



BWB

CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

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Sladen Estates Ltd
Lakeview Drive
Bicester, Oxfordshire

Phase 1 Geo-environmental Assessment

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Lakeview Drive
Bicester, Oxfordshire
Phase 1 Geo-environmental
Assessment

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EXECUTIVE SUMMARY

| | |
|--|--|
| Site Address | Land off Lakeview Drive, Bicester, Oxfordshire, OX26 1DE |
| Proposed Development | The proposed development is anticipated to comprise the development of up to 55,000m ² of office space. |
| Site Setting | <p>The site is irregular in shape and occupies approximately 21.0ha of land. The site currently comprises three large open fields used for grass / hay making and a landscaped area to the north including a large pond.</p> <p>The western half of the site is generally flat, with the eastern half gently sloping to the east. Numerous small banks have been formed across the landscaped area to the north. Two drainage ditches cut north to south across the site, one in the western area and the second towards the east. Both ditches were noted to be dry.</p> |
| Anticipated Ground Conditions | <p>Information published by the BGS indicates that the site is directly underlain by Alluvium overlying River Terrace Deposits (RTD) to the east, south and western areas of the site, no superficial deposits are mapped across to the centre and northern areas. The solid geology beneath the site comprises the Kellaways Clay Member underlain by the Cornbrash Formation, although the Kellaways Formation is absent in the west of the site.</p> <p>The Environment Agency (EA) classifies the superficial deposits (RTD) and Cornbrash Formation as a Secondary A Aquifer. The Kellaways Clay Member is designated as an unproductive strata.</p> <p>The southern and eastern areas of the site lie within an EA designated Zone 2 and 3 floodplain.</p> |
| Site History | <p>The site has remained relatively undeveloped since the earliest mapping produced in 1881. The site has been shown to comprise agricultural land with several small buildings located in the western extents of the site, these are believed to be associated with farming activities.</p> <p>The surrounding land has been utilised for agricultural uses, with a sewage works and railway line located immediately south and east of the site since 1880. The sewage works was extended in the 1970s and 80s. The residential and shopping centres close to the site have been constructed since the early 2000s with the Tesco completed approximately 18 months ago.</p> |
| Regulatory Setting | With the exception of two offsite entries for the uses of Dangerous Substances and a Part B Process, the regulatory review did not highlight land uses which are considered to represent a significant risk to the site or surrounds. |
| Geotechnical Setting | The Alluvium deposits present on site may be highly organic in nature and are known to be compressible, therefore foundations may need to be deepened through this stratum. The River Terrace deposits and underlying solid geologies may be suitable as founding strata. |
| Environmental Appraisal | Based on the historical land uses that have occurred at or in close proximity to the site, the risk assessment has indicated that site poses a low to moderate risk to future site users and to controlled waters receptors. |
| Recommendations | A detailed ground investigation is recommended to ascertain the geotechnical and environmental properties of the underlying ground conditions for foundation design. |
| This summary should be read in conjunction with BWB's full report (ref. LDB-BWB-00-XX-RP-EN-0001-DS_P1) and reflects an assessment of the Site based on information received by BWB at the time of production. | |

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Appendix 4 Historical Ordnance Survey Plans
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1 INTRODUCTION

Instruction

- 1.1 BWB Consulting (BWB) was instructed by Sladen Estates Ltd (the Client) to carry out a Geo-environmental review at the site at Lakeview Drive, Bicester, Oxfordshire. Details of the project brief are included in BWB proposal reference 170623/01/NTE2366/RPD/LC, dated June 2017.
- 1.2 The proposed development is anticipated to comprise the development of up to 55,000m² of office space. Details on the design of the proposed development have not been provided to date, however BWB anticipate that development will be no taller than 3 stories and include areas of car parking and limited soft landscaping.
- 1.3 A proposed development plan (drawing reference 16SK109, undated) and assumed current at the time of writing this report is presented as **Appendix 1**.

Objectives

- 1.4 This report has been completed to present pertinent information on the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS10175: 2011 'Investigation of Potentially Contaminated Sites Code of Practice' and CLR11 'Model Procedures for the Management of Contaminated Land'. The objectives of the report are:
 - To assess historical activities at the site with respect to their potential impact on the site environment;
 - To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities;
 - To assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact the subject property;
 - To review existing site investigation and remediation information available for the site;
 - To develop a preliminary Conceptual Site Model (CSM); and
 - To assess potential environmental liabilities associated with the site.

Scope of Works

- 1.5 The scope of work included:
 - Site visit to inspect the current condition of the site at ground surface (photographs presented as **Appendix 2**);
 - Review of the following information:
 - Historical Ordnance Survey Mapping (presented as **Appendix 3**);
 - Groundsure Reports comprising GeoInsight and EnviroInsight numbered HMD-214-4080158 and HMD-214-4080159 (presented as **Appendix 4**) respectively;
 - British Geological Survey (BGS) Borehole Records (www.bgs.co.uk);
 - BGS mapping sheet 219 'Buckingham: solid and drift' (1:50,000 scale), dated 2002;

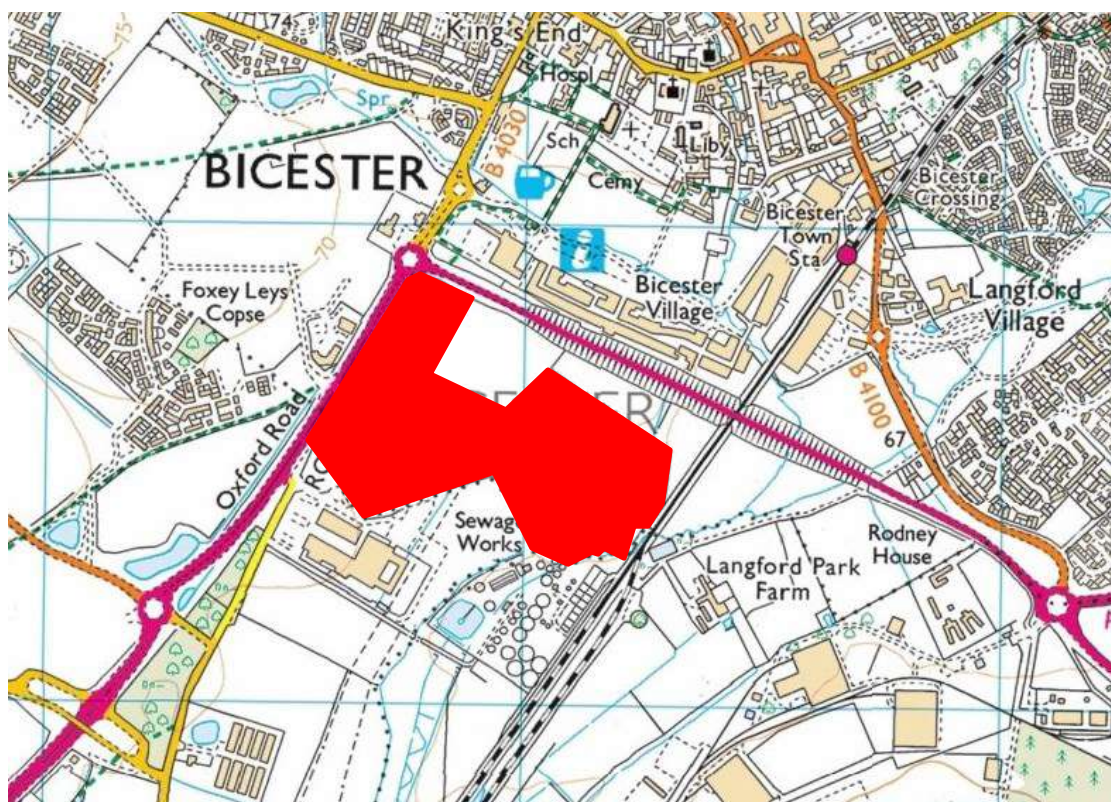
- Environment Agency website (www.environment-agency.gov.uk).
- Provide a summary of key ground risks that require further ground investigation in order to control the identified risks; and
- Produce a geo-environmental desk study (this report) providing qualitative contamination risk assessment and ground-related constraints to the proposed development.

2 THE SITE

Site Location

- 2.1 The site is located at Lakeview Drive Bicester, Oxfordshire, centred at National Grid reference 457953, 221555. The approximate location of the site is shown in **Figure 1**.

Figure 1 Site Location Plan



Reproduced from the Ordnance Survey Open Map with the permission of the controller of Her Majesty's Stationery Office Crown Copyright Reserved.

Site Description

- 2.2 BWB undertook a site walkover on Monday 14th August 2017. Photographs from the site visit are presented in **Appendix 2**. The layout of the site with the main features shown is presented on **Drawing 1**.
- 2.3 The site is irregular in shape and occupies approximately 21.0ha of land. The site currently comprises three large open fields used for grass / hay making and a landscaped area to the north including a large pond. The site is accessed via a traffic island off Lakeview Drive to the northeast of the site. A stone roadway is present in the north of the site, which is believed to have formed a yard area for recent development works.
- 2.4 The western half of the site is generally flat, with the eastern half gently sloping to the east. Numerous small banks have been formed across the landscaped area to the north. Two drainage ditches cut north to south across the site, one in the western area and the second towards the east. Both ditches were noted to be dry with the exception of the most southerly extents of the west ditch where it fed into a small pond

-
- located offsite. The most western and eastern fields are accessed via small bridges spanning the drainage ditches.
- 2.5 Several large stockpiles of materials including set concrete, bricks and surplus topsoil is located near the former yard area near Lakeview Drive.
- 2.6 Numerous Aboveground Storage Tanks (ASTs) are located along the northern boundary of the grassed fields. These are understood to contain water for use in the fields.
- 2.7 Offsite land uses comprise a Tesco supermarket and Bicester shopping village to the north, railway land to the east, further shopping outlets and a sewage works to the south and a residential development with hotel and restaurant to the west. An Electrical Substation (ESS) is located approximately 20m north of the site boundary (east of Tesco).

3 PUBLISHED GROUND CONDITIONS

3.1 The anticipated ground conditions for the site and controlled waters vulnerability is discussed within **Table 1** below.

Table 1 Published Ground Conditions

| | |
|-----------------------|---|
| <p>Geology</p> | <p>Information published by the BGS indicates that the site is directly underlain by Alluvium overlying River Terrace Deposits (RTD) to the east, south and western areas of the site, no superficial deposits are mapped across the centre and northern areas. The solid geology beneath the site comprises the Kellaways Clay Member underlain by the Cornbrash Formation, with the Kellaways Clay Member absent in the west.</p> <p>No Made Ground is mapped across the site, however limited Made Ground deposits are anticipated to the north west area as a result of historical developments and recent construction works across the neighbouring plots (Tesco Superstore). The Groundsure Report indicates Made Ground is present along the northern boundary (A41 roadway) and eastern boundary (railway line).</p> <p>Varying thicknesses of Topsoil are anticipated across the site.</p> <p>Several historical BGS borehole records are located within the site boundary. Borehole log SP25SE81 is located along the eastern boundary and details topsoil to 0.25m below ground level (bgl), Alluvium deposits to 3.7m bgl, dense clayey sand to 6.2m bgl, the Kellaways Clay member to 9.3m bgl overlying the Cornbrash Formation (limestone).</p> <p>Additional borehole records (refs: SP25SE78 & SP25SE82) also located along the eastern boundary generally confirm the ground conditions detailed above, with the Cornbrash Formation encountered between 8.05m and 10.6m bgl respectively.</p> |
| <p>Hydrogeology</p> | <p>The EA classifies the superficial deposits (RTD) and Cornbrash Formation as a Secondary A Aquifer. The Kellaways Clay Member is designated as an unproductive stratum.</p> <p>There are no licenced discharge consents to groundwater listed within 250m of the site boundary.</p> <p>There is one groundwater abstraction license listed as approximately 190m north east of the site for pollution remediation purposes at a former petrol station.</p> <p>The site is not within an EA designated Source Protection Zone.</p> <p>Historical borehole logs located on site encountered perched groundwater within the shallow Alluvium deposits at depths between 1.7m and 3.3m bgl. A second water body was recorded within the Kallaways Clay Member between 5.5m and 7.8m bgl.</p> |
| <p>Surface Waters</p> | <p>The Groundsure report indicates that two surface water features are present on site, one running north to south in the eastern part of site and the second along the eastern boundary. Both are listed as unnamed tertiary rivers. An unnamed primary river runs along with south eastern boundary (fed by the tertiary rivers), all these entries are understood to flow in a southerly direction.</p> <p>Two drainage ditches are present on site cutting east to west. One is located to the north of the site with the second located to the south. Both were noted to be dry at the time of the site visit.</p> |

| | |
|--------------------------------------|---|
| | <p>A small pond is located immediately adjacent to the northwest boundary of the site.</p> <p>There are 11 records of licensed discharge to surface waters listed within the Groundsure® EnviroInsight Report within 250m off the site. The closest entry is located 70m southwest of the site and refers to sewage discharge from a sewage treatment works (STW). Other entries relate to miscellaneous water discharges from the retail park to the north of the site and other effluent discharges from the neighbouring STW to the south. None of the entries are considered to represent a significant risk to the site environs.</p> <p>There are no surface water abstraction licences listed within 500m of the site.</p> <p>There is one pollution incident listed approximately 5m south of the site for the release of an unknown pollutant which caused category 3 (minor) impact to water. It is considered unlikely that any of these incidents have had a detrimental impact upon the site.</p> <p>The southern and eastern areas of the site lie within an EA designated Zone 2 and 3 floodplain.</p> <p>Biological water quality for the Langford Brook, located 300m south of the site, has been recorded as B (good) between 2005 and 2009. Chemical quality at the same location was recorded as B (good) 2005 to 2008 and C in 2009.</p> |
| <p>Ground Gas & Radon</p> | <p>The site is not located within a radon affected area, as less than 1% of properties are above the action level.</p> <p>Made Ground deposits are indicated to be present to the north and east of the site. Depending on the presence of deleterious/degradable materials, there is the potential for elevated concentrations of ground gases to be present beneath the proposed development.</p> <p>The Alluvium superficial deposits present on site are likely to be highly organic in nature and may represent a source of hazardous ground gases.</p> |
| <p>Mining and Mineral Extraction</p> | <p>No mining or mineral extraction is known to have occurred within 1 km of the site.</p> |

4 SITE HISTORY

- 4.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from the 1880 OS County Series to the current 2014 OS Plans. The historical plans reviewed have been reproduced in **Appendix 4**. The key points of the historical development of the site and surrounding area are summarised below in **Tables 2** and **3**.

Table 2 Key Points of Site Development History

| Dates | On Site | Significance |
|-------------|--|---|
| 1881 - 2014 | <p>The site is shown to comprise agricultural fields.</p> <p>Two outbuildings are mapped to the north of the site between 1881 to 1922. These were likely DEMOLISHED and a small pond was constructed. By 1983, the pond has been INFILLED and numerous small BUILDINGS of unknown uses have been constructed</p> <p>A small pond is mapped in the south of the site from 1900 to 1993 when it is assumed to be INFILLED.</p> <p>A small water course is mapped to cut across the eastern part of site (north to south) with several crossing points. By 1986 a second unnamed water course is mapped along the eastern boundary.</p> <p>By 2014, the small buildings to the north of site have been DEMOLISHED, with Lakeview Drive now constructed and a water feature (assumed to be a pond) created to the north of site.</p> <p>Maps reviewed:</p> <p>1:2,500 – 1881, 1900, 1922, 1966, 1967, 1968, 1972 & 1980.</p> <p>1:10,000 – 2002, 2010 & 2014.</p> | <p>Limited potentially significant sources of contamination have been identified from the onsite history.</p> <p>The INFILLED ponds, DEMOLISHED buildings and excavated pond may have generated MADE GROUND on the site which may potentially represent a source of elevated ground gases (carbon dioxide and methane).</p> <p>The agricultural uses of the site may have led to a build-up of AGROCHEMICALS within the shallow soils across the site.</p> |

SOURCES IN BOLD AND CAPS *Receptors bold and italics*

Table 3 Key Points of Surrounding Area Development History

| Dates | Off Site | Significance |
|-------------|---|---|
| 1880 - 1966 | <p>The area around the site is indicated to generally comprise agricultural land. A RAILWAY is located immediately adjacent to the eastern boundary, with the Roman Way (road) immediately to the west. A SEWAGE TANK is located approximately 25m south of the site. An unnamed water course is mapped to flow around the eastern and southern boundaries of the site flowing in a southerly direction.</p> | <p>The surrounding land use is believed to represent limited risks to the site.</p> <p>The SEWAGE TANK may be a source of metals, inorganics, asbestos, organic compounds, micro-organisms and hazardous ground gases.</p> |

| Dates | Off Site | Significance |
|--------|---|--|
| | <p>The town of Bicester is located approximately 500m north of the site and is shown to expand in all directions throughout the mapping period.</p> <p>By 1966 a number of DEPOTS are mapped approximately 450m southeast.</p> <p>No further significant changes are noted throughout this mapping period.</p> <p>Maps reviewed:</p> <p><i>1;10,000 – 1880, 1885, 1898, 1920, 1938, 1950, 1955 & 1966.</i></p> | |
| 1970 - | <p>By 1970 the SEWAGE TANK has been expanded into a SEWAGE TREATMENT WORKS with numerous TANKS and FILTER BEDS. This facility was expanded further by 1985.</p> <p>A Nursery is located immediately south of the site. By 1995 a pond is shown within its grounds. By 2010 the Nursery has been DEMOLISHED with the Bicester Village retail development now constructed.</p> <p>A number of small BUILDINGS of unknown use with an associated well are located approximately 75m north of the site.</p> <p>By 1995 the Roman Road has been renamed as Oxford Road, with EARTHWORKS for the A41 road development now mapped along the northern boundary. A number of unnamed BUILDINGS belonging to the Bicester Retail Village are mapped approximately 100m north of the site.</p> <p>The 2014 map shows that the Tesco superstore has been developed immediately north of the site.</p> <p>Maps reviewed:</p> <p><i>1;10,000 – 1970, 1985, 1995, 2002, 2010 & 2014.</i></p> | <p>The SEWAGE TREATMENT WORKS may be a source of metals, inorganics, asbestos, organic compounds, micro-organisms and hazardous ground gases.</p> <p>Limited MADE GROUND is likely to be present as a result of nearby road and building developments which may be a source of hazardous ground gases.</p> |

SOURCES IN BOLD AND CAPS

Receptors bold and italics

Aerial Photographs

- 4.2 An aerial photograph contained within the Groundsure® Report (**Appendix 4**, dated 6th September 2015) shows the site in its current layout, comprising mostly agricultural fields with Lakeview Drive to the north and the Bicester Village and a sewage treatment works (STW) to the south. A storage yard area for the Tesco development to the north of the site is shown in the north of the site, which is now understood to have been removed and the site reinstated to agricultural land.

Operational / Company Records

- 4.3 No operation records have been reviewed as part of this assessment.

Previous Investigation Reports

- 4.4 No investigation reports have been undertaken by BWB or have been provided for review as part of this assessment.

5 REGULATORY SETTING

Planning History

- 5.1 Review of the online planning portal for Cherwell District Council indicates that planning permission for the construction of Lakeview Drive and alternations to the surrounding road network including landscaping was made on 16th June 2016 (ref: 16/00282/DOSC) and granted on 18th April 2017. In total, 13 constraints were placed on the development, relating to land classification, groundwater vulnerability, water utilities, air safeguarding (wind farm and airport airspace), archaeological, habitat protection (otter, badger and lapwings) and public rights of way.
- 5.2 The above application was related to the application for the construction of the Tesco Superstore (including petrol station) (ref: 15/01651/F) made on 4th September 2015 and granted on 18th April 2016 and an application (ref: 12/01193/F) made on 20th August 2012 and granted 13th January 2013). Both applications were subject to the same constraints as detailed above.

Permits Consents and Authorisations

- 5.3 A full listing of permits, consents and authorisations including discharge consents, pollution incidences and other environmental information included in the Groundsure® Report, is presented in **Appendix 4**.
- 5.4 The following pertinent features have been identified which have the potential to have a detrimental impact on site.
- Four entries for List 2 Dangerous Substances all located 185m southwest of the site (STW site), the authorised substances include chromium, copper, lead, nickel, zinc, silver and iron; and
 - Two entries for Part B Processes within 250m of the site, the nearest being located 125m northwest of the site and related to gasification, liquefaction and refining activities.

Landfilling and Waste Management

- 5.5 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure® Report presented in **Appendix 4**.
- 5.6 Following a review of the Groundsure® Report, none of the landfill records are considered likely to represent a significant risk to the site.

6 GEOTECHNICAL APPRAISAL

6.1 The Groundsure Report, site history, current site setting and geology setting have all been considered in order to provide an indication of the potential ground related constraints and opportunities in the context of the proposed development as set out in **Table 4** below.

Table 4 Ground Related Constraints & Opportunities

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|------------------------------------|---|--|
| Made Ground | The Groundsure® Report and BGS mapping have not identified Made Ground deposits on site. However, some limited Made Ground is expected as a result of historical developments and recent construction works in the area. Due to its variability, Made Ground is not considered to be a suitable founding stratum. | Foundations may locally require deepening or where Made Ground thickness preclude shallow spread foundations, then ground improvement techniques or piles should be considered. |
| Topsoil | Topsoil is likely to be encountered across the site. | The development is indicated to incorporate open landscaped areas. Additional topsoil may need to be imported onto site to facilitate this. |
| Preliminary Foundation Solution | The proposed development is anticipated to comprise 55,000m ² of office space, at this time the new development is anticipated to be no higher than 3 stories. | <p>Any Made Ground present on site is likely to be highly variable in nature and is unlikely to be a suitable founding medium.</p> <p>The Alluvium deposits present on site may be highly organic in nature and could be compressible, therefore foundations should be locally deepened through this stratum.</p> <p>If the above is not economically viable then ground improvement or a piled foundation solution transferring loads into the Kellaways Clay Member or Cornbrash Formation may be utilised.</p> <p>Similarly, depending on the performance requirements of the floor slabs, lightly loaded ground bearing floor slabs maybe acceptable. However where higher loads are required then ground improvement or a suspended solution may need to be considered.</p> |
| Buried Obstructions / services | A sewer / drain is known to cut across the eastern area of site (north to south), feeding into the STW to the south. | This may require redirecting or a development exclusion zone put in place. |

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|------------------------------------|--|--|
| Overhead Services | Overhead power lines are known to be present on site. | These may require redirecting or transferring below ground for the proposed development to be constructed. |
| Trees | <p>Mature trees and hedgerows are present along each boundary of the site.</p> <p>Trees will likely be planted within the landscaped areas as part of the proposed development plan.</p> <p>If root systems are based within cohesive material, the introduction/removal of trees may impact upon local foundations or services.</p> | Cohesive Alluvium deposits have been encountered in localised areas, the volume change potential of the material should be assessed and shrink/ heave precautions adopted where necessary. |
| Enabling Works | Overhead electrical cables and underground drains/sewers are present on site. | Discussions with the service stakeholders will be required to discuss any works required to re-direct or to develop around any services present. |
| Ground Dissolution Hazards | <p>The Groundsure Report indicates that the site has a negligible to low risk of landslides, ground dissolution, collapsible deposits and running sands.</p> <p>However, the Groundsure Report indicates that there is a moderate risk of compressible deposits and shrink/ swell clays across the entire site.</p> | <p>It is considered that the moderate compressibility and shrink/swell risk is related to the presence of Alluvium across the southern and eastern areas of site.</p> <p>If compressible deposits are identified, foundations may need to be locally deepened.</p> |

7 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Introduction

- 7.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.
- 7.2 The following sections discuss all the identified potential on and off site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.
- 7.3 Three impact potentials exist for any given site; these are:
- The site impacting upon itself;
 - The site impacting on its surroundings; and
 - The surroundings impacting on the site.
- 7.4 All three impacts need to be considered in a risk assessment.
- 7.5 A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as **Table 5** and further information about the risk classification scheme is included within **Appendix 5**.
- 7.6 **Sources (S);** These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).
- 7.7 **Pathways (P);** A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.
- 7.8 **Receptors (R);** Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

Table 5 Preliminary Conceptual Site Model

| Source | Pathway | Receptor | Con | Prob | Risk | Mitigation/Investigation |
|--|---|--|-----|------|------|---|
| <p>S1: On site: Ground conditions and historical site uses, most notably agricultural uses, infilled ponds, out buildings (unknown uses) & construction yard (temporary). Possible contaminants to include – agrochemicals, fuel oils, heavy metals and hazardous ground gases.</p> | <p>P1: Direct contact and incidental ingestion.</p> | <p>R1: Construction personnel</p> | Md | Lw | M/L | <p>A ground investigation is recommended in order to assess current concentrations of organic and inorganic contaminants within soils and groundwater at the site that are likely to impact construction workers and future site users via ingestion, direct contact, and inhalation pathways. If present, it is likely that these contaminant linkages will be easily severed through remediation/mitigation measures such as the provision of a hardstanding surface layer, capping layers in areas of soft landscaping and ground gas/vapour protection measures. The risk to the Aquifer present within the Cornbrash Formation is likely to be reduced due to the relatively impermeable cohesive Kellaways Clay Member present above.</p> |
| | | <p>R2: Future site users (commercial)</p> | Md | UI | L | |
| | <p>P2: Vertical migration of contaminants in the soil leachate.</p> | <p>R3: Underlying Secondary A Aquifer (RTD)</p> | Md | Lw | M/L | |
| | | <p>R4: Underlying Secondary A Aquifer (Cornbrash Formation)</p> | Md | UI | L | |
| | <p>P3: Migration and accumulation of ground gasses in enclosed spaces.</p> | <p>R1: Construction personnel</p> | Sv | Lw | M | |
| | | <p>R2: Future site users (commercial)</p> | | | | |
| <p>S2: Offsite – Land uses including the STW, petrol filling station and infilled ground. Contaminants to potentially include hydrocarbons, heavy metals, inorganics,</p> | <p>P4: Leaching and permeation through the soil profile and migration</p> | <p>R3: Underlying Secondary A Aquifer (RTD)</p> | Md | UI | L | |
| | | <p>R4: Underlying Secondary A Aquifer (Cornbrash Formation)</p> | | | | <p>Ground investigation with consideration of the ground gas regime will aid in the assessment of potential contamination to risks to human health and controlled water receptors. Low permeability of the surrounding geology may have reduced leaching of contaminated groundwater onto site.</p> |

| Source | Pathway | Receptor | Con | Prob | Risk | Mitigation/Investigation |
|--|--|---|-----|------|------|--------------------------|
| asbestos, organic compounds, micro-organisms and hazardous ground gases. | P5: Lateral migration of contaminated groundwater | R5: Unnamed Primary River | Md | UI | L | |
| | P3: Migration and accumulation of ground gasses in enclosed spaces. | R2: Future site users (commercial) | Sv | UI | M/L | |
| <p>VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low</p> <p>KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely</p> | | | | | | |

Pollutant Linkage Assessment Summary

When considered in the context of the conceptual site model and the historical activities that have taken place, most notably the infilled ground, agricultural uses and offsite STW, the proposed development is considered to pose a low to moderate risk to human health.

The risk posed to controlled waters is predominantly considered to be low to moderate due to presence of two Secondary A Aquifers beneath the site and surrounding area.

Ground investigation would help to quantify the identified pollutant linkages and assess any likely mitigation measures.

8 ENVIRONMENTAL LIABILITY ASSESSMENT/DEVELOPMENT CONSTRAINTS

Statutory Liability

- 8.1 The contaminated land regime has implications for those who cause or knowingly permit land to be contaminated, or who own or occupy land that is contaminated.
- 8.2 Contaminated land is defined in Section 78A(2) of Part IIA of the Environmental Protection Act 1990 as:
- 'Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under land, that:
- 8.3 Significant harm is being caused or there is a significant possibility of such harm being caused; or
- a) Pollution of controlled waters is being or is likely to be, caused.
 - b) Harm is defined in Section 78(4) of the Environmental Protection Act 1990 as:

'Harm to the health of living organisms or other interference with ecological systems of which they form part and, in the case of man, includes harm to property'.
- 8.4 Once an area of land has been identified as contaminated land, appropriate persons will be identified as being responsible for the cost of cleaning up the land by the enforcing authority. The appropriate person will be liable for all or part of the remediation of the land. Two classes of appropriate person have been identified:
- Class A appropriate persons are those who cause or knowingly permit the pollutants to be in, on or under the land.
 - Class B appropriate persons are the owners(s) or occupier(s) of the land.
- 8.5 Where no Class A appropriate persons can be identified, then Class B appropriate persons may become liable.
- 8.6 Based on the information available regarding the site, the potential for Statutory Authority action based on 'pollution of controlled waters' or 'significant harm' as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW** to **MODERATE**.

Third Party Liability

- 8.7 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be **LOW**.

Public Relations

- 8.8 The likelihood of public relations being tarnished due to contamination issues at the site are considered to be **LOW**.

Development Implications

- 8.9 Several overhead and underground services are known to be present on site, discussions with the stakeholders will be required to confirm if the services could be redirected or the proposed development needs to incorporate these into the final layout.
- 8.10 Numerous planning constraints are likely to be placed upon the development, including land classification, groundwater vulnerability, water utilities, air safeguarding (wind farm and airport airspace), archaeological, habitat protection (otter, badger and lapwings) and public rights of way as per previous planning applications in the surrounding area.

9 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 9.1 The proposed development is anticipated to comprise the development of up to 55,000m² of office space. BWB anticipate that development will be no taller than 3 stories and include areas of car parking and limited soft landscaping.

Environmental

- 9.2 The underlying geology is anticipated to comprise Alluvium overlying River Terrace Deposits (RTD (Secondary A Aquifer)) to the east, south and western areas of the site, no superficial deposits are mapped across to the centre and northern areas. The solid geology beneath the site comprises the Kellaways Clay Member (Unproductive Strata) underlain by the Cornbrash Formation (Secondary A Aquifer), with the Kellaways Clay Member absent in the west of the site.
- 9.3 Topsoil is anticipated across the entire site with limited Made Ground deposits.
- 9.4 The site has been predominantly utilised for agricultural uses, a number of outbuildings have been present to the north of the site and have all been demolished. The wider area has also been predominately used for agriculture, an STW is located immediately south of the site with a railway line immediately east. A Tesco Superstore including petrol station was developed in 2016/17.
- 9.5 The site is considered to pose a low to moderate risk of contamination to human health and controlled waters receptors.

Geotechnical

- 9.6 Any Made Ground present on site is unlikely to be a suitable founding medium. The Alluvium deposits are likely to be highly organic in nature and compress when loaded upon, therefore it is not considered a suitable founding stratum. If the RTD, Kellaway Clay Member or Cornbrash Formation are not within economical reach of shallow spread foundations then ground improvement techniques or a piled foundation solution may have to be considered. Lightly loaded ground bearing floor slabs may be suitable.

Recommendations

- 9.7 A detailed ground investigation is recommended to ascertain the geotechnical and environmental properties of the underlying ground conditions for foundation design.
- 9.8 The investigations and subsequent assessment will indicate whether remediation or mitigation measures, with respect to contamination and the potential for shallow mining, are likely to be required during construction of the proposed development.

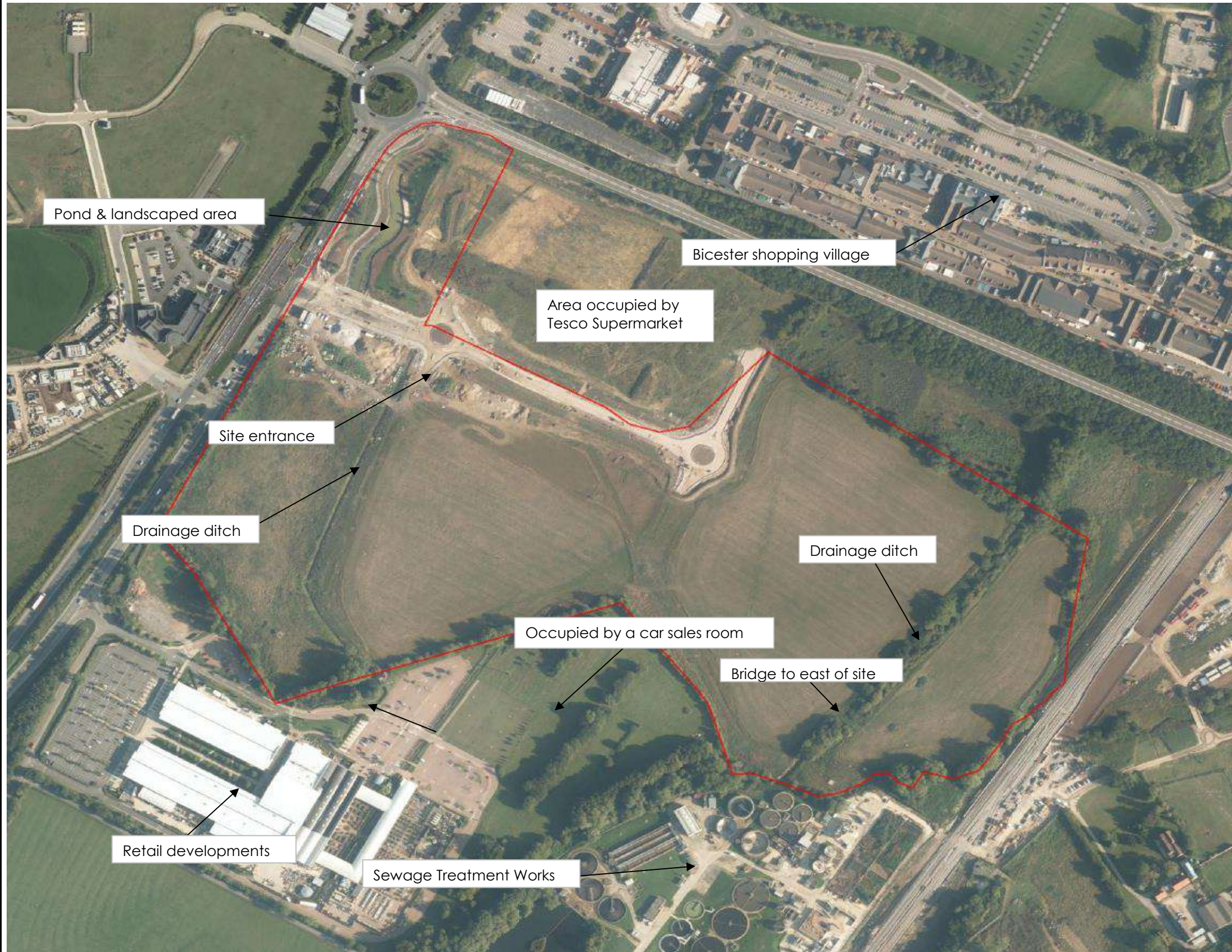
10 REFERENCES

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- NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008

DRAWINGS

DRAWING 1
SITE LAYOUT PLAN



NOTES

1. DO NOT SCALE THIS DRAWING. ALL DIMENSIONS MUST BE CHECKED/ VERIFIED ON SITE. IF IN DOUBT ASK.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE.
4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

LEGEND

— Site boundary



Building, Infrastructure and Environmental Consultancy

5th Floor, Waterfront House, Station Street,
Nottingham, NG2 3DQ
T 0115 924 1100 F 0115 950 3966 W bwbconsulting.com

Client:

SLADEN ESTATES

Project Title:

LAKEVIEW DRIVE, BICESTER

Drawing Title:

SITE LAYOUT PLAN

| | | | |
|--------------|----------|---------|-------------|
| Scale: | Date: | Drawn: | Authorised: |
| Not to Scale | 21.08.17 | L.Cross | R.Robinson |

Drawing Status: **FINAL**

| | |
|--------------------------|-----------|
| Drawing No: | Revision: |
| LDB-BWB-00-XX-EN-DR-0001 | F1 |

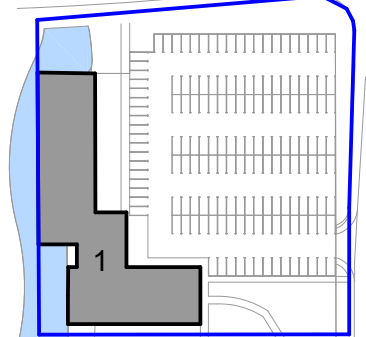
APPENDICES

APPENDIX 1
PROPOSED MASTERPLAN

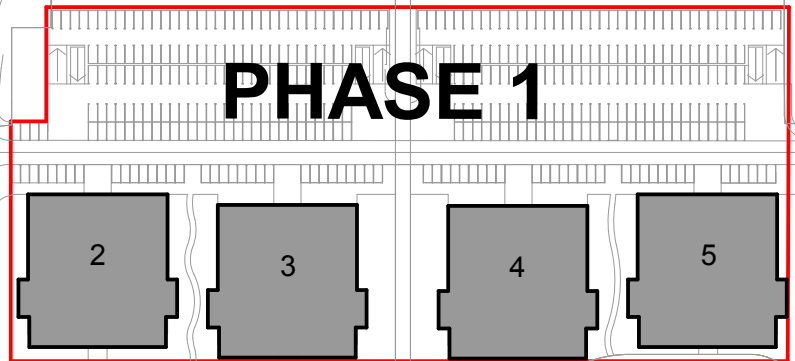
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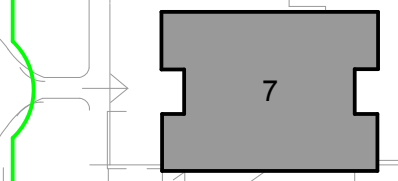
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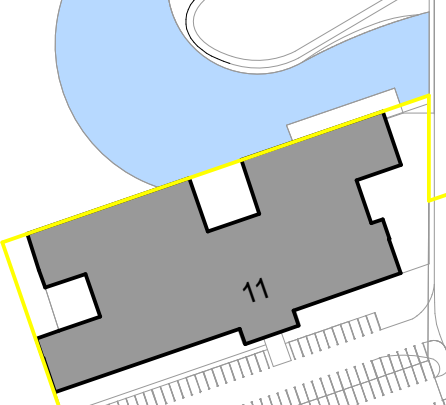
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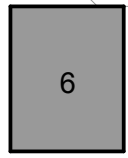
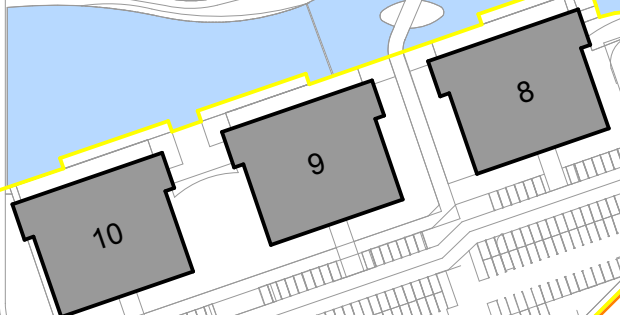
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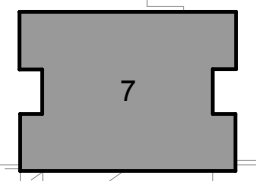
PHASE 3



PHASE 4



6



7

AMENITY LAND WEST

AMENITY LAND EAST

Line of Flood Plain

EXISTING DRAINAGE DITCH



BICESTER AVENUE GARDEN CENTRE

Site Plan

1105_(SK)057

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NYI

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|--|--------|------------------------------|-------------------------------|--|--|---|--|----------------|------------|------|-------|------|------|------------|----------|
| Purpose of Issue Information | status | Scales @ A3 1:2000 | Project No. 16SK109 | Originator  | Project Bicester Office Park | Client  | Layout Title Site Phasing Layout | Drawing Number | | | | | | | |
| | | | | | | | | project | originator | zone | level | type | role | number | rev |
| | | | | | | | | DW | - | - | - | - | A | 001 | A |

APPENDIX 2
SITE PHOTOGRAPHS

Project Number: NTE2366
Project Name: Lakeview Drive, Bicester
Site Photographs



Photo 1—Site entrance from Lakeview Drive



Photo 2— Typical view of site

Project Number: NTE2366
Project Name: Lakeview Drive, Bicester
Site Photographs



Photo 3—Stone yard area to the north of the site.



Photo 4— Water AST located along the boundary with Lakeview Drive.

Project Number: NTE2366
Project Name: Lakeview Drive, Bicester
Site Photographs



Photo 5—Drainage ditch to the western area of site



Photo 6— Drainage ditch to the east of site

Project Number: NTE2366
Project Name: Lakeview Drive, Bicester
Site Photographs



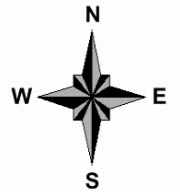
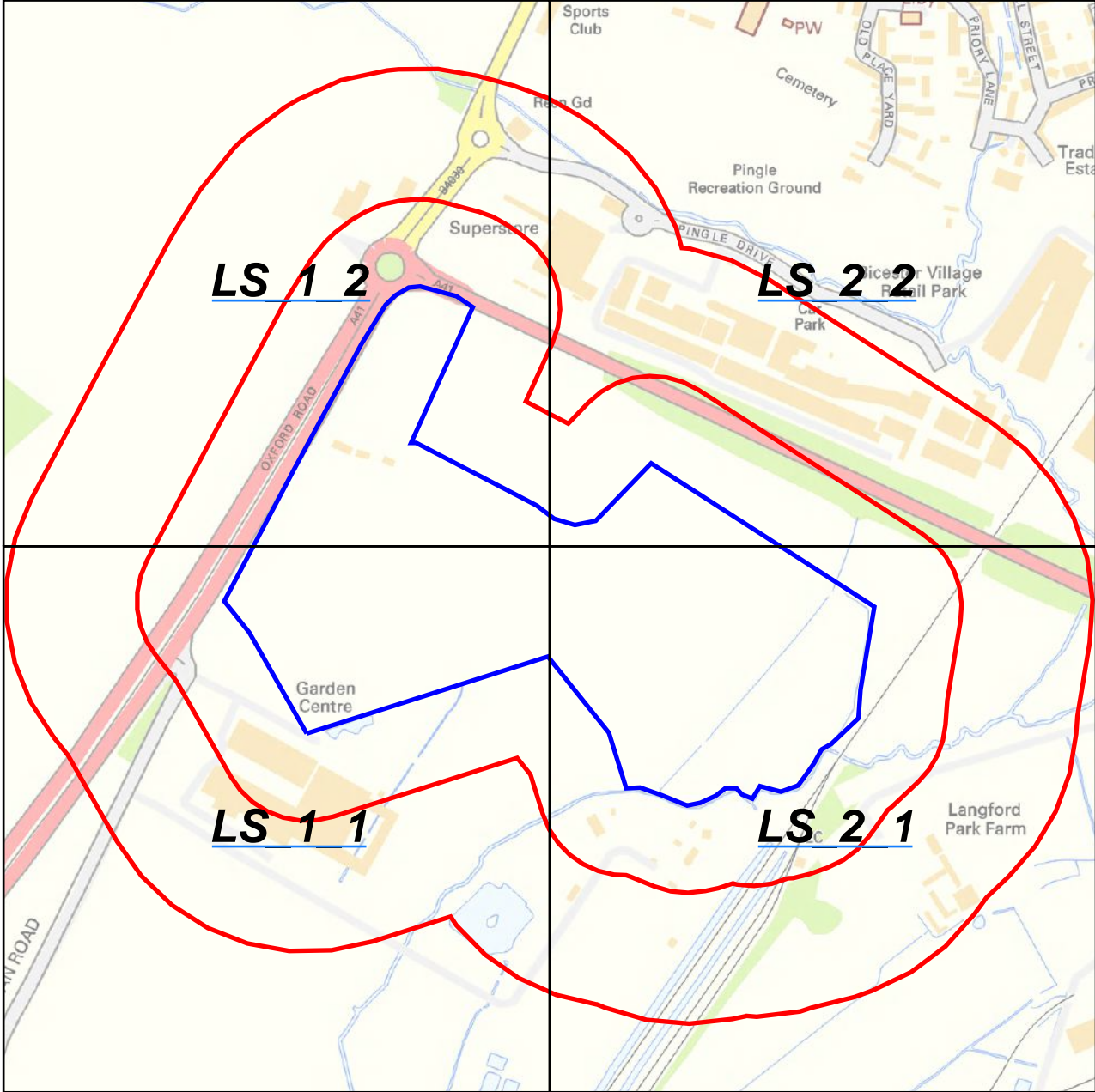
Photo 7—Pond and landscaped area to the north of the site



Photo 8— Typical view of Lakeview Drive.

APPENDIX 3

HISTORICAL ORDNANCE SURVEY MAPPING



1:2500 Scale Grid Index

Site Details:

457789, 221586

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Report Ref: HMD-214-4080160_LS_1_1
Grid Ref: 457628, 221287

Map Name: County Series

Map date: 1877-1881

Scale: 1:2,500

Printed at: 1:2,500



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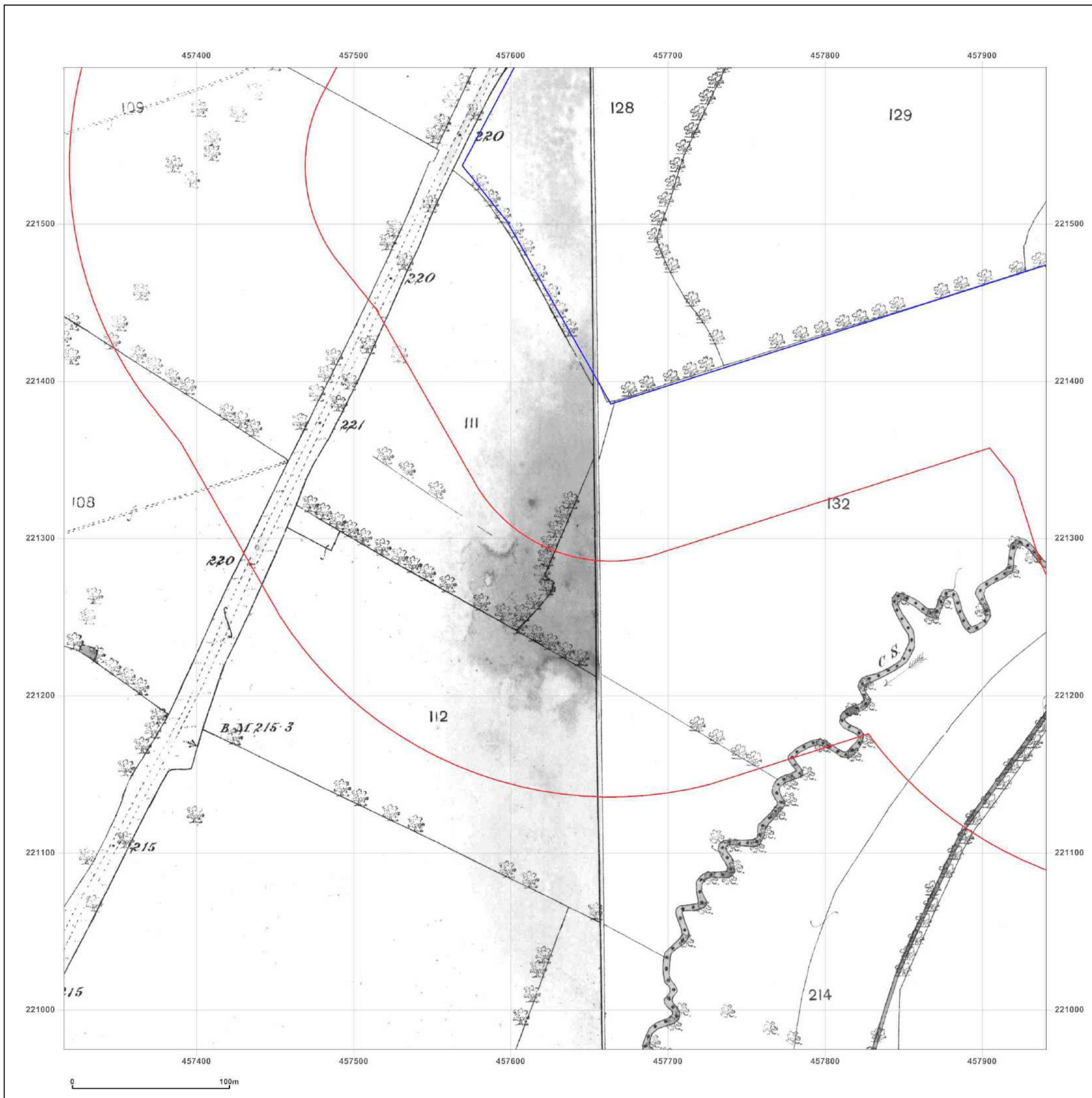


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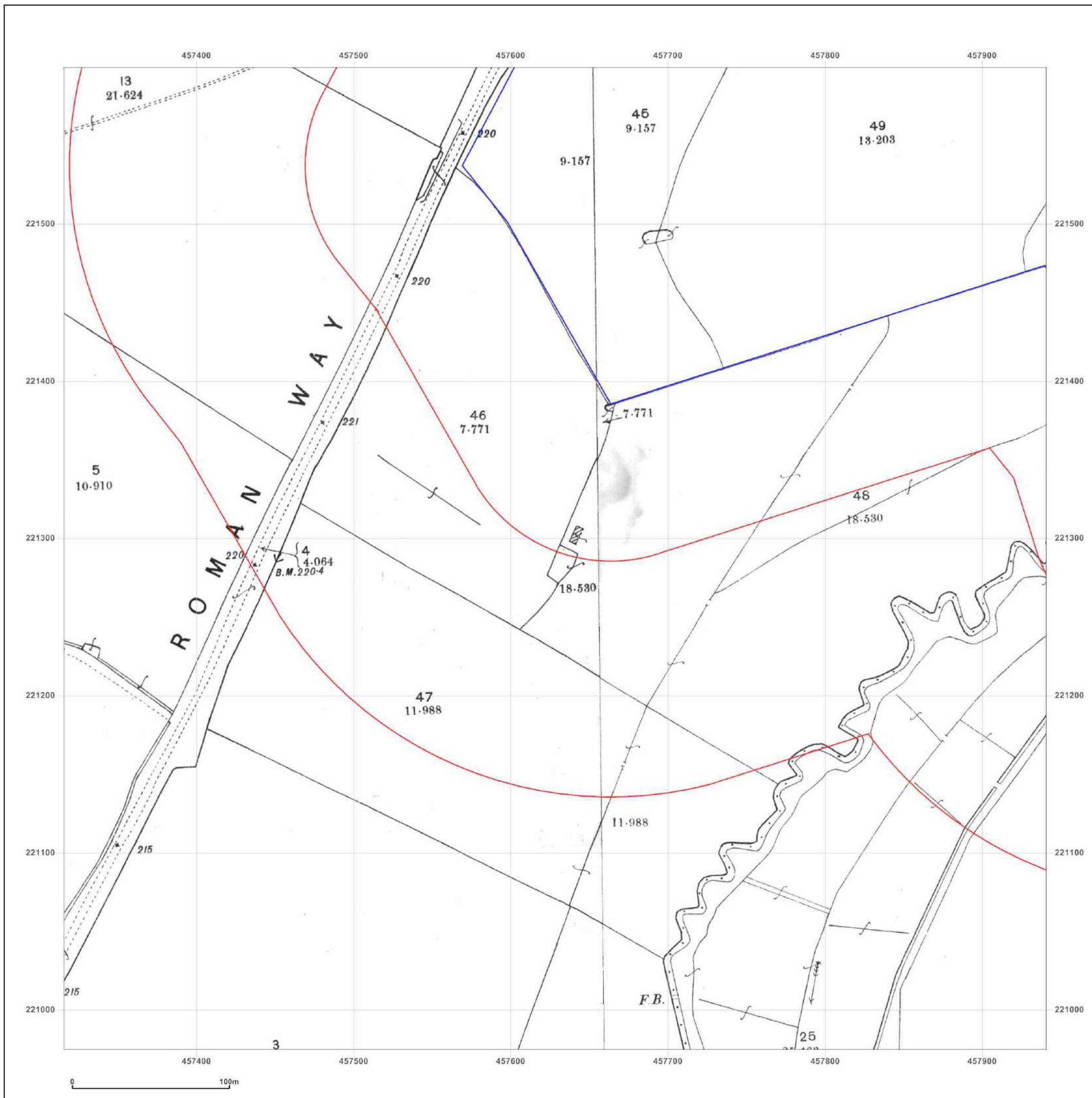


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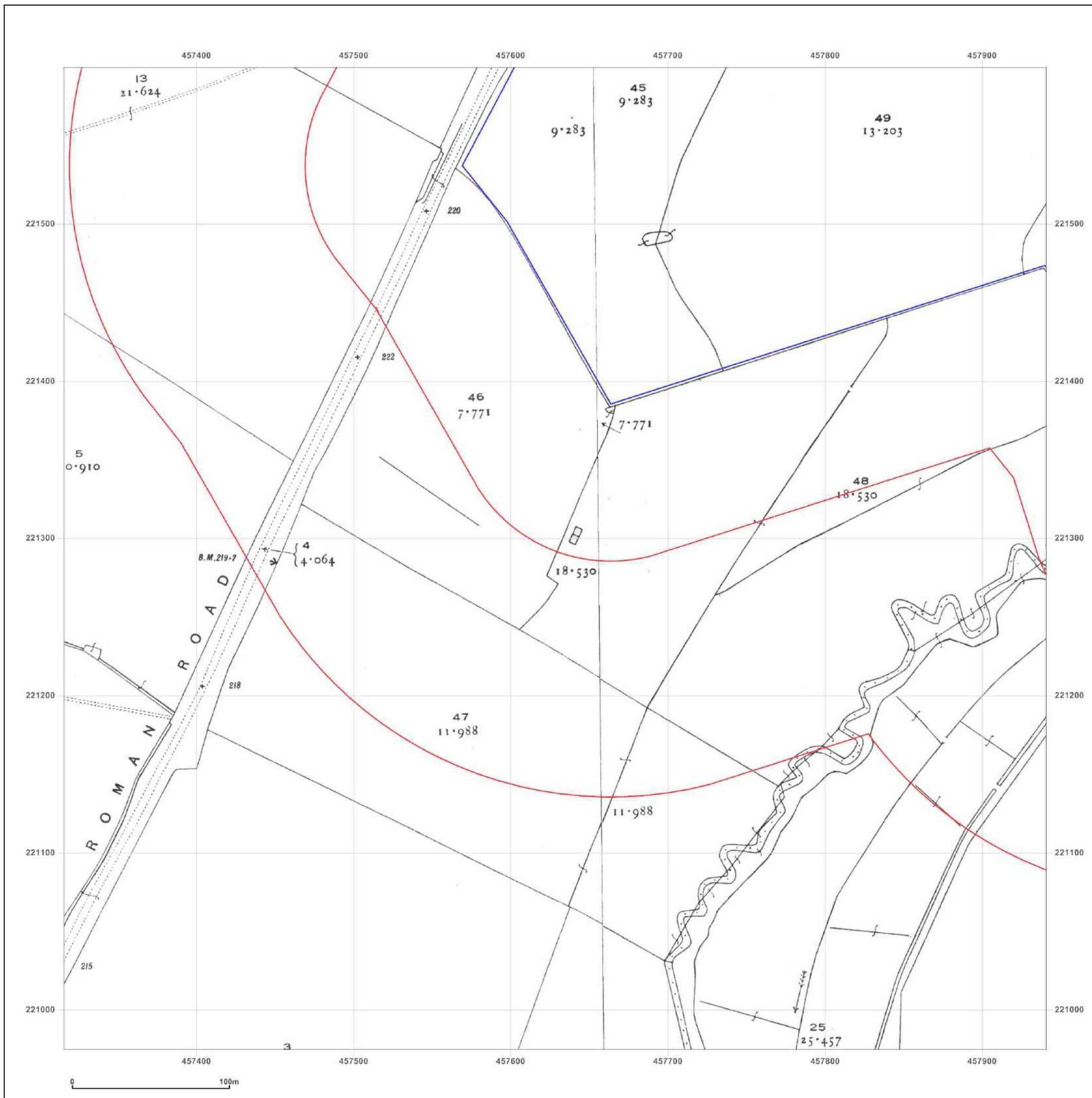


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Scale: 1:2,500

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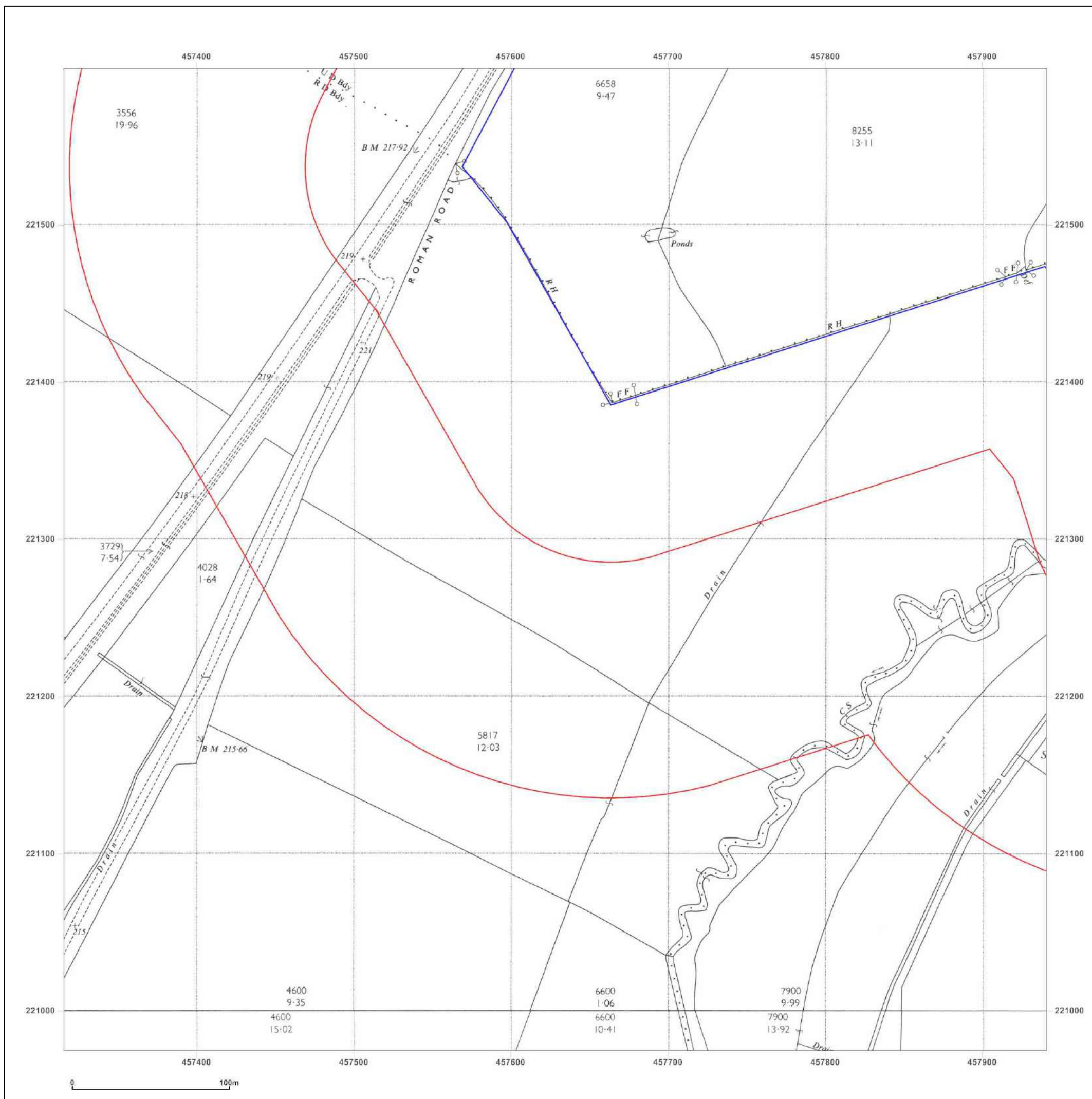


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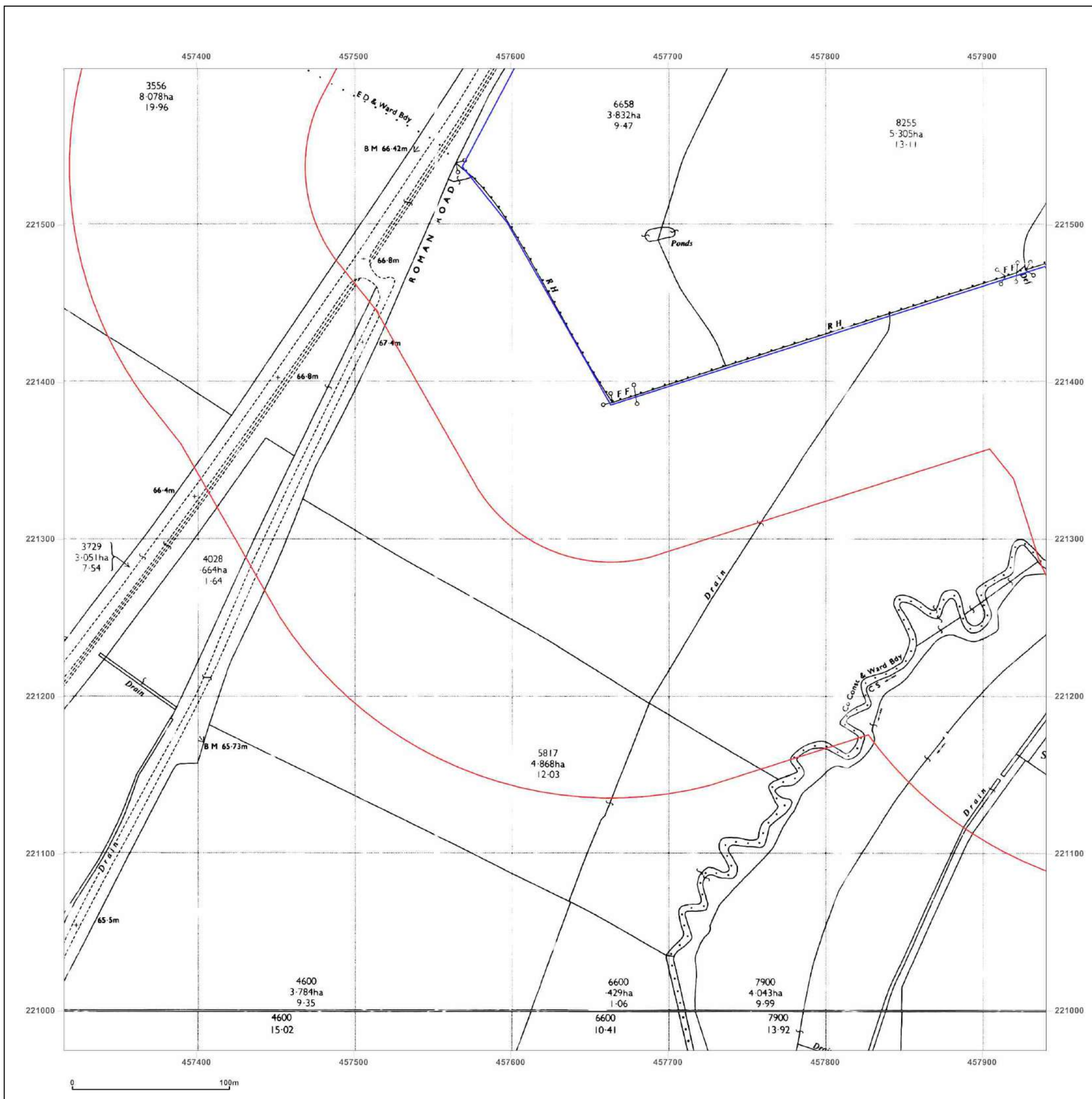


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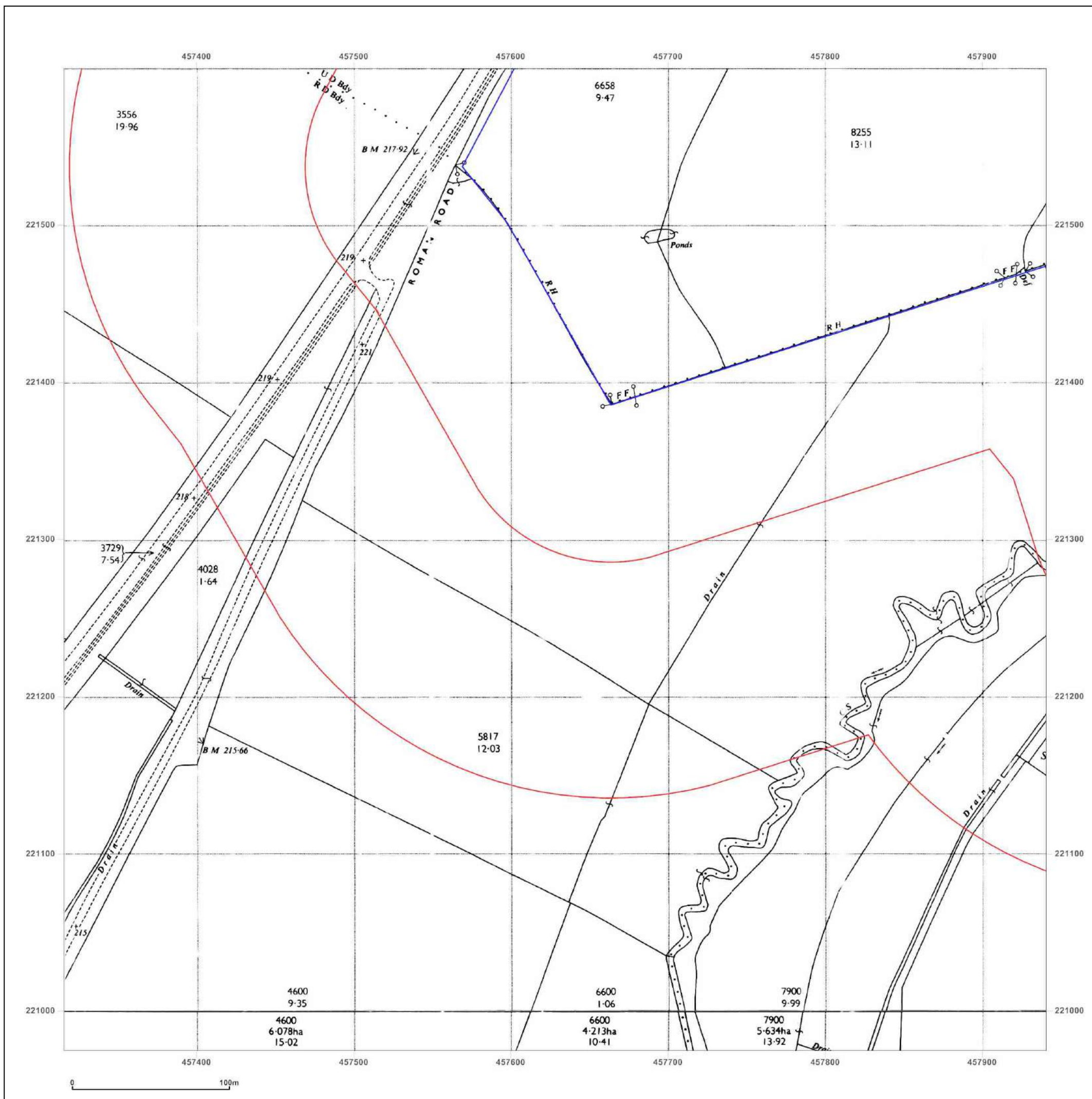


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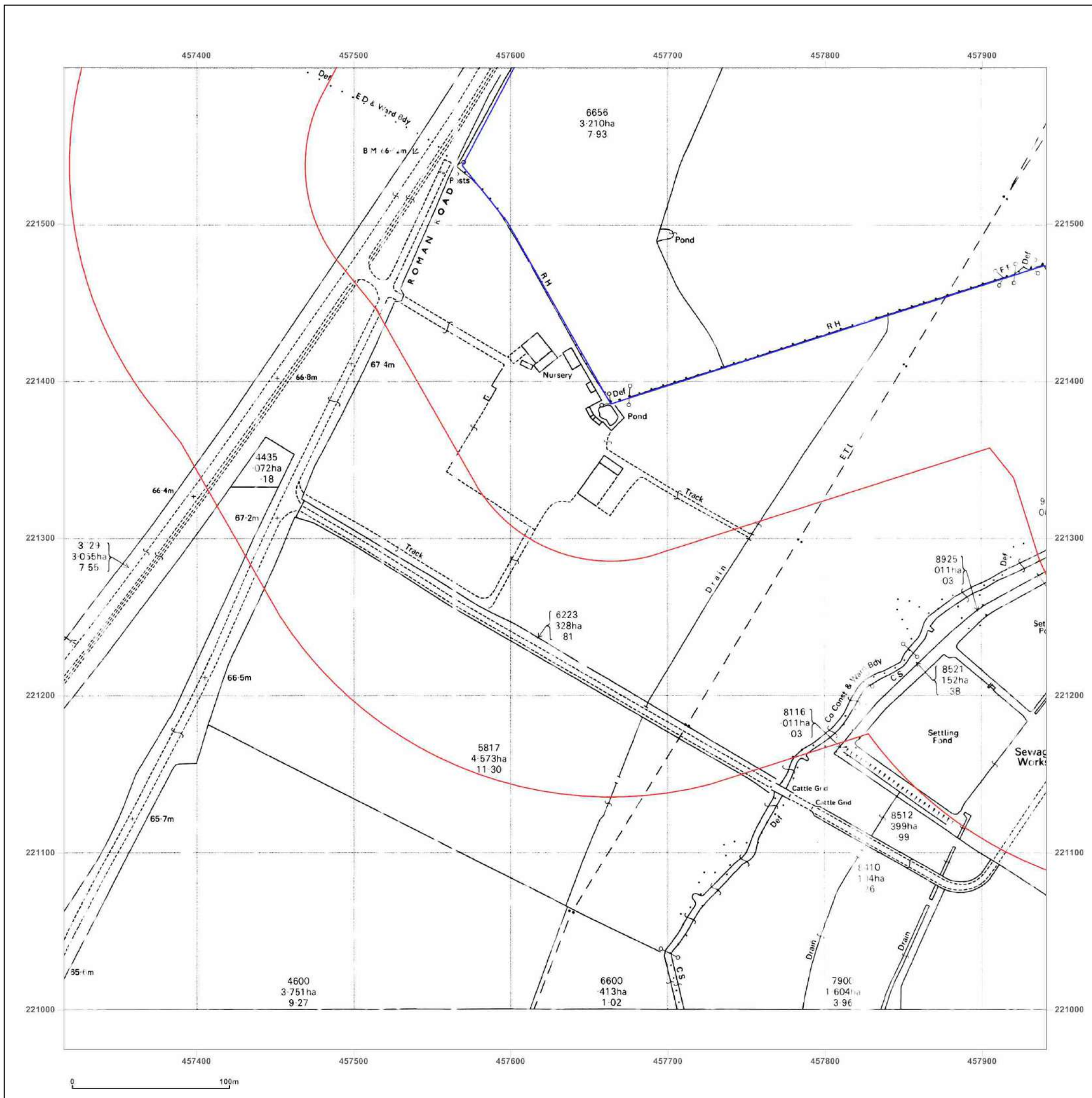


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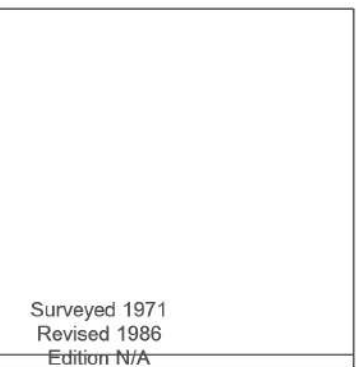
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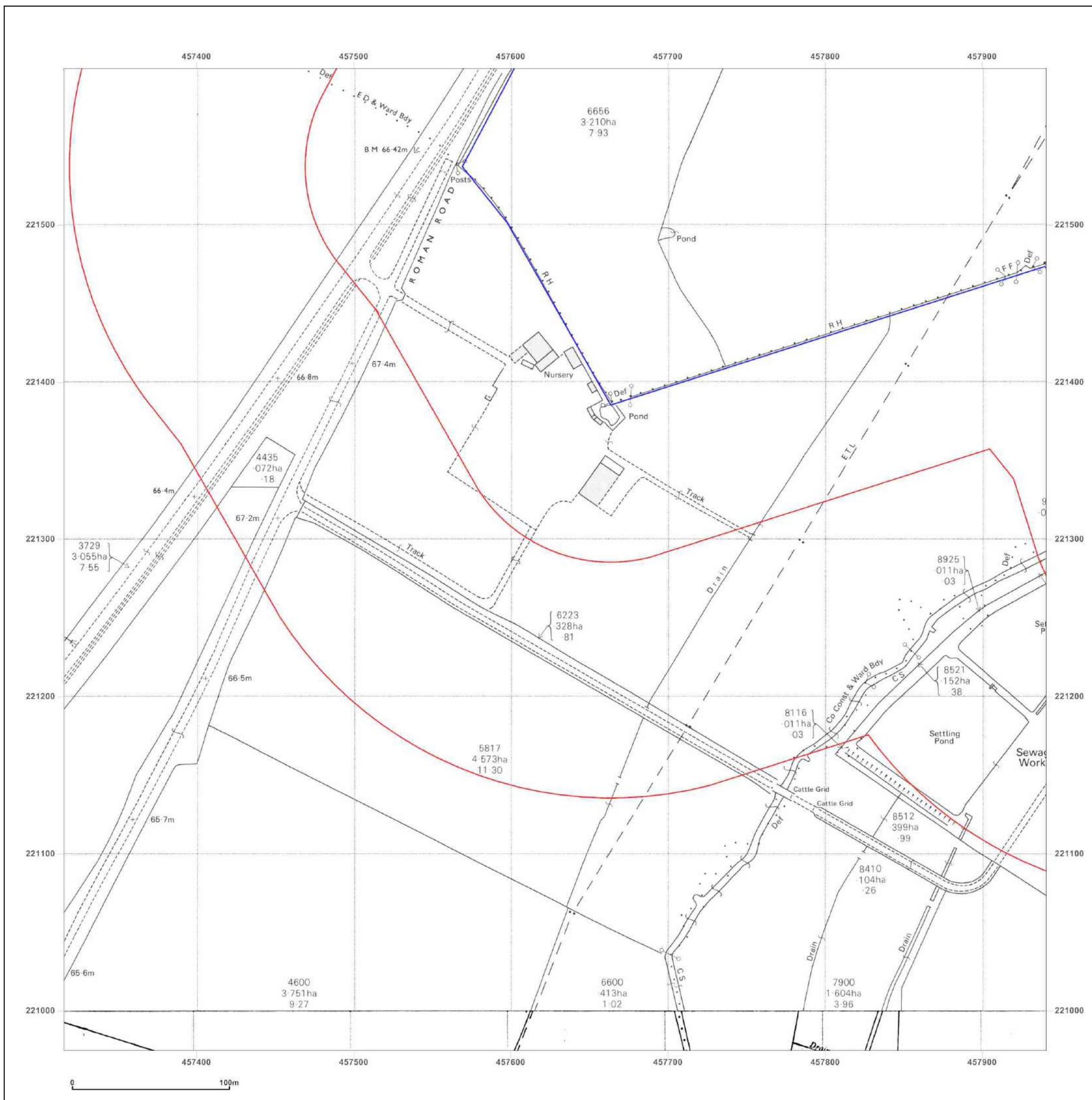


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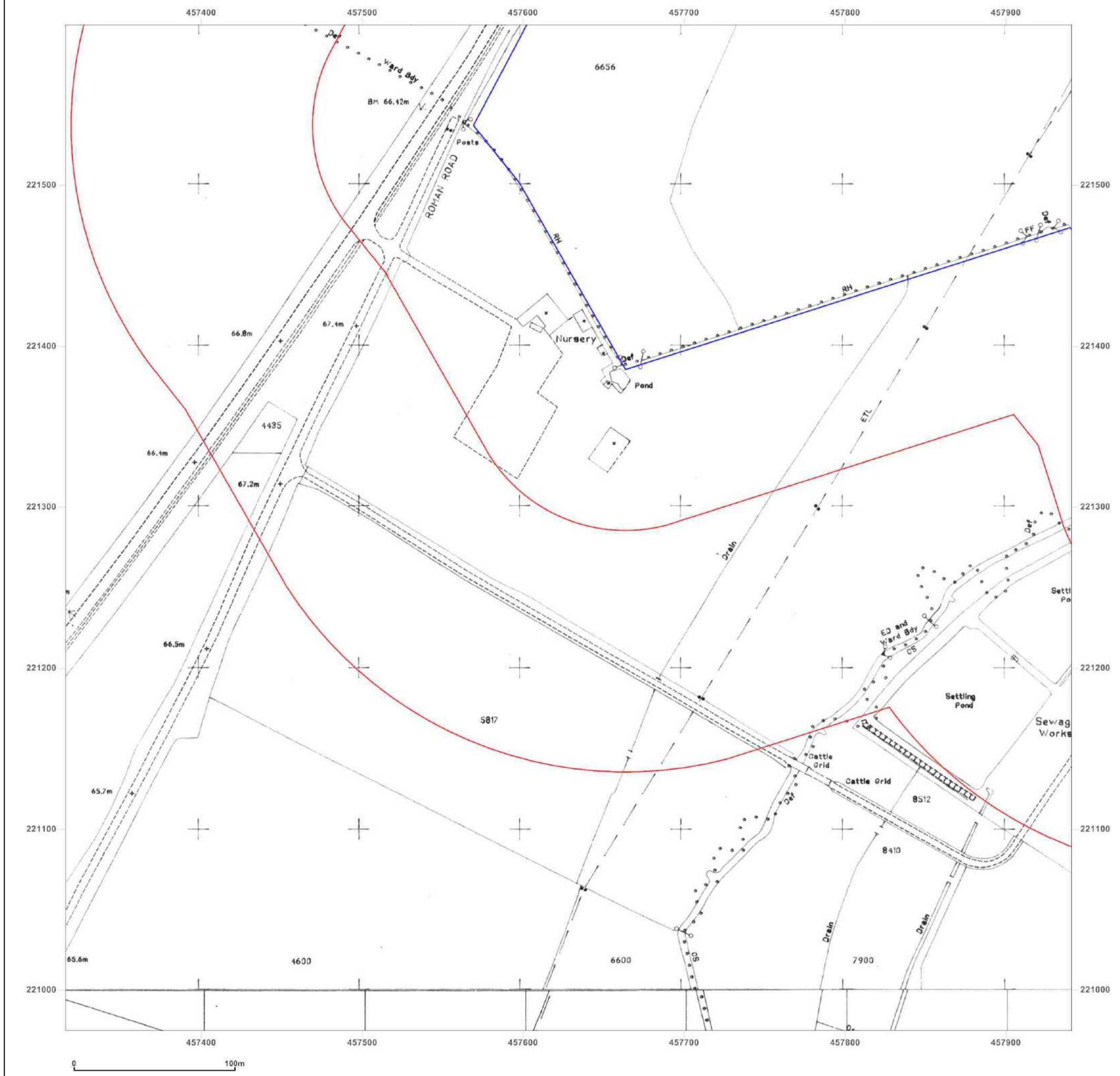
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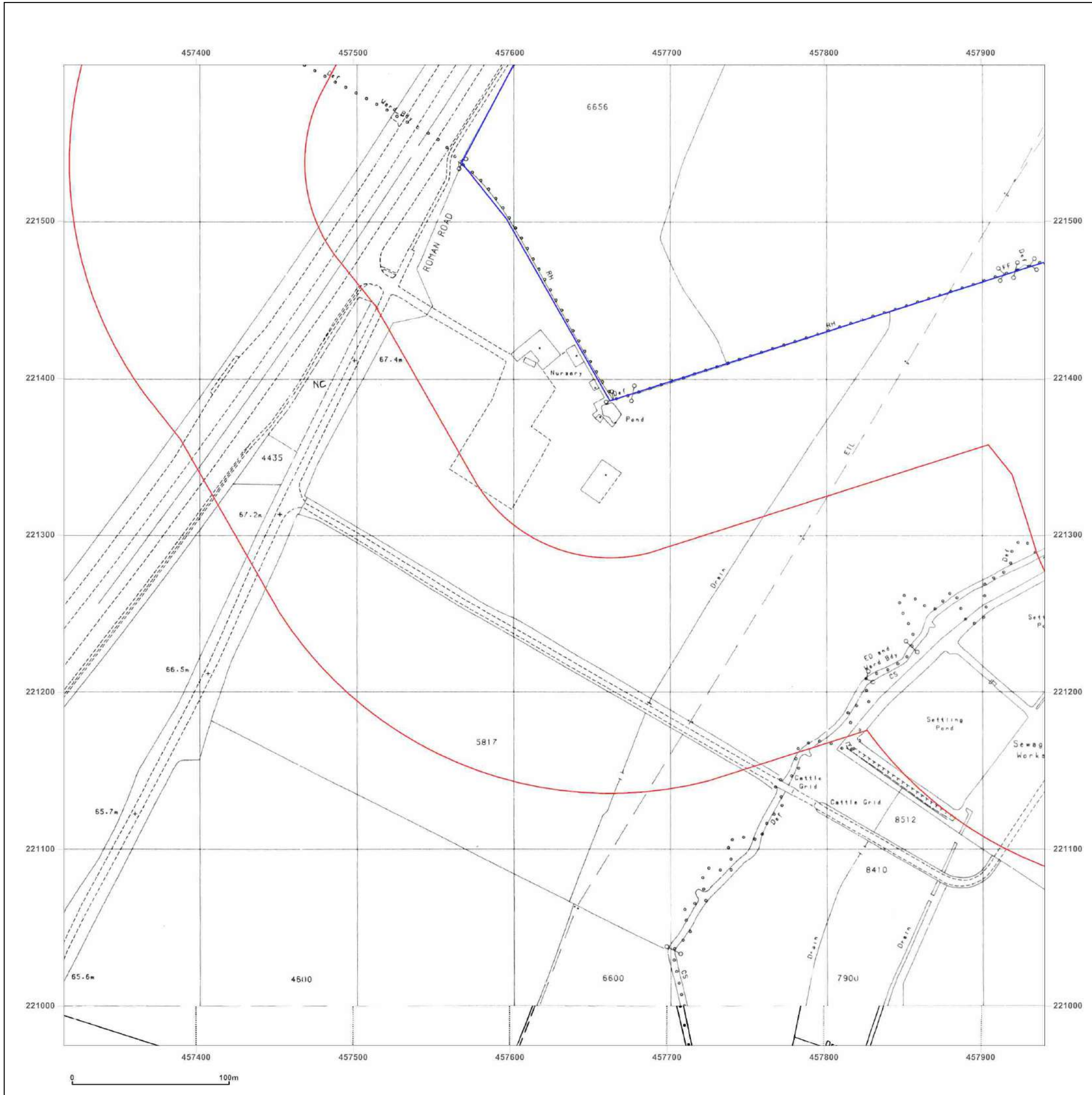
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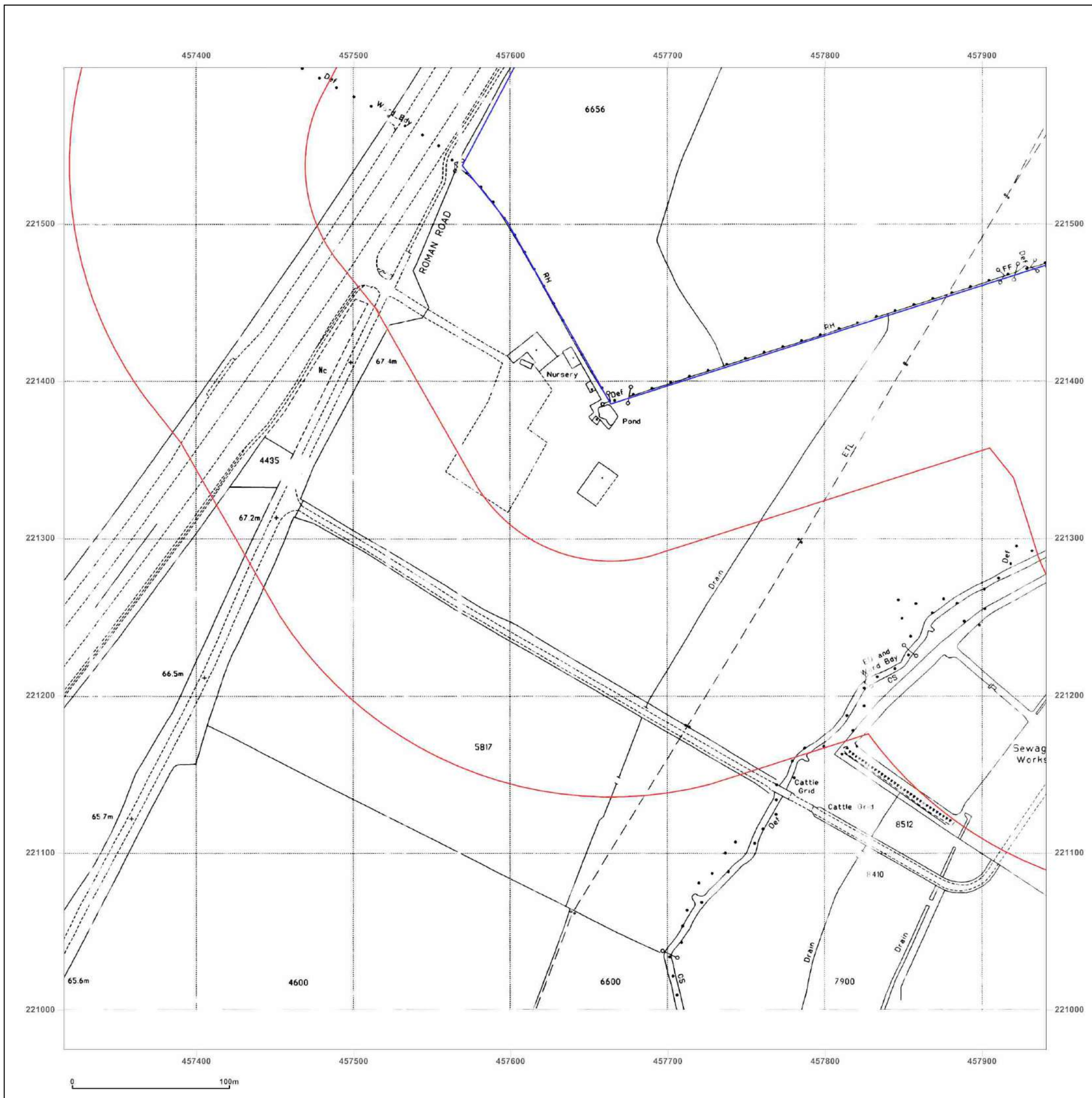


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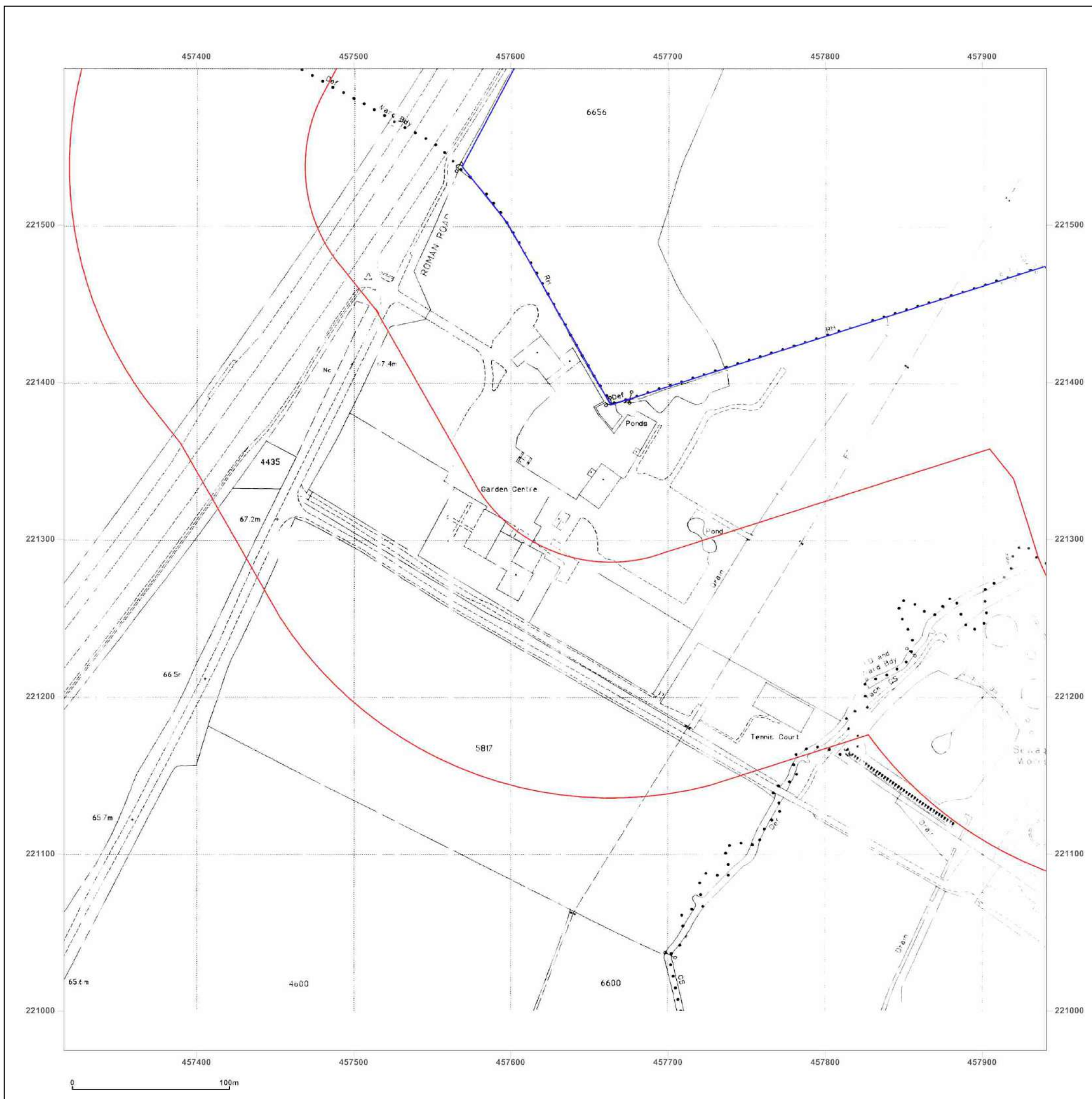


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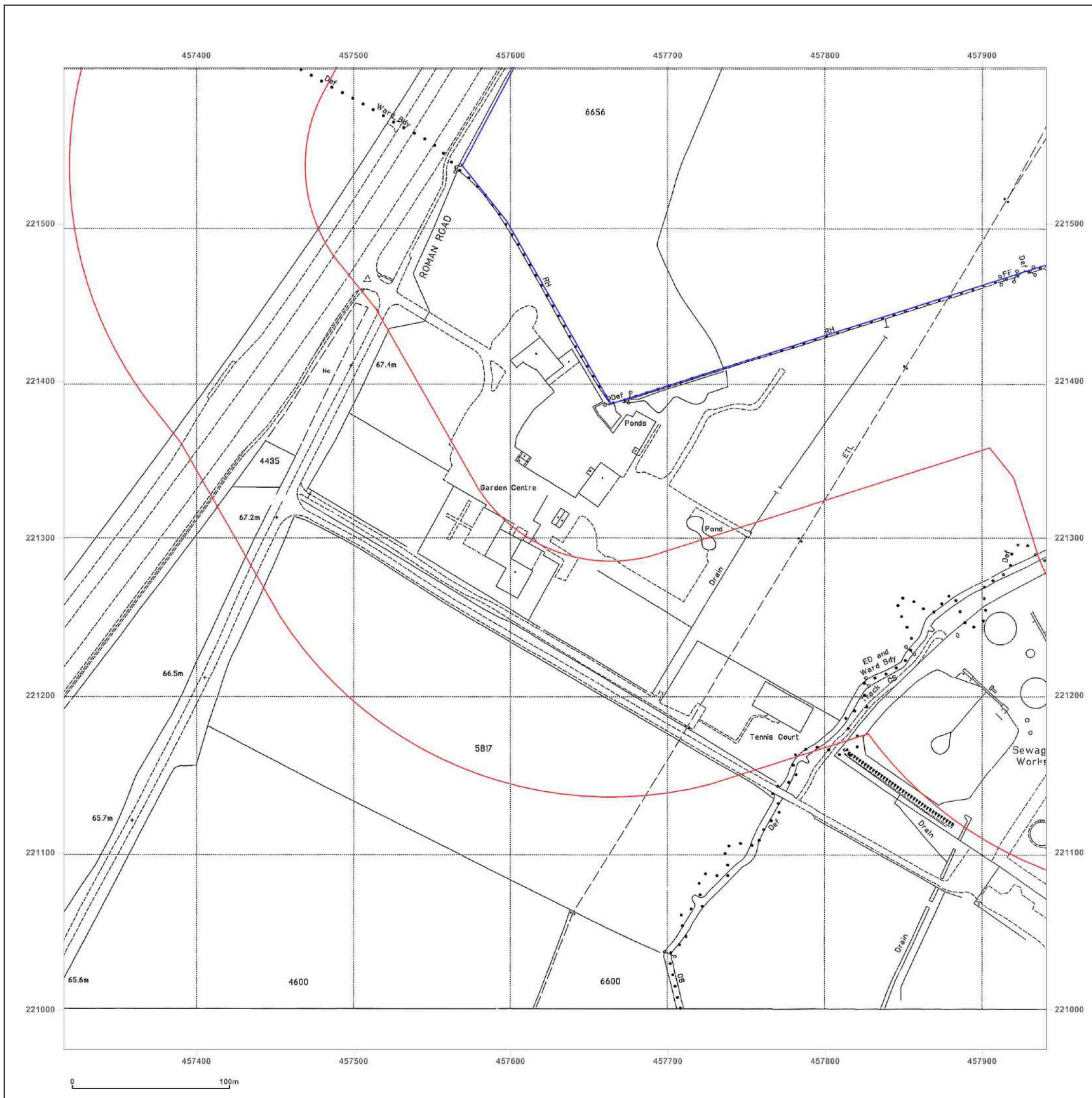


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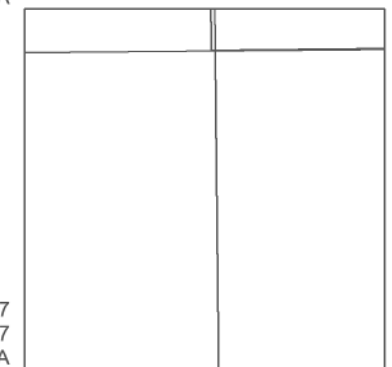


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 Copyright N/A
 Levelled N/A

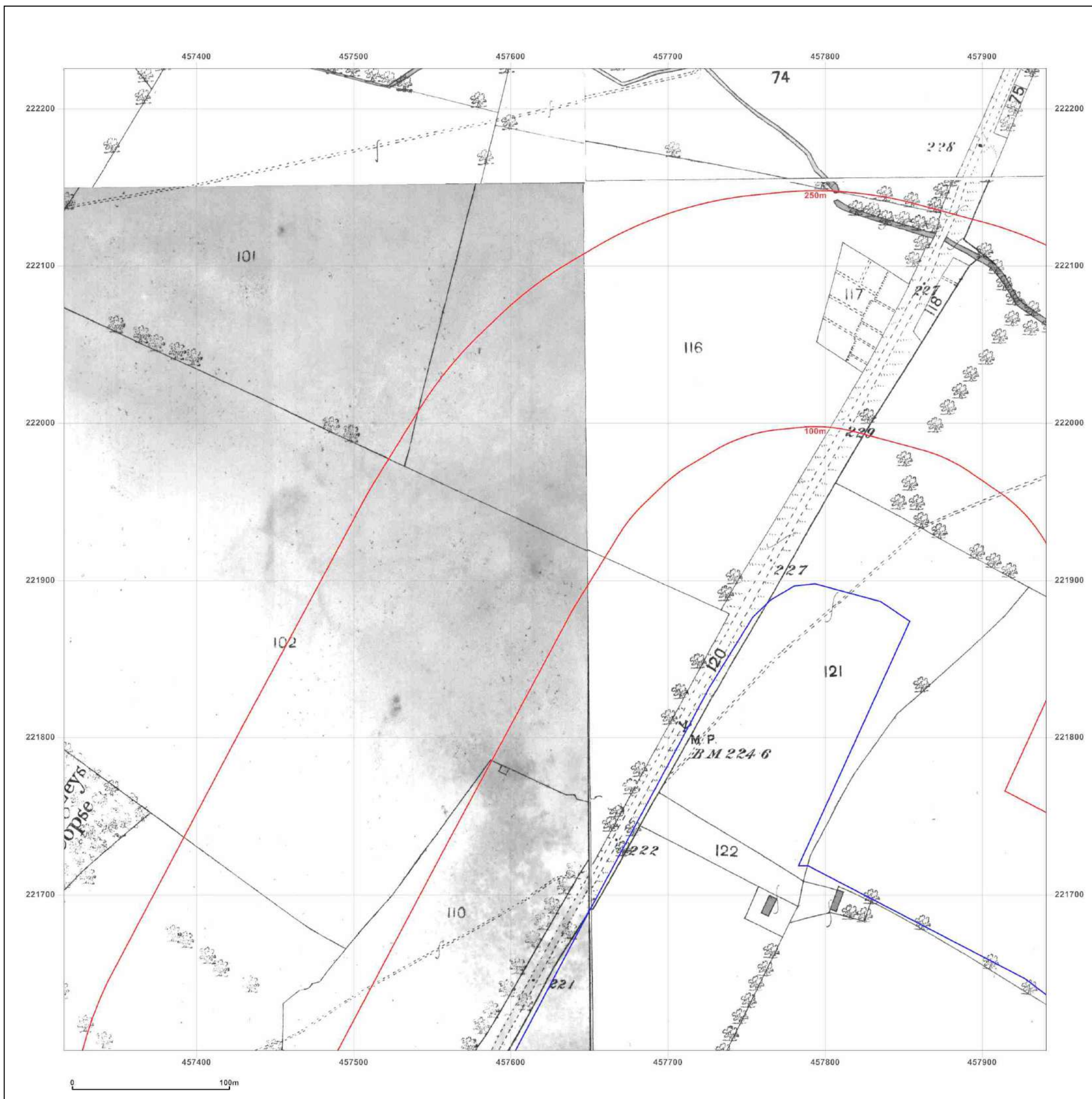


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: County Series

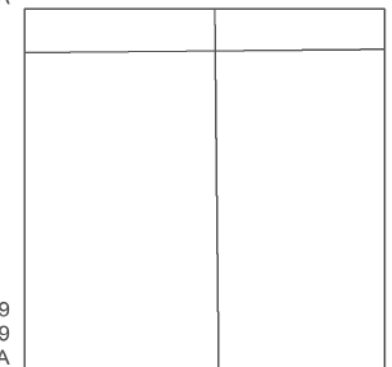
Map date: 1899-1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1899
 Revised 1899
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1899
 Revised 1899
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1900
 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A

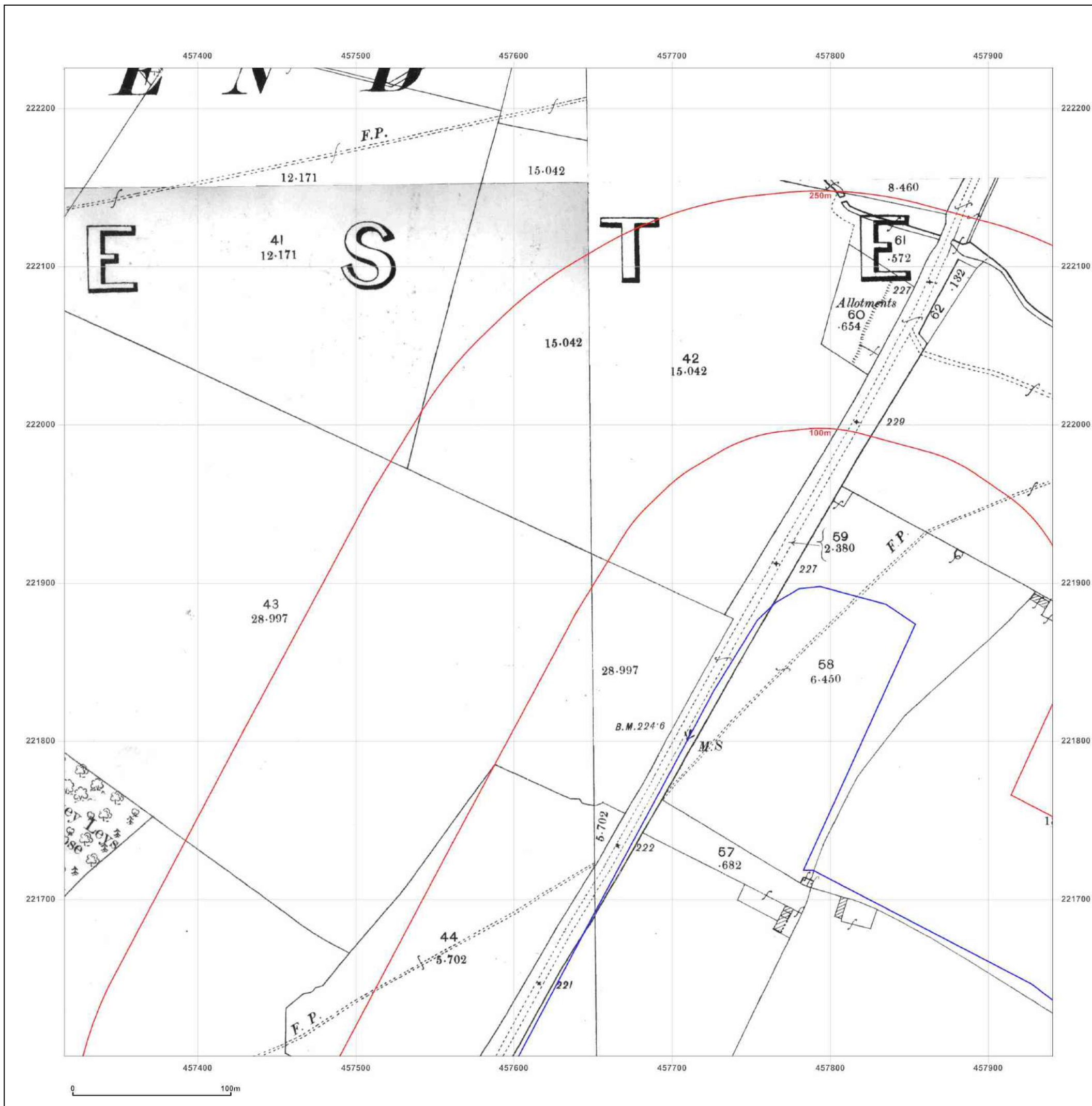


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: County Series

Map date: 1922

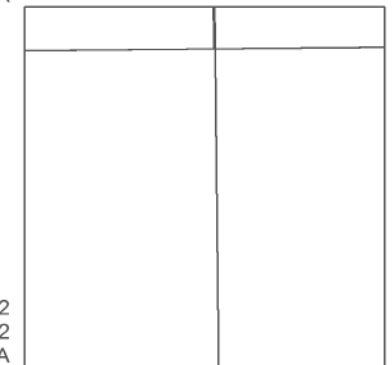
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A

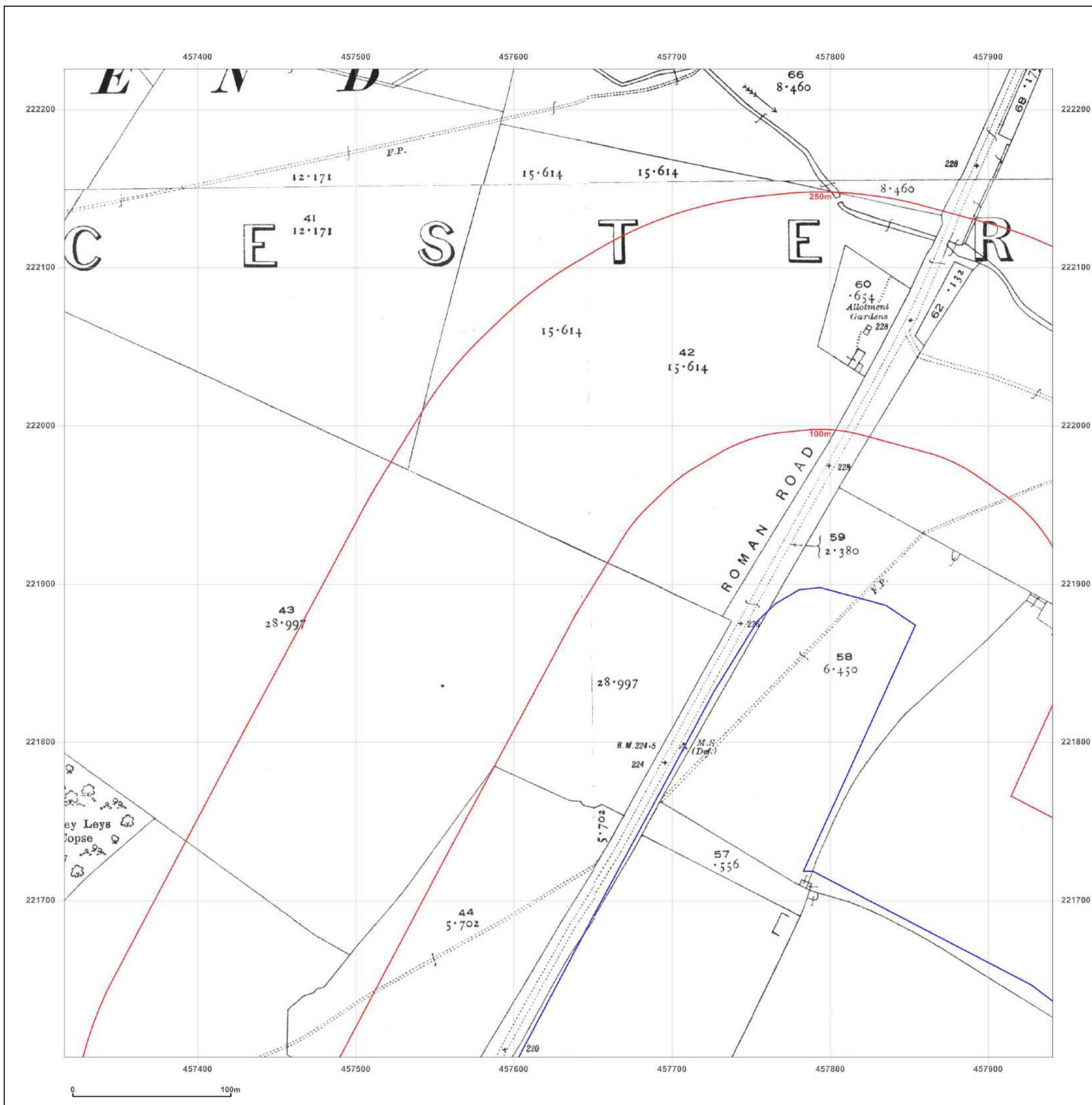


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1966

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962



Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962

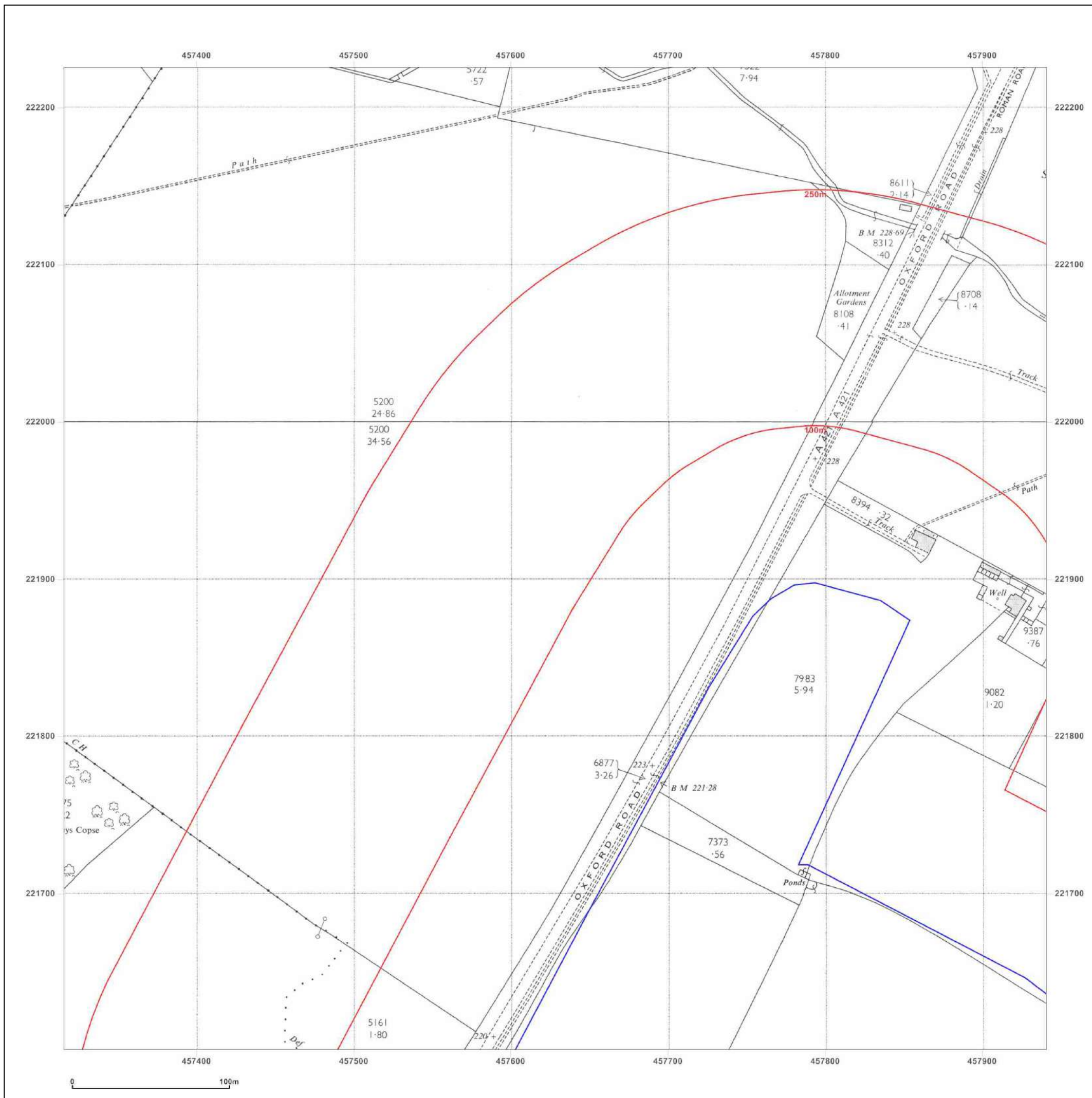


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1967

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled N/A

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

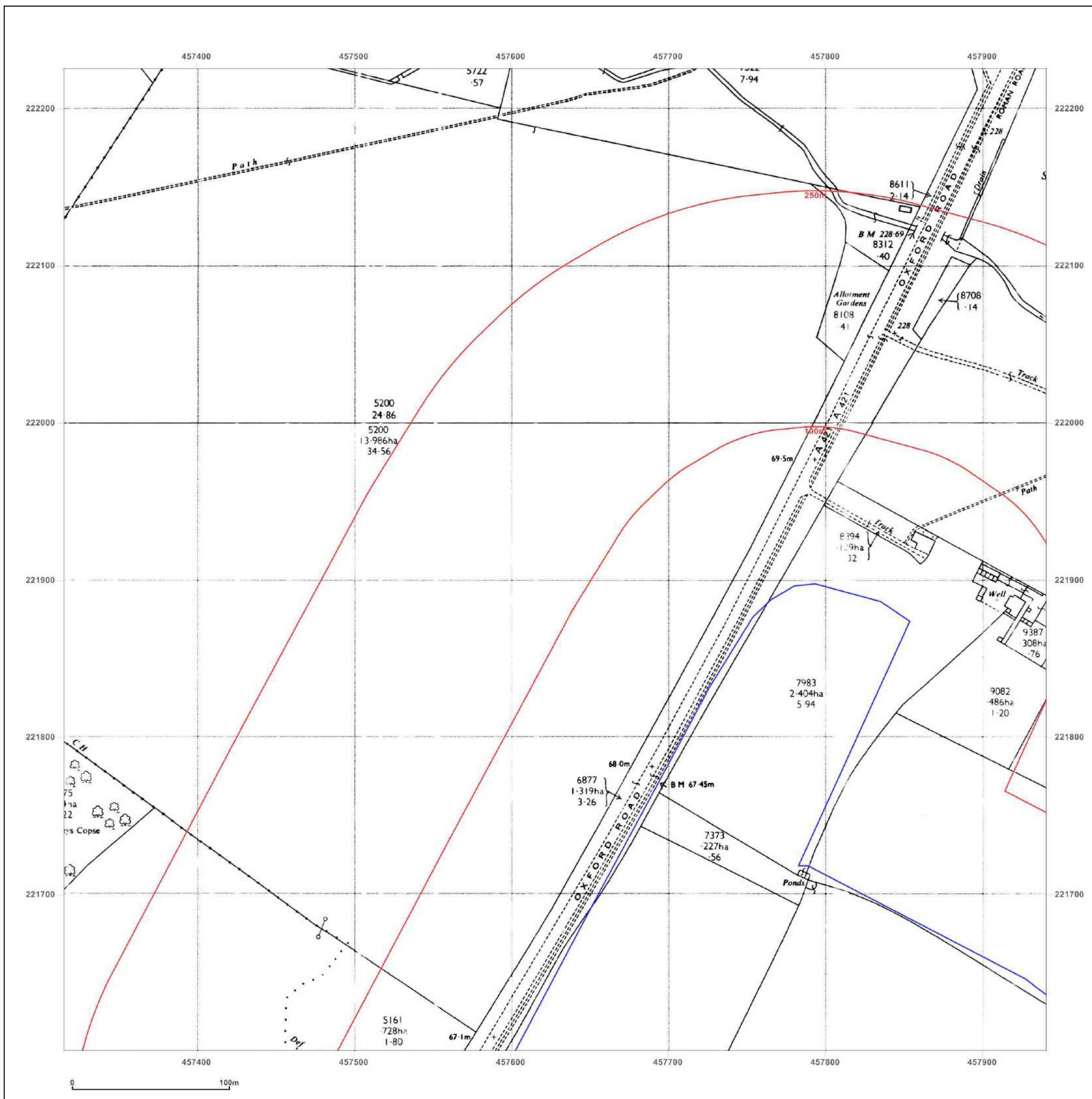


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Site Details:

457789, 221586

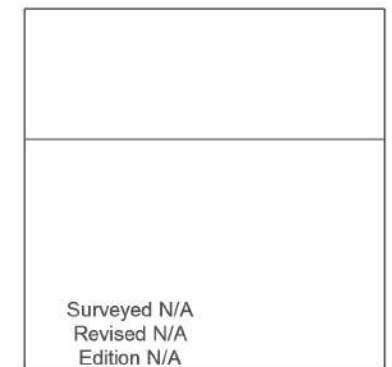
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Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1967

Scale: 1:2,500

Printed at: 1:2,500



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

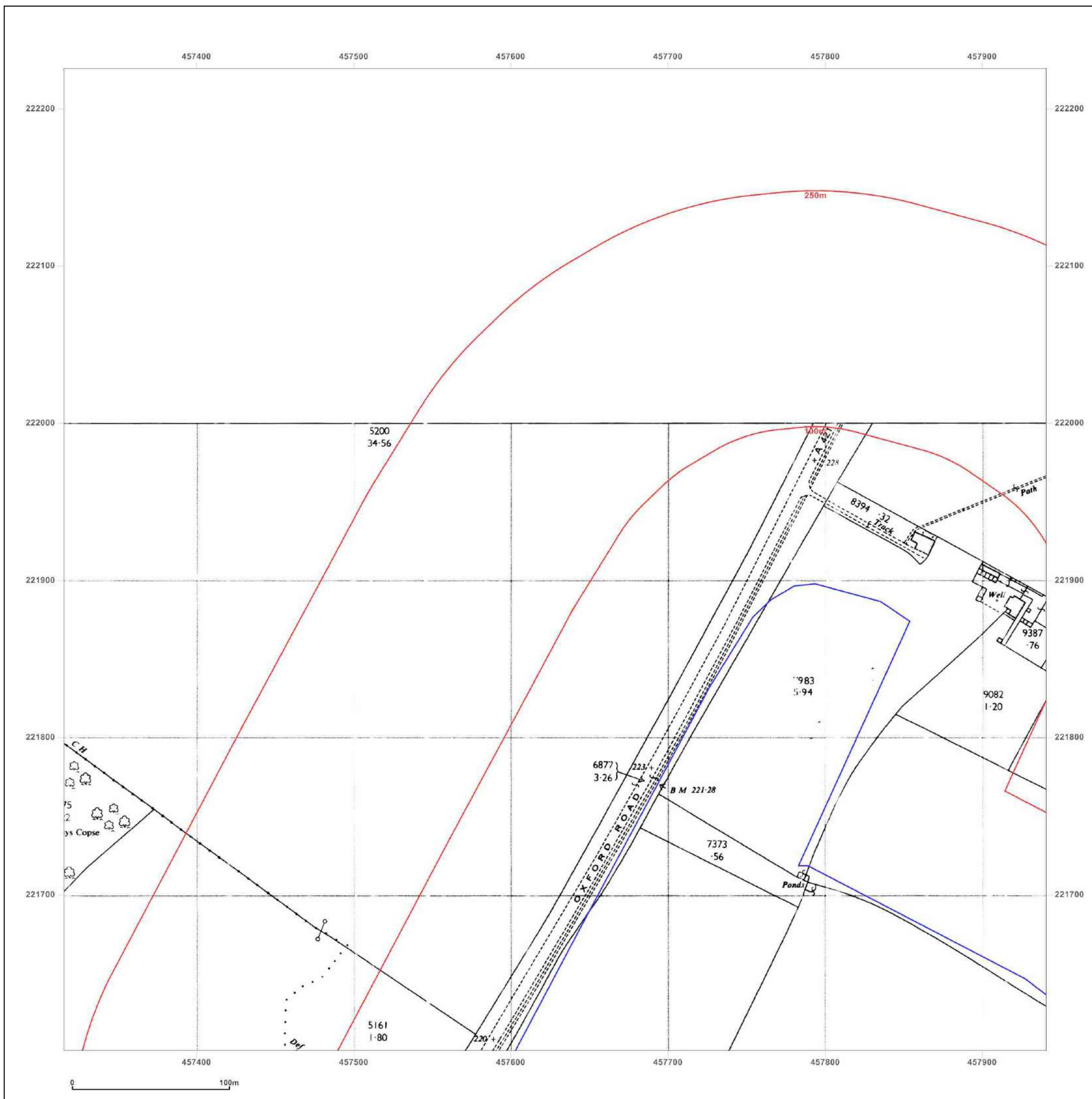


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

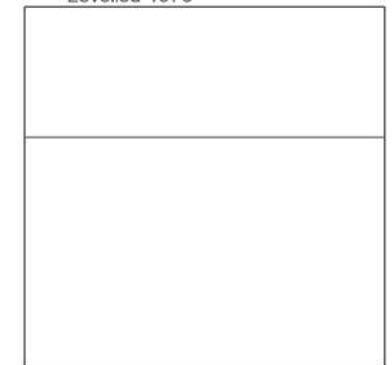
Map date: 1976

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1976
 Revised 1976
 Edition N/A
 Copyright 1977
 Levelled 1970

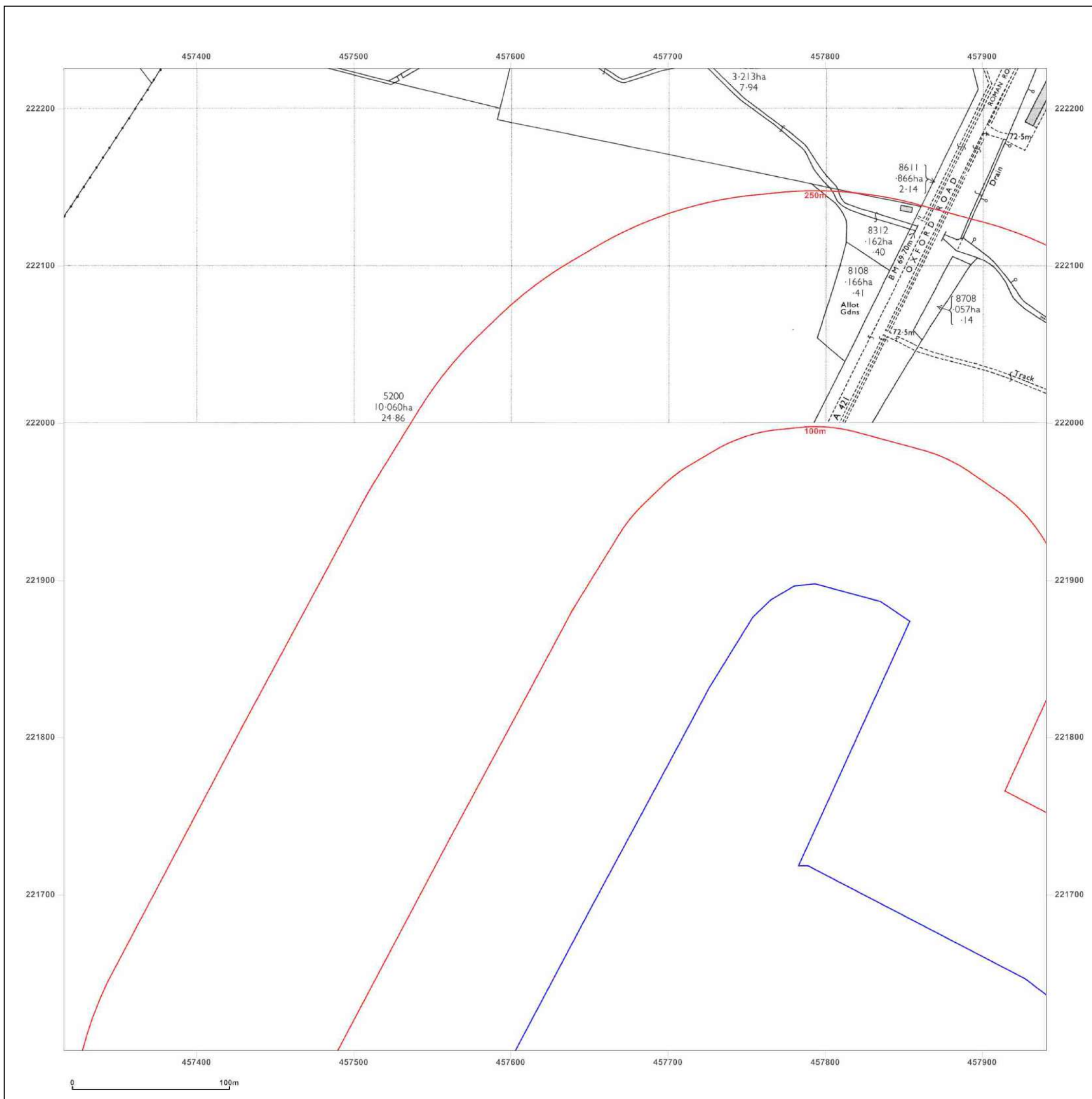


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1981-1983

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1970
 Revised 1981
 Edition N/A
 Copyright 1981
 Levelled 1970

Surveyed 1983
 Revised 1983
 Edition N/A
 Copyright 1984
 Levelled 1971

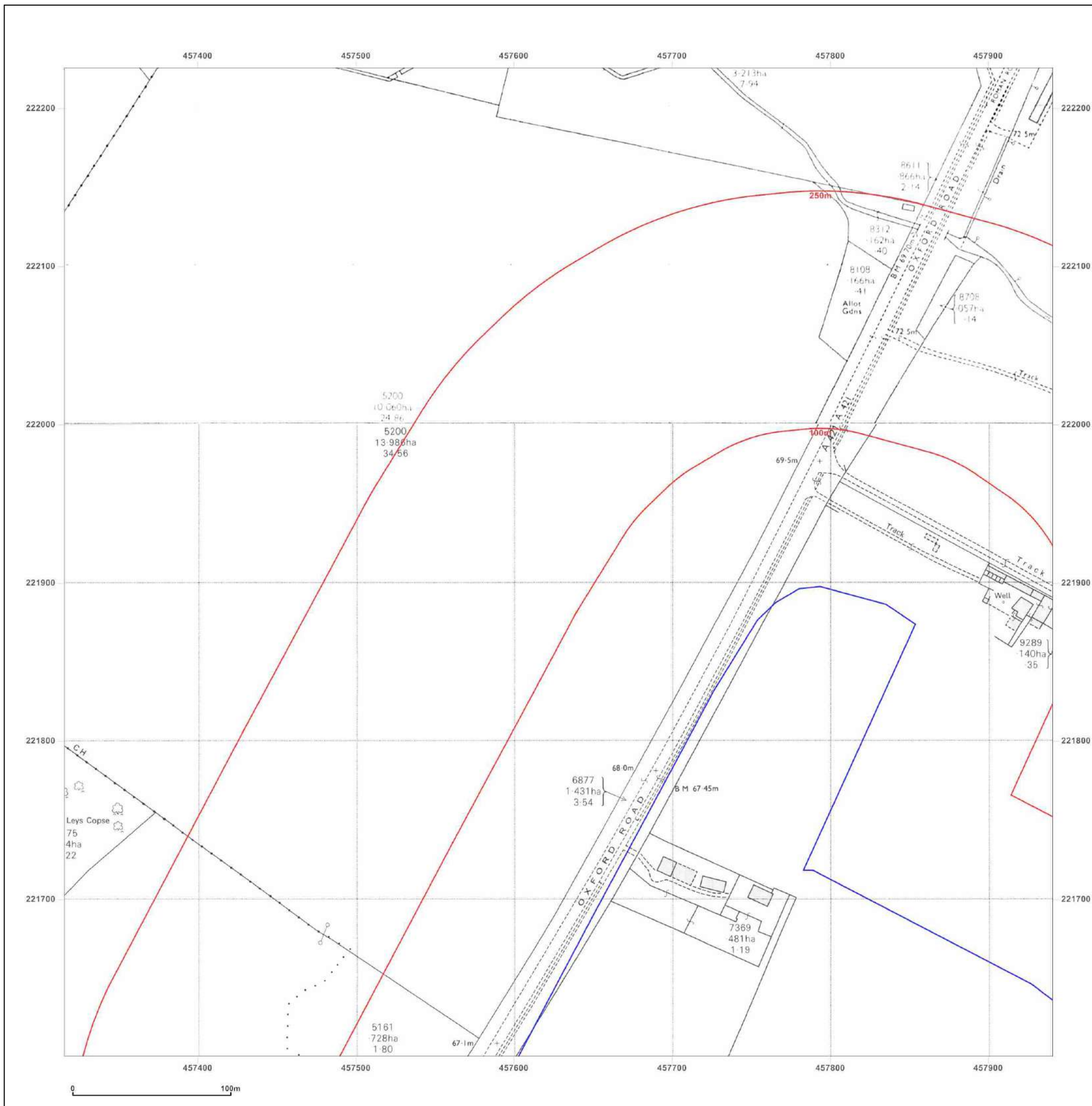


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Site Details:

457789, 221586

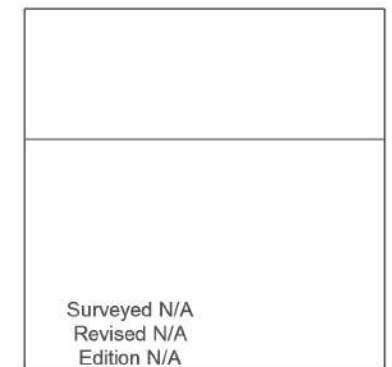
Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1984

Scale: 1:2,500

Printed at: 1:2,500



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

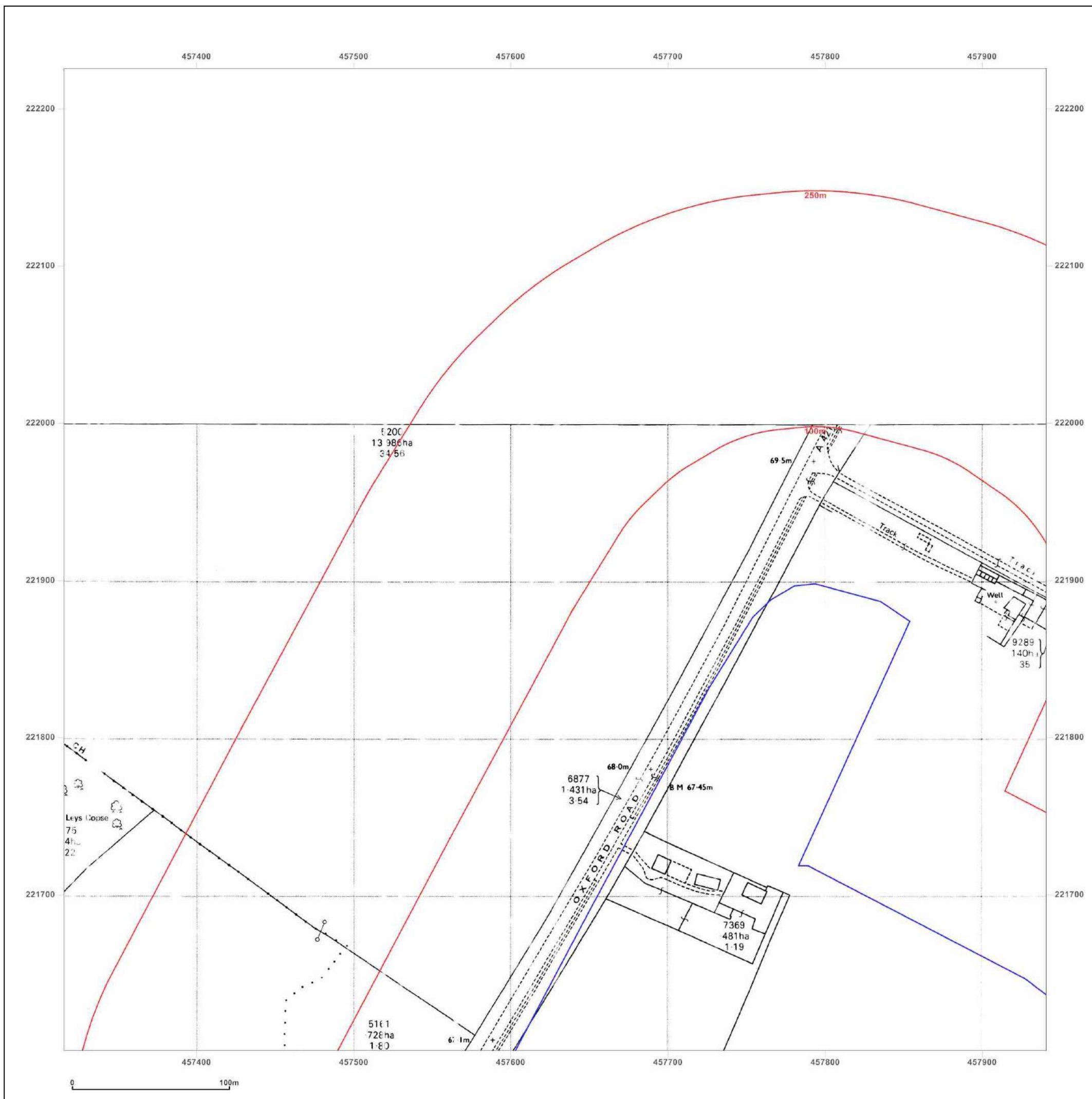


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1992

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

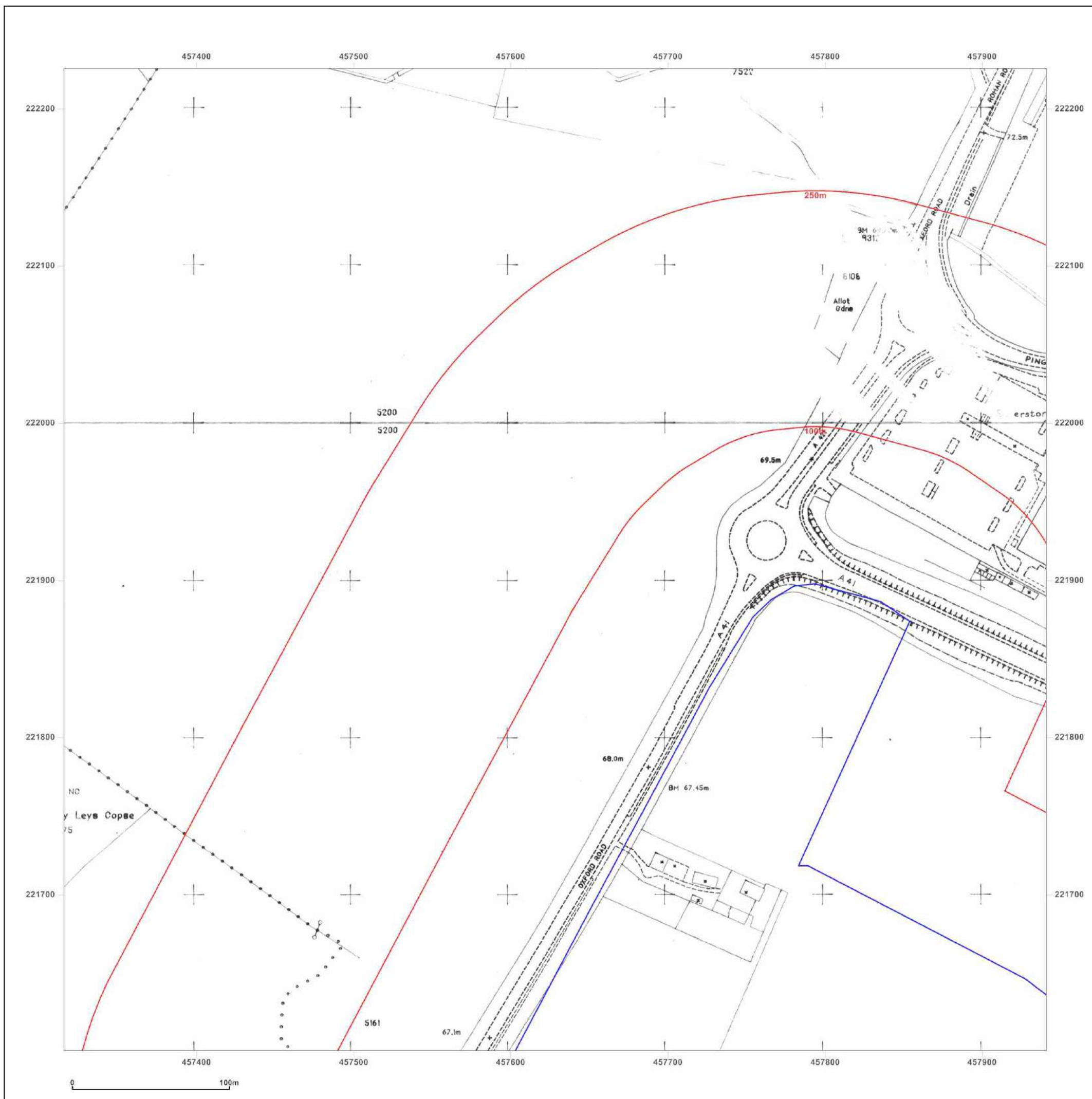


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Site Details:

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Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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

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

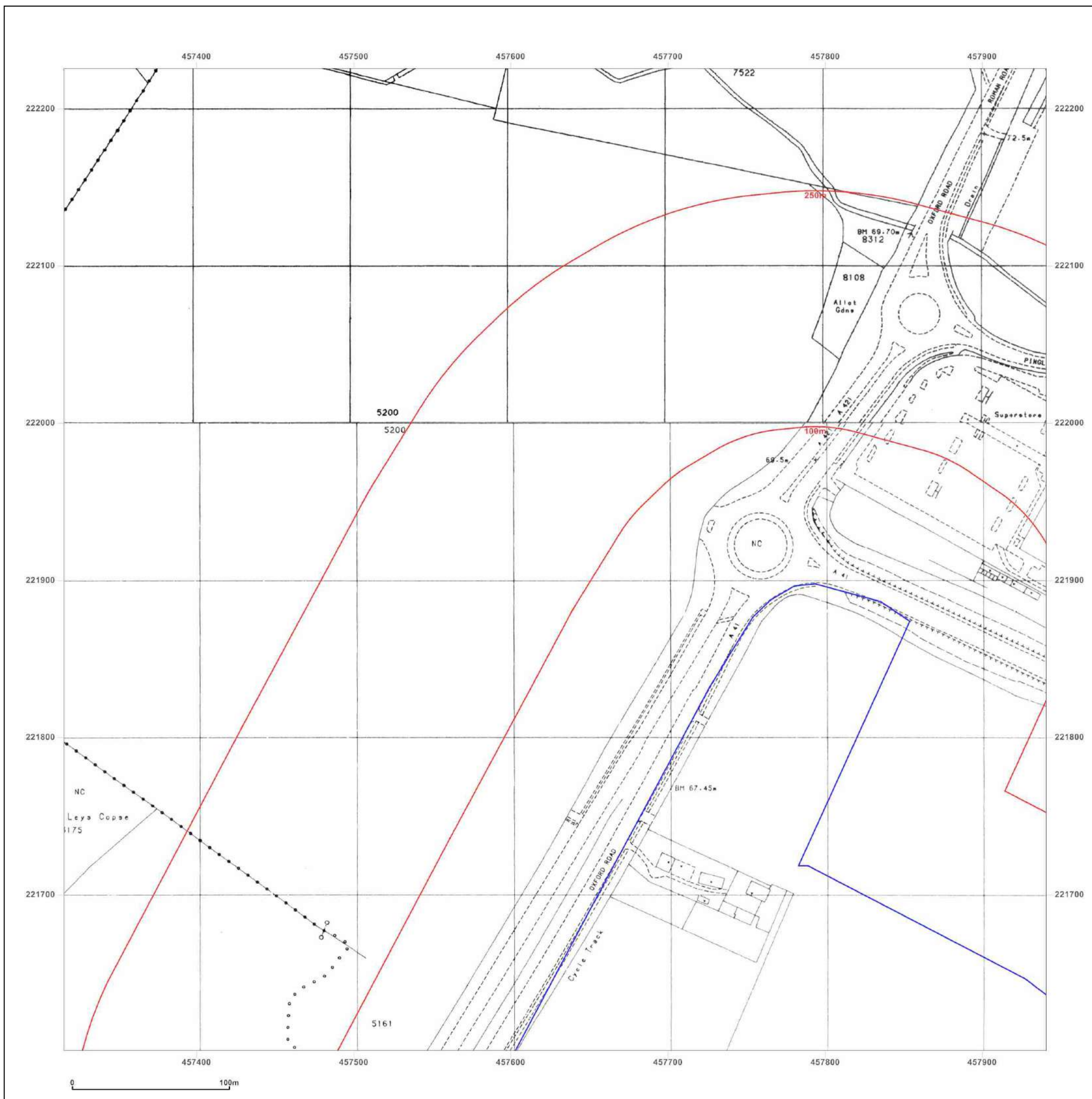


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1994

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

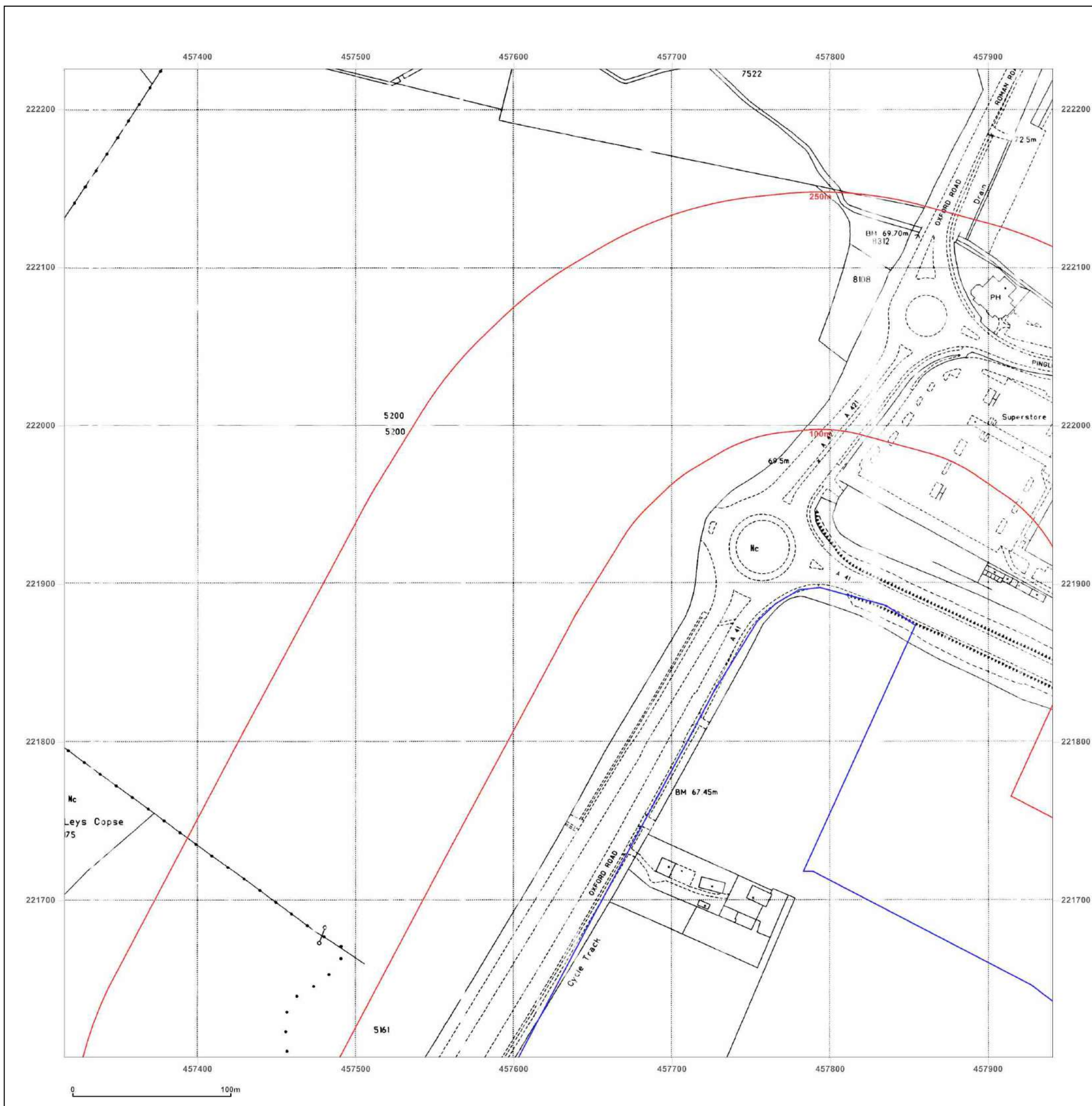


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

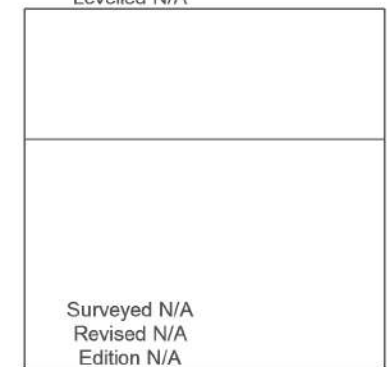
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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



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

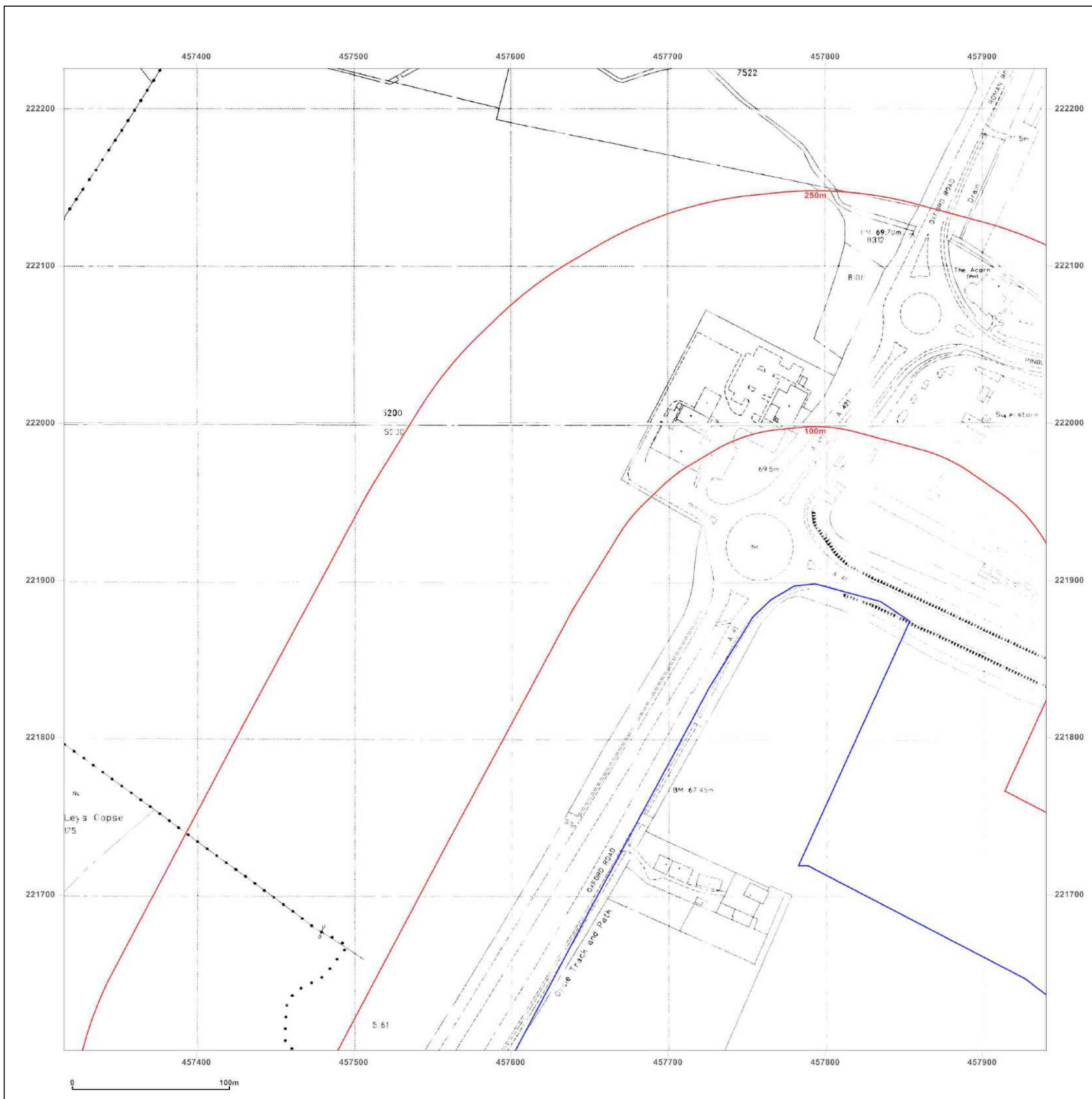


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_1_2
Grid Ref: 457628, 221913

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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

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

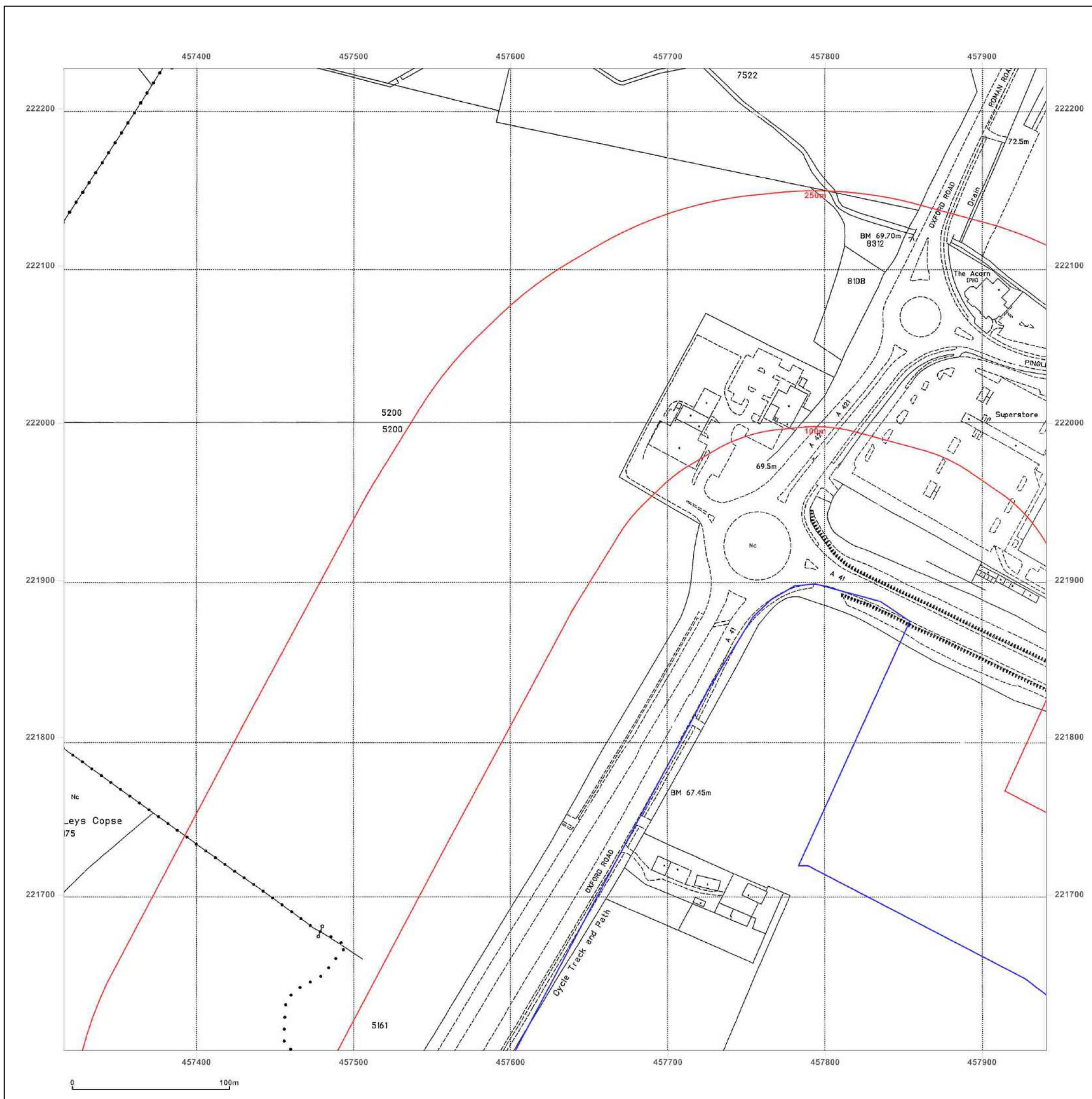


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Site Details:

457789, 221586

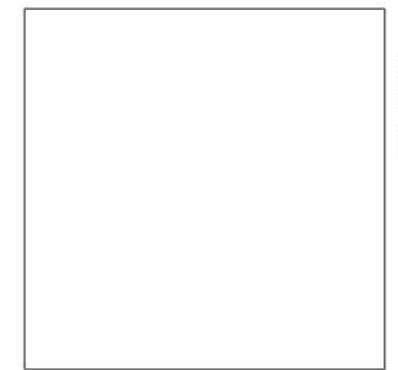
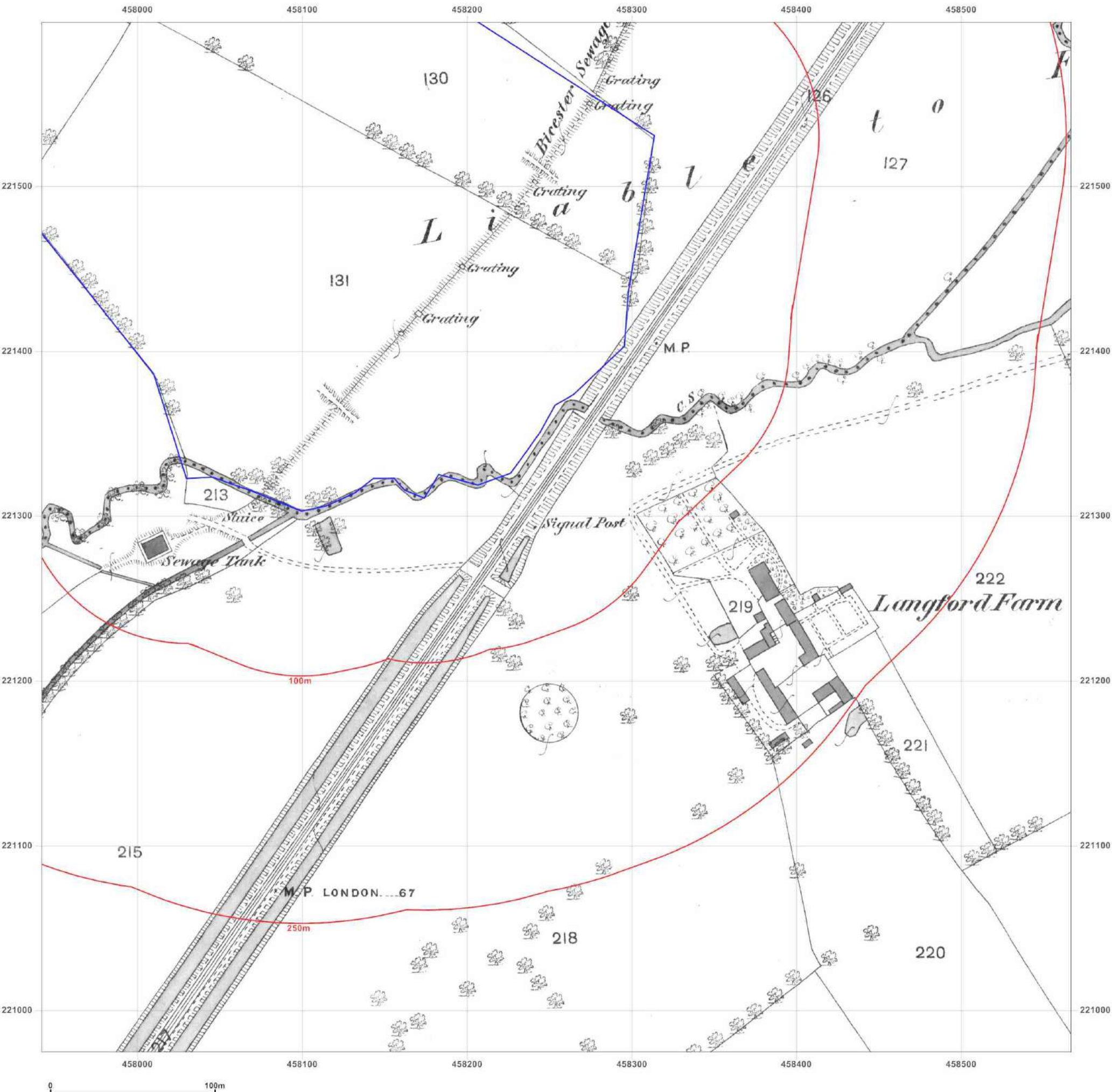
Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: County Series

Map date: 1881

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1881
 Revised 1881
 Edition N/A
 Copyright N/A
 Levelled N/A



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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: County Series

Map date: 1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1900
 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A

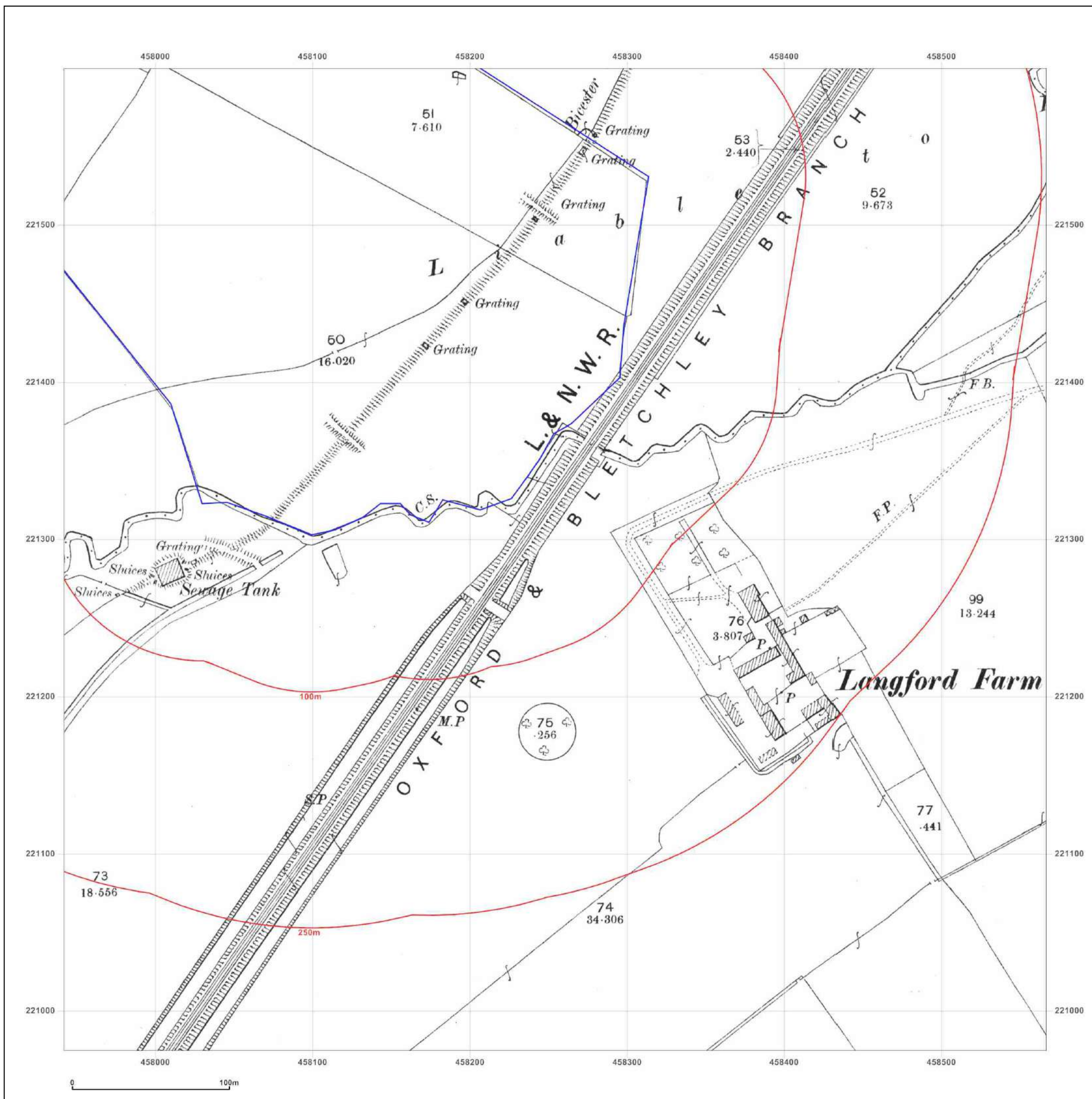


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Site Details:

457789, 221586

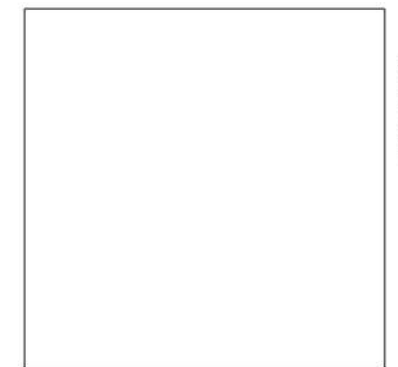
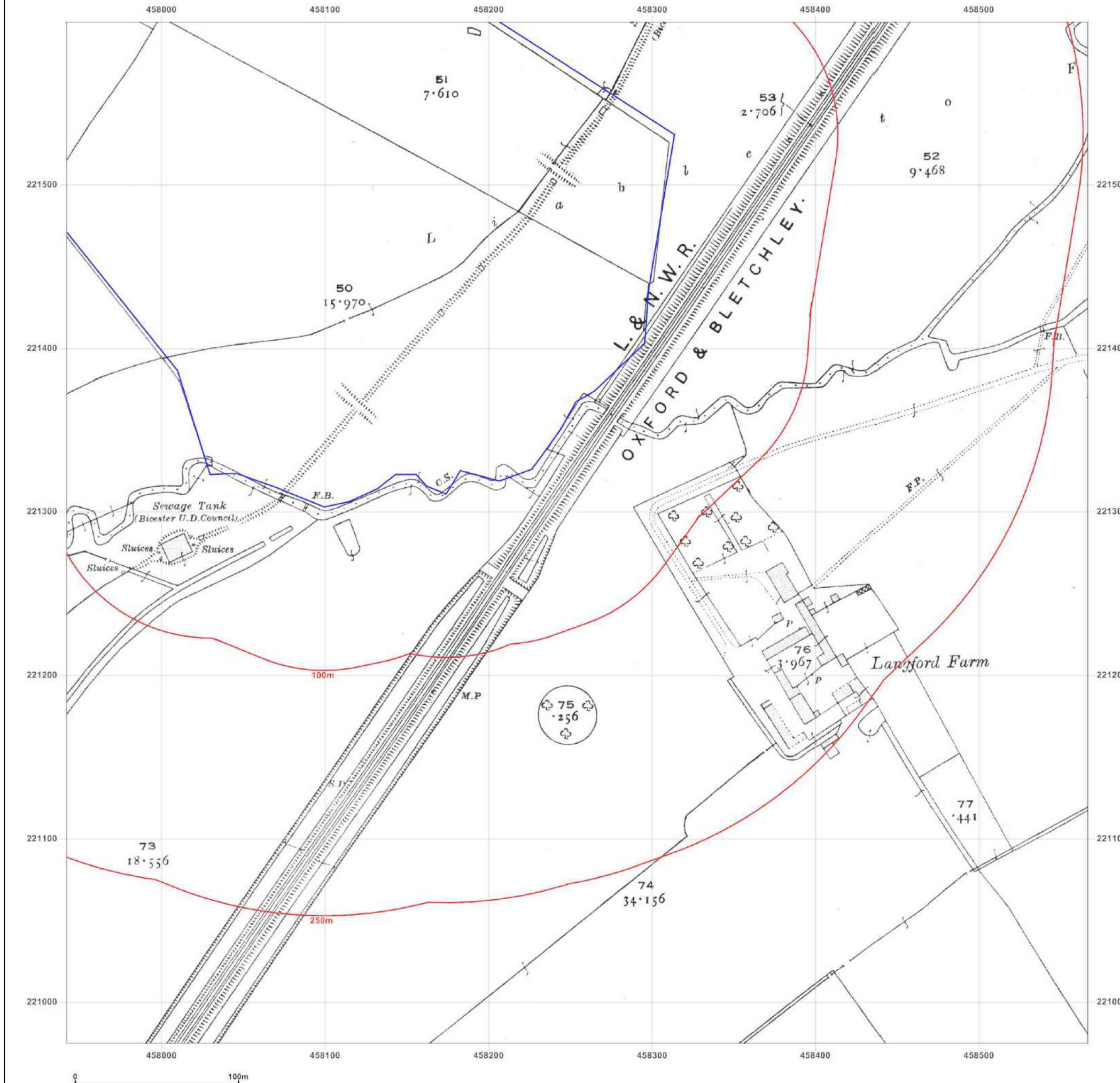
Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: County Series

Map date: 1922

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A



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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

Map date: 1966-1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1968
 Levelled N/A

Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962

Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962



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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

Map date: 1967-1968

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed N/A
 Revised 1966
 Edition N/A
 Copyright 1968
 Levelled 1962

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

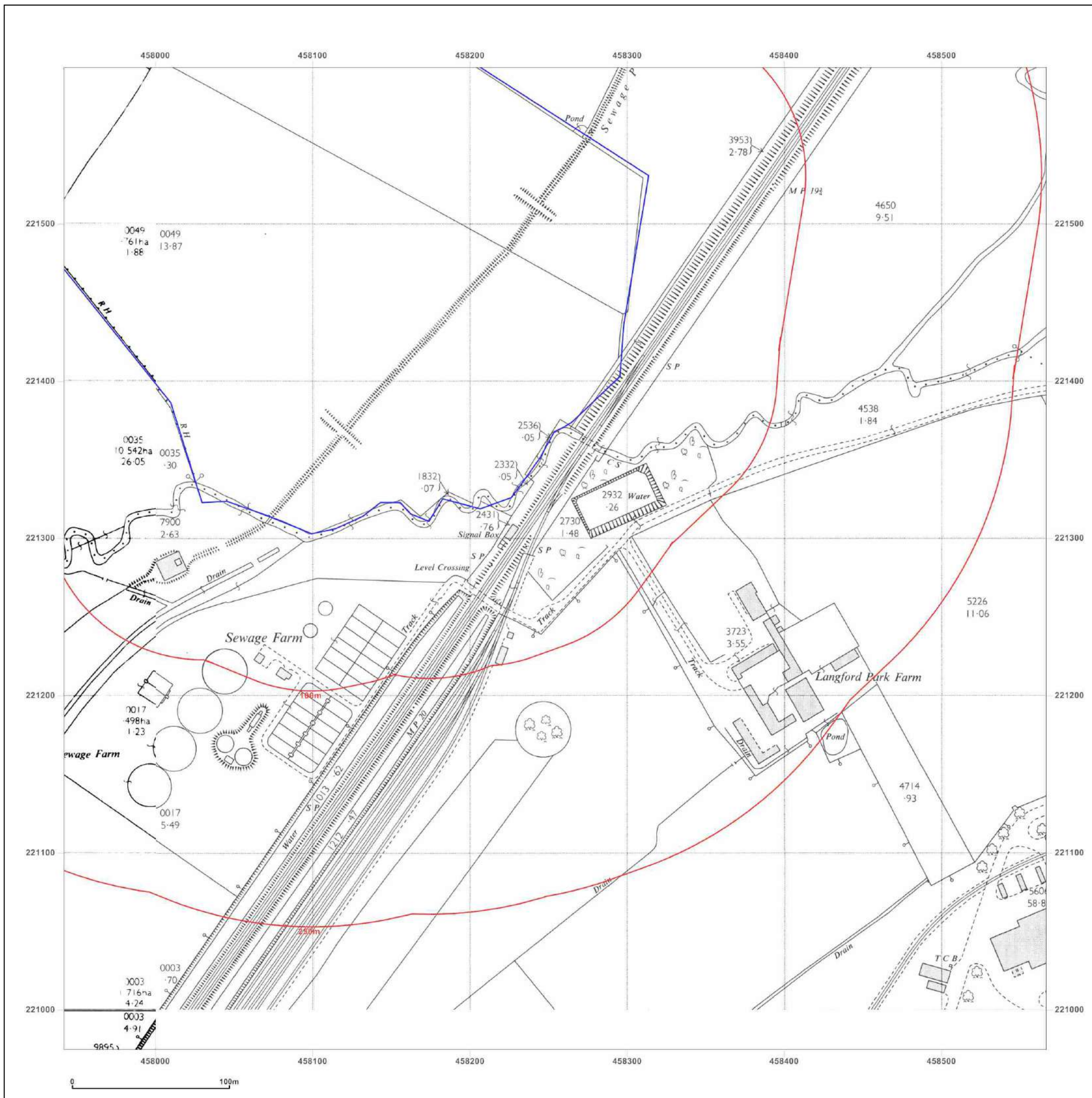


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

Map date: 1983-1986

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1983
 Revised 1983
 Edition N/A
 Copyright 1984
 Levelled 1971

Surveyed 1968
 Revised 1986
 Edition N/A
 Copyright 1986
 Levelled 1968

Surveyed 1971
 Revised 1986
 Edition N/A
 Copyright 1986
 Levelled 1971

Surveyed 1971
 Revised 1986
 Edition N/A
 Copyright 1986
 Levelled 1971

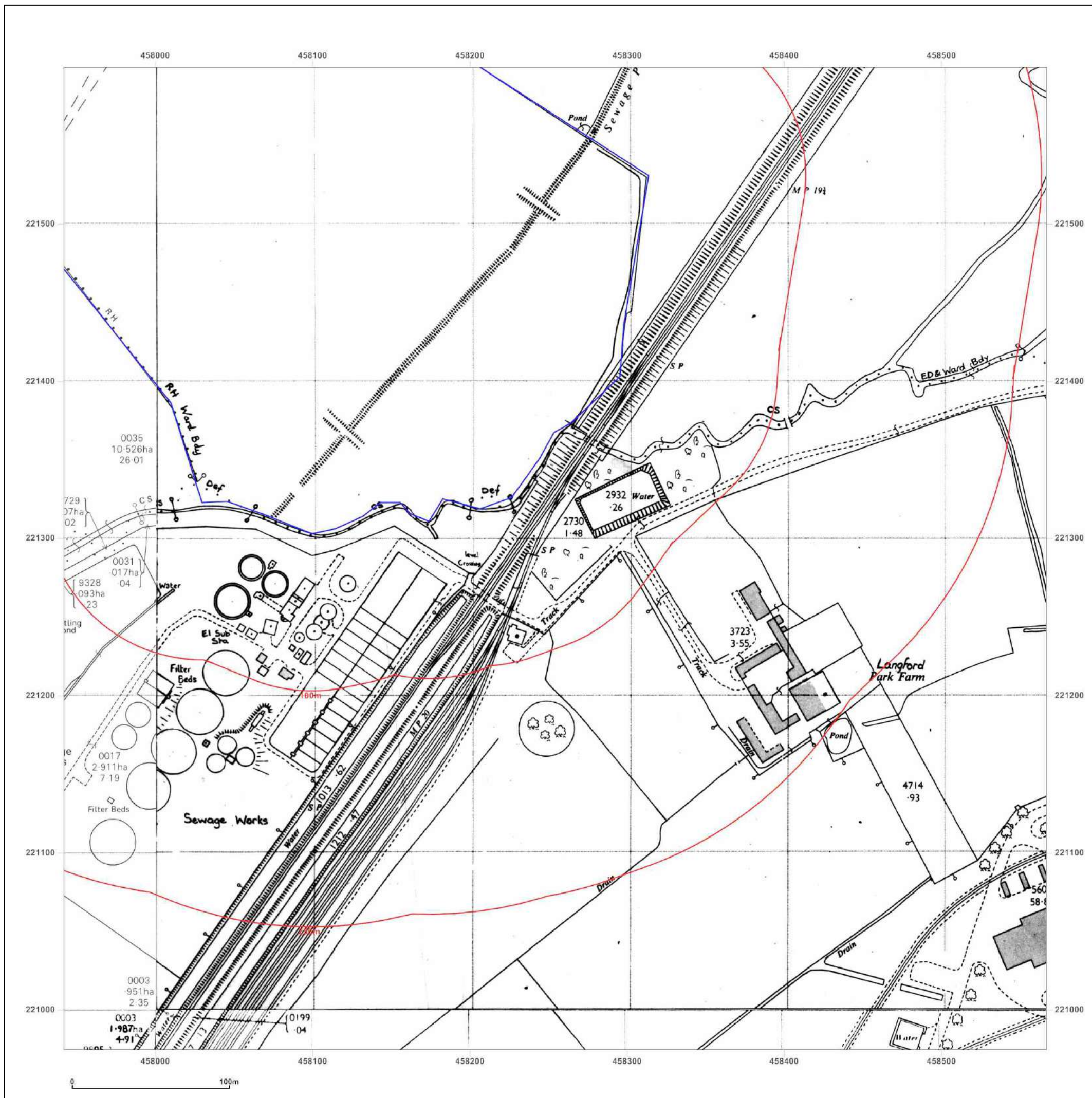


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Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

Map date: 1992-1994

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

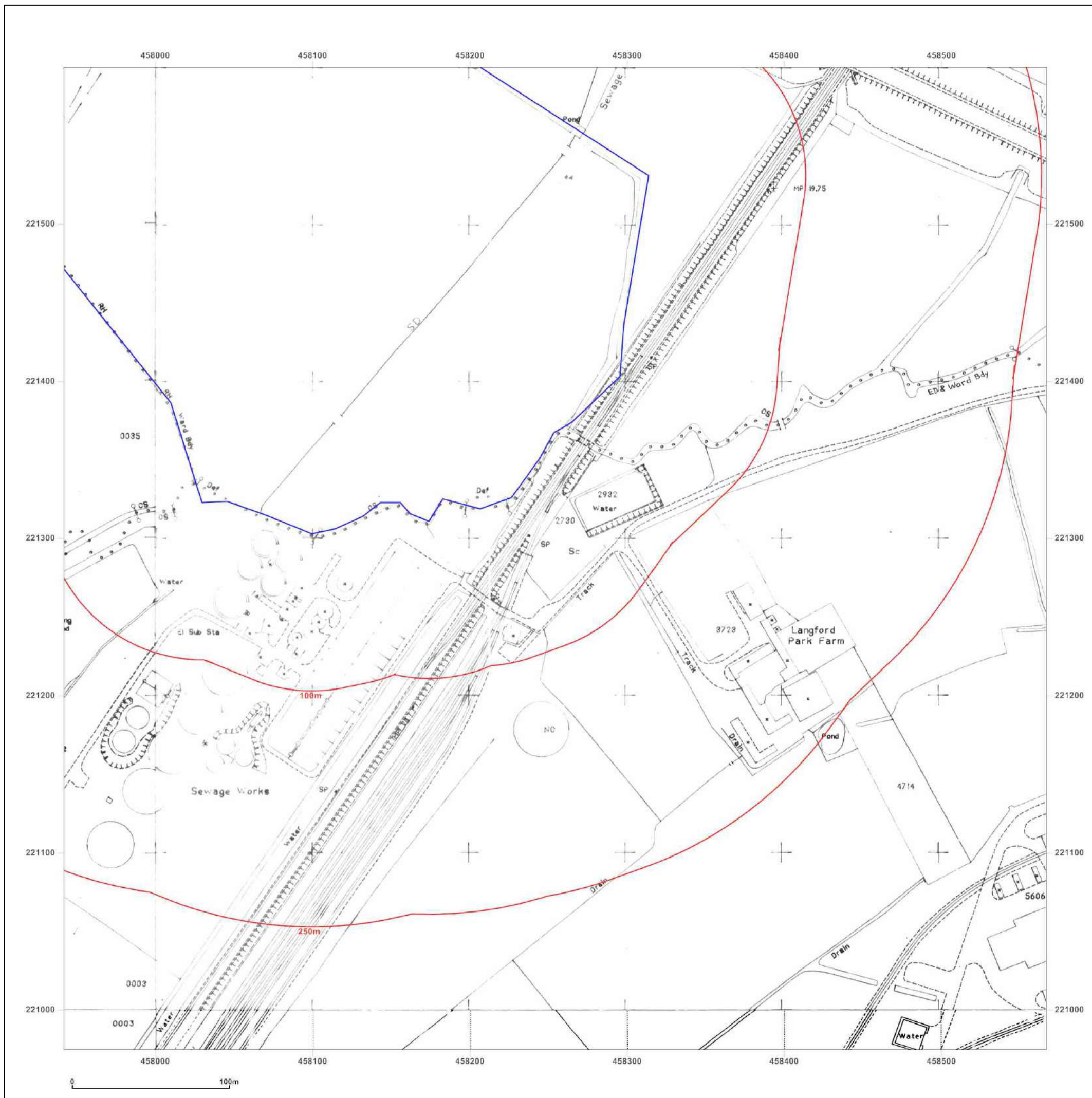


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

Map date: 1993-1994

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

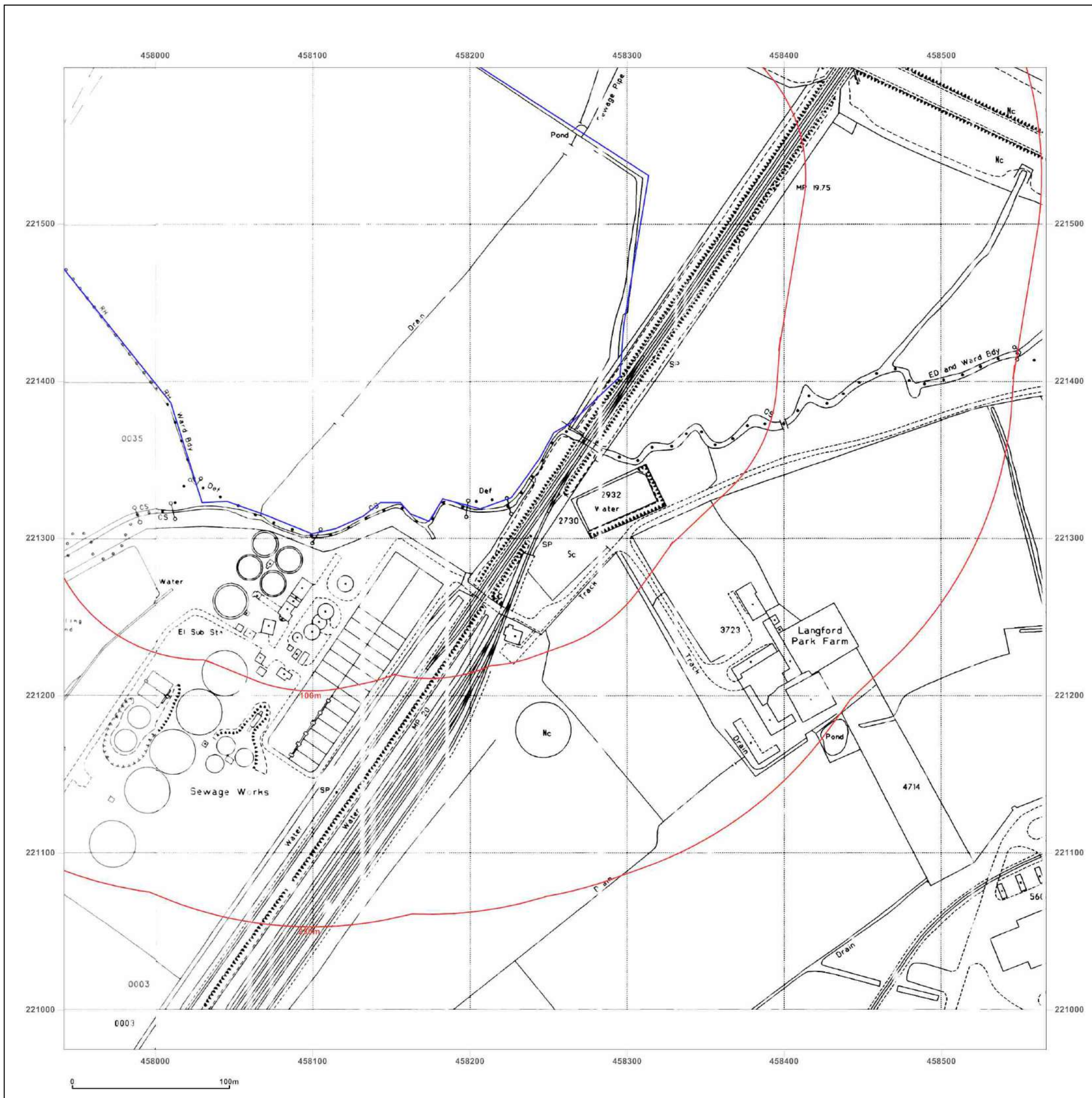


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Site Details:

457789, 221586

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Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

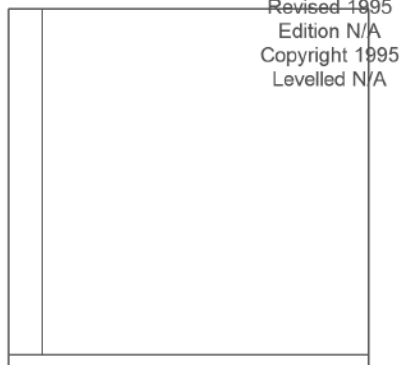
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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



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

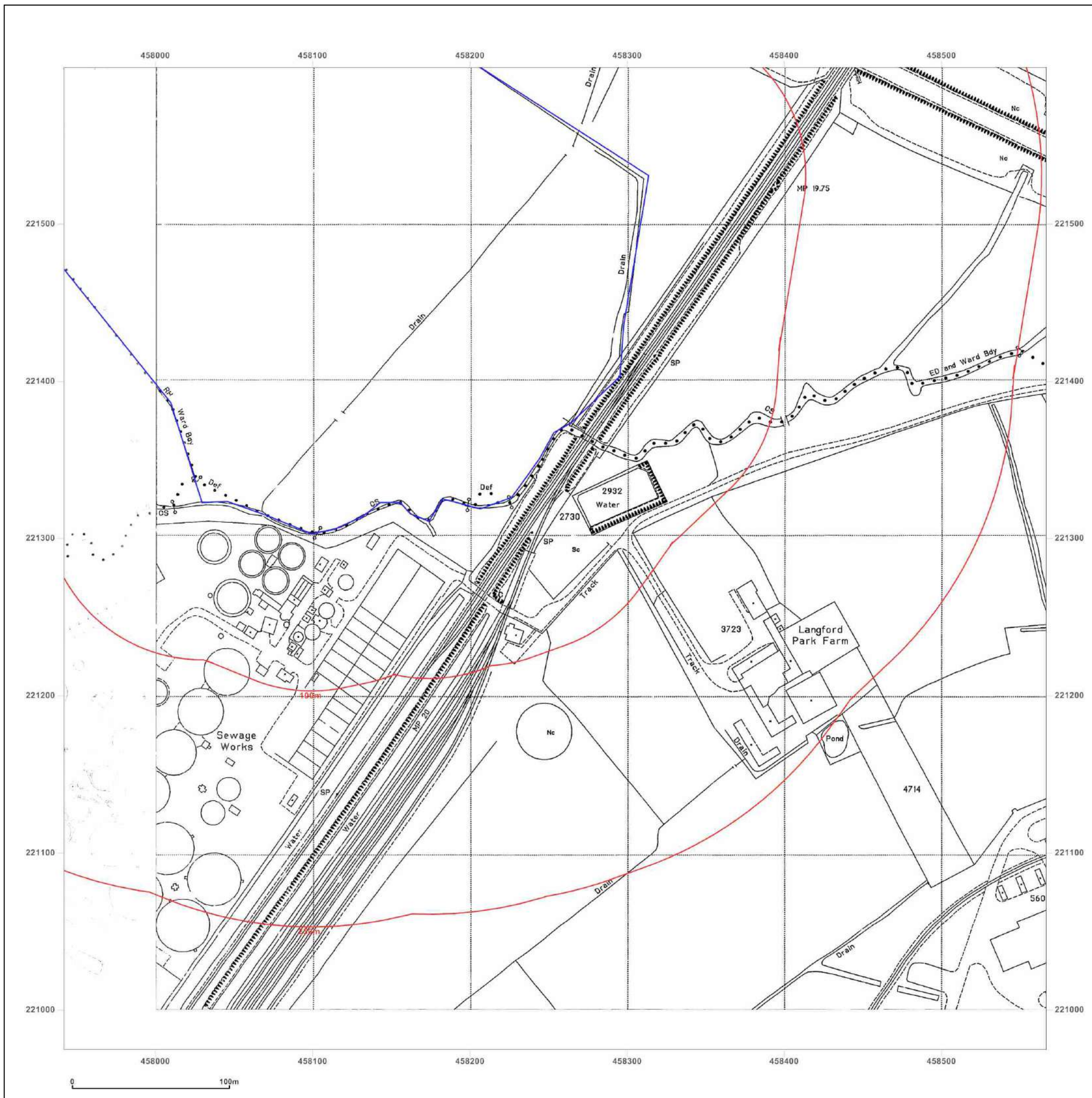


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_1
Grid Ref: 458254, 221287

Map Name: National Grid

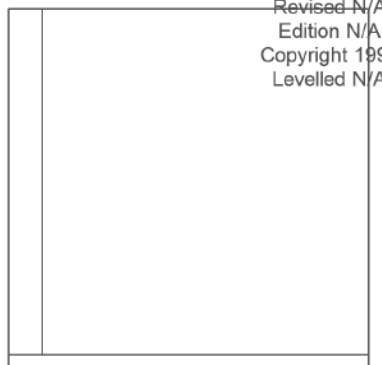
Map date: 1994-1995

Scale: 1:2,500

Printed at: 1:2,500



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 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A



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

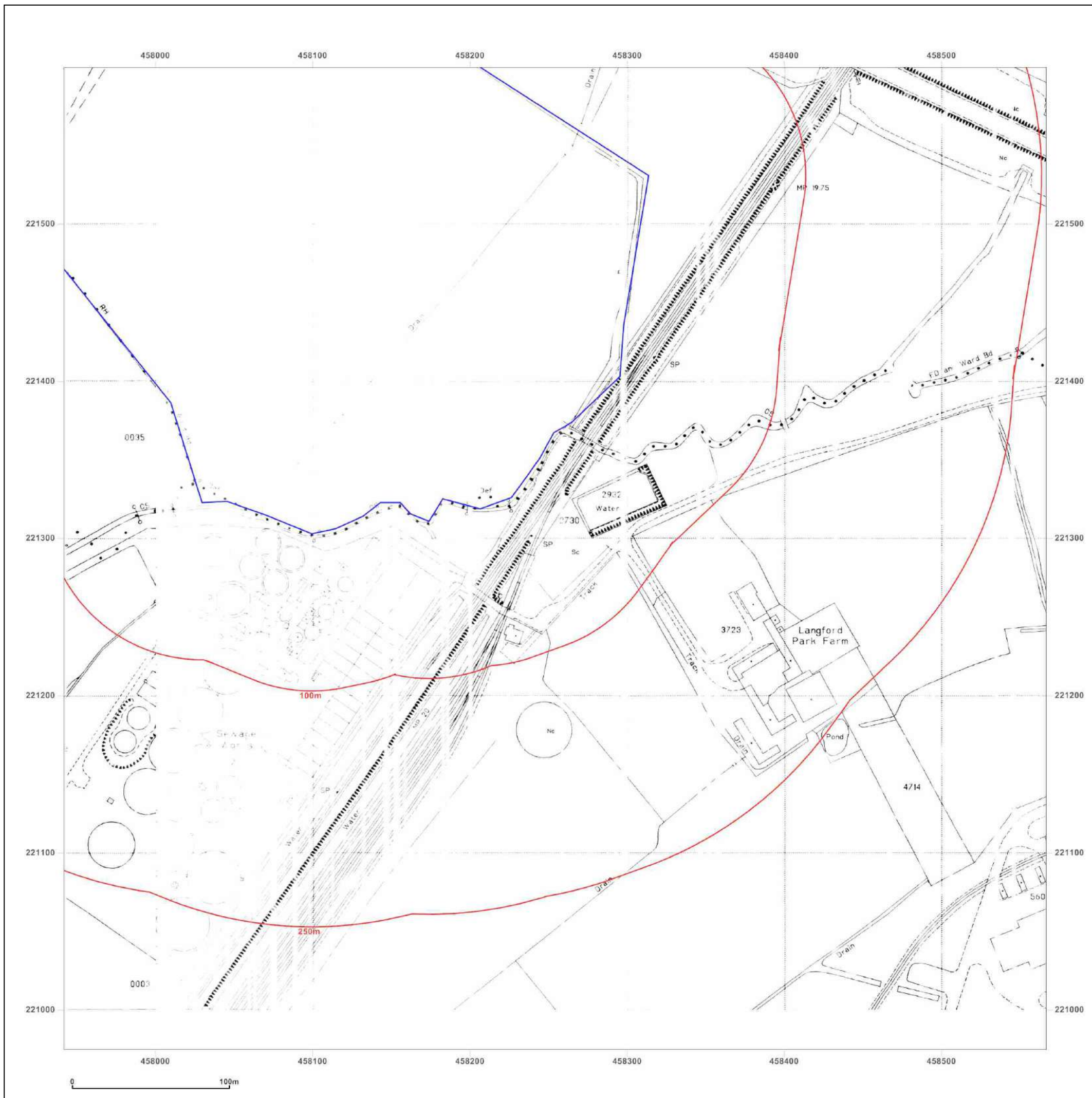


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: County Series

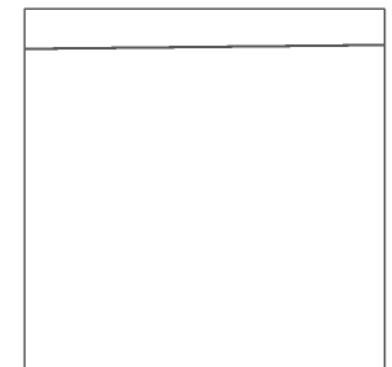
Map date: 1881

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1881
 Revised 1881
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1881
 Revised 1881
 Edition N/A
 Copyright N/A
 Levelled N/A

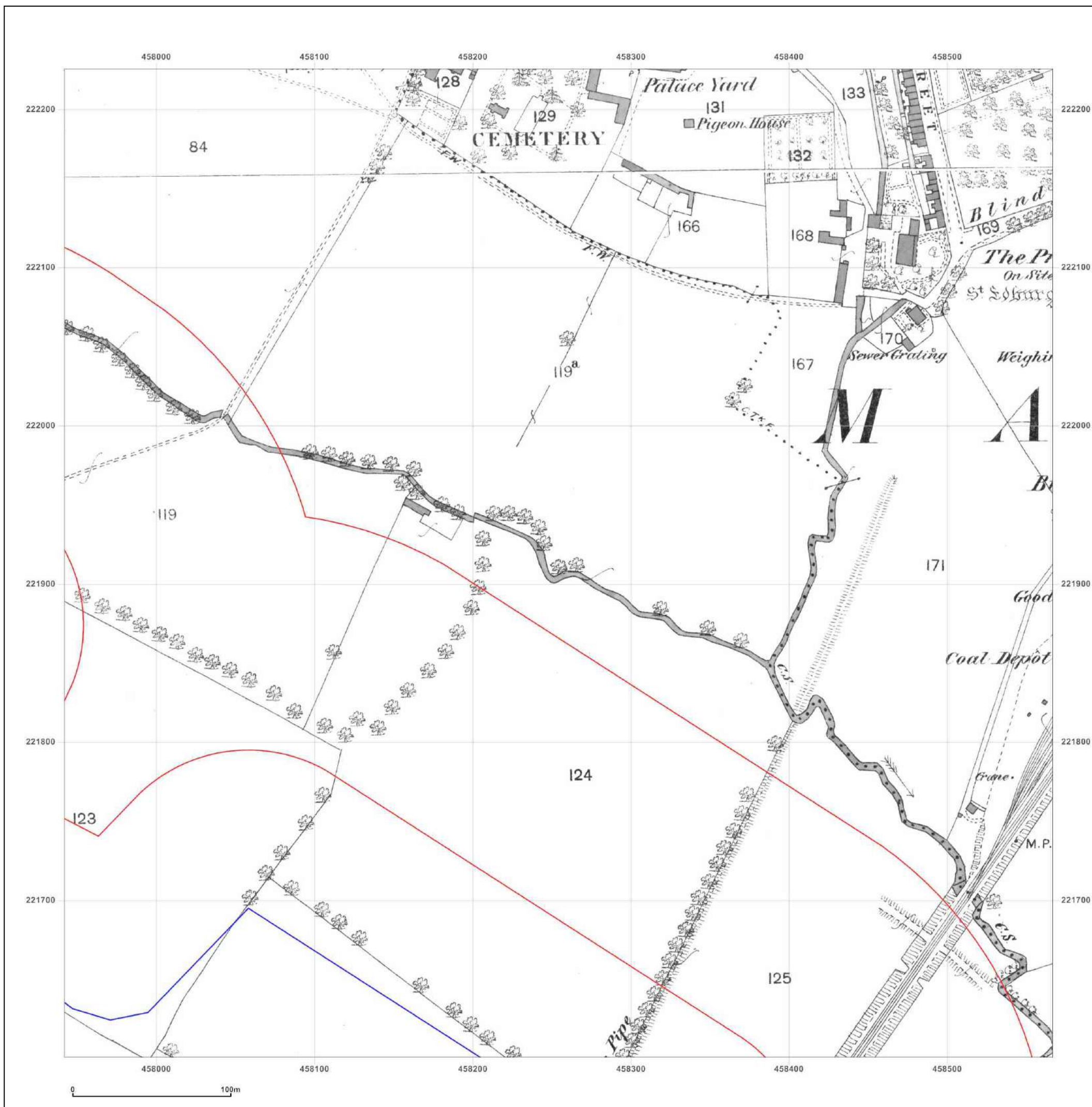


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Site Details:

457789, 221586

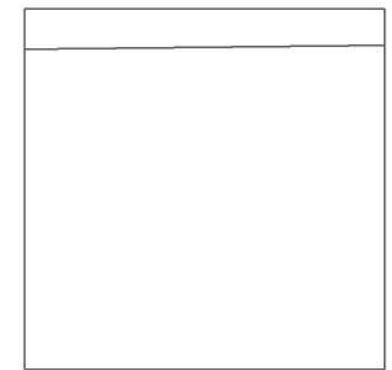
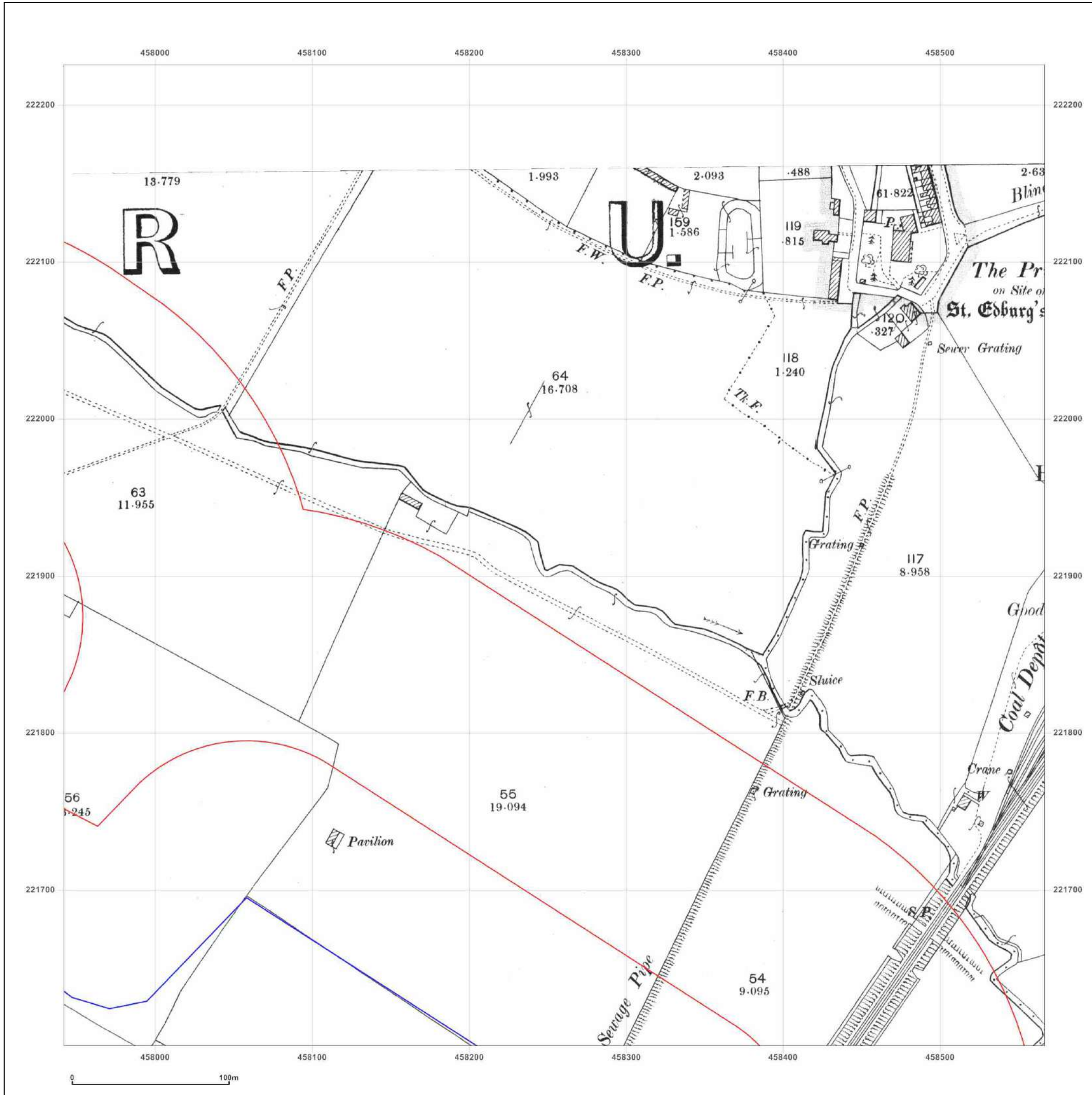
Client Ref: NTE2366-POR012085
 Report Ref: HMD-214-4080160_LS_2_2
 Grid Ref: 458254, 221913

Map Name: County Series

Map date: 1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1900
 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A



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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: County Series

Map date: 1922

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1922
 Revised 1922
 Edition N/A
 Copyright N/A
 Levelled N/A

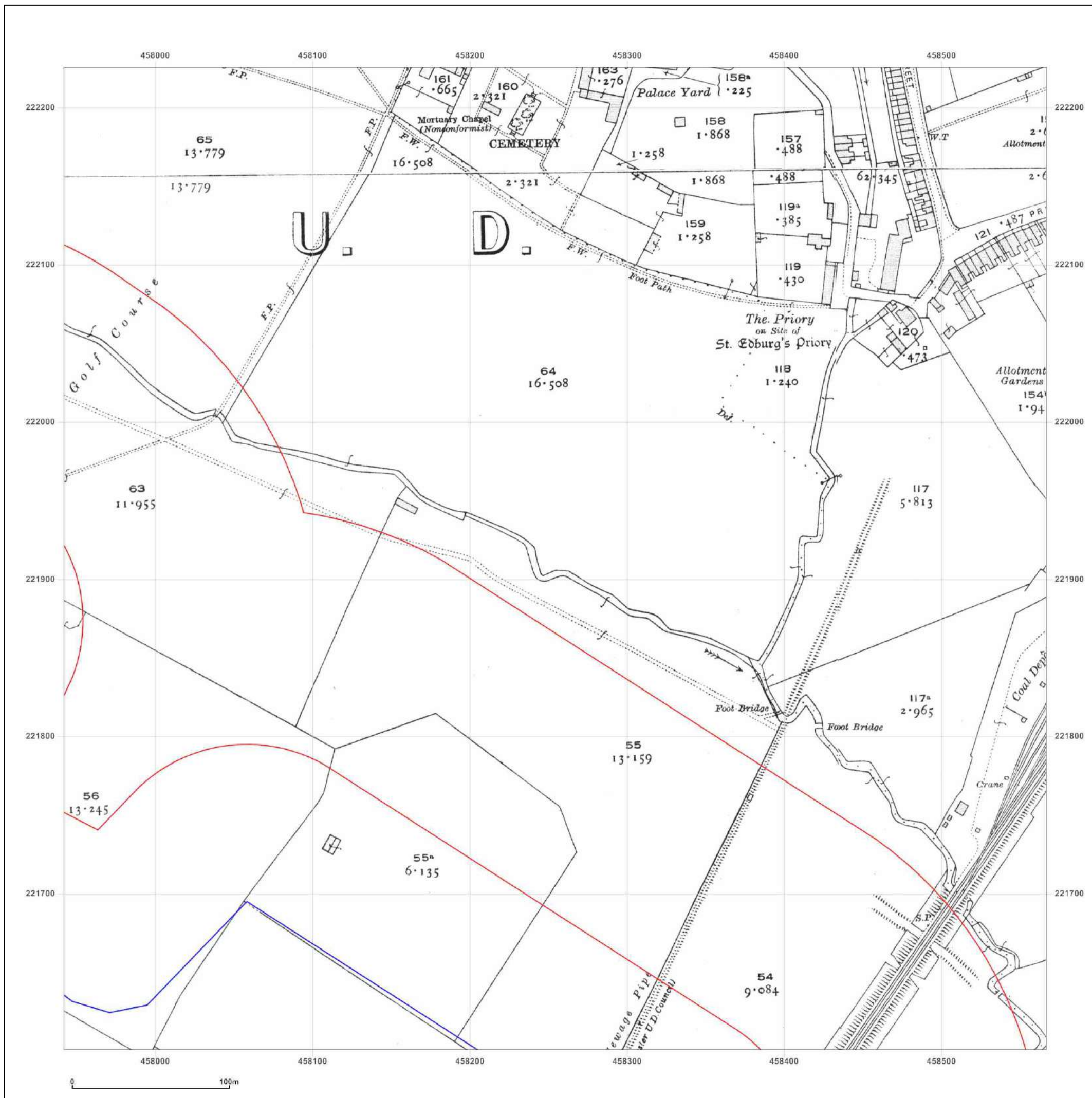


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1966-1968

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962

Surveyed N/A
 Revised 1966
 Edition N/A
 Copyright 1968
 Levelled 1962

Surveyed 1966
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled 1962

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1968
 Levelled N/A

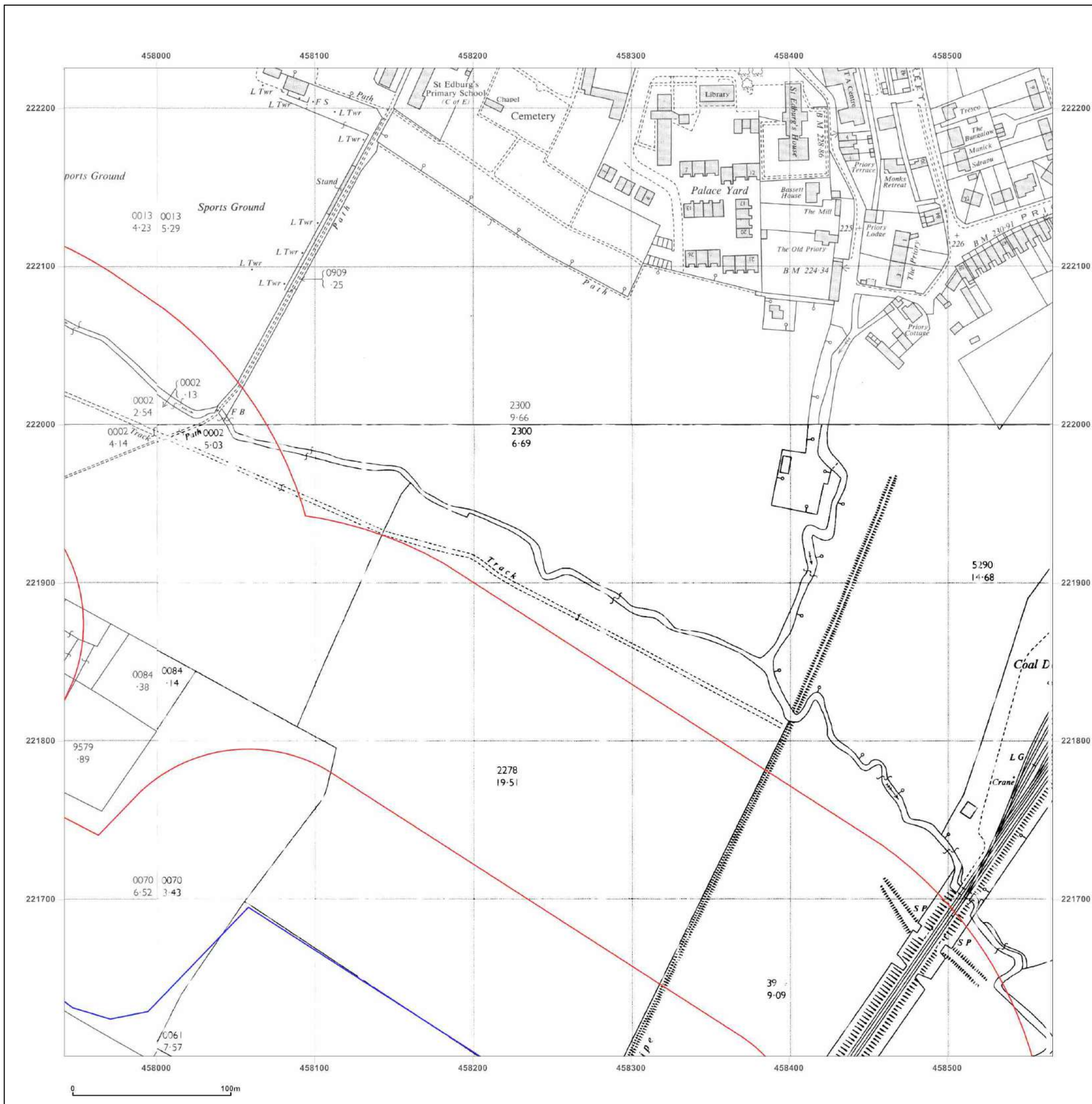


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1967-1972

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised 1966
 Edition N/A
 Copyright 1967
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1972
 Levelled N/A

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

Surveyed N/A
 Revised 1966
 Edition N/A
 Copyright 1968
 Levelled 1962

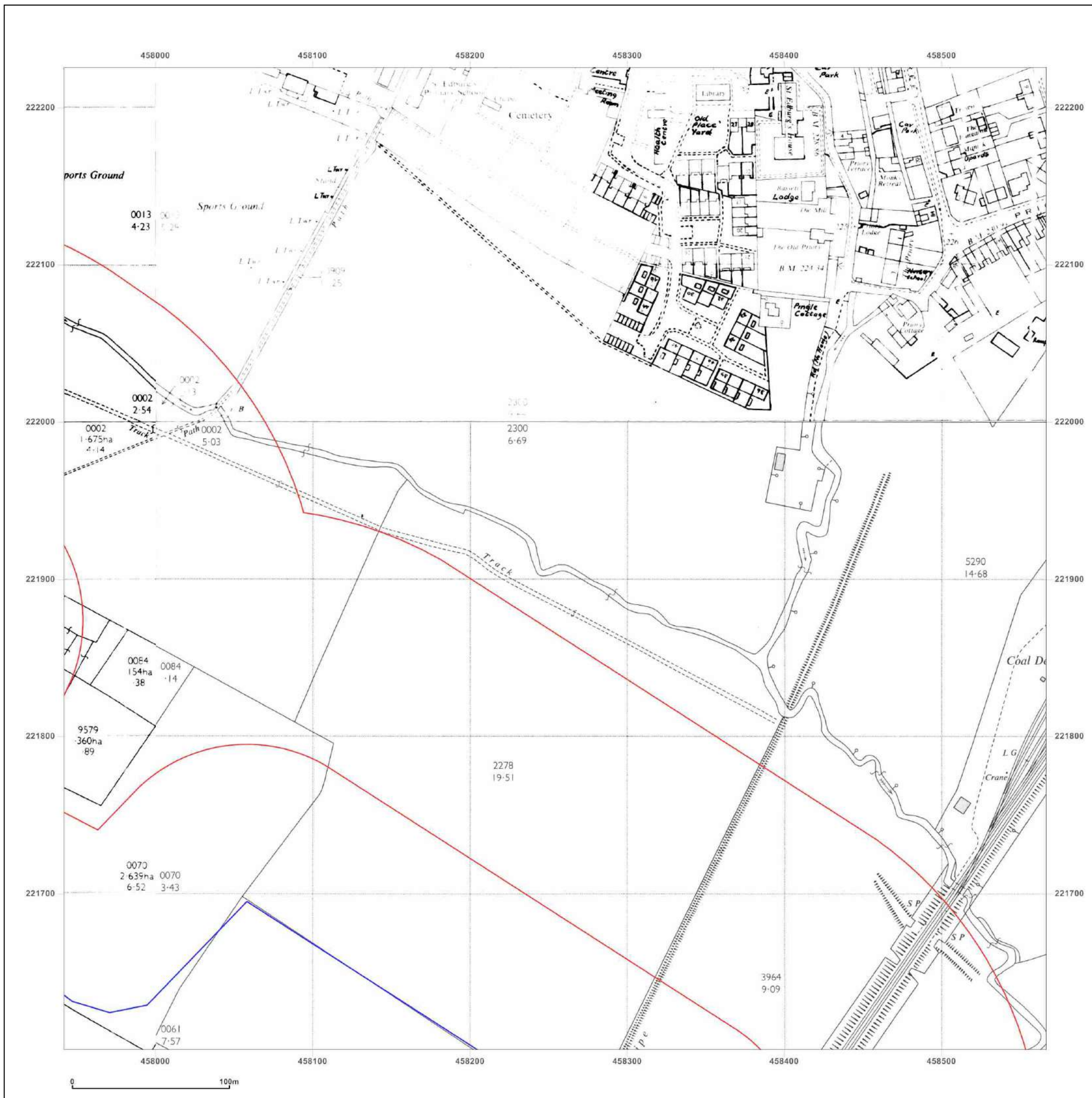


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1967-1972

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1972
 Revised 1972
 Edition N/A
 Copyright 1973
 Levelled 1971

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

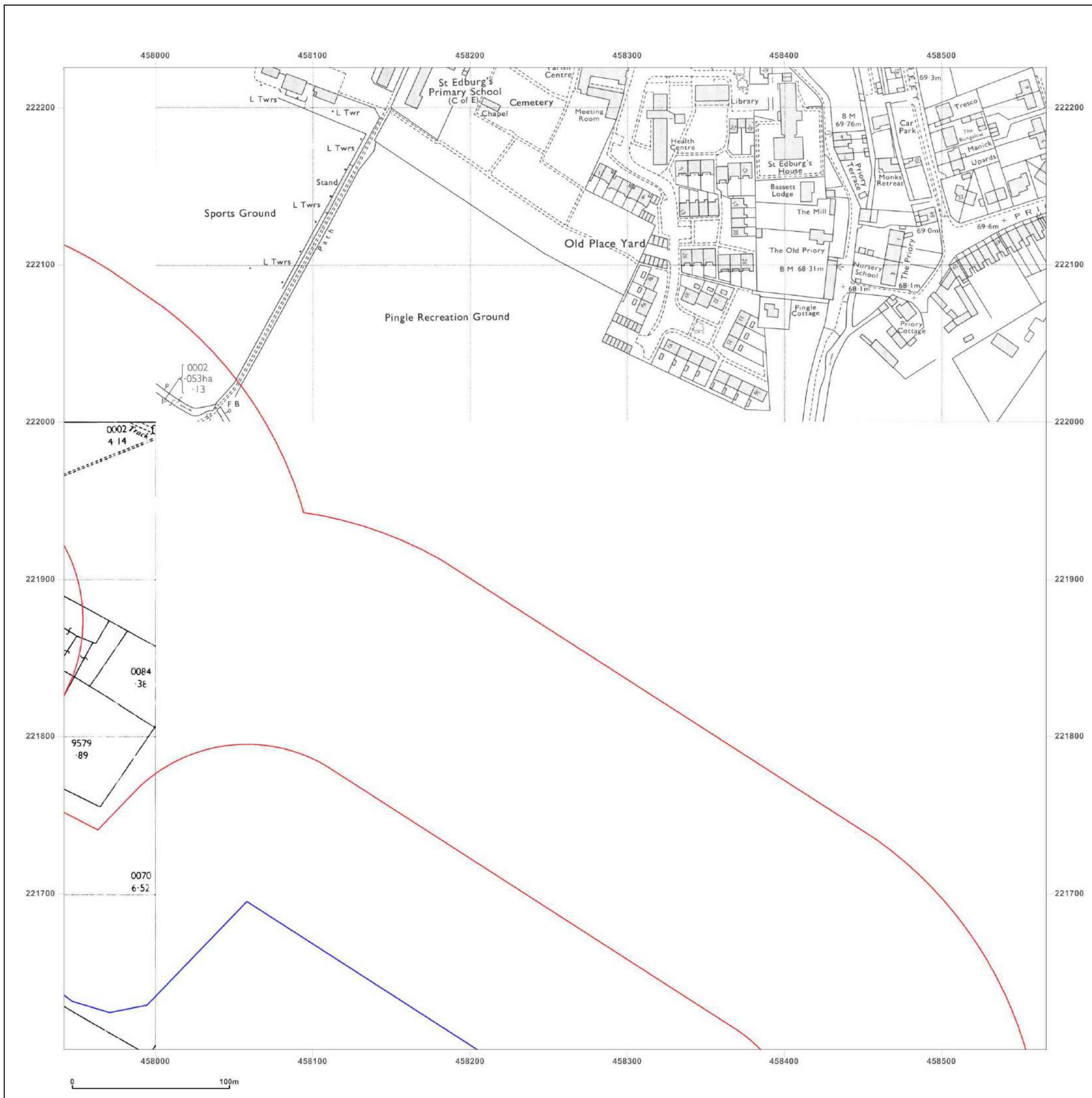


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1976-1980

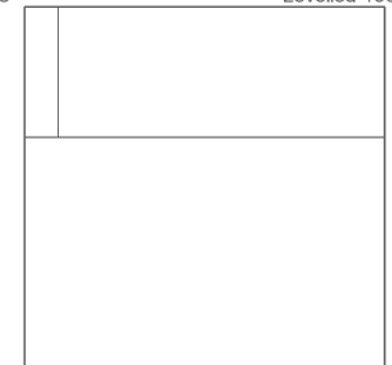
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1976
 Revised 1976
 Edition N/A
 Copyright 1977
 Levelled 1970

Surveyed 1968
 Revised 1980
 Edition N/A
 Copyright 1980
 Levelled 1968

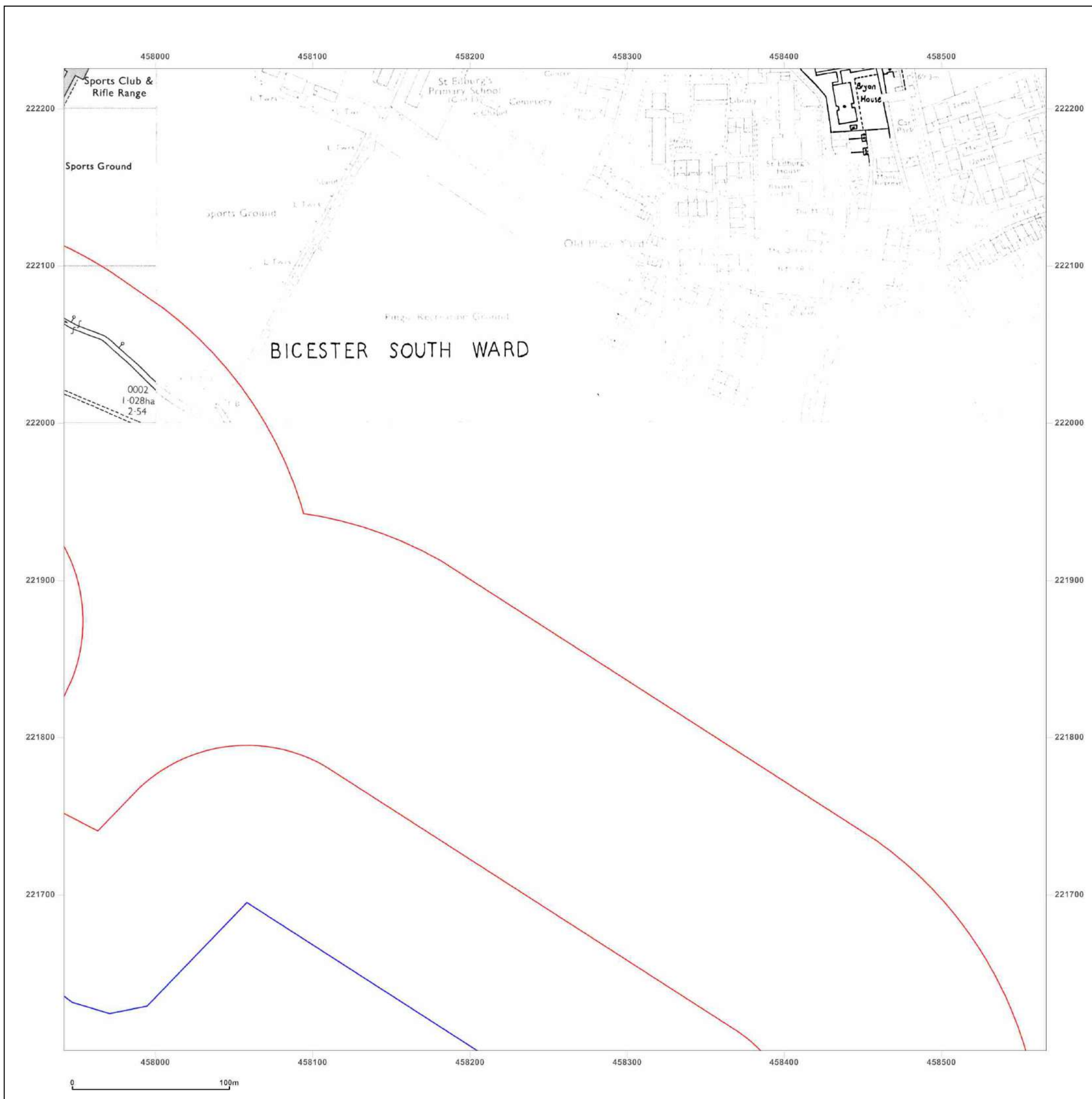


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

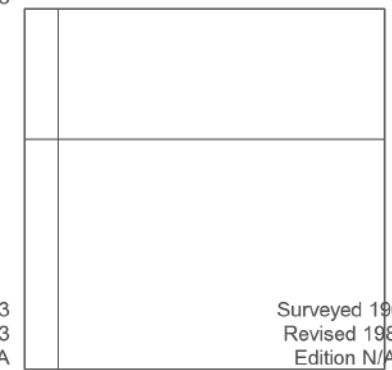
Map date: 1981-1986

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1970
 Revised 1981
 Edition N/A
 Copyright 1981
 Levelled 1970



Surveyed 1983
 Revised 1983
 Edition N/A
 Copyright 1984
 Levelled 1971

Surveyed 1968
 Revised 1986
 Edition N/A
 Copyright 1986
 Levelled 1968

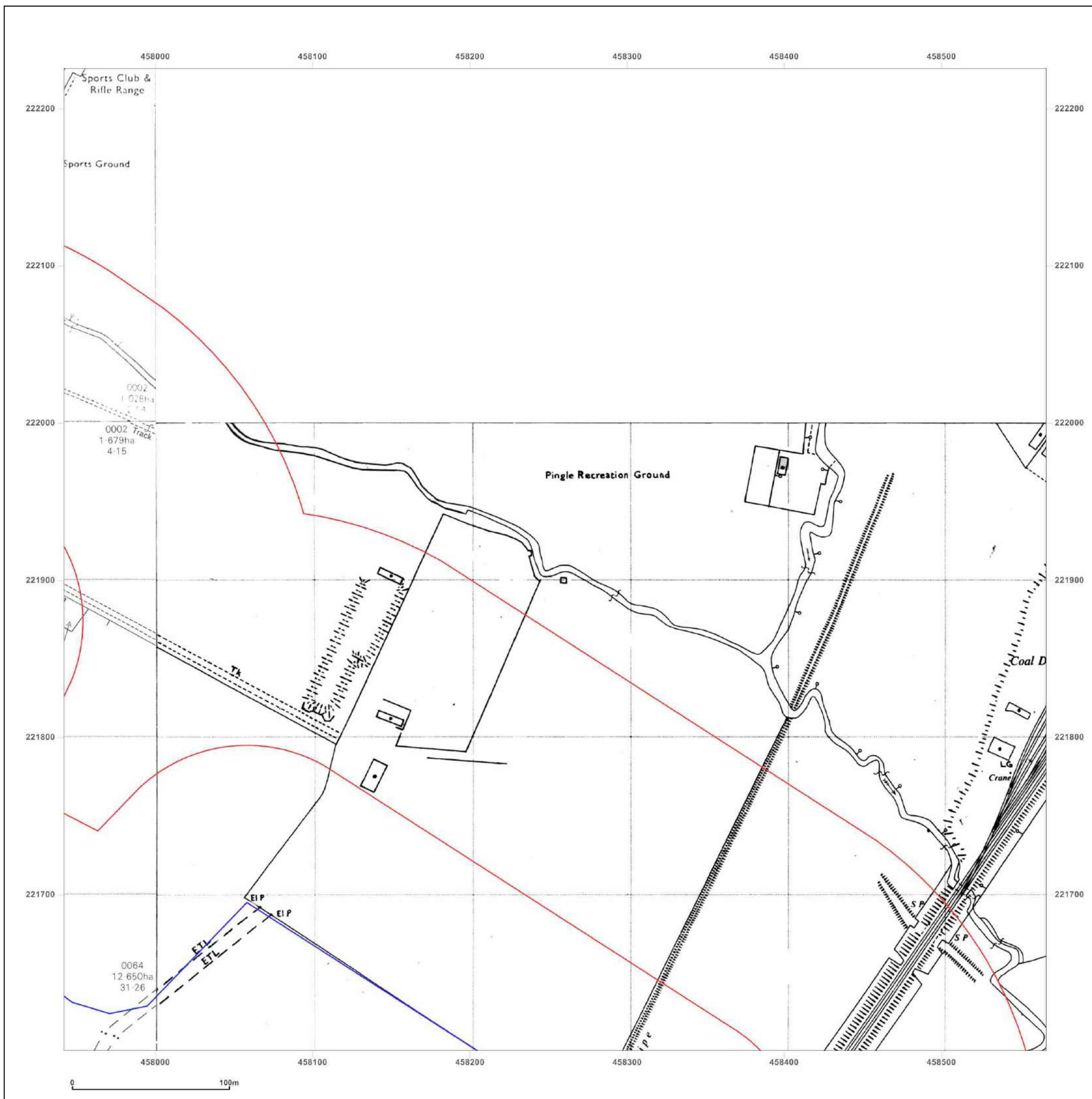


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1984-1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1989
 Revised 1989
 Edition N/A
 Copyright 1989
 Levelled 1971

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

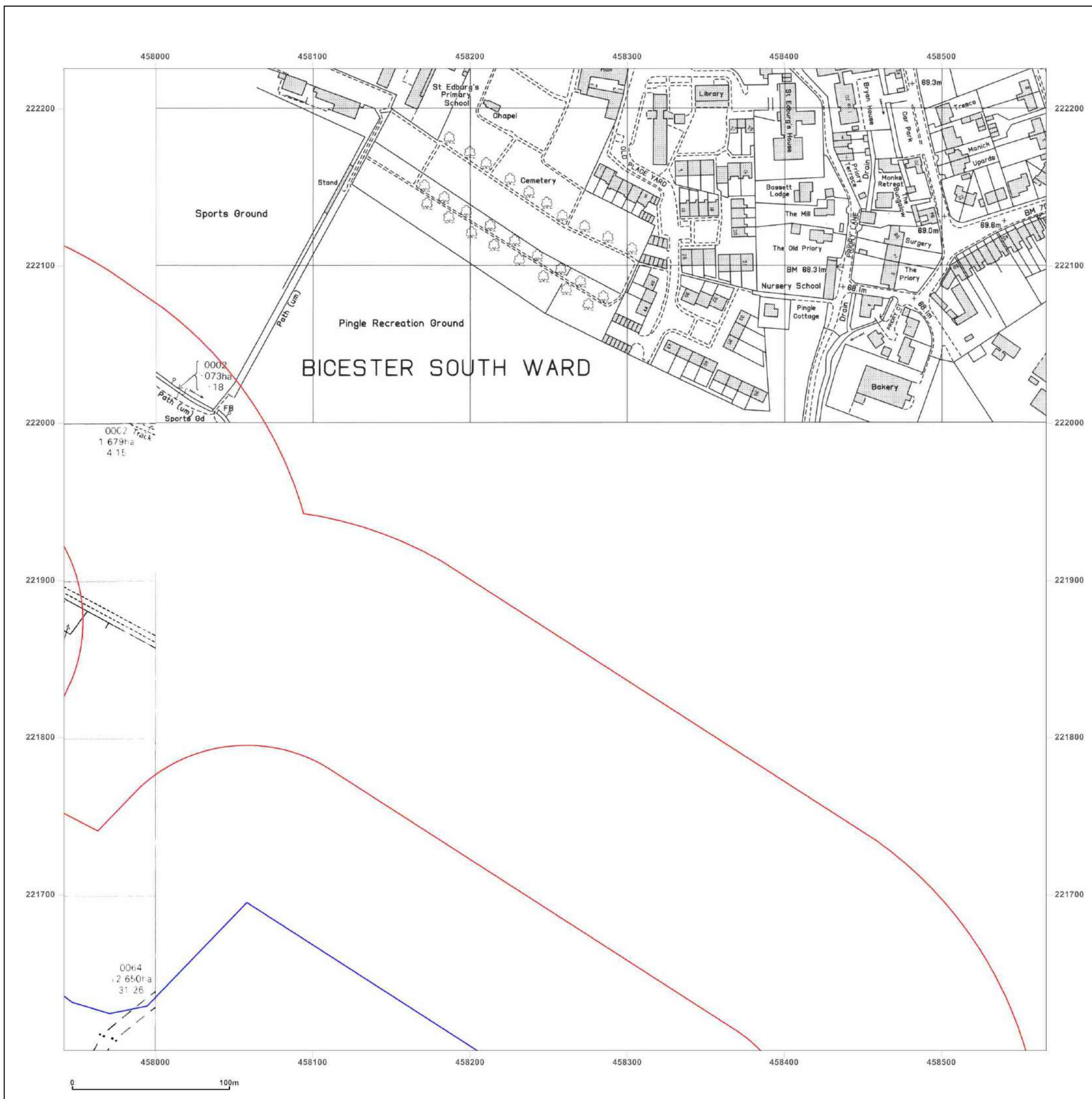


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Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1992-1994

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

Surveyed 1992
 Revised 1992
 Edition N/A
 Copyright 1992
 Levelled N/A

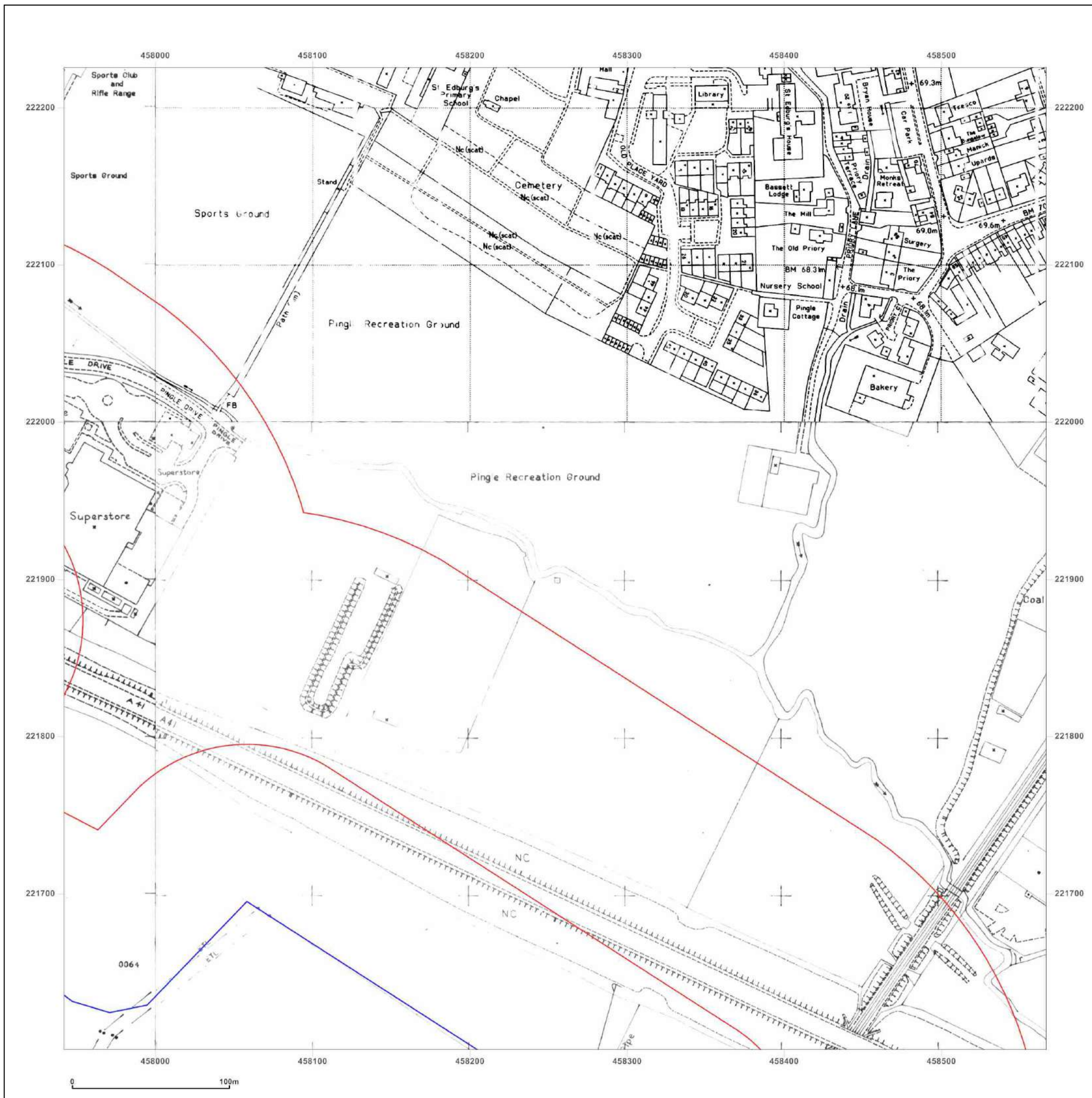


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Site Details:

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Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1993-1995

Scale: 1:2,500

Printed at: 1:2,500



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

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

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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

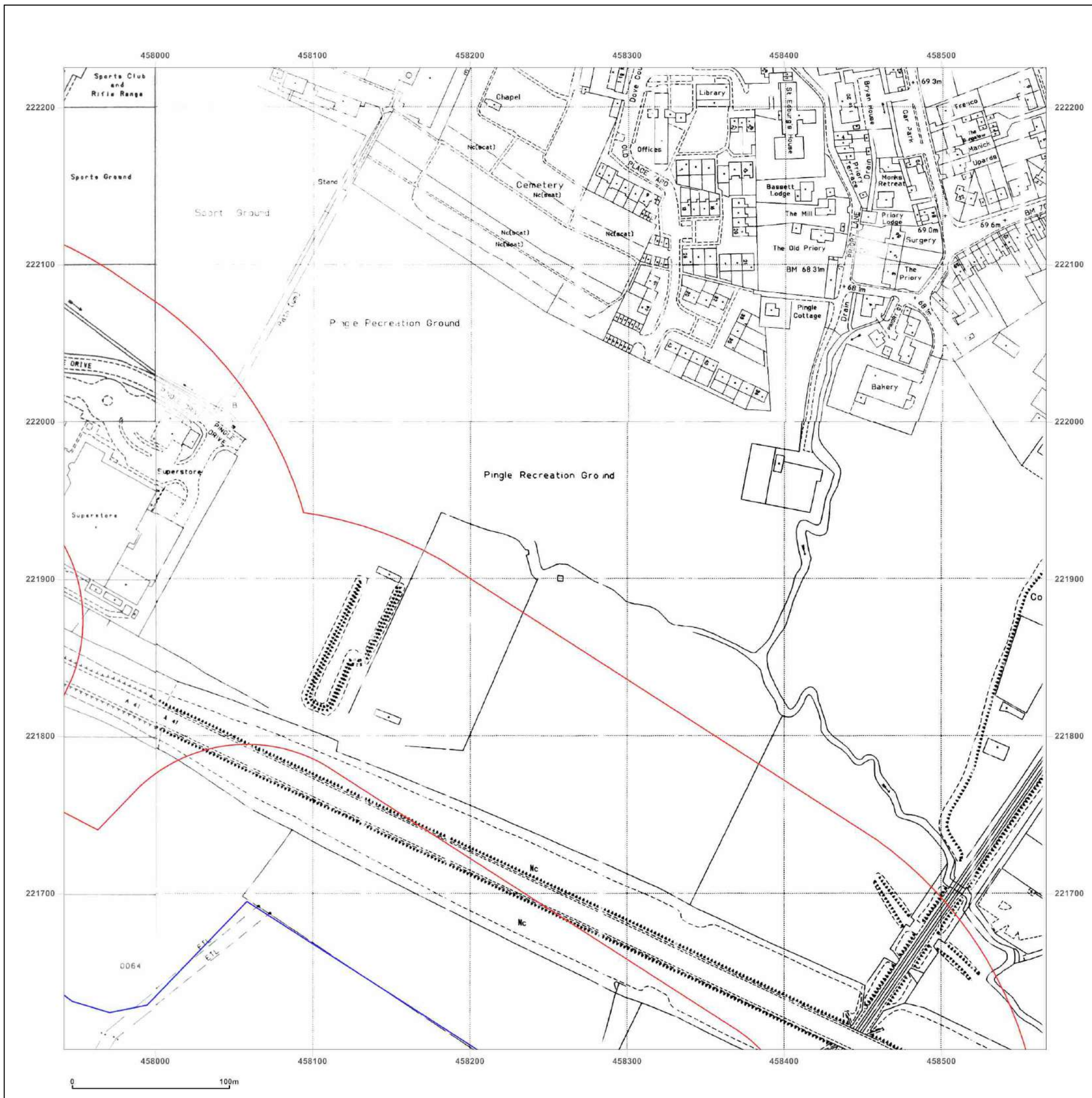


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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

Map date: 1994-1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1994
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
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Site Details:

457789, 221586

Client Ref: NTE2366-POR012085
Report Ref: HMD-214-4080160_LS_2_2
Grid Ref: 458254, 221913

Map Name: National Grid

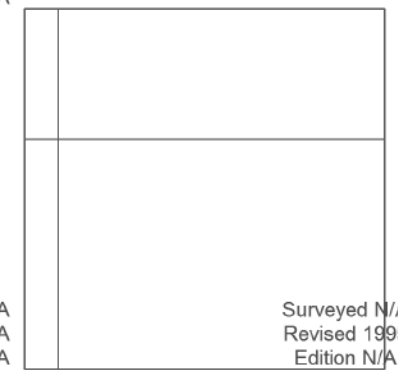
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



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



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

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



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