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ENVIRONMENT - LAND

Consortium of Bloor Homes,
Taylor Wimpey, Nottingham
County Council, Nottingham
and City Council

Land East of Gamston

Phase 1 Geo-Environmental
Assessment Report



ENVIRONMENT LAND

Consortium of Bloor Homes, Taylor
Wimpey, Nottingham County Council,
Nottingham and City Council

Land East of Gamston

Phase 1 Geo-Environmental Assessment
Report

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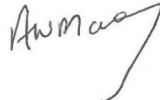


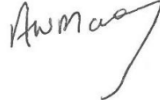

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Limitations

The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at that time.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by BWB during our investigations.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

Any diagram or opinion of the possible configuration of the findings is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

Except as otherwise requested by the Client, BWB is not obliged and disclaims any obligation to update the report for events taking place after:

- a) the date on which this assessment was undertaken; and
- b) the date on which the final report is delivered.

BWB makes no representation whatsoever concerning the legal significance of its findings or to other legal matters referred to in the following report.

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EXECUTIVE SUMMARY

<p>Site Setting</p>	<p>The site forms a 245 hectare parcel of land located to the east of Gamston which is currently occupied by Nottingham Airport, Tollerton Business Park, a caravan park and agricultural land. Grade II pill boxes and infrastructure associated with a former sewage works is present within the airport boundary. Current and redundant fuel storage has been identified on both the airport and business park sites.</p> <p>The disused Grantham Canal is present along the northern boundary with a small stream present along the eastern boundary, Gamston is present to the west and agricultural land is present to the south. Several drainage ditches on site feed directly</p>
<p>Site History</p>	<p>The site has been utilised for agricultural purposes until 1931 when Nottingham Airport was developed. The airport was utilised by the RAF during World War II with two aircraft maintenance works and associated hangers and tanks. During the late 20th century, the aircraft maintenance works were changed into Tollerton Business Park and Tollerton Caravan Park.</p>
<p>Regulatory Setting</p>	<p>Review of historic reports indicates that Rushcliffe Borough Council consider the site as potentially contaminated land. It was reported that 50-60 drums of solvents and paints were buried in the vicinity of Sherwood Flying Club and that Lancaster Bombers were dismantled within one of the aircraft maintenance works.</p> <p>The regulatory review has indicated that no landfills are present within 250m of the site, however a high pressure oil pipeline is present to the west of the site.</p>
<p>Geological Setting</p>	<p>The site is indicated to be underlain by limited superficial deposits comprising Lacustrine deposits, Till and Head deposits present along the eastern, north western and south western boundaries. Bedrock geology is indicated to comprise the Branscombe Mudstone (west and north west), Arden Sandstone (central) and the Edwalton Mudstone (east and south east) underlying the site.</p> <p>Coal has been worked within two seams underlying the site at depths between 330m and 470m. Small scale clay extraction is indicated to have occurred within the northern area of the site. 14 faults are present crossing the site in a north west to south east orientation.</p> <p>The superficial deposits are predominantly classified as undifferentiated Secondary Aquifers with the limited Till deposits listed as an unproductive strata. The Sandstone bedrock is classified as a Secondary A Aquifer whilst the Mudstone bedrock is a Secondary B Aquifer.</p>
<p>Geotechnical Setting</p>	<p>Made Ground is likely to be present within the developed areas of the site with the potential for obstructions to be encountered within the business park area. Coal mining has been undertaken below the site, however it is considered likely that sufficient rock-head is present above the workings to not influence shallow foundations.</p> <p>The Lacustrine deposits are indicated to have a moderate compressibility risk which may mean that shallow spread foundations are not suitable.</p> <p>Differential settlement issues may arise due to presence of Made Ground in backfilled clay extraction pits, and varying ground conditions associated with fault lines.</p>
<p>Contamination Sources</p>	<p>The following potential sources of contamination have been identified:</p> <ul style="list-style-type: none"> • Fuel/chemical/solvent storage in business park and airport; • Radium 226 associated with aircraft dismantling;

	<ul style="list-style-type: none"> • Organic/inorganic contamination associated with disused sewage works; • Heavy Metals associated with industrial activities on business park; • Made Ground Stockpiles potentially containing asbestos; • Hazardous ground gas associated with coal measures; • Buried unexploded ordinance; and • Pesticides and herbicides associated with agricultural activities.
Pollutant Linkages	<p>Any contamination present within shallow Made Ground could potentially leach directly into the underlying aquifers within the superficial and bedrock geological horizons.</p> <p>The drainage ditches on site present a preferential pathway for any site-borne contamination to migrate into the surrounding watercourses.</p> <p>There is a risk to human health from ingestion/inhalation of asbestos and/or radioactive isotopes associated with stockpiled demolition waste and historic aircraft dismantling.</p> <p>There is potential for hazardous ground gasses generated within the underlying coal measures to accumulate within confined spaces and present a risk of asphyxiation/ignition risk.</p>
Recommendations	<p>A targeted ground investigation should be undertaken to assess the ground conditions and contamination status of the site. The investigation should include a period of ground gas monitoring and groundwater sampling.</p> <p>Prior to any intrusive investigation works, a non-intrusive radiation survey should be undertaken to assess the potential for elevated radiation to be present.</p> <p>A Unexploded Ordinance desk study assessment should be undertaken prior to any intrusive investigation, to investigate the potential for UXO to be present on site.</p>
<p>This summary should be read in conjunction with BWB's full report (ref. NTW2248/01/V2) and reflects an assessment of the Site based on information received by BWB at the time of production.</p>	

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- Appendix 1 Site Photographs
- Appendix 2 Historical Ordnance Survey Plans
- Appendix 3 Groundsure Report
- Appendix 4 Coal Authority Mining Report
- Appendix 5 CIRIA Risk Classification Scheme

1 INTRODUCTION

Instruction

- 1.1 BWB Consulting (BWB) was instructed by the Consortium of Bloor Homes, Taylor Wimpey, Nottingham County Council, Nottingham and City Council (the Client) to carry out a Phase 1 Geo-environmental review at the site at Land East of Gamston Land East of Gamston . Details of the project brief are included in BWB proposal detailed in an email proposal issued by Rachel Cheetham dated 13 February 2014.
- 1.2 The proposed development is anticipated to comprise a mixed use development including approximately 4,000 dwellings and 20 hectares of employment development on land to the east of Gamston. A preliminary proposed site masterplan is included as **Figure 1**.

Objectives

- 1.3 The report has been completed to present pertinent information into 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

- 1.4 The scope of work included:
- Site visit to inspect the current condition of the site at ground surface;
 - Review of the following information:
 - British Geological Survey (BGS) Borehole Records (www.bgs.co.uk);
 - British Geological Survey (BGS) 1:50,000 series, Sheet 126 Nottingham: 1996 Solid and Drift edition geological map.
 - Groundsure Report No. HMD 214-1342877 and HMD 214-1342878 (see Appendix 3);
 - Non-Residential Coal Authority Mining Report, ref: 51000492875001. (see Appendix 4)

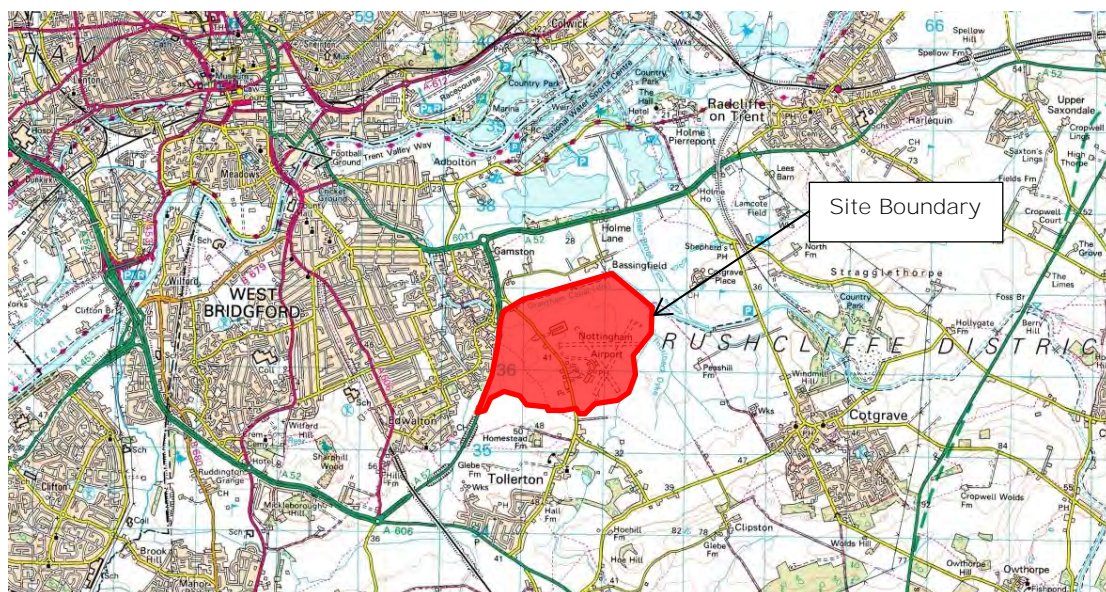
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- Environment Agency (www.environment-agency.gov.uk);
 - Charsley, T. J, Rathbone, P. A and Lowe, D. J. 1990. Nottingham: A geological background for planning and development. British Geological Survey Technical report WA/90/1.
 - Provide a summary 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 Land East of Gamston to the south east of Nottingham, approximately centred at national grid reference 461918, 335845. The location of the site is shown in **Figure 2**.

Figure 2 Site Location Plan



Reproduced from the Ordnance Survey 1:25,000 scale map with the permission of the controller of Her Majesty's Stationery Office Crown Copyright Reserved. OS Licence number 100013665.

Site Description

- 2.2 The layout of the site with the main features is presented as **Figure 3**. Photographs from the site visit are presented in **Appendix 1**.
- 2.3 The site forms an irregular shape and covers approximately 245 hectares of mixed use land to the east of Gamston, approximately 4 miles south east of Nottingham. The site ranges in elevation from 40m above ordnance datum (AOD) in the central area to 30mAOD in the west and 25mAOD in the north.
- 2.4 The western site boundary is formed by the Gamston Lings Bar Road, the northern and north east boundary is formed by the disused Grantham Canal, the eastern boundary is formed by a small tree-lined stream and the southern boundary is formed by a mixture of drainage ditches, gravel tracks and hedgerows. Within the immediate surrounding area, Gamston residential area is located to the west with predominantly agricultural land uses located to the north east and south.
- 2.5 The site can broadly be segregated into three distinct zones; land associated with Nottingham Airport, land associated with Tollerton Business Park, and agricultural land.

Nottingham Airport

- 2.6 Nottingham Airport is a small private airfield used for private aviation, business aviation and training of light aircraft and helicopters, operating on two (of three) tarmac runways. The buildings on site consist of a small building which houses the control tower and emergency response team, three hangars, and a small temporary office unit.
- 2.7 The hangars comprised steel structures housing light aircraft and helicopters. The two hangars to the south of the control tower had external bunded above ground metallic storage tanks (ASTs) which, despite appearing in a state of disrepair, did not show any sign of leakage or staining and were not considered to be currently in use. The brick and steel hangar to the west of the control tower did not have any ASTs, however the interior storage rooms were noted to contain a towable mobile fuel tank, oil cans, gas canisters, paints, acids and numerous unidentified chemicals stored on concrete flooring. A fire rescue area built onto the side of the control tower was noted to contain various unlabelled chemicals stored on a concrete floor and an exterior bunded steel AST which showed no sign of leakage.
- 2.8 Two active refuelling points were located in close proximity to the control tower; a self-contained AST with an associated pump and two underground fuel storage tanks (UST) with associated pumps. The volumes of the tanks were not indicated.
- 2.9 An old sewage filter bed was present to the south of the site with an associated reservoir and two derelict voids/tanks which were overgrown with dense vegetation. Numerous Grade II listed pill boxes were present across the airport area and several overgrown concrete areas were present which were considered to be historic plane storage areas whilst the airport was under RAF control during World War II.
- 2.10 A large metal tank which appeared to have been converted into a fire training area was located at the end of one of the runways. Several liquids were stored underneath the old tank and stockpiled waste was also stored in the vicinity including refrigerators, tyres, gas (butane) bottles, oil drums, electrical goods and general waste within a skip. Evidence of small fires was noted in the area.
- 2.11 A small void was noted adjacent to one of the pill boxes which was infilled with earth. The void had a concrete cover and was considered likely to be an historic service duct.
- 2.12 Several shallow drainage ditches were located to the south and east of the airport runways.

Tollerton Business Park

- 2.13 The business park area is located centrally on site, immediately to the west of the airport. The area is dominated by a large, potentially asbestos-clad, hangar with several smaller outbuildings and the following companies were indicated to be operating on site:
- Jacksons Recovery Ltd;
 - Monarch Education Furniture;
 - Metric Precision Engineers;
 - Body Shop (Car repairs); and
 - Indian Restaurant

-
- 2.14 The site appeared to operate generally poor housekeeping, with general waste sporadically located across site, stockpiled demolition waste potentially containing asbestos, waste oil drums, an abandoned refrigerator, concrete in varying states of disrepair, and old unbanded ASTs present on site. A sawdust extraction unit appeared to have overflowed the collection skip and two disused buildings were located to the south with an unbanded AST and waste oil drums stored inside and out.
- 2.15 An electricity substation (ESS) operated by Western Power Distribution was located along the border with Tollerton Road which appeared in good condition with no staining noted. An external locked steel cabinet was located outside one of the smaller breezeblock outbuildings which was indicated to house flammable gas and flammable liquids.
- 2.16 The Indian Restaurant is located to the east of the site; a propane gas tank was located in the car park area, which was surrounded by a 50cm high brick wall. A disused building within a small fenced compound and a concrete aboveground bunker was located between the restaurant and the active operations on site.
- 2.17 The internal areas of the buildings were not accessed during the walkover.

Agricultural Land

- 2.18 Large areas of the site were being utilised for agricultural purposes at the time of the walkover. Land to the west of the site (between Gamston Lings Bar Road and Tollerton Road) and to the north of the airport was being used for arable farming. Fields to the north west of the site appeared to have been left fallow whilst the small areas of land surrounding the runway appeared to have been seeded for some silage production.
- 2.19 Hill Farm was not accessed during the walkover however it was noted that a Canine Academy was operating from the site. Aerial imagery indicates that it is a modern commercially orientated farm rather than a traditional farm.

Other Land Uses

- 2.20 Limited residential dwellings are present on site located to the west of Tollerton Road adjacent to the airfield.
- 2.21 A caravan park is located off Tollerton Road to the north west of the airfield, housing static caravans. Also located on site was a row of eight locked garages.
- 2.22 A storage yard was located to the south of the site which consisted of a derelict building, a covered hay store, three grain silos, farm machinery, abandoned cars, portacabins, horse boxes and lorry trailers. The site was not accessed for a close inspection.
- 2.23 A high pressure oil pipeline was identified running parallel within the western site boundary. The pipeline enters the site along the northern boundary passing underneath the canal and passes below fields and Tollerton Road with markers at most field boundaries.

3 DESK STUDY

Historical Mapping

- 3.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from the 1883 OS County Series to the current 2012 OS Plans. The historical plans reviewed have been reproduced in **Appendix 2**. The key points of the historical development of the site and surrounding area are summarised below in **Tables 1** and **2**.

Table 1 Key Points of Site Development History (1883 – 2012)

Dates	On Site	Significance
1883 - 1884	<p>The site is undeveloped and being used for AGRICULTURAL purposes with multiple field boundaries identified.</p> <p>A road (Tollerton Road) passes through the centre of the site and approximately 12 small ponds are present, predominantly in the south and north west of the site. A drain feature is present within the eastern boundary.</p>	<p>The ponds are indicated to have been present on site up until the airport was developed. The backfilling of these ponds could potentially lead to areas of MADE GROUND and localised generation of ground gasses on site.</p>
1899-1901	<p>A pump is indicated centrally on site and a WHARF/footpath is located along the canal in the north west corner.</p> <p>A small copse of trees towards the north of the site is now labelled as BASSINGFIELD PLANTATION and an additional pond is located towards the north east.</p>	<p>The pump is a potential receptor for site borne contamination, whilst the Wharf presents a potential source of MADE GROUND.</p> <p>A plantation on site will mean the possible use of PESTICIDES and HERBICIDES.</p>
1913-1914	No significant changes noted.	No significance.
1938	No significant changes noted.	No significance.
1950 – 1957	<p>NOTTINGHAM AERODROME (TOLLERTON) is present covering a large portion of the southern and eastern areas of the site with associated runways and taxiing strips.</p> <p>Two AIRCRAFT MAINTENANCE WORKS, a small SEWAGE WORKS, a MINIATURE RIFLE RANGE, HANGER and CLUB HOUSE are located inbetween the airfield and Tollerton Road whilst several HOUSES are located west of Tollerton Road.</p>	<p>The development of the site presents a potential source of FUELS, OILS, HEAVY METAL, ASBESTOS and ORGNANIC/ INORGANIC CONTAMINATION as well as the potential for UNEXPLODED ORDINANCE (UXO) and RADIUM 226 associated with aircraft dismantling. Research indicates that the airport was actually developed in 1930 and utilised by the RAF during World War II. These facilities are often unmapped during war time periods.</p>

	<p>Two TANKS associated with the airfield are indicated adjacent to the airfield buildings and a further two TANKS are located adjacent to one of the aircraft maintenance works to the north of the airport. A TANK, HUMUS TANK, SLUDGE BED and FILTER BED are present associated with the sewage works.</p> <p>The drain to the east of the site is no longer present.</p>	
1962 – 1967	Bassingfield Plantation is no longer indicated on site.	No significance.
1974 - 1980	<p>The taxi road around the edge of the runway is no longer present however some of the aircraft storage areas remain. The sewage works is described as disused.</p> <p>The former aircraft maintenance works to the west is now described as a HANGER, WORKS and WAREHOUSES whilst the maintenance works to the north west of the airport is no longer present however a tank remains.</p> <p>A new control tower has been developed alongside the runway.</p>	The works and warehouses present a potential source of contamination depending upon the activities undertaken.
1983 - 1989	An additional HANGER is developed to the north of the disused sewage works.	Potential source of FUEL and OIL contamination associated with use/storage of aircraft.
1993 - 1995	No significant changes noted.	No significance.
2002 - 2012	<p>TOLLERTON PARK CARAVAN PARK is indicated in the area of the former aircraft maintenance works to the north west of the airport.</p> <p>The control tower appears to have been extended.</p>	Removal of the tank on site could potentially have removed a source of fuel/oil contamination. Caravan park could potentially store gas canisters on site.

SOURCES IN BOLD AND CAPS *Receptors bold and italics*

Table 2 Key Points of Surrounding Area Development History (1883 – 2012)

Dates	Off Site	Significance
1883 - 1884	<p>Grantham Canal is present along the northern and north eastern boundary and two small streams are intermittently present along the eastern boundary</p> <p>The villages of Gamston, Tollerton</p>	The waterways have the potential to transport contaminants from further upstream onto site.

	<p>and Bassingfield are located 500m north west, 200m south and 150m north east respectively, with the surrounding area indicated to be predominantly agricultural.</p> <p>A SMITHY is located 350m south of the site.</p>	
1899-1901	<p>Numerous pumps and a well are indicated within the surrounding villages.</p> <p>A SWING BRIDGE is indicated to be in operation immediately north east of the site providing access across Grantham Canal onto the site.</p>	<p>The pumps and wells, if still active, could act as a potential receptor to site borne contamination.</p> <p>Potential source of MADE GROUND associated with the construction and potential source of OILS associated with the operation of the bridge.</p>
1913-1914	<p>A GRAVEL PIT is located 700m north west of the site.</p>	<p>No significance.</p>
1938	<p>The pumps and wells in Gamston and Bassingfield are no longer identified.</p>	<p>Receptor may no longer be present.</p>
1950 – 1957	<p>The canal is listed as disused.</p>	<p>No significance.</p>
1962 – 1967	<p>Minor expansion of the surrounding villages is noted. The gravel pit is no longer indicated on the plans.</p>	<p>Infilling of gravel pits may have led to generation of MADE GROUND which could generate potentially hazardous GROUND GAS.</p>
1974 - 1980	<p>No significant changes noted.</p>	<p>No significance.</p>
1983 - 1989	<p>GAMSTON LINGS BAR ROAD has been constructed along the western site boundary.</p> <p>A golf course is indicated immediately south west of the site.</p>	<p>No significance.</p>
1993 - 1995	<p>Widespread RESIDENTIAL EXPANSION of Gamston is indicated immediately west of the site with associated ELECTRICITY SUBSTATIONS (ESSs). Small areas of associated COMMERCIAL land use are also present including a supermarket and PETROL FILLING STATION.</p>	<p>The development presents a potential source of MADE GROUND which could generate potentially hazardous GROUND GAS.</p> <p>The ESSs are unlikely to present a source of PCB contamination given the age of construction.</p>
2002 - 2012	<p>No significant changes</p>	<p>Nil</p>

SOURCES IN BOLD AND CAPS

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Aerial Photographs

- 3.2 An aerial photograph is presented within the Groundsure Report and presents the site in its current layout with the airport located in the central and eastern areas surrounded by agricultural land.

Operational / Company Records

- 3.3 No operational or company records were viewed in compiling this report.

Previous Investigation Reports

- 3.4 BWB have reviewed a draft Ground Conditions Chapter produced for inclusion within an Environmental Impact Assessment relating to Tollerton Business Park. The pertinent information from the chapter is summarised below:

Waterman Civils Limited for Nottingham City Airport Plc; 'Chapter 8: Geomorphology, Geology, Geotechnical and Contamination – Tollerton Enterprise Park, Nottingham City Airport. Dated April 2008.

- 3.5 The Chapter provided a desk based review and ground investigation information for the area of land to the west of the airfield described as Tollerton Business Park in the site description.
- 3.6 Regulatory correspondence with Rushcliffe Borough Council indicated the site has not been identified as contaminated land however it had been identified as potentially contaminated land and was ranked at 200th out of 1,873 sites. Also, the Local Authority were investigating a complaint 500m north of the site (within the current site boundary) relating to the historical aircraft maintenance works which was reportedly used for the demolition of a large number of Lancaster Bombers. Nottingham County Council were notified of approximately 50-60 drums of paint and solvents being buried within the vicinity of Sherwood Flying Club.
- 3.7 The ground investigation comprised the excavation of 12no. trial pits to a maximum depth of 3.6m below ground level. Ground conditions were identified as Made Ground/Topsoil (0.3m – 1.0m thick) directly overlying weathered clays of the Mercia Mudstone. No groundwater was encountered during the investigation. Buried structures were encountered in some of the trial pits, considered to be relic foundations.
- 3.8 No laboratory reports have been seen by BWB, however the report indicates that slightly elevated concentrations of petroleum hydrocarbons and Polyaromatic Hydrocarbons were identified within the Made Ground in several areas across the site, whilst one slightly elevated lead concentration was identified within the natural strata.
- 3.9 The report concluded that no significant contamination had been identified during the limited investigation, however hotspots of contamination are likely to exist given the historical and current land use at the site.

Permits, Consents and Authorisations

- 3.10 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 3**.
- 3.11 The following pertinent features have been identified which have the potential to have a detrimental impact on site.
- 3.12 Four current or historical Part B Permits have been identified 303.0 to 330.0m west of the site border. The current permits refer to dry cleaners and petrol vapour recovery at a supermarket filling station. The historic permits refer to Unloading of petrol for Safeway stores.
- 3.13 There have been four recorded pollution incidents identified on site. All four entries are identified in the same area and relate to natural organic material, metal wastes, and construction and demolition materials having a minor (category 3) impact upon Land.
- 3.14 The site contains current land uses that could potentially introduce contaminants to the site. A full list can be found in **Appendix 3**; the most pertinent uses can be found below in **Table 3**.

Table 3 Current Land Uses

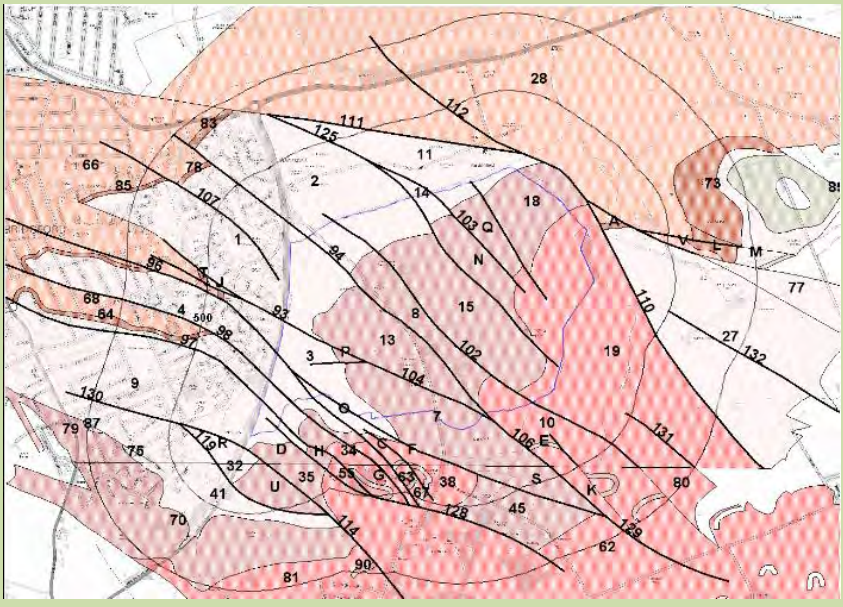
Location	Company	Activity	Category
On Site	Mainland Pipelines	High pressure oil pipeline	Underground High Pressure Oil and Gas Pipelines
On Site	Warehouses	Container and Storage	Transport, Storage and Delivery
On Site	Gantry	Travelling Cranes and Gantries	Industrial features
On Site	Works	Unspecified Works or Factories	Industrial features
On Site	Sewage Works (Disused)	Waste Storage, Processing and Disposal	Infrastructure and Facilities
On Site	Tank	Tanks (Generic)	Industrial Features
On Site	Tank	Tanks (Generic)	Industrial Features
On Site	Nottingham Airport	Airports and Landing Strips	Air
On Site	Jacksons Recovery	Vehicle Breakdown and Recovery services	Personal, Consumer and Other Services
On Site	Elevated Access	Construction and Tool Hire	Hire Services
164.0m west	Morrisons	Petrol or Fuel Site	

Landfilling and Waste Management

- 3.15 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure Report presented in **Appendix 3**.
- 3.16 The closest entry to site is listed as a waste transfer station for household, commercial and industrial waste which is no longer active. The nearest landfill site is listed 557m north east of the site which is indicated to have been related to a gravel quarry which is listed as a landfill 'taking other wastes'.
- 3.17 The risk of hazardous ground gases or leachate migrating towards the site associated with the landfill is considered to be low.

Geology, Hydrogeology and Hydrology

Table 4 Published Ground Conditions

<p>Geology</p>	<p>Made Ground is not indicated to be present on site. Limited superficial deposits are indicated to be present on site, predominantly located around the north west, south west and eastern boundaries. Along the eastern edge of the site, Lacustrine Deposits (clay, silt and sand) are present overlying Mid-Pleistocene Till (diamicton). Head deposits (clay, silt, sand and gravel) are present along the north western border and in the south western corner, with Lacustrine Deposits overlying the Head deposits in the south west.</p> <p>Three main parent bedrock groups are present underlying the site, with a series of faults crossing the site in a north west to south east orientation. The Bedrock and Faults Map from the Groundsure report is reproduced below in Figure 4.</p> <p>Figure 4 Bedrock and Fault Map</p>  <p>The three types of bedrock outcropping on site comprise the Edwalton Member (mudstone) to the west of the site, the Arden Sandstone Formation centrally on site and the Branscombe Mudstone Formation to the east of the site.</p> <p>The Edwalton Member, approximately 35m to 45m thick, can be</p>
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	<p>identified as mudstone and siltstone, red-brown and greenish grey, with beds of indurated, variably dolomitic siltstone and very fine-grained sandstone common in the lower half and finely disseminated gypsum common in upper half.</p> <p>Regionally, the Arden Sandstone Formation can be expected to be 2 to 3m thick and is described as heterolithic, consisting of grey, green and purple mudstones interbedded with paler grey-green to buff coloured siltstones and fine to medium-grained, varicoloured green, brown, buff, mauve sandstones; beds of conglomerate occur locally.</p> <p>The Branscombe Mudstone Formation is between 25m to 60m thick and described as mudstone and siltstone, red-brown with common grey-green reduction patches and spots. The mudstones are mostly structureless, with a blocky weathering habit. Gypsum/anhydrite, locally of economic importance, is common throughout in beds, nodules and veins.</p> <p>14no. faults are located on site and are described as inferred, normal faults.</p> <p>A review of several BGS borehole logs has identified the typical ground conditions to comprise topsoil over weathered mudstone.</p>
Hydrogeology	<p>The superficial deposits are categorised by the Environment Agency as an undifferentiated Secondary Aquifers with the exception of the Till which is classified as an unproductive aquifer.</p> <p>The Edwalton and Branscombe Mudstone Members are classified as a Secondary B Aquifer which can be described as 'Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.</p> <p>The Arden Sandstone Formation is categorised as a Secondary A Aquifer which are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.</p> <p>The site is not located within a groundwater Source Protection Zone.</p> <p>One discharge consent that is issuing to groundwater is listed within 500m of the site, located 263m to the south. The entry relates to sewage discharges from Homestead Farm in Tollerton dating back to 1976.</p> <p>Three groundwater abstraction licences are identified within 1km of the site, the closest of which is located 367m east of site for spray/irrigation. The remaining entries are for top-up water and general farming and domestic use.</p> <p>The BGS has identified the site as being susceptible to groundwater flooding and have assigned a moderate confidence rating to their categorisation.</p>
Surface Waters	<p>The disused Grantham Canal is located along the northern and north eastern site boundary and a small unnamed stream flowing in a northerly direction forms the eastern boundary.</p> <p>Thurlbeck Dyke flows in a northerly direction and joins the unnamed stream along the north eastern boundary before passing underneath the Grantham Canal and continuing to flow northwards where it is labelled as Polser Brook. A drain is indicated to flow in a northerly direction through the developed residential area of Gamston approaching within 125m of the south western site boundary.</p>

	<p>Several small drainage ditches are located towards the south of site which were noted to be dry to the west of Tollerton Road, or with minimal flow to the east of Tollerton Road.</p> <p>No surface water abstraction licences are listed within 1km of the site boundary.</p> <p>Two sewage discharge consents are listed on site associated with The Elms (dated 2004) and Nottingham Airport (dated 1972). The consents are indicated to be discharging into the Polser Brook and a tributary of the River Trent respectively. 10no. discharge consents are listed within 500m of the site mainly related to sewage discharges into local watercourses.</p> <p>No biological water quality data is available for the surrounding watercourses, however chemical data has been collated at two points: 22m north west of site from the Grantham Canal and 334m north east of the site from Cotgrave Brook. Data collected from 2005 to 2009 indicates the canal to have been Grade E throughout whilst Cotgrave Brook has fluctuated between Grade C and E, with Grade A being 'Very Good' and F being 'Bad'.</p> <p>The extreme eastern edge of the site is indicated to lie in a zone 2 and 3 floodplain as designated by the Environment Agency.</p>
<p>Mining and Mineral Extraction</p>	<p>Historic groundworkings have been identified on site associated with the canal and wharf, small ponds and the disused sewage works discussed in the Historical Review.</p> <p>Opencast sand and gravel extraction is indicated to have occurred 621m north west (Gamston Gravel Pit), 747m north east (Bassingfield), and 878m north (Holme Pierrepont).</p> <p>The site is indicated to lie in an area of potential clay extraction, gypsum extraction and coal mining.</p> <p><u>Gypsum Extraction</u></p> <p>The Branscombe Mudstone is a gypsum bearing strata that contains quantities of gypsum that could potentially have been historically worked. Reference to 'Nottingham: A Geological Background for Planning and Development' indicates the closest workings are located in Cropwell Bishop approximately four miles east of the site within the Cropwell Bishop Member. This suggests that although it is unlikely to have been worked on site, shallow, unrecorded gypsum extraction may have occurred.</p> <p><u>Coal Mining</u></p> <p>A Coal Authority Mining Report has been obtained (Appendix 4) for the site which indicates that the site is in the zone of influence of two seams of coal worked at depths of between 340m and 470m up until 1990. The report states that any movement from these seams should have stopped by now and although there are no current applications to remove coal being considered, reserves of coal are known to exist which could be worked in the future.</p> <p>No mine entries are present within 50m of the site boundary and the site is not located within 800 metres of a site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods. A damage claim for alleged subsidence was made by Tollerton Aerodrome in 2010 which was subsequently rejected.</p> <p>Reference to 'Nottingham: A Geological Background for Planning and Development' indicates the main seam that was worked under the site</p>

	<p>was the Deep Hard seam. The second worked seam is not labelled however the overlying Deep Soft and underlying Piper seam have been locally worked. The closest shafts are identified in Cotgrave, approximately 2km east of site.</p> <p><u>Clay Extraction</u></p> <p>'Nottingham: A Geological Background for Planning and Development' also shows four small scale local clay extraction points on site which have since been abandoned. Three of these extractions are located along the northern site boundary and the fourth is located just off of Tollerton Road in the vicinity of Hill Farm. Whilst these are localised, small scale extractions, they may represent a potential area of relatively deep backfilled Made Ground.</p> <p>An inspection of online satellite images provided by Bing indicates four areas of slightly different coloured vegetation which could indicate the specific location of these former clay extraction areas.</p>
Ground Stability and Constraints	Ground stability risks associated with shrink/swell of clay, landslides, ground dissolution, collapsible deposits and running sands range from negligible to low. However the risk from compressible deposits is rated as moderate in areas underlain by Lacustrine deposits.
Ground Gas & Radon	The site is located in a radon affected area with between 1% and 3% of properties found above the action level. No radon protective measures are necessary however it is always advised that new developments include basic radon protection.

Ground Related Constraints & Opportunities

Table 5 Ground Related Constraints & Opportunities

Potential Constraint	Explanation	Potential Mitigation Options
Made Ground	Made Ground is anticipated to be present in all previously developed areas, areas adjacent to the canal and potential areas of backfilled clay extraction points and historic ponds.	Foundations bearing onto Made Ground may be subject to excessive and differential settlement due to the variable nature of the deposits.
Obstructions	There is potential for relic foundations, current/historic underground service trenches, historic USTs, and potential underground bunkers to be present on the airport site and business park. Furthermore, a high pressure oil pipeline is present in the western area of the site.	Underground obstructions could lead to a non-uniform founding strata potentially resulting in differential settlement issues. All obstructions should be identified and removed prior to the setting of foundations. If the high pressure oil pipeline is not going to be redirected offsite, a stand-off easement zone will need to be adopted to ensure foundation are not placed above or in the vicinity of the pipeline.
Trees	The majority of the site has very little tree cover. Trees are present located within residential gardens, around the caravan park and business park and sporadically along	These are potentially high water demand tree species which can impact upon shallow soils and foundations. The shrink/swell potential of the soils in the vicinity of

	Tollerton Road. The stream along the eastern boundary is tree lined in places and occasional trees are located along the canal and adjacent to pill boxes.	areas of trees should be assessed during ground investigation to inform foundation design.
Faults	The faults present on site may lead to variable ground conditions which could lead to differential settlement.	Foundations positioned across fault lines may result differential settlement issues. Foundations may need to be locally deepened.
Coal Mining	Coal Mining has been conducted underlying the site in two seams up from 340m – 470m bgl.	It is considered likely that there is depths of competent bedrock overlying the coal workings, however the depth to bedrock would need confirming through intrusive investigation.
Mineral Extraction	It is unlikely that gypsum has been extracted from site, however it has been indicated that clay has been extracted from the north of the site in small localised areas.	The localised clay extraction presents a potential source of deeper Made Ground associated with backfilling of these areas which could lead to differential settlement if foundations are located within these deposits.
Ground Dissolution Hazards	The Lacustrine deposits located along the south western and eastern areas of the site are potentially compressible soils.	If the Lacustrine deposits are found to be compressible, they are unlikely to be suitable as founding strata. A ground investigation will be required to confirm the ground conditions in these areas.
UXO & Radiation	There is a high potential for UXO to be present underlying the airport site and in the area of the historic miniature rifle range. Furthermore, given the possibility that Lancaster Bombers were dismantled on site, there is potential for radio isotope contamination (specifically Radium 226) to be present within the Made Ground associated with discard instrument dials.	A UXO desk study should be carried out for the site prior to any intrusive groundworks. A non-intrusive radiation survey should be conducted on site prior to any intrusive work being undertaken.

4 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Introduction

- 4.1 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.
- 4.2 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.
- 4.3 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.
- 4.4 All three impacts need to be considered in a risk assessment.
- 4.5 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 6**.
- 4.6 **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).
- 4.7 **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.
- 4.8 **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 6 Conceptual Site Model

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
S1: Made Ground associated with airport and northern aircraft maintenance works including ASTs and USTs – TPH, PAHs, heavy metals, Asbestos, Radium 226, Carbon Dioxide and Methane.	P1: Direct contact, ingestion and inhalation	R1: Current site users.	Md	Li	M	The risk to current site users and services personnel is increased given the stockpiles of demolition waste aboveground. A detailed targeted ground investigation should be undertaken to characterise any contamination within Made Ground. Prior to any intrusive investigation works, a non-intrusive radiation survey should be conducted to assess the potential risk to groundworkers. If identified, mitigation measures could include capping with a clean capping material in landscaped/garden areas.
		R2: Construction/services personnel.	Md	Li	M	
		R3: Future site users.	Md	Li	M	
	P2: Migration into buildings through foundation cracks, service entry points	R1: Current site users.	Md	UI	L	No significant source of contamination has been identified through the desk study, however Made Ground has the potential to generate low levels of Methane and/or Carbon Dioxide. The potential presence of ground gases should be investigated through a period of ground gas monitoring.
		R3: Future site users.	Md	UI	L	
	P3: Vertical migration of contamination	R4: Underlying Secondary A Aquifers – Bedrock.	Md	Li	M	The geology underlying the most likely areas of contamination is the most sensitive (Secondary A) Aquifer and given the lack of superficial deposits, it is plausible that any contamination could have impacted upon the underlying aquifer. Limited investigation into the adjacent
		R5: Underlying Secondary B Aquifers – Bedrock.	Mi	Lw	L	

		R6: Underlying undifferentiated Secondary Aquifers – Superficial.	Mi	Lw	L	business park has identified the geology to comprise cohesive deposits which could restrict the potential migration towards the aquifer. A ground investigation should be conducted to confirm the presence of any contamination and to understand the risk to the aquifers.
	P4: Vertical and subsequent horizontal migration of contamination.	R7: Grantham Canal.	Mi	UI	VL	There is a plausible pathway for site-borne contamination to enter the surrounding watercourses. The canal is above site level and potentially clay-lined therefore not considered to be in connectivity with groundwater. Groundwater in the stream and dyke is considered likely to be in continuity with groundwater and the risk is increased. The risk to surface water should be assessed through a targeted ground investigation and subsequent chemical analysis.
		R8: Unnamed stream and Thurlbrook Dyke to east of site.	Md	Li	M	
	P5: Direct contact.	R9: Water Utility pipes.	Md	Li	M	Potential contaminants in the Made Ground could corrode utility pipes and/or foundations. A ground investigation and subsequent laboratory analysis should be undertaken to inform the design of new services and foundations.
		R10: Buried structures/foundations.	Md	Li	M	
	S2: Made Ground associated with Tollerton Business Park and historic aircraft maintenance works – Heavy metals, TPH, PAH, PCBs, solvents, Radium 226, Asbestos, Carbon Dioxide	P1: Direct contact, ingestion and inhalation.	R1: Current site users.	Md	Li	M
R2: Construction/services personnel.			Md	Li	M	

and Methane.		R3: Future site users.	Md	Lw	M/L	<p>within Made Ground. Prior to any intrusive investigation works, a non-intrusive radiation survey should be conducted to assess the potential risk to groundworkers.</p> <p>If identified, mitigation measures could include capping with a clean capping material in landscaped/garden areas.</p>
	P2: Migration into buildings through foundation cracks, service entry points.	R1: Current site users.	Md	UI	L	A significant source of contamination has not been identified, however Made Ground has the potential to generate low levels Methane and/or Carbon Dioxide.
		R3: Future site users.	Md	UI	L	The potential presence of ground gasses should be investigated through a period of ground gas monitoring.
	P3: Vertical migration of contamination.	R4: Underlying Secondary A Aquifers – Bedrock.	Md	Li	M	Previous limited investigation identified the ground conditions to be cohesive in nature which may restrict migration of contamination into the underlying aquifers. A targeted investigation should be conducted to confirm the presence of any contamination in the Made Ground.
		R5: Underlying Secondary B Aquifers – Bedrock.	Mi	Lw	L	
	P4: Vertical and subsequent horizontal migration of contamination.	R7: Grantham Canal.	Mi	UI	VL	There is a plausible pathway for site-borne contamination to enter the surrounding watercourses. The canal is above site level and potentially clay-lined therefore not considered to be in connectivity with groundwater. Groundwater in the stream and dyke is considered likely to display connectivity with groundwater and the risk is increased.
		R8: Unnamed stream and Thurlbrook Dyke to east of site.	Md	Li	M	The risk to surface water should be assessed through a targeted ground investigation and subsequent chemical analysis.

	P5: Direct contact	R9: Water Utility pipes.	Md	Li	M	Potential contaminants in the Made Ground could corrode utility pipes and/or foundations. A ground investigation and subsequent laboratory analysis should be undertaken to inform the design of new services and foundations.
		R10: Buried structures/foundations.	Md	Li	M	
S4: Pesticides and herbicides associated with agricultural land use and historic plantation.	P1: Direct contact, ingestion and inhalation	R1: Current site users.	Mi	UI	VL	It is considered unlikely that historic pesticides associated with the plantation will still be present in the soils if they were used. Any ground investigation should seek to assess the presence of pesticides through laboratory analysis.
		R2: Construction/services personnel.				
		R3: Future site users.				
	P3: Vertical migration of contamination	R4: Underlying Secondary A Aquifers – Bedrock.	Md	UI	L	
		R5: Underlying Secondary B Aquifers – Bedrock.	Mi	UI	VL	
		R6: Underlying undifferentiated Secondary Aquifers – Superficial.	Mi	UI	VL	
	P4: Vertical and subsequent horizontal migration of contamination.	R7: Grantham Canal.	Mi	UI	VL	
R8: Unnamed stream and Thurlbrook Dyke to east of site.		Mi	Lw	L		
S5: Made Ground associated with	P1: Direct contact,	R1: Current site users.	Mi	UI	VL	The former sewage works is located away

disused sewage works – Heavy metals, Asbestos, PAH, organic and inorganic contamination.	ingestion and inhalation	R2: Construction/services personnel.	Mi	UI	VL	from current site users and would be excavated and removed from site prior to development.
		R3: Future site users.	Mi	UI	VL	Ground investigation surrounding the abandoned tanks and filter bed should be conducted to confirm the whether the tanks have leaked.
	P3: Vertical migration of contamination	R4: Underlying Secondary A Aquifers – Bedrock.	Md	UI	L	A ground investigation is required to assess the potential impact to underlying aquifers.
		R5: Underlying Secondary B Aquifers – Bedrock.	Mi	UI	VL	
		R6: Underlying undifferentiated Secondary Aquifers – Superficial.	Mi	UI	VL	
	P4: Vertical and subsequent horizontal migration of contamination.	R7: Grantham Canal.	Mi	UI	VL	Given the distance from the Canal and the assumed lack of connectivity between groundwater and the canal, it is considered unlikely to detrimentally impact the water quality. Drainage ditches feed water from the disused sewage works area into the stream and could directly impact upon the water quality. A ground investigation should be conducted to assess the potential impact.
		R8: Unnamed stream and Thurlbrook Dyke to east of site.	Md	Lw	M/L	
	S6: Ground gasses associated with coal measures- Methane and Carbon Dioxide.	P2: Migration into buildings through foundation cracks, service entry points	R1: Current site users.	Md	Lw	M/L
R3: Future site users.			Md	Lw	M/L	

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely

Pollutant Linkage Assessment Summary

When considered in the context of the conceptual site model and the historic activities that have taken place within the airport boundary (including Tollerton Business Park), the proposed development is considered to pose a **moderate** risk to both Human Health and Controlled Waters. The main drivers upon which the assessment is made are the on site fuel/chemical storage, two aircraft maintenance works (including aeroplane dismantling) and the more recent industrial activities that have taken place at Tollerton Business Park.

In areas that have historically only been used for agricultural purposes, the proposed development is indicated to present a **very low to low** risk to Controlled Waters and a **low/moderate** risk to Human Health. The main driver for the increased risk to human health is the potential for elevated ground gasses generated within the coal measures.

It is recommended that a ground investigation be undertaken to quantify the identified pollutant linkages and assess likely mitigation measures. Prior to any intrusive investigation, a non-intrusive radiation survey and a desk based UXO survey should be conducted for the site.

5 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 5.1 The site forms a large parcel of land located to the east of Gamston which is currently occupied by Nottingham Airport and Tollerton Business Park, with the remaining site areas occupied by agricultural activities. Current and redundant fuel ASTs have been identified on site in the airport and business park areas, with a current UST present within the airport.
- 5.2 Historic activities at the site include the use of the airport by the RAF during World War II, a small sewage works associated with the airport, and two aircraft maintenance works. A review of a third party regulatory correspondence has indicated that the site has been identified by Rushcliffe Borough Council as being potentially contaminated, with a report suggesting 50-60 drums of paints and solvents have been buried in the vicinity of Sherwood Flying Club and that Lancaster Bombers were dismantled within one of the aircraft maintenance works.
- 5.3 The regulatory review has indicated that no landfills are located within 250m of the site and that a high pressure oil pipeline is indicated to be present underlying the western portion of the site.
- 5.4 The site is indicated to be underlain by limited superficial deposits comprising Lacustrine deposits, Till and Head deposits present along the eastern, north western and south western boundaries. Bedrock geology is indicated to comprise the Branscombe Mudstone (west and north west), Arden Sandstone (central) and the Edwalton Mudstone (east and south east) underlying the site. Coal Measures are present at depth with two seams having been worked at depths of 340m – 470m underground. It is indicated that small scale clay extraction may have occurred towards the north of the site. Fourteen faults are present within the site boundary orientated in a north west to south east direction.
- 5.5 The superficial deposits are predominantly classified as undifferentiated Secondary Aquifers with the limited Till deposits listed as an unproductive strata. The Sandstone bedrock is classified as a Secondary A Aquifer whilst the Mudstone bedrock is a Secondary B Aquifer.
- 5.6 Several water courses are located within close proximity of the site, with the disused Grantham Canal located along the north and north eastern boundary, and an unnamed stream flowing along the eastern boundary. Several small drainage ditches drain into these watercourses from the site.
- 5.7 The current and historic activities conducted within Nottingham Airport and Tollerton Business Park present a moderate risk to both Human Health and Controlled Waters receptors. Historic areas used solely for agricultural purposes present a low risk to Controlled Waters and a low/moderate risk to human health, generated solely by the potential for underlying coal measures to generate hazardous ground gasses.

Recommendations

- 5.8 A ground investigation should be undertaken to assess the ground conditions present on site and to target areas of suspected contamination. The investigation should incorporate ground gas monitoring and groundwater analysis.
- 5.9 Prior to any intrusive works, a non-intrusive radiation survey should be conducted to assess the potential radioactive contamination to be present within the Made Ground associated with both aircraft maintenance works.
- 5.10 Also prior to any ground investigation, a UXO desk study should be conducted to assess the potential for any unexploded ordinance to be present on site.
- 5.11 It is considered unlikely that underground coal mining will influence the shallow foundation design, however the requirement for a coal mining risk assessment should be reviewed based on the findings of a ground investigation.

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FIGURES

FIGURE 1
PROPOSED DEVELOPMENT PLAN



	Planning Boundary	326.00ha
Built Development		
	Residential (up to 4,000 houses)	133.69ha
	Employment	18.21ha
	District Centre	4.90ha
	Secondary School	10.00ha
	Primary School	5.00ha
	Private Hospital	1.50ha
	Primary Street	10.11ha
Green Infrastructure		
	Green Space	135.45ha
	SUDs Detention Basin	8.01ha
	NCAP	5.38ha
	LEAP	2.41ha
	Sports Pitches	16.58ha

Taylor Wimpey, Bloor Homes, Nottingham City Council and Nottinghamshire County Council
 Land to the East of Gamston and North of Tollerton
 ILLUSTRATIVE LAYOUT
 1:5000 @ A1 JVR/DH May 2014
4324-L-110 D

NOTES

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

LEGEND

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Client:
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Project Title:
 Gamston Strategic Urban Planning

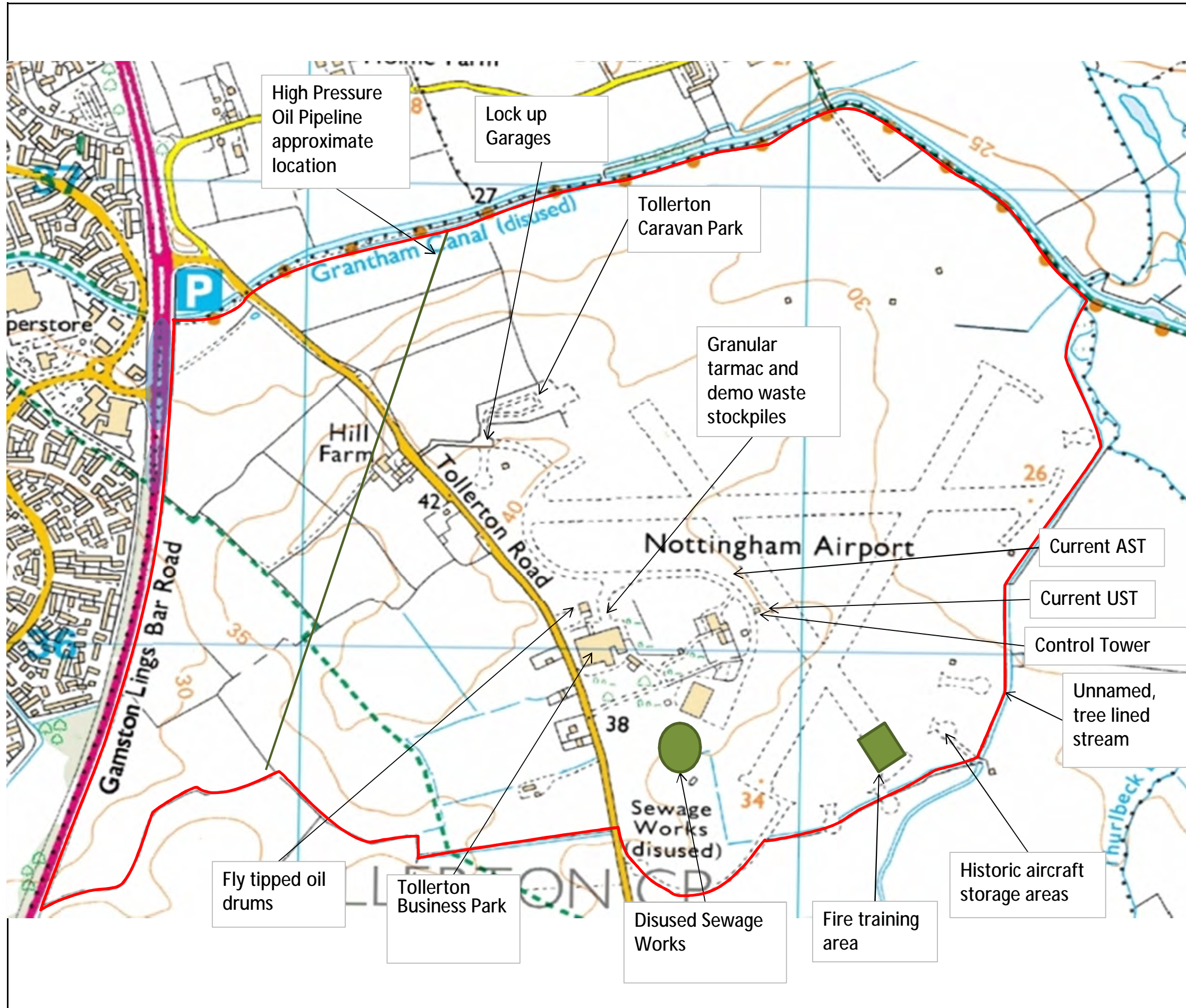
Drawing Title:
 Preliminary Site Development Plan

Scale:	Date:	Drawn:	Authorised:
Not to Scale	Mar-14	CR	KES

Drawing Status:
 Final

Drawing No:	Revision:
NTW2248/EN/F1	R2

**FIGURE 3
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			
— high pressure underground oil pipeline			
BW B			
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Client: Consortium of Bloor Homes, Taylor Wimpey, Nottingham County Council, Nottingham City Council			
Project Title: Gamston Strategic Urban Planning			
Drawing Title: Site Layout Plan			
Scale: Not to Scale	Date:	Drawn: A Bennett	Authorised:
Drawing Status: DRAFT			
Drawing No: NTW2248/LD/V1			Revision: R1

APPENDICES

APPENDIX 1 SITE PHOTOGRAPHS



Photo 1— Historic bunded AST of unlabelled use located outside the aircraft hanger.



Photo 2— Grade II listed pill boxes found across Airport site in various states of disrepair

Project Number: NTW2248
Project Name: Gamston Strategic Urban Extension
Site Photographs



Photo 3 — Airport control tower



Photo 4 — Historic tank bund with waste Propane gas canister.



Photo 5 — Abandoned reservoir associated with disused sewage works.



Photo 6 — Abandoned structure associated with sewage works. Algae present on surface water.



Photo 7— Filter bed associated with disused sewage works.



Photo 8— Fire training area.



Photo 9— Waste tyres and refrigerators stored on disused section of runway.



Photo 10— stream flowing along eastern site boundary.



Photo 11— Tollerton Caravan Park.



Photo 12— Flammable liquid and gas storage on business park.

Project Number: NTW2248
Project Name: Gamston Strategic Urban Extension
Site Photographs



Photo 13— Former hangar on business park now indicated to be in use by Jackson Recovery.



Photo 14— Electricity substation on Tollerton Business Park



Photo 15— Disused AST and oil drums on business park.



Photo 16— Propane gas tank in restaurant car park.



Photo 17— Chemical storage within hanger.



Photo 18— AST for light aircraft

Project Number: NTW2248
Project Name: Gamston Strategic Urban Extension
Site Photographs



Photo 19— UST for light aircraft.



Photo 20— High pressure oil pipeline sign.

APPENDIX 2
HISTORICAL ORDINANCE SURVEY PLANS

Site Details:

1 CHESTNUT MEWS,
TOLLERTON LANE,
TOLLERTON, NOTTINGHAM,
NG12 4GA

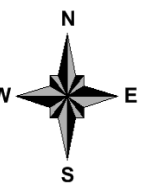
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Grid Ref: 460694, 336898

Map Name: National Grid

Map date: 1993-1995

Scale: 1:1,250

Printed at: 1:2,500



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

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

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
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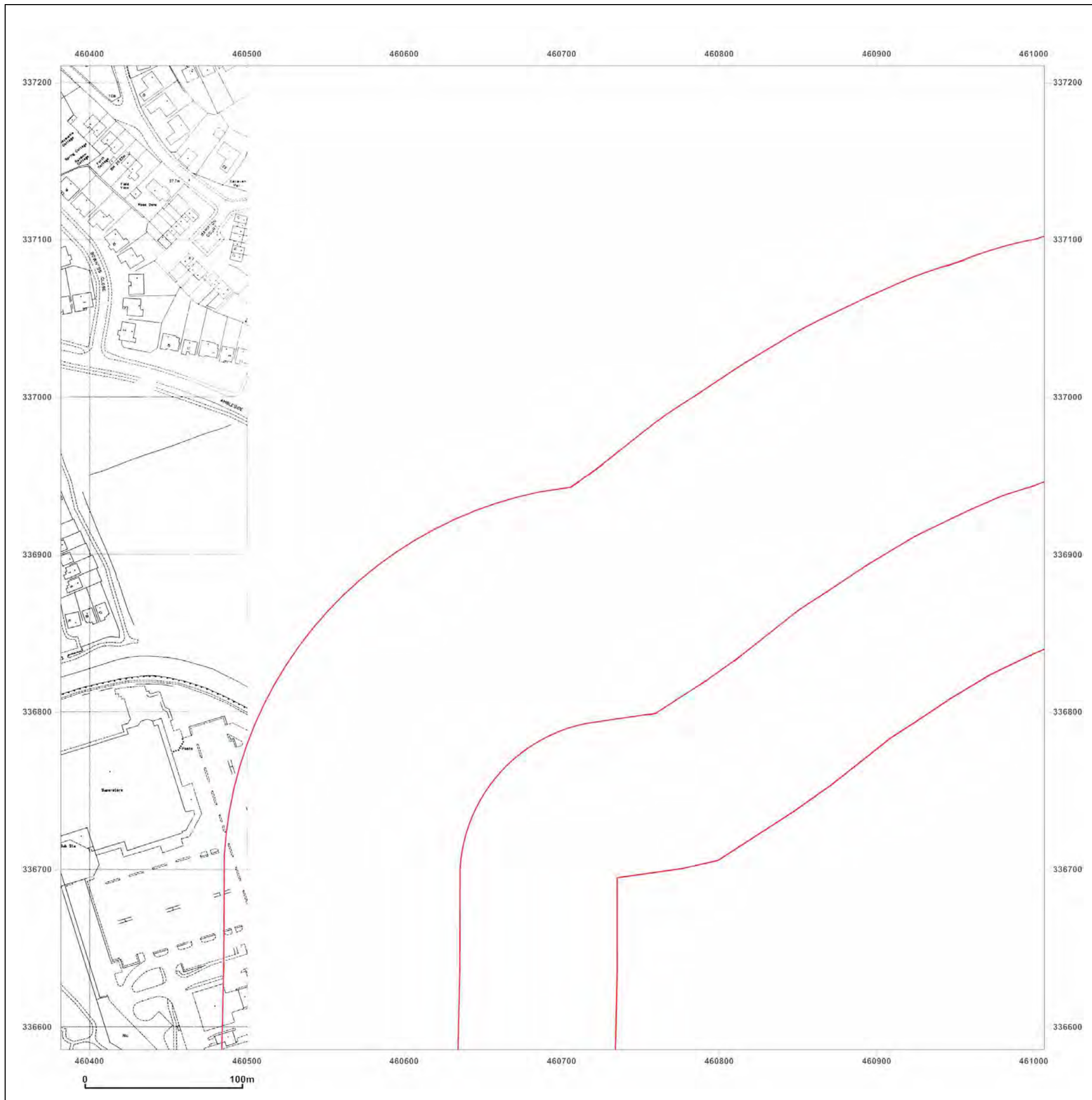
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Client Ref: ENV131183~NTW2248
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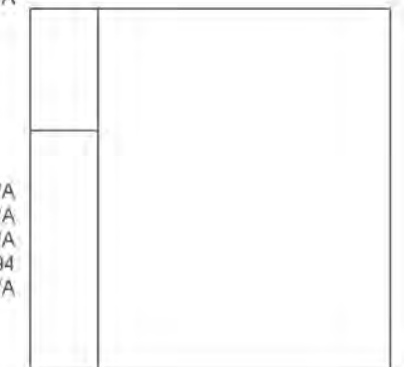
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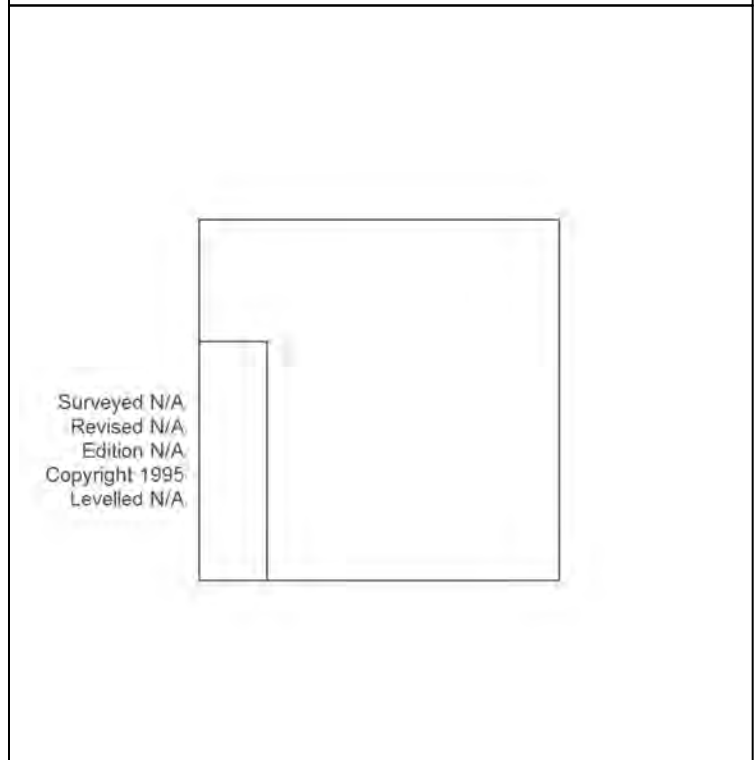
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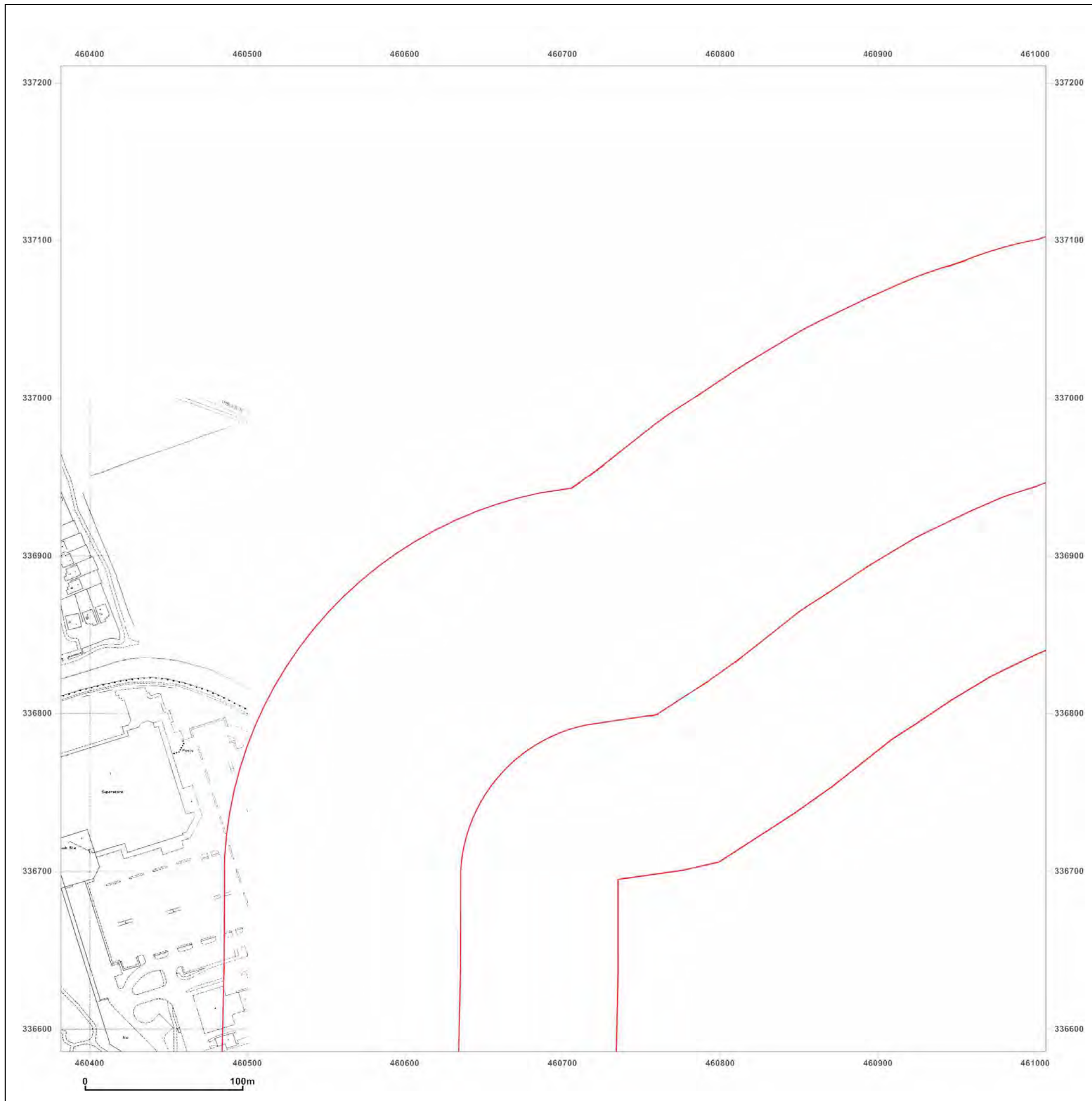


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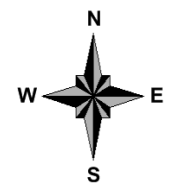
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 NG12 4GA

Client Ref: ENV131183~NTW2248
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Grid Ref: 460694, 336898

Map Name: National Grid
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Grid Ref: 460694, 336898

Map Name: National Grid
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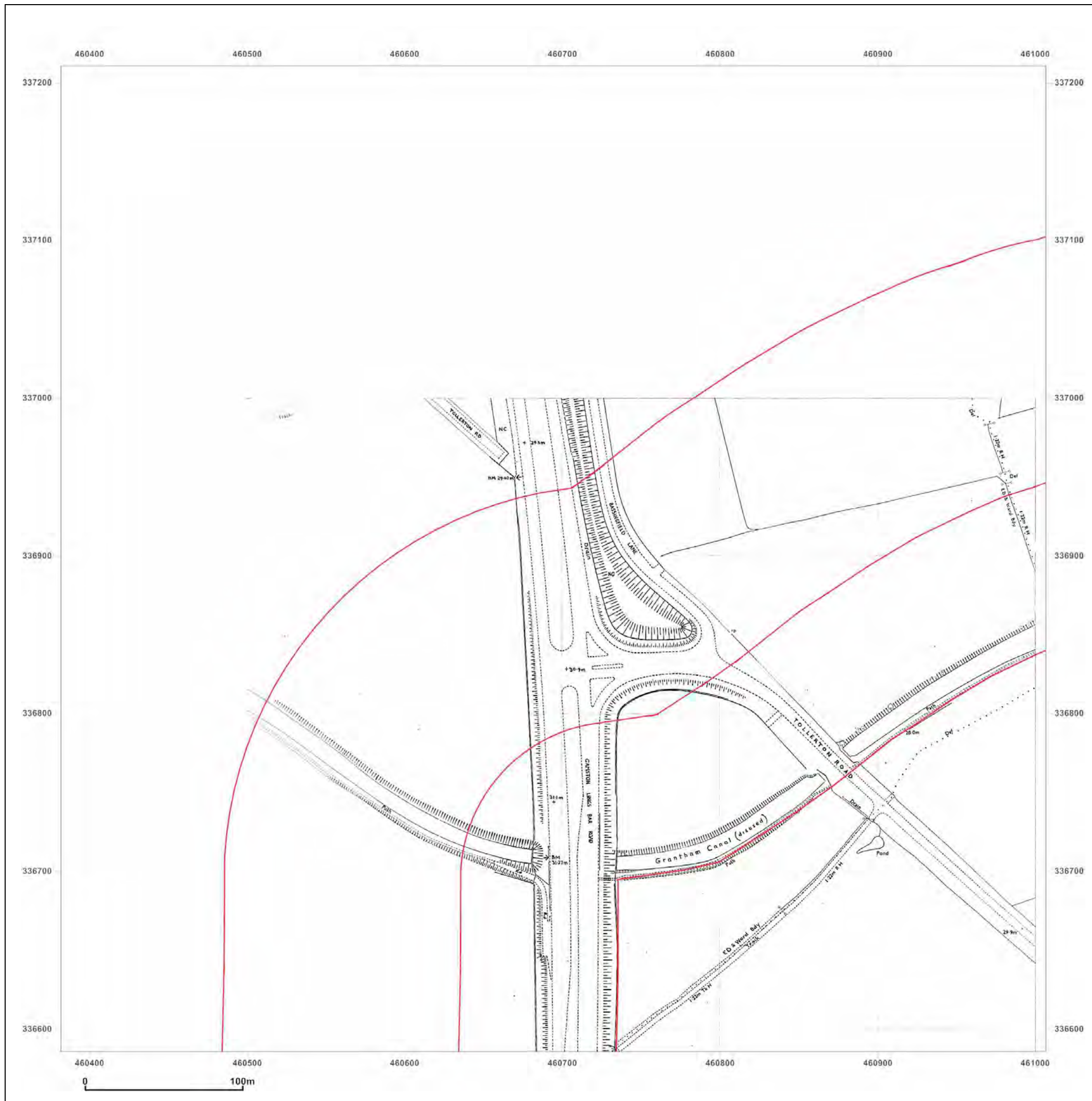


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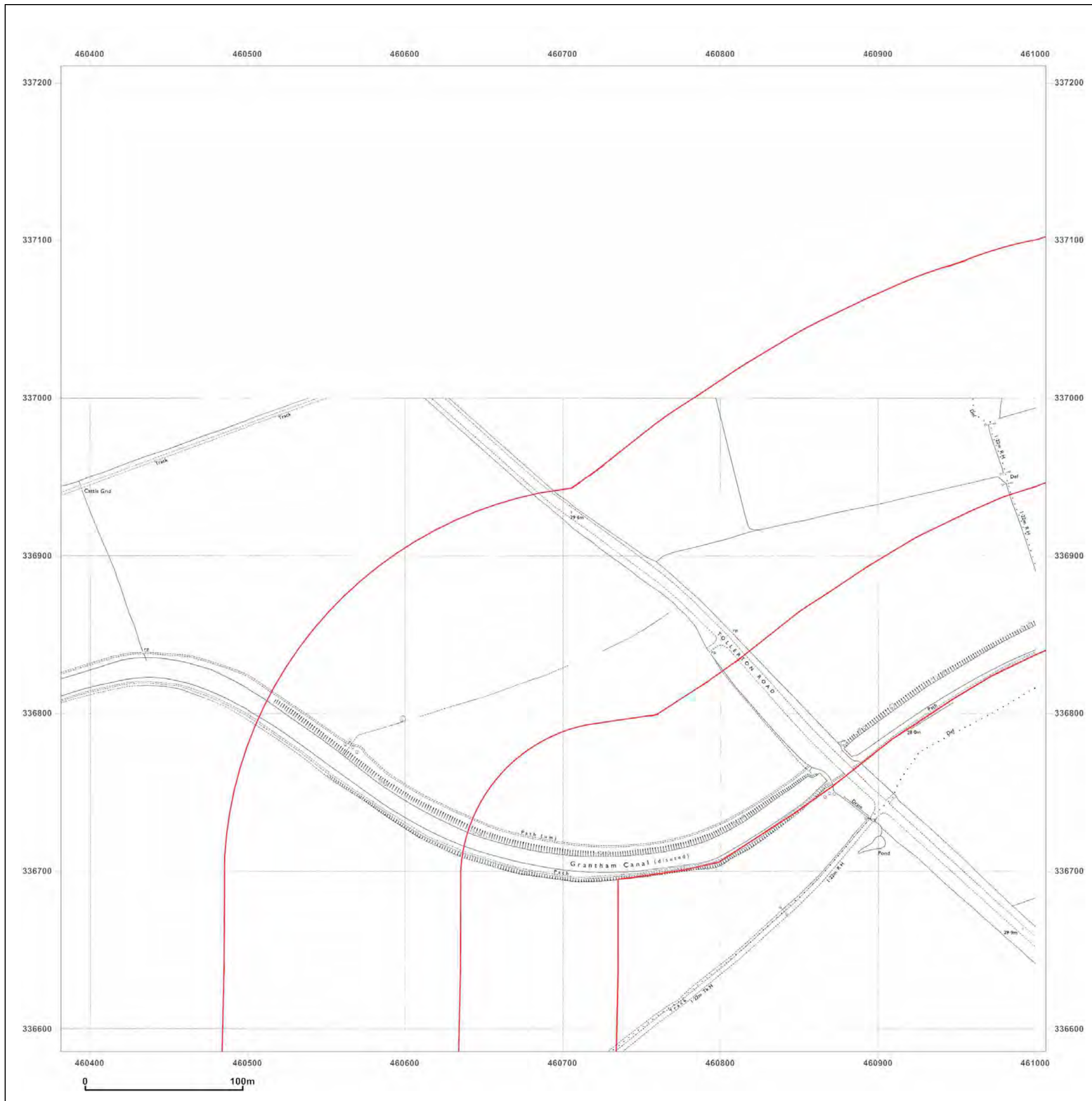
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Map date: 1974

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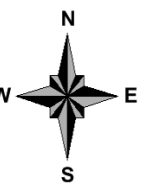
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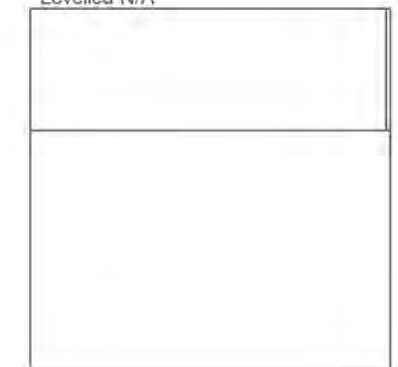
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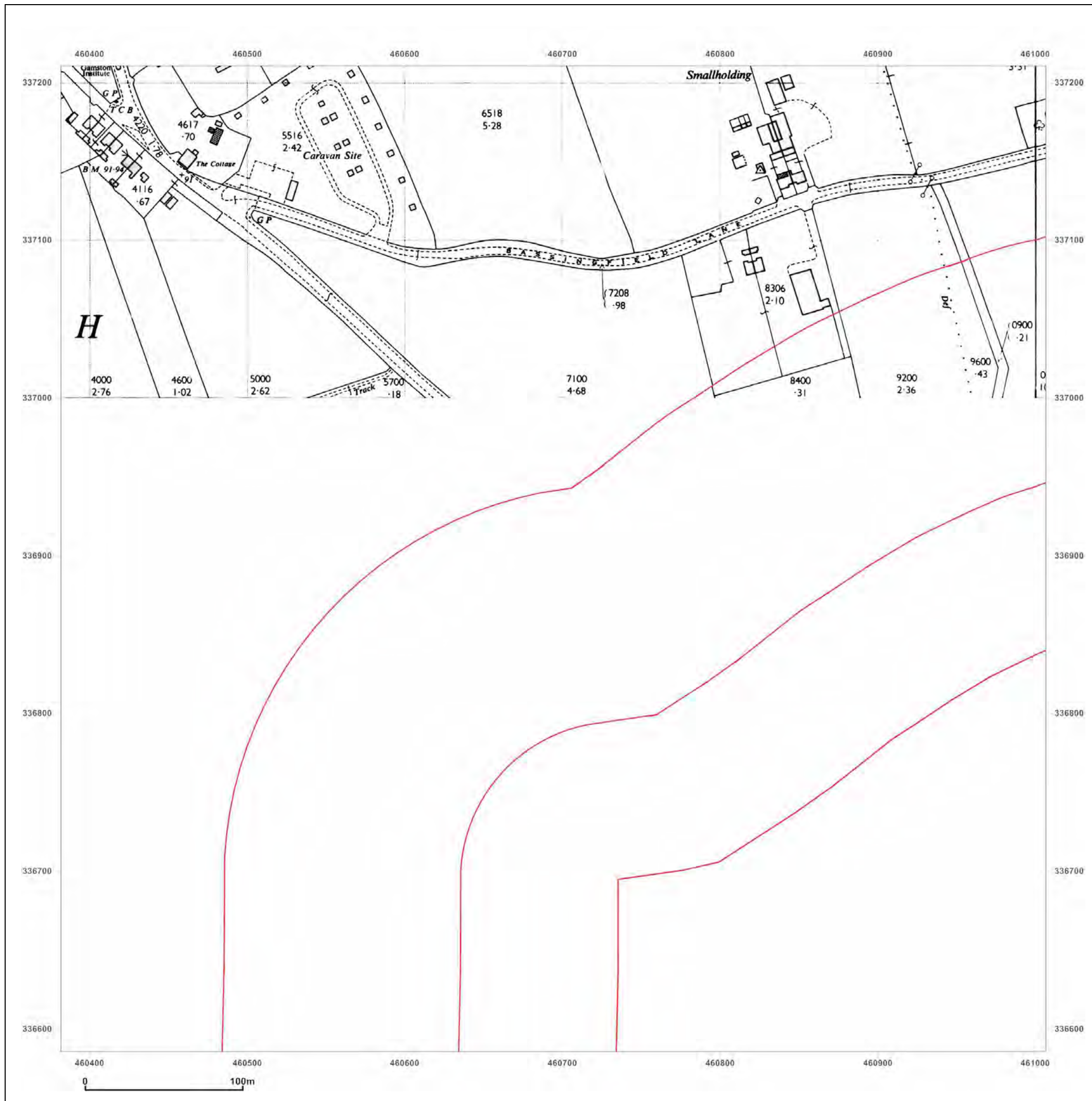


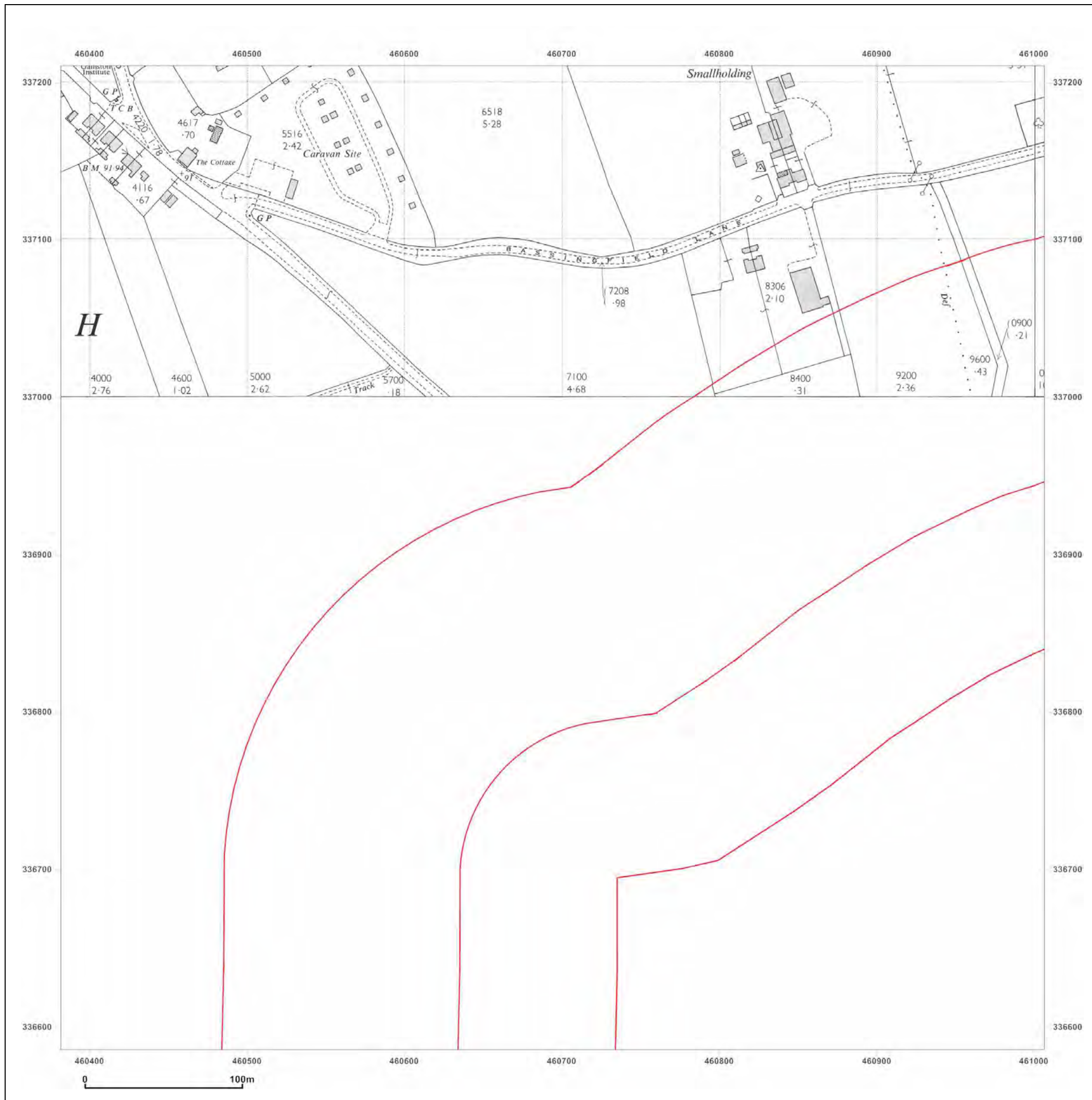
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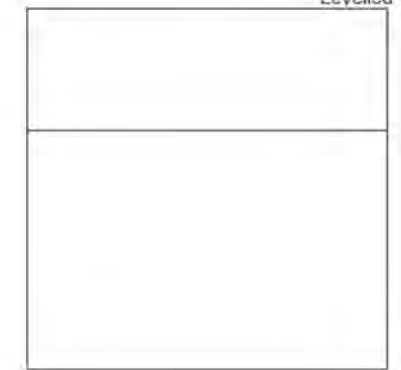
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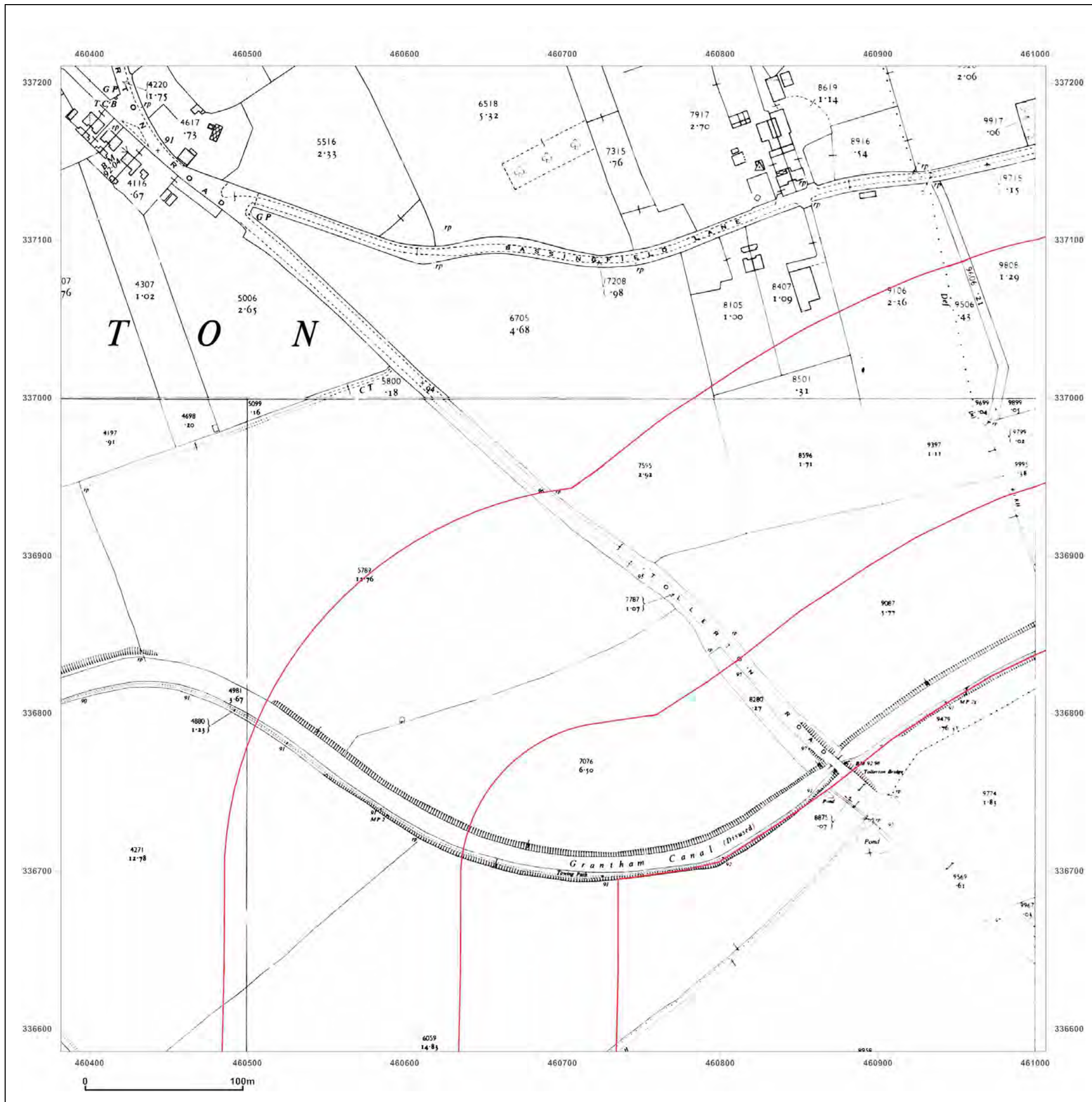


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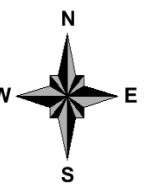
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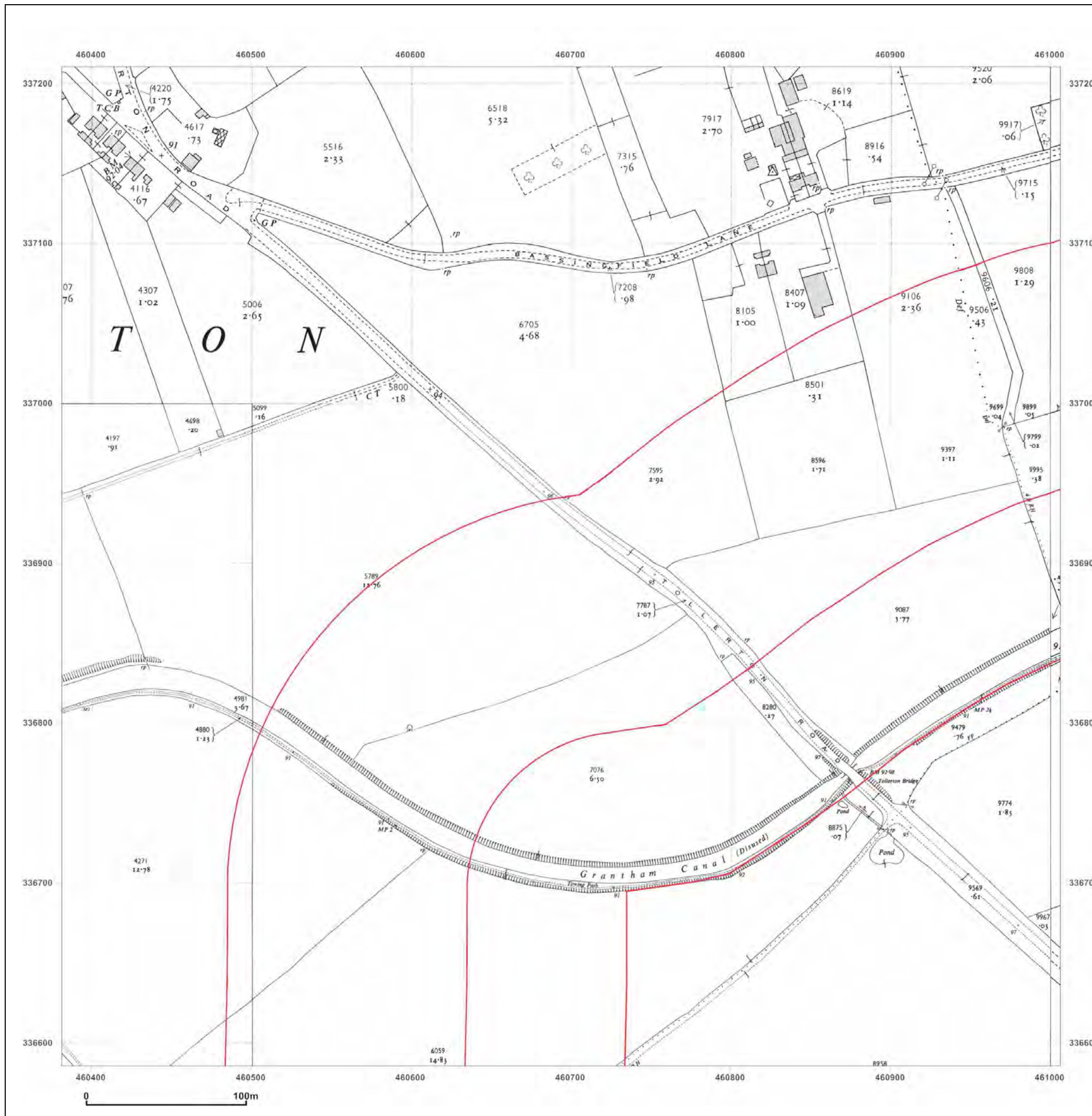
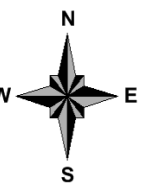
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Grid Ref: 460694, 336898

Map Name: National Grid

Map date: 1952-1956

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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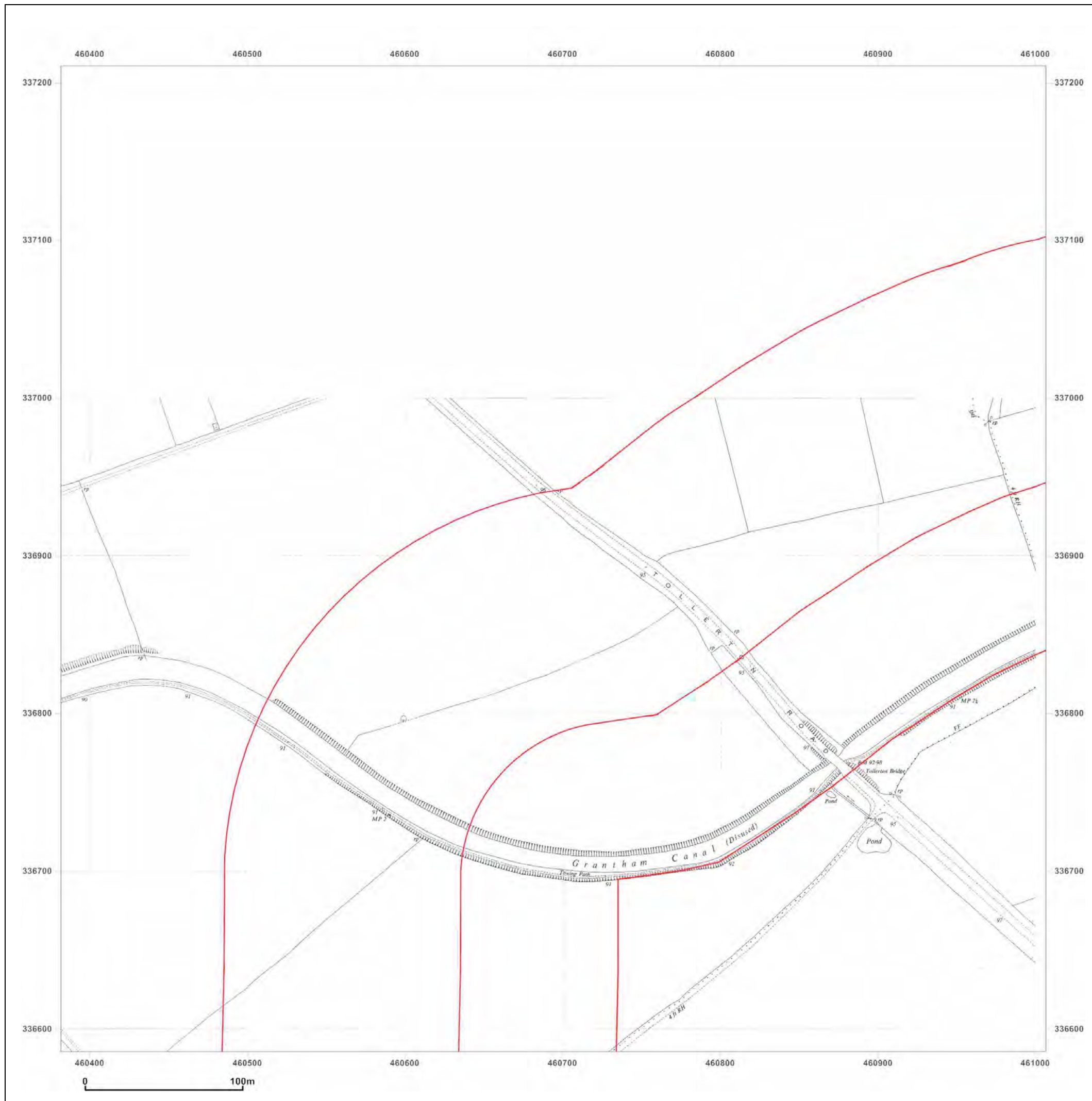
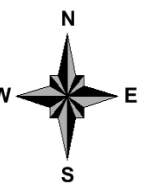
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Grid Ref: 460694, 336898

Map Name: National Grid

Map date: 1952

Scale: 1:1,250

Printed at: 1:2,500



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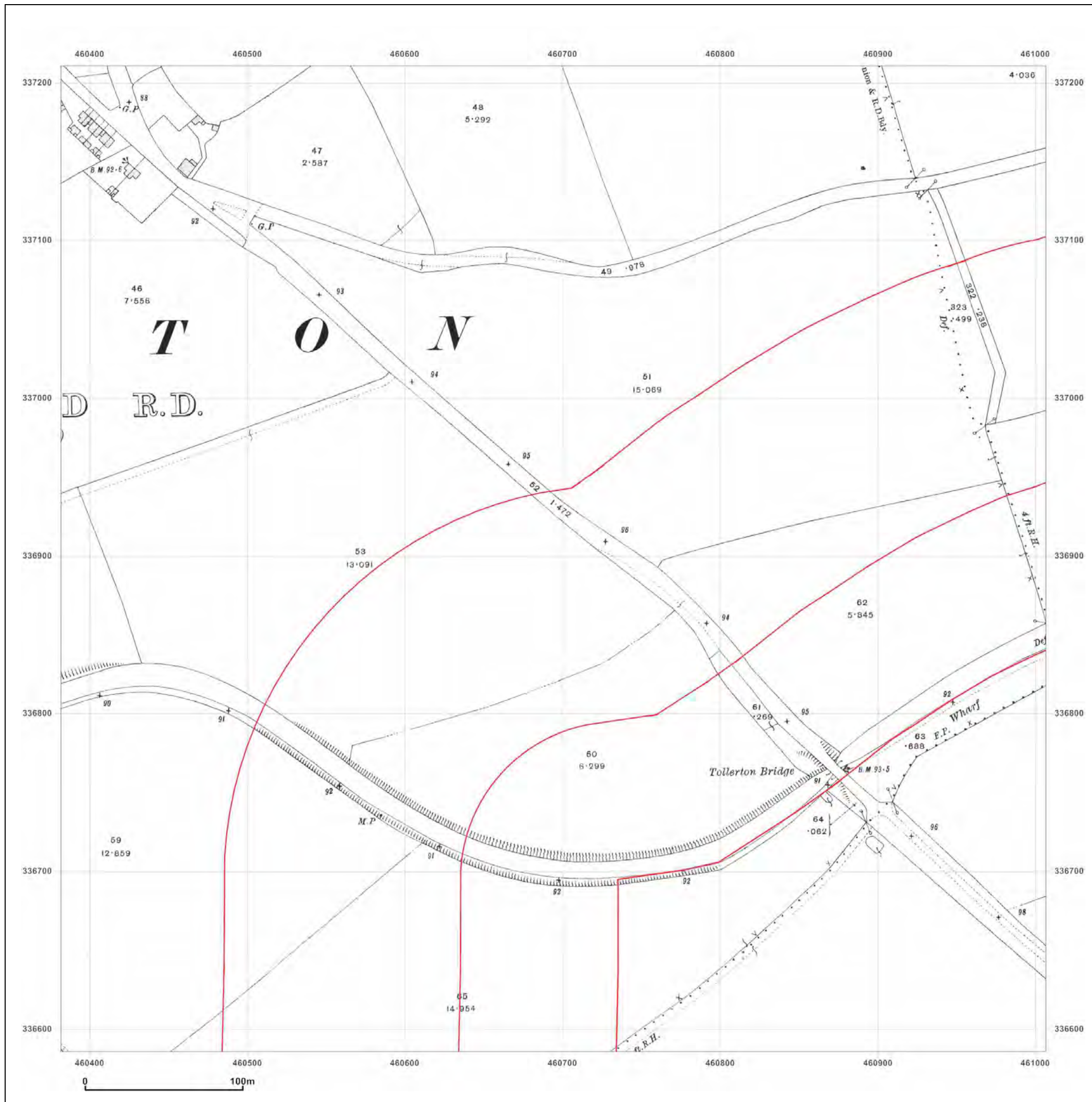


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NG12 4GA

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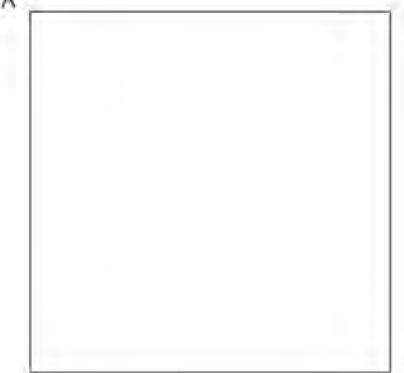
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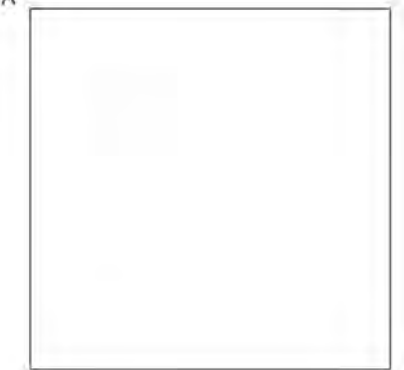
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Copyright N/A
Levelled N/A

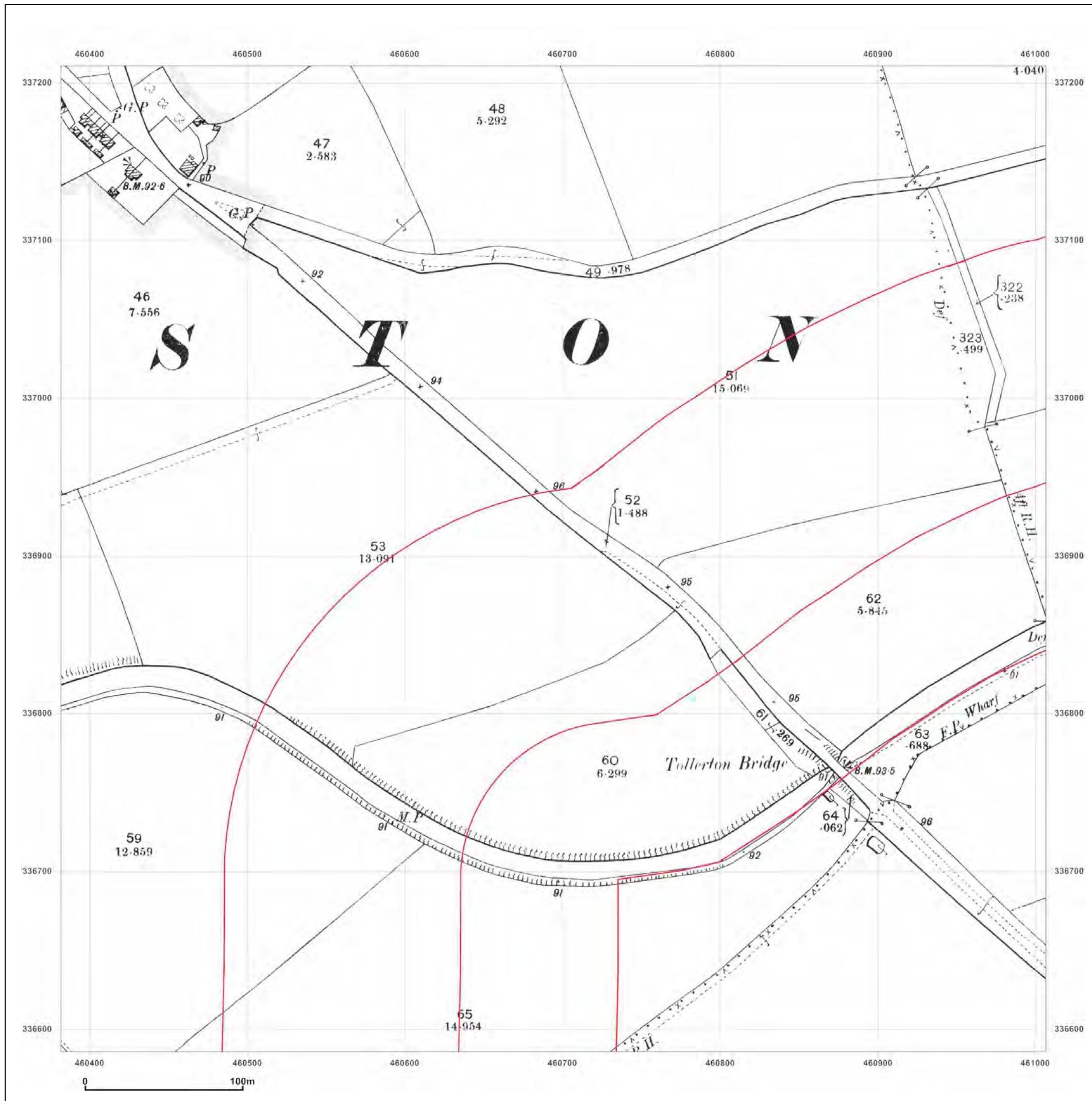


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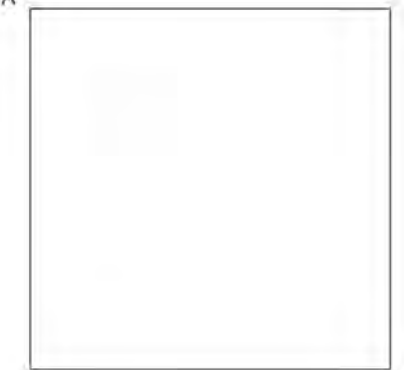
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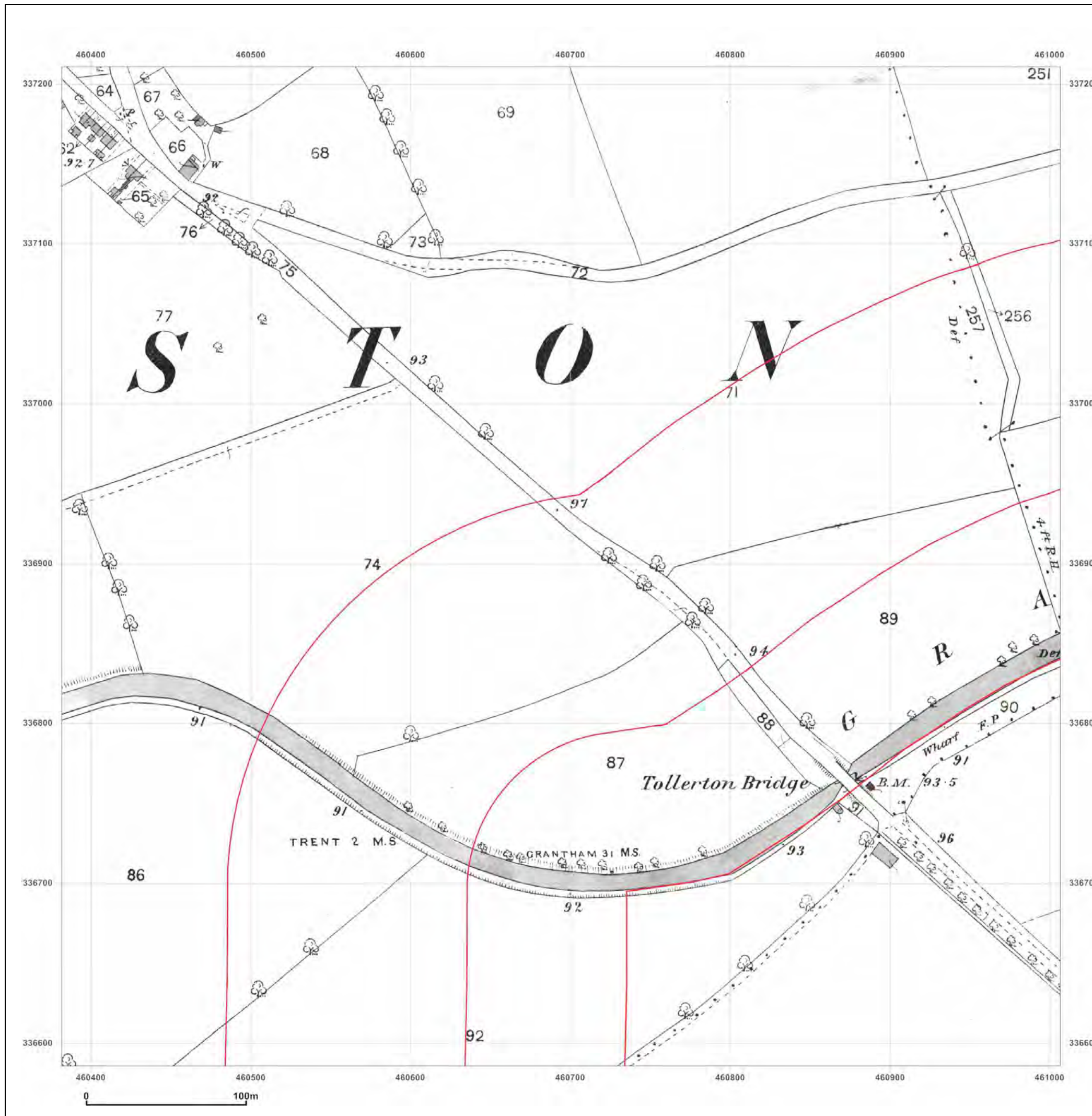


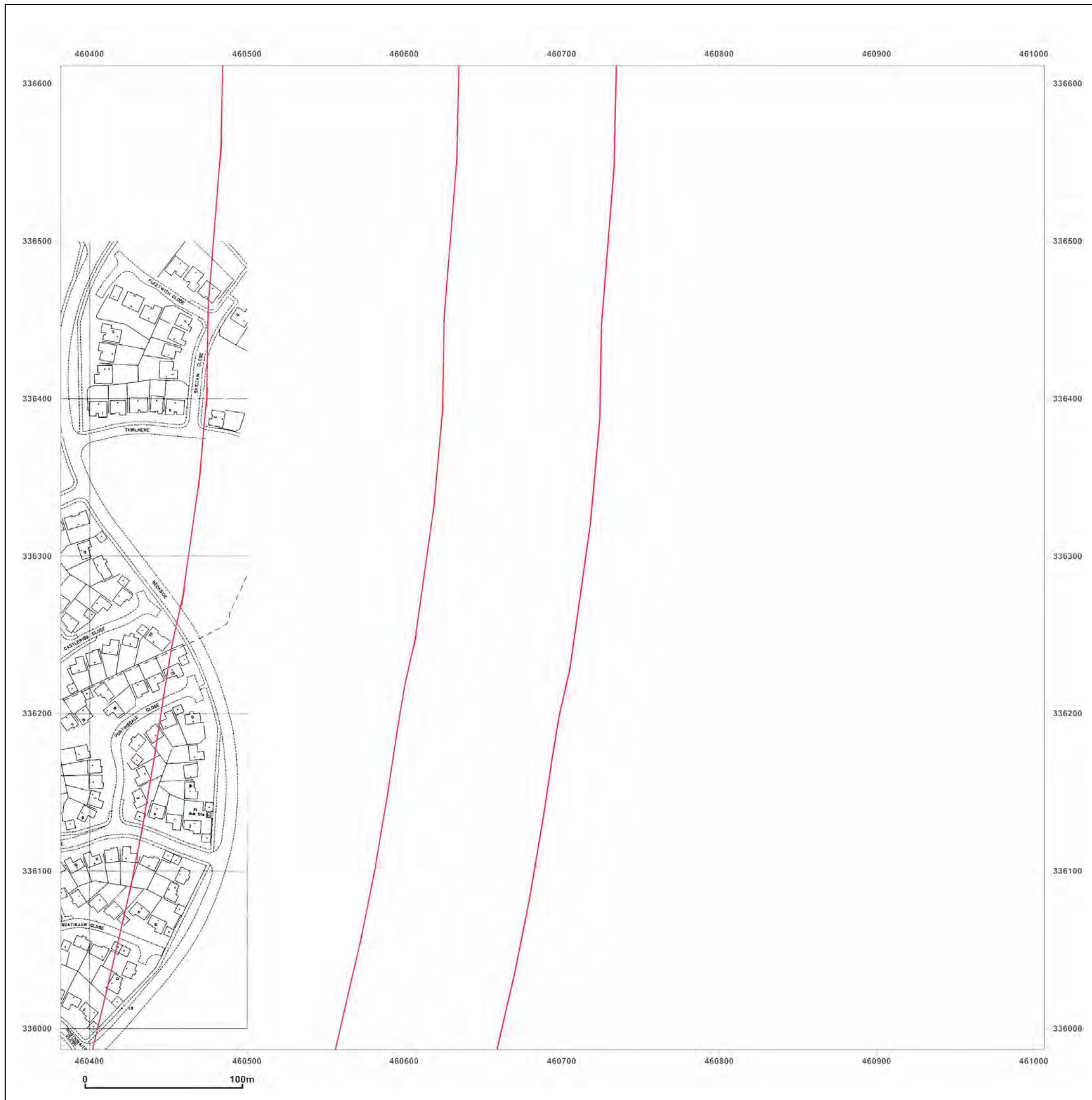
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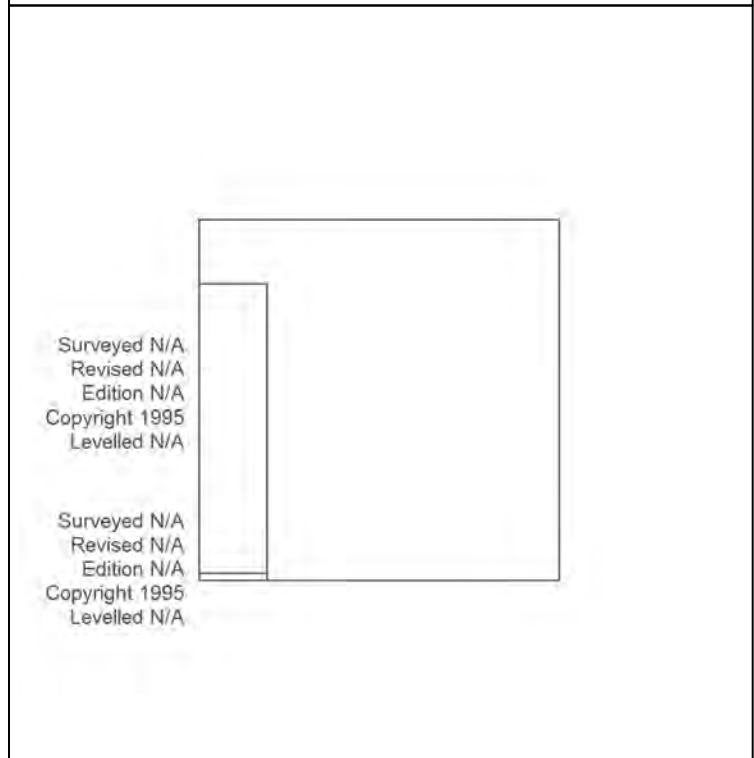
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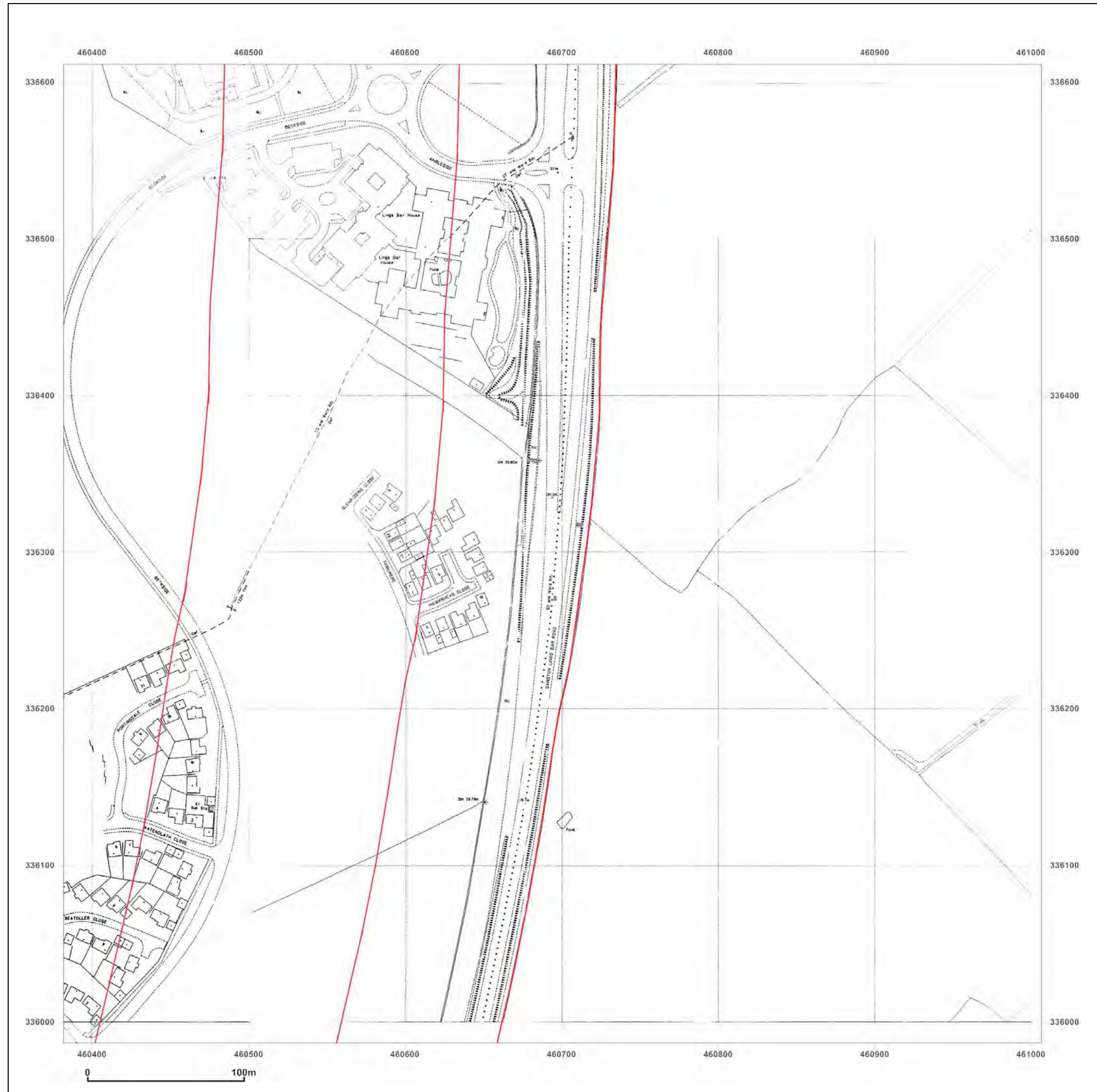


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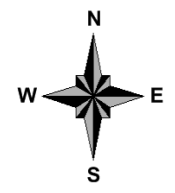
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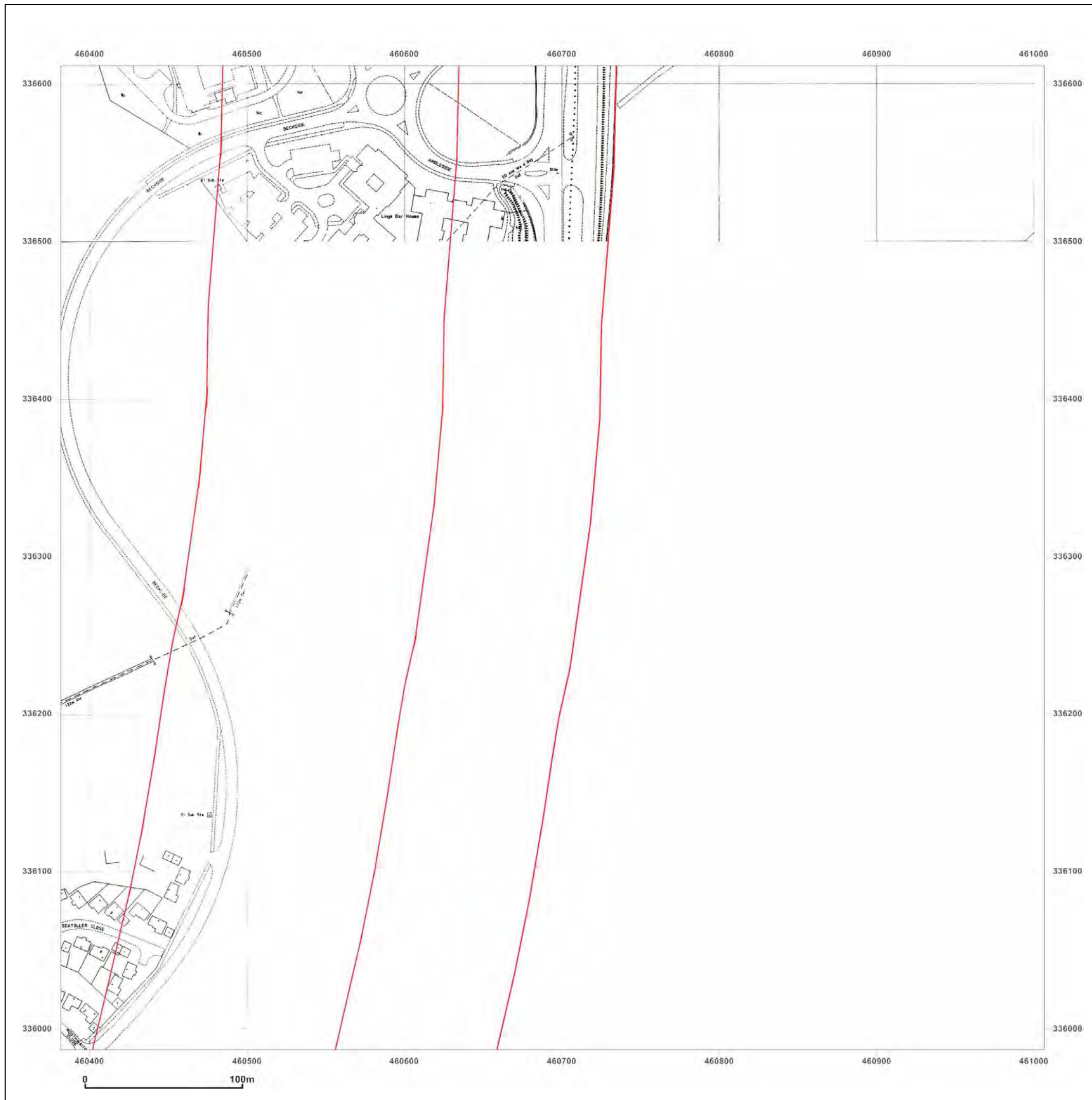
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Map Name: National Grid

Map date: 1993-1995

Scale: 1:1,250

Printed at: 1:2,500



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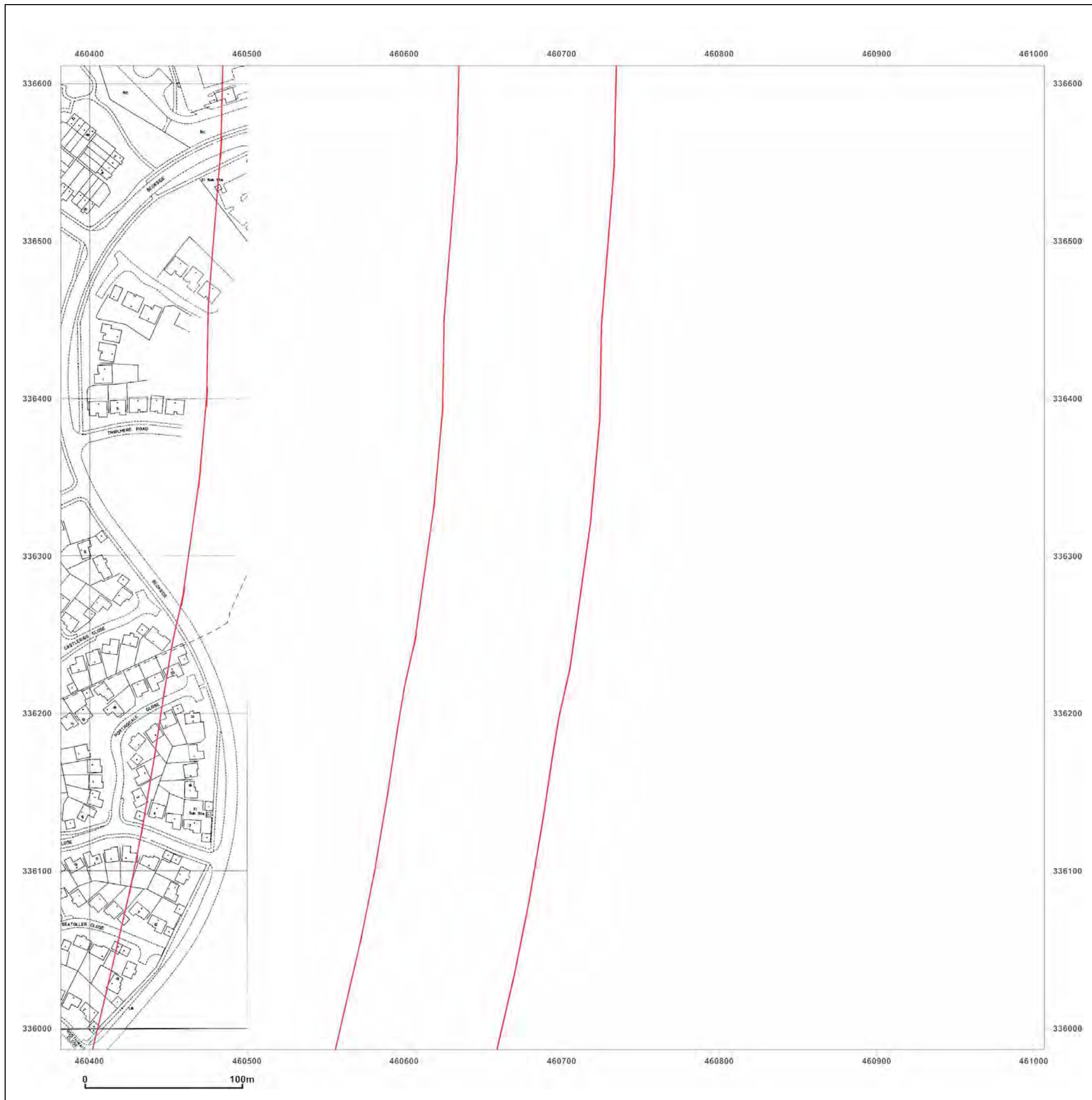


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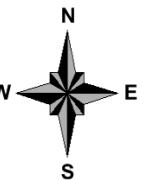
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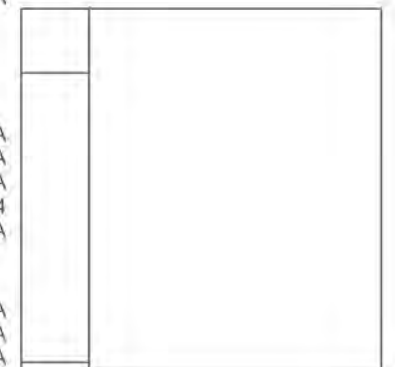
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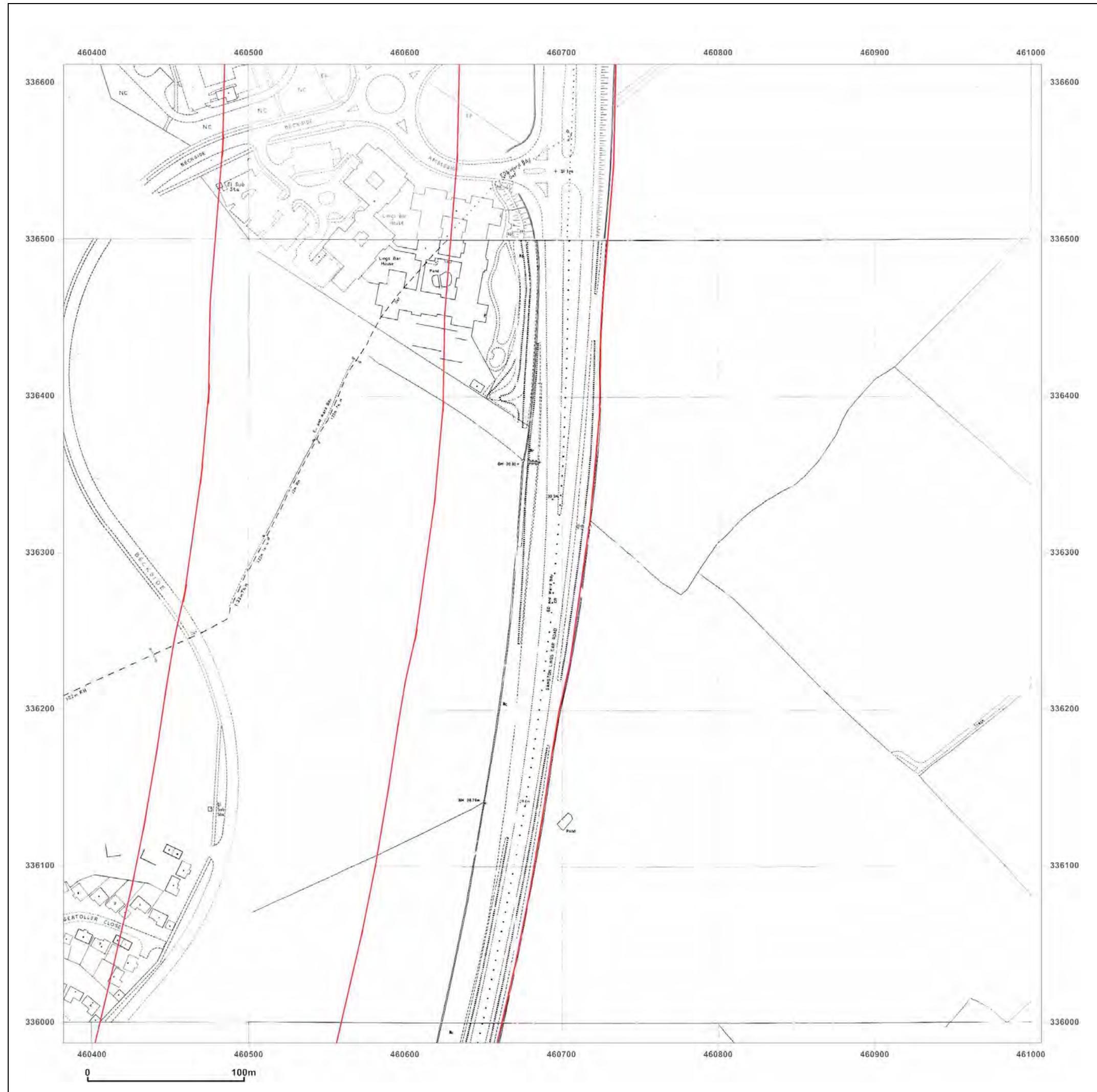


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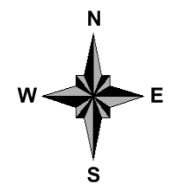
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Map Name: National Grid
Map date: 1990-1993
Scale: 1:1,250
Printed at: 1:2,500



Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A	Surveyed 1982 Revised 1992 Edition N/A Copyright 1992 Levelled 1982
Surveyed 1982 Revised 1992 Edition N/A Copyright 1992 Levelled 1982	Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A
Surveyed N/A Revised N/A Edition N/A Copyright 1990 Levelled 1965	Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A

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Site Details:

1 CHESTNUT MEWS,
TOLLERTON LANE,
TOLLERTON, NOTTINGHAM,
NG12 4GA

Client Ref: ENV131183~NTW2248
Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid

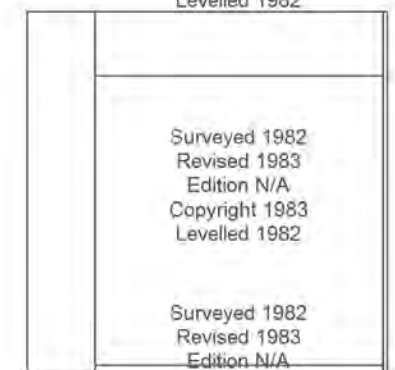
Map date: 1983

Scale: 1:1,250

Printed at: 1:2,500



Surveyed 1982
Revised 1983
Edition N/A
Copyright 1983
Levelled 1982



Surveyed 1982
Revised 1983
Edition N/A
Copyright 1983
Levelled 1982

Surveyed 1982
Revised 1983
Edition N/A
Copyright 1983
Levelled 1982

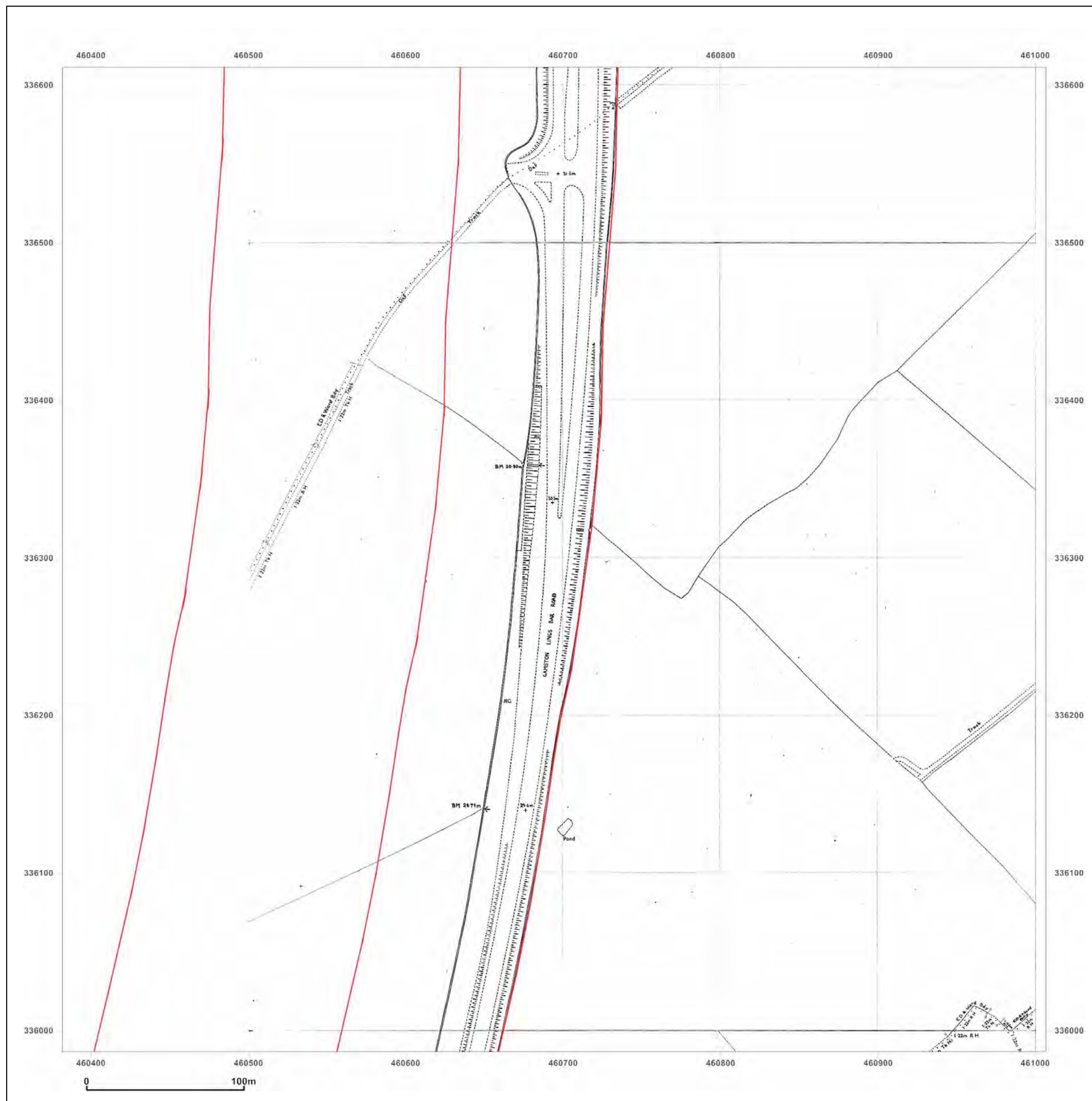


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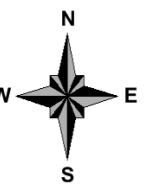
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Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid

Map date: 1974

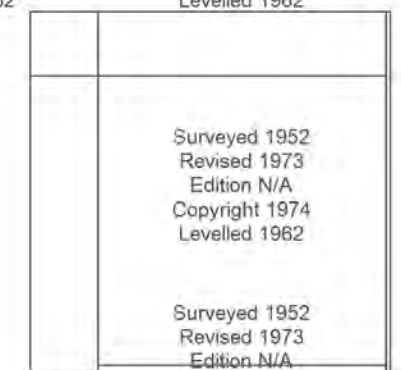
Scale: 1:1,250

Printed at: 1:2,500



Surveyed 1952
Revised 1973
Edition N/A
Copyright 1974
Levelled 1962

Surveyed 1952
Revised 1973
Edition N/A
Copyright 1974
Levelled 1962

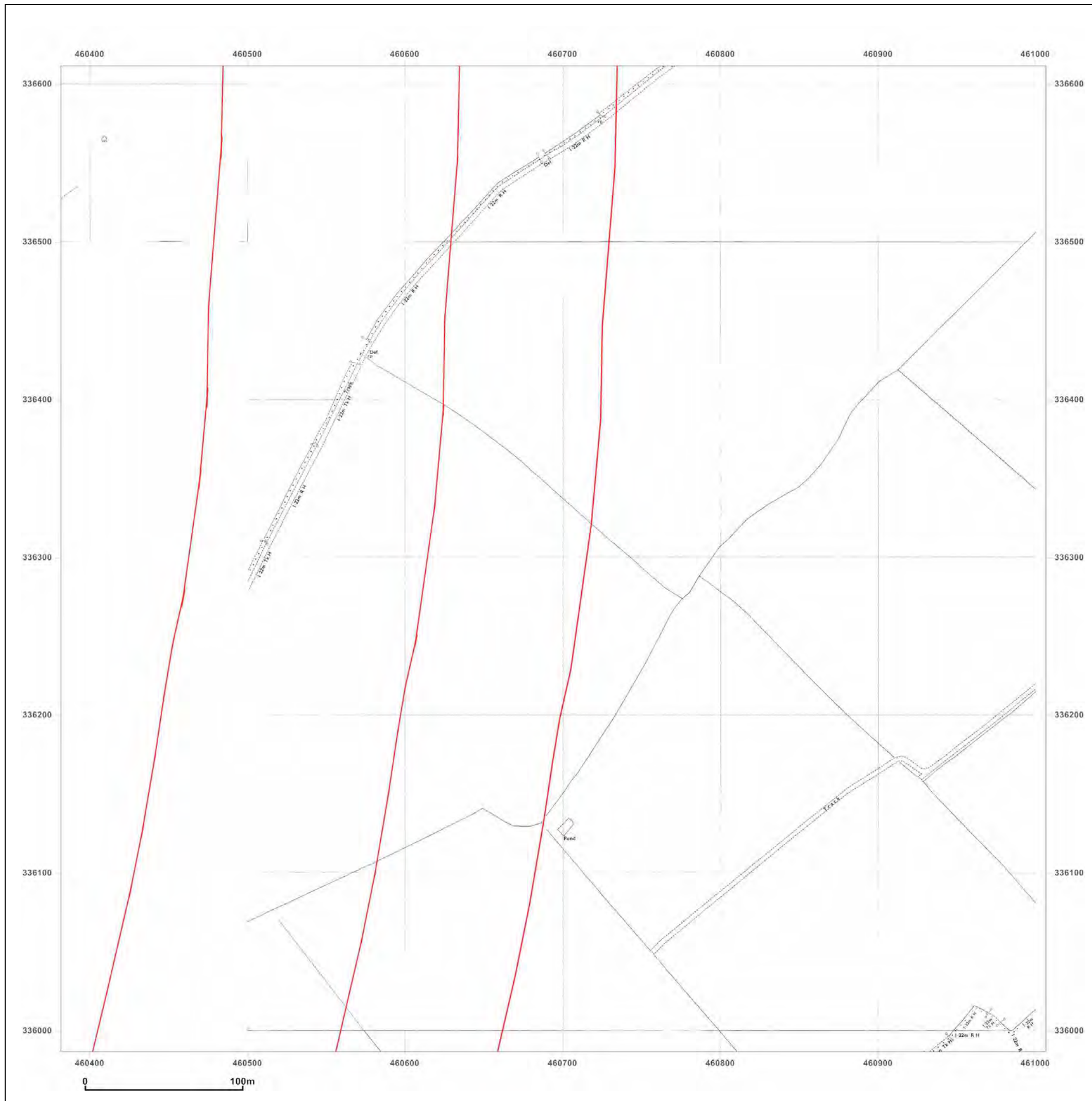


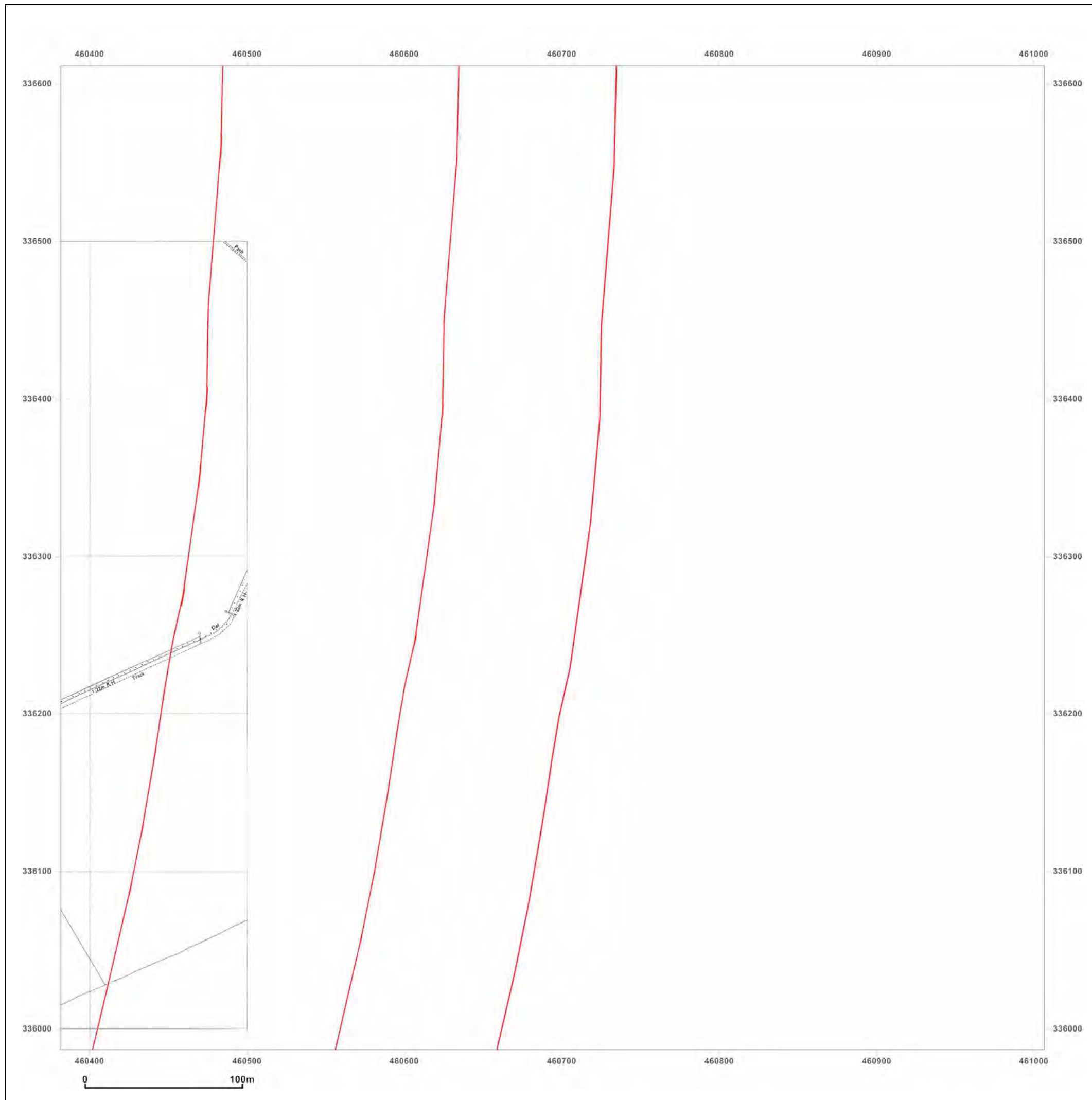
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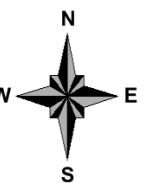
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Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid

Map date: 1966-1971

Scale: 1:1,250

Printed at: 1:2,500



Surveyed 1952
Revised 1970
Edition N/A
Copyright 1971
Levelled 1962

Surveyed 1952
Revised 1965
Edition N/A
Copyright 1966
Levelled 1962

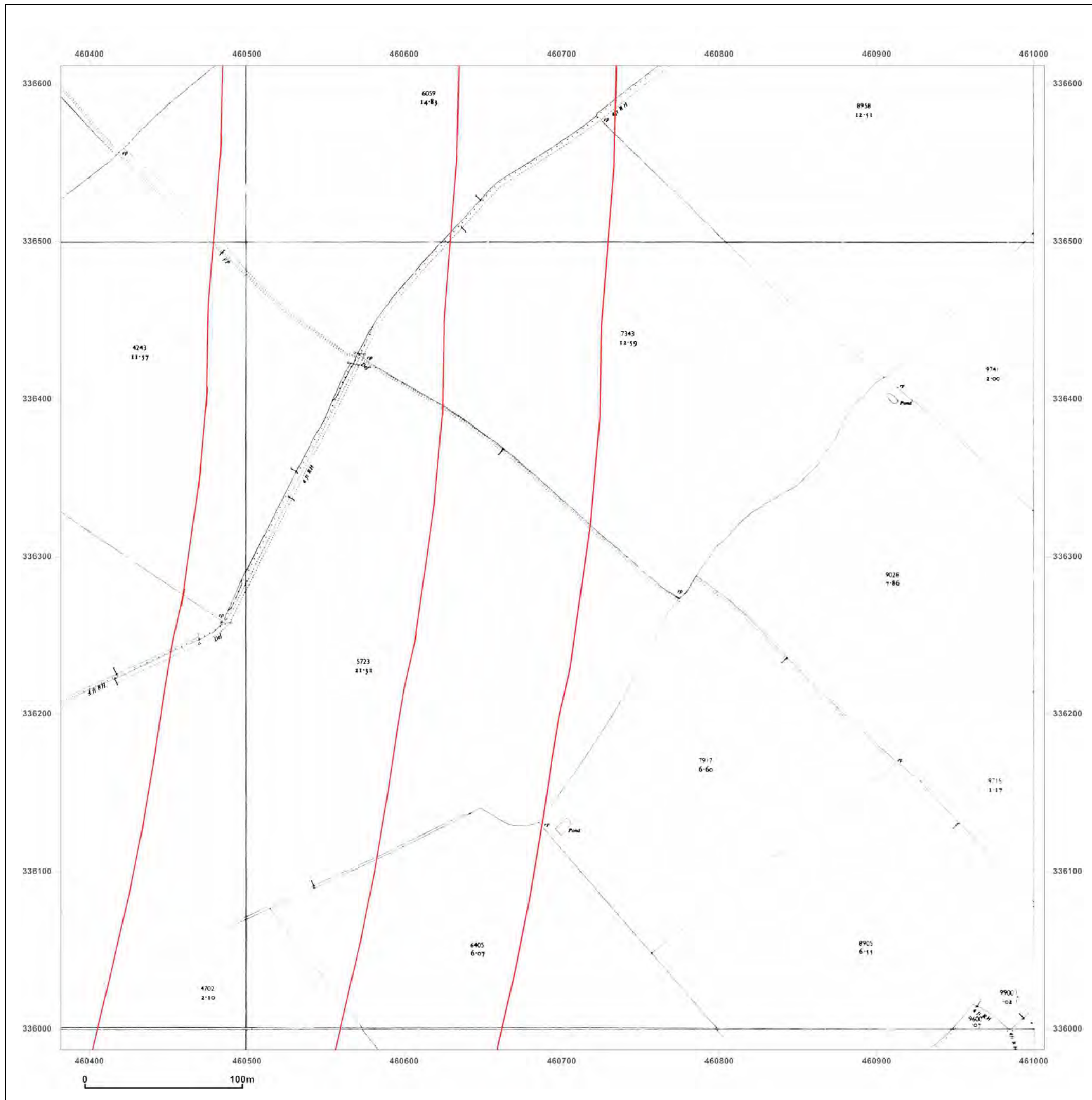


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Client Ref: ENV131183~NTW2248
Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid

Map date: 1953-1957

Scale: 1:2,500

Printed at: 1:2,500



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

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

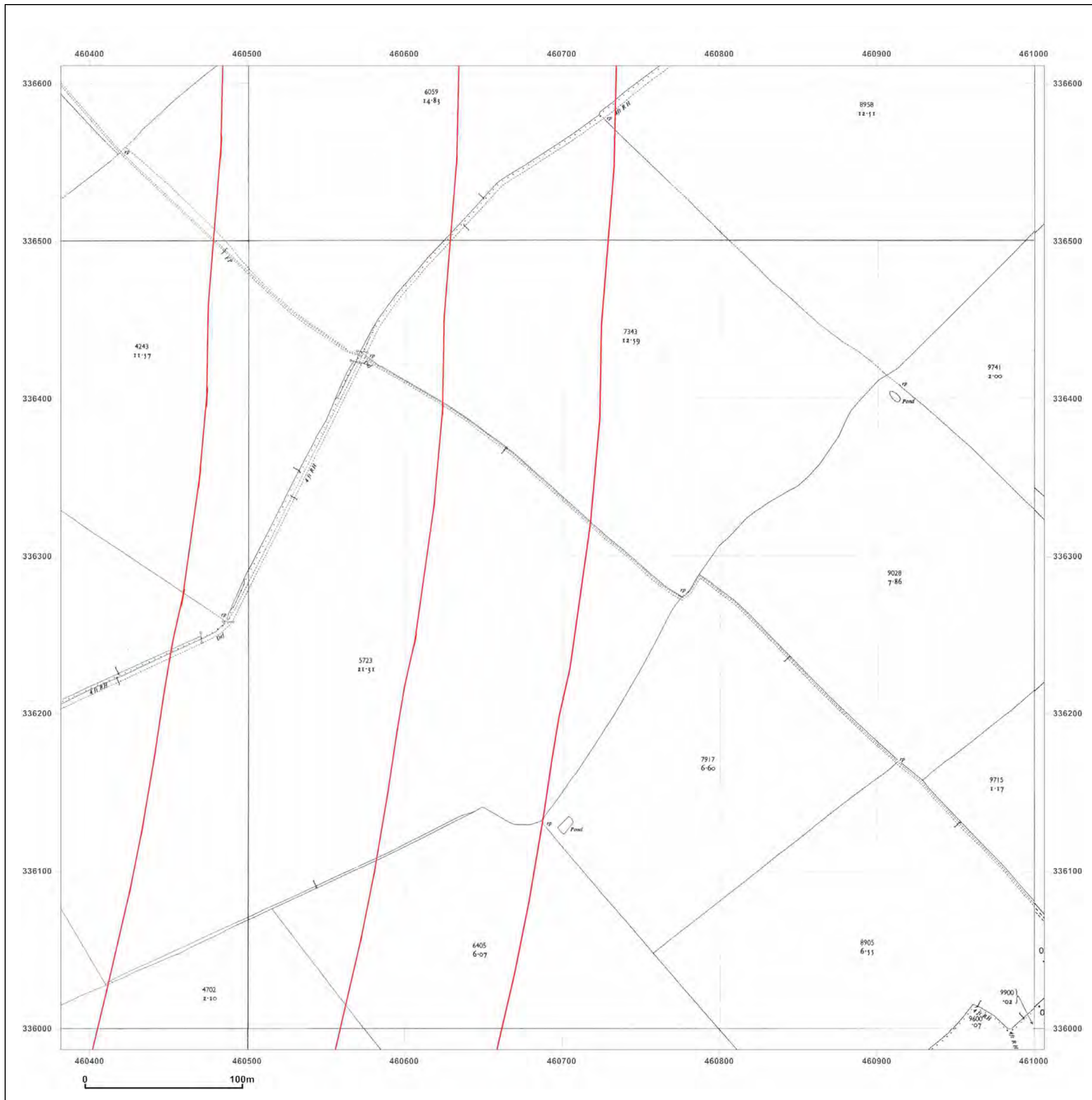


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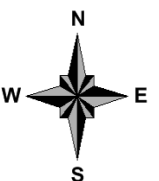
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Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid

Map date: 1952-1956

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1945	Surveyed 1956 Revised 1956 Edition N/A Copyright N/A Levelled 1948

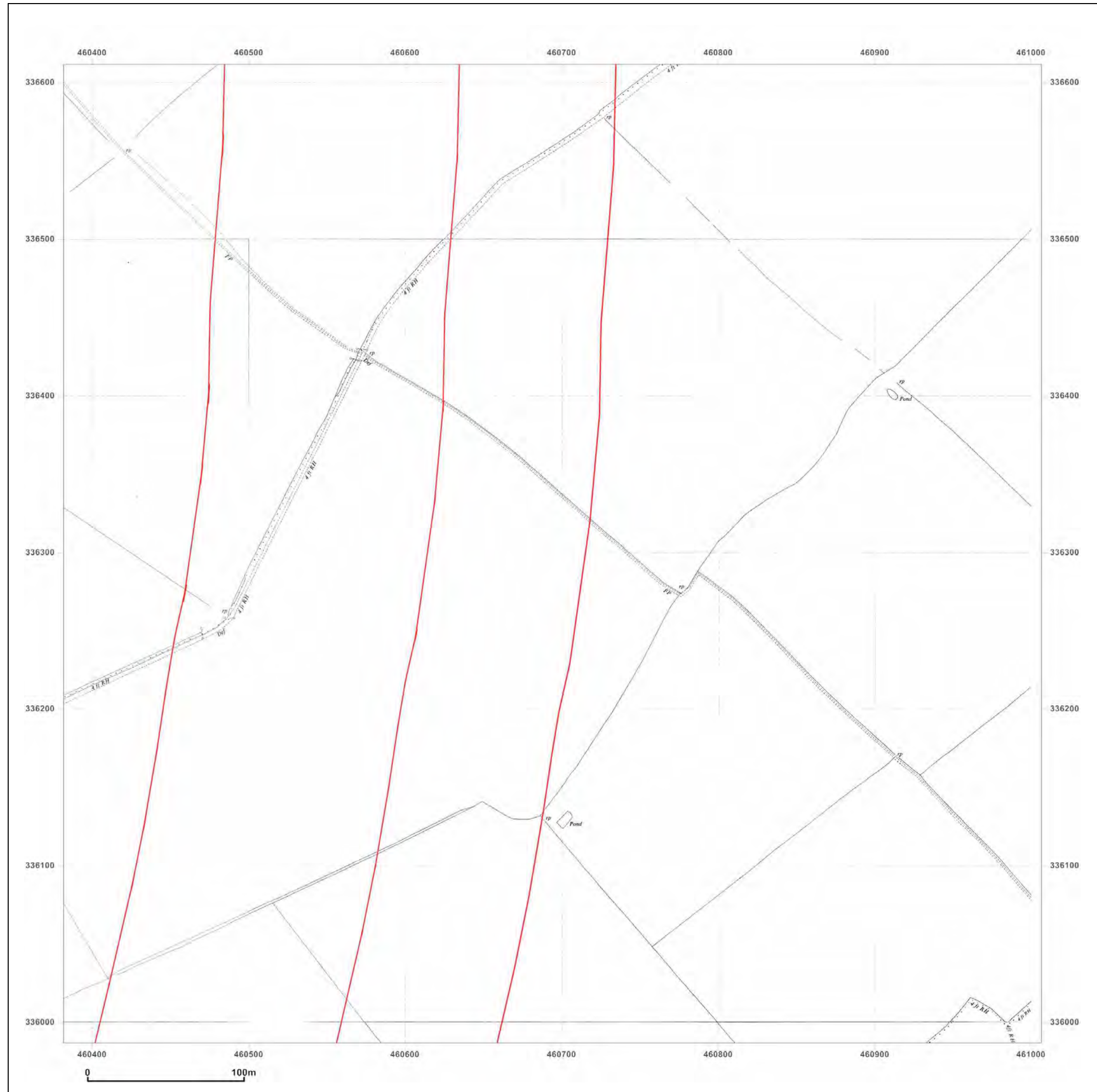


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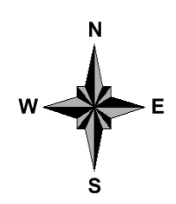
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Client Ref: ENV131183~NTW2248
Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: National Grid
Map date: 1952
Scale: 1:1,250
Printed at: 1:2,500



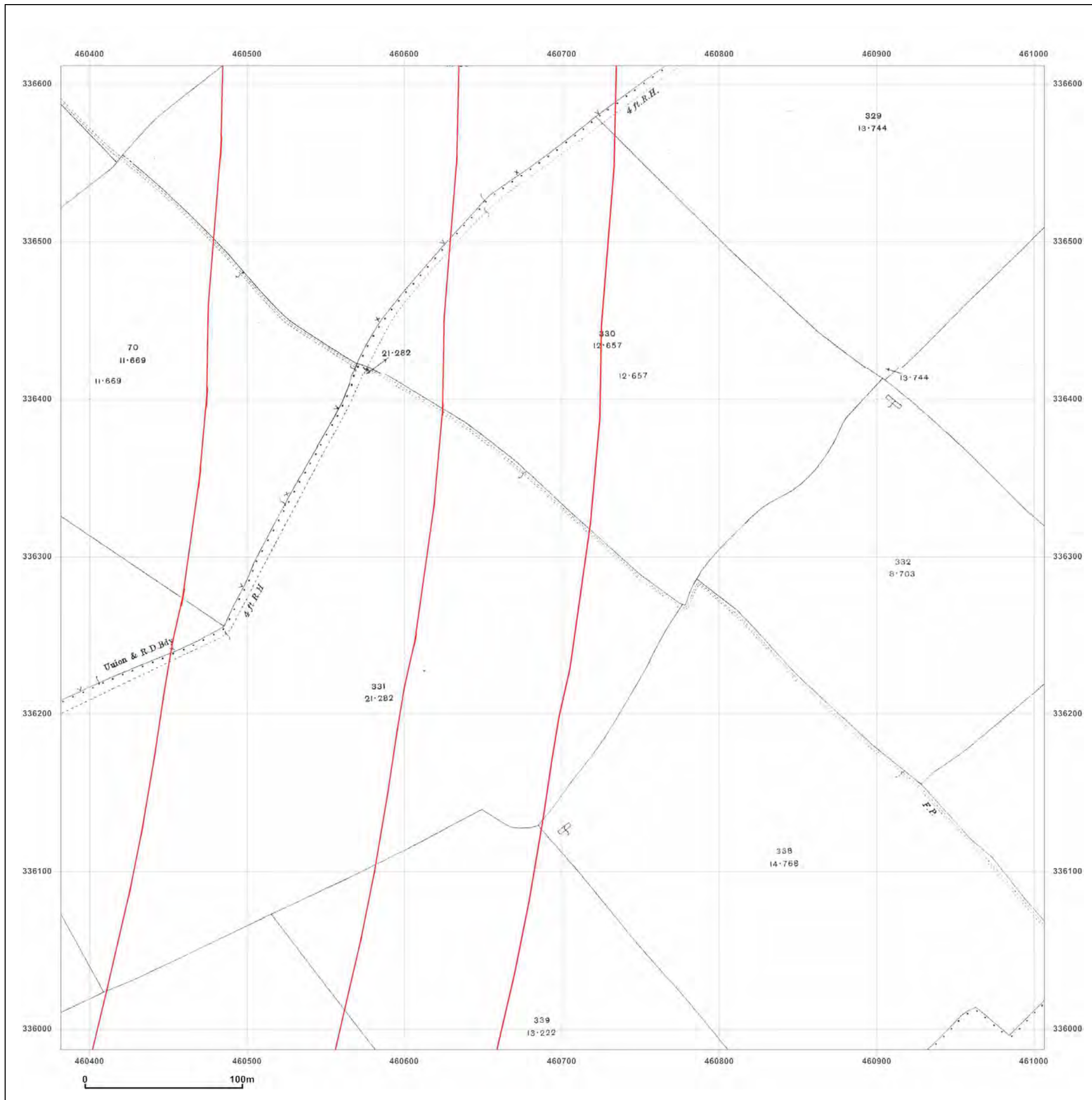
Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948	Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948
Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948	Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1948
Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1945	Surveyed 1952 Revised 1952 Edition N/A Copyright N/A Levelled 1945

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Client Ref: ENV131183~NTW2248
Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: County Series

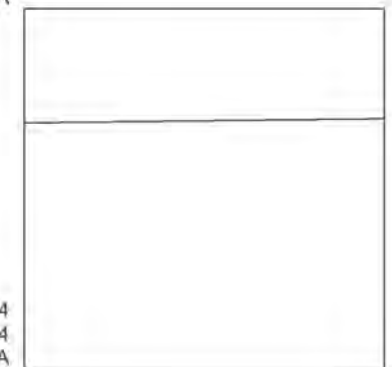
Map date: 1914

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

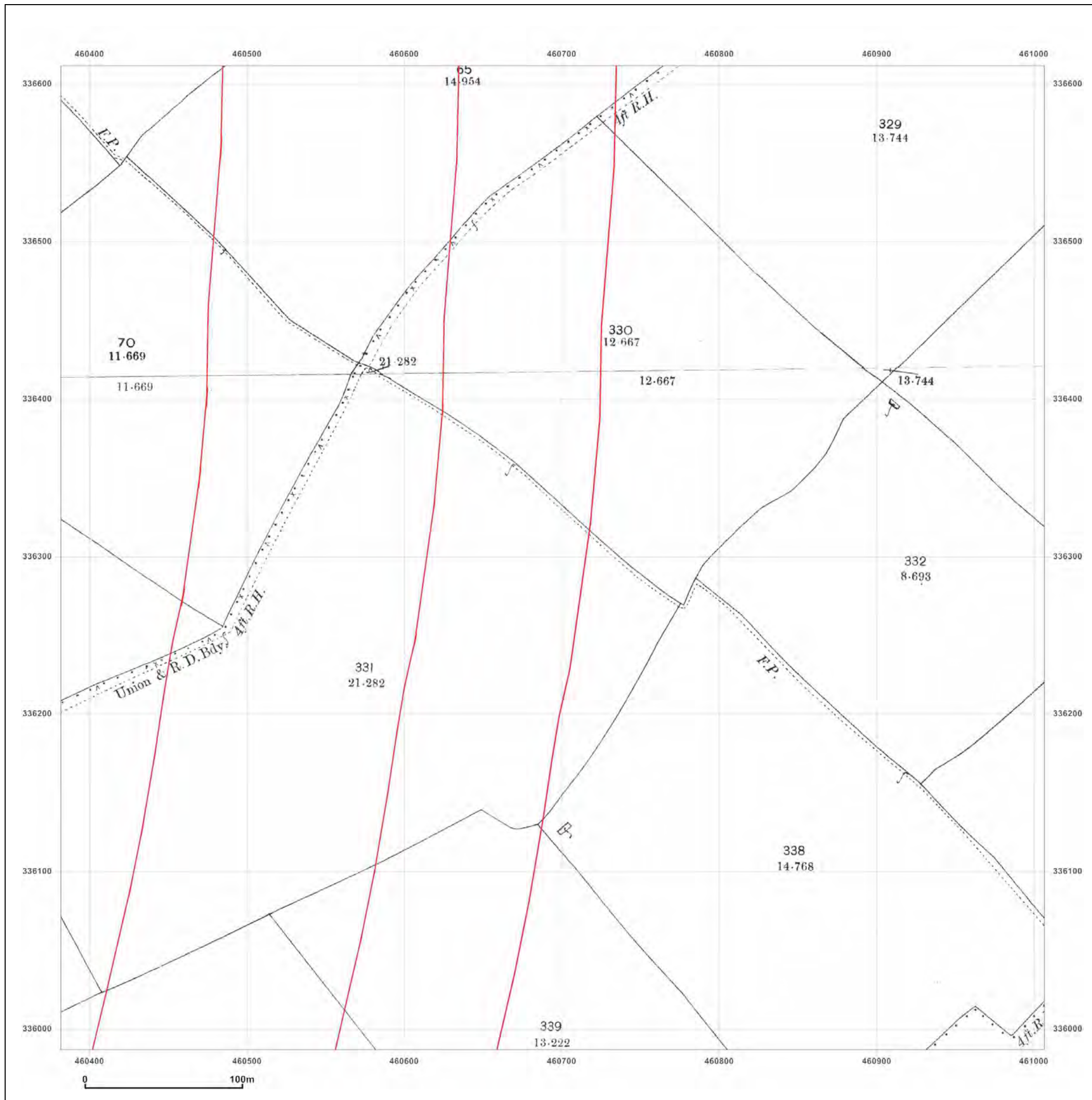


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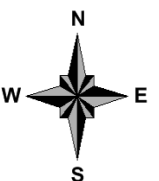
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Grid Ref: 460694, 336299

Map Name: County Series

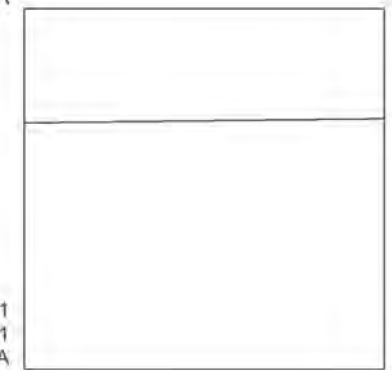
Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

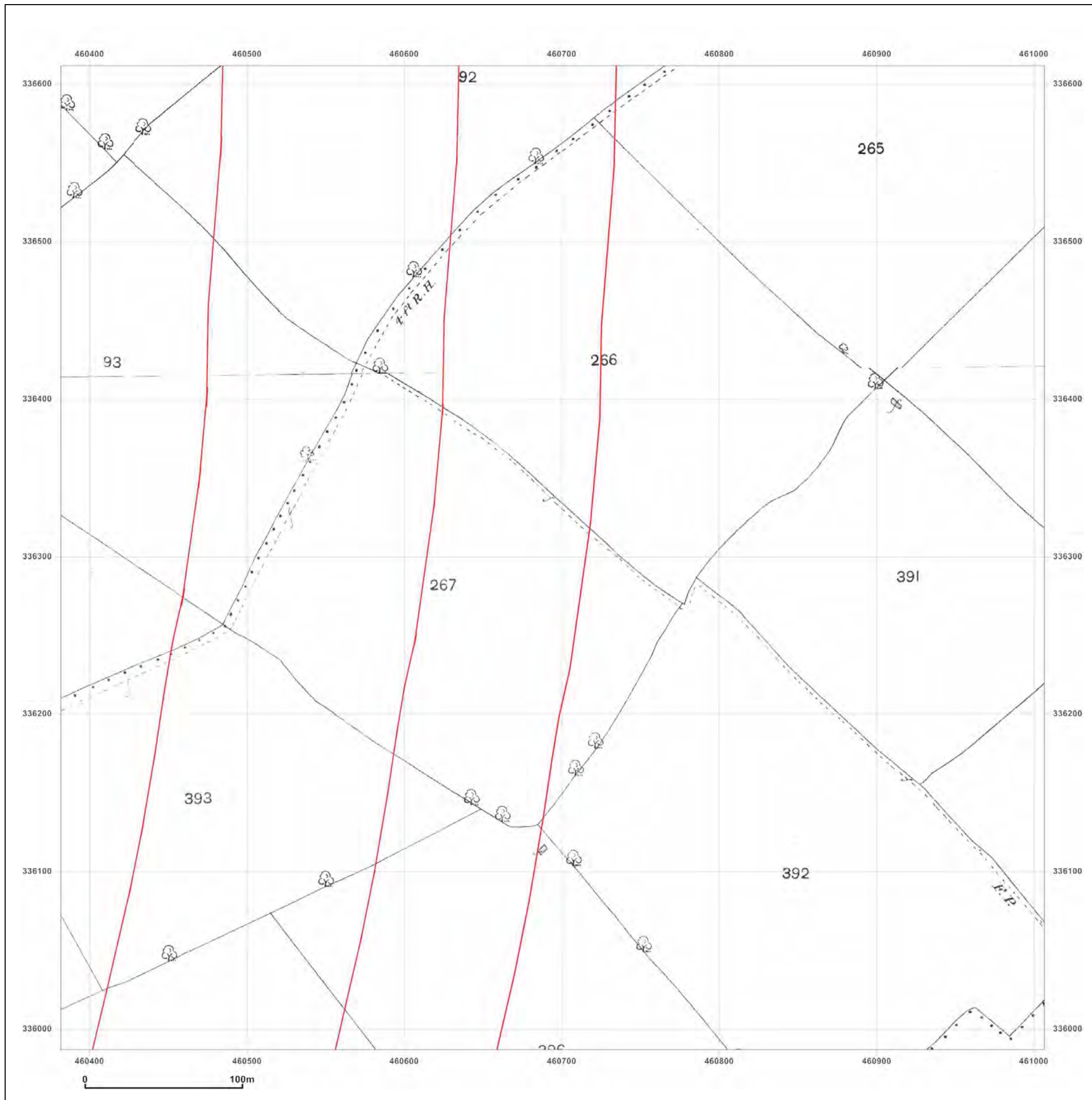


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Client Ref: ENV131183~NTW2248
Report Ref: HMD-214-1342876_LS_A2
Grid Ref: 460694, 336299

Map Name: County Series

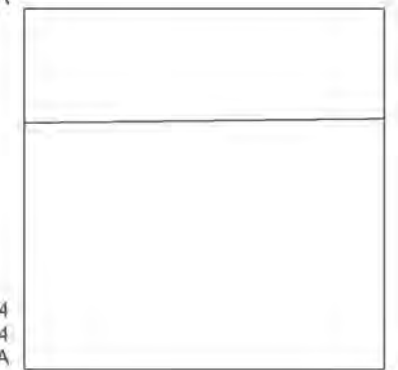
Map date: 1884

Scale: 1:2,500

Printed at: 1:2,500



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