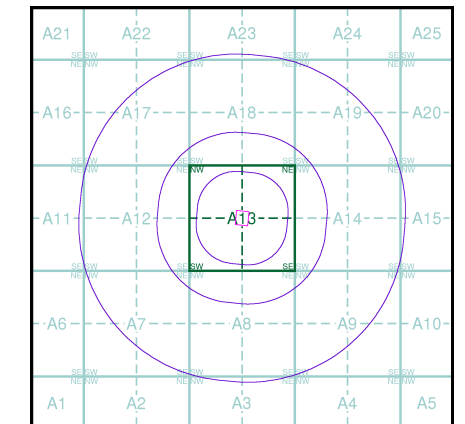
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A

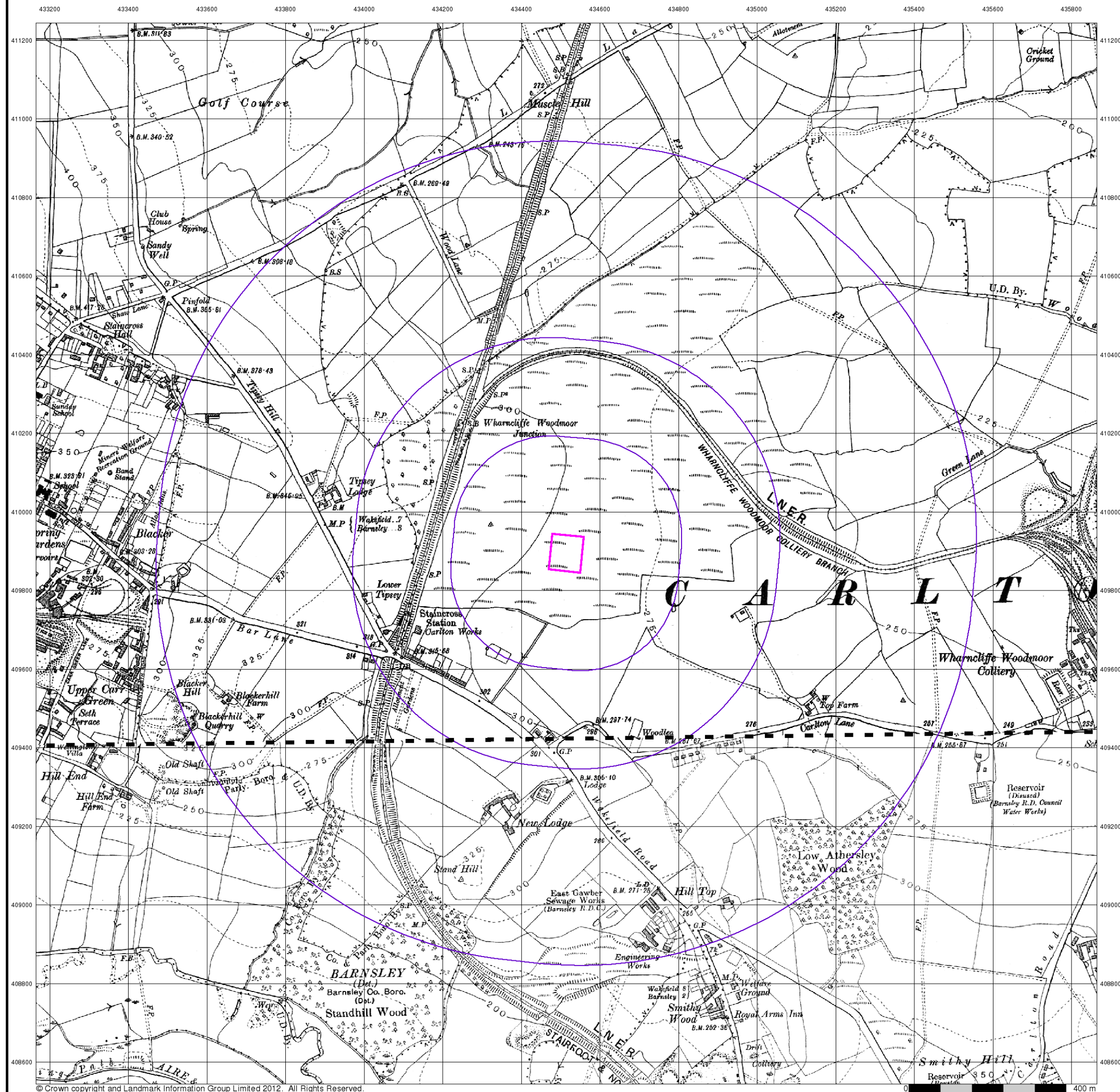


## Order Details

Order Number: 48145389\_1\_1  
Customer Ref: S130805  
National Grid Reference: 434510, 409890  
Slice: A  
Site Area (Ha): 0.73  
Search Buffer (m): 1000

## Site Details

24, Laxton Road, Barnsley, S71 3DH



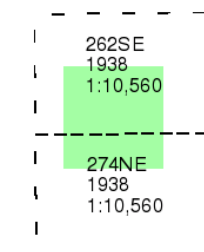
## Yorkshire

Published 1938

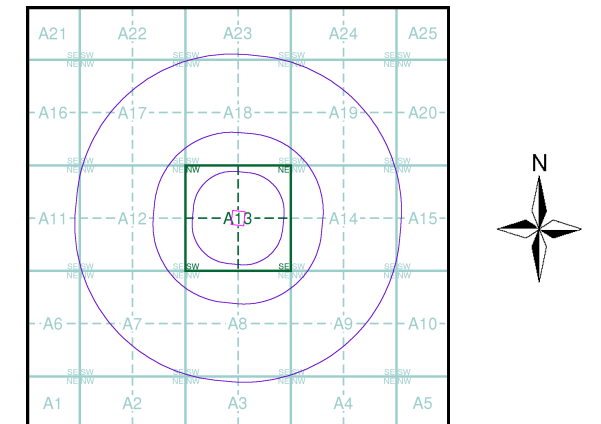
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

### Map Name(s) and Date(s)



### Historical Map - Slice A



### Order Details

Order Number: 48145389\_1\_1  
 Customer Ref: S130805  
 National Grid Reference: 434510, 409890  
 Slice: A  
 Site Area (Ha): 0.73  
 Search Buffer (m): 1000

### Site Details

24, Laxton Road, Barnsley, S71 3DH

